

Control	0912-73-220
Project	F 2021(384)
Highway	VA
County	GALVESTON

## ADDENDUM ACKNOWLEDGMENT

**Each bidder is required to acknowledge receipt of an addendum issued for a specific project. This page is provided for the purpose of acknowledging an addendum.**

FAILURE TO ACKNOWLEDGE RECEIPT OF AN ADDENDUM WILL RESULT IN THE BID NOT BEING READ.

In order to properly acknowledge an addendum place a mark in the box next to the respective addendum.

- ADDENDUM NO. 1
- ADDENDUM NO. 2
- ADDENDUM NO. 3
- ADDENDUM NO. 4
- ADDENDUM NO. 5

In addition, the bidder by affixing their signature to the signature page of the proposal is acknowledging that they have taken the addendum(s) into consideration when preparing their bid and that the information contained in the addendum will be included in the contract, if awarded by the Commission or other designees.

This page intentionally left blank.

Control	0912-73-220
Project	F 2021(384)
Highway	VA
County	GALVESTON

# PROPOSAL TO THE TEXAS TRANSPORTATION COMMISSION

## 2014 SPECIFICATIONS WORK CONSISTING OF FERRY OPERATION PROJECTS GALVESTON COUNTY, TEXAS

The quantities in the proposal are approximate. The quantities of work and materials may be increased or decreased as considered necessary to complete the work as planned and contemplated.

This project is to be completed in 700 working days and will be accepted when fully completed and finished to the satisfaction of the Executive Director or designee.

Provide a proposal guaranty in the form of a Cashier's Check, Teller's Check (including an Official Check) or Bank Money Order on a State or National Bank or Savings and Loan Association, or State or Federally chartered Credit Union made payable to the Texas Transportation Commission in the following amount:

ONE HUNDRED THOUSAND (Dollars) ( \$100,000 )

A bid bond may be used as the required proposal guaranty. The bond form may be detached from the proposal for completion. The proposal may not be disassembled to remove the bond form. The bond must be in accordance with Item 2 of the specifications.

Any addenda issued amending this proposal and/or the plans that have been acknowledged by the bidder, become part of this proposal.

By signing the proposal the bidder certifies:

1. the only persons or parties interested in this proposal are those named and the bidder has not directly or indirectly participated in collusion, entered into an agreement or otherwise taken any action in restraint of free competitive bidding in connection with the above captioned project.
2. in the event of the award of a contract, the organization represented will secure bonds for the full amount of the contract.
3. the signatory represents and warrants that they are an authorized signatory for the organization for which the bid is submitted and they have full and complete authority to submit this bid on behalf of their firm.
4. that the certifications and representations contained in the proposal are true and accurate and the bidder intends the proposal to be taken as a genuine government record.

• **Signed:** \*\*

(1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_

**Print Name:**

(1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_

**Title:**

(1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_

**Company:**

(1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_

- Signatures to comply with Item 2 of the specifications.

\*\*Note: Complete (1) for single venture, through (2) for joint venture and through (3) for triple venture.

\* **When the working days field contains an asterisk (\*) refer to the Special Provisions and General Notes.**

## **NOTICE TO CONTRACTORS**

**ANY CONTRACTORS INTENDING TO BID ON ANY WORK TO BE AWARDED BY THIS DEPARTMENT MUST SUBMIT A SATISFACTORY “AUDITED FINANCIAL STATEMENT” AND “EXPERIENCE QUESTIONNAIRE” AT LEAST TEN DAYS PRIOR TO THE LETTING DATE.**

**UNIT PRICES MUST BE SUBMITTED IN ACCORDANCE WITH ITEM 2 OF THE STANDARD SPECIFICATIONS OR SPECIAL PROVISION TO ITEM 2 FOR EACH ITEM LISTED IN THIS PROPOSAL.**



# TEXAS DEPARTMENT OF TRANSPORTATION

## BID BOND

KNOW ALL PERSONS BY THESE PRESENTS,

That we, (Contractor Name) \_\_\_\_\_  
\_\_\_\_\_

Hereinafter called the Principal, and (Surety Name) \_\_\_\_\_  
\_\_\_\_\_

a corporation or firm duly authorized to transact surety business in the State of Texas, hereinafter called the Surety, are held and firmly bound unto the Texas Department of Transportation, hereinafter called the Oblige, in the sum of not less than two percent (2%) of the department's engineer's estimate, rounded to the nearest one thousand dollars, not to exceed one hundred thousand dollars (\$100,000) as a proposal guaranty (amount displayed on the cover of the proposal), the payment of which sum will and truly be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the principal has submitted a bid for the following project identified as:

<b>Control</b>	<b>0912-73-220</b>
<b>Project</b>	<b>F 2021(384)</b>
<b>Highway</b>	<b>VA</b>
<b>County</b>	<b>GALVESTON</b>

NOW, THEREFORE, if the Oblige shall award the Contract to the Principal and the Principal shall enter into the Contract in writing with the Oblige in accordance with the terms of such bid, then this bond shall be null and void. If in the event of failure of the Principal to execute such Contract in accordance with the terms of such bid, this bond shall become the property of the Oblige, without recourse of the Principal and/or Surety, not as a penalty but as liquidated damages.

Signed this \_\_\_\_\_ Day of \_\_\_\_\_ 20\_\_\_\_\_

By: \_\_\_\_\_  
(Contractor/Principal Name)

\_\_\_\_\_  
(Signature and Title of Authorized Signatory for Contractor/Principal)

\*By: \_\_\_\_\_  
(Surety Name)

\_\_\_\_\_  
(Signature of Attorney-in-Fact)

Impressed  
Surety Seal  
Only

\*Attach Power of attorney (Surety) for Attorney-in-Fact

**This form may be removed from the proposal.**

This page intentionally left blank.

# BIDDER'S CHECK RETURN

## IMPORTANT

The space provided for the return address must be completed to facilitate the return of your bidder's check. Care must be taken to provide a legible, accurate, and complete return address, including zip code. A copy of this sheet should be used for each different return address.

## NOTE

Successful bidders will receive their guaranty checks with the executed contract.

RETURN BIDDERS CHECK TO (PLEASE PRINT):


<b>Control</b>	<b>0912-73-220</b>
<b>Project</b>	<b>F 2021(384)</b>
<b>Highway</b>	<b>VA</b>
<b>County</b>	<b>GALVESTON</b>

## IMPORTANT

### PLEASE RETURN THIS SHEET IN ITS ENTIRETY

Please acknowledge receipt of this check(s) at your earliest convenience by signing below in longhand, in ink, and returning this acknowledgement in the enclosed self addressed envelope.

Check Received By: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

For (Contractor's Name): \_\_\_\_\_

Project \_\_\_\_\_ County \_\_\_\_\_

This page intentionally left blank.

## NOTICE TO THE BIDDER

In the space provided below, please enter your total bid amount for this project. Only this figure will be read publicly by the Department at the public bid opening.

It is understood and agreed by the bidder in signing this proposal that the total bid amount entered below is not binding on either the bidder or the Department. It is further agreed that **the official total bid amount for this proposal will be determined by multiplying the unit bid prices for each pay item by the respective estimated quantities shown in this proposal and then totaling all of the extended amounts.**

\$ \_\_\_\_\_  
**Total Bid Amount**

Control 0001-03-030  
 Project STP 2000(938)HES  
 Highway SH 20  
 County EL PASO

ALT	ITEM	DESC	SP	Bid Item Description	Unit	Quantity	Bid Price	Amount	Seq
	104	509	X	REMOV CONC (SDWLK)	MSY	266.400	\$10.000	\$2,664.00	1
						Total Bid Amount	\$2,664.00		

Signed \_\_\_\_\_  
 Title \_\_\_\_\_  
 Date \_\_\_\_\_

Additional Signature for Joint Venture:

Signed \_\_\_\_\_  
 Title \_\_\_\_\_  
 Date \_\_\_\_\_

**EXAMPLE OF BID PRICES SUBMITTED BY COMPUTER PRINTOUT**

EXAMPLE

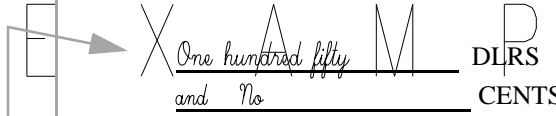
EXAMPLE

EXAMPLE


EXAMPLE

# EXAMPLES

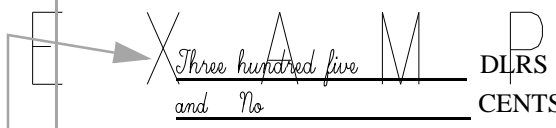
## BID PRICES SUBMITTED BY HAND WRITTEN FORMAT

ALT	ITEM-CODE			UNIT BID PRICE <u>ONLY</u> WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC NO	S.P. NO.				
	190	026		RED OAK 1 1/2 - 1 3/4 GAL BB  	EA	9.000	1

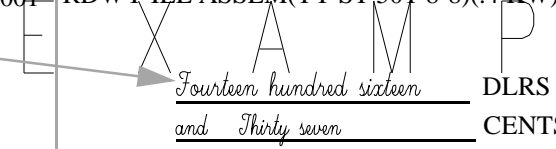
**Unit price for each plant in place**

	249	014		FLEX BASE(DEL)(DENSOT)(TY A GR4 CL2)  	TON	56,787.00	14
--	-----	-----	--	--	-----	-----------	----

**Unit price for each ton of Flexible Base**

	430	001	001	CL A CONC FOR EXT STR (CULV)  	CY	45.000	27
--	-----	-----	-----	---	----	--------	----

**Unit price for each cubic yard of Concrete**

	610	007	001	RDWY ILL ASSEM(TY ST 50T-8-8)(.4 KW)S  	EA	13.000	7
--	-----	-----	-----	--	----	--------	---

**Unit price of each Roadway Illumination Assembly**

EXAMPLE

EXAMPLE

EXAMPLE

EXAMPLE

This page intentionally left blank.



PROJECT F 2021(384)  
 COUNTY GALVESTON

Proposal Sheet  
 TxDOT  
 FORM 234-B I-61-5M

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	7263	6001		FERRYBOAT EQUIPMENT UPGRADE  DOLLARS and CENTS	LS	1.000	1

## **CERTIFICATION OF INTEREST IN OTHER BID PROPOSALS FOR THIS WORK**

By signing this proposal, the bidding firm and the signer certify that the following information, as indicated by checking "Yes" or "No" below, is true, accurate, and complete.

- A. Quotation(s) have been issued in this firm's name to other firm(s) interested in this work for consideration for performing a portion of this work.

\_\_\_\_\_ YES

\_\_\_\_\_ NO

- B. If this proposal is the low bid, the bidder agrees to provide the following information prior to award of the contract.

1. Identify firms which bid as a prime contractor and from which the bidder received quotations for work on this project.
2. Identify all the firms which bid as a prime contractor to which the bidder gave quotations for work on this project.

# DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352 (See reverse for public burden disclosure.)

<p>1. Type of Federal Action:</p> <ul style="list-style-type: none"> <li>a. contract</li> <li>b. grant</li> <li>c. cooperative agreement</li> <li>d. loan</li> <li>e. loan guarantee</li> <li>f. loan insurance</li> </ul>	<p>2. Status of Federal Action:</p> <ul style="list-style-type: none"> <li>a. bid/offer/application</li> <li>b. initial award</li> <li>c. post-award</li> </ul>	<p>3. Report Type:</p> <ul style="list-style-type: none"> <li>a. initial filing</li> <li>b. grant</li> </ul> <p style="text-align: right;">For material change only:  year _____ quarter _____  date of last report _____</p>
<p>4. Name and Address of Reporting Entity:</p> <p>? Prime                      ? Subawardee</p> <p style="padding-left: 100px;">Tier _____, if known:</p> <p><b>Congressional District</b>, if known:</p>		<p>5. <b>If Reporting Entity in No. 4 is Subawardee</b>, Enter Name and Address of Prime:</p> <p><b>Congressional District</b>, if known:</p>
<p>6. Federal Department/Agency:</p>	<p>7. Federal Program Name/Description:</p> <p>CFDA Number, if applicable: _____</p>	
<p>8. Federal Action Number, if known:</p>	<p>9. Award Amount, if known:</p> <p>\$ _____</p>	
<p>10. a. Name and Address of Lobbying Entity (if individual, last name, first name, MI):</p>		<p>b. Individuals Performing Services (including address if different from No. 10a) (last name, first name, MI):</p>
<p>(attach Continuation Sheet(s) SF-LLL-A, if necessary)</p>		
<p>11. Amount of Payment (check all that apply):</p> <p>\$ _____ actual                      planned</p>	<p>13. Type of Payment (check all that apply):</p> <ul style="list-style-type: none"> <li>a. retainer</li> <li>b. one-time fee</li> <li>c. commission</li> <li>d. contingent fee</li> <li>e. deferred</li> <li>f. other; specify: _____</li> </ul>	
<p>12. Form of Payment (check all that apply)</p> <ul style="list-style-type: none"> <li>a. cash</li> <li>b. in-kind; specify:                      nature _____ value _____</li> </ul>		
<p>14. Brief Description of Services Performed or to be Performed and Date(s) of Service, including officer(s), employee(s), or Member(s) contacted, for Payment Indicated in Item 11:</p> <p>(attach Continuation Sheet(s) SF-LLL-A, if necessary)</p>		
<p>15. Continuation Sheet(s) SF-LLL-A attached:                      ? Yes                      ? No</p>		
<p>16. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.</p>	<p>Signature: _____</p> <p>Print Name: _____</p> <p>Title: _____</p> <p>Telephone No: _____ Date: _____</p>	
<p>FEDERAL USE ONLY</p>		<p>Authorized for Local Reproduction Standard Form - LLL</p>

## **INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES**

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Use the SF-LLL-A Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a follow-up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity or this covered Federal action.
4. Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee", then enter the full name, address, city, state and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number, the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, state and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.  
(b) Enter the full names of the individual(s) performing services, and include full address if different from 10(a). Enter Last Name, First Name, and Middle Initial (MI).
11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.
14. Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in actual contact with Federal officials. Identify the Federal official(s) or employee(s) contacted or the officer(s), employee(s), or Member(s) of Congress that were contacted.
15. Check whether or not a SF-LLL-A Continuation Sheet(s) is attached.
16. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503.

# DISCLOSURE OF LOBBYING ACTIVITIES

Approved by OMB

0348-0046

## CONTINUATION SHEET

Reporting Entity: \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

# CONTRACTOR'S ASSURANCE

(Subcontracts-Federal Aid Projects)

By signing this proposal, the contractor is giving assurances that all subcontract agreements will incorporate the Standard Specification and Special Provisions to Section 9.9., Payment Provisions for Subcontractors, all subcontract agreements exceeding \$2,000 will incorporate the applicable Wage Determination Decision, and all subcontract agreements will incorporate the following:

Special Provision	Certification of Nondiscrimination in Employment
Special Provision	Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)
Special Provision	Standard Federal Equal Employment Opportunity
Construction	Construction Specifications (Executive Order 11246)
Form FHWA 1273	Required Contract Provisions Federal-aid Construction Contracts (Form FHWA 1273 must also be physically attached to subcontracts and all lower-tier subcontracts)
Special Provision	Nondiscrimination (Include provisions of Sections 3.1 – 3.6 in all subcontracts and agreements for materials)
Special Provision	Cargo Preference Act Requirements in Federal-Aid Contracts
Special Provision	Disadvantaged Business Enterprise in Federal-Aid Contracts

# ENGINEER SEAL

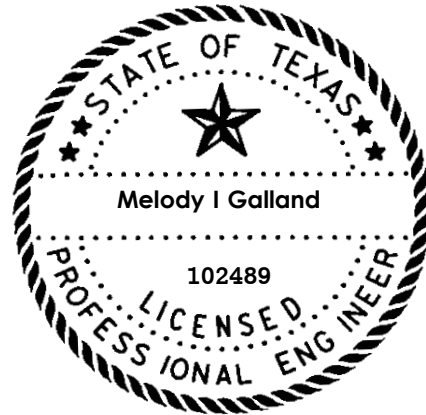
Control 0912-73-220

Project F 2021(384)

Highway VA

County GALVESTON

The enclosed Texas Department of Transportation Specifications, Special Specifications, Special Provisions, General Notes and Specification Data in this document have been selected by me, or under my responsible supervision as being applicable to this project. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.



The seal appearing on this document was authorized by  
*Melody I Galland, P.E.*  
APRIL 21, 2022

**County:** GALVESTON

**Highway:** SH 87

**General Notes:**

Contractor questions on this project are to be addressed to the following individual(s):

Vincent Hieu Tong, P.E.; [Hieu.Tong@txdot.gov](mailto:Hieu.Tong@txdot.gov) Assistant Director of Maintenance

Donald A. Marquise; [Donald.Marquise@txdot.gov](mailto:Donald.Marquise@txdot.gov) Maintenance Supervisor

Contractor questions will be accepted through email, phone, and in person by the above individuals. Contractor questions will be reviewed by the Assistant Director of Maintenance, or the Maintenance Supervisor. Once a response is developed, it will be posted to TxDOT's Public FTP at the following address:

<https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/>

Questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, and CCSJ/Project Name.

The following standard detail sheets are modified: None.

**General: Site Management**

This will be a 700 Calendar day project. This will include Contractor pick up of the ferryboat John W. Johnson from Galveston Ferry Landing after day 300 due to anticipated Engineering and materials lead times. Contractor is responsible for all trials and movement of the Ferryboat from / to Galveston ferry.

A Schedule and Schedule of Values (SOV) including all items of work will be submitted to TxDOT for approval prior to commencement of work.

Contractor is responsible to obtain all USCG / ABS approvals.

Provide secure location for vessel at all times while at vendor's shipyard. Vessel is considered State of Texas vehicle. Under no circumstances is smoking allowed in State of Texas vehicle. Responsible for security and watertight integrity of vessel. Watertight doors shall be secured when no personnel are working on vessel.

TxDOT property shall be properly stored in secure location and properly marked by project and vessel. All electrical equipment stored as per manufacture's recommendations.

Parts removed by the vendor will become property of TxDOT upon the request of TxDOT representative. Should TxDOT waive salvage of any parts said items become property of the



**County:** GALVESTON

**Highway:** SH 87

vendor. Disposal of parts shall be in accordance with all City, County, State, and Federal regulations.

Provide secure workspace/office to be able to hold two desks and two filing cabinets for TxDOT use throughout term of contract.

Provide all electrical service needed to complete contract. Isolation transformer shall be utilized at all times when providing power to ferry.

Provide all gangways, ensure all are secured and have at least one handrail.

TxDOT reserves the right to have TxDOT crews working on the ferryboat as needed while at the vendor location.

Perform tests and issue Gas Free Certificate(s) as needed at no charge to TxDOT. Testing shall include but not be limited to oxygen content, explosive gases or poisonous gases. Testing shall be performed by licensed Marine Chemist as required by TxDOT, Shipyard, ABS, and USCG. Gas Free Certificate(s) shall be provided to TxDOT.

Remove construction materials, debris, trash, and vendor equipment to the satisfaction of the designated TxDOT representative during and at the completion of work. Oil and grease that gets on the deck plates and painted areas shall be cleaned immediately to prevent accidents and staining.

The contractor shall take all necessary precautions to protect the existing equipment, areas and furnishings during the execution of the work.

**Item 5: Control of the Work**

Provide engineering & working drawings and calculations to TxDOT as outlined in the "Specifications" included in the proposal.

**Item 6: Control of Materials**

Buy America. Comply with the Legal Relations and Responsibilities

**Item 7: Legal Relations and Responsibilities**

No significant traffic generator events have been identified.

**Item 8: Prosecution and Progress**

Create, maintain, and submit for approval, a Critical Path Method (CPM) project schedule using

**County:** GALVESTON

**Highway:** SH 87

computer software that is fully compatible with the latest version of Primavera Systems, Inc. or Primavera Project Planner (P3 or P6).

The Department will supply bidders, upon written request, one electronic copy of the time determination schedule. The time determination schedule provided is for informational use only and is not intended for bidding or construction purposes.

The Department will not adjust the number of days for the project and milestones, if any, due to differences in opinion regarding any assumptions made in the preparation of the schedule or for errors, omissions, or discrepancies found in the time determination schedule.

Working days will be computed and charged based on Calendar Day in accordance with Section 8.3.1.5 of the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges.

Provide approved electronic construction schedule.

**Item 506: Temporary Erosion, Sedimentation and Environmental Controls**

Due to the nature of the work involved, a Storm Water Pollution Prevention Plan (SWP3) is not required. However, if a SWP3 becomes necessary, it will be paid as extra work.

Use appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging area. Remove and dispose of materials in compliance with State and Federal laws.

**Item 7263: Ferryboat Equipment Upgrade**

Furnish all materials, equipment, labor allowances and incidentals necessary for the upgrade of Ferryboat Equipment as shown in the Plans, Re-Power Technical Specification, and all applicable TxDOT Specifications.

Ensure all materials conform to the details shown on the plans and the requirements of this item.

Use construction methods in accordance with the plans, details, and the specifications.

This item will be measured by the lump sum.

This Item will be measured for completed work corresponding to the "Schedule of Values" to facilitate accurate partial payments. The lump sum dollar amount will be rounded to the nearest integer and this number will serve as the total number of units multiplied by the unit price of one dollar.

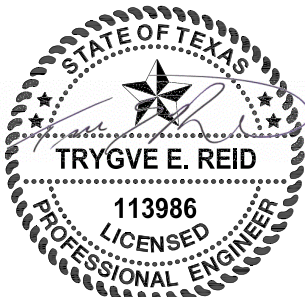
**County:** GALVESTON

**Highway:** SH 87

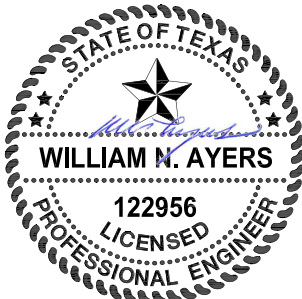
The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Ferryboat Equipment Upgrade." This price is full compensation for furnished tools, equipment, labor, materials, and incidentals necessary to complete the work.



ELLIOTT BAY  
DESIGN GROUP, LLC  
F-10172



ELLIOTT BAY  
DESIGN GROUP, LLC  
F-10172



ELLIOTT BAY  
DESIGN GROUP, LLC  
F-10172

**JOHN W. JOHNSON**  
**(O.N. 1228845)**

Re-Power Technical  
Specification

Prepared for: Texas Dept. of Transportation • Galveston, TX

Ref: 20050-002-832-0

Rev. -

February 3, 2022

better to build • better to operate

Seattle | New Orleans | Ketchikan | New York

[www.ebdg.com](http://www.ebdg.com)

## PREPARED BY

ELLIOTT BAY DESIGN GROUP  
5305 SHILSHOLE AVE. NW, STE. 100  
SEATTLE, WA 98107

## GENERAL NOTES

1. Reg Wren, TX PE #140118 is the engineer in responsible charge for the machinery systems. Trygve E Reid, TX PE# 113986 is the engineer in responsible charge for the structural and naval architecture design. William N. Ayers, TX PE# 122956 is the engineer in responsible charge for the electrical systems. Refer to the sealed Contract Guidance drawings for a more detailed subdivision of responsible engineer subdivision.
2. The USCG MSC has evaluated the proposed repowering of the JOHN W JOHNSON against the major conversion criteria in Title 46, United States Code §2101(18). Per USCG MSC Letter H2-2100110 dated 1/21/21, this work has been determined to not constitute a major conversion.

## REVISIONS

REV	DESCRIPTION	DATE	APPROVED
-	100% Final Issue	2/03/22	RKW 140118  TER 113986  WNA 122956

CONFIDENTIAL AND PROPRIETARY PROPERTY OF  
ELLIOTT BAY DESIGN GROUP LLC  
MAY NOT BE USED FOR CONSTRUCTION OR PROVIDED TO  
ANY THIRD PARTIES WITHOUT PRIOR WRITTEN CONSENT.  
© 2022 ELLIOTT BAY DESIGN GROUP.

## TABLE OF CONTENTS

	PAGE
Group 000 - General	1
010.0    Principal Characteristics and General Description	1
011.0    Definitions	1
030    Contract and Contract Guidance Drawings	1
031    Contractor Drawings	3
040    Master Construction Schedule	4
041    Plan Schedule	6
042    Buy America Compliance	6
043    Material Substitutions	6
046    Purchase Technical Specifications, Requisitions, and Purchase Orders	8
072    Classification, Government Regulation and Other Requirements	8
073    Vibration and Noise	10
074    Welding	10
075    Removals, Alterations, And Interference Resolution	11
076    Guarantee	11
078    Materials and Workmanship	12
079    Environmental Conditions	12
083    Equipment Storage	13
088    Care of Vessel During Construction	13
091    Inspection	14
092    Scheduled Routine Maintenance	14
096    Weight Control Program	14
099    Photographs	14
Group 100 – Hull Structure	15
101.1    General Arrangement	15
101.2    Fire and Safety Plan	16
101.7    Structural Fire Protection	16
101.8    Pilot House Arrangement	16
110.6    ESS Space Structural Modifications	16
110.7    EOS Structural Modifications	16
180.0    Generator Foundations	17

191.0	Fixed Ballast	17
Group 200 – Propulsion Machinery		18
201.1	Machinery Arrangement	19
202.1	Emergency Generator Room Arrangement	19
233.0	Propulsion Generator Internal Combustion Engines	21
243	Propulsion Shafting Alignment	24
251	Combustion Air System	24
252	Main Propulsion Controls	24
256	Cooling Systems	25
259	Exhaust and Ventilation Systems	26
261.0	Fuel Oil Systems	28
262	Main Propulsion Lube Oil System	30
Group 300 – Electrical		33
300.1	Equipment and Materials	34
300.2	Equipment Nameplates and Markings	35
300.3	Electrical Equipment Removals	36
301	Battery Management System	37
302	Electric Motors and Controllers	38
310	Propulsion Alternators	42
320	Electrical Distribution Systems	43
324	New 600V Ship Service Switchboard	48
325	Propulsion DC Switchboards	51
326	Emergency Switchboard	54
Group 400 – Command and Surveillance / Electronics		56
410	EOS Consoles	56
420	Navigation Equipment	57
430	Interior Communications	57
436	Fire Detection and Alarm System	59
439	Closed-Circuit Television System (CCTV)	59
Group 500 – Auxiliary Machinery		61
505	Piping	61
508	Piping Insulation	66
514	ESS HVAC And Ventilation	68

521	Fire Main System	70
533	Potable Water	70
551	Compressed Air System	70
555	Fixed Fire Extinguishing Systems	71
Group 600 – Equipment and Outfit		74
602	Nameplates, Notices and Markings	74
622	Floor Plates, Ladders and Guards	77
631	Painting	77
632	Deck Coverings	77
633	Insulation, Linings and Ceilings	77
633.0	Structural Fire Insulation	78
633.1	Acoustic Insulation	78
633.2	Linings & Ceilings	78
633.3	EOS -Linings, Ceiling and Deck	78
Group 800 – Integration Engineering		79
810	Engineering and Working Drawings, Calculations, and Review	79
810.1	EOS and Pilot house Arrangements	80
810.2	Regulatory Procedures and Analysis	80
810.3	Arc Flash Study	81
810.4	As-Built Drawings	81
810.5	Vendor System Diagrams	81
810.6	Display Drawings for Mounting Onboard	82
810.7	Docking Plan	82
835.0	Field Office for Inspectors	82
843.0	Trim and Stability Booklet	83
851.0	Training	83
856.0	Instruction Books, Operating Manuals, and Technical Data Sheets	84
Group 900 – Tests, Trials and Delivery		86
982.0	Tests and trials	86
982.1	Hull Tests	87
982.2	Machinery Tests	87
982.3	Electrical Power, Control, and Monitoring Tests	89
982.4	Dock and Builder's Trials	90



982.5	Sea Trials	90
982.6	Operational Trials	91
982.7	Test and Trial Instruments	92
983.0	Delivery	92
996.0	Dry Docking	93
Appendix A		95
	Paint Specification	96
Appendix B		107
	Weight Moment Calculation	108
Appendix C		111
	Routine Maintenance Specification	112
Appendix D		120
	Contractor Provided Oils	121
Appendix E		122
	Siemens Schedule	123
Appendix F		124
	Existing As-Built Drawings	125
Appendix G		128
	Siemens Specification	129

## GROUP 000 - GENERAL

It is the intent of this Specification and the accompanying Contract Plans to describe the Re-Powering of the JOHN W. JOHNSON for the Texas Department of Transportation (TxDOT). The vessel is to be complete in all respects, fully equipped and fitted out in accordance with this Specification and complying with all applicable requirements of the U.S. Coast Guard and the American Bureau of Shipping. It is not the intent of this Specification and the accompanying plans to cover every minor detail of construction and equipment. Therefore, any material or parts, the omission of which would be detrimental to the seaworthiness or serviceability of the vessels and the inclusion of which is generally accepted good shipbuilding practice, shall be provided by the Contractor to the satisfaction of the TxDOT's Representative and without increase in cost to TxDOT.

Main propulsion will be supplied by a diesel-electric plant at amidships that powers two electric motors and one fixed pitched propeller at each end. The ferry also has a lithium-ion battery energy storage system (ESS) that can power the ferry for 20-30 minutes at rated motor power (with final time to be verified in sea trials) without generator operation. The ESS shall be designed to operate so that only one or two generators out of four shall be online in normal operation.

All equipment, form and function, shall be provided so as to allow for double-ended operation. Where two of any pieces of equipment are required for proper operation of the ferry, even if only one is mentioned in this Specification, both shall be provided by the Contractor.

### 010.0 PRINCIPAL CHARACTERISTICS AND GENERAL DESCRIPTION

The vessel is a double-ended, geared diesel-electric powered automobile and passenger ferry, outfitted for service between Galveston and Bolivar, TX. The vessel is certificated under 46 CFR Subchapter H and is classed by ABS as a ✕ A1, Vehicle Passenger Ferry, Harbor, River Service, ✕ AMS.

### 011.0 DEFINITIONS

- |    |  |   |
|----|--|---|
| A. | Owner, Owner's Representative, TxDOT or TxDOT's Representative | Where the terms "Owner" or "Owner's Representative" are used, they refer to the Texas Department of Transportation, or its authorized representative who shall have exclusive authority to approve work performed, changes other than to plans, substitutions, etc. |
| B. | Contractor or Shipyard   | Where the term "Contractor" appears in this Specification, such terms refer to the individual, firm, or corporation undertaking the execution of the work under the terms of the Contract.  |
| C. | Naval Architect  | Where the term "Naval Architect" appears in this Specification, such term refers to Elliott Bay Design Group LLC, Naval Architects and Marine Engineers, Seattle, WA.   |
| D. | USCG   | United States Coast Guard   |
| E. | ABS  | American Bureau of Shipbuilding   |

## 030 CONTRACT AND CONTRACT GUIDANCE DRAWINGS

The vessel shall be modified in accordance with the drawings listed below, which form part of this Specification. Any conflict or disagreement between this Specification and the Contract Guidance Drawings are to be brought to the attention of TxDOT via a submittal RFI process.

The Contract Documents are intended to supplement each other. Items contained in one, but omitted from the other, are intended to be provided and installed by the Contractor.

Changes to work shown on the Contract Guidance Drawings or in the Specification shall not be made without the written approval of Owner. The Contract Guidance Drawings show acceptable arrangements and features to guide the Contractor in the development of the additional details required for construction, and for regulatory agency and Owner approvals. The Contract Guidance Drawings are not intended to show a completed and detailed design. The Contractor shall develop the Construction Drawings as appropriate and as necessary for construction using the sources of information not available during contract design development including certified vendor drawings, templating from actual equipment, or using more detailed information provided by equipment vendors under contract to the Contractor.

Piping systems are diagrammatic; hence the Contractor will be required to develop the systems and conduct his own interference survey. All pipe routing to be approved by Owner prior to installation. Machinery and equipment have been arranged so that proper clearance for working the vessel and performing repairs can be conveniently carried out. The Contractor is cautioned to check and verify dimensions and sizes from the manufacturer's certified drawing or the actual equipment itself, to ensure that the customary growth in machinery size does not cause interferences. Unusually large changes in size must be promptly called to the attention of TxDOT.

The Contract Guidance Drawings are in two phases. Phase 001 highlights equipment which is to be removed as a part of the work. The final extent of removals will be determined by the Contractor during detailed planning of the work, see Section 075. Phase 001 drawings will be submitted to ABS for Information. Phase 002 drawings represent the final planned configuration. The Phase 002 drawings and supporting documentation will be submitted to ABS and USCG (as required) for review.

*Table 1: List of References – Contract Guidance Drawings and Supporting Documentation*

DRAWING NO.	TITLE
Contract Guidance Drawings (Removals)	
20050-001-101-0	General Arrangement Removal
20050-001-201-1	Machinery Arrangement Removal
20050-001-202-1	Emergency Generator Room Arrangement Removal
20050-001-256-2	Keel Cooling Removal
20050-001-259-1	Exhaust Arrangement Removal
20050-001-261-0	Fuel Oil System Removal
20050-001-262-1	Lube Oil System Removal
20050-001-262-2	Dirty Oil System Removal
20050-001-320-1	Electrical One-Line Diagram Removal
20050-001-551-0	Compressed Air System Removal
20050-001-662-0	EOS Arrangement Removal
Contract Guidance Drawings (Final Configuration)	
20050-002-101-0	General Arrangement
20050-002-101-2	Fire & Safety Plan
20050-002-101-7	Structural Fire Protection
20050-002-101-8	Pilot House Arrangement
20050-002-110-6	ESS Structural Modifications
20050-002-110-7	EOS Structural Modifications

DRAWING NO.	TITLE
20050-002-180-0	Generator Foundations
20050-002-201-1	Machinery Arrangement
20050-002-202-1	Emergency Generator Room Arrangement
20050-002-256-2	Keel Cooling Arrangement
20050-002-259-1	Exhaust Arrangement
20050-002-261-0	Fuel Oil System
20050-002-262-1	Lube Oil System
20050-002-262-2	Dirty Oil System
20050-002-320-1	AC Electrical One-Line Diagram
20050-002-320-2	DC Electrical One-Line Diagram
20050-002-514-0	ESS HVAC And Ventilation
20050-002-551-0	Compressed Air System
20050-002-662-0	EOS Arrangement

The following supporting documents and files will also be provided to the Contractor:

DOCUMENTS	TITLE
20050-002-300-0	Electrical Power Loads Analysis
20050-002-833-1	Weight Moment Calculation

Electronic format modifiable files of the drawings and documents listed above will be provided to the Contractor for use on this project at the start of contract.

The design described by this Re-Power Technical Specification and the above listed Contract Guidance Drawings and Documents are proprietary to Elliott Bay Design Group LLC. They are assigned to use by the Contractor, its sub-contractors, and agents for use in the re-powering of the JOHN W JOHNSON. They shall not be used in whole or in part for any other purpose. This restriction in use does not extend to design details wholly developed by the Contractor, its sub-contractors, or agents that may be used in the construction of these ferries.

In addition to the drawings above, the existing as-built drawings listed in Appendix F will be provided to the contractor for use on this project. Note that these drawings are provided for reference only. Modifications to the vessel have been made after their creation, and they may not accurately depict the current condition of the vessel in all details. It is incumbent upon the Contractor to determine how such inaccuracies may impact the execution of the work and include the costs of such in their price.

## 031 CONTRACTOR DRAWINGS

Prints of all arrangements, structural, piping, electrical, plans and other documentation required for approval shall be prepared by the Contractor and submitted to the applicable Regulatory Bodies, representatives of Owner and the Architect for approval before work is commenced. Any additions and corrections required by Owner, in keeping with this Specification, shall be made by the Contractor. After revision, submission will be repeated and further revisions incorporated, if required, until final approval is obtained. Such approval, however, will not relieve the Contractor of his responsibility with regard to details and the necessity of making subsequent revisions in the plans, or changes on the vessel, to ensure satisfactory installation and operation.

Any item submitted to Owner in accordance with the above shall be considered approved if their written approval action is not received by the Contractor within a period of 15 days after submittal. Any work undertaken by the Contractor in advance of approval shall be at the Contractor's risk.

Any errors found in the Contract Plans or Contract Guidance Plans shall be corrected on detailed drawings, but failure to discover errors will not relieve the Contractor from responsibility for the satisfactory installation and operation, and any incorrect work resulting there from shall be corrected without additional cost to TxDOT. Contractor shall submit all needed questions during the letting process.

The Contractor shall provide all detailed working drawings necessary for the construction of the ferry to suit its own construction methods. It should be noted that all system drawings are schematic and generally show where systems may be run. The Contractor shall be required to develop the details of the systems and how they are to be run.

Bills of material and requisitions for all items purchased by the Contractor shall be submitted to Owner in duplicate, for approval and revisions, as required.

Changes to work shown in the Contract Guidance Drawings or in the Specification shall not be made without written approval from Owner. The Contract Guidance Drawings show acceptable arrangements and features to provide guidance to the Contractor in the development of additional details required for construction and for regulatory agency and Owner approvals.

The Contractor shall provide final as-built drawings as described in Section 810.4.

## 040 MASTER CONSTRUCTION SCHEDULE

Contract shall follow the 2014 Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges Section 8.3.1.5 Calendar Day. Working Days will be charged Sunday through Saturday, including all Holidays, regardless of weather conditions, material availability, or other conditions not under the control of the Contractor. Work is permitted 24 hours a day and contractor shall utilize as needed to maintain schedule. This includes all material to complete contract. No weather days will be credited on contract. Contract is 700-day contract with first 299 days for engineering and parts approval and procurement. Contractor cannot take possession of the vessel JOHN W. JOHNSON until day 300 of contract. It is assumed that machinery installation work will commence 50 days prior to the scheduled receipt of the gensets. Contractor is responsible for all movement of the vessel from Galveston to Shipyard, trials, and return of Ferryboat back to Galveston upon completion of Contract. Vessel shall be delivered back to Galveston in same or better condition on all areas of vessel including area of upgrades and all other areas of vessel.

Within twenty-one (21) calendar days after execution of the contract, Contractor will submit to TxDOT, four (4) preliminary copies of a complete Master Construction Schedule showing the Contractor's plan and construction sequence proposed to accomplish the work within the Contract period. TxDOT will review this document, comment, return a marked-up copy within ten (10) working days to the Contractor, and then meet with the Contractor to discuss the comments. The Contractor shall schedule the review meeting to be held within ten (10) working days after receipt of TxDOT's comments. The Master Construction Schedule shall be updated by the Contractor within two (2) working days after the review meeting, and then resubmitted to TxDOT for final approval as the working document.

The Master Construction Schedule shall sequence and schedule all work detailed in the Contract Documents, in accordance with the generally accepted practices for project management. The Master Construction Schedule shall be a time-phased/resource loaded Gantt Bar Chart. The Contractor shall decompose the activities indicated in the Contract Documents, down to a sufficient number of discreet

tasks, to adequately control and monitor the work and to clearly report progress for the duration of the project. Progress shall be shown as a percentage by task and by overall project completion. Indicate, by table or directly on the Gantt Bar Chart, the start and stop dates, free float, and total float for each task. Indicate, by table or by link lines, all predecessor and successor dependencies for each task. Develop and clearly indicate the critical path through the project.

The Contractor shall schedule and chair a monthly progress meeting, starting the first week, with the TxDOT Representative and the Contractor's key production persons. The Contractor shall provide four (4) copies of an updated Master Construction Schedule and a progress report (expressed as a percentage of work complete) by Activity in a tabular form, and a list of completed milestones. The updated Master Construction Schedule shall reflect opened items, additional work, deleted work, and modifications, in addition to work progress and completions. In the last 120 calendar days of the scheduled performance period, the Contractor shall additionally prepare and submit an Open Task Report. The Contractor shall update and submit the Open Task Report at each subsequent progress meeting, and then daily starting the first day of the last thirty (30) calendar days of the scheduled performance period.

The Master Construction Schedule shall additionally indicate the starting and completion dates for the following items:

- The Contract award date
- Commencement and completion of engineering
- Regulatory body submittal dates for calculations and drawings.
- Long lead time purchase order submittals. Anticipated date of delivery of all long lead time equipment and components and all major equipment.
- Receipt of vessel in shipyard / commencement of vessel work.
- Drydocking schedule
- Removal of main engines
- Removal of existing fixed ballast and installation of new.
- Prefabrication, fabrication, assembly, and erection of all structural components.
- Installation of major machinery components and packaged subassemblies.
- Builder's trials
- Dock trials
- Sea trials
- Delivery of the vessel to TxDOT
- Owner's acceptance of the Vessel
- Start, duration and completion of all significant task items.
- Anticipated date of all items described in this Specification for TxDOT Representative's Review or Approval.
- Earned value schedule of payments for construction progress (Schedule of Values).
- Milestone dates for payment on major equipment purchases which are to be approved by TxDOT and supported with documentation.

Review of the Master Construction Schedule by the TxDOT Representative does not relieve the Contractor of responsibility to adjust labor force, equipment resources, or work schedule, as necessary, to anticipate and ensure completion of the work within the prescribed contract period.

The Contractor shall provide bi-weekly engineering updates to the TXDOT Representative for the duration of the contract.

## 041 PLAN SCHEDULE

Within twenty-one (21) calendar days after execution of the Contract, the Contractor shall submit a plan schedule of working drawings for approval by the TxDOT Representative. The Plan Schedule shall list all drawings and documents required for submittal in this Specification and Contract Guidance Drawings and as required for all regulatory and class approval requirements. The schedule shall be submitted as paper copy and as an Excel spreadsheet. The schedule shall include the following:

- A drawing number for each drawing listed.
- Drawing title
- Scheduled date the drawing will be submitted by the Contractor for approval to TxDOT.
- Scheduled date the drawing will be submitted by the Contractor for approval by the regulatory agencies.
- Columns for recording the actual date of the initial submittal, the dates for approvals, and a column showing the current letter revision of each drawing.
- A list of drawings prepared by all subcontractors and vendors.

The Contractor shall revise and submit the schedule by the first of each month to show all changes, progress, and delays. Upon completion of the vessel, and prior to delivery to TxDOT, the Contractor shall furnish a final copy of this schedule to TxDOT.

## 042 BUY AMERICA COMPLIANCE

This is a Federal Highway Administration (FHWA) funded project. Source of supply and quality of materials shall comply with TxDOT requirements, as specified in Standard Specifications for Construction of and Maintenance of Highways, Streets and Bridges 2014, Item 6 Control of Materials (1.1) Buy America which mandate compliance with 23 CFR 635.410 (Buy America requirements) for federal aid highway projects.

In accordance with 23 CFR 635.410, a nationwide waiver has been granted for certain ferryboat equipment and machinery items: marine diesel engines, electrical switchboards and switch gear, fittings, electric motors, pumps, ventilation fans, boilers, electrical controls, and electronic equipment. Items not specifically included in the waiver remain subject to the Buy America requirements. While waivers may be requested for other items, the basis of successful waiver applications is the non-availability of a functionally equivalent and serviceable product in which all steel and iron is of wholly US origin.

Any waiver request must be submitted by TxDOT; therefore the Contractor must apply to TxDOT to make a waiver application on their behalf. Any delay associated with any waiver application is the sole responsibility of the Contractor and is not grounds for additional time or receipt of additional payment.

The Contractor shall be responsible for ensuring that its subcontractors comply with these requirements.

The Contractor shall monitor the Buy America compliance throughout the duration of the Contract. The Contractor shall provide monthly updates of Buy America certification, inclusive of detailed, current status of contract percentages. Form 1818 (D-9-USA-1) shall be submitted by the Contractor for all materials required to be Buy America compliant.

## 043 MATERIAL SUBSTITUTIONS

Names of certain manufacturers and items, where mentioned in this Specification and on the Drawings as a means of describing the general character of the quality, design, and construction of the various

items and articles, shall be understood as meaning TxDOT's preference. Substitutions for such items must be of equivalent quality and must be approved by TxDOT in writing.

An "or equal" product or material is one which exhibits the same general size, weight, characteristics, performance, reliability, and maintainability as the product or material identified in the Specification. The Contractor shall be wholly responsible for demonstrating the "or equal" status of any product or material, which is offered as a substitute for those cited in the Specification.

Requests for substitutions shall be made in writing to TxDOT, setting forth the reason for the proposed substitution and providing documented evidence of the substitute's equivalence or superiority to the specified product or material. The request shall also provide the Contractor's assurance that the substitution, if approved, will not result in any increase in the Contract Price nor an extension of the delivery date of the vessel.

Requests for substitutions must include in writing:

- Regulatory Body approval (as applicable)
- Compliance with Buy America requirements (as applicable)
- Comprehensive comparison of construction features and materials between the specified item and the proposed item. Complete drawings and dimensional data shall be submitted for each item. The weight of each item will be provided.
- Comprehensive comparison of performance characteristics between the specified item and the proposed item.
- Comprehensive list of impacts that the substitution will cause to arrangements, structure and interfacing of piping, ventilation, electrical, and control systems.
- Valid manufacturer's price quote for the specified and the proposed substitute item.
- Location of nearest distributor stocking parts for the items and providing field service for the proposed substitution and the specified item.
- Statement from Contractor indicating that the proposed substitution will not be a cost increase and will not extend the delivery date of the vessel.

Incomplete substitution requests will not be considered.

Substitutions will be considered based upon Contractor preference or familiarity with an item or equipment, provided it can be demonstrated that the item is equal (as defined above) to or better than the specified item. Substitutions for specified items that have been discontinued shall be for the current equivalent or better item from the same manufacturer.

Substitutions will not be considered based upon cost savings alone. For each substitution proposed, a valid price quote shall be obtained by the Contractor from the manufacturer of the specified item and the proposed substitution. If the substitution is approved, any such cost savings will be subject of a change order providing a credit for the full difference to the Owner. Substitutions for more expensive items will only be considered if they are a no cost change to the Owner.

TxDOT will respond to complete written requests within fifteen (15) calendar days of the request and completed submittal of supporting documentation described above. TxDOT's decision will be final.

The Contractor shall be responsible for all engineering costs and construction costs associated with any substitution.



## 046 PURCHASE TECHNICAL SPECIFICATIONS, REQUISITIONS, AND PURCHASE ORDERS

The Contractor shall submit all purchase (technical) specifications, requisitions, purchase orders, or similar descriptive data for review of compliance with the contract requirements by TxDOT prior to purchasing equipment. Each document shall contain a full technical description of the material to be ordered. If the Contractor wishes to purchase or supply equipment, fittings or outfit other than that specified, TxDOT shall first be informed of the details of the intended purchase, and secure specific written approval in each such instance.

The Contractor shall, as a minimum, develop detailed purchase technical specifications for the following major equipment and systems:

- Generator sets
- Propulsion switchboards, drives, and control systems
- Ship service switchboards
- Alarm and monitoring system (AMS)
- Fire Detection Systems
- Fire suppression systems
- Energy Storage Systems
- Chillers and HVAC Equipment
- Insulation

For all other equipment, purchase orders shall be submitted for review by TxDOT. This includes all fans, pumps, rudder and Steering Gear, steering system, barrier gate systems, electrical and electronic equipment, pipe, valves and pipe components, heat exchangers, electrical cable and components, propellers, propulsion shafting, bearings, couplings, and components, paint and coatings, windows and doors.

Deliver three (3) prints and one (1) electronic copy of all vendor drawings or literature to TxDOT not later than the date the equipment is delivered to the Contractor's facilities.

Furnish a copy of all correspondence and technical data affecting design features of vendor items along with the submittal of the drawings showing these items.

## 072 CLASSIFICATION, GOVERNMENT REGULATION AND OTHER REQUIREMENTS

All work shall be completed to the requirements of 46 CFR Subchapter H and the American Bureau of Shipping (ABS) Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways. The vessel shall remain classed ~~A~~ A1, Vehicle Passenger Ferry, Harbor, River Service, ~~A~~ AMS.

The vessel will be picked up from the State, on date specified and approved by the State. Vessel will be docked at 1000 Ferry Road North Galveston TX 77550. Contractor is responsible to crew vessel as per the Certificate of Inspection (COI) or provide approved United States Coast Guard (USCG) movement plan and all needed tugs and equipment to complete move. The ferry will be Trialed and delivered to same location with a valid United States Coast Guard (USCG) COI issued by Texas City OCMI as a Subchapter H passenger/vehicle ferry with no deficiencies noted in a USCG Vessel Inspection Requirements document (835). If COI is to be obtained in Galveston this shall be coordinated and

approved by the State. Day count continues until Texas City OCMI COI is issued and all USCG and ABS outstanding items are cleared on vessel.

With the exception of the Owner's crew demonstrating familiarity with the vessel operation, lifesaving and firefighting, the Contractor shall be entirely responsible for obtaining all certifications and documentation, and provide all testing, failure analyses, components, and signage as necessary for the vessel to be put into passenger carrying service as described above.

The Contractor shall develop and submit all plans, details, calculations, material and equipment certification, documents and any other information to the USCG and other regulatory agencies and to the ABS necessary to obtain regulatory and class approval. All USCG and ABS submittals shall be reviewed by TxDOT prior to submittal. All email and written correspondence to or from and all plans, calculations, information and documents submitted to or received by the USCG, ABS or other regulatory agency shall immediately be copied to the Owner's Representative. All fees entailed in securing certificates, including associated inspection fees and expenses of regulatory body inspectors, shall be paid by the Contractor.

The applicable requirements of the various regulatory bodies and rules noted below, in force at the time of contract execution, shall be complied with:

- A. ABS "Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways"
- B. ABS Guide for "Hybrid Electric Power Systems for Marine and Offshore Applications"
- C. ABS Guide for "Use of Lithium Batteries in the Marine and Offshore Industries"
- D. USCG CG-ENG Policy Letter 02-19: "Design Guidance for Lithium-Ion Battery Installations Onboard Commercial Vessels"
- E. ASTM F3353-19: "Standard Guide for Shipboard Use of Lithium-Ion (Li-ion) Batteries"
- F. 46 CFR Subchapter H "Rules for Passenger Vessels" and other applicable CFRs and USCG Navigation and Vessel Inspection Circulars (NVIC)
- G. USCG NVIC 12-82 – *Recommendations on Control of Excessive Noise*
- H. 23 CFR, 635.410: "Buy America Requirements"
- I. IEEE Standard No. 45: "Recommended Practice for Electrical Installations on Shipboard"
- J. U.S. Public Health Service: "Handbook on Sanitation of Vessel Construction"
- K. World Health Organization
- L. Federal Communications Commission
- M. U.S. Access Board: Passenger Vessel Accessibility Guidelines
- N. US EPA Tier III – Exhaust Emission Standards for Category I Marine Diesel Engines

The Plans provided herein have been submitted to the ABS for Detail Design Review (pre-contract) only. Physical changes to the vessel, if any, that result from the ABS provisional review shall be communicated to the Contractor for incorporation into the detailed design and shall be submitted by the Contractor to the USCG for regulatory approval as described above. It shall be the Contractor's responsibility to make all review submittals. Also see Section 810.

## 073 VIBRATION AND NOISE

The Contractor shall be responsible to locate and correct unsatisfactory vibration conditions arising during tests or trials, or subsequently during the guarantee period, which can be attributed to the design or construction of those elements accomplished by the Contractor. Vibration is unsatisfactory when it results in damage or clear potential damage to the vessel structure, machinery, equipment, or systems, or interferes with the proper operation of the vessel or components. Dangerous resonances at normal operation speeds will not be acceptable.

## 074 WELDING

Weld joints shall be prepared and welded in compliance with the requirements of the American Bureau of Shipping. Intermittent welding will not be permitted on foundations, Engine Room, and Steering Gear bilges (structure below the floor plate level or chine).

Fillet welds shall be wrapped around the ends of members, in weld relief locations, and around brackets to eliminate stress risers and corrosion points, and in accordance with ABS Rules.

Welds of poor quality, including cracked or cold tack welds, shall be removed by chipping, or grinding. Cold starts, weld cracks, crater cracks, and substandard defects shall be chipped or ground out and repaired.

Errant arc strikes outside the area of permanent welds shall be avoided. The Contractor shall grind smooth any cracks or blemishes caused by errant arc strikes.

Peening or caulking of weld material will not be allowed, except as specifically approved by the TxDOT's Representative and ABS. Surfaces to be welded shall be free from mill scale, excessive rust, moisture, grease, or other contaminants that would prevent proper welding.

The Contractor shall submit a welding procedure and a welding schedule to the TxDOT's Representative and ABS for approval prior to the start of construction. The welding sequence shall be designed to minimize distortion and locked-in stresses. Structural welding shall be carried out in such sequence as to compensate for creeping and shrinkage as the work progresses, keeping distortion within the fairness standards of the ABS Guide for Shipbuilding and Repair Quality Standard for Hull Structures During Construction, unless a higher requirement for fairness is specified elsewhere in the Specification.

Welding procedure, size and type of electrode, current values, and details of welding and reinforcing shall be in accordance with standard practice as approved by the American Welding Society Structural Welding Code- Steel (D1.1), and ABS Rules for Materials and Welding, except where such requirements are exceeded by the Technical Specification or Contract Guidance Drawings. No deviation in the approved weld joint design or procedure will be permitted, without the concurrence of the TxDOT's Representative and ABS prior to fabrication.

All welding shall be performed by welders holding current ABS certification. Certificates shall be maintained during the Contract performance period.

All welding shall be visually inspected to the standards in the American Welding Society Structural Welding Code- Steel (D1.1). Additional non-destructive testing (NDT) of welds shall be performed at the frequency, location, and methods as specified in the ABS Guide for Nondestructive Inspection of Hull Welds, and to the Surveyor's satisfaction. Contractor shall prepare an NDT plan in advance of additional NDT to be approved by ABS and accepted by TxDOT's Representative.

## 075 REMOVALS, ALTERATIONS, AND INTERFERENCE RESOLUTION

It is the Contractor's responsibility to effect all removals, relocations, and alterations as required by the drawings/plans, specifications and Contractor-provided working drawings (Owner/Regulatory Body approved). Where structure or equipment interferences require deviation from the drawings/plans, specifications, working drawings, diagrams and/or sketches, such deviation shall only be made with the approval of the Owner. Any such deviations will be at the Contractor's expense.

The Contractor is responsible for identifying interferences and including such in their price. All interferences in way of the contracted work shall be removed by the Contractor. Such removals are considered incidental to other items of work and no separate payment will be made. Interferences may include, but are not limited to, bulkheads, ceilings, overhead panels, primary structure, other machinery/equipment, piping, valves, ventilation ductwork, insulation, deck coverings, electrical cabling/support structure, lighting, receptacles, and fittings.

Temporarily removed structure shall be reinstalled and repaired to match the existing structure. Repaired stiffeners, girders, and web frames shall be reconnected to all existing members and the connections between the repaired and existing members shall have adequate shear area and section modulus to meet or exceed the properties of the existing structure. All temporary supporting structures erected for installation and removal shall be completely removed and ground back to the existing structure.

The Contractor shall provide alternative service for systems which are rendered "out of service" through removal of mechanical, electrical and/or piping interferences.

All items removed as "interferences" shall be retained for reinstallation, except for those items not required for the vessel as modified, in which case the Contractor shall obtain, in writing, the Owner's approval to discard same.

Items discarded are the sole responsibility of the Contractor.

It is the Contractor's responsibility to properly handle and store those items retained for reinstallation. Any loss, damage, or deterioration resulting from improper handling and/or storage is the responsibility of the Contractor and shall be corrected to the satisfaction of the Owner.

Upon completion of adjacent work elements, all previously removed interferences shall be reinstalled, tested and demonstrated to prove that the material condition and operability of reinstalled items and systems are at least equal to their condition and operability prior to removal.

Alterations made to strength members shall maintain the structural integrity of the original installation and shall be accomplished to the satisfaction of ABS, USCG, and the Owner.

## 076 GUARANTEE

The Contractor shall guarantee all work completed upon the hull, outfit, and machinery, including work of subcontractors, against defects resulting from faulty material or poor workmanship that may become apparent within 12 months from the date of vessel acceptance by Owner.

The Contractor shall correct such defects at no cost to Owner in accordance with the terms of the Contract Documents.

All components shall be warranted by their manufacturers for no less than one (1) year. The warranty period will start upon vessel acceptance by TxDOT.

## 078 MATERIALS AND WORKMANSHIP

The Contractor shall supply the necessary labor, material, skill, and equipment required to complete and test the construction of the vessel. All materials shall be new unless specific approval to the contrary is obtained from TxDOT in writing.

The work shall be complete in all respects. Anything inadvertently omitted from the Plans and Specification that is necessary and usual to a complete vessel, shall be supplied as a part of this Contract. Materials used and the workmanship thereon shall be of the best description and quality throughout and of adequate sizes to accomplish the purpose intended. The work, in every respect, shall be made under the supervision and to the complete satisfaction of TxDOT and their Representatives.

Defects appearing at any stage of the work shall be cause for rejection even though the piece in question may have previously been passed as satisfactory.

Steel plates, shapes and bars for use in the hull structure shall be electric furnace or open hearth ship steel to ABS Grade A or ASTM A36 (with the exception of the Car Deck plate which shall be ABS AH-36 or DH-36) and ABS Specifications.

Except where expressly stated in this Specification that a waiver is available for a particular equipment or material item, the Contractor shall be responsible for complying with the governing "Buy America" requirements. Refer to Section 042 for **Buy America Compliance** requirements.

Materials subject to test and inspection used in the construction of the vessel shall comply with the rules of ABS.

Propulsion components, including the propulsion generators, propulsion motors, reduction gears, shafts, shafting components, and propellers shall be provided with ABS certification in accordance with the ABS requirements and as described in 46 CFR 58.05-1.

Galvanizing shall be done by the "hot dip" process. Electro-galvanizing will not be accepted.

Where fasteners, pipe, tube, sheet metal, or plates and shapes are described as being "stainless steel," marine grade 300 series stainless steel shall be used in all cases. Fasteners and piping shall be 316 or 316L stainless steel unless otherwise specifically stated in this Re-Power Technical Specification and Contract Guidance Drawings. Piping and materials used for exterior handrails shall be 316L stainless steel.

## 079 ENVIRONMENTAL CONDITIONS

All equipment must be designed and installed to operate for the particular location and environment in which it is to be used. Additionally, electrical equipment necessary for the maneuvering, navigation, and safety of the vessel or its personnel must be designed and installed to operate under any combination of the following conditions:

- Static list of 15 degrees and dynamic roll of 22.5 degrees
- Static trim of 10 degrees
- All emergency installations must be designed and installed to operate when the vessel is at 22.5 degrees list and 10 degrees trim
- Double amplitude roll of 30 degrees in a period of 10 seconds
- Double amplitude pitch of 10 degrees in a period of 5 seconds
- Ambient air and seawater temperatures as tabulated below

PARAMETER	UNITS	SUMMER	WINTER
Air Temperature (dry bulb)	(°F)	95	25
Seawater Temperature	(°F)	90	35

## 083 EQUIPMENT STORAGE

All equipment purchased by the Contractor for use in the construction of this vessel shall be securely warehoused by the Contractor and segregated from other project's equipment. The equipment shall be kept in a covered clean, dry environment of low humidity and relatively constant temperature (less than 30 degree +/- from a 70-degree ambient). Equipment requiring special handling by its manufacturer (including any necessary power supply and climate controls) shall be stored in accordance with manufacturer's requirements.

Batteries must be stored per manufacturer's specification and approval. The batteries will be shipped in specialized environmentally controlled ISO containers. These containers, when stored at the yard must be placed on a level surface and kept connected to a power outlet. Battery modules shall be stored above 41°F and below 77°F, with relative humidity as low as possible at all times. Direct contact with water is to be avoided at all times. Flammable items shall be kept away from the battery modules and their storage containers.

The Owner's Representative shall be provided with access to stored equipment at any time upon request. Generators shall be kept heated in storage and onboard until such time as their own heaters are able to be kept in use. Transformers shall be plugged in while in storage or on the vessel so heating elements can keep coils dry until such time as the permanent wiring is activated.

The Contractor shall adequately protect all equipment from overspray of solvents, paints, impact damage, and weld or cutting materials contact while in storage and onboard. Temporary fire-resistant covers or enclosures shall be placed over all equipment where overhead or adjacent hot work is being performed. Scaffolding or work platforms shall be placed over equipment where overhead work is being performed. In no case shall the Contractor use the installed equipment to stand on or walk across for access overhead or beyond.

The Contractor shall immediately comply with all directives as they may be provided from Owner's Representative to protect or improve the protection of installed equipment and components from physical damage.

## 088 CARE OF VESSEL DURING CONSTRUCTION

### 088.1 FIRE PROTECTION

During construction, flammable material shall not be stored onboard the vessel in such a manner to create a serious fire hazard. The Contractor shall exercise special care to prevent the possible outbreak of fire. A pressurized fire hose shall be available and maintained at the site of the vessel construction at all times.

Where torch cutting or where welding is being carried out in the vicinity of combustible material, a fire watch whose sole purpose shall be to watch for fires and keep firefighting equipment on hand shall be constantly on duty.

## 088.2 HULL PROTECTION

The Contractor shall maintain rigid control of welding and grounding for the protection of the hull, its systems, and appendages during the entire time the vessel is in the custody of the Contractor.

## 091 INSPECTION

During construction, and any time prior to the delivery and acceptance, Owner's inspectors and representatives, and inspectors of regulatory bodies, shall be given free access to the Contractor's facility for the purpose of inspecting work and materials. The inspectors and representatives will have the authority to reject any material or workmanship that does not conform to the requirements of this Specification. Contractor is responsible for all regulatory inspections.

## 092 SCHEDULED ROUTINE MAINTENANCE

During the construction period the Contractor shall additionally complete the scheduled routine maintenance as described in the relevant Appendix of this Specification. This work is to be incorporated into the Master Construction Schedule and Contractor will liaise as necessary with USCG and ABS for inspections and approvals of all work.

## 096 WEIGHT CONTROL PROGRAM

Minimizing weight growth during construction is important. The Contractor shall not change the structural sizes, exceed the scantlings, or increase the pipe sizes and wall thicknesses described by the Re-Power Technical Specification and Contract Guidance Drawings unless it can be demonstrated by the Contractor to be necessary for the suitability of the vessel for its service. Scantlings shall be kept to a reasonably minimum size for foundations, floor plate supports, and other details developed by the Contractor.

The Contractor shall be responsible for preparing a builder's weight estimate. This estimate shall be submitted to TxDOT within forty-five (45) calendar days after Contract award. The estimate shall be done in SWBS format, to facilitate comparison with the contract design weight estimate.

Disparities between the two estimates shall be identified and resolved, in order to establish an approved maximum vessel lightship weight. Throughout the construction period, the Contractor shall monitor the actual weight of equipment and materials against the weight estimate. The builder's weight estimate shall be updated and resubmitted monthly. Weight growth shall be brought to the attention of TxDOT. The Contractor shall be responsible for delivering the vessel within the limit of the agreed maximum light ship weight.

TxDOT and the Contractor shall conduct a weight survey at the time of launching to compare estimated weight at completion with the observed displacement.

## 099 PHOTOGRAPHS

Contractor shall submit a set of at least 36 digital format (JPEG) progress photographs every two weeks during the construction period, illustrating the progress of the work. Provide a digital photo file index describing the date, subject, and location corresponding to each file name. Provide the file index and digital photo files as a USB drive and delivered via email as attachments to the Owner's Representative. Clearly label the USB drive with the date of submittal.

## GROUP 100 – HULL STRUCTURE

The Contractor shall be responsible for adding brackets, chocks, and clips as required to develop the full strength of the members shown on the Contract Guidance Drawings and as required in accordance with the ABS Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways.

Plating for bulkheads, shell plating, and decks shall meet the fairness standards of the ABS Guide for Shipbuilding and Repair Quality Standard for Hull Structures During Construction, unless otherwise noted in the Specification.

Efficient means of compensation shall be fitted where it is necessary to provide holes for passage of wiring, piping, or ventilation in important structural members.

Close attention shall be paid to the fabrication and installation of machinery foundations to ensure rigidity of the foundations and their continuity with adjacent structural members.

During construction, access shall be provided to all compartments and spaces for cleaning, painting, and inspection.

Sharp and ragged edges or corners of structure that could cause injury to personnel, interfere with subsequent coatings application, or which are unsightly, shall be removed, ground smooth, or sniped. Weld spatter shall be ground smooth.

Structural steel shall be ABS Grade A, ASTM A36 may be substituted for ABS Grade A for plate thicknesses up to and including 0.5 inches, and section thicknesses up to and including 1.57 inches. All plate and shapes are to be in accordance with ABS Rules for Materials and Welding, and provided with the appropriate certification as required by ABS. All structural steel must meet Buy America requirements.

*Table 2: List of References – Hull Structure*

REFERENCE ID	NUMBER	TITLE
(1A)	20050-002-101-0	General Arrangement
(1B)	20050-002-101-2	Fire and Safety Plan
(1C)	20050-002-101-7	Structural Fire Protection
(1D)	20050-002-101-8	Pilot House Arrangement
(1E)	20050-002-110-6	ESS Structural Modifications
(1F)	20050-002-110-7	EOS Structural Modifications
(1G)	20050-002-180-1	Generator Foundations
(1H)	20050-002-185-0	Battery Foundations

### 101.1 GENERAL ARRANGEMENT

The Contractor shall follow the arrangement in Reference (1A) as far as practicable. Where there is disagreement between the general arrangement and the Specification, the Contractor shall submit questions during letting. If awarded, Contractor shall submit through submittal / RFI process. Disagreements do not relieve Contractor of responsibility or allow cost increase to State.



## 101.2 FIRE AND SAFETY PLAN

A preliminary Fire and Safety plan, Reference (1B), will be provided by the Naval Architect. The Contractor shall update this to reflect the final locations of the referenced safety equipment for USCG approval at delivery to the Owner.

## 101.7 STRUCTURAL FIRE PROTECTION

The Naval Architect will provide the Contractor with an updated structural fire protection plan, Reference (1C), incorporating the requirements in way of the ESS Space and the modified EOS.

## 101.8 PILOT HOUSE ARRANGEMENT

The Pilot House Arrangement (1D) will be provided as general guidance. The Contractor shall update this drawing to reflect the as-built condition of vessel upon delivery to the Owner.

## 110.6 ESS SPACE STRUCTURAL MODIFICATIONS

Transverse and longitudinal bulkheads shall be located and constructed as shown on the Contract Drawings, Reference (1E). Bulkhead scantlings shall be generally as shown. The Contractor shall provide stiffeners, brackets, and chocks as required to complete the installation.

Bulkhead stiffeners shall be arranged to line up with girders or other stiffeners. Bolted plate manholes are to be arranged to provide access to all areas below the ESS Space. Structure is to be configured to ensure adequate ventilation across the compartment below the ESS Space.

Per the ABS Guide for use of Lithium Batteries in the Marine and Offshore Industries, a floor drain shall be provided in each ESS Space. As there is a NOVEC fire suppression system the drain shall be provided with a P-trap and a spring-loaded check valve positioned below the P-trap. (P-Trap and check valve should be located as low as possible in the floor drain line, separated vertically from the floor drain and from each other by at least 12 inches. Both should also be located above the highest anticipated level of bilge water in this area of the bilge. The check valve will have a crack pressure approximately equal to the head of water from the top of the P-trap to the check valve. The purpose of the P-trap and spring-loaded check valve is twofold: (a) to provide some resistance to - and help prevent - a discharge of NOVEC fluid from escaping the ESS through the floor drain, and (b) to allow water to drain away from the battery cabinets inside the ESS, in the event of a water mist discharge, but still maintain a water seal inside the P-trap. The drain line is to discharge adjacent to the existing bilge suction.

The new ESS Space in compartment 6 ("B" end), shall have one new 30-inch x 76-inch self-closing fume tight A-class door and one 24 inchx36inch self-closing fume tight A-class door. The new ESS Space in compartment 3 ("A" end), shall have two new 24 inch x 36 inch self-closing fume tight A-class doors. Doors to be DeanSteel or Owner approved equal.

## 110.7 EOS STRUCTURAL MODIFICATIONS

Transverse and longitudinal bulkheads shall be located and constructed as shown on the Contract Drawings, Reference (1E). Bulkhead scantlings shall be generally as shown. The Contractor shall provide stiffeners, brackets, and chocks as required to complete the installation.

Bulkhead stiffeners shall be arranged to line up with girders or other stiffeners.

## 180.0 GENERATOR FOUNDATIONS

The propulsion machinery foundation shall be fabricated in accordance with EBDG drawing 20050-002-180-0. Abrupt discontinuities shall be avoided by gradual tapers at the extremities of foundation structure.

Sway bracing shall be provided for electrical enclosures not solidly bolted or welded to structure. For enclosures that have been mounted using vibration isolators (Main Switchboard, VFD Sections, etc.), the sway bracing shall provide similar vibration isolation techniques.

## 191.0 FIXED BALLAST

The current permanent ballast, independent tanks containing High Density Perma Ballast, is being removed due to maintenance issues; to maintain a sufficient draft at all load conditions replacement permanent ballast shall be installed. During removal of existing ballast only one (1) opening is to be cut in the vessel at a time. Prior to cutting the next hole, the previous one is to be welded closed and inspected. Contractor shall provide Owner a written ballast removal and installation plan for review and approval a minimum of two weeks prior to commencing work. The new ballast shall consist of coated lead bars and be distributed throughout the vessel (minimum four locations) to minimize stresses due to hogging or sagging.

The shipyard shall install approximately 207 long tons of fixed ballast prior to the incline to adjust trim, heel, and draft of the vessel. Prior to installation, the Contractor shall prepare a fixed ballast plan for submittal to Owner and the USCG for review and approval. This shall include placement, all new structure, calculations of the vessel's trim, heel, and draft after installation.

The Contractor shall provide a steel structural rack with wood dunnage for securing the ballast, allowing adequate space for access to vessel hull and structure for inspection and maintenance. The ballast rack shall be positioned to provide a minimum of 24 inches separation between the hull and the bottom of the ballast rack. The stowage arrangement and location of the permanent ballast shall be approved by Owner prior to installation. Contractor shall create a new Permanent Ballast Plan documenting the installation for the USCG.

## GROUP 200 – PROPULSION MACHINERY

The basic propulsion drive train remains as currently exists and represents a double-ended design with a single propeller shaft driving a fixed pitch propeller at each end of the vessel. The propulsion machinery equipment and installations at each end shall not be extensively modified and consist of two drive motors, each connected to its respective combining (2 input shafts/1 output shaft) reduction gear.

Existing propulsion motors are nominally rated at 1150 BHP at 1193 RPM. See Section 302 for propulsion motor details. The motors will be powered by a combination of diesel gensets and a lithium battery energy storage system (ESS).

Four 599 kW Tier III diesel gensets will provide both propulsive power and ship's hotel loads as specified in Section 233.0. All diesel engines shall burn ultra-low sulfur, No. 2 diesel fuel having a flash point greater than 110°F.

If an item of equipment is identified specifically by the manufacturer and part number within the Specification or Drawings, it shall be considered as being approved for purchase, provided the Contractor has verified and confirms the following:

- Part numbers are current with manufacturer numbers. [Note: Part numbers provided by the Specification and Drawings are not intended to describe every feature required. For example, a pump part number may not describe the requirements of the motor or may not include such required features as mechanical seals.]
- The item meets the performance and material requirements of the system as required by the Specification and the Drawings.
- The item complies with USCG and ABS requirements for material, construction, and performance.
- The item, if subject to Buy America, complies with Buy America requirements or has been granted a waiver. See Section 042.

All machinery, equipment, fittings, and similar items shall be new and unused, made by recognized manufacturers having facilities to supply service and parts in the Galveston area of Texas. Common equipment shall be selected to the maximum extent possible.

A foundation shall be provided for each piece of machinery. Foundations shall be attached to basic structure, which shall be stiffened where necessary to carry both static and dynamic machinery loads. Generally, foundations shall be fabricated from steel plate, welded together, and to the ship's structure.

Each machine and piece of equipment shall be installed, aligned, and fastened within the tolerances prescribed by the manufacturer. Equipment shall be removable without cutting foundations or attachments.

The entire machinery installation shall be free of excessive vibration while operating. Reciprocating machines or other machines that generate objectionable vibration shall be isolated from the hull with resilient mounts having a vibration damping material. Complete tests of all machinery and electrical equipment, installations, including dock and sea trials, shall be as described in Section 982.0.

*Table 3: List of References – Propulsion Machinery*

REFERENCE ID	NUMBER	TITLE
(2A)	20050-002-101-0	General Arrangement
(2B)	20050-002-201-1	Machinery Arrangement
(2C)	20050-001-202-1	Emergency Generator Room Removals
(2D)	20050-002-202-1	Emergency Generator Room Arrangement
(2E)	20050-002-256-2	Keel Cooling Arrangement
(2F)	20050-002-259-1	Exhaust Arrangement
(2G)	20050-002-261-0	Fuel Oil System
(2H)	20050-002-262-0	Lube Oil System
(2I)	20050-002-262-1	Dirty Oil System
(2J)	20050-002-551-0	Compressed Air System
(2K)	20050-002-110-7	EOS Structural Modifications

**201.1 MACHINERY ARRANGEMENT**

The Engine Room machinery shall be arranged as generally shown on the Machinery Arrangement drawing (2B) and is intended for manned operation. Machinery shall be installed in a manner and arrangement that will allow easy access for maintenance and disassembly. Adequate air space shall be allowed around machinery for cooling and combustion air circulation. The final location of all machinery shall be subject to the approval of the Owner.

Obstructions or interferences shall be avoided where possible. The Contractor shall pay particular attention to sharp edges, corners, overhead and/or protruding objects and appendages of equipment or structure where operating personnel are likely to pass or work. Such obstructions, if unavoidable, shall be provided with guards or other means to protect personnel from injury.

To facilitate future machinery removal and re-installation, route all wiring, and piping in the Engine Room overhead clear of the machinery removal hatches. Pad eyes or lifting points shall be installed in the overhead of the machinery space to facilitate future removal of major machinery items. Pad eyes or lifting points are to extend below the structural fire protection to allow use without disruption of the insulation.

Machinery layout shall be such as to allow an unobstructed path for removal of major machinery items.

**202.1 EMERGENCY GENERATOR ROOM ARRANGEMENT**

The post modification arrangement of the Emergency Generator Room shall generally be as shown on Drawing References (2C) & (2D). Modifications to the Emergency Generator Room are intended to expand the space and relocate electrical equipment to improve access to the generator, generator control panel, and emergency switchboard breakers. These modifications will also create a new closet to house CCTV equipment.

A section of the bulkhead that separates the Emergency Generator Room from the upper deck passenger space shall be cut out between the port overhead longitudinal and the port outboard bulkhead. The cutout shall be made generally as shown in Drawing Reference (2C) and Figure 1, leaving the existing electrical transit in the overhead intact.

The window in the port outboard bulkhead of the upper deck passenger space immediately forward of the removed bulkhead section shall be removed. This opening shall be sealed with steel plate and associated stiffeners of type, quality, and thickness equal to that of the surrounding structure.

Two new transverse bulkheads shall be installed. The first new bulkhead shall be located immediately aft of the existing port side aft door that leads from the upper deck passenger space to the exterior upper deck. The second new bulkhead shall be installed four feet aft of the first new bulkhead. The space between the new bulkheads shall be a closet for the vessel's existing CCTV equipment, which is to be relocated from the EOS. See Section 439 for further detail about CCTV equipment and the new CCTV closet. Transits for electrical or mechanical systems in these two new bulkheads shall be built around existing cableways and equipment. Cables, pipes, ducting, and any other equipment in way of the new bulkhead installations shall be protected from heat and other damage for the duration of structural modification work. New bulkheads shall be fitted with vertical stiffeners of size and spacing equal to that of existing ship structure.

All cables connected to electrical panel EP1, the batteries, the battery switch, battery low voltage alarm, battery charger, and transformer T4 shall be clearly labeled, disconnected, pulled back, and protected from damage for the duration of the structural modifications. Panel EP1, the batteries, the battery switch, battery low voltage alarm, and battery charger shall be taken down and safely stored for the duration of the structural modifications. Cables in the electrical transit above the cutout shall also be protected from heat and other damage for the duration of the structural modifications. Joiner panel and ceiling tiles in the passenger space forward of the cutout and aft of the door to the exterior upper deck shall also be removed and safely stored so the material may be re-used.

When structural modifications are complete, electrical panel EP1 shall be relocated to the inboard longitudinal bulkhead of the expanded area in the Emergency Generator Room. The battery switch and battery low voltage alarm shall be mounted to the port outboard bulkhead of the Emergency Generator Room. The batteries shall be placed along the outboard bulkhead below the battery switch and battery low voltage alarm. Contractor shall provide steel trays with bolted hold-downs to prevent the batteries from sliding. Trays are to be set on the floor and attached to the basic ship structure. The battery charger shall be re-installed in its current location.

The existing Emergency Switchboard and Emergency Generator control panel cabinet shall be removed and disposed of by the Contractor. A new electrical cabinet that contains both the Emergency Generator control panel and Emergency Switchboard shall be installed against the new transverse bulkhead separating the Emergency Generator Room from the new CCTV closet. The existing EasyGen controls are to be retained and installed in the new cabinet. The switchboard portion of the cabinet shall be selected and configured to accommodate new breakers as shown in Drawing 20050-002-320-1 and in accordance with the Siemens specification in an Appendix of this Specification.

The existing four-foot fluorescent light in the upper deck passenger space in way of the Emergency Generator Room expansion shall be removed. Two new Dialight LED fixtures, UL 1598A Listed, two feet in length each, of the same type as the existing fixtures in the Emergency Generator Room, shall be installed. One of the new LED fixtures is to be installed in the CCTV closet and the other is to be installed in the expanded area of the Emergency Generator Room. The new LED fixture in the expanded area of the Emergency Generator Room shall be operable by the same switch and breaker that operates existing LED fixtures in the Emergency Generator Room. The new LED fixture in the CCTV closet shall be on the same breaker as the removed fluorescent light and shall be operable from a dedicated switch inside the CCTV closet, independent of the switch that operates the remainder of the lights in the upper deck passenger space.

With the enlargement of the Emergency Generator Room, it is necessary to enlarge the Novec fixed firefighting system in the space. The new Fire Extinguishment System is addressed in Section 555.



Figure 1: Example Emergency Generator Room Bulkhead Cutout

## 233.0 PROPULSION GENERATOR INTERNAL COMBUSTION ENGINES

The propulsion generators' internal combustion engines, propulsion control system and associated equipment listed and described herein shall be furnished and installed by the Contractor. The installed propulsion system and its controls shall comply with all applicable USCG and ABS class requirements including all regulatory documentation, failure modes analysis, and testing and verification procedures.

Furnish and install four diesel generator sets for vessel propulsion. The diesels shall be fully self-contained, with mechanically driven fuel oil, jacket water and lube oil pumps installed on the engine.

These generators shall provide all electrical power for the propulsion system, the ESS, and for the ship's service electrical system. The generator sets shall meet all applicable regulatory rules and requirements set out in Specification Sections 072 and 200. See Section 310 of this Specification for the description of the alternators.

The propulsion generators shall be shipped to the engine supplier, who is responsible for coupling, aligning, and mounting the engine / generator set onto their respective skids. The engines and generators are to be painted CAT® yellow and the skids are to be painted flat black.

The propulsion generators' diesel engines shall be CAT Model C18 SCAC T3 AUX 803 BHP or equal, integrated and installed with a propulsion system integrator specified alternator on a common skid for installation on vibration isolation mounts to a structural foundation. TSC T10 isolation mounts (or equivalent) shall be supplied by Christie and Grey. The engine shall have a prime power rating of 599ekW at an operating speed of 1,800 rpm. The diesel engines' jacket and aftercooler cooling circuits water shall be cooled via keel coolers.

The Owner's approval shall be required in writing for the choice of the diesel engines which will power the diesel gensets, prior to Contractor purchase.

The engines shall be provided with all necessary documentation to demonstrate certification to EPA Tier 3 and IMO Marine Commercial Propulsion (E3 Cycle) Emission Standards and certification to EU Stage IIIA and CCNR Stage II (E3 Cycle) Emissions Standards.

The four propulsion generator engines shall be configured for compressed air starting with turbine air starting motors and installed with drip pans/spill pans under each generator set.

Each generator engine shall be furnished with all necessary features, equipment, and accessories, in an ABS approved package, including but not limited to the following:

*Generator Features and Equipment*

QTY	ITEM
1	LO Filtration System, or equal
1	LO Service Pump, engine-driven
1	FO Service Pump, engine-driven
1	3-micron FO filter, engine-mounted
1	Oil Cooler
1	Set Regulatory approved flexible cooling water inlet and outlet connections.
1	Spin on water filter with Fleetguard DC4A4 corrosion inhibitor
1	JW Centrifugal Pump, engine-driven
1	Air Pressure Regulator
1	Air Start Motor Filter
1	Air Start Solenoid Valve
1	Engine Support, Rear
1	Marine Engine Control Panel, with Mounting Bracket
1	Color Marine Display Pilot House 13" Display Group
1	CMD Wiring Connection Kit
1	Set for Transmission Sensors-ADEM 4
1	Flex Fuel Lines, with spray shielding
2	Pressure Cap & Filler Neck Kit
1	Dry Exhaust Elbow, 203.2mm (8")
1	Flexible Exhaust Fitting, 203.2mm (8")
1	Exhaust Outlet Flange, 203.2mm (8")
1	Air Inlet Adapter
1	Muffler, 10" with weld flanges, bolts, nuts and gaskets (per Specification)
1	Deep (18 gallon) Oil Pan with deep sump (Pan group 322-8954)
1	JW Temperature Control Valve (thermostat and housing)
1	JW Heater Kim Hotstart
2	Expansion Tanks mounted off skid by shipyard (see SWBS 256 below)



QTY	ITEM
1	Exhaust Manifold, water-cooled
1	Side Outlet, single exhaust connection, standard 6
1	Water Cooled Turbocharger
1	Fleetguard Intake Air Cleaner
1	Set Tuned Skid Vibration Mounts, Christie Grey
1	Starting Motor Compressed Air
1	Speed Control Governor (speed regulation from
1	Automatic Over-Speed Shutdown
6	Alarm Contacts (open for alarm condition) for the following parameters: LO Pressure (low) FO Pressure (low) LO Temperature (high) JW Temperature (high) Over-Speed Shutdown
1	Customer Interface Box, CIB, with color digital
1	Set Lifting Eyes
1	Operation, maintenance, and parts manual
1	Single point lift spreader bar for engine

Alarm and control functions are to be wired in accordance with mgrs. requirements, and to the separate remote mounted customer interface box (NEMA-12 enclosure) with terminal strips. Each diesel generator gauge board shall be mounted near the unit it serves, but also off the skids.

### 235.1 DIESEL ENGINE CONTROL

Each diesel engine shall be provided with an Engine Control Unit housed in a Customer Interface Box (CIB) provided by the diesel manufacturer and mounted off the engine skid, in a nearby location approved by the TxDOT Representative and allowing for local control of the diesel engine. The CIB (with full color digital display monitor) shall include:

- Full color digital display to monitor:
  - Engine speed
  - Engine run hours
  - Engine load (% of MCR)
  - Water in fuel connection on harness
  - Engine oil pressure
  - Fuel consumption
  - Coolant temperature
  - Low coolant level alarm
  - System DC voltage gauge
  - Stack temperature monitoring
- Engine Control Unit enclosure will house:
  - Engine PLC related wiring (Contractor shall provide correct cable length to engine – cable splices are not acceptable.)
  - Two independent power supply circuit breakers (16A)



- Terminal strip for ship interface to fire suppression shutdown signal, throttle interface, fused power supply circuit and communications wiring
- Emergency stop button

It shall be possible to start and stop the diesel engine and to control diesel engine speed locally. A Local/Remote Control Switch shall be provided in the CIB to place the diesel in remote control by the Propulsion Switchboard PMS. An Idle/Run switch shall be provided in the CIB to allow the engine to operate offline at a pre-set idle RPM for warm up or maintenance.

## 243 PROPULSION SHAFTING ALIGNMENT

The existing propulsion motors, reduction gears, and propulsion shafting are not being modified by this contract, and no hot work is anticipated in the immediate vicinity of the reduction gears, stern tubes, or shafting.

Prior to beginning any vessel modifications, the Contractor shall verify alignment of the shafting at both ends of the vessel. An alignment report documenting the measurements taken and the results shall be submitted to the TxDOT Representative for review and approval within two weeks of completion of the alignment verification.

Upon completion of the vessel construction, the Contractor shall again check the shafting alignments, and verify that the shafting, reduction gear, and propulsion motors at each end of the vessel remain in an acceptable alignment. A post-refit alignment report documenting such shall be prepared and submitted to the TxDOT's Representative for review and approval. Should a misalignment be discovered, the Contractor shall notify the TXDOT's Representative, and provide a summary of recommended corrective actions. Any work to correct misalignment of the existing propulsion shall be the subject of a written change order.

Alignment check shall be performed in accordance with SNAME T&R 3-51 "Procedures for Marine Main Propulsion Shafting Alignment." Alignment checks shall be performed with the vessel afloat with no list or trim, and the post construction checks shall be performed after all other vessel modifications are complete. Both alignment checks are to be accomplished with the vessel in identical loading conditions. A procedure describing the alignment check procedure shall be submitted to the Owner's Representative for approval at least 14 days prior to performing the procedure. A description of the intended setup procedures, alignment offsets, alignment equipment to be used, component maximum tolerances, maximum expected engine movements, inspection hold points, and hot and cold loads shall be included in the Contractor's alignment procedure.

## 251 COMBUSTION AIR SYSTEM

The combustion air for the propulsion generator sets shall come from the existing main Engine Room supply air ventilation system. See Section 259 for more details.

## 252 MAIN PROPULSION CONTROLS

The vessel shall have an electronic propulsion control system, supplied by the Contractor's propulsion system vendor/integrator and meeting all requirements of References (3B), (3K) and (3K). The propulsion control systems shall be installed and adjusted under the supervision of the manufacturer's authorized representative.

Propulsion system control heads shall be mounted remotely at both Pilot House consoles. Local propulsion control shall be installed on the main console in the EOS, Section 410.

The EOS control station shall provide touch screens, manual pushbuttons, and pilot lights to mimic the bridge controls. Each control station shall have an indicator showing when the station is in control.

On each control station there shall be a "GIVE CMD" button and a "TAKE CMD" button. On the control station in command, the first push of "GIVE CMD" shall "arm" the operation while the second push shall activate the operation. On the control station taking command, the first push of "TAKE CMD" shall "arm" the operation while the second push shall finalize the transfer. At either control station, there shall be an automatic cancel of the "arm" setting if the operator does not execute the second push within a certain time. If the command is not taken within this time, the transfer times out.

The levers shall be in the same position at either control station before the command transfer will be executed. A not fulfilled command transfer shall be indicated with flashing "TAKE CMD" and REMOTE lamps. The remote lamp shall indicate that the actual lever is not in command, and the take command lamp shall indicate that the control station does not have command over all the propulsion motors.

The Contractor shall furnish the following items to TxDOT upon delivery of the vessel:

- Three sets of operation and maintenance manuals for each item of equipment.
- Three sets of parts books that include prices.
- Three sets of main propulsion installation plans, wiring diagrams, and other documentation.

## 256 COOLING SYSTEMS

Freshwater cooling circuits for the propulsion generator diesel engines shall be provided in accordance with the Keel Cooling Arrangement (2E). Each engine cooling circuit shall be equipped with an engine-driven close-coupled coolant pump provided with the engine. Connections at the engines shall be in accordance with manufacturer's requirements.

### 256.1 EXPANSION TANKS

The Contractor shall design, fabricate, and install eight new expansion tanks, sized as indicated on the reference drawing and in accordance with manufacturer's requirements. Each expansion tank shall be mounted with the bottom of the tank located above all vent locations on the engine it serves at any normal vessel trim.

Each tank shall be fitted with an engine manufacturer provided pressure cap with stainless steel tube vent line leading to approximately three inches above the floorplate level, sight glass, low level alarm switch, drain line, and means for filling the tank. The expansion tanks shall be fitted with vent lines connected to the highest points of their respective systems to allow the venting of trapped gases. The expansion tanks are to be mounted above and near their respective engines. Proposed expansion tank locations are to be approved by the Owner's Representative prior to installation.

### 256.2 KEEL COOLERS

New keel coolers shall be mounted to the hull exterior as illustrated in the Keel Cooling Arrangement (2E) and in accordance with the manufacturer's instructions. Existing keel coolers that will be reused, shall be removed, cleaned, inspected, pressure tested, and remounted. Keel cooler pressure tests shall not exceed 35 psi.

All keel coolers shall be fitted with aluminum anode kits, new anodes shall be fit to existing keel coolers.

New one-half inch (1/2") thick steel guards shall be welded to the hull as indicated to protect new and existing keel coolers from underwater debris. All metal-to-metal connections between hull and keel

coolers shall be isolated with non-metallic gaskets, washers and bolt hole inserts. Electrical isolation shall be verified to Owner's satisfaction with multimeter prior to the vessel's entry into the water.

Each keel cooler guard shall be fitted with four (4) 24 lb aluminum anodes. The four anodes for each cooler shall be bolt on type and electrically isolated from the guard by use of insulation washers and sleeves. Each isolated anode shall be electrically bonded to the keel cooler with an insulated welding cable grounding strap connected between the isolated anode and the anode post on the keel cooler. Care shall be taken to assure that the grounding strap only provides electrical continuity between the isolated anode and the keel cooler, and the grounding strap cannot come into contact with the keel cooler guard or hull. The keel cooler anodes shall be installed under the guidance of a TxDOT Representative.

Keel coolers and system piping shall be cleaned and flushed with fresh water prior to filling with CAT cooling fluid.

Immediately prior to undocking the vessel, Contractor shall demonstrate, and the Owner witness, total electrical isolation between keel coolers and hull, and between dedicated keel cooler anodes and hull.

### 256.3 COOLING WATER TREATMENT

Engine cooling water shall be treated in accordance with the engine manufacturer's written instructions, including the addition of the approved cooling system corrosion inhibitor. Alternatively, the Contractor shall provide pre-mixed engine coolant as recommended by the engine manufacturer.

The Contractor shall provide one additional 30-gallon drum of pre-mixed engine coolant, and a corrosion inhibitor test kit to the vessel prior to delivery.

## 259 EXHAUST AND VENTILATION SYSTEMS

### 259.1 EXHAUST

All diesel engines shall exhaust through a separate pipe and silencer. The prime mover diesel engine silencers and tail pipes shall be grouped within the Engine Room uptake and lead up individually to the weather as shown in the Exhaust Arrangement (2F). There are no exhaust system modifications planned or required for the emergency generator.

Each generator engine exhaust pipe shall be as specified on the Exhaust Arrangement (2F). A hospital grade, spark arresting silencer, MAXIM MSA44 or equivalent, shall be installed in each exhaust system. The Contractor shall verify, by calculations prior to installation and during trials, that the engine backpressure does not exceed the manufacturer's requirements.

See Section 505 for general piping requirements. The exhaust piping, silencer, and expansion joints shall be insulated and lagged, see Section 508.

Flexible connections shall be provided in each engine exhaust near the engine exhaust outlet and elsewhere as indicated on drawing (2F), to allow for vibration and thermal deflection. The flexible connections shall be multi-ply convoluted stainless steel tube (single ply bellows are not acceptable), stainless steel Type 321, with fine pattern convolutions, flow liners, and flanged ends. Flow direction shall be permanently marked on the exterior. One flanged end of each flexible connection shall be a "Van Stone" type. Other flexible connections shall be installed as needed to provide for thermal movement.

Supports shall be provided for each exhaust pipe and silencer with provision for thermal movement without straining the piping, machinery, or ship structure. Mountings and supports for exhaust piping

and silencers shall be Christie & Grey or equivalent as developed by Contractor. Arrangement and details of the mountings and supports for exhaust piping and silencers to be submitted for review and approval by Owner. Heat stops shall be fitted at the hangers and foundations to insulate the piping and silencers from the structure. Hangers shall clamp to exhaust pipes. Welded connections to the pipe shall not be accepted. Arrangement and details of the mountings and supports for exhaust piping and silencers to be submitted for review and approval by Owner.

Each exhaust pipe shall be fitted with thermocouple/thermowell assemblies for interface with the vessel's engine room alarm system. The thermocouples shall be installed at a location near the turbocharger outlet(s).

Flanged connections shall be provided to all silencers. A 1 1/2-inch drain line fitted with a gate valve shall be installed at the lower end of each main generator exhaust pipe vertical run. The Owner shall approve all exhaust pipe drain locations prior to their installation.

Each generator diesel exhaust pipe shall penetrate the stack above the Bridge Deck through a collar with a nominal diameter two inches greater than the tail pipe. Three flat bar clips equally spaced around each pipe shall be provided to center the tail pipe in the collar. A rain hood of 3/16 inches, ASTM A316 stainless steel plate shall be provided over each collar with the hood continuously welded to the tail pipe at a height of two inches above the collar. The outer diameter of the rain hood shall be approximately two inches greater than the diameter of the collar. The rain hood, centering clips, and tailpipes shall be 316 stainless steel.

A maintainable, heavy duty, 316SS, flapper type weather stop shall be installed on top of each exhaust outlet.

## 259.2 ENGINE ROOM VENTILATION

The current engine room ventilation system is equipped with two supply fans, capable of 28,000 CFM @ 2 inH<sub>2</sub>O providing approximately 56,000 CFM total. No change to the ventilation fans will be required.

The Contractor shall modify the supply ducting over the generators that is served by the B-end supply fan. The duct routing and size and quantity of terminals shall be extended and revised as needed to ensure that adequate cooling air is directed to the air intake of each engine and propulsion alternator.

Fabricate new engine room ducts from 16-gauge hot dipped galvanized sheet steel. Install ducting as close to the overhead as possible. All joints shall be flanged, riveted, or welded. Install debris screens on each terminal. Provide duct hangers and supports as needed for new ducting.

In coordination with the EOS structural modifications shown in Reference 1F the Contractor shall modify the structural ducting between Frames 4 and 7 in the EOS overhead to accommodate the new Siemens BDPC cabinets. The structural ducting at the port and starboard sides of EOS shall be reduced in depth so that the structural duct and insulation over the cabinets does not encroach into the required BDPC overhead clearance. Modify existing ducts in the Engine Room adjacent to each side of the EOS to suit the ducting revisions.

The existing aft facing terminals above the EOS windows in BHD 4 shall be increased in size so that the revised structural duct can accommodate the full flow of the existing supply fan. Provide short segments of ducting with adjustable terminals on these outlets to direct air outboard into the Engine Room, and away from the uptake casing.

The outside of the structural ducting inside the EOS shall be insulated to A60, to match the EOS overhead.

The Contractor shall develop a diagram detailing the proposed ducting revisions, indicating extent of changes and proposed airflows, and submit the diagram to the Owner for review and approval prior to installation.

## 261.0 FUEL OIL SYSTEMS

### 261.1 GENERAL

The fuel oil service piping for the diesel engines shall be modified and arranged as shown on Fuel Oil System Drawing (2G).

The new generator engines shall take fuel oil from a 600-gallon day tank which in turn draws from a 4,500-gallon fuel oil tank located in the No. 6 Compartment. The Emergency Diesel Generator takes and returns fuel from a local 60-gallon fuel tank on the Upper Deck within the Emergency Generator Room. Relocate Fuel Tank Gems Gauges as necessary in the way of affected areas.

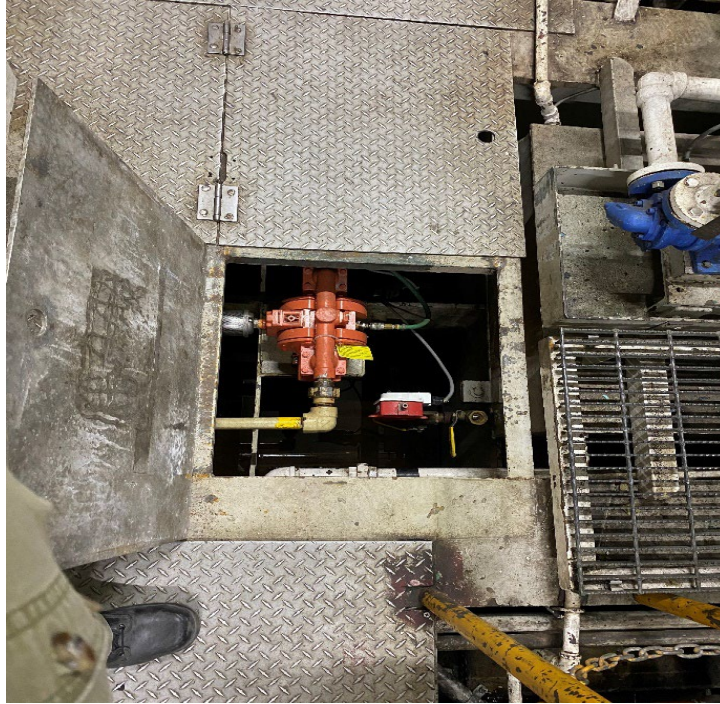
Fuel oil system pipe shall be seamless steel Schedule 80 ASTM A106 or A53. Galvanized pipe and fittings shall not be used. Contractor is to fabricate and install a FO manifold, generally as configured and located in Reference (2G). Final location for FO manifold to be approved by TxDOT Representative. Manifold height is to be below the fuel oil pump inlets of the generator engine fuel pumps.

Flexible hose assemblies shall be installed at the fuel oil connections for the generator and EDG engines. The hose assemblies shall have 37 degrees SAE flare swivel fittings on both ends. The hose shall be flame resistant and shall meet the requirements of U.S. Coast Guard 46 CFR 56.60-25(b), SAE J1942 and SAE J1475. The hose assemblies shall not be less than nine inches in length or more than 24 inches in length.

Drip pans with turned down, non-sharp edges and drain valves shall be provided as needed to collect normal oil leakage under pumps, filters, spigots, and other similar equipment. Existing drip pans may be modified and reused where suitable.

Figure 2 illustrates the existing fuel drain down pump located beneath the ER stairs. Contractor is to remove both the pump and the fuel drain down tank with the removal of the existing GE engines. (These removals are documented on the Machinery Arrangement Removals drawing.)





*Figure 2: Fuel drain down pump to be removed*

#### 261.2 FLUSHING

Prior to connecting the engines, the fuel oil service piping shall be flushed in its entirety using a high velocity heated oil flush. Installed filter assemblies shall be bypassed during flushing. The system shall be flushed to an ISO 4406 18/16/13 cleanliness. Cleanliness test reports shall be submitted to the Owner's Representative.

#### 261.3 SPARES

Contractor shall provide spare filters of each size and type, for six complete change outs of all primary (Racor), generator vendor supplied off engine filters and engine mounted fuel filters. In addition to these six whole vessel sets of spare filters, Contractor shall supply all filters required for trials.

#### 261.4 EMERGENCY GENERATOR ROOM MODIFICATIONS

The existing fuel supply lines for the emergency generator enter the emergency generator room through the floor on the starboard side of transformer T4. They are routed along the floor in way of a bulkhead section that is to be cut out in accordance with Section 201.1. These fuel lines shall be cut back to the exterior, just below the generator room floor, and the existing penetrations shall be sealed. New 316 stainless steel fuel lines of equal size as the existing are to be routed on the exterior, below the floor of the Generator Room, and brought up through new penetrations near the forward side of the fire damper/louver assembly on the port side of the Generator Room. This will require the addition of penetrations for the exterior fuel lines to pass through the port bulkhead of the stairwell.

Fuel lines on the interior shall remain carbon steel. Take down joints and connections between carbon steel and stainless steel pipe shall be bolted flange type with gaskets. These flanges are to be located interior to the ER and E Gen Room - they are not to be located exterior in the weather. Fire tight penetrations shall be fitted with non-conducting, USCG and ABS approved sleeves or filler material.

New fuel lines on the exterior shall be secured to the ship's structure with hangers in accordance with ASTM F708. Hangers for new exterior pipe shall not be welded directly to pipes and shall be lined to prevent galvanic corrosion.

#### 261.5 FUEL OIL SYSTEM MODIFICATIONS IN WAY OF ESS SPACE

The fuel oil piping in Compartment #6 shall be modified to accommodate the new ESS Space Structure as follows:

- The fuel oil overflow pipe leading from the Fuel Oil Storage Tank to the Oily Bilge Tank in Compartment #5 shall be rerouted outboard, so it does not pass through the ESS Space.
- The Gems Suresite gauge mounted on the inboard side of the tank will interfere with the new ESS Space bulkhead. The Suresite gauge and attached level sender shall be relocated to a new location on the fuel oil tank that is accessible to the crew and outside the ESS Space. Final location to be approved the Owner.
- The emergency generator FO tank transfer supply line, and the emergency generator FO tank overflow line currently lead up through the Main Deck at Bulkhead 26, in a location that places them just inside the new ESS Space. These two lines shall be protected from fire in a manner acceptable to ABS and USCG. At the Contractor's option, these lines may be rerouted outside the ESS Space, fitted with double wall piping provided where they pass through the ESS Space, or surrounded by a structural pocket to separates them from the ESS Space fabricated.

#### 261.6 EMERGENCY GENERATOR FUEL SUPPLY IN WAY OF SINK RELOCATION

The fuel supply line for the emergency generator shall be rerouted to accommodate the Engine Room sink relocation. The existing line shall be cut back transversely to a point above the fuel oil transfer pumps and vertically to a point just below the pump control switches. New pipe shall be run vertically from just above the fuel oil transfer pumps and transversely below the pump control switches to the existing vertical section.

Existing pipe supports in sections of removed pipe shall also be removed. The new pipe sections shall be fitted with similar pipe supports to prevent vibration of the fuel supply line.

The fuel oil transfer pump pressure gauges with their existing support plate that are currently mounted on the existing emergency generator fuel supply line shall be relocated either to the bulkhead or to the foundation of the fuel oil transfer pumps. The new location for the pressure gauges shall be fitted with a bracket welded to its support. The bracket shall accommodate a bolted installation for the pressure gauge support plate. If necessary, new holes shall be drilled in the support plate to accommodate the installation.

## 262 MAIN PROPULSION LUBE OIL SYSTEM

Each diesel engine shall have its own self-contained Lube Oil (LO) system with attached pumps, cooler, strainers, and filters. Engine lube oil alarms and sensors shall be as required by Sections 233.0 and 430.

Engine lube oil storage shall be provided by an existing (1,290 gallons at 100%) steel, bulk LO storage tank and via an existing 600-gallon steel LO storage day tank. The location of the tanks and modifications to the LO piping system shall be as shown on Lube Oil System Drawing (2H). Contractor is to fabricate and install a FO manifold, generally as configured and located in Reference (2G). Final location for FO manifold to be approved by TxDOT Representative. Manifold height is to be below the fuel oil pump inlets of the generator engine fuel pumps.

Both the bulk LO storage and LO day tanks shall be thoroughly cleaned by the Contractor. Following inspection and acceptance of clean LO tanks by the Owner, the Contractor is to fill the LO day tank with 500 gallons of clean lube oil, and the larger bulk LO storage tank with 300 gallons. (800 gallons total). All Contractor furnished LO is to be appropriate for the prime mover gensets and approved by the Owner and engine manufacturer in advance of purchase.

Each engine shall also be filled with clean lubricating oil, of a brand and type chosen by the Owner and approved by the engine manufacturer prior to tests and trials.

Immediately upon completion of sea trials, oil samples are to be taken from each engine and sent to a qualified lab for analysis, in accordance with engine manufacturer guidelines. Contractor is to provide the Owner with the oil analysis lab report, within one week of completion of sea trials. After completion of sea trials, and just prior to the vessel's delivery, the initial lube oil and oil filter elements from each generator engine shall be removed and replaced with new.

#### 262.1 CLEAN LUBE OIL SYSTEM

Transfer of clean oil between the tanks and the machinery is achieved with an existing positive displacement rotary pump and a metered piping system connected to each prime mover.

One and one quarter inch (1 1/4") lube oil replenishment lines shall be installed between the engine lube oil storage tank and a new Contractor furnished LO manifold, and between the new LO manifold and each generator prime mover, in accordance with the Lube Oil System Drawing (2H). An isolation valve and a flexible hose section with SAE swivel flare connections at each end shall be installed at the connection to each generator engine sump. The replenishment line shall be separate from and shall not connect directly to the engine-mounted lube oil system piping. The new LO manifold shall be located in close proximity to the LO pump.

The engine lube oil replenishment piping shall be separate from waste oil drain piping.

The existing clean lube oil transfer pump is to be relocated. Considering the "A" End forward, the pump and motor shall be moved aft, into the space made available where fuel oil filters are to be removed. Note that this pump is identical to the existing dirty lube oil transfer pump.

The Contractor shall fabricate a drip pan such that it forms an integrated skid unit identical to that used for the dirty lube oil transfer pump. Contractor shall also fabricate a steel foundation on which to mount the integrated skid unit. The foundation shall be welded to the basic ship structure and the skid unit shall be secured to the foundation with bolts. Installation shall be such that the length of the pump and motor are oriented longitudinally.

Piping on the suction side of the pump shall be cut back as necessary and re-routed to suit the pump's new location. Piping on the discharge side of the pump shall be routed to the new, Contractor provided clean lube oil manifold.

#### 262.2 DIRTY LUBE OIL SYSTEM

The existing dirty lube oil transfer pump, located in the Engine Room beneath the stairs providing access between the Main Deck and the Engine Room on the "B" end, shall be relocated. It is suggested that this work scope be coordinated with removal of the fuel drain down tank, see Section 261.0.

The pump, motor, and associated skid with integrated drip pan shall be retained as a single unit. The entire unit shall be moved farther underneath the stairwell and rotated 90 degrees so that the length of the pump and motor are oriented transversely. Considering the "A" end to be forward, the pump end of the skid shall be oriented to port and the motor end to starboard. The final location shall be as far under



the stairs as possible while still allowing ample space to access and operate all valves, pipe connections, service points, and electrical connections for maintenance. If any existing cables are not of sufficient length, new cables of sufficient length, equal to the existing in size, type, and quality shall be installed. In all cases, any new cables shall be marine grade and USCG approved for use in shipboard installations.

Suction and discharge piping shall be installed in accordance with the Dirty Oil System Drawing, (21).

Each generator engine sump shall be fitted with a drain connected to the suction side of the Dirty Lube Oil Piping System. The horizontal sections of the generator sump drain lines shall be continuously sloped downward towards the waste oil transfer pump, at a slope of not less than 1:48.

A ball valve shall be provided as near as possible to the connection to each sump. The valve body shall be oriented horizontally with the valve stem oriented vertically. Attached drain piping between this drain valve and the drainpipe shall be a flexible hose section with SAE swivel flare connections at each end. Drain valves shall be protected against impact if installed in an exposed location. Arrangement of the drain piping shall be generally as shown in the Dirty Oil System Drawing, (21).

### 262.3 FLUSHING

Prior to connecting the engines and filling the system with oil, the clean lube oil piping system shall be flushed in its entirety using a high velocity heated oil flush. The clean lube system shall be flushed to an ISO 4406 18/16/13 cleanliness. Cleanliness test reports shall be submitted to the Owner's Representative.

The dirty lube oil system shall be flushed in its entirety to ensure it is free of debris.

## GROUP 300 – ELECTRICAL

The Contractor shall provide a complete electrical system, including wiring and equipment, as described in this Specification. The installation of electrical equipment and wiring required by items specified in this Specification shall be provided and installed whether or not specifically called for in the drawing or document references cited by this Specification.

The electrical system shall be constructed in three portions of both AC and DC: 1) energy storage electrical propulsion system, 2) diesel-electric propulsion system and 3) the ship's service electrical system. Battery assist electrical propulsion system, diesel-electric propulsion system and ship's service electrical AC system shall be a Siemens Blue Drive Plus C solution in accordance with Reference (3B).

The propulsion bus shall be an approximately 1000 VDC, ungrounded system. It shall include four 690 VAC generators, though typically will operate on only two generators connected to the propulsion bus. The propulsion system will include two DC propulsion switchboards. Each propulsion switchboard shall be subdivided into various sections including one for each of two generators, one for each of two propulsion motors, one per ESS Space, one for each propulsion bus-tie side and one per ship service bus-tie. Each propulsion generator cubicle will have AC voltage rectified to DC by diode bridges. The propulsion switchboard will supply power to the 600 VAC propulsion motors via Pulse Width Modulated (PWM) inverters inside each motor cubicle. Ship service bus-tie cubicle PWM inverters will supply AC voltage to transformers which will supply the ship service electrical system.

The ship service electrical system shall derive power from either the ship's propulsion electrical system, or from the shore power connection. Power shall be distributed via the ship service switchboard, emergency switchboard, motor control centers and associated power distribution panels. See Section 324 for switchboard operations. The ship service switchboard distribution voltage shall be 600 VAC, 60Hz, 3-phase, 3-wire. The shore power connection shall accept a 480 VAC 3-phase, 3-wire supply, which shall power a 480 VAC wye primary 600 VAC delta secondary isolation transformer, which shall in turn supply the ship service switchboard.

Any deviations from the assigned voltages shall be subject to approval by TxDOT. All equipment, materials and workmanship shall fully comply with the requirements of 46 CFR and ABS Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways. The installation of electrical equipment and wiring required by items specified in other sections of this Specification shall be provided and installed whether or not specifically called for in the electrical sections of this Specification.

The Contractor shall maintain a continuous record of changes in electrical load conditions due to design development during construction and from final selection of equipment. Electrical load changes shall be reported to TxDOT in an electrical load analysis.

For both the electrical propulsion system and ship service electrical system, a plasticized, reduced sized copy of the final as-built electrical one-line diagram shall be provided and mounted in a frame in the vicinity of the corresponding switchboard.

Circuit design schematics shall be mounted on the inside cover of new or modified motor controllers along with other pertinent system data such as overload heater and fuse sizes.

All sensors, switches, transducers, RTDs, thermocouples, and other instrumentation currently part of existing control, monitoring, instrumentation and alarm systems affected by new scope shall be supplied as new, modified to suit the new installation, or reused as authorized by the TxDOT representative. Cable shall be new to such sensors except where reuse is approved by the TxDOT Representative.

Table 4: List of References - Electrical

REFERENCE ID	NUMBER	TITLE
(3A)	20050-002-320-1	AC Electrical One-Line Diagram
(3B)	1VDV3SH	Siemens Energy, Inc. Proposal for TxDOT John W. Johnson Ferry Siemens BlueDrive PlusC™ Solution (see Appendix )
(3C)	20050-001-300-0	Electrical Power Loads Analysis
(3D)	20050-002-101-8	Pilot House Arrangements
(3E)	20050-002-201-1	Machinery Arrangement
(3F)	20050-002-662-0	EOS Arrangement
(3G)	20050-002-101-0	General Arrangements
(3H)	MTN 02-11, 12/15/2011	Marine Safety Center Technical Note: Review of Vital System Automation and Dynamic Positioning System Plans
(3I)	20050-002-320-2	DC Electrical One-Line Diagram
(3J)	1VDV3SH-09-M103A_Technical_Description	Siemens User Manual, RCS, Remote Control System for Thrusters and Propulsion
(3K)	1VDV3SH-09-H100A_TxDOT_JWJ_RCS_Network_Topology	Siemens Remote Control System (RCS) for Thrusters and Propulsion Network Topology
(3L)	07-1123-160-020-001-AB	600V Emergency Generator Oneline
(3M)	07-1123-160-110-001-AB	Emergency Generator Component Layout BOM
(3N)	07-1123-160-110-002-AB	Emergency Gen Breaker Enclosure Layout BOM
(3O)	07-1123-160-130-001-AB	Emergency Generator Control Schematic
(3P)	07-1123-160-140-001-AB	Emergency Generator Control
(3Q)	07-1123-160-140-002-AB	Emergency Generator Control
(3R)	20050-001-320-1	Electrical One-Line Diagram Removal
(3S)	20050-002-514-1	ESS HVAC and Ventilation

In the event of discrepancy between the propulsion system integrator References (3B), (3J) and (3K) and this Specification, other reference drawings in this Specification or Contract Guidance Plans, an RFI shall be submitted to clarify any discrepancies.

### 300.0 EPLA

The EPLA shall be updated by the Contractor to a final as-built condition based on Reference (3C). It shall match the contractor's as-built of Reference (3A) for shared information.

### 300.1 EQUIPMENT AND MATERIALS

The arrangement and installation of the electrical equipment shall be generally as shown on the Contract Guidance drawings. Equipment not shown shall be located subject to the approval of the

TxDOT Representative. Equipment to be reused but requiring relocation, such as equipment currently installed in areas to become new ESS spaces, shall be relocated subject to the approval of the TxDOT Representative.

The Contractor shall be responsible for balancing single-phase loads between the three phases of the ship service distribution system. Each phase of the system shall operate within 15% of average current when the vessel is operating under cruise condition. Cable and circuit breaker sizing shown on the drawings is for guidance only. The Contractor shall be responsible for final design sizing in accordance with the applicable regulatory requirements.

Electrical equipment and materials shall be of types suitable for marine application in the services intended, and shall operate under regulatory required conditions of temperature, vibration, roll, and pitch of the vessel.

Equipment requiring external wiring shall have suitable terminal boards or blocks with solderless terminals to which the Contractor shall make the connections.

Protection covers and safety signage shall be provided for all live and rotating parts.

The maximum allowable temperature rise for any equipment or wiring shall be in accordance with the applicable regulations.

Waterproof metal enclosed equipment, NEMA Type 4X or IP66, and impervious sheathed wiring shall be used in all locations subject to condensation, and in locations exposed to the weather or subjected to routine washing down by hose.

Drip-proof enclosures shall be used for all other equipment, unless noted otherwise. NEMA Type 12 enclosures with oil resistant synthetic gaskets will be acceptable as drip-proof. Rotating machinery shall be protected with drip-proof enclosures, unless noted otherwise.

Connection boxes, outlet boxes, junction boxes, light fixtures, and similar wiring fittings and fixtures installed in locations exposed to weather, condensation, or excessive dampness shall be watertight. They shall be brass, bronze, copper free aluminum, or other non-corrosive material approved by the TxDOT Representative.

Electrical equipment, wiring, and spare parts shall be suitably protected against corrosion, moisture, mold, or other destructive agents to which the vessel may be exposed during normal operation. In general, the equipment shall be finished to suit the space in which it is installed. For painting requirements, see Section 631 of this Specification.

The Contractor shall ensure that positive grounding is provided for the frames or cases of permanently installed generators, motors, controllers, light fixtures, enclosures, instruments, and other electrical equipment. Grounding straps shall be installed as necessary.

All electrical equipment and panels installed on bulkheads that are required to have fire insulation are to be installed on mounts constructed of steel that extend outside the insulation such that mounting bolts are accessible after insulation is installed

### 300.2 EQUIPMENT NAMEPLATES AND MARKINGS

Nameplates and markings shall be provided in accordance with 46 CFR and IEEE-45 requirements. Refer to Section 602.

New or modified electrical equipment for which the function is not readily apparent, shall be fitted with identifying label plates. Any special instructions or precautions shall be included on the label plate, or on a separate plate attached on or adjacent to the equipment.

New or modified power distribution panels shall contain a panel directory card that lists the following information aligning with the as-built one-line diagram required by Section 810.4:

- Panel Designation
- Feeder designation
- Circuit designation, circuit destination, and the circuit breaker trip setting and frame for each circuit breaker in the panel.

New or modified power distribution panels shall have nameplates with the following information that aligns with the as-built one-line diagram required by Section 810.4:

- Panel Designation, prominently displayed on the front exterior
- Feeder designation (cable tag meeting the requirements of Section 320.6 shall suffice)
- A phenolic nameplate that recreates the depiction of the panel in the as-built one-line diagram required by Section 810.4

Label plates shall be made from laminated phenolic, white text on black background; labels of particular importance shall be white text on red background. Inscriptions shall be clear and concise with a minimum amount of abbreviation. Standard marine abbreviations shall be used. Lettering shall not be less than one-eighth inch (1/8") in height with primary information in letters of larger size than secondary information.

### 300.3 ELECTRICAL EQUIPMENT REMOVALS

In addition to electrical equipment indicated elsewhere in this Specification or on referenced drawings as removal items, the following electrical panels including removal of all attached power, control and communication cables shall be removed by the Contractor:

- Vessel Alarm Panel #1, Engine Room, Starboard Side
- EMI Auxiliary Alarm System Main Alarm Panel, Engine Room, Starboard Side
- EMI Auxiliary Alarm System 24VDC P/S and Battery Back-Up Panel, Engine Room, Starboard Side
- EMI Auxiliary Alarm System Flowmeter Breaker Panel, Engine Room, Starboard Side
- EMI Auxiliary Alarm System Engine Room Strobe
- EMI Auxiliary Alarm System Engine Room Siren
- Vessel Alarm Panel #2, Compartment #2
- Vessel Alarm Panel #3, Compartment #7
- Generator Trend Monitor and Enclosure, EOS bulkhead between 600V MCCs
- Generator Trend Monitor battery charger and associated, main deck locker
- #1 GE Engine Alarm System T/C Cabinet
- #2 GE Engine Alarm System T/C Cabinet
- #1 GE Engine Alarm System Local Cabinet
- #2 GE Engine Alarm System Local Cabinet
- #1 Hotstart Engine Heating Panel (Oil Heater #1)
- #2 Hotstart Engine Heating Panel (Oil Heater #2)
- Emergency Generator Control Panel

Panel circuit breakers indicated as removal items from panels that will remain part of the installation as shown on Reference (3R) shall be returned to the TxDOT Representative for vessel spare inventory.

## 301 BATTERY MANAGEMENT SYSTEM

Contractor shall provide a complete battery management system with its subcomponents as follows:

### 301.1 ENERGY STORAGE MODULE CONTROLLER

The Battery Module Controller (BMC) includes two temperature measurements per battery cell and individual voltage measurements for all cells. These measurements are delivered to the BMC once per second. These measurements are sent to the battery pack controller if the temperature has changed 2 degrees Celsius or with a 30 second time interval.

### 301.2 ENERGY STORAGE PACK CONTROLLER

The battery pack controller will communicate to each battery module through a closed secured wireless network. Breaker control is operated by this controller. All operating limits are implemented and parameters are monitored at this controller. Any overstep in the operating values will cause the battery pack controller to trip its load breaker. Multiple battery pack controllers are connected in a Profinet ring configuration to the battery system control.

### 301.3 ENERGY STORAGE SYSTEM CONTROLLER

The battery system controller is connected to the battery charger supplying power to battery packs. The battery system controller collects data from all parallel battery packs within the system. This system receives and performs commands such as pre-charging, connection, disconnection, etc. Alarms and warnings generated are transmitted to the charger and then to the alarm system.

### 301.4 ENERGY STORAGE COOLING SYSTEM

The battery temperature is regulated by the battery cooling system. The water-cooling system's purpose is to keep all of the battery's temperatures stable and ensure optimal lifespan of the batteries. The cooling system also functions as a passive safety layer to ensure that a cell thermal runaway will not propagate to any neighboring battery cells. This system is controlled by the battery system controller.

### 301.5 ENERGY STORAGE OUTGASSING SYSTEM

Install battery outgas piping leading from each battery rack in the ESS Spaces as shown on the ESS HVAC and Ventilation Drawing Reference (3S). The ESS outgassing system for each ESS Space shall maintain a under pressure in the battery racks relative to the ESS Space, utilizing an EX rated fan suitable for Zone 2 installations. The outgas fans shall run continuously and be monitored by the IAS400 system to provide an alarm if the fan stops.

Each ESS Space will also have a dedicated HVAC and ventilation systems, see Section 514.

### 301.6 GAS DETECTION SYSTEM

The Contractor shall install an EX certified gas detection system. Battery gas monitoring shall be provided by a Nexceris Li-Ion Tamer or equal. Per Section 043, the Contractor shall be wholly responsible for demonstrating that the "or equal" detector has an equivalent capability for early detection of thermal runaway from lithium-ion batteries as the Nexceris Li-Ion Tamer.

At minimum, one gas detector shall be installed in the outgassing pipe leading from each battery room, and two gas detectors installed in each ESS Space.

In addition, Carbon monoxide (CO) gas detection meeting the requirements of the Contractor's propulsion system integrator may be installed to supplement the Li-Ion Tamer system.

Once gas is detected, the sensor shall give feedback to the ESS Controller and trip all battery packs in the impacted ESS Space.

Gas detection system alarms shall comply with applicable ABS, USCG, and the battery manufacturer requirements, including the requirement of 46 CFR 62.25-20(d)(5) to remain separate and independent from the main machinery alarm system. Summary or trouble alarms that do not replace but only supplement gas detection alarms are allowed.

## 302 ELECTRIC MOTORS AND CONTROLLERS

### 302.1 SHIP SERVICE ELECTRIC MOTORS

#### GENERAL

New motors shall be of best quality standard commercial marine type, meeting the applicable requirements of the USCG. Motors shall be of one manufacturer to the maximum extent possible. Exceptions are motors integral to packaged machinery items, and small fractional horsepower units.

New motors shall be IEEE-45 where identified elsewhere in this Specification or in the Contract Guidance Drawings. New motors in the Engine Room shall be rated for 50° C ambient temperature. Unless otherwise noted, motors shall not exceed 1750 rpm.

#### RATING

Unless otherwise defined in this Specification or the Contract Guidance Drawings, when describing new specific equipment motors, 3/4 horsepower and larger shall be 3-phase, 208, 480 or 600 VAC, 60 Hz. New motors smaller than 3/4 horsepower may be single phase, 120 VAC, 60 HZ.

New motors shall be AC squirrel cage induction type, designed for continuous duty.

New motors, unless otherwise defined, shall be NEMA Design "B" torque characteristics.

New electric motor continuous duty service factors shall be a minimum of 1.15 with Class F or better insulation.

New motors in frequent or near continuous operation shall meet or exceed NEMA Premium Efficiency ratings.

#### ELECTRICAL CHARACTERISTICS

All new motors shall be suitable for full voltage across the line starting. Locked rotor and breakdown torques and locked rotor currents shall be as specified in the NEMA standards for the design application.

#### MECHANICAL CHARACTERISTICS

New motors shall be TEFC unless located within axial fans, where they may be TEAO. New motors shall have a marine grade corrosion resistant coating. New motors shall be inverter duty rated when controlled by variable frequency drives.

#### NAMEPLATE DATA

Each new motor shall be fitted with a nameplate of corrosion resistant material marked permanently with the following information:

- Manufacturer's type and frame designation
- Rated horsepower

- Rating classification
- Temperature rise at rated load
- Voltage
- Number of phases
- Code for locked rotor KVA on motors 1/2 HP and larger in accordance with NEMA standards
- Design ambient temperature
- RPM at rated load
- Amperes at rated load
- Frequency
- Service Factor, if above 1.0

The Contractor shall provide a new motor data booklet to TxDOT upon delivery of the vessel. The booklet shall list all new electric motors throughout the vessel. The booklet shall contain the following information:

- Complete nameplate data
- New motor service and circuit number
- Location of each new motor on the vessel
- Manufacturer's name, address, local representative

## 302.2 MOTOR CONTROLLERS

### GENERAL REQUIREMENTS

New motor controllers shall be marine type, complying with the requirements of the Underwriters Laboratories, Inc. Standard for Industrial Control Equipment and the U.S. Coast Guard 46 CFR Subchapter J. New controllers shall be supplied by one manufacturer, Siemens or equal, to the maximum extent possible.

New motor controllers shall have 120 VAC or lower power for control and indication functions derived from transformers internal to the motor controller and powered off of the incoming motor supply circuit.

Illuminated pushbuttons shall be provided for "Motor Running" indication and speed and direction where applicable. Run indicator lights shall be green and stop indicators shall be red for single speed motors; amber for low speed and green for high speed in the case of two speed motors. Automatic controllers shall have blue indicator lights for automatic control, and green for motor running on "hand-off-auto" or "off-auto" controllers. Indicator lights shall be LED type.

Operating controls shall be mounted in the front of the enclosure and push-to-test motor running pilot lights shall be provided.

New motor controllers in machinery spaces shall be corrosion resistant NEMA 12 type. The enclosures shall not be supplied with knock out sections.

The thermal-magnetic circuit breaker in each steering gear HPU pump motor controller (Type Siemens Sentron CED63M030) shall be removed and replaced by an instantaneous-only circuit breaker of the same instantaneous range and same frame size (e.g. ED63A030).

### COMBINATION STARTERS

Combination type controllers shall be provided for all motors.

All controllers shall incorporate an instantaneous-only circuit breaker that opens all phase conductors. An external disconnect suitable for lock out shall be provided on each motor controller. An overload or fault on any conductor shall open all phase conductors. Each conductor shall be provided with long term (thermal) trip protection inside the controller.



Thermal overloads shall be of the ambient temperature self-compensating, adjustable range type. Motors starters started and stopped automatically by control devices, such as pressure switches, shall include a selector switch with positions marked "manual", "off" and "automatic", which are connected to function accordingly.

New pushbutton stations in normally dry locations shall be oil tight in NEMA 12 enclosures; in damp or wet locations they shall be watertight NEMA 4 or 4X.

Motor starters for motors which can be started and stopped from remote locations shall include a selector switch with positions marked "Local" and "Remote" and connected to function accordingly and a suitable warning label affixed to the motor starter and motor. Starters shall be installed as conveniently near their respective motors as possible. If a starter must be installed at a point from which the motor served is not visible, separately mounted start-stop push stations shall be installed near the motor, within sight of the motor, and be fitted with a lockout facility.

Each motor controller shall be labeled with the load description and circuit number.

### NAMEPLATE AND WIRING DIAGRAM

Controllers shall be marked with the following information on a corrosion resistant nameplate:

- Service
- Voltages and phases
- Operating instructions, if any
- Manufacturer, type and serial numbers
- Current or horsepower
- Circuit Designation

A laminated copy of the wiring diagram for each controller as installed shall be permanently mounted inside the cover. Terminals shall be clearly identified.

### 302.3 VENTILATION SHUTDOWN CIRCUIT

New vessel systems shall be integrated with the existing Engine Room ventilation shutdown circuit, which shall be controlled from the Pilot House stop buttons and car deck level break glass stations. The Pilot House shall be equipped with ventilation shutdown and reset buttons, which shall be labeled and accompanied with instructions, and be configured for pull to shut down, push to reset. The Engine Room ventilation fan motor controllers shall be provided with UV trip functionality, either through normally open contactors, or through VFD input. UV trip power shall be 24 VDC. Either the shutdown button, or discharge of the Engine Room fixed CO<sub>2</sub> fire extinguishing system shall interrupt the supply from the 24 VDC source, which shall cause shutdown of the ventilation fans and closure of the fire dampers. The fans shall not restart, and dampers shall not reopen, without positive reset action on behalf of the operator. Additionally, the fans shall shut down upon loss of power to the fire damper supply circuit. EOS shutdown buttons shall be pull to shut down, push to reset.

Remote emergency shutdown stations for the various fuel oil, flammable liquids and ventilation systems shall consist of contact pushbutton stations in break glass enclosures. Provide labels at the station describing the function performed.

### 302.4 PROPULSION MAIN MOTORS

The existing propulsion main motors shall be reused. However, reused motors shall be tested in accordance with IEEE 45 requirements. During initial commissioning of the new system, insulation resistance measurements shall be made at a minimum of 500 VDC for a minimum of 1 minute. Insulation resistance shall be measured at a minimum of 1.6 MΩ. In addition, Contractor's propulsion system integrator shall perform a motor inspection of the existing motors after award of the contract

but prior to the vessel being relocated to the awarded shipyard. A full report of the motor conditions shall be provided and serve as a baseline for subsequent testing. A similar motor inspection shall be performed, and conditions reported by the Contractor's propulsion system integrator during their initial commissioning of the new system. See Section 320.5 for testing of motor cables.

The Binsfield TorqueTrak on the output shaft of each reduction gear shall be reused or replaced by the Contractor. Contractor shall incorporate the same analog values as the existing system into the new system and have the values recorded like other I/O and reported on the HMI screens in the EOS.

### 302.5 PROPULSION MAIN MOTOR VARIABLE FREQUENCY DRIVES

The propulsion main motors shall be controlled through Variable Frequency Drives (VFD).

All variable frequency drives shall be of a commercial off the shelf design, suitable for a marine environment and approved, built, tested and certified by ABS. The variable frequency drives shall be provided by the Contractor to supply 1000 kW at 600VAC to each propulsion motor. See Reference (3B). The propulsion system shall function by receiving AC generator voltage and converting to a variable DC grid voltage through a liquid cooled diode rectifier. The VFD modules shall then take power from the DC grid to supply four (4) quadrant, reversing, pulse width modulated AC power to each motor at variable torque, frequency, and voltage. The drive modules shall have a motor operated isolator and DC pre-charge. The variable frequency drives shall be controlled by the energy management system (EMS) with input from each generator control unit (GCU). They shall use new braking resistors, each a Siemens Type per Ref. 3B. Contractor shall remove existing braking resistors and protective screens and install a flat foundation in the same location on which to install the new braking resistors. Braking resistors shall not be installed at an angle like the existing units so as to preserve the IP23 rating of the new braking resistors.

The propulsion system design shall ensure that the total harmonic distortion in the power system and their effect on the power distribution system is within Class and Regulatory limits under all operating conditions.

The drives will have local touch pad control panels for diagnostic and manual operation, capable of standalone operation. The control system will be PLC controlled and all alarms, controls and monitoring inputs and outputs will be achieved by data link compatible with the PMS, AMS and Pilot House propulsion control systems equipment.

The drive control system shall limit the power according to actual generator and ESS capacity. It shall be possible to start the main motors with only one generator running. The internal control system in the VFD shall limit its power consumption to the actual generator maximum load capability. In case of a trip of one generator, the remaining generator(s) shall not become overloaded to the point of tripping offline or causing a blackout of propulsion power.

All tools, software (two licensed copies minimum) and equipment required for diagnostics and maintenance of the units will be supplied with the drives as part of the equipment package. Software will include room for growth.

A list of recommended spares will be provided by the system vendor for Owner's information.

Special cabling or installation requirements shall be noted in quotations including a cost estimate of special items not included.

Recommended maintenance and operational training of Owner's personnel shall be quoted. Vendor shall guarantee ready availability, in Galveston, Texas, of repair personnel to attend any faults.

Training of selected Owner's staff shall be provided during Commissioning.

The drives shall be of a model and type currently in production for marine use with parts production for at least 10 years.

Vendor's technical staff will be required for installation and positioning of the drive cubicles, commissioning of the propulsion system and full attendance during Sea Trials.

Warranty will be for 12 months from date of acceptance of the vessel by Owner.

## 310 PROPULSION ALTERNATORS

### 310.1 GENERAL

This section shall be applied in conjunction with the generator set engine requirements described in Section 233.0. Requirements for the alternator (the electrical machine) portion of the generator set are contained herein; requirements for the diesel engine prime mover are in Section 233.0. Each generator set shall consist of an ABS-certified diesel engine and ABS-certified alternator with brushless exciter, all mounted on a common fabricated steel base, with a full-length drip-pan integrated into the skid frame under both engine and generator, fitted with resilient mounts, and furnished complete with the equipment listed below.

The alternators shall be Siemens 1DC0423-4AY02-Z dual bearing alternators, or equal for prime power service. [NOTE: Generator bearings are to be spherical roller type or other, requiring no external independent cooling water or lubricating oil inputs.] Each alternator shall be directly coupled to its diesel engine; there shall be four generator sets.

Generator shall also be supplied with all components necessary to support the AUTO-START function described on Section 324, Switchboard.

### 310.2 PROPULSION ALTERNATOR

The alternators shall be air-cooled, 690 VAC, 3-phase, 3-wire, ungrounded, 60Hz, 599kW, 750 kVA, 0.80pf, 1800 rpm. The alternator shall be drip-proof protected to IP23. Windings shall have Class H insulation. All generators shall be brushless machines, suitably rated for the harmonics of the 6-pulse diode rectifiers.

The generator shall be excited by a Basler DECS-150 voltage regulator. Generators shall be provided with suitable electronic governors with hydraulic actuators on the engines and other necessary equipment for a complete installation suitable for continuous operation 24 hours daily in single or parallel operation and EPA Tier 3 emissions standards. Engine governors and generator voltage regulators shall be suitable for interfacing with the Power Management System described as part of the provided Siemens specification, Reference (3B).

Transient voltage variation when applying and removing the maximum propulsion motor load shall be maintained within the limits of ABS Rules. All propulsion generators shall be able to run in parallel, load share in static and dynamic operating conditions and be set up to have similar response characteristics for suddenly applied and shed loads, without becoming unstable within their operation power ranges and regardless of whether ESS are connected or not.

The alternator connection box shall be arranged for cable entrance from the top, bottom, or from either side. Internal connections shall be made to terminal strips with separate strips for power and for control functions.

Each alternator shall be fitted with a 600/540W, 230/208 VAC single-phase strip heater and provision for automatically heating whenever the generator is not operating. Two RTD type temperature sensors shall be fitted per winding, one RTD type per bearing, one RTD type for intake air temperature and one RTD type for exhaust air temperature.

Prior to installation aboard the vessel, the generator sets shall be stored in a dry, climate-controlled warehouse to prevent weather or condensation damage.

## 320 ELECTRICAL DISTRIBUTION SYSTEMS

The distribution of electrical power in general shall be in accordance with References (3A) and (3B). This drawing is intended to cover only the principal electrical components. It shall not excuse the Contractor from providing a complete and operable system to meet the requirements of all regulatory authorities.

Electrical equipment and components shall be located in a manner that facilitates efficient operation and allows for ease of maintenance.

Electrical equipment that is not specifically required to be portable shall be permanently connected to the ship's wiring. Where portable cords are used, the frame of the equipment shall be grounded by an additional conductor in the cord to the receptacle.

### 320.1 POWER DISTRIBUTION

The distribution of electric power, lighting and interior communication systems shall be in accordance with References (3A) and (3B). The plans are not intended to show the complete system but only to cover the principal features required for the distribution system. All facilities and features required for the comprehensive and proper operation of the electrical apparatus and equipment for the vessel shall be provided in accordance with the intent of this Specification.

The Contractor shall supply the power distribution equipment where the incoming AC power from the diesel generators is rectified to DC inside and through either of two BlueDrive Plus C (BDPC) switchboards. Each BDPC will connect directly to a BlueDrive lithium-ion energy storage system (ESS). Each BDPC will provide AC power to main consumers via inverters integrated into the BDPC. Between each DC switchboard, a DC bus-tie via Intelligent Load Controller (ILC) will balance loads. The ILC is an autonomous high-speed semiconductor device capable of detecting, and effectively limiting and interrupting a short current in case of a short circuit in one of the DC link bus bars.

With the exception of propulsion power, AC circuits for power and lights shall be run direct from a 600 VAC switchboard to the emergency switchboard, motors control centers and distribution panels for final branch circuit supply to various loads throughout the vessel.

The 600 and 480 VAC systems shall be ungrounded except as required to be provided for ground detection. Ground detection on switchboards that can operate split-bus shall automatically ensure that ground detection operates with internal bus-tie split or connected. All non-current carrying parts of electrical equipment and devices shall be grounded to the ship structure. Grounding of the equipment shall be accomplished with separate grounding straps or conductors. For final single-phase circuits the third core in the conductor shall be used for grounding back to the distribution panel. Grounding continuity shall be tested for all equipment during commissioning.

All circuits shall be properly fitted with protected switches. Calibrated breakers are to be rated for 50°C ambient if used in the Engine Room, and 40°C ambient if used outside the Engine Room.

## 320.2 24VDC ELECTRICAL SYSTEMS

The distribution of 24VDC electrical power in general shall be in accordance with Reference (31). This drawing is intended to cover only the principal electrical components. It shall not excuse the Contractor from providing a complete and operable system to meet the requirements of all regulatory authorities.

## 320.4 CABLEWAYS/WIREWAYS

New or modified cables shall be routed in wireways wherever possible. Existing main wireways shall be supplemented where necessary between the Engine Room and each Steering Gear Room and Motor Room, and between the Engine Room and the Pilot House. Wireways containing AC and DC power cables shall be separate from those containing control, communication, instrumentation, signal, or network cables. Any new or modified generator feed, propulsion power, and braking resistor cables shall be single banked in their trays.

New or modified wireways shall be fitted with multi-cable transits (MCTs), Roxtec or Owner-approved equal, wherever they transit through watertight or A-class decks or bulkheads. Cables transiting through watertight or A-class boundaries shall be fitted or insulated, as appropriate, to maintain the integrity of the boundary. Signal and power cables shall be separated utilizing separate MCTs.

The ESS layouts have been selected in part to minimize impact on existing cable routing. The cable tray which crosses through Compartment 6 on a diagonal will require modification to move the forward bulkhead penetration outboard of the new ESS bulkhead. A not all-inclusive list of cables in this tray include the following:

- Propulsion Motor power
- Propulsion Motor Cooling Pumps
- Shaft Gland Cooling Pump Controller Boxes
- Lighting, normal and emergency
- Light Switches
- Power Outlets
- Steering Indicators
- Rudder Indicators
- Rudder Room Fan Controllers
- Rescue Boat Battery Charger Boxes
- Torque Trax Revolution on shafts
- Gai-Tronics phone system
- Sound Powered Phones on Main Deck
- Battle Lanterns
- Motor Room Fan Controller Power
- Camera System
- Barrier Gate Controllers on Main Deck

## 320.5 ELECTRICAL CABLE

All disturbed cables are to be replaced unless otherwise approved by Owner. All cables that become unused as part of this contract must be removed. No dead ending of cables shall be allowed. Existing vital cables run through or over areas to become new ESS spaces shall be relocated or replaced as necessary so that they are not running through or over the ESS space unless serving that space. New cables shall not be run through or over an ESS space unless serving that space. All control and

communication cables attached to removed panels shall also be removed unless specified elsewhere in this Specification or references herein as to be retained.

Existing propulsion motor cables are to receive specific consideration for retention and reuse with a corresponding credit to Owner. Reused motor cables shall be tested in accordance with IEEE 45 requirements. Insulation resistance measurements shall be made at 500 VDC for a minimum of 1 minute. Insulation resistance shall be measured at a minimum of 100,000  $\Omega$ .

Cable in interior spaces shall generally be unarmored overall sheathed cable in accordance with regulatory agency requirements. Aluminum conductors or armor shall not be used. Wiring shall be carried in stranded, low halogen insulated, flame-proof marine cable, carried in open (except in lined spaces) and clipped up. Conductors to be of soft annealed round copper wire, without weld, splice or joint throughout entire length. Junction boxes for other than lighting circuits shall not be allowed except where shown on Contract Guidance Drawings, drawings produced by the Contractor's propulsion system integrator or specifically approved by the TxDOT's Representative.

Electric wire and cable shall comply with 46 CFR and ABS requirements. The Contract Guidance Drawings reflect the use of IEEE 1580 (2001) low smoke zero halogen cable in some cases. New power cable shall be TriCab Type BV for unarmored applications, or Type DV for armored applications, or equal. New cables connecting the BDPC to propulsion motors shall be TriCab Type DF, or equal and rated for 2000V. Cables connecting the BDPC to the propulsion batteries, braking resistors or other DC sources and loads shall be rated for 2000V. Insulation shall be type LSE or LSX, with type TPO or L jacket. Cables shall be unarmored unless otherwise noted on the Contract Guidance Drawings.

All cables shall be concealed from weather to the maximum extent possible. Special cable may be used for electronic equipment as recommended by the equipment manufacturer.

No cable smaller than 4100 circular mils (14 AWG) in size shall be used for general power and lighting service.

Portable cables shall be of the heavy-duty rubber covered type. Portables cables shall contain a conductor for equipment grounding.

Wire sizes indicated in the Contract Plans are nominal. It shall be the responsibility of the Contractor to calculate circuit voltage drops and determine final wire size to comply with IEEE-45 requirements, based on actual cable lengths.

Generator, VFD, propulsion switchboard, propulsion battery, braking resistor and propulsion motor power and control cables shall be approved by the propulsion system vendor/integrator prior to purchase. Contractor shall supply all DC battery cables necessary to connect between multiple battery cubicle lineups in each ESS space.

### 320.6 CABLE INSTALLATION

New or relocated cables shall be run as directly as possible consistent with practical wireway grouping, and similar factors. New or relocated cables should not be double-banked, but if unavoidable, the requirements of IEEE 45 shall apply.

New or relocated cables that are subjected to mechanical damage shall be protected by metal guards. Likewise, new or relocated cables subjected to potential moisture dripping, or those below the deck plate level, shall be provided with sheet metal drip shields. Wireways shall be installed in a manner that will minimize rat harborage.

New or relocated cables shall be concealed in spaces that require lining.

New or relocated cables where requiring new or modified cableways shall be supported by galvanized steel hangers not more than twenty-four inches (24") wide and spaced not more than fourteen inches (14") in a horizontal run, or eighteen inches (18") in a vertical run. Hangers shall be strong enough to withstand short circuit conditions. Hot dip galvanized steel cable trays shall be used throughout for any new or modified wireways. Cable banding shall be stainless steel.

Openings for passage of cables through non-tight bulkheads shall be collared with round bar or flat bar to prevent chafing. New, modified or relocated cables passing through watertight bulkheads and decks shall be provided with stuffing tubes, or bulkhead transit fittings. New or relocated cables passing through decks shall be provided with kick pipes or trunks at least ten inches (10") high in the weather, and six inches (6") elsewhere.

New or modified cable connections shall be made within equipment enclosures or standard approved appliances with terminal blocks. Terminal blocks shall be non-combustible moisture proof phenolic or plastic with barriers between terminals. Connections shall be of the solderless type with conductor ends solder dipped or ferruled before attaching. The lugs shall be of a type that will prevent turning.

New or relocated cables shall be tagged with their identification at each point of connection and at both sides of bulkhead and deck penetrations. Cable tags shall be aluminum or other non-corrosive metal with embossed figures. Conductors shall be provided with identifying floaters, embossed plastic sleeves, at terminals.

### 320.7 SHORE POWER CONNECTION

Shore power available at the Galveston and Bolivar ferry facilities is 480 VAC, 3-phase, 150A. The Contractor system shall be designed to integrate with the existing 150 kVA 480/600 V step-up shore power transformer. Power from shore shall be received by a Contractor provided shore power breaker in the new 600 V ship service switchboard.

The transfer from ship's power to shore power and the reverse shall be bumpless and accomplished with switchboard-mounted controls. The source of power on the ship's service bus shall be synchronized with shore power, and the shore power breaker closed. Load transfer to or from shore power shall not last longer than twenty (20) seconds. After this time, the source originally supplying the bus shall be automatically opened. There shall be no interruption or creation of switching transients that negatively impacts the onboard electrical systems during the transfer to or from shore power.

The shore power circuit breaker shall be blocked from closing if the load current exceeds the setting of the shore power over current protection. This setting shall be visible on a switchboard-mounted shore power ammeter.

### 320.8 TRANSFORMERS

Two new power transformers T-1 and T-2 shall be provided to supply the new 600 VAC ship service switchboard from the propulsion DC grid. Size and voltage levels are shown in References (3A) and (3B), and general locations are shown in Reference (3E). Each transformer is a dry insulated three phase distribution transformer with natural cooling and shall be stored in accordance with Section 083 including connection of anti-condensate heaters. The windings shall not absorb humidity and be suitable for marine environment. Transformers shall withstand the dynamic stresses coming from short-circuit currents. Transformers shall be mounted on dedicated foundations and shall be set away from bulkheads and equipment so as to allow adequate cooling air circulation.

Transformers shall be 450 kVA with the following characteristics:



- Rated frequency 60 Hz 3 phase
- Degree of protection IP23, air cooled
- Rated delta/wye, primary/secondary voltage of 570/600 V, neutral floated on secondary
- Winding material Copper
- Terminations prepared for copper
- Class H insulation, 220C temperature class with 140C temperature rise
- Vector group YNd5
- K-factor rated for harmonics
- Rated for an ambient temperature of 50°C
- Weight approx. 2850 lbs preliminary
- Be provided with
  - 3x2 Pt 100 temperature sensors in windings (1 set as spare)
  - 1x Pt 100 temperature sensor in core
  - Two anticondensation heaters – each 500W, 120V
  - Earthed screen between windings
  - Cable entry from bottom
  - Earthing boundary bolt

Contractor shall provide new transformers T7, T-8 and T-9 to supply 480V and 208V loads as shown in References (3A) and (3B). Transformers T-3, T-4, T-5 & T-6 shall be reused as necessary in the new installation.

### 320.9 ELECTRICAL DISTRIBUTION PANELS

New power distribution panels shall be Siemens Type P1, or Owner-approved equal, provided with automatic short circuit and over-current protective devices of the circuit breaker Type BL. Distribution panels shall comply with U.S. Coast Guard 46 CFR 111.40 and shall be Underwriters Laboratories listed, bearing the UL label. They shall be assembled into a single interior unit mounted in a steel enclosure, consisting of a box and front designed to be mounted on a bulkhead. The panels shall be of the dead-front type, designed for connection to a 4-wire 208/120 volt, 3-phase AC source.

New panel enclosures shall be classed NEMA 12 in machinery spaces and NEMA 4X in exterior locations.

Each panel shall be identified with its voltage and panel number on the exterior of the enclosure.

Circuit directory frames and cards, fitted with a clear plastic covering, and shall be provided on the inside of each panel door as required by U.S. Coast Guard 46 CFR 111.40.

Contractor shall install fixed locking hasps on all power panels throughout the vessel, whether new, modified or existing. These locking hasps shall remain attached to the power panels when the lock is removed except where approved by the TxDOT Representative. Siemens P1 or P2 power panels shall be fitted with a Siemens product of the appropriate pole count, Type ECPLD1, ECPLD2 or ECPLD3 or similar type approved by the TxDOT Representative. Square D NQ power panels shall be fitted with a Square D product of the appropriate pole count, Type QO1PAF, QO2PAF or similar type approved by the TxDOT representative. Square D I-Line panels using Type BL circuit breakers shall be fitted with a Square D product Type LV426908 or similar type approved by the TxDOT Representative.

### 320.10 PROTECTIVE DEVICES

Branch circuit breakers in electrical distribution panels shall be the molded-case type, Siemens Type BL or equal, with thermal-magnetic trips. Circuit breakers shall be the quick-make, quick-break type and shall trip free upon overload or short circuit. Individual breakers shall be factory sealed. Multi-pole



circuit breakers shall have a common trip. Breakers shall be interchangeable and shall be capable of operating in any position. Panel feeder circuit breakers shall use adjustable LSI trip circuit breakers as necessary to provide selective coordination.

Circuit breakers used for switching shall be switch duty rated.

Within each panel, one spare circuit breaker and space for an additional circuit breaker shall be provided for every ten active circuits, or fraction thereof. Spare circuit breakers shall be of representative sizes of the circuits used in the panel.

### 320.11 ELECTRICAL WIRING EQUIPMENT

Electrical enclosures shall prevent the ingress of solids and liquids and shall meet the Ingress Protection ratings outlined by 46 CFR and the ABS Rules. Electrical enclosures within mechanical spaces shall generally be NEMA 12. Enclosures in areas exposed to weather shall be NEMA 4X.

### 320.12 SPARE PARTS AND TOOLS

An allowance of \$500,000 shall be made in the contract price for the cost of spare parts for one year's operation of the vessel, inclusive of spare batteries and storage. The Contractor shall supply Owner with a list of spares recommended by the manufacturers for one year's operation of all major items of machinery and equipment. Owner shall select the spares to be provided from the list and indicate for each selection whether the item is to be shore-based or shipboard. The Contractor shall deduct the cost of the selected spares, adjusted for shore or ship location, from the allowance. The credit or debit at the end of the process shall be handled in accordance with the provisions of the Contract.

## 324 NEW 600V SHIP SERVICE SWITCHBOARD

### 324.0 GENERAL

A new 600V Ship Service (SS) switchboard shall provide for the control and distribution of 3-phase, 3-wire 600 VAC electrical power as shown on Reference (3B). The 600V ship service switchboard, located in the EOS, shall be deck mounted and sway braced to the surrounding structure.

The marine switchboards shall be type tested with acceptance and approval by ABS, built of solid steel construction with framework of steel profiles and covered with front and rear steel doors and side plates.

The switchboard manufacturer shall provide wiring diagrams and shop drawings of the switchboard to the Contractor, and the Contractor shall provide same to TxDOT for approval prior to fabrication. The drawings shall clearly show design, construction material, finish installation, front layout, point to point wiring diagrams, material list, mounting details, and label plate list including floaters for terminal blocks. The manufacturer shall provide to the Contractor three (3) complete sets, as well as electronic sets in PDF format, of as-built drawings of the switchboard and cut sheets of the components. The Contractor shall in turn provide the physical and electronic documents to the TxDOT Representative.

Switchboard components listed in this Specification and all others required for a complete system shall be provided. The switchboard shall be furnished as specified herein and shown on Reference (3B) and shall be installed and fully connected into the ferry electrical system by the Contractor.

The switchboard shall be demonstrated during onsite tests at the manufacturer's facility, or Contractor's facility to provide operating logic that accomplishes the functionality and operation specified in the below paragraphs.

Rubber matting with the required dielectric resistance shall be provided by the Contractor in front of all switchboards.

### 324.1 SWITCHBOARD CONSTRUCTION

Switchboard construction shall meet the requirements of U.S. Coast Guard 46 CFR.

#### A. Enclosure

The switchboard shall be IP31 enclosed and dead front. All operating controls and indicators shall be front mounted and fully accessible by hinged panels. All other components shall be accessible by removable front, side and rear panels. Provide continuous emergency-powered lighting across the front face of the entire switchboard consisting of a marine-type LED fixtures so that all items on the switchboard are well illuminated. The switchboard shall be bolted to the foundations on the ship. Construction shall allow for cables entering the top or bottom of the switchboard.

The switchboard bottom shall be completely open for possible cable entrance. All front instrument panels shall be formed approximately one inch (1") on all sides and hinged. Front panels covering molded case distribution circuit breakers shall be formed and bolted. Side and rear panels shall be flat sheets, bolted on. All formed and hinged front panels shall be fastened with open and turn flush clamps. All hinged panels shall be equipped with door positioners for holding the panel in the open position during access to internally mounted components. Non-conducting grab rails shall be provided across the entire front of the switchboard.

#### B. Bus Bars

All buses shall be copper, with tin or silver-plated connections over their entire length. Bolts, washers and nuts used for bus and stud connections shall be corrosion resistant. All bus connections shall be provided with mechanical locking to prevent loosening. Solderless compression lugs shall be used for all cable connections, or an approved compression type tunnel lug on circuit breakers and other equipment installed in the switchboard. All bolts in bus connections shall be torque wrench tightened to an appropriate uniform value for each size bolt and marked across all joints with permanent marker or paint pen. The main bus shall be sized to a minimum of 120% of the connected ship service inverter capacity; braced to suit maximum available short circuit current. Bus supports shall be of high-quality moisture-resistant insulation material arranged to minimize dust accumulation across any horizontal surfaces. The mechanical strength, bracing and supports of the bus shall be designed for a minimum symmetrical RMS short circuit current of 18 kA. Bus bars and associated shall be designed and installed for the marine installation. Points of amplifying resonance on back panels and other surfaces on which electrical components are mounted shall have additional bracing added to minimize such detrimental effects.

#### C. Components

All cable and all electrical equipment shall be selected to operate satisfactorily in a 45°C ambient temperature and all control and instrumentation equipment shall be selected to operate satisfactorily in a 55°C ambient temperature. All electrical components shall be as described below.

##### Circuit Breakers:

Circuit breakers shall be quick-make, quick-break, trip free, with tripping mechanisms capable of safely opening the circuit they protect while subjected to the maximum fault current of 25 kA. All poles shall be opened simultaneously by a common trip mechanism. Trip elements or sensors shall be calibrated or ambient compensated for operation in a minimum 40°C ambient temperature. Breaker frame size

and trip settings shall be shown on the switchboard design drawings and on the engraved breaker ID plate attached to the front of the switchboard.

All under-voltage trip (UV) devices shall be 24 VDC, to prevent tripping during power transfer operations.

#### Instruments:

All instrumentation shall be provided by one or more generator multifunction digital meters, arranged to sense the supply from any of the transformers. Instruments shall be constructed to minimize damage from dust or moisture.

The system shall include relays as necessary to interface with the Integrated Monitoring Alarm and Control System (IAS400) (see Section 0) to display all alarms.

#### Instrument and Control Switches:

All rotary type instrument, control and circuit breaker switches shall be clearly labeled for function.

#### Fuses:

Instrument fuses shall be of the non-renewable cartridge type. They shall be accessible from the front of the switchboard through the hinged panels containing the instruments and controls they protect.

#### Indicating Lights:

Indicating lights will be long-life LED type.

#### Wiring:

Instrument and control wire shall be flame retarding, flexible switchboard wire. Each wire end shall be fitted with a permanent sleeve type wire number. Grommets shall be provided to protect wiring where it passes thorough metal panels. Components required to be interconnected with external equipment shall be wired to terminal boards that are readily accessible and clearly marked for shipyard cable terminations. The secondary of all current transformers are to be wired to shorting type terminal blocks. Plastic wiring support devices and materials on the back pans, side pans or rear of doors shall meet UL 94V-0 flame retardant standard. Wiring duct, cable tie mounting devices, clamps or clips shall be permanently fastened. Any adhesives used shall be epoxy. Foam tape is specifically prohibited.

#### Nameplates and Labels:

Components mounted on the front of the switchboard shall be provided with nameplates that clearly indicate their use. Nameplates for circuit breakers shall give the circuit designation, breaker frame size, trip settings and load served. All instruments, switches, and front mounted components shall have nameplates, appropriately engraved. Internally, easily readable, use identification shall be provided for all fuses and any other components. Main buses shall be marked with their phase designation. All terminal blocks shall be numbered and keyed to circuit designations on wiring diagrams. Engraved nameplates shall be white letters engraved on black background.

#### Switchboard Components:

The following description of components required within various compartments is for guidance only and does not relieve the manufacturer of responsibility for the final design and arrangement. It is the switchboard manufacturer's responsibility to furnish all components required for a complete and workable system. Switchboard manufacturer shall provide sufficiently detailed descriptive information about the switchboard including all drawings, parts lists, operating description and other

documentation to obtain regulatory and owner approvals.

## 325 PROPULSION DC SWITCHBOARDS

### 325.0 GENERAL

The Main Propulsion DC Switchboards shall be composed of two BlueDrive Plus C (BDPC) cabinets or equal. These shall provide for the control and protection of the propulsion generators, propulsion lithium-ion batteries, propulsion motors, ship service bus-ties and braking resistor banks as shown on Reference (3A). The switchboards shall provide for parallel operation and control of the generators. The Propulsion DC switchboards, located in the EOS, shall be deck mounted and sway braced to the surrounding structure through vibration isolation mounts.

The propulsion DC switchboards shall be designed and provided by the Contractor's propulsion system vendor/integrator as described in this Specification.

The switchboards shall be designed, built and installed in accordance with regulatory requirements referenced in Section 0. The Contractor's propulsion system vendor/integrator shall prepare and submit a switchboard arrangement plan to the TxDOT Representative prior to commencement of construction. The arrangement plan shall be detailed, and complete with a description of features and technical data on all devices.

The Contractor's propulsion system vendor/integrator shall provide wiring diagrams and shop drawings of the switchboards to the Contractor, and the Contractor shall provide same to the TxDOT Representative for approval prior to fabrication. The drawings shall clearly show design, construction material, finish installation, front layout, point to point wiring diagrams, material list, mounting details, and label plate list including floaters for terminal blocks.

The manufacturer shall provide three complete sets and one electronic set of as-built drawings of the switchboards and cut sheets of the components to the Contractor for delivery to the TxDOT Representative.

Switchboard components listed in this Specification and all others required for a complete system shall be provided. The switchboards shall be furnished as specified herein and shown on References (3A), (3E) and (3F), and shall be installed and fully integrated into the ferry electrical system by the Contractor and propulsion system vendor/integrator. The BDPC cubicles shall be located on the exterior bulkhead to the EOS approximately as indicated by Reference (3F) but with exact locations to be approved by the TxDOT Representative.

Factory tests shall be performed to show the functionality of the Power Management System (PMS) and main propulsion switchboard automation to properly control all generators and the distribution of power in the automatic mode.

Rubber matting with the required dielectric resistance shall be provided by the Contractor in front of all switchboards.

The Contractor's propulsion vendor/integrator shall perform Short Circuit and Device Evaluation Studies, a Protective Device Coordination Study, and a Harmonic Study for the entire electrical system. The studies shall include all AC and DC electrical power distribution systems aboard the vessel.

### 325.1 MAIN PROPULSION SWITCHBOARD CONSTRUCTION

#### A. Enclosure

The switchboard shall be IP22 enclosed at a minimum and dead front. All operating controls and indicators shall be front mounted and fully accessible by hinged panels. All other components shall be accessible by removable front, side and rear panels. Construction shall allow for cables entering the bottom of the switchboard. The switchboard shall be bolted to the ship's structural foundation.

All front instrument panels shall be formed approximately one inch on all sides and hinged. Front panels covering molded case distribution circuit breakers shall be formed, hinged and bolted. Side and rear panels shall be flat sheets, bolted on. All formed and hinged front panels shall be fastened with open and turn flush clamps. All hinged panels shall be equipped with door positioners for holding the panel in the open position during access to internally mounted components. Non-conducting grab rails shall be provided across the entire front of the switchboard.

#### B. Bus Bars

All buses shall be copper, with tin- or silver-plated connections over their entire length. Bolts, washers and nuts used for bus and stud connections shall be corrosion resistant. All bus connections shall be provided with mechanical locking to prevent loosening. Solderless compression lugs shall be used for all cable connections, or an approved compression type tunnel lug on circuit breakers and other equipment installed in the switchboard. All bolts in bus connections shall be torque wrench tightened to an appropriate uniform value for each size bolt and marked across all joints with permanent marker or paint pen. The main bus shall be braced to suit maximum available short circuit current. Bus supports shall be of high-quality moisture-resistant insulation material arranged to minimize dust accumulation across any horizontal surfaces.

#### C. Components

All cable and all electrical equipment shall be selected to operate satisfactorily in a 45°C ambient temperature and all control and instrumentation equipment shall be selected to operate satisfactorily in a 55°C ambient temperature. All electrical components shall be as described below.

##### Circuit Breakers:

Circuit breakers shall be quick-make, quick-break, trip free, with tripping mechanisms capable of safely opening the circuit they protect while subjected to the maximum fault current. All poles shall be opened simultaneously by a common trip mechanism. Trip elements or sensors shall be calibrated or ambient compensated for operation in a minimum 40°C ambient temperature. Breaker frame size and trip settings shall be shown on the switchboard design drawings and on the engraved breaker ID plate attached to the front of the switchboard.

##### Instruments:

Instruments shall be constructed to minimize damage from dust or moisture.

The system shall include relays or electronic I/O as necessary to interface with the Integrated Alarm System (IAS400) (see Section 0) to display all pertinent alarms.

##### Instrument and Control Switches:

All rotary type instrument, control, and circuit breaker switches shall be oil-tight and clearly labeled for function.

All under-voltage trip (UV) devices shall be 24 VDC from a battery source, to prevent tripping during power transfer operations.

Fuses:

Instrument fuses shall be of the non-renewable cartridge type. They shall be accessible from the front of the switchboard through the hinged panels containing the instruments and controls they protect.

Indicating Lights:

Indicating lights will be long-life LED type.

Wiring:

Instrument and control wire shall be flame retarding, flexible switchboard wire, or equal. Each wire end shall be fitted with a permanent sleeve type wire number. Spring leaf wire capture type terminals shall not be used. Switchboard wiring shall be neatly run and properly supported. Grommets shall be provided to protect wiring where it passes through metal panels. Components required to be interconnected with external equipment shall be wired to terminal boards that are readily accessible and clearly marked for shipyard cable terminations. The secondary of all current transformers are to be wired to shorting type terminal blocks. Wiring duct, cable tie mounting devices, clamps or clips shall be permanently fastened. Any adhesives used shall be epoxy type. Foam tape is specifically prohibited.

Nameplates and Labels:

Components mounted on the front of the switchboard shall be provided with nameplates that clearly indicate their use. Engraved nameplates shall be white letters engraved on black background. Nameplates for circuit breakers shall give the circuit designation, breaker frame size, trip settings and load served. All instruments, switches, and front mounted components shall have nameplates, appropriately engraved. Internal to the switchboard, easily readable identification shall be provided for all fuses and other components. Main buses shall be marked with their phase designation. All terminal blocks shall be numbered and keyed to circuit designations on wiring diagrams.

Switchboard Components:

It is the Contractor's propulsion system vendor/integrator's responsibility to furnish all components required for a complete and workable system. The propulsion system vendor/integrator shall provide sufficiently detailed descriptive information about the switchboard, including all drawings, parts lists, operating descriptions, and other documentation necessary to obtain regulatory and Owner approvals.

## 325.2 PROPULSION DC SWITCHBOARD OPERATIONS

The propulsion DC switchboard operations shall meet the requirements of Reference (3B).

The DC switchboards shall control the four propulsion generators. The DC switchboards shall be arranged for automatic and manual operation of propulsion generators in any combination. The Power Management System (PMS) shall, in automatic mode, monitor and control the power available to the propulsion main motors, automatically starting standby generators and placing them online on the loss of one or more operating generators. Generator start priority switches or controls shall be provided for each generator to determine the start order of generators when the PMS is in control.

A Power Management System (PMS), designed to comply with the Class and Regulatory requirements, shall be incorporated into the design of the switchboards. The PMS shall be PLC based using the same

PLC system components as those used for the AMS and all general requirements for equipment and parts for the AMS apply to the PMS. Each half of the two DC switchboards shall be able to operate independently with its own PMS system or subsystem, which shall be integrated into one system on closing of the DC bus-tie.

Each half of the switchboard shall have a touch screen input/output panel or similar to permit local input and control of switchboard functionality not provided by other switchboard-mounted operators or metering. Touch screens shall operate independently of the AMS system. The switchboard shall be able to be operated locally for all functions and displays as per the requirements of ABS and USCG. The PMS shall be arranged to monitor and control ship's load on the generators in the event of overloading of the ship's generation system in the following order:

- Immediately backing off propulsion power by control of the variable frequency drive system, to achieve a total system power level not exceeding 98% of the rated connected generation.
- Commencing a start sequence and automatic paralleling onto the board of any standby or available propulsion generators when the total ships load exceeds a level of 95% of total connected capacity for a period no longer than 15 seconds.
- With two generators online, once load is reduced to 45% of one propulsion generator's rating for a period no longer than 1 minute, one of the two generators shall be shut down, unless inhibited by operator intervention.
- With three generators online, once load is reduced to 60% of one propulsion generator's rating for a period no longer than 1 minute, one of the three generators shall be shut down, unless inhibited by operator intervention.
- With four generators online, once load is reduced to 67% of one propulsion generator's rating for a period no longer than 1 minute, one of the four generators shall be shut down, unless inhibited by operator intervention.

All generators with exception of the Emergency Generator shall be able to operate in parallel and shall be available as standby generators. In the event of shut down of any "in service" generator, the standby or available generator shall be put online automatically by the PMS.

All necessary QFA/FMEA/DVTP and documentation for the PMS shall be prepared and submitted for Class and Regulatory approval.

## 326 EMERGENCY SWITCHBOARD

A new 600V emergency switchboard shall be provided for the control and distribution of 3-phase, 3-wire 600 VAC emergency electrical power as shown on Reference (3B). The 600V emergency switchboard, located in the emergency generator room, shall be mounted to new mounting structure.

The marine switchboard shall be type tested with acceptance and approval by ABS, built of solid steel construction with framework of steel profiles and covered with a front steel door.

The emergency switchboard shall meet the requirements of Section 324, where applicable. All functionality present in the existing emergency switchboard and emergency generator control panel shall be replicated in the new design. The one exception shall be with regards to functionality related to the existing emergency switchboard having dual feeds from each 600V propulsion switchboard vs the new design having only one power feed from the new 600V ship service switchboard.

If there is a reduction of potential of the normal ship service source of power to the emergency switchboard by 15 to 40 percent, the emergency generator shall start automatically with no load. When the voltage of the emergency generator reaches 85 to 95 percent of the nominal value, the emergency

switchboard and its loads shall transfer automatically to the emergency generator. This transfer shall be accomplished in no more than 45 seconds after failure of the normal ship service source of power.

New drawings shall be submitted to TxDOT accurately detailing the new emergency switchboard to replace References (3L) through (3Q).



## GROUP 400 – COMMAND AND SURVEILLANCE / ELECTRONICS

*Table 5: List of References: Command and Surveillance / Electronics*

REFERENCE ID	NUMBER	TITLE
(4A)	20050-XXX-XXX-X	Fire and Safety Plan
(4B)	20050-002-320-1	Electrical One-Line Diagram
(4C)	20050-001-662-0	EOS Arrangement Removals

### 410 EOS CONSOLES

The existing EOS consoles shall be modified as necessary to accommodate all new, reused or modified vessel systems as necessary for a fully operable system. For arrangement of components and devices mounted at each EOS control console, contractor shall use as guidance Reference (3B) and (4C). Additional, modified or removed items shall be implemented in the Pilot Houses as necessary to accommodate new, modified or removed vessels systems and otherwise meet all regulatory requirements. Contractor to confirm compatibility of existing field devices to new system and replace as needed.

#### 410.1 EOS PROPULSION AND STEERING CONSOLE

Contractor shall blank out, add cover plate(s), make precise cutouts and modify the EOS propulsion steering console as necessary to accommodate all new, modified or removed components. All cables terminating inside that no longer serve a function in the new design shall be removed. Din-rail mounted terminals shall be added as necessary to accommodate new or modified cables. Other interior panels shall be modified to install new system components associated with console mounted ones. The new propulsion control system shall replicate the existing alternate manual controls (four ammeters, four rpm meters, four motor on/off switches one emergency switch and potentiometers inside EOS EOT that directly connect to existing motor drives) to meet 46 CFR 62 requirements.

#### 410.2 EOS SHUTDOWNS AND COMMUNICATION CONSOLE

The Contractor shall remove the entire shutdown console at Frame 9 inside the EOS. Contractor shall remove any associated foundations and smooth the steel plate below to match surrounding area to allow for location/installation of other equipment.

The EMI alarm screen and EMI alarm buzzer/lamp/reset button shall be removed as part of this work. Alarms and indications that are part of the EMI alarm screen shall be incorporated as necessary into the new vessel machinery alarm system. WT door indications that are part of the EMI alarm screen shall be shown on a new dedicated HMI screen to meet 46 CFR 170.270(e) and other regulatory requirements.

Contractor shall relocate the fire pump start/stop controls and items from the shutdown drop-in panel to a new bulkhead or stanchion mounted enclosure. This new shutdown panel shall be located close to the EOS propulsion/steering console at the direction of the TxDOT Representative. This panel shall be constructed as necessary to accommodate new, modified or removed vessel shutdown systems and emergency stops as well as fire and bilge pump indications and/or controls. All emergency stop and shutdown buttons shall be pull to stop or pull to trip, push to reset.

## 420 NAVIGATION EQUIPMENT

### 420.1 PILOT HOUSE CONSOLE

The Pilot House shall have its existing consoles modified as necessary to accommodate all new, reused or modified Pilot House systems as necessary for a fully operable system. For arrangement of components and devices mounted at each Pilot House control station, Contractor shall use as guidance Reference (3B) and (3D). Additional, modified or removed items shall be implemented in the Pilot Houses as necessary to accommodate new, modified or removed vessels systems and otherwise meet all regulatory requirements. All lights shall be dimmable. Finish surfaces shall be wood paneling and trim to match where they are currently wood. The finish and color shall be submitted to TxDOT for approval. Corners and edges of wood panels shall be protected against damage with finished rounded surfaces to match existing. There shall be no sharp edges or corners that may cause damage to equipment or personnel.

This Re-Power Technical Specification provides the notional layout of the Pilot House and console and the items of outfit. The Contractor shall template from the existing Pilot House consoles and shall ensure that their new design conforms or adapts to the existing console. The JOHN W. JOHNSON will be made available to the Contractor with sufficient advance warning and approval of Owner for Contractor access and templating.

### 420.7 PILOT HOUSE CONTROLS, MONITORING AND ALARMS

Each Pilot House control station shall be provided with two propulsion motor control heads with throttle handles, one control head for each end of the vessel.

An HMI digital display with built-in dimmer control shall be mounted in the Pilot House side console to display all propulsion related information, as well as all alarm and monitoring information from the rest of the vessel. Systems shall be displayed in clear and simple TxDOT's Representative approved arrangements.

Controls and displays shall be provided as required by rules and regulations.

## 430 INTERIOR COMMUNICATIONS

### 430.1 INTEGRATED MONITORING ALARM AND CONTROL SYSTEM

The integrated monitoring alarm and control system shall be Siemens IAS400 or equal and be part of the Contractor's propulsion vendor/integrator's supply. It shall collect and display information from switched or analog inputs, or from digital communications. The system shall monitor and display important propulsion related information, as well as incorporate specified control functions. The system shall also display all other ship's alarm and monitored points and systems in a single system.

Alarm system logic shall be such that alarms are self-monitoring fail safe type. The system shall utilize open-architecture PLC programming, with all required software and hardware provided to the Owner for future system modifications (additions/deletions of monitoring/alarm points and/or modifications of set points). See Software Programming in Section 856.1.

The system shall be PLC based, with digital and analog I/O modules and main touch screen HMI displays located in both Pilot Houses, the EOS and Engine Room. A series of distributed I/O cabinets shall receive inputs directly from the various system sensors and transmit them to redundant main PLC cabinets over

redundant PROFINET communication networks as required by USCG and ABS Rules. The redundant main PLCs shall with redundant WinCC Servers over a redundant fiber optic ring.

Displays in locations other than a Pilot House or EOS shall be minimum IP22 and shall be supplemented with a siren and strobe mounted at a location that is central to that engineering space. The displays shall have an audible alarm annunciator and controls to allow scanning and viewing various screens.

The alarm system shall have time delay and enabling programming capabilities to prevent nuisance alarms from occurring when transient alarm conditions exist. Alarms shall not occur during normal startup or shutdown of equipment, or during normal maneuvering operations such as rapid throttle and direction changes from the operator. The Contractor shall be required to demonstrate this capability during trials.

The normal display screen and alternate system display screens shall be developed in consultation with and approved by the TxDOT's Representative.

All alarms and indications that are part of the existing vessel management HMI screens and that will be retained with existing systems or replicated with new systems shall be made part of the new Siemens IAS HMI screens. The Anchor Status panel located under the EOS stairs shall be retained and existing external alarm signal(s) rerouted into the new Siemens IAS.

All sensors, switches, transducers, RTDs, thermocouples, and other instrumentation currently part of the alarm and monitoring systems onboard shall be supplied as new, modified to suit the new installation or reused as authorized by the TxDOT Representative.

#### Sound Powered Phone Additions/Modifications

Contractor shall add a sound powered phone headset jack located immediately outside each ESS with associated cabling and other equipment necessary for communication with the EOS. Each new headset jack shall be located in Compartments 4 or 5 alongside the watertight door to each ESS space.

Contractor shall add one sound powered phone headset jack located near the starboard engine room walkway between Frame 8B and the bulkhead with Compartment 5. Location shall be approved by the TxDOT Representative. Headset jack shall be installed in an appropriate enclosure mounted inside a minimum - 23dB yellow acoustic enclosure, GAI-TRONICS PN# 988-60-0002-50 or equal.

Added or modified equipment sound powered phone equipment shall be made by Hose-McCann Communications and of the same approximate type to match the existing headset and headset jacks on the vessel. Contractor shall provide sound powered phone additions either as part of the wider existing sound powered phone system or as dedicated circuits to the EOS, either solution in accordance with pending USCG approvals of the submittal design.

Contractor shall install a Remote Diagnostic System (RDS) and Marine Diagnostic Recording (MDR) System per Reference (3B). The Siemens Energy equipment, such as EMS, Frequency Converters, RCS and IAS shall be connected by the contractor to this cabinet with Ethernet or Profinet cables. The RDS shall include a safe and encrypted connection between the vessel and Siemens Energy Onshore Service Department.

RDS/MDR System shall be supplied with a Gateway, antenna and cell modem. Antenna shall be suitably located on top of the B End Pilot House to have clear line of sights and not create or receive appreciable interference with other vessel antennae. Gateway and modem to be located inside B End Pilot House. System shall be suitably interconnected including long Ethernet connection to EOS (~160 ft).

## 436 FIRE DETECTION AND ALARM SYSTEM

The Contractor shall install new fire detection and alarm system, Consilium or Owner approved equal. The main alarm panel installed in Bridge A and repeater panels in Bridge B and the EOS. Alarm annunciation shall be provided in each Pilot House, the EOS, and as required by regulation. A minimum of two intrinsically safe combination smoke/heat detectors shall be installed in each ESS Space, Consilium Type N11250 EX or equal. Detector spacing shall be in accordance with manufacturer approvals. These heat detectors shall be set to trip at 135°F.

All fire detection equipment installed shall fully comply with ABS and USCG rules and regulations and shall be approved by TxDOT or their representatives. Fire detection systems shall meet the requirements of 46 CFR 62.25-20(d)(5) to remain separate and independent from the main machinery alarm system. Summary or trouble alarms into the machinery alarm and monitoring system (Siemens IAS) that do not replace but only supplement fire detection alarms, are allowed.

## 439 CLOSED-CIRCUIT TELEVISION SYSTEM (CCTV)

All existing CCTV equipment located in the EOS is to be relocated to the new CCTV closet unless specified elsewhere in this Specification. Contractor shall temporarily and properly shutdown the existing CCTV Seneca server. Contractor shall remove the server from the EOS and relocate inside the new CCTV closet. The existing 24 port POE Cisco switch shall remain inside the EOS.

A minimum set of new equipment shall include:

- (1) Cisco 12 port POE ethernet switch to be installed in the new CCTV closet.
- (1) Wall mount rack enclosure, that will fit the server, UPS and ethernet switch, shall be installed in the new CCTV closet.
- (1) Dell OptiPlex Micro Desktop with Windows 10 O/S and ExacqVision firmware that shall be installed in the EOS.
- (1) 27-inch LED/LCD multiport connection display monitor that shall be installed in the EOS.
- (1) APC Smart-UPS C 1500VA SmartConnect Port Sinewave 2U Rackmount, LCD, 120V that shall be installed in the new wall mount enclosure in the new CCTV closet.
- Properly rated electrical receptacle(s) located inside the new CCTV closet to supply CCTV loads.

Contractor shall provide any electrical penetrations necessary for all new or modified CCTV cable runs. Contractor shall connect the CCTV system electrical to the emergency power system. Contractor shall repair all electrical ground issues, as needed. Contractor shall run additional CAT6 cable from the B-End P/H switch to the CCTV closet, that shall be connected to the Cisco 12 port POE ethernet switch. Contractor shall install a CAT6 patch cord cable from switch to server. Contractor shall, after mounting new server, make sure all CCTV configurations/settings are properly restored. Contractor shall install the new Dell Optiplex micro desktop computer inside the EOS and shall make sure all CCTV configurations/settings are as an ExacqVision client CCTV viewing only. All equipment locations shall be approved by the TxDOT Representative.

The closet is to be framed by bulkheads as specified in Section 0. Contractor shall provide storage for all components of the CCTV system that are being relocated such that all components are accessible for service and replacement. Contractor may re-use the existing wooden cabinet for the CCTV equipment, if possible. Contractor shall provide a small desk or desktop wall-mounted shelf, attached to the basic ship structure that spans the full width of the closet. Prior to moving the CCTV equipment, Contractor shall provide the Owner with a sketch of the proposed closet arrangement and obtain Owner approval of the layout.

The closet shall be fitted with a door that swings out of the closet with the hinges located on the inboard side of the door. The door shall be a security door with a numerical keypad lock of the same make and model as is fitted on other doors for crew-only spaces on the vessel. The door jamb shall be protected with a security flange to prevent the door being picked open by unauthorized personnel. To accommodate the door swing, the fire extinguisher in that area is to be relocated to the opposite side of fire station number 13.

Lighting for the CCTV closet shall be provided as specified in Section 202.1. The existing HVAC ducting in the adjacent overhead shall have a small extension added with a single 6-inch, louvered, circular type discharge located in the CCTV closet. A fixed louver vent shall be fitted in the bottom of the closet door to allow for air movement through the closet.

## GROUP 500 – AUXILIARY MACHINERY

*Table 6: List of References – Auxiliary Machinery*

REFERENCE ID	NUMBER	TITLE
(5A)	20050-002-101-0	General Arrangement
(5B)	20050-002-201-1	Machinery Arrangement
(5C)	20050-002-256-2	Keel Cooling Arrangement
(5D)	20050-002-259-1	Exhaust Arrangement
(5E)	20050-002-261-0	Fuel Oil System
(5F)	20050-002-261-1	Lube Oil System
(5G)	20050-002-261-2	Dirty Oil System
(5H)	20050-002-514-0	ESS HVAC and Ventilation
(5I)	20050-002-551-0	Compressed Air System

### 505 PIPING

Piping system requirements shall be as described in the various sections of the Specification describing the systems and as shown on the piping system diagrams. Piping diagrams shall be used as guidance.

Piping systems shall be designed and installed in accordance with the requirements of the ABS Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways, and the U.S. Coast Guard.

Pipe, valves, and fitting materials shall conform to the material schedules on the diagrams. Refer to Section 042 for Buy America Compliance requirements. The Contractor shall verify the pipe sizes and pump characteristics given on the diagrams.

Piping shall be led as directly as practicable with a minimum number of bends and fittings and with sufficient joints to provide for removal, inspection, servicing, and replacement of piping, valves, fittings, and equipment. Piping shall be routed to avoid cutting the ship's structure where possible.

Pipe bends shall be used to the maximum extent possible in lieu of elbows, and where employed, the Contractor shall lay out piping systems for machine bending of pipe, with a minimum radius greater than or equal to the minimum required by ASME B31.1 & USCG regulations. The Contractor shall perform calculations as needed and obtain regulatory approval of all proposed pipe bend radii that is less than five times nominal pipe OD prior to fabrication.

The Contractor shall exercise care to develop the system arrangements and installation of piping aboard the vessel to permit the following:

- A. Free passage along walkways and ladders
- B. Free access to perform maintenance
- C. Free access to all doors, hatches, and openings
- D. Be free of interference to the ready removal of the vessel's equipment and system components

Where piping penetrates a watertight bulkhead, a deck or a tank top, an approved penetration fitting shall be used to ensure the tightness of the structure. Penetration details shall be developed as shown on the Contract Drawings. In no case shall the plating form part of a joint or piping. The Contractor shall ensure that any penetrations through tonnage frames do not violate tonnage rules for openings.

Generally, penetrations through tonnage frames shall be made tight around the pipe or duct or shall be

spaced such that the distance between the edges of two openings is equal, or greater, to the largest dimension of the larger of the two openings.

In order to prevent damage to piping and joints at bulkheads and decks, expansion bends shall be provided, as necessary, to allow for sufficient piping movement due to the working of the ship's structure. Expansion joints shall not be used except in engine exhaust.

Where ferrous pipe and fittings required to be galvanized, they shall be galvanized by the hot dip process, after fabrication when welding is necessary. Where galvanizing is damaged during installation, a cold galvanized coating for repairs shall be applied.

As applicable, where joints of ferrous and nonferrous materials cannot be avoided, the connection shall be made with a flanged takedown joint fully isolated with gasket and sleeved fasteners using isolating washers under the fastener.

Pipe welding shall comply with the rules and regulations of the U.S. Coast Guard, American Bureau of Shipping, and the details of ASTM Volume 01.07 "Shipbuilding" Standard F722-82.

Piping systems containing oils shall be installed so that flanged connectors are located remotely from exposed surfaces having a temperature in excess of 450°F. Protective shielding shall be provided around the flanged connections to prevent the possibility of spray onto exposed hot surfaces. Piping shall be located at least 18 inches away from surfaces that have temperatures under the insulation in excess of 450°F.

Pipe fittings shall not be located directly over or within two feet of electrical switchboards, panels, disconnects, switches, or receptacles. Pipes shall not be routed directly over engines except for systems connected to the engine. Pipes shall not obstruct manholes, hatches or other accesses.

## 505.0 SYSTEM DESIGN

Piping sizes indicated on the Contract Guidance Drawings are given for reference purposes. The final selection of pipe sizes for fabrication and installation is the responsibility of the Contractor and shall meet all ABS and USCG requirements. Fluid velocity criteria given in the following table shall be used in piping system sizing.

SERVICE	NOMINAL Velocity - ft/s	MAXIMUM Velocity - ft/s
Fuel Oil Suction	$2D^{1/2}$	7
Fuel Oil Discharge	$5D^{1/2}$	12
Lube Oil Suction	$D^{1/2}$	4
Lube Oil Discharge	$2D^{1/2}$	6
Sea Water Suction	$3D^{1/2}$	7
Sea Water Discharge	$5D^{1/2}$	9

D = pipe internal diameter, inches.

Pumps shall be provided with ensured suctions either through submergence, foot valves, or priming systems in order that pump operation is immediate and positive.

As applicable, unions are not acceptable in piping located behind linings, false ceilings, or in other inaccessible locations.

Except as noted elsewhere in the Specification or Drawings, each bilge branch and fuel oil tank suction connection shall have a suction bell mouth with the inlet diameter not less than 1-1/2 times the pipe

diameter. The bottom of the inlet shall be 1/2 the pipe diameter from the bottom of the tank, but not over 1-1/2 inches.

Cleanout plugs shall be provided in all drain lines.

Piping systems that require drainage during start-up or relatively frequent manual drainage in service shall be provided with valved drains. Screwed plugs shall be installed where drainage is required on an infrequent basis, such as for periodic inspection, maintenance, or dry docking.

Flanged or bossed drainage fittings shall be installed where an unavoidable low point or pocket exists in a pipe run. Vent fittings shall be provided for removal of air in piping installed with unavoidable high points.

Flexible connections shall be provided to isolate vibration and to accommodate thermal growth. Exhaust systems shall use multi-ply stainless steel bellows type (single ply bellows are not acceptable) flexible connections with flanged end connections, one end being a Van-stone type flange. Other systems shall use flexible hose assemblies with 37-degree flare swivel end connections on both ends, or Garlock style 206 flanged flexible connections depending upon pipe size and fluid type. Cut hose with hose clamps are not acceptable except with express approval of the Owner. Hose assemblies conveying fuel or lube oil shall be USCG-approved flame-resistant type, Aeroquip FC 234, or equal. In general, flexible hose assemblies shall not be less than nine inches in length, or more than 24 inches in length. Flexible hose runs shall not substitute for pipe or tube.

Piping systems and components shall be insulated in accordance with Section 508.

#### 505.1 VALVES, FITTINGS, AND INSTRUMENT PIPING

Valves shall be accessible from the grating level unless otherwise specifically approved by the Owner. If specifically approved by the Owner, valves located beneath the deck plates shall be provided with reach rods, remote operators, or some other suitable means of access.

Hand wheels for sea valves shall be easily accessible.

Manually operated valves shall be readily operable by one person, directly or through mechanical advantage type operators. Valves or valve hand wheels shall be located so that the operator's hand may easily pass between the hand wheel and any interference, with the handle wheel open, closed, or in between.

Manually operated valve stems shall be installed with the valve stem rotated above the horizontal plane. Butterfly valves are to be avoided and only installed with advance, specific approval from the owner. Ball valves shall be installed in such a manner that the valve opens and the handle points with the media flow under normal operating conditions.

Valves shall be right-hand closing and shall have either a rising stem, or an indicator to show whether the valve is open or closed.

Unless otherwise noted in the Specification or Drawings, valves that are 2-1/2 inches and larger, shall be flanged with bolted bonnets and packing glands. Valves that are 2 inches and smaller may have union ends and bonnets.

Ball valves shall be bolted body construction. Seats and seals shall be Buna N in water service, Viton in diesel oil and lubricating oil service, and reinforced TFE in compressed air service.

Check valves shall be installed wherever flow reversal in a system would be detrimental to operational requirements.



Stop check valves shall be installed wherever flow reversals could flood a space.

Swing check valves shall be installed in a horizontal plane and in a fore and aft orientation where possible.

Relief valves shall be provided on the discharge side of all positive displacement pumps and air compressors, which do not have built-in relief valves.

Gate or ball valves shall be used where shut-off only is required. Globe or angle valves shall be used where throttling is required.

Spindles, seats, and disks of valves shall be corrosion resisting material.

If needed, installation of automatic flow control valves (with takedown fittings) are preferred over orifice plates, for balancing flows. If orifice plates are required, the following design and installation guidelines are to be observed:

- Orifice size shall be determined by calculations developed from the actual piping system as installed, and then flow shall be verified during trials using a calibrated pressure gauge installed on each side of the orifice.
- Each orifice shall be installed between flanges that are positioned in straight sections of pipe no closer than four times the diameter of the pipe from elbows, tees, reducers, valves, and other flow disruptive components.
- A pressure tap with valve shall be installed on each flange or adjacent each flange holding the orifice to allow pressure drop measurement.
- Final orifice plates shall be 316L stainless steel plate, not less than 1/8 in thick and shall have the orifice size stamped on a tab extending from the edge of the flange.
- Pressure balance shall be to the Owner's satisfaction.

All thermometers are to have dry wells. Connections for thermometers with dry wells, and pressure gauges with snubbers, shall be provided to check proper operation of piping and equipment.

Pressure gauges shall be provided with a compound type at the suction side and a pressure type at the discharge side of all pumps. The gauges shall be 2 1/2-inch diameter, liquid filled. Pressure gauges shall be provided with shut-off valves and snubbers, and shall be mounted on gauge panels or directly at each pump. Ball type root valves shall be located at the sensing source. Gauge piping assemblies shall meet the requirements of ASTM Volume 01.07 "Shipbuilding" Standard F721-81, except that gauge tubing shall be 316 stainless steel.

Priming vents shall be installed in the case or adjacent to the discharge side of all centrifugal pumps. Priming vents shall be 1/4 to 1/2 inch in size and fitted with a ball valve and goose neck discharge tube. In general, priming vent tubing and valve shall be stainless steel.

Flexible connections shall be provided between piping assemblies and resiliently mounted equipment.

Flexible reach rods shall be provided for all valves under the Engine Room floor plates, or in other inaccessible locations complete with a means to indicate position, or be provided with hand access hatches in the deck plates if within reach of deck plate level. (Rigid reach rods are not to be used.)

Valves, except for small ones whose functions are obvious, shall be provided with labels. See Section 602.

Valve locking devices shall meet the requirements of ASTM Volume 01.07 "Shipbuilding" Standard F993-86, Type II.

Valves are not to be located underneath the ESS, the EOS, or any electrical equipment, including batteries.

#### 505.2 TAKEDOWN JOINTS

Unless otherwise noted in the Specification or Drawings, flanged takedown joints shall be provided in piping 2-1/2 inches and over, and unions may be used in piping two inches and smaller. Takedown joints shall be provided to allow removal of all in line equipment, or to allow removal of equipment normally blocked by the pipe. Takedown joints with isolation shall be installed wherever dissimilar metals are used as described elsewhere in this section.

Flanges in piping shall conform to ANSI standards for the appropriate service.

Where a steel flange is used with either a cast iron flange or bronze flange, the steel flange shall have a flat face, and a full-face gasket shall be used. Flange gaskets shall be asbestos free.

Flange gaskets for engine cooling, fuel oil, bilge, vents and fills, firefighting, HVAC, lube oil and compressed air systems shall be Garlock Style 5500.

Unions in metal piping shall be ground joint type.

Takedown joints in tubing shall be SAE 45 degrees flare type, with long nuts.

#### 505.3 PERMANENT JOINTS

Generally, in steel pipe 2 1/2 inches and over joints shall be butt weld, and in sizes 2 inches and under joints shall be socket weld unless threaded fittings are specified.

Fuel and lubricating oil piping shall be kept away from engine exhaust pipes. The Contractor shall avoid routing pipes near electrical equipment as much as possible, and in no case shall flanges, unions, or other takedown joints be located over electrical equipment.

Piping in each system shall be sloped to drain naturally to the low end. In addition, compressed air piping shall be sloped to drain into the air receivers.

Pockets in pipe lines shall be avoided. Each system shall be provided with fittings, valves, or traps to enable complete drainage of pipes when desired. Where pockets do occur, bosses and valves or screwed plugs shall be provided for draining.

#### 505.4 PIPE HANGERS

Piping shall be adequately supported by hangers suitable for the material and service.

Pipe hangers shall meet the requirements of ASTM Volume 01.07 "Shipbuilding" Standard F708. The Contractor shall adjust the design, spacing, and installation of pipe hangers, as necessary, to provide an installation suitable for carrying the weight of the pipe and its contents; including dynamic loading imposed by the operating conditions of the vessel, and to prevent damage from vibration and thermal expansion.

Contractor may weld the hangers to the steel pipes, provided this is accomplished in strict accordance with ASTM F708, Figure 5 and associated notes. Care shall be exercised to place pipe hangers so that strain is avoided where piping is connected to machinery.

Hangers supporting Cu-Ni tubing, copper tubing, or stainless steel tubing **shall not** be welded directly to the tubing. These hangers shall be welded to ship structure and utilize non-metal resilient materials between the tubing and bolted (clamping) portions of the hanger, poly-block style or similar.

Where dissimilar materials occur or where hangers support non-ferrous pipe, hangers shall be lined with an approved isolation material.

For hot engine piping such as exhaust and jacket water, flexible hangers shall be provided to accommodate thermal growth along with flexible pipe connections to the engine. See Section 259.

All pipe hangers shall be approved through the submittal process prior to fabrication.

## 508 PIPING INSULATION

All insulation material and installation details shall be in accordance with ASTM Volume 01.07 "Shipbuilding" Standard F683-10, except as modified herein. Prior to the application of insulation or linings, the surfaces to be covered shall have been treated and coated as specified elsewhere.

Insulation installed in accommodation, service, and control areas shall be noncombustible unless approved by USCG for use on this project as described in NVIC 9-97 Ch. 1.

An aluminum sheet metal cover shall be provided over lagging in way of access areas where the insulation might be damaged.

Insulation exposed to weather shall be lagged with corrosion resistant stainless steel sheet metal.

### 508.2 CHILLED WATER PIPE INSULATION

All chilled water piping shall be separated and insulated individually. Insulation materials, thickness and method of application shall be in accordance with commercial marine standards and USCG Regulations. The insulation shall keep the chilled water at the required temperature. See low temperature and anti-sweat insulation below.

### 508.3 MEDIUM AND HIGH TEMPERATURE INSULATION

Insulation materials, thickness and method of application shall be in accordance with commercial marine standards.

All surfaces having normal operating temperatures above 125°F shall be insulated as described below with a thickness not less than that given in the accompanying tables.

Where thicknesses are three inches or greater, or the temperature is over 600°F double layers shall be used with all joints staggered. Surface temperature of insulation shall not exceed 135°F.

Engine exhaust systems shall be insulated from the connection at the engine to the penetration at the stack diaphragm. Engine exhaust pipe and components shall be insulated with removable blankets. Removable blankets shall be manufactured from needled glass mat, JPS "Tempmat" or equal, three inch (3") minimum total thickness, with a stainless steel mesh interior and silicone impregnated glass cloth exterior. Insulating blankets shall be secured with stainless hooks and laces.

Exhaust insulation sections within the Engine Room shall be no greater than six feet between flanges to allow for removal for maintenance. Separate short sections of insulation pads shall be installed over flanges and flexible connections sized to overlap adjacent exhaust pipe insulating pads.

All insulating materials shall be properly secured to prevent settling and to permit ready removal for maintenance of equipment. Blankets shall be fitted to encase the fitting and laced with stainless steel wire and lacing anchors as applicable to permit easy removal for service.

The surface to be insulated shall be properly wire brushed, cleaned and painted with two coats of heat resistant aluminum paint before application of insulation.

Piping under the engine room floor plates, and in other locations where there is little or no contact with personnel, is not required to be insulated.

Valves and fittings shall be suitably insulated with material and thickness equal to adjacent piping. The minimum thickness of insulating material for large surface areas such as exhaust silencers heaters tanks, etc. shall be as follows:

Surface Temperature Insulation

- 125F to 299F                    1 1/2 inches thick
- 300F and above                3 inches thick

Insulation joints shall be tightly butted and secured to the pipe with not less than two metal bands per segment. In cases where the pipe insulation abuts flanges and fittings the ends of the insulation shall be tapered to permit free removal of bolts.

Thickness of insulation shall not be less than that listed in the following table for the service temperature of the pipe:

TEMPERATURE RANGE, °F	PIPE SIZE:	4" OR LARGER	2" TO 3 1/2"	LESS THAN 2"
126-266		1"	1"	1"
267-337		1 1/2"	1"	1"
338-387		2 1/2"	1 1/2"	1"
388-499		2"	2"	1 1/2"
500-599		3"	2"	2"

All flanges, flange fittings, valves, piping components, applicable machinery and equipment shall be covered with removable and reusable insulated fitted material, completely lagged, where required for inspection and maintenance.

**508.9 LOW TEMPERATURE AND ANTI-SWEAT INSULATION**

Low temperature insulation thicknesses for surfaces listed below are based on cellular glass material which does not preclude the use of other acceptable materials.

OPERATING TEMPERATURE, °F	PIPING/EQUIPMENT	THICKNESS OF INSULATION
Up to 35F	Standard	3"
36-100	Light duty/anti sweat	1 1/2"
50F	Chilled Water Piping	2"

Anti-Sweat Insulation shall be provided for hot and cold-water piping and equipment with surface temperatures from 56F to 125F, including soil pipes and deck drains. Such items shall be suitably insulated and lagged to prevent condensation.

## 514 ESS HVAC AND VENTILATION

The two new ESS Spaces shall have independent HVAC systems controlling their environments as shown in the ESS HVAC and Ventilation Drawing, Reference (5H).

The air in each ESS space shall be maintained between 68°F and 77°F, with relative humidity not exceeding 65%. To achieve these design conditions, each ESS space will be cooled by a horizontal air handling unit (AHU), FirstCo WHDS Series or equal, sized for the application. The systems shall be arranged for summer reheat. A marine grade flanged, finned tube duct heater, Indeco TZFU or equal, shall be installed in the supply air duct to each ESS Space for this purpose.

Air shall be exhausted from each ESS Space at a rate of six air changes per hour, ducted to and discharged through a sealed plenum and outboard facing louver in the bulwark as shown on the plans. Dedicated UL rated Class 1 Division 1 exhaust fans, Knape BRCV10 or equal, shall be provided for this purpose. The exhaust louver shall be a ZAZZ Moisture Rejection Closure with electric actuator.

Replenishment air in equal quantity shall be drawn in through a 10" gooseneck on the Main Deck and ducted to the return side of the ESS Space AHU as shown on the plans. A marine grade flanged, finned tube duct heater, Indeco TZFU or equal, shall be installed in the replenishment air duct to preheat incoming air when required.

Each ESS Space will also to be equipped with a battery outgassing system. See Section 301.5 for additional information.

### 514.2 DESIGN CONDITIONS

ESS HVAC design conditions shall be as follows:

	COOLING SEASON	HEATING SEASON
Outside DB	95 °F	25 °F
Outside WB	82 °F	
Inside DB	75 °F	
Relative Humidity	65% maximum	

### 514.3 CONTROLS

Provide and install programmable automatic temperature and humidity controls for each ESS AC Unit.

### 514.4 DUCTING

Fabricate ductwork from galvanized steel sheet metal in accordance with the standards of the Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) and USCG requirements. Break large panels to prevent panting. Ducts shall be smooth inside with no protruding edges. Fabricate ducts in sections no longer than 60 inches, with bolted flange joints at each end. All ducts shall be airtight. Where required by USCG for fire protection, ducts shall be a minimum of 11-gauge (3mm) steel. 11-gauge minimum steel shall be used for sleeves between fire dampers and the adjacent fire boundary.

Where practicable, fabricate bends and elbows with a throat radius of at least 1 1/2 times the width or diameter of the duct. Where a smaller throat radius is required, splitters or turning vanes shall be used. Round 90° elbows shall be made of at least five (5) parts or vaned turns, which may be used at the

Contractor's choice. Accomplish reduction in duct size by long transitions with maximum included angle of 30°.

#### 514.5 HVAC INSULATION AND LAGGING

New HVAC ducting shall be insulated and lagged. HVAC insulation shall be noncombustible and comply with USCG requirements.

Insulation shall be 1-inch-thick fibrous glass board with minimum density of 3 pounds per cubic foot for rectangular duct. Insulation on round or flat oval ducts and bends shall be 1-inch-thick flexible fibrous glass with a minimum density of 1.5 pounds per cubic foot. Vapor barrier shall be factory-applied aluminum foil, at least 0.002 inches thick. Joints in the vapor barrier shall be overlapped a minimum of 2 inches and coated with an approved vapor sealing compound.

The ESS Space HVAC exhaust plenums shall be lined with 2-inch-thick fiberglass insulation.

#### 514.6 CHILLED WATER SYSTEM

A chilled water system shall be provided as described in the ESS HVAC and Ventilation Drawing. (5H) The chilled water system shall provide water at 50 °F to two ESS air handling units, two ESS cooling cabinets, one in each ESS Space, and two Blue Drive Plus C cooling skids located in the Engine Room outside the EOS.

Three (3) York model YCAL air cooled chiller units shall be installed on the Bridge Deck. The chillers shall be sized such that two of three chillers can provide chilled water to meet the maximum cooling load. Two of three chillers shall operate continuously, with a third held in standby. The standby chiller shall be rotated in for one of the two operating units consistently to maintain equivalent runtime on all chillers.

Each chiller shall be equipped with the following options: onboard circulation pump, single point circuit breaker, 115V control transformer, service isolation valves, high and low ambient kits, discharge pressure read out kit, interface card (BacNET/N2/Modbus), TEAO fan motors, low sound fans, 1 1/2 inches thick double insulation of evaporator, copper fin coils (fin and tube), louvered enclosure panels, hot gas bypass (1 circuit), flow switch, vibration isolators.

A buffer tank shall be provided in the chilled water system. The tank shall be sized such that the total loop volume of the installed chilled water system is at least 7 gallons / ton. The chilled water tank shall be designed and stamped in accordance with ASME Boiler and Pressure Vessel Code Section VII, have an internal baffle, and be fitted two 3" ANSI B16.5 150# flanged system connection. The tank shall be insulated in accordance with Section 508, and the insulation covered with aluminum sheet metal lagging.

Chilled water will be supplied to each Siemens ESS cooling cabinet and BDPC cooling skid at a fixed flow rate specified by the Siemens, passing through a two-circuit heat exchanger in each cooling skid. Within each cooling skid, an internal cooling circuit with circulation pump, controls, and 3-way valve provide cooling water to the electrical equipment, modulating flow and temperature on the internal circuit as required to cool the equipment served.

Chilled water supply to each ESS air handling unit shall be modulated to maintain temperature and humidity in the ESS Space within required limits.

Chilled water piping shall be insulated with cellular glass or closed cell foam meeting USCG regulations and NVIC 9-97 CH 1. Insulation shall be noncombustible or low flame spread and tested in accordance with 164.012 or Annex 1 Part 5 of the FTP code. See Section 508.

## 521 FIRE MAIN SYSTEM

The fire main system will require minor modification to accommodate installation of the new ESS Spaces. Where required to accommodate new equipment in the ESS Spaces, the fire stations may be relocated within the compartment they serve. Ensure the fire stations remain easily accessible from the primary walkway.

In Compartment #6, the fire main is routed outside of the new ESS boundary. The branch serving Fire Station No. 5 will require a penetration at the new ESS bulkhead.

In Compartment #3, the fire main crosses the space in the overhead near Frame 33, potentially interfering with the new ESS battery racks. Reroute the fire main so that it does not pass directly over the battery racks and provides adequate room for new equipment in the space. Relocate the isolation ball valve at Frame 27 in Compartment #3 to the opposite side of Bulkhead 25 so it is easily accessible without passing through the ESS Space, and retains its current function, isolating only Fire Station #1 in Compartment 3 and the A end shore connection from the rest of the fire main system.

## 533 POTABLE WATER

Potable water service lines pass through the overhead of Compartments #3 and #6 in the overhead each space. Where required to resolve interferences, the potable water lines shall be rerouted within the compartment.

In Compartment #6 near the fuel oil storage tank, there is an existing hose bib, which will interfere with the new ESS Space bulkhead. Relocate the hose bib within Compartment #6. Location to be as directed by Owner.

The sink in the Engine Room shall be relocated as shown in the Machinery Arrangement (5B). The sink, in its new location, shall be furnished with a mounting bracket welded to the bulkhead, similar to the existing. Any existing brackets, handholds, or pipe supports in way of the new sink location shall be removed to accommodate the sink relocation. All disturbed coatings shall be renewed in accordance with the guidance in Section 631.

The copper water supply line for the sink shall be removed back to the tee fitting on the bulkhead just above the sink, adjacent to the potable water manifold located there. The open port of the tee shall be capped, or the tee shall be replaced with an elbow fitting. A new copper supply line shall be run from the main potable water line in the overhead of the engine room to the new location of the sink. This line shall be fitted with sufficient non-metallic pipe supports to prevent excessive vibration of the line.

The fuel supply line for the emergency generator shall be re-routed to accommodate the sink relocation, see Section 261.6 for additional details.

## 551 COMPRESSED AIR SYSTEM

The existing compressed air system will largely remain intact and will be reused. Supply air piping to the existing GE generators shall be removed, along with the compressed air supply pipe to the pneumatic fuel oil drain down pump, which is also being removed. New air start piping for the four (4) new propulsion generator diesel engines shall be installed and configured in accordance with the Compressed Air Modifications Diagram, Reference (5I).

Horizontal runs of piping shall be pitched to drain toward the air receivers where possible. Low points shall be fitted with dirt legs and drain valves. Wye strainers shall protect the air start valves, reducing station, and other items of equipment supplied with compressed air.

The piping materials shall be as specified the Compressed Air Modifications Diagram, Reference (51).

Before testing, the systems shall be thoroughly blown out with air, and strainers installed ahead of any equipment not already protected.

The compressed air systems shall be tested as described in Section 982.0.

#### 551.0 COMPRESSED AIR LINES PASSING THROUGH ESS SPACES

The compressed air service providing ship service air lines in Compartment #3 and Compartment #6 and the service air connection branches in each compartment may need to be rerouted to accommodate installation of the ESS battery racks and ancillary equipment. In coordination with the ESS Space modifications, reroute these lines as needed and relocate the service air drops within Compartments #3 and #6 so they are in a convenient, Owner approved location.

Install two isolation ball valves between Frames 25 and 26, one on each end of the vessel, immediately before the compressed air main passes into the ESS Space.

## 555 FIXED FIRE EXTINGUISHING SYSTEMS

### 555.1 NOVEC 1230 FIRE EXTINGUISHING SYSTEMS

Provide and install fixed gas fire extinguishing systems as required by 46 CFR Subchapter H and as described herein. New fixed fire systems shall utilize Novec 1230, which is electrically non-conducting and non-hazardous at design concentrations.

The design, installation, testing, and maintenance of the clean agent fire extinguishing systems shall be in accordance with USCG and NFPA 2001 Rules and Regulations. Agent quantities shall meet the vendor specified minimum design concentrations.

All components of the fire extinguishing system shall be products of the same manufacturer or listed by the manufacturer as compatible with those devices, components, and equipment. The Contractor shall utilize the manufacturer's authorized technicians for final connections and system tests of the fire extinguishing systems.

Clean agent cylinders shall be new, fully charged, and fitted with level indicators. When required to protect discharge heads during handling and transportation, safety caps shall be provided.

Mount all fixed clean agent cylinders on elevated foundations and securely fasten in a vertical position. Secure cylinders with circumferential band/steel strap type bolted clamps around the cylinder body. Use individual band clamps for each bottle to permit maintenance service and removal.

The system shall include all necessary storage cylinders, piping and control systems, alarms, warning lights, relief valves, discharge nozzles, solenoid shutdown and pressure release cylinders, and interfaces with engine, damper, and ventilation controls.

Arrange nozzles to evenly distribute and diffuse the clean agent throughout the protected spaces. Design size and flow requirements per the manufacturer's approved design manual and USCG requirements.

Configure pressure switches to stop the ventilation supply and exhaust fans, close the fire dampers, and shut down all diesel-fired equipment in the protected space upon release of the clean agent system serving the space protected.



Each NOVEC cylinder piping header shall incorporate a threaded mechanical coupling for maintenance blowdown capability located as closely downstream as practicable in the piping design.

### ESS SPACES

An ABS and USCG approved NOVEC 1230 fixed gas system shall be provided for each ESS Space. Contractor shall install the (2) new NOVEC systems inside the existing main deck lockers above the new ESSs. Contractor is to modify and re-arrange existing equipment (the deck hatches are also being from these two deck storage lockers) and wiring as needed in order to accommodate the new NOVEC systems. Local and remote actuation controls shall be provided in accordance with regulatory requirements. Remote actuation controls shall be provided immediately outside of the ESS space served.

Activation of the NOVEC system shall trigger all disconnects, ventilation shutdowns, and alarms required by regulation or by Siemens. The NOVEC systems for each ESS Room each space shall be independent. Activation of the NOVEC system in one ESS Space shall not shut down equipment or actuate dampers in the other ESS Space.

### EMERGENCY GENERATOR ROOM

Due to enlargement of the Emergency Generator Room, specified in Section 0, a larger Novec system is required. The existing Emergency Generator Room NOVEC 1230 fire suppression system shall be modified to accommodate the increased volume and in accordance with regulatory requirements. The following modifications are anticipated:

- The existing 80 lb Novec bottle, propellant bottle, 1 inch distribution piping, and nozzle shall be removed.
- A new 125 lb Novec bottle, Kidde part number 45-550121-001 or equal, shall be installed. The bottle shall be charged with a volume of Novec adequate for the enlarged space.
- New 1-1/4-inch distribution piping of 316 stainless steel shall be installed between the Novec locker and the Emergency Generator Room, following the existing pipe routing. Existing bulkhead penetrations shall be enlarged or replaced as necessary to accommodate the larger pipe and re-sealed in accordance with regulatory requirements.
- Within the Emergency Generator Room, new distribution piping and nozzles shall be fit to distribute NOVEC agent throughout space.

The Contractor shall be responsible for final system sizing configuration, and supply of equipment in accordance with regulatory and vendor requirements.

### 555.2 WATER MIST SYSTEMS

Provide and install an Ultra Fog or equal water mist fire suppression system covering each ESS Space.

The systems shall be both ABS and USCG approved, modular, and self-contained. Each shall be powered by an accumulator/pressure tank and shall function without electric power for system discharge. The systems shall meet applicable USCG requirements and the ASTM F3353-19 Standard Guide for Shipboard Use of Lithium-Ion Batteries.

The systems shall be installed and tested in accordance with the manufacturer's approved marine design, installation, operation, and maintenance manual, to include actuation arrangements, controls, labels, and placards configured in accordance with ABS and USCG requirements for fixed fire extinguishing systems.

Each water mist system shall be sized in accordance with ABS and USCG requirements for the ESS Space it serves. The water for the system shall be stored in dedicated accumulators. Activation of each water mist system shall be possible from each Pilot House, the EOS, and immediately outside the ESS Space served. Activation of the system shall trigger all disconnects, ventilation shutdowns, and alarms required by regulation or by Siemens. The fire systems in each space shall be independent. Activation of the water mist system in one ESS Space shall not shut down equipment or actuate dampers in the other ESS Space.

The location of the water mist accumulator skids system components shall be generally as shown on Reference (5B).

Each water mist cylinder piping header shall incorporate a threaded mechanical coupling for maintenance blowdown capability located as closely downstream of the cylinders, as practicable, in the piping design.

## GROUP 600 – EQUIPMENT AND OUTFIT

*Table 7: List of References – Equipment and Outfit*

REFERENCE ID	NUMBER	TITLE
(6A)	20050-002-101-0	General Arrangements
(6B)	20050-002-101-7	Structural Fire Protection
(6C)	20050-002-101-8	Pilot House Arrangements
(6D)	20050-002-101-2	Fire and Safety Plan
(6E)	20050-002-110-6	ESS Structural Modifications
(6F)	20050-002-201-1	Machinery Arrangements
(6G)	20050-002-256-2	Keel Cooling

### 602 NAMEPLATES, NOTICES AND MARKINGS

The Contractor shall provide nameplates, signs, labels, notices, and similar markings and devices throughout the vessel as required by the cognizant regulatory agencies whether local, state, or federal. The Contractor may utilize commercially available marine safety signage as an alternative to the signage described herein. All signage must meet the fabrication requirements described below and must be approved by the TxDOT.

In general, all nameplates and labels shall be engraved phenolic plastic laminate or engraved stainless steel, unless otherwise specified. Metal engraved nameplates, signs, labels, notices, and other similar markings and devices shall be provided on material no less than 0.05 in thick. The engraving shall be 0.02 in deep, filled with black or red paint as determined by the application. Nameplates, signs, labels, notices, and similar markings and devices shall be firmly attached with stainless steel drive screws. Where screws are impractical, water and oil proof adhesives may be used.

Exterior signage that is over 2 ft<sup>2</sup> in size shall be painted aluminum sheet metal. The signs shall have sharp corners ground smooth and shall be free of burrs. Such signage shall be affixed to the vessel's structure with 1 1/2-inch standoffs and fastened with stainless steel studs, flat washers and lock nuts.

The Contractor shall give special consideration to the prevention of theft and vandalism regarding the installation of labels, notices, frames, signs, and similar items.

Phenolic label plates shall be installed on the Pilot House consoles to identify instruments, controls, and alarms.

#### 602.7 DOOR, HATCH, AND MANHOLE MARKINGS

For all new and relocated doors Identifying labels shall be provided to show the compartment designation of each door accessible space in the vessel. Labels shall be affixed to the outside of each access door, approximately 5 feet 6 inches off the deck, in the center.

#### 602.8 SERVICE SYSTEM LABELS AND NAMEPLATES

System and equipment labels or nameplates shall be provided throughout the vessel as needed for systems being modified or otherwise impacted and disturbed under this specification. Lettering shall not be less than 3/16 inches high. Primary information shall be in letters of larger size than secondary information.

## HEATING AND VENTILATION SYSTEMS

Labels or nameplates shall be provided to clearly identify each fire damper, fan, controller, heater, motor, access plate, thermostat, damper, weather supply, exhaust outlet, and other major components of the heating and ventilation systems throughout the vessel.

Labels for fire dampers shall have a red background and white lettering.

## PIPING SYSTEMS

Operating systems associated components and/or equipment, piping, and appurtenances shall be readily identifiable.

Except where the function of a valve or component is obvious, such as a freshwater cutout valve immediately adjacent to a lavatory fixture, each valve throughout the vessel shall be identified as to its service and function.

New or modified exposed piping shall be stenciled or labeled to indicate the medium contained in the system and the normal direction of flow at least once between takedown joints, on each side of bulkhead penetrations, and at least once in each compartment through which the pipe passes. The letters and numerals shall be proportional to the diameter of the pipe, and the color of the figures shall provide a sharp contrast to the background (normally black letters on white pipe). Additionally, new or modified pipe in the Engine Room and hold shall be color banded to describe its function.

Valve nametags or label plates shall be brass or stainless steel, engraved with the system service and the valve function.

The valve naming convention shall be as follows: letters designating function, one or two numerals designating deck level, one or two numerals designating the nearest frame number, one numeral designating vessel end (1 or 2), one letter designating port or starboard, and one numeral designating transverse location, with 0 starting at valve nearest to centerline.

The decks shall be designated as follows: inside hull (2), Car Deck (1), A Deck (01), Bridge Deck (02). The systems shall be designated as follows: fuel oil (FO), sea water (SW), fresh water (FW), compressed air (CA), overboard discharge (OVBD), fire main (FM), bilge (BLG), ballast (BAL), steering gear hydraulics (STR), barrier gate hydraulics (BG).

The following example FM-2-7-2S2 would indicate a valve in the fire main system, in the Engine Room (Deck 2), at Frame 7, on end No. 2, being the third valve out from centerline at this frame.

Compressed air reducing valves shall be labeled CA-RED1, CA-RED2, etc. in no particular order.

The tag or label shall be a circular disk attached to the valve wheel and held in place by the valve wheel nut, or it shall be a rectangular tag attached to the valve operating lever or body by a short brass chain or flexible stainless steel safety lock wire, as appropriate to the type of valve.

Metal engraved label plates shall be affixed to all tanks.

## ELECTRICAL SYSTEMS

Identifying nameplates or labels shall be provided for each piece of electrical equipment and for each electrical cable installed in the vessel.

Equipment labels shall identify the item by name and its power source by circuit number.

Cables shall be clearly identified by circuit number. Cable labels shall be aluminum embossed with raised lettering. Cables shall be labeled on each side of bulkhead penetrations, entry into and exit from junction boxes, distribution panels, switches and other similar items or devices.

Wires within new or modified control, alarm and monitoring, and communications enclosures shall be labeled with adhesive labels, alpha-numeric floaters, or via labeling of the terminal to which the wire is connected. Labels shall correspond to design drawings

Special operating instructions or precautions shall be included on the label plate or on a separate plate mounted adjacent to the equipment.

Any device or enclosure with two or more sources of power shall be provided with a red warning label. Circuit numbers of the power sources shall be clearly indicated on the label plate.

Label plates for precautionary notices and emergency operations shall have a red background with white lettering. Others shall have standard colors. Refer to Section 300 for additional requirements.

Emergency light fixtures shall be labeled in accordance with regulatory requirements.

Electrical distribution panels shall have nameplates showing the following:

- Space, apparatus, or circuits controlled
- Type of service (power, lighting, etc.)
- Circuit designation shown on wiring diagrams
- Feeder designation
- Each circuit breaker shall have a label plate showing the circuit designation and number, the circuit breaker trip setting, and the breaker frame size

## 602.9 REGULATORY MARKINGS

The Contractor shall provide label plates, markings, signs, and instruction plates required to comply with regulations of the cognizant local, state, federal, and regulatory agencies. These include, but are not limited to exit signs, pollution abatement, rudder orders, non-smoking signs, fire alarm bells, fire alarm pull-boxes, and aids to mobility impaired persons.

As a minimum, the Contractor shall provide nameplates, signs, labels, notices, and other similar markings for the following:

### FIRE EXTINGUISHING EQUIPMENT

Identification labels for fire stations, fire hoses, portable extinguishers, carbon dioxide alarms and flooding system, ventilation shutdown mechanisms, and fire dampers shall be provided. All identification labels shall match the fire and safety plan. Relocate fire stations as necessary in way of affected areas.

### INSTRUCTION PLATES

Plastic laminated plans for operating instructions and emergency procedures as required to safely navigate and operate the vessel shall be provided including, but not limited to, the following:

#### Switchboard:

- Generator setup procedures
- Transfer procedures
- Shore power connection and switching procedure
- Emergency ventilation shutdown procedure

#### Car Deck:

- NOVEC and water mist fire suppression actuation procedures
- Modifications to ventilation shutdowns
- Shore power connection procedure

#### Fire and Safety Plan:

The Contractor shall update a vessel Fire and Safety Plan, Reference (6D) and submit it to TxDOT for approval. The Fire and Safety Plan shall be developed in color using SOLAS symbols. Copies of the approved Fire and Safety Plan shall be laminated and mounted or stored in a document tube in the Pilot House and Engine Room. A copy of the Fire and Safety Plan shall be mounted in a weather resistant notice frame in each Passenger Shelter.

## 622 FLOOR PLATES, LADDERS AND GUARDS

### 622.1 FLOOR PLATES

Walkways below main deck shall be modified by the Contractor as necessary to access the revised engine arrangement, ESS and EOS. The grating shall be steel equivalent to the existing walkways. The Contractor shall create a grating arrangement plan and submit it for Owner's approval prior to making the final changes.

### 622.2 MANHOLES

New access manholes to access the voids created around the ESS shall be sized and located as indicated on the arrangement and structural drawings, Reference (6A).

Manholes shall be fabricated in accordance with the standards of ASTM Volume 01.07 "Shipbuilding," F-1142 and F-1143, and shall be fitted with stainless steel studs and bronze nuts. Round bar lifting handles shall be fitted for non-flush manholes. Gaskets and stud grommets, compatible with the tank contents, shall be fitted on all manholes. Grab bars shall be fitted over the manholes on both sides of the opening.

## 631 PAINTING

All new structure shall be blasted near white and coated according to the Owner's paint specification for this vessel, included in an Appendix to this Specification. All areas where the existing coating is disturbed shall be re-coated as required in the paint specification.

## 632 DECK COVERINGS

### 632.0 SWITCHBOARD MATTING

ASTM switchboard Type 1 matting, 36 inches wide, shall be provided in front of the ship's service switchboard, the propulsion switchboard and drive units, the 600V MCCs and the battery cubicles for their full length. The matting shall meet the requirements of ASTM D-178 and Mil Spec M-15562F.

## 633 INSULATION, LININGS AND CEILINGS

Surfaces to which insulation is applied shall be prepared in accordance with Section 631.

Insulation materials shall be USCG approved, certified for the intended use, and shall be 100 percent free of asbestos containing materials (ACM). The Contractor shall provide documented proof of the certification prior to installation of insulation materials.

Insulation shall be installed with weld or glue pin hangers spaced on 12-inch centers for bulkheads and overheads.

Insulation shall be provided in the following areas:

All surfaces of ESS shall be covered with 4 inches of mineral wool insulation, with 1 inch wrap over stiffeners. Structural Fire Insulation is required for the ESS overheads. The remaining surfaces shall be covered with the same insulation.

### 633.0 STRUCTURAL FIRE INSULATION

The Contractor shall provide structural fire protection as described herein, Reference (6B), and as required by USCG. Structural fire insulation shall be a faced mineral wool product approved by the USCG under Series 164.007 "Structural Insulation." The structural fire insulation shall be installed in batts or blankets. Insulation shall be impaled on steel pins fitted with steel speed clip retainers and aluminum finish caps outside of coverage of perforated sheet metal flashing, or where injury from exposed steel pins could occur.

Mineral wool batts or blankets shall be installed tight to the surface being protected. They shall be contoured around angles and tees to ensure that there is no reduction in cross section and that there is minimal loss of contact with the structure.

### 633.1 ACOUSTIC INSULATION

Acoustic insulation, if required, shall be applied across the faces of plating to meet the noise goals stated in Section 073. As there are various combinations and types of USCG approved material available, the Contractor may use his standard practice in developing the details to meet the noise limits. However, the Contractor shall submit them to TxDOT for approval prior to submission to the USCG for approval. Fire and thermal insulation can double as acoustic insulation if appropriate. The spaces to be acoustically insulated in addition to thermal insulation include the trunks passing through the Salon and the EOS. The insulation shall be of suitable thickness and configuration to obtain the noise limits listed in Section 073 with all machinery in operation. All existing acoustic insulation that is disturbed during the course of this project shall be restored to the as-found condition.

### 633.2 LININGS & CEILINGS

All insulated bulkheads shall be covered with liner panels. All liner panels shall use 316 stainless steel joiner and terminations. All existing bulkhead liner panels that are disturbed during the course of this project shall be restored to the as-found condition.

### 633.3 EOS -LININGS, CEILING AND DECK

All existing linings, ceiling and decking that is disturbed during the course of this project shall be restored to the as-found condition.

## GROUP 800 – INTEGRATION ENGINEERING

*Table 8: List of References – Integration Engineering*

REFERENCE ID	NUMBER	TITLE
8A	MTN 02-11, 12/15/2011	Marine Safety Center Technical Note: Review of Vital System Automation and Dynamic Positioning System Plans
8B	20050-002-101-0	General Arrangements
8C	20050-002-101-2	Fire and Safety Plan
8D	20050-002-843-0	Trim and Stability Calculations
8E	B879-1-A04	Docking Plan & Cathodic Protection

### 810 ENGINEERING AND WORKING DRAWINGS, CALCULATIONS, AND REVIEW

The Contractor shall provide all engineering services necessary for the work in accordance with the Specification. Services shall include technical calculations, surveys, material selection, preparation of diagrams, sketches, schedules, data, new or updated fire system manuals, and preparation of all working drawings and as-built drawings.

Drawings shall be complete in all detail, serve to gain regulatory approval, and facilitate future use by TxDOT for maintenance and repair activity.

All drawings shall be produced using Computer Aided Design (CAD) in AutoCAD 2013 or more current format. Provide the data files in both AutoCAD and Adobe PDF format on USB drives and as 11 inch x 17 inch paper format.

The Contractor shall submit a full sample drawing format showing a typical sheet one and sheet two, including title block, reference, general notes, and revision table format to the TxDOT Representative for approval.

The TxDOT Representative will review the Contractor's detailed design to determine compliance with the Plans, Specification and Contract. TxDOT review will not relieve the Contractor of responsibility for deviations from the Specification unless Contractor has, in writing, called attention to the deviation at the time of drawing submittal. Approval of a drawing does not constitute approval of a deviation, mistake, or omission. TxDOT approval of a deviation from the Specification will not relieve the Contractor of the responsibility for satisfactory operation of the system or equipment. Work performed by the Contractor prior to TxDOT's review and approval of the Contractor's drawings will be at the Contractor's own risk.

Booklets of details and calculations may be on sheets 11 x 17 inches or 8 1/2 x 11 inches.

Symbols on drawings shall conform to recognized marine commercial standards.

Materials shown on drawings shall have item numbers and be identified in a material list by material specifications, ASTM, ANSI, NEMA, etc., as appropriate.

Each drawing shall contain a view showing the entire system covered by the drawing. If the two ends of the vessel are substantially similar, one end may be indicated as such, and not shown specifically on the system plan. All drawings shall be initialed in the title block by the drafter and the engineer responsible for the design prior to submittal to the TxDOT Representative. They shall be signed by the engineer stamping the drawing.



Each drawing shall be checked and finished before submitting to the TxDOT Representative. Drawings without appropriate signatures and drawings which are not complete, will not be reviewed by the Owner and will be returned to the Contractor for completion. Returned drawing submittals do not count towards fulfilling the Contractor's obligations with regard for scheduling, i.e. all returned drawings must be resubmitted complete within the scheduled time.

Furnish a copy of all written or email correspondence sent to or received from regulatory agencies to the TxDOT Representative.

The Contractor shall submit the drawings, documents, and engineering calculations to the TxDOT Representative, in a timely fashion, according to the approved Master Construction Schedule and the Plan Schedule. When submitting system design drawings, such as piping diagrams and isometric wiring diagrams, include the calculations by which the system components were sized. TxDOT will not review these drawings without supporting calculations. TxDOT will respond to submittals normally not later than fourteen (14) calendar days after receipt of the paper copy of the document, with "approved", "conditionally approved subject to comments", or "returned for revision and re-submittal" action. TxDOT review responses shall be via mail/fax or email.

The Contractor shall furnish two paper copies and one electronic file copy of each drawing, document, or calculation when submitted to the TxDOT Representative for approval. The Contractor shall use a transmittal form for each submittal giving the drawing number, revision letter, title, date submitted, and spaces for the Owner to enter the return date, approval action, comments, reviewer's name, and the signature of the TxDOT Representative. Drawings for submittal shall be complete in all respects with all material and equipment shown and shall be accompanied by supporting calculations.

#### 810.1 EOS AND PILOT HOUSE ARRANGEMENTS

Contractor shall develop the EOS arrangement, Reference (3F), and Pilot House arrangement drawing, References (3D) and (6C), to a sufficient detail to demonstrate the arrangement of equipment in the spaces and the individual operators and devices installed on the EOS and both Pilot House console surfaces. Final arrangements shall be subject to TxDOT approval prior to equipment orders.

#### 810.2 REGULATORY PROCEDURES AND ANALYSIS

The Contractor or its subcontractors shall develop and submit the following documents at a minimum for regulatory approval. The documents shall be developed in accordance with 46 CFR Subchapter F, 46 CFR Subchapter J and Reference(8A) applicable, for steering systems, propulsion systems, control and monitoring systems, power generation and distribution systems and all other vital system automation throughout vessel.

- Qualitative Failure Analysis/Failure Mode and Effects Analysis (QFA/FMEA): Examines the results of the failure of each control, alarm, and instrumentation system component, and verifies that a single non-concurrent failure will not prevent sustained or restored operation.
- Design Verification Test Procedures (DVTP): A detailed test procedure to verify each failure mode identified by the QFA.
- Periodic Safety Test Procedures (PSTP): Test procedures to periodically verify the proper function of vital system automation, alarm, and controls. The PSTP is a vessel-wide document and the Contractor provided PSTP must include all onboard systems whether new, modified, or existing. The Contractor shall work closely with their systems integrator to ensure that all required PSTP tests for the systems integrator's equipment are included.
- Short circuit and device evaluation studies.

- Overcurrent protective device coordination study: A comparison of the time and current relationships of each series set of protective devices, to verify selective tripping of circuit breakers and fuses. This study shall integrate with the above short circuit study.
- Harmonic Study: To predict the harmonic content and total harmonic distortion of the AC waveform. The predictive study shall be followed by testing and verification during commissioning and sea trials.
- Voltage drop: To determine required conductor sizes and voltage drops of AC and DC circuits, using final load values and cable lengths.
- Fire system calculations, drawings or manuals as may be required
- In accordance with Reference B of Section 0, required documentation including showing optimization calculations/ results for sizing the hybrid-electric power system (HEPS) is to be supplied to TxDOT and submitted to ABS for review.

The approved documents shall be provided to TxDOT with approval letters and shall be provided in electronic format as Word or Excel files.

### 810.3 ARC FLASH STUDY

The Contractor or its subcontractors shall develop and submit to TxDOT an arc flash study. It shall encompass all electrical systems onboard the vessel operating at 50 volts or higher. The document shall be developed in accordance with NFPA 70E and IEEE 1584 or an alternate internationally recognized standard approved in advance by TxDOT. The study will integrate with the short circuit and coordination studies required by Section 810.2.

The study shall be delivered 90 days prior to redelivery of the vessel. After a 30-day review period by TxDOT, Contractor shall label all equipment in accordance with NFPA 70E prior to redelivery. Contractor provided training shall encompass arc flash related training including lock-out/tag-out procedures for new or modified equipment, verification of energized states and emergency transfer procedures for new or modified equipment.

### 810.4 AS-BUILT DRAWINGS

Final as-built drawings shall include all original letting document drawings, any drawing modifications, and additional drawings developed to define the full work scope. Such drawings shall be updated to conform to an "as-built" condition and stamped "AS-BUILT FINAL" in the title block. They shall fully reflect systems and arrangements of vessel as delivered to TxDOT.

The Contractor shall provide all outside engineering services necessary to complete all construction inspections and complete the as-built drawings. The provider of these outside engineering services shall be a single firm, whose qualifications shall be reviewed and approved by Owner before construction assistance or inspections begin.

No later than two (2) weeks prior to delivery of the vessel to TxDOT, the Contractor shall submit "AS-BUILT " to TxDOT for review and approval. These shall be provided as three (3) sets in paper format and on USB drives with all electronic files in both AutoCAD 2013 .dwg and Adobe .pdf format to the TxDOT Representative.

### 810.5 VENDOR SYSTEM DIAGRAMS

All vendor supplied systems are to include system diagrams (piping and electrical) providing ship specific system configurations. Wiring and cabling diagrams shall include the cable type and unique designations

for each cable. As-built versions of these diagrams shall be provided by the Contractor prior to sea-trials for review by the Owner.

**810.6 DISPLAY DRAWINGS FOR MOUNTING ONBOARD**

The Contractor shall develop and provide the following reduced size, non-fading positive prints of drawings to be mounted in the locations noted on board the vessel. Two copies shall be provided for each, one each for onboard the vessel and one for the shore-side TxDOT offices. These drawings shall be mounted prior to delivery of the vessel to TxDOT. Mount all drawings in anodized aluminum, or stainless steel frames with clear plastic covers, or in tubes as listed below. The tube-mounted drawings shall be completely enclosed in clear plastic.

The set of prints shall include:

QTY	DESCRIPTION
4	Fire and Safety Plan, 11x17 in size. Two laminated copies of the vessel safety plan shall be mounted on the Car Deck in each Passenger Shelter; two laminated copies shall be provided in the Pilot House and Engine Room in document tubes. The plan shall be updated from Reference (8C) to reflect the as-built condition of the vessel.
1	AC/DC electric power distribution system, one-line wiring diagram mounted near the ship service switchboard.
1	AC/DC electric propulsion power system, one-line wiring diagram mounted near the propulsion switchboard.
1	NOVEC and water mist system diagrams and operating instructions to be mounted just outside the ESS Spaces and inside the main deck lockers housing the new NOVEC systems.

Additionally, the Contractor shall provide and place on board all plans and documents required by regulatory agencies. Prior to delivery, obtain a Stability Letter in accordance with 46 CFR 170.120. Mount the letter in a suitable anodized aluminum frame installed under glass, and located permanently in the Pilot House. The final locations of all mounted plans shall be subject to approval by TxDOT's Representative.

**810.7 DOCKING PLAN**

The Contractor shall update Reference (8E) to reflect the current vessel condition (post re-power modifications). This revised docking plan will be used by TxDOT for future dry-dockings. This plan shall show the required keel block heights and minimum contact areas, cross sections of the hull for building bilge blocks, locations of all propellers, rudders, drain plugs, sea chests, anodes, over boards and through-hull appurtenances such as depth transducer. Locations of all items shall be with dimensions to physical common reference points. Vessel particulars such as major dimensions, tank capacities, draft and lightship weight shall also be provided on the Docking Plan.

**835.0 FIELD OFFICE FOR INSPECTORS**

Office facilities and telephone service shall be provided at the Contractor's facility for Owner's Representatives and consultants. The expenses shall be borne by the Contractor. Office facilities shall have proper ventilation and shall be heated and air conditioned as appropriate. The facilities shall include the following as a minimum:

QTY	ITEM
3	Desk w/chair

QTY	ITEM
3	Side chair
2	Legal size, 4 drawer file cabinet
1	Drawing review table at least 3 ft x 6 ft and of standard height
2	Dedicated phone line capable of long-distance calls
1	High speed internet connection
2	Telephone
3	Dedicated parking space
-	Cylinder door locks and keys
-	Access to multifunction scanner/copier/printer capable of processing documents up to 11x17 format
-	Adequate lighting
-	Access to sanitary facilities

The Owner's Representatives shall be granted unhindered access to the Contractor's construction and shop areas. All costs associated with this inspection section shall be included in the Contract Price.

## 843.0 TRIM AND STABILITY BOOKLET

Prior to delivery of the vessel, the Contractor shall furnish three (3) copies of a trim and stability booklet based on the inclining experiment performed on the vessel. The booklet shall include loading examples at least with conditions of light ship, full load operating, 10% consumables with full load of passengers and vehicles, truck loading and worst-case loading. Loading conditions used shall be subject to review and approval by the TxDOT Representative.

When available, furnish three (3) copies of the trim and stability booklet marked with USCG and/or ABS approval as required. The booklets shall be produced using General Hydrostatics (GHS) computer software and the Contractor shall provide the data files on USB drives, two copies each.

### 843.1 STABILITY TEST

A stability test shall be performed by the Contractor, at his expense, in accordance with the requirements of the USCG NVIC 17-91 and the procedures described in ASTM Volume 01.07 "Shipbuilding" Standard F-1321-92.

A test memo shall be submitted for approval. The Contractor shall inform the USCG and TxDOT of the scheduled stability test date at least thirty (30) calendar days prior to the test and obtain written USCG approval of the test procedure. The TxDOT's Representative and the USCG shall witness the test.

Using the results of the stability test, the Contractor shall prepare a stability test report, submit the report to USCG and TxDOT, and obtain written USCG approval of the calculated vessel light ship weight and center of gravity. The Contractor shall prepare a trim and stability booklet and secure USCG's and TxDOT's approval. The trim and stability booklet shall set forth the stability data necessary to permit safe and efficient handling of the vessel. The trim and stability booklet shall present the information in the same manner as Reference (8D).

## 851.0 TRAINING

As part of this contract, Contractor shall assist vessel crew to prepare for and perform the Contractor's PSTP (see Section 810.2). A walk-through and training session of the entire PSTP shall be conducted. This

training will be performed with Contractor and/or subcontractor's personnel that are knowledgeable about each specific system being tested and able to answer questions from TxDOT crew. Contractor and/or subcontractor's same personnel shall be available to support TxDOT crew during their actual PSTP testing with USCG.

Contractor shall inform the TxDOT Representative at least 24 hours in advance of any DVTP testing to be conducted with USCG so that the TxDOT Representative may attend such testing.

TxDOT will contract directly with the propulsion system vendor for more extensive operational, maintenance and troubleshooting training.

## 856.0 INSTRUCTION BOOKS, OPERATING MANUALS, AND TECHNICAL DATA SHEETS

The Contractor shall prepare a list of operating manuals and instruction books to be provided with the vessel. The list shall be submitted to the TxDOT Representative for review no later than ninety (90) calendar days before delivery of the vessel. TxDOT will review this list for omissions and corrections, and return the document to the Contractor for revision.

One (1) draft copy of each instruction book shall be submitted to the TxDOT Representative for review and approval of format no later than sixty (60) calendar days before the vessel is delivered to TxDOT.

The Contractor shall prepare or obtain instruction books for all machinery, equipment, and systems provided by the Contractor for the vessel. The instruction books provided shall contain complete operating, installation, maintenance, troubleshooting, and repair instructions and parts lists in sufficient detail for the operating personnel to operate, maintain, and repair ALL new or modified equipment. The parts lists shall be complete with the parts described so that required spare repair parts may be easily identified and ordered by the operating personnel.

The Contractor shall not use operating manuals intended for final delivery to the Owner as working manuals for use in installing and operating the equipment. If the Contractor requires this information, then additional operating manuals shall be ordered for that use with the attendant cost borne by the Contractor. Instruction manuals and books clearly showing misuse shall not be accepted.

Items that are merely advertisements shall not be included in the books.

Photocopies of original manufacturer's manuals shall not be accepted and do not count towards fulfillment of this requirement. Quality print-outs from electronic copies of documentation from equipment manufacturers will be acceptable. Each instruction book shall be complete with factory or manufacturer original information. The cost incurred from the purchase of original manufacturer manuals shall be borne by the Contractor.

Instruction books shall contain information at least equivalent to that available to mechanics at an authorized overhaul facility of the manufacturer of the machinery or equipment covered. Omission of information due to reasons such as "not normally furnished by the manufacturer" or "factory only" are not acceptable.

The Contractor shall deliver three (3) copies of the finished instruction books. Final copies shall be bound in loose leaf 3-ring binders appropriately marked on the front cover as to the content. Additionally, all information in the manuals shall be supplied electronically. The vessel shall not be accepted without first receiving the final copies of all instruction books.

Additional to above, the Contractor shall provide an abbreviated step-by-step, start-up, operation and shut-down procedures manual for the diesel electric propulsion system. The operation and procedures

manual shall include photos, as necessary, of the actual components to help identify and locate them. The operation and procedures manual shall be provided bound in loose leaf 3-ring binders and as a Microsoft Word® file.

#### 856.1 SOFTWARE PROGRAMS

Where equipment or systems are programmed for use on this vessel such as may be used in propulsion systems, monitoring systems, HMIs, PLCs, door locks, etc., TxDOT shall be provided with the specific program as installed on the vessel and such licensed programs to allow their viewing, modification, updating and troubleshooting. TxDOT shall be the licensed owner/registered user of all programs provided. TxDOT shall be provided with all data link cables for connection between the equipment and a PC.

## GROUP 900 – TESTS, TRIALS AND DELIVERY

### 982.0 TESTS AND TRIALS

The Contractor shall conduct a testing program to demonstrate satisfactory workmanship, proper installation of equipment and materials, compliance with the Technical Specification and Drawings, and compliance with regulatory agency requirements.

Alternate test methods from those detailed in this section will be accepted with the approval of the ABS Surveyor or USCG inspector, as appropriate, and the TxDOT's Representative. ABS or USCG may require more stringent test methods than those outlined in this section; the Contractor is required to satisfy the regulatory test requirements.

All new machinery shall be shop tested at the points of manufacture to demonstrate the ability of the machinery to meet the design conditions, as required. Power consumption shall be determined during the shop tests. For duplicate pumps and other duplicate units, only one (1) set of such tests shall be necessary.

Test reports shall be submitted to Owner for approval.

Representatives of Owner and the Contractor shall be notified in advance of manufacturers' tests so that they may be present if they so desire.

Prior to the dock and sea trials, the Contractor shall test all main and auxiliary machinery, heating and ventilating systems, lifesaving equipment, fire extinguishing systems, piping systems, steering gears, propulsion system, ship's service systems, navigating equipment, interior communication systems, alarms, etc. Any defects which may develop or become apparent in connection with the work covered herein shall be made good by the Contractor to the satisfaction of the representatives of Owner and the Regulatory Bodies.

Before sea trials and delivery of the vessel to the Ferry landing in Galveston, a temporary Certificate of Inspection (COI) must be provided. The final USCG COI must be issued to Owner by the Texas City OCMI, and be in place without any outstanding ABS or USCG items before final acceptance.

The Contractor shall submit a complete schedule of tests to the TxDOT's Representative for approval not less than thirty (30) calendar days prior to commencement of testing. The Contractor shall prepare a test and trial agenda, and procedures for each test.

Operational, dock, builder's trials and sea trials shall be conducted in accordance with applicable sections of SNAME T&R Bulletin 3-39 "Guide for Shop and Installation Tests" and SNAME T&R Bulletin No. 3-47 "Guide For Sea Trials". All trials and testing are to be coordinated with the Contractor's propulsion system integrator for their scope of supply.

The Contractor shall prepare and submit test memoranda of the test results to the TxDOT's Representative for approval. Two copies of completed tests and test reports shall be submitted to the TxDOT's Representative.

The Contractor shall bear all expenses, furnish the crew, fuel, water, lubricating oil, special instruments, and supplies required for all tests and for all trials.

## 982.1 HULL TESTS

The purpose of hull tests is to demonstrate the watertightness and fairness of the structure and fittings. It is further intended that the Contractor demonstrate the satisfactory installation and operation, where applicable, of all items of outfit.

### STRUCTURE

New or modified areas of the hull, watertight bulkheads, Car Deck, superstructure, and watertight closures shall be air box or air jet tested to prove tight all exterior surfaces. Watertight tests shall be performed prior to paint out.

### DOORS, SCUTTLES, MANHOLES, AND CLOSURES

Doors, scuttles, manholes, and similar closures which are gasketed shall be chalk tested to prove full gasket contact. Visually inspect other doors, scuttles, manholes, and closures to demonstrate proper workmanship and operation.

## 982.2 MACHINERY TESTS

The Contractor shall test new and modified machinery, equipment, piping, and systems according to the following procedures:

### HEATING AND VENTILATION AND AIR CONDITIONING

New or modified HVAC systems shall be tested as described herein.

Test the electrical circuits of the fans.

Commission, balance, and test each system to assure delivery of designed air quantities. Before testing and balancing, the following conditions shall exist:

- Systems shall be clean
- Normally open closures and dampers shall be open
- Fans and motors shall run in the proper direction of rotation with correct speed

Operate each system at full design capacity and measure air flow.

Operate all ventilation system weather closures and fire dampers to demonstrate free operation without binding.

Test to confirm the proper operation of each ESS Space ventilation control system to the satisfaction of the system supplier and TxDOT. Confirm the proper operation of each function included with the control system.

Test the ESS off-gassing fan and piping to confirm conformance with ESS manufacturer requirements.

Ensure ventilation shutdowns operate properly. Fans and dampers that are interlocked with fire suppression system releases shall be tested using test gas or another acceptable method to simulate actuation of each fire suppression system release. Tests shall be witnessed by ABS or USCG as appropriate.

### PIPING

Each new or modified piping system shall be tested then cleaned and flushed. Equipment, such as strainers and heat exchangers, which are normally subject to the pressure of the system, shall be tested



with the system. For equipment such as heat exchangers, pressure shall be applied to one system at a time to allow the unit to be checked for internal leakage.

For fuel and lube oil system flushing requirements refer to Sections 261.0 and 262.

Pressure shall be applied to each system in its entirety, unless otherwise specified. System Hydrostatic pressure specified for the piping systems shall be maintained for a minimum of 10 minutes, and long enough to check thoroughly for leaks. The Contractor shall retest after any leaks have been repaired to prove each system tight.

The test fluid used shall be compatible with the system being tested.

Shipboard test procedures, in pounds per square in gage, shall be as follows:

SYSTEM	TEST PRESSURE	TEST FLUID
Fire Main	150 psi	Fresh water
Interior and exterior deck drains	Fill system to top fixture or vent	Fresh water
Sounding tubes, vents and overflows	Fill system to top fixture or vent	Fresh water
Engine jacket water/after cooler	30 psi	Fresh water
Compressed air:		
Engine starting and Service, 150 PSI	150 psi	Fresh Water
High Pressure Piping, 275 PSI	413 psi	Fresh Water
Diesel oil transfer and service	50 psi	Oil
Lube Oil and Dirty Oil	60 psi	Oil
Potable Water	100 psi	Fresh Water
Chilled Water	87 psi	Fresh Water

Pressure test piping for water mist and Novec fire suppression systems in accordance with ABS, USCG, and manufacturer requirements.

All relief valves and pressure safety devices shall be demonstrated that they operate at their set pressure or shall be provided with current test certification. All pressure gauges shall be provided with lab calibration test and certification stickers along with certifying documents provided to the TxDOT's Representative.

All new or modified hydraulic, fuel, and oil hose assemblies shall be hydrostatically tested and provided with metal tags attached showing their test date and pressures. Contractor shall verify and calibrate as necessary any tank level indicators (TLIs) against soundings or sight gauges for new or modified tanks or TLIs.

**COMPRESSED AIR SYSTEM**

Demonstrate the compressed air system can support the requisite number of engines starts. Confirm correct airflow rate and pressure to all installed equipment. Upon completion of the engine starting tests, demonstrate that the ship service air compressor can restore the compressed air system receivers to their starting pressure of 250 psig within 45 minutes in accordance with ABS Rules.

**DIESEL GENERATOR SETS**

Prior to installation onboard the vessel, Contractor shall conduct a factory acceptance test (FAT) for each combined diesel engine and generator skid. Individual generator set load testing shall be performed at

the engine vendor facility and witnessed by the TxDOT and Siemens Representatives. FATs performed separately on the diesel engine or generator shall not count towards this requirement. The FAT is to include a build-up in loading of 25% increments for 30 minutes each. This will continue until 100% (MCR) is reached and maintained for four hours, for each generator set. For this an appropriately rated Industrial Resistor Bank or other TxDOT approved method is to be used. The generator set shall be checked after installation for proper alignment and clearances. The generator shall be tested for insulation resistance.

### AUXILIARY MACHINERY

Each new or modified pump and compressor shall be tested with its respective system, both hydrostatically to determine tightness, and in operation. The Contractor shall confirm that pump shaft seals are rated for the test pressure. Check each item for proper installation, alignment, and rotation prior to the operating test. Data shall be recorded such that equipment performance can be evaluated and compared with the requirements of the Specification. Generally, the required data shall include the pressure change across the machine, rpm, power consumption, and, where applicable, the performance of controls and functions.

After data collection as listed above, and before acceptance, auxiliary machinery and related equipment susceptible to cyclic operations shall be operationally tested for five full, rapid cycles to the satisfaction of TxDOT.

### TANKS

Tanks normally vented to the atmosphere and modified by this contract shall be tested hydrostatically to 3 psig. Tanks not modified or opened during the performance of this contract need not be tested. Tanks that are not modified but are opened for standard cleaning and inspection, shall be leak tested at the tank openings only.

## 982.3 ELECTRICAL POWER, CONTROL, AND MONITORING TESTS

### GENERAL

Inspect the electrical installation for completeness, including tagging, labeling, and phase balancing of single-phase loads. Operate circuit breakers manually under load to demonstrate proper action.

### GENERATOR

The generator load test shall be conducted as described above. The loads used in these tests shall be measured as functions of the rated full load current. Measure and record the insulation resistance of the armature, field, and exciter windings "hot" immediately upon the conclusion of the factory load test.

### INSULATION RESISTANCE

For new or modified circuits, measure and record the insulation resistance of each circuit between conductors with branch and main circuit breakers open for all AC power circuits and for DC power circuits over 20 AT protection and elsewhere as required by USCG or ABS. Where applicable, the main neutral conductor shall be temporarily ungrounded.

Disconnect the equipment from each circuit to enable satisfactory resistance values to be obtained and to protect the equipment. This test does not apply to signal and control circuits.

## HARMONIC CONTENT

Under operational conditions, record and analyze the AC waveform at the ship service bus, and/or other locations identified by the propulsion integrator, TxDOT Representative, or regulatory bodies. Verify that total harmonic distortion does not exceed regulatory limits.

## OPERATIONAL TESTS

Check all switches, control devices, etc., for proper function. Calibrate and check automatic thermal control devices, alarm, and indicator devices. Record the date, any deficiencies and corrections, and the date of satisfactory completion of each test.

Perform a thermographic imaging inspection of the generator, propulsion switchboard, ships service switchboard, propulsion drives, braking resistors and all power distribution circuits under load, results of which shall be provided to the TxDOT's Representative as a narrated video tape and as an interpreted printed color report.

Test all alarm circuits by simulating the troubles monitored and record performance observed. Monitoring and alarm circuits shall be demonstrated to not alarm under normal transient conditions when equipment is being started or shutdown or during operator command changes such as rapid RPM reduction of the main propulsion system.

Check electronic equipment under the supervision of the equipment manufacturer's representative. The electronic system shall not be considered complete until the FCC inspection and certification has been accomplished, or addressed to the satisfaction of TxDOT.

Test all motor driven appliances under normal operating load conditions. Record operating volts and amps for each motor for each phase. Check all operating pushbuttons, selector switches, pilot lights, remote pushbuttons, pressure switches and control devices to assure their proper operation. Check overload-tripping devices for the proper size heater element and freedom of operation.

### 982.4 DOCK AND BUILDER'S TRIALS

The Contractor shall conduct dock trials of three (3) days of minimum four (4) hours per day duration to demonstrate the satisfactory operation of the entire power plant as a whole, including all main and auxiliary machinery. Readings shall be taken every thirty (30) minutes. The plant shall develop maximum power considering mooring and dock facilities. If practicable, maximum propulsion power shall be applied at each end of the vessel. Power shall be applied at each end of the vessel for half the allotted time. Where there are duplicate auxiliary units, each unit shall be in service for half the time with the other unit shut down. All parts of the machinery shall operate without undue heating, noise, or vibration. If any defects develop during these trials, the Contractor shall record all temperatures, pressures, electrical readings, etc. Readings from all trials to be provided to Owner.

The Owner's Representatives may attend all dock, builder's, and sea trials. During builder's trials the throttle settings will also be tested and adjusted in accordance with Owner's operational requirements and to the satisfaction of the Owner's Representative.

### 982.5 SEA TRIALS

Upon satisfactory completion of the dock and builder's trial, the vessel shall be taken on a sea trial. Speed and endurance trials shall be conducted by the Contractor at suitable locations, under fair weather and sea conditions. The first part of the endurance run shall include normal propulsion running for two (2) days of six (6) hours each day. The second part of the endurance run shall include propulsion

running without batteries for two (2) days of six (6) hours each day. The third part of the endurance run shall include propulsion running only on batteries for twenty (20) minutes two (2) separate times.

Trials shall be run in a depth of water not less than 30 feet and preferably not more than 100 feet. The trial draft shall be as near as possible to the design mean draft.

During the standardization trials, and at any other times as may be appropriate, a ship's vibration and noise survey throughout the whole vessel, with adequate instrumentation, shall be made by the Contractor.

The trial shall include:

- Endurance runs at sustained maximum shaft rpm. An equal number of endurance runs shall be performed with the vessel operating in both directions (A end forward, and B end forward). The endurance runs shall alternate propulsion generators so that all get approximately equal run time. Operating data shall be taken and recorded for all vessel systems at 15-minute intervals. Shaft torque and horsepower shall be recorded at 30-minute intervals.
- Progressive speed trial over a measured mile. Perform three trials at each of four different speeds: 30%, 60%, 90%, and full power, each trial consisting of two runs in opposite directions, with the A end forward. Repeat sequence of trials with the B end forward. Shaft torque and horsepower shall be recorded for each run.
- Shaft torque and horsepower shall be recorded for each of the following runs: crash stops, stern shaft only and with both shafts (about twelve (12) each direction).
- Steering and maneuvering, including two turning circles each way with each end driving (four circles total). Bow rudder shall be kept at center position.
- Demonstrate "Crabbing" and "pivoting" with both propellers thrusting in opposition and rudders turned to each side and to opposite sides. Bow rudder shall be kept at center position at speeds greater than 10 knots.
- Operation of vessel with different combinations of two generators online. With each combination, diesel engine shutdown trip of one of the two shall be simulated. Control system response shall be recorded including how long it takes for a second generator to come online and whether there is any reduction in available propulsion power during the period with just one generator online.

Complete trial reports shall be prepared by the Contractor and submitted to Owner as promptly as possible, for review and approval. Three printed (3) copies of the approved trial reports, suitably bound and in oil and water repellent covers, and one (1) electronic copy of the approved trial reports shall be furnished to TxDOT's Representative.

#### 982.6 OPERATIONAL TRIALS

Operational trials shall consist of simulation of actual running conditions with two generators online and batteries load leveling:

- Run twelve (12) minutes full ahead
- Run five (5) minutes at 25% of full ahead power on motor shafts to simulate maneuvering
- Ten (10) minutes at 25% power to each motor to simulate unloading/loading evolution
- Switch Pilot House and repeat the three previous steps in the opposite direction

The above shall be repeated in order and repeating for ten (10) days of six (6) hours each day. The vessel should complete a minimum of one hundred and twenty-five (125) hours of documented total trials with Owner and Naval Architect approval.

All readings from operational trials will be taken at appropriate intervals and shall be provided to Owner. A fully licensed crew shall be provided by the Contractor for any power movement or trials as described above. This applies to the entire build of the vessel as well.

### 982.7 TEST AND TRIAL INSTRUMENTS

The Contractor shall furnish instruments for operational tests to provide sufficient data to analyze the performance of all systems, machinery, and equipment which are a part of this vessel repower.

Ship's gauges and instruments may be used for tests of the systems they serve. The Contractor shall furnish test instruments and means of connection, as necessary, for additional readings required to test machinery and systems.

Instruments shall be checked against standards at the beginning and end of the test program. If readings taken during a test appear unreasonable, Owner shall require the Contractor to check all the instruments, gauges, and thermometers used on the test in question.

For trials described above, each shaft shall be fitted with strain gage type torsion meters and with data processed to provide torque and horsepower output.

Following completion of sea trials, the Contractor shall coordinate with a local oil test laboratory to perform diagnostic analysis on all lubricants. The tests shall include the standard diagnostics recommended by the engine manufacturer, including tests for water and fuel contamination. Tests shall include a sample of fresh oil of each type, prior to filling machinery, and an operating sample. The operating oil sample shall be drawn from a machine operating at normal temperatures. Samples shall not be drawn from stagnant points in the equipment system.

A spectrographic analysis shall be conducted for trace metals, employing an emission spectrometer for the following elements:

- Iron
- Aluminum
- Silicon
- Tin
- Lead
- Nickel
- Magnesium
- Molybdenum
- Copper
- Silver
- Chromium

The following machinery shall be sampled:

- Propulsion generator engines

## 983.0 DELIVERY

Upon completion of construction, operational tests, acceptance trials, and after all known defects ABS / USCG outstanding have been corrected, and the vessel is ready and able to be put into passenger service, complete with COI issued by Texas City OCMI, the Contractor shall deliver the vessel to the State DOT's ferry operations facility at 1000 Ferry Road North Galveston TX 77550.

The vessel shall be in first class condition throughout. The vessel shall be thoroughly cleared of all dunnage, staging, debris, spatters, and dirt and shall be washed down, painted out and left clean. Special care shall be taken to see that all surfaces in bilges, tanks and voids, piping, wireways, machinery, floor plates, and gratings are clean and free from any foreign substances. The vessel's engines and related equipment shall be filled with lubricating oil. The L/O storage tank shall have not less than 100 gallons of lubricating oil at the time of delivery. Any additional quantities of lubricating oil required by the State shall be stored at this time. This additional oil will be to the account of the State. Diesel oil remaining on the vessel at delivery shall match quantity on vessel at time of pick up and all will become the property of the State.

### 983.1 TRANSPORTATION OF THE FERRY BEYOND 1000 MILES OF GALVESTON, TX

All of the provisions above as described for "delivery" shall be applicable and additionally this section shall apply if the vessel is upgraded beyond the Gulf Coast region of the United States. Except within 1000 miles by navigable waters of Galveston, TX the vessel shall not be transported afloat on its own hull, either by towing or under its own power, but must be moved via heavy lift transport or semi-submersible vessel. The Contractor shall submit a transportation plan for State approval. The transportation plan shall include:

- Particulars of the heavy lift vessel to be used for the transportation.
- Schedule of transportation voyage.
- Stability information demonstrating that the heavy lift or semi-submersible vessel is suited to the entire load it will carry, in the waters it will transit, in lifting, departure, and arrival conditions.
- If the vessel is to be lifted onto the deck of a transport vessel then the Contractor shall be required to provide calculations demonstrating stresses in bending and shear for the lifting points and fixtures and hull structure do not exceed allowable levels during the lift. The calculations shall be subject to review by the State.
- Detailed description and drawings of the cradle and support fixtures to be used and the securing arrangements for the ferry and for the supporting structure.
- Insurance information demonstrating that the builder's risk insurance in conjunction with cargo insurance provides full coverage for a transportation voyage naming TxDOT as the beneficiary for 100% of the value of the ferry in the event of its loss or damage. Insurance coverage shall be reviewed and subject to approval by TxDOT.

Prior to re-floating the ferry (while still aboard the transport vessel) and prior to acceptance, the Contractor shall provide for State Representative inspection of the hull. Subsequent to re-floating the ferry, it shall be subject to an underwater video inspection as described in "Launching and Dry Docking." Damaged coatings, structure, appendages or equipment shall be repaired or replaced prior to acceptance. It shall be the responsibility of the Contractor to arrange for and execute such repairs.

## 996.0 DRY DOCKING

While dry-docking prior to sea trials is not an absolute requirement unless the vessel has been in the water for more than ninety (90) calendar days, the Contractor is responsible for conducting sea trials with a clean bottom and clean sea chests. Approximately fourteen (14) days prior to scheduled sea trials, the Contractor shall determine the condition of the bottom and sea chests and notify TxDOT of same. If necessary, for the purpose of conducting proper trials, the Contractor shall be required to thoroughly clean the underwater surface of the hull. If the vessel has been in the water for more than ninety (90) calendar days prior to sea trials or delivery, the vessel shall be re-dry-docked and underwater surfaces including appendages, propellers, and sea chests shall be thoroughly cleaned and inspected.

If the vessel work is completed beyond the Gulf Coast region of the United States, the Contractor shall make arrangements to dry dock the vessel within 200 miles of Galveston, TX or as an alternative, conduct an underwater survey after delivery and prior to acceptance by the Owner. The dry-docking shall include a thorough cleaning and inspection of underwater hull surfaces, including appendages, propellers, and sea chests. Damaged coatings, plate, propellers, rudders, and hull fittings shall be repaired prior to acceptance. As an alternative to this dry-docking, the Contractor may contract for an underwater video survey. The survey shall be conducted by a company certified for the procedure by ABS. The underwater video survey shall be conducted to the satisfaction of the TxDOT's Representative. The underwater survey shall be recorded and include live video and communications link to an

observing area on the surface. Damage found shall be the responsibility of the Contractor to arrange and repair.

## APPENDIX A

### Paint Specification



## PAINT SPECIFICATION

STATEMENT OF WORK NO.  
TxDOT 959-46-20309  
REVISED: SEPTEMBER 2021

### ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

1. DEFINITIONS OF TERMS AND ACRONYMS SPECIFIC TO CLEANING, BLASTING AND COATING
  - 1.1. The Society for Protective Coatings – Surface Preparation Standards and Specifications (SSPC SP) cover the requirements for the cleaning of unpainted or painted steel surfaces by the use of abrasives.
  - 1.2. Surface preparation in accordance with the SSPC SP standards includes a cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, oxides, corrosion products, and other foreign matter.
    - 1.2.1. SSPC-SP 6 (Commercial Blast Cleaning) – Random staining shall be limited to no more than 33% of each unit area of surface, and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coating.]
    - 1.2.2. SSPC-SP 10 (Near-White Blast Cleaning) – Random staining shall be limited to no more than 5% of each unit area of surface, and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coating.
    - 1.2.3. Sand Sweep and Spot Blast Cleaning – Sandblasting an entire area sufficient enough to remove all marine growth, old fouling, rust and abraded areas and provide an anchor pattern suitable for top coating and sandblasting only a small portion of the area to achieve Commercial Blast Cleaning standard.
2. CLEANING, BLASTING, AND COATING REQUIREMENTS
  - 2.1. The vendor shall comply with all applicable OSHA standards to include 29 CFR 1910.1025, General Industry Lead Standard and 1910.146, Confined Space Entry. The vendor shall provide TxDOT a written program addressing compliance with the following items before performing work: Personnel monitoring, respiratory protection, protective work clothing and equipment, housekeeping, hygiene facilities and practices, medical surveillance, medical removal protection, employee information and training, signs, and record keeping.  
NOTE: Manufacturer items listed in this specification are proven coating applications. TxDOT reserves the right to test and accept or reject any equivalent product submitted on the response before award of a purchase order. If requested by TxDOT, part supplier shall monitor preparation and coating applications.
  - 2.2. All equipment, glass, nameplates, electric cables, etc. on board the ferryboats shall be protected from sandblasting and painting operations by the vendor. Any equipment removed or damaged by the vendor's operations shall be replaced at the vendor's expense.
  - 2.3. During surface preparation, the vendor shall remove oil, grease and other contaminants from entire area using a chemical cleaner and ensure that surface areas are clean from all sand, dust, etc. The chemical cleaner shall not be allowed to dry before removing with fresh water and then blown dry prior to application of any materials.
  - 2.4. Any areas affected by overspray from sandblasting shall be recoated. If any area is affected by extreme overspray, the entire area shall be properly prepared and recoated.
  - 2.5. No blasted surfaces shall stand overnight without specified coating. TxDOT Representative shall be notified of All/Any damaged discovered during blasting. TxDOT shall be notified daily.
  - 2.6. Power mixers shall be used on all coating materials. Main deck non-skid coating shall be mixed and poured, no scrapping of buckets on to deck.
  - 2.7. Only full units of coating materials shall be mixed at all times. No partial units shall be mixed.

STATEMENT OF WORK NO.  
 TxDOT 959-46-20309  
 REVISED: SEPTEMBER 2021

ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

- 2.8. Coatings shall not be thinned more than 10% by volume. Only thinners recommended by manufacturer of the coatings shall be used.
- 2.9. All recommended wet film thickness readings are for paints that have not been thinned. If thinners are used, the wet film thickness readings shall be increased accordingly. Wet mil readings shall be taken during application of all materials.
- 2.10. Dry mil readings shall be taken of each coat.
- 2.11. Proper painting practices and procedures shall be followed at all times.
- 2.12. No application shall take place after daylight hours.
- 2.13. No coating materials shall be applied if humidity is 85% or higher.
- 2.14. No coating materials shall be applied if temperature is 45°F or lower. Unless approved by coating manufacturer.
- 2.15. Anchor pattern on all blasted surfaces shall be 1.5 - 2.5 mils deep.
- 2.16. Any new steel work or pipe work shall be blasted and primed with inorganic zinc prior to being used on the ferries.
- 2.17. Dehumidifying equipment shall be used when paint is being applied to any compartment. This equipment shall continue to be used until all coatings have been applied and completely dried.
- 2.18. Forced air ventilation shall be used until all vapors and fumes have been exhausted in all compartments.
- 2.19. Minimum and maximum cure and dry times shall be in accordance with manufacturer's recommendations.
- 2.20. Painting Certificates shall be provided to TxDOT upon vessel departure from shipyard.
3. WATER LINE DOWN (28,583 estimated square foot): The purpose of the following shall be to renew the underwater coating system by use of one of the systems listed below. The system used will be determined and approved by TxDOT representative depending on the degree of fouling which has occurred between dry dockings. System will be determined upon dry docking of vessel. The three designated systems are:
  - "A" SYSTEM – SAND BLAST TO SSPC-SP10 (NEAR WHITE BLAST CLEANING)
  - "B" SYSTEM – PRESSURE WASH AND SPOT BLAST
  - "C" SYSTEM – PRESSURE WASH ONLY
- 3.1. "A" SYSTEM – SANDBLASTING: Shall be performed as follows:
  - 3.1.1. Surface Preparation: Entire area shall be sandblasted to achieve the SSPC-SP 10 standard. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.
  - 3.1.2. Coating Application
    - 3.1.2.1. Apply one full coat of red epoxy primer at 6.8 wet mils for a dry film thickness of 5.0 mils (172 estimate gallons volume).
    - 3.1.2.2. Apply one stripe coat of red epoxy by brush to cut-outs, weld seams and any other areas the painter would have difficulty in applying coating thickness (111 estimate gallons volume).
    - 3.1.2.3. Apply one stripe coat of grey epoxy by brush to cut-outs, weld seams and

STATEMENT OF WORK NO.  
TxDOT 959-46-20309  
REVISED: SEPTEMBER 2021

ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

- any other areas the painter would have difficulty in applying full coating thickness (11 estimate gallon volume).
- 3.1.2.4. Apply one full coat of gray epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (172 gallons estimate volume).
  - 3.1.2.5. Apply one full coat of red, tin free, antifouling at 8.3 wet mils for a dry film thickness of 5.0 mils. Minimum dry time of six hours at 77°F (209 gallons estimate volume).
    - 3.1.2.5.1. The first coat of antifouling shall be applied while the epoxy is still tacky. If the epoxy is allowed to dry then a tack coat shall be applied before applying the first coat of antifouling.
  - 3.1.2.6. Apply one full coat of black, tin free, antifouling at 8.3 wet mils for a dry film thickness of 5.0 mils. Minimum dry time of 24 hours prior to immersion (209 gallons estimate volume).
  - 3.1.2.7. Paint draft marks, etc.
- 3.2. "B" SYSTEM – PRESSURE-WASH AND SPOT BLAST STANDARD: Shall be performed as follows:
- 3.2.1. Surface Preparation: Pressure-wash the entire area with 3500 psi fresh water to remove all marine growth and salts. This shall include any scraping required. Sand sweep and spot blast up to 20% of WATER LINE DOWN to achieve the SSPC-SP 6 standard. 20% shall always include sea strainers and strainer plates. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.
  - 3.2.2. Coating Application
    - 3.2.2.1. Apply one spot coat of red epoxy primer at 6.8 wet mils for a dry film thickness of 5.0 mils.
    - 3.2.2.2. Apply one stripe coat of red epoxy by brush to cut-outs, weld seams and any other areas the painter would have difficulty in applying coating thickness.
    - 3.2.2.3. Apply one stripe coat of grey epoxy by brush to cut-outs, weld seams and any other areas the painter would have difficulty in applying full coating thickness.
    - 3.2.2.4. Apply one full coat of gray epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (172 gallons estimate volume).
    - 3.2.2.5. Apply one full coat of red, tin free, antifouling at 8.3 wet mils for a dry film thickness of 5.0 mils. Minimum dry time of six hours at 77°F (209 gallons estimate volume).
      - 3.2.2.5.1. The first coat of antifouling shall be applied while the epoxy is still tacky. If the epoxy is allowed to dry then a tack coat shall be applied before applying the first coat of antifouling.
    - 3.2.2.6. Apply one full coat of black, tin free, antifouling at 8.3 wet mils for a dry film thickness of 5.0 mils. Minimum dry time of 24 hours prior to

STATEMENT OF WORK NO.  
 TxDOT 959-46-20309  
 REVISED: SEPTEMBER 2021

ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

immersion (209 gallons estimate volume).

3.2.2.7. Paint draft marks, etc.

3.3. "C" SYSTEM – PRESSURE WASH ONLY: Shall be performed as follows:

3.3.1. Surface Preparation: Freshwater pressure-wash the entire area with 3500 psi to remove all marine growth, loose coating, salts and foreign matter. This shall include any scraping required.

4. WATER LINE UP TO AND INCLUDING RUB RAIL (3,718 estimated square foot): The purpose of the following shall be to renew the coatings from the water line up to and including the rub rail by use of one of the systems listed below. The system used will be determined by TxDOT's representative depending on the degree of abrasion which has occurred between dry dockings. The two systems are designated:

"A" SYSTEM – SANDSWEEP AND SPOT BLAST

"B" SYSTEM – SAND BLAST TO SSPC-SP 10 STANDARD (NEAR WHITE BLAST CLEANING)

4.1. "A" SYSTEM – SAND SWEEP AND SPOT BLAST: Shall be performed as follows:

4.1.1. Surface Preparation: Spot blast all rusted and abraded areas to achieve the SSPC-SP 6 standard. Sand sweep all remaining areas only enough to remove all marine growth, damaged coatings, and to provide an anchor pattern suitable for top coating. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.

4.1.2. Coating Application

4.1.2.1. Apply one full coat of red, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (23 gallons estimated volume).

4.1.2.2. Apply one stripe coat of grey, surface tolerant epoxy, by brush to all cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness 2 gallon estimate volume).

4.1.2.3. Apply one stripe coat of black, surface tolerant epoxy by brush to all cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness 2 gallons estimate volume).

4.1.2.4. Apply one full coat black, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (23 gallons estimated volume).

4.1.2.5. Apply one stripe coat of black, polyurethane epoxy finish by brush to all cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (2 gallons estimate volume).

4.1.2.6. Apply one full coat of black, polyurethane epoxy finish at 3.5 wet mils for a dry film thickness of 2.0 mils (12 gallon estimated volume).

4.1.2.7. Paint draft marks, etc.

4.2. "B" SYSTEM – SANDBLAST TO SSPC-SP 10 STANDARD: Shall be performed as follows:

4.2.1. Surface Preparation: Entire area shall be sandblasted to achieve the SSPC-SP 10 standard. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.

STATEMENT OF WORK NO.  
 TxDOT 959-46-20309  
 REVISED: SEPTEMBER 2021

ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

4.2.2. Coating Application

- 4.2.2.1. Apply one full coat of red, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (23 gallons estimated volume).
- 4.2.2.2. Apply one stripe coat of grey, surface tolerant epoxy by brush to all cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (2 gallons estimated volume).
- 4.2.2.3. Apply one stripe coat of black, surface tolerant epoxy by brush to all cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (2 gallons estimated volume).
- 4.2.2.4. Apply one full coat black, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (23 gallons estimated volume).
- 4.2.2.5. Apply one stripe coat of black, polyurethane epoxy finish by brush to all cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (2 gallons estimate volume).
- 4.2.2.6. Apply one full coat of black, polyurethane epoxy finish at 3.5 wet mils for a dry film thickness of 2.0 mils (12 gallon estimated volume).
- 4.2.2.7. Paint draft marks, etc.

5. INTERIOR OR EXTERIOR STEEL ABOVE THE MAIN VEHICLE DECK (SUPERSTRUCTURE) (46,937 estimated square foot): The purpose of the following shall be to renew the coating from the rub rail over the bulwarks down to the Vehicle deck and any interior or exterior steel above the main deck by use of one of the systems listed below. The system used will be determined and approved by a TxDOT representative depending upon the degree of abrasion that occurs between dry dockings. The two systems designated are:

"A" SYSTEM – SAND SWEEP AND SPOT BLAST

"B" SYSTEM – SSPC-SP 10 STANDARD (NEAR WHITE BLAST CLEANING)

- 5.1. "A" SYSTEM – SAND SWEEP AND SPOT BLAST: Shall be performed as follows:

- 5.1.1. Surface Preparation: Spot blast all rusted and abraded areas to achieve the SSPC-SP 6 standard. Sand sweep all remaining areas only enough to remove all marine growth, old antifouling, and to provide an anchor pattern suitable for top coating. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.
- 5.1.2. Coating Application
  - 5.1.2.1. Apply one spot coat of red, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils.
  - 5.1.2.2. Apply one stripe coat of clear sealer epoxy by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (13 gallon estimate volume).
  - 5.1.2.3. Apply one full coat of gray, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (282 gallon estimated volume).
    - 5.1.2.3.1. Crushed glass shall be applied as non-skid on the Bridge deck, Observation deck and Walkaround deck.
  - 5.1.2.4. Apply one stripe coat of grey, surface tolerant epoxy by brush to backs of

STATEMENT OF WORK NO.  
TxDOT 959-46-20309  
REVISED: SEPTEMBER 2021

ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

- all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (17 gallons estimate volume).
- 5.1.2.5. Apply one full coat of white, polyurethane epoxy finish at 3.5 wet mils for a dry film thickness of 2.0 mils (145 gallon estimated volume).
  - 5.1.2.6. Apply one stripe coat of white, polyurethane epoxy finish by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (22 gallons estimated volume).
  - 5.1.2.7. Apply one full coat of polyurethane epoxy finish to trim at 3.5 wet mils for a dry film thickness of 2.0 mils. Color and volume dependent upon trim colors.
  - 5.1.2.8. Apply second full coat of polyurethane epoxy finish to trim at 3.5 wet mils for a dry film thickness of 2.0 mils. Color and volume dependent upon trim colors.
  - 5.1.2.9. Apply third full coat of polyurethane epoxy finish to trim at 3.5 wet mils for a dry film thickness of 2.0 mils. Color and volume dependent upon trim colors until color coating is complete without any shadowing.

"B" SYSTEM – SSPC-SP 10 STANDARD (NEAR WHITE BLAST CLEANING)

5.2. SANDBLASTING: Shall be performed as follows:

- 5.2.1. Surface Preparation: Entire area shall be sandblasted to achieve the SSPC-SP 10 standard. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.
- 5.2.2. Coating Application
  - 5.2.2.1. Apply one full coat of red, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (282 gallons estimated volume).
  - 5.2.2.2. Apply one stripe coat of clear sealer epoxy by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (13 gallon estimate volume).
  - 5.2.2.3. Apply one full coat of gray, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (282 gallon estimated volume).
    - 5.2.2.3.1. Crushed glass shall be applied as non-skid on the Bridge deck, Observation deck and Walkaround deck.
  - 5.2.2.4. Apply one stripe coat of grey, surface tolerant epoxy by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (17 gallons estimate volume).
  - 5.2.2.5. Apply one full coat of white, polyurethane epoxy finish at 3.5 wet mils for a dry film thickness of 2.0 mils (145 gallon estimated volume).
  - 5.2.2.6. Apply one stripe coat of white, polyurethane epoxy finish by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (22 gallons estimated volume).

STATEMENT OF WORK NO.  
TxDOT 959-46-20309  
REVISED: SEPTEMBER 2021

ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

- 5.2.2.7. Apply one full coat of polyurethane epoxy finish to trim at 3.5 wet mils for a dry film thickness of 2.0 mils. Color and volume dependent upon trim colors.
  - 5.2.2.8. Apply second full coat of polyurethane epoxy finish to trim at 3.5 wet mils for a dry film thickness of 2.0 mils. Color and volume dependent upon trim colors.
  - 5.2.2.9. Apply third full coat of polyurethane epoxy finish to trim at 3.5 wet mils for a dry film thickness of 2.0 mils. Color and volume dependent upon trim colors until color coating is complete without any shadowing.
6. VEHICLE DECK INCLUDING THE INTERIOR OF SAFETY GATES(17,046 estimated square foot): The purpose of the following shall be to prepare and paint the main Vehicle deck areas on each ferryboat. Main deck non-skid shall be mixed and poured at all times, any scrapping of buckets shall be to next mixed bucket NEVER ONTO MAIN DECK. The designated system is:
- "A" SYSTEM – SANDBLAST TO SSPC-SP 10 STANDARD (NEAR WHITE BLAST CLEANING)
- 6.1. "A" SYSTEM – SANDBLAST TO SSPC-SP 10 STANDARD
- 6.1.1. Surface Preparation: Entire area shall be sandblasted to achieve the SSPC-SP 10 standard. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.
  - 6.1.2. Coating Application
    - 6.1.2.1. Apply one full coat of Zinc-Rich epoxy at 4.7 wet mils for a dry film thickness of 3.0 mils (71 gallons estimated volume).
    - 6.1.2.2. Apply one full coat of bronze aluminum, surface tolerant epoxy at 7.7 wet mils for a dry film thickness of 6.0 mils (115 gallons estimated volume).
    - 6.1.2.3. Apply one full coat of gray high solids extended durability non-skid deck epoxy at 48.2 wet mils for a dry film thickness of 40.0 mils (664 gallons estimated volume).
    - 6.1.2.4. Apply stripe coat of polyurethane at 3.5 mils wet for a dry film thickness of 2.0 mils for color coding and striping purposes as directed by designated TxDOT representative until color coating is complete. This include evacuation areas and striping on main deck. Shall be coated until no shadowing is achieved (18 gallons estimated volume).
7. EXTERIOR SAFETY GATE AREAS ON ALL FERRYBOATS AND RUNNING LIGHT SHIELDS (12,236 estimate square foot): The purpose of the following shall be to prepare and paint the vessels from the gate hinge to the end of the vessel, including exterior side of each gate. Also included in this item are the running light shields. Shall be performed as follows:
- 7.1. SURFACE PREPARATION: Entire area shall be sandblasted to achieve the SSPC-SP 10 standard. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.
  - 7.2. COATING APPLICATION
    - 7.2.1. Apply one full coat of zinc-rich epoxy at 4.7 mils for a dry film thickness of 3.0 mils ( 51 gallon estimated volume).

STATEMENT OF WORK NO.  
 TxDOT 959-46-20309  
 REVISED: SEPTEMBER 2021

ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

- 7.2.2. Apply one stripe coat of zinc-rich epoxy by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (5 gallons estimated volume).
  - 7.2.3. Apply one full coat of red, surface tolerant epoxy at 8.2 wet mils for a dry film thickness of 6.0 mils (89 gallons estimated volume).
  - 7.2.4. Apply one stripe coat of red, surface tolerant epoxy by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (5 gallon estimated volume).
  - 7.2.5. Apply one full coat of black, surface tolerant epoxy at 8.2 wet mils for a dry film thickness of 6.0 mils 89 gallons estimated volume).
  - 7.2.6. 20 feet of vehicle deck area to refer to section 6.0.
8. COMPARTMENTS (121,224 estimated square foot for entire compartment): The purpose of the following shall be to renew the paint systems in the compartments on the ferryboats. The system designated is:
- "A" SYSTEM – ENTIRE COMPARTMENT
- 8.1. "A" SYSTEM – ENTIRE COMPARTMENT: Shall be performed as follows:
    - 8.1.1. Surface Preparation: Entire area shall be sandblasted to achieve the SSPC-SP 10 standard. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.
    - 8.1.2. Coating Application
      - 8.1.2.1. Apply one full coat of red, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (578 gallons estimated volume).
      - 8.1.2.2. Apply one stripe coat of red, surface tolerant epoxy primer by brush to backs of all angles, cut-outs, weld seams or any other area the painter would have difficulty in applying full coating thickness (35 gallons estimated volume).
      - 8.1.2.3. Apply one full coat of white, surface tolerant epoxy at 6.8 wet mils for a dry film thickness 5.0 mils (578 gallons estimated volume).
      - 8.1.2.4. Apply one stripe coat of white, polyurethane epoxy finish by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (45 gallons estimated volume).
      - 8.1.2.5. Apply one full coat of white, polyurethane epoxy finish at 3.5 wet mils for a dry film thickness of 2.0 mils (296 gallons estimated volume).
9. ANCHOR AND CABLE (2,534 estimated square foot): The purpose of the following is to prepare and paint the anchor.
- 9.1. ANCHOR
    - 9.1.1. Surface Preparation: Entire area shall be sandblasted to achieve the SSPC-SP 10 standard. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.



STATEMENT OF WORK NO.  
 TxDOT 959-46-20309  
 REVISED: SEPTEMBER 2021

ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

9.1.2. Coating Application

- 9.1.2.1. Apply one full coat of red, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (15 gallons estimated volume).
- 9.1.2.2. Apply one stripe coat of gray, surface tolerant epoxy by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (1 gallon estimated volume).
- 9.1.2.3. Apply one full coat of gray, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (16 gallon estimates volume).
- 9.1.2.4. Apply one full coat of white, polyurethane epoxy finish at 3.5 wet mils for a dry film thickness of 2.0 mils (8 gallons estimated volume).
- 9.1.2.5. Apply one stripe coat of gray, surface tolerant epoxy by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (1 gallon estimated volume).
- 9.1.2.6. Apply one coat of black, Polyurethane Finish (8 gallon estimated volume).
- 9.1.2.7. Apply second coat of black, Polyurethane Finish (8 gallon estimated volume).

9.2. ANCHOR CABLE

- 9.2.1. Surface Preparation: If strands of cable are not visible due to buildup of cable guard coating, clean with degreaser and wire brush or other suitable means. Cable shall be inspected by TxDOT, USCG and ABS representatives.

10. ANCHOR WINDLASS (785 estimated square foot): The purpose of the following is to prepare and paint the exterior of the anchor windlass.

- 10.1. SURFACE PREPARATION: Entire area shall be sandblasted to achieve the SSPC-SP 10 standard. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.

10.2. COATING APPLICATION:

- 10.2.1. Apply one full coat of zinc-rich epoxy at 4.7 wet mils for a dry film thickness of 3.0 mils (4 gallon estimated volume).
- 10.2.2. Apply one full coat of light gray, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils 6 gallon estimated volume).
- 10.2.3. Apply one full coat of blue, polyurethane epoxy finish at 3.5 wet mils for a dry film thickness of 2.0 mils (2.5 gallon estimated volume).

11. DAVITS (5,068 estimated square foot): The purpose of the following is to prepare and paint the exterior of the davits.

- 11.1. SURFACE PREPARATION: Entire area shall be sandblasted to achieve the SSPC-SP 10 standard. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.

11.2. COATING APPLICATION:

STATEMENT OF WORK NO.  
TxDOT 959-46-20309  
REVISED: SEPTEMBER 2021

ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

- 11.2.1. Apply one full coat of zinc-rich epoxy at 4.7 wet mils for a dry film thickness of 3.0 mils (21 gallons estimated volume).
  - 11.2.2. Apply one stripe coat of clear sealer epoxy by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (2 gallons estimated volume).
  - 11.2.3. Apply one full coat of gray, surface tolerant epoxy at 8.2 wet mils for a dry film thickness of 6.0 mils (37 gallons estimated volume).
  - 11.2.4. Apply one full coat of white, polyurethane epoxy finish at 3.5 wet mils for a dry film thickness of 2.0 mils (16 gallon estimated volume).
12. FRESH WATER BALLAST TANKS: The purpose of the following is to prepare and paint the interior of the fresh water ballast tanks.
- 12.1. SURFACE PREPARATION: Entire area shall be sandblasted to achieve the SSPC-SP 10 standard. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.
  - 12.2. COATING APPLICATION:
    - 12.2.1. Apply one full coat of grey, surface tolerant epoxy 6.8 wet mils for a dry film thickness 5.0 mils (167 gallon estimated volume).
    - 12.2.2. Apply one stripe coat of off white, surface tolerant epoxy by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (10 gallons estimated volume).
    - 12.2.3. Apply one stripe coat of grey, surface tolerant epoxy by brush to backs of all angles, cut-outs, weld seams and any other area the painter would have difficulty in applying full coating thickness (10 gallons estimated volume).
    - 12.2.4. Apply one full coat of off-white colored, tar-free modified epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (167 gallons estimated volume).
13. GALVANIZED MATERIALS
- 13.1. SURFACE PREPARATION: Brush or sand sweep all surface areas only enough to obtain an anchor pattern suitable for top coating.
  - 13.2. COATING APPLICATION
    - 13.2.1. Apply one full coat of gray, surface tolerant epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils.
    - 13.2.2. Apply one full coat of white epoxy finish at 3.5 wet mils for a dry film thickness of 2.0 mils.
14. NON-SKID OBSERVATION, SALON, BRIDGE DECKS INLCUDING TOP OF THE PILOT HOUSE (7,704 ESTIMATES SQUARE FOOT):
- 14.1. SURFACE PREPARATION: Sandblast entire surface area to SSPC-SP 10 standard. All surrounding equipment and superstructure shall be protected from blasting and coating.
  - 14.2. COATING APPLICATION
    - 14.2.1. Apply one full coat of Zinc-Rich epoxy at 4.7 wet mils for a dry film thickness of 3.0 mils (32 gallons estimated volume).
    - 14.2.2. Apply one full coat of bronze aluminum, surface tolerant epoxy at 7.7 wet mils for a

STATEMENT OF WORK NO.  
TxDOT 959-46-20309  
REVISED: SEPTEMBER 2021

ATTACHMENT A – CLEANING, BLASTING, AND COATING SPECIFICATIONS

dry film thickness of 6.0 mils (52 gallons estimated volume).

14.2.3. Apply one full coat of gray high solids extended durability non-skid deck epoxy at 48.2 wet mils for a dry film thickness of 40.0 mils (300 gallons estimated volume).

15. COATING MATERIALS: The coatings materials listed below are the current TxDOT approved coatings used throughout the ferryboats. The respondent shall submit the response using the following materials or a TxDOT approved equivalent (Ref. Para. 2.1).

- 15.1. Intertuf 262 KHA300/KHA062 Off White.
- 15.2. Intertuf 262 KHA303/KHA062 Red Epoxy.
- 15.3. Intertuf 262 KHA302/KHA062 Gray Epoxy.
- 15.4. Intertuf 262 KHA304/KHA062 Black Epoxy.
- 15.5. Interspeed 6400NA BQA674 Red Antifouling.
- 15.6. Interspeed 6400NA BQA679 Black Antifouling.
- 15.7. Interthane 990 PHB000/PHA046 White Polyurethane Finish.
- 15.8. Interthane PHR807/PHA046 Dark Gray Polyurethane Finish (touch up main deck).
- 15.9. Interthane 990 PHY999/PHA046 Black Polyurethane Finish.
- 15.10. Interthane 990 PHC935/PHA046 Blue Polyurethane Finish.
- 15.11. Interthane 990 Polyurethane Finish (Trim work, color varies).
- 15.12. Interbond 600 EPA439 EPA440 Clear Epoxy Sealer.
- 15.13. Interzinc 75V EPA075V/EPA076V Zinc-Rich Epoxy.
- 15.14. Intershield 300HS ENA380/ENA383 Bronze Aluminum Epoxy
- 15.15. Intergard EK5040H/EBA744 Non-Skid Dk Gray Deck Epoxy (touch up main deck).
- 15.16. Intershield 6GV EGA650/EGA651 High Solids Epoxy Non-Skid Deck Coating.

## APPENDIX B

### Weight Moment Calculation

## WEIGHT MOMENT CALCULATION

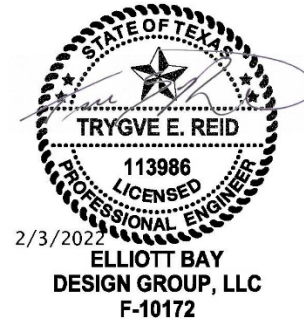


206.782.3082 · 800.788.7930 | Seattle · New Orleans · Ketchikan · New York  
www.ebdg.com

better to build · better to operate

### MEMORANDUM

Vessel: JOHN W. JOHNSON  
 Engineer: Trygve E. Reid  
 Reference: 20050-002-833-1 Rev. -  
 Date: 2022-02-03  
 Subject: Weight Moment Calculation



The anticipated changes to the Lightship and Center of Gravity resulting from the re-powering of the ferry JOHN W JOHNSON are as follows. The existing permanent ballast has been removed. The shipyard shall determine the final quantity and location of the new permanent ballast.

Vessel Particulars from Ref [1]:

- Conrad Industries Hull C-831
- Length overall 264'-4"
- LBP 256'-0"
- Beam 65'-4"
- Depth 15'-6"

The current lightship from the current ABS Approved Stability Booklet, Ref [2], issued on 2019-07-19 is:

Weight LT	LCG ft	TCG ft	VCG ft
1399.01	0.09 f	0.04 p	11.75

The vessel origin is amidship (FR 0), baseline, centerline.

The vessel has had a previous weight moment adjustment to the lightship and therefore is not eligible for another under MTN 04-95, Ref [3]. The expected lightship without permanent ballast is as follows:

	Weight LT	LCG ft	TCG ft	VCG ft	L-Mom LT-ft	T-Mom LT-ft	V-Mom LT-ft
Approved Lightship	1399.01	0.09 f	0.04 p	11.75	-125.9	-56.0	16438.4
Weights to Add	82.14	2.31 a	0.41 s	9.36	189.6	34.0	769.1
Weights to Remove	-357.66	0.87 a	0.21 s	8.94	-310.4	-75.8	-3198.0
Weights to Relocate (add)	0.00	0.0	0.0	0.00	0.0	0.0	0.0
Weights to Relocate (remove)	0.00	0.0	0.0	0.00	0.0	0.0	0.0
<b>Revised Lightship</b>	<b>1123.50</b>	<b>0.22 f</b>	<b>0.09 p</b>	<b>12.47</b>	<b>-246.8</b>	<b>-97.8</b>	<b>14009.46</b>

TXDOT

Ref:20050-002-833-1-

02/03/22

Notes and assumptions:	
1.	Electric Cabling will be approximately the same weight and CG for the purpose of this document
2.	Assume Exhaust insulation approx the same off and on
3.	Existing Permanent Ballast has been removed and not replaced

The following weights to add and remove were obtained from Ref [1], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13]

WEIGHTS TO ADD												
Item	Qty	Area or Length	Units	Width or Thickness	Units	Wt/Unit or Unit Wt	Units	Weight (lbs)	Weight (LT)	LCG (ft)	TCG (ft)	VCG (ft)
C18 SCAC T3 AUX (GEN 1)	1					13376.10	lbs ea	13376.1	5.97	8.8 a	7.1 p	4.5
Entrained Fluids	1					295.00	lbs ea	295.0	0.13	8.8 a	7.1 p	4.5
Foundation	1					466.00	lbs ea	466.0	0.21	8.8 a	7.1 p	1.8
C18 SCAC T3 AUX (GEN 2)	1					13376.10	lbs ea	13376.1	5.97	7.5 a	5.3 s	4.5
Entrained Fluids	1					295.00	lbs ea	295.0	0.13	7.3 a	5.3 s	4.5
Foundation	1					466.00	lbs ea	466.0	0.21	7.3 a	5.3 s	1.8
C18 SCAC T3 AUX (GEN 3)	1					13376.10	lbs ea	13376.1	5.97	19.7 a	0.3 s	5.9
Entrained Fluids	1					295.00	lbs ea	295.0	0.13	19.7 a	0.3 s	5.9
Foundation	1					1075.35	lbs ea	1075.3	0.48	19.7 a	0.3 s	3.4
C18 SCAC T3 AUX (GEN 4)	1					13376.10	lbs ea	13376.1	5.97	8.7 a	14.2 s	8.0
Entrained Fluids	1					295.00	lbs ea	295.0	0.13	8.7 a	14.2 s	8.0
Foundation	1					2437.50	lbs ea	2437.5	1.09	8.7 a	14.2 s	5.4
BlueVault A-End Port 9 Cabinets	1					14726.88	lbs ea	14726.9	6.57	59.9 f	8.2 p	10.5
BlueVault A-End Stbd 9 Cabinets	1					14837.11	lbs ea	14837.1	6.62	59.1 f	8.2 s	10.5
BlueVault B-End Port 10 Cabinets	1					16600.81	lbs ea	16600.8	7.41	60.7 a	8.2 p	10.5
BlueVault B-End Stbd 8 Cabinets	1					12963.18	lbs ea	12963.2	5.79	56.6 a	0.2 s	10.5
BlueDrive PlusC	1					17747.21	lbs ea	17747.2	7.92	12.0 f	0.0	7.0
Exhaust Piping 8" SCH10	4	120.000 ft				13.51	lbs/ft	6484.8	2.90	4.0 a	0.0	30.0
8" 90° Elbows	8					64.90	lbs ea	519.2	0.23	8.00 a	0.0	12.75
Exhaust Silencers	4					304.00	lbs ea	1216.0	0.54	0.0	0.0	27.8
A-End Battery Rm Long'l Bhds	2	190.246 ft <sup>2</sup>				12.75	lbs/ft <sup>2</sup>	4851.3	2.17	61.8 f	0.0	9.8
Long'l Bhd Stiffeners L4x3.5x5/16"	2	66.500 ft				7.70	lbs/ft	1024.1	0.46	61.8 f	0.0	9.8
A-End Battery Rm Deck	1	410.230 ft <sup>2</sup>				12.75	lbs/ft <sup>2</sup>	5230.4	2.34	61.8 f	0.0	6.0
Deck Stiffeners L5x3x5/16	1	168.000 ft				8.20	lbs/ft	1377.6	0.62	61.8 f	0.0	6.0
A-End Span Break (Girder)	2	26.875 ft <sup>2</sup>				12.75	lbs/ft <sup>2</sup>	685.3	0.31	61.8 f	0.0	5.5
Span Break Stiffeners FB2x5/16	2	10.000 ft				0.63	lbs/ft	12.5	0.01	61.8 f	0.0	5.5
B-End Battery Rm Port Long'l Bhd	1	190.246 ft <sup>2</sup>				12.75	lbs/ft <sup>2</sup>	2425.6	1.08	61.8 a	10.5 p	9.8
Long'l Bhd Stiffeners L4x3.5x5/16"	1	66.500 ft				7.70	lbs/ft	512.1	0.23	61.8 a	10.5 p	9.8
B-End Battery Rm Stbd Long'l Bhd	1	209.670 ft <sup>2</sup>				12.75	lbs/ft <sup>2</sup>	2673.3	1.19	61.8 a	2.5 s	9.8
Long'l Bhd Stiffeners L4x3.5x5/16"	1	68.750 ft				7.70	lbs/ft	529.4	0.24	61.8 a	2.5 s	9.8
B-End Battery Rm Deck	1	260.000 ft <sup>2</sup>				12.75	lbs/ft <sup>2</sup>	3315.0	1.48	61.8 a	4.0 p	6.0
Deck Stiffeners L5x3x5/16	1	104.000 ft				8.20	lbs/ft	852.8	0.38	61.8 a	4.0 p	6.0
B-End Span Break (Girder)	1	26.875 ft <sup>2</sup>				12.75	lbs/ft <sup>2</sup>	342.7	0.15	61.8 a	2.5 p	5.5
Span Break Stiffeners FB2x5/16	1	10.000 ft				0.63	lbs/ft	6.3	0.00	61.8 a	2.5 p	5.5
Water Mist (A-End)	1					2314.85	lbs ea	2314.9	1.03	64.8 f	12.0 s	7.5
Water Mist (B-End)	1					2314.85	lbs ea	2314.9	1.03	65.0 a	13.0 s	8.5
125# NOVEC bottle E-Gen	1					223.00	lbs ea	223.0	0.10	43.0 a	1.0 s	17.3
600# NOVEC bottle ESS Spaces	2					1105.00	lbs ea	2210.0	0.99	46.0 a	1.0 s	19.0
FB5x5/16" at FR26	1	22.250 ft				5.32	lbs/ft	118.4	0.05	52.0 a	5.3 p	39.0
Bulkheads at FR21 and FR22.5	2	52.083 ft <sup>2</sup>				10.20	lbs/ft <sup>2</sup>	1062.5	0.47	43.6 a	5.3 p	38.3
Stiffeners	4	9.500 ft				5.80	lbs/ft	220.4	0.10	43.6 a	5.0 p	38.3
Fwd ESS Insulation	1	1620.000 ft <sup>2</sup>		0.333 ft		7.00	lbs/ft <sup>3</sup>	3780.0	1.69	62.0 f	0.0	11.0
Aft ESS Insulation	1	1180.000 ft <sup>2</sup>		0.333 ft		7.00	lbs/ft <sup>3</sup>	2753.3	1.23	62.0 a	4.0 p	11.0
EOS Insulation	1	285.500 ft <sup>2</sup>		0.333 ft		7.00	lbs/ft <sup>3</sup>	666.2	0.30	6.0 f	0.0	7.8
Emergency Gen Room Insulation	1	117.760 ft <sup>2</sup>		0.333 ft		7.00	lbs/ft <sup>3</sup>	274.8	0.12	47.0 a	3.7 p	38.6

TxDOT

Ref:20050-002-833-1-

02/03/22

WEIGHTS TO REMOVE												
Item	Qty	Area or Length	Units	Width or Thickness	Units	Wt/Unit or Unit Wt	Units	Weight (lbs)	Weight (LT)	LCG (ft)	TCG (ft)	VCG (ft)
8V228 - Dry Weight	2					27509.00	lbs ea	55018.0	24.56	11.49 a	0.0	5.63
Entrained Fluid	2					750.00	lbs ea	1500.0	0.67	11.49 a	0.0	5.63
AvK IP44 TEWAC Generators	2					19400.68	lbs ea	38801.4	17.32	1.86 a	0.0	4.85
Entrained Fluid	2					400.00	lbs ea	800.0	0.36	1.86 a	0.0	8.25
Skid	2					4800.00	lbs ea	9600.0	4.29	6.64 a	0.0	2.50
Permanent Ballast Block Stbd Comp 3	1					123295.30	lbs ea	123295.3	55.04	63.95 f	6.42 s	8.25
Permanent Ballast Block Port Comp 3	1					77522.10	lbs ea	77522.1	34.61	62.00 f	15.96 p	9.75
Permanent Ballast Block Port Comp 4	1					128199.80	lbs ea	128199.8	57.23	40.00 f	16.00 p	9.25
Permanent Ballast Block Stbd Comp 5	1					128199.80	lbs ea	128199.8	57.23	36.00 a	16.04 s	9.75
Permanent Ballast Block Port Comp 6	1					123295.30	lbs ea	123295.3	55.04	64.00 a	6.42 p	8.25
Permanent Ballast Block Stbd Comp 6	1					77522.10	lbs ea	77522.1	34.61	69.92 a	16.89 s	9.75
Exhaust Piping 18" SCH10	2	120.000	ft			47.39	lbs/ft	11373.6	5.08	4.00 a	0.0	30.00
18" 90° Elbows STD	4					163.00	lbs ea	652.0	0.29	8.00 a	0.0	12.75
Exhaust Silencers	2					1623.00	lbs ea	3246.0	1.45	0.0	0.0	27.75
6SCH40 Stanchions 20' OCL	2	4.750	ft			18.97	lbs/ft	180.2	0.08	62.0 f	0.0	11.9
4SCH80 Diagonals 20' OCL	4	10.209	ft			14.98	lbs/ft	611.7	0.27	61.6 f	0.0	12.1
80# NOVEC Bottle E-Gen	1					178.00	lbs ea	178.0	0.08	43.0 a	1.0 s	17.3
Bulkhead at FR26 PL	1	37.500	ft²			10.20	lbs/ft²	382.5	0.17	52.0 a	5.3 p	39.0
Stiffeners L3x2.5x1/4	2	8.167	ft			4.90	lbs/ft	80.0	0.04	52.0 a	5.3 p	39.0
Bhd 26 Insulation	1	37.500	ft²	0.333	ft	7.00	lbs/ft³	87.5	0.04	52.0 a	5.3 p	39.0
Propulsion Switchboard	1					15085.13	lbs ea	15085.1	6.73	14.0 f	0.0	7.0
Harbor Generator	1					4950.00	lbs ea	4950.0	2.21	5.00 f	18.92 s	11.00
Exhaust 5" sch10	1	64.000	ft			7.70	lbs/ft	492.8	0.22	1.00 f	2.00 s	20.00
Silencer	1					80.00	lbs ea	80.0	0.04	5.00 f	9.00 s	15.00

REFERENCES

- [1] EBDG, "General Arrangement, 20050-002-101-0," 2022.
- [2] EBDG, "Stability Booklet 18055-03-843-7," 2019.
- [3] USCG-MS, "MTN-04-95," USCG-MS, Washington, DC, 1995.
- [4] Louisiana CAT, "20D001-01," 2020.
- [5] EBDG, "Generator Foundations, 20050-002-180-0," 2022.
- [6] Siemens Energy, "Proposal 1VDV3SH R04," 2022.
- [7] EBDG, "Emergency Generator Rm Removal, 20050-001-202-1," 2022.
- [8] EBDG, "Emergency Generator Rm Arrangement, 2005-002-202-1," 2022.
- [9] Schuller & Allan, inc, "Engine Exhaust System, B879-1 P09," 2011.
- [10] EBDG, "ESS Structural Modifications, 20050-002-110-6," 2022.
- [11] EBDG, "Machinery Arrangement, 20050-002-201-1," 2022.
- [12] EBDG, "EOS Structural Modifications, 20050-002-110-7," 2022.
- [13] Kidde Fire Systems, "K-45-\*0513 RevAB," 2018.

## APPENDIX C

### Routine Maintenance Specification



## ROUTINE MAINTENANCE SPECIFICATION

**ROUTINE MAINTENANCE ITEMS:** The following items shall be completed during upgrade of vessel as part of United States Coast Guard (USCG) and American Bureau of Shipping (ABS) routine dry dock and maintenance. Shipyard is responsible to schedule all inspections, complete all task, and any follow up that is required.

### # 1: DRY DOCK VESSEL

#### ITEM DETAIL

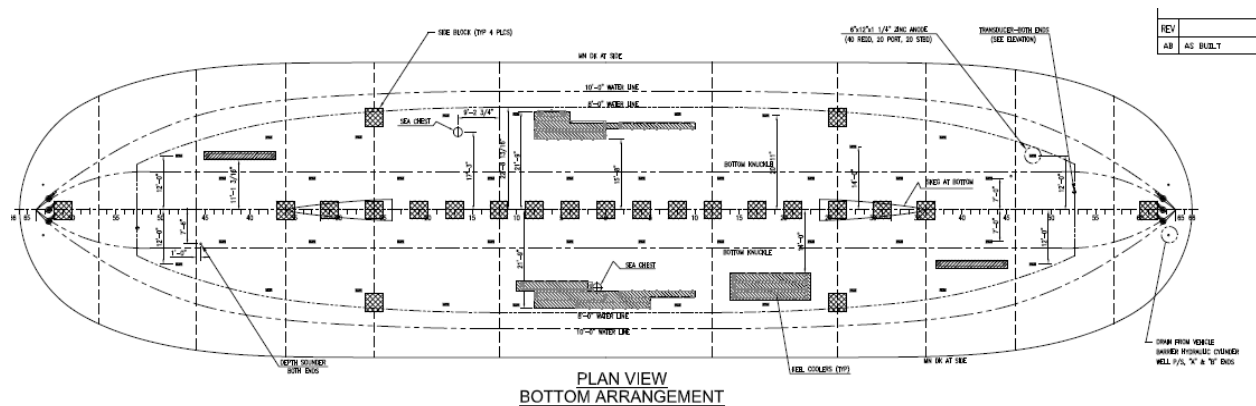
Provide dry dock and required set up to dry dock the ferryboat. Furnish all utilities, scaffolds, floating platforms, crews, tow boats, line handlers, secure stairway with handrail, and overhead crane needed to complete the dry docking and to remove from dry dock upon completion of repairs and inspections.

All dry docking shall be done as per docking plan with designated TxDOT representative approval upon docking. Vendor is responsible to check docking plans. Caution shall be taken to protect propellers and rudders during dry docking and always while on dry dock.

Caution shall be taken when floating of vessel to ensure vessel is water tight at sea chest, and all other areas of work performed.

Vessel must be dry docked within 60 days of delivery to Galveston or re-dry docked and waterline down cleaned as per paint representative guidance.

Docking plan from Ferry John W. Johnson below:



### # 2: CLEAN ENGINE ROOM BILGES

#### ITEM DETAIL

The vendor shall clean the engine room bilges from outboard of all girders on both sides of the

engine room and where the deck plates meet the hull plating down to and including the keel. This shall include the cleaning of the upper and lower sides of the deck plates and the angle supports they are bolted to. It shall also include the unbolting of the deck plates prior to cleaning and the bolting down of the deck plates after cleaning is completed. The vendor shall save all bolts for reuse, any missing or damaged bolts shall be replaced with stainless steel flush Allen screws. Any gasket material glued to the support angles that comes loose during cleaning shall be saved and re-adhered, or replaced as needed, to the support angle after cleaning is completed using weather stripping adhesive. The hull plating shall be cleaned and wiped down for inspection of same and all over sprayed white work shall be cleaned prior to inspection.

This item shall include, but is not limited to, pumping the bilge free of diesel fuel, oil, and water, removing dirt, sludge, grime, rags, trash and any other items found. Apply de-greaser wash down hand clean as needed, and wiping the hull plating clean and dry to obtain gas free certificates to start all planned work.

Follow up cleaning shall be cleaned to the satisfaction of ABS, USCG and designated TxDOT representative. Designated TxDOT representative shall inspect bilges and girders before any plating is put back into place. Caution shall be taken not to damage any electrical equipment or insulation. Bilge hazardous waste shall be disposed of in accordance with General Specifications.

NOTE: Ferryboat shall be cleaned to gas free for start of work. Bilges must be cleaned and dry for all ABS/USCG inspections and for departure of ferryboat from shipyard.

### **# 3: SEA VALVES REPLACEMENT**

#### **ITEM DETAIL**

The Vendor shall remove listed valves for ferryboat and replace each with new stainless-steel valves. Any nipples on each side of a valve shall be replaced with new stainless-steel nipple. Each valve shall be 250# minimum WOG solid disc, gate, rising stem type stainless steel valve except blow down valves shall all be 300#.

**All valves shall be ABS / USCG tested, witnessed, and certified valves. Documentation shall be provided to TxDOT on all valves.**

All sea valves shall be closed when they are installed in the vessel. Once the vessel is taken off the dry dock, all valves shall be operated and the packing tightened up if necessary.

The term "Sea Valves" as used in this item, is the first valve in each line coming from the sea chest. It may be a sea valve, blow down valve, or vent valve.

All new and disturbed areas shall be prepared and painted. USCG does require sea valves to be painted green – Vendor to complete.

**The following valves with location are for the JWJ.**

SIZE	TYPE	LOCATION
3-inch	Gate Valve	Sea Chest Suction – Compartment #2
3-inch	Gate Valve	Sea Chest Vent – Compartment #2
4-inch	Gate Valve	Sea Chest Suction – Engine Room
2-inch	Gate Valve	Sea Chest Vent – Engine Room
4-inch	Gate Valve	Sea Chest Suction – Compartment #5
2-inch	Gate Valve	Sea Chest Vent – Compartment #5
3-inch	Gate Valve	Sea Chest Suction – Compartment #7
3-inch	Gate Valve	Sea Chest Vent – Compartment #7

**#4: OVERBOARD VALVES REPLACEMENT**

**ITEM DETAIL**

The Vendor shall remove the overboard discharge valves and check valves listed for ferryboat and replace each with new stainless-steel valves. Any nipples on each side of a valve shall be replaced with new stainless-steel nipple. Each valve shall be 250# minimum WOG solid disc, gate, rising stem type stainless steel valve except blow down valves shall all be 300#. All valves shall be ABS and USCG approved valves.

**All valves shall be ABS / USCG tested, witnessed, and certified valves. Documentation shall be provided to TxDOT on all valves.**

All overboard valves shall be closed when they are installed in the vessel. Once the vessel is taken off the dry dock, all valves shall be operated and the packing tightened up if necessary.

The term "Overboard Valves" as used in this item, is the first set of valves in each line coming from any hull discharge point. It may be a gate valve or check valve.

All new and disturbed areas shall be prepared and painted (stainless steel does not require painting).

**The following valves with location are for the JWJ.**

SIZE	TYPE	LOCATION
1 ½-inch	Gate Valve	Sea Chest Vent Overboard – Compartment #2
1 ½-inch	Check Valve	Sea Chest Vent Overboard – Compartment #2
1-inch	Gate Valve	Stern Tube Overboard – Compartment #2
1-inch	Check Valve	Stern Tube Overboard – Compartment #2

5-inch	Gate Valve	Bilge Pump Overboard – Engine Room
4-inch	Check Valve	Bilge Pump Overboard – Engine Room
3-inch	Check Valve	Fire Main Overboard – Engine Room
3-inch	Gate Valve	Fire Main Overboard – Engine Room
3-inch	Check Valve	Fire Main Overboard – Compartment #5
3-inch	Gate Valve	Fire Main Overboard – Compartment #5
4-inch	Gate Valve	Bilge Pump Overboard – Compartment #5
4-inch	Check Valve	Bilge Pump Overboard – Compartment #5
1 ½-inch	Gate Valve	Sea Chest Vent Overboard – Compartment #7
1 ½-inch	Check Valve	Sea Chest Vent Overboard – Compartment #7
1-inch	Gate Valve	Stern Tube Overboard – Compartment #7
1-inch	Check Valve	Stern Tube Overboard – Compartment #7

## # 5: KEEL & SKEG INSPECTIONS

### ITEM DETAIL

When ferryboat is on dry dock the vendor shall remove the docking plugs from the skeg and keel on each end of the ferryboat to check for the presence of water. Vendor shall provide the necessary adapter fittings to hook an air hose to the lower docking plug opening and manometer (of size to measure 1 to 1-1/2 pounds Air pressure or 28 inches - 42 inches water column) to the upper docking plug opening. Hold this pressure long enough to ascertain there are no leaks. This test will be viewed by ABS, USCG and designated TxDOT representatives. Vendor is responsible for tightness of all plugs and should witness with TxDOT representative.

**The shipyard shall then fill the skeg(s) and keel(s) with corrosion prevention compound (shipyard provided), fill with water then drain, as recommended by manufacturer.**

All new and disturbed areas shall be prepared and painted.

## # 6: OPEN & INSPECT (FOUR) BALLAST TANKS

### ITEM DETAIL

The vendor shall open four ballast tanks, tanks are currently empty. All four ballast tanks shall be opened, gas free inspection completed daily. After completion of ABS, USCG and TxDOT inspection the four tanks shall be closed (using new gaskets and replace bolts as needed). **Vendor shall add 2 gallons of bleach (per tank) and all tanks shall be totally filled with fresh water, verified by TxDOT Rep.** Inspection of the ballast tanks shall be witnessed by TxDOT, USCG and ABS representatives. Verification of tanks filled shall be witnessed by TxDOT representative.

All new and disturbed areas shall be prepared and painted.

## # 7: CATHODIC PROTECTION

### ITEM DETAIL

The vendor shall remove 50 anodes and straps, as designated by TxDOT representative, from the ferryboat prior to the hull being cleaned. New anodes shall be furnished by vendor. Prepare and coat all areas disturbed.

NOTE: After the hull is painted then the new anodes shall be welded to the ferryboat at places designated by a TxDOT representative.

The anodes shall meet or exceed the following specifications: M-24; 6 inches x 12 inches x 1 ¼ inches; contains two cast-in galvanized steel mounting straps, **ALL ALUMINUM ANODE**.

**Anode specification / purchase shall be provided to TxDOT for EPA documentation.**

## # 8: ANCHOR WINDLASS & DAVITS MAINTENANCE

### ITEM DETAIL

#### ANCHOR WINDLASS DUCKBILL & CABLE MAINTENANCE

1. Provide new cover for anchor windlass. Cover shall be fabricated to allow cable passage and operation with cover in place on anchor windlass. Cover shall be fabricated for weather and outdoor usage with Velcro on open for cable and rope around bottom to secure as needed.
2. Provide labor and material needed to replace anchor windlass cable. New cable shall be 420 feet in length and ¾ inch diameter. Fittings shall match existing on vessel. New cable shall be approved by the USCG, ABS, and designated TxDOT representative. **ABS, USCG and designated TxDOT representative shall be provided with load certificate for new cable.**
3. Disconnect and remove the anchor from the anchor windlass cable. The anchor shall be taken to the sand blasting pad, blasted, primed, painted and lubricated to insure flutes are free and movable.
4. The anchor windlass working mechanisms and protective devices (drum bearings, hand brake pads, threads, hydraulic motor and cover, gauges, control switches/levers, etc.) shall be wrapped or taped off in such a way as to prevent damage or the entrance of blasting media into same. The vendor shall replace any damage from blast and paint. **Vendor shall purchase new name plates to match all existing on windlass and install on windlass upon completion of sandblasting and coating.**

5. The entire exterior of the anchor windlass shall be blasted, primed, and painted as outlined in Attachment A Paragraph 10, ANCHOR WINDLASS.
6. All blasting media shall be blown from same including from inside the control cabinet prior to painting.
7. The anchor windlass cable shall be made up to the anchor.
8. Testing shall be performed to prove operability in the presence of the USCG, ABS, and/or designated TxDOT's representative. Operation test shall include all stops and emergency shutdown. Anchor shall be fully cradled upon completion of work.

#### DAVITS MAINTENANCE (ITEM IS PER VESSEL = 2 DAVITS)

1. The davit rescue boat cables shall be removed and replaced. New cables shall be purchased with copies of load certificates provided to ABS, USCG and designated TxDOT representative. Davit cables shall be tagged to USCG requirements.
9. The davit operating oil shall be drained from both davits and disposed of in accordance with Paragraph 9 – Hazardous Material. Holding tanks shall be wiped cleaned and dry. Oil shall be replaced with Panolin 15 Hydraulic Oil. Each davit holds 25 gallons. Slewing rate shall be tested with designated TxDOT representative before cover is resealed on holding tank. **Vendor shall purchase new name plates to match all existing on windlass and install on windlass upon completion of sandblasting and coating.**
2. The davit winch oil shall be drained and disposed of in accordance Paragraph 9 – Hazardous Material. Oil shall be replaced with heavy medium oil or TxDOT approved equivalent (each davit holds 1.5 gallons).
3. The davit shall be blasted and painted as outlined in Attachment A Paragraph 11.
4. All grease fittings shall be replaced and properly greased on both davits.
5. Testing, including weight testing cable, shall be performed to prove operability in the presence of the ABS, USCG and/or designated TxDOT's representative.

#### # 9: CLEAN AND SANITIZE VESSEL

##### ITEM DETAIL

The vendor shall clean and sanitize the vessel public and crew interior areas on ferry.

This shall include disinfected wipe down of the entire salon, 7 restrooms, crews room, crew's restrooms, both pilothouses (including stairways), ADA restroom, and Engine Observation Station (EOS). Vendor shall provide new ice box and microwave in both the crew's room and the EOS. Wipe down shall include entire area from ceiling to walls to the floor. All cleaning shall be approved and done to the satisfaction of TxDOT Representative.

#### # 10: COMPARTMENT CLEANING

##### ITEM DETAIL

Provide labor and material to pressure wash all compartments with detergent type degreaser

and 2800-3000 psi pressure washer to remove all oils, grease, stains, etc. **In areas of heavy deposits hand cleaning shall be used.** The vendor shall clean all trash from the compartment. This item shall include pumping all bilges out after washing and disposing of same. Bilges shall be dry throughout the vessel.

All electrical equipment or any other devices that may be harmed by the cleaning process shall be protected by TxDOT approved means to preclude the entry of water.

Bilge hazardous waste shall be disposed of in accordance with General Specification.

## # 12: WATERLINE DOWN "B" SYSTEM

### ITEM DETAIL

The purpose of this item is to prepare and paint the hull from the waterline down. The Vendor shall remove the strainer plates from the ferryboat. Ferryboat has 4 strainer plates. The Vendor shall blast, paint and reinstall strainer plates before vessel is taken off dry dock.

WATER LINE DOWN (28,583 estimated square foot): The purpose of the following shall be to renew the underwater coating system by use of one of the systems listed below. The system used will be determined and approved by TxDOT representative depending on the degree of fouling which has occurred between dry dockings. System will be determined upon dry docking of vessel. The three designated systems are:

"B" SYSTEM – PRESSURE WASH AND SPOT BLAST

"B" SYSTEM – PRESSURE-WASH AND SPOT BLAST STANDARD: Shall be performed as follows:

Surface Preparation: Pressure-wash the entire area with 3500 psi fresh water to remove all marine growth and salts. This shall include any scraping required. Sand sweep and spot blast up to 20% of WATER LINE DOWN to achieve the SSPC-SP 6 standard. 20% shall always include sea strainers and strainer plates. Remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Apply the material before visible oxidation occurs. If oxidation occur, the entire oxidized surface should be re-blasted to the standard specified above.

Coating Application: Apply one spot coat of red epoxy primer at 6.8 wet mils for a dry film thickness of 5.0 mils.

Apply one stripe coat of red epoxy by brush to cut-outs, weld seams and any other areas the painter would have difficulty in applying coating thickness.

Apply one stripe coat of grey epoxy by brush to cut-outs, weld seams and any other areas the painter would have difficulty in applying full coating thickness.

Apply one full coat of gray epoxy at 6.8 wet mils for a dry film thickness of 5.0 mils (172 gallons estimate volume).

Apply one full coat of red, tin free, antifouling at 8.3 wet mils for a dry film thickness of 5.0 mils. Minimum dry time of six hours at 77°F (209 gallons estimate volume). The first coat of antifouling shall be applied while the epoxy is still tacky. If the epoxy is allowed to dry then a

tack coat shall be applied before applying the first coat of antifouling.

Apply one full coat of black, tin free, antifouling at 8.3 wet mils for a dry film thickness of 5.0 mils. Minimum dry time of 24 hours prior to immersion (209 gallons estimate volume).

Paint draft marks, etc.

### **# 13: UPDATE SAFETY PLAN**

#### **ITEM DETAIL**

Vendor shall provide all labor and material needed to update vessel safety plan. This shall include:

1. Review of existing safety plan.
2. Any changes required by ABS, USCG and/or TxDOT.
3. TxDOT approved updated plan stamped by Naval Architect.
4. 5 color copies 11-inches by 17-inches.
5. USCG approval of plan (completed by TxDOT upon return to Galveston).
6. If USCG disapproves plan shall be updated as required and submitted for approval to USCG until resolved
7. Once USCG approved 3 each 11-inch by 17-inch and 1 each 20-inch by 24-inch signs shall be made and installed on vessel.



## APPENDIX D

### Contractor Provided Oils

## CONTRACTOR PROVIDED OILS

The following oils may be considered pre-approved by TX for use on the JOHN W JOHNSON. Any deviations from this list require prior approval by TX.

### OILS USED ON JOHN W. JOHNSON UPDATED MAY 2021

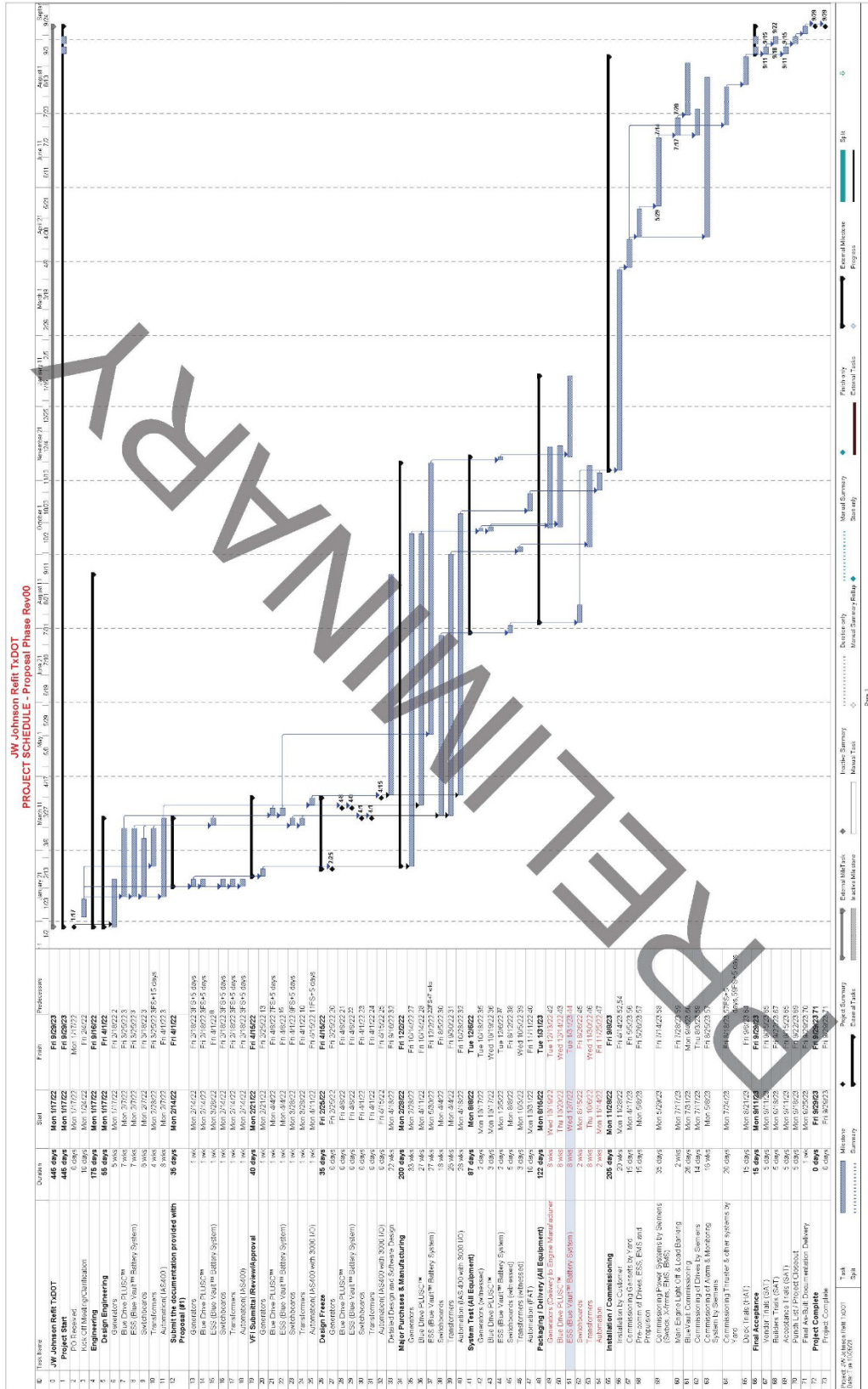
C-18 Engine Oil:	. . . .	Cat DEO ULS SAE 15W-40
C-18 Engine Coolant:	. . . .	Cat ELC
Emergency Diesel Generator:	. . . .	Shell Caprinus XR40 (SAE 40)
Emergency Generator Coolant:	. . . .	Ethelyne Glycol
Reduction Gears	. . . .	Mobil Gear 600xp 220
Steering Units	. . . .	Panolin HLP Synth ISO VG 46
Barrier Gates.	. . . .	Panolin HLP Synth ISO VG 46 (EAL)
Air Compressors	. . . .	Mobil DTE Oil Heavy (ISO VG 100)
Centrifugal Pumps	. . . .	Mobil DTE Oil Heavy (ISO VG 100)
Davit Hydraulic Reservoir	. . . .	Panolin HLP Synth ISO VG 15 (EAL)
Evinrude Outboard Engine	. . . .	Evinrude E-Tec XD100
Evinrude Outboard Engine Gear Case	. . . .	HPF XR Gear Lube
Anchor Winch	. . . .	Shell Omala S2 G68
All Cable Coatings	. . . .	Panolin Bio Grease EP-2 (EAL)
All Greaseable Items (Barrier Gates, etc.):		Panolin Bio Grease EP-2 (EAL)
Chill Water	. . . .	TBD
BDPC and Battery Cooling System.	. . . .	TBD

Revised: May 2021

## APPENDIX E

### Siemens Notional Schedule

# SIEMENS SCHEDULE



## APPENDIX F

Existing As-Built Drawings

## EXISTING AS-BUILT DRAWINGS

The following drawings will be made available to the Contractor for reference only. Modifications have been made after their creation, and they may not accurately depict the current condition of the vessel in all details. It is incumbent upon the Contractor to determine how such inaccuracies may impact the execution of the work and include the costs of such in their price.

DRAWING NO.	TITLE
<b>(A)</b>	<b>Arrangements</b>
B879-1-A00	Cover & Drawing List
B879-1-A01	Outboard Profile
B879-1-A02	General Arrangement
B879-1-A03	Machinery Arrangement
B879-1-A04	Docking Plan & Cathodic Protection
B879-1-A05	Fire & Safety Plan
B879-1-A06	Pilot House Arrangement
B879-1-A07	Lines Plan & Station Offsets
B879-1-A08	Inboard Profile
B879-1-A09	End View
B879-1-A10	Structural Fire Protection
B879-1-A11	EOS Arrangement
B879-1-A12	Emergency Generator Rm Arr
<b>(E)</b>	<b>Electrical</b>
B879-1-E01	Electrical One Line [see electrical dwgs.]
B879-1-E02	Load Analysis [see reports]
B879-1-E03	Lighting Plan
B879-1-E04	Electric Panel Locations
B879-1-E05	Electric Cable Ways
B879-1-E06	GA, PA, & Ship Phone System
B879-1-E07	Sound Powered Phone System
B879-1-E08	Navigation Light System
07-1123-160-020-001-AB	600V Emergency Generator Oneline
07-1123-160-110-001-AB	Emergency Generator Component Layout BOM
07-1123-160-110-002-AB	Emergency Gen Breaker Enclosure Layout BOM

<b>DRAWING NO.</b>	<b>TITLE</b>
07-1123-160-130-001-AB	Emergency Generator Control Schematic
07-1123-160-140-001-AB	Emergency Generator Control
07-1123-160-140-002-AB	Emergency Generator Control
<b>(M)</b>	<b>Mechanical</b>
B879-1-M01	Propulsion Shafting Arrangement & Details
<b>(P)</b>	<b>Piping Diagrams</b>
B879-1-P01	Bilge & Ballast Water System
B879-1-P02	Fire Water System
B879-1-P03	Cooling Water System
B879-1-P04	Vent & Sounding Tube System
B879-1-P05	Fresh & Sanitary Water System
B879-1-P06	Fuel Oil System
B879-1-P07	Lube Oil System
B879-1-P08	Compressed Air System
B879-1-P09	Engine Exhaust System
B879-1-P10	Dirty Oil & Oily Bilge Water System
B879-1-P11	Barrier Gate Hydraulic System
B879-1-P12	Steering Gear Hydraulic System
B879-1-P13	Fill & Discharge System
<b>(S)</b>	<b>Structure</b>
B879-1-S02	Deck & Bottom Structure
B879-1-S03	Longitudinal Elevations
B879-1-S04	Transverse Sections Frms 0 - 12
B879-1-S05	Transverse Sections Frms 13 - 36
B879-1-S06	Transverse Sections Frms 37 - 57
B879-1-S07	Transverse Sections Frms 58 - 65
B879-1-S08	Side Shell & Centerline Elevation
B879-1-S09	Engine / Generator Skid Assembly
B879-1-S10	Generator Foundations
B879-1-S11	Deck House Scantlings

DRAWING NO.	TITLE
B879-1-S13	Independent Tanks
B879-1-S14	Engineer's Operating Stn Str Arr & Details
B879-1-S15	Nozzle, Rudder & Steering Gear Arr & Dets
B879-1-S16	Handrails & Ladders
B879-1-S16	Rescue Boat Access
B879-1-S17	Bulwark & Misc. Details
B879-1-S18	Propulsion Motor & Marine Gear Foundation
B879-1-S19	Seachest Details
B879-1-S20	Anchor Pocket Arrangement & Details
B879-1-S21	Depth Sounder Transducer Housing
B879-1-S22	Mast Str & Nav Eqpt Fdn Details
B879-1-S24	Vehicle Barrier Arrangement
B879-1-S26	Summary of Openings
B879-1-S27	Ventilation
B879-1-S28	Life Jacket Box
B879-1-S44	Draft Marks / Names Designation



## APPENDIX G

### Siemens Specification

## SIEMENS SPECIFICATION

# **SIEMENS ENERGY INC**

## **Marine Solutions**

PROPOSAL TO

## **Elliott Bay Design Group**

For

**Texas Department of Transportation (TXDOT)  
John W. Johnson Ferry**

**Siemens BlueDrive *PlusC*™ Solution**



**Revision History**

Rev.	Date	Sections	Author	Comment
00	02/23/2021	All	J. Carrillo	Preliminary Release
01	08/12/2021	Multiple	J. Carrillo	Updated spec based on design changes
02	12/06/2021	Multiple	J. Carrillo	Additional updates
03	01/13/2022	Multiple	L. Briant / J. Carrillo	Updates from customer's comments
04	01/27/2022	Multiple	J. Carrillo	Updates from customer's comments
05	02/03/2022	Multiple	J. Carrillo	EDBG Comments

**TABLE OF CONTENTS**

**1 INTRODUCTION .....6**

**2 SYSTEM DESCRIPTION .....7**

2.1 SYSTEM LAYOUT .....7

2.2 SCOPE OF SUPPLY .....7

**3 GENERAL CONDITIONS .....8**

**4 QUALITY ASSURANCE SYSTEM .....9**

**5 GENERAL CONDITIONS AND EXCLUSIONS.....9**

**6 GENERATORS .....11**

6.1 SCOPE OF SUPPLY .....11

6.2 STANDARDS AND TESTING .....13

6.3 COMMENTS & CLARIFICATIONS .....13

6.4 SIEMENS ENERGY SCOPE OF SUPPLY FOR THE GENERATORS INCLUDES .....14

6.5 SCOPE OF SUPPLY FOR DIESEL ENGINE SUPPLIER .....14

**7 FUNCTIONAL DESCRIPTION OF BLUEDRIVE PLUSC.....15**

7.1 POWER GENERATION .....15

7.2 POWER DISTRIBUTION .....15

7.3 CLEAN GRID CONVERTER .....15

7.4 BUS TIE BREAKER (ILC).....15

7.5 THRUSTER AND PROPULSION DRIVES SECTIONS .....16

7.6 ENERGY MANAGEMENT SYSTEM (EMS).....16

7.7 SIEMENS ENERGY GENERATOR CONTROL UNIT (GCU) SYSTEM .....17

7.8 BATTERY CONNECTION .....17

7.9 REMOTE DIAGNOSTIC SYSTEM (RDS).....18

7.10 THRUSTER AND PROPULSION CONTROL SYSTEM .....19

**8 MAIN SWITCHBOARD BLUEDRIVE PLUSC.....20**

8.1 BLUEDRIVE PLUSC GENERAL DETAILS .....20

8.2 ENERGY MANAGEMENT SYSTEM (EMS).....20

8.3 DC BUS DUCT (SWBD NO. 1 – SWBD NO. 2).....21

8.4 GENERATOR CONTROL UNIT (GCU).....21

8.5 PEAK VOLTAGE BRAKING RESISTOR .....21

8.6 PANELS INCLUDED IN THE BDPC LAYOUT .....23

8.7 BLUEVAULT ENERGY STORAGE – BATTERY SYSTEM.....26

**9 THRUSTER AND PROPULSION CONTROL SYSTEM .....33**

**10 ECOMAIN BLUE - HISTORIAN .....35**

**11 REMOTE DIAGNOSTIC SYSTEM (RDS).....35**

11.1 CELLULAR GATEWAY .....36

**12 AC MARINE SWITCHBOARDS, PANELBOARDS, AND MOTOR STARTERS.....37**

12.1 GENERAL DESCRIPTION FOR MARINE SWITCHBOARDS. ....37

12.2 MARINE PANELBOARDS .....42

12.3 CLARIFICATIONS & EXCEPTIONS.....45

<b>13</b>	<b>DISTRIBUTION TRANSFORMERS .....</b>	<b>46</b>
13.1	SHIP SERVICE TRANSFORMERS.....	46
13.2	150 kVA DISTRIBUTION TRANSFORMER (T7) .....	47
13.3	75 kVA DISTRIBUTION TRANSFORMER (T8 & T9) .....	48
13.4	ADDITIONAL INFORMATION .....	48
<b>14</b>	<b>PROPULSION MOTORS .....</b>	<b>49</b>
14.1	MOTOR INSPECTION .....	49
<b>15</b>	<b>FIRE FIGHTING PUMP – N/A .....</b>	<b>49</b>
<b>16</b>	<b>INTEGRATED MONITORING IAS400, ALARM AND CONTROL SYSTEM .....</b>	<b>50</b>
16.1	GENERAL.....	50
16.2	SCOPE OF SUPPLY SUMMARY .....	50
16.3	SUMMARY OF HARDWARE DELIVERY.....	51
16.4	SUMMARY OF SERIAL COMMUNICATIONS .....	52
16.5	SUMMARY OF FUNCTIONALITY .....	53
16.6	SCOPE OF SUPPLY SUMMARY .....	54
16.7	SUMMARY OF SERIAL COMMUNICATIONS .....	55
16.8	SUMMARY OF FUNCTIONALITY .....	55
16.9	SYSTEM TOPOLOGY.....	56
16.10	SPECIAL PROCESS FUNCTIONALITY .....	56
16.11	CLARIFICATIONS AND EXCEPTIONS.....	57
<b>17</b>	<b>DYNAMIC POSITIONING SYSTEM – N/A.....</b>	<b>58</b>
<b>18</b>	<b>NAVIGATION AND COMMUNICATION EQUIPMENT – N/A .....</b>	<b>58</b>
<b>19</b>	<b>LOADING &amp; STABILITY SYSTEM – N/A.....</b>	<b>58</b>
<b>20</b>	<b>PROJECT ORGANIZATION AND ADMINISTRATIVE PROVISIONS .....</b>	<b>59</b>
20.1	PROJECT ORGANIZATION AT SIEMENS ENERGY.....	59
20.2	PROJECT ORGANIZATION BY CUSTOMER.....	59
20.3	PROJECT MANAGER .....	59
20.4	LIAISON ENGINEER .....	59
20.5	EXCHANGE OF DOCUMENTS AND DOCUMENTATION .....	59
20.6	EXCHANGE OF DOCUMENTS AND DOCUMENTATION .....	60
20.7	DESIGN FREEZE.....	60
20.8	DELIVERY OF DOCUMENTATION .....	61
20.9	OWNERSHIP OF DRAWINGS, DESCRIPTIONS AND DOCUMENTATION .....	62
20.10	CHANGES AND VARIATION ORDERS .....	62
20.11	TESTING.....	62
<b>21</b>	<b>ENGINEERING AND DOCUMENTATION.....</b>	<b>64</b>
21.1	GENERAL PROJECT DOCUMENTATION.....	64
21.2	GENERAL TECHNICAL DOCUMENTATION.....	64
21.3	DIMENSION DRAWINGS AND CALCULATION SHEETS .....	65
21.4	FINAL DOCUMENTATION (AS COMMISSIONED) .....	65
21.5	SYSTEM STUDIES .....	66
<b>22</b>	<b>SPECIFICATION OF SUPPORT, COMMISSIONING, SEA TRIALS AND TRAINING.....</b>	<b>69</b>
22.1	INSTALLATION SUPPORT .....	69
22.2	COMMISSIONING .....	69

---

22.3	DOCK TRIALS, OPERATIONAL TRIALS, AND SEA TRIALS.....	69
22.4	TRAINING.....	69
22.5	POST START-UP SUPPORT .....	70
22.6	TRAVEL, ACCOMMODATION AND WORKING TIME .....	70
22.7	PLANNING OF COMMISSIONING AND SEA TRIALS.....	70
22.8	DAILY WORKING REPORTS (TIME SHEETS) AND WEEKLY REPORTS. ....	72
22.9	LIMITING OF DAILY WORKING HOURS .....	72
22.10	OTHER EQUIPMENT .....	73
22.11	HEALTH, ENVIRONMENT AND SAFETY (HES) .....	73
22.12	RESPONSIBILITY AND SCOPE OF SUPPLY.....	73
22.13	FACILITIES FOR SUPPLIER .....	73
<b>23</b>	<b>PROJECT SCHEDULE .....</b>	<b>74</b>
<b>24</b>	<b>RESPONSIBILITY MATRIX .....</b>	<b>74</b>
<b>25</b>	<b>STORAGE AND LOADING .....</b>	<b>74</b>
<b>26</b>	<b>LIST OF ATTACHMENTS .....</b>	<b>75</b>

## 1 ***Introduction***

For more than a hundred years Siemens Marine Technology has been specializing in the design, manufacture and commissioning of automation, electrical and propulsion solutions for all types of merchant vessels, naval vessels and submarines worldwide.

Siemens became the world's first company to electrify a ship in the year 1879 and built the world's first ship with electric propulsion in the year 1886. Since then, Siemens has always remained experienced in shipboard electrical engineering technology. Today Siemens Energy is leading in the design of advanced diesel-electric propulsion systems of all kinds and sizes.

Siemens Energy Marine Solutions is among the world's leading suppliers of diesel-electric propulsion, automation and electric systems with over 200 vessels in operation around the world. Our solutions ensure operational benefits and give a strong contribution to lower fuel consumption and reduced emission of harmful greenhouse gases. As a supplier, we create a long-running cooperation with ship owners - to reduce vessel life-cycle costs - and at the same time help the Yards to be more competitive. At Siemens Energy you can get all components and systems from the same single source vendor.

Due to our long history as a system supplier for automation and monitoring systems as well as complete electrical systems we have extensive experience in total system engineering to ensure the performance of the complete system. For this reason, we integrate, as key components, well-approved components from Siemens Energy or other approved manufacturers only.

This specification describes the machinery and equipment included in our scope of supply to be installed on board the TX DOT John W. Johnson Ferry.

The scope of supply includes the design, assembly and testing per this technical proposal for Qty. one (1) Vessel. Siemens Energy scope of supply for subsequent vessels will be the same.



## 2 System Description

### 2.1 SYSTEM LAYOUT

Siemens Energy is offering our BlueDrive PlusC™ for the proposed solution.

Refer to [ATTACHMENT A](#) - Preliminary Single Line *TXDOTJW Johnson \_ SLD\_ BDPC REV05\_02-03-22\_JC.pdf* prepared by EDBG for preliminary equipment ratings.

### 2.2 SCOPE OF SUPPLY

Siemens Energy scope of supply for one vessel is outlined below. The scope of supply for additional **duplicate** vessels will be the same.

- **Generators:**
  - Qty (4) Main alternators, 750kVA, 600kW, 0.80 PF, Air Cooled
- **Switchboards and Distribution consisting of:**
  - Qty (1) Main Propulsion Switchboard 690VAC/930VDC, BlueDrive PlusC™ with cooling skids
    - Energy Management System (EMS)
    - Generator Control Unit (GCU) System
    - Energy Storage System (ESS) - \*BMS
  - Qty (1) Ship Service Switchboards, 600V, 60 Hz
  - Qty (2) Ship Service Transformer T1 & T2, 450 kVA, 570/600 V, 60 Hz, IP23, air cooled, Cu windings
  - Qty (1) Distribution Transformer T7, 150 kVA, 600/480 V, 60 Hz, IP23, air cooled, Cu windings
  - Qty (2) Distribution Transformer T8 & T9, 75 kVA, 600/208-120 V, 60 Hz, IP23, air cooled, Cu windings
  - Qty (1) Main Distribution, LD Panel, 208/120V, 400A, 42 Poles, NEMA 3R
  - Qty (1) Distribution Panel P7, 208/120V, 100A, 42 Poles, NEMA 3R
  - Qty (2) Distribution Panel UPS1-1 & UPS2-1, 230V, 100A, 42 Poles, NEMA 3R, with Ammeter and test push button
  - Qty (2) Distribution Panel UPS1-2 & UPS2-2, 230V, 100A, 30 Poles, NEMA 3R
  - Qty (1) Automatic Transfer Switch, 208/120V, 300A, 4-wire, switching ground
- **Propulsion System:**
  - Qty (4) Main Propulsion Drives integrated into Siemens Energy BlueDrive PlusC™, 1000kW, 600V, fresh water cooled
  - Remote Diagnostic System (RDS) and Marine Diagnostic Recording (MDR)
  - Qty (1) Cellular Gateway with Antenna and Modem for remote connection
  - Qty (1) Inspection of existing propulsion motors with report.
- **Thruster and Propulsion Control System:**
  - Thruster and Propulsion Control System – 2 steering positions + one steering position for main propulsion in Engine Control Room (ECR)

- **Battery System (Siemens Blue Vault™):**
  - 2 x 949 kWh batteries (nominal capacity) Incl. incomer panel in BDPC-switchboard
- **Alarm and Monitoring System**
  - Siemens Energy (IAS 400) (Integrated Alarm System), Approx. 1500I/O points
- **Consoles**
  - Siemens Energy will upgrade and resurface EOS and Pilot House consoles. Final design will be developed with EDBG, TXDOT, and SE US.
- **Uninterrupted Power Supply (UPS)**
  - Qty (2): 8kVA, 230VAC, 60Hz
- **System Integration for Siemens Energy scope of supply**
- **Testing**
  - FAT (Factory Acceptance Test) for Siemens Energy scope of supply
  - HAT (Harbor Acceptance Test) for Siemens Energy scope of supply
  - SAT (Sea Acceptance Test) for Siemens Energy scope of supply
- **Engineering Studies**
  - Short circuit calculation
  - Selectivity & discrimination calculation
  - Harmonic distortion calculation & measurements
- FMEA and DVTP for Siemens Energy scope of supply only. Siemens Energy will provide inputs for a PSTP within the Siemens Energy scope of supply.
- ABS & USCG Certification for Siemens Energy supplied equipment as required by class
- Commissioning and Sea Trials
- Project Management

### 3 **General Conditions**

All equipment will be built and inspected according to the Rules and Regulations of ABS & USCG where applicable.

The components are designed and assembled for rough duty and will maintain correct operation under all conditions described in the rules and regulations of the classification society.

The major propulsion equipment is based on European and International standards IEC, DIN and VDE.

The relevant equipment is designed for:

- maximum cooling water (freshwater) temperature of 32°C
  - maximum ambient air temperature of 45°C
  - maximum ambient air temperature for rotating equipment in machinery space of 55°C
- maximum relative humidity of 90%
- minimum ambient air temperature of 0°C
- minimum water inlet temp for the converter 20 deg C, against additional charges 4 deg C.
- nonexplosive area (if not otherwise specified)
- Angular motion for all equipment except emergency ones:
  - Steady                    ± 15 degrees list
  - ± 5 degrees trim

- Transient             $\pm 22.5$  degrees roll  
                          $\pm 7.5$  degrees pitch
- Angular motion for emergency machinery, emergency and safety equipment and automatic circuit breaker:
  - Steady               $\pm 22.5$  degrees list  
                          $\pm 10$  degrees trim
  - Transient:         $\pm 22.5$  degrees roll  
                          $\pm 10$  degrees pitch

In the most adverse situation roll and pitch are to be considered simultaneously. Automatic circuit breakers are to operate up to 45 degrees without any malfunction.

Electrical equipment and machinery will be capable of operating without any malfunction in presence of vibrations up to the values, mentioned in the rules and regulations of the classification society.

#### **4      *Quality Assurance System***

We offer our customer products, systems and services with maximum utility value. Our aim is to satisfy your requirements and to achieve your complete confidence in our products and services.

The quality management system of the Industrial Projects and Technical Services Group are detailed within a quality manual and certified equivalent to **DIN/ISO 9001**. We furthermore ensure that all sub suppliers will also be certified according to this or equivalent standards.

The project team, who is responsible for quality management, will handle the project according to the quality management plan. In addition to other responsibilities, the project team will interact with the classification society to reach all drawing approvals. Test plans and reports will be issued and forwarded to the Shipyard / Owner. Components that fail to meet our test standards will be handled according to our quality management plan.

#### **5      *General Conditions and Exclusions***

Siemens Energy scope of supply is based upon the following documentation received from Elliot Bay Design Group and Siemens Energy experience with similar vessels.

- 20050-002-320-1P1 Electrical One-Line Diagram.pdf
- 20050-001-320-1P1-Electrical One-Line Removals.pdf

Furthermore, please kindly note that the following comments and exclusions apply:

- Please note that any dimensions and weights included may change and are related to the proposed design.
- The quoted scope of supply is based on the included technical specification and our experience with similar vessels. Some details may need additional clarifications and have to be mutually agreed on.

- Based on our experience with similar systems, we have decided to integrate well-approved components from Siemens Energy or other approved manufacturers as key components.
- All major equipment will be manufactured in the US or Europe. If different manufacturers are mentioned within this specification, it is Siemens Energy responsibility to select the final supplier.
- Couplings, cables, cable glands or cable lugs or other mounting materials unless mentioned are not included in our scope of supply.
- Costs for fees of the classification society ABS & USCG for factory tests and documents for equipment certification and equipment for Siemens Energy scope of supply are included in our scope. Other costs for ABS, i.e. fees for harbor (HAT) and sea tests (SAT), as well as other costs if applicable, are to be covered by the Yard.
- Load resistors with related cabling for HAT are to be supplied by the Yard. Load banks need only to be resistive.
- Siemens Energy will provide recommendations for cable types, cross sections and termination points for the power cables (transformers, drives, motors, main propulsion switchboard, propulsion controls, generators (if included in our scope), motor control centers and automation) in an excel spread sheet. External connecting diagram / interconnecting diagram of components and systems not within our scope of supply will be supplied by others.
- Harmonic analysis is not included in Siemens Energy scope of supply. It can be quoted if required by the Yard.
- Siemens Energy does not anticipate any additional filtering equipment will be required. Filtering equipment, if required based on the harmonic analysis, can be provided.
- Switchboard designs allow for changes in loads as long as space is available, and no vertical sections are added.
- Ship-wide Load Analysis, FMEA, DVTP and PSTP are not included in Siemens Energy scope of supply.
- It is our understanding that installation and installation supervision will be done by the Yard.
- Siemens Energy scope includes integration of other vendors' equipment into Siemens Energy systems where applicable. Any integration work required on the other vendors' equipment, is excluded from Siemens Energy scope. Siemens Energy can accept various signal types. Siemens Energy standard and preference for communication is via Profibus or Profinet
- Individual wiring diagrams for non-Siemens Energy supplied equipment are excluded.
- Battery Chargers and 24V Power Supplies are excluded, except where specifically noted.
- Spare parts are not included in the Siemens Energy scope of supply. A recommendation for start-up and commissioning spares will be made after contract signing and clarification.
- Vessel single line, ELA and load lists are not included in Siemens Energy scope of supply. Siemens Energy will provide information on Siemens Energy scope for input into these documents and analysis.

## 6 Generators

### 6.1 SCOPE OF SUPPLY

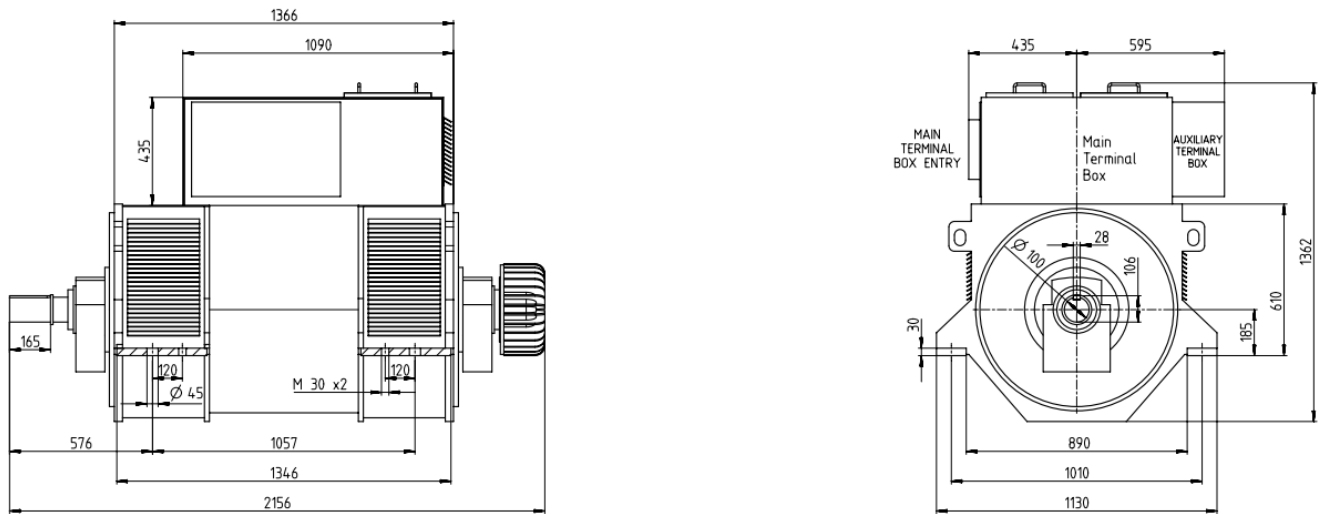
Siemens Energy scope of supply includes four (4) 3AC, 730V, 750kVA, 600kWe  $\cos \phi = 0.80$ , 1800 rpm main generators. Refer below for additional preliminary details.

Refer to [ATTACHMENT B](#) for preliminary generator dimensions and detailed technical data.

#### 6.1.1 750 KVA MAIN GENERATORS DETAILS

**Table 1: 750 kVA Generator Details**

Main data specifications	Value/type	Comment
Type	Siemens / 1DC04	Brushless, self-excited with AVR, rotating field and damper winding
Rated power	750 kVA	
Electrical power	600 kW	
Rated Power Factor	0.80	Lagging
Rated Voltage	730 VAC	3 phase star connection
Speed	1800 RPM	
Cooling method	Air Cooled (IC01)	
Insulation/utilization class	H/F	
Degree of protection	IP23	
Cooling temperature	Pt100 sensors for cold and hot air	Resistance thermometers
Cooler monitoring	Leakage detection	Capacitive with relay
Sensors to terminals	6x3 Pt100 sensors in windings	Resistance thermometers
Bearing type	Roller Bearings	Two bearings
Bearing measurement	1 x PT100 in each bearing	Resistance thermometers
Voltage regulating type (AVR)	DECS 150	Or similar
Paint finish	RAL 7032	
Ambient temperature max.	50°C	
Weight approx.	3500 kg	Preliminary
Cable connection	MCT frame	
Space heater	1AC230V	



**Figure 1: Preliminary 750kVA generator dimension drawing**

## 6.2 STANDARDS AND TESTING

Generators are tested and certified to ABS. Noise and vibration are according to EN 21 680-2. The generators will be tested running in motor mode at no load condition for measurement of vibration level according to requirements given in EN 21 680-2. No spectrum analysis will be performed. Any special requirements or natural frequencies/firing frequencies from the diesel engines that have to be avoided in the generator's natural frequencies shall be stated by the yard or diesel engine supplier prior to final order. We are not responsible for the mechanical vibrations of the entire system consisting of diesel-engine, base frame and generator. The responsibility has to be clarified according to ISO 8528-5, 1993, 15.10.

## 6.3 COMMENTS & CLARIFICATIONS

Due to the repetitive Surges and Impulse created by the Propulsion Drives, proper sizing / dimensioning of the generator is critical for Marine Propulsion applications. The Sub-transient Reactance  $X''_d$  plays a key role. If the generators are excluded from Siemens Energy scope of supply, it is important that Siemens Energy provides input to the generator selection as the sub-transient reactance has a significant effect on the switchboard design. Our scope is based on the sub-transient reactance as defined in the generator data. A lower sub-transient reactance value will affect the short circuit current and may require changes to Siemens Energy switchboard design.

If the generators are being provided by others, they must be provided with DSLC-2 load controller modules to interface properly to Siemens Energy' system. Additional work beyond Siemens Energy' current proposed budget will be required if different modules are supplied. This additional work will be addressed through a variation order.

**6.4 SIEMENS ENERGY SCOPE OF SUPPLY FOR THE GENERATORS INCLUDES**

- Final generator design
- ABS Certificate for generator
- FAT of generator at Factory
- AVR – DECS 150 or Similar
- Drop Ship Generators to Engine supplier
- Supervision of installation on-board vessel
- Supervision of cable connections on-board
- Interface clarifications with Yard and Diesel Engine supplier
- Commissioning assistance with Engine supplier

**6.5 SCOPE OF SUPPLY FOR DIESEL ENGINE SUPPLIER**

- ABS Certificate for engine
- Common base frame for engine and generator
- Mounting of generator on common base frame (skid)
- Torsional analysis of system (engine & generator)
- Complete elastic coupling for connection of generator to engine
- Coolant expansion tank
- Skid mounts as required by vibration analysis to meet customer specs
- Local operating panel
- Electronic Governor
- Painting of generators to match engines
- Testing of genset in compliance with ABS requirements
- All plumbing to connect components to connection flanges for interface to ship systems is to be included.
- Assistance for interface clarifications with Siemens Energy supplied generators, power management and automation systems and other ship systems.
- Commissioning of genset at shipyard (including governor tuning and overall system response to meet ABS requirements for Freq, Voltage, load recovery times, and large load coordination).



## **7 Functional Description of BlueDrive PlusC**

### **7.1 POWER GENERATION**

The main power generation is performed by fixed speed diesel generator sets delivering electric power to the BlueDrive PlusC switchboard. The AC voltage is then converted to a variable DC link voltage through a liquid cooled diode rectifier in the generator incomer section. DC link voltage as well as the load sharing between diesel engines and batteries, is controlled by the Energy Management System (EMS) via the Generator Control Unit (GCU) and the Automatic Voltage Regulator (AVR). The GCU is integrated in the BlueDrive PlusC switchboard, while the AVR is placed in a cabinet close to the generator.

The number of generator sets in operations will be adapted to the consumed power.

### **7.2 POWER DISTRIBUTION**

The incoming power from the diesel generators is distributed in the BlueDrive PlusC switchboard via the DC link, and via the bus-tie breaker (ILC – Intelligent Load Controller) to the different main consumers integrated in the switchboard. Each consumer connected to the DC link via semiconductor fuses and a dedicated no load isolation breaker for galvanic isolation.

### **7.3 CLEAN GRID CONVERTER**

The AC voltage distribution switchboards are powered from the DC bus via the Clean Grid Converter. The Clean Grid Converter consists of an IGBT converter and a Clean Grid Transformer with Power Filter.

The Power Filter is designed specifically together with the Clean Grid Converter to remove harmonic content created by the converter switching operation and harmonic content caused by nonlinear consumers, ensuring that the THD level on the AC switchboard is kept within classification limits.

Transformers on the AC switchboard system must be equipped with pre-charge if the size is above 200 kVA. All motors above 50-200 kW (depending on load precondition) must be operated by soft starters or frequency converters.

The Clean Grid Converter can operate in parallel with shore connection or harbor generator on AC switchboard. If start from AC (no voltage on DC) is required, the option “pre-charge from AC” must be included.

### **7.4 BUS TIE BREAKER (ILC)**

The bus tie breaker/ILC is an autonomous high-speed semiconductor device capable of detecting, and effectively limiting and interrupting a short circuit current in case of a short circuit in one of the DC link bus bars. It ensures selectivity on the DC link bus bar level. During a fault, the ILC will stop the current within 15-20 microseconds and subsequently segregate the bus-bars. Due to the response time which is more than 22.000 times faster than a normal bus-tie

breaker, the non-failure bus-bar section will not see any disturbance in voltage and will continue to operate unaffected.

## 7.5 THRUSTER AND PROPULSION DRIVES SECTIONS

The BlueDrive PlusC switchboard is fitted with inverters feeding the propulsion and thruster motors.

## 7.6 ENERGY MANAGEMENT SYSTEM (EMS)

Energy production will be controlled by the Energy Management System - EMS. The system controls the operative number and speed of diesel engines, based on the load situation. The EMS is integrated in the BlueDrive PlusC switchboard. Figure 3 illustrates the conceptual topology of EMS.

The EMS will, for each of the generators, perform generator control functions such as:

- Load-dependent (and fault dependent) start and stop of generators
- Individual selection of standby sequence
- Automatic load shedding
- Handling of heavy consumers
- Power plant control with status and alarm presentation on the touch screen panel located in Main Switchboard or Machine Control Room
- Profinet communication to IAS for status indication and alarm presentation
- Constant Speed Engine Control Interface to Engine Governor
  - \* *Note: Constant Speed Engines used in this Siemens Energy BDPC Application*
- Intelligent adaption of power by communication with the Remote Control System (predicting power changes and adapting power consumption and production)

## 7.7 SIEMENS ENERGY GENERATOR CONTROL UNIT (GCU) SYSTEM

The Generator Control Unit (GCU) is the control system for the generator and takes care of all the basic functions which are necessary for safe operation.

- Manual and auto control
- Active load sharing
- Protection and safety functions

The main safety functions for the Generator Control Unit are:

- Short circuit
- Over-current/ over-load
- Diode fault monitoring (replace differential protection)
- Overvoltage
- Excitation failure
- De-excitation
- Vessel Power Adaption Limit is a dynamic and fast acting limitation circuit which is always active. It monitors generator or battery max current or load. In case of overload the Vessel Power Adaption will limit the propulsion power to avoid overload and blackout. The monitored values are sent from the Generator Control Unit to Energy Management System and further to Remote Control System which will keep the power output from the Variable Speed Drives within maximum allowed limits.
- Generator Load Limitation is a blackout prevention system preventing overload of the diesel motor dependent of speed

## 7.8 BATTERY CONNECTION

The battery connection is a separate cubicle for integration of batteries to the BlueDrive PlusC DC bus. It interfaces the Battery Management System and the Energy Management System for best utilization of the batteries, control and safety.

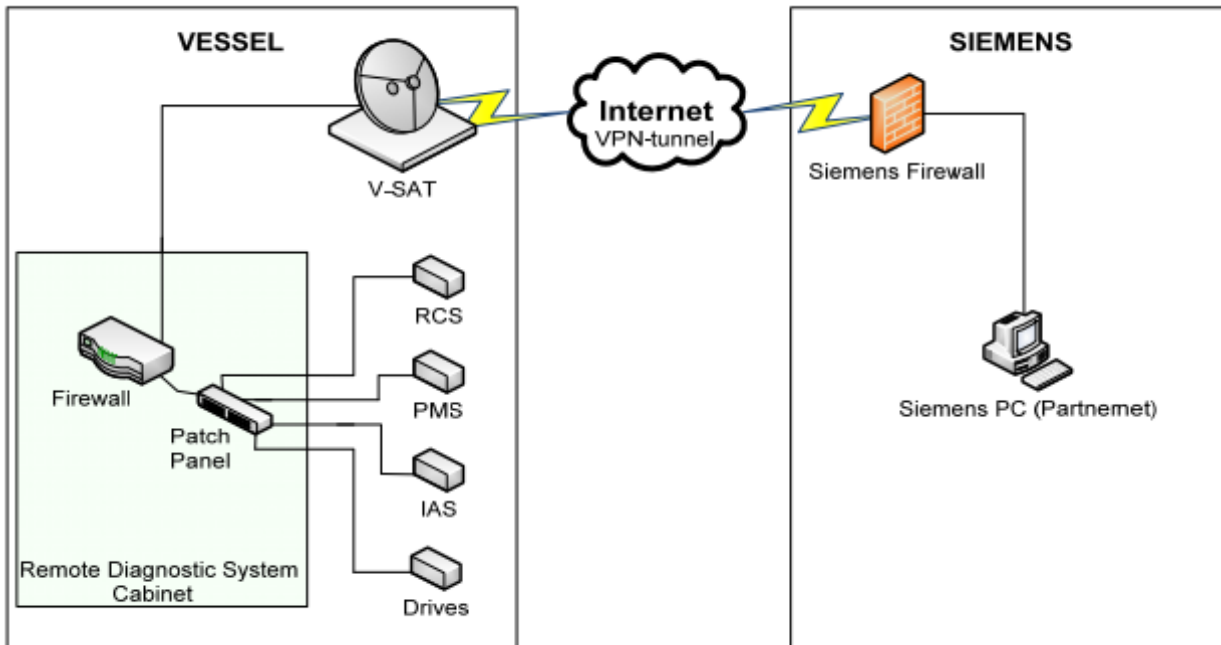
**7.9 REMOTE DIAGNOSTIC SYSTEM (RDS)**

A Remote Diagnostic System is included for a safe and encrypted connection between the vessel and Siemens Energy Onshore Service Department. The connection is made by the existing onboard internet connection through the vessels external communication system (V-SAT or Cellular network) and requires activation by onboard crew. The solution can be used for diagnostics, when fault situations occur as well as for planned maintenance. This system ensures rapid assistance during working hours and with a service agreement also outside working hours.

Additionally, to RDS, A Marine Diagnostic Recording (MDR) system is included for acquisition, recording and visualization of data. The MDR records and stores event information of Siemens Energy equipment. This data can be used for diagnosis and troubleshooting.

The delivery includes a cabinet (W x H x D) 600x600x350mm with patch panel and a firewall completely configured for remote connection through the VPN-tunnel. The Siemens Energy equipment, as EMS, Frequency Converters, RCS and IAS will be connected to this cabinet by Ethernet or Profinet cables (yard supply).

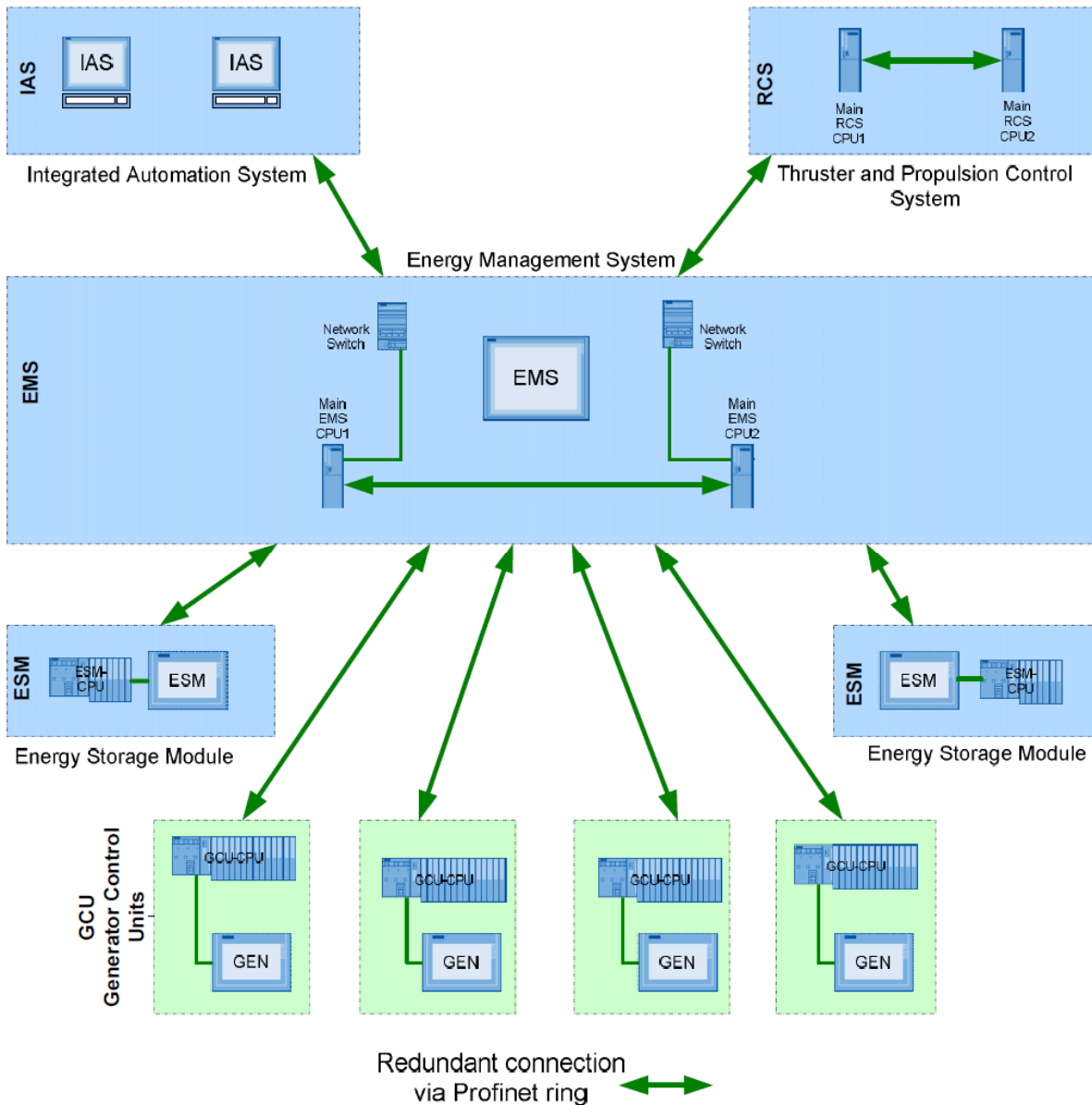
In the scope of supply from Siemens Energy there will also be included a Fujitsu Celsius Laptop for use as an engineering station.



**Figure 2: RDS system illustration – REFERENCE DWG ONLY**

**7.10 THRUSTER AND PROPULSION CONTROL SYSTEM**

The Thruster and Propulsion Control System is fully integrated with the BlueDrive PlusC system via bus communication. The Energy Management System and the Thruster and Propulsion Control System are closely integrated and controls speed and power of the generators. Control of propeller thrust is therefore achieved using this system.



**Figure 3:** General topology drawing of Energy Management System (conceptual drawing that might include sub systems that are not included in scope of supply)

## 8 Main Switchboard BlueDrive PlusC

The main component of the proposed system is the BlueDrive PlusC converter. This switchboard contains consumers as listed in single line diagram and sub sections below.

Refer to [ATTACHMENT C](#) for preliminary General Arrangement of the BDPC

### 8.1 BLUEDRIVE PLUSC GENERAL DETAILS

**Table 2:** contains the specification of the BDPC switchboard.

<i>Data</i>	<i>Value/type</i>	<i>Comment</i>
Type	Siemens Energy 8PT	
Rated Voltage	3AC 690V / 930V DC	3 phase
Rated Frequency	60 Hz	60Hz Fixed Speed for TX DOT
Degree of protection	IP22	Open bottom
Painting	RAL7032	Light Grey
Rated Dc bus current	2000A	Max at 930VDC
Plated Cable Connections	Tin/Silver	Only external cable connections points
Ambient temperature	45°C	Maximum
Location	Indoor	Clean dry air
Cooling method	Fresh water	
Inlet water temp.	10 °C – 15 °C	30 °C is the recommended water temperature
Max cooling demand	2 x 48kW	Preliminary
Max. operating pressure	6 Bar	
Wire marking	With	

### 8.2 ENERGY MANAGEMENT SYSTEM (EMS)

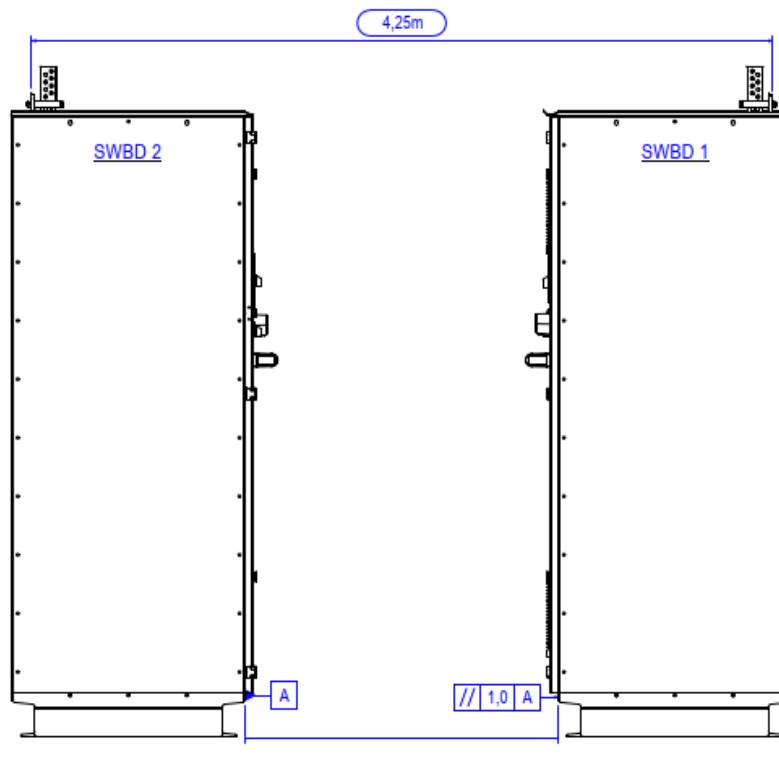
Energy production will be controlled by the Energy Management System – EMS, based on the load situation.

### 8.3 DC BUS DUCT (SWBD NO. 1 – SWBD NO. 2)

Isolated Bus Duct between the BDPC SWBD1 and SWBD2 will be delivered. It is designed to go in a straight line between the ILC cabinet and the EMS cabinet. The connections point will be in the top of the cabinet, as illustrated in the figure below.

The busduct will have connection points along the length of the span between the two lineups, and the purchaser are responsible to supply the support system.

**Note:** The Shipyard must provide the EXACT distance between BDPC SWBD No. 1 and SWBD No. 2 in order to provide the DC bus duct. Failure to do so at in a timely manner will cause delays to the delivery of the DC Bus duct equipment.



### 8.4 GENERATOR CONTROL UNIT (GCU)

The Generator Control Unit (GCU) is the control system for the generator and takes care of all the basic functions which are necessary for safe operation.

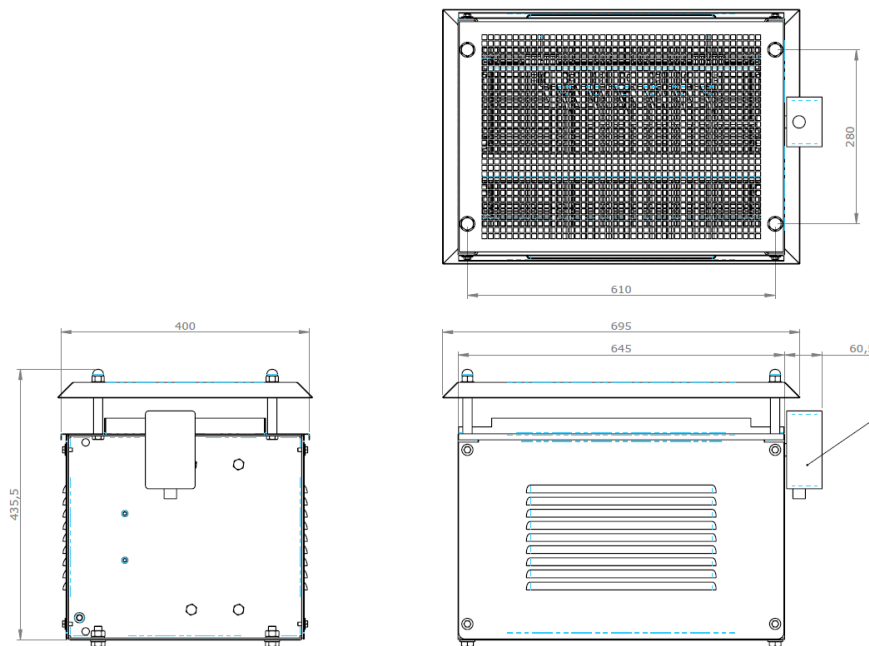
### 8.5 PEAK VOLTAGE BRAKING RESISTOR

The braking resistor is intended for mounting towards shipnet supply (Clean Grid Converter) used for short time power.

Qty. 1 resistor for each ShipNet supply.

**Table 3:** Braking resistor details

<i>Data</i>	<i>Value/type</i>	<i>Comment</i>
Type	TBA	
Design	Cast Iron Resistor type 3PR24-V	Stainless Steel finish
Location	Machine Room	
Degree of protection	IP23	
Cooling	Air Cooled	
Resistance at 20°C	0,585 ohms	
Tolerance	+/- 10%	
Voltage max	1000 V	
Continuous power	100kW	
Peak Power	1500 kW	
Time	3 sec	
Energy Storage capacity	4500 kJ	
Weight	65 kg	Approx.



**Figure 4:** Preliminary braking resistor dimension drawing



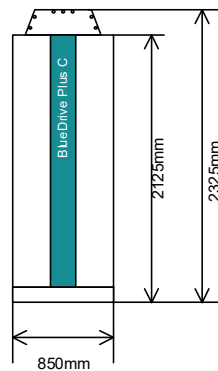
**8.6 PANELS INCLUDED IN THE BDPC LAYOUT**

**8.6.1 SWITCHBOARD #1 DETAILS AND LAYOUT**

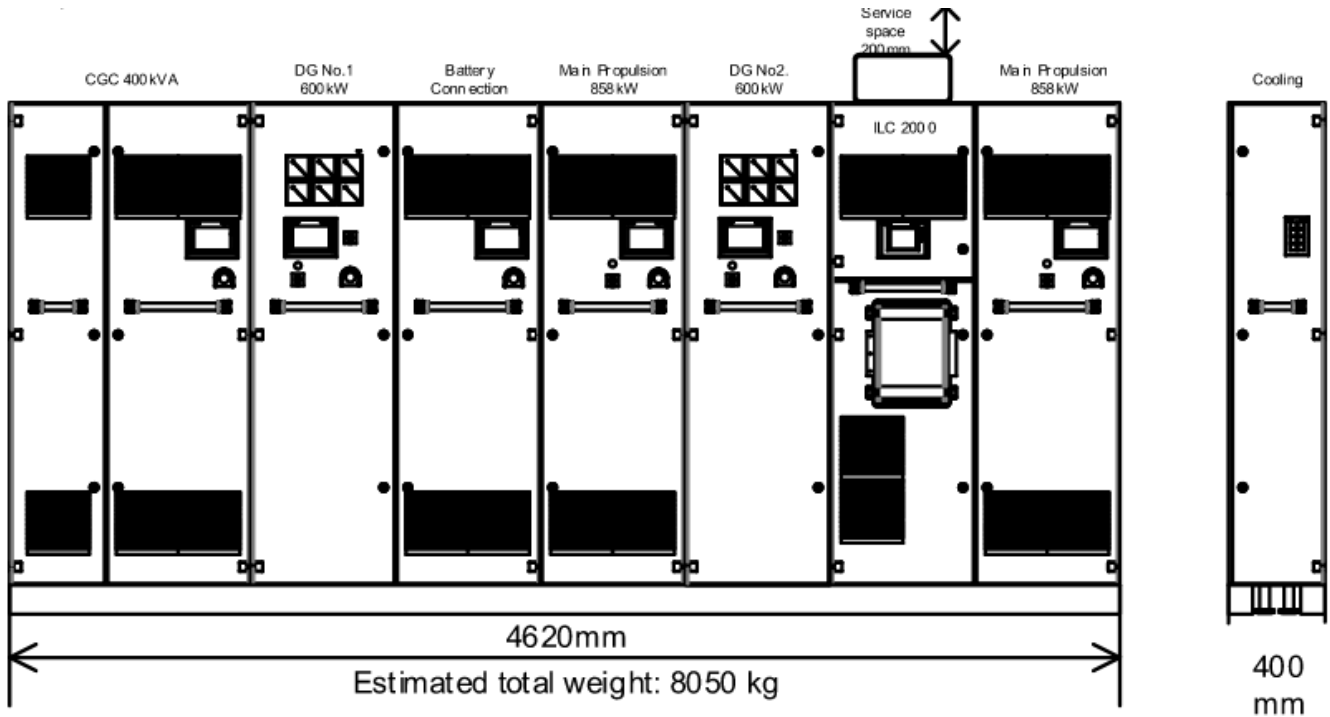
**Table 4:** Modules included in switchboard

Qty.	Module	Data
2 (two)	Generator incomer module	600 kW with diode rectifier and generator control
1 (one)	Shipnet supply (Clean Grid Converter)	450 kVA with 600V external pre-charge.
1 (one)	Energy Storage Feeder (ESF)	1500 A Battery connection With 2000A 3WL Isolator
1 (one)	ILC Bus tie	2000A DC with motor operated isolator Integrated monitoring and protection
2 (two)	Propulsion variable frequency drive	For 858 kW Thruster Max 1025A/ 1x 1000kW modules with motor operated isolator and DC Precharge.
1 (one)	Cooling skids	48 kW heat exchanger with dual Pump, input temperature 10°C - 15°C

SIDE VIEW



**Figure 5:** Side view dimension drawing



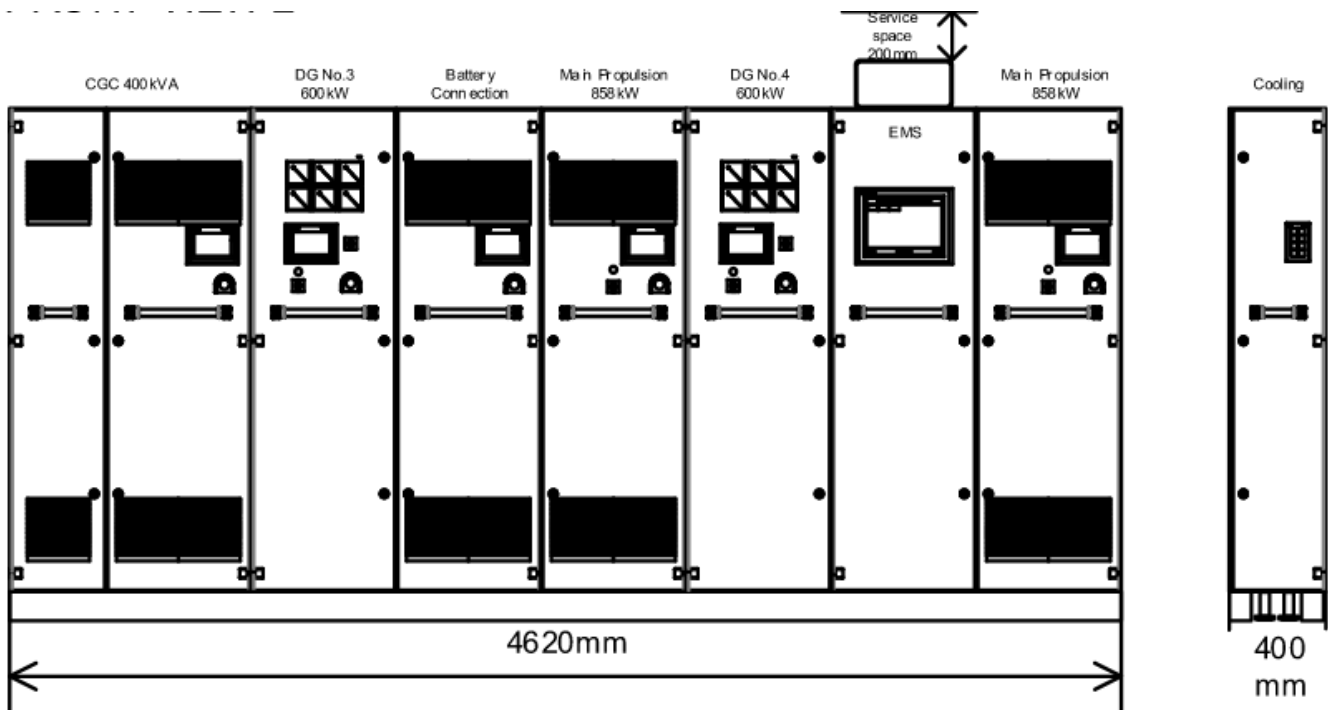
**Figure 6:** Preliminary front and rear dimension drawing SWBD #1

**8.6.2 SWITCHBOARD #2 DETAILS AND LAYOUT**

**Table 5:** Modules included in switchboard

Qty.	Module	Data
2 (two)	Generator incomer module	600 kW with diode rectifier and generator control
1 (one)	Shipnet supply (Clean Grid Converter)	450 kVA with 600V external pre-charge.
1 (one)	Energy Storage Feeder (ESF)	1500 A Battery connection With 2000A 3WL Isolator
1 (one)	Bus tie isolator	3950A bustie isolator manual operated with fuse protection
1 (one)	Energy Management System	EMS Cabinet for control
2 (two)	Propulsion variable	For 858 kW Thruster

Qty.	Module	Data
	frequency drive	Max 1025A/ 1x 1000kW modules with motor operated isolator and DC Precharge
1 (one)	Cooling skids	48 kW heat exchanger with dual Pump, input temperature 10°C - 15°C



**Figure 7:** Preliminary front and rear dimension drawing SWBD #2

**Note:** Final cubicle arrangement will be determined during construction by EDBG, TX DOT, and Siemens Energy

**8.7 BLUEVAULT ENERGY STORAGE – BATTERY SYSTEM**

The suggested system includes Siemens Energy Blue Vault™ battery system(s) for connection to the BDPC switchboard and controlled by the Energy Management System.

The cost related to assemble and installation work to be performed is not included in the Siemens Energy scope of supply.

Refer to [ATTACHMENT C](#) for preliminary General Arrangement of the BlueVault Battery System

**8.7.1 Operational Profile and Clarifications**

The calculated battery size is based on the following operational profile and requirements:  
“SF201694711\_Battery lifetime summary v2”

**Table 6:** Power load profile used as basis for capacity sizing

<i>Mode</i>	<i>Power [kW]</i>	<i>Time [min]</i>	<i>Energy [kwh]</i>
Maneuvering	550	8	73
At cruising speed	2000	16	533
Berthing	280	12	56
Total	2730	36	662

**Operating limitations to optimize battery lifetime**

The battery lifetime is depending on how the batteries are operated. To optimize the battery lifetime, certain limitations are set for battery operation concerning charging and discharging current and power, and battery energy level. The Depth of Discharge (DoD) should be limited, and the State of Charge (SoC) should be kept within a limited interval and at an average level of approx. 35%.

**8.7.2 Technical specifications for BlueVault Energy Storage System**

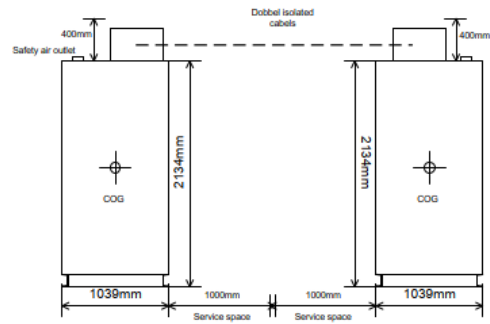
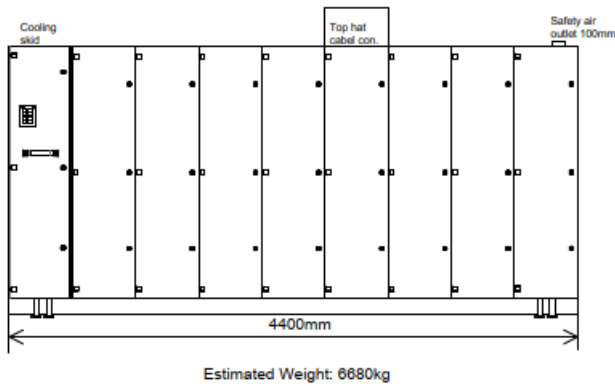
Note: Nominal energy, charging and discharging power values are rounded for simplicity reasons.

**Table 7:** Battery specifications

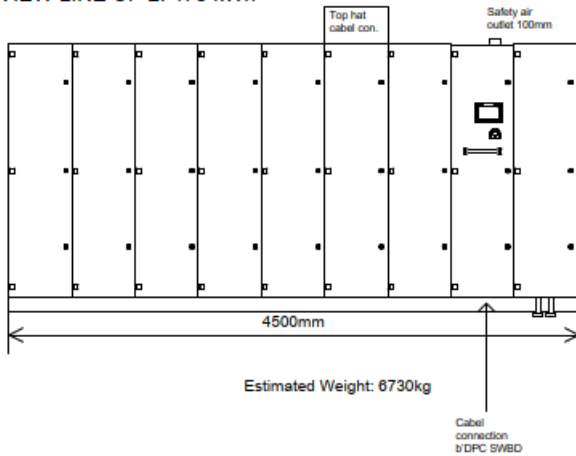
Data	Value/type	Comment
Nominal energy	2 x 949 kWh	Note: Available energy is dependent on load profile and State of Health (SoH). Depth of Discharge (DoD) for the batteries has to be limited to a value based on load profile.

Data	Value/type	Comment
State of Charge interval	55%-85%	State of Charge (SoC) has to be kept within the interval for the given profile throughout the design lifetime. The interval shall be smaller at beginning of operation than at end of life.
Max charging power into batteries	3500 kW	This is a general maximum value, not design criteria for design life. Value based on 1,9 CP (constant power)
Operational charging power into batteries	1040 kW normal weather	Battery power after charging losses
Operational discharging power out of batteries	1120 Kw normal weather	Battery power after discharging losses
Max discharging power out of batteries	2000kW	With minimum SOC 65%. Emergency transit 20minutes.
Cooling method	Water cooled	10-16°C chilled water inlet temperature, provided by Yard
Degree of protection	IP22	
Dimensions W x D x H [mm]	According to Figure 8 & 9	Preliminary
Weight with racking	According to Figure 10	Approx.

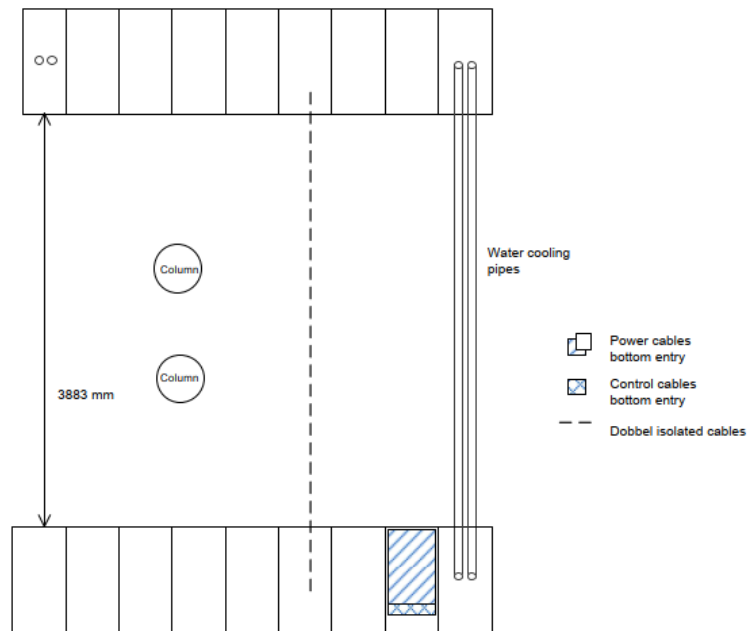
FRONT VIEW LINE UP 1: 475 kWh



FRONT VIEW LINE UP 2: 475 kWh



FOOTPRINT: Front to front solution



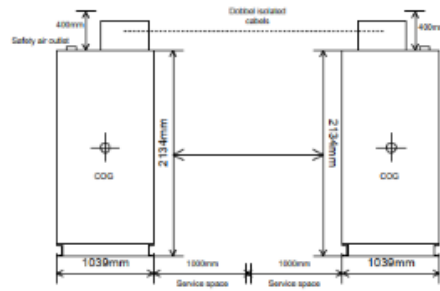
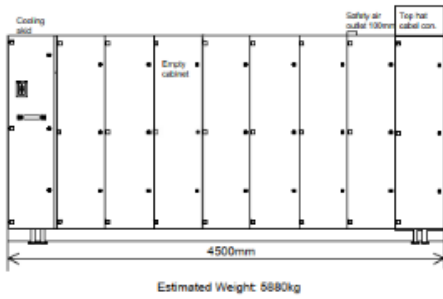
Total Battery Energy: 949,6 kWh

Figure 8: Preliminary battery GA, Battery Room #1

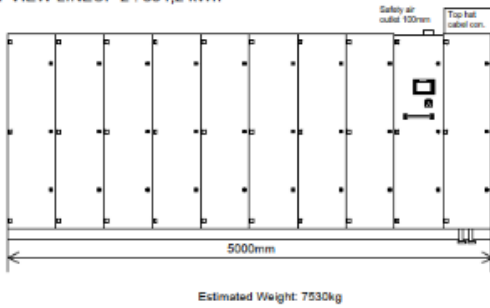
**Battery System - General arrangement Battery room 2**

SIDE VIEW

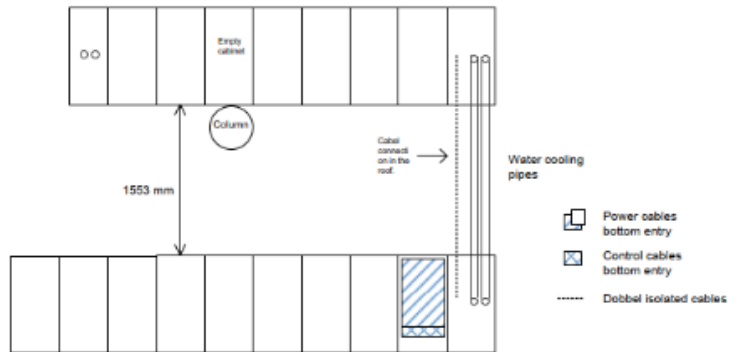
FRONT VIEW LINEUP 1 : 415,5kW



FRONT VIEW LINEUP 2 : 534,2 kWh



FOOTPRINT: Front to front solution



Total Battery Energy: 949,6 kWh

**Figure 9: Preliminary battery GA, Battery Room #2**

PRELIMINARY

**Preliminary cooling data:**

**A** External cooling water inlet temperature  
 With cooling skid: 5-15°C

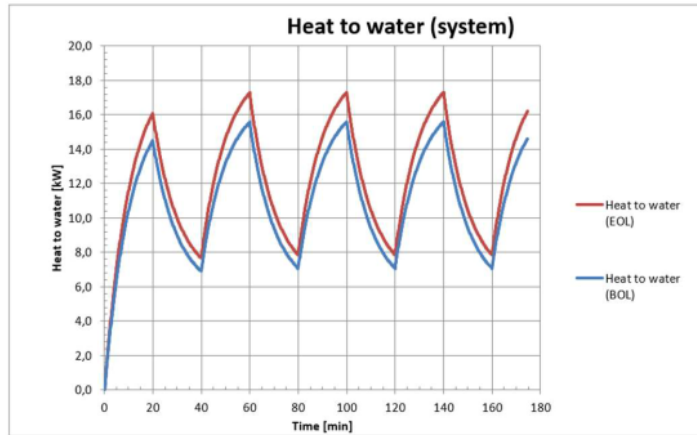
**B** Losses to Water per system (peak)  
 12.1 kW EOL  
 10.9 kW BOL

**C** Losses to Air per system (average)  
 7 kW

**D** Cooling fluid (internal flow)  
 Flow 144 l/min  
 Fresh water free from floating particles and mineral salts.  
 Internal pressure drop approx 0.68 bar  
 When using circulation cooling skid, external water temp and flow:  
 10-16.5degC

**E** Color RAL7032  
 IP22/44

**F** Ambient Temperatur  
 20-25°C



<table border="1"> <tr><td>REV</td><td>Updated with cooling data</td><td>08.11.20</td><td>JWJ</td><td></td><td></td></tr> <tr><td>REV</td><td>Updated proposal</td><td>08.11.20</td><td>JWJ</td><td></td><td></td></tr> <tr><td>REV</td><td>Proposed</td><td>08.09.20</td><td>JWJ</td><td></td><td></td></tr> <tr><td>REV</td><td>Issued</td><td></td><td></td><td></td><td></td></tr> </table>		REV	Updated with cooling data	08.11.20	JWJ			REV	Updated proposal	08.11.20	JWJ			REV	Proposed	08.09.20	JWJ			REV	Issued					Client TXDOT Ferry - Retrofit	Supplier <b>SIEMENS</b>	Title Battery rack General Arrangement	Tag no. -	P.O.Number -	
REV	Updated with cooling data	08.11.20	JWJ																												
REV	Updated proposal	08.11.20	JWJ																												
REV	Proposed	08.09.20	JWJ																												
REV	Issued																														
			Subsupplier	Hull No. -	SDL Code -	Scale -	Siemens Desig. no. 20-1XVUYDS																								
					SPI -	DWG Size A4	Project Desig. no. -	Rev. 1A1																							
								Sheet 1																							
								Sheets 2																							

**Figure 10:** Preliminary cooling data calculated for one system



**8.7.3 Technical specifications for BlueVault Energy Storage System cooling skid**

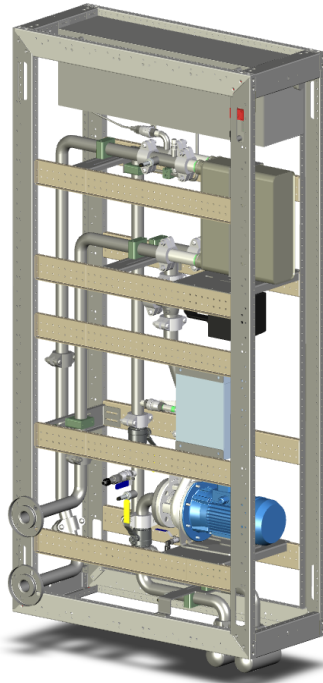
The cooling skid ensures that each battery system is supplied with cooling liquid of the correct type, flow rate, pressure and temperature. The cooling circuit of the battery is separated from the ship's cooling system in a closed loop, allowing a wide range of water temperature, water quality and pressure on the raw water side. The temperature and flow rate are automatically regulated based on measurements from the cooling skid and the current operation state of the battery system.

The cooling skid includes the following components

- Circulation pump
- Three-way valve for temperature regulation
- Expansion vessel with level indicator and level switch
- Temperature and pressure sensors
- Heat exchanger

**Table 8:** Technical specification – cooling skid

Data	Value/type	Comment
Maximum cooling capacity	84 kW	
Main circuit flow	65 – 280 l/min	
Dimensions (WxDxH)	400 x 1000 x 2000 mm	
Aux supply voltage	3x220V	
Aux supply current	8-9A	Range
Weight with water	133 kg	
Water volume	37 liters	
Raw water pressure	Max 10 bar	
Raw water temperature	10 – 16 °C	Chilled water inlet
Raw water pressure drop	Max 0,8 bar	
Raw water flow	Max 280 l/min	
Maximum particle size	1 mm	
External flange	DN32	



**Figure 11:** Illustrational drawing of standard cooling skid for BlueVault Energy Storage System

#### 8.7.4 Notes and requirements

Additional detailed requirements for the battery system and battery room will be provided in early Engineering phase.

- Yard must provide a dedicated exhaust system for the battery with piping, EX-fan and gas sensor according to *Battery Room Requirement* document provided during Engineering phase. Fan to be continuously running.
- Ventilation in the room must ensure that condensation is avoided for the liquid cooled batteries, the temperature shall therefore be 20 - 25°C with a relative air humidity at max 65%. Liquid cooling quality according to *Battery Room Requirement* document.
- There shall be no other high temperature sources in the battery room.
- Equipment in the battery room does not need to be EX-certified
- Power cables between the batteries and the switchboard are to be double isolated without screen.
- DC Power between battery room cabinets and between batteries and BDPC are not included in Siemens Energy scope of supply.
- A pressure relief valve at 2,5 bar shall be installed before the battery system inlet – yard supply.
- Piping shall be of Stainless Steel
- At end of design life for the battery system, the Purchaser is responsible for return of battery modules according to the applicable regulations in the relevant country.
- Siemens Energy will deliver battery modules separately from the battery cabinets. Yard is responsible for battery cabinets and battery cubicles installation.

## 9 THRUSTER AND PROPULSION CONTROL SYSTEM

The main objective of the Thruster and Propulsion Control System is to control the propulsion and thrust units in a vessel, and to interface with the vessel's maneuvering and control systems. Thruster remote control is based on two steering positions.

- 1 main steering position on bridge forward
- 1 main steering position on bridge aft
- 1 emergency steering position on EOS.

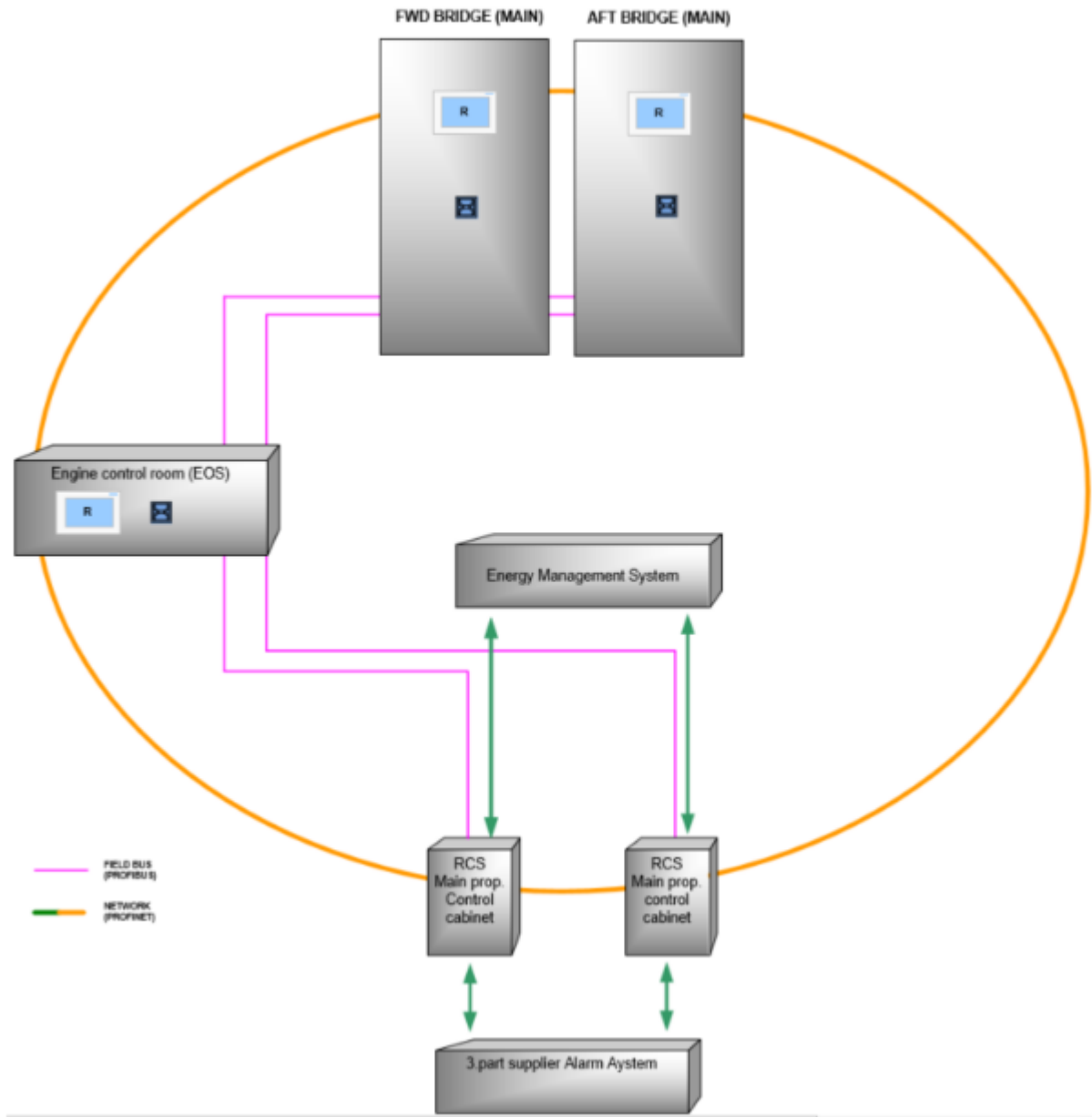
The Remote Control System is an independent system that interfaces with IAS, EMS and drives units by bus interface. Scope of supply is:

### Hardware included in scope of supply

ID	Qty	Description
09-002	2	Medium controller cabinet with I/O for thrusters or main propulsions
09-003	2	Hardware for pitch or gear control
09-105	2	Dual lever for two main propulsion
09-122	4	Backup control on levers for main propulsions (FFU)
09-131	2	Common parts for bridge or ecr consoles (with power supplies)
09-132	2	Emergency stop panel for thrusters and main propulsions.
09-134	2	Operation and alarm monitor for consoles 9"

### Interfaces included in scope of supply

ID	Qty	Description
09-201	1	HW I/O interface to autopilot for main propulsions
09-202	1	Interface VDR with NMEA
09-203	1	Interface conning with NMEA
09-205	1	Interface to external automation and monitoring system with
09-209	1	Sea current or speed log interface (NMEA) ET200
09-222	1	GPS sensor interface (NMEA) ET200



**Figure 12:** Preliminary RCS topology

## 10 ECOMAIN BLUE - HISTORIAN

The digitalization solution has the following main component:

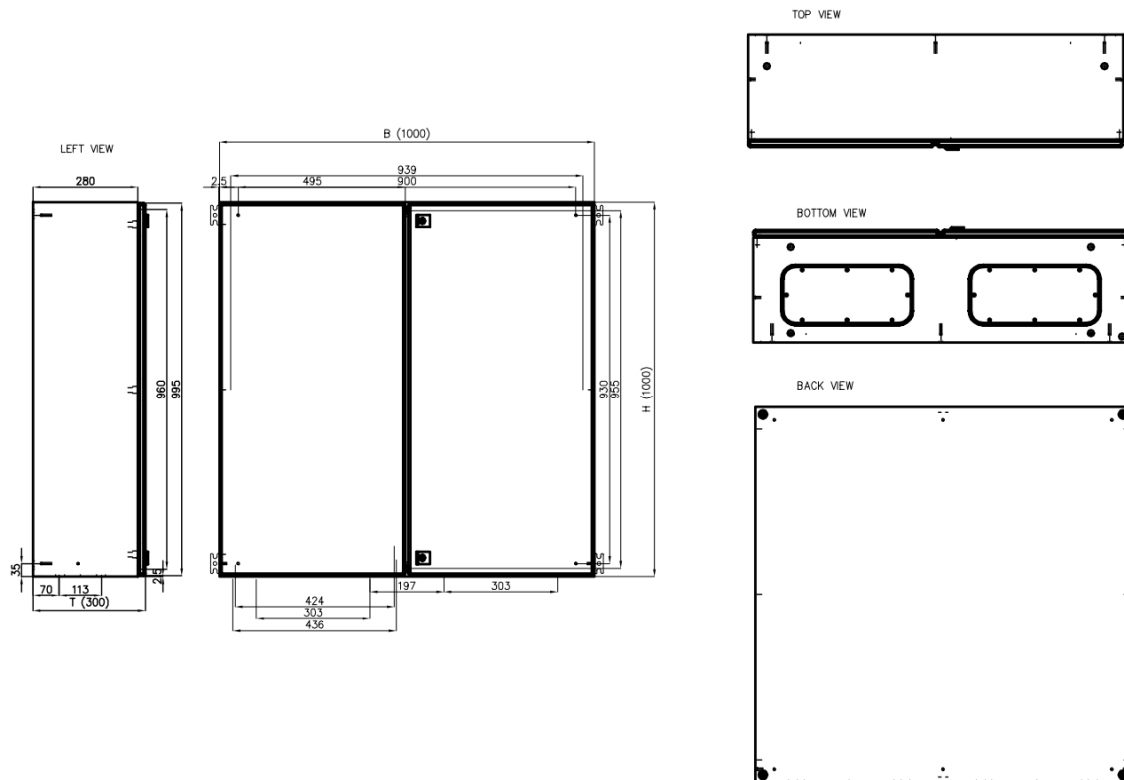
- EcoMAIN Blue - Historian Collection and logging of data with trend viewer
- Application – Ferry Dashboard and Cloud Energy Consumption Reports

Historian for logging locally on the Vessel is integrated in the different products/systems offered.

The hardware is included in the RDS cabinet.

## 11 REMOTE DIAGNOSTIC SYSTEM (RDS)

A Remote Diagnostic System is included for a safe and encrypted connection between the vessel and Supplier's Onshore Service Department. The connection is made by the existing onboard internet connection through the vessels V-SAT and requires activation by onboard crew. The solution can be used for diagnostics, when fault situations occur as well as for planned maintenance. This system ensures rapid assistance during working hours and with a service agreement also outside working hours.



**Figure 13:** Preliminary GA drawing - Combined for EcoMAIN Blue and Remote Diagnostic System

## 11.1 Cellular Gateway

Siemens Energy has included a Qty (1) Peplink MAX-BR1-MINI-LTEA-W-T Industrial grade 4G Cellular Router for RDS connection. This system includes an external antenna and RF cable between antenna and router.

### 11.1.1 Comments & clarifications

- Siemens Energy will only provide the hardware for the cellular gateway. The end customer is responsible for finding and setting up a cellular service with a wireless network provider with a SIM card. Monthly charges will apply
- Siemens Energy will provide the cable between the external antenna and the cellular router. The ethernet cable (CAT6 or similar) between the router and the RDS cabinet is not in the scope of supply.
- Hardware installation and cable routing is not in the scope of supply of Siemens Energy

## 12 AC Marine Switchboards, Panelboards, and motor starters

### 12.1 GENERAL DESCRIPTION FOR MARINE SWITCHBOARDS.

The marine switchboards will be type tested, built of solid steel construction with framework of steel profiles and covered with front and rear steel doors and side plates. The switchboard will be enclosed and self-supporting for deck or bulkhead mounting. The switchboard will be equipped with standardized electrical and mechanical components and to be correctly dimensioned both thermally and mechanically. Interlocking devices, barriers and other constructional details will be incorporated to eliminate the risk of contact with "live" parts.

The following documentation was used to create the preliminary design of the switchboards.

- 20050-002-320-1P4 AC Electrical One-Line Diagram.pdf
- 20050-001-320-1P1-Electrical One-Line Removals.pdf

For details on the designs, see [ATTACHMENT D](#) for the preliminary data and preliminary layout drawings.

Switchboards included in Siemens Energy scope of supply:

- Qty (1) Ship Service Switchboard, 600V, 60 Hz
- Qty (1) Emergency Switchboard 600V, 60 Hz

#### 12.1.1 600V Ship Service Switchboard

##### EQUIPMENT DESCRIPTION

Technical Data - SEE [ATTACHMENT D](#) for Dwg's and SWBD details

- Nominal Voltage: 600VAC
- Rated Frequency: 60 Hz
- Rated short-time current: 35kA
- Estimated plant weight: To be finalized during construction
- Ambient Temp: 45 Degrees C
- Color: RAL7035
- Degree of Protection: IP 31
- Design: Single Front

## 600V SHIP SERVICE SWITCHBOARD

	BUSSING:
1	LOT SILVERPLATED COPPER MAIN BUS
1	LOT SILVERPLATED COPPER GROUND BUS
1	LOT INSULATORS
1	LOT LEXAN SHEET INSULATION
	600V MOLDED CASE CIRCUIT BREAKERS:
3	CIRCUIT BREAKER HARDWARE MOUNTING CHANNEL 5-CB
1	CIRCUIT BREAKER AUXILIARY SWITCH, 3VA99780AA12
1	CIRCUIT BREAKER, 600V, 125AF, 3VA61407HN310AA0, 3P, 15AT, 35K
2	CIRCUIT BREAKER, 600V, 250AF, 3VA61157HN310AA0, 3P, 150A, 35K
1	STORED ENERGY MOTOR OPERATOR, 3VA92770HA20 (250A)
1	CIRCUIT BREAKER, 600V, 125AF, 3VA61157HN310AA0, 3P, 100AT, 35K (SP)
1	CIRCUIT BREAKER, 600V, 400AF, 3VA63407HN310AA0, 3P, 400AT, 35K
1	CIRCUIT BREAKER, 600V, 125AF, 3VA61157HN310AA0, 3P, 90AT, 35K
3	CIRCUIT BREAKER, 600V, 250AF, 3VA62257HN310AA0, 3P, 175A, 35K
9	CIRCUIT BREAKER PLUG-IN KITS, 3P 3VA91430KP00/3VA92430QE00 225A
1	CIRCUIT BREAKER PLUG-IN KITS, 3P 3VA93430KP00/3VA94730QE00 400A
1	CIRCUIT BREAKER UVT 3VA99780BB24
1	CIRCUIT BREAKER SHUNT TRIP 3VA99780BA22
	POWER CIRCUIT BREAKERS
2	INCOMING, 800A SIEMENS POWER CB 480V, 65KA EODO, 3WL1112-3EB31-1AA2-Z,A61,U01
2	LT,ST,INST STATIC TRIP
2	BELL ALARM-HAND RESET
2	SHUNT TRIP
2	UVT INSTANTANEOUS
2	4 STAGE AUX SW
2	4 STAGE TOC SW
1	BUS TIE, 800A SIEMENS POWER CB 480V, 65KA EODO, 3WL1112-3EB31-1AA2-Z,A61,U01
1	LT,ST,INST STATIC TRIP
1	BELL ALARM-HAND RESET
1	SHUNT TRIP
1	UVT INSTANTANEOUS
1	4 STAGE AUX SW
1	4 STAGE TOC SW
	CONTROL POWER TRANSFORMERS:
1	LOT CONTROL POWER TRANSFORMER
	CURRENT TRANSFORMERS:
1	LOT CURRENT TRANSFORMER



	ENCLOSURES / STRUCTURES:
2	ENCLOSURE 84Hx30Wx36D (INCOMING)
1	ENCLOSURE 84Hx18Wx36D (DISTRIBUTION)
3	ENCLOSURE HANDRAILS
6	ENCLOSURE BACK BARS
2	ENCLOSURE DOORSTOP BRACKETS
1	LOT ENCLOSURE THUMB SCREWS
	FUSE HOLDERS & FUSES:
1	LOT FUSE HOLDERS & FUSES
	INDICATORS:
3	ENCLOSURE 120V LED LIGHT BANNER #BA-WLB322C5700M/#BA-LOMAC-306B
2	GROUND DETECTION LIGHTS, 480 OR 240V
3	POWER AVAILABLE INDICATING LIGHT, WHITE LED 230VAC M22-L-W-W (C-H)
1	SHORE POWER IN USE INDICATING LIGHT, GREEN LED 230VAC M22-L-G-230G (C-H)
1	IN PHASE INDICATING LIGHT, GREEN LED 230VAC M22-L-G-230G (C-H)
1	OUT OF PHASE INDICATING LIGHT, RED LED 230VAC M22-L-R-230R (C-H)
1	AUTO MODE INDICATING LIGHT, BLUE LED 230VAC M22-L-B-230B (C-H)
1	LOCAL MODE INDICATING LIGHT, BLUE LED 230VAC M22-L-B-230B (C-H)
	INSTRUMENT SWITCH:
3	AMMETER SWITCH
3	VOLTMETER SWITCH
3	CB OPEN ILLUM. PUSHBUTTON EATON M22S-DL-G-K11-230G, 22MM COMPLETE
3	CB CLOSE ILLUM. PUSHBUTTON EATON M22S-DL-R-K11-230R, 22MM COMPLETE
	DOCUMENTATION:
6	INSTRUCTION MANUALS
	METERS:
3	AMMETER, DUAL SCALE
3	Model: PCDS2N1FM Dual HZ Meter, 96mm
3	PCDE962N1ACV Dual AC Voltmeter, 96mm
3	DIGITAL MULTIFUNCTION METERS Siemens Furnished
	NAMEPLATE:
1	LOT NAMEPLATE
	CONTROL RELAYS:
1	LOT CONTROL RELAY
1	LOT MACHINE TOOL RELAY
2	DIODE BEST BATTERY
	PROTECTIVE RELAYS:
2	PHASE SEQUENCE RELAY
1	MANUAL/AUTO SWITCH
	INSULATION MONITOR & INDICATOR:

1	INSULATION MONITORING RELAY
1	MEGOHMMETER
	POTENTIAL TRANSFORMERS:
1	LOT POTENTIAL TRANSFORMER
	SIEMENS VENDOR FURNISHED POWER MANAGEMENT, REMOTE I/O AND HMI :
1	LOT SIEMENS FURNISHED PLC EQUIPMENT
	TRANSDUCERS:
3	VOLTAGE TRANSDUCER 4-20MA
3	CURRENT TRANSDUCER 4-20MA
	TERMINAL BLOCKS:
1	LOT TERMINAL BLOCK
1	LOT CT SHORTING TERMINAL BLOCK
	WIRE:
1	LOT WIRE DUCT WITH COVER
1	LOT WIRE MARKER
1	LOT WIRE 14/41 SIS

## 12.1.2 600V Emergency Switchboard EQUIPMENT DESCRIPTION

Technical Data - SEE [ATTACHMENT D](#) for Dwg's and SWBD details

- Nominal Voltage: 600VAC
- Rated Frequency: 60 Hz
- Rated short-time current: 22kA
- Estimated plant weight: To be finalized during construction
- Ambient Temp: 45 Degrees C
- Color: RAL7035
- Degree of Protection: IP 31
- Design: Single Front

12	BUS 0.75X.125 1BR210A .36#/FT
36	BUS 1X.25 1BR410A .96#/FT
20	INSULATORS, GLASTIC 1603-1D, 600V
1	INSULATION, SHEET LEXAN 1/8 X 48 X 96
	<b>480V MOLDED CASE CIRCUIT BREAKERS:</b>
2	CIRCUIT BREAKER HARDWARE MOUNTING CHANNEL 5-CB
3	CIRCUIT BREAKER AUXILIARY SWITCH, 3VA99780AA12
1	CIRCUIT BREAKER, 480V, 125AF, ED63M015, 3P, 15AT, 18K
1	CIRCUIT BREAKER, 480V, 250AF, 3VA63256HL310AA0, 3P, 225A, 22K
2	CIRCUIT BREAKER, 480V, 400AF, 3VA63406HL310AA0, 3P, 400AT, 22K
1	CIRCUIT BREAKER, 480V, 400AF, 3VA63406HL310AA0, 3P, 400AT, 22K (BUS TIE)
1	CIRCUIT BREAKER, 480V, 400AF, 3VA63256HN310AA0, 3P, 400AT LSI, 22K (EMG GEN)
2	MOTOR OPERATOR, 3VA92670HC30
2	CIRCUIT BREAKER PLUG-IN KITS, 3P PC2657/PC2658 125A
2	CIRCUIT BREAKER PLUG-IN KITS, 3P 3VA91430KP00/3VA92430QE00 225A
8	CIRCUIT BREAKER PLUG-IN KITS, 3P 3VA93430KP00/3VA94730QE00 400A
2	CIRCUIT BREAKER UVT 3VA99780BB24
2	CIRCUIT BREAKER SHUNT TRIP 3VA99780BA22

1	ENCLOSURE 120V LED LIGHT BANNER #BA-WLB322C5700M/#BA-LOMAC-306B
1	ENCLOSURE 72"Hx36"Wx20"D (EMG. GEN.)
1	ENCLOSURE HANDRAILS
1	ENCLOSURE DOOR STOP BRACKETS
	INDICATORS:
1	ENCLOSURE 120V LED LIGHT BANNER #BA-WLB322C5700M/#BA-LOMAC-306B
2	GROUND DETECTION LIGHTS 480V
2	POWER AVAILABLE INDICATING LIGHT, WHITE LED 230VAC M22-L-W-W (C-H)
1	BREAKER OPEN INDICATING LIGHT, GREEN LED 230VAC M22-L-G-230G (C-H)
1	BREAKER CLOSED INDICATING LIGHT, RED LED 230VAC M22-L-R-230R (C-H)
1	AUTO MODE INDICATING LIGHT, BLUE LED 230VAC M22-L-B-230B (C-H)
	INSTRUMENT SWITCH:
1	AMMETER SWITCH
1	VOLTMETER SWITCH
1	FREQUENCY METER SWITCH
	DOCUMENTATION:
3	INSTRUCTION MANUALS
	INSULATION, MONITOR & INDICATOR:
1	INSULATION MONITORING RELAY, 1 CHANNEL, DIEF
	CONTROL SWITCH:
1	TEST/MANUAL/AUTO 3 POSITION SELECTOR SWITCH EATON #M22-WRK3-K22
1	EMERGENCY STOP PUSHBUTTON EATON M22-DP-R-K11, 22MM COMPLETE
	CONTROL RELAYS:
10	RELAY 4POLE 10A DC SIEMENS 3TH40-40-0B
	METERS:
1	AMMETER, 4½", 1% CLASS, XFMR RATED PC&S #LS1105800A
1	FREQUENCY, 4½", 1% CLASS, 120V PC&S #LS110HZ4561
1	VOLTMETER, 4½", 1% CLASS, 0-300V FV PC&S #LS110150600V
1	WATTMETER, 4½", 1% CLASS, 3P3W 5A CT PC&S #LS110KW34
	NAMEPLATE:
20	NAMEPLATE
	POTENTIAL TRANSFORMERS:
5	POTENTIAL TRANSFORMER MOD 465 480V, 600V, 150VA, NOT FUSED PROGRAMMING
	RELAYS:
1	DGC-2020, DIGITAL GEN SET CONTROLLER BASLER
1	GROUND OVERCURRENT RELAY
8	RELAY 2PDT RR2BAU-12 OR 24VDC W/SKT&CLIP
	TERMINAL BLOCKS:
50	TERMINAL BLOCK AMP 20A 1P
1	TERMINAL BLOCK CT SHORTING KUSC4
	WIRE:
10	WIRE DUCT WITH COVER 1" X 1"
10	WIRE DUCT WITH COVER 1" X 2"
10	WIRE DUCT WITH COVER 2" X 3"
250	WIRE MARKER
400	WIRE 14/41 SIS

## 12.2 MARINE PANELBOARDS

The following documentation was used to create the preliminary design of the panelboards.

- 20050-002-320-1P4 AC Electrical One-Line Diagram.pdf
- 20050-001-320-1P1-Electrical One-Line Removals.pdf

Panelboards included in Siemens Energy scope of supply:

- Qty (1) Main Distribution, LD Panel, 208/120V, 400A, 42 Poles, NEMA 3R
- Qty (1) Distribution Panel P7, 208/120V, 100A, 42 Poles, NEMA 3R
- Qty (2) Distribution Panel UPS1-1 & UPS2-1, 230V, 100A, 42 Poles, NEMA 3R, with Ammeter and test push button
- Qty (2) Distribution Panel UPS1-2 & UPS2-2, 230V, 100A, 30 Poles, NEMA 3R

### 12.2.1 Main Distribution LD Panelboard – Details

#### MAIN DISTRIBUTION LD--PANELBOARD P2

- 1 - SECTION  
P2C42ML400FTS, SYSTEM VOLTAGE: 208Y/120 3Ø 4W WYE AC, IR @ 10,000  
AIC, TOP FEED, SURFACE MOUNT, BUS RATING: 400A, BUS MATERIAL:  
COPPER, PLATING: TIN, NEMA 3R/12 OUTDOOR.
- 1 - INTERIOR W/ 400A MAIN LUG
  - 1 - (1) 4/0-600KCMIL
  - 1 - FRONT
  - 1 - CERTIFICATION - NONE
  - 1 - STD AL/CU GND CONNECTOR
- 8 - 125A /3P-ED4
  - 1 - MARINE 50C CALIBRATION
  - 1 - CATALOG #: ED43M125
- 1 - 100A /3P-BL
  - 1 - MARINE 50C CALIBRATION
  - 1 - CATALOG #: B3100
- 2 - 50A /3P-BL
  - 1 - MARINE 50C CALIBRATION
  - 1 - CATALOG #: B350
- 3 - BL/BQD PROVISION  
ENCLOSURE, CATALOG NUMBER WP50
  - 1 - WP 3R/12 ENCL ASSY-50HX5.75D, 20 WIDE
  - 1 - AMMETER WITH PUSHBUTTON

## 12.2.2 P7 Panelboard – Details

### PANEL P7--PANELBOARD P1

- 1 - SECTION  
P1C42ML125CTST, SYSTEM VOLTAGE: 208Y/120 3Ø 4W WYE AC, IR @  
10,000 AIC, TOP FEED, SURFACE MOUNT, BUS RATING: 250A, BUS  
MATERIAL: COPPER, PLATING: TIN, NEMA 3R/12 OUTDOOR.
  - 1 - INTERIOR W/ 125A MAIN LUG
    - 1 - (1) #6-350KCMIL
    - 1 - SUBFEED/FEEDTHRU PROVISION
    - 1 - FRONT
    - 1 - CERTIFICATION - NONE
    - 1 - STD AL/CU GND CONNECTOR
  - 8 - BL/BQD PROVISION
  - 14 - 15A /2P-BL
    - 1 - MARINE 50C CALIBRATION
    - 1 - CATALOG #: B215
  - 1 - 15A /3P-BL
    - 1 - MARINE 50C CALIBRATION
    - 1 - CATALOG #: B315
  - 1 - 30A /3P-BL
    - 1 - MARINE 50C CALIBRATION
    - 1 - CATALOG #: B330
- ENCLOSURE, CATALOG NUMBER WP44
- 1 - WP 3R/12 ENCL ASSY-44HX5.75D, 20 WIDE

## 12.2.3 UPS1-1 Panelboard – Details

### UPS1-1--PANELBOARD P2

- 1 - SECTION  
P2J42BQ100FTS, SYSTEM VOLTAGE: 240 1Ø 2W NO NEUTRAL AC, IR @  
10,000 AIC, TOP FEED, SURFACE MOUNT, BUS RATING: 250A, BUS  
MATERIAL: COPPER, PLATING: TIN, NEMA 3R/12 OUTDOOR.
- 1 - INTERIOR W/ 100A /2P-BQD MAIN BREAKER
  - 1 - (1) #8-#1 CU / #6-#1/0 AL
  - 1 - FRONT
  - 1 - CERTIFICATION - NONE
  - 1 - STD AL/CU GND CONNECTOR
  - 1 - CATALOG #: BQD2100
- 20 - 20A /2P-ED4
  - 1 - CATALOG #: ED42B020
- 2 - ED PROVISION  
ENCLOSURE, CATALOG NUMBER WP38
  - 1 - WP 3R/12 ENCL ASSY-38HX5.75D, 20 WIDE
  - 1 - AMMETER WITH PUSHBUTTON

## 12.2.4 UPS2-1 Panelboard – Details

### UPS2-1--PANELBOARD P2

- 1 - SECTION  
P2J42BQ100FTS, SYSTEM VOLTAGE: 240 1Ø 2W NO NEUTRAL AC, IR @  
10,000 AIC, TOP FEED, SURFACE MOUNT, BUS RATING: 250A, BUS  
  
MATERIAL: COPPER, PLATING: TIN, NEMA 3R/12 OUTDOOR.
- 1 - INTERIOR W/ 100A /2P-BQD MAIN BREAKER
  - 1 - (1) #8-#1 CU / #6-#1/0 AL
  - 1 - FEED THRU LUG
  - 1 - FRONT
  - 1 - MASTER NP SECURED -ADHESIVE
  - 1 - CERTIFICATION - NONE
  - 1 - STD AL/CU GND CONNECTOR
  - 1 - CATALOG #: BQD2100
- 20 - 15A /2P-ED4
  - 1 - CATALOG #: ED42B015
- 2 - ED PROVISION  
ENCLOSURE, CATALOG NUMBER WP44
  - 1 - WP 3R/12 ENCL ASSY-44HX5.75D, 20 WIDE
  - 1 - AMMETER WITH PUSHBUTTON

## 12.2.5 UPS2-2 Panelboard – Details

### UPS2-2--PANELBOARD P2

QUOTED LEAD TIME : 11 WORKING DAYS

- 1 - SECTION  
P2J30ML125FTS, SYSTEM VOLTAGE: 240 1Ø 2W NO NEUTRAL AC, IR @  
10,000 AIC, TOP FEED, SURFACE MOUNT, BUS RATING: 250A, BUS  
MATERIAL: COPPER, PLATING: TIN, NEMA 3R/12 OUTDOOR.
- 1 - INTERIOR W/ 125A MAIN LUG
  - 1 - (1) #6-350KCMIL
  - 1 - FRONT
  - 1 - CERTIFICATION - NONE
  - 1 - STD AL/CU GND CONNECTOR
- 14 - 20A /2P-ED4
  - 1 - CATALOG #: ED42B020
- 2 - ED PROVISION  
ENCLOSURE, CATALOG NUMBER WP38
  - 1 - WP 3R/12 ENCL ASSY-38HX5.75D, 20 WIDE

### 12.2.6 UPS2-1 Panelboard – Details

#### UPS1-2--PANELBOARD P2

- 1 - SECTION  
P2J30ML125FTS, SYSTEM VOLTAGE: 240 1Ø 2W NO NEUTRAL AC, IR @  
10,000 AIC, TOP FEED, SURFACE MOUNT, BUS RATING: 250A, BUS  
MATERIAL: COPPER, PLATING: TIN, NEMA 3R/12 OUTDOOR.
- 1 - INTERIOR W/ 125A MAIN LUG
  - 1 - (1) #6-350KCMIL
  - 1 - FRONT
  - 1 - MASTER NP SECURED -ADHESIVE
  - 1 - CERTIFICATION - NONE
  - 1 - STD AL/CU GND CONNECTOR
- 14 - 15A /2P-ED4
  - 1 - CATALOG #: ED42B015
- 2 - ED PROVISION  
ENCLOSURE, CATALOG NUMBER WP38
  - 1 - WP 3R/12 ENCL ASSY-38HX5.75D, 20 WIDE

### 12.3 CLARIFICATIONS & EXCEPTIONS

Please note the following:

- Clients are encouraged to visit the facility and inspect equipment during final production tests at no charge. Factory Acceptance Tests are included for Switchboards and motor starters. FAT for panelboards is not included or required by ABS.
- The switchboards interrupting rating is offered as 35Ka and 22Ka. Client to advise any changes required to the interrupting rating upon completion of short circuit studies.
- Switchboards and panelboard feeds were designed using the client supplied single line diagram. Changes to the amount of feeders in the single line will affect the price equipment and / or the dimensions and weights of the equipment

## 13 Distribution Transformers

### 13.1 SHIP SERVICE TRANSFORMERS

The following transformers are included. Each transformer is a dry insulated three phase distribution transformer with natural cooling. The transformer also works as an isolating transformer. The windings do not absorb humidity and are suitable for marine environment. The transformer withstands the dynamic stresses coming from short-circuit currents.

#### 13.1.1 450 kVA CLEAN GRID TRANSFORMER (T1 & T2)

**Included accessories for all distribution transformers**

- 3x2 Pt 100 temperature sensors in windings (1 set as spare)
- 1x Pt100 temperature sensor in core
- Anticondensation heaters – 230V
- Earthed screen between windings
- Cable entry from bottom
- Earthing boundary bolt

**Table 9:** 450 kVA transformer details

<i>Specification</i>	<i>Value/type</i>	<i>Comment</i>
Rated power	450 kVA	
Rated frequency	60 Hz	3 phase
Degree of protection	NEMA 3R/ IP23, air cooled	
Rated primary/secondary voltage	570/600 V	
Winding material	Cu	
Proposed terminations	Prepared for copper	
Type of insulation	Dry type	Heat impregnated
Insulation class	220°C	
Paint finish	ANSI 61 Grey, UL50	
Connection	Delta – Delta	
Ambient temperature	50°C	
Weight approx. [lb]	3100 lb	preliminary
Dimensions W x D x H [in]	59 x 38 x 48.5	preliminary



## 13.2 150 KVA DISTRIBUTION TRANSFORMER (T7)

### Included accessories for all distribution transformers

- 3x2 Pt 100 temperature sensors in windings (1 set as spare)
- 1x Pt100 temperature sensor in core
- Anticondensation heaters – 230V
- Earthed screen between windings
- Cable entry from bottom
- Earthing boundary bolt

**Table 10:** 150KVA transformer details

Specification	Value/type	Comment
Rated power	150 kVA	
Rated frequency	60 Hz	3 phase
Degree of protection	NEMA 3R/ IP23, air cooled	
Rated primary/secondary voltage	600 / 480V	
Winding material	Cu	
Proposed terminations	Prepared for copper	
Type of insulation	Dry type	Heat impregnated
Insulation class	220°C	
Paint finish	ANSI 61 Grey, UL50	
Connection	Delta – Delta	
Ambient temperature	50°C	
Weight approx. [lb]	1050	preliminary
Dimensions W x D x H [in]	32 x 25.5 x 41	preliminary

**13.3 75 KVA DISTRIBUTION TRANSFORMER (T8 & T9)**

**Included accessories for all distribution transformers**

- Anticondensation heaters – 120V

**Table 11: 75 KVA transformer details**

<i>Specification</i>	<i>Value/type</i>	<i>Comment</i>
Rated power	75 kVA	
Rated frequency	60 Hz	3 phase
Degree of protection	NEMA 3R/ IP23, air cooled	
Rated primary/secondary voltage	600 / 208-120V	
Winding material	Cu	
Proposed terminations	Prepared for copper	
Type of insulation	Dry type	
Insulation class	220°C	
Paint finish	ANSI 61 Grey, UL50	
Connection	Delta – Wye-N	
Ambient temperature	50°C	
Weight approx. [lb]	650	preliminary
Dimensions W x D x H [in]	39.5 x 34 x 51.5	preliminary

**13.4 ADDITIONAL INFORMATION**

Please note the following:

- The Yard is to arrange for cable ladders inside of the transformers at its' own cost, if necessary, for power and signal cables.

## **14 Propulsion Motors**

### **14.1 Motor Inspection**

While propulsion motors are not included in the scope of supply, Siemens Energy has included a motor inspection of the existing motors with a full report of the motor conditions.

Siemens Energy recommends performing the inspection early in the project to determine the state of the motors and to determine if any repairs or maintenance necessary.

## **15 Fire Fighting Pump – N/A**

Not included in Siemens Energy scope of supply.

## 16 ***Integrated Monitoring IAS400, Alarm and Control System***

### 16.1 **GENERAL**

Control and Monitoring system IAS400 is Siemens Energy' control and monitoring system for ships with medium level of automation. It is based on the well proven hardware in the Simatic PLC-series of central processing units.

The IAS400 system has a modular design that provides safety in the system architecture. The system is built around redundant Simatic 400 PLCs and a redundant pair of WinCC servers. These core components including operator stations are connected by an optical fiber network ring. The remote input/output cabinets are connected to the redundant PLCs through redundant Profibus communication. Single failures in either of the redundant components or networks will not affect the operators' ability to monitor and control the system. 3rd party serial interfaces are typically connected through single lines in remote I/O cabinets or via managed network switches to the redundant PLCs. Redundant communication to 3rd party interfaces are possible if provided by sub supplier.

The system is scalable in terms of number of operator stations, operator work locations, number of remote cabinets, and thus the number of hard-wired signals, number and types of interfaces. IAS400 comprise a number of built-in functions. See own section for description.

With the same look and feel, the IAS400 system is a part of Siemens Energy Marine Solutions which ensures a common platform for easy integration of numerous different systems and process functions. A typical configuration includes connection to power management system, propulsion system, thruster control system, breakers in the main switchboard, starters in the motor control center, frequency converters and tank level readings

The close integration with the other Siemens Energy systems provide benefits for all parts involved and minimize interface risks and costs for controlling and monitoring the other systems.

See [ATTACHMENT F](#) for detailed scope of supply and typical topology. Below is a summary of the IAS400 scope of supply:

### 16.2 **Scope of supply summary**

This chapter summarizes the scope of supply for the offered solution. Note that quantities are stated for one vessel. Please see chapter [ATTACHMENT F](#) for more information on each item. Each item is easily identified by the ID number.

Figure 13 illustrates typical system topology in a single line diagram.

### 16.3 Summary of hardware delivery

#### 16.3.1 Hardware included in scope of supply

**Table 12:** Summary of hardware included

<i>ID</i>	<i>Quantity</i>	<i>Component</i>
11a-100	5	Operator Stations
11a-101	2	Redundant WinCC Servers
11a-102	1	Printer (ECR / Bridge)
11a-103	2	Main control cabinet with I/O stations
11a-104	20	Optical fiber cable for CPU synchronization [Quantity in meters]
11a-105	0	Large I/O cabinet with I/O stations
11a-106	2	Medium I/O cabinet with I/O stations
11a-107	3	Mounting plate for IAS equipment (ECR / Bridge)
11a-108	0	Extension Alarm System touch panel (ECR / Bridge)
11a-109	0	Extension Alarm System push button panel (cabin and accommodation)
11a-110	0	Dead Man System activation panel
11a-111	0	Dead Man System reset panel
11a-112	40	Total quantity Siemens Energy internal hard wired I/Os
11a-113	400	Total quantity hard wired I/Os for customer and 3 <sup>rd</sup> party systems
11a-114	10	Standardized process areas and pictures (EMS, RCS, IAS)
11a-115	30	Customized process areas and pictures (vessel specific)
11a-116	1	I/O list for Siemens Energy AS scope of supply
11a-117	1	I/O list for I/O scope of 3 <sup>rd</sup> party interfaces
11a-118	1	Completion of Yard HW I/O list (engineering basis to be provided by Yard)
11a-119	1	Documentation according to NS5820
11a-120	1	Classification approval

#### 16.3.2 Available options of hardware delivery

**Table 13:** Available options for hardware delivery

<i>ID</i>	<i>Quantity</i>	<i>Component</i>
11a-150	0	Dual monitor for Operator Stations
11a-151	0	Optical fiber cable for IAS400 network ring
11a-152	1	Control unit for alarm columns
11a-153	4	110dB alarm columns for machinery space (2 in engine room and 1 per propulsion room)
11a-154	0	120dB alarm columns for machinery space
11a-155	0	110dB alarm columns for EX zone
11a-156	0	Mini Alarm Panel for ECR console
11a-157	0	Load Computer
11a-158	0	I/O list for customer / Yard HW I/O scope

**16.4 Summary of serial communications**

Serial communications are communication interfaces between two systems. Serial communication is the process of sending data one bit at a time, sequentially, over a data communication channel or a data bus. Typical serial communication protocols are RS-422, RS-485, Profibus, or Profinet.

Siemens Energy can provide several standard interface communication modules with the Integrated Automation System. The recommended interface type and communication protocols are

:

Protocol	Interface	Comments
Profibus DP/FDL	RS485	Used on several applications e.g. MCC, valves, converters, PMS, Joystick, engines
Modbus RTU	RS485/422	Loadable protocol from Siemens Energy typically used for IAS interface to diesel engines. Siemens Energy configured as Modbus master.
Modbus TCP	Ethernet	Send/receive data using TCP/IP. Typically used for cargo systems, tank systems, load computers, etc.
CanBus		Only used for Siemens Energy interface to Eltorque valves
NMEA	RS422	Typical; Send data on NMEA protocol to voyage data recorder RS422/NMEA/ VDR or Vessel Logbook

Due to the complexity of clarification, set-up and testing of serial communication, this chapter lists the serial communication included in the scope of supply.

**16.4.1 Serial communications included in scope of supply**

**Table 14:** Summary of interfaces included

ID	Quantity	Interface
11a-200	1000	Total number of serial I/Os for power plant, energy management and thrusters
11a-201	To be finalized during construction	Total quantity serial I/Os for customer and 3 <sup>rd</sup> party systems
11a-202	0	Extension Alarm System
11a-203	Red.	Propulsion system drives
11a-204	Red.	Thruster Control System
11a-205	0	Power Management System (PMA300)
11a-206	Red.	Energy Management System (EMS)
11a-207	Red.	Power plant - Main switchboards
11a-208	1	Voyage Data Recorder (VDR)
11a-209	4	Engine interface
11a-210	0	CANBus communication for Eltorque valve actuators (no. of loops)
11a-211	1	RDS - Internet connection for remote diagnostics
Quantity is equal to number of physical interface connections – Qty = “Red.” if redundant interface		

## 16.4.2 Available options for serial communications

**Table 15:** Available options for interfaces

<i>ID</i>	<i>Quantity</i>	<i>Interface</i>
11a-251	0	Modbus TCP to Load Computer
11a-252	0	Other custom interface on request
11a-253	0	Simocode Motor Management and Control
11a-254	0	Other interfaces using Modbus RTU for ET200S
11a-255	0	Other interfaces using ASCII for ET200S
11a-256	0	Auxiliary variable speed drive
11a-257	1	EcoMain
Quantity is equal to number of physical interface connections		

## 16.5 Summary of functionality

### 16.5.1 Functionality included in scope of supply

**Table 16:** Summary of functionality included

<i>ID</i>	<i>Quantity</i>	<i>Functionality</i>
11a-300	0	Extension Alarm System
11a-301	0	Dead Man Alarm System
11a-302	0	Engineer watch call system
11a-303	1	Automatic blocking of alarms
11a-304	1	Manual suppressing of alarms
11a-305	1	Automatic start of standby pumps and fans after failure (duty/standby function)
11a-306	1	Automatic restart of pumps and fans after blackout
11a-307	1	Running hours counting
11a-308	1	Tank sounding system for remote level measurements
11a-309	1	Automatic calculation of tank content
11a-310	1	Automatic calculation of total volume in tanks
11a-311	1	Exhaust temperatures deviation monitoring
11a-312	1	Integrated logging system
11a-313	1	Integrated trending system
11a-314	1	Exclusive Control
11a-315	1	Degraded network detection (class requirement)
Quantity set to "1" when functionality is included		

### 16.5.2 Available options for functionality

**Table 17: Available options for functionality**

<i>ID</i>	<i>Quantity</i>	<i>Functionality</i>
11a-350	1	Fuel Consumption Logger (FCL)
11a-351	0	Special trend curves
11a-352	1	Calculation and presentation of tank totals
11a-353	1	Dynamic pipelines for specified systems
11a-354	0	Customer defined control function
11a-355	0	HW I/O interface to Bridge Alarm Management System (BAMS)

### 16.5.3 Customer defined functionality

**Table 18: Available options for functionality**

<i>ID</i>	<i>Quantity</i>	<i>Functionality</i>
11a-390	0	Automatic sequence control of machinery, pumps and valves
11a-391	0	Automatic fuel transfer control

## 16.6 SCOPE OF SUPPLY SUMMARY

This chapter summarizes the scope of supply for the described solution. Note that quantities are stated for one vessel.

Figure 14 Diagram illustrates the system topology in a single line diagram.

### 16.6.1 Hardware included in scope of supply

**Table 19: Summary of hardware included**

<i>ID</i>	<i>Quantity</i>	<i>Component</i>
11b-100	5	Operator Stations
11b-101	0	Printer
11b-102	2	Main control cabinet with I/O station
11b-103	2	Remote I/O cabinet with I/O station
11b-104	2	Extension Alarm System touch panel
11b-105	4	Extension Alarm System push button panel
11b-106	0	Dead Man System activation panel
11b-107	0	Dead Man System reset panel
11b-108	To be finalized during construction	Total quantity off Hardwired I/Os for customer, 3 <sup>rd</sup> party systems and Siemens
11b-109	1	I/O list for Siemens Energy AS scope of supply
11b-110	1	Documentation according to NS5820
11b-111	1	Classification approval



**16.7 Summary of serial communications**

Serial communications are communication interfaces between two systems. It is the process of sending data one bit at a time, sequentially, over a communication channel or a data bus. In our context, serial communication is the contrast of hard-wired signals, meaning sensors are directly connected to I/O modules by wire.

Typical serial communication protocols are RS-422, RS-485, CANbus, Profibus, Ethernet or Profinet. Due to the complexity of clarification, set-up and testing of serial communication, this chapter lists the serial communication included in the scope of supply.

The total quantity of serial I/O is fixed as specified below, but a distribution of serial I/Os is estimated in the table.

**16.7.1 Serial communications included in scope of supply**

**Table 20: Summary of interfaces included**

<i>ID</i>	<i>Quantity(I/O)</i>	<i>Interface</i>
11b-200	To be finalized during construction	Total quantity off Serial I/Os for the listed interfaces below
<i>Estimate of I/Os for each interface</i>		
11b-201	40	Propulsion system drive
11b-202	40	Thruster Control System
11b-203	60	Power Management System / Energy Management System
11b-204	40	Main switchboards
11b-205	50	Voyage Data Recorder (VDR)
11b-206	180	Diesel engine
11b-207	10	Simocode Motor Management and Control

**16.8 Summary of functionality**

**16.8.1 Functionality included in scope of supply**

**Table 21: Summary of functionality included**

<i>ID</i>	<i>Quantity</i>	<i>Functionality</i>
11b-300	1*	Extension Alarm System
11b-301	0	Dead Man Alarm System
11b-302	1*	Engineer watch call system
11b-303	1*	Automatic blocking of alarms
11b-304	1*	Manual suppressing of alarms
11b-305	1*	Automatic restart of pumps and fans after blackout
11b-306	1*	Tank sounding system for remote level measurements
11b-307	1*	Automatic calculation of tank content
11b-308	1*	Automatic calculation of total volume in tanks
11b-309	1*	Exhaust temperatures deviation monitoring
11b-310	To be determined during	Integrated logging system, quantity defines number of logs.

ID	Quantity	Functionality
	construction	
11b-311	To be determined during construction	Integrated trending system, quantity defines number of trends.
11b-312	0*	Ferry dashboard route information
11b-313	0*	Engine room automatic ventilation control
11b-314	1*	Remote control of pumps and fans
11b-315	1*	Energy consumption monitoring
* Quantity set to "1" when functionality is included		

## 16.9 System topology

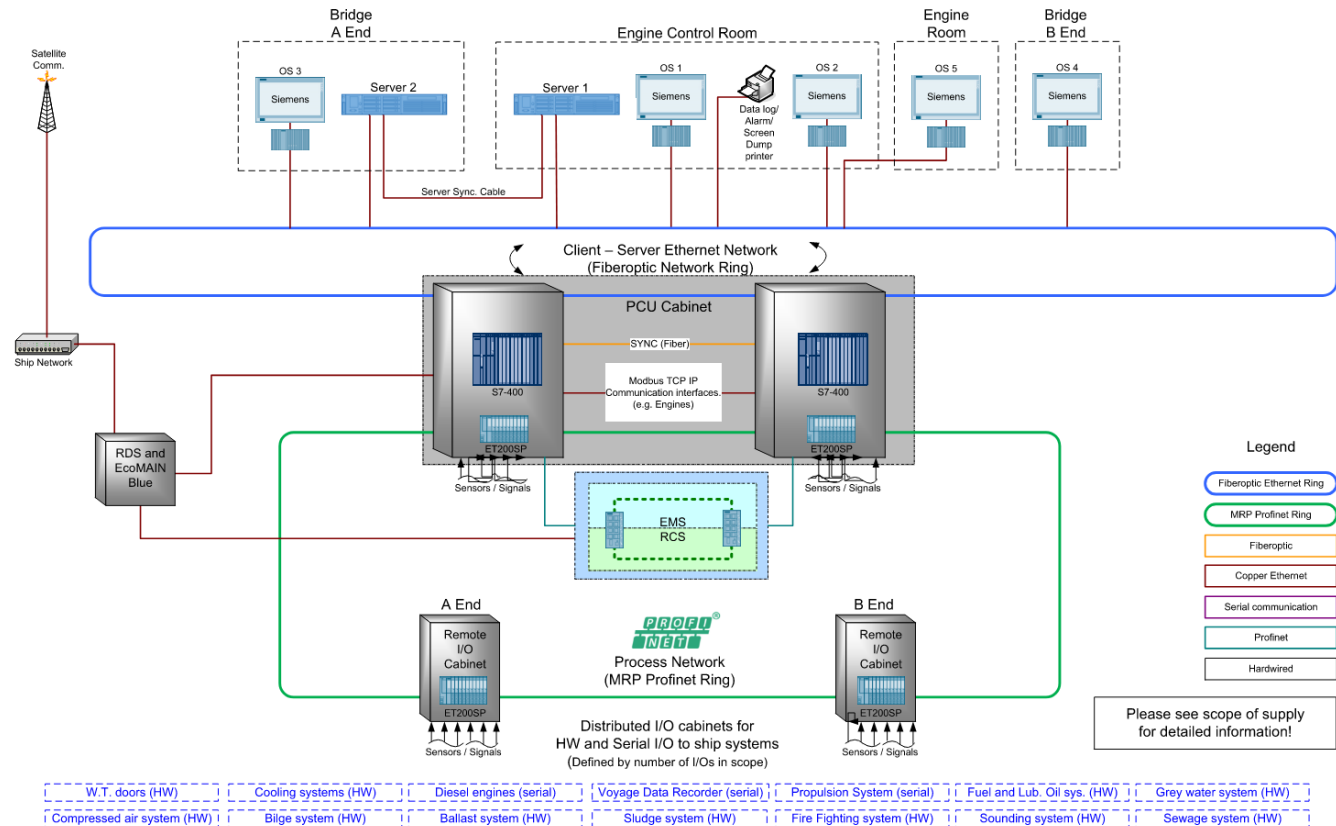


Figure 14: Topology Diagram

## 16.10 SPECIAL PROCESS FUNCTIONALITY

### 16.10.1 Battery Charger

Monitoring of customer furnished battery chargers on board based on finalized I/O list. Total I/O quantity limited to previous total listed above.

**16.10.2 Fire Main & Automatic Sprinkler System**

Indication of alarms only, according to Class, as included in current I/O count. Fire and sprinkler system equipment is not in Siemens Energy scope of supply.

**16.10.3 Fire Detection and Alarm system**

Indication of Alarms only, according to Class, as included in current I/O count. Fire detection equipment is not in Siemens Energy scope of supply.

**16.11 CLARIFICATIONS AND EXCEPTIONS**

Following are clarifications and exceptions

- While full consoles are not in Siemen Energy scope of supply, resurfacing and modifications to the EOS and Pilot House Consoles will be part of the scope.
- Siemens Energy automation system is based on the customer specification. The customer's drawing was used for reference only. Where the specification and drawing conflicts, Siemens Energy followed the customer's specification.

**17 Dynamic Positioning System – N/A**

Not included in Siemens Energy scope of supply.

**18 Navigation and Communication Equipment – N/A**

Not included in Siemens Energy scope of supply.

**19 Loading & Stability System – N/A**

Not included in Siemens Energy scope of supply.

## **20 Project Organization and Administrative Provisions**

### **20.1 PROJECT ORGANIZATION AT SIEMENS ENERGY**

Within thirty (30) days after the contract becomes effective, Siemens Energy will forward a project organization plan for the project. This plan will at least define the Project Manager and the Liaison Engineer for the project with names, address, and phone and fax number.

### **20.2 PROJECT ORGANIZATION BY CUSTOMER**

Within 30 days after the contract becomes effective, the customer shall in written form inform Siemens Energy of the customers' project responsibilities with names, address, phone and fax no.

Additional information on the technical personnel involved is to be informed as needed.

### **20.3 PROJECT MANAGER**

The Project Manager from Siemens Energy and the Project representative appointed by the customer shall be the single point of contact for all correspondence in the project. For technical issues, a Liaison Engineer or other provisions will be used after prior agreement. All commercial issues shall, regardless of this, be made with the Siemens Energy Project Manager. A total of five (5) trips have been included for project review meetings during the engineering design phase to review and clarify the design and deliverables. Additional meetings can be conducted by conference if required.

### **20.4 LIAISON ENGINEER**

A Lead / Liaison Engineer (LE) is included for technical clarifications. He/She will serve as the extended arm of the PM to provide technical assistance for *Siemens Energy scope of supply*. He/She would be involved during the engineering and integration of the equipment to clarify interconnection and installation questions, along with coordination efforts to ensure that commissioning and sea trials are prepared and run smoothly. The LE would be available on site at various times during the project for meetings and clarifications, limited to two (2) trips.

### **20.5 EXCHANGE OF DOCUMENTS AND DOCUMENTATION**

Exchange of administrative documents can be made by mail, fax or email.

Technical documentation for approval and exchange of technical information shall preferably be sent by email.

Drawings shall preferably be on data format DWG, DXF or PDF.

Other technical documents may be on PDF format.

Technical documentation can be drawings, mimic pictures, tables and Word documents.

## 20.6 EXCHANGE OF DOCUMENTS AND DOCUMENTATION

The conditions for engineering during the project execution are defined as follows:

- Siemens Energy will be responsible for the engineering of the scope of supply covered by this contract and that the equipment meets the technical specifications which forms a part of the contract.
- The scope of supply does not include any engineering related to the design of equipment not covered by the contract, nor the function of such equipment (e.g. operational philosophies, field instrument index, hook-up to other equipment, etc) or incorporating this into the documentation from Siemens Energy.
- Engineering for other auxiliary equipment that have to be connected to the equipment from Siemens Energy, is not included.
- The customer shall return approved drawings, including comments if any, back to Siemens Energy within ten (10) working days after receipt, otherwise the delivery time may be delayed. If drawings sent for approval have not been returned within the time limit, the documentation is to be regarded as approved, and the engineering shall proceed. Changes after this time limit will be handled as change orders.
- The customer shall, prior to the start of the engineering of the Alarm and Monitoring System, provide a complete and final I/O-list and process & instrument diagrams for the automation system.
- The customer shall work out and forward to Siemens Energy the complete documentation as stated in this Technical Specification within the defined contractual time limits.
- Siemens Energy will, if required, supply the above-mentioned drawings, technical information and function descriptions to other suppliers.
- Project management and engineering will attend a kick-off meeting to clarify Siemens Energy scope of supply. The kick-off meeting will be attended by two (2) to three (3) Siemens Energy personnel.

## 20.7 DESIGN FREEZE

For the following equipment the customer is to respond on the defined terms of design freeze:

- Generators
- Frequency converters
- Motors
- Switchboards
- Transformers
- Alarm and monitoring system
- Power Management System

Design freeze means that all interfaces, function descriptions and hardware layout and configurations are approved.

***For changes after the design freeze, or missing information from the customer needed by Siemens Energy to issue the necessary documentation for the design freeze, Siemens Energy is entitled to have any extra costs covered by the customer, and postponement of the delivery time.***

These costs may consist of additional work, waiting time, demobilization and mobilization as a result of full or partial failure to comply with these obligations or Design Freeze. Waiting time means the time from demobilization to mobilization.

The parties may agree to the cost consequences and postponed delivery time in an approved Variation Order. A missing approval of a Variation Order Request for the issues defined above do not reduce or eliminate Siemens Energy right to have the extra costs covered by the customer.

## **20.8 DELIVERY OF DOCUMENTATION**

The documentation for the scope of supply will be executed in two parts:

### **20.8.1 *Engineering***

Siemens Energy will issue Engineering documents in 3 sets (unless noted otherwise) consisting of:

- Configuration drawings including ampacity calculations for Siemens Energy supplied equipment.
- Diagram with all connection terminal numbers and functions for outgoing cables. Not including remote (out of Siemens Energy scope) terminations.
- Dimension and installation drawings for all mechanical and electrical equipment in our scope of supply.
  - o As a first step, the dimension drawings will be confirmed for footprints and for interface to other equipment, such as shaft flanges for motors and generators.
  - o As the second step, all other dimensions will be confirmed.
- Drawings for the automation system will be issued in two sets: 1) "Release for manufacture" – approved by the customer and 2) "As commissioned"
- Equipment manuals will be delivered in three (3) sets.

### **20.8.2 *As Commissioned Documentation***

Siemens Energy will issue the as-commissioned documentation within six weeks after commissioning and sea trials are complete. The documentation will be delivered in a format and with numbers as defined in the contract. If this is not defined, the documentation will be delivered in 3 sets of paper copies.

## 20.9 OWNERSHIP OF DRAWINGS, DESCRIPTIONS AND DOCUMENTATION

All drawings and technical documents related to the work submitted by one party to the other prior to or subsequent to the formation of this contract shall remain the property of the submitting party. Drawings, technical documents or other technical information received by one party shall not, without the consent of the submitting party, be used for any other purpose than erection of the plant and commissioning, operation or maintenance of the works. They may not, without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to a third party.

## 20.10 CHANGES AND VARIATION ORDERS

All changes are to be agreed by the parties in form of an approved and signed Change Order (CO). Variation Orders shall include specification, price and schedule impact. No variations or changes are to be carried out until Siemens Energy receives an accepted and signed Change Order.

The customer may request the supplier to issue a Change Order Request.

## 20.11 TESTING

This section describes, per cluster of major equipment, the tests that are included in the scope of work. The aim for this testing is to verify that the physical design of the equipment is correct and to demonstrate compliance with the Contract Specification and Class Requirements of ABS.

### 20.11.1 Factory Testing

Factory Acceptance Tests (FAT) will be executed at the manufacturing facilities. Tests of all equipment, systems and subsystems shall be conducted to demonstrate compliance with the Contract Specification.

Siemens Energy scope includes standard FAT at a Siemens Energy facility. Buyer and owner will be informed about the factory acceptance tests (FAT) including test protocols and procedures and do have the right to participate. Customer witness testing for major equipment is included for the first vessel only. Customer travel and living costs are excluded. Prior to testing, final documentation will be submitted for the equipment, including technical data, certificates and a datasheet on which results of the required tests are to be documented.

**Note:**

In case of type approval for Class Notation, additional type testing for individual machinery at the manufacturer's shop may be required.

The costs for fees of the classification society for factory tests are covered within our scope of supply. If interfaces from subcontractors are to be tested or shown to classification society, the Buyer is responsible for providing all necessary equipment.



**20.11.2 Harbor Acceptance Test (HAT)**

Dock trials and Harbour Acceptance Tests (HAT's) shall be carried out to ensure the correct and safe performance of equipment and systems (as far as this can be demonstrated in harbour and as specified in the relevant chapters of the Contract Specification) and shall demonstrate the readiness of all machinery, equipment and systems necessary for the safe execution of the sea trials. At latest five (5) weeks before the HAT, Siemens Energy will deliver a test program for the relevant equipment and systems, which is to be approved by the Buyer.

**20.11.3 Sea Acceptance Test (SAT)**

Sea trials and Sea Acceptance Tests (SAT) shall be carried out to prove the safe handling and performance of all equipment, systems and subsystems in accordance with the class requirements and the Delivery Specification of the Contract Specification and to demonstrate that the ship is ready for acceptance by the Buyer as specified.

The sea trials shall be carried out under the responsibility of the Buyer. At latest five (5) weeks before SAT, Siemens Energy will deliver a test program for the relevant equipment and systems, which is to be approved by the Buyer.

## 21 **Engineering and Documentation**

Siemens Energy will be responsible for the necessary integration engineering, along with, the complete basic and detailed design for Siemens Energy scope of supply. Siemens Energy has included two (2) review meetings to clarify and finalize the design. These are the initial kick-off and one drawing review / approval meeting.

The electrical as well as mechanical interfaces of the components within our scope of supply will be clarified and specified. The electrical interfaces from Siemens Energy equipment to components delivered by third parties will be clarified.

This contract does not include any engineering related to design of equipment not covered by the contract, nor the function of equipment not within our scope of supply.

All functions and interfaces are based on standards described in the manuals issued by Siemens Energy.

The results of the design and engineering will create the following outgoing documentation.

The following technical documentation will be supplied for our scope of supply.

### 21.1 **GENERAL PROJECT DOCUMENTATION**

The following documents will be delivered in an 8.5 x 11 format with white paper copies. As far as practicable these documents will also be delivered on electronic format/CD-ROM (Portable-Document-Format / pdf and/or Microsoft Office Suite-format or AutoCAD-format, if applicable):

- Contractual supply specification
- Time schedules
- Documentation delivery schedule
- Manufacturing schedule
- Commissioning program including HAT
- Sea trials program
- ABS approved documents for individual Siemens Energy supplied equipment.

### 21.2 **GENERAL TECHNICAL DOCUMENTATION**

The following documents will be delivered in 8.5x11 or 11x17 formats with white paper copies. As far as practicable these documents can also be delivered on electronic format/CD-ROM (Portable-Document-Format / pdf and/or Microsoft Office Suite-format or AutoCAD-format, if applicable):

- Descriptions
- Engineering studies (harmonic, stability, short circuit)
- I/O Lists (Yard to provide initial list)
- Single line diagram for switchboards in Siemens Energy scope

- Data sheets (machinery and aux. services el. supply)
- Testing procedures
- Material list
- Spare parts lists, if applicable
- Terminal diagrams for Siemens Energy equipment
- Circuit diagrams for Siemens Energy scope

It is our understanding that an external connecting diagram / interconnecting diagram for the scope of supply not delivered by Siemens Energy is included in the cable installation package and is not covered by Siemens Energy.

### **21.3 DIMENSION DRAWINGS AND CALCULATION SHEETS**

The following documents will be delivered in binders in 8.5x11 or 11x17 formats with white paper copies. As far as practicable these documents will also be delivered on electronic format/CD-ROM (Portable-Document-Format / pdf and/or Microsoft Office Suite-format or AutoCAD-format, if applicable):

- Dimension drawing, with fixation, load weights
- Dimension drawing of components supplied loose
- Arrangement drawings

### **21.4 FINAL DOCUMENTATION (AS COMMISSIONED)**

The following documents (as build) for Siemens Energy scope of supply will be delivered in binders (3 sets) in 8.5x11 or 11x17 formats with white paper copies. As far as practicable these documents can also be delivered on electronic format/CD-ROM (Portable-Document-Format / pdf and/or Microsoft Office Suite-format or AutoCAD-format, if applicable):

- Data sheets
- Testing results with certificate where applicable
- Material list
- Spare parts lists, if applicable
- Terminal diagrams
- Circuit diagrams with cable tags (provided by the Yard)
- Operation instruction
- Maintenance and / or repair documentation
- Equipment Manuals (3 sets)
- Short circuit calculation
- Power System Harmonic Analysis

## 21.5 SYSTEM STUDIES

Siemens Energy as a Systems Integrator will be responsible for the necessary integration engineering for its scope of supply, along with, the complete basic and detailed design engineering of the offered propulsion and power system as outlined in this specification.

The integration requires, prior to the design and delivery of components, comprehensive calculations and studies of the vessel operation modes of propulsion and ship service output. Possible power plant and switchgear line ups will be considered as well as the impact of the ship service loads. The ship-wide electrical load analysis is not included in Siemens Energy scope of supply.

The Studies will consider the static and dynamic behavior of the power network, including:

- Crash stop maneuver (related to the electrical drives)
- Voltage dip in the network
- FMEA (Failure mode effect analysis) for Siemens Energy scope
- Network voltage harmonic distortion
- Short circuit calculations
- Protective devices selectivity

Computer mathematical models in accordance with IEC or other recognized standards shall be used to determine system stability, harmonic study, short-circuit calculations.

### 21.5.1 **Study Documentation**

The study documents shall be delivered in electronic format/CD-ROM (Portable-Document-Format / pdf and/or Microsoft Office Suite-format or AutoCAD-format, if applicable):

### **21.5.2 Data required for studies**

It is understood that Siemens Energy will furnish the data for Siemens Energy scope of supply. Data for equipment and design not included in Siemens Energy scope of supply is to be provided by the Yard. The following data is needed to conduct the required engineering studies.

- Single line diagrams of the electrical networks 690V, 440V, 230/130V.
- Positive, Negative, and Zero Sequence Source Data for each source (utility, local source) configuration to be considered (the available fault MVA (three phase, single line to ground, and phase to phase), X/R ratio).
- Cable and/or Conductor Data (lengths, sizes, no. per phase). Cable and Conductor Installation Data (raceway type for cable; spacing for conductors)
- Transformer Data (voltage and kVA ratings, impedance (nameplate), X/R ratio, available tap positions/connected tap). If nameplate impedance is unavailable, specified impedance and tolerances should be provided.
- Power Factor Correction/Filter Capacitor Data (rated voltage and MVA of system capacitors)
- Motor and Generator Data (KW/kVA, voltage, full load amperes, service factor)
- Detailed load list of equipment
- Motor Control Center, Switchboard and Panel board Data (manufacturer, model, rated voltage, rated current, breaker/fuse ratings, connected load, demand load, aggregate load power factor, load type (motor, constant power, constant current, constant impedance, or other) data as appropriate)

### **21.5.3 Network Voltage Harmonic Distortion Study**

A computer mathematical model will be used to calculate voltage distortion in the AC distribution system. The study will be performed on those parts of the system that show distortion and quantify the distortion for the purpose of quantifying rectification and filtration requirements, if necessary. The Harmonic Distortion Study will cover the worst-case scenario of the system layout. The study provides:

- A discussion of the methods/software used and anticipated performance of the power system under harmonic conditions.
- A summary of the calculated harmonic voltage and current magnitudes at major system buses.
- A summary of the estimated harmonic currents and power flows on major system branches under expected loading conditions.

- Determination of parallel resonance and system impedance at any harmonic frequency in the power system

#### **21.5.4 Short Circuit Calculation**

A Short Circuit Calculation study will be conducted for all three-phase consumers to determine the short circuit ratings at various parts of the ship's power network and anticipated performance of the power system under short circuit conditions. The study shall be prepared in a format suitable for submission to ABS.

The following data will be required: Transformer (winding connections, grounding method / impedance), Motors (steady state/transient/sub transient reactance's) Generators (sub transient, transient, and synchronous reactance's for positive, negative, and zero sequences), Motor Control Center, Switchboard and Panel board Data (short circuit capacity, breaker/fuse interrupting ratings, trip settings as appropriate).

The study will establish fault levels at major locations, power distribution and component locations to establish equipment design requirements.

#### **21.5.5 FMEA and DVTP**

An FMEA and DVTP are included for Siemens Energy scope of supply only.

All documentation for ABS will be supplied to the Yard. The Yard is responsible for final overall ABS approval at the Yard.

## 22 **Specification of Support, Commissioning, Sea Trials and Training**

The scope of supply includes a *confined* commissioning of the equipment to be delivered by Siemens Energy. Commissioning is based on the following.

### 22.1 **INSTALLATION SUPPORT**

Siemens Energy has included **30 man-days** for installation support. Installation support is limited to **2** trips total among the engineers and a 60-hour work week.

Separately, Siemens Energy has also included **20 man-days** for consoles installation support. Console Installation support is limited to **1** trips total among engineers.

### 22.2 **COMMISSIONING**

The commissioning for the equipment defined in Siemens Energy scope of supply will be accomplished by various engineers and is based on the following per vessel:

Siemens Energy has included **300 man-days** for commissioning of Siemens Energy scope of supply as defined in this document. Commissioning and dock trials is limited to **up to 20** trips total among the engineers and a 60-hour work week.

**NOTE: A man-day is defined as 10 hours per day.**

### 22.3 **DOCK TRIALS, OPERATIONAL TRIALS, AND SEA TRIALS**

- Siemens Energy has included **60 man-days** for trial of Siemens Energy scope of supply as defined in this document. Trials are limited to up to **8** trips total among the engineers and a 60-hour work week.
- Sea trials costs are based on Siemens Energy engineers being back on land at the end of each day.
- Siemens Energy is entitled to perform tests on its own equipment as deemed necessary to verify all functions and performance of the delivered equipment, independent of numbers of days identified in this paragraph.

### 22.4 **TRAINING**

No after delivery training included at this time. Siemens Energy can include training at a later time.

## 22.5 POST START-UP SUPPORT

Due to our long history as a system supplier for integrated electrical systems and automation and monitoring systems in the marine industry, we have extensive experience regarding the life-cycle support services required to support the customer's operation and equipment investment. Our life-cycle services encompass an array of services tailored to pro-actively support the customer with visit to the vessels, dedicated phone support, spares parts, repairs and preferential rates.

The customer's specification does not specify any additional support, beyond warranty support, and is currently excluded from this proposal. However, Siemens Energy can provide long term post start-up support for the customer's vessel(s) and we welcome the opportunity to provide a long-term solution for vessel support.

## 22.6 TRAVEL, ACCOMMODATION AND WORKING TIME

### 22.6.1 *Travel and accommodation*

Travel and accommodation as well as daily expenses for the commissioning crew are included for the specified number of days for the commissioning and sea trials.

Travel time for trips not included in the offer will be charged at the normal working rate for commissioning engineers.

Travel costs, accommodation and daily allowance for commissioning and sea trials not included in the scope of supply will be charged at actual cost-plus administration fee.

### 22.6.2 *Working hours*

#### **Normal working hours**

Working hours in this context is to be understood as hours present at the Shipyard (including waiting time), or onboard the ship.

Working hours for the commissioning and sea trials included is defined up to 10 hours per working day, between 08.00 and 18.00.

#### **Overtime work**

For work over 8 hours per day, on weekends and public holidays, special conditions and rates will apply according to the rates stated under commercial conditions.

## 22.7 PLANNING OF COMMISSIONING AND SEA TRIALS

### 22.7.1 *Siemens Energy's planning responsibility*

Siemens Energy will provide test procedures 4 weeks prior to commissioning for the scope of supply for the Commissioning and Sea Trials.



**22.7.2 Yard's planning responsibility**

The Yard is responsible for planning and organizing the commissioning in such a manner that the commissioning can be performed efficiently without excessive delays.

The Yard shall inform Siemens Energy of relevant information and schedules, including Siemens Energy activities for the commissioning period, 30 days before the commissioning is scheduled to start.

The Yard shall inform Siemens Energy about the exact date for the start of the commissioning 14 days prior to the start date of the commissioning. This information shall include a detailed schedule and test plan with the daily activities listed in a written form for Siemens Energy main activities, and relevant dependencies.

If Siemens Energy commissioning engineers show up at the Yard at the date for start-up defined by the Yard and the equipment is not ready or prepared for commissioning, this waiting time is considered part of the commissioning.

During the commissioning period, frequently planned meetings should be arranged by the Yard together with Siemens Energy and other suppliers to confirm activities and status.

**22.7.3 Ready for commissioning**

The Yard is responsible for the correct installation of equipment listed in the Scope of supply. The installation work comprises loading, erection and fixing of equipment.

Dimensioning, installation, connection and termination of all cables, wires, pipes and ducts according to delivered technical documentation is also the Yard's responsibility. Siemens Energy will provide the Yard with single lines for Siemens Energy provided equipment.

Before commissioning takes place, the installation work shall be completed and checked before circuits are energized. All signal connections and loop testing and repair of faults detected during testing, shall be done by the Yard prior to commissioning.

All locations where equipment under commissioning is installed shall have free access during the entire commissioning period.

Please note that all equipment during installation-, connecting- and testing period must be protected against dust, condensation and water / humidity to avoid reduction or exclusion of warranty.

The Yard shall confirm that all preconditions for the commissioning are fulfilled prior to the start of the commissioning.

**22.7.4 Siemens Energy responsible persons for commissioning**

Siemens Energy shall nominate a responsible person for commissioning activities to be carried out by Siemens Energy, as the Commissioning Leader.

The Commissioning Leader shall be the Yard's single point of contact for all matters and activities taking place as part of the commissioning.

The Commissioning Leader has the authority to present and sign Change Orders concerning the commissioning and sea trials.

**22.7.5 Yard's responsible persons for commissioning**

The Yard shall nominate a responsible person for the commissioning, with a deputy.

The nominated person from the Yard, or his deputy in case of absence, shall be authorized to sign the daily working report (time sheets) and the weekly status report.

The Yard's responsible, or his deputy in case of absence, shall also be authorized to sign the test protocols as they are performed.

**22.8 DAILY WORKING REPORTS (TIME SHEETS) AND WEEKLY REPORTS.**

Siemens Energy Commissioning Leader shall, daily if required, work out and present "Daily working reports" (time sheets) for the Yard's approval.

Siemens Energy will work out a "Weekly status report" after each completed week, with information on the Commissioning progress. This report will include information on the total accumulated number of working hours and single trips related to the contract.

The Yard's commissioning representative, or his deputy in case of absence, shall sign the presented time sheets from Siemens Energy daily. These signed time sheets are the basis for calculating elapsed commissioning time, and additional commissioning hours not included in contract and chargeable upon the Yard.

When a "Daily working report" is signed it is an acceptance from the Yard that the described work is done and that the number of worked hours is used and accepted. Any dispute shall be clarified before the "Daily working report" is signed.

**22.9 LIMITING OF DAILY WORKING HOURS**

If our commissioning, for some reason, is prevented from its expected and planned progress, the Yard is entitled to limit the daily working hours of Siemens Energy commissioning engineers until normal progress is established.

The limitation is to be 10 working hours per day, or 50 hours per week. In this context, working hours is to be understood as time present at the Yard (including waiting time).

## **22.10 OTHER EQUIPMENT**

Siemens Energy is only responsible for equipment as defined in this specification. Equipment which is supplied by the Yard or other sub suppliers and connected to Siemens Energy equipment is not a Siemens Energy responsibility.

During commissioning and sea trials the Yard is responsible for ensuring that competent technicians for the engines, propellers and other auxiliary equipment are present and that our commissioning engineers have necessary access to the systems that are to be commissioned.

## **22.11 HEALTH, ENVIRONMENT AND SAFETY (HES)**

The Yard is to provide the necessary information and documentation to Siemens Energy and the individual commissioning engineers for matters concerning HES.

It is presupposed that the Yard will give individual briefing on the HES rules and arrangements at the commissioning engineers' first arrival at the Yard, including a HES-course if required.

Siemens Energy will include the Yard's HES rules and arrangements in the Siemens Energy Commissioning manual.

## **22.12 RESPONSIBILITY AND SCOPE OF SUPPLY**

The representatives from Siemens Energy carrying out the commissioning will only be responsible for the equipment and functions according to the final specifications covered by this contract, and additional contracts or approved Change Orders signed during the project, where commissioning is clearly stated as part of the scope of supply.

Siemens Energy is not responsible for the planning and execution of load tests of the diesel-generator sets.

Short circuit and discrimination tests are included in Siemens Energy scope of supply.

Participation on sea trials for the Dynamic Positioning System is not included in Siemens Energy scope for commissioning and sea trials.

## **22.13 FACILITIES FOR SUPPLIER**

The Yard is to supply, free of charge, one office for commissioning engineers from Siemens Energy, with one phone and access to a fax machine. Where necessary a data line of at least 56 kb shall be provided.

## 23 ***Project Schedule***

For a common understanding of the Yard's delivery schedule and project management, a project schedule will be developed with the Yard. A detailed schedule must be worked out in the beginning of the engineering phase.

See [ATTACHMENT G](#) for a preliminary equipment delivery schedule.

Milestones such as freezing points and approval dates have to be integrated and finally agreed on and will become of contractual relevance.

## 24 ***Responsibility Matrix***

A draft division of responsibility / division of work matrix will be developed for providing a clear base and overview about the dependencies, responsibilities etc. between the contractual partners. It will become the clear guidance for the partners in respect to "who is providing what".

## 25 ***Storage and loading***

If Siemens Energy equipment is not to be put into operation immediately, it should be stored in a dry room which is free from vibrations and dust. The relative humidity is to be kept below 50%. The room temperature should be approx. 10 deg C above the outside temperature. The shaft and rotor of the motors should be rotated several times each month.

The equipment must always be lifted using the eyes or included lifting devices provided for this purpose. When connecting the cables on site the equipment must be covered with plastic to prevent dust and particles inside the unit. See also the instruction manuals that will be included in the project documentation.

## 26 *List of Attachments*

**Attachment A – Preliminary Single Line Diagram**

**Attachment B – Preliminary Generator Drawings**

**Attachment C – Siemens Blue Drive PLUSC™ and ESS SLD and Layout Drawings**

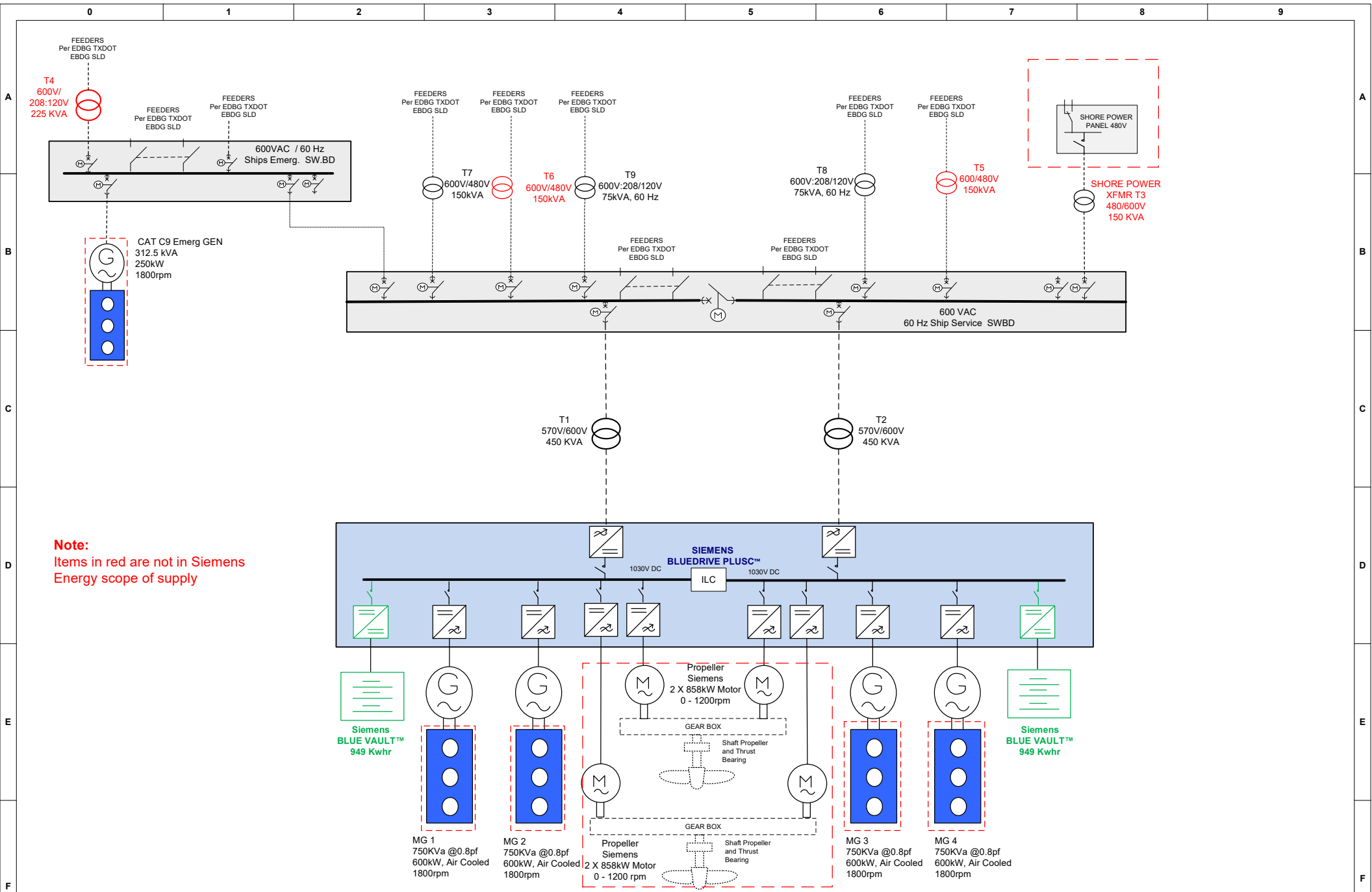
**Attachment D – Preliminary AC Switchboard & Panelboard Drawings**

**Attachment E – Preliminary Distribution Transformer Drawings – To be Finalized During Construction**

**Attachment F – IAS400 Scope of Supply and Topology**

**Attachment G – Preliminary Equipment Schedule**

***ATTACHMENT A***  
**Preliminary Single Line Diagram**  
(Following Page)



ISSUE	DESCRIPTION	DATE	DRAWN	CHECKED	APPR'D
3	Updated to Reflect Ferry Topology	10-10-19	L. Briant		
4	Updated from TXDOT Feedback 02-20-20	07-20-20	L. Briant		
5	Updated to TX DOT JWJ Topology	02-03-22	J. Carrillo		

TX DOT JW JOHNSON  
Mid Life

Initial rel.:                      Repl. for:

**SIEMENS**  
energy  
MARINE SOLUTIONS  
CONFIDENTIAL PROPERTY  
ALL RIGHTS RESERVED

DEP Solution W/ Blue Drive  
PLUSC™ (BDPC) Propulsion  
W/ESS

=	
+	
SHT	
CONT	

***ATTACHMENT B***  
**Preliminary Generator Drawing**  
(Following Page)



**Technical specification**

doc. no. D210029A-111

Project name: TX DOT Ferry

## I. Application

01.01. Application of the generator	vessel / ship
01.02. Manufactured according rules:	IEC 60034
01.03. Marine class / certification	ABS
01.04. Definition of Ex-protection (rules)	Without
01.05. Type of Ex-protection	Without
01.06. Comments - Application	

## II. Electrical parameters

02.01. Rated apparent power [kVA]	750
02.02. Active electrical power [kWe]	600
02.03. Rated power factor	0,8
02.04. Rated power factor - underexcited operation	--
02.05. Requested efficiency [%]	no
02.06. Rated voltage [V]	730
02.07. Voltage tolerance [%]	+/- 10
02.08. Rated frequency [Hz]	60
02.09. Frequency tolerance [%]	acc. IEC 60034-1
02.10. Number of poles	4
02.11. Duty type	S1
02.12. Operation mode	island / parallel operation
02.13. Winding pitch - 2/3 step	no
02.14. Neutral point connection	insulated starpoint
02.15. Insulation class / Utilisation class	H/F
02.16. Suitable for operation with frequency converter	yes
02.17. Designed to overload	no
02.18. Reactance (saturated) Xd" [%]	--
02.19. Comments - Electrical parameters	

## III. Cooling

03.01. Cooling type	Without (IC01 type of cooling)
03.02. Heat exchanger	Clean air (IC01 / IC616 type of cooling)
03.03. Cooling medium	N/A
03.04. Content of glycol	N/A
03.05. Water analysis	N/A
03.06. Water temperature rise	IP23
03.07. Machine ingress protection	0
03.08. Maximal temperature of cooling medium [°C]	N/A
03.09. Tubes material of the heat exchanger	N/A
03.10. Position of cooling medium inlet / outlet	N/A
03.11. Cooling medium inlet / outlet design	N/A
03.12. Design and test pressure of heat exchanger [bar]	N/A
03.13. Redundancy of the heat exchanger	N/A
03.14. Max. fouling factor [m2K/W]	N/A
03.15. Emergency operation	N/A
03.16. Emergency output [%]	no
03.17. Air filter on air inlet	no
03.18. Safety valve	N/A
03.19. Water cooler extraction	N/A
03.20. Cooler certificate	no certification requested
03.21. Comments - Cooling	

## IV. Site operation conditions

04.01. Min. ambient temperature [°C]	0
04.02. Max. ambient temperature [°C]	50
04.03. Max. site elevation [m.a.s.l.]	1000
04.04. Max. relative humidity [%]	80
04.05. Environment / location	Indoor
04.06. Comments - Site operation conditions	

## V. Drive

- 05.01. Drive type
- 05.02. Manufacturer of the drive
- 05.03. Exact type of the drive
- 05.04. Mechanical power of the drive [kWm]
- 05.05. Generator direction of rotation
  
- 05.06. Rated speed [r.p.m.]
- 05.07. Over speed [%]
- 05.08. Over speed duration [min]
- 05.09. Min. turn speed [r.p.m.]
- 05.10. Max. external axial force [kN]
- 05.11. Direction of axial force
- 05.12. Max. external radial force [kN]
- 05.13. Distance from bearing of the forces
- 05.14. Requested rotor moment of inertia [kgm<sup>2</sup>]
- 05.15. Comments - Drive

Diesel Engine

right (CW)  
(seen from the gear drive looking to the generator shaft)

1800  
120  
2  
N/A  
0  
N/A  
0  
N/A

## VI. Mounting

- 06.01. Mounting / feet design
- 06.02. Number of shaft extension
- 06.03. Type of the shaft extension
- 06.04. Type of coupling
- 06.05. Support for coupling guard
- 06.06. Shield flange
- 06.07. Shield flange depth
- 06.08. Foundation for machine
- 06.09. Mounting material
- 06.10. Anti-condensation heaters
- 06.11. Grounding brush
- 06.12. Rotor extracting tool
- 06.13. Comments - Mounting

IM1101  
1  
shaft end with key (a feather key)  
flexible coupling (coupling is not in scope of our supply)  
no  
no  
N/A  
steel baseframe  
without  
220V - 240V (1phase)  
no  
no

## VII. Cable boxes

- 07.01. Main terminal box ingress protection
- 07.02. Position of the main terminal box
- 07.03. Auxiliar terminal boxes ingress protection
- 07.04. Position of the star point
- 07.05. Location of cable entry
- 07.06. Cable output penetration
- 07.07. Anti-condensation heater for main terminal box
- 07.08. Comments - Cable boxes

IP54  
terminals under the cooler housing (1DK1 type)  
IP54  
in common compartment with main terminals  
left-up (1DK1 type)  
MCT frame without modules  
no

## VIII. Excitation and voltage regulation

- 08.01. Excitation method
- 08.02. Exciter feeding
- 08.03. Pilot exciter
- 08.04. Type of voltage regulator
- 08.05. Voltage regulator placement
- 08.06. Voltage regulator functions
- 08.07. External power for voltage regulator
- 08.08. Comments - Excitation and voltage regulation

integrated brushless exciter  
AVR  
auxillary winding (AREP)  
DECS 150  
separetely in cubicle  
volt. reg., cos φ reg.,  
not needed  
DECS 150 loose supply

## IX. Paintwork

- 09.01. Finish / painting method
- 09.02. Tone
- 09.03. Comments - Paintwork

C4/C5  
CAT YELLOW

## X. Bearings

10.01. Number of bearings	2
10.02. Type of DE bearing	roller bearing
10.03. Type of NDE bearing	roller bearing
10.04. Locating bearing position	DE bearing (locating)
10.05. Axial play +/- [mm]	0
10.06. Lubricant type	
10.07. Lubricant viscosity	
10.08. Oil inlet temperature [°C]	
10.09. Oil filtration grade	
10.10. Drain valve	no (plug only)
10.11. Bearing fixation for transport	yes
10.12. Duty inclinations / designed to	standard vessel inclinations
10.13. Comments - Bearings	

## XI. Lubrication

11.03. Lubrication oil pump	yes (own lubrication unit)
11.04. Redundant lubrication oil pump	no
11.05. Oil / water heat exchanger	yes
11.06. Oil flow meter	yes
11.07. Throttle valve	no
11.08. Electric protection (voltage, current, short-circuit)	no
11.09. Collecting pipe work	no
11.10. Shaft lifting provision (hydrostatic)	no
11.11. Jacking oil pump	no
11.12. Lubrication oil inlet / outlet	N/A
11.13. Lubrication system flanges - inlet / outlet	N/A
11.14. Comments - Lubrication	

## XII. Noise

12.01. Noise pressure level [dB(A)]	IEC 60034-9
12.02. Noise level tolerance [dB(A)]	IEC 60034-9
12.03. Noise level measuring condition	no load
12.04. Comments - Noise	

## XIII. Vibrations

13.01. Max. vibration of bearings	acc. IEC 60034-14 vibration level A
13.02. Max. vibration of shaft	acc. IEC 60034-14 vibration level A
13.03. Bearing vibration monitoring provision	no
13.04. Shaft vibration monitoring provision	no
13.05. Vibration norms	IEC 60034-14 vibration level A (standard)
13.06. External mechanical stress of machine (vibrations)	ISO 8528-9, C.1, value 1
13.07. Comments - Noise and vibrations	

## XIV. Additional information to design

14.01. Total weight [Kg]	3500
14.02. Inclination angles - Generator is designed for	
Steady - list:	15°
Steady - trim:	5°
Transient - roll:	22,5°
Transient - pitch:	7,5°
14.03. Flow rate for water cooler [m3/hour] (preliminary value)	3,22

## XV. Accessories

### 15.01. Temperature monitoring

15.01.01. Winding (per phase)	2x PT100 - 3 wire (6 total)
15.01.02. Bearings (per bearing)	1x single PT100 - 3 wire (2 total)
15.01.03. Cold air (per channel)	1x single PT100 - 3 wire (1DT1: 2 total / 1DK1: 1 total)
15.01.04. Hot air (per channel)	1x single PT100 - 3 wire (1DT1: 2 total / 1DK1: 1 total)
15.01.05. Transmitters (4-20mA)	no
15.01.06. Calibration certificate request	no
15.01.07. Comments - Temperature monitoring	

### 15.02. Vibration monitoring

15.02.01. Bearing housing vibration monitoring	no
15.02.02. Position of bearing vibration probes	N/A
15.02.03. Shaft vibration monitoring	no
15.02.04. Generator housing vibration monitoring	no
15.02.05. Comments - Vibration monitoring	no

### 15.03. Other monitoring

15.03.01. Speed detection / Keyphasor	no
15.03.02. Leakage detector	no
15.03.03. Rotor earth fault monitoring brushes	no
15.03.04. Transducer for excitation current	no
15.03.05. Comments - Other monitoring	

### 15.04. Voltage transformers

15.04.01. Type	1×1 core - used for AVR sensing only
15.04.02. Ratio	
15.04.03. Output	
15.04.04. Accuracy	
15.04.05. Placement	on generator main terminals
15.04.06. Comments - Voltage transformers	

### 15.05. Current transformers

15.05.01. Type	3×1 core, diff. protection	1×1 core, AVR sensing
15.05.02. Ratio		
15.05.03. Output		
15.05.04. Accuracy		
15.05.05. Placement	On the generator	On the generator
15.05.06. Main terminals lightning (surge) arrestors		no
15.05.07. Main terminals surge capacitors		no
15.05.08. Comments - Current transformers		

## XVI. Production and Factory acceptance tests

16.01. Type of test	Routine test
16.02. Scope of tests	according ABS marine certification standards
16.03. Special tests	no
16.04. Test with voltage regulator	yes
16.05. Witnessing of tests - FAT (customer participation)	no
16.06. Scope of FAT	
16.07. Number of units for FAT	
16.08. Comments - Tests	

## XVII. Documentation

### 17.01. General

17.01.01. Quantity per machine	1x electronically per machine
17.01.02. Language of the final documentation	English
17.01.03. Language of labels / name plates	English
17.01.04. Material of labels / name plates	plastic / glued
17.01.05. Date of preliminary documentation	see bellow
17.01.06. Documentation format	e-copy; no print
17.01.07. Scope of final documentation	to be negotiated
17.01.08. Comments - Documentation	

### Standard Drasov scope of documentation

Technical data:	Operating and maintenance manual Dimension drawing text Components / accessories documentation
Drawings:	Tightening torques Dimension drawing Connection diagram Shaft inertia Electrical data sheet
Quality documents:	I+T Plan Test protocols according to the I+T Plan Declaration of Conformity

Note: Components /accesories documentation (manuals, catalogues, ...) are not translated

### 17.02. Scope and delivery time for documentation

17.02.01. Generator datasheet	6 WAO (See NOTES)
17.02.02. General dimension drawing	6 WAO (See NOTES)
17.02.03. Shaft dimension drawing with moment of inertia	6 WAO (See NOTES)
17.02.04. Dynamic foundation loads	8 WAO (See NOTES)
17.02.05. Foundation plan	8 WAO (See NOTES)
17.02.06. Final documentation	WD

### 17.03. Documentation provided with the offer

17.03.01. Electrical datasheet and curves	D180430B-2
17.03.02. Preliminary dimension drawing	D180430B-21
17.03.03. Technical specification	D210029A-111
17.03.04. Other	

### NOTES:

WAO - Weeks after fully clarified purchase order (without open points in technical specification)  
WD - With delivery  
WAD - Weeks after delivery

**IMPORTANT: The stated delivery times are not including the process time needed by the region for placing the order. Therefore we strongly recommend to calculate extra time when stating deadlines to the customers.**

Three-Phase Synchronous Generator with Salient Pole Rotor (Laminated Pole)

Nominal data		Type	1DC0423-4AY02-Z	
Output	$S_n$	750 kVA	Standard	IEC 60034
Voltage	$U_n$	730 V +/-10%	Marine classification	ABS
Frequency	$f_n$	60 Hz	Ex-Protect	---
Power factor	p.f.	0,8	Ex-Standard	---
Current	$I_n$	593 A	Cooling system	IC01
Speed	$n_n$	1800 min <sup>-1</sup>	Ambient temperature	50 °C
Torque in air gap	$M_n$	4,0 kNm	Cooling water temperature	--- °C
Winding pitch		≈5/6	Installation altitude	1000 m
Excitation	brushless with AVR and auxiliary winding		Insulation class	180 (H)
Mounting		IM1101	Stator Winding Temperature	≤ 145 °C (R)
Enclosure		IP23	Field Winding Temperature	≤ 145 °C (R)

**Operating data** Generator driven by: Diesel engine

	Apparent output	Electrical output	Mechanical input	Shaft input torque
Power factor 0,80	750 kVA	600 kWe	626 kWm	3,32 kNm
Power factor 1,00	604 kVA	604 kWe	626 kWm	3,32 kNm

**Reactances and time constants**  $Z_n$  0,711 Ω

	unsat.	sat.		unsat.	sat.		
$x_d$	251,1	194,2 %	$x_q$	121,4	%	$T_{d0}'$	3,960 s
$x_d'$	21,4	16,8 %	$x_q'$	121,4	%	$T_d'$	0,338 s
$x_d''$	10,6	9,3 %	$x_q''$	11,8	10,4 %	$T_d''$	0,013 s
$x_2$	11,2	9,9 %	$x_0$	3,6	3,6 %	$T_a$	0,038 s

**Efficiencies**

S/S <sub>n</sub>	%	50	75	100	110
Power factor 0,80	%	94,5	95,5	95,9	95,9
Power factor 1,00	%	94,8	96,1	96,5	96,6

**Short circuit data**

$I_k''$	6,36 kA	Initial short circuit current (3 ~)
$I_s$	16,15 kA	Max. peak current (3 ~)
$I_k$ ≥	1,78 kA	Sustained short circuit current (AVR, 3 sec.)
$k_c$	0,51	Short circuit ratio
$M_{2k}$	49 kNm	Initial short circuit torque (2~)
$M_{3k}$	37 kNm	Initial short circuit torque (3~)

**Transient voltage variation**

Voltage drop	≤ 15 %	Voltage rise	≤ 20 %
Sudden load increase	60 %	Sudden load decrease	60 %
Power factor	0,4	Power factor	0,4

**Other data**

AVR type	DECS-150	Axial force at nominal run*	0,8 kN
Losses to be dissipated	26 kW	Eccentric radial magnetic force CM	23 kN·mm <sup>-1</sup>

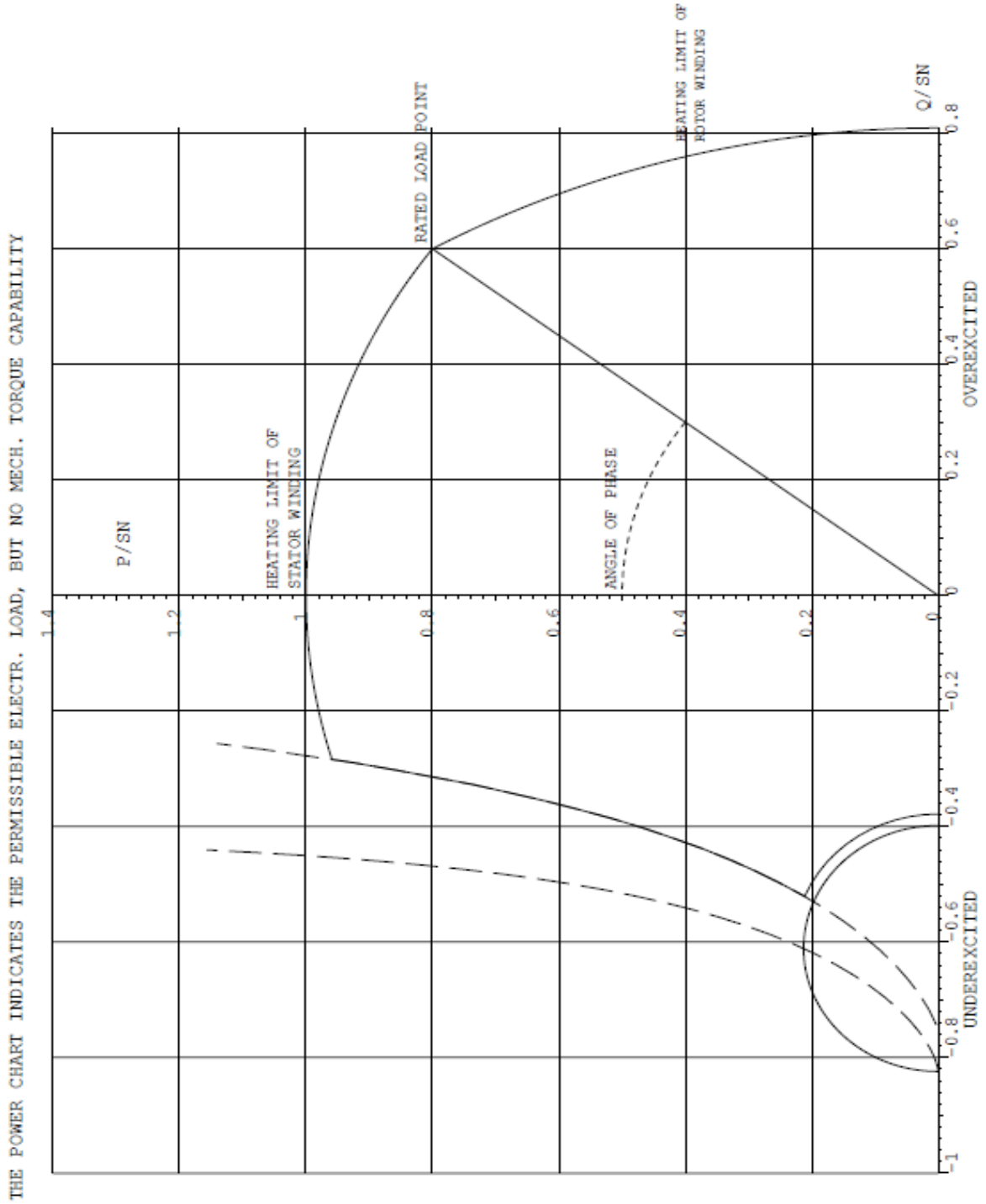
\* In case of non-locating bearings this will have effect on the shaft end.

**Remarks**

Change	Note issued	DATE	NAME	Electrical Data Sheet		Project No.	Project Code
-		08.02.2021	Havránek	<b>SIEMENS</b>		Job No.	Document No.
						LoA:D210029A-1	D210029A-1
						Type	Sheet
						1DC0423-4AY02-Z	1 of 2

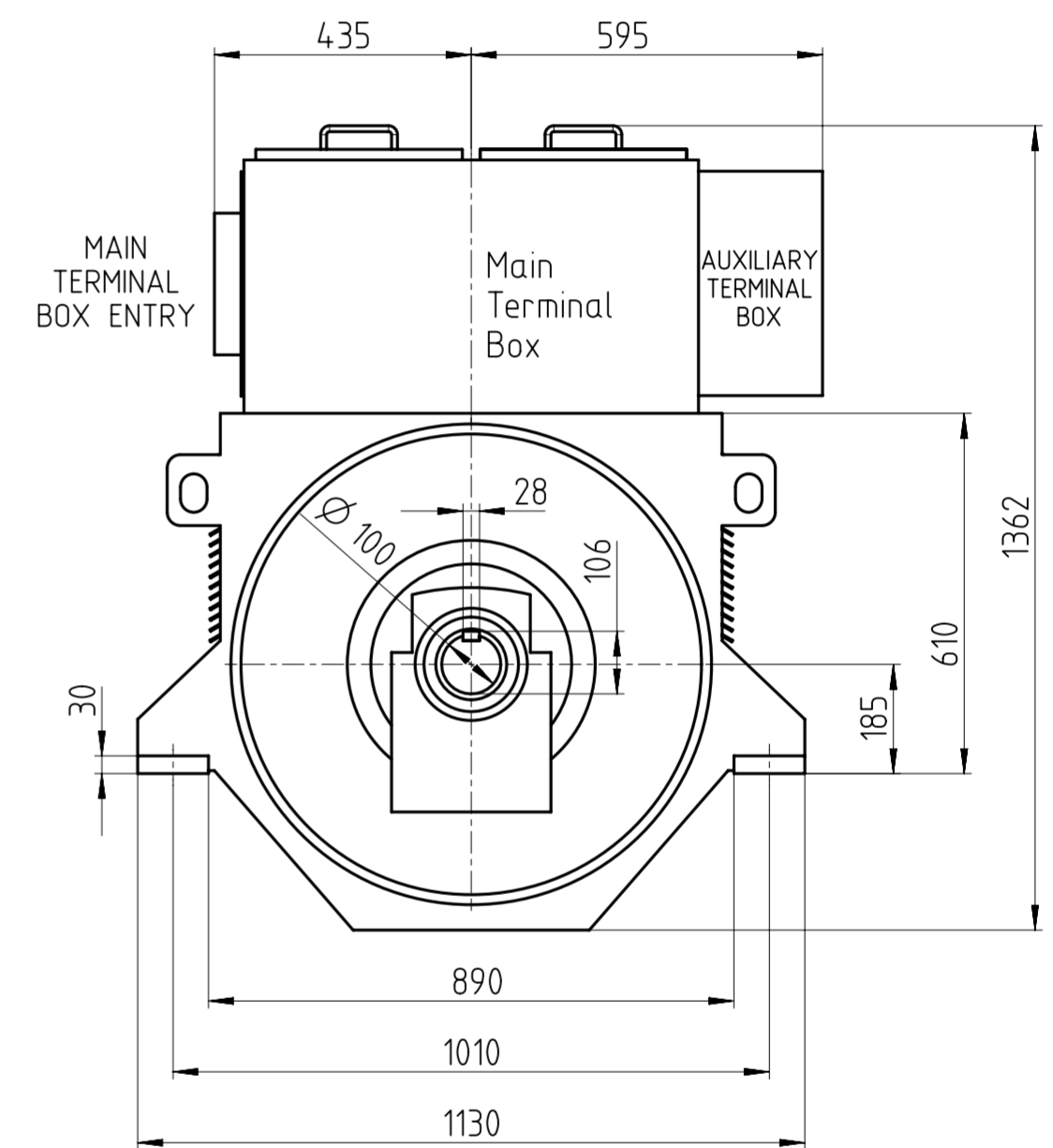
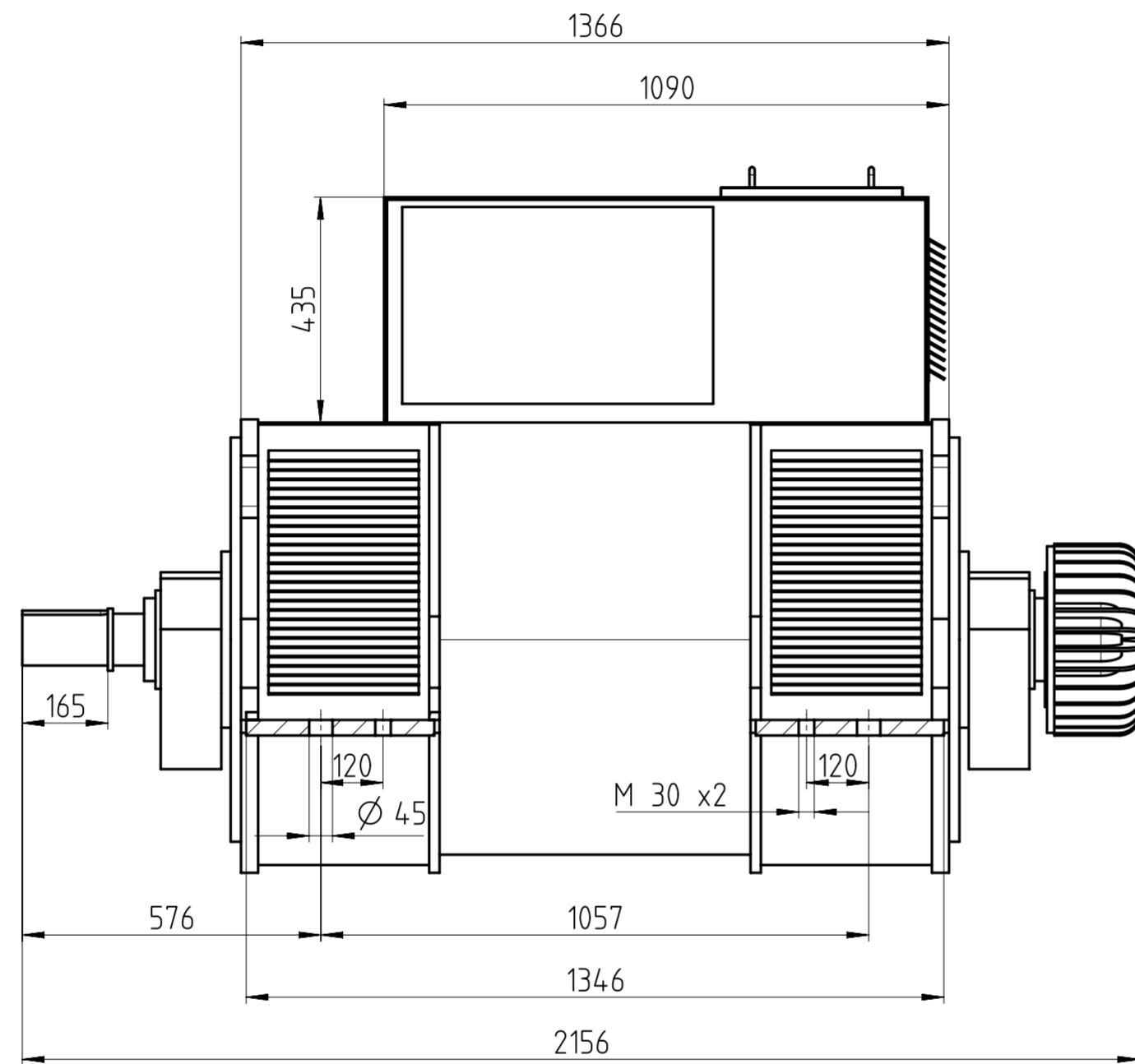
## REACTIVE CAPABILITY CURVE

Output	Sn	750 kVA	Power factor	p.f.	0,80
Voltage	Un	730 V	Current	In	593 A
Frequency	fn	60 Hz	Speed	nn	1800 min <sup>-1</sup>



Change -	Note issued	DATE 08.02.2021	NAME Havráněk	<b>Electrical Data Sheet</b>	Project No.	Project Code
<b>SIEMENS</b>				Job No. LoA:D210029A-1		Document No. D210029A-1
				Type 1DC0423-4AY02-Z		Sheet 2 of 2





Generator type:	1DC0423-4AY02-Z	Dimensions	
Output:	750 kVA	Length:	2156 mm
Voltage:	730 V	Width:	1160 mm
Frequency:	60 Hz	Height:	1362 mm
Speed:	1800 1/min	Weight:	cca 3200 kg

DIMENSION DRAWING SUBJECT TO CHANGE!

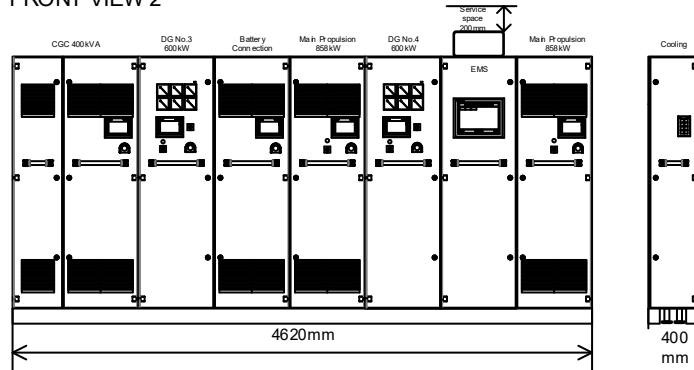
<b>SIEMENS</b>		TOLERANCE					
		ISO 8015, ISO 9013-442, DIN6930-f ISO 278-m(c)-K(L), DIN 16901-140					
CREATOR	Viktora	TITLE					
DATUM	09.02.2021						
		<b>D210029A-11</b>					
		SIZE	A2	TITLE	1DC0423-4AY02-Z	SHEET REV.	A
		DEPARTMENT PD LD AP MF-DSV S&QC QC			SHEET 1 of 1		

***ATTACHMENT C***

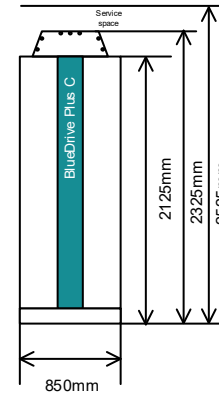
**Preliminary Siemens Blue Drive PLUSC™ and ESS Layout Drawings**

(Following Page)

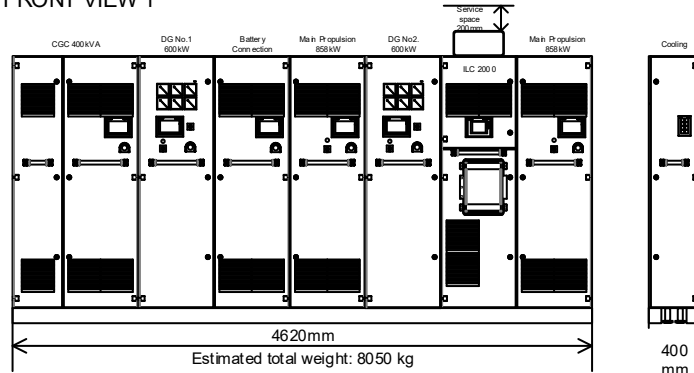
FRONT VIEW 2



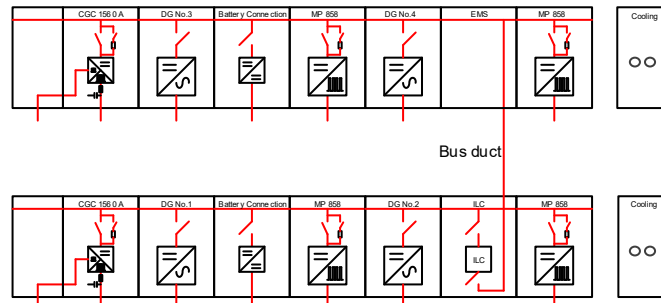
SIDE VIEW



FRONT VIEW 1



TOP VIEW



**Preliminary cooling data:**  
 Max. system pressure for external Fresh-water is 6 barg  
 Internal piping SS316/External piping/Heat exchanger SS316 Stainless steel  
 Temp. external Fresh- water: 30 – 38 deg.C  
 SWBD 1: external water flow 8.2m3/h  
 SWBD 2: external water flow 8.2m3/h  
 Minimum maintenance space in front 800mm  
 Minimum free space above Switchboard 300mm above 2150 height

D	Updated with cooling data	06.11.20	JHP	-	-
C	Updated proposal	25.09.20	JHP	-	-
F	Updated with battery cooling pipes	19.07.21	JHP	+	-
E	Updated with service space	01.12.20	JHP	-	-
Issue	Date	Date	Mark	Check	Approval

Client  
**Siemens US**  
 Texas Ferry Upgrade Job

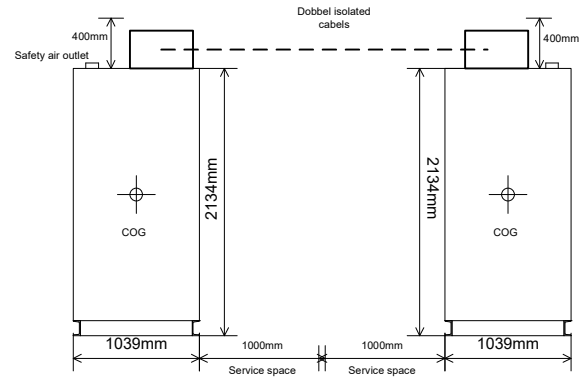
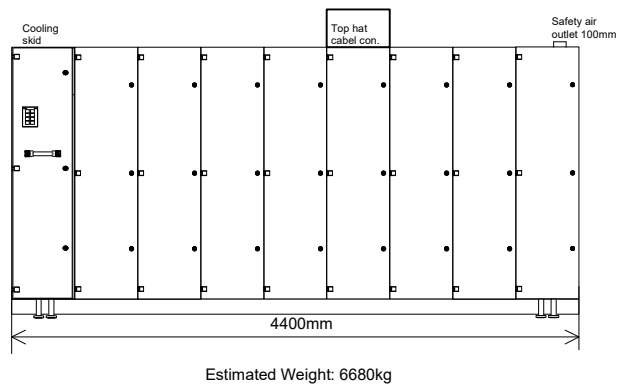


Title **BlueDrive Plus C**  
 General Arrangement

Tag no.	-	P.O.Number	-	=	-
SDL Code	-	Scale	-	+	-
SFI	-	DWG Size	A4	Project Dwg. no.	-
Hull No.	-	Rev.	A	Sheet	1
				Sheets	1

# Battery System - General arrangement Battery room 1

FRONT VIEW LINE UP 1: 475 kWh



**Preliminary cooling data:**

**A External cooling water inlet temperature**  
With cooling skid: 5-15°C

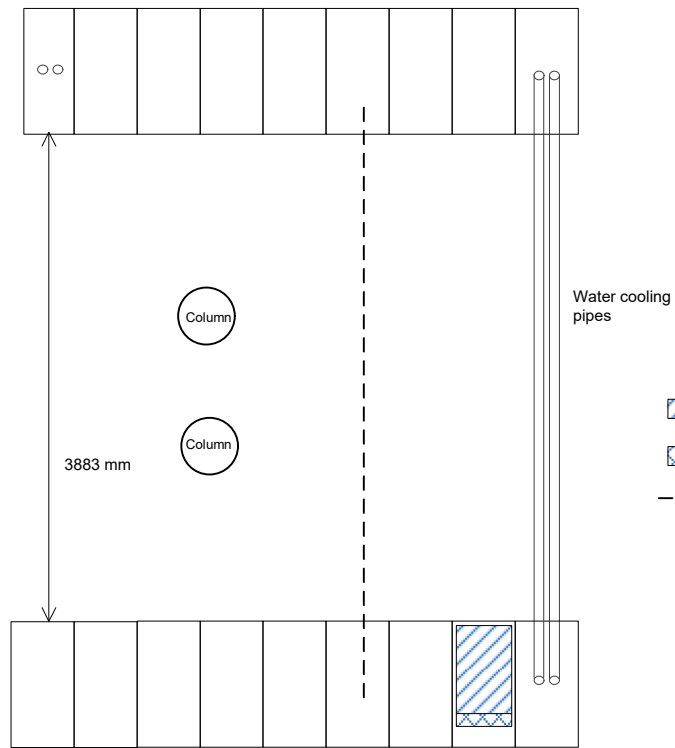
**C Losses to Air per system (average)**  
7 kW

**D Cooling fluid**  
Fresh water free from floating particles and mineral salts.  
Internal pressure drop approx 0.68 bar  
When using circulation cooling skid, external water temp and flow:  
10-16.5degC

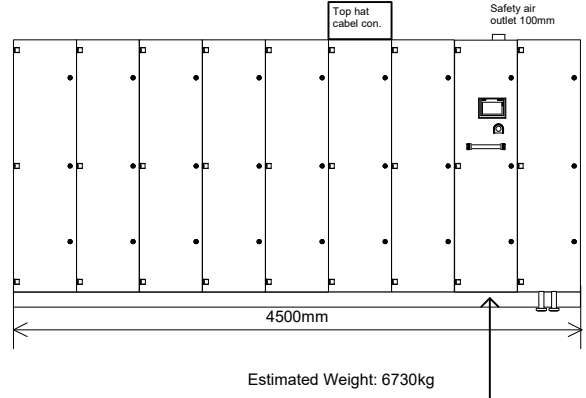
**E Color RAL7032**  
IP22/44

**F Ambient Temperatur**  
20-25°C

FOOTPRINT: Front to front solution



FRONT VIEW LINE UP 2: 475 kWh



Total Battery Energy: 949,6 kWh

Issue	Description	Date	Made	Check	Approval
1C1	Updated with cooling data	06.11.20	JHP	-	-
1B1	Updated proposal	05.11.20	TR	-	-
1A2	Proposal	24.09.20	JHP	-	-

Client	
TXDOT Ferry - Retrofit	

Supplier	<b>SIEMENS</b>
Subsupplier	

Title	Battery rack General Arrangement
Hull No.:	-

Tag no.	-
SDL Code	-
SF1	-

P.O.Number	-
Siemens Dwg. no.	20-1XVUYD5
Project Dwg. no.	-

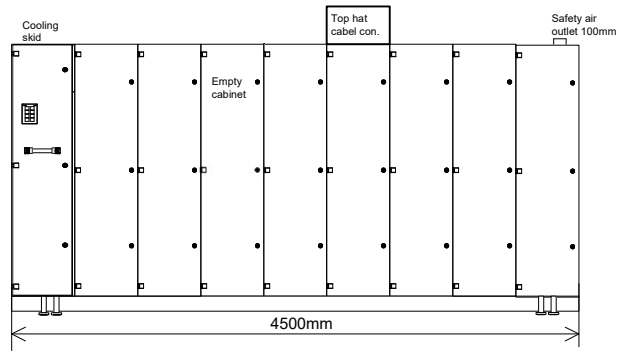
Rev.	1A1	Sheet	1	Sheets	2
------	-----	-------	---	--------	---

Proprietary data, company confidential. All rights reserved.

# Battery System - General arrangement Battery room 2

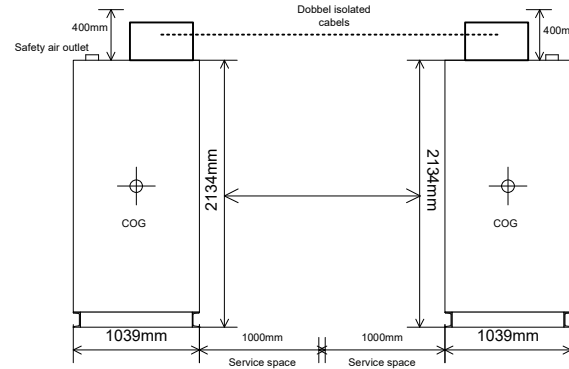
PRELIMINARY

FRONT VIEW LINEUP 1: 415,5kW



Estimated Weight: 5880kg

SIDE VIEW



**Preliminary cooling data:**

**A External cooling water inlet temperature**  
With cooling skid: 5-15°C

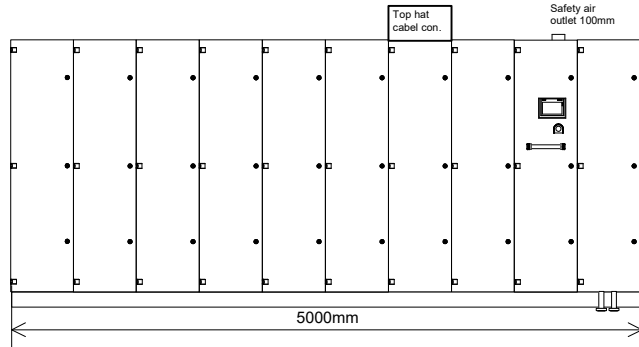
**C Losses to Air per system (average)**  
7 kW

**D Cooling fluid**  
Fresh water free from floating particles and mineral salts.  
Internal pressure drop approx 0.68 bar  
When using circulation cooling skid, external water temp and flow:  
10-16.5degC

**E Color RAL7032**  
IP22/44

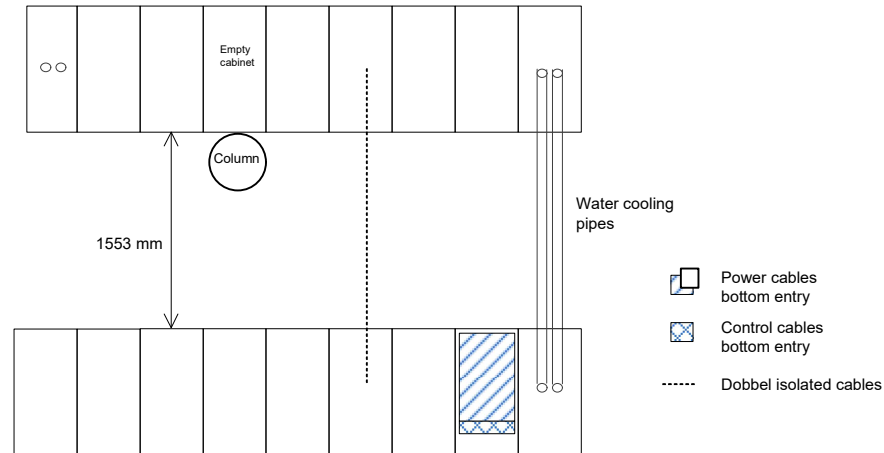
**F Ambient Temperatur**  
20-25°C

FRONT VIEW LINEUP 2 : 534,2 kWh



Estimated Weight: 7530kg

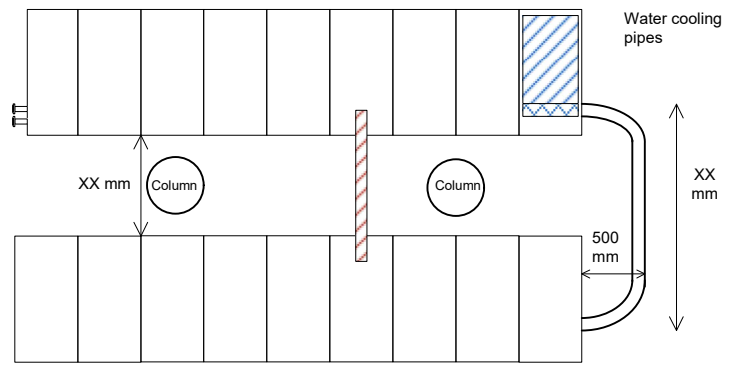
FOOTPRINT: Front to front solution






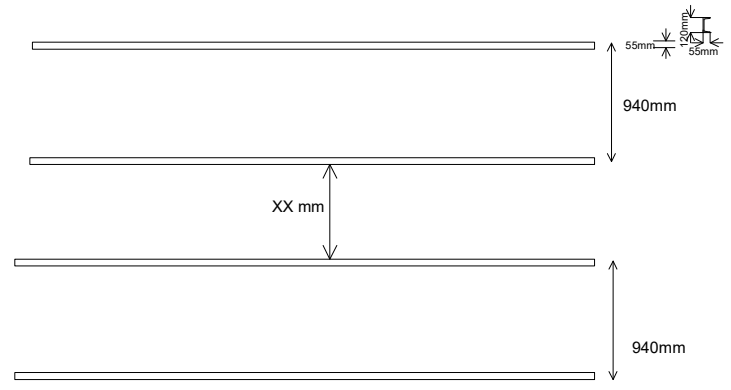
Total Battery Energy: 949,6 kWh

1	2	3	4	5	6	7	8																																				
<table border="1"> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>Client</td> </tr> <tr> <td>1C1</td> <td>Updated with cooling data</td> <td>06.11.20</td> <td>JHP</td> <td>-</td> <td>-</td> <td rowspan="3">TXDOT Ferry - Retrofit</td> </tr> <tr> <td>1B1</td> <td>Updated proposal</td> <td>05.11.20</td> <td>TR</td> <td>-</td> <td>-</td> </tr> <tr> <td>1A2</td> <td>Proposal</td> <td>24.09.20</td> <td>JHP</td> <td>-</td> <td>-</td> </tr> <tr> <td>Issue</td> <td>Description</td> <td>Date</td> <td>Made</td> <td>Check</td> <td>Approval</td> <td></td> </tr> </table>			-	-	-	-	-	-	Client	1C1	Updated with cooling data	06.11.20	JHP	-	-	TXDOT Ferry - Retrofit	1B1	Updated proposal	05.11.20	TR	-	-	1A2	Proposal	24.09.20	JHP	-	-	Issue	Description	Date	Made	Check	Approval		Supplier 		Title Battery rack General Arrangement		Tag no. -		P.O.Number -	
-	-	-	-	-	-	Client																																					
1C1	Updated with cooling data	06.11.20	JHP	-	-	TXDOT Ferry - Retrofit																																					
1B1	Updated proposal	05.11.20	TR	-	-																																						
1A2	Proposal	24.09.20	JHP	-	-																																						
Issue	Description	Date	Made	Check	Approval																																						
			Subsupplier		Hull No.: -		SDI Code -		Scale -		Siemens Dwg. no. 20-1XVUYD5																																
					SF1		DWG Size A4		Project Dwg. no. -		Rev. 1A1		Sheet 1		Sheets 2																												

FOOTPRINT



-  Power cables bottom entry
-  Control cables bottom entry
-  Bus Duct or Dobbel isolated cables



-	-	-	-	-	-	Client <b>TXDOT Ferry - Retrofit</b>
-	-	-	-	-	-	
1B2	-	-	-	-	-	
1A2	Proposal	24.09.20	JHP	-	-	
Issue	Description	Date	Made	Check	Approval	

Supplier  
**SIEMENS**  
Subsupplier

Title  
**Battery rack**  
**General Arrangement**

Tag no. -  
P.O.Number -  
SDL Code -  
Scale -  
SF1 -  
DWG Size A4

Siemens Dwg. no. 20-1XVUYD5  
Project Dwg. no. -

=	-
+	-
Rev. 1A1	Sheet 1
	Sheets 1

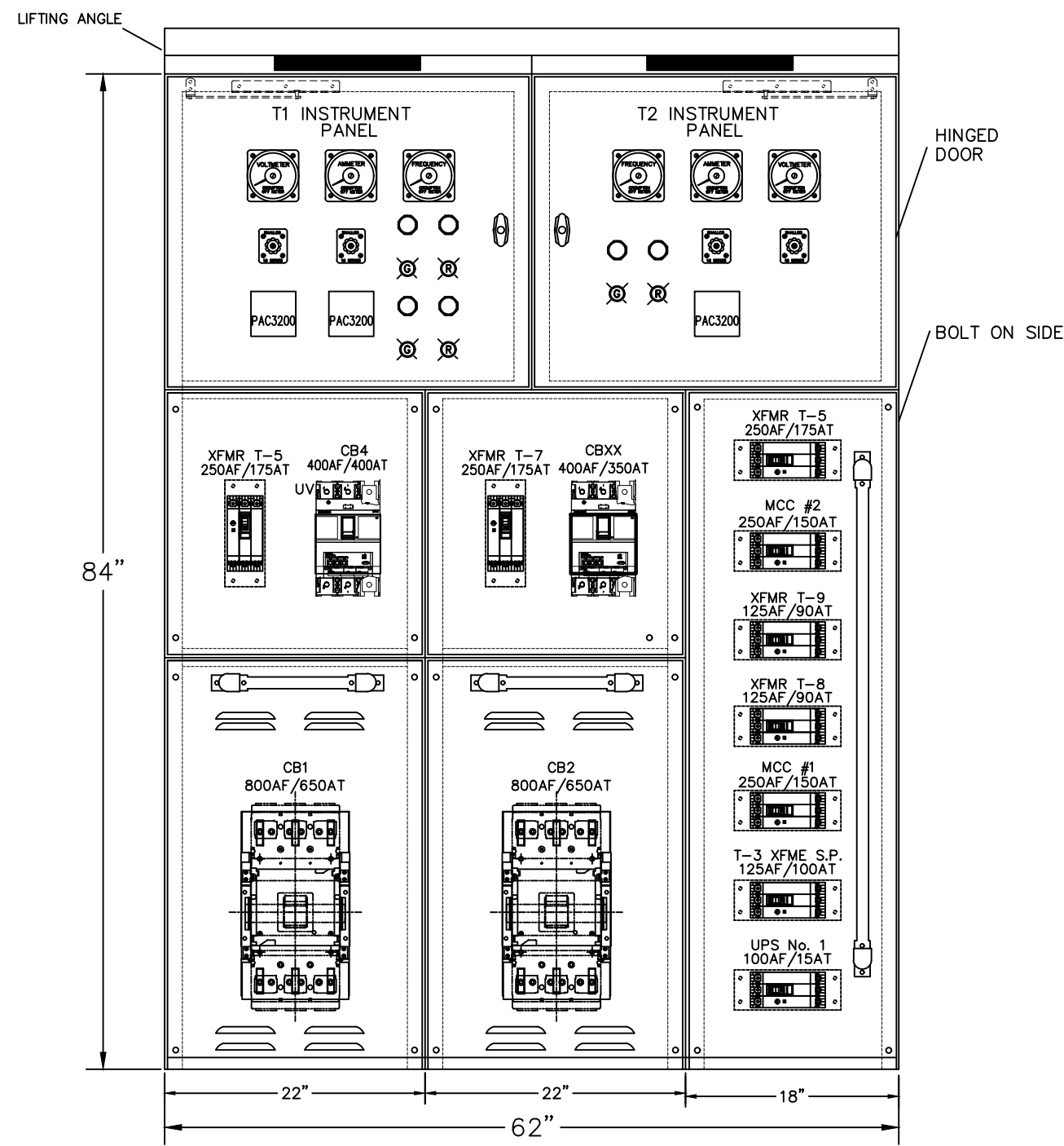
Proprietary data, company confidential. All rights reserved.

## ***ATTACHMENT D***

### **Preliminary AC Switchboard and Panelboards Datasheets and Drawings**

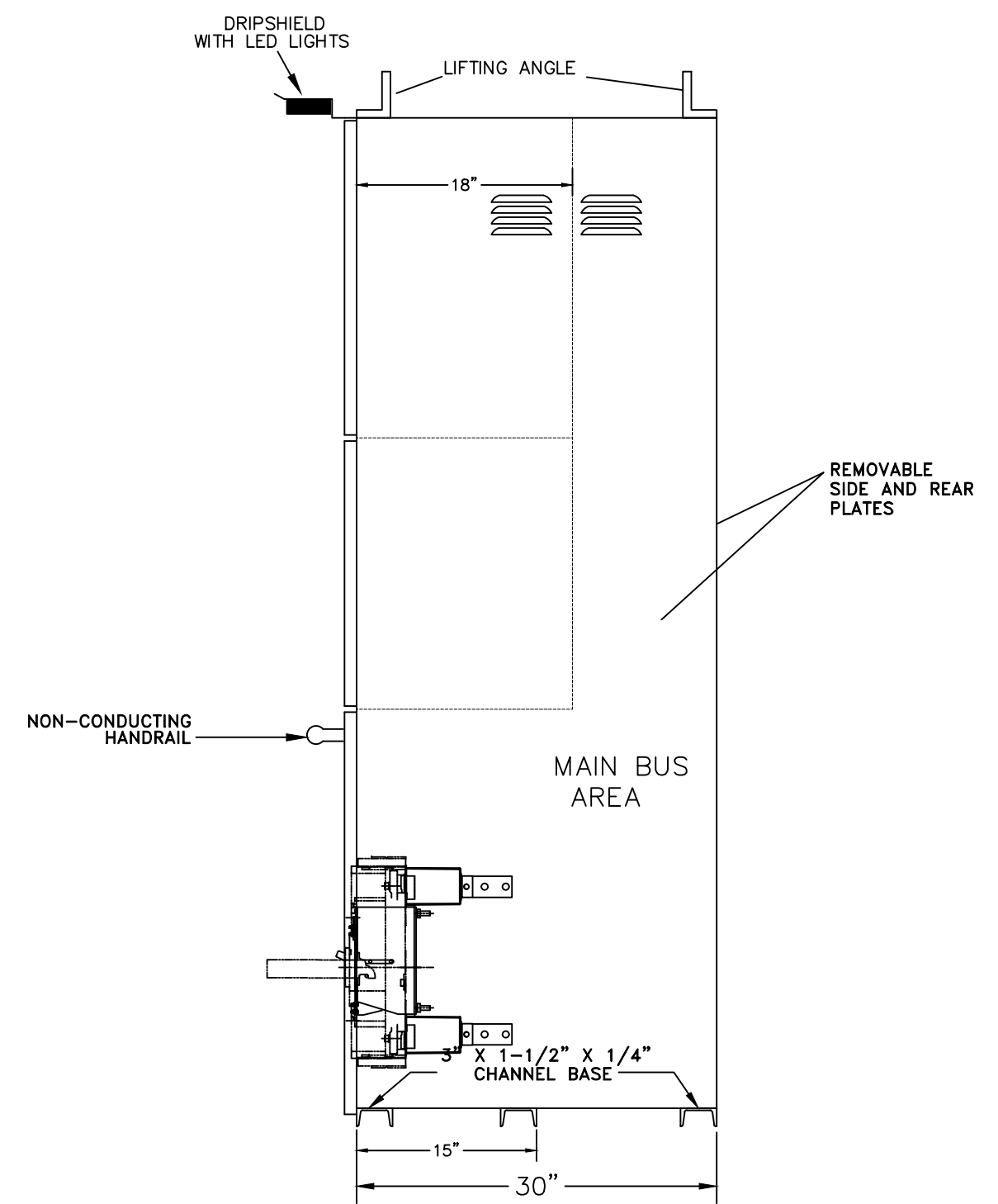
(Following Page)

REV NO.	REV BY	DATE	REVISIONS
P	CA	2/3/2021	PER CUSTOMER REQUIREMENTS
P1	GS	2/17/2021	REVISED LAYOUT TO SUIT CUSTOMER COMMENT
P2	GS	5/14/2021	REVISED LAYOUT TO SUIT CUSTOMER COMMENT



FRONT VIEW

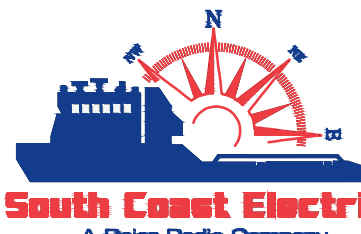

IP 31 CONSTRUCTION



SIDE VIEW

**PRELIMINARY**

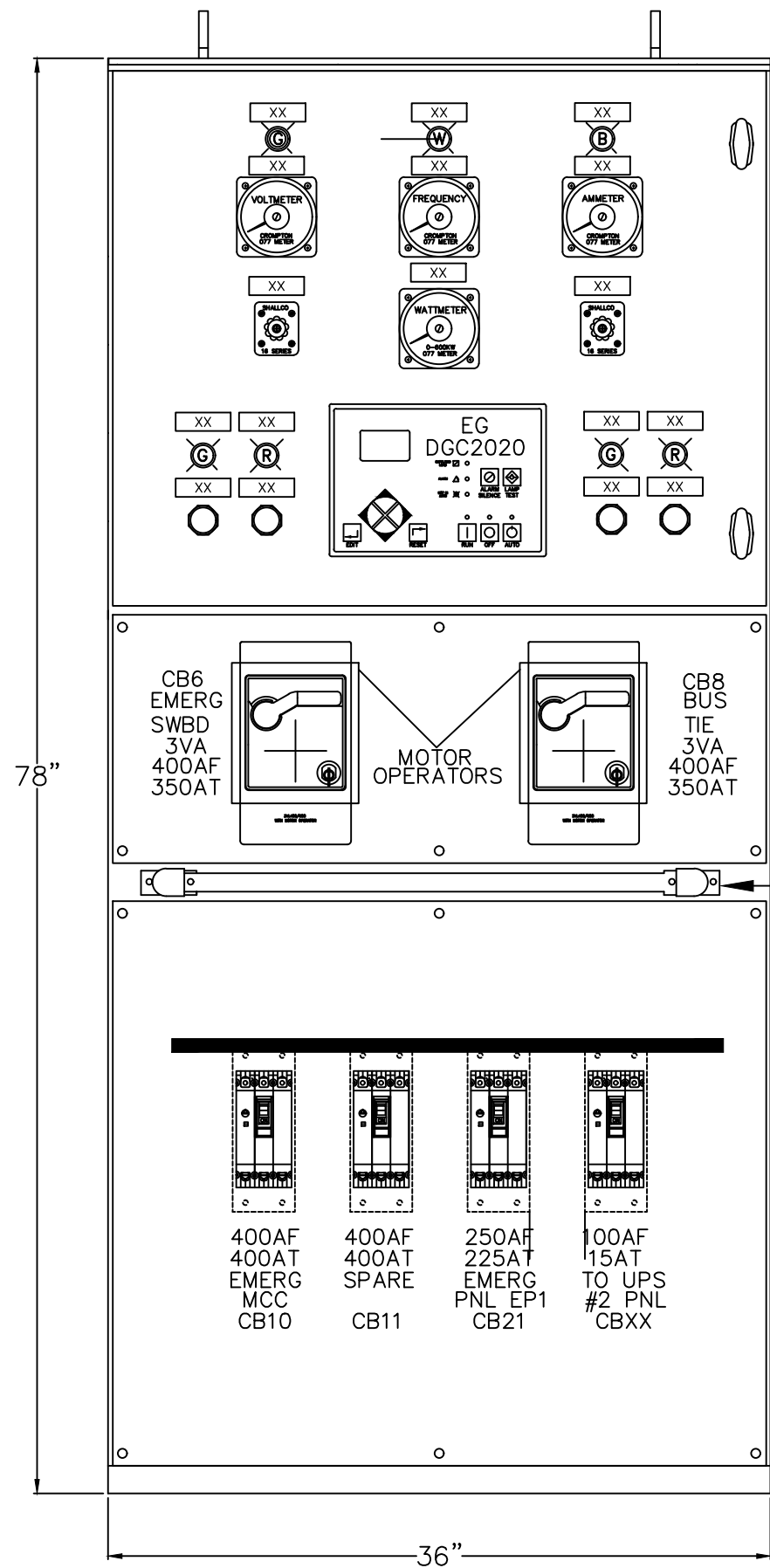
THIS DRAWING OR ANY REPRODUCTION OF IT SHALL NOT BE USED FOR MANUFACTURE, PRODUCTION, OR PROCUREMENT WITHOUT THE EXPRESS WRITTEN PERMISSION OF SOUTH COAST ELECTRIC. USE OR REPRODUCTION FOR USE, IN A NORMAL MANNER ASSOCIATED WITH GOODS OR SERVICE FURNISHED OR TENDERED BY SOUTH COAST ELECTRIC IS APPROVED.

 <p><b>South Coast Electric</b> A Belier-Radio Company</p>	CUSTOMER: <b>SIEMENS ENERGY</b>	DRAWN BY: XX
	DWG TITLE: GALVENSTON ISLAND FERRY 600V SS SWITCHBOARD OVERALL LAYOUT OPTION B	PROJECT MGR: 
Ph: (228)533-0002 Fax: (228)533-0082 13061 ROAD D BAY ST. LOUIS, MS 39520	CUSTOMER P.O. NO.: PROJECT NO.: BIS03121RL	DATE: 02/03/2021 SCALE: NTS
PROJECT NO.: BIS03121RL		DWG NO.: 1 OF 1

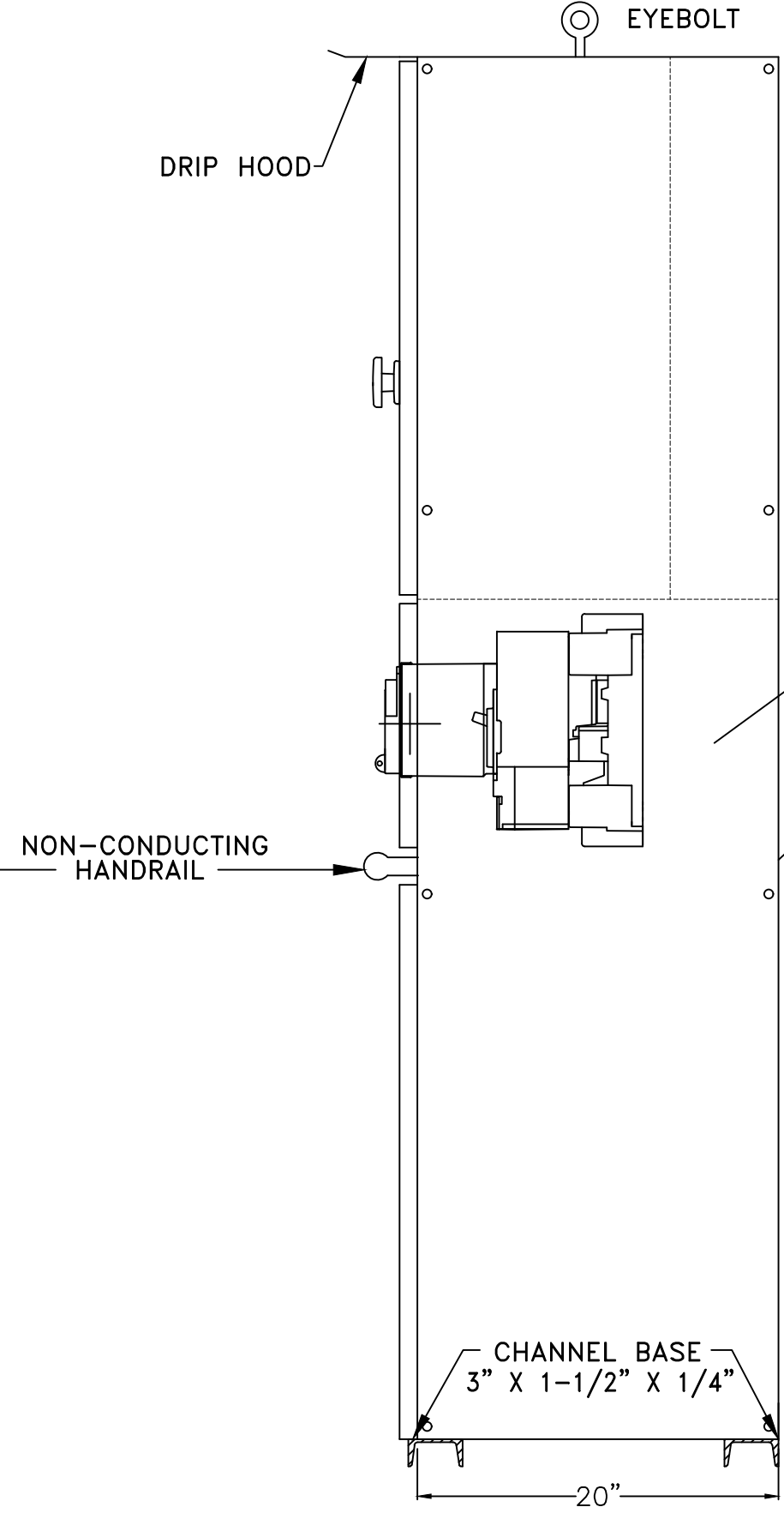
Plot Information



REV NO.	REV BY	DATE	REVISIONS
P	CA	2/3/2021	PER CUSTOMER REQUIREMENTS
P2	GS	7/27/2021	UPDATED PER CUSTOMER REQUEST
P3	GS	10/28/2021	UPDATED TO SINGLE ENCLOSURE PER CUSTOMER



FRONT VIEW



SIDE VIEW

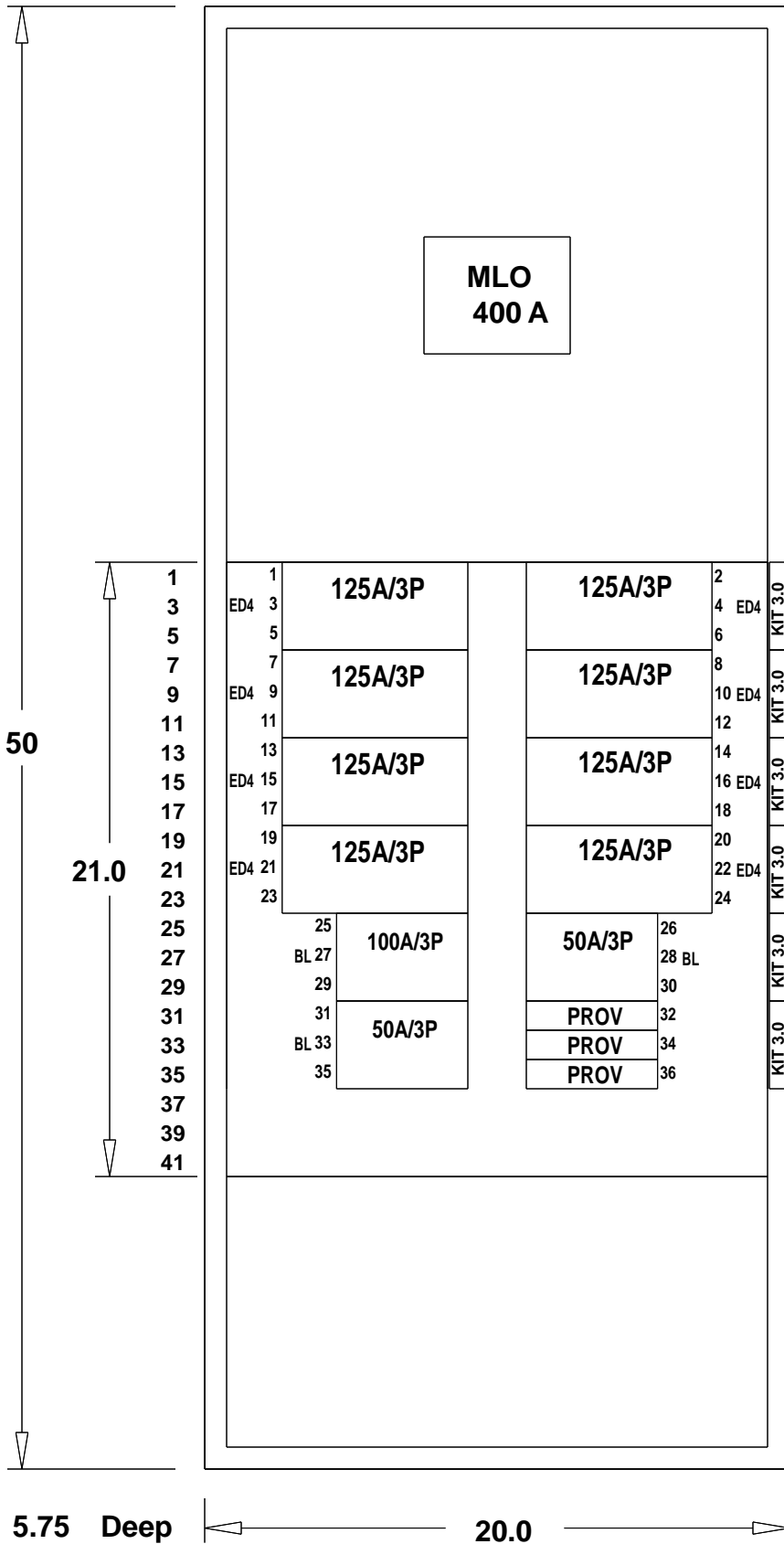
THIS DRAWING OR ANY REPRODUCTION OF IT SHALL NOT BE USED FOR MANUFACTURE, PRODUCTION, OR PROCUREMENT WITHOUT THE EXPRESS WRITTEN PERMISSION OF SOUTH COAST ELECTRIC. USE OR REPRODUCTION FOR USE, IN A NORMAL MANNER ASSOCIATED WITH GOODS OR SERVICE FURNISHED OR TENDERED BY SOUTH COAST ELECTRIC IS APPROVED.

<p><b>South Coast Electric</b> A Beier Radio Company</p>	CUSTOMER: <b>SIEMENS ENERGY</b>	DRAWN BY: GS
	DWG TITLE: GALVENSTON ISLAND FERRY EMERGENCY SWITCHBOARD	PROJECT MGR: RL
DATE: 07/27/2021	SCALE: NTS	CUSTOMER P.O. NO.:
Ph: (228)533-0002 Fax: (228)533-0082 13061 ROAD D BAY ST. LOUIS, MS 39520	PROJECT NO.:	DWG NO.:
	BIS03121RL	1 OF 1

SECTION :1 OF 1  
 PANEL TYPE :P2  
 CATALOG NUMBER :P2C42ML400FTS  
 ENCLOSURE :3R/12 Outdoor  
 SYSTEM VOLTAGE :208Y/120 3Ø 4W Wye AC  
 IR RATING :10 K AIC  
 MAIN BUS :400 A  
 BUS MATERIAL :Tin Plated Copper  
 FEED :Top  
 MOUNTING :Surface  
 SE LABEL :No  
 SERIES RATED :No  
 CONDUIT AREA :N/A  
 \*INDICATES POSITIONING NUMBERS TO HELP WITH THE MANUAL PLACEMENT OF BREAKERS ON THE MECHANICAL VIEW

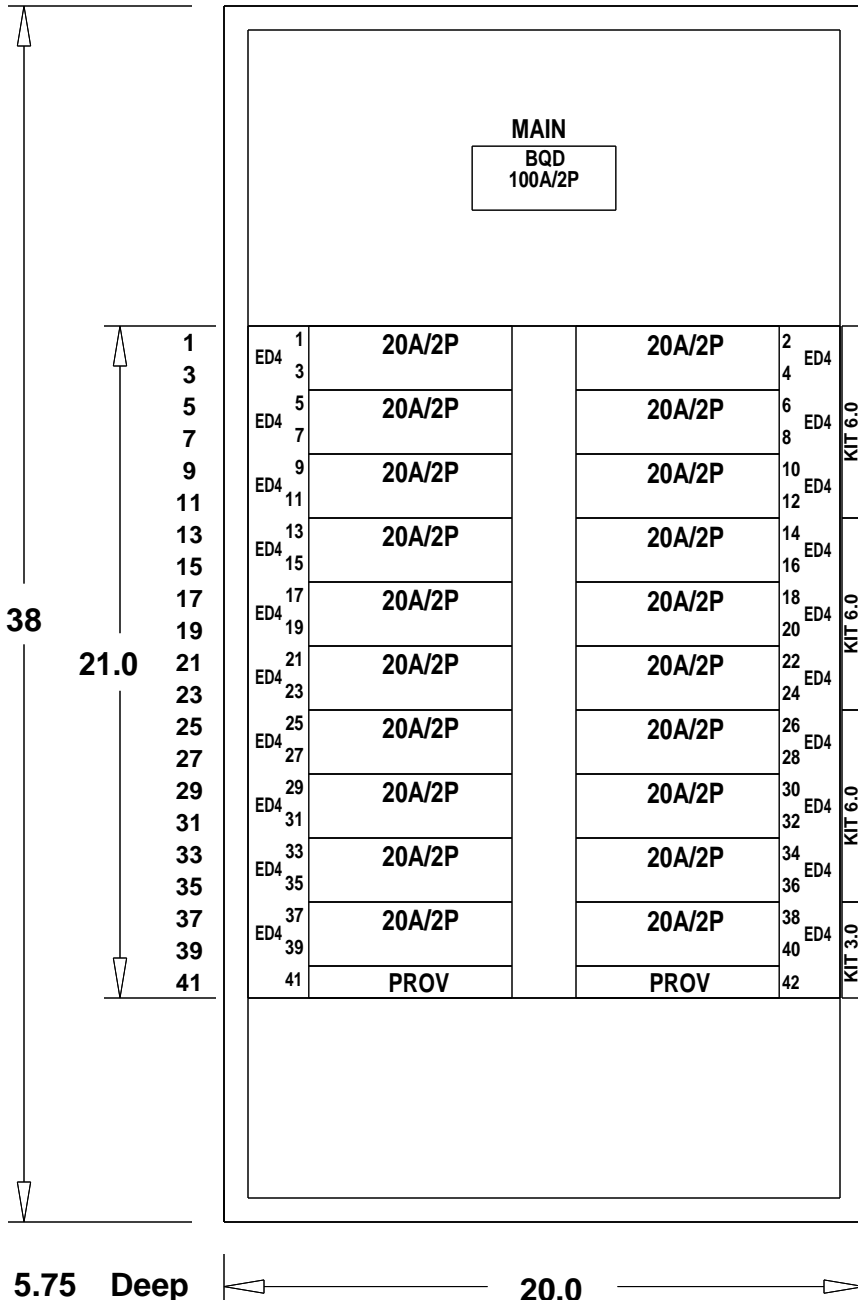
PANELBOARD COMPONENTS

Main :  
 1 - 400A MAIN LUG  
 1-(1)4/0-600Kcmil  
 Branches :  
 8 - 125A /3P-ED4  
 1-Marine 50C Calibration  
 1 - 100A /3P-BL  
 1-Marine 50C Calibration  
 2 - 50A /3P-BL  
 1-Marine 50C Calibration  
 3 - BL/BQD PROVISION  
 Options :  
 1-No Front  
 1-Certification - NONE  
 1-Std Al/Cu Gnd Connector



				JOB <b>South Coast Electric</b>		
				P.O.	CUST.	
				-	AWC INC	
				CONTR	CONSULT	
				-	-	
				TITLE	BY	DESIGNATION
				-	landcx00c	MAIN DISTRIBUTION LD
				S.O.	DATE	
				-	2-1-2021	
				DWG. NO.		
				landcx00c_04032000_21_00_M00-20000-1		
1	0	landcx00c020121	2-1-2021	Siemens Industry, Inc.		
NO.	REVISIONS	DRAWN BY	DATE	APP.	MFG. LOC.	REV.
				APP.	DWG. FILE	1
				SHEET 1 of 1		1
				Norcross, Georgia		

SECTION :1 OF 1  
 PANEL TYPE :P2  
 CATALOG NUMBER :P2J42BQ100FTS  
 ENCLOSURE :3R/12 Outdoor  
 SYSTEM VOLTAGE :240 1Ø 2W No Neutral AC  
 IR RATING :10 K AIC  
 MAIN BUS :100 A  
 BUS MATERIAL :Tin Plated Copper  
 FEED :Top  
 MOUNTING :Surface  
 SE LABEL :No  
 SERIES RATED :No  
 CONDUIT AREA :N/A  
 \*INDICATES POSITIONING NUMBERS TO HELP WITH THE MANUAL PLACEMENT OF BREAKERS ON THE MECHANICAL VIEW



PANELBOARD COMPONENTS

Main :  
 1 - 100A /2P-BQD MAIN BREAKER  
 1-(1)#8-#1 Cu / #6-#1/0 Al

Branches :  
 20 - 20A /2P-ED4  
 2 - ED PROVISION

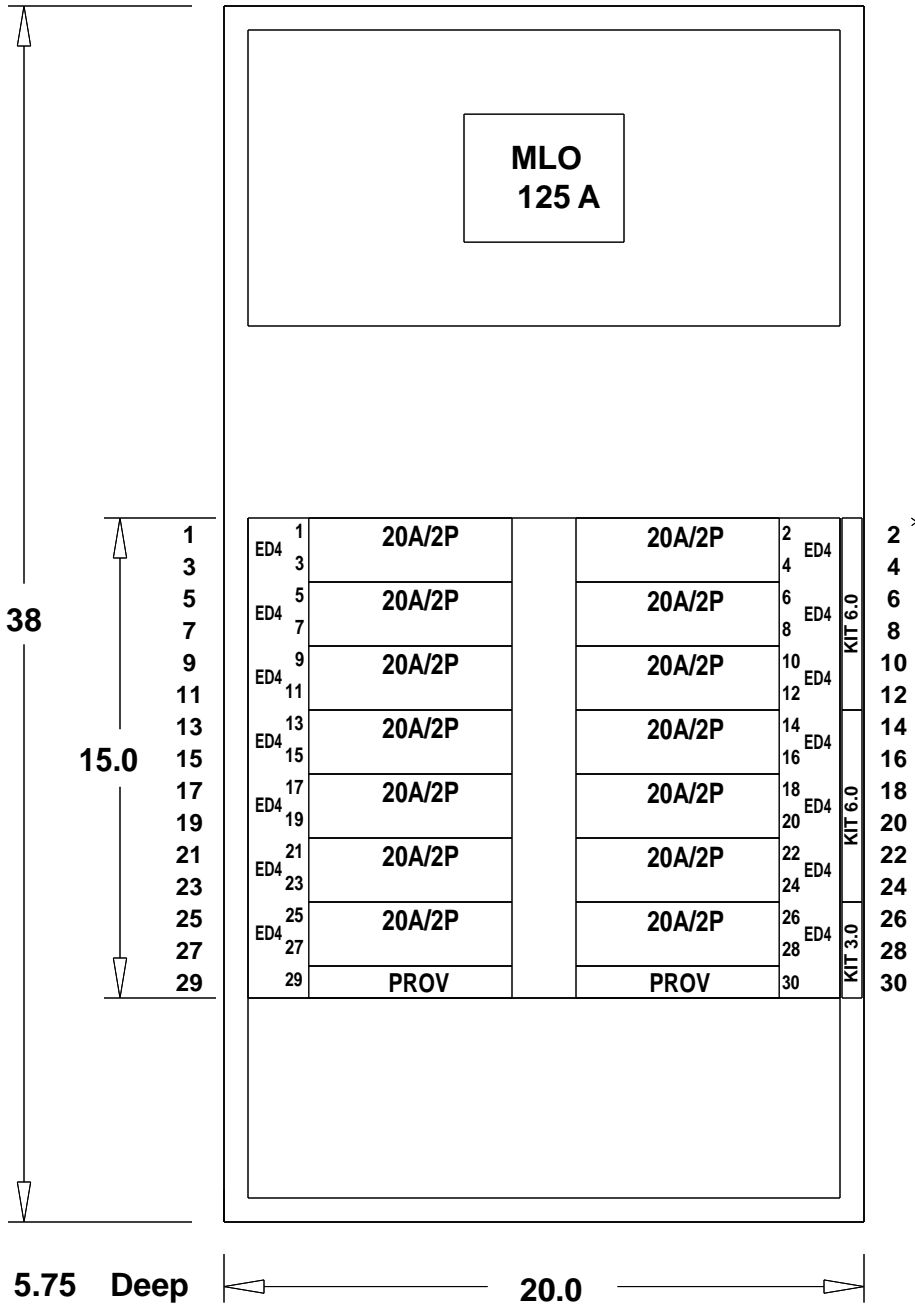
Options :  
 1-No Front  
 1-Certification - NONE  
 1-Std Al/Cu Gnd Connector

				JOB <b>South Coast Electric</b>			
				P.O. -		CUST. <b>AWC INC</b>	
				CONTR -		CONSLT -	
				TIE -		BY <b>landcx00c</b>	
				S.O. -		ENG. LOC. -	
				DATE <b>2-1-2021</b>		DESIGNATION <b>UPS1-1</b>	
				DWG. NO. <b>landcx00c_04032000_21_00_M00-21000-1</b>			
1	0	landcx00c020121	2-1-2021	Siemans Industry, Inc.			
NO.	REVISIONS	DRAWN BY	DATE	APP. -		MFG. LOC. -	
				APP. -		DWG. FILE -	
				Norcross, Georgia			
				SHEET 1 of 1			
				REV. 1			

SECTION :1 OF 1  
 PANEL TYPE :P2  
 CATALOG NUMBER :P2J30ML125FTS  
 ENCLOSURE :3R/12 Outdoor  
 SYSTEM VOLTAGE :240 1Ø 2W No Neutral AC  
 IR RATING :10 K AIC  
 MAIN BUS :125 A  
 BUS MATERIAL :Tin Plated Copper  
 FEED :Top  
 MOUNTING :Surface  
 SE LABEL :No  
 SERIES RATED :No  
 CONDUIT AREA :N/A  
 \*INDICATES POSITIONING NUMBERS TO HELP WITH THE MANUAL PLACEMENT OF BREAKERS ON THE MECHANICAL VIEW

PANELBOARD COMPONENTS

Main :  
 1 - 125A MAIN LUG  
 1-(1)#6-350Kcmil  
 Branches :  
 14 - 20A /2P-ED4  
 2 - ED PROVISION  
 Options :  
 1-No Front  
 1-Certification - NONE  
 1-Std Al/Cu Gnd Connector



JOB <b>South Coast Electric</b>			
P.O. -		CUST. <b>AWC INC</b>	
CONTR. -		CONSULT -	
TIE -		BY <b>landcx00c</b>	DESIGNATION <b>UPS2-2</b>
S.O. -		DATE <b>2-1-2021</b>	ENG. LOC. -
DWG. NO. <b>landcx00c_04032000_21_00_M00-22000-1</b>			
NO.		DRAWN BY	DATE
REVISIONS			
Siemens Industry, Inc. Norcross, Georgia			
APP.	MFG. LOC.	APP.	REV.
		DWG. FILE	
SHEET 1 of 1			1

***ATTACHMENT E***

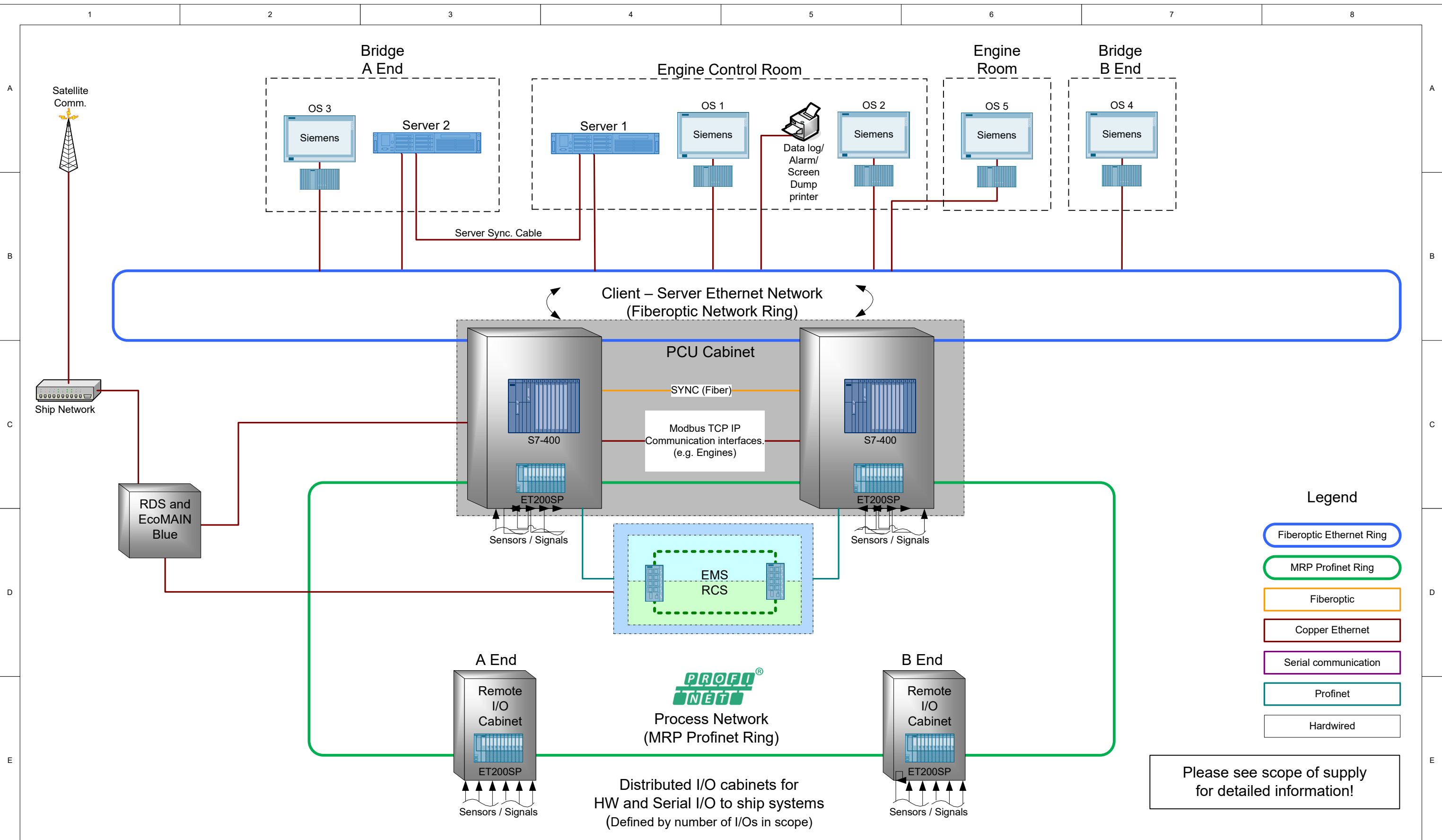
**Preliminary Distribution Transformer Drawings –  
To be Finalized During Construction**

(Following Page)

***ATTACHMENT F***

**IAS 400 Topology**

(Following Page)



Please see scope of supply for detailed information!

- W.T. doors (HW)    Cooling systems (HW)    Diesel engines (serial)    Voyage Data Recorder (serial)    Propulsion System (serial)    Fuel and Lub. Oil sys. (HW)    Grey water system (HW)
- Compressed air system (HW)    Bilge system (HW)    Ballast system (HW)    Sludge system (HW)    Fire Fighting system (HW)    Sounding system (HW)    Sewage system (HW)

This document may not be made known, reproduced or otherwise used without permission from Siemens Industry, Inc. The document is for information only and is not valid as a definition of our scope of supply. Some of the components shown are only included to give an overview of the system (e.g. diesel engines, azimuths, tunnel thrusters, EMS, RCS etc.).

REV.	DESCRIPTION	DATE	ORIG.	VERIF.	APPR.
-	First Issue	03.01.2021	JGo	JGo	JCa

IAS400 TOPOLOGY  
INTEGRATED AUTOMATION SYSTEM



Texas DOT  
John W. Johnson Ferry

IAS400  
JWJ-11-IAS400

***ATTACHMENT G***  
**Prelim Equipment Schedule**  
(Following Page)



## High Level View of Major Equipment Material Delivery Schedule

### TX DOT JWJ Refit - Siemens Energy Preliminary Material Summary Schedule

Prepared By:	J. Carrillo
Date:	9/28/2021
Rev	0

	Wks	Date
Customer PO to Siemens Energy (SE)		1/15/2022
SE Book PO and Issue PO to Suppliers	1	1/23/2022

Long Lead Time - Major Equipment		First Submittal Cycle				Second Submittal Cycle Required for SWBD for Shipyard				Release for Mfg Based on Submittals		Supplier Manufacture Duration (Wks)	Factory Test Complete	Shipping 8 wks sea	Deliver to Yard	Months from Award Date
		Prep. Wks	Sub Date	Review Wks	Return Date	Prep. Wks	Sub Date	Review Wks	Return Date	Finalize PO's	Release For Mfg					
750kVA Siemens Main Generators	Siemens	3	2/13/2022	0	2/13/2022	0	2/13/2022	0	2/13/2022	0	2/20/2022	32	10/2/2022	8	11/27/2022	11
BlueDrive Plus C	Siemens Energy	7	3/13/2022	1	3/20/2022	1	3/27/2022	0	3/27/2022	1	4/3/2022	18	8/5/2022	8	9/27/2022	9
Energy Storage System (ESS)	Siemens Energy	7	3/13/2022	1	3/20/2022	1	3/27/2022	0	3/27/2022	1	4/3/2022	18	8/5/2022	8	9/27/2022	9
BlueVault Battery Modules*	Siemens Energy	7	3/13/2022	1	3/20/2022	1	3/27/2022	0	3/27/2022	1	4/3/2022	18	8/7/2022	8	9/28/2022	9
600VAC SWBD & 480VAC E-SWBD	Beier	6	3/6/2022	1	3/13/2022	0	3/13/2022	0	3/13/2022	0	3/13/2022	14	6/19/2022	2	7/3/2022	6
Panelboards	Beier	6	3/6/2022	1	3/13/2022	0	3/13/2022	0	3/13/2022	0	3/13/2022	12	6/5/2022	2	6/19/2022	6
UPS	TBD	3	2/13/2022	1	2/20/2022	1	2/27/2022	0	2/27/2022	0	3/6/2022	18	7/8/2022	2	7/22/2022	7
EMS	Siemens Energy	7	3/13/2022	1	3/20/2022	1	3/27/2022	0	3/27/2022	1	4/3/2022	18	8/5/2022	8	9/27/2022	9
ECO Main	Siemens Energy	7	3/13/2022	1	3/20/2022	1	3/27/2022	0	3/27/2022	1	4/3/2022	18	8/5/2022	8	9/27/2022	9
Transformers	Hammond	3	2/13/2022	1	2/20/2022	0	2/20/2022	0	2/20/2022	1	2/27/2022	7	4/17/2022	2	5/1/2022	4

This date is delivery to Engine Manufacturer

**Note:**  
- Battery modules to arrive close to start of installation



# **UNIFORM GENERAL CONDITIONS**

TEXAS DEPARTMENT of TRANSPORTATION  
125 E. 11<sup>th</sup> Street  
Austin, Texas 78701

Support Services Division  
Facilities Planning & Management Section  
Riverside Annex, Bldg. 150-4 North

Revision Date: 12/28/2020

## Table of Contents

<b><u>ARTICLE 1</u></b>	<b><u>GENERAL DEFINITIONS</u></b>	8
<b><u>ARTICLE 2</u></b>	<b><u>PROCEDURES GOVERNING BIDDING</u></b>	
2.1	Resolution of Conflicts in the Documents -----	13
2.2	Examining Documents and Work Locations -----	13
2.3	Eligible Bidder -----	13
2.4	Preparing and Submitting the Bid -----	13
2.4.1	Proposal Form	
2.4.2	Proposal Guaranty	
2.4.3	Guaranty Check	
2.4.4	Bid Bond	
2.4.5	Addendum	
2.4.6	HUB Subcontracting Plan	
2.4.7	Department of Homeland Security (DHS) E-Verify Registration	
2.4.8	Submittal of Bid	
2.4.9	Revising the Proposal Form	
2.4.10	Withdrawing a Bid	
2.5	Opening and Reading of Bids-----	14
2.5.1	Reading of Bids	
2.5.2	Nonresponsive Bid	
2.6	Consideration of Bid Errors -----	14
2.6.1	Consideration	
2.6.2	Evaluation	
2.6.3	Acceptance	
2.7	Tie Bids -----	15
2.8	Return of Proposal Guaranty -----	15
2.8.1	Proposal Guaranty Check	
2.8.2	Bid Bond	
<b><u>ARTICLE 3</u></b>	<b><u>AWARD AND EXECUTION OF CONTRACT</u></b>	
3.1	Resolution of Conflicts in the Documents -----	16
3.2	Award of Contract -----	16
3.2.1	Time	
3.2.2	Reservations	
3.2.3	Award	
3.2.4	Rejection	
3.3	Rescinding of Award -----	16
3.3.1	Award Cancel	
3.4	Execution of Contract -----	16
3.4.1	Contract	
3.4.2	Bonds	
3.4.3	Insurance	
3.4.4	Business Ownership Information	
3.4.5	Certificate of Interested Parties (Form 1295)	
3.5	Failure to Enter Contract -----	18
3.5.1	Proposal Guaranty	
3.6	Return of Proposal Guaranty -----	18
3.6.1	Guaranty Check	
3.6.2	Bid Bond	
3.7	Beginning of Work -----	18
3.7.1	Written Authorization	
3.8	Assignment of Contract -----	18
3.9	Excluded Parties -----	18
3.10	Notice of State Audit Authority -----	18

<b>ARTICLE 4</b>		<b><u>LAWS GOVERNING CONSTRUCTION</u></b>	
4.1		<b>Resolution of Conflicts in the Documents -----</b>	19
4.2		<b>Compliance with Laws -----</b>	19
4.2.1	Fees and Permits		
4.2.2	Change in Laws		
4.3		<b>Environmental Laws -----</b>	19
4.3.1	Hazardous Materials		
4.4		<b>Wage Rates -----</b>	19
4.5		<b>Records -----</b>	19
4.6		<b>Venue for Suits -----</b>	19
4.7		<b>Licensing of Trades -----</b>	19
4.7.1	Loss of License		
4.8		<b>State Sales and Use Taxes -----</b>	20
<b>ARTICLE 5</b>		<b><u>GENERAL RESPONSIBILITIES OF OWNER AND CONTRACTOR</u></b>	
5.1		<b>Resolution of Conflicts in the Documents -----</b>	21
5.2		<b>Owner's General Responsibilities -----</b>	21
5.2.1	Preconstruction Conference		
5.2.2	TxDOT Project Manager (PM)		
5.2.3	TxDOT District Representative (DR)		
5.2.4	TxDOT Supplied Materials and Information		
5.2.5	Availability of Lands		
5.2.6	Limitation on Owner's Duties		
5.2.7	Site Visits		
5.2.8	Clarifications and Interpretations		
5.3		<b>Role of Architect / Engineer (A/E) -----</b>	22
5.3.1	Site Visits		
5.3.2	Clarifications and Interpretations		
5.3.3	Limitations on Architect / Engineer Authority		
5.4		<b>Contractor's General Responsibilities -----</b>	22
5.4.1	Beginning of Work		
5.4.2	Services, Materials, and Equipment		
5.4.3	Cooperation of Contractor		
5.4.4	Contractor's Superintendent		
5.4.5	Project Administration		
5.4.6	Communications		
5.4.7	Non-Compliant Work		
5.4.8	Cleaning		
5.4.9	Labor		
5.4.10	Subcontractors		
5.4.11	Availability of Other Lands		
5.4.12	Laws to be Observed		
5.4.13	Ancillary Areas		
5.4.14	Ancillary / Integral Professional Services		
5.4.15	Notifications		
5.4.16	Continuing the Work		
5.4.17	Environment		
5.4.18	Indemnity for Environmental Damages		
5.4.19	Utilities		
5.4.20	Separate Contracts		
5.4.21	Errors, Omissions and Negligent Acts of the Contractor, its Subcontractors and Employees		
5.4.22	Indemnification of TxDOT		
5.4.23	Contractor's Risk of Performance		

<b>ARTICLE 6</b>	<b>HISTORICALLY UNDERUTILIZED BUSINESS SUBCONTRACTING PLAN</b>	
6.1	Resolution of Conflicts in the Documents -----	25
6.2	General Description -----	25
6.3	Compliance with Approved HUB Subcontracting Plan -----	25
6.4	Failure to Demonstrate Good Faith Effort -----	25
6.5	Monthly Reporting -----	25
6.6	Final Report -----	25
<b>ARTICLE 7</b>	<b>BONDS AND INSURANCE</b>	
7.1	Resolution of Conflicts in the Documents -----	26
7.2	Construction Bonds -----	26
7.2.1	Payment Bond	
7.2.2	Performance Bond	
7.2.3	Surety Requirements	
7.2.4	Power of Attorney	
7.3	Bond Indemnification -----	26
7.4	Furnishing Bond Information -----	26
7.5	Claims on Payment Bonds -----	26
7.6	Performance Bond Surety's Obligation -----	26
7.7	Insurance Requirements -----	26
7.7.3	Policy Expiration	
7.8	Required Policy Clauses -----	27
7.9	Worker's Compensation Insurance -----	27
7.10	Commercial General Liability Insurance -----	27
7.11	Business Automobile Liability Insurance -----	27
7.12	Builder's Risk Insurance -----	28
7.13	Special Insurance Coverage -----	28
7.13.1	Asbestos Abatement Liability Insurance	
<b>ARTICLE 8</b>	<b>CONTRACT DOCUMENTS</b>	
8.1	Resolution of Conflicts in the Documents -----	29
8.2	Drawings and Specifications -----	29
8.2.1	Copies Furnished	
8.2.2	Ownership of Plans and Specifications	
8.2.3	Interrelation of Documents	
8.2.4	Resolution of Conflicts in the Documents	
8.2.5	Contractor's Duty to Review Contract Documents	
8.2.6	Errors and Omissions in Drawings and Specifications	
8.3	Requirements for Record Documents -----	29
<b>ARTICLE 9</b>	<b>SAFETY</b>	
9.1	Resolution of Conflicts in the Documents -----	30
9.2	General -----	30
9.3	Notices -----	30
9.4	Emergencies -----	30
9.5	Injuries -----	30
9.6	Environmental Safety -----	30
9.6.6	Environmental Quality	
9.7	Indemnity for Environmental Damages -----	31
9.8	Trenching Safety -----	31
9.9	Indemnification of TxDOT -----	31

<b>ARTICLE 10</b>		<b><u>QUALITY CONTROL</u></b>	
<b>10.1</b>	<b>Resolution of Conflicts in the Documents -----</b>		<b>32</b>
<b>10.2</b>	<b>Materials &amp; Workmanship -----</b>		<b>32</b>
<b>10.3</b>	<b>Testing -----</b>		<b>32</b>
10.3.1	Contractor Testing		
10.3.2	TxDOT Testing		
10.3.3	Non-Compliance (Test Results)		
10.3.4	Notice of Testing		
10.3.5	Test Samples		
10.3.6	Covering up Work		
<b>10.4</b>	<b>Inspections -----</b>		<b>32</b>
10.4.1	Access		
10.4.2	Notice of Inspection		
10.4.3	Covering up Work		
<b>10.5</b>	<b>Deficiencies in the Work -----</b>		<b>33</b>
<b>10.6</b>	<b>Submittals -----</b>		<b>33</b>
10.6.1	Contractor's Submittals		
10.6.2	Review of Submittals		
10.6.3	Correction and Resubmission		
10.6.4	Limits on Shop Drawing Review		
10.6.5	No Substitutions without Review		
10.6.6	Unauthorized Substitutions at Contractor's Risk		
<b>10.7</b>	<b>Field Mock-up -----</b>		<b>34</b>
<b>10.8</b>	<b>Inspection During Construction -----</b>		<b>34</b>
<b>10.9</b>	<b>Buy America -----</b>		<b>35</b>
<b>10.10</b>	<b>Buy Texas -----</b>		<b>35</b>
<b>ARTICLE 11</b>		<b><u>CONSTRUCTION SCHEDULES</u></b>	
<b>11.1</b>	<b>Resolution of Conflicts in the Documents -----</b>		<b>36</b>
<b>11.2</b>	<b>Work Progress Schedule -----</b>		<b>36</b>
11.2.1	Schedule Requirements		
11.2.2	Schedule Updates		
11.2.3	Effect of Work Progress Schedule		
<b>11.3</b>	<b>Ownership of Float -----</b>		<b>36</b>
<b>11.4</b>	<b>Force Majeure -----</b>		<b>36</b>
<b>ARTICLE 12</b>		<b><u>CONTRACT TIME</u></b>	
<b>12.1</b>	<b>Resolution of Conflicts in the Documents -----</b>		<b>38</b>
<b>12.2</b>	<b>Contract Time -----</b>		<b>38</b>
<b>12.3</b>	<b>Authorization to Begin Work -----</b>		<b>38</b>
<b>12.4</b>	<b>Completion of Work -----</b>		<b>38</b>
<b>12.5</b>	<b>Computation of Contract Time for Completion -----</b>		<b>38</b>
<b>12.6</b>	<b>Modification of the Contract Time -----</b>		<b>38</b>
12.6.1	Extension of Time		
12.6.2	Excusable Delay		
12.6.3	Excusable Delay Relief		
12.6.4	Non-compensable Delay		
12.6.5	Non-compensable Delay Relief		
12.6.6	Concurrent Delay		
12.6.7	Other Time Extension Requests		
<b>12.7</b>	<b>No Damages for Delay -----</b>		<b>39</b>
<b>12.8</b>	<b>Duty to Perform -----</b>		<b>39</b>
<b>12.9</b>	<b>Failure to Complete Work within the Contract Time -----</b>		<b>39</b>
<b>12.10</b>	<b>Liquidated Damages -----</b>		<b>40</b>

<b>ARTICLE 13</b>		<b>PAYMENTS</b>	
13.1	Resolution of Conflicts in the Documents -----		41
13.2	Schedule of Values -----		41
13.3	Lump Sum Payment -----		41
13.4	Texas Identification Number -----		41
13.5	Progress Payments -----		41
13.5.1	Preliminary Pay Worksheet		
13.5.2	Contractor's Application for Progress Payment		
13.6	Owner's Duty to Pay -----		42
13.6.4	Stored Material		
13.6.5	Retainage		
13.6.6	Price Reduction to Cover Loss		
13.6.7	Final Payment		
13.6.8	Title to Material and Work		
13.7	Continued Obligations -----		43
13.8	Off-Site Storage -----		43
<b>ARTICLE 14</b>		<b>CONTRACT CHANGES</b>	
14.1	Resolution of Conflicts in the Documents -----		44
14.2	Minor Changes -----		44
14.3	Emergency Change -----		44
14.4	Unilateral Change Order -----		44
14.5	Change Orders -----		44
14.6	Administration of Change Order Requests -----		44
14.6.1	Routine Change		
14.6.2	Unexpected Circumstance		
14.6.3	Emergency Change		
14.6.4	Valuation of Change Order Work		
14.6.5	Contractor Cost Reduction Proposal		
14.7	Claims for Additional Costs -----		47
14.8	Concealed Site Conditions -----		47
14.9	Extension of Time -----		47
14.10	Contractor's Risk of Performance -----		47
<b>ARTICLE 15</b>		<b>PROJECT COMPLETION AND ACCEPTANCE</b>	
15.1	Resolution of Conflicts in the Documents -----		48
15.2	Closing Inspections -----		48
15.2.1	Request for Substantial Completion Inspection		
15.2.2	Substantial Completion Inspection		
15.2.3	Requirements for Substantial Completion		
15.2.4	Substantial Completion Punch List		
15.2.5	Final Completion Inspection		
15.2.6	Final Punch List		
15.2.7	Final Punch List Inspection		
15.2.8	Annotation		
15.2.9	Purpose of Inspection		
15.2.10	Additional Inspections		
15.2.11	Phased and Whole Completion		
15.2.12	Time Charges		
15.3	TxDOT's Right of Occupancy -----		50
15.4	Acceptance and Payment -----		50
15.4.1	Request for Final Payment		
15.4.2	Allowances		
15.4.3	Final Payment Documentation		
15.4.4	Offsets and Deductions		

15.4.5	TxDOT Approval	
15.4.6	Final Payment Due	
15.4.7	Effect of Final Payment (TxDOT)	
15.4.8	Effect of Final Payment (Contractor)	
15.4.9	Effect on Warranty	

<b>ARTICLE 16</b>	<b>WARRANTY AND GUARANTY</b>	
16.1	Resolution of Conflicts in the Documents -----	52
16.2	Contractor’s General Warranty and Guaranty -----	52
16.3	Warranty Period -----	52
16.4	Limits on Warranty -----	52
16.5	Events Not Affecting Warranty -----	52
16.6	Separate Warranties -----	52
16.7	Correction of Defects -----	53
16.8	Certification of No Asbestos Containing Materials or Work -----	53
16.9	Telecommunications System Warranty Period -----	53
<b>ARTICLE 17</b>	<b>SUSPENSION AND TERMINATION</b>	
17.1	Resolution of Conflicts in the Documents -----	54
17.2	Suspension of Work for Cause -----	54
17.3	Suspension of Work for TxDOT’s Convenience -----	54
17.4	Termination by TxDOT for Cause -----	54
17.5	Termination for Convenience of TxDOT -----	55
17.6	Termination by Contractor -----	56
17.7	Settlement on Termination -----	56
<b>ARTICLE 18</b>	<b>DISPUTE RESOLUTION</b>	
18.1	Resolution of Conflicts in the Documents -----	57
18.2	Contractor Disputes -----	57
18.3	Unresolved Contractor Disputes -----	57
18.3.1	Contractor Claim	
18.3.2	Owner Claim	
18.4	Condition Precedent to Formal Administrative Hearing -----	57
18.5	Condition Precedent to Seeking Consent to Sue -----	57
18.6	Continued Performance -----	57
18.7	Access to Documents -----	57
<b>ARTICLE 19</b>	<b>MISCELLANEOUS</b>	
19.1	Resolution of Conflicts in the Documents -----	58
19.2	Special Conditions -----	58
19.3	Standard Specifications -----	58
19.3.1	Measurement	
19.3.2	Payment	
19.4	Personal Liability of Public Officials -----	58
19.5	Assignment of Contract -----	58
19.6	Responsibility for Damage Claims -----	58
19.7	Assertion of Claim -----	58



## Article 1 General Definitions

*Unless the context clearly requires another meaning, the following terms have the meaning assigned herein.*

- 1.1 **Addendum** means a change in proposal forms developed between advertising and bid submittal deadline. Addenda will be issued only by TxDOT and must be acknowledged by a bidder for his proposal to be publicly read.
- 1.2 **Advertisement** means the public announcement for work to be performed or materials to be furnished. The public announcement will be via the Electronic State Business Daily (ESBD) web site operated and maintained by the State acting through the Texas Comptroller of Public Accounts. (<http://www.txsmartbuy.com/sp>)
- 1.3 **Apparent Low Bidder** means the Bidder determined to have the numerically lowest total bid as a result of tabulation of bids by TxDOT.
- 1.4 **Architect/Engineer (A/E)** means a person registered as an architect pursuant to Tex. Occ. Code Ann., Chapter 1051, as a landscape architect pursuant to Tex. Occ. Code Ann., Chapter 1052, a person licensed as a professional engineer pursuant Tex. Occ. Code Ann., Chapter 1001 and/or a firm employed by TxDOT or Contractor to provide professional architectural and/or engineering services and to exercise overall responsibility for the design of a Project or a portion thereof, and to perform contract administration responsibilities as set forth in the Contract Documents.
- 1.5 **Authorization to Begin Work Letter** means the letter issued by TxDOT authorizing the Contractor to begin work in accordance with the provisions of the Contract and establishing the date stated in the Contract for completion of the Work, or establishing the beginning date time charges will commence for computing Contract Time for completion of the Work.
- 1.6 **Award** means the Commission's authorized representative's written acceptance of the Bidder's bid for a proposed Contract that authorizes TxDOT to enter into a Contract.
- 1.7 **Bid** means the offer of a Bidder for performing the Work described in the Contract Documents including any changes made by addendum.
- 1.8 **Bid Bond** means the security executed by the Bidder and the Surety furnished to TxDOT to guarantee payment of liquidated damages if the Bidder fails to enter into an awarded Contract.
- 1.9 **Bid Error** means a mathematical mistake made by a Bidder in an item number price entered into the proposal.
- 1.10 **Bid Form** means **Proposal Form**.
- 1.11 **Bidder** means an individual, partnership, limited liability company, corporation or joint venture submitting a bid for a proposed Contract.
- 1.12 **Building Contract** means a contract entered under Transportation Code, Chapter 223, Subchapter A for the construction or maintenance of a Department building or appurtenant facilities and considered to be a Highway Improvement Contract as defined in Texas Administrative Code, § 9.11.
- 1.13 **Business Day** means Monday through Friday, 8 a.m. to 5 p.m. excluding state and federal holidays.
- 1.14 **Calendar Day** means any day including Saturdays, Sundays, and legal holidays.
- 1.15 **Certificate of Insurance** means a form approved by the Department covering insurance requirements stated in the Contract.
- 1.16 **Change Order** means TxDOT's written order to the Contractor detailing changes to the specified Work, item quantities, or any other necessary modification of the Contract, at TxDOT's sole discretion.

- 1.17 **Claim** means a claim for compensation, for a time extension, or for any other remedy arising from a dispute, disagreement, or controversy concerning respective rights and obligations under the Contract.
- 1.18 **Commission** means the Texas Transportation Commission or authorized representative.
- 1.19 **Company** means the Bidder and/or Contractor.
- 1.20 **Contract** means the entire agreement between the Owner and the Contractor, including all of the Contract Documents, establishing the obligation of the parties for furnishing of materials and performance of the Work prescribed in the Contract Documents.
- 1.21 **Contract Documents** means the elements of the agreement (Contract) between the Owner and the Contractor. These include, but are not limited to, Bonds, Insurance, Plans, Shop Drawings, Specifications, Uniform General Conditions, Special Conditions, *Special Provisions*, *Special Specifications*, *Standard Specifications*, Change Orders, Bidding Documents, Advertisement, Bidder's Proposal, and all pre-bid addenda.
- 1.22 **Contractor** means the individual, company, partnership, limited liability company, corporation, or joint venture and all principals and representatives, jointly and severally, that are responsible for performance of a Contract awarded by TxDOT. In the event of termination for cause of a Contract with a Performance Bond the Surety becomes the Contractor.
- 1.23 **Contract Sum** means the total compensation payable to the Contractor for completion of the Work in accordance with the terms of the Contract.
- 1.24 **Contract Time** means the period of time from the date computation of time charges begin as set forth in the Authorization to Begin Work letter to the date stated in the Contract for completion of the Work, or the number of calendar days allowed in the Contract for completion of the Work, plus any TxDOT approved extensions.
- 1.25 **Day** means a calendar day, unless otherwise specifically stipulated.
- 1.30 **Dispute** means a disagreement between TxDOT and the Contractor or its authorized successor over the interpretation of the Contract Documents.
- 1.31 **District Representative (DR)** means the individual identified by TxDOT who will assist the Project Manager; perform periodic observations of the Work for general compliance with the plans and specifications; be the point of contact for coordination with the end-user for Work being conducted on an operational site; and perform other duties as specifically defined elsewhere in the Contract Documents and/or reflected in the Pre-construction Conference meeting minutes.
- 1.32 **Drawings** mean the sealed product of the Architect and/or Engineer which graphically depicts the Work.
- 1.33 **Engineer** see **Architect/Engineer (A/E)**.
- 1.34 **Environmental Laws** means Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA") 42 U.S.C. §9601 et seq.; the Toxic Substance Control Act ("TSCAS"), 15 U.S.C. §2601 et seq.; the Hazardous Materials Transportation Act, 49 U.S.C. §1802; the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. §9601, et seq.; the Clean Water Act ("CWA"), 33 U.S.C. §1251 et seq.; the Safe Drinking Water Act, 42 U.S.C. §300f et seq.; the Clean Air Act ("CAA"), 42 U.S.C. §7401 et seq.; M.G.L. c. 21C and c. 21E; Texas Health and Safety Code Chapter 361; Texas Water Code Chapter 26; and any permits, licenses, approvals, plans, rules, regulations or ordinances adopted, or other criteria and guidelines promulgated pursuant to the preceding laws or other similar federal, state or local laws, regulations, rules or ordinances now in effect, or that may hereafter apply, relating to environmental matters.
- 1.35 **Executive Director** means the executive director of the Texas Department of Transportation.
- 1.37 **Final Acceptance** means the date determined and certified by the Architect/Engineer and TxDOT on which the Work is fully and satisfactorily complete in accordance with the Contract subject to the expiration of all warranty periods or any other overriding provision of the Contract Documents.

- 1.38 **Final Completion** means the date determined and certified by the Architect and/or Engineer, if applicable, and TxDOT on which the Work to the best of their information, knowledge and belief is fully and satisfactorily complete in accordance with the Contract subject to the expiration of all warranty periods or any other overriding provision of the Contract Documents.
- 1.39 **Hazardous Materials** means (i) hazardous wastes, hazardous substances, hazardous constituents, toxic substances or related materials, whether solids, liquids or gases, including but not limited to substances defined as "hazardous wastes," "hazardous substances," "oils," "toxic substances," "pollutants," "contaminants," "radioactive materials," or other similar designations in, or otherwise subject to regulation under, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. §9601 et seq.; the Toxic Substance Control Act ("TSCAS"), 15 U.S.C. §2601 et seq.; the Hazardous Materials Transportation Act, 49 U.S.C. §1802; the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. §9601, et seq.; the Clean Water Act ("CWA"), 33 U.S.C. §1251 et seq.; the Safe Drinking Water Act, 42 U.S.C. §300f et seq.; the Clean Air Act ("CAA"), 42 U.S.C. §7401 et seq.; M.G.L. c. 21C and c. 21E; Texas Health and Safety Code Chapter 361; Texas Water Code Chapter 26; and in any permits, licenses, approvals, plans, rules, regulations or ordinances adopted, or other criteria and guidelines promulgated pursuant to the preceding laws or other similar federal, state or local laws, regulations, rules or ordinance now in effect, or that may hereafter apply, relating to environmental matters (collectively the "Environmental Laws"); and (ii) any other substances, constituents or wastes subject to any applicable federal, state or local law, regulation or ordinance, including any environmental law, now or hereafter in effect, including but not limited to (A) petroleum, (B) refined petroleum products, (C) waste oil, (D) waste aviation or motor vehicle fuel and (E) asbestos.; and (iii) any materials that, prior to execution of the Contract, were not designated as hazardous materials that, after execution of the Contract, become new hazardous materials subject to regulation under the aforementioned "Environmental Laws" and any applicable federal, state, or local law, regulation or ordinance.
- 1.40 **Letting** means the receipt, opening and determination of the apparent low Bidder.
- 1.41 **Letting Official** means the Executive Director or any TxDOT employee empowered by the Executive Director to officially receive and close the receipt of bids at a letting.
- 1.42 **Manufactured**, for the purposes of the *Buy America* provision of this Contract, means any process that modifies the chemical content, physical shape or size, or finish of a product. Manufacturing begins with initial melting and mixing and continues through fabrication (rolling, extruding, machining, bending, grinding, drilling, welding, cutting, etc.) and coating (paint, galvanizing, epoxy or any other coating that protects or enhances the value of the material.)
- 1.43 **Owner** means the State of Texas acting through the Texas Department of Transportation (TxDOT).
- 1.44 **Payment Bond** means the security executed by the Contractor and the Surety, furnished to the TxDOT obligating the Surety to guarantee payment of all legal debts of the Contractor pertaining to the Contract.
- 1.45 **Performance Bond** means the security executed on a form provided by TxDOT by the Contractor and the Surety, furnished to TxDOT to guarantee the completion of the Work in accordance with the terms of the Contract.
- 1.47 **Plans** mean Drawings.
- 1.48 **Power of Attorney for Surety Bonds** means an instrument under corporate seal appointing an attorney-in-fact to act on behalf of a Surety in signing bonds.
- 1.49 **Prime Contractor** means Contractor.
- 1.50 **Project** means all activities necessary for realization of the Work. This includes design, contract award(s), execution of the Work itself, and fulfillment of all Contract and warranty obligations.
- 1.51 **Project Manager (PM)** means the individual identified by TxDOT who will be responsible for the general administration of the Contract; is the single point of contact between TxDOT and the Contractor; conveys all directives on behalf of TxDOT to the Contractor; decides all questions which

may arise as to the quality or acceptability of materials furnished, work performed, and interpretations of the plans and specifications when such action is not a contravention of a design decision made by an Architect / Engineer in preparation of the plans and specifications or such action is in conflict with statutes under which the Architect or Engineer is licensed for the protection of the public health or safety; the manner of performance and rate of progress of the Work; and acceptable fulfillment of the Contract on the part of the Contractor unless otherwise specifically defined elsewhere in the Contract Documents.

- 1.52 **Project Site** means the real property on which the demolition, improvements, alternations, etc. as described in the Contract Documents will be implemented.
- 1.53 **Proposal** means the offer of the Bidder submitted on the prescribed form giving a bid price for performing the Work described in the plans and specifications and all addenda issued.
- 1.54 **Proposal Form** means the forms printed by the Bidder from the Electronic State Business Daily (ESBD) website operated and maintained by the State acting through the Texas Comptroller of Public Accounts.
- 1.55 **Proposal Guaranty** means the security designated in the proposal and furnished by the bidder as a guaranty that the bidder will enter into an awarded contract.
- 1.56 **Request for Proposal (RFP)** means a document generated by TxDOT which informs the Contractor of a proposed change in the Work, and appropriately describes or otherwise documents such proposed change.
- 1.57 **Responsive Bid** means a proposal that meets all requirements of the proposal form for acceptance.
- 1.58 **Routine Facilities Contract (RFC)** means a Contract let through the routine facilities contracting procedure for the construction or maintenance of a Department building or appurtenant facilities.
- 1.59 **Samples** mean representative physical examples of materials, equipment or workmanship, used to confirm compliance with requirements and/or to establish standards for use in execution of the Work.
- 1.60 **Schedule of Values** means the cost breakdown, in such detail as acceptable to TxDOT, of the materials, labor and equipment necessary to accomplish the Work as described in the Contract Documents, submitted by Contractor for approval by TxDOT.
- 1.61 **Shop Drawings** means the drawings, diagrams, illustrations, schedules, performance charts, brochures and other data prepared by the Contractor or its agents, which detail a portion of the Work.
- 1.62 **Site** see **Project Site**.
- 1.63 **Special Conditions** means supplemental additions or revisions to the Uniform General Conditions applicable to the Contract not covered by the Uniform General Conditions. Special Conditions are a part of the Contract Documents and have precedence over the Uniform General Conditions.
- 1.64 **Special Provisions** means additions or revisions to standard specifications.
- 1.65 **Specifications** means the written product of the Architect and/or Engineer, if applicable, that establishes the quality and/or performance of products utilized in the Work and processes/standards to be used, including testing and verification, for compliance.
- 1.66 **Standard Specifications** means the Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges adopted November 1, 2014 and updates as posted on TxDOT official website at <http://www.txdot.gov> and relevant to the Project.
- 1.67 **State** means the State of Texas.
- 1.68 **State Let Building Contract (SLBC)** means a Contract let through the state let building contracting procedure for the construction or maintenance of a Department building or appurtenant facilities.

- 1.69 **Subcontract** means the agreement between the Contractor and subcontractor establishing the obligations of the parties for furnishing of materials and performance of the Work prescribed in the Contract Documents.
- 1.70 **Subcontractor** means an individual, partnership, limited liability company, corporation, or any combination thereof that the Contractor sublets any portion of the Work or provide services, materials or equipment for use in the Work.
- 1.71 **Substantial Completion** means the stage of progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents, so that TxDOT employees and the public can safely occupy, utilize, and operate the improvements and all elements of the Work for purposes intended without hindrance or material interference from the Contractor's minor "punch list items" completion activities or on-going work performance of those portions of the Work not being considered for Substantial Completion. The date of Substantial Completion is the date established by the Contractor and TxDOT as set forth in the Certificate of Substantial Completion issued by TxDOT.
- 1.72 **Supplemental Instruction** means a written order issued by the PM or authorized representative making minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time.
- 1.73 **TxDOT** means the Texas Department of Transportation acting on behalf of the State of Texas.
- 1.74 **Unit Price Work** means Work or a portion of the Work paid for based on incremental units of measurement.
- 1.75 **Unilateral Change Order (ULCO)** means a Change Order issued by TxDOT without the agreement of the Contractor.
- 1.76 **Work** means the administration, procurement, materials, equipment, construction and all services necessary for the Contractor, or its agents or both, to fulfill the Contractor's obligations under the Contract.

## Article 2 Procedures Governing Bidding

- 2.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 2.2 **EXAMINING DOCUMENTS AND WORK LOCATIONS**
- 2.2.1 Examine the proposal form, plans, and specifications, and specified work locations before submitting a bid for the work. Submitting a bid will be considered evidence that the Bidder has performed the examination. For plans which include data for borings, soil profiles, ground water elevations, and underground utilities the information was obtained for use by TxDOT in the preparation of the plans. This information is provided for the Bidder's information only and TxDOT makes no representation as to the accuracy of the data.
- 2.2.2 Oral explanations, instructions, or consideration of Contractor-proposed changes in the proposal form given during the bidding process are not binding. Only requirements included in the proposal form, associated uniform general conditions, specifications, plans and TxDOT-issued addenda are binding. Request explanations of documents in adequate time to allow TxDOT to reply before the bid opening.
- 2.2.3 Immediately notify TxDOT of any error, omission, or ambiguity discovered in any part of the proposal form and Contract documents. TxDOT will issue addenda when appropriate.
- 2.3 **ELIGIBLE BIDDER**
- 2.3.1 To be eligible to bid on a building contract a potential bidder must satisfactorily comply with any financial, experience, technical, or other requirement contained in the governing specifications applicable to the project in accordance with Texas Administrative Code Rule §9.12 (e).
- 2.4 **PREPARING AND SUBMITTING THE BID**
- 2.4.1 **Proposal Form.** Prepare the bid on the proposal form provided by TxDOT. Documents may be obtained electronically at the Electronic State Business Daily (ESBD) website operated and maintained by the State acting through the Texas Comptroller of Public Accounts. <http://www.txsmartbuy.com/sp>.
- 2.4.1.1 Execute the proposal form in ink with the complete and correct name of the individual, firm, corporation or combination thereof making the proposal. The person authorized to bind the Bidder or Bidders must sign the proposal. Specify a price in dollars and cents for each bid item and if included each allowance item on the proposal form.
- 2.4.2 **Proposal Guaranty.** Provide a proposal guaranty in the amount indicated on the proposal form. Use either a guaranty check or a printed bid bond. If a proposal guaranty is not required it will state so on the proposal form.
- 2.4.3 **Guaranty Check.** Make the check payable to the Texas Transportation Commission or the Texas Department of Transportation. The check must be a cashier's check, money order, or teller's check drawn by or on a state or national bank, or a state or federally chartered credit union (collectively referred to as a "bank"). The check must be dated on or before the date of the bid opening. Postdated checks will not be accepted. The type of check or money order must be indicated on the face of the instrument, except in the case of a teller's check, and the instrument must be no more than 90 days old. A check must be made payable at or through the institution issuing the instrument; or drawn by a bank and on a bank; or be payable at or through a bank. TxDOT will not accept personal checks, certified checks, or other types of money orders.
- 2.4.4 **Bid Bond.** Use the bid bond form provided by TxDOT. Submit the bid bond in the amount specified with the powers of attorney dated and attached. Retyped copies of the bid bond form will not be accepted. The bond must be dated on or before the date of the bid opening, bear the impressed seal of the Surety, and be signed by the Bidder or Bidders and an authorized individual of the Surety. As an alternative for joint venture Bidders, each of the Bidders may submit a separate bid bond completed as outlined in this Section. Bid bonds will only be accepted from Sureties authorized to execute a bond under and in accordance with State law.
- 2.4.5 **Addendum.** Verify if addenda have been issued for the proposed Contract. If addenda have been issued they must be acknowledged on the Addendum Acknowledgment form. Submit the Addendum Acknowledgment form with the proposal.
- 2.4.6 **HUB Subcontracting Plan.** If a HUB Subcontracting Plan is required it will be so stated on the proposal form. If a HUB Subcontracting Plan is required complete and sign the HUB Subcontracting Plan (HSP) and submit with the proposal.
- 2.4.7 **Department of Homeland Security (DHS) E-Verify Registration.** Register in the DHS E-Verify system. Remain active in E-Verify throughout the life of the contract. Subcontractors must also register and remain active in E-Verify until their work is completed.
- 2.4.8 **Submittal of Bid.** Place the completed proposal form and the proposal guaranty in a sealed envelope marked to indicate the contents.

2.4.8.1 When submitting by mail or delivery service, place the envelope in another sealed envelope and address as indicated in the official advertisement. It is the Bidder's responsibility to ensure that the sealed bid arrives at the location described on or before the time and date set for the bid opening. To be accepted, the bid must be in the hands of the Letting Official by the time and date set for the receipt of proposals, regardless of the method chosen for delivery.

2.4.9 **Revising the Proposal Form.** Make desired changes to the Bidder entered information on the proposal form in ink, initial each change made, and submit the proposal to the Letting Official. TxDOT will not make revisions to a bid on behalf of a Bidder.

2.4.10 **Withdrawing a Bid.** Submit a written request to withdraw a bid before the time and date set for the receipt of proposals. TxDOT will not accept oral requests. A written request must be signed and submitted to the Letting Official with proof of identification. The request must be made by a person authorized to bind the Bidder or Bidders. In case of joint venture, TxDOT will accept a request from a person authorized to bind a party to the joint venture. TxDOT may require written delegation of authority to withdraw a bid when the individual sent to withdraw the bid is not authorized to bind the Bidder or Bidders.

## 2.5 OPENING AND READING OF BIDS

2.5.1 **Reading of Bids.** At the time, date, and location specified in the official advertisement, the Letting Official will publicly open and read bids. A bid determined to be nonresponsive may or may not be read.

2.5.2 **Nonresponsive Bid.** TxDOT will not accept a nonresponsive bid. A bid that has one or more of the deficiencies listed below is considered nonresponsive:

2.5.2.1 the bid was not in the hands of the Letting Official at the time and location specified in the advertisement,

2.5.2.2 a bid was submitted for the same proposal form by a Bidder or Bidders and one or more of its partners or affiliates,

2.5.2.3 the Bidder did not acknowledge or improperly acknowledged all addenda,

2.5.2.4 the Bidder is suspended or debarred by the Commission, Department, or any federal agency,

2.5.2.5 the Bidder was prohibited from rebidding a specific proposal form due to failure to enter into a Contract on the original award,

2.5.2.6 the bidder failed to enter into a Contract on the original award,

2.5.2.7 the Bidder was defaulted or terminated on the original Contract, unless TxDOT terminated in the best interest of the State or the public,

2.5.2.8 the Bidder or a subsidiary or affiliate of the Bidder has received compensation from TxDOT to participate in the preparation of the plans or specification or both on which the bid or Contract is based,

2.5.2.9 the Bidder's HUB Subcontracting Plan was determined by TxDOT to be non-compliant,

2.5.2.10 the Bidder did not submit a HUB Subcontracting Plan when it was required to be submitted,

2.5.2.11 the Bidder failed to participate in the Department of Homeland Security's (DHS) E-Verify System as specified above,

2.5.2.12 the proposal guaranty did not comply with the requirements contained in this Article,

2.5.2.13 the proposal form was not signed,

2.5.2.14 the proposal form was signed by a person who was not authorized to bind the Bidder or Bidders,

2.5.2.15 a bid item or allowance item or both are left blank,

2.5.2.16 the bid was in a form other than TxDOT official proposal form,

2.5.2.17 the Bidder modified the bid in a manner that altered the conditions or requirements for work as stated in the proposal form as determined solely by TxDOT,

2.5.2.18 certifications were not acknowledged,

2.5.2.19 the Bidder did not attend a mandatory pre-bid conference.

## 2.6 CONSIDERATION OF BID ERRORS

2.6.1 **Consideration.** TxDOT will consider a claim of a bid error by the apparent low Bidder if the following requirements have been met:

2.6.1.1 a written notification is submitted to TxDOT within 5 business days after the date the bid is opened; and

2.6.1.2 the submittal identifies the items of work involved and include bidding documentation. TxDOT may request clarification of submitted documentation.

2.6.2 **Evaluation.** TxDOT will evaluate the claim of an error by the apparent low Bidder by considering the following:

- 2.6.2.1 the bid error relates to a material item of work,
- 2.6.2.2 the bid error amount is significant portion of the total bid,
- 2.6.2.3 the bid error occurred despite the exercise of ordinary care, and
- 2.5.2.4 the delay of the proposed work will not impact cost and safety to the public.

2.6.3 **Acceptance.** Acceptance of the bid error claim by TxDOT will result in the rejection of all bids. The erring Contractor will not be allowed to bid the project when it is re-let. Rejection of bids due to the Contractor's bid error may result in the application of sanctions by TxDOT.

## 2.7 TIE BIDS

2.7.1 **Tie Bids.** If the bid amount for 2 or more Bidders is equal and those bids are the lowest responsive bids submitted, each tie Bidder will be given an opportunity to withdraw their bid. If 2 or more tie Bidders and do not withdraw their bids, the low Bidder will be determined by a coin toss or a series of coin tosses when there are more than 2 Bidders. If all Bidders request to withdraw their bids, no withdrawals will be allowed and the low Bidder will be determined by a coin toss or a series of coin tosses when there are more than 2 Bidders. The Letting Official will preside over the proceedings.

## 2.8 RETURN OF PROPOSAL GUARANTY

2.8.1 **Proposal Guaranty Check** The proposal guaranty check of all Bidder's except the apparent low Bidder will be returned via U.S. mail to the address specified on TxDOT [Return Bid Guaranty Check Form](#) by the Bidder.

2.8.2 **Bid Bond.** Bid bonds will not be returned.



## Article 3 Award and Execution of Contract

3.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.

### 3.2 AWARD OF CONTRACT

3.2.1. **Time.** The Commission or designated representative will award, reject, or defer the Contract within 30 days after the opening of the proposal.

3.2.2. **Reservations.** TxDOT reserves the right to reject any or all proposals and to waive technicalities in the best interest of the State.

3.2.3. **Award.** The Commission or designated representative will award the Contract to the Bidder with the lowest responsive bid (low Bidder). The Commission or designated representative may award a Contract to the Bidder with the second lowest responsive bid (second lowest Bidder) when the following requirements have been met:

3.2.3.1 the Contract is for work with a TxDOT estimated cost to construct of less than \$300,000 and the Contract does not include federal funds,

3.2.3.2 the low Bidder withdraws its bid or fails to enter into Contract,

3.2.3.3 the second lowest Bidder agrees to perform the work for the amount of the low Bidder,

3.2.3.4 the Executive Director or designated representative recommends in writing the award of the Contract to the second lowest Bidder, and

3.2.3.5 the Commission or designated representative agrees with the Executive Director or designated representative's recommendation for award to the second lowest Bidder.

3.2.4. **Rejection.** The Commission or designated representative will reject the Contract if:

3.2.4.1 the low bid contains a bid error that in the sole determination of TxDOT satisfies the requirements and criteria in Article 2, or

3.2.4.2 rejection of the Contract is in the best interest of the State.

### 3.3 RESCINDING OF AWARD

3.3.1 **Award Cancel.** The Commission or designated representative reserves the right to cancel the award of any Contract before contract execution with no compensation due when the cancellation is in the best interest of the State. TxDOT will return the proposal guaranty to the Contractor.

3.4 **EXECUTION OF CONTRACT.** Provide the following within fifteen (15) days after written notification of award of the Contract. If bonds are not required provide the following within seven (7) days after written notification of award of the Contract.

3.4.1. **Contract.** Execute the Contract as prescribed by TxDOT.

3.4.2. **Bonds.** Tender to TxDOT performance and payment bonds in accordance with Table 1. Execute and date the performance and payment bond in the full amount of the Contract with the powers of attorney. Furnish the payment and performance bond as guaranty for the protection of the claimants and TxDOT for labor and materials and the faithful performance of the Work in accordance with the Contract Documents.

3.4.2.1 Each bond shall be executed on TxDOT's form by a corporate surety or sureties authorized to do business in the State of Texas, acceptable to TxDOT and in compliance with relevant provisions of the Texas Insurance Code. If a Surety upon a bond loses its authority to do business in the State, the Surety's underwriting limitation drops below the required bond amount or the Surety is declared bankrupt or insolvent, the Contractor shall, within fifteen (15) days after occurrence of any of the aforementioned events, furnish a replacement bond at no added cost to TxDOT. In such event the Work will be suspended until a substitute Surety acceptable to TxDOT is provided and a non-compensable time extension to the Contract will be granted for the fifteen (15) days or thirty (30) days if an acceptable Surety is not readily provided, whichever is sooner. The Contractor's inability to find an acceptable Surety within thirty (30) days will be deemed a breach of contract and TxDOT may, in its sole discretion assess liquidated damages or declare the Contract in default and terminate the Contract

**Table 1**  
**Bonding Requirements**

Contract Amount	Required Bonds
Less than \$25,000	None
\$25,000 to \$100,000	Payment
More than \$100,000	Performance and Payment

3.4.2.2 The process of requiring and accepting bonds and making claims thereunder shall be conducted in compliance with Tex. Gov't Code, Chapter 2253. **IF FOR ANY REASON A STATUTORY PAYMENT OR PERFORMANCE BONDS IS NOT HONORED BY THE SURETY, THE CONTRACTOR SHALL FULLY INDEMNIFY AND HOLD THE OWNER HARMLESS OF AND FROM ANY COSTS, LOSSES, OBLIGATIONS OR LIABILITIES IT INCURS AS A RESULT.**

3.4.3. **Insurance.** Submit a certificate of insurance on TxDOT's form showing coverages in accordance with Contract requirements.

3.4.3.1 Insurance must cover the work for the duration of the Contract and must remain in effect until final acceptance. Failure to obtain and maintain insurance for the contracted Work may result in suspension of work or default of the Contract. If the insurance expires and coverage lapses for any reason, stop all work until TxDOT receives an acceptable certificate of insurance. Time charges will not stop for work stoppage due to expired insurance.

3.4.3.2 Provide TxDOT with a certificate of insurance verifying the types and amounts of coverage shown in Table 2. TxDOT shall not be deemed or construed to have assessed the risk that may be applicable to the Contractor under the Contract. The Contractor shall assess its own risks and if it deems appropriate or prudent or both, maintain higher limits or broader coverages or both at no additional cost to TxDOT.

**Table 2**  
**Insurance Requirements**

Type of Insurance	Amount of Coverage
Commercial General Liability Insurance	Not Less Than: \$600,000 each occurrence
Business Automobile Policy	Not Less Than: \$600,000 combined single limit
Workers' Compensation *	Not Less Than: Statutory - Texas
All Risk Builder's Risk Insurance **	100% of Contract Amount

\* The Workers' Compensation policy must include a waiver of subrogation endorsement in favor of TxDOT.

\*\* The All Risk Builder's Risk Insurance policy must name TxDOT as Loss Payee. Coverage shall include, but not be limited to, loss by fire, storm, extended coverage perils on work and materials intended for use on the project including adjacent structure, and damage resulting from faulty workmanship, materials, or design provided directly or indirectly by the Contractor.

3.4.3.3 By signing the Contract, the Contractor certifies compliance with all applicable laws, rules, and regulations pertaining to workers' compensation insurance. This certification includes all subcontractors. Pay all deductibles stated in the policy. Subcontractors must meet the requirements of Table 2 either through their own coverage or through the Contractor's coverage.

3.4.3.4 In the event the Contractor does not provide Workers' Compensation Insurance coverage for each Subcontractor and all sub-tier subcontractors employed on the project the Contractor shall provide TxDOT with a current Workers' Compensation Insurance coverage certificate for each Subcontractor and all sub-tier subcontractors employed on the project in accordance with Texas Labor Code §406 .096(b).

3.4.4 **Business Ownership Information.** Submit the names and social security numbers of each individual owning 25% or more of the firm, or firms in the case of a joint venture, on TxDOT's form.

3.4.4.1 Provide written notification to TxDOT immediately upon discovery information provided was erroneous when submitted or has become erroneous by reason of changed circumstances.

3.4.5 **Certificate of Interested Parties (Form 1295).** Submit the form at contract execution for;

3.4.5.1 contracts awarded by the Commission

3.4.5.2 contracts with award amounts of \$1,000,000 or more

3.4.5.3 when an existing contract increases in value to \$1,000,000 or more

3.4.5.4 when there is an increase of \$1,000,000 or more to an existing contract,

3.4.5.5 or when there is a change to the information in the Form 1295.

### 3.5 FAILURE TO ENTER CONTRACT

3.5.1 **Proposal Guaranty.** If the Contractor fails to comply with all the requirements in this Article, the proposal guaranty will become the property of the State, not as a penalty, but as liquidated damages. The Contractor forfeiting the proposal guaranty will not be considered in future proposal for the same work unless there has been a substantial change in design of the work.

### 3.6 RETURN OF PROPOSAL GUARANTY

3.6.1. **Guaranty Check.** The proposal guaranty check of the low Bidder will be retained until after the Contract has been rejected or awarded and executed by TxDOT. The guaranty check will be returned via U.S. mail to the address specified on TxDOT [Return Bid Guaranty Check Form](#) by the Bidder.

3.6.2. **Bid Bond.** Bid bond will not be returned.

### 3.7 BEGINNING OF WORK

3.7.1. **Written Authorization.** Do not start work until receipt of the authorization to begin work letter issued by TxDOT. Do not start work at the project site until completion of the pre-construction meeting.

3.8 **ASSIGNMENT OF CONTRACT.** Do not assign, sell, transfer or otherwise dispose of the Contract or any portion, rights, title, or interest (including claims) without the approval of the company or designated representative. TxDOT must deem any proposed assignment justified and legally acceptable before the assignment can take place. Any assignment without TxDOT approval is void.

3.9 **EXCLUDED PARTIES.** The Contractor certifies by signing the Contract that the Contractor will not enter into any subcontract with a subcontractor that is debarred or suspended by TxDOT or any federal agency.

3.10 **NOTICE OF STATE AUDIT AUTHORITY.** The state auditor may conduct an audit or investigation of any entity receiving funds from the state directly under the Contract or indirectly through a subcontract under the Contract. Acceptance of funds directly under the Contract or indirectly through a subcontract under this Contract acts as acceptance of the authority of the state auditor, under the direction of the legislative audit committee, to conduct an audit or investigation in connection with those funds. An entity that is the subject of an audit or investigation must provide the state auditor with access to any information the state auditor considers relevant to the investigation or audit.

## Article 4 Laws Governing Construction

- 4.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 4.2 **COMPLIANCE WITH LAWS.** Become familiar with and, at all times, comply with all applicable State and Federal laws, statutes, ordinances and regulations including but not limited to, laws governing labor, equal employment opportunity, safety, environmental protection, antiquities and primitive records preservation, and prevailing wage rates which, in any manner, affect the conduct of the Work.
- 4.2.1 **Fees and Permits.** Cooperate with governmental officials at all times where their jurisdiction applies. Apply for, pay all fees and provide supporting documentation necessary to secure permits, licenses, certificates, etc. which are required for performance of the Work. TxDOT hereby affirms the Contractor is not required to obtain building permits nor secure inspections by local jurisdictions for Work performed on State property. Any Texas Accessibility Standards (TAS) compliance review and inspection fees will be the responsibility of TxDOT.
- 4.2.2 **Change in Laws.** If there is any change between the date the Contract is executed and Final Completion in any applicable legal requirements which require a change in the Work in order to avoid a violation of any such applicable legal requirement, Contractor shall be responsible for changing the Work in order to avoid a violation of such legal requirements. A Change Order shall be executed to adjust the Contract Sum and/or Contract Time, if applicable, as a result of a change in legal requirements. If there is a change in any applicable legal requirement but the Work or portion thereof affected by such change is deemed to be "grandfathered" (i.e., the applicable legal requirement does not require that the Work be changed), such portion of the Work shall nevertheless be deemed to be in compliance with such applicable legal requirements and Contractor shall not be required to change the Work to otherwise comply with such changed legal requirements.
- 4.3 **ENVIRONMENTAL LAWS.** Conduct activities in compliance with applicable Environmental Laws and regulations and other requirements of the Contract relating to the environment, and its protection at all times.
- 4.3.1 **Hazardous Materials.** Contractor is responsible for all items it brings to site, including Hazardous Materials, and all such items brought to the site by its subcontractors and suppliers, or by other entities subject to direction of the Contractor. Contractor is responsible for the cost of any environmental remediation required resulting from the action or inaction of its employees, subcontractors, suppliers, or by other entities subject to direction of the Contractor.
- 4.3.1.1 Do not incorporate hazardous materials into the Work without prior written approval of TxDOT, and provide an affidavit attesting to such in association with request for Substantial Completion inspection.
- 4.4 **WAGE RATES.** Do not pay less than the wage scale of the various classes of labor as set forth in 29 USC Section 206. Published wage rates for the State of Texas and county of the project can be located at <https://beta.sam.gov/> (Davis-Bacon Act) pursuant to Chapter 2258, Texas Government Code. The specified wage rates are minimum rates only and no representation is made that qualified labor adequate to perform the Work is available locally at the prevailing wage rates. The Contractor or Subcontractor shall pay overtime wages as required by the Fair Labor Standards Act, 29 United States Code 201, et. seq.
- 4.5 **RECORDS.** In accordance with Texas Government Code, Title 5, Subtitle A, Chapter 552 the Contractor shall make any information created, maintained, or exchanged with the State pursuant to the Contract, (public information) and not otherwise excepted from disclosure under the Texas Public Information Act, available to the State at no additional cost to unit.
- 4.5.1 Contractor and all Subcontractors shall keep, or cause to be kept, copies of weekly payrolls for review by TxDOT for a period of three years after completion of the project in accordance with Texas Administrative Code, Title 43, Part 1, Chapter 9, Subchapter A, Rule §9.5. As a condition of payment and pursuant to Texas Government Code §2113.102, TxDOT internal audit staff may audit the Contractor and Subcontractor during normal business hours.
- 4.5.2 By entering into Contract, the Contractor agrees to provide or make available to the Department and any authorized governmental agency all records, including electronic and payment records related to the Contract for a period required in accordance with the Texas Administration Code, Title 43, Part 1, Chapter 9, Subchapter K, Rule §9.327, *Contractor Records*. Additionally, subcontracts shall include a clause adhering to the same requirement. Failure to provide access to the required documents by any party to the project may result in action by the State.
- 4.6 **VENUE FOR SUITS.** Venue for any suit arising from this Contract will be in a court of competent jurisdiction in Travis County, Texas.

- 4.7 **LICENSING OF TRADES.** Contractor shall comply with all applicable provisions of state law related to license requirements for professionals, skilled tradesmen, contractors, materialmen, suppliers and or laborers, as necessary to accomplish the Work.
- 4.7.1 **Loss of License.** In the event the Contractor, or one of its Subcontractors or sub-tier contractors, loses its license during the term of performance of the Contract, the Contractor shall promptly hire or contract or cause to hire or contract with a licensed provider of the service at no additional cost to TxDOT.
- 4.8 **STATE SALES AND USE TAXES.** TxDOT qualifies for exemption from State and Local Sales and Use Taxes pursuant to the provisions of Tex. Tax Code, Chapter 151. Contractor shall claim exemption from payment of applicable State taxes by complying with such procedures as prescribed by the State Comptroller of Public Accounts in Title 34 Texas Administrative Code §3.287.

## Article 5 General Responsibilities of Owner and Contractor

- 5.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 5.2 **OWNER'S GENERAL RESPONSIBILITIES.** Owner is the entity identified as such in the Contract and referred to throughout the Contract Documents as if singular in number
- 5.2.1 **Preconstruction Conference.** After the issuance of the Authorization to Begin Work Letter but prior to the commencement of time charges a conference will be convened for attendance by the TxDOT Project Manager (PM), Contractor, and others as deemed appropriate by the PM. The purpose of the conference is to establish a working understanding among the parties as to the Work, the operational conditions at the project site, general administration of the Contract, effective communications between the project team members, and address any other item set forth in the preconstruction conference agenda. PM will provide an agenda for the preconstruction conference.
- 5.2.2 **TxDOT Project Manager (PM).**
- 5.2.2.1 Prior to the start of construction, TxDOT will identify the Owner's Representative also known as the TxDOT Project Manager
- 5.2.2.2 will be responsible for the general administration of the Contract;
- 5.2.2.3 is the single point of contact between TxDOT and the Contractor;
- 5.2.2.3.1 Notice to the PM, unless otherwise noted, constitutes notice to TxDOT under the Contract.
- 5.2.2.4 will convey all directives on behalf of TxDOT to the Contractor;
- 5.2.2.5 will decide all questions which may arise as to the quality or acceptability of materials furnished, work performed, and interpretations of the plans and specifications when such action is not a contravention of a design decision made by an Architect or Engineer in preparation of the plans and specifications or such action is in conflict with statutes under which an Architect or Engineer is licensed for the protection of the public health or safety; the manner of performance and rate of progress of the Work and acceptable fulfillment of the Contract on the part of the Contractor,
- 5.2.2.5.1 unless otherwise specifically defined elsewhere in the Contract Documents or conveyed to the Contractor in writing.
- 5.2.3 **TxDOT District Representative (DR).**
- 5.2.3.1 Prior to the start of construction, TxDOT will identify the District Representative (DR) who will assist the Project Manager (PM)
- 5.2.3.2 will perform periodic observations of the Work for general compliance with the plans and specifications;
- 5.2.3.3 will be the point of contact for coordination with the end-user for Work being conducted on the operational site;
- 5.2.3.4 will perform other duties as specifically defined in the Contract Documents, reflected in the Pre-construction Conference meeting minutes, or conveyed to the Contractor in writing by the PM.
- 5.2.4 **TxDOT Supplied Materials and Information.** TxDOT shall provide information, equipment, or services under TxDOT's control required by the Contract Documents to the Contractor with reasonable promptness.
- 5.2.5 **Availability of Lands.** Provide property access license(s) for permanent infrastructure on State property when so required for execution of the Work, unless otherwise required in the Contract Documents.
- 5.2.6 **Limitation on Owner's Duties.** TxDOT and its consultants will not supervise, direct, control or have authority over or be responsible for Contractor's means, methods, technologies, sequences or procedures of construction or the safety precautions and programs incident thereto. TxDOT is not responsible for any failure of Contractor to comply with laws and regulations applicable to the Work. TxDOT is not responsible for the failure of Contractor to perform or furnish the Work in accordance with the Contract Documents. TxDOT is not responsible for the acts or omissions of Contractor, or any of its subcontractors, suppliers or of any other person or organization performing or furnishing any of the Work directly or indirectly on behalf of the Contractor.
- 5.2.7 **Site Visits.** Make site visits at intervals and in accordance with notification provisions as provided in the Contract Documents to observe the progress and quality of the various aspects of Contractor's executed Work and report findings. TxDOT retains the sole authority to accept or reject Work and issue direction for correction, removal, or replacement of Work.
- 5.2.8 **Clarifications and Interpretations.** Provide clarifications or interpretations of the plans and specifications when determined by TxDOT to be necessary. The PM or designated representative will provide such clarifications or interpretations consistent with the intent of the plans and specifications with reasonable promptness to the Contractor as Supplemental Instruction (SI) or similar instrument. TxDOT shall respond to request for clarifications or interpretations

within fourteen (14) calendar days of receipt of such request. If the services of a TxDOT consultant are required for a clarification or interpretation of a request TxDOT will respond within twenty one (21) calendar days of receipt of such request. Clarifications to the drawings and specifications by TxDOT are not considered changes to the drawings and specifications.

**5.3 ROLE OF ARCHITECT / ENGINEER (A/E).** To the extent specified in the Contract between TxDOT and the Architect/Engineer, the A/E shall provide general administration services for TxDOT during the construction phase of the Project. Written correspondence, requests for information, and shop drawings/submittals shall be directed to the TxDOT PM with a copy to the A/E. The A/E has the authority to act on behalf of TxDOT to the extent provided in the Contract Documents, unless otherwise modified by written instrument, which will be furnished to the Contractor by the PM, upon request.

**5.3.1 Site Visits.**

5.3.1.1 The A/E will make visits to the site at intervals as provided in the A/E's contract agreement with TxDOT, to observe the progress and the quality of the various aspects of Contractor's executed Work and report findings to TxDOT.

5.3.1.2 The A/E has the authority to interpret plans and specifications provided by the A/E and inspect the Work covered by same for compliance and conformance with the plans and specifications. TxDOT retains the sole authority to accept or reject Work and issue direction for correction, removal, or replacement of Work.

**5.3.2 Clarifications and Interpretations.** It may be determined that clarifications or interpretations of the plans and specifications provided by the A/E are necessary. Upon direction by the PM such clarifications or interpretations will be provided by the A/E consistent with the intent of the aforementioned plans and specifications. The A/E will issue these clarifications with reasonable promptness to the PM as Architect's Supplemental Instruction (ASI) or similar instrument. The PM will be responsible for transmittal of an ASI to the Contractor. If the Contractor believes that such clarification or interpretation justifies an adjustment in the Contract Sum or the Contract Time, the Contractor shall so notify TxDOT in accordance with the provisions of Article 14.

**5.3.3 Limitations on Architect / Engineer Authority.** The A/E is not responsible for:

5.3.3.1 The Contractor's means, methods, techniques, sequences, procedures, safety, or programs incident to the Project nor will the A/E supervise, direct, control or have authority over the same.

5.3.3.2 The failure of Contractor to comply with laws and regulations applicable to the furnishing or performing the Work.

5.3.3.3 The Contractor's failure to perform or furnish the Work in accordance with the Contract Documents.

5.3.3.4 Acts or omissions of the Contractor, or of any other person or organization performing or furnishing any of the Work.

**5.4 CONTRACTOR'S GENERAL RESPONSIBILITIES.** Contractor is solely responsible for implementing the Work in full compliance with all applicable laws and the Contract Documents and shall supervise and direct the Work using the best skill and attention to assure that each element of the Work conforms to the Contract requirements. Contractor is solely responsible for all construction means, methods, techniques, safety, sequences, coordination and procedures

**5.4.1 Beginning of Work.** The Contractor shall not begin work until authorized by TxDOT in the Authorization to Begin Work letter.

**5.4.2 Services, Materials, and Equipment.** Unless otherwise specified, provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities, incidentals, and services necessary for the construction, performance, testing, start-up, inspection and completion of the Work.

**5.4.3 Cooperation of Contractor.** Cooperate with TxDOT, TxDOT representatives, other contractors, utility companies, governmental / regulatory agency representatives, etc. whose work/operations are directly or indirectly impacted by the execution of the Work. At the written request of TxDOT, the Contractor shall immediately remove from the work locations any employee or representative of the Contractor or a subcontractor who, in the option of TxDOT, displays uncooperative behavior or who is disrespectful, disorderly, or otherwise objectionable. These individuals may not be reinstated without the written consent of TxDOT.

**5.4.4 Contractor's Superintendent.** Employ a competent superintendent who will be present at the Project Site during the progress of the Work. The superintendent proposed for the project is subject to the approval of the PM. Approved superintendents may not be changed during the course of the project without the written approval of the PM, unless the superintendent leaves the employ of the Contractor.

**5.4.5 Project Administration.** Provide project administration for all subcontractors, sub-tier contractors, vendors, suppliers, and others involved in implementing the Work and shall coordinate administration efforts with those of the PM in accordance with any applicable provision of the Contract Documents.

- 5.4.6 **Communications.** The Contractor will direct all communications to TxDOT through the PM or designated representative(s).
- 5.4.7 **Non-Compliant Work.** Should the PM or designated representative identify Work as non-compliant with the Contract Documents, the PM will communicate the finding to the Contractor and the Contractor will correct such Work at its expense.
- 5.4.8 **Cleaning.** At all times, keep the Site and the Work clean and free from accumulation of waste materials or rubbish caused by the construction activities under the Contract.
- 5.4.9 **Labor.** Provide competent, suitably qualified personnel to provide any services required to construct the Work as required by the Contract Documents and maintain good discipline and order at the Site at all times. At the written request of TxDOT, Contractor shall immediately remove from the work locations any employee or representative of the Contractor or a subcontractor who, in the sole opinion of TxDOT, does not perform work in a proper and skillful manner and may not reinstate these individuals without the written consent of TxDOT.
- 5.4.10 **Subcontractors.**
- 5.4.10.1 Do not employ, directly or indirectly, any Subcontractor, supplier or other person or organization, whether initially or as a substitute, against whom TxDOT may have reasonable objection. TxDOT will communicate such objections in writing. The Contractor is not required to employ any Subcontractor, supplier or other person or organization to furnish any of the work to whom the Contractor has reasonable objection.
- 5.4.10.2 Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with the Contractor. Upon written request of the PM, the Contractor shall promptly furnish to TxDOT a copy of any specified subcontract promptly. The Contractor agrees that TxDOT has no obligation to review or approve the content of such contracts and that providing TxDOT such copies in no way relieves the Contractor of any of the terms and conditions of the Contract, including, without limitation, any provisions of the Contract which require the Subcontractor to be bound to the Contractor in the same manner in which the Contractor is bound to TxDOT.
- 5.4.10.3 Do not substitute Subcontractors without the acceptance of TxDOT and compliance with the conditions of the HUB Subcontracting Plan if applicable. Subcontracts and supply contracts shall be consistent with and bound to the terms and conditions of the Contract Documents including provisions of the Agreement between the Contractor and TxDOT. Require all Subcontractors, suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with TxDOT only through the Contractor.
- 5.4.10.4 Contractor shall require all subcontractors to register and remain active in the Department of Homeland Security's (DHS) E-Verify System until their work is complete on the project.
- 5.4.11 **Availability of Other Lands.** The Contractor shall be solely responsible for obtaining authorization and pay any related fees to work within lands not under the sole control of TxDOT.
- 5.4.12 **Laws to be Observed.** Become familiar with and, at all times, observe and comply with all Federal and State laws and regulations which in any manner affect the conduct of the Work.
- 5.4.13 **Ancillary Areas.** Operate and maintain operations and associated storage areas at the site of the Work in accordance with the following:
- 5.4.13.1 Confine all operations, including storage of materials and employee parking upon the Site of Work, to areas designated by the PM or DR.
- 5.4.13.2 The Contractor may erect, at its own expense, temporary buildings that will remain its property and shall remove such buildings and associated utility service lines upon completion of the Work, unless the Contractor requests and TxDOT provides written consent that it may abandon such buildings and utilities in place.
- 5.4.13.3 Use only established roadways or construct and use such temporary roadways as may be authorized by the PM or DR. Do not allow load limits of vehicles to exceed the limits prescribed by appropriate regulations or law; and provide protection to road surfaces, curbs, edges of pavement, sidewalks, trees, shrubbery, sprinkler systems, drainage structures and other like existing improvements to prevent damage; and repair any damage thereto at the expense of the Contractor.
- 5.4.13.4 TxDOT may restrict the Contractor's entry to the site to specifically assigned entrances and routes.
- 5.4.14 **Ancillary / Integral Professional Services.** In selecting an architect, engineer or land surveyor, etc. to provide professional services, if any, that are required by the Plans and Specifications, do so on the basis of competitive bids but make such selection on the basis of demonstrated competence and qualifications to perform the services in the manner provided by Texas Government Code §2254.004.
- 5.4.15 **Notifications.** Provide written notifications to the PM or designate representative for all observations and inspections of the Work and any other required notifications set forth in the Contract Documents within the time frames specified.



- 5.4.16 **Continuing the Work.** Carry on the Work and adhere to the Progress Schedule during all disputes, disagreements or dispute resolution processes with TxDOT. No Work shall be delayed or postponed pending resolution of any disputes, disagreements or processes, except as TxDOT and the Contractor may agree in writing
- 5.4.17 **Environment.** Do not cause directly or indirectly pollution of air, soil, and water in, on, or around the Site or improvements through the release or discharge of any Hazardous Materials. At its sole cost and expense take any and all corrective action required by any applicable federal, state, county, municipal, and other laws, codes, ordinances, rules, and regulations to clean up, remove, and abate any and all soil contamination, groundwater contamination, or any other contamination of the Site caused directly or indirectly by any release or discharge of any Hazardous Materials in, on, under, and around the Site by Contractor and/or Contractor's employees, agents representatives, Subcontractors, invitees, or any other person occupying the Site or any portion thereof by, through, or under the Contractor, excluding TxDOT and its employees, agents, representatives or invitees occupying the Site or any portion thereof.
- 5.4.18 **Indemnity for Environmental Damages. IF THE CONTRACTOR AND/OR ANY ENTITIES OR PERSONS FOR WHOM THE CONTRACTOR IS RESPONSIBLE BRING OR DISPOSE OF ANY HAZARDOUS, TOXIC, OR OTHERWISE HARMFUL SUBSTANCES ONTO THE SITE, THE CONTRACTOR WILL INDEMNIFY, SAVE AND HOLD HARMLESS TXDOT FROM AND AGAINST ANY AND ALL CLAIMS, SUITS, CAUSES OF ACTION, LOSSES AND ALL OTHER DAMAGE AND EXPENSE (INCLUDING COST OF DEFENDING AGAINST THE AFORESAID).**
- 5.4.18.1 **THE CONTRACTOR'S INDEMNITY HEREUNDER INCLUDES, BUT IS NOT LIMITED TO, ANY NEGLIGENT ACT OR OMISSION OF THE CONTRACTOR AND/OR ANY ENTITIES OR PERSONS FOR WHOM THE CONTRACTOR IS RESPONSIBLE. CONTRACTOR SHALL BEAR THE COSTS FOR REMEDIATION OF ANY RESULTING ENVIRONMENTAL DAMAGES DUE TO THE ACTIVITIES OF THE CONTRACTOR, ITS SUBCONTRACTORS AND/OR ANY ENTITIES OR PERSONS FOR WHOM THE CONTRACTOR IS RESPONSIBLE. THE CONTRACTOR'S INDEMNITY AND OBLIGATIONS HEREUNDER WILL SURVIVE THE TERMINATION OF THIS CONTRACT.**
- 5.4.19 **Utilities.** Be responsible for, unless stated otherwise in the plans and specifications, and bear all costs to extend any required utility service to the site as called for on the plans and specifications. Provide and pay all costs for protection of infrastructure under control of any utility service provider at no additional cost to TxDOT.
- 5.4.20 **Separate Contracts.** Additional Contractor responsibilities when TxDOT awards separate Contracts.
- 5.4.20.1 TxDOT reserves the right to award other contracts in connection with other portions of the Project under these or similar contract conditions.
- 5.4.20.2 TxDOT reserves the right to perform operations related to the Project with TxDOT forces and shall be responsible for any activities performed under separate contract.
- 5.4.20.3 Under a system of separate contracts, the conditions described herein continue to apply except as may be amended by Change Order.
- 5.4.21 **Errors, Omissions and Negligent Acts of the Contractor, its Subcontractors and Employees.** Be responsible for errors, omissions and negligent acts of its employees, subcontractors, suppliers and their agents and employees. This shall not be limited by any tier of subcontracting/supplier or "independent" contractor status. TxDOT may, in writing, require the Contractor to remove from the Project any of its employees or Subcontractor employees that the PM or designated representative finds to be careless, incompetent, or otherwise objectionable.
- 5.4.22 **Indemnification of TxDOT. THE CONTRACTOR COVENANTS AND AGREES TO FULLY INDEMNIFY AND HOLD HARMLESS, TXDOT, ET AL, AS SET FORTH IN VARIOUS SECTIONS OF THE CONTRACT DOCUMENTS. IN THE EVENT THE CONTRACTOR AND TXDOT ARE FOUND JOINTLY LIABLE BY A COURT OF COMPETENT JURISDICTION, LIABILITY SHALL BE APPORTIONED COMPARATIVELY IN ACCORDANCE WITH THE LAWS OF THE STATE OF TEXAS AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW. THIS PROVISION SHALL SURVIVE THE TERMINATION OF THE CONTRACT.**
- 5.4.22.1 Provisions of this Indemnification are solely for the benefit of the parties hereto and TxDOT's successor or assignee, if any, and not intended to create or grant any rights, contractual or otherwise, to any other person or entity.
- 5.4.22.2 Contractor shall promptly advise TxDOT in writing of any claim or demand against TxDOT or the Contractor known to the Contractor related to or arising out of the Contractor's activities under this Contract.
- 5.4.23 **Contractor's Risk of Performance.** Except as expressly provided in the contract provisions the Contractor shall not be entitled to an increase in the Contract Sum or Contract Time and shall bear full responsibility for all risks affecting the Contractor's cost of performance.

## Article 6 Historically Underutilized Business (HUB) Subcontracting Plan (if required)

- 6.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 6.2 **GENERAL DESCRIPTION.** The purpose of the Historically Underutilized Business (HUB) Program is to promote equal business opportunities for economically disadvantaged persons (as defined by Tex. Gov't Code, Chapter 2161) to contract with the State of Texas. The HUB Program is applicable to TxDOT contracts relating to buildings, professional services, aviation, public transportation, private consultant services, and purchases funded entirely with State and local funds.
- 6.2.1 State agencies are required by statute to make a good faith effort to assist HUBs in participating in contract awards issued by the State. TxDOT's rules, Texas Administrative Code, Title 43, Part 1, Chapter 9, Subchapter D, outline TxDOT's policy to encourage outreach to and potential utilization of HUBs in subcontracting opportunities through race, ethnic and gender-neutral means. The goal of this program is to promote full and equal business opportunity for all businesses in State contracting.
- 6.2.2 A Contractor who contracts with the State in an amount in excess of \$100,000 shall be required to make a good faith effort to award subcontracts to HUBs in accordance with the cited rules by submitting a HUB Subcontracting Plan and complying with the Subcontracting Plan after it is accepted by TxDOT and during the term of the Contract.
- 6.3 **COMPLIANCE WITH APPROVED HUB SUBCONTRACTING PLAN.** Comply with the HUB Program as follows.
- 6.3.1 Maintain and make available to TxDOT upon request business records documenting compliance with the accepted HUB Subcontracting Plan.
- 6.3.2 Upon receipt of payment for performance of Work, the Contractor shall submit to TxDOT a compliance report, in the format as provided by TxDOT that demonstrates Contractor's performance of the HUB Subcontracting Plan.
- 6.3.3 Prior to substituting a Subcontractor, promptly notify TxDOT in the event a change is required for any reason to the accepted HUB Subcontracting Plan.
- 6.3.4 Conduct the good faith effort activities required and provide TxDOT with necessary documentation to justify approval of a change to the approved HUB Subcontracting Plan.
- 6.3.5 Promptly and accurately explain and provide supplemental information to TxDOT to assist in TxDOT's investigation of the Contractor's good faith effort to fulfill the HUB Subcontracting Plan.
- 6.3.6 Cooperate in the execution of a Change Order or such other approval of the change in the HUB Subcontracting Plans as the Contractor and TxDOT may agree to.
- 6.4 **FAILURE TO DEMONSTRATE GOOD FAITH EFFORT.** Upon a determination by TxDOT the Contractor has failed to demonstrate a good faith effort to fulfill the HUB Subcontracting Plan or any Contract covenant detailed above, TxDOT may, in addition to all other remedies available to it, report the failure to perform to the Texas Procurement and Support Services (TPASS) with the Texas Comptroller of Public Accounts, and may bar the Contractor from future contracting opportunities with TxDOT.
- 6.5 **MONTHLY REPORTING.** Submit monthly a current HUB Subcontracting Plan (HSP) Prime Contractor Progress Assessment Report on forms downloaded from the Texas Comptroller of Public Accounts web site [www.window.state.tx.us](http://www.window.state.tx.us). This report shall include current information for all HUB and Non-HUB subcontractors and HUB suppliers.
- 6.6 **FINAL REPORT.** Submit monthly HUB Subcontracting Plan (HSP) Prime Contractor Progress Assessment Report documenting compliance with the HSP until all HUB and Non-HUB subcontractors and HUB suppliers have been tendered final payment and shall so designate by labeling the report form "FINAL REPORT".

## Article 7 Bonds & Insurance

- 7.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 7.2 **CONSTRUCTION BONDS.** The Contractor is required to tender to TxDOT, prior to commencing work, performance and payment bonds, as required by Texas Government Code, Chapter 2253.
- 7.2.1 **Payment Bond.** A payment bond is required if the Contract Sum is in excess of \$25,000. The payment bond is payable to the State, in the full amount of the Contract Sum and solely for the protection and use of payment bond beneficiaries who have a direct contractual relationship with the Contractor or supplied required materials or labor.
- 7.2.2 **Performance Bond.** A performance bond is required if the Contract Sum is in excess of \$100,000. The Performance Bond is solely for the protection of the State, in the full amount of the Contract Sum and conditioned on the faithful performance of the Work in accordance with the Contract Documents.
- 7.2.3 **Surety Requirements.** Each bond shall be executed on TxDOT's form by a corporate surety or sureties authorized to do business in the State of Texas, acceptable to TxDOT and in compliance with the relevant provisions of the Texas Insurance Code. If a Surety upon a bond loses its authority to do business in the State, the Surety's underwriting limitation drops below the required bond amount or the Surety is declared bankrupt or insolvent, the Contractor shall, within fifteen (15) days after occurrence of any of the aforementioned events, furnish a replacement bond at no added cost to TxDOT. In such event the Work will be suspended until a substitute Surety acceptable to TxDOT is provided and a non-compensable time extension to the Contract will be granted for the fifteen (15) days or thirty (30) days if an acceptable Surety is not readily provided, whichever is sooner. The Contractor's inability to find an acceptable Surety within thirty (30) days will be deemed a breach of contract and TxDOT may, in its sole discretion assess liquidated damages or declare the Contract in default and terminate the Contract.
- 7.2.4 **Power of Attorney.** Each bond shall be accompanied by a valid Power-of- Attorney (issued by the Surety company and attached, signed and sealed with the corporate embossed seal, to the bond) authorizing the attorney in fact who signs the bond to obligate the company to the terms of the bond, and state any limits in the amount for which the attorney can issue a single bond.
- 7.3 **BOND INDEMNIFICATION.** The process of requiring and accepting bonds and making claims thereunder shall be conducted in compliance with Tex. Gov't Code, Chapter 2253. **IF FOR ANY REASON A STATUTORY PAYMENT OR PERFORMANCE BOND IS NOT HONORED BY THE SURETY, THE CONTRACTOR SHALL FULLY INDEMNIFY AND HOLD TXDOT HARMLESS OF AND FROM ANY COSTS, LOSSES, OBLIGATIONS OR LIABILITIES IT INCURS AS A RESULT.**
- 7.4 **FURNISHING BOND INFORMATION.** TxDOT shall furnish a copy of the payment bond to any qualified person who complies with Tex. Gov't Code, §2253.026.
- 7.5 **CLAIMS ON PAYMENT BONDS.** Claims on payment bonds must be sent directly to the Contractor and his Surety in accordance with Texas Government Code § 2253.041. All Payment Bond claimants are cautioned that no lien exists on the funds unpaid to the Contractor on such Contract, and that reliance on notices sent to TxDOT may result in loss of their rights against the Contractor and/or his Surety. TxDOT is not responsible in any manner to a claimant for collection of unpaid bills, and accepts no such responsibility because of any representation by any agent or employee.
- 7.6 **PERFORMANCE BOND SURETY'S OBLIGATION.** The Surety for the Performance Bond, if required, shall undertake the obligations of the Contractor in the event of the Contractor's failure to perform pursuant to the Contract or in the event of Contractor's insolvency or bankruptcy.
- 7.7 **INSURANCE REQUIREMENTS.** Carry insurance in the types and amounts indicated in Article 3 and as otherwise required by the Contract Documents for the duration of the Contract unless specifically stated otherwise. Regardless of approval and issuance of Final Acceptance, the Contract is not deemed fully performed by the Contractor and closed until the expiration of all warranty periods. TxDOT shall not be deemed or construed to have assessed the risk that may be applicable to the Contractor under this Contract. The Contractor shall assess its own risks and if it deems appropriate or prudent or both, maintain higher limits or broader coverages or both at no additional cost to TxDOT.

- 7.7.1 The required insurance shall include coverage for TxDOT's property in the care, custody and control of Contractor, its subcontractors and its agents prior to construction, during construction and during the warranty period.
- 7.7.2 The required insurance shall be evidenced by delivery of a TxDOT certificate of insurance executed by the insurer or its authorized agent during contract execution
- 7.7.3 **Policy Expiration.** Provide an updated TxDOT certificate of insurance prior to expiration. In the event the Contractor fails to maintain the required insurance all work shall stop until TxDOT receives an acceptable certificate of insurance. Contract Time charges will not be suspended in the event work is stopped due to the failure of the Contractor to maintain the required insurance. Acceptance of the insurance certificate by TxDOT shall not relieve or decrease the liability of the Contractor.
- 7.7.4 Without limiting any of the other obligations or liabilities of the Contractor, the Contractor shall require each Subcontractor performing work under the Contract to maintain during the term of the Contract, the same required minimum insurance including the required provisions and additional policy conditions unless specifically stated otherwise. The Contractor shall obtain and monitor the certificates of insurance from each Subcontractor in order to assure compliance with the insurance requirements. As an alternative, the Contractor may include its Subcontractors as additional insured on the Contractor's coverage. In such event the Contractor's certificate of insurance shall note that Subcontractors are included as additional insured.
- 7.7.5 Coverage shall be written on an occurrence basis by companies authorized and admitted to do business in the State of Texas and acceptable to TxDOT unless specifically stated otherwise.
- 7.7.6 Builder's Risk Insurance shall be dedicated project insurance and specific to this Contract.
- 7.7.7 All deductibles shall be the sole responsibility of the Contractor.
- 7.7.8 The insurance requirements specified do not reduce the liability the Contractor has assumed in the indemnification/hold harmless provisions of the Contract.
- 7.7.9 Upon written request, TxDOT, and/or its agents, shall be entitled to receive without expense, copies of the required policies and endorsements.

**7.8 REQUIRED POLICY CLAUSES.** Unless stated otherwise policies must include the following clauses:

- 7.8.1 Notice shall be delivered to TxDOT in accordance with the policy provisions should this insurance policy be cancelled before the expiration date thereof.
- 7.8.2 This insurance policy shall not be materially changed or non-renewed without notice being delivered to TxDOT in accordance with the policy provisions.
- 7.8.3 It is agreed that the Contractor's insurance shall be deemed primary with respect to any insurance or self-insurance carried by the State agency for liability arising out of operations and activities under the Contract with TxDOT.
- 7.8.4 TxDOT, its officials, directors, employees, representatives, and volunteers are added as additional insured as respects operations and activities of, or on behalf of, the named insured performed under Contract with TxDOT. This requirement is not applicable to the workers' compensation policy.

**7.9 WORKER'S COMPENSATION INSURANCE.**

- 7.9.1 Limits of liability: not less than statutory requirements by the Texas Workers' Compensation Act.
- 7.9.2 Worker's Compensation Insurance coverage must meet the statutory requirements of the Texas Labor Code, §401.011(44) and specific to construction projects for public entities as required by the Texas Labor Code, §406.096.
- 7.9.3 The Contractor shall provide TxDOT with a current Workers' Compensation Insurance coverage certificate for each Subcontractor and all sub-tier subcontractors employed on the project in accordance with Texas Labor Code §406.096(b).
- 7.9.4 The policy shall be endorsed with a Waiver of Subrogation in favor of TxDOT.

**7.10 COMMERCIAL GENERAL LIABILITY INSURANCE.**

- 7.10.1 Limits of liability: not less than \$600,000 for each occurrence.
- 7.10.2 Coverage shall include liability arising from products/completed operations, liability arising from explosion, collapse, underground property damage, damage to the work, and liability assumed under contract.

**7.11. BUSINESS AUTOMOBILE LIABILITY INSURANCE.**

- 7.11.1 Limits of liability: not less than \$600,000 combined single limit.

7.11.2 If coverage is specified separately, limits of liability not less than:

7.11.2.1 Bodily Injury: \$250,000 each person.

7.11.2.2 Property Damage: \$500,000 each occurrence.

7.11.3 Coverage extends to owned, hired and non-owned vehicles assigned to or used in performance of the Contract.

#### 7.12 \* **BUILDER'S RISK INSURANCE.**

\* For renovation projects or projects that involve portions of work contained within an existing structure refer to Special Condition, if any, for additional Builder's Risk Insurance requirements.

7.12.1 Limits of liability: not less than 100% of Contract Sum.

7.12.2. Policy shall be an all risk policy. Coverage shall be all risk including, but not limited to, Fire, Wind, Lightning, Water, Hail, Smoke, Theft, Vandalism, Malicious Mischief, Collapse, Flood, Earthquake, Hurricane, Tornado, and damage resulting from faulty workmanship, materials, or design provided directly or indirectly by the Contractor. Coverage shall include transit and storage of materials and equipment in an amount sufficient to protect property being transported or stored.

7.12.3. The policy shall have endorsements as follows.

7.12.3.1. TxDOT shall be named as Loss Payee under the Loss Payable clause.

7.12.3.2. This insurance shall be specific as to coverage and not considered as contributing insurance with any permanent insurance maintained on the property.

7.12.3.3. This insurance shall not contain an occupancy clause suspending or reducing coverage should TxDOT occupy, or begin beneficial occupancy before TxDOT has issued the certificate of Final Completion for the project.

#### 7.13 **SPECIAL INSURANCE COVERAGE.**

7.13.1. **Asbestos Abatement Liability Insurance.** If the Contract Documents include work requiring the encapsulation, removal, handling, storage, transportation, and disposal of asbestos containing materials by the Contractor, its subcontractors or agents, the Contractor shall carry insurance providing coverage for any liability arising from such activities. In lieu of the Contractor carrying the aforementioned insurance the Contractor may retain the services of an asbestos abatement contractor with a current asbestos abatement contractor license issued by the Texas Department of State Health Services (TDSHS) and the services of an asbestos transporter with a current asbestos transporter license issued by TDSHS to provide the required services.

7.13.2. The liability insurance for asbestos related work required by the Texas Department of State Health Services must be in force in order to perform any asbestos related work.

## Article 8 Contract Documents

- 8.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 8.2 **DRAWINGS AND SPECIFICATIONS**
- 8.2.1 **Copies Furnished.** Contractor will be furnished, a digital set of Drawings and Specifications and any Addenda issued prior to or at the pre-construction conference.
- 8.2.2 **Ownership of Plans and Specifications.** All Plans, Specifications and copies thereof furnished by TxDOT are, and shall remain, TxDOT's intellectual property. These documents are not to be used on any other project, and shall be returned to TxDOT, upon request, following completion of the Work.
- 8.2.3 **Interrelation of Documents.** The Contract Documents as referenced in the Contract between TxDOT and the Contractor are complimentary; and, what is required by one, shall be as binding as if required by all.
- 8.2.4 **Resolution of Conflicts in Documents.** In the event of a conflict between and/or within the Contract Documents, the higher quality, greater quantity, more restrictive, and/or more expensive requirement shall be the basis of Contractor pricing, and the Contractor shall notify the PM or designated representative for resolution of the issue prior to executing the Work in question.
- 8.2.5 **Contractor's Duty to Review Contract Documents.** In order to facilitate its responsibilities for completion of the Work in accordance with and as reasonably inferable from the Contract Documents, prior to pricing or commencing the Work, the Contractor shall examine and compare the Contract Documents, information furnished by TxDOT, relevant field measurements made by the Contractor and any visible or reasonably anticipated conditions at the site affecting the Work. This duty extends throughout the construction phase prior to commencing each particular work activity and/or system installation.
- 8.2.6 **Errors and Omissions in Drawings and Specifications.**
- 8.2.6.1 Promptly report to the PM or designated representative the discovery of any apparent error, omission or inconsistency in the Contract Documents prior to execution of the Work.
- 8.2.6.2 Contractor has no liability for design errors and omissions unless the Contractor knowingly failed to report a recognized problem to TxDOT or the Contractor, its subcontractors, or agents provided the design for the element of Work. Should the Contractor fail to perform the examination and reporting obligations of these provisions, the Contractor is responsible for avoidable costs, direct, and/or consequential damages.
- 8.2.6.3 It is recognized that the Contractor is not acting in the capacity of a licensed design professional, unless the Contractor, its subcontractors or agent provide the design for any element of the Work requiring the services of a licensed design professional.
- 8.2.6.4 When the Contractor, its subcontractors or agents provide the design for any element of the Work requiring the services of a licensed design professional the Contractor has responsibility for discrepancies, errors, and omissions in the drawings and specifications provided for that element of the Work.
- 8.3 **REQUIREMENTS FOR RECORD DOCUMENTS.** Contractor shall maintain at the Site one copy of all Drawings, Specifications, addenda, approved Submittals, Contract modifications, and all Project correspondence; keep current and maintain Drawings and Specifications in good order with postings and markings to record actual conditions of Work and show and reference all changes made during construction; and provide PM or designated representative access to these documents.
- 8.3.1 Failure to maintain such records constitutes cause for denial of a progress payment otherwise due.
- 8.3.2 Prior to requesting Substantial Completion Inspection Contractor shall furnish the PM or designated representative a complete legible set (a legible digital scan is acceptable) of the marked up "As-Constructed" set of plans and specifications maintained at the site. Concurrently with furnishing these record drawings, the Contractor shall furnish a preliminary digital copy of each operating and maintenance manual (O&M) required by the Contract Documents, for review by the PM or designated representative.
- 8.3.2.1 Once determined acceptable, Contractor shall provide one (1) digital set of operating and maintenance manuals, approved submittals, and other record documents as required elsewhere in the Contract Documents. Submission and acceptance of these documents is a condition for the issuance of the Certificate of Substantial Completion by the PM. Any "As-Built" modifications to approved shop drawings which were prepared and issued under the seal of a licensed/registered professional must be reviewed and reissued under the seal of the licensed/registered professional of record.

## Article 9 Safety

- 9.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 9.2 **GENERAL.** It is the duty and responsibility of the Contractor and all of its Subcontractors to be familiar with, enforce and comply with all requirements of Public Law 91-596, 29 U.S.C. §§651 et. seq., the Occupational Safety and Health Act of 1970, (OSHA) and all amendments thereto. Contractor and all of its Subcontractors shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property to protect them from damage, injury or loss and erect and maintain all necessary safeguards for such safety and protection.
- 9.3 **NOTICES.** Contractor shall provide notices as follows:
- 9.3.1 Notify owners of adjacent property including those that own or operate utility services and/or underground facilities, and utility owners, when prosecution of the Work may in any way affect them or their facilities, and cooperate with them in the protection, removal, relocation and replacement, and access to their facilities and/or utilities.
- 9.3.2 Coordinate the exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the site in connection with laws and regulations. Maintain a complete file of MSDS for all materials in use on site throughout the construction phase and make such file available to TxDOT and its agents as requested.
- 9.4 **EMERGENCIES.** In any emergency affecting the safety of persons or property, the Contractor shall act to minimize, mitigate, and prevent threatened damage, injury or loss.
- 9.4.1 Contractor shall have its authorized agents respond immediately upon call at any time of day or night when circumstances warrant the presence of Contractor to protect the Work or adjacent property from damage or to take such action pertaining to the Work as may be necessary to provide for the safety of the public.
- 9.4.2 Give the PM or designated representative prompt notice of all such events.
- 9.4.3 Should the Contractor fail to respond, TxDOT is authorized to direct other forces to take action as necessary and TxDOT may deduct any cost of remedial action from funds otherwise due the Contractor.
- 9.4.4 If the Contractor believes that any changes in the Work or variations from Contract Documents have been caused by its emergency response, promptly notify the PM, DR and A/E in writing within 72 hours of the emergency response event detailing the event, actions taken and changes in the Work.
- 9.5 **INJURIES.** In the event of an incident or accident involving outside medical care for an individual on or near the Work, notify the PM or designated representative and other parties as may be directed within twenty-four (24) hours of the event and provide the PM or designated representative an incident report if so requested.
- 9.5.1 Record the location of the event and the circumstances surrounding it, by using photography or other means, and gather witness statements and other documentation which describes the event.
- 9.5.2 Supply the PM, DR and A/E with an incident report no later than 36 hours after the occurrence of the event. In the event of a catastrophic incident (one fatality or a worker hospitalized), barricade and leave intact the scene of the incident until all investigations are complete. A full set of incident investigation documents, including facts, finding of cause, and remedial plans shall be provided within one week after occurrence, unless otherwise directed by legal counsel. Contractor shall provide the PM with written notification within one week of such catastrophic event and submit a full report.
- 9.6 **ENVIRONMENTAL SAFETY.** Upon encountering any potentially hazardous material, or other materials potentially contaminated by hazardous material, Contractor shall immediately stop work activities impacted by the discovery, secure the affected area, and notify the PM or designated representative immediately.
- 9.6.1 Contractor shall bind all Subcontractors to the same duty.
- 9.6.2 Upon receiving notice of previously unknown hazardous material, the PM will promptly engage qualified experts to make such investigations and conduct such tests as may be reasonably necessary to determine the existence or extent of any environmental hazard. As soon as possible upon completion of this investigation, the PM will issue a written report to the Contractor identifying the material(s) found and indicate any necessary steps to be taken to treat, handle, transport or dispose of the material.
- 9.6.3 TxDOT may hire third-party contractors to perform any or all such steps.

- 9.6.4 Should compliance with the PM's instructions result in an increase in the Contractor's cost of performance, or delay the Work, TxDOT will make an equitable adjustment to the Contract price and/or the time of completion, and modify the Contract in writing accordingly in accordance with the provisions of the Contract.
- 9.6.5 If the hazardous material event is the result of a release or discharge of Hazardous Materials by the Contractor directly or indirectly through any employees, agents, representatives, Subcontractors, invitees or any other persons occupying the Site or any portion thereof by, through or under the Contractor, the Contractor at its sole cost and expense, shall take any and all corrective action required by any applicable federal, state, county, municipal, and other laws, codes, ordinances, rules, and regulations to report, clean up, remove, and abate any and all soil contamination, groundwater contamination, or any other contamination of the Site caused directly or indirectly by any release or discharge of any Hazardous Materials.
- 9.6.6 **Environmental Quality.** The Contract shall prevent pollution of air, soil, and water in, on, under or around the Project Site. The Contractor, at its sole cost and expense shall take any and all corrective actions deemed necessary or desirable by TxDOT, and as required by any applicable federal, state, county, municipal, and other laws, codes, ordinances, rules and regulations to clean, remove and abate any and all such contamination of the air, soil, and water in, on under or around the Project Site or adjacent lands caused directly or indirectly by any release or discharge of any hazardous, toxic, or otherwise harmful substances at the Project Site by the Contractor and/or any entities or persons for whom the Contractor is responsible.
- 9.7 **INDEMNITY FOR ENVIRONMENTAL DAMAGES. IF THE CONTRACTOR AND/OR ANY ENTITIES OR PERSONS FOR WHOM THE CONTRACTOR IS RESPONSIBLE BRING OR DISPOSE OF ANY HAZARDOUS, TOXIC, OR OTHERWISE HARMFUL SUBSTANCES ONTO THE SITE, THE CONTRACTOR WILL INDEMNIFY, SAVE AND HOLD HARMLESS TXDOT FROM AND AGAINST ANY AND ALL CLAIMS, SUITS, CAUSES OF ACTION, LOSSES AND ALL OTHER DAMAGE AND EXPENSE (INCLUDING COST OF DEFENDING AGAINST THE AFORESAID).**
- 9.7.1 **THE CONTRACTOR'S INDEMNITY HEREUNDER INCLUDES, BUT IS NOT LIMITED TO, ANY NEGLIGENT ACT OR OMISSION OF THE CONTRACTOR AND/OR ANY ENTITIES OR PERSONS FOR WHOM THE CONTRACTOR IS RESPONSIBLE. CONTRACTOR SHALL BEAR THE COSTS FOR REMEDIATION OF ANY RESULTING ENVIRONMENTAL DAMAGES DUE TO THE ACTIVITIES OF THE CONTRACTOR, ITS SUBCONTRACTORS AND/OR ANY ENTITIES OR PERSONS FOR WHOM THE CONTRACTOR IS RESPONSIBLE. THE CONTRACTOR'S INDEMNITY AND OBLIGATIONS HEREUNDER WILL SURVIVE THE TERMINATION OF THIS CONTRACT.**
- 9.8 **TRENCHING SAFETY.** When the project requires excavation which either exceeds a depth of five feet, or results in any worker's upper body being positioned below grade level, the Contractor is required to submit a trenching plan to the PM prior to commencing trenching operations providing the necessary protection to comply with the most current version of OSHA Standards and Interpretations, 29 CFR 1926, Subpart P, "Excavations." The plan is required to be prepared and sealed by a professional engineer registered in the State of Texas, and employed by the Contractor.
- 9.9 **INDEMNIFICATION OF TXDOT. THE CONTRACTOR SHALL FULLY INDEMNIFY, SAVE AND HOLD HARMLESS TXDOT OF AND FROM ANY COSTS, LOSSES, DAMAGES OR LIABILITIES RESULTING FROM ITS FAILURE, OR THE FAILURE OF THE CONTRACTORS AND/OR SUBCONTRACTORS, TO COMPLY STRICTLY WITH THESE PROVISIONS. CONTRACTOR SHALL BEAR THE COSTS FOR ANY DAMAGES DUE TO THE ACTIVITIES OF THE CONTRACTORS, ITS SUBCONTRACTORS AND/OR ANY ENTITIES OR PERSONS FOR WHOM THE CONTRACTOR IS RESPONSIBLE. THIS PROVISION SHALL SURVIVE THE TERMINATION OF THE CONTRACT.**



## Article 10 Quality Control

- 10.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 10.2 **MATERIALS & WORKMANSHIP.** Execute Work in a good and workmanlike matter in accordance with the Contract Documents. If required by a Special Condition the Contractor shall develop and provide a Quality Control Plan specific to this project and acceptable to TxDOT. Where Contract Documents do not specify quality standards, the Contractor shall complete and construct all Work in compliance with generally accepted construction industry standards. Unless otherwise specified, the Contractor shall incorporate all new materials and equipment into the Work under the Contract.
- 10.3 **TESTING.**
- 10.3.1 **Contractor Testing.** Contractor is responsible for coordinating and paying for all routine and special tests required to confirm compliance with quality and performance requirement of the Contract Documents. This "quality control" testing shall include any particular testing required by the Plans and Specifications and the following general tests:
- 10.3.1.1 Any test of basic material or fabricated equipment included as part of a submittal for a required item in order to establish compliance with the Contract Documents.
- 10.3.1.2 Any test of basic material or fabricated equipment offered as a substitute for a specified item on which a test may be required in order to establish compliance with the Contract Documents.
- 10.3.1.3 Routine, preliminary, start-up, pre-functional and operational testing of building equipment and systems as necessary to confirm operational compliance with requirements of the Contract Documents.
- 10.3.1.4 All subsequent tests on original or replaced materials conducted as a result of prior testing failure.
- 10.3.2 **TxDOT Testing.** TxDOT reserves the right to subject materials and systems incorporated into the Project to routine tests as may be specified or as deemed necessary by the PM or designated representative to ensure compliance with the quality and/or performance requirements of the Contract Documents and/or with laws, ordinances, rules, regulations and/or orders of any public authority having jurisdiction. The results of such "quality assurance" testing will be provided to the Contractor and, to the extent provided, the Contractor may rely on findings.
- 10.3.2.1 All testing shall be performed in accordance with standard test procedures by an accredited laboratory, a TxDOT testing laboratory, or special consultant as appropriate, acceptable to TxDOT. Results of all tests shall be provided promptly to the PM and the Contractor.
- 10.3.3 **Non-Compliance (Test Results).** Should any of the tests indicate that a material and/or system does not comply with the contract requirements, the burden of proof remains with the Contractor, subject to:
- 10.3.3.1 Contractor selection and submission of the laboratory for TxDOT acceptance.
- 10.3.3.2 Acceptance by TxDOT of the quality and nature of tests.
- 10.3.3.3 All tests or bids or both be taken in the presence of the PM or designated representative.
- 10.3.3.4 If tests confirm that the material/systems, indicated by TxDOT testing to not be in compliance with Contract Documents, are in compliance with Contract Documents, TxDOT will pay the Contractor the cost of the test.
- 10.3.3.5 If tests reveal noncompliance, the Contractor will pay those laboratory fees and costs of that particular test and all future tests, of that failing Work, necessary to eventually confirm compliance with Contract Documents.
- 10.3.3.6 Proof of noncompliance with the Contract Documents will make the Contractor liable for any corrective action which the PM determines appropriate, including complete removal and replacement of non-compliant work or material at no additional cost to TxDOT.
- 10.3.4 **Notice of Testing.** Contractor shall give the PM or designated representative twenty-four (24) hours written notice of its readiness and the date arranged so the PM or their designated representative may observe such testing or gathering of test samples.
- 10.3.5 **Test Samples.** Contractor is responsible for providing samples of sufficient size for test purposes and for coordinating such tests with their Work Progress Schedule to avoid delay
- 10.3.6 **Covering up Work.** If Contractor covers up any Work without providing TxDOT an opportunity to observe the testing, the Contractor shall, if requested by PM, uncover and recover the work at Contractor's expense.
- 10.4 **INSPECTIONS.**
- 10.4.1 **Access.** Contractor shall provide sufficient, safe, and proper facilities, including equipment as necessary for safe access, at all reasonable times for observation or inspection or both of the Work by TxDOT and its agents.

10.4.2 **Notice of Inspection.** Contractor shall provide the PM or designated representative written notice five (5) calendar days or as otherwise mutually agreed, prior to the anticipated need for a cover up inspection. Should the PM or designated representative fail to make the necessary inspection within the agreed period, the Contractor may proceed with cover up Work, but is not relieved of responsibility for Work to comply with requirements of the Contract Documents.

10.4.3 **Covering Up Work.** If the Contractor covers up any Work without providing TxDOT an opportunity to inspect, the Contractor shall, if requested by PM or designated representative, uncover and recover the work at Contractor's expense.

10.4.3.1 Should corrections of the Work be required, the Contractor shall not cover up corrected Work until TxDOT indicates review.

10.5 **DEFICIENCIES IN THE WORK.** TxDOT reserves the right to withhold from funds remaining unpaid under the Contract amounts required to pay the costs of, but not limited to, the following:

10.5.1 Special site visits required to re-examine a cited deficiency which has not been corrected after a total of two (2) visits. The provisions for comprehensive inspections set forth in Article 10.4 shall govern those inspections.

10.5.2 Special monitoring to ensure compliance with the Contract Documents due to non-performance or poor workmanship.

10.5.3 Assessments of potential damage, resulting from failure of the Contractor to protect the Work.

## 10.6 SUBMITTALS.

10.6.1 **Contractor's Submittals.** Contractor shall submit in accordance with the Project Schedule and in orderly sequence all Shop Drawings, Samples, or other information required by the Contract Documents, or subsequently required by Change Order. Prior to submitting, Contractor shall review each submittal for compliance with Contract Documents and certify compliance by review stamp affixed to each copy. Submittal data presented without the Contractor's certification will be returned without review or comment, and any delay resulting from such certification is the Contractor's responsibility.

10.6.1.1 Within twenty-one (21) calendar days of issuance of the Authorization to Begin Work letter, unless otherwise modified by the PM in writing, the Contractor shall submit to the PM, a submittal schedule/register, organized by specification section, listing all items to be furnished for review by the PM or designated representative. The list shall include shop drawings, manufacturer's literature, certificates of compliance, materials samples, materials colors, guarantees, and all other items identified throughout the specifications.

10.6.1.2 Contractor shall indicate the type of item, contract requirements reference, and Contractor's scheduled dates for submitting the item along with the requested dates for review answers from the PM. Reference Special Conditions for any additional item tracking/reporting information required to be included in the submittal schedule/register. The submittal register shall be updated at least monthly with actual reviewed dates. Contractor shall schedule submissions at least forty (40) days before reviewed submittal will be required. Contractor shall allow a minimum of twenty-one (21) calendar day duration after receipt by the PM for review of each submittal. If re-submittal is required, the Contractor shall allow a minimum of fifteen (15) calendar days for review. Contractor shall submit the updated submittal register with each request for progress payment.

**TxDOT may establish alternate routine review procedures and schedules for submittals at the preconstruction conference, elsewhere in the Contract Documents, or as otherwise necessary.**

10.6.1.3 Contractor shall coordinate the submittal register with the Work Progress Schedule. Contractor shall not schedule Work requiring a submittal to begin prior to scheduling review of the related submittal. Contractor shall revise and/or update both schedules monthly to ensure consistency and current project data. Provide to the PM the updated submittal register and schedule with each application for progress payment. Refer to requirements for the Work Progress Schedule for inclusion of procurement activities therein, if any; and schedule for inclusion of procurement activities therein, if any. The submittal register shall identify dates submitted and returned and shall be used to confirm status and disposition of particular items submitted, including review or other action taken and other information not conveniently tracked through the Work Progress Schedule.

10.6.1.4 By submitting Shop Drawings, Samples or other required information, the Contractor represents and certifies that they have determined and verified all applicable field measurements, field construction criteria, materials, catalog numbers and similar data, have been determined and verified and that each Shop Drawing and Sample has been checked and coordinated with the requirements of the Work and the Contract Documents.

10.6.2 **Review of Submittals.** PM or designated representative's review are only for conformance with the design concept and the information provided in the Contract Documents. Responses to submittals will be in writing. The review of a separate item does not indicate review of an assembly in which the item functions. The review of a submittal does not relieve the Contractor of responsibility for any deviation from the requirements of the Contract unless the Contractor informs the PM or designated representative of such deviation in a clear, conspicuous, and written manner on the submittal transmittal and at the time of submission, and obtains TxDOT's written specific acceptance of the particular deviation.

10.6.3 **Correction and Resubmission.** Make any corrections required to a submittal and resubmit the required number of corrected copies promptly so as to avoid delay of submittal review. Contractor shall direct attention in writing to the PM or designated representative, when applicable, to any new revisions other than the corrections requested on previous submissions.

- 10.6.4 **Limits on Shop Drawing Review.** Do not commence any Work requiring a submittal before review of the submittal. Contractor shall construct all such work in accordance with reviewed submittals and the Contract Documents. Review of Shop Drawings and Samples is not authorization to Contractor to perform extra work or changed work unless authorized through a Change Order. The PM or designated representative's review, if any, does not relieve Contractor from responsibility for defects in the Work resulting from errors or omissions of any kind on the submittal, regardless of any review action.
- 10.6.5 **No Substitutions without Review.** PM or designated representative may receive and consider the Contractor's request for substitution when the Contractor agrees to reimburse TxDOT for direct and indirect review costs and satisfies 10.6.5.1, 10.6.5.2, and 10.6.5.3 in combination with one or more of the items in 10.6.5.4 through 10.6.5.11 of the following conditions, as determined by TxDOT. If the Contractor does not satisfy these conditions, the PM or designated representative will return the request without action except to record noncompliance with these requirements. TxDOT will not consider the request if the Contractor cannot provide the product or method because of failure to pursue the Work promptly or coordinate activities properly.
- 10.6.5.1 Contract Documents do not require extensive revisions.
- 10.6.5.2 Proposed changes are in keeping with the general intent of the Contract Documents and the design intent and do not result in an increase in cost to TxDOT.
- 10.6.5.3 Request is timely, fully documented, and properly submitted.
- 10.6.5.4 Contractor cannot provide the specified product, assembly or method of construction within the Contract Time.
- 10.6.5.5 Request directly relates to an "or-equal" clause or similar language in the Contract Documents.
- 10.6.5.6 Request directly relates to a "product design standard" or "performance standard" clause in the Contract Documents.
- 10.6.5.7 Requested substitution offers TxDOT a substantial advantage in cost, time, energy conservation or other considerations, after deducting additional responsibilities TxDOT must assume.
- 10.6.5.8 Specified product or method of construction cannot receive necessary review by an authority having jurisdiction, and the PM or designated representative can review the request.
- 10.6.5.9 Contractor cannot provide the specified product, assembly or method of construction in a manner that is compatible with other materials and where Contractor certifies that the substitution will overcome the incompatibility.
- 10.6.5.10 Contractor cannot coordinate the specified product, assembly or method of construction with other materials and Contractor certifies they can coordinate the proposed substitution.
- 10.6.5.11 Specified product, assembly or method of construction cannot provide a warranty required by the Contract Documents and Contractor certifies that the proposed substitution provides the required warranty.
- 10.6.6 **Unauthorized Substitutions at Contractor's Risk.** Contractor is financially responsible for any additional costs or delays resulting from using materials, equipment or fixtures other than those specified. Contractor shall reimburse TxDOT for any increased design or contract administration costs resulting from any unauthorized substitutions.

## 10.7 FIELD MOCK-UP.

- 10.7.7 Mock-ups shall be constructed prior to commencement of a specified scope of work to confirm acceptable workmanship.
- 10.7.7.1 As a minimum, field mock-ups shall be as identified throughout the Contract Documents. Mockups for systems not part of the project scope shall not be required.
- 10.7.7.2 Mock-ups may be incorporated into the Work if allowed by the Contract Documents and if acceptable to the PM. If mock-ups are freestanding, they shall remain in place until otherwise directed by the PM.
- 10.7.7.3 Include field mock-ups in their Work Progress Schedule and shall notify the PM and A/E of readiness for review sufficiently in advance to coordinate review without delay.

## 10.8 INSPECTION DURING CONSTRUCTION.

- 10.8.8 Provide sufficient, safe, and proper facilities, including equipment as necessary for safe access, at all reasonable times for observation and/or inspection of the Work by TxDOT and its agents.
- 10.8.9 Do not cover up any work with finishing materials or other building components prior to providing TxDOT and its agents an opportunity to perform an inspection of the Work.
- 10.8.9.1 Should corrections of the Work be required for approval, do not cover up corrected Work until TxDOT indicates approval.
- 10.8.9.2 Provide notification of at least five (5) calendar days or as otherwise mutually agreed, to the PM of the anticipated need for a cover up inspection. Should the PM fail to make the necessary inspection within the agreed period, the Contractor may proceed with cover up Work, but is not relieved of responsibility for Work to comply with requirements of the Contract Documents.

10.9 **BUY AMERICA.** Comply with the latest provisions of Buy America as listed at 23 CFR 635.410. Use steel or iron materials manufactured in the United States except when:

10.9.1 Cost of materials, including delivery, does not exceed 0.1% of the total Contract cost or \$2,500, whichever is greater;

10.9.2 Contract contains an alternate item for a foreign source steel or iron product and the Contract is awarded based on the alternate item;

10.9.3 The materials are temporarily installed.

Provide a notarized original of FORM D-9-USA-1 (Department Form 1818) with the proper attachments for verification of compliance.

10.10 **BUY TEXAS.** Buy materials produced in Texas when the materials are available at a comparable price and in a comparable period of time. Provide documentation of purchases or a description of good-faith efforts on request.

## Article 11 Construction Schedules

- 11.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 11.2 **WORK PROGRESS SCHEDULE.** Refer to any Special Condition, any Division 1 Specifications, or preconstruction conference meeting minutes for any alternate or additional schedule requirements. Unless indicated otherwise in those documents, submit the initial Work Progress Schedule for the Work in relation to the entire Project not later than twenty-one (21) days after the date of the Authorization to Begin Work Letter to the PM or designated representative. Unless otherwise indicated or directed in writing the Work Progress Schedule shall be a computerized Critical Path Method (CPM) with full reporting capability and in a format and in sufficient detail acceptable to the PM or designated representative. The initial schedule shall indicate the dates for starting and completing the various aspects required to complete the Work, including mobilization, procurement, installation, testing, inspection, and acceptance of all the Work of the Contract. The schedule, when accepted by TxDOT, shall be the Baseline Schedule for comparison to actual conditions throughout the contract duration. Failure of the Contractor to provide a Work Progress Schedule as set forth above will be considered sufficient cause for TxDOT to order the work under the Contract to be stopped without suspension of Contract time charges.
- 11.2.1 **Schedule Requirements.** Submit in an electronic format acceptable to TxDOT the Work Progress Schedule accepted by TxDOT reflecting accurate and reliable representations of the planned progress of the Work, the Work performed to date, if any, and the Contractor's actual plans for its completion. Organize and provide adequate detail so the Schedule is capable of measuring and forecasting the effect of delaying events on completed and uncompleted activities.
- 11.2.1.1 Re-submit initial Schedule as required to address review comments from the PM or designated representative until such Schedule is accepted by TxDOT as the Baseline Schedule.
- 11.2.1.2 Submittal of a schedule, schedule revision or schedule update constitutes the Contractor's representation to TxDOT of the accurate depiction of all progress to date and that the Contractor will follow the schedule as submitted in performing the Work.
- 11.2.2 **Schedule Updates.** Update the Work Progress Schedule and the Submittal Schedule not less than monthly to reflect progress to date and current plans for completing the Work, and submit an electronic copy of the update to the PM or designated representative. TxDOT has no duty to make progress payments unless accompanied by the updated Work Progress Schedule. Show the anticipated date of completion reflecting all extensions of time granted through Change Order as of the date of the update. Contractor may revise the Progress Schedule logic only with TxDOT's concurrence when, in the Contractor's judgment, it becomes necessary for the management of the Work. Identify all proposed changes to schedule logic to the PM or designated representative via an Executive Summary accompanying the updated schedule for review prior to implementation of revisions.
- 11.2.3 **Effect of Work Progress Schedule.** The Work Progress Schedule is for the Contractor's use in managing the Work. Submittal of the Schedule, and successive updates or revisions, is for the information of TxDOT and to demonstrate that the Contractor has complied with requirements for planning the Work. TxDOT's acceptance of a schedule, schedule update or revision constitutes TxDOT's agreement to coordinate its own activities with the Contractor's activities as shown on the schedule.
- 11.2.3.1 Acceptance of a Work Progress Schedule update or revision indicating early or late completion does not constitute TxDOT's consent or approval, alter the terms of the Contract, constitute a change in terms of the contract, or waive either the Contractor's responsibility for timely completion or TxDOT's right to damages for the Contractor's failure to do so. Change Orders are the only method of modifying the completion Date(s) and Contract Time.
- 11.3 **OWNERSHIP OF FLOAT.** Float time contained in the Work Progress Schedule is not for the exclusive benefit of the Contractor or TxDOT, but belongs to the Project and may be consumed by either party as needed on a first-used basis.
- 11.4 **FORCE MAJEURE.** Force Majeure shall mean any delays, hindrances, or suspensions of the Work for (1) unexpected natural events (sometimes called "acts of God"); (2) strikes, labor disputes, labor shortages, or material shortages outside of the Contractor's reasonable control; (3) acts of public enemy; (4) riots; (5) epidemics disabling the labor force; (6) landslides; (7) earthquakes affecting the Project; (8) fires; (9) hurricanes (10) tornadoes; (11) partial or entire failure of public utilities affecting the Project; (12) delays associated with concealed, unknown, or unforeseen conditions associated with the Property which with reasonable diligence could not

have been discovered by the Contractor prior to execution of this Contract; (13) delay in issuing any governmental or regulatory permit, license or approval necessary or required for implementation of the Project which with reasonable diligence could not have been avoided by the Contractor; (14) any other similar cause or event not reasonably within the Contractor's / subcontractor's control and not resulting from their errors, omissions or negligent acts.

- 11.4.1 The Contractor's relief in the event of such Force Majeure delays, hindrances, or suspensions of the Work is the time impact to the critical path as determined by analysis of the Contractor's schedule. Upon review and concurrence of the time impact documentation by the PM a non-compensable time extension to the Contract Time will be issued by Change Order. When such delays, hindrances, or suspensions are the result of the conditions defined under Article 17.6, Termination by Contractor, the Contractor's relief will be governed by the conditions of Article 14 should the Contract be terminated under Article 17.

## Article 12 Contract Time

- 12.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 12.2 **CONTRACT TIME. TIME IS AN ESSENTIAL ELEMENT OF THE CONTRACT.** Contract Time can be modified only by Change Order. Failure to achieve Substantial Completion within the Contract Time will cause damage to TxDOT and subject the Contractor to Liquidated Damages as provided in the Contract Documents.
- 12.3 **AUTHORIZATION TO BEGIN WORK.** TxDOT will issue an Authorization to Begin Work Letter authorizing the Contractor to begin construction in accordance with the provisions of the Contract and establishing the date stated in the Contract for completion of the Work, or establishing the beginning date time charges will commence for computing Contract Time for completion of the Work.
- 12.4 **COMPLETION OF WORK.** Contractor is accountable for completing the Work in the time stated in the Contract, or as otherwise amended by Change Order.
- 12.4.1 If, in the judgment of TxDOT, the work is behind schedule and the rate of placement of work is inadequate to regain scheduled progress to insure timely completion of the entire work or a separable portion thereof, TxDOT shall so notify the Contractor and Surety, if any.
- 12.4.2 Within ten (10) calendar days after such notice from the PM or designated representative, Contractor shall notify the PM in writing of the specific measures taken and/or planned to facilitate timely completion of the entire work or a separable portion thereof and include an estimate as to the date of scheduled progress recovery and an updated Work Progress Schedule illustrating the Contractor's plan for achieving timely completion of the project.
- 12.5 **COMPUTATION OF CONTRACT TIME FOR COMPLETION.** TxDOT will furnish the Contractor a monthly statement on prescribed forms, showing the number of calendar days charged during the month, total number of days allowed in the Contract and the number of days remaining under the Contract. The Contractor will be allowed ten (10) calendar days in which to protest the correctness of the statement with supporting documentation, otherwise the statement will stand.
- 12.6 **MODIFICATION OF THE CONTRACT TIME.**
- 12.6.1 **Extension of Time.** Delays and extension of time as hereinafter described are valid only if executed in accordance with provisions set forth in *Article 14*. All extensions of time will be granted in calendar days. In no event will an extension of time be granted for delays that merely extend the duration of non-critical activities, or which only consume float without delaying the project completion date.
- 12.6.2 **Excusable Delay.** Contractor may be entitled to an equitable adjustment of time, issued via change order, for delays caused by the following:
- 12.6.2.1 Errors, omissions and imperfections in design which TxDOT corrects by means of changes in the drawings and specifications. Clarifications to the drawings and specifications by TxDOT are not considered changes to the drawings and specifications.
- 12.6.2.2 Unanticipated physical conditions at the Site which with reasonable diligence could not have been discovered by the Contractor prior to the execution of this Contract and the PM corrects by means of changes to the drawings and specifications or for which the PM directs changes in the Work identified in the Contract Documents.
- 12.6.2.3 Changes in the Work that effect activities identified in the Contractor's schedule as "critical" to completion of the entire Work, if such changes are ordered by the PM.
- 12.6.2.4 Suspension of Work for convenience of TxDOT, which prevents Contractor from completing the Work within the Contract Time.
- 12.6.3 **Excusable Delay Relief.** In the event of such delays the time relief is the time impact to the critical path as determined by analysis of the Contractor's schedule. If the Contractor and TxDOT cannot agree on the time extension, TxDOT may issue a ULCO for fair and reasonable time extension. In the event that the Contractor incurs additional direct costs because of the delay, they are to be determined pursuant to the provisions of *Article 14*.
- 12.6.4 **Non-compensable Delay.** Contractor may be entitled to an equitable adjustment of time, issued via change order, for delays caused by the following:
- 12.6.4.1 "Weather Day" is a day on which the Contractor's current schedule indicates Work is to be done, and on which inclement weather and related site conditions prevent the Contractor from performing seven (7) continuous hours

of Work between the hours of 7:00 a.m. and 6:00 p.m. Weather days are non-compensable delays. When weather conditions at the site prevent work from proceeding, immediately notify the PM or designated representative for confirmation of the conditions. At the end of each calendar month, submit to the PM or designated representative a list of Weather Days occurring in that month along with documentation of the impact on critical activities. Such documentation shall include the impact of any concurrent delay occurring during the "Weather Days" in question.

- 12.6.4.2 Force Majeure shall mean any delays, hindrances, or suspensions of the Work for (1) unexpected natural events (sometimes called "acts of God"); (2) strikes, labor disputes, labor shortages, or material shortages outside of the Contractor's reasonable control; (3) acts of public enemy; (4) riots; (5) epidemics disabling the labor force; (6) landslides; (7) earthquakes affecting the Project; (8) fires; (9) hurricanes (10) tornadoes; (11) partial or entire failure of public utilities affecting the Project; (12) delays associated with concealed, unknown, or unforeseen conditions associated with the Property which with reasonable diligence could not have been discovered by the Contractor prior to execution of this Contract; (13) delay in issuing any governmental or regulatory permit, license or approval necessary or required for implementation of the Project which with reasonable diligence could not have been avoided by the Contractor; (14) any other similar cause or event not reasonably within the Contractor's / subcontractor's control and not resulting from their errors, omissions or negligent acts.
- 12.6.5 **Non-compensable Delay Relief.** Contractor's sole relief in the event of such Weather Day or Force Majeure or both delays, hindrances, or suspensions of the Work is the time impact to the critical path as determined by analysis of the Contractor's schedule. Upon review and concurrence of the time impact documentation by the PM or designated representative a non-compensable time extension to the Contract Time will be issued by Change Order. In the event the Contractor and TxDOT cannot agree on the time extension, TxDOT may issue a ULCO for fair and reasonable time extension. When such delays, hindrances, or suspensions are the result of the conditions defined under *Article 14*, the Contractor's relief will be governed by the conditions of said Article should the Contract be terminated under *Article 17*.
- 12.6.6 **Concurrent Delay.** When the completion of the Work is simultaneously delayed by an excusable delay and a delay arising from a cause not designated as excusable, the Contractor may not be entitled to a time extension for the period of concurrent delay.
- 12.6.7 **Other Time Extension Requests.** If the Contractor believes that the completion of the Work is delayed by a circumstance other than for changes directed to the Work, weather, or force majeure, they shall give the PM or designated representative written notice, stating the nature of the delay, activities potentially affected, and evidence documenting the cause of delay within five (5) calendar days after the onset of the event or circumstance giving rise to the excusable delay. Clarifications to the drawings and specifications by TxDOT are not considered changes to the drawings and specifications.
- 12.6.7.1 Contractor shall provide with each Time Extension Request a quantitative demonstration of the impact of the delay on project completion time, based on the Work Progress Schedule and include with Time Extension Requests a reasonably detailed narrative setting forth:
- 12.6.7.1.1 The nature of the delay and its cause; the basis of the Contractor's claim of entitlement to a time extension.
- 12.6.7.1.2 Documentation of the actual impacts of the claimed delay on the critical path indicated in the Contractor's Work Progress Schedule, and any concurrent delays.
- 12.6.7.1.3 Description and documentation of steps taken by the Contractor to mitigate the effect of the claimed delay, including, when appropriate, the modification of the Work Progress Schedule.
- 12.6.7.2 TxDOT will respond, subject to receipt of all required information, to the Time Extension Request by providing to the Contractor written notice of the number of days granted, if any, and giving its reason if this number differs from the number of days requested by the Contractor.
- 12.6.7.2.1 TxDOT will not grant time extensions for delays that do not affect the Contract Completion Date.
- 12.6.7.2.2 TxDOT will respond to each properly submitted Time Extension Request within fifteen (15) calendar days following receipt of all required information. If TxDOT cannot reasonably make a determination about the Contractor's entitlement to a time extension within that time, TxDOT will notify the Contractor in writing. Unless otherwise agreed by the Contractor, TxDOT has no more than fifteen (15) additional calendar days to prepare a final response. If TxDOT fails to respond within forty-five (45) calendar days from the date the Time Extension Request is received, the Contractor is entitled to a time extension in the amount requested.
- 12.7 **NO DAMAGES FOR DELAY.** Contractor has no claim for monetary damages for delay or hindrances to the work from any cause, including without limitation any act or omission of TxDOT.
- 12.8 **DUTY TO PERFORM.** No extension of time releases the Contractor or the Surety furnishing a performance or payment bond, if any, from any obligations under the contract or such a bond. Those obligations remain in full force until the discharge of the Contract.
- 12.9 **FAILURE TO COMPLETE WORK WITHIN THE CONTRACT TIME. TIME IS OF THE ESSENCE FOR THIS CONTRACT.** Contractor's failure to substantially complete the Work within the Contract Time will cause damage to TxDOT. These damages are liquidated by agreement of the Contractor and TxDOT, as set forth in the Contract Documents.



12.10 **LIQUIDATED DAMAGES.** TxDOT may collect Liquidated Damages due from the Contractor directly or indirectly by reducing the contract sum in the amount of Liquidated Damages stated in the Contract Documents.

12.10.1 The amount per day given in the following schedule will be deducted from the money due or to become due to the Contractor, not as a penalty, but as liquidated damages and added expense for engineering and administrative supervision.

PER DAY RATE FOR AMOUNT OF ORIGINAL CONTRACT		
Greater Than	Through	Amount Per Calendar Day
\$ 0	\$ 100,000	\$ 570
\$ 100,000	\$ 500,000	\$ 590
\$ 500,000	\$ 1,000,000	\$ 610
\$ 1,000,000	\$ 1,500,000	\$ 685
\$ 1,500,000	\$ 3,000,000	\$ 785
\$ 3,000,000	\$ 5,000,000	\$ 970
\$ 5,000,000	\$ 10,000,000	\$ 1,125
\$ 10,000,000	\$ 20,000,000	\$ 1,285
\$ 20,000,000		\$ 2,590

## Article 13 Payments

- 13.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 13.2 **SCHEDULE OF VALUES.** Contractor shall submit to the PM or designated representative a Schedule of Values accurately itemizing each line item by material and labor for the various classifications of the Work based on the organization of the specification sections and using the same activity names and terms as the Work Progress Schedule. The Schedule of Values shall include line items for general conditions, fees, TxDOT allowance items and any additional detail as required by the PM or designated representative. The format for the Schedule of Values will be as provided by TxDOT.
- 13.2.1 The accepted Schedule of Values will be the basis for the progress payment under the Contract. No progress payments will be made prior to receipt of a Schedule of Values in such detail as acceptable to the PM or designated representative.
- 13.2.2 No progress payments will be made prior to receipt and acceptance of the Schedule of Values, provided in such detail as required by the PM, and submitted not less than twenty-one calendar (21) days prior to the first request for payment. The Schedule of Values shall follow the order of trade divisions of the specifications and include costs for general conditions, fees, contingencies, and TxDOT allowance items, if applicable, so that the sum of the items will equal the contract price. Each line item will contain labor and material value categories with values assigned as appropriate, the subtotal thereof equaling the value of the work in place when complete.
- 13.3 **LUMP SUM PAYMENT.** Contractor may elect to receive a single lump sum payment, adjusted as may be required by the requirements of the Contract Documents, for the Work after final acceptance of the Work by TxDOT. Work progress payments will not be made without the Contractor submitting a Schedule of Values acceptable to TxDOT.
- 13.4 **TEXAS IDENTIFICATION NUMBER.** Contractor will be required to secure from the Texas Comptroller of Public Accounts, a Texas Payee Identification Number. The Texas Payee Identification Number must correspond to the person(s) or entity shown on the Contract. A valid Texas Payee Identification Number is required prior to payment being processed for this Contract.
- 13.5 **PROGRESS PAYMENTS.** Contractor will receive periodic progress payments for Work performed, materials in place, suitably stored on site, or as otherwise agreed to by TxDOT and the Contractor. Payment is not due until receipt by the PM or designated representative of a correct and complete Pay Application in electronic copy format. Progress payments are made provisionally and do not constitute acceptance of work not in accordance with the Contract Documents. TxDOT will not process progress payment applications for Change Order work until all required parties execute the Change Order.
- 13.5.1 **Preliminary Pay Worksheet.** Once each month that a progress payment is to be requested, Contractor shall submit to the PM or designated representative a complete, clean copy of a preliminary pay application such that it is received by the PM or designated representative a minimum of seven (7) calendar days prior to any scheduled monthly work progress meeting, and shall include the following:
- 13.5.1.1 Contractor's estimate of the amount of Work performed, labor furnished and materials incorporated into the Work during the time covered by the application for payment, using the accepted Schedule of Values and approved form.
- 13.5.1.2 Copies of original invoices for any materials or equipment stored on site but not incorporated into the Work for which the Contractor is requesting payment.
- 13.5.1.3 Insurance certificates, invoices and any other documents required by the Contract Documents for materials or equipment stored off-site for which the Contractor is requesting payment.
- 13.5.1.4 TxDOT's Contractor's Application for Payment form reflecting any adjustments to the Contract Sum or Contract Time approved during the period of time covered by the application for payment.
- 13.5.1.5 An updated Work Progress Schedule including the Executive Summary and all required schedule reports.
- 13.5.1.6 An updated submittal schedule/register, if required.
- 13.5.1.7 An updated HUB Subcontracting Plan (HSP) Prime Contractor Progress Assessment Report and associated documentation for any modification to the plan authorized during the time covered by the application for payment.

- 13.5.1.8 Copy of any apprenticeship or trainee program registered with the United States Department of Labor, Employment and Training Administration if such program is being utilized by Contractor or any Subcontractor in performance of the Work. The Contractor shall provide a copy of any program modifications, updates or additional programs with subsequent applications for payment.
- 13.5.1.9 Such additional documentation as TxDOT may require as set forth in a Special Condition or elsewhere in the Contract Documents.
- 13.5.2 **Contractor's Application for Progress Payment.** Subject to the Contractor providing a complete preliminary pay application: Within the time frame as set forth in *Article 13* the Contractor, PM and A/E will conduct a conference call review of the preliminary pay application prior to the scheduled monthly work progress meeting. Based on this review, the PM and A/E may require modifications to the preliminary pay application prior to submittal of the formal application for progress payment. The Contractor shall submit for approval during the scheduled monthly progress meeting the formal application for progress payment on the appropriate and completed forms reflecting the required modifications. Approval is subject to the condition TxDOT may require modification to the application based on observations of the Work made during the site visit. The Contractor shall promptly make such revisions as necessary for approval. Attach all additional documentation required by the PM and A/E, as well as an affidavit affirming that all payrolls, bills for labor, materials, equipment, subcontracted work and other indebtedness connected with the Contractor's invoice are paid or will be paid within the time specified in Texas Government Code, Chapter 2251. No invoice is complete unless it fully reflects all required modifications and attaches all required documentation including, but not limited to, the following:
- 13.5.2.1 TxDOT Contractor's Application for Payment form must be signed by a corporate officer or a representative duly authorized by the Contractor,
- 13.5.2.2 Updated Schedule of Values form;
- 13.5.2.3 Updated Work Progress Schedule;
- 13.5.2.4 TxDOT Contractor's Affidavit of Payments of Debts and Claims (monthly);
- 13.5.2.5 HUB Subcontracting Plan (HSP) Prime Contractor Progress Assessment Report;
- 13.5.2.6 Copies of manufacturer/supplier original invoice price for materials and equipment stored on the site but not incorporated in the Work payment is being requested for; and
- 13.5.2.7 Copies of warehouse records, receipts and manufacturer/supplier invoices for any materials and equipment stored off site verifying current status of quantities and their disposition.
- 13.6 **OWNER'S DUTY TO PAY.** Owner has no duty to pay the Contractor except on receipt by the PM or designated representative of the following:
- 13.6.1 a complete TxDOT Contractor's Application for Payment form certified by the Contractor, PM and designated representatives, as required, and all attachments;
- 13.6.2 the Contractor's updated Work Progress Schedule; and
- 13.6.3 confirmation that the Contractor's as-built documentation at the site is kept current.
- 13.6.4 **Stored Material.** Payment for stored materials and equipment confirmed by the PM or designated representative to be on-site or otherwise properly stored but not incorporated into the Work is limited to the manufacturer/supplier original invoice price or the scheduled value for the materials or equipment, whichever is less. Payment for off-site stored materials or equipment is subject to compliance with the provisions of *Article 13.8*.
- 13.6.5 **Retainage.** TxDOT will withhold from each progress payment, as retainage, five (5) percent of the total earned amount, the amount authorized by law, or as otherwise set forth in a Special Condition. Retainage may be managed in conformance with Transportation Code §223.010.
- 13.6.5.1 Provide written consent of Surety for any request for release of retainage.
- 13.6.6 **Price Reduction to Cover Loss.** TxDOT may reduce any application for payment, prior to payment to the extent necessary to protect TxDOT from loss on account of actions of the Contractor including, but not limited to:
- 13.6.6.1 Defective or incomplete Work not remedied.
- 13.6.6.2 Damage to Work of a separate Contractor.
- 13.6.6.3 Failure to maintain scheduled progress or reasonable evidence that the Work will not be completed within the Contract Time.
- 13.6.6.4 Persistent failure to carry out the Work in accordance with the Contract Documents.
- 13.6.6.5 Reasonable evidence that the Work cannot be completed for the unpaid portion of the contract sum.
- 13.6.6.6 Assessment of fines for violations of Prevailing Wage Rate law.
- 13.6.6.7 Failure to include the appropriate amount of retainage for that periodic progress payment.

- 13.6.6.8 Failure to maintain acceptable storage/protection for stored materials and equipment on-site and off-site.
- 13.6.7 **Final Payment.** For purposes of Tex. Gov't Code § 2251.021 (a) (2), the date the performance of service is complete is the date when the PM or designated representative approves the final application for payment.
- 13.6.8 **Title to Material and Work.** Title to all material and Work covered by progress payments transfers to TxDOT upon payment.
- 13.6.8.1 Transfer of title to TxDOT does not relieve the Contractor of the sole responsibility for the care and protection of materials and Work upon which payments have been made until final acceptance of the entire Work, or the restoration of any damaged Work, or waive the right of TxDOT to require the fulfillment of all the terms of the Contract.
- 13.7 **CONTINUED OBLIGATIONS.** Progress payments to the Contractor do not release the Contractor or its Surety from any obligations under this Contract.
- 13.7.1 Upon TxDOT's request, furnish manifest proof of the status of Subcontractor's accounts in a form acceptable to TxDOT.
- 13.7.2 Pay estimate certificates must be signed by a corporate officer or a representative duly authorized by the Contractor.
- 13.7.3 Provide copies of bills of lading, invoices, delivery receipts or other evidence of the location and value of such materials in requesting payment for materials not incorporated in the work.
- 13.7.4 For purposes of Texas Government Code § 2251.021(a)(2), the date the performance of service is complete is the date when the PM approves the final application for payment. The effects of Final Payment are as set forth in Article 15.4.7.
- 13.8 **OFF-SITE STORAGE.** With prior approval by TxDOT and in the event Contractor elects to store materials or equipment at an off-site location, the Contractor shall abide by the following conditions, unless otherwise agreed to in writing by TxDOT and the Contractor.
- 13.8.1 Store materials and equipment in a Bonded Commercial Warehouse.
- 13.8.2 Provide separate Insurance Coverage adequate not only to cover materials and equipment while in storage, but also in transit from the off-site storage areas to the project site. Copies of duly authenticated Certificates of Insurance, made out to insure TxDOT, must be filed with PM or designated representative.
- 13.8.3 Inspection by PM or designated representative is allowed at any time. TxDOT must be satisfied with the security, control, maintenance, and preservation measures.
- 13.8.4 Materials and equipment for this project must be physically separated and marked for the project in a sectioned-off area. Only materials and equipment which have been approved through the submittal process are to be considered for payment.
- 13.8.5 TxDOT reserves the right to reject materials and equipment at any time prior to final acceptance of the complete Contract if they do not meet Contract requirements, regardless of any previous progress payment made.
- 13.8.6 With each monthly payment estimate, submit a report to the PM and A/E listing the quantities of materials and equipment already paid for and still stored in the off-site location.
- 13.8.7 Make warehouse records, receipts and invoices available to PM or designated representatives, upon request, to verify the quantities and their disposition.
- 13.8.8 In the event of Contract termination or default by Contractor, the items in storage off-site, upon which payment has been made, will be promptly turned over to TxDOT or TxDOT's agents at a location near the jobsite as directed by the PM or designated representative. The full provisions of PERFORMANCE AND PAYMENT BONDS, if required, on this project cover the materials off-site in every respect as though they were stored on the Project Site.

## Article 14 Contract Changes

- 14.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 14.2 **MINOR CHANGES.** TxDOT has the authority to order minor changes in the Work that do not involve an adjustment in the Contract Sum or an extension of the Contract Time. Such changes shall be effected by written order, i.e. Supplemental Instruction, which the Contractor shall carry out promptly and record on as-built record documents.
- 14.3 **EMERGENCY CHANGE.** Emergency changes to save life or property may be initiated by the Contractor alone (per Article 9) with the claimed cost and/or time of such work fully documented as to necessity and detail to TxDOT's satisfaction.
- 14.4 **UNILATERAL CHANGE ORDER.** TxDOT, without invalidating the Contract, may order changes in the Work not included in the Contract that are necessary for the completion of the project, and will pay the Contractor a reasonable sum.
- 14.5 **CHANGE ORDERS.** A Change Order issued after execution of the Contract is a written order to the Contractor, signed by TxDOT (in accordance with TxDOT signature authorization policy), the Contractor, and (when applicable) the Architect/Engineer, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time can only be changed by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum and/or the Contract Time. Subject to compliance with TxDOT signature authorization policy, the PM may issue written authorization for the Contractor to proceed with work of a change order in advance of final execution by all parties.
- 14.5.1 TxDOT, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, and the Contract Sum and the Contract Time will be adjusted accordingly, if required. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents. Authorization to execute a Change Order is reserved exclusively to TxDOT and may not be delegated to a private firm under contract with the State.
- 14.5.2 If such changes cause an increase or decrease in the Contractor's cost of, or time required for, performance of the Contract, a mutually agreeable, equitable, adjustment shall be made and confirmed in writing in a Change Order.
- 14.5.3 It is recognized by the parties hereto and agreed by them that the specifications and drawings may not be complete or free from errors, omissions and imperfections or that they may require changes or additions in order for the work to be completed to the satisfaction of TxDOT. Accordingly, it is the express intention of the parties, notwithstanding any other provisions in this Contract, that any errors, omissions or imperfections in such specifications and drawings, or any changes in or additions to the specifications and drawings or to the Work ordered by TxDOT, and any resulting delays in the work or increases in Contractor's costs and expenses, shall not constitute or give rise to any claim, demand or cause of action of any nature whatsoever in favor of Contractor, whether for breach of contract, *quantum meruit*, or otherwise. TxDOT shall be liable to Contractor for the sum stated to be due Contractor in any Change Order, approved and signed by both parties. It is agreed hereby that such sum, together with any extension of time contained in said Change Order, shall constitute full compensation to Contractor for all costs, expenses and damages to Contractor, whether direct, consequential or otherwise that are incident to, arising out of, or resulting directly or indirectly from the work performed by Contractor under such Change Order.
- 14.5.4 Procedures for administration of Change Orders shall be established by TxDOT and stated in the Contract Documents.
- 14.5.5 No order, oral statement, or direction from TxDOT or any duly appointed representative shall be treated as a Change Order or entitle the Contractor to an adjustment.
- 14.5.6 The Contractor agrees that TxDOT and any of its duly authorized representatives shall have access and the right to examine, during normal business hours, any books, documents, papers, and records of the Contractor related to the Project. Further, the Contractor agrees to include this provision in all its subcontracts. The period of access and examination described herein also relates to appeals under Article 18 of the Contract, litigation, or the settlement of claims arising out of the performance of this Contract. The period of access and examination shall continue until final disposition of such claims, appeals or litigation.
- 14.6 **ADMINISTRATION OF CHANGE ORDER REQUESTS.** All changes in the Contract shall be administered in accordance with TxDOT procedures.

- 14.6.1 **Routine Change.** Routine changes in the Contract shall be formally initiated by TxDOT with a Request for Proposal form detailing requirements of the proposed change for pricing by the Contractor. This action may be preceded by communications between the Contractor, PM and/or designated representative concerning the need and nature of the change, but such communications shall not constitute a basis for beginning the proposed Work by the Contractor without a Change Order. Approval of the Contractor's cost proposal by TxDOT, in compliance with TxDOT's signature authorization policy, will be required for authorization to proceed with the work being changed. TxDOT will not be responsible for the cost of work changed without prior approval and the Contractor may be required to remove such work at no cost to TxDOT.
- 14.6.1.1 Contractor shall furnish TxDOT an itemized breakdown, in such detail and form as acceptable to TxDOT, of all costs and supporting information including but not limited to quantities, material / equipment prices, tier subcontracted work performed, labor rates and employer payments, compensable insurance and rental rates for all proposed Change Order work. The itemized breakdown detail shall be the same for any Subcontractor work. Photocopies of Subcontractor and vendor/supplier proposals shall be furnished unless specifically waived in writing by the PM or designated representative. The Contractor shall provide a written response to TxDOT's Request for Proposal within fifteen (15) calendar days of receipt unless the Contractor and TxDOT mutually agree otherwise.
- 14.6.2 **Unexpected Circumstance.** Any unexpected circumstance which necessitates an immediate change in order to avoid a delay in progress of the Work may be expedited by verbal communication and authorization by TxDOT in compliance with TxDOT's signature authorization policy, with written confirmation following within twenty-four (24) hours. A limited scope not-to-exceed estimate of cost and time will be requested prior to authorizing work to proceed. TxDOT reserves the right to issue a ULCO or Supplemental Instruction when in its sole opinion the circumstance which necessitated the change request could have been reasonably detected by the Contractor in fulfilling its duty to review the Contract Documents.
- 14.6.3 **Emergency Change.** Emergency changes to save life or property may be initiated by the Contractor alone (see [Article 9.4](#)) with the claimed cost and/or time of such work to be fully documented as to necessity and detail of the reported costs and/or time to TxDOT's satisfaction.
- 14.6.4 **Valuation of Change Order Work.** The value of changes in the Work, either additive or deductive, executed under a Change Order, shall be determined in one of the following ways:
- 14.6.4.1 **Lump Sum.** By acceptance of a lump sum proposal as described by the following paragraphs.
- 14.6.4.1.1 Contractor shall furnish TxDOT an itemized breakdown, in such detail and form as acceptable to TxDOT, of all costs and supporting information including but not limited to quantities, material prices including supplier invoices/quotes, tier subcontracted work performed, labor rates and employer payments, and rental rates. The itemized breakdown detail shall be the same for any Subcontractor work. The Contractor shall furnish TxDOT the following additional information in the itemized breakdown, including insurance charges and bond charges used in computing the lump sum proposal. The information shall also be provided by any Subcontractor work.
- 14.6.4.1.2 Cost shall include:
- Labor cost, including the classifications through foremen when engaged in the actual and direct performance of the work, and actual employer payments to or on behalf of workers for health and welfare, pension, vacation, insurance, and any similar charges imposed by law (Social Security Tax, Workers' Compensation) or required by applicable collective bargaining agreements;
  - materials, installed permanently in the work or expended in performance thereof;
  - rental cost of construction plant and equipment at the work site;
  - energy, fuel, and supplies consumed in operation of power-driven equipment;
  - additional insurance cost, if any and only cost applicable to insurance limits required by the Contract Documents, directly resulting from the additional Work;
  - necessary professional design and consulting fees; revisions of previously finalized shop drawings and/or fabrication drawings, and
  - other allowable costs involved with Change Order work, except those costs listed in [Paragraph 14.6.4.1.3](#).
  - In lieu of providing information for all employer payments to or on behalf of workers, excluding actual gross wages, the Contractor proposal may use a percentage factor based on methodology acceptable to TxDOT, which shall constitute full compensation for all employer payments other than actual gross wages. The Contractor shall provide complete supporting information for calculation of the percentage factor(s) when so requested by TxDOT.
- 14.6.4.1.3 Costs shall not include: (These costs shall be considered a part of overhead and profit or markups and no separate allowance will be made therefore)
- Labor for superintendents, assistant superintendents, office personnel (home and field);

- timekeepers and maintenance mechanics at any level of contracting;
- per diem and travel allowances for any of the aforementioned labor classifications;
- pieces of equipment, hand and small tools, or instruments having a new value of \$500.00 or less, whether or not consumed by use;
- safety programs;
- scheduling;
- on site and main offices and operating costs;
- incidental job burdens;
- modifications to record drawings;
- guarantee period cost allowances;
- punch list allowances, and
- insurance other than mentioned in Paragraph 14.6.4.1.2.

14.6.4.1.4 For work performed by the Contractor's forces, the maximum allowable percentages for overhead and profit on changes will not exceed:

- fifteen percent (15%) if the total of self-performed work is less than \$10,000;
- ten percent (10%) if the total of self-performed work is between \$10,000 and \$20,000; and
- seven and one half percent (7.5%) if the total of self-performed work is over \$20,000 for any specific change priced.

14.6.4.1.5 For subcontracted Work each affected Subcontractor shall figure its cost, overhead and profit as described above.

14.6.4.1.6 All subcontractor costs shall be combined, and to that total subcontractor cost the Contractor will be allowed to add a maximum mark-up of:

- ten percent (10%) if the total of all subcontracted work is less than \$10,000;
- seven and one half percent (7.5%) if the total of all subcontracted work is between \$10,000 and \$20,000; and
- five percent (5%) if the total of all subcontracted work is over \$20,000.

14.6.4.1.7 To the total of the above costs, Contractor will be allowed to add Bond cost, if bonds are required, if the change results in an increase in the Bond premium paid by the Contractor. Contractor shall provide written evidence from the Bonding Company of any increase in the Bond premium to TxDOT. Subcontractors shall be allowed to add Bond cost to their total costs if the changed work results in an increase in the Bond premium paid by the Subcontractor, and Contractor's contract with the Subcontractor requires the Subcontractor to maintain a bond for their Work. Contractor shall provide a copy of written evidence from the Bonding Company for any additional Subcontractor bond cost that is requested for inclusion in the change order.

14.6.4.1.8 On lump sum changes involving both additions and deletions, percentages for overhead and profit will be allowed only on the net addition.

14.6.4.2 **Unit Price Work.** By acceptance of unit prices agreed upon by TxDOT and the Contractor.

14.6.4.2.1 Unit price is full compensation for all materials, equipment, labor, tools, and supplies necessary to complete the item of work. Unit price includes all markups, overhead, profit, insurance, bond, etc. costs.

14.6.4.3 If a Surety has assumed the responsibilities of the Contract, TxDOT may pay the Surety for the completion contractor's profit and overhead, but it will not pay the Surety any profit or overhead.

14.6.4.4 TxDOT does not accept and will not pay for additional contract cost identified as indirect, consequential, or as damages caused by delay due to Force Majeure or the Contractor.

14.6.5 **Contractor Cost Reduction Proposal.** Contractor may submit a cost reduction proposal for changing the requirements of the Contract Documents. The proposal shall demonstrate that changing the Contract requirements would:

- 14.6.5.1 Represent an advantage to TxDOT over the specified requirement;
- 14.6.5.2 Result in a net reduction in the total Contract Sum;
- 14.6.5.3 Not impact any essential function or characteristic of the Work such as safety, service life, reliability, economy of operation, esthetic, ease of maintenance, and necessary standardize features; and
- 14.6.5.4 Not detrimentally affect the Contract completion date.

14.6.5.5 All costs for compliance with these requirements, whether accepted or not, shall be borne by the Contractor.

14.6.5.6 The determination of TxDOT as to acceptability of the proposal will be final and TxDOT may accept in whole or in part any proposal submitted pursuant to this provision by issuing a Change Order that will identify the proposal on which it is based. The Change order will provide for an equitable adjustment in the Contract Sum in accordance with the provisions herein and will revise any other affected provisions of the Contract Documents.

#### 14.7 CLAIMS FOR ADDITIONAL COSTS

14.7.1 In order for the Contractor to make a valid claim for an increase in the Contract Sum for unforeseen circumstances, Contractor shall give the PM or designated representative written notice thereof within ten (10) days after the occurrence of the event giving rise to such claim. Contractor shall not execute any work involving additional cost or time, except in an emergency endangering life or property without an approved Change Order or written authorization issued in accordance with TxDOT's signature authorization policy. Any TxDOT approved change in the Contract Sum shall be authorized by Change Order. If TxDOT and the Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined as set forth under Article 18.

14.7.2 If the Contractor claims that additional cost is involved because of, but not limited to, 1) any written interpretation of the Contract Documents, 2) any order by TxDOT to stop the Work where the Contractor was not at fault, 3) any written order for a minor change in the Work, the Contractor shall make such claim as stated above.

14.7.3 Failure of the Contractor or his Subcontractors failure to notify the A/E of obvious discrepancies or omissions in the Bid/Proposal Documents during the pre-bid/pre-proposal period, but claim additional costs for corrective work after contract award, shall be deemed an intent to circumvent competitive bidding for necessary corrective work. In such case, TxDOT, in its sole discretion, may let a separate contract for the corrective work, or issue a Unilateral Change Order to require performance by the Contractor. Claims for time extensions or for extra cost resulting from delayed notice of contract document discrepancies or omissions will not be considered by TxDOT.

14.8 **CONCEALED SITE CONDITIONS.** If, in the performance of the Contract, subsurface, latent or concealed conditions at the site are found to be materially different from the information included in the bid/proposal documents, or if unknown conditions of an unusual nature are disclosed differing materially from the conditions usually inherent in work of the character shown and specified, the PM and A/E shall be notified in writing of such conditions before they are disturbed. Upon such notice, or upon its own observation of such conditions, the A/E, upon the approval of the PM, will promptly make such changes in the Drawings and Specifications as they deem necessary to conform to the different conditions. Any increase or decrease in the cost of the Work, or in the time within which the Work is to be completed resulting from such changes will be adjusted by Change Order, subject to TxDOT's approval.

14.9 **EXTENSION OF TIME.** All Changes to the Contract Time shall be made by Change Order.

14.9 **CONTRACTOR'S RISK OF PERFORMANCE.** Except as expressly provided in this Article, other contract provisions or as may be determined by Article 18, the Contractor shall not be entitled to an increase in the Contract Sum or Contract Time and shall bear full responsibility for all risks affecting the Contractor's cost of performance.



## Article 15 Project Completion and Acceptance

15.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.

### 15.2 CLOSING INSPECTIONS

15.2.1 **Request for Substantial Completion Inspection.** When the Contractor considers the entire Work or part thereof Substantially Complete, it shall notify the PM or designated representative in writing that the Work will be ready for Substantial Completion Inspection on a specific date. Contractor shall include with this written notice:

15.2.1.1 Contractor's Punch List to indicate that it has previously inspected all Work associated with the request for inspection;

15.2.1.2 Documentation it has completed or scheduled items required for Substantial Completion to be complete before the specific date requested for the Substantial Completion Inspection.

15.2.1.3 If any item on the Punch List is required for Substantial Completion and not complete or scheduled for completion the Contractor shall not request a Substantial Completion Inspection.

15.2.1.4 If any item on the Punch List will prevent use of the building for the purposes it is intended to be utilized and not corrected, the Contractor shall not request a Substantial Completion Inspection.

15.2.1.5 The failure to include any items on the Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

15.2.1.6 TxDOT will review the list of items and schedule the requested inspection, or inform the Contractor in writing that such an inspection is premature because the Work is not sufficiently advanced, items required to be complete or scheduled for completion are not completed, or conditions are not as represented on the Contractor's list.

15.2.2 **Substantial Completion Inspection.** On the date requested by Contractor, or as mutually agreed upon, with consideration of the status of open Punch List items, the PM or designated representative, Contractor and other TxDOT representatives as determined by TxDOT, will jointly attend the Substantial Completion Inspection, which shall be conducted by the PM or designated representative. If the PM or designated representative determines that the Work is Substantially Complete, the PM will issue a Certificate of Substantial Completion to be signed by the A/E of Record, if required, TxDOT and Contractor, establishing the date of Substantial Completion. If TxDOT determines the Work is not Substantially Complete the Contractor will be so notified. The PM or designated representative will provide with or independent of this certificate a list of Substantial Completion Punch List items. The term "Substantial Completion Punch List" items shall mean details of construction and mechanical and electrical adjustments which are minor in character and do not materially interfere with TxDOT's safe use, enjoyment and operation of the Project or designated portions thereof. If TxDOT elects to occupy the facility upon determination of Substantial Completion, the Contractor shall complete all corrective Work at the convenience of TxDOT, without disruption to TxDOT's use of the facility for its intended purposes.

15.2.3 **Requirements for Substantial Completion.** The Certificate of Substantial Completion for all or a designated portion of the Work will not be issued if the following items are incomplete, unless otherwise agreed to by TxDOT in writing, as they are considered essential elements of the Project and completion of these is a prerequisite for TxDOT's safe use, enjoyment and operation of the project or designated portions thereof.

15.2.3.1 Complete and accepted operation and maintenance (O&M) manuals for all installed equipment, systems and like items to include, but not be limited to, submittals, shop drawings, operation and maintenance instructions, wiring diagrams, spare parts lists, test/inspection results/reports and written warranties,

15.2.3.2 Verification that training of designated TxDOT personnel for various items of the Work requiring training as set forth in the Contract Documents is complete, as evidenced by submittal of a copy of the "sign in" sheet for each required training session;

15.2.3.3 A notarized affidavit attesting to TxDOT no hazardous materials were incorporated into the Work unless prior written approval of TxDOT was granted, as verified by attaching a copy of the TxDOT authorization,

15.2.3.4 A notarized certification to TxDOT that all equipment and materials used in fulfillment of their contract responsibilities are non-Asbestos Containing Building Materials (ACBM) in compliance with the Texas Asbestos Health Protection Rules as administered by the Texas Department of State Health Services;

15.2.3.5 Verification, to the satisfaction of the PM or designated representative, that inspections required by any authority having jurisdiction over any element of the Work have been conducted which shall include any registrations as may be required and the issuance of any permits, licenses, certificates, etc. as may be required for any system or equipment, i.e. boilers, elevators, etc., unless specifically stated otherwise in the Plans and Specifications. The Texas Accessibility Standards (TAS) compliance review and inspection will be the responsibility of TxDOT or authorized representative and is not a condition for Substantial Completion;

- 15.2.3.6 Demonstration, to the satisfaction of the PM or designated representative(s), that all equipment and systems function as required by the Contract Documents, i.e commissioning;
- 15.2.3.7 Completion of landscaping as set forth in the Contract Documents; and
- 15.2.3.8 Submittal of all asbestos containing material abatement documentation and/or mold remediation documentation, if asbestos abatement and/or mold remediation is part of the Contract Work.
- 15.2.4 **Substantial Completion Punch List.** In the event the thirty (30) calendar day time frame or the time frame set forth in the Certificate of Substantial Completion to complete the Substantial Completion Punch List Work expires and TxDOT has not been provided written notice from the Contractor that the Work is ready for Final Completion Inspection, and as **TIME IS OF THE ESSENCE IN COMPLETION OF THE WORK**, TxDOT will provide the Contractor written notice of a date specific an inspection will be held. The Contractor, PM or designated representative and other TxDOT representatives as determined by TxDOT shall conduct the inspection. If TxDOT determines the Substantial Completion Punch List Work is not complete and/or corrected, TxDOT shall, without invalidating the Contract, have the right, upon written notice to the Contractor, to complete the Work using duly qualified contractors or TxDOT forces. The Contractor shall reimburse TxDOT for any reasonable costs incurred by TxDOT in completing the Work with offsets and deductions in the Final Payment. This provision does not invalidate any other provision in the Contract Documents available to TxDOT for completion and/or correction of the Work.
- 15.2.5 **Final Completion Inspection.** Contractor shall complete the list of items identified on the Substantial Completion Punch List within the time frame specified and prior to requesting a Final Completion Inspection. Unless otherwise specified, directed by TxDOT in writing or otherwise agreed in writing by the parties, the Contractor shall complete and/or correct all Substantial Completion Punch List work within thirty (30) calendar days of the Substantial Completion date. Upon completion of the Substantial Completion Punch List work, the Contractor shall give written notice to the PM or designated representative that the Work will be ready for Final Inspection on a specific date. Contractor shall include with this written notice:
- 15.2.5.1 copy of the updated Substantial Completion Punch List indicating resolution of all items;
- 15.2.5.2 original marked-up As-Built drawings reflecting all modifications and changes made to the Work. If the Project is being delivered in phases the original marked-up As-Built drawings shall be delivered at completion of the last phase.
- 15.2.5.3 On the date specified or as soon thereafter as is practicable, the PM or designated representative, Contractor and other TxDOT representatives as determined by TxDOT will inspect the Work. The PM or designated representative will submit a Final Punch List of open items that the inspection team requires corrected or completed before final acceptance of the Work.
- 15.2.6 **Final Punch List.** In the event the Contractor fails to complete the Final Punch List items within seven (7) days of receipt of the Final Punch List or as otherwise agreed to in writing by the parties and as **TIME IS OF THE ESSENCE IN COMPLETION OF THE WORK**, TxDOT shall, without invalidating the Contract, have the right, upon written notice to the Contractor, to complete the Final Punch List Work using duly qualified contractors or TxDOT forces and the Contractor shall reimburse TxDOT for any reasonable costs incurred by TxDOT in completing the Work with offsets and deductions in the Final Payment. This provision does not invalidate any other provision in the Contract Documents available to TxDOT for completion and/or correction of the Work.
- 15.2.7 **Final Punch List Inspection.** Contractor shall correct or complete all items on the Final Punch List before requesting Final Payment. Unless otherwise agreed to in writing by the parties, the Contractor shall complete this work within seven (7) days of receipt of the Final Punch List and notify the PM or designated representative in writing stating the disposition of each Final Punch List item. The PM or designated representative, Contractor and other TxDOT representatives as determined by TxDOT shall promptly inspect the completed items. When the Final Punch List is complete, and the Contract is fully satisfied according to the Contract Documents, subject to the limitations of the **Effect on Warranty** provision, the PM or designated representative will issue a certificate establishing the date of Final Completion. Final Completion of all Work is a condition precedent to the Contractor's right to receive Final Payment.
- 15.2.8 **Annotation.** Any Certificate issued under this Article may be annotated to indicate that it is not applicable to specified portions of the Work, or that it is subject to limitation(s) as determined by TxDOT.
- 15.2.9 **Purpose of Inspection.** Inspection is for determining the completion of the Work, and does not relieve the Contractor of its overall responsibility for completing the Work in a good and workmanlike manner, in compliance with the Contract. Work accepted with incomplete Punch List items or failure of TxDOT or other parties to identify Work that does not comply with the Contract Documents, or is defective in operation or workmanship does not constitute a waiver of TxDOT's rights under the Contract or relieve the Contractor of its responsibility for performance or warranties.
- 15.2.10 **Additional Inspections.** The Contract Agreement contemplates three (3) comprehensive inspections: the Substantial Completion Inspection, the Final Completion Inspection, and the Completed Final Punch List Inspection. The cost to TxDOT of additional inspections resulting from the Work not being ready for one or more of these inspections shall be charged to the Contractor. TxDOT may issue a Unilateral Change Order deducting these costs from Final Payment. Upon the Contractor's written request, TxDOT will furnish documentation of any costs so deducted. Work added to the Contract by Change Order after the Substantial Completion Inspection is not corrective work for purposes of determining timely completion, or assessing the cost of additional inspections. However, such work shall be subject to all provisions of this Contract.

- 15.2.11 **Phased and Whole Completion.** The contract may provide, or project conditions may warrant, as determined by the PM or designated representative, that designated elements or parts of the Work be completed in phases. Where phased completion is required or specifically agreed to by the parties, the provisions of the Contract related to Closing Inspections and Occupancy apply independently to each designated element or part of the Work. For all other purposes, unless otherwise agreed by the parties in writing, Substantial Completion of the Work as a whole is the date on which the last element or part of the Work completed receives a Substantial Completion certificate. Final Completion of the Work as a whole is the date on which the last element or part of the Work completed receives a Final Completion certificate.
- 15.2.12 **Time Charges.** The date Time Charges for the project as a whole terminates will be the date set forth in the Certificate of Substantial Completion for the project issued by TxDOT. When the Work is to be completed in designated elements or portions (phases), time charges for the project will not stop until the date set forth in the Certificate of Substantial Completion for the last phase of the Work issued by TxDOT.
- 15.3 **TXDOT'S RIGHT OF OCCUPANCY.** TxDOT may occupy or use all or any portion of the Work following Substantial Completion, or at any earlier stage of completion. Should TxDOT wish to use or occupy the Work, or part thereof, at or prior to Substantial Completion, the PM or designated representative will notify the Contractor in writing. Work performed on the premises by third parties on TxDOT's behalf does not constitute occupation or use of the Work by TxDOT for purposes of this Article. All Work performed by the Contractor after occupancy, whether in part or in whole, shall be at the convenience of TxDOT so as to not disrupt TxDOT's use of, or access to occupied areas of the project.
- 15.4 **ACCEPTANCE AND PAYMENT**
- 15.4.1 **Request for Final Payment.** Following the certified completion of all work, including all punch list items, cleanup, and the delivery and approval of record documents, the Contractor shall submit an Application for Final Payment. The Contractor shall include all sums held as retainage and forward the Application for Final Payment to the PM or designated representative for review and approval. If TxDOT determines that any item remains incomplete, including but not be limited to, maintenance and operation manuals, training, guarantees and warranties, record documents and all other items required by the Contract that have not been submitted to and approved by TxDOT, TxDOT may take no action on the Application for Final Payment and return the Application for Final Payment to the Contractor with a list of missing or incomplete items.
- 15.4.2 **Allowances.** If the Contract Documents contains allowance items, all savings under any of the designated Allowance Items shall accrue to the benefit of TxDOT and the Contract Sum shall be reduced by one hundred percent (100%) of such savings.
- 15.4.3 **Final Payment Documentation.** No Application for Final Payment is complete unless it fully reflects all required modifications and includes all required executed documentation including, but not limited to, the following:
- 15.4.3.1 TxDOT Contractor's Application for Payment form;
- 15.4.3.2 Updated Schedule of Values form;
- 15.4.3.3 TxDOT' Contractor's Affidavit of Payments of Debts and Claims (final) form;
- 15.4.3.4 If requested, documentation establishing payment or satisfaction of all such obligations connected with the work of the Contract, such as receipts, releases and waivers of claims, to the extent and in such form as designated by TxDOT;
- 15.4.3.5 If required, TxDOT Consent of Surety Company to Final Payment form;
- 15.4.3.6 If required, a signed TxDOT Change Order making final adjustment to the Contract Sum or Contract Time as may be required for offsets and deductions, allowance items reconciliation, time adjustments, or any other item requiring a change to the Contract;
- 15.4.3.7 HUB Subcontracting Plan (HSP) Prime Contractor Progress Assessment Report,
- 15.4.3.8 TxDOT Buy America Affidavit form.
- 15.4.4 **Offsets and Deductions.** TxDOT may deduct from the Final Payment all sums due from the Contractor. If the Certificate of Final Completion notes any Work remaining, incomplete, or defects not remedied, TxDOT may deduct the cost of remedying such deficiencies from the Final Payment. On such deductions, TxDOT will identify each deduction, the amount, and the explanation of the deduction. Such offsets and deductions shall be incorporated via a final Change Order, including Unilateral Change Order as may be applicable.
- 15.4.5 **TxDOT Approval.** The A/E and PM will review a submitted complete Application for Final Payment promptly but in no event later than ten (10) days after its receipt. The PM will either 1) return the Application for Final Payment to Contractor with corrections for action and resubmission or 2) accept it subject to any offsets and deductions, noting approval and forward for payment processing.
- 15.4.6 **Final Payment Due.** Final Payment is due and payable by TxDOT, subject to all allowable offsets and deductions, on receipt of a complete Application for Final Payment. If the Contractor disputes any amount deducted by TxDOT, the

- Contractor shall give notice of the dispute on or before the thirtieth (30<sup>th</sup>) day following receipt of Final Payment and Article 18 shall apply to unresolved disputes.
- 15.4.7 **Effect of Final Payment (TxDOT).** Final Payment, when accepted by the Contractor, constitutes a waiver of all claims by TxDOT, relating to the condition of the Work except those arising from any one, combination or all of the following:
- 15.4.7.1 Faulty or defective Work appearing after Substantial Completion (latent defects);
  - 15.4.7.2 Failure of the Work to comply with the requirements of the Contract Documents;
  - 15.4.7.3 Terms of any warranties required by the Contract, or implied by law;
  - 15.4.7.4 Claims arising from personal injury or property damage to third parties; and
  - 15.4.7.5 Disputes pending under Article 18 that have not been resolved.
- 15.4.8 **Effect of Final Payment (Contractor).** Acceptance of Final Payment constitutes a waiver of all claims by the Contractor, except those specifically identified in writing and submitted prior to or at the time of Final Payment and disputes pending under Article 18 that have not been resolved. Provided, however, that the Contract shall not be deemed fully performed and closed until the expiration of all periods of time provided under the Contract Documents or applicable law for the Contractor to submit a claim or protest a Unilateral Change Order (ULCO).
- 15.4.9 **Effect on Warranty.** Regardless of approval and issuance of Final Payment, the Contract is not deemed fully performed by the Contractor and closed until the expiration of all warranty periods.

## Article 16 Warranty and Guaranty

- 16.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 16.2 **CONTRACTOR'S GENERAL WARRANTY AND GUARANTY.**
- 16.2.1 Contractor warrants to TxDOT that all Work is executed in accordance with the Contract, complete in all parts and in accordance with approved practices and customs, and of the best finish and workmanship.
  - 16.2.2 Contractor further warrants that unless otherwise specified, all materials and equipment incorporated in the Work under the Contract are new.
  - 16.2.3 TxDOT may, at its option, agree in writing to waive any failure of the Work to conform to the Contract, and to accept a reduction in the Contract Sum for the cost of repair or diminution in value of the Work by reason of such defect. Absent such a written agreement, the Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute and is not waived by any inspection or observation by TxDOT or others, by making any progress payment or final payment, by the use or occupancy of the Work or any portion thereof by TxDOT, at any time, or by any repair or correction of such defect made by TxDOT.
  - 16.2.4 All warranties must include statements that the warranty is assignable to the end user, subject to Texas laws and that venue for any legal proceedings under the warranty shall be in a court of competent jurisdiction in the county where the warranted item is incorporated into the Project.
- 16.3 **WARRANTY PERIOD.** Except as may be otherwise specified in the Contract Documents or agreed, the Contractor shall repair all defects in materials, equipment, or workmanship appearing within one year from the date of Substantial Completion of the Work at no cost to TxDOT. If Substantial Completion occurs by phase, then the warranty period for that particular Work begins on the date of completion of the relevant phase, or as otherwise stipulated on the Certificate of Substantial Completion for the particular Work. Regardless of approval and issuance of Final Payment, the Contract is not deemed fully performed by the Contractor and closed until the expiration of all warranty periods.
- 16.4 **LIMITS ON WARRANTY.** Contractor's warranty and guaranty hereunder excludes defects or damage caused by:
- 16.4.1 Modification or improper maintenance or operation by persons other than Contractor, Subcontractors, or any other individual or entity for whom Contractor is not responsible.
  - 16.4.2 Normal wear and tear under normal usage after acceptance of the Work by TxDOT.
- 16.5 **EVENTS NOT AFFECTING WARRANTY.** Contractor's obligation to perform and complete the Work in a good and workmanlike manner in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
- 16.5.1 Observations by TxDOT and/or designated representatives.
  - 16.5.2 Recommendation or authorization to pay any progress or final payment by PM or designated representative.
  - 16.5.3 Issuance of a certificate of Substantial Completion by TxDOT or any payment TxDOT to Contractor under the Contract Documents.
  - 16.5.4 Use or occupancy of the Work or any part thereof by TxDOT.
  - 16.5.5 Any acceptance by TxDOT or any failure to do so.
  - 16.5.6 Any review of a Shop Drawing or sample submittal;
  - 16.5.7 Any inspection, test or approval by others; or
  - 16.5.8 Final payment by TxDOT.
- 16.6 **SEPARATE WARRANTIES.** If a particular piece of equipment or component of the Work for which the contract requires a separate warranty is placed in continuous service before Substantial Completion, the Warranty Period for that equipment or component will not begin until Substantial Completion, regardless of any warranty agreements in place between suppliers and/or

Subcontractors and the Contractor. The PM or designated representative will certify the date of service commencement in the Substantial Completion Certificate.

- 16.6.1 In addition to the Contractor's warranty and duty to repair, the Contractor expressly assumes all warranty obligations required under the Contract for specific building components, systems and equipment.
- 16.6.2 Contractor may satisfy any such obligation by obtaining and assigning to TxDOT a complying warranty from a manufacturer, supplier, or Subcontractor, provided the warranty provides for assignment to the end user. Where an assigned warranty is tendered to TxDOT but does not fully comply with the requirements of the Contract, the Contractor remains liable to TxDOT on all elements of the required warranty not provided by the tendered warranty.
- 16.6.3 A complying warranty from a manufacturer, supplier, or Subcontractor assigned to TxDOT by the Contractor shall be subject to and governed by the laws of the State of Texas.
- 16.7 **CORRECTION OF DEFECTS.** Upon receipt of written notice from TxDOT, or any agent of TxDOT designated as responsible for management of the Warranty Period, of the discovery of a defect, the Contractor shall promptly remedy the defect(s), and provide written notice to TxDOT and its designated agent indicating action taken. In case of emergency where delay would cause serious risk of loss or damage to TxDOT, or if the Contractor fails to remedy within thirty (30) days, or within another period agreed to in writing, TxDOT may correct the defect and be reimbursed the cost of remedying the defect from the Contractor or its Surety.
- 16.8 **CERTIFICATION OF NO ASBESTOS CONTAINING MATERIALS OR WORK.** Ensure compliance with the Asbestos Hazard Emergency Response Act (AHERA—40 CFR 763-99 (7)) from all subcontractors and materials suppliers, and provide a notarized certification to TxDOT that all equipment and materials used in fulfillment of their contract responsibilities are non-Asbestos Containing Building Materials (ACBM). This certification is a condition for Substantial Completion of the Project in whole or in part.
- 16.9 **TELECOMMUNICATIONS SYSTEM WARRANTY PERIOD.** Except as may be otherwise specified or agreed, repair all defects in materials, equipment, or workmanship appearing within two (2) years from the date of Substantial Completion of the telecommunications system Work at no cost to TxDOT. If Substantial Completion occurs by phase, then the warranty period for the particular telecommunications system Work begins on the date of completion of the relevant phase, or as otherwise stipulated on the Certificate of Substantial Completion for the particular Work. Regardless of approval and issuance of Final Payment, the Contract is not deemed fully performed by the Contractor and closed until the expiration of all warranty periods.

## Article 17 Suspension and Termination

- 17.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 17.2 **SUSPENSION OF WORK FOR CAUSE.** TxDOT may, at any time without prior notice, suspend all or any part of the Work, if TxDOT determines it is considered necessary to prevent or correct any condition of the Work, which constitutes an immediate safety hazard, or which is expected to impair the integrity, usefulness or longevity of the Work when completed, or for any reason set forth in any other Article of the Uniform General Conditions.
- 17.2.1 TxDOT will give the Contractor a written notice of suspension for cause, setting forth the reason for the suspension and identifying the work suspended. Upon receipt of such notice, the Contractor shall immediately stop the work so identified. As soon as practicable following the issuance of such a notice, TxDOT will initiate and complete a further investigation of the circumstances giving rise to the suspension, and issue a written determination of the findings.
- 17.2.2 If it is confirmed that the cause was within the control of the Contractor, the Contractor will not be entitled to an extension of time or any compensation for delay resulting from the suspension. If the cause is determined not to have been within the control of the Contractor, and the suspension has prevented the Contractor from completing the Work within the Contract Time, the Contractor may be entitled to a Change Order increasing the Contract Sum and/or extending the Contract Time caused by any such suspension of Work.
- 17.2.3 Suspension of work under this provision will be no longer than is reasonably necessary to identify and remedy the conditions giving rise to the suspension. If TxDOT and the Contractor cannot reach agreement on the validity of any work suspension issued by TxDOT or on Contractor's entitlement to an adjustment to the Contract Sum and/or Contract Time such dispute shall be resolved pursuant to the Article 18.
- 17.3 **SUSPENSION OF WORK FOR TXDOT'S CONVENIENCE.** Upon seven (7) calendar days written notice to the Contractor, TxDOT may at any time without breach of the Contract suspend all or any portion of the Work for a period of up to thirty (30) days for its own convenience. TxDOT will give the Contractor a written notice of suspension for convenience, which sets forth the dates and number of suspension days for the Work, or any portion of it. When such a suspension prevents the Contractor from completing the Work within the Contract Time, it is an Excusable Delay. A notice of suspension for convenience may be modified by TxDOT at any time on seven (7) calendar days written notice to the Contractor. If TxDOT suspends the Work for its convenience for more than sixty (60) consecutive calendar days, the Contractor may elect to terminate the contract pursuant to the provisions of the Contract.
- 17.4 **TERMINATION BY TXDOT FOR CAUSE.**
- 17.4.1 TxDOT may, without prejudice to any right or remedy, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor, under any of, but not limited to, the following circumstances.
- 17.4.1.1 Persistent or repeated failure or refusal, except during complete or partial suspensions of Work authorized under the Contract, to supply enough properly skilled workmen or proper materials to continue prosecution of the Work,
- 17.4.1.2 Persistent disregard of laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, including the PM or designated representative,
- 17.4.1.3 Persistent failure to prosecute the Work in accordance with the Contract, and to insure its completion within the time, or any approved extension thereof, specified in this Contract,
- 17.4.1.4 Failure to remedy defective work condemned by the PM or designated representative,
- 17.4.1.5 Failure to pay subcontractors, laborers, materialmen and suppliers pursuant to Tex. Gov't Code Chapter 2251;
- 17.4.1.6 Persistent endangerment to the safety of labor or of the Work, including display of uncooperative, disruptive or threatening behavior,
- 17.4.1.7 Failure to resume the Work that has been discontinued within a reasonable number of days after written notice to do so,
- 17.4.1.8 Failure to supply or maintain statutory bonds or to maintain required insurance, pursuant to the Contract,
- 17.4.1.9 Any material breach or substantial violation of a provision of the Contract,
- 17.4.1.10 Contractor's insolvency, bankruptcy, or demonstrated financial inability to perform the Work.

- 17.4.2 Should TxDOT decide to terminate the employment of the Contractor under any of the provisions of the **Termination by TxDOT For Cause** provision of this Article, it will provide to the Contractor and its Surety, if Surety is required, written notice of the intent to declare the Contractor in default if the Contractor does not proceed as directed within ten (10) days after receipt of the notice.
- 17.4.3 Should the Contractor or its Surety, if Surety is required, after having received notice of intent to declare the Contractor in default, demonstrate to the satisfaction of TxDOT within the time frame set forth in the notice, remedy to the condition(s) upon which the notice was based, the notice shall be rescinded in writing by TxDOT. If so rescinded, the Work may continue without an extension of time or any increase in the Contract Sum related directly or indirectly to the remedy.
- 17.4.4 Failure by TxDOT to exercise the right to terminate in any instance or for any proper reason is not a waiver of the right to do so in any other instance or for any other proper reason.
- 17.4.5 If the Contractor or its Surety, if Surety is required, fails to demonstrate activities to remedy the condition(s) upon which the notice of intent was based, to the satisfaction of TxDOT and within the time frame set forth in the notice following receipt of notice, TxDOT will give written notice to the Contractor and Surety, if Surety is required, declare the Contractor to be in default of the Contract, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor. TxDOT shall also without violating the Contract, demand the Contractor's Surety, if Surety is required, complete the remaining Work in accordance with the terms of the original Contract subject to, but not limited to, the following:
- 17.4.5.1 The Surety, if Surety is required, becomes the Contractor in a takeover;
- 17.4.5.2 A completing Contractor will be considered a subcontractor of the Surety, if Surety is required;
- 17.4.5.3 TxDOT reserves the right to approve or reject proposed subcontractors. HUB's must continue to be used in accordance with the commitments previously approved in the HSP by TxDOT;
- 17.4.5.4 Work may resume after TxDOT receives and approves certificates of insurance as required by the Contract Documents. Certificates of insurance may be issued in the name of the completing Contractor;
- 17.4.5.5 The Surety, if Surety is required, is responsible for making every effort to expedite the resumption of the Work and completion of the Contract;
- 17.4.5.6 The completing Contractor may complete the Work utilizing the materials at the work location it deems suitable and acceptable subject to compliance with the provisions of the Contract Documents;
- 17.4.5.7 Time charges will continue until completion of the Contract;
- 17.4.5.8 Any costs incurred by TxDOT including, but not limited to, the cost of additional A/E services, other consultants, contract administration, liquidated damages, and any work or service of any type made necessary by such default or neglect will be the responsibility of the Surety. All costs associated with this work will be deducted from money due to the Surety. If the amount due TxDOT exceeds the sum that would have been payable under the Contract, the Surety will be liable and pay TxDOT the balance of these costs in excess of the Contract Sum. This obligation for payment survives the termination of the Contract.
- 17.4.6 In termination for cause the Contractor may be subject to sanctions under Title 43 Texas Administrative Code Chapter 9, Subchapter G.
- 17.4.7 The Surety's obligation for performance shall survive the termination of the Contract. Should the Surety fail to so demonstrate within thirty (30) days following receipt of termination notice to TxDOT's reasonable satisfaction that the condition or conditions upon which the notice of termination is based have been removed, corrected, or will not recur, TxDOT may, upon written notice to the Surety arrange for completion of the Work and pursue its legal remedies. TxDOT shall file suite for the cost incurred by TxDOT to complete the Work including, but not limited to, the cost of additional A/E services, other consultants, contract administration, and any work or service of any type made necessary by such default, corrections to the Work, or neglect.
- 17.4.7.1 In addition to any rights TxDOT may have against the Surety TxDOT reserves the right in termination for cause to take assignment of any and all contracts between the Surety, and its Subcontractors, vendors and suppliers. The PM or designated representative will promptly notify the Surety of the contracts, TxDOT elects to assume. Upon receipt of such notice, the Surety shall promptly take all steps necessary to affect such assignment.
- 17.4.8 If it is determined, after the Contractor is declared in default, that the Contractor was not in default, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of TxDOT as provided for in the **Termination for Convenience of TxDOT** provision under this Article.
- 17.5 **TERMINATION FOR CONVENIENCE OF TXDOT.** TxDOT reserves the right, without breach, to terminate the Contract prior to, or during the performance of the Work, for any reason. Upon such an occurrence, the following shall apply:
- 17.5.1 TxDOT will immediately notify the Contractor and the A/E in writing, specifying the reason for and the effective date of contract termination. Such notice may also contain instructions necessary for the protection, storage or decommissioning of incomplete work or systems, and for safety.



- 17.5.2 Upon receipt of the notice of termination, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due at that point in the Contract:
- 17.5.2.1 Stop all work.
  - 17.5.2.2 Place no further subcontracts or orders for materials or services.
  - 17.5.2.3 Terminate all subcontracts.
  - 17.5.2.4 Cancel all materials and equipment orders as applicable.
  - 17.5.2.5 Take action that is necessary to protect and preserve all property related to this Contract and materials, equipment and other property which is in the possession of the Contractor and for which TxDOT has paid the Contractor.
- 17.5.3 When the Contract is terminated for TxDOT's convenience, the Contractor may recover from TxDOT payment for all Work executed, including any additional work required pursuant to the notice of termination, and for any provable loss and reasonable expenses attributable to the Work resulting from such termination, but not for anticipated profits after the date of termination.
- 17.6 **TERMINATION BY CONTRACTOR.** If the Work is stopped for a period of ninety (90) days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with the Contractor, then the Contractor may, upon thirty (30) additional days' written notice to the PM or designated representative, terminate the Contract and recover from TxDOT payment for all Work previously executed and for any provable loss and reasonable expenses attributable to the Work resulting prior to such termination, but not for anticipated profits after the date of notice by the Contractor. If the cause of the work stoppage is removed prior to the end of the thirty (30) day notice period, the Contractor may not terminate the Contract.
- 17.7 **SETTLEMENT ON TERMINATION.** When the Contract is terminated for any reason, the Contractor shall, at any time prior to sixty (60) days after the effective date of termination, submit a final termination settlement proposal to TxDOT based upon recoverable costs as provided herein. If the Contractor fails to submit the proposal within the time allowed, TxDOT may determine the amount due to the Contractor because of the termination and TxDOT will pay the determined amount to the Contractor. All settlements on termination shall be administered as a Change Order.

## Article 18 Dispute Resolution

- 18.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 18.2 **CONTRACTOR DISPUTES.** It is TxDOT's goal to have a dispute settled at the District / Office / Division, depending on the type of contract, level prior to elevating it to the Contract Claim Committee.
- 18.3 **UNRESOLVED CONTRACTOR DISPUTES.** The Alternate Dispute Resolution Process is authorized under Texas Government Code Chapter 2009. The Alternative Dispute Resolution Process shall be used by TxDOT and the Contractor to attempt to resolve any claim made by the Contractor or TxDOT.
- 18.3.1 **Contractor Claim.** A claim filed by the Contractor shall follow the Contract Claim Procedure as set forth in Texas Administrative Code (TAC) Title 43, Part 1, Chapter 9, Subchapter A, Rule §9.2.
- 18.3.1.1 Only the Contractor (prime contractor) shall submit a claim to begin a claim proceeding.
- 18.3.1.2 The prime contractor agrees to file a claim only after completion of the contract or when required for orderly performance of the contract.
- 18.3.1.3 The Prime Contractor shall file a claim no later than one year after the earlier of: the date TxDOT issues notice to the Contractor that it is in default, or the date TxDOT terminates the Contract; or the date TxDOT issues Final Acceptance of the Project.
- 18.3.1.4 After a claim proceeding has begun TxDOT may make a counter claim.
- 18.3.1.5 A claim filed by the prime contractor must be considered by the Contract Claim Committee. After a committee decision is issued, the Contractor can file with TxDOT's Executive Director a written petition requesting an administrative hearing.
- 18.3.2 **Owner Claim.** TAC 43, §9.2 does not abrogate TxDOT's authority to file a claim in a court of competent jurisdiction. The procedure for TxDOT to file a claim in a court of competent jurisdiction, including the deadline to file a claim, is set by other law.
- 18.4 **CONDITION PRECEDENT TO FORMAL ADMINISTRATIVE HEARING.** Compliance by the Contractor with TAC 43, §9.3 Contract Claim Procedure is a condition precedent to the filing of a contested case proceeding under Government Code Chapter 2001.
- 18.5 **CONDITION PRECEDENT TO SEEKING CONSENT TO SUE.** Compliance with the contested case process provided in Government Chapter 2001 is a condition precedent to seeking consent to sue from the Legislature under Chapter 107 of the Texas Civil Practices and Remedies Code.
- 18.6 **CONTINUED PERFORMANCE.** The pendency of a claim or claims does not authorize any suspension of performance by the Contractor nor relieve the Contractor from any of its obligations, in whole or in part.
- 18.7 **ACCESS TO DOCUMENTS.** The Contractor agrees that TxDOT and any of its duly authorized representatives shall have access and the right to examine, during normal business hours, any books, documents, papers, and records of the Contractor related to the Project. Further, the Contractor agrees to include this provision in all its subcontracts. The period of access and examination described herein also relates to appeals under this Article of the Contract, litigation, or the settlement of claims arising out of the performance of this Contract. The period of access and examination shall continue until final disposition of such claims, appeals or litigation.

## Article 19 Miscellaneous

- 19.1 **RESOLUTION OF CONFLICTS IN THE DOCUMENTS.** In the event of conflict between the requirements of this Article and the Specifications the more restrictive shall apply.
- 19.2 **SPECIAL CONDITIONS.** When the Work contemplated by TxDOT is of such a character that the foregoing Uniform General Conditions of the Contract cannot adequately cover necessary and additional contractual relationships, the Contract may include Special Conditions as described below.
- 19.2.1 Special Conditions shall relate to a particular project, be peculiar to that project, and may alter or expand any of the Uniform General Conditions.
- 19.3 **STANDARD SPECIFICATIONS.** When the Work contemplated by TxDOT requires the use of *Standard Specifications*, as defined in *Article 1*, for construction of elements of the Work, the Measurement and Payment sections of each *Standard Specifications* Item Number referenced are modified as described below. The term "TxDOT Item Number" or "Item Number", if used, shall have the same meaning as *Standard Specifications* Item Number.
- 19.3.1 **Measurement.** The Measurement section of the *Standard Specifications* Item Number is voided and the Item will be measured on a percentage of Work completed and materials stored corresponding to the Schedule of Values Work classification under which the Item is included.
- 19.3.2 **Payment.** The Payment section of the *Standard Specifications* Item Number is voided and the payment for the Item will be made on a percentage of Work completed and materials stored corresponding to the Schedule of Values Work classification under which the Item is included
- 19.4 **PERSONAL LIABILITY OF PUBLIC OFFICIALS.** TxDOT employees are agents and representatives of the State and will incur no liability, personal or power or authority granted under the Contract.
- 19.5 **ASSIGNMENT OF CONTRACT.** Contractor shall not assign, sell, transfer, or otherwise dispose of the Contract or any portion, rights, title, or interest (including claims) without the approval of the Commission or designated representative. TxDOT must deem any proposed assignment justified and legally acceptable before the assignment may be approved. Any assignment, without TxDOT's approval, is void.
- 19.6 **RESPONSIBILITY FOR DAMAGE CLAIMS. THE CONTRACTOR AGREES TO INDEMNIFY AND SAVE HARMLESS THE STATE AND ITS AGENTS AND EMPLOYEES FROM ALL SUITES, ACTION OR CLAIMS AND FROM ALL LIABILITY AND DAMAGES FOR ANY INJURY OR DAMAGE TO ANY PERSON OR PROPERTY DUE TO THE CONTRACTOR'S NEGLIGENCE IN THE PERFORMANCE OF THE WORK AND FROM ANY CLAIMS ARISING OR AMOUNTS RECOVERED UNDER ANY LAWS, INCLUDING WORKERS' COMPENSATION AND THE TEXAS TORT CLAIMS ACT. INDEMNITY AND SAVE HARMLESS THE STATE AND ASSUME RESPONSIBILITY FOR ALL DAMAGES AND INJURY TO PROPERTY OF ANY CHARACTER OCCURRING DURING THE PROSECUTION OF THE WORK RESULTING FROM ANY ACT, OMISSION, NEGLIGENCE OR MISCONDUCT ON THE CONTRACTOR'S PART IN THE MANNER OR METHOD OF EXECUTING THE WORK; FROM FAILURE TO PROPERLY EXECUTE THE WORK; OR FROM DEFECTIVE WORK OR MATERIALS. THE CONTRACTOR SHALL NOT BE RELEASED FROM THESE RESPONSIBILITIES UNTIL ALL CLAIMS HAVE BEEN SETTLED AND SUITABLE EVIDENCE TO THAT EFFECT TENDERED TO THE STATE.**
- 19.7 **ASSERTION OF CLAIM.** If the Contractor asserts any claim or brings any type of legal action (including an Original Action, Third Party Action, or Cross Claim) against any Commissioner, or individual employee of TxDOT for any cause of action or claim for alleged negligence arising from the Contract, the Contractor will be ineligible to bid on any contract with TxDOT during the pendency of the claim or legal action.
- 19.7.1 Individual owners of a contracting firm are treated the same as a contractor. Therefore, the requirement is met when owners of a contracting firm bring a claim of legal action against a TxDOT employee.

# **NOTICE**

**FOR FEDERAL FUNDED PROJECTS**

**BUILDING UNIFORM GENERAL CONDITIONS AND**  
**INSTRUCTIONS TO BIDDERS**

**IN ALL AREAS REFERENCING THE**  
**HISTORICALLY UNDERUTILIZED**  
**BUSINESS (HUB) PROGRAM AND**  
**REQUIREMENTS**

**DO NOT APPLY TO THIS**  
**CONTRACT**

**The Texas Department of Transportation is dedicated to providing information to vendors on how to do business with TxDOT. If you have any questions, feel free to contact our office at 512-486-5500.**

## **SPECIAL CONDITION - INSURANCE**

*Only Item 4 – Builder’s Risk Insurance has been modified for this contract.*

### **All other requirements for insurance under this contract remain the same.**

Requirements of the 1560 insurance form provided by The State shall be used for this project. A “Waiver of Subrogation Endorsement” in favor of the State shall be a part of each policy for the coverage in 1 below. The State shall also be named under the Loss Payable clause in 4 below.

The Contractor shall be responsible for any deductions stated in the policy.

- |      |  |   |
|------|--|---|
| 1.   | Workers' Compensation Insurance  | In accordance with Texas Workers' Compensation Act.                               |
| 2.   | Comprehensive General Liability Insurance<br>Amounts - Bodily Injury<br>- Property Damage  | \$500,000 each occurrence<br>\$100,000 each occurrence<br>\$100,000 for aggregate |
|      | <b>OR</b>  |   |
|      | Commercial General Liability Insurance<br>Amount   | \$600,000 combined single limit   |
| 3.   | Comprehensive Automobile Liability Insurance or Texas Business Auto Policy<br>Amounts - Bodily Injury<br><br>Property Damage   | \$250,000 each person<br>\$500,000 each occurrence<br>\$100,000 each occurrence   |
| 4. * | Builder's Risk against loss by storm or fire or extended coverage perils on work and materials intended for use on the project including structures adjacent thereto | 100% of Contract Price *<br>TxDOT to be named under the Loss Payable Clause       |

**\* 100% of Contract Price for Item 7187-6001, Construction associated with (Restroom Buildings, Picnic Arbor Buildings, associated mechanical, electrical, plumbing and site utilities) TxDOT to be named under the Loss Payable Clause.**

The Contractor shall provide the Department with the Department's Certificate of Insurance, in accordance with contract requirements and with the requirements of Paragraph 8.3, Workers' Compensation Insurance Coverage. Upon signing the contract for this project, all insurance certificates should be sent by **overnight delivery service** for approval to:

Texas Department of Transportation  
Construction Division  
Attention: Contract Processing Branch  
200 East Riverside Drive  
Austin, TX 78704

## **SPECIAL CONDITION - PRECEDENCE**

TO BE INCLUDED IN THIS CONTRACT

The Contractor's attention is also directed to the fact that in the Specifications for (Building Site Plans) reference is made to the TxDOT Building "Uniform General Conditions" .

Whenever there is a conflict between the TxDOT Building "Uniform General Conditions" (UGC) and TxDOT's Item's 1 to 9 including special provisions to Item 1 to 9, the TxDOT Building "Uniform General Conditions" shall take precedence.

CONTROL : 0912-73-220  
PROJECT : F 2021(384)  
HIGHWAY : VA  
COUNTY : GALVESTON

TEXAS DEPARTMENT OF TRANSPORTATION

**GOVERNING SPECIFICATIONS AND SPECIAL PROVISIONS**

ALL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE TO THIS PROJECT ARE IDENTIFIED AS FOLLOWS:

STANDARD SPECIFICATIONS: ADOPTED BY THE TEXAS DEPARTMENT OF  
----- TRANSPORTATION NOVEMBER 1, 2014.  
STANDARD SPECIFICATIONS ARE INCORPORATED  
INTO THE CONTRACT BY REFERENCE.

ITEMS 1 TO 9 INCL., GENERAL REQUIREMENTS AND COVENANTS  
ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL  
CONTROLS <506>

SPECIAL PROVISIONS: SPECIAL PROVISIONS WILL GOVERN AND TAKE  
----- PRECEDENCE OVER THE SPECIFICATIONS ENUMERATED  
HEREON WHEREVER IN CONFLICT THEREWITH.

REQUIRED CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION CONTRACTS  
(FORM FHWA 1273, MAY, 2012)

WAGE RATES

SPECIAL PROVISION "NONDISCRIMINATION" (000---002)  
SPECIAL PROVISION "CERTIFICATION OF NONDISCRIMINATION IN EMPLOYMENT"  
(000---003)  
SPECIAL PROVISION "NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO  
ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE  
ORDER 11246" (000---004)  
SPECIAL PROVISION "STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY  
CONSTRUCTION CONTRACT SPECIFICATIONS" (000---005)  
SPECIAL PROVISION "ONTHEJOB TRAINING PROGRAM" (000---006)  
SPECIAL PROVISION "CERTIFICATE OF INTERESTED PARTIES (FORM 1295)"  
(000--1019)  
SPECIAL PROVISION "CARGO PREFERENCE ACT REQUIREMENTS IN FEDERAL AID  
CONTRACTS" (000---241)  
SPECIAL PROVISION "DISADVANTAGED BUSINESS ENTERPRISE IN FEDERAL AID  
CONTRACTS" (000---394)  
SPECIAL PROVISION "SCHEDULE OF LIQUIDATED DAMAGES" (000---658)  
SPECIAL PROVISION "NOTICE OF CONTRACTOR PERFORMANCE EVALUATIONS"

(000---659)

SPECIAL PROVISIONS TO ITEM	2	(002---009) (002---011) (002---013)
SPECIAL PROVISIONS TO ITEM	3	(003---011) (003---013)
SPECIAL PROVISIONS TO ITEM	5	(005---002) (005---003)
SPECIAL PROVISIONS TO ITEM	6	(006---001) (006---012)
SPECIAL PROVISIONS TO ITEM	7	(007---004) (007---008) (007---010) (007---011)
SPECIAL PROVISIONS TO ITEM	8	(008---030) (008---033)
SPECIAL PROVISIONS TO ITEM	9	(009---010) (009---011)
SPECIAL PROVISION TO ITEM	506	(506---002)

SPECIAL SPECIFICATIONS:

-----

ITEM 7263 FERRYBOAT EQUIPMENT UPGRADE

GENERAL: THE ABOVE-LISTED SPECIFICATION ITEMS ARE THOSE UNDER WHICH  
 ----- PAYMENT IS TO BE MADE. THESE, TOGETHER WITH SUCH OTHER  
 PERTINENT ITEMS, IF ANY, AS MAY BE REFERRED TO IN THE ABOVE-  
 LISTED SPECIFICATION ITEMS, AND INCLUDING THE SPECIAL  
 PROVISIONS LISTED ABOVE, CONSTITUTE THE COMPLETE SPECIFI-  
 CATIONS FOR THIS PROJECT.



**Control**    **0912-73-220**  
**Project**    **F 2021(384)**  
**Highway**   **VA**  
**County**    **GALVESTON**

**DISADVANTAGED BUSINESS ENTERPRISE  
REQUIREMENTS**

The following goal for disadvantaged business enterprises is established:

**DBE**  
**0.0%**

## **CHILD SUPPORT STATEMENT**

**Under Section 231.006, Family Code, the vendor or applicant certifies that the individual or business entity named in this contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate.**

## CONFLICT OF INTEREST CERTIFICATION

Pursuant to Texas Government Code Section 2261.252(b), the Department is prohibited from entering into contracts in which Department officers and employees have a financial interest.

By signing the Contract, the Contractor certifies that it is not prohibited from entering into a Contract with the Department as a result of a financial interest as defined under Texas Government Code Section 2261.252(b), and that it will exercise reasonable care and diligence to prevent any actions or conditions that could result in a conflict of interest with the Department.

The Contractor also certifies that none of the following individuals, nor any of their family members within the second degree of affinity or consanguinity, owns 1% or more interest or has a financial interest as defined under Texas Government Code Section 2261.252(b) in the Contractor:

- Any member of the Texas Transportation Commission; and
- The Department's Executive Director, General Counsel, Chief of Procurement and Field Support Operations, Director of Procurement, and Director of Contract Services.

Violation of this certification may result in action by the Department.

## E-VERIFY CERTIFICATION

Pursuant to Texas Transportation Code §223.051, all TxDOT contracts for construction, maintenance, or improvement of a highway must include a provision requiring Contractors and subcontractors to use the U.S. Department of Homeland Security's E-Verify system to determine employment eligibility. By signing the contract, the Contractor certifies that prior to the award of the Contract:

- the Contractor has registered with and will, to the extent permitted by law, utilize the United States Department of Homeland Security's E-Verify system during the term of the Contract to determine the eligibility of all persons hired to perform duties within Texas during the term of the agreement; and
- the Contractor will require that all subcontractors also register with and, to the extent permitted by law, utilize the United States Department of Homeland Security's E-Verify system during the term of the subcontract to determine the eligibility of all persons hired to perform duties within Texas during the term of the agreement.

Violation of this requirement constitutes a material breach of the Contract, subjects a subcontractor to removal from the Contract, and subjects the Contractor or subcontractors to possible sanctions in accordance with Title 43, Texas Administrative Code, Chapter 10, Subchapter F, "Sanctions and Suspension for Ethical Violations by Entities Doing Business with the Department."

## Certification Regarding Disclosure of Public Information

Pursuant to Subchapter J, Chapter 552, Texas Government Code, contractors executing a contract with a governmental body that results in the expenditure of at least \$1 million in public funds must:

- 1) preserve all contracting information\* as provided by the records retention requirements applicable to Texas Department of Transportation (TxDOT) for the duration of the contract,
- 2) on request of TxDOT, promptly provide any contracting information related to the contract that is in the custody or possession of the entity, and
- 3) on completion of the contract, either:
  - A. provide, at no cost to TxDOT, all contracting information related to the contract that is in the custody or possession of the entity, or
  - B. preserve the contracting information related to the contract as provided by the records retention requirements applicable to TxDOT

The requirements of Subchapter J, Chapter 552, Government Code, may apply to this contract, and the contractor or vendor agrees that the contract can be terminated if the contractor or vendor knowingly or intentionally fails to comply with a requirement of that subchapter.

By entering into Contract, the Contractor agrees to:

- provide, or make available, to TxDOT and any authorized governmental investigating or auditing agency all records, including electronic and payment records related to the contract, for the same period provided by the records retention schedule applicable to TxDOT, and
- ensure that all subcontracts include a clause requiring the same.

\* As defined in Government Code §552.003, “Contracting information” means the following information maintained by a governmental body or sent between a governmental body and a vendor, contractor, potential vendor, or potential contractor:

- 1) information in a voucher or contract relating to the receipt or expenditure of public funds by a governmental body;
- 2) solicitation or bid documents relating to a contract with a governmental body;
- 3) communications sent between a governmental body and a vendor, contractor, potential vendor, or potential contractor during the solicitation, evaluation, or negotiation of a contract;
- 4) documents, including bid tabulations, showing the criteria by which a governmental body evaluates each vendor, contractor, potential vendor, or potential contractor responding to a solicitation and, if applicable, an explanation of why the vendor or contractor was selected; and
- 5) communications and other information sent between a governmental body and a vendor or contractor related to the performance of a final contract with the governmental body or work performed on behalf of the governmental body.

## CERTIFICATION TO NOT BOYCOTT ISRAEL

Pursuant to Texas Government Code §2271.002, the Department must include a provision requiring a written verification affirming that the Contractor does not boycott Israel, as defined in Government Code §808.001, and will not boycott Israel during the term of the contract. This provision applies to a contract that:

- 1) is with a Contractor that is not a sole proprietorship,
- 2) is with a Contractor with 10 or more full-time employees, and
- 3) has a value of \$100,000 or more.

By signing the contract, the Contractor certifies that it does not boycott Israel and will not boycott Israel during the term of this contract. "Boycott" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

Violation of this certification may result in action by the Department.

## CERTIFICATION TO NOT BOYCOTT ENERGY COMPANIES

Pursuant to Texas Government Code §2274.002, the Department must include a provision requiring a written verification affirming that the Contractor does not boycott energy companies, as defined in Government Code §809.001, and will not boycott energy companies during the term of the contract. This provision applies to a contract that:

- 1) is with a Contractor that is not a sole proprietorship,
- 2) is with a Contractor with 10 or more full-time employees, and
- 3) has a value of \$100,000 or more.

By signing the contract, the Contractor certifies that it does not boycott energy companies and will not boycott energy companies during the term of this contract. "Boycott" means taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company: (1) engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does not commit or pledge to meet environmental standards beyond applicable federal and state law; or (2) does business with a company described by (1).

Violation of this certification may result in action by the Department.

## CERTIFICATION TO NOT DISCRIMINATE AGAINST FIREARM ENTITIES OR FIREARM TRADE ASSOCIATIONS

Pursuant to Texas Government Code §2274.002, the Department must include a provision requiring a written verification affirming that the Contractor:

- 1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, as defined in Government Code §2274.001, and
- 2) will not discriminate against a firearm entity or firearm trade association during the term of the contract.

This provision applies to a contract that:

- 1) is with a Contractor that is not a sole proprietorship,
- 2) is with a Contractor with 10 or more full-time employees, and
- 3) has a value of \$100,000 or more.

By signing the contract, the Contractor certifies that it does not discriminate against a firearm entity or firearm trade association as described and will not do so during the term of this contract. "Discriminate against a firearm entity or firearm trade association" means, with respect to the entity or association, to: (1) refuse to engage in the trade of any goods or services with the entity or association based solely on its status as a firearm entity or firearm trade association; (2) refrain from continuing an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association; or (3) terminate an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association. "Discriminate against a firearm entity or firearm trade association" does not include: (1) the established policies of a merchant, retail seller, or platform that restrict or prohibit the listing or selling of ammunition, firearms, or firearm accessories; (2) a company's refusal to engage in the trade of any goods or services, decision to refrain from continuing an existing business relationship, or decision to terminate an existing business relationship to comply with federal, state, or local law, policy, or regulations or a directive by a regulatory agency, or for any traditional business reason that is specific to the customer or potential customer and not based solely on an entity's or association's status as a firearm entity or firearm trade association.

Violation of this certification may result in action by the Department.



# PROHIBITION ON CERTAIN TELECOMMUNICATIONS EQUIPMENT OR SERVICES

The Federal Register Notice issued the Final Rule and states that the amendment to 2 CFR 200.216 is effective on August 13, 2020. The new 2 CFR 200.471 regulation provides clarity that the telecommunications and video surveillance costs associated with 2 CFR 200.216 are unallowable for services and equipment from these specific providers. OMB's Federal Register Notice includes the new 2 CFR 200.216 and 2 CFR 200.471 regulations.

<https://www.federalregister.gov/documents/2020/08/13/2020-17468/guidance-for-grants-and-agreements>

Per the Federal Law referenced above, use of services, systems, or services or systems that contain components produced by any of the following manufacturers is strictly prohibited for use on this project. Therefore, for any telecommunications, CCTV, or video surveillance equipment, services or systems cannot be manufactured by, or have components manufactured by:

- Huawei Technologies Company,
- ZTE Corporation (any subsidiary and affiliate of such entities),
- Hytera Communications Corporation,
- Hangzhou Hikvision Digital Technology Company,
- Dahua Technology Company (any subsidiary and affiliate of such entities).

Violation of this prohibition will require replacement of the equipment at the contractor's expense.

**REQUIRED CONTRACT PROVISIONS  
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

**ATTACHMENTS**

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

**I. GENERAL**

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

**II. NONDISCRIMINATION**

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

**1. Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

**2. EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

**3. Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

**4. Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

**5. Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

**6. Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

**7. Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

**8. Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

**9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

**10. Assurance Required by 49 CFR 26.13(b):**

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

**11. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

### III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

### IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

#### 1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

## 2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

## 3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and trainees

##### a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

##### b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

**5. Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

**6. Subcontracts.** The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

**7. Contract termination: debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8. Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

**9. Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

**10. Certification of eligibility.**

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

**V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT**

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

**1. Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

**2. Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

**3. Withholding for unpaid wages and liquidated damages.** The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

**4. Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.



## VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

## VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

## VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

#### **IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

#### **X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

##### **1. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

\* \* \* \* \*

## **2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:**

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

### **2. Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

\* \* \* \* \*

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

\* \* \* \* \*

**XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

The wage rates listed herein are those predetermined by the Secretary of Labor and State Statute and listed in the United States Department of Labor's (USDOL) General Decisions dated **02-24-2022** and are the minimum wages to be paid accordingly for each specified classification. To determine the applicable wage rate zone, a list entitled "TEXAS COUNTIES IDENTIFIED BY WAGE RATE ZONES" is provided in the contract. Any wage rate that is not listed herein and not in the USDOL's general decision, must be submitted to the Engineer for approval. **IMPORTANT NOTICE FOR STATE PROJECTS:** only the controlling wage rate zone applies to the contract. Effective 02-24-2022.

CLASS. #	CLASSIFICATION DESCRIPTION	ZONE TX02 *(TX20220002)	ZONE TX03 *(TX20220003)	ZONE TX04 *(TX20220004)	ZONE TX05 *(TX20220005)	ZONE TX06 *(TX20220006)	ZONE TX07 *(TX20220007)	ZONE TX08 *(TX20220008)	ZONE TX24 *(TX20220024)	ZONE TX25 *(TX20220025)	ZONE TX27 *(TX20220027)	ZONE TX28 *(TX20220028)	ZONE TX29 *(TX20220029)	ZONE TX30 *(TX20220030)	ZONE TX37 *(TX20220037)	ZONE TX38 *(TX20220038)	ZONE TX42 *(TX20220042)
1428	Agricultural Tractor Operator						\$12.69					\$12.35			\$11.75		
1300	Asphalt Distributor Operator	\$14.87	\$13.48	\$13.88	\$15.72	\$15.58	\$15.55	\$15.72	\$13.28	\$15.32	\$15.62	\$14.36	\$14.25	\$14.03	\$13.75	\$14.06	\$14.40
1303	Asphalt Paving Machine Operator	\$13.40	\$12.25	\$12.35	\$13.87	\$14.05	\$14.36	\$14.20	\$13.26	\$13.99	\$14.68	\$12.92	\$13.44	\$12.53	\$14.00	\$14.32	\$12.99
1106	Asphalt Raker	\$12.28	\$10.61	\$12.02	\$14.21	\$11.65	\$12.12	\$11.64	\$11.44	\$12.69	\$12.05	\$11.34	\$11.67	\$11.40	\$12.59	\$12.36	\$11.78
1112	Batching Plant Operator, Asphalt																
1115	Batching Plant Operator, Concrete																
1214	Blaster																
1615	Boom Truck Operator						\$18.36										
1444	Boring Machine Operator																
1305	Broom or Sweeper Operator	\$11.21	\$10.33	\$10.08	\$11.99		\$11.04	\$11.62		\$11.74	\$11.41	\$10.30		\$10.23	\$10.60	\$12.68	\$11.05
1144	Communications Cable Installer																
1124	Concrete Finisher, Paving and Structures	\$13.55	\$12.46	\$13.16	\$12.85	\$12.64	\$12.56	\$12.77	\$12.44	\$14.12	\$13.04	\$13.38	\$12.64	\$12.80	\$12.79	\$12.98	\$13.32
1318	Concrete Pavement Finishing Machine Operator				\$16.05		\$15.48			\$16.05		\$19.31				\$13.07	
1315	Concrete Paving, Curing, Float, Texturing Machine Operator											\$16.34					\$11.71
1333	Concrete Saw Operator				\$14.67					\$14.48	\$17.33					\$13.99	
1399	Concrete/Gunite Pump Operator																
1344	Crane Operator, Hydraulic 80 tons or less				\$18.22		\$18.36			\$18.12	\$18.04	\$20.21			\$18.63	\$13.86	
1345	Crane Operator, Hydraulic Over 80 Tons																
1342	Crane Operator, Lattice Boom 80 Tons or Less	\$16.82	\$14.39	\$13.85	\$17.27		\$15.87			\$17.27		\$14.67			\$16.42	\$14.97	\$13.87
1343	Crane Operator, Lattice Boom Over 80 Tons				\$20.52		\$19.38			\$20.52		\$17.49			\$25.13	\$15.80	
1306	Crawler Tractor Operator	\$13.96	\$16.63	\$13.62	\$14.26		\$15.67			\$14.07	\$13.15	\$13.38			\$14.60	\$13.68	\$13.50
1351	Crusher or Screen Plant Operator																
1446	Directional Drilling Locator						\$11.67										
1445	Directional Drilling Operator				\$20.32		\$17.24										
1139	Electrician	\$20.96		\$19.87	\$19.80		\$26.35		\$20.27	\$19.80		\$20.92				\$27.11	\$19.87
1347	Excavator Operator, 50,000 pounds or less	\$13.46	\$12.56	\$13.67	\$17.19		\$12.88	\$14.38	\$13.49	\$17.19		\$13.88			\$14.09	\$12.71	\$14.42
1348	Excavator Operator, Over 50,000 pounds		\$15.23	\$13.52	\$17.04		\$17.71			\$16.99	\$18.80	\$16.22				\$14.53	\$13.52
1150	Flagger	\$9.30	\$9.10	\$8.50	\$10.28	\$8.81	\$9.45	\$8.70		\$10.06	\$9.71	\$9.03	\$8.81	\$9.08	\$9.90	\$10.33	\$8.10
1151	Form Builder/Setter, Structures	\$13.52	\$12.30	\$13.38	\$12.91	\$12.71	\$12.87	\$12.38	\$12.26	\$13.84	\$12.98	\$13.07	\$13.61	\$12.82	\$14.73	\$12.23	\$12.25
1160	Form Setter, Paving & Curb	\$12.36	\$12.16	\$13.93	\$11.83	\$10.71	\$12.94			\$13.16	\$12.54	\$11.33	\$10.69		\$13.33	\$12.34	\$13.93
1360	Foundation Drill Operator, Crawler Mounted				\$17.99					\$17.99						\$17.43	
1363	Foundation Drill Operator, Truck Mounted		\$16.86	\$22.05	\$21.51		\$16.93			\$21.07	\$20.20	\$20.76		\$17.54	\$21.39	\$15.89	\$22.05
1369	Front End Loader Operator, 3 CY or Less	\$12.28	\$13.49	\$13.40	\$13.85		\$13.04	\$13.15	\$13.29	\$13.69	\$12.64	\$12.89			\$13.51	\$13.32	\$12.17
1372	Front End Loader Operator, Over 3 CY	\$12.77	\$13.69	\$12.33	\$14.96		\$13.21	\$12.86	\$13.57	\$14.72	\$13.75	\$12.32			\$13.19	\$13.17	\$13.02
1329	Joint Sealer																
1172	Laborer, Common	\$10.30	\$9.86	\$10.08	\$10.51	\$10.71	\$10.50	\$10.24	\$10.58	\$10.72	\$10.45	\$10.30	\$10.25	\$10.03	\$10.54	\$11.02	\$10.15
1175	Laborer, Utility	\$11.80	\$11.53	\$12.70	\$12.17	\$11.81	\$12.27	\$12.11	\$11.33	\$12.32	\$11.80	\$11.53	\$11.23	\$11.50	\$11.95	\$11.73	\$12.37

CLASS. #	CLASSIFICATION DESCRIPTION	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	
		TX02 *(TX20220002)	TX03 *(TX20220003)	TX04 *(TX20220004)	TX05 *(TX20220005)	TX06 *(TX20220006)	TX07 *(TX20220007)	TX08 *(TX20220008)	TX24 *(TX20220024)	TX25 *(TX20220025)	TX27 *(TX20220027)	TX28 *(TX20220028)	TX29 *(TX20220029)	TX30 *(TX20220030)	TX37 *(TX20220037)	TX38 *(TX20220038)	TX42 *(TX20220042)	
1346	Loader/Backhoe Operator	\$14.18	\$12.77	\$12.97	\$15.68		\$14.12			\$15.18	\$13.58	\$12.87		\$13.21	\$14.13	\$14.29	\$12.90	
1187	Mechanic	\$20.14	\$15.47	\$17.47	\$17.74	\$17.00	\$17.10			\$17.68	\$18.94	\$18.58	\$17.00	\$16.61	\$18.46	\$16.96	\$17.47	
1380	Milling Machine Operator	\$15.54	\$14.64	\$12.22	\$14.29		\$14.18			\$14.32	\$14.35	\$12.86			\$14.75	\$13.53	\$12.80	
1390	Motor Grader Operator, Fine Grade	\$17.49	\$16.52	\$16.88	\$17.12	\$18.37	\$18.51	\$16.69	\$16.13	\$17.19	\$18.35	\$17.07	\$17.74	\$17.47	\$17.08	\$15.69	\$20.01	
1393	Motor Grader Operator, Rough	\$16.15	\$14.62	\$15.83	\$16.20	\$17.07	\$14.63	\$18.50		\$16.02	\$16.44	\$15.12	\$16.85	\$14.47	\$17.39	\$14.23	\$15.53	
1413	Off Road Hauler			\$10.08	\$12.26		\$11.88			\$12.25		\$12.23			\$13.00	\$14.60		
1196	Painter, Structures					\$21.29	\$18.34						\$21.29			\$18.62		
1396	Pavement Marking Machine Operator	\$16.42		\$13.10	\$13.55		\$19.17	\$12.01		\$13.63	\$14.60	\$13.17		\$16.65	\$10.54	\$11.18	\$13.10	
1443	Percussion or Rotary Drill Operator																	
1202	Piledriver																\$14.95	
1205	Pipelayer		\$11.87	\$14.64	\$13.17	\$11.17	\$12.79		\$11.37	\$13.24	\$12.66	\$13.24	\$11.17	\$11.67			\$12.12	\$14.64
1384	Reclaimer/Pulverizer Operator	\$12.85			\$11.90		\$12.88			\$11.01		\$10.46						
1500	Reinforcing Steel Worker	\$13.50	\$14.07	\$17.53	\$16.17		\$14.00			\$16.18	\$12.74	\$15.83		\$17.10		\$15.15	\$17.72	
1402	Roller Operator, Asphalt	\$10.95		\$11.96	\$13.29		\$12.78	\$11.61		\$13.08	\$12.36	\$11.68		\$11.71	\$11.95	\$11.50		
1405	Roller Operator, Other	\$10.36		\$10.44	\$11.82		\$10.50	\$11.64		\$11.51	\$10.59	\$10.30		\$12.04	\$12.85	\$11.57	\$10.66	
1411	Scraper Operator	\$10.61	\$11.07	\$10.85	\$12.88		\$12.27		\$11.12	\$12.96	\$11.88	\$12.43		\$11.22	\$13.95	\$13.47	\$10.89	
1417	Self-Propelled Hammer Operator																	
1194	Servicer	\$13.98	\$12.34	\$14.11	\$14.74		\$14.51	\$15.56	\$13.44	\$14.58	\$14.31	\$13.83		\$12.43	\$13.72	\$13.97	\$14.11	
1513	Sign Erector																	
1708	Slurry Seal or Micro-Surfacing Machine Operator																	
1341	Small Slipform Machine Operator									\$15.96								
1515	Spreader Box Operator	\$12.60		\$13.12	\$14.71		\$14.04			\$14.73	\$13.84	\$13.68		\$13.45	\$11.83	\$13.58	\$14.05	
1705	Structural Steel Welder															\$12.85		
1509	Structural Steel Worker						\$19.29									\$14.39		
1339	Subgrade Trimmer																	
1143	Telecommunication Technician																	
1145	Traffic Signal/Light Pole Worker						\$16.00											
1440	Trenching Machine Operator, Heavy						\$18.48											
1437	Trenching Machine Operator, Light																	
1609	Truck Driver Lowboy-Float	\$14.46	\$13.63	\$13.41	\$15.00	\$15.93	\$15.66			\$16.24	\$16.39	\$14.30	\$16.62	\$15.63	\$14.28	\$16.03	\$13.41	
1612	Truck Driver Transit-Mix				\$14.14					\$14.14								
1600	Truck Driver, Single Axle	\$12.74	\$10.82	\$10.75	\$13.04	\$11.61	\$11.79	\$13.53	\$13.16	\$12.31	\$13.40	\$10.30	\$11.61		\$11.97	\$11.46	\$10.75	
1606	Truck Driver, Single or Tandem Axle Dump Truck	\$11.33	\$14.53	\$11.95	\$12.95		\$11.68		\$14.06	\$12.62	\$11.45	\$12.28		\$13.08	\$11.68	\$11.48	\$11.10	
1607	Truck Driver, Tandem Axle Tractor with Semi Trailer	\$12.49	\$12.12	\$12.50	\$13.42		\$12.81	\$13.16		\$12.86	\$16.22	\$12.50			\$13.80	\$12.27	\$12.50	
1441	Tunneling Machine Operator, Heavy																	
1442	Tunneling Machine Operator, Light																	
1706	Welder		\$14.02		\$14.86		\$15.97		\$13.74	\$14.84					\$13.78			
1520	Work Zone Barricade Servicer	\$10.30	\$12.88	\$11.46	\$11.70	\$11.57	\$11.85	\$10.77		\$11.68	\$12.20	\$11.22	\$11.51	\$12.96	\$10.54	\$11.67	\$11.76	

Notes:

\*Represents the USDOL wage decision.

Any worker employed on this project shall be paid at the rate of one and one half (1-1/2) times the regular rate for every hour worked in excess of forty (40) hours per week.

For reference, the titles and descriptions for the classifications listed here are detailed further in the AGC of Texas' *Standard Job Classifications and Descriptions for Highway, Heavy, Utilities, and Industrial Construction in Texas* posted on the AGC's Web site for any contractor.

**TEXAS COUNTIES IDENTIFIED BY  
WAGE RATE ZONES: 2, 3, 4, 5, 6, 7, 8, 24, 25, 27, 28, 29, 30, 37, 38, 42**

County Name	Zone	County Name	Zone	County Name	Zone	County Name	Zone
Anderson	28	Donley	37	Karnes	27	Reagan	37
Andrews	37	Duval	30	Kaufman	25	Real	37
Angelina	28	Eastland	37	Kendall	7	Red River	28
Aransas	29	Ector	2	Kenedy	30	Reeves	8
Archer	25	Edwards	8	Kent	37	Refugio	27
Armstrong	2	El Paso	24	Kerr	27	Roberts	37
Atascosa	7	Ellis	25	Kimble	37	Robertson	7
Austin	38	Erath	28	King	37	Rockwall	25
Bailey	37	Falls	28	Kinney	8	Runnels	37
Bandera	7	Fannin	28	Kleberg	27	Rusk	4
Bastrop	7	Fayette	27	Knox	37	Sabine	28
Baylor	37	Fisher	37	Lamar	28	San Augustine	28
Bee	27	Floyd	37	Lamb	37	San Jacinto	38
Bell	7	Foard	37	Lampasas	7	San Patricio	29
Bexar	7	Fort Bend	38	LaSalle	30	San Saba	37
Blanco	27	Franklin	28	Lavaca	27	Schleicher	37
Borden	37	Freestone	28	Lee	27	Scurry	37
Bosque	28	Frio	27	Leon	28	Shackelford	37
Bowie	4	Gaines	37	Liberty	38	Shelby	28
Brazoria	38	Galveston	38	Limestone	28	Sherman	37
Brazos	7	Garza	37	Lipscomb	37	Smith	4
Brewster	8	Gillespie	27	Live Oak	27	Somervell	28
Briscoe	37	Glasscock	37	Llano	27	Starr	30
Brooks	30	Goliad	29	Loving	37	Stephens	37
Brown	37	Gonzales	27	Lubbock	2	Sterling	37
Burleson	7	Gray	37	Lynn	37	Stonewall	37
Burnet	27	Grayson	25	Madison	28	Sutton	8
Caldwell	7	Gregg	4	Marion	28	Swisher	37
Calhoun	29	Grimes	28	Martin	37	Tarrant	25
Callahan	25	Guadalupe	7	Mason	27	Taylor	2
Cameron	3	Hale	37	Matagorda	27	Terrell	8
Camp	28	Hall	37	Maverick	30	Terry	37
Carson	2	Hamilton	28	McCulloch	37	Throckmorton	37
Cass	28	Hansford	37	McLennan	7	Titus	28
Castro	37	Hardeman	37	McMullen	30	Tom Green	2
Chambers	38	Hardin	38	Medina	7	Travis	7
Cherokee	28	Harris	38	Menard	37	Trinity	28
Childress	37	Harrison	42	Midland	2	Tyler	28
Clay	25	Hartley	37	Milam	28	Upshur	4
Cochran	37	Haskell	37	Mills	37	Upton	37
Coke	37	Hays	7	Mitchell	37	Uvalde	30
Coleman	37	Hemphill	37	Montague	37	Val Verde	8
Collin	25	Henderson	28	Montgomery	38	Van Zandt	28
Collingsworth	37	Hidalgo	3	Moore	37	Victoria	6
Colorado	27	Hill	28	Morris	28	Walker	28
Comal	7	Hockley	37	Motley	37	Waller	38
Comanche	37	Hood	28	Nacogdoches	28	Ward	37
Concho	37	Hopkins	28	Navarro	28	Washington	28
Cooke	37	Houston	28	Newton	28	Webb	3
Coryell	7	Howard	37	Nolan	37	Wharton	27
Cottle	37	Hudspeth	8	Nueces	29	Wheeler	37
Crane	37	Hunt	25	Ochiltree	37	Wichita	5
Crockett	8	Hutchinson	37	Oldham	37	Wilbarger	37
Crosby	2	Irion	2	Orange	38	Willacy	30
Culberson	8	Jack	28	Palo Pinto	28	Williamson	7
Dallam	37	Jackson	27	Panola	28	Wilson	7
Dallas	25	Jasper	28	Parker	25	Winkler	37
Dawson	37	Jeff Davis	8	Parmer	37	Wise	25
Deaf Smith	37	Jefferson	38	Pecos	8	Wood	28
Delta	25	Jim Hogg	30	Polk	28	Yoakum	37
Denton	25	Jim Wells	27	Potter	2	Young	37
DeWitt	27	Johnson	25	Presidio	8	Zapata	30
Dickens	37	Jones	25	Rains	28	Zavala	30
Dimmit	30			Randall	2		



# Special Provision to Item 000

## Nondiscrimination



### 1. DESCRIPTION

All recipients of federal financial assistance are required to comply with various nondiscrimination laws including Title VI of the Civil Rights Act of 1964, as amended, (Title VI). Title VI forbids discrimination against anyone in the United States on the grounds of race, color, or national origin by any agency receiving federal funds.

Texas Department of Transportation, as a recipient of Federal financial assistance, and under Title VI and related statutes, ensures that no person shall on the grounds of race, religion (where the primary objective of the financial assistance is to provide employment per 42 U.S.C. § 2000d-3), color, national origin, sex, age or disability be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any Department programs or activities.

### 2. DEFINITION OF TERMS

Where the term “contractor” appears in the following six nondiscrimination clauses, the term “contractor” is understood to include all parties to contracts or agreements with the Texas Department of Transportation.

### 3. NONDISCRIMINATION PROVISIONS

During the performance of this contract, the contractor agrees as follows:

- 3.1. **Compliance with Regulations.** The Contractor shall comply with the Regulations relative to nondiscrimination in Federally-assisted programs of the Department of Transportation (hereinafter, “DOT”) Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.
- 3.2. **Nondiscrimination.** The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.
- 3.3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.
- 3.4. **Information and Reports:** The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Texas Department of Transportation to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information the contractor shall so certify to the Recipient, or the Texas Department of Transportation as appropriate, and shall set forth what efforts it has made to obtain the information.

3.5. **Sanctions for Noncompliance.** In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the Recipient shall impose such contract sanctions as it or the Texas Department of Transportation may determine to be appropriate, including, but not limited to:

- withholding of payments to the contractor under the contract until the contractor complies, and/or
- cancellation, termination or suspension of the contract, in whole or in part.

3.6. **Incorporation of Provisions.** The contractor shall include the provisions of paragraphs (1) through (6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Recipient or the Texas Department of Transportation may direct as a means of enforcing such provisions including sanctions for non-compliance: Provided, however, that, in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the Recipient to enter into such litigation to protect the interests of the Recipient, and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

---

# Special Provision to Item 000

## Certification of Nondiscrimination in Employment

---



### 1. GENERAL

By signing this proposal, the Bidder certifies that he has participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114, or 11246, or if he has not participated in a previous contract of this type, or if he has had previous contract or subcontracts and has not filed, he will file with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

**Note**—The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by Bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

## Special Provision to Item 000

# Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)



### 1. GENERAL

In addition to the affirmative action requirements of the Special Provision titled "Standard Federal Equal Employment Opportunity Construction Contract Specifications" as set forth elsewhere in this proposal, the Bidder's attention is directed to the specific requirements for utilization of minorities and females as set forth below.

### 2. GOALS

2.1. Goals for minority and female participation are hereby established in accordance with 41 CFR 60-4.

2.2. The goals for minority and female participation expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area are as follows:

Goals for minority participation in each trade, %	Goals for female participation in each trade, %
See Table 1	6.9

2.3. These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it will apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction. The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 will be based on its implementation of the Standard Federal Equal Employment Opportunity Construction Contract Specifications Special Provision and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and the Contractor must make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority and female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals will be a violation of the Contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

2.4. A Contractor or subcontractor will be considered in compliance with these provisions by participation in the Texas Highway-Heavy Branch, AGC, Statewide Training and Affirmative Action Plan. Provided that each Contractor or subcontractor participating in this plan must individually comply with the equal opportunity clause set forth in 41 CFR 60-1.4 and must make a good faith effort to achieve the goals set forth for each participating trade in the plan in which it has employees. The overall good performance of other Contractors and subcontractors toward a goal in an approved plan does not excuse any covered Contractor's or subcontractor's failure to make good faith efforts to achieve the goals contained in these provisions. Contractors or subcontractors participating in the plan must be able to demonstrate their participation and document their compliance with the provisions of this Plan.

### 3. SUBCONTRACTING

The Contractor must provide written notification to the Department within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the Contract resulting from this solicitation pending concurrence of the Department in the award. The notification will list the names,

address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the Contract is to be performed.

---

#### 4. COVERED AREA

As used in this special provision, and in the Contract resulting from this solicitation, the geographical area covered by these goals for female participation is the State of Texas. The geographical area covered by these goals for other minorities are the counties in the State of Texas as indicated in Table 1.

---

#### 5. REPORTS

The Contractor is hereby notified that he may be subject to the Office of Federal Contract Compliance Programs (OFCCP) reporting and record keeping requirements as provided for under Executive Order 11246 as amended. OFCCP will provide direct notice to the Contractor as to the specific reporting requirements that he will be expected to fulfill.

**Table 1**  
**Goals for Minority Participation**

County	Participation, %	County	Participation, %
Anderson	22.5	Chambers	27.4
Andrews	18.9	Cherokee	22.5
Angelina	22.5	Childress	11.0
Aransas	44.2	Clay	12.4
Archer	11.0	Cochran	19.5
Armstrong	11.0	Coke	20.0
Atascosa	49.4	Coleman	10.9
Austin	27.4	Collin	18.2
Bailey	19.5	Collingsworth	11.0
Bandera	49.4	Colorado	27.4
Bastrop	24.2	Comal	47.8
Baylor	11.0	Comanche	10.9
Bee	44.2	Concho	20.0
Bell	16.4	Cooke	17.2
Bexar	47.8	Coryell	16.4
Blanco	24.2	Cottle	11.0
Borden	19.5	Crane	18.9
Bosque	18.6	Crockett	20.0
Bowie	19.7	Crosby	19.5
Brazoria	27.3	Culberson	49.0
Brazos	23.7	Dallam	11.0
Brewster	49.0	Dallas	18.2
Briscoe	11.0	Dawson	19.5
Brooks	44.2	Deaf Smith	11.0
Brown	10.9	Delta	17.2
Burleson	27.4	Denton	18.2
Burnet	24.2	DeWitt	27.4
Caldwell	24.2	Dickens	19.5
Calhoun	27.4	Dimmit	49.4
Callahan	11.6	Donley	11.0
Cameron	71.0	Duval	44.2
Camp	20.2	Eastland	10.9
Carson	11.0	Ector	15.1
Cass	20.2	Edwards	49.4
Castro	11.0	Ellis	18.2

County	Participation, %	County	Participation, %
El Paso	57.8	Kenedy	44.2
Erath	17.2	Kent	10.9
Falls	18.6	Kerr	49.4
Fannin	17.2	Kimble	20.0
Fayette	27.4	King	19.5
Fisher	10.9	Kinney	49.4
Floyd	19.5	Kleberg	44.2
Foard	11.0	Knox	10.9
Fort Bend	27.3	Lamar	20.2
Franklin	17.2	Lamb	19.5
Freestone	18.6	Lampasas	18.6
Frio	49.4	LaSalle	49.4
Gaines	19.5	Lavaca	27.4
Galveston	28.9	Lee	24.2
Garza	19.5	Leon	27.4
Gillespie	49.4	Liberty	27.3
Glasscock	18.9	Limestone	18.6
Goliad	27.4	Lipscomb	11.0
Gonzales	49.4	Live Oak	44.2
Gray	11.0	Llano	24.2
Grayson	9.4	Loving	18.9
Gregg	22.8	Lubbock	19.6
Grimes	27.4	Lynn	19.5
Guadalupe	47.8	Madison	27.4
Hale	19.5	Marion	22.5
Hall	11.0	Martin	18.9
Hamilton	18.6	Mason	20.0
Hansford	11.0	Matagorda	27.4
Hardeman	11.0	Maverick	49.4
Hardin	22.6	McCulloch	20.0
Harris	27.3	McLennan	20.7
Harrison	22.8	McMullen	49.4
Hartley	11.0	Medina	49.4
Haskell	10.9	Menard	20.0
Hays	24.1	Midland	19.1
Hemphill	11.0	Milam	18.6
Henderson	22.5	Mills	18.6
Hidalgo	72.8	Mitchell	10.9
Hill	18.6	Montague	17.2
Hockley	19.5	Montgomery	27.3
Hood	18.2	Moore	11.0
Hopkins	17.2	Morris	20.2
Houston	22.5	Motley	19.5
Howard	18.9	Nacogdoches	22.5
Hudspeth	49.0	Navarro	17.2
Hunt	17.2	Newton	22.6
Hutchinson	11.0	Nolan	10.9
Irion	20.0	Nueces	41.7
Jack	17.2	Ochiltree	11.0
Jackson	27.4	Oldham	11.0
Jasper	22.6	Orange	22.6
Jeff Davis	49.0	Palo Pinto	17.2
Jefferson	22.6	Panola	22.5
Jim Hogg	49.4	Parker	18.2
Jim Wells	44.2	Parmer	11.0
Johnson	18.2	Pecos	18.9
Jones	11.6	Polk	27.4
Karnes	49.4	Potter	9.3
Kaufman	18.2	Presidio	49.0
Kendall	49.4	Randall	9.3

<b>County</b>	<b>Participation, %</b>	<b>County</b>	<b>Participation, %</b>
Rains	17.2	Reagan	20.0
Real	49.4	Throckmorton	10.9
Red River	20.2	Titus	20.2
Reeves	18.9	Tom Green	19.2
Refugio	44.2	Travis	24.1
Roberts	11.0	Trinity	27.4
Robertson	27.4	Tyler	22.6
Rockwall	18.2	Upshur	22.5
Runnels	20.0	Upton	18.9
Rusk	22.5	Uvalde	49.4
Sabine	22.6	Val Verde	49.4
San Augustine	22.5	Van Zandt	17.2
San Jacinto	27.4	Victoria	27.4
San Patricio	41.7	Walker	27.4
San Saba	20.0	Waller	27.3
Schleicher	20.0	Ward	18.9
Scurry	10.9	Washington	27.4
Shackelford	10.9	Webb	87.3
Shelby	22.5	Wharton	27.4
Sherman	11.0	Wheeler	11.0
Smith	23.5	Wichita	12.4
Somervell	17.2	Wilbarger	11.0
Starr	72.9	Willacy	72.9
Stephens	10.9	Williamson	24.1
Sterling	20.0	Wilson	49.4
Stonewall	10.9	Winkler	18.9
Sutton	20.0	Wise	18.2
Swisher	11.0	Wood	22.5
Tarrant	18.2	Yoakum	19.5
Taylor	11.6	Young	11.0
Terrell	20.0	Zapata	49.4
Terry	19.5	Zavala	49.4

# Special Provision to Item 000

## Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246)



### 1. GENERAL

1.1. As used in these specifications:

- "Covered area" means the geographical area described in the solicitation from which this Contract resulted;
- "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
- "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
- "Minority" includes:
  - Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
  - Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
  - Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
  - American Indian or Alaskan Native (all persons having origins in any of the original peoples of North American and maintaining identifiable tribal affiliations through membership and participation or community identification).

1.2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it will physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this Contract resulted.

1.3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U. S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) will be in accordance with that plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the equal employment opportunity (EEO) clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

1.4. The Contractor will implement the specific affirmative action standards provided in Section 1.7.1. through Section 1.7.16. of these specifications. The goals set forth in the solicitation from which this Contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction Contractors performing Contracts in geographical areas where they do not have a Federal or federally assisted construction Contract will apply the minority and female goals established for the geographical area where the Contract is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or any Federal procurement contracting officer. The



Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

- 1.5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women will excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
- 1.6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U. S. Department of Labor.
- 1.7. The Contractor will take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications will be based upon its effort to achieve maximum results from its actions. The Contractor will document these efforts fully, and will implement affirmative action steps at least as extensive as the following:
  - 1.7.1. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor will specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
  - 1.7.2. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
  - 1.7.3. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this will be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
  - 1.7.4. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral Process has impeded the Contractor's efforts to meet its obligations.
  - 1.7.5. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor will provide notice of these programs to the sources compiled under 7b above.
  - 1.7.6. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and Collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
  - 1.7.7. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other

employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., before the initiation of construction work at any job site. A written record must be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

- 1.7.8. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
- 1.7.9. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month before the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor will send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- 1.7.10. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
- 1.7.11. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
- 1.7.12. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- 1.7.13. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
- 1.7.14. Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities will be provided to assure privacy between the sexes.
- 1.7.15. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- 1.7.16. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
- 1.8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (Section 7.1. through Section 7.16.). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under Section 7.1. through Section 7.16. of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation will not be a defense for the Contractor's noncompliance.
- 1.9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor

may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

- 1.10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
- 1.11. The Contractor will not enter into any Subcontract with any person or firm debarred from Government Contracts pursuant to Executive Order 11246.
- 1.12. The Contractor will carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties will be in violation of these specifications and Executive Order 11246, as amended.
- 1.13. The Contractor, in fulfilling its obligations under these specifications, will implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director will proceed in accordance with 41 CFR 60-4.8.
- 1.14. The Contractor will designate a responsible official to monitor all employment-related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records must at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records must be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors shall not be required to maintain separate records.
- 1.15. Nothing herein provided will be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).
- 1.16. In addition to the reporting requirements set forth elsewhere in this Contract, the Contractor and the subcontractors holding subcontracts, not including material suppliers, of \$10,000 or more, will submit for every month of July during which work is performed, employment data as contained under Form PR 1391 (Appendix C to 23 CFR, Part 230), and in accordance with the included instructions.

---

# Special Provision to Item 000

## On-the-Job Training Program

---



---

### 1. DESCRIPTION

The primary objective of this Special Provision is the training and advancement of minorities, women and economically disadvantaged persons toward journeyworker status. Accordingly, make every effort to enroll minority, women and economically disadvantaged persons to the extent that such persons are available within a reasonable area of recruitment. This training commitment is not intended, and will not be used to discriminate against any applicant for training, whether or not he/she is a member of a minority group.

---

### 2. TRAINEE ASSIGNMENT

Training assignments are based on the past volume of state-let highway construction contracts awarded with the Department. Contractors meeting the selection criteria will be notified of their training assignment at the beginning of the reporting year by the Department's Office of Civil Rights.

---

### 3. PROGRAM REQUIREMENTS

Fulfill all of the requirements of the On-the-Job Training Program including the maintenance of records and submittal of periodic reports documenting program performance. Trainees will be paid at least 60% of the appropriate minimum journeyworker's rate specified in the Contract for the first half of the training period, 75% for the third quarter, and 90% for the last quarter, respectively.

---

### 4. REIMBURSEMENT

If requested, Contractors may be reimbursed \$0.80 per training hour at no additional cost to the Department. Training may occur on this project, all other Department contracts, or local-administered federal-aid projects with concurrence of the local government entity. However, reimbursement for training is not available on projects to the extent that such projects that do not contain federal funds.

---

### 5. COMPLIANCE

The Contractor will have fulfilled the contractual responsibilities by having provided acceptable training to the number of trainees specified in their goal assignment. Noncompliance may be cause for corrective and appropriate measures pursuant to Article 8.7., "Abandonment of Work or Default of Contract," which may be used to comply with the sanctions for noncompliance pursuant to 23 CFR Part 230.

---

## Special Provision 000

### Certificate of Interested Parties (Form 1295)

---



Submit a notarized Form 1295, "Certificate of Interested Parties," in the following instances:

- at Contract execution for Contracts awarded by the Commission;
- at Contract execution for Contracts awarded by the District Engineer or Chief Engineer with an award amount of \$1,000,000 or more; at any time an existing Contract awarded by the District Engineer or Chief Engineer increases in value to \$1,000,000 or more due to changes in the Contract; at any time there is an increase of \$1,000,000 or more to an existing Contract (change orders, extensions, and renewals); or
- at any time there is a change to the information in Form 1295, when the form was filed for an existing Contract.

Form 1295 and instructions on completing and filing the form are available on the Texas Ethics Commission website.

---

# Special Provision 000

## Cargo Preference Act Requirements in Federal Aid Contracts

---



### 1. DESCRIPTION

All recipients of federal financial assistance are required to comply with the U.S. Department of Transportation's (DOT) Cargo Preference Act Requirements, 46 CFR Part 381, Use of United States-Flag Vessels.

This requirement applies to material or equipment that is acquired specifically for a Federal-aid highway project. It is not applicable to goods or materials that come into inventories independent of a Federal Highway Administration (FHWA) funded contract.

When oceanic shipments are necessary for materials or equipment acquired for a specific Federal-aid construction project, the contractor agrees to:

- Utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.
- Furnish a legible copy of a rated, on-board commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of 46 CFR Part 381 Section 7, "Federal Grant, Guaranty, Loan and Advance of Funds Agreements," within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, to both the Engineer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.
- Insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.

# Special Provision to Item 000

## Disadvantaged Business Enterprise in Federal-Aid Contracts



### 1. DESCRIPTION

The purpose of this Special Provision is to carry out the U.S. Department of Transportation's (DOT) policy of ensuring nondiscrimination in the award and administration of DOT-assisted Contracts and creating a level playing field on which firms owned and controlled by individuals who are determined to be socially and economically disadvantaged can compete fairly for DOT-assisted Contracts.

### 2. DISADVANTAGED BUSINESS ENTERPRISE IN FEDERAL-AID CONTRACTS

2.1. **Policy.** It is the policy of the DOT and the Texas Department of Transportation (Department) that DBEs, as defined in 49 CFR Part 26, Subpart A, and the Department's DBE Program, will have the opportunity to participate in the performance of Contracts financed in whole or in part with federal funds. The DBE requirements of 49 CFR Part 26, and the Department's DBE Program, apply to this Contract as follows.

The Contractor will solicit DBEs through reasonable and available means, as defined in 49 CFR Part 26, Appendix A, and the Department's DBE Program, or show a good faith effort to meet the DBE goal for this Contract.

The Contractor, subrecipient, or subcontractor will not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. Carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted Contracts. Failure to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the Department deems appropriate.

The requirements of this Special Provision must be physically included in any subcontract.

By signing the Contract proposal, the Bidder is certifying that the DBE goal as stated in the proposal will be met by obtaining commitments from eligible DBEs or that the Bidder will provide acceptable evidence of good faith effort to meet the commitment.

#### 2.2. Definitions.

2.2.1. **Administrative Reconsideration.** A process by which the low bidder may request reconsideration when the Department determines the good faith effort (GFE) requirements have not been met.

2.2.2. **Commercially Useful Function (CUF).** A CUF occurs when a DBE has the responsibility for the execution of the work and carrying out such responsibilities by actually performing, managing, and supervising the work.

2.2.3. **Disadvantaged Business Enterprise (DBE).** A for-profit small business certified through the Texas Unified Certification Program in accordance with 49 CFR Part 26, that is at least 51% owned by one or more socially and economically disadvantaged individuals, or in the case of a publicly owned business, in which is at least 51% of the stock is owned by one or more socially and economically disadvantaged individuals, and whose management and daily business operations are controlled by one or more of the individuals who own it.

2.2.4. **DBE Joint Venture.** An association of a DBE firm and one or more other firms to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills, and knowledge, and

in which the DBE is responsible for a distinct, clearly defined portion of the work of the Contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture are commensurate with its ownership interest.

- 2.2.5. **DOT.** The U.S. Department of Transportation, including the Office of the Secretary, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the Federal Aviation Administration (FAA).
- 2.2.6. **Federal-Aid Contract.** Any Contract between the Department and a Contractor that is paid for in whole or in part with DOT financial assistance.
- 2.2.7. **Good Faith Effort.** All necessary and reasonable steps to achieve the contract goal which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if not fully successful. Good faith efforts are evaluated prior to award and throughout performance of the Contract. For guidance on good faith efforts, see 49 CFR Part 26, Appendix A.
- 2.2.8. **North American Industry Classification System (NAICS).** A designation that best describes the primary business of a firm. The NAICS is described in the North American Industry Classification Manual—United States, which is available on the Internet at the U.S. Census Bureau website: <http://www.census.gov/eos/www/naics/>.
- 2.2.9. **Race-Conscious.** A measure or program that is focused specifically on assisting only DBEs, including women-owned businesses.
- 2.2.10. **Race-Neutral DBE Participation.** Any participation by a DBE through customary competitive procurement procedures.
- 2.2.11. **Texas Unified Certification Program (TUCP) Directory.** An online directory listing all DBEs currently certified by the TUCP. The Directory identifies DBE firms whose participation on a Contract may be counted toward achievement of the assigned DBE Contract goal.
- 2.3. **Contractor's Responsibilities.**
- 2.3.1. **DBE Liaison Officer.** Designate a DBE liaison officer who will administer the Contractor's DBE program and who will be responsible for maintenance of records of efforts and contacts made to subcontract with DBEs.
- 2.3.2. **Compliance Tracking System (CTS).** This Contract is subject to electronic Contract compliance tracking. Contractors and DBEs are required to provide any noted and requested Contract compliance-related data electronically in the Department's tracking system. This includes commitments, payments, substitutions, and good faith efforts. Contractors and DBEs are responsible for responding by any noted response date or due date to any instructions or request for information, and to check the system on a regular basis. A Contractor is responsible for ensuring all DBEs have completed all requested items and that their contact information is accurate and up-to-date. The Department may require additional information related to the Contract to be provided electronically through the system at any time before, during, or after contract award. The system is web-based and can be accessed at the following Internet address: <https://txdot.txdotcms.com/>.
- In its sole discretion, the Department may require that contract compliance tracking data be submitted by Contractors and DBEs in an alternative format prescribed by the Department.
- 2.3.3. **Apparent Low Bidder.** The apparent low bidder must submit DBE commitments to satisfy the DBE goal or submit good faith effort Form 2603 and supporting documentation demonstrating why the goal could not be achieved, in whole or part, no later than 5 calendar days after bid opening. The means of transmittal and the risk of timely receipt of the information will be the bidder's responsibility and no extension of the 5-calendar-day timeframe will be allowed for any reason.



2.3.4. **DBE Contractor.** A DBE Contractor may receive credit toward the DBE goal for work performed by its own forces and work subcontracted to DBEs. In the event a DBE subcontracts to a non-DBE, that information must be reported monthly.

2.3.5. **DBE Committal.** Only those DBEs certified by the TUCP are eligible to be used for goal attainment. The Department maintains the TUCP DBE Directory. The Directory can be accessed at the following Internet address: <https://txdot.txdotcms.com/FrontEnd/VendorSearchPublic.asp?TN=txdot&XID=2340>.

A DBE must be certified on the day the commitment is considered and at time of subcontract execution. It is the Contractor's responsibility to ensure firms identified for participation are approved certified DBE firms.

The Bidder is responsible to ensure that all submittals are checked for accuracy. Any and all omissions, deletions, and/or errors that may affect the end result of the commitment package are the sole liabilities of the bidder.

Commitments in excess of the goal are considered race-neutral commitments.

2.3.6. **Good Faith Effort Requirements.** A Contractor who cannot meet the Contract goal, in whole or in part, must make adequate good faith efforts to obtain DBE participation as so stated and defined in 49 CFR Part 26, Appendix A.

2.3.6.1. **Administrative Reconsideration.** If the Department determines that the apparent low bidder has failed to satisfy the good faith efforts requirement, the Department will notify the Bidder of the failure and will give the Bidder an opportunity to provide written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so..

The Bidder must request an administrative reconsideration of that determination within 3 days of the date of receipt of the notice. The request must be submitted directly to the Texas Department of Transportation, Civil Rights Division, 125 East 11th Street, Austin, Texas 78701-2483.

If a request for administrative reconsideration is not filed within the period specified the determination made is final and further administrative appeal is barred.

If a reconsideration request is timely received, the reconsideration decision will be made by the Department's DBE liaison officer or, if the DBE liaison officer took part in the original determination, the Department's executive director will appoint a department employee to perform the administrative reconsideration. The employee will hold a senior leadership position and will report directly to the executive director.

The meeting or written documentation must be provided or held within 7 days of the date the request was submitted.

The Department will provide to the Bidder a written decision if the Bidder did or did not make adequate good faith efforts to meet the Contract goal. The reconsideration decision is final and is not administratively appealed to DOT.

2.3.7. **Determination of DBE Participation.** The work performed by the DBE must be reasonably construed to be included in the work area and NAICS work code identified by the Contractor in the approved commitment.

Participation by a DBE on a Contract will not be counted toward DBE goals until the amount of the participation has been paid to the DBE.

Payments made to a DBE that was not on the original commitment may be counted toward the Contract goal if that DBE was certified as a DBE before the execution of the subcontract and has performed a Commercially Useful Function.

The total amount paid to the DBE for work performed with its own forces is counted toward the DBE goal. When a DBE subcontracts part of the work of its Contract to another firm, the value of the subcontracted work may be counted toward DBE goals only if the subcontractor is itself a DBE.

DBE Goal credit for the DBE subcontractors leasing of equipment or purchasing of supplies from the Contractor or its affiliates is not allowed. Project materials or supplies acquired from an affiliate of the Contractor cannot directly or indirectly (second or lower tier subcontractor) be used for DBE goal credit.

If a DBE firm is declared ineligible due to DBE decertification after the execution of the DBE's subcontract, the DBE firm may complete the work and the DBE firm's participation will be counted toward the Contract goal. If the DBE firm is decertified before the DBE firm has signed a subcontract, the Contractor is obligated to replace the ineligible DBE firm or demonstrate that it has made good faith efforts to do so.

The Contractor may count 100% of its expenditure to a DBE manufacturer. According to 49 CFR 26.55(e)(1)(i), a DBE manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the Contract and of the general character described by the specifications.

The Contractor may count only 60% of its expenditure to a DBE regular dealer. According to 49 CFR 26.55(e)(2)(i), a DBE regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles, or equipment of the general character described by the specifications and required under the Contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. A firm may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business if the firm both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment must be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis. A long-term lease with a third-party transportation company is not eligible for 60% goal credit.

With respect to materials or supplies purchased from a DBE that is neither a manufacturer nor a regular dealer, the Contractor may count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site.

A Contractor may count toward its DBE goal a portion of the total value of the Contract amount paid to a DBE joint venture equal to the distinct, clearly defined portion of the work of the Contract performed by the DBE.

2.3.8. **Commercially Useful Function.** It is the Contractor's obligation to ensure that each DBE used on federal-assisted contracts performs a commercially useful function on the Contract.

The Department will monitor performance during the Contract to ensure each DBE is performing a CUF.

Under the terms established in 49 CFR 26.55, a DBE performs a CUF when it is responsible for execution of the work of the Contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved.

With respect to material and supplies used on the Contract, a DBE must be responsible for negotiating price, determining quality and quantity, ordering the material, installing the material, if applicable, and paying for the material itself.

With respect to trucking, the DBE trucking firm must own and operate at least one fully licensed, insured, and operational truck used on the Contract. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the Contract. The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE that leases trucks equipped with drivers from a non-DBE is entitled to credit for the total value of transportation services provided by non-DBE leased trucks equipped with drivers not to exceed the value of transportation services on the Contract

provided by DBE-owned trucks or leased trucks with DBE employee drivers. Additional participation by non-DBE owned trucks equipped with drivers receives credit only for the fee or commission it receives as a result of the lease arrangement.

A DBE does not perform a CUF when its role is limited to that of an extra participant in a transaction, Contract, or project through which funds are passed in order to obtain the appearance of DBE participation. The Department will evaluate similar transactions involving non-DBEs in order to determine whether a DBE is an extra participant.

If a DBE does not perform or exercise responsibility for at least 30% of the total cost of its Contract with its own work force, or the DBE subcontracts a greater portion of the work than would be expected on the basis of normal industry practice for the type of work involved, the Department will presume that the DBE is not performing a CUF.

If the Department determines that a DBE is not performing a CUF, no work performed by such DBE will count as eligible participation. The denial period of time may occur before or after a determination has been made by the Department.

In case of the denial of credit for non-performance of a CUF, the Contractor will be required to provide a substitute DBE to meet the Contract goal or provide an adequate good faith effort when applicable.

- 2.3.8.1. **Rebuttal of a Finding of No Commercially Useful Function.** Consistent with the provisions of 49 CFR 26.55(c)(4)&(5), before the Department makes a final finding that no CUF has been performed by a DBE, the Department will notify the DBE and provide the DBE the opportunity to provide rebuttal information.

CUF determinations are not subject to administrative appeal to DOT.

- 2.3.9. **Joint Check.** The use of joint checks between a Contractor and a DBE is allowed with Department approval. To obtain approval, the Contractor must submit a completed Form 2178, "DBE Joint Check Approval," to the Department.

The Department will closely monitor the use of joint checks to ensure that such a practice does not erode the independence of the DBE nor inhibit the DBE's ability to perform a CUF. When joint checks are utilized, DBE credit toward the Contract goal will be allowed only when the subcontractor is performing a CUF in accordance with 49 CFR 26.55(c)(1).

Long-term or open-ended joint checking arrangements may be a basis for further scrutiny and may result in the lack of participation towards the Contract goal requirement if DBE independence cannot be established.

Joint checks will not be allowed simply for the convenience of the Contractor.

If the proper procedures are not followed or the Department determines that the arrangements result in a lack of independence for the DBE involved, no credit for the DBE's participation as it relates to the material cost will be used toward the Contract goal requirement, and the Contractor will need to make up the difference elsewhere on the project.

- 2.3.10. **DBE Termination and Substitution.** No DBE named in the commitment submitted under Section 2.3.5. will be terminated for convenience, in whole or part, without the Department's approval. This includes, but is not limited to, instances in which a Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

Unless consent is provided, the Contractor will not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.

The Contractor, prior to submitting its request to terminate, must first give written notice to the DBE of its intent to terminate and the reason for the termination. The Contractor will copy the Department on the Notice of Intent to terminate.

The DBE has 5 calendar days to respond to the Contractor's notice and will advise the Contractor and the Department of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Department should not approve the prime Contractor's request for termination.

The Department may provide a shorter response time if required in a particular case as a matter of public necessity.

The Department will consider both the Contractor's request and DBE's stated position prior to approving the request. The Department may provide a written approval only if it agrees, for reasons stated in its concurrence document, that the Contractor has good cause to terminate the DBE. If the Department does not approve the request, the Contractor must continue to use the committed DBE firm in accordance with the Contract. For guidance on what good cause includes, see 49 CFR 26.53.

Good cause does not exist if the Contractor seeks to terminate, reduce, or substitute a DBE it relied upon to obtain the Contract so that the Contractor can self-perform the work for which the DBE firm was engaged.

When a DBE subcontractor is terminated, make good faith efforts to find, as a substitute for the original DBE, another DBE to perform, at least to the extent needed to meet the established Contract goal, the work that the original DBE was to have performed under the Contract.

Submit the completed Form 2228, "DBE Termination Substitution Request," within seven (7) days, which may be extended for an additional 7 days if necessary at the request of the Contractor. The Department will provide a written determination to the Contractor stating whether or not good faith efforts have been demonstrated. If the Department determines that good faith efforts were not demonstrated, the Contractor will have the opportunity to appeal the determination to the Civil Rights Division.

- 2.3.11. **Reports and Records.** By the 15th of each month and after work begins, report payments to meet the DBE goal and for DBE race-neutral participation on projects with or without goals. These payment reports will be required until all DBE subcontracting or material supply activity is completed. Negative payment reports are required when no activity has occurred in a monthly period.

Notify the Area Engineer if payment to any DBE subcontractor is withheld or reduced.

Before receiving final payment from the Department, the Contractor must indicate a final payment on the compliance tracking system. The final payment is a summary of all payments made to the DBEs on the project.

All records must be retained for a period of 3 years following completion of the Contract work, and must be available at reasonable times and places for inspection by authorized representatives of the Department or the DOT. Provide copies of subcontracts or agreements and other documentation upon request.

- 2.3.12. **Failure to Comply.** If the Department determines the Contractor has failed to demonstrate good faith efforts to meet the assigned goal, the Contractor will be given an opportunity for reconsideration by the Department.

A Contractor's failure to comply with the requirements of this Special Provision will constitute a material breach of this Contract. In such a case, the Department reserves the right to terminate the Contract; to deduct the amount of DBE goal not accomplished by DBEs from the money due or to become due the Contractor; or to secure a refund, not as a penalty but as liquidated damages, to the Department or such other remedy or remedies as the Department deems appropriate.

- 2.3.13. **Investigations.** The Department may conduct reviews or investigations of participants as necessary. All participants, including, but not limited to, DBEs and complainants using DBE Subcontractors to meet the

Contract goal, are required to cooperate fully and promptly with compliance reviews, investigations, and other requests for information.

2.3.14.

**Falsification and Misrepresentation.** If the Department determines that a Contractor or subcontractor was a knowing and willing participant in any intended or actual subcontracting arrangement contrived to artificially inflate DBE participation or any other business arrangement determined by the Department to be unallowable, or if the Contractor engages in repeated violations, falsification, or misrepresentation, the Department may:

- refuse to count any fraudulent or misrepresented DBE participation;
- withhold progress payments to the Contractor commensurate with the violation;
- reduce the Contractor's prequalification status;
- refer the matter to the Office of Inspector General of the US Department of Transportation for investigation; and/or
- seek any other available contractual remedy.

# Special Provision to Item 000

## Schedule of Liquidated Damages



Table 1  
Schedule of Liquidated Damages

For Dollar Amount of Original Contract		Dollar Amount of Daily Contract Administration Liquidated Damages per Working Day
From More Than	To and Including	
0	100,000	570
100,000	500,000	590
500,000	1,000,000	610
1,000,000	1,500,000	685
1,500,000	3,000,000	785
3,000,000	5,000,000	970
5,000,000	10,000,000	1,125
10,000,000	20,000,000	1,285
20,000,000	Over 20,000,000	2,590

In addition to the amount shown in Table 1, the Liquidated Damages will be increased by the amount shown in Item 8 of the General Notes for Road User Cost (RUC), when applicable.

# Special Provision 000

## Notice of Contractor Performance Evaluations



### 1. GENERAL

In accordance with Texas Transportation Code §223.012, the Engineer will evaluate Contractor performance based on quality, safety, and timeliness of the project.

### 2. DEFINITIONS

- 2.1. **Project Recovery Plan (PRP)**—a formal, enforceable plan developed by the Contractor, in consultation with the District, that documents the cause of noted quality, safety, and timeliness issues and specifies how the Contractor proposes to correct project-specific performance deficiencies.

In accordance with Title 43, Texas Administrative Code (TAC), §9.23, the District will request a PRP if the Contractor's performance on a project is below the Department's acceptable standards and will monitor the Contractor's compliance with the established plan.

- 2.2. **Corrective Action Plan (CAP)**—a formal, enforceable plan developed by the Contractor, and proposed for adoption by the Construction or Maintenance Division, that documents the cause of noted quality, safety, and timeliness issues and specifies how the Contractor proposes to correct statewide performance deficiencies.

In accordance with 43 TAC §9.23, the Division will request a CAP if the average of the Contractor's statewide final evaluation scores falls below the Department's acceptable standards for the review period and will monitor the Contractor's compliance with the established plan.

### 3. CONTRACTOR EVALUATIONS

In accordance with Title 43, Texas Administrative Code (TAC) §9.23, the Engineer will schedule evaluations at the following intervals, at minimum:

- Interim evaluations—at or within 30 days after the anniversary of the notice to proceed, for Contracts extending beyond 1 yr., and
- Final evaluation—upon project closeout.

In case of a takeover agreement, neither the Surety nor its performing Contractor will be evaluated.

In addition to regularly scheduled evaluations, the Engineer may schedule an interim evaluation at any time to formally communicate issues with quality, safety, or timeliness. Upon request, work with the Engineer to develop a PRP to document expectations for correcting deficiencies.

Comply with the PRP as directed. Failure to comply with the PRP may result in additional remedial actions available to the Engineer under Item 5, "Control of the Work." Failure to meet a PRP to the Engineer's satisfaction may result in immediate referral to the Performance Review Committee for consideration of further action against the Contractor.

The Engineer will consider and document any events outside the Contractor's control that contributed to the failure to meet performance standards or comply with a PRP, including consideration of sufficient time.

Follow the escalation ladder if there is a disagreement regarding an evaluation or disposition of a PRP. The Contractor may submit additional documentation pertaining to the dispute. The District Engineer's decision

on a Contractor's evaluation score and recommendation of action required in a PRP or follow up for non-compliance is final.

---

#### **4. DIVISION OVERSIGHT**

Upon request of the Construction or Maintenance Division, develop and submit for Division approval a proposed CAP to document expectations for correcting deficiencies in the performance of projects statewide.

Comply with the CAP as directed. The CAP may be modified at any time up to completion or resolution after written approval of the premise of change from the Division. Failure to meet an adopted or revised adopted CAP to the Division's satisfaction within 120 days will result in immediate referral to the Performance Review Committee for consideration of further action against the Contractor.

The Division will consider and document any events outside the Contractor's control that contributed to the failure to meet performance standards or comply with a CAP, including consideration of sufficient time and associated costs as appropriate.

---

#### **5. PERFORMANCE REVIEW COMMITTEE**

The Performance Review Committee, in accordance with 43 TAC §9.24, will review at minimum all final evaluations, history of compliance with PRPs, any adopted CAPs including agreed modifications, any information about events outside a Contractor's control contributing to the Contractor's performance, and any documentation submitted by the Contractor and may recommend one or more of the following actions:

- take no action,
- reduce the Contractor's bidding capacity,
- prohibit the Contractor from bidding on one or more projects,
- immediately suspend the Contractor from bidding for a specified period of time, by reducing the Contractor's bidding capacity to zero, or
- prohibit the Contractor from being awarded a Contract on which they are the apparent low bidder.

The Deputy Executive Director will determine any further action against the Contractor.

---

#### **6. APPEALS PROCESS**

In accordance with 43 TAC §9.25, the Contractor may appeal remedial actions determined by the Deputy Executive Director.



## Special Provision to Item 2

### Instructions to Bidders



Item 2, "Instructions to Bidders," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Article 2.3., "Issuing Proposal Forms,"** second paragraph, is supplemented by the following.

The Department will not issue a proposal form if one or more of the following apply:

- the Bidder or affiliate of the Bidder that was originally determined as the apparent low Bidder on a project, but was deemed nonresponsive for failure to submit a DBE commitment as specified in Article 2.14., "Disadvantaged Business Enterprise (DBE)," is prohibited from rebidding that specific project.

**Article 2.7., "Nonresponsive Bid,"** is supplemented by the following:

The Department will not accept a nonresponsive bid. A bid that has one or more of the deficiencies listed below is considered nonresponsive:

- the Bidder failed to submit a DBE commitment as specified in Article 2.14., "Disadvantaged Business Enterprise (DBE)."

**Article 2.14., "Disadvantaged Business Enterprise (DBE),"** is added.

The apparent low bidder must submit DBE commitment information on federally funded projects with DBE goals within 5 calendar days (as defined in 49 CFR Part 26, Subpart A) of bid opening. For a submission that meets the 5-day requirement, administrative corrections will be allowed.

If the apparent low Bidder fails to submit their DBE information within the specified timeframe, they will be deemed nonresponsive and the proposal guaranty will become the property of the State, not as a penalty, but as liquidated damages. The Bidder forfeiting the proposal guaranty will not be considered in future proposals for the same work unless there has been a substantial change in the design of the work. The Department may recommend that the Commission:

- reject all bids, or
- award the Contract to the new apparent low Bidder, if the new apparent low Bidder submits DBE information within one calendar day of notification by the Department.

If the new apparent low Bidder is unable to submit the required DBE information within one calendar day:

- the new apparent low Bidder will not be deemed nonresponsive,
- the new apparent low Bidder's guaranty will not be forfeited,
- the Department will reject all bids, and
- the new apparent low Bidder will remain eligible to receive future proposals for the same project.

---

## Special Provision to Item 2

### Instructions to Bidders

---



Item 2, "Instructions to Bidders," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Article 2.3., "Issuing Proposal Forms,"** is supplemented by the following:

- the Bidder or affiliate of the Bidder that was originally determined as the apparent low Bidder on a project, but was deemed nonresponsive for failure to register or participate in the Department of Homeland Security's (DHS) E-Verify system as specified in Article 2.15., "Department of Homeland Security (DHS) E-Verify System," is prohibited from rebidding that specific project.

**Article 2.7., "Nonresponsive Bid,"** is supplemented by the following:

- the Bidder failed to participate in the Department of Homeland Security's (DHS) as specified in Article 2.15., "Department of Homeland Security (DHS) E-Verify System."

**Article 2.15., "Department of Homeland Security (DHS) E-Verify System,"** is added.

The Department will not award a Contract to a Contractor that is not registered in the DHS E-Verify system. Remain active in E-Verify throughout the life of the contract. In addition, in accordance with paragraph six of Article 8.2, "Subcontracting," include this requirement in all subcontracts and require that subcontractors remain active in E-Verify until their work is completed.

If the apparent low Bidder does not appear on the DHS E-Verify system prior to award, the Department will notify the Contractor that they must submit documentation showing that they are compliant within 5-business days after the date the notification was sent. A Contractor who fails to comply or respond within the deadline will be declared non-responsive and the Department will execute the proposal guaranty. The proposal guaranty will become the property of the State, not as a penalty, but as liquidated damages. The Bidder forfeiting the proposal guaranty will not be considered in future proposals for the same work unless there has been a substantial change in the scope of the work.

The Department may recommend that the Commission:

- reject all bids, or
- award the Contract to the new apparent low Bidder, if the Department is able to verify the Bidder's participation in the DHS E-verify system. For the Bidder who is not registered in E-Verify, the Department will allow for one business day after notification to provide proof of registration.

If the Department is unable to verify the new apparent low Bidder's participation in the DHS E-Verify system within one calendar day:

- the new apparent low Bidder will not be deemed nonresponsive,
- the new apparent low Bidder's guaranty will not be forfeited,
- the Department will reject all bids, and
- the new apparent low Bidder will remain eligible to receive future proposals for the same project.

---

## Special Provision to Item 2

### Instructions to Bidders

---



Item 2, "Instructions to Bidders" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Article 3., "Issuing Proposal Forms,"** is supplemented by the following:

The Electronic State Business Daily (ESBD), the Integrated Contractor Exchange (iCX) system, and the project proposal are the official sources of advertisement and bidding information for the State and Local Lettings. Bidders should bid the project using the information found therein, including any addenda. These sources take precedence over information from other sources, including TxDOT webpages, which are unofficial and intended for informational purposes only.

---

## Special Provision to Item 3 Award and Execution Contract

---



Item 3, Award and Execution of Contract," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Section 4.3, "Insurance."** The first sentence is voided and replaced by the following:

For construction and building Contracts, submit a certificate of insurance showing coverages in accordance with Contract requirements. For routine maintenance Contracts, refer to Article 8, "Beginning of Work."

**Article 8, "Beginning of Work."** The first sentence is supplemented by the following:

For a routine maintenance Contract, do not begin work until a certificate of insurance showing coverages in accordance with the Contract requirements is provided and accepted.

## Special Provision to Item 3

### Award and Execution of Contract



Item 3, "Award and Execution of Contract" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Section 4.3 "Insurance" is being amended by the following:**

**Table 2**  
**Insurance Requirements**

<b>Type of Insurance</b>	<b>Amount of Coverage</b>
Commercial General Liability Insurance	Not Less Than: \$600,000 each occurrence
Business Automobile Policy	Not Less Than: \$600,000 combined single limit
Workers' Compensation	Not Less Than: Statutory
All Risk Builder's Risk Insurance (For building-facilities contracts only)	100% of Contract Price

---

## Special Provision to Item 5

### Control of the Work

---



Item 5, "Control of the Work," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Article 5.1, "Authority of Engineer,"** is voided and replaced by the following.

The Engineer has the authority to observe, test, inspect, approve, and accept the work. The Engineer decides all questions about the quality and acceptability of materials, work performed, work progress, Contract interpretations, and acceptable Contract fulfillment. The Engineer has the authority to enforce and make effective these decisions.

The Engineer acts as a referee in all questions arising under the terms of the Contract. The Engineer's decisions will be final and binding.

The Engineer will pursue and document actions against the Contractor as warranted to address Contract performance issues. Contract remedies include, but are not limited to, the following:

- conducting interim performance evaluations requiring a Project Recovery Plan, in accordance with Title 43, Texas Administrative Code (TAC) §9.23,
- requiring the Contractor to remove and replace defective work, or reducing payment for defective work,
- removing an individual from the project,
- suspending the work without suspending working day charges,
- assessing standard liquidated damages to recover the Department's administrative costs, including additional project-specific liquidated damages when specified in the Contract in accordance with 43 TAC §9.22,
- withholding estimates,
- declaring the Contractor to be in default of the Contract, and
- in case of a Contractor's failure to meet a Project Recovery Plan, referring the issue directly to the Performance Review Committee for consideration of further action against the Contractor in accordance with 43 TAC §9.24.

The Engineer will consider and document any events outside the Contractor's control that contributed to the failure to meet performance standards, including consideration of sufficient time.

Follow the issue escalation ladder if there is disagreement regarding the application of Contract remedies.

---

## Special Provision to Item 5

### Control of the Work

---



Item 5, "Control of the Work" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Article 5.4, "Coordination of Plans, Specifications, and Special Provisions," the last sentence of the last paragraph is replaced by the following:**

Failure to promptly notify the Engineer will constitute a waiver of all contract claims against the Department for misunderstandings or ambiguities that result from the errors, omissions, or discrepancies.

---

## Special Provision to Item 6

### Control of Materials

---



For this project, Item 6, "Control of Materials," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

**Article 4., "Sampling, Testing, and Inspection,"** is supplemented by the following:

Meet with the Engineer and choose either the Department or a Department-selected Commercial Lab (CL) for conducting the subset of project-level sampling and testing shown in Table 1, "Select Guide Schedule Sampling and Testing." Selection may be made on a test by test basis. CLs will meet the testing turnaround times shown (includes test time and time for travel/sampling and reporting) and in all cases issue test reports as soon as possible.

If the Contractor chooses a Department-selected CL for any Table 1 sampling and testing:

- notify the Engineer, District Lab, and the CL of project scheduling that may require CL testing;
- provide the Engineer, District Lab, and CL at least 24 hours' notice by phone and e-mail;
- reimburse the Department for CL Table 1 testing using the contract fee schedule for the CL (including mileage and travel/standby time) at the minimum guide schedule testing frequencies;
- reimburse the Department for CL Table 1 testing above the minimum guide schedule frequencies for retesting when minimum frequency testing results in failures to meet specification limits;
- agree with the Engineer and CL upon a policy regarding notification for testing services;
- give any cancellation notice to the Engineer, District Lab, and CL by phone and e-mail;
- reimburse the Department a \$150 cancellation fee to cover technician time and mileage charges for previously scheduled work cancelled without adequate notice, which resulted in mobilization of technician and/or equipment by the CL; and
- all CL charges will be reimbursed to the Department by a deduction from the Contractor's monthly pay estimate.

If the CL does not meet the Table 1 turnaround times, testing charge to the Contractor will be reduced by 50% for the first late day and an additional 5% for each succeeding late day.

Approved CL project testing above the minimum testing frequencies in the Guide Schedule of Sampling and Testing, and not as the result of failing tests, will be paid by the Department.

Other project-level Guide Schedule sampling and testing not shown on Table 1 will be the responsibility of the Department.



**Table 1  
Select Guide Schedule Sampling and Testing (Note 1)**

<b>TxDOT Test</b>	<b>Test Description</b>	<b>Turn-Around Time (Calendar days)</b>
<b>SOILS/BASE</b>		
Tex-101-E	Preparation of Soil and Flexible Base Materials for Testing (included in other tests)	
Tex-104-E	Liquid Limit of Soils (included in 106-E)	
Tex-105-E	Plastic Limit of Soils (included in 106-E)	
Tex-106-E	Calculating the Plasticity Index of Soils	7
Tex-110-E	Particle Size Analysis of Soils	6
Tex-113-E	Moisture-Density Relationship of Base Materials	7
Tex-114-E	Moisture-Density Relationship of Subgrade and Embankment Soil	7
Tex-115-E	Field Method for In-Place Density of Soils and Base Materials	2
Tex-116-E	Ball Mill Method for the Disintegration of Flexible Base Material	5
Tex-117-E, Part II	Triaxial Compression Tests For Disturbed Soils and Base Materials (Part II)	6
Tex-113-E w/ Tex-117-E	Moisture-Density Relationship of Base Materials <b>with</b> Triaxial Compression Tests For Disturbed Soils and Base Materials (Part II)	10
Tex-140-E	Measuring Thickness of Pavement Layer	2
Tex-145-E	Determining Sulfate Content in Soils - Colorimetric Method	4
<b>HOT MIX ASPHALT</b>		
Tex-200-F	Sieve Analysis of Fine and Coarse Aggregate (dry, from ignition oven with known correction factors)	1 (Note 2)
Tex-203-F	Sand Equivalent Test	3
Tex-206-F, w/ Tex-207-F, Part I, w/ Tex-227-F	<b>(Lab-Molded Density of Production Mixture – Texas Gyrotory)</b> Method of Compacting Test Specimens of Bituminous Mixtures <b>with</b> Density of Compacted Bituminous Mixtures, Part I - Bulk Specific Gravity of Compacted Bituminous Mixtures, <b>with</b> Theoretical Maximum Specific Gravity of Bituminous Mixtures	1 (Note 2)
Tex-207-F, Part I &/or Part VI	<b>(In-Place Air Voids of Roadway Cores)</b> Density of Compacted Bituminous Mixtures, Part I- Bulk Specific Gravity of Compacted Bituminous Mixtures <b>&amp;/or</b> Part VI - Bulk Specific Gravity of Compacted Bituminous Mixtures Using the Vacuum Method	1 (Note 2)
Tex-207-F, Part V	Density of Compacted Bituminous Mixtures, Part V- Determining Mat Segregation using a Density-Testing Gauge	3
Tex-207-F, Part VII	Density of Compacted Bituminous Mixtures, Part VII - Determining Longitudinal Joint Density using a Density-Testing Gauge	4
Tex-212-F	Moisture Content of Bituminous Mixtures	3
Tex-217-F	Deleterious Material and Decantation Test for Coarse Aggregate	4
Tex-221-F	Sampling Aggregate for Bituminous Mixtures, Surface Treatments, and LRA (included in other tests)	
Tex-222-F	Sampling Bituminous Mixtures (included in other tests)	
Tex-224-F	Determination of Flakiness Index	3
Tex-226-F	Indirect Tensile Strength Test (production mix)	4
Tex-235-F	Determining Draindown Characteristics in Bituminous Materials	3
Tex-236-F (Correction Factors)	Asphalt Content from Asphalt Paving Mixtures by the Ignition Method (Determining Correction Factors)	4
Tex-236-F	Asphalt Content from Asphalt Paving Mixtures by the Ignition Method (Production Mixture)	1 (Note 2)
Tex-241-F w/ Tex-207-F, Part I, w/ Tex-227-F	<b>(Lab-Molded Density of Production Mixture – Superpave Gyrotory)</b> Superpave Gyrotory Compacting of Specimens of Bituminous Mixtures (production mixture) <b>with</b> Density of Compacted Bituminous Mixtures, Part I- Part I - Bulk Specific Gravity of Compacted Bituminous Mixtures, <b>with</b> Theoretical Maximum Specific Gravity of Bituminous Mixtures	1 (Note 2)
Tex-242-F	Hamburg Wheel-Tracking Test (production mix, molded samples)	3
Tex-244-F	Thermal Profile of Hot Mix Asphalt	1
Tex-246-F	Permeability of Water Flow of Hot Mix Asphalt	3
Tex-280-F	Flat and Elongated Particles	3
Tex-530-C	Effect of Water on Bituminous Paving Mixtures (production mix)	4

AGGREGATES		
Tex-400-A	Sampling Flexible Base, Stone, Gravel, Sand, and Mineral Aggregates	3
Tex-410-A	Abrasion of Coarse Aggregate Using the Los Angeles Machine	5
Tex-411-A	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate	12
Tex-461-A	Degradation of Coarse Aggregate by Micro-Deval Abrasion	5
CHEMICAL		
Tex-612-J	Acid Insoluble Residue for Fine Aggregate	4
GENERAL		
HMA Production Specialist [TxAPA – Level 1-A] (\$/hr)		
HMA Roadway Specialist [TxAPA – Level 1-B] (\$/hr)		
Technician Travel/Standby Time (\$/hr)		
Per Diem (\$/day – meals and lodging)		
Mileage Rate (\$/mile from closest CL location)		
<b>Note 1– Turn-Around Time includes test time and time for travel/sampling and reporting.</b> <b>Note 2 – These tests require turn-around times meeting the governing specifications. Provide test results within the stated turn-around time.</b> <b>CL is allowed one additional day to provide the signed and sealed report.</b>		

# Special Provision to Item 6

## Control of Materials



Item 6, "Control of Materials" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Article 6.10., "Hazardous Materials,"** is voided and replaced by the following:

Comply with the requirements of Article 7.12., "Responsibility for Hazardous Materials."

Notify the Engineer immediately when a visual observation or odor indicates that materials on sites owned or controlled by the Department may contain hazardous materials. Except as noted herein, the Department is responsible for testing, removing, and disposing of hazardous materials not introduced by the Contractor. The Engineer may suspend work wholly or in part during the testing, removing, or disposing of hazardous materials, except in the case where hazardous materials are introduced by the Contractor.

Use materials that are free of hazardous materials. Notify the Engineer immediately if materials are suspected to contain hazardous materials. If materials delivered to the project by the Contractor are suspected to contain hazardous materials, have an approved commercial laboratory test the materials for the presence of hazardous materials as approved. Remove, remediate, and dispose of any of these materials found to contain hazardous materials. The work required to comply with this section will be at the Contractor's expense if materials are found to contain hazardous materials. Working day charges will not be suspended and extensions of working days will not be granted for activities related to handling hazardous material introduced by the Contractor. If suspected materials are not found to contain hazardous materials, the Department will reimburse the Contractor for hazardous materials testing and will adjust working day charges if the Contractor can show that this work impacted the critical path.

**10.1. Painted Steel Requirements.** Coatings on existing steel contain hazardous materials unless otherwise shown on the plans. Remove paint and dispose of steel coated with paint containing hazardous materials in accordance with the following:

**10.1.1. Removing Paint From Steel** For contracts that are specifically for painting steel, Item 446, "Field Cleaning and Painting Steel" will be included as a pay item. Perform work in accordance with that item.

For projects where paint must be removed to allow for the dismantling of steel or to perform other work, the Department will provide for a separate contractor (third party) to remove paint containing hazardous materials prior to or during the Contract. Remove paint covering existing steel shown not to contain hazardous materials in accordance with Item 446, "Field Cleaning and Painting Steel."

**10.1.2. Removal and Disposal of Painted Steel.** For steel able to be dismantled by unbolting, paint removal will not be performed by the Department. The Department will remove paint, at locations shown on the plans or as agreed, for the Contractor's cutting and dismantling purposes. Utilize Department cleaned locations for dismantling when provided or provide own means of dismantling at other locations.

Painted steel to be retained by the Department will be shown on the plans. For painted steel that contains hazardous materials, dispose of the painted steel at a steel recycling or smelting facility unless otherwise shown on the plans. Maintain and make available to the Engineer invoices and other records obtained from the facility showing the received weight of the steel and the facility name. Dispose of steel that does not contain hazardous material coatings in accordance with federal, state and local regulations.

**10.2. Asbestos Requirements.** The plans will indicate locations or elements where asbestos containing materials (ACM) are known to be present. Where ACM is known to exist or where previously unknown ACM has been found, the Department will arrange for abatement by a separate contractor prior to or during the Contract. Notify the Engineer of proposed dates of demolition or removal of structural elements with ACM at least 60 days before beginning work to allow the Department sufficient time for abatement.

The Department of State Health Services (DSHS), Asbestos Programs Branch, is responsible for administering the requirements of the National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 61, Subpart M and the Texas Asbestos Health Protection Rules (TAHPR). Based on EPA guidance and regulatory background information, bridges are considered to be a regulated "facility" under NESHAP. Therefore, federal standards for demolition and renovation apply.

The Department is required to notify the DSHS at least 10 working days (by postmarked date) before initiating demolition or renovation of each structure or load bearing member shown on the plans. If the actual demolition or renovation date is changed or delayed, notify the Engineer in writing of the revised dates in sufficient time to allow for the Department's notification to DSHS to be postmarked at least 10 days in advance of the actual work.

Failure to provide the above information may require the temporary suspension of work under Article 8.4., "Temporary Suspension of Work or Working Day Charges," due to reasons under the control of the Contractor. The Department retains the right to determine the actual advance notice needed for the change in date to address post office business days and staff availability.

**10.3. Lead Abatement.** Provide traffic control as shown on the plans, and coordinate and cooperate with the third party and the Department for managing or removing hazardous materials. Work for the traffic control shown on the plans and coordination work will not be paid for directly but will be subsidiary to pertinent Items.

# Special Provision to Item 7

## Legal Relations and Responsibilities



Item 7, "Legal Relations and Responsibilities," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Section 7.7.2., "Texas Pollutant Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention Plans (SWP3)," is voided and replaced by the following:**

**7.2. Texas Pollution Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention Plans (SWP3).**

**7.2.1. Projects with less than one acre of soil disturbance including required associated project specific locations (PSL's) per TPDES GP TXR 150000.**

No posting or filing will be required for soil disturbances within the right of way. Adhere to the requirements of the SWP3.

**7.2.2. Projects with one acre but less than five acres of soil disturbance including required associated PSL's per TPDES GP TXR 150000.**

The Department will be considered a primary operator for Operational Control Over Plans and Specifications as defined in TPDES GP TXR 150000 for construction activity in the right of way. The Department will post a small site notice along with other requirements as defined in TPDES GP TXR 150000 as the entity of having operational control over plans and specifications for work shown on the plans in the right of way.

The Contractor will be considered a Primary Operator for Day-to-Day Operational Control as defined in TPDES GP TXR 150000 for construction activity in the right of way. In addition to the Department's actions, the Contractor will post a small site notice along with other requirements as defined in TPDES GP TXR 150000 as the entity of having day-to-day operational control of the work shown on the plans in the right of way. This is in addition to the Contractor being responsible for TPDES GP TXR 150000 requirements for on- right of way and off- right of way PSL's. Adhere to all requirements of the SWP3 as shown on the plans. The Contractor will be responsible for Implement the SWP3 for the project site in accordance with the plans and specifications, TPDES General Permit TXR150000, and as directed.

**7.2.3. Projects with 5 acres or more of soil disturbance including required associated PSL's per TPDES GP TXR 150000.**

The Department will be considered a primary operator for Operational Control Over Plans and Specifications as defined in TPDES GP TXR 150000 for construction activities in the right of way. The Department will post a large site notice, file a notice of intent (NOI), notice of change (NOC), if applicable, and a notice of termination (NOT) along with other requirements per TPDES GP TXR 150000 as the entity having operational control over plans and specifications for work shown on the plans in the right of way.

The Contractor will be considered a primary operator for Day-to-Day Operational Control as defined in TPDES GP TXR 150000 for construction activities in the right of way. In addition to the Department's actions, the Contractor shall file a NOI, NOC, if applicable, and NOT and post a large site notice along with other requirements as the entity of having day-to-day operational control of the work shown on the plans in the right of way. This is in addition to the Contractor

being responsible for TPDES GP TXR 150000 requirements for on- right of way and off- right of way PSL's. Adhere to all requirements of the SWP3 as shown on the plans.

---

## Special Provision to Item 7

### Legal Relations and Responsibilities

---



Item 7, "Legal Relations and Responsibilities" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Section 19.1., Minimum Wage Requirements for Federally Funded Contracts.** The second paragraph is voided and replaced by the following:

Submit electronic payroll records to the Engineer using the Department's payroll system.

**Section 19.2., Minimum Wage Requirements for State Funded Contracts.** The second paragraph is voided and replaced by the following:

Submit electronic payroll records to the Engineer using the Department's payroll system.

---

## Special Provision to Item 7

### Legal Relations and Responsibilities

---



Item 7, "Legal Relations and Responsibilities," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Section 7.2.4., "Public Safety and Convenience."** The first paragraph is deleted and replaced by the following.

Ensure the safety and convenience of the public and property as provided in the Contract and as directed. Keep existing roadways open to traffic or construct and maintain detours and temporary structures for safe public travel. Manage construction to minimize disruption to traffic. Maintain the roadway in a good and passable condition, including proper drainage and provide for ingress and egress to adjacent property.

If the construction of the project requires the closing of a highway, as directed, coordinate the closure with the Engineer and work to ensure all lanes and ramps possible are available during peak traffic periods before, during, and after significant traffic generator events to avoid any adverse economic impact on the municipalities during:

- dates or events as shown on the plans, and
- other dates as directed.



# Special Provision to Item 007

## Legal Relations and Responsibilities



Item 7, "Legal Relations and Responsibilities," of the Standard Specifications is amended with respect to the clauses cited below.

**Section 2.6., "Barricades, Signs, and Traffic Handling,"** the first paragraph is voided and replaced by the following:

- 2.6. **Barricades, Signs, and Traffic Handling.** Comply with the requirements of Item 502 "Barricades, Signs, and Traffic Handling," and as directed. Provide traffic control devices that conform to the details shown on the plans, the TMUTCD, and the Department's Compliant Work Zone Traffic Control Device List maintained by the Traffic Safety Division. When authorized or directed, provide additional signs or traffic control devices not required by the plans.

**Section 2.6.1., "Contractor Responsible Person and Alternative,"** is voided and replaced by the following:

- 2.6.1. **Contractor Responsible Person and Alternative.** Designate in writing, a Contractor's Responsible Person (CRP) and an alternate to be the representative of the Contractor who is responsible for taking or directing corrective measures regarding the traffic control. The CRP or alternate must be accessible by phone 24 hr. per day and able to respond when notified. The CRP and alternate must comply with the requirements of Section 2.6.5., "Training."

**Section 2.6.2, "Flaggers,"** the first paragraph is voided and replaced by the following:

- 2.6.2. **Flaggers.** Designate in writing, a flagger instructor who will serve as a flagging supervisor and is responsible for training and assuring that all flaggers are qualified to perform flagging duties. Certify to the Engineer that all flaggers will be trained and make available upon request a list of flaggers trained to perform flagging duties.

**Section 2.6.5, "Training,"** is voided and replaced by the following:

- 2.6.5. **Training.** Train workers involved with the traffic control using Department-approved training as shown on the "Traffic Control Training" Material Producer List.

Coordinate enrollment, pay associated fees, and successfully complete Department-approved training or Contractor-developed training. Training is valid for the period prescribed by the provider. Except for law enforcement personnel training, refresher training is required every 4 yr. from the date of completion unless otherwise specified by the course provider. The Engineer may require training at a frequency instead of the period prescribed based on the Department's needs. Training and associated fees will not be measured or paid for directly but are considered subsidiary to pertinent Items.

Certify to the Engineer that workers involved in traffic control and other work zone personnel have been trained and make available upon request a copy of the certification of completion to the Engineer. Ensure the following is included in the certification of completion:

- name of provider and course title,
- name of participant,
- date of completion, and
- date of expiration.

Where Contractor-developed training or a Department-approved training course does not produce a certification, maintain a log of attendees. Make the log available upon request. Ensure the log is legible and includes the following:

- printed name and signature of participant,
- name and title of trainer, and
- date of training.

2.6.5.1. **Contractor-developed Training.** Develop and deliver Contractor-developed training meeting the minimum requirements established by the Department. The outline for this training must be submitted to the Engineer for approval at the preconstruction meeting. The CRP or designated alternate may deliver the training instead of the Department-approved training. The work performed and materials furnished to develop and deliver the training will not be measured or paid for directly but will be considered subsidiary to pertinent Items.

2.6.5.1.1. **Flagger Training Minimum Requirements.** A Contractor's certified flagging instructor is permitted to train other flaggers.

2.6.5.1.2. **Optional Contractor-developed Training for Other Work Zone Personnel.** For other work zone personnel, the Contractor may provide training meeting the curriculum shown below instead of Department-approved training.

Minimum curriculum for Contractor-provided training is as follows:

Contractor-developed training must provide information on the use of personnel protection equipment, occupational hazards and health risks, and other pertinent topics related to traffic management. The type and amount of training will depend on the job duties and responsibilities. Develop training applicable to the work being performed. Develop training to include the following topics.

- The Life You Save May Be Your Own (or other similar company safety motto).
- Purpose of the training.
  - It's the Law.
  - To make work zones safer for workers and motorist.
  - To understand what is needed for traffic control.
  - To save lives including your own.
- Personal and Co-Worker Safety.
  - **High Visibility Safety Apparel.** Discuss compliant requirements; inspect regularly for fading and reduced reflective properties; if night operations are required, discuss the additional and appropriate required apparel in addition to special night work risks; if moving operations are underway, discuss appropriate safety measures specific to the situation and traffic control plan.
  - **Blind Areas.** A blind area is the area around a vehicle or piece of construction equipment not visible to the operators, either by line of sight or indirectly by mirrors. Discuss the "Circle of Safety" around equipment and vehicles; use of spotters; maintain eye contact with equipment operators; and use of hand signals.
  - **Runovers and Backovers.** Remain alert at all times; keep a safe distance from traffic; avoid turning your back to traffic and if you must then use a spotter; and stay behind protective barriers, whenever possible. Note: It is not safe to sit on or lean against a concrete barrier, these barriers can deflect four plus feet when struck by a vehicle.
  - Look out for each other, warn co-workers.
  - Be courteous to motorists.
  - Do not run across active roadways.
  - Workers must obey traffic laws and drive courteously while operating vehicles in the work zones.
  - Workers must be made aware of company distracted driving policies.
- **Night Time Operations.** Focus should be placed on projects with a nighttime element.

- **Traffic Control Training.** Basics of Traffic Control.
  - Identify work zone traffic control supervisor and other appropriate persons to report issues to when they arise.
  - Emphasize that work zone traffic control devices must be in clean and in undamaged condition. If devices have been hit but not damaged, put back in their correct place and report to traffic control supervisor. If devices have been damaged, replace with new one and report to traffic control supervisor. If devices are dirty, faded or have missing or damaged reflective tape clean or replace and report to traffic control supervisor. Show examples of non-acceptable device conditions. Discuss various types of traffic control devices to be used and where spacing requirements can be found.
  - **Channelizing Devices and Barricades with Slanted Stripes.** Stripes are to slant in the direction you want traffic to stay or move to; demonstrate this with a device.
  - **Traffic Queuing.** Workers must be made aware of traffic queuing and the dangers created by it. Workers must be instructed to immediately notify the traffic control supervisor and other supervisory personnel if traffic is queuing beyond advance warning sign and devices or construction limits.
  - **Signs.** Signs must be straight and not leaning. Report problems to the traffic control supervisor or other as designated for immediate repair. Covered signs must be fully covered. If covers are damaged or out of place, report to traffic control supervisor or other as designated.

---

## Special Provision to Item 8 Prosecution and Progress

---



Item 8, "Prosecution and Progress" of the Standard Specification is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Article 8.2., "Subcontracting,"** is supplemented by the following paragraph, which is added as paragraph six to this article:

The Contractor certifies by signing the Contract that the Contractor will not enter into any subcontract with a subcontractor that is not registered in the Department of Homeland Security's (DHS) E-Verify system. Require that all subcontractors working on the project register and require that all subcontractors remain active in the DHS E-Verify system until their work is complete on the project.

---

## Special Provision to Item 8 Prosecution and Progress

---



Item 8, "Prosecution and Progress" of the Standard Specifications is amended with respect to the clause cited below. No other clauses or requirements of this Item are waived or changed.

**Article 8.7.2., "Wrongful Default,"** is revised and replaced by the following:

If it is determined after the Contractor is declared in default, that the Contractor was not in default, the rights and obligations of all parties will be the same as if termination had been issued for the convenience of the public as provided in Article 8.8 "Termination of Contract."

---

## Special Provision to Item 009

### Measurement and Payment

---



Item 009 "Measurement and Payment" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Article 9.5., "PROGRESS PAYMENTS" is supplemented with the following:**

It is the Department's desire to pay a Contractor for work through the last working day of the month; however, the use of early cut-off dates for monthly estimates and MOH is a project management practice to manage workload at the Area Office level. Approval for using early cut-off dates is at the District's discretion. The earliest cut-off date for estimates is the 25<sup>th</sup> of the month.

**Article 9.6., "PAYMENT FOR MATERIAL ON HAND (MOH)" first paragraph is amended as follows:**

If payment for MOH is desired, request compensation for the invoice cost of acceptable nonperishable materials that have not been used in the work before the request, and that have been delivered to the work location or are in acceptable storage places. Nonperishable materials are those that do not have a shelf life or whose characteristics do not materially change when exposed to the elements. Include only materials that have been sampled, tested, approved, or certified, and are ready for incorporation into the work. Only materials which are completely constructed or fabricated on the Contractor's order for a specific Contract and are so marked and on which an approved test report has been issued are eligible. Payment for MOH may include the following types of items: concrete traffic barrier, precast concrete box culverts, concrete piling, reinforced concrete pipe, and illumination poles. Any repairs required after fabricated materials have been approved for storage will require approval of the Engineer before being made and will be made at the Contractor's expense. Include only those materials and products, when cumulated under an individual item or similar bid items, that have an invoice cost of at least \$1,000 in the request for MOH payment (e.g. For MOH eligibility, various sizes of conductor are considered similar bid items and may be cumulated to meet the threshold; for small roadside signs, the sign supports, mounting bolts, and the sign face is considered one bid item or similar bid items for more than one pay item for sign supports.) Requests for MOH are to be submitted at least two days before but not later than the estimate cutoff date unless otherwise agreed. If there is a need to request MOH after the established cut-off date, the district can make accommodation as the need arises. This needed accommodation is to be the exception, though, and not the rule.

---

## Special Provision to Item 9

### Measurement and Payment

---



Item 9, "Measurement and Payment" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Section 9.7.1.4.3., "Standby Equipment Costs,"** is voided and replaced by the following:

7.1.4.3. **Standby Equipment Costs.** Payment for standby equipment will be made in accordance with Section 9.7.1.4., "Equipment," except that the 15% markup will not be allowed and that:

**Section 7.1.4.3.1., "Contractor-Owned Equipment,"** is voided and replaced by the following:

7.1.4.3.1. **Contractor-Owned Equipment.** For Contractor-owned equipment:

- Standby will be paid at 50% of the monthly Equipment Watch rate after the regional and age adjustment factors have been applied. Operating costs will not be allowed. Calculate the standby rate as follows.

$$\text{Standby rate} = (\text{FHWA hourly rate} - \text{operating costs}) \times 50\%$$

- If an hourly rate is needed, divide the monthly *Equipment Watch* rate by 176.
- No more than 8 hr. of standby will be paid during a 24-hr. day period, nor more than 40 hr. per week.
- Standby costs will not be allowed during periods when the equipment would have otherwise been idle.

# Special Provision to Item 506

## Temporary Erosion, Sedimentation, and Environmental Controls



For this project, Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

**Article 506.1., "Description,"** is voided and replaced by the following:

Install, maintain, and remove erosion, sedimentation, and environmental control measures to prevent or reduce the discharge of pollutants in accordance with the Storm Water Pollution Prevention Plan (SWP3) or as directed. Ensure the installation and maintenance of control measures is performed in accordance with the manufacturer's or designer's specifications. Erosion and sediment control devices must be selected from the "Erosion Control Approved Products" or "Sediment Control Approved Products" lists. Perform work in a manner to prevent degradation of receiving waters, facilitate project construction, and comply with applicable federal, state, and local regulations.

**Article 506.3., "Qualifications, Training, and Employee Requirements,"** is voided and not replaced.

**Section 506.4.1., "Contractor Responsibilities," Section 506.4.2., "Implementation," and Section 506.4.3., "General,"** are voided and replaced by the following:

4.1. **Contractor Responsibilities.** Implement the SWP3 for the project site in accordance with the plans and specifications, and as directed. Coordinate storm water management with all other work on the project. Develop and implement an SWP3 for project-specific material supply plants within and outside of the Department's right of way in accordance with the specific or general storm water permit requirements. Prevent water pollution from storm water associated with construction activity from entering any surface water or private property on or adjacent to the project site.

4.2. **Implementation.**

4.2.1. **Commencement.** Implement the SWP3 as shown and as directed. Contractor proposed recommendations for changes will be allowed as approved. Do not implement changes until approval has been received and changes have been incorporated into the plans by the Engineer. Minor adjustments to meet field conditions are allowed and will be recorded by the Engineer in the SWP3.

Implement control measures before the commencement of activities that result in soil disturbance. Phase and minimize the soil disturbance to the areas shown on the plans. Coordinate temporary control measures with permanent control measures and all other work activities on the project to assure economical, effective, safe, continuous water pollution prevention. Provide control measures that are appropriate to the construction means, methods, and sequencing allowed by the Contract.

Do not prolong final grading and shaping. Preserve vegetation where possible throughout the project and minimize clearing, grubbing, and excavation within stream banks, bed, and approach sections.

4.3. **General.**

4.3.1. **Temporary Alterations or Control Measure Removal.** Altering or removal of control measures is allowed when control measures are restored within the same working day.



- 4.3.2. **Stabilization.** Initiate stabilization for disturbed areas no more than 14 days after the construction activities in that portion of the site has temporarily or permanently ceased. Establish a uniform vegetative cover or use another stabilization practice as approved.
- 4.3.3. **Finished Work.** Upon the Engineer's acceptance of vegetative cover or other stabilization practice, remove and dispose of all temporary control measures unless otherwise directed. Complete soil disturbing activities and establish a uniform perennial vegetative cover. A project will not be considered for acceptance until a vegetative cover of 70% density of existing adjacent undisturbed areas is obtained or equivalent permanent stabilization is obtained as approved.
- 4.3.4. **Restricted Activities and Required Precautions.** Do not discharge onto the ground or surface waters any pollutants such as chemicals, raw sewage, fuels, lubricants, coolants, hydraulic fluids, bitumens, or any other petroleum product. Operate and maintain equipment on site in a manner as to prevent actual or potential water pollution. Manage, control, and dispose of litter on site such that no adverse impacts to water quality occur. Prevent dust from creating a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property. Wash out concrete trucks only in approved contained areas. Use appropriate controls to minimize the offsite transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water (i.e. dewatering). Prevent discharges that would contribute to a violation of Edwards Aquifer Rules, water quality standards, the impairment of a listed water body, or other state or federal law.

**Section 506.4.4., "Installation, Maintenance, and Removal Work."** The first paragraph is voided and replaced by the following.

Perform work in accordance with the SWP3, and according to the manufacturers' guidelines. Install and maintain the integrity of temporary erosion and sedimentation control devices to accumulate silt and debris until soil disturbing activities are completed and permanent erosion control features are in place or the disturbed area has been adequately stabilized as determined by the Engineer.

**Section 506.4.5., "Monitoring and Documentation,"** is voided and not replaced.

**Section 506.6.5.2., "Maintenance Earthwork for Erosion and Sediment Control for Cleaning and/or Restoring Control Measures,"** is voided and replaced by the following:

Earthwork needed to remove and obliterate of erosion-control features will not be paid for directly but is subsidiary to pertinent Items unless otherwise shown on the plans.

Sprinkling and rolling required by this Item will not be paid for directly but will be subsidiary to this Item.

---

# Special Specification 7263

## Ferryboat Equipment Upgrade

---



---

### 1. DESCRIPTION

Furnish all materials, equipment, labor allowances and incidentals necessary for the upgrade of Ferryboat Equipment as shown in the attached Plan Set and specifications.

---

### 2. MATERIALS

Furnish new materials. Ensure all materials conform to the details shown on the plans and the requirements of this Item.

---

### 3. CONSTRUCTION

Use construction methods in accordance with the attached plans, details, and the specifications. Perform an approved "Schedule of Values" work.

---

### 4. MEASUREMENT

This Item will be measured by lump sum.

This Item will be measured for completed work corresponding to the "Schedule of Values" to facilitate accurate partial payments. The lump sum dollar amount will be rounded to the nearest integer and this number will serve as the total number of units multiplied by the unit price of one dollar.

---

### 5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Ferryboat Equipment Upgrade." This price is full compensation for furnishing tools, equipment, labor, materials, and incidentals necessary to complete the work.