STATE DISTRICT	FEDERAL REGION	PROJECT NO.			SHEET
HOU	6	C 114-12-15			1
COUNTY		CONTROL	SECTION	JOB	HIGHWAY
HARRIS		0114	12	015	US 290

INDEX OF SHEETS

- SEE SHEET 2 FOR INDEX OF SHEETS

STATE OF TEXAS

DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED

STATE HIGHWAY IMPROVEMENT

PROJECT NO.: C 114-12-15

CSJ NO.: 0114-12-015

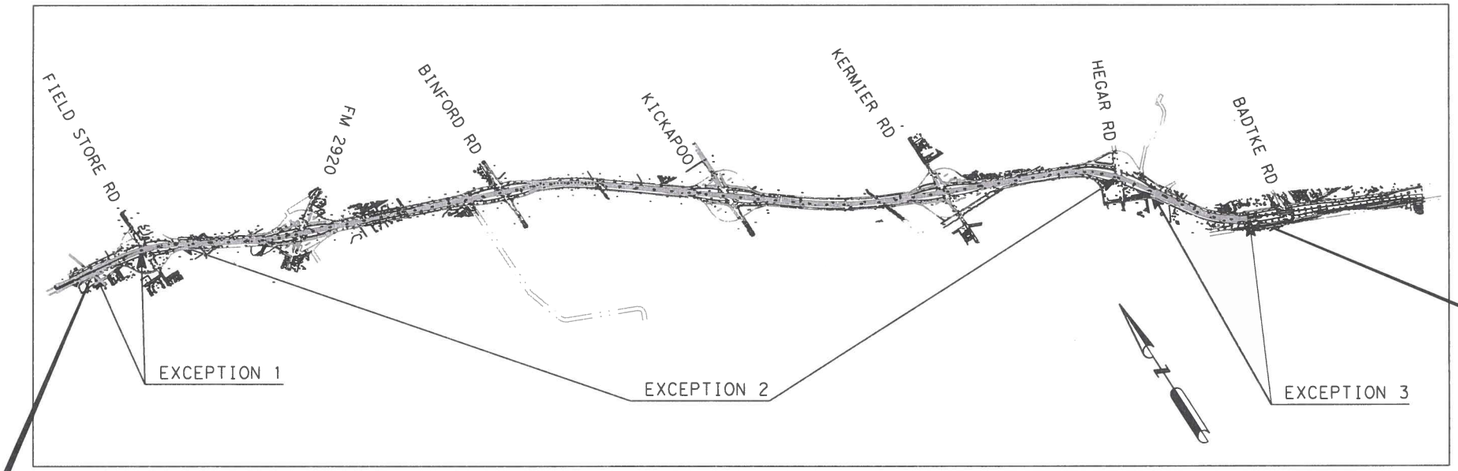
COUNTY: HARRIS

US 290 (DETENTION PONDS)

LIMITS: AT HEGAR ROAD AND FIELD STORE ROAD

NET LENGTH OF ROADWAY = 2,000 FT. / 0.379 MI.
NET LENGTH OF BRIDGE = 0 0
TOTAL LENGTH OF PROJECT = 2,000 FT. / 0.379 MI.

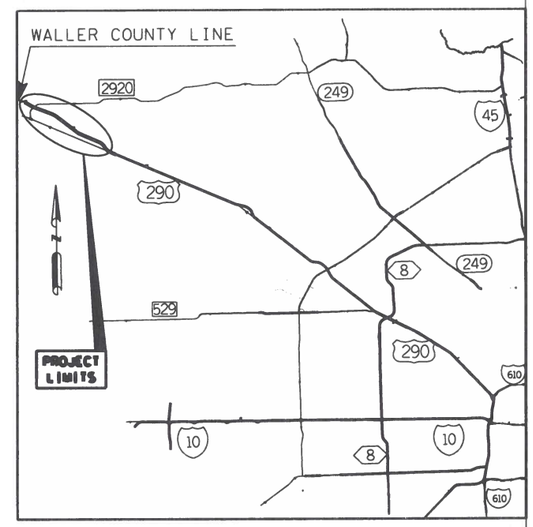
FOR THE CONSTRUCTION OF WORK CONSISTING OF DETENTION POND IMPROVEMENTS
FOR EXCAVATION, EMBANKMENT, STORM SEWER, EROSION CONTROL, SEEDING AND WATERING.



LOCATION MAP
NTS

BEGIN PROJECT
CSJ 0114-12-015
STA 10000+00.00
REF. MRKR 704A+1.714
MP: 0.016
X = 2940931.8025
Y = 13951048.1082
LAT = 30.0695828°
LONG = -95.9266230°

END PROJECT
CSJ 0114-12-015
STA 10340+00.00
REF. MRKR 0712A+0.181
MP: 6.455
X = 2970315.5965
Y = 13935228.4194
LAT = 30.0239553°
LONG = -95.8351260°



VICINITY MAP
N. T. S.

DESIGN SPEED = VARIES

FUNCTIONAL CLASS: VARIES

ADT = VARIES

RR CROSSINGS: NONE
EQUATIONS: NONE
EXCEPTIONS:
1 FROM STA 10000+00 TO STA 10015+00 = 1,500 FT
2 FROM STA 10025+00 TO STA 10300+00 = 27,500 FT
3 FROM STA 10310+00 TO STA 10340+00 = 3,000 FT
TOTAL = 32,000 FT

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND THE SPECIFICATION ITEM LISTED AS FOLLOWS SHALL GOVERN ON THIS PROJECT:
REQUIRED LABOR PROVISION FOR STATE PROJECTS: SP000---008

Texas Department of Transportation

SUBMITTED FOR LETTING 11/10/22
P.E.
AREA ENGINEER

APPROVED FOR LETTING 1/6/2023
DocuSigned by:
Larry W. Blackburn, P.E.
B9928A09E03E42F...
For DISTRICT ENGINEER

H:\WCHAO\Design\CONSTRUCTION PROJECTS\0114-12-015 US 290 DETENTION PONDS\PLAN SET\GENERAL\GTsht.DGN

COUNTY HARRIS PROJ. NO. C 114-12-15
HWY. NO. US 290 LETTING DATE MARCH 2023
DATE ACCEPTED

I. GENERAL

II. TRAFFIC CONTROL STANDARDS

III. LAYOUT DETAILS

III. DRAINAGE STANDARDS

IV. ENVIRONMENTAL

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

* STANDARD SHEETS
THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE, HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THE PROJECT.

WILLIAM D. BURCH, P.E. William Burch, P.E. DATE 1-12-23

TEXAS DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS

SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			2
STATE	STATE DIST. NO.	COUNTY	
TEXAS	HOU	HARRIS	
CONT.	SECT.	JOB	HIGHWAY NO.
0114	12	015	US 290

General Notes:

General:

Contractor questions on this project are to be addressed to the following individuals:

Area Engineer :Hamoon Bahrami, P.E. e-mail: Hamoon.Bahrami@txdot.gov
Assistant Area Engineer:Brett McLeod, P.E. e-mail: Brett.McLeod@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals. Contractor questions will be reviewed by the Area Engineer or Assistant Area 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%20Responses/

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

If fixed features require, the governing slopes shown may vary between the limits shown and to the extent determined by the Engineer.

Notify the Engineer immediately if discrepancies are discovered in the plans location point survey data or the benchmark data.

References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved, except for roadway illumination, electrical, and traffic signal items.

The cost for materials, labor, and incidentals to provide for traffic across the roadway and for ingress and egress to private property in accordance with Section 7.2.4 of the standard specifications is subsidiary to the various bid items. Restore access roadways to their original condition upon completing construction.

Clearly mark or highlight on the shop drawings, the items being furnished for this project. Submit required shop drawings in accordance with the shop drawing distribution list shown in the note for Item 5 for review and distribution.

Unless otherwise shown on the plans or otherwise directed, commence work after sunrise and ensure construction equipment is off the road by sunset.

General: Site Management

Mow the grass and weeds within the project limits a maximum of 3 times a year as directed. This work is subsidiary to the various bid items.

Mark project length every 100 ft. and maintain the markings for the project duration. Remove the markings at the completion of the project. This work is subsidiary to the various bid items.

Do not mix or store materials, or store or repair equipment, on top of concrete or asphalt pavement unless authorized by the Engineer.

Personal vehicles of employees are not permitted to park within the right of way, including sections closed to public traffic. Employees may park on the right of way at the Contractor's office, equipment, and materials storage yard sites.

Assume ownership of debris and dispose of at an approved location. Do not dispose of debris on private property unless approved in writing by the District Engineer.

Control the dust caused by construction operations. For sweeping the base material in preparation for laying asphalt and for sweeping the finished concrete pavement, use one of the following types of sweepers or approved equal:

Tricycle Type	**Truck Type - 4 Wheel**
Wayne Series 900	M-B Cruiser II
Elgin White Wing	Wayne Model 945
Elgin Pelican	Mobile TE-3
	Mobile TE-4
	Murphy 4042

General: Traffic Control and Construction

Schedule construction operations such that preparing individual items of work follows in close sequence to constructing storm drains in order to provide as little inconvenience as practical to the businesses and residents along the project.

This project requires extensive grading operations in an environmentally sensitive area.

If relocating mailboxes, place them with the post firmly in the ground at nearby locations. Upon completing the project, the Engineer will locate the final mailbox placement. Perform this work in accordance with the requirements of the Item, "Mailbox Assemblies," except for measurement and payment. This work is subsidiary to the various bid items.

If fences cross construction easements shown on the plans and work is required beyond the fences, remove, and replace the fences as directed. This work and the materials are subsidiary to the various bid items.

When design details are not shown on the plans, provide signs and arrows conforming to the latest "Standard Highway Sign Designs for Texas" manual.

General: Utilities

There should be no utility conflict in the scope of work area, but if a utility marker located is in the vicinity of work area consider the locations of underground utilities and employ responsible care to avoid damaging utility facilities. Depending upon scope and magnitude of planned construction activities, advanced field confirmation by the utility owner or operator may be prudent. Where possible, protect and preserve permanent signs, markers, and designations of underground facilities.

If the Contractor damages or causes damage (breaks, leaks, nicks, dents, gouges, etc.) to the utility, contact the utility facility owner or operator immediately.

At least 72 hours before starting work, make arrangements for locating existing Department-owned above ground and underground fiber optic, communications, power, illumination, and traffic signal cabling and conduit. Do this by calling the Department's Houston District Traffic Signal Operations Office at 713-802-5662, or by e-mailing the Department's Houston District Traffic Signal Operations Office at HOU-LocateRequest@txdot.gov, to schedule marking of underground lines on the ground. Use caution if working in these areas to avoid damaging or interfering with existing facilities.

Notify the Engineer at least 48 hours before constructing junction boxes at storm drain and utility intersections.

If overhead or underground power lines need to be de-energized, contact the electrical service provider to perform this work. Costs associated with de-energizing the power lines or other protective measures required are at no expense to the Department.

If working near power lines, comply with the appropriate sections of Texas State Law and Federal Regulations relating to the type of work involved.

Perform electrical work in conformance with the National Electrical Code (NEC) and Department standard sheets.

Item 5: Control of Work

Submit shop drawings electronically for the fabrication of items as documented in Table 1 below. Information and requirements for electronic submittals can be viewed in the "Guide to Electronic Shop Drawing Submittal" which can be accessed through the following web link, ftp://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/bus/bridge/e_submit_guide.pdf. References to 11 in. x 17 in. sheets in individual specifications for structural items imply electronic CAD sheets.

Table 1

2014 Construction Specification Required Shop/Working Drawing Submittals - TxDOT Generated Plans

Spec Item No.'s	Product	Submittal Required	Approval Required (Y/N)	Contractor/ Fabricator P.E. Seal Required	Reviewing Party	Shop or Working Drawing (Note 1)
7.16.1&.2	Construction Load Analyses	Y	Y	Y	B	WD
400	Excavation and Backfill for Structures (cofferdams)	Y	N	Y	A	WD
403	Temporary Special Shoring	Y	N	Y	C	WD
420	Formwork/Falsework	Y	N	Y	A	WD
423	Retaining Walls, (calcs req'd.)	Y	Y	Y	C	SD
425	Optional Design Calculations (Prstrs Bms)	Y	Y	Y	B	SD
425	Prestr Concr Sheet Piling	Y	Y	N	B	SD
425	Prestr Concr Beams	Y	Y	N	B	SD
425	Prestr Concr Bent	Y	Y	N	B	SD
426	Post Tension Details	Y	Y	N	B	SD
434	Elastomeric Bearing Pads (All)	Y	Y	N	B	SD
441	Bridge Protective Assembly	Y	Y	N	B	SD
441	Misc Steel (various steel assemblies)	Y	Y	N	B	SD
441	Steel Pedestals (bridge raising)	Y	Y	N	B	SD
441	Steel Bearings	Y	Y	N	B	SD
441	Steel Bent	Y	Y	N	B	SD
441	Steel Diaphragms	Y	Y	N	B	SD
441	Steel Finger Joint	Y	Y	N	B	SD
441	Steel Plate Girder	Y	Y	N	B	SD
441	Steel Tub-Girders	Y	Y	N	B	SD
441	Erection Plans, including Falsework	Y	N	Y	A	WD
449	Sign Structure Anchor Bolts	Y	Y	N	T	SD
450	Railing	Y	Y	N	A	SD
462	Concrete Box Culvert	Y	Y	N	C	SD
462	Concrete Box Culvert (Alternate Designs Only,calcs reqd.)	Y	Y	Y	B	SD
464	Reinforced Concrete Pipe (Jack and Bore only; ONLY when requested)	Y	Y	Y	A	SD
465	Pre-cast Junction Boxes, Grates, and Inlets	Y	Y	N	A	SD
465	Pre-cast Junction Boxes, Grates, and Inlets (Alternate Designs Only, calcs req'd.)	Y	Y	Y	B	SD
466	Pre-cast Headwalls and Wingwalls	Y	Y	N	A	SD
467	Pre-cast Safety End Treatments	Y	Y	N	A	SD
495	Raising Existing Structure (calcs reqd.)	Y	Y	Y	B	SD
610	Roadway Illumination Supports (Non-Standard only, calcs reqd.)	Y	Y	Y	BRG	SD
613	High Mast Illumination Poles (Non-standard only, calcs reqd.)	Y	Y	Y	BRG	SD
627	Treated Timber Poles	Y	Y	N	T	SD
644	Special Non-Standard Supports (Bridge Mounts, Barrier Mounts, Etc.)	Y	Y	Y	T	SD
647	Large Roadside Sign Supports	Y	Y	Y	T	SD

650	Cantilever Sign Structure Supports - Alternate Design Calcs.	Y	Y	Y	T	SD
650	Sign Structures	Y	Y	N	T	SD
680	Installation of Highway Traffic Signals	Y	Y	N	T	SD
682	Vehicle and Pedestrian Signal Heads	Y	Y	N	T	SD
684	Traffic Signal Cables	Y	Y	N	T	SD
685	Roadside Flashing Beacon Assemblies	Y	Y	N	T	SD
686	Traffic Signal Pole Assemblies (Steel) (Non-Standard only)	Y	Y	Y	T	SD
687	Pedestal Pole Assemblies	Y	Y	N	T	SD
688	Detectors	Y	Y	N	A	SD
784	Repairing Steel Bridge Members	Y	Y	Y	B	WD
SS	Prestr Concr Crown Span	Y	Y	N	B	SD
SS	Sound Barrier Walls	Y	Y	Y	A	SD
SS	Camera Poles	Y	Y	Y	TMS	SD
SS	Pedestrian Bridge (Calcs req'd.)	Y	Y	Y	B	SD
SS	Screw-In Type Anchor Foundations	Y	Y	N	T	SD
SS	Fiber Optic/Communication Cable	Y	Y	N	TMS	SD
SS	Spread Spectrum Radios for Signals	Y	Y	N	T	SD
SS	VIVDS System for Signals	Y	Y	N	T	SD
SS	CTMS Equipment	Y	Y	N	TMS	SD

Notes:

1. Document flow for Working Drawings differs from Shop Drawings in that Working Drawings must be submitted to the Engineer rather than the Engineer of Record and they are for the information of the Engineer only; an approval stamp and distribution to all project offices is not required.

Key to Reviewing Party

A - Area Office

Area Office	Email Address
Brazoria Area Office	HOU-BRZAShpDrwgs@txdot.gov
Fort Bend Area Office	HOU-FBAShpDrwgs@txdot.gov
Galveston Area Office	HOU-GALVAShpDrwgs@txdot.gov
Montgomery Area Office	HOU-MONTAShpDrwgs@txdot.gov
North Harris Area Office	HOU-NHAShpDrwgs@txdot.gov
Southeast Area Office	HOU-SEHAShpDrwgs@txdot.gov
Traffic Systems Construction Office	HOU-TSCShpDrwgs@txdot.gov
West/Central Harris Area Office	HOU-WWCHAOShpDrwgs@txdot.gov

B - Houston Bridge Engineer

Bridge Design (Houston TxDOT)	HOU-BrgShpDrwgs@txdot.gov

BRG - Austin Bridge Division

Bridge Design (Austin TxDOT)	BRG_ShopPlanReview@txdot.gov

C - Construction Office

Construction	HOU-ConstrShpDrwgs@txdot.gov
Laboratory	HOU-LabShpDrwgs@txdot.gov

T - Traffic Engineer

Traffic Operations	HOU-TrfShpDrwgs@txdot.gov

TMS – Traffic Management System

Computerized Traffic Management Systems (CTMS)	HOU-CTMSShpDrwgs@txdot.gov

Item 7: Legal Relations and Responsibilities

Do not initiate activities in a Project Specific Location (PSL), associated with a U.S. Army Corps of Engineers (USACE) permit area, that have not been previously evaluated by the USACE as part of the permit review of this project. Such activities include those pertaining to, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Associated defined here means materials are delivered to or from the PSL. The permit area includes the waters of the U.S. or associated wetlands affected by activities associated with this project. Special restrictions may be required for such work. Assume responsibility for consultations with the USACE regarding activities, including PSLs that have not been previously evaluated by the USACE. Provide the Department with a copy of consultations or approvals from the USACE before initiating activities.

The Contractor may proceed with activities in PSLs that do not affect a USACE permit area if a self-determination has been made that the PSL is non-jurisdictional or if proper USACE clearances have been obtained in jurisdictional areas or have been previously evaluated by the USACE as part of the permit review of this project. The Contractor is solely responsible for documenting any determinations that their activities do not affect a USACE permit area. Maintain copies of their determinations for review by the Department or any regulatory agency.

Document and coordinate with the USACE, if required, before hauling any excavation from or hauling any embankment to a USACE permit area by either 1 or 2 below:

1. **Restricted Use of Materials for the Previously Evaluated Permit Areas.** Document both the Project Specific Locations (PSL) and their authorization. Maintain copies for review by the Department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:
   a. Suitable excavation of required material in the areas shown on the plans and cross sections as specified in the Item, “Excavation” is used for permanent or temporary fill (under the Item, “Embankment”) within a USACE permit area.
   b. Suitable embankment (under the Item, “Embankment”) from within the USACE permit area is used as fill within a USACE evaluated area.
   c. Unsuitable excavation or excess excavation, “Waste” (under the Item, “Excavation”), that is disposed of at a location approved within a USACE evaluated area.

2. **Contractor Materials from Areas Other than Previously Evaluated Areas.** Provide the Department with a copy of USACE coordination or approvals before initiating any activities for an area within the project limits that has not been

evaluated by the USACE or for any off right of way locations used for the following, but not limited to, haul roads, equipment staging areas, borrow and disposal sites:

a. The Item, "Embankment" used for temporary or permanent fill within a USACE permit area.
b. Unsuitable excavation or excess excavation, "Waste" (under the Item, "Excavation"), that is disposed of outside a USACE evaluated area.

Before bidding on this project, obtain a copy of the complete U.S. Army Corps of Engineers Nationwide Permit Number NWP 7 and NWP 13 at the Area Engineer's office. Review the permit before bidding on the project and become aware of its conditions.

Place erosion control measures around the perimeter of impacted wetlands as shown in the above-mentioned U.S. Army Corps of Engineers Nationwide permits. During staging and construction operations, equipment is not allowed in the Waters of the United States.

This project does not require a U.S. Army Corps of Engineers (USACE) Section 404 Permit before letting, but if a permit is needed during construction, assume responsibility for preparing the permit application. Submit the permit application to the Department's District Environmental Section for approval. Once the permit application is approved, the Department will submit it to the USACE. Assume responsibility for the requested revisions, in coordination with the Department's District Environmental Section.

Avoid encroaching into the wetland areas delineated in the plans. Place erosion control measures around the wetlands as shown on the plans. No construction work or construction equipment is permitted within this delineated area. If applicable for bridge construction, construct drilled shafts outside of this delineated area. Secure approval for the locations of field offices, material storage sites, material disposal sites, plants, borrow pits, etc. in writing before use to ensure that the proposed location is not within Jurisdictional Waters of the United States (wetlands).

Do not store any material in Waters of the United States inside the right of way without written approval.

Before construction operations begin, provide a drawing of the location of proposed temporary access roads, haul roads, or temporary fill used during construction operations to ensure that they are not within Jurisdictional Waters of the United States.

If the Contractor elects to use an area not permitted and determined to be within Jurisdictional Waters of the United States during the prosecution of the work, the Contractor will hold the Department harmless for delays caused by procuring the necessary permits from the United States Army Corps of Engineers.

This project requires permits with environmental resource agencies. There is a high probability of encountering environmentally sensitive areas on Contractor designated project specific locations (PSLs) for this project (haul roads, equipment staging areas, borrow pits, disposal sites, field offices, storage areas, parking areas, etc.). This Item provides listings of regulatory agencies the Contractor may need to contact for this project, for any questions towards this

matter please contact the Houston District Environmental group at 713-802-5000 for questions and guidance of which regulatory agencies the Contractor may need to contact.

Maintain the roadway slope stability. Maintaining slope stability is subsidiary to the various bid items.

This project is on a hurricane evacuation route. Provide at the pre-construction meeting a written plan outlining procedures to suspend work, secure the job site, and safely handle traffic through and across the project in the event of a hurricane evacuation.

During the hurricane season (June 1 through November 30), do not close any travel lanes except when the Contractor can demonstrate that he/she can provide labor, equipment, material, a work plan, and quality of work to satisfactorily return all lanes to an open, all-weather travel surface within 3 days of receiving written or verbal notice but no later than 3 days before the predicted hurricane landfall. Construction of temporary lanes to an all-weather surface will be paid for in accordance with Article 9.7, "Payment for Extra Work and Force Account Method."

In addition to lane closures, cease work 3 days before the predicted hurricane landfall on or near the roadway that adversely impacts the flow of traffic and reduces the capacity of the highway during an evacuation. Vehicles of the Contractor, subcontractors, or material suppliers will not be allowed to enter or exit the traffic stream, including those for the purpose of material hauling and delivery, and mobilization or demobilization of equipment. When directed, this prohibition will include a reasonable time period for the evacuees to return to their point of origin.

No significant traffic generator events have been identified.

Item 8: Prosecution and Progress

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

Working days will be computed and charged based on a standard workweek in accordance with Section 8.3.1.4.

The Lane Closure Assessment Fee is $ 500.00. This fee applies to the Contractor for closures or obstructions that overlap into restricted hour traffic for each hour or portion thereof, per lane, regardless of the length of lane closure or obstruction. For Restricted Hours subject to Lane Assessment Fee refer to the Item, "Barricades, Signs, and Traffic Handling." The time increment for the Lane Closure Assessment fee for this project is one hour.

Item 100: Preparing Right of Way

Clean existing ditches under fill sections of undesirable materials including grass, muck, and trash. Perform this work in accordance with the Construction section of the Item, "Preparing Right of Way." This work is subsidiary to this bid Item.

The Item, “Preparing Right of Way” will be measured for payment only in those designated areas shown on the plans. Preparing right of way necessary to perform construction that is outside designated areas is subsidiary to this bid Item.

Remove abandoned utilities that are in conflict with the new utilities, at no expense to the Department.

Reestablish and maintain right of way stakes after completing the right of way preparation activities and until the new utilities are in place.

Remove and assume ownership of the existing ground mounted signs within the limits of roadway construction unless otherwise noted or directed. This work is subsidiary to the Item, “Preparing Right of Way.”

Item 110: Excavation

If manipulating the excavated material requires moving the same material more than once to accomplish the desired results, the excavation is measured and paid for only once regardless of the manipulation required.

Transition the ditch grades and channel bottom widths at structure locations. Use only approved channel excavation in the embankment.

Item 132: Embankment

If salvaged base is used for the embankment material, break it into small pieces to achieve the required density and to facilitate placing in the embankment. Obtain approval of the material before placing in the embankment.

Furnish Type C material with a maximum Liquid Limit (LL) of 65, a minimum Plasticity Index (PI) of 5, and composed of suitable earth material such as loam, clay, or other materials that form a suitable embankment.

The embankment material used on the project which has a Liquid Limit exceeding 45 will be tested for Liquid Limits at the rate of one test per 20,000 cu. yd. or per total quantity less than 20,000 cu. yd., unless otherwise directed. Only use material that passes the above tests.

For unpaved areas, provide a finished grade with the top 4 in. capable of sustaining vegetation. Use fertile soil that is easily cultivated, free from objectionable material and highly resistant to erosion.

Item 162: Sodding for Erosion Control
Item 166: Fertilizer
Item 168: Vegetative Watering

Refer to the “Fertilizer, Seed, Sod, Straw, Compost, and Water” plan sheet for material specifications, application rates, and for watering requirements.

Item 204: Sprinkling

Perform subsidiary sprinkling as required under various other items in accordance with the Item, “Sprinkling.”

Sprinkling for dust control is subsidiary to the various bid items.

Item 210: Rolling

Use a medium pneumatic roller meeting the requirements of Item 210 as directed. This work is subsidiary to the various bid items. Use approved rolling patterns.

Item 400: Excavation and Backfill for Structures

Plugging existing pipe culverts is subsidiary to the various bid items.

If Recycled Cement Treatment (Type D) is included in the plans, the following additional requirements apply:

1. Use only approved sand, crushed concrete, or salvaged base free from deleterious matter, as aggregate for cement-stabilized backfill.

2. Provide crushed concrete or salvaged base backfill material in accordance with the Item, “Cement Treatment (Plant-Mixed)(Type D)” (base or crushed concrete), except the recycled Type D material must not contain Reclaimed Asphalt Pavement (RAP).

3. For backfill material below the spring line of pipes, use cement-stabilized sand rather than Recycled Type D backfill material.

4. For the cement-stabilized sand backfill, use a minimum of 7 percent of hydraulic cement based on the dry weight of backfill material. The cement content for the crushed concrete and salvaged base is specified in the Item, “Cement Treatment (Plant-Mixed) (Type D).”

5. Place and compact the stabilized backfill material using a gradation that provides a dense mass without segregating and is impervious to passing of water.

Item 432: Riprap

If stone riprap is shown on the plans, use common stone riprap in accordance with Section 432.2.3.3, placed dry in accordance with Section 432.3.2.3. Do not grout. Crushed concrete may also be used.

Item 464: Reinforced Concrete Pipe

Concrete collars are subsidiary to the various bid items except for those specified on the plans for stage construction, which are paid for under the Item, “Concrete Substructures” as “Cl C Conc (Collar).”

Rubber gaskets are required for concrete pipe joints except for connections of safety end treatments, driveway culverts, and joints between the existing pipes and extensions.

Open, install, and backfill each section, or a portion of a section, in the same day at locations requiring pipe culverts under existing roadways.

Place the pipe drains across existing roadways half at a time to allow passage of traffic. No trenches may remain open overnight.

Known locations of existing stub-outs are shown on the plans, but these stub-outs may be in a different position or condition. Delays, inconveniences, or additional work required will not be a basis for additional compensation.

Provide leave-outs or holes in the proposed storm drain structures and pipes for drainage during interim construction. This work is subsidiary to the various bid items.

The flowline elevations of side road structures are based on the proposed ditches. Field-verify these elevations and adjust them as necessary to meet the field conditions. Before placing these structures, prepare and submit for approval, the data (revised elevation, alignment, length, etc.) for the adjusted structures.

If groundwater is encountered while installing the storm drain system, install a suitable dewatering system to facilitate construction of the storm drains. The costs for materials and labor required to install and maintain this system are subsidiary to the Item, "Reinforced Concrete Pipe."

Item 465: Junction Boxes, Manholes, and Inlets

If required on the plans, build manholes and inlets to stage 1 construction, cover with temporary pavement, and complete in a later phase of construction. This temporary covering and pavement are subsidiary to the various bid items.

Construct manholes and inlets in graded areas, first to an elevation at least 4 in. above the top of the highest entering pipe and cover with a wooden cover. Complete the construction of such manholes and inlets to the finished elevation when completing the grading work for such manholes and inlets. Adjust the final elevation, if required, since this elevation is approximate.

Construct manholes and inlets in paved areas to an elevation so their temporary wooden covers are flush with the surface of the base material.

Do not leave excavations or trenches open overnight.

Item 502: Barricades, Signs, and Traffic Handling

Use a traffic control plan for handling traffic through the various phases of construction. Follow the phasing sequence unless otherwise agreed upon by the Area Engineer and the Project Manager. Ensure this plan conforms to the latest "Texas Manual on Uniform Traffic Control Devices" and the latest Barricade and Construction (BC) Standard Sheets. The latest versions of

Work Zone Standard Sheets WZ (BTS-1) and WZ (BTS-2) are the traffic control plan for the signal installations.

Submit changes to the traffic control plan to the Area Engineer. Provide a layout showing the construction phasing, signs, striping, and signalizations for changes to the original traffic control plan.

Furnish and maintain the barricades and warning signs, including the necessary temporary and portable traffic control devices, during the various phases of construction. Place and construct these barricades and warning signs in accordance with the latest "Texas Manual on Uniform Traffic Control Devices" for typical construction layouts.

Cover work zone signs when work related to the signs is not in progress, or when any hazard related to the signs no longer exists.

Keep the delineation devices, signs, and pavement markings clean. This work is subsidiary to the Item, "Barricades, Signs, and Traffic Handling."

If a section is not complete before the end of the workday, pull back the base material to the existing pavement edge on a 6H: 1V slope. Edge drop-offs during the hours of darkness are not permitted.

Before detouring traffic onto the mainlane shoulders, remove dirt, debris, vegetation, and other deleterious material from the surface of the shoulders. Appropriately sign the detour in an approved manner. This work is subsidiary to the various bid items.

Do not mount signs on drums or barricades, except those listed in the latest Barricades and Construction standard sheets.

Use traffic cones for daytime work only. Replace the cones with plastic drums during nighttime hours.

Place positive barriers to protect drop-off conditions greater than 2 ft. within the clear zone that remain overnight.

Do not reduce the existing number of lanes open to traffic except as shown on the following time schedule:

One Lane Closure (US 290 WBFR, Field Store Road & Hegar Road)

Day	Daytime Closure Hours	Nighttime Closure Hours	Restricted Hours Subject to Lane Assessment Fee
Monday	9:00 AM – 3:00 PM	N/A	5:00 AM – 9:00 AM AND 3:00 PM-9:00 PM
Tuesday	9:00 AM – 3:00 PM	N/A	5:00 AM – 9:00 AM AND 3:00 PM-9:00 PM
Wednesday	9:00 AM – 3:00 PM	N/A	5:00 AM – 9:00 AM AND 3:00 PM-9:00 PM
Thursday	9:00 AM – 3:00 PM	N/A	5:00 AM – 9:00 AM AND 3:00 PM-9:00 PM
Friday	9:00 AM – 3:00 PM	N/A	5:00 AM – 9:00 AM AND 3:00 PM-9:00 PM
Saturday	N/A	N/A	N/A
Sunday	N/A	N/A	N/A

The above times and restricted hours approved by Area Engineer if appliable are approved for the traffic control conditions listed. The Area Engineer may approve other closure times if traffic counts warrant. The Area Engineer may reduce the above times for special events.

Law enforcement assistance will be required for this project and is expected to be required for major traffic control changes and lane closures. Coordinate with local law enforcement and arrange for law enforcement as directed or agreed by the Engineer. Before payment will be made, complete the "Daily Report on Law Enforcement Force Account Work" (Form 318), provided by the Department and submit daily invoices that agree with this form for any day during the month in which approved services were provided.

Provide full-time, off-duty, uniformed, certified peace officers, as part of traffic control operations. The peace officers must be able to show proof of certification by the Texas Commission on Law Enforcement Officers Standards. The cost of the officers is paid for on a force account basis.

A minimum of 7 days in advance of any total closure, notify the Houston District Public Information Office of which roadways, ramps, intersections, or lanes will be closed, the dates they will remain closed, and when they will be opened again to traffic.

A minimum of 7 days in advance of any total closure, place a portable changeable message (PCM) sign at the location of each total closure which informs the traveling public of the details of the closure. Alternately, if the Traffic Control Plan provides a positive barrier at the location, a non-trailer mounted static message board sign behind the positive barrier may be used in place of a PCM.

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

A Storm Water Pollution Prevention Plan (SWP3) is required. Since the disturbed area is less than 5 acres, a "Notice of Intent" (NOI) is not required.

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

Before starting construction, review with the Engineer the SWP3 used for temporary erosion control as outlined on the plans. Before construction, place the temporary erosion and sedimentation control features as shown on the SWP3.

Schedule the seeding or sodding work as soon as possible. The project schedule provides for a vegetation management plan.

After completing earthwork operations, restore and reseed the disturbed areas in accordance with the Department's specifications for permanent or temporary erosion control.

Implement temporary and permanent erosion control measures to comply with the National Pollution Discharge Elimination System (NPDES) general permit under the Clean Water Act.

Before starting grading operations and during the project duration, place the temporary or permanent erosion control measures to prevent sediment from leaving the right of way.

Item 6185: Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

A shadow vehicle with Truck Mounted Attenuators (TMAs) or Trailer Attenuators (TAs) is required as shown on the appropriate Traffic Control Plan (TCP) sheets. TMAs/TAs must meet the requirements of the Compliant Work Zone Traffic Control Device List.

Level 3 Compliant TMSs/Tas are required for this project

A total of one (1) shadow vehicle with a TMA/TA is required for the work with the exception of Pavement Marking Operations. The Contractor is responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs/TAs needed on the project.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0114-12-015 **DISTRICT** Houston **COUNTY** Harris
HIGHWAY US 290

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0114-12-015**			
		PROJECT ID		**A00178958**			
		COUNTY		**Harris**			
		HIGHWAY		**US 290**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6001	PREPARING ROW	AC	1.000		1.000	
	110-6003	EXCAVATION (SPECIAL)	CY	6,328.000		6,328.000	
	132-6038	EMB(FNL)(ORD COM)(TYC SPL)CLAY LINER	CY	1,315.000		1,315.000	
	162-6002	BLOCK SODDING	SY	8,025.000		8,025.000	
	166-6001	FERTILIZER	AC	1.600		1.600	
	168-6001	VEGETATIVE WATERING	MG	189.000		189.000	
	400-6001	STRUCT EXCAV	CY	470.000		470.000	
	400-6005	CEM STABIL BKFL	CY	98.000		98.000	
	400-6009	CEMENT STAB BACKFILL (INLET OR MH)	CY	11.000		11.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	146.000		146.000	
	403-6001	TEMPORARY SPL SHORING	SF	3,200.000		3,200.000	
	432-6051	RIPRAP (STONE COMMON)(GROUT)(18 IN)	CY	6.000		6.000	
	464-6020	RC PIPE (CL IV)(36 IN)	LF	141.000		141.000	
	465-6173	MANH (COMPL)(TY A)	EA	1.000		1.000	
	467-6450	SET (TY II) (36 IN) (RCP) (4: 1) (C)	EA	1.000		1.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000		4.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	9.000		9.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	9.000		9.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	224.000		224.000	
	506-6033	BULLDOZER WORK (EROSION & SEDMT CONT)	HR	48.000		48.000	
	506-6034	CONSTRUCTION PERIMETER FENCE	LF	3,778.000		3,778.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	3,411.000		3,411.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	3,411.000		3,411.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	1,709.000		1,709.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1,709.000		1,709.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	60.000		60.000	
	6185-6002	TMA (STATIONARY)	DAY	60.000		60.000	
	08	CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS	1.000		1.000	
		CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS	1.000		1.000	
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS	1.000		1.000	

SUMMARY OF MISCELLANEOUS QUANTITIES

SHEET #	ITEM	100	110	132	162	166	168	400	400	400	402	403	432	464
	DESC. CODE	6001	6003	6038	6002	6001	6001	6001	6005	6009	6001	6001	6051	6020
	US 290	PREPARING ROW	EXCAVATION (SPECIAL)	EMB (FNL) (ORD COM) (TYC SPL) CLAY LINER	BLOCK SODDING	FERTILIZER	VEGETATIVE WATERING	STRUCT EXCAV	CEM STABIL BKFL	CEMENT STAB BACKFILL (INLET OR MH)	TRENCH EXCAVATION PROTECTION	TEMPORARY SPL SHORING	RIPRAP (STONE COMMON) (GROUT)(18 IN)	RC PIPE (CL IV)(36 IN
		AC	CY	CY	SY	AC	MG	CY	CY	CY	LF	SF	CY	LF
	FIELD STORE ROAD	0.7	6104		7130	1.5	177							
	HEGAR ROAD	0.3	224	1315	895	0.1	12	470	98	11	146	3200	6	141
TOTAL		1.0	6,328	1,315	8,025	1.6	189	470	98	11	146	3,200	6	141

SHEET #	ITEM	465	467	506	506	506	506	506	506	506	506	506	6001	6185
	DESC. CODE	6173	6450	6002	6011	6020	6033	6034	6038	6039	6040	6043	6001	6002
	US 290	MANH (COMPL)(TY A)	SET (TY II) (36 IN) (RCP) (4: 1) (C)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	BULLDOZER WORK (EROSION & SEDMT CONT)	CONSTRUCTION PERIMETER FENCE	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)
		EA	EA	LF	LF	SY	HR	LF	LF	LF	LF	LF	DAY	DAY
	FIELD STORE ROAD			9	9	112	24	1670	2719	2719	872	872	30	30
	HEGAR ROAD	1	1			112	24	2108	692	692	837	837	30	30
TOTAL		1	1	9	9	224	48	3,778	3,411	3,411	1,709	1,709	60	60

US 290
SUMMARY OF MISCELLANEOUS QUANTITIES

SHEET 1 OF 1

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			5
STATE	STATE DIST. NO.	COUNTY	
TEXAS	HOU	HARRIS	
CONT.	SECT.	JOB	HIGHWAY NO.
0114	12	015	US 290

DATE: DATE TIME
FILE: \\H\...\CONSTRUCTION PROJECTS\-12-015 DETENTION PONDS\PLAN SET\...\STANDARDS\BC-21.DGN

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. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.

11. 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 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.

2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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 Safety Division Standard

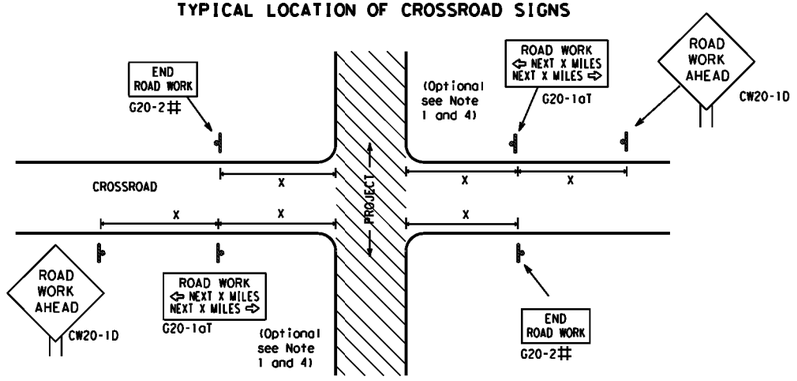
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13	0114	12	015	US 290
9-07 8-14	DIST	COUNTY		SHEET NO.
5-10 5-21	HOU	HARRIS		6

DATE: DATE TIME
FILE: \\H\MCHAO\CONSTRUCTION PROJECTS--12-015 DETENTION PONDS\PLAN SET\ TCP\STANDARDS\BC-21.DGN

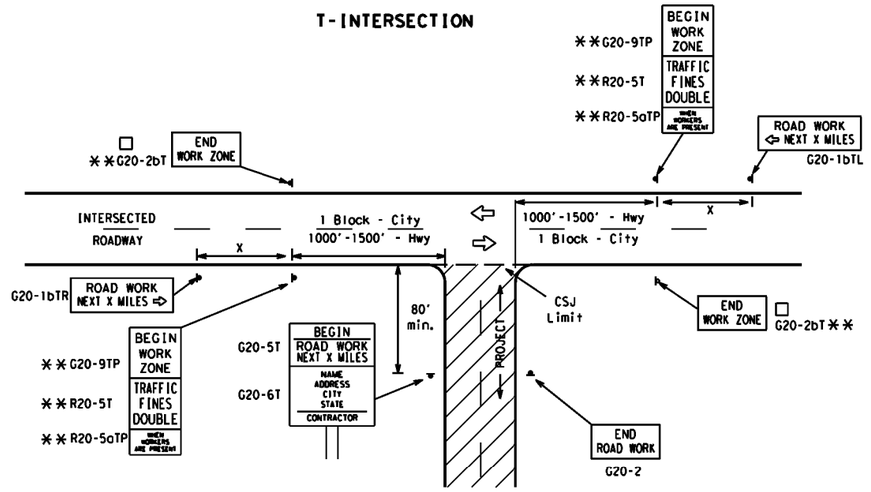
TYPICAL LOCATION OF CROSSROAD SIGNS



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 as per TMUTCD Part 5. 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]

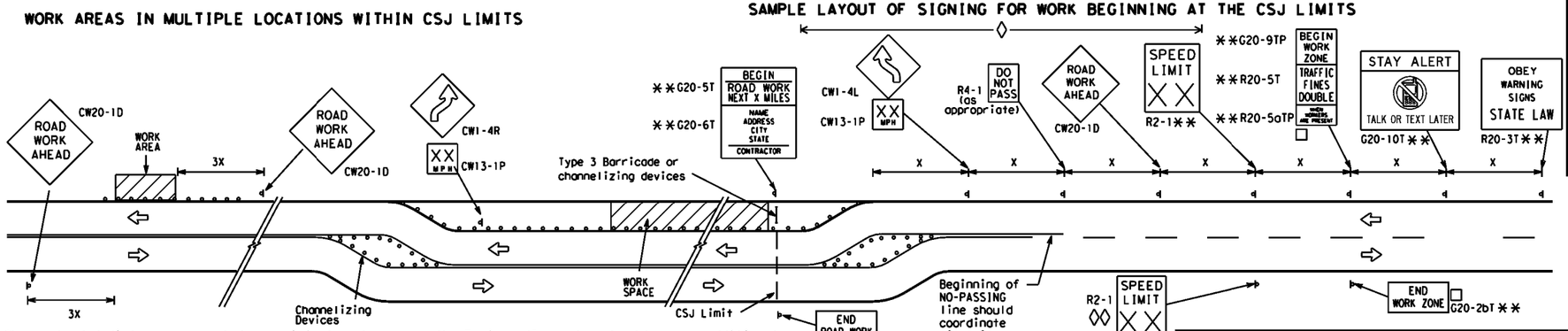
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

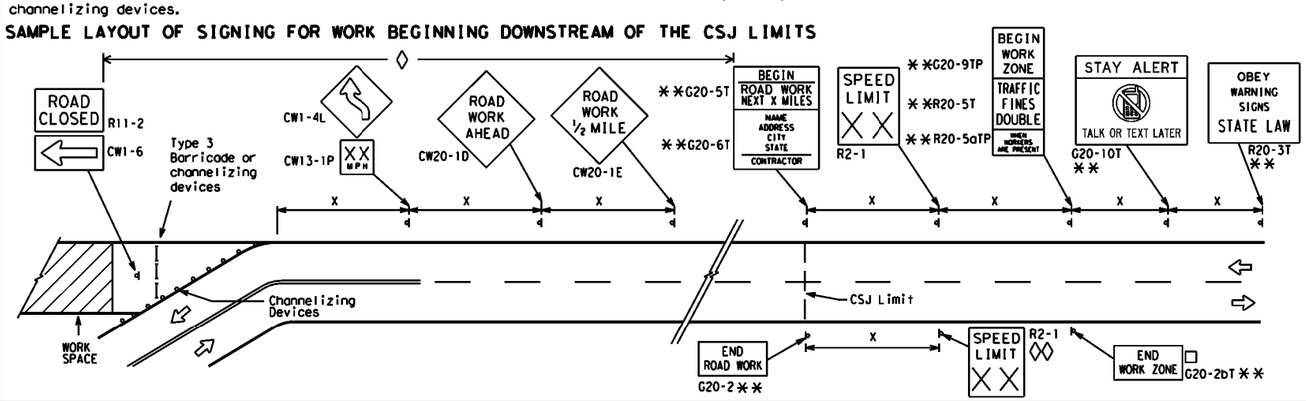
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. 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 DOWNSTREAM OF THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT 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.

** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

◊ 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
o o o	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 Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	HARRIS		7

DATE: DATE TIME
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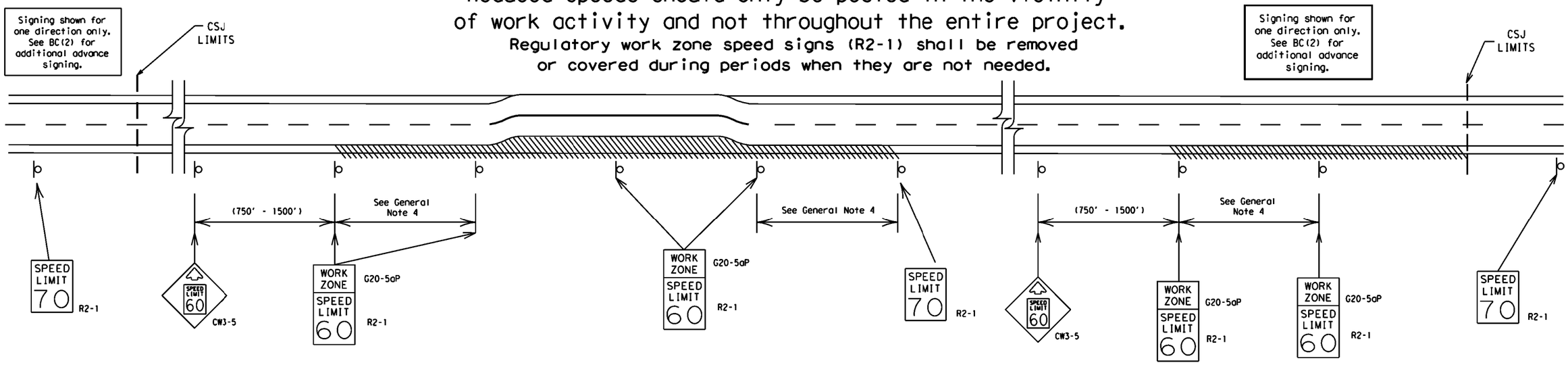
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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 traveled 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 Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	HARRIS		8

DATE: DATE TIME
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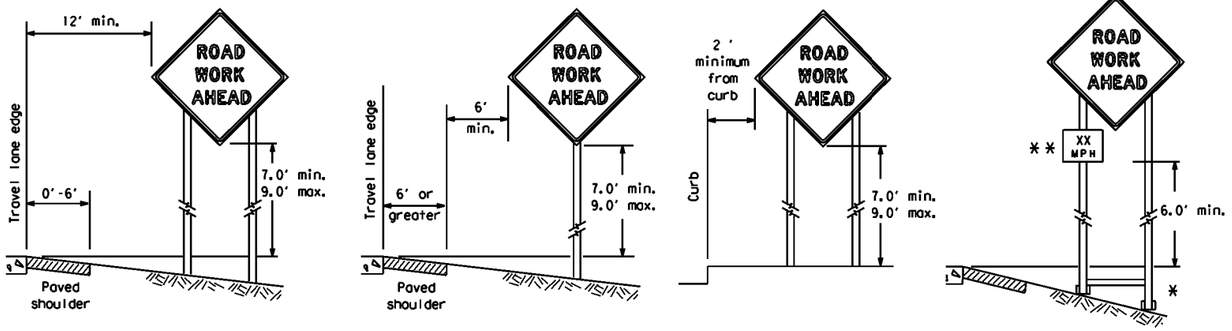
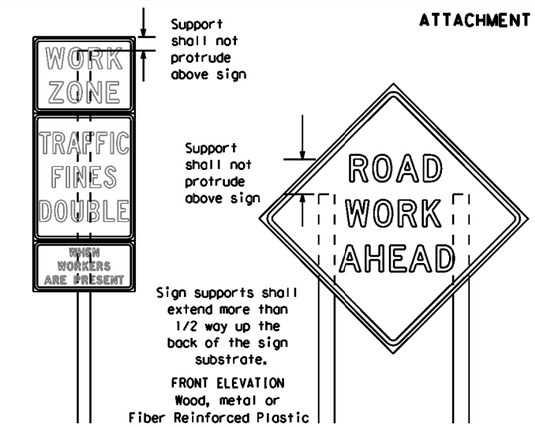
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

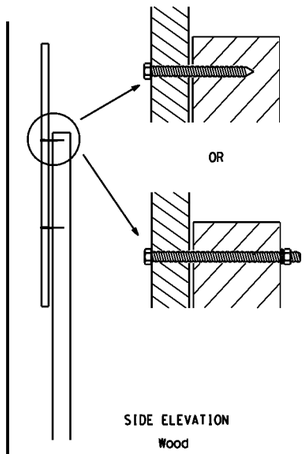


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





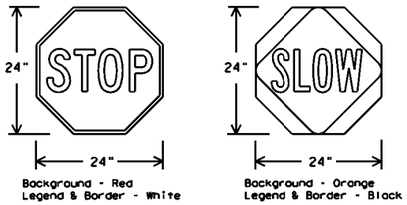
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

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.

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".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
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.



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

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, specific service (LOGO), 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. For details for covering large guide signs see the TS-CD standard.
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 standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets 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) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. 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 Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	HARRIS		9

DATE: DATE TIME
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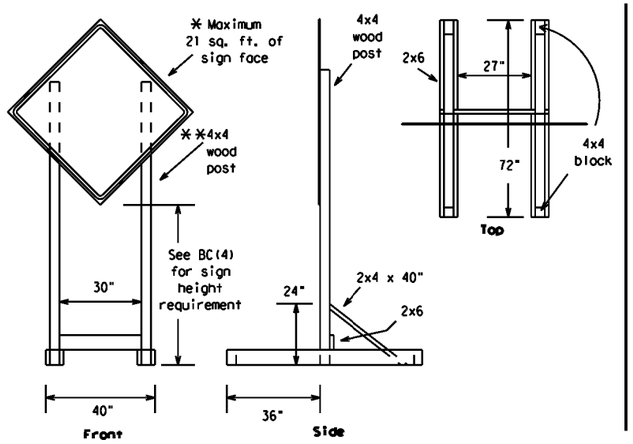
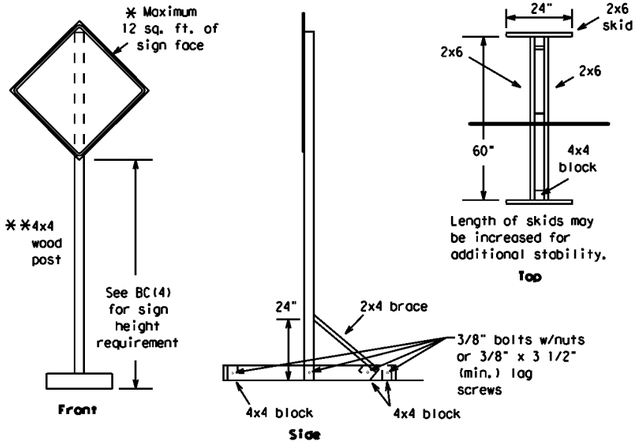
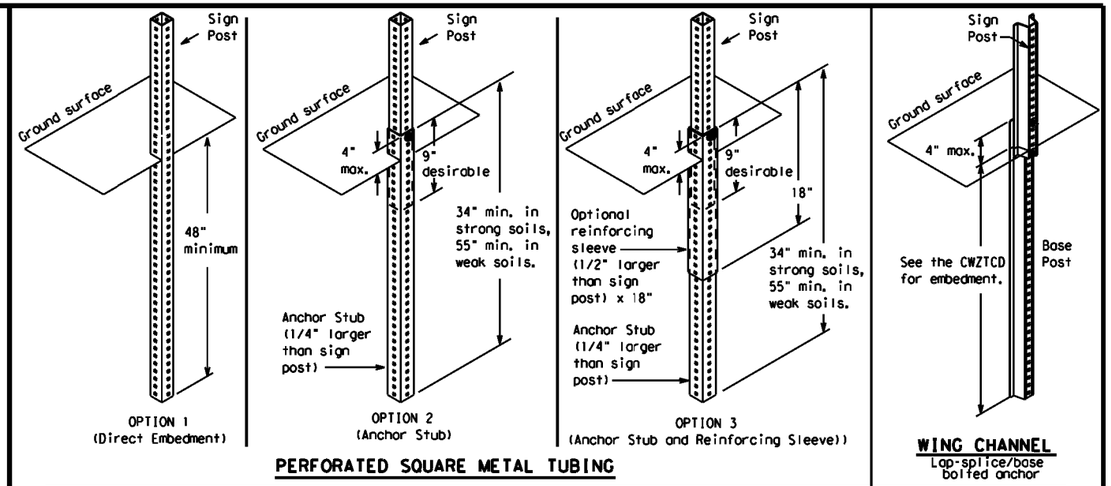




SKID MOUNTED WOOD SIGN SUPPORTS

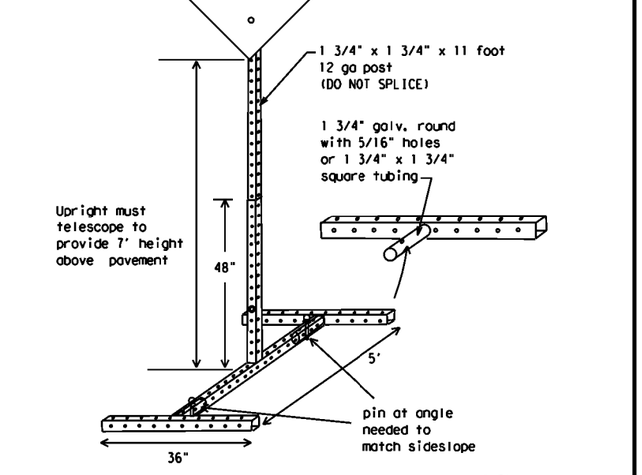
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

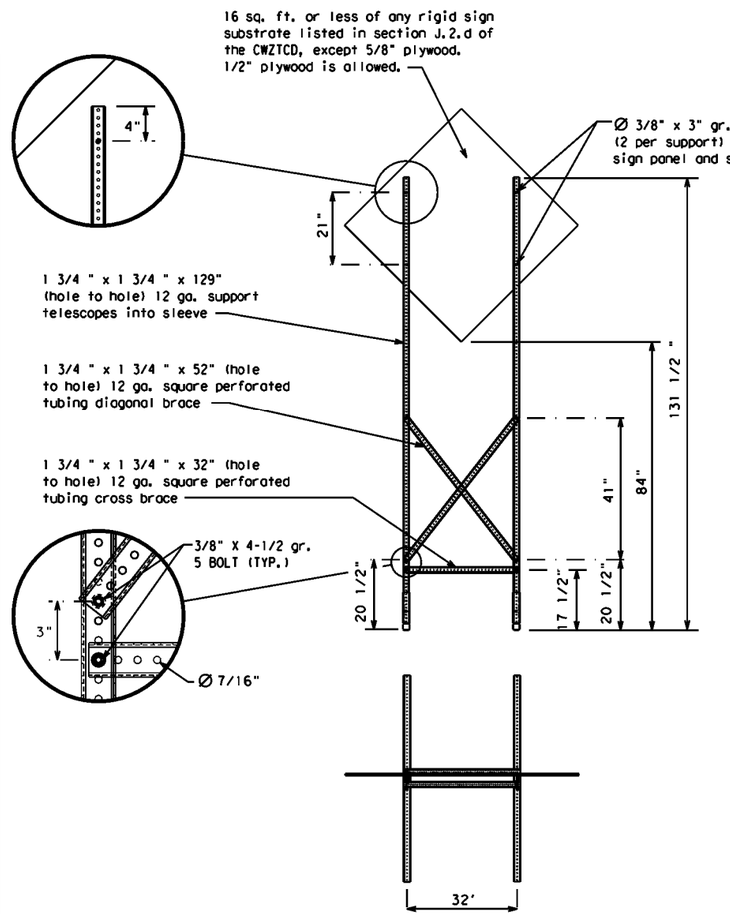


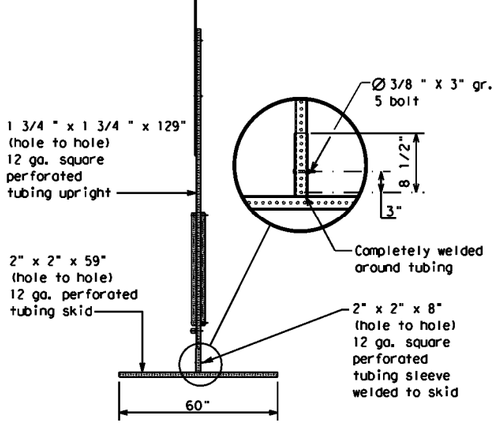
PERFORATED SQUARE METAL TUBING

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.







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID 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 Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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9-07 8-14	DIST	COUNTY		SHEET NO.
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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		Other Condition List	
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED			

* 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		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
STAY IN LANE *				

* 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 Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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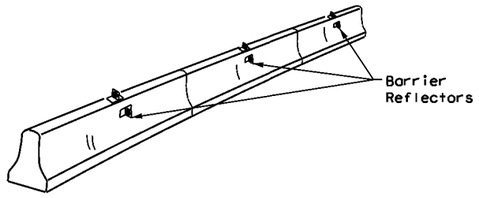
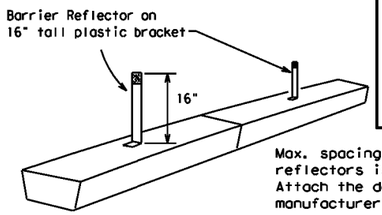
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



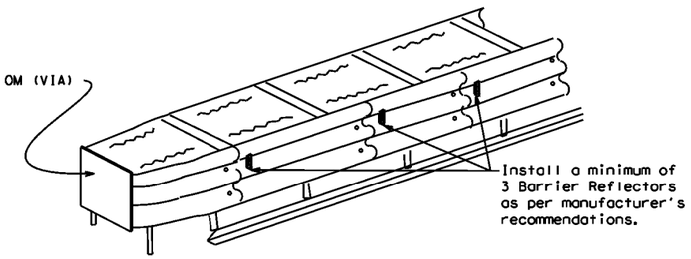
CONCRETE TRAFFIC BARRIER (CTB)

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.



Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

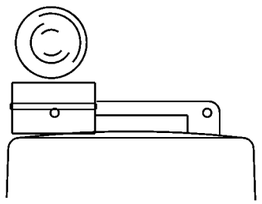
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the appropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

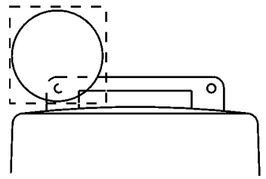
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

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

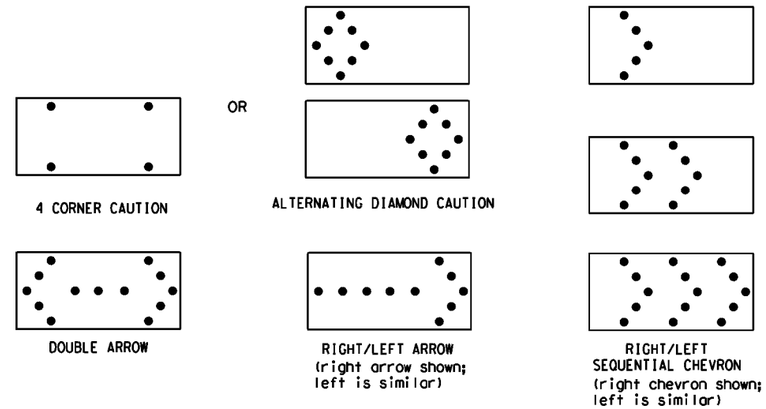
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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 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 on extended distance from the TMA.

SHEET 7 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	HARRIS		12

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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:

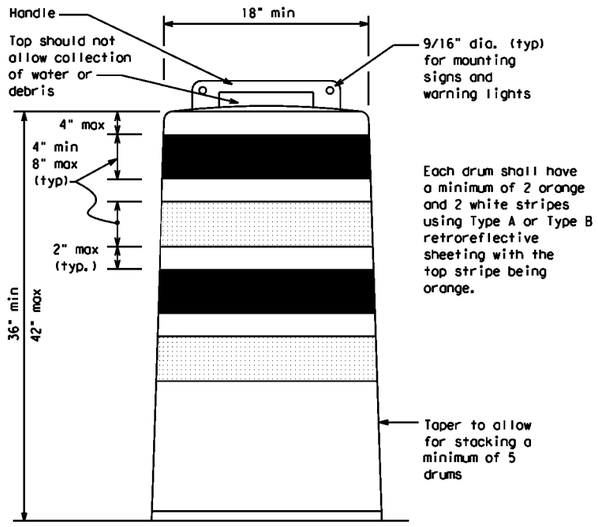
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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.

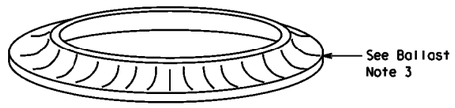
RETROREFLECTIVE SHEETING

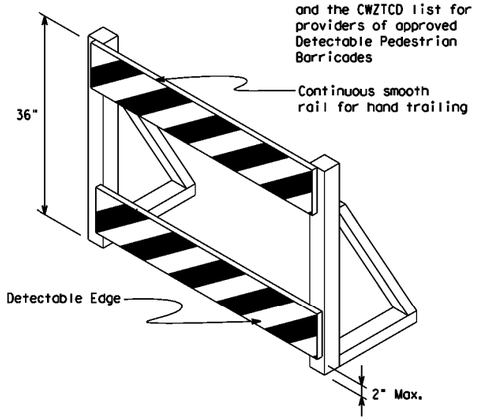
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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.

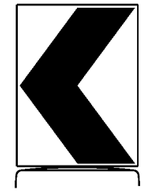




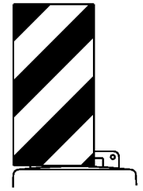


DETECTABLE PEDESTRIAN BARRICADES

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. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
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 (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 should 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 or Type B. 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 Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
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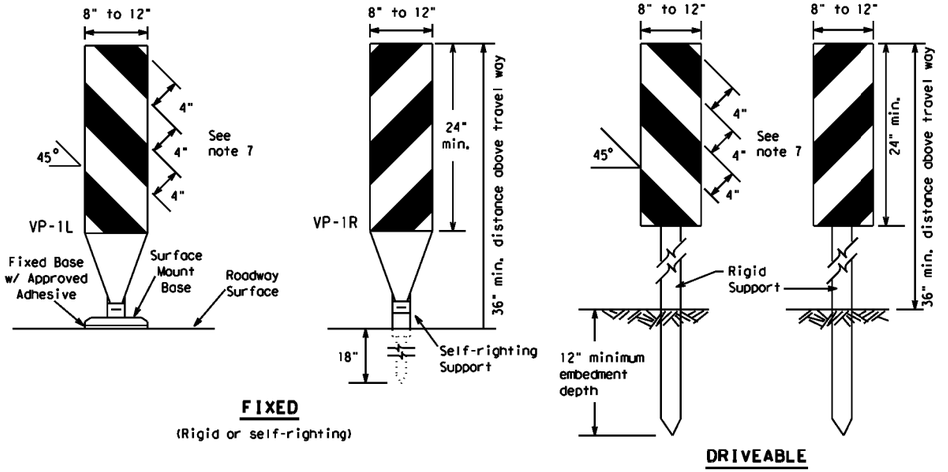
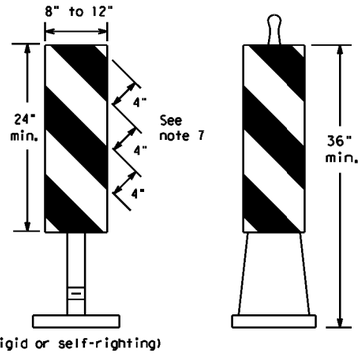


FIXED
(Rigid or self-righting)

DRIVEABLE

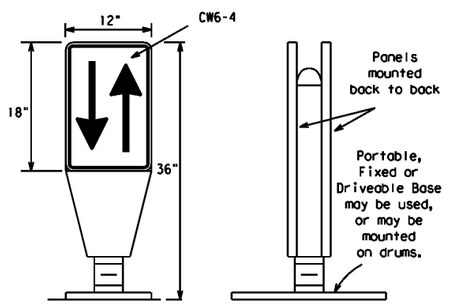


(Rigid or self-righting)

PORTABLE

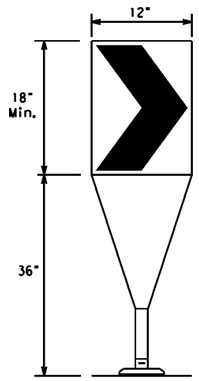
VERTICAL PANELS (VPs)

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 for additional requirements on the use 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 or Type B 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.



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)



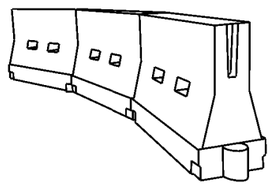
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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). Place reflective sheeting 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 Manual for Assessing Safety Hardware (MASH) 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 Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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7-13 5-21	HOU	HARRIS		14

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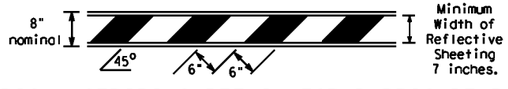
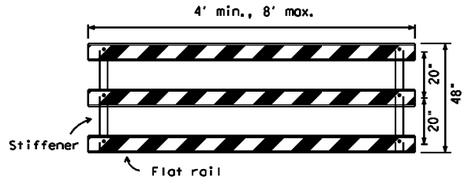
TYPE 3 BARRICADES

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 or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



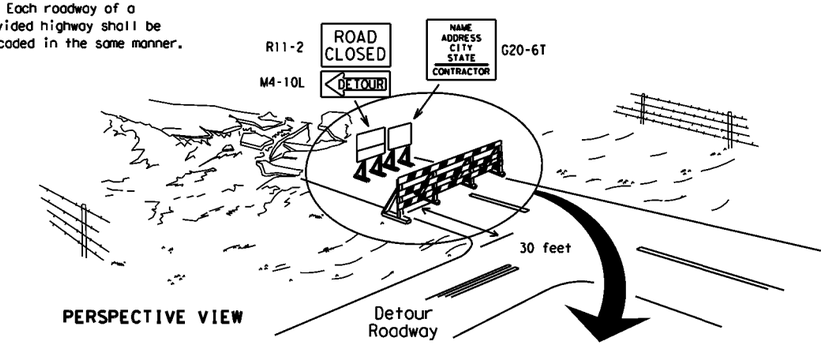
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

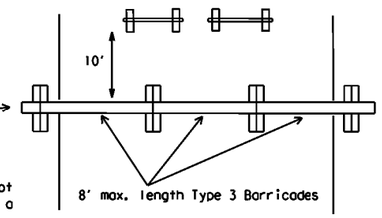
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

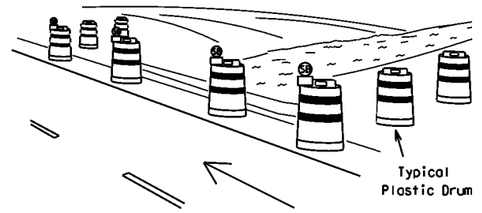
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

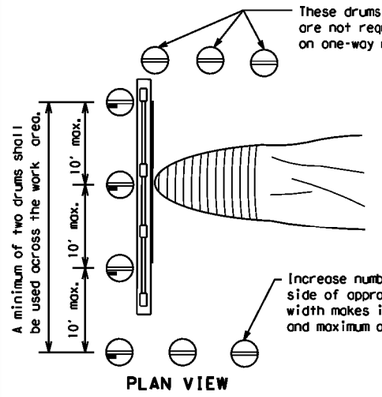
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

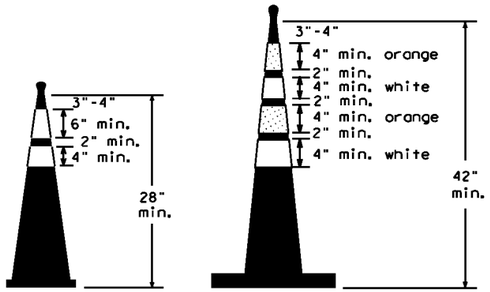
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder 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

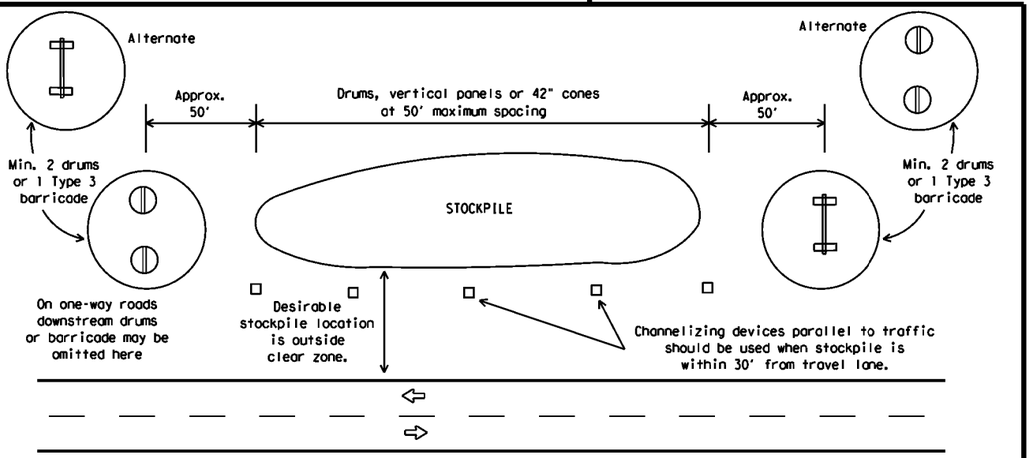
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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 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 or Type B.
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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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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.

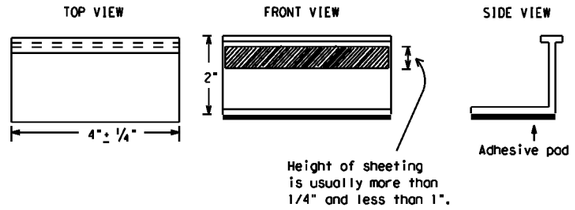
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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 Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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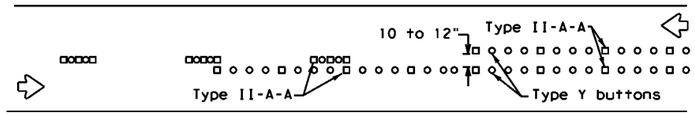
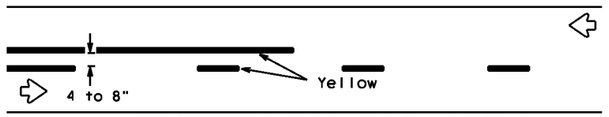
PAVEMENT MARKING PATTERNS

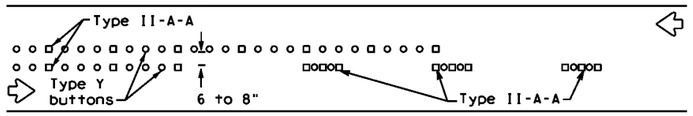
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



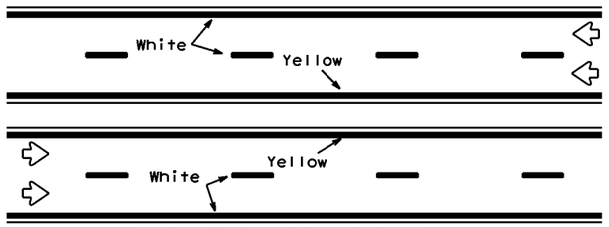
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



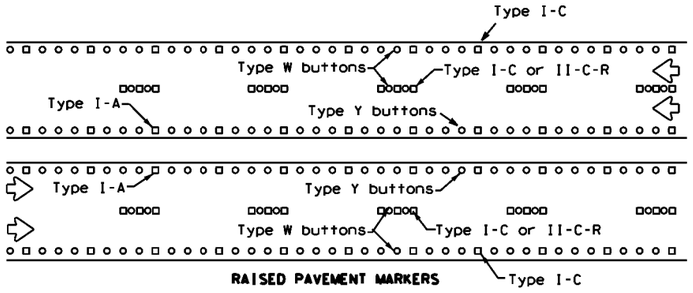
RAISED PAVEMENT MARKERS - PATTERN B

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



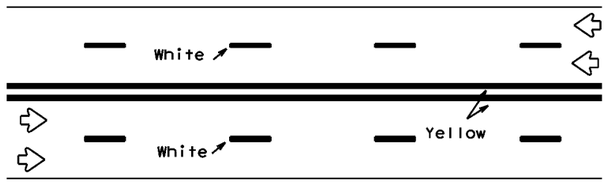
REFLECTORIZED PAVEMENT MARKINGS



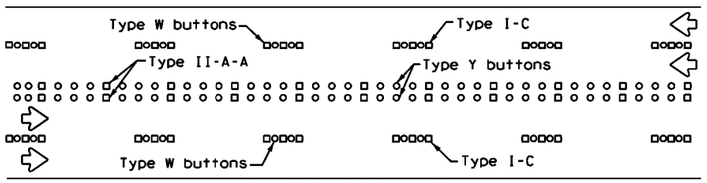
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



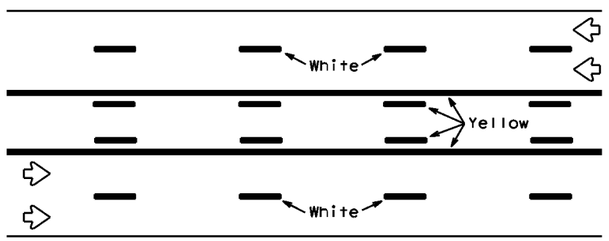
REFLECTORIZED PAVEMENT MARKINGS



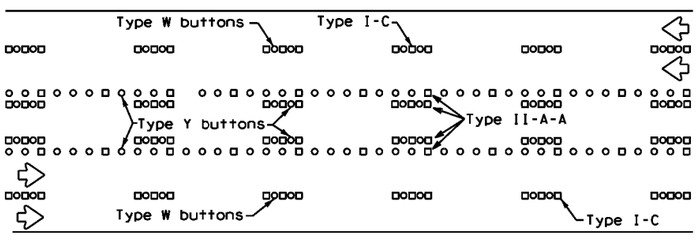
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

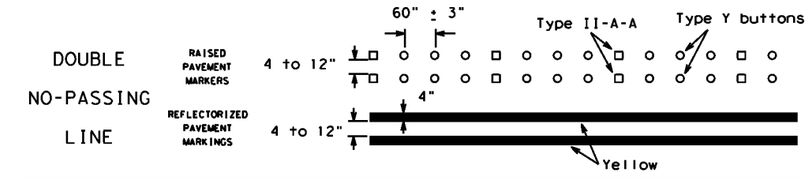
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

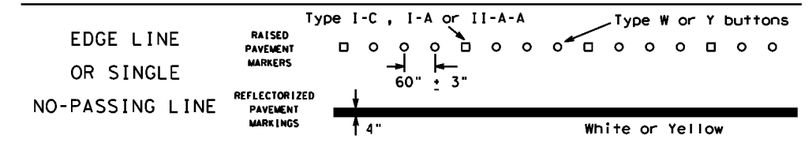
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

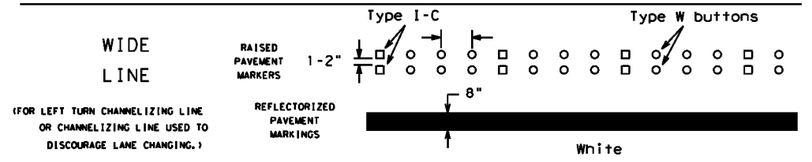


EDGE LINE OR SINGLE NO-PASSING LINE



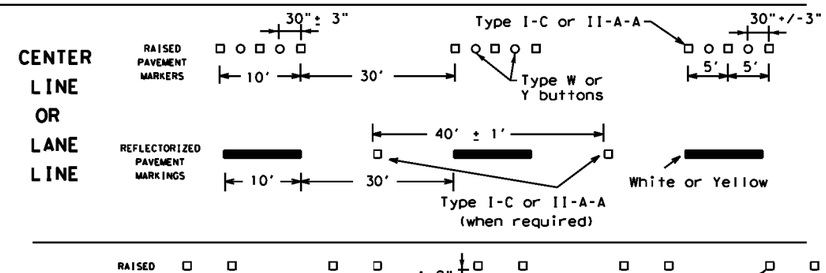
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

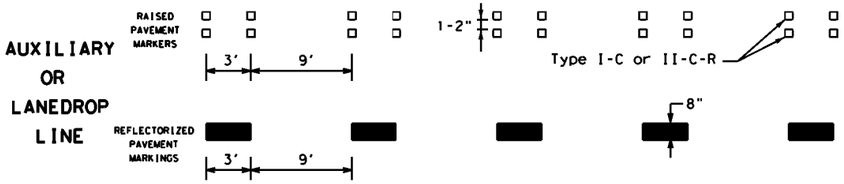


BROKEN LINES

CENTER LINE OR LANE LINE

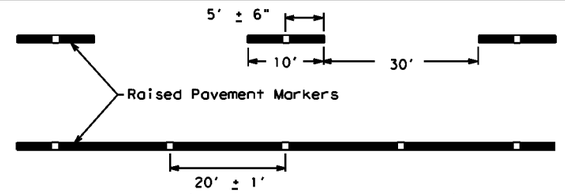


AUXILIARY OR LANEDROP LINE



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 Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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DATE: DATE TIME
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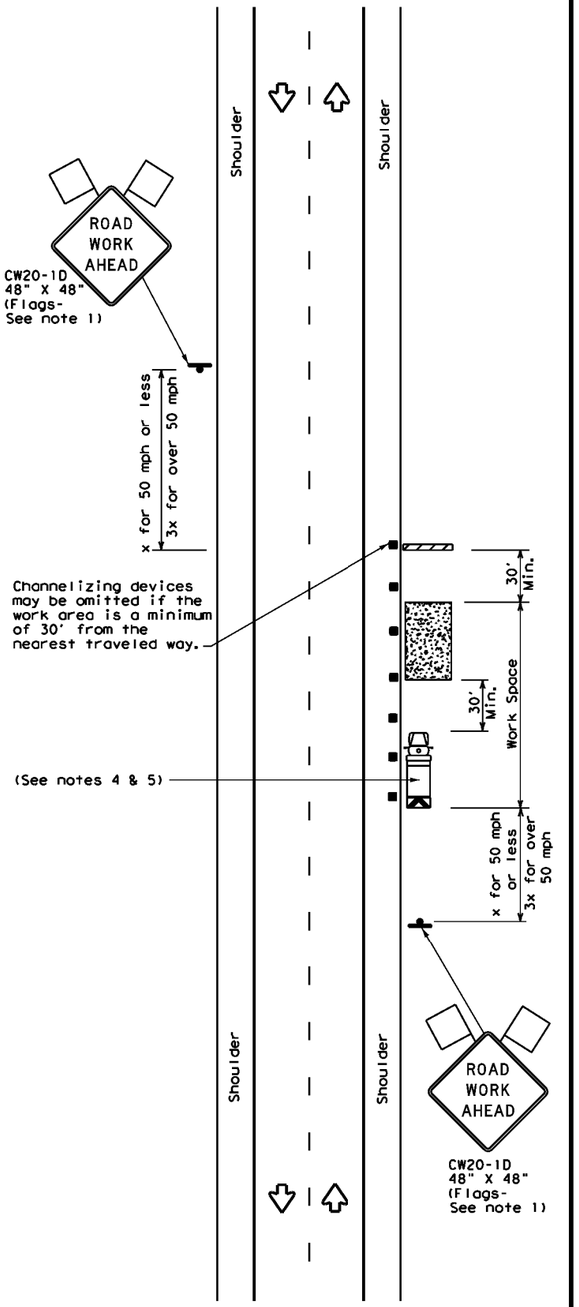
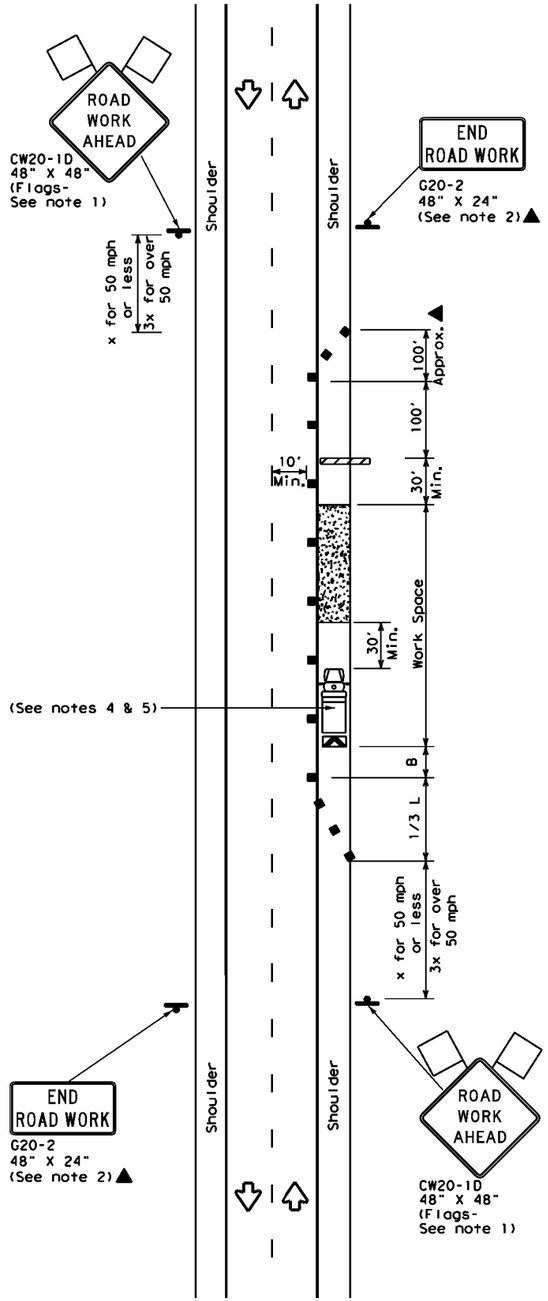


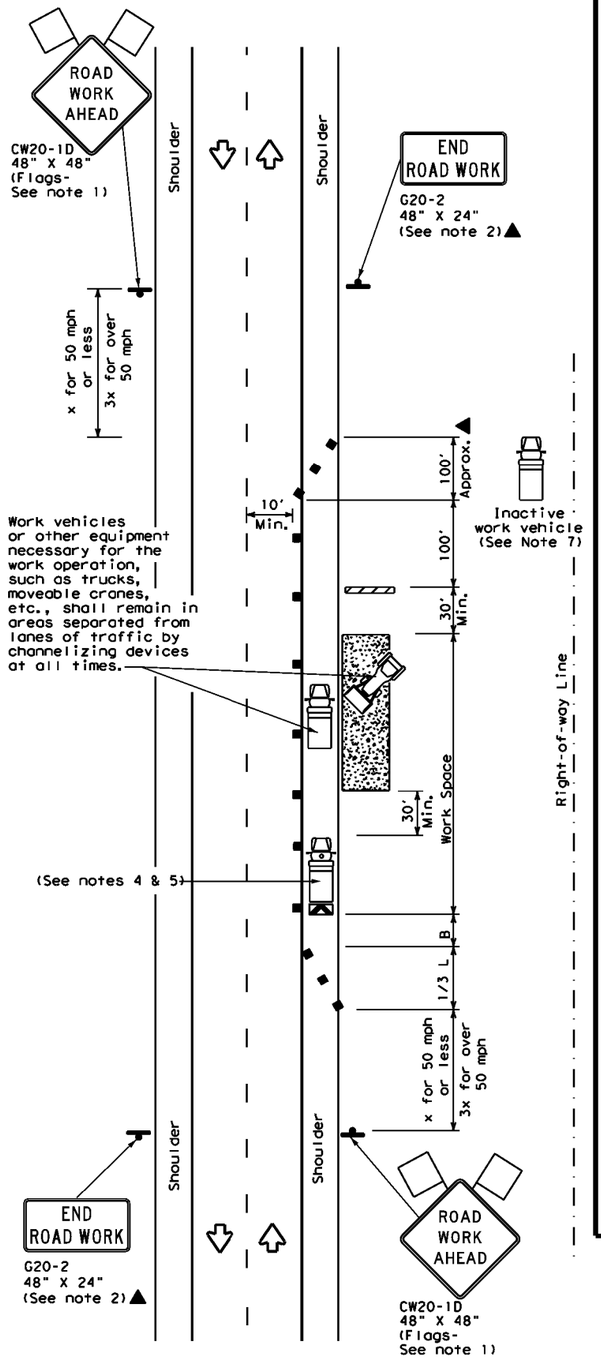
TCP (2-1a)

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	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 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 CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

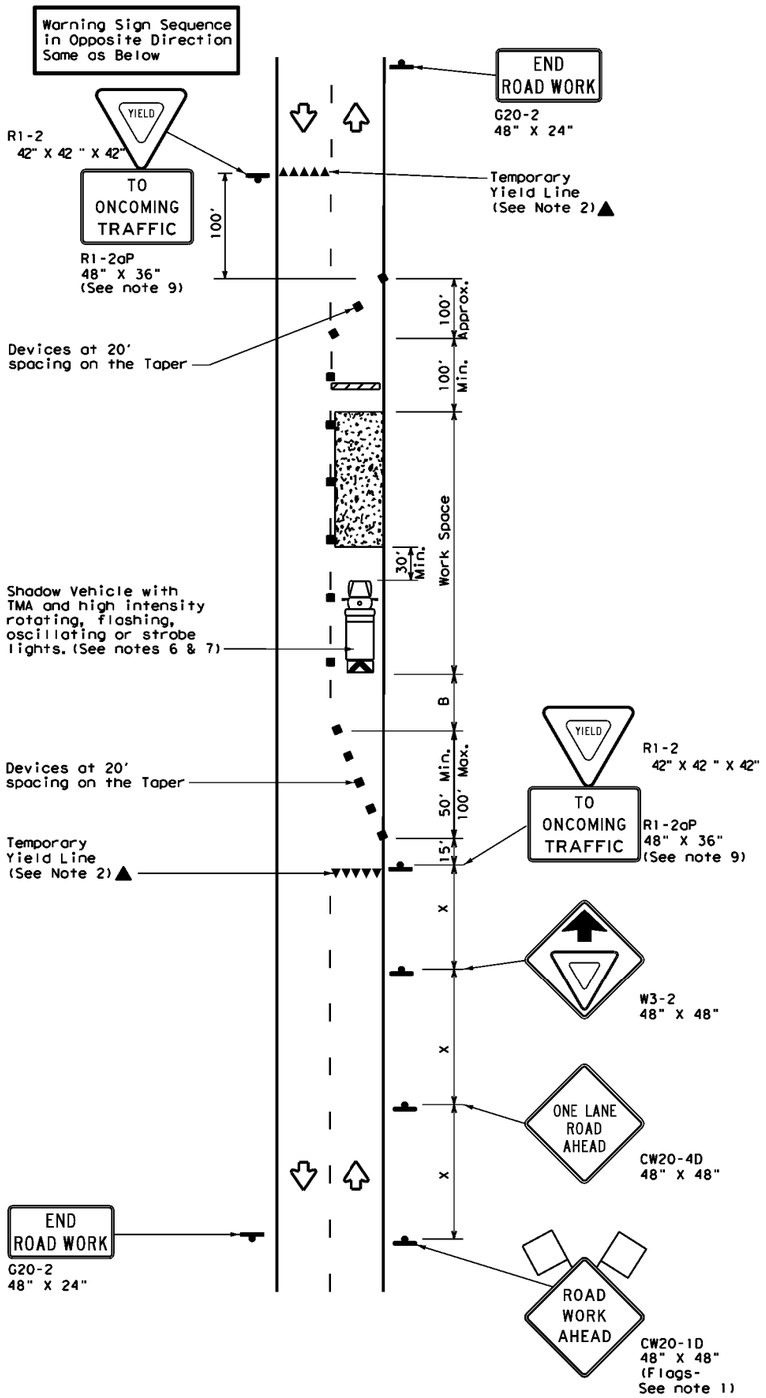
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

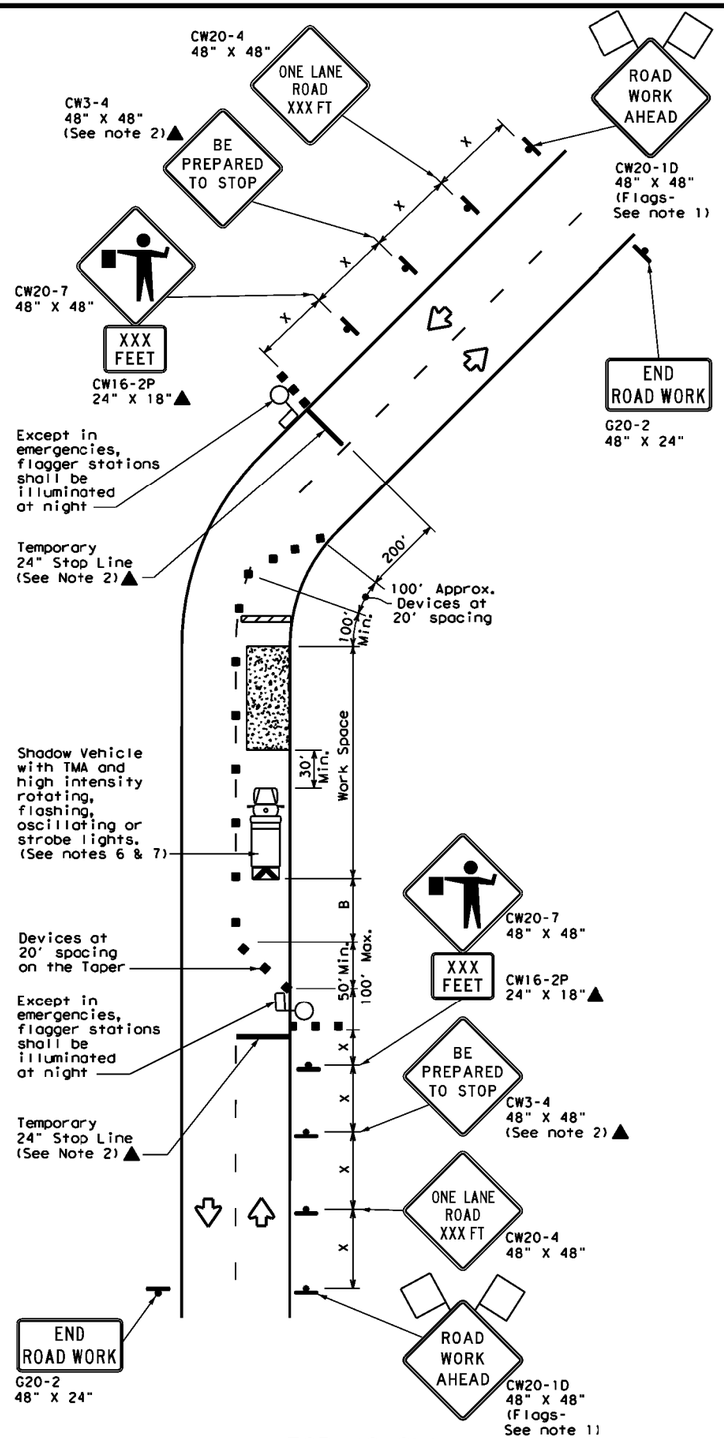
TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0114	12	015	US 290
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		18

DATE: DATE TIME
FILE: \\H\...\MICHAO\CONSTRUCTION PROJECTS-12-015 DETENTION PONDS\PLAN SET\...TCP\STANDARDS\TCP2-1-18.DGN



TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* 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 CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. 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.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

8. The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
9. The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

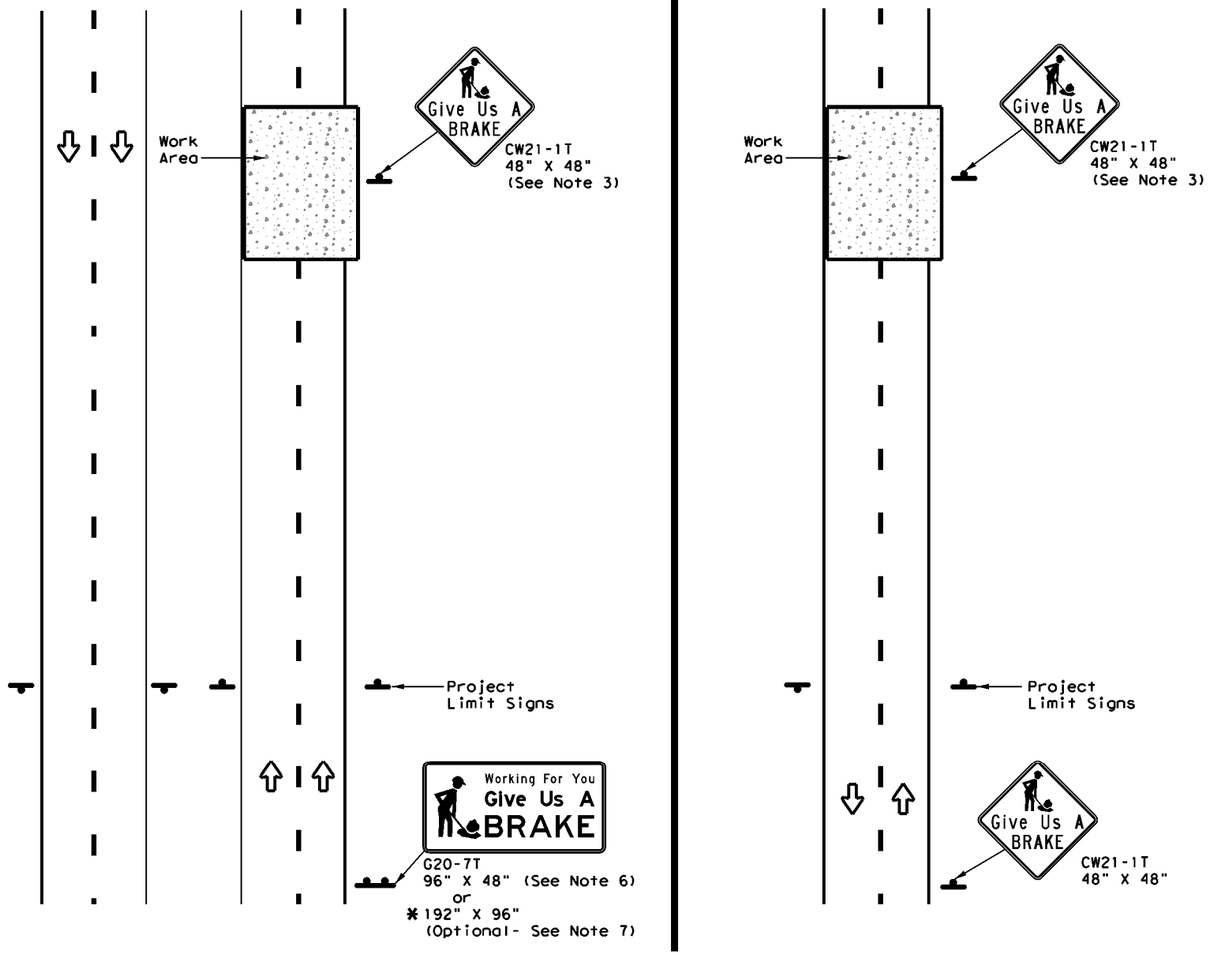
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0114	12	015	US 290
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		19

DATE: DATE TIME
FILE: \\H\MCHAO\CONSTRUCTION PROJECTS\12-015 DETENTION PONDS\PLAN SET\, TCP\STANDARDS\TCP2-1-18.DGN



DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
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.

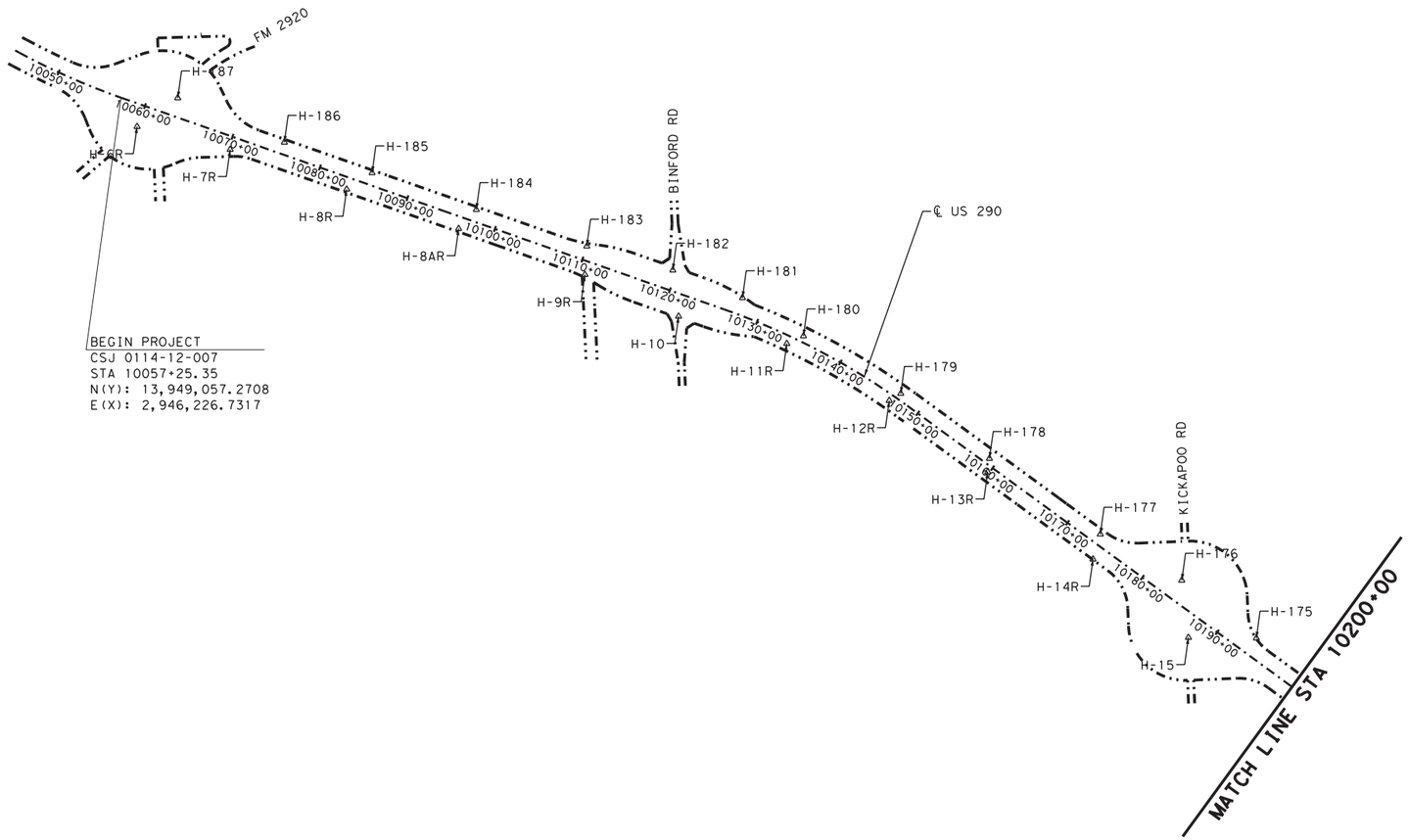
Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	HOU	HARRIS		20



NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

   THESE TxDOT CONTROL MONUMENTS ARE LOCATED THROUGHOUT THE ENTIRE US 290 CORRIDOR, FROM THE HARRIS/WALLER COUNTY LINE EAST TO IH 610. NONE OF THESE MONUMENTS ARE WITHIN THE LIMITS OF THIS PROJECT AND ARE THEREFORE NOT SHOWN.

2. ALL SURFACE VALUES WERE DERIVED UTILIZING THE COMBINED ADJUSTMENT FACTORS (SEA LEVEL FACTOR X SCALE FACTOR) WHICH HAVE BEEN DEVELOPEDBY TEH STATE FOR ITS USE AS FOLLOWS: GRID VALUES ARE MULTIPLIED BY A COMBINED ADJUSTMENT FACTOR OF 1.00013.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (1991 ADJUSTMENT). DURING THE ANALYSIS OF A 2002 US 290 PROJECT BETWEEN IH 10 AND BELTWAY 8 USING L1020202 AND N1020238, IT WAS DETERMINED THAT A 0.7 OF ONE FOOT VARIATION EXISTS BETWEEN THE PUBLISHED VALUES AND THE MEASURED VALUES.

4. SIMILAR DISCREPANCIES WERE FOUND IN THESE SECTIONS OF US 290. ELEVATIONS FOR THE EXISTING TXDOT CONTROL MONUMENTS H-78 AND H-20 (AS PUBLISHED BY CLARK SURVEYING COMPANY IN 1999) WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES. A VARIABLE (BY SECTION) CORRECTION - RANGING BETWEEN 0.01 AND 0.03 OF ONE FOOT PER MONUMENT - WAS APPLIED TO THE MEASURED VALUES TO ALIGN THE EXISTING ELEVATIONS MORE CLOSELY WITH THE PUBLISHED VALUES.

5. CLOSED DIFFERENTIAL LEVEL LOOPS WERE RUN BETWEEN ALL MONUMENTS USING ELECTRONIC RECORDING LEVELS.

LEGEND

EXIST ROW

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.

10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

0 400 800 1600

REV. NO.	DATE	DESCRIPTION	BY

COMMUNITY 290 DRIVEN

Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

Texas Department of Transportation
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US 290

SURVEY CONTROL INDEX SHEET

STA 10057+25.35 TO STA 10200+00.00

SHEET 1 OF 3

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				US 290
DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	20A

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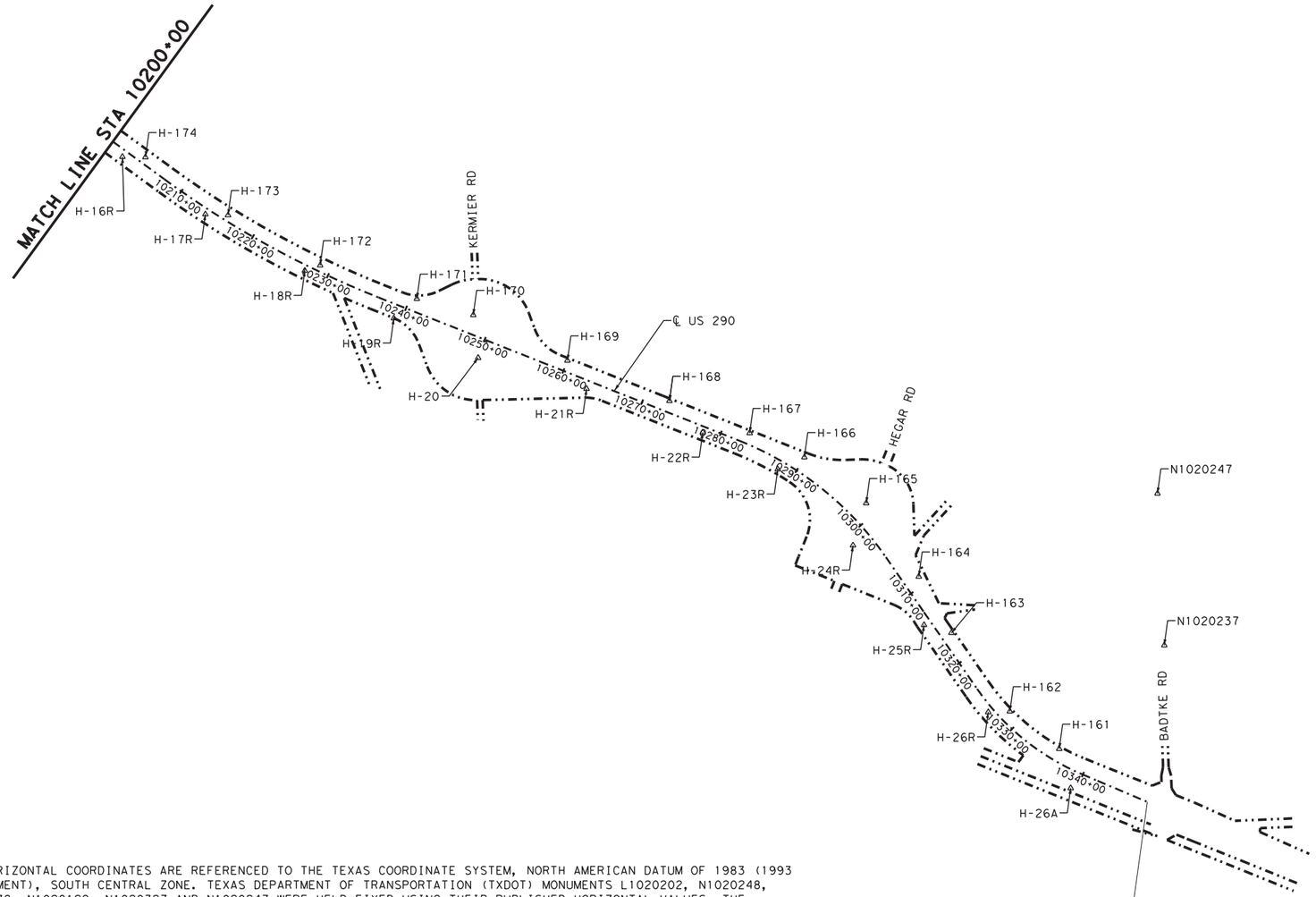

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1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

   THESE TxDOT CONTROL MONUMENTS ARE LOCATED THROUGHOUT THE ENTIRE US 290 CORRIDOR, FROM THE HARRIS/WALLER COUNTY LINE EAST TO IH 610. NONE OF THESE MONUMENTS ARE WITHIN THE LIMITS OF THIS PROJECT AND ARE THEREFORE NOT SHOWN.

2. ALL SURFACE VALUES WERE DERIVED UTILIZING THE COMBINED ADJUSTMENT FACTORS (SEA LEVEL FACTOR X SCALE FACTOR) WHICH HAVE BEEN DEVELOPEDBY TEH STATE FOR ITS USE AS FOLLOWS: GRID VALUES ARE MULTIPLIED BY A COMBINED ADJUSTMENT FACTOR OF 1.00013.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (1991 ADJUSTMENT). DURING THE ANALYSIS OF A 2002 US 290 PROJECT BETWEEN IH 10 AND BELTWAY 8 USING L1020202 AND N1020238, IT WAS DETERMINED THAT A 0.7 OF ONE FOOT VARIATION EXISTS BETWEEN THE PUBLISHED VALUES AND THE MEASURED VALUES.

4. SIMILAR DISCREPANCIES WERE FOUND IN THESE SECTIONS OF US 290. ELEVATIONS FOR THE EXISTING TXDOT CONTROL MONUMENTS H-78 AND H-20 (AS PUBLISHED BY CLARK SURVEYING COMPANY IN 1999) WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES. A VARIABLE (BY SECTION) CORRECTION - RANGING BETWEEN 0.01 AND 0.03 OF ONE FOOT PER MONUMENT - WAS APPLIED TO THE MEASURED VALUES TO ALIGN THE EXISTING ELEVATIONS MORE CLOSELY WITH THE PUBLISHED VALUES.

5. CLOSED DIFFERENTIAL LEVEL LOOPS WERE RUN BETWEEN ALL MONUMENTS USING ELECTRONIC RECORDING LEVELS.

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.

10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

REV. NO.	DATE	DESCRIPTION	BY

COMMUNITY 290 DRIVEN

Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

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US 290

SURVEY CONTROL INDEX SHEET

STA 10200+00.00 TO STA 10340+56.75

SHEET 2 OF 3

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
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DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	20B

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CONTROL INFORMATION						
NAME	N	E	STA	OFFSET	ELEV	DESCRIPTION
H-6R	13,948,765.517	2,946,410.911	10059+95.77	214.29' RT	276.09	FOUND 5/8" IR W/TxDOT ALUM DISK
H-7R	13,948,497.517	2,947,404.167	10070+21.72	138.19' RT	280.20	FOUND 5/8" IR W/TxDOT ALUM DISK
H-8R	13,948,068.774	2,948,660.846	10083+49.48	126.51' RT	272.63	FOUND 5/8" IR W/TxDOT ALUM DISK
H-8AR	13,947,644.245	2,949,868.747	10096+29.81	127.02' RT	267.44	FOUND PK NAIL W/BRASS SHINER
H-9R	13,947,148.331	2,951,230.606	10110+79.05	143.89' RT	269.84	FOUND 5/8" IR W/TxDOT ALUM DISK
H-10	13,946,698.550	2,952,241.099	10121+81.48	233.61' RT	263.74	FOUND PK NAIL
H-11R	13,946,404.222	2,953,408.474	10133+90.46	86.11' RT	263.40	FOUND 5/8" IR W/TxDOT ALUM DISK
H-12R	13,945,788.749	2,954,513.129	10146+69.27	68.27' RT	256.63	FOUND 5/8" IR W/TxDOT ALUM DISK
H-13R	13,945,019.841	2,955,575.264	10159+82.22	64.94' RT	254.08	FOUND 5/8" IR W/TxDOT ALUM DISK
H-14R	13,944,078.532	2,956,710.537	10174+54.20	155.33' RT	246.06	FOUND 5/8" IR W/TxDOT ALUM DISK
H-15	13,943,234.315	2,957,739.732	10187+83.26	229.90' RT	245.29	FOUND PK NAIL W/SHINER
H-16R	13,942,522.035	2,958,970.793	10201+97.48	78.85' RT	240.53	FOUND 5/8" IR W/TxDOT ALUM DISK
H-17R	13,941,844.238	2,959,950.608	10213+85.17	65.87' RT	236.83	FOUND 5/8" IR W/TxDOT ALUM DISK
H-18R	13,941,178.569	2,961,125.187	10227+28.41	64.13' RT	232.96	FOUND 5/8" IR W/TxDOT ALUM DISK
H-19R	13,940,615.105	2,962,176.741	10239+09.51	162.66' RT	227.70	FOUND 5/8" IR W/TxDOT ALUM DISK
H-20	13,940,148.684	2,963,172.588	10250+07.18	228.78' RT	228.60	FOUND PK NAIL W/SHINER
H-21R	13,939,783.348	2,964,453.483	10263+32.50	95.78' RT	224.33	FOUND 5/8" IR W/TxDOT ALUM DISK
H-22R	13,939,268.137	2,965,825.549	10277+97.86	68.44' RT	224.87	FOUND 5/8" IR W/TxDOT ALUM DISK
H-23R	13,938,832.782	2,966,711.963	10287+99.94	105.71' RT	223.67	FOUND 5/8" IR W/TxDOT ALUM DISK
H-24	13,937,934.428	2,967,600.428	10301+21.39	224.26' RT	220.64	FOUND PK NAIL W/SHINER
H-25R	13,936,995.025	2,968,439.987	10313+93.15	85.11' RT	223.64	FOUND PK NAIL W/SHINER
H-26R	13,935,965.583	2,969,197.996	10326+65.03	63.91' RT	222.63	FOUND PK NAIL W/SHINER
H-26A	13,935,068.256	2,970,172.630	10339+34.34	203.76' RT	217.60	FOUND PK NAIL W/SHINER
H-161	13,935,531.978	2,970,036.569	10336+03.64	146.27' LT	215.34	FOUND 5/8" IR W/TxDOT ALUM DISK
H-162	13,935,974.501	2,969,453.371	10328+32.13	131.19' LT	215.77	FOUND 5/8" IR W/TxDOT ALUM DISK
H-163	13,936,901.194	2,968,763.170	10316+54.39	127.03' LT	218.07	FOUND 5/8" IR W/TxDOT ALUM DISK
H-164	13,937,565.373	2,968,377.697	10308+88.93	188.64' LT	228.30	FOUND 5/8" IR W/TxDOT ALUM DISK
H-165	13,938,432.215	2,967,756.360	10298+56.29	225.27' LT	220.54	FOUND CUT "X" IN CONCRETE
H-166	13,938,975.577	2,967,026.303	10289+91.30	180.50' LT	222.58	FOUND 5/8" IR W/TxDOT ALUM DISK
H-167	13,939,261.070	2,966,380.078	10283+13.26	130.37' LT	222.51	FOUND 5/8" IR W/TxDOT ALUM DISK
H-168	13,939,639.899	2,965,432.328	10272+95.22	132.02' LT	226.16	FOUND 5/8" IR W/TxDOT ALUM DISK
H-169	13,940,116.775	2,964,227.565	10259+99.51	130.78' LT	227.43	FOUND 5/8" IR W/TxDOT ALUM DISK
H-170	13,940,654.215	2,963,114.802	10247+66.97	219.77' LT	228.10	FOUND CUT "X" IN CONCRETE
H-171	13,940,845.872	2,962,448.830	10240+77.27	152.21' LT	238.18	FOUND 5/8" IR W/TxDOT ALUM DISK
H-172	13,941,240.849	2,961,306.614	10228+64.42	71.18' LT	230.93	FOUND 5/8" IR W/TxDOT ALUM DISK
H-173	13,941,833.539	2,960,218.075	10216+16.77	68.40' LT	233.60	FOUND 5/8" IR W/TxDOT ALUM DISK
H-174	13,942,517.649	2,959,242.585	10204+19.54	77.94' LT	234.64	FOUND 5/8" IR W/TxDOT ALUM DISK
H-175	13,943,226.831	2,958,472.493	10193+79.36	196.32' LT	240.75	FOUND 5/8" IR W/TxDOT ALUM DISK
H-176	13,943,851.643	2,957,667.928	10183+61.12	226.23' LT	245.51	FOUND CUT "X" IN CONCRETE
H-177	13,944,348.242	2,956,789.375	10173+58.76	108.96' LT	249.98	FOUND 5/8" IR W/TxDOT ALUM DISK
H-178	13,945,164.640	2,955,593.810	10159+11.78	62.93' LT	253.90	FOUND 5/8" IR W/TxDOT ALUM DISK
H-179	13,945,866.150	2,954,637.212	10147+26.67	66.24' LT	258.29	FOUND 5/8" IR W/TxDOT ALUM DISK
H-180	13,946,486.619	2,953,587.913	10135+16.83	65.76' LT	264.43	FOUND 5/8" IR W/TxDOT ALUM DISK

CONTROL INFORMATION						
NAME	N	E	STA	OFFSET	ELEV	DESCRIPTION
H-181	13,946,898.871	2,952,930.581	10127+62.22	185.16' LT	271.99	FOUND 5/8" IR W/TxDOT ALUM DISK
H-182	13,947,196.432	2,952,178.392	10119+57.41	215.41' LT	263.62	FOUND CUT "X" IN CONCRETE
H-183	13,947,454.071	2,951,250.676	10109+96.73	151.24' LT	266.71	FOUND CUT "X" IN CONCRETE
H-184	13,947,849.202	2,950,059.156	10097+41.59	129.43' LT	265.81	FOUND 5/8" IR W/TxDOT ALUM DISK
H-185	13,948,245.364	2,948,935.145	10085+49.81	130.96' LT	270.77	FOUND 5/8" IR W/TxDOT ALUM DISK
H-186	13,948,574.890	2,947,988.940	10075+47.87	128.50' LT	277.18	FOUND 5/8" IR W/TxDOT ALUM DISK
H-187	13,949,053.348	2,946,839.277	10063+04.62	199.18' LT	277.17	FOUND CUT "X" IN CONCRETE
N1020237	13,936,754.920	2,971,277.612	10342+88.99	1780.73' LT	213.84	FOUND 5/8" IR W/TxDOT ALUM CAP
N1020247	13,938,547.281	2,971,197.598	10316+88.53	3065.55' LT	213.13	FOUND 5/8" IR W/TxDOT ALUM CAP

NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

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2. ALL SURFACE VALUES WERE DERIVED UTILIZING THE COMBINED ADJUSTMENT FACTORS (SEA LEVEL FACTOR X SCALE FACTOR) WHICH HAVE BEEN DEVELOPEDBY TEH STATE FOR ITS USE AS FOLLOWS: GRID VALUES ARE MULTIPLIED BY A COMBINED ADJUSTMENT FACTOR OF 1.00013.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (1991 ADJUSTMENT). DURING THE ANALYSIS OF A 2002 US 290 PROJECT BETWEEN IH 10 AND BELTWAY 8 USING L1020202 AND N1020238, IT WAS DETERMINED THAT A 0.7 OF ONE FOOT VARIATION EXISTS BETWEEN THE PUBLISHED VALUES AND THE MEASURED VALUES.

4. SIMILAR DISCREPANCIES WERE FOUND IN THESE SECTIONS OF US 290. ELEVATIONS FOR THE EXISTING TXDOT CONTROL MONUMENTS H-78 AND H-20 (AS PUBLISHED BY CLARK SURVEYING COMPANY IN 1999) WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES. A VARIABLE (BY SECTION) CORRECTION - RANGING BETWEEN 0.01 AND 0.03 OF ONE FOOT PER MONUMENT - WAS APPLIED TO THE MEASURED VALUES TO ALIGN THE EXISTING ELEVATIONS MORE CLOSELY WITH THE PUBLISHED VALUES.

5. CLOSED DIFFERENTIAL LEVEL LOOPS WERE RUN BETWEEN ALL MONUMENTS USING ELECTRONIC RECORDING LEVELS.

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.

10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

REV. NO.	DATE	DESCRIPTION	BY

COMMUNITY 290 DRIVEN

Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

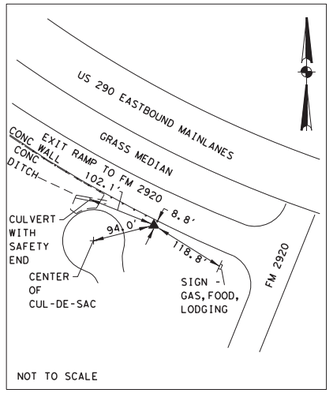
 Texas Department of Transportation

US 290

SURVEY CONTROL INDEX SHEET

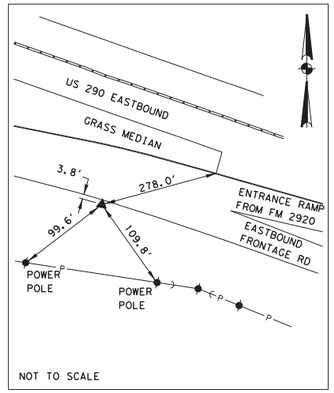
SHEET 3 OF 3

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				US 290
DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	20C



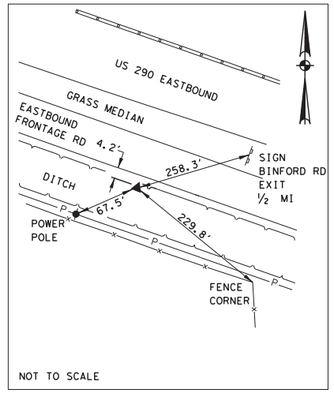
TxDOT POINT H-6R
N: 13,948,765.517
E: 2,946,410.911
ELEV: 276.09'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED ON THE SOUTHWEST SIDE OF US 290 APPROXIMATELY 500 FT NORTHWEST OF FM 2920.



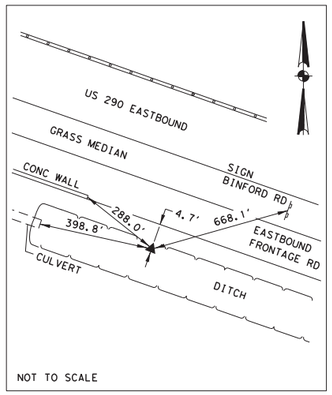
TxDOT POINT H-7R
N: 13,948,497.517
E: 2,947,404.167
ELEV: 280.20'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED AT THE SOUTHWEST SIDE OF US 290 APPROXIMATELY 0.19 MI SOUTHEAST OF FM 2920.



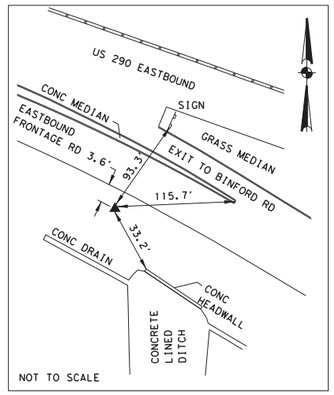
TxDOT POINT H-8R
N: 13,948,068.774
E: 2,948,660.846
ELEV: 272.63'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED AT THE SOUTHWEST SIDE OF US 290 EASTBOUND FRONTAGE ROAD, APPROXIMATELY 390 FT NORTHWEST OF WALKER VETERINARY CLINIC.



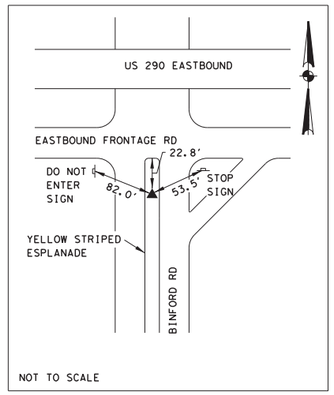
TxDOT POINT H-8AR
N: 13,947,644.245
E: 2,949,868.747
ELEV: 267.44'

FOUND PK NAIL WITH BRASS SHINER LOCATED ON THE SOUTHWEST SIDE OF US 290 EASTBOUND FRONTAGE ROAD, APPROXIMATELY 0.49 MI NORTHWEST OF BINFORD ROAD.



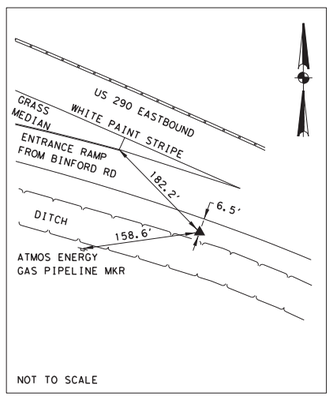
TxDOT POINT H-9R
N: 13,947,148.331
E: 2,951,230.606
ELEV: 269.84'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED ON THE SOUTHWEST US 290 EASTBOUND FRONTAGE ROAD APPROXIMATELY 0.21 MI NORTHWEST OF BINFORD ROAD.



TxDOT POINT H-10
N: 13,946,698.550
E: 2,952,241.099
ELEV: 263.74'

FOUND PK NAIL IN ASPHALT ON THE SOUTH SIDE OF US 290 EASTBOUND FRONTAGE ROAD AT THE CENTERLINE OF BINFORD ROAD.



TxDOT POINT H-11R
N: 13,946,404.222
E: 2,953,408.474
ELEV: 263.74'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED ON THE SOUTHWEST SIDE OF US 290 APPROXIMATELY 0.21 MI NORTHWEST OF BINFORD ROAD.

NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

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4. SIMILAR DISCREPANCIES WERE FOUND IN THESE SECTIONS OF US 290. ELEVATIONS FOR THE EXISTING TXDOT CONTROL MONUMENTS H-78 AND H-20 (AS PUBLISHED BY CLARK SURVEYING COMPANY IN 1999) WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES. A VARIABLE (BY SECTION) CORRECTION - RANGING BETWEEN 0.01 AND 0.03 OF ONE FOOT PER MONUMENT - WAS APPLIED TO THE MEASURED VALUES TO ALIGN THE EXISTING ELEVATIONS MORE CLOSELY WITH THE PUBLISHED VALUES.

5. CLOSED DIFFERENTIAL LEVEL LOOPS WERE RUN BETWEEN ALL MONUMENTS USING ELECTRONIC RECORDING LEVELS.

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.

10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

REV. NO.	DATE	DESCRIPTION	BY

COMMUNITY 290 DRIVEN
Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

Texas Department of Transportation
© 2012

US 290

SURVEY CONTROL POINTS

SHEET 1 OF 8

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				US 290
DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	20D

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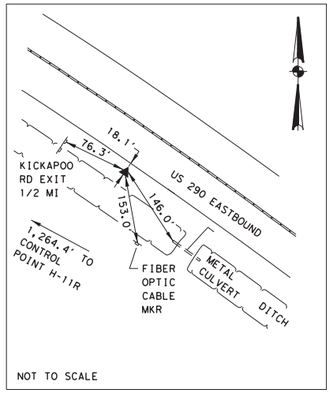
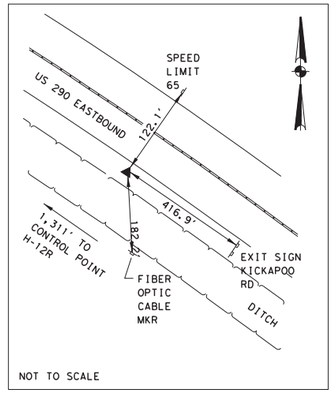


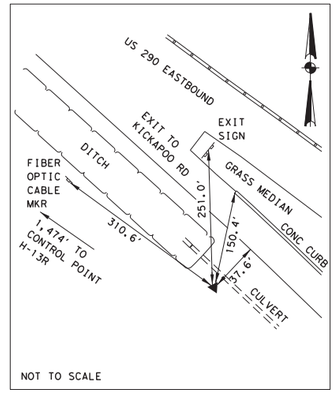
TxDOT POINT H-12R
N: 13,945,788.749
E: 2,954,513.129
ELEV: 256.63'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED ON THE SOUTH SIDE OF THE US 290 EASTBOUND FRONTAGE ROAD APPROXIMATELY 0.20 MI NORTHWEST OF BARKER-CYPRESS ROAD.



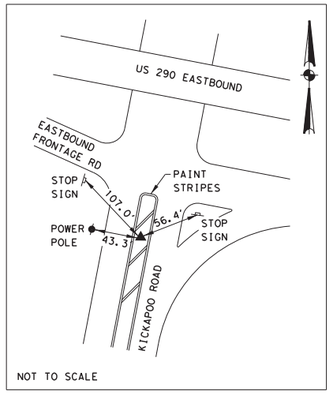
TxDOT POINT H-13R
N: 13,945,019.841
E: 2,955,575.264
ELEV: 254.08'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED ON THE SOUTH SIDE OF US 290 APPROXIMATELY 745 FT NORTHWEST OF THE KICKAPOO ROAD EXIT RAMP.



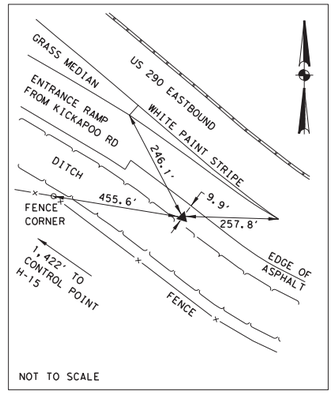
TxDOT POINT H-14R
N: 13,944,078.532
E: 2,956,710.537
ELEV: 246.06'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED ON THE SOUTH SIDE OF US 290 APPROXIMATELY 0.25 MI NORTHWEST OF KICKAPOO ROAD.



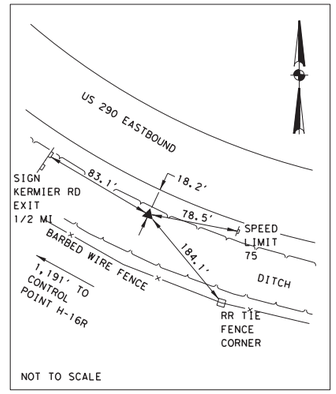
TxDOT POINT H-15
N: 13,943,234.315
E: 2,957,739.732
ELEV: 245.29'

FOUND PK NAIL WITH SHINER LOCATED ON THE SOUTH SIDE OF THE US 290 AT THE CENTERLINE OF KICKAPOO ROAD.



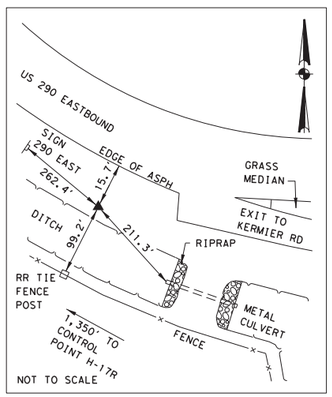
TxDOT POINT H-16R
N: 13,942,522.035
E: 2,958,970.793
ELEV: 240.53'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED ON THE SOUTHWEST SIDE OF US 290 APPROXIMATELY 0.27 MI SOUTHEAST OF KICKAPOO ROAD.



TxDOT POINT H-17R
N: 13,941,844.238
E: 2,959,950.608
ELEV: 236.83'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED ON THE SOUTH SIDE OF US 290 APPROXIMATELY 0.49 MI SOUTHEAST OF KICKAPOO ROAD.



TxDOT POINT H-18R
N: 13,941,178.569
E: 2,961,125.187
ELEV: 232.96'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED ON THE SOUTH SIDE OF US 290 APPROXIMATELY 0.43 MI NORTHWEST OF KERMIER ROAD.

NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

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STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.

10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

REV. NO.	DATE	DESCRIPTION	BY

COMMUNITY 290 DRIVEN

Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

 Texas Department of Transportation

US 290

SURVEY CONTROL POINTS

SHEET 2 OF 8

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				US 290
DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	20E

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CChestnut

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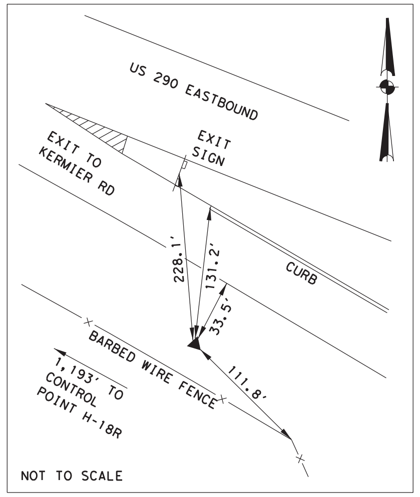
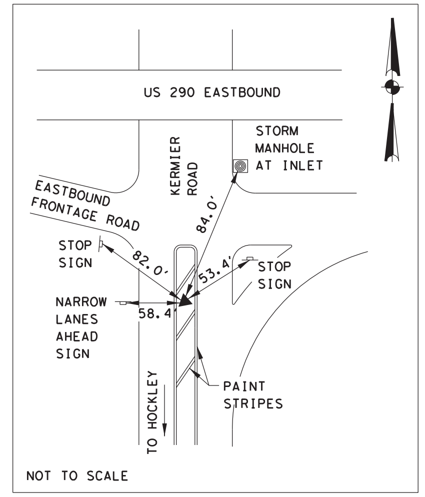


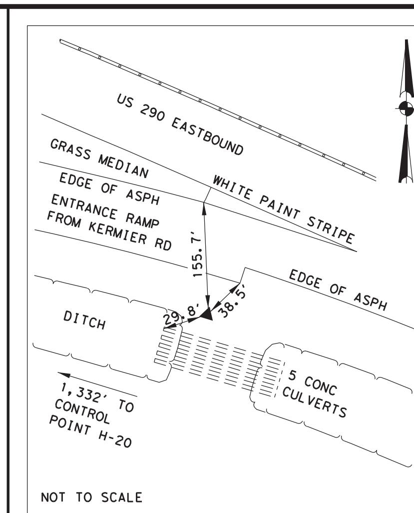
TxDOT POINT H-19R
N: 13,940,615.105
E: 2,962,176.741
ELEV: 227.70'

FOUND TxDOT ALUMINUM DISK ON 36" x ⅝" IRON ROD LOCATED ON THE SOUTH SIDE OF US 290 APPROXIMATELY 0.21 MI NORTHWEST OF KERMIER ROAD.



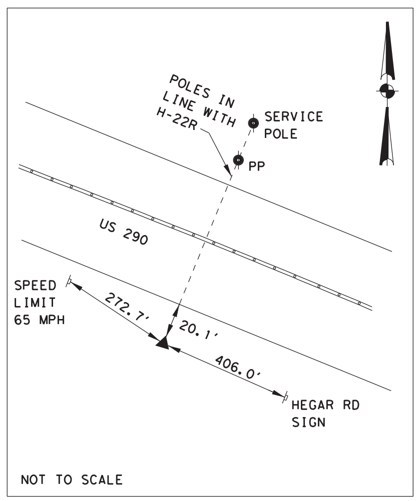
TxDOT POINT H-20
N: 13,940,148.684
E: 2,963,172.588
ELEV: 228.60'

FOUND PK NAIL WITH SHINER LOCATED ON THE SOUTH SIDE OF THE US 290 EASTBOUND FRONTAGE ROAD AT THE CENTERLINE OF KERMIER ROAD IN THE PAINTED MEDIAN.



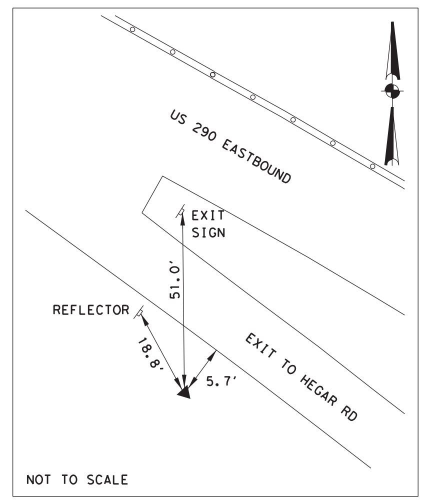
TxDOT POINT H-21R
N: 13,939,783.348
E: 2,964,453.483
ELEV: 224.33'

FOUND TxDOT ALUMINUM DISK ON 36" x ⅝" IRON ROD LOCATED ON THE SOUTH SIDE OF US 290 APPROXIMATELY 0.25 MI SOUTHEAST OF KERMIER ROAD.



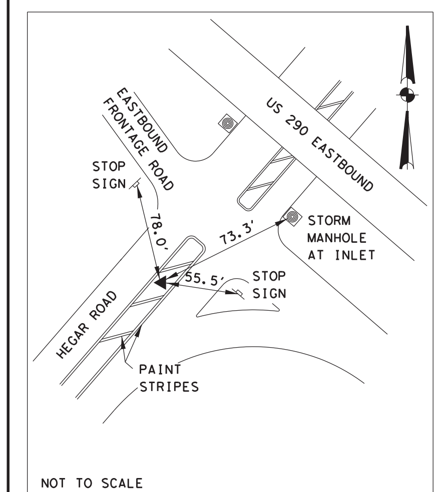
TxDOT POINT H-22R
N: 13,939,268.137
E: 2,965,825.549
ELEV: 224.87'

FOUND TxDOT ALUMINUM DISK ON 36" x ⅝" IRON ROD LOCATED ON THE SOUTH SIDE OF US 290 APPROXIMATELY 0.54 MI SOUTHEAST OF KERMIER ROAD.



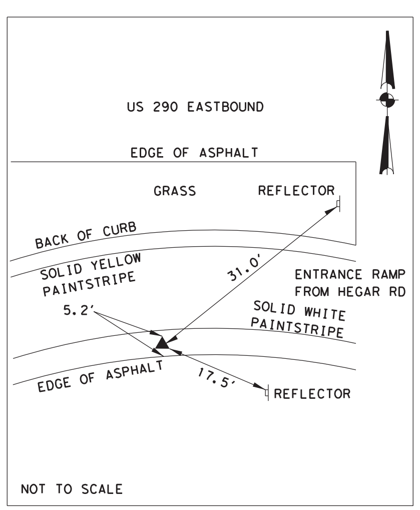
TxDOT POINT H-23R
N: 13,938,832.782
E: 2,966,711.963
ELEV: 223.67'

FOUND TxDOT ALUMINUM DISK ON 36" x ⅝" IRON ROD LOCATED ON THE SOUTH SIDE OF US 290 APPROXIMATELY 0.21 MI NORTHWEST OF HEGAR ROAD.



TxDOT POINT H-24
N: 13,937,934.428
E: 2,967,600.428
ELEV: 220.64'

FOUND PK NAIL WITH SHINER LOCATED ON THE SOUTH SIDE OF THE US 290 EASTBOUND FRONTAGE ROAD AT THE CENTERLINE OF HEGAR ROAD IN THE PAINTED MEDIAN.



TxDOT POINT H-25R
N: 13,936,995.025
E: 2,968,439.987
ELEV: 223.64'

FOUND PK NAIL WITH SHINER LOCATED APPROXIMATELY 0.16 MI SOUTHEAST OF HEGAR ROAD AT THE SOUTH EDGE OF THE ENTRANCE RAMP TO US 290.

NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

   THESE TxDOT CONTROL MONUMENTS ARE LOCATED THROUGHOUT THE ENTIRE US 290 CORRIDOR, FROM THE HARRIS/WALLER COUNTY LINE EAST TO IH 610. NONE OF THESE MONUMENTS ARE WITHIN THE LIMITS OF THIS PROJECT AND ARE THEREFORE NOT SHOWN.

2. ALL SURFACE VALUES WERE DERIVED UTILIZING THE COMBINED ADJUSTMENT FACTORS (SEA LEVEL FACTOR X SCALE FACTOR) WHICH HAVE BEEN DEVELOPEDBY TEH STATE FOR ITS USE AS FOLLOWS: GRID VALUES ARE MULTIPLIED BY A COMBINED ADJUSTMENT FACTOR OF 1.00013.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (1991 ADJUSTMENT). DURING THE ANALYSIS OF A 2002 US 290 PROJECT BETWEEN IH 10 AND BELTWAY 8 USING L1020202 AND N1020238, IT WAS DETERMINED THAT A 0.7 OF ONE FOOT VARIATION EXISTS BETWEEN THE PUBLISHED VALUES AND THE MEASURED VALUES.

4. SIMILAR DISCREPANCIES WERE FOUND IN THESE SECTIONS OF US 290. ELEVATIONS FOR THE EXISTING TXDOT CONTROL MONUMENTS H-78 AND H-20 (AS PUBLISHED BY CLARK SURVEYING COMPANY IN 1999) WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES. A VARIABLE (BY SECTION) CORRECTION - RANGING BETWEEN 0.01 AND 0.03 OF ONE FOOT PER MONUMENT - WAS APPLIED TO THE MEASURED VALUES TO ALIGN THE EXISTING ELEVATIONS MORE CLOSELY WITH THE PUBLISHED VALUES.

5. CLOSED DIFFERENTIAL LEVEL LOOPS WERE RUN BETWEEN ALL MONUMENTS USING ELECTRONIC RECORDING LEVELS.

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED PROFESSIONAL ENGINEER

William Burch, P.E.
10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

REV. NO.	DATE	DESCRIPTION	BY

COMMUNITY 290 DRIVEN
Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

Texas Department of Transportation
© 2012

US 290

SURVEY CONTROL POINTS

SHEET 3 OF 8

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				US 290
DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	20F

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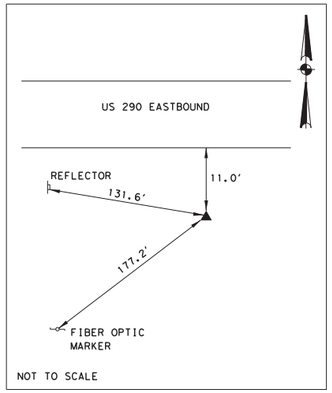
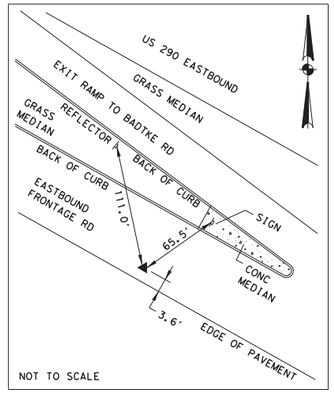
...\CADD\SURVEY\007PBM06P.dgn
CChestnut



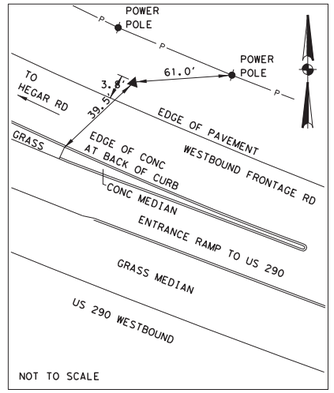
TxDOT POINT H-26R
N: 13,935,965.583
E: 2,969,197.996
ELEV: 222.63'

FOUND PK NAIL WITH SHINER LOCATED SOUTH OF US 290 APPROXIMATELY 0.47 MI NORTHWEST OF BADTKE ROAD.



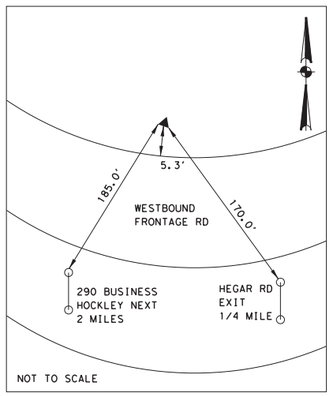
TxDOT POINT H-26A
N: 13,935,068.256
E: 2,970,172.630
ELEV: 217.60'

FOUND PK NAIL WITH SHINER LOCATED SOUTH OF THE US 290 EASTBOUND FRONTAGE ROAD AT THE EXIT RAMP TO BADTKE ROAD.



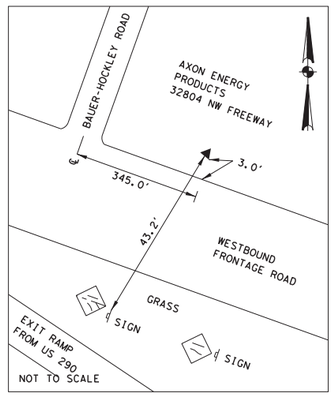
TxDOT POINT H-161
N: 13,935,531.978
E: 2,970,036.569
ELEV: 215.34'

FOUND TxDOT ALUMINUM DISK ON 36" x ⅝" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD.



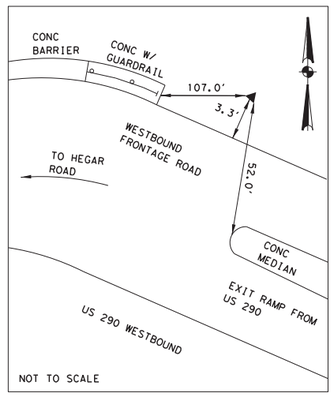
TxDOT POINT H-162
N: 13,935,974.501
E: 2,969,453.371
ELEV: 215.77'

FOUND TxDOT ALUMINUM DISK ON 36" x ⅝" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD.



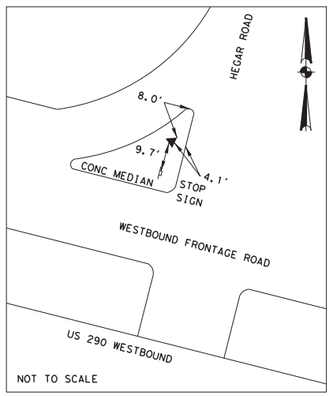
TxDOT POINT H-163
N: 13,936,901.194
E: 2,968,763.170
ELEV: 218.07'

FOUND TxDOT ALUMINUM DISK ON 36" x ⅝" IRON ROD LOCATED AT THE INTERSECTION OF THE US 290 WESTBOUND FRONTAGE ROAD AND BAUER-HOCKLEY ROAD.



TxDOT POINT H-164
N: 13,937,565.373
E: 2,968,377.697
ELEV: 228.30'

FOUND TxDOT ALUMINUM DISK ON 36" x ⅝" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD.



TxDOT POINT H-165
N: 13,938,432.215
E: 2,967,756.360
ELEV: 220.54'

FOUND CUT "X" IN CONCRETE MEDIAN AT THE INTERSECTION OF THE US 290 WESTBOUND FRONTAGE ROAD AND HEGAR ROAD.

NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

   THESE TxDOT CONTROL MONUMENTS ARE LOCATED THROUGHOUT THE ENTIRE US 290 CORRIDOR, FROM THE HARRIS/WALLER COUNTY LINE EAST TO IH 610. NONE OF THESE MONUMENTS ARE WITHIN THE LIMITS OF THIS PROJECT AND ARE THEREFORE NOT SHOWN.

2. ALL SURFACE VALUES WERE DERIVED UTILIZING THE COMBINED ADJUSTMENT FACTORS (SEA LEVEL FACTOR X SCALE FACTOR) WHICH HAVE BEEN DEVELOPEDBY TEH STATE FOR ITS USE AS FOLLOWS: GRID VALUES ARE MULTIPLIED BY A COMBINED ADJUSTMENT FACTOR OF 1.00013.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (1991 ADJUSTMENT). DURING THE ANALYSIS OF A 2002 US 290 PROJECT BETWEEN IH 10 AND BELTWAY 8 USING L1020202 AND N1020238, IT WAS DETERMINED THAT A 0.7 OF ONE FOOT VARIATION EXISTS BETWEEN THE PUBLISHED VALUES AND THE MEASURED VALUES.

4. SIMILAR DISCREPANCIES WERE FOUND IN THESE SECTIONS OF US 290. ELEVATIONS FOR THE EXISTING TXDOT CONTROL MONUMENTS H-78 AND H-20 (AS PUBLISHED BY CLARK SURVEYING COMPANY IN 1999) WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES. A VARIABLE (BY SECTION) CORRECTION - RANGING BETWEEN 0.01 AND 0.03 OF ONE FOOT PER MONUMENT - WAS APPLIED TO THE MEASURED VALUES TO ALIGN THE EXISTING ELEVATIONS MORE CLOSELY WITH THE PUBLISHED VALUES.

5. CLOSED DIFFERENTIAL LEVEL LOOPS WERE RUN BETWEEN ALL MONUMENTS USING ELECTRONIC RECORDING LEVELS.

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.

10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

REV. NO.	DATE	DESCRIPTION	BY

COMMUNITY 290 DRIVEN

Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

Texas Department of Transportation

US 290

SURVEY CONTROL POINTS

SHEET 4 OF 8

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				US 290
DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	20G

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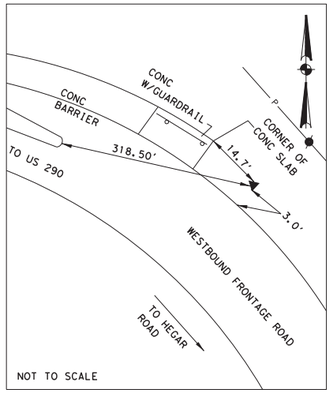
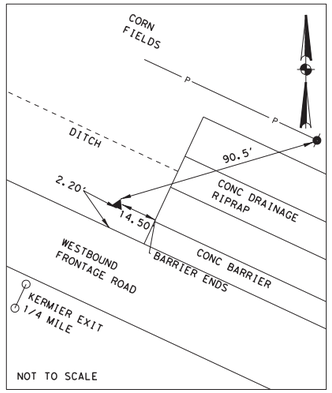


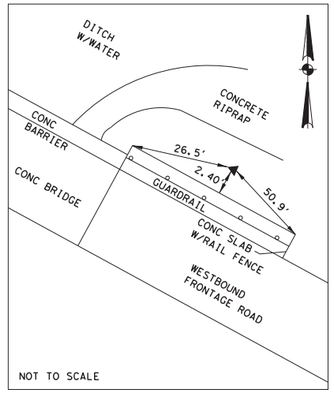
TxDOT POINT H-166
N: 13,938,975.577
E: 2,967,026.303
ELEV: 222.58'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD.



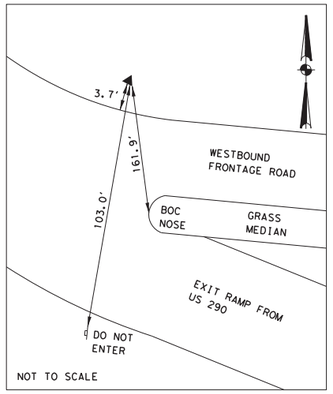
TxDOT POINT H-167
N: 13,939,261.070
E: 2,966,380.078
ELEV: 222.51'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD APPROXIMATLEY 0.30 MI WEST OF HEGAR ROAD.



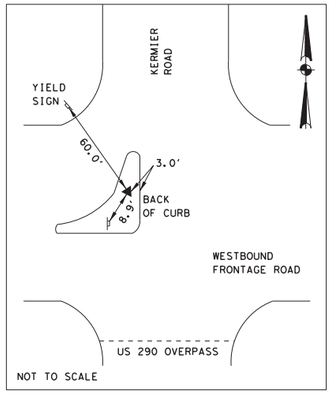
TxDOT POINT H-168
N: 13,939,639.899
E: 2,965,432.328
ELEV: 226.16'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD APPROXIMATELY 0.49 MI WEST OF HEGAR ROAD.



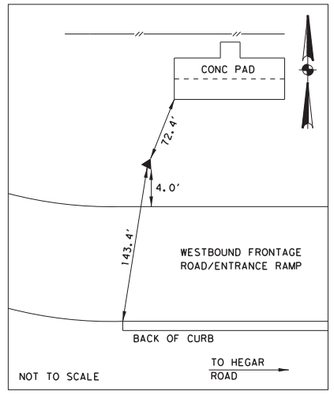
TxDOT POINT H-169
N: 13,940,116.775
E: 2,964,227.565
ELEV: 227.43'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD APPROXIMATELY 0.22 MI EAST OF KERMIER ROAD.



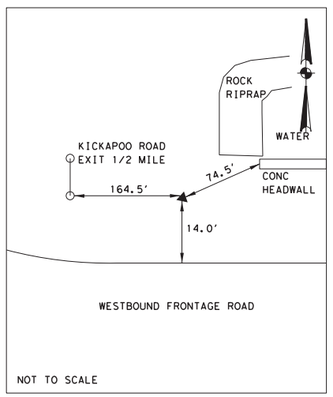
TxDOT POINT H-170
N: 13,940,654.215
E: 2,963,114.802
ELEV: 228.10'

FOUND CUT "X" IN CONCRETE MEDIAN AT THE INTERSECTION OF THE US 290 WESTBOUND FRONTAGE ROAD AND KERMIER ROAD.



TxDOT POINT H-171
N: 13,940,845.872
E: 2,962,448.830
ELEV: 238.18'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD.



TxDOT POINT H-172
N: 13,941,240.849
E: 2,961,306.614
ELEV: 230.93'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD.

NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

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2. ALL SURFACE VALUES WERE DERIVED UTILIZING THE COMBINED ADJUSTMENT FACTORS (SEA LEVEL FACTOR X SCALE FACTOR) WHICH HAVE BEEN DEVELOPEDBY TEH STATE FOR ITS USE AS FOLLOWS: GRID VALUES ARE MULTIPLIED BY A COMBINED ADJUSTMENT FACTOR OF 1.00013.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (1991 ADJUSTMENT). DURING THE ANALYSIS OF A 2002 US 290 PROJECT BETWEEN IH 10 AND BELTWAY 8 USING L1020202 AND N1020238, IT WAS DETERMINED THAT A 0.7 OF ONE FOOT VARIATION EXISTS BETWEEN THE PUBLISHED VALUES AND THE MEASURED VALUES.

4. SIMILAR DISCREPANCIES WERE FOUND IN THESE SECTIONS OF US 290. ELEVATIONS FOR THE EXISTING TXDOT CONTROL MONUMENTS H-78 AND H-20 (AS PUBLISHED BY CLARK SURVEYING COMPANY IN 1999) WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES. A VARIABLE (BY SECTION) CORRECTION - RANGING BETWEEN 0.01 AND 0.03 OF ONE FOOT PER MONUMENT - WAS APPLIED TO THE MEASURED VALUES TO ALIGN THE EXISTING ELEVATIONS MORE CLOSELY WITH THE PUBLISHED VALUES.

5. CLOSED DIFFERENTIAL LEVEL LOOPS WERE RUN BETWEEN ALL MONUMENTS USING ELECTRONIC RECORDING LEVELS.

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.
10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

REV. NO.	DATE	DESCRIPTION	BY

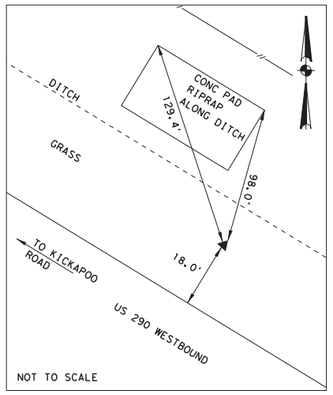
COMMUNITY 290 DRIVEN
Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

US 290

SURVEY CONTROL POINTS

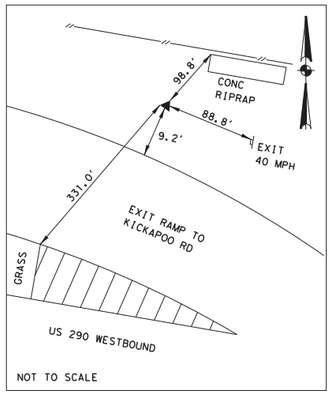
SHEET 5 OF 8

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				US 290
DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	20H



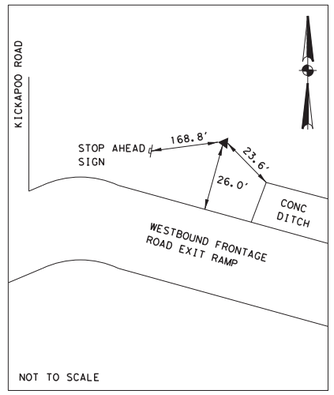
TxDOT POINT H-173
N: 13,941,833.539
E: 2,960,218.075
ELEV: 233.60'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD.



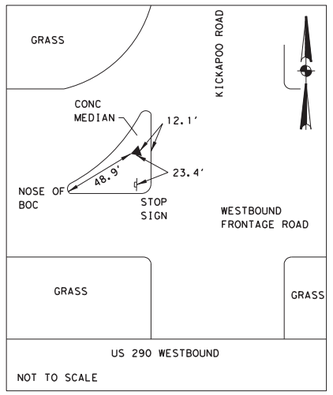
TxDOT POINT H-174
N: 13,942,517.649
E: 2,959,242.585
ELEV: 234.64'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD.



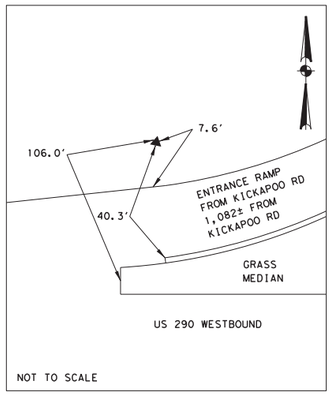
TxDOT POINT H-175
N: 13,943,226.831
E: 2,958,472.493
ELEV: 240.75'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD.



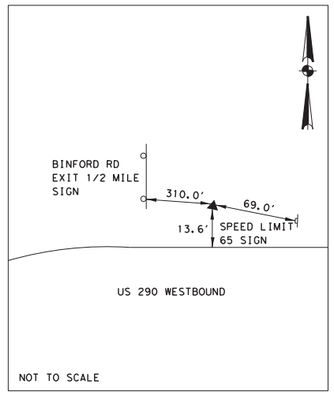
TxDOT POINT H-176
N: 13,943,851.643
E: 2,957,667.928
ELEV: 245.51'

FOUND CUT "X" IN CONCRETE MEDIAN AT THE INTERSECTION OF THE US 290 WESTBOUND FRONTAGE ROAD AND KICKAPOO ROAD.



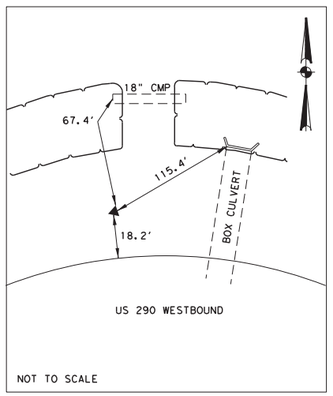
TxDOT POINT H-177
N: 13,944,348.242
E: 2,956,789.375
ELEV: 249.98'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE ENTRANCE RAMP FROM KICKAPOO ROAD.



TxDOT POINT H-178
N: 13,945,164.640
E: 2,955,593.810
ELEV: 235.90'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF US 290 APPROXIMATELY 0.48 MI NORHTHWEST OF KICKAPOO ROAD.



TxDOT POINT H-179
N: 13,945,866.150
E: 2,954,637.212
ELEV: 258.29'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF US 290 APPROXIMATELY 0.70 MI NORTHWEST OF KICKAPOO ROAD.

NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

   THESE TxDOT CONTROL MONUMENTS ARE LOCATED THROUGHOUT THE ENTIRE US 290 CORRIDOR, FROM THE HARRIS/WALLER COUNTY LINE EAST TO IH 610. NONE OF THESE MONUMENTS ARE WITHIN THE LIMITS OF THIS PROJECT AND ARE THEREFORE NOT SHOWN.

2. ALL SURFACE VALUES WERE DERIVED UTILIZING THE COMBINED ADJUSTMENT FACTORS (SEA LEVEL FACTOR X SCALE FACTOR) WHICH HAVE BEEN DEVELOPEDBY TEH STATE FOR ITS USE AS FOLLOWS: GRID VALUES ARE MULTIPLIED BY A COMBINED ADJUSTMENT FACTOR OF 1.00013.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (1991 ADJUSTMENT). DURING THE ANALYSIS OF A 2002 US 290 PROJECT BETWEEN IH 10 AND BELTWAY 8 USING L1020202 AND N1020238, IT WAS DETERMINED THAT A 0.7 OF ONE FOOT VARIATION EXISTS BETWEEN THE PUBLISHED VALUES AND THE MEASURED VALUES.

4. SIMILAR DISCREPANCIES WERE FOUND IN THESE SECTIONS OF US 290. ELEVATIONS FOR THE EXISTING TXDOT CONTROL MONUMENTS H-78 AND H-20 (AS PUBLISHED BY CLARK SURVEYING COMPANY IN 1999) WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES. A VARIABLE (BY SECTION) CORRECTION - RANGING BETWEEN 0.01 AND 0.03 OF ONE FOOT PER MONUMENT - WAS APPLIED TO THE MEASURED VALUES TO ALIGN THE EXISTING ELEVATIONS MORE CLOSELY WITH THE PUBLISHED VALUES.

5. CLOSED DIFFERENTIAL LEVEL LOOPS WERE RUN BETWEEN ALL MONUMENTS USING ELECTRONIC RECORDING LEVELS.

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.

10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

REV. NO.	DATE	DESCRIPTION	BY

COMMUNITY 290 DRIVEN

Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

Texas Department of Transportation

US 290

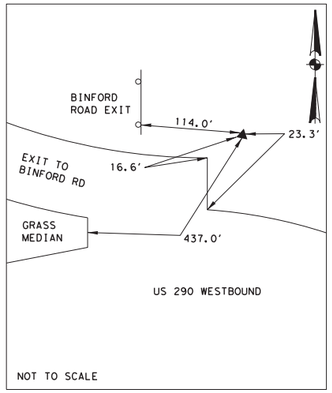
SURVEY CONTROL POINTS

SHEET 6 OF 8

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				US 290
DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	201

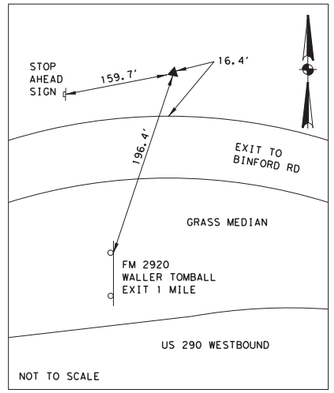
8/21/2012 11:32:59 PM ...\CADD\SURVEY\007PBW09P.dgn

...\CADD\CSJ 0114-12-007\CADD\SURVEY\007PBW09P.dgn



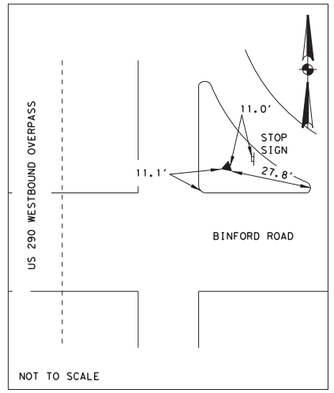
TxDOT POINT H-180
N: 13,946,486.619
E: 2,953,587.913
ELEV: 264.43'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND EXIT RAMP TO BINFORD ROAD.



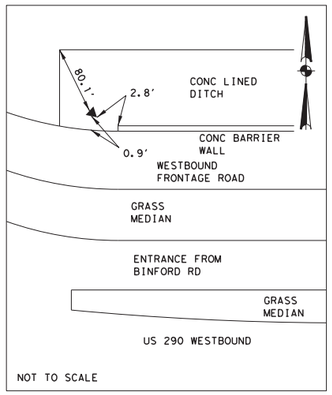
TxDOT POINT H-181
N: 13,946,898.871
E: 2,952,930.581
ELEV: 271.99'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND EXIT RAMP TO BINFORD ROAD.



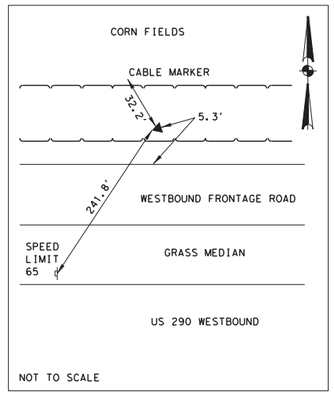
TxDOT POINT H-182
N: 13,947,196.432
E: 2,952,178.392
ELEV: 263.62'

FOUND CUT "X" IN CONCRETE MEDIAN LOCATED AT THE NORTHWEST CORNER OF THE INTERSECTION OF THE US 290 WESTBOUND FRONTAGE ROAD AND BINFORD ROAD.



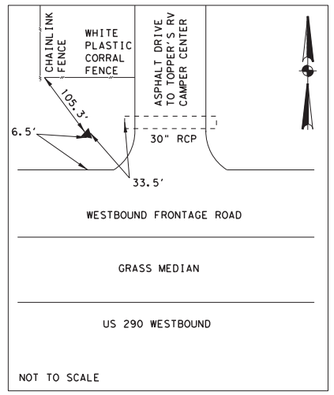
TxDOT POINT H-183
N: 13,947,454.071
E: 2,951,250.676
ELEV: 266.71'

FOUND CUT "X" IN CONCRETE LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD AND THE ENTRANCE RAMP FROM BINFORD ROAD.



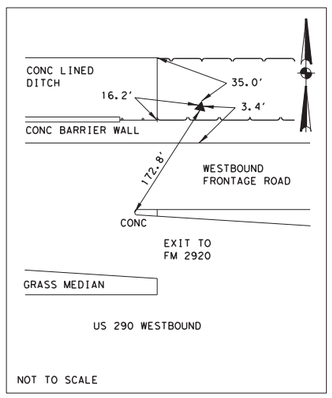
TxDOT POINT H-184
N: 13,947,849.202
E: 2,950,059.156
ELEV: 265.81'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD APPROXIMATELY 0.43 MI NORTHWEST OF BINFORD ROAD.



TxDOT POINT H-185
N: 13,948,245.364
E: 2,948,935.145
ELEV: 270.77'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED AT THE INTERSECTION OF THE US 290 WESTBOUND FRONTAGE ROAD AND THE ASPHALT DRIVE TO TOPPER'S RV CAMPER CENTER.



TxDOT POINT H-186
N: 13,948,574.890
E: 2,947,988.940
ELEV: 277.18'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED NORTH OF THE US 290 WESTBOUND FRONTAGE ROAD AND THE EXIT TO FM 2920.

NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

   THESE TxDOT CONTROL MONUMENTS ARE LOCATED THROUGHOUT THE ENTIRE US 290 CORRIDOR, FROM THE HARRIS/WALLER COUNTY LINE EAST TO IH 610. NONE OF THESE MONUMENTS ARE WITHIN THE LIMITS OF THIS PROJECT AND ARE THEREFORE NOT SHOWN.

2. ALL SURFACE VALUES WERE DERIVED UTILIZING THE COMBINED ADJUSTMENT FACTORS (SEA LEVEL FACTOR X SCALE FACTOR) WHICH HAVE BEEN DEVELOPEDBY TEH STATE FOR ITS USE AS FOLLOWS: GRID VALUES ARE MULTIPLIED BY A COMBINED ADJUSTMENT FACTOR OF 1.00013.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (1991 ADJUSTMENT). DURING THE ANALYSIS OF A 2002 US 290 PROJECT BETWEEN IH 10 AND BELTWAY 8 USING L1020202 AND N1020238, IT WAS DETERMINED THAT A 0.7 OF ONE FOOT VARIATION EXISTS BETWEEN THE PUBLISHED VALUES AND THE MEASURED VALUES.

4. SIMILAR DISCREPANCIES WERE FOUND IN THESE SECTIONS OF US 290. ELEVATIONS FOR THE EXISTING TXDOT CONTROL MONUMENTS H-78 AND H-20 (AS PUBLISHED BY CLARK SURVEYING COMPANY IN 1999) WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES. A VARIABLE (BY SECTION) CORRECTION - RANGING BETWEEN 0.01 AND 0.03 OF ONE FOOT PER MONUMENT - WAS APPLIED TO THE MEASURED VALUES TO ALIGN THE EXISTING ELEVATIONS MORE CLOSELY WITH THE PUBLISHED VALUES.

5. CLOSED DIFFERENTIAL LEVEL LOOPS WERE RUN BETWEEN ALL MONUMENTS USING ELECTRONIC RECORDING LEVELS.

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.

10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

REV. NO.	DATE	DESCRIPTION	BY

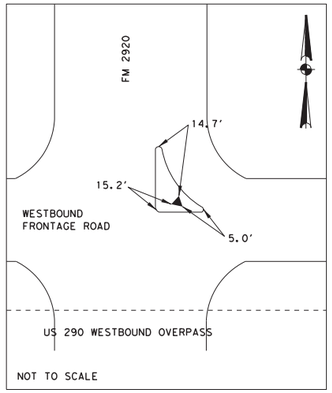
COMMUNITY 290 DRIVEN
Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

US 290

SURVEY CONTROL POINTS

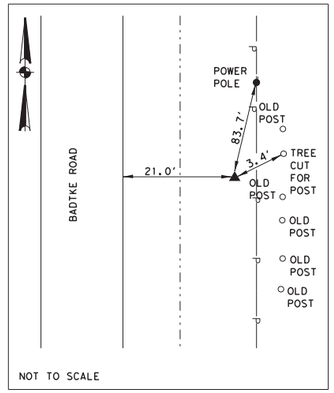
SHEET 7 OF 8

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				US 290
DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	20J



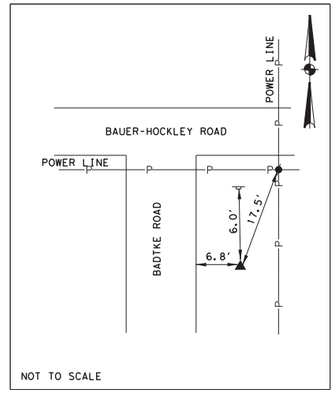
TxDOT POINT H-187
N: 13,949,053.348
E: 2,946,839.277
ELEV: 277.17'

FOUND CUT "X" IN CONCRETE MEDIAN AT THE INTERSECTION OF THE US 290 WESTBOUND FRONTAGE ROAD AND FM 2920.



TxDOT POINT N1020237
N: 13,936,754.920
E: 2,971,277.612
ELEV: 213.84'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED EAST OF BADTKE ROAD, 0.35 MI NORTH OF US 290.



TxDOT POINT N1020247
N: 13,938,547.281
E: 2,971,197.598
ELEV: 213.13'

FOUND TxDOT ALUMINUM DISK ON 36" x 5/8" IRON ROD LOCATED AT THE SOUTHEAST CORNER OF THE BAUER-HOCKLEY ROAD/BADTKE ROAD INTERSECTION.

NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (1993 ADJUSTMENT), SOUTH CENTRAL ZONE. TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MONUMENTS L1020202, N1020248, N1020238, N1020128, N1020327 AND N1020247 WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES. THE COORDINATE POSITION FOR ALL POINTS ARE BASED ON GPS SURVEYS MEETING THE STANDARDS OF ACCURACY SET FORTH IN THE FEDERAL GEODETIC CONTROL COMMITTEE PUBLICATION ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", REPRINTED WITH CORRECTIONS AUGUST 1, 1989.

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2. ALL SURFACE VALUES WERE DERIVED UTILIZING THE COMBINED ADJUSTMENT FACTORS (SEA LEVEL FACTOR X SCALE FACTOR) WHICH HAVE BEEN DEVELOPEDBY TEH STATE FOR ITS USE AS FOLLOWS: GRID VALUES ARE MULTIPLIED BY A COMBINED ADJUSTMENT FACTOR OF 1.00013.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (1991 ADJUSTMENT). DURING THE ANALYSIS OF A 2002 US 290 PROJECT BETWEEN IH 10 AND BELTWAY 8 USING L1020202 AND N1020238, IT WAS DETERMINED THAT A 0.7 OF ONE FOOT VARIATION EXISTS BETWEEN THE PUBLISHED VALUES AND THE MEASURED VALUES.

4. SIMILAR DISCREPANCIES WERE FOUND IN THESE SECTIONS OF US 290. ELEVATIONS FOR THE EXISTING TXDOT CONTROL MONUMENTS H-78 AND H-20 (AS PUBLISHED BY CLARK SURVEYING COMPANY IN 1999) WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES. A VARIABLE (BY SECTION) CORRECTION - RANGING BETWEEN 0.01 AND 0.03 OF ONE FOOT PER MONUMENT - WAS APPLIED TO THE MEASURED VALUES TO ALIGN THE EXISTING ELEVATIONS MORE CLOSELY WITH THE PUBLISHED VALUES.

5. CLOSED DIFFERENTIAL LEVEL LOOPS WERE RUN BETWEEN ALL MONUMENTS USING ELECTRONIC RECORDING LEVELS.

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.

10-24-22

THIS SURVEY CONTROL INFORMATION FROM CSJ: 0114-12-007 AND HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

REV. NO.	DATE	DESCRIPTION	BY

Program Office
Brookhollow III,
2950 North Loop W.
Suite 1150
Houston, Texas 77092

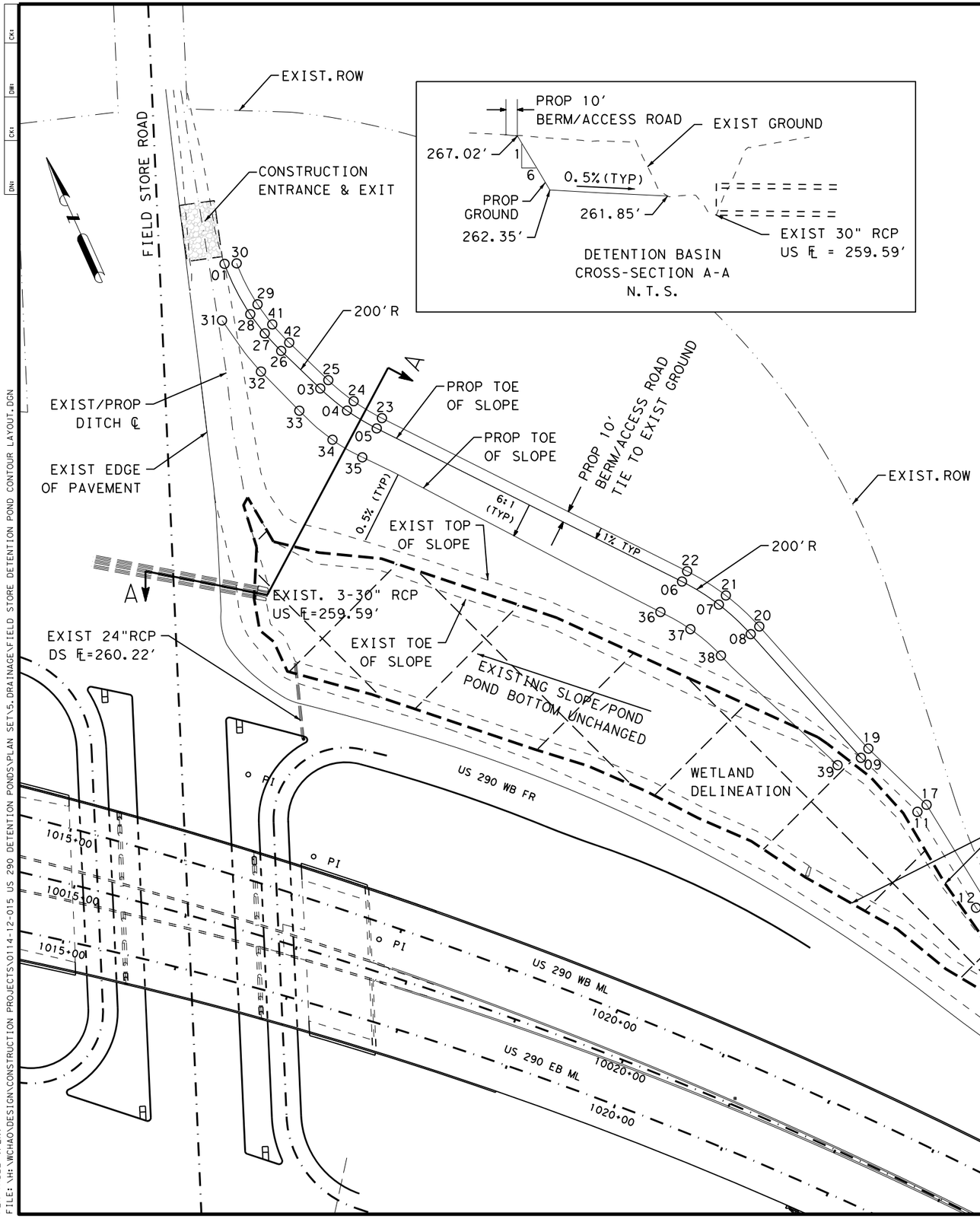
 Texas Department of Transportation

US 290

SURVEY CONTROL POINTS

SHEET 8 OF 8

DSN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				US 290
DRN: CC	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	HOU	HARRIS	0114	12	015	20K



XX o GRADING CONTROL POINTS

POINT LABEL	X	Y	Elevation
01	2942549.48	13951406.78	266.82
02	OMITTED	OMITTED	OMITTED
03	2942632.55	13951298.58	266.86
04	2942655.37	13951279.12	266.88
05	2942681.55	13951263.88	267.02
06	2942944.71	13951131.94	267.33
07	2942978.56	13951110.98	267.42
08	2943005.91	13951085.64	267.37
09	2943101.68	13950978.37	266.89
11	2943151.16	13950931.47	267.41
12	2943201.30	13950848.47	267.57
13	2943226.44	13950816.56	267.96
14	2943243.41	13950815.57	268.20
15	2943233.48	13950823.83	268.06
16	2943209.64	13950853.79	267.69
17	2943158.57	13950937.53	267.50
19	2943108.27	13950986.14	266.97
20	2943013.58	13951092.07	267.47
21	2942983.94	13951119.50	267.53
22	2942951.01	13951140.01	267.43
23	2942686.11	13951272.88	267.13
24	2942661.69	13951287.57	267.06
25	2942639.32	13951305.94	266.97
26	2942598.01	13951331.90	266.85
27	2942584.55	13951346.20	266.57
28	2942571.47	13951363.72	266.65
29	2942578.10	13951371.60	266.78
30	2942559.96	13951407.48	266.81
31	2942547.25	13951357.49	262.89
32	2942580.37	13951314.62	262.80
33	2942613.77	13951280.29	262.51
34	2942647.62	13951251.15	262.34
35	2942668.67	13951239.26	262.43
36	2942931.82	13951102.60	262.22
37	2942954.71	13951089.36	262.23
38	2942982.55	13951064.46	262.14
39	2943081.37	13950971.97	263.57
40	OMITTED	OMITTED	OMITTED
41	2942590.99	13951354.44	266.93
42	2942605.60	13951338.44	266.96

LEGEND:

WETLAND DELINEATION

NOTE:

FOR HYDRAULIC ANALYSIS, SEE US 290 PHASE III DRAINAGE IMPACT MITIGATION STUDY, SEGMENT 12, NOVEMBER 2016 CSJ 0114-12-007 FROM TXDOT HOUSTON DISTRICT HYDRAULIC SECTION

DETENTION SUMMARY

SURFACE AREA (ACRES) = 3.18
INFLOW/OUTFLOW CONDUIT SIZE = 3-30"RCP
MAXIMUM INFLOW/DISCHARGE (CFS) = 242.33
DETENTION STORAGE VOLUME REQUIRED (AC-FT) = 12.24
DETENTION STORAGE VOLUME PROVIDED (AC-FT) = 12.24
MAXIMUM DESIGN WATER ELEVATION (FT) = 266.74
MINIMUM TOP OF BANK ELEVATION (FT) = 266.50
MINIMUM BASIN ELEVATION (FT) = 259.59

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED PROFESSIONAL ENGINEER

William Burch, P.E.
1-4-23

US 290
FIELD STORE ROAD DETENTION POND PLAN LAYOUT

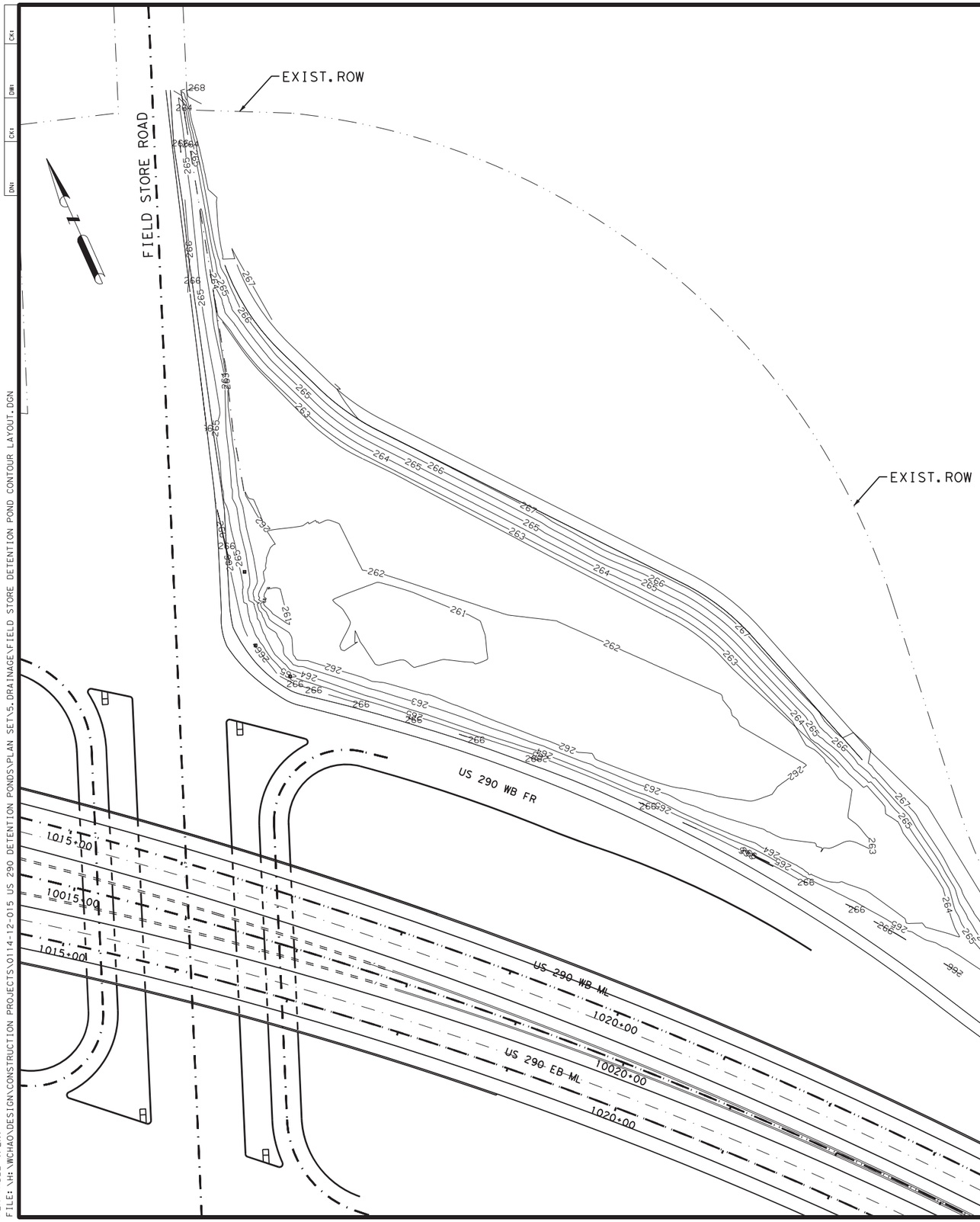
SCALE: 1":100' HORZ
1":10' VERT

SHEET 1 OF 1

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0114	12	015	US 290
DIST	COUNTY		SHEET NO.
HOU	HARRIS		21

DATE: $DATE$ $TIME$
PEN TABLE: PEN
FILE: \\H: \WCHAO\DESIGN\CONSTRUCTION PROJECTS\0114-12-015 US 290 DETENTION PONDS\PLAN SET\5.DRAINAGE\FIELD STORE DETENTION POND CONTOUR LAYOUT.DGN



NOTE:
FOR HYDRAULIC ANALYSIS, SEE US 290 PHASE III DRAINAGE IMPACT MITIGATION STUDY, SEGMENT 12, NOVEMBER 2016

THIS SHEET HAS BEEN PROVIDED FOR CONTRACTOR'S INFORMATION ONLY. FOR SPECIFIC INFORMATION SUCH AS POINT ELEVATIONS, SIDE SLOPE, AND STUCTURAL FEATURES, SEE FIELD STORE POND LAYOUT AND POINT TABLE SHEET

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.
1-4-23

US 290
FIELD STORE ROAD DETENTION POND CONTOUR LAYOUT

SCALE: 1":100' HORZ
1":10' VERT

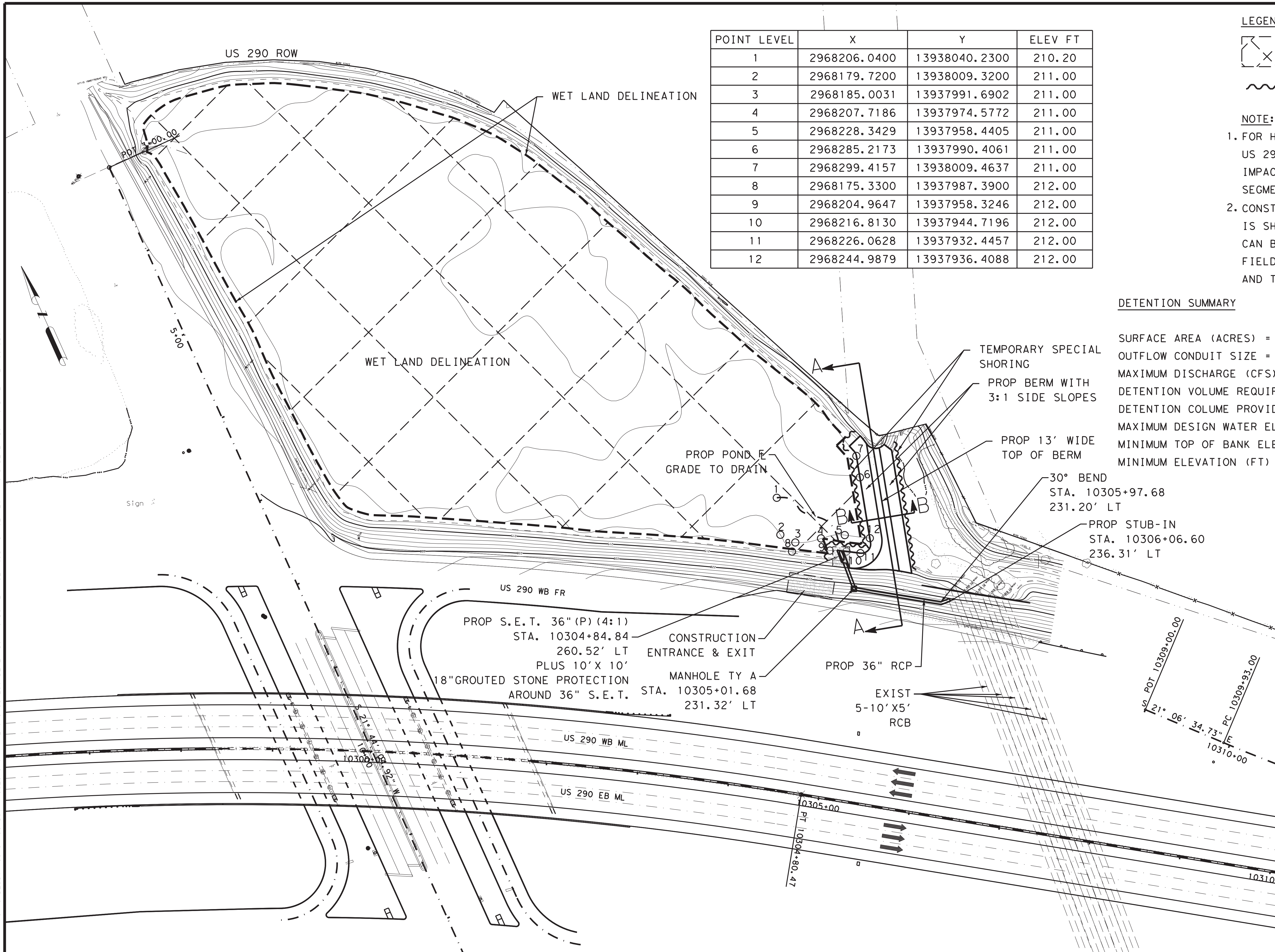
SHEET 1 OF 1

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0114	12	015	US 290
DIST	COUNTY		SHEET NO.
HOU	HARRIS		22

DATE: $DATE$ $TIME$
PEN TABLE: PEN
FILE: \H:\WCHAO\DESIGN\CONSTRUCTION PROJECTS\0114-12-015 US 290 DETENTION PONDS\PLAN SET\5.DRAINAGE\FIELD STORE DETENTION POND CONTOUR LAYOUT.DGN

POINT LEVEL	X	Y	ELEV FT
1	2968206.0400	13938040.2300	210.20
2	2968179.7200	13938009.3200	211.00
3	2968185.0031	13937991.6902	211.00
4	2968207.7186	13937974.5772	211.00
5	2968228.3429	13937958.4405	211.00
6	2968285.2173	13937990.4061	211.00
7	2968299.4157	13938009.4637	211.00
8	2968175.3300	13937987.3900	212.00
9	2968204.9647	13937958.3246	212.00
10	2968216.8130	13937944.7196	212.00
11	2968226.0628	13937932.4457	212.00
12	2968244.9879	13937936.4088	212.00



LEGEND:

WETLAND DELINEATION

TEMPORARY SPECIAL SHORING

NOTE:

1. FOR HYDRAULIC ANALYSIS, SEE US 290 PHASE III DRAINAGE IMPACT MITIGATION STUDY, SEGMENT 12, NOVEMBER 2016
2. CONSTRUCTION ENTRANCE/EXIT IS SHOWN ON PLANS BUT CAN BE DETERMINED IN THE FIELD BY THE CONTRACTOR AND THE ENGINEER

DETENTION SUMMARY

SURFACE AREA (ACRES) = 6.33
OUTFLOW CONDUIT SIZE = 36" RCP
MAXIMUM DISCHARGE (CFS) = 350.96
DETENTION VOLUME REQUIRED (AC-FT) = 29.38
DETENTION COLUME PROVIDED (AC-FT) = 29.38
MAXIMUM DESIGN WATER ELEVATION (FT) = 216.46
MINIMUM TOP OF BANK ELEVATION (FT) = 215.00
MINIMUM ELEVATION (FT) = 210.18

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED PROFESSIONAL ENGINEER

William Burch, P.E.
1-4-23

US 290
HEGAR ROAD DETENTION POND PLAN LAYOUT

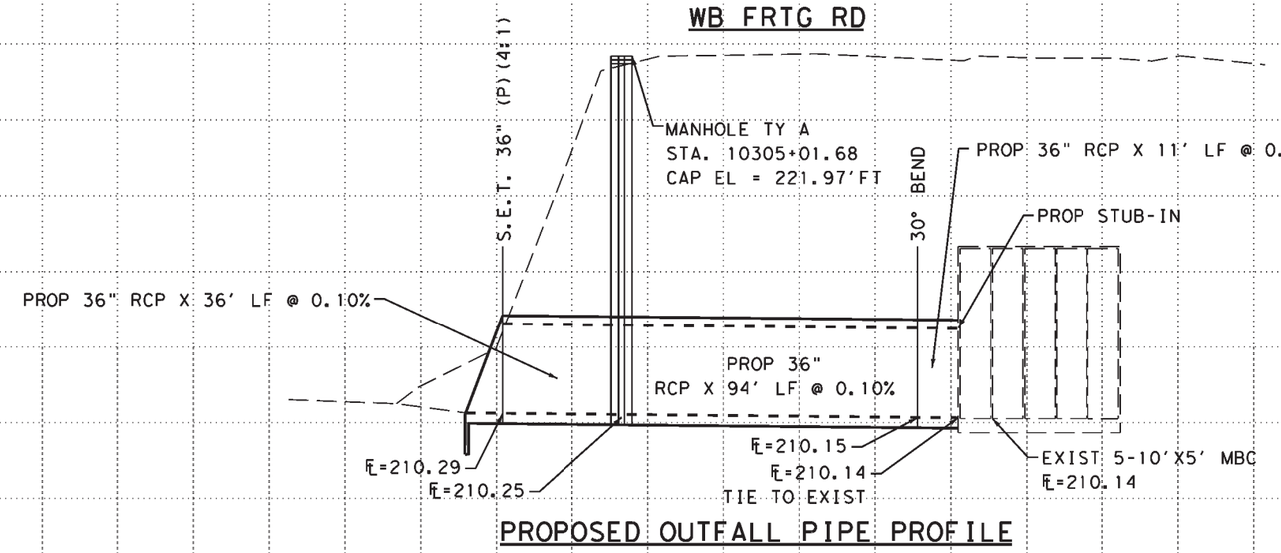
SCALE: 1"=100' HORZ 1"=10' VERT

SHEET 1 OF 1

TEXAS DEPARTMENT OF TRANSPORTATION

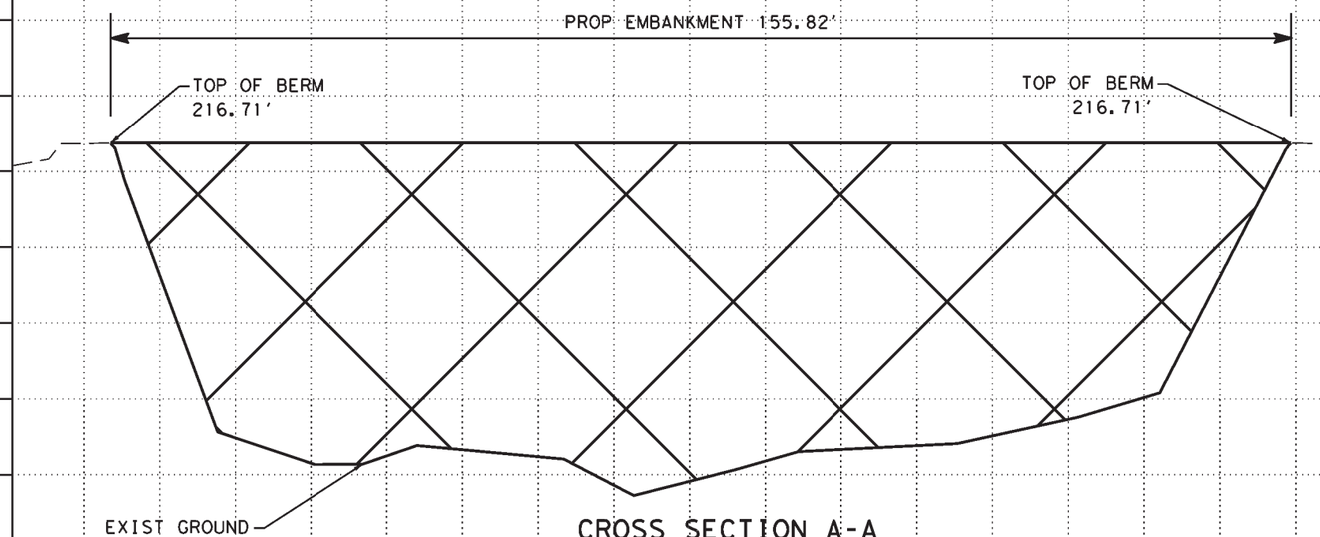
CONT	SECT	JOB	HIGHWAY
0114	12	015	US 290
DIST		COUNTY	SHEET NO.
HOU		HARRIS	23

DATE: $DATE$ $TIME$
PEN TABLE: PEN
FILE: \H:\WCHAO\DESIGN\CONSTRUCTION PROJECTS\0114-12-015 US 290 DETENTION PONDS\PLAN SET\5.DRAINAGE\HEGAR ROAD DETENTION POND PLAN LAYOUT.DGN



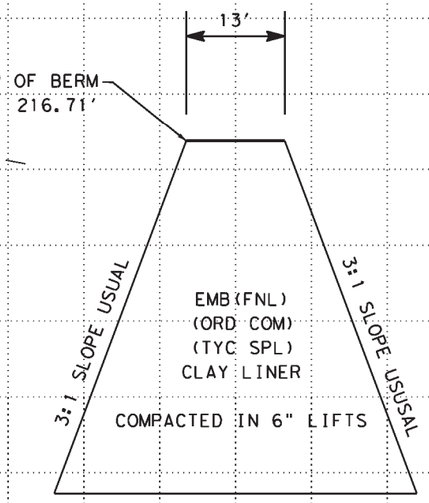
PROPOSED OUTFALL PIPE PROFILE

SCALE: 1"=50' HORIZONTAL
1"5' VERTICAL



CROSS SECTION A-A
PROPOSED EARTH BERM PROFILE

SCALE: 1"=20' HORIZONTAL
1"=2.5' VERTICAL



CROSS SECTION B-B
PROPOSED EARTH BERM PROFILE

SCALE: 1"=20' HORIZONTAL
1"=2.5' VERTICAL

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED PROFESSIONAL ENGINEER

William Burch, P.E.
1-4-23

US 290
HEGAR ROAD DETENTION POND PLAN & PROFILE LAYOUT

SCALE: 1":100' HORZ
1":10' VERT
SHEET 1 OF 1

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0114	12	015	US 290
DIST	COUNTY		SHEET NO.
HOU	HARRIS		24

DATE: $DATE$ $TIME$
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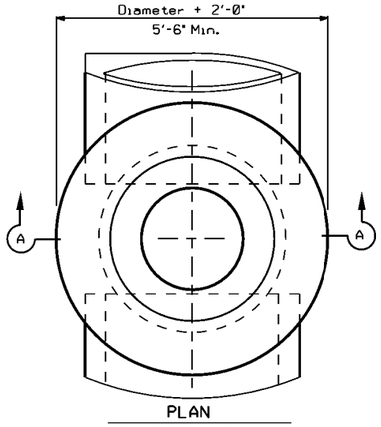
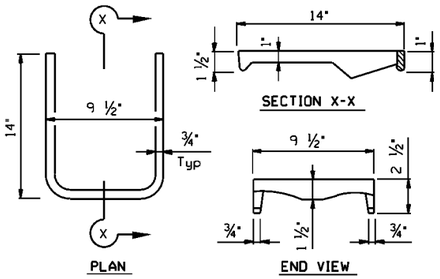
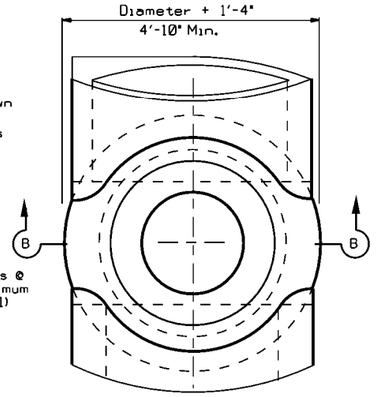


PLAN
OVER 12' HEIGHT

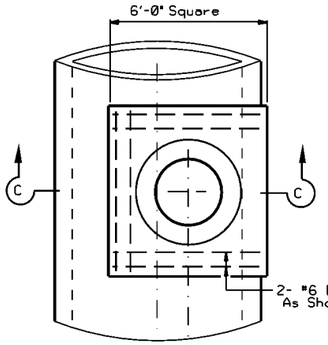


PLAN | END VIEW

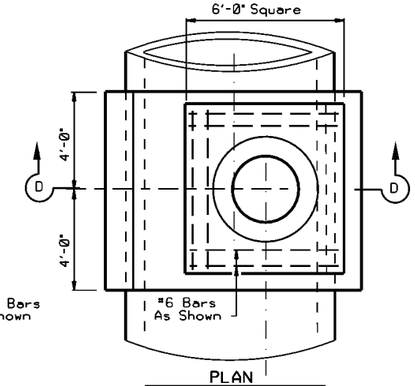
CAST IRON MANHOLE STEPS
(In Stock Locally)



PLAN
12' HEIGHT & UNDER



PLAN
MONOLITHIC SEWERS



PLAN
PRECAST PIPE SEWERS

GENERAL NOTES:

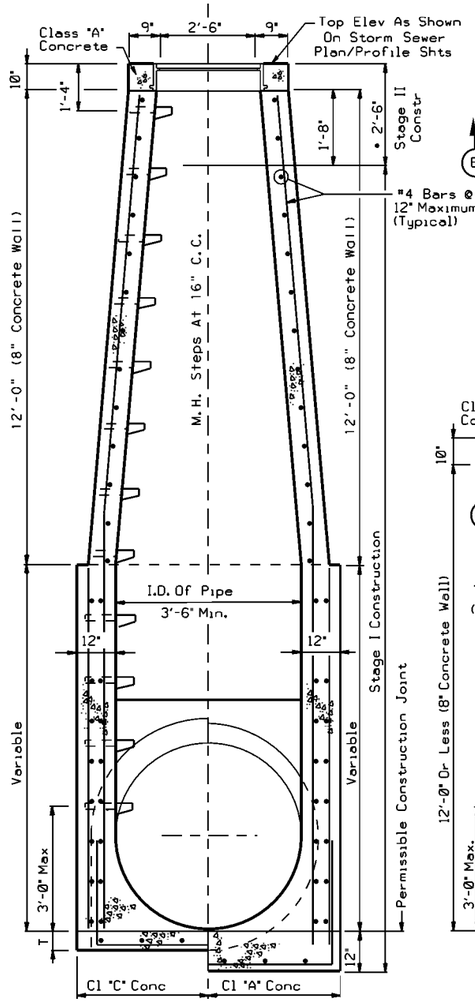
See Standard or Detail Sheet For Excavation And Backfill Diagrams.

All Manholes In Graded Areas Shall Be Built To Stage I And Finished After All Grading Operations Are Substantially Completed.

- But Not Less Than 6 Inches Above Highest Pipe.

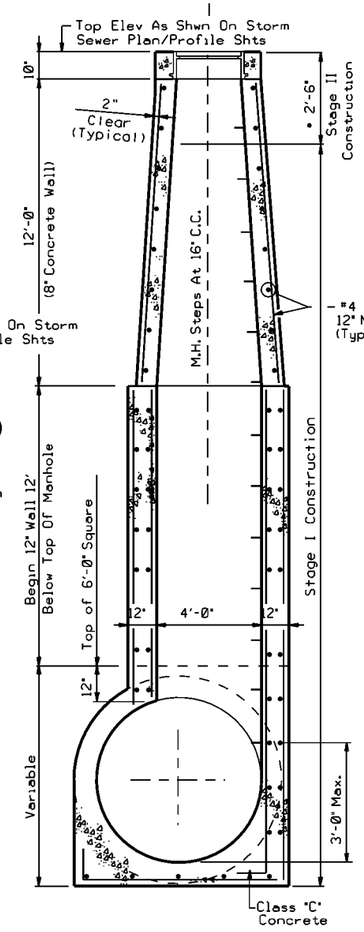
'T' Thickness Of Shell Equals That Of Larger Diameter Pipe.

Optional Monolithic Or Precast Designs Permitted. Optional Designs Shall Be Signed & Sealed By A Registered Professional Engineer.

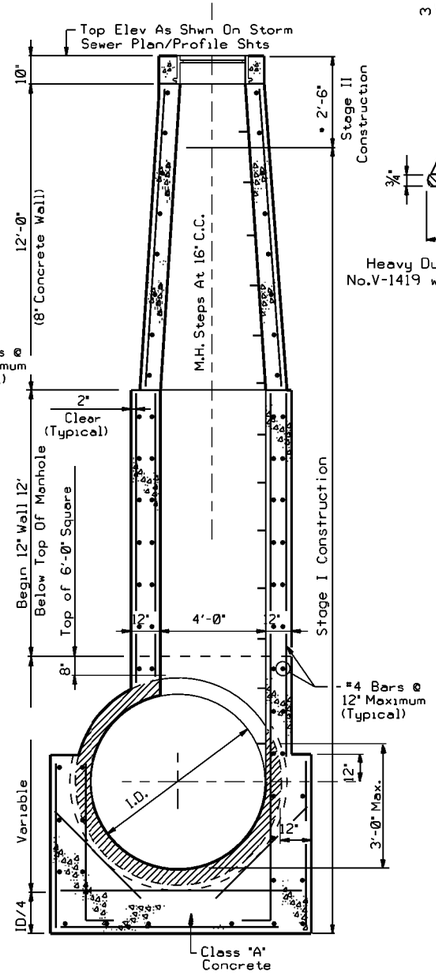


MONOLITHIC SEWERS | PRECAST PIPE SEWERS
SECTION A-A

MONOLITHIC SEWERS | PRECAST PIPE SEWERS
SECTION B-B



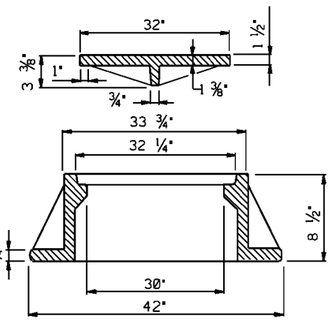
SECTION C-C



SECTION D-D

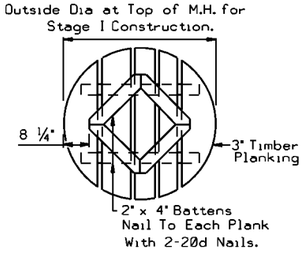
MANHOLE - TYPE A
FOR PIPES 54" AND SMALLER

MANHOLE - TYPE B
FOR PIPES 60" AND LARGER



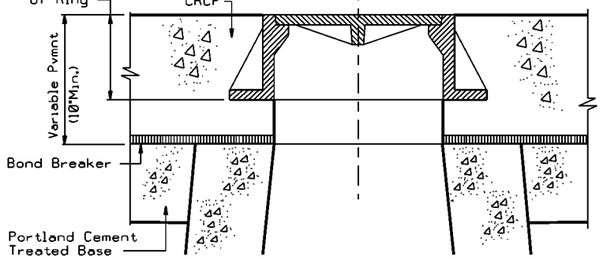
Heavy Duty 30"ID Ring as Required. Vulcan No.V-1419 w/ribbed cover, Neenah No.R1740-BTX

RING AND COVER



PLAN

TEMPORARY TIMBER COVER



RING AND COVER CAST
MONOLITHICALLY WITH PAVEMENT

FOR DIRECT TRAFFIC

Texas Department of Transportation
Houston District

MANHOLES
TYPE A & B

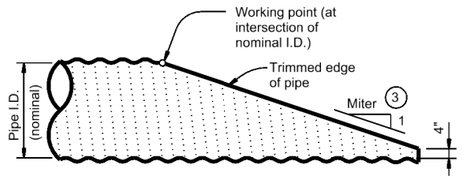
MH-A/B

FILE: STDD10.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	STD:			
© TxDOT December 2006	DIST	FED REG	PROJECT NO.					SHEET
REVISIONS 3/15 MINOR CORRECTIONS	HOU	6						25
	COUNTY			CONTROL	SECT	JOB	HIGHWAY	
	HARRIS			0114	12	015	US 290	

STD-D10

d = Diameter
R = Radius

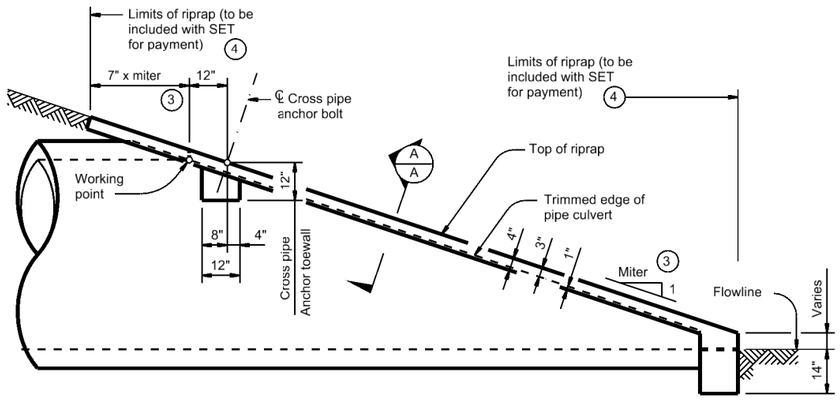
$FILE$



NOTE: All pipe runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

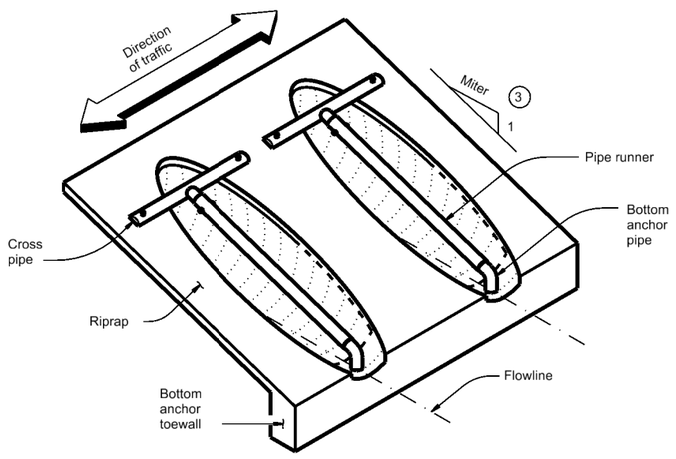
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert.
Details of reinforced concrete pipe (RCP) culvert are similar.)



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert.
Details of corrugated metal pipe (CMP) culvert
are similar. Pipe runners not shown for clarity)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)

CROSS PIPE LENGTHS AND PIPE RUNNER LENGTHS (1) (2)

Nominal Culvert I.D.	Pipe Culvert Spa ~ G	Cross Pipe Length	Pipe Runner Length											
			3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
			0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
24"	1' - 7"	3' - 5"	N/A	N/A	N/A	5' - 10"	N/A	N/A	N/A	8' - 1"	N/A	N/A	N/A	12' - 9"
27"	1' - 8"	3' - 8"	N/A	N/A	5' - 5"	6' - 11"	N/A	N/A	7' - 7"	9' - 7"	N/A	N/A	11' - 11"	14' - 11"
30"	1' - 10"	3' - 11"	N/A	N/A	6' - 4"	8' - 0"	N/A	N/A	8' - 9"	11' - 0"	N/A	N/A	13' - 8"	17' - 0"
33"	1' - 11"	4' - 2"	6' - 2"	6' - 5"	7' - 3"	9' - 1"	8' - 6"	8' - 10"	10' - 0"	12' - 5"	13' - 3"	13' - 9"	15' - 5"	19' - 2"
36"	2' - 1"	4' - 5"	6' - 11"	7' - 3"	8' - 2"	10' - 2"	9' - 6"	9' - 11"	11' - 2"	13' - 10"	14' - 9"	15' - 3"	17' - 2"	21' - 3"
42"	2' - 4"	4' - 11"	8' - 6"	8' - 10"	9' - 11"	12' - 4"	11' - 7"	12' - 0"	13' - 6"	16' - 8"	17' - 9"	18' - 5"	20' - 8"	25' - 7"
48"	2' - 7"	5' - 5"	10' - 1"	10' - 5"	11' - 9"	N/A	13' - 7"	14' - 2"	15' - 10"	N/A	20' - 9"	21' - 6"	24' - 2"	N/A
54"	3' - 0"	5' - 11"	11' - 8"	12' - 1"	N/A	N/A	15' - 8"	16' - 3"	N/A	N/A	23' - 10"	24' - 8"	N/A	N/A
60"	3' - 3"	6' - 5"	13' - 3"	N/A	N/A	N/A	17' - 9"	N/A	N/A	N/A	26' - 10"	N/A	N/A	N/A

TYPICAL PIPE CULVERT MITERS (3)

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3.106:1	3.464:1	4.243:1
4:1	4:1	4.141:1	4.619:1	5.657:1
6:1	6:1	6.212:1	6.928:1	8.485:1

CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED (2)

Nominal Culvert I.D.	Single Pipe Culvert	Multiple Pipe Culverts
12" thru 21"	Skews thru 45°	Skews thru 45°
24"	Skews thru 45°	Skews thru 30°
27"	Skews thru 30°	Skews thru 15°
30"	Skews thru 15°	Skews thru 15°
33"	Skews thru 15°	Always required
36"	Normal (no skew)	Always required
42" thru 60"	Always required	Always required

STANDARD PIPE SIZES AND MAX PIPE RUNNER LENGTHS (1)

Pipe Size	Pipe O.D.	Pipe I.D.	Max Pipe Runner Length
2" STD	2.375"	2.067"	N/A
3" STD	3.500"	3.068"	10' - 0"
4" STD	4.500"	4.026"	19' - 8"
5" STD	5.563"	5.047"	34' - 2"

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) (5)

Nominal Culvert I.D.	3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
12"	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8
15"	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
18"	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0
21"	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2
24"	0.6	0.7	0.7	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.1	1.3
27"	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.1	1.1	1.1	1.2	1.4
30"	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.3	1.6
33"	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.7
36"	0.9	0.9	0.9	1.1	1.1	1.1	1.2	1.4	1.4	1.5	1.6	1.8
42"	1.0	1.0	1.1	1.3	1.2	1.3	1.3	1.6	1.6	1.7	1.8	2.1
48"	1.1	1.1	1.2	N/A	1.4	1.4	1.5	N/A	1.9	1.9	2.1	N/A
54"	1.3	1.3	N/A	N/A	1.6	1.6	N/A	N/A	2.1	2.1	N/A	N/A
60"	1.4	N/A	N/A	N/A	1.7	N/A	N/A	N/A	2.3	N/A	N/A	N/A

(1) Provide pipe runner of the size shown in the tables. Provide cross pipe of the same size as the pipe runner. Provide cross pipe stub out and bottom anchor pipe of the next smaller size pipe as shown in the Standard Pipe Sizes and Max Pipe Runner Lengths table.

(2) This standard allows for the placement of only one pipe runner across each culvert pipe opening. In order to limit the clear opening to be traversed by an errant vehicle, the following conditions must be met:

For 60" culvert pipes, the skew must not exceed 0°.
For 54" culvert pipes, the skew must not exceed 15°.
For 48" culvert pipes, the skew must not exceed 30°.
For all culvert pipe sizes 42" and less, the skew must not exceed 45°.

If the above conditions cannot be met, the designer should consider using a safety end treatment with flared wings. For further information, refer to the TxDOT Roadway Design Manual.

(3) Miter = slope of mitered end of pipe culvert.

(4) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(5) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

DATE: DATE$ TIME$
FILE: DOCUMENT NAME

SHEET 1 OF 2

Texas Department of Transportation

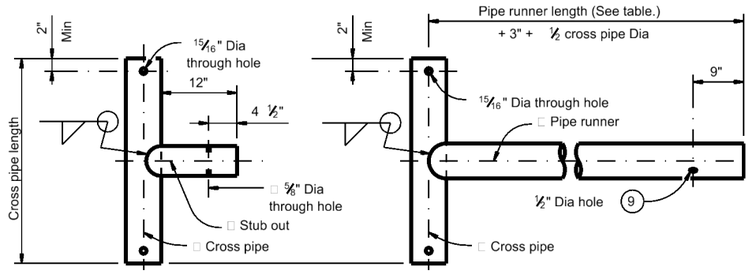
Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 60" DIA
PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

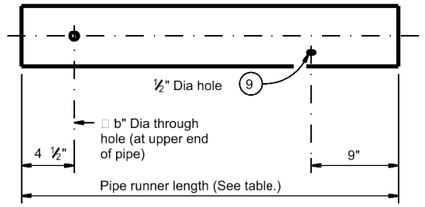
SETP-CD

FILE:	setpcdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		0114	12	015	US 290
		DIST	COUNTY		SHEET NO.
		HOU	HARRIS		26



OPTION A1 OPTION A2

CROSS PIPE AND CONNECTIONS DETAILS

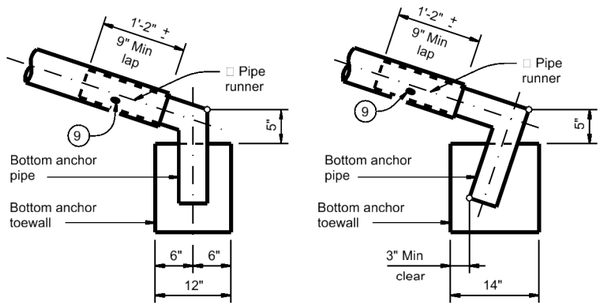


NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

OPTION B1 OPTION B2

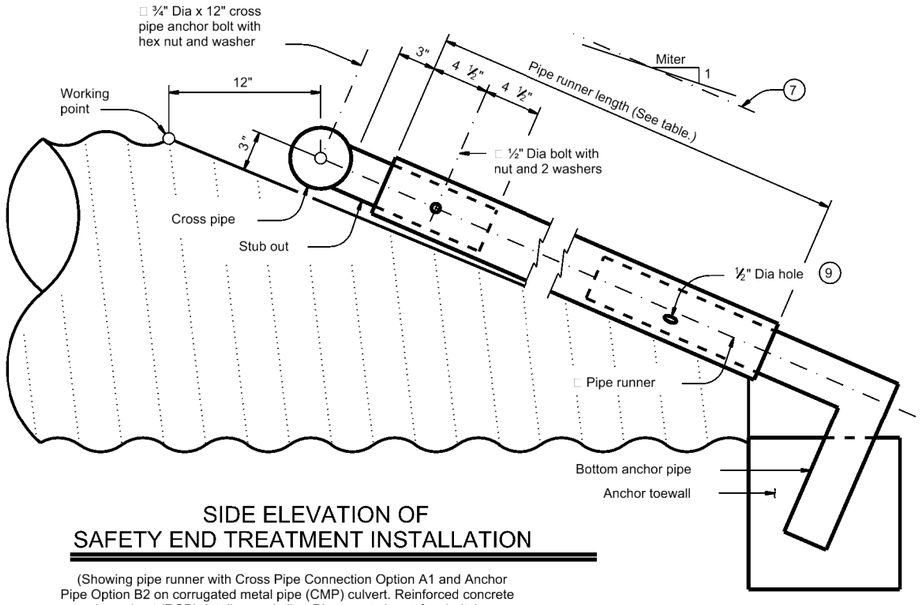
BOTTOM ANCHOR PIPE DETAILS (10)



OPTION B1 OPTION B2

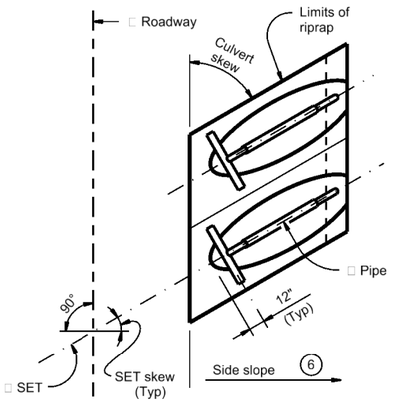
BOTTOM ANCHOR TOEWALL DETAILS

(Culvert and riprap not shown for clarity.)

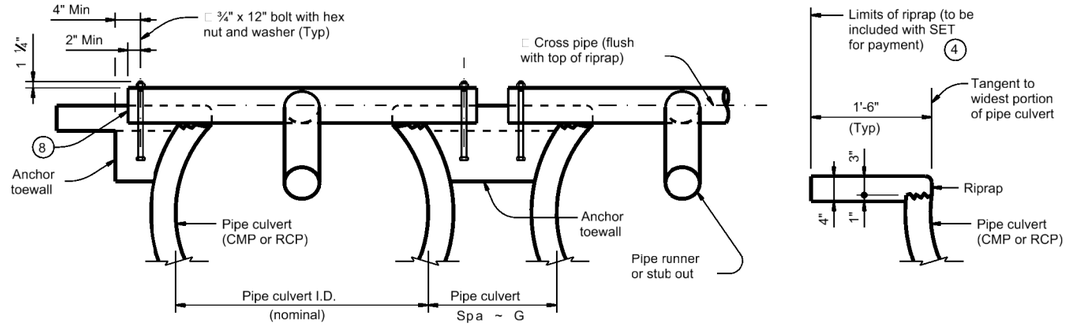


SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION

(Showing pipe runner with Cross Pipe Connection Option A1 and Anchor Pipe Option B2 on corrugated metal pipe (CMP) culvert. Reinforced concrete pipe culvert (RCP) details are similar. Riprap not shown for clarity)



PLAN OF SKEWED INSTALLATION



SHOWING CROSS PIPE AND ANCHOR TOEWALL

SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SECTION A-A

(4) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Recommended values of side slope are 3:1, 4:1, and 6:1. All quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.

(7) Note that actual slope of pipe runner may vary slightly from side slope of riprap and trimmed culvert pipe edge.

(8) Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.

(9) After installation, inspect the 1/2" hole to ensure that the lap of the pipe runner with the bottom anchor pipe is adequate.

(10) At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the runner) may be substituted for the mitered and welded joint in the bottom anchor pipe.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide pipe runners, cross pipes, and anchor pipes conforming to the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication.

Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Pipe runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where cut of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.

Payment for riprap and toewall is included in the price bid for each safety end treatment.

Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

DATE: DATE&TIME
FILE: DOCUMENT NAME

SHEET 2 OF 2

Texas Department of Transportation

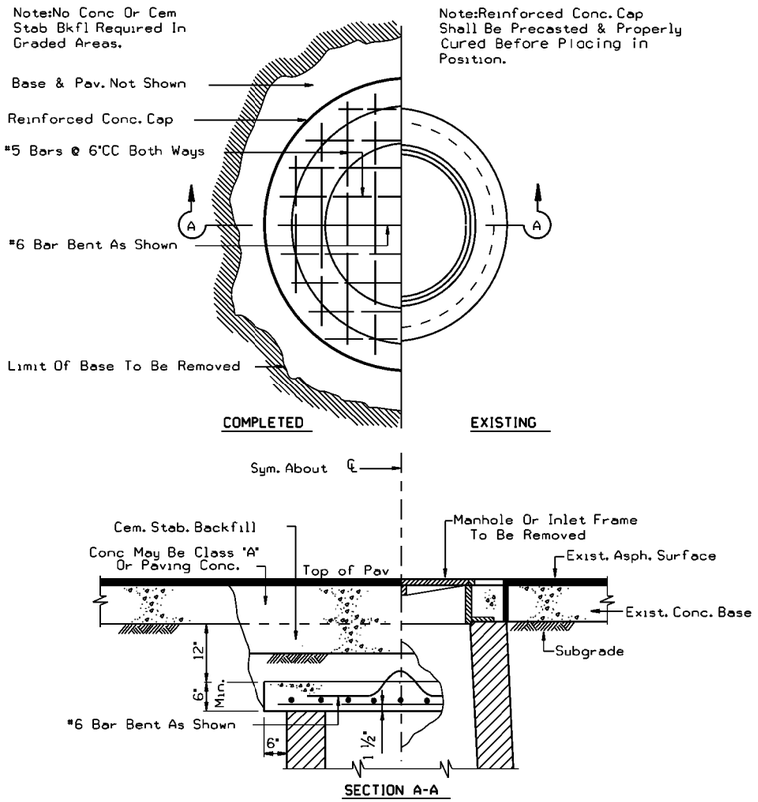
Bridge Division Standard

SAFETY END TREATMENT

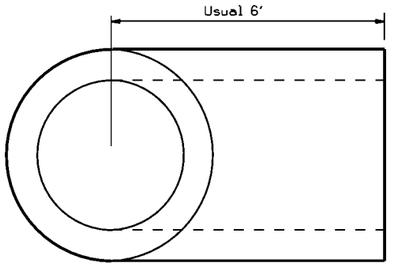
FOR 12" DIA TO 60" DIA
PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD

FILE: setpcdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		27

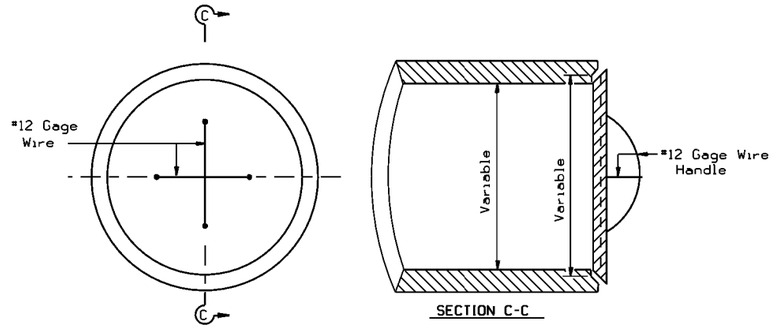


DETAIL SHOWING METHOD OF CAPPING ABANDONED MANHOLES OR INLETS (GRADED OR PAVED AREAS)



Note: Jointing Material Shall Conform To Requirements Of Item "Reinforced Concrete Pipe." Material For Tees Shall Conform To Requirements Of Item "Reinforced Concrete Pipe." Payment For Tee To Be In Accordance With Item "Reinforced Concrete Pipe."

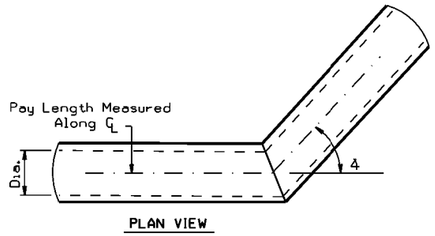
PRECAST STORM SEWER TEE



Note: The Price Of Plug Shall Be Subsidiary To The Unit Bid Price For Pipe Sewer Or RCP. Mortar Joints To Be Used As Directed By The Engineer. Removal Of The Existing Plugs For Storm Sewer Or RCP Conns. Shall Be Considered Incidental To Item "Excavation And Backfill For Structures."

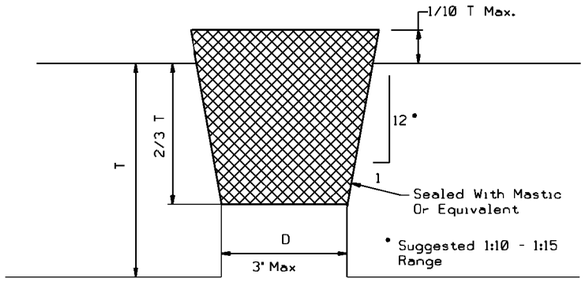
Concrete Plug For End Of Pipe Culvert Or Sewer

CONCRETE PLUG FOR PIPE



BENDING DETAIL

Note: Bending Of Proposed Pipe Sewer Or RCP In A Vertical & /Or Horizontal Plane Shall Be Accomplished By The Use Of A "Pipe Collar" Or A "Precast Elbow", As Approved By The Engineer.
Price Of "Pipe Collar" Or, "Precast Elbow" Shall Be Subsidiary To The Unit Prices Bid For Item Reinforced Concrete Pipe.
Pay Length Measurement To Be Along Horizontal ℄ & Horizontal Plane Of Pipes.

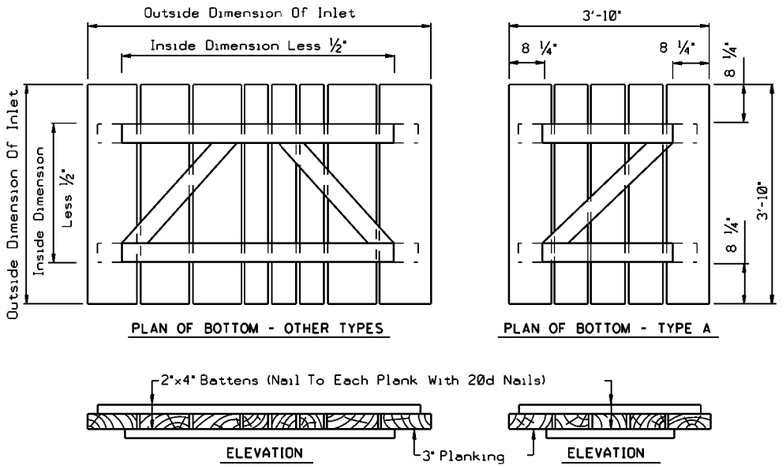


T = Wall Thickness On Top Of Box Or Pipe
D = Diameter Of Lifting Hole

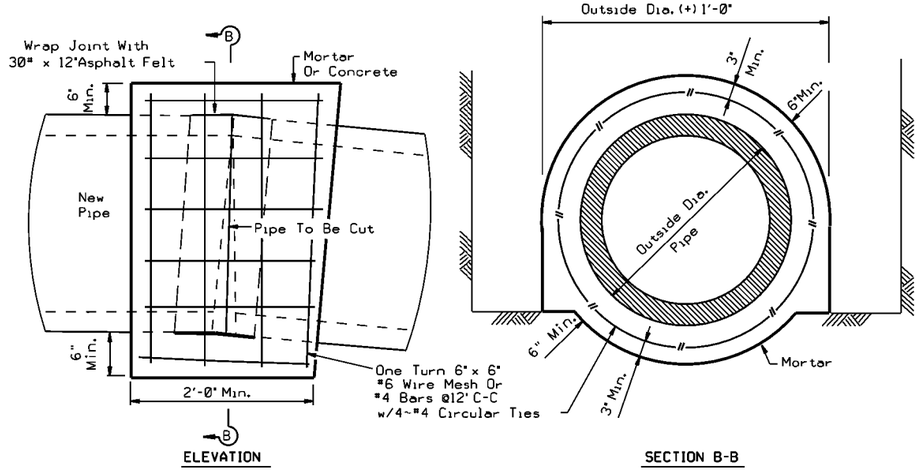
Minimum Length Of Plug Is 2/3 T +/-
Minimum Diameter At Bottom Of Plug = D - ⅛"
Maximum 1/10 T Of Plug Not Seated In Lifting Hole

Note: The Plug Shall Be Cast With The Same Taper As The Lifting Hole.

DETAIL OF PLUG FOR LIFTING HOLES IN RCB AND RCP



TEMPORARY COVERS FOR ALL TYPES OF INLETS



PIPE COLLAR DETAIL

For Horizontal Or Vertical Placement

d = Diameter
R = Radius

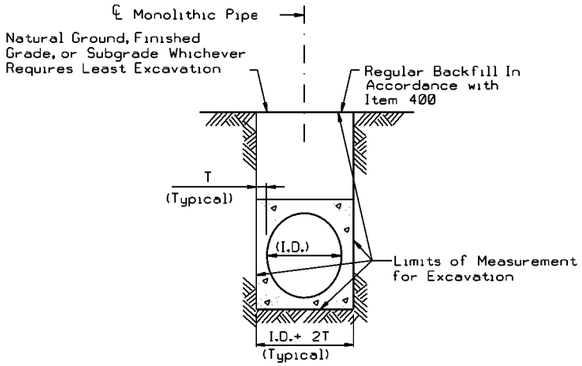
Texas Department of Transportation
Houston District (Bridge)

MISCELLANEOUS SEWER DETAILS

MSD

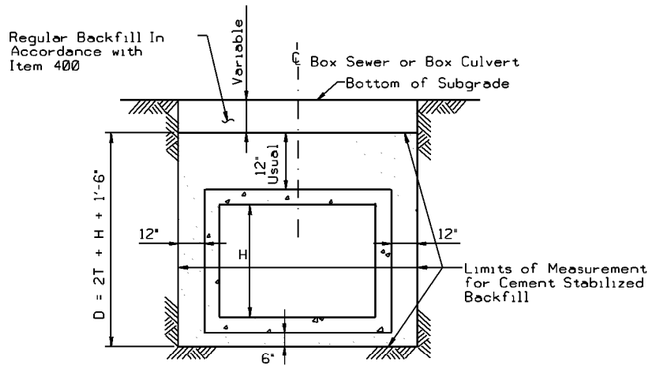
FILE: STD011.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK:
© TxDOT Mar 2004	DISTRICT	FED REG	PROJECT NO.	SHEET
REVISIONS 3/2015 2014 Specs	HOU	6		28
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HARRIS	0114	12	015	US 290

STD011.DGN



EXCAVATION DETAIL

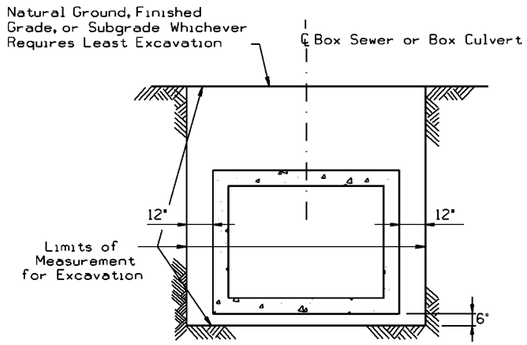
MONOLITHIC PIPE
IN A PAVED OR GRADED AREA



BACKFILL DETAIL

BOX CULVERTS
IN A GRADED OR PAVED AREA
INCLUDING DETOURS •

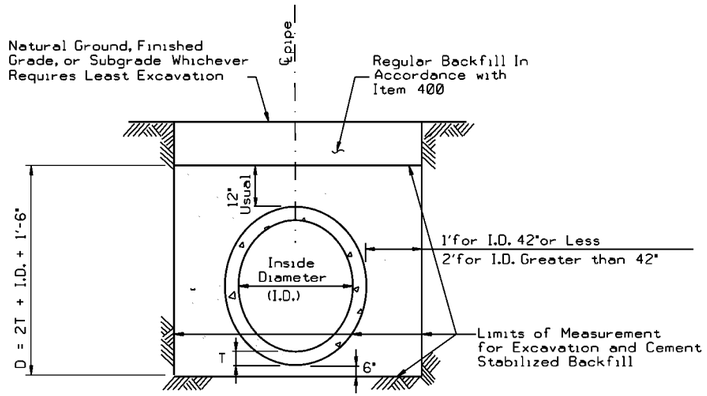
REINFORCED CONCRETE PIPE			
EXCAVATION AND BACKFILL QUANTITIES			
PIPE DIA. IN.	T FT.	CULVERT OR SEWER EXCAVATION IN A PAVED OR GRADED AREA C.Y.PER L.F.PER FT.OF DEPTH	CEMENT STABILIZED BACKFILL IN A PAVED OR GRADED AREA C.Y.PER L.F. OF PIPE
18	0.19	0.144	0.383
24	0.23	0.165	0.478
30	0.29	0.188	0.586
36	0.33	0.210	0.692
42	0.38	0.231	0.808
48	0.42	0.327	1.394
54	0.46	0.349	1.560
60	0.50	0.370	1.731
66	0.54	0.392	1.907
72	0.58	0.414	2.088
78	0.62	0.435	2.275
84	0.67	0.457	2.474



EXCAVATION DETAIL

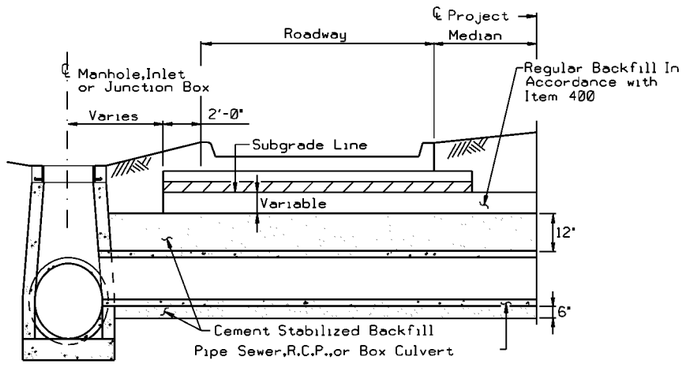
BOX CULVERTS
IN A GRADED AREA

MONOLITHIC PIPE		
EXCAVATION QUANTITIES		
PIPE DIA. IN.	T FT.	EXCAVATION C.Y.PER L.F.PER FT.OF DEPTH
36	0.417	0.142
42	0.458	0.164
48	0.458	0.182
54	0.500	0.204
60	0.583	0.228
66	0.583	0.247
72	0.625	0.269
78	0.625	0.287
84	0.625	0.306



EXCAVATION & BACKFILL DETAIL

REINFORCED CONCRETE PIPE
IN A GRADED OR PAVED AREA
INCLUDING DETOURS



BACKFILL DETAIL

AT MANHOLE, INLET OR JUNCTION BOX

NOTE:

Cement stabilized backfill may be omitted in private driveways as indicated elsewhere in the plans.

Rubber gaskets shall be required for all joints on proposed cross drainage, pipe culverts and proposed storm sewer systems, unless otherwise shown in the plans.

• Backfill with cement stabilized material will be required for all structures under detours unless noted otherwise in the General Notes.

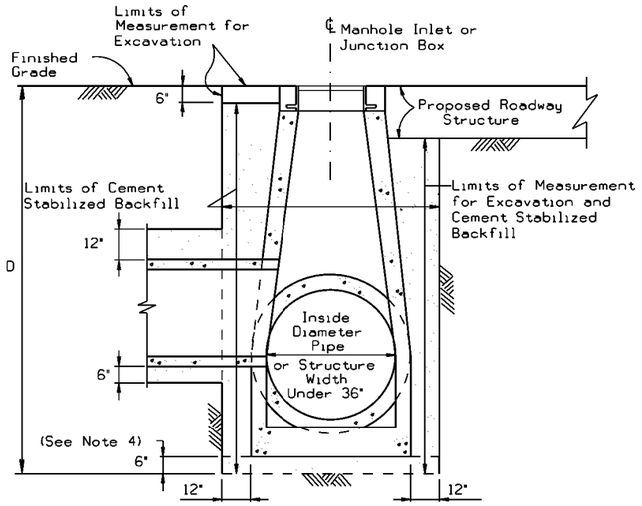
D = Depth
H = Height
T = Thickness
R = Radius
Dia = Diameter

Texas Department of Transportation
Houston District

EXCAVATION AND BACKFILL DIAGRAMS

E&BD

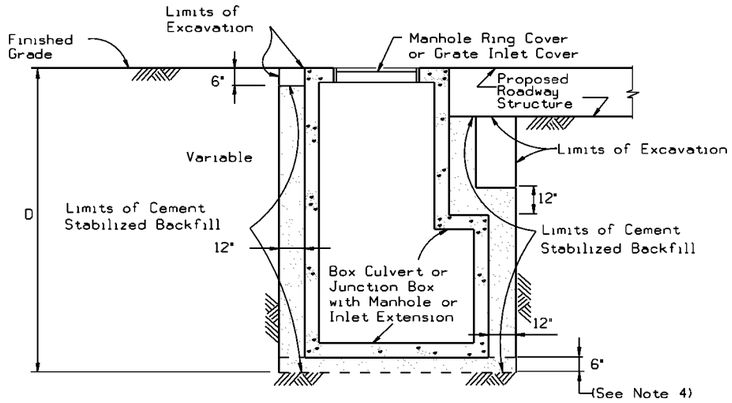
FILE: STDE1.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
© TxDOT FEB 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS REVISED 11/05 REVISED 2/2010 Added note to Table 1.Sht 2 of 2. REVISED 6/12 REVISED 9/14	HOUSTON	6		29
	COUNTY		CONTROL SECT JOB	HIGHWAY
	HARRIS		0114 12 015	US 290



EXCAVATION AND BACKFILL DETAIL

MANHOLES SMALLER THAN 36 IN.
IN A PAVED OR GRADED AREAS

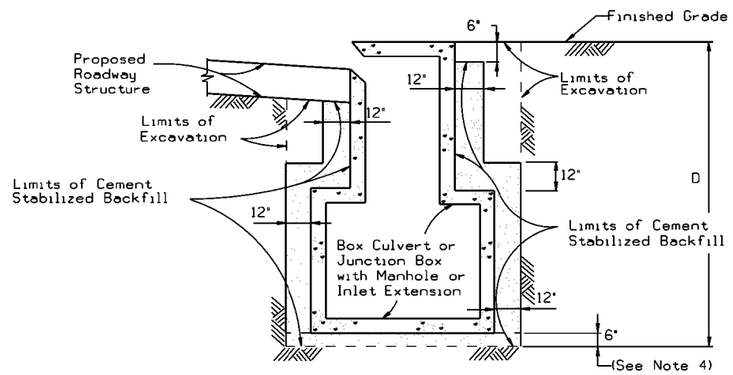
N.T.S.



EXCAVATION AND BACKFILL DETAIL

JUNCTION BOXES IN A
PAVED OR GRADED AREA

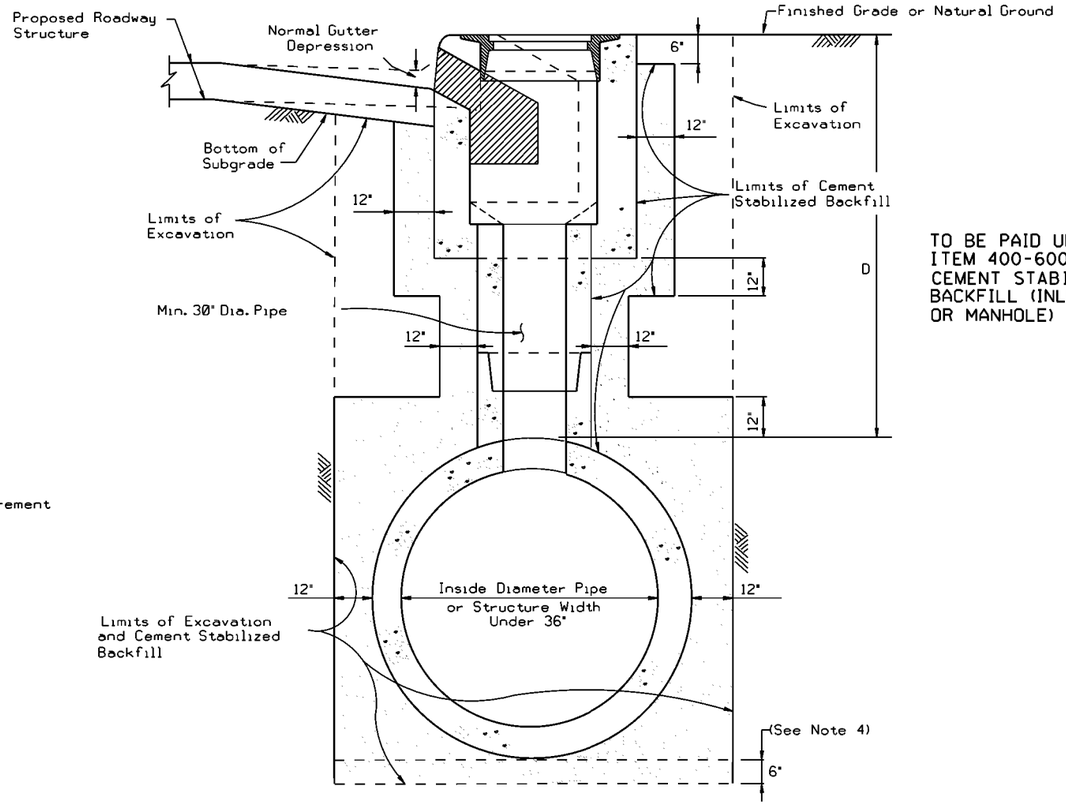
N.T.S.



EXCAVATION AND BACKFILL DETAIL

INLET EXTENSIONS ON A BOX CULVERT
IN A PAVED OR GRADED AREA

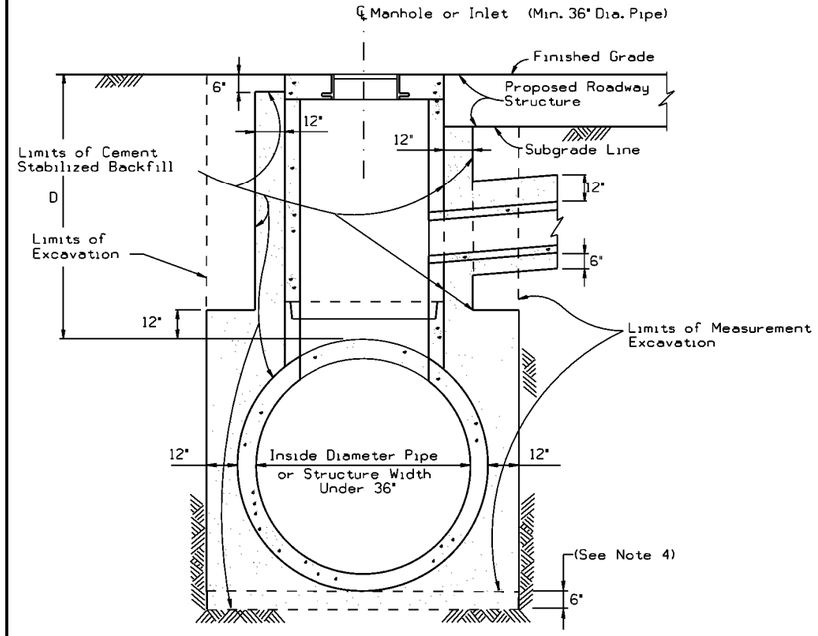
N.T.S.



EXCAVATION AND BACKFILL DETAIL

CURB INLETS IN A PAVED OR GRADED AREA

N.T.S.



EXCAVATION AND BACKFILL DETAIL

MANHOLES 36 IN. AND GREATER
IN A PAVED OR GRADED AREA

N.T.S.

D = Depth
H = Height
T = Thickness
R = Radius
Dia = Diameter

TABLE 1

SCHEDULE FOR PAY QUANTITIES OF CEMENT STABILIZED BACKFILL (SEE NOTE 1)

MANHOLE OR INLET DEPTH (D) IN FEET	CEMENT STABILIZED BACKFILL IN CUBIC YARDS
0 through 5	5.75
> 5 through 10	8.25
greater than 10	12.75

TO BE PAID UNDER ITEM 400-6009 CEMENT STABILIZED BACKFILL (INLET OR MANHOLE)

NOTES:

1. The Contractor is paid a fixed estimated amount for cement stabilized backfill based on depth (D) and Table. 1.
2. Proposed roadway structure includes pavement, base and any subgrade.
3. For backfill of intersecting pipes and box culverts, see "Excavation and Backfill Diagram for Pipes and Box Culverts."
4. 6" cement stabilized backfill will be required only for precast units.

SHEET 2 OF 2

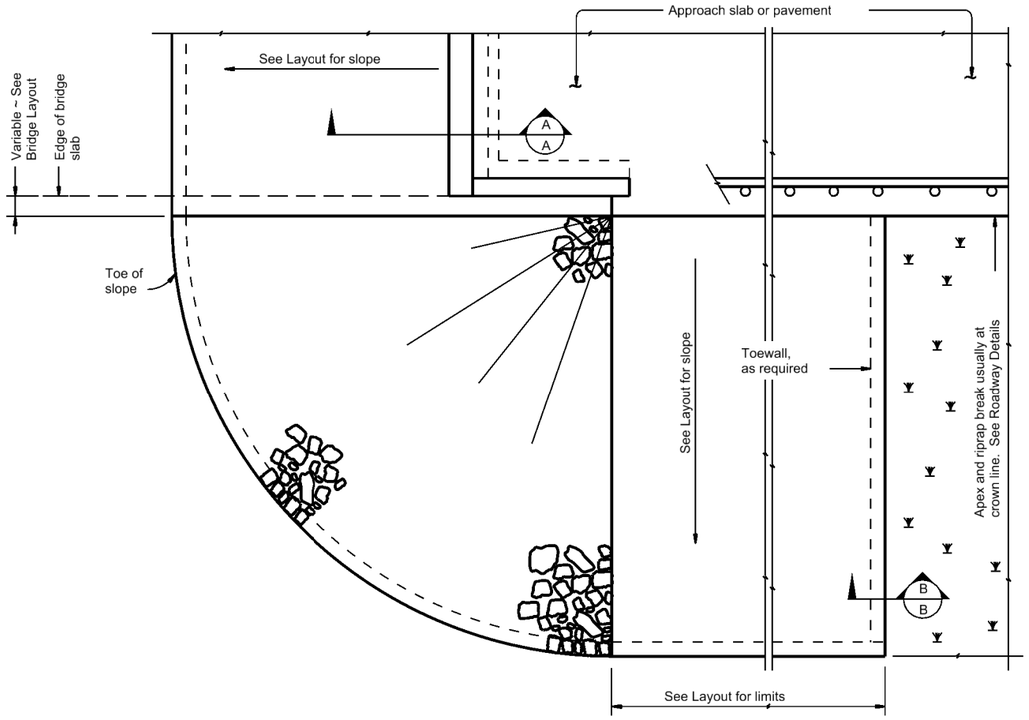
Texas Department of Transportation
Houston District

EXCAVATION AND BACKFILL DIAGRAMS

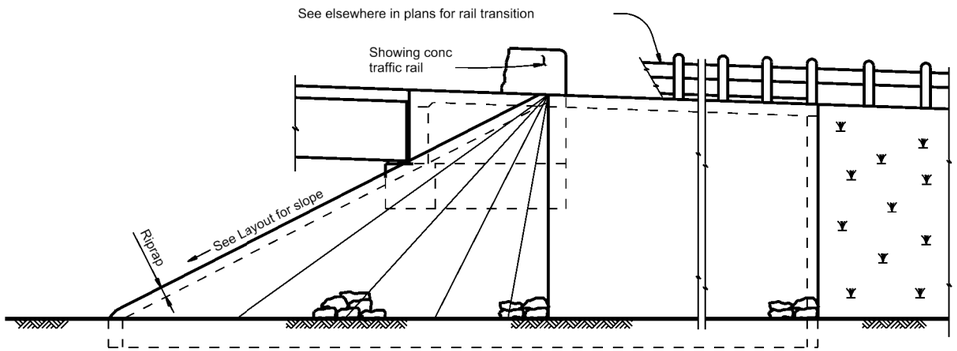
E&BD

FILE: STDE1.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
© TxDOT FEB 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS REVISED 2/2010 Added note to Table 1. REVISED 6/12 REVISED 9/14 REVISED 3/15	HOUSTON	6		30
	COUNTY		CONTROL SECT JOB	HIGHWAY
	HARRIS		0114 12 015	US 290

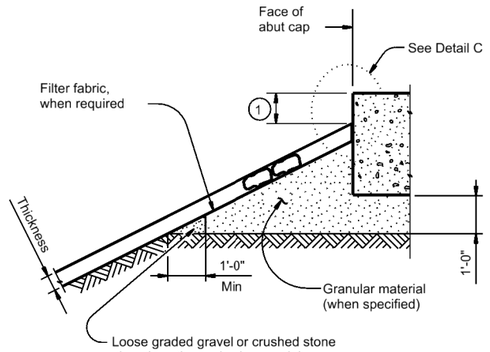
DATE: DATE&TIME $TIMES
FILE: DOCUMENT NAME



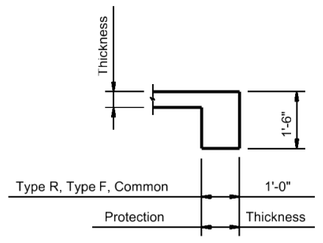
PLAN



ELEVATION

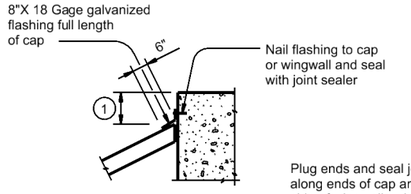


SECTION A-A AT CAP

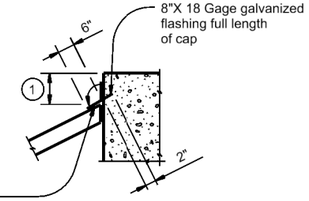


SECTION B-B

Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A



CAP OPTION B

DETAIL C

(1) Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

GENERAL NOTES:
Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
See elsewhere in plans for locations and details of shoulder drains.

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		31

DATE: DATE&TIME
FILE: DOCUMENT NAME

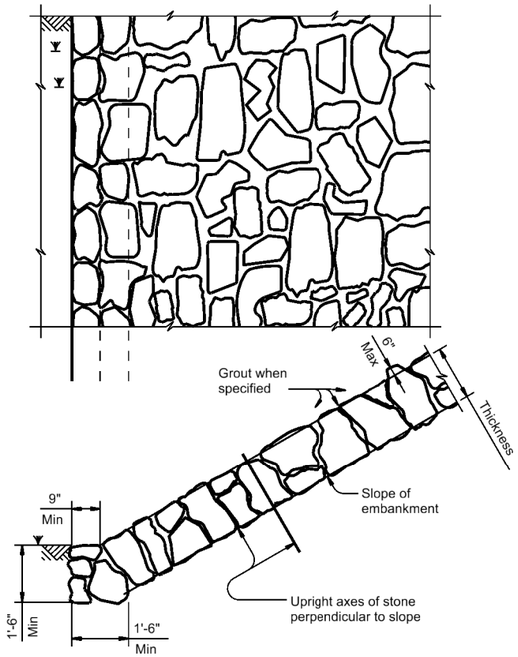


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

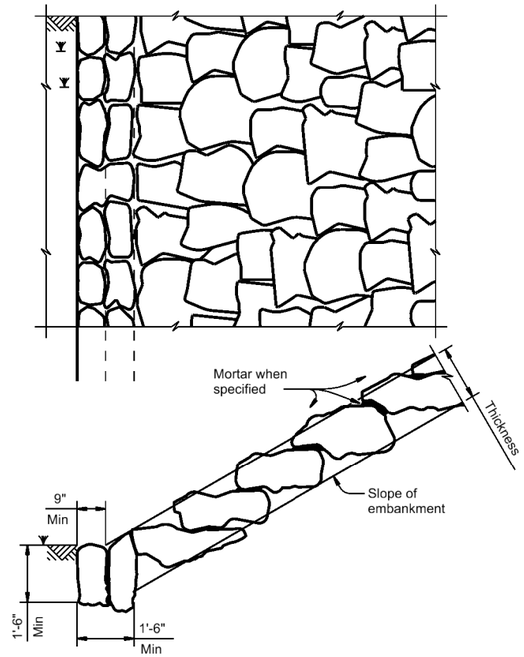


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

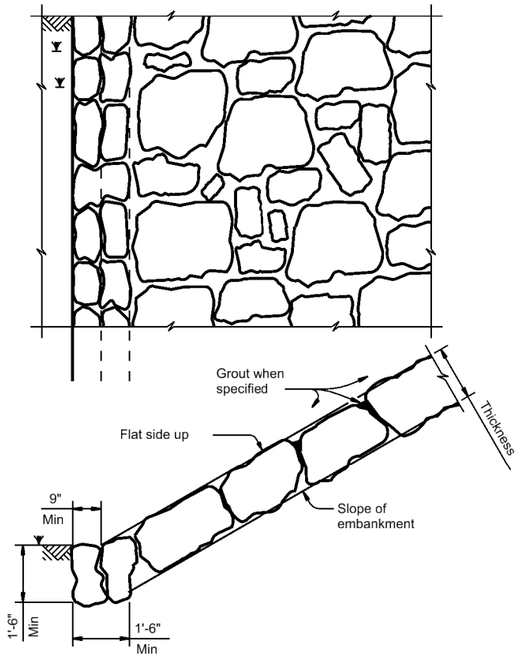
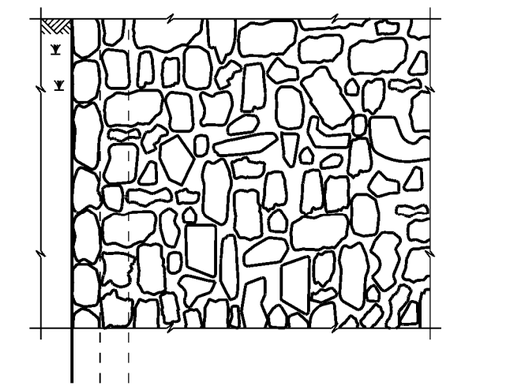
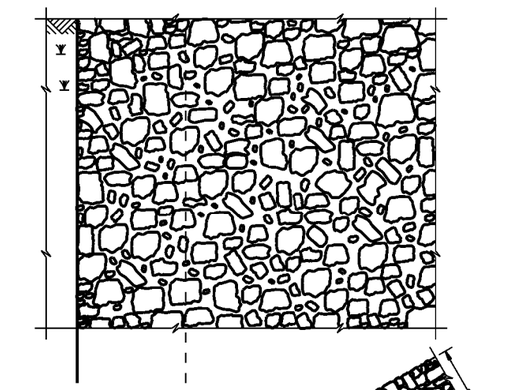


FIGURE 3 ~ TYPE F STONE RIPRAP

grouted





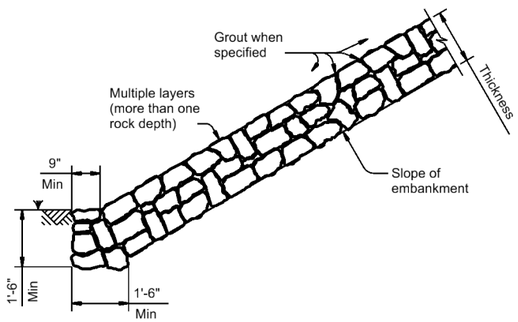


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

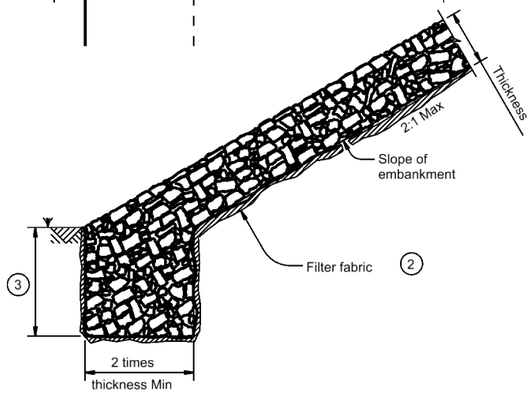


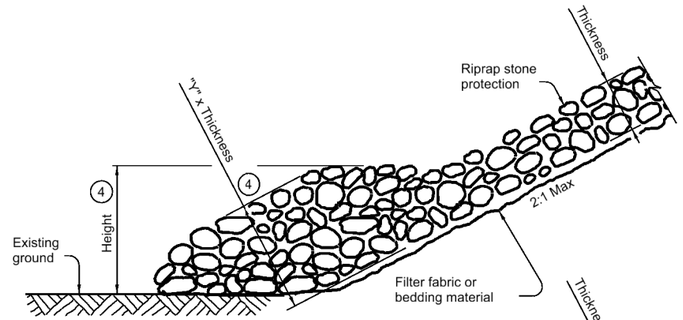
FIGURE 5 ~ PROTECTION STONE RIPRAP 5

2 Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

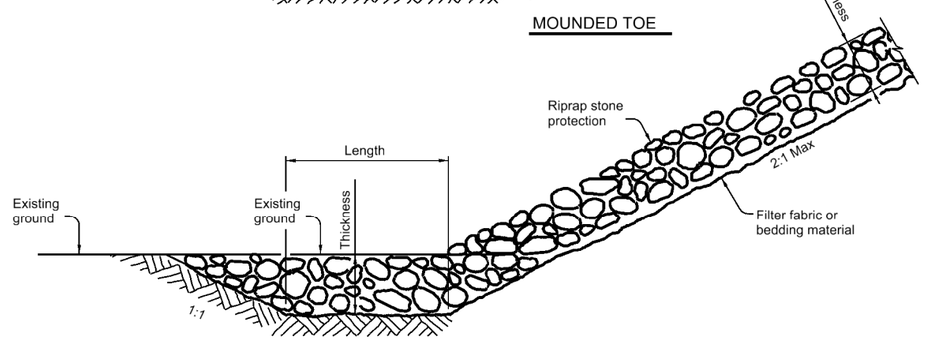
3 Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

4 "Y" and Height need to be defined. See layout or detail sheet for values if this option is used.

5 List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS 5

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES		CK: JGD	DW: BWH		CK: AES
©TxDOT April 2019	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0114	12	015		US 290	
	DIST	COUNTY			SHEET NO.	
	HOU	HARRIS			32	

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept at the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

US 290 DETENTION PONDS

1.1 PROJECT CONTROL SECTION JOB (CSJ):

CSJ 0114-12-015

1.2 PROJECT LIMITS:

From: AT FIELD STORE ROAD NW DETENTION POND

To: AT HEGAR ROAD NW DETENTION POND

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 30.0689456° ,(Long) -95.9216689°

END: (Lat) 30.0322334° ,(Long) -95.8431876°

1.4 TOTAL PROJECT AREA (Acres): 15.4 ACRES

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.9 ACRES

1.6 NATURE OF CONSTRUCTION ACTIVITY:

WIDENING PORTION OF POND AT FIELD STORE ROAD DETENTION POND AND SEPARATING DETENTION POND AND CREEK BY ADDING A BERM AT HEGAR ROAD.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
FIELD STORE ROAD	
WOCKLY FINE	FINE SANDY LOAM, CLAY LOAM, SANDY CLAY LOAM
HEGAR ROAD	
WOCKLY FINE	FINE SANDY LOAM, CLAY LOAM, SANDY CLAY LOAM

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

X PSLs determined during preconstruction meeting
X PSLs determined during construction
☐ No PSLs planned for construction

Type	Sheet #s
Confined work area for repair	021 FIELD STORE PLAN LAYOUT
Confined work area for repair	023 HEGAR ROAD PLAN LAYOUT

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

X Mobilization
X Install sediment and erosion controls
☐ Blade existing topsoil into windrows, prep ROW, clear and grub
☐ Remove existing pavement
X Grading operations, excavation, and embankment
☐ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☐ Install proposed pavement per plans
☐ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☐ Place flex base
X Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☐ Revegetation of unpaved areas
X Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

X Sediment laden stormwater from stormwater conveyance over disturbed area
☐ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☐ Solvents, paints, adhesives, etc. from various construction activities
☐ Transported soils from offsite vehicle tracking
☐ Construction debris and waste from various construction activities
X Contaminated water from excavation or dewatering pump-out water
☐ Sanitary waste from onsite restroom facilities
☐ Trash from various construction activities/receptacles
☐ Long-term stockpiles of material and waste
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
FIELD STORE ROAD DETENTION POND	TO MOUND CREEK TO CYPRESS CREEK TO SPRING CREEK
	TO SAN JACINTO RIVER TO SHIP CHANNEL TO GALVESTON BAY
HEGAR ROAD DETENTION POND	TO LITTLE CYPRESS CREEK TO CYPRESS CREEK TO SPRING CREEK
	TO SAN JACINTO RIVER TO SHIP CHANNEL TO GALVESTON BAY

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

X Development of plans and specifications
X Perform SWP3 inspections
X Maintain SWP3 records and update to reflect daily operations
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

X Day To Day Operational Control
X Maintain schedule of major construction activities
X Install, maintain and modify BMPs
☐ Other: _____
☐ Other: _____
☐ Other: _____

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.
1-4-23

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			33
STATE	STATE DIST.	COUNTY	
TEXAS	HOU	HARRIS	
CONT.	SECT.	JOB	HIGHWAY NO.
0114	12	015	US 290

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- [X] [ ] Protection of Existing Vegetation
- [ ] [ ] Vegetated Buffer Zones
- [ ] [ ] Soil Retention Blankets
- [ ] [ ] Geotextiles
- [ ] [ ] Mulching/ Hydromulching
- [ ] [X] Soil Surface Treatments
- [ ] [ ] Temporary Seeding
- [ ] [X] Permanent Planting, Sodding or Seeding
- [ ] [X] Biodegradable Erosion Control Logs
- [X] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [X] Vertical Tracking
- [ ] [ ] Interceptor Swale
- [ ] [X] Riprap
- [X] [ ] Diversion Dike
- [ ] [ ] Temporary Pipe Slope Drain
- [ ] [X] Embankment for Erosion Control
- [ ] [ ] Paved Flumes
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- [ ] [X] Biodegradable Erosion Control Logs
- [X] [ ] Dewatering Controls
- [ ] [ ] Inlet Protection
- [X] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Sandbag Berms
- [ ] [X] Sediment Control Fence
- [X] [ ] Stabilized Construction Exit
- [ ] [ ] Floating Turbidity Barrier
- [X] [ ] Vegetated Buffer Zones
- [ ] [ ] Vegetated Filter Strips
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
CONSTRUCTION EXITS	AT FIELD STORE ROAD DETENTION POND	
EROSION SOIL LOGS	AT FIELD STORE ROAD DETENTION POND	
CONSTRUCTION EXITS	AT HEGAR ROAD DETENTION POND	
EROSION SOIL LOGS	AT HEGAR ROAD DETENTION POND	

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- [X] Excess dirt/mud on road removed daily
- [X] Haul roads dampened for dust control
- [X] Loaded haul trucks to be covered with tarpaulin
- [X] Stabilized construction exit
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- [ ] Chemical Management
- [X] Concrete and Materials Waste Management
- [X] Debris and Trash Management
- [X] Dust Control
- [ ] Sanitary Facilities
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To
WET LAND DELINEATION	AT FIELD STORE ROAD DETENTION POND	
WET LAND DELINEATION	AT HEGAR ROAD DETENTION POND	

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- [X] Fire hydrant flushings
- [X] Irrigation drainage
- [X] Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- [X] Potable water sources
- [X] Springs
- [X] Uncontaminated groundwater
- [X] Water used to wash vehicles or control dust
- [X] Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.9 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER

William Burch, P.E.

1-4-23

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			33A
STATE	STATE DIST.	COUNTY	
TEXAS	HOU	HARRIS	
CONT.	SECT.	JOB	HIGHWAY NO.
0114	12	015	US 290

ITEM-DESCRP.	ITEM-DESCRIPTION	UNIT	QNTY
0506-6038	TEMPORARY SEDIMENT CONTROL FENCE INSTALL	LF	2,719
0506-6039	TEMPORARY SEDIMENT CONTROL FENCE REMOVE	LF	2,719
0506-6040	EROSION CONTROL LOGS INSTALL	LF	872
0506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	872

LEGEND:

SEDIMENT CONTROL FENCE

EROSION CONTROL LOG

NOTE:

1. TXDOT STADARD EC(1), EC(3), AND EC(9) TO BE PLACED WITHIN TXDOT RIGHT OF WAY.

2. ALL EROSION CONTROL PROTECTION TO REMAIN UNTIL THE END OF CONSTRUCTION.

3. THE LOCATIONS FOR THE CONSTRUCTION EXIT WILL BE IDENTIFIED BY THE ENGINEER.

4. ALL SODDING TO BE PERFORMED BY CONTRACTOR AS DIRECTED BY THE ENGINEER.

EXIST. ROW

FIELD STORE ROAD

EXIST. /PROP. DITCH ℄

PPROPOSED AREA OF SODDING

PROP ROCK FILTER DAM INSTALL & REMOVE

PROP SILT FENCE

PROP EROSION LOG

EXIST. ROW

EXISTING SLOPE/POND POND BOTTOM UNCHANGED

US 290 WB FR

PI

PI

PI

1015+00

10015+00

1015+00

US 290 WB ML

1020+00

10020+00

US 290 EB ML

1020+00

EXIST. /PROP. DITCH ℄

STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED PROFESSIONAL ENGINEER

William Burch, P.E.

1-4-23

US 290
FIELD STORE ROAD DETENTION POND SWP3 LAYOUT

SCALE: 1":100' HORZ
1":10' VERT

SHEET 1 OF 1

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0114	12	015	US 290
DIST	COUNTY		SHEET NO.
HOU	HARRIS		34

DATE: $DATE$ $TIME$
PEN TABLE: PEN
FILE: \\H:\WCHAO\DESIGN\CONSTRUCTION PROJECTS\0114-12-015 US 290 DETENTION PONDS\PLAN SET\9. ENVIRONMENTAL\FIELD STORE DETENTION POND SW3P LAYOUT.DGN

ITEM-DESCRP.	ITEM-DESCRIPTION	UNIT	QNTY
0506-6038	TEMPORARY SEDIMENT CONTROL FENCE INSTALL	LF	692
0506-6039	TEMPORARY SEDIMENT CONTROL FENCE REMOVE	LF	692
0506-6040	EROSION CONTROL LOGS INSTALL	LF	837
0506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	877

LEGEND:

SEDIMENT CONTROL FENCE

EROSION CONTROL LOG

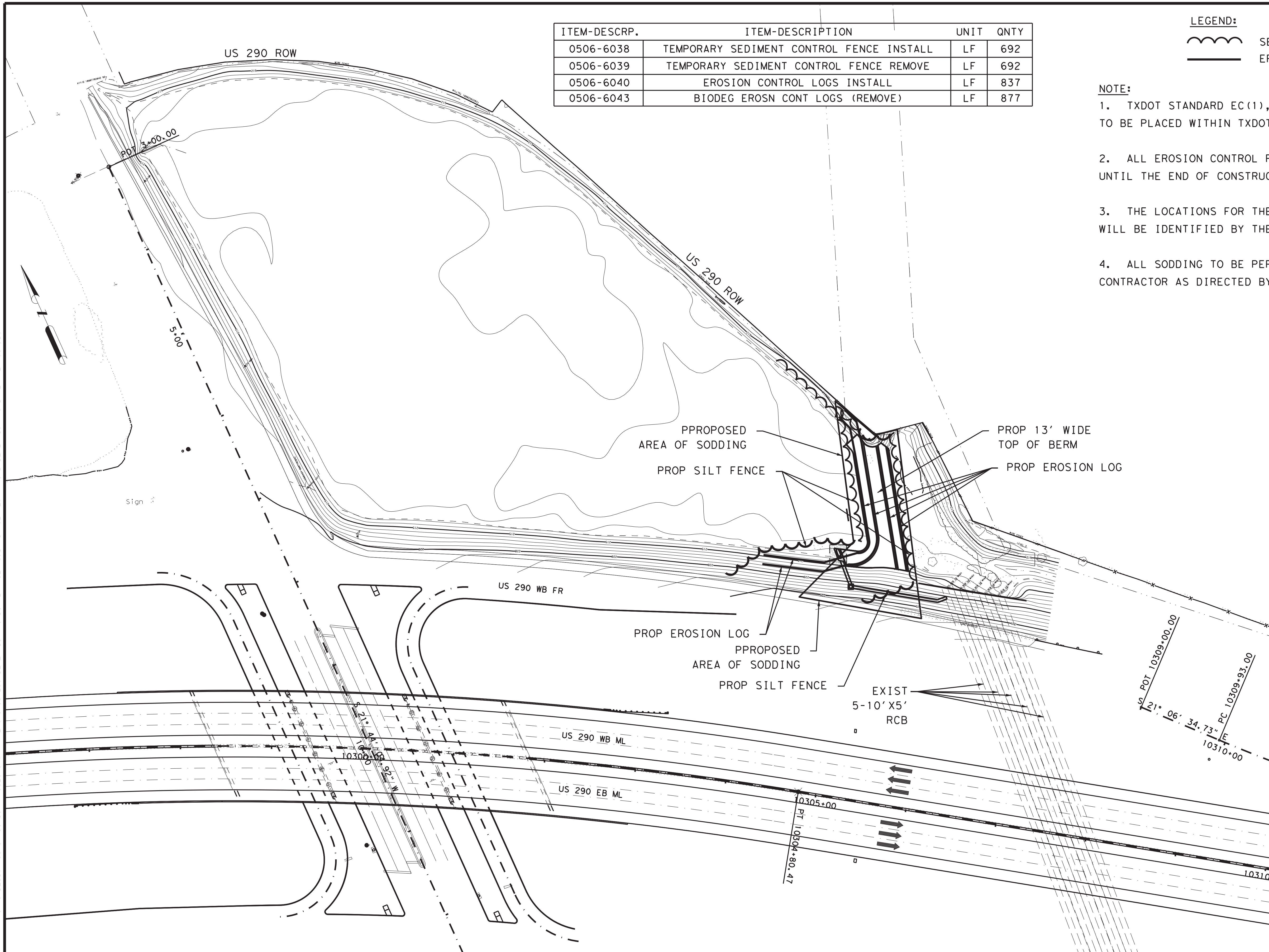
NOTE:

1. TXDOT STANDARD EC(1), EC(3), AND EC(9) TO BE PLACED WITHIN TXDOT RIGHT OF WAY.

2. ALL EROSION CONTROL PROTECTION TO REMAIN UNTIL THE END OF CONSTRUCTION.

3. THE LOCATIONS FOR THE CONSTRUCTION EXIT WILL BE IDENTIFIED BY THE ENGINEER.

4. ALL SODDING TO BE PERFORMED BY CONTRACTOR AS DIRECTED BY THE ENGINEER.



WILLIAM D. BURCH
111304
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

William Burch, P.E.
1-4-23

US 290
HEGAR ROAD DETENTION POND SWP3 LAYOUT

SCALE: 1":100' HORZ 1":10' VERT

SHEET 1 OF 1

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0114	12	015	US 290
DIST		COUNTY	SHEET NO.
HOU		HARRIS	35

DATE: $DATE$ $TIME$
PEN TABLE: PEN
FILE: \H:\WCHAO\DESIGN\CONSTRUCTION PROJECTS\0114-12-015 US 290 DETENTION PONDS\PLAN SETS\5_DRAINAGE\HEGAR ROAD DETENTION POND PLAN LAYOUT.DGN

I. STORMWATER POLLUTION PREVENTION

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit is 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. Refer to Storm Water Pollution Prevention Plan (SWP3) Houston District standard plan.

No Additional Comments

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS

United States Army Corps of Engineers (USACE) Permit is required for filling, dredging, excavating or other work in water bodies, rivers, creeks, streams, wetlands or wet areas. The Contractor must adhere to all of the terms and general conditions associated with the following permit(s). If additional work not represented in the plans is required, contact the Engineer immediately.

☐ No United States Army Corps (USACE) Permit Required

☐ Work is authorized by the United States Army Corps of Engineers (USACE) under a Nationwide Permit (NWP) without a Pre-Construction Notification (PCN). Project specific permit was not issued by USACE, therefore is not in the plan set. The USACE general conditions are in the “General Notes."

☐ Work is authorized by the United States Army Corps of Engineers (USACE) under a Nationwide Permit (NWP) with a Pre-Construction Notification (PCN). The project specific permit issued by the United States Army Corps of Engineers (USACE) is included in the plan set. The USACE general conditions are in the “General Notes."

☐ Work is authorized by the United States Army Corps of Engineers (USACE) under a Individual Permit (IP). The project specific permit issued by the United States Army Corps of Engineers (USACE) is included in the plan set.

☒ Work would be authorized by the United States Army Corps of Engineers (USACE) permit. The project specific permit issued by the USACE will be provided to the contractor.

United States Coast Guard (USCG) Permit is required for projects that involve the construction or modification (including changes to lighting) of a bridge or causeway across a water body determined to be navigable by the United States Coast Guard (USCG) under Section 9 of the Rivers and Harbors Act. If additional work not represented in the plans is required, contact the Engineer immediately.

☒ No United States Coast Guard (USCG) Coordination Required

☐ United States Coast Guard (USCG) Permit

☐ United States Coast Guard (USCG) Exemption

Additional Comments

This project will use a NWP 7 and NWP 13 for the work in the detention pond.

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 area and contact the Engineer immediately.

No Additional Comments

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical. Refer to TxDOT Standard Specifications in order to comply with requirements for invasive species, beneficial landscaping and tree/brush removal.

No Additional Comments

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS

If any of the listed species below are observed, cease work in the area, do not disturb species or habitat and contact the Engineer immediately.

The work may not remove active nests (from bridges, structures, or vegetation adjacent to the roadway, etc.) during nesting season (February 15 to October 1). If removal of structures or vegetation is necessary during the nesting season, the Contractor shall conduct a bird survey no more than 3 days in advance of the clearing/demolish start date. All bird surveys shall be conducted by a Field Biologist and adhere to the guidance document “Avoiding Migratory Birds and Handling Potential Violations” found in the TxDOT Environmental Compliance Toolkits at the time of the survey. (See below for Field Biologist and Ornithologist qualifications)

No Additional Comments

Field Biologist, Ornithologist – a field biologist is defined as an individual qualified to perform field investigations, presence/absence surveys and habitat surveys for protected avian species or species of concern. A mandatory bachelor’s degree in biology or a related science is required. At a minimum, the Field Biologist, Ornithologist, shall have completed and reported a minimum of three presence/absence and habitat surveys for protected avian species in the past five years. A minimum of three projects must have been conducted in Texas. Surveys shall have been performed for documentation of species in accordance with a protocol approved by USFWS or TPWD, or following generally accepted methodologies.

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

Refer to TxDOT Standard Specifications in the event potentially contaminated materials are observed, such as dead or distressed vegetation, trash disposal areas, drums, canisters, barrels, leaching or seepage of substances, unusual smells or odors, or stained soil, cease work in the area and contact the Engineer immediately.

No Additional Comments

VII. OTHER ENVIRONMENTAL ISSUES

Comments:

Once the Individual Permit (IP) has been issued, the AO and TxDOT Engineer would be notify when activities permitted under the United States Army Corps of Engineers (USACE).

DATE: Jun 15, 2022
FILE:

Version 2.1

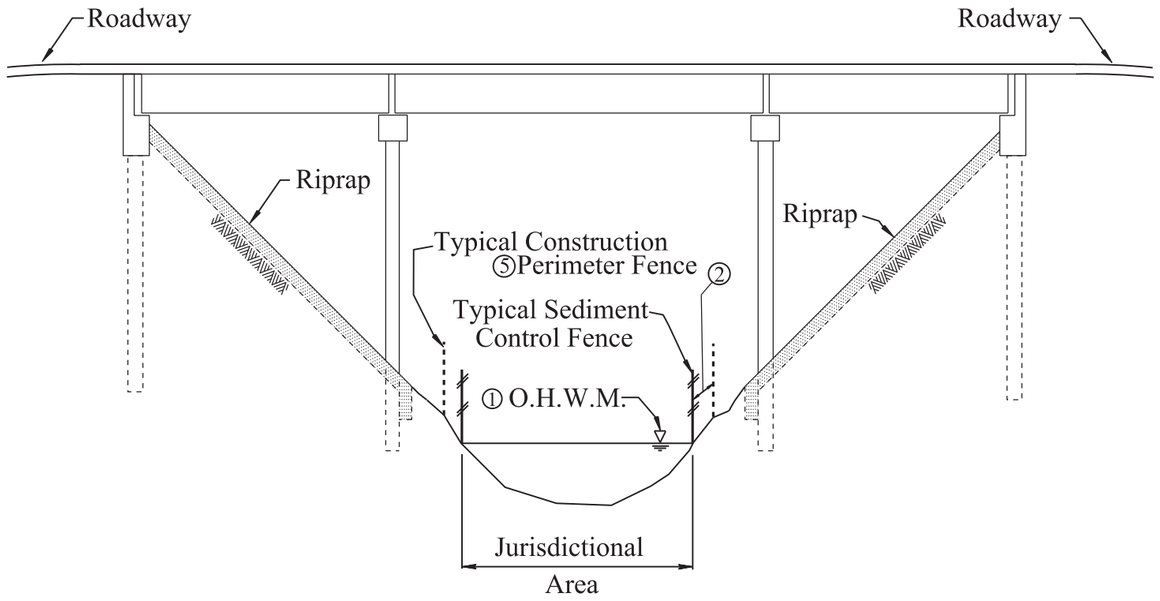
Texas Department of Transportation

TxDOT Houston District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

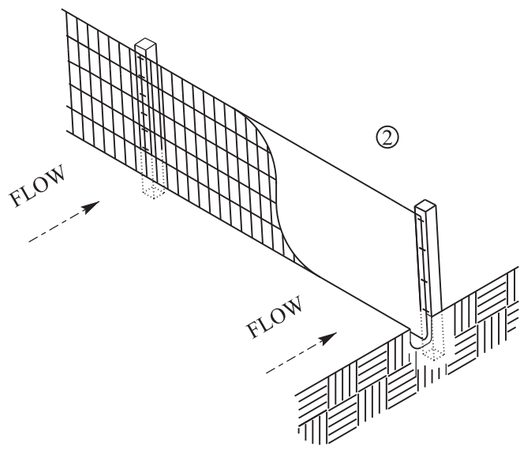
EPIC

FILE: EPIC Sheet.dgn	DN:	CK:	DW:	CK:
© TxDOT: March 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
UPDATED section V. text and added definition (10/17) ADDED USCG and USACE notes in Section VII (04/18)	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		36



TYPICAL RELATIONSHIP OF O.H.W.M., SEDIMENT CONTROL & CONSTRUCTION FENCING, PILING/DRILL SHAFT & RIPRAP TOE WALLS

N.T.S.



TEMPORARY SEDIMENT CONTROL FENCE

1.50" Radius, 0.50" Border, Black on White;
[WETLAND AREA] C; [DO NOT ENTER] C;
CIRCLE, DIAG LINE, RED

GENERAL DESIGN CONSIDERATIONS

1. Ordinary high water mark (elevation) (O.H.W.M.) is determined by the Environmental Project Manager and elevation is set by a Surveyor.

2. All non-permitted jurisdictional wetlands and waters within or adjacent to the project area shall be avoided and protected by signage and fencing, including both sediment control and construction fencing (see note 5). Construction equipment, materials/sediment are not allowed in the non-permitted wetlands/waters.

3. Any wetlands permitted for impacts/fill and non-permitted wetlands are shown elsewhere on plans or United States Army Corps of Engineers (USACE) permit.

4. The Contractor will be required to obtain the appropriate permits if she/he alters the construction method or deviates from the permit.

5. See item 506 for temporary sediment control fence and for construction perimeter fence. See item 502 for signs.

Texas Department of Transportation

TxDOT Houston District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: Wetland EPIC Sheet.dgn	DN:	CK:	DW:	CK:
© TxDOT: March 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
ADDED construction fencing (06/17)	DIST	COUNTY		SHEET NO.
UPDATED typical relationship diagram (09/17)	HOU	HARRIS		37
UPDATED notes 2 and 5 (09/17)				
UPDATED note 5 (05/18)				

DATE:
FILE:

Crayfish BMP

• Avoid or minimize impacts to the natural riparian buffer that provides terrestrial and aquatic plant matter for the diet of most crayfish species.

Aquatic Amphibian and Reptile BMP

o Minimize impacts to wetlands, temporary and permanent open water features, including depressions, and riverine habitats.
o Maintain the existing hydrologic regime and any connections between wetlands and other aquatic features.
o Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
o Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas around wetlands and in riparian areas. If erosion control blankets or mats will be used, the product should not contain netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
o Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
o When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and refugia/overwinter sites (e.g., brush and debris piles, crayfish burrows, aquatic logjams, and leaf packs).

2.6.2 Terrestrial Amphibian and Reptile BMP

• For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling
• Avoid or minimize disturbing or removing cover objects, such as downed trees, rotting stumps, brush piles, and leaf litter. If avoidance or minimization is not practicable, consider removing cover objects prior to the start of the project and replace them at project completion.
• Examine heavy equipment stored on site before use, particularly after rain events when reptile and amphibian movements occur more often, to ensure use will not harm individuals that might be seeking temporary refuge.
• Due to increased activity (mating) of reptiles and amphibian during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (March-May) season. Also, timing ground disturbing activities before October when reptiles and amphibians become less active and may be using burrows in the project area is also encouraged.

Bat BMP

• For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
• For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
• If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
• Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F AND minimum daytime temperatures are above 70° F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is

Bat BMP, cont.

recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area.
• If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features.
• Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
• In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.
• Bat surveys of structures should include visual inspections of structural fissures (cracked or spalled concrete, damaged or split beams, split or damaged timber railings), crevices (expansion joints, space between parallel beams, spaces above supports piers), and alternative structures (drainage pipes, bolt cavities, open sections between support beams, swallow nests) for the presence of bats.
• Before excluding bats from any occupied structure, bat species, weather, temperature, season, and geographic location must be incorporated into any exclusion plans to avoid unnecessary harm or death to bats. Winter exclusion must entail a survey to confirm either, 1) bats are absent or 2) present but active (i.e., continuously active – not intermittently active due to arousals from hibernation).
o Avoid using materials that degrade quickly, like paper, steel wool or rags, to close holes.
o Avoid using products or making structural modifications that may block natural ventilation, like hanging plastic sheeting over an active roost entrance, thereby altering roost microclimate.
o Avoid using chemical and ultrasonic repellents.
o Avoid use of silicone, polyurethane or similar non-water-based caulk products.
o Avoid use of expandable foam products at occupied sites.
o Avoid the use of flexible netting attached with duct tape.

2.2.1 Bird BMP

• Avoid vegetation clearing activities during the general bird nesting season, March through August, to minimize adverse impacts to birds.
• Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed. If active nests are observed during surveys, TPWD recommends a 150-foot buffer of vegetation remain around the nests until the young have fledged or the nest is abandoned.
• Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season.
• If unoccupied, inactive nests will be removed, ensure that nests are not protected under the Endangered Species Act (ESA), MBTA, or BGEPA.
• Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
• Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
• Minimize extended human presence near nesting birds during construction and maintenance activities. Protect sensitive habitat areas with temporary barriers or fencing to limit human foot- traffic and off-road vehicle use to alert and discourage contractors from causing any unintentional impacts.
• Minimize construction noise above ambient levels during general bird nesting season to minimize adverse impacts on birds.
• Minimize construction lighting during the general bird nesting season by scheduling work activities between dawn and dusk.

2.6.1 Aquatic Amphibian and Reptile BMP

o Minimize impacts to wetlands, temporary and permanent open water features, including depressions, and riverine habitats.
o Maintain the existing hydrologic regime and any connections between wetlands and other aquatic features.
o Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
o Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas around wetlands and in riparian areas. If erosion control blankets or mats will be used, the product should not contain netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
o Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
o When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and refugia/overwinter sites (e.g., brush and debris piles, crayfish burrows, aquatic logjams, and leaf packs).

Texas Department of Transportation

TxDOT Houston District

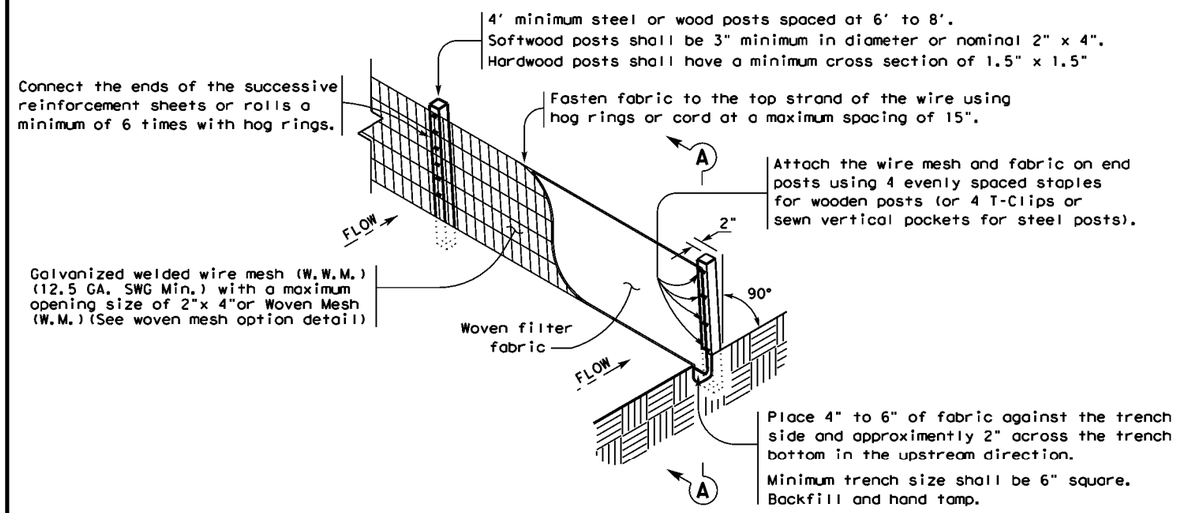
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: EPIC Additional Comment Sheet.dgn	DN:	CK:	DW:	CK:
© TxDOT: March 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		38

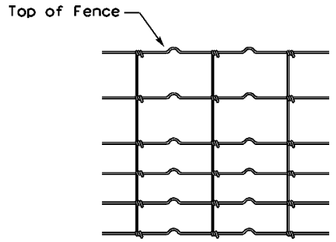
DATE:
FILE:

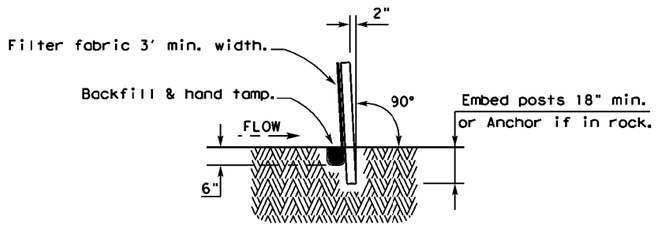
$DATE$
FILE: %H:\WCHAO\CONSTRUCTION PROJECTS*-12-015 DETENTION PONDS\PLAN SET*\9. ENVIRONMENTAL\SWP3.DGN



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

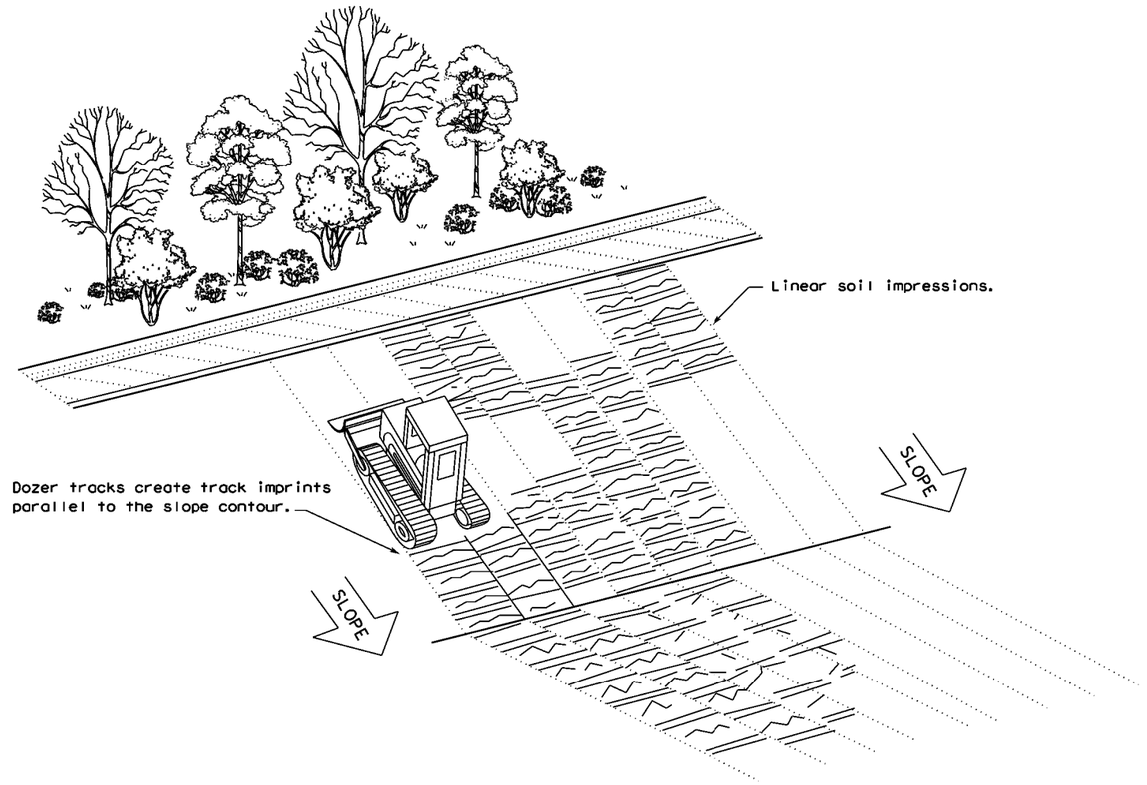
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

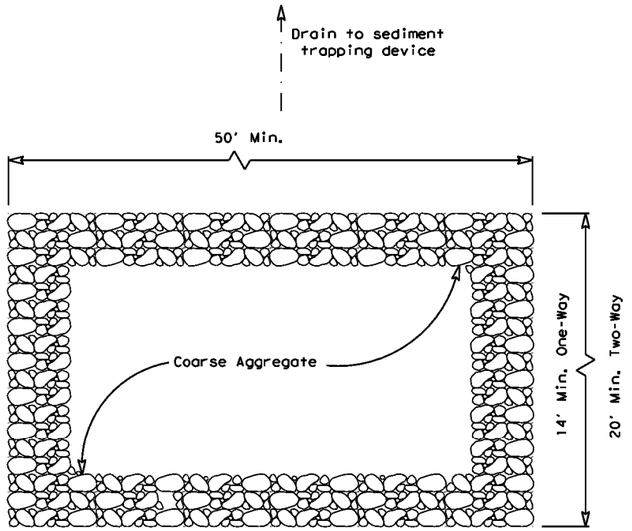
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

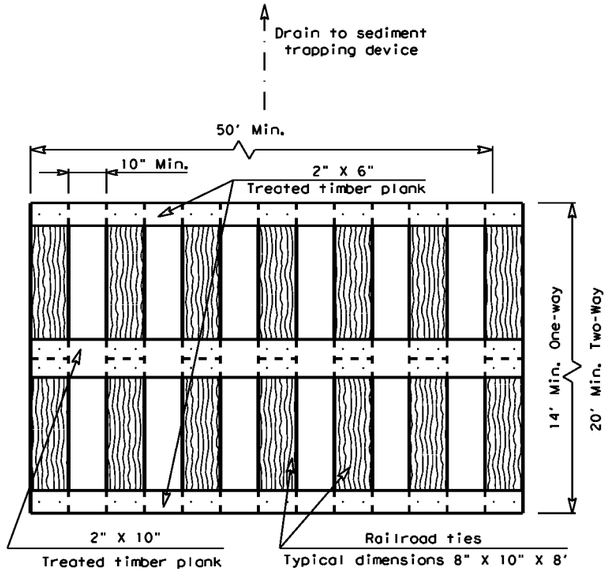
EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM	DW: VP		DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0114	12	015		US 290	
	DIST	COUNTY				SHEET NO.
	HOU	HARRIS				39

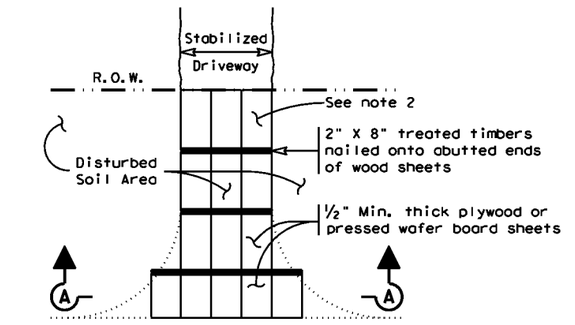
DATE: $DATE$
FILE: N:\WCHAO\CONSTRUCTION PROJECTS\-12-015 DETENTION PONDS\PLAN SET\9. ENVIRONMENTAL\EC316.DGN



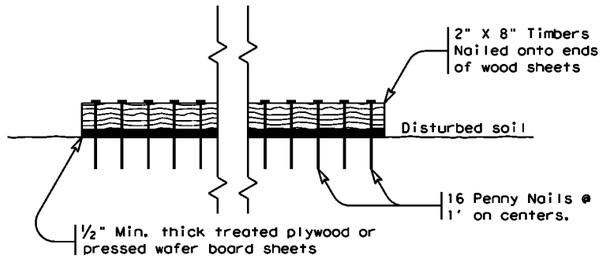
PLAN VIEW



PLAN VIEW



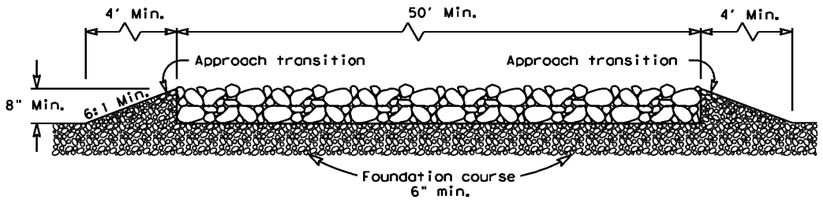
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM



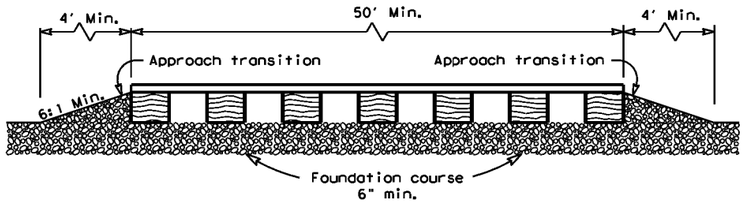
ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

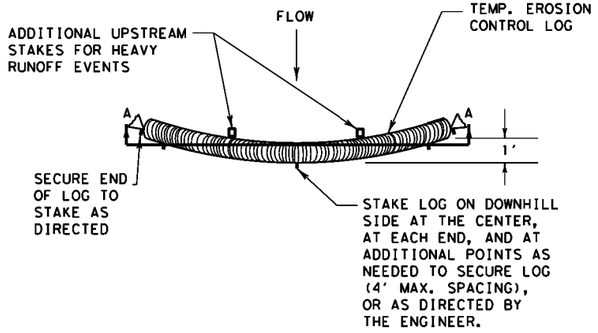
Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

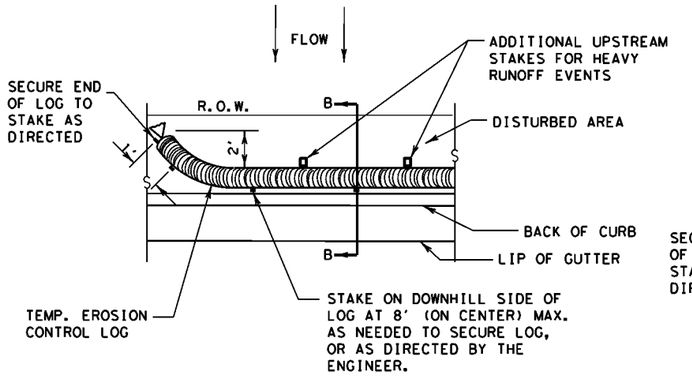
CONSTRUCTION EXITS

EC(3)-16

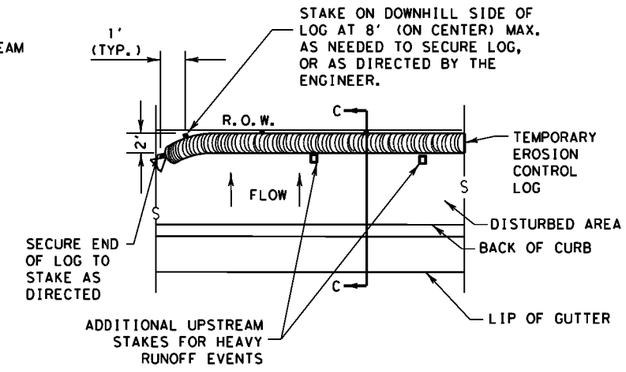
FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	12	015	US 290
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		40



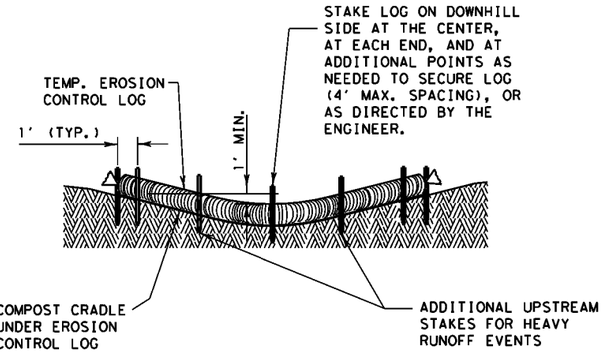
PLAN VIEW



PLAN VIEW



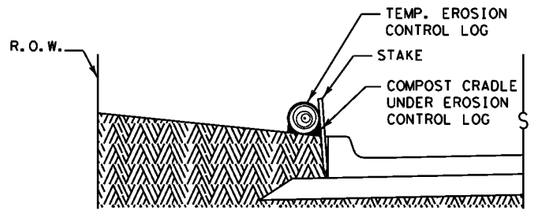
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

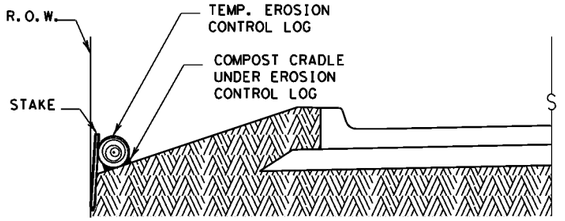
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

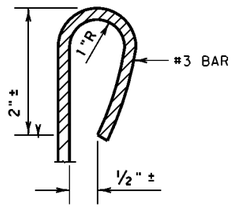
CL-BOC



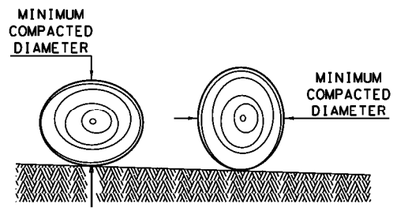
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

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.

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

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

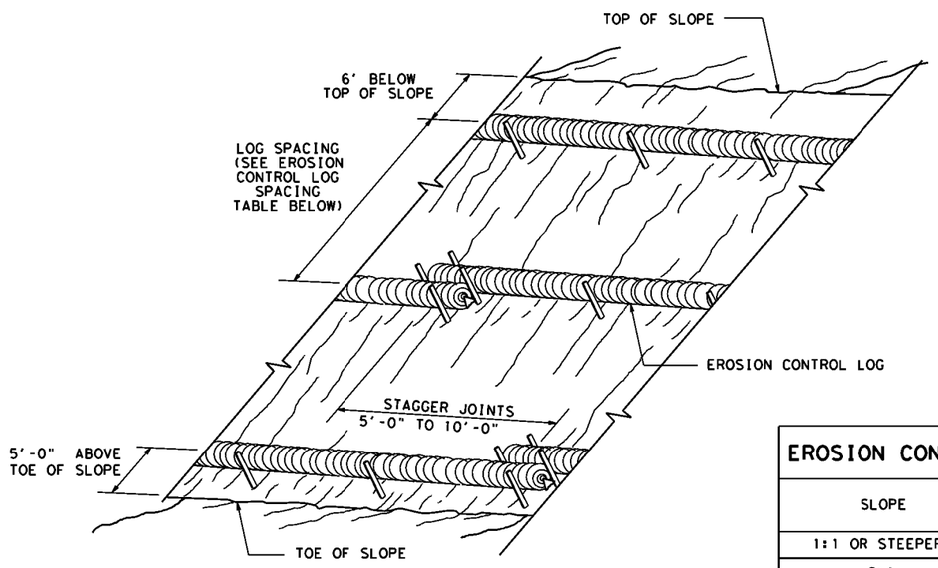
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

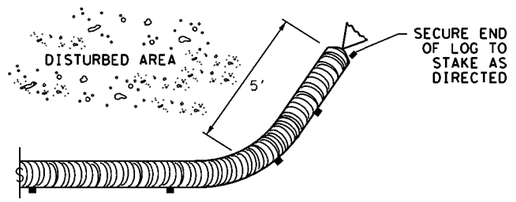
FILE: ec916		DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0114	12	015		US 290	
		DIST		COUNTY			SHEET NO.
		HOU		HARRIS			41

DATE: $DATE$
FILE: $FILE$



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

CL-SST

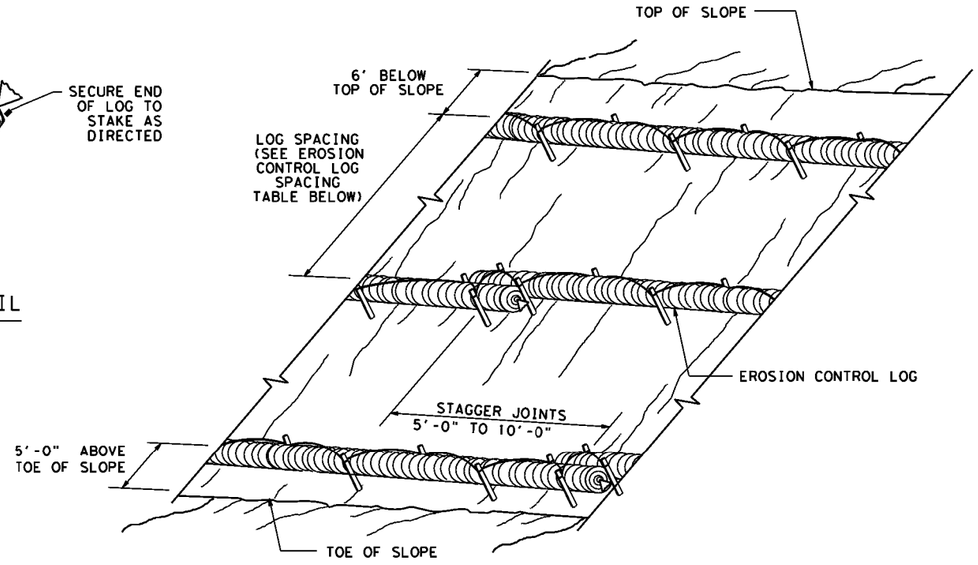


END SECTION RAP DETAIL

EROSION CONTROL LOG SPACING TABLE

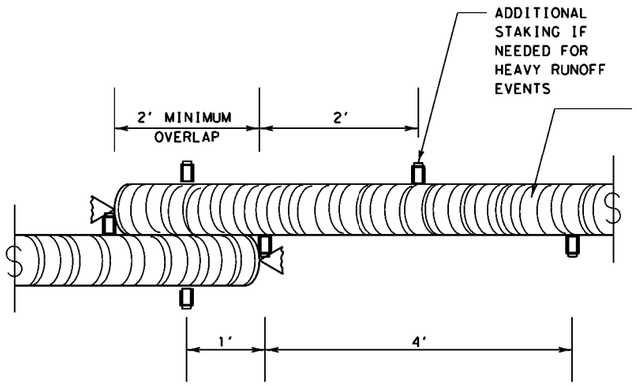
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

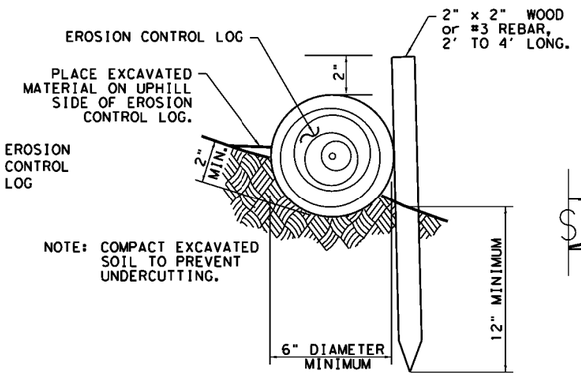
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL



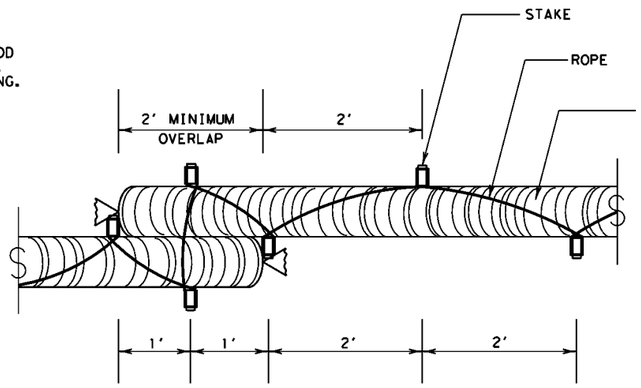


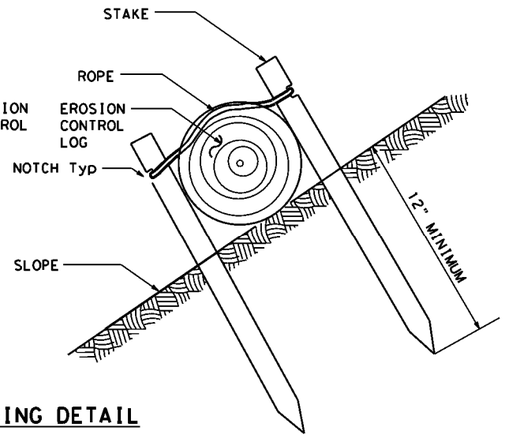
STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

TRENCH DEPTH TABLE

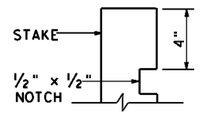
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

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
REVISIONS	0114	12	015	US 290
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		42

DATE: $DATE$
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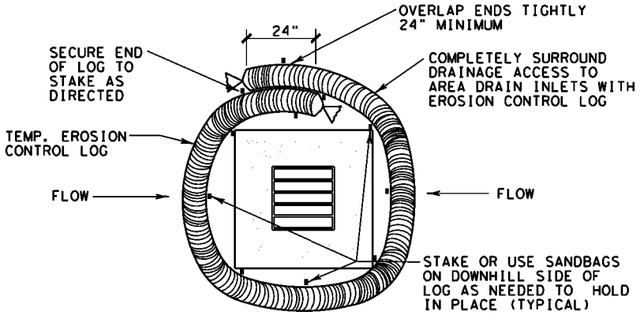
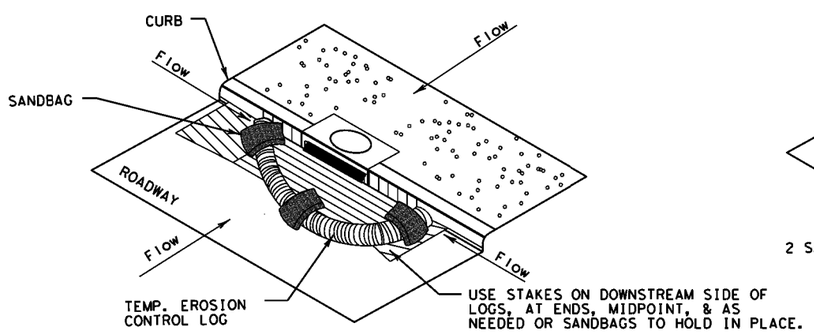


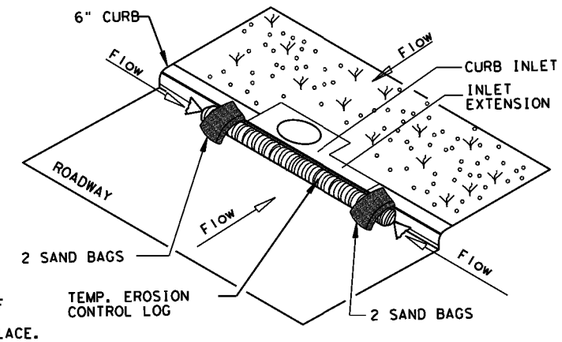
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

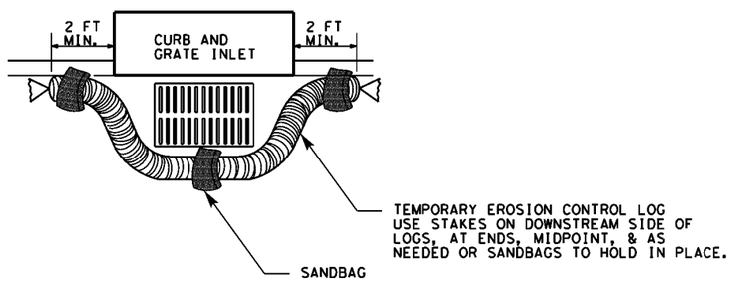
CL-CI



EROSION CONTROL LOG AT CURB INLET

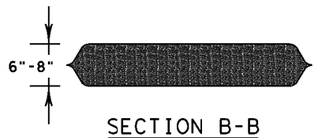
CL-CI

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.

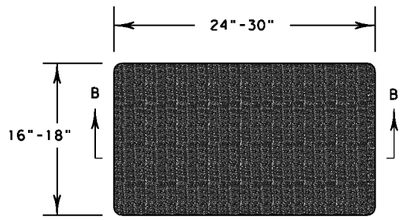


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

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		
REVISIONS	0114	12	015		US 290		
	DIST	COUNTY					SHEET NO.
	HOU	HARRIS					43

TYPE OF WORK — ITEMS AND REQUIREMENTS FOR EACH TYPE OF WORK

SODDING	PERMANENT SEEDING	TEMPORARY SEEDING	Reference Item 161, 162, 164, 166, 168 of the Texas Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges 2014 for specifications, dimensions, volumes and measurements that are not shown. Use latest Houston District, Special Provisions for those items indicated.		
	✓		**161-6017 COMPOST MANUF TOPSOIL (BIP)(4") SY**	APPLICATION RATE Item 161.2.1. Compost Manufactured Topsoil (CMT)	Item 161.2. Materials. Submit quality control (QC) documentation to the Engineer. Compost producer's STA certification must be dated to meet STA requirements (certification must be within 30 or 90 days per STA requirements). Lab analysis performed by an STA-certified lab must be dated within 30 days before delivery of the compost.
✓			**162-6002 BLOCK SODDING SY**	GRASS SPECIES Item 162.2. Materials. Common Bermuda (Cynodon Dactylon)	Item 162.2.1. Block Sod. Use block palletized or roll type sod. **REMOVE PLASTIC BACKING FROM ROLL TYPE SOD.** Place sod within 48 hours of delivery to site. No exceptions. Place sod with joints alternating on each row to prevent continuous joint lines. Peg sod as needed with wood pegs to hold sod in place. Pegging sod is subsidiary to Item 162.
	✓		**164-6066 DRILL SEEDING(PERM)(WARM OR COOL) SY** Item 164.1. Description Provide and install seeding as shown on District Standard	PLANTING MONTH / SEED MIX March, April, May, June, July, August, September, October: Hulled - Bermudagrass (Cynodon dactylon) - 40.0 lbs PLS/acre Foxtail Millet (Setaria italica) - 34.0 lbs PLS/acre Green Sprangletop (Leptochloa dubia) - 4.0 lbs PLS/acre Sideoats Grama (Bouteloua curtipendula) - 3.2 lbs PLS/acre Little Bluestem (Schizachyrium scoparium) - 1.4 lbs PLS/acre November, December, January, February, Unhulled - Bermudagrass (Cynodon dactylon) - 40.0 lbs PLS/acre Oats (Avena sativa) - 72.0 lbs PLS/acre Green Sprangletop (Leptochloa dubia) - 4.0 lbs PLS/acre Sideoats Grama (Bouteloua curtipendula) - 3.2 lbs PLS/acre Little Bluestem (Schizachyrium scoparium) - 1.4 lbs PLS/acre	PLS (Pure Live Seed) Provide documentation of PLS requirements per Item 164.2.1. CONSTRUCTION. Cultivate the area to a depth of 4 inches before placing the seed unless otherwise directed. When performing permanent seeding after an established temporary seeding, cultivate the seedbed to a depth of 4 inches or mow the area before placement of the permanent seed. Plant the seed and place the straw or hay mulch after the area has been completed to lines and grades as shown on the plans. Drill Seeding. Plant seed or seed mixture uniformly over the area shown on the plans at a depth of 1/4 to 1/3 inch using a cultipacker(turfgrass) type seeder. Plant seed along the contour of the slopes. Use broadcast seeding method where site conditions prevent drill seeding method. Broadcast Seeding. Distribute the dry seed or dry seed mixture uniformly over the areas shown on the plans using hand or mechanical distribution on top of soil.
	✓		**164-6052 BROADCAST SEED(PERM)(SPECIAL MIX) SY** Item 164.1. Description Provide and install seeding as shown on District Standard		
		✓	**164-6051 DRILL SEED(TEMP)(WARM OR COOL) SY** Item 164.1. Description Provide and install seeding as shown on District Standard	PLANTING MONTH / SEED MIX March, April, May, June, July, August, September, October: Foxtail Millet (Setaria italica) - 34.0 lbs PLS/acre November, December, January, February, Oats (Avena sativa - 72.0 lbs PLS/acre	
		✓	**164-6009 BROADCAST SEED(TEMP)(WARM) SY** Item 164.1. Description Provide and install seeding as shown on District Standard		
	✓	✓	**162-6003 STRAW OR HAY MULCH SY**	APPLICATION RATE Immediately after planting the seed or seed mixture, apply straw or hay mulch uniformly over the seeded area. Apply straw or hay mulch at 2 tons per acre. Use tacking agent with straw or hay mulch as described on this sheet.	Use straw or hay mulch in conformance with Article 162.2.5, "Mulch." Use biodegradable tacking agents only applied at a rate in accordance with manufacturer's recommendations. Use the following products or an approved equal(see note this sheet): Conweb/Contac Guar Gum, Profile Products Corporation, (307) 655-9565, Ramtec/Procol/Viscol Guar Gum, Ramtec Corporation, (800) 366-1180
✓	✓	✓	**166-6001 FERTILIZER AC** Item 166.2. Materials Use fertilizer as shown on District Standard	APPLICATION RATE Deliver and evenly distribute fertilizer at a rate of 4000 lbs/acre.	Use a **NON-CHEMICAL** fertilizer which meets all the following criteria: (1) BRAND NAME must be registered with the Texas State Chemist as a commercial fertilizer. (2) Meets USEPA guidelines for unrestricted use. (3) Derived from biological sources such as, but not limited to: sewage sludge, manures, vegetation, etc. (4) In granular form and essentially dust free. Submit proof of registration and nutrient source to Engineer. Use the following products or an approved equal(see note this sheet): Sigma, SIGMA AgriScience, 281-851-6749 Sustanite-standard grade, Automation Nation, Inc., 713-675-4999 Milorganite, MMSD, 800-287-9645 Agricultural Organic P/L, Ag Org, INC., 713-523-4396
✓	✓	✓	**168-6001 VEGETATIVE WATERING MG**	APPLICATION RATE Item 168.3 Construction. 6000 gallons/acre per working day x 20 consecutive working days = 120,000 gallons total/acre	Begin watering immediately after installation of seed or sod. Replace, fertilize, and water any seed or sod in poor condition due to the failure to apply the specified amount of water within the time allowed at no expense to the Department.

SEQUENCE OF WORK

BLOCK SOD	PERMANENT SEEDING	TEMPORARY SEEDING
1. FERTILIZER 2. CULTIVATE SOIL (ITEM 162.3) 3. SOD 4. VEGETATIVE WATERING	1. FERTILIZER 2. COMPOST MANUFACTURED TOPSOIL 3. CULTIVATE SOIL (ITEMS 164.3 AND 161.3.1) 4. PERMANENT SEEDING 5. STRAW OR HAY MULCH 6. VEGETATIVE WATERING	1. FERTILIZER 2. CULTIVATE SOIL (PER ITEM 164.3) 3. TEMPORARY SEEDING 4. STRAW OR HAY MULCH 5. VEGETATIVE WATERING

Texas Department of Transportation

HOUSTON DISTRICT

FERTILIZER, SEED, SOD, STRAW, COMPOST, AND WATER

SHEET 1 OF 1

REVISIONS	FILE:	FED DIV	STATE	PROJECT NUMBER			SHEET
10/2014 UPDATED TO 2014 SPECS 3/2015 MINOR CORRECTIONS	OCT 2014	6	TEXAS				44
	ORIGINAL:	DIST	COUNTY	CONTROL	SECT	JOB	HIGHWAY
		12	HARRIS	0114	12	015	US 290

STD K-1

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
2000 FORT POINT RD
GALVESTON, TEXAS 77550

January 10, 2023

Evaluation Branch

SUBJECT: Permit No. SWG-2017-00292; Nationwide Permit Verification

TxDOT-Houston District
c/o: Sue Theiss
PO Box 1386
Houston, Texas 77251

Dear Ms. Theiss:

This is in reference to your request, dated October 19, 2022, to discharge fill material into 0.095-acre of wetlands and 0.02-acre of Little Cypress Creek during the installation of a bank stabilization berm and 36-inch outfall pipe within an existing detention basin. The project site is located in wetlands and Little Cypress Creek, within an existing detention basin located on the east side of Hegar Road at the intersection of Hegar Road and United States 290 Frontage Road, in Houston, Harris County, Texas.

This request is verified by Nationwide Permit (NWP) 7 and NWP 13 pursuant to Section 404 of the Clean Water Act. These NWP verifications are valid provided the activity is compliant with the enclosed plans, in 8 sheets. In addition, the activity must be in compliance with the NWP General/Regional Conditions, Section 401 Water Quality Certification, and the Coastal Management Program, which can be found at: https://www.swg.usace.army.mil/Missions/Regulatory/Permits/Nationwide-General-Permits/, a hard copy can be provided to you upon request.

NWP 7. Outfall Structures and Associated Intake Structures: Authorizes activities related to the construction or modification of outfall structures and associated intake structures, where the effluent from the outfall is authorized, conditionally authorized, or specifically exempted by or otherwise in compliance with regulations issued under the National Pollutant Discharge Eliminations System Program (Section 402 of the Clean Water Act).

NWP 13. Bank Stabilization: Authorizes activities necessary for erosion control or prevention, such as vegetative stabilization, bioengineering, sills, rip rap, revetment, gabion baskets, stream barbs, and bulkheads, or combinations of other methods.

The NWP verification is valid until the NWP is modified, reissued, or revoked. The subject NWPs authorized in 2021 are scheduled to be modified, reissued, or revoked prior to March 15, 2026. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you

commence or are under contract to commence this activity before the date that the relevant NWP is modified or revoked, you will have 12 months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP.

The following special conditions have been added to your authorization:

1. The permittee shall not initiate activities in the permit area associated with this permit, which have not previously been evaluated by the Corps of Engineers, Galveston District, Regulatory Division (Corps) as part of the permit review for this project, until such work has been submitted to and approved by the Corps. Such activities include, but are not limited to, haul roads, equipment staging areas, laydown yards, temporary work areas, as well as borrow and disposal sites. The permit area includes all waters of the United States affected by activities associated with the project, as well as any additional area(s) of non-waters of the United States in the immediate vicinity of, directly associated with, and/or affected by, activities in waters of the United States. Special restrictions may be required for such work. The permittee shall develop procedures to ensure that contractors are aware of this condition and encourage contractors to coordinate their selection of these sites with the permittee as soon as possible to avoid construction delays. The permittee, or its designated agent/contractor, may coordinate with the Corps on compliance with this special condition.

2. The permittee shall conduct a meeting with the construction contractor or contractors detailing the terms and conditions of this permit prior to commencing construction activities of the project. Within two weeks following the meeting, the permittee will also provide electronic mail (email) confirmation, to include the agenda and list of all attendees, to the Corps of Engineers, Galveston District, Regulatory Division, Chief of the Compliance Branch (Corps) at CESWGRegulatoryInbox@USACE.Army.mil, that the meeting was held.

3. The permittee must notify the Corps of Engineers, Galveston District, Regulatory Division, Chief of the Compliance Branch (Corps), by electronic mail (email) at CESWGRegulatoryInbox@USACE.Army.mil, prior to the start of construction (i.e., fill or structures) within the jurisdictional areas.

This verification does not address nor include any consideration for geographic jurisdiction on aquatic resources and shall not be interpreted as such. If you have any questions, please contact Ms. Andria Davis by electronic mail (email) at Andria.E.Davis@USACE.Army.Mil or by telephone at 409-255-7329. Please notify the

Chief of the Compliance Branch in the Galveston District Regulatory Division in writing by email at CESWGRegulatoryInbox@USACE.Army.Mil, upon completion of the authorized project.

FOR THE DISTRICT COMMANDER:

K. Marie Taylor
Leader, Central Evaluation Unit

cc w/Encl.

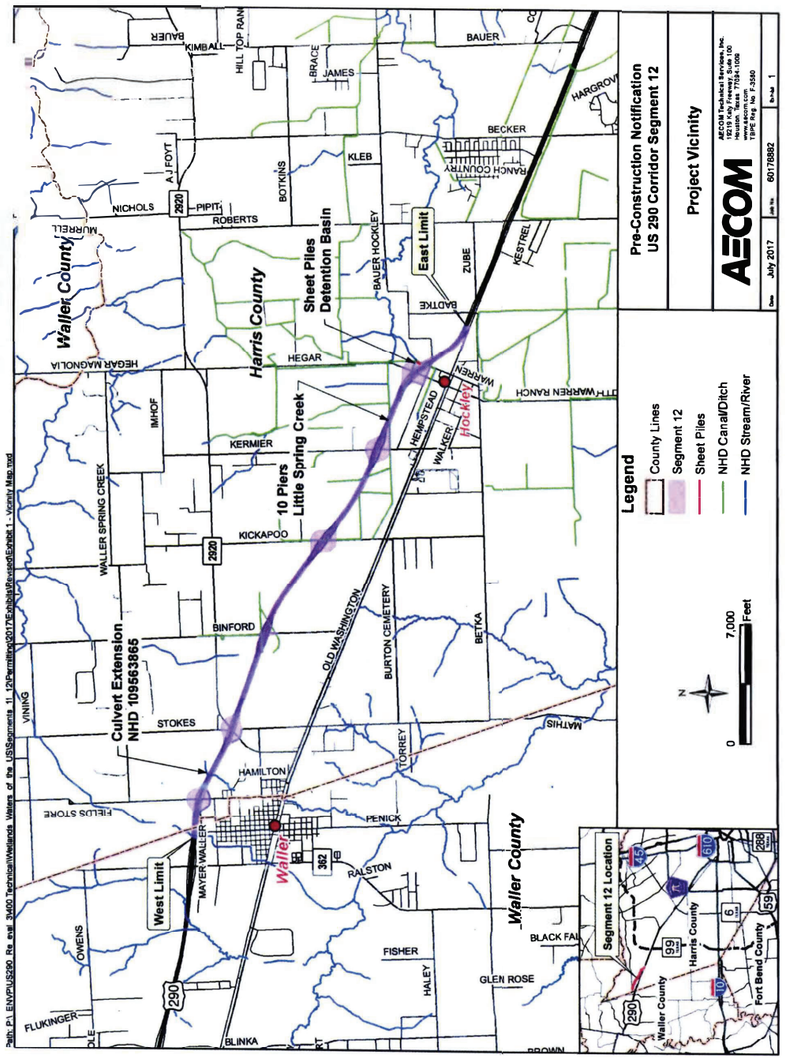
TxDOT-Houston District, via email at Carrington.Wright@txdot.gov

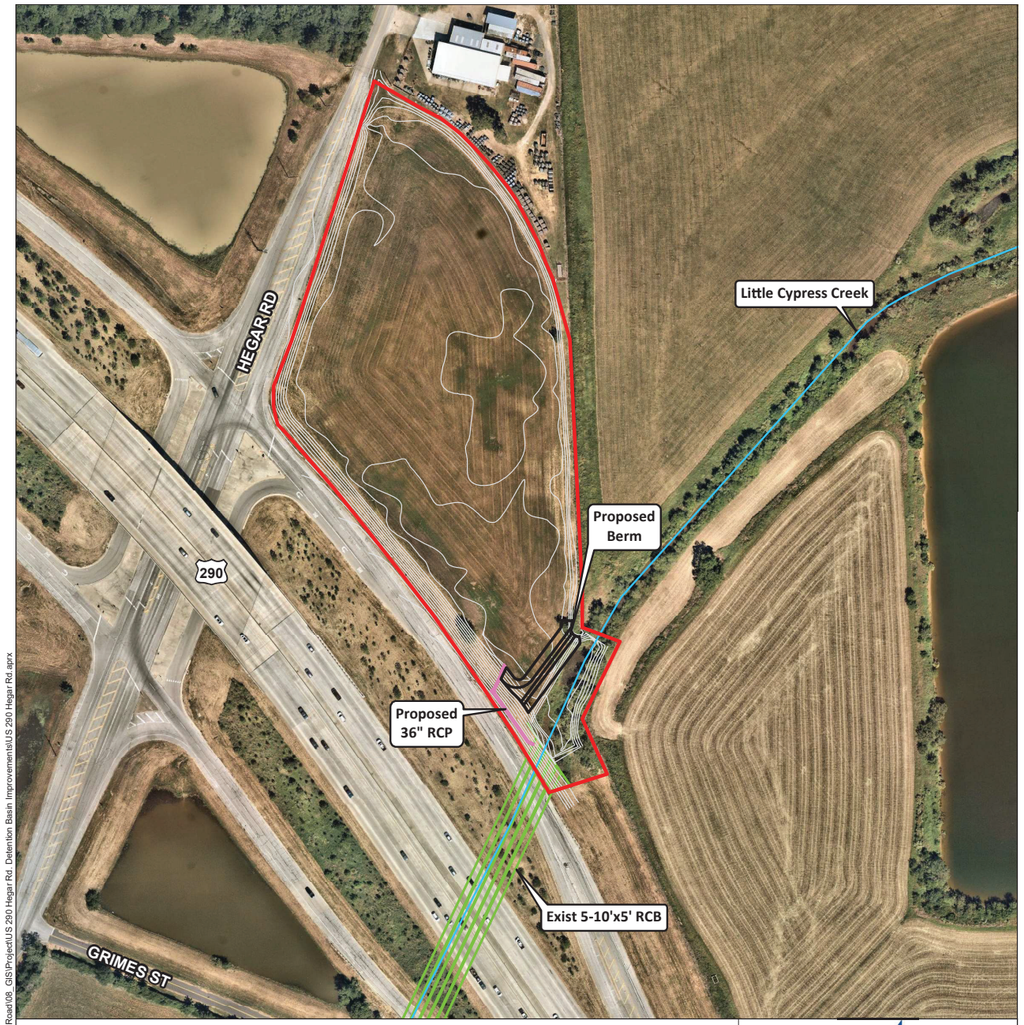
Eighth Coast Guard District, New Orleans, LA

National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), Coast & Geodetic Survey, Silver Spring, MD

Texas Commission on Environmental Quality

Texas General Land Office





Legend
- NHD Stream
- Proposed Culvert
- Existing Box Culvert
- Proposed Berm
- Proposed 1 ft. Contour
- Project Area

0 100 200
Feet

US 290 Hegar Road Detention Basin Improvements

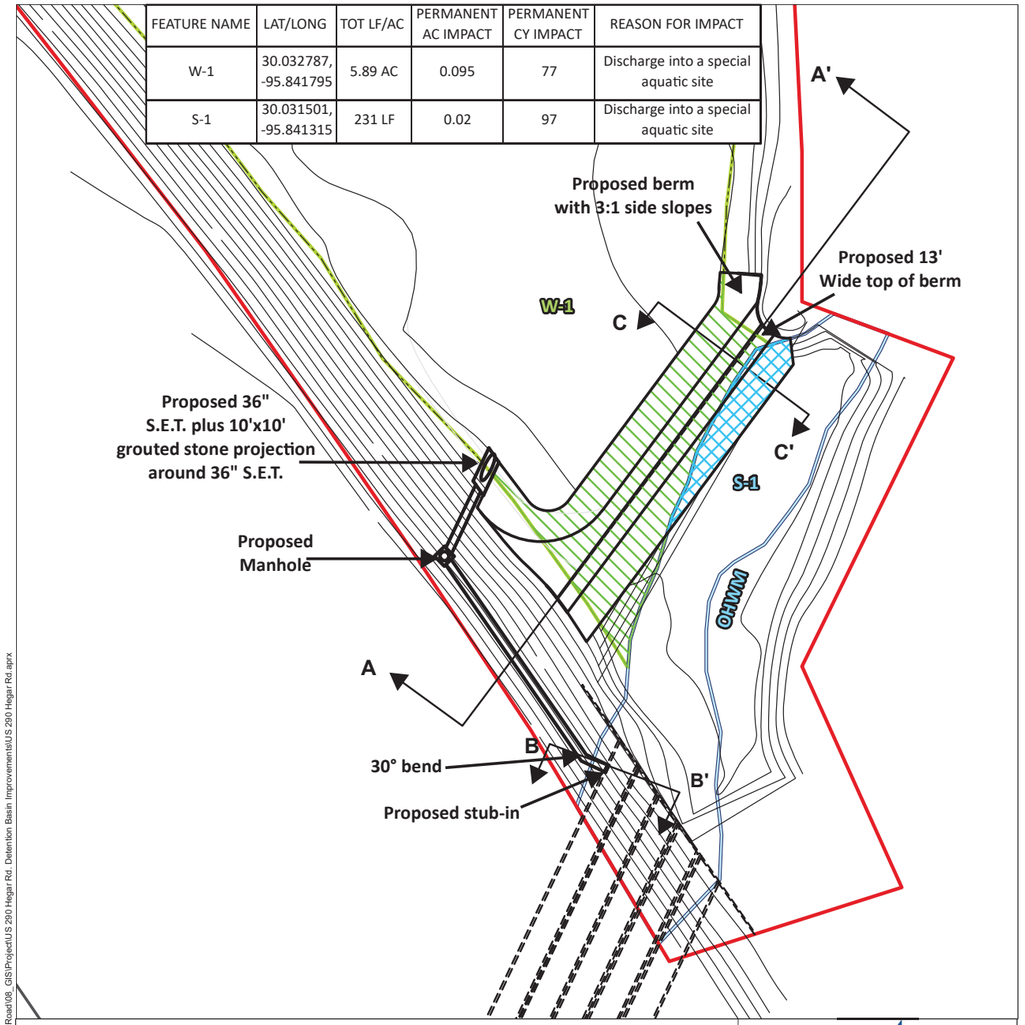
Figure 1: Project Overview
Harris County, TX
CSJ: 0114-12-015

Date: October 2022 | Proj. No: 7292-10

Data Source: Google Earth 2021 Aerial Imagery

File Path: G:\TXH\Projects\TxDOT\7292-10-WA#10-US290\ES\Hegar Road\08_GIS\Project\US 290 Hegar Rd. Detention Basin Improvements\tsl\US 290 Hegar Rd.aprx

FEATURE NAME	LAT/LONG	TOT LF/AC	PERMANENT AC IMPACT	PERMANENT CY IMPACT	REASON FOR IMPACT
W-1	30.032787, -95.841795	5.89 AC	0.095	77	Discharge into a special aquatic site
S-1	30.031501, -95.841315	231 LF	0.02	97	Discharge into a special aquatic site



Legend
- Proposed Culvert
- Existing Box Culvert
- Proposed 1 ft. Contour
- Proposed Berm
- Project Area

Wetland Type
- PEM

Stream Type
- Perennial OHWM

Impact Type
- Stream Impact
- Wetland Impact

0 20 40
Feet

US 290 Hegar Road Detention Basin Improvements

Figure 2: Detailed Overview
Harris County, TX
CSJ: 0114-12-015

Date: October 2022 | Proj. No: 7292-10

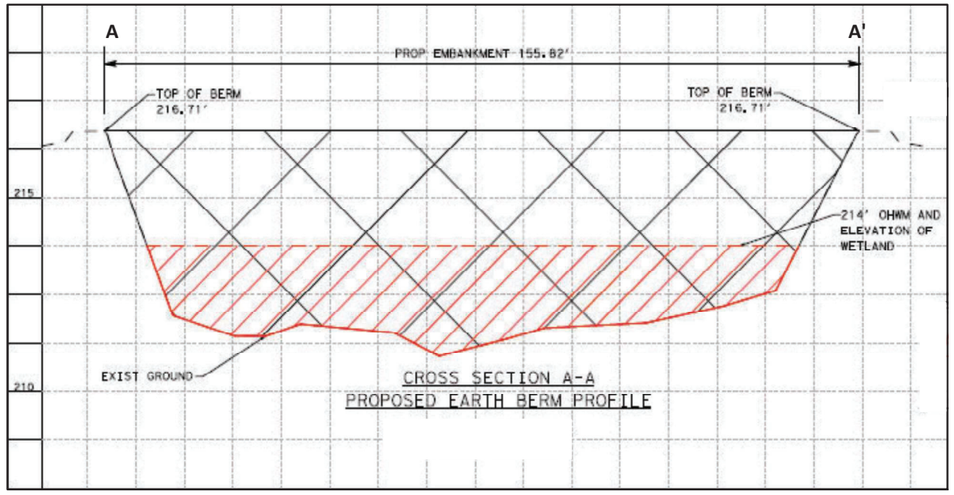
GIS Analyst: wihlanfeldt

Data Source: Google Earth 2021 Aerial Imagery

File Path: G:\TXH\Projects\TxDOT\7292-10-WA#10-US290\ES\Hegar Road\08_GIS\Project\US 290 Hegar Rd. Detention Basin Improvements\tsl\US 290 Hegar Rd.aprx

FEATURE NAME	LAT/LONG	TOT LF/AC	PERMANENT AC IMPACT	PERMANENT CY IMPACT	REASON FOR IMPACT
W-1	30.032787, -95.841795	5.89 AC	0.095	77	Discharge into a special aquatic site
S-1	30.031501, -95.841315	231 LF	0.02	97	Discharge into a special aquatic site

CROSS SECTION A-A'
PROPOSED EARTH BERM PROFILE



*Not to scale

Legend
- – – Ordinary High Water Mark and elevation of wetland
- Impact to Wetland and Stream

*Approximately 77 cubic yards
of concrete and fill in PEM wetland.

*Approximately 97 cubic yards
of concrete and fill in Little Cypress Creek

**US 290 Hegar Road
Detention Basin Improvements**

Figure 3: A-A' Profile View
Harris County, TX
CSJ: 0114-12-015

Date: October 2022 | Proj. No: 7292-10

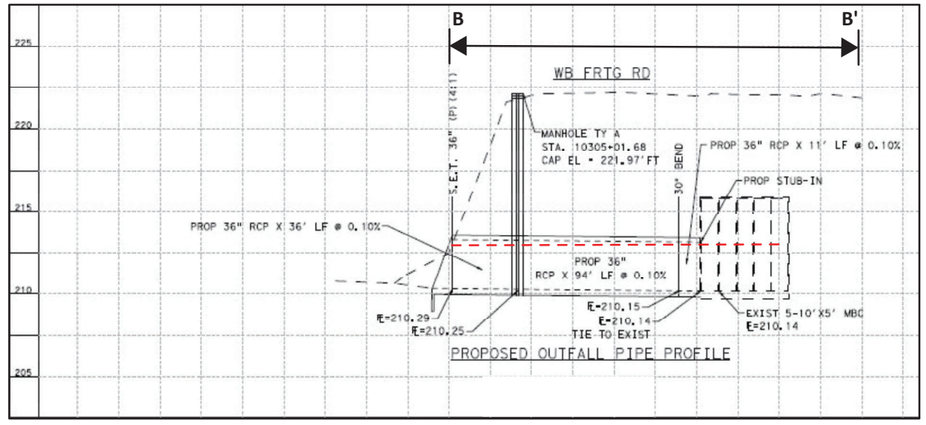
GIS Analyst: wlhlanfeldt

Data Source: Google Earth 2021 Aerial Imagery

File Path: G:\TXHP\Projects\TxDOT\7292-10-WA#1\0-US290ES\Hegar Road\08_GIS\Project\US 290 Hegar Rd. Detention Basin Improvements\US 290 Hegar Rd.aprx

FEATURE NAME	LAT/LONG	TOT LF/AC	PERMANENT AC IMPACT	PERMANENT CY IMPACT	REASON FOR IMPACT
W-1	30.032787, -95.841795	5.89 AC	0.095	77	Discharge into a special aquatic site
S-1	30.031501, -95.841315	231 LF	0.02	97	Discharge into a special aquatic site

CROSS SECTION B-B'
PROPOSED OUTFALL PIPE PROFILE



*Not to scale

Legend
- – – Ordinary High Water Mark and elevation of wetland

**US 290 Hegar Road
Detention Basin Improvements**

Figure 4: B-B' Profile View
Harris County, TX
CSJ: 0114-12-015

Date: October 2022 | Proj. No: 7292-10

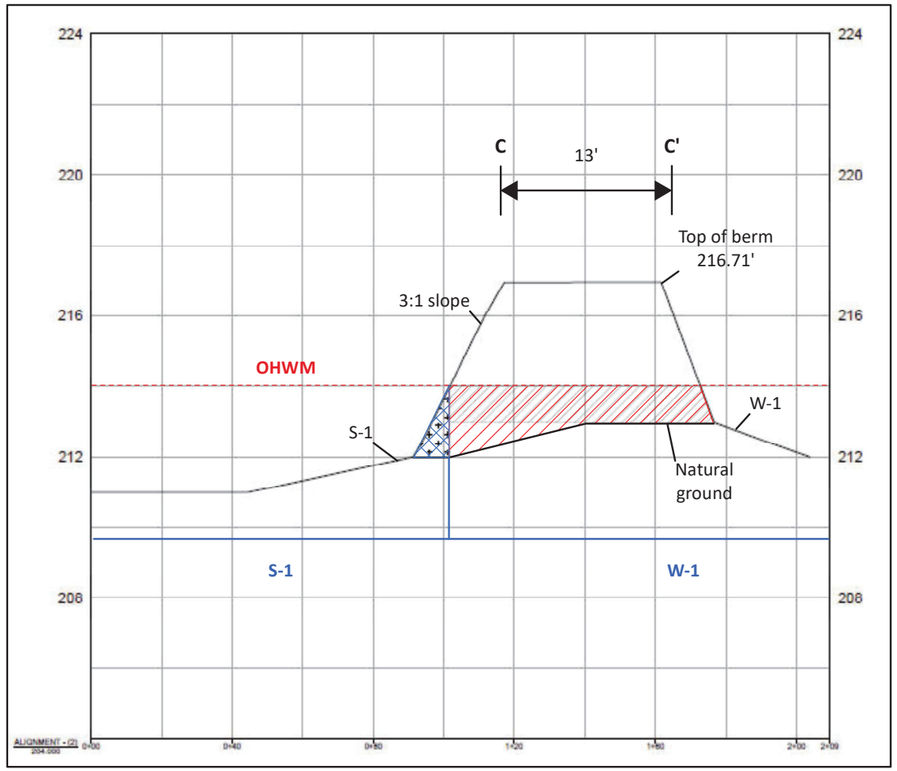
GIS Analyst: wlhlanfeldt

Data Source: Google Earth 2021 Aerial Imagery

File Path: G:\TXHP\Projects\TxDOT\7292-10-WA#1\0-US290ES\Hegar Road\08_GIS\Project\US 290 Hegar Rd. Detention Basin Improvements\US 290 Hegar Rd.aprx

FEATURE NAME	LAT/LONG	TOT LF/AC	PERMANENT AC IMPACT	PERMANENT CY IMPACT	REASON FOR IMPACT
W-1	30.032787, -95.841795	5.89 AC	0.095	77	Discharge into a special aquatic site
S-1	30.031501, -95.841315	231 LF	0.02	97	Discharge into a special aquatic site

CROSS SECTION C-C'
PROPOSED EARTH BERM PROFILE



*Not to scale

Legend
- Ordinary High Water Mark and elevation of wetland
- Impact to Wetland W-1
- Impact to Wetland S-1

*Approximately 77 cubic yards of concrete and fill in PEM wetland.

*Approximately 97 cubic yards of concrete and fill in Little Cypress Creek

S-1 (Little Cypress Creek)	
Width (ft)	Height (ft)
40.7	3

Texas Department of Transportation

US 290 Hegar Road Detention Basin Improvements

Figure 5: C-C' Profile View
Harris County, TX
CSJ: 0114-12-015

Date: October 2022 | Proj. No: 7292-10

File Path: G:\TXHP\Projects\TxDOT\7292-10-WA#10-US290\ESI\Hegar Road\08_GIS\Project\US 290 Hegar Rd. Detention Basin Improvement\US 290 Hegar Rd.aprx

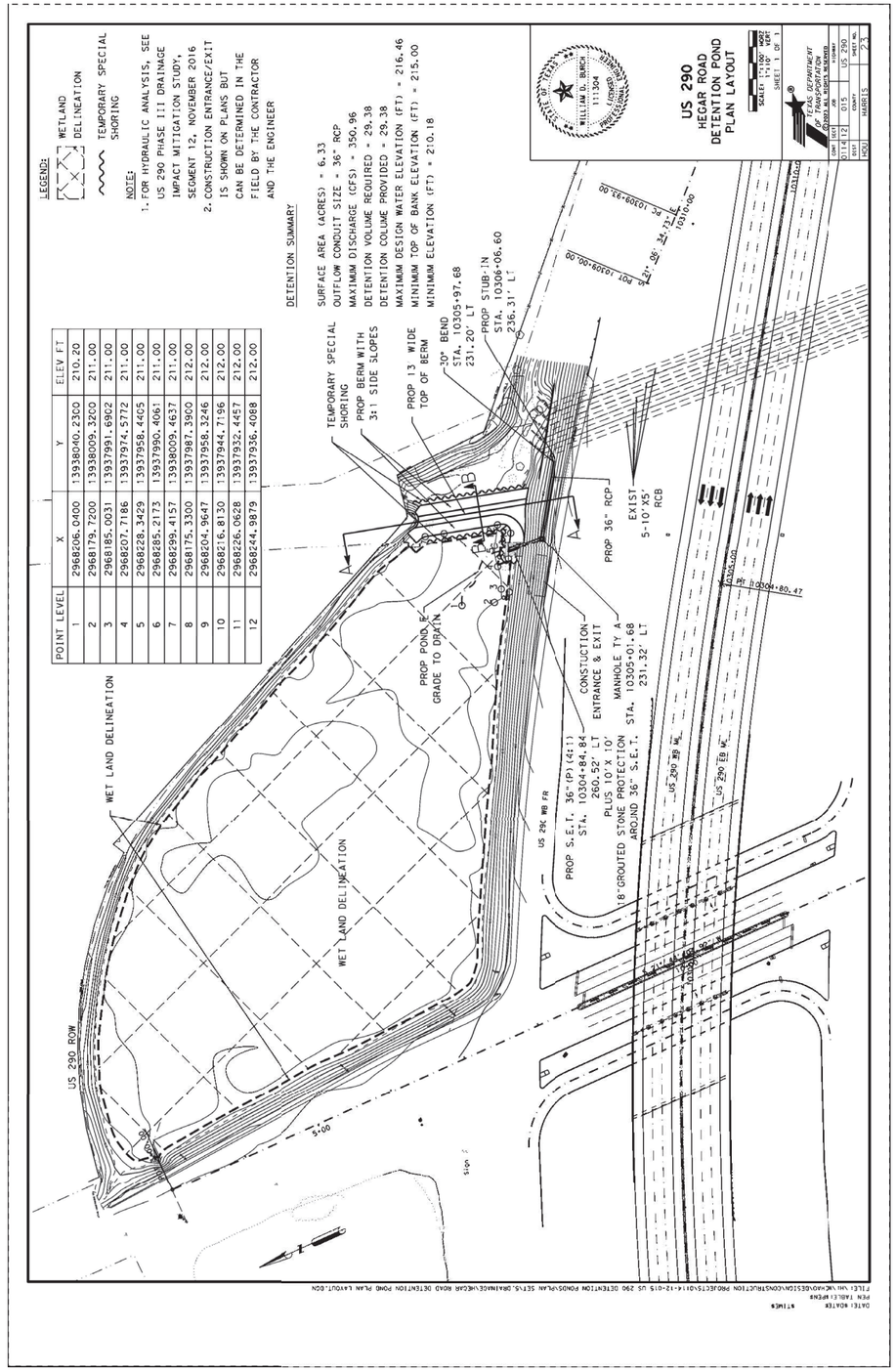
GIS Analyst: wihlanfeldt

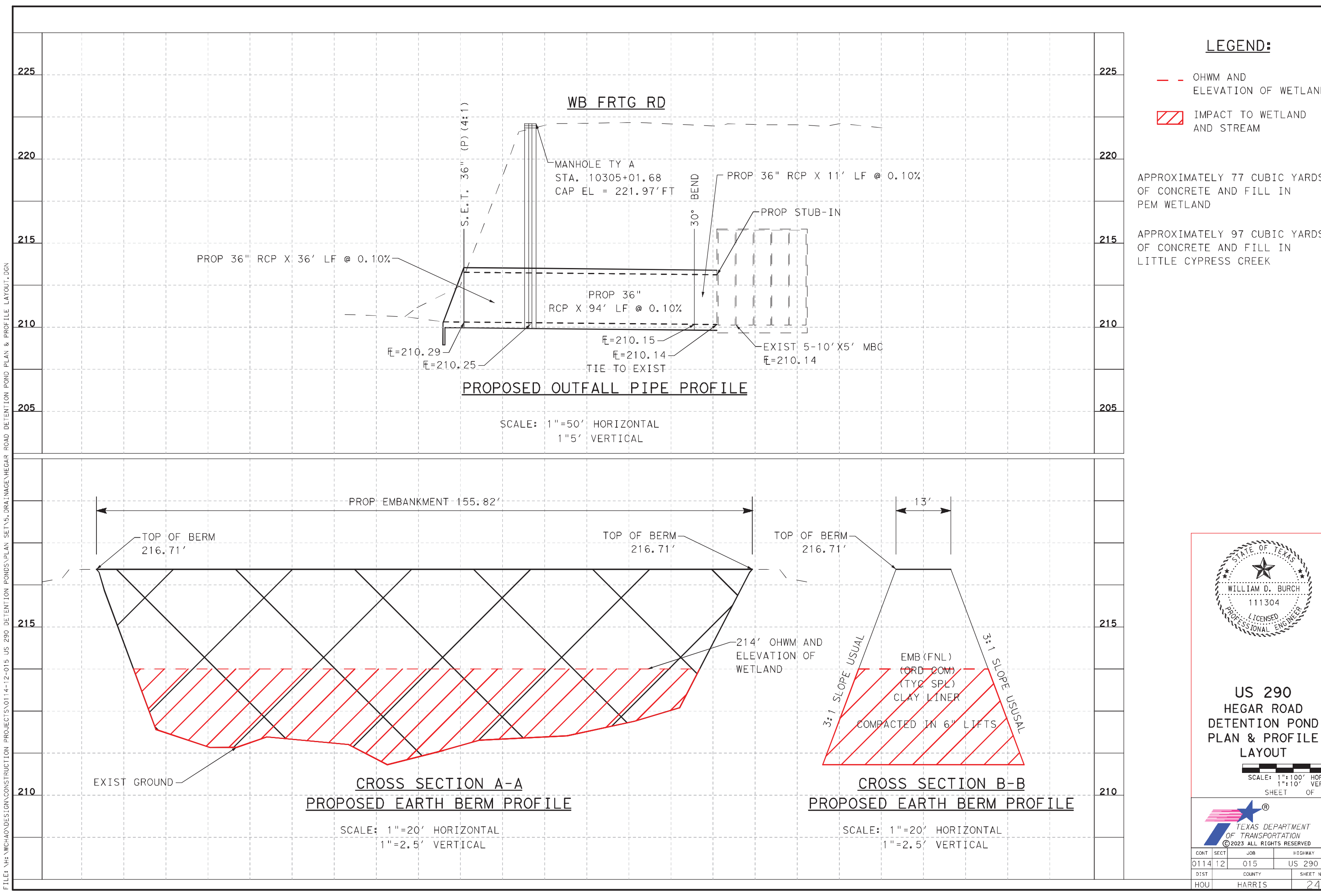
Data Source: Google Earth 2021 Aerial Imagery

Received 19 October 2022

Verified Project Plans
Page 7 of 8

SWG-2017-00292
Texas Department of Transportation




WB FRTG RD
MANHOLE TY A
STA. 10305+01.68
CAP EL = 221.97'FT
S.E.T. 36" (P) (4:1)
30° BEND
PROP 36" RCP X 11' LF @ 0.10%
PROP STUB-IN
PROP 36" RCP X 36' LF @ 0.10%
PROP 36"
RCP X 94' LF @ 0.10%
FL=210.29
FL=210.25
FL=210.15
FL=210.14
TIE TO EXIST
EXIST 5-10'X5' MBC
FL=210.14
PROPOSED OUTFALL PIPE PROFILE
SCALE: 1"=50' HORIZONTAL
1"5' VERTICAL
PROP EMBANKMENT 155.82'
TOP OF BERM
216.71'
214' OHWM AND
ELEVATION OF
WETLAND
EXIST GROUND
CROSS SECTION A-A
PROPOSED EARTH BERM PROFILE
SCALE: 1"=20' HORIZONTAL
1"=2.5' VERTICAL
13'
3:1 SLOPE USUAL
EMB(FNL)
(ORD COMP)
(TYC SPL)
CLAY LINER
COMPACTED IN 6" LIFTS
CROSS SECTION B-B
PROPOSED EARTH BERM PROFILE
SCALE: 1"=20' HORIZONTAL
1"=2.5' VERTICAL
225
220
215
210
205
LEGEND:
OHWM AND
ELEVATION OF WETLAND
IMPACT TO WETLAND
AND STREAM
APPROXIMATELY 77 CUBIC YARDS
OF CONCRETE AND FILL IN
PEM WETLAND
APPROXIMATELY 97 CUBIC YARDS
OF CONCRETE AND FILL IN
LITTLE CYPRESS CREEK
STATE OF TEXAS
WILLIAM D. BURCH
111304
LICENSED
PROFESSIONAL ENGINEER
US 290
HEGAR ROAD
DETENTION POND
PLAN & PROFILE
LAYOUT
SCALE: 1"=100' HORZ
1"=10' VERT
SHEET OF
TEXAS DEPARTMENT
OF TRANSPORTATION
©2023 ALL RIGHTS RESERVED
CONT SECT JOB HIGHWAY
0114 12 015 US 290
DIST COUNTY SHEET NO.
HOU HARRIS 24
DATE: 9/26/2022 1:57:24 PM

US Army Corps of Engineers ®

2021-COMBINED NATIONWIDE PERMIT (NWP) REGIONAL CONDITIONS FOR THE STATE OF TEXAS

The following regional conditions only apply within the Albuquerque District.

1. Dredge and Fill Activities in Intermittent and Perennial Streams, and Special Aquatic Sites: For all activities subject to regulation under the Clean Water Act Section 404 in intermittent and perennial streams, and special aquatic sites (including wetlands, riffle and pool complexes, and sanctuaries and refuges), Pre-Construction Notification (PCN) to the Albuquerque District Engineer is required in accordance with Nationwide Permit General Condition 32.

2. Suitable Fill. Use of broken concrete as fill or bank stabilization material is prohibited unless the applicant demonstrates that its use is the only practicable material (with respect to cost, existing technology, and logistics). Any applicant who wishes to use broken concrete as bank stabilization must provide notification to the Albuquerque District Engineer in accordance with Nationwide Permit General Condition 32 - PCN along with justification for such use. Use of broken concrete with rebar or used tires (loose or formed into bales) is prohibited in all waters of the United States.

3. NWP 27 – Aquatic Habitat Restoration, Establishment, and Enhancement Activities. For all proposed activities under NWP 27 that require pre-construction notification, a monitoring plan commensurate with the scale of the proposed restoration project and the potential for risk to the aquatic environment must be submitted to the Corps. (See “NWP 27 Guidelines” at http://www.spa.usace.army.mil/Missions/RegulatoryProgramandPermits/NWP.aspx).

The following regional conditions apply within the Fort Worth District and Galveston District Boundaries:

4. Notification to the appropriate District Engineer in accordance with Nationwide Permit General Condition 32 - Pre-Construction Notification (PCN) is required for all activities proposed for authorization by any NWP into the below listed ecologically unique and sensitive areas located within waters of the United States. The Corps will coordinate with the resource agencies as specified in NWP General Condition 32(d)(3).
    a. Pitcher plant bogs ((*Sarracenia* spp.) and/or sundews (*Drosera* spp.) and/or Bald Cypress/Tupelo swamps ((*Taxodium distichum*) and/or water tupelo (*Nyssa aquatica*)).
    b. Karst Zones 1 and 2 located in Bexar, Travis and Williamson Counties (see https://www.fws.gov/southwest/es/AustinTexas/Maps_Data.html).
    c. Caddo Lake and associated areas that are designated as “Wetland of International Importance” under the Ramsar Convention (see http://caddolakedata.us/media/145/1996caddolakeramsar.pdf or http://caddolakedata.us/media/144/1996caddolakeramsar.jpg).
    d. Reaches of rivers (and their adjacent wetlands) that are included in the Nationwide Rivers Inventory (see https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm).

US Army Corps of Engineers ®

2021-COMBINED NATIONWIDE PERMIT (NWP) REGIONAL CONDITIONS FOR THE STATE OF TEXAS

5. For all activities proposed for authorization under any NWP at sites approved as compensatory mitigation sites (either permittee-responsible, mitigation bank and/or in-lieu fee) under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899, the applicant shall notify the appropriate District Engineer in accordance with the Nationwide Permit General Condition 32 - PCN prior to commencing the activity.

The following regional conditions apply only within the Galveston District.

6. No NWP, except NWP 3, shall be used to authorize discharges into the habitat types or specific areas located within waters of the United States, listed in paragraphs a through c, below. The applicant shall notify the Galveston District Engineer in accordance with the NWP General Condition 32 - Pre-Construction Notification (PCN) prior to commencing the activity under NWP 3.
    a. Mangrove Marshes. For the purpose of this regional condition, Mangrove marshes are those waters of the United States that are dominated by mangroves (*Avicennia* spp., *Laguncuaria* spp., *Conocarpus* spp., and *Rhizophora* spp.).
    b. Coastal Dune Swales. For the purpose of this regional condition, coastal dune swales are wetlands and/or other waters of the United States located within the backshore and dune areas in the coastal zone of Texas. They are formed as depressions within and among multiple beach ridge barriers, dune complexes, or dune areas adjacent to beaches fronting tidal waters of the United States.
    c. Columbia Bottomlands. For the purpose of this regional condition, Columbia bottomlands must meet all of the following criteria: 1) wetlands and/or other waters of the United States, 2) currently dominated by bottomland hardwoods (Quercus spp.), and 3) located in the Lower Brazos and San Bernard River basins identified in the 1997 Memorandum of Agreement between the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Natural Resource Conservation Service, and Texas Parks and Wildlife Department for bottomland hardwoods in Brazoria County. (For further information, see http://www.swg.usace.army.mil/Business-With-Us/Regulatory/Permits/Nationwide-General-Permits/)

7. For all activities proposed under NWP 10 and 11 located in vegetated shallows and coral reefs; as defined by 40 CFR 230.43 and 230.44 respectively, the applicant shall notify the Galveston District Engineer in accordance with the NWP General Condition 32 - PCN. Examples include, but are not limited to: seagrass beds, oyster reefs, and coral reefs.

US Army Corps of Engineers ®

2021-COMBINED NATIONWIDE PERMIT (NWP)
REGIONAL CONDITIONS FOR
THE STATE OF TEXAS

8. Nationwide Permit 12, 57, and 58 shall not be used to authorize all discharges within 500 feet of vegetated shallows and coral reefs; as defined by 40 CFR 230.43 and 230.44 respectively. Examples include, but are not limited to: seagrass beds, oyster reefs, and coral reefs.

9. For all activities proposed for authorization under Nationwide Permit 12, 57, or 58 that involve underground placement below a non-navigable tributary there shall a minimum cover of 48 inches of soil below the river and/or perennial stream thalweg.

10. For all discharges and work proposed under NWP 14 and 18 in tidal waters, the applicant shall notify the Galveston District Engineer in accordance with the NWP General Condition 32 - PCN. The Galveston District will coordinate with the resource agencies in accordance with NWP General Condition 32(d)(3) - PCN.

11. No NWPs, except NWPs 3, 16, 20, 22, 37, shall be used to authorize discharges, structures, and/or fill within the standard setback and high hazard zones of the Sabine-Neches Waterway as defined in the Standard Operating Procedure - Permit Setbacks along the Sabine-Neches Waterway. The applicant shall notify the Galveston District Engineer in accordance with NWP General Condition 32 - PCN for all discharge, structures and/or work in medium hazard zones and all NWP 3 applications within the standard setback and high hazard zones of the Sabine-Neches Waterway.

12. No NWP, except 20, 22, and 37, shall be used to authorize discharges, structures, and/or fill within the standard setback exemptions of the Gulf Intracoastal Waterway as defined in the Standard Operating Procedure- Department of the Army Permit Evaluation Setbacks along the Gulf Intracoastal Waterway. The applicant shall notify the Galveston District Engineer in accordance with NWP General Condition 32 – PCN for all discharges, structures and/or work within the standard setback, shoreward of the standard setback, and/or standard setback exemption zones.

13. All work in the San Jacinto Waste Pit (SWJP) Area of Concern (AOC), authorized under an NWP, requires a waiver from the Galveston District Engineer (DE). The applicant shall notify the DE in accordance with the NWP General Condition 32 - PCN. The PCN shall be used to review the project to determine if it will result in more than minimal effects to the region and does not lessen the restriction provided by any General Condition of the NWPs. The applicant must receive written approval, including a waiver, from the DE prior to starting work in jurisdictional areas. (For further information, see http://www.swg.usace.army.mil/Business-With-Us/Regulatory/Permits/Nationwide-General-Permits/)

2021 Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. ***Navigation.*** (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his or her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. ***Aquatic Life Movements.*** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. ***Spawning Areas.*** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. ***Migratory Bird Breeding Areas.*** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. ***Shellfish Beds.*** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. ***Suitable Material.*** No activity may use unsuitable material (*e.g.,* trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. ***Water Supply Intakes.*** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. ***Adverse Effects From Impoundments.*** If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. ***Management of Water Flows.*** To the maximum extent practicable, the preconstruction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the preconstruction course, condition, capacity, and location of open waters if it benefits the aquatic environment (*e.g.,* stream restoration or relocation activities).

10. ***Fills Within 100-Year Floodplains.*** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. ***Equipment.*** Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. ***Soil Erosion and Sediment Controls.*** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. ***Removal of Temporary Structures and Fills.*** Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. Temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The affected areas must be revegetated, as appropriate.

14. ***Proper Maintenance.*** Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. ***Single and Complete Project.*** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. ***Wild and Scenic Rivers.*** (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a ''study river'' for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a ''study river'' for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. Permittees shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: http://www.rivers.gov/.

17. ***Tribal Rights.*** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. ***Endangered Species.*** (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify designated critical habitat or critical habitat proposed for such designation. No activity is authorized under any NWP which ''may affect'' a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or critical habitat has been completed. See 50 CFR 402.02 for the definition of ''effects of the action'' for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding ''activities that are reasonably certain to occur'' and ''consequences caused by the proposed action.''

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat or critical habitat proposed for such designation, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation), the pre-construction notification must include the name(s) of the endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or that utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. The district engineer will determine whether the proposed activity ''may affect'' or will have ''no effect'' to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have ''no effect'' on listed species (or species proposed for listing or designated critical habitat (or critical habitat proposed for such designation), or until ESA section 7 consultation or conference has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation or conference with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.

(e) Authorization of an activity by an NWP does not authorize the ''take'' of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (*e.g.,* an ESA Section 10 Permit, a Biological Opinion with ''incidental take'' provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where ''take'' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The

word ''harm'' in the definition of ''take'' means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://ww.nmfs.noaa.gov/pr/species/esa/ respectively.

19. *Migratory Birds and Bald and Golden Eagles.* The permittee is responsible for ensuring that an action authorized by an NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether ''incidental take'' permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. *Historic Properties.* (a) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If preconstruction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance

with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the preconstruction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: No historic properties affected, no adverse effect, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/ THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. ***Discovery of Previously Unknown Remains and Artifacts.*** Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. ***Designated Critical Resource Waters.*** Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 58 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after she or he determines that the impacts to the critical resource waters will be no more than minimal.

23. ***Mitigation.*** The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (*i.e.,* on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10 acre and require preconstruction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10 acre or less that require preconstruction notification, the district engineer may determine on a case-by case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100 acre and require preconstruction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100 acre or less that require preconstruction notification, the district engineer may determine on a case-by case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. If restoring riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the

stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (*e.g.,* riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f).)

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). If permittee responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(6) Compensatory mitigation requirements (*e.g.,* resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2 acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2 acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. ***Safety of Impoundment Structures.*** To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state or federal, dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. ***Water Quality.*** (a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived

(see 33 CFR 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires preconstruction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer. The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. ***Coastal Zone Management.*** In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). If the permittee cannot comply with all of the conditions of a coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by an NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. ***Regional and Case-By-Case Conditions.*** The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its CWA section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. ***Use of Multiple Nationwide Permits.*** The use of more than one NWP for a single and complete project is authorized, subject to the following restrictions:

(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3 acre.

(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2 acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 acre.

29. ***Transfer of Nationwide Permit Verifications.*** If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

''When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.''

_____

(Transferee)

_____

(Date)

30. ***Compliance Certification.*** Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation. The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. ***Activities Affecting Structures or Works Built by the United States.*** If an NWP activity also requires review by, or permission from, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a ''USACE project''), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission and/or review is not authorized by an NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. ***Pre-Construction Notification.*** (a) *Timing.* Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is ''no effect'' on listed species or ''no potential to cause effects'' on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the

permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification:* The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) (i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures. (ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project, and does not change those non-PCN NWP activities into NWP PCNs. (iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial and intermittent streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project

site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45-day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a ''study river'' for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the ''study river'' (see general condition 16); and

(10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.

(c) *Form of Pre-Construction Notification:* The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) *Agency Coordination:* (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) All NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via email, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or email that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the preconstruction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat

conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of preconstruction notifications to expedite agency coordination.