SEE SHEET 2 FOR
INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

DESIGN SPEED = N/A MPH
A.D.T. (20XX) IH-10 = N/A
A.D.T (20XX) IH-10 = N/A

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		1

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE AID PROJECT NO. C 924-6-635

VEGETATIVE LANDSCAPE
EL PASO COUNTY

NET LENGTH OF ROADWAY= 24,272 FT. = 4.402 MI.
NET LENGTH OF BRIDGE = 517 FT. = 0.098 MI. (NO WORK PROPOSED)
NET LENGTH OF PROJECT= 23,755 FT. = 4.500 MI.

LIMITS: CITY WIDE

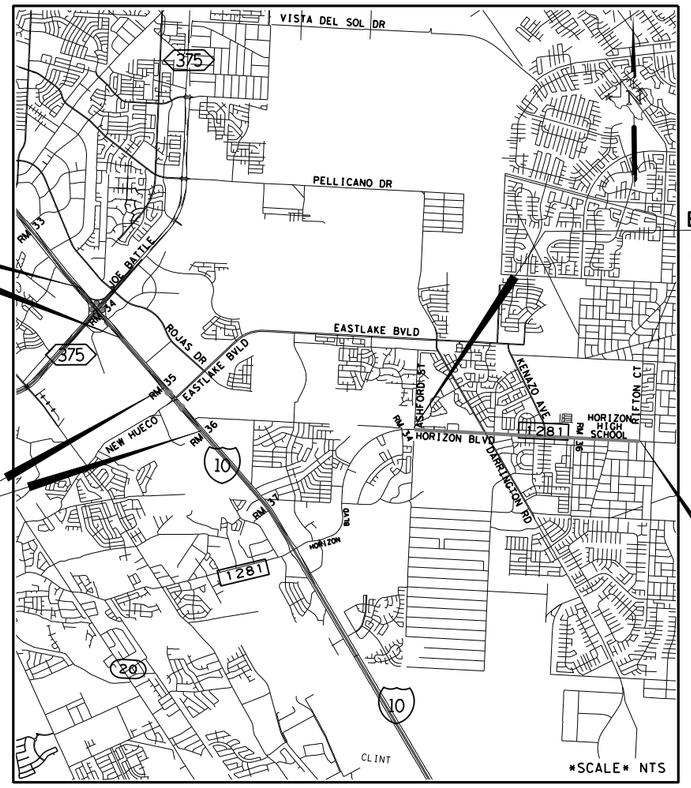
FOR THE CONSTRUCTION OF LANDSCAPE IMPROVEMENT
CONSISTING OF DESERT VEGETATIVE LANDSCAPE TO INCLUDE EXCAVATION, GROUND COVER, IRRIGATION SYSTEM AND MAINTENANCE CYCLE

BEGIN LIMITS:
IH-10
RM: 33+0.50
LAT: 31.706669
LONG: -106.290375

END LIMITS:
IH-10
RM: 34+0.00
LAT: 31.700264
LONG: -106.283253

BEGIN LIMITS:
IH-10
RM: 35+0.00
LAT: 31.691181
LONG: -106.272994

END LIMITS:
IH-10
RM: 36+0.00
LAT: 31.680864
LONG: -106.26111



BEGIN PROJECT
FM-1281
RM: 34+0.17
LAT: 31.6827478
LONG: -106.215498

END PROJECT
FM-1281
RM : 36+1.17
LAT: 31.6827569
LONG: -106.167521

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

TDLR INSPECTION NOT REQUIRED

FINAL PLANS

CONTRACTOR: _____
TIME CHARGES BEGAN: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK WAS COMPLETED: _____
DATE WORK WAS ACCEPTED: _____
TOTAL DAYS CHARGED: _____
ORIGINAL CONTRACT AMOUNT: $ _____
AMOUNT OF CONTRACT AMENDMENTS: $ _____
FINAL CONTRACT COST: $ _____

_____ 20 _____

_____
AREA ENGINEER

KEY TO COUNTIES

Texas Department of Transportation

RECOMMENDED FOR LETTING: 5/7/2021
DocuSigned by:
Eduardo Perales, P.E.
2778C60ADBF7426...
SAFETY REVIEW COMMITTEE CHAIRMAN

RECOMMENDED FOR LETTING: 5/7/2021
DocuSigned by:
L. Raul Ortega Jr., P.E.
0F17B0B8F6044...
DISTRICT DIRECTOR OF TRANSPORTATION
PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 5/7/2021
DocuSigned by:
Tom Truan, P.E.
7A68C5EA0D94496...
DISTRICT ENGINEER

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED SPECIAL LABOR PROVISIONS FOR ALL STATE CONSTRUCTION PROJECTS. (SP000-008)

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)- 14 THRU BC (12)- 14 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

DATE: 05/03/2021 07:59 AM
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INDEX OF SHEETS

SHEET NO.	DESCRIPTION
	GENERAL
1	TITLE SHEET
2	INDEX OF SHEETS
3-4	PROJECT LAYOUT
5	PROJECT LAYOUT (HORIZON BLVD)
6, 6A-6H	GENERAL NOTES
7	QUANTITY SHEET
8	QUANTITY SUMMARY
9	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
	TRAFFIC CONTROL
10	TYPICAL SECTION
	"TRAFFIC CONTROL STANDARDS"
*11-22	BC (1)-14 THRU BC (12)-14
*23	TCP (1-1)-18
*24	TCP (6-8)-14
*25	WZ (BRK)-13
	IRRIGATION
26-29	IRRIGATION PLAN (HORIZON BLVD)
29A	IRRIGATION DETAILS
	LANDSCAPE
30-33	HARDSCAPE LAYOUT
34	HARDSCAPE LAYOUT (HORIZON BLVD)
35-40	PLANTER LAYOUT
41-47	TREE LOCATION PLAN (HORIZON BLVD)
	DETAILS
48-49	PLANT SCHEME LAYOUT
50	PLANTING DETAILS
51	PLANT SPECIFICATIONS
52	MISCELLANEOUS DETAILS
	ENVIRONMENTAL
53	STORMWATER POLLUTION PREVENTION PLAN (SWP3)
54-57	SWP3 PLAN LAYOUT
58-60	SWP3 PLAN LAYOUT (HORIZON BLVD)
	"ENVIRONMENTAL ISSUES STANDARDS"
*61	EC (1)-16
*62-64	EC (9)-16

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A "*" HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

, P.E. — 6/1/21

NAME — DATE

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

, P.E.

06-01-2021

VEGETATIVE LANDSCAPE

LANDSCAPE

INDEX OF SHEETS

NTS — SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		2

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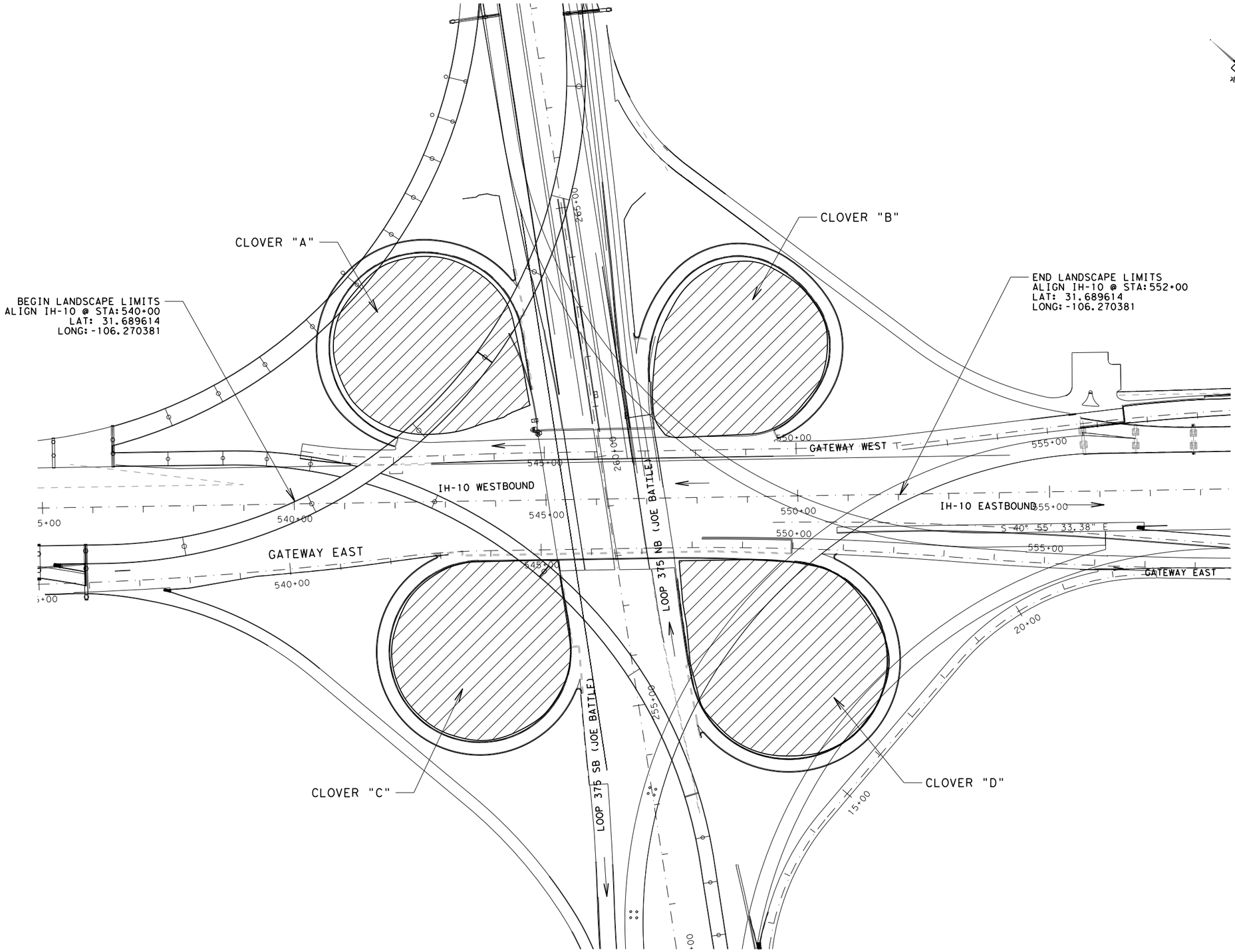

IH 10 AND LOOP 375

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

P.E.

06-01-2021

VEGETATIVE LANDSCAPE AT IH-10
GENERAL

PROJECT LAYOUT

NOT TO SCALE SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		3

DATE: 05/06/2021 12:03 AM
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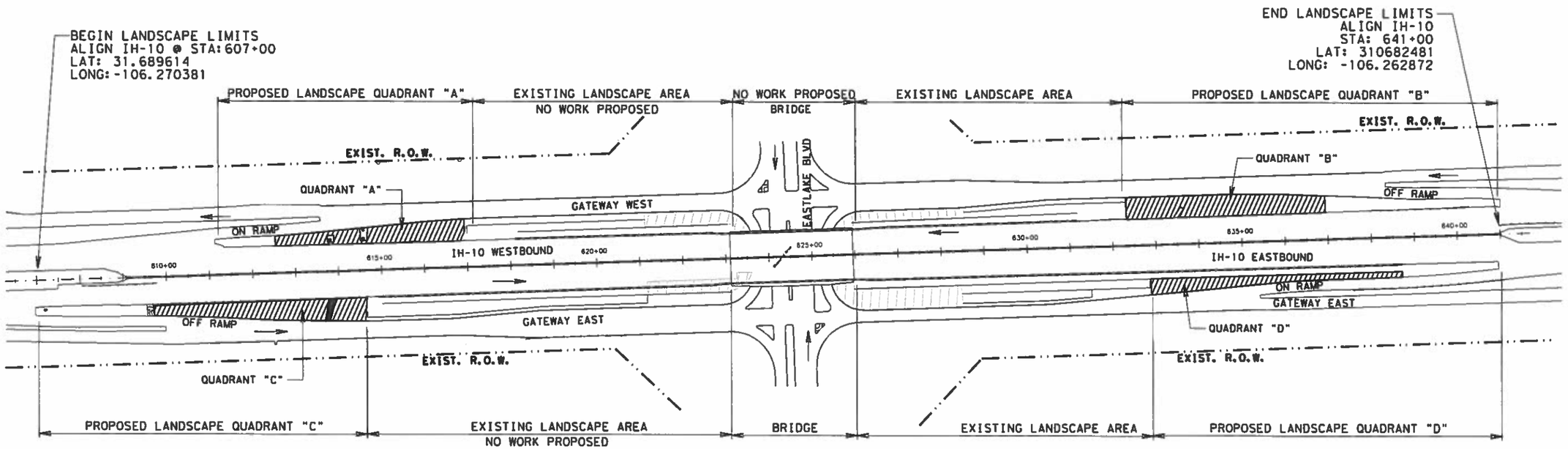
TRAFFIC DIRECTION

PROPOSED WORK



IH 10 AND EASTLAKE BLVD

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

P.E.

5/6/21

VEGETATIVE LANDSCAPE AT IH-10 GENERAL

PROJECT LAYOUT
(EASTLAKE BLVD)

NOT TO SCALE SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		4

DATE: 05/04/2021 05:50 AM
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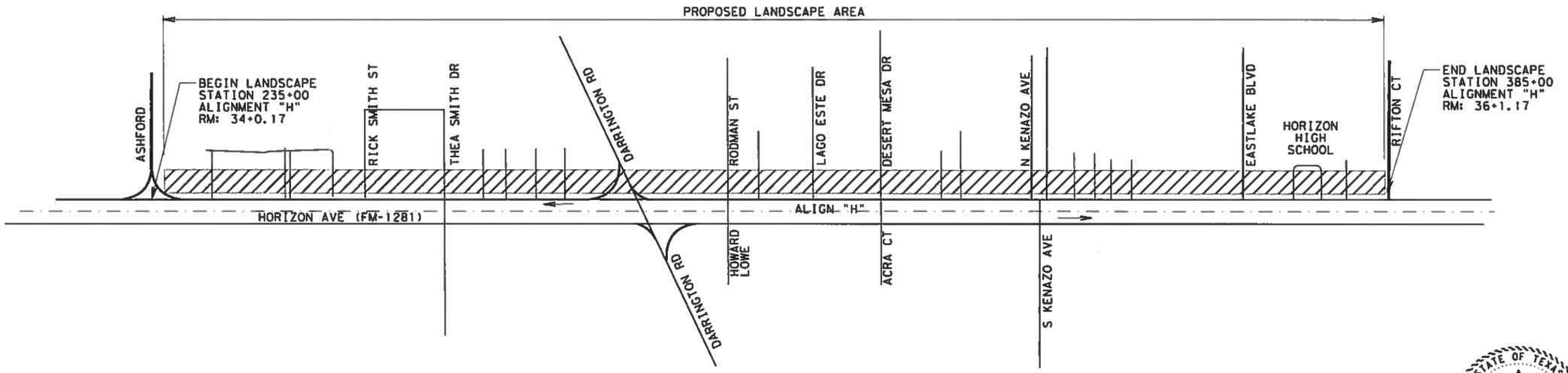
TRAFFIC DIRECTION

PROPOSED WORK



FM 1281 (HORIZON BLVD)

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

P.E.
05/6/21

VEGETATIVE LANDSCAPE AT FM-1281
GENERAL

PROJECT LAYOUT
(HORIZON BLVD)

NOT TO SCALE SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		5

DATE: 05/04/2021 05:50 AM
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General Notes:

General Requirements

Maintain the entire project area in a neat and orderly manner throughout the duration of the work. Remove all construction litter and undesirable vegetation within the right of way inside the project limits. This work will be subsidiary to the various bid items.

Become familiar with project site prior to submitting bids.

Coordinate with project engineer before performing any right of way or excavation preparation to ensure that proposed work does not interfere with other construction projects in the same area.

Do not leave vehicles, equipment or material within 30 feet of edge lines nor within 9 feet of any service roads when vehicles, equipment or materials are not in use.

Protect pavement and right of way (R.O.W.) areas within and outside the actual project limits from damage when moving or crossing equipment on public highways.

Damaged areas must be repaired within forty-eight (48) hours of notification from the Department. Contact the Department to receive direction and prior approval to any repairs.

Comply with all Occupational Safety & Health Administration (OSHA) and United States Environmental Protection Agency (EPA) regulations as well as all local and State requirements.

Refer to the various traffic control plan project overview sheets for the proposed sequence of work. Changes will not be permitted, except as approved in writing by the Engineer.

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

Ricardo Romero Ricardo.Romero@txdot.gov

Aldo Madrid Aldo.Madrid@txdot.gov

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:

https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

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

Protect tree root systems from damage due to: noxious materials caused by runoff or spillage while mixing, placing or storing construction materials; flooding, eroding, or excessive wetting caused by watering operations.

Item 4 – Scope of Work

This contract is for landscape improvements on IH-10 at Loop 375 Clover areas, Eastlake Blvd. Intersection and right of way area at FM 1281 (Horizon Blvd) in El Paso County, Texas.

Landscape existing ponding clover areas on IH-10 and Loop 375 and at Eastlake Blvd. intersection. Prepare planting areas by removing top layer of contaminated soil or riprap as shown on the plans. Work planting mix into existing soil, add new vegetation, weed barrier, and 3" layer of landscape rock as shown on the plans.

Propose landscape improvement for FM-1281 (Horizon Blvd.) at the bike and walk trail by planting additional trees and vegetation including an irrigation system to include removal of earthen mounds on areas shown on the plans.

Maintain newly landscapes areas for a 12 months maintenance cycle on project areas of IH-10.

Provide vehicular and pedestrian access at all times, including Saturdays, Sundays, and holidays. This access includes, but is not limited to, driveways, streets, parking areas, and walkways. This shall be considered subsidiary to the various bid items.

Schedule and perform all work to assure proper drainage during the course of construction operations. All labor, tools, equipment and supervision required, to ensure drainage, removal, and handling of water shall be considered incidental work.

Repair any existing pavement, curb, utilities, structures, etc., damaged as a result of construction operations, at no additional cost to the Department.

Maintain all Contract items until final acceptance of the project.

Item 5 – Control of the Work

Inform the Engineer and the respective utility companies, when it becomes apparent that the utility lines will interfere with the work in progress.

Arrange the operations so that any two-consecutive exit or entrance ramps will not be closed at the same time, unless directed.

Protect existing native areas and existing plants to remain within the work zone with orange plastic tape fence and stakes, or as directed. Materials and labor are subsidiary to this Item.

Prior to construction, meet with Engineer in the field to review status and intentions for existing trees in project area.

Coordinate with ongoing construction projects prior to setting up lane closures and beginning work.

Item 7 – Legal Relations and Responsibilities

Comply with all requirements of the Environmental Permits Issues and Commitments (EPIC) Sheet.

Dispose of all waste materials in compliance with Local, State, and Federal regulations. Submit list of all approved waste sites to the Engineer for review.

Do not discharge any liquid pollutant from vehicles onto the roadside. Immediately clean spills and dispose in compliance with local, state, and federal regulations to the satisfaction of the Engineer at no additional cost to the Department.

Occupational Safety & Health Administration (OSHA) regulations prohibit operations that bring people or equipment within 10 ft. of an energized electrical line. Where workers and/or equipment may be close to an energized electrical line, notify the electrical power company and make all necessary adjustments to ensure the safety of workers near the energized line.

No significant traffic generator events identified.

Item 8 – Prosecution and Progress

Working days will be calculated in accordance with Section 8.3.1.4., “Standard Workweek.”

A bar chart schedule is required for this project conforming to Section 8.5.5.1., “Bar Chart.” Provide updates as directed by the Engineer.

Prior to beginning operations, schedule and attend a preconstruction conference with the Engineer. Provide the Department a written outline of the proposed sequence of work (Bar Chart Schedule) and an estimated progress schedule.

Keep traveled surfaces used in hauling operations clear and free of dirt or other material.

Existing pavement, utilities, structures, etc. damaged as a result of the operations will be repaired at no additional cost to the Department.

Protect from damage and destruction all areas of the right of way, which are not included in the actual limits of the proposed construction areas. Exercise care to prevent damage to trees, vegetation, and other natural features.

Item 9 – Measurement and Payment

Submit Material on Hand (MOH) payment requests at least **three (3)** working days before the end of the month for payment consideration on that month’s estimate.

This Item shall cover all items requiring removal as directed by the Engineer not governed otherwise by individual removal pay items elsewhere in the plans.

Item 110 – Excavation

Use this Item within during initial grading. Protect newly graded areas from traffic and erosion.

Remove and disposed of properly of all materials at approved locations off the right of way in accordance with local, state, and federal requirements. Disposal of materials is subsidiary to this Item.

For FM-1281 (Horizon Blvd) this Item shall be used to remove existing weeds, litter, tree stumps, rocks and foreign materials not deemed for preservation buried in the areas of proposed work. Existing earth mounds of accumulated sand and weeds located approximately between stations 329+50 to 332+00 (between the Clint Independent School District (CISD) driveways) shall be removed under this item to the natural ground level. Locations are shown on the “Tree Location Plan” sheets 4 and 5. Preserve existing bike and walk trail, trees, plants and irrigation system PVC lines and other features located within the project limits.

For the proposed excavation work on IH-10 at Loop 375 Clovers and Eastlake Blvd use this Item to remove a 6 inch earthen or millings layer from top of existing grade level of deleterious soil on the limits shown on the “Removal Layout” and “Section Detail” sheets.

Remove asphalt, weeds, roots, buried concrete, and any other items not designated for preservation. Prepare area as shown on the “Removal Layout” and “Section Detail” sheets.

Contractor shall remove soil and prepare the area for proposed new planter bed area as per Item 192. Dispose of excavated soil, roots, weeds, millings and other materials within the project area.

Should disputes in earthwork quantities exist, provide notification to the Engineer prior to performing any related work. Provide existing and proposed cross-sections for further review and consideration for payment. Failure to provide documentation voids the Contractor’s work for any potential compensation.

Do not excavate within drip line of existing trees unless otherwise indicated. Maintain original grades within drip line around existing trees. Minimize site disturbance during all grading operations.

Accept ownership of and properly dispose removed excavated soil in accordance with federal, state, and local regulations.

Contractor shall remove and disposed of properly of all materials at approved locations off the right of way in accordance with local, state, and federal requirements. Disposal of materials is subsidiary to this Item.

Item 170 – Irrigation System

Install a drip system and new irrigation components in the areas shown on the irrigation layout sheets. Special care should be taken to protect plant roots. Install proposed emitters as shown on the Irrigation Details sheet. All work, materials, and labor required for connection are subsidiary to this Item.

Provide Schedule 80 PVC rated for direct sunlight exposure for all above ground pipe including risers and swing-joint components.

Install irrigation system using the bore method when crossing existing roadways and driveways as directed. All bores are subsidiary to this Item.

Measure pressure on outflow side of meter and provide information to the Engineer to verify system function.

Drawings are generally diagrammatic and indicative of the work to be installed. Alternate plans submitted by the Contractor must be sealed by a licensed Engineer and submitted for approval.

Due to the scale of the drawings, it is not possible to indicate all offsets, fittings, and sleeves that may be required. Investigate site conditions affecting all work and plan accordingly, furnishing such offsets, fittings, borings, and sleeves as may be required to meet site conditions as directed. This work and materials are subsidiary to this Item.

Contact and coordinate with Albert Valle, CFM, Public Works Director, Town of Horizon City, Cell Number: (915)630-8528 Office Number: (915)852-1046 ext. #402 and the El Paso Water Utilities to verify meter locations prior to installation. Obtain all required permits and licenses and pay all fees necessary for the installation and operation of the proposed irrigation system subsidiary to this Item.

Upon completion of the project, furnish a set of 11x17 as-built plan sheets prepared by a qualified draftsperson. Show all system changes, rerouting of main and lateral lines, size of water meters installed along with the location address and meter number. Provide any manufacturer literature and warranty documents for the irrigation system components for submission to the agency responsible for maintenance. This work is subsidiary to this Item.

Do not willfully install the irrigation system as shown on the plans when it is obvious in the field that obstructions, grade differences, or discrepancies in area dimensions exist. Bring such observations to the attention of the Engineer who will recommend necessary changes. Consider this work incidental to the project. Assume full responsibility in the even this notification is not performed.

In the event of a conflict between plans and the irrigation design, notify the Engineer in writing. Do not precede with installation of conflicting irrigation components until written clarification is received.

Sleeve all pipes installed under paved areas. Extend sleeves 24 in. beyond the edge of hard surfaces. Wrap ends with 4 mm. plastic and good quality plastic tape. Gray duct tape is not acceptable.

Hydrostatically test irrigation main line for a 24-hour period and present the results in writing to the Engineer. Secure approval for any alternative locations before installation.

Ensure all fittings incorporated into the system are of the same type and class material as the irrigation pipe and regularly manufactured parts (reducers, bushings, and other appurtenances).

Miter all pipe cuts to 90 degree and remove all burrs prior to gluing. Pipes that are 3 in. or larger must have a filed, beveled edge a minimum of 1/4 the width of pipe wall to assure a proper solvent weld.

Perform pipe solvent welding procedures on all joints as follows: First use IPS weld-on purple primer P68 or P10; then use IPS weld-on Gray Glue #711 heavy duty. Wipe off all excess cement and let set as per manufacturer's recommendations. Install set and cure times are as shown on Table 1 Set and Cure Times.

Table 1
Set and Cure Times

Pipe Size	Set Times	Cure Times
1/2" to 1-1/4"	4 min.	20 min.
1-1/2" to 2"	8 min.	30 min.
2-1/2" to 6"	2 hr.	4 hr.

When humidity exceeds 60% increase cure time by 50%. Once weld is set, do not move pipe for any reason until set time is achieved and do not turn water on until cure time is achieved.

Provide drip emitters with an application rate of 1 gal. per hour such as Rainbird Xeri-Tube-PC, Orbit Irrigation, The Toro Company, or an approved equal. Use distribution line consisting of 1/2 in. (nominal) low density linear polyethylene tubing. Provide emitters that independently regulate constant discharge rates throughout the run of the tubing. Discharge rates may range between 0.9 to 2.0 gal. per hour when pressure ranges between 5 psi to 50 psi. Provide emitters that continuously clean themselves while in operation. Provide dripper-line connections made with approved insert or compressed fittings.

Provide Rainbird “PEB,” Orbit Irrigator, or The Toro Company remote control valves of the sizes indicated on the plans or an approved equal. Furnish valve data for approval prior to beginning work. Provide two, Three-Program Battery Operated remote control units.

Mount all gate valves, remote control valves, and quick coupling valves below grade in Ametek or approved equal valve boxes. Minimum size of box must be the same as Model No. 1011. Install with the top flush with finished grade. Increase the size of box as directed when more than one valve occupies the same box in order to provide easy access to valves and controller for maintenance.

Provide two-piece, single-lug operated brass quick-coupling valves with 3/4 in. IPS connection and 1/2 in. IPS discharge at the key (Rainbird 33DRC, Orbit Irrigation, The Toro Company, or an approved equal). Furnish one key complete with a hose swivel fitting for each quick-coupling valve shown on the plans.

Separate field wiring in a separate trench with expansion loops every 200 ft. Do not stretch wire tight. Use standard colors: red (hot) and white (common) for valve wire and label at controller and in valve box. Color code all low voltage control wire and provide waterproof compression clamps covered with fusion bonding epoxy or fine powder coating, an approved electrical coating varnish such as Scotchkote, Rilsan, or an approved alternate for all connections.

Protect all connections to a potable water supply with a double check backflow preventer in the sizes shown on the plans. Backflow preventer must meet El Paso Water Utilities and Horizon Regional Municipal Utility District standards and specifications requirements.

Provide instructions covering full operation, care, and maintenance of the equipment, including a schedule showing length of time each valve is to be open to provide determined amount of water. Instruct designated personnel in proper operation of the system.

Irrigation in Texas is regulated by the Texas Commission on Environmental Quality (TCEQ), P.O. Box 13087, Austin, TX 78711.

Item 192 – Landscape Planting

After plants have been placed in the ground place colored ribbon to all newly planted stock to help identify and separate from existing vegetation for maintenance purposes under this item and Item 193 Maintenance Cycle.

Plant material: Provide quality plants of the size, and condition at nursery and when delivered at job site will be in accordance with American Standard for Nursery Stock, current edition, as published by The American Association of Nurserymen and the Texas Association of Nurserymen requirements.

Provide written assurance that all materials necessary to complete the project as specified have been located.

Plants or trees shall not interfere with existing structures or a utility box.

Do not place trees with the potential of blocking a sign or in front of the face of any sign. Trees shall be moved or transferred to another location within the planting area to avoid obstruction.

Plant material substitutions are not allowed without the written permission of the Engineer. Requests for substitutions must be submitted no later than 2 weeks prior to the initiation of work. The sum of materials differing in kind and quality or size from that specified will be allowed only after proving that all means of obtaining and specified materials have been exhausted.

Provide nursery grown plants that are tagged with nursery labels indicating species and variety. Remove nursery tags after acceptance of planted material at site.

Remove all protective material such as burlap, strings, wire, etc. before placing plant in plant pits and completion of all planting work.

Notify Engineer when plant material is available for inspection at the nursery prior to delivery and before and after planting at the job site.

The Engineer will be the judge of the quality and acceptability of all plant materials. All rejected material will be immediately removed from the site and replaced with acceptable materials as specified under this Item and no additional cost to the Department.

Provide plants typical of their species or variety and have normal, well developed branches and vigorous root systems that are sound, healthy, free from defects, disfiguring knots, abrasions or the bark, sunscald injuries, plant diseases, insect eggs, borers and all other forms of infections.

Provide plant material that has a uniform shape around its complete circumference. Plant material with irregular branching patterns or with branching patterns more highly developed on one side than the other sides are not acceptable.

Ensure that container grown plant material has been established in its delivery container no less than six months but not more than two years. Root-bound material will not be accepted.

Plant Replacement: Remove and dispose of any vegetation as per item 192.3.15.9. Replace plants that do not flourish or show signs of good health, disease or insects within the first 90 days of planting as per Item192.3.15.9.

Plant mix: Provide a planting soil mix that is appropriate for desert and cactus plants. Provide a mix with the following ingredients and shall be primarily a combination of sand, peat and cactus potting soil. Combine the ingredients and mix at a separate location prior to placing it into the planter bed areas.

Prepare the mixture to have the following ratio: 25% sand, 50% peat and 25% potting soil.

Mixing and combining the peat, sand and cacti soil – cactus soil is not to be paid separately but all work, tools, labor and incidentals is subsidiary under this item.

Avoid cactus potting soil that is mostly compounded of large bark pieces and wood chips. Use potting soil that is compounded of organic materials that is appropriate for cactus vegetation.

Fertilizer: Use time-release fertilizer release in granular form with a NPK of 5-20-20. Carefully work fertilizer into the soil prior to placing plants. Avoid spreading fertilizer on the plant leaves or tree trunks.

Weed barrier: A minimum 30 mm woven polypropylene vegetative barrier or approved equal is to be placed under loose aggregate, as shown on the plans.

Excessive overlapping of weed barrier causing an over-usage of material will not be paid for separately but it is subsidiary to this Item. Vegetation barrier will be paid for as the quantity provided on the estimate sheet. Keep weed barrier overlaps at a minimum of 6 inches to a maximum of 12 inches between fabric overlay.

Plant Pit Excavation and basins: Excavate plant pits as shown in the “Planting Details” sheets and as per Item 192.3.4. Construct plant basins as per Item 192.3.6 and as shown on the “Planting Details” sheet. Plant pits and basins will not be paid for separately but is subsidiary to this Item 192.

Plant Bed Preparation: Prepare planting areas on the limits shown on the “Plant Scheme Layout” sheets. Use this Item to prepare the planting areas by removing sticks, rocks, weeds, grasses, trash, and any foreign material that is detrimental to plant growth. Cultivate a 6 inch layer of the native soil with plant mix to cover the entire planter areas.

Use a 50% native soil and 50% plant mix ratio to cultivate the plant bed areas. Place a 3” layer of the newly prepared plant mix at the entire planter bed area and work (mix it) it into the native soil (backfill) at planter areas down to 3” depth from top of new grade. This is to provide a 6 inch layer of cultivated soil with a 50% native soil and 50% plant mix ratio.

Thoroughly cultivate (mix) the plant mixture into the plant bed areas to a depth of 6 inches below new grade creating a loose friable soil within the planting area before placing the plants.

Complete this task several days before weed barrier and plant installation.

Comply and follow vegetation maintenance during the required establishment period as stated under Item 193, “Plant Maintenance”.

Existing plant material damaged during construction activities will be replaced with a similar type and size of plant at no additional cost to the Department.

Item 193 – Landscape Establishment

Begin this Item after final payment is approved in accordance with Article 192.5.4, “Final Payment”.

Coordinate site visits for maintenance with Albert Valle, CFM, Public Works Director, Town of Horizon City, as there is existing maintenance contract for existing trail vegetation and not interfere with existing maintenance schedule.

Irrigation system Maintenance: Inspect irrigation system to ensure valves and system is working properly. Repair leaks and/or replace malfunctioning components of the same type and manufacture as originally installed. Repairs to be performed in a timely manner as required or as directed by the engineer. Coordinate maintenance visits and repairs with

Adjust water to provide adequate moisture to plants during the hot season and reduce water during plant’s dormant season. Winterize the system to prevent freeze damage when the temperatures fall below 32 degrees Fahrenheit

Plant Maintenance: Inspect planted stock in planted areas, rock, and mulch at least every two weeks. Maintenance includes vegetative watering, weeding, cultivating, removal of dead material and debris, resetting of trees to upright positions and such other operations as may be necessary for the health of the planted stock and the general appearance of the landscaped areas. Plant protection and health shall include the care of the planted stock from damages resulting from overwatering or lack of watering, root rot, apparent maintenance neglect, erosion of rock, disease and the like.

Apply pesticides under the supervision of a person processing a license issued by the Texas Department of Agriculture. Inspect for pests and dead vegetation and apply pesticide as needed. Perform required maintenance in accordance with Section 193.3 “Work Methods”.

Notify the Engineer in writing of problems with insects, diseases or animals as problem arise. Apply herbicide for insects and animal control as needed or as directed. This labor, tools and incidentals needed to perform this work are subsidiary to this Item.

Exercise care when applying herbicide, any damage incurred due to Contractor negligence will be Contractor’s responsibility.

Apply fertilizer uniformly to all plants as part of the 12-month maintenance period and as indicated on the schedule chart on the “Planting Details” sheet.

Remove litter, weeds and debris from landscaped areas as part of the maintenance duties under item 193.3 “Work Methods”. Plants shall be trimmed, edged and weeds removed under this Item.

Vegetative Watering: Adjust water during heavy rainfall and monsoon season. Water frequency to be adjusted as needed for desert and cactus plants to avoid root rot and/or excessive watering for desert plants.

Plant Replacement: Remove dead or dying plants and dead, diseased, or damaged limbs on trees and shrubs. Use quantities shown for plant replacement on the “General Summary” and “Plant Specifications” sheets to replace vegetation that does not flourish due to Contractors negligence, “Acts of God” or die during the plant establishment period.

This Item is for full compensation for plant replacement, furnishing and operating equipment for litter pick up, trimming, pruning, fertilizer, herbicide application, labor, materials, tools and incidentals required to perform maintenance work.

Item 502 – Barricades, Signs, and Traffic Handling

Prior to beginning construction, the Engineer will approve the routing of traffic and sequence of work.

Additional signs and barricades, placed as directed, will be considered subsidiary to this Item.

All work and lane closures are restricted to non-peak hours defined as 9 A.M. to 4 P.M., Monday through Friday, or night-time hours of 7 P.M. to 6 A.M., Sunday through Thursday, unless otherwise directed in writing.

All TMA Operators must participate in a TMA workshop to be conducted by the El Paso District Safety Office, on the proper use of TMAs, prior to working on Department Right of Way (ROW). A certificate of completion will be issued to TMA Operators that successfully complete the TMA workshop. The certificate of completion must be carried by TMA Operators at all times while working on Department right of way.

In accordance with Section 7.2.6.1, designate, in writing, a Contractor Responsible Person (CRP) and a CRP alternate to take full responsibility for the set-up, maintenance, and necessary corrective measures of the traffic control plan. The CRP or CRP alternate must be present at site and implement the initial set up of every traffic control phase/stage, at each location, and/or each call out, for the entire duration of the project.

At the written request of the Engineer, immediately remove the CRP or CRP alternate from the project if, in the opinion of the Engineer, is not competent, not present at initial TCP set-ups, or does not perform in a proper, skillful, or safe manner. These individuals shall not be reinstated without written consent of the Engineer.

CRP and CRP alternate must be trained using Department approved training. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 2 for Department approved Training.

Table 2

Contractor Responsible Person and Alternate

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCS	Traffic Control Supervisor	2 days	
National Highway Institute	133112 133113	Design and Operation of Work Zone Traffic Control Work Zone Traffic Control for Maintenance Operations	1 day 1 day	Both courses are required to meet minimum required training.
Texas Engineering Extension Services	133112A	Design and Operation of Work Zone Traffic Control	3 days	
University of Texas Arlington Division for	WKZ421	Traffic Control Supervisor	16 hours	Contact UTA for training needs.

All contractor workers involved with the traffic control implementation and maintenance must participate and complete a Department approved training course. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 3 for Department approved training.

Table 3

Other Work Zone Personnel

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCT	Traffic Control Technician	1 day	
Texas Engineering Extension Services	HWS002	Work Zone Traffic Control	16 hours	Identical to HWS-410. Counts for 3 year CRP requirement.
National Highway Institute	133116	Maintenance of Traffic for Technicians	5 hours	Web based
National Highway Institute	134109-I	Maintenance Training Series: Basics of Work Zone Traffic Control	1 hour	Free, Web based
University of Texas at Arlington, Division for Enterprise	WKZ100	Work Zone Safety: Temporary Traffic Control	4 hours	Note name change. Free, Web based
TxDOT/AGC Joint Development	N/A	Safe Workers Awareness Highway Construction Work Zone Hazards	16 minutes 18 minutes	Videos available through AGC of Texas offices. English & Spanish
AGC America	N/A	Highway Work Zone Safety Training	1 day	
Texas Engineering Extension Service	HWS400	Temporary Traffic Control Worker	4 hours	Contact TEEX, if interested in course
TxDOT/AGC Joint Development	N/A	Work Zone Fundamentals	10 minutes	Videos available through ACT of Texas offices. English & Spanish

Contractor may choose to train workers involved with the traffic control implementation and maintenance with a contractor developed training in lieu of Department approved training. Contractor developed training must be equivalent to the Department approved training shown in Table 2. Provide the Engineer a copy of the course curriculum for pre-approval, prior to conducting the contractor developed training. Provide the Engineer a copy of the log of attendees after training completion for project records.

Acquire the TCP and TMA Operator's certificates of completion prior to the authorization to begin work. No time suspension will be granted and no traffic control work will be allowed without certificates of completion.

Existing regulatory signs, route marker auxiliaries, guide signs, and warning signs that must be removed due to widening shall be relocated temporarily and erected on approved supports at locations shown in the plans, or as directed. This work will not be paid for directly, but considered subsidiary to this Item.

Notify the Department officials when major traffic changes are to be made, such as detours. Coordinate with the Department on all traffic changes. Advance notification for the following week's work must be made by 5 P.M. on Wednesdays.

If Law Enforcement Personnel is required by the Engineer, coordinate with local law enforcement as directed or agreed. Complete the weekly tracking form provided by the Department and submit invoices with 5% allowance for Law Enforcement payments by Contractor that agree with the tracking form for payment at the end of each month where approved services were provided.

Provide access to intersecting side roads and driveways at all times, unless otherwise directed.

Any change to the sequence of work or TCP, with approval, assumes the responsibility for any additional barricade signs and devices.

Use striping operations to channelize traffic into the newly completed roadway, as directed. Maintain shoulders and median areas in a condition capable of serving as emergency paths, as approved. This work will be subsidiary to this Item.

Use portable changeable message signs (PCMS) to alert public of temporary ramp construction two weeks prior to construction.

Use flaggers when directed. Provide two-way radio communication for all flaggers.

Place and maintain sufficient additional warning signs, beacons, delineators, and barricades to warn and guide the public of all hazards through the construction zone at all times, and as directed.

Use flashing arrow boards on all tapers for each lane closure.

Some signs, barricades, and channelization devices may not be shown at the precise or measured position. Place the barricades, devices, or signs, with approval, in positions to meet field conditions.

Fill any holes left by barricade or sign supports and restore the area to its original condition.

Use Type A flashing warning lights or delineators to mark open excavation, footings, foundations, or other obstructions near lanes that may be open to traffic, as directed.

For additional information pertaining to channelization, signing, spacing details, and flagging procedures required to regulate, warn, and guide traffic through project, refer to the "Barricade and Construction Standards," BC(1)-14 and to the current *Texas Manual on Uniform Traffic Control Devices(TMUTCD).*

Remove or cover signs that do not apply to current conditions at the end of each day's work.

Repair and/or replace all signs damaged by the public or due to weather events.

Safety Contingency

The contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancement, to improve the effectiveness of the TCP 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

Place Best Method Practices (BMP's) in locations as designated in the plans or as directed to meet field conditions.

Place a weatherproof bulletin board containing the Texas Commission on Environmental Quality (TCEQ) required information on the project at a site as directed. Post the following documents:

TCEQ "TPDES Storm Water Program" Construction Site Notice;

The total disturbed area for this project is 6.5 acres. The soil disturbed area in this project, all project locations in the Contract, and Contractor Project Specific Locations (PSLs), within one mile of the project limits, for the Contract will further establish the authorization requirements for Storm Water Discharges. The Department will obtain an authorization to discharge storm water from TCEQ for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any Contractor PSLs for construction support activities on or off right of way. When the total area disturbed for all projects in the Contract and PSLs within one mile of the project limits exceeds five acres, provide a copy of the Contractor NOI PSLs on the right of way to the Engineer (to the appropriate Municipal Separate Storm Sewer System (MS4) Operator when on an Off-system State route).

Place Best Method Practices (BMP's) as shown on the plans, or as directed. Maintain and properly place the erosion control measures to prevent storm water pollution to the Waters of the United States, as directed. Within the project limits, keep all inlets functional as long as possible to accept storm water as part of the Storm Water Pollution Prevention Plan (SWP3), as directed.

Grading operations will be limited to the catch point of the proposed cross-section.

Preserve any vegetation outside these limits.

Item 1005 – Loose Aggregate for Ground Cover

Protect newly graded areas from traffic and erosion.

Secure locally quarried aggregate rock that is clean, free from foreign materials and debris prior to placement and approved by the Engineer.

For aggregate Type I use crushed granite gravel, graded to range from 2 inch to 3 inch placed in a uniform 3" layer. Provide a Padre Canyon Red (Franklin Red) color as approved prior to placement. Place rock where shown on the plans or as directed.

For Type II aggregate use crushed rhyolite rock graded to range from ¾ inch to 1 inch rock size placed in a 3" layer. Provide a Dark Grey (Aztec Grey) rock color as approved prior to placement. Place rock where shown on the plans or as directed.

The aggregate shall fill in the eroded areas, gaps, improve and satisfy the layer thickness and to the satisfaction of the engineer.

Provide a sample of each aggregate color to project Engineer for approval.

Keep rock 1 in below top of concrete or concrete curb.

Rock colors will not be changed to match Contractor's rock.

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

All TMA Operators must participate in a TMA workshop to be conducted by the El Paso District Safety Office, on the proper use of TMAs, prior to working on Department Right of Way (ROW). A certificate of completion will be issued to TMA Operators that successfully complete the TMA workshop. The certificate of completion must be carried by TMA Operators at all times while working on Department right of way.

Acquire the TCP and TMA Operator's certificates of completion prior to the authorization to begin work. No time suspension will be granted and no traffic control work will be allowed without certificates of completion.

In addition to the shadow vehicles with Truck Mounted Attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide 0 additional shadow vehicle(s) with TMA for TCP (6-8)-14 as detailed on General Note 4 of this standard sheet.

Therefore, 1 total shadow vehicles with TMA will be required for this type of work. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

The supporting vehicle for the TMA shall have a minimum gross (i.e., ballasted) vehicular weight of 19,000 pounds.

Basis of Estimate for Stationary TMAs				
		TMA(Stationary)		
Phase	Standard	Required	Additional	TOTAL
1	1	1	0	1

Basis of Estimate for Mobile TMAs			
	TMA(Mobile)		
Standard	Required	Additional	TOTAL
0	0	0	0

QUANTITY SHEET

CONTROLLING PROJECT ID 0924-06-635 **DISTRICT** El Paso **COUNTY** El Paso
HIGHWAY Various

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0924-06-635**			
		PROJECT ID		**A00138286**			
		COUNTY		**El Paso**			
		HIGHWAY		**Various**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	110-6003	EXCAVATION (SPECIAL)	CY	4,661.000		4,661.000	
	168-6001	VEGETATIVE WATERING	MG	39.000		39.000	
	170-6001	IRRIGATION SYSTEM	LS	1.000		1.000	
	192-6004	PLANT MATERIAL (5-GAL)	EA	751.000		751.000	
	192-6014	PLANT SOIL MIX	CY	623.000		623.000	
	192-6015	LANDSCAPE EDGE	LF	1,860.000		1,860.000	
	192-6016	PLANT BED PREPARATION	SY	32,295.000		32,295.000	
	192-6017	VEGETATION BARRIER	SY	7,450.000		7,450.000	
	192-6024	PLANT MATERIAL (30 GAL) (TREE)	EA	191.000		191.000	
	192-6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	938.000		938.000	
	193-6001	PLANT MAINTENANCE	MO	12.000		12.000	
	193-6005	PLANT REPLACEMENT (5-GAL)	EA	220.000		220.000	
	193-6006	VEGETATIVE WATERING	MG	57.000		57.000	
	193-6007	IRRIGATION SYSTEM OPER AND MAINT	MO	12.000		12.000	
	193-6010	PLANT REPLACEMENT (30 GAL)	EA	38.000		38.000	
	500-6001	MOBILIZATION	LS	100.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000		4.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10,535.000		10,535.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10,535.000		10,535.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	275.000		275.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	275.000		275.000	
	1005-6001	LOOSE AGGR FOR GROUNDCOVER (TYPE I)	CY	980.000		980.000	
	1005-6002	LOOSE AGGR FOR GROUNDCOVER (TYPE II)	CY	715.000		715.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	45.000		45.000	
	6185-6002	TMA (STATIONARY)	DAY	45.000		45.000	
	08	SAFETY CONTINGENCY (NON-PART)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE (NON-PART)	LS	1.000		1.000	

SUMMARY OF WORKZONE CONTROL ITEMS				
ITEM	**500**	**502**	**6185**	6001
CODE	**6001**	**6001**	**6002**	6001
DESCRIPTION	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING	TMA (STATIONARY)	PORTABLE CHANGEABLE MESSAGE SIGN
UNIT	LS	MO	DAY	DAY
	1	4	45	45
PROJECT TOTALS	1	4	45	**45**

SUMMARY OF EROSION CONTROL ITEMS				
ITEM CODE	506 6038	506 6039	506 6040	506 6043
DESCRIPTION	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)
UNIT	LF	LF	LF	LF
AT IH10				
SHEET 1 OF 4	1950	1950	125	125
SHEET 2 OF 4	1890	1890	90	90
SUBTOTAL	3840	3840	215	215
AT EASTLAKE BLVD				
SHEET 3 OF 4	2960	2960	30	30
SHEET 4 OF 4	1,675	1,675	30	30
SUBTOTAL	4,635	4,635	60	60
AT FM 1281 (HORIZON BLVD)				
SHEET 1 OF 3	1,500	1,500	0	0
SHEET 2 OF 3	0	0	0	0
SHEET 3 OF 3	560	560	0	0
SUBTOTAL	2,060	2,060	0	0
PROJECT TOTALS	10,535	10,535	275	275

SUMMARY OF HARDSCAPE ITEMS					
ITEM	**110**	**192**	**1005**	**1005**	**170**
CODE	**6003**	**6015**	**6001**	**6002**	**6001**
DESCRIPTION	EXCAVATION (SPECIAL)	LANDSCAPE EDGE	LOOSE AGGR FOR GROUNDCOVER (TYPE I)	LOOSE AGGR FOR GROUNDCOVER (TYPE II)	IRRIGATION SYSTEM
UNIT	CY	LF	CY	CY	LS
AT IH10					0
SHEET 1 OF 4	1235	990	355	346	
SHEET 2 OF 4	1460	870	265	369	
SUBTOTAL	2695	1860	620	715	0
AT EASTLAKE BLVD					0
SHEET 3 OF 4	564	0	195	0	
SHEET 4 OF 4	471	0	165	0	
SUBTOTAL	1,035	0	360	0	0
AT FM 1281 (HORIZON BLVD)					1
SHEET 1 OF 2	711	0	0	0	
SHEET 2 OF 2	220	0	0	0	
SUBTOTAL	931	0	0	0	1
				1	
PROJECT TOTALS	4,661	1,860	980	715	1

SUMMARY OF LANDSCAPE PLANTING ITEMS							
ITEM	**168**	**192**	**192**	**192**	**192**	**192**	**192**
CODE	**6001**	**6004**	**6014**	**6016**	**6017**	**6024**	**6031**
DESCRIPTION	VEGETATIVE WATERING	PLANT MATERIAL (5-GAL)	PLANT SOIL MIX	PLANT BED PREPARATION	VEGETATION BARRIER	PLANT MATERIAL (30 GAL) (TREE)	PLANT MATERIAL (5 GAL) (SHRUB)
UNIT	MG	EA	CY	SY	SY	EA	EA
AT IH-10							
SHEET 1 OF 6	7	109	20	6260	0	22	170
SHEET 2 OF 6	6	108	15	5840	0	13	114
SHEET 3 OF 6	8	124	21	5830	0	20	178
SHEET 4 OF 6	7	85	19	8125	0	17	184
SUBTOTAL	28	426	75	26,055	0	72	646
AT EASTLAKE BLVD							
SHEET 5 OF 6	6	137	285	3390	4050	0	126
SHEET 6 OF6	5	119	240	2850	3400	0	106
SUBTOTAL	11	256	525	6,240	7,450	0	232
AT FM 1281 (HORIZON BLVD)							
SHEET 1 OF 7	0	69	10	0	0	22	60
SHEET 2 OF 7	0	0	0	0	0	0	0
SHEET 3 OF 7	0	0	1	0	0	3	0
SHEET 4 OF 7	0	0	3	0	0	24	0
SHEET 5 OF 7	0	0	3	0	0	20	0
SHEET 6 OF 7	0	0	5	0	0	39	0
SHEET 7 OF 7	0	0	1	0	0	11	0
SUBTOTAL	0	69	23	0	0	119	60
PROJECT TOTALS	39	751	623	32,295	7,450	191	938

	SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	**193**	**193**	**193**	**193**	**193**
CODE	**6001**	**6005**	**6006**	**6010**	**6007**
DESCRIPTION	PLANT MAINTENANCE	PLANT REPLACEMENT (5-GAL)	VEGETATIVE WATERING	PLANT REPLACEMENT (30 GAL)	IRRIGATION SYSTEM OPER AND MAINT
UNIT	MO	EA	MG	EA	MO
AT IH-10					0
SHEET 1 OF 6		36	11	4	
SHEET 2 OF 6		29	8	3	
SHEET 3 OF 6		39	11	4	
SHEET 4 OF 6		35	10	3	
SUBTOTAL		139	40	14	
AT EASTLAKE BLVD					0
SHEET 5 OF 6		34	9	0	
SHEET 6 OF6		29	8	0	
SUBTOTAL		63	17	0	
AT FM 1281 (HORIZON BLVD)					12
SHEET 1 OF 7		17	0	4	
SHEET 2 OF 7		0	0	0	
SHEET 3 OF 7		0	0	1	
SHEET 4 OF 7		0	0	5	
SHEET 5 OF 7		0	0	4	
SHEET 6 OF 7		0	0	8	
SHEET 7 OF 7		0	0	2	
SUBTOTAL		17	0	24	12
PROJECT TOTALS	12	220	57	38	12

VEGETATIVE LANDSCAPE

GENERAL

QUANTITY SUMMARY

NOT TO SCALE SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		8

DATE: 05/04/2021 05:50 AM
FILE: ix001_Sheets_XM.cel

CK1: DW1: CK2: DN1:

DATE: 5/4/2021
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\092406635\4 - Design\Plan Set\9. Environmental\ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3 and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3 information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required
☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☒ Biodeg. Erosion Cntrl Logs	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☐ No Action Required ☒ Required Action

Action No.

1. Contractor shall not remove existing trees and shrubs

2.

3.

4.

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	TWE:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:
- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☒ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☒ No Action Required ☐ Required Action

Action No.

1.

2.

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

M. Sotelo, P.E.
5/5/21

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

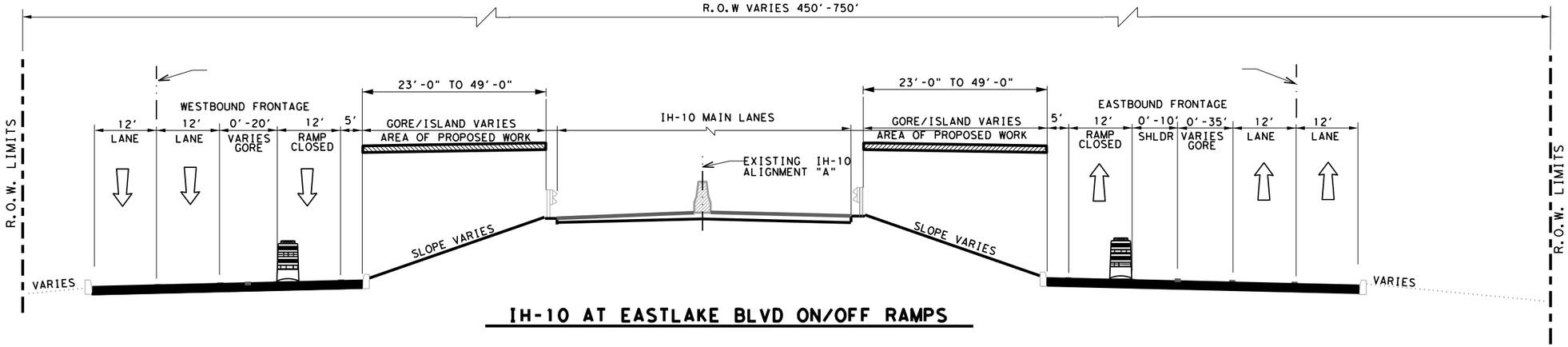
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0924	06	635	VARIOUS
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		9

TCP SELECTION TABLE

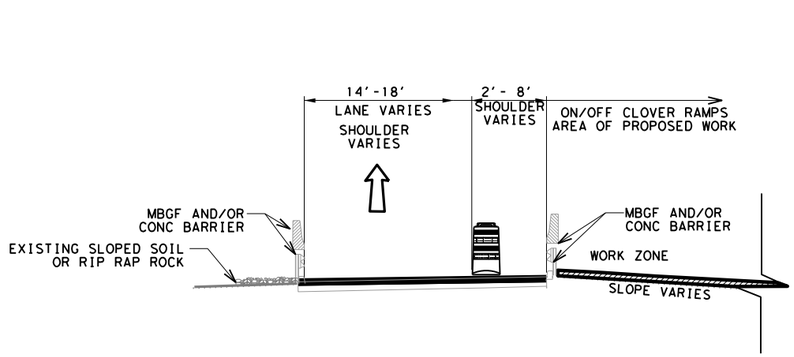
LOCATION	TYPE OF WORK	STANDARD SHEET	SHEET DESCRIPTION	SHEET DIAGRAM	SUGGESTED USE
IH10 & LOOP 375 AT CLOVER RAMP	INSTALL DESERT VEGETATION AND LANDSCAPE ROCK	TCP(1-1)-18	WORK SPACE NEAR SHOULDER	TCP(1-1a)-18 or TCP(1-1b)-18	DAILY SHOULDER CLOSURE: OPEN AFTER COMPLETED WITH DAILY OPERATION
EASTLAKE BLVD IH10 FRONTAGE	INSTALL DESERT VEGETATION AND LANDSCAPE ROCK	TCP(6-8)-14	WORK IN EXIT GORE FOR ADT GREATER THAN 10,000	TCP(6-8a)-18	DAILY LANE CLOSURE: OPEN LANE AFTER COMPLETED WITH DAILY OPERATION
FM-1281 (HORIZON BLVD)	INSTALL NEW VEGETATION AT EXISTING LANDSCAPED AREAS	TCP(1-1)-18	WORK SPACE NEAR SHOULDER	TCP(1-1a)-18	DAILY SHOULDER CLOSURE: OPEN AFTER COMPLETED WITH DAILY OPERATION

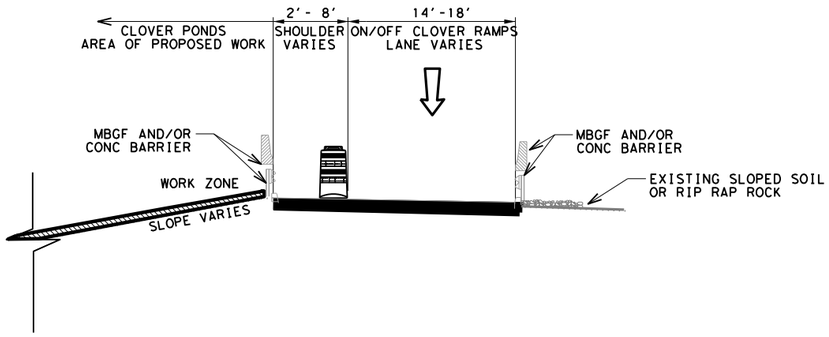
NOTES:

1. APPLY TRAFFIC CONTROL PLAN SETUP AS DESCRIBED IN THE TCP SELECTION TABLE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. COORDINATE WITH ONGOING CONSTRUCTION PROJECTS PRIOR TO SETTING UP LANE CLOSURES AND BEGINNING WORK.
3. PERFORM WORK ON EASTLAKE BLVD AT GORE (SLOPED) AREA WHEN IT REQUIRES THE RAMP LANE TO BE CLOSED. PERFORM WORK DURING NON PEAK DAY TIME HOURS OF 9 A.M. TO 4 P.M. OR AS DIRECTED BY THE ENGINEER.
4. PERFORM ALL WORK ON IH-10 ON/OFF CLOVER RAMP POND AREAS WITH A SHOULDER CLOSURE APPLICATION. PERFORM WORK DURING NON PEAK DAY TIME HOURS OF 9 A.M. TO 4 P.M. OR AS DIRECTED BY THE ENGINEER.
5. USE "TRUCKS ENTERING ROADWAY" SIGN CW27-1T AND/OR FLAGGERS WHEN CONSTRUCTION TRUCKS ARE ENTERING INTO THE TRAVELING LANE AT CLOVER RAMP WHEN EXITING THE WORK ZONE.
6. PERFORM ALL WORK ON THE NORTH SIDE OF FM-1281 AT EXISTING LANDSCAPED RIGHT OF WAY AREA (WALK AND BIKE TRAIL). PERFORM WORK ON AREA WHEN PEDESTRIAN TRAFFIC IS MINIMAL AND/OR DURING NON-PEAK DAY TIME HOURS OF 9 A.M. TO 4 P.M. OR DIRECTED BY THE ENGINEER.



IH-10 AT EASTLAKE BLVD ON/OFF RAMPS





IH-10 AT LOOP 375 ON/OFF CLOVER RAMPS

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

P.E.

06-01-2021

VEGETATIVE LANDSCAPE AT IH-10
TRAFFIC CONTROL

TYPICAL SECTION

NOT TO SCALE SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		10

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

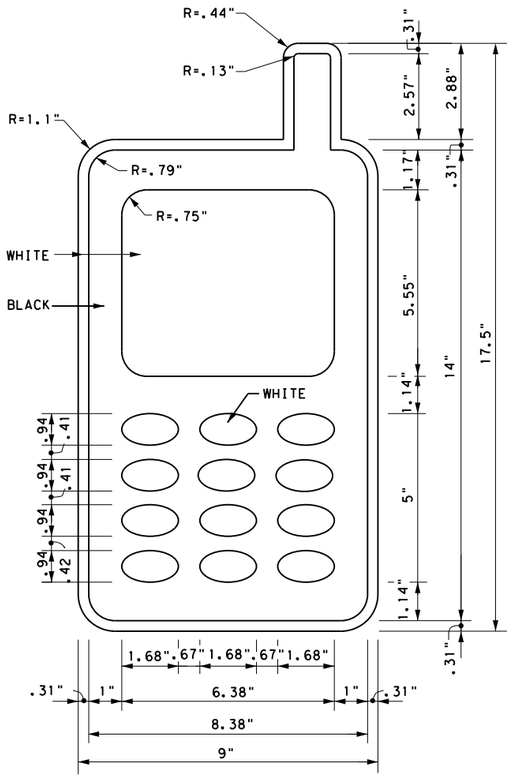
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

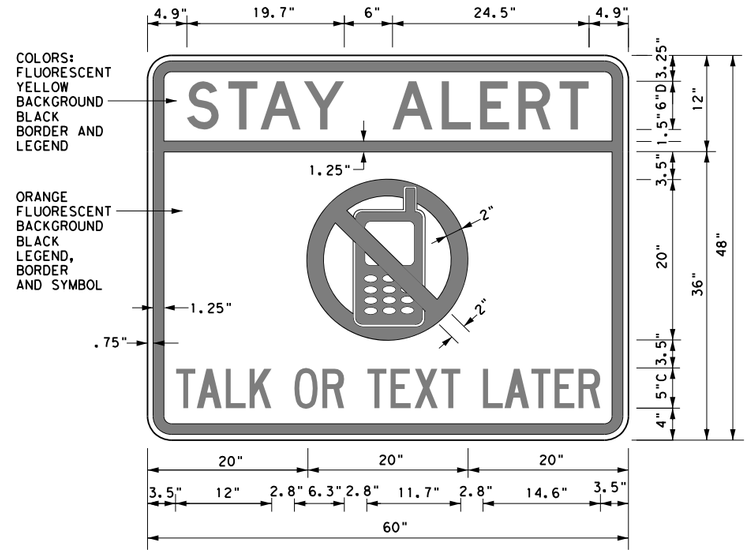
12. The Engineer has the final decision on the location of all traffic control devices.

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

WORKER SAFETY APPAREL NOTES:

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





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

SIGN DETAIL (G20-10T)

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3118

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	635	VAR
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13	ELP	EL PASO		11

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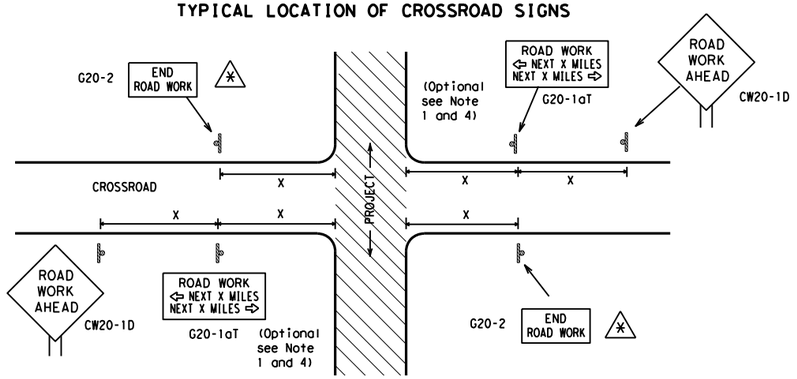
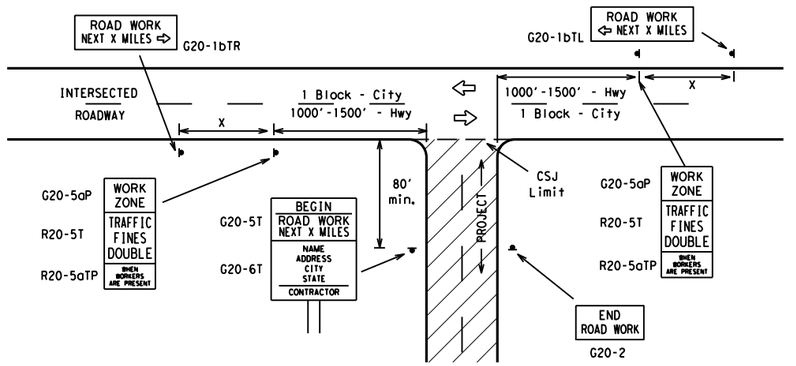
TYPICAL LOCATION OF CROSSROAD SIGNS



(*) May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign Spacing "X" (△)
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
*	*[3]

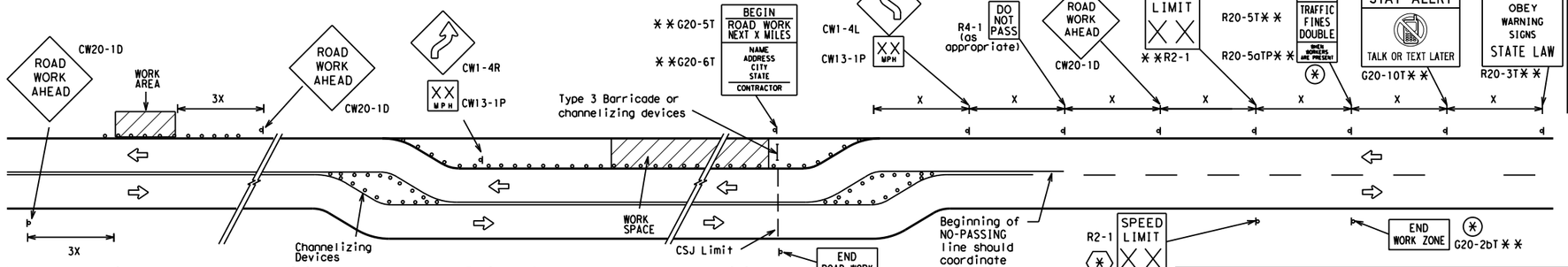
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

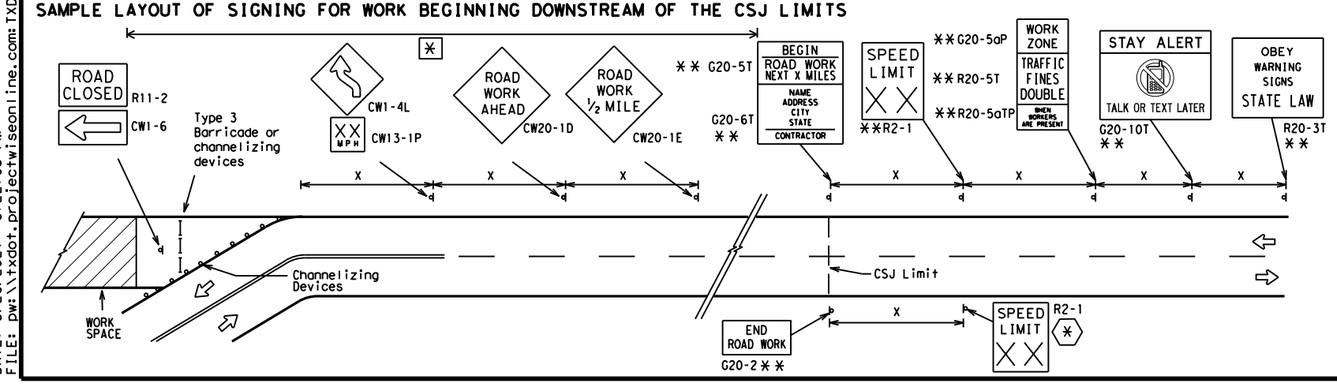
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T)sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

(*) The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

* * Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.

[*] Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

(*) Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND	
⊢⊣	Type 3 Barricade
○ ○ ○	Channelizing Devices
▬	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	635	VAR
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	EL PASO		12

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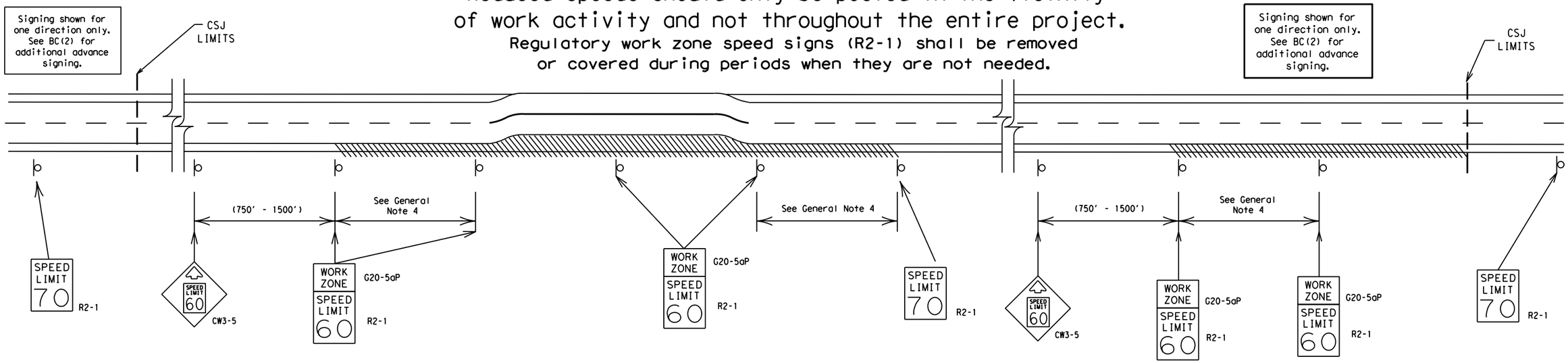
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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 travelled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0924	06	635	VAR
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		13

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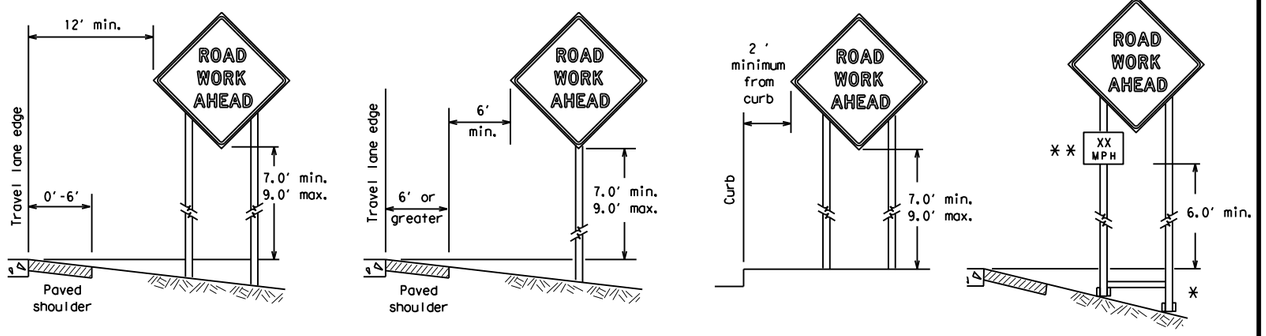
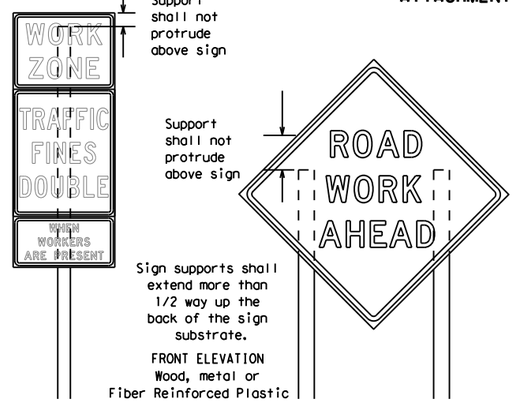
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



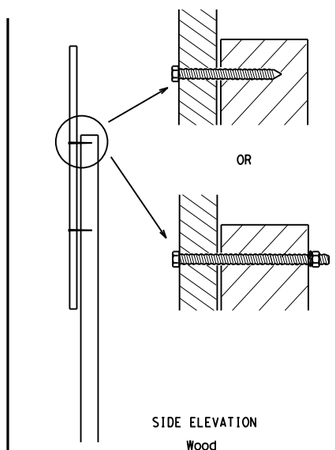
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

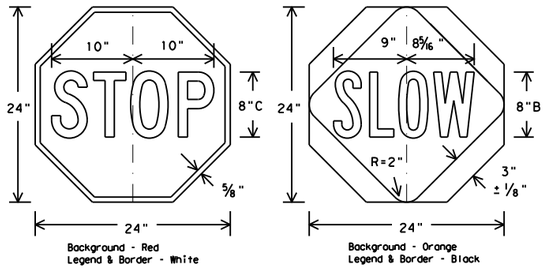


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectorized.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	635	VAR
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	EL PASO		14

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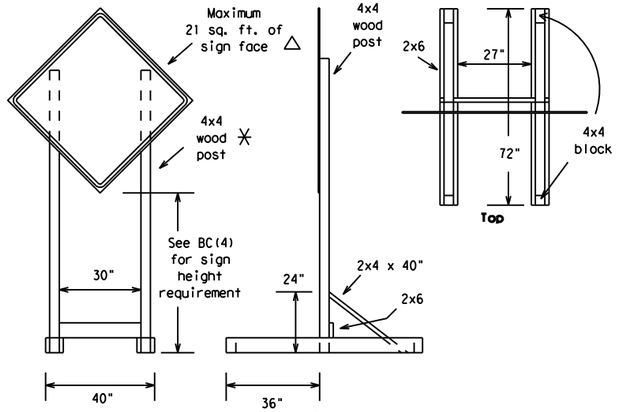
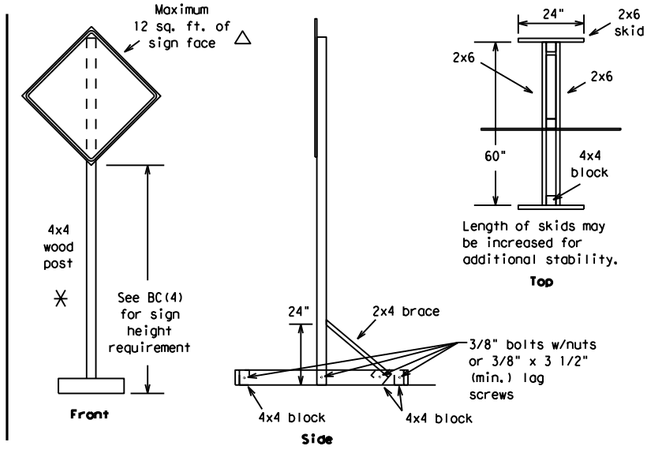
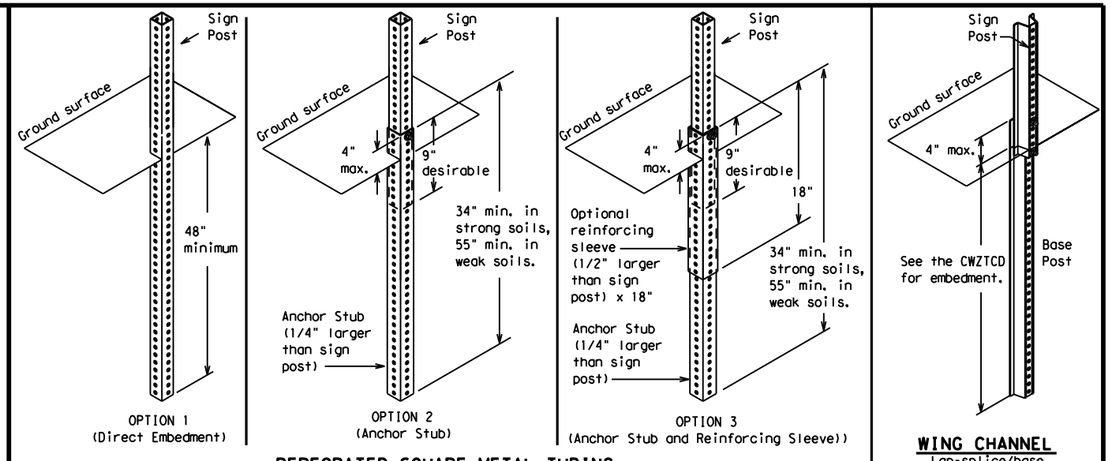




SKID MOUNTED WOOD SIGN SUPPORTS

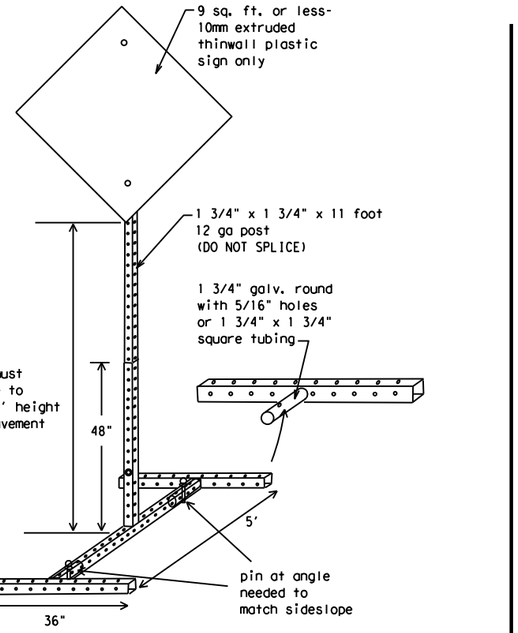
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

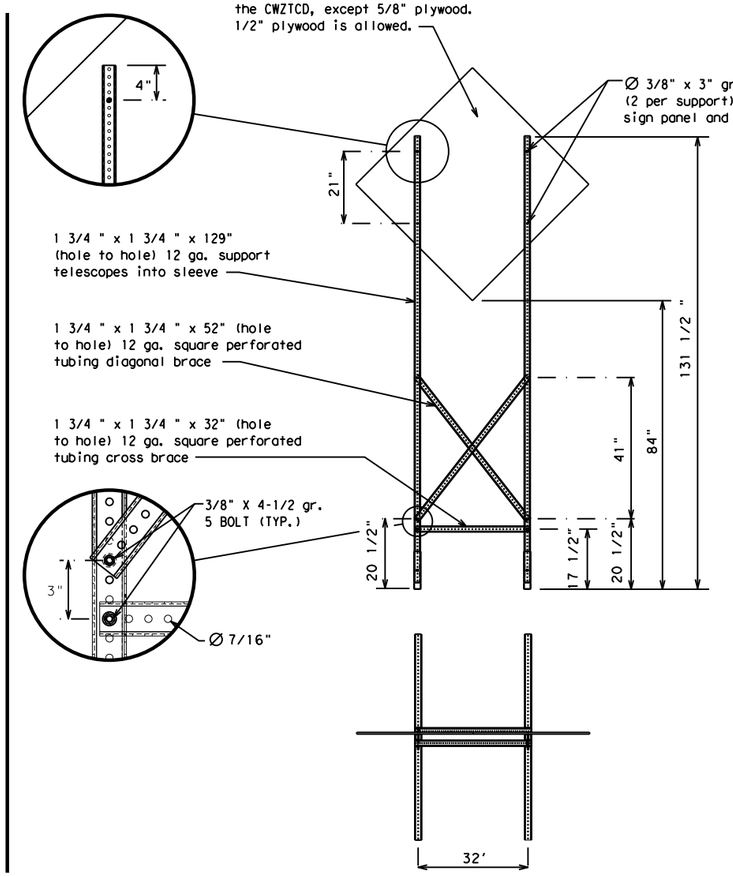


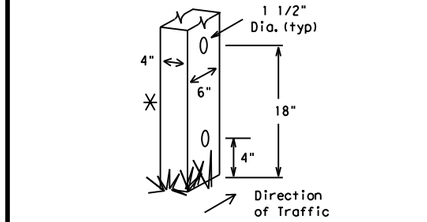
PERFORATED SQUARE METAL TUBING

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.

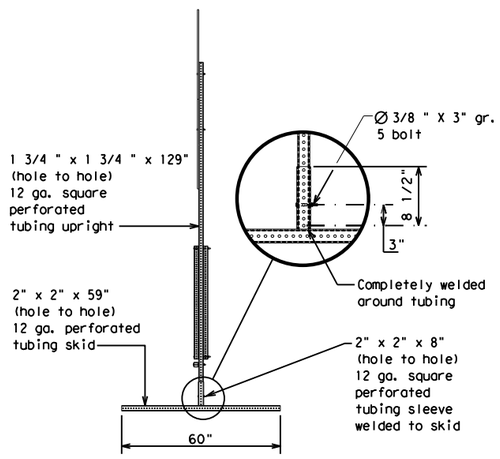






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

□ See BC(4) for definition of "Work Duration."

✳ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

△ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

Texas Department of Transportation | *Traffic Operations Division Standard*

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	635	VAR
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	EL PASO		15

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FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\092406635\4 - Design\Plan Set\15. Standards\BC (1)-14 thru BC (12)-14.dgn

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 *				

* * See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the "Flagger Symbol"(CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	EL PASO		16

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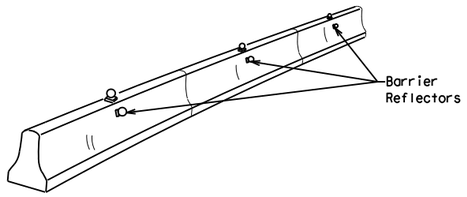
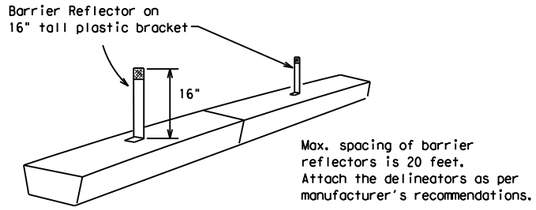
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

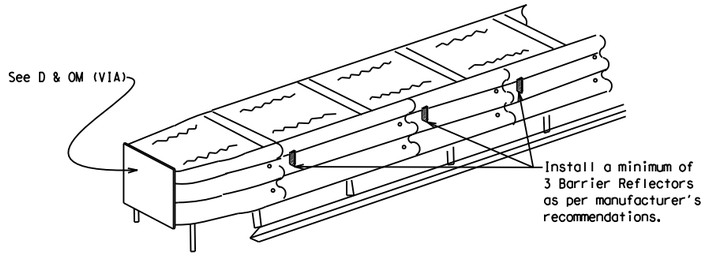


CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.



LOW PROFILE CONCRETE BARRIER (LPCB)

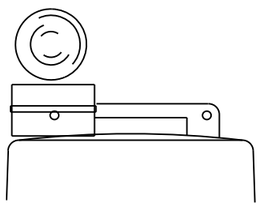


DELINEATION OF END TREATMENTS

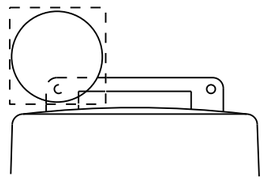
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square.Must have a yellow reflective surface area of at least 30 square inches

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

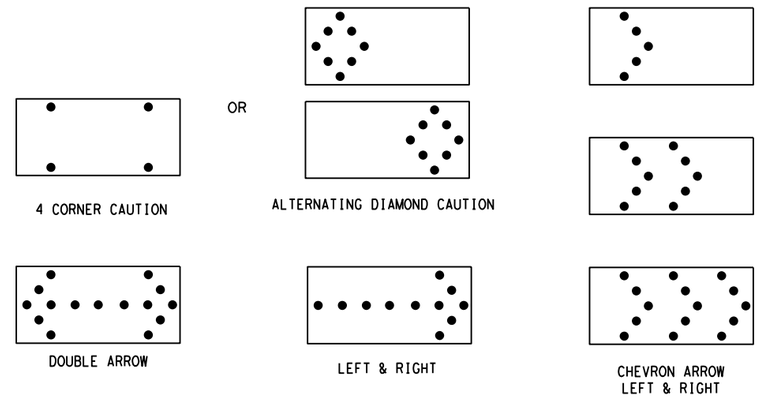
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION
Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation — Traffic Operations Division Standard

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

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 9-07 8-14 7-13	0924	06	635	VAR
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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

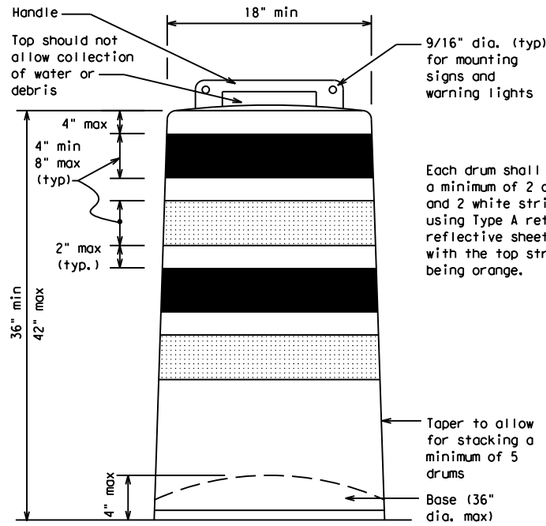
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

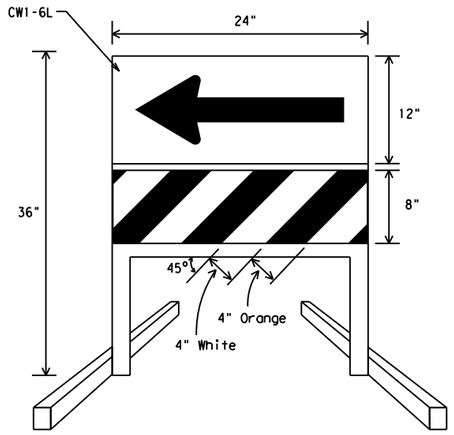
RETROREFLECTIVE SHEETING

1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

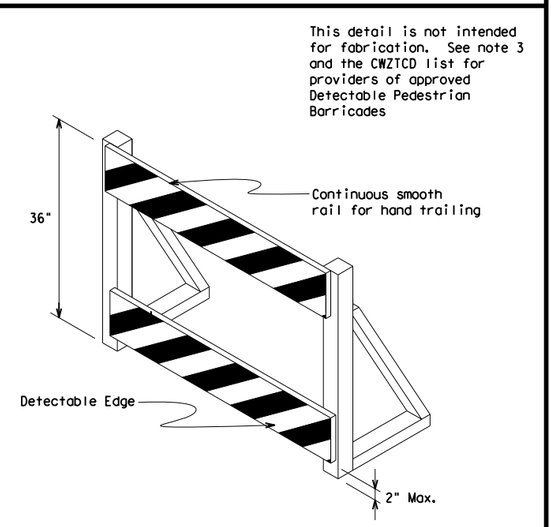
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.





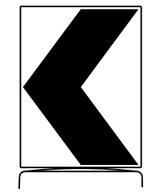
DIRECTION INDICATOR BARRICADE

1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.

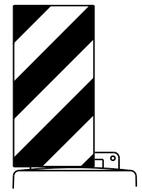


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades may use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

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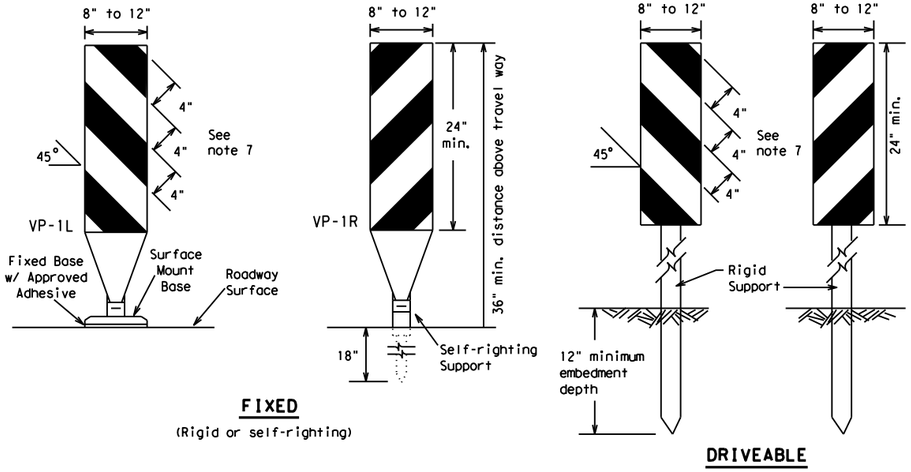
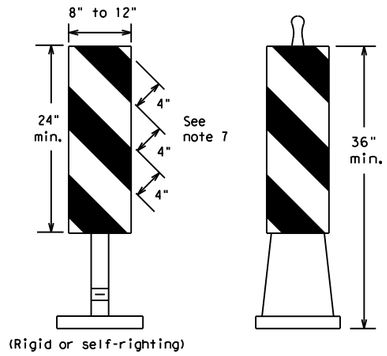


FIXED
(Rigid or self-righting)

DRIVEABLE

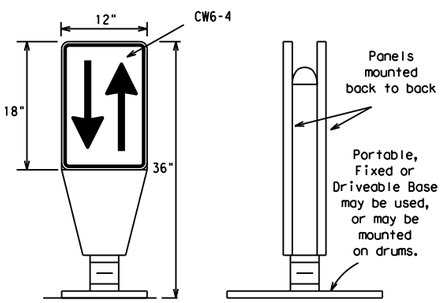


(Rigid or self-righting)

PORTABLE

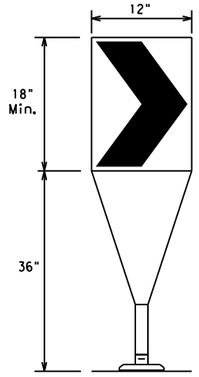
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



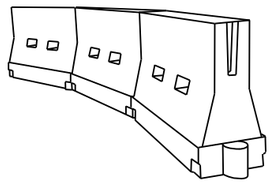
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10) placed near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

** Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

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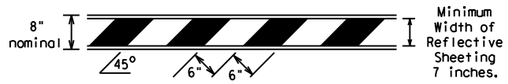
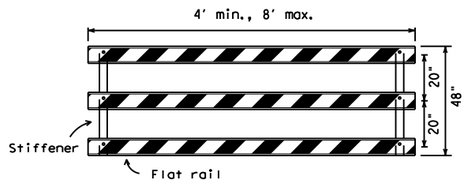
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



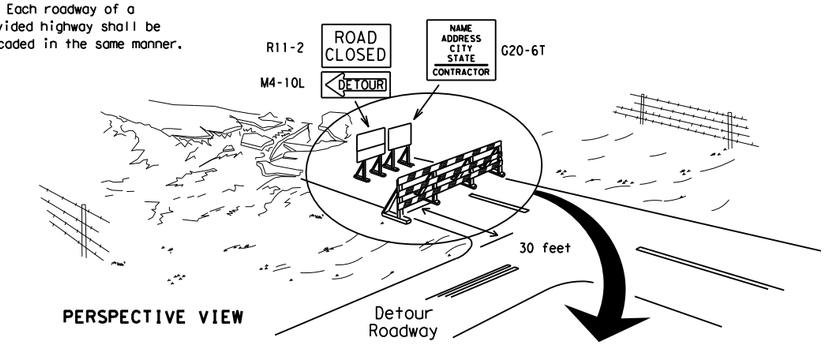
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

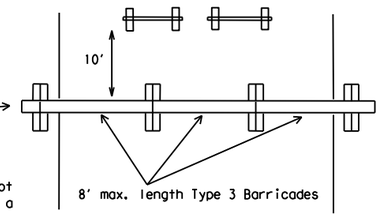
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

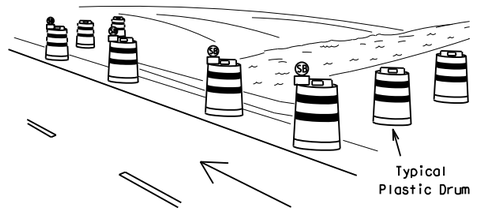
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

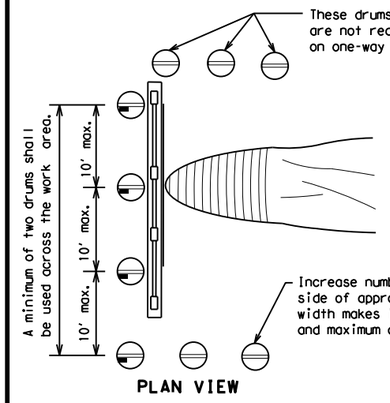
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

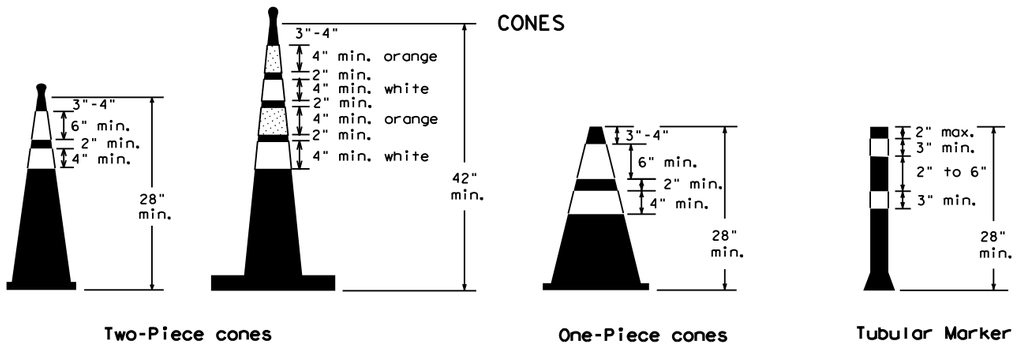
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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

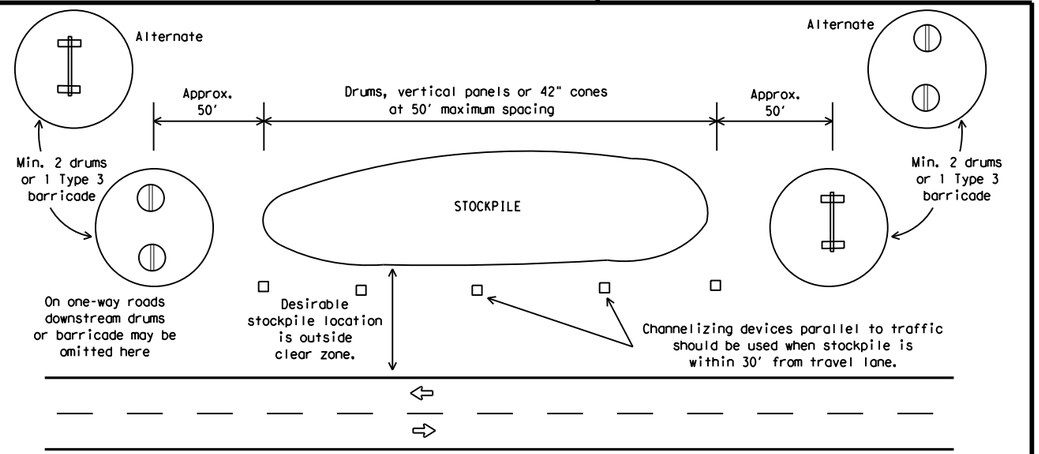
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



28" Cones shall have a minimum weight of 9 1/2 lbs.

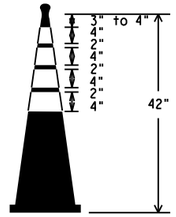
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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 used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0924	06	635	VAR
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		20

WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

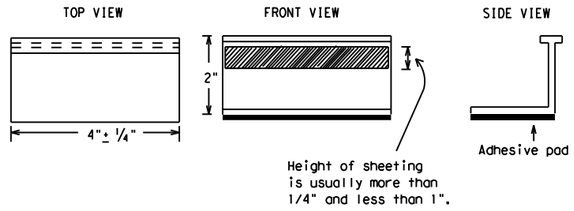
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	635	VAR
2-98 9-07	DIST	COUNTY		SHEET NO.
1-02 7-13	ELP	EL PASO		21
11-02 8-14				

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DATE: 5/26/2021 8:22:42 PM
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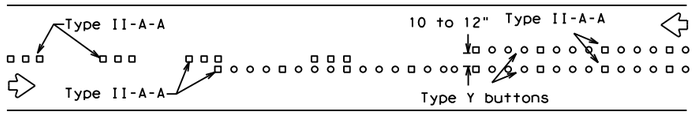
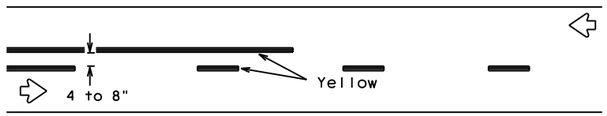
PAVEMENT MARKING PATTERNS

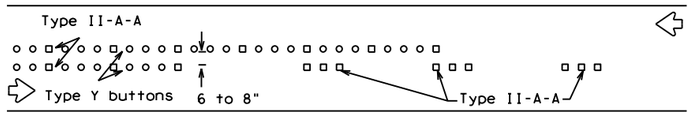
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



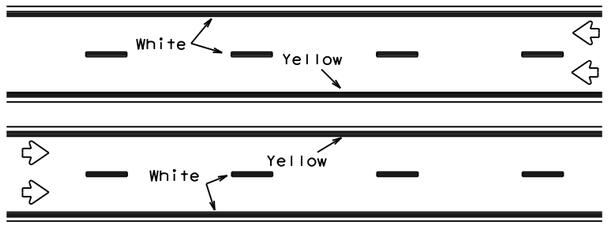
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



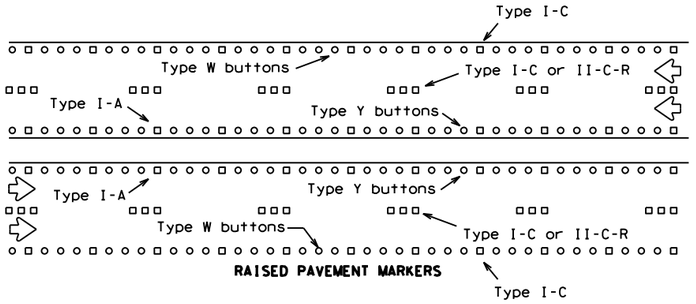
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



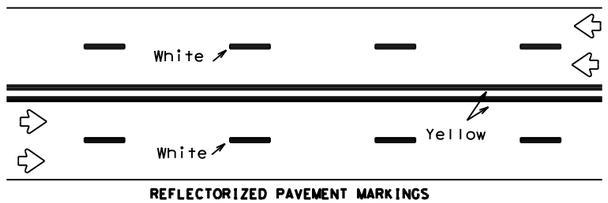
REFLECTORIZED PAVEMENT MARKINGS



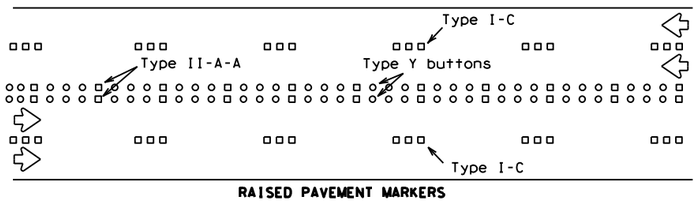
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



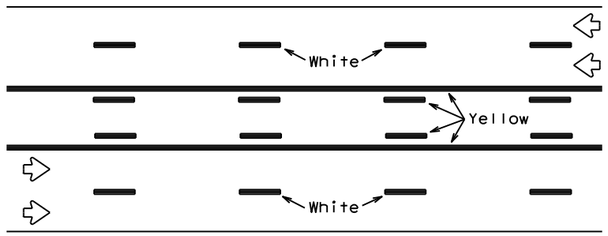
REFLECTORIZED PAVEMENT MARKINGS



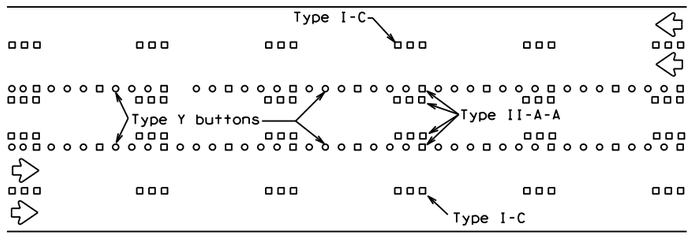
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

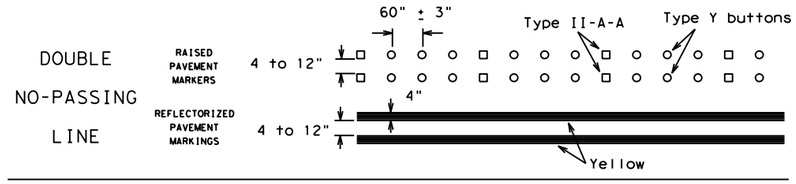
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

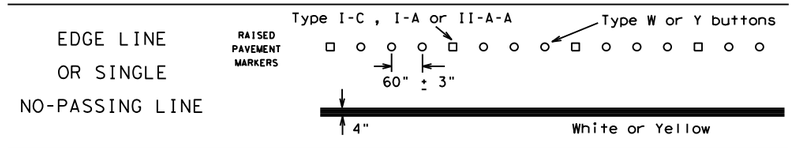
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

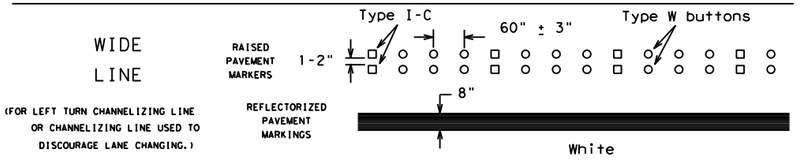


EDGE LINE OR SINGLE NO-PASSING LINE



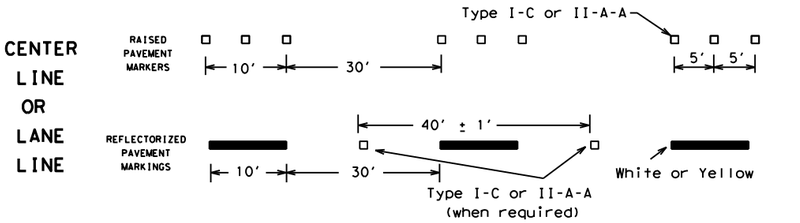
WIDE LINE

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

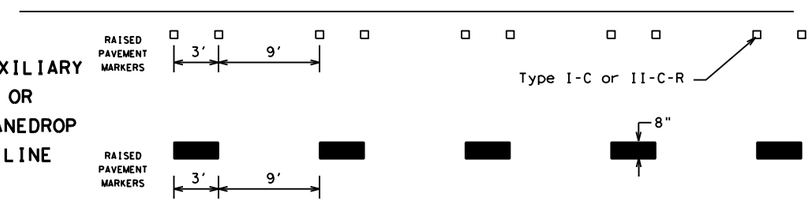


BROKEN LINES

CENTER LINE OR LANE LINE

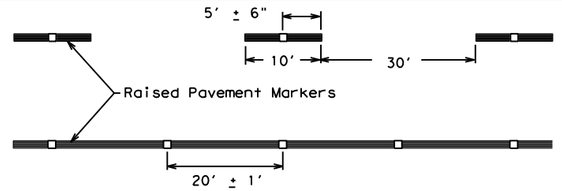


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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2-98 7-13	ELP	EL PASO		22
11-02 8-14				

DATE:
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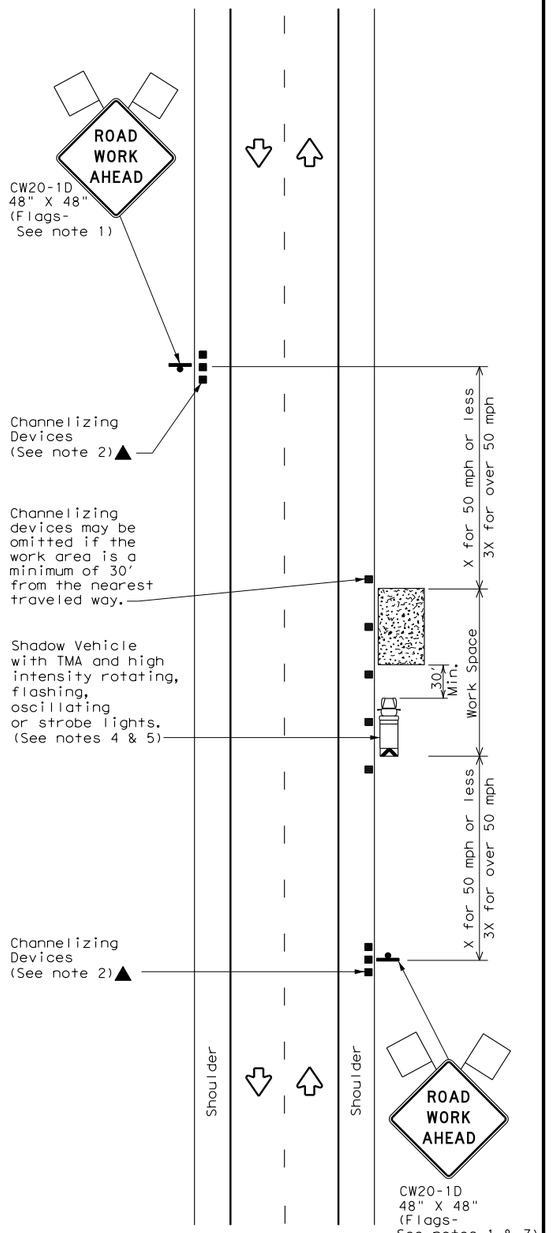
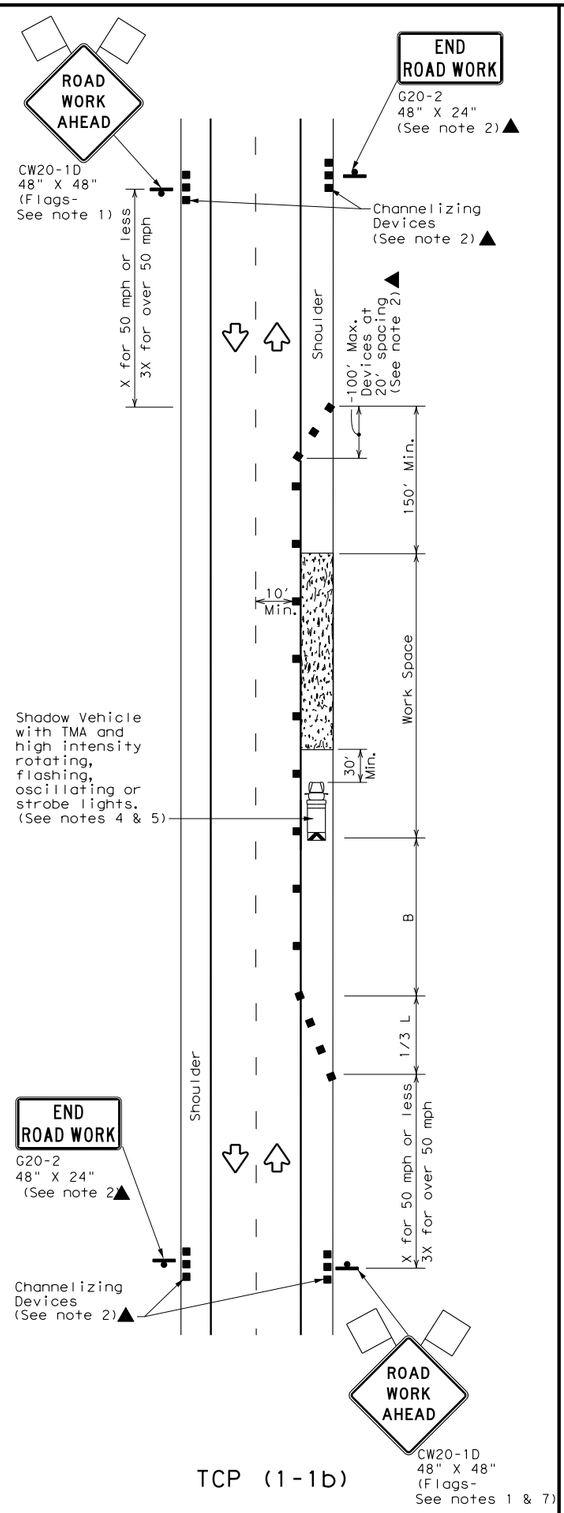


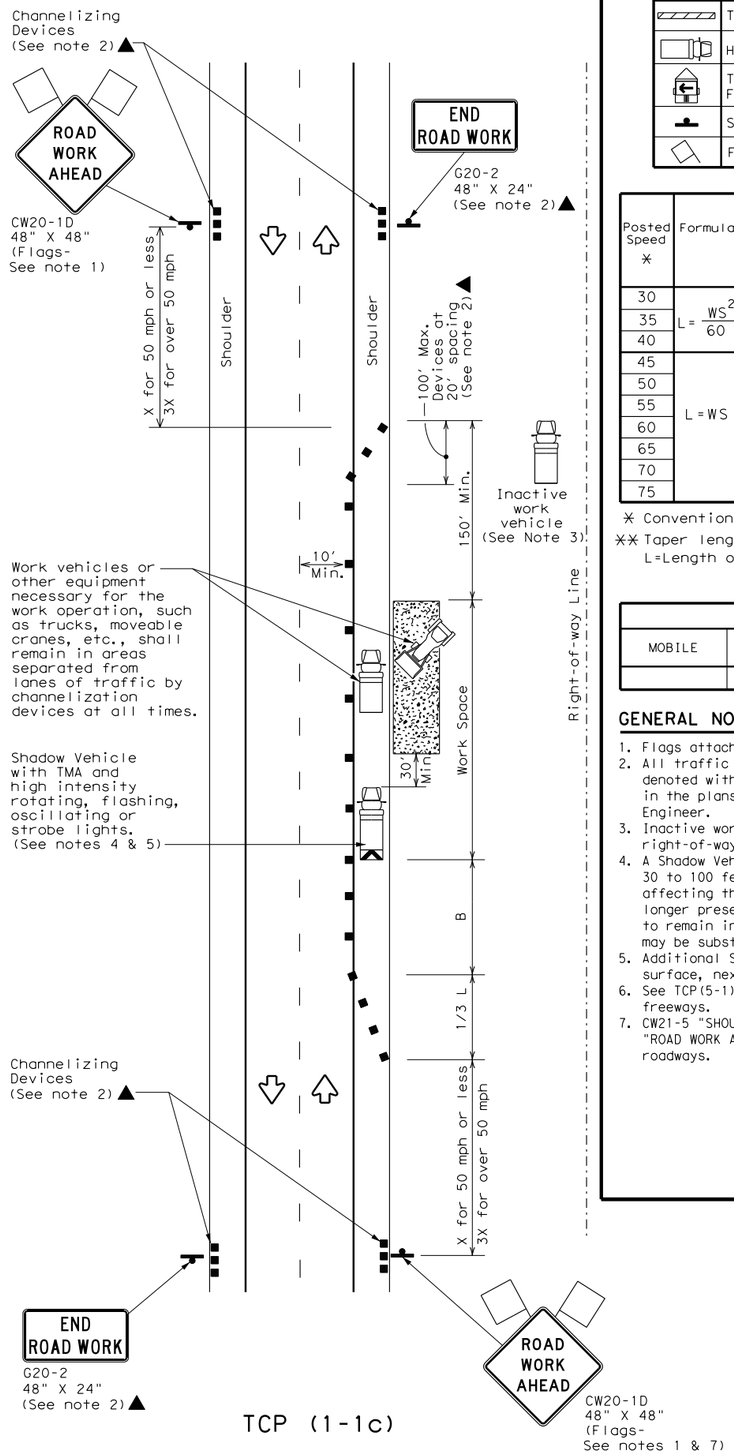
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

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 elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. 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 wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. 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

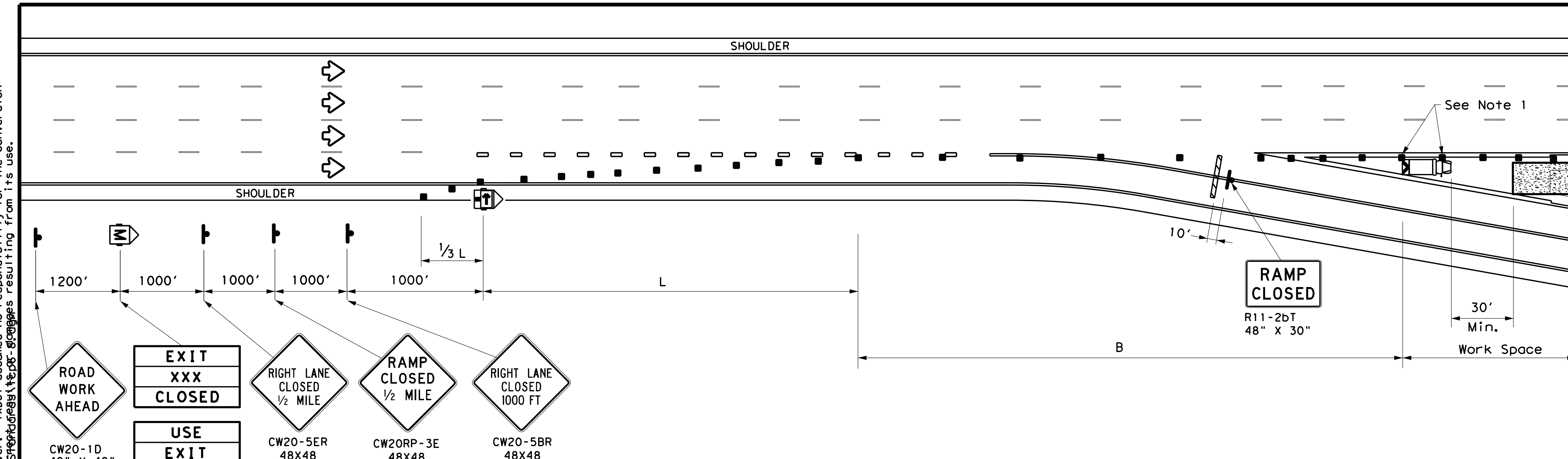
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

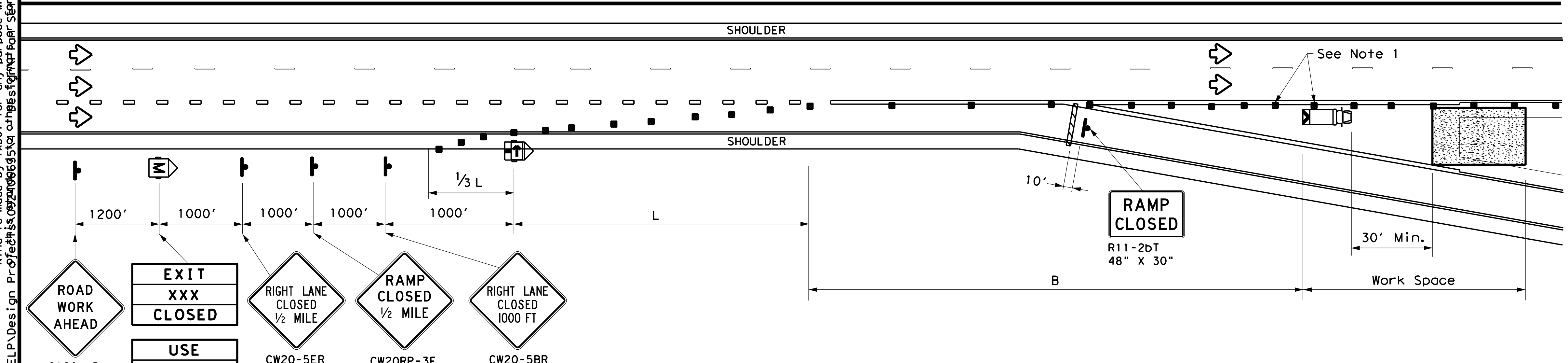
TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	635	VARIOUS
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ELP	EL PASO		23
1-97 2-18				

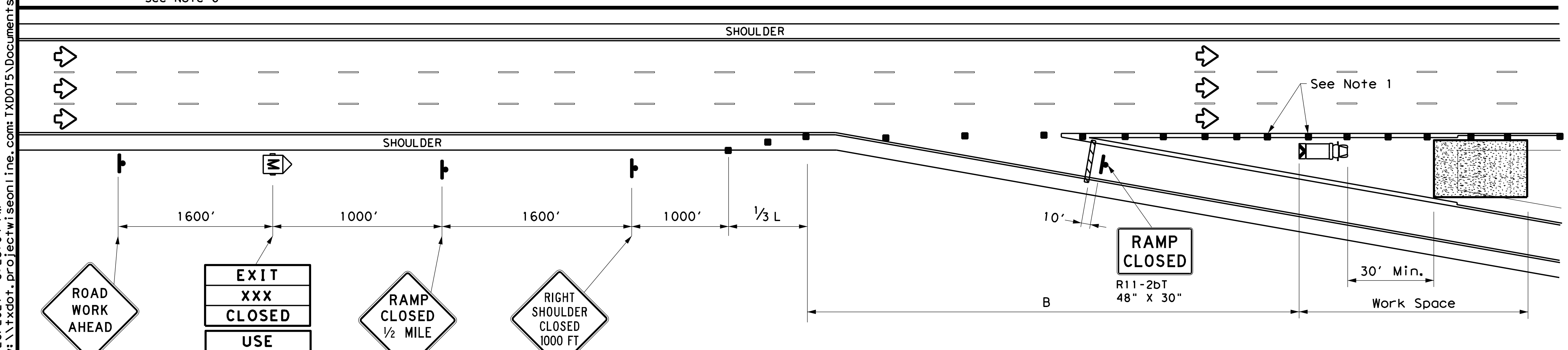
151



TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

LEGEND

Symbol	Description	Symbol	Description
	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" **			Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT)
S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Place channelizing devices in the gore at 20' spacing.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
5. Truck mounted attenuator is required.
6. The PCMS may be omitted if replaced with a "RAMP CLOSED" AHEAD (CW20RP-3D) Sign.
7. Roadway ADT should be greater than 10,000.

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP(6-8)-14

FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	635	VARIOUS
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		24

208

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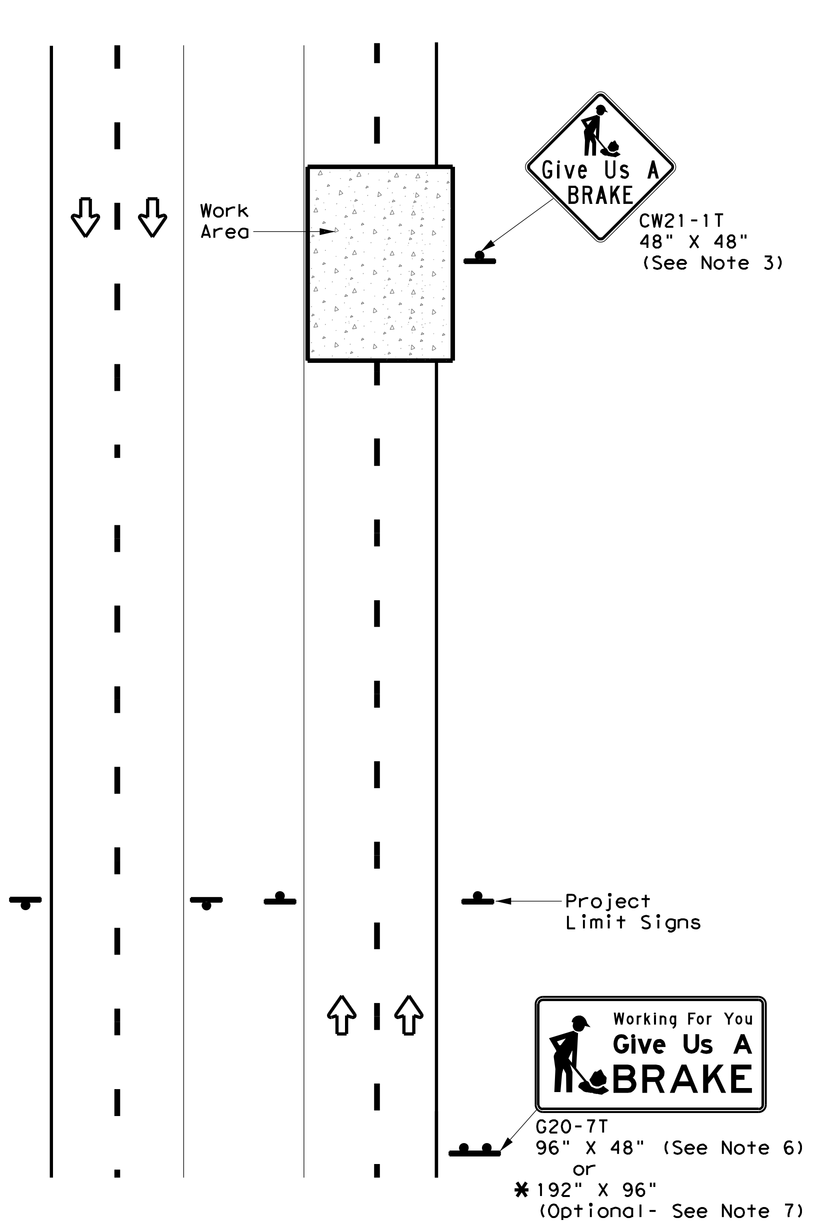
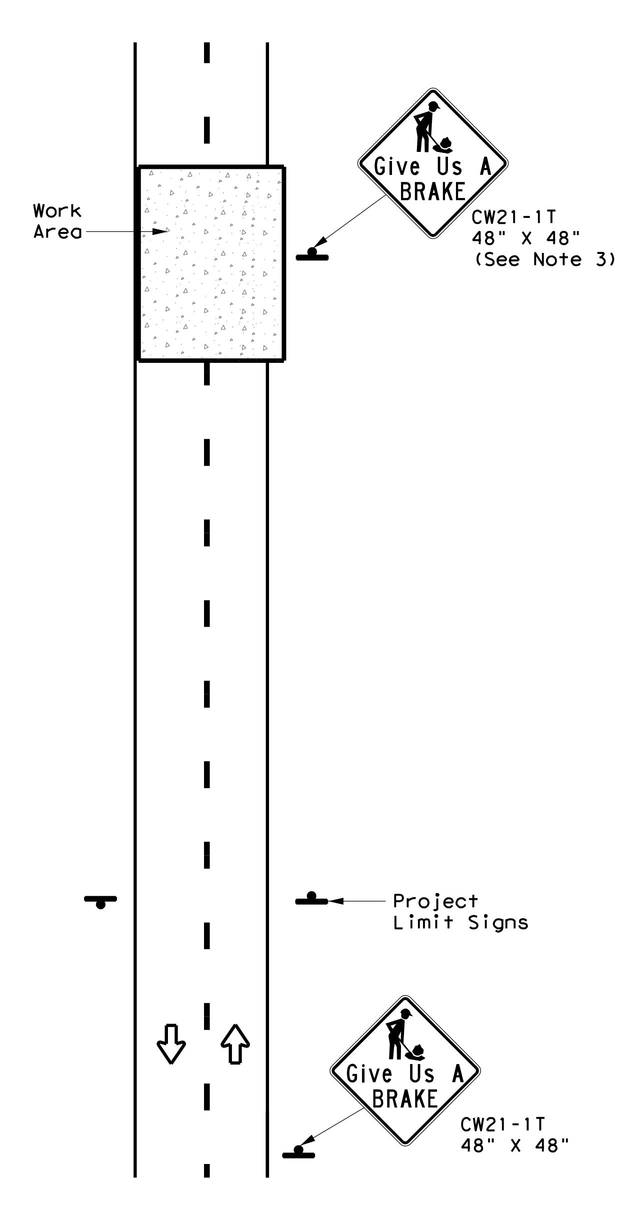


DIVIDED HIGHWAY



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 Size	GALVANIZED STRUCTURAL STEEL (LF) ①	GALVANIZED STRUCTURAL STEEL (LF) ②	DRILLED SHAFT 24" DIA. (LF)
Orange	G20-7T		96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T		192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
(symbol)	Sign
(symbol)	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

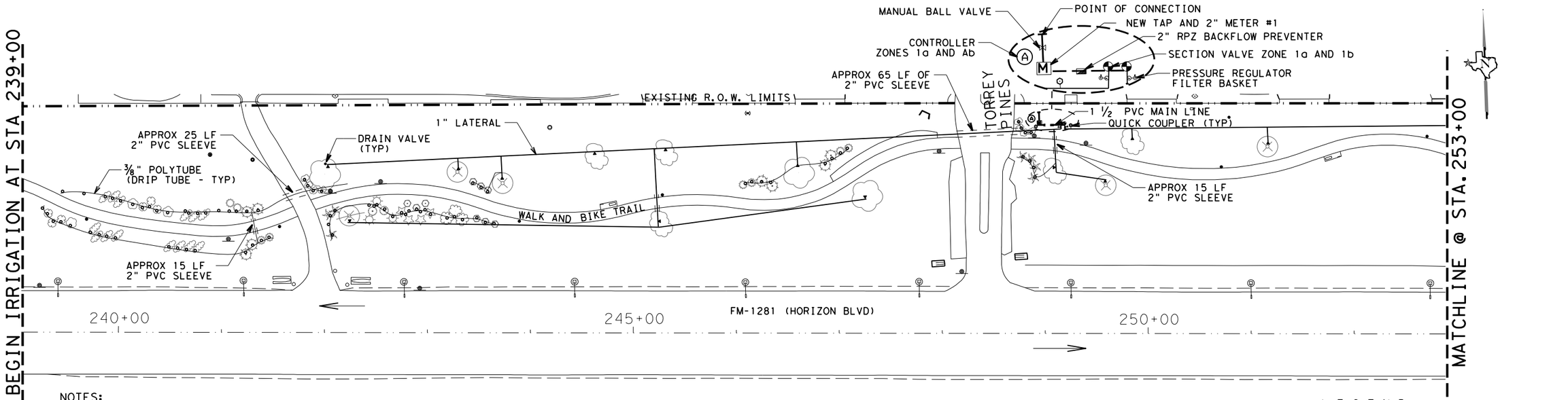
1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone 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

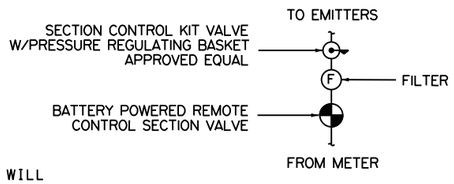
FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT 0924	SECT 06	JOB 635	HIGHWAY VARIOUS
REVISIONS 6-96 5-98 7-13 8-96 3-03	DIST ELP	COUNTY EL PASO		SHEET NO. 25



NOTES:

1. THERE ARE UNDERGROUND UTILITIES IN THE AREA. VERIFY LOCATIONS OF ALL UTILITIES WITH THE CONTROLLING AUTHORITIES PRIOR TO ANY EXCAVATION.
2. LOCATION SHOWN FOR NEW TAPS AND METERS ARE APPROXIMATE AND MAY BE ADJUSTED AT THE SITE BY THE ENGINEER.
3. LOCATE QUICK-COUPLING VALVES IN SEPARATE BOXES FROM SECTION VALVES.
4. LOCATION SHOWN FOR CONTROLLERS ARE APPROXIMATE AND MAY BE ADJUSTED AT THE SITE WITH APPROVAL OF THE ENGINEER AND RECORDED ON THE AS-BUILT DRAWING.
5. ALL MAIN LINES WILL BE 1½" PIPE SIZE. ALL LATERAL LINES WILL BE 1" PIPE SIZE.

EACH SECTION SHALL INCLUDE THE FOLLOWING DRIP ASSEMBLY:



6. PIPING FROM 1" LATERALS TO EMITTERS IS ¾" UNLESS OTHERWISE NOTED.
7. THE IRRIGATION SYSTEM SHALL BE OPERABLE TO THE QUICK-COUPLING VALVES BEFORE ANY PLANTS MAY BE DELIVERED TO THE SITE. EACH DRIP EMITTER DOT OR TRIANGLE IS NOT REPRESENTATIVE OF PROPOSED PLANTS. SEE LEGEND FOR EMITTER QUANTITIES PER PLANTS.

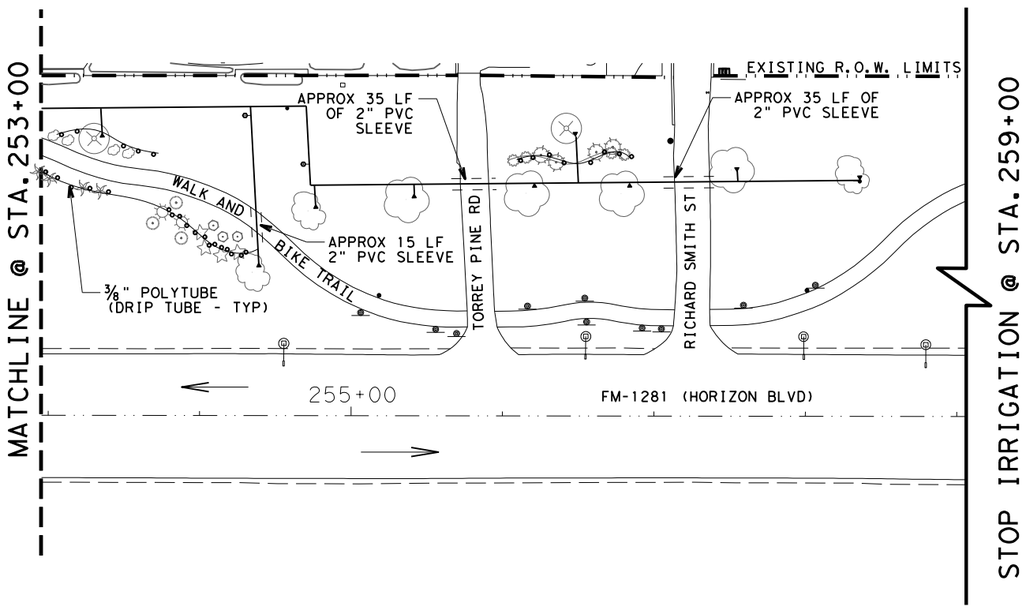
* EMITTERS TO BE EQUALLY SPACED AROUND PLANT/TREE. THE NUMBER OF EMITTERS PER PLANT SHOULD BE AS FOLLOWS:

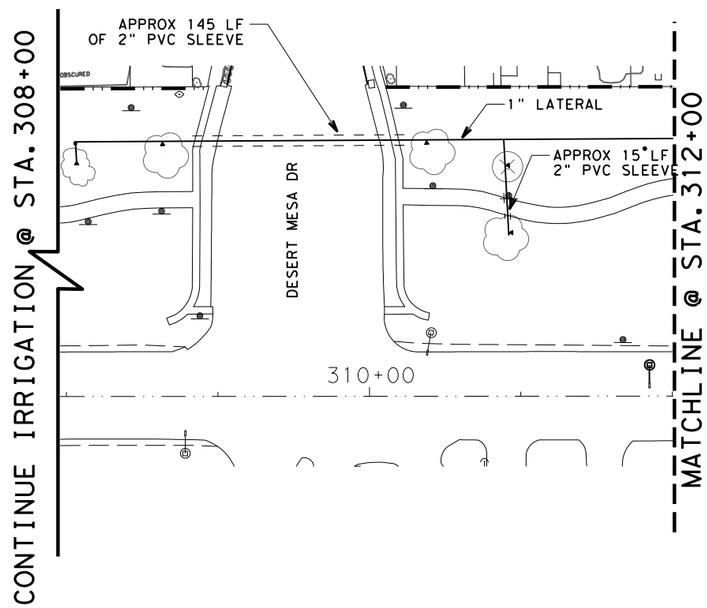
- ○ 5 GAL = 2 EMITTERS
- ▲ 30 - GAL = 8 EMITTERS
- ▲ 1.5" TO 2" CALIPER TREE = 8 EMITTERS

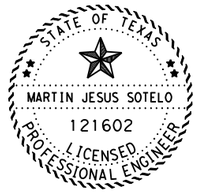
8. TRENCHING AND/OR BORING REQUIRED FOR THE INSTALLATION OF THE IRRIGATION SYSTEM IS SUBSIDIARY TO ITEM 170.
9. THE IRRIGATION SYSTEM COMPONENTS, INCLUDING WATER METER, SHALL NOT EXCEED THE MANUFACTURER'S PUBLISHED PERFORMANCE LIMITATIONS FOR THE COMPONENT.

LEGEND

- ▲ MULTI OUTLET EMISSION DEVICE 8 (1.0 GPH EA)
- ○ 2 EMITTERS 1.0 GPH EA
- Ⓐ CONTROLLER
- • MANUAL DRAIN VALVE
- 1.5" MAIN LINE
- PVC SLEEVE
- 1" LATERAL
- ⬡ QUICK COUPLER
- TRAFFIC DIRECTION







P.E.

06-02-2021

VEGETATIVE LANDSCAPE AT FM-1281 LANDSCAPE

IRRIGATION LAYOUT

(HORIZON BLVD)

SCALE: 1"=100' SHEET 1 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		26

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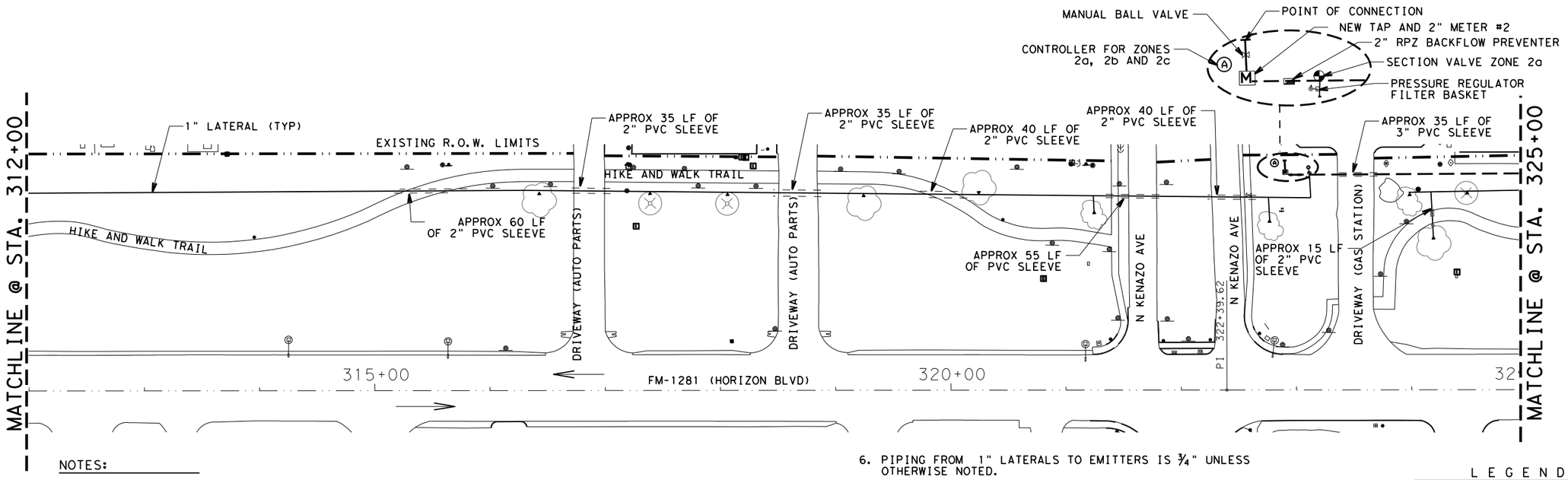

NOTES:

1. THERE ARE UNDERGROUND UTILITIES IN THE AREA. VERIFY LOCATIONS OF ALL UTILITIES WITH THE CONTROLLING AUTHORITIES PRIOR TO ANY EXCAVATION.
2. LOCATION SHOWN FOR NEW TAPS AND METERS ARE APPROXIMATE AND MAY BE ADJUSTED AT THE SITE BY THE ENGINEER.
3. LOCATE QUICK-COUPLING VALVES IN SEPARATE BOXES FROM SECTION VALVES.
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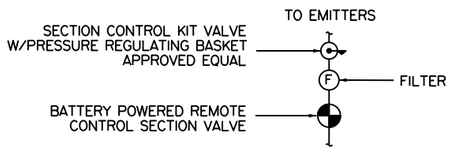

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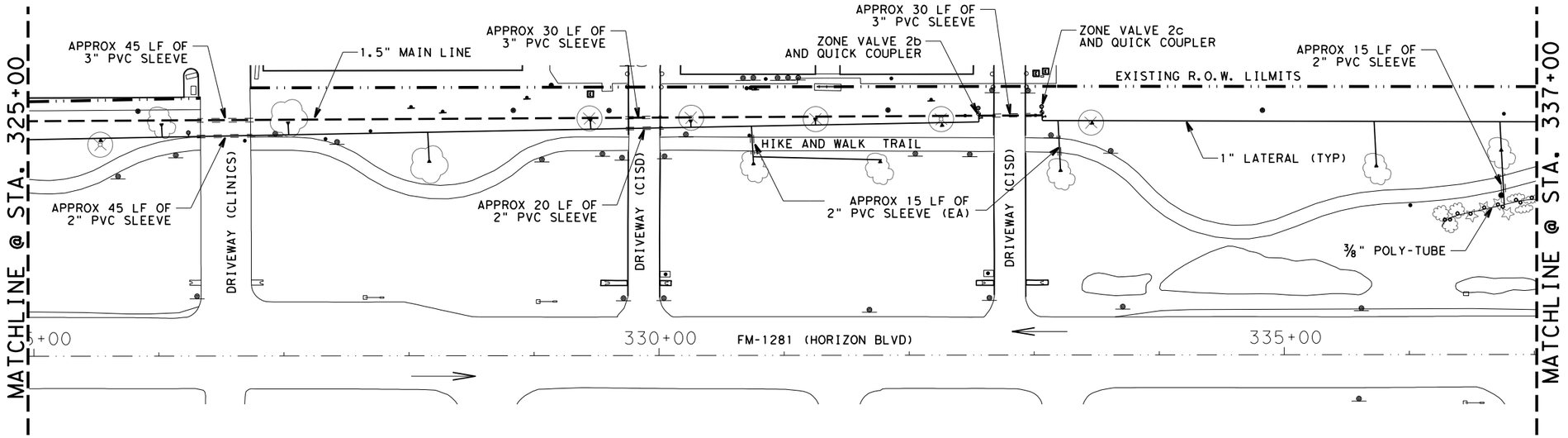
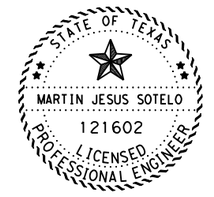
9. THE IRRIGATION SYSTEM COMPONENTS, INCLUDING WATER METER, SHALL NOT EXCEED THE MANUFACTURER'S PUBLISHED PERFORMANCE LIMITATIONS FOR THE COMPONENT.

LEGEND

▲ MULTI OUTLET EMMISION DEVICE = 8 (1.0 GPH)	1.5" MAIN LINE
○ 2 EMITTERS @ 1.0 GPH	PVC SLEEVE
Ⓐ CONTROLLER	1" LATERAL
● MANUAL DRAIN VALVE	QUICK COUPLER
	TRAFFIC DIRECTION





P.E.

06-02-2021

VEGETATIVE LANDSCAPE AT FM-1281
LANDSCAPE

IRRIGATION LAYOUT
(HORIZON BLVD)

SCALE: 1"=100' SHEET 2 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		27

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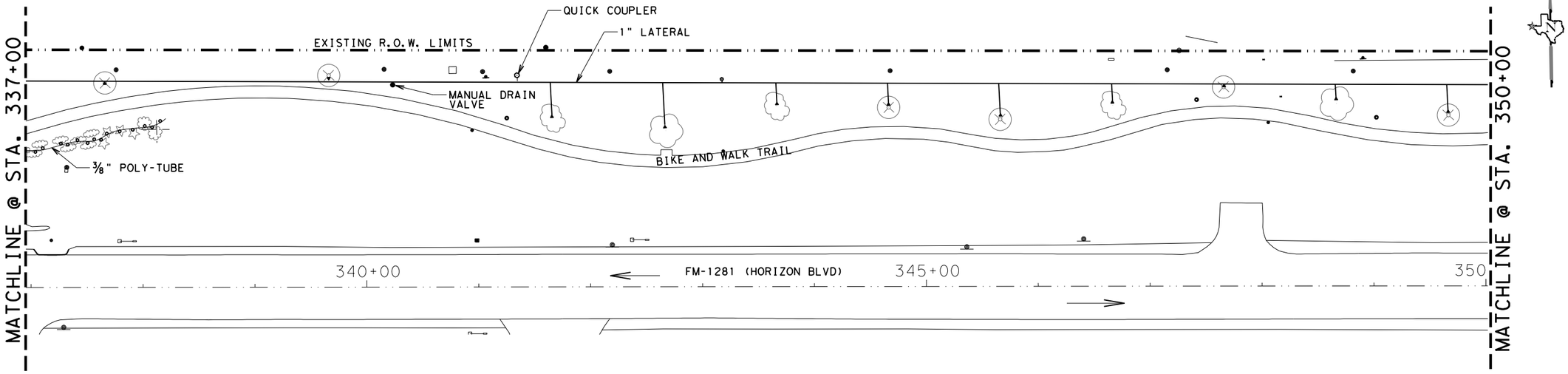

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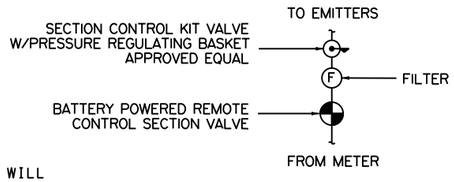

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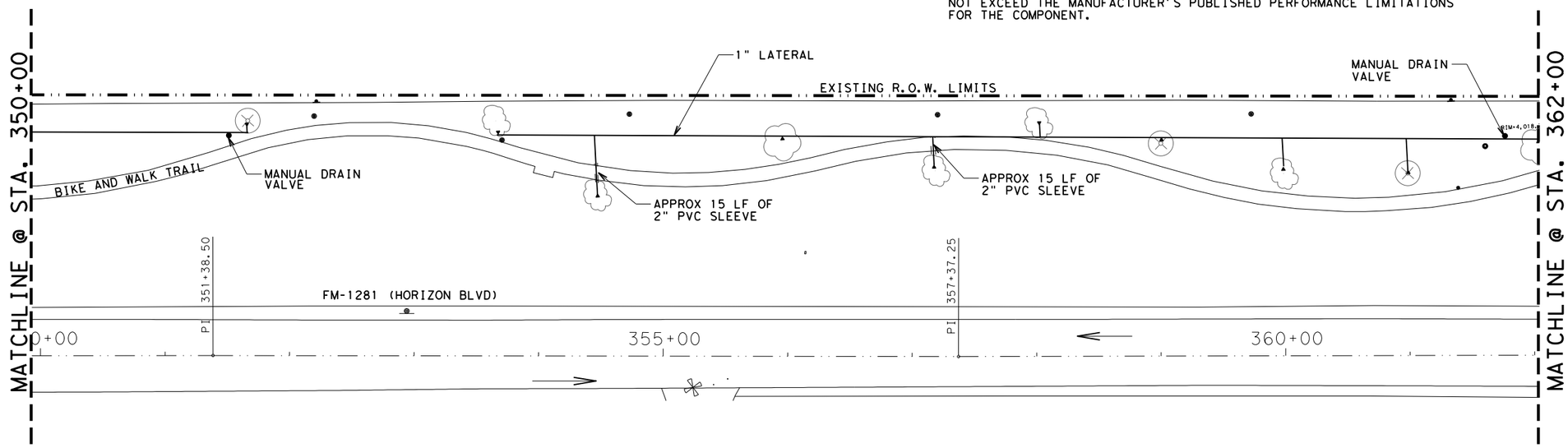
LEGEND

- ▲ MULTI OUTLET EMMISION DEVICE = 8 (1.0 GPH)
- O 2 EMITTERS @ 1.0 GPH
- (A) CONTROLLER
- ● MANUAL DRAIN VALVE
- 1.5" MAIN LINE
- PVC SLEEVE
- 1" LATERAL
- QUICK COUPLER
- TRAFFIC DIRECTION



STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

, P.E.

06-02-2021

VEGETATIVE LANDSCAPE AT FM-1281
LANDSCAPE

IRRIGATION LAYOUT
(HORIZON BLVD)

SCALE: 1"=100' SHEET 3 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
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ELP	EL PASO		28

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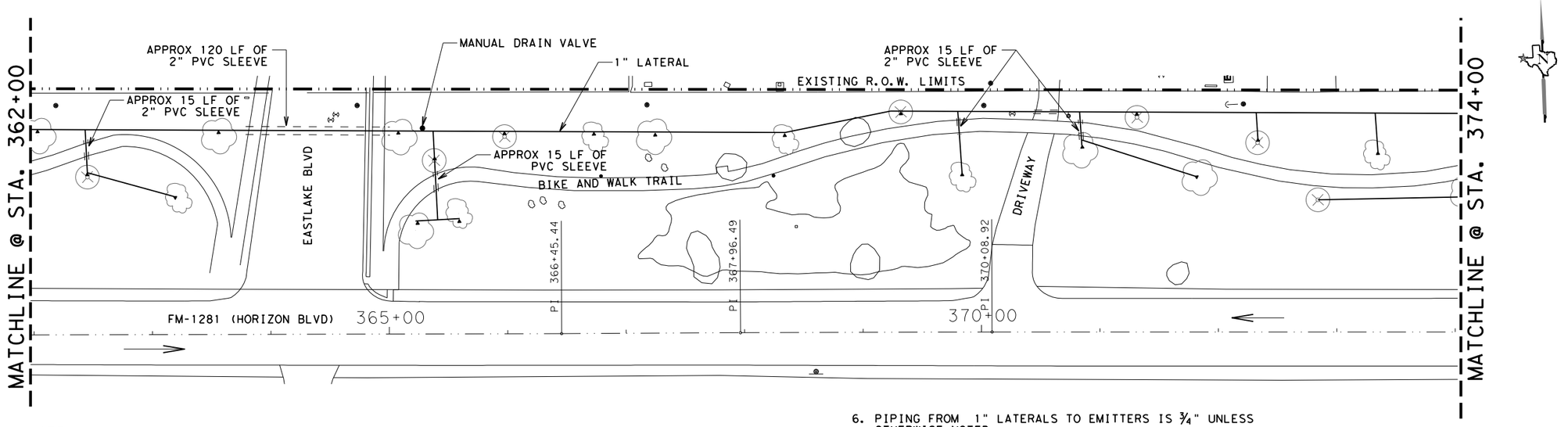

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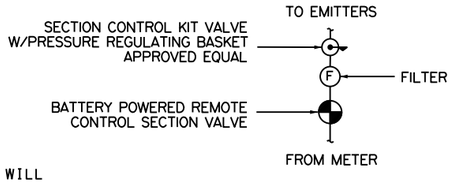

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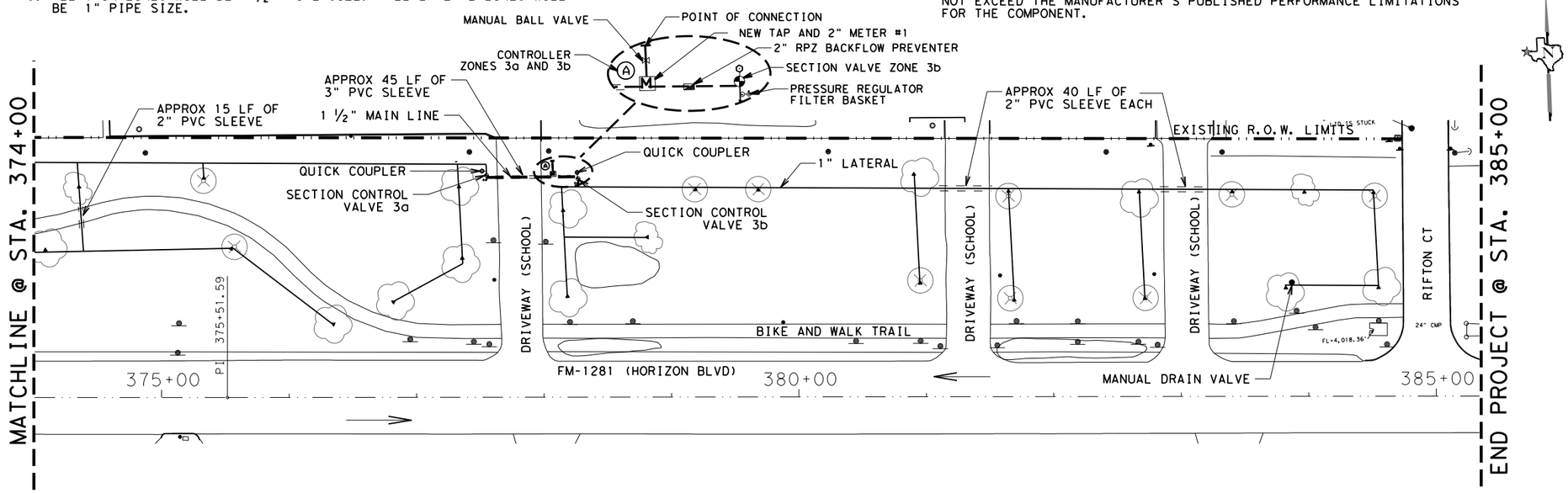
- Ⓐ CONTROLLER
- ● MANUAL DRAIN VALVE
- 1.5" MAIN LINE
- PVC SLEEVE
- 1" LATERAL
- ⬡ QUICK COUPLER
- TRAFFIC DIRECTION



STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

P.E.

06-02-2021

VEGETATIVE LANDSCAPE AT FM-1281

LANDSCAPE

IRRIGATION LAYOUT

(HORIZON BLVD)

SCALE: 1"=100' SHEET 4 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
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ELP	EL PASO		29

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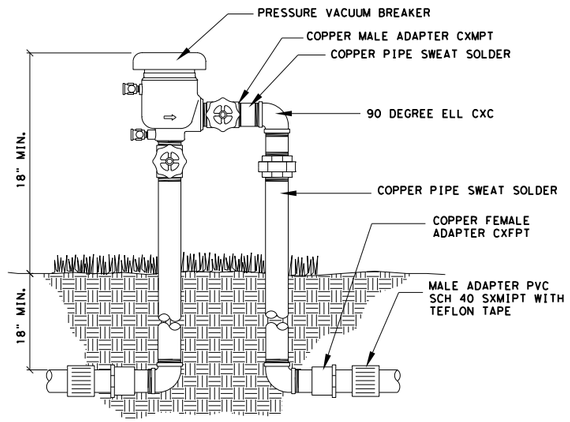
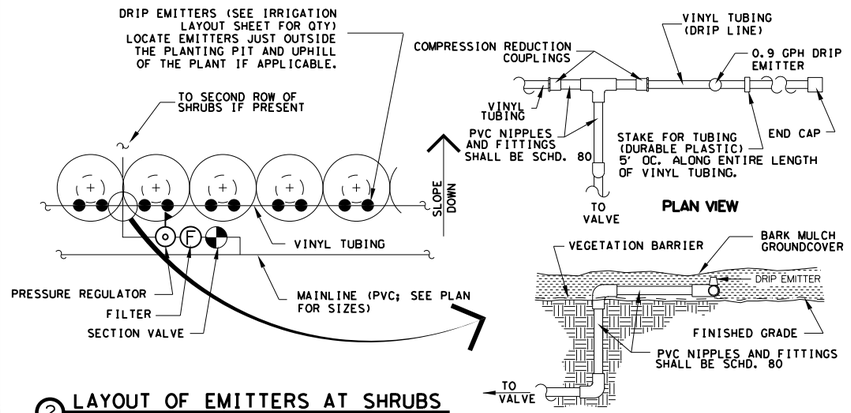
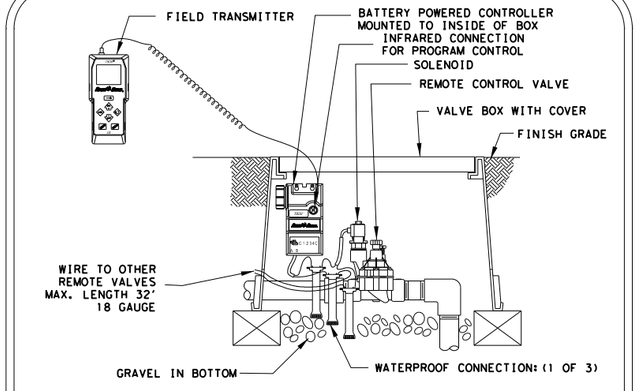


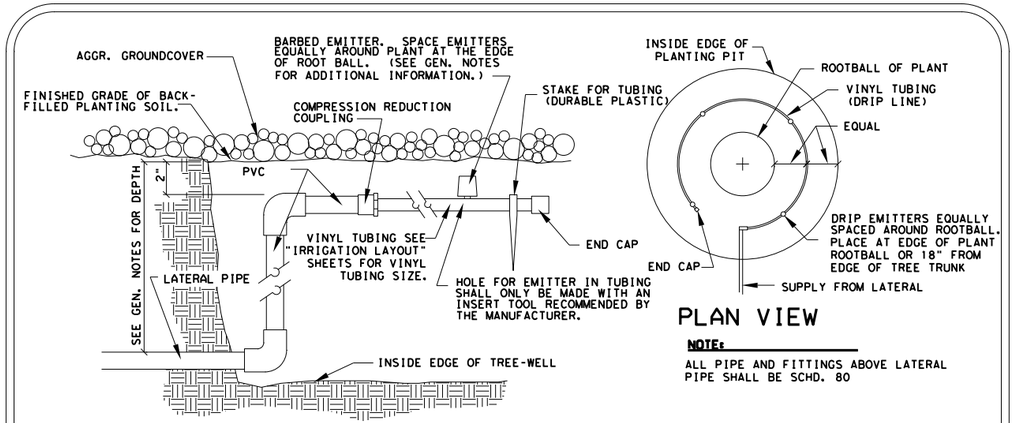
1 PRESSURE VACUUM BREAKER IRRIGATION SECTION VIEW



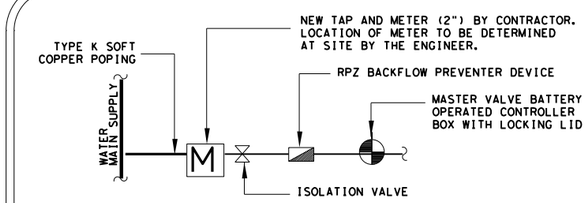
2 LAYOUT OF EMITTERS AT SHRUBS



3 BATTERY OPERATED CONTROLLER INSTALLATION



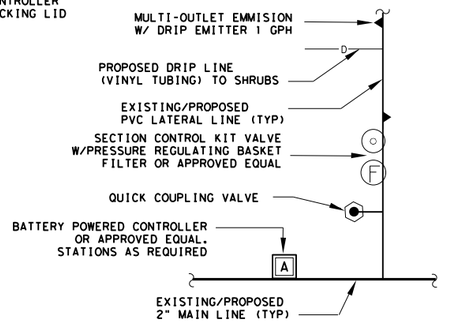
4 INSTALLATION OF DRIP TUBING AT SHRUBS

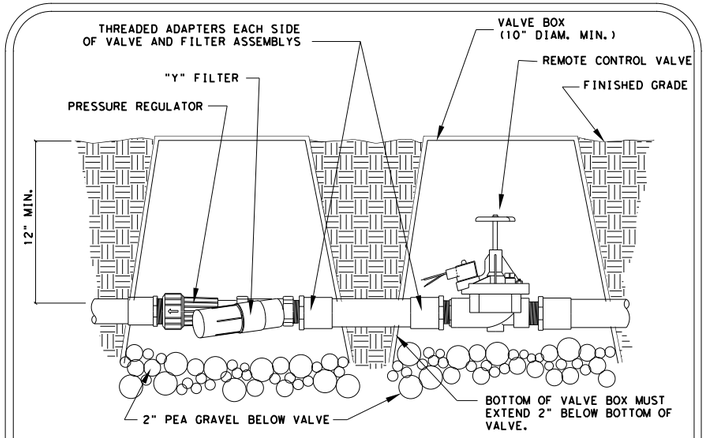


5 METER/MASTER VALVE ASSEMBLY (TYP)

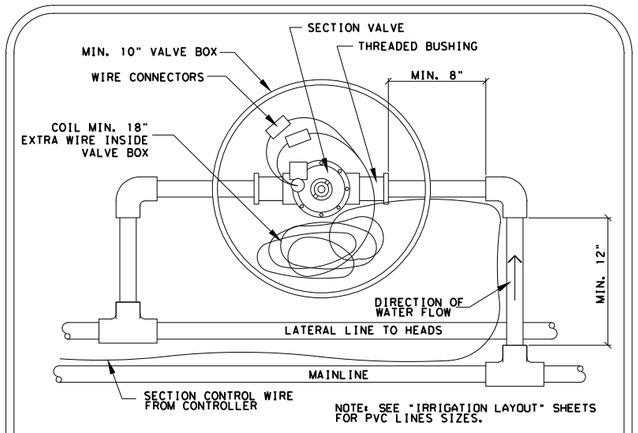
NOTES:

1. LOCATE QUICK-COUPING VALVES IN SEPARATE BOXES FROM SECTION VALVES.
2. LOCATION SHOWN FOR NEW TAPS AND METERS ARE APPROXIMATE AND MAY BE ADJUSTED AT THE SITE BY THE ENGINEER.
3. THERE ARE UNDERGROUND UTILITIES IN THE AREA. VERIFY THE LOCATIONS OF ALL UTILITIES WITH THE CONTROLLING AUTHORITIES PRIOR TO ANY EXCAVATION.
4. ENSURE IRRIGATION SYSTEM IS OPERABLE TO THE QUICK-COUPLING VALVES BEFORE DELIVERING ANY PLANTS TO THE SITE.
5. SEE "IRRIGATION LAYOUT" SHEETS FOR PVC LINES AND VINYL TUBING SIZES.
6. INCLUDE THE FOLLOWING ASSEMBLY ON EACH SECTION:

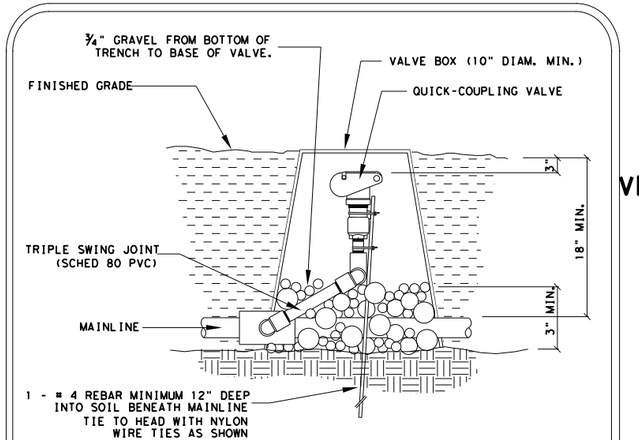




6 VALVE ASSEMBLY FOR DRIP IRRIGATION SECTION VIEW



7 PLAN OF PIPING TO SECTION VALVE



8 QUICK-COUPLING VALVE

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

, P.E.

06-01-2021

VEGETATIVE LANDSCAPE AT FM-1281

LANDSCAPE

IRRIGATION LAYOUT

(HORIZON BLVD)

NOT TO SCALE SHEET OF

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		29A

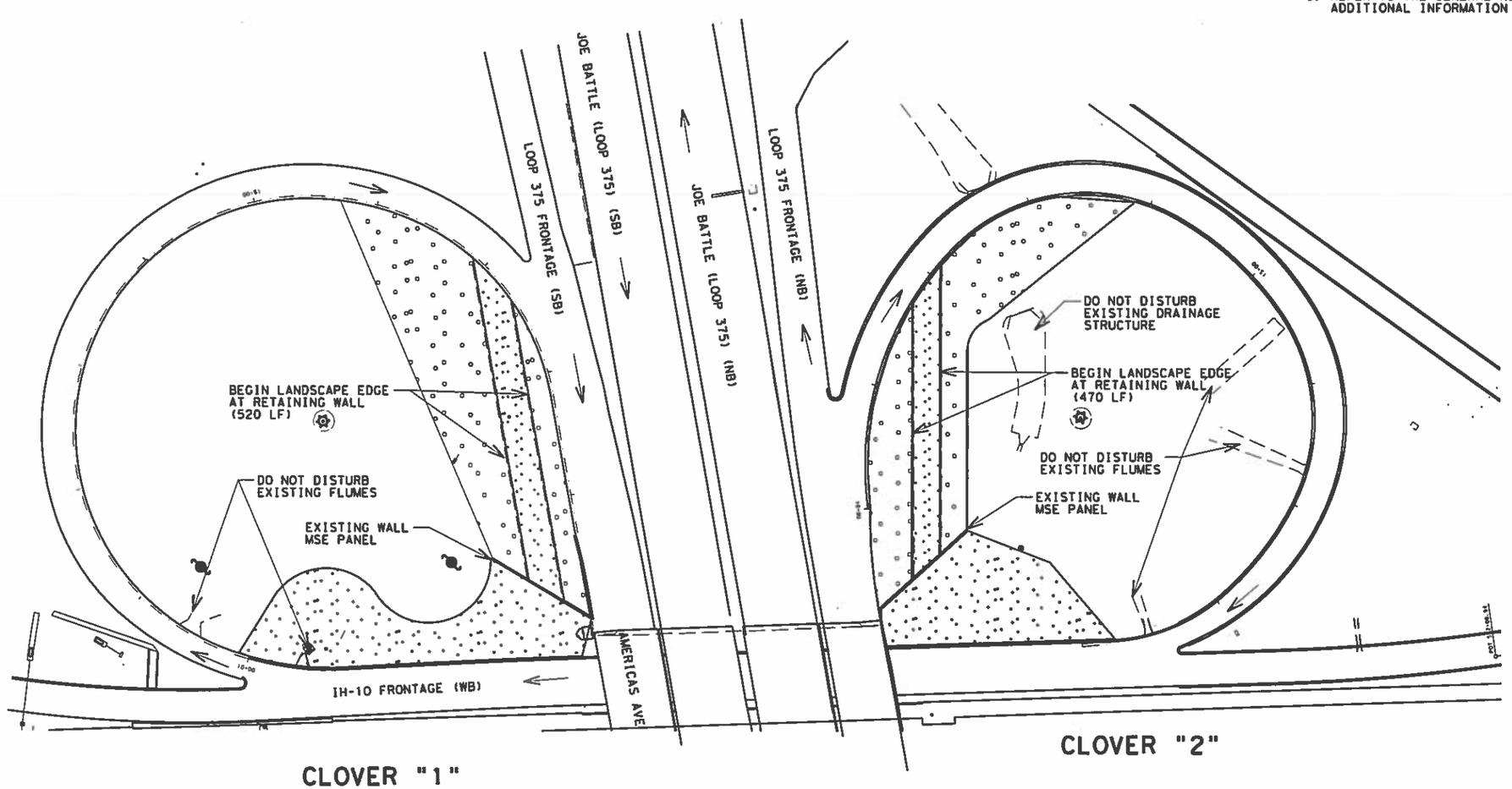
DATE: 05/06/2021 12:03 AM
FILE: TxDOT_Sheets_KM.cel

NOTES:

1. LOOSE AGGREGATE SHALL BE CLEAN, FREE OF WEEDS, PLASTIC, BROKEN GLASS PIECES OR OTHER FOREIGN DEBRIS.
2. PLACE AGGREGATE OF THE TYPE SPECIFIED IN A UNIFORM LAYER WHERE SHOWN. KEEP AGGREGATE AT A MINIMAL ONE INCH BELOW TOP OF PAVEMENT OR CONCRETE CURB/SIDEWALK.
3. REFER TO "MISCELLANEOUS DETAILS" SHEET FOR ADDITIONAL LANDSCAPE DETAILS.
4. PLACE VEGETATION BARRIER UNDER ALL LOOSE AGGREGATE.
5. REFER TO THE GENERAL NOTES FOR AGGREGATE COLORS, SIZE AND ADDITIONAL INFORMATION

LEGEND

- TRAFFIC DIRECTION
- LOOSE AGGREGATE TY I COLOR: PADRE RED SIZE: 2" TO 3"
- LOOSE AGGREGATE TY II COLOR: DARK GREY SIZE: 3/4" TO 1"
- LANDSCAPE EDGE



CLOVER "1"

CLOVER "2"

LANDSCAPE ROCK LAYOUT AT LOOP 375

SUMMARY OF HARDSCAPE ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
110	6003	EXCAVATION (SPECIAL)	CY	1,235
192	6015	LANDSCAPE EDGE	LF	990
1005	6001	LOOSE AGGR FOR GROUNDCOVER (TYPE I)	CY	355
1005	6002	LOOSE AGGR FOR GROUNDCOVER (TYPE II)	CY	346

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

M J S, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10
LANDSCAPE

HARDSCAPE LAYOUT

SCALE: 1"=100' SHEET 1 OF 4

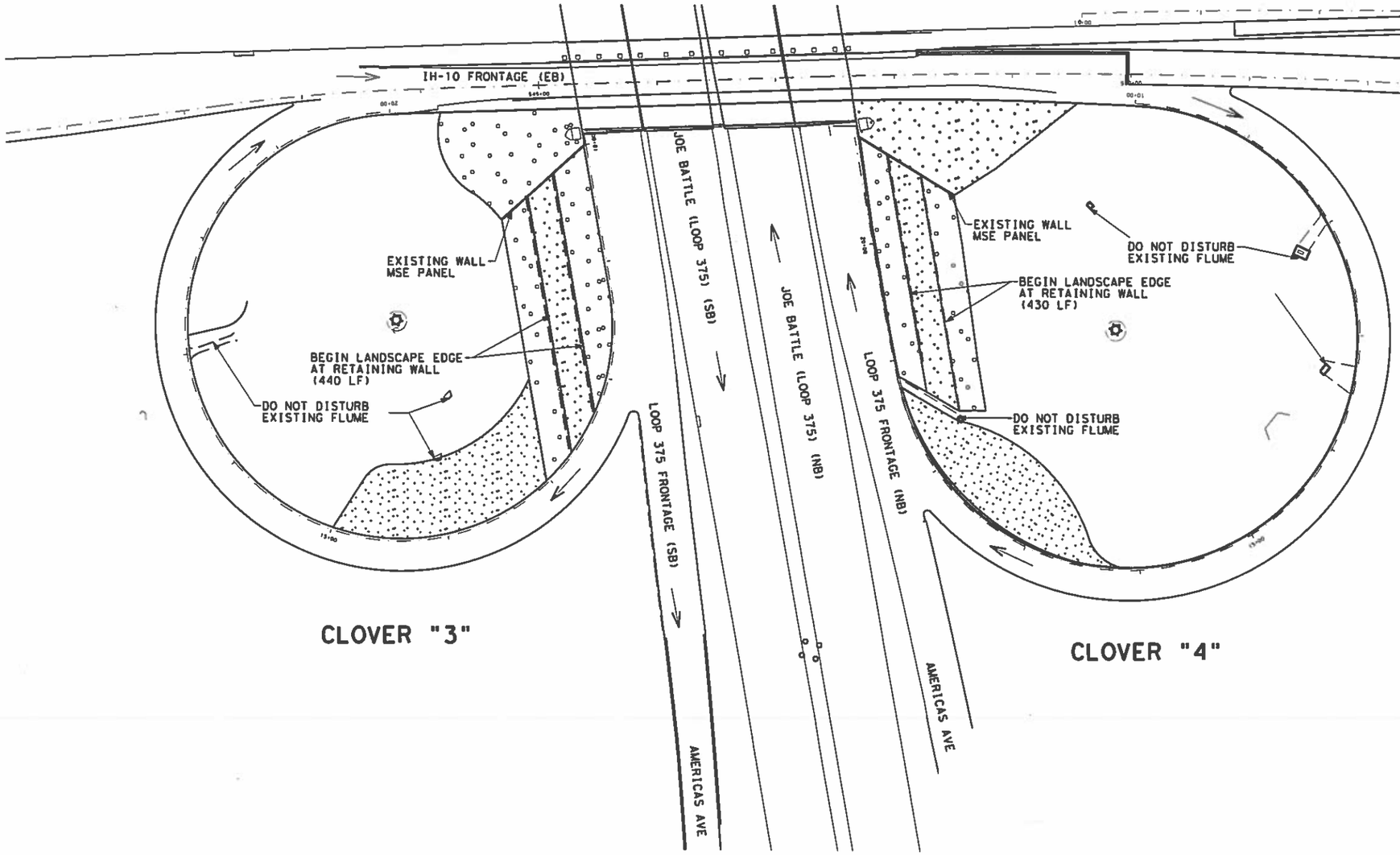
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		30

DATE: 05/04/2021 05:50 AM
FILE: TxDOT_Sheets_XM.cel

NOTE:

1. REFER TO SHEET 1 OF 4 OF THE "HARDSCAPE LAYOUT" SHEETS FOR NOTES THAT APPLY TO THIS SHEET.



TRAFFIC DIRECTION

LOOSE AGGREGATE TY I
COLOR: PADRE RED
SIZE: 2" TO 3"

LOOSE AGGREGATE TY II
COLOR: DARK GREY
SIZE: 3/4" TO 1"

LANDSCAPE EDGE

LANDSCAPE ROCK LAYOUT AT LOOP 375

SUMMARY OF HARDSCAPE ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
110	6003	EXCAVATION (SPECIAL)	CY	1,460
192	6015	LANDSCAPE EDGE	LF	870
1005	6001	LOOSE AGGR FOR GROUNDCOVER (TYPE I)	CY	265
1005	6002	LOOSE AGGR FOR GROUNDCOVER (TYPE II)	CY	369

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

M. J. S., P.E.
5/6/21

VEGETATIVE LANDSCAPE AT IH-10
LANDSCAPE

HARDSCAPE LAYOUT

SHEET 2 OF 4

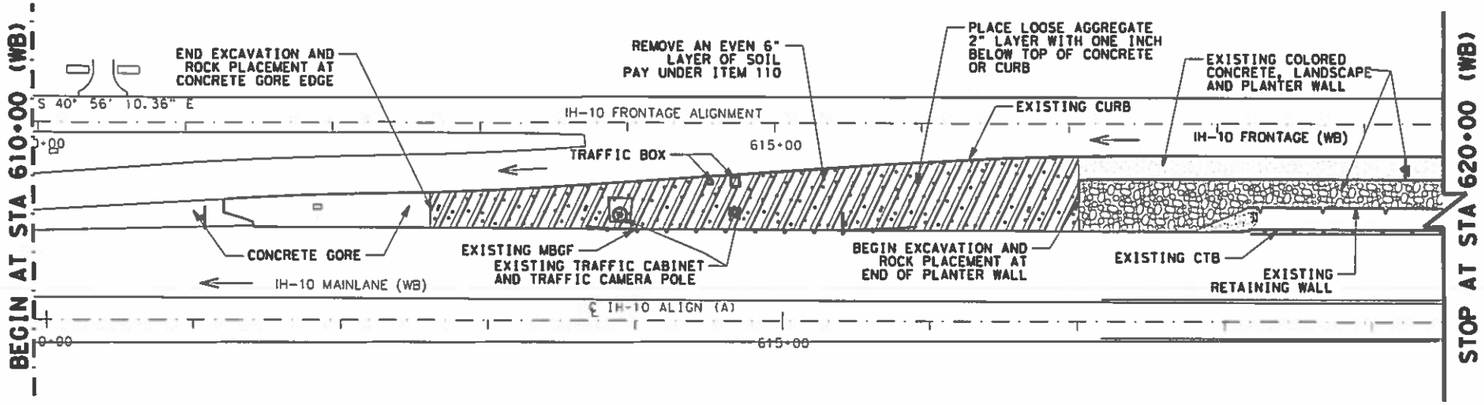
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		31

DATE: 05/04/2021 05:50 AM
FILE: TxDOT_Sheet8_AM.cel

NOTES:

1. REFER TO SHEET 1 OF 4 OF THE "IH-10 HARDSCAPE LAYOUT" SHEETS FOR NOTES THAT APPLY TO THIS SHEET.



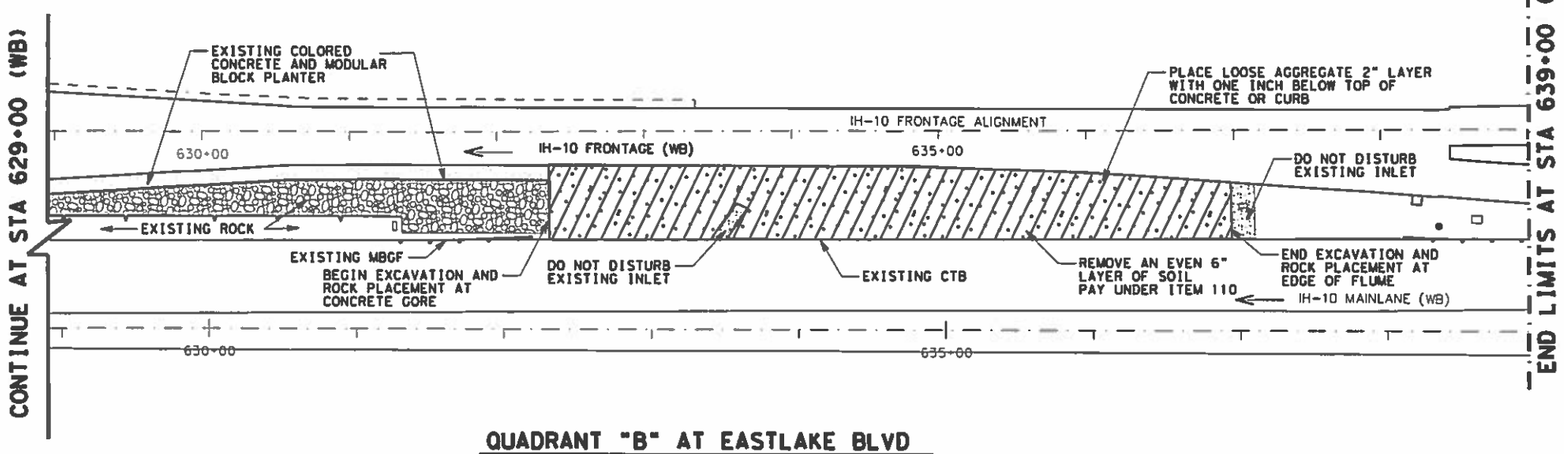
LEGEND

- LOOSE AGGREGATE FOR GROUND COVER (TY I)
- EXCAVATION (SPECIAL) AREA
- TRAFFIC DIRECTION

QUADRANT "A" AT EASTLAKE BLVD

SUMMARY OF HARDSCAPE ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
110	6003	EXCAVATION (SPECIAL)	CY	564
192	6015	LANDSCAPE EDGE	LF	0
1005	6001	LOOSE AGGR FOR GROUNDCOVER (TYPE	CY	195

SCALE: 1"=100'



QUADRANT "B" AT EASTLAKE BLVD

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

M J S, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10
LANDSCAPE

HARDSCAPE LAYOUT

SCALE: 1"=100' SHEET 3 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		32

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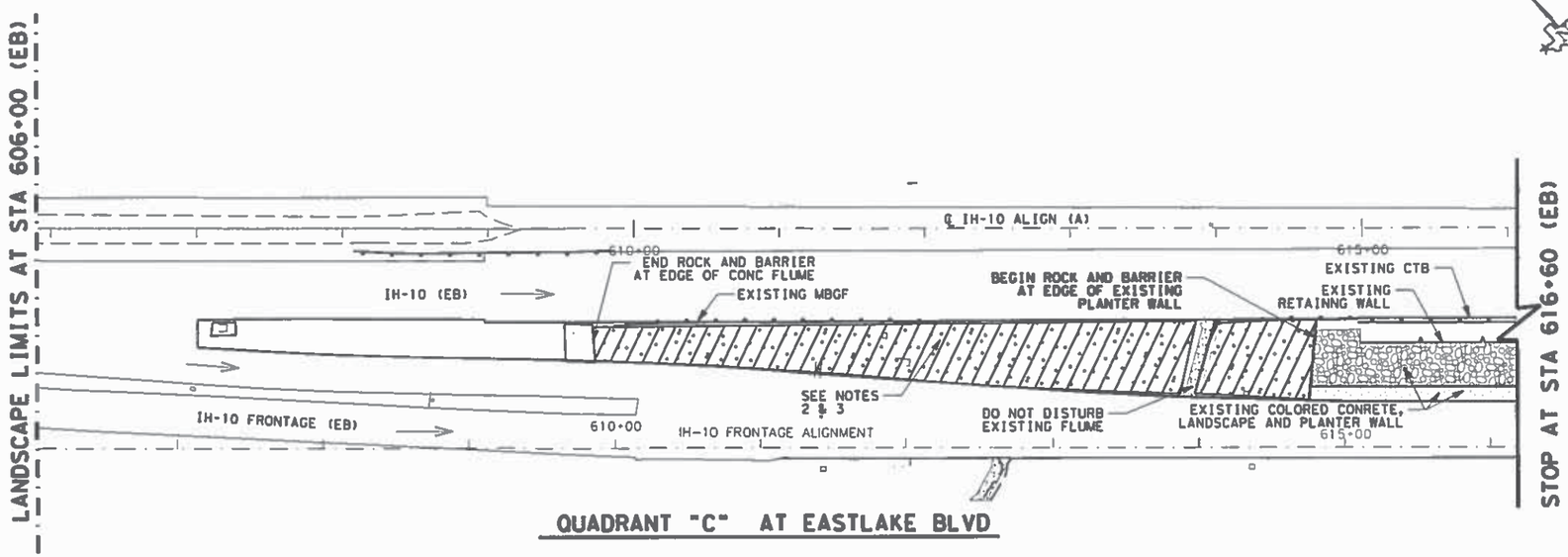
NOTES:

1. REFER TO SHEET 1 OF 4 OF THE "IH-10 HARDSCAPE LAYOUT" SHEETS FOR NOTES THAT APPLY TO THIS SHEET.



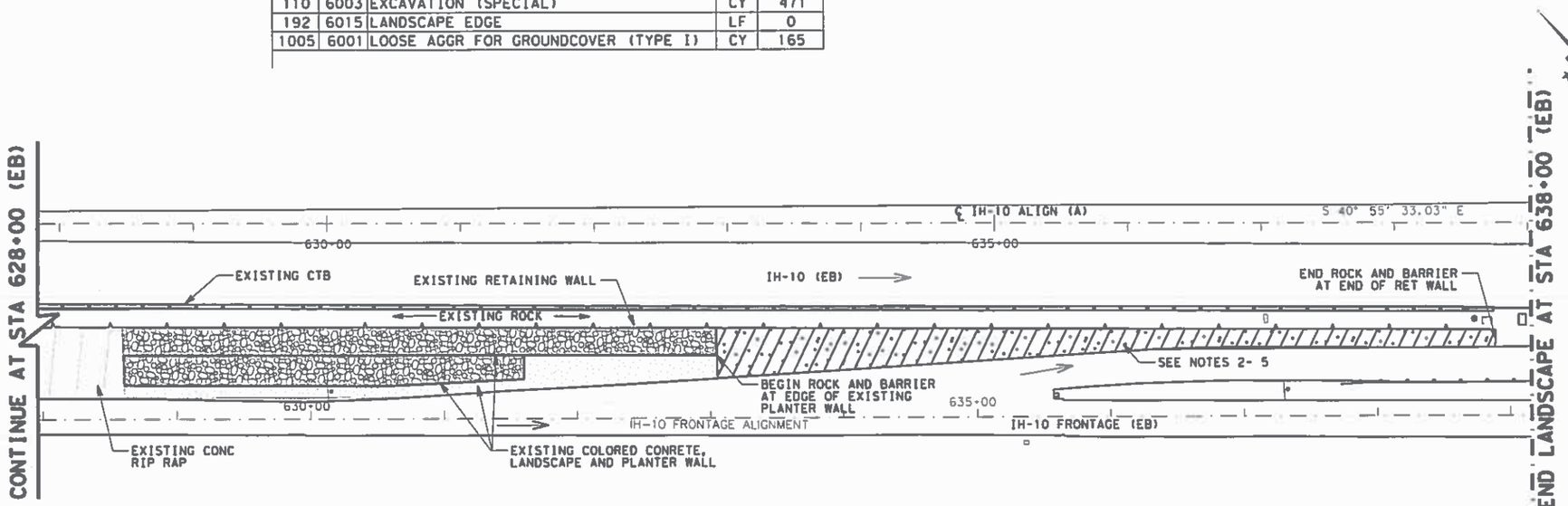
QUADRANT "C" AT EASTLAKE BLVD

LEGEND

- LOOSE AGGREGATE FOR GROUND COVER (TY I)
- EXCAVATION (SPECIAL) AREA
- TRAFFIC DIRECTION

SCALE: 1"=100'

SUMMARY OF HARDSCAPE ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
110	6003	EXCAVATION (SPECIAL)	CY	471
192	6015	LANDSCAPE EDGE	LF	0
1005	6001	LOOSE AGGR FOR GROUNDCOVER (TYPE I)	CY	165



QUADRANT "D" AT EASTLAKE BLVD

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

M. Sotelo, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10
LANDSCAPE

HARDSCAPE LAYOUT

SCALE: 1"=100' SHEET 4 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR&BUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		33

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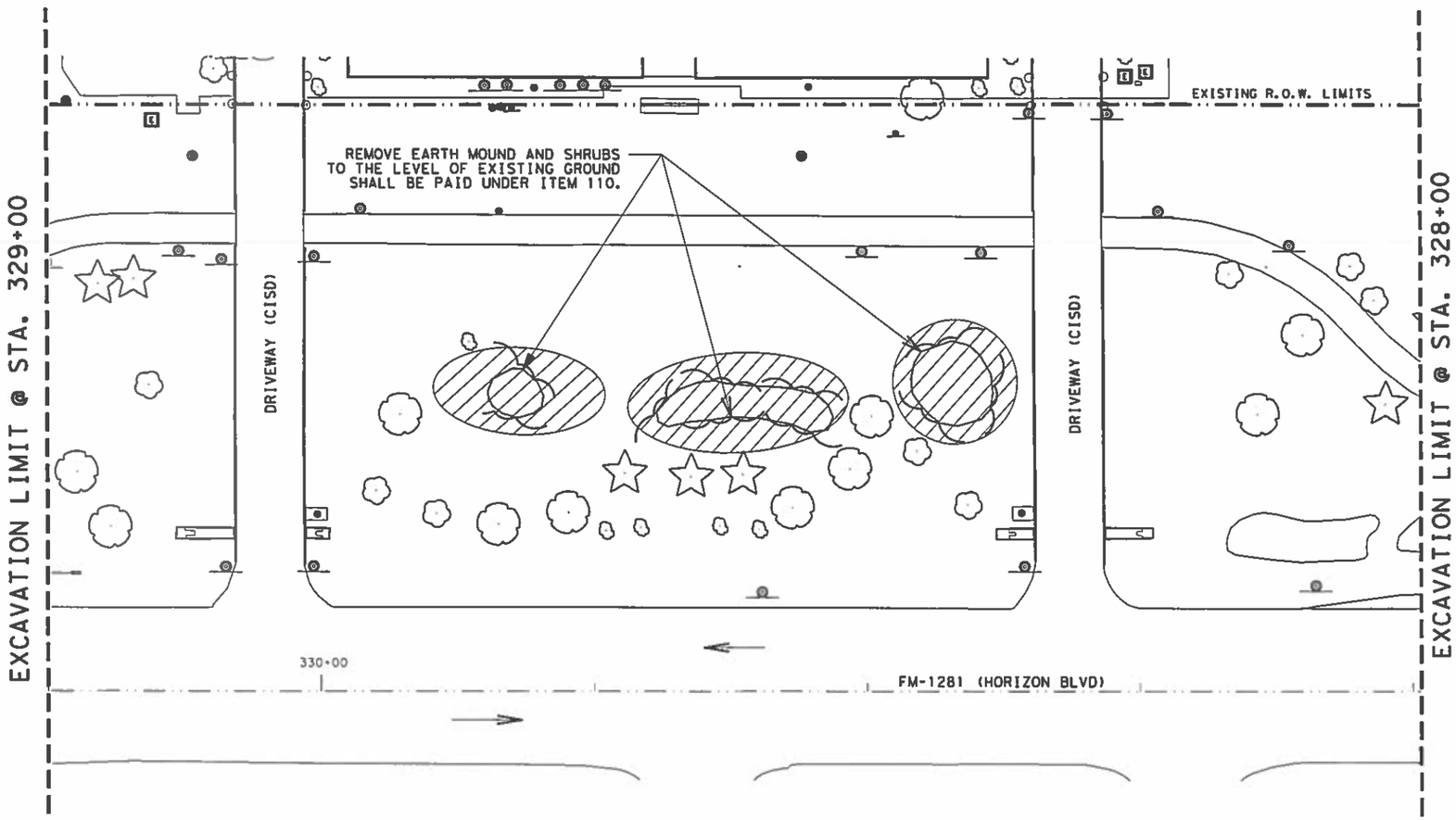

HARDSCAPE AT BIKE AND WALK TRAIL

LEGEND
- EXCAVATION (SPL)
- EXISTING VEGETATION (DO NOT DISTURB)
- TRAFFIC DIRECTION

SUMMARY OF HARDSCAPE ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
110	6003	EXCAVATION (SPECIAL)	CY	931

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

P.E.
5/5/21

VEGETATIVE LANDSCAPE AT FM-1281
LANDSCAPE

HARDSCAPE LAYOUT
(HORIZON BLVD)

SCALE: 1"=50' SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		34

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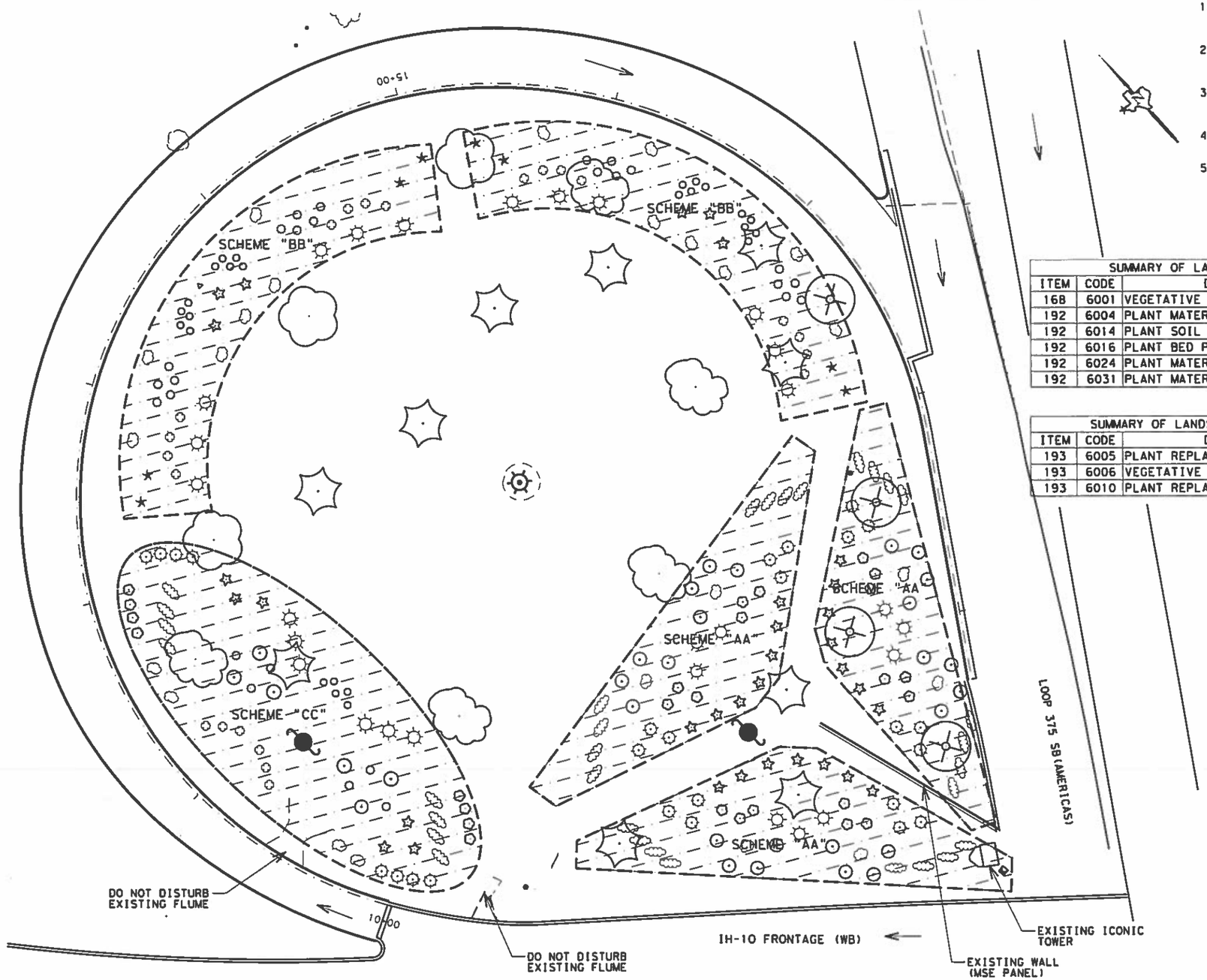

CLOVER "1" PLANTING AT LOOP 375

NOTES:

1. THERE ARE UNDERGROUND UTILITIES IN THE AREA. VERIFY THE LOCATIONS OF ALL UTILITIES WITH THE CONTROLLING AUTHORITIES PRIOR TO ANY EXCAVATION.
2. STAKE AND LOCATE VEGETATION AT THE SITE ACCORDING TO THE SCHEME LAYOUT. ANY ADJUSTMENTS DEEMED NECESSARY FOR CLEAR-ZONE SETBACKS AND SIGHT DISTANCE WILL BE AS DIRECTED.
3. PLANT PIT EXCAVATION, INSTALLATION AND BASIN CONSTRUCTION WILL NOT BE PAID FOR SEPARATELY BUT IS SUBSIDIARY TO ITEM 192. REFER TO "PLANTING DETAILS" SHEET FOR ADDITIONAL INFORMATION.
4. FOR LOOSE AGGREGATE REFER TO "HARDSCAPE LAYOUT" SHEETS FOR ROCK TYPE, PAY ITEM AND QUANTITY.
5. FOR PLANT TYPES AND LAYOUT REFER TO THE "PLANT SCHEME LAYOUT" SHEET 2 OF 2.

SUMMARY OF LANDSCAPE PLANTING ITEMS

ITEM	CODE	DESCRIPTION	UNIT	QTY
168	6001	VEGETATIVE WATERING	MG	7
192	6004	PLANT MATERIAL (5-GAL)	EA	109
192	6014	PLANT SOIL MIX	CY	20
192	6016	PLANT BED PREPARATION	SY	6260
192	6024	PLANT MATERIAL (30 GAL) (TREE)	EA	22
192	6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	170

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS

ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	36
193	6006	VEGETATIVE WATERING	MG	11
193	6010	PLANT REPLACEMENT (30 GAL)	EA	4

LEGEND

PLANT BED PREPARATION
TRAFFIC DIRECTION
PLANT SCHEME LIMITS

SCHEME LEGEND	QTY
SCHEME "AA"	3
SCHEME "BB"	2
SCHEME "CC"	1
TREE QUANTITY	22

CHASTE VITEX 10
PALO VERDE 5
DESERT WILLOW 4
HONEY MESQUITE 3

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10 LANDSCAPE

PLANTER LAYOUT

SCALE: 1"=50' SHEET 1 OF 6

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		35

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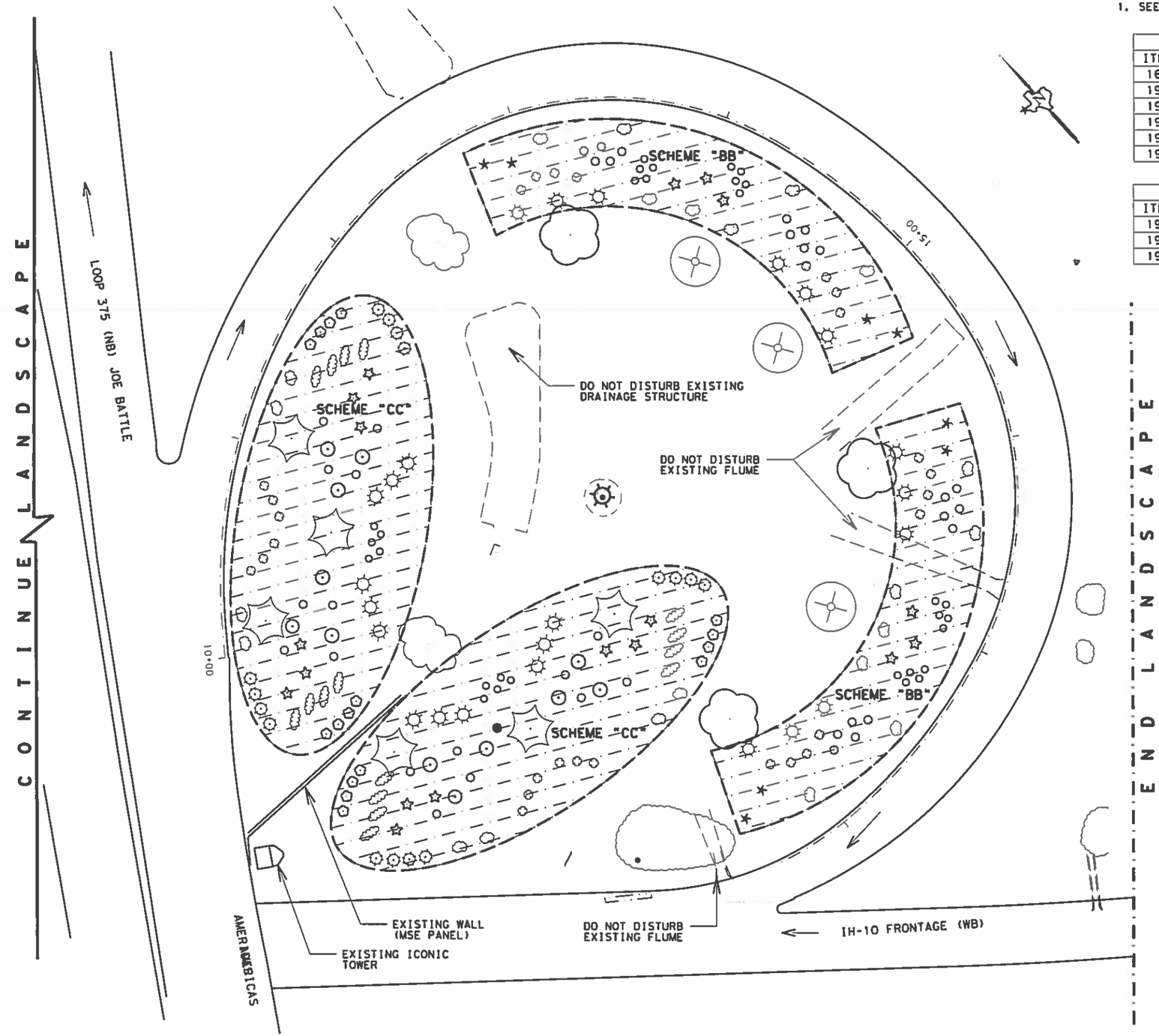

CLOVER "2" PLANTING AT LOOP 375

NOTES:

1. SEE SHEET 1 OF 6 FOR NOTES THAT APPLY TO THIS SHEET

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
168	6001	VEGETATIVE WATERING	MG	6
192	6004	PLANT MATERIAL (5-GAL)	EA	108
192	6014	PLANT SOIL MIX	CY	15
192	6016	PLANT BED PREPARATION	SY	5840
192	6024	PLANT MATERIAL (30 GAL) (TREE)	EA	13
192	6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	114

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	29
193	6006	VEGETATIVE WATERING	MG	8
193	6010	PLANT REPLACEMENT (30 GAL)	EA	3

LEGEND

- PLANT BED PREPARATION
- TRAFFIC DIRECTION
- PLANT SCHEME LIMITS

SCHEME LEGEND	QTY
SCHEME "AA"	0
SCHEME "BB"	2
SCHEME "CC"	2
TREE QUANTITY	13

- CHASTE VITEX 6
- PALO VERDE 2
- DESERT WILLOW 2
- HONEY MESQUITE 3

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

M. J. Sotelo, P.E.
5/15/21

VEGETATIVE LANDSCAPE AT IH-10 LANDSCAPE

PLANTER LAYOUT

SCALE: 1"=50' SHEET 2 OF 6

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		36

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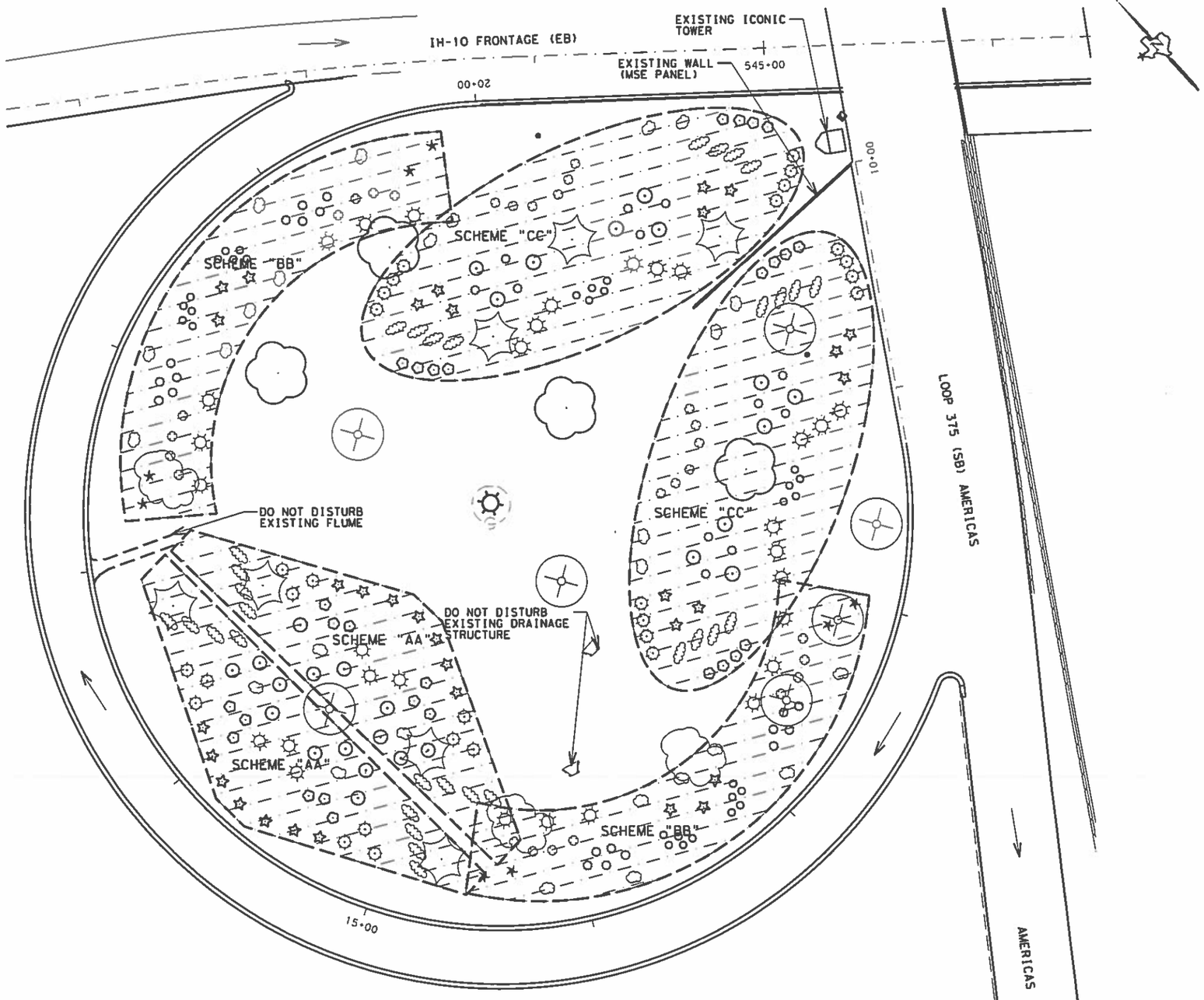

CLOVER "3" PLANTING AT LOOP 375

1. SEE SHEET 1 OF 6 FOR NOTES THAT APPLY TO THIS SHEET

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
168	6001	VEGETATIVE WATERING	MG	8
192	6004	PLANT MATERIAL (5-GAL)	CE	124
192	6014	PLANT SOIL MIX	CY	21
192	6016	PLANT BED PREPARATION	SY	5830
192	6024	PLANT MATERIAL (30 GAL) (TREE)	EA	20
192	6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	178

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	39
193	6006	VEGETATIVE WATERING	MG	11
193	6010	PLANT REPLACEMENT (30 GAL)	EA	4

PLANT BED PREPARATION
TRAFFIC DIRECTION
PLANT SCHEME LIMITS

SCHEME LEGEND	QTY
SCHEME "AA"	2
SCHEME "BB"	2
SCHEME "CC"	2
TREE QUANTITY	20

- CHASTE VITEX 6
- PALO VERDE 3
- DESERT WILLOW 7
- HONEY MESQUITE 4

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

M J S, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10 LANDSCAPE

PLANTER LAYOUT

SCALE: 1"=50' SHEET 3 OF 6

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		37

DATE: 5/4/2021 11:18:18 AM
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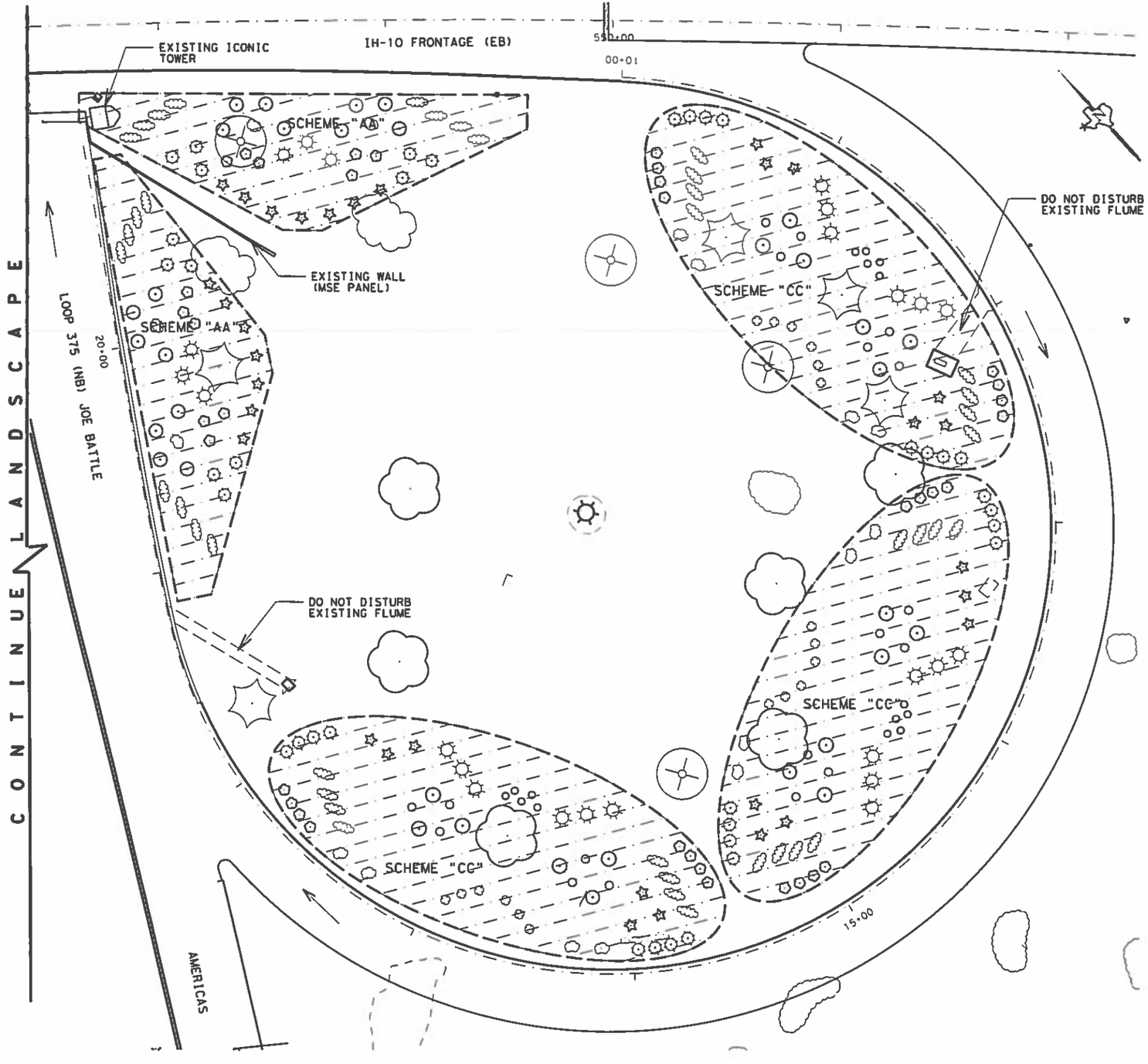

CLOVER "4" PLANTINGAT LOOP 375

NOTES:

1. SEE SHEET 1 OF 6 FOR NOTES THAT APPLY TO THIS SHEET

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
168	6001	VEGETATIVE WATERING	MG	7
192	6004	PLANT MATERIAL (5-GAL)	EA	85
192	6014	PLANT SOIL MIX	CY	19
192	6016	PLANT BED PREPARATION	SY	8125
192	6024	PLANT MATERIAL (30 GAL) (TREE)	EA	17
192	6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	184

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	35
193	6006	VEGETATIVE WATERING	MG	10
193	6010	PLANT REPLACEMENT (30 GAL)	EA	3

LEGEND

PLANT BED PREPARATION
TRAFFIC DIRECTION
PLANT SCHEME LIMITS

SCHEME LEGEND	QTY
SCHEME "AA"	2
SCHEME "BB"	0
SCHEME "CC"	3
TREE QUANTITY	17

CHASTE VITEX 5
PALO VERDE 2
DESERT WILLOW 4
HONEY MESQUITE 6

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10 LANDSCAPE

PLANTER LAYOUT

SCALE: 1"=50' SHEET 4 OF 6

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		38

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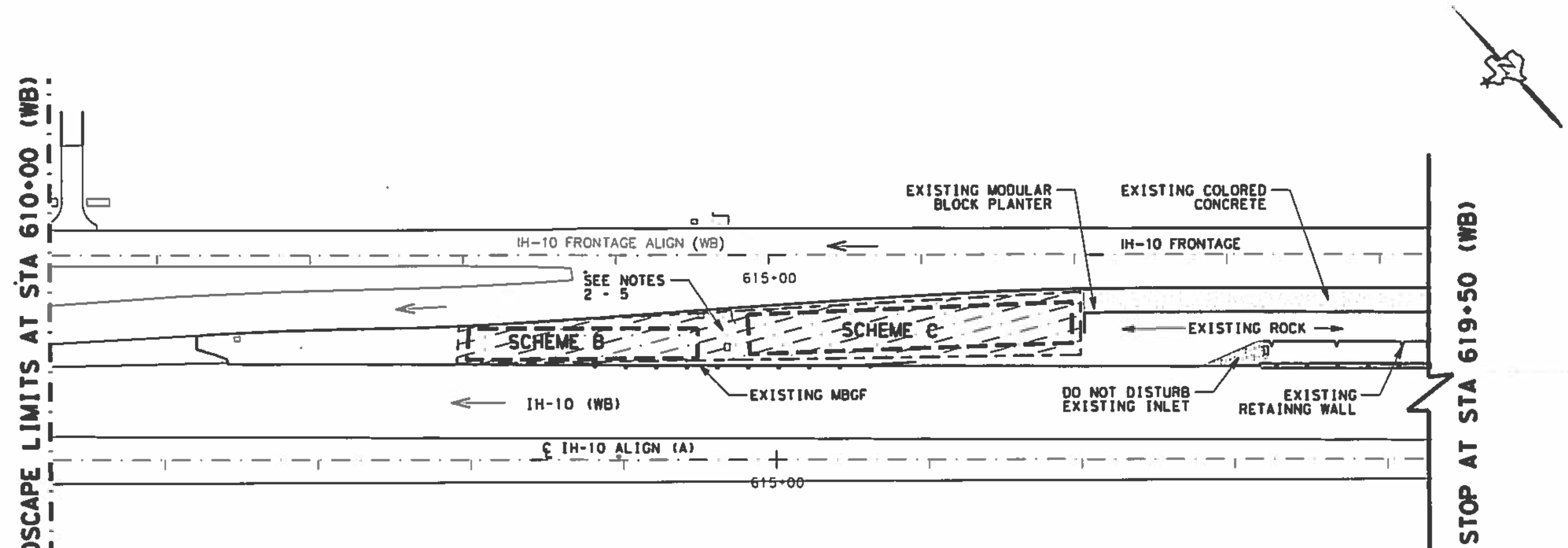
NOTES:

1. THERE ARE UNDERGROUND UTILITIES IN THE AREA. VERIFY THE LOCATIONS OF ALL UTILITIES WITH THE CONTROLLING AUTHORITIES PRIOR TO ANY EXCAVATION.
2. STAKE AND LOCATE VEGETATION AT THE SITE ACCORDING TO THE SCHEME LAYOUT. ANY ADJUSTMENTS DEEMED NECESSARY FOR CLEAR-ZONE SETBACKS AND SIGHT DISTANCE WILL BE AS DIRECTED.
3. PLANT PIT EXCAVATION, INSTALLATION AND BASIN CONSTRUCTION WILL NOT BE PAID FOR SEPARATELY BUT IS SUBSIDIARY TO ITEM 192. REFER TO "PLANTING DETAILS" SHEET FOR ADDITIONAL INFORMATION.
4. PLACE VEGETATION BARRIER UNDER AND ALL LOOSE AGGREGATE. REFER TO "HARDSCAPE LAYOUT" SHEETS FOR ROCK TYPE, PAY ITEM AND QUANTITY.
5. FOR PLANT TYPES AND LAYOUT REFER TO THE "PLANT SCHEME LAYOUT" SHEET 2 OF 2.



QUADRANT "A" PLANTING AT EASTLAKE BLVD

LEGEND

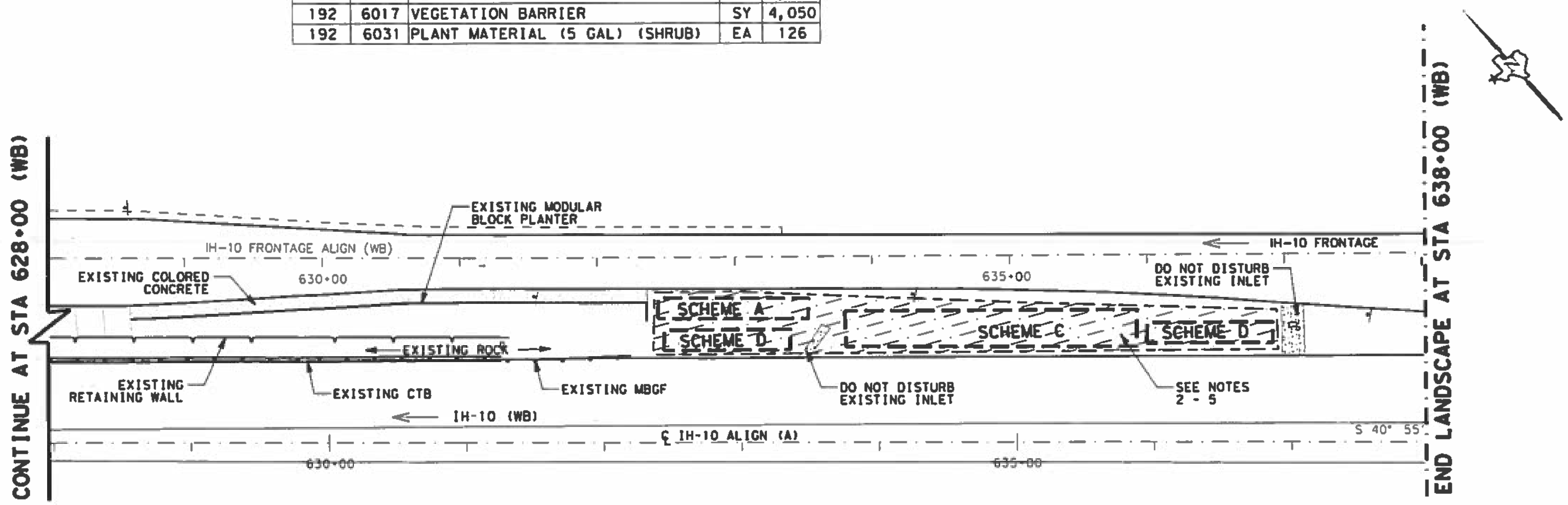
- PLANT BED PREPARATION
- TRAFFIC DIRECTION
- PROPOSED PLANT SCHEME

SCHEME LEGEND	QTY
SCHEME "A"	1
SCHEME "B"	1
SCHEME "C"	2
SCHEME "D"	2

SCALE: 1"=100'

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
168	6001	VEGETATIVE WATERING	MG	6
192	6004	PLANT MATERIAL (5-GAL)	EA	137
192	6014	PLANT SOIL MIX	CY	285
192	6016	PLANT BED PREPARATION	SY	3,390
192	6017	VEGETATION BARRIER	SY	4,050
192	6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	126

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	34
193	6006	VEGETATIVE WATERING	MG	9



QUADRANT "B" PLANTING AT EASTLAKE BLVD

PRELIMINARY SUBJECT TO REVISION

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VEGETATIVE LANDSCAPE AT IH-10
LANDSCAPE

PLANTER LAYOUT

SCALE: 1"=100' SHEET 5 OF 6

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		39

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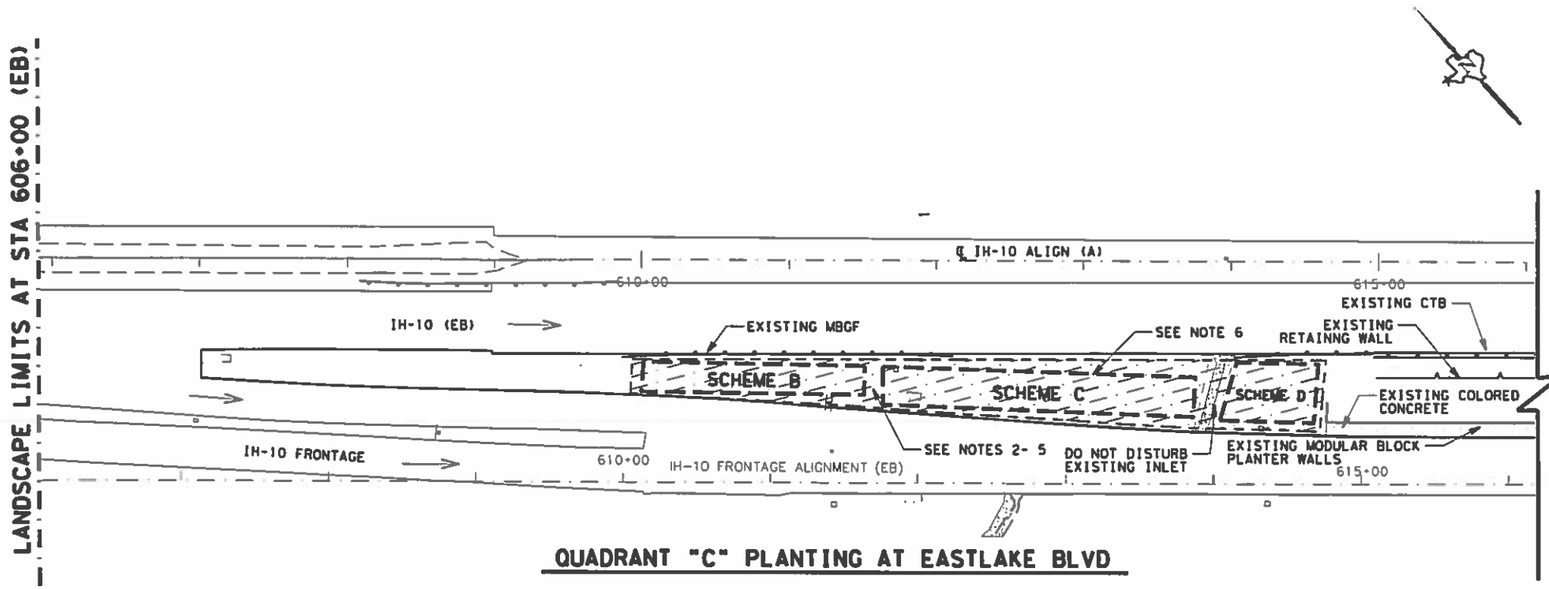


QUADRANT "C" PLANTING AT EASTLAKE BLVD

NOTES:

1. THERE ARE UNDERGROUND UTILITIES IN THE AREA. VERIFY THE LOCATIONS OF ALL UTILITIES WITH THE CONTROLLING AUTHORITIES PRIOR TO ANY EXCAVATION.
2. STAKE AND LOCATE VEGETATION AT THE SITE ACCORDING TO THE SCHEME LAYOUT. ANY ADJUSTMENTS DEEMED NECESSARY FOR CLEAR-ZONE SETBACKS AND SIGHT DISTANCE WILL BE AS DIRECTED.
3. PLANT PIT EXCAVATION, INSTALLATION AND BASIN CONSTRUCTION WILL NOT BE PAID FOR SEPARATELY BUT IS SUBSIDIARY TO ITEM 192. REFER TO "PLANTING DETAILS" SHEET FOR ADDITIONAL INFORMATION.
4. PLACE VEGETATION BARRIER UNDER AND ALL LOOSE AGGREGATE. REFER TO "HARDSCAPE LAYOUT" SHEETS FOR ROCK TYPE, PAY ITEM AND QUANTITY.
5. FOR PLANT TYPES AND LAYOUT REFER TO THE "PLANT SCHEME LAYOUT" SHEET 2 OF 2.

LEGEND

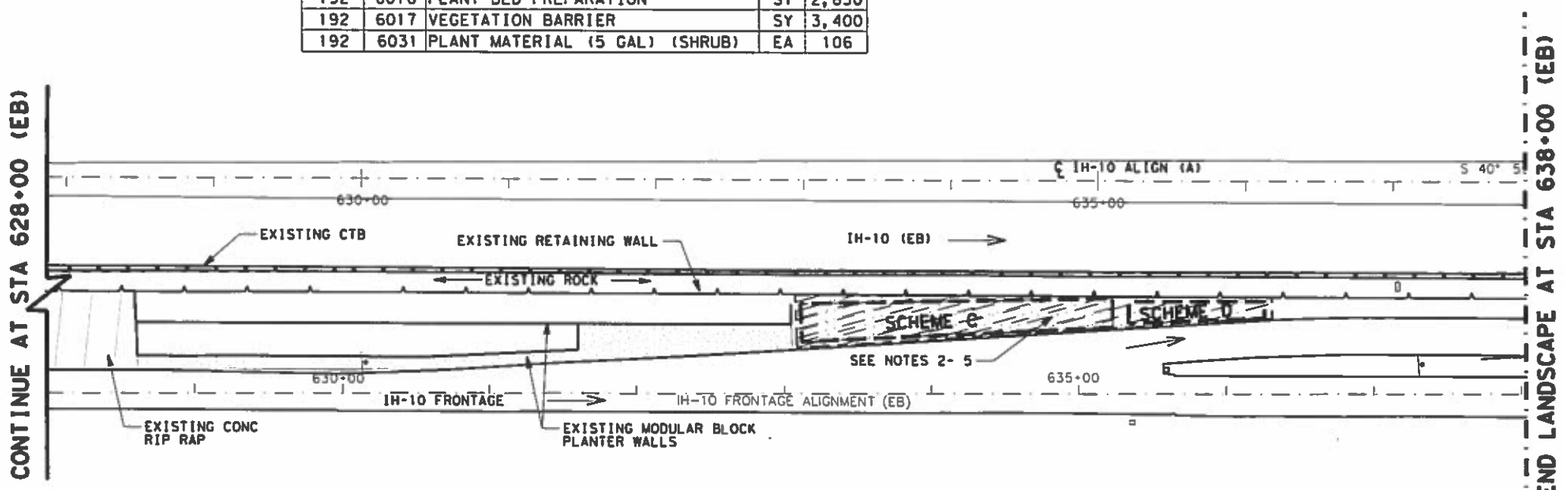
- PLANT BED PREPARATION
- TRAFFIC DIRECTION
- PROPOSED PLANT SCHEME

SCHEME LEGEND	QTY
SCHEME "A"	0
SCHEME "B"	1
SCHEME "C"	2
SCHEME "D"	2

SCALE: 1"=100'

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
168	6001	VEGETATIVE WATERING	MG	5
192	6004	PLANT MATERIAL (5-GAL)	EA	119
192	6014	PLANT SOIL MIX	CY	240
192	6016	PLANT BED PREPARATION	SY	2,850
192	6017	VEGETATION BARRIER	SY	3,400
192	6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	106

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	29
193	6006	VEGETATIVE WATERING	MG	8



QUADRANT "D" PLANTING AT EASTLAKE BLVD

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

M J S, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10 LANDSCAPE

PLANTER LAYOUT

SCALE: 1"=100' SHEET 6 OF 6

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		40

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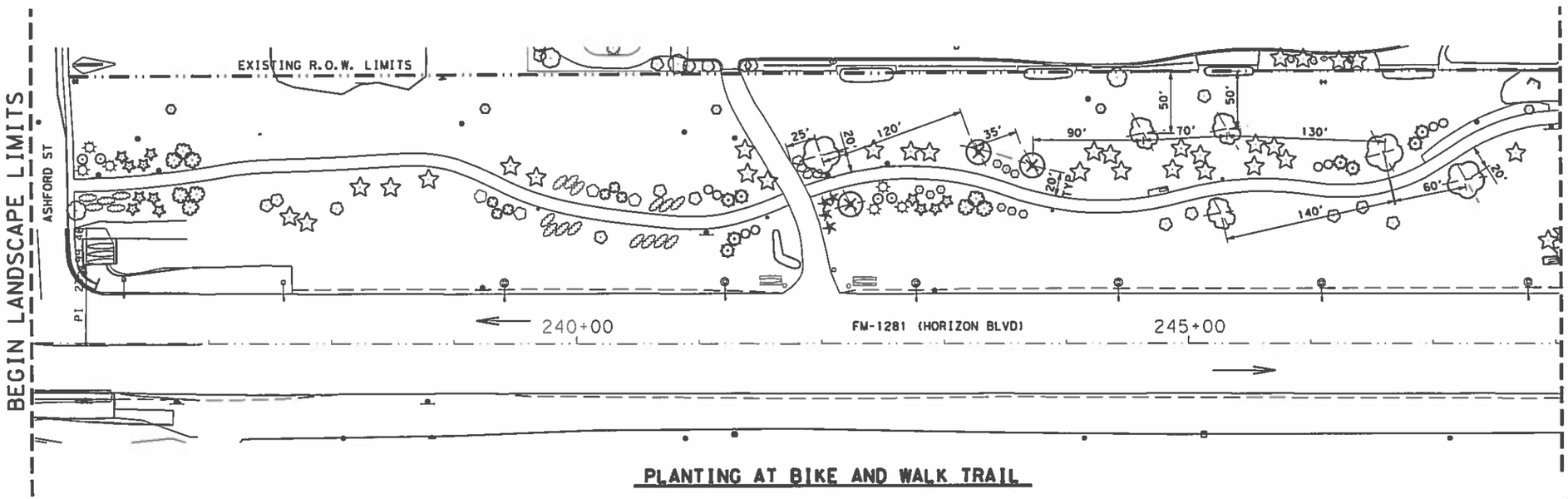


PLANTING AT BIKE AND WALK TRAIL

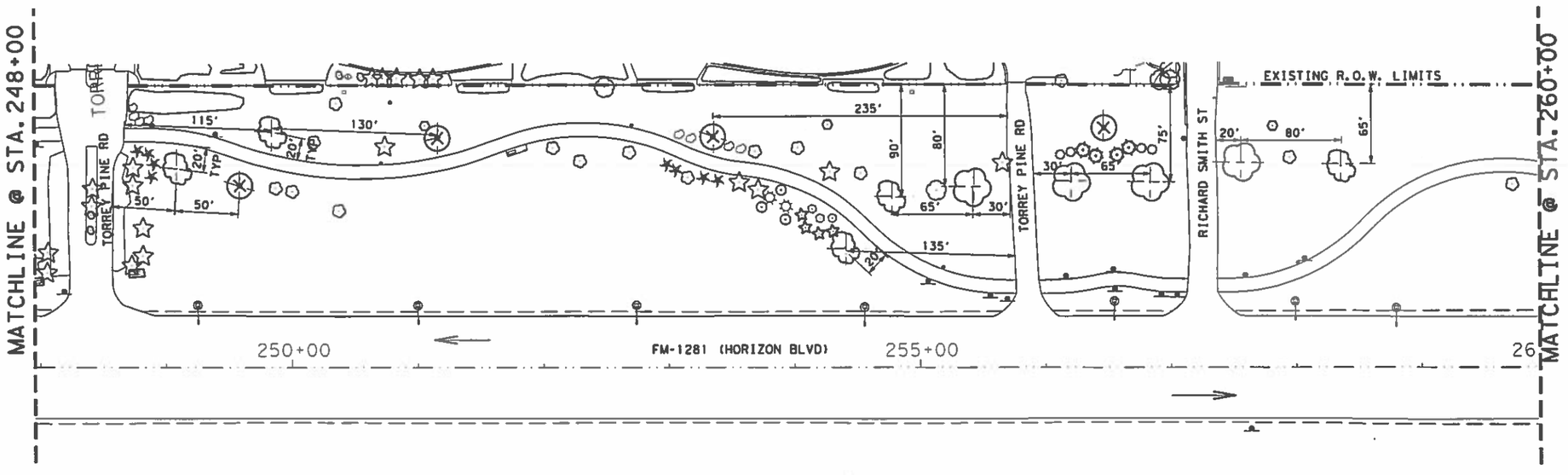
LEGEND	SHEET 1
PLANT NAME	QTY
DESERT AGAVE	12
AMERICAN AGAVE	12
AGAVE LECHUGUILLA	12
SPANISH DAGGER	12
GOLDEN BARREL	12
THOMPSON YUCCA	9
RED YUCCA	19
TOOTHLESS SPOON	16
BEARGRASS	7
DESERT GREY SPOON	4
DESERT GREEN SPOO	6
TEXAS SOTOL	8
PALO VERDE	8
DESERT WILLOW	7
HONEY MESQUITE	7

EXISTING VEGETATION (DO NOT DISTURB)

TRAFFIC DIRECTION

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
192	6004	PLANT MATERIAL (5-GAL)	EA	69
192	6014	PLANT SOIL MIX	CY	10
192	6024	PLANT MATERIAL (30 GAL) (TREE)	EA	22
192	6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	60

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	17
193	6010	PLANT REPLACEMENT (30 GAL)	EA	4



PLANTING AT BIKE AND WALK TRAIL

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
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5/5/21

VEGETATIVE LANDSCAPE AT FM-1281 LANDSCAPE

TREE LOCATION PLAN
(HORIZON BLVD)

SCALE: 1"=100' SHEET 1 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		41

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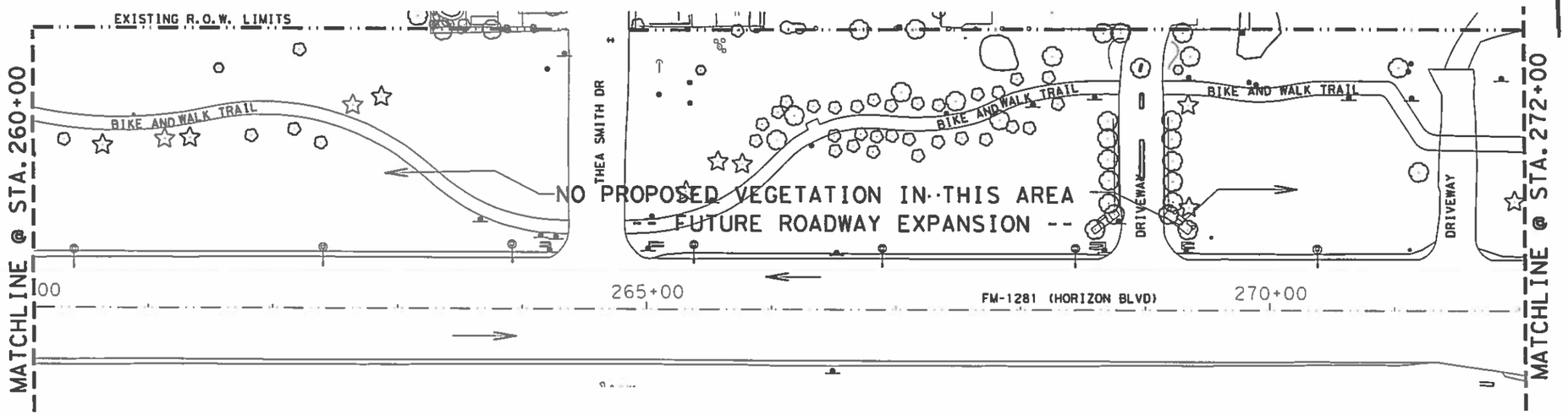
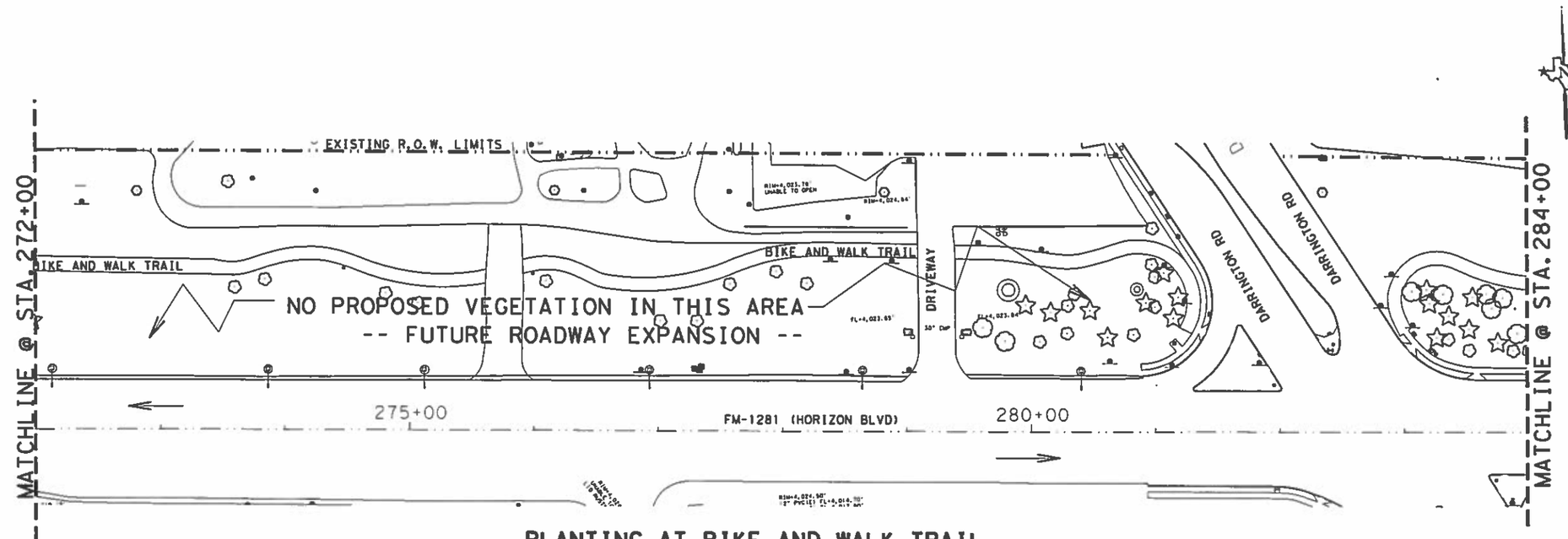


PLANTING AT BIKE AND WALK TRAIL

—NO PROPOSED VEGETATION IN THIS AREA
-- FUTURE ROADWAY EXPANSION --

EXISTING VEGETATION (DO NOT DISTURB)

TRAFFIC DIRECTION



PLANTING AT BIKE AND WALK TRAIL

—NO PROPOSED VEGETATION IN THIS AREA
-- FUTURE ROADWAY EXPANSION --

STATE OF TEXAS
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MJS, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT FM-1281 LANDSCAPE

TREE LOCATION PLAN
(HORIZON BLVD)

SCALE: 1"=100' SHEET 2 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		42

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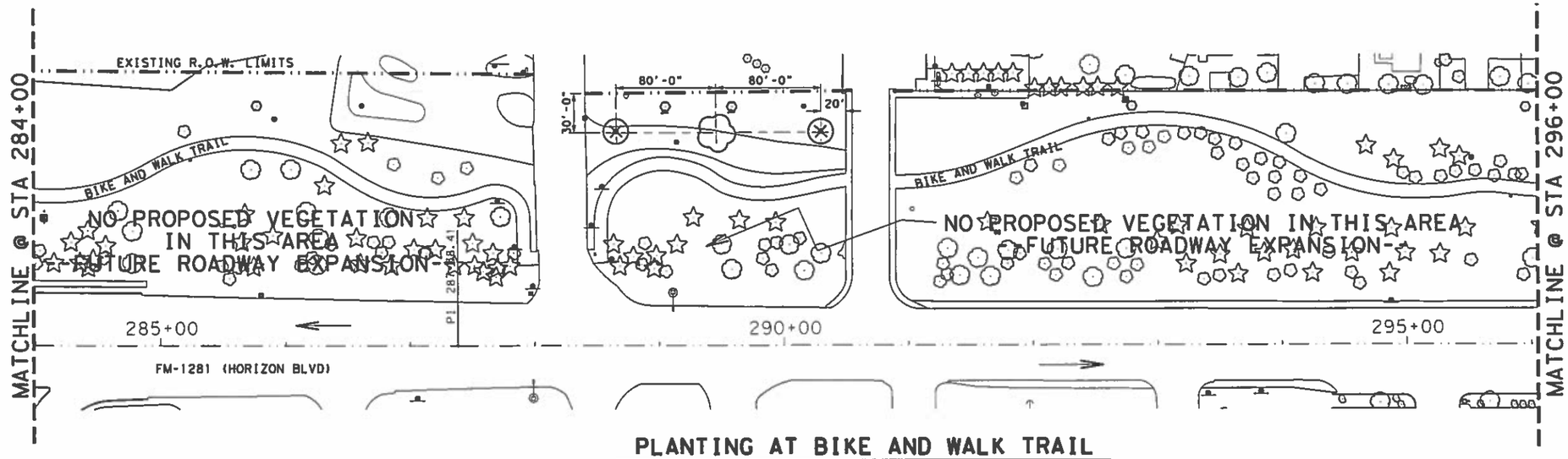


PLANTING AT BIKE AND WALK TRAIL

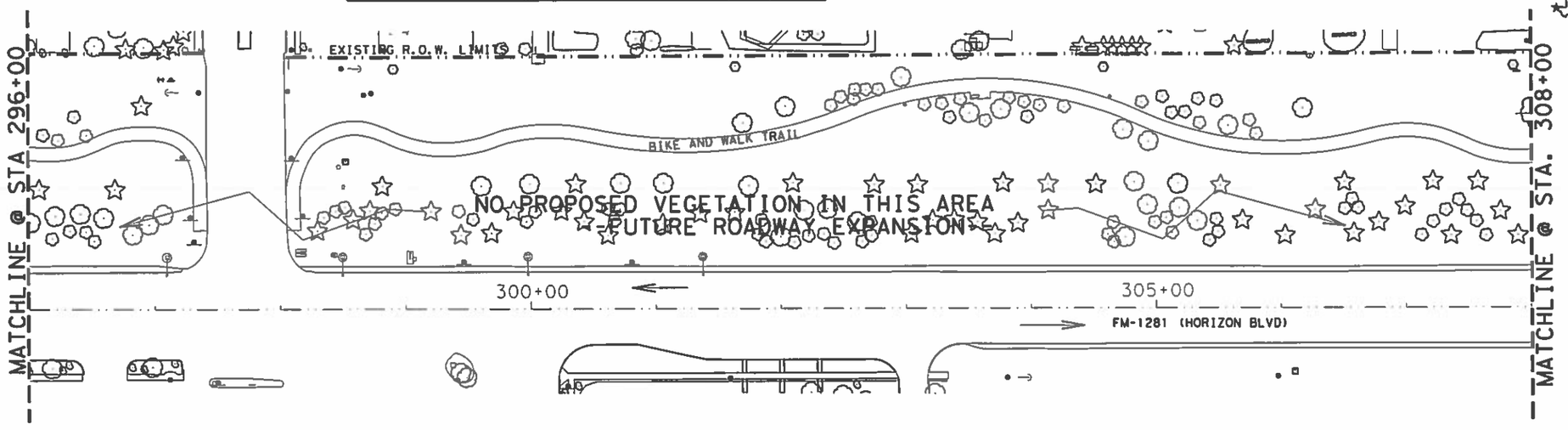
LEGEND	
PLANT NAME	QTY
DESERT AGAVE	0
AMERICAN AGAVE	0
AGAVE LECHUGUILLA	0
SPANISH DAGGER	0
GOLDEN BARREL	0
THOMPSON YUCCA	0
RED YUCCA	0
TOOTHLESS SPOON	0
BEARGRASS	0
DESERT GREY SPOON	0
DESERT GREEN SPOON	0
TEXAS SOTOL	0
PALO VERDE	0
DESERT WILLOW	2
HONEY MESQUITE	1

EXISTING VEGETATION (DO NOT DISTURB)

TRAFFIC DIRECTION

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
192	6004	PLANT MATERIAL (5-GAL)	EA	0
192	6014	PLANT SOIL MIX	CY	1
192	6024	PLANT MATERIAL (30 GAL) (TREE)	EA	3
192	6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	0

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	0
193	6010	PLANT REPLACEMENT (30 GAL)	EA	1



PLANTING AT BIKE AND WALK TRAIL
NO PROPOSED VEGETATION IN THIS AREA
FUTURE ROADWAY EXPANSION

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

M. Sotelo, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT FM-1281
LANDSCAPE

TREE LOCATION PLAN
(HORIZON BLVD)

SCALE: 1"=100' SHEET 3 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		43

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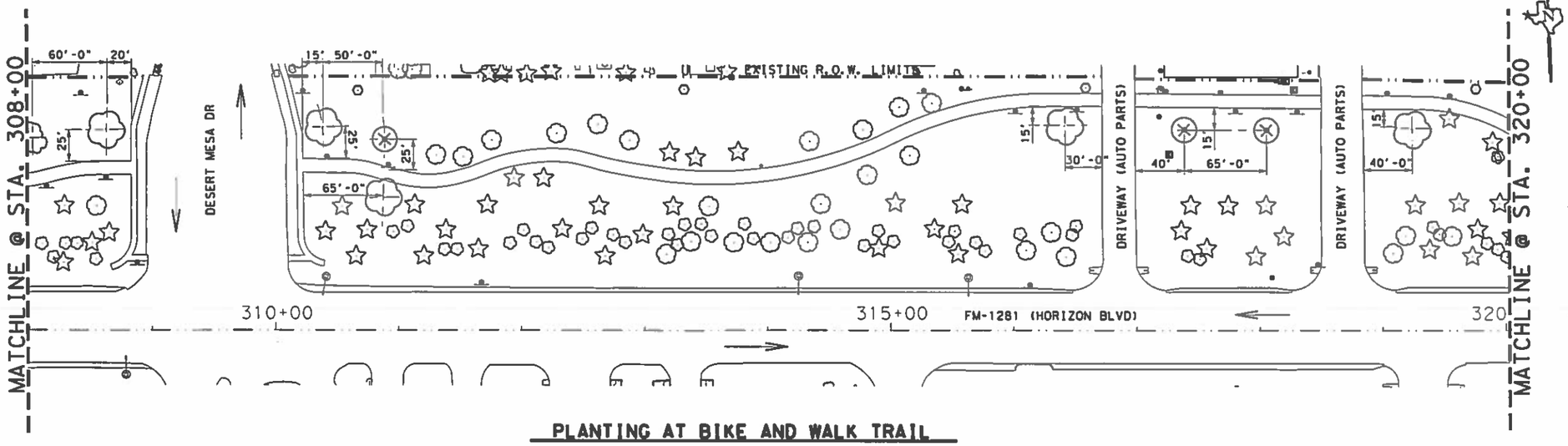


PLANTING AT BIKE AND WALK TRAIL

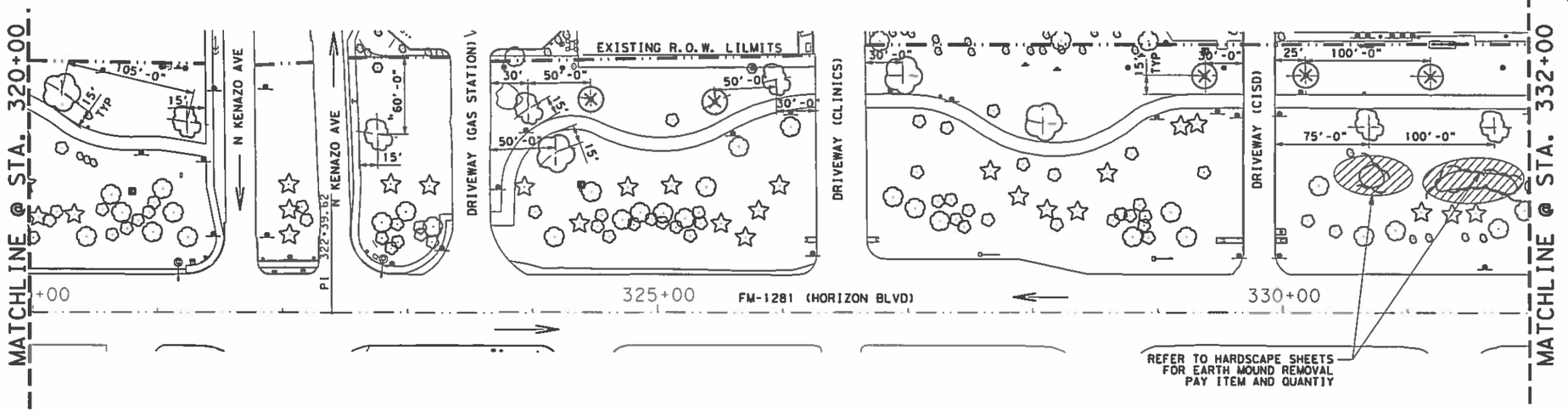
LEGEND	
PLANT NAME	QTY
DESERT AGAVE	0
AMERICAN AGAVE	0
AGAVE LECHUGUILLA	0
SPANISH DAGGER	0
GOLDEN BARREL	0
THOMPSON YUCCA	0
RED YUCCA	0
TOOTHLESS SPOON	0
BEARGRASS	0
DESERT GREY SPOON	0
DESERT GREEN SPOON	0
TEXAS SOTOL	0
PALO VERDE	7
DESERT WILLOW	8
HONEY MESQUITE	9

EXISTING VEGETATION (DO NOT DISTURB)

TRAFFIC DIRECTION

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
192	6004	PLANT MATERIAL (5-GAL)	EA	0
192	6014	PLANT SOIL MIX	CY	3
192	6024	PLANT MATERIAL (30 GAL)	EA	24
192	6031	PLANT MATERIAL (5 GAL)	EA	0

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	0
193	6010	PLANT REPLACEMENT (30 GAL)	EA	5



PLANTING AT BIKE AND WALK TRAIL

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

M. J. Sotelo, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT FM-1281
LANDSCAPE

TREE LOCATION PLAN
(HORIZON BLVD)

SCALE: 1"=100' SHEET 4 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		44

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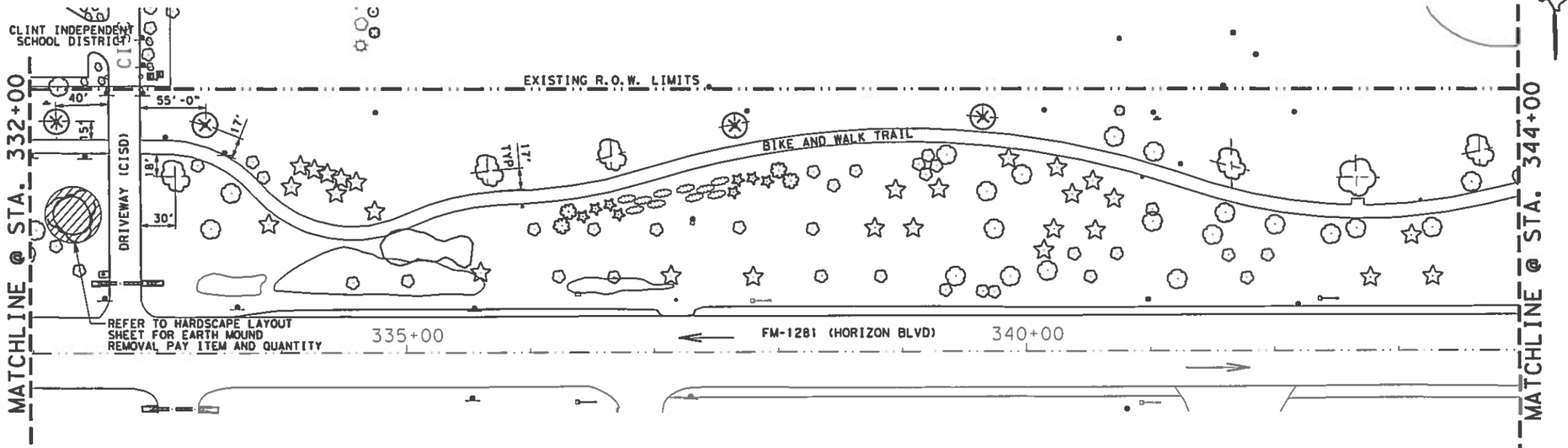


PLANTING AT BIKE AND WALK TRAIL

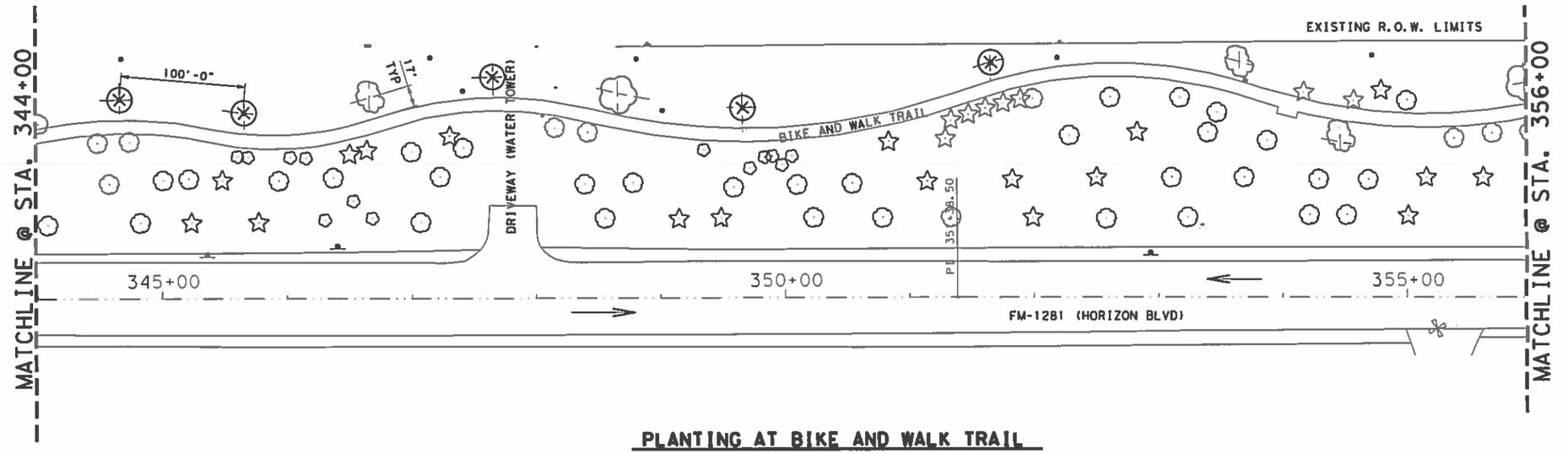
LEGEND	
PLANT NAME	QTY
DESERT AGAVE	0
AMERICAN AGAVE	0
AGAVE LECHUGUILLA	0
SPANISH DAGGER	0
GOLDEN BARREL	0
THOMPSON YUCCA	0
RED YUCCA	0
TOOTHLESS SPOON	0
BEARGRASS	0
DESERT GREY SPOON	0
DESERT GREEN SPOON	0
TEXAS SOTOL	0
PALO VERDE	9
DESERT WILLOW	8
HONEY MESQUITE	3

EXISTING VEGETATION (DO NOT DISTURB)

TRAFFIC DIRECTION

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
192	6004	PLANT MATERIAL (5-GAL)	EA	0
192	6014	PLANT SOIL MIX	CY	3
192	6024	PLANT MATERIAL (30 GAL)	EA	20
192	6031	PLANT MATERIAL (5 GAL)	EA	0

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	0
193	6010	PLANT REPLACEMENT (30 GAL)	EA	4



PLANTING AT BIKE AND WALK TRAIL

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

P.E.
5/5/21

VEGETATIVE LANDSCAPE AT FM-1281
LANDSCAPE

TREE LOCATION PLAN
(HORIZON BLVD)

SCALE: 1"=100' SHEET 5 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		45

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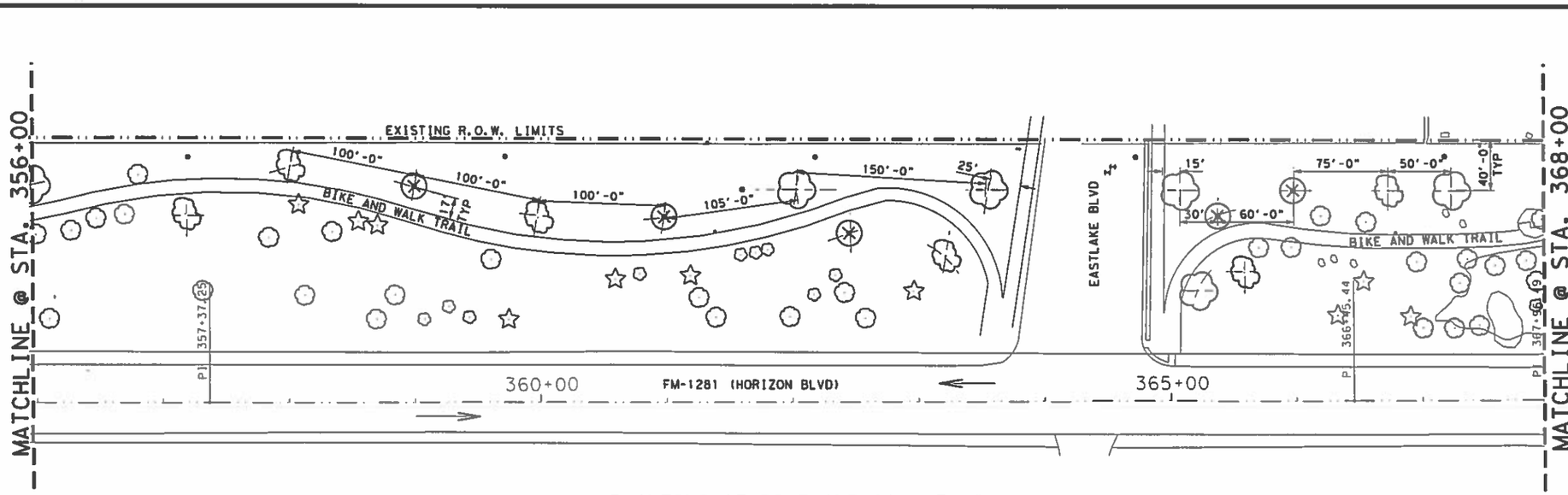


PLANTING AT BIKE AND WALK TRAIL

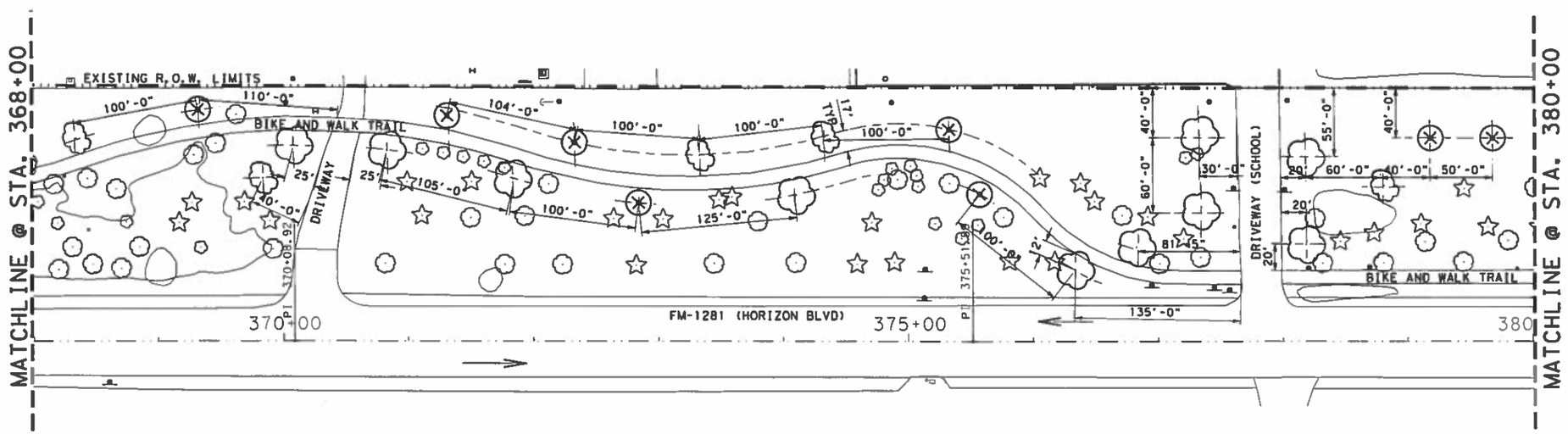
LEGEND	
PLANT NAME	QTY
DESERT AGAVE	0
AMERICAN AGAVE	0
AGAVE LECHUGUILLA	0
SPANISH DAGGER	0
GOLDEN BARREL	0
THOMPSON YUCCA	0
RED YUCCA	0
TOOTHLESS SPOON	0
BEARGRASS	0
DESERT GREY SPOON	0
DESERT GREEN SPOON	0
TEXAS SOTOL	0
PALO VERDE	11
DESERT WILLOW	13
HONEY MESQUITE	15

EXISTING VEGETATION (DO NOT DISTURB)

TRAFFIC DIRECTION

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
192	6004	PLANT MATERIAL (5-GAL)	EA	0
192	6014	PLANT SOIL MIX	CY	5
192	6024	PLANT MATERIAL (30 GAL) (TREE)	EA	39
192	6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	0

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	0
193	6010	PLANT REPLACEMENT (30 GAL)	EA	8



PLANTING AT BIKE AND WALK TRAIL

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

M. J. Sotelo, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT FM-1281 LANDSCAPE

TREE LOCATION PLAN
(HORIZON BLVD)

SCALE: 1"=100' SHEET 6 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		46

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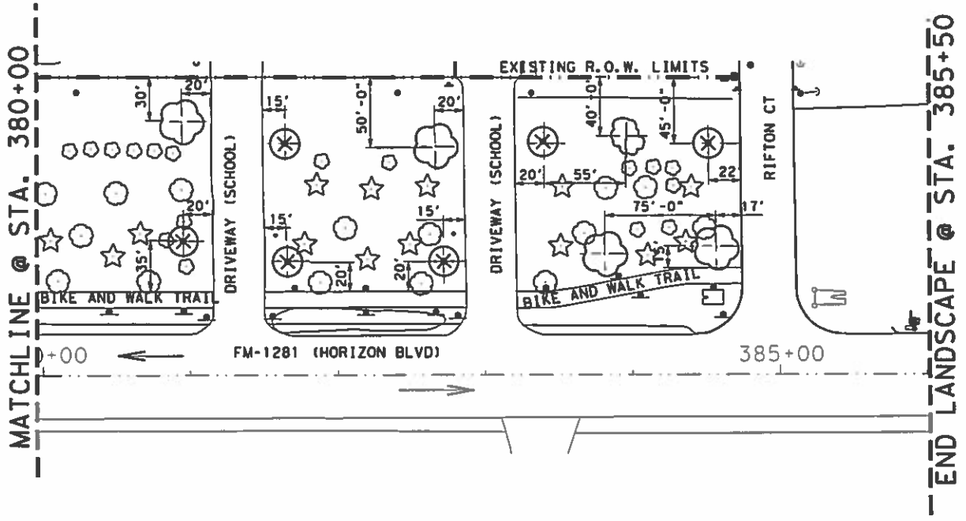

PLANTING AT BIKE AND WALK TRAIL

SUMMARY OF LANDSCAPE PLANTING ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
192	6004	PLANT MATERIAL (5-GAL)	EA	0
192	6014	PLANT SOIL MIX	CY	1
192	6024	PLANT MATERIAL (30 GAL) (TREE)	EA	11
192	6031	PLANT MATERIAL (5 GAL) (SHRUB)	EA	0

SUMMARY OF LANDSCAPE ESTABLISHMENT ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
193	6005	PLANT REPLACEMENT (5-GAL)	EA	0
193	6010	PLANT REPLACEMENT (30 GAL)	EA	2

LEGEND

PLANT NAME	QTY
DESERT AGAVE	0
AMERICAN AGAVE	0
AGAVE LECHUGUILLA	0
SPANISH DAGGER	0
GOLDEN BARREL	0
THOMPSON YUCCA	0
RED YUCCA	0
TOOTHLESS SPOON	0
BEARGRASS	0
DESERT GREY SPOON	0
DESERT GREEN SPOON	0
TEXAS SOTOL	0
PALO VERDE	1
DESERT WILLOW	6
HONEY MESQUITE	4

EXISTING VEGETATION (DO NOT DISTURB)

TRAFFIC DIRECTION

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

P.E.
5/5/21

VEGETATIVE LANDSCAPE AT FM-1281
LANDSCAPE

TREE LOCATION PLAN
(HORIZON BLVD)

SCALE: 1"=100' SHEET 7 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		47

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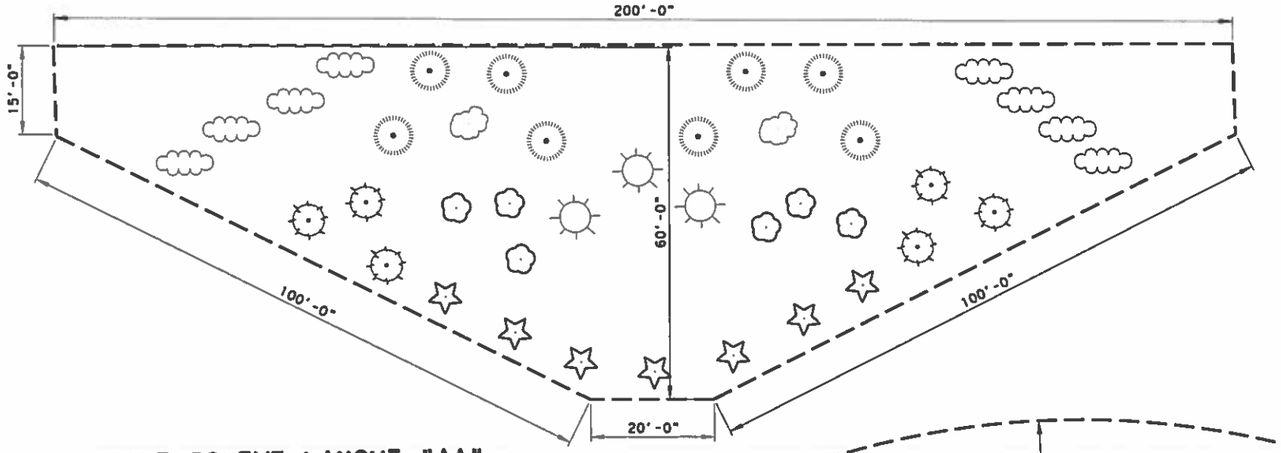
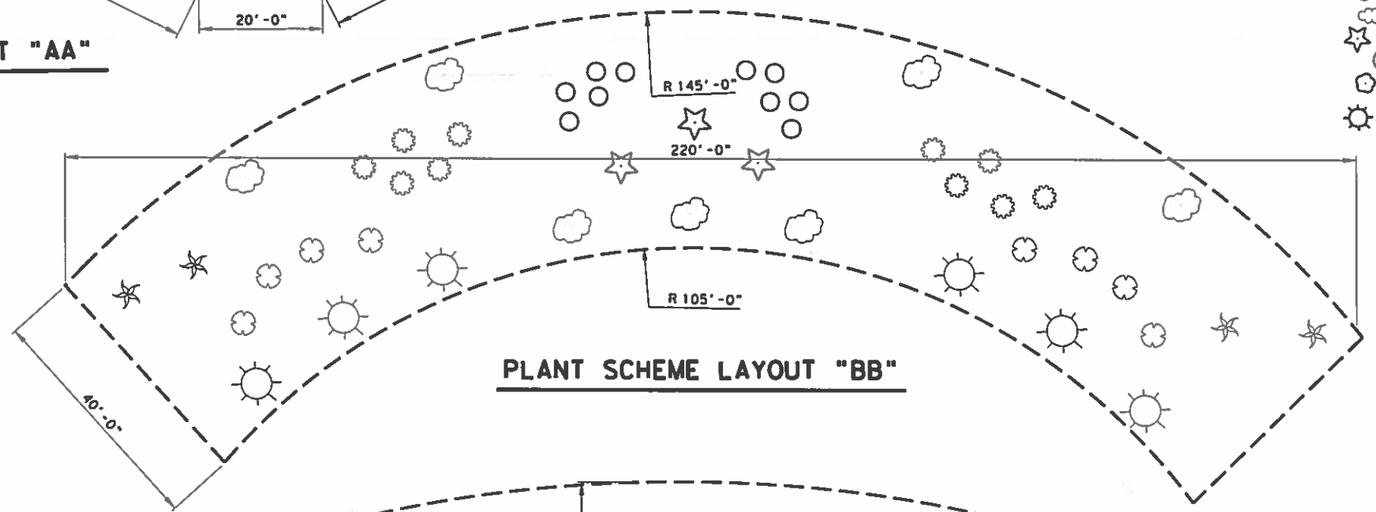
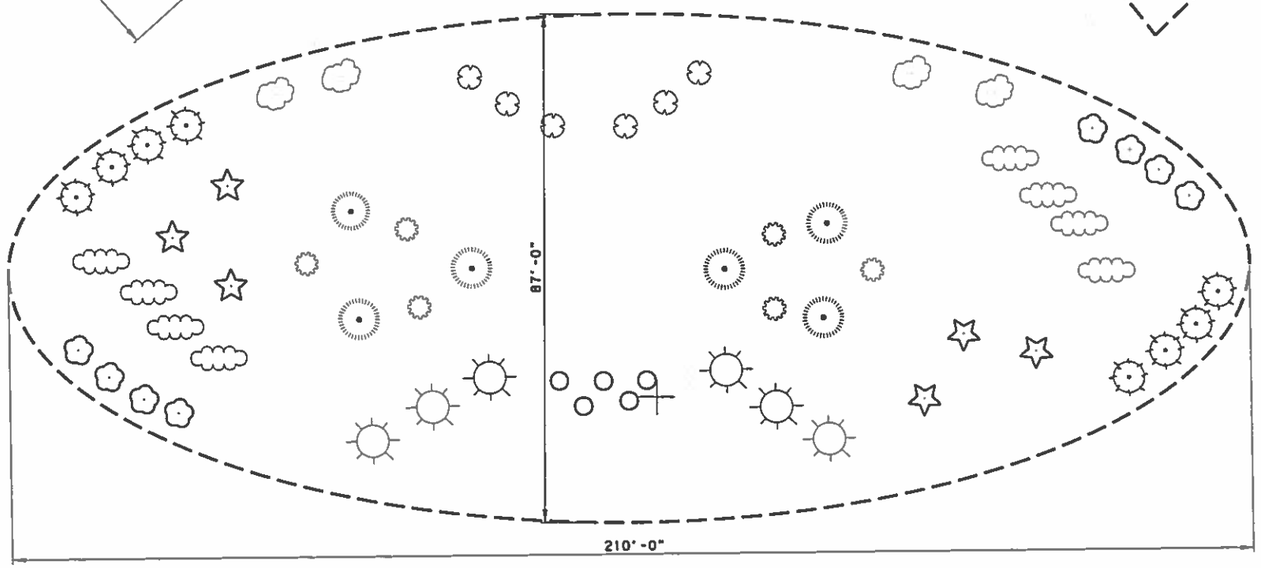


PLANT SCHEME LAYOUT "AA"



PLANT SCHEME LAYOUT "BB"



PLANT SCHEME LAYOUT "CC"

NOTES:

1. REFER TO "LANDSCAPE SCHEME LAYOUT" SHEETS FOR PLANTING LOCATIONS, PLANT QUANTITIES AND PAY ITEMS.
2. REFER TO "PLANTING DETAILS" SHEET FOR PLANTING DETAILS, PIT WIDTH, PLANT BED PREPARATION, SOIL MIX, AND SHEET NOTES 1-12.
3. INSTALL VEGETATION BARRIER UNDER LOOSE AGGREGATE WHERE SHOWN. VEGETATION BARRIER TO BE PAID UNDER IT'S PERTINENT PAY ITEM 192.
4. PLANT BED PREPARATION TO BE PERFORMED ON PLANT SCHEMES WHERE SHOWN AS PER ITEM 192.3.13. PLANT BED PREPARATION TO BE PAID UNDER ITS PERTINENT PAY ITEM 192.

IH-10 @ LOOP 375 PLANT SCHEME LEGEND			
	SCHEME "AA"	SCHEME "BB"	SCHEME "CC"
PLANT NAME	QTY	QTY	QTY
DESERT AGAVE	2	7	4
AMERICAN AGAVE	6	0	8
AGAVE LECHUGUILLA	0	4	0
SPANISH DAGGER	0	10	6
GOLDEN BARREL CACTU	0	10	5
RED YUCCA	8	0	8
TOOTHLESS SPOON	7	3	6
BEARGRASS	8	0	6
DESERT GREY SPOON	6	0	8
DESERT GREEN SPOON	0	8	6
TEXAS SOTOL	3	6	6

DESCRIPTION	PLANTS PER EACH SCHEME		
	SCHEME "AA"	SCHEME "BB"	SCHEME "CC"
PLANTS (5 GAL) TOTAL	8	31	23
SHRUB (5 GAL) TOTAL	32	17	40
SCHEME PLANT TOTAL	40	48	63

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

M. J. Sotelo, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10
LANDSCAPE

PLANT SCHEME LAYOUT

NOT TO SCALE SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		48

DATE: 05/04/2021 05:50 AM
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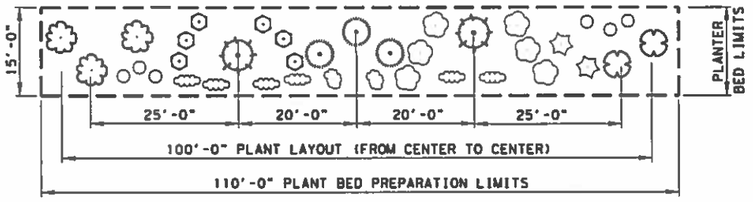
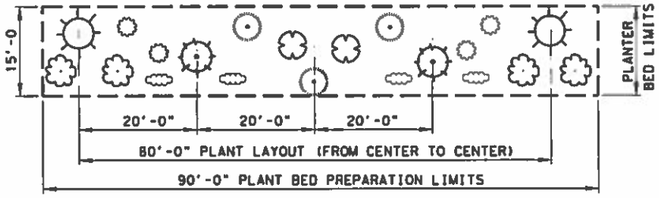
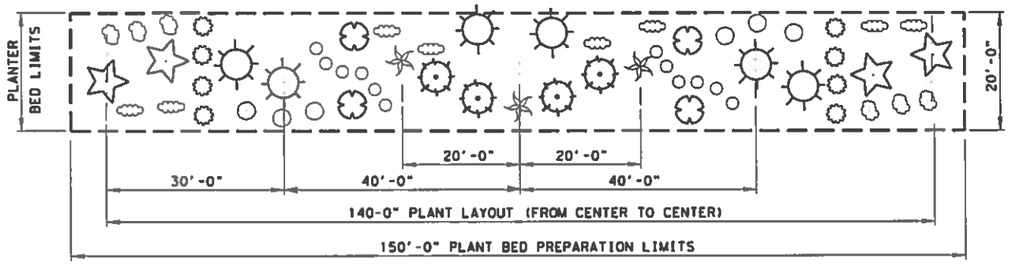


PLANT SCHEME LAYOUT "A"



PLANT SCHEME LAYOUT "D"



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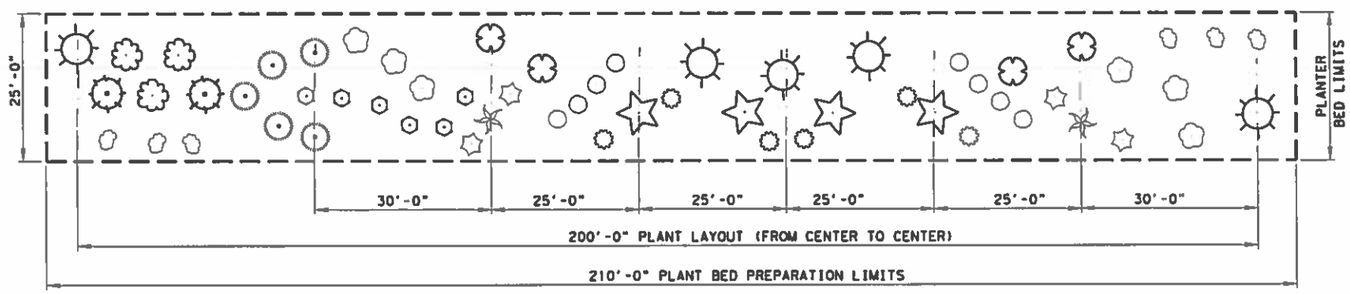

PLANT SCHEME LAYOUT "C"

NOTES:

1. REFER TO "PROJECT LAYOUT" SHEETS FOR PLANTING LOCATIONS. SEE LANDSCAPE LAYOUT SHEETS FOR PLANT QUANTITIES AND PAY ITEMS.
2. REFER TO "PLANTING DETAILS" SHEET FOR PLANTING DETAILS, PIT WIDTH, PLANT BED PREPARATION, SOIL MIX, AND SHEET NOTES 1-12.
3. INSTALL VEGETATION BARRIER UNDER LOOSE AGGREGATE WHERE SHOWN. VEGETATION BARRIER TO BE PAID UNDER IT'S PERTINENT PAY ITEM 192.
4. PLANT BED PREPARATION TO BE PERFORMED ON PLANT SCHEMES WHERE SHOWN AS PER ITEM 192.3.13. PLANT BED PREPARATION TO BE PAID UNDER ITS PERTINENT PAY ITEM 192.

IH-10 @ EASTLAKE BLVD PLANT SCHEME LEGEND				
	SCHEME "A"	SCHEME "B"	SCHEME "C"	SCHEME "D"
PLANT NAME	QTY	QTY	QTY	QTY
DESERT AGAVE	2	6	6	0
HONOKAM AGAVE	0	6	8	0
AMERICAN AGAVE	2	4	2	2
AGAVE LECHUGUILLA	0	3	2	0
SPANISH DAGGER	0	8	6	4
BLUE AGAVE	2	0	4	0
GOLDEN BARREL CACTU	6	12	0	0
THOMPSON YUCCA	6	0	6	0
CREOSOTE BUSH	3	0	3	4
RED YUCCA	6	8	0	4
TOOTHLESS SPOON	0	4	4	0
BEARGRASS	3	0	5	3
DESERT GREY SPOON	6	0	6	0
DESERT GREEN SPOON	2	4	4	2
TEXAS SOTOL	0	6	5	2

DESCRIPTION	PLANTS PER EACH SCHEME			
	SCHEME "A"	SCHEME "B"	SCHEME "C"	SCHEME "D"
PLANTS (5 GAL) TOTAL	18	39	34	6
SHRUB (5 GAL) TOTAL	20	22	27	15
SCHEME PLANT TOTAL	38	61	61	21

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10
LANDSCAPE

PLANT SCHEME LAYOUT
(EASTLAKE BLVD)

NOT TO SCALE SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		49

DATE: 05/04/2021 05:50 AM
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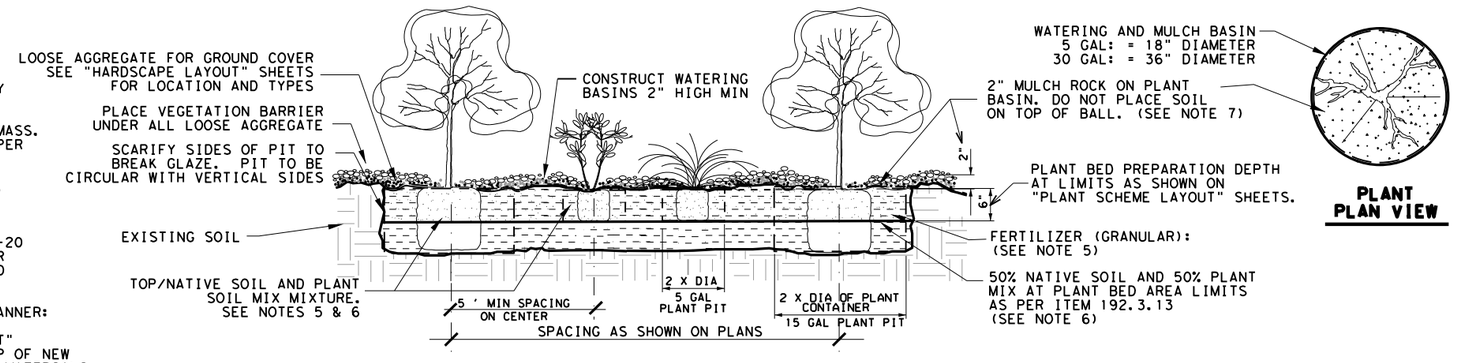
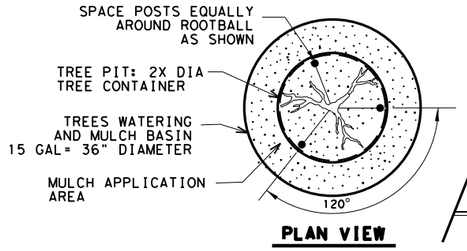
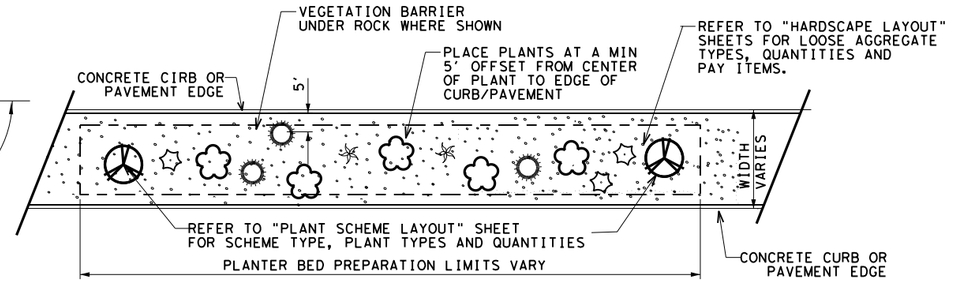
NOTES:

1. CONTRACTOR'S ATTENTION IS DIRECTED TO ITEM 192 FOR SPECIFICATIONS, DIMENSIONS, VOLUMES AND MEASUREMENTS THAT HAVE BEEN MODIFIED OR ARE NOT SHOWN.
2. REMOVE EXCESS EXCAVATED DIRT MATERIAL FROM PROJECT SITE AS DIRECTED BY THE ENGINEER AND AS PER ITEM 110. REMOVED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND DISPOSED OF BY A METHOD APPROVED BY THE ENGINEER. THIS WORK AND INCIDENTALS ARE SUBSIDIARY TO THE PERTINENT PAY ITEM.
3. ENSURE THAT ALL PLANTS AND TREES ARE VIGOROUS, HEALTHY AND WELL FORMED WITH FULL FOLIAGE MASS. REJECTION OF PLANTS WILL BE IN ACCORDANCE WITH ITEM 192.2.2. FOLLOW PLANT REPLACEMENT AS PER ITEM 192.3.15.9 AND AS DIRECTED BY THE ENGINEER.
4. STAKE ALL LOCATION OF PLANTS IN FIELD IN ACCORDANCE WITH ITEM 192.3.3 PRIOR TO EXCAVATION. PLACE PLANTS IN A NATURAL FORM AND AS PER "PLANT SCHEME LAYOUT" SHEETS. PLANTS TO BE A MIN OF 5' APART FROM CENTER TO CENTER.
5. EXCAVATE PLANT PITS AS PER ITEM 192.3.4. AND APPLY GRANULAR FERTILIZER WITH A NPK OF 5-20-20 AS PER ITEM 166 "ARTICLE 166.2" "MATERIALS". WORK FERTILIZER CAREFULLY INTO THE SOIL PRIOR TO PLACING PLANT. FERTILIZER AND APPLICATION LABOR, TOOLS AND INCIDENTALS WILL NOT BE PAID FOR SEPARATELY BUT IS SUBSIDIARY TO ITEM 192.
6. FOR ALL PLANTER BED PREPARATION LIMITS CULTIVATE PLANTING SOIL MIXTURE IN THE FOLLOWING MANNER: PLACE AN EVEN 3 INCH LAYER OF PLANT MIX WITH THE FOLLOWING RATIO: 25% SAND, 50% PEAT AND 25% CACTI POTTING SOIL TO COVER THE ENTIRE PLANTER BED AREA. REFER TO "PLANT SCHEME LAYOUT" SHEETS FOR PLANTER BED AREA LIMITS. TURN, TILL AND WORK MIXTURE TO A DEPTH OF 3" BELOW TOP OF NEW GRADE BREAKING UP CLODS AND LOOSENING SOIL. REMOVE ROCKS, STICKS, WEEDS AND OTHER FOREIGN MATERIALS BEFORE PLACING PLANTS. TURNING, TILLING OR RAKING THE SOIL LAYER WILL NOT BE PAID SEPARATELY BUT IS SUBSIDIARY TO THE PLANT BED PREPARATION BID ITEM. REFER TO GENERAL NOTES UNDER ITEM 192 FOR ADDITIONAL INFORMATION. PLANT SOIL MIX (PEAT, SAND AND CACTI SOIL) TO BE PAID UNDER ITS PERTINENT BID ITEM. PLANT BED PREPARATION TO BE PAID UNDER ITS PERTINENT BID ITEM.
7. USE MULCH (ORGANIC MULCH) FOR SURFACE APPLICATION ON PROPOSED PLANT AND TREE BASINS. APPLY A TWO INCH (2") MAX ORGANIC MULCH LAYER AT PLANT AND TREE BASINS AS SHOWN. MULCH APPLICATION SHALL COMPLY TO ITEM 192.2.4 "MULCH" AND 192.3.14 "CONSTRUCTION" AND AS SHOWN ON DETAILS.
8. FOR IH-10 LANDSCAPE AREAS FOLLOW WITH A 12 MONTHS "LANDSCAPE ESTABLISHMENT" PERIOD AS PER ITEM 193. COMPLY WITH 193.3 "WORK METHODS" AFTER COMPLETING ITEM 192. PERFORM PRUNING AS NEEDED TO REMOVE DEAD, DAMAGED OR DISEASED PLANT PARTS. REFER TO GENERAL NOTES ITEM 193 FOR PLANT MAINTENANCE INSTRUCTIONS.
9. DURING THE 12 MONTHS "LANDSCAPE ESTABLISHMENT" PERIOD APPLY WATER TO PLANTS ON A STABLE AND REGULAR SCHEDULE SHOWN ON THIS SHEET FOR EACH SEASON AND WHEN SOIL IS DRY. DO NOT WATER PLANTS WHEN RAINFALL IS APPARENT OR DURING THE MONSOON SEASON OR AFTER A RAIN FALL. DO NOT MAINTAIN SOIL HUMID OR WET AS ROOT ROT MAY DEVELOP CAUSING THE CACTI OR DESERT PLANTS TO ROT, WILT OR DIE.
10. DURING THE 12 MONTHS "LANDSCAPE ESTABLISHMENT" PERIOD APPLY FERTILIZER ON THE 5TH MONTH OF THE MAINTENANCE CYCLE WITH THE RATE SHOWN ON THE SCHEDULE ON THIS SHEET. USE A CONTROLLED RELEASE FERTILIZER WITH A NPK OF 5-20-20. CAREFULLY SPREAD THE FERTILIZER NEAR AND AROUND THE TOP OF THE PLANTS. AVOID SPREADING FERTILIZER ON THE LEAFS OR TRUNKS. DO NOT APPLY FERTILIZER DURING THE HOT OR DORMANT SEASON.
11. FURNISH WATER THAT IS CLEAN AND FREE OF INDUSTRIAL WASTES AND OTHER SUBSTANCES HARMFUL TO THE PLANTS.
12. WATER PLANTS AND TREES RIGHT AFTER PLANT INSTALLATION AND EVERY 30 DAYS DURING THE 90 DAYS MAINTENANCE PERIOD UNDER ITEM 192 AND AT THE RATE SHOWN ON THE SCHEDULE ON THIS SHEET. AFTER COMPLETION OF THE 90 DAYS MAINTENANCE UNDER ITEM 192 BEGIN AN APPROPRIATE WATER CYCLE UNDER ITEM 193 OR AS DIRECTED BY THE ENGINEER.

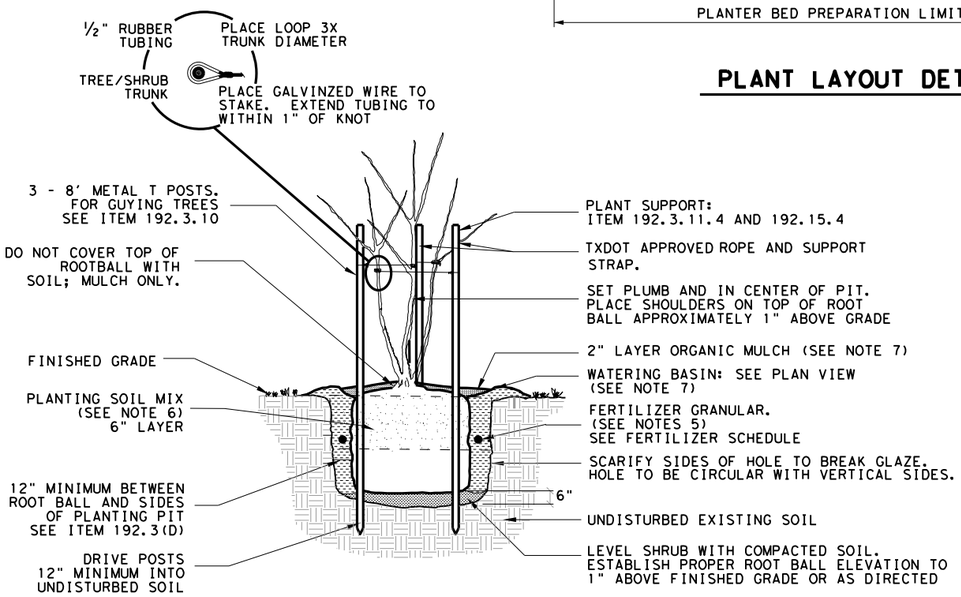


SHRUB PLANTING DETAIL





PLANT LAYOUT DETAILS



TREE SUPPORTS

FERTILIZER SCHEDULE AT PLANTING

CONTROLLED RELEASE FERTILIZER FOR CACTI AND DESERT PLANTS APPLICATION RATE SCHEDULE: (NPK 5-20-20) APPLY AT PLANTING	
TREES AND PALM TREE	SHRUBS AND PLANTS:
15-GALLON = 5 TABLESPOON 20-GALLON = 6 TABLESPOONS	1-GALLON = 1 TABLESPOON 3-GALLON = 2 TABLESPOONS 5-GALLON = 3 TABLESPOONS
Apply Slow-Release Fertilizer and carefully work into the soil prior to plant placement. See note 4.	

FERTILIZER SCHEDULE DURING MAINTENANCE CYCLE (ITEM 193)

FERTILIZER SCHEDULE FOR LANDSCAPE ESTABLISHMENT (ITEM 193) APPLY CONTROLLED RELEASE PERTILIZER WITH NPK 5-20-20 ON THE 5TH MONTH OF THE 6 MONTHS PERIOD

If dia. of plant basin is:	The area is:	The amt. of Nit. required is:	Amount of fertilizer of a 100 lb bag to be applied to each plant if the actual amount of Nit. in the bag is:				
			5 %	12 %	15 %	20 %	24 %
1.5 ft	3.14 ft	0.16 oz.	1.6 oz.	1.3 oz.	1.0 oz.	0.8 oz.	0.7 oz.
3 ft	7.1 ft	0.36 oz.	3.7 oz.	3 oz.	2.4 oz.	1.8 oz.	1.5 oz.
4 ft	12.6 ft	0.63 oz.	6.4 oz.	5.3 oz.	4.2 oz.	3.2 oz.	2.6 oz.
5 ft	19.6 ft	1.0 oz.	10.1 oz.	8.3 oz.	6.6 oz.	5 oz.	4.2 oz.
6 ft	28.3 ft	1.4 oz.	14.1 oz.	11.7 oz.	9.3 oz.	7 oz.	5.8 oz.

**Do not fertilize during the dormant period (Oct-Feb) (SEE NOTE 11)

PLANT WATER SCHEDULE

WATER SCHEDULE - (ITEM 168) DURING 90 DAYS (ITEM 192)		
PROJECT AREA	MONTHLY (MG)	TOTAL (MG)/90 DAYS
IH-10 AT EASTLAKE BLVD	3.66	28
IH-10 AT LOOP 375 CLOVERS	9.33	11
WATERING SEASON TOTAL (MG)		**39**

WATER SCHEDULE - (ITEM 193) 12 MONTH MAINTENANCE			
PROJECT AREA	OCT- MAR MONTHLY (MG)	APR- SEPT MONTHLY (MG)	TOTAL (MG)/12 MOS
IH-10 AT EASTLAKE BLVD	1.0	1.75	17
IH-10 AT LOOP 375 CLOVERS	2.25	4.5	40
12 MONTHS WATERING SEASON TOTAL (MG)			**57**

STATE OF TEXAS
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121602
LICENSED PROFESSIONAL ENGINEER

P.E.

06-01-2021

VEGETATIVE LANDSCAPE

DETAILS

PLANTING DETAILS

NOT TO SCALE SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		50

DATE: 05/06/2021 12:03 AM
FILE: TxDOT_Sheets_XM.cel

CSJ: 0924-06-635 LANDSCAPE

Botanical Name	Common Name	Color	IH-10	EAST LAKE BLVD Qty	FM-1281 Qty	Root Condition	Caliper/Container	Height (Min)	Spread (Min)	Remarks
PARKINSONIA SPP (CERCIDIUM)	PALO VERDE	LIME GREEN TRUNK W/ YLW FLWR	12	0	36	WELL ROOTED	(30 GAL) W/SPECIES NAME TAG	7'	36"	SINGLE TRUNK- NURSERY GROWN IN CONTAINER.
CHILOPSIS LINEARIS	DESERT WILLOW	NARROW LEAVES W/LILAC FLWR	17	0	44	WELL ROOTED	(30 GAL) W/SPECIES NAME TAG	9'	30"	MULTITRUNK- NURSERY GROWN IN CONTAINER.
VITEXM AGNUS-CASTUS	CHASTE VITEX	SHORT TRUNK W/PURPLE FLWR	27	0	0	WELL ROOTED	(30 GAL) W/SPECIES NAME TAG	6'	40"	MULTITRUNK- NURSERY GROWN IN CONTAINER.
PROSOPIS GLANDULOSA	HONEY MESQUITE	SHORT TRUNK W/YLW FLWR	16	0	39	WELL ROOTED	(30 GAL) W/SPECIES NAME TAG	10'	30"	SINGLE TRUNL- NURSERY GROWN IN CONTAINER.
		PROJECT TREES PER AREA	72	0	119					
		TOTAL PROJECT TREES		191						
AGAVE DESERTI	DESERT AGAVE	GREEN LEAF W/SPINE IN MIDDLE	88	38	12	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	18"	14"	CACTI - NURSERY GROWN IN CONTAINER.
AGAVE MURPHEYI (Honokan)	HONOKAM AGAVE	LIGHT GREY/GREEN	0	44	0	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	9"	6"	CACTI - NURSERY GROWN IN CONTAINER.
AGAVE AMERICANA (Marginata)	AMERICAN AGAVE	BLUE-GREEN W/YELLOW STRIPE	106	26	12	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	10"	10"	CACTI - NURSERY GROWN IN CONTAINER.
AGAVE LECHUGUILLA	AGAVE LECHUGUILLA	LONG GREEN TOUGH LEAVES	24	14	12	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	15"	10"	CACTI - NURSERY GROWN IN CONTAINER.
YUCCA GLORIOSA	SPANISH DAGGER	SWORD SHAPED GREEN LEAF	108	56	12	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	13"	13"	CACTI - NURSERY GROWN IN CONTAINER.
AGAVE COLORATA	BLUE AGAVE	POWDER BLUE LEAF	0	18	0	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	10"	8"	CACTI - NURSERY GROWN IN CONTAINER.
ECHINOCANTUS GRUSONII	GOLDEN BARREL CACTUS	ROUND WITH GOLDEN SPIKES	100	30	12	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	6"	10"	CACTI - NURSERY GROWN IN CONTAINER.
YUCCA THOMPSONIA	THOMPSON YUCCA	NARROW DAGGER LIKE LEAVES	0	30	0	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	12"	16"	PLANT - NURSERY GROWN IN CONTAINER.
LARREA TRIDENTATA	CREOSOTE BUSH	EVER GREEN W/ TINY YELLOW FLWR	0	31	9	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	18"	24"	PLANT - NURSERY GROWN IN CONTAINER.
HESPERALOE PARVIFLORA	RED YUCCA	GREEN W/ RED FLOWER STEM	120	38	19	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	18"	16"	PLANT - NURSERY GROWN IN CONTAINER.
DASYLIRION LONGISSIMA	TOOTHLESS SPOON	LONG GRASS LIKE GREEN STEMS	115	24	16	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	24"	16"	SHRUB - NURSERY GROWN IN CONTAINER.
NOLINA MICROCARPA	BEARGRASS	SHAGGY GRASS LIKE GREEN STEMS	104	35	7	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	24"	14"	SHRUB - NURSERY GROWN IN CONTAINER.
DASYLIRION WHEELERI	DESERT GREY SPOON	GREEN SWORD SHAPED LEAVES	106	30	4	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	24"	16"	SHRUB - NURSERY GROWN IN CONTAINER.
DASYLIRION ACROTRICHUM	DESERT GREEN SPOON	GREEN SHAGGY CLUMPY GRASS LIKE	96	34	6	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	24"	12"	SHRUB - NURSERY GROWN IN CONTAINER.
DASYLIRION TEXANUM	TEXAS SOTOL	BRIGHT GREEN W/ SHARP TEETH	105	40	8	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	24"	12"	SHRUB - NURSERY GROWN IN CONTAINER.
		SUBTOTAL FOR EACH AREA	1072	488	129					
		TOTAL PROJECT PLANTS/SHRUBS/CACTI (5 GAL)		1689						

PLANT REPLACEMENT (ITEM 193) See Notes 7 - 9

Botanical Name	Common Name	Color	IH 10	EAST LAKE BLVD Qty	FM-1281 Qty	Root Condition	Caliper/Container	Heigh t	Spread (Min)	Remarks
PARKINSONIA SPP (CERCIDIUM)	PALO VERDE	LIME GREEN TRUNK W/ YLW FLWR	2	0	7	WELL ROOTED	(30 GAL) W/SPECIES NAME TAG	7'	36"	SINGLE TRUNK- NURSERY GROWN IN CONTAINER.
CHILOPSIS LINEARIS	DESERT WILLOW	NARROW LEAVES W/LILAC FLWR	3	0	9	WELL ROOTED	(30 GAL) W/SPECIES NAME TAG	9'	30"	MULTITRUNK- NURSERY GROWN IN CONTAINER.
VITEXM AGNUS-CASTUS	CHASTE VITEX	SHORT TRUNK W/PURPLE FLWR	5	0	0	WELL ROOTED	(30 GAL) W/SPECIES NAME TAG	6'	40"	MULTITRUNK- NURSERY GROWN IN CONTAINER.
PROSOPIS GLANDULOSA	HONEY MESQUITE	SHORT TRUNK W/YLW FLWR	3	0	8	WELL ROOTED	(30 GAL) W/SPECIES NAME TAG	10'	30"	SINGLE TRUNL- NURSERY GROWN IN CONTAINER.
		PROJECT TREES PER AREA	14	0	24					
		TOTAL PROJECT TREES		38						
AGAVE DESERTI	DESERT AGAVE	GREEN LEAF W/SPINE IN MIDDLE	11	5	2	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	18"	14"	CACTI - NURSERY GROWN IN CONTAINER.
AGAVE MURPHEYI (Honokan)	HONOKAM AGAVE	LIGHT GREY/GREEN	0	6	0	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	9"	6"	CACTI - NURSERY GROWN IN CONTAINER.
AGAVE AMERICANA (Marginata)	AMERICAN AGAVE	BLUE-GREEN W/YELLOW STRIPE	14	3	2	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	10"	10"	CACTI - NURSERY GROWN IN CONTAINER.
AGAVE LECHUGUILLA	AGAVE LECHUGUILLA	LONG GREEN TOUGH LEAVES	3	2	2	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	15"	10"	CACTI - NURSERY GROWN IN CONTAINER.
YUCCA GLORIOSA	SPANISH DAGGER	SWORD SHAPED GREEN LEAF	14	7	2	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	13"	13"	CACTI - NURSERY GROWN IN CONTAINER.
AGAVE COLORATA	BLUE AGAVE	POWDER BLUE LEAF	0	2	0	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	10"	8"	CACTI - NURSERY GROWN IN CONTAINER.
ECHINOCANTUS GRUSONII	GOLDEN BARREL CACTUS	ROUND WITH GOLDEN SPIKES	13	4	2	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	6"	10"	CACTI - NURSERY GROWN IN CONTAINER.
YUCCA THOMPSONIA	THOMPSON YUCCA	NARROW DAGGER LIKE LEAVES	0	4	0	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	12"	16"	PLANT - NURSERY GROWN IN CONTAINER.
LARREA TRIDENTATA	CREOSOTE BUSH	EVER GREEN W/ TINY YELLOW FLWR	0	4	1	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	18"	24"	PLANT - NURSERY GROWN IN CONTAINER.
HESPERALOE PARVIFLORA	RED YUCCA	GREEN W/ RED FLOWER STEM	16	5	2	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	18"	16"	PLANT - NURSERY GROWN IN CONTAINER.
DASYLIRION LONGISSIMA	TOOTHLESS SPOON	LONG GRASS LIKE GREEN STEMS	15	3	2	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	24"	16"	SHRUB - NURSERY GROWN IN CONTAINER.
NOLINA MICROCARPA	BEARGRASS	SHAGGY GRASS LIKE GREEN STEMS	14	5	1	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	24"	14"	SHRUB - NURSERY GROWN IN CONTAINER.
DASYLIRION WHEELERI	DESERT GREY SPOON	GREEN SWORD SHAPED LEAVES	14	4	1	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	24"	16"	SHRUB - NURSERY GROWN IN CONTAINER.
DASYLIRION ACROTRICHUM	DESERT GREEN SPOON	GREEN SHAGGY CLUMPY GRASS LIKE	12	4	1	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	24"	12"	SHRUB - NURSERY GROWN IN CONTAINER.
DASYLIRION TEXANUM	TEXAS SOTOL	BRIGHT GREEN W/ SHARP TEETH	14	5	1	WELL ROOTED	(5 GAL) W/SPECIES NAME TAG	24"	12"	SHRUB - NURSERY GROWN IN CONTAINER.
		SUBTOTAL FOR EACH AREA	139	63	17					
		TOTAL PROJECT PLANTS/SHRUBS/CACTI (5 GAL)		219						

NOTES:

1. Contractor is responsible for referencing Item 192 of the for specifications, dimensions, volumes and measurements that have been modified or not shown.

2. Rejection of plants shall be in accordance with Item 192.2.2 and 192.3.15.9.

3. The Contractor will be responsible for the safe transport of plants to the project site and their condition upon arrival.

4. Plant materials will not be stored on hard surface or left exposed to the sun. Protect the root balls and water regularly until planting. If plants are left in storage over the weekend or holiday, a means of periodically watering and inspecting container moisture shall be provided.

5. Plants to be hardy, symmetrical, tight knit, and so trained or favored in development and appearance as to be superior in form, number of branches, and compactness. Plants will be sound, healthy and vigorous, well branched, and densely foliated when in leaf, and will have healthy, well developed root systems.

6. Use nursery grown plants with containers from nursery, unless otherwise shown on plans.

7. Use plant replacement listed under Item 193 only to replace those plants damaged due to apparent negligence from contractor, acts of God or poor survival during the 6 months maintenance period.

8. Item 193, Plant Replacement - this item is to be used to pay for plant replacement as per plant type and specified container size. Damaged plants of the same container size will be replaced as specified under this Item and to the satisfaction of engineer.

9. Plant material substitutions are not allowed without the written permission of the Engineer. Submit request for substitutions no later than 2 weeks prior to the initiation of work. The sum of materials differing in kind and quality or size from that specified will be allowed only after proving that all means of obtaining the specified materials have been exhausted.

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

MJS, P.E.
5/5/21

VEGETATIVE LANDSCAPE

LANDSCAPE

PLANT SPECIFICATIONS

NOT TO SCALE SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		51

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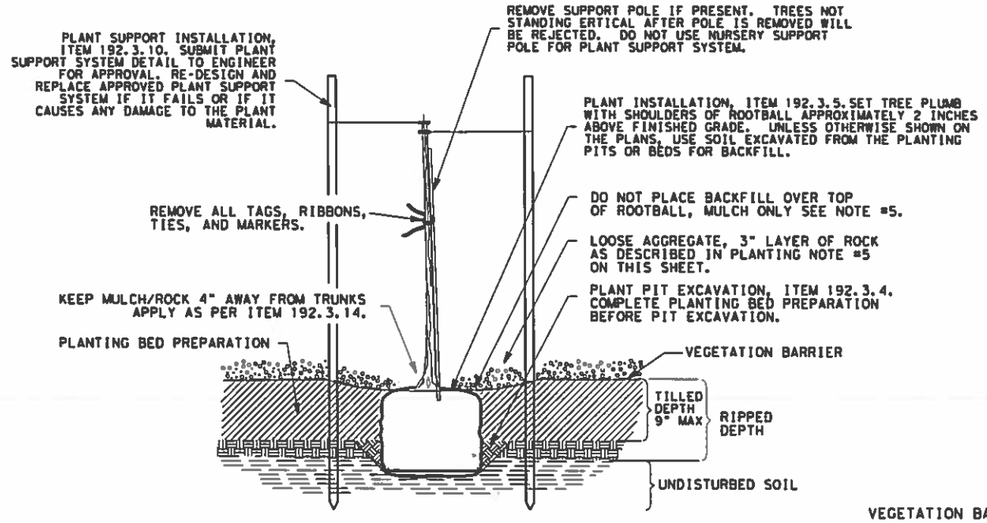
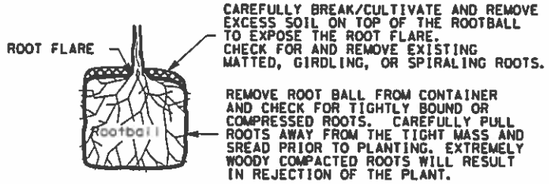
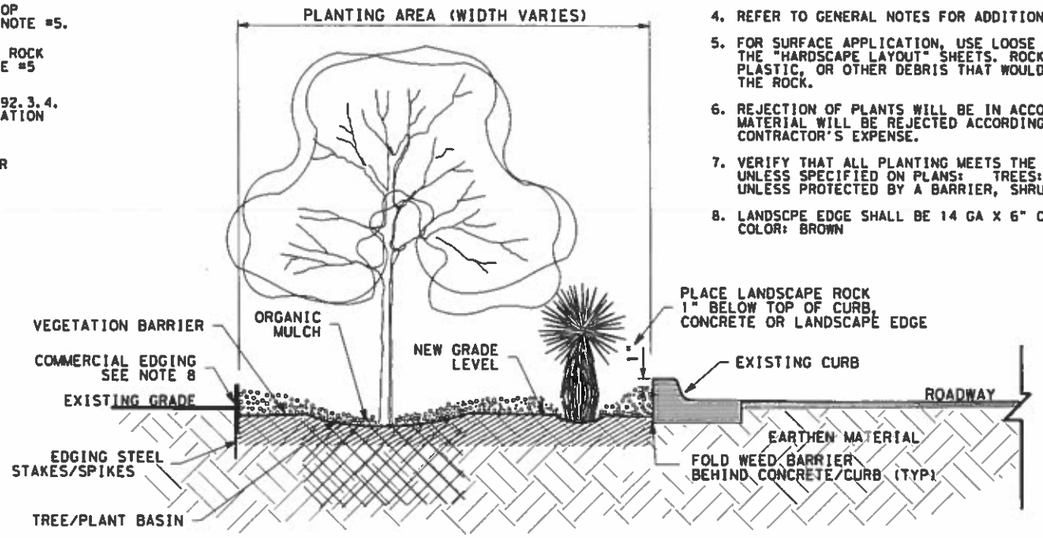


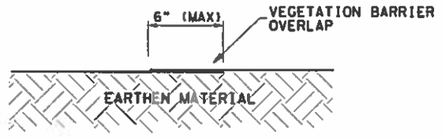
TREE AND SHRUB PLANTING DETAIL



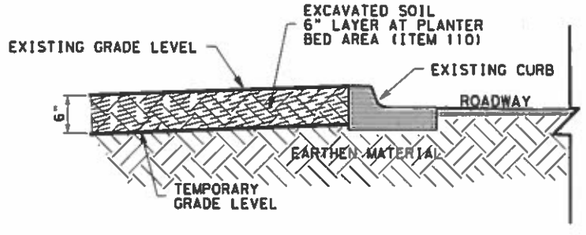
PRIOR TO PLACING ROOTBALL IN PLANT PIT



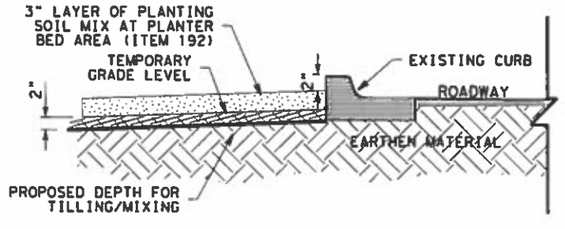
VEGETATION AND LANDSCAPE EDGE



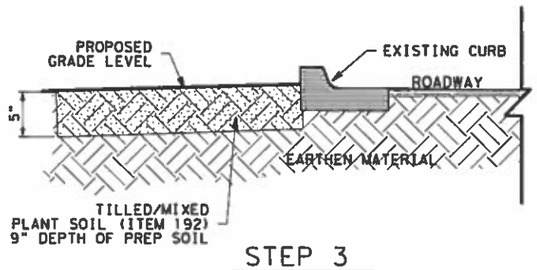
VEGETATION BARRIER OVERLAP DETAIL



STEP 1



STEP 2



STEP 3

PLANT BED PREPARATION STEPS

NOTES:

REFERENCE ITEM 192 OF THE TEXAS STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS AND BRIDGES 2014 FOR SPECIFICATIONS, DIMENSIONS, VOLUMES AND MEASUREMENTS THAT HAVE BEEN MODIFIED OR ARE NOT SHOWN.

1. PLANT SOIL MIX SHALL BE UNIFORMLY APPLIED OVER THE NEW GRADE AT PLANTING AREA AT AN AVERAGE LAYER OF 3 INCHES.
2. INCORPORATE PLANT SOIL MIX UNIFORMLY TO A DEPTH OF 6 INCHES USING A ROTARY TILLER OR OTHER APPROPRIATE EQUIPMENT. RAKE SOIL SURFACE SMOOTH PRIOR TO PLANTING. SEE "SOIL PREP LAYOUT" SHEET FOR EXCAVATION, AND SOIL MIX QUANTITIES AND PAY ITEM.
3. REFER TO "HARDSCAPE LAYOUT" SHEETS FOR LANDSCAPE ROCK, VEGETATION BARRIER AND LANDSCAPE EDGE LAYOUT,QUANTITY AND PAY ITEMS. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
4. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION ON LOOSE AGGREGATE.
5. FOR SURFACE APPLICATION, USE LOOSE AGGREGATE TY I OR TY II AS SHOWN ON THE "HARDSCAPE LAYOUT" SHEETS. ROCK SHALL NOT HAVE VISIBLE GLASS, METAL, TRASH, PLASTIC, OR OTHER DEBRIS THAT WOULD AFFECT THE POSITIVE AESTHETIC QUALITY OF THE ROCK.
6. REJECTION OF PLANTS WILL BE IN ACCORDANCE WITH ITEM 192.2.2. STRESSED PLANT MATERIAL WILL BE REJECTED ACCORDING TO ITEM 192.2.2. AND REPLACED AT CONTRACTOR'S EXPENSE.
7. VERIFY THAT ALL PLANTING MEETS THE FOLLOWING CLEAR ZONE MINIMUM STANDARDS UNLESS SPECIFIED ON PLANS: TREES: 20' MIN TO 30'+ FROM EDGE OF PAVEMENT UNLESS PROTECTED BY A BARRIER, SHRUBS: 8' FROM EDGE OF PAVEMENT.
8. LANDSCPE EDGE SHALL BE 14 GA X 6" COMMERCIAL GRADE STEEL EDGING. COLOR: BROWN

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

M J S, P.E.
5/5/21

VEGETATIVE LANDSCAPE DETAILS

MISCELLANEOUS DETAILS

NOT TO SCALE SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		52

DATE: 5/4/2021 1:21:34 AM
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STORM WATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TPDES General Permit TXR150000. The operator, The Texas Department of Transportation ensures that: Project specifications provide that adequate BMPs have been developed for this project. The contractor shall be the party responsible for implementing the BMPs described herein. The contractor shall implement changes approved by the Project Engineer to the SWP3 within the times specified in the SWP3 or the TPDES General Permit. Operators affected by modifications to specifications will be notified in a timely manner.

1. SITE OR PROJECT DESCRIPTION:

NATURE OF THE CONSTRUCTION ACTIVITY: SEE TITLE SHEET

POTENTIAL POLLUTANTS AND SOURCES:

Sediment laden storm water	*Storm water conveyance over disturbed areas*
Fuels, oils, and lubricants	*Construction vehicles and storage areas*
Construction debris and waste	*Various construction activities*
Sanitary waste	*Restroom facilities*
Trash	*Construction site and Receptacles*

SEQUENCE OF ACTIVITIES THAT WILL DISTURB SOILS:

1. *Excavate existing sloped eroded dirt to create a more stable planting area. Remove existing top layer of dirt, weeds, and other materials not deemed for preservation.*
2. *Rehabilitate areas by preventing soil erosion with the placement of plants. Place weed barrier and landscape rock.*
3. *Complete rehabilitation by furnishing native desert vegetation, plant soil mix, fertilizer and maintenance.*
4. *Project cleanup.*

AREAS:

TOTAL AREA OF PROJECT: 140 ACRES

TOTAL AREA OF SOIL DISTURBANCE: 11 ACRES

TOTAL AREA OFF-SITE: N/A

WEIGHTED RUNOFF COEFFICIENT (BEFORE AND AFTER CONSTRUCTION): *N/A*

DATA DESCRIBING THE SOIL:

GENERAL LOCATION MAP: *SEE PROJECT LAYOUT SHEET*

DETAILED SITE MAP: *SEE SWP3 LAYOUT SHEETS*

THE LOCATION AND DESCRIPTION OF CONCRETE AND ASPHALT PLANTS:
Concrete plant is not required. Project consist mainly of planting.

NAME OF RECEIVING WATERS: *Storm water runoff passing through project will be intercepted on site by existing flumes, inlets and drainage system. Once intercepted water will drain into a municipal storm water system and eventually drain into the Rio Grande.*

A COPY OF TPDES CGP TXR150000 IS INCLUDED IN THE SWP3 FILE.

REMARKS: N/A

401 WATER QUALITY CERTIFICATION: YES____ NO__X__

2. BEST MANAGEMENT PRACTICES (BMPs):

EROSION AND SEDIMENT CONTROLS: Erosion and sediment controls have been designed to retain sediment on-site. Controls shall be utilized to reduce off site transport of suspended sediments and pollutants if it is necessary to pump water from the site. Control measures shall be installed per specifications or as directed. Sediment must be removed from controls per the plan requirements or manufacturers recommendations, but no later than the time that design capacity has been reduced by 50%. If sediment escapes the site, accumulations will be removed to minimize further negative effects. Controls will be developed to limit the off site transportation of litter, construction debris, and construction materials.

INTERIM(INT), PERMANENT(PER), AND 401 CERTIFICATION BMP'S:

EROSION CONTROLS:	401	INT	PER
☐ *Compaction & Tracking of slopes*	—	—	—
☐ *Diversion Dike*	—	—	—
☒ *Preserve Existing Vegetation*	—	—	X
☐ *Soil Stabilization*	—	—	—
☒ *Permanent Vegetation*	—	—	X
☐ *No Erosion Controls are Required.*			

SEDIMENT CONTROLS:	401	INT	PER
☒ *Silt Fence*	—	X	—
☐ *Rock Berm*	—	—	—
☒ *Erosion Control Logs*	—	X	—
☐ *Vegetative Filter Strips*	—	—	—
☐ *Ditch Block*	—	—	—
☐ *No Sediment Controls are Required.*			

POST CONSTRUCTION TSS CONTROL (401 CERTIFICATION ONLY):

- ☐ *Vegetation Lined Drainage Ditch*
- ☐ *Retention/Irrigation*
- ☐ *Erosion Control Compost*
- ☐ *Grassy Swales*
- ☐ *Vegetative Filter Strips*
- ☒ *No Post Construction TSS Control Required.*

SEQUENCE OR SCHEDULE OF IMPLEMENTATION:

1. *Install appropiate storm pollution prevention measures as shown on plans.*
2. *Place erosion control measure at project areas. .*
3. *Perform special excavation activities to instal plants.*
4. *Remove erosion control logs from system at project completion.*
5. *Remove all SWP3 measures before final project clean-up.*
6.
7.

The El Paso District of the Texas Department of Transportation uses Site-Manager, a computer based construction record-keeping system. Documentation describing major grading activities, temporary or permanent cessation of construction, and stabilization measures is a part of this system and is incorporated by reference into this SWPPP.

Stabilization measures must be initiated within 14 days when practicable in portions of the site where construction has temporarily or permanently ceased, if earth disturbing activities will not be resumed within 21 days.

3. STRUCTURAL CONTROL PRACTICES:

Structural control practices for this project are listed elsewhere herein.

4. PERMANENT STORM WATER CONTROLS:

Structural control practices installed during construction will be maintained and inspected after construction has ceased on the site and until final stabilization is attained. Unless specified in the plans, after project acceptance TxDOT will assume maintenance responsibilities for the controls and measures. Other permanent controls include existing and proposed; riprap at culvert inlets and outlets, diversion dikes, swales, retaining walls, and other similar devices.

5. OTHER CONTROLS:

OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST: The off site vehicle tracking of sediments shall be minimized by removal of excess dirt from the road and at entrances to the work site. The generation of dust will be minimized as directed by the Project Engineer by dampening haul roads and covering haul trucks with a tarpaulin.

CONSTRUCTION AND WASTE MATERIALS: The contractor will maintain a clean, orderly construction site. Construction waste including trash, rubble, scrap and vegetation shall be disposed of in lidded dumpsters or in a manner approved by the Project Engineer. Disposal methods must meet Federal, State, and Local waste management guidelines. No construction waste will be buried or burned on site. Spoils disposal, material storage, and materials resulting from the destruction of existing roads and structures shall be stored in areas designated by the Project Engineer and protected from run-off. All waterways shall be cleared of temporary embankment, temporary bridges, matting, false work, piling, debris, or other obstructions placed during construction operations, that are not part of the finished work, as soon as practicable. All excess soil generated by the construction will be collected and disposed of by the contractor. Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, water body, or stream bed.

POLLUTANT SOURCES FROM AREAS OTHER THAN CONSTRUCTION: Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants. If potential pollutant sources are identified after the start of construction, controls and measures shall be implemented as directed by the Project Engineer.

5. OTHER CONTROLS (CONT):

DEDICATED ASPHALT PLANTS: Asphalt or asphaltic material for this project will be produced off site. If the project requires a dedicated asphalt plant and the plant within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer.

DEDICATED CONCRETE PLANTS: Cement or Concrete material for this project will be produced off site. If the project requires a dedicated concrete plant and the plant is within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer. Concrete trucks shall be washed or washed out in locations designated by the Project Engineer. The locations shall be protected by a berm sufficient to contain all waste and wash water. Wash water shall not be allowed to enter any storm drainage system or waterway. The residual material and contaminated soil shall be collected and disposed of in accordance with Federal, State, and Local guidelines. Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants.

HAZARDOUS MATERIALS AND SPILL REPORTING: The contractor shall take appropriate measures to prevent, minimize, and control the spillage or leakage of hazardous materials and any associated wastes on site and in maintenance and staging areas. hazardous materials shall include but are not limited to paints, acids, solvents, asphalt products, chemical additives, curing compounds, oils, fuels, and lubricants. Hazardous materials shall not be stored, accumulated, or transported in open containers subject to precipitation or spillage, but shall be stored, accumulated, or transported in closed containers of the type recommended by the manufacturer. In the event of a spill the Project Engineer should be contacted immediately. All spills shall be immediately cleaned and any contaminated soil removed and disposed of in accordance with Local, State, and Federal laws. Fuel tanks shall be protected by a secondary containment, such as a lined berm, capable of containing 1.5 times the capacity of the tank, or as approved by the Project Engineer.

OFF SITE PSLs: All off site project specific locations including dedicated asphalt plants, concrete plants, or utility installations, required by the contractor, are the contractor's responsibility. The contractor shall secure all permits required by local, state, or federal laws for off site PSLs. The contractor shall provide diagrams and areas of disturbance for all PSL's within 1 mile of the project.

SANITARY FACILITIES: All sanitary or septic wastes that are generated onsite shall be treated and disposed of in accordance with state and local regulations. Raw sewage or septage shall not be discharged or buried on site. Precaution shall be taken to prevent illicit discharges to storm water. Licensed waste management contractors shall be required to dispose of sanitary waste. Porta johns will be required for the construction site or as directed by the Project Engineer.

VELOCITY DISSIPATION DEVICES: Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as shown in the plans or as directed by the Project Engineer to provide a non-erosive flow velocity from the structure to a watercourse so that the natural physical and biological characteristics and functions are maintained and protected.

6. APPROVED STATE AND LOCAL PLANS:

This SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or storm water management site plans or permits approved by federal, state, or local officials.

7. MAINTENANCE:

Control measures shall be properly installed according to specifications. If inspections or other information indicates a control has been installed, used, or is performing inadequately, the contractor must replace or modify the control as soon as practicable after discovery. Control measures shall be maintained in effective operating condition. If inspections determine that BMPs are not operating effectively maintenance will be performed as necessary to continue the effectiveness of the controls. Maintenance must be accomplished as soon as practicable. Controls adjacent to creeks, culverts, bridges, and water crossings shall have priority. Controls that have been disabled, run over, removed, or otherwise rendered ineffective must be corrected immediately upon discovery.

8. INSPECTION OF CONTROLS:

A TxDOT inspector will inspect disturbed areas of the site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Sediment and erosion controls measures identified in the SWP3 will be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site will be inspected for evidence of off-site vehicle tracking. Inspections will be conducted every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. The SWP3 will be modified based on the result of these inspections. Revisions will be completed within 7 Calendar days following the inspection. Revised implementation schedules will be described in the SWP3 and implemented as soon as practicable. Rain gages will be maintained on site for the duration of the project. Reports summarizing the scope of the inspections are included in the SWP3 file.

9. NON-STORM WATER COMPONENTS:

The contractor shall be required to implement appropriate pollution prevention controls and measures for all eligible non-storm water components of the discharge as approved and directed by the Project Engineer.

STATE OF TEXAS
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121602
LICENSED PROFESSIONAL ENGINEER

M. Sotelo, P.E.
5/5/21

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SWP3)

FED. RD. DIV. NO.			SHEET NO.
6			53
STATE	STATE DIST.	COUNTY	
TEXAS	ELP	EL PASO	
CONT.	SECT.	JOB	HIGHWAY NO.
0924	06	635	VARIOUS

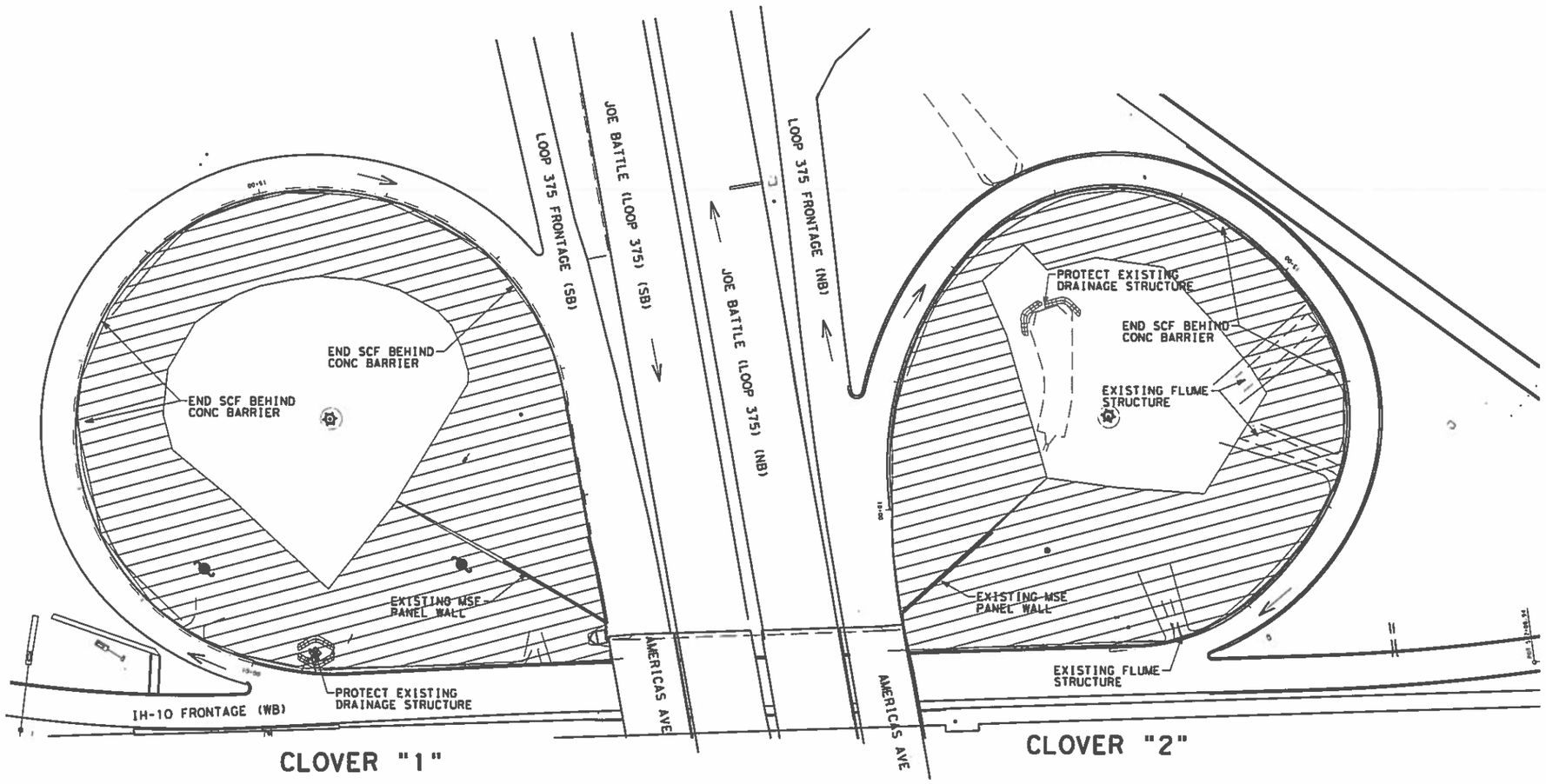
REV: 07-2014

NOTES:

1. REFER TO TRAFFIC CONTROL PLANS FOR CONSTRUCTION STAGES.
2. COORDINATE SWP3 MEASURES WITH TCP, EXISTING AND PROPOSED IMPROVEMENTS.
3. RENDER SWP3 AREAS TO THEIR ORIGINAL FORM AS DIRECTED PRIOR TO VARIOUS SWP3 PAY ITEMS.
4. STAKE EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE IN ACCORDANCE WITH STANDARDS SHEETS WHERE APPLICABLE.

SWP3 LEGEND

	SEDIMENT CONTROL FENCE
	BIODEG EROSION LOGS
	DISTURBED AREA



SUMMARY OF EROSION CONTROL ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6038	TEMP SEDMT CONT FENCE	LF	1,950
506	6039	TEMP SEDMT CONT FENCE	LF	1,950
506	6040	BIODEG EROSN CONT LOGS	LF	125
506	6043	BIODEG EROSN CONT LOGS	LF	125

EROSION CONTROL LAYOUT AT LOOP 375

STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER

M J S, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10
ENVIRONMENTAL

SWP3 PLAN LAYOUT

SCALE: 1"=100' SHEET 1 OF 4

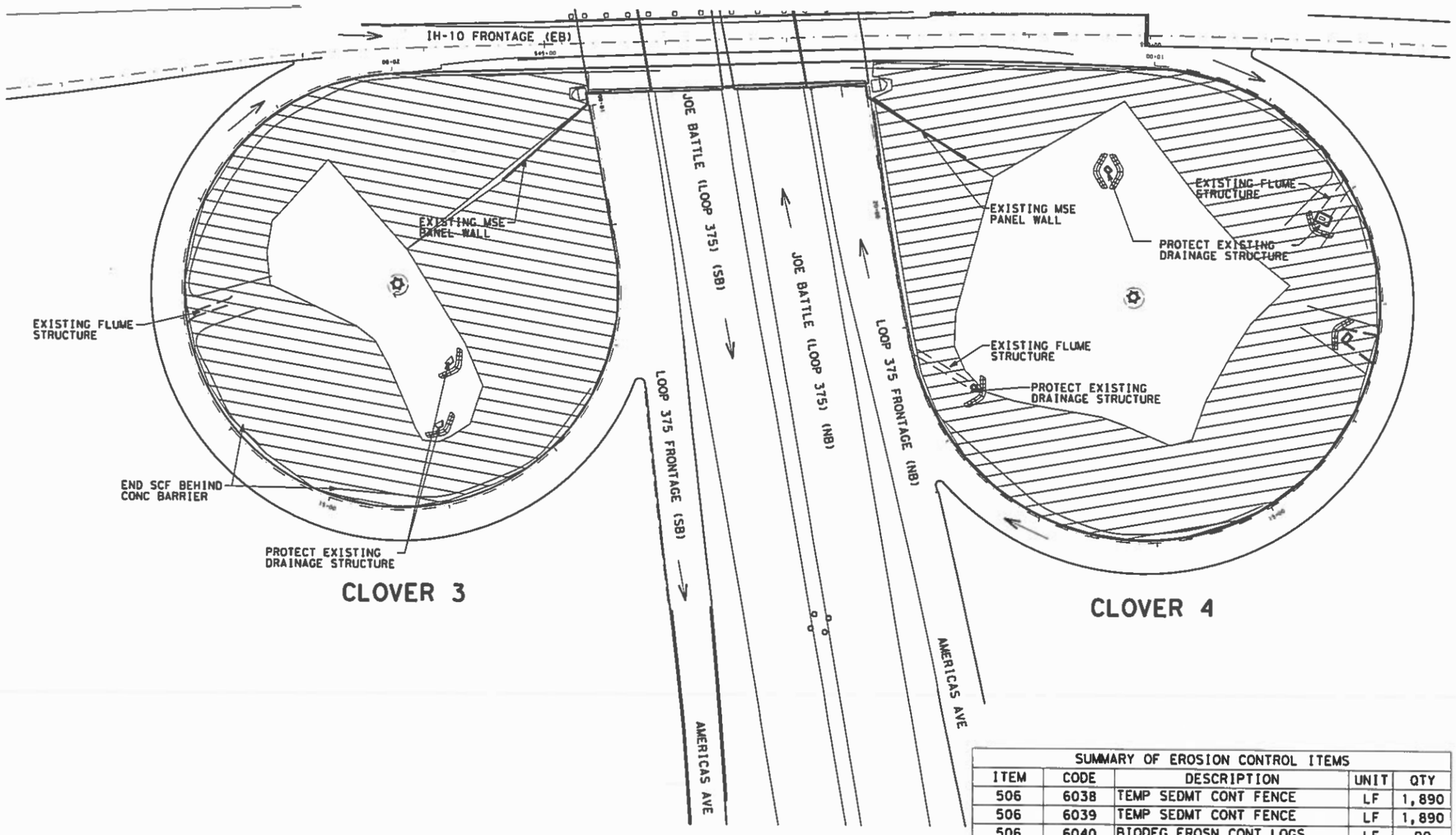
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		54

DATE: 05/04/2021 05:50 AM
FILE: TxDOT_Sheets_XM.cel

NOTES:

1. REFER TO TRAFFIC CONTROL PLANS FOR CONSTRUCTION STAGES.
2. COORDINATE SWP3 MEASURES WITH TCP, EXISTING AND PROPOSED IMPROVEMENTS.
3. RENDER SWP3 AREAS TO THEIR ORIGINAL FORM AS DIRECTED PRIOR TO VARIOUS SWP3 PAY ITEMS.
4. STAKE EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE IN ACCORDANCE WITH STANDARDS SHEETS WHERE APPLICABLE.



SWP3 LEGEND

	SEDIMENT CONTROL FENCE
	BIODEGRADABLE LOG
	DISTURBED AREA

SUMMARY OF EROSION CONTROL ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6038	TEMP SEDMT CONT FENCE	LF	1,890
506	6039	TEMP SEDMT CONT FENCE	LF	1,890
506	6040	BIODEG EROSN CONT LOGS	LF	90
506	6043	BIODEG EROSN CONT LOGS	LF	90

EROSION CONTROL LAYOUT AT LOOP 375

STATE OF TEXAS
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P.E.
5/6/21

VEGETATIVE LANDSCAPE AT IH-10
ENVIRONMENTAL

SWP3 PLAN LAYOUT

SCALE: 1"=100' SHEET 2 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		55

DATE: 5/5/2021 5:51:12 PM
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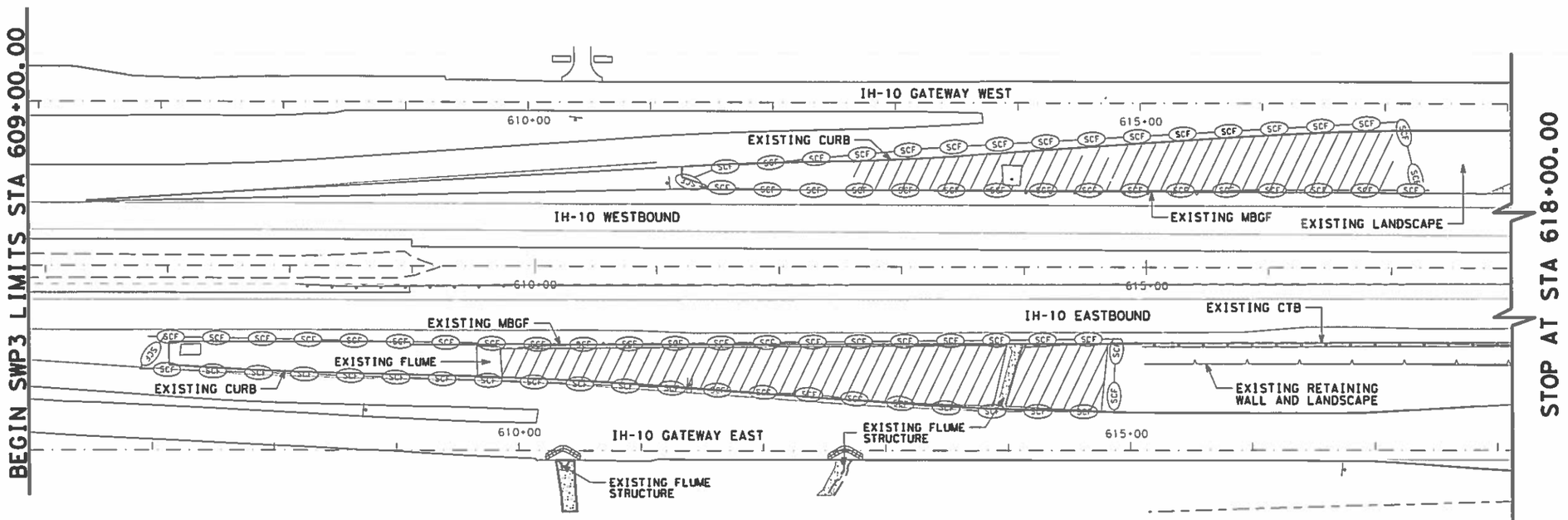
NOTES:

1. REFER TO TRAFFIC CONTROL PLANS FOR CONSTRUCTION STAGES.
2. COORDINATE SWP3 MEASURES WITH TCP, EXISTING AND PROPOSED IMPROVEMENTS.
3. RENDER SWP3 AREAS TO THEIR ORIGINAL FORM AS DIRECTED PRIOR TO VARIOUS SWP3 PAY ITEMS.
4. STAKE EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE IN ACCORDANCE WITH STANDARDS SHEETS WHERE APPLICABLE.

SWP3 LEGEND

SCF	SEDIMENT CONTROL FENCE
	BIODEGRADABLE LOG
	DISTURBED AREA



EROSION CONTROL LAYOUT AT EASTLAKE BLVD

SUMMARY OF EROSION CONTROL ITEMS

ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6038	TEMP SEDMT CONT FENCE	LF	2,960
506	6039	TEMP SEDMT CONT FENCE	LF	2,960
506	6040	BIODEG EROSN CONT LOGS	LF	30
506	6043	BIODEG EROSN CONT LOGS	LF	30

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
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PROFESSIONAL ENGINEER

M J S, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10
ENVIRONMENTAL

SWP3 PLAN LAYOUT

SCALE: 1"=100' SHEET 3 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		56

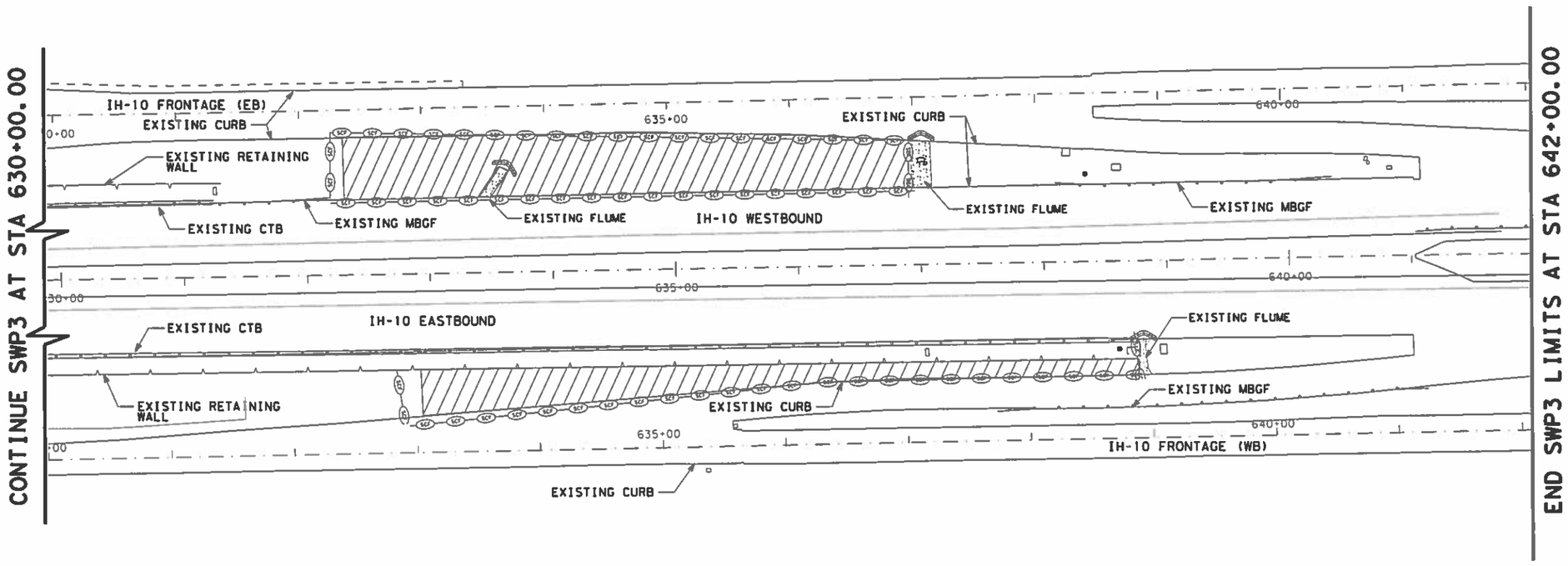
DATE: 05/04/2021 05:50 AM
FILE: TxDOT_Sheets_XM.cel

NOTES:

1. REFER TO TRAFFIC CONTROL PLANS FOR CONSTRUCTION STAGES.
2. COORDINATE SWP3 MEASURES WITH TCP, EXISTING AND PROPOSED IMPROVEMENTS.
3. RENDER SWP3 AREAS TO THEIR ORIGINAL FORM AS DIRECTED PRIOR TO VARIOUS SWP3 PAY ITEMS.
4. STAKE EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE IN ACCORDANCE WITH STANDARDS SHEERS WHERE APPLICABLE.

SWP3 LEGEND

SCF	SEDIMENT CONTROL FENCE
	BIODEGRADABLE LOG
	DISTURBED AREA



EROSION CONTROL LAYOUT AT EASTLAKE BLVD

SUMMARY OF EROSION CONTROL ITEMS

ITEM	CODE	DESCRIPTION	UNIT	QTY
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506	6039	TEMP SEDMT CONT FENCE	LF	1,675
506	6040	BIODEG EROSN CONT LOGS	LF	30
506	6043	BIODEG EROSN CONT LOGS	LF	30

STATE OF TEXAS
MARTIN JESUS SOTELO
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LICENSED PROFESSIONAL ENGINEER

M J Sot, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT IH-10
ENVIRONMENTAL

SWP3 PLAN LAYOUT

SCALE: 1"=100' SHEET 4 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VARIOUS
DIST	COUNTY		SHEET NO.
ELP	EL PASO		57

DATE: 5/4/2021 11:22:55 AM
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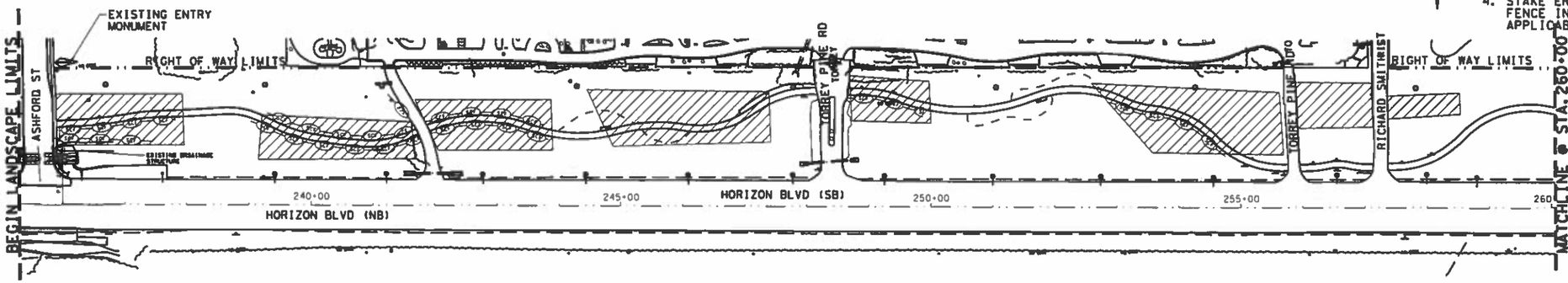
NOTES:

1. REFER TO TRAFFIC CONTROL PLANS FOR CONSTRUCTION STAGES.
2. COORDINATE SWP3 MEASURES WITH TCP, EXISTING AND PROPOSED IMPROVEMENTS.
3. RENDER SWP3 AREAS TO THEIR ORIGINAL FORM AS DIRECTED PRIOR TO VARIOUS SWP3 PAY ITEMS.
4. STAKE EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE IN ACCORDANCE WITH STANDARDS SHEETS WHERE APPLICABLE.



SWP3 LEGEND

SCF	SEDIMENT CONTROL FENCE
	BIODEGRADABLE LOG
	DISTURBED AREA

EROSION CONTROL LAYOUT AT HORIZON BLVD

SCALE: 1"=200'

SUMMARY OF EROSION CONTROL ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
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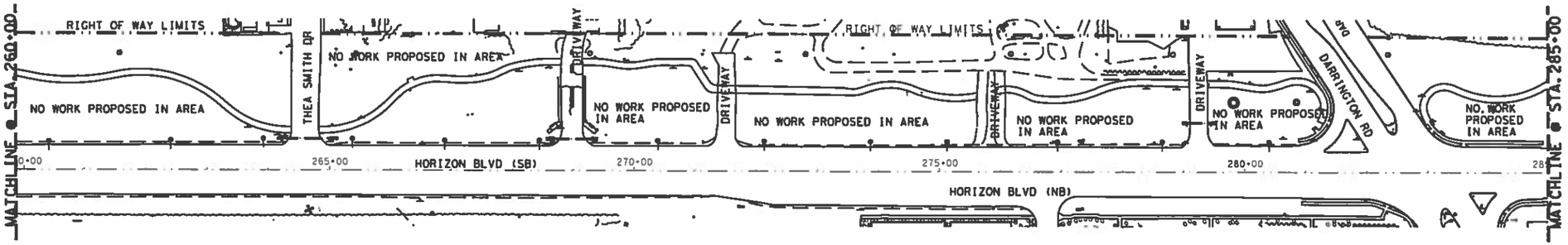
506	6039	TEMP SEDMT CONT FENCE	LF	1,500



EROSION CONTROL LAYOUT AT HORIZON BLVD

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

M J S, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT FM-1281
ENVIRONMENTAL

SWP3 PLAN LAYOUT
(HORIZON BLVD)

SCALE: 1"=200' SHEET 1 OF 3

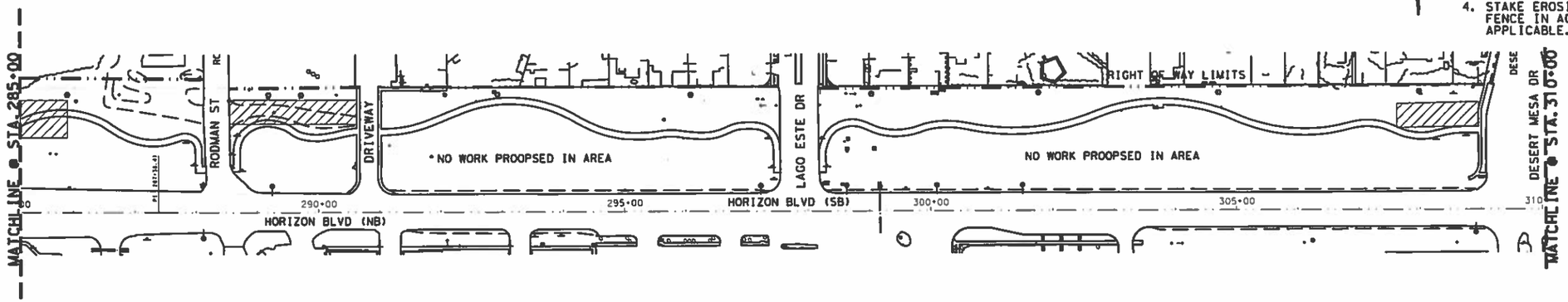
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		58

DATE: 05/04/2021 05:50 AM
FILE: TxDOT_Sheets_XM.cel

NOTES:

1. REFER TO TRAFFIC CONTROL PLANS FOR CONSTRUCTION STAGES.
2. COORDINATE SWP3 MEASURES WITH TCP, EXISTING AND PROPOSED IMPROVEMENTS.
3. RENDER SWP3 AREAS TO THEIR ORIGINAL FORM AS DIRECTED PRIOR TO VARIOUS SWP3 PAY ITEMS.
4. STAKE EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE IN ACCORDANCE WITH STANDARDS SHEETS WHERE APPLICABLE.

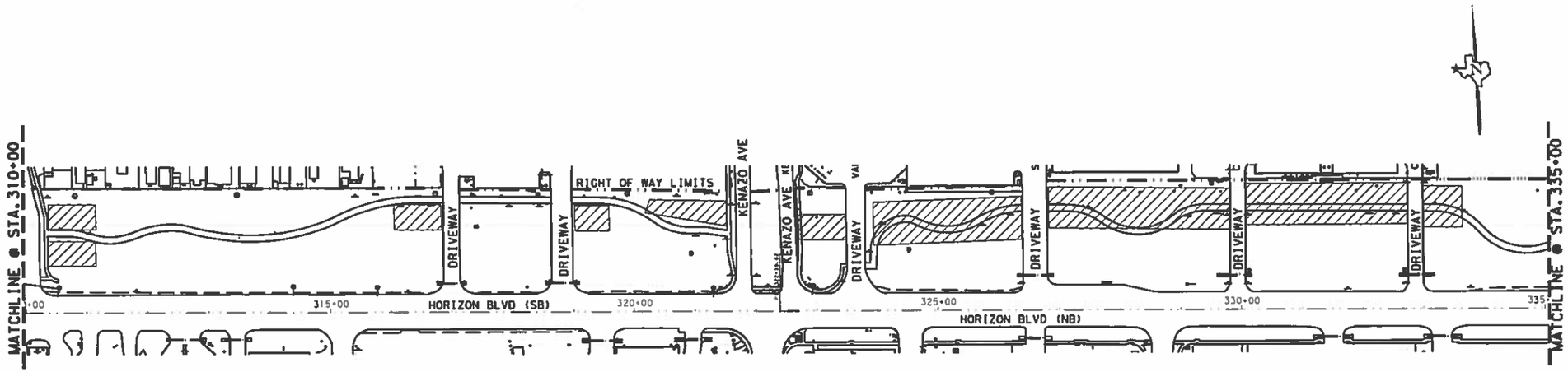


EROSION CONTROL LAYOUT AT HORIZON BLVD

SWP3 LEGEND

SCF	SEDIMENT CONTROL FENCE
	BIODEGRADABLE LOG
	DISTURBED AREA

SCALE: 1"=200'



EROSION CONTROL LAYOUT AT HORIZON BLVD

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED PROFESSIONAL ENGINEER

M J S, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT FM-1281
ENVIRONMENTAL

SWP3 PLAN LAYOUT
(HORIZON BLVD)

SCALE: 1"=200' SHEET 2 OF 3

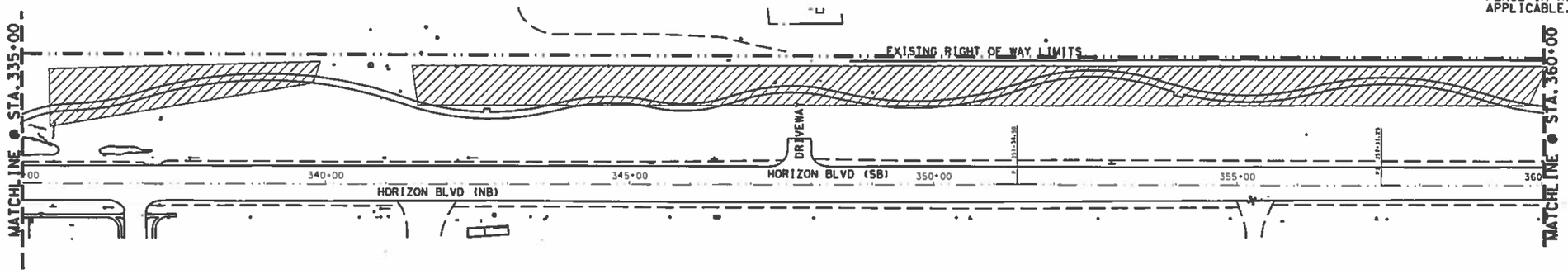
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		59

DATE: 05/04/2021 05:50 AM
FILE: TxDOT_Sheets_XM.cel

NOTES:

1. REFER TO TRAFFIC CONTROL PLANS FOR CONSTRUCTION STAGES.
2. COORDINATE SWP3 MEASURES WITH TCP, EXISTING AND PROPOSED IMPROVEMENTS.
3. RENDER SWP3 AREAS TO THEIR ORIGINAL FORM AS DIRECTED PRIOR TO VARIOUS SWP3 PAY ITEMS.
4. STAKE EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE IN ACCORDANCE WITH STANDARDS SHEETS WHERE APPLICABLE.



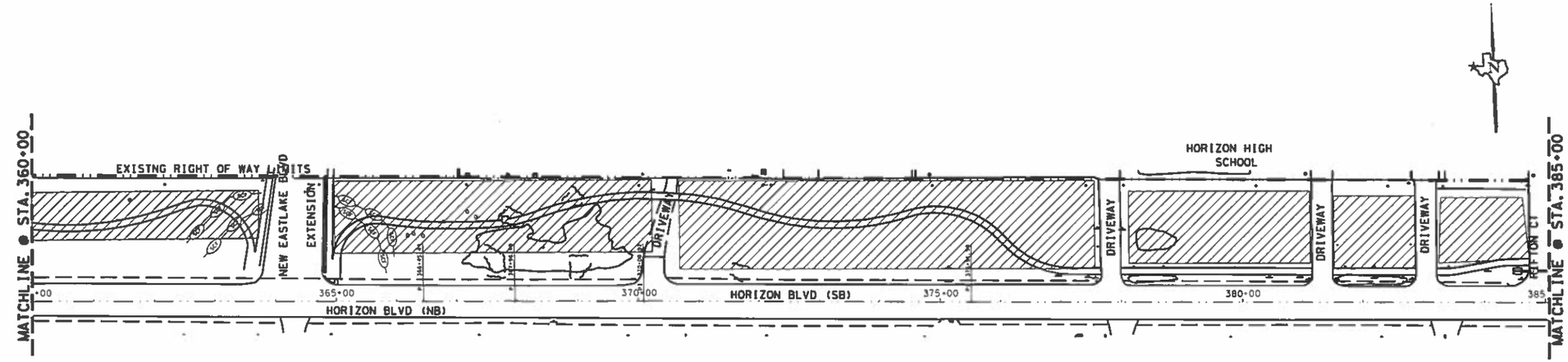
EROSION CONTROL LAYOUT AT HORIZON BLVD

SWP3 LEGEND

SCF	SEDIMENT CONTROL FENCE
	BIODEGRADABLE LOG
	DISTURBED AREA

SUMMARY OF EROSION CONTROL ITEMS				
ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6038	TEMP SEDMT CONT FENCE	LF	560
506	6039	TEMP SEDMT CONT FENCE	LF	560

SCALE: 1"=200'



EROSION CONTROL LAYOUT AT HORIZON BLVD

STATE OF TEXAS
MARTIN JESUS SOTELO
121602
LICENSED
PROFESSIONAL ENGINEER

M J S, P.E.
5/5/21

VEGETATIVE LANDSCAPE AT FM-1281 ENVIRONMENTAL

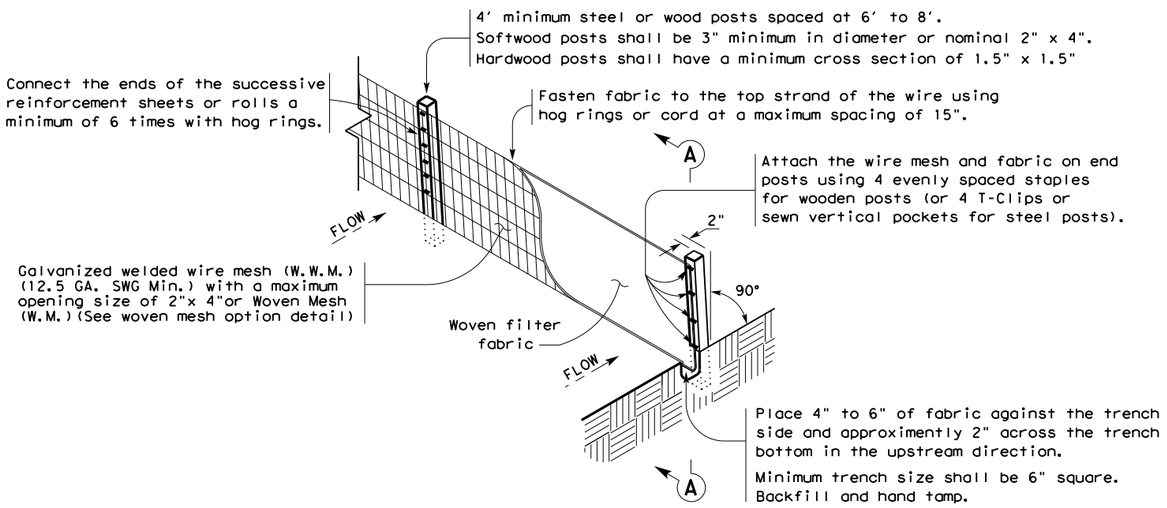
SWP3 PLAN LAYOUT
(HORIZON BLVD)

SCALE: 1"=200' SHEET 3 OF 3

Texas Department of Transportation

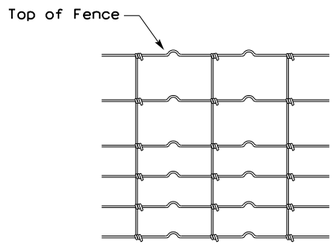
CONT	SECT	JOB	HIGHWAY
0924	06	635	VAR
DIST	COUNTY		SHEET NO.
ELP	EL PASO		60

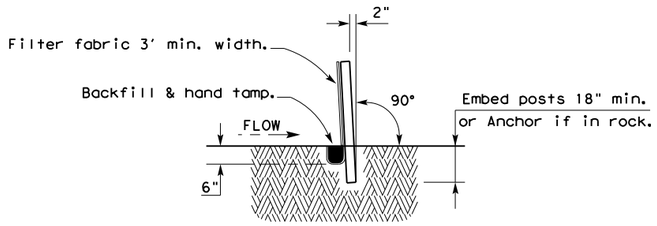
DATE: 05/04/2021 05:50 AM
FILE: TxDOT_Sheets_XW.cel



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.

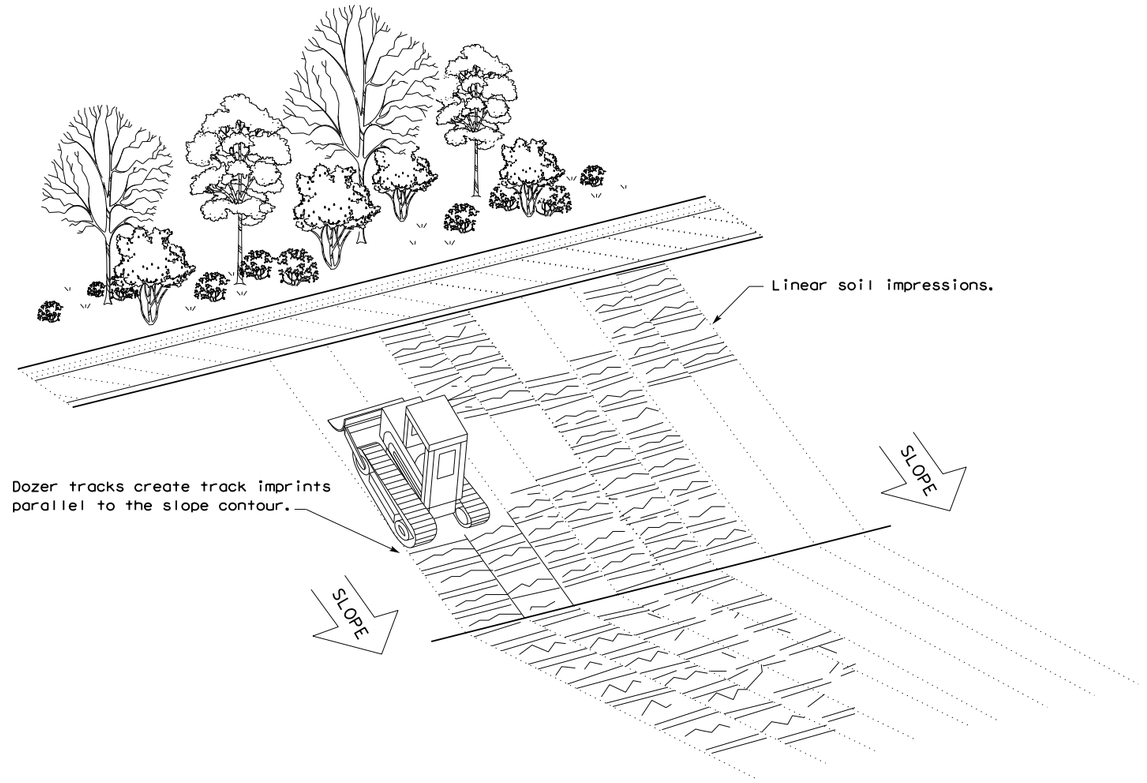
LEGEND

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

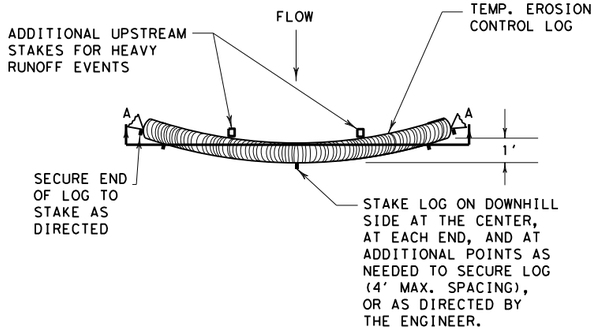
FENCE & VERTICAL TRACKING

EC(1)-16

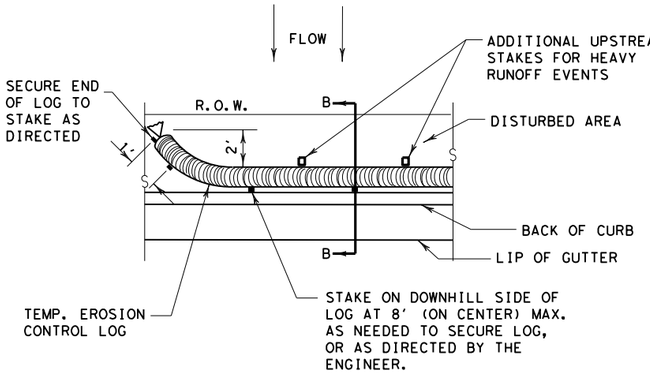
FILE: ec116	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0924	06	635		VARIOUS	
	DIST	COUNTY			SHEET NO.	
	ELP	EL PASO			61	

5/28/2021
pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\092406635\4 - Design\Plan Set\15. Standards\EC (1)-16.dgn

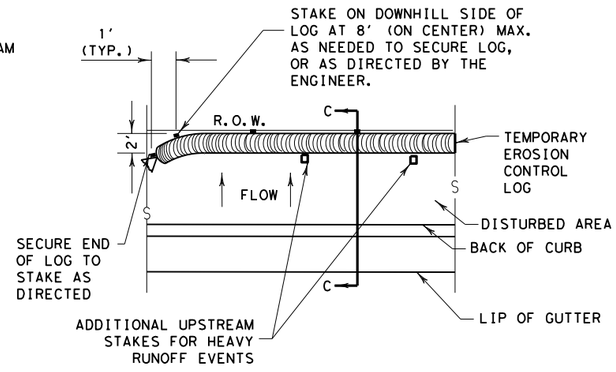
DATE: 5/26/2021
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\092406635\4 - Design\Plan Set\15. Standards\EC (9)-16.dgn



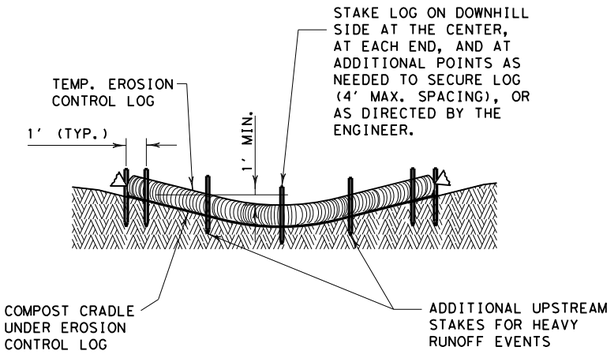
PLAN VIEW



PLAN VIEW



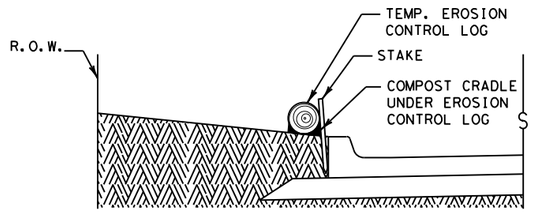
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

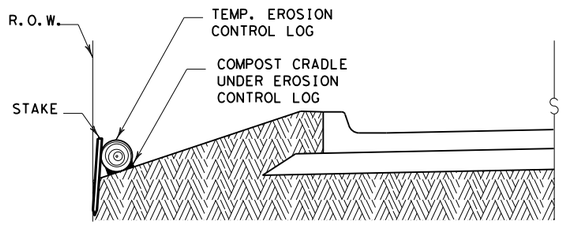
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

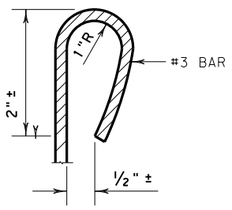
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

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

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.

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.

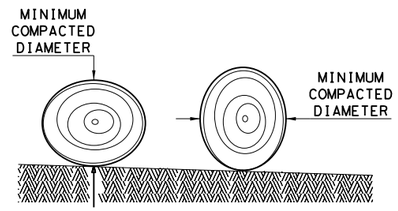
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

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.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

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		0924	06	635		VARIOUS	
		DIST		COUNTY			SHEET NO.
		ELP		EL PASO			62

DATE: 5/26/2021
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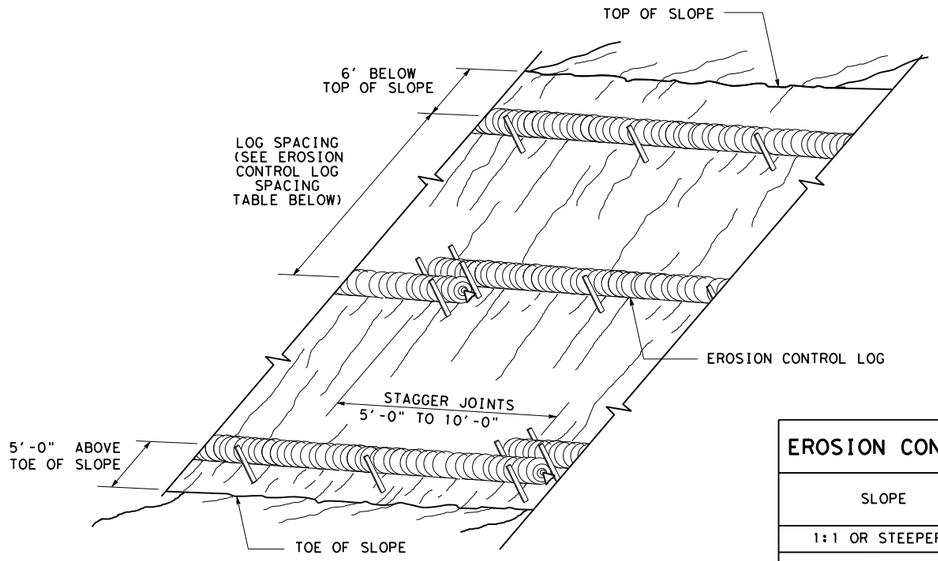
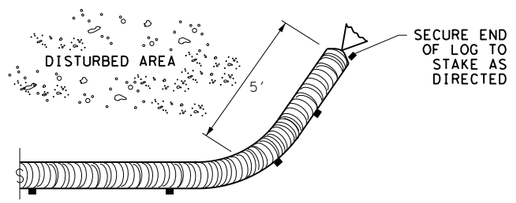


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

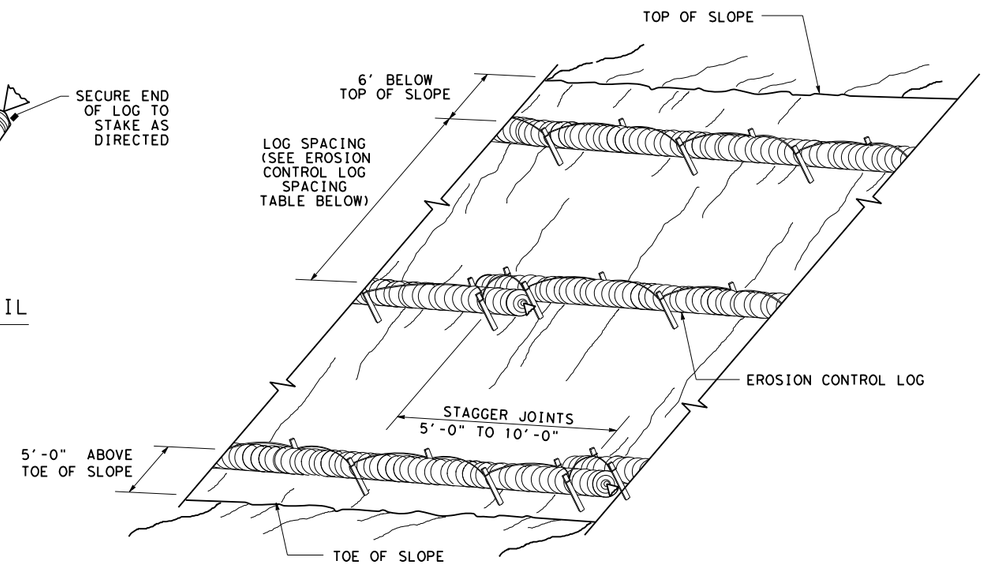
CL-SST



END SECTION RAP DETAIL

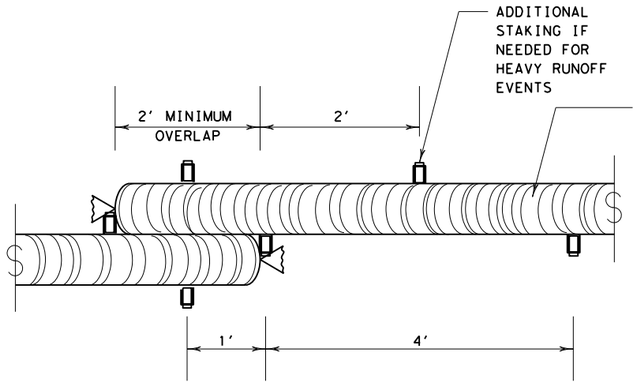
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

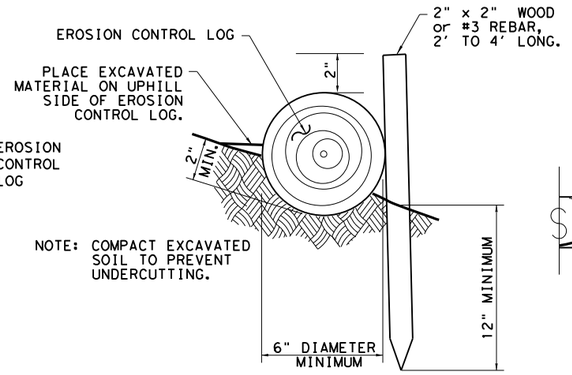
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

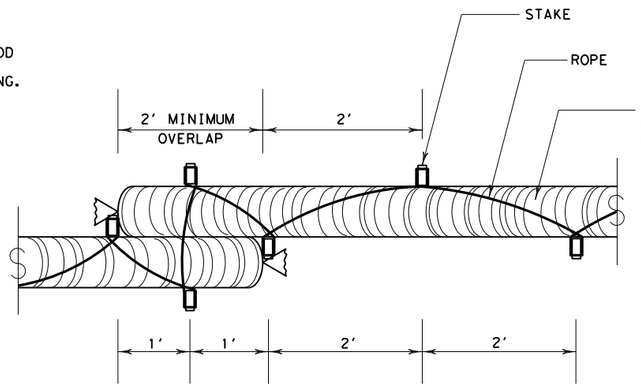


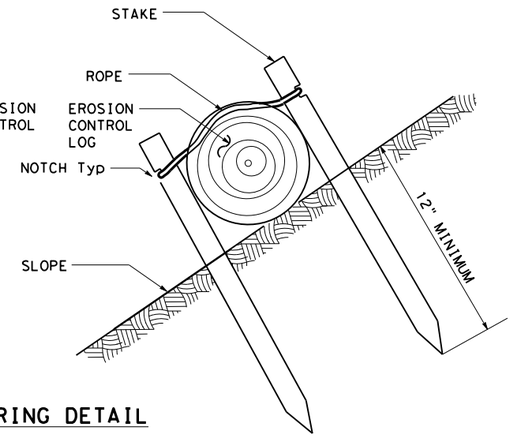


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

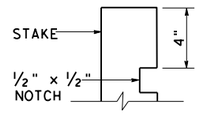
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

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	0924	06	635	VARIOUS
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		63

DATE: 5/26/2021
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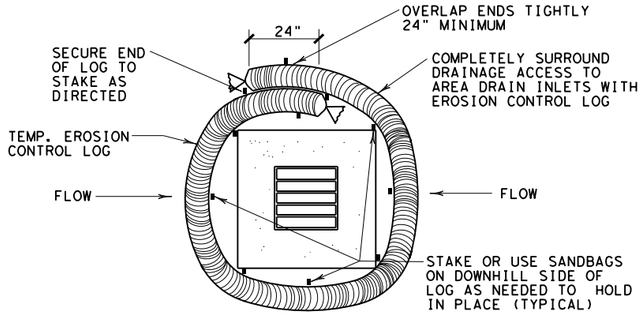
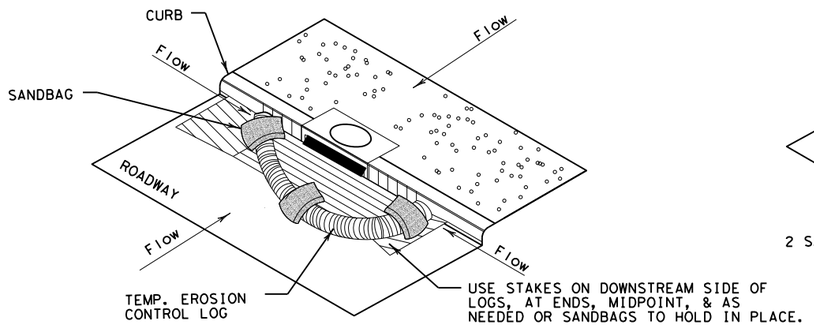


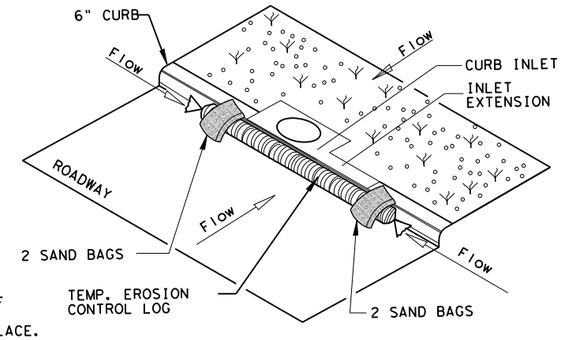
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

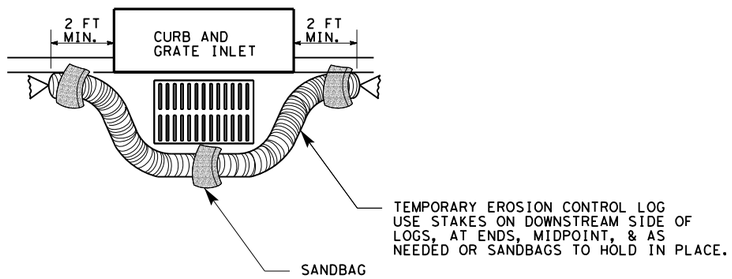
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

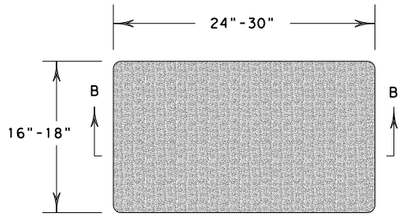
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



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	0924	06	635		VARIOUS	
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	ELP	EL PASO				64