DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
HHK	6	C 902-90-111		VA
GRAPHICS HHK	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	1
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

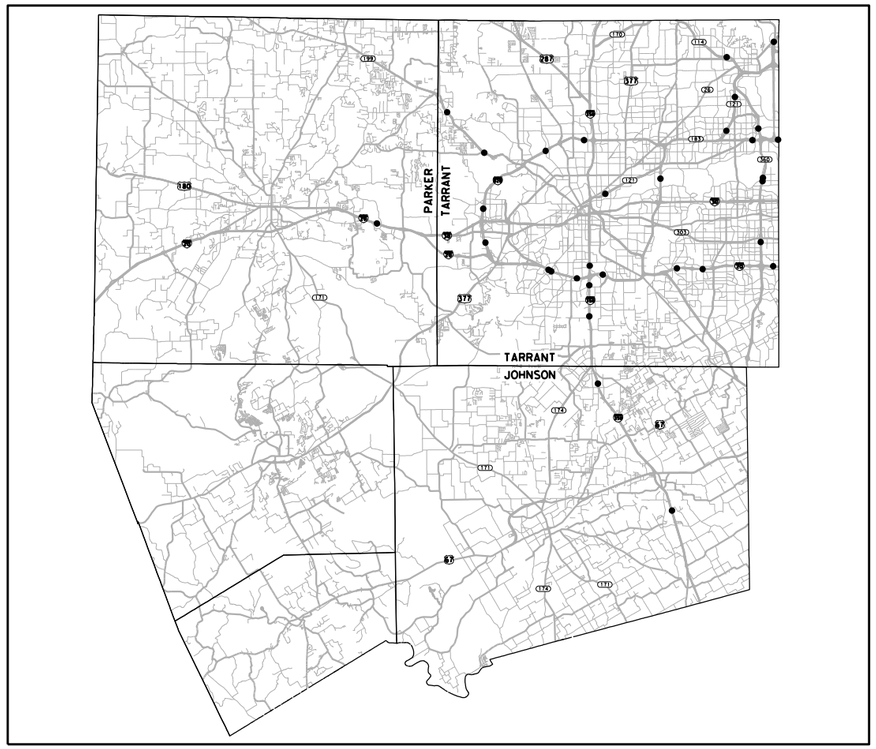
STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT NUMBER: C 902-90-111
NO PROJECT LENGTH
TARRANT COUNTY
VA

FOR CONSTRUCTION OF TRAFFIC CONTROL DEVICES
CONSISTING OF: REPLACEMENT OF DYNAMIC MESSAGE SIGNS

LIMITS OF WORK: VARIOUS LOCATIONS WITHIN FORT WORTH DISTRICT



NO EQUATIONS
NO EXCEPTIONS
NO RAILROAD CROSSINGS

FINAL PLANS
LETTING DATE: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK WAS COMPLETED: _____
DATE WORK WAS ACCEPTED: _____
FINAL CONTRACT COST: $ _____
CONTRACTOR: _____

Kimley»Horn
13455 Noel Rd, Two Galleria Office Tower, Suite 700
Dallas, Texas 75240
F-928
Tel No. (972) 770-1300
Fax No. (972) 239-3820

Texas Department of Transportation

SUBMITTED FOR LETTING: 2/21/2021
DocuSigned by: Theresa Poer
DIRECTOR OF TRANSPORTATION OPERATIONS
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RECOMMENDED FOR LETTING: 3/1/2021
DocuSigned by:
DIRECTOR, TP&D
7879B0B92E5D403...

APPROVED FOR LETTING: 3/1/2021
DocuSigned by: Carl Johnson
DISTRICT ENGINEER
2FE36138F0614C3...

NOTE:

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014, AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000---008)

PLOTTED: 2/19/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_COVER_00.dgn.dgn
BY: Nate.Taylor

SHEET	DESCRIPTION
	I. GENERAL
1	TITLE SHEET
2	INDEX SHEET
3	PROJECT KEYMAP
4,4A-4I	GENERAL NOTES
5-5A	ESTIMATE AND QUANTITY SHEET
6-9	SHEET QUANTITIES
10-11	ELECTRICAL SERVICE POLE DATA
12-15	TRAFFIC CONTROL PLAN
16	CONSTRUCTION NOTES
	II. ITS
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18	IH 20 WB AT S GREAT SW PKWY FIBER OPTIC SCHEMATIC
19	IH 20 EB AT S BOWEN RD DMS LAYOUT
20	IH 20 EB AT S BOWEN RD FIBER OPTIC SCHEMATIC
21-22	IH 20 EB AT GREEN OAKS BLVD DMS LAYOUT
23	IH 20 EB AT GREEN OAKS BLVD FIBER OPTIC SCHEMATIC
24	IH 20 WB AT CHUCKWAGON TRAIL DMS LAYOUT
25	IH 20 WB AT CHUCKWAGON TRAIL WIRELESS SCHEMATIC
26	SH 360 SB AT HARWOOD RD DMS LAYOUT
27	SH 360 SB AT HARWOOD RD FIBER OPTIC SCHEMATIC
28	SH 360 SB AT ARKANSAS LN DMS LAYOUT
29	SH 360 SB AT ARKANSAS LN FIBER OPTIC SCHEMATIC
30	SH 360 NB AT GREEN OAKS BLVD DMS LAYOUT
31	SH 360 SB AT GREEN OAKS BLVD DMS LAYOUT
32-33	SH 360 NB AND SB AT GREEN OAKS BLVD FIBER OPTIC SCHEMATIC
34-35	SH 121 NB AND SB AT FAIRVIEW ST DMS LAYOUT
36	SH 121 NB AND SB AT FAIRVIEW ST FIBER OPTIC SCHEMATIC
37	SH 121 NB AND SB AT HARWOOD RD DMS LAYOUT
38	SH 121 NB AND SB AT HARWOOD RD FIBER OPTIC SCHEMATIC
39	SH 121 NB AT HALL JOHNSON RD DMS LAYOUT
40	SH 121 NB AT HALL JOHNSON RD FIBER OPTIC SCHEMATIC
41-42	IH 820 NB AT CHAPIN RD DMS LAYOUT
43	IH 820 NB AT CHAPIN RD FIBER OPTIC SCHEMATIC
44	IH 820 NB AND SB AT TRINITY BLVD DMS LAYOUT
45	IH 820 NB AND SB AT TRINITY BLVD FIBER OPTIC SCHEMATIC
46-47	SH 183 WB AND EB AT AMERICAN BLVD DMS LAYOUT
48	SH 183 WB AND EB AT AMERICAN BLVD FIBER OPTIC SCHEMATIC
49	SH 183 WB AT COUNTY LINE RD DMS LAYOUT
50	SH 183 WB AT COUNTY LINE RD FIBER OPTIC SCHEMATIC
51	SH 199 NB AT FM 1886/CONFEDERATE PARK RD DMS LAYOUT
52	SH 199 NB AT FM 1886/CONFEDERATE PARK RD FIBER OPTIC SCHEMATIC
53	SH 199 SB AT DENVER TRAIL DMS LAYOUT
54	SH 199 SB AT DENVER TRAIL FIBER OPTIC SCHEMATIC
55	IH 20 WB AT CAMPUS DR DMS LAYOUT
56	IH 20 WB AT CAMPUS DR FIBER OPTIC SCHEMATIC
57-58	IH 20 EB AND WB AT JAMES AVE DMS LAYOUT
59	IH 20 EB AND WB AT JAMES AVE FIBER OPTIC SCHEMATIC
60-61	IH 20 EB AT TRAIL LAKE DR DMS LAYOUT
62	IH 20 EB AT TRAIL LAKE DR FIBER OPTIC SCHEMATIC
63-64	IH 20 WB AT GRANBURY RD DMS LAYOUT
65	IH 20 WB AT GRANBURY RD FIBER OPTIC SCHEMATIC
66	SH 114 EB AT KIMBALL AVE DMS LAYOUT
67	SH 114 EB AT KIMBALL AVE FIBER OPTIC SCHEMATIC
68	SH 121 SB AT BASS PRO DR DMS LAYOUT
69	SH 121 SB AT BASS PRO DR FIBER OPTIC SCHEMATIC
70	IH 820 WB AT MARK IV PKWY DMS LAYOUT
71	IH 820 WB AT MARK IV PKWY FIBER OPTIC SCHEMATIC

SHEET	DESCRIPTION
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73	IH 820 EB AT MARINE CREEK PKWY FIBER OPTIC SCHEMATIC
74	IH 820 SB AT WESTPOINT BLVD DMS LAYOUT
75	IH 820 SB AT WESTPOINT BLVD FIBER OPTIC SCHEMATIC
76	IH 35W NB AND SB AT FELIX ST DMS LAYOUT
77	IH 35W NB AND SB AT FELIX ST FIBER WIRELESS SCHEMATIC
78	IH 35W NB AND SB AT ALTAMESA BLVD DMS LAYOUT
79	IH 35W NB AND SB AT ALTAMESA BLVD FIBER OPTIC SCHEMATIC
80	IH 35W SB AT RISINGER RD DMS LAYOUT
81	IH 35W SB AT RISINGER RD FIBER OPTIC SCHEMATIC
82	IH 35W NB AT HIDDEN CREEK PKWY DMS LAYOUT
83	IH 35W NB AT HIDDEN CREEK PKWY WIRELESS SCHEMATIC
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THE STANDARD SHEETS, SPECIFICALLY IDENTIFIED IN THIS SHEET, HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
102185
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Dhruva Lahon

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DMS REPLACEMENT
INDEX

SHEET 1 OF 1

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GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
HHK	TEXAS	FTW	TARRANT	2
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
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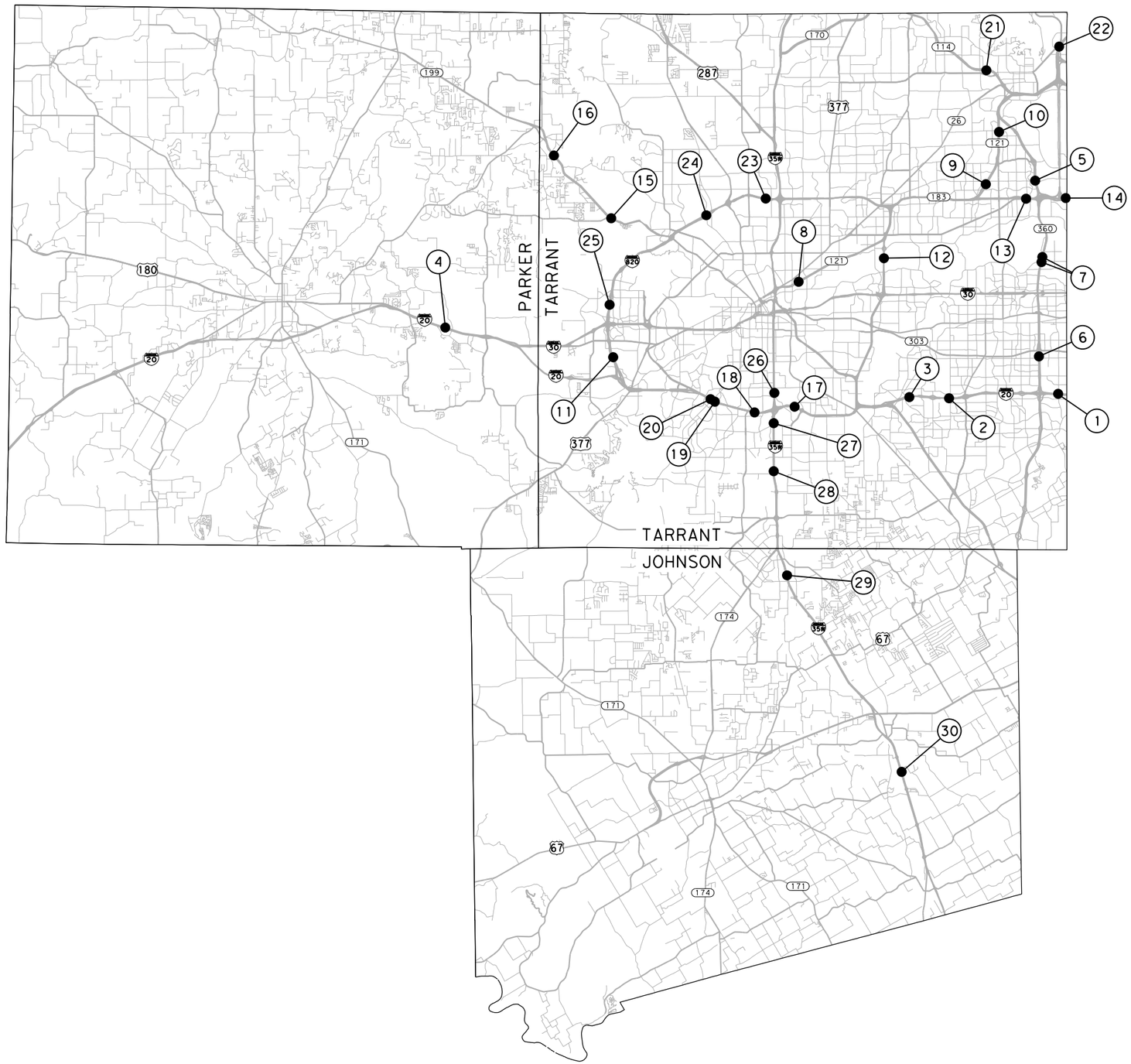
BY: Nate.Taylor



NOT TO SCALE

LEGEND

● DMS LOCATIONS

SHEET NO.	SITE NO.	DMS LOCATIONS
17	1.	IH 20 WB AT GREAT SW PKWY
19	2.	IH 20 EB AT BOWEN RD
21	3.	IH 20 EB AT GREEN OAKS BLVD
24	4.	IH 20 WB AT CHUCKWAGON TRAIL
26	5.	SH 360 SB AT HARWOOD RD
28	6.	SH 360 SB AT ARKANSAS LN
30	7A.	SH 360 NB AT GREEN OAKS PKWY
31	7B.	SH 360 SB AT GREEN OAKS PKWY
34	8.	SH 121 NB AND SB FAIRVIEW ST
37	9.	SH 121 NB AND SB HARWOOD RD
39	10.	SH 121 NB AT HALL JOHNSON RD
41	11.	IH 820 NB AT CHAPIN RD
44	12.	IH 820 NB AND SB AT TRINITY BLVD
46	13.	SH 183 WB AND EB AT AMERICAN BLVD
49	14.	SH 183 WB AT COUNTY LINE RD
51	15.	SH 199 NB AT FM 1886/CONFEDERATE PARK RD
53	16.	SH 199 SB AT DENVER TRAIL
55	17.	IH 20 WB AT CAMPUS DR
57	18.	IH 20 EB AND WB AT JAMES AVE
60	19.	IH 20 EB AT TRAIL LAKE DR
63	20.	IH 20 WB AT GRANBURY RD
66	21.	SH 114 EB AT KIMBALL AVE
68	22.	SH 121 SB AT BASS PRO DR
70	23.	IH 820 WB AT MARK IV PKWY
72	24.	IH 820 EB AT MARINE CREEK PKWY
74	25.	IH 820 SB AT WESTPOINT BLVD
76	26.	IH 35W NB AND SB AT FELIX ST
78	27.	IH 35W NB AND SB AT ALTAMESA BLVD
80	28.	IH 35W SB AT RISINGER RD
82	29.	IH 35W NB AT HIDDEN CREEK PKWY
84	30.	IH 35W NB AT CR 204

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
102185
LICENSED
PROFESSIONAL ENGINEER

Dhruva Lahon

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DMS REPLACEMENT
KEYMAP

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
HHK	6	SEE TITLE SHEET		VA
GRAPHICS HHK	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	3
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276?\FTW_DMS_KEY_01.dgn
BY: Nate.Taylor

Project Number: C 902-90-111

County: Tarrant **Control:** 0902-90-111

Highway: VA

General Notes – Intelligent Transportation Systems (ITS)

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

Theresa Poer, P.E. theresa.poer@txdot.gov
Carlos Molina, P.E. carlos.molina@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals.

All contractor questions will be reviewed by the Engineer. 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/

All 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, CCSJ/Project Name.

Basis of Estimate

Item	Description	Rate	Unit
166	Fertilizer (16-8-8)	600 lb./acre**	ton
168	Vegetative Watering	169,400 gal./acre	1,000 gal.

** Non-Pay, for Contractor's Information Only.

The major component of the ITS system consist of the replacement of Dynamic Message Signs (DMS).

Furnish and install all incidental work, material and services not explicitly called for in the specifications or not shown in the plans, which may be necessary for a complete and properly functioning ITS system.

The quantities provided in the sheet summary tables and general notes are estimates to be used for Contractor information only and may not reflect the actual quantities required to accomplish this project.

The contractor is responsible for picking up materials furnished by the State at 2501 SW Loop 820, Fort Worth, TX 76133. Contact the TxDOT Signal Shop at 817-370-3664 seventy-two (72) hours in advance.

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Highway: VA

Perform all work in this project in a manner acceptable to and approved by the Engineer.

Contact Texas excavation safety system at 1-800-dig-tess or 1-800-344-8377, and TxDOT Signal Shop at 817-370-3664 prior to beginning any excavation work in the area of existing utilities, to prevent any damage or interference with present facilities.

Provide TxDOT with confirmation tickets of utility and line locates.

Contact the utility companies or the utility coordinating committee for exact locations prior to any work that might interfere with or damage present facilities. Verify the locations of all existing underground installations that would conflict with the new conduit prior to construction to avoid conflict or damage to utilities. Contact the respective utility company 72 hours prior to excavating. Coordinate with the respective utility company for any adjustment necessary to the utility. Contractor shall pothole the locations that conflict with utilities. Contractor is responsible for utility coordination, locates, and potholing at no additional expense to the State.

Replace within 48 hours all existing underground and above ground installations damaged by Contractor's forces during construction at no cost to the state.

Procure all permits and licenses. Permit the electrical work to be inspected by the State.

The Engineer shall approve the starting date for system acceptance testing and, if required, shall terminate the system testing because of malfunctions or obvious unsuitability of the equipment.

Do not remove or relocate existing equipment in existing cabinets without the Engineer's approval. Install all necessary shelves, terminal panels, wiring, cabling, harnesses, etc. where new equipment is to be installed in existing cabinets. All costs associated with these cabinet modifications shall be considered subsidiary to the various bid items.

The locations of all ground boxes shall be as shown on the plans and may be moved only as approved by the Engineer in writing.

Maintain the median of the freeway in a serviceable condition, free of obstructions, and acceptable to the Engineer. Take special care to eliminate hazards to the traveling public.

Remove any obstructions to existing drainage due to the Contractor's operation as required at the Contractor's entire expense.

Do not mix materials, store materials, store equipment, or repair equipment on top of concrete pavement or bridge decks. Remove all construction related debris from the R. O. W. to a dump site approved by the Engineer in writing.

Replace all pavement, shoulders, and metal beam guard fence damaged by Contractor's forces during construction at no cost to the state.

Ensure existing curb, and curb and gutter is not discolored or damaged during construction operations. In the event of discoloration or damage, clean, replace, or repair as directed, at no cost to the State.

All Contractor's vehicles shall be clearly identified with company name plates when working on the project.

All materials, which are deemed salvageable by the Engineer, shall be the property of the Department and shall be transported to, and stored at TxDOT's Signal Shop, 2501 SW Loop 820, Fort Worth, TX 76133.

Item 7. Legal Relations and Responsibilities

No significant traffic events identified.

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with article 8.3.1.1. 'Five-Day Workweek.'

The start of work will be delayed 120 calendar days after the authorization date to begin work to allow time for the procurement of materials.

Item 8.5. Project Schedules

Contractor shall submit Critical Path Method (CPM) schedule in bar chart format in accordance with 8.5.5.2. Submit preliminary schedule in accordance with 8.5.5.2.1. Submit progress schedule in accordance with 8.5.5.2.3. The Estimate will be held if monthly update is not submitted.

Item 162. Sodding for Erosion Control

Furnish and place Bermudagrass sod if the adjacent grass is Bermuda. Furnish and place St. Augustine if the adjacent grass is St. Augustine.

Item 166. Fertilizer

Fertilize all areas of project to be sodded.

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Item 168. Vegetative Watering

Furnish and install an approved rain gauge at the project site, as directed. Furnishing and installation of the rain gauge will not be paid for directly, but will be subsidiary to Item 168.

Apply vegetative watering for an establishment period of thirteen weeks following installation of sod, at a rate of 1/2 inch of water depth per week (approximately 13,030 gallons per acre). During the first four weeks after sodding, apply water twice per week, on non-consecutive days, each at half the weekly application rate. For the remainder of the establishment period, apply vegetative watering once per week during the months of January through June or September through December, at the weekly application rate; apply watering twice per week, on non-consecutive days during the months of July and August, each at one-half the weekly application rate.

Average weekly rainfall rates for the District are:

January—0.39"	April—0.86"	July—0.48"	October—0.68"
February—0.46"	May—1.00"	August—0.47"	November—0.46"
March—0.48"	June—0.63"	September—0.74"	December—0.37"

Item 400. Excavation and Backfill for Structures

Drilling, boring, and trenching through any type of rock or soil is subsidiary to the various bid items. No additional compensation will be paid to the contractor for the removal of rock or any other obstruction during excavation, trenching, jacking, boring, or drilling and for any additional equipment, materials, labor, tools, or incidentals required to complete the work.

Item 421. Hydraulic Cement Concrete

Notify the TxDOT Signal Shop 48 hours in advance of placing concrete. Do not place concrete without an inspector present unless approved.

Contractor personnel performing job-control (QC) testing on concrete must be ACI certified and maintain certification. Provide a copy of all personnel certification papers to the Engineer at the preconstruction meeting. The Engineer may require the Contractor's testers to provide the certification papers upon arrival before testing at the job site. Certified testers will be required to participate with certified TxDOT personnel annually for slump (Tex-415-A), air content (Tex-416-A), compression testing (Tex-418-A), and capping cylinders (Tex-450-A) to retain their certification on TxDOT projects.

Contractor shall furnish a hard copy of all testing equipment calibration reports at the preconstruction meeting when non-TxDOT equipment is used to test concrete. Furnish updated

reports as equipment is calibrated through the project contract. The calibration frequency will match TxDOT's and will apply for each piece of equipment as follows:

Slump Cone – Annual
Air Meter – Every 3 Months
Compression Tester – Annual
Beam Breaker – Annual

The Engineer may allow the use of local commercial laboratories under contract to provide these services. The Commercial Laboratory must fulfill requirements listed above prior to performing any work.

Item 429 and Item 780. Concrete Structure Repair and Concrete Crack Repair

The subsidiary items shall consist of, but is not limited to the following:

- Painting of repaired structure

Quantities for subsidiary items are as shown on the plans.

Use materials from prequalified producer list as shown on the Texas Department of Transportation (TxDOT) materials producer list, category "Concrete Surface Finishes." No payment shall be made directly for all the above mentioned work, or other incidentals required to complete the work, but shall be considered subsidiary to this Item.

Item 502. Barricades, Signs and Traffic Handling

Do not close a freeway lane, shoulder, or ramp during the peak hours of 6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 7:00 p.m. weekdays.

Provide minimal interference to traffic during construction operations.

One week prior to any intermediate-term ramp or roadway lane closures, place message boards or sign panels, as shown on the plans or as directed by the Engineer, to inform the public of such closure.

The following Holiday/Event lane closure restriction requirements apply to this project:

No work that restricts or interferes with traffic shall be allowed between 3 PM on the day preceding a Holiday or Event and 9 AM on the day after the Holiday or Event.

Holiday Lane Closure Restrictions	
New Year's Eve and New Year's Day (December 31 through January 1)	3 PM December 30 through 9 AM January 2

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Easter Holiday Weekend (Friday through Sunday)	3PM Thursday through 9 AM Monday
Memorial Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Independence Day (July 3 through July 5)	3 PM July 2 through 9 AM July 6
Labor Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday
Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

Plan work schedules around the appropriate dates above to ensure productive work is performed without lane closures.

Do not leave excavation open overnight.

Do not reduce existing number of lanes open to traffic. Exceptions will only be made during off-peak hours as shown on the plans, or as approved by the Engineer. The Engineer may direct that operations be curtailed or halted out of consideration for traffic expected to and from public gatherings, which in his opinion may result in undue traffic congestion and delays to the traveling public.

Two weeks prior to any alterations of traffic patterns, provide the Engineer, for his approval, a layout showing all signs, barricades, striping and signalization.

The Engineer may request additional signing not shown and this will be considered subsidiary to the pertinent bid items.

A qualified flagger may be required during certain phases of construction, and shall be equipped with the proper reflective clothing and two-way radios, as directed by the Engineer. Notify the proper city traffic and transportation Department officials when major traffic changes are to be made. The notification must be made three days prior to the change. Use plastic drums in accordance with the plans and manufacturer's recommendations as approved by the Engineer.

Close one adjacent lane in both directions, as directed by the Engineer, at locations where the Contractor is required to replace DMS signs in the center median.

Existing signs are to remain as long as they do not interfere with construction and they do not conflict with the traffic control plan.

Any sign not detailed in the plans but called for in the layout shall be as shown in the current "Standard Highway Sign Designs for Texas".

When traffic is obstructed, arrange warning devices in accordance with arrangements indicated in the latest edition of the "Texas Manual on Uniform Traffic Control Devices".

The contractor force account "safety contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the traffic control plan that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the engineer and the contractor's responsible person based on weekly or more frequent traffic management reviews on the project. The engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

The SW3P for this project will consist of using the following items as directed:

- Erosion control logs

Remove accumulated sediment or replace SW3P controls when the capacity has been reduced by 50% or when the depth of sediment at the control structure exceeds one foot.

Item 618. Conduit

The subsidiary items shall consist of, but is not limited to the following:

- Removal of conduit

Quantities for subsidiary items are as shown on the plans.

No payment shall be made directly for all the above mentioned work, or other incidentals required to complete the work, but shall be considered subsidiary to this Item.

Use materials from prequalified producer list as shown on the Texas Department of Transportation (TxDOT) materials producer list, category "Roadway Illumination and Electrical Supplies."

Place conduit runs behind curbs at all locations where curbs exist.

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Place conduit along the frontage road a minimum clearance of six (6) feet from the back of curbs, unless such clearance shall interfere with "straight through" conduit placement, conflict with retaining walls or utilities, or introduce additional or unnecessary right angle bends into the cable path. Adjust, with Engineer's approval, the placement of conduit and ground boxes to ensure the "straight through" conduit concept and avoid the aforementioned interference; conflict, or introduction of additional, unnecessary bends.

Install a continuous bare or green insulated copper wire no. 8 AWG or larger in every conduit throughout the electrical system in accordance with the electrical detail sheets, and the latest edition of the National Electrical Code.

For power carrying conduit, provide a continuous grounded system. If PVC or HDPEC is used, the continuous system shall be accomplished by running 1-#8 AWG bare copper wire in conduit between foundations and grounding it at each foundation ground rod. If rigid metal conduit is used, it shall be bonded to form a continuous system.

After installing conduit and pulling conductor or communication cable or after pulling conductor or communication cable in existing conduit, leave a high tensile strength polyester fiber pull tape in the conduit for future use. Subsidiary to Item 618.

All conduit elbows and rigid metal extensions required to be installed on PVC conduit systems will not be paid for separately, but will be considered subsidiary to various bid items.

High-density polyethylene (HDPE) pipe may be threaded and used with threaded PVC connectors or couplings.

PVC conduit systems that snap or lock together without glue that are designed and UL listed to be used for bored PVC electrical conduit applications will be allowed for bored PVC schedule 80, when approved by the Engineer.

No additional compensation will be paid to the Contractor when these specific purpose conduit systems are substituted for this purpose.

Place conduit under existing pavement at a minimum depth of four (4) feet below the pavement surface.

If the Contractor is required to place conduit under existing riprap, remove and replace riprap according to Item 432, "Riprap," except for measurement and payment. Replace riprap to a depth and finish matching that of the original riprap. Measurement and payment for riprap shall be subsidiary to Item 618 and no additional payment shall be made for this work.

Seal all conduits in the cabinets and in the ground boxes with expandable urethane foam.

Place cables in conduit to provide maximum use of each conduit's capacity, as defined by the NEC. Each conduit shall be completely filled, according to NEC guidelines, before cables may be placed in another conduit; however, the Contractor is still responsible for mandated cable separations as directed by the Engineer (e.g., placing power cables in separate conduit from communications cables).

Backfill all open trench/excavation by dusk. Do not leave any open trench/excavation overnight.

The plans show the conduits numbered and specific cables in specific conduits. The purpose of these notes is to instruct the Contractor on how to group the cables in the conduits and not to specify the exact conduit that is to carry the cables i.e., the numbering system used is arbitrary and may be set by the Contractor with Engineer's approval.

Drilling, boring, and trenching through any type of rock or soil is subsidiary to the various bid items. No additional compensation will be paid to the contractor for the removal of rock or any other obstruction during excavation, trenching, jacking, boring, or drilling and for any additional equipment, materials, labor, tools, or incidentals required to complete the work.

Item 620. Electrical Conductors

Do not use non-certified persons to perform electrical work. Electrical certification for this project will be as per Item 7 of the current Texas Standard Specifications and any Special Provisions to Item 7.

All cable ties shall be securely fastened by rivet or other mechanical means. Do not use double-sided adhesive stick-ons or pressure clamps.

Include extra cable length in each run to provide adequate slack at each ground box or cabinet, as determined by the Engineer.

Furnish and attach compression type connectors with a compression mechanical release hand crimping tool to each individual conductor before making connections to all terminal strips.

All electrical work shall be in conformance with latest edition of the National Electrical Code (NEC), and TxDOT Standards.

Bonding conductors no. 6 and smaller, tied to ground rods, shall be solid. Connection of bonding conductor to ground rod shall be made using UL listed connectors designed for such purpose.

All power conductors, shielded twisted wire pair cables, coax cables, control cables, and fiber optic cables shall be color-coded consistently or permanently labeled between all connections

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and splices to ensure immediate identification. Submit a chart or list identifying all cables and conductors in a logical and sequential manner prior to installation for the Engineer's approval.

All conductors shall be continuous without splices from terminal point to terminal point or otherwise as directed by the Engineer.

Splices, in locations permitted by the Engineer, shall be made in accordance with the ED(3)-14 sheet.

When pulling cables, conductors or innerducts through conduit, lubricate the cables, conductors or innerducts with a lubricant generally used for this purpose. The lubricant shall be non-aqueous, non-toxic and non-conductive and shall not harm the conduit or the insulation of cable.

Test each wire of each cable or conductor before and after installation. Any incomplete circuit or damage to any wire or cable will be cause for immediate rejection of the entire cable being tested. Remove and replace the rejected cable at Contractor's own expense.

Bond the grounding conductors that share the same conduit, junction box, ground box or structure together at every accessible point in accordance with the electrical detail sheets, and the latest edition of the National Electrical Code, and as per TxDOT Standards.

All circuits shall test clear of faults, grounds and open circuits.

Use ratchet type crimp tools to install connectors and terminations on all type of cables.

Item 628. Electrical Services

Locations of service poles as shown on the layouts are approximate. Contact the electric provider for electric service and for exact locations. Locations of the service poles are subject to approval by the Engineer. The service pole for each location shall supply 120/240v/ 3 wire single phase circuit.

The street address of the electrical service and "Surveillance" will be stenciled in one inch high black letters on the cover of the service enclosure.

Do not apply power to service poles until approved by the Engineer. Verify all power locations. Place a decal stating "Danger/High Voltage ARC Flash" on the cover of the enclosure above the street address of the electrical service and surveillance lettering. The size of the decal and lettering shall be as approved by the Engineer.

No photo-electric control, lighting contactor and control unit- "manual-off-automatic" shall be needed in the service pole.

Before installing any electrical service, verify all metering equipment requirements with the electric service provider. The Contractor shall provide a commercial grade, meter base with by-pass switch as part of this item when required by the electric provider.

Verify existing service or activate the service, if necessary, as directed by the Engineer.

All work and incidentals performed, as described, shall not be paid for directly but shall be considered subsidiary to Item 628.

Item 6001. Portable Changeable Message Signs

Provide all portable changeable message signs and arrow panels with a photoelectric device to allow for automatic dimming of operations to approximately 50% of their normal brightness when ambient light drops to approximately five footcandles, and then increase back again for daytime operations.

Four electronic portable changeable message sign units will be required. Individual or collective use of signs will be required by the Engineer when deemed necessary to supplement the traffic control plan.

Each sign must have programmed in its permanent memory the following 15 messages:

1. Exit Closed Ahead
2. Use Other Routes
3. Right Lane
4. Left Lane
5. Closed Ahead
6. Two Lane
7. Detour Ahead
8. Thru Traffic
9. Prepare To Stop
10. Merging Traffic
11. Expect 15 Minute Delay
12. Max Speed ** MPH
13. Merge Right
14. Merge Left
15. No Exit Next ** Miles

Item 6005. Testing, Training, Documentation, Final Acceptance and Warranty.

It is the policy of the Department to require performance testing of all materials and equipment not previously tested and approved. If technical data is not considered adequate for approval,

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samples may be requested for test by the Engineer. The contract period will not be extended for time lost or delays caused by testing prior to final Department approval of any items.
Four (4) complete sets of operation and maintenance manuals shall be provided prior to the installation of the equipment. Schematics shall be updated at the end of the job to show "as-built" condition.

Item 6007. Intelligent Transportation System (ITS) Fiber Optic Cable

The subsidiary items shall consist of, but is not limited to the following:

- Fiber optic jumpers with ST connectors
- Fiber optic jumpers with ST to LC connectors
- Connecting harnesses of appropriate length and terminated with matching connectors for interconnection with communications system equipment.
- 12 connector fiber preterminated patch panels
- 12 SM fibers pigtail cable
- Installation or replacement of SFPs
- Removal or relocation of preterminated patch panels
- Relocation of fiber optic interconnect housings
- Cat6 cable

Quantities for subsidiary items are as shown on the plans.

Furnish and install factory preterminated simplex connector patch panel modules with integrated pigtail cable in a protective housing at locations called for in the plans to accommodate the cables being terminated at that point. Furnish patch panel housing with an epoxy fill material that is environmentally and temperature stable to permanently secure the connectors and the cable inside the housing to protect the fiber optic components from vibration and shock. Provide housing with strain relief boot around the exiting pigtail cable to provide bend radius protection and short term retention of at least 200 lbf. Provide housing with integrated mounting notches. Provide patch panel with ST connectors and dust caps installed by the manufacturer. Document the designation of each connector on labels and charts. Place charts in the cabinet in a heavy plastic envelope approved by the Engineer.

Replace the equipment damaged or lost at no cost to the Department.

The fiber optic cables will be installed in existing TxDOT conduits. However, if any relocation of existing cable is required to allow routing of cables installed on this project, it will be done by the Contractor and will be considered subsidiary to this Item.

Individually and uniquely identify the fiber optic cable in ground boxes and cabinets with durable, permanent, high visibility marking, such as reflective tape or label. This marking must identify the type of fiber optic cable (i.e. single-mode and fiber counts).

Maintain the integrity of the existing fiber optic and other cable systems. If the cables are damaged during construction, replace or repair the damaged cables, as directed by the Engineer, at Contractor's own expense. The replacement or repair method must be approved by the Engineer, prior to implementation. If the fiber optic cable is damaged, repair the damaged cable within 4 hours with Contractor's own force or be responsible to pay the third party for the repair. Depending on the severity of the damage, replace the damaged fiber, as directed by the Engineer, at Contractor's own expense. Maintaining the integrity of the existing fiber optic and other cable systems during the construction shall be subsidiary to this Item.

When shown in the plans and as directed by the Engineer, the fiber optic cable must be pulled with a continuous #8 AWG bare copper wire in the same conduit. Ensure that a 5 foot service loop of the #8 AWG bare copper wire is pulled up, coiled, and tied in each cabinet to provide conduit trace capability.

Furnish and install all necessary fiber optic jumpers with ST connectors, fiber optic jumpers with ST to LC connectors, and Cat6 cables at locations as shown in the plans and as directed by the Engineer. Fiber optic jumpers and Cat6 cables are subsidiary to this Item.

Removal or relocation of cables shall be paid by the length of the conduit run regardless of number of cables and type in the conduit run, and shall not be paid by each cable removed.

No payment shall be made directly for all the above mentioned work, or other incidentals required to complete the work, but shall be considered subsidiary to this Item.

Item 6010. Closed Circuit Television (CCTV) Field Equipment

This item shall also include, but is not limited to the following subsidiary items:

- Connecting harnesses of appropriate length and terminated with matching connectors for interconnection with communications system equipment
- Removal of CCTV Cat cables
- Removal of CCTV multi-conductor cables
- Removal of radio cable
- Cat6 cables
- CCTV multi-conductor cables
- Relocation of local control units or video communication junction box
- Relocation of Digital Video Encoders
- Relocation of PoE Injectors

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- Removal and relocation of mounting supports.

Existing non-PTZ CCTV cameras for the over height detection, if removed, they will need to be aligned with assistance from the TxDOT operation's staff

No payment shall be made directly for all the above mentioned work and for the subsidiary items furnished and installed, materials, or other incidentals required to complete the work, but shall be considered subsidiary to this Item.

Item 6027. Preparation of Existing Conduits, Ground Boxes, or Manholes

Fill around conduit the voids or abandoned concrete openings with concrete grout in all ground boxes with concrete walls.

The existing ground boxes are welded shut, buried, or sealed with a concrete pad. The Contractor shall be responsible for access to the existing ground boxes and restoring to original photographically documented conditions (by the Contractor); this includes any removals necessary to access the ground box as well as concrete, welding, repairing galvanized welded areas in accordance with Item 445 "Galvanizing," etc. to establish ground box lid to original conditions after fiber or conductor cable work is complete. The Contractor is responsible for the security of both new and existing ground boxes and ground box contents such as wiring, fiber optic cables, splice closures, etc. while they are uncovered or not welded. ITS ground boxes will be sealed by tack welding two corners for at least two inches on each side after work is completed and the seals galvanized.

No payment shall be made directly for all the above mentioned work, materials, or other incidentals required to complete the work, but shall be considered subsidiary to this item.

Item 6028. Installation of Dynamic Message Sign System

The subsidiary items shall consist of, but is not limited to the following:

- DMS mounting supports
- DMS ground mounted cabinets installation
- Concrete foundation for DMS ground mounted cabinets
- DMS cabinet supports
- Installation of pole mounted DMS cabinets including enlarging of holes on DMS tower and installation of couplings, LB connectors, Rigid Metal Conduit.
- Adjustment of existing walkway platforms, safety rails, and supports
- LFMC conduits
- Junction boxes

- J-Bolts, Bolts, Nuts, Washers, and all the hardware needed for the installation of the DMS and cabinets.
- Relocation of Ethernet Switches
- Cat 6 Cables
- Installation of Cat5e cables
- 6 strand factory terminated MM fiber optic jumpers
- Removal of over height detector power cable
- Over height detector power cable

Quantities for subsidiary items are as shown on the plans.

The Contractor is responsible for all DMS signs, DMS cabinets, and their components during receiving, storage, transportation, and final installation. If any of the DMS signs, DMS cabinets, or their components are damaged, the Contractor will be required to repair or replace the damaged DMS signs, DMS cabinets, or their components at the Contractor's expense

Furnish and install all items, materials, hardware, and incidentals, whether or not specifically shown on the plans which may be necessary for the installation of the DMS and DMS cabinets including but not limited to DMS mounting supports, Concrete Foundations, DMS cabinet supports, junction boxes, Liquidtight Flexible Metal Conduit (LFMC), and modifications to the walkway platform, platform supports, and safety rail.

Any galvanizing coating damaged during removal and reinstallation, shall be touched up by the Contractor per DMS 8103.

Contractor shall maintain the existing vertical clearance at all DMS sign locations.

Relocate the Hardened Ethernet Switches as shown in the plans or as directed by the Engineer and make the equipment functional.

The existing Over height detector installed on the DMS tower cannot be misaligned, moved, bumped, or anything else. It is set for a certain height as provided by survey for the over height detection. If the over height detector is misaligned, moved, or bumped, the Contractor is responsible for aligning and making it functional at the Contractor's expense and as directed by the Engineer. If the over height detector is damaged the Contractor is responsible for replacing, installing, aligning, and making it functional at the Contractor's expense.

No payment shall be made directly for all the above mentioned work and for the subsidiary items furnished and installed, materials, or other incidentals required to complete the work, but shall be considered subsidiary to this Item.

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Item 6062. Intelligent Transportation System (ITS) Radio

This item shall also include, but is not limited to the following subsidiary items:

- Connecting harnesses of appropriate length and terminated with matching connectors for interconnection with communications system equipment.
- Removal of Cat cables
- Cat6 cables
- Coax cables
- Removal and relocation of antennas.
- Removal of Yagi antennas and supports
- Removal of Yagi antenna cables
- Removal of ethernet switches
- Removal and relocation of mounting supports

Quantities for subsidiary items are as shown on the plans.

No payment shall be made directly for all the above mentioned work and for the subsidiary items furnished and installed, materials, or other incidentals required to complete the work, but shall be considered subsidiary to this Item.

Item 6185. Truck Mounted Attenuators (TMA)

No additional shadow vehicle(s) with TMA other than those shown in the TCP Standard Sheets and as detailed on the General Note(s) of these Standard Sheets.

Therefore, 2 total shadow vehicles with TMA will be required for this type of work. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Item 6304. Radar Vehicle Sensing Device (RVSD)

This item shall also include, but is not limited to, the following subsidiary items:

- Connecting harnesses of appropriate length and terminated with matching connectors for interconnection with communications system equipment
- RVSD cable(s) (regardless of number of cables required)
- Removal of RVSD cable(s)(regardless of number of cables)
- Relocation of power supplies and communication modules
- Power supplies and communication modules mounting hardware
- Relocation of Serial Server Units

Quantities for subsidiary items are shown on the plans.

Relocate the Serial Server Units as shown in the plans or as directed by the Engineer and make the equipment functional.

No payment shall be made directly for all the above mentioned work and for the subsidiary items furnished and installed, materials, or other incidentals required to complete the work, but shall be considered subsidiary to this Item.

Item 6331. Remove Dynamic Message Sign System

This item shall also include, but is not limited to, the following subsidiary items:

- Removal of pole mounted cabinets
- Removal of power and communication cables from pole mounted cabinet to DMS sign
- Removal of fiber optic interconnect housings
- Removal of Serial Server Units

Quantities for subsidiary items are shown on the plans.

No payment shall be made directly for all the above mentioned work or other incidentals required to complete the work, but shall be considered subsidiary to this Item.

The removal of the truss and tower, for all the DMS locations, is not required for this project.

Maintain the integrity of the existing trusses, towers, concrete columns, concrete beams, bolts, conduits, and junction boxes. If any of these systems are damaged, the Contractor will be required to repair or replace the damaged trusses, towers, concrete columns, concrete beams, bolts, conduits, or junction boxes at the Contractor's expense. The replacement or repair method must be approved by the Engineer, prior to implementation. Maintaining the integrity of the existing systems during the work shall be subsidiary to this Item.

Miscellaneous

TxDOT personnel will verify network communications to the work site from an appropriate ITS cabinet, satellite building, or from TransVision. If network communications fail, the Contractor will correct the fault so that successful communication is established. The Contractor will correct all problems related to his work which develop during the test at no additional cost to the state.

Reference to any specific manufacturer's name, make or number for any item of equipment or material necessary to meet the requirements of the specifications and the plans is intended to be descriptive but not mandatory and is intended to indicate the type of equipment or materials that

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will be acceptable. The type of equipment or materials that will be acceptable shall be subject to acceptable test results, by the Engineer or his named representative, at the time of product installation. However, provide all like items on this contract to be identical and from the same manufacturer.

Within thirty days after the authorization to begin work, provide four copies of descriptive manuals and brochures for each type of electronic equipment and apparatus proposed for this project. These documents shall contain sufficient technical data for complete evaluation. Incomplete submittals will not be accepted. Describe the quality, function and capability of each deliverable item. Submit originals or copies equal in quality to the originals manuals or brochures. Where a brochure describes several similar items, highlight the specific item being submitted. Where an item has several options or accessories, highlight the options or accessories he intends to deliver. Bond all manuals, brochures, and data sheets relating to a bid item together in a folder. Identify on the cover with the TxDOT contract number, title and bid item number. Submit four copies of detailed equipment submittals and shop drawings for each fabricated item proposed for this project within thirty days after the authorization to begin work. Submit these equipment submittals and drawings to contain all information required for complete evaluation and fabrication in accordance with the plans and specifications. Stamp the drawings with Contractor's approval, sequentially numbered and identified as to TxDOT contract number, title and bid item number.

The Engineer, upon approval of the above submittals, will indicate any correction to the details in the submittals.

Correct any errors in the submittals, as directed by the Engineer, and if required, shall resubmit to the Engineer four copies of the same. Begin work upon approval of the corrected drawings and equipment. No change will be permitted in the list of equipment or shop drawings once approved, unless authorized by the Engineer in writing.

Equipment will not be accepted for delivery or any payment made until the equipment, materials lists and shop drawings have been approved by the Engineer. Approval by the Engineer does not relieve the Contractor of his responsibilities to meet the requirements of the specifications and plans.

The TxDOT, through its authorized representative, retains the right to inspect all structures, equipment and materials used in the project before, during and after installation, also the right to inspect the work during the process of fabrication or manufacture for the purpose of determining if the plans and specifications upon which the award was made are being complied with and being satisfied as to quality of the material and workmanship. Such inspection will not release the manufacturer from strict compliance with specifications when the work is finally completed and offered for acceptance.

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Provide each field cabinet with three copies of the final as-built cabinet wiring diagrams. Deliver a mylar reproducible of the cabinet wiring diagrams showing all field changes incorporated by the Contractor to the Engineer.

Provide system support during the entire project. This includes any required design reviews, complete "parts and labor" on-site maintenance until final acceptance by the state, operational support during system integration and manufacturer's warranties and guarantees at no additional cost to the state.

Conduct design reviews of the entire ITS system as required, at no additional cost to the State. The Contractor is responsible for all new materials and equipment furnished and installed, as well as existing equipment modified as part of this contract, until final acceptance of the system. The Contractor is responsible for the replacement of equipment (including wire and fiber optic cable) that fails due to all causes including theft, vandalism, and "knock downs" until final acceptance of the system.

Designate an ITS supervisor who shall be responsible for the ITS project and serve as the Contractor's official contact with the Department. This ITS supervisor shall be on-site from the beginning of the ITS construction until final system acceptance. Supplement the ITS supervisor's support with the services of qualified Engineers and the services of vendor technical representatives for the duration of the project.

Upon final system acceptance, furnish a set of as-built plans which shall show the actual equipment installation and construction details.

Provide complete on-site parts and labor support for the furnishing and the installation of the Intelligent Transportation Systems for the duration of the entire project and during the warranty period. During the project, make any adjustments or repairs which may be required and correct any defects or damages that may occur at Contractor expense.

During the warranty period, furnish parts and labor required to repair, on-site, any manufacturer's defects (materials or workmanship), damage caused by manufacturer's defects and damage caused by the Contractor during the performance of warranty work. Natural disasters or other events not directly controllable by the Contractor are specifically exempted from warranty.

During the test period, make any adjustments or repairs which may be required and remedy any defects or damages that may occur at Contractor expense.

No time charges will be assessed during the 90 days test period, provided all other work is completed to the satisfaction of the Engineer.

QUANTITY SHEET

Texas Department of Transportation

CONTROLLING PROJECT ID 0902-90-111 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY Various

				CONTROL SECTION JOB	0902-90-111		TOTAL EST.	TOTAL FINAL
				PROJECT ID	A00064319			
				COUNTY	Tarrant			
				HIGHWAY	Various			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL			
	162-6002	BLOCK SODDING	SY	320.000		320.000		
	168-6001	VEGETATIVE WATERING	MG	12.000		12.000		
	429-6009	CONC STR REPAIR (STANDARD)	SF	1.000		1.000		
	432-6005	RIPRAP (CONC) (CL A)	CY	3.000		3.000		
	500-6001	MOBILIZATION	LS	100.00%		100.00%		
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	11.000		11.000		
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	120.000		120.000		
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	120.000		120.000		
	618-6023	CONDT (PVC) (SCH 40) (2")	LF	340.000		340.000		
	618-6029	CONDT (PVC) (SCH 40) (3")	LF	330.000		330.000		
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	855.000		855.000		
	618-6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	130.000		130.000		
	618-6070	CONDT (RM) (2")	LF	35.000		35.000		
	620-6007	ELEC CONDR (NO.8) BARE	LF	1,690.000		1,690.000		
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	390.000		390.000		
	620-6009	ELEC CONDR (NO.6) BARE	LF	710.000		710.000		
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	2,020.000		2,020.000		
	620-6011	ELEC CONDR (NO.4) BARE	LF	3,165.000		3,165.000		
	620-6012	ELEC CONDR (NO.4) INSULATED	LF	8,375.000		8,375.000		
	620-6015	ELEC CONDR (NO.2) BARE	LF	2,935.000		2,935.000		
	620-6016	ELEC CONDR (NO.2) INSULATED	LF	10,005.000		10,005.000		
	620-6017	ELEC CONDR (NO.1) BARE	LF	5,165.000		5,165.000		
	620-6018	ELEC CONDR (NO.1) INSULATED	LF	17,775.000		17,775.000		
	620-6019	ELEC CONDR (NO.1/0) BARE	LF	700.000		700.000		
	620-6020	ELEC CONDR (NO.1/0) INSULATED	LF	2,100.000		2,100.000		
	620-6021	ELEC CONDR (NO.2/0) BARE	LF	2,595.000		2,595.000		
	620-6022	ELEC CONDR (NO.2/0) INSULATED	LF	8,040.000		8,040.000		
	620-6023	ELEC CONDR (NO.3/0) BARE	LF	540.000		540.000		
	620-6024	ELEC CONDR (NO.3/0) INSULATED	LF	1,620.000		1,620.000		
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	2.000		2.000		
	628-6002	REMOVE ELECTRICAL SERVICES	EA	16.000		16.000		
	628-6194	ELC SRV TY D 120/240 070(NS)SS(N)SP(O)	EA	7.000		7.000		
	628-6195	ELC SRV TY D 120/240 070(NS)SS(N)SP(U)	EA	3.000		3.000		
	628-6250	ELC SRV TY D 120/240 100(NS)SS(N)SP(O)	EA	3.000		3.000		
	628-6251	ELC SRV TY D 120/240 100(NS)SS(N)SP(U)	EA	2.000		2.000		
	628-6342	ELEC SRV TY D 120/240 125(NS)SS(N)PS(U)	EA	1.000		1.000		
	780-6004	CNC CRCK REPAR(DISCRETE)(ROUT AND SEAL)	LF	10.000		10.000		

QUANTITY SHEET

Texas Department of Transportation

CONTROLLING PROJECT ID 0902-90-111 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY Various

				CONTROL SECTION JOB	0902-90-111	TOTAL EST.	TOTAL FINAL
				PROJECT ID	A00064319		
				COUNTY	Tarrant		
				HIGHWAY	Various		
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	780-6006	CNC CRACK REPAIR (FLOOD)(GRAVITY)	SF	4.000		4.000	
	6000-6099	REPLACE CIRCUIT BREAKER	EA	12.000		12.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	275.000		275.000	
	6007-6050	FO CBL (36 SMF)	LF	14,105.000		14,105.000	
	6007-6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	20.000		20.000	
	6007-6094	FIBER OPTIC FUSION SPLICE	EA	426.000		426.000	
	6007-6102	RELOCATE FIBER OPTIC CABLE	LF	1,545.000		1,545.000	
	6007-6103	REMOVE FIBER OPTIC CABLE	LF	13,815.000		13,815.000	
	6010-6012	RELOCATE CCTV FIELD EQUIPMENT	EA	5.000		5.000	
	6027-6003	CONDUIT (PREPARE)	LF	24,905.000		24,905.000	
	6027-6008	GROUND BOX (PREPARE)	EA	131.000		131.000	
	6028-6001	INSTALL DMS (POLE MTD CABINET)	EA	31.000		31.000	
	6028-6002	INSTALL DMS (FOUNDATION MTD CABINET)	EA	7.000		7.000	
	6062-6018	ITS RADIO (SNGL)(5 GHZ)-I-U	EA	2.000		2.000	
	6062-6042	RELOCATE ITS RADIO	EA	4.000		4.000	
	6062-6043	REMOVE ITS RADIO	EA	5.000		5.000	
	6163-6002	REMOVE EXISTING CABLES (POWER)	LF	14,910.000		14,910.000	
	6185-6002	TMA (STATIONARY)	DAY	76.000		76.000	
	6186-6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA	3.000		3.000	
	6304-6005	ITS RVSD (DC ONLY) (RELOCATE)	EA	5.000		5.000	
	6331-6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	38.000		38.000	
	06	MATERIAL FURNISHED BY STATE	LS	1.000		1.000	
	08	SAFETY CONTINGENCY (NON-PART)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE (NON-PART)	LS	1.000		1.000	

QUANTITY SUMMARY

SHEET NO.	LOCATION	ITEM NO.	0162	0168	0429	0432	0500	0502	0506	0506	0618	0618	0618	0618	0618	0620	0620	0620	0620	0620	0620	0620	0620	0620	0620	0620
		CODE	6002	6001	6009	6005	6001	6001	6042	6043	6023	6029	6047	6054	6070	6007	6008	6009	6010	6011	6012	6015	6016	6017	6018	6019
		DESCRIPTION	BLOCK SODDING	VEGETATIVE WATERING	CONC STR REPAIR (STANDARD)	RIPRAP (CONC) (CL A)	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING	BIODEG EROSN CONT LOGS (INSTL) (18")	BIODEG EROSN CONT LOGS (REMOVE)	CONDT (PVC) (SCH 40) (2")	CONDT (PVC) (SCH 40) (3")	CONDT (PVC) (SCH 80) (2") (BORE)	CONDT (PVC) (SCH 80) (3") (BORE)	CONDT (RM) (2")	ELEC CONDR (NO. 8) BARE	ELEC CONDR (NO. 8) INSULATED	ELEC CONDR (NO. 6) BARE	ELEC CONDR (NO. 6) INSULATED	ELEC CONDR (NO. 4) BARE	ELEC CONDR (NO. 4) INSULATED	ELEC CONDR (NO. 2) BARE	ELEC CONDR (NO. 2) INSULATED	ELEC CONDR (NO. 1) BARE	ELEC CONDR (NO. 1) INSULATED	ELEC CONDR (NO. 1/0) BARE
		UNIT	SY	MG	SF	CY	LS	MO	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF
17	IH 20 WB AT S CREAT SW PKWY	ITS-01	16								20									440	2020			670	3720	
19	IH 20 EB AT S BOWEN RD	ITS-02	16								25					455				270	810					
21-22	IH 20 EB AT GREEN OAKS BLVD	ITS-03	16								20					300										700
24	IH 20 WB AT CHUCKWAGON TRAIL	ITS-04																		205	615					
26	SH 360 SB AT HARWOOD RD	ITS-05														25								470	1410	
28	SH 360 SB AT E ARKANSAS LN	ITS-06	16								10					75	210									
30	SH 360 NB AT NE GREEN OAKS BLVD	ITS-07A	16								45		80			60	180							595	1785	
31	SH 360 SB AT NE GREEN OAKS BLVD	ITS-07B	16									50						190	570							
34-35	SH 121 NB & SB AT FAIRVIEW ST	ITS-08	16									25	110		35							160	660	290	870	
37	SH 121 NB & SB AT HARWOOD RD	ITS-09														125		110	330					280	840	
39	SH 121 AT HALL-JOHNSON RD	ITS-10	16								15					40								530	1755	
41-42	IH 820 HB AT CHAPIN RD	ITS-11																				315	945			
44	IH 820 NB & SB AT TRINITY BLVD	ITS-12														10				110	330			220	660	
46-47	SH 183 EB & WB AT AMERICAN BLVD	ITS-13	32								60					60				270	810	410	1230			
49	SH 183 WB AT COUNTY LINE RD	ITS-14	16								10					30								490	1470	
51	SH 199 NB AT CONFEDERATE PARK RD	ITS-15														40				230	690					
53	SH 199 SB AT DENVER TRAIL	ITS-16														35						360	1080			
55	IH 20 WB AT CAMPUS DR	ITS-17	32								30	45		130												
57-58	IH 20 EB & WB AT JAMES AVE	ITS-18	16									40												245	1140	
60-61	IH 20 EB AT TRAIL LAKE DR	ITS-19				3					15	40										305	975			
63-64	IH 20 WB AT GRANBURY RD	ITS-20	32		1						20	70								1160	1660	145	540			
66	SH 114 EB AT S KIMBALL AVE	ITS-21														25								425	1275	
68	SH 121 SB AT BASS PRO DR	ITS-22	16										665			115										
70	IH 820 WB AT MARK IV PARKWAY	ITS-23														155						375	1125			
72	IH 820 EB AT MARINE CREEK PKWY	ITS-24														65								535	1605	
74	IH 820 SB AT WESTPOINT BLVD	ITS-25														40				185	555					
76	IH 35W & SB AT EAST FELIX ST	ITS-26	16								25									110	330			275	825	
78	IH 35W & SB AT ALTMESA BLVD	ITS-27	16								30	60										435	2160	140	420	
80	IH 35W SB AT RISINGER ROAD EAST	ITS-28														35						430	1290			
82	IH 35W NB AT E HIDDEN CREEK PKWY	ITS-29																		185	555					
84	IH 35W NB AT COUNTY ROAD 204	ITS-30	16								15							410	1120							
Total		TOTAL	320	12	1	3	1	11	120	120	340	330	855	130	35	1690	390	710	2020	3165	8375	2935	10005	5165	17775	700

+ SUBSIDIARY TO ITEM 6028
++ SUBSIDIARY TO ITEM 6062
+++ SUBSIDIARY TO ITEM 6304
++++ SUBSIDIARY TO ITEM 6007
+++++ SUBSIDIARY TO ITEM 628
6+ SUBSIDIARY TO ITEM 6010
7+ SUBSIDIARY TO ITEM 6027
8+ SUBSIDIARY TO ITEM 429, 780
9+ SUBSIDIARY TO ITEM 620
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

2/24/2021

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DMS REPLACEMENT
TOTAL SHEET QUANTITIES

SHEET 1 OF 4

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	6
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

PLOTTED: 2/24/2021
FILENAME: c:\pwworking\kho\pwproad\iman.rahim\dms42767\FTW_DMS_SHEET_QUANTITIES_01.dgn
BY: Iman.Rahim

QUANTITY SUMMARY

SHEET NO.	LOCATION	ITEM NO.	0620	0620	0620	0620	0620	0624	0628	0628	0628	0628	0628	0628	0780	0780	6000	6001	6007	6007	6007	6007	6007	6010	6027	6027
		CODE	6020	6021	6022	6023	6024	6010	6002	6194	6195	6250	6251	6342	6004	6006	6099	6001	6050	6087	6094	6102	6103	6012	6003	6008
		DESCRIPTION	ELEC CONDR (NO. 1/0) INSULATED	ELEC CONDR (NO. 2/0) BARE	ELEC CONDR (NO. 2/0) INSULATED	ELEC CONDR (NO. 3/0) BARE	ELEC CONDR (NO. 3/0) INSULATED	GROUND BOX TY D (1629221)W/ APRON	REMOVE ELECTRICAL SERVICES	ELC SRV TY D 120/240 070(NS)SS(N)SP(O)	ELC SRV TY D 120/240 070(NS)SS(N)SP(U)	ELC SRV TY D 120/240 100(NS)SS(N)SP(O)	ELC SRV TY D 120/240 100(NS)SS(N)SP(U)	ELC SRV TY D 120/240 125(NS)SS(N)PS(U)	CNC CRCK REPAR(DISCRETE)(ROUT AND SEAL)	CNC CRACK REPAIR (FLOOD)(GRAVITY)	REPLACE CIRCUIT BREAKER	PORTABLE CHANGEABLE MESSAGE SIGN	FO CBL (36 SMF)	FO SPLICE ENCLOSURE (TYPE 1)	FIBER OPTIC FUSION SPLICE	RELOCATE FIBER OPTIC CABLE	REMOVE FIBER OPTIC CABLE	RELOCATE CCTV FIELD EQUIPMENT	CONDUIT (PREPARE)	GROUND BOX (PREPARE)
		UNIT	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	LF	SF	EA	DAY	EA	EA	LF	LF	LF	EA	LF	EA
17	IH 20 WB AT S CREAT SW PKWY	ITS-01							1			1											75		1005	5
19	IH 20 EB AT S BOWEN RD	ITS-02							1		1									1	12	85			445	5
21-22	IH 20 EB AT GREEN OAKS BLVD	ITS-03	2100						1	1									1665	2	24		1535		2035	7
24	IH 20 WB AT CHUCKWAGON TRAIL	ITS-04															1							1	130	2
26	SH 360 SB AT HARWOOD RD	ITS-05														3	1			1	12	70			390	5
28	SH 360 SB AT E ARKANSAS LN	ITS-06		855	2565				1			1									12	80			775	6
30	SH 360 NB AT NE GREEN OAKS BLVD	ITS-07A							1				1						1610	2	36		1435		1350	4
31	SH 360 SB AT NE GREEN OAKS BLVD	ITS-07B							1	1									775	1	12		760		770	2
34-35	SH 121 NB & SB AT FAIRVIEW ST	ITS-08							1					1					2930	2	24		2805	2	2970	6
37	SH 121 NB & SB AT HARWOOD RD	ITS-09															1				24	180			360	3
39	SH 121 AT HALL-JOHNSON RD	ITS-10							1	1											24	180			610	4
41-42	IH 820 HB AT CHAPIN RD	ITS-11															1		2720	2	24		2565		2735	5
44	IH 820 NB & SB AT TRINITY BLVD	ITS-12													3		1				12	65			205	1
46-47	SH 183 EB & WB AT AMERICAN BLVD	ITS-13							2	2											12	170			1305	7
49	SH 183 WB AT COUNTY LINE RD	ITS-14							1		1										6	75			420	4
51	SH 199 NB AT CONFEDERATE PARK RD	ITS-15															1				12	85			160	2
53	SH 199 SB AT DENVER TRAIL	ITS-16															1				12	80			285	3
55	IH 20 WB AT CAMPUS DR	ITS-17		920	3015			1	1	1											12		180		830	4
57-58	IH 20 EB & WB AT JAMES AVE	ITS-18				540	1620										1		2305	2	24		2105		2100	16
60-61	IH 20 EB AT TRAIL LAKE DR	ITS-19							1		1				1				1660	2	24		1370		1365	11
63-64	IH 20 WB AT GRANBURY RD	ITS-20						1	1				1		3				440	2	24		385		655	3
66	SH 114 EB AT S KIMBALL AVE	ITS-21														1				1	12		70		360	4
68	SH 121 SB AT BASS PRO DR	ITS-22		820	2460															1	12		115		1330	2
70	IH 820 WB AT MARK IV PARKWAY	ITS-23															1				12	200			310	1
72	IH 820 EB AT MARINE CREEK PKWY	ITS-24															1				12	110		1	455	4
74	IH 820 SB AT WESTPOINT BLVD	ITS-25															1				12	85			115	2
76	IH 35W & SB AT EAST FELIX ST	ITS-26							1			1													230	
78	IH 35W & SB AT ALTMESA BLVD	ITS-27													3		1						355		430	4
80	IH 35W SB AT RISINGER ROAD EAST	ITS-28																			12	80			355	3
82	IH 35W NB AT E HIDDEN CREEK PKWY	ITS-29																						1	110	3
84	IH 35W NB AT COUNTY ROAD 204	ITS-30							1	1										1	12		60		310	3
Total		TOTAL	2100	2595	8040	540	1620	2	16	7	3	3	2	1	10	4	12	275	14105	20	426	1545	13815	5	24905	131

+ SUBSIDIARY TO ITEM 6028
++ SUBSIDIARY TO ITEM 6062
+++ SUBSIDIARY TO ITEM 6304
++++ SUBSIDIARY TO ITEM 6007
+++++ SUBSIDIARY TO ITEM 628
6+ SUBSIDIARY TO ITEM 6010
7+ SUBSIDIARY TO ITEM 6027
8+ SUBSIDIARY TO ITEM 429, 780
9+ SUBSIDIARY TO ITEM 620
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

2/24/2021

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DMS REPLACEMENT
TOTAL SHEET QUANTITIES

SHEET 2 OF 4

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	7
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 2/24/2021
FILENAME: c:\pwworking\kho\pwproad\iman.rahim\dms42767\FTW_DMS_SHEET_QUANTITIES_02.dgn
BY: Iman.Rahim

QUANTITY SUMMARY

SHEET NO.	LOCATION	ITEM NO.	6028	6028	6062	6062	6062	6163	6185	6186	6304	6331	*	*	***	*	11*	*	**	10*	****	**	****	***	****
		CODE	6001	6002	6018	6042	6043	6002	6002	6002	6005	6001													
		DESCRIPTION	INSTALL DMS (POLE MTD CABINET)	INSTALL DMS (FOUNDATION MTD CABINET)	ITS RADIO (SNGL)(5 GHZ)-I-U	RELOCATE ITS RADIO	REMOVE ITS RADIO	REMOVE EXISTING CABLES (POWER)	TMA (STATIONARY)	ITS GND BOX(PCAST) TY 1 (243636)W/ APRN	ITS RVSD (DC ONLY) (RELOCATE)	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	RELOCATE ETHERNET SWITCH	ETHERNET CABLE CAT 6	RVSD CONTROL CABLE	INSTALL DMS CAT 5E CABLE	REMOVE FIBER OPTIC INTERCONNECT HOUSING	6 STND FACTORY TERMINATED MM FO JUMPER	REMOVE YAGI ANTENNA CABLES	REMOVE CONDUIT	12 FIBER PRETERMINATED PATCH PANEL	RADIO ETHERNET CABLE CAT 6	12 FIBER PIGTAIL SM	RELOCATE SERIAL SERVER UNIT	REPLACE SFP
		UNIT	EA	EA	EA	EA	EA	LF	DAY	EA	EA	EA	EA	LF	LF	LF	EA	LF	LF	LF	EA	LF	LF	EA	EA
17	IH 20 WB AT S CREAT SW PKWY	ITS-01	1				1	1110		1		1		55			2	75	100	5					
19	IH 20 EB AT S BOWEN RD	ITS-02	1					250				1	1				1	55		5	1		165		
21-22	IH 20 EB AT GREEN OAKS BLVD	ITS-03	1				1	645			1	1	1		55	55	2		55	5	2		325	1	2
24	IH 20 WB AT CHUCKWAGON TRAIL	ITS-04	1			2		205				1	1			55						110			
26	SH 360 SB AT HARWOOD RD	ITS-05	1					470			1	1	1		55	55	1				1		150	1	
28	SH 360 SB AT E ARKANSAS LN	ITS-06	1					915			1	1	1		55	55				5				1	
30	SH 360 NB AT NE GREEN OAKS BLVD	ITS-07A	1					600				1	1				1	55		35	3		320		3
31	SH 360 SB AT NE GREEN OAKS BLVD	ITS-07B	1					185				1	1				1	55		5	1		165		1
34-35	SH 121 NB & SB AT FAIRVIEW ST	ITS-08	2			1		385				2	1			110	1		55	10	2		355	1	2
37	SH 121 NB & SB AT HARWOOD RD	ITS-09	2					335				2	1					110							
39	SH 121 AT HALL-JOHNSON RD	ITS-10	1					600				1	1			55				5					
41-42	IH 820 HB AT CHAPIN RD	ITS-11	1					315				1	1			55	2				2		310		2
44	IH 820 NB & SB AT TRINITY BLVD	ITS-12	2					275			2	2	1		110			110						1	
46-47	SH 183 EB & WB AT AMERICAN BLVD	ITS-13	2					660				2	2					110		10					
49	SH 183 WB AT COUNTY LINE RD	ITS-14	1					500				1	1			55				5					
51	SH 199 NB AT CONFEDERATE PARK RD	ITS-15	1					230				1	1			55									
53	SH 199 SB AT DENVER TRAIL	ITS-16	1					360				1	1			55									
55	IH 20 WB AT CAMPUS DR	ITS-17		1				810		1		1	1			255	1			5	1		485		
57-58	IH 20 EB & WB AT JAMES AVE	ITS-18		2				690				2	1					380			2		350		2
60-61	IH 20 EB AT TRAIL LAKE DR	ITS-19		1				290				1	1			290	2			5	2		305		2
63-64	IH 20 WB AT GRANBURY RD	ITS-20		1				515				1	1			200	2			5	2		395		2
66	SH 114 EB AT S KIMBALL AVE	ITS-21	1					425				1	1			55	1				1		150		
68	SH 121 SB AT BASS PRO DR	ITS-22	1					1250		1		1	1			55					1		240		
70	IH 820 WB AT MARK IV PARKWAY	ITS-23	1					375				1	1			55									
72	IH 820 EB AT MARINE CREEK PKWY	ITS-24	1					535				1	1			55									
74	IH 820 SB AT WESTPOINT BLVD	ITS-25	1					185				1	1			55									
76	IH 35W & SB AT EAST FELIX ST	ITS-26	2		2		2	330				2	1					110	70	5		70			
78	IH 35W & SB AT ALTMESA BLVD	ITS-27		2				440				2	1	55				720							
80	IH 35W SB AT RISINGER ROAD EAST	ITS-28	1					430				1	1					55							
82	IH 35W NB AT E HIDDEN CREEK PKWY	ITS-29	1			1		185				1	1					55	55			55			
84	IH 35W NB AT COUNTY ROAD 204	ITS-30	1				1	410				1	1				1	55	55	5	1		230		
Total		TOTAL	31	7	2	4	5	14910	76	3	5	38	31	110	275	1625	18	1945	390	110	22	235	3945	5	16

*SUBSIDIARY TO ITEM 6028
**SUBSIDIARY TO ITEM 6062
***SUBSIDIARY TO ITEM 6304
****SUBSIDIARY TO ITEM 6007
*****SUBSIDIARY TO ITEM 628
6*SUBSIDIARY TO ITEM 6010
7*SUBSIDIARY TO ITEM 6027
8*SUBSIDIARY TO ITEM 429, 780
9*SUBSIDIARY TO ITEM 620
10*SUBSIDIARY TO ITEM 618
11*SUBSIDIARY TO ITEM 6331

2/24/2021

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DMS REPLACEMENT
TOTAL SHEET QUANTITIES

SHEET 3 OF 4

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	8
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/24/2021
FILENAME: c:\pwworking\kho\pwprod\iman.rahim\dms42767\FTW_DMS_SHEET_QUANTITIES_03.dgn
BY: Iman.Rahim

QUANTITY SUMMARY

SHEET NO.	LOCATION	ITEM NO.	•••	6•	7•	8•	9•	•	••••	11•	••••	6•	6•	••	••••	•	6•	••••	••	••	6•	6•	•
		CODE																					
		DESCRIPTION	REMOVE RVSD CABLE	CCTV CAT6 CABLE	CONCRETE GROUT CONDUIT OPENING	PAINT REPAIRED STRUCTURE	POWER DISCONNECT & RECONNECT	JUNCTION BOX (AS NEEDED)	RELOCATE PRETERM FIBER PATCH PANEL (12 POSITION)	REMOVE SERIAL SERVER UNIT	RELOCATE FIBER OPTIC INTERCONNECT HOUSING	RELOCATE POE	REMOVE CCTV CABLES	COAXIAL CABLE	RELOCATE PRETERM FIBER PATCH PANEL (24 POSITION)	OVDWS SENSOR CABLE	REMOVE RADIO CABLE	REMOVE PRETERM FIBER PATCH PANEL (12 POSITION)	REMOVE ETHERNET SWITCH	REMOVE YAGI ANTENNA	RELOCATE VIDEO COMM. JUNCTION BOX	RELOCATE DVE	DMS CABINET FOUNDATION
		UNIT	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
17	IH 20 WB AT S CREAT SW PKWY	ITS-01			1		1	2		1								1	1	1			
19	IH 20 EB AT S BOWEN RD	ITS-02			1			2		1													
21-22	IH 20 EB AT GREEN OAKS BLVD	ITS-03	55		1			2												1			
24	IH 20 WB AT CHUCKWAGON TRAIL	ITS-04		55				2		1			55				55						
26	SH 360 SB AT HARWOOD RD	ITS-05	55			1		2															
28	SH 360 SB AT E ARKANSAS LN	ITS-06	55		1			2	1														
30	SH 360 NB AT NE GREEN OAKS BLVD	ITS-07A			1			2		1													
31	SH 360 SB AT NE GREEN OAKS BLVD	ITS-07B			1			2		1													
34-35	SH 121 NB & SB AT FAIRVIEW ST	ITS-08		110	1			3					180	50		35					2	1	
37	SH 121 NB & SB AT HARWOOD RD	ITS-09						3		1					1								
39	SH 121 AT HALL-JOHNSON RD	ITS-10			1			2		1					1								
41-42	IH 820 HB AT CHAPIN RD	ITS-11						2		1													
44	IH 820 NB & SB AT TRINITY BLVD	ITS-12	110			1		3	1														
46-47	SH 183 EB & WB AT AMERICAN BLVD	ITS-13			2			4		2	2												
49	SH 183 WB AT COUNTY LINE RD	ITS-14			1		1	2		1	1												
51	SH 199 NB AT CONFEDERATE PARK RD	ITS-15						2	1	1													
53	SH 199 SB AT DENVER TRAIL	ITS-16						2	1	1													
55	IH 20 WB AT CAMPUS DR	ITS-17			1			2		1													1
57-58	IH 20 EB & WB AT JAMES AVE	ITS-18						3		1													1
60-61	IH 20 EB AT TRAIL LAKE DR	ITS-19			1	2		2		1													1
63-64	IH 20 WB AT GRANBURY RD	ITS-20			1	2	1	2		1													1
66	SH 114 EB AT S KIMBALL AVE	ITS-21				1		2															
68	SH 121 SB AT BASS PRO DR	ITS-22						2		1								1					
70	IH 820 WB AT MARK IV PARKWAY	ITS-23						2	1	1													
72	IH 820 EB AT MARINE CREEK PKWY	ITS-24		55				2	1	1		1	55										
74	IH 820 SB AT WESTPOINT BLVD	ITS-25						2	1	1													
76	IH 35W & SB AT EAST FELIX ST	ITS-26			1			3		1										1			
78	IH 35W & SB AT ALTMESA BLVD	ITS-27				1		3		1								2					1
80	IH 35W SB AT RISINGER ROAD EAST	ITS-28						2	1	1													
82	IH 35W NB AT E HIDDEN CREEK PKWY	ITS-29		55				2		1		2	55										
84	IH 35W NB AT COUNTY ROAD 204	ITS-30			1		1	2		1													
Total		TOTAL	275	275	16	8	4	70	8	26	3	3	345	50	2	35	55	4	1	3	2	1	5

•SUBSIDIARY TO ITEM 6028
••SUBSIDIARY TO ITEM 6062
•••SUBSIDIARY TO ITEM 6304
••••SUBSIDIARY TO ITEM 6007
•••••SUBSIDIARY TO ITEM 628
6•SUBSIDIARY TO ITEM 6010
7•SUBSIDIARY TO ITEM 6027
8•SUBSIDIARY TO ITEM 429, 780
9•SUBSIDIARY TO ITEM 620
10•SUBSIDIARY TO ITEM 618
11•SUBSIDIARY TO ITEM 6331

2/24/2021

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DMS REPLACEMENT
TOTAL SHEET QUANTITIES

SHEET 4 OF 4

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	9
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/24/2021
FILENAME: c:\pwworking\kho\pwprod\iman.rahim\dms42767\FTW_DMS_SHEET_QUANTITIES_04.dgn
BY: Iman.Rahim

ELECTRICAL SERVICE SUMMARY TABLE

Electrical Service No.	Sheet No.	Existing or Proposed	Electrical Service Description (see ED(5)-14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
ES-01	17	Proposed	ELEC SERV TY D (120/240) 100 (NS) SS (N) SP (O)	1 1/2" RM	3/#2	N/A	2P/100	N/A	100	Surveillance Cabinet DMS-01 CCTV	2P/40 2P/40 1P/20	25 32 6	14.4
ES-02	19	Proposed	ELEC SERV TY D (120/240) 070 (NS) SS (N) SP (U)	2" RM	3/#2	N/A	2P/70	N/A	100	DMS-02	2P/40	32	7.68
ES-03	21	Proposed	ELEC SERV TY D (120/240) 070 (NS) SS (N) SP (O)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-03	2P/50	40	9.6
ES-04	24	Existing	ELEC SERV TY D (120/240) 060 (NS) GS (N) GC (O)	1 1/2" RM	3/#6	N/A	2P/60	N/A	100	DMS-04	2P/50 ***	40	9.6
ES-05	26	Existing	ELEC SERV TY D (120/240) 100 (NS) GS (N) SP (U)	2" RM	3/#2	N/A	2P/100	N/A	100	DMS-05 Surveillance Cabinet	2P/50*** 2P/40	40 25	15.6
ES-06	28	Proposed	ELEC SERV TY D (120/240) 100 (NS) SS (N) SP (O)	1 1/2" RM	3/#2	N/A	2P/100	N/A	100	DMS-06 Surveillance Cabinet	2P/50 2P/40	40 25	15.6
ES-07A	30	Proposed	ELEC SERV TY D (120/240) 100 (NS) SS (N)SP (U)	2" RM	3/#2	N/A	2P/100	N/A	100	DMS-07A Surveillance Cabinet	2P/40 2P/40	32 25	13.7
ES-07B	31	Proposed	ELEC SERV TY D (120/240) 070 (NS) SS (N) SP (O)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-07B	2P/40	32	7.68
ES-08	34	Proposed	ELEC SERV TY D (120/240) 125 (NS) SS (N) PS (U)	2" RM	3/#0	N/A	2P/125	N/A	125	DMS CABINET OVHD	2P/100 1P/20	80 16	21.1
ES-09	37	Existing	ELEC SERV TY D (120/240) 100 (NS) SS (N) TP (O)	1 1/2" RM	3/#4	N/A	2P/100	N/A	100	DMS CABINET	2P/80***	64	15.4
ES-10	39	Proposed	ELEC SERV TY D (120/240) 070 (NS) SS (N) SP (O)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-10	2P/50	40	9.6
ES-11	41	Existing	ELEC SERV TY D (120/240) 100 (NS) SS (N) GC (O)	1 1/2" RM	3/#2	N/A	2P/100	N/A	100	DMS-11	2P/50***	40	9.6
ES-12	44	Existing	ELEC SERV TY D (120/240) 100 (NS) GS (N) SP (O)	1 1/4" RM	3/#2	N/A	2P/100	N/A	100	DMS CABINET	2P/80***	64	15.4
ES-13A	46	Proposed	ELEC SERV TY D (120/240) 070 (NS) SS (N) SP (O)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-13A	2P/40	32	7.68
ES-13B	46	Proposed	ELEC SERV TY D (120/240) 070 (NS) SS (N) SP (O)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-13B	2P/40	32	7.68
ES-14	49	Proposed	ELEC SERV TY D (120/240) 070 (NS) SS (N) SP (U)	2" RM	3/#2	N/A	2P/70	N/A	100	DMS-14 SC-14 CCTV-14	2P/50 1P/20 1P/20	40 10 13	12.36
ES-15	51	Existing	ELEC SERV TY D (120/240) 070 (NS) GS (N) GC (O)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-15	2P/50***	40	9.6
ES-16	53	Existing	ELEC SERV TY D (120/240) 070 (NS) GS (N) GC (O)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-16	2P/50***	40	9.6
ES-17	55	Proposed	ELEC SERV TY D (120/240) 070 (NS) SS (N) SP (O)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-17	2P/50	40	9.6
ES-18	57	Existing	ELEC SERV TY D (120/240) 100 (NS) GS (N) GC (O)	1 1/2" RM	3/#2	N/A	2P/100	N/A	100	DMS CABINET	2P/80***	64	15.4

CONTRACTOR SHALL CONNECT EXISTING ITS ELEMENTS TO REMAIN, TO THE PROPOSED ELECTRICAL SERVICES AND KEEP THEM OPERATIONAL.
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ITEMS IDENTIFIED WITH (***) ARE TO BE REPLACED UNDER ITEM 6000 6099.

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwprod\nate.taylor\dms4276\FTW_DMS_ESUM_01.dgn
BY: Nate.Taylor

2/23/2021

STATE OF TEXAS
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102185
LICENSED
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DMS REPLACEMENT
ELECTRICAL SERVICE SUMMARY

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	10
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

ELECTRICAL SERVICE SUMMARY TABLE													
Electrical Service No.	Sheet No.	Existing or Proposed	Electrical Service Description (see ED(5)-14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
ES-19	60	Proposed	ELEC SERV TY D (120/240) 070 (NS) SS (N) SP (U)	2" RM	3/#2	N/A	2P/70	N/A	100	DMS-19	2P/50	40	9.6
ES-20	63	Proposed	ELEC SERV TY D (120/240) 100 (NS) SS (N) SP (U)	2" RM	3/#2	N/A	2P/100	N/A	100	DMS-20 SC-20 CCTV-20	2P/50 2P/40 1P/15	40 25 6	16.3
ES-21	66	Existing	ELEC SERV TY D (120/240) 070 (NS) SS (N) GC (O)	1 1/2" RM	3/#4	N/A	2P/70	N/A	100	DMS-21	2P/50	40	9.6
ES-22	68	Existing	ELEC SERV TY D (120/240) 100 (NS) SS (N) GC (U)	2" RM	3/#2	N/A	2P/100	N/A	100	DMS-22 RVSD-22 CCTV-22	2P/50 2P/20 2P/30	40 15 20	18.0
ES-23	70	Existing	ELEC SERV TY D (120/240) 100 (NS) SS (N) SP (U)	2" RM	-	N/A	2P/100	N/A	100	DMS-23	2P/50*** 1P/20 1P/20	40 - -	9.6
ES-24	72	Existing	ELEC SERV TY D (120/240) 100 (NS) GS (N) SP (U)	2" RM	3/#2	N/A	2P/100	N/A	100	DMS-24A DMS-24B	2P/50*** 2P/40	40 32	17.3
ES-25	74	Existing	ELEC SERV TY D (120/240) 070 (NS) GS (N) SP (U)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-25	2P/50***	40	9.6
ES-26	76	Proposed	ELEC SERV TY D(120/240)100(NS)SS(N)SP(O)	1 1/2" RM	3/#2	N/A	2P/100	N/A	100	DMS CABINET	2P/80***	64	15.4
ES-27	78	Existing	ELEC SERV TY D (120/240) 100 (NS) GS (N) GC (O)	1 1/2" RM	3/#2	N/A	2P/100	N/A	100	DMS CABINET SC-27	2P/80*** 2P/40	64 10	17.8
ES-28	80	Existing	ELEC SERV TY D (120/240) 070 (NS) GS (N) GC (O)	1 1/2" RM	3/#4	N/A	2P/70	N/A	100	DMS-28 CCTV	2P/40 1P/20	32 6	8.4
ES-29	82	Existing	ELEC SERV TY D (120/240) 070 (NS) GS (N) GC (U)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-29	2P/40	32	7.68
ES-30	84	Proposed	ELEC SERV TY D (120/240) 070 (NS) SS (N) SP (O)	1 1/2" RM	3/#2	N/A	2P/70	N/A	100	DMS-30 CCTV-29	2P/40 1P/20	32 6	8.4

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DMS REPLACEMENT
ELECTRICAL SERVICE SUMMARY

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	11
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

PLOTTED: 2/23/2021
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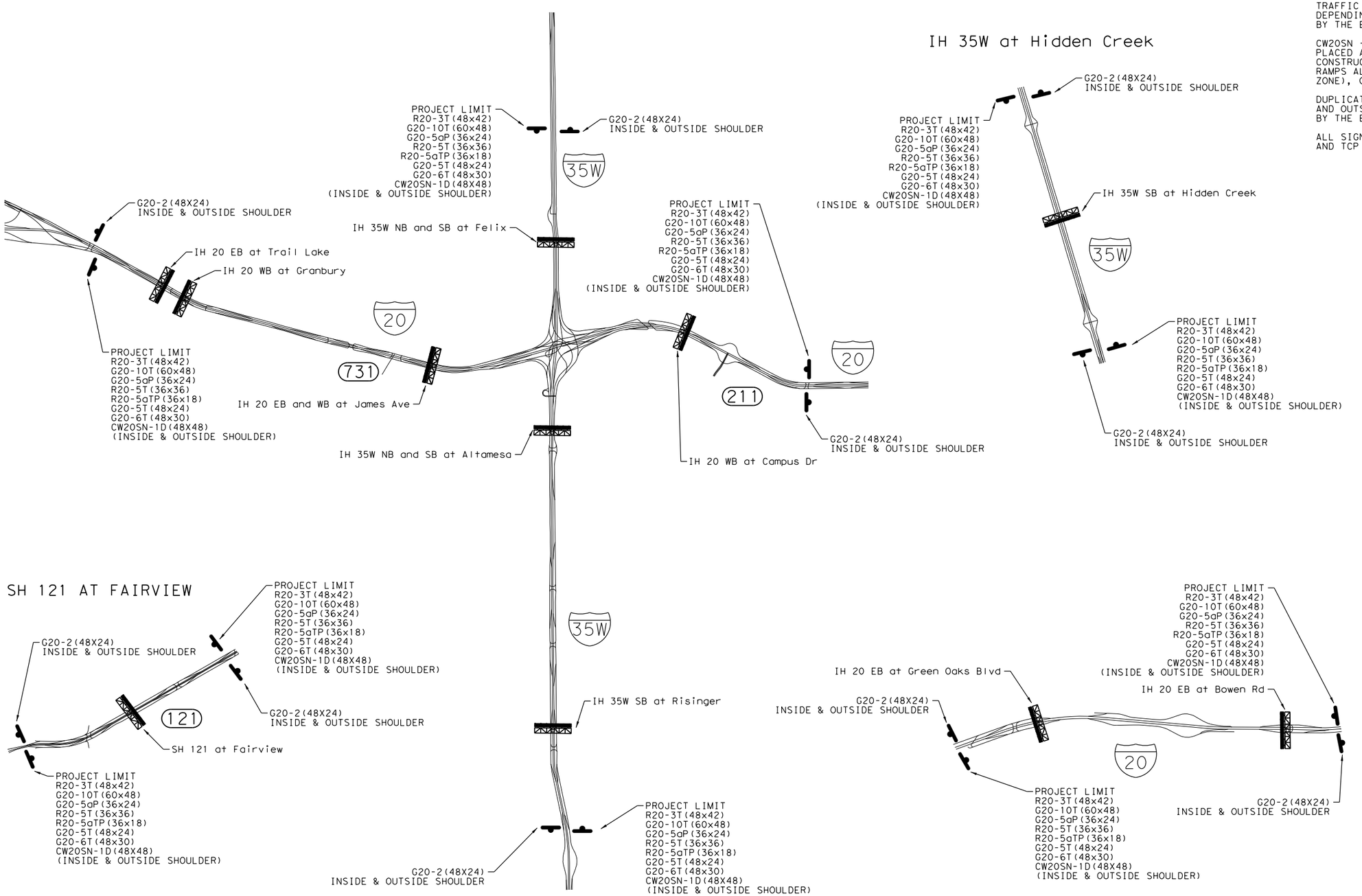
BY: Nate.Taylor



IH 20 AT TRAIL LAKE, GRANBURY, JAMES AVE & CAMPUS DR
AND
IH 35W AT FELIX, ALTAMESA & RISINGER

IH 20 AT GREEN OAKS BLVD, BOWEN RD

NOTE:

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- WORK ZONE SIGN
- R20-3T (OBSERVE WARNING SIGNS / STATE LAW)
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- R20-5T (TRAFFIC FINES DOUBLE)
- R20-5aTP (WHEN WORKERS ARE PRESENT)
- G20-5T (BEGIN ROAD WORK NEXT 5 MILES)
- G20-6T (NAME / ADDRESS / CITY / STATE / CONTRACTOR)
- CW20SN-1D (SIGN WORK AHEAD)
- G20-2 (END ROAD WORK)

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DMS REPLACEMENT
DMS TCP

SCALE: N.T.S. SHEET 1 of 4

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
NTT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
NTT	TEXAS	FTW	TARRANT	12
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
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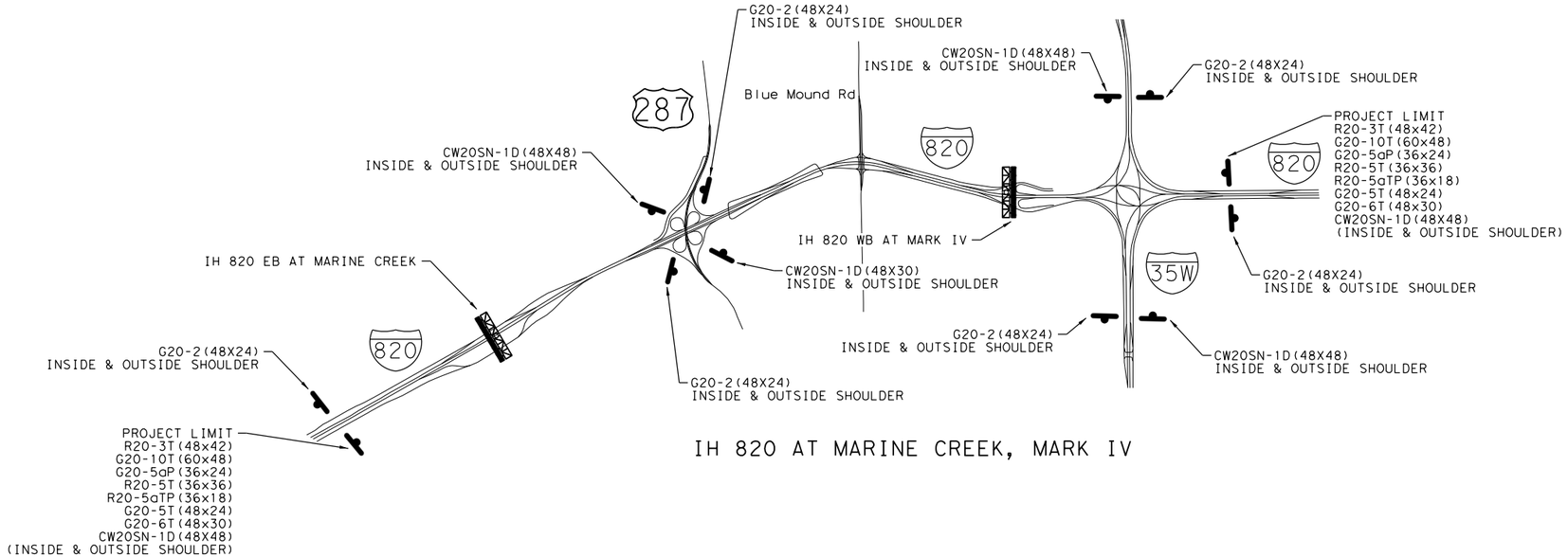
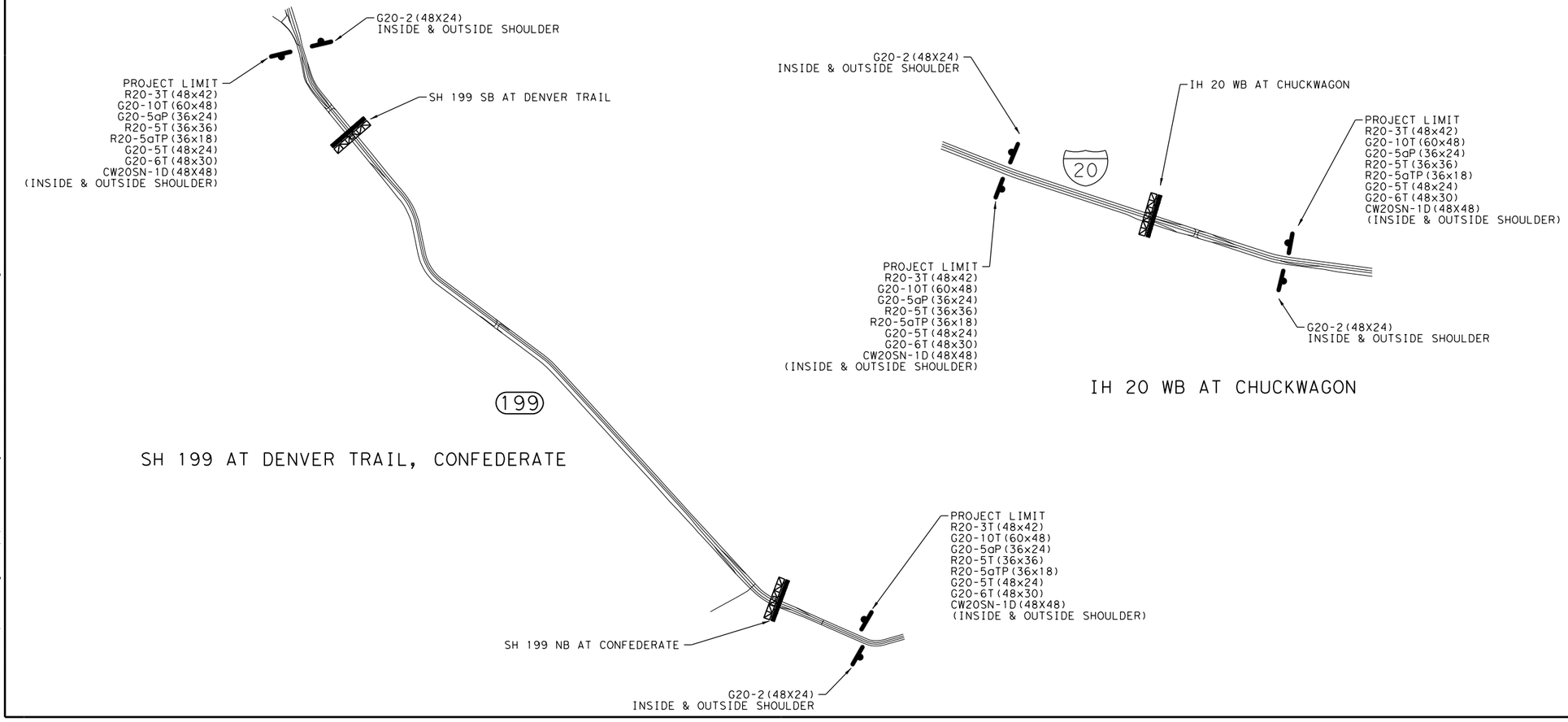
BY: Nate.Taylor



IH 820 AT MARINE CREEK, MARK IV



SH 199 AT DENVER TRAIL, CONFEDERATE

IH 20 WB AT CHUCKWAGON

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- R20-5aTP (WHEN WARNING ARE PRESENT)
- G20-5T (BEGIN ROAD WORK NEXT 5 MILES)
- G20-6T (NAME ADDRESS CITY STATE CONTRACTOR)
- CW20SN-1D (SIGN WORK AHEAD)
- G20-2 (END ROAD WORK)

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DMS REPLACEMENT
DMS TCP

SCALE: N.T.S. SHEET 2 of 4

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
NTT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
NTT	TEXAS	FTW	TARRANT	13
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
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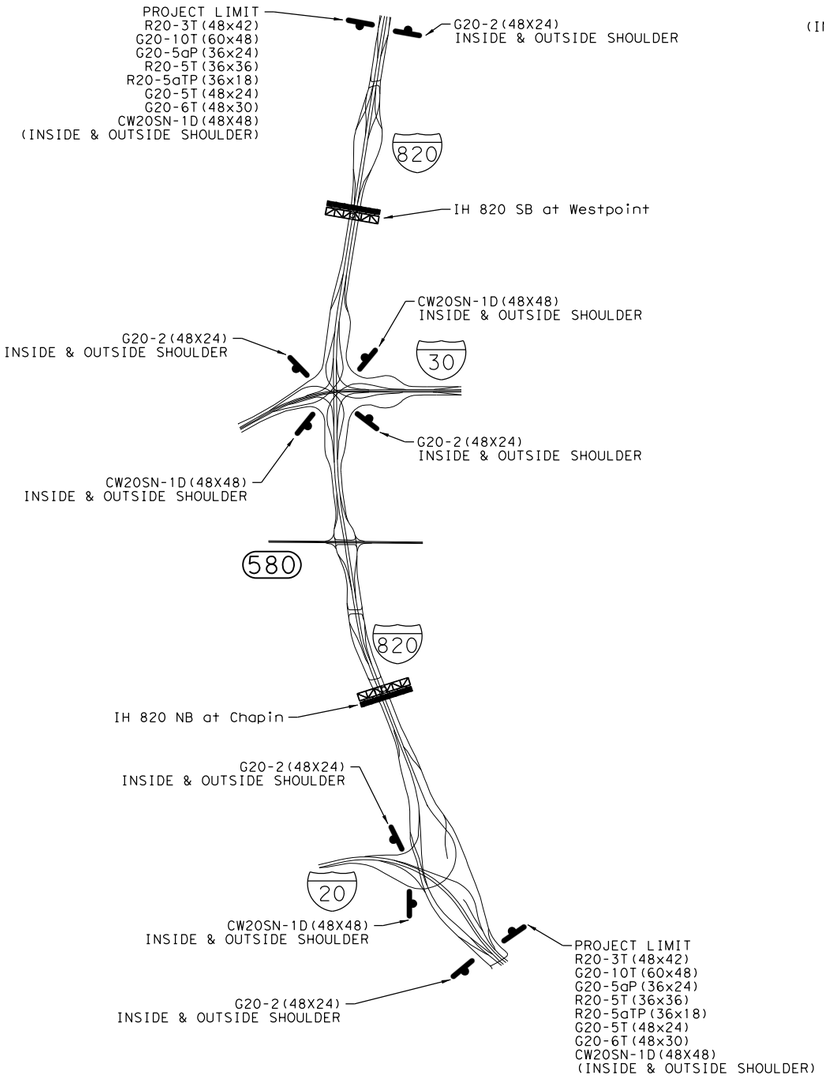
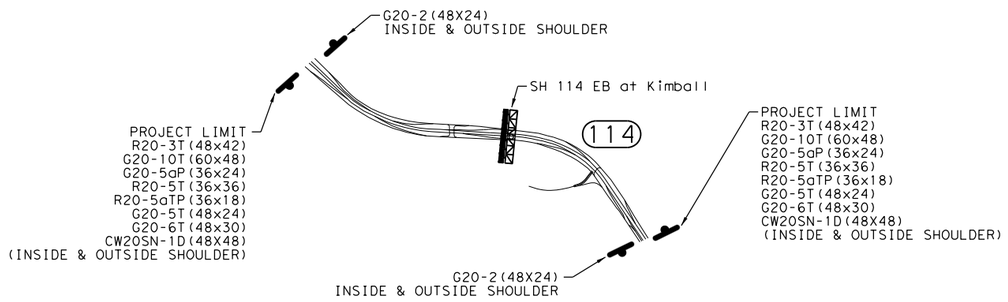
BY: Nate.Taylor

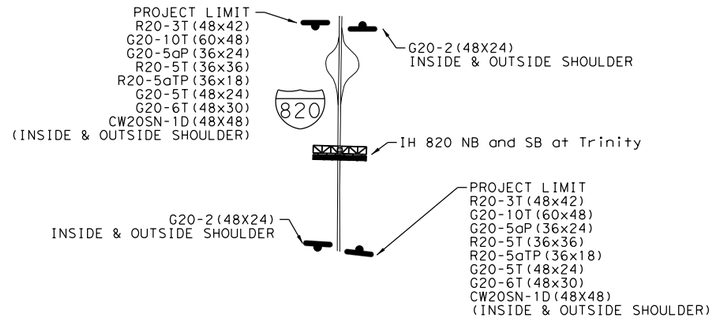
IH 820 at Westpoint, Chapin



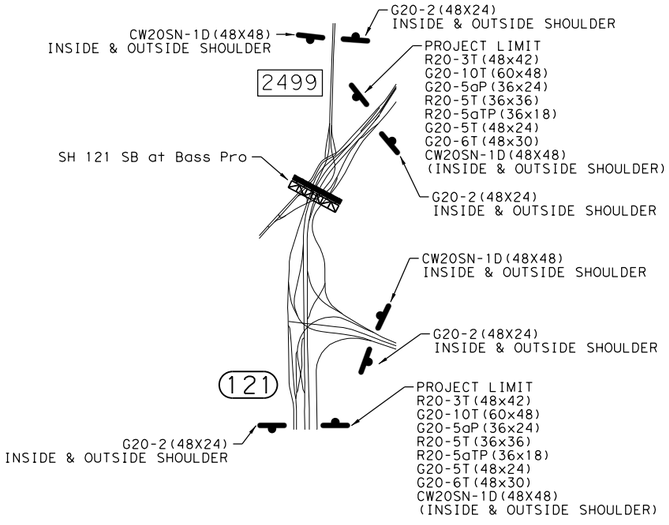
SH 114 EB at Kimball



IH 820 at Trinity



SH 121 at Bass Pro



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Texas Department of Transportation

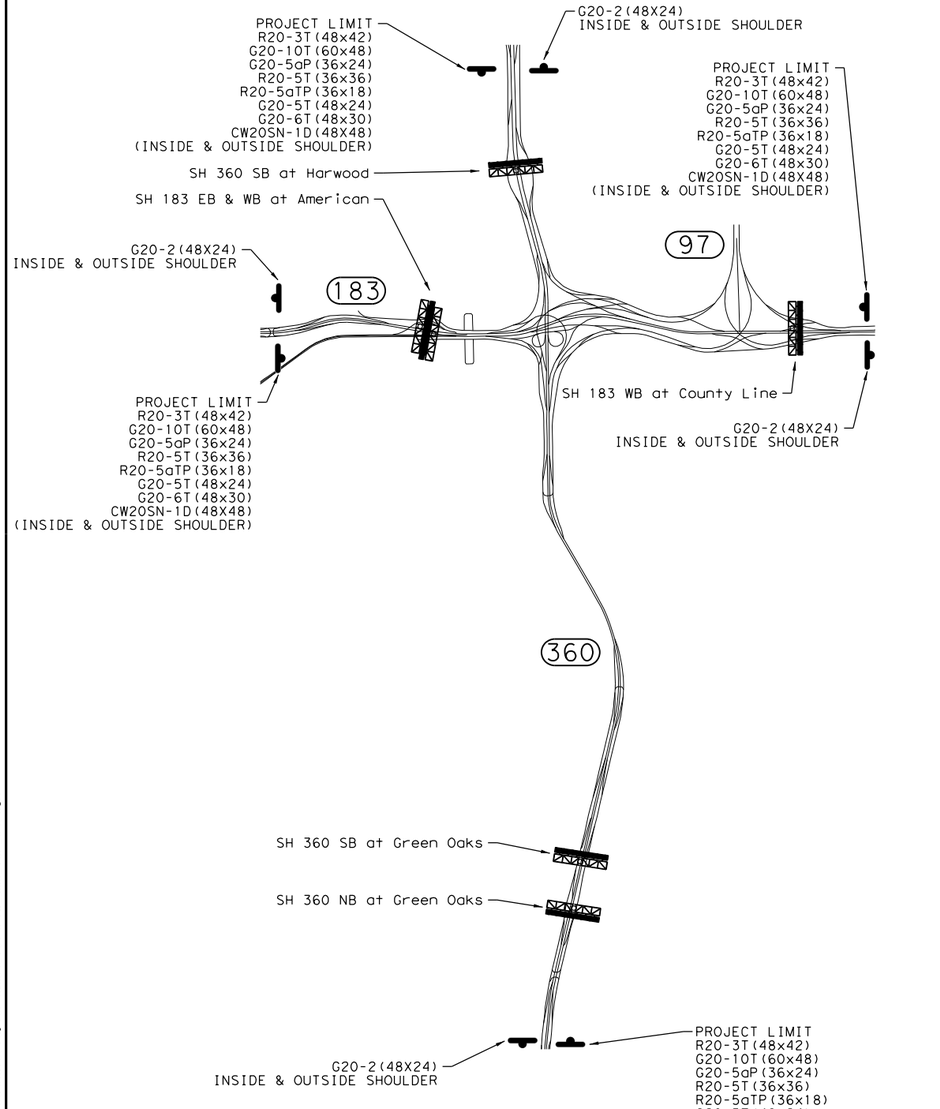
DMS REPLACEMENT
DMS TCP

SCALE: N.T.S. SHEET 3 of 4

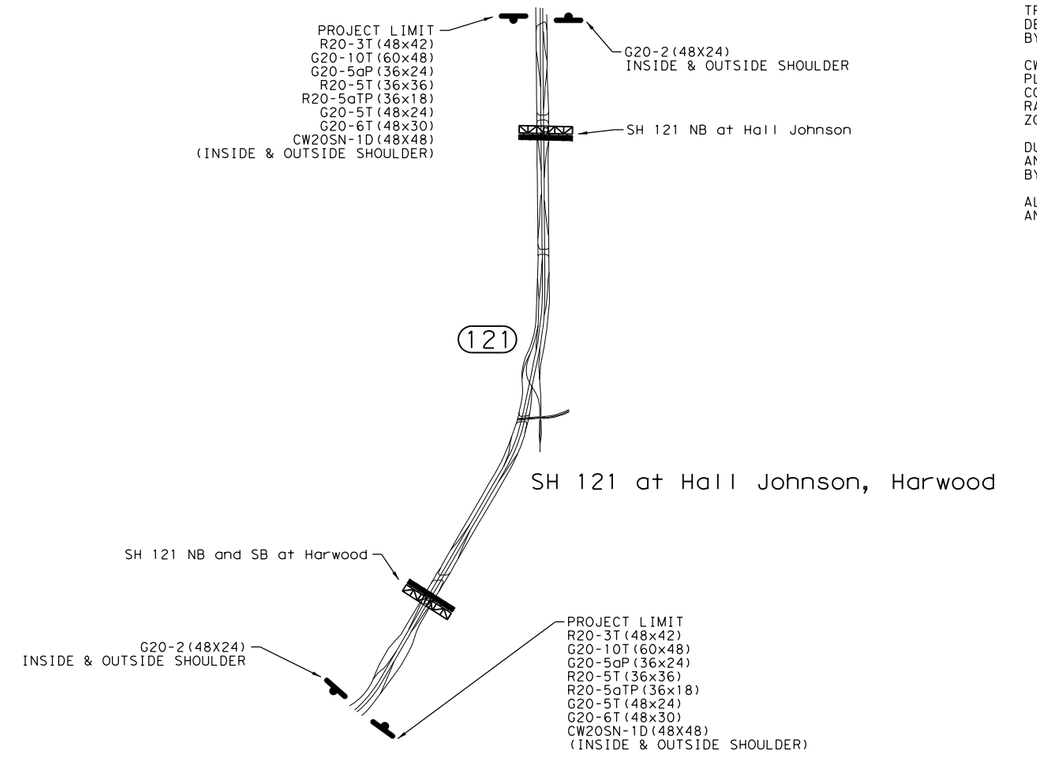
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
NTT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
NTT	TEXAS	FTW	TARRANT	14
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276\FTW_DMS_TCP_03.dgn
BY: Nate.Taylor

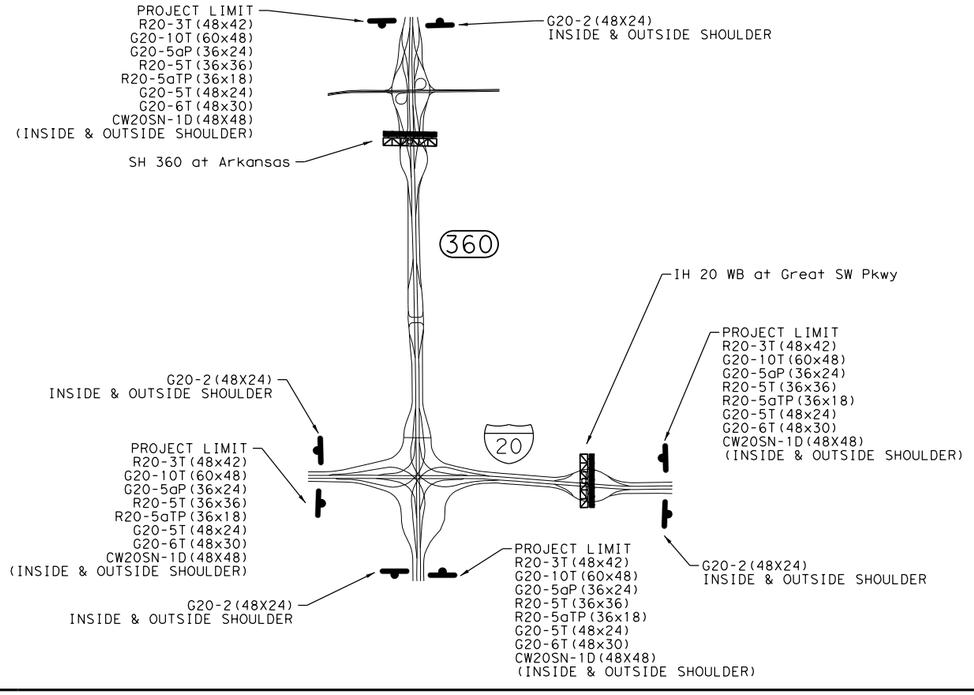
SH 183 at American, County Line and SH 360 at Harwood, Green Oaks



SH 121 at Hall Johnson, Harwood



SH 360 at Arkansas and IH 20 at Great SW Pkwy



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DMS REPLACEMENT
DMS TCP

SCALE: N.T.S. SHEET 4 of 4

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
NTT	6	SEE TITLE SHEET		VA
GRAPHICS NTT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	15
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276?\FTW_DMS_TCP_04.dgn
BY: Nate.Taylor

CONSTRUCTION NOTES:

1. EXISTING FIBER OPTICS, WATER, SAN. SEWER, STORM SEWER, TELEPHONE, GAS AND ELECTRICAL SYSTEMS WITHIN PROJECT AREA ARE NOT SHOWN IN THE PLANS. BEFORE DIGGING, DRILLING, OR BORING IN THE PROJECT AREA, THE CONTRACTOR SHALL PERFORM A "ONE CALL" AND NOTIFY THE UTILITY COMPANIES AND TXDOT SIGNAL SHOP AT 817-370-3664 72 HOURS PRIOR TO CONSTRUCTION.
2. THE CONTRACTOR SHALL HAVE A PRE-CONSTRUCTION MEETING WITH MANUFACTURER'S REPRESENTATIVE TO REVIEW DECOMMISSION PROCEDURES AND INSTALLATION REQUIREMENTS. THE MANUFACTURE'S REPRESENTATIVES TO ACCOMPANY THE CONTRACTOR FOR THE FIRST TWO TO THREE SITES.
3. DAMAGE TO ANY EQUIPMENT IDENTIFIED TO REMAIN OR DURING RELOCATION TO BE REPAIRED OR REPLACED AT CONTRACTOR'S EXPENSE.
4. ALL EXISTING GROUND BOXES AND CONDUIT TO REMAIN UNLESS OTHERWISE NOTED ON THE PLANS.
5. THE EXISTING GROUND BOXES ARE WELDED SHUT, BURIED, OR SEALED WITH A CONCRETE PAD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACCESS TO THE EXISTING GROUND BOXES AND RESTORING TO ORIGINAL PHOTOGRAPHICALLY DOCUMENTED CONDITIONS (BY THE CONTRACTOR); THIS INCLUDES ANY REMOVALS NECESSARY TO ACCESS THE GROUND BOX AS WELL AS CONCRETE, WELDING, REPAIRING GALVANIZED WELDED AREAS IN ACCORDANCE WITH ITEM 445 GALVANIZING, ETC. TO ESTABLISH GROUND BOX LID TO ORIGINAL CONDITIONS AFTER FIBER OR CONDUCTOR CABLE WORK IS COMPLETE. THE CONTRACTOR IS RESPONSIBLE FOR THE SECURITY OF BOTH NEW AND EXISTING GROUND BOXES AND GROUND BOX CONTENTS SUCH AS WIRING, FIBER OPTIC CABLES, SPLICE CLOSURES, ETC. WHILE THEY ARE UNCOVERED OR NOT WELDED. ITS GROUND BOXES WITH METAL LIDS WILL BE SEALED BY TACK WELDING TWO CORNERS FOR AT LEAST TWO INCHES ON EACH SIDE AFTER WORK IS COMPLETED AND THE SEALS GALVANIZED. ALL WORK AND INCIDENTALS REQUIRED TO COMPLETE THIS WORK SHALL BE SUBSIDIARY TO ITEM 6027.
6. EXISTING DMS WALKWAY TO REMAIN. CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE WALKWAY AND SUPPORTS ARE NOT DAMAGED DURING REMOVAL AND INSTALLATION OF DMS.
7. CONTRACTOR SHALL VERIFY ROW AND INSTALL ALL ELEMENTS WITHIN THE ROW.
8. ROW AND COMPLETE SURVEY INFORMATION WERE NOT AVAILABLE. EXISTING UNDERGROUND UTILITIES IN THE AREA. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION.
9. CONTRACTOR TO REMOVE EXISTING DMS AND DELIVER TO TXDOT AS DIRECTED BY THE ENGINEER.
10. CONTRACTOR SHALL FURNISH AND INSTALL NEW ELECTRICAL CONDUCTORS FROM THE SERVICE PANEL TO DMS CABINET AND FROM THE DMS CABINET TO THE SIGN.
11. CONTRACTOR TO REMOVE EXISTING RIGID METAL CONDUIT ASSOCIATED WITH DMS CABLES ATTACHED TO CONCRETE COLUMN. CONTRACTOR TO PLUG CONDUIT OPENING IN JUNCTION BOX. THIS SHALL BE SUBSIDIARY TO ITEM 6331 6001.
12. DMS SIGNS AND DMS CABINETS CANNOT BE TURNED ON WITHOUT PRIOR APPROVAL FROM THE DMS MANUFACTURER. CONTRACTOR TO PICK-UP MATERIAL FURNISHED BY THE STATE AT 2501 SW LOOP 820, FORT WORTH, TX 76133 OR AT THE LOCATION DESIGNATED BY THE ENGINEER. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE.

ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE:

1. CONTRACTOR SHALL COORDINATE WITH THE POWER COMPANY REGARDING THE PROPOSED ELECTRICAL SERVICE DETAILS AND TO RECONNECT THE NEW SERVICE. ANY ASSOCIATED NEW CONDUIT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 628.
2. CONTRACTOR SHALL INSTALL ELECTRICAL SERVICE FOUNDATIONS ON STABLE GROUND. THESE FOUNDATIONS ARE SUBSIDIARY TO ITEM 628.
3. CONTRACTOR SHALL CONNECT EXISTING ELEMENTS/CIRCUITS TO THE PROPOSED SERVICE AND KEEP THEM OPERATIONAL. THIS SHALL BE SUBSIDIARY TO THE INSTALLATION OF THE NEW SERVICE UNDER ITEM 628.

ADDITIONAL CONSTRUCTION NOTES - SITES WITH RVSD:

1. CONTRACTOR TO PROVIDE NEW RADAR VEHICLE SENSING DEVICE CABLE BETWEEN RADAR DEVICE AND NEW POLE MOUNTED DMS CABINET. THIS SHALL BE CONSIDERED SUBSIDIARY TO ITEM 6304.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR TESTING RVSD UPON RELOCATION OF CLICKS AND NEW CABLE AS PER SPEC 6304 SECTION 4.9.
3. ANY DAMAGE TO ANY COMPONENT OF THE RVSD EQUIPMENT SHALL BE REPLACED BY THE CONTRACTOR AT THEIR OWN EXPENSE AS DIRECTED BY THE ENGINEER.

ADDITIONAL CONSTRUCTION NOTES - SITES WITH RADIO:

1. IF ANTENNA(S) IS (ARE) REMOVED AND RELOCATED OR MISALIGNED DURING THE REMOVAL OF THE DMS, THE CONTRACTOR SHALL ALIGN THE ANTENNA(S) WITH THE EXISTING ANTENNA(S) AND MAKE THE LINKS OPERATIONAL.
2. CONTRACTOR TO ALIGN ANTENNA(S) AND MAKE RADIO LINK OPERATIONAL.
3. ANY DAMAGE TO ANY COMPONENT OF THE RADIO EQUIPMENT SHALL BE REPLACED BY THE CONTRACTOR AT THEIR OWN EXPENSE AS DIRECTED BY THE ENGINEER.

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_CONSTRUCTION_NOTES.dgn
BY: Nate.Taylor

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
102185
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PROFESSIONAL ENGINEER

Dhruva Lahon

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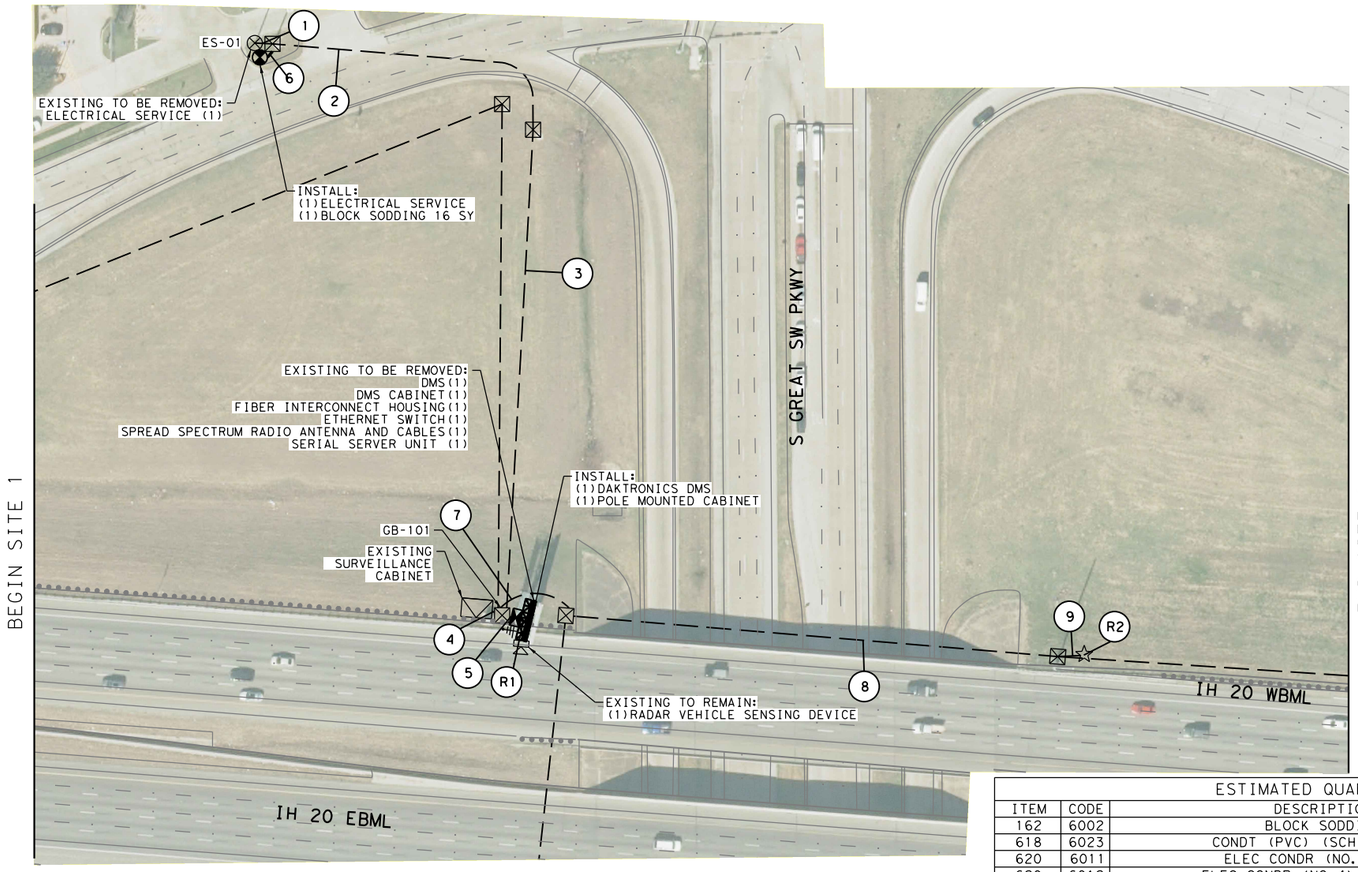
DMS REPLACEMENT
CONSTRUCTION NOTES

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	16
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

NOTES:
1. A 4 HOUR WINDOW FOR SWITCHOVER WILL BE ALLOWED TO RECONNECT POWER FOR THE SURVEILLANCE CABINET AND CCTV CABINET. THE CONTRACTOR SHALL PROVIDE 72 HOUR ADVANCE NOTICE AND RECEIVE APPROVAL FOR THE OUTAGE FROM THE TXDOT SIGNAL SHOP AT 817-370-3664.
2. CONTRACTOR SHALL REUSE EXISTING HOLES IN DMS TOWER. IF HOLES NEED TO BE ENLARGED, CONTRACTOR SHALL DO THIS IN THE FIELD. THIS WILL BE SUBSIDIARY TO ITEM 6028.
3. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT.
4. CONTRACTOR TO INSTALL NEW POLE MOUNTED DMS CABINET PROVIDED BY TXDOT ON EXISTING STRUCTURE.
5. SEE SHEET 16 FOR CONSTRUCTION NOTES, ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE, ADDITIONAL CONSTRUCTION NOTES - SITES WITH RVSD, AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH RADIO.



0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (RM) (3") Qty	CONDT (RM) (3") LF	CONDT (PVC) (SCHD 40) (2") Qty	CONDT (PVC) (SCHD 40) (2") LF	CONDT (PVC) (SCHD 40) (3") Qty	CONDT (PVC) (SCHD 40) (3") LF	CONDT (PVC) (SCHD 40) (3") (BORE) Qty	CONDT (PVC) (SCHD 40) (3") (BORE) LF	CABLE LENGTH: ELEC CONDR (NO. 1) BARE Qty	ELEC CONDR (NO. 1) BARE LF	ELEC CONDR (NO. 4) BARE Qty	ELEC CONDR (NO. 4) BARE LF	ELEC CONDR (NO. 1) INSULATED Qty	ELEC CONDR (NO. 1) INSULATED LF	ELEC CONDR (NO. 4) INSULATED Qty	ELEC CONDR (NO. 4) INSULATED LF	ETHERNET CABLE CAT 6 + Qty	ETHERNET CABLE CAT 6 + LF	DMS 6 MM FO JUMPER + Qty	DMS 6 MM FO JUMPER + LF	REMOVALS: CONDUIT 10+ Qty	CONDUIT 10+ LF	36 MM FO CBL Qty	36 MM FO CBL LF	DMS, SC ELECTRICAL CIRCUIT Qty	DMS, SC ELECTRICAL CIRCUIT LF	ANTENA/RADIO CABLES ++ Qty	ANTENA/RADIO CABLES ++ LF	TOTAL LENGTH OF RUN	RUN NO
1	E			1																		1	5			1	20			15	1
2	E						2			1	215			6	1290	2	430									1	215			210	2
3	E					1				1	335			6	2010	2	670									1	335			330	3
4	E					8				1	25			3	75			1	25							1	25	1	25	20	4
5	E					2				1	20			3	60			1	20					1	20	1	20	1	20	15	5
6	I			1	20					1	20			6	120	2	40			1	20									15	6
7	E					3						1	65			2	130									1	65			60	7
8	E	2										1	335			2	670									1	335			330	8
9	E					2						1	30			2	60									1	30			25	9
R1	I									1	55			3	165			1	10	1	55			1	55	1	55	1	55	50	R1
R2	I											1	10			2	20									1	10			5	R2
TOTAL					20						670		440		3720		2020		55		75		5		75		1110		100		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6023	CONDT (PVC) (SCH 40) (2")	LF	20
620	6011	ELEC CONDR (NO. 4) BARE	LF	440
620	6012	ELEC CONDR (NO. 4) INSULATED	LF	2020
620	6017	ELEC CONDR (NO. 1) BARE	LF	670
620	6018	ELEC CONDR (NO. 1) INSULATED	LF	3720
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6250	ELC SRV TY D 120/240 100(NS)SS(N)SP(O)	EA	1
6007	6103	REMOVE FIBER OPTIC CABLE	LF	75
6027	6003	CONDUIT (PREPARE)	LF	1005
6027	6008	GROUND BOX (PREPARE)	EA	5
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6062	6043	REMOVE ITS RADIO	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	1110
6186	6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA	1
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	2
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	75
++		REMOVE YAGI ANTENNA CABLES	LF	100
10+		REMOVE CONDUIT	LF	5
+		ETHERNET CABLE CAT 6	LF	55
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
9+		POWER DISCONNECT & RECONNECT	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1
++++		REMOVE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	1
++		REMOVE ETHERNET SWITCH	EA	1
++		REMOVE YAGI ANTENNA	EA	1

\+ SUBSIDIARY TO ITEM 6028
++ SUBSIDIARY TO ITEM 6062
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
9+ SUBSIDIARY TO ITEM 620
10+ SUBSIDIARY TO ITEM 618

2/23/2021
STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT SITE #1

IH 20 WB AT S GREAT SW PKWY

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	17
CHECK DL	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
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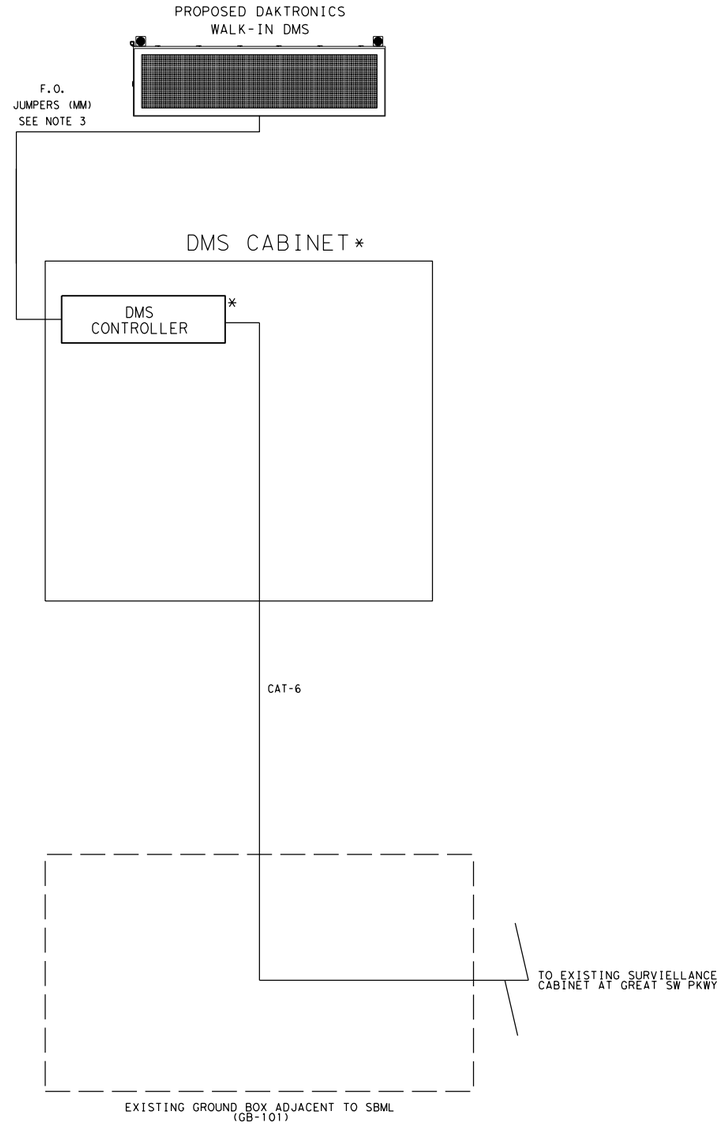
BY: Nate.Taylor

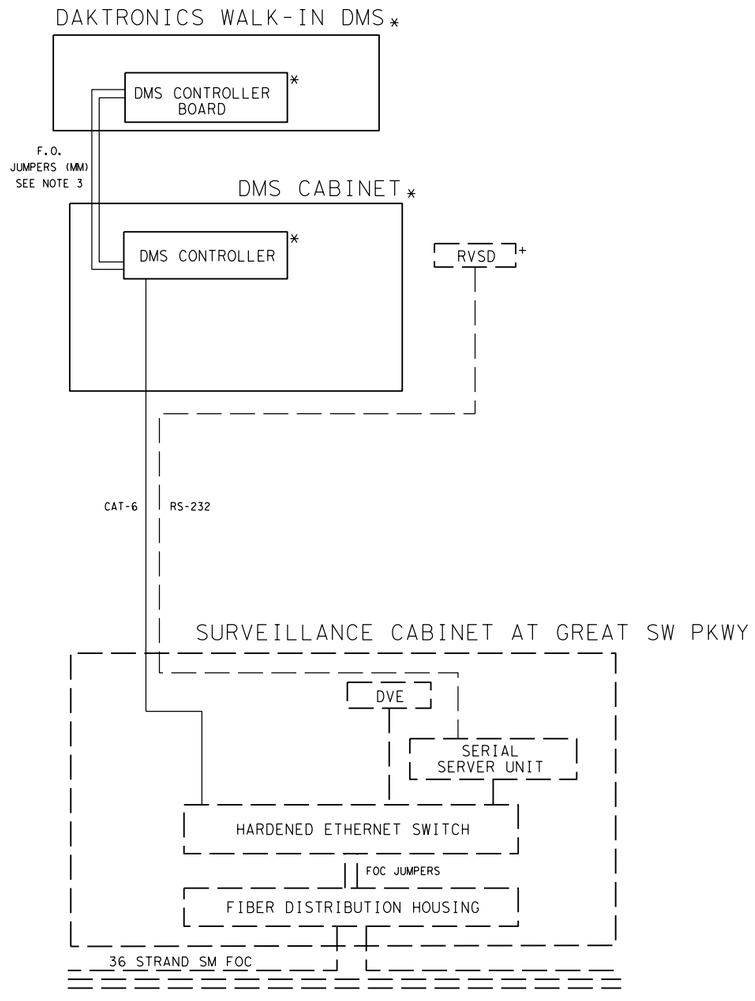
FIBER CABLING AND PATCH PANEL DETAIL

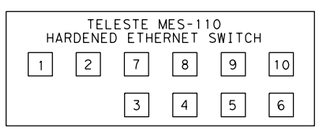


NOTES:

1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
3. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
4. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.

COMMUNICATION BLOCK DIAGRAM





PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. SERIAL SERVER UNIT (IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV PoE (IF PRESENT)

PORT ASSIGNMENTS:

1. CCTV
2. SENSOR#1 OR DMS#3
3. SENSOR#2 OR DMS#2
4. SENSOR#3 OR DMS#1

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

SITE #1
IH 20 WB AT S GREAT SW PKWY

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	18
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
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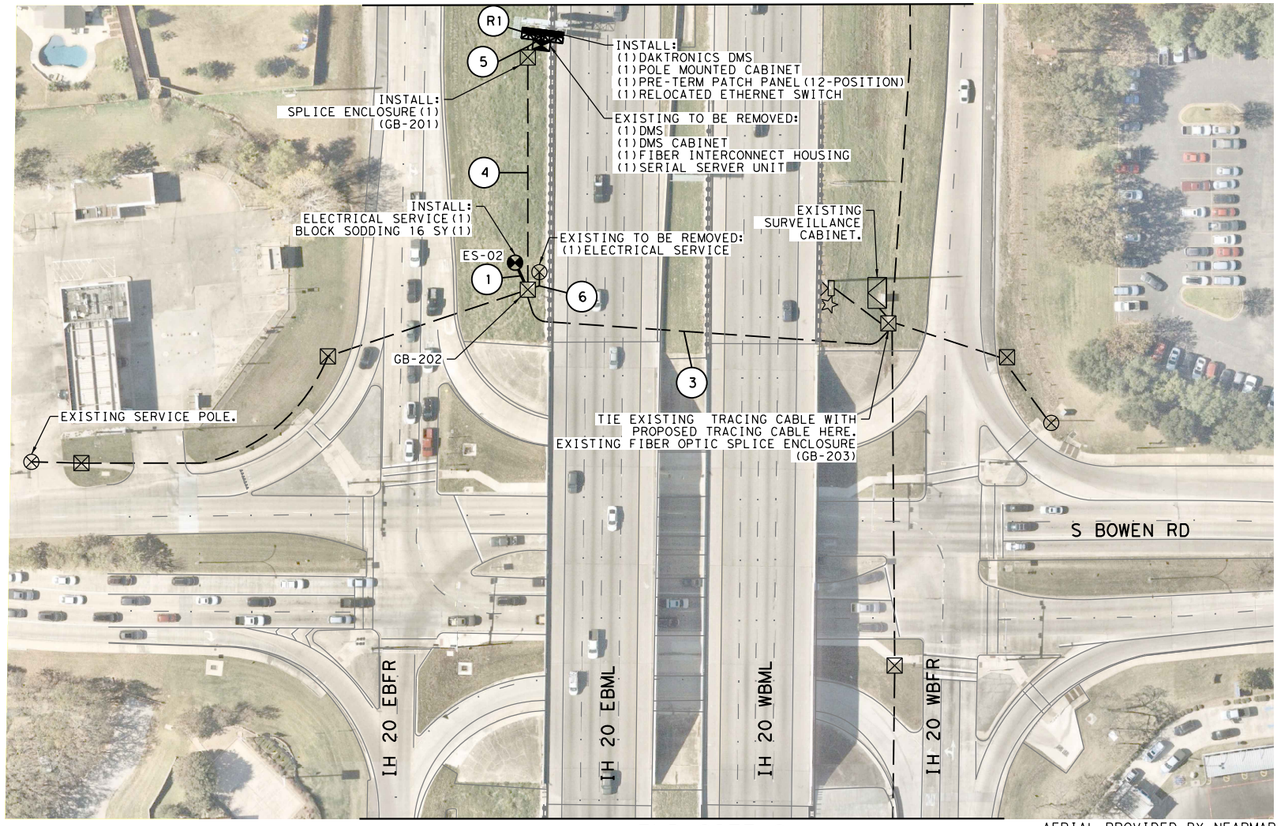
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS (RUNS 5 AND R1), SAFELY COIL IT AND STORE IT IN GB-201, INSTALL NEW DMS AND CABINET, INSTALL PATCH PANEL INSIDE CABINET, AND INSTALL NEW FIBER PIGTAIL THROUGH RUNS 5 AND R1 INTO CABINET.
2. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
3. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT.
4. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE

0 50 100
SCALE: 1"=100'

BEGIN SITE 2



AERIAL PROVIDED BY NEARMAP

END SITE 2

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") Qty	CONDT (PVC) (SCHD 40) (3") LF	CONDT (PVC) (SCHD 40) (2") Qty	CONDT (PVC) (SCHD 40) (2") LF	4" MDC CONDUIT SYS Qty	4" MDC CONDUIT SYS LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 4) BARE Qty	ELEC CONDR (NO. 4) BARE LF	ELEC CONDR (NO. 8) BARE (TRACE) Qty	ELEC CONDR (NO. 8) BARE (TRACE) LF	ELEC CONDR (NO. 4) INSULATED Qty	ELEC CONDR (NO. 4) INSULATED LF	DMS 6 MM FO JUMPER + Qty	DMS 6 MM FO JUMPER + LF	FO CBL (SMF) PIGTAIL (12 FIBER) ++++ Qty	FO CBL (SMF) PIGTAIL (12 FIBER) ++++ LF	RELOCATED: FO CBL (SMF) (36 FIBER) Qty	FO CBL (SMF) (36 FIBER) LF	REMOVALS: CONDUIT 10+ Qty	CONDUIT 10+ LF	DMS ELECTRICAL CIRCUIT Qty	DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	I			1	25			I	1	25			3	75											20	1
3	E					1		I			1	255													250	3
4	E					1		I	1	160	1	160	3	480									1	160	155	4
5	E	2						I	1	30	1	30	3	90			1	30	1	30			1	30	25	5
6	R							R													1	5	1	5	5	6
R1	I							I	1	55	1	10	3	165	1	55	1	10	1	55			1	55	50	R1
TOTAL					25					270		455		810		55		40		85		5		250		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS. PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6023	CONDT (PVC) (SCH 40) (2")	LF	25
620	6007	ELEC CONDR (NO. 8) BARE	LF	455
620	6011	ELEC CONDR (NO. 4) BARE	LF	270
620	6012	ELEC CONDR (NO. 4) INSULATED	LF	810
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6195	ELC SRV TY D 120/240 070(NS)SS(N)SP(U)	EA	1
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	85
6027	6003	CONDUIT (PREPARE)	LF	445
6027	6008	GROUND BOX (PREPARE)	EA	5
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	250
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	1
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	55
10+		REMOVE CONDUIT	LF	5
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	1
++++		12 FIBER PIGTAIL SM	LF	165
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

SLACK SUMMARY

ID	FO CBL (12 SMF) ++++
DMS-CABINET	25
GB-201	100
TOTAL	125

2/23/2021
STATE OF TEXAS
DHRUVA LAHON
102185
LICENSED PROFESSIONAL ENGINEER
Dhruva Lahon

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F-928
Tel. No. (972) 770-1300
Fax No. (972) 239-3820

DMS REPLACEMENT

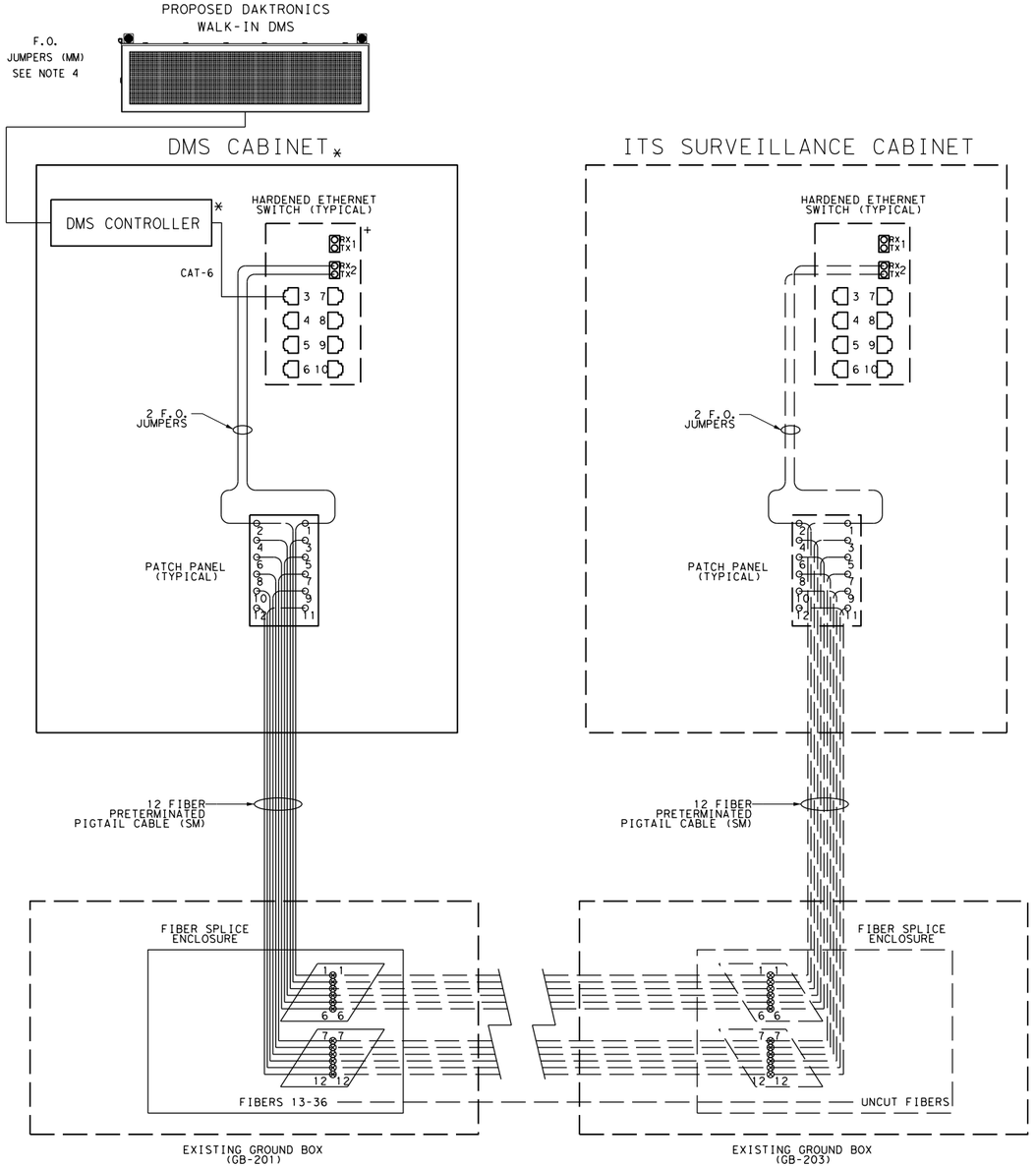
DMS LAYOUT
SITE #2
IH 20 EB AT S BOWEN RD

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	19
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_02.dgn
BY: Nate.Taylor

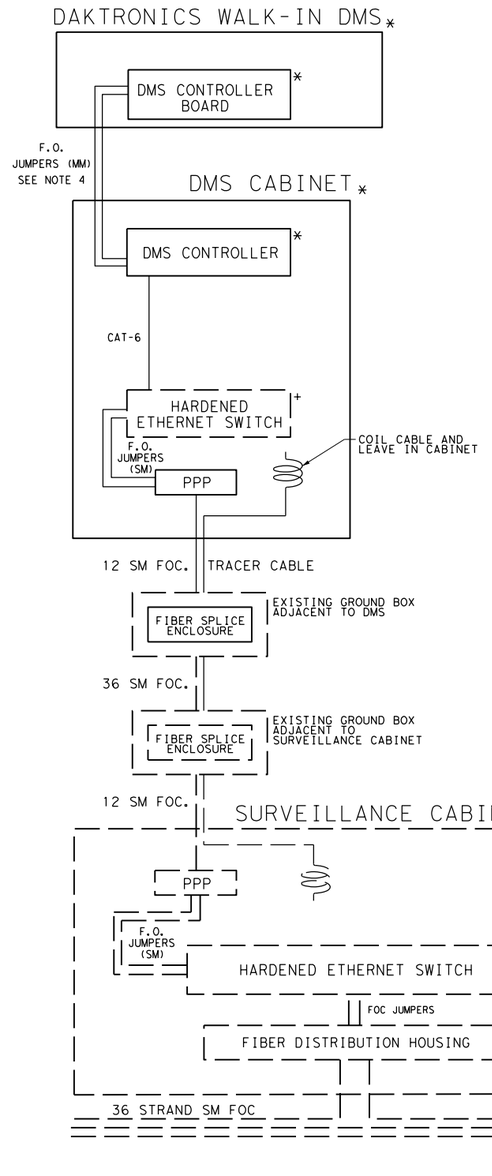
FIBER CABLING AND PATCH PANEL DETAIL

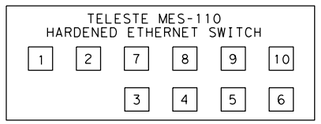


NOTES:

1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT BY TXDOT.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
3. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
4. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
5. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
6. THE CONNECTOR SHALL BE AN ST CONNECTOR.
7. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
8. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
9. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
10. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
11. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.

COMMUNICATION BLOCK DIAGRAM





PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

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DMS REPLACEMENT
SCHEMATIC
FIBER OPTIC CONNECTIONS
SITE #2
IH 20 EB AT S BOWEN RD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS				
CL	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	
DL	CONTROL	SECTION	JOB	20
CHECK				
DJB	0902	90	111	

PLOTTED: 2/23/2021 BY: Nate.Taylor
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_02.dgn

NOTES:
1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
2. CONTRACTOR SHALL REUSE EXISTING HOLES IN DMS TOWER. IF HOLES NEED TO BE ENLARGED, CONTRACTOR SHALL DO THIS IN THE FIELD. THIS WILL BE SUBSIDIARY TO ITEM 6028.
3. CONTRACTOR TO INSTALL NEW POLE MOUNTED DMS CABINET PROVIDED BY TXDOT ON EXISTING STRUCTURE.
4. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT.
5. SEE SHEET 16 FOR CONSTRUCTION NOTES, ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE, AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH RVSD

0 50 100
SCALE: 1"=100'

N

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

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DMS REPLACEMENT

DMS LAYOUT
SITE #3

IH 20 EB AT GREEN OAKS BLVD

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	21
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276?\FTW_DMS_SHT_03.dgn
BY: Nate.Taylor

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH						CABLE STATUS	CABLE LENGTH														REMOVALS										TOTAL LENGTH OF RUN	RUN NO
		CONDT (PVC) (SCHD 40) (2")		CONDT (PVC) (SCHD 40) (3")		4" MD CONDUIT SYS			ELEC CONDR (NO. 8) BARE (TRACE)		ELEC CONDR (NO. 1/0) BARE		ELEC CONDR (NO. 1/0) INSULATED		DMS CAT5E CABLE +		RVSD CONTROL CABLE +++		FO CBL (SMF) PIGTAIL (12 FIBER) ++++		FO CBL (36 SMF)		CONDUIT 10+		MM FO CBL		DMS ELECTRICAL CIRCUIT		ANTENA/RADIO CABLES ++		RVSD CABLES +++			
		Qty	LF	Qty	LF	Qty	LF		Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF		
1	R			1				R															1	5			1	20					15	1
2	E					1		I			1	60	3	180													1	60					55	2
3	E			1				I			1	445	3	1335													1	445					440	3
4	E					1		I			1	85	3	255													1	85					80	4
5	E					1		I	1	255											1	255			1	255							250	5
6	E			1				I													1	1005			1	1005							1000	6
7	E					1		I													1	155			1	155							150	7
8	E			2				I	1	35	1	35	3	105					1	35					1	35	1	35					30	8
9	E					1		I											1	30					1	30							30	9
10	I	1	20					I			1	20	3	60																			15	10
R1	I							I	1	10	1	55	3	165	1	55	1	55	1	10					1	55			1	55	1	55	50	R1
TOTAL			20							300		700		2100		55		55		75		1415		5		1535		645		55		55		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6023	CONDT (PVC) (SCH 40) (2")	LF	20
620	6007	ELEC CONDR (NO.8) BARE	LF	300
620	6019	ELEC CONDR (NO.1/0) BARE	LF	700
620	6020	ELEC CONDR (NO.1/0) INSULATED	LF	2100
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6194	ELC SRV TY D 120/240 070(NS)SS(N)SP(O)	EA	1
6007	6050	FO CBL (36 SMF)	LF	1665
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	2
6007	6094	FIBER OPTIC FUSION SPLICE	EA	24
6007	6103	REMOVE FIBER OPTIC CABLE	LF	1535
6027	6003	CONDUIT (PREPARE)	LF	2035
6027	6008	GROUND BOX (PREPARE)	EA	7
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6062	6043	REMOVE ITS RADIO	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	645
6304	6005	ITS RVSD (DC ONLY) (RELOCATE)	EA	1
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+++		RVSD CONTROL CABLE	LF	55
+		INSTALL DMS CAT 5E CABLE	LF	55
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	2
++		REMOVE YAGI ANTENNA CABLES	LF	55
10+		REMOVE CONDUIT	LF	5
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	2
++++		12 FIBER PIGTAIL SM	LF	325
+++		RELOCATE SERIAL SERVER UNIT	EA	1
++++		REPLACE SFP	EA	2
+++		REMOVE RVSD CABLE	LF	55
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
++		REMOVE YAGI ANTENNA	EA	1

\+ SUBSIDIARY TO ITEM 6028
++ SUBSIDIARY TO ITEM 6062
+++ SUBSIDIARY TO ITEM 6304
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

SLACK SUMMARY

ID	~~FO CBL~~	~~FO CBL~~
SURVEILLANCE-CABINET	25	
DMS-CABINET	25	
GB-301	100	100
GB-302		25
GB-303		25
GB-304	100	100
TOTAL	250	250

2/23/2021

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Texas Department of Transportation

DMS REPLACEMENT

DMS LAYOUT
SITE #3

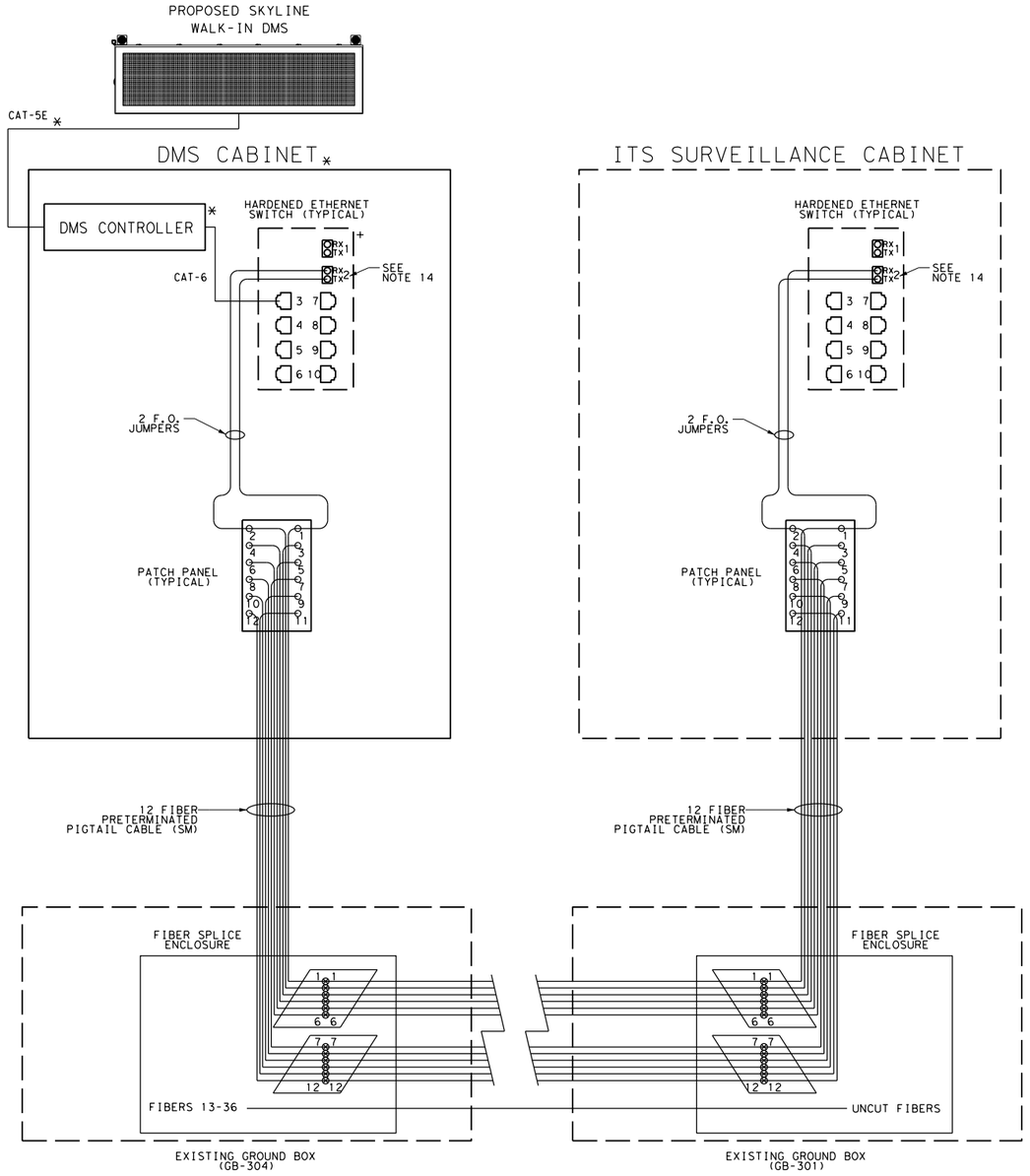
IH 20 EB AT GREEN OAKS BLVD

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	22
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_03A.dgn
BY: Nate.Taylor

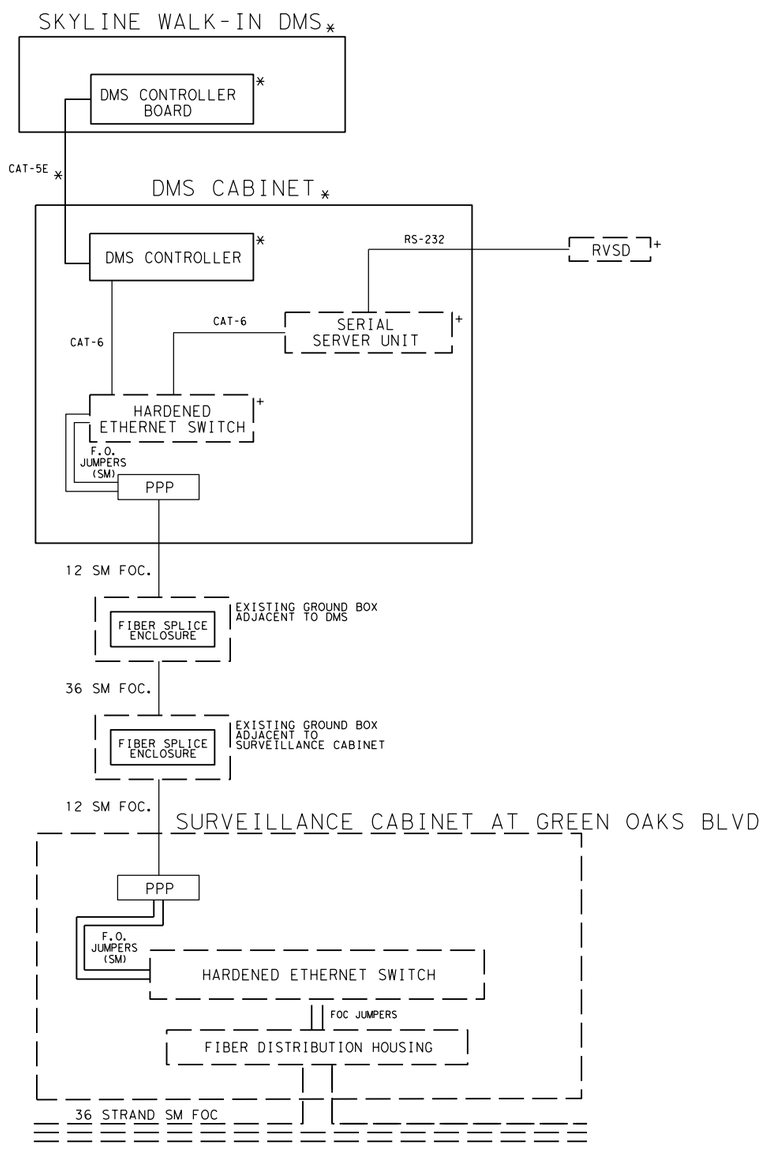
FIBER CABLING AND PATCH PANEL DETAIL



NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGARMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT 5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
11. CONTRACTOR SHALL RELOCATE EXISTING CLICKS FOR RADAR DEVICE FROM EXISTING DMS SIGN TO NEW POLE MOUNTED DMS CABINET. THIS WILL BE SUBSIDIARY TO ITEM 6304 RELOCATE RADAR VEHICLE SENSING DEVICE.
12. CONTRACTOR TO PROVIDE NEW RADAR VEHICLE SENSING DEVICE CABLE FROM RADAR DEVICE TO POLE MOUNTED DMS CABINET. THIS WILL BE SUBSIDIARY TO ITEM 6304 RELOCATE RADAR VEHICLE SENSING DEVICE.
13. CONTRACTOR TO REPLACE EXISTING MM SFP ON ETHERNET SWITCH WITH SM SFP TO BE PROVIDED BY TXDOT. THIS WORK WILL BE SUBSIDIARY TO ITEM 6007.

COMMUNICATION BLOCK DIAGRAM



TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

SERIAL SERVER UNIT

1	2	3	4

PORT ASSIGNMENTS:

1. CCTV
2. SENSOR#1 OR DMS#3
3. SENSOR#2 OR DMS#2
4. SENSOR#3 OR DMS#1

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

SITE #3
IH 20 EB AT GREEN OAKS BLVD

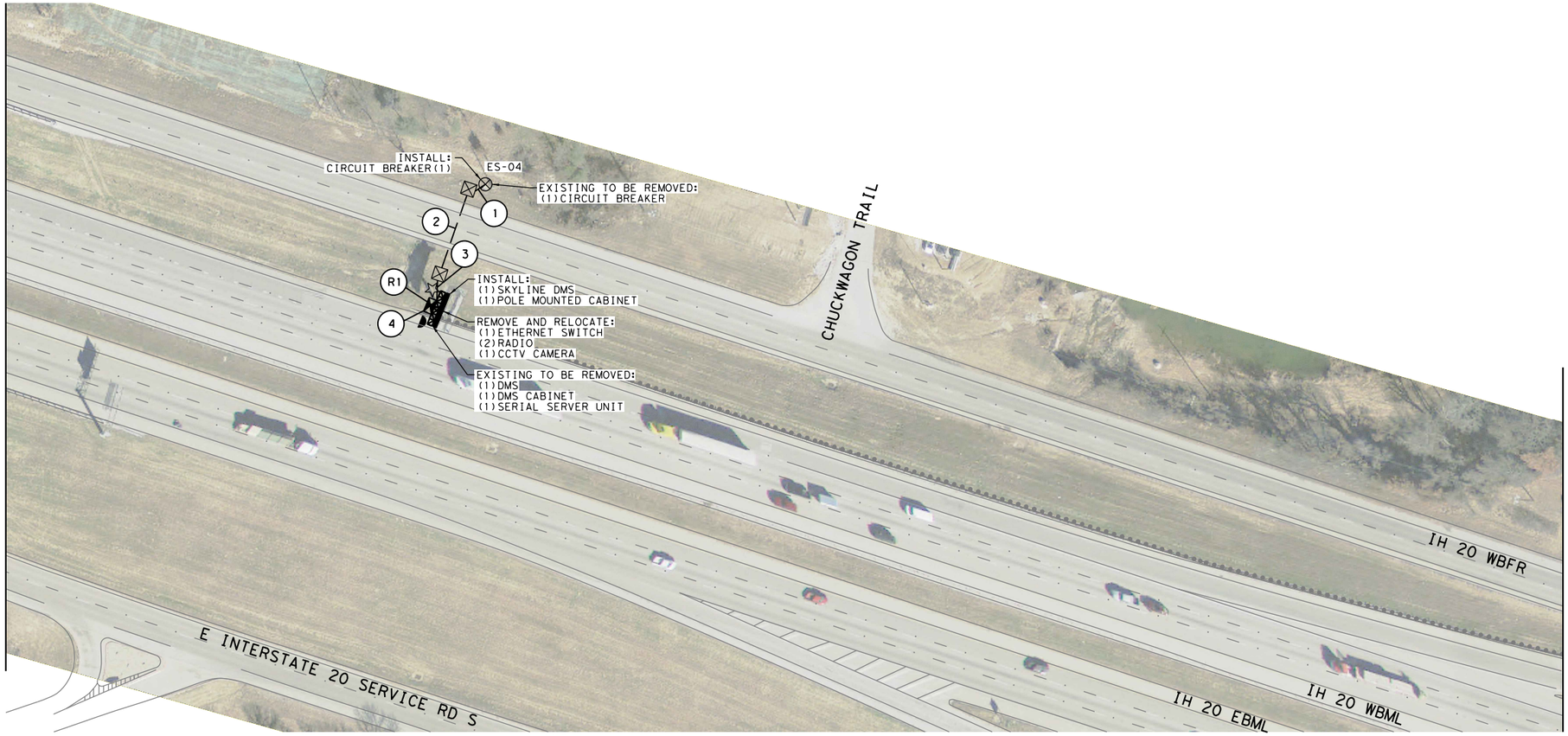
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	23
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\khq\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_03.dgn
BY: Nate.Taylor

NOTES:
1. ANY DAMAGE TO ANY COMPONENT OF THE CCTV EQUIPMENT SHALL BE REPLACED BY THE CONTRACTOR AT THEIR OWN EXPENSE AS DIRECTED BY THE ENGINEER.
2. CONTRACTOR SHALL REMOVE EXISTING CAT CABLE FROM CCTV TO DMS SIGN AND INSTALL NEW CAT6 CABLE FROM CCTV TO THE RELOCATED POE IN THE DMS CABINET.
3. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT.
4. EXISTING ELECTRICAL SERVICE TO REMAIN. CONTRACTOR SHALL REMOVE EXISTING ELECTRICAL CONDUCTORS FROM SERVICE PANEL TO EXISTING DMS SIGN.
5. CONTRACTOR TO COVER SPACE LEFT IN SERVICE ENCLOSURE ONCE EXISTING CIRCUIT BREAKER IS REMOVED.
6. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH RADIO.

0 50 100
SCALE: 1"=100'



LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") LF	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 4) BARE Qty	CABLE LENGTH: ELEC CONDR (NO. 4) BARE LF	CABLE LENGTH: ELEC CONDR (NO. 4) INSULATED Qty	CABLE LENGTH: ELEC CONDR (NO. 4) INSULATED LF	CABLE LENGTH: DMS CAT5E CABLE + Qty	CABLE LENGTH: DMS CAT5E CABLE + LF	CABLE LENGTH: CCTV CAT6 CABLE 6+ Qty	CABLE LENGTH: CCTV CAT6 CABLE 6+ LF	CABLE LENGTH: RADIO ETHERNET CABLE CAT 6 ++ Qty	CABLE LENGTH: RADIO ETHERNET CABLE CAT 6 ++ LF	REMOVALS: DMS ELECTRICAL CIRCUIT Qty	REMOVALS: DMS ELECTRICAL CIRCUIT LF	REMOVALS: RADIO CABLE ++ Qty	REMOVALS: RADIO CABLE ++ LF	REMOVALS: CCTV CABLE 6+ Qty	REMOVALS: CCTV CABLE 6+ LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1				I	1	15	3	45							1	15					10	1
2	E			2		I	1	90	3	270							1	90					85	2
3	E			2		I	1	20	3	60							1	20					15	3
4	E			2		I	1	25	3	75							1	25					20	4
R1	I					I	1	55	3	165	1	55	1	55	2	110	1	55	1	55	1	55	50	R1
TOTAL								205		615		55		55		110		205		55		55		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6011	ELEC CONDR (NO.4) BARE	LF	205
620	6012	ELEC CONDR (NO.4) INSULATED	LF	615
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6010	6012	RELOCATE CCTV FIELD EQUIPMENT	EA	1
6027	6003	CONDUIT (PREPARE)	LF	130
6027	6008	GROUND BOX (PREPARE)	EA	2
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6062	6042	RELOCATE ITS RADIO	EA	2
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	205
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
++		RADIO ETHERNET CABLE CAT 6	LF	110
6+		CCTV CAT6 CABLE	LF	55
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1
6+		REMOVE CCTV CABLES	LF	55
6+		REMOVE RADIO CABLE	LF	55

\+ SUBSIDIARY TO ITEM 6028
++ SUBSIDIARY TO ITEM 6062
6+ SUBSIDIARY TO ITEM 6010
11+ SUBSIDIARY TO ITEM 6331

2/23/2021
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LICENSED
PROFESSIONAL ENGINEER
Dhruva Lahon

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DMS REPLACEMENT

DMS LAYOUT
SITE #4

IH 20 WB AT CHUCKWAGON TRAIL

SHEET 1 OF 1

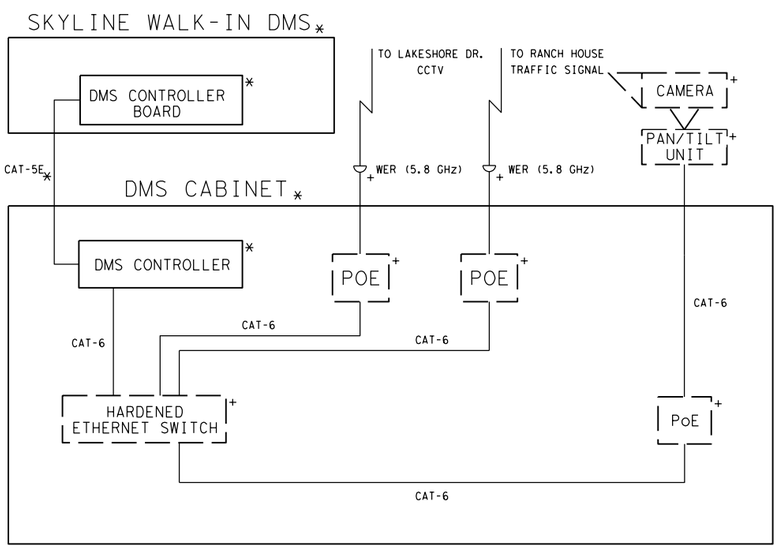
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	24
CHECK DL	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_04.dgn
BY: Nate.Taylor

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

COMMUNICATION BLOCK DIAGRAM



TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

NOTES:

1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT 5E BETWEEN DMS AND DMS CONTROLLER.
3. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
4. AS PART OF THE REMOVAL AND REMOUNTING OF THE EXISTING ITS RADIO, CONTRACTOR TO RELOCATE RADIO POWER SUPPLY AND ASSOCIATED HARDWARE FROM EXISTING DMS HOUSING TO NEW DMS CABINET. THIS WORK WILL BE SUBSIDIARY TO ITEM 6062, RELOCATE ITS RADIO. CONTRACTOR TO PROVIDE NEW CAT 6 EHTERNET CABLE FROM DMS CABINET TO ITS RADIO. THIS WILL BE SUBSIDIARY TO ITEM 6062, RELOCATE ITS RADIO.
5. AS PART OF THE REMOVAL AND REMOUNTING OF THE EXISTING CCTV CAMERA, CONTRACTOR TO RELOCATE CCTV FIELD EQUIPMENT HARDWARE FROM EXISTING DMS HOUSING TO NEW DMS CABINET. CONTRACTOR TO PROVIDE NEW CCTV CONTROL CABLING, CAT 6 EHTERNET OR HYBRID CABLE, FROM DMS CABINET TO CCTV CAMERA. THIS WORK AND MATERIALS WILL BE SUBSIDIARY TO ITEM 6010, RELOCATE CCTV FIELD EQUIPMENT.
6. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
102185
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DMS REPLACEMENT

SCHEMATIC
WIRELESS CONNECTIONS

SITE #4
IH 20 WB AT CHUCKWAGON TRAIL

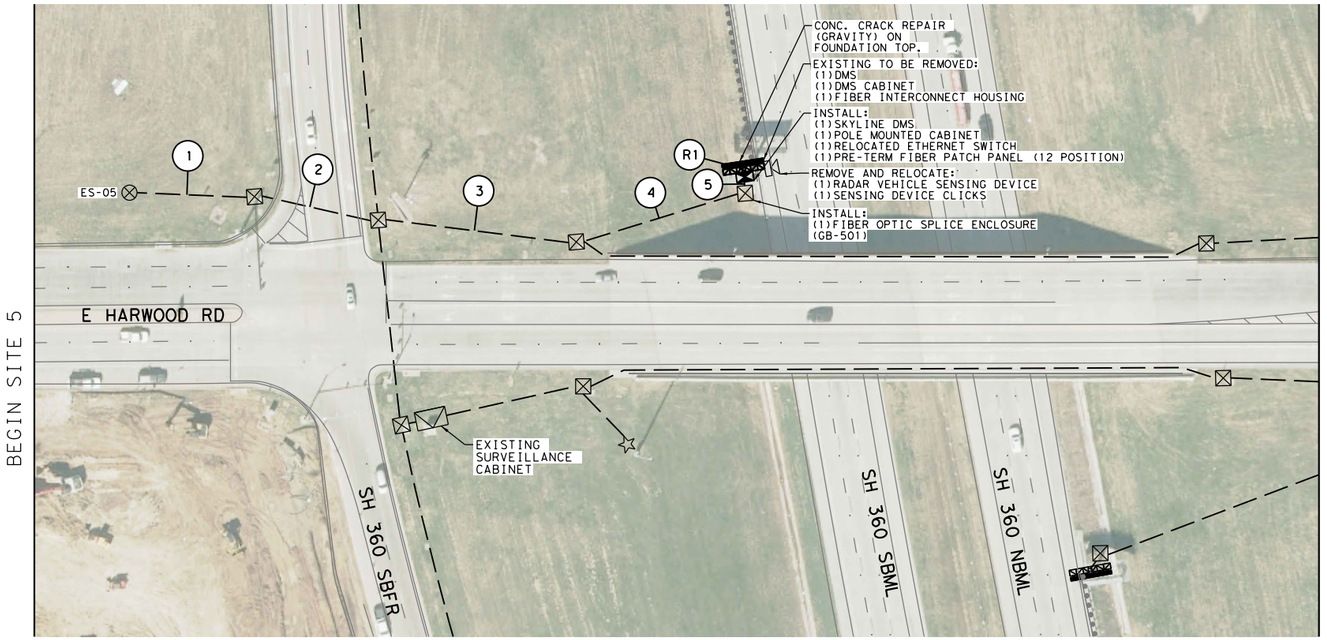
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	25
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_04.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS (RUNS 5 AND R1), SAFELY COIL IT AND STORE IT IN GB-501, INSTALL NEW DMS AND CABINET, INSTALL NEW PATCH PANEL INSIDE CABINET, AND INSTALL NEW FIBER PIGTAIL THROUGH RUNS (5 AND R1) INTO CABINET.
2. CONTRACTOR SHALL REPAINT CONCRETE REPAIRS TO MATCH EXISTING/ORIGINAL PAINT COLOR OF THE STRUCTURES. THIS IS SUBSIDIARY TO ITEM 780.
3. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT.
4. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH RVSD

0 50 100
SCALE: 1"=100'



LOCATION OF CONC. CRACK REPAIR (GRAVITY) ON FOUNDATION TOP:

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") LF	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 1) BARE Qty	ELEC CONDR (NO. 1) BARE LF	ELEC CONDR (NO. 8) BARE (TRACE) Qty	ELEC CONDR (NO. 8) BARE (TRACE) LF	ELEC CONDR (NO. 1) INSULATED Qty	ELEC CONDR (NO. 1) INSULATED LF	DMS CAT 5E + Qty	DMS CAT 5E + LF	RVSD CONTROL CABLE +++ Qty	RVSD CONTROL CABLE +++ LF	FO CBL (12 SMF) (PIGTAIL) ++++ Qty	FO CBL (12 SMF) (PIGTAIL) ++++ LF	RELOCATED: FIBER OPTIC CBL (SMF) (36 FIBER) Qty	RELOCATED: FIBER OPTIC CBL (SMF) (36 FIBER) LF	REMOVALS: DMS ELECTRICAL CIRCUIT Qty	REMOVALS: DMS ELECTRICAL CIRCUIT LF	REMOVALS: RVSD CABLE +++ Qty	REMOVALS: RVSD CABLE +++ LF	TOTAL LENGTH OF RUN	RUN NO
1	E			1		I	1	40			3	120									1	40			35	1
2	E			1		I	1	90			3	270									1	90			85	2
3	E	4				I	1	140			3	420									1	140			135	3
4	E			2		I	1	130			3	390									1	130			125	4
5	E			2		I	1	15	1	15	3	45					1	15	1	15	1	15			10	5
R1	I					I	1	55	1	10	3	165	1	55	1	55	1	10	1	55	1	55	1	55	50	R1
TOTAL								470		25		1410		55		55		25		70		470		55		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS. PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

SLACK SUMMARY

ID	FO CBL (12 SMF) ++++
DMS-CABINET	25
GB-501	100
TOTAL	125

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6007	ELEC CONDR (NO.8) BARE	LF	25
620	6017	ELEC CONDR (NO.1) BARE	LF	470
620	6018	ELEC CONDR (NO.1) INSULATED	LF	1410
780	6006	CNC CRACK REPAIR (FLOOD)(GRAVITY)	SF	3
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	70
6027	6003	CONDUIT (PREPARE)	LF	390
6027	6008	GROUND BOX (PREPARE)	EA	5
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	470
6304	6005	ITS RVSD (DC ONLY) (RELOCATE)	EA	1
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+++		RVSD CONTROL CABLE	LF	55
+		INSTALL DMS CAT 5E CABLE	LF	55
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	1
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	1
++++		12 FIBER PIGTAIL SM	LF	150
+++		RELOCATE SERIAL SERVER UNIT	EA	1
+++		REMOVE RVSD CABLE	LF	55
8+		PAINT REPAIRED STRUCTURE	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2

\+ SUBSIDIARY TO ITEM 6028
+++ SUBSIDIARY TO ITEM 6304
++++ SUBSIDIARY TO ITEM 6007
8+ SUBSIDIARY TO ITEM 780
11+ SUBSIDIARY TO ITEM 6331

2/23/2021
STATE OF TEXAS
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102185
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DMS REPLACEMENT

DMS LAYOUT
SITE #5

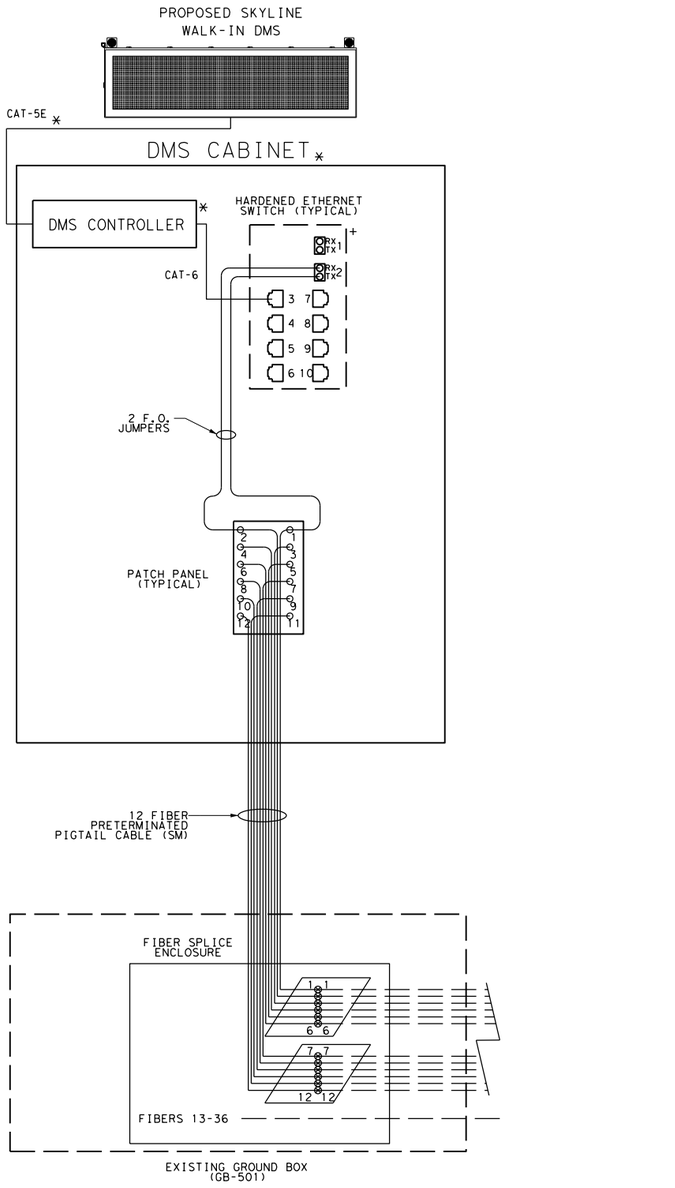
SH 360 SB AT HARWOOD RD

SHEET 1 OF 1

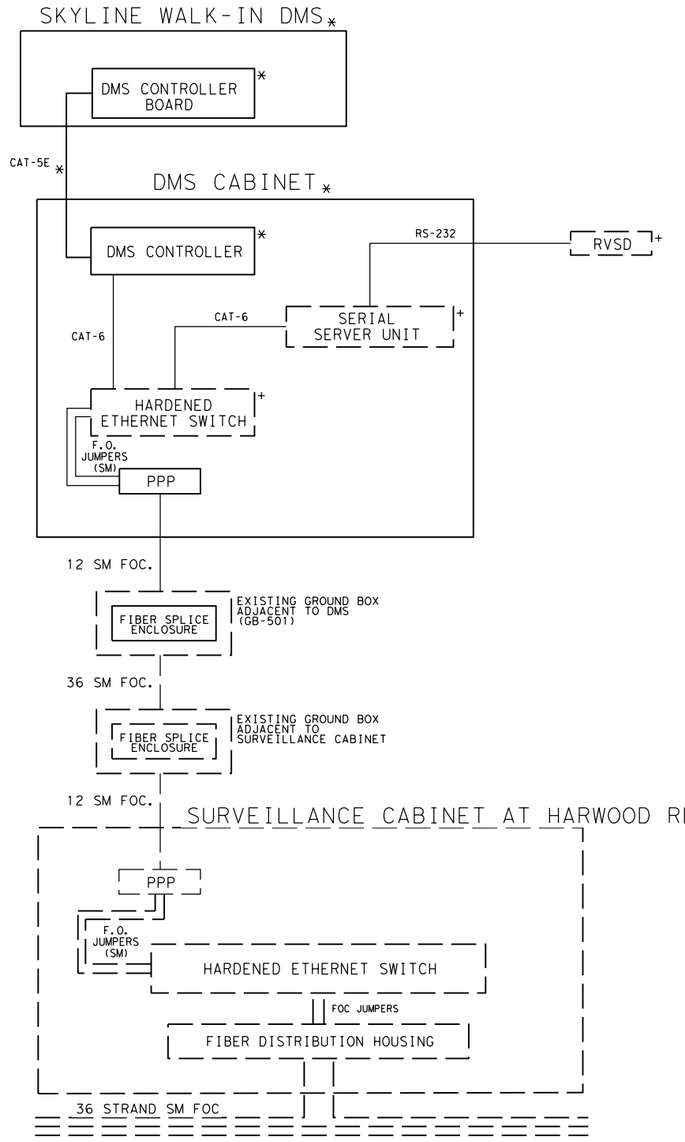
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	
CHECK DL	CONTROL	SECTION	JOB	26
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\khalpwprod\nate.taylor\dms42767\FTW_DMS_SHT_05.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM



LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT 5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
11. CONTRACTOR SHALL RELOCATE EXISTING CLICKS FOR RADAR DEVICE FROM EXISTING DMS SIGN TO NEW POLE MOUNTED DMS CABINET. THIS WILL BE SUBSIDIARY TO ITEM 6304 RELOCATE RADAR VEHICLE SENSING DEVICE.
12. CONTRACTOR TO PROVIDE NEW RADAR VEHICLE SENSING DEVICE CABLE FROM RADAR DEVICE TO POLE MOUNTED DMS CABINET. THIS WILL BE SUBSIDIARY TO ITEM 6304 RELOCATE RADAR VEHICLE SENSING DEVICE.

TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

SERIAL SERVER UNIT

1	2	3	4

PORT ASSIGNMENTS:

1. CCTV
2. SENSOR#1 OR DMS#3
3. SENSOR#2 OR DMS#2
4. SENSOR#3 OR DMS#1

2/23/2021

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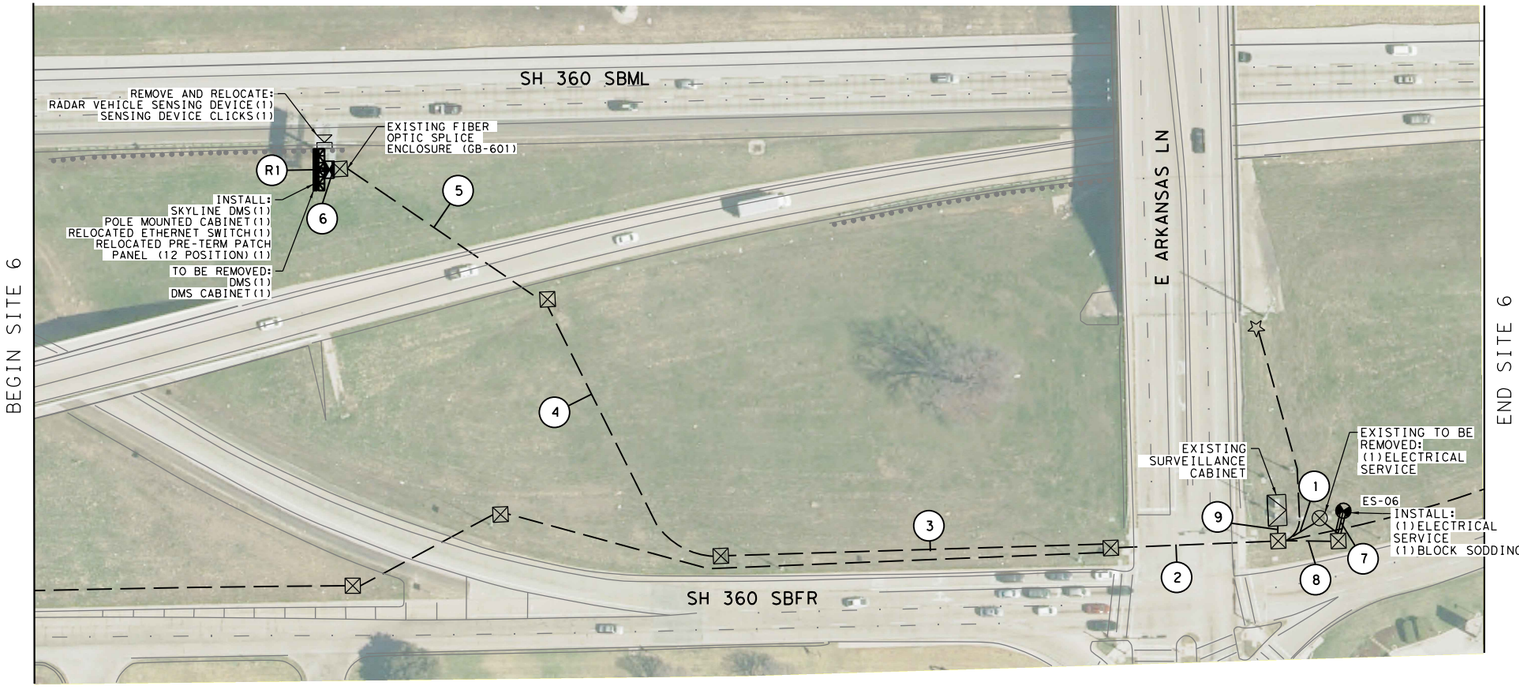
DMS REPLACEMENT
SCHEMATIC
FIBER OPTIC CONNECTIONS
SITE #5
SH 360 SB AT HARWOOD RD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS				
CL	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK				
DL	TEXAS	FTW	TARRANT	27
	CONTROL	SECTION	JOB	
CHECK				
DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_05.dgn
BY: Nate.Taylor

NOTES:
1. A 4-HOUR WINDOW FOR SWITCHOVER WILL BE ALLOWED TO RECONNECT POWER FOR THE SURVEILLANCE CABINET. THE CONTRACTOR SHALL PROVIDE 72-HOUR ADVANCE NOTICE AND RECEIVE APPROVAL FOR THE OUTAGE FROM THE TXDOT SIGNAL SHOP AT 817-370-3664.
2. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS (RUNS 6 AND R1), SAFELY COIL IT AND STORE IT IN GB-601, INSTALL NEW DMS AND CABINET, INSTALL PATCH PANEL INSIDE CABINET, AND PULL FIBER THROUGH RUNS 6 AND R1 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
3. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
4. CONTRACTOR SHALL REUSE EXISTING HOLES IN DMS TOWER. IF HOLES NEED TO BE ENLARGED, CONTRACTOR SHALL DO THIS IN THE FIELD. THIS WILL BE SUBSIDIARY TO ITEM 6028.
5. CONTRACTOR TO INSTALL NEW POLE MOUNTED DMS CABINET PROVIDED BY TXDOT ON EXISTING STRUCTURE.
6. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT.
7. SEE SHEET 16 FOR CONSTRUCTION NOTES, ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE, AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH RVSD.



0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") LF	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") LF	CONDUIT LENGTH: MULTIDUCT COND SYS (PVC) (SCHD 80) 4"BORE Qty	CONDUIT LENGTH: MULTIDUCT COND SYS (PVC) (SCHD 80) 4"BORE LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 8) BARE (TRACE) Qty	ELEC CONDR (NO. 8) BARE (TRACE) LF	ELEC CONDR (NO. 8) BARE Qty	ELEC CONDR (NO. 8) BARE LF	ELEC CONDR (NO. 2/0) BARE Qty	ELEC CONDR (NO. 2/0) BARE LF	ELEC CONDR (NO. 8) INSULATED Qty	ELEC CONDR (NO. 8) INSULATED LF	ELEC CONDR (NO. 2/0) INSULATED Qty	ELEC CONDR (NO. 2/0) INSULATED LF	DMS CAT 5E + Qty	DMS CAT 5E + LF	RVSD CONTROL CABLE +++ Qty	RVSD CONTROL CABLE +++ LF	RELOCATED: FO CBL (SMF) PIGTAIL (12 FIBER) Qty	RELOCATED: FO CBL (SMF) PIGTAIL (12 FIBER) LF	REMOVALS: CONDUIT 10+ Qty	REMOVALS: CONDUIT 10+ LF	REMOVALS: DMS, SC ELECTRICAL CIRCUIT Qty	REMOVALS: DMS, SC ELECTRICAL CIRCUIT LF	REMOVALS: RVSD CABLE +++ Qty	REMOVALS: RVSD CABLE +++ LF	TOTAL LENGTH OF RUN	RUN NO
1	R			2				R																		1	5	1	40			35	1
2	E			1		2		I					1	130			3	390										1	130			125	2
3	E			2				I					1	200			3	600										1	200			195	3
4	E			2				I					1	220			3	660										1	220			215	4
5	E			2				I					1	175			3	525										1	175			170	5
6	E			1				I	1	25			1	25			3	75							1	25			1	25			20	6
7	I	1	10					I					1	10	3	30	3	30										1	10			5	7
8	E			1				I					1	40	3	120	3	120										1	40			35	8
9	E			1				I	1	20	1	20			3	60												1	20			15	9
R1	I							I	1	10			1	55			3	165	1	55	1	55	1	55				1	55	1	55	50	R1
TOTAL			10						55		20		855		210		2565		55		55		80		5		915		55			

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6023	CONDT (PVC) (SCH 40) (2")	LF	10
620	6007	ELEC CONDR (NO.8) BARE	LF	75
620	6008	ELEC CONDR (NO.8) INSULATED	LF	210
620	6021	ELEC CONDR (NO.2/0) BARE	LF	855
620	6022	ELEC CONDR (NO.2/0) INSULATED	LF	2565
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6250	ELC SRV TY D 120/240 100(NS)SS(N)SP(O)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	80
6027	6003	CONDUIT (PREPARE)	LF	775
6027	6008	GROUND BOX (PREPARE)	EA	6
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	915
6304	6005	ITS RVSD (DC ONLY) (RELOCATE)	EA	1
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+++		RVSD CONTROL CABLE	LF	55
+		INSTALL DMS CAT 5E CABLE	LF	55
10+		REMOVE CONDUIT	LF	5
+++		RELOCATE SERIAL SERVER UNIT	EA	1
+++		REMOVE RVSD CABLE	LF	55
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
++++		RELOCATE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	1

\+ SUBSIDIARY TO ITEM 6028
+++ SUBSIDIARY TO ITEM 6304
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
10+ SUBSIDIARY TO ITEM 618

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
102185
LICENSED
PROFESSIONAL ENGINEER

Dhruva Lahon

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DMS REPLACEMENT

DMS LAYOUT
SITE #6

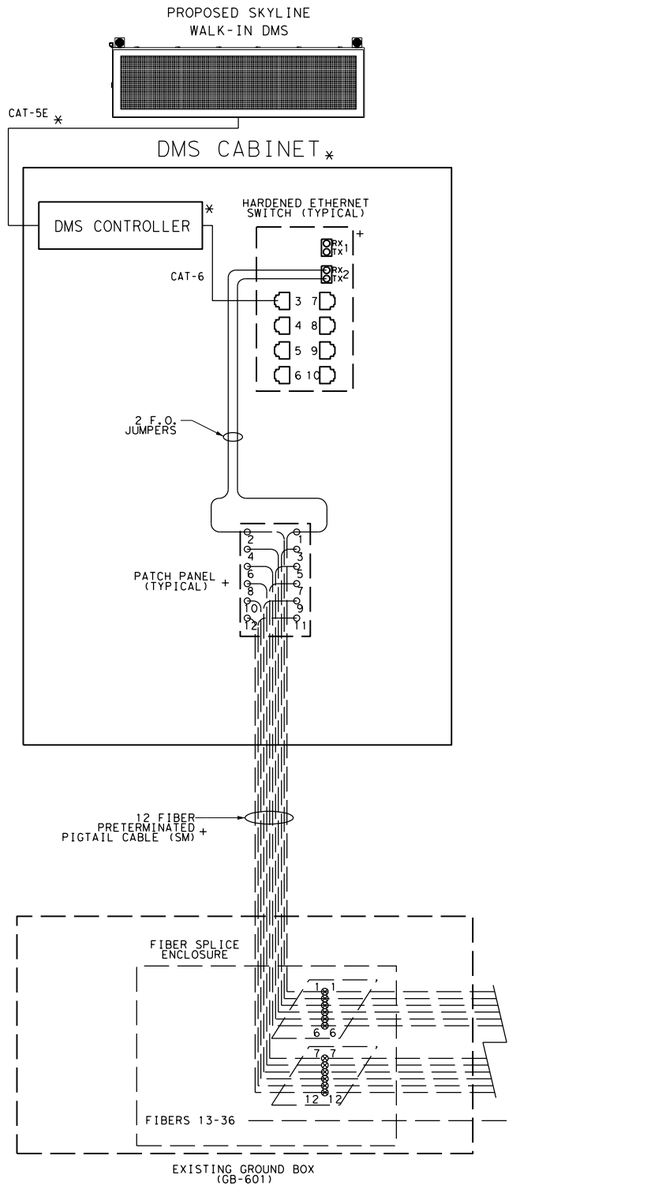
SH 360 SB AT E ARKANSAS LN

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS				
IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	
DL	CONTROL	SECTION	JOB	28
CHECK	0902	90	111	
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_06.dgn
BY: Nate.Taylor

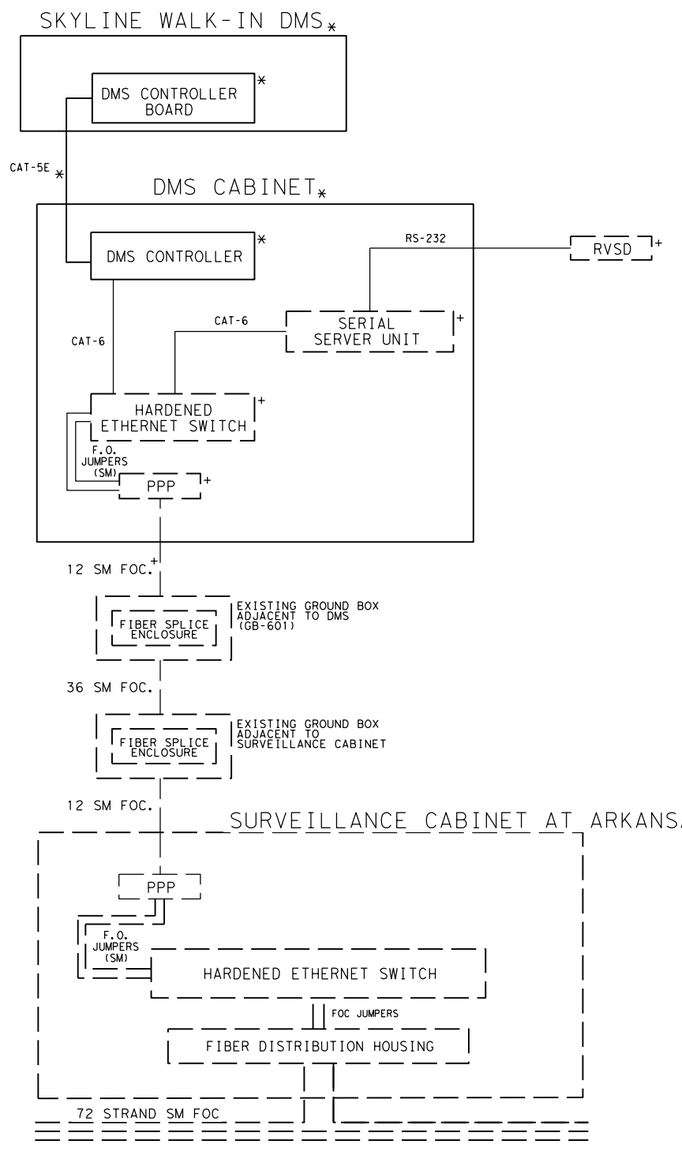
FIBER CABLING AND PATCH PANEL DETAIL



NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT 5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
11. CONTRACTOR SHALL RELOCATE EXISTING CLICKS FOR RADAR DEVICE FROM EXISTING DMS SIGN TO NEW POLE MOUNTED DMS CABINET. THIS WILL BE SUBSIDIARY TO ITEM 6304 RELOCATE RADAR VEHICLE SENSING DEVICE.
12. CONTRACTOR TO PROVIDE NEW RADAR VEHICLE SENSING DEVICE CABLE FROM RADAR DEVICE TO POLE MOUNTED DMS CABINET. THIS WILL BE SUBSIDIARY TO ITEM 6304 RELOCATE RADAR VEHICLE SENSING DEVICE.

COMMUNICATION BLOCK DIAGRAM



TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

SERIAL SERVER UNIT

1	2	3	4

PORT ASSIGNMENTS:

1. CCTV
2. SENSOR#1 OR DMS#3
3. SENSOR#2 OR DMS#2
4. SENSOR#3 OR DMS#1

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

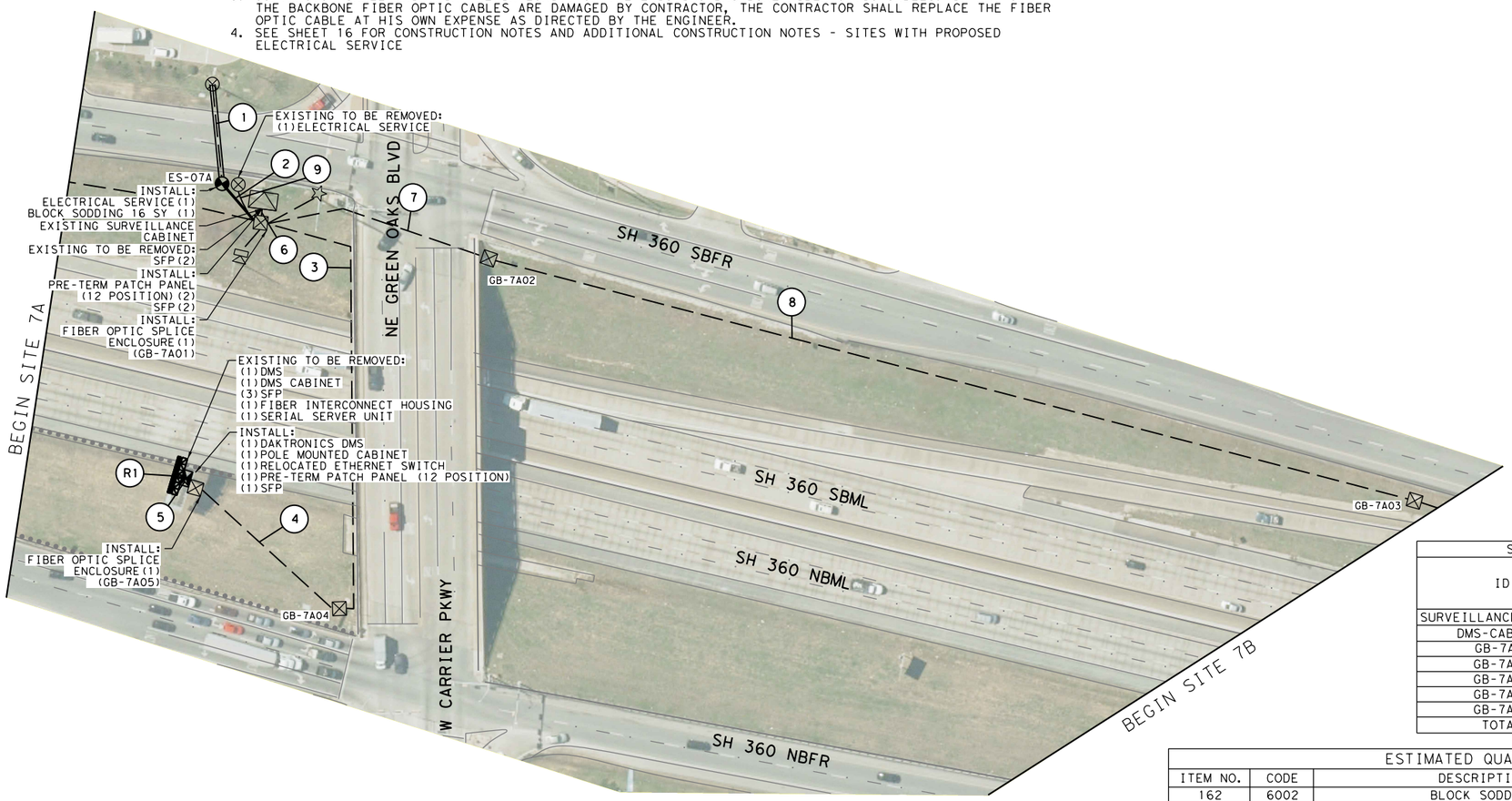
SITE #6
SH 360 SB AT E ARKANSAS LN

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	29
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276\FTW_DMS_FOC_06.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT.
2. ELECTRIC COMPANY TO INSTALL CONDUCTOR WIRES FROM THE EXISTING SERVICE POLE TO THE PROPOSED SERVICE POLE. CONTRACTOR TO COORDINATE WITH THE POWER COMPANY.
3. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
4. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE



0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

SLACK SUMMARY		
ID	FO CBL (12 SMF) +++	FO CBL (36 SMF)
SURVEILLANCE-CABINET	25	
DMS-CABINET	25	
GB-7A01	100	100
GB-7A02		25
GB-7A03		25
GB-7A04		25
GB-7A05	100	100
TOTAL	250	275

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (RM) (2") Qty	CONDT (RM) (2") LF	CONDT (RM) (3") Qty	CONDT (RM) (3") LF	CONDT (PVC) (SCHD 40) (2") Qty	CONDT (PVC) (SCHD 40) (2") LF	CONDT (PVC) (SCHD 40) (3") Qty	CONDT (PVC) (SCHD 40) (3") LF	CONDT (PVC) (SCHD 80) (2") (BORE) Qty	CONDT (PVC) (SCHD 80) (2") (BORE) LF	4" MD CONDUIT SYS Qty	4" MD CONDUIT SYS LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 1) BARE Qty	ELEC CONDR (NO. 1) BARE LF	ELEC CONDR (NO. 8) BARE Qty	ELEC CONDR (NO. 8) BARE LF	ELEC CONDR (NO. 1) INSULATED Qty	ELEC CONDR (NO. 1) INSULATED LF	ELEC CONDR (NO. 8) INSULATED Qty	ELEC CONDR (NO. 8) INSULATED LF	DMS 6 MM FO JUMPER + Qty	DMS 6 MM FO JUMPER + LF	FO CBL (12 SMF) (PIGTAIL) ++++ Qty	FO CBL (12 SMF) (PIGTAIL) ++++ LF	FO CBL (36 SMF) Qty	FO CBL (36 SMF) LF	REMOVALS: CONDUIT 10+ Qty	CONDUIT 10+ LF	MM FO CBL Qty	MM FO CBL LF	DMS, SC ELECTRICAL CIRCUIT Qty	DMS, SC ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	I									1	80			I																					75	1
2	I					1	45							I	1	45	1	45	3	135	3	135													40	2
3	E	1		1										I	1	345			3	1035									1	345		1	345	1	345	340	3
4	E							2				1		I	1	120			3	360									1	120		1	120	1	120	115	4
5	E							2						I	1	30			3	90					1	30			1	30	1	30	1	30	25	5
6	E							8						I			1	15			3	45			2	30					1	15	1	15	10	6
7	E							2						I													1	175			1	175			170	7
8	E							2						I													1	695			1	695			690	8
9	R					1								R																					30	9
R1	I													I	1	55			3	165			1	55	1	10			1	55	1	55	50	R1
TOTAL							45				80					595		60		1785		180		55		70		1335		35		1435		600		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6023	CONDT (PVC) (SCH 40) (2")	LF	45
618	6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	80
620	6007	ELEC CONDR (NO.8) BARE	LF	60
620	6008	ELEC CONDR (NO.8) INSULATED	LF	180
620	6017	ELEC CONDR (NO.1) BARE	LF	595
620	6018	ELEC CONDR (NO.1) INSULATED	LF	1785
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6251	ELC SRV TY D 120/240 100(NS)SS(N)SP(U)	EA	1
6007	6050	FO CBL (36 SMF)	LF	1610
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	2
6007	6094	FIBER OPTIC FUSION SPLICE	EA	36
6007	6103	REMOVE FIBER OPTIC CABLE	LF	1435
6027	6003	CONDUIT (PREPARE)	LF	1350
6027	6008	GROUND BOX (PREPARE)	EA	4
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	600
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+	0	RELOCATE ETHERNET SWITCH	EA	1
11+	0	REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	1
+	0	6 STND FACTORY TERMINATED MM FO JUMPER	LF	55
10+	0	REMOVE CONDUIT	LF	35
++++	0	12 FIBER PRETERMINATED PATCH PANEL	EA	3
++++	0	12 FIBER PIGTAIL SM	LF	320
++++		REPLACE SFP	EA	3
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #7A

SH 360 NB AT NE GREEN OAKS BLVD

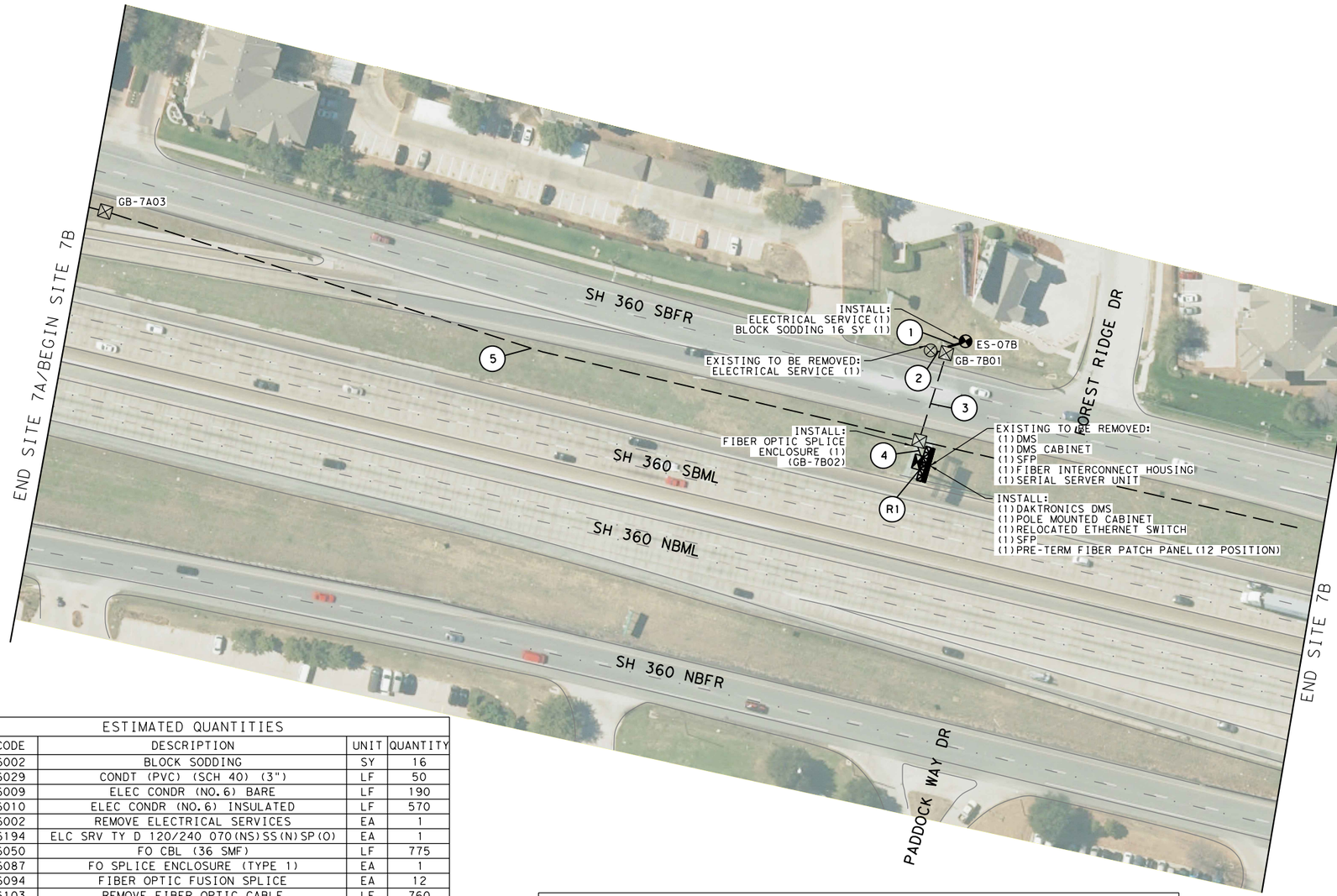
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	30
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\khq\pwprod\nate.taylor\dms4276?\NTW_DMS_SHT_07A.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT.
2. ELECTRIC COMPANY TO INSTALL CONDUCTOR WIRES FROM THE EXISTING SERVICE POLE TO THE PROPOSED SERVICE POLE. CONTRACTOR TO COORDINATE WITH THE POWER COMPANY.
3. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE.

0 50 100
SCALE: 1"=100'



LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6029	CONDT (PVC) (SCH 40) (3")	LF	50
620	6009	ELEC CONDR (NO.6) BARE	LF	190
620	6010	ELEC CONDR (NO.6) INSULATED	LF	570
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6194	ELC SRV TY D 120/240 070(NS)SS(N)SP(O)	EA	1
6007	6050	FO CBL (36 SMF)	LF	775
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6103	REMOVE FIBER OPTIC CABLE	LF	760
6027	6003	CONDUIT (PREPARE)	LF	770
6027	6008	GROUND BOX (PREPARE)	EA	2
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	185
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	1
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	55
10+		REMOVE CONDUIT	LF	5
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	1
++++		12 FIBER PIGTAIL SM	LF	165
++++		REPLACE SFP	EA	1
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 6) BARE Qty	ELEC CONDR (NO. 6) BARE LF	ELEC CONDR (NO. 6) INSULATED Qty	ELEC CONDR (NO. 6) INSULATED LF	DMS 6 MM FO JUMPER + Qty	DMS 6 MM FO JUMPER + LF	FO CBL (12 SMF) (PIGTAIL) ++++ Qty	FO CBL (12 SMF) (PIGTAIL) ++++ LF	FO CBL (36 SMF) Qty	FO CBL (36 SMF) LF	REMOVALS: CONDUIT 10+ Qty	CONDUIT 10+ LF	MM FO CBL Qty	MM FO CBL LF	DMS ELECTRICAL CIRCUIT Qty	DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	I	2	50	I	1	25	3	75													20	1
2	R	2		R											1	5			1	20	15	2
3	E	1		I	1	80	3	240											1	80	75	3
4	E	2		I	1	30	3	90			1	30					1	30	1	30	25	4
5	E	2		I									1	675			1	675			670	5
R1	I			I	1	55	3	165	1	55	1	10					1	55	1	55	50	R1
TOTAL			50			190		570		55		40		675		5		760		185		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

SLACK SUMMARY

ID	FO CBL (12 SMF)	FO CBL (36 SMF)
DMS-CABINET	25	
GB-7B02	100	100
TOTAL	125	100

2/23/2021
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Fax No. (972) 239-3820

DMS REPLACEMENT

DMS LAYOUT
SITE #7B

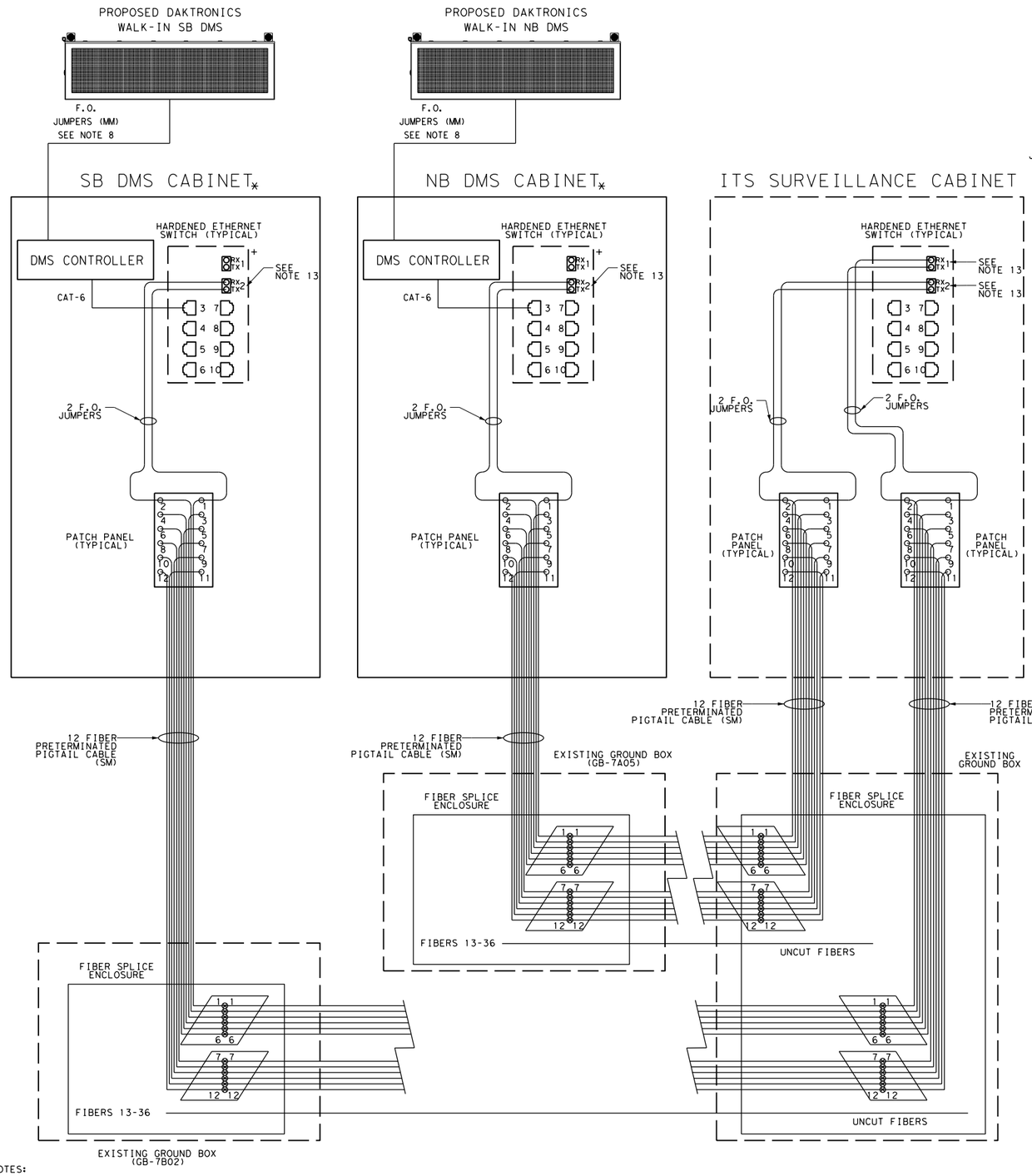
SH 360 SB AT NE GREEN OAKS BLVD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	31
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_07B.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL

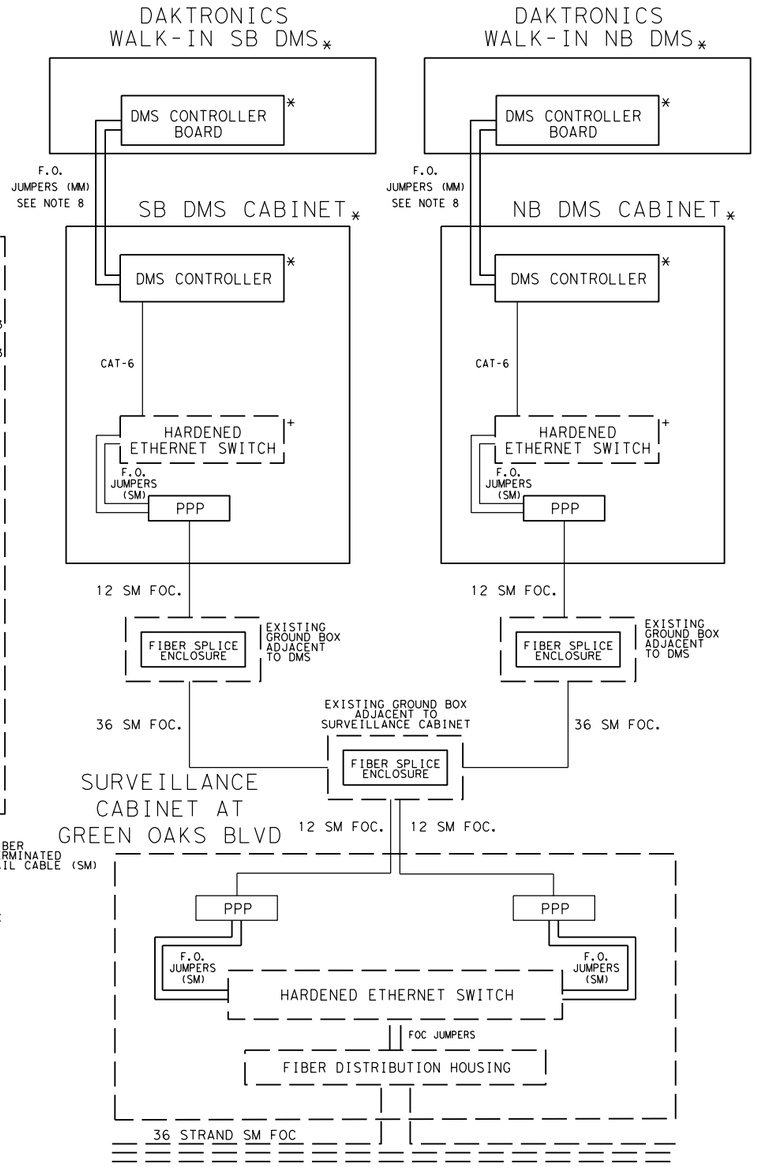


NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.

NOTES CONTINUED ON NEXT SHEET.

COMMUNICATION BLOCK DIAGRAM



TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

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DMS REPLACEMENT

SCHEMATIC FIBER OPTIC CONNECTIONS

SITE #7A & 7B
SH 360 NB & SB AT GREEN OAKS BLVD

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	32
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_07.dgn
BY: Nate.Taylor

NOTES:

5. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.

6. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.

7. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.

8. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.

9. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.

10. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.

11. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRMS FOR CLARITY.

12. CONTRACTOR TO REPLACE EXISTING MM SFP ON ETHERNET SWITCH WITH SM SFP TO BE PROVIDED BY TXDOT. THIS WORK WILL BE SUBSIDIARY TO ITEM 6007.

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276\FTW_DMS_FOC_07A.dgn
BY: Nate.Taylor

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

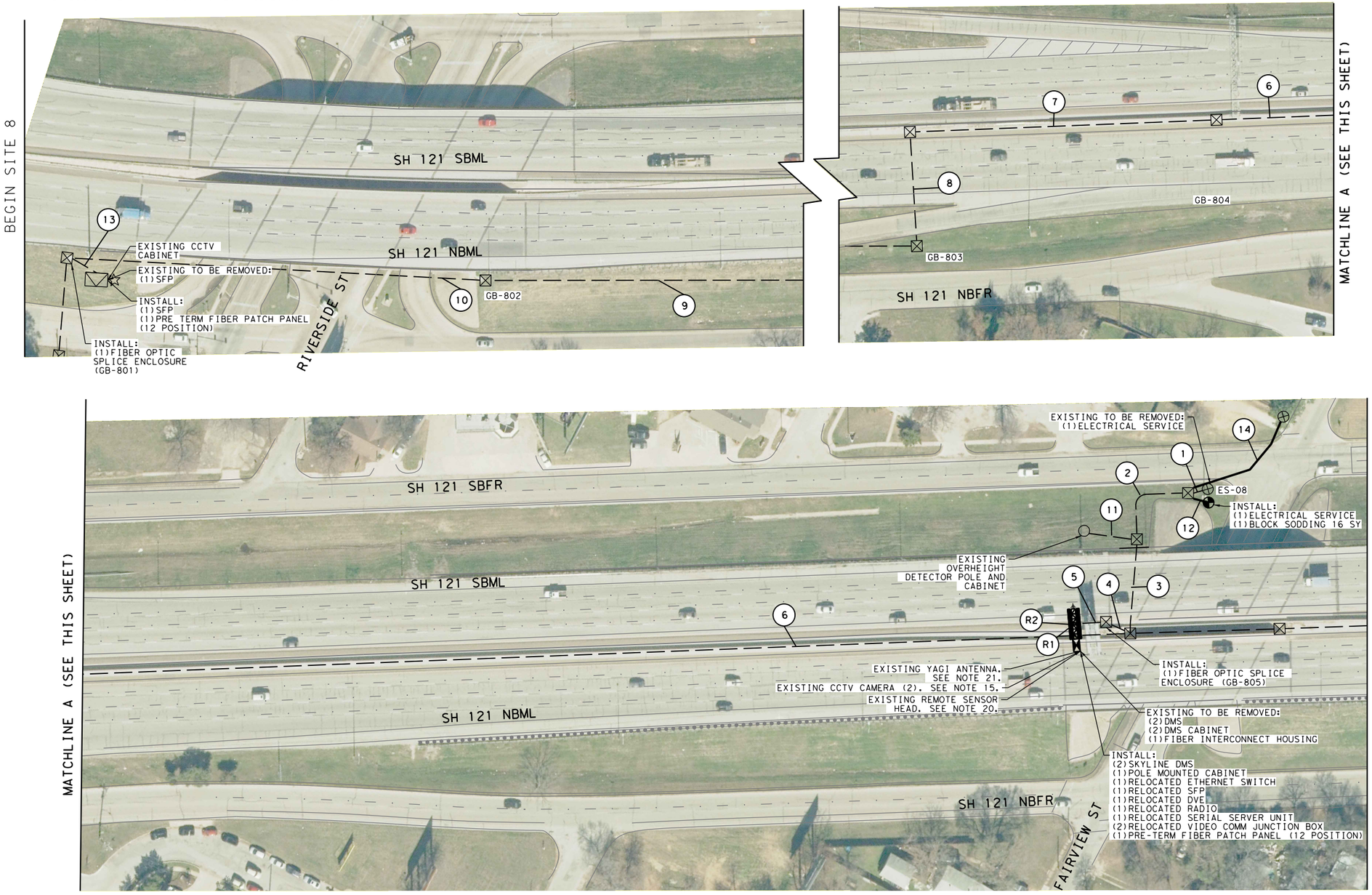
SCHEMATIC
FIBER OPTIC CONNECTIONS

SITE #7A & 7B
SH 360 NB & SB AT GREEN OAKS BLVD

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	33
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

NOTES:
1. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT.
2. EXISTING OVERHEIGHT DETECTOR INSTALLED ON THE DMS POLE CANNOT BE MOVED, BUMPED, MISALIGNED, OBSTRUCTED, OR ANYTHING ELSE. IT IS SET AT THE EXISTING HEIGHT AND ALIGNED WITH THE DETECTOR ON THE SIDE OF THE ROAD FOR THE DETECTION OF OVERHEIGHT VEHICLES.
3. EXISTING YAGI ANTENNA TO BE REMOVED AND RELOCATED AFTER DMS REPLACEMENT. NEW COAXIAL CABLE TO BE INSTALLED. THIS SHALL BE SUBSIDIARY TO ITEM 6062.
4. NEW RIGID METAL CONDUIT TO BE INSTALLED FROM NEW DMS CABINET TO REMOTE OVERHEIGHT DECTECTOR SENSOR ON DMS POLE. NEW OVDWS POWER SENSOR CABLE TO BE INSTALLED. THIS SHALL BE CONSIDERED SUBSIDIARY TO ITEM 6028.
5. THE TWO EXISTING CCTVS ARE NON-PTZ AND USED FOR OVERHEIGHT VEHICLE DETECTION. CONTRACTOR SHALL ALIGN THEM WITH THE ASSITANCE FROM TXDOT FORT WORTH'S OPERATIONS' STAFF IF THEY ARE MISALIGNED OR RELOCATED.
6. SEE SHEET 16 FOR CONSTRUCTION NOTES, ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE, AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH RADIO



0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

2/23/2021
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DMS REPLACEMENT

DMS LAYOUT
SITE #8

SH 121 NB & SB AT FAIRVIEW ST

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	34
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_08.dgn
BY: Nate.Taylor

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH								CABLE STATUS	CABLE LENGTH																		REMOVALS										TOTAL LENGTH OF RUN	RUN NO
		CONDT (RM) (2")		CONDT (PVC) (SCHD 80) (2") (BORE)		CONDT (PVC) (SCHD 40) (3")		CONDT (PVC) (SCHD 40) (3") (BORE)			ELEC CONDR (NO. 1) BARE		ELEC CONDR (NO. 2) BARE		ELEC CONDR (NO. 1) INSULATED		ELEC CONDR (NO. 2) INSULATED		DMS CAT 5E +		CCTV CONTROL CABLE 6+		COAXIAL CABLE ++		OVDWS SENSOR CABLE +		FO CBL (12 SMF) (PIGTAIL) ++++		FO CBL (36 SMF)		CONDUIT 10+		2 MM FO CBL		DMS, OVDWS ELECTRICAL CIRCUIT		ANTENA/RADIO CABLES ++		CCTV/OVDWS CABLE 6+			
		Qty	LF	Qty	LF	Qty	LF	Qty	LF		Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF		
1	E					1				I																			2	10			1	15					10	1
2	E									I	1	90			3	270	2	180															1	90					85	2
3	E									I	1	115			3	345																	1	115					110	3
4	E					1				I	1	30			3	90													1	30					1	30			25	4
5	E					1				I	1	30			3	90											1	30					1	30	1	30			30	5
6	E					1				I																					1	1070							1065	6
7	E					1				I																					1	280							275	7
8	E							1		I																					1	110							105	8
9	E					1				I																					1	805							800	9
10	E					1				I																					1	385							380	10
11	E					1				I			1	50			2	100																	1	50			45	11
12	I					1	25			I	1	25			3	75	2	50																					20	12
13	E					1				I																	1	40							1	40			40	13
14	I			1	110					I																													105	14
R1	I									I			2	110			6	330	2	110	2	110					1	10							1	55	1	55	1	55	2	110	50	R1
R2	I	1	35							I															1	35													2	70	30	R2
R3	I									I													1	50																	50	R3
TOTAL			35		110		25					290		160		870		660		110		110		50		35		80		2680		10		2805		385		55		180		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

SLACK SUMMARY		
ID	FO CBL (12 SMF) ++++	FO CBL (36 SMF)
SURVEILLANCE-CABINET	25	
DMS-CABINET	25	
GB-801	100	100
GB-802		25
GB-803		25
GB-804	25	
GB-805	100	100

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6029	CONDT (PVC) (SCH 40) (3")	LF	25
618	6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	110
618	6070	CONDT (RM) (2")	LF	35
620	6015	ELEC CONDR (NO.2) BARE	LF	160
620	6016	ELEC CONDR (NO.2) INSULATED	LF	660
620	6017	ELEC CONDR (NO.1) BARE	LF	290
620	6018	ELEC CONDR (NO.1) INSULATED	LF	870
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6342	ELC SRV TY D 120/240 125(NS)SS(N)PS(U)	EA	1
6007	6050	FO CBL (36 SMF)	LF	2930
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	2
6007	6094	FIBER OPTIC FUSION SPLICE	EA	24
6007	6103	REMOVE FIBER OPTIC CABLE	LF	2805
6010	6012	RELOCATE CCTV FIELD EQUIPMENT	EA	2
6027	6003	CONDUIT (PREPARE)	LF	2970
6027	6008	GROUND BOX (PREPARE)	EA	6
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	2
6062	6042	RELOCATE ITS RADIO	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	385
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	2
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	110
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	1
++		REMOVE YAGI ANTENNA CABLES	LF	55
10+		REMOVE CONDUIT	LF	10
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	2
++++		12 FIBER PIGTAIL SM	LF	355
+++		RELOCATE SERIAL SERVER UNIT	EA	1
++++		REPLACE SFP	EA	2
6+		CCTV CAT6 CABLE	LF	110
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	3
6+		REMOVE CCTV CABLES	LF	180
++		COAXIAL CABLE	LF	50
+		OVDWS SENSOR CABLE	LF	35
6+		RELOCATE VIDEO COMM. JUNCTION BOX	EA	2
6+		RELOCATE DVE	EA	1

+	SUBSIDIARY TO ITEM 6028
++	SUBSIDIARY TO ITEM 6062
+++	SUBSIDIARY TO ITEM 6304
++++	SUBSIDIARY TO ITEM 6007
6+	SUBSIDIARY TO ITEM 6010
7+	SUBSIDIARY TO ITEM 6027
10+	SUBSIDIARY TO ITEM 618
11+	SUBSIDIARY TO ITEM 6331

2/23/2021

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DMS REPLACEMENT

DMS LAYOUT
SITE #8

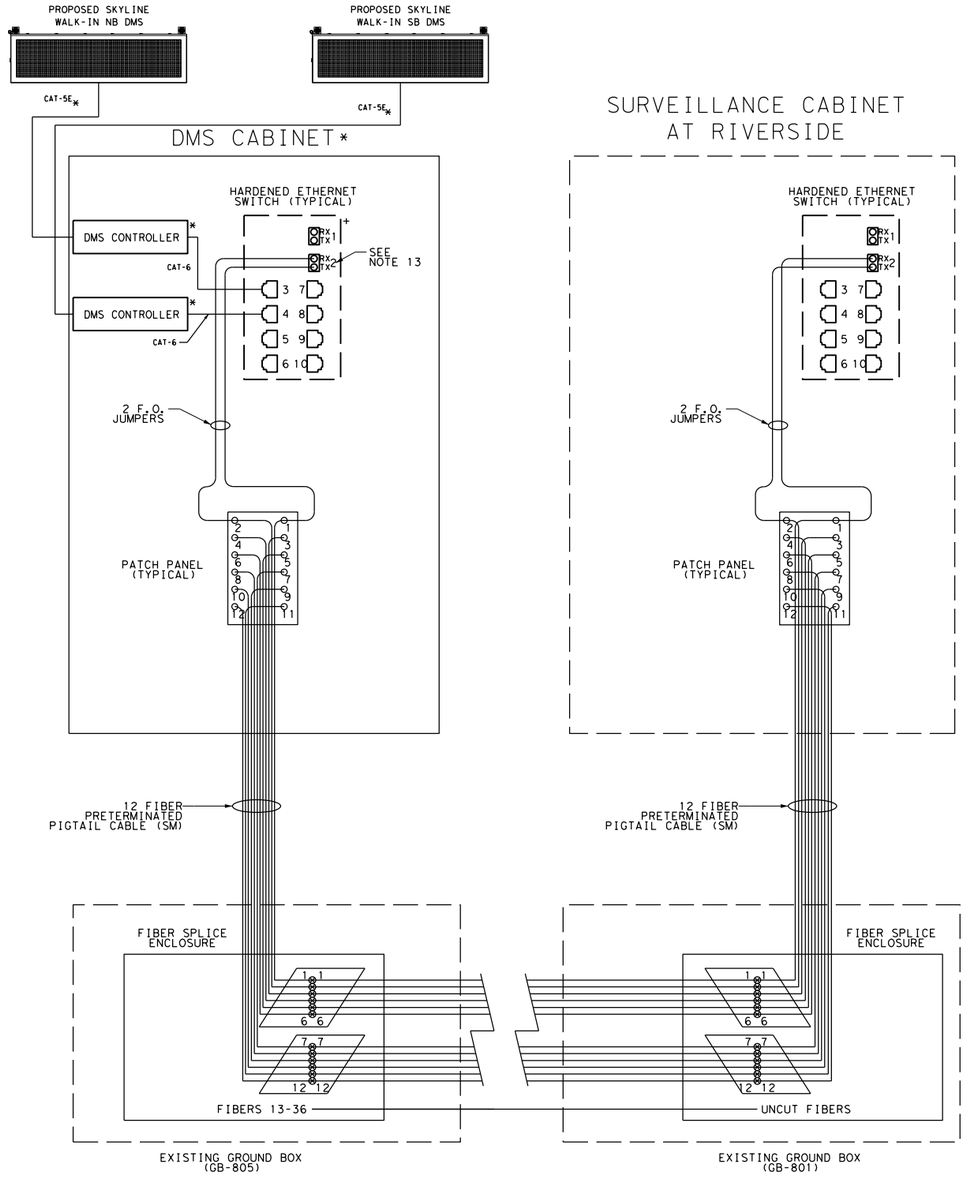
SH 121 NB & SB AT FAIRVIEW ST

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS				
IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	
DL	CONTROL	SECTION	JOB	35
CHECK	0902	90	111	
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_08A.dgn
BY: Nate.Taylor

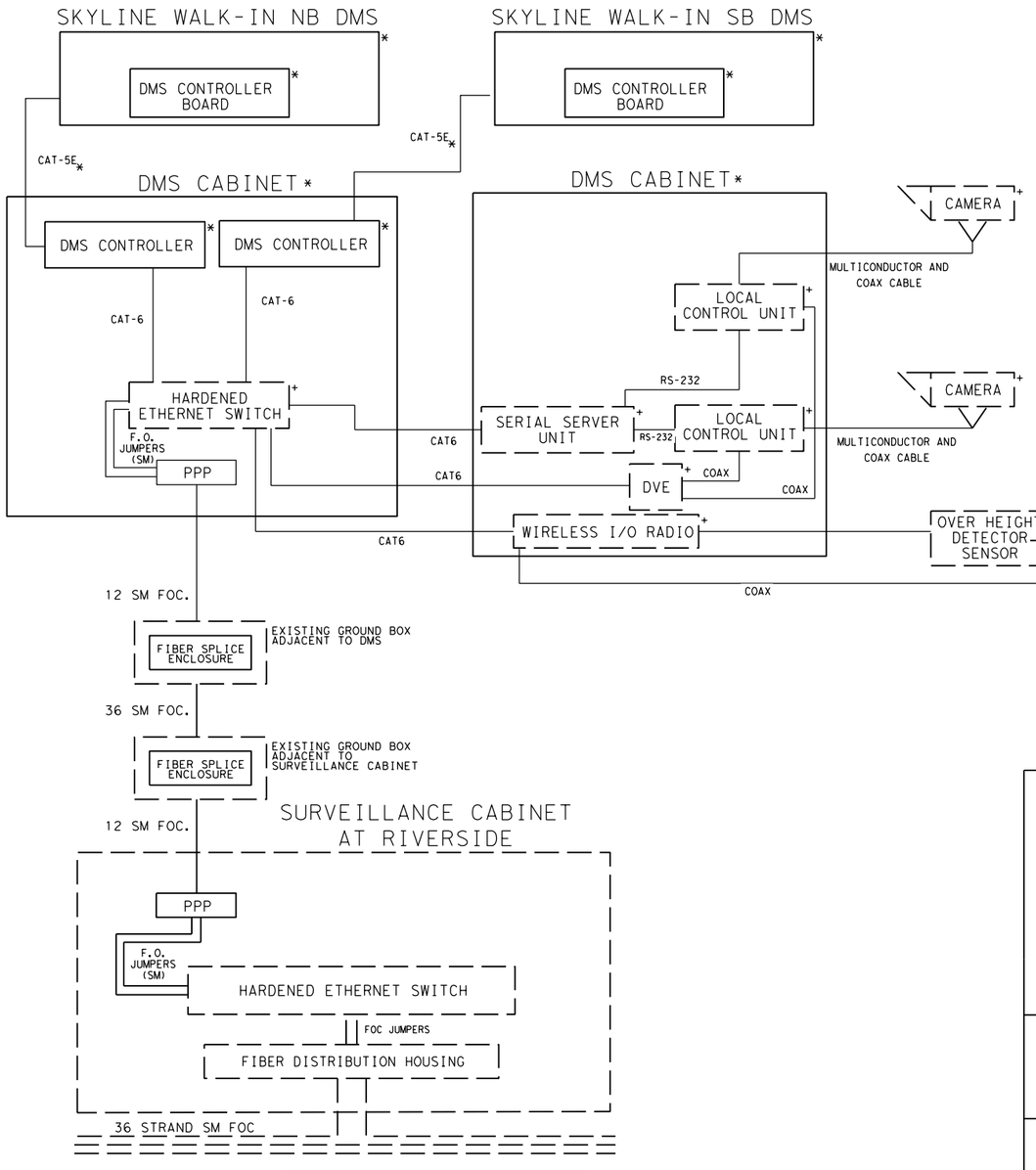
FIBER CABLING AND PATCH PANEL DETAIL



NOTES:

1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-5E CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
3. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
4. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
5. THE CONNECTOR SHALL BE AN ST CONNECTOR.
6. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
7. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
8. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
9. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS
10. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
11. CONTRACTOR TO REPLACE EXISTING MM SFP ON ETHERNET SWITCH WITH SM SFP TO BE PROVIDED BY TXDOT. THIS WORK WILL BE SUBSIDIARY TO ITEM 6007.

COMMUNICATION BLOCK DIAGRAM



TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
5. DMS CONTROLLER
5. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
7. SERIAL SERVER UNIT (IF PRESENT)
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

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DMS REPLACEMENT

SCHEMATIC FIBER OPTIC CONNECTIONS

SITE #8
SH 121 NB & SB AT FAIRVIEW ST

SHEET 1 OF 1

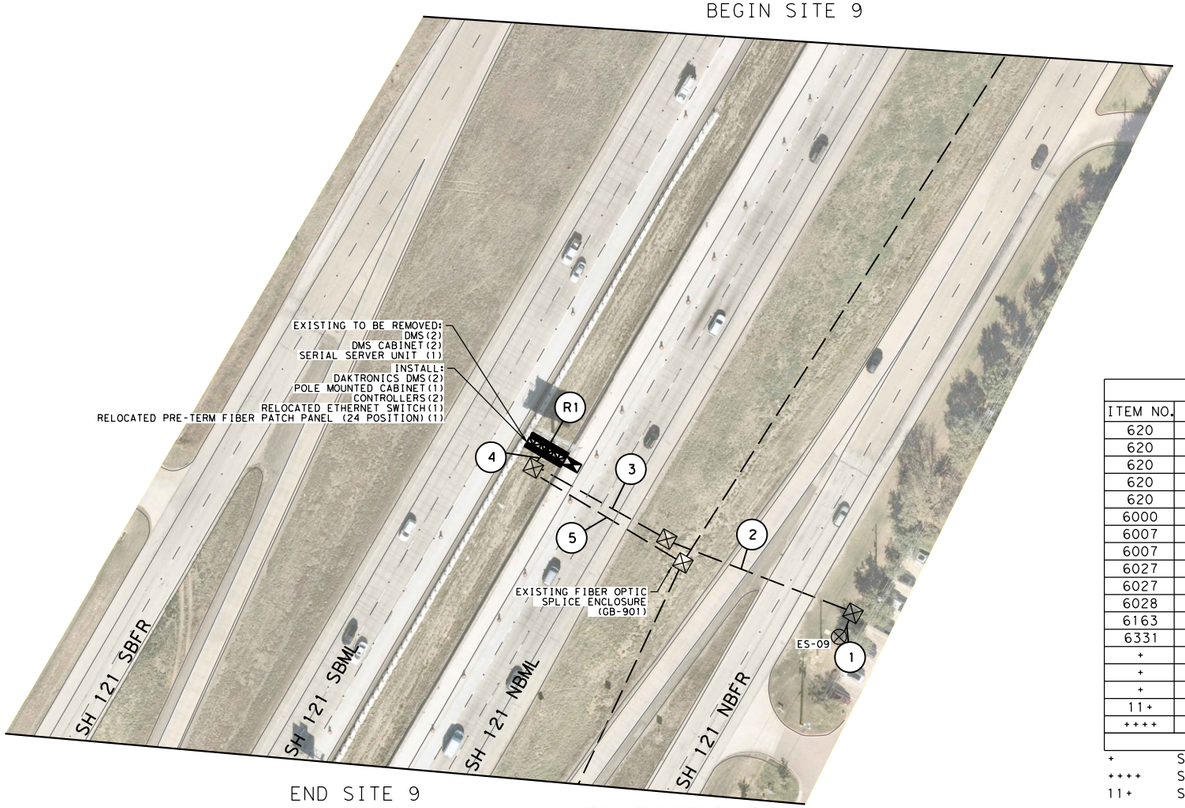
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	36
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276?\FTW_DMS_FOC_08.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS (RUNS 4,5 AND R1), SAFELY COIL IT AND STORE IT IN GB-901, INSTALL NEW DMS AND CABINET, INSTALL PATCH PANEL INSIDE CABINET, AND PULL FIBER THROUGH RUNS 4,5 AND R1 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
3. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT.
4. SEE SHEET 16 FOR CONSTRUCTION NOTES.

0 50 100
SCALE: 1"=100'

BEGIN SITE 9



END SITE 9

AERIAL PROVIDED BY NEARMAP

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6007	ELEC CONDR (NO.8) BARE	LF	125
620	6009	ELEC CONDR (NO.6) BARE	LF	110
620	6010	ELEC CONDR (NO.6) INSULATED	LF	330
620	6017	ELEC CONDR (NO.1) BARE	LF	280
620	6018	ELEC CONDR (NO.1) INSULATED	LF	840
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	24
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	180
6027	6003	CONDUIT (PREPARE)	LF	360
6027	6008	GROUND BOX (PREPARE)	EA	3
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	2
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	335
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	2
+		RELOCATE ETHERNET SWITCH	EA	1
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	110
+		JUNCTION BOX (AS NEEDED)	EA	3
11+		REMOVE SERIAL SERVER UNIT	EA	1
++++		RELOCATE PRETERM FIBER PATCH PANEL (24 POSITION)	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
11+ SUBSIDIARY TO ITEM 6331

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (RM) (2") Qty	CONDT (RM) (2") LF	CONDT (PVC) (SCHD 40) (2") Qty	CONDT (PVC) (SCHD 40) (2") LF	CONDT HDPE (3") Qty	CONDT HDPE (3") LF	CONDT HDPE (4") Qty	CONDT HDPE (4") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 1) BARE Qty	ELEC CONDR (NO. 1) BARE LF	ELEC CONDR (NO. 6) BARE DMS POWER Qty	ELEC CONDR (NO. 6) BARE DMS POWER LF	ELEC CONDR (NO. 8) BARE (TRACE) Qty	ELEC CONDR (NO. 8) BARE (TRACE) LF	ELEC CONDR (NO. 1) INSULATED Qty	ELEC CONDR (NO. 1) INSULATED LF	ELEC CONDR (NO. 6) INSULATED DMS POWER LF	DMS 6 MM FO JUMPER + Qty	DMS 6 MM FO JUMPER + LF	RELOCATED: FO CBL (SMF) PIGTAIL (24 FIBER) Qty	FO CBL (SMF) PIGTAIL (24 FIBER) LF	REMOVALS: DMS ELECTRICAL CIRCUIT Qty	DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1		1						I	1	25					3	75							1	25	20	1
2	E			1				1		I	1	130					3	390							1	130	125	2
3	E							1		I	1	105			1	105	3	315							1	105	100	3
4	E					3				I	1	20			1	20	3	60					1	20	1	20	15	4
5	E							1		I													1	105			100	5
R1	I									I			2	110					6	330	2	110	1	55	1	55	50	R1
TOTAL												280		110		125		840		330		110		180		335		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #9

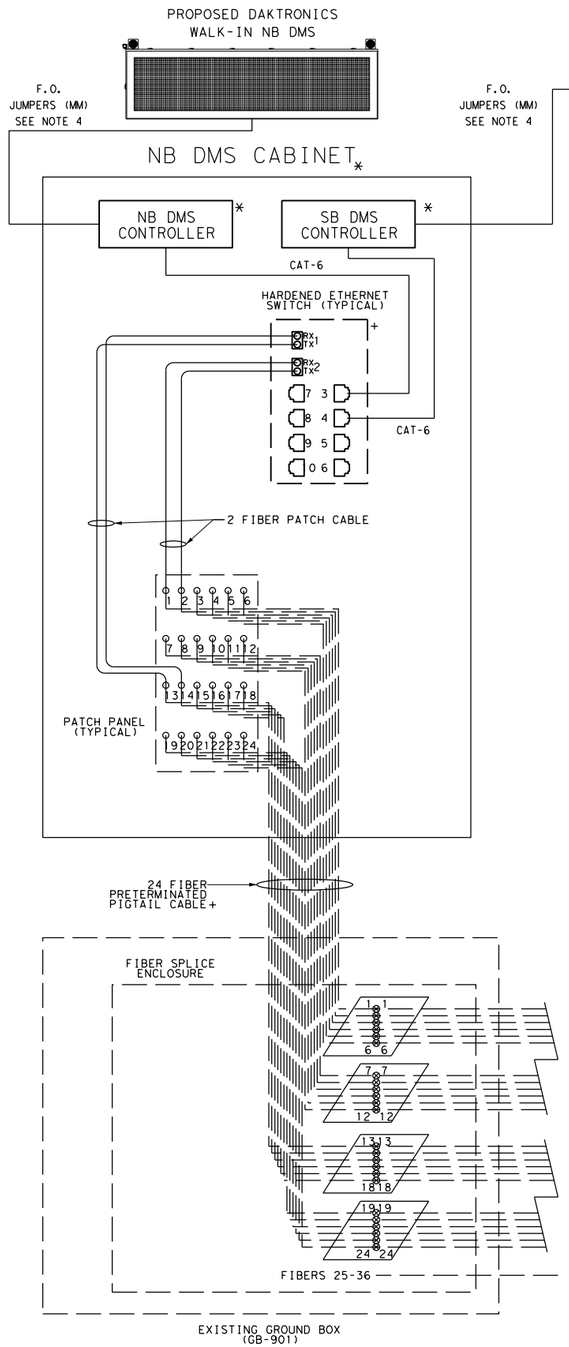
SH 121 NB & SB AT HARWOOD RD

SHEET 1 OF 1

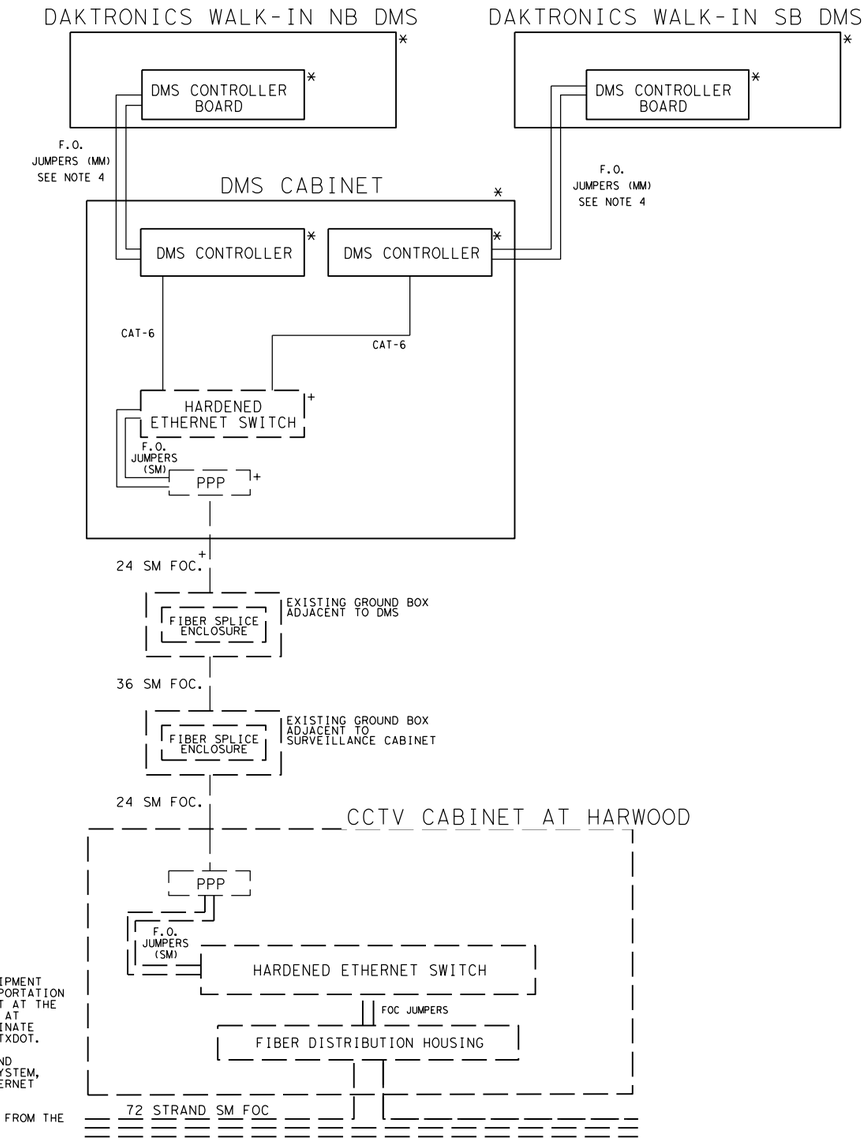
DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS				
IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	
DL	CONTROL	SECTION	JOB	37
CHECK	0902	90	111	
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_09.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM

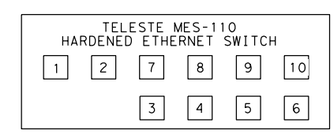


LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-5E CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
3. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
4. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
5. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
6. THE CONNECTOR SHALL BE AN ST CONNECTOR.
7. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
8. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
9. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
10. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
11. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.



PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. DMS CONTROLLER
5. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
7. SERIAL SERVER UNIT (IF PRESENT)
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV PoE (IF PRESENT)

2/23/2021

STATE OF TEXAS
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PROFESSIONAL ENGINEER

Dhruva Lahon

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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

SITE #9
SH 121 NB & SB AT HARWOOD RD

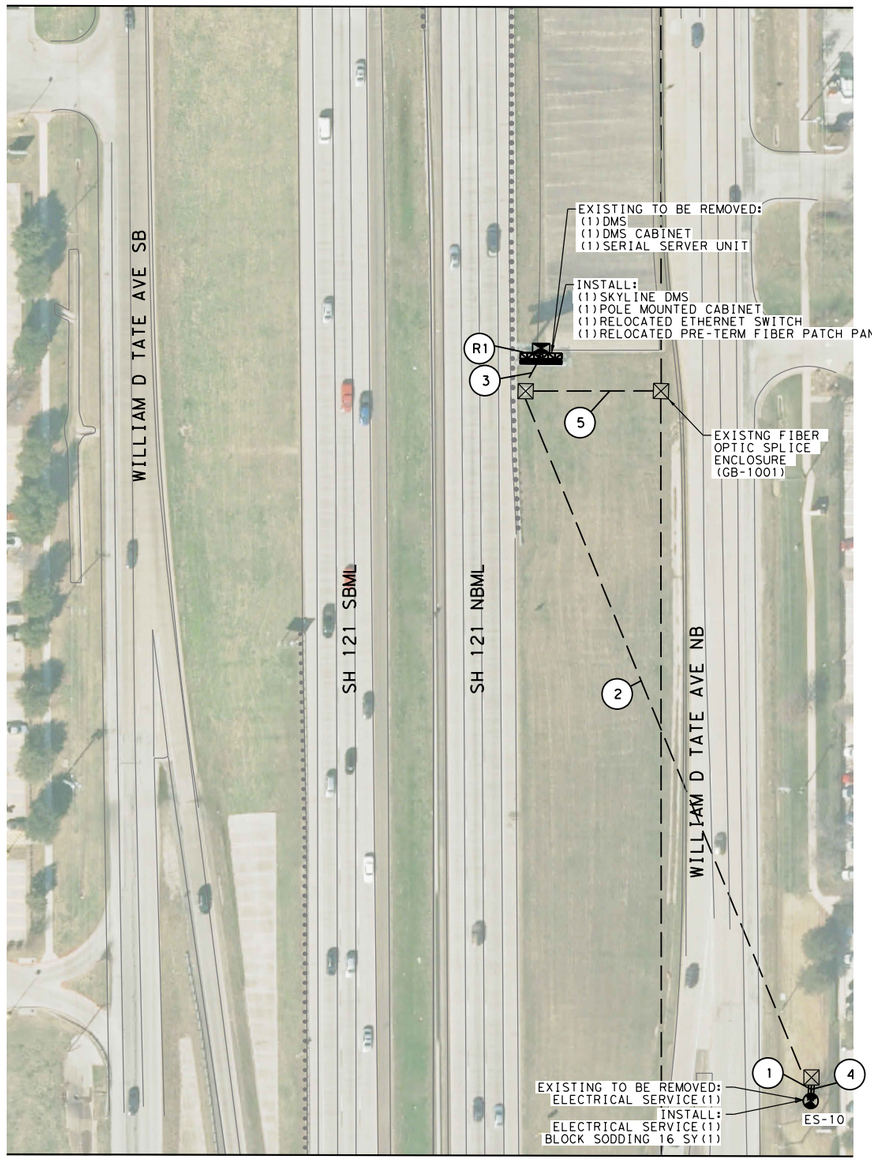
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS				
CL	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	
DL	CONTROL	SECTION	JOB	38
CHECK				
DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_09.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS (RUNS 3, 5 AND R1), SAFELY COIL IT AND STORE IT IN GB-1001, INSTALL NEW DMS AND CABINET, INSTALL PATCH PANEL INSIDE CABINET, AND PULL FIBER THROUGH RUNS 3, 5 AND R1 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
3. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT.
4. ELECTRIC COMPANY TO INSTALL CONDUCTOR WIRES FROM THE EXISTING SERVICE POLE TO THE PROPOSED SERVICE POLE. CONTRACTOR TO COORDINATE WITH THE POWER COMPANY.
5. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE.

BEGIN SITE 10



END SITE 10

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH				CABLE STATUS	CABLE LENGTH								RELOCATED		REMOVALS				TOTAL LENGTH OF RUN	RUN NO
		CONDT (PVC) (SCHD 40) (2")		CONDT (PVC) (SCHD 40) (3")			ELEC CONDR (NO. 1) BARE		ELEC CONDR (NO. 8) BARE (TRACE)		ELEC CONDR (NO. 1) INSULATED		DMS CAT 5E +		FO CBL (24 SMF) (PIGTAIL)		CONDUIT 10+		DMS ELECTRICAL CIRCUIT			
		Qty	LF	Qty	LF		Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF		
1	I	1	15			I															10	1
2	E			1		I	1	500			3	1500							1	500	495	2
3	E			2		I	1	30	1	30	3	90			1	30			1	30	25	3
4	R	1				R											1	5	1	15	10	4
5	E			1		I									1	95					90	5
R1	I					I	1		1	10	3	165	1	55	1	55			1	55	50	R1
TOTALS			15					530		40		1755		55		180		5		600		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6023	CONDT (PVC) (SCH 40) (2")	LF	15
620	6007	ELEC CONDR (NO.8) BARE	LF	40
620	6017	ELEC CONDR (NO.1) BARE	LF	530
620	6018	ELEC CONDR (NO.1) INSULATED	LF	1755
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6194	ELC SRV TY D 120/240 070(NS)SS(N)SP(O)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	24
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	180
6027	6003	CONDUIT (PREPARE)	LF	610
6027	6008	GROUND BOX (PREPARE)	EA	4
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	600
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
10+		REMOVE CONDUIT	LF	5
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1
++++		RELOCATE PRETERM FIBER PATCH PANEL (24 POSITION)	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

2/24/2021

STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #10

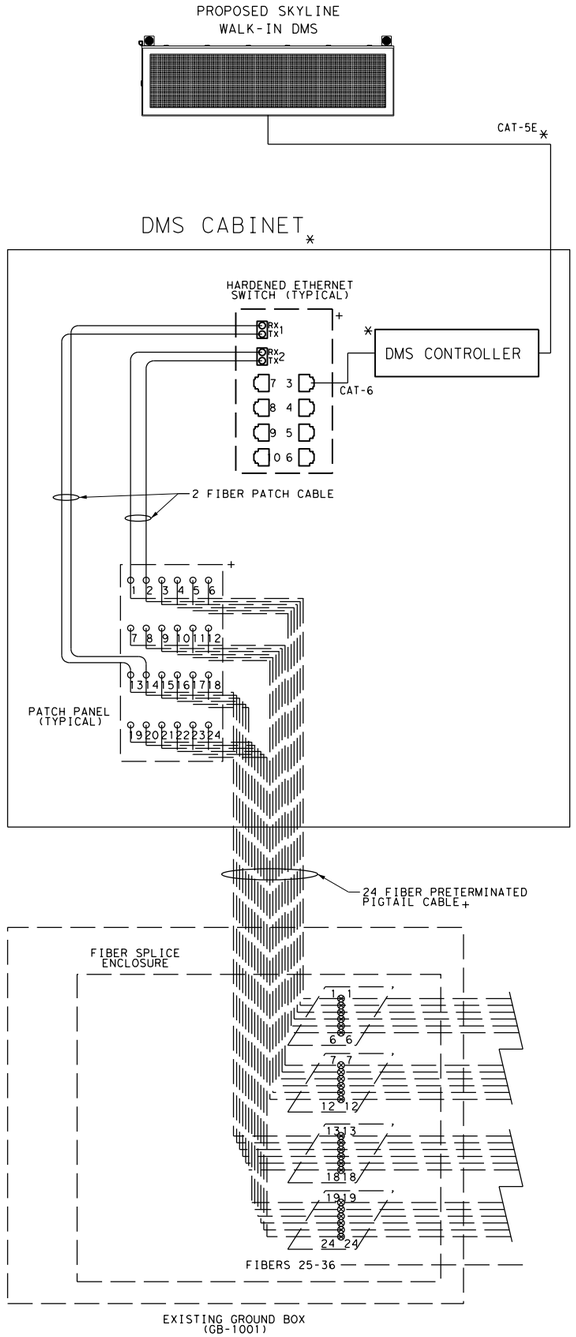
SH 121 NB AT HALL-JOHNSON RD

SHEET 1 OF 1

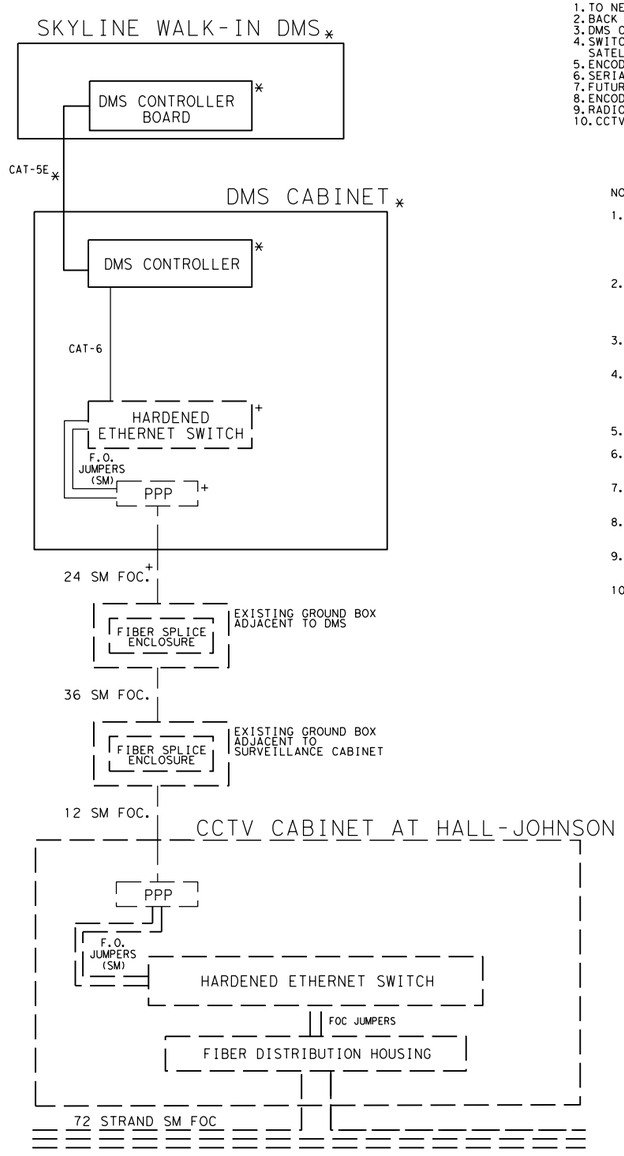
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	39
CHECK				
DJB				

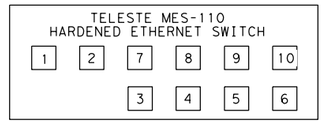
PLOTTED: 2/24/2021
FILENAME: c:\pwworking\kha\pwprod\iman.rahim\dms42767\FTW_DMS_SHT_10.dgn
BY: Iman.Rahim

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM





PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

NOTES:

1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
3. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
4. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
5. THE CONNECTOR SHALL BE AN ST CONNECTOR.
6. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
7. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
8. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
9. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
10. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

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Texas Department of Transportation

DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

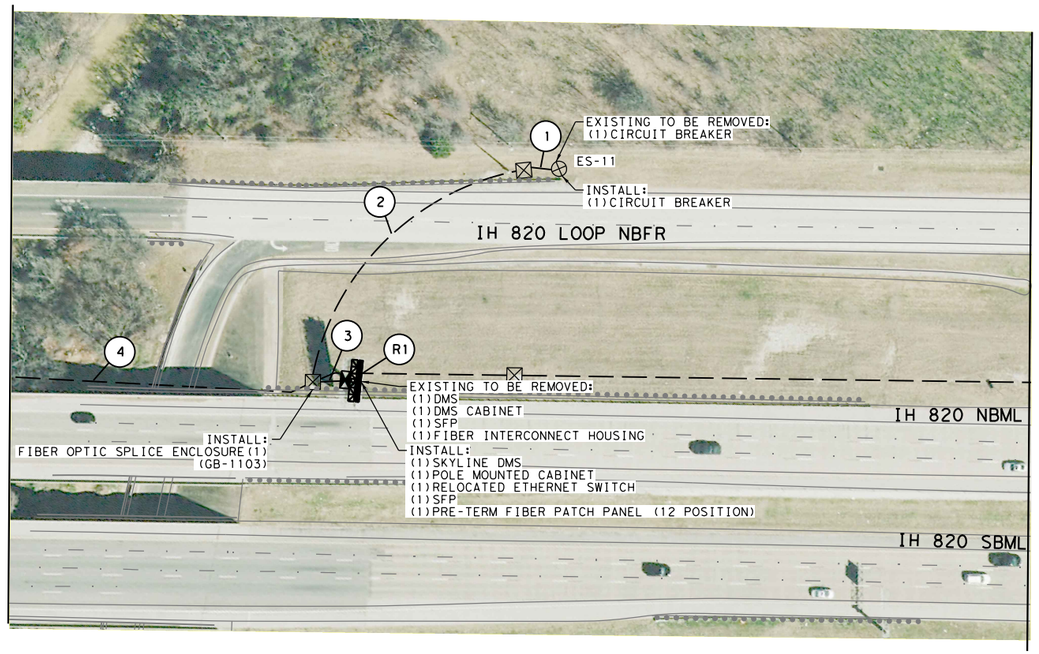
SITE #10
SH 121 AT HALL-JOHNSON RD

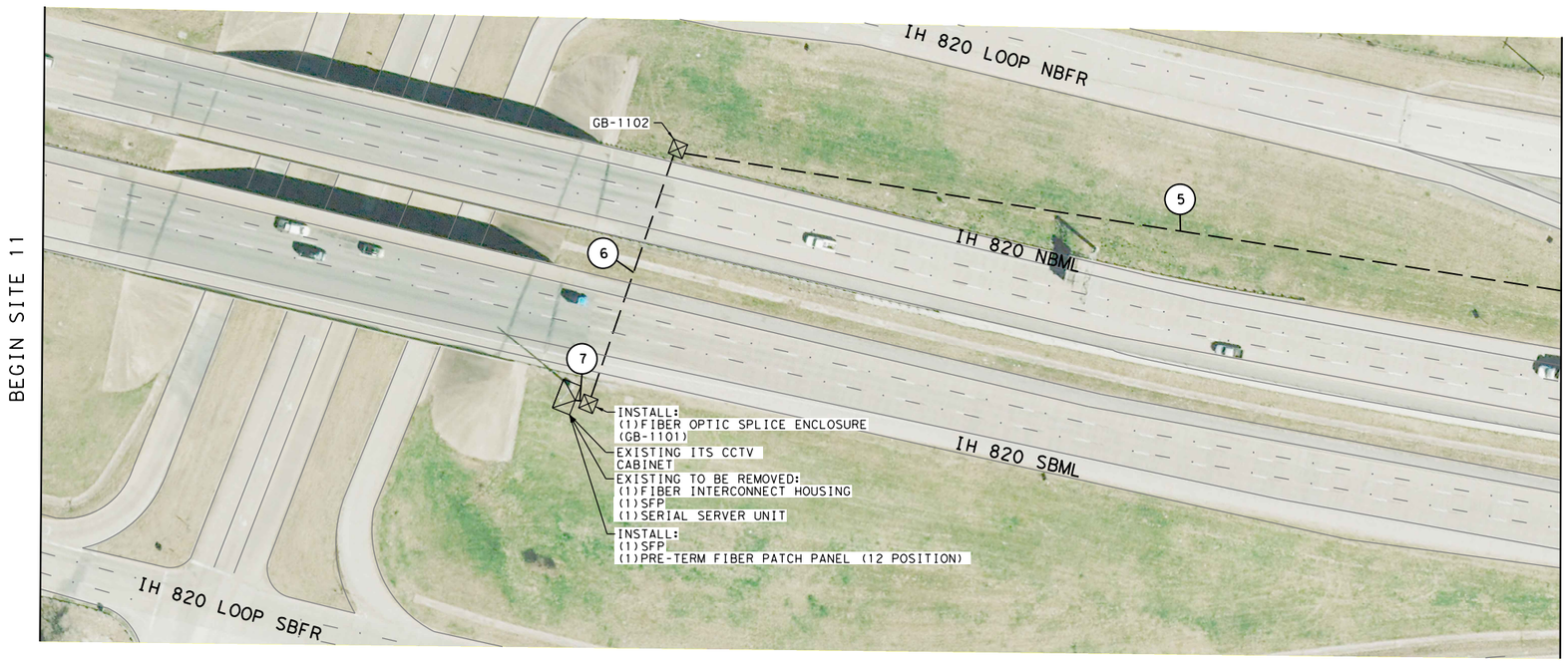
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	40
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_10.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
2. CONTRACTOR SHALL REUSE EXISTING HOLES IN DMS TOWER. IF HOLES NEED TO BE ENLARGED, CONTRACTOR SHALL DO THIS IN THE FIELD. THIS WILL BE SUBSIDIARY TO ITEM 6028.
3. CONTRACTOR TO INSTALL NEW POLE MOUNTED DMS CABINET PROVIDED BY TXDOT ON EXISTING STRUCTURE.
4. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT.
5. CONTRACTOR TO COVER SPACE LEFT IN SERVICE ENCLOSURE ONCE EXISTING CIRCUIT BREAKER IS REMOVED.
6. SEE SHEET 16 FOR CONSTRUCTION NOTES, ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE, ADDITIONAL CONSTRUCTION NOTES - SITES WITH RVSD, AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH RADIO





0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

2/23/2021
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DMS REPLACEMENT

DMS LAYOUT
SITE #11

IH 820 NB AT CHAPIN RD

SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE SHEET TITLE		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	41
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_11.dgn
BY: Nate.Taylor

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH						CABLE STATUS	CABLE LENGTH										REMOVALS				TOTAL LENGTH OF RUN	RUN NO
		CONDT (PVC) (SCHD 40) (2")		CONDT (PVC) (SCHD 40) (3")		MULTIDUCT CONDUIT SYS (PVC) (SCHD 40) 4"			ELEC CONDR (NO. 2) BARE		ELEC CONDR (NO. 2) INSULATED		DMS CAT 5E +		FO CBL (12 SMF) (PIGTAIL) ++++		FO CBL (36 SMF)		MM FO CBL		DMS ELECTRICAL CIRCUIT			
		Qty	LF	Qty	LF	Qty	LF		Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF		
1	E	1						I	1	15	3	45											1	15	10	1
2	E			2				I	1	210	3	630											1	210	205	2
3	E					2		I	1	35	3	105			1	35							1	35	30	3
4	E			1				I									1	1505	1	1505					1500	4
5	E			1				I									1	805	1	805					800	5
6	E			1				I									1	185	1	185					180	6
7	E			1				I							1	15			1	15					10	7
R1	I							I	1	55	3	165	1	55	1	10			1	55	1	55	1	55	50	R1
TOTAL										315		945		55		60		2495		2565		315		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6015	ELEC CONDR (NO.2) BARE	LF	315
620	6016	ELEC CONDR (NO.2) INSULATED	LF	945
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6007	6050	FO CBL (36 SMF)	LF	2720
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	2
6007	6094	FIBER OPTIC FUSION SPLICE	EA	24
6007	6103	REMOVE FIBER OPTIC CABLE	LF	2565
6027	6003	CONDUIT (PREPARE)	LF	2735
6027	6008	GROUND BOX (PREPARE)	EA	5
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	315
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	2
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	2
++++		12 FIBER PIGTAIL SM	LF	310
++++		REPLACE SFP	EA	2
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
11+ SUBSIDIARY TO ITEM 6331

SLACK SUMMARY

ID	FO CBL (12 SMF) ++++	FO CBL (36 SMF)
DMS-CABINET	25	
SURVEILLANCE-CABINET	25	
GB-1101	100	100
GB-1102		25
GB-1103	100	100
TOTAL	250	225

2/23/2021

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DMS REPLACEMENT

DMS LAYOUT
SITE #11

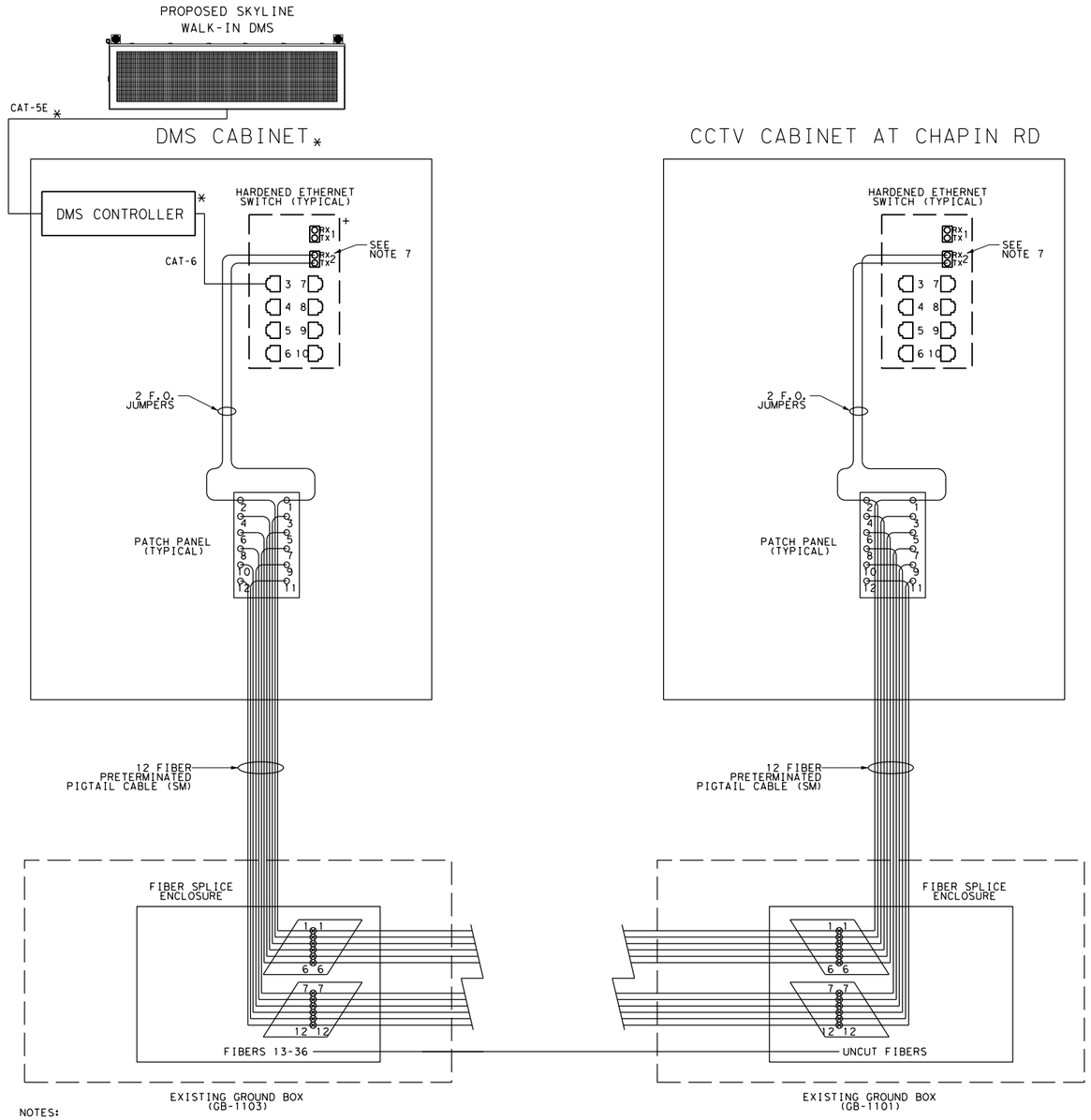
IH 820 NB AT CHAPIN RD

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE SHEET TITLE		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	42
CHECK DL	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_11A.dgn
BY: Nate.Taylor

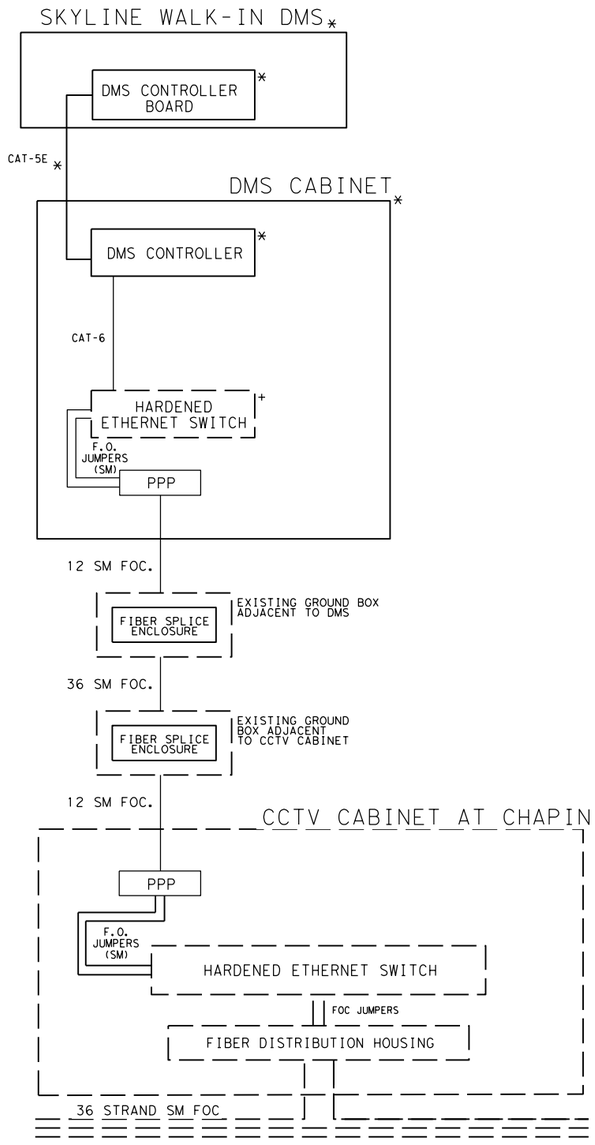
FIBER CABLING AND PATCH PANEL DETAIL

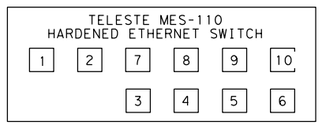


NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS
7. CONTRACTOR TO REPLACE EXISTING MM SFP ON ETHERNET SWITCH WITH SM SFP TO BE PROVIDED BY TXDOT. THIS WORK WILL BE SUBSIDIARY TO ITEM 6007.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.

COMMUNICATION BLOCK DIAGRAM





PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
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DMS REPLACEMENT
SCHEMATIC
FIBER OPTIC CONNECTIONS
SITE #11
IH 820 NB AT CHAPIN RD

SHEET 1 OF 1

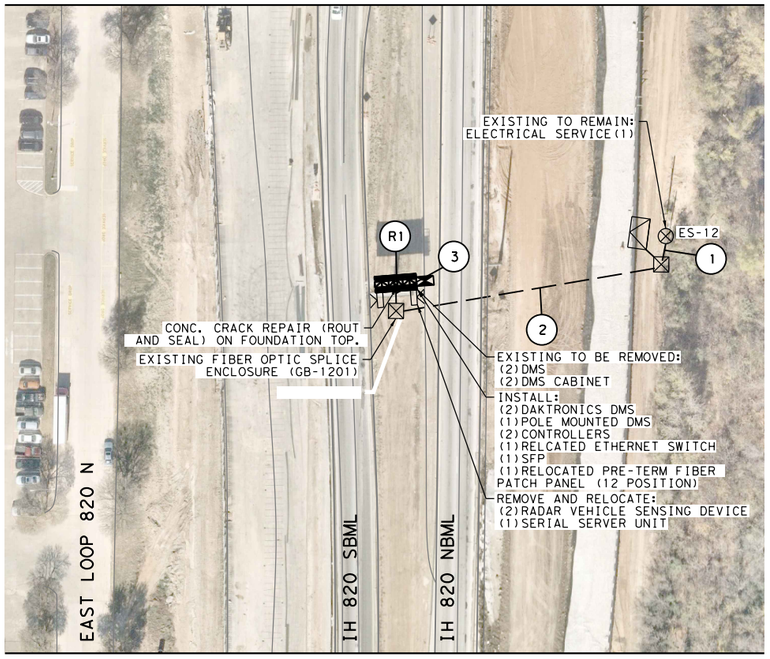
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	43
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_11.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS (RUNS 3 AND R1), SAFELY COIL IT AND STORE IT IN GB-1201, INSTALL NEW DMS AND CABINET, INSTALL PATCH PANEL INSIDE CABINET, AND PULL FIBER THROUGH RUNS 3 AND R1 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR SHALL REPAINT CONCRETE REPAIRS TO MATCH EXISTING/ORIGINAL PAINT COLOR OF THE STRUCTURES. THIS IS SUBSIDIARY TO THE CONCRETE REPAIR ITEM.
3. CONTRACTOR SHALL REUSE EXISTING HOLES IN DMS TOWER. IF HOLES NEED TO BE ENLARGED, CONTRACTOR SHALL DO THIS IN THE FIELD. THIS WILL BE SUBSIDIARY TO ITEM 6028.
4. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT.
5. SEE SHEET 16 FOR CONSTRUCTION NOTES, ADDITIONAL CONSTRUCTION NOTES - SITES WITH RVSD.

0 50 100
SCALE: 1"=100'

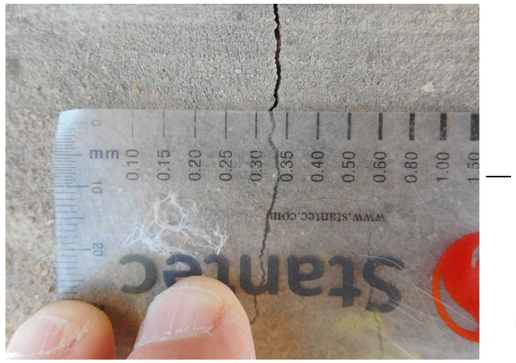
BEGIN SITE 12



END SITE 12

AERIAL PROVIDED BY NEARMAP

LOCATION OF CONC. CRACK REPAIR (ROUT AND SEAL) ON FOUNDATION TOP



LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6007	ELEC CONDR (NO.8) BARE	LF	10
620	6011	ELEC CONDR (NO.4) BARE	LF	110
620	6012	ELEC CONDR (NO.4) INSULATED	LF	330
620	6017	ELEC CONDR (NO.1) BARE	LF	220
620	6018	ELEC CONDR (NO.1) INSULATED	LF	660
780	6004	CNC CRCK REPAR(DISCRETE)(ROUT AND SEAL)	LF	3
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	65
6027	6003	CONDUIT (PREPARE)	LF	205
6027	6008	GROUND BOX (PREPARE)	EA	1
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	2
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	275
6304	6005	ITS RVSD (DC ONLY) (RELOCATE)	EA	2
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	2
+		RELOCATE ETHERNET SWITCH	EA	1
+++		RVSD CONTROL CABLE	LF	110
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	110
+++		RELOCATE SERIAL SERVER UNIT	EA	1
+++		REMOVE RVSD CABLE	LF	110
8+		PAINT REPAIRED STRUCTURE	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	3
++++		RELOCATE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	1

+ SUBSIDIARY TO ITEM 6028
+++ SUBSIDIARY TO ITEM 6304
8+ SUBSIDIARY TO ITEM 780

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") Qty	LF	CONDT (PVC) (SCHD 40) (3") (BORE) Qty	LF	CONDT (HDPE C) (3") Qty	LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 1) BARE Qty	LF	ELEC CONDR (NO. 4) BARE Qty	LF	ELEC CONDR (NO. 8) BARE (TRACE) Qty	LF	ELEC CONDR (NO. 1) INSULATED Qty	LF	ELEC CONDR (NO. 4) INSULATED Qty	LF	DMS 6 MM FO JUMPER + Qty	LF	RVSD CONTROL CABLE ++ Qty	LF	RELOCATED: FO CBL (12 SMF) (PIGTAIL) Qty	LF	REMOVALS: DMS ELECTRICAL CIRCUIT Qty	LF	RVSD CABLES +++ Qty	LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1						I	1	25					3	75									1	25			20	1
2	E	1		1				I	1	185					3	555									1	185			180	2
3	E	1		1		3		I	1	10			1	10	3	30							1	10	1	10			5	3
R1	I							I			2	110					6	330	2	110	2	110	1	55	1	55	2	110	50	R1
TOTAL			0		0		0			220		110		10		660		330		110		110		65		275		110		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

2/24/2021
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Texas Department of Transportation
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DMS REPLACEMENT

DMS LAYOUT
SITE #12

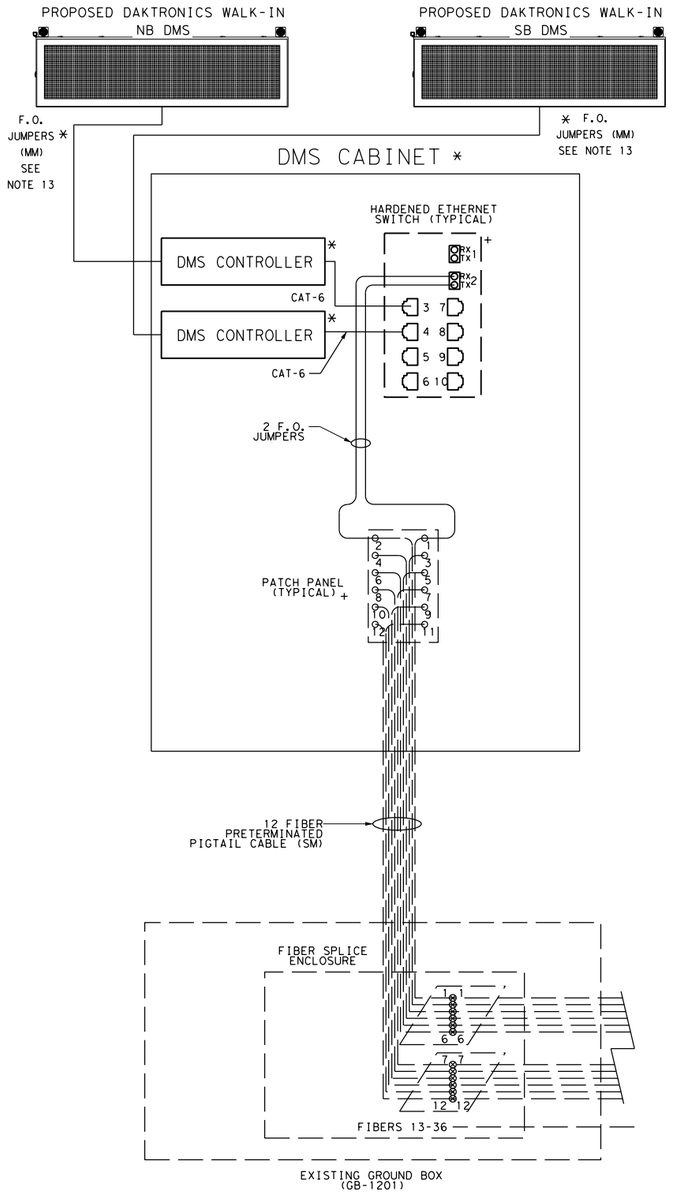
IH 820 NB & SB AT TRINITY BLVD

SHEET 1 OF 1

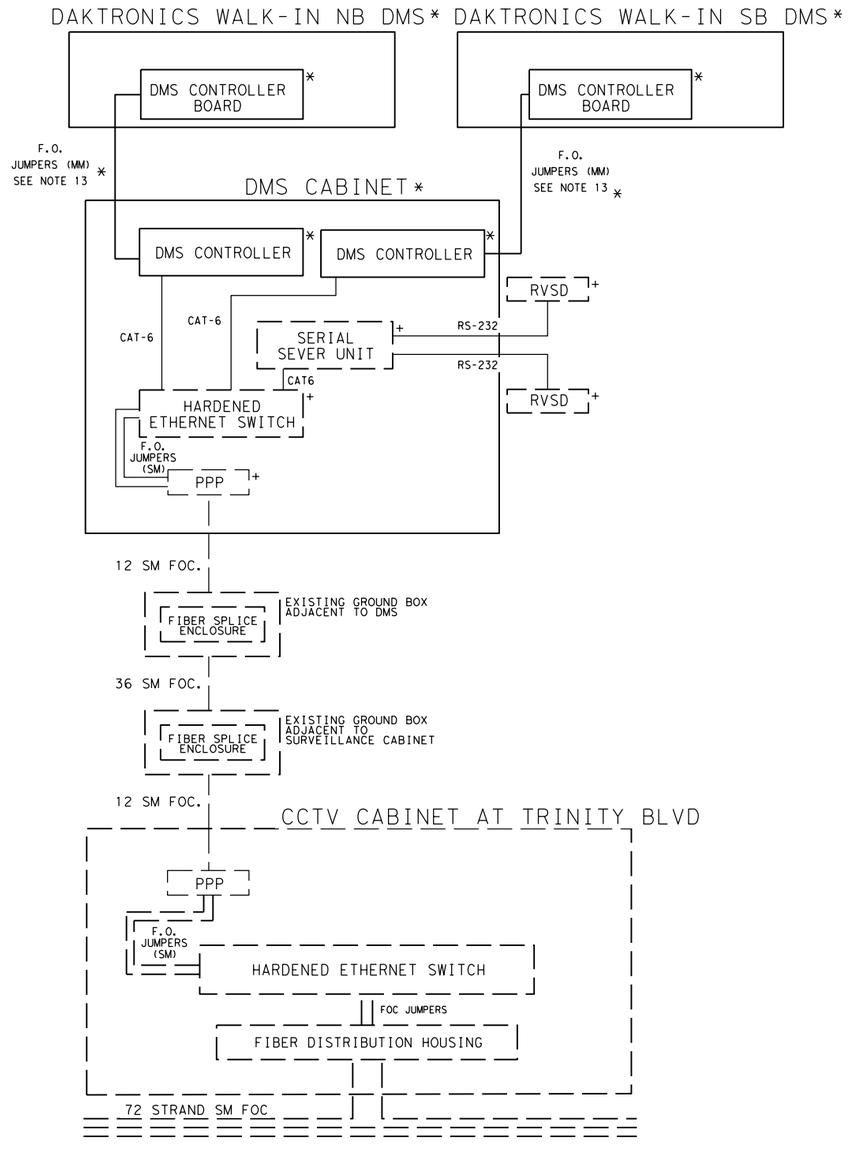
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	44
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/24/2021
FILENAME: c:\pwworking\kho\pwprod\iman.rahim\dms42767\FTW_DMS_SHT_12.dgn
BY: Iman.Rahim

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM



SERIAL SERVER UNIT

1	2	3	4

PORT ASSIGNMENTS:

1. CCTV
2. SENSOR#1 OR DMS#3
3. SENSOR#2 OR DMS#2
4. SENSOR#3 OR DMS#1

TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. DMS CONTROLLER
5. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
7. SERIAL SERVER UNIT(IF PRESENT)
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
11. CONTRACTOR SHALL RELOCATE EXISTING CLICKS FOR RADAR DEVICE FROM EXISTING DMS SIGN TO NEW POLE MOUNTED DMS CABINET. THIS WILL BE SUBSIDIARY TO ITEM 6304 RELOCATE RADAR VEHICLE SENSING DEVICE.
12. CONTRACTOR TO PROVIDE NEW RADAR VEHICLE SENSING DEVICE CABLE FROM RADAR DEVICE TO POLE MOUNTED DMS CABINET. THIS WILL BE SUBSIDIARY TO ITEM 6304 RELOCATE RADAR VEHICLE SENSING DEVICE.
13. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.

2/23/2021

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Texas Department of Transportation

DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

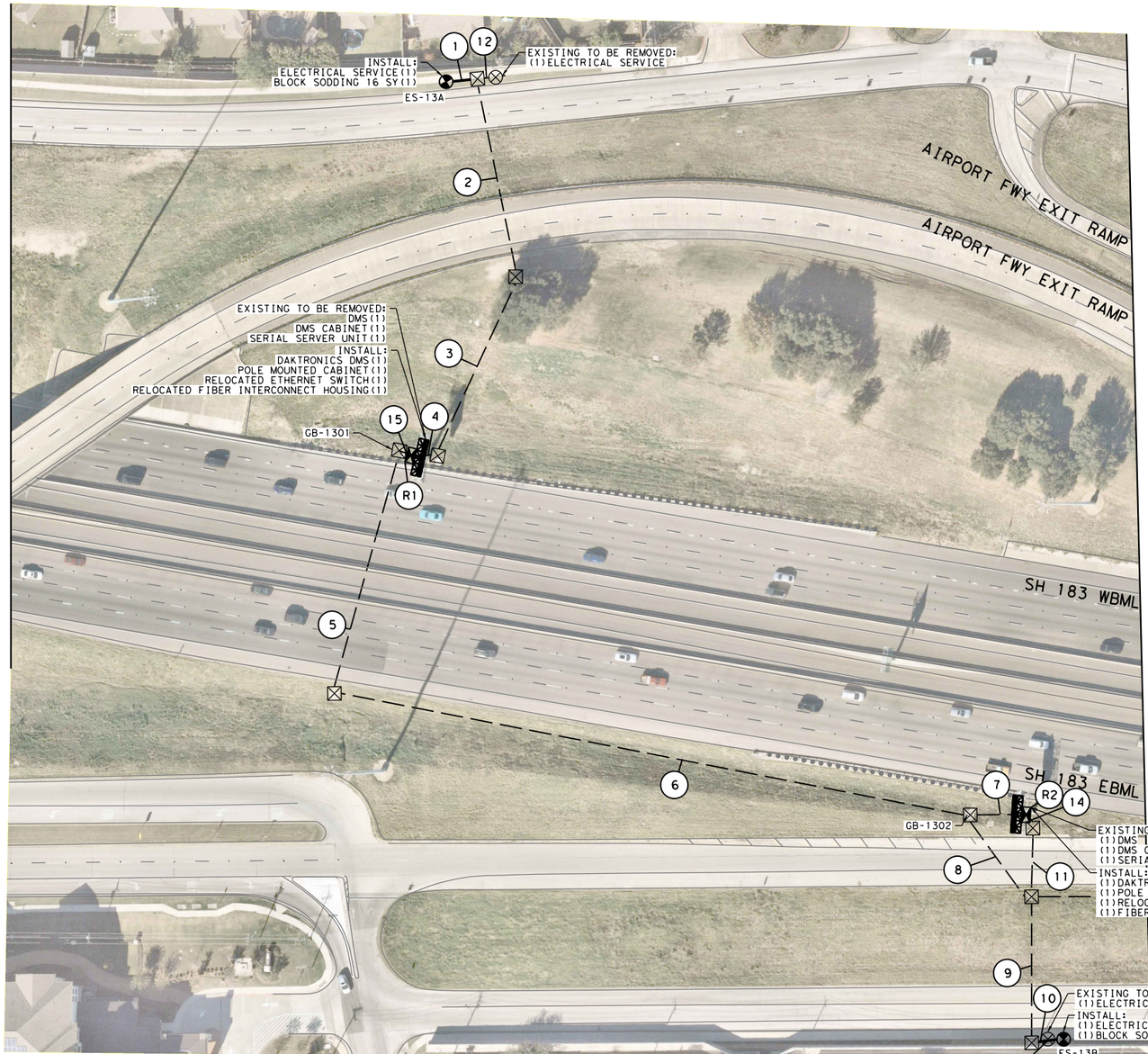
SITE #12
IH 820 NB & SB AT TRINITY BLVD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	45
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_12.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS (RUNS 15 AND R1 & RUNS 14 AND R2), SAFELY COIL IT AND STORE IT IN GB-1301 AND GB-1302, INSTALL NEW DMS AND CABINET, INSTALL PATCH PANEL INSIDE CABINET, AND PULL FIBER THROUGH RUNS 15 AND R1 & RUNS 14 AND R2 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT.
3. ELECTRIC COMPANY TO INSTALL CONDUCTOR WIRES FROM THE EXISTING SERVICE POLE TO THE PROPOSED SERVICE POLE. CONTRACTOR TO COORDINATE WITH THE POWER COMPANY.
4. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE.



AERIAL PROVIDED BY NEARMAP

0 50 100
SCALE: 1"=100'

N

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #13

SH 183 EB & WB AT AMERICAN BLVD

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	
CHECK DL	CONTROL	SECTION	JOB	46
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_13.dgn
BY: Nate.Taylor

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH								CABLE STATUS	CABLE LENGTH												RELOCATED		REMOVALS				TOTAL LENGTH OF RUN	RUN NO
		CONDT (PVC) (SCHD 40) (2")		CONDT (PVC) (SCHD 40) (3")		CONDT (PVC) (SCHD 80) (3")		4" MD CONDUIT SYS			ELEC CONDR (NO. 2) BARE		ELEC CONDR (NO. 4) BARE		ELEC CONDR (NO. 8) BARE (TRACE)		ELEC CONDR (NO. 2) INSULATED		ELEC CONDR (NO. 4) INSULATED		DMS 6 MM FO JUMPER +		FIBER OPTIC CBL (SMF) (6 FIBER)		CONDUIT 10+		DMS ELECTRICAL CIRCUIT			
		Qty	LF	Qty	LF	Qty	LF	Qty	LF		Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF		
1	I	1	30							I	1	30					3	90											25	1
2	E					2				I	1	155					3	465									1	155	150	2
3	E	1								I	1	150					3	450									1	150	145	3
4	E	1								I	1	20					3	60									1	20	15	4
5	E							1		I																			190	5
6	E							1		I																			475	6
7	E			1						I													1	40					35	7
8	E							1		I																			80	8
9	E							1		I			1	110					3	330							1	110	105	9
10	E			1						I															1	5	1	20	15	10
11	E	1								I			1	55					3	165							1	55	50	11
12	E			1						I															1	5	1	20	15	12
13	I	1	30							I			1	30					3	90									25	13
14	E	1								I			1	20	1	20			3	60							1	20	15	14
15	E			1						I					1	20							1	20					15	15
R1	I									I	1	55			1	10	3	165			1	55	1	55			1	55	50	R1
R2	I									I			1	55	1	10			3	165	1	55	1	55			1	55	50	R2
TOTAL			60									410		270		60		1230		810		110		170		10		660		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	32
618	6023	CONDT (PVC) (SCH 40) (2")	LF	60
620	6007	ELEC CONDR (NO.8) BARE	LF	60
620	6011	ELEC CONDR (NO.4) BARE	LF	270
620	6012	ELEC CONDR (NO.4) INSULATED	LF	810
620	6015	ELEC CONDR (NO.2) BARE	LF	410
620	6016	ELEC CONDR (NO.2) INSULATED	LF	1230
628	6002	REMOVE ELECTRICAL SERVICES	EA	2
628	6194	ELC SRV TY D 120/240 070(NS)SS(N)SP(O)	EA	2
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	170
6027	6003	CONDUIT (PREPARE)	LF	1305
6027	6008	GROUND BOX (PREPARE)	EA	7
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	2
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	660
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	2
+		RELOCATE ETHERNET SWITCH	EA	2
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	110
10+		REMOVE CONDUIT	LF	10
7+		CONCRETE GROUT CONDUIT OPENING	EA	2
+		JUNCTION BOX (AS NEEDED)	EA	4
11+		REMOVE SERIAL SERVER UNIT	EA	2
++++		RELOCATE FIBER OPTIC INTERCONNECT HOUSING	EA	2

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
102185
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PROFESSIONAL ENGINEER

Dhruva Lahon

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DMS REPLACEMENT

DMS LAYOUT
SITE #13

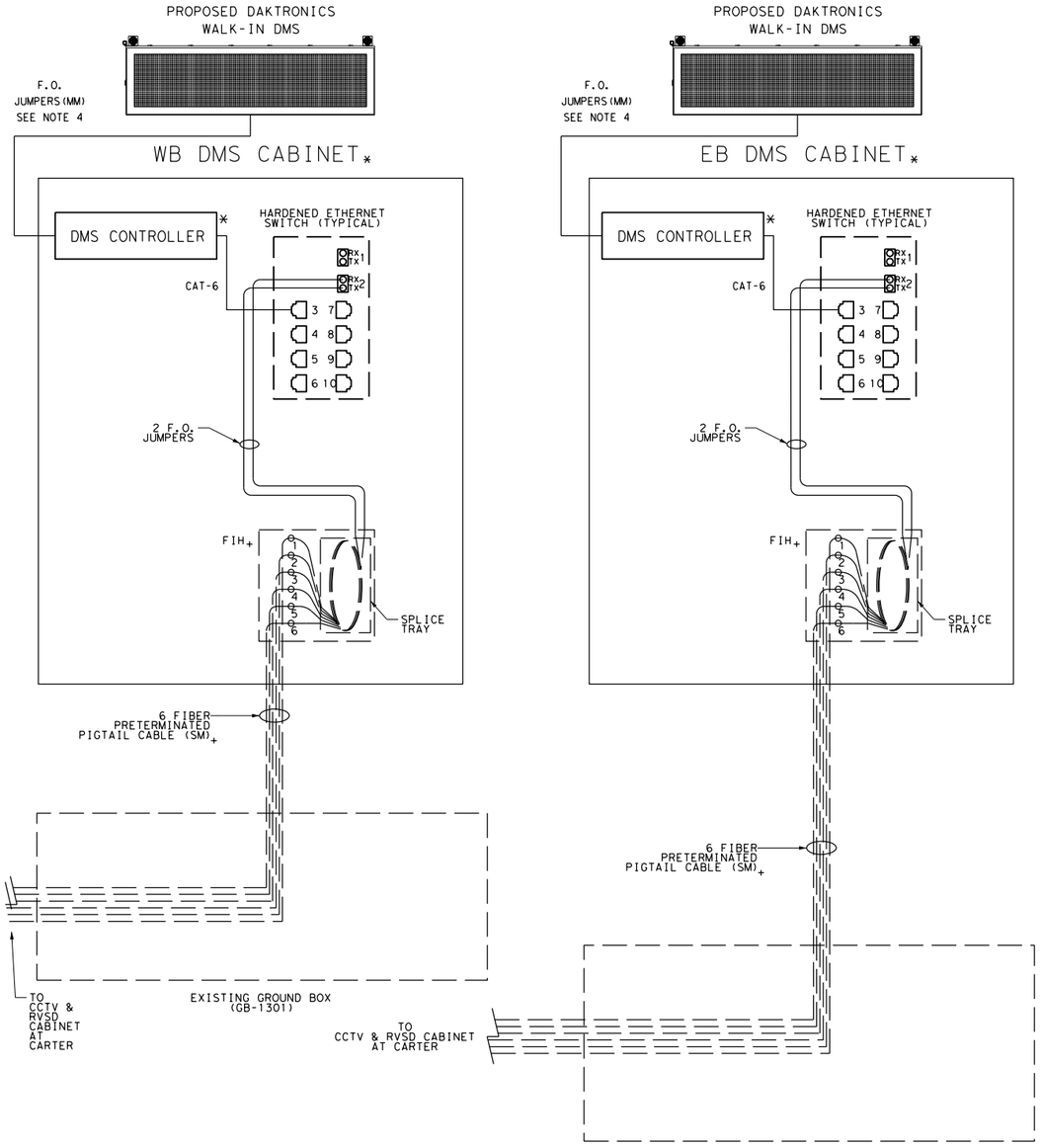
SH 183 EB & WB AT AMERICAN BLVD

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	47
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276\FTW_DMS_SHT_13A.dgn
BY: Nate.Taylor

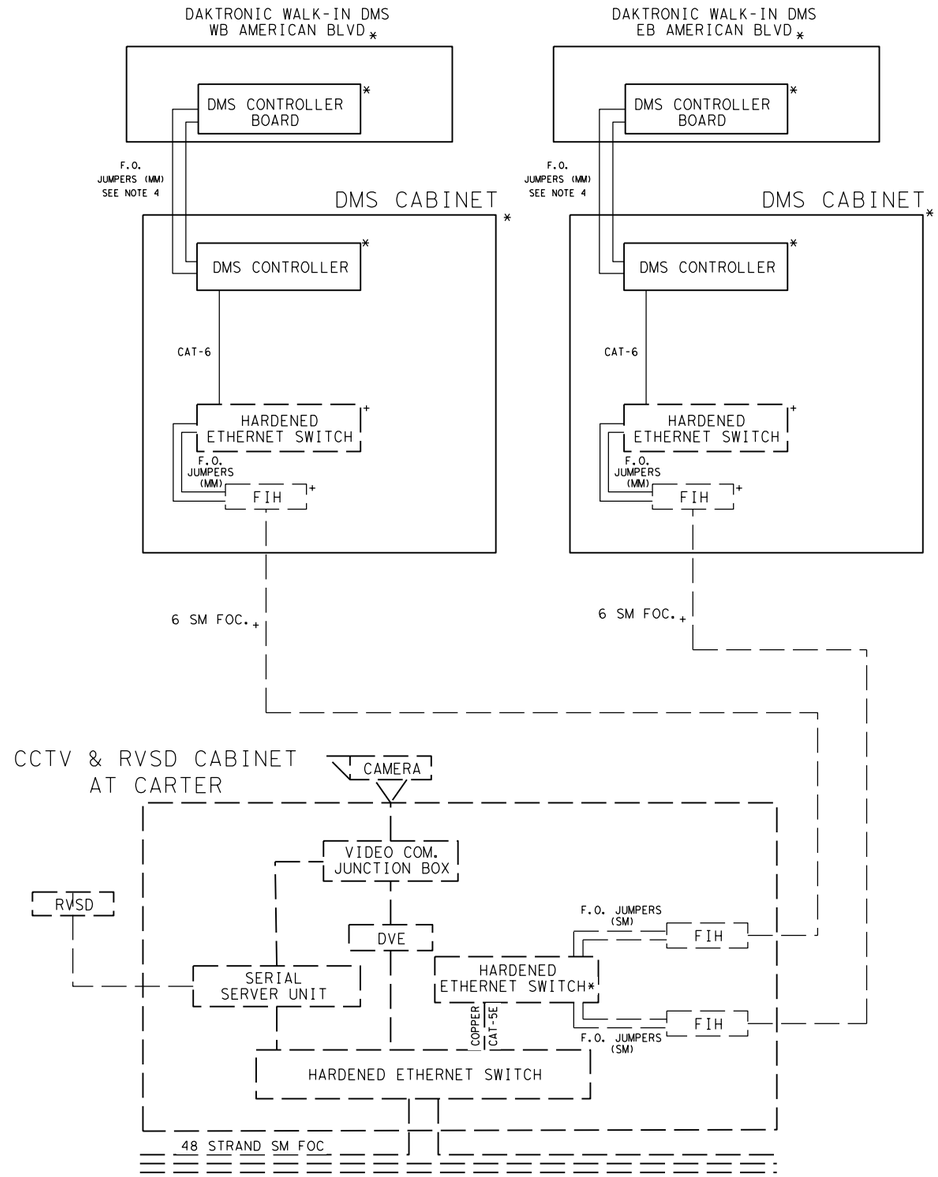
FIBER CABLING AND PATCH PANEL DETAIL



NOTES:

1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
3. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
4. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
5. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
6. THE CONNECTOR SHALL BE AN ST CONNECTOR.
7. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
8. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
9. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
10. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
11. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.

COMMUNICATION BLOCK DIAGRAM



TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

SITE #13
SH 183 EB & WB AT AMERICAN BLVD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
DL				48
CHECK	0902	90	111	
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_13.dgn
BY: Nate.Taylor

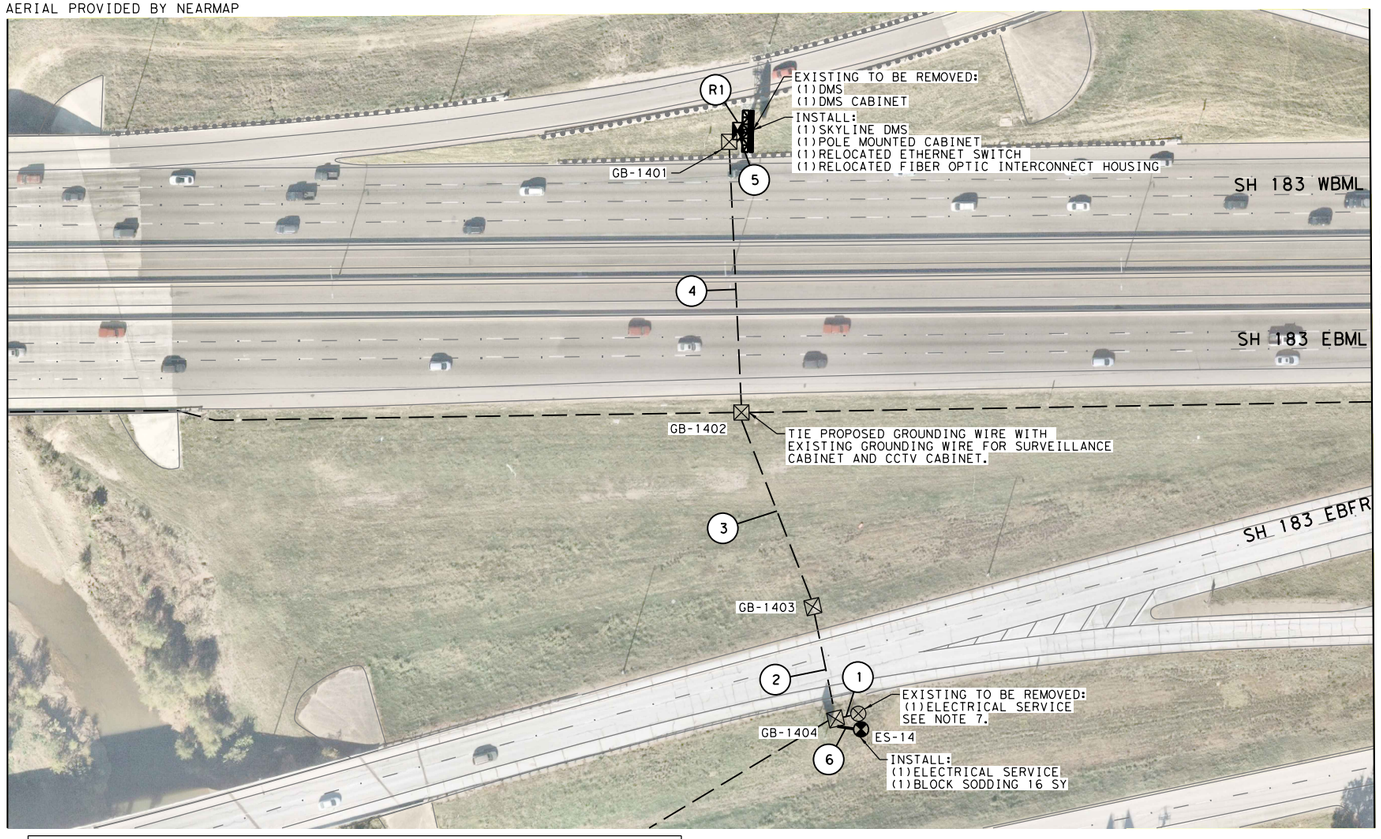
NOTES:

1. A 4-HOUR WINDOW FOR SWITCHOVER WILL BE ALLOWED TO RECONNECT POWER OR THE SURVEILLANCE CABINET AND CCTV CABINET. THE CONTRACTOR SHALL PROVIDE 72-HOUR ADVANCE NOTICE AND RECEIVE APPROVAL FOR THE OUTAGE FROM THE TXDOT SIGNAL SHOP AT 817-370-3664.
2. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS (RUNS 5 AND R1), SAFELY COIL IT AND STORE IT IN GB-1401, INSTALL NEW DMS AND CABINET, REINSTALL PATCH PANEL INSIDE CABINET, AND PULL FIBER BACK THROUGH RUNS 5 AND R1 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
3. CONTRACTOR SHALL REUSE EXISTING HOLES IN DMS TOWER. IF HOLES NEED TO BE ENLARGED, CONTRACTOR SHALL DO THIS IN THE FIELD. THIS WILL BE SUBSIDIARY TO ITEM 6028.
4. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT.
5. ELECTRIC COMPANY TO INSTALL CONDUCTOR WIRES FROM THE EXISTING SERVICE POLE TO THE PROPOSED SERVICE POLE. CONTRACTOR TO COORDINATE WITH THE POWER COMPANY.
6. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
7. RETRACT CCTV AND SURVEILLANCE CABINET ELECTRICAL CONDUCTORS FROM RUN 1 AND RECONNECT TO PROPOSED SERVICE.
8. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE.

0 50 100

SCALE: 1"=100'

AERIAL PROVIDED BY NEARMAP



LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6023	CONDT (PVC) (SCH 40) (2")	LF	10
620	6007	ELEC CONDR (NO.8) BARE	LF	30
620	6017	ELEC CONDR (NO.1) BARE	LF	490
620	6018	ELEC CONDR (NO.1) INSULATED	LF	1470
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6195	ELC SRV TY D 120/240 070(NS)SS(N)SP(U)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	6
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	75
6027	6003	CONDUIT (PREPARE)	LF	420
6027	6008	GROUND BOX (PREPARE)	EA	4
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	500
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
10+		REMOVE CONDUIT	LF	5
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
9+		POWER DISCONNECT & RECONNECT	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1
++++		RELOCATE FIBER OPTIC INTERCONNECT HOUSING	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
9+ SUBSIDIARY TO ITEM 620
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDT (PVC) (SCHD 40) (2") LF	CONDT (PVC) (SCHD 40) (3") Qty	CONDT (PVC) (SCHD 40) (3") LF	CONDT (HDPEC) (SCHD 40) (4") Qty	CONDT (HDPEC) (SCHD 40) (4") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 1) BARE Qty	ELEC CONDR (NO. 1) BARE LF	ELEC CONDR (NO. 8) BARE (TRACE) Qty	ELEC CONDR (NO. 8) BARE (TRACE) LF	ELEC CONDR (NO. 1) INSULATED Qty	ELEC CONDR (NO. 1) INSULATED LF	DMS CAT 5E + Qty	DMS CAT 5E + LF	RELOCATED: FIBER OPTIC CBL (SMF) (6 FIBER) Qty	FIBER OPTIC CBL (SMF) (6 FIBER) LF	REMOVALS: CONDUIT 10+ Qty	CONDUIT 10+ LF	DMS ELECTRICAL CIRCUIT Qty	DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	E			1		1		I											1	5	1	20	15	1
2	E			1		1		I	1	80			3	240							1	80	75	2
3	E			1		1		I	1	140			3	420							1	140	135	3
4	E	1		1				I	1	185			3	555							1	185	180	4
5	E	1		1				I	1	20	1	20	3	60			1	20			1	20	15	5
6	I	1	10					I	1	10			3	30									5	6
R1	I							I	1	55	1	10	3	165	1	55	1	55			1	55	50	R1
TOTAL		10								490		30		1470		55		75		5		500		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
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DMS REPLACEMENT

DMS LAYOUT
SITE #14

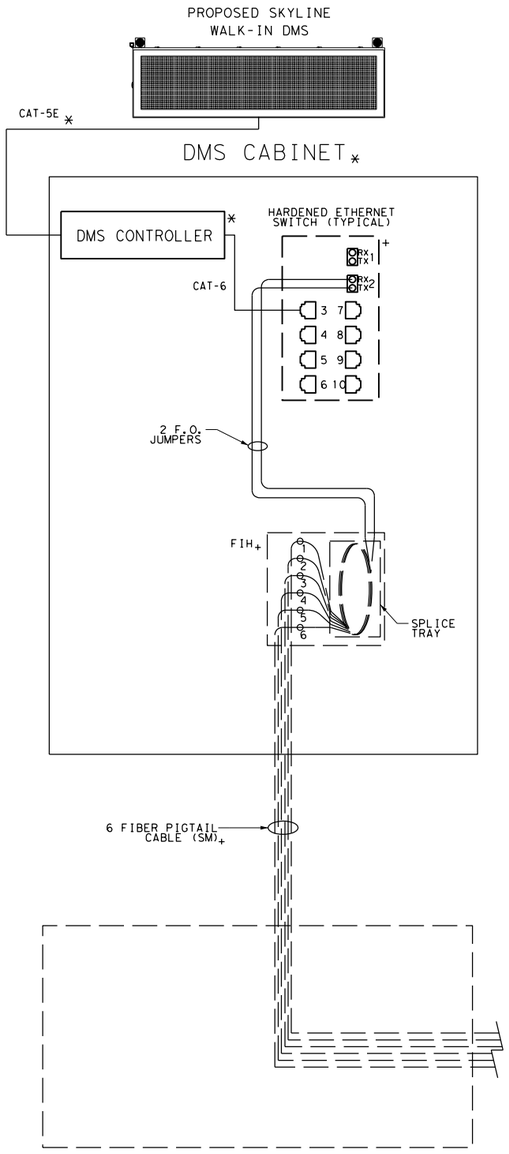
SH 183 WB AT COUNTY LINE RD

SHEET 1 OF 1

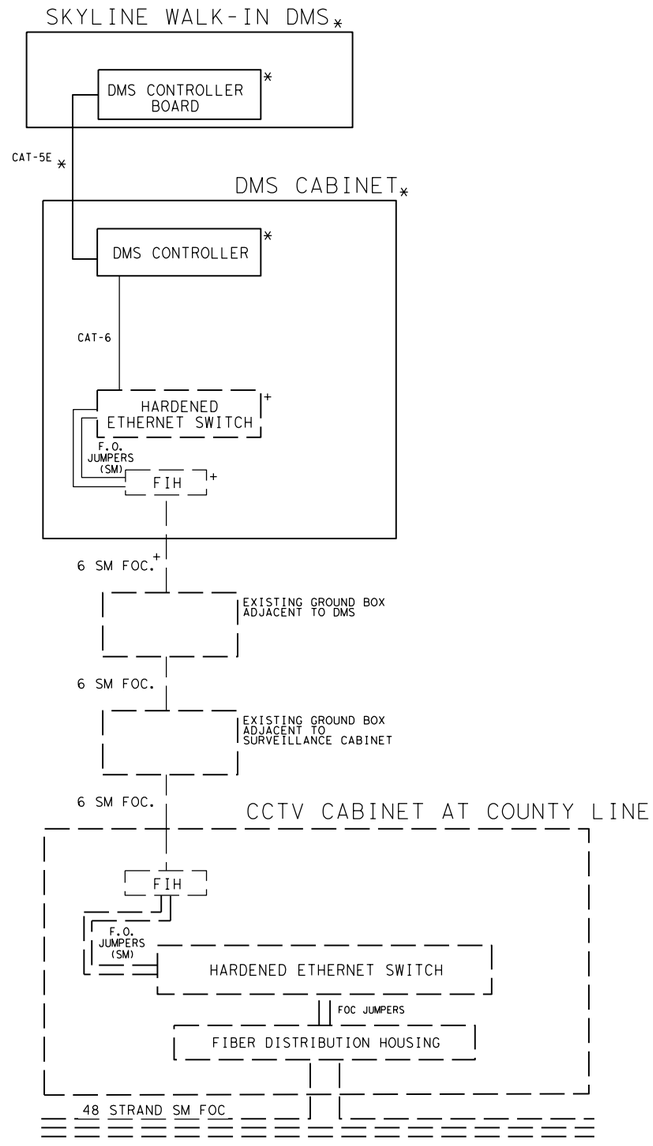
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	49
CHECK DL	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276?\FTW_DMS_SHT_14.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM

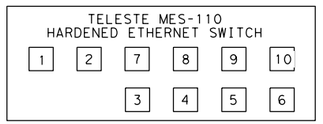


LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.



PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. SERIAL SERVER UNIT (IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV PoE (IF PRESENT)

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
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DMS REPLACEMENT
SCHEMATIC
FIBER OPTIC CONNECTIONS
SITE #14
SH 183 WB AT COUNTY LINE RD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	50
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_14.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER PIGTAIL FROM DMS (RUNS 3 AND R1), SAFELY COIL IT AND STORE IT IN GB-1501, INSTALL NEW DMS AND CABINET, INSTALL PATCH PANEL INSIDE CABINET, AND PULL FIBER PIGTAIL BACK THROUGH RUNS 3 AND R1 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR SHALL REUSE EXISTING HOLES IN DMS TOWER. IF HOLES NEED TO BE ENLARGED, CONTRACTOR SHALL DO THIS IN THE FIELD. THIS WILL BE SUBSIDIARY TO ITEM 6028.
3. CONTRACTOR TO INSTALL NEW POLE MOUNTED DMS CABINET PROVIDED BY TXDOT ON EXISTING STRUCTURE.
4. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT.
5. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT.THIS SHALL BE SUBSIDIARY TO ITEM 6331.
6. CONTRACTOR TO COVER SPACE LEFT IN SERVICE ENCLOSURE ONCE EXISTING CIRCUIT BREAKER IS REMOVED.
7. SEE SHEET 16 FOR CONSTRUCTION NOTES.

0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH CONDT (PVC) (SCHD 40) (3") Qty	CONDUIT LENGTH CONDT (PVC) (SCHD 40) (3") LF	CABLE STATUS	CABLE LENGTH ELEC CONDR (NO. 4) BARE Qty	ELEC CONDR (NO. 4) BARE LF	ELEC CONDR (NO. 8) BARE (TRACE) Qty	ELEC CONDR (NO. 8) BARE (TRACE) LF	ELEC CONDR (NO. 4) INSULATED Qty	ELEC CONDR (NO. 4) INSULATED LF	DMS CAT 5E + Qty	DMS CAT 5E + LF	RELOCATED FO CBL (12 SMF) (PIGTAIL) Qty	RELOCATED FO CBL (12 SMF) (PIGTAIL) LF	REMOVALS DMS ELECTRICAL CIRCUIT Qty	REMOVALS DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1		I	1	25			3	75					1	25	20	1
2	E	2		I	1	120			3	360					1	120	115	2
3	E	2		I	1	30	1	30	3	90			1	30	1	30	25	3
R1	I			I	1	55	1	10	3	165	1	55	1	55	1	55	50	R1
TOTAL						230		40		690		55		85		230		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6007	ELEC CONDR (NO.8) BARE	LF	40
620	6011	ELEC CONDR (NO.4) BARE	LF	230
620	6012	ELEC CONDR (NO.4) INSULATED	LF	690
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	85
6027	6003	CONDUIT (PREPARE)	LF	160
6027	6008	GROUND BOX (PREPARE)	EA	2
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	230
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
+		JUNCTION BOX (AS NEEDED)	EA	2
++++		RELOCATE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	1
11+		REMOVE SERIAL SERVER UNIT	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
11+ SUBSIDIARY TO ITEM 6331

2/23/2021
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DMS REPLACEMENT

DMS LAYOUT
SITE #15

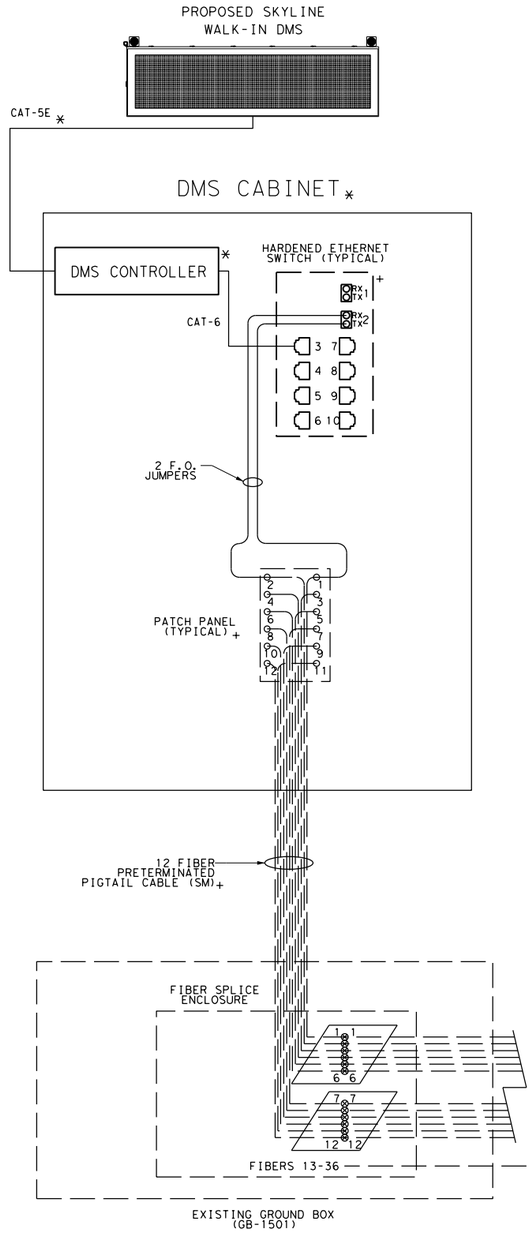
SH 199 NB AT CONFEDERATE PARK RD

SHEET 1 OF 1

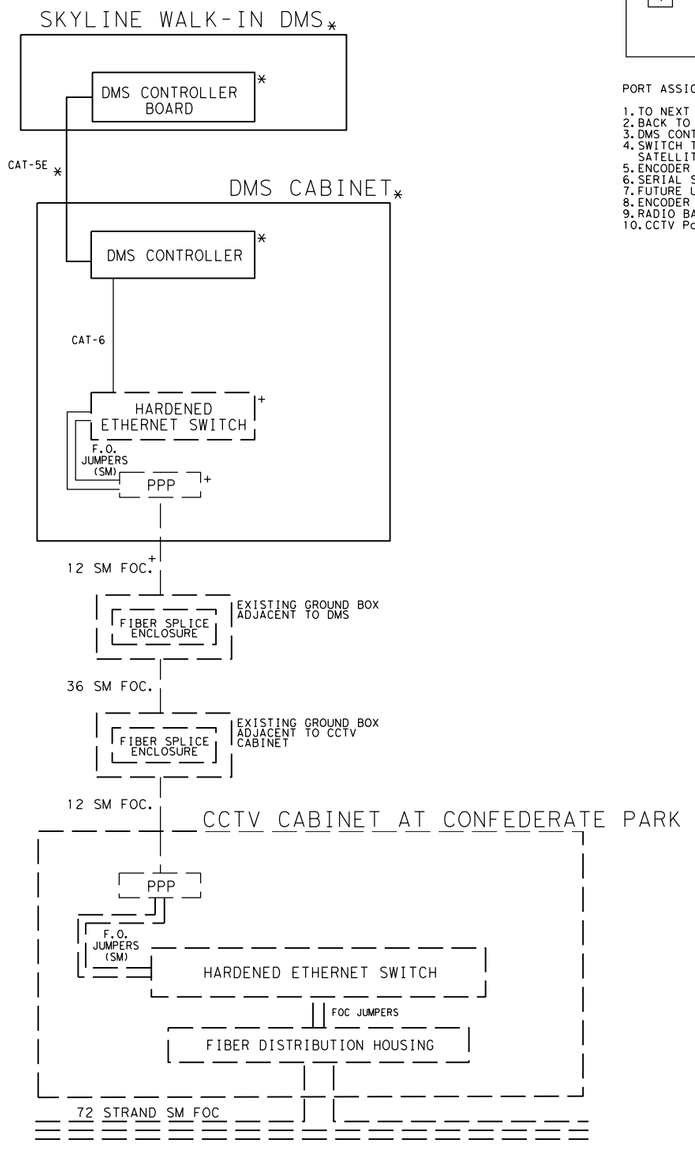
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	51
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

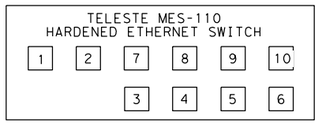
PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_15.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM





PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
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PROFESSIONAL ENGINEER

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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

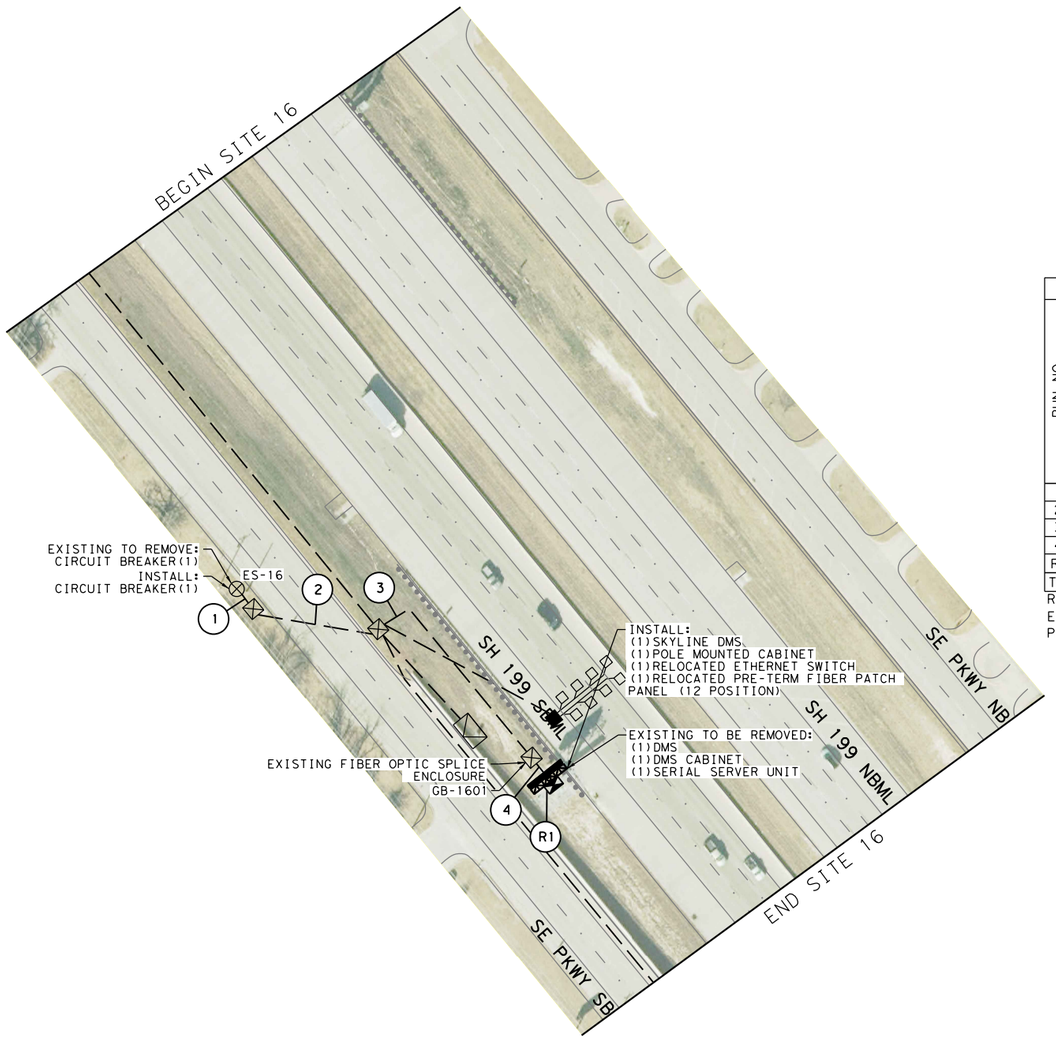
SITE #15
SH 199 NB AT CONFEDERATE PARK RD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL				
CHECK	TEXAS	FTW	TARRANT	
DL	CONTROL	SECTION	JOB	52
CHECK				
DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_15.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER PIGTAIL FROM DMS (RUNS 4 AND R1), SAFELY COIL IT AND STORE IT IN GB-1601, INSTALL NEW DMS AND CABINET, INSTALL PATCH PANEL INSIDE CABINET, AND PULL FIBER PIGTAIL BACK THROUGH RUNS 4 AND R1 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR SHALL REUSE EXISTING HOLES IN DMS TOWER. IF HOLES NEED TO BE ENLARGED, CONTRACTOR SHALL DO THIS IN THE FIELD. THIS WILL BE SUBSIDIARY TO ITEM 6028.
3. CONTRACTOR TO INSTALL NEW POLE MOUNTED DMS CABINET PROVIDED BY TXDOT ON EXISTING STRUCTURE.
4. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT
5. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
6. SEE SHEET 16 FOR CONSTRUCTION NOTES.



0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH		CABLE STATUS	CABLE LENGTH								RELOCATED		REMOVALS		TOTAL LENGTH OF RUN	RUN NO
		CONDT (PVC) (SCHD 40) (3")			ELEC CONDR (NO. 2) BARE		ELEC CONDR (NO. 8) BARE (TRACE)		ELEC CONDR (NO. 2) INSULATED		DMS CAT 5E +		FO CBL (12 SMF) (PIGTAIL)		DMS ELECTRICAL CIRCUIT			
		Qty	LF		Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF		
1	E	1		I	1	25			3	75					1	25	20	1
2	E	2		I	1	95			3	285					1	95	90	2
3	E	2		I	1	160			3	480					1	160	155	3
4	E	2		I	1	25	1	25	3	75			1	25	1	25	20	4
R1	I			I	1	55	1	10	3	165	1	55	1	55	1	55	50	R1
TOTAL					360		35		1080		55		80		360			

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6007	ELEC CONDR (NO.8) BARE	LF	35
620	6015	ELEC CONDR (NO.2) BARE	LF	360
620	6016	ELEC CONDR (NO.2) INSULATED	LF	1080
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	80
6027	6003	CONDUIT (PREPARE)	LF	285
6027	6008	GROUND BOX (PREPARE)	EA	3
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	360
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
+		JUNCTION BOX (AS NEEDED)	EA	2
++++		RELOCATE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	1
11+		REMOVE SERIAL SERVER UNIT	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
11+ SUBSIDIARY TO ITEM 6331

2/23/2021

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DMS REPLACEMENT

DMS LAYOUT
SITE #16

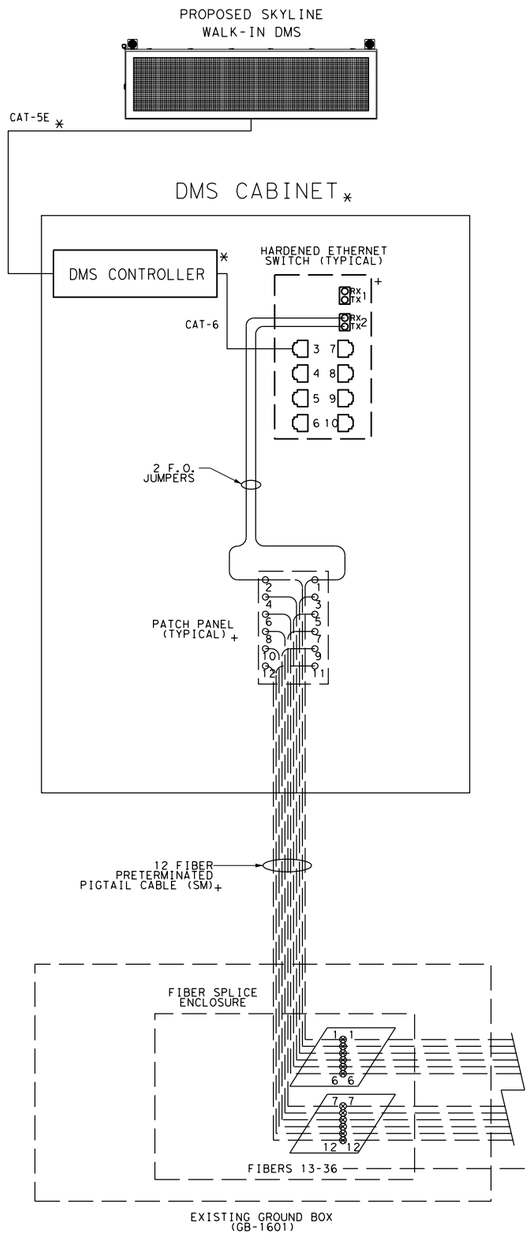
SH 199 SB AT DENVER TRAIL

SHEET 1 OF 1

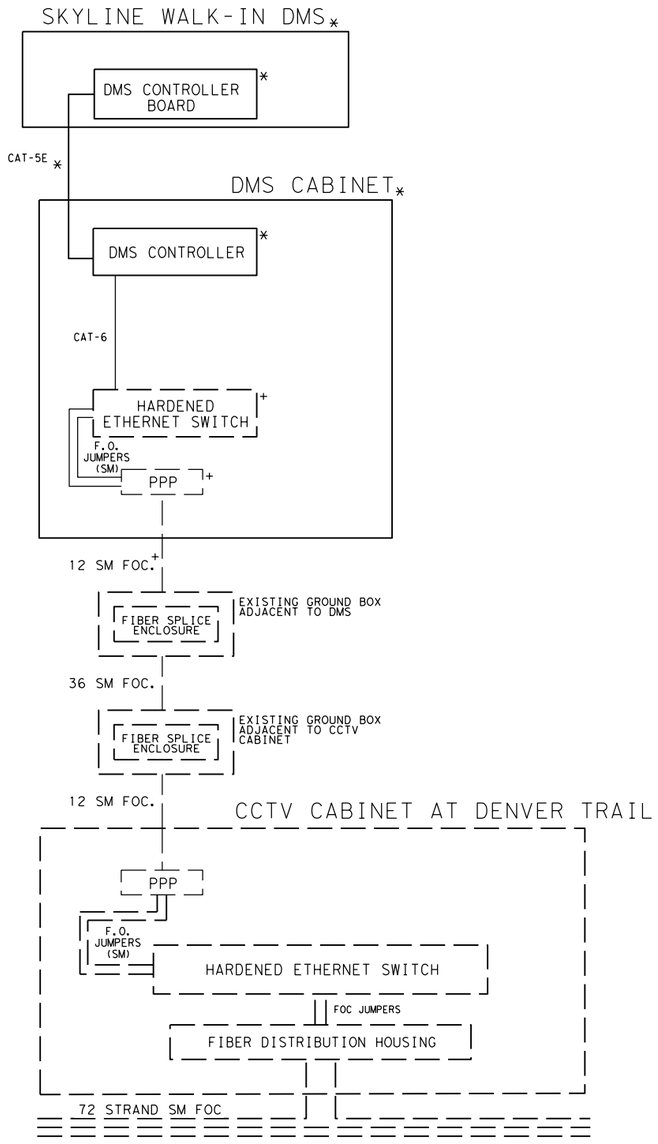
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE SHEET TITLE		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	53
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

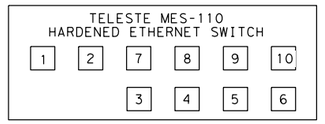
PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_16.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM





PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

SCHEMATIC FIBER OPTIC CONNECTIONS

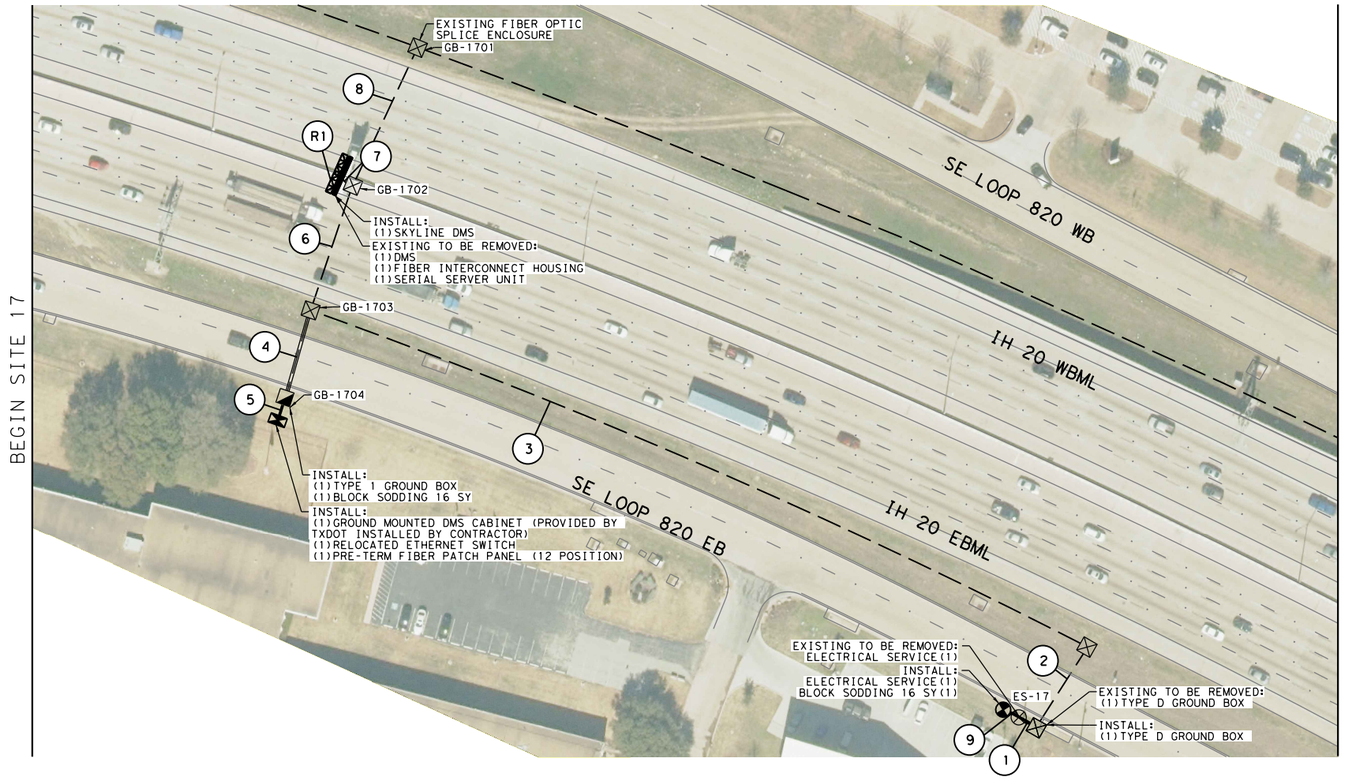
SITE #16
SH 199 SB AT DENVER TRAIL

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	54
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_16.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER PIGTAIL FROM DMS (RUNS 7,8 AND R1), SAFELY COIL IT AND STORE IT IN GB-1702, INSTALL NEW DMS AND CABINET, INSTALL PATCH PANEL INSIDE CABINET, AND INSTALL FIBER PIGTAIL THROUGH RUNS 4,5,6,7 AND 8 INTO CABINET AND TERMINATE IT.
2. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
3. CONTRACTOR SHALL REPAINT CONCRETE REPAIRS TO MATCH EXISTING/ORIGINAL PAINT COLOR OF THE STRUCTURES. THIS IS SUBSIDIARY TO THE CONCRETE REPAIR ITEM.
4. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT
5. ELECTRIC COMPANY TO INSTALL CONDUCTOR WIRES FROM THE EXISTING SERVICE POLE TO THE PROPOSED SERVICE POLE. CONTRACTOR TO COORDINATE WITH THE POWER COMPANY.
6. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
7. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE.



0 50 100
SCALE: 1"=100'

N

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	32
618	6023	CONDT (PVC) (SCH 40) (2")	LF	30
618	6029	CONDT (PVC) (SCH 40) (3")	LF	45
618	6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	130
620	6021	ELEC CONDR (NO.2/0) BARE	LF	920
620	6022	ELEC CONDR (NO.2/0) INSULATED	LF	3015
624	6010	GROUND BOX TY D (162922)W/APRON	EA	1
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6194	ELC SRV TY D 120/240 070(NS)SS(N)SP(O)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6103	REMOVE FIBER OPTIC CABLE	LF	180
6027	6003	CONDUIT (PREPARE)	LF	830
6027	6008	GROUND BOX (PREPARE)	EA	4
6028	6002	INSTALL DMS (FOUNDATION MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	810
6186	6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA	1
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	255
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	1
10+		REMOVE CONDUIT	LF	5
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	1
++++		12 FIBER PIGTAIL SM	LF	485
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1
+		DMS CABINET FOUNDATION	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
8+ SUBSIDIARY TO ITEM 780
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (HDPEC) (SCHD 80) (2") Qty	LF	CONDT (PVC) (SCHD 40) (2") Qty	LF	CONDT (PVC) (SCHD 40) (3") Qty	LF	CONDT (PVC) (SCHD 80) (3") Qty	LF	CONDT (PVC) (SCHD 80) (3") (BORE) Qty	LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 2/0) BARE Qty	LF	ELEC CONDR (NO. 2/0) INSULATED Qty	LF	DMS CAT 5E + Qty	LF	FO CBL (12 SMF) (PIGTAIL) ++++ Qty	LF	REMOVALS: CONDUIT 10+ Qty	LF	12 SM FO CBL Qty	LF	DMS ELECTRICAL CIRCUIT Qty	LF	TOTAL LENGTH OF RUN	RUN NO
1	R					1	5					R									1	5			1	5	5	1
2	E	1										I	1	70	3	210									1	70	65	2
3	E					2						I	1	565	3	1695									1	565	560	3
4	I									2	130	I	1	65	6	390	1	65	1	65							60	4
5	I					2	40					I	1	20	6	120	1	20	1	20							15	5
6	E							2				I	1	95	3	285	1	95	1	95					1	95	90	6
7	E							2				I	1	20	3	60	1	20					1	20	1	20	15	7
8	E							1				I							1	105			1	105			100	8
9	I			1	30							I	1	30	3	90											25	9
R1	I											I	1	55	3	165	1	55					1	55	1	55	50	R1
TOTAL					30		45				130			920		3015		255		285		5		180		810		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

SLACK SUMMARY	
ID	FO CBL (12 SMF) ++++
GB-1701	100
GB-1702	25
GB-1703	25
GB-1704	25
DMS CABINET	25
TOTAL	200

2/23/2021
STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #17

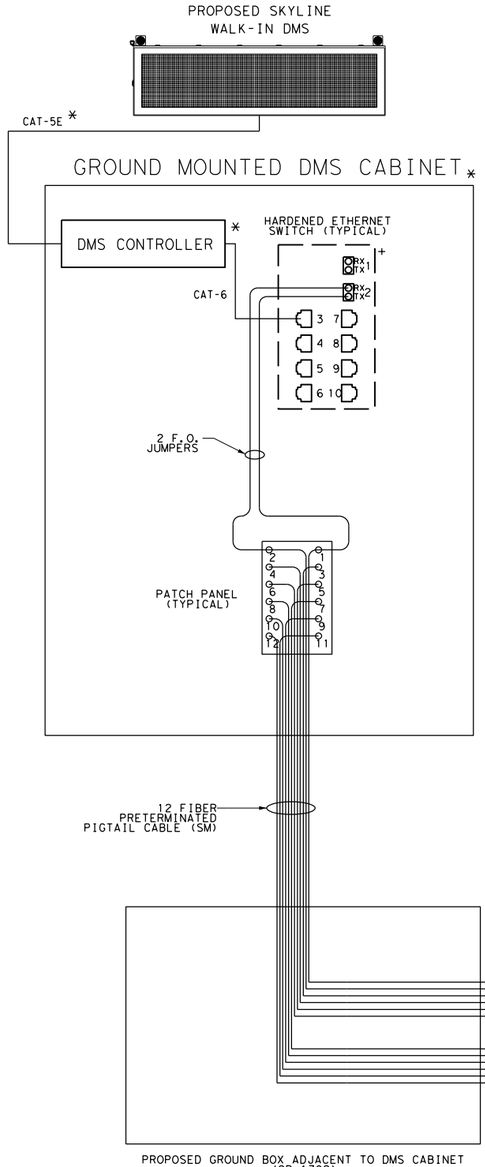
IH 20 WB AT CAMPUS DR

SHEET 1 OF 1

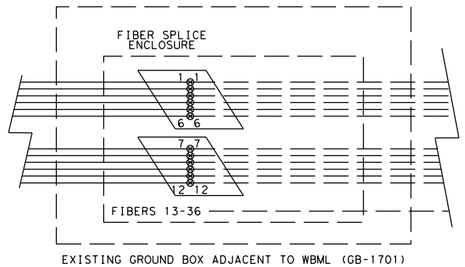
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	55
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_17.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



PROPOSED GROUND BOX ADJACENT TO DMS CABINET (GB-1702)

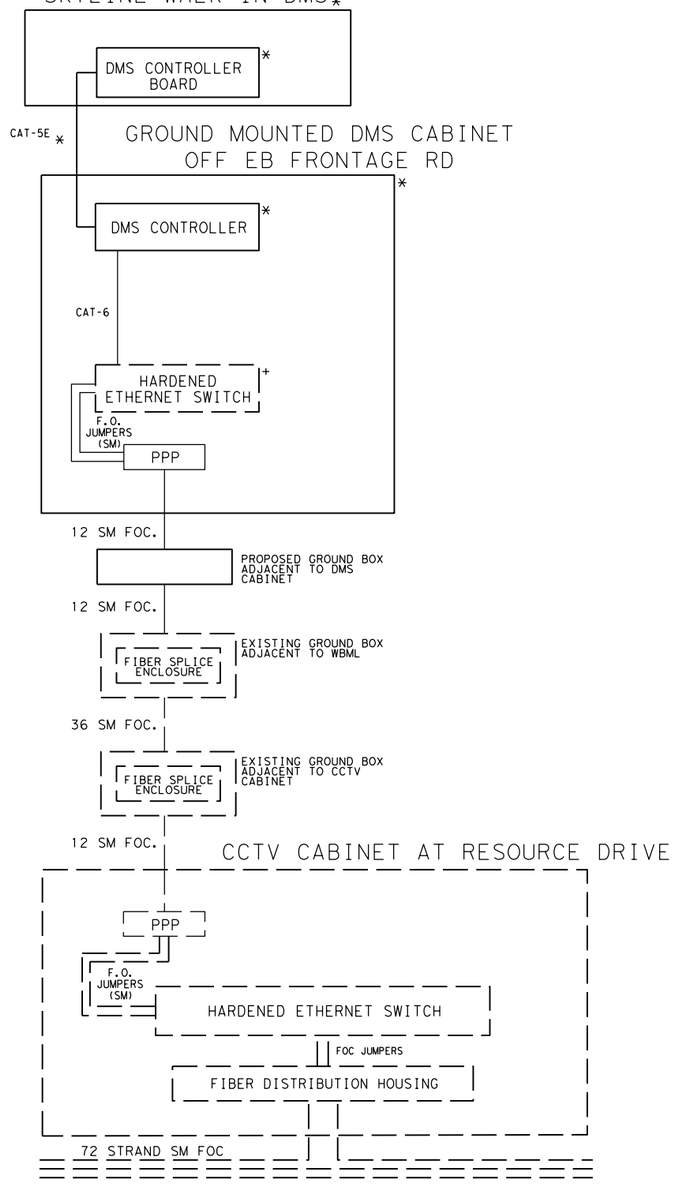


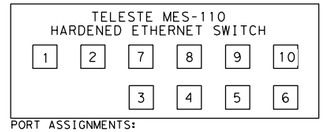
EXISTING GROUND BOX ADJACENT TO WBML (GB-1701)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW GROUND MOUNTED DMS CABINET.

COMMUNICATION BLOCK DIAGRAM





PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. SERIAL SERVER UNIT (IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
102185
LICENSED
PROFESSIONAL ENGINEER

Dhruva Lahon

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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

SITE #17
IH 20 WB AT CAMPUS DR

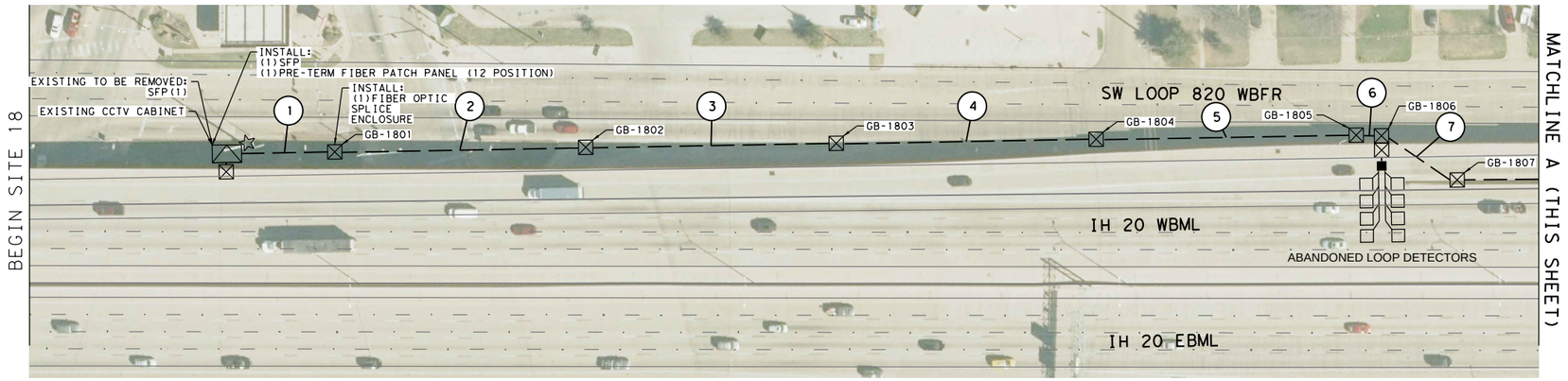
SHEET 1 OF 1

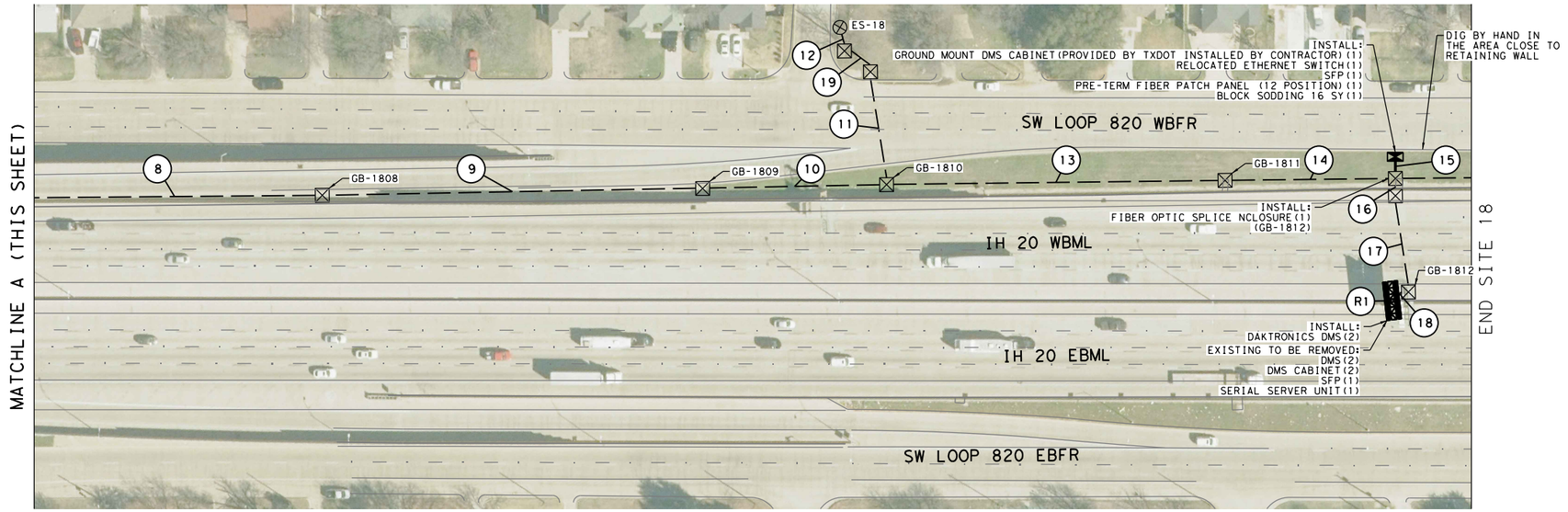
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	56
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276\FTW_DMS_FOC_17.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT
2. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
3. SEE SHEET 16 FOR CONSTRUCTION NOTES.

0 50 100
SCALE: 1"=100'





LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

2/23/2021

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DMS REPLACEMENT

DMS LAYOUT
SITE #18

IH 20 EB & WB AT JAMES AVE

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	57
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_18.dgn
BY: Nate.Taylor

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH				CABLE STATUS	CABLE LENGTH														REMOVALS				TOTAL LENGTH OF RUN	RUN NO
		CONDT (PVC) (SCHD 40) (2")		CONDT (PVC) (SCHD 40) (3")			ELEC CONDR (NO. 3/0) BARE		ELEC CONDR (NO. 1) BARE DMS POWER		ELEC CONDR (NO. 3/0) INSULATED		ELEC CONDR (NO. 1) INSULATED DMS POWER		DMS 6 MM FO JUMPERS +		FO CBL (12 SMF) (PIGTAIL) ++++		FO CBL (36 SMF)		MM FO CBL		DMS ELECTRICAL CIRCUIT			
		Qty	LF	Qty	LF		Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF		
1	E	1		2		I											1	80			1	80			75	1
2	E	1		2		I													1	180	1	180			175	2
3	E	1		2		I													1	180	1	180			175	3
4	E	1		2		I													1	190	1	190			185	4
5	E	1		2		I													1	190	1	190			185	5
6	E	1		2		I													1	25	1	25			20	6
7	E	1		2		I													1	70	1	70			65	7
8	E	1		2		I													1	220	1	220			215	8
9	E	1		2		I													1	280	1	280			275	9
10	E	1		2		I													1	140	1	140			135	10
11	E	1		2		I	1	90			3	270											1	90	85	11
12	E	1		2		I	1	20			3	60											1	20	15	12
13	E	1		2		I	1	250			3	750									1	250	1	250	245	13
14	E	1		2		I	1	130			3	390									1	130	1	130	125	14
15	I			2	40	I	1	20			3	60	6	120	2	40	1	20							15	15
16	E	1		2		I			1	20			6	120	2	40					1	20	1	20	15	16
17	E	1		2		I			1	75			6	450	2	150					1	75	1	75	70	17
18	E	1		2		I			2	40			6	120	2	40					1	20	1	20	15	18
19	E	1		2		I	1	30			3	90											1	30	25	19
R1	I					I			2	110			6	330	2	110					1	55	1	55	50	R1
TOTAL					40			540		245		1620		1140		380		100		1855		2105		690		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6029	CONDT (PVC) (SCH 40) (3")	LF	40
620	6017	ELEC CONDR (NO.1) BARE	LF	245
620	6018	ELEC CONDR (NO.1) INSULATED	LF	1140
620	6023	ELEC CONDR (NO.3/0) BARE	LF	540
620	6024	ELEC CONDR (NO.3/0) INSULATED	LF	1620
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6007	6050	FO CBL (36 SMF)	LF	2305
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	2
6007	6094	FIBER OPTIC FUSION SPLICE	EA	24
6007	6103	REMOVE FIBER OPTIC CABLE	LF	2105
6027	6003	CONDUIT (PREPARE)	LF	2100
6027	6008	GROUND BOX (PREPARE)	EA	16
6028	6002	INSTALL DMS (FOUNDATION MTD CABINET)	EA	2
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	690
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	2
+		RELOCATE ETHERNET SWITCH	EA	1
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	380
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	2
++++		12 FIBER PIGTAIL SM	LF	350
++++		REPLACE SFP	EA	2
+		JUNCTION BOX (AS NEEDED)	EA	3
11+		REMOVE SERIAL SERVER UNIT	EA	1
+		DMS CABINET FOUNDATION	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
8+ SUBSIDIARY TO ITEM 780
11+ SUBSIDIARY TO ITEM 6331

SLACK SUMMARY

ID	FO CBL (12 SMF) ++++	FO CBL (36 SMF)
SURVEILLANCE-CABINET	25	
DMS-CABINET	25	
GB-1801	100	100
GB-1802		25
GB-1803		25
GB-1804		25
GB-1805		25
GB-1806		25
GB-1807		25
GB-1808		25
GB-1809		25
GB-1810		25
GB-1811		25
GB-1812	100	100
TOTAL	250	450

2/23/2021

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DMS REPLACEMENT

DMS LAYOUT
SITE #18

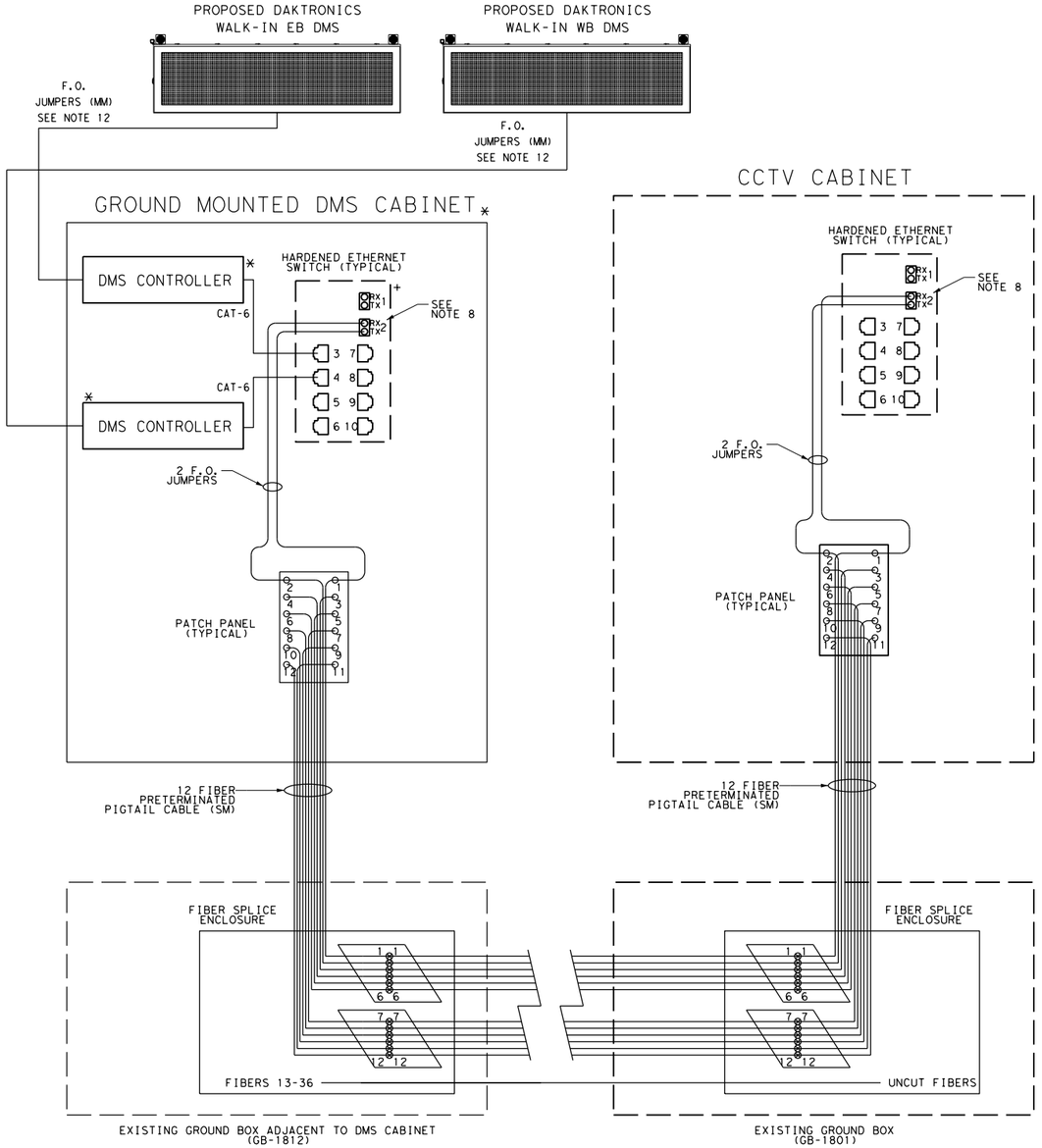
IH 20 EB & WB AT JAMES AVE

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	58
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_18A.dgn
BY: Nate.Taylor

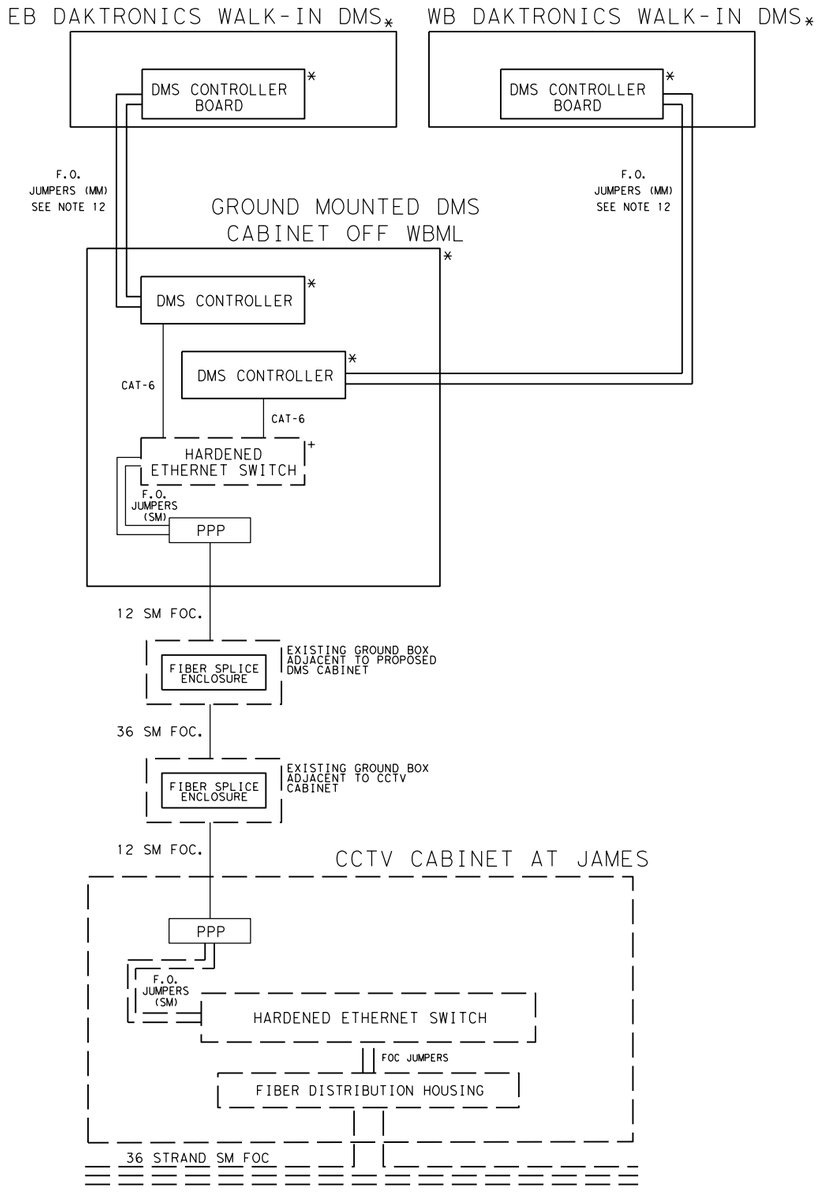
FIBER CABLING AND PATCH PANEL DETAIL

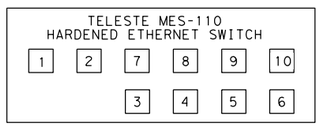


NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR TO REPLACE EXISTING MM SFP ON ETHERNET SWITCH WITH SM SFP TO BE PROVIDED BY TXDOT. THIS WORK WILL BE SUBSIDIARY TO ITEM 6007.
9. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
10. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
11. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW GROUND MOUNTED DMS CABINET.
12. FOR DAKTRONICS SIGNS, USE 6 STRAND MM WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.

COMMUNICATION BLOCK DIAGRAM





PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. DMS CONTROLLER
5. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
7. SERIAL SERVER UNIT (IF PRESENT)
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

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DMS REPLACEMENT

SCHEMATIC FIBER OPTIC CONNECTIONS

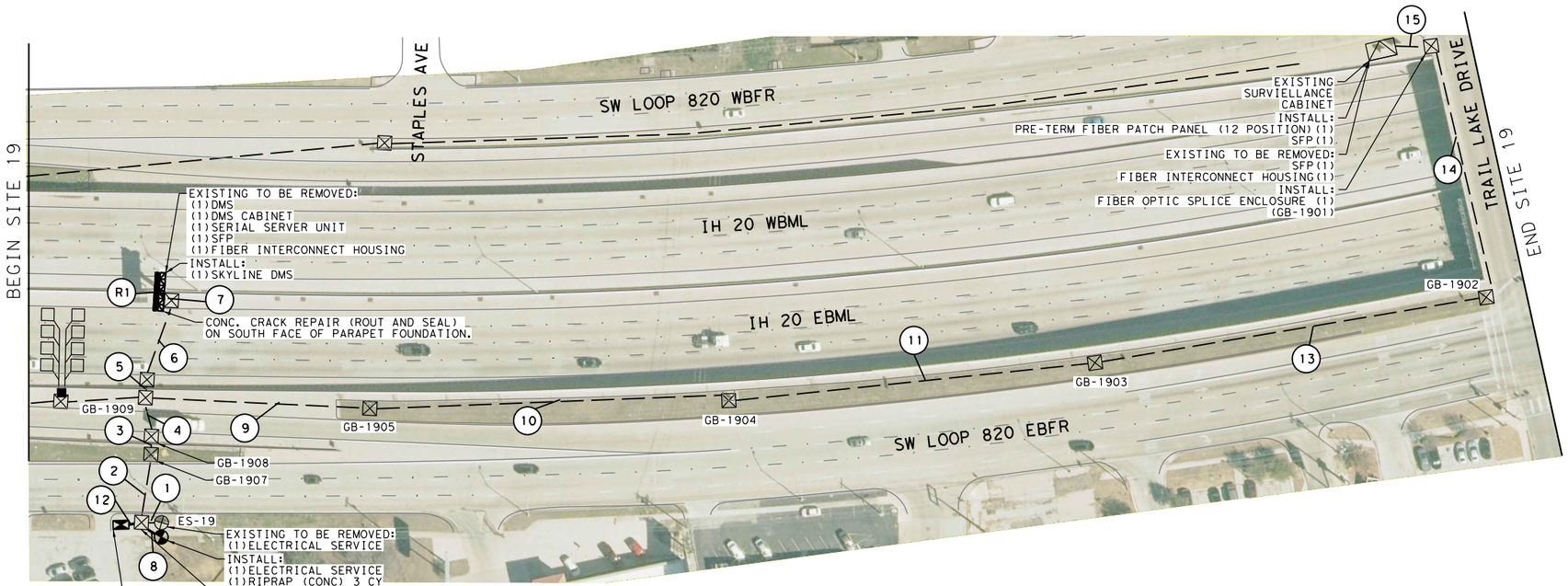
SITE #18
IH 20 EB & WB AT JAMES AVE

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	59
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_18.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL REPAINT CONCRETE REPAIRS TO MATCH EXISTING/ORIGINAL PAINT COLOR OF THE STRUCTURES. THIS IS SUBSIDIARY TO THE CONCRETE REPAIR ITEM.
2. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT
3. ELECTRIC COMPANY TO INSTALL CONDUCTOR WIRES FROM THE EXISTING SERVICE POLE TO THE PROPOSED SERVICE POLE. CONTRACTOR TO COORDINATE WITH THE POWER COMPANY.
4. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
5. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE.



CONC. CRACK REPAIR (ROUT AND SEAL) ON SOUTH FACE OF PARAPET FOUNDATION:

0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

2/23/2021

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DMS REPLACEMENT

DMS LAYOUT
SITE #19

IH 20 EB AT TRAIL LAKE DR

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	60
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_19.dgn
BY: Nate.Taylor

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH				CABLE STATUS	CABLE LENGTH										REMOVALS						TOTAL LENGTH OF RUN	RUN NO
		CONDT (PVC) (SCHD 40) (2")		CONDT (PVC) (SCHD 40) (3")			ELEC CONDR (NO. 2) BARE		ELEC CONDR (NO. 2) INSULATED		DMS CAT 5E +		FO CBL (12 SMF) (PIGTAIL) ++++		FO CBL (36 SMF)		CONDUIT 10+		MM FO CBL		DMS ELECTRICAL CIRCUIT			
		Q+y	LF	Q+y	LF		Q+y	LF	Q+y	LF	Q+y	LF	Q+y	LF	Q+y	LF	Q+y	LF	Q+y	LF	Q+y	LF		
1	R	1		4		R											1	5			1	20	15	1
2	E	1		2		I	1	55	3	165	1	55			1	55					1	55	50	2
3	E	1		2		I	1	20	3	60	1	20			1	20					1	20	15	3
4	E	1		2		I	1	35	3	105	1	35			1	35					1	35	30	4
5	E	1		2		I	1	20	3	60	1	20							1	20	1	20	15	5
6	E	1		2		I	1	65	3	195	1	65							1	65	1	65	60	6
7	E			2		I	1	20	3	60	1	20							1	20	1	20	15	7
8	I	1	15			I	1	15	3	45													10	8
9	E	1		2		I									1	165			1	165			160	9
10	E	1		2		I									1	260			1	260			255	10
11	E	1		2		I									1	270			1	270			265	11
12	I			2	40	I	1	20	6	120	1	20	1	20									15	12
13	E	1		2		I									1	290			1	290			285	13
14	E	5				I									1	190			1	190			185	14
15	E	1		4		I							1	35					1	35			30	15
R1	I					I	1	55	3	165	1	55							1	55	1	55	50	R1
TOTAL			15		40			305		975		290		55		1285		5		1370		290		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
432	6005	RIPRAP (CONC) (CL A)	CY	3
618	6023	CONDT (PVC) (SCH 40) (2")	LF	15
618	6029	CONDT (PVC) (SCH 40) (3")	LF	40
620	6015	ELEC CONDR (NO.2) BARE	LF	305
620	6016	ELEC CONDR (NO.2) INSULATED	LF	975
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6195	ELC SRV TY D 120/240 070(NS)SS(N)SP(U)	EA	1
780	6004	CNC CRCK REPAR(DISCRETE)(ROUT AND SEAL)	LF	1
6007	6050	FO CBL (36 SMF)	LF	1660
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	2
6007	6094	FIBER OPTIC FUSION SPLICE	EA	24
6007	6103	REMOVE FIBER OPTIC CABLE	LF	1370
6027	6003	CONDUIT (PREPARE)	LF	1365
6027	6008	GROUND BOX (PREPARE)	EA	11
6028	6002	INSTALL DMS (FOUNDATION MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	290
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	290
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	2
10+		REMOVE CONDUIT	LF	5
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	2
++++		12 FIBER PIGTAIL SM	LF	305
++++		REPLACE SFP	EA	2
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
8+		PAINT REPAIRED STRUCTURE	EA	2
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1
+		DMS CABINET FOUNDATION	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
8+ SUBSIDIARY TO ITEM 780
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

SLACK SUMMARY

ID	FO CBL (12 SMF) ++++	FO CBL (36 SMF)
SURVEILLANCE-CABINET	25	
DMS-CABINET	25	
GB-1901	100	100
GB-1902		25
GB-1903		25
GB-1904		25
GB-1905		25
GB-1906	100	100
GB-1907		25
GB-1908		25
GB-1909		25
TOTAL	250	375

2/23/2021

STATE OF TEXAS
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Texas Department of Transportation

DMS REPLACEMENT

DMS LAYOUT
SITE #19

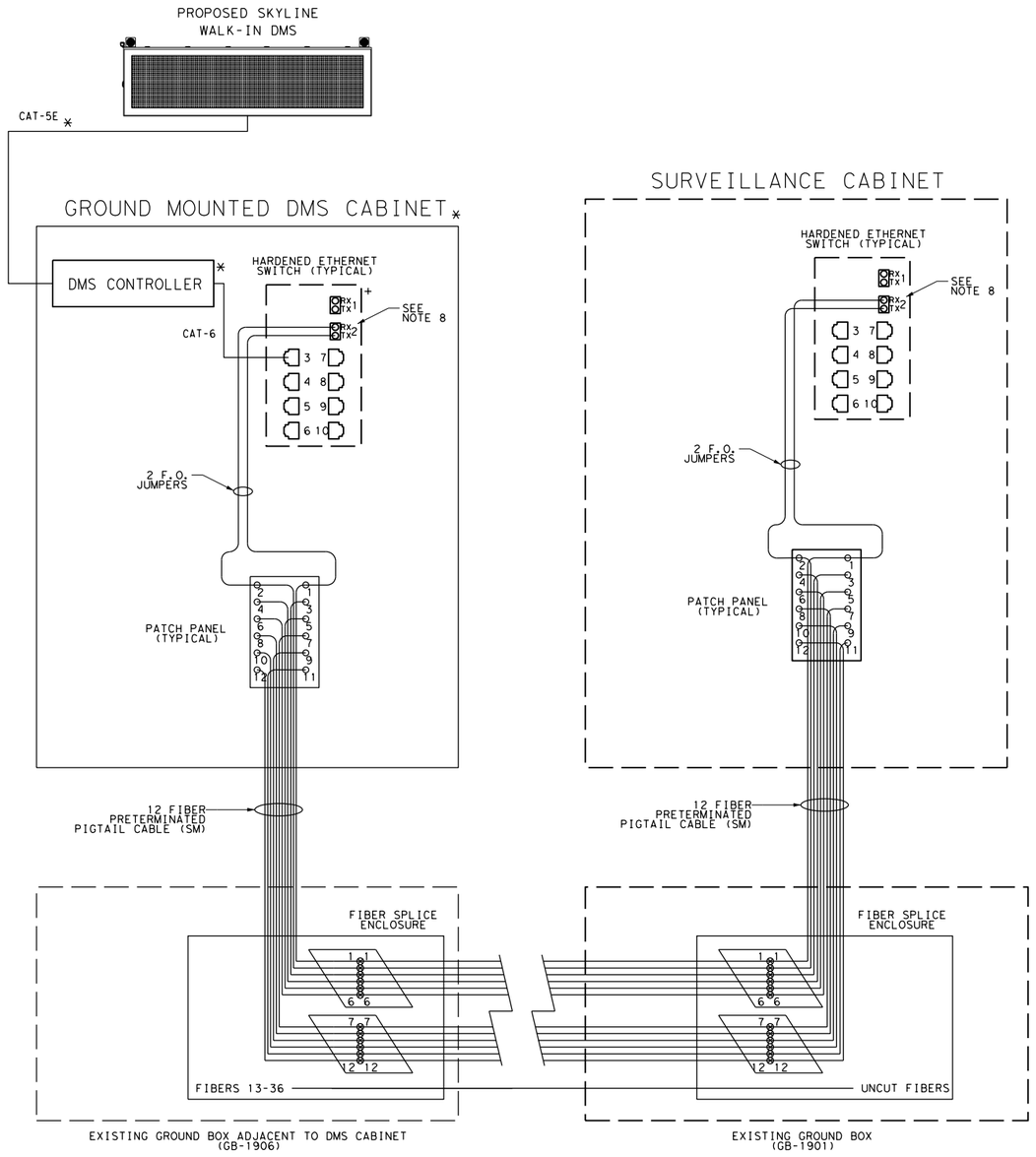
IH 20 EB AT TRAIL LAKE DR

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	61
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_19A.dgn
BY: Nate.Taylor

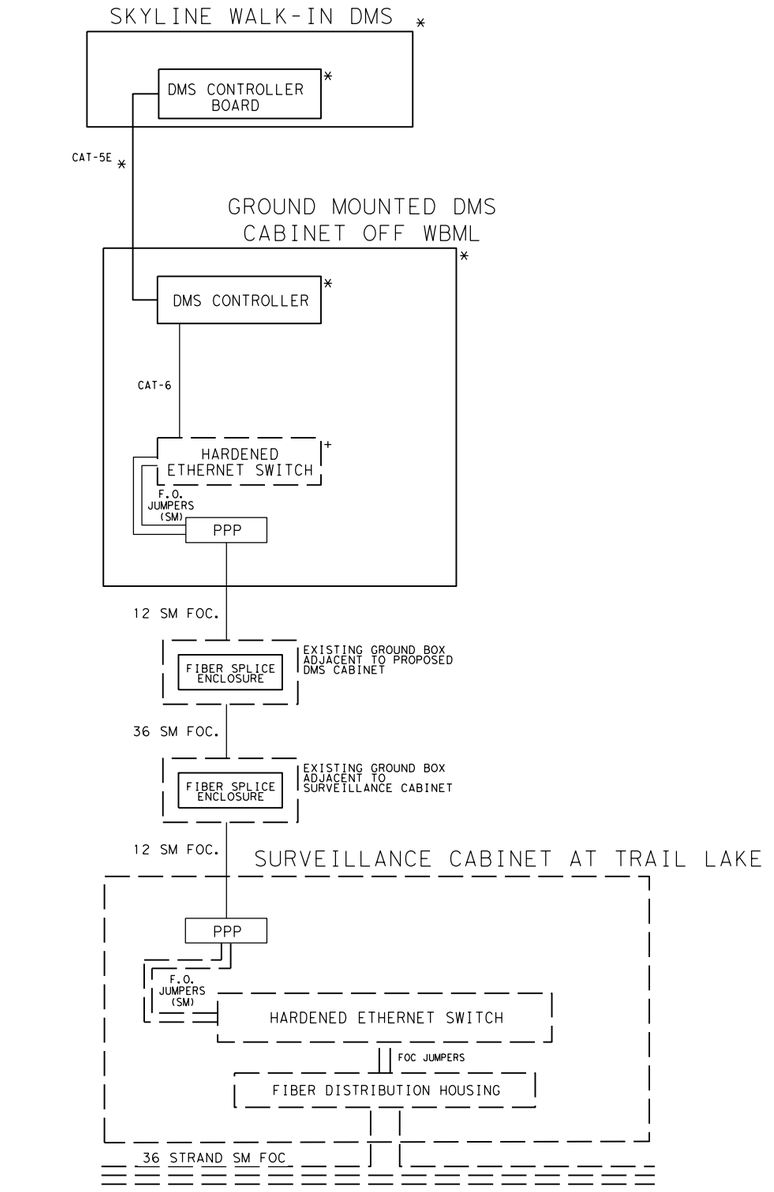
FIBER CABLING AND PATCH PANEL DETAIL

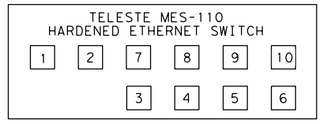


NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR TO REPLACE EXISTING MM SFP ON ETHERNET SWITCH WITH SM SFP TO BE PROVIDED BY TXDOT. THIS WORK WILL BE SUBSIDIARY TO ITEM 6007.
9. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
10. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
11. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW GROUND MOUNTED DMS CABINET.

COMMUNICATION BLOCK DIAGRAM





PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. SERIAL SERVER UNIT (IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV POE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

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DMS REPLACEMENT

SCHEMATIC FIBER OPTIC CONNECTIONS

SITE #19
IH 20 EB AT TRAIL LAKE

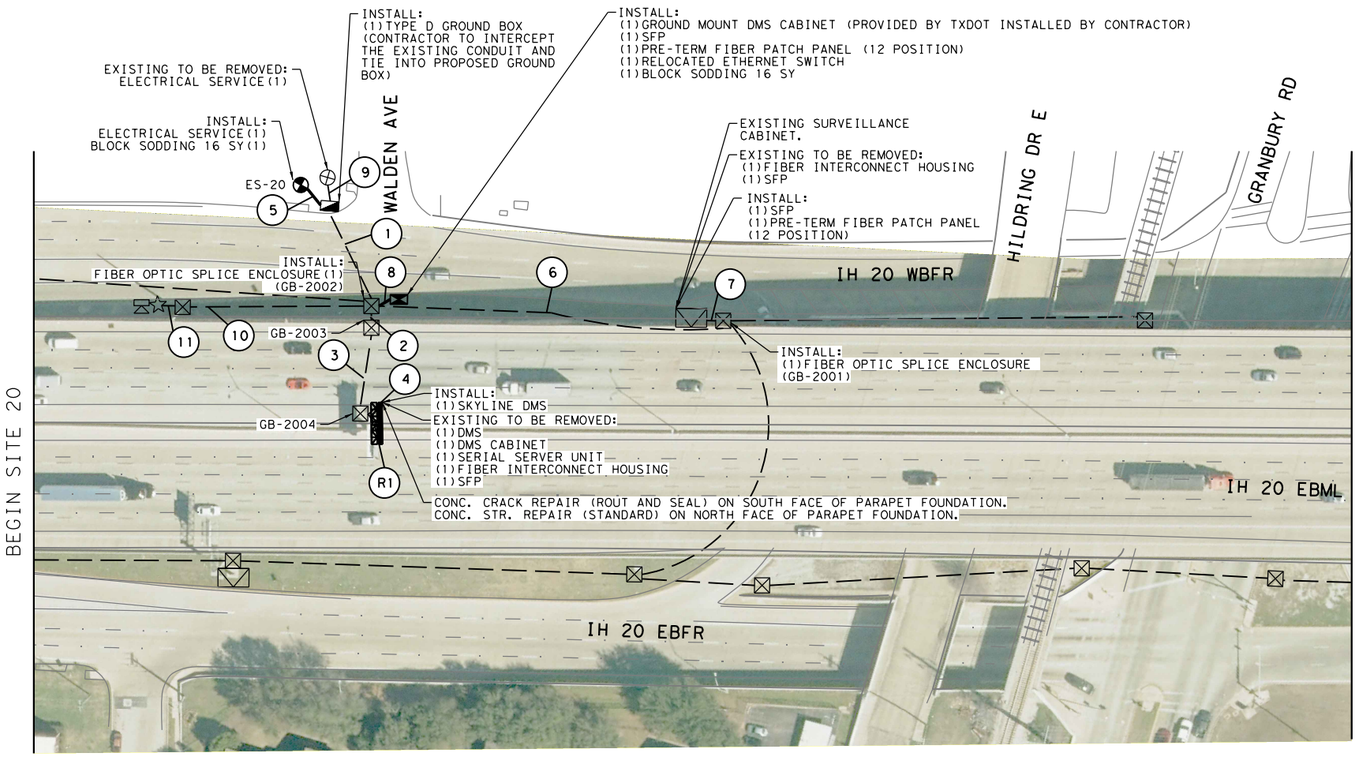
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	62
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprodvnate.taylor\dms42767\FTW_DMS_FOC_19.dgn
BY: Nate.Taylor

NOTES:
1. A 4-HOUR WINDOW FOR SWTICHOVER WILL BE ALLOWED TO RECONNECT POWER FOR THE SURVEILLANCE CABINET AND CCTV CABINET. THE CONTRACT SHALL PROVIDE 72-HOUR ADVANCE NOTICE AND RECEIVE APPROVAL FOR THE OUTAGE FROM THE TXDOT SIGNAL SHOP AT 817-370-3664.
2. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT
3. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
4. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE.

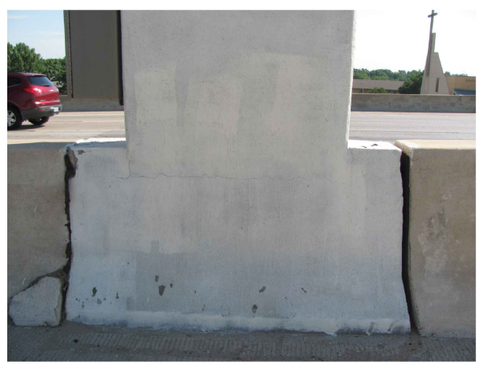
0 50 100
SCALE: 1"=100'



LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

LOCATION OF CONC. CRACK REPAIR (ROUT AND SEAL) ON SOUTH FACE OF PARAPET FOUNDATION:



LOCATION OF CONC. CRACK REPAIR (STANDARD) ON NORTH FACE OF PARAPET FOUNDATION:

2/23/2021
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DMS REPLACEMENT

DMS LAYOUT
SITE #20

IH 20 WB AT GRANBURY RD

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	63
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_20.dgn
BY: Nate.Taylor

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH				CABLE STATUS	CABLE LENGTH														REMOVALS						TOTAL LENGTH OF RUN	RUN NO
		CONDT (PVC) (SCHD 40) (2")		CONDT (PVC) (SCHD 40) (3")			ELEC CONDR (NO. 2) BARE		ELEC CONDR (NO. 4) BARE		ELEC CONDR (NO. 2) INSULATED		ELEC CONDR (NO. 4) INSULATED		DMS CAT 5E +		FO CBL (12 SMF) (PIGTAIL) ++++		FO CBL (36 SMF)		CONDUIT 10+		MM FO CBL		DMS ELECTRICAL CIRCUIT			
		Qty	LF	Qty	LF		Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF		
1	E	1		2		I	1	90	5	450	3	270													1	90	85	1
2	E	1		2		I			1	20			3	60	1	20							1	20	1	20	15	2
3	E	1		2		I			1	65			3	195	1	65							1	65	1	65	60	3
4	E			2		I			1	25			3	75	1	25							1	25	1	25	20	4
5	I	1	20			I	1	20	5	100	3	60															15	5
6	E	1		2		I			1	240			3	720							1	240	1	240	1	240	235	6
7	E	1		4		I			1	35			3	105			1	35					1	35			30	7
8	I			2	70	I	1	35			6	210			1	35	1	35									30	8
9	R					R	1														1	5			1	20	15	9
10	E			1		I			1	135			2	270													130	10
11	E			1		I			1	35			2	70													30	11
R1	E					I			1	55			3	165	1	55									1	55	50	R1
TOTAL			20		70			145		1160		540		1660		200		70		240		5		385		515		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	32
429	6009	CONC STR REPAIR (STANDARD)	SF	1
618	6023	CONDT (PVC) (SCH 40) (2")	LF	20
618	6029	CONDT (PVC) (SCH 40) (3")	LF	70
620	6011	ELEC CONDR (NO.4) BARE	LF	1160
620	6012	ELEC CONDR (NO.4) INSULATED	LF	1660
620	6015	ELEC CONDR (NO.2) BARE	LF	145
620	6016	ELEC CONDR (NO.2) INSULATED	LF	540
624	6010	GROUND BOX TY D (162922)W/APRON	EA	1
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6251	ELC SRV TY D 120/240 100(NS)SS(N)SP(U)	EA	1
780	6004	CNC CRCK REPAR(DISCRETE)(ROUT AND SEAL)	LF	3
6007	6050	FO CBL (36 SMF)	LF	440
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	2
6007	6094	FIBER OPTIC FUSION SPLICE	EA	24
6007	6103	REMOVE FIBER OPTIC CABLE	LF	385
6027	6003	CONDUIT (PREPARE)	LF	655
6027	6008	GROUND BOX (PREPARE)	EA	3
6028	6002	INSTALL DMS (FOUNDATION MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	515
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	200
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	2
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	2
++++		12 FIBER PIGTAIL SM	LF	395
++++		REPLACE SFP	EA	2
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
8+		PAINT REPAIRED STRUCTURE	EA	2
9+		POWER DISCONNECT & RECONNECT	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1
+		DMS CABINET FOUNDATION	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
8+ SUBSIDIARY TO ITEM 429, 780
9+ SUBSIDIARY TO ITEM 620
11+ SUBSIDIARY TO ITEM 6331

SLACK SUMMARY

ID	FO CBL (12 SMF) ++++	FO CBL (36 SMF)
SURVEILLANCE-CABINET	100	
DMS-CABINET	25	
GB-2001	100	100
GB-2002	100	100
TOTAL	325	200

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
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DMS REPLACEMENT

DMS LAYOUT
SITE #20

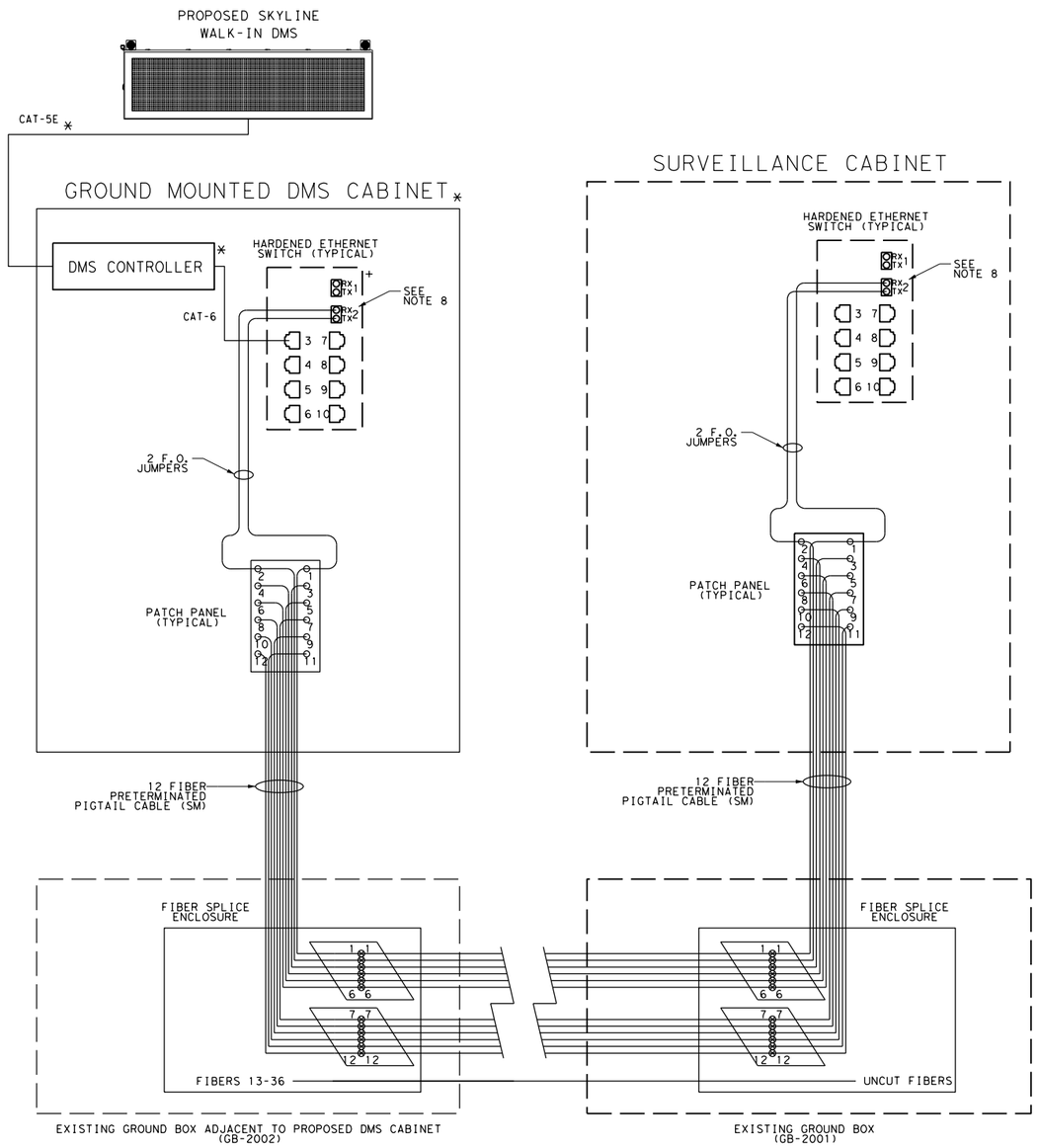
IH 20 WB AT GRANBURY RD

SHEET 2 OF 2

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	64
CHECK DL	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_20A.dgn
BY: Nate.Taylor

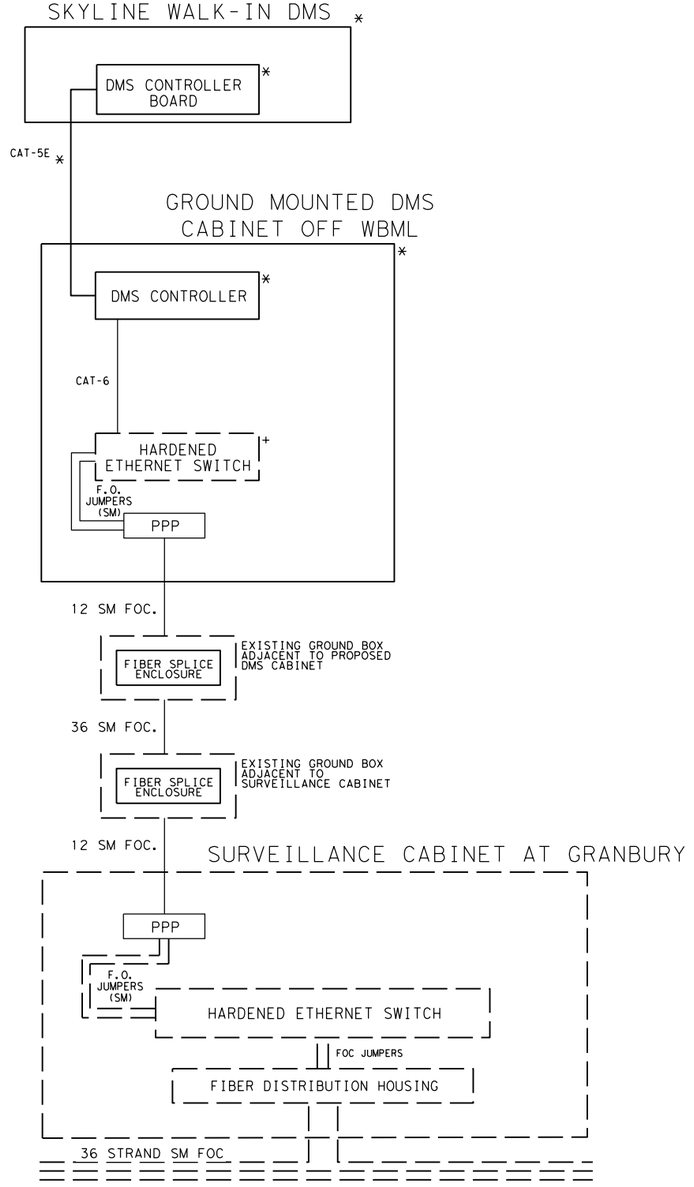
FIBER CABLING AND PATCH PANEL DETAIL

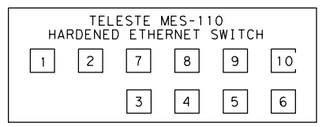


NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR TO REPLACE EXISTING MM SFP ON ETHERNET SWITCH WITH SM SFP TO BE PROVIDED BY TXDOT. THIS WORK WILL BE SUBSIDIARY TO ITEM 6007.
9. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
10. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
11. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW GROUND MOUNTED DMS CABINET.

COMMUNICATION BLOCK DIAGRAM





PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT
SCHEMATIC
FIBER OPTIC CONNECTIONS
SITE #20
IH 20 WB AT GRANBURY RD

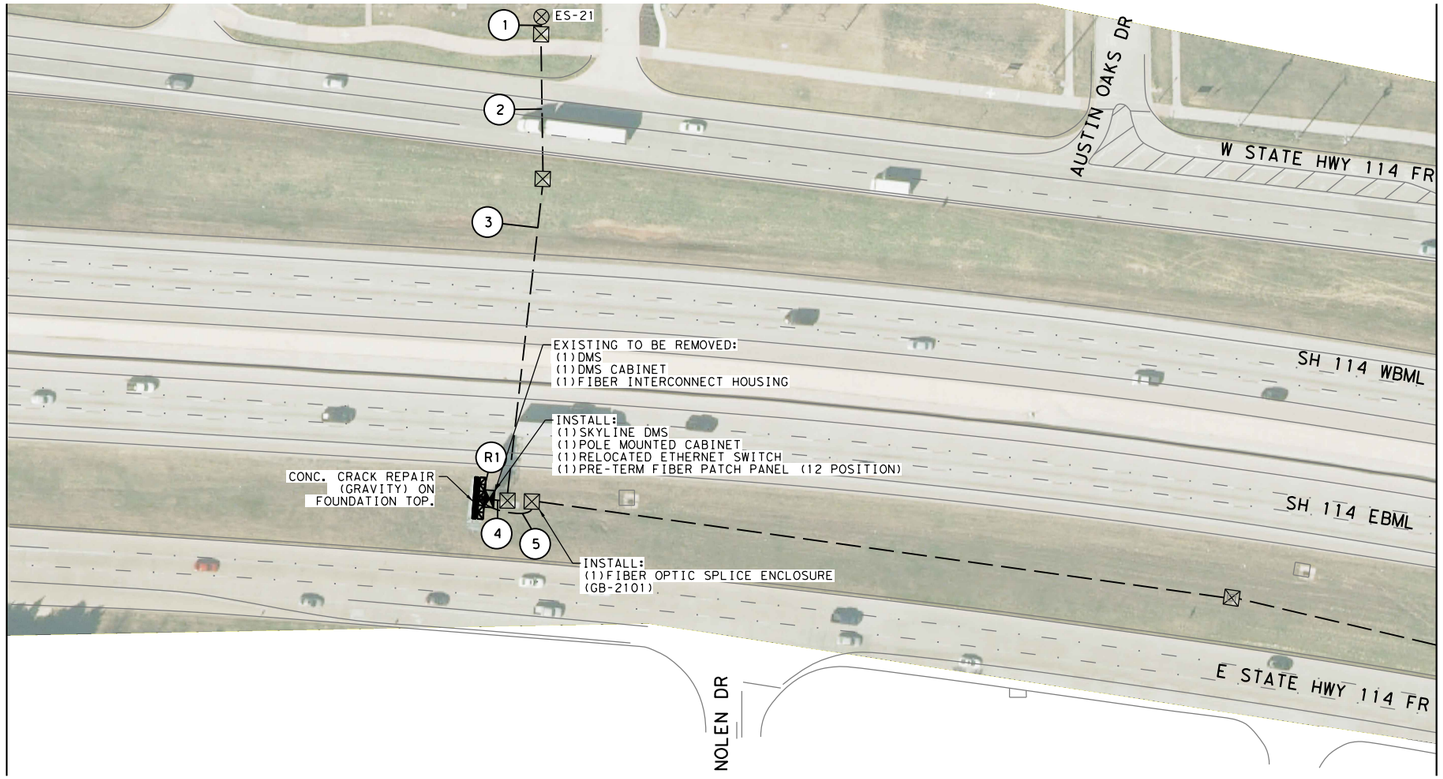
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	65
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_20.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER PIGTAIL FROM DMS CABINET (RUN 5 & R1), SAFELY COIL IT AND STORE IT IN GB-2101, INSTALL NEW DMS AND CABINET, INSTALL NEW PATCH PANEL INSIDE CABINET, AND INSTALL NEW FIBER PIGTAIL FROM GB-2101 THROUGH RUNS 5 AND R1 INTO CABINET AND TERMINATE IT.
2. CONTRACTOR SHALL REPAINT CONCRETE REPAIRS TO MATCH EXISTING/ORIGINAL PAINT COLOR OF THE STRUCTURES. THIS IS SUBSIDIARY TO THE CONCRETE REPAIR ITEM.
3. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT
4. SEE SHEET 16 FOR CONSTRUCTION NOTES.

0 50 100
SCALE: 1"=100'



LOCATION OF CONC. CRACK REPAIR (GRAVITY) ON FOUNDATION TOP:

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDT (PVC) (SCHD 40) (2") LF	CONDT (PVC) (SCHD 40) (3") Qty	CONDT (PVC) (SCHD 40) (3") LF	CONDT (PVC) (SCHD 80) (2") (BORE) Qty	CONDT (PVC) (SCHD 80) (2") (BORE) LF	CONDT (PVC) (SCHD 80) (3") (BORE) Qty	CONDT (PVC) (SCHD 80) (3") (BORE) LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 1) BARE Qty	ELEC CONDR (NO. 1) BARE LF	ELEC CONDR (NO. 8) BARE (TRACE) Qty	ELEC CONDR (NO. 8) BARE (TRACE) LF	ELEC CONDR (NO. 1) INSULATED Qty	ELEC CONDR (NO. 1) INSULATED LF	DMS CAT 5E + Qty	DMS CAT 5E + LF	FO CBL (12 SMF) (PIGTAIL) ++++ Qty	FO CBL (12 SMF) (PIGTAIL) ++++ LF	REMOVALS: 12 SM FO CBL Qty	12 SM FO CBL LF	DMS ELECTRICAL CIRCUIT Qty	DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1								I	1	15			3	45							1	15	10	1
2	E					1				I	1	105			3	315							1	105	100	2
3	E							2		I	1	225			3	675							1	225	220	3
4	E	1								I	1	25			3	75							1	25	20	4
5	E			1						I			1	15					1	15	1	15			10	5
R1	I									I	1	55	1	10	3	165	1	55	1	10	1	55	1	55	50	R1
TOTAL												425		25		1275		55		25		70		425		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6007	ELEC CONDR (NO.8) BARE	LF	25
620	6017	ELEC CONDR (NO.1) BARE	LF	425
620	6018	ELEC CONDR (NO.1) INSULATED	LF	1275
780	6006	CNC CRACK REPAIR (FLOOD)(GRAVITY)	SF	1
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6103	REMOVE FIBER OPTIC CABLE	LF	70
6027	6003	CONDUIT (PREPARE)	LF	360
6027	6008	GROUND BOX (PREPARE)	EA	4
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	425
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	1
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	1
++++		12 FIBER PIGTAIL SM	LF	150
8+		PAINT REPAIRED STRUCTURE	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
8+ SUBSIDIARY TO ITEM 780
11+ SUBSIDIARY TO ITEM 6331

SLACK SUMMARY

ID	FO CBL (12 SMF) ++++
GB-2101	100
DMS-CABINET	25
TOTAL	125

2/23/2021
STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #21

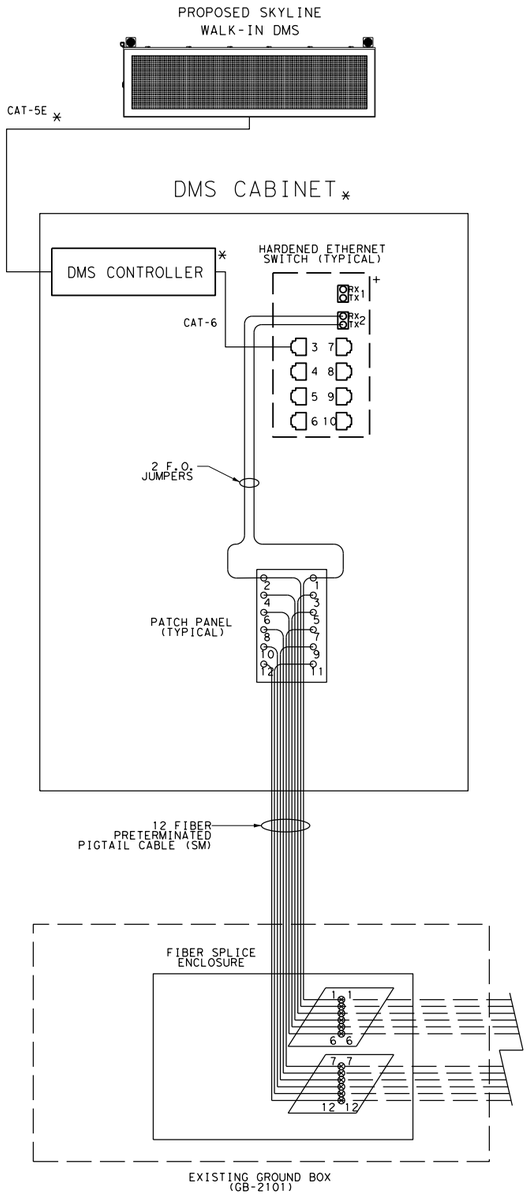
SH 114 EB AT S KIMBALL AVE

SHEET 1 OF 1

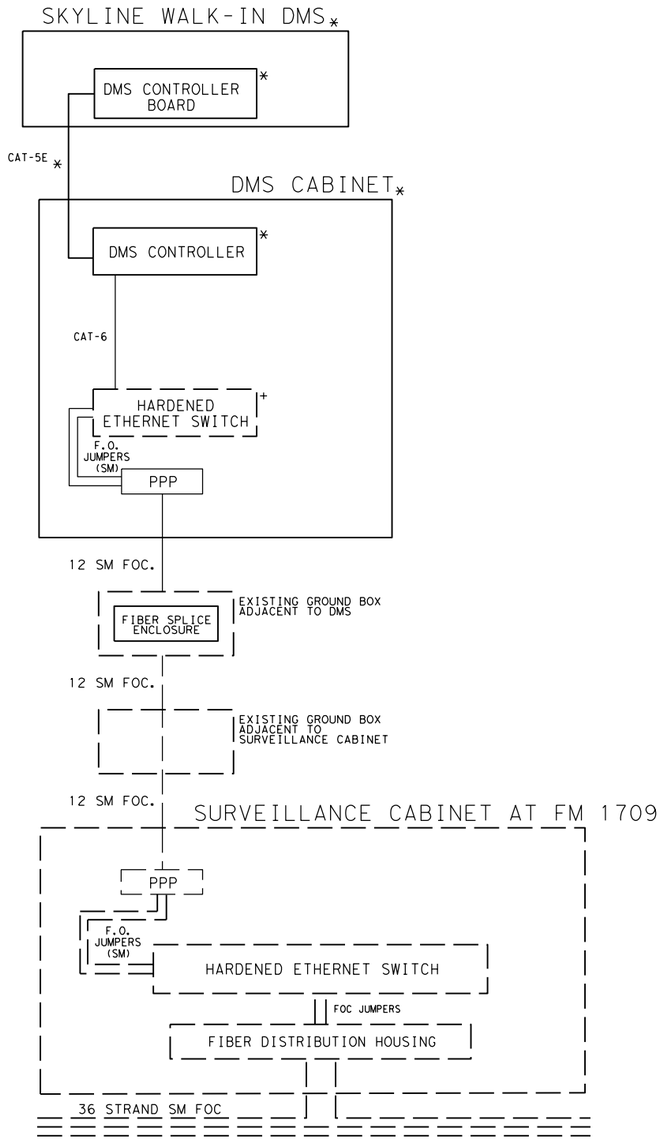
DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	66
CHECK DL	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_21.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM

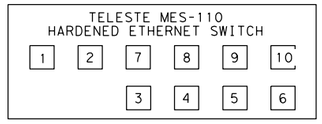


LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.



PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. SERIAL SERVER UNIT (IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV PoE (IF PRESENT)

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

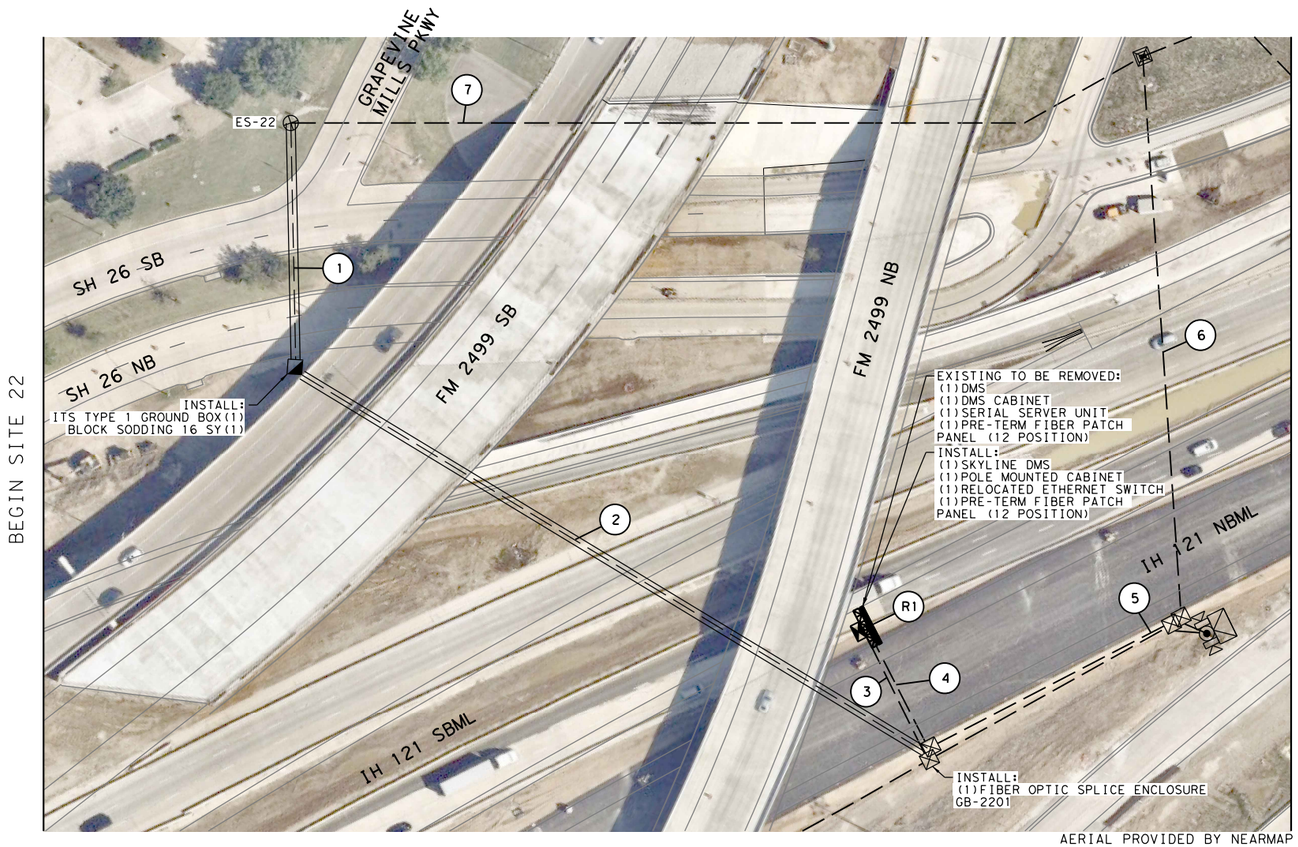
SITE #21
SH 114 EB AT S KIMBALL AVE

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	67
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_21.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS (RUNS 3 AND R1), SAFELY COIL IT AND STORE IT IN GB-2201, INSTALL NEW DMS AND CABINET, INSTALL PRE TERM FIBER PATCH PANEL (12 POSITION) INSIDE CABINET, AND PULL FIBER BACK THROUGH RUNS 3 AND R1 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
3. CONTRACTOR SHALL REUSE EXISTING HOLES IN DMS TOWER. IF HOLES NEED TO BE ENLARGED, CONTRACTOR SHALL DO THIS IN THE FIELD. THIS WILL BE SUBSIDIARY TO ITEM 6028.
4. SEE SHEET 16 FOR CONSTRUCTION NOTES.



AERIAL PROVIDED BY NEARMAP

0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

SLACK SUMMARY	
ID	FO CBL (12 SMF) ++++
GB-2201	100
DMS-CABINET	25
TOTAL	125

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 80) (2") (BORE) Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 80) (2") (BORE) LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 8) BARE (TRACE) Qty	ELEC CONDR (NO. 8) BARE (TRACE) LF	ELEC CONDR (NO. 2/0) BARE Qty	ELEC CONDR (NO. 2/0) BARE LF	ELEC CONDR (NO. 2/0) INSULATED Qty	ELEC CONDR (NO. 2/0) INSULATED LF	DMS CAT5E CABLE + Qty	DMS CAT5E CABLE + LF	FO CBL (12 SMF) (PIGTAIL) ++++ Qty	FO CBL (12 SMF) (PIGTAIL) ++++ LF	REMOVALS: 12 SM FO CBL Qty	12 SM FO CBL LF	DMS ELECTRICAL CIRCUIT Qty	DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	I	1	170	I			1	170	3	510									165	1
2	I	1	495	I			1	495	3	1485									490	2
3	E	1		I	1	105							1	105	1	105			100	3
4	E	1		I			1	100	3	300							1	100	95	4
5	E	1		I													1	190	185	5
6	E	1		I													1	380	375	6
7	E	1		I													1	580	575	7
R1	I			I	1	10	1	55	3	165	1	55	1	10	1	10			50	R1
TOTAL			665			115		820		2460		55		115		115		1250		

RUN STATUS = E - EXISTING; I - INSTALL; A - ABANDON; R - RELOCATE

EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	665
620	6007	ELEC CONDR (NO.8) BARE	LF	115
620	6021	ELEC CONDR (NO.2/0) BARE	LF	820
620	6022	ELEC CONDR (NO.2/0) INSULATED	LF	2460
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6103	REMOVE FIBER OPTIC CABLE	LF	115
6027	6003	CONDUIT (PREPARE)	LF	1330
6027	6008	GROUND BOX (PREPARE)	EA	2
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	1250
6186	6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA	1
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	1
++++		12 FIBER PIGTAIL SM	LF	240
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1
++++		REMOVE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #22

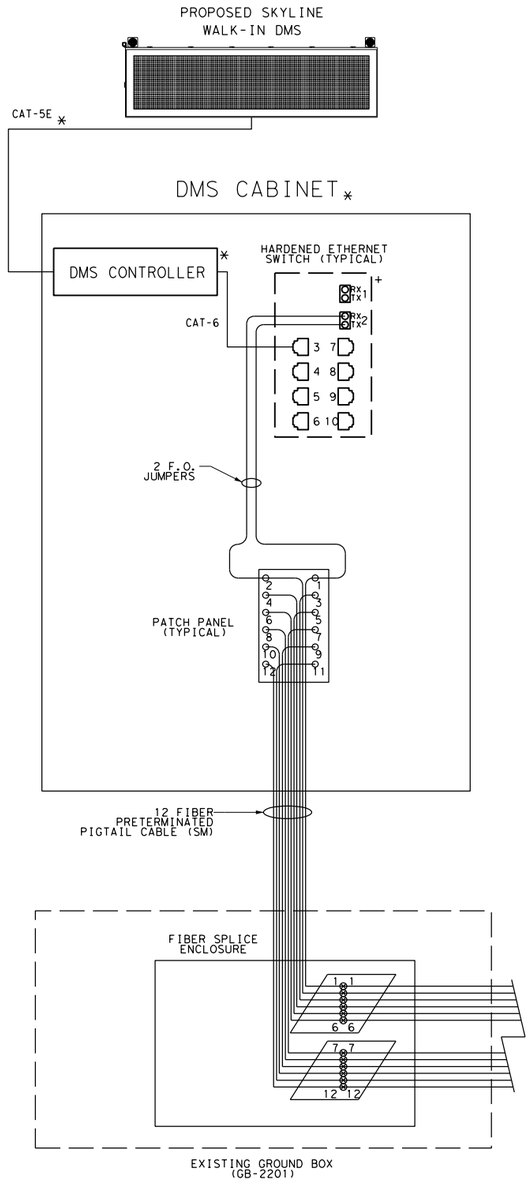
SH 121 SB AT BASS PRO DR

SHEET 1 OF 1

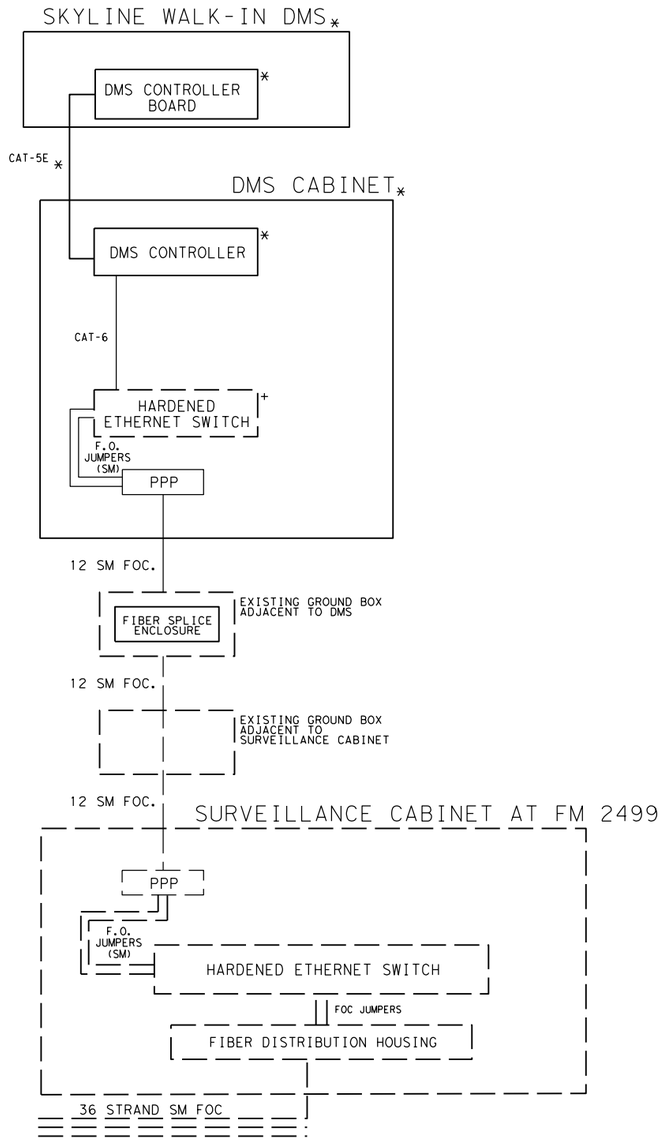
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS				
IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	
DL	CONTROL	SECTION	JOB	68
CHECK	0902	90	111	
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_22.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM

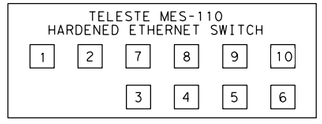


LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.



PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

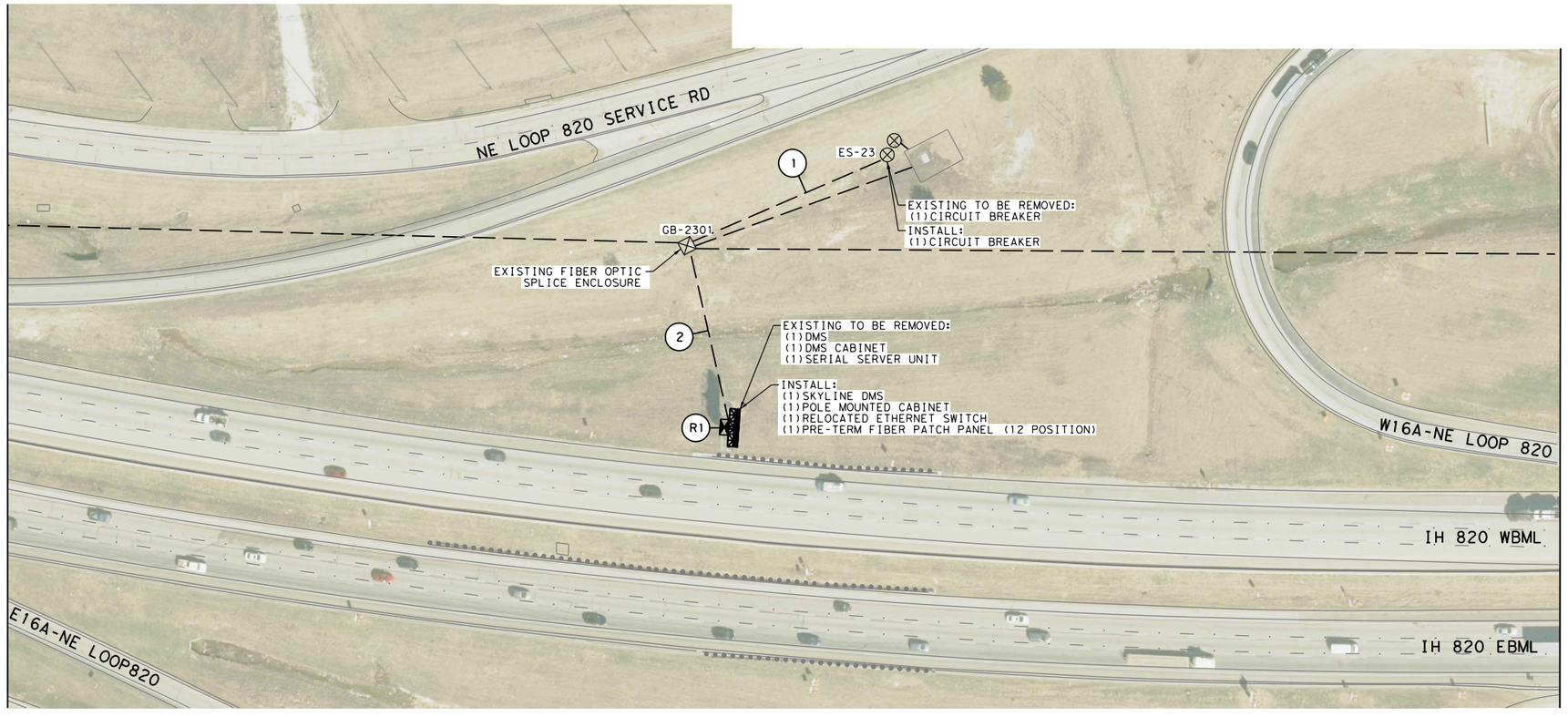
SITE #22
SH 121 SB AT BASS PRO DR

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	69
CHECK DL	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_22.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS CABINET (RUN 2 & R1), SAFELY COIL IT AND STORE IT IN GB-2301, INSTALL NEW DMS AND CABINET, INSTALL RELOCATED PATCH PANEL INSIDE CABINET, AND REINSTALL FIBER FROM GB-2301 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
3. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT
4. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
5. CONTRACTOR TO COVER SPACE LEFT IN SERVICE ENCLOSURE ONCE EXISTING CIRCUIT BREAKER IS REMOVED.
6. SEE SHEET 16 FOR CONSTRUCTION NOTES.



0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") LF	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 2) BARE Qty	CABLE LENGTH: ELEC CONDR (NO. 2) BARE LF	CABLE LENGTH: ELEC CONDR (NO. 8) BARE (TRACE) Qty	CABLE LENGTH: ELEC CONDR (NO. 8) BARE (TRACE) LF	CABLE LENGTH: ELEC CONDR (NO. 2) INSULATED Qty	CABLE LENGTH: ELEC CONDR (NO. 2) INSULATED LF	CABLE LENGTH: DMS CAT5E CABLE + Qty	CABLE LENGTH: DMS CAT5E CABLE + LF	RELOCATED: FO CBL (SMF) PIGTAIL (12 FIBER) Qty	RELOCATED: FO CBL (SMF) PIGTAIL (12 FIBER) LF	REMOVALS: DMS ELECTRICAL CIRCUIT Qty	REMOVALS: DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1				I	1	175			3	525					1	175	170	1
2	E			1		I	1	145	1	145	3	435			1	145	1	145	140	2
R1	I					I	1	55	1	10	3	165	1	55	1	55	1	55	50	R1
TOTAL								375		155		1125		55		200		375		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6007	ELEC CONDR (NO.8) BARE	LF	155
620	6015	ELEC CONDR (NO.2) BARE	LF	375
620	6016	ELEC CONDR (NO.2) INSULATED	LF	1125
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	200
6027	6003	CONDUIT (PREPARE)	LF	310
6027	6008	GROUND BOX (PREPARE)	EA	1
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	375
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
+		JUNCTION BOX (AS NEEDED)	EA	2
++++		RELOCATE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	1
11+		REMOVE SERIAL SERVER UNIT	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
11+ SUBSIDIARY TO ITEM 6331

2/23/2021
STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #23

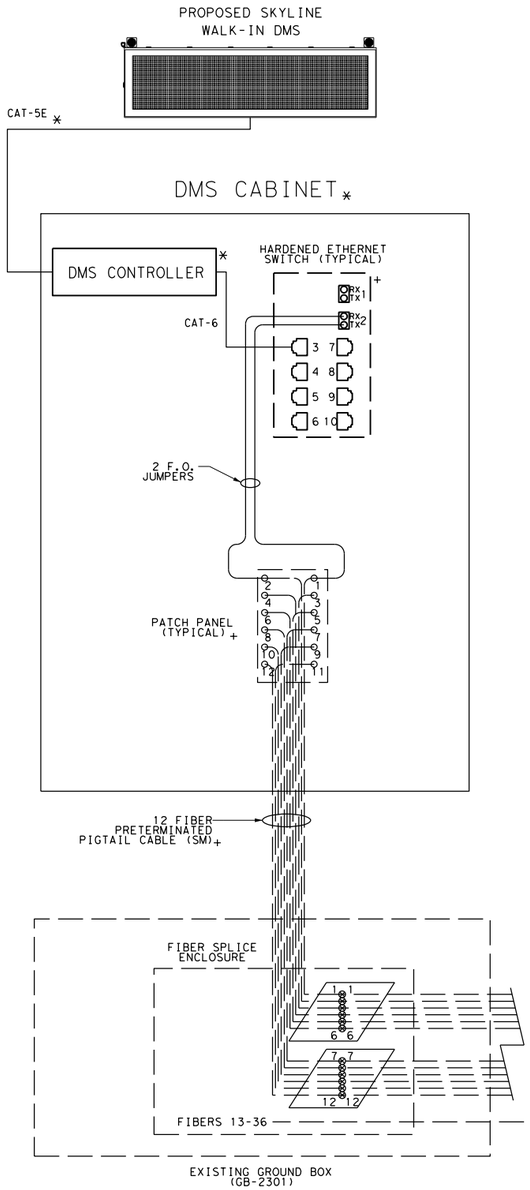
IH 820 WB AT MARK IV PARKWAY

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	70
CHECK DL	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_23.dgn
BY: Nate.Taylor

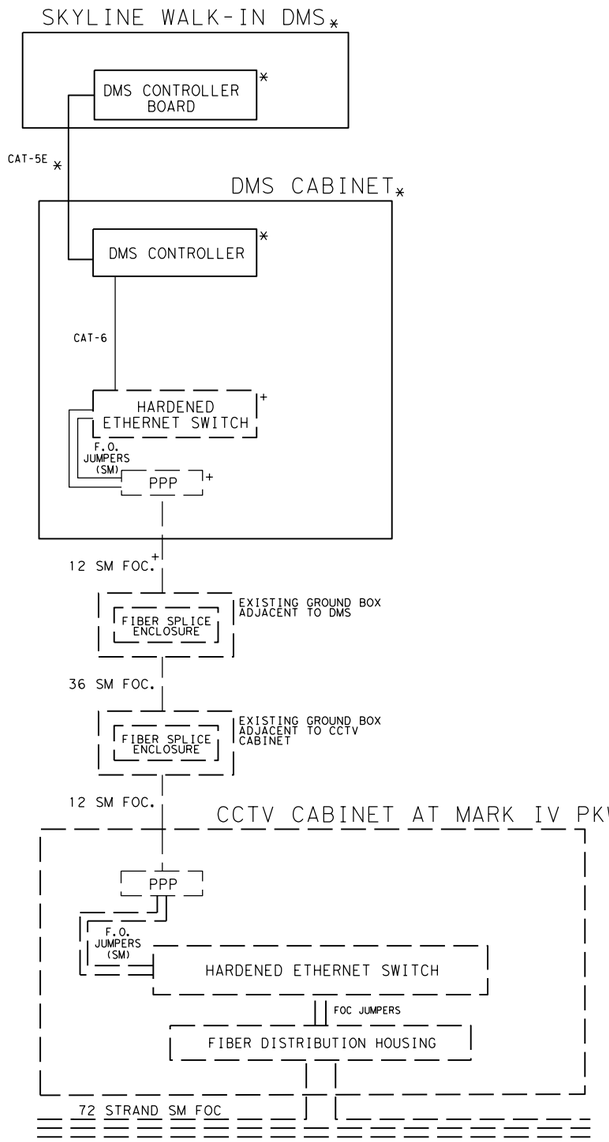
FIBER CABLING AND PATCH PANEL DETAIL



NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.

COMMUNICATION BLOCK DIAGRAM



TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. SERIAL SERVER UNIT (IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

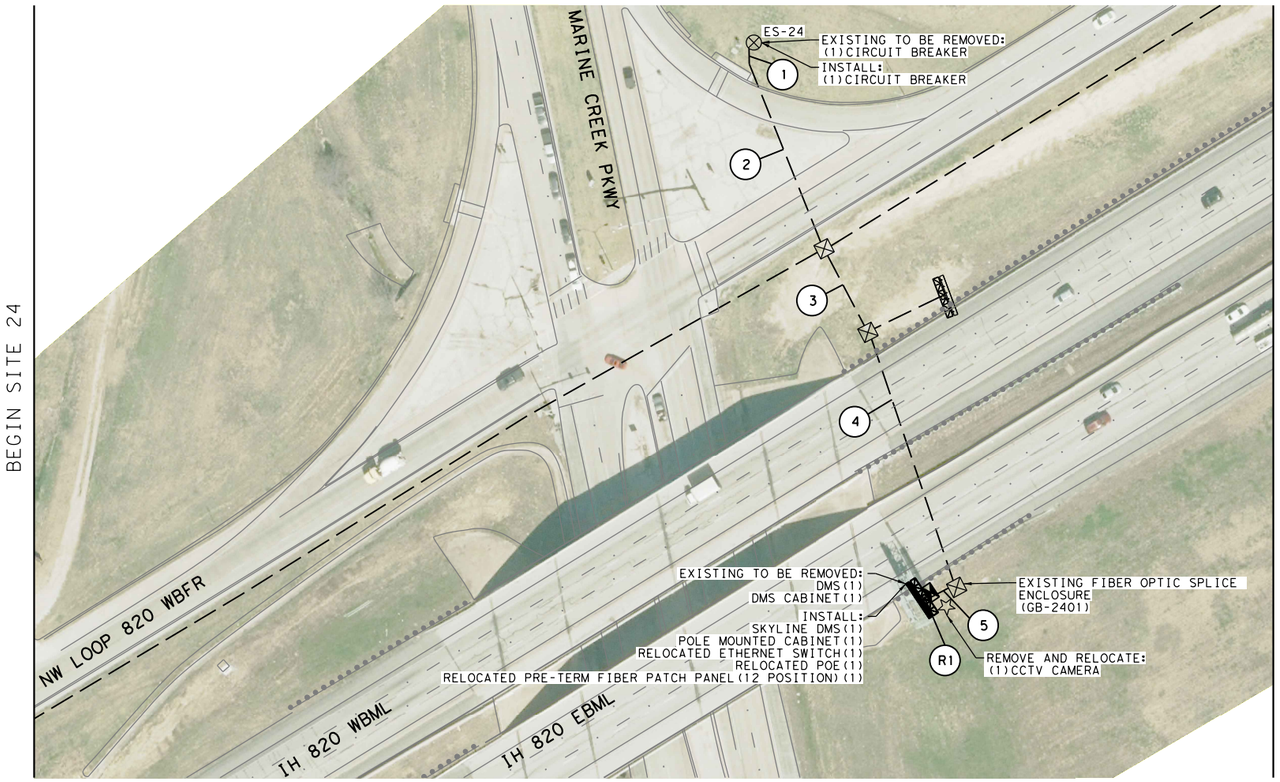
SITE #23
IH 20 WB AT S GREAT SW PKWY

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	71
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_23.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS CABINET (RUN 5 & R1), SAFELY COIL IT AND STORE IT IN GB-2401, INSTALL NEW DMS AND CABINET, INSTALL RELOCATED PATCH PANEL INSIDE CABINET, AND REINSTALL FIBER FROM GB-2401 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
3. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT
4. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
5. CONTRACTOR TO COVER SPACE LEFT IN SERVICE ENCLOSURE ONCE EXISTING CIRCUIT BREAKER IS REMOVED.
6. SEE SHEET 16 FOR CONSTRUCTION NOTES.



0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") LF	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 1) BARE Qty	CABLE LENGTH: ELEC CONDR (NO. 1) BARE LF	CABLE LENGTH: ELEC CONDR (NO. 8) BARE Qty	CABLE LENGTH: ELEC CONDR (NO. 8) BARE LF	CABLE LENGTH: ELEC CONDR (NO. 1) INSULATED Qty	CABLE LENGTH: ELEC CONDR (NO. 1) INSULATED LF	CABLE LENGTH: DMS CAT5E CABLE + Qty	CABLE LENGTH: DMS CAT5E CABLE + LF	CABLE LENGTH: CCTV ETHERNET CABLE CAT 6 6+ Qty	CABLE LENGTH: CCTV ETHERNET CABLE CAT 6 6+ LF	RELOCATED: FO CBL (SMF) PIGTAIL (12 FIBER) Qty	RELOCATED: FO CBL (SMF) PIGTAIL (12 FIBER) LF	REMOVALS: DMS EB ELECTRICAL CIRCUIT Qty	REMOVALS: DMS EB ELECTRICAL CIRCUIT LF	REMOVALS: CCTV CABLES 6+ Qty	REMOVALS: CCTV CABLES 6+ LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1				I	1	20			3	60							1	20			15	1
2	E			2		I	1	145			3	435							1	145			140	2
3	E			2		I	1	70			3	210							1	70			65	3
4	E			2		I	1	190			3	570							1	190			185	4
5	E			2		I	1	55	1	55	3	165					1	55	1	55			50	5
R1	I					I	1	55	1	10	3	165	1	55	1	55	1	55	1	55	1	55	50	R1
TOTAL								535		65		1605		55		55		110		535		55		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6007	ELEC CONDR (NO.8) BARE	LF	65
620	6017	ELEC CONDR (NO.1) BARE	LF	535
620	6018	ELEC CONDR (NO.1) INSULATED	LF	1605
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	110
6010	6012	RELOCATE CCTV FIELD EQUIPMENT	EA	1
6027	6003	CONDUIT (PREPARE)	LF	455
6027	6008	GROUND BOX (PREPARE)	EA	4
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	535
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
6+		CCTV CAT6 CABLE	LF	55
+		JUNCTION BOX (AS NEEDED)	EA	2
++++		RELOCATE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	1
11+		REMOVE SERIAL SERVER UNIT	EA	1
6+		RELOCATE POE	EA	1
6+		REMOVE CCTV CABLES	LF	55

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
6+ SUBSIDIARY TO ITEM 6010
11+ SUBSIDIARY TO ITEM 6331

2/23/2021
STATE OF TEXAS
DHRUVA LAHON
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DMS REPLACEMENT

DMS LAYOUT
SITE #24

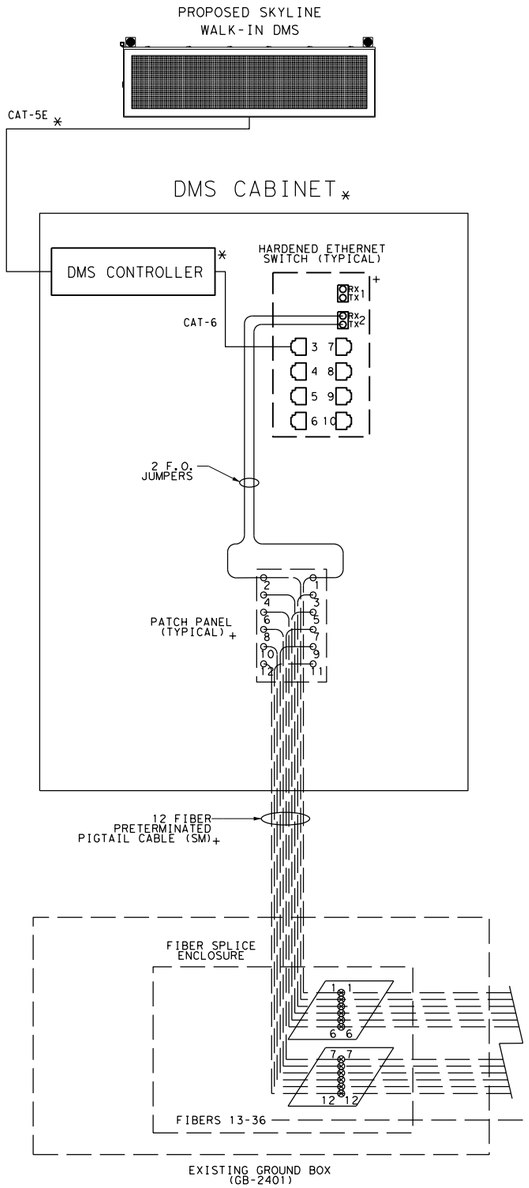
IH 820 EB AT MARINE CREEK PKWY

SHEET 1 OF 1

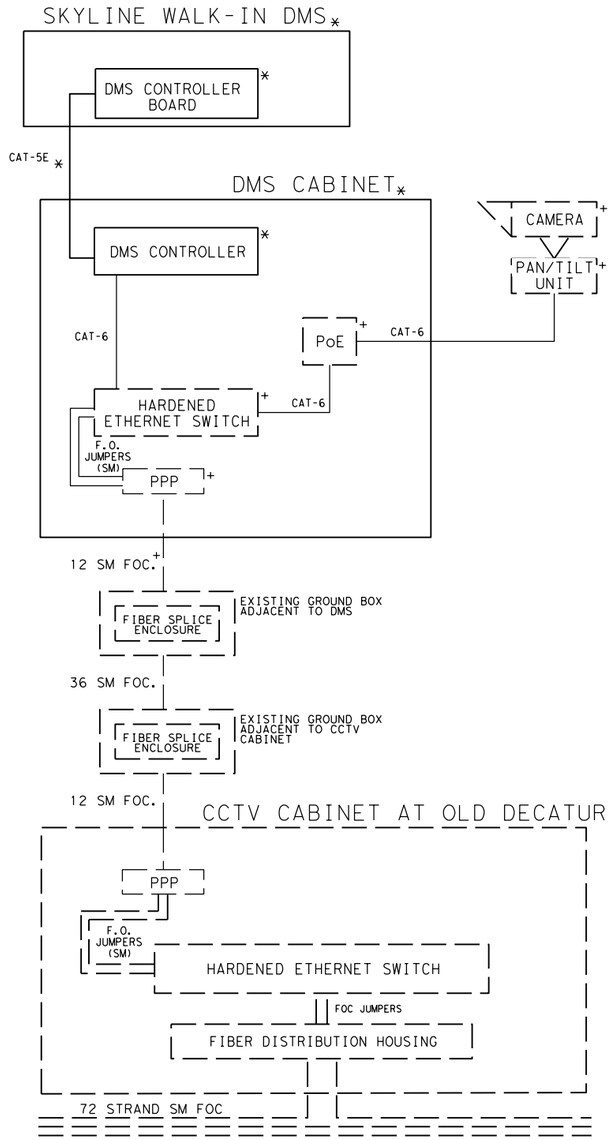
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	72
CHECK DL	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_24.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM



LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT-5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
11. AS PART OF THE REMOVAL AND REMOUNTING OF THE EXISTING CCTV CAMERA, CONTRACTOR TO RELOCATE CCTV FIELD EQUIPMENT HARDWARE FROM EXISTING DMS HOUSING TO NEW DMS CABINET. CONTRACTOR TO PROVIDE NEW CCTV CONTROL CABLING, AND CAT 6 EHTERNET FROM DMS CABINET TO CCTV CAMERA. THIS WORK AND MATERIALS WILL BE SUBSIDIARY TO ITEM 6010, RELOCATE CCTV FIELD EQUIPMENT.

TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

SITE #24
IH 820 EB AT MARINE CREEK PKWY

SHEET 1 OF 1

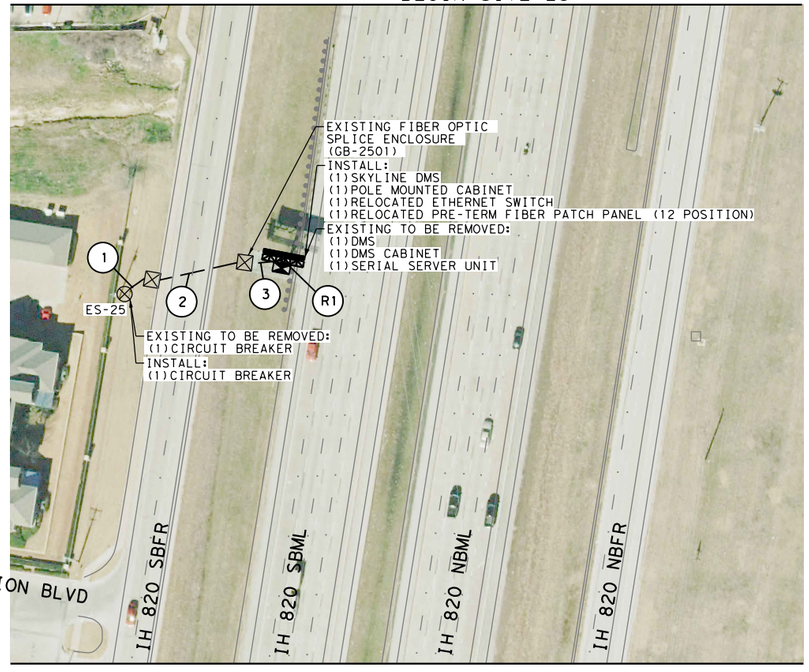
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	
CHECK DL	CONTROL	SECTION	JOB	73
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_24.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER PIGTAIL FROM DMS (RUNS 3 AND R1), SAFELY COIL IT AND STORE IT IN GB-2501, INSTALL NEW DMS AND CABINET, INSTALL RELOCATED PATCH PANEL INSIDE CABINET, AND PULL FIBER PIGTAIL BACK INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR TO INSTALL SKYLINE WALK-IN DMS PROVIDED BY TXDOT.
3. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
4. CONTRACTOR TO COVER SPACE LEFT IN SERVICE ENCLOSURE ONCE EXISTING CIRCUIT BREAKER IS REMOVED.
5. SEE SHEET 16 FOR CONSTRUCTION NOTES.

0 50 100
SCALE: 1"=100'

BEGIN SITE 25



END SITE 25

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDT (PVC) (SCHD 40) (2") LF	CONDT (PVC) (SCHD 40) (3") Qty	CONDT (PVC) (SCHD 40) (3") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 4) BARE Qty	ELEC CONDR (NO. 4) BARE LF	ELEC CONDR (NO. 8) BARE (TRACE) Qty	ELEC CONDR (NO. 8) BARE (TRACE) LF	ELEC CONDR (NO. 4) INSULATED Qty	ELEC CONDR (NO. 4) INSULATED LF	DMS CAT5E CABLE + Qty	DMS CAT5E CABLE + LF	RELOCATED REMOVALS: FO CBL (SMF) PIGTAIL (12 FIBER) Qty	FO CBL (SMF) PIGTAIL (12 FIBER) LF	DMS ELECTRICAL CIRCUIT Qty	DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1				I	1	20			3	60					1	20	15	1
2	E			2		I	1	80			3	240					1	80	75	2
3	E			2		I	1	30	1	30	3	90			1	30	1	30	25	3
R1	I					I	1	55	1	10	3	165	1	55	1	55	1	55	50	R1
TOTAL								185		40		555		55		85		185		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6007	ELEC CONDR (NO. 8) BARE	LF	40
620	6011	ELEC CONDR (NO. 4) BARE	LF	185
620	6012	ELEC CONDR (NO. 4) INSULATED	LF	555
6000	6099	REPLACE CIRCUIT BREAKER	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	85
6027	6003	CONDUIT (PREPARE)	LF	115
6027	6008	GROUND BOX (PREPARE)	EA	2
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	185
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		INSTALL DMS CAT 5E CABLE	LF	55
+		JUNCTION BOX (AS NEEDED)	EA	2
++++		RELOCATE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	1
11+		REMOVE SERIAL SERVER UNIT	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
11+ SUBSIDIARY TO ITEM 6331

2/23/2021
STATE OF TEXAS
DHRUVA LAHON
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Texas Department of Transportation

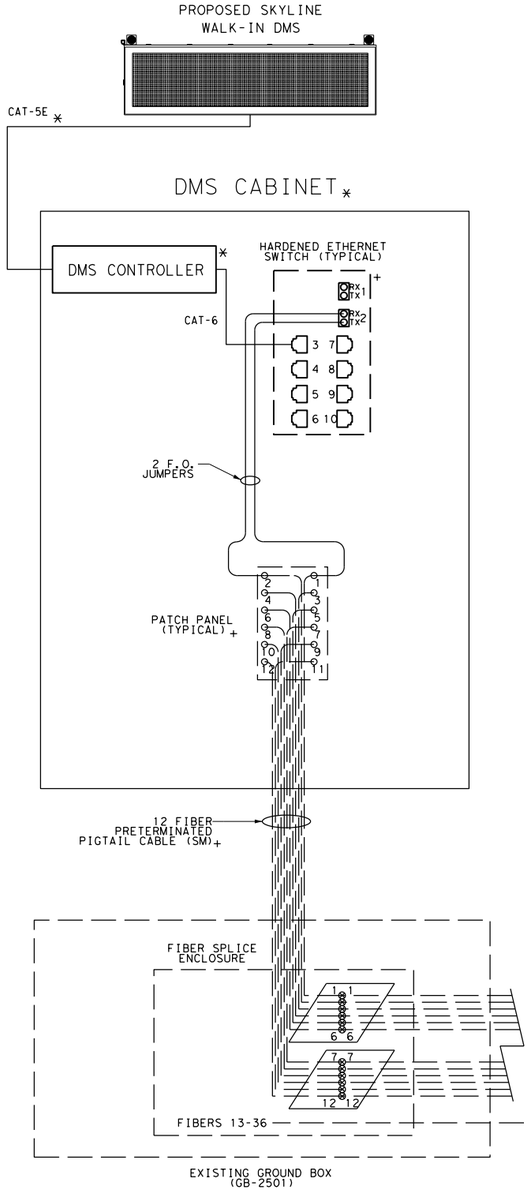
DMS REPLACEMENT
DMS LAYOUT
SITE #25
IH 820 SB AT WESTPOINT BLVD

SHEET 1 OF 1

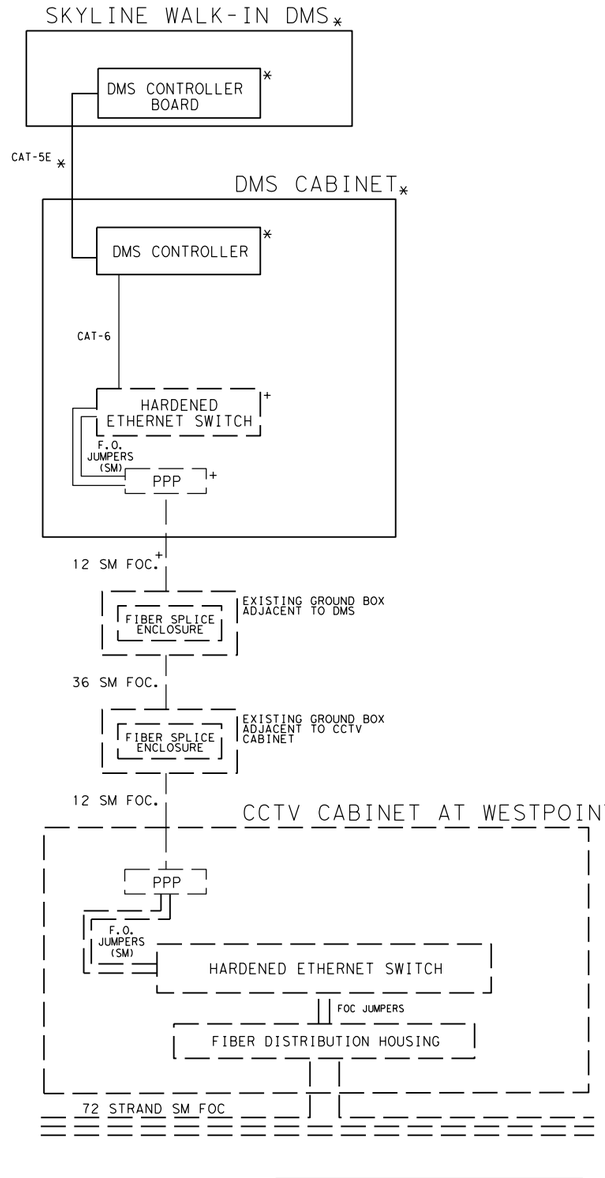
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	74
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_25.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM



LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS. THIS EXCLUDES CAT 5E BETWEEN DMS AND DMS CONTROLLER.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.

TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

2/23/2021

STATE OF TEXAS
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Texas Department of Transportation

DMS REPLACEMENT

SCHEMATIC FIBER OPTIC CONNECTIONS

SITE #25
IH 820 SB AT WESTPOINT BLVD

SHEET 1 OF 1

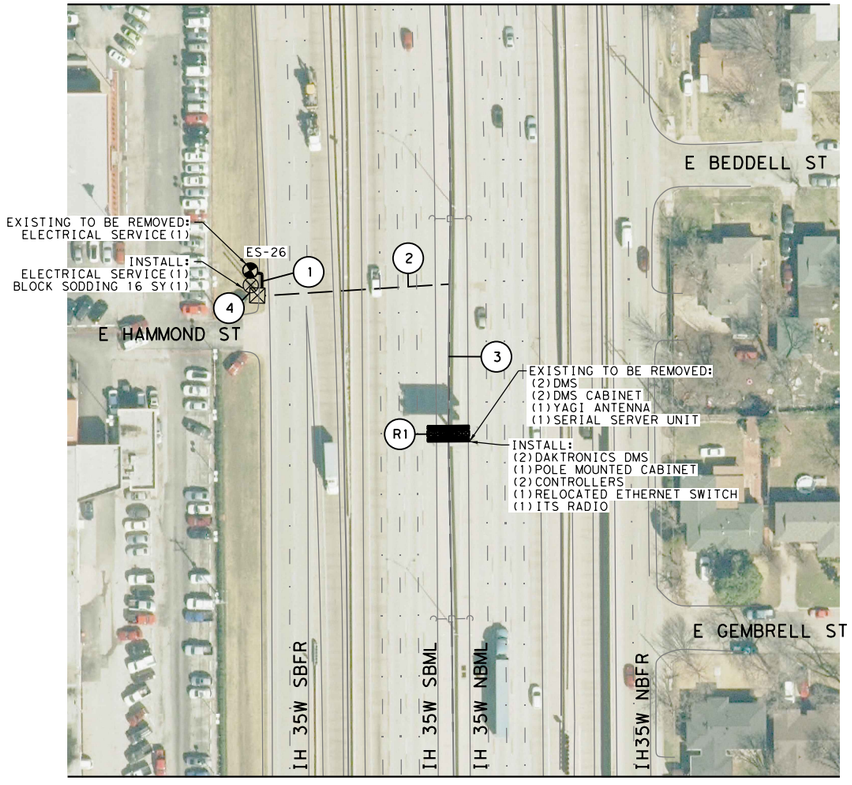
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	75
CHECK DL	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_25.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT.
2. ELECTRIC COMPANY TO INSTALL CONDUCTOR WIRES FROM THE EXISTING SERVICE POLE TO THE PROPOSED SERVICE POLE. CONTRACTOR TO COORDINATE WITH THE POWER COMPANY.
3. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
4. SEE SHEET 16 FOR CONSTRUCTION NOTES, ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE, AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH RADIO.

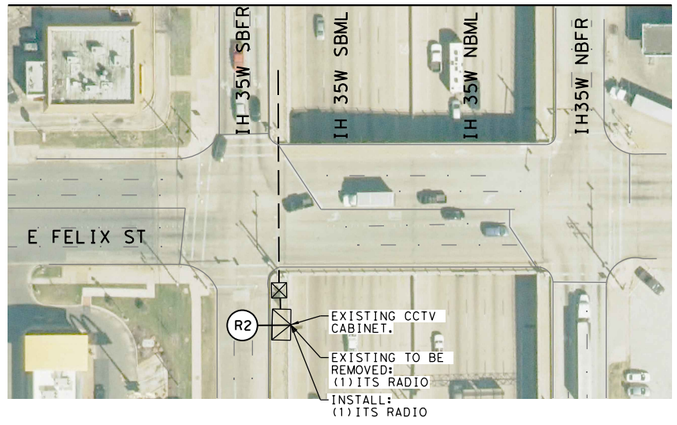
0 50 100
SCALE: 1"=100'

BEGIN SITE 26



MATCHLINE A (THIS SHEET)

APPROX. 1,000 FT. SOUTH OF MATCHLINE A
MATCHLINE A (THIS SHEET)



LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 1) BARE Qty	ELEC CONDR (NO. 1) BARE LF	ELEC CONDR (NO. 4) BARE Qty	ELEC CONDR (NO. 4) BARE LF	ELEC CONDR (NO. 1) INSULATED Qty	ELEC CONDR (NO. 1) INSULATED LF	ELEC CONDR (NO. 4) INSULATED Qty	ELEC CONDR (NO. 4) INSULATED LF	DMS 6 MM FO JUMPER + Qty	DMS 6 MM FO JUMPER + LF	RADIO ETHERNET CABLE CAT 6 + Qty	RADIO ETHERNET CABLE CAT 6 + LF	REMOVALS: CONDUIT 10+ Qty	CONDUIT 10+ LF	DMS ELECTRICAL CIRCUIT Qty	DMS ELECTRICAL CIRCUIT LF	ANTENNA/RADIO CABLES ++ Qty	ANTENNA/RADIO CABLES ++ LF	TOTAL LENGTH OF RUN	RUN NO
1	I	1	25	I	1	25			3	75									1	25			20	1
2	E	1		I	1	135			3	405									1	135			130	2
3	E	1		I	1	105			3	315									1	105			100	3
4	R	1		R													1	5	1	10			5	4
R1	I			I	1	10	2	110	3	30	6	330	2	110	1	55			1	55	1	55	50	R1
R2	I			I											1	15					1	15	10	R2
TOTAL			25			275		110		825		330		110		70		5		330		70		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY		
162	6002	BLOCK SODDING	SY	16		
618	6023	CONDT (PVC) (SCH 40) (2")	LF	25		
620	6011	ELEC CONDR (NO.4) BARE	LF	110		
620	6012	ELEC CONDR (NO.4) INSULATED	LF	330		
620	6017	ELEC CONDR (NO.1) BARE	LF	275		
620	6018	ELEC CONDR (NO.1) INSULATED	LF	825		
628	6002	REMOVE ELECTRICAL SERVICES	EA	1		
628	6250	ELC SRV TY D 120/240 100(NS)SS(N)SP(O)	EA	1		
6027	6003	CONDUIT (PREPARE)	LF	230		
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	2		
6062	6018	ITS RADIO (SNGL)(5 GHZ)-I-U	EA	2		
6062	6043	REMOVE ITS RADIO	EA	2		
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	330		
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	2		
+		RELOCATE ETHERNET SWITCH	EA	1		
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	110		
++		REMOVE YAGI ANTENNA CABLES	LF	70		
10+		REMOVE CONDUIT	LF	5		
++		RADIO ETHERNET CABLE CAT 6	LF	70	+	SUBSIDIARY TO ITEM 6028
7+		CONCRETE GROUT CONDUIT OPENING	EA	1	++	SUBSIDIARY TO ITEM 6062
+		JUNCTION BOX (AS NEEDED)	EA	3	7+	SUBSIDIARY TO ITEM 6027
11+		REMOVE SERIAL SERVER UNIT	EA	1	10+	SUBSIDIARY TO ITEM 618
++		REMOVE YAGI ANTENNA	EA	1	11+	SUBSIDIARY TO ITEM 6331

2/23/2021
STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #26

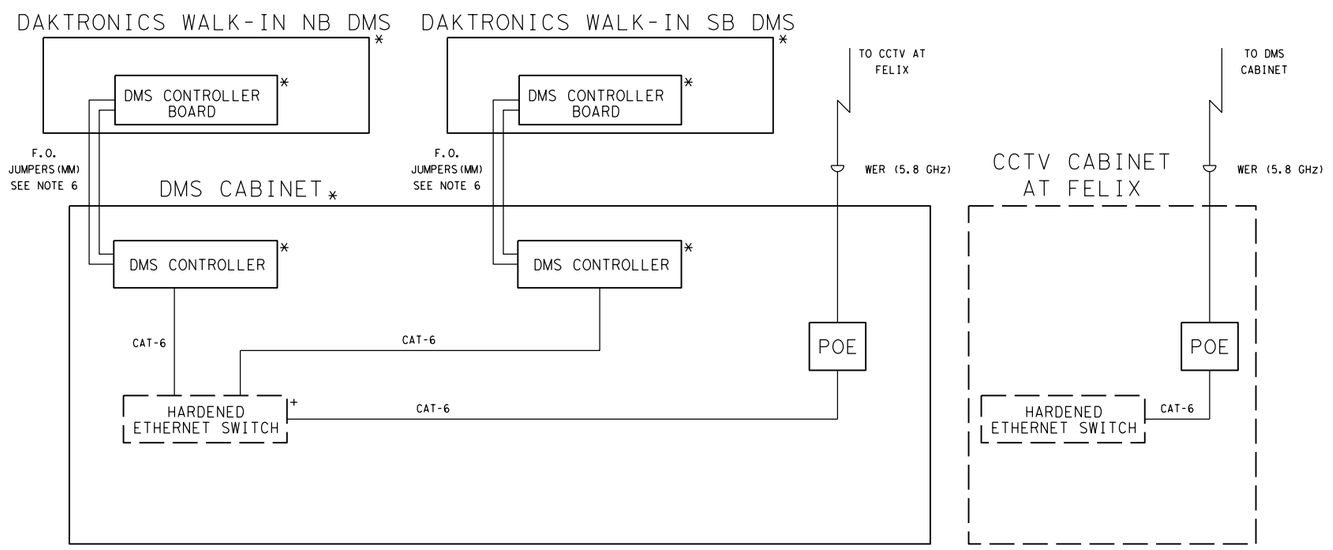
IH 35W NB & SB AT EAST FELIX ST

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT				
CHECK	TEXAS	FTW	TARRANT	
DL	CONTROL	SECTION	JOB	76
CHECK				
DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_26.dgn
BY: Nate.Taylor

COMMUNICATION BLOCK DIAGRAM



LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
EWS	ETHERNET WORKGROUP SWITCH
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
3. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
4. CONTRACTOR TO PROVIDE NEW CAT 6 EHTERNET CABLE FROM DMS CABINET TO ITS RADIO. THIS WILL BE SUBSIDIARY TO ITEM 6062, RELOCATE ITS RADIO.
5. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
6. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.

TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. DMS CONTROLLER
5. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
7. SERIAL SERVER UNIT (IF PRESENT)
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV PoE (IF PRESENT)

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

SCHEMATIC
WIRELESS CONNECTIONS

SITE #26
IH 35W NB & SB AT EAST FELIX ST

SHEET 1 OF 1

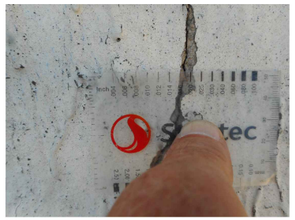
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	77
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276\FTW_DMS_FOC_26.dgn
BY: Nate.Taylor

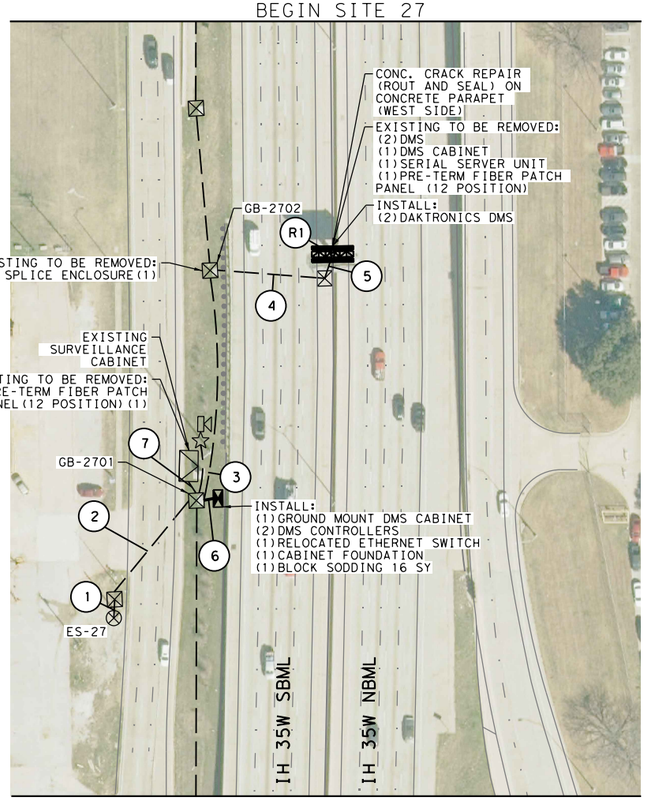
NOTES:
1. CONTRACTOR SHALL REPAINT CONCRETE REPAIRS TO MATCH EXISTING/ORIGINAL PAINT COLOR OF THE STRUCTURES. THIS IS SUBSIDIARY TO THE CONCRETE REPAIR ITEM.
2. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT
3. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
4. SEE SHEET 16 FOR CONSTRUCTION NOTES.

0 50 100
SCALE: 1"=100'

LOCATIONS OF CONC. CRACK REPAIR (ROUT AND SEAL) ON CONCRETE PARAPET (WEST SIDE):



BEGIN SITE 27



END SITE 27

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDT (PVC) (SCHD 40) (2") LF	CONDT (PVC) (SCHD 40) (3") Qty	CONDT (PVC) (SCHD 40) (3") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 1) BARE Qty	ELEC CONDR (NO. 1) BARE LF	ELEC CONDR (NO. 2) BARE Qty	ELEC CONDR (NO. 2) BARE LF	ELEC CONDR (NO. 1) INSULATED Qty	ELEC CONDR (NO. 1) INSULATED LF	ELEC CONDR (NO. 2) INSULATED Qty	ELEC CONDR (NO. 2) INSULATED LF	DMS 6 MM FO JUMPER + Qty	DMS 6 MM FO JUMPER + LF	ETHERNET CABLE CAT 6 + Qty	ETHERNET CABLE CAT 6 + LF	REMOVALS: FO CBL (SMF) PIGTAIL (12 FIBER) Qty	FO CBL (SMF) PIGTAIL (12 FIBER) LF	36 SMF FO CABLE Qty	36 SMF FO CABLE LF	DMS ELECTRICAL CIRCUIT Qty	DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1				I	1	15			3	45											1	15	10	1
2	E			2		I	1	95			3	285											1	95	90	2
3	E			2		I			1	165			6	990	2	330					1	165	1	165	160	3
4	E			2		I			1	90			6	540	2	180			1	90			1	90	85	4
5	E					I			2	40			6	120	2	40			1	20			1	20	15	5
6	I	1	30	2	60	I	1	30	1	30	3	90	6	180	2	60	1	30							25	6
7	E			2		I											1	25	1	25					20	7
R1	E					I			2	110			6	330	2	110			1	55			1	55	50	R1
TOTAL			30		60			140		435		420		2160		720		55		190		165		440		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS. PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY		
162	6002	BLOCK SODDING	SY	16		
618	6023	CONDT (PVC) (SCH 40) (2")	LF	30		
618	6029	CONDT (PVC) (SCH 40) (3")	LF	60		
620	6015	ELEC CONDR (NO.2) BARE	LF	435		
620	6016	ELEC CONDR (NO.2) INSULATED	LF	2160		
620	6017	ELEC CONDR (NO.1) BARE	LF	140		
620	6018	ELEC CONDR (NO.1) INSULATED	LF	420		
780	6004	CNC CRCK REPAR(DISCRETE)(ROUT AND SEAL)	LF	3		
6000	6099	REPLACE CIRCUIT BREAKER	EA	1		
6007	6103	REMOVE FIBER OPTIC CABLE	LF	355		
6027	6003	CONDUIT (PREPARE)	LF	430		
6027	6008	GROUND BOX (PREPARE)	EA	4		
6028	6002	INSTALL DMS (FOUNDATION MTD CABINET)	EA	2		
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	440		
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	2		
+		RELOCATE ETHERNET SWITCH	EA	1		
+		ETHERNET CABLE CAT 6	LF	55		
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	720		
8+		PAINT REPAIRED STRUCTURE	EA	1		
+		JUNCTION BOX (AS NEEDED)	EA	3	+	SUBSIDIARY TO ITEM 6028
11+		REMOVE SERIAL SERVER UNIT	EA	1	++++	SUBSIDIARY TO ITEM 6007
++++		REMOVE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	2	8+	SUBSIDIARY TO ITEM 780
+		DMS CABINET FOUNDATION	EA	1	11+	SUBSIDIARY TO ITEM 6331

2/23/2021

STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #27

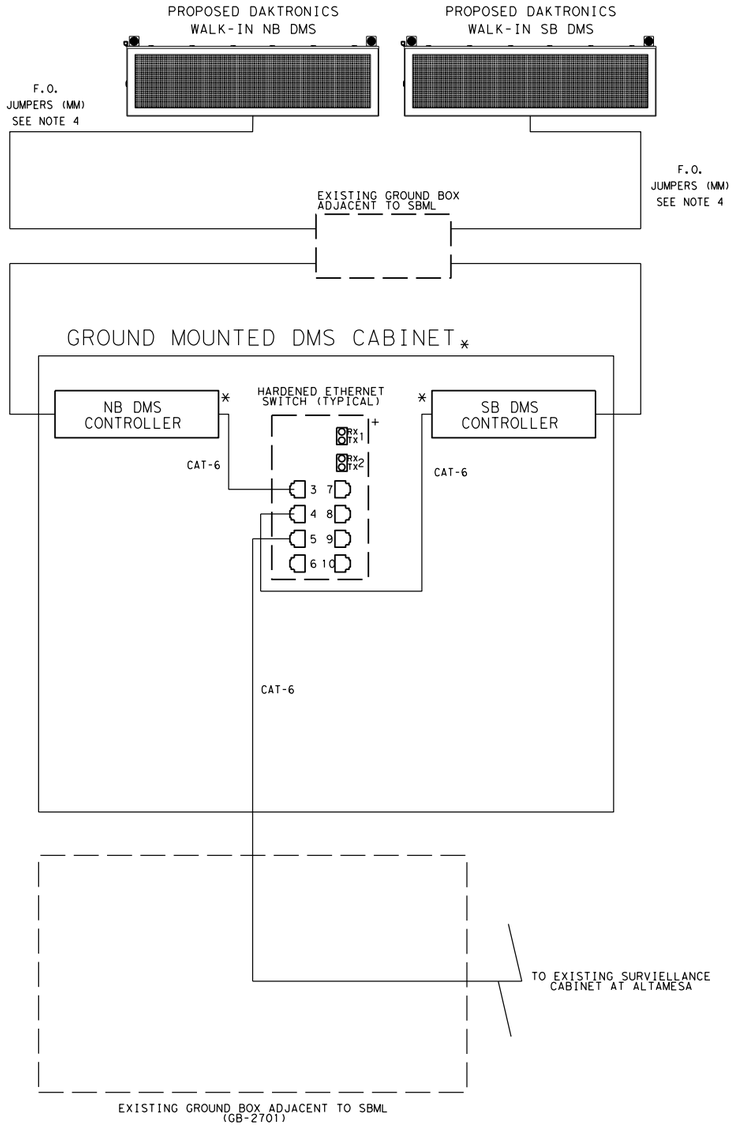
IH 35W NB & SB AT ALTAMESA BLVD

SHEET 1 OF 1

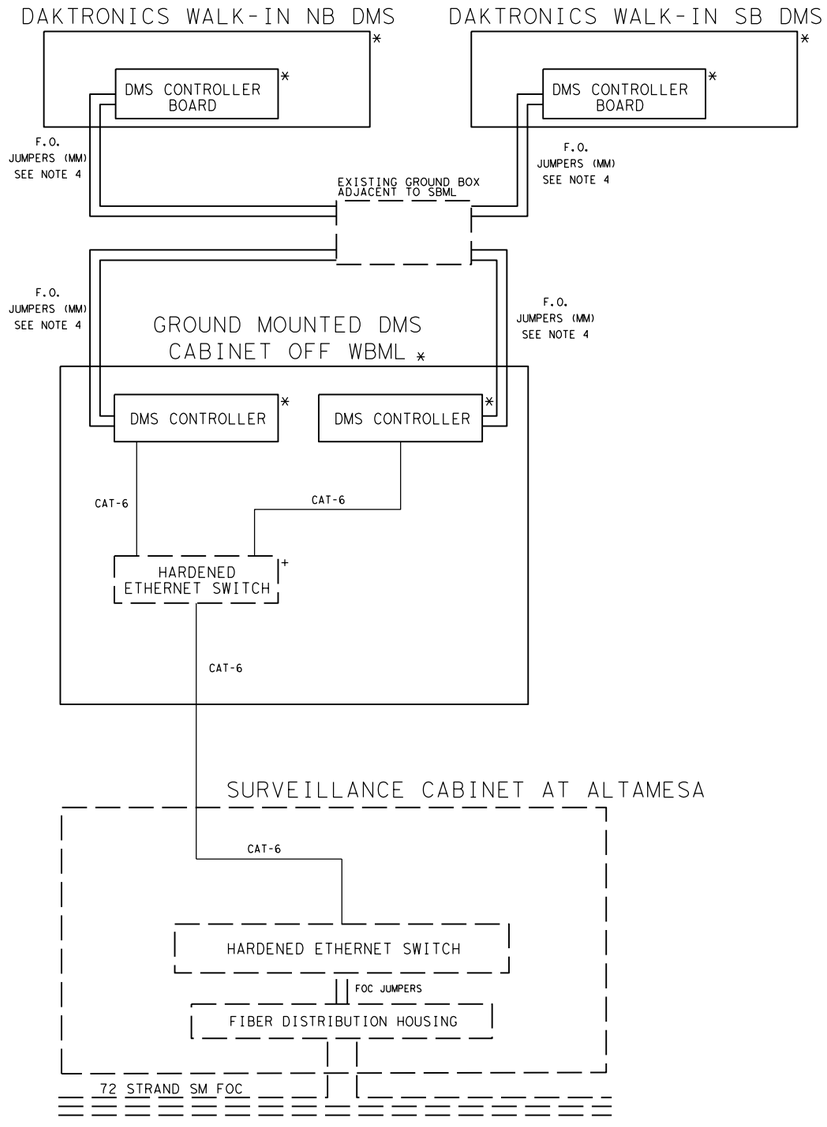
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	
CHECK DL	CONTROL	SECTION	JOB	78
CHECK DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_27.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM

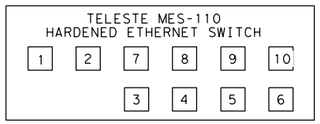


LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
EWS	ETHERNET WORKGROUP SWITCH
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
3. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
4. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
5. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
6. THE CONNECTOR SHALL BE AN ST CONNECTOR.
7. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
8. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
9. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
10. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
11. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.



PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. DMS CONTROLLER
5. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
7. SERIAL SERVER UNIT (IF PRESENT)
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV POE (IF PRESENT)

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
102185
LICENSED
PROFESSIONAL ENGINEER

Dhruva Lahon

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Tel. No. (972) 770-1300
Fax No. (972) 239-3820

DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

SITE #27
IH 35W NB & SB AT ALTAMESA BLVD

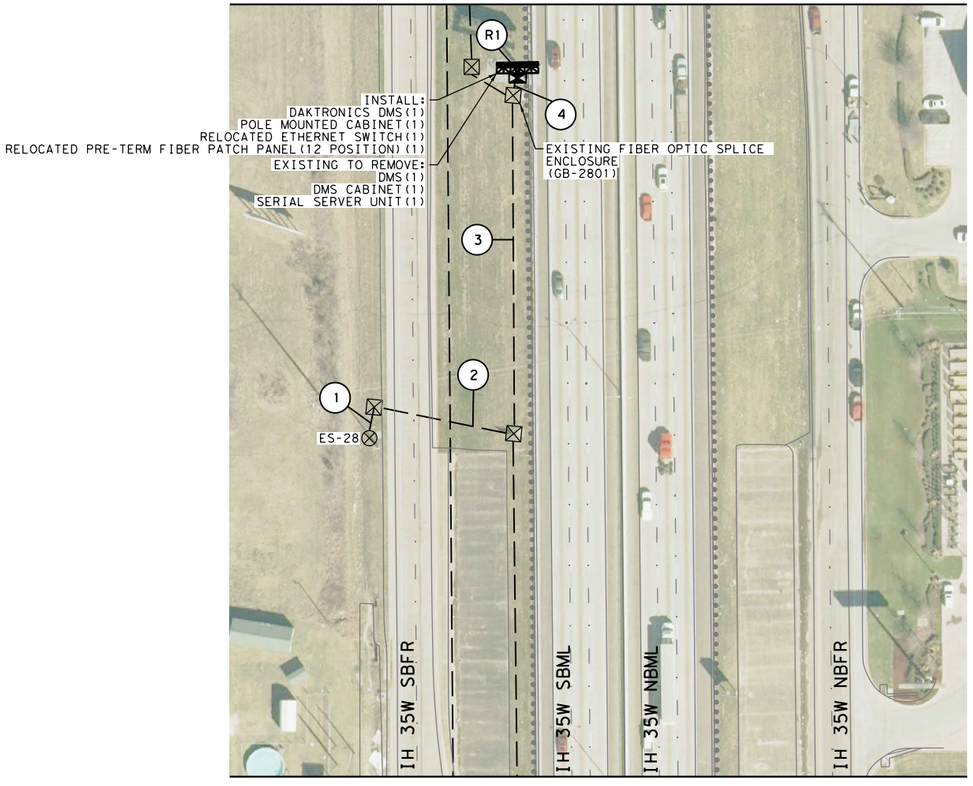
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	79
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms4276?\FTW_DMS_FOC_27.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR SHALL DISCONNECT EXISTING FIBER FROM DMS CABINET(RUNS 4 AND R1), SAFELY COIL IT AND STORE IT IN GB-2801, INSTALL NEW DMS AND CABINET, INSTALL RELOCATED PATCH PANEL INSIDE CABINET, AND PULL FIBER THROUGH RUNS 4 AND R1 INTO CABINET AND TERMINATE IT IN THE SAME POSITIONS AS PREVIOUSLY.
2. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING BACKBONE FIBER OPTIC CABLES. IF ANY OF THE BACKBONE FIBER OPTIC CABLES ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE THE FIBER OPTIC CABLE AT HIS OWN EXPENSE AS DIRECTED BY THE ENGINEER.
3. CONTRACTOR SHALL REUSE EXISTING HOLES IN DMS TOWER. IF HOLES NEED TO BE ENLARGED, CONTRACTOR SHALL DO THIS IN THE FIELD. THIS WILL BE SUBSIDIARY TO ITEM 6028.
4. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT
5. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
6. SEE SHEET 16 FOR CONSTRUCTION NOTES.

BEGIN SITE 28



END SITE 28

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") LF	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 2) BARE Qty	CABLE LENGTH: ELEC CONDR (NO. 2) BARE LF	CABLE LENGTH: ELEC CONDR (NO. 8) BARE (TRACE) Qty	CABLE LENGTH: ELEC CONDR (NO. 8) BARE (TRACE) LF	CABLE LENGTH: ELEC CONDR (NO. 2) INSULATED Qty	CABLE LENGTH: ELEC CONDR (NO. 2) INSULATED LF	CABLE LENGTH: DMS 6 MM FO JUMPER + Qty	CABLE LENGTH: DMS 6 MM FO JUMPER + LF	RELOCATED: FO CBL (SMF) PIGTAIL (12 FIBER) Qty	RELOCATED: FO CBL (SMF) PIGTAIL (12 FIBER) LF	REMOVALS: DMS ELECTRICAL CIRCUIT Qty	REMOVALS: DMS ELECTRICAL CIRCUIT LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1				I	1	15			3	45					1	15	10	1
2	E			2		I	1	105			3	315					1	105	100	2
3	E			2		I	1	230			3	690					1	230	225	3
4	E			2		I	1	25	1	25	3	75			1	25	1	25	20	4
R1	I					I	1	55	1	10	3	165	1	55	1	55	1	55	50	R1
TOTAL								430		35		1290		55		80		430		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS. PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
620	6007	ELEC CONDR (NO.8) BARE	LF	35
620	6015	ELEC CONDR (NO.2) BARE	LF	430
620	6016	ELEC CONDR (NO.2) INSULATED	LF	1290
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6102	RELOCATE FIBER OPTIC CABLE	LF	80
6027	6003	CONDUIT (PREPARE)	LF	355
6027	6008	GROUND BOX (PREPARE)	EA	3
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	430
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	55
+		JUNCTION BOX (AS NEEDED)	EA	2
++++		RELOCATE PRETERM FIBER PATCH PANEL (12 POSITION)	EA	1
11+		REMOVE SERIAL SERVER UNIT	EA	1

\+ SUBSIDIARY TO ITEM 6028
++++ SUBSIDIARY TO ITEM 6007
11+ SUBSIDIARY TO ITEM 6331

0 50 100
SCALE: 1"=100'

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

2/23/2021
STATE OF TEXAS
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DMS REPLACEMENT

DMS LAYOUT
SITE #28

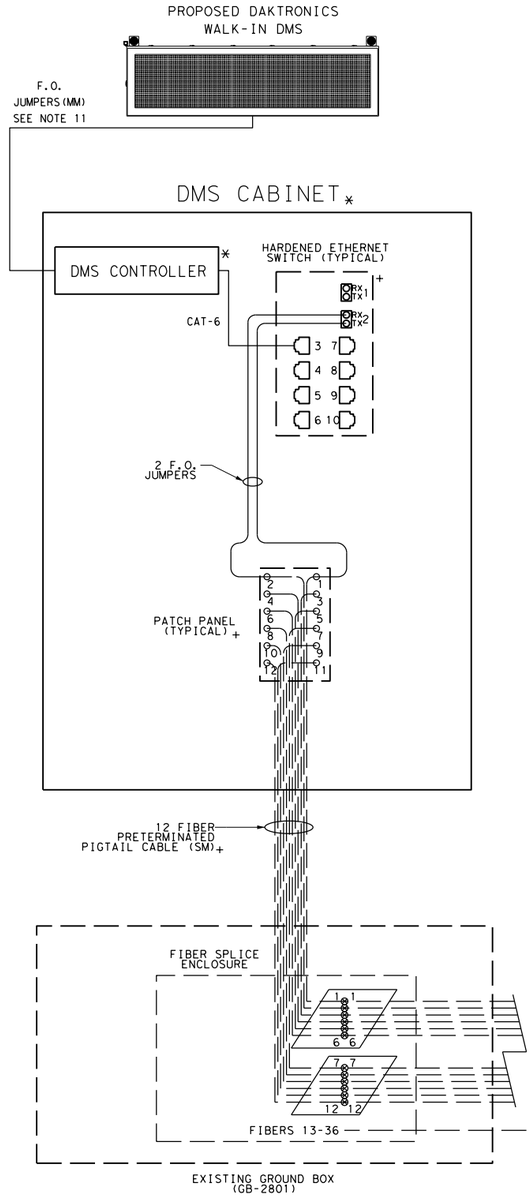
IH 35W SB AT RISINGER ROAD EAST

SHEET 1 OF 1

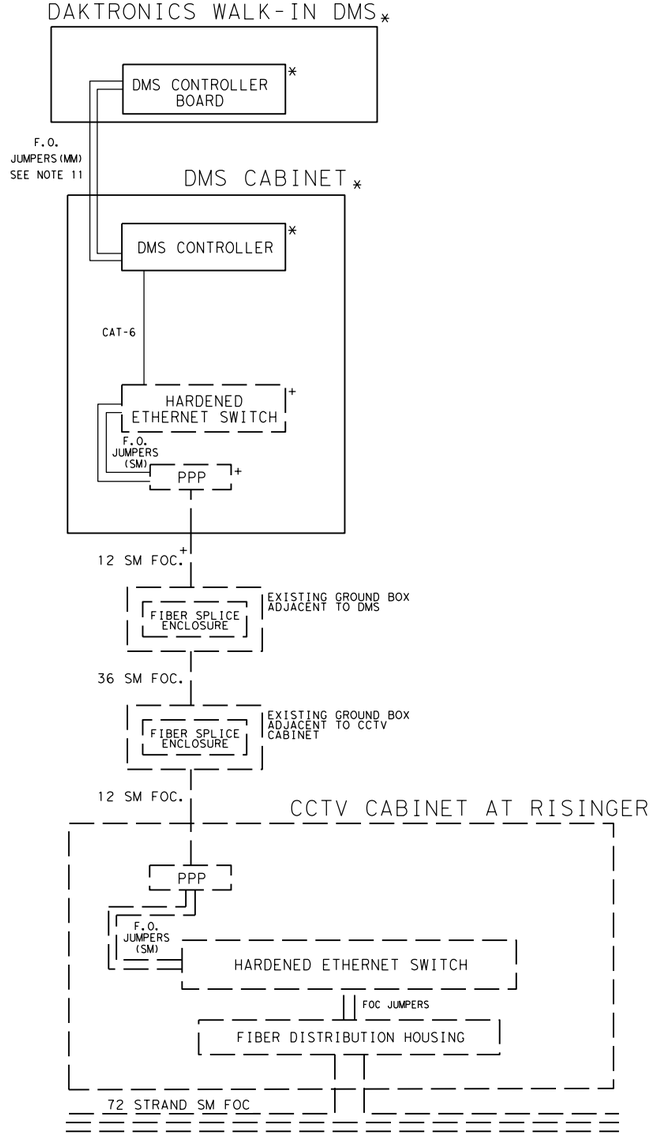
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS IR/NT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	80
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_28.dgn
BY: Nate.Taylor

FIBER CABLING AND PATCH PANEL DETAIL



COMMUNICATION BLOCK DIAGRAM

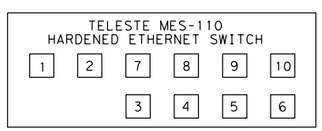


LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
11. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.



PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. SERIAL SERVER UNIT (IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV POE (IF PRESENT)

2/23/2021

STATE OF TEXAS
DHRUVA LAHON
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DMS REPLACEMENT

SCHEMATIC
FIBER OPTIC CONNECTIONS

SITE #28
IH 35W SB AT RISINGER ROAD EAST

SHEET 1 OF 1

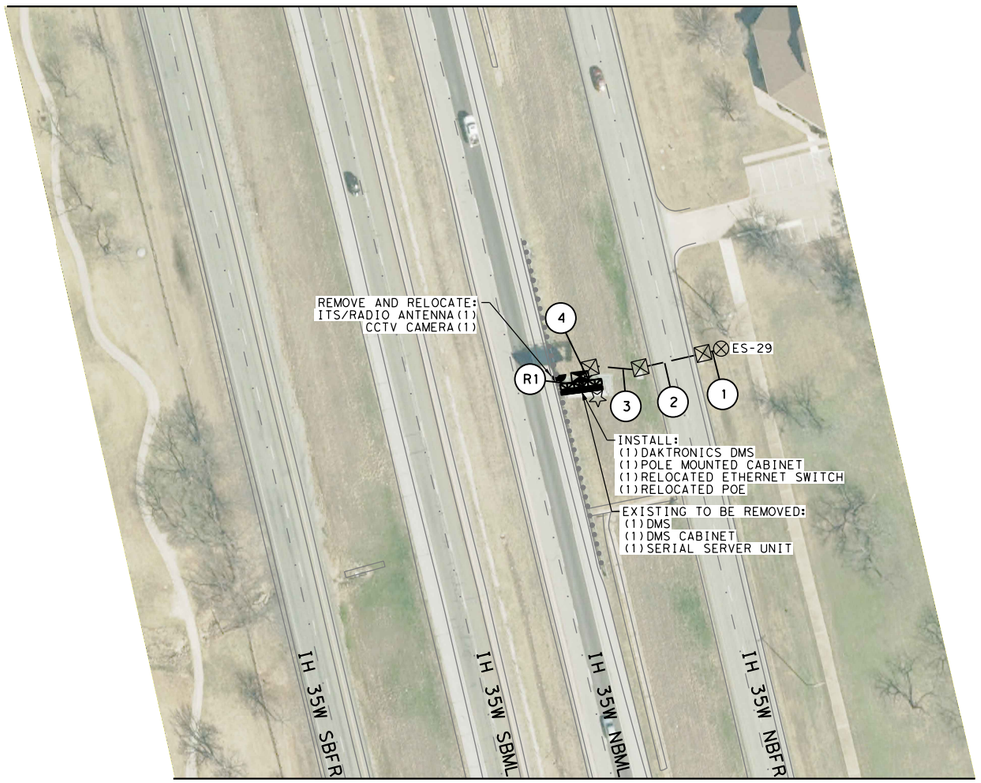
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS				
CL	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK				
DL	TEXAS	FTW	TARRANT	
	CONTROL	SECTION	JOB	81
CHECK				
DJB	0902	90	111	

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_28.dgn
BY: Nate.Taylor

NOTES:
1. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT.
2. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
3. SEE SHEET 16 FOR CONSTRUCTION NOTES AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH RADIO.

0 50 100
SCALE: 1"=100'

BEGIN SITE 29



END SITE 29

LEGEND

- PROP CONDUIT
- PROP CONDUIT (BORE)
- PROP TYPE 1 ITS GROUND BOX
- PROP TYPE 2 ITS GROUND BOX
- PROP TYPE D GROUND BOX
- PROP SERVICE POLE
- PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
- PROP DYNAMIC MESSAGE SIGN WITH CABINET
- EXISTING CONDUIT
- EXISTING CCTV INSTALLATION
- EXISTING RADAR VEHICLE SENSING DEVICE
- EXISTING GROUND BOX
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
- EXISTING SERVICE POLE
- EXISTING DYNAMIC MESSAGE SIGN
- EXISTING SURVEILLANCE CABINET
- EXISTING SPREAD SPECTRUM WIRELESS RADIO
- EXISTING SPREAD SPECTRUM ANTENNA

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (2") LF	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") Qty	CONDUIT LENGTH: CONDT (PVC) (SCHD 40) (3") LF	CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 4) BARE Qty	ELEC CONDR (NO. 4) BARE LF	ELEC CONDR (NO. 4) INSULATED Qty	ELEC CONDR (NO. 4) INSULATED LF	DMS 6 MM FO JUMPER + Qty	DMS 6 MM FO JUMPER + LF	CCTV ETHERNET CABLE CAT 6 6+ Qty	CCTV ETHERNET CABLE CAT 6 6+ LF	RADIO ETHERNET CABLE CAT 6 ++ Qty	RADIO ETHERNET CABLE CAT 6 ++ LF	REMOVALS: DMS ELECTRICAL CIRCUIT Qty	DMS ELECTRICAL CIRCUIT LF	ANTENA/RADIO CABLES ++ Qty	ANTENA/RADIO CABLES ++ LF	CCTV CABLES 6+ Qty	CCTV CABLES 6+ LF	TOTAL LENGTH OF RUN	RUN NO
1	E	1				I	1	15	3	45							1	15					10	1
2	E			2		I	1	50	3	150							1	50					45	2
3	E			2		I	1	45	3	135							1	45					40	3
4	E			2		I	1	20	3	60							1	20					15	4
R1	I					I	1	55	3	165	1	55	1	55	1	55	1	55	1	55	1	55	50	R1
TOTAL								185		555		55		55		55		185		55		55		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	QUANTITY
620	6011	ELEC CONDR (NO.4) BARE	185
620	6012	ELEC CONDR (NO.4) INSULATED	555
6010	6012	RELOCATE CCTV FIELD EQUIPMENT	1
6027	6003	CONDUIT (PREPARE)	110
6027	6008	GROUND BOX (PREPARE)	3
6028	6001	INSTALL DMS (POLE MTD CABINET)	1
6062	6042	RELOCATE ITS RADIO	1
6163	6002	REMOVE EXISTING CABLES (POWER)	185
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	1
+		RELOCATE ETHERNET SWITCH	1
+		6 STND FACTORY TERMINATED MM FO JUMPER	55
++		REMOVE YAGI ANTENNA CABLES	55
++		RADIO ETHERNET CABLE CAT 6	55
6+		CCTV CAT6 CABLE	55
+		JUNCTION BOX (AS NEEDED)	2
11+		REMOVE SERIAL SERVER UNIT	1
6+		RELOCATE POE	2
6+		REMOVE CCTV CABLES	55

\+ SUBSIDIARY TO ITEM 6028
++ SUBSIDIARY TO ITEM 6062
6+ SUBSIDIARY TO ITEM 6010
11+ SUBSIDIARY TO ITEM 6331

2/23/2021
STATE OF TEXAS
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Texas Department of Transportation

DMS REPLACEMENT

DMS LAYOUT
SITE #29

IH 35W NB AT E HIDDEN CREEK PKWY

SHEET 1 OF 1

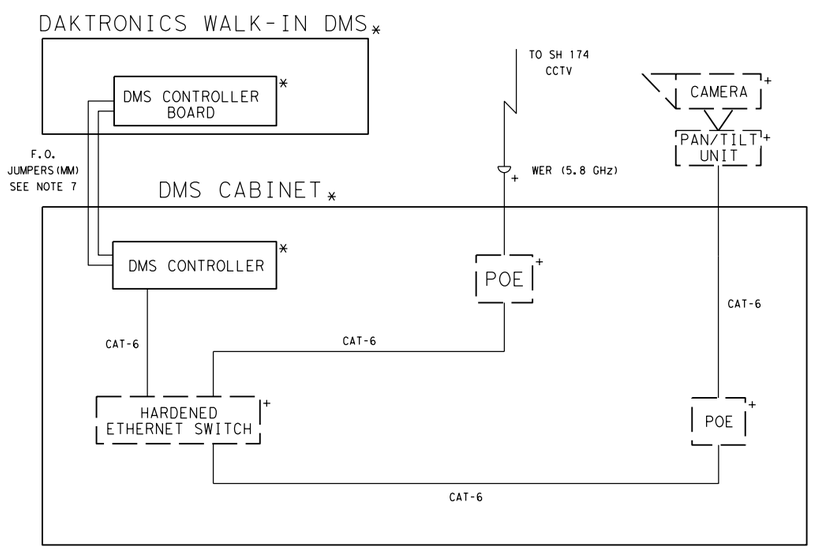
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	82
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_SHT_29.dgn
BY: Nate.Taylor

LEGEND

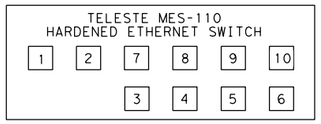
———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

COMMUNICATION BLOCK DIAGRAM



NOTES:

1. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
3. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
4. AS PART OF THE REMOVAL AND REMOUNTING OF THE EXISTING ITS RADIO, CONTRACTOR TO RELOCATE RADIO POWER SUPPLY AND ASSOCIATED HARDWARE FROM EXISTING DMS HOUSING TO NEW DMS CABINET. THIS WORK WILL BE SUBSIDIARY TO ITEM 6062, RELOCATE ITS RADIO. CONTRACTOR TO PROVIDE NEW CAT 6 EHTERNET CABLE FROM DMS CABINET TO ITS RADIO. THIS WILL BE SUBSIDIARY TO ITEM 6062, RELOCATE ITS RADIO.
5. AS PART OF THE REMOVAL AND REMOUNTING OF THE EXISTING CCTV CAMERA, CONTRACTOR TO RELOCATE CCTV FIELD EQUIPMENT HARDWARE FROM EXISTING DMS HOUSING TO NEW DMS CABINET. CONTRACTOR TO PROVIDE NEW CCTV CONTROL CABLING, AND CAT 6 EHTERNET FROM DMS CABINET TO CCTV CAMERA. THIS WORK AND MATERIALS WILL BE SUBSIDIARY TO ITEM 6010, RELOCATE CCTV FIELD EQUIPMENT.
6. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
7. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.



PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK(IF PRESENT)
6. SERIAL SERVER UNIT(IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK(IF PRESENT)
10. CCTV PoE (IF PRESENT)

2/23/2021

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Texas Department of Transportation

DMS REPLACEMENT

SCHEMATIC WIRELESS CONNECTIONS

SITE #29
IH 35W NB AT E HIDDEN CREEK PKWY

SHEET 1 OF 1

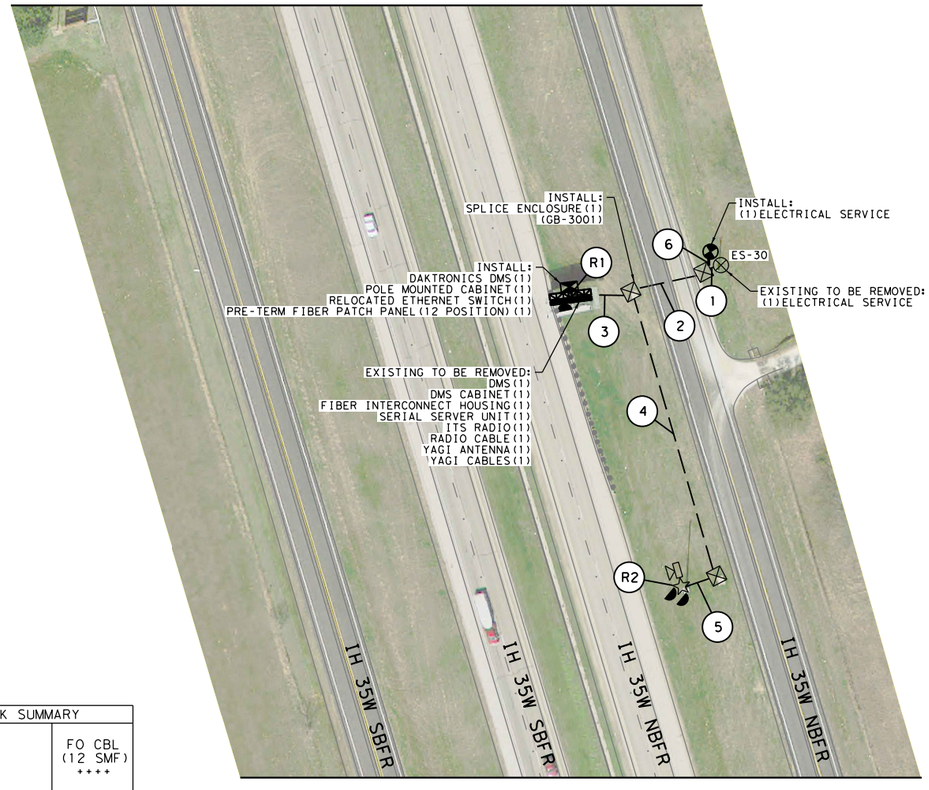
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	83
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kha\pwprod\nate.taylor\dms42767\FTW_DMS_FOC_29.dgn
BY: Nate.Taylor

NOTES:
1. A 4 HOUR WINDOW FOR SWITCHOVER WILL BE ALLOWED TO RECONNECT POWER FOR THE SURVEILLANCE CABINET AND CCTV CABINET. THE CONTRACTOR SHALL PROVIDE 72 HOUR ADVANCE NOTICE AND RECEIVE APPROVAL FOR THE OUTAGE FROM THE TXDOT SIGNAL SHOP AT 817-370-3664
2. CONTRACTOR SHALL REMOVE EXISTING FIBER FROM DMS CABINET (RUN 3 AND R1), COIL EXISTING FIBER IN GROUND BOX 3001, INSTALL NEW DMS AND CABINET, INSTALL NEW PRE-TERMINATED PATCH PANEL INSIDE CABINET, AND INSTALL 12 SM PIGTAIL THROUGH RUNS 3 AND R1 INTO CABINET AND CONNECTED IT TO THE PRE-TERMINATED PATCH PANEL.
3. CONTRACTOR TO INSTALL DAKTRONICS WALK-IN DMS PROVIDED BY TXDOT
4. SERIAL SERVER UNIT TO BE REMOVED AND RETURNED TO TXDOT. THIS SHALL BE SUBSIDIARY TO ITEM 6331.
5. SEE SHEET 16 FOR CONSTRUCTION NOTES, ADDITIONAL CONSTRUCTION NOTES - SITES WITH PROPOSED ELECTRICAL SERVICE, AND ADDITIONAL CONSTRUCTION NOTES - SITES WITH RADIO.

0 50 100
SCALE: 1"=100'

BEGIN SITE 30



END SITE 30

LEGEND

	PROP CONDUIT
	PROP CONDUIT (BORE)
	PROP TYPE 1 ITS GROUND BOX
	PROP TYPE 2 ITS GROUND BOX
	PROP TYPE D GROUND BOX
	PROP SERVICE POLE
T	PROP GROUND MOUNTED TRANSFORMER (POINT OF SERVICE)
	PROP DYNAMIC MESSAGE SIGN WITH CABINET
	EXISTING CONDUIT
	EXISTING CCTV INSTALLATION
	EXISTING RADAR VEHICLE SENSING DEVICE
	EXISTING GROUND BOX
	EXISTING TRAFFIC SIGNAL CONTROLLER CABINET
	EXISTING SERVICE POLE
	EXISTING DYNAMIC MESSAGE SIGN
	EXISTING SURVEILLANCE CABINET
	EXISTING SPREAD SPECTRUM WIRELESS RADIO
	EXISTING SPREAD SPECTRUM ANTENNA

SLACK SUMMARY	
ID	FO CBL (12 SMF) ++++
DMS-CABINET	25
GB-3001	100

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDT (PVC) (SCHD 40) (2")		CONDT (PVC) (SCHD 40) (3")		CABLE STATUS	CABLE LENGTH: ELEC CONDR (NO. 6) BARE		ELEC CONDR (NO. 6) INSULATED		DMS 6 MM FO JUMPER +		FO CBL (SMF) PIGTAIL (12 FIBER) ++++		REMOVALS: CONDUIT 10+		12 SM FO CBL		DMS, CCTV ELECTRICAL CIRCUIT		ANTENA/RADIO CABLES ++		TOTAL LENGTH OF RUN	RUN NO
		Qty	LF	Qty	LF		Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF	Qty	LF		
1	E	1				I									1	5			1	15			10	1
2	E			2		I	1	50	5	250									1	50			45	2
3	E			2		I	1	50	3	150			1	50			1	50	1	50			45	3
4	E			2		I	1	200	2	400									1	200			195	4
5	E			4		I	1	30	2	60									1	30			25	5
6	I	1	15			I	1	15	5	75													10	6
R1	I					I	1	55	3	165	1	55	1	55			1	10	1	55	1	55	50	R1
R2	I					I	1	10	2	20									1	10			5	R2
TOTAL			15					410		1120		55		105		5		60		410		55		

RUN STATUS = E - EXISTING; I - INSTALL; R - REMOVE;
EXISTING CONDUCTORS BETWEEN THE ELECTRICAL SERVICE AND THE DMS SHALL BE REPLACED WITH NEW CONDUCTORS.
PROPOSED CONDUCTORS CAN BE PULLED THROUGH THE SAME CONDUIT AS EXISTING CONDITIONS.

ESTIMATED QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	QUANTITY
162	6002	BLOCK SODDING	SY	16
618	6023	CONDT (PVC) (SCH 40) (2")	LF	15
620	6009	ELEC CONDR (NO.6) BARE	LF	410
620	6010	ELEC CONDR (NO.6) INSULATED	LF	1120
628	6002	REMOVE ELECTRICAL SERVICES	EA	1
628	6194	ELC SRV TY D 120/240 070(NS)SS(N)SP(O)	EA	1
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	12
6007	6103	REMOVE FIBER OPTIC CABLE	LF	60
6027	6003	CONDUIT (PREPARE)	LF	310
6027	6008	GROUND BOX (PREPARE)	EA	3
6028	6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6062	6043	REMOVE ITS RADIO	EA	1
6163	6002	REMOVE EXISTING CABLES (POWER)	LF	410
6331	6001	REMOVE DYNAMIC MESSAGE SIGN SYSTEM	EA	1
+		RELOCATE ETHERNET SWITCH	EA	1
11+		REMOVE FIBER OPTIC INTERCONNECT HOUSING	EA	1
+		6 STND FACTORY TERMINATED MM FO JUMPER	LF	55
++		REMOVE YAGI ANTENNA CABLES	LF	55
10+		REMOVE CONDUIT	LF	5
++++		12 FIBER PRETERMINATED PATCH PANEL	EA	1
++++		12 FIBER PIGTAIL SM	LF	230
7+		CONCRETE GROUT CONDUIT OPENING	EA	1
9+		POWER DISCONNECT & RECONNECT	EA	1
+		JUNCTION BOX (AS NEEDED)	EA	2
11+		REMOVE SERIAL SERVER UNIT	EA	1

\+ SUBSIDIARY TO ITEM 6028
++ SUBSIDIARY TO ITEM 6062
++++ SUBSIDIARY TO ITEM 6007
7+ SUBSIDIARY TO ITEM 6027
9+ SUBSIDIARY TO ITEM 620
10+ SUBSIDIARY TO ITEM 618
11+ SUBSIDIARY TO ITEM 6331

2/23/2021
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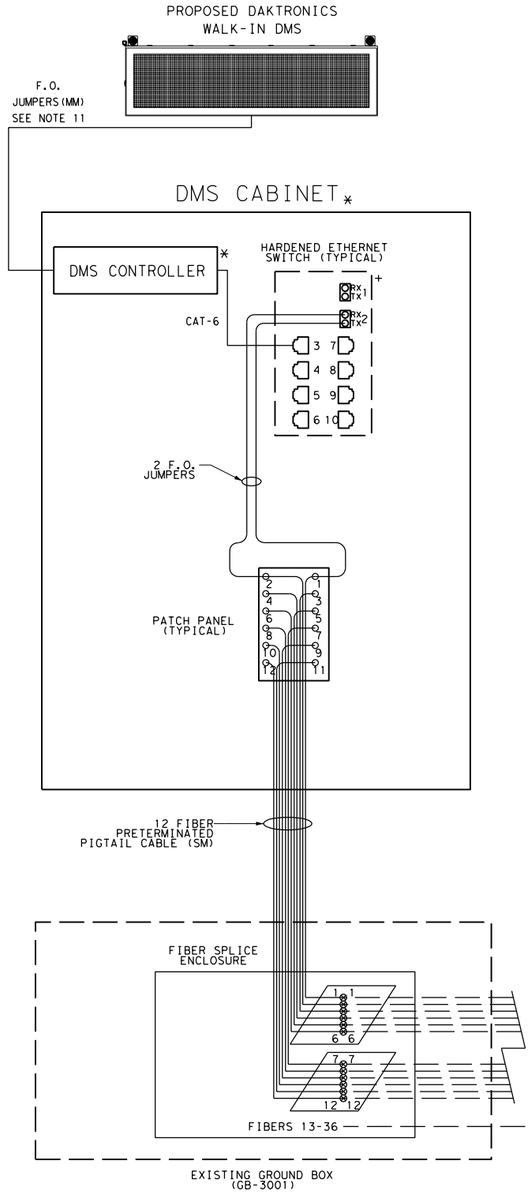
DMS REPLACEMENT
DMS LAYOUT
SITE #30
IH 35W NB AT COUNTY ROAD 204

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
IR/NT	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IR/NT	TEXAS	FTW	TARRANT	84
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwproad\nate.taylor\dms42767\FTW_DMS_SHT_30.dgn
BY: Nate.Taylor

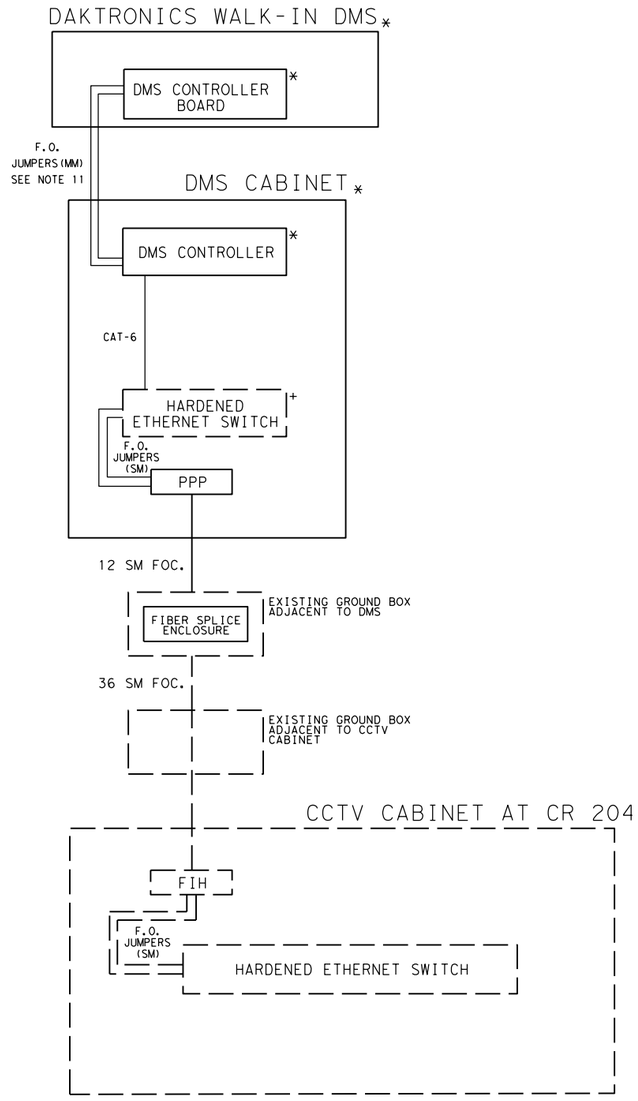
FIBER CABLING AND PATCH PANEL DETAIL



NOTES:

1. THE PRETERMINATED SIMPLEX CONNECTOR PATCH PANEL MODULE SHALL INCLUDE CONNECTOR SLEEVES AND DUST CAPS AND SHALL BE SUPPLIED FROM THE MANUFACTURER WITH SUFFICIENT CABLE LENGTH TO EXTEND FROM THE CABINET TO THE GROUND BOX PLUS 50 FEET COILED IN THE GROUND BOX.
2. THE CONNECTOR SHALL BE AN ST CONNECTOR.
3. THE SPLICE IS A FUSION SPLICE CONNECTING THE INCOMING AND OUTGOING FIBERS OF THE SAME COLOR EXCEPT AS INDICATED.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES.
5. THE TERMINATING AND SPLICING OF FIBER OPTIC CABLES SHALL BE AS DIRECTED BY THE ENGINEER.
6. APPROVED REMOVABLE DUST COVERS SHALL BE USED AT ALL EMPTY PATCH PANEL CONNECTORS.
7. EQUIPMENT NOT APART OF THIS PROJECT IS REMOVED FROM THE DIAGRAMS FOR CLARITY.
8. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EQUIPMENT PROVIDED. IF THE EQUIPMENT IS DAMAGED DURING TRANSPORTATION OR WORK, THE CONTRACTOR SHALL REPLACE THE EQUIPMENT AT THE CONTRACTORS EXPENSE. CONTACT THE TXDOT SIGNAL SHOP AT 817-370-3664 AT LEAST 72 HOURS IN ADVANCE TO COORDINATE PICK-UP AND INSTALLATION OF EQUIPMENT PROVIDED BY TXDOT.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLING AND CONNECTORS NEEDED TO COMPLETE A FULLY FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO CAT-6 CABLES FOR ETHERNET CONNECTION AND FIBER OPTIC JUMPERS.
10. CONTRACTOR SHALL RELOCATE EXISTING ETHERNET SWITCH FROM THE DMS TO THE NEW POLE MOUNTED DMS CABINET.
11. FOR DAKTRONICS SIGNS, USE 6 STRAND MULTIMODE FIBER OPTIC WITH FACTORY LC CONNECTORS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.

COMMUNICATION BLOCK DIAGRAM



TELESTE MES-110
HARDENED ETHERNET SWITCH

1	2	7	8	9	10
		3	4	5	6

PORT ASSIGNMENTS:

1. TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
2. BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
3. DMS CONTROLLER
4. SWITCH TO SWITCH COPPER CONNECTION OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
5. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
6. SERIAL SERVER UNIT (IF PRESENT)
7. FUTURE USE
8. ENCODER OR RADIO TO NEXT CABINET AWAY FROM SATELLITE/MAIN NETWORK (IF PRESENT)
9. RADIO BACK TO SATELLITE/MAIN NETWORK (IF PRESENT)
10. CCTV PoE (IF PRESENT)

LEGEND

———	PROPOSED
- - - - -	EXISTING
*	PROVIDED BY TXDOT AND -INSTALLED BY CONTRACTOR
DMS	DYNAMIC MESSAGE SIGN
DVE	DIGITAL VIDEO ENCODER
F.O.C.	FIBER OPTIC CABLE
RVSD	RADAR VEHICLE SENSING DEVICE
SSU	SERIAL SERVER UNIT
PPP	PRETERMINATED PATCH PANEL
SM	SINGLE MODE
HES	HARDENED ETHERNET SWITCH
FIH	FIBER INTERCONNECT HOUSING
⊗	PROPOSED FUSION SPLICE
+	RELOCATED EQUIPMENT
▱	SPLICE TRAY (SPLICE TRAYS ARE FOR DIAGRAMATIC PURPOSES ONLY AND MAY NOT BE THE ACTUAL NUMBER REQUIRED)

2/23/2021

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DMS REPLACEMENT

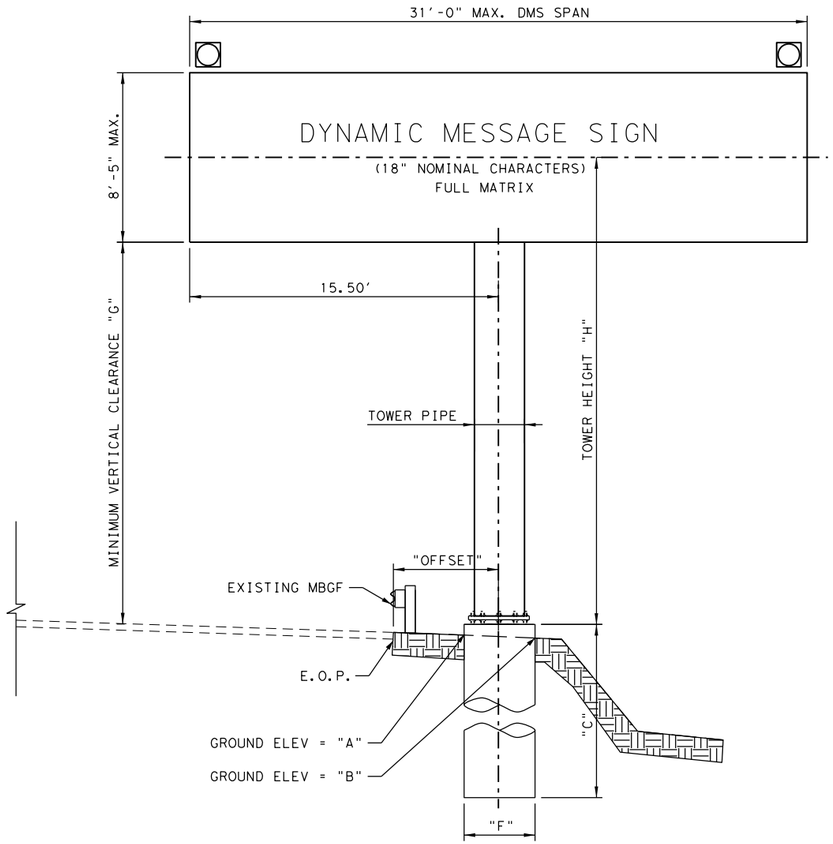
SCHEMATIC
FIBER OPTIC CONNECTIONS

SITE #30
IH 35W NB AT COUNTY ROAD 204

SHEET 1 OF 1

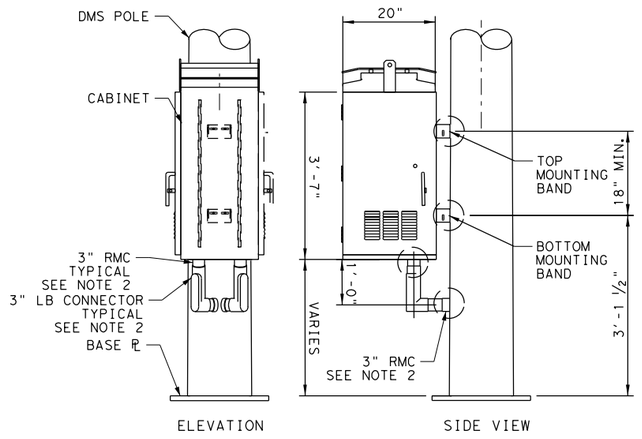
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
CL	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CL	TEXAS	FTW	TARRANT	85
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\kho\pwproad\nate.taylor\dms42767\FTW_DMS_FOC_30.dgn
BY: Nate.Taylor



TYPICAL DYNAMIC MESSAGE SIGN ELEVATION

NOT TO SCALE



DMS CABINET DETAILS (TYPE 336)

NOT TO SCALE

TYPICAL DMS HOUSING CABLE MANGEMENT

NOT TO SCALE

NOTES:

1. EXISTING DMS STRUCTURE TO REMAIN UNLESS OTHERWISE NOTED ON THE DMS SUMMARY TABLE ON NEXT SHEET.
2. EXISTING CONDUIT OPENINGS IN THE POST MAYBE OVERSIZED BY DRILLING/FILING IN THE FIELD BY UP TO 1" DIAMETER. THE OVERSIZING SHALL BE ON THE FLAT SIDE OF THE DODECAGONAL POST AND SHALL NOT BE TOWARDS THE BENT/CURVED PORTION OF THE POST. COUPLINGS SHALL BE INSERTED INTO EACH HOLE AND WELDED. APPLY ZINC RICH PAINT OVER AND AROUND ANY OVERSIZED CONDUIT OPENINGS AND WELDS. THE OVERSIZING IS CONSIDERED INCIDENTAL TO THE SIGN INSTALLATION.
3. A JUNCTION BOX SHOULD BE INSTALLED AT THE ENTRY POINT OF THE COLUMN AND THE ENTRY POINT OF THE DMS HOUSING. JUNCTION BOXES ARE SUBSIDIARY TO ITEM 6028.

2/23/2021

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DMS REPLACEMENT

CROSS SECTION TYPICAL

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
HHK	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
HHK	TEXAS	FTW	TARRANT	86
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 2/23/2021
FILENAME: c:\pwworking\khq\pwprod\nate.taylor\dms4276\FTW_DMS_XSEC_01.dgn
BY: Nate.Taylor

DMS PARAMETERS														
LOCATION					STRUCTURE DIMENSIONS					ELEVATIONS			DRILL SHAFT DIA. "F"
STRUCTURE NO.	STRUCTURE NAME	DIRECTION	STRUCTURE	MOUNT	SPAN LENGTH	E.O.P. "OFFSET"	MIN. VERTICAL CLEARANCE "G"	TOWER PIPE	TOWER HEIGHT "H"	GROUND EL "A"	GROUND EL "B"	DRILL SHAFT "C"	
					LF	LF	LF	IN	LF	LF	FT	FT	IN
1	IH 20 WB at Great SW Pkwy	IH 20 WB	EXISTING	SINGLE	30	4	19.74	30	24	577.082	574.981	19.5	54
2	IH 20 EB at Bowen Rd	IH 20 EB	EXISTING	SINGLE	30	4	20.08	30	24	622.216	620.115	19.5	54
3	IH 20 EB at Green Oaks Blvd.	IH 20 EB	EXISTING	SINGLE	30	4	19.74	30	24	615.033	613.824	19	54
4	IH 20 WB at Chuckwagon	IH 20 WB	EXISTING	SINGLE	30.5	8.25	20.16	30	25	879.942	880.612	38	54
5	SH 360 SB at Harwood	SH 360 SB	EXISTING	SINGLE	30	7	20.49	30	24.5	537.021	537.935	22	54
6	SH 360 SB at Arkansas	SH 360 SB	EXISTING	SINGLE	30	7	21.58	30	25.5	584.702	584.245	19	54
7A	SH 360 NB at Green Oaks	SH 360 NB	EXISTING	SINGLE	30	7	21.91	30	26	533.876	533.858	19	54
7B	SH 360 SB at Green Oaks	SH 360 SB	EXISTING	SINGLE	30	8	19.99	30	24.5	NA	NA	19	54
8A	SH 121 NB at Fairview	SH 121 NB	EXISTING	BACK TO BACK	30	11.75	19.66	30	22.5	578.034	578.037	18	54
8B	SH 121 SB at Fairview	SH 121 SB	EXISTING		0	11.75							
9A	SH 121 NB at Harwood	SH 121 NB	EXISTING	BACK TO BACK	30	31	NA	30	23.5	602.415	602.466	18.5	54
9B	SH 121 SB at Harwood	SH 121 SB	EXISTING			30							
10	SH 121 NB at Hall Johnson	SH 121 NB	EXISTING	SINGLE	29.33	7	21.33	30	24.5	596.913	595.803	35	54
11	IH 820 NB at Chapin	IH 820 NB	EXISTING	SINGLE	29.33	8.25	19.83	30	25.5	693.502	694.823	26	54
12	IH 820 NB and SB at Trinity	IH 820	EXISTING	BACK TO BACK	30	20	NA	30	21.5	508.28	507.695	18	54
13A	SH 183 WB at American	SH 183 WB	EXISTING	SINGLE	30	8	19.41	30	21.5	521.931	521.85	21	54
13B	SH 183 EB at American	SH 183 EB	EXISTING	SINGLE	30	9.25	21.74	30	25	586.34	586.696	20	54
14	SH 183 WB at County Line	SH 183 WB	EXISTING	SINGLE	30	17.78	NA	30	23.5	492.248	494.322	20	54
15	SH 199 NB at FM 1886/Confederate	SH 199 NB	EXISTING	SINGLE	30	5.25	NA	30	28	681.424	683.688	28	54
16	SH 199 SB at Denver Trail	SH 199 SB	EXISTING	SINGLE	30	5.25	NA	30	26.5	694.751	697.152	29	54
17	IH 20 WB at Campus Dr	IH 20 WB	EXISTING	SINGLE	30	CTB	17.74	15x48*	22.23	NA	NA	18.17	36
18A	IH 20 EB at James Ave.	IH 20 EB	EXISTING	BACK TO BACK	30	CTB	18.66	15x48*	21.46	NA	NA	18.167	36
18B	IH 20 WB at James Ave.	IH 20 WB	EXISTING										
19	IH 20 EB at Trail Lake	IH 20 EB	EXISTING	SINGLE	30	CTB	18.08	15x48*	21.94	NA	NA	18.167	36
20	IH 20 WB at Granbury	IH 20 WB	EXISTING	SINGLE	30	CTB	17.58	15x48*	21.87	NA	NA	18.167	36
21	SH 114 EB at Kimball	SH 114 EB	EXISTING	SINGLE	29.33	21.94	NA	30	25.5	NA	NA	19.25	54
22	SH 121 SB at Bass Pro	SH 121 SB	EXISTING	SINGLE	29.33	NA	19.91	30	25	543.121	543.061	36.5	54
23	IH 820 WB at Mark IV	IH 820 WB	EXISTING	SINGLE	30	23.75	NA	NA	22.5	631.997	632.266	NA	NA
24	IH 820 EB at Marine Creek	IH 820 EB	EXISTING	SINGLE	29.33	7	19.91	30	24.167	710.675	709.814	34.08	54
25	IH 820 SB at Westpoint	IH 820 SB	EXISTING	SINGLE	29.33	8.25	21.16	30	25.5	719.382	718.939	18	54
26A	IH 35W NB at Felix	IH 35W NB	EXISTING	BACK TO BACK	30	CTB	19.33	30	21.75	NA	NA	21.58	54
26B	IH 35W SB at Felix	IH 35W SB	EXISTING										
27A	IH 35W NB at Altamesa	IH 35W NB	EXISTING	BACK TO BACK	NA	CTB	17.91	15x48*	22.12	NA	NA	18.167	36
27B	IH 35W SB at Altamesa	IH 35W SB	EXISTING										
28	IH 35W SB at Risinger	IH 35W SB	EXISTING	SINGLE	29.33	7	23.41	30	25.5	727.496	726.498	34	54
29	IH 35W NB at Hidden Creek	IH 35W NB	EXISTING	SINGLE	29.33	7	21.08	30	25.5	734.562	734.717	25	54
30	IH 35W NB at CR 204	IH 35W NB	EXISTING	SINGLE	29.33	9	22.91	30	26	686.124	685.3	25	54

*TOWER PIPE IS RECTANGULAR IN DIMENSION.
MINIMUM VERTICAL CLEARANCE IS BASED ON FIELD MEASUREMENTS MINUS DIFFERENCE BETWEEN THE EXISTING AND PROPOSED DMS HEIGHTS.
LOCATIONS WHERE MINIMUM VERTICAL CLEARANCE IS NA IMPLIES THAT AT THESE LOCATIONS, THE DMS DID NOT ENCROACH THE ROADWAY.
E.O.P. "OFFSET" ARE BASED OFF AS-BUILT INFORMATION, ACTUAL OFFSET MAY VARY IN FIELD.

2/23/2021
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Texas Department of Transportation

DMS REPLACEMENT
DMS SUMMARY

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
HHK	6	SEE TITLE SHEET		VA
GRAPHICS HHK	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	87
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

PLOTTED: 2/23/2021
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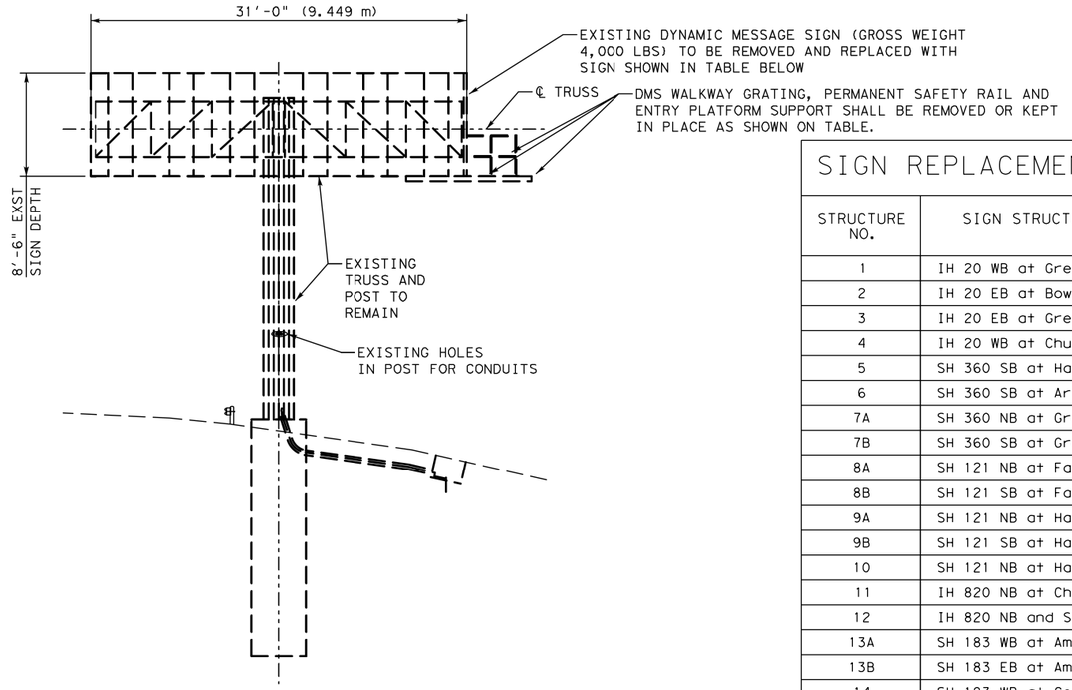
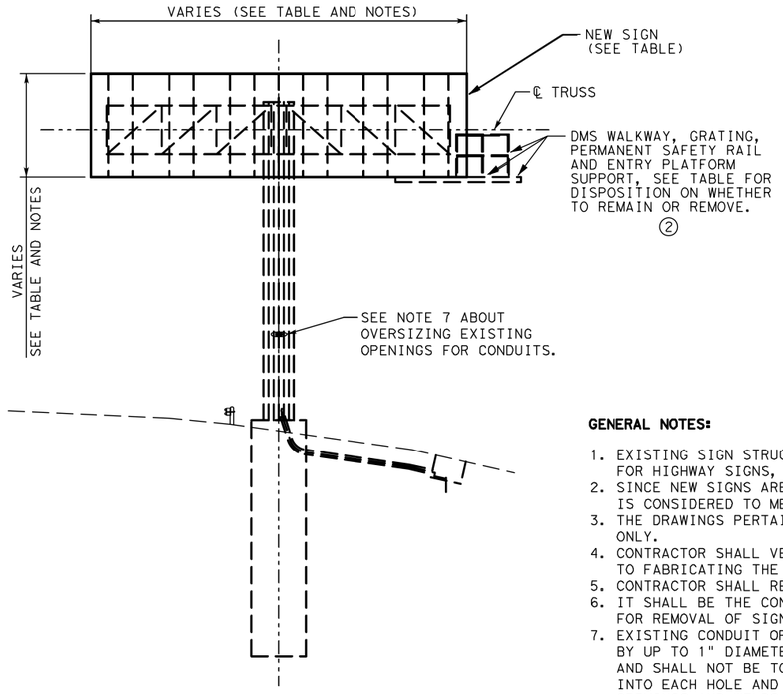
BY: Nate.Taylor



EXISTING SIGN STRUCTURE WITH EXISTING SIGN



EXISTING SIGN STRUCTURE WITH NEW SIGN ①

① CONNECT TO DMS ATTACHMENT

② SEE SHEETS 97 THROUGH 99 FOR WALKWAY SUPPORT DETAILS.

SIGN REPLACEMENT TABLE ON EXISTING STRUCTURE

STRUCTURE NO.	SIGN STRUCTURE LOCATION	NEW SIGN	EXISTING WALKWAY	WALKWAY STATUS
1	IH 20 WB at Great SW Pkwy	DAKTRONICS WALK-IN SIGN	SIDE AND BACK	KEEP
2	IH 20 EB at Bowen Rd	DAKTRONICS WALK-IN SIGN	SIDE AND BACK	KEEP
3	IH 20 EB at Green Oaks Blvd.	SKYLINE WALK-IN SIGN	SIDE ONLY	KEEP
4	IH 20 WB at Chuckwagon	SKYLINE WALK-IN SIGN	SIDE AND BACK	KEEP
5	SH 360 SB at Harwood	SKYLINE WALK-IN SIGN	SIDE AND BACK	KEEP
6	SH 360 SB at Arkansas	SKYLINE WALK-IN SIGN	SIDE AND BACK	KEEP
7A	SH 360 NB at Green Oaks	DAKTRONICS WALK-IN SIGN	SIDE AND BACK	KEEP
7B	SH 360 SB at Green Oaks	DAKTRONICS WALK-IN SIGN	SIDE AND BACK	KEEP
8A	SH 121 NB at Fairview	SKYLINE WALK-IN SIGN	SIDE ONLY	KEEP
8B	SH 121 SB at Fairview	SKYLINE WALK-IN SIGN	SIDE ONLY	KEEP
9A	SH 121 NB at Harwood	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
9B	SH 121 SB at Harwood	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
10	SH 121 NB at Hall Johnson	SKYLINE WALK-IN SIGN	SIDE AND BACK	KEEP
11	IH 820 NB at Chapin	SKYLINE WALK-IN SIGN	SIDE AND BACK	KEEP
12	IH 820 NB and SB at Trinity	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
13A	SH 183 WB at American	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
13B	SH 183 EB at American	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
14	SH 183 WB at County Line	SKYLINE WALK-IN SIGN	SIDE ONLY	KEEP
15	SH 199 NB at FM 1886/Confederate	SKYLINE WALK-IN SIGN	SIDE AND BACK	KEEP
16	SH 199 SB at Denver Trail	SKYLINE WALK-IN SIGN	SIDE AND BACK	KEEP
17	IH 20 WB at Campus Dr	SKYLINE WALK-IN SIGN	SIDE ONLY	KEEP
18A	IH 20 EB at James Ave.	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
18B	IH 20 WB at James Ave.	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
19	IH 20 EB at Trail Lake	SKYLINE WALK-IN SIGN	SIDE ONLY	KEEP
20	IH 20 WB at Granbury Rd	SKYLINE WALK-IN SIGN	SIDE ONLY	KEEP
21	SH 114 EB at Kimball	SKYLINE WALK-IN SIGN	SIDE ONLY	KEEP
22	SH 121 SB at Bass Pro	SKYLINE WALK-IN SIGN	SIDE ONLY	KEEP
23	IH 820 WB at Mark IV	SKYLINE WALK-IN SIGN	SIDE ONLY	KEEP
24	IH 820 EB at Marine Creek	SKYLINE WALK-IN SIGN	SIDE AND BACK	KEEP
25	IH 820 SB at Westpoint	SKYLINE WALK-IN SIGN	SIDE AND BACK	KEEP
26A	IH 35W NB at Felix	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
26B	IH 35W SB at Felix	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
27A	IH 35W NB at Altamesa	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
27B	IH 35W SB at Altamesa	DAKTRONICS WALK-IN SIGN	SIDE ONLY	KEEP
28	IH 35W SB at Risinger	DAKTRONICS WALK-IN SIGN	SIDE AND BACK	KEEP
29	IH 35W NB at Hidden Creek	DAKTRONICS WALK-IN SIGN	SIDE AND BACK	KEEP
30	IH 35W NB at CR 204	DAKTRONICS WALK-IN SIGN	SIDE AND BACK	KEEP

NOTE: SIGNS 8A AND 8B, 9A AND 9B, 12, 18A AND 18B, 26A AND 26B, AND 27A AND 27B ARE TWO EXISTING SIGNS MOUNTED TO THE SAME STRUCTURE BACK TO BACK.

GENERAL NOTES:

1. EXISTING SIGN STRUCTURES ARE DESIGNED IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS (1994 EDITION).
2. SINCE NEW SIGNS ARE LESS AREA AND WEIGHT THAN EXISTING SIGN, THE EXISTING STRUCTURE IS CONSIDERED TO MEET THE CRITERIA FOR WHICH THESE STRUCTURES WERE DESIGNED.
3. THE DRAWINGS PERTAIN TO SHOWING ATTACHMENT DETAILS OF NEW SIGNS TO THE EXISTING STRUCTURE ONLY.
4. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND EXISTING ATTACHMENT DETAILS PRIOR TO FABRICATING THE NEW SUPPORTS.
5. CONTRACTOR SHALL REMOVE EXISTING DMS SIGNS AND WALKWAY (WHERE REQUIRED).
6. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE TEMPORARY SUPPORTS/CRANES FOR REMOVAL OF SIGNS/WALKWAYS AND INSTALLATION OF NEW SIGNS.
7. EXISTING CONDUIT OPENINGS IN THE POST MAYBE OVERSIZED BY DRILLING/FILING IN THE FIELD BY UP TO 1" DIAMETER. THE OVERSIZING SHALL BE ON THE FLAT SIDE OF THE DODECAGONAL POST AND SHALL NOT BE TOWARDS THE BENT/CURVED PORTION OF THE POST. COUPLINGS SHALL BE INSERTED INTO EACH HOLE AND WELDED. APPLY ZINC RICH PAINT OVER AND AROUND ANY OVERSIZED CONDUIT OPENINGS AND WELDS. THE OVERSIZING IS CONSIDERED INCIDENTAL TO THE SIGN INSTALLATION.
8. THE EXISTING SIGN REMOVALS WILL BE PAID FOR AS EACH UNDER BID CODE -
   6331 6001 REMOVE DYNAMIC MESSAGE SIGN SYSTEM EA
9. THE NEW SIGN INSTALLATION WILL BE PAID FOR AS EACH UNDER BID CODE -
   6028 6001 INSTALL DMS (POLE MTD CABINET) EA OR 6028 6002 INSTALL DMS (FDN MTD CABINET)

2/23/2021
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DHRUVA LAHON
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DMS REPLACEMENT
SIGN REPLACEMENT DETAILS

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
HHK	6	SEE TITLE SHEET		VA
GRAPHICS HHK	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	88
CHECK DJB	CONTROL 0902	SECTION 90	JOB 111	

PLOTTED: 2/23/2021
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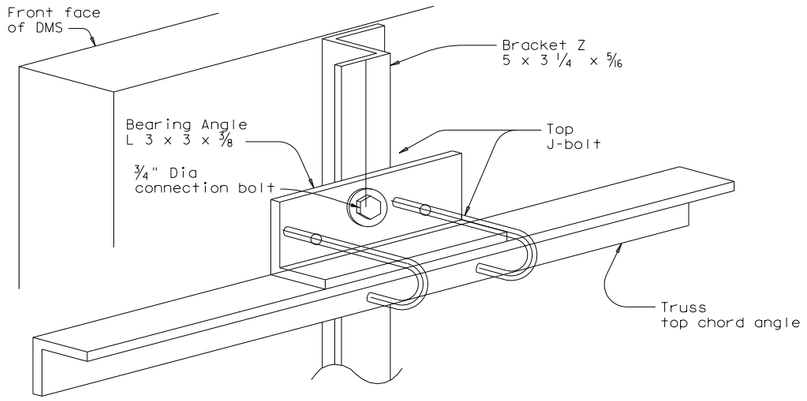
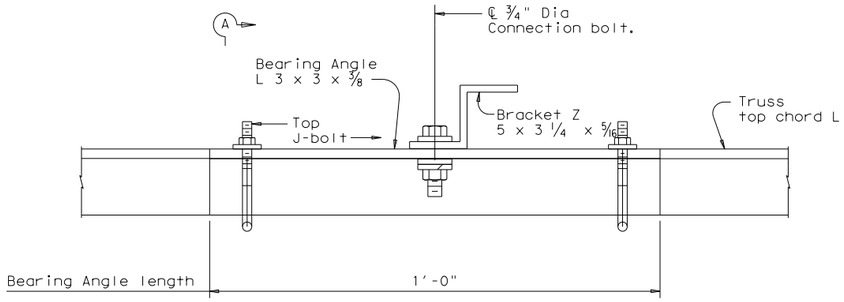
BY: Nate.Taylor



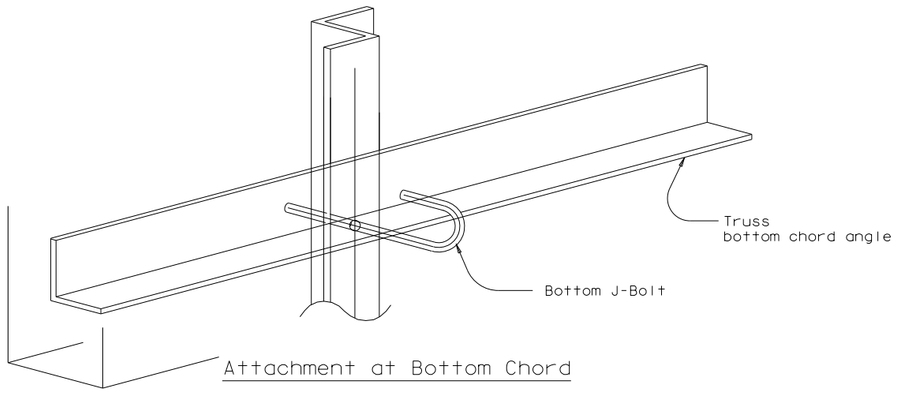
Attachment at Top Chord

(Showing Chord Angle 3")



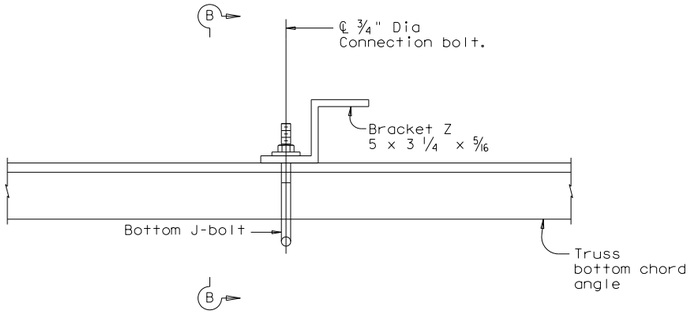
Attachment at Top Chord

(Showing Chord Angle 3")



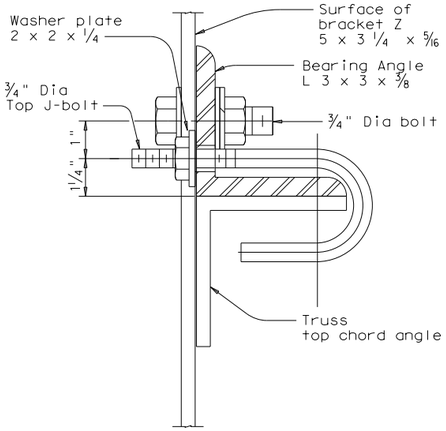
Attachment at Bottom Chord

ISOMETRIC VIEW

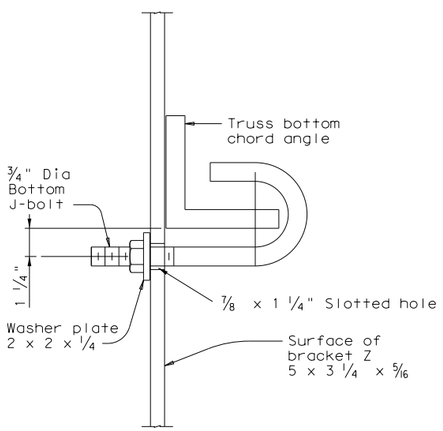


Attachment at Bottom Chord

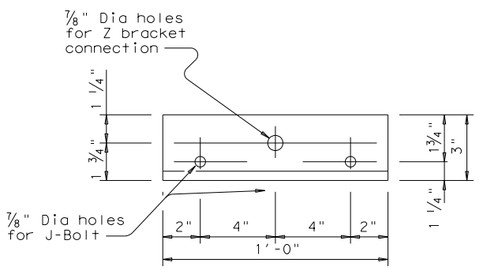
PLAN VIEW



SECTION A-A

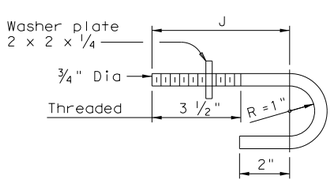


SECTION B-B



BEARING ANGLE 3 x 3 x 3/8

Chord Angle	J
3", 3 1/2", 4"	5 1/2"
5" and 6"	7 1/2"



TOP & BOTTOM J-BOLT

GENERAL NOTES:

1. Application of the mounting detailed on Sheet 1 of 3 is limited to a dynamic message sign (DMS) attachment that is not in conflict with the truss connection bolts at the point(s) of attachment. The overhead sign structure must have adequate capacity to support the DMS. A determination of adequacy shall be made prior to attaching the DMS supports to the truss.
2. Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. The Design Sustained Wind Velocity is 100 mph with a gust factor of 1.3. Connections are designed for a DMS weight of 4000 lbs and a design Effective Projected Area (EPA) of 453 sq ft, with the EPA based on a DMS nominal width of 30.5 feet and nominal depth of 8.25 feet plus four top and bottom 1'-8" square flashing beacons. The EPA includes drag coefficients of 1.7 (applied to sign area) and 1.2 (applied to flashing beacon area). A horizontal eccentricity of 1.0 ft from the face of the truss to the center of gravity of the DMS for attachment of DMS is assumed. An even number of Z brackets, spaced at 5 ft max., is assumed to transfer forces through the connection.
3. All structural steel shall conform to ASTM A36, A572 Gr 50 or A588. Connection bolts shall conform to ASTM A325 or A449. Each connection bolt shall be provided with 1 heavy hex nut, 2 flat washers, and 1 lock washer. J bolts and washer plate both shall be Type 304 stainless steel, with bolt minimum yield strength of 50 ksi and an elongation of 16 percent in 2 inches. All parts except stainless steel shall be galvanized.
4. Contractor shall verify applicable field dimensions before fabrication.

3/5/2021

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DMS REPLACEMENT

SKYLINE DMS-TO-TRUSS MOUNTING AT OVERHEAD SIGN SUPPORTS

(NON_BUILD-UP)
DMS(TM-1)-16(MOD)

SHEET 1 of 3

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS JG	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	89
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 3/5/2021
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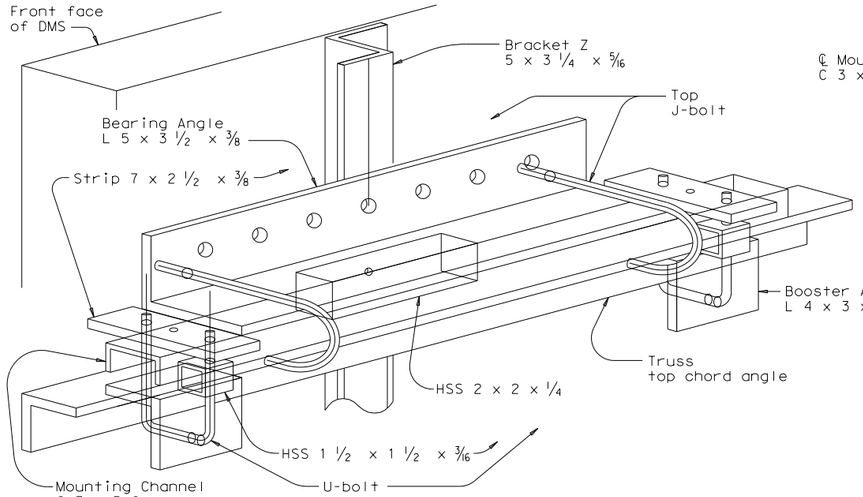
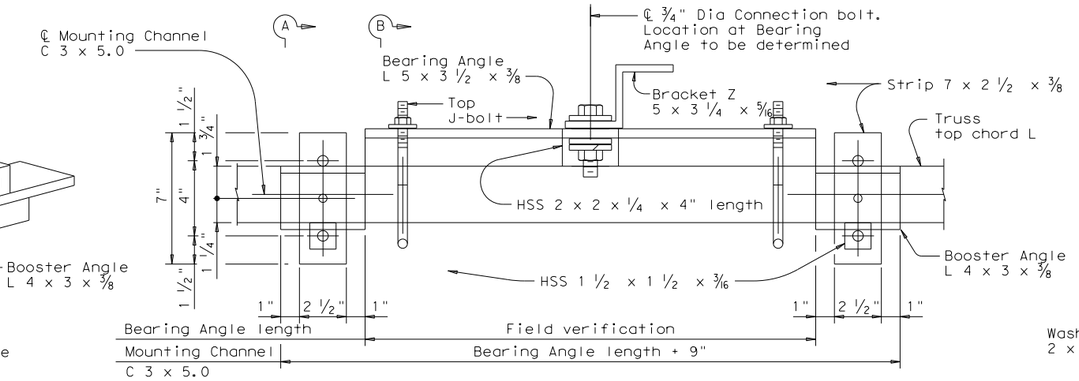
BY: hamza.khan



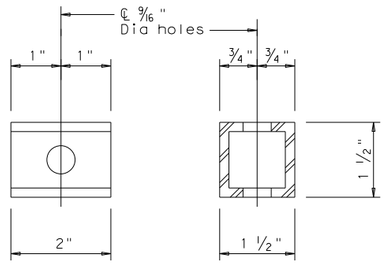
Built-up Attachment at Top Chord

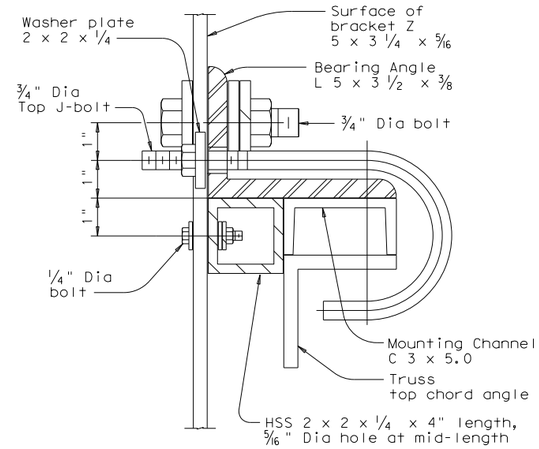
(Showing Chord Angle 3")



PLAN VIEW (AT TOP CHORD)

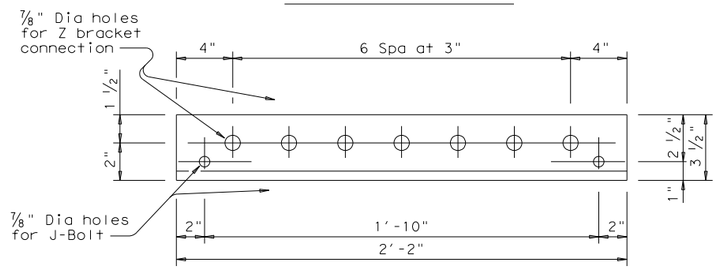
(Showing Chord Angle 3")



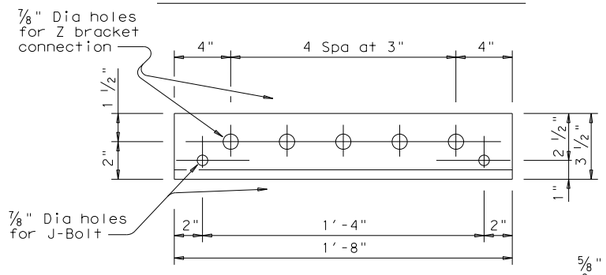


SECTION B-B

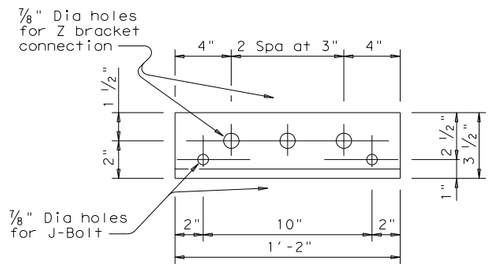
ISOMETRIC VIEW



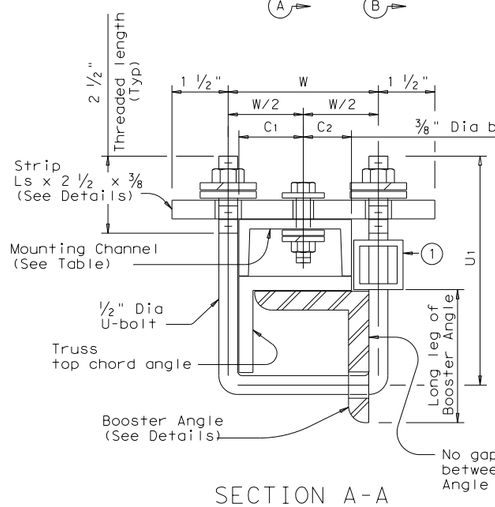
BEARING ANGLE 5 x 3 1/2 x 3/8



BEARING ANGLE 5 x 3 1/2 x 3/8



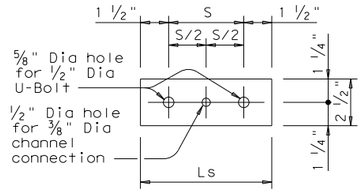
BEARING ANGLE 5 x 3 1/2 x 3/8



SECTION A-A

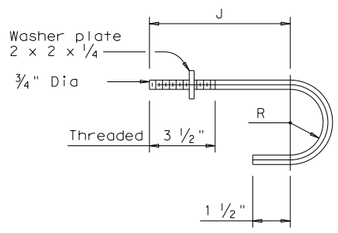
(Showing Chord Angle 3",4",5" & 6")

Chord Angle	U1	W	C1	C2	Mounting Channel
3"	7"	4"	1 3/4"	1 1/4"	C3 x 5.0
4"	8"	5"	2 1/4"	1 3/4"	C4 x 7.25
5"	9"	6"	2 3/4"	2 1/4"	C5 x 9.0
6"	10 1/2"	7"	3 1/4"	2 3/4"	C6 x 13



Strip Ls x 2 1/2 x 3/8

Chord Angle	S	Ls
3"	4"	7"
3 1/2"	4"	7"
4"	5"	8"
5"	6"	9"
6"	7"	10"

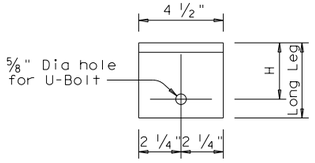


TOP J-BOLT

Chord Angle	J	R
3 & 3 1/2"	7"	1 3/4"
4 & 5"	8"	2"
6"	9"	2 1/4"

SECTION A-A

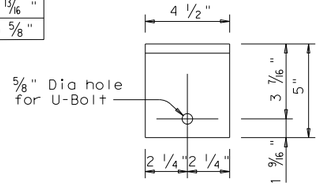
(Showing Chord Angle 3 1/2")



BOOSTER ANGLE

(For Chord Angle 3",4",5" and 6")

Chord Angle	Booster Angle	H
3"	4 x 3 x 3/8	3"
4"	5 x 3 1/2 x 3/8	3 13/16"
5"	6 x 4 x 3/8	4 13/16"
6"	7 x 4 x 3/8	5 5/8"



BOOSTER ANGLE 5 x 3 x 3/8

(For Chord Angle 3 1/2")

3/5/2021

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DMS REPLACEMENT

SKYLINE DMS-TO-TRUSS MOUNTING AT OVERHEAD SIGN SUPPORTS

(NON_BUILD-UP)
DMS(TM-2)-16(MOD)

SHEET 2 of 3

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS JG	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	90
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 3/5/2021
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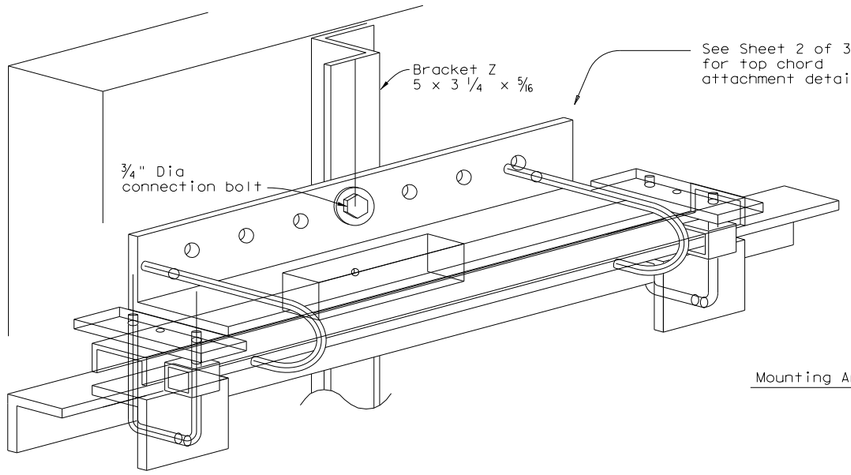
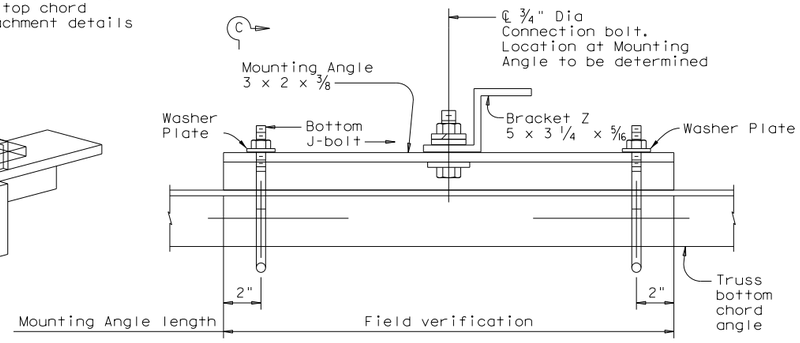
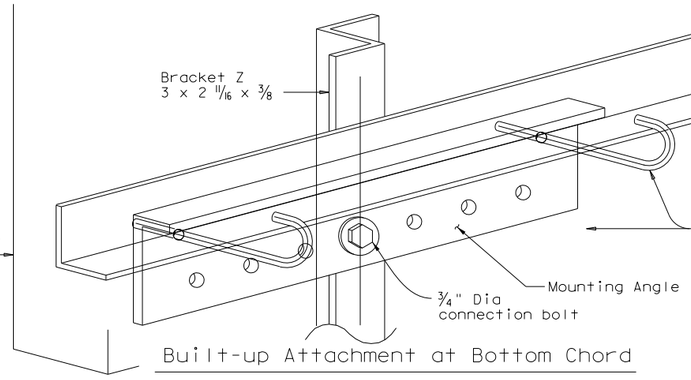
BY: hamza.khan



Built-up Attachment at Top Chord

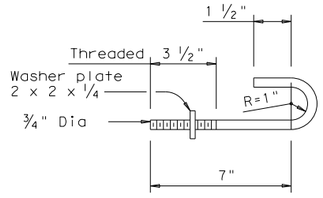


PLAN VIEW
(AT BOTTOM CHORD)

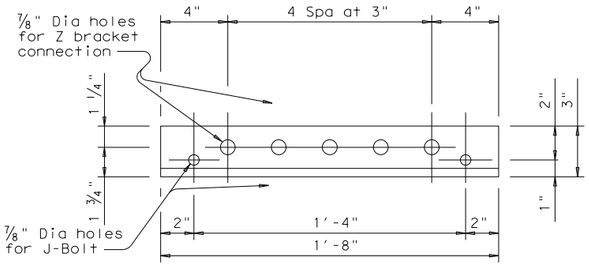


Built-up Attachment at Bottom Chord

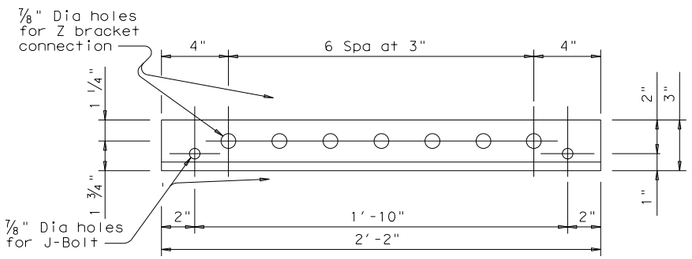
ISOMETRIC VIEW



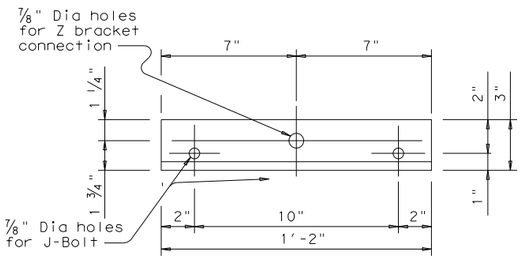
BOTTOM J-BOLT



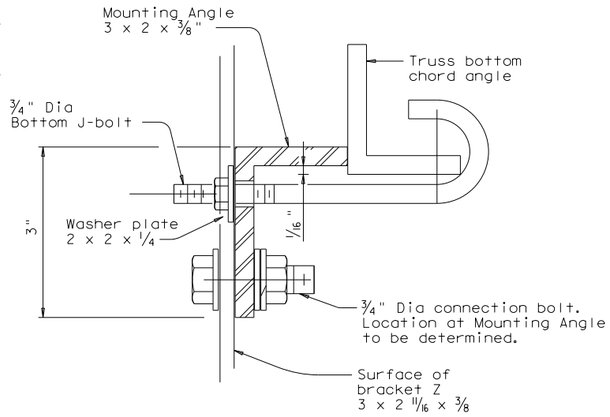
MOUNTING ANGLE 3 x 2 x 3/8



MOUNTING ANGLE 3 x 2 x 3/8



MOUNTING ANGLE 3 x 2 x 3/8



SECTION C-C

GENERAL NOTES:

1. Application of the built-up detailed on Sheet 2 and 3 of 3 is limited to the dynamic message sign (DMS) attachment which is in conflict with the truss connection bolts at the point(s) of attachment. The overhead sign structure must have adequate capacity to support the DMS. A determination of adequacy shall be made prior to attaching the DMS supports to the truss.
2. Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. The Design Sustained Wind Velocity is 100 mph with a gust factor of 1.3. Connections are designed for a DMS weight of 4000 lbs and a design Effective Projected Area (EPA) of 453 sq ft, with the EPA based on a DMS nominal width of 30.5 feet and nominal depth of 8.25 feet plus four top and bottom 1'-8" square flashing beacons. The EPA includes drag coefficients of 1.7 (applied to sign area) and 1.2 (applied to flashing beacon area). A horizontal eccentricity of 1.0 ft from the face of the truss to the center of gravity of the DMS for attachment of DMS is assumed. An even number of Z brackets, spaced at 5 ft max., is assumed to transfer forces through the connection.
3. All structural steel shall conform to ASTM A36, A572 Gr 50 or A588. Connection bolts shall conform to ASTM A325 or A449. Each connection bolt shall be provided with 1 heavy hex nut, 2 flat washers, and 1 lock washer. U bolts shall conform to ASTM A307 with 2 hex nuts, 2 flat washers and 2 lock washers. Hollow structural section (HSS) shall conform to ASTM A500, A501, or A847. J bolts and washer plate both shall be Type 304 stainless steel, with bolt minimum yield strength of 50 ksi and an elongation of 16 percent in 2 inches. All parts, except stainless steel shall be galvanized.
4. Contractor shall verify applicable field dimensions before fabrication. Various lengths of bearing and mounting angle are provided for suitable mounting. Contractor shall determine the proper bearing and mounting angle length, and the connection along the length at Z bracket to accommodate J-bolt hook. Contractor may substitute HSS for the mounting channel as long as the HSS has equal or greater thickness at the mounting channel. Limit HSS height to achieved mounting clearance.

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DMS REPLACEMENT

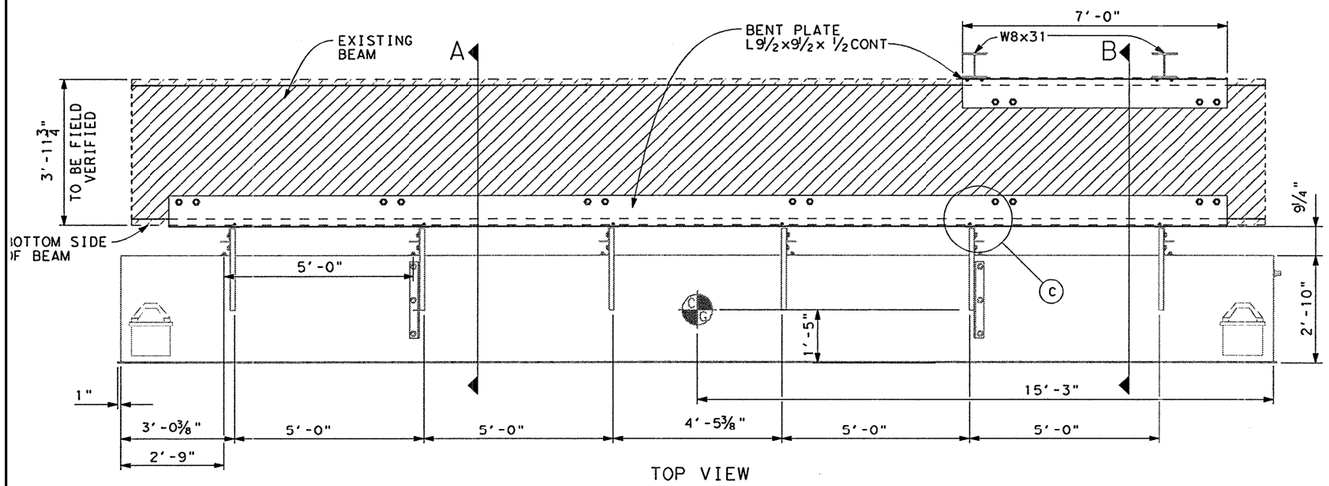
SKYLINE DMS-TO-TRUSS MOUNTING AT OVERHEAD SIGN SUPPORTS

(NON_BUILD-UP)
DMS(TM-3)-16(MOD)

SHEET 3 of 3

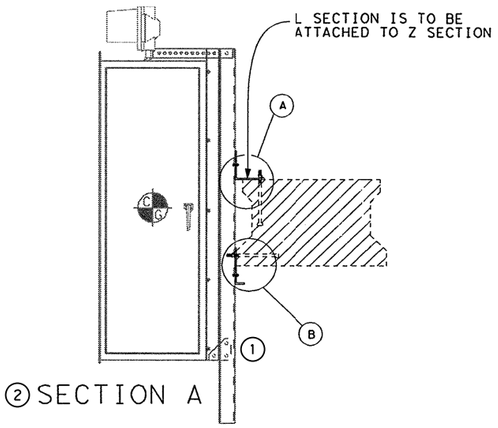
DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS JG	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	91
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 3/5/2021
FILENAME: c:\pwworking\kho\pwproad\hamza.khan\d0110470\dms-tm-16 3 MOD (Skyline).dgn
BY: hamza.khan



TOP VIEW

TYPICAL ANGLE FRAMING PLAN FOR SINGLE SIGN

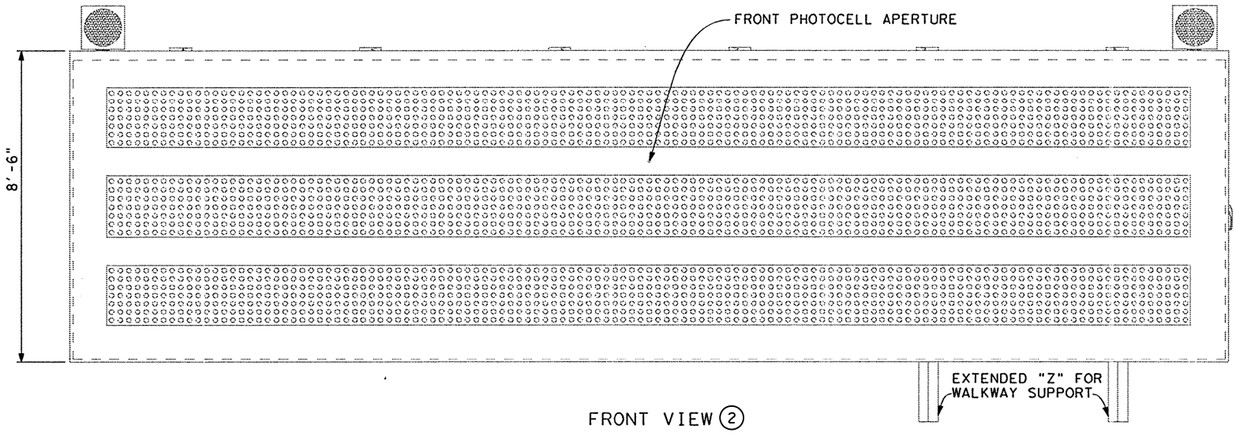


② SECTION A

General Notes:
See notes for single sign layout.
The exisiting framing for the concrete T-mounts will remain to accommodate proposed DMS with its vertical support Z brackets.

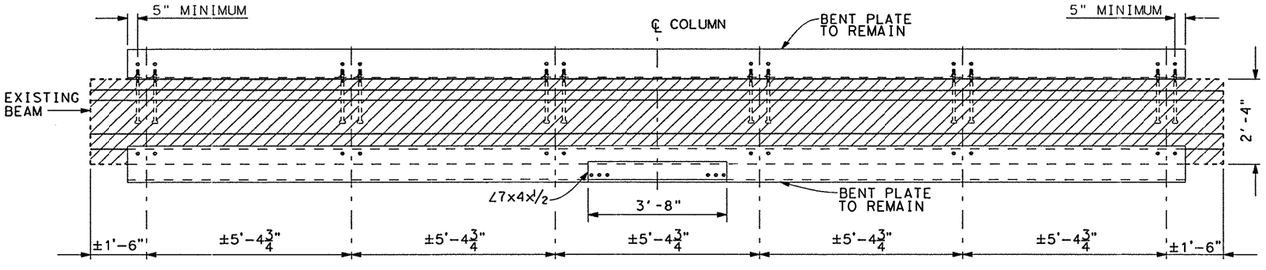
(1) Size and condition of existing vertical W Shapes (W8x31) to be field verified to support proposed DMS and platform.

(2) Where required by proposed Z Bracket spacing, new holes are allowed to be created, on existing bent plate, on the condition that minimum spacing to the existing holes is no less than 3" c-c.

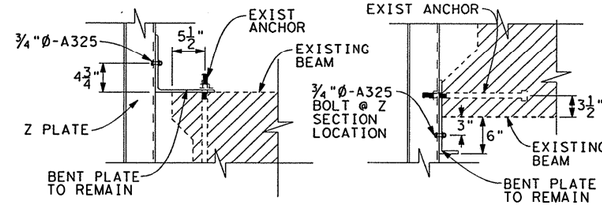


FRONT VIEW ②

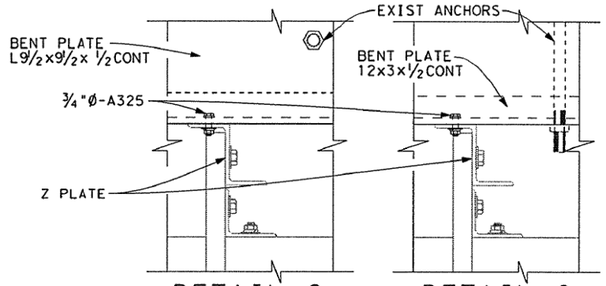
WEIGHT APPX. 4,000 lbs.
DMS TO BE PROVIDED BY OTHERS



TYPICAL ANGLE FRAMING ELEVATION FOR SINGLE SIGNS AT BEAM



DETAIL A DETAIL B



DETAIL C TOP VIEW DETAIL C BOTTOM VIEW

DRAWING NOT TO SCALE

3/5/2021

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DMS REPLACEMENT

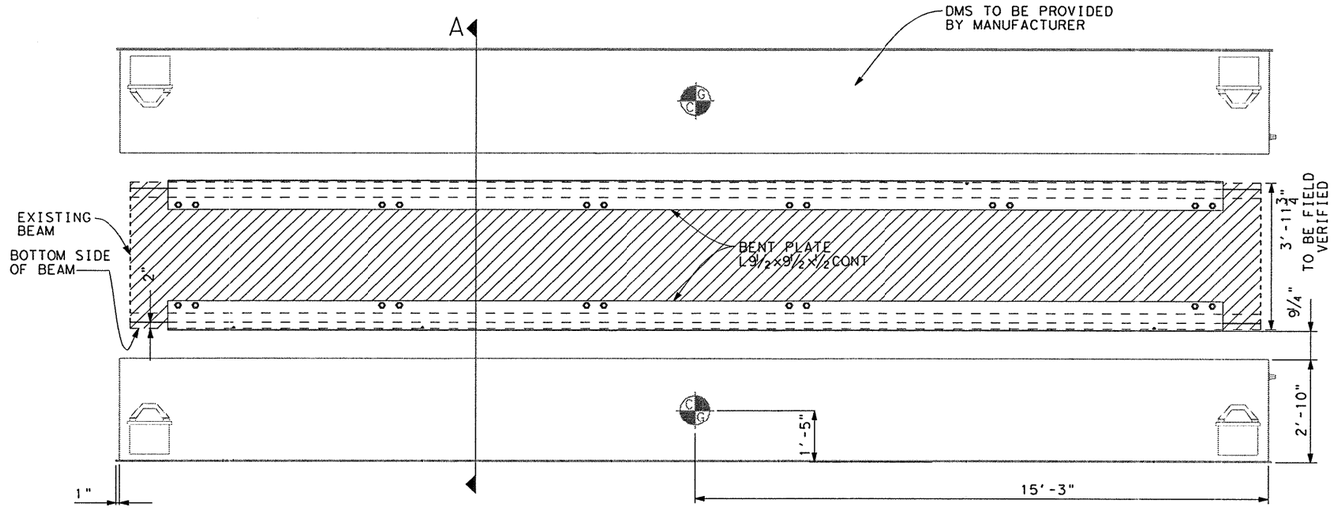
DMS STRUCTURAL SUPPORT SINGLE SIGN LAYOUT

FOR CONCRETE STRUCTURES AT TRAIL LAKE DR, CAMPUS DR, & GRANBURY RD *(TO INSTALL SKYLINE SIGN)

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
JG	TEXAS	FTW	TARRANT	92
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 3/5/2021
FILENAME: c:\pwworking\kha\pwprod\hamza.khan\d0110470\DMS-SS-02-SINGLE.dgn
BY: hamza.khan

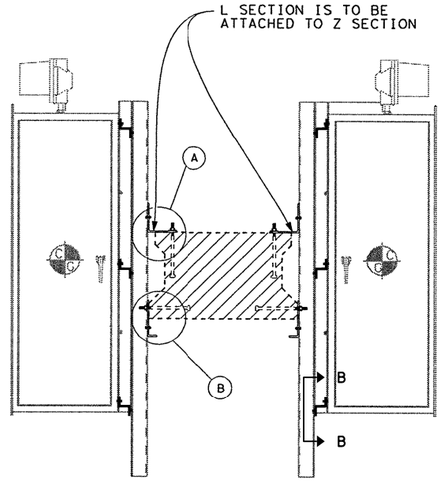


TOP VIEW

TYPICAL ANGLE FRAMING PLAN FOR DOUBLE SIGN

(EXTRUSION HORZ. ZEE ON THE REAR OF DMS NOT SHOWN FOR CLARITY)

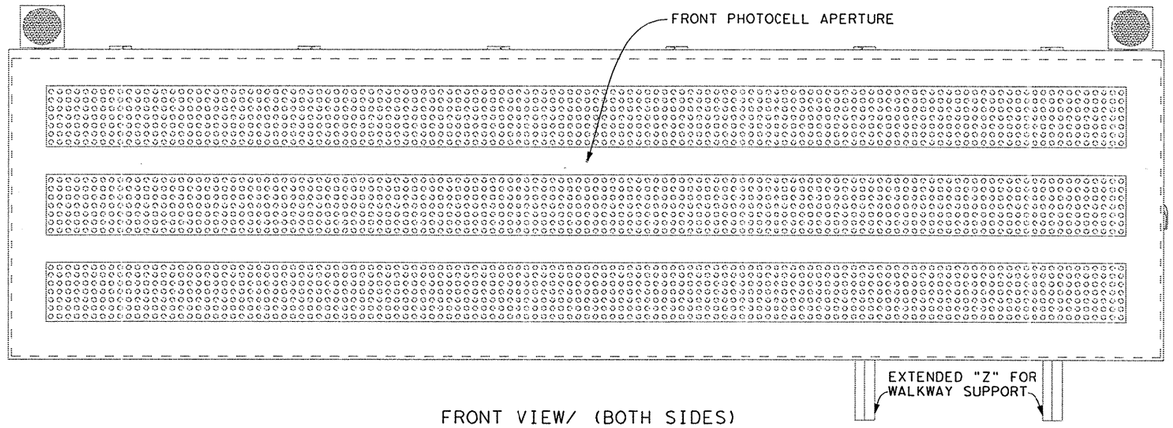
*DIMENSIONS ON DMS MAY VARY DEPENDING ON MANUFACTURER



SECTION A

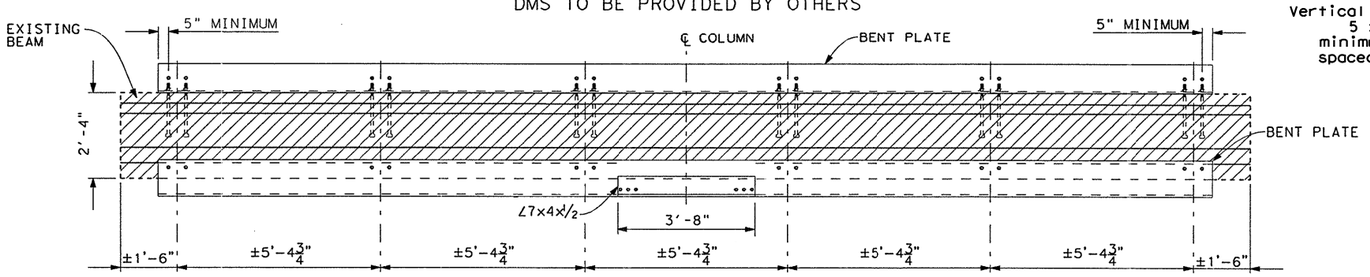
General Notes:
See notes for single sign layout.
The exisiting framing for the concrete T-mounts will remain to accommodate proposed DMS with its vertical support Z brackets.

1. Where there is only one sign proposed, omit the other one from the attachment details.
2. Where required by proposed Z Bracket spacing, new holes are allowed to be created, on existing bent plate, on the condition that minimum spacing to the existing holes is no less than 3" c-c.
3. Connect to DMS attachments.
4. Center the hole at flanges of both connecting brackets.

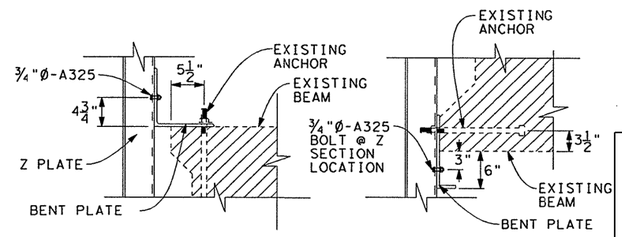


FRONT VIEW/ (BOTH SIDES)

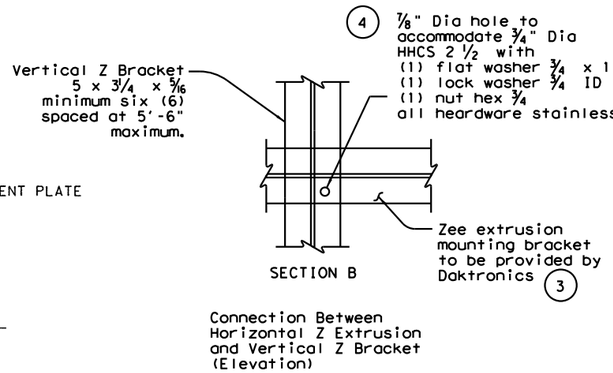
WEIGHT APPX. 4,000 lbs.
DMS TO BE PROVIDED BY OTHERS



TYPICAL ANGLE FRAMING ELEVATION FOR DOUBLE SIGNS AT BEAM



DETAIL A DETAIL B



SECTION B

Connection Between Horizontal Z Extrusion and Vertical Z Bracket (Elevation)

DRAWING NOT TO SCALE

3/5/2021

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DMS REPLACEMENT

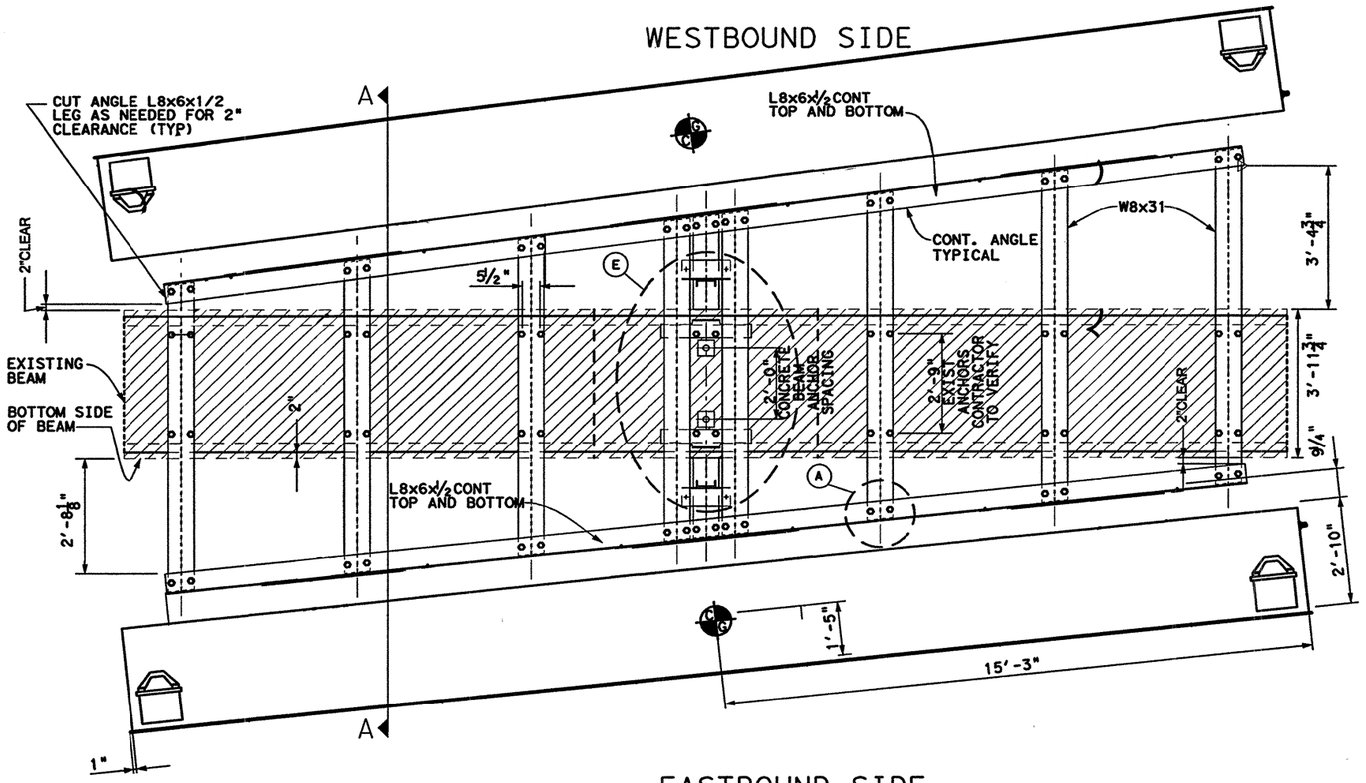
DMS STRUCTURAL SUPPORT DOUBLE SIGN LAYOUT

FOR CONCRETE STRUCTURES AT ALTAMESA BLVD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
JG	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	93
DL				
CHECK	0902	90	111	
DJB				

PLOTTED: 3/5/2021
FILENAME: c:\pwworking\kha\pwprod\hamza.khan\d0110470\DMS-SS-02.dgn
BY: hamza.khan

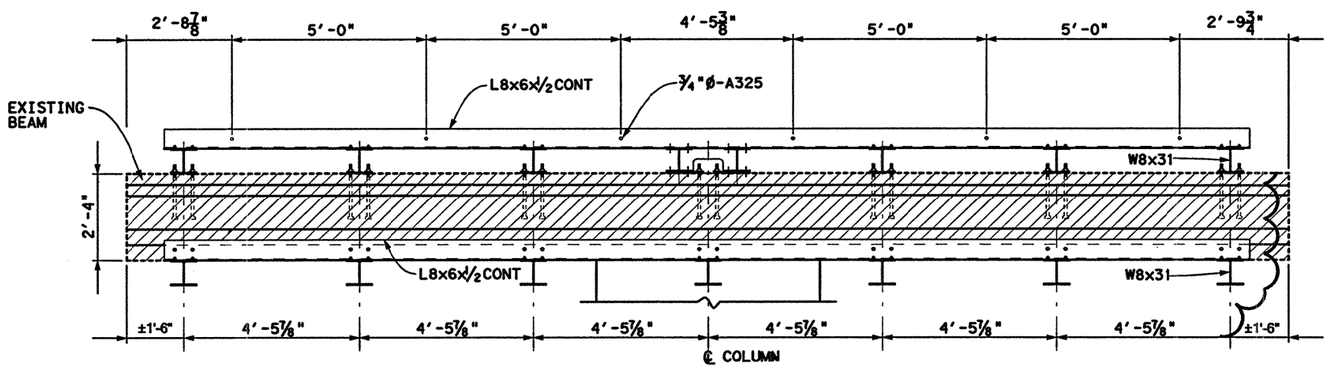


TOP VIEW

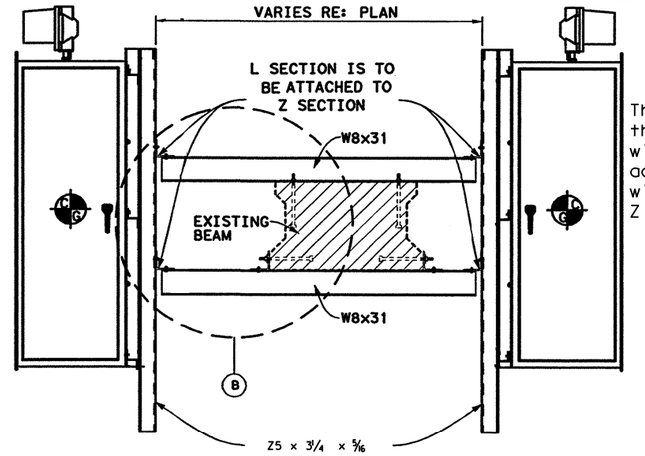
ANGLE FRAMING PLAN

(EXTRUSION HORZ. ZEE ON THE REAR OF DMS NOT SHOWN FOR CLARITY)

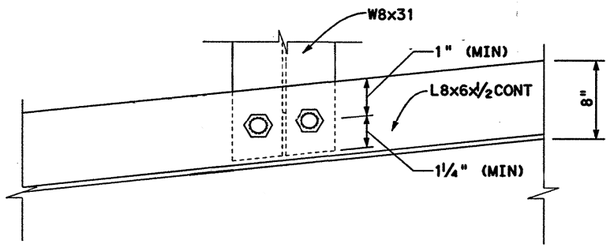
*DIMENSIONS ON DMS MAY VARY DEPENDING ON MANUFACTURER



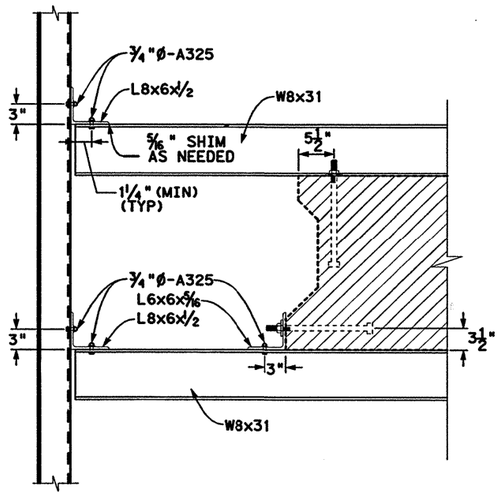
TYPICAL ANGLE FRAMING ELEVATION FOR DOUBLE SIGNS AT BEAM



SECTION A



DETAIL A



DETAIL B

GENERAL NOTES

See notes for single sign layout.

The existing framing for the concrete T-mounts will remain to accommodate proposed DMS with its vertical support Z brackets.

NOTE:
SEE SHEET 2 OF 2
FOR ADDITIONAL DETAILS

DRAWING NOT TO SCALE

3/5/2021

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DMS REPLACEMENT

DMS STRUCTURAL SUPPORT
FOR CONCRETE STRUCTURE AT JAMES AVE

SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS JG	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	94
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 3/5/2021
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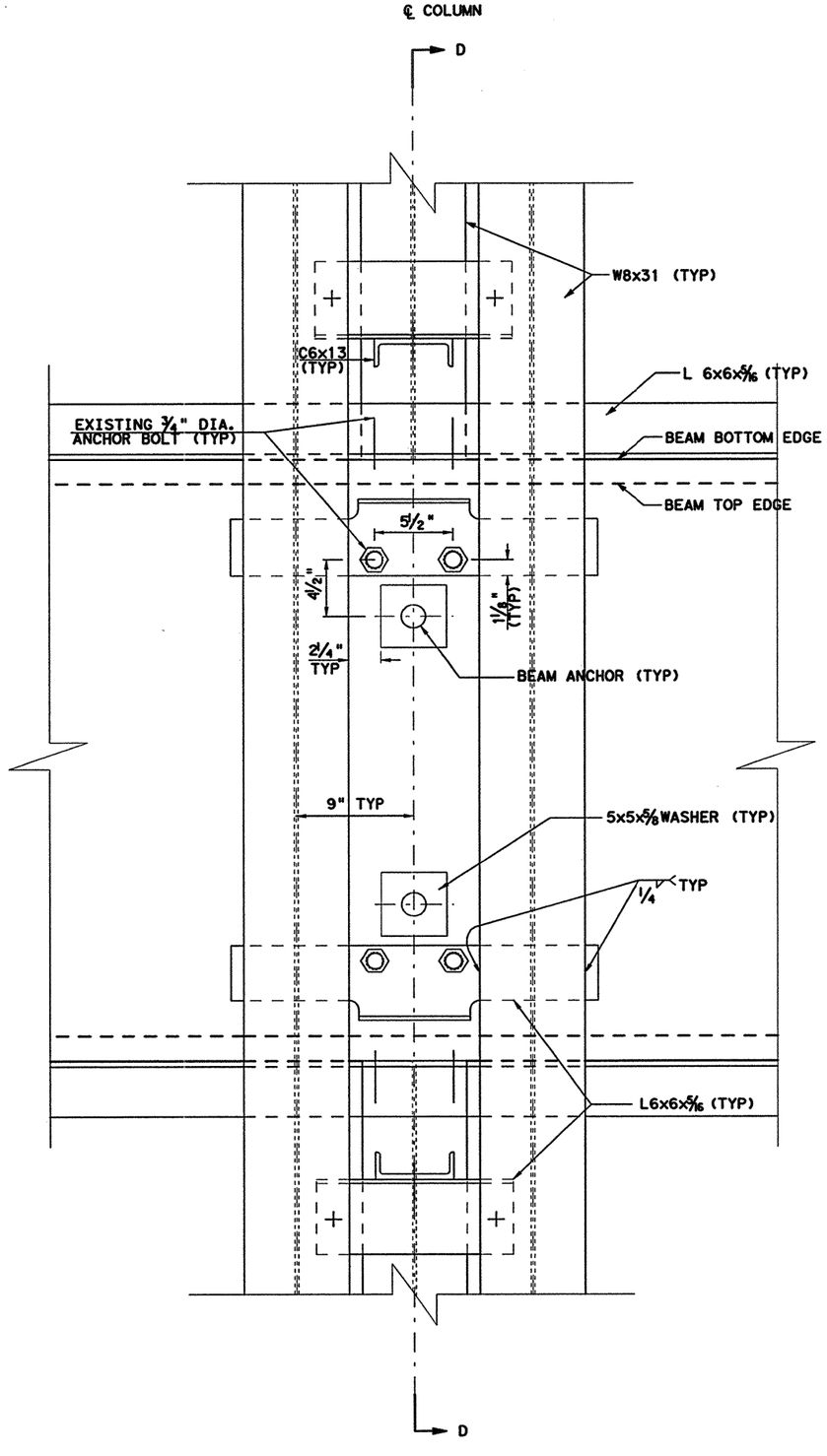
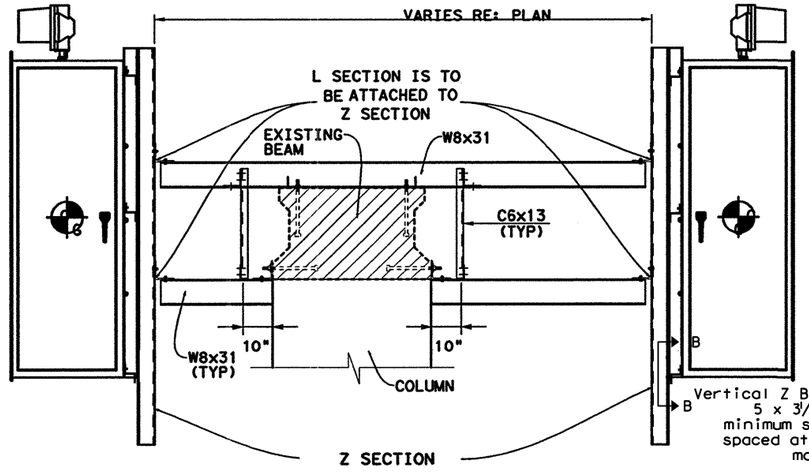
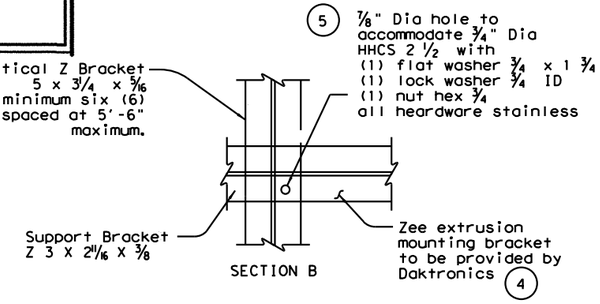
BY: hamza.khan



DETAIL E

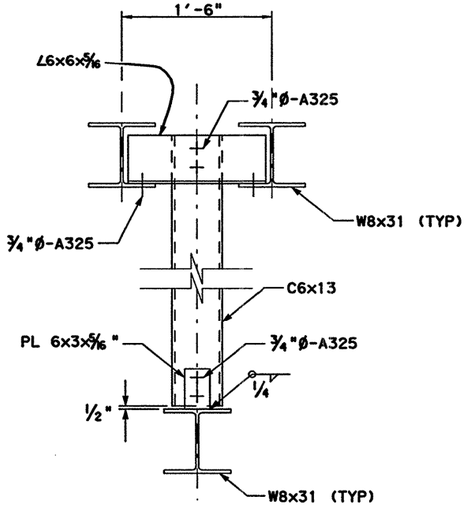


SECTION AT COLUMN

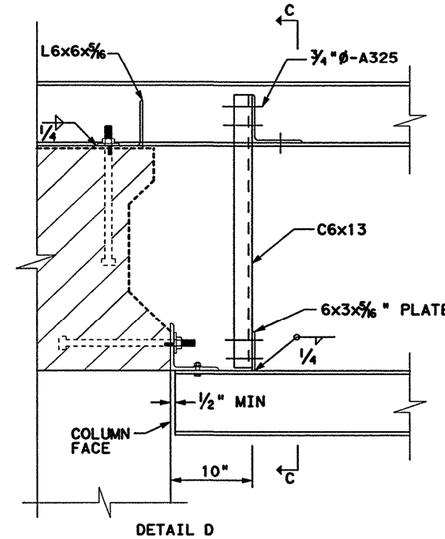


SECTION B

Connection Between Horizontal Z Extrusion and Vertical Z Bracket (Elevation)



SECTION C



DETAIL D

GENERAL NOTES

1. See notes for single sign layout.
2. Bolts to be 3/4" Dia., A325, unless otherwise shown.
3. All steel components to be galvanize
4. Connect to DMS attachments.
5. Center the hole at flanges of both connecting brackets.
6. The existing framing for the concrete T-mounts will remain to accommodate proposed DMS with its vertical support Z brackets.

3/5/2021

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DMS REPLACEMENT

DMS STRUCTURAL SUPPORT DOUBLE SIGN LAYOUT

FOR CONCRETE STRUCTURE AT JAMES AVE

SHEET 2 of 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS JG	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	95
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 3/5/2021
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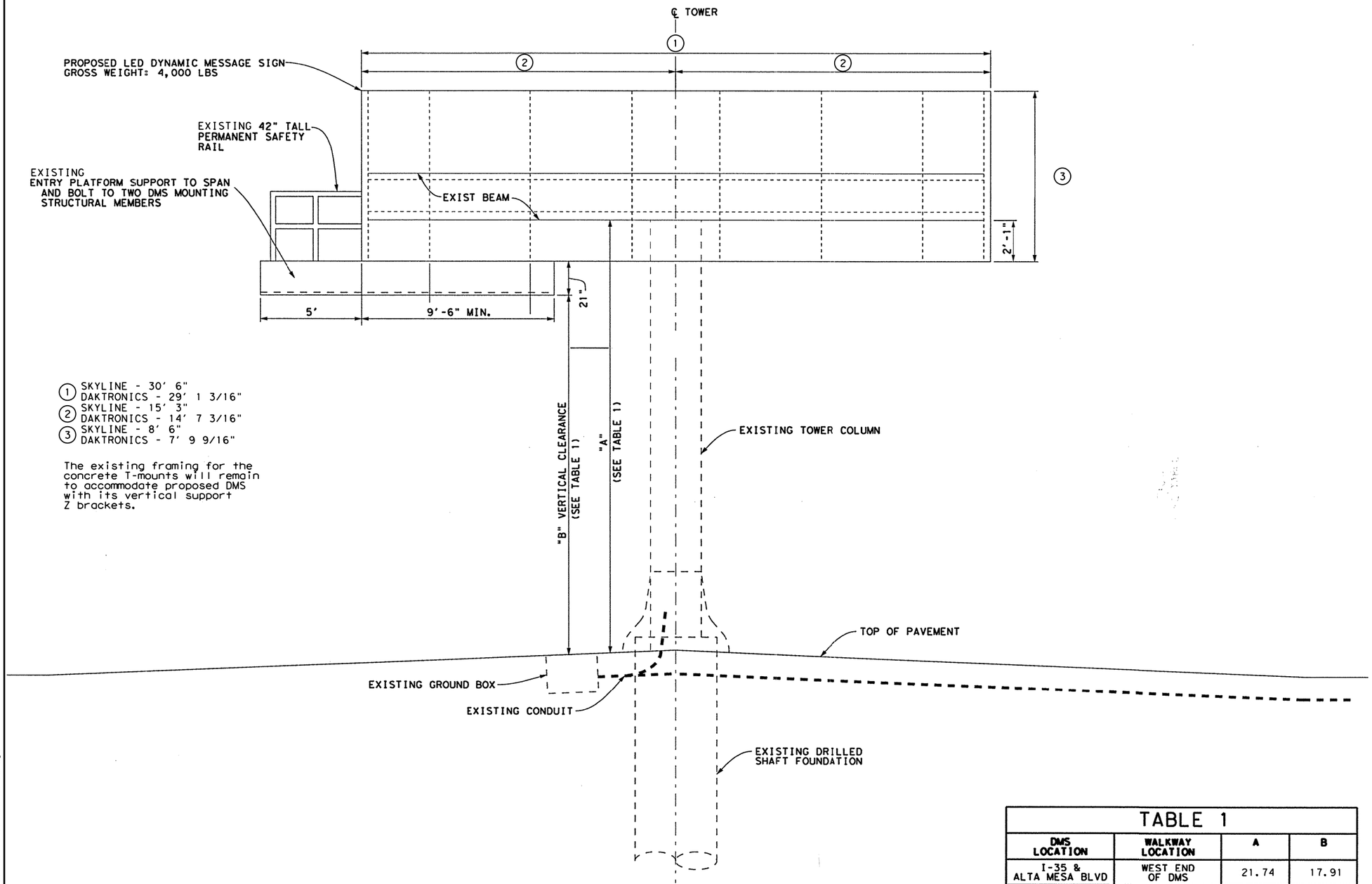
BY: hamza.khan



1. SKYLINE - 30' 6"
   DAKTRONICS - 29' 1 3/16"
2. SKYLINE - 15' 3"
   DAKTRONICS - 14' 7 3/16"
3. SKYLINE - 8' 6"
   DAKTRONICS - 7' 9 9/16"

The existing framing for the concrete T-mounts will remain to accommodate proposed DMS with its vertical support Z brackets.

STRUCTURE ELEVATION

TABLE 1			
DMS LOCATION	WALKWAY LOCATION	A	B
I-35 & ALTA MESA BLVD	WEST END OF DMS	21.74	17.91
I-20 & CAMPUS DR	SOUTH END OF DMS	21.57	17.74
I-20 & GRANBURY RD	SOUTH END OF DMS	21.41	17.58
I-20 & JAMES ST	NORTH END OF DMS	22.49	18.66
I-20 & TRAIL LAKE DR	NORTH END OF DMS	21.91	18.08

DRAWING NOT TO SCALE

General Notes:

1. Designed according to the 2013 edition of the AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions. Designed for a Sustained (Fastest Mile) Wind Velocity of 100 mph with a gust factor of 1.3. Connections are designed for a DMS weight of 4000 lbs. The structural support is designed for an Effective Projected Area (EPA) of 453 sq. ft. based on a DMS nominal width of 30.5 feet and nominal depth of 8.5 feet, with a drag coefficient of 1.7 applied, plus two(Skyline) or four (Daktronics) 1'-8" square flashing beacons with a drag coefficient of 1.2. DMS attachment is designed for a horizontal eccentricity of 2.4 ft. from the face of the concrete beam to the center of gravity of the DMS. Provide an even number of sign supporting brackets (6 minimum), Z5x3¼x⅜, spaced at 5'-6" max. The maximum distance between the sign edge to the nearest supporting bracket is 2'-3".
2. Verify applicable field dimensions before fabrication. Determine the required number and spacing of sign support brackets, along with the Aluminum Extrusion Horizontal Zees provided by the DMS manufacturer, to connect the DMS to the truss.
3. Provide structural steel meeting the requirements of ASTM A36, A572 Gr 50 or A588. Provide connection bolts meeting the requirements of ASTM F3125, Grade A325 or A449 with 1 heavy hex nut, 2 flat washers, and 1 lock washer. Galvanize all parts except stainless steel.
4. Prior to the initialization of DMS mounting, the DMS manufacturer Daktronics must provide and install the 6061-T6 Aluminum Extrusion Horizontal Zees, 4⅛ x ⅝ x3⅛.
5. Adjust the bracket position along the beam depth to achieve the required vertical clearance to be confirmed by the Engineer.
6. When the structure is to be exposed to a highly corrosive environment, provide elastomeric spacer to separate aluminum alloy parts from direct contact with steel.

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DMS REPLACEMENT

DMS STRUCTURAL SUPPORT

DYNAMIC MESSAGE SIGN STRUCTURE ELEVATION

FOR CONCRETE STRUCTURES AT TRAIL LAKE DR, CAMPUS DR, GRANBURY RD, ALTAMESA BLVD, & JAMES AVE

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
JG	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	96
CHECK				
DJB				

PLOTTED: 3/5/2021
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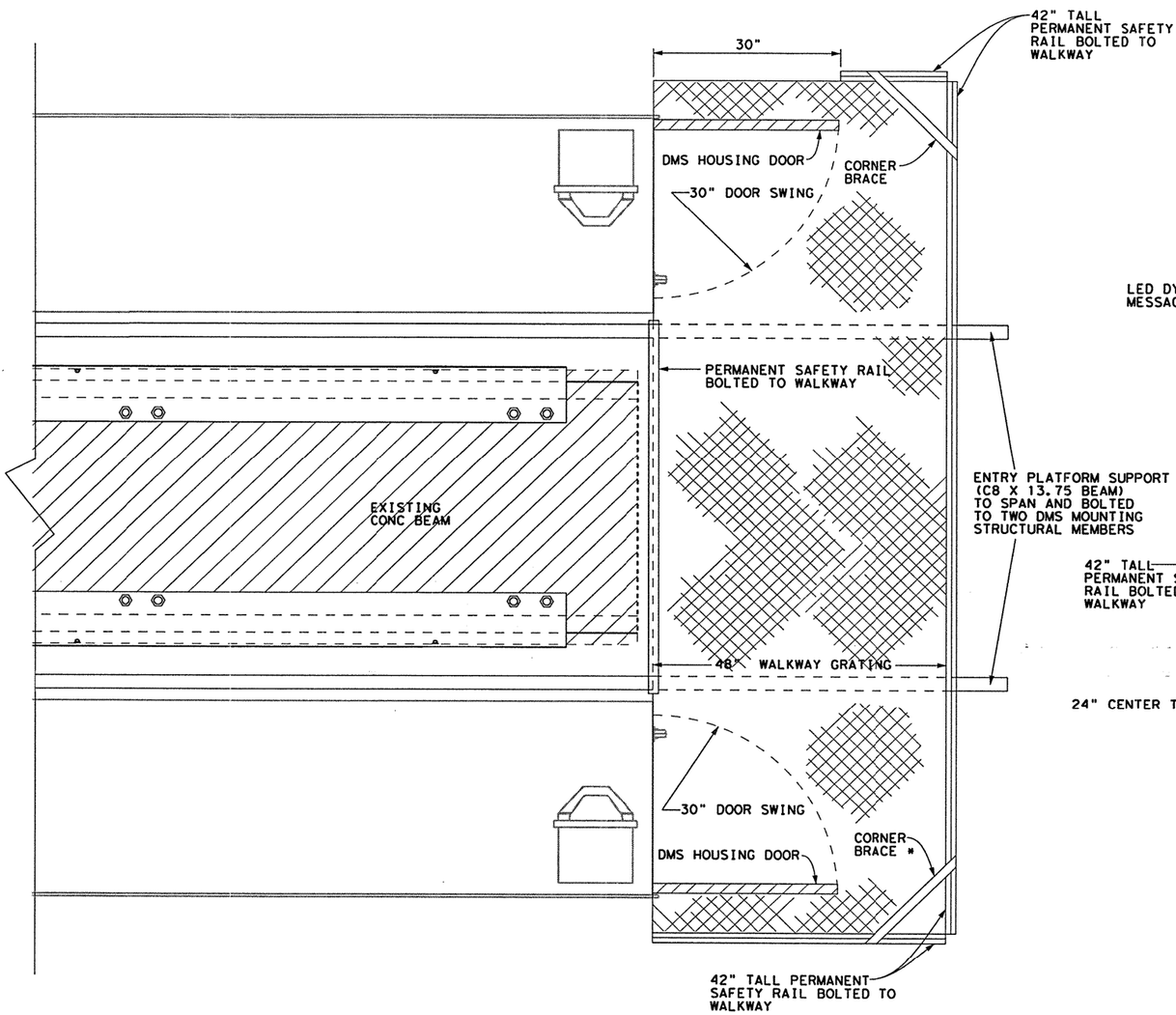
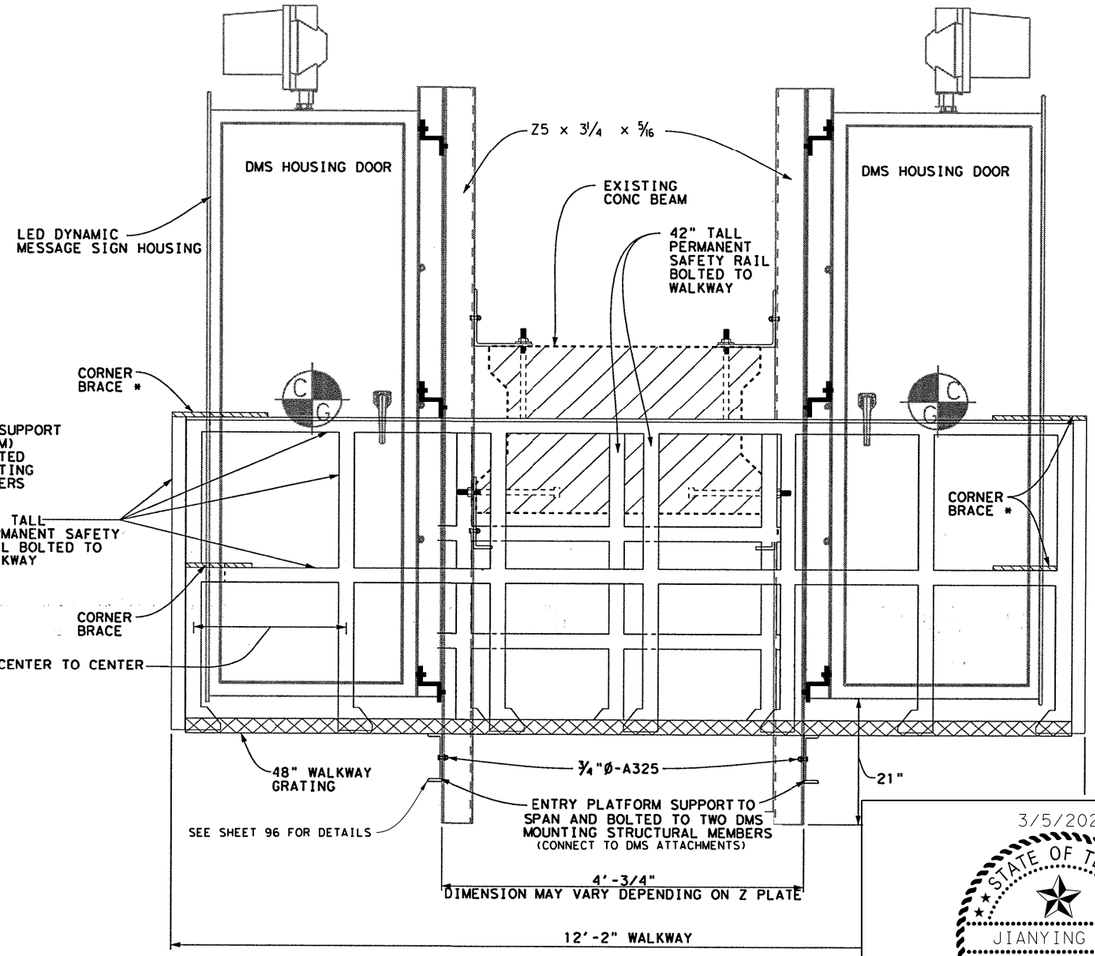
BY: hamza.khan



TOP VIEW

(EXTRUSION HORZ. ZEE ON THE REAR OF DMS NOT SHOWN FOR CLARITY)



FRONT VIEW

(TYPICAL)

LED DYNAMIC MESSAGE SIGN WALKWAY PLATFORM DETAILS FOR BACK TO BACK SIGNS

DRAWING NOT TO SCALE

NOTES:

1. THE EXISTING FRAMING ON THE CONCRETE WILL REMAIN TO ACCOMODATE PROPOSED DMS WITH ITS VERTICAL SUPPORT Z BRACKETS.

3/5/2021

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DMS REPLACEMENT

DMS STRUCTURAL SUPPORT
PLATFORM DETAILS FOR BACK TO BACK SIGNS

FOR CONCRETE STRUCTURE AT ALTAMESA BLVD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS JG	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	97
CHECK DJB	CONTROL	SECTION	JOB	
	0902	90	111	

PLOTTED: 3/5/2021
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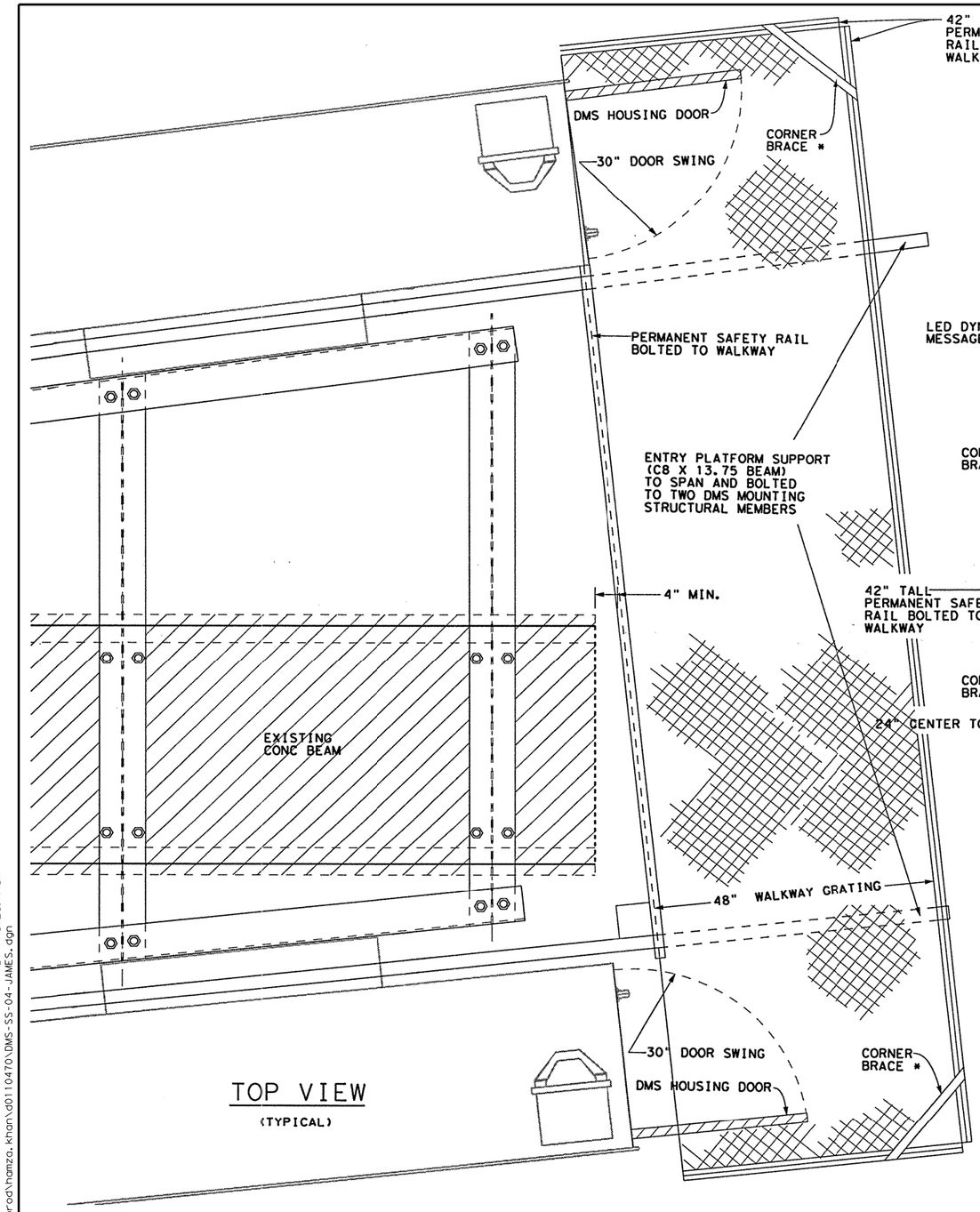
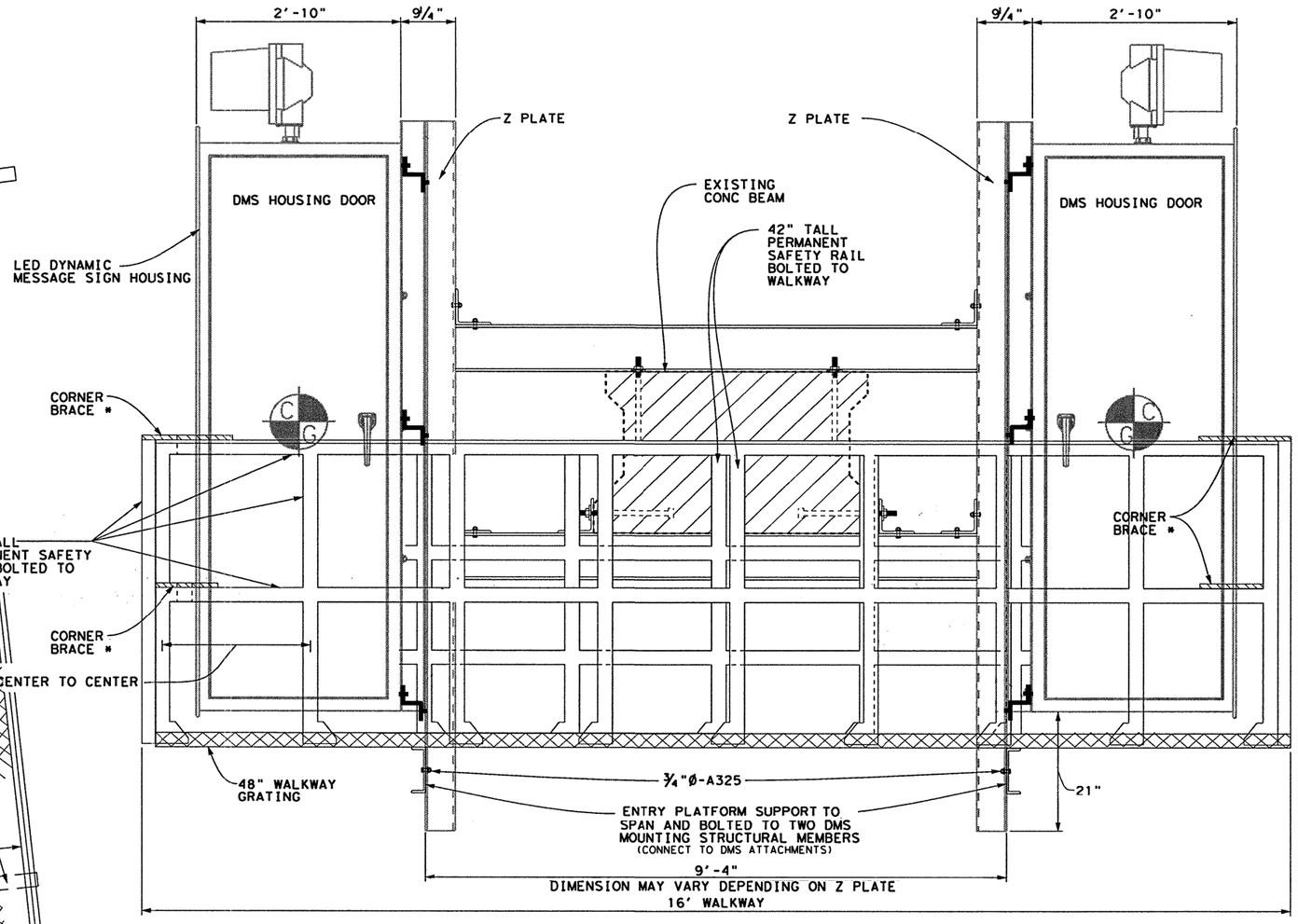
BY: hamza.khan



TOP VIEW

(TYPICAL)



FRONT VIEW

(TYPICAL)

LED DYNAMIC MESSAGE SIGN WALKWAY PLATFORM DETAILS FOR BACK TO BACK SIGNS

(EXTRUSION HORZ. ZEE ON THE REAR OF DMS NOT SHOWN FOR CLARITY)

NOTES:

1. THE EXISTING FRAMING ON THE CONCRETE T-MOUNTS WILL REMAIN TO ACCOMODATE PROPOSED DMS WITH ITS VERTICAL SUPPORT Z BRACKETS.
2. SIZE AND CONDITION OF EXISTING W SHAPES (W8x31) TO BE FIELD VERIFIEd TO SUPPORT PROPOSED DMS AND PLATFORM.

3/5/2021

STATE OF TEXAS
JIANYING GUO
104055
LICENSED
PROFESSIONAL ENGINEER

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DMS REPLACEMENT

DMS STRUCTURAL SUPPORT
PLATFORM DETAILS FOR BACK TO BACK SIGNS

FOR CONCRETE STRUCTURE AT JAMES AVE

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS JG	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DL	TEXAS	FTW	TARRANT	98
	CONTROL	SECTION	JOB	
CHECK DJB	0902	90	111	

PLOTTED: 3/5/2021
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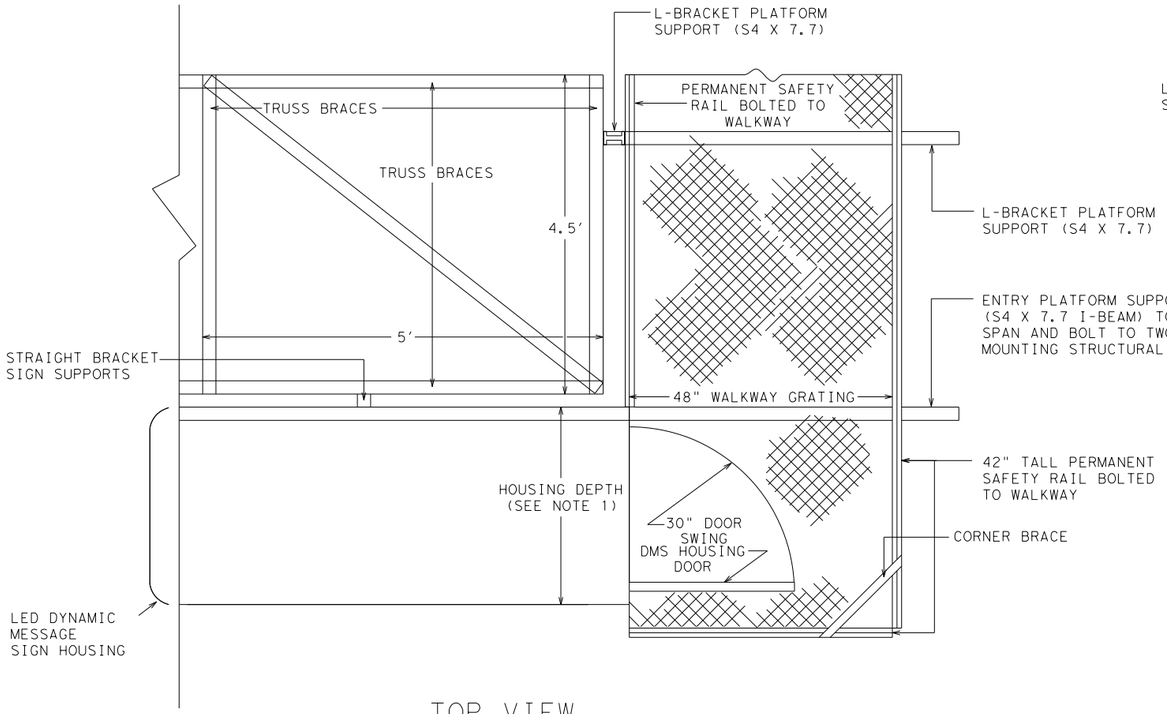
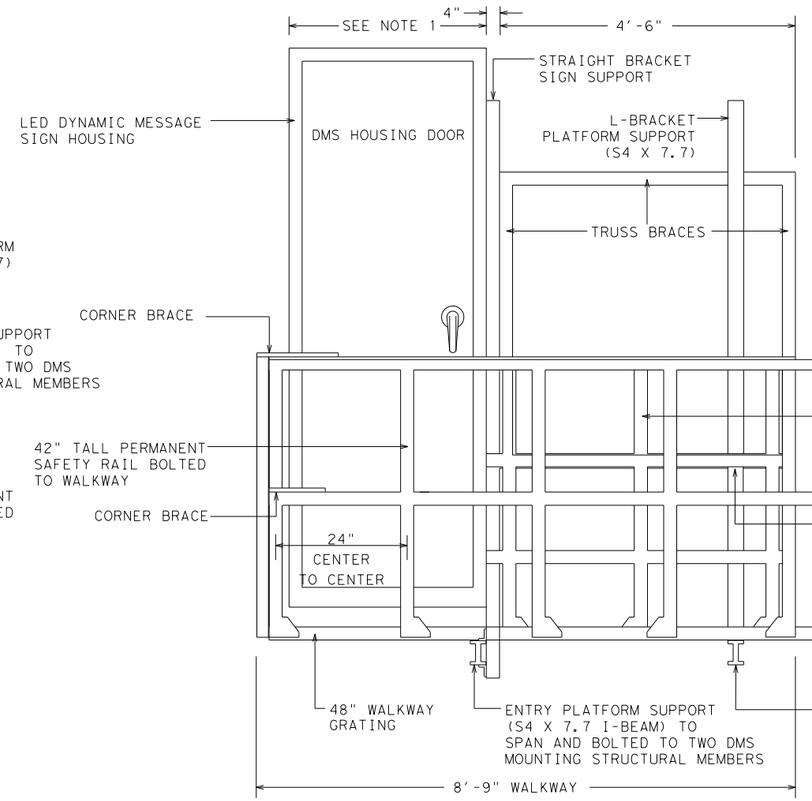
BY: hamza.khan



TOP VIEW
(TYPICAL)



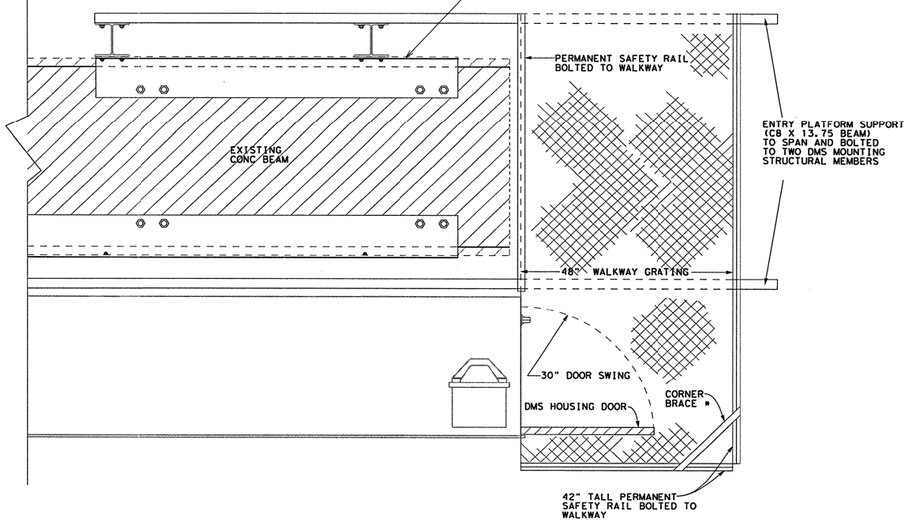
FRONT VIEW
(TYPICAL)

THE EXISTING STEEL FRAMING WILL REMAIN TO ACCOMMODATE PROPOSED DMS WITH ITS VERTICAL SUPPORT Z BRACKETS.

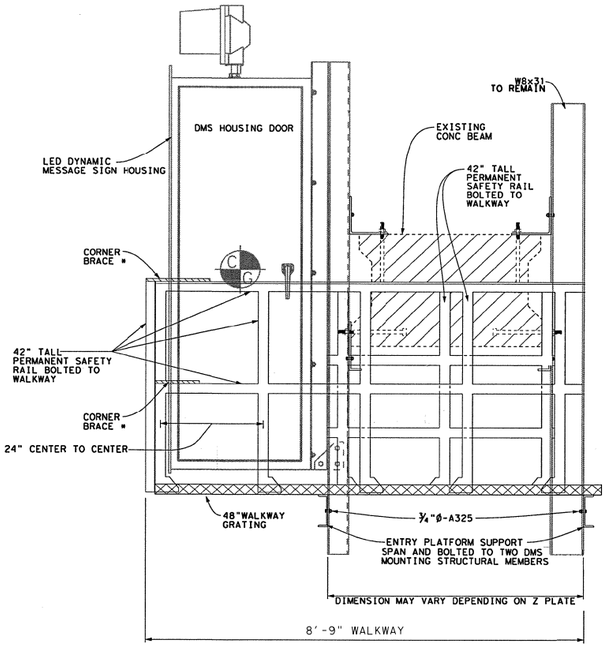
THE WALKWAY PLATFORM WILL NEED TO BE UNINSTALLED AND REINSTALLED AFTER THE NEW VERTICAL Z BRACKETS ARE INSTALLED.

NOTES:

1. SEE DMS MANUFACTURER'S PLAN FOR DIMENSION.



TOP VIEW
(TYPICAL)



FRONT VIEW
(TYPICAL)

DRAWING NOT TO SCALE

3/5/2021

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Texas Department of Transportation

DMS REPLACEMENT

DMS STRUCTURAL SUPPORT
WALKWAY PLATFORM DETAILS FOR SINGLE SIGN

FOR CONCRETE STRUCTURES AT TRAIL LAKE DR, CAMPUS DR, & GRANBURY RD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
JG	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	99
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 3/5/2021
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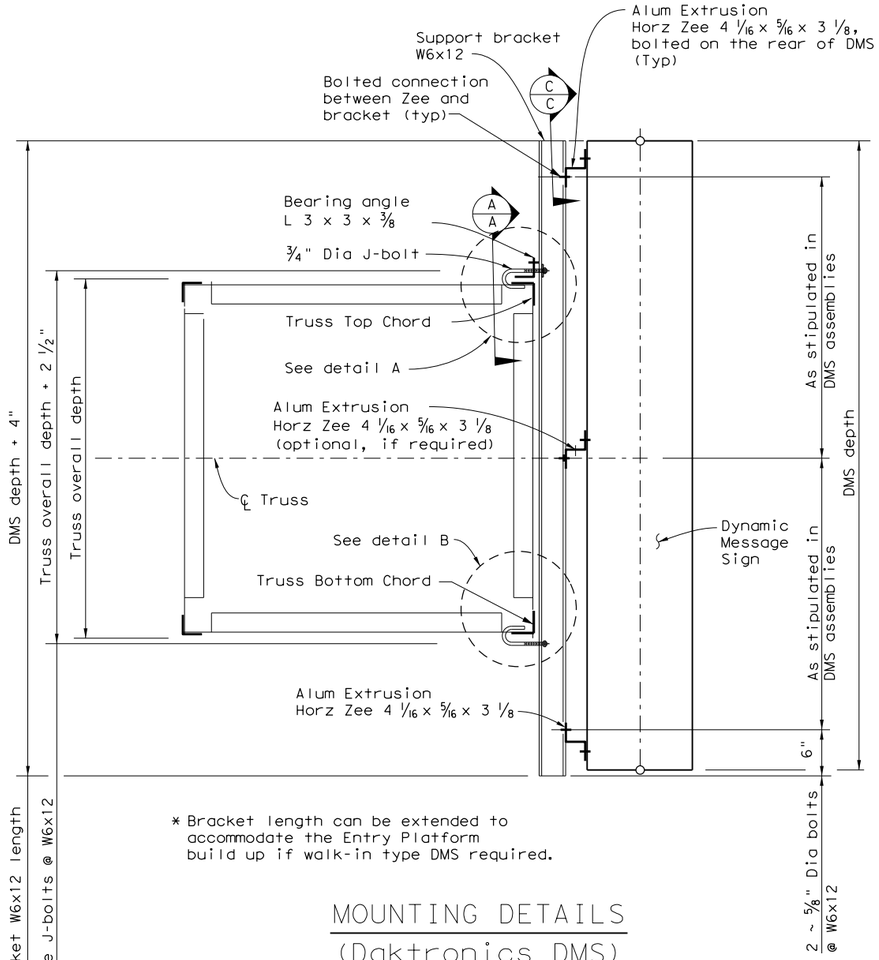
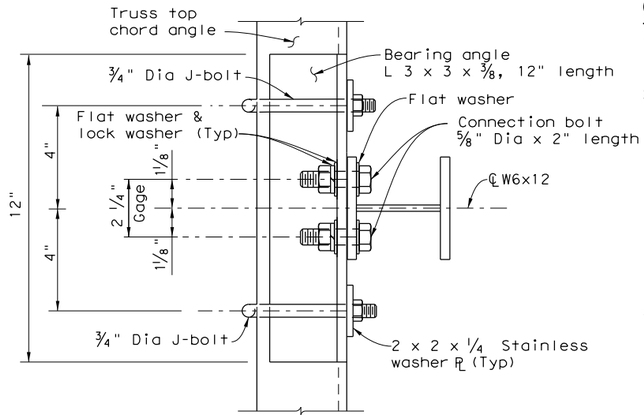
BY: hamza.khan

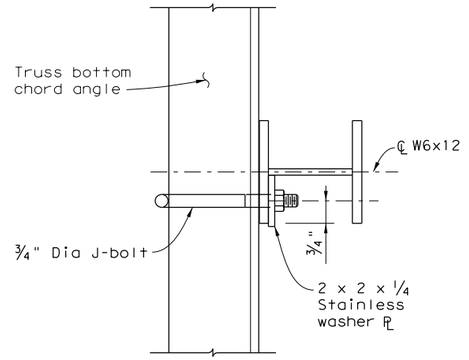


* Bracket length can be extended to accommodate the Entry Platform build up if walk-in type DMS required.

MOUNTING DETAILS
(Daktronics DMS)



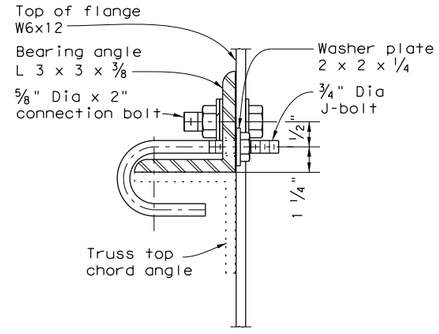
TOP VIEW
TRUSS TOP CONNECTION



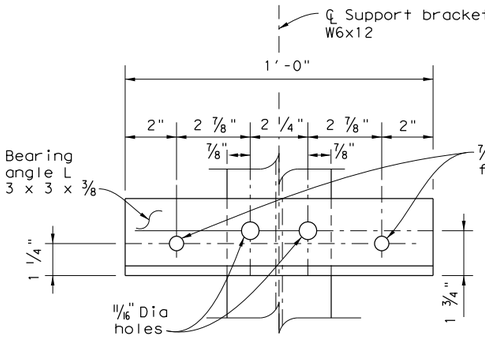
TOP VIEW
TRUSS BOTTOM CONNECTION

GENERAL NOTES:

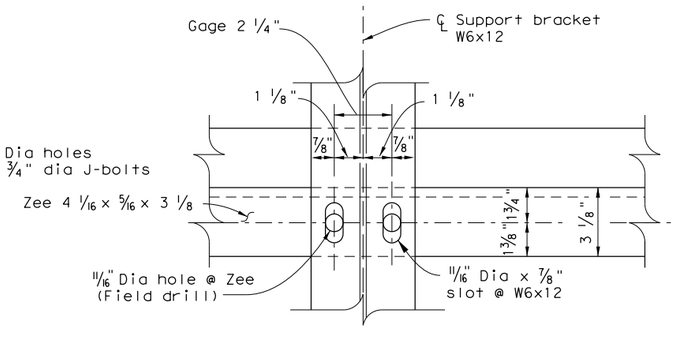
1. Determine the adequacy of the overhead sign support structure to support the dynamic message sign (DMS) prior to attaching the sign to the truss.
2. Designed according to the 1994 edition of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions. Designed for a Sustained (Fastest Mile) Wind Velocity of 100 mph with a gust factor of 1.3. Connections are designed for a DMS weight of 4000 lbs. The structural support is designed for an Effective Projected Area (EPA) of 453 sq. ft. based on a DMS nominal width of 29.1 feet and nominal depth of 7.8 feet, with a drag coefficient of 1.7 applied, plus four 1'-8" square flashing beacons with a drag coefficient of 1.2. DMS attachment is designed for a horizontal eccentricity of 2.4 ft. from the face of the truss to the center of gravity of the DMS. Provide an even number of sign supporting brackets (6 minimum), W6x12, spaced at 5'-6" max. The maximum distance between the sign edge to the nearest supporting bracket is 2'-3".
3. Verify applicable field dimensions before fabrication. Determine the required number and spacing of sign support brackets, along with the Aluminum Extrusion Horizontal Zees provided by the DMS manufacturer, to connect the DMS to the truss. For the J-bolt connection of DMS to overhead sign structure, align each arranged sign bracket with its bearing angle to avoid conflict with the truss connection bolts at the point of attachment.
4. Provide structural steel meeting the requirements of ASTM A36, A572 Gr 50 or A588. Provide connection bolts meeting the requirements of ASTM F3125, Grade A325 or A449 with 1 heavy hex nut, 2 flat washers, and 1 lock washer. Provide Type 304 stainless steel J bolt and washer plate, with bolt minimum yield strength of 50 ksi and an elongation of 16 percent in 2 inches. Galvanize all parts except stainless steel
5. Prior to the initialization of DMS mounting, the DMS manufacturer must provide and install the 6061-T6 Aluminum Extrusion Horizontal Zees, 4 1/16 x 5/16 x 3 1/8.
6. The sign support bracket attached to the truss shown here is an example only. Adjust the bracket position along the truss depth to achieve the required vertical clearance to be confirmed by the Engineer.
7. When the structure is to be exposed to a highly corrosive environment, provide elastomeric spacer to separate aluminum alloy parts from direct contact with steel.



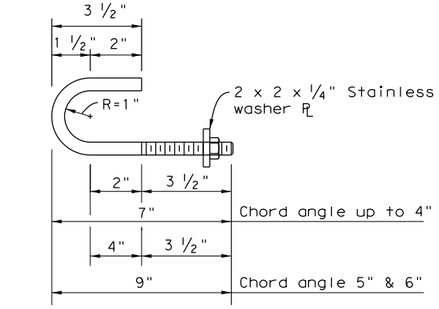
DETAIL A



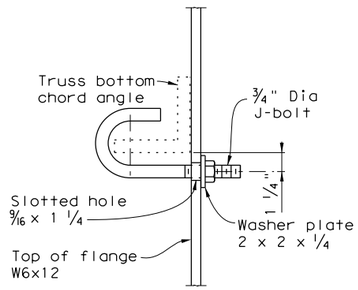
SECTION A-A
(Truss chord angle not shown)



SECTION C-C



3/4" Dia J-BOLT



DETAIL B

3/5/2021

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DMS REPLACEMENT

DAKTRONICS DMS-TO-TRUSS MOUNTING

DMS (HZ-2)-21 MOD

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
JG	6	SEE TITLE SHEET		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
JG	TEXAS	FTW	TARRANT	100
CHECK	CONTROL	SECTION	JOB	
DL	0902	90	111	
CHECK				
DJB				

PLOTTED: 3/5/2021
FILENAME: c:\pwworking\kha\pwprod\hamza.khan\d0110470\dms-mnt-to-truss.dgn
BY: hamza.khan

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).

2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.

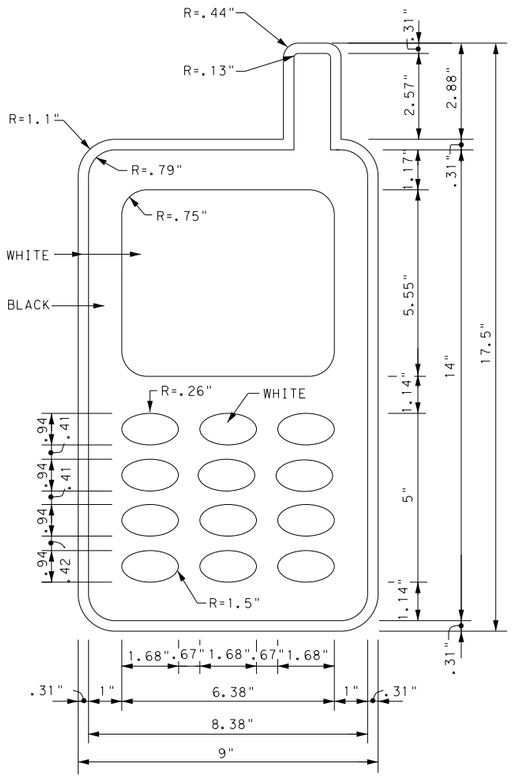
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY APPAREL NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.



3.0" Radius, 1.25" Border, 0.75" Indent, Black on Yellow;
"STAY ALERT" Font: D
3.0" Radius, 1.25" Border, 0.75" Indent, Black on Orange;
"TALK OR TEXT LATER" Font: C specified length;

SIGN DETAIL (G20-10T)

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3118

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	111	VA
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13	FTW	TARRANT		101

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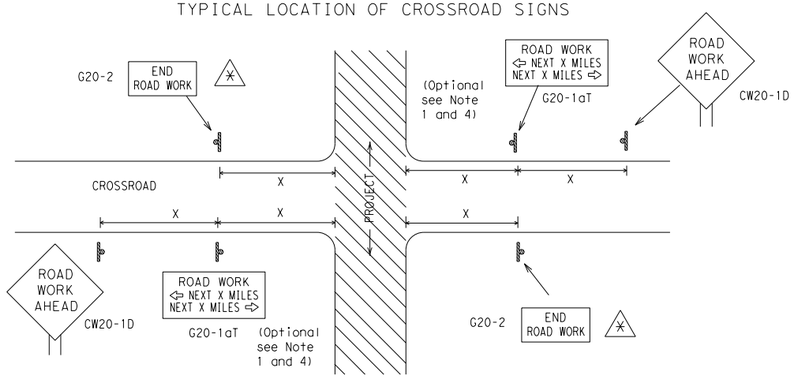
DATE: 2/23/2021 9:57:22 AM
FILE: c:\pwworking\khd\pwprod\nate.taylor\d0110470\BC(2)-14.dgn

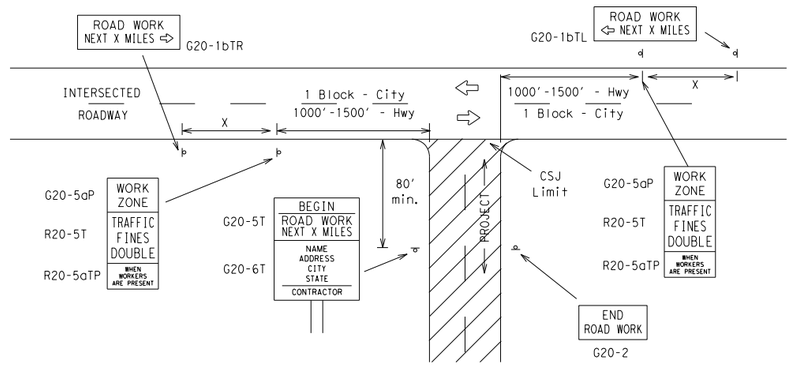
TYPICAL LOCATION OF CROSSROAD SIGNS



✳ May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign Spacing "X" △
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
✳	✳[3]

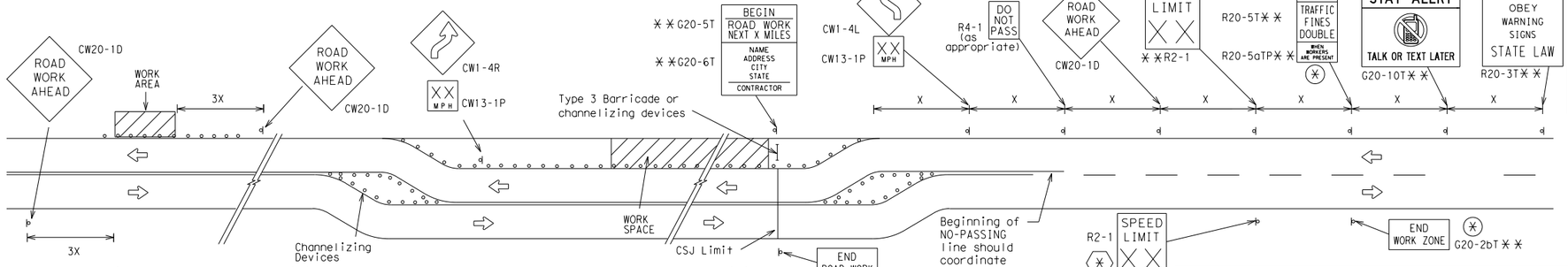
✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

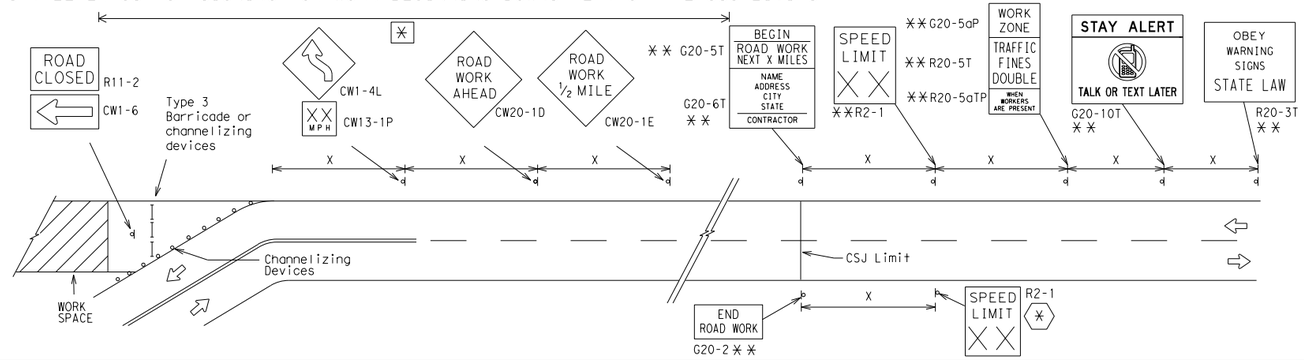
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T)sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

(✳) The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

✳✳ Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.

✳ Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

(✳) Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND	
⊢⊣	Type 3 Barricade
○ ○ ○	Channelizing Devices
▬	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

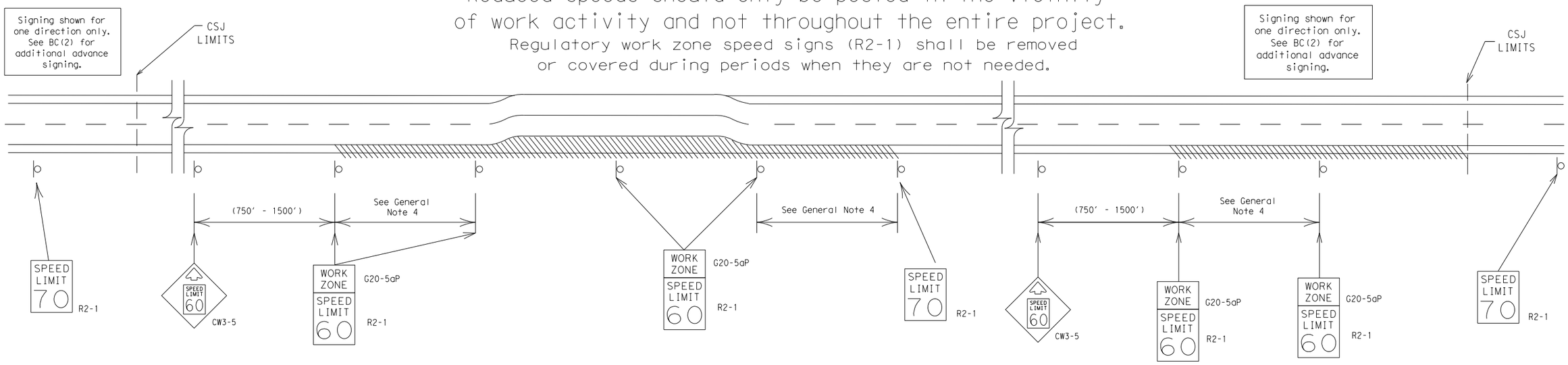
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	111	VA
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	FTW	TARRANT		102

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the travelled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0902	90	111	VA
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		103

97

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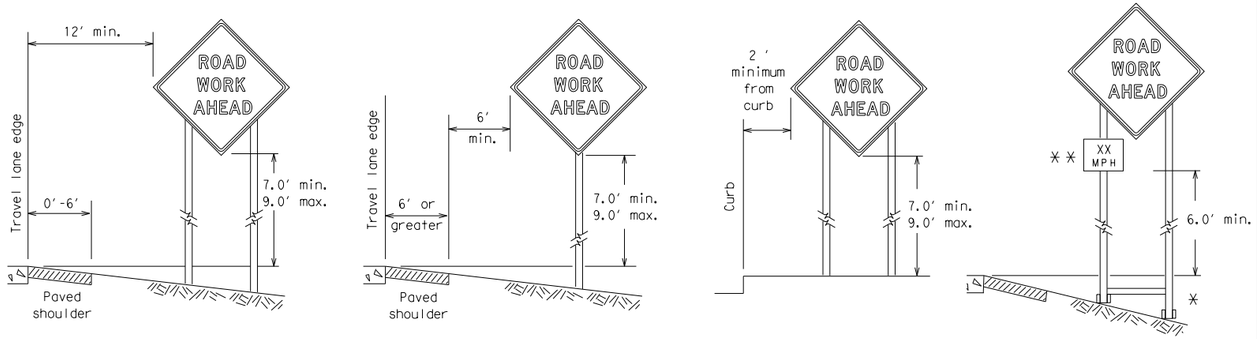
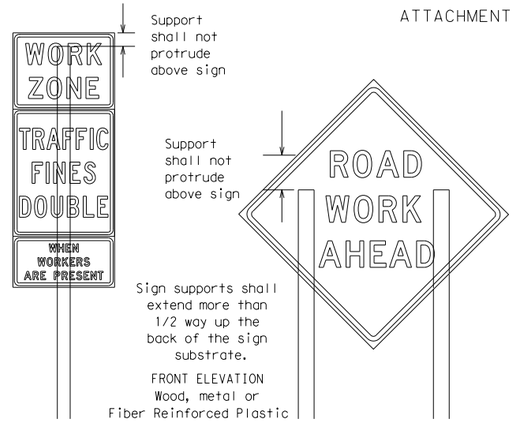
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



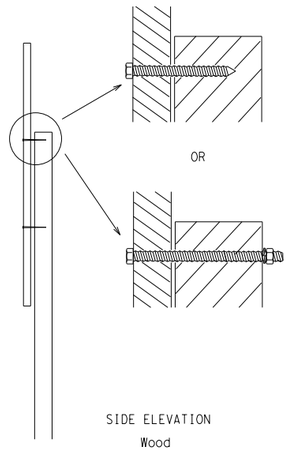
⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

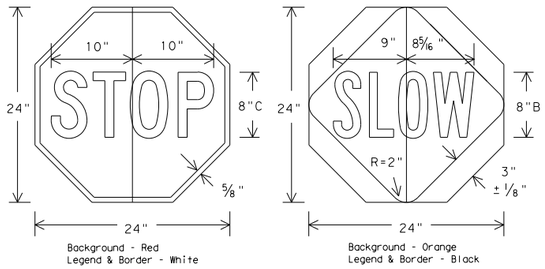


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectorized.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6′ to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

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	FTW	TARRANT		104

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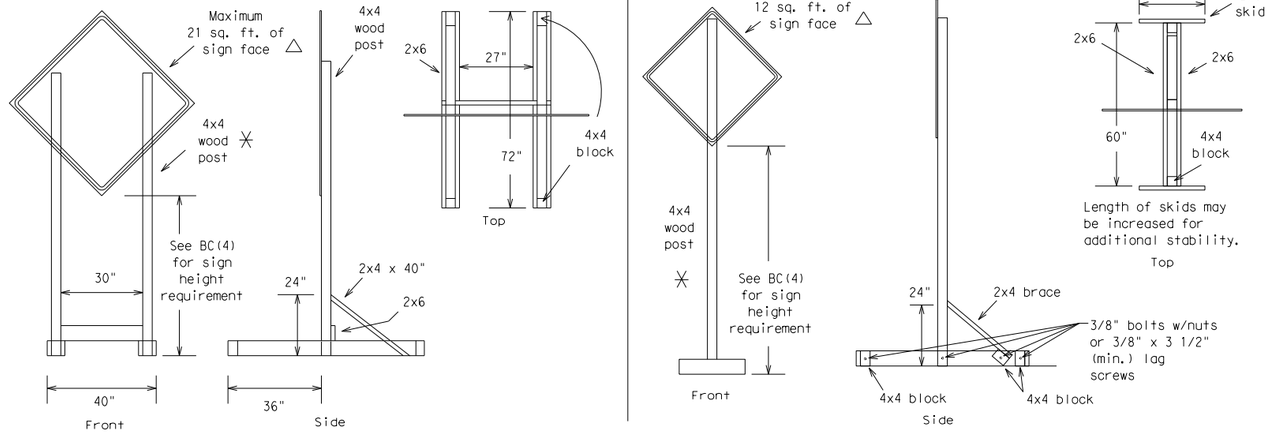
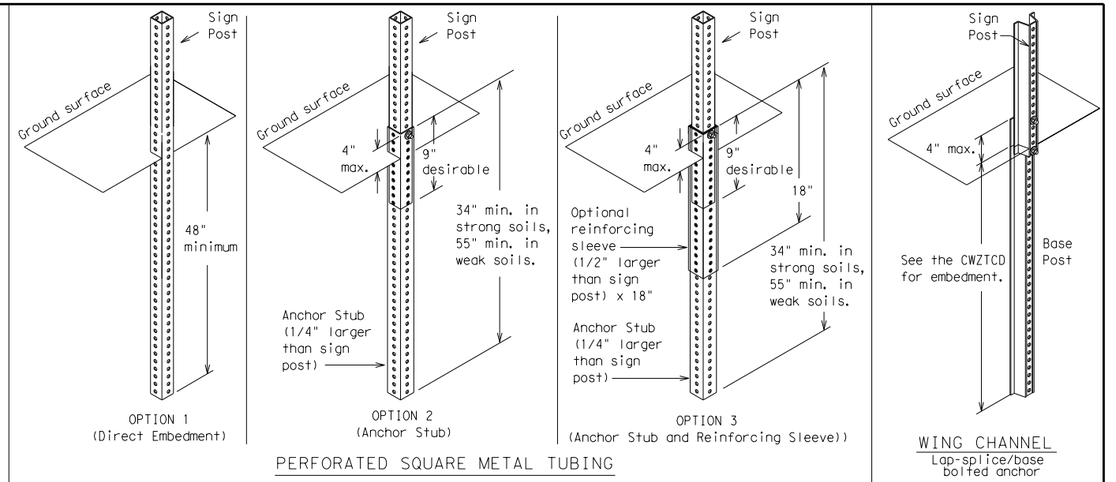


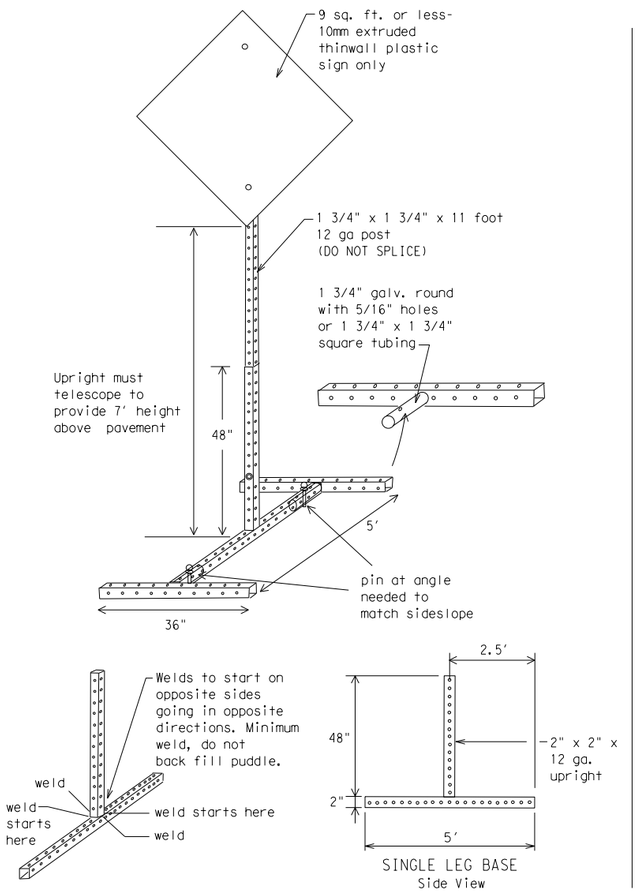
SKID MOUNTED WOOD SIGN SUPPORTS

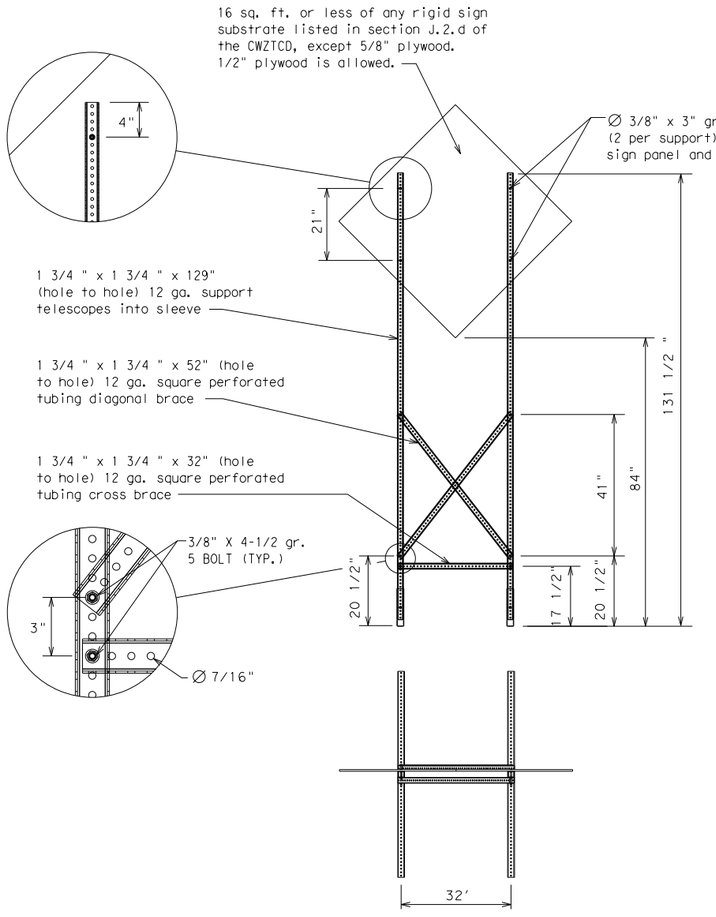
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

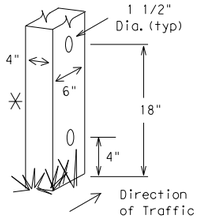


GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.

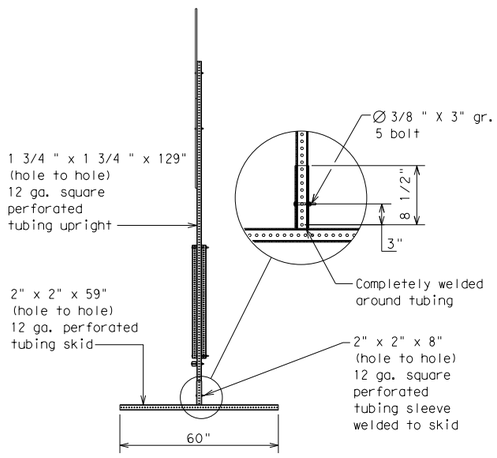






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

□ See BC(4) for definition of "Work Duration."

✳ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

△ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

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SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

Roadway designation # IH-number, US-number, SH-number, FM-number

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- FREEWAY CLOSED X MILE
- FRONTAGE ROAD CLOSED
- ROAD CLOSED AT SH XXX
- SHOULDER CLOSED XXX FT
- ROAD CLSD AT FM XXXX
- RIGHT LN CLOSED XXX FT
- RIGHT X LANES CLOSED
- RIGHT X LANES OPEN
- CENTER LANE CLOSED
- DAYTIME LANE CLOSURES
- NIGHT LANE CLOSURES
- I-XX SOUTH EXIT CLOSED
- VARIOUS LANES CLOSED
- EXIT XXX CLOSED X MILE
- EXIT CLOSED
- RIGHT LN TO BE CLOSED
- MALL DRIVEWAY CLOSED
- X LANES CLOSED TUE - FRI
- XXXXXXXX BLVD CLOSED

Other Condition List

- ROADWORK XXX FT
- ROAD REPAIRS XXXX FT
- FLAGGER XXXX FT
- LANE NARROWS XXXX FT
- RIGHT LN NARROWS XXXX FT
- TWO-WAY TRAFFIC XX MILE
- MERGING TRAFFIC XXXX FT
- CONST TRAFFIC XXX FT
- LOOSE GRAVEL XXXX FT
- UNEVEN LANES XXXX FT
- DETOUR X MILE
- ROUGH ROAD XXXX FT
- ROADWORK PAST SH XXXX
- ROADWORK NEXT FRI-SUN
- BUMP XXXX FT
- US XXX EXIT X MILES
- TRAFFIC SIGNAL XXXX FT
- LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

- MERGE RIGHT
- FORM X LINES RIGHT
- DETOUR NEXT X EXITS
- USE XXXXX RD EXIT
- USE EXIT XXX
- USE EXIT I-XX NORTH
- STAY ON US XXX SOUTH
- USE I-XX E TO I-XX N
- TRUCKS USE US XXX N
- WATCH FOR TRUCKS
- WATCH FOR TRUCKS
- EXPECT DELAYS
- EXPECT DELAYS
- PREPARE TO STOP
- REDUCE SPEED XXX FT
- END SHOULDER USE
- USE OTHER ROUTES
- WATCH FOR WORKERS
- STAY IN LANE *

Location List

- AT FM XXXX
- BEFORE RAILROAD CROSSING
- NEXT X MILES
- PAST US XXX EXIT
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

- SPEED LIMIT XX MPH
- MAXIMUM SPEED XX MPH
- MINIMUM SPEED XX MPH
- ADVISORY SPEED XX MPH
- RIGHT LANE EXIT
- USE CAUTION
- DRIVE SAFELY
- DRIVE WITH CARE

** Advance Notice List

- TUE-FRI XX AM- X PM
- APR XX-XX X PM-X AM
- BEGINS MONDAY
- BEGINS MAY XX
- MAY X-X XX PM - XX AM
- NEXT FRI-SUN
- XX AM TO XX PM
- NEXT TUE AUG XX
- TONIGHT XX PM- XX AM

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the "Flagger Symbol"(CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

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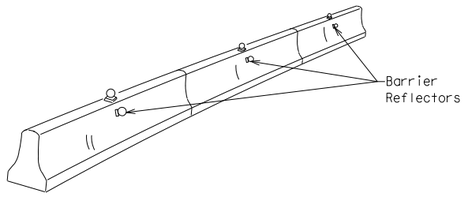
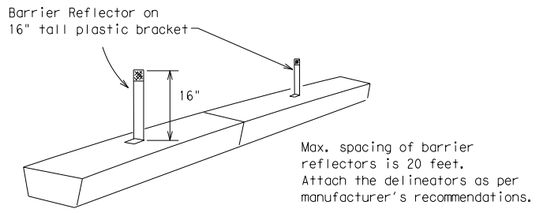
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

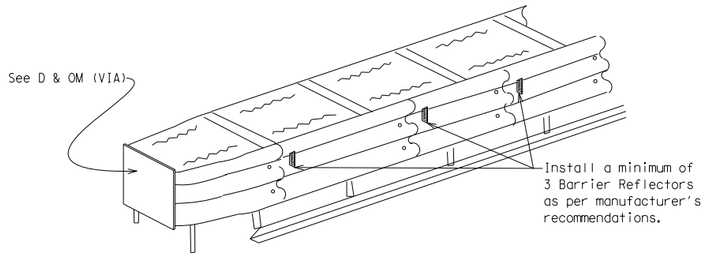


CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.



LOW PROFILE CONCRETE BARRIER (LPCB)

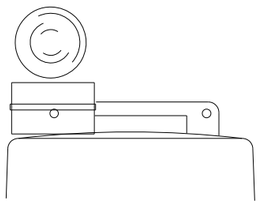


DELINEATION OF END TREATMENTS

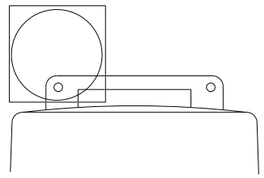
END TREATMENTS FOR
CTB'S USED
IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square.Must have a yellow reflective surface area of at least 30 square inches

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

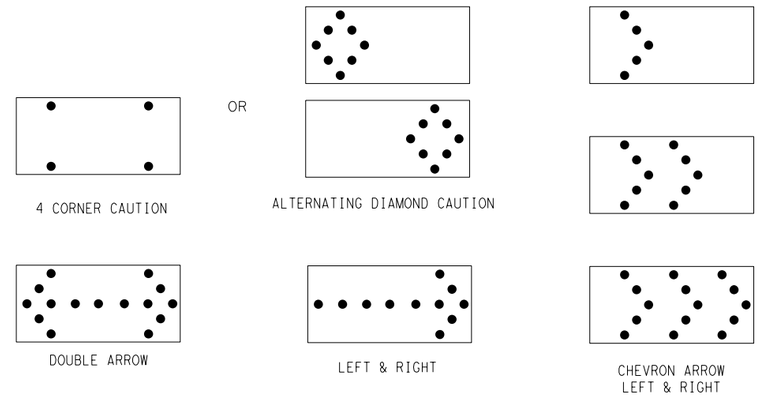
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION
Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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7-13	FTW	TARRANT		107

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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

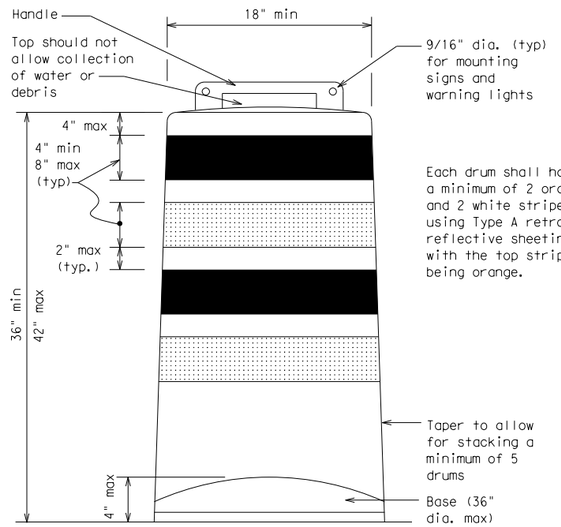
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

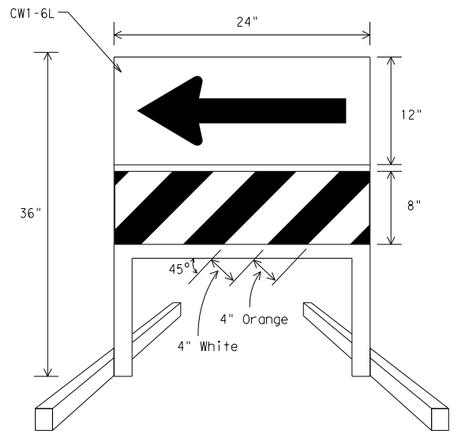
RETROREFLECTIVE SHEETING

1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

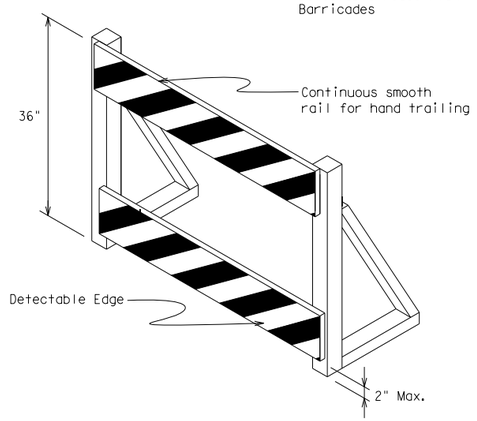




DIRECTION INDICATOR BARRICADE

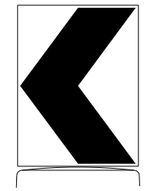
1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.

This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades

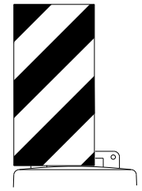


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades may use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

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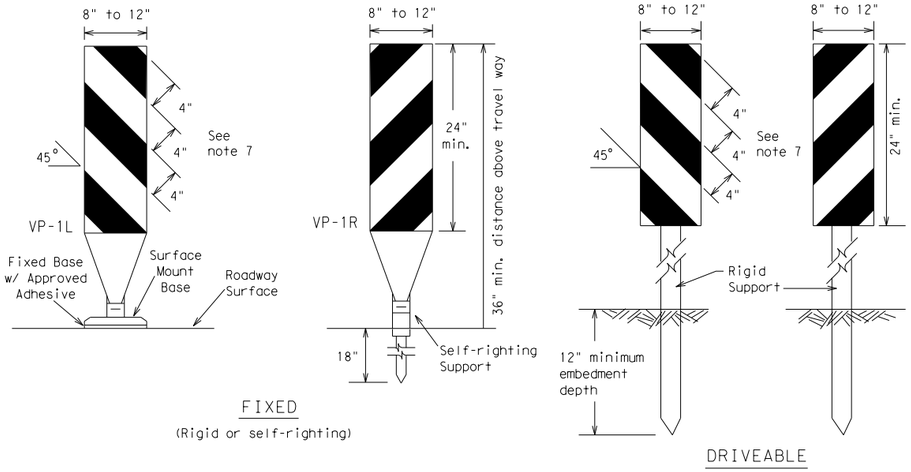
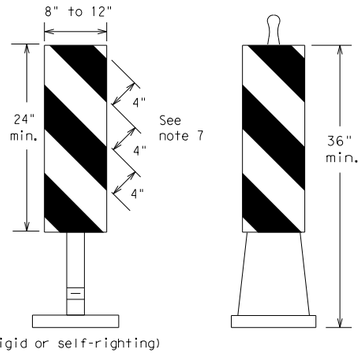


FIXED

(Rigid or self-righting)

DRIVEABLE

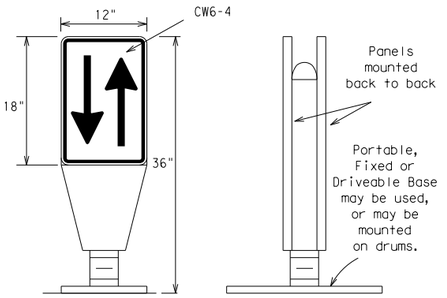


(Rigid or self-righting)

PORTABLE

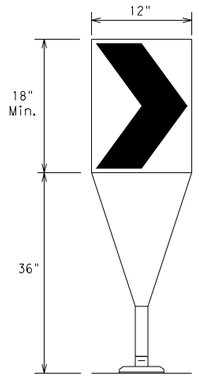
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



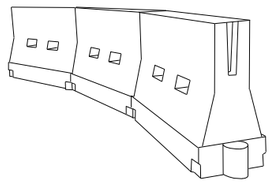
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10) placed near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

Posted Speed *	Formula	Minimum Desirable Taper Lengths * * 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

* * Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

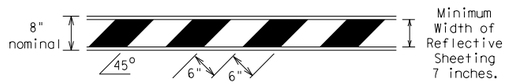
BC(9)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0902	90	111	VA
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		109

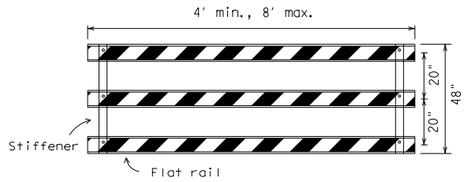
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



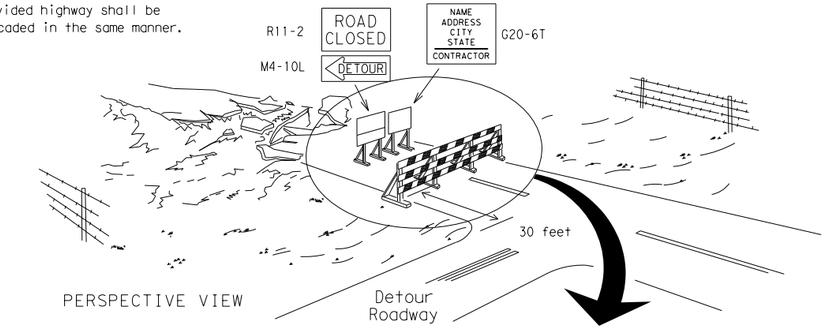
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

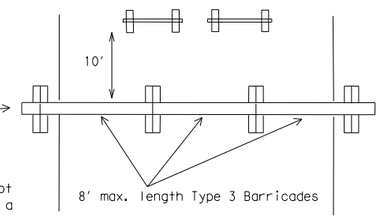
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

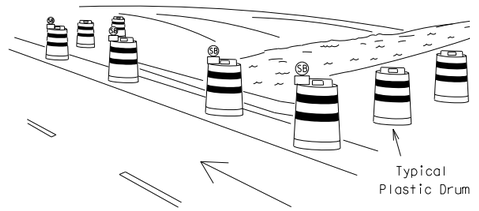
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

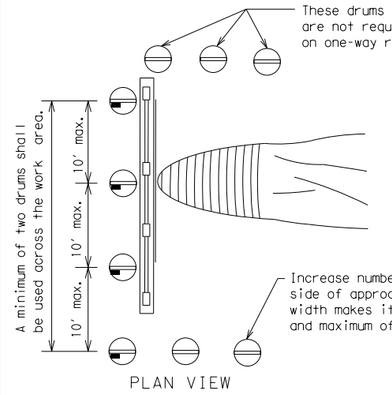
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

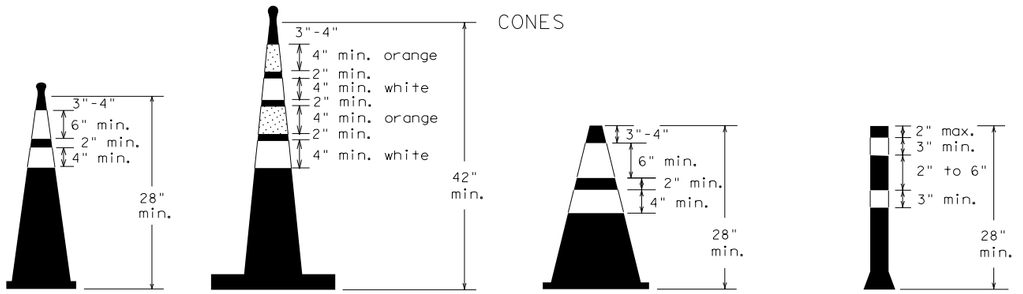
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.



LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones

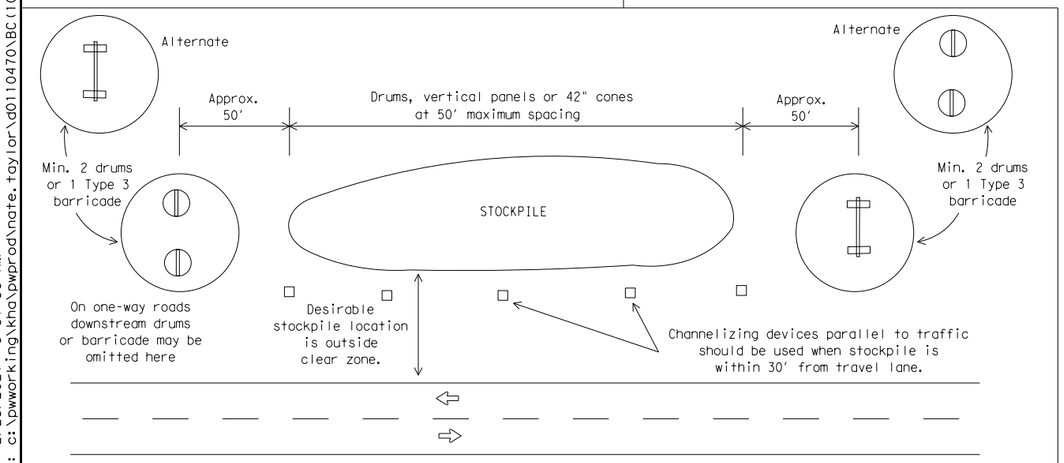
One-Piece cones

Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

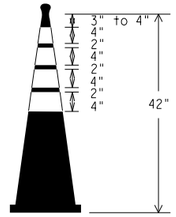
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

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REVISIONS	0902	90	111	VA
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	FTW	TARRANT		110

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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

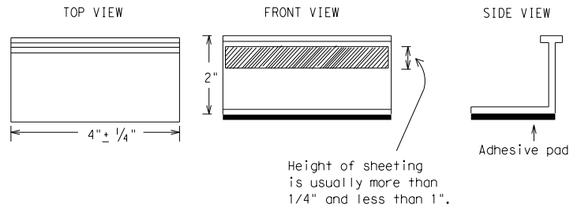
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0902	90	111	VA
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1-02 7-13	FTW	TARRANT		111
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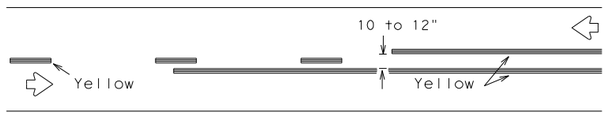
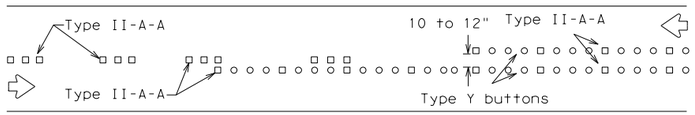
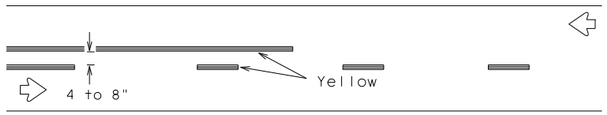
PAVEMENT MARKING PATTERNS



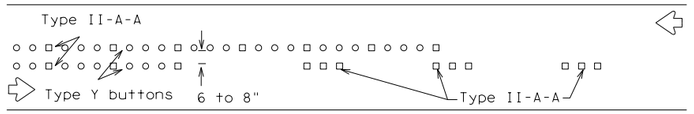
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



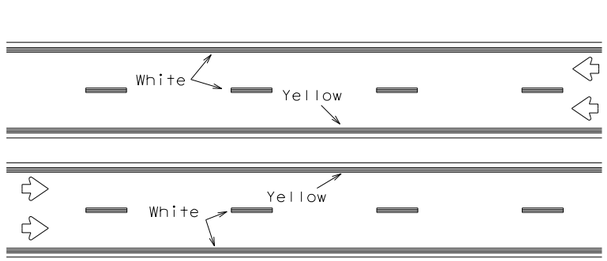
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



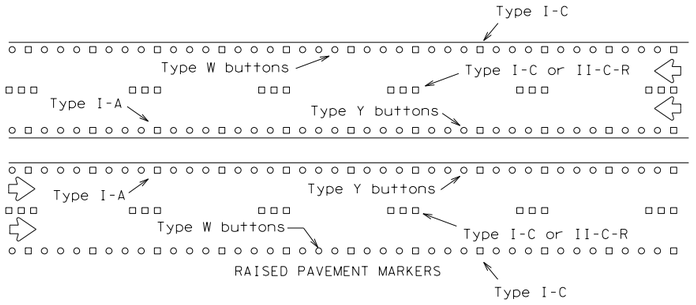
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



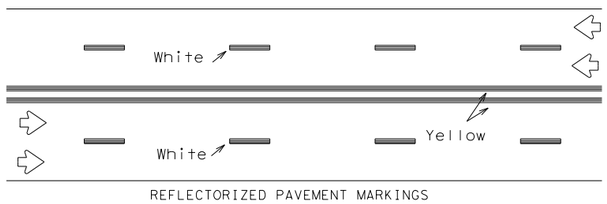
REFLECTORIZED PAVEMENT MARKINGS



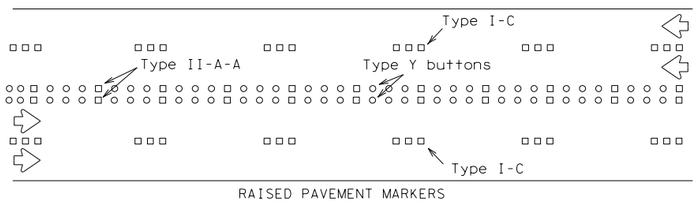
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



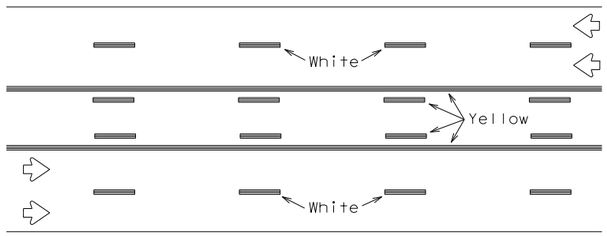
REFLECTORIZED PAVEMENT MARKINGS



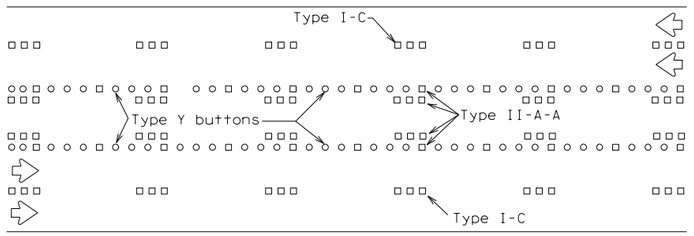
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

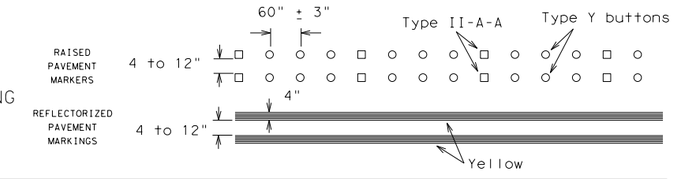
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

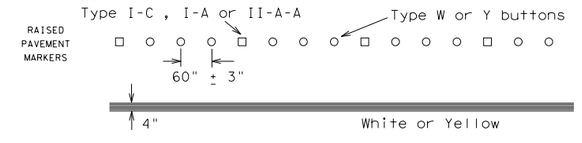
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

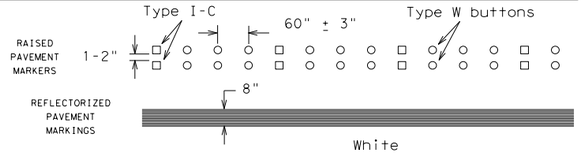


EDGE LINE OR SINGLE NO-PASSING LINE



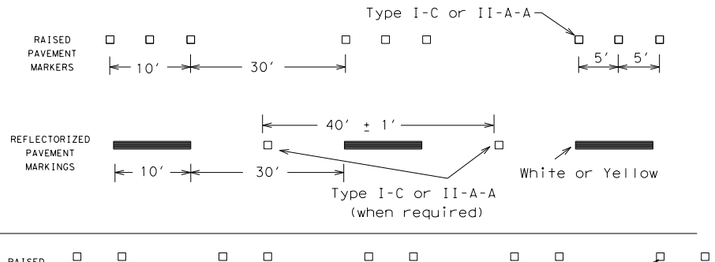
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

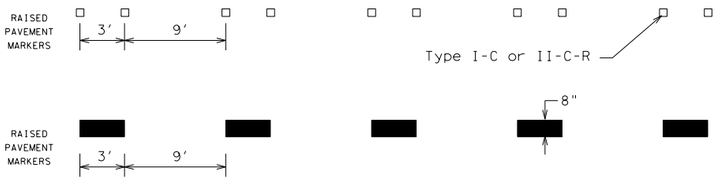


BROKEN LINES

CENTER LINE OR LANE LINE

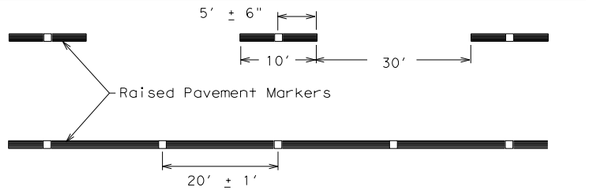


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	111	VA
1-97 9-07	DIST	COUNTY		SHEET NO.
2-98 7-13	FTW	TARRANT		112
11-02 8-14				

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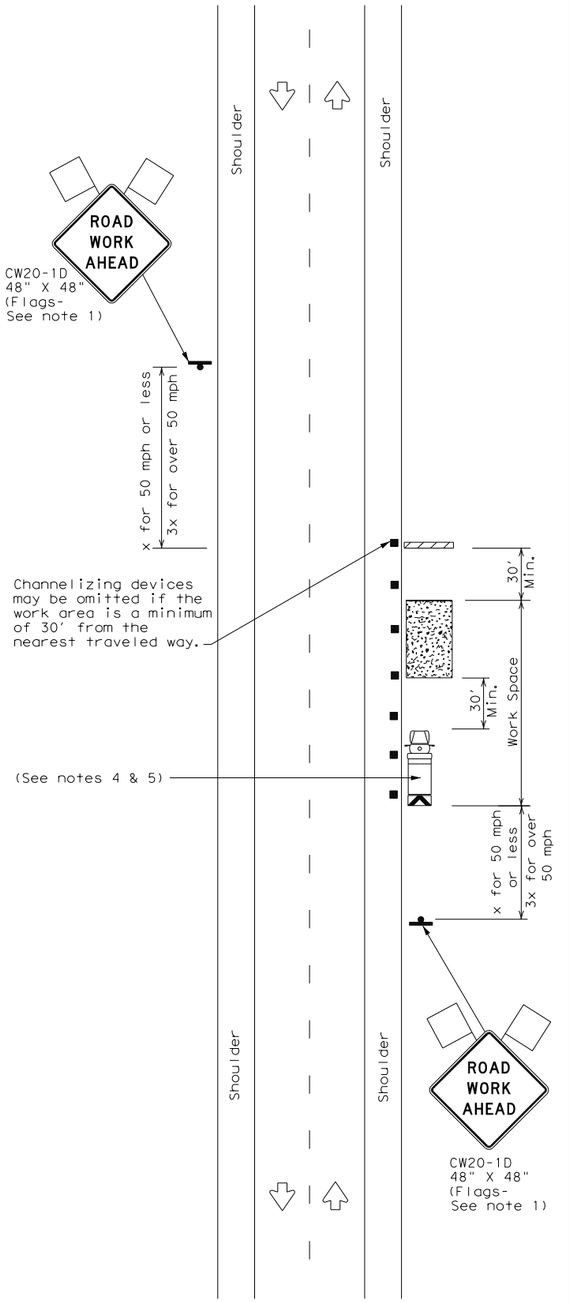
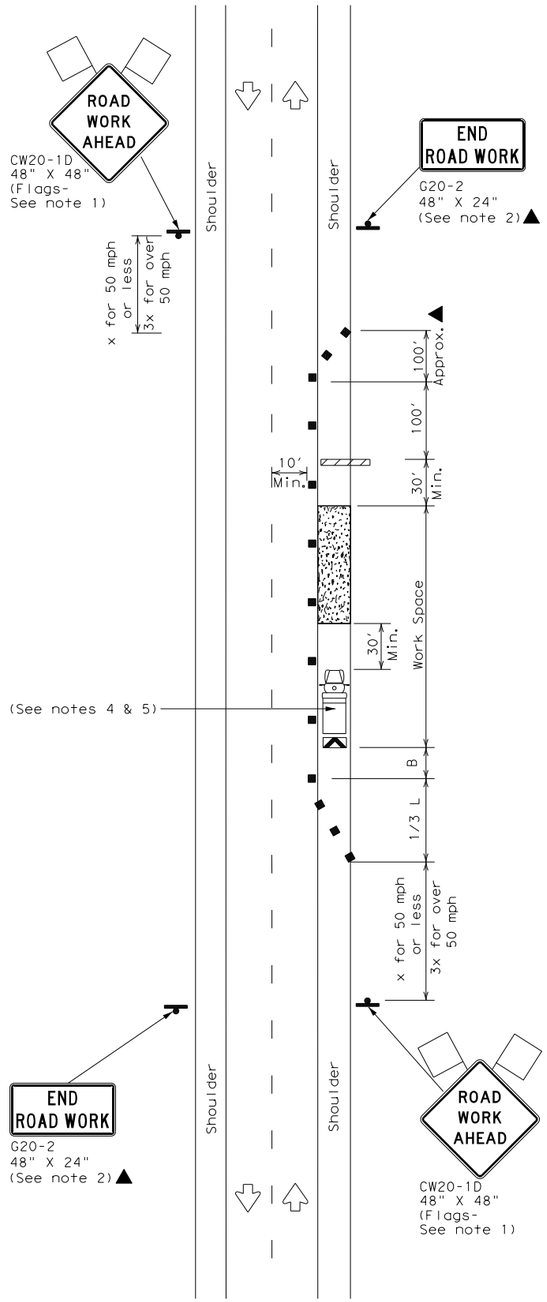
DATE: 2/23/2021 9:57:44 AM
FILE: c:\pwworking\kha\pwprod\nate.taylor\d0110470\tcp2-1-18.dgn



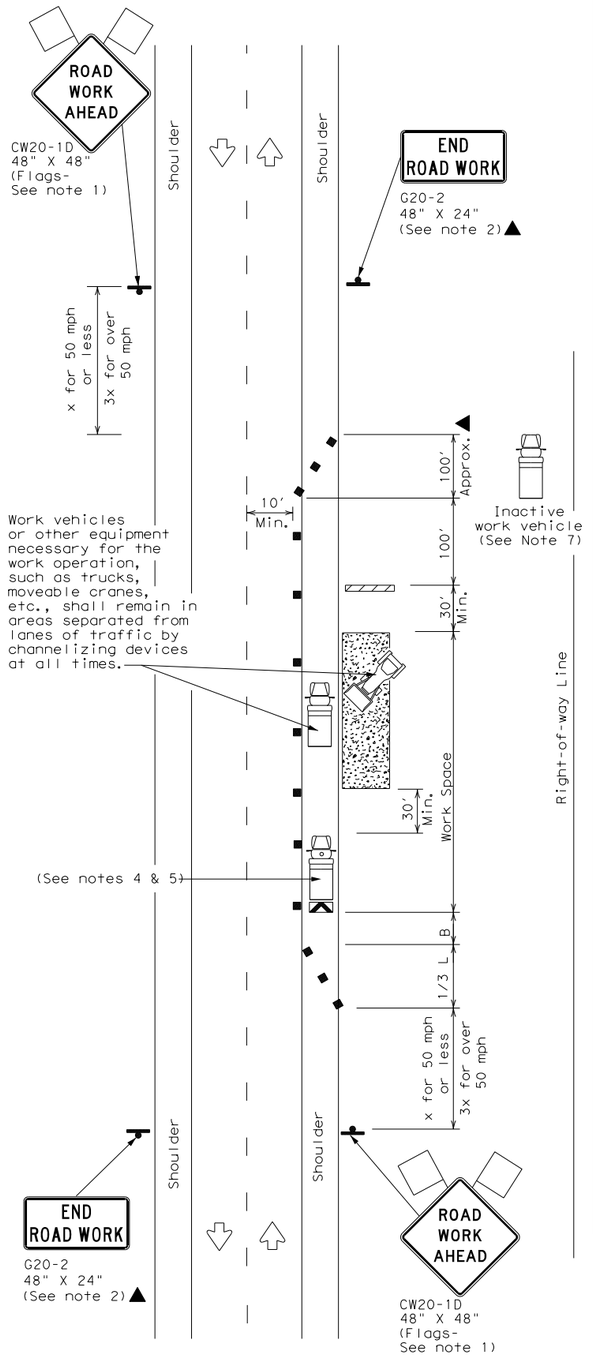
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW21-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	111	VA
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	FTW	TARRANT		113
1-97 2-18				

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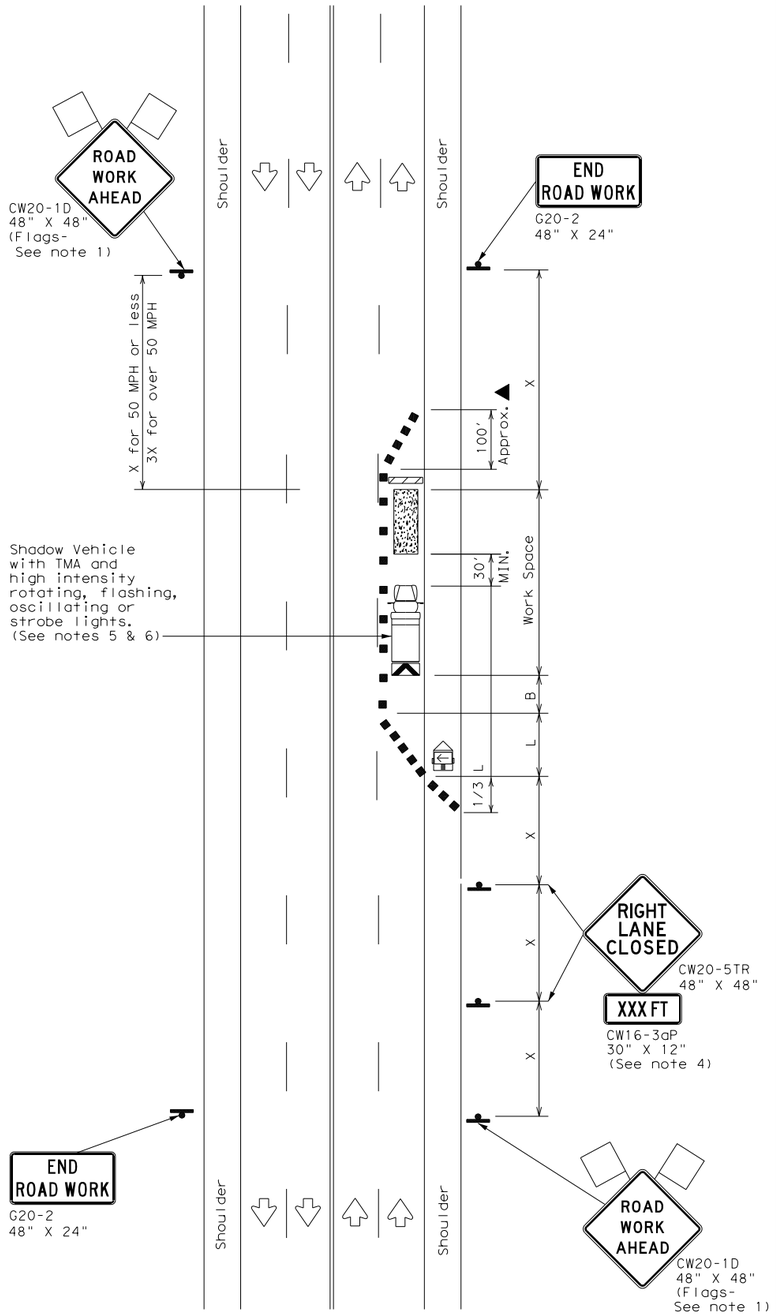
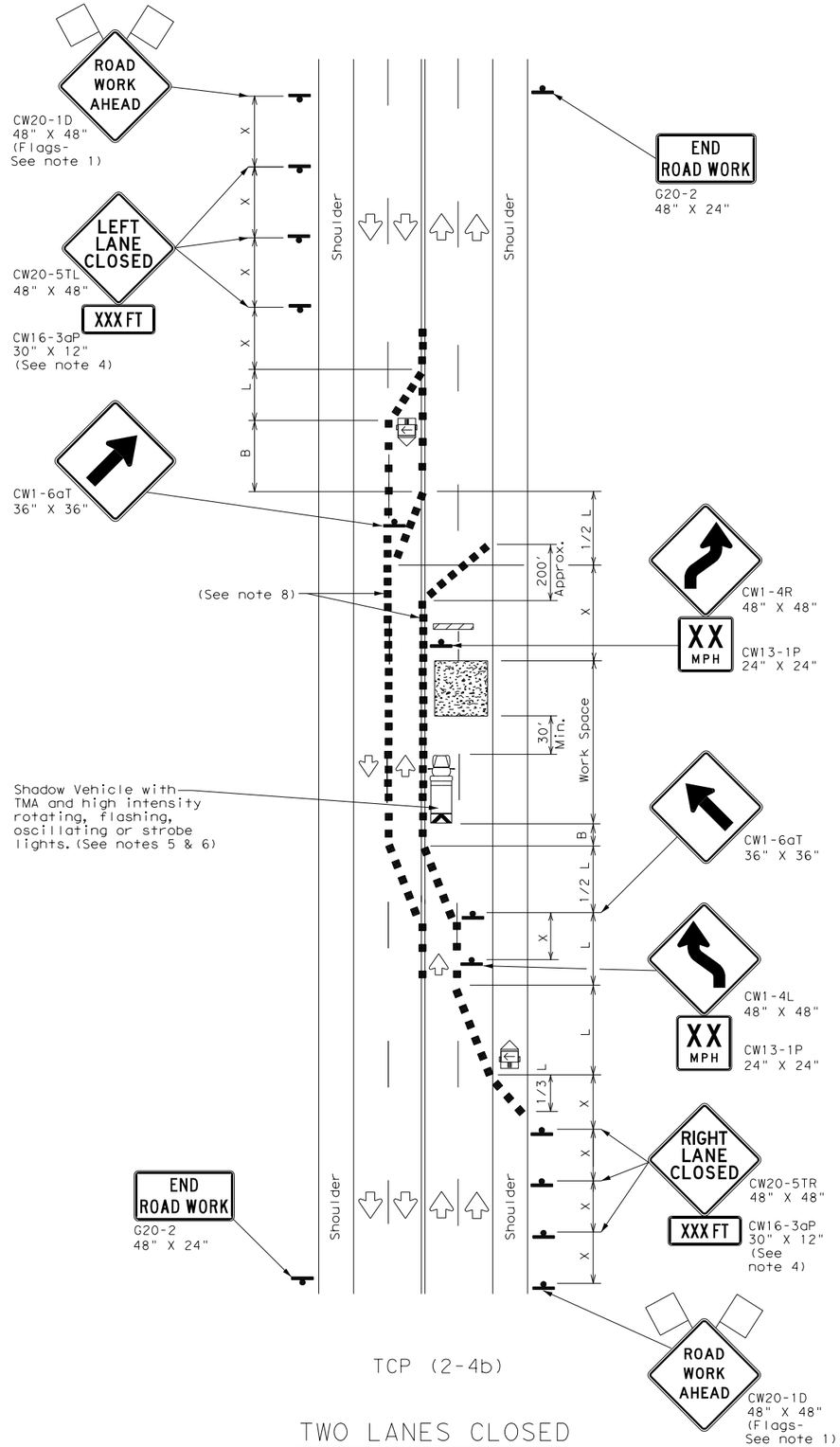
DATE: 2/23/2021 9:57:46 AM
FILE: c:\pwworking\kha\pwprod\nate.taylor\d0110470\tcp2-4-18.dgn



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓	✓	

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

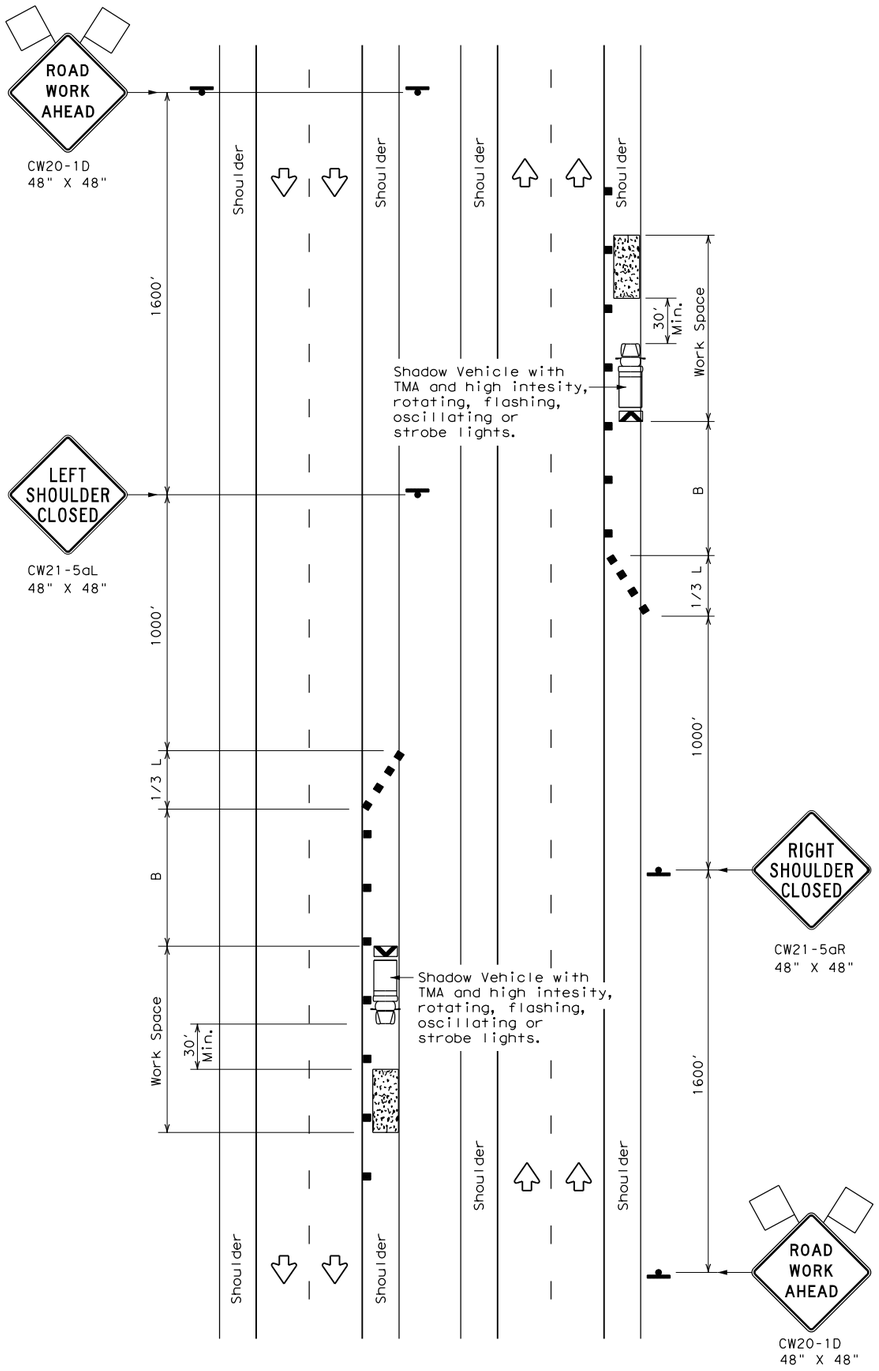
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

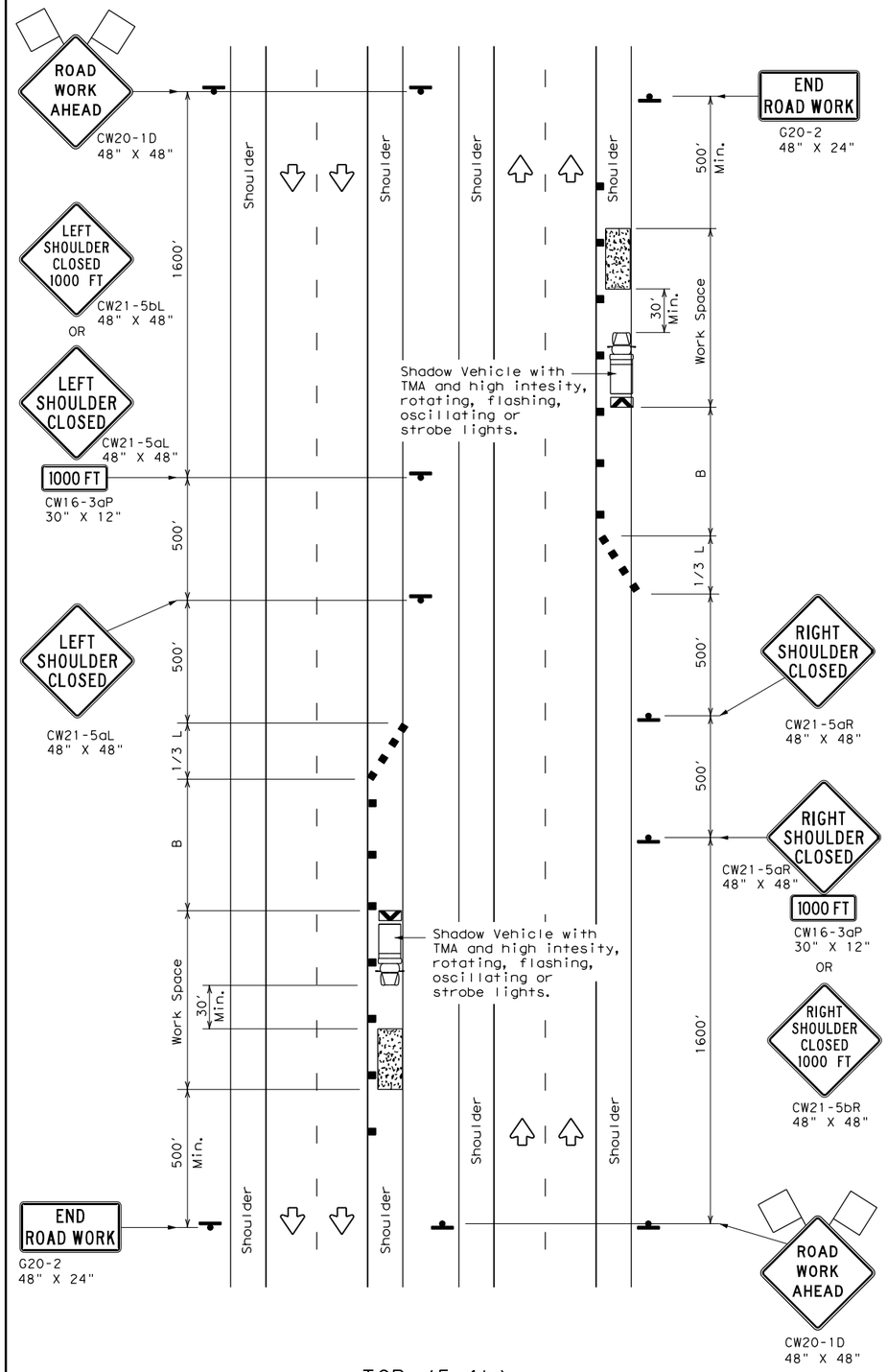
TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0902	90	111	VA
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	FTW	TARRANT		114



TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

* Conventional Roads Only

** Taper lengths have been rounded off.

L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	TCP(5-1a)	TCP(5-1b)	TCP(5-1b)	

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	111	VA
2-18	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		115

DATE: 2/23/2021 9:57:48 AM
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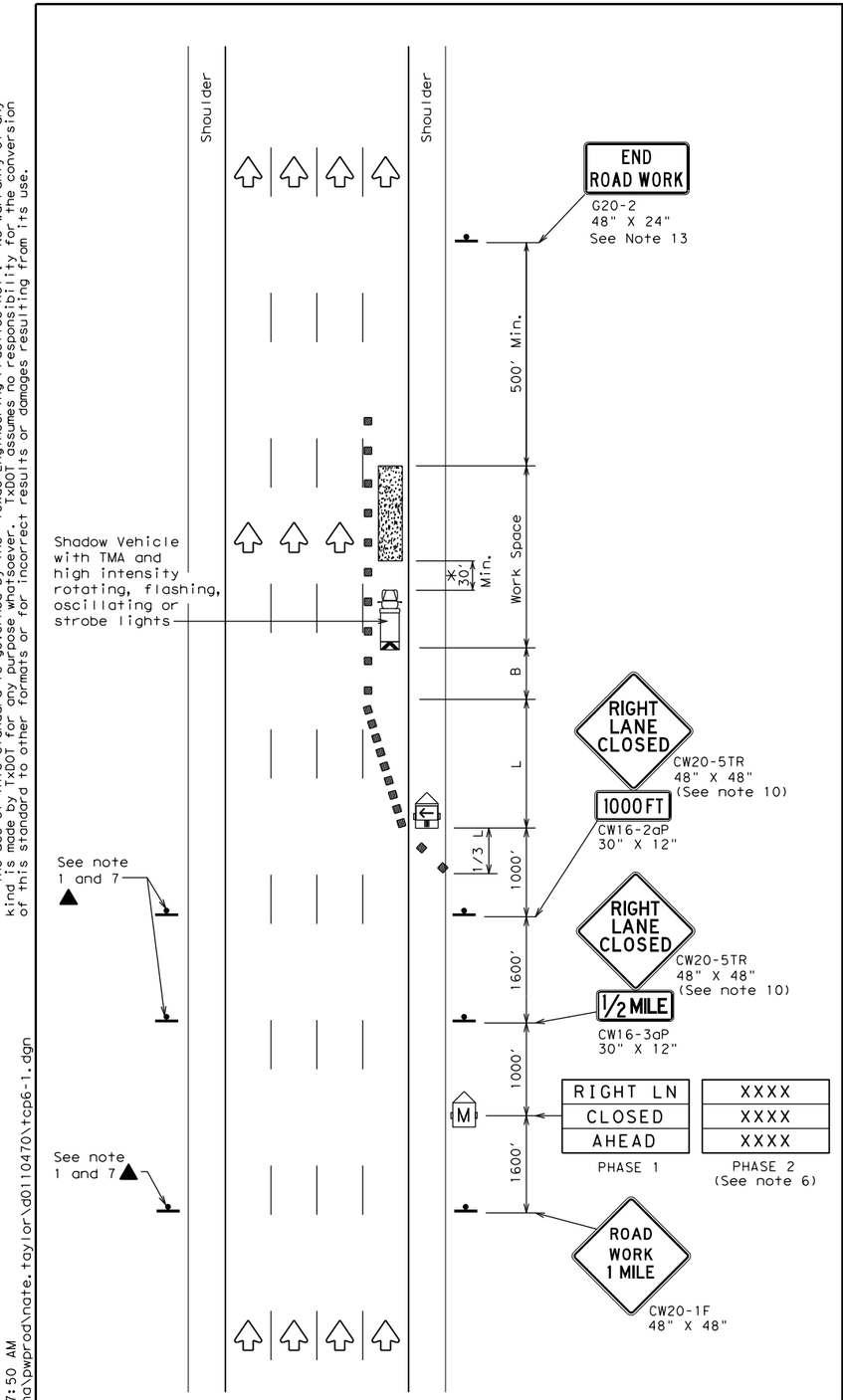
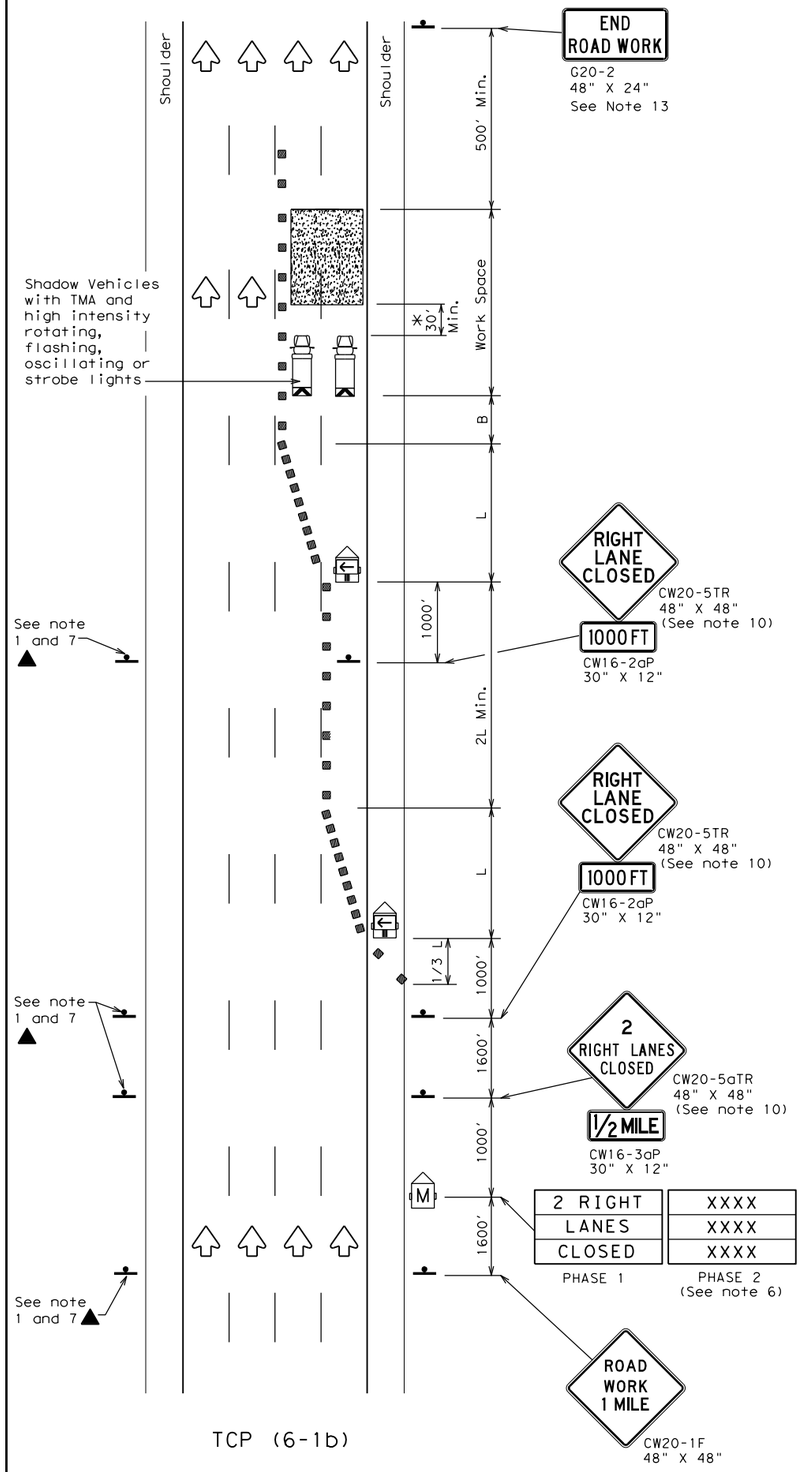


TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Drums or 42"cones are the typical channelizing devices. For Intermediate Term Stationary work, drums shall be used on tapers with drums or 42" cones used on tangent sections. Other channelizing devices may be used as directed by the Engineer.
3. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
4. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
5. Static message boards or changeable message signs stating the date and duration of ramp or freeway lane closures shall be placed a minimum of seven (7) calendar days in advance of the actual closure.
6. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE LEFT," recommended advisory speed, delay information, or other specific warnings.
7. Duplicate construction warning signs should be erected on the medians side of freeways where median width will permit and traffic volume justifies the signing.
8. The number of closed lanes may be increased provided the spacing of traffic control devices, taper lengths and tangent lengths meet the requirements of the TMUTCD.
9. Warning signs for intermediate term stationary work should be mounted at 7' to the bottom of the sign.
10. Warning signs shown shall be appropriately altered for left lane closures. When signs are mounted at 1' height for short term stationary or short duration work, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
11. When possible, PCMS units should be located in advance of the last available exit ramp prior to the lane closure to allow motorists an alternate route. They may also be relocated to improve advance warning in case of unanticipated queuing or congestion.
12. For Intermediate Term Stationary work at night, floodlights should be used to illuminate the work area and equipment crossings. Floodlights shall not produce a disabling glare condition for road users or workers.
13. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-12	0902	90	111	VA
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		116

DATE: 2/23/2021 9:57:50 AM
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DATE: 2/23/2021 9:57:54 AM
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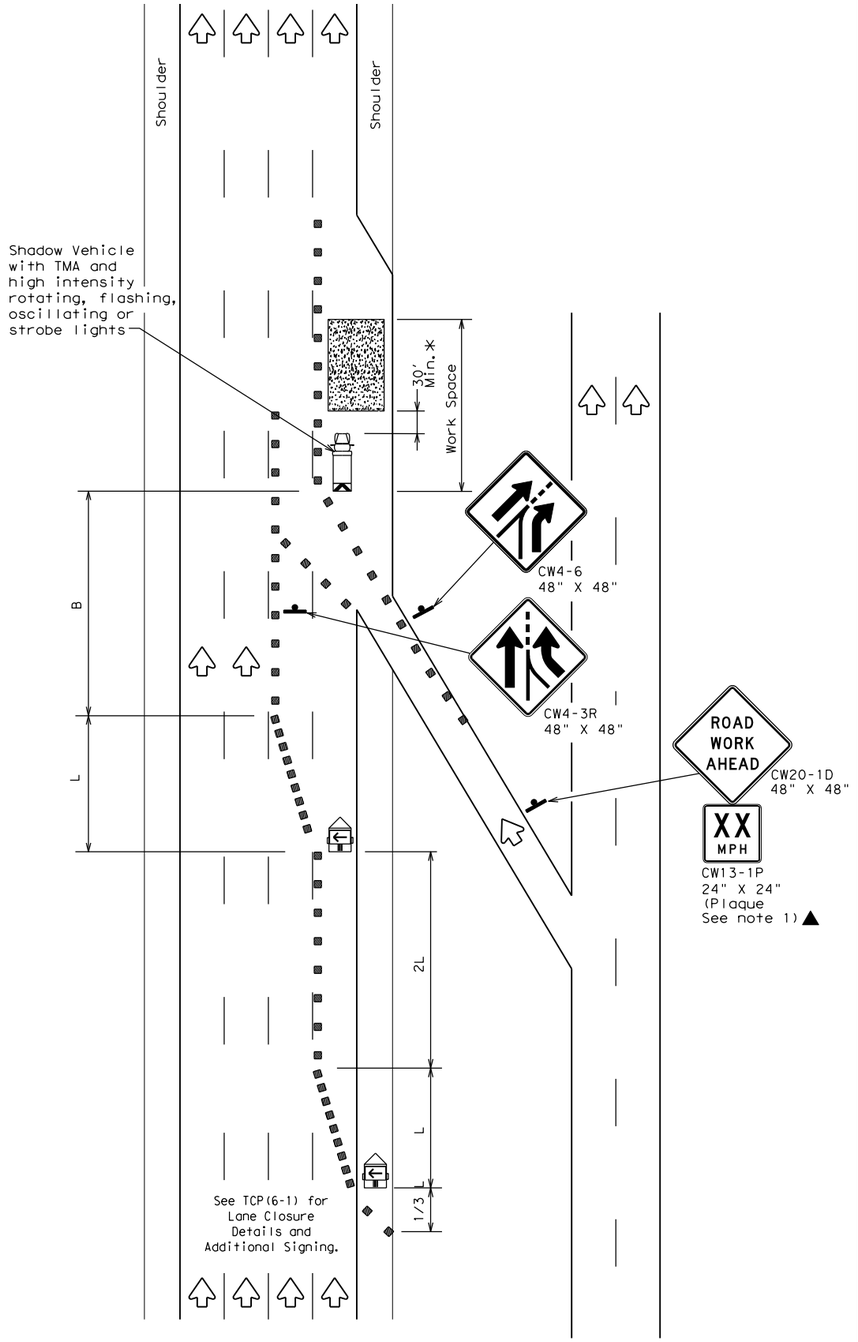
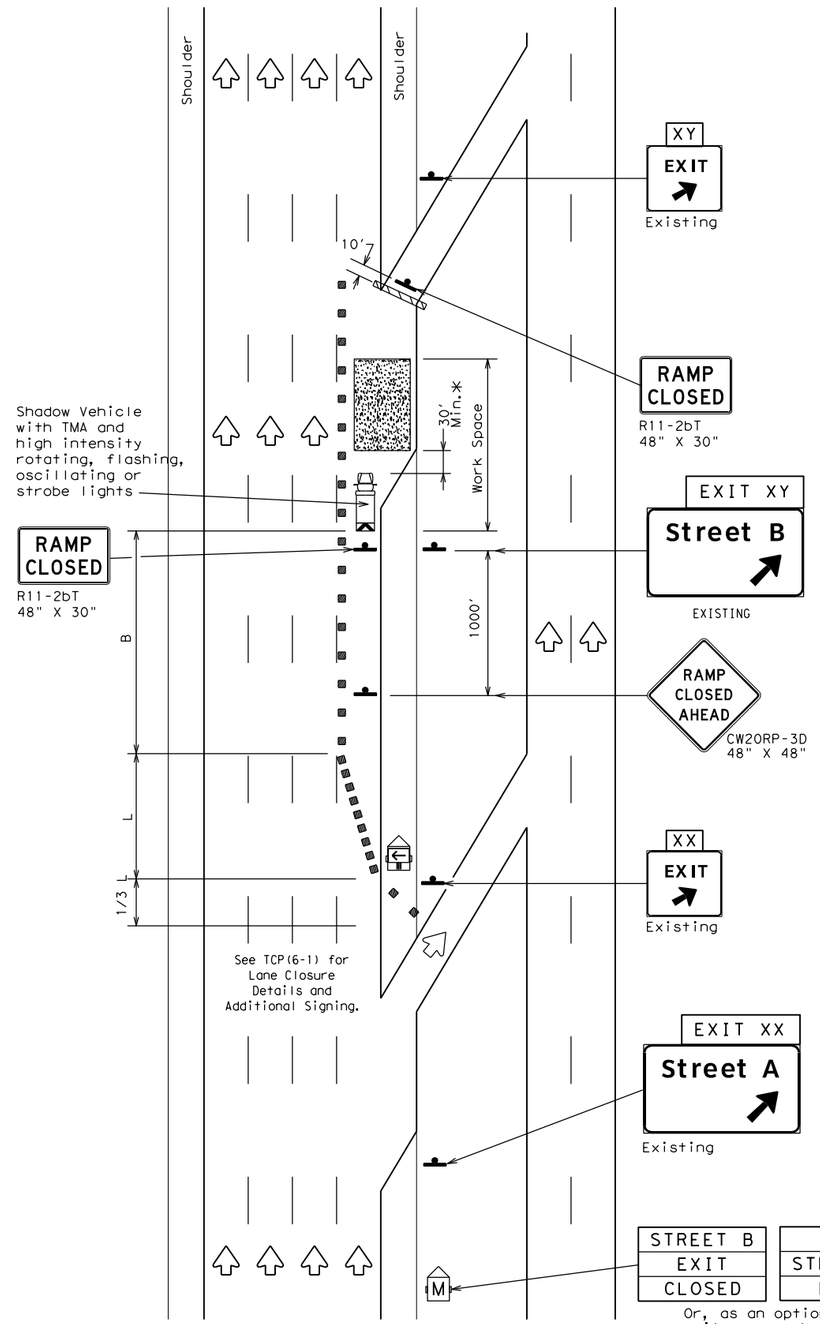


TCP (6-3a)

ENTRANCE RAMP OPEN



STREET B	USE
EXIT	STREET A
CLOSED	EXIT

Or, as an option when exits are numbered

EXIT XY	USE
CLOSED	EXIT XX

Place 1 mile (approx.) in advance of Street A exit.

TCP (6-3b)

EXIT RAMP CLOSED

TRAFFIC EXITS PRIOR TO CLOSED RAMP

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" **			Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	

GENERAL NOTES:

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

TCP(6-3)-12

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	111	VA
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	FTW	TARRANT		117

DATE: 2/23/2021
FILE: c:\pwworking\khq\pwprod\nate.taylor\d0110470\EPIC.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☒ No Action Required ☐ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☐ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
☒ Erosion Control Logs	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☐ No Action Required ☒ Required Action

Action No.

1. No landscaping will be a part of the proposed project activities. Re-vegetation of disturbed areas will be in compliance with the Executive Memorandum on Beneficial Landscaping (26Apr94) and the Executive Order on Invasive Species (EO 13112). Regionally native and non-invasive plants will be used to the extent practicable in landscaping and re-vegetation.
2. During construction, efforts will be taken to avoid and minimize disturbance of vegetation and soils.. Areas within the existing ROW, but outside the limits of construction, will not be disturbed. Every effort will be made to preserve trees where they will neither compromise safety nor substantially interfere with the proposed projects.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

1. No disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season. Avoid the removal of unoccupied, inactive nests as practicable. Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair. No collecting, capturing, relocating or transporting birds, eggs, young or active nests without a permit. Eagle Protection Act prohibits the taking or possession of and commerce in eagles, parts, feathers, nests, or eggs with limited exceptions. The definition of take includes pursue, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Eagles may not be taken for any purpose unless a permit is issured prior to the taking.
2. The contractor and/or TxDOT personnel will be advised of the potential for Whopping Cranes to occur within the project limits. Construction personnel will be advised to avoid adverse impacts to this species and to report any sightings to TxDOT District Environmental staff. Drainage modifications will be limited to the extent practical to accommodate the additional paved surface needed to bring the roadway up to current TxDOT safety standards.The construction personnel will report all sightings to TxDOT Fort Worth District Environmental staff. Reports should include the time, date, and location and any available photos.
3. Between October 1 and February 15, the contractor will remove all old migratory bird nests from any structure that will be affected by the proposed project, and complete any bridge work/demolition and/or vegetation clearing. In addition, Contractor will be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between February 15 and October
   1. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young will be avoided.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

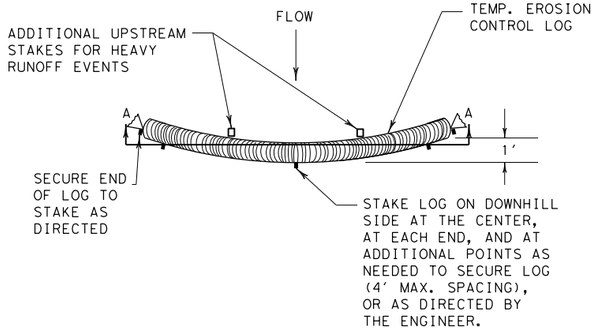
Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

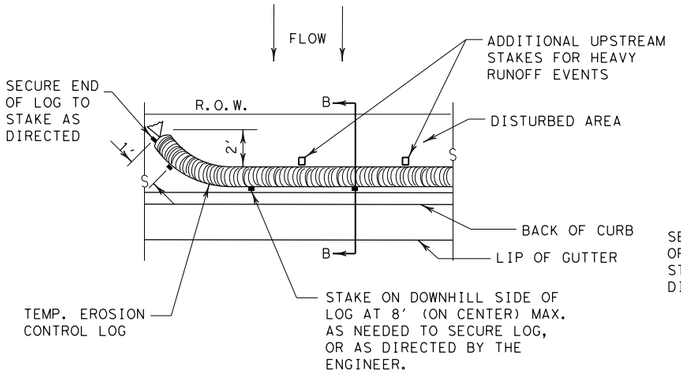
EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0902	90	111	VA
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	FTW	TARRANT		118

DATE: 2/23/2021
FILE: c:\pwworking\vkha\pwprodvnate.taylor\d0110470\ec916.dgn



PLAN VIEW



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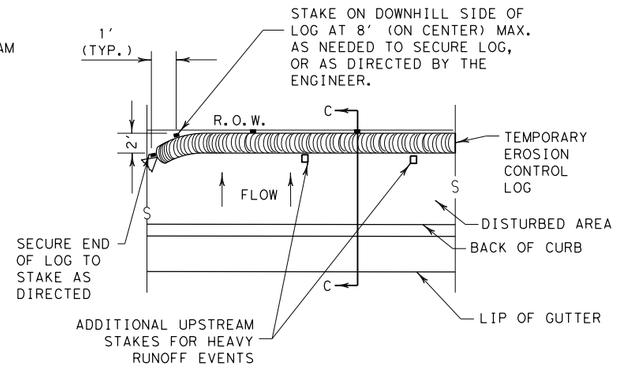

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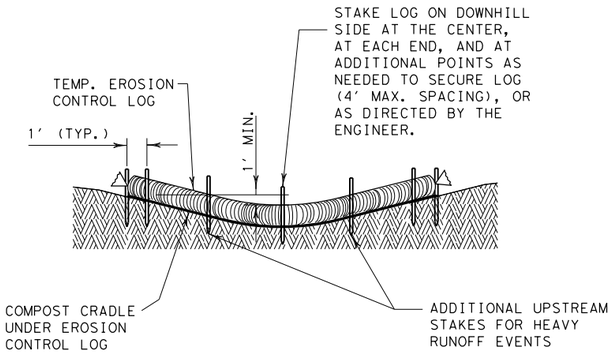
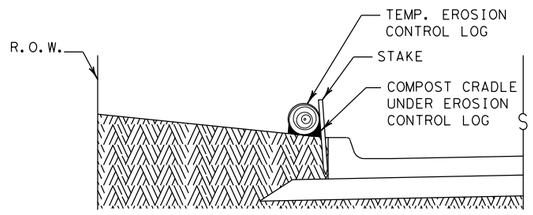


SECTION A-A

EROSION CONTROL LOG DAM

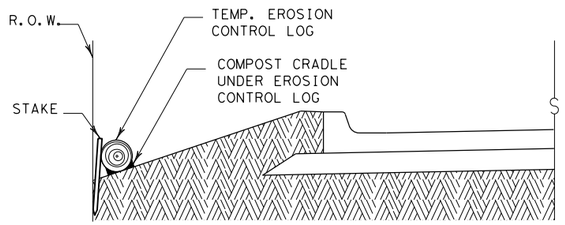
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



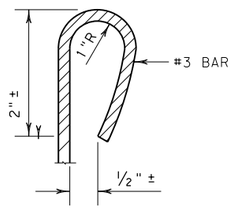
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW

LEGEND

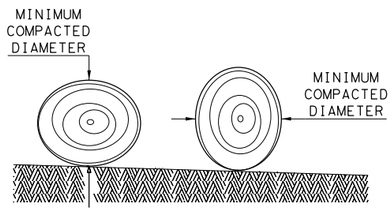
- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET



REBAR STAKE DETAIL

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
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	DIST	COUNTY					SHEET NO.
	FTW	TARRANT					119

DATE: 2/23/2021
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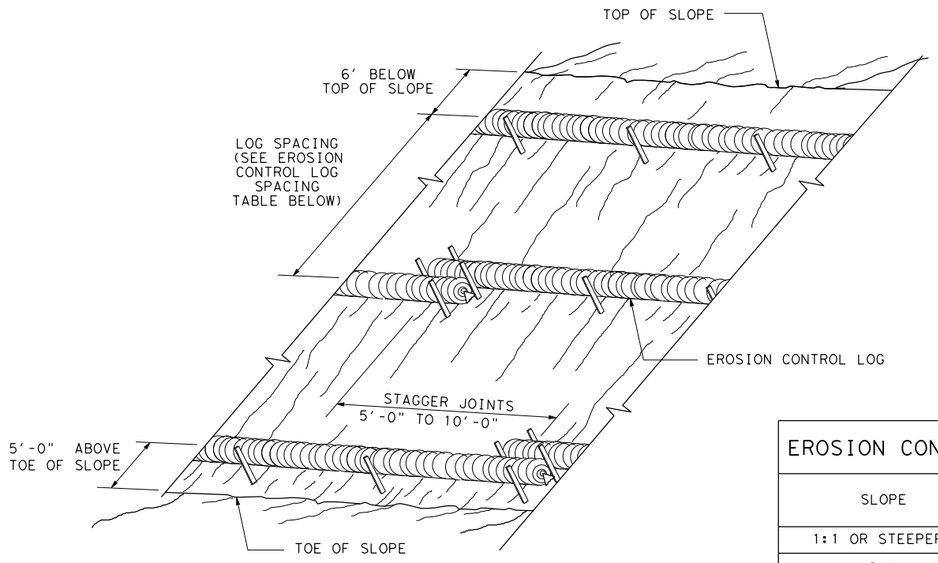
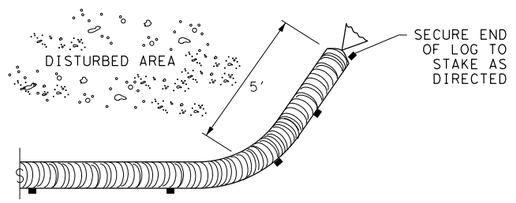


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

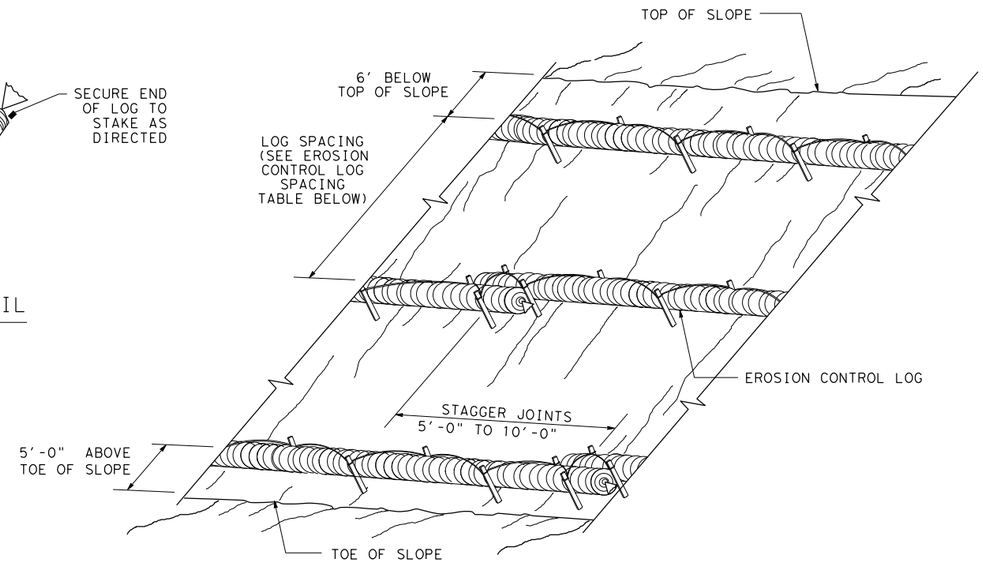
CL-SST



END SECTION RAP DETAIL

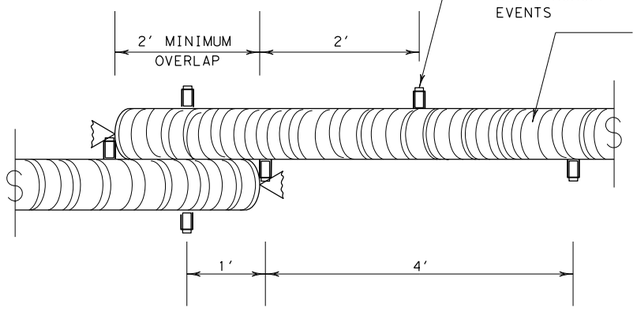
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5′	10′	15′	20′
2:1	10′	20′	30′	40′
3:1	15′	30′	45′	60′
4:1 OR FLATTER	20′	40′	60′	80′

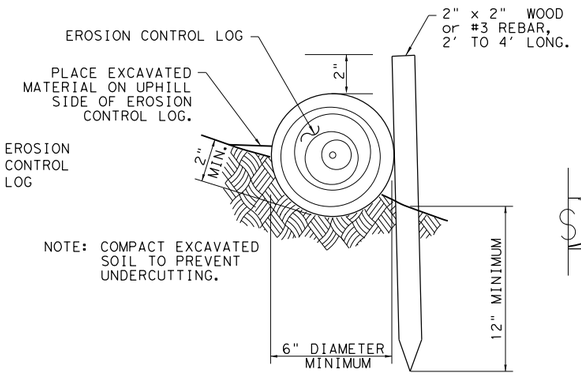
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

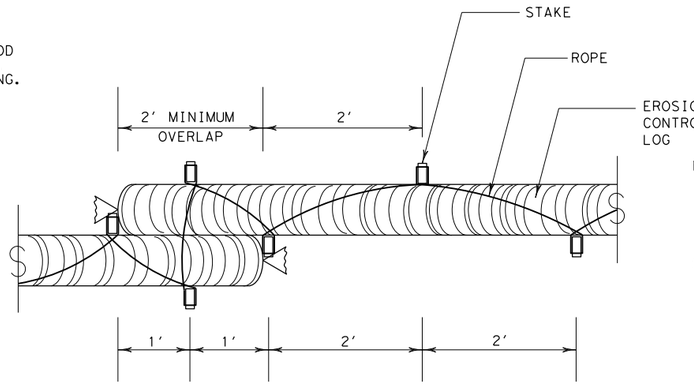


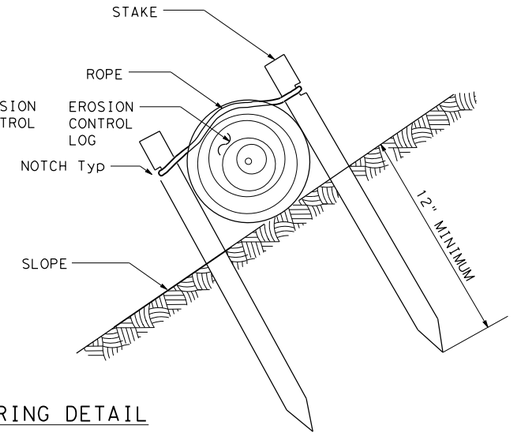


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

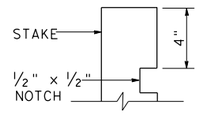
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
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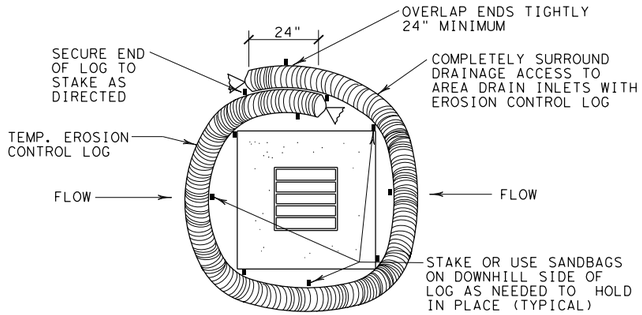
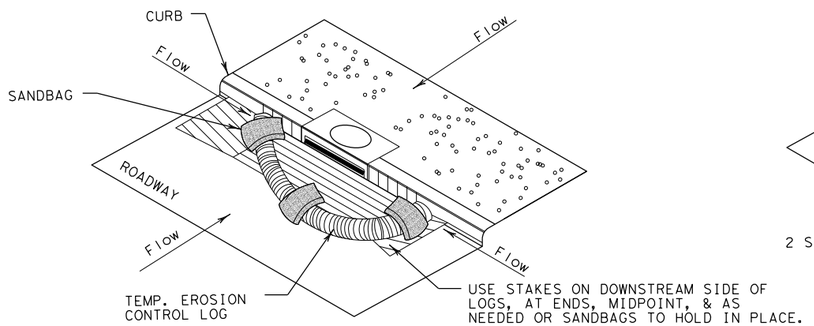


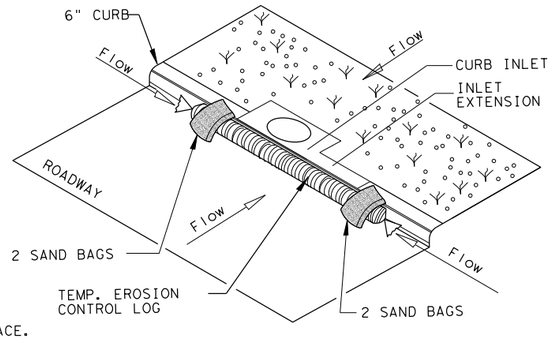
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

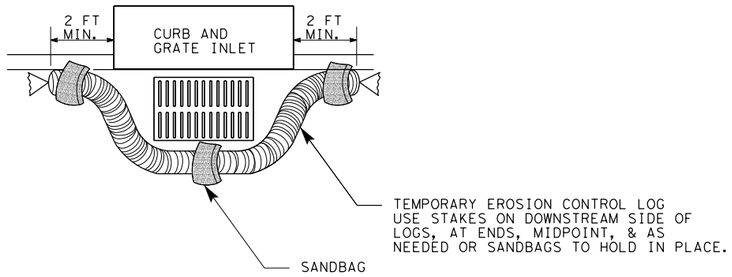
CL-CI



EROSION CONTROL LOG AT CURB INLET

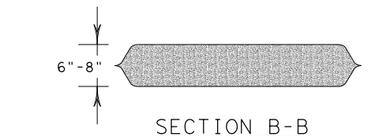
CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.

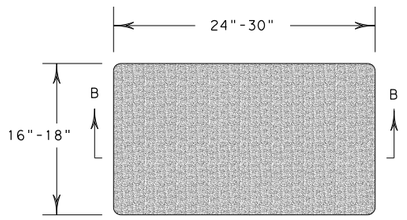


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
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	DIST	COUNTY			SHEET NO.		
	FTW	TARRANT			121		

DATE: 2/23/2021
FILE: c:\pwworking\kha\pwprod\nate.taylor\d0110470\ed1-14.dgn

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

FILE:	ed1-14.dgn	DN:	CK:	DW:	CK:
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
	REVISIONS	0902	90	111	VA
		DIST	COUNTY		SHEET NO.
		FTW	TARRANT		122

71A

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

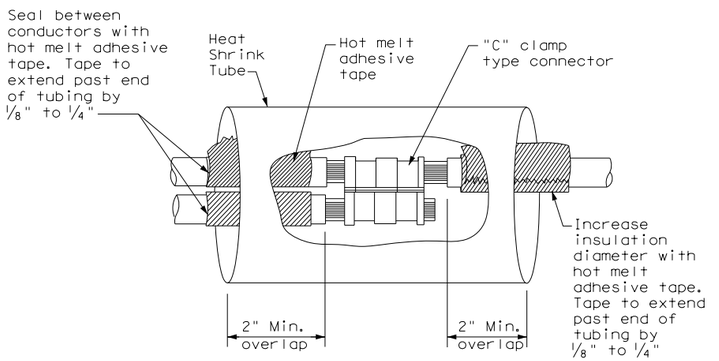
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

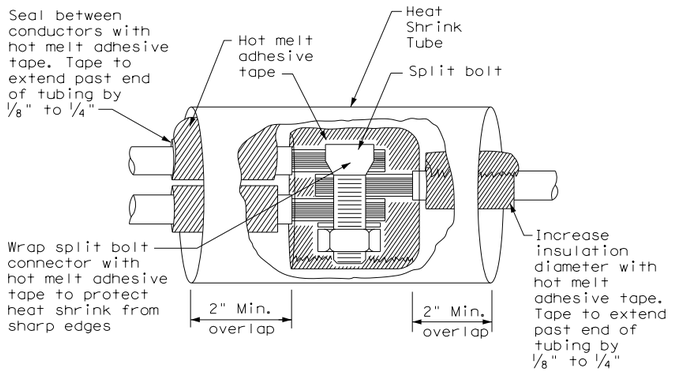
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

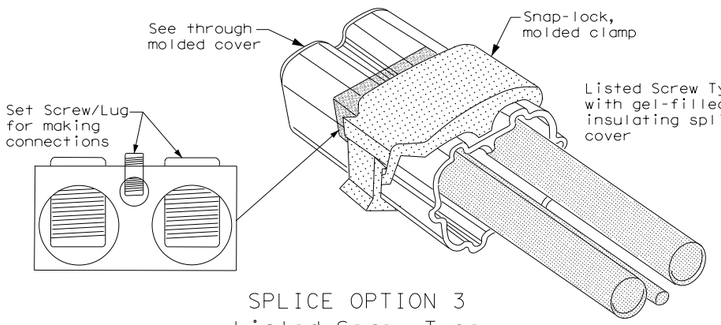
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

FILE:	ed3-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS		0902	90	111	VA
		DIST	COUNTY		SHEET NO.
		FTW	TARRANT		123

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DATE: 2/23/2021
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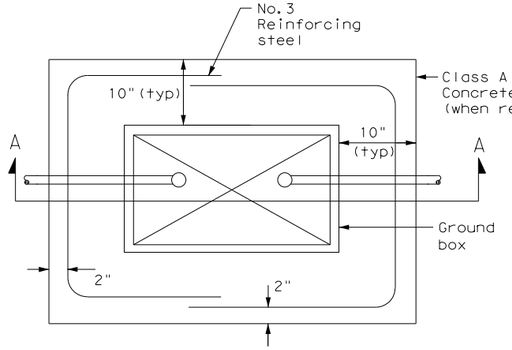
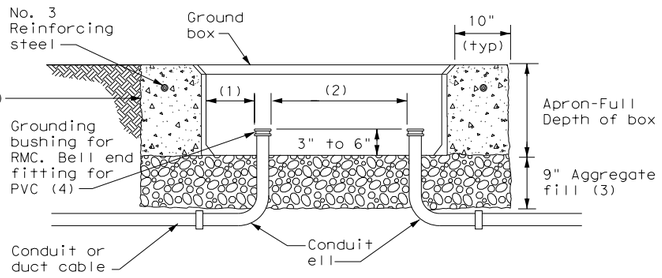


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

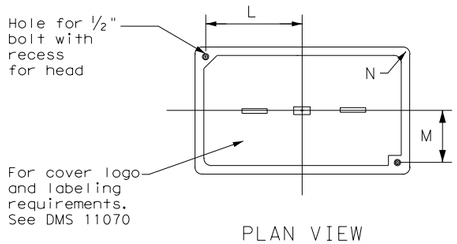
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

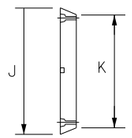
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

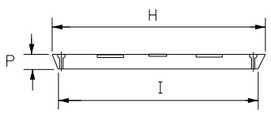
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



END



SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
GROUND BOXES

ED(4)-14

FILE: ed4-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	111	VA
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		124

71D

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

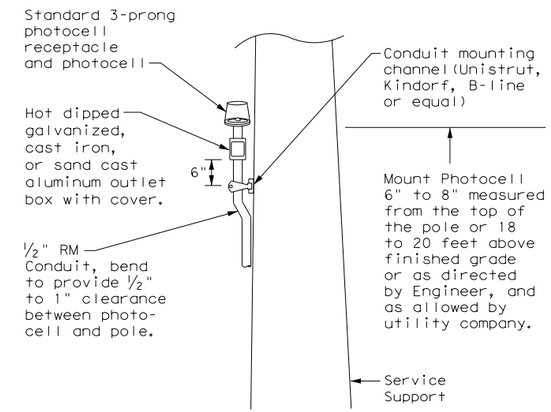
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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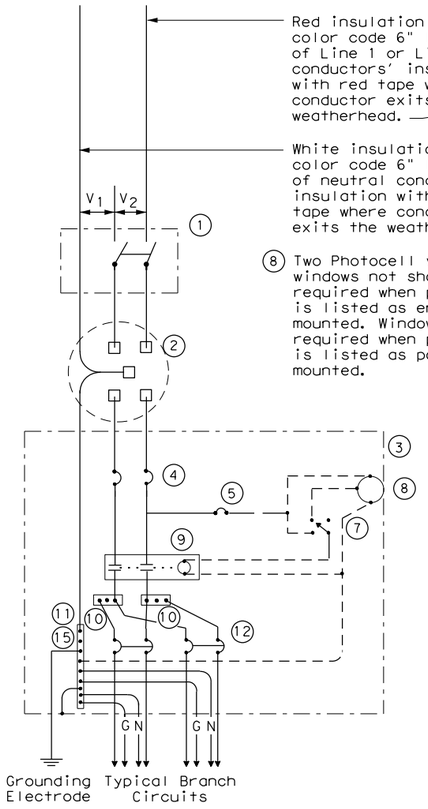
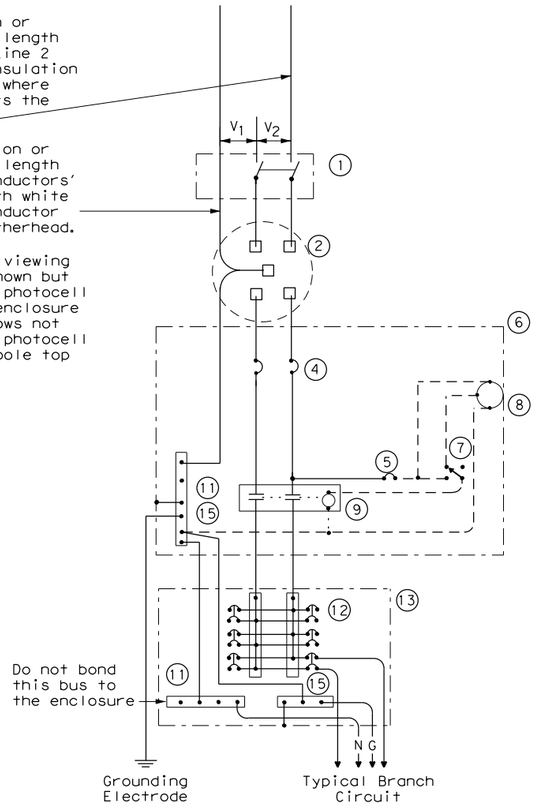
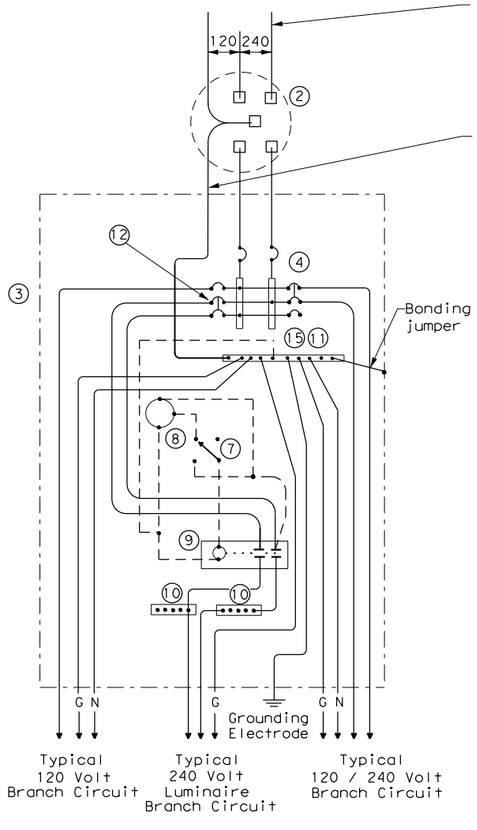
71E



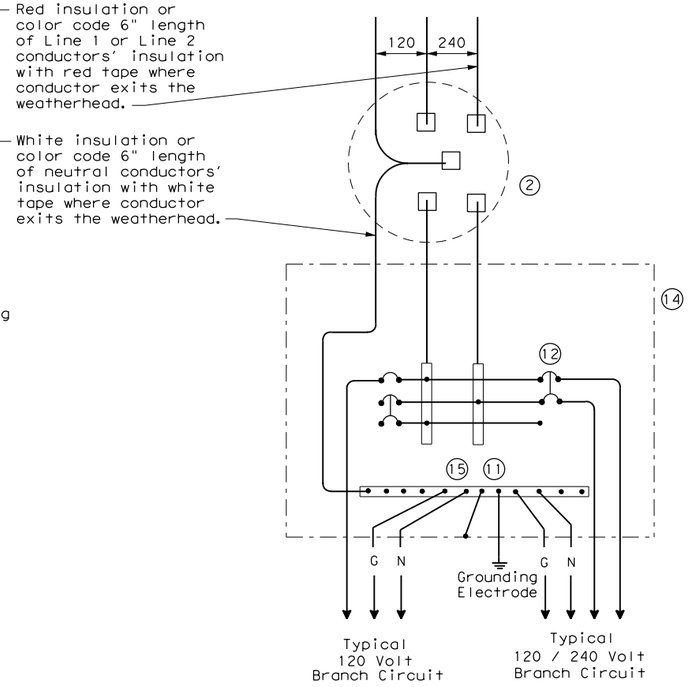
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
- - - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

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DATE: 2/23/2021
FILE: c:\pwworking\kha\pwprod\nate.taylor\d0110470\ed7-14.dgn

SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.

2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.

3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.

4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.

5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.

6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.

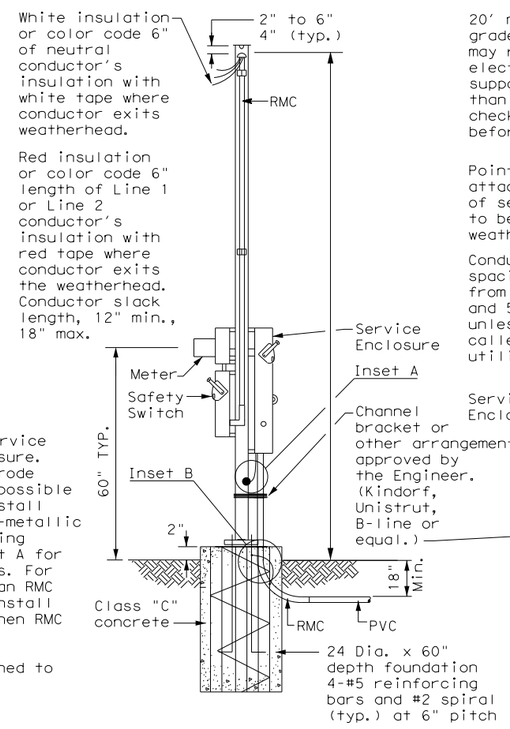
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.

8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.

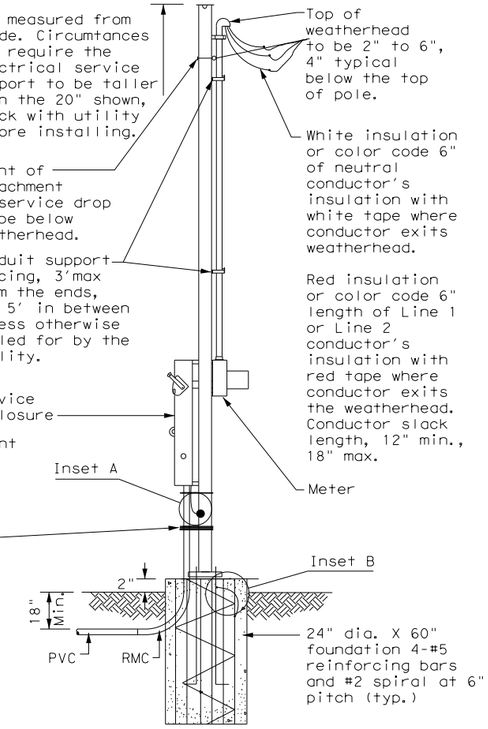
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.

11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

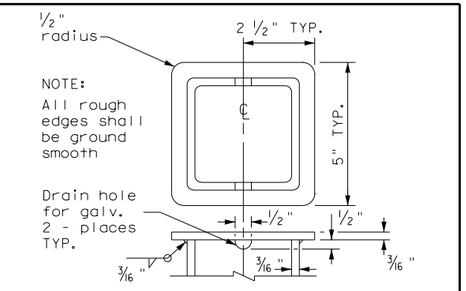


WITH SAFETY SWITCH

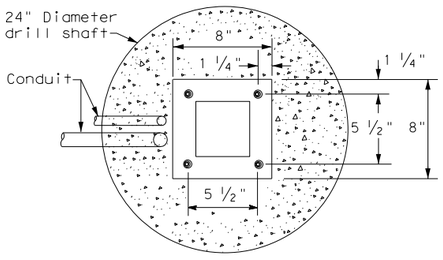


WITHOUT SAFETY SWITCH

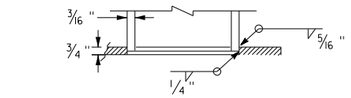
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



POLE TOP PLATE

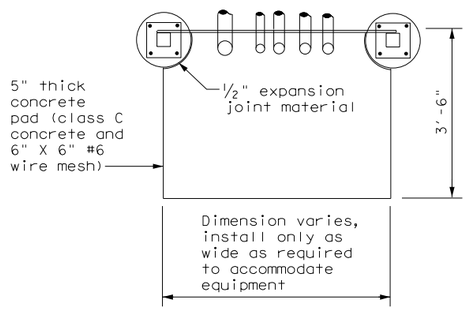


BASE PLATE DETAIL



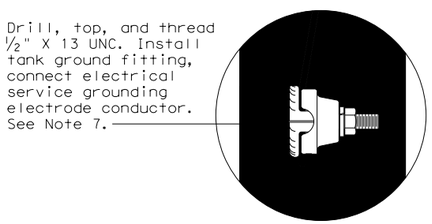
BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP

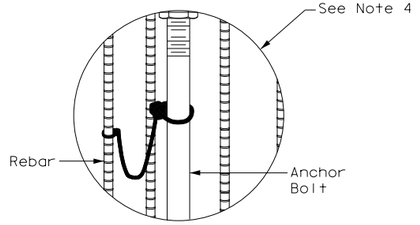


TOP VIEW

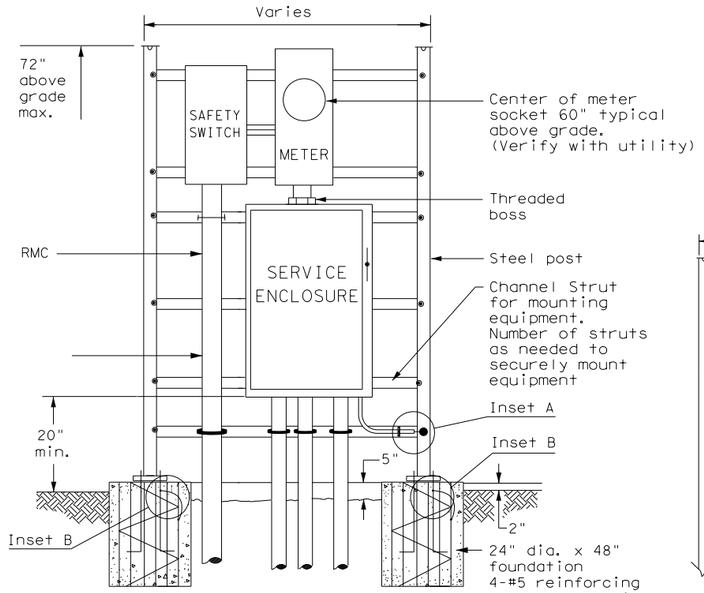
SERVICE SUPPORT TY SF (O) & SF (U)



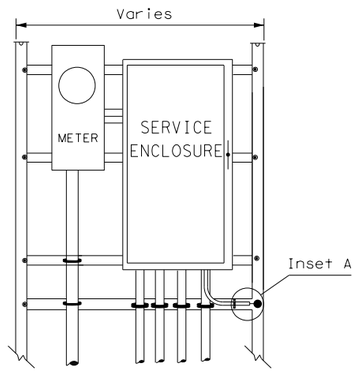
FRONT VIEW
INSET A



INSET B

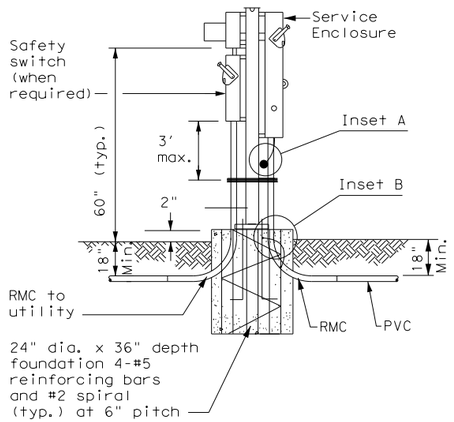


WITH SAFETY SWITCH
FRONT VIEW

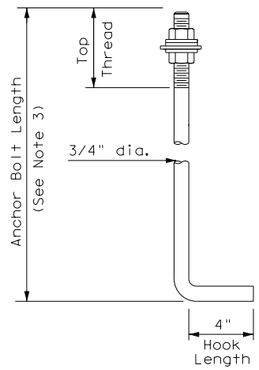


WITHOUT SAFETY SWITCH

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE



WITH SAFETY SWITCH



HOOKED ANCHOR DETAIL

SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE

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Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

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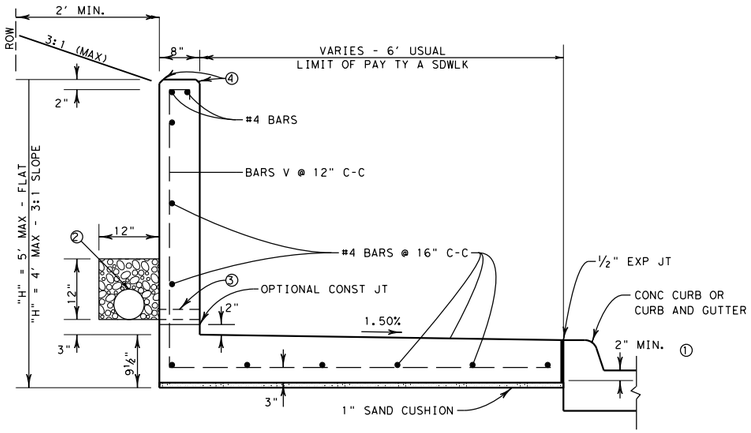
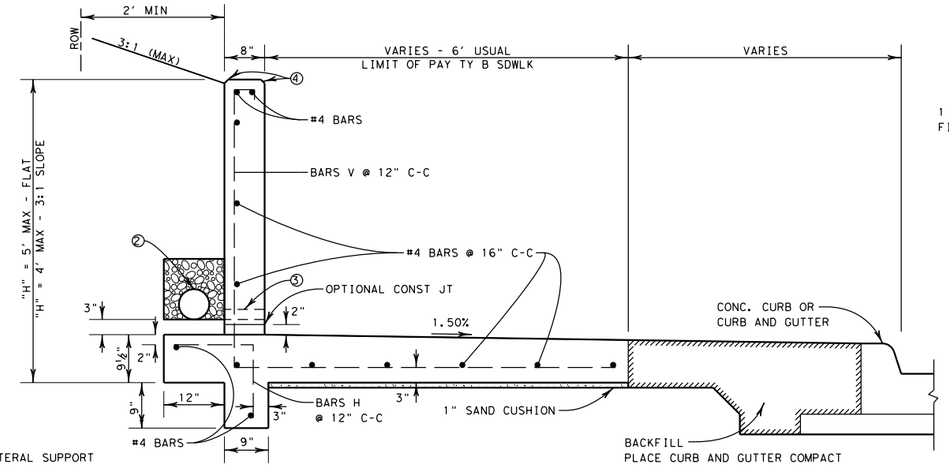
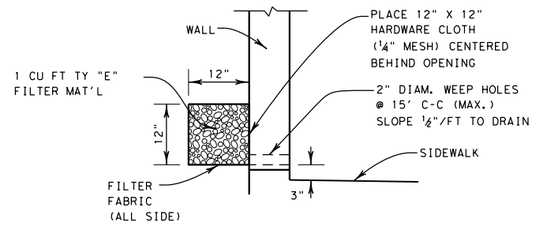


TYPE A SIDEWALK-ADJACENT TO CURB



① 2" MINIMUM REQUIRED FOR LATERAL SUPPORT
② INSTALL 6" PIPE UNDERDRAIN (TY. 5, 6, 7, OR 8) ENTIRE LENGTH OF WALL. USE TY. "E" FILTER MATERIAL. SLOPE TO DRAIN AND CONNECT TO STORM DRAIN.
⑤ IF, IN THE OPINION OF THE ENGINEER, USE OF UNDERDRAIN IS IMPRACTICAL, INSTALL WEEP HOLES AS SHOWN.
④ ¾" CHAMFER

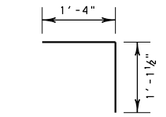
TYPE B SIDEWALK-REMOTE FROM CURB



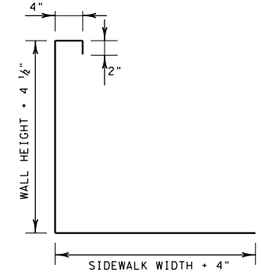
WEEP HOLE DETAIL

SPECIAL CONCRETE SIDEWALK w/ INTEGRATED RETAINING WALL

N.T.S.

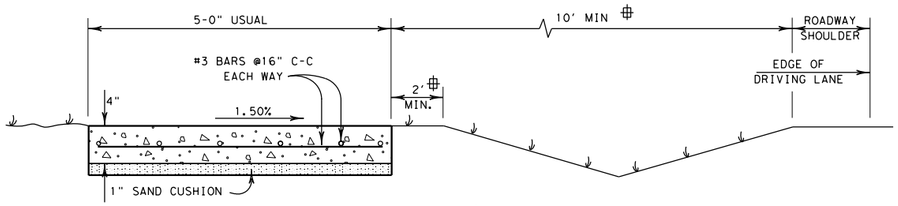


#4 BARS H @ 12" C-C



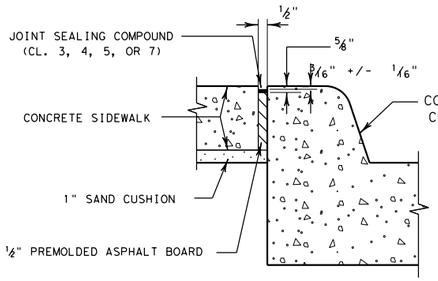
#4 BARS V @ 12" C-C

REINFORCING STEEL DETAILS



SIDEWALK TO BE 10' MIN. FROM EDGE OF SHOULDER OR 2' MIN. FROM TOP OF DITCH BACK SLOPE, WHICHEVER IS GREATER (10' MIN. FROM EDGE OF SHOULDER IF NO DITCH.)

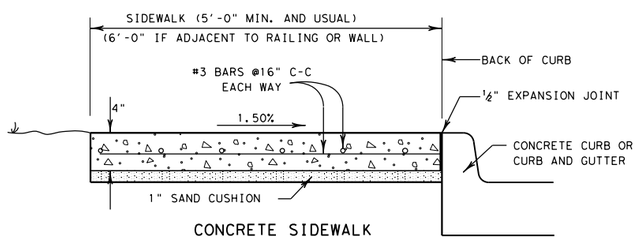
CONCRETE SIDEWALK
(ROADWAY W/O CURB)



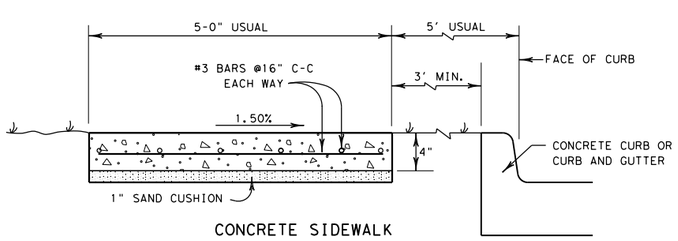
1#2" EXPANSION JOINT
(SIDEWALK ADJACENT TO CURB)

GENERAL NOTES:

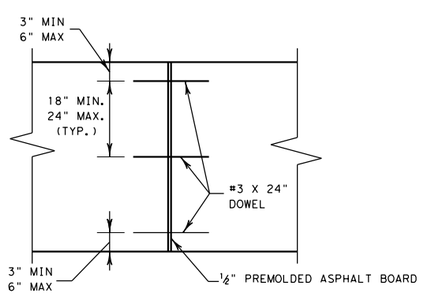
1. ALL CONCRETE SHALL BE CLASS "C".
2. ALL REINFORCING STEEL SHALL BE GRADE 60, # 4 BARS UNLESS OTHERWISE INDICATED.
3. SEE PLAN SHEETS FOR LOCATIONS OF SIDEWALKS AND RETAINING WALLS.
4. LONGITUDINAL SLOPE OF SIDEWALKS SHALL NOT EXCEED 5% EXCEPT IN CASES WHERE THE ADJACENT ROADWAY SLOPE EXCEEDS 5%. IF ROADWAY SLOPE EXCEEDS 5%, LONGITUDINAL SLOPE OF SIDEWALK MAY MATCH THAT OF ROADWAY.
5. IF SIDEWALK WIDTH IS LESS THAN 5', PROVIDE 5' X 5' PASSING AREAS AT INTERVALS NOT TO EXCEED 200' SPACING.
6. RETAINING WALL WILL BE SUBSIDIARY TO THE ITEM, "CONC SIDEWALKS (SPECIAL) (TYPE A)" OR "CONC SIDEWALKS (SPECIAL)(TYPE B)", WITH LIMITS OF PAY AS SHOWN.
7. SURFACE TREATMENT OF RETAINING WALL FACE DETAILED ELSEWHERE IN THE PLANS.
8. SEE PED STANDARDS FOR TREATMENT AT INTERSECTIONS AND CROSSWALKS.



CONCRETE SIDEWALK
(ADJACENT TO CURB)



CONCRETE SIDEWALK
(REMOTE FROM CURB)



TRANSVERSE EXPANSION JOINT

CONCRETE SIDEWALK DETAILS

N.T.S.

Texas Department of Transportation

Fort Worth District Standard

CONCRETE SIDEWALK DETAILS
CSWD (FTW)

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DATE	REVISIONS				128
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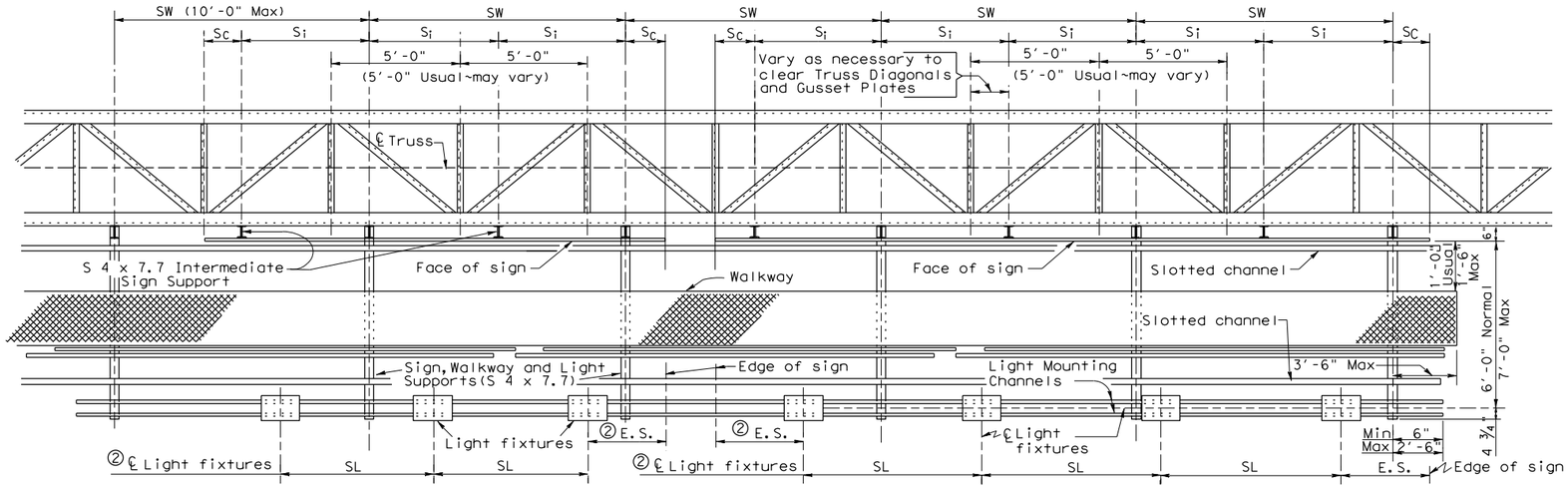
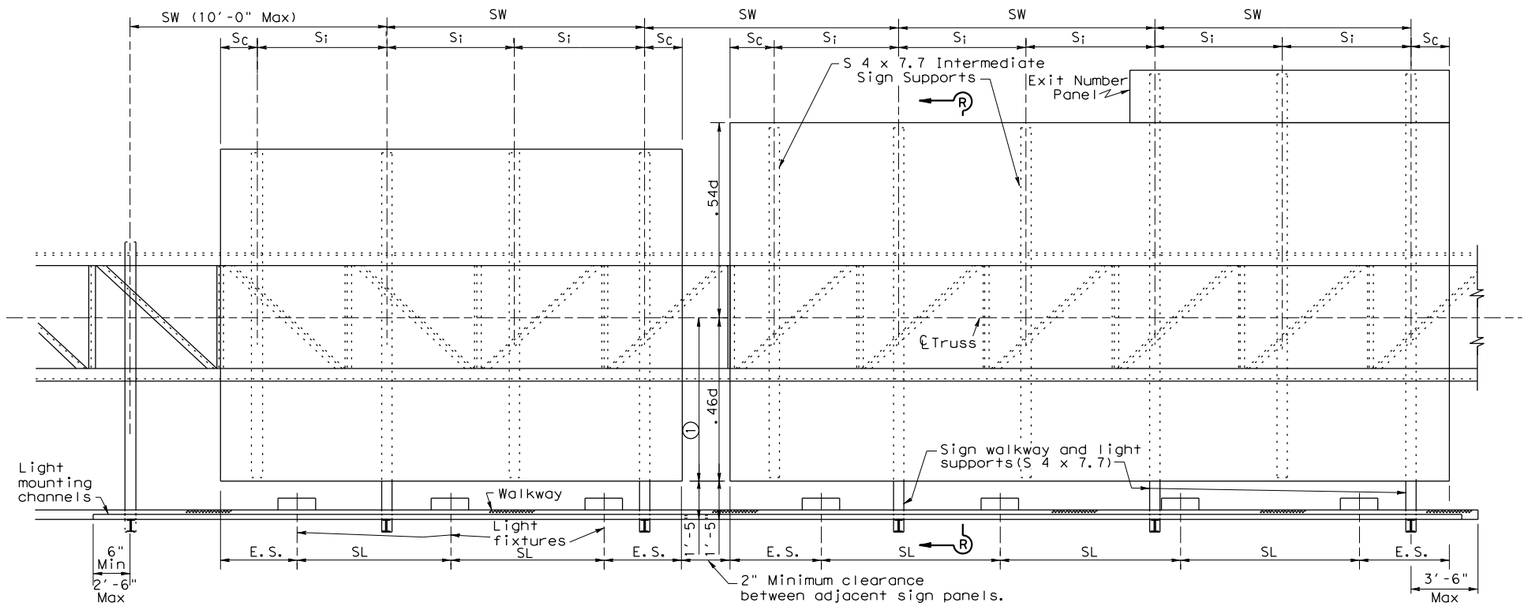


Sc=6" Min and .25 Si Max
② See SL(MV) for light fixture spacing.

PART PLAN
(Showing Truss, Signs, Walkways and Lights)

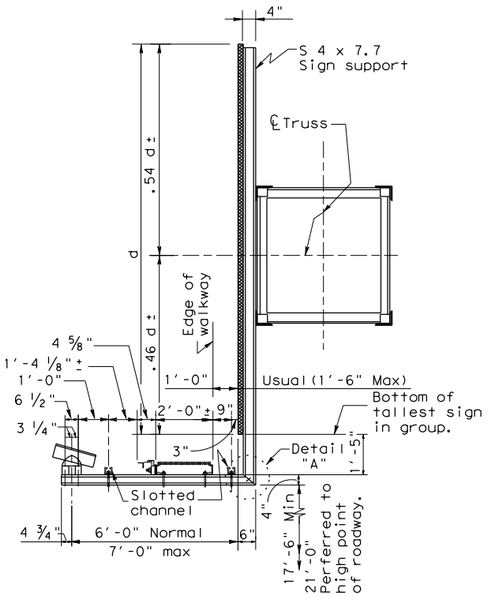


PART ELEVATION

① Where signs of different depths are used, the bottom edge of all signs may be placed in line. Where this is done, all signs should be so positioned that the bottom edges are approximately 0.46 of the depth of the deepest sign below the ℄ of the truss. When signs are spaced thus, Si is determined by the deepest sign.

See sheet SL(MV) for Lighting Details & Spa.S.L. & E.S.
See sheet SWW(1) for Walkway Details.
See sheet SMD(2-4) for Extruded Aluminum Sign Details & Max. Spa. for Si.
Sc= 6" min, .25 Si max.

Note: Exit Number Panel may be supported by sign support brackets as shown hereon, or may be supported as shown on sheet SMD(2-4). Regardless of method used spacing of supports shall not exceed Si.



SECTION R-R

SHEET 1 OF 2

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SUPPORT BRACKETS FOR SIGNS, WALKWAYS & LIGHTS

SB(SWL-1)-14

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	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		129

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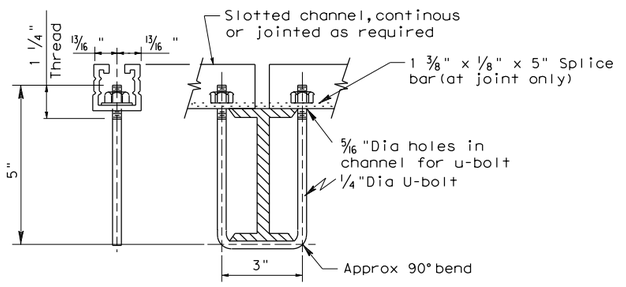
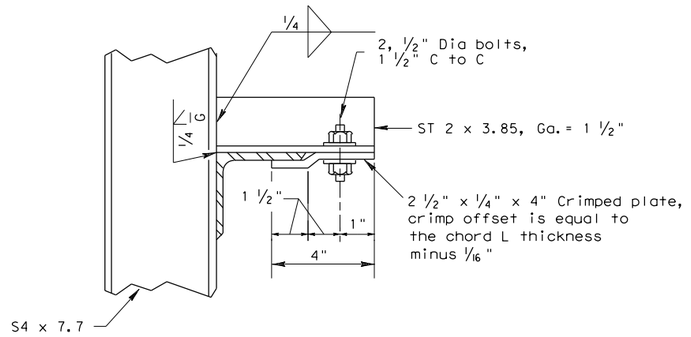
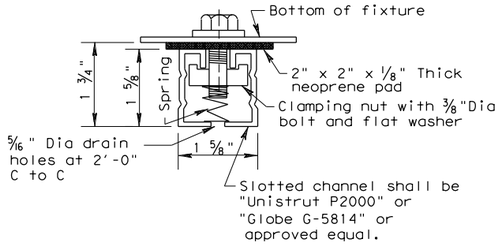


SECTION A-A

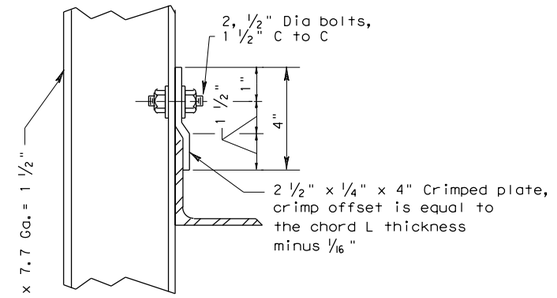


TOP CHORD



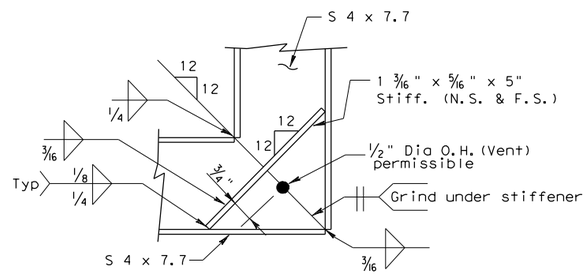
TYPICAL SLOTTED CHANNEL

CONNECTED TO LIGHTING FIXTURE



BOTTOM CHORD

SUPPORT TO TRUSS CONNECTION



DETAIL"A"

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interim revisions thereto.

Materials, fabrication, construction and erection shall conform to Item 654, "Sign Walkways" and with details, dimensions, and weld procedures shown herein. Structural steel shall conform with ASTM A36 unless noted otherwise.

Bolts shall have hexagon heads and nuts and conform with ASTM A307.

All parts shall be galvanized after fabrication per Item 445, "Galvanizing".

Texas Department of Transportation

Traffic Operations Division Standard

SUPPORT BRACKETS FOR SIGNS, WALKWAYS & LIGHTS

SB(SWL-1)-14

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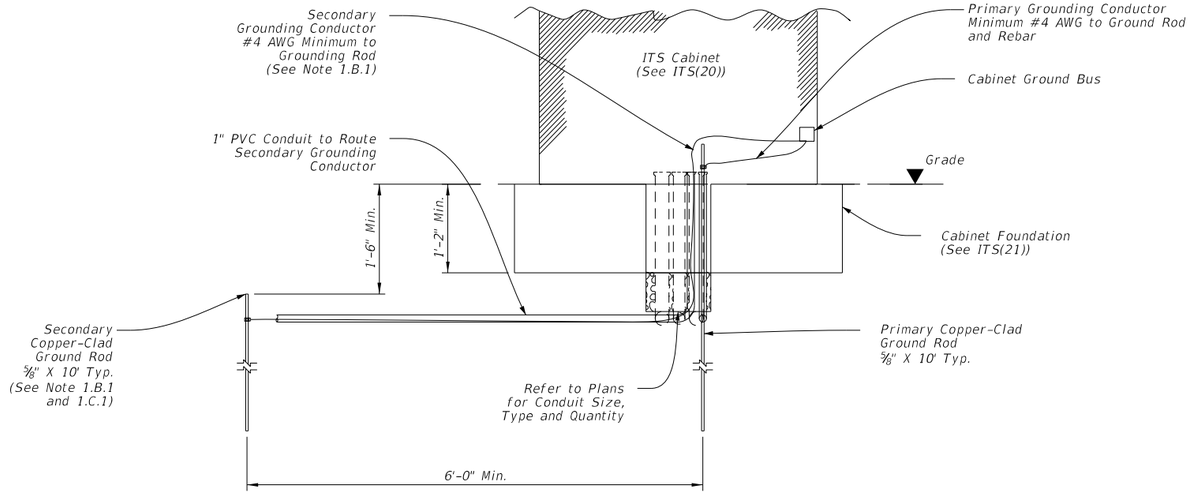
General Notes:

1. Grounding System:
   - A. Description:
     1. Provide ground system consisting of copper wires, ground rods, and concrete-encased grounding electrodes (Ufers), of the configuration shown to minimize potential gradient irregularities, drain leakage, and fault currents to earth.
   - B. Performance:
     1. Provide a grounding system, consisting of a minimum one ground rod, having a resistance not greater than 5 Ohms to ground. Additional ground rods may be added to the system to achieve less than 5 Ohms resistance.
   - C. Design Criteria:
     1. The combined ground resistance of separate systems bonded together below grade may be used to meet the specified ground resistance, but the minimum number of rods indicated shall still be provided.
     2. Measure the resistance of systems requiring separate ground resistance separately before bonding below grade.
     3. Only provide UL-approved materials listed for grounding systems.
     4. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture, unless moisture is permanently excluded from the junction of such materials.
     5. Submit product data for the materials and products used to perform the work of this section.
   - D. Materials:
     1. Conductors:
        - a. Bare Ground Conductor:
          1) For No. 8 AWG or larger bare ground wire sizes, provide soft drawn copper, Class A or Class B, stranded wire meeting the requirements of ASTM B 8.
     2. Ground Compression Connectors:
        - a. Provide molds, thermite packages, and other material for ground compression connectors that are full-rated to carry 100% of the cable rating and which meet IEEE 837.
          1) Provide the compression materials from a single manufacturer throughout the project.
        - b. Provide the items necessary for connecting cable to ground rods.
     3. Ground Rods:
        - a. Provide copper-clad steel ground rods conforming to the requirements specified in UL 467.
          1) Diameter: ⅝ in.
          2) Length: 10 Ft.

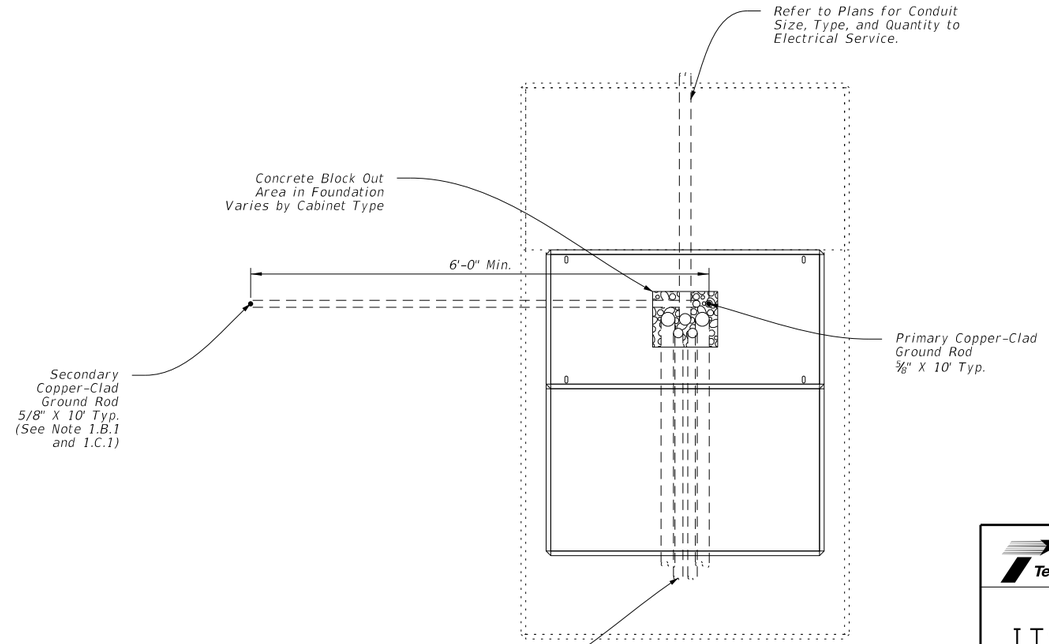
2. Installation:
   - A. Install grounding components and systems in accordance with the requirements specified in UL 467, IEEE 81, and IEEE 142.
   - B. System Grounding:
     1. Ground Rods:
        - a. Drive ground rods into the ground until the tops of the rods are approximately 18 in. below finished grade.
        - b. If multiple ground rods are needed to meet the minimum resistance of 5 Ohms, space ground rods as evenly as possible, at least 6 feet apart, and so conductors will be connected below grade.
     2. Conductors:
        - a. Provide minimum No. 4 AWG ground wire for system and equipment grounding.
        - b. Using suitable fasteners, securely attach exposed ground wires to structural supports at not more than 2 ft. intervals, where applicable.
        - c. Bends in ground wires greater than 45 degrees are unacceptable.
     3. Cable Connections:
        - a. Use approved exothermic-welded connections for conductor splices and connections between conductors and other components.

3. Testing:
   - A. Resistance Test:
     1. Test Procedure:
        - a. The ground-resistance measurements of each ground Rod shall be taken.
          1) The resistance to ground shall be measured in accordance with the fall-of-potential method specified in IEEE 81 and IEEE 142.
          2) Ground-resistance measurements shall be made in normally dry weather, not less than 48 hours after rainfall, and with the ground under test isolated from other grounds.
        - b. Test reports shall be prepared that indicate the location of the ground rod, the grounding system, and the resistance and soil conditions at the time the test was performed.
     2. Acceptance Criteria:
        - a. The grounding system must have a resistance not greater than 5 Ohms.
        - b. Do not energize any part of the electrical distribution system prior to the resistance testing of that system's ground rods and grounding system, and submission of the test results for approval.
     3. Inspections:
        - a. Prepare and submit as-built record drawings of the grounding system as installed and test reports for approval.



Ground Mounted Cabinet – Side View

(Slab & Base)
Not to Scale



Ground Mounted Cabinet - Top View

(Slab & Base)
Not to Scale

Texas Department of Transportation

Traffic Operations Division Standard

ITS CABINET GROUNDING DETAILS

ITS(18)-15

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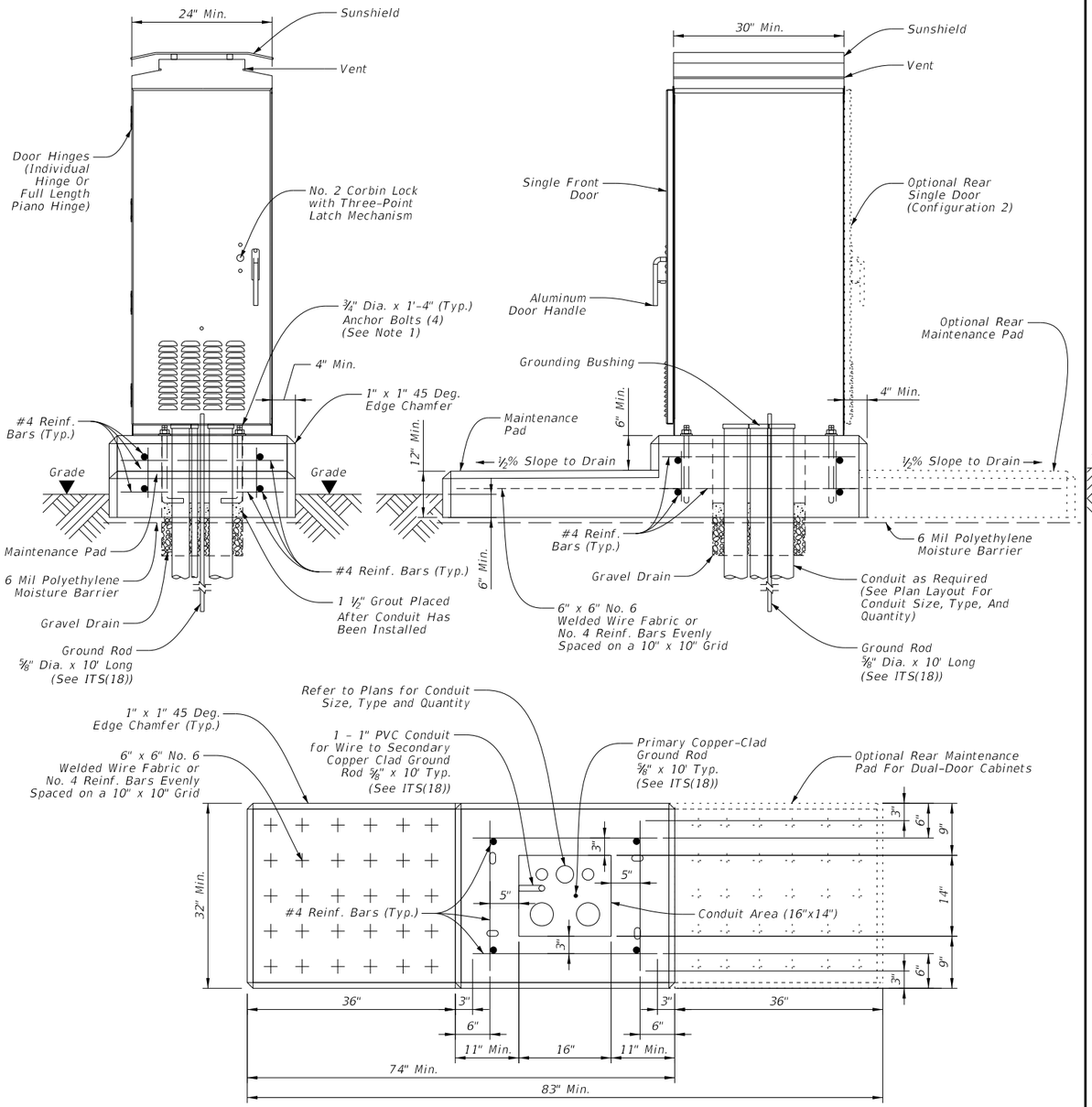
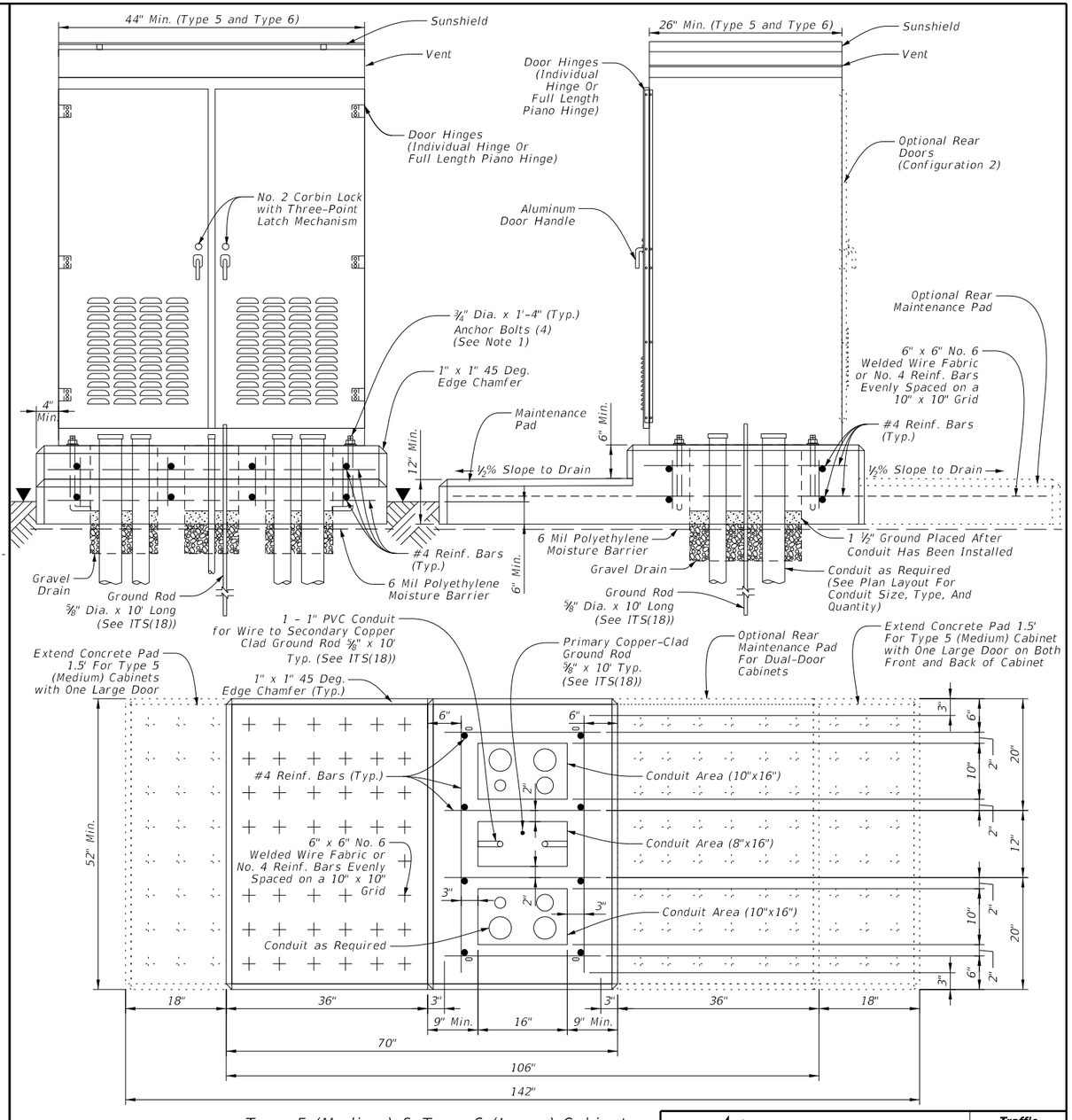


Type 4 (Small) Cabinet



Type 5 (Medium) & Type 6 (Large) Cabinet

General Notes:

1. Details of anchor bolt location to be furnished by the cabinet manufacturer. Size and length of anchor bolts shown in details may vary by manufacturer.
2. Modify concrete base dimensions to fit required cabinet type.
3. Ensure conduit area has gravel drain, 12" depth, course aggregate, grade No. 1.
4. All concrete to be Class "A" in accordance with Item 421.
5. Set the cabinet foundation level with the pavement surface, in unpaved area. The foundation shall be a minimum of 4" above surrounding grade, or as approved by the Engineer.
6. Furnish any additional concrete which may be necessary to stabilize foundation at unusual locations.
7. Foundation will be subsidiary to Special Specification "ITS Ground Mounted Cabinet.
8. Ground cabinet as required in cabinet specifications and as detailed on ITS(18) in accordance with the National Electric Code (NEC).
9. Treat cabinet foundation with moisture sealant.
10. Type 5 cabinet foundation will have a slightly larger foundation than Type 6. See foundation notes on details.
11. Drain pipe shall be screened for drainage portion below foundation in gravel.

Texas Department of Transportation

Traffic Operations Division Standard

ITS GROUND MOUNTED CABINET FOUNDATION DETAILS

ITS(21)-15

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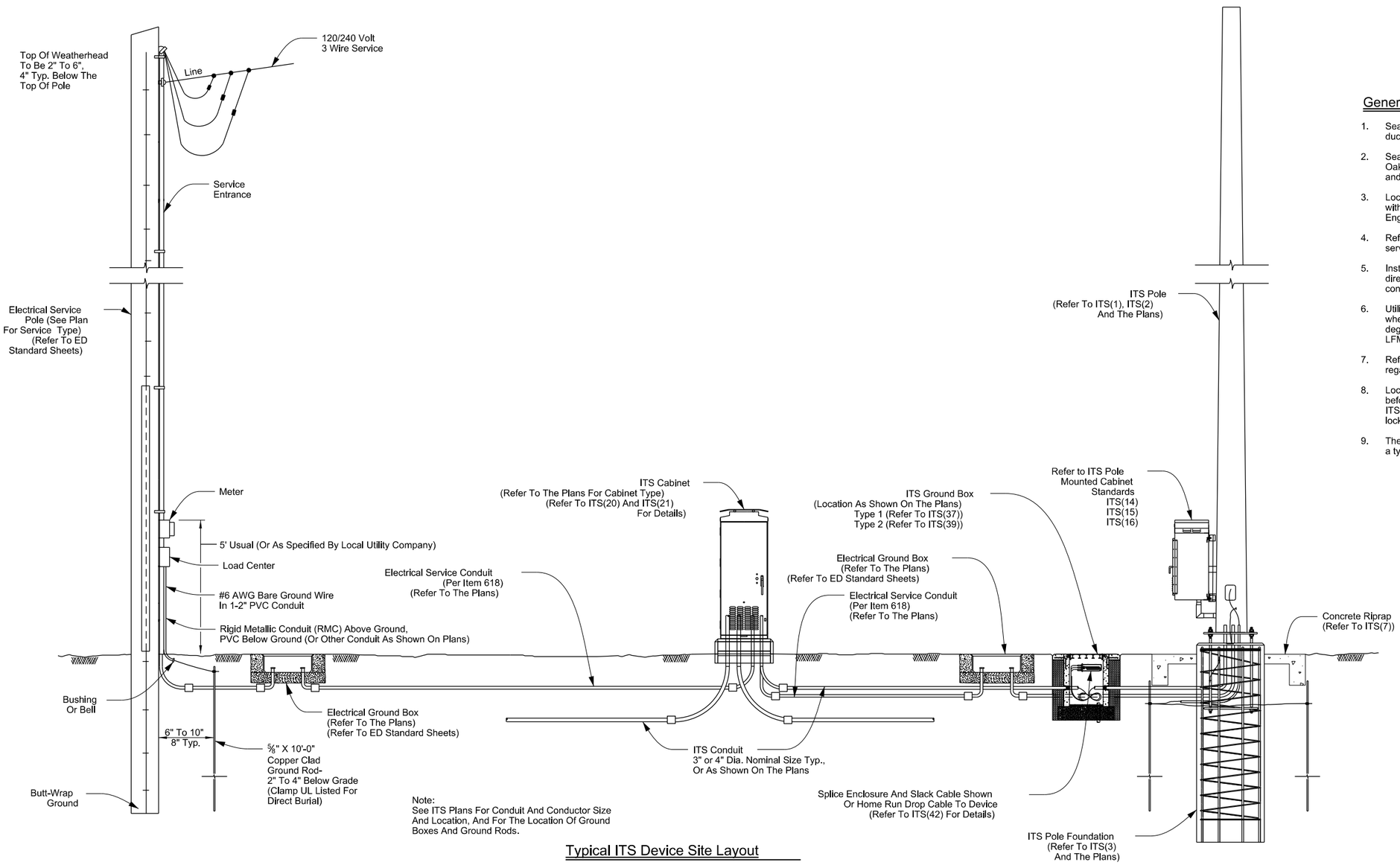

Note:
See ITS Plans For Conduit And Conductor Size And Location, And For The Location Of Ground Boxes And Ground Rods.

Typical ITS Device Site Layout

General Notes:

1. Seal all ITS communications conduits with waterproof duct plugs and seals.
2. Seal ends of all conduit entries into ITS cabinets with Oakum or other as approved by the District representative and pack with duct sealant.
3. Locate ground boxes for electrical and ITS communications within 5'-0" of cabinet enclosure, or as directed by the Engineer.
4. Refer to ED standard sheets for additional notes regarding electrical service.
5. Install service pole ground rod at alternate location when directed by the engineer. Maintain a minimum of 8'-0" in contact with the earth.
6. Utilize liquidtight flexible metal conduit (LFMC), as required when meter and service enclosure are mounted 90 to 180 degrees to each other. Refer to ED standard sheets for details on LFMC use.
7. Refer to ITS(21), ITS(37) and ITS(39) for details regarding conduit depth and entry into ITS ground boxes.
8. Lock all enclosures and bolt all ground box covers before power is applied to the circuit. Refer to the ITS cabinet references indicated on this sheet for cabinet lock requirements.
9. The detail shown is diagrammatic and is intended to represent a typical layout from electrical service to ITS devices.

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Traffic Operations Division Standard

TYPICAL ITS DEVICE SITE LAYOUT

ITS(36)-16

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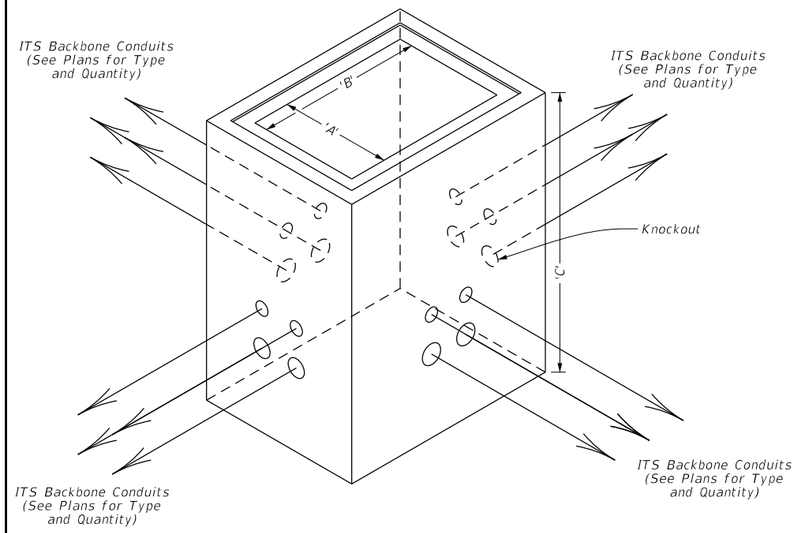
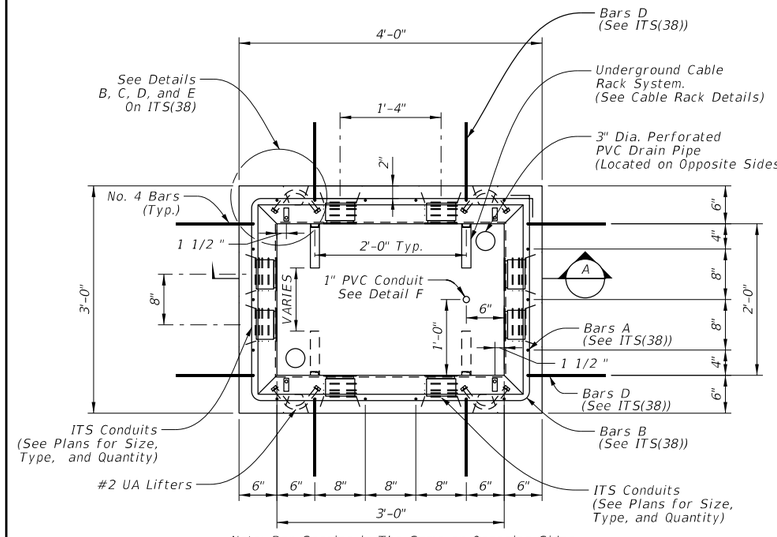


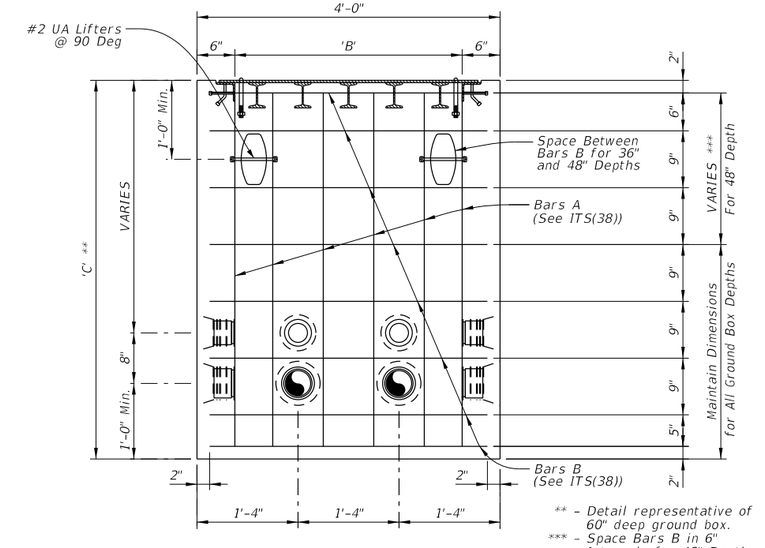
See Ground Box Schedule for A, B, and C Dimensions

Type 1 Ground Box Isometric View

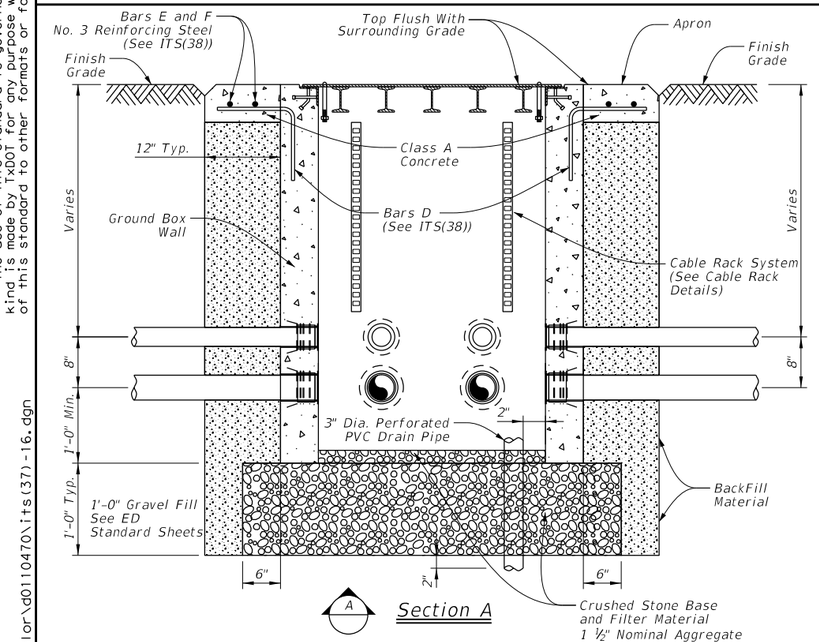


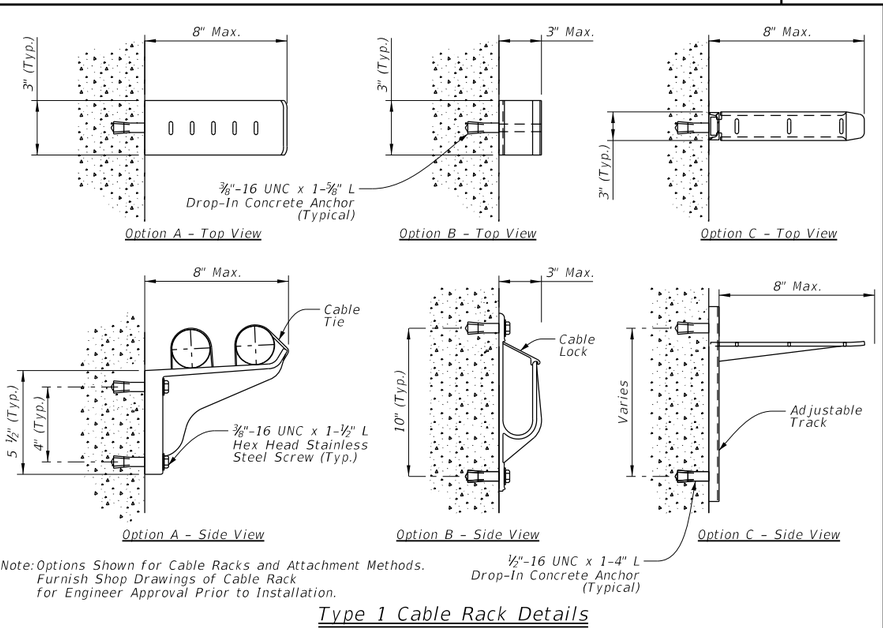
Note: Bar Spacing is The Same on Opposing Sides.

Type 1 Ground Box Plan View



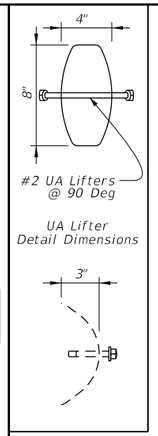
Type 1 Ground Box Elevation View

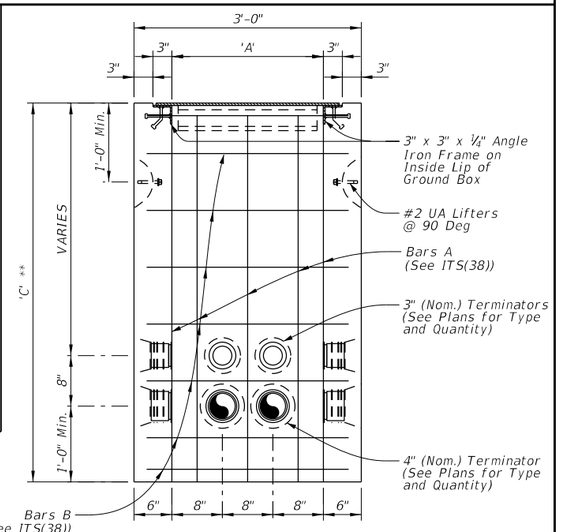




Note: Options Shown for Cable Racks and Attachment Methods. Furnish Shop Drawings of Cable Rack for Engineer Approval Prior to Installation.

Type 1 Cable Rack Details





Type 1 Ground Box Side View

** - Detail representative of 60" deep ground box.

General Notes:

1. Conduit entry points shown represent the standard configuration for backbone conduit as detailed on ITS(27). Additional conduits may be required as shown on the plans.
2. Provide Class A concrete for Type "1" ground boxes.
3. Provide terminators for the PVC conduit cast in the walls and placed symmetrically about the centerline of the box at the depths shown, unless otherwise noted, for the number of conduits identified on the plans to enter the box.
4. Provide terminators appropriately sized for the conduits indicated on the plans. Provide terminators with an air tight and water tight connection.
5. Closed bottom Type "1" ground boxes are acceptable in lieu of open bottom boxes. Provide two 3" Dia. perforated PVC drain pipes on opposite corners to optimize water drainage. Provide 12-inch base of crushed stone which extends 6 inches in all directions from the perimeter of the box for closed bottom boxes. Crushed stone will be subsidiary to Special Specification, "ITS Ground Box."
6. Install all open bottom Type "1" ground boxes on a 12-inch base of crushed stone which extends 6 inches in all directions from the perimeter of the box. Crushed stone will be subsidiary to Special Specification, "ITS Ground Box."
7. Cap and seal terminators that do not have conduits attached.
8. When additional conduit entry points are needed to accommodate existing conduit, core drill conduit knockouts in the field of the appropriate number and size of conduit at each location, as directed by the Engineer.
9. Provide a bell fitting on the end of each conduit to ensure a flush fit inside the ground box.
10. Concrete grout around the knockout (inside and out) and around the conduit and bell fitting to ensure a neat watertight fit after the conduit and bell fitting have been placed in a knockout. Ensure all openings in the ground box are sealed prior to grouting operations.
11. Install a nylon string and plug all unused conduits with tug-plugs sized for the particular conduits. Provide split innerduct plugs in conduits or innerducts with cables to seal the innerduct around the cables to prevent water and dirt from entering.
12. Provide steel (ASTM A-153), glass reinforced nylon, or equivalent cable rack assemblies designed to support the amount of cable storage slack identified in the plans. Locate cable rack system on one side only (longer length side) to allow access to the inside of the ground box. Cable racks may be installed at the factory or in the field. When mounting cable racks in the field, seal all penetrations to the concrete side wall to prevent moisture penetration. Ground metallic cable rack systems to grounding system inside ground box in accordance with the National Electrical Code.

Ground Box Schedule			
Ground Box Type	'A' Width Inside (Inches)	'B' Length Inside (Inches)	'C' Depth Inside (Inches)
Type 1	24	36	36, 48, 60

Sheet Details
Not to Scale

SHEET 1 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

ITS GROUND BOX DETAILS TYPE "1" WITH STEEL COVER

ITS(37)-16

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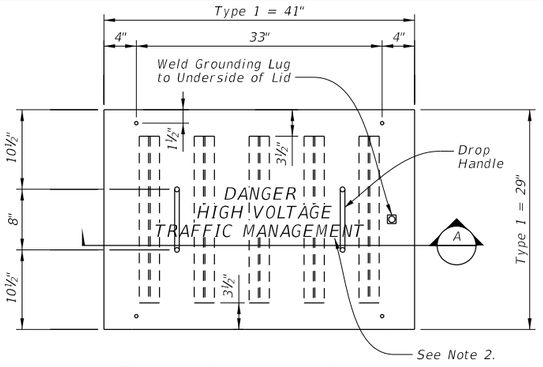
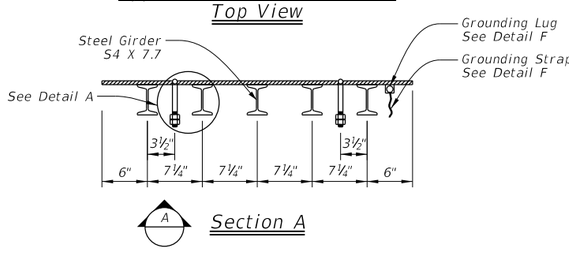
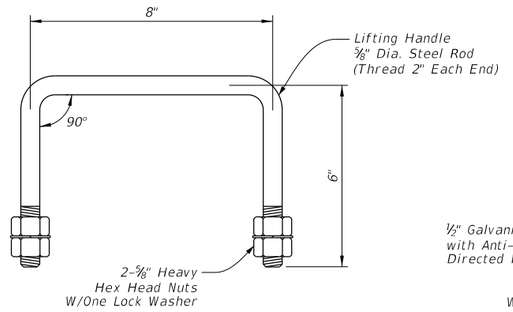


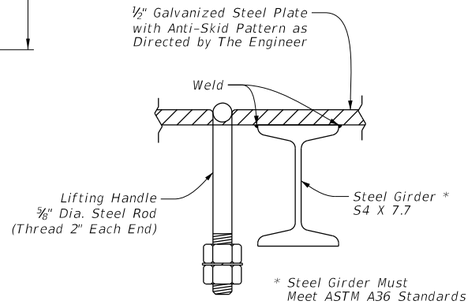
Type 1 Steel Cover Details
Top View



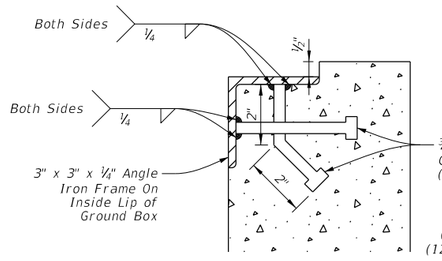
Section A



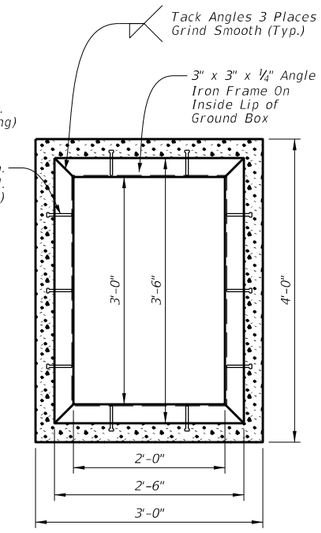
Drop Handle Detail



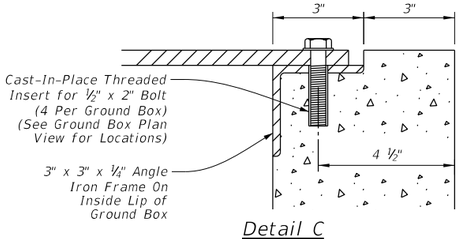
Detail A



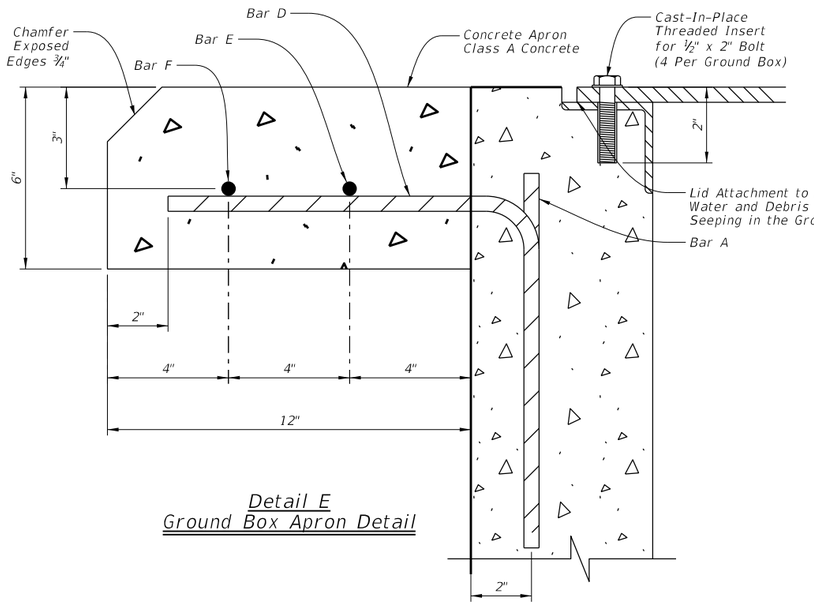
Detail B



Detail D



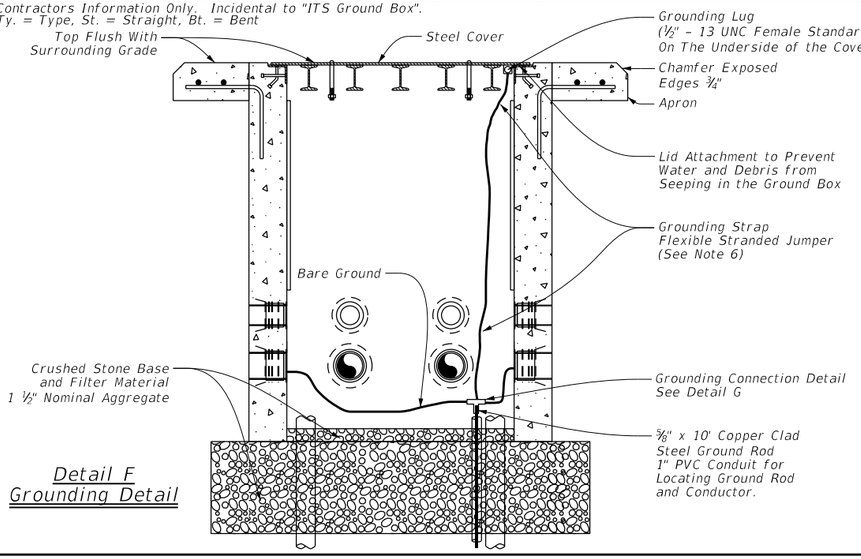
Detail C
Lid Attachment Detail



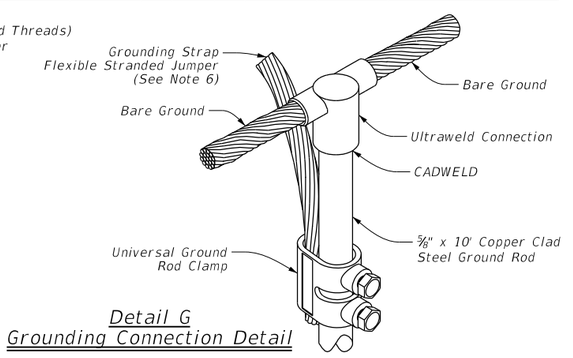
Detail E
Ground Box Apron Detail

Ground Box Type 1	BAR A					BAR B					BAR D					BAR E					BAR F					TOTALS	
	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	Steel * LBS.	Conc. * CY
36" Depth	22	#4	St.	2'-8"	39.3	5	#4	Bt.	13'-2"	44.1	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	108.1	.67
48" Depth	22	#4	St.	3'-8"	54.0	7	#4	Bt.	13'-2"	61.8	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	140.5	.89
60" Depth	22	#4	St.	4'-8"	68.8	8	#4	Bt.	13'-2"	70.6	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	164.1	1.11

* - For Contractors Information Only. Incidental to "ITS Ground Box".
Legend: Ty. = Type, St. = Straight, Bt. = Bent



Detail F
Grounding Detail



Detail G
Grounding Connection Detail

Note - All grounding connections to be CADWELD or approved equal. This work will not be paid for directly, but is considered incidental to ITS ground box.

General Notes:

1. See ITS(37) for additional Type "1" ground box details.
2. Hot-dip galvanized steel covers after all welds are made.
3. Label top of cover with the words "DANGER HIGH VOLTAGE TRAFFIC MANAGEMENT" using template-guided, hand-welded lettering at a height of 2 inches to ensure neatness.
4. Provide all Type "1" ground boxes with a securable, tamper-proof cover equipped with a bolting system that positively secures the cover in place.
5. Ground steel covers in accordance with the National Electrical Code.
6. Ground covers to the grounding cable using a split-bolt kearney clamp, and a minimum 8-foot long flexible stranded jumper the same size as the grounding conductor. Terminate to metal ground box cover with a tank ground type lug as approved and directed by the Engineer.
7. Provide Type "1" ground box and cover designed for heavy duty loading in accordance with AASHTO H20 loading when located where the box may experience deliberate, continuous vehicular traffic, such as near the shoulder or an auxiliary lane, or immediately adjacent to the unprotected edge of pavement.
8. Provide a Type "1" ground box and cover tested by a laboratory independent of the manufacturer certifying loading requirements are met. Provide certification of such tests to the Engineer for approval.
9. Provide a steel or cast iron cover in accordance with Item 471, Article 471.2, "Frames, Grates, Rings, and Covers." Provide covers with the number of drop handles shown. Provide Class "A" concrete for ground box construction and aprons.
10. Fabricate cover so to fits properly on the ground box, and no undue noise results when traffic contacts the cover.

Sheet Details
Not to Scale

SHEET 2 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

ITS GROUND BOX DETAILS TYPE "1" WITH STEEL COVER

ITS(38)-17

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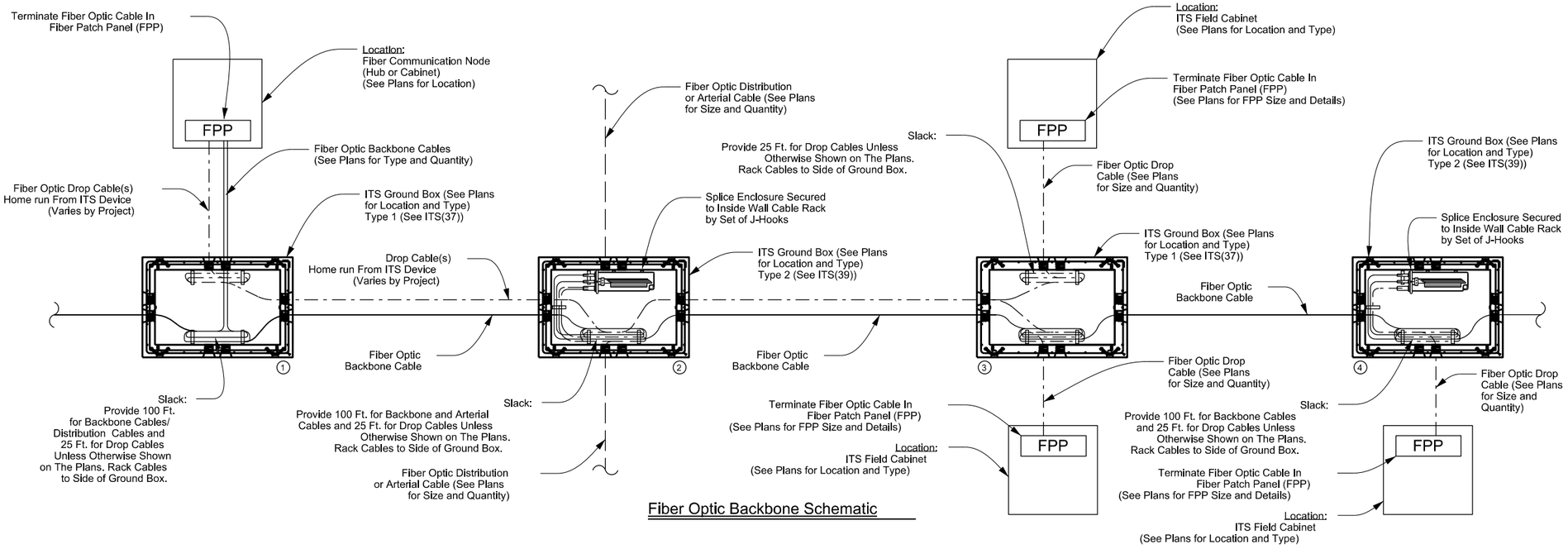
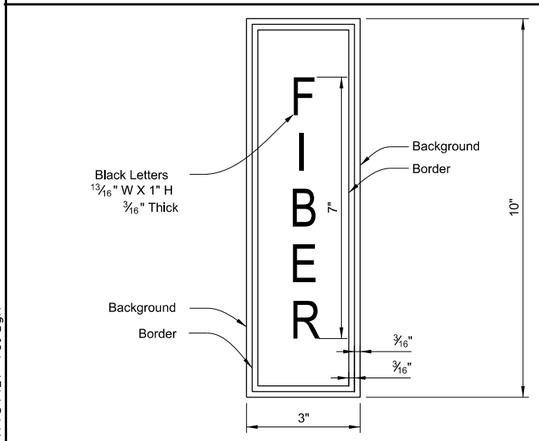
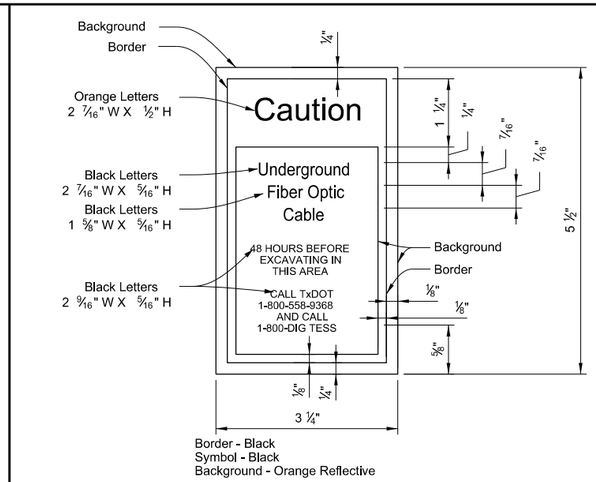


Fiber Optic Backbone Schematic



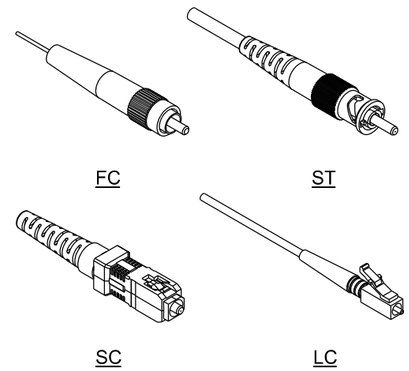
Border - Black
Background - Orange Reflective

Fiber Decal Details



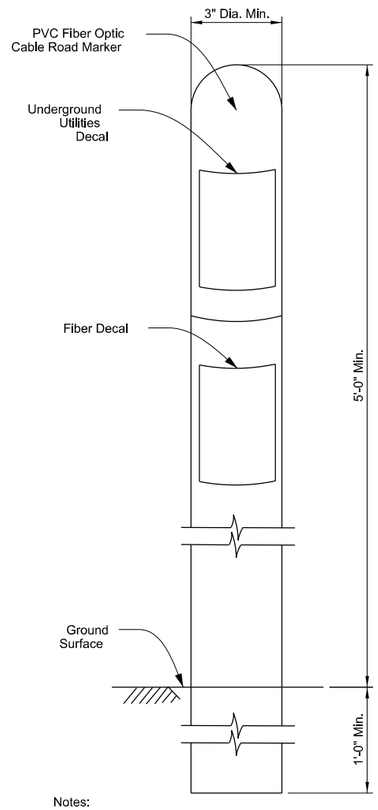
Border - Black
Symbol - Black
Background - Orange Reflective

Underground Utilities Decal Details



Fiber Optic Connectors

Note - Details are diagrammatic and may vary by manufacturer.



Notes:
1. Space fiber optic cable road markers at maximum 1000' intervals or at significant changes in direction such as a 90 degree turn.
2. Provide all orange fiber optic cable road markers for non-splice locations.
3. Provide orange fiber optic cable road markers with white dome for splice locations.
4. Locate marker within concrete apron of fiber ground box.

Fiber Optic Cable Road Markers

Reference Notes:

1. Fiber architecture at communication node.
2. Fiber architecture for splicing arterial distribution cables.
3. Fiber architecture for home run of drop cables from ITS field equipment cabinets to communication node.
4. Fiber architecture for splicing drop cable from ITS field equipment cabinet.

General Notes:

1. The fiber optic backbone schematic shown is diagrammatic only and intended to represent the various fiber optic communication architectures seen across the state and may not show all configurations seen. Connection of ITS field equipment to ITS communication nodes or hubs is achieved through home run drop cables or spliced to the backbone in a splice enclosure. Refer to fiber communication schematic details and fiber termination information shown on the plans for further information.
2. Install a flat pull cord in all empty conduits and inner-ducts identified for communication use. The pull cord must have a tensile strength of 1,250 lbs minimum and have foot markings to determine length installed. Furnish and installation of pull cord will be subsidiary to special specification "ITS Fiber Optic Cable".
3. Color code each type of fiber optic cable to identify the cable as a "backbone" (green or blue), "distribution" (red), or "drop" (orange or yellow).
4. Terminate fibers at fiber patch panel (FPP), also referred to as patch panel, with SC connectors for new installations. When connecting to existing FPP, terminate with FC or ST connectors as shown on the plans. Provide connector adaptors as required to accommodate existing equipment if information is not provided in the plans.
5. Provide a list showing cable number assignments and highway or facility that the cable services.
6. Provide a single 1/C #14 insulated wire in conduit runs which have been identified in the plans to carry fiber optic cable. Provide UL listed solid copper wire with orange color low density polyethylene insulation suitable for conduit installation rated for temperature range -20 C to 60 C and a voltage rating of 600V. This wire will serve as a tracer, or locate, wire for locating underground conduit containing fiber optic cabling and will be paid for under Item 620, "Electrical Conductors."
7. Ensure each cable is marked on the outer jacket with a label detailing the manufacturer's name, the date of manufacturer (month/year), the fiber count (Example: 48F SM or 48 SMF), and sequential length markings at maximum 3 FT increments.

Sheet Details
Not to Scale

SHEET 1 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

ITS FIBER OPTIC CABLE MISCELLANEOUS DETAILS

ITS(42)-16

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	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		136

DATE: 2/23/2021 9:58:36 AM
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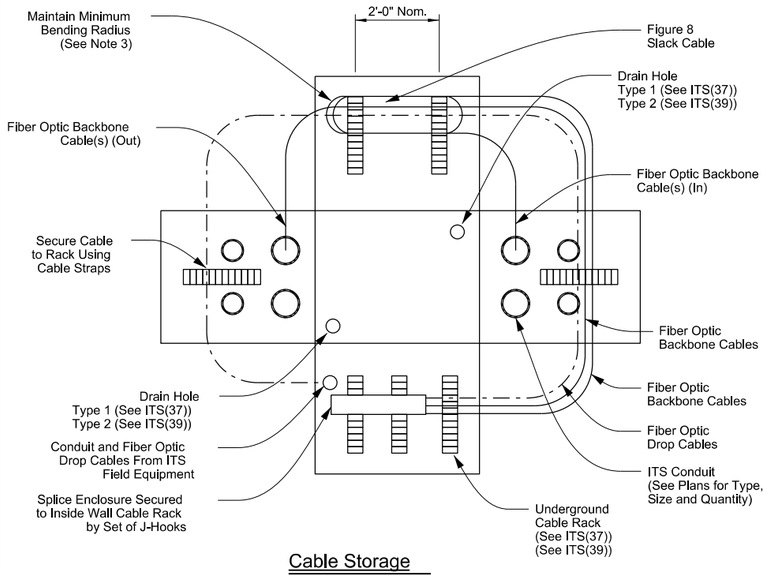
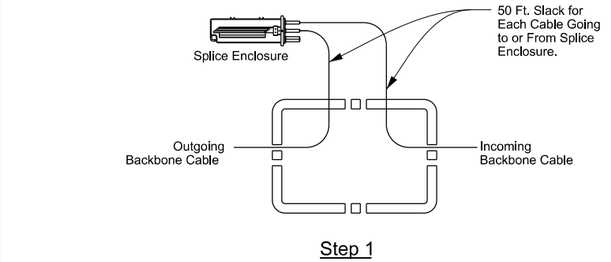
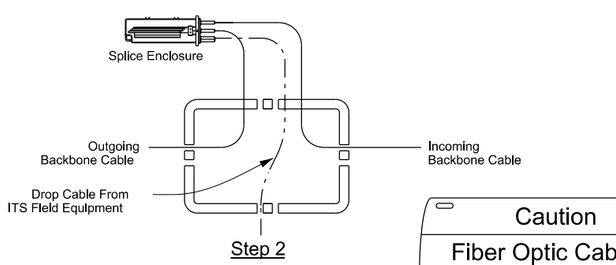


Cable Storage

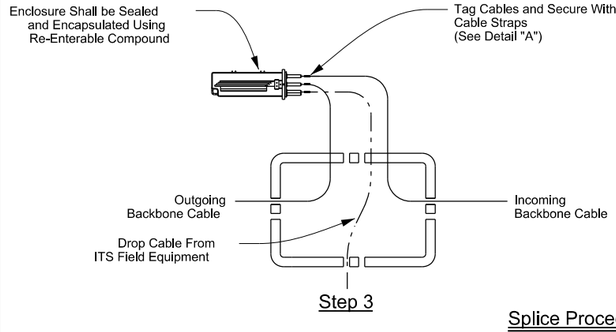
Top View - Ground Box Walls Folded Down for Clarity



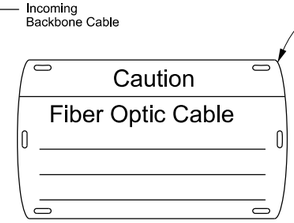
Step 1



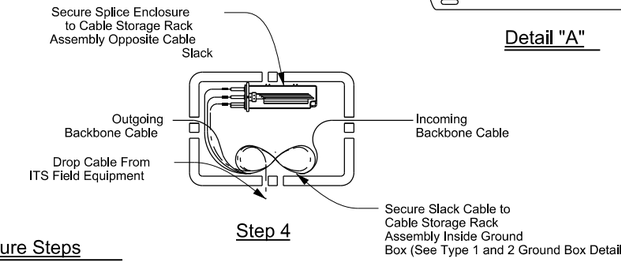
Step 2



Step 3

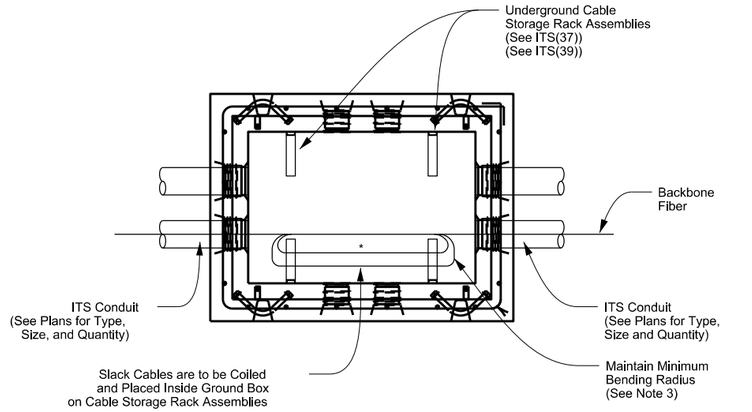


Detail "A"



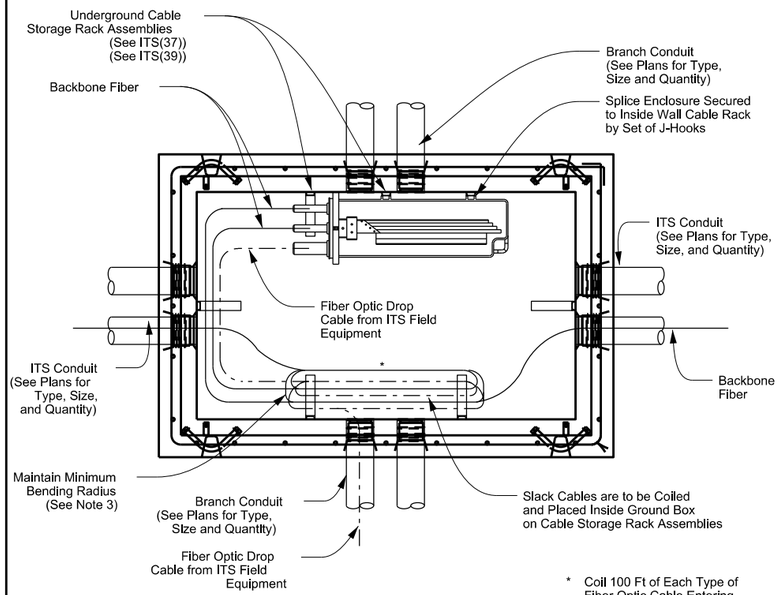
Step 4

Splice Procedure Steps



Type "1" Ground Box

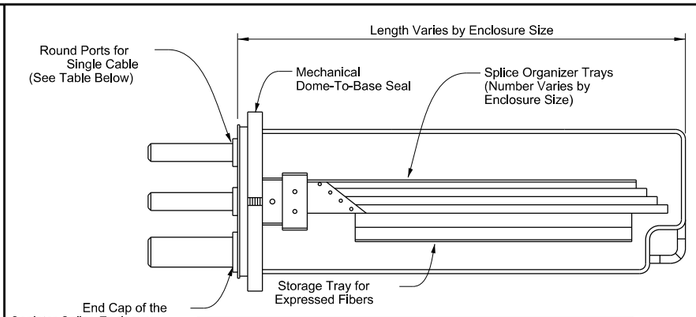
* Coil 25 Ft of Fiber Optic Cable for Slack



Type "2" Ground Box

with Splice

* Coil 100 Ft of Each Type of Fiber Optic Cable Entering the Ground Box



Splice Enclosure Sizes			
Type	No. of Ports	Port Capacity	Fiber Use
1	4	2 - Up to 144 Sm	Backbone
		2 - Up to 48 Sm	Drop
2	6	4 - Up to 144 Sm	Backbone/Arterial
		2 - Up to 48 Sm	Drop
3	8	4 - Up to 144 Sm	Backbone/Arterial
		4 - Up to 48 Sm	Drop

Splice Enclosure Fiber Accommodations

General Notes:

1. Conduit entry points to the Type 1 and Type 2 ground boxes are diagrammatic. Refer to ITS ground box standards, ITS(37) and ITS(39), for more information. Additional conduits may be required as shown on the plans.
2. Type 2 ground boxes are to be used, as shown on the plans, when splice enclosures are required.
3. Maintain a minimum bend radius of 20 times the fiber optic cable diameter during installation, relocation, and removal and a minimum of 10 times the fiber optic cable diameter when in operation.
4. Caulk all conduit around the top of the cable ducts with an engineer approved caulking compound to seal clearance between the cables and ducts. Place conduit plugs in all vacant conduits or inner-ducts.
5. Provide cable straps that will withstand ultra-violet exposure and do not damage cables when tightening.
6. All incidental equipment necessary for the cable installation and mounting of splice enclosure within the ground box will be incidental to Special Specification, "ITS Fiber Optic Cable."
7. Submit all splice locations to the field engineer for approval before beginning work.
8. Provide splice enclosures designed to seal, bond, anchor, and protect fiber optic cable splices. Provide splice enclosures designed to handle mechanical and fusion type splices. Provide splice enclosures with port configurations for the sizes detailed above.
9. Provide splice enclosures designed for underground placement with a sealing system preventing water penetration when submerged under 10 ft. of water.
10. Furnish, install, and secure fiber optic cable tags for each fiber optic cable entering a ground box, ITS field equipment cabinet (ground and pole), and hub building or communication node as detailed above. Provide information including fiber optic type, count, origin, and destination on the cable tag. Use UV resistant tie-wraps for securing the tag to the cable. Provide tie-wraps that do not damage fiber when securing to cable.

Sheet Details
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Traffic Operations Division Standard

ITS FIBER OPTIC CABLE MISCELLANEOUS DETAILS

ITS(43)-16

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	DIST	COUNTY		SHEET NO.
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