CONT	SECT	JOB	HIGHWAY
0914	05	209	VARIOUS
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT NUMBER

C 914-5-209

CSJ: 0914-05-209

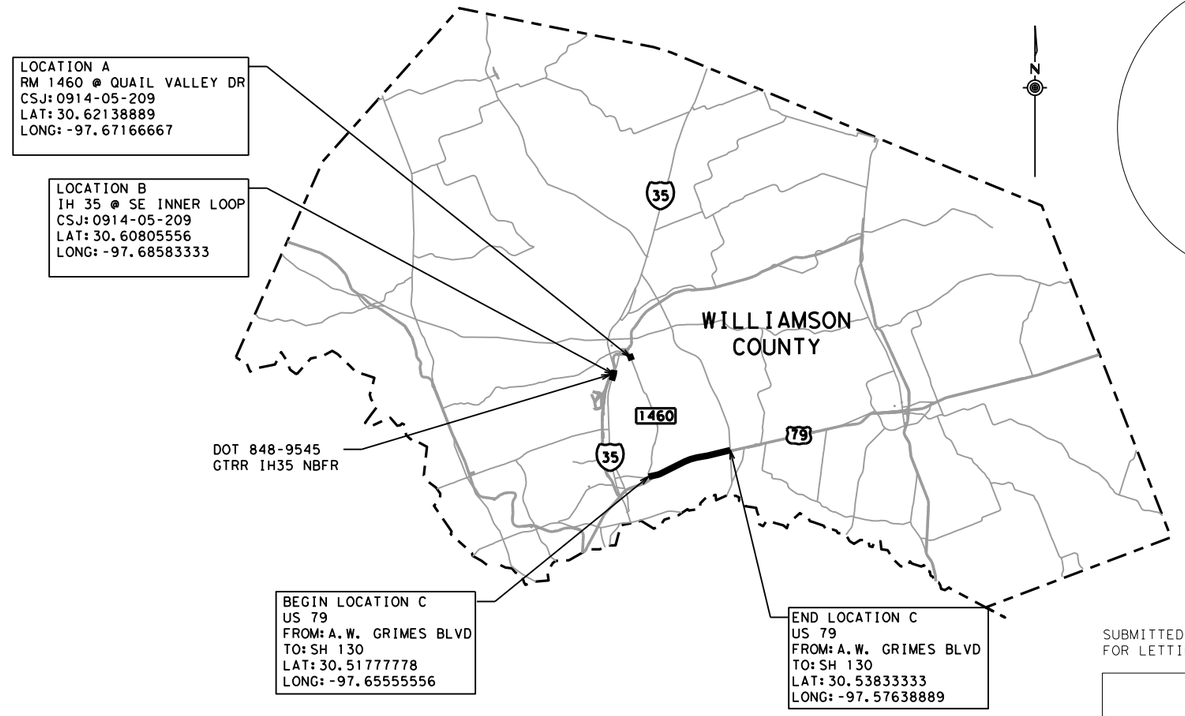
NET LENGTH OF PROJECT =528.00 FEET = 0.01 MILES
- ROADWAY = 528.00 FEET = 0.01 MILES
- BRIDGE = 00.00 FEET = 0.00 MILES

WILLIAMSON COUNTY
VARIOUS

FROM: VARIOUS ON IH 35, RM 1460, & US 79
TO: IN WILLIAMSON COUNTY

FOR THE CONSTRUCTION OF LANDSCAPE AND SCENIC ENHANCEMENT

CONSISTING OF LANDSCAPE AND IRRIGATION



LOCATION MAP NOT TO SCALE

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: GTRR

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

Texas Department of Transportation

DESIGN SPEED

MAIN LANES: N/A
FRONTAGE ROADS: N/A
RAMPS: N/A

FINAL PLANS

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED AND ACCEPTED: _____

FINAL CONTRACT COST: $_____

CONTRACTOR: _____

LIST OF APPROVED CHANGE ORDERS:

I CERTIFY THAT THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THE FINAL AS-BUILT PLANS AND SPECIFICATIONS.

_____ P.E. _____
DATE

SUBMITTED FOR LETTING:

LOCAL PUBLIC AGENCY

RECOMMENDED FOR LETTING: 1/29/2021

DocuSigned by:
Dwayne Hellmann, P.E.
198012497A804A0...
DISTRICT DESIGN ENGINEER

SUBMITTED FOR LETTING: 1/29/2021

DocuSigned by:
089654558998492...
AREA ENGINEER

APPROVED FOR LETTING: 1/31/2021

DocuSigned by:
8912AF18E45A416...
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\091405209\4 - Design\Plan Set\1. General\WILLIAMSON*GEN*TITLE.dgn
DATE: 1/20/2021 7:52:57 AM

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STATE OF TEXAS
MARK F. HERBER
91828
LICENSED
PROFESSIONAL ENGINEER

REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

DocuSigned by:
Alisa West
B5ED8BB569EE470...
12/10/2020

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED SHOWN WITH A (>>) HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

DocuSigned by:
Mark F. Herber
640CCE004A5D45C...
MARK F. HERBER, P.E.

12/10/2020
DATE

Texas Department of Transportation

WILLIAMSON

INDEX OF SHEETS

SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	05	209	VARIOUS
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		2

GENERAL NOTES: Version: October 26, 2020

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

Georgetown Jason.Hudson@txdot.gov
Georgetown John.Peters@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.

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

If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

Equip all construction equipment used in roadway work with highly visible omnidirectional flashing warning lights.

Intelligent Transportation Systems (ITS) Infrastructure may exist within the limits of this project and that the system must remain operational throughout construction. The exact location of ITS Infrastructure is not known. Contact the TxDOT Area Engineer's or Inspection Team's Office for the location(s) at least 48 hours before commencing any work that might affect present ITS Infrastructure. Use caution if working in these areas to avoid damaging or interfering with existing facilities. Repair any damage to this system within 8 hours of occurrence at no cost to the Department. In the event of system damage, notify TxDOT/CTECC at (512) 974-0883 within one hour of occurrence. Failure of the Contractor to repair damage to any infrastructure that conveys any corridor information to TxDOT/CTECC will result in the Contractor being billed for the full cost of emergency repairs.

Provide a smooth, clean sawcut along the existing asphalt or concrete pavement structure, as directed. Consider subsidiary to the pertinent Items.

Supply litter barrels in enough numbers at locations as directed to control litter within the project. Consider subsidiary to pertinent Items.

Use a self-contained vacuum broom to sweep the roadway and keep it free of sediment as directed. The contractor will be responsible for any sweeping above and beyond the normal maintenance required to keep fugitive sediment off the roadway as directed by the Engineer.

Protect all areas of the right of way, which are not included in the actual limits of the proposed construction areas, from disturbance. Restore any area disturbed because of the Contractor's operations to a condition as good as, or better than, before the beginning of work at no cost to the state.

Damage to existing pipes and SET's due to Contractor operations will be repaired at Contractor's expense.

Be responsible for protection of project materials and equipment from theft, vandalism, animals, fire, etc., while said materials and equipment are on the project site, whether stored or installed in place, until the project has been accepted by the Engineer. Replacement of stolen or damaged material is subsidiary to the various bid items.

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right of way, will be as directed. Use of right of way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will not have exclusive use of right of way but will cooperate in the use of the right of way with the city/county and various public utility companies as required.

ITEM 5 – CONTROL OF THE WORK
Overhead and underground utilities may exist in the vicinity of the project. The exact location of underground utilities is not known.

ITEM 7 – LEGAL RELATIONS AND RESPONSIBILITIES
Roadway closures during key dates and/or special events are prohibited. See notes for Item 502 for the key dates and/or special events.

Refer to the Environmental Permits, Issues and Commitments (EPIC) plan sheets for additional requirements and permits.

When any abandoned well is encountered, cease construction operations in this area and notify the Engineer who will coordinate the proper plugging procedures. A water well driller licensed in the State of Texas must be used to plug a well.

Erosion control and stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. Track all exposed soil, stockpiles, and slopes. Tracking consists of operating a tracked vehicle or equipment up and down the slope, leaving track marks perpendicular to the

direction of the slope. Re-track slopes and stockpiles after each rain event or every 14 days, whichever occurs first. This work is subsidiary.

Perform maintenance of vehicles or equipment at designated maintenance sites. Keep a spill kit on-site during fueling and maintenance. This work is subsidiary.

Maintain positive drainage for permanent and temporary work for the duration of the project. Be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work is subsidiary.

Suspend all activities near any significant recharge features, such as sinkholes, caves, or any other subterranean openings that are discovered during construction or core sampling. Do not proceed until the designated Geologist or TCEQ representative is present to evaluate and approve remedial action.

Locate aboveground storage tanks kept on-site for construction purposes in a contained area as to not allow any exposure to soils. The containment will be sized to capture 150% of the total capacity of the storage tanks.

Migratory Birds and Bats.
Migratory birds and bats may be nesting within the project limits and concentrated on roadway structures such as bridges and culverts. Remove all old and unoccupied migratory bird nests from any structures, trees, etc. between September 16 and February 28. Prevent migratory birds from re-nesting between March 1 and September 15. Prevention shall include all areas within 25 ft. of proposed work. All methods used for the removal of old nesting areas and the prevention of re-nesting must be submitted to TxDOT 30 business days prior to begin work. This work is subsidiary.

If active nests are encountered on-site during construction, all construction activity within 25 ft. of the nest must stop. Contact the Engineer to determine how to proceed.

Tree and Brush Trimming and Removal.
Work will be conducted September 16 thru February 28. Work conducted outside this timeframe will require a bird survey. Submit a survey request to TxDOT 30 business days prior to begin work.

No extension of time or compensation will be granted for a delay or suspension due to the above bird, bat and tree/brush requirements.

Back Up Alarm.
For hours 9 P to 5 A, utilize a non-intrusive, self-adjusting noise level reverse signal alarm. This is not applicable to hotmix or seal coat operations. This is subsidiary.

ITEM 8 – PROSECUTION AND PROGRESS
Electronic versions of schedules will be saved in Primavera P6 format.

Special Provision 008-003 has been included to amend Standard Article 8.1 to extend the begin work date due to procurement of materials.

ITEM 161 – COMPOST
Furnish compost that meets the requirement of DMS 6360, "Compost." Use sources pre-qualified by the Department to supply compost. The use of compost from non-qualified sources must be approved before use.

ITEM 169 – SOIL RETENTION BLANKETS
Type A blankets containing straw fibers are not allowed.

ITEM 170 - IRRIGATION SYSTEM
All work, equipment, and materials for the irrigation system are considered subsidiary to Item 170. Submit copy of Texas Irrigation license at preconstruction meeting.

Submit for approval, an irrigation plan for a drip irrigation system, designed by a licensed irrigator, according to the information shown in the plans and following TCEQ requirements. Design the system to sufficiently distribute water to all plant material in accordance with the rules and regulations of TCEQ and the local water authority. Install the irrigation design, as approved.

Locate all underground utilities and conduit locations prior to digging or trenching.

Place irrigation pipe to avoid conflicts with utilities and other appurtenances. Place all valves in accessible locations, as directed. Contact Engineer for location of TxDOT utility lines.

Do not install substitutions or alternate equipment without prior approval. Install equipment according to manufacturer's directions, unless otherwise directed.

All costs and fees for water will be considered subsidiary to Item 170.

Establish the water service account under the Contractor's name and pay for all fees, deposits, and costs related to equipment, installation, inspections, and water service throughout the project, until final completion and acceptance. Contact Georgetown Utility Systems Customer Service to obtain information regarding fees and costs. The State will not be responsible for any changes or increases in water fees or price structure.

Provide 1 inch, temporary hydrant water meters from the City of Georgetown Water Services for irrigation purposes and provide water throughout the duration of the entire contract. Be aware of all hydrant meter renewal requirements, fines, and/or penalties. Contact Georgetown Water Services at (512)930-3640 to obtain information regarding the costs and all current requirements for temporary fire hydrant meters.

Provide backflow prevention devices that are approved by the city water authority. Ensure that temporary hydrant meters are secured to hydrants. The State is not responsible for theft of hydrant meters.

Schedule, coordinate, and pay all fees for installation of hydrant meters and BPA testing, as required by the local water authority.

All sleeves and bores for irrigation are considered subsidiary. No additional compensation will be given for bores that are needed to replace lost, damaged, or non-existing sleeves. Provide a minimum of eighteen (18) inches clearance below the bottom of roadway pavement structures for bores, with a minimum depth of no less than 30 inches to pavement surface.

Use SCHD 80 PVC pipe for all exposed, above ground irrigation pipe. Use SCHD 40 PVC for all below ground irrigation pipe and bore casings, unless otherwise directed. Bury main lines and lateral pipe a minimum of 12 inches below grade.

Provide one-half (½) inch drip tubing with punch-in emitters, as shown in the plans. Staple and bury drip tubing two (2) inches below soil line.

Prior to backfilling, test the system according to Item 170, with TxDOT inspector present.

AS-BUILT DRAWINGS. Provide "As-Built" drawings on 11" x 17" sheets that show the exact location of valves, backflow preventer, quick couplers, and location changes of irrigation mainlines, if different from original layout. Show the dimensional distances of valve and device locations from 2 permanent objects such as curbs, walls, light poles, etc. Additional irrigation sheets for this purpose can be obtained from the Engineer. Show valve and mainline location changes in RED ink, if different than originally shown in the plans. As-Built Drawings must be sealed by a Licensed Irrigation Contractor and must include all information required by TCEQ.

Submit As-Built Irrigation Drawings for approval before final payments for Item 170 are made and before the Landscape Establishment period (Item 193) begins.

Monitor water distribution and check for leaks or over-saturation. Repair and adjust irrigation to prevent wasted water.

Conform to watering schedule, times, and usage restrictions set by the city or local water authority. Repair and replace parts as required to keep irrigation systems operating and functioning properly, without additional compensation, throughout the entire contract.

Ensure proper distribution of water for proper plant growth. Immediately repair irrigation malfunctions and replace materials or equipment, as needed, to keep irrigation system fully operational. Plants that are damaged or die as a result of irrigation failures, will be immediately replaced at no additional expense to the State.

At completion of contract and as directed, contact the local water authority to disconnect temporary hydrant meters. Remove hydrant meters and cap irrigation lines. Close the water account, as directed. Do not transfer account to the State.

ITEM 180 – WILDFLOWER SEEDING
Distribute wildflower seed at the rate of 20 PLS lbs (Pure Live Seed pounds) per acre.

Seed species and rate of PLS lbs per acre:

1. 0.80 lbs - Purple Prairie Clover – Dalea purpurea
2. 1.20 lbs - Engelmann Daisy – Engelmannia peristenia
3. 0.90 lbs - Goliad Orange Zexmenia - Wedelia acapulcensis
4. 0.20 lbs - Venado Awnless Bush Sunflower - Simsia calva
5. 1.20 lbs - Zapata Rio Grande Clammyweed - Polanisia dodecandra ssp. Riograndensis
6. 0.91 lbs - Texas Bluebonnets - Lupinus texensis
7. 0.87 lbs - Plains Coreopsis - Coreopsis tinctoria
8. 0.22 lbs - Purple Coneflower - Echinacea angustifolia.
9. 0.87 lbs - Clasping Leaf Coneflower - Dracopis amplexicaulis
10. 0.69 lbs - Black-Eyed Susan - Rudbeckia hirta
11. 0.69 lbs - Mexican Hat - Ratibida columnifera
12. 0.39 lbs - Drummond Phlox - Phlox drummondii
13. 0.22 lbs - Greenthread - Thelesperma filifolium
14. 0.22 lbs - Scarlet Sage - Salvia coccinea
15. 0.22 lbs - Standing Cypress - Ipomopsis rubra
16. 0.40 lbs - Indian Blanket - Gaillardia pulchella

Wildflower seed must be supplied either in single species bags, as mixes of each seed type (small seeds, large seeds and fluffy-type seeds), as bags of a commercial mix, or any combination of these.

Wildflower species 6-16 above can be purchased from Native American Seed, Junction, Texas; phone 1-800-728-4043; https://www.seedsource.com .

Equipment: Use a no-till or pasture type drill that is capable of accurately metering the release of small seeds, large seeds, and fluffy type seeds individually using separate seed boxes on the drill. Typical grain seeding drills will not meet this requirement.

Use the width of the seed drill multiplied by the length of each run in calculating acreage for each site listed on the plans. (Using an 8' wide seed drill, the length of run to cover 1 acre (43,560 square feet) would be 5,445 feet.) (43,560 square feet / 8 feet = 5,445 feet)

When mowing adjacent to the edge of pavement according to Item 180.4, mow in the direction of traffic flow. Check for and remove large debris from the seeding area prior to mowing.

ITEM 192 – LANDSCAPE PLANTING
Locate all underground utilities and conduits prior to digging.

The Engineer may make adjustments to the plant and planting bed locations to meet field conditions. These changes are considered incidental and there will be no additional compensation.
Do not work subsoil for planting operations when moisture content is so great that excessive compaction will occur, or when subsoil is so dry that the clods will not break readily. Apply water if necessary. These conditions will be determined by the Engineer as planting operations begin.

It may be necessary to suspend planting operations if the Engineer determines that unusually hot, dry weather or water restrictions will affect thriving growth of plant material. If planting operations are suspended, time charges will also be suspended until the Engineer determines that planting operations can begin again. Continue to maintain previously planted plants during time suspension. No extra compensation will be allowed due to such suspensions.

Remove undesirable vegetation from work zone, as directed. This work is incidental and will be considered subsidiary to Item 192.

If requested, provide tree or plant photos that show that the materials provided will meet minimum measurements and size specifications. Submit one photo per size and item. Photo will be used as the standard for all sizes.

Provide Compost that meets specifications under Item 161. Ensure that mulch and compost is free of visible debris and unsuitable materials.

Prior to backfilling bed areas, conduct water percolation tests, as shown in the plans. Contact Landscape Architect if excavated bed areas do not drain efficiently.

Water all plants within the same day of installation. Thoroughly soak root balls of large plants and trees. Set base of plant pit so that top of root ball is set slightly above grade and will not settle below grade. If top of root ball settles below grade, plant must be replanted at proper depth or replaced, without additional compensation.

Stake trees for support during the same day as planted. Trees that cannot stand erect without plant supports will be rejected. Ensure trees and tall shrubs remain plumb and straight for all given conditions throughout the contract period. Staking method must allow trunk to sway with the wind while remaining plumb.

Maintenance and 90-Day Warranty.
Maintain all plants in a healthy, growing condition. Replace dead or severely damaged plants as directed.

Keep project area clean and remove all litter. Remove all trimmings and debris from project site.

Keep planting beds free of weeds and undesirable species. Do not use string trimmers or spray herbicide in planting beds or tree watering basins. Spraying herbicide is not allowed. Apply herbicide by a wicking method, only. A wicking method consists of a wick or rope soaked in

herbicide attached to a handle. The wetted wick is used to wipe or brush herbicide over the weed. Do not allow herbicide to contact planted vegetation, contaminate the soil, or contact bodies of water.

Use Glysophate, (Round-Up or approved equal), in a wicking method for weed control after plants have been installed. Follow manufacturer's directions and use properly licensed personnel.

Mow a five (5) foot border around each planting bed. Mow turf to a height of four (4) inches. Remove litter from area before mowing. Mow according to the following schedule:

Mow every two weeks from March 1 to October 31.
Mow once a month from November 1 to February 28.

At the end of the 90-day maintenance period of Item 192, and prior to beginning Item 193, "Plant Establishment," replace all dead or damaged plants that are considered unacceptable, as directed. Item 193 will begin after all work is complete and in-place, and all punch list items have been corrected, as directed and approved.

ITEM 193 -LANDSCAPE ESTABLISHMENT
Item 193 will begin, as directed, after the 90-day maintenance and warranty period (Item 192) has been completed and approved.

Continue to provide all maintenance activities described in Item 192 and as shown in the plans.

Assume responsibility for health and growth of all plant material in landscaped areas. Keep plants, trees, plant beds, watering basins, and areas immediately around plantings neat and presentable. Remove all dead or broken limbs, sucker growth, litter, and debris from beds and tree basins.

Correct erosion damage. Maintain depth of mulch or erosion control compost, as shown in the plans. Additional mulch or erosion control compost material needed to maintain proper depth and coverage will be considered subsidiary to Item 193.

Keep irrigation system fully operational. Cost of water will be considered subsidiary to this Item. If irrigation system fails, provide an alternative means of watering plants until system is made fully operational. Trucks, tanks, or any additional equipment needed to provide water to plants will be considered subsidiary. Plants that are damaged or die as a result of irrigation failures, will be immediately replaced at no additional expense to the State.

Keep irrigation system operating and fully functional.

Replace dead or unacceptable plant material, only as directed. Replacements for deciduous trees and deciduous woody shrubs that are planted during winter dormancy, without green foliage, will only be considered acceptable after healthy, visible foliage appears after dormancy period.

Do not replace any perennial-type plants during the period from November 1, to March 1.

Notify Engineer two (2) days prior to each maintenance visit. Record dates, times, and completed tasks of all maintenance visits, for approval. Notify Engineer immediately if emergencies or significant problems arise.

Complete all punch list items before final approval and project close-out.

ITEM 432 - RIPRAP
This Item will be used for repair and/or replacement of concrete riprap that is cut or removed to provide access for irrigation lines. Obtain approval before cutting riprap

If riprap repair is needed, Saw-cut existing riprap then epoxy 12 in. long No. 3 or No. 4 bars 6 in. deep at a maximum spacing of 18 in. in each direction to tie new riprap to existing riprap. This work is subsidiary.

ITEM 502 - BARRICADES, SIGNS, AND TRAFFIC HANDLING

Table 1

Roadway	Limits	Allowable Closure Time
IH 35	All (1 lane closed)	9 P to 5 A
IH 35	All (2 lanes closed, see allowable work below)	9 P to 5 A
IH 35	All (2 lanes closed, all work)	11 P to 5 A
SH 45	US 183 to SH130	8 P to 5 A
LP 1	William Cannon to Parmer Lane	8 P to 5 A
US 183	SH 29 to FM 1327	8 P to 5 A
SH 71	SH 130 to IH 35	8 P to 5 A
SH 71	SH 304 to Tahitian Drive	8 P to 5 A
SH 71	US 290 W to RM 3238	8 P to 5 A
US 290 W	IH 35 to Nutty Brown Rd	8 P to 5 A
US 290 E	IH 35 to SH 95	8 P to 5 A
FM 734	FM 1431 to US 290 E	8 P to 5 A
US 79	IH 35 to Bus 79 in Taylor	8 P to 5 A
RM 1431	Lohmans Ford Rd to IH 35	8 P to 5 A
SH 29	LP 332 western terminus to SH 130	8 P to 5 A
SH 80	Charles Austin to River Road	8 P to 5 A
RM 2222	All	8 P to 5 A
RM 620	All	8 P to 5 A
RM 2244	All	8 P to 5 A
SPUR 69	All	8 P to 5 A
LP 360	All	8 P to 5 A
LP 343	All	8 P to 5 A
LP 275	All	8 P to 5 A
FM 1325	All	8 P to 5 A
All	Within 200’ of a signalized intersection	9 P to 5 A
All	All (Full Closure, see allowable work below)	11 P to 4 A

No closures will be allowed on the weekends, working day prior, and working day after the National Holidays defined in the Standard Specifications, Good Friday, and Easter weekend. Closures the Sunday of the Super Bowl will not be allowed from 1 P to 11 P. No closures will be allowed on Friday and the weekends for projects within 20 miles of Formula 1 at COTA, ACL Fest, SXSW, ROT Rally, UT home football games (includes games not on a Friday or weekend), sales tax holiday, Dell Match Play (includes Thursday) or other special events that could be impacted by the construction. All lanes will be open by noon of the day before these special events.

To account for directional traffic volumes, begin and end times of closures may be shifted equally by the Engineer. The closure duration will remain. Added compensation is not allowed.

Submit an emailed request for a lane closure (LCN) to TxDOT. The email will be submitted in the format provided. Receive concurrence prior to implementation. Submit a cancellation of lane closures a minimum of 18 hours prior to implementation. Blanket requests for extended periods are not allowed. Max duration of a request is 2 weeks prior to requiring resubmittal. Provide 2 hour notice prior to implementation and immediately upon removal of the closure.

For roadways listed in Table 1: Submit the request 96 hours prior to implementation.

For roadways not listed in Table 1: Submit the request a minimum of 48 hours prior to the closure and by the following deadline immediately prior to the closure: 11A on Tuesday or 11A on Friday.

Closures that conflict with adjacent contractor will be prioritized according to critical path work per latest schedule. Conflicting critical path or non-critical work will be approved for first LCN submitted. Denial of a closure due to prioritization or other reasons will not be reason for time suspension, delay, overhead, etc.

Cover, relocate or remove existing signs that conflict with traffic control. Install all permanent signs, delineation, and object markers required for the operation of the roadway before opening to traffic. Use of temporary mounts is allowed or may be required until the permanent mounts are installed or not impacted by construction. Maintain the temporary mounts. This work is subsidiary.

Meet with the Engineer prior to lane closures to ensure that sufficient equipment, materials, devices, and workers will be used. Take immediate action to modify traffic control, if at any time the queue becomes greater than 20 minutes. Have a contingency plan of how modification will occur. Consider inclement weather prior to implementing the lane closures. Do not set up traffic control when the pavement is wet.

Edge condition treatment types must be in accordance with the TxDOT standard. Installation and removal of a safety slope is subsidiary.

To determine a speed limit or an advisory speed limit, submit a request to TxDOT 60 business days prior to manufacture of the sign.

For non-site specific signal projects, 2 months of barricades will be paid per work order location.

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS
Install, maintain, remove erosion, sedimentation and environmental control measures in areas of the right of way utilized by the contractor that are outside the limits of disturbance required for construction. Permanently stabilize the area. This work is subsidiary.

Consider the SW3P for this project to consist of the following items, as directed: Temporary Sediment Control Fence, Sandbags, and Biodegradable Erosion Control Logs.

Silt fence and sand bags will be used, as required, for erosion controls throughout the site, as directed.

Install Biodegradable Erosion Control Logs throughout planting beds and at bed edges as needed to control erosion. Biodegradable Erosion Control Logs will be used to retain mulch and soil on sloped planting beds. Engineer will determine if logs will remain in-place or be removed at the end of the contract.

Install the Biodegradable Erosion Control Logs in accordance with the manufacturer's recommendations, or as directed by the Engineer. Provide lengths of logs suitable for the purposes intended. If shorter lengths are used, provide 4 foot overlaps and stake all sides of the overlapped areas securely in place.

Use only biodegradable containment mesh, brown in color, without visible logos, colored stripes, or markings. Fill logs with sufficient filter material to achieve the specified minimum compacted diameter without excessive deformation.

Secure the log into the planting bed to prevent wash-outs underneath log. Curve the ends of logs upslope or extend the ends of the logs as needed to ensure that runoff or washouts do not go around the ends of the logs.

Secure logs with 2"x2" wood stakes or #3 rebar, embedded so that the top of the stake is flush with the top of the log, unless otherwise directed. Do not place stakes through the containment mesh. Place stakes at a minimum of 4 foot intervals along the down-sloped side of the log. Place stakes on both down-slope side and up-slope side if needed to secure log in place. Use more stakes at closer spaced intervals, as needed, to secure areas where logs may overlap.

ITEM 6001 – PORTABLE CHANGEABLE MESSAGE SIGN
Provide 2 PCMS. Provide a replacement within 12 hours. PCMS will be available for traffic control, event notices, roadway conditions, service announcements, etc.

Place PCMS 10 calendar days prior to begin work stating, "Road Work Begin Soon, Contact 832-7000 For Info".

Place PCMS at time of LCN request. Place the PCMS at the expected end of queue caused by the closure. When the closure is active, revise the message to reflect the actual condition during the closure, such as "RIGHT LN CLOSED XXX FT".

ITEM 6185 – TRUCK MOUNTED ATTENUATOR AND TRAILER ATTENUATOR
The TMA/TA used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

The contractor will be responsible for determining if one or more operations will be ongoing at the same time to determine the total number of TMA/TA required for the work. TMA/TAs paid by the day is full compensation for all worksite locations during an entire day.

TMA/TAs used to protect damaged attenuators will be paid by the day using the force account item for the repair.

QUANTITY SHEET

CONTROLLING PROJECT ID 0914-05-209 **DISTRICT** Austin **COUNTY** Williamson
HIGHWAY Various

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0914-05-209**			
		PROJECT ID		**A00133480**			
		COUNTY		**Williamson**			
		HIGHWAY		**Various**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	161-6022	GENERAL USE COMPOST (4")	SY	4,269.000		4,269.000	
	170-6001	IRRIGATION SYSTEM	LS	1.000		1.000	
	180-6001	WILDFLOWER SEEDING	AC	35.000		35.000	
	192-6002	PLANT MATERIAL (1-GAL)	EA	1,109.000		1,109.000	
	192-6004	PLANT MATERIAL (5-GAL)	EA	1,863.000		1,863.000	
	192-6005	PLANT MATERIAL (15-GAL)	EA	20.000		20.000	
	192-6006	PLANT MATERIAL (30-GAL)	EA	12.000		12.000	
	192-6013	MULCH	SY	4,269.000		4,269.000	
	192-6016	PLANT BED PREPARATION	SY	4,269.000		4,269.000	
	193-6001	PLANT MAINTENANCE	MO	24.000		24.000	
	193-6003	PLANT REPLACEMENT (1-GAL)	EA	100.000		100.000	
	193-6005	PLANT REPLACEMENT (5-GAL)	EA	140.000		140.000	
	193-6007	IRRIGATION SYSTEM OPER AND MAINT	MO	24.000		24.000	
	193-6009	PLANT REPLACEMENT (15 GAL)	EA	3.000		3.000	
	193-6010	PLANT REPLACEMENT (30 GAL)	EA	3.000		3.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	50.000		50.000	
	403-6001	TEMPORARY SPL SHORING	SF	50.000		50.000	
	432-6002	RIPRAP (CONC)(5 IN)	CY	5.000		5.000	
	500-6001	MOBILIZATION	LS	100.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	2.000		2.000	
	506-6035	SANDBAGS FOR EROSION CONTROL	EA	50.000		50.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	200.000		200.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	200.000		200.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	3,380.000		3,380.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	3,380.000		3,380.000	
	1004-6001	TREE PROTECTION	EA	3.000		3.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	6185-6002	TMA (STATIONARY)	DAY	32.000		32.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS		
LOCATION	6185 6002	6001 6002
	TMA (STATIONARY)	PORTABLE CHANGEABLE MESSAGE SIGN
	DAY	EA
N/A	32	2
PROJECT TOTALS	32	2

SUMMARY OF ROADWAY ITEMS	
LOCATION	432 6002
	RIPRAP (CONC)(5 IN)
	CY
N/A	5
PROJECT TOTALS	5

SUMMARY OF EROSION CONTROL ITEMS					
LOCATION	506 6035	506 6038	506 6039	506 6041	506 6043
	SANDBAGS FOR EROSION CONTROL	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
	EA	LF	LF	LF	LF
BED A				970	970
BED B				640	640
BED C				735	735
BED D				1035	1035
N/A	50	200	200		

SUMMARY OF LANDSCAPE ITEMS									
LOCATION	161 6022	170 6001	180 6001	192 6002	192 6004	192 6005	192 6006	192 6013	192 6016
	GENERAL USE COMPOST (4")	IRRIGATION SYSTEM	WILDFLOWER SEEDING	PLANT MATERIAL (1-GAL)	PLANT MATERIAL (5-GAL)	PLANT MATERIAL (15-GAL)	PLANT MATERIAL (30-GAL)	MULCH	PLANT BED PREPARATION
	SY	LS	AC	EA	EA	EA	EA	SY	SY
BED A	1026			301	506	4	4	1026	1026
BED B	766			235	351	3	1	766	766
BED C	1014			244	459	6	3	1014	1014
BED D	1384			329	547	7	4	1384	1384
N/A		1	35						
PROJECT TOTALS	4190	1	35	1109	1863	20	12	4190	4190

SUMMARY OF LANDSCAPE ITEMS (CONTINUED)									
LOCATION	193 6001	193 6003	193 6005	193 6007	193 6009	193 6010	402 6001	403 6001	1004 6001
	PLANT MAINTENANCE	PLANT REPLACEMENT (1-GAL)	PLANT REPLACEMENT (5-GAL)	IRRIGATION SYSTEM OPER AND MAINT	PLANT REPLACEMENT (15 GAL)	PLANT REPLACEMENT (30 GAL)	TRENCH EXCAVATION PROTECTION	TEMPORARY SPL SHORING	TREE PROTECTION
	MO	EA	EA	MO	EA	EA	LF	SF	EA
BED A									
BED B									
BED C									
BED D									
N/A	24	100	140	24	3	3	50	50	3
PROJECT TOTALS	24	100	140	24	3	3	50	50	3

Texas Department of Transportation

WILLIAMSON

SUMMARY

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	05	209	VARIOUS
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		5

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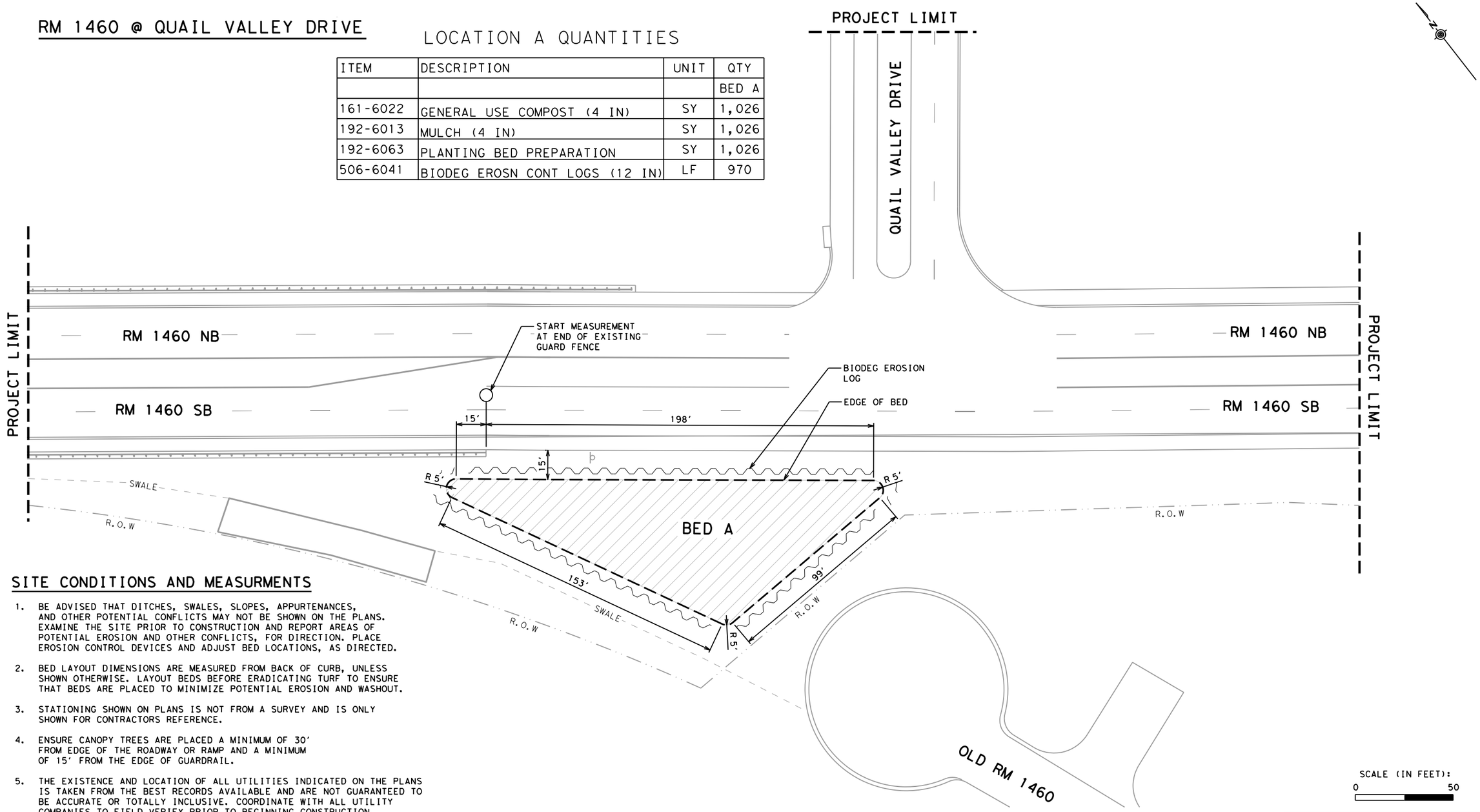
RM 1460 @ QUAIL VALLEY DRIVE

LOCATION A QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY
			BED A
161-6022	GENERAL USE COMPOST (4 IN)	SY	1,026
192-6013	MULCH (4 IN)	SY	1,026
192-6063	PLANTING BED PREPARATION	SY	1,026
506-6041	BIODEG EROSN CONT LOGS (12 IN)	LF	970



SITE CONDITIONS AND MEASURMENTS

1. BE ADVISED THAT DITCHES, SWALES, SLOPES, APPURTENANCES, AND OTHER POTENTIAL CONFLICTS MAY NOT BE SHOWN ON THE PLANS. EXAMINE THE SITE PRIOR TO CONSTRUCTION AND REPORT AREAS OF POTENTIAL EROSION AND OTHER CONFLICTS, FOR DIRECTION. PLACE EROSION CONTROL DEVICES AND ADJUST BED LOCATIONS, AS DIRECTED.
2. BED LAYOUT DIMENSIONS ARE MEASURED FROM BACK OF CURB, UNLESS SHOWN OTHERWISE. LAYOUT BEDS BEFORE ERADICATING TURF TO ENSURE THAT BEDS ARE PLACED TO MINIMIZE POTENTIAL EROSION AND WASHOUT.
3. STATIONING SHOWN ON PLANS IS NOT FROM A SURVEY AND IS ONLY SHOWN FOR CONTRACTORS REFERENCE.
4. ENSURE CANOPY TREES ARE PLACED A MINIMUM OF 30' FROM EDGE OF THE ROADWAY OR RAMP AND A MINIMUM OF 15' FROM THE EDGE OF GUARDRAIL.
5. THE EXISTENCE AND LOCATION OF ALL UTILITIES INDICATED ON THE PLANS IS TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE OR TOTALLY INCLUSIVE. COORDINATE WITH ALL UTILITY COMPANIES TO FIELD VERIFY PRIOR TO BEGINNING CONSTRUCTION.

NOTES

1. INSTALL BIODEGRADABLE EROSION CONTROL LOGS INSIDE OF PLANT BEDS TO RETAIN SOIL AND MULCH ON SLOPES, AS DIRECTED. EROSION CONTROL LOGS INSIDE OF PLANT BEDS ARE NOT SHOWN ON THE PLANS.
2. DO NOT REMOVE EROSION CONTROL LOGS FROM THE PLANT BEDS, UNLESS OTHERWISE DIRECTED.
3. ALL MATERIALS AND STOCK PILES TO BE CONTAINED WITH SILT FENCE.

SCALE (IN FEET):
0 50

REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

Docusigned by:
Alisa West
B55D8BB569EE470...
12/7/2020

Texas Department of Transportation

WILLIAMSON

SITE LOCATION
LOCATION A

SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	05	209	VARIOUS
	DIST	COUNTY		SHEET NO.
DW: CK:	AUS	WILLIAMSON		6

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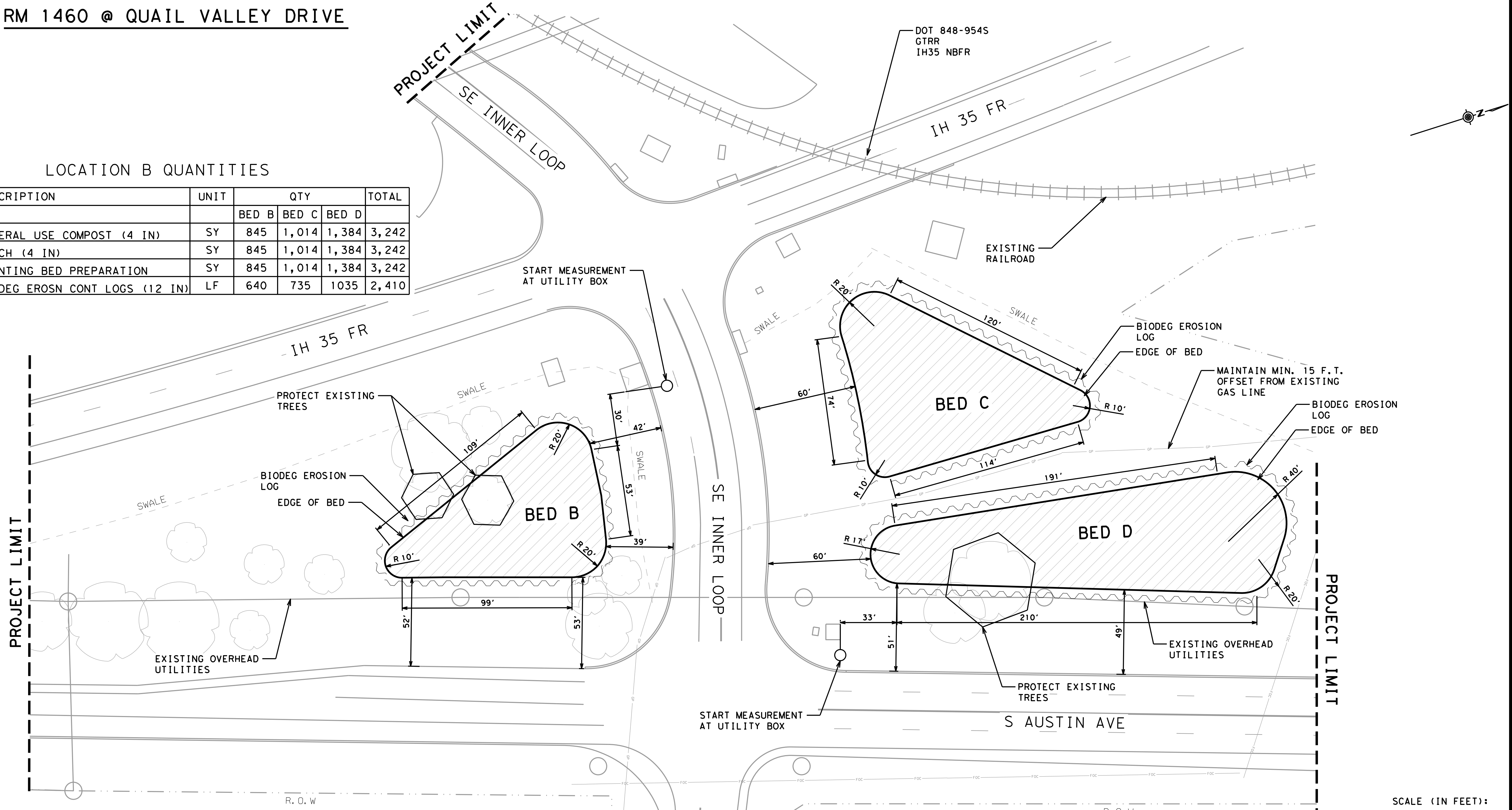
RM 1460 @ QUAIL VALLEY DRIVE



LOCATION B QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY			TOTAL
			BED B	BED C	BED D	
161-6022	GENERAL USE COMPOST (4 IN)	SY	845	1,014	1,384	3,242
192-6013	MULCH (4 IN)	SY	845	1,014	1,384	3,242
192-6063	PLANTING BED PREPARATION	SY	845	1,014	1,384	3,242
506-6041	BIODEG EROSN CONT LOGS (12 IN)	LF	640	735	1035	2,410

SITE CONDITIONS AND MEASURMENTS

1. BE ADVISED THAT DITCHES, SWALES, SLOPES, APPURTENANCES, AND OTHER POTENTIAL CONFLICTS MAY NOT BE SHOWN ON THE PLANS. EXAMINE THE SITE PRIOR TO CONSTRUCTION AND REPORT AREAS OF POTENTIAL EROSION AND OTHER CONFLICTS, FOR DIRECTION. PLACE EROSION CONTROL DEVICES AND ADJUST BED LOCATIONS, AS DIRECTED.
2. BED LAYOUT DIMENSIONS ARE MEASURED FROM BACK OF CURB, UNLESS SHOWN OTHERWISE. LAYOUT BEDS BEFORE ERADICATING TURF TO ENSURE THAT BEDS ARE PLACED TO MINIMIZE POTENTIAL EROSION AND WASHOUT.
3. STATIONING SHOWN ON PLANS IS NOT FROM A SURVEY AND IS ONLY SHOWN FOR CONTRACTORS REFERENCE.
4. ENSURE CANOPY TREES ARE PLACED A MINIMUM OF 30' FROM EDGE OF THE ROADWAY OR RAMP AND A MINIMUM OF 15' FROM THE EDGE OF GUARDRAIL.
5. THE EXISTENCE AND LOCATION OF ALL UTILITIES INDICATED ON THE PLANS IS TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE OR TOTALLY INCLUSIVE. COORDINATE WITH ALL UTILITY COMPANIES TO FIELD VERIFY PRIOR TO BEGINNING CONSTRUCTION.

NOTES

1. INSTALL BIODEGRADABLE EROSION CONTROL LOGS INSIDE OF PLANT BEDS TO RETAIN SOIL AND MULCH ON SLOPES, AS DIRECTED. EROSION CONTROL LOGS INSIDE OF PLANT BEDS ARE NOT SHOWN ON THE PLANS.
2. DO NOT REMOVE EROSION CONTROL LOGS FROM THE PLANT BEDS, UNLESS OTHERWISE DIRECTED.
3. ALL MATERIALS AND STOCK PILES TO BE CONTAINED WITH SILT FENCE.

REGISTERED LANDSCAPE ARCHITECT ALISA M. WEST 3187 STATE OF TEXAS

DocuSigned by:
Alisa West
B5ED8BB569EE470...
12/7/2020

Texas Department of Transportation

WILLIAMSON

SITE LOCATION
LOCATION B

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0914	05	209	VARIOUS
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		7

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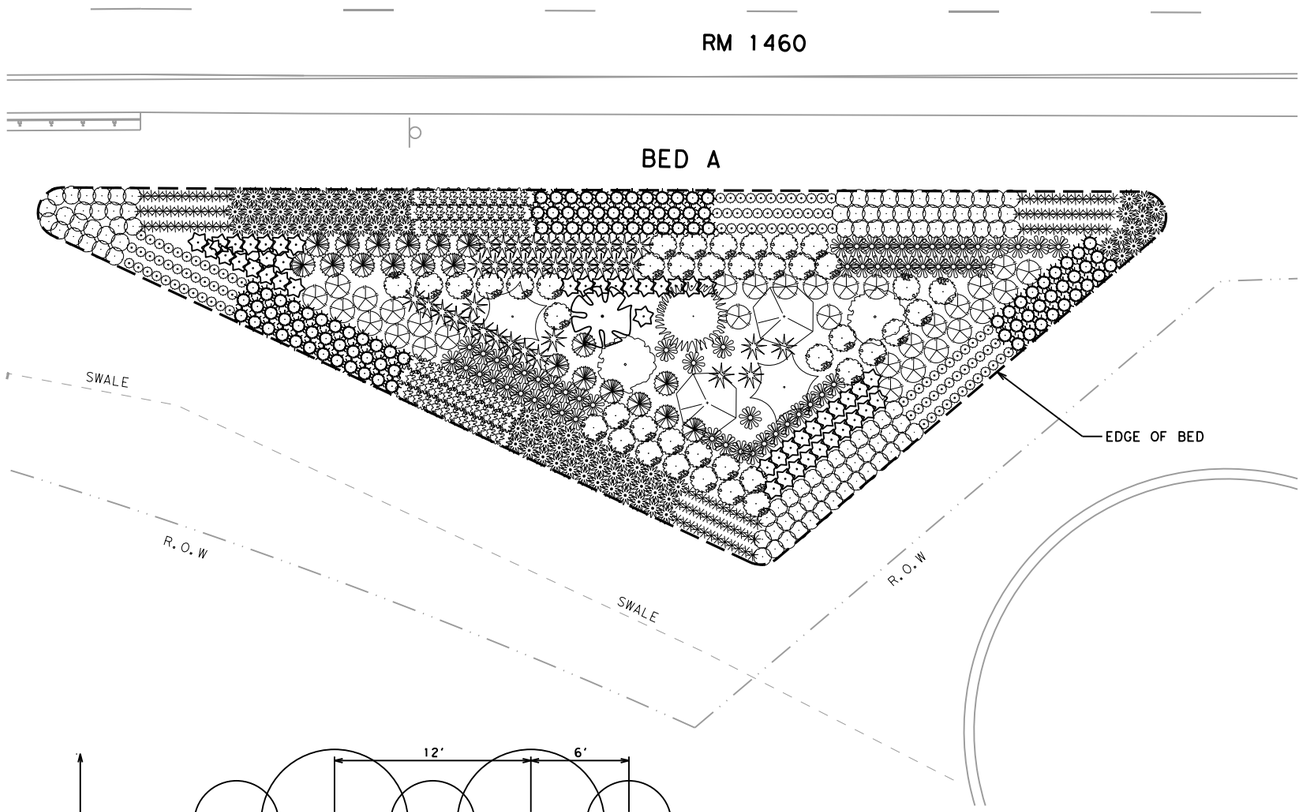

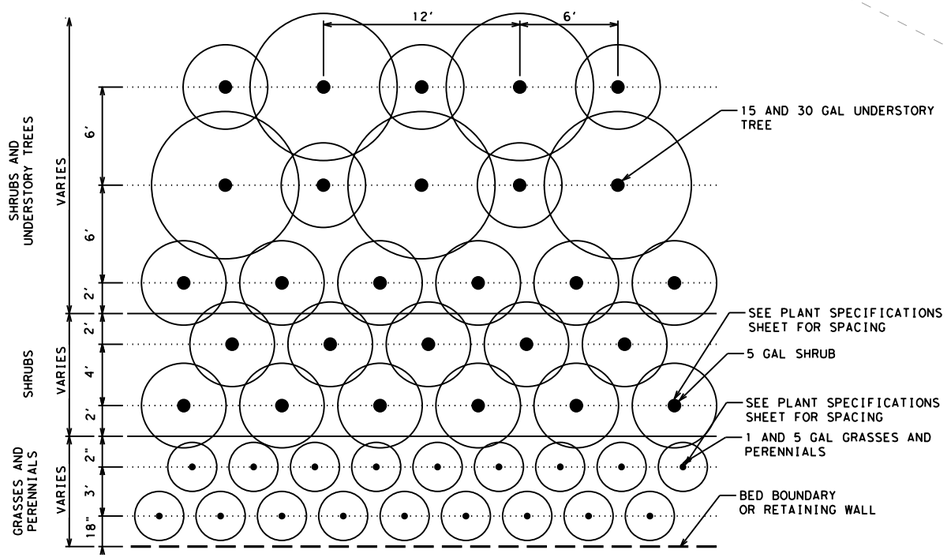

TYPICAL PLANT SPACING DETAIL

NOTE:
ALL DIMENSIONS ARE TAKEN FROM THE EDGE OF PAVEMENT OR BACK OF CURB UNLESS OTHERWISE NOTED.

THE EXISTENCE AND LOCATION OF ALL UTILITIES INDICATED ON THE PLANS IS TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE OR TOTALLY INCLUSIVE. COORDINATE WITH ALL UTILITY COMPANIES TO FIELD VERIFY PRIOR TO BEGINNING CONSTRUCTION.

BED A PLANT QUANTITIES

SYMBOL	COMMON NAMES		
GRASSES & PERENNIALS (1 GAL)			
		QTY	TOTAL
	ARTEMISIA	84	
	GAYFEATHER	109	
	PINK SKULL CAP	108	301
GRASSES & PERENNIALS (5 GAL)			
		QTY	TOTAL
	BLACK DALEA	99	
	GULF MUHLY	72	
	RUSSIAN SAGE	99	270
SHRUBS (5 GAL)			
		QTY	TOTAL
	BIG MUHLY	47	
	BUSH GERMANDER	20	
	FRAGRANT SUMAC	41	
	IRIS BICOLOR	38	
	MEXICAN BUSH SAGE	59	
	SKELETON LEAF GOLDENEYE	31	236
UNDERSTORY (15 GAL)			
		QTY	TOTAL
	EVERGREEN SUMAC	1	
	MEXICAN PLUM	1	
	WAX MYRTLE	2	4
UNDERSTORY (30 GAL)			
		QTY	TOTAL
	TEXAS MOUNTAIN LAUREL	2	
	YAUPON HOLLY	2	4

REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

DocuSigned by:
Alisa West
B5ED8BB569EE470...
12/7/2020

SCALE (IN FEET):
0 50

Texas Department of Transportation

WILLIAMSON
PLANTING BED LAYOUT LOCATION A
SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	05	209	VARIOUS
	DIST	COUNTY		SHEET NO.
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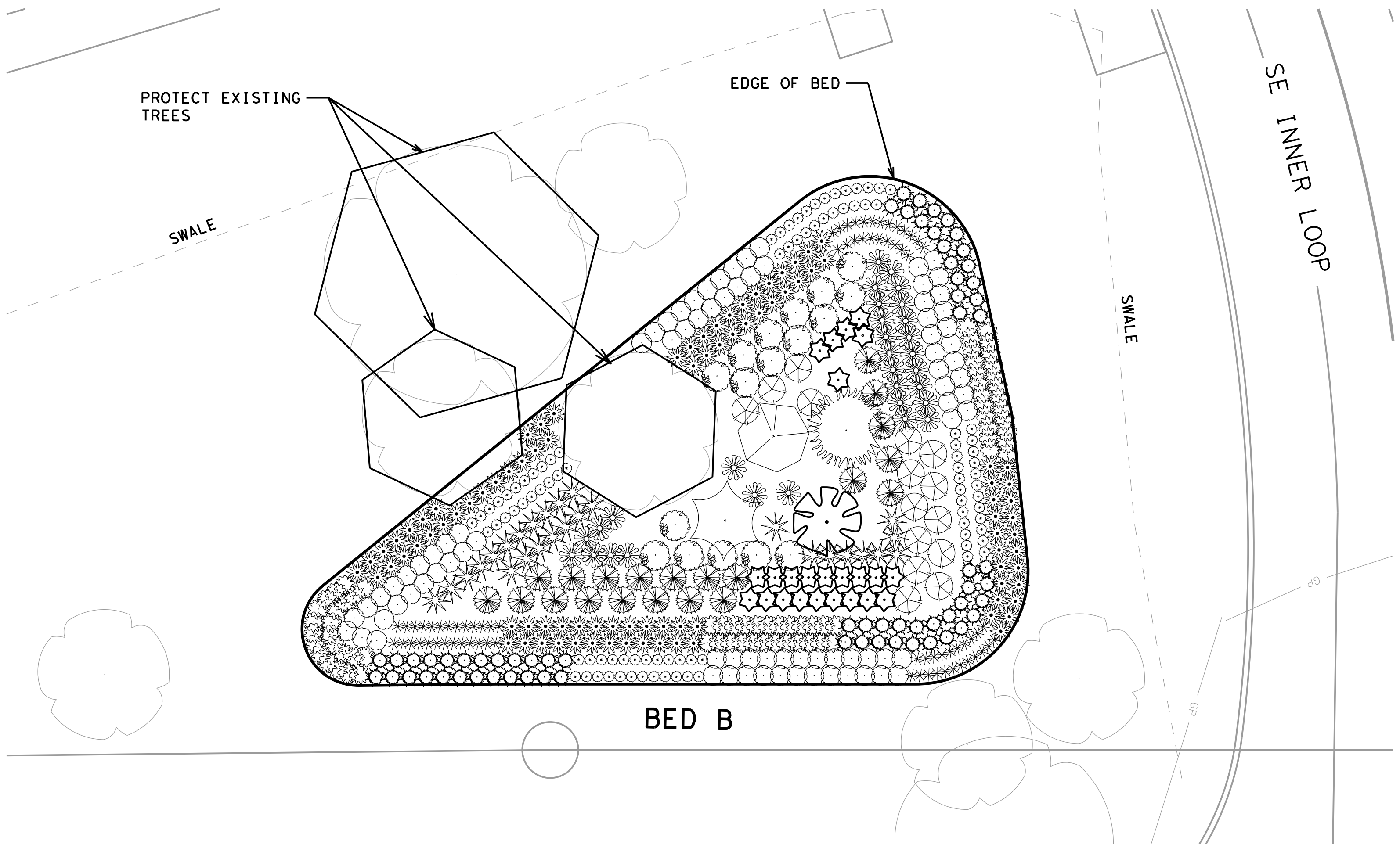

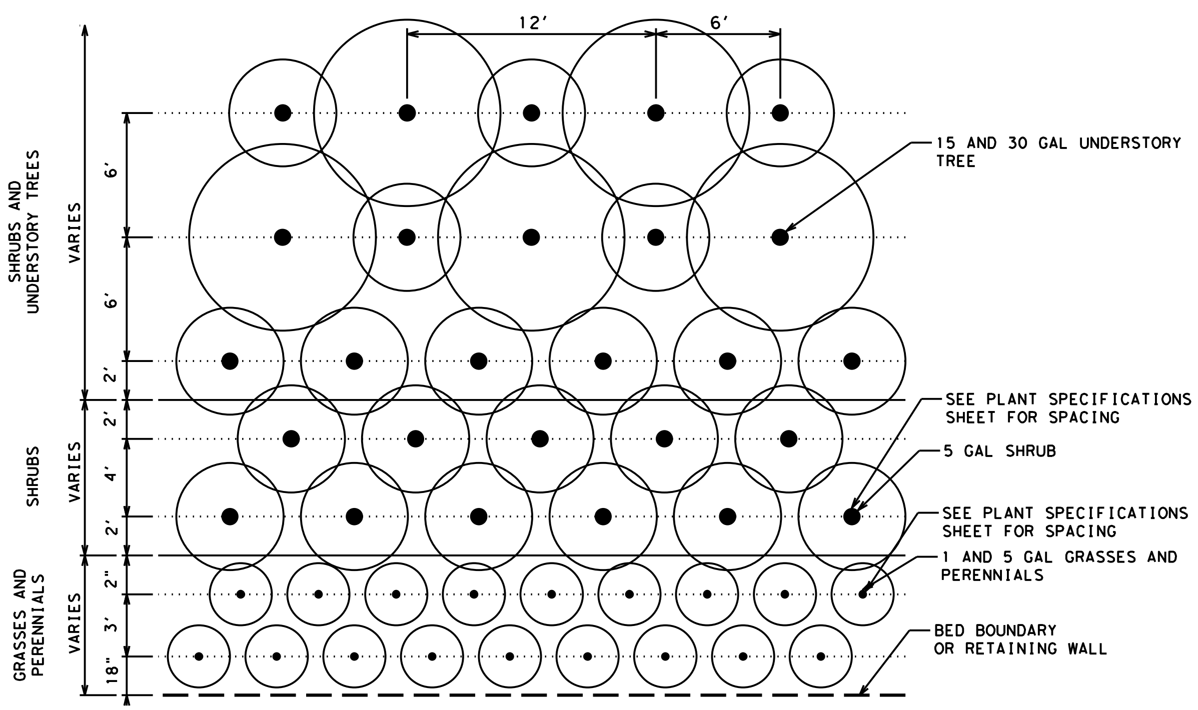

TYPICAL PLANT SPACING DETAIL

NOTE:
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BED B PLANT QUANTITIES

SYMBOL	COMMON NAMES	QTY	TOTAL
GRASSES & PERENNIALS (1 GAL)			
	ARTEMISIA	92	
	GAYFEATHER	71	
	PINK SKULL CAP	72	235
GRASSES & PERENNIALS (5 GAL)			
	BLACK DALEA	82	
	GULF MUHLY	70	
	RUSSIAN SAGE	65	217
SHRUBS (5 GAL)			
	BIG MUHLY	24	
	BUSH GERMANDER	21	
	FRAGRANT SUMAC	17	
	IRIS BICOLOR	27	
	MEXICAN BUSH SAGE	30	
	SKELETON LEAF GOLDENEYE	15	134
UNDERSTORY (15 GAL)			
	EVERGREEN SUMAC	1	
	MEXICAN PLUM	1	
	WAX MYRTLE	1	3
UNDERSTORY (30 GAL)			
	TEXAS MOUNTAIN LAUREL	1	
	YAUPON HOLLY	0	1

DocuSigned by:
Alisa West
12/7/2020

SCALE (IN FEET):
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Texas Department of Transportation

WILLIAMSON
PLANTING BED LAYOUT LOCATION B
SHEET 1 OF 2

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	05	209	VARIOUS
DW: CK:	DIST		COUNTY	SHEET NO.
	AUS		WILLIAMSON	9

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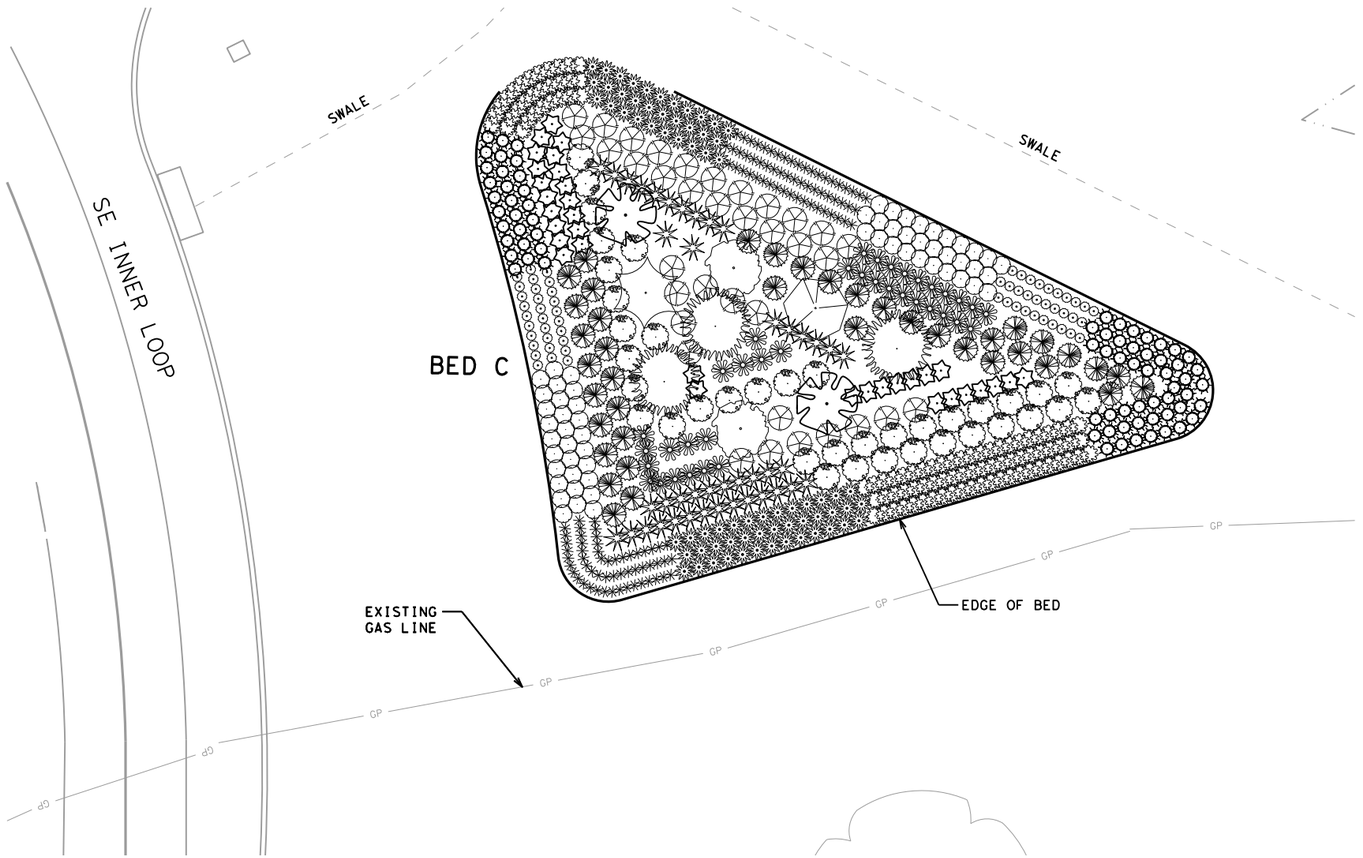

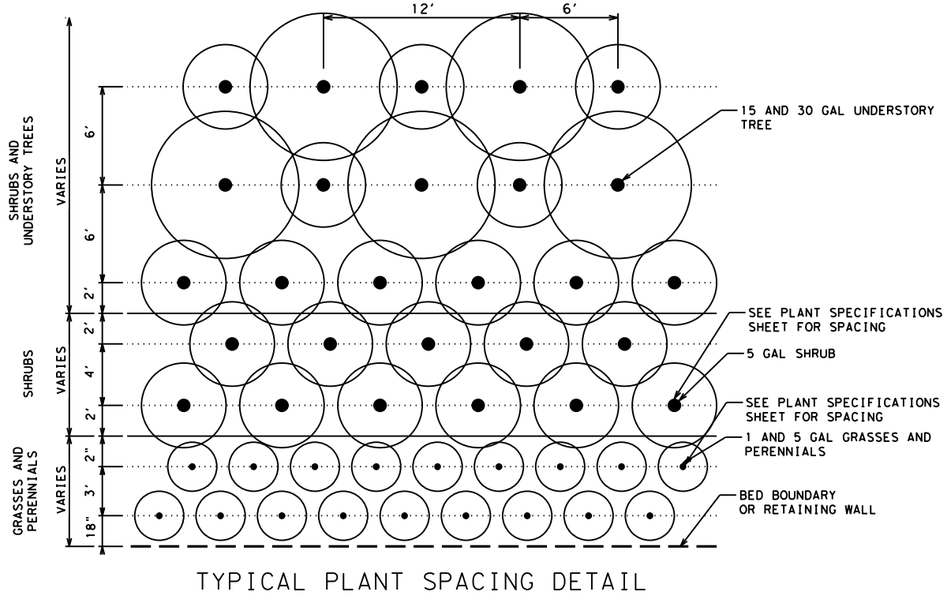

TYPICAL PLANT SPACING DETAIL

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BED C PLANT QUANTITIES

SYMBOL	COMMON NAMES		
GRASSES & PERENNIALS (1 GAL)			
		QTY	TOTAL
	ARTEMISIA	70	
	GAYFEATHER	114	
	PINK SKULL CAP	60	244
GRASSES & PERENNIALS (5 GAL)			
		QTY	TOTAL
	BLACK DALEA	60	
	GULF MUHLY	98	
	RUSSIAN SAGE	74	232
SHRUBS (5 GAL)			
		QTY	TOTAL
	BIG MUHLY	34	
	BUSH GERMANDER	40	
	FRAGRANT SUMAC	38	
	IRIS BICOLOR	42	
	MEXICAN BUSH SAGE	37	
	SKELETON LEAF GOLDENEYE	36	227
UNDERSTORY (15 GAL)			
		QTY	TOTAL
	EVERGREEN SUMAC	3	
	MEXICAN PLUM	2	
	WAX MYRTLE	1	6
UNDERSTORY (30 GAL)			
		QTY	TOTAL
	TEXAS MOUNTAIN LAUREL	1	
	YAUPON HOLLY	2	3

REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

DocuSigned by:
Alisa West
05ED8BB569EE470...
12/7/2020

SCALE (IN FEET):
0 30

Texas Department of Transportation

WILLIAMSON
PLANTING BED LAYOUT LOCATION B
SHEET 2 OF 2

© 2021		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0914	05	209	VARIOUS
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		10

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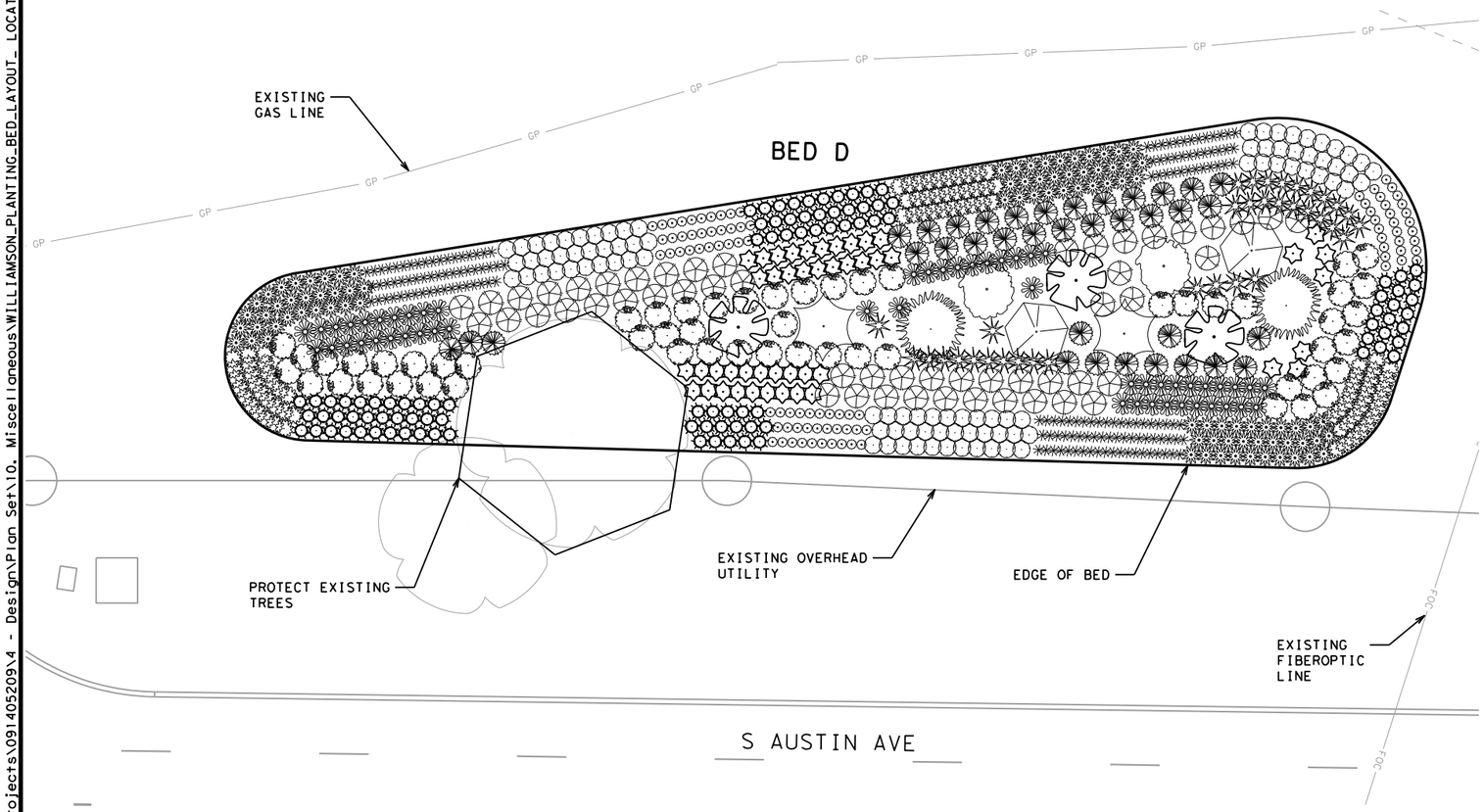
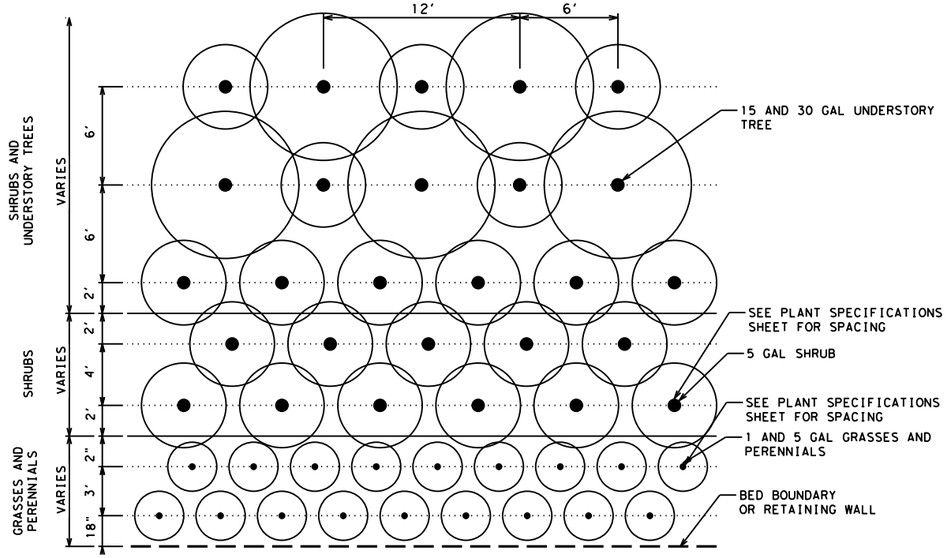
RM 1460 @ QUAIL VALLEY DRIVE





TYPICAL PLANT SPACING DETAIL

NOTE:
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BED D PLANT QUANTITIES

SYMBOL	COMMON NAMES		
GRASSES & PERENIALS (1 GAL)			
		QTY	TOTAL
	ARTEMISIA	89	
	GAYFEATHER	152	
	PINK SKULL CAP	88	329
GRASSES & PERENIALS (5 GAL)			
		QTY	TOTAL
	BLACK DALEA	90	
	GULF MUHLY	82	
	RUSSIAN SAGE	97	269
SHRUBS (5 GAL)			
		QTY	TOTAL
	BIG MUHLY	46	
	BUSH GERMANDER	36	
	FRAGRANT SUMAC	55	
	IRIS BICOLOR	35	
	MEXICAN BUSH SAGE	53	
	SKELETON LEAF GOLDENEYE	53	278
UNDERSTORY (15 GAL)			
		QTY	TOTAL
	EVERGREEN SUMAC	2	
	MEXICAN PLUM	3	
	WAX MYRTLE	2	7
UNDERSTORY (30 GAL)			
		QTY	TOTAL
	TEXAS MOUNTAIN LAUREL	2	
	YAUPON HOLLY	2	4

REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

DocuSigned by:
Alisa West
B5ED8BB569EE470...
12/7/2020

SCALE (IN FEET):
0 30

Texas Department of Transportation

WILLIAMSON
PLANTING BED LAYOUT LOCATION B
SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	05	209	VARIOUS
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		11

DATE: 12/4/2020 9:23:15 AM
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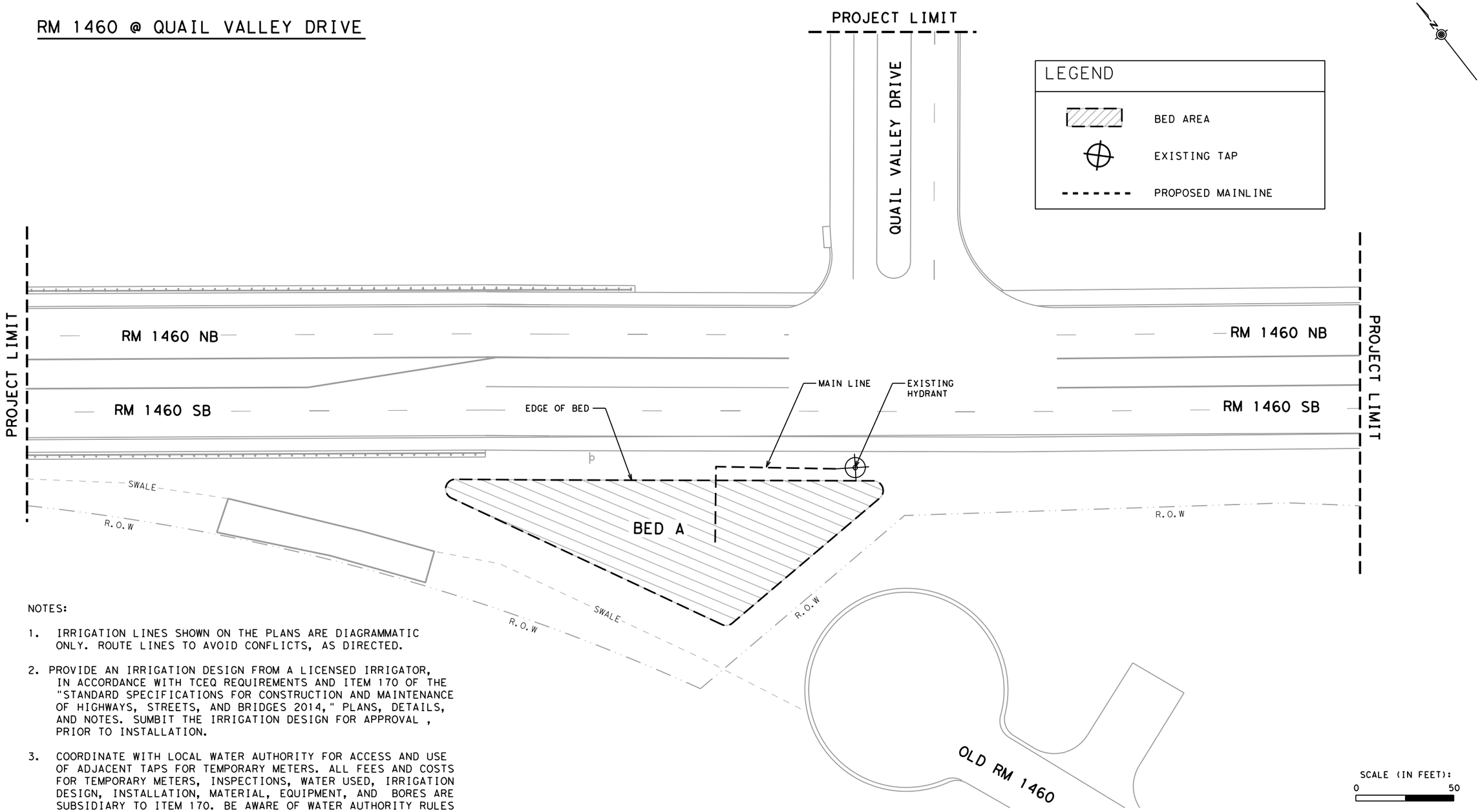
RM 1460 @ QUAIL VALLEY DRIVE



NOTES:

1. IRRIGATION LINES SHOWN ON THE PLANS ARE DIAGRAMMATIC ONLY. ROUTE LINES TO AVOID CONFLICTS, AS DIRECTED.

2. PROVIDE AN IRRIGATION DESIGN FROM A LICENSED IRRIGATOR, IN ACCORDANCE WITH TCEQ REQUIREMENTS AND ITEM 170 OF THE "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES 2014," PLANS, DETAILS, AND NOTES. SUMBIT THE IRRIGATION DESIGN FOR APPROVAL , PRIOR TO INSTALLATION.

3. COORDINATE WITH LOCAL WATER AUTHORITY FOR ACCESS AND USE OF ADJACENT TAPS FOR TEMPORARY METERS. ALL FEES AND COSTS FOR TEMPORARY METERS, INSPECTIONS, WATER USED, IRRIGATION DESIGN, INSTALLATION, MATERIAL, EQUIPMENT, AND BORES ARE SUBSIDIARY TO ITEM 170. BE AWARE OF WATER AUTHORITY RULES AND TIME LIMITATIONS THAT APPLY TO USE OF TEMPORARY METERS. (SEE IRRIGATION DETAILS AND GENERAL NOTES)

4. EXTEND BORE CASINGS A MINIMUM OF 8' BEHIND THE FACE OF THE CURB, THE SIDEWALK, OR THE EDGE OF PAVEMENT.

5. APPROX. LENGTH OF CASED BORES IS FOR CONTRACTORS INFORMATION ONLY. CASED BORES ARE SUBSIDIARY TO THE IRRIGATION SYSTEM.

6. ALL BORES TO BE MARKED AND VERIFIED FOR APPROVAL BY TXDOT INSPECTOR PRIOR TO CONSTRUCTION.

SCALE (IN FEET):
0 50

REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

Digitally signed by:
Alisa West
B5ED8BB569EE470...
12/7/2020

Texas Department of Transportation

WILLIAMSON

IRRIGATION LAYOUT
LOCATION A

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	05	209	VARIOUS
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		12

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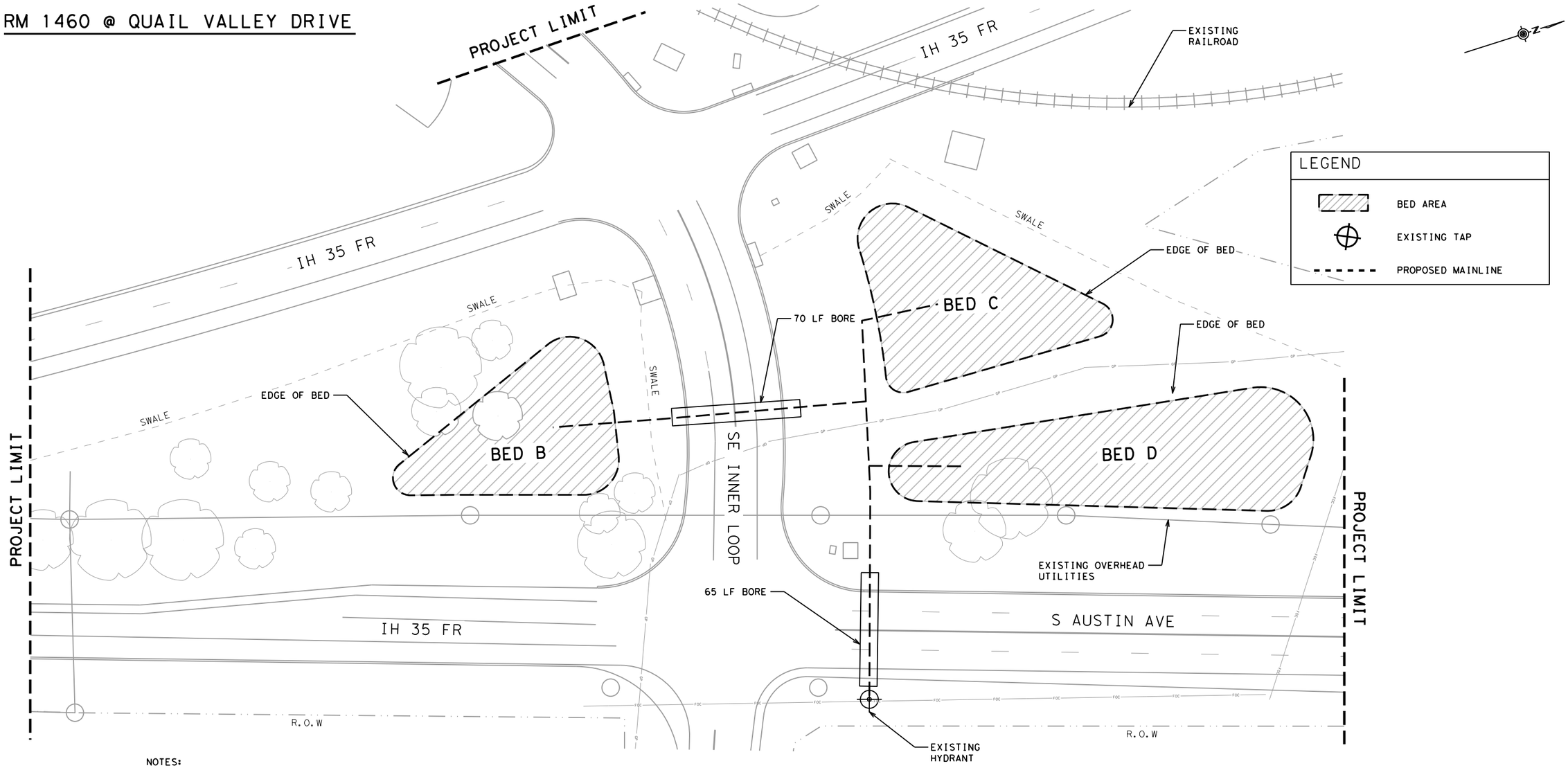
RM 1460 @ QUAIL VALLEY DRIVE



NOTES:

1. IRRIGATION LINES SHOWN ON THE PLANS ARE DIAGRAMMATIC ONLY. ROUTE LINES TO AVOID CONFLICTS, AS DIRECTED.

2. PROVIDE AN IRRIGATION DESIGN FROM A LICENSED IRRIGATOR, IN ACCORDANCE WITH TCEQ REQUIREMENTS AND ITEM 170 OF THE "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES 2014," PLANS, DETAILS, AND NOTES. SUMBIT THE IRRIGATION DESIGN FOR APPROVAL , PRIOR TO INSTALLATION.

3. COORDINATE WITH LOCAL WATER AUTHORITY FOR ACCESS AND USE OF ADJACENT TAPS FOR TEMPORARY METERS. ALL FEES AND COSTS FOR TEMPORARY METERS, INSPECTIONS, WATER USED, IRRIGATION DESIGN, INSTALLATION, MATERIAL, EQUIPMENT, AND BORES ARE SUBSIDIARY TO ITEM 170. BE AWARE OF WATER AUTHORITY RULES AND TIME LIMITATIONS THAT APPLY TO USE OF TEMPORARY METERS. (SEE IRRIGATION DETAILS AND GENERAL NOTES)

4. EXTEND BORE CASINGS A MINIMUM OF 8' BEHIND THE FACE OF THE CURB, THE SIDEWALK, OR THE EDGE OF PAVEMENT.

5. APPROX. LENGTH OF CASED BORES IS FOR CONTRACTORS INFORMATION ONLY. CASED BORES ARE SUBSIDIARY TO THE IRRIGATION SYSTEM.

6. ALL BORES TO BE MARKED AND VERIFIED FOR APPROVAL BY TXDOT INSPECTOR PRIOR TO CONSTRUCTION.

SCALE (IN FEET):
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REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
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STATE OF TEXAS

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WILLIAMSON

IRRIGATION LAYOUT LOCATION B

SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	05	209	VARIOUS
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		13

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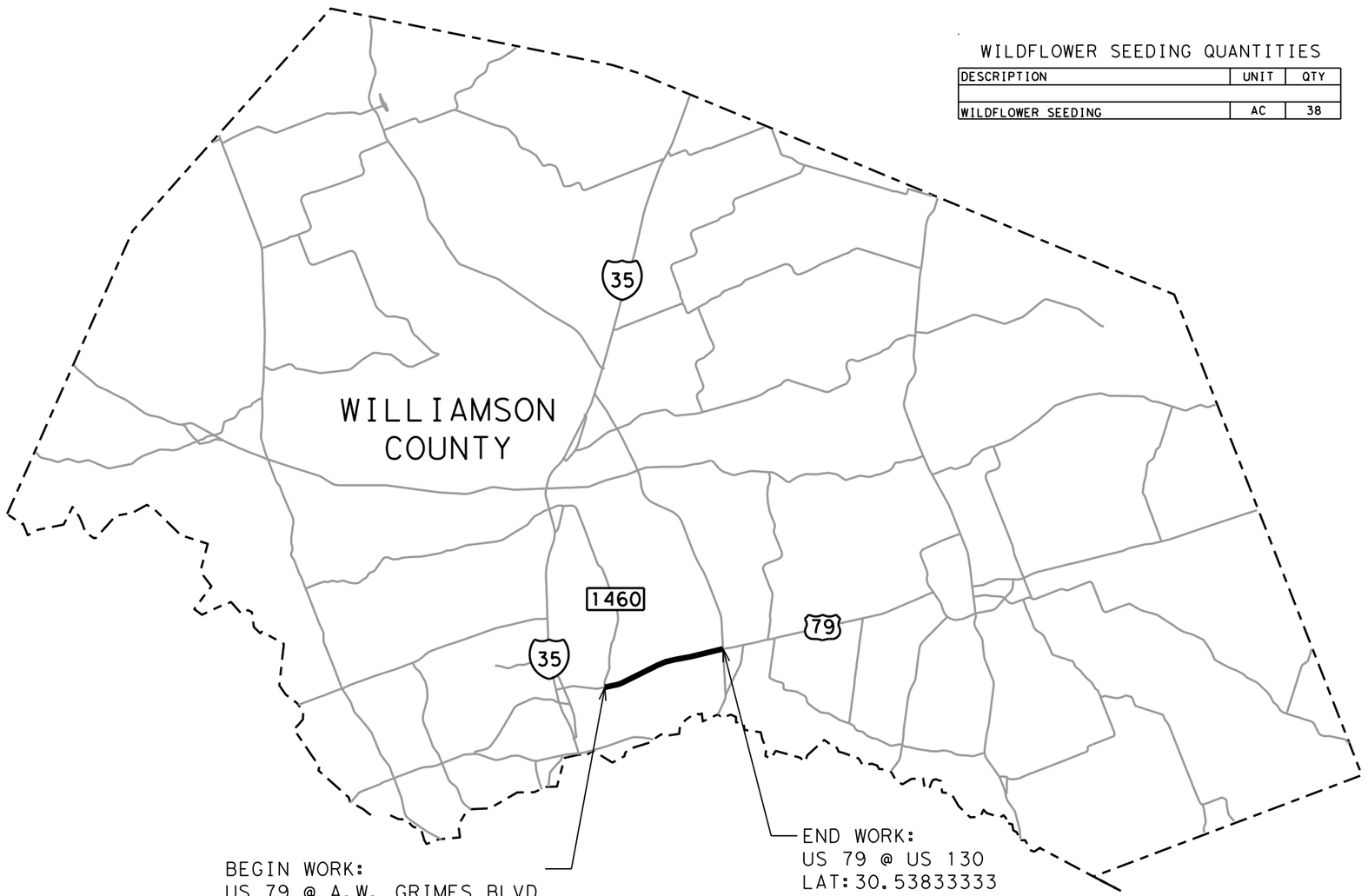
WILDFLOWER SEEDING QUANTITIES

DESCRIPTION	UNIT	QTY
WILDFLOWER SEEDING	AC	38



NOTES:

1. LOCATE SEEDED AREAS ON GENTLE SLOPES. ENIGINEER WILL DETERMINE EXACT LOCATIONS IN THE FIELD.
2. SEE GENERAL NOTES FOR SEEDING SPECIFICATIONS.
3. SEE SHEET FOR NO PLANTING AREAS IN R.O.W.
4. APPLY WILDFLOWER SEEDING BETWEEN OCTOBER 15 AND NOVEMBER 15.
5. PREPARE WILDFLOWER SEEDING BY MOWING TURF TO A MAXIMUM HIEGHT OF 4". THIS IS SUBSIDIARY TO WILDFLOWER SEEDING.
6. NOTIFY ENGINEER 48 HOURS PRIOR TO DRILL SEEDING. ENSURE THAT TXDOT PERSONNEL IS ON-SITE TO VISUALLY VERIFY SEEDING OPERATIONS.
7. USE A NO-TILL OR PASTURE TYPE DRILL THAT IS CAPABLE OF RELEASING SMALL, LARGE, AND FLUFFY SEEDS UNIFORMLY. (GRAIN SEEDING DRILLS ARE NOT ALLOWED).

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ALISA M. WEST
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STATE OF TEXAS

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12/7/2020

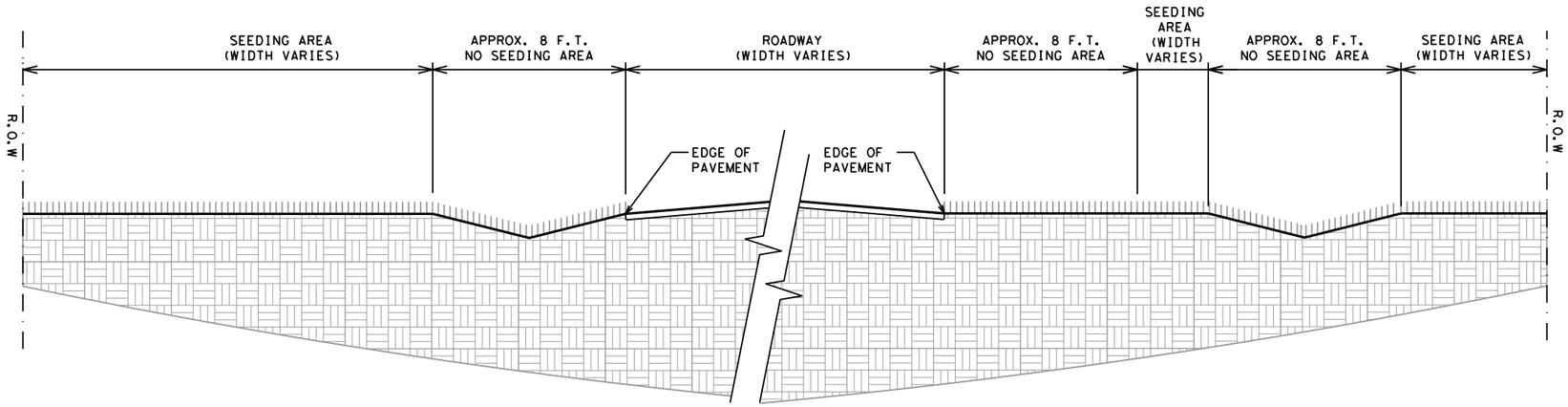
NOT TO SCALE

Texas Department of Transportation

WILLIAMSON
WILDFLOWER PLANTING LOCATION C

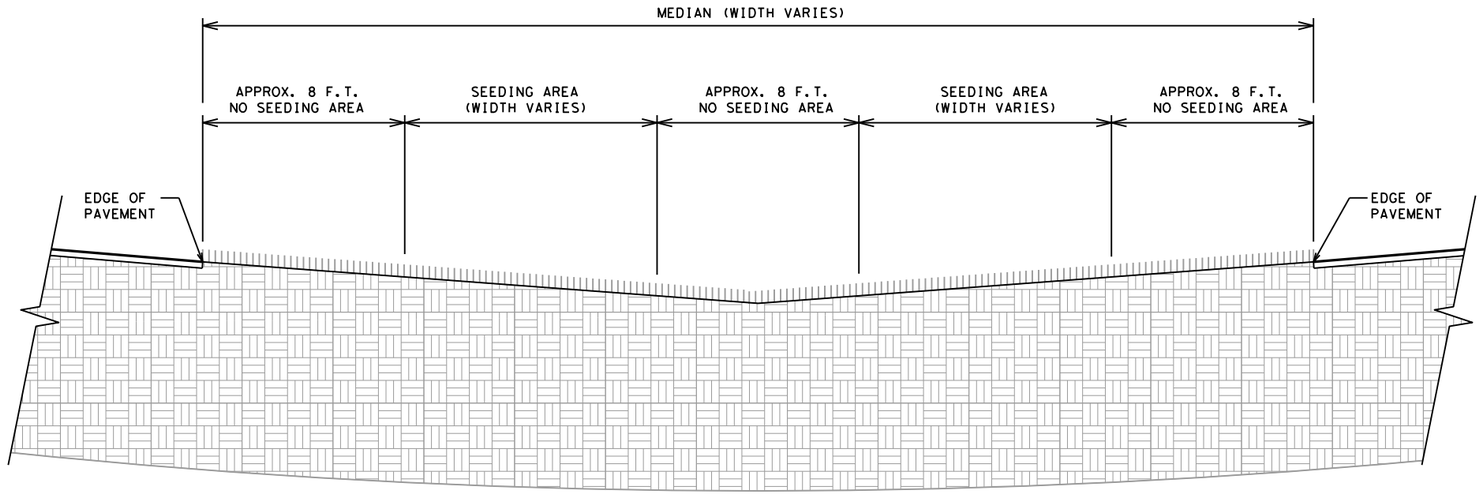
SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	05	209	VARIOUS
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		14



TYPICAL SEEDING LAYOUT SECTION- NON-CURBED VEGETATED R.O.W

N.T.S



TYPICAL SEEDING LAYOUT SECTION - NON-CURBED VEGETATED MEDIAN

N.T.S

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ALISA M. WEST
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12/7/2020

Texas Department of Transportation

WILLIAMSON

TYPICAL SEEDING LAYOUT SECTIONS

SHEET 1 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	05	209	VARIOUS
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		15

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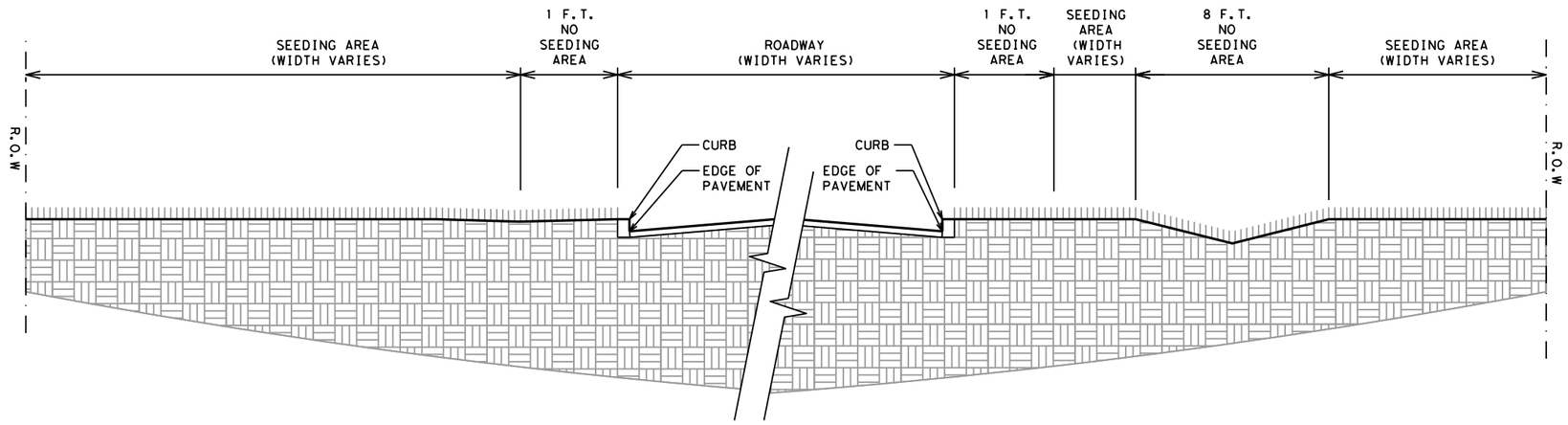
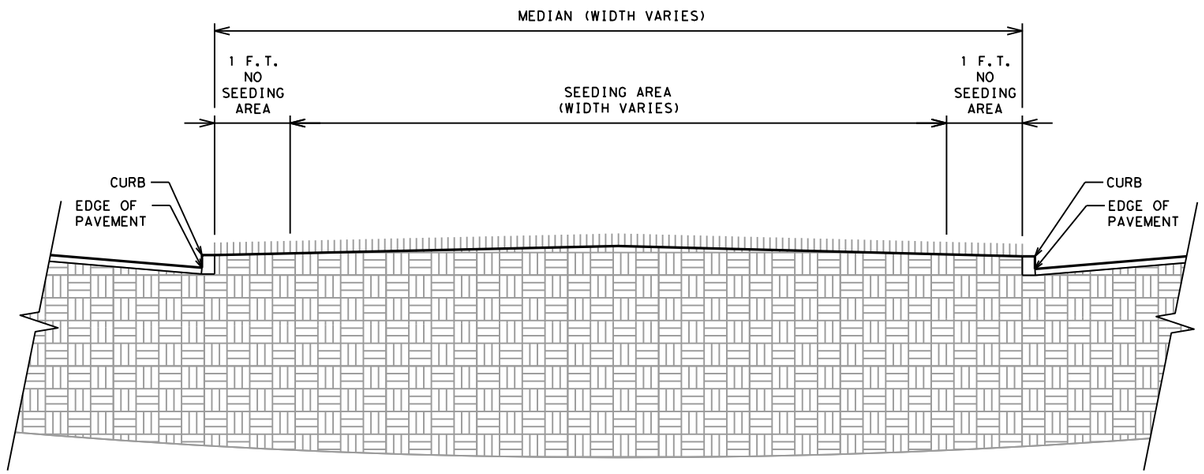


TYPICAL SEEDING LAYOUT SECTION - CURBED VEGETATED R.O.W

N.T.S



TYPICAL SEEDING LAYOUT SECTION - CURBED VEGETATED MEDIAN

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Texas Department of Transportation

WILLIAMSON

TYPICAL SEEDING LAYOUT SECTIONS

SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	05	209	VARIOUS
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		16

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ASSET DESCRIPTION	ROADWAY	LIMITS	
		FROM	TO
Traffic Signals			
Illumination			
Landscaping Features	RM 1460 @ QUAIL VALLEY DR	LAT= 30.62138889 , LONG= -97.67166667	
	IH 35 @ SE INNER LOOP	LAT= 30.60805556 , LONG= -97.68583333	
	US 79	LAT= 30.51777778 , LONG= -97.65555556	LAT= 30.53833333 , LONG= -97.57638889
Aesthetic/ Special Features			
Other			

Note: The asset locations specified in the tables are provided in GPS grid coordinates.

The City of Georgetown accepts the fixed responsibility to maintain, control, supervise, and regulate the above on State highway ROW through its corporate limits Code.

This document is per Chapter 311 of the Texas Transportation Code supplemental to the existing Municipal Maintenance Agreement (MMA) with the City of Georgetown .

This document does not relieve the City of Georgetown from their responsibility to maintain all roads within their city limits as stated in the MMA.

Executed on behalf of the City by: _____ Date: _____

Austin District
Maintenance Office

Texas Department of Transportation

ROADWAY NAME HERE
ASSET MAINTENANCE

SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	05	209	VARIOUS
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		17

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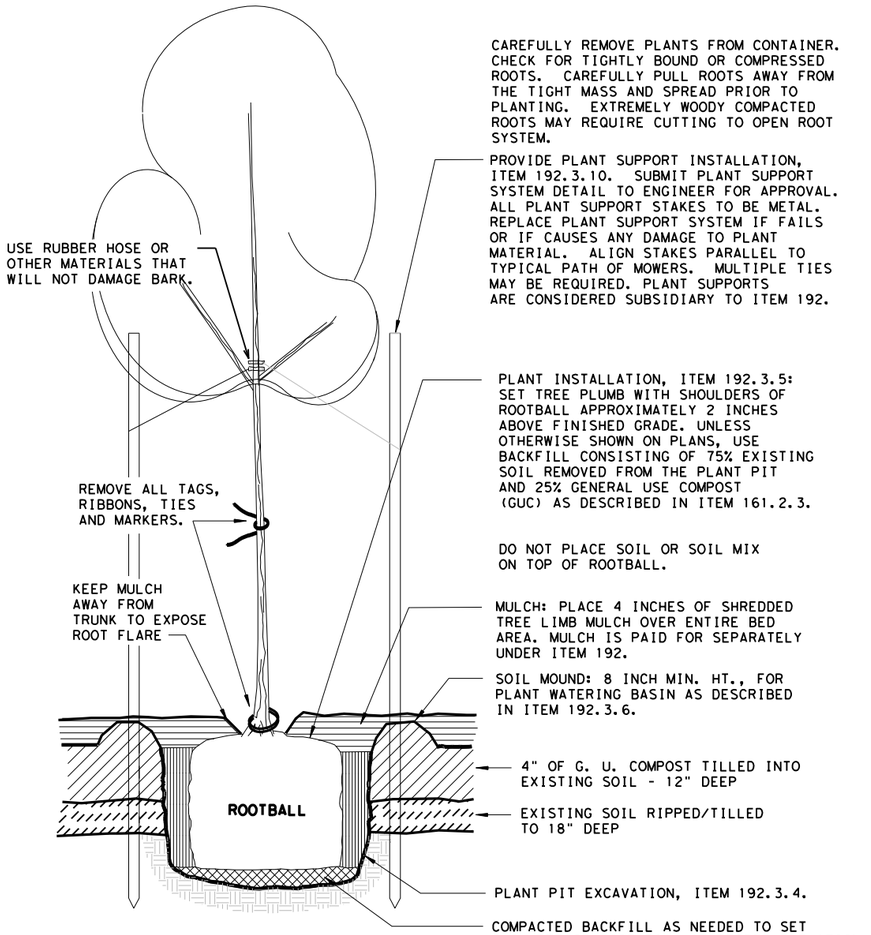
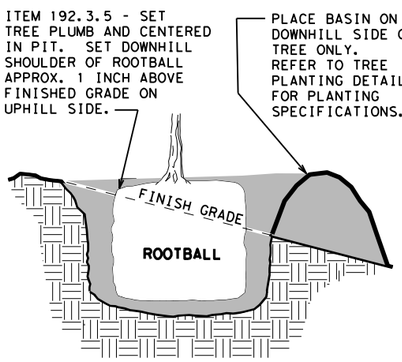
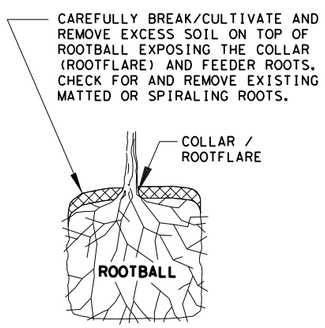


TREE PLANTING DETAILS - 15 GAL.

NTS



FOR SLOPE PLANTING



PRIOR TO PLACING ROOTBALL IN HOLE

PLANTING NOTES

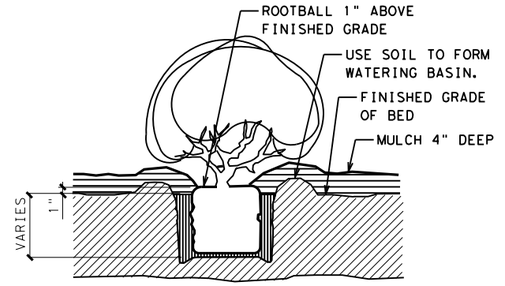
1. REFERENCE ITEM 192 OF THE TEXAS STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS AND BRIDGES 2014 FOR SPECIFICATIONS, DIMENSIONS, VOLUMES AND MEASUREMENTS THAT HAVE BEEN MODIFIED OR ARE NOT SHOWN.
2. REJECTION OF PLANTS WILL BE IN ACCORDANCE WITH ITEM 192.2.2.
3. PLANTING AREA PREPARATION:

   MULCH: FURNISH COARSE SHREDDED TREE LIMB MULCH.

   GENERAL USE COMPOST: FURNISH GENERAL USE COMPOST ACCORDING TO ITEM 161. 2.3.

   FURNISH COMPOST AND MULCH MATERIALS THAT ARE FREE OF VISIBLE GLASS, METAL, ROCK, PLASTIC, PAPER, LARGE PIECES OF WOOD, DIRT CLODS, DEBRIS, OR ANY UNSUITABLE MATERIAL THAT WOULD DETRACT THE QUALITY AND APPEARANCE OF THE PLANTING AREA.
4. DO NOT INSTALL PLANTS UNTIL IRRIGATION SECTIONS ARE OPERABLE.
5. AFTER PLANT AND BED LOCATIONS HAVE BEEN VERIFIED NOT TO BE IN CONFLICT WITH UTILITIES OR POSE A SAFETY HAZARD, PREPARE BED AREAS ACCORDING TO THE PLANS, AND DIG PLANT PITS ACCORDING TO 192.3.4.
6. INSTALL PLANTS ACCORDING TO THE PLANS AND SPECIFICATIONS. WATER ALL PLANTS WITHIN THE SAME DAY OF PLANTING. THOROUGHLY SOAK ROOT BALLS. SET TOP OF ROOTBALL HIGH ENOUGH TO ALLOW FOR SETTLING SO THAT THE TOP OF ROOT BALL DOES NOT SINK OR SETTLE BELOW GRADE. REPLANT AND RAISE THE ELEVATION OF ANY PLANTS THAT SETTLES WHERE THE TOP OF THE ROOT BALL IS BELOW THE SURROUNDING GRADE. DO NOT PLACE ANY ADDITIONAL SOIL ON TOP OF THE ROOT BALL.
7. INSTALL IRRIGATION EMITTERS DURING OR IMMEDIATELY AFTER PLANT INSTALLATION. WATER USED FOR IRRIGATION WILL BE CONSIDERED SUBSIDIARY TO ITEM 170 AND ITEM 193.
8. APPLY WATER IMMEDIATELY AFTER PLANTING AT TWO (2) TIMES THE GALLON SIZE OF THE PLANT CONTAINER. THEREAFTER, SCHEDULE IRRIGATION TO KEEP THE PLANTS IN A HEALTHY, GROWING CONDITION.
9. STRESSED PLANT MATERIAL WILL BE REJECTED ACCORDING TO ITEM 192.2.2. AND REPLACED AT THE CONTRACTOR'S EXPENSE.
10. MAINTAIN ALL LANDSCAPING, IRRIGATION, AND ASSOCIATED WORK IMMEDIATELY AFTER PLANTING AND DURING THE 90-DAY MAINTENANCE PERIOD. AT THE COMPLETION OF THE 90-DAY MAINTENANCE PERIOD, AND AS DIRECTED, CONDUCT A WALK-THRU WITH TXDOT PERSONNEL AND CORRECT PUNCHLIST ITEMS, PRIOR TO ENTERING THE LANDSCAPE ESTABLISHMENT PERIOD (ITEM 193). MAINTENANCE DURING THE LANDSCAPE ESTABLISHMENT PERIOD (ITEM 193) WILL BE PAID FOR MONTHLY.
11. MAINTAIN MULCH AT THE SPECIFIED DEPTH OF FOUR (4) INCHES OVER THE FULL EXTENT OF THE BED. KEEP TREE WATERING BASINS INTACT AND MAINTAINED. KEEP BED AREAS AND TREE WATERING BASINS FREE OF WEEDS. NYLON STRING TRIMMERS (WEED-EATERS) ARE NOT ALLOWED IN TREE BASINS.
    A WICKING METHOD OF HERBICIDE APPLICATION, (ROUND-UP OR APPROVED EQUAL), MAY BE USED BY PROPERLY LICENSED PERSONNEL.

    IMMEDIATELY REPLACE ANY PLANT THAT IS DAMAGED OR KILLED BY HERBICIDE OR WEED CONTROL OPERATIONS, AS DIRECTED, AND WITHOUT ADDITIONAL COMPENSATION. REPLACE DEAD OR DAMAGED PLANTS AS DIRECTED.
12. UNDER ITEM 193, OBTAIN APPROVAL PRIOR TO REPLACING PLANTS. REPLACE PLANTS ONLY AS APPROVED AND AS DIRECTED.
13. SUPPORT STAKES TO BE REMOVED BY THE CONTRACTOR AT THE END OF THE 24 MONTH MAINTENANCE PERIOD.



SHRUB & TREE PLANTING - 5 GAL

NTS

SOIL PERCOLATION TEST

1. CONDUCT SOIL PERCOLATION TESTS PRIOR TO PLANT INSTALLATION IN FLAT AREAS OF THE PLANTING BEDS BY EXCAVATING A TEST PIT EIGHTEEN (18) INCHES DEEP AND EIGHTEEN (18) INCHES WIDE.
2. PROVIDE SEVERAL TEST PITS AT THE PROJECT SITE AND PERFORM PERCOLATION TESTS AT EACH ONE, AS DIRECTED.
3. FILL PIT WITH WATER TO ONE HALF DEPTH. ALLOW TO DRAIN.
4. FILL HOLE AGAIN WITH WATER TO ONE HALF DEPTH. MEASURE WATER LEVEL FROM TOP EDGE OF PIT. TIME THE RATE OF DRAINAGE.
5. IF WATER DRAINS SLOWER THAN ONE HALF INCH PER HOUR, REPORT FINDINGS AND CONTACT TXDOT LANDSCAPE ARCHITECT FOR DIRECTION.

MINIMUM PLANT PIT SIZES

1. PIT DEPTH:
   EXCAVATE PIT TWO (2) INCHES DEEPER THAN ROOT BALL AND BACKFILL BOTTOM WITH TWO (2) INCHES OF SOIL/COMPOST MIX AND LIGHTLY COMPACT. WHEN SETTING PLANTS INTO THE PIT, ENSURE THAT THE TOP OF THE ROOT BALL IS SLIGHTLY HIGHER THAN THE SURROUNDING GRADE.
2. PIT DIAMETER:
   PLANTS 15 GALLON OR LARGER:
   PROVIDE A MINIMUM HORIZONTAL DIMESION OF TWELVE (12) INCHES BETWEEN THE ROOT BALL AND THE SIDES OF THE PIT.
   PLANTS SMALLER THAN 15 GALLON:
   PROVIDE A MINIMUM HORIZONTAL DIMENSION OF TWO (2) TIMES THE ROOT BALL DIAMETER ACROSS THE PIT.

REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

DocuSigned by:
Alisa West
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12/7/2020

Texas Department of Transportation

WILLIAMSON

PLANTING DETAILS

SHEET 1 OF 3

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	05	209	VARIOUS
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		18

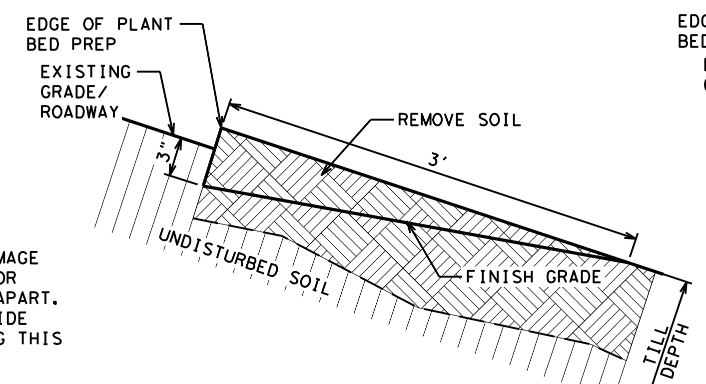
DATE: 12/4/2020 9:24:44 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\0914052094 - Design\Plan Set\10. Miscellaneous\WILLIAMSON_PLANT_DETAILS

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

192-6063 PLANTING BED PREP (TYPE I) SY	192-6064 PLANT BED PREP (TYPE II) SY	192-6065 PLANT BED PREP (TYPE III) SY	192-6066 PLANT BED PREP (TYPE IV) SY	REFERENCE ITEM 161, 192 OF THE TEXAS STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES 2014 FOR SPECIFICATIONS, DIMENSIONS VOLUMES, AND MEASUREMENTS THAT ARE NOT SHOWN. REFERENCE SPECIAL SPECIFICATIONS ITEM 1006.		
✓	✓	✓		161-6012 GENERAL USE COMPOST CY	APPLICATION RATE ITEM 161.2.3. GENERAL USE COMPOST. APPLY 4 INCH UNIFORM LAYER OVER BED PREPARATION AREA.	ITEMS 161.2. MATERIALS. COMPOST PRODUCER'S STA CERTIFICATION MUST BE DATED TO MEET STA REQUIREMENTS (CERTIFICATION MUST BE WITHIN 30 OR 90 DAYS). LAB ANALYSIS PERFORMED BY AN STA-CERTIFIED LAB MUST BE DATED WITHIN 30 DAYS BEFORE DELIVERY OF THE COMPOST.
✓	✓	✓	✓	1006-6001 LANDSCAPE SOIL AMENDMENT (TYPE I) SY	APPLICATION RATE APPLY 0.30 LBS/SY. EACH APPLICATION IS PAID FOR SEPARATELY. SEE TIMELINE FOR MULTIPLE APPLICATIONS.	USE A NON-CHEMICAL FERTILIZER WITH THE FOLLOWING REQUIREMENTS: (1) IS OMRI LISTED OR CERTIFIED BY WASHINGTON STATE DEPARTMENT OF AGRICULTURE MEETING USDA NATIONAL ORGANIC PROGRAM RULES, PROVIDE CURRENT CERTIFICATION. (2) IS REGISTERED WITH TEXAS STATE CHEMIST AS A COMMERCIAL FERTILIZER. (3) MEET USEPA GUIDELINES FOR UNRESTRICTED USE. (4) DERIVED FROM THE FOLLOWING BIOLOGICAL SOURCE: PROCESSED POULTRY MANURE. (5) CONTAINS 3.0% NITROGEN AND 2.2% OF NITROGEN IS WATER INSOLUBLE, 4% PHOSPATE, 3% NITROGEN SOLUBLE POTASH, 10% CALCIUM. (6) USE THE FOLLOWING PRODUCT OR AN APPROVED EQUAL: PLANT VIGOR 3-4-3 PLUS 10% CALCIUM MANUFACTURED BY NATURAL RESOURCES GROUP, INC. TOMBALL, TEXAS 800-279-9567.
✓	✓	✓	✓	1006-6002 LANDSCAPE SOIL AMENDMENT (TYPE II) SY	APPLICATION RATE APPLY 0.25 LBS/SY.	HUMATE CONTAINING 2.25% IRON IN THE RAW MATERIAL AND GREATER THAN 45% HUMIC ACID, DEXTROSE 2.5% TO 5% ON WEIGHT BASIS. PELLETIZED HUMATE WITHOUT ADDED BINDERS AND PASS #16 MESH. USE THE FOLLOWING PRODUCT OR AN APPROVED EQUAL: SAN JACINTO HUMATE, SAN JACITO ENVIRONMENTAL SUPPLIES, 713-957-0909.
	✓	✓	✓	1006-6003 LANDSCAPE SOIL AMENDEMENT (TYPE III) SY	SEE PLANTING AND ESTABLISHMENT SHEET 5 OF 8 FOR REQUIREMENTS	
				1006-6004 LANDSCAPE SOIL AMENDMENT (TYPE IV) SY	SEE PLANTING AND ESTABLISHMENT SHEET 5 OF 8 FOR REQUIREMENTS	
✓	✓	✓	✓	1006-6005 LANDSCAPE SOIL AMENDMENT (TYPE V) SY	APPLICATION RATE APPLY 0.30 LBS/SY. EACH APPLICATION IS PAID FOR SEPARATELY. SEE TIMELINE FOR MULTIPLE APPLICATIONS.	USE A NON-CHEMICAL FERTILIZER WITH THE FOLLOWING REQUIREMENTS: (1) IS OMRI LISTED OR CERTIFIED BY WASHINGTON STATE DEPARTMENT OF AGRICULTURE MEETING USDA NATIONAL ORGANIC PROGRAM RULES, PROVIDE CURRENT CERTIFICATION. (2) IS REGISTERED WITH TEXAS STATE CHEMIST AS A COMMERCIAL FERTILIZER. (3) MEETS USEPA GUIDELINES FOR UNRESTRICTED USE. (4) DERIVED FROM THE FOLLOWING BIOLOGICAL SOURCE: WORM CASTINGS. (5) CONTAINS 0.02% HUMIC ACID DERIVED FROM HUMATE, 1.0% NITROGEN AND 0.9% OF NITROGEN IS WATER INSOLUBLE, 0.5% PHOSPHATE, 0.2% SOLUBLE POTASH , 1.0% CALCIUM, 0.2% IRON. (6) USE THE FOLLOWING PRODUCT OR APPORVED EQUAL: BLACK CASTINGS MANUFACTURED BY VERMI-TECHNOLOGY UNLIMITED AVAILABLE FROM EARTH'S OUTLET 866-504-1139.
✓				RIPPING/ TRENCHING INCIDENTAL TO ITEM 192 PLANT BED PREPARATION	RIP/TRENCH DEPTH RIP/TRENCH TO A DEPTH OF 18 INCHES (+/- 2"). DISTANCE BETWEEN EACH RIP/TRENCH (WHEN REQUIRED), ROTOR TILL TO A DEPTH OF 8 INCHES (+/- 2").	
✓	✓	✓		ROTOR TILLING INCIDENTAL TO ITEM 192 PLANT BED PREPARATION	ROTOR TILL DEPTH AFTER APPLICATION OF COMPOST AND AMENDMENTS AND RIP/TRENCH (WHEN REQUIRED), ROTOR TILL TO A DEPTH OF 12 INCHES (+/- 2").	
		✓	✓	HERBICIDE AND MOWING INCIDENTAL TO ITEM 192 PLANT BED PREPARATION. SCALP MOW 15 DAYS AFTER FINAL HERBICIDE TREATMENT.	APPLICATION RATE PRIOR TO ALL OTHER WORK, APPLY TWO APPLICATIONS OF AN APPROVED HERBICIDE WITH 15 DAYS BETWEEN THE APPLICATIONS. APPLY HERBICIDE DURING WEATHER CONDITIONS AND AT A RATE PER MANUFACTURER'S RECOMMENDATIONS.	

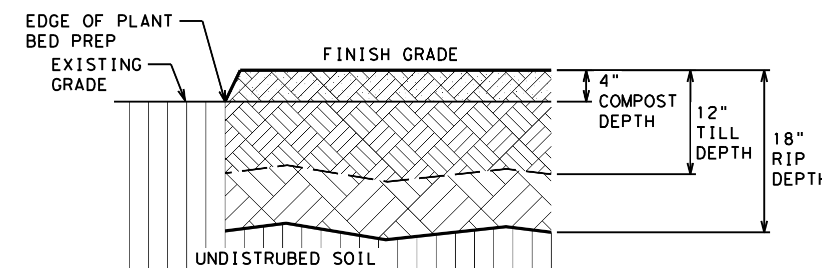
PLANTING BED PREPARATION NOTES:

1. REFERENCE ITEM 192 OF THE TEXAS STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES 2014 FOR SPECIFICATIONS, DIMENSIONS, VOLUMES, AND MEASUREMENTS NOT SHOWN.
2. REFERENCE ITEM 192.3: MARK PLANT LOCATIONS AND BED OUTLINES AS SHOWN IN PLANS.OBTAIN APPROVAL OF FINAL LOCATIONS BEFORE CONTINUING WORK UNDER THIS ITEM.
3. LOCATE AND STAKE ALL UNDERGROUND CONDUITS, UTILITIES, GROUND BOXES, INLETS, CULVERTS, MANHOLES, ETC. MAINTAIN THE STAKES IN PLACE FOR DURATION OF THE PROJECT. REMOVE STAKES WHEN DIRECTED BY ENGINEER.
4. PROVIDE EROSION CONTROL DEVICES AND METHODS TO CONTROL EROSION DURING BED CONSTRUCTION, AS DIRECTED.
5. ERADICATE AND REMOVE EXISTING TURF VEGETATION WITHIN BED AREAS BY APPLYING A GLYPHOSATE-TYPE HERBICIDE OR OTHER APPROVED METHODS. USE EXTREME CAUTION TO PREVENT DAMAGE TO EXISTING TREES AND SHRUBS. DO NOT ALLOW HERBICIDE TO DRIFT INTO CONTACT WITH TREES OR TURF AREAS THAT ARE TO REMAIN. IF GLYSPHOSATE IS USED, MAKE TWO APPLICATIONS, 15 DAYS APART. OBTAIN APPROVAL BEFORE APPLICATION OF HERBICIDE. FIFTEEN (15) DAYS AFTER SECOND HERBICIDE APPLICATION, REMOVE DEAD VEGETATION FROM THE BED AREAS. TIME CHARGES WILL ACCRUE DURING THIS PERIOD.
6. REPAIR ANY DAMAGE WITHIN RIGHT OF WAY CAUSED BY CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE DEPARTMENT.
7. PROVIDE A 100 SF "MOCK UP" OF SOIL AMENDMENT, GENERAL USE COMPOST, AND BED PREPARATION COMPLETE AND IN PLACE WITHIN AN APPROVED AREA FOR APPROVAL BY ENGINEER.
8. PICK-UP LITTER PRIOR TO BED PREPARATION. ALL CONCRETE, STEEL, TRASH, AND OTHER DEBRIS UNCOVERED DURING BED PREPARATION WORK WHICH THE ENGINEER DETERMINES AS DETRIMENTAL TO THE PROJECT WILL BECOME THE RESPONSIBILITY OF REMOVAL WILL OCCUR DAILY AND WILL BE INCIDENTAL TO BED PREPARATION AND WILL NOT BE PAID FOR SEPARATELY.
9. REFERENCE ITEM 5.10 INSPECTION OF THE TEXAS STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES 2014. AT ANY TIME DURING ALL PHASES OF THE CONTRACT, ANY MATERIALS OR WORK PERFORMED NOT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS WILL BE REPLACED AND/OR REWORKED UNTIL IN COMPLIANCE.
10. ANY ADJUSTMENTS DUE TO THE FAILURE TO COMPLY WITH PLANS AND SPECIFICATIONS SHOWN WILL BE AT CONTRACTORS EXPENSE.
11. CLEAN AND CLEAR BED PREP AREAS AND NEARBY INLETS OF EXISTING TALL VEGETATION AND ANY PILES OR LAYERS OF DEAD GRASS AND WEEDS CAUSED BY DROUGHT OR MOWING OPERATIONS BY OTHERS.



TOP-OF-SLOPE AND/OR EDGE OF PAVEMENT TREATMENT OF BED PREPARATION AREA

NOTE: INSTALL AT ALL AREAS WITH THE FOLLOWING CONDITIONS: WITHIN THE BED PREP AREAS AT TOP-OF-SLOPE (ADJACENT TO SHOULDER SECTIONS AND AREAS WITH SLOTTED BARRIER/CURB) AND/OR AT EDGE OF ROADWAY, REMOVE TILLED OR UNTILLED(TYPE IV) SOIL AS SHOWN. EVENLY DISTRIBUTE REMOVED SOIL IN A THIN LAYER OVER ADJACENT EXISTING TILLED OR UNTILLED (TYPE IV) SOIL BEING CAREFUL NOT TO CREATE A MOUND. THIS WORK IS INCIDENTAL TO ITEM 192 PLANT BED PREPARATION.



PLANTING BED PREPARATION SECTION

NOTE: SEE ITEMS AND REQUIREMENTS ON THIS SHEET FOR DIMENSIONS, RATES, AND SPECIFICATIONS.

REGISTERED LANDSCAPE ARCHITECT ALISA M. WEST 3187 STATE OF TEXAS

DocuSigned by: Alisa West B5ED9DD569EE470...
12/7/2020

Texas Department of Transportation

WILLIAMSON
PLANTING DETAILS
SHEET 2 OF 3

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	05	209	VARIOUS
	DIST		COUNTY	SHEET NO.
DW: CK:	AUS		WILLIAMSON	19

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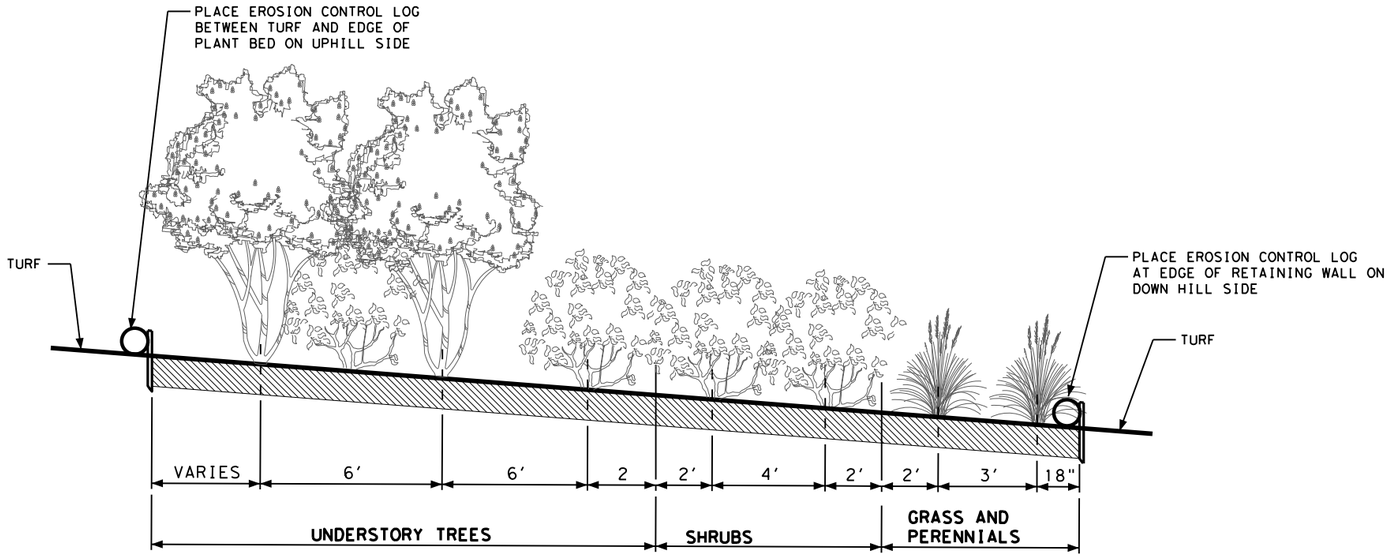

PLANT LAYOUT ON SLOPE-TYPICAL

NTS

REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

Docusigned by:
Alisa West
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12/7/2020

Texas Department of Transportation

WILLIAMSON

PLANTING DETAILS

SHEET 3 OF 3

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	05	209	VARIOUS
DW:	CK:	DIST	COUNTY		SHEET NO.
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CSJ: 0914-05-209

PLANT QUANTITIES PER PLANT BED

LOCATION	COMMON NAME	SHEET A	B	C	D	TOTAL
0192-6002 PLANT MATERIAL (1 GAL)					**TOTAL QTY:**	**1109**
GRASSES & PERENNIALS	ARTEMISIA	84	92	70	89	**335**
	GAYFEATHER	109	71	114	152	**446**
	PINK SKULL CAP	108	72	60	88	**328**
0192-6004 PLANT MATERIAL (5 GAL)					**TOTAL QTY:**	**1863**
GRASSES & PERENNIALS	BLACK DALEA	99	82	60	90	**331**
	GULF MUHLY	72	70	98	82	**322**
	RUSSIAN SAGE	99	65	74	97	**335**
SHRUBS	BIG MUHLY	47	24	34	46	**151**
	BUSH GERMANDER	20	21	40	36	**117**
	FRAGRANT SUMAC	41	17	38	55	**151**
	IRIS BICOLOR	38	27	42	35	**142**
	MEXICAN BUSH SAGE	59	30	37	53	**179**
	SKELETON LEAF GOLDENEY	31	15	36	53	**135**
0192-6005 PLANT MATERIAL (15 GAL)					**TOTAL QTY:**	**20**
UNDERSTORY	EVERGREEN SUMAC	1	1	3	2	**7**
	MEXICAN PLUM	1	1	2	3	**7**
	WAX MYRTLE	2	1	1	2	**6**
0192-6006 PLANT MATERIAL (30 GAL)					**TOTAL QTY:**	**12**
UNDERSTORY	TEXAS MOUNTAIN LAUREL	2	1	1	2	**6**
	YAUPON HOLLY	2	0	2	2	**6**

CSJ: 0914-05-209

WILDFLOWER SPECIFICATIONS

LOCATION	COMMON NAME	SCIENTIFIC NAME	SPECIFICATIONS
0180-6001 WILDFLOWER SEEDING			
			LB. PLS / ACRE
WILDFLOWERS	BLACK-EYED SUSAN	*Rudbecia hirta*	1
	BLUEBONNET	*Lupinus texensis*	12
	ILLINOIS BUNDLEFLOWER	*Desmanthus illinoensis*	6
	INDIAN BLANKET	*Gaillarda pulchella*	6
	INDIAN PAINTBRUSH	*Castilleja miniata*	1
	LEMON MINT	*Mondarda citriodora*	1
	PARTRIDGE PEA	*Cassia (Chamaecrista) fasiculata*	8
	PINK EVENING PRIMROSE	*Oenothera Speciosa*	1
	PLAINS COREOPSIS	*Coreopsis tinctoria*	1

PLANT REQUIREMENTS

1. PROVIDE PLANTS THAT ARE NURSERY GROWN IN CONTAINERS.
2. PROVIDE 48 HOUR NOTICE OF DELIVERY OF PLANT MATERIAL PRIOR TO ARRIVAL AT PROJECT SITE OR STORAGE AREA. PROVIDE DOCUMENTATION FROM DELIVERY SOURCE SHOWING QUANTITIES, SIZE, AND NAME OF PLANTS (COMMON AND BOTANICAL) THAT MATCHES NAMES SHOWN IN THE PLANS.
3. PROVIDE PLANS FOR WATER AND CARE OF PLANTS THAT WILL BE STORED AT THE SITE, FOR APPROVAL.
4. PROPERLY HANDLE AND MAINTAIN PLANTS DURING DELIVERY, STORAGE, AND INSTALLATION. PLANTS THAT SHOW SIGNS OF DAMAGE OR STRESS, MAY BE REJECTED AT ANY TIME. COVER AND PROTECT THE PLANTS DURING TRANSPORT TO PREVENT DAMAGE TO FOLIAGE, LIMBS, AND TRUNKS FROM WIND, HEAT, BREAKAGE, SCARRING, ABRASIONS, AND DRYING.
5. IF REQUESTED, SUBMIT FOR APPROVAL, A DIGITAL PHOTO OF EACH PLANT SPECIES PROCURED FOR THE PROJECT, TO BE USED AS AN EXAMPLE OF THE PLANT. TAKE PHOTOS WITH A MEASURING STICK OR POLE, CLEARLY VISIBLE IN THE PHOTO, TO VERIFY SIZE REQUIREMENTS.

CSJ: 0914-05-209

PLANT SPECIFICATIONS

LOCATION	COMMON NAME	SCIENTIFIC NAME	QTY	SPECIFICATIONS	HEIGHT	SPREAD	SPACING (F.T.)
0192-6004 PLANT MATERIAL (1 GAL)			**TOTAL QTY:**	**1109**			
GRASSES & PERENNIALS	ARTEMISIA	*Artemisia 'Powis Castle'*	335	1 GAL. FULL			3
	GAYFEATHER	*Liatris mucronata*	446	1 GAL. FULL			1.5
	PINK SKULL CAP	*Scutellaria suffrutescens*	328	1 GAL. FULL			2
0192-6004 PLANT MATERIAL (5 GAL)			**TOTAL QTY:**	**1863**			
GRASSES & PERENNIALS	BLACK DALEA	*Dalea frutescens*	331	5 GAL. FULL			3
	GULF MUHLY	*Muhlenbergia capillaris*	322	5 GAL. FULL			2
	RUSSIAN SAGE	*Perovaskia atriciplifolia*	335	5 GAL. FULL			3
SHRUBS	BIG MUHLY	*Muhlenbergia lindheimeri*	151	5 GAL. FULL			3
	BUSH GERMANDER	*Teucrium fruticans*	117	5 GAL. FULL			6
	FRAGRANT SUMAC	*Rhus aromatica*	151	5 GAL. FULL			6
	IRIS BICOLOR	*Dietes sp*	142	5 GAL. FULL			3
	MEXICAN BUSH SAGE	*Salvia leucantha*	179	5 GAL. FULL			3
	SKELETON LEAF GOLDENEY	*Viguiera stenoloba*	135	5 GAL. FULL			6
0192-6005 PLANT MATERIAL (15 GAL)			**TOTAL QTY:**	**20**			
					HEIGHT	SPREAD	SPACING (F.T.)
UNDERSTORY	EVERGREEN SUMAC	*Rhus virens*	7		5	3	12
	MEXICAN PLUM	*Prunus mexicana*	7		5	3	12
	WAX MYRTLE	*Myrica cerifera*	6		5	3	12
0192-6006 PLANT MATERIAL (30 GAL)			**TOTAL QTY:**	**12**			
					HEIGHT	SPREAD	SPACING (F.T.)
UNDERSTORY	TEXAS MOUNTAIN LAUREL	*Sophora secundiflora*	6		10	4	12
	YAUPON HOLLY	*Ilex vomitoria 'Nana'*	6		10	4	12

REPAIR OF DISTURBED AREAS

1. REPAIR AND RESEED ALL BARE OR DISTURBED AREAS THAT OCCUR AS A RESULT OF WORK ACTIVITIES, INCLUDING VEHICLES, EQUIPMENT, STOCKPILING, STORAGE, ETC., DURING THIS CONTRACT.
2. CORRECT GRADES AND ESTABLISH TURF WITH SEEDING AND WATERING, AS DIRECTED, UNTIL AN ACCEPTIBLE COVERAGE HAS BEEN ATTAINED AND APPROVED. RYE GRASS IS NOT ALLOWED.
3. THIS WORK IS CONSIDERED SUBSIDIARY, AND WILL NOT BE PAID FOR SEPARATELY.

WARRANTY

1. ASSUME RESPONSIBILITY FOR KEEPING PLANTS AND TREES IN A HEALTHY, GROWING CONDITION AND THE IRRIGATION SYSTEM FUNCTIONING, THROUGHOUT THE PROJECT DURATION.
2. REPLACE DEAD OR UNACCEPTABLE PLANT MATERIAL, ACCORDING TO ITEM 192, AS DIRECTED.
3. REPLACE DEAD OR UNACCEPTABLE PLANT MATERIAL UNDER ITEM 193, ONLY AS DIRECTED BY THE ENGINEER. PLANT REPLACEMENTS UNDER ITEM 193 WILL BE PAID FOR SEPARATELY.
4. CORRECT IRRIGATION PROBLEMS, REPLACE DAMAGED, FAILED, OR DEFICIENT EQUIPMENT AND/OR MATERIALS, AND CORRECT UNACCEPTABLE WORKMANSHIP, AS DIRECTED. FAILURE TO COMPLY WILL RESULT IN FORFEITED PAYMENTS.
5. PLANT MATERIAL THAT IS IN DORMANCY WILL NOT BE EVALUATED UNTIL OTHER PLANTS OF SAME SPECIES ARE LEAFED-OUT. REMOVAL AND DISPOSAL OF DAMAGED OR REJECTED MATERIAL IS INCIDENTAL TO ITEM 192.
6. PLANTS OR WORK THAT IS DAMAGED BY ACTIONS DESCRIBED IN ITEM 7.17.1. WILL BE REIMBURSED IN ACCORDANCE WITH THAT ITEM, AS DIRECTED. THEFT IS NOT A REIMBURSABLE REPAIR.
7. REMOVAL AND DISPOSAL OF DAMAGED OR REJECTED MATERIAL IS INCIDENTAL TO THE VARIOUS BID ITEMS.

REGISTERED LANDSCAPE ARCHITECT ALISA M. WEST 3187 STATE OF TEXAS

DocuSigned by: Alisa West B5ED8BB569EE470...

12/7/2020

Texas Department of Transportation

WILLIAMSON

PLANTING SPECIFICATIONS AND QUANTITIES

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	05	209	VARIOUS
DW:	CK:	DIST	COUNTY		SHEET NO.
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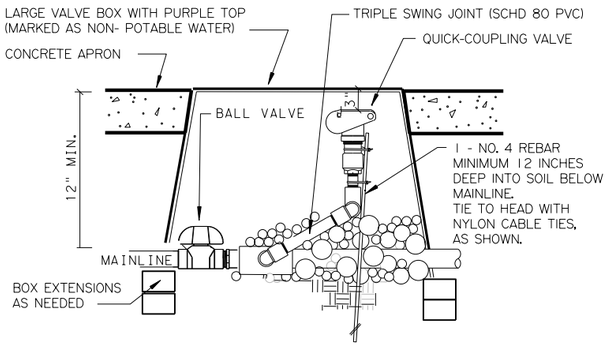
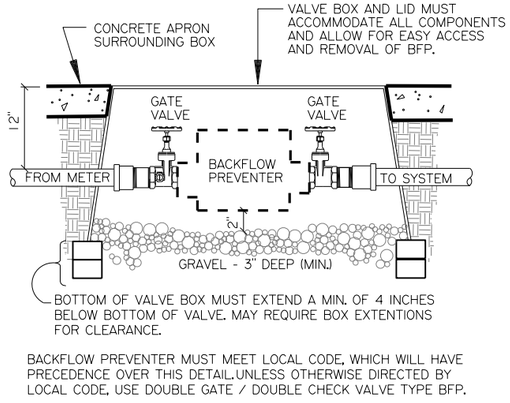


QUICK-COUPLER VALVE
SECTION

NOTE: AT END OF PROJECT, SUBMIT 1 QUICK-COUPLER KEY WITH ATTACHED SWIVEL HOSE BIB

NTS

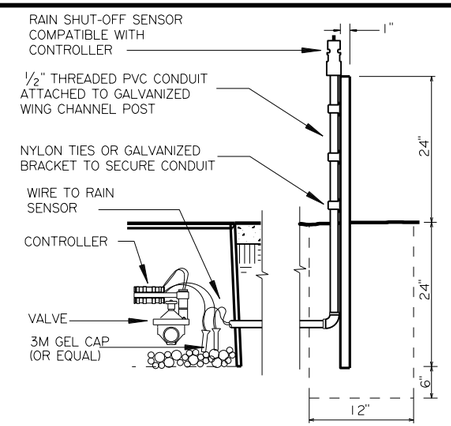


BACKFLOW PREVENTER MUST MEET LOCAL CODE, WHICH WILL HAVE PRECEDENCE OVER THIS DETAIL. UNLESS OTHERWISE DIRECTED BY LOCAL CODE, USE DOUBLE GATE / DOUBLE CHECK VALVE TYPE BFP.

BACKFLOW PREVENTER
IN-GROUND INSTALLATION

SECTION

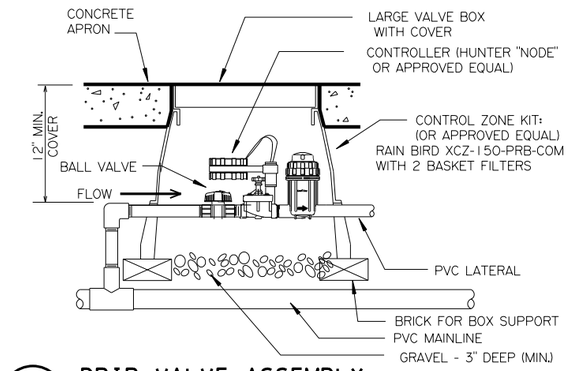
NTS



PLACE RAIN SENSOR POST AS DIRECTED. DO NOT EXCEED MAXIMUM WIRE DISTANCE LIMITS FROM CONTROLLER TO SENSOR.

RAIN SENSOR
SECTION - PLACE WITHIN BED AREA

NTS



DRIP VALVE ASSEMBLY
SECTION - PLACE WITHIN BED AREA

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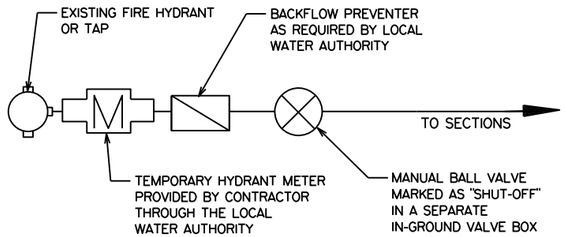
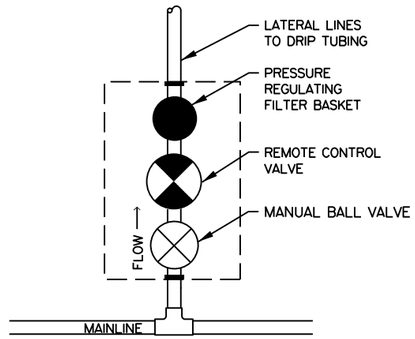


TYPICAL HYDRANT METER ASSEMBLY

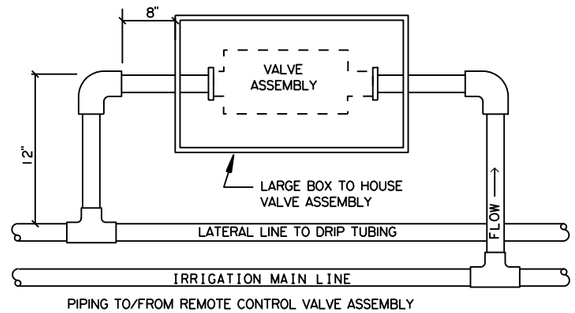
NOTE:
CONTRACTOR IS RESPONSIBLE FOR SECURITY OF TEMPORARY HYDRANT METERS. SECURE TEMPORARY HYDRANT METERS AGAINST THEFT OR VANDALISM.

NTS



DRIP VALVE ASSEMBLY
PLAN - PLACE WITHIN BED AREA

NTS



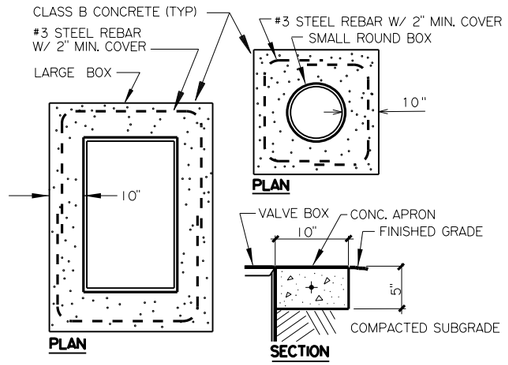
PIPING TO/FROM REMOTE CONTROL VALVE ASSEMBLY

DRIP VALVE ASSEMBLY
PLAN - PLACE WITHIN BED AREA

NTS

NOTES:

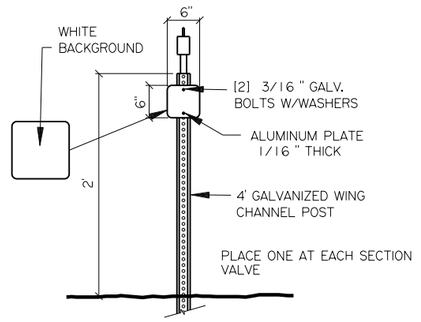
1. SUBMIT AN IRRIGATION DESIGN FOR AN UNDERGROUND, AUTOMATIC, IRRIGATION SYSTEM OPERATED BY BATTERY-POWERED CONTROLLERS, DESIGNED BY A LICENSED IRRIGATOR, AS LICENSED BY TCEQ. INCLUDE CALCULATIONS OF FLOW, PIPE SIZES, VALVES, ZONES, BACKFLOW PREVENTION DEVICE, AND OTHER DEVICES AND INFORMATION AS REQUIRED BY TCEQ. SUBMIT PLAN TO ENGINEER FOR APPROVAL.
2. PROVIDE TEMPORARY HYDRANT METERS FROM THE LOCAL WATER AUTHORITY. ESTABLISH ACCOUNT(S) FOR WATER SERVICE AND PAY FOR ALL FEES AND INSPECTIONS. PROVIDE AND PAY FOR WATER USAGE THROUGHOUT THE CONTRACT.
   REQUIREMENTS AND RESTRICTIONS REGARDING TEMPORARY HYDRANT PERMITS VARY FROM ONE WATER AUTHORITY TO ANOTHER. BE AWARE OF TIME LIMITATIONS, PENALTIES, FINES, AND/OR FEES INCLUDED IN PERMITS FOR TEMPORARY HYDRANT METERS.
3. PROVIDE AND PAY FOR BACKFLOW PREVENTION DEVICES THAT ARE APPROVED BY THE LOCAL WATER AUTHORITY. PAY FOR INSPECTIONS, AND MAINTENANCE OF BACKFLOW PREVENTION DEVICES.
4. BURY ALL IRRIGATION LINES THAT ARE DOWNSTREAM FROM TEMPORARY HYDRANT METER. USE SCHEDULE 40 PVC FOR ALL UNDERGROUND LINES AND SCHEDULE 80 PVC FOR ALL ABOVE GROUND LINES.
5. PROVIDE CASED BORES, ACCORDING TO ITEM 170, FOR CROSSING DRIVES, SIDEWALKS, AND ROADWAYS. CASED BORES FOR IRRIGATION PURPOSES ARE CONSIDERED SUBSIDIARY TO ITEM 170.
6. PROVIDE A MANUAL SHUT-OFF VALVE FOR IRRIGATION MAIN LINE NEAR THE WATER SOURCE (HYDRANT METER). PLACE VALVE IN SEPARATE, IN-GROUND, VALVE BOX. MARK AS "SHUT-OFF."
7. PROVIDE QUICK COUPLERS THAT CAN CONNECT TO HOSES TO REACH ALL PLANTED AREAS.
8. PROVIDE AIR RELIEF VALVES AT THE HIGHEST POINT AND FLUSH VALVES AT THE LOWEST POINT IN EACH SECTION (ZONE) AS REQUIRED. PLACE AIR RELIEF VALVES IN VALVE BOXES.
7. ALL FEES, COSTS, DEVICES, MATERIALS, AND LABOR ASSOCIATED WITH THE IRRIGATION SYSTEMS ARE CONSIDERED SUBSIDIARY TO ITEM 170.



NOTE: SURROUND ALL IRRIGATION VALVE BOXES WITH CONCRETE APRONS AS SHOWN. ONE APRON MAY SURROUND TWO OR MORE BOXES WHEN CLUSTERED TOGETHER. CONCRETE APRONS ARE CONSIDERED SUBSIDIARY TO ITEM 170.

CONCRETE APRON FOR VALVE BOXES
PLAN

NTS



IRRIGATION VALVE DELINEATOR
SECTION

NTS

REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

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Alisa West
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12/7/2020

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WILLIAMSON

IRRIGATION DETAILS

SHEET 1 OF 2

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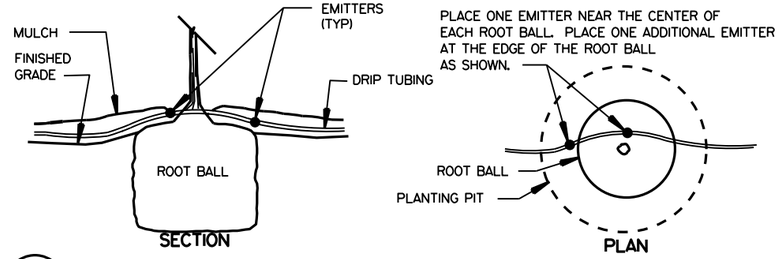
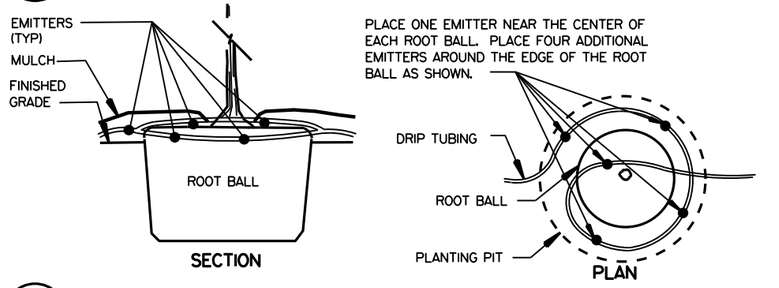


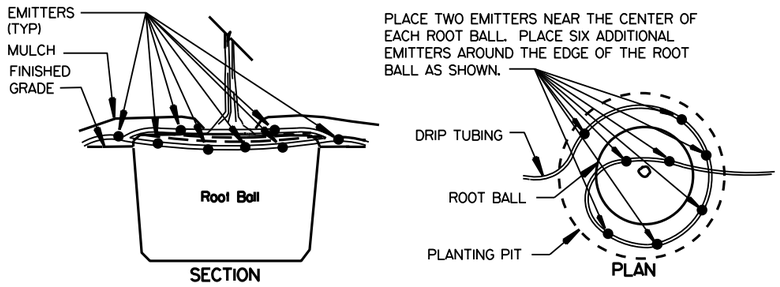
INDIVIDUAL EMITTER PLACEMENT - 5 GAL. CONTAINER

NTS



INDIVIDUAL EMITTER PLACEMENT - 15 GAL. CONTAINER

NTS



INDIVIDUAL EMITTER PLACEMENT - 30 GAL. CONTAINER

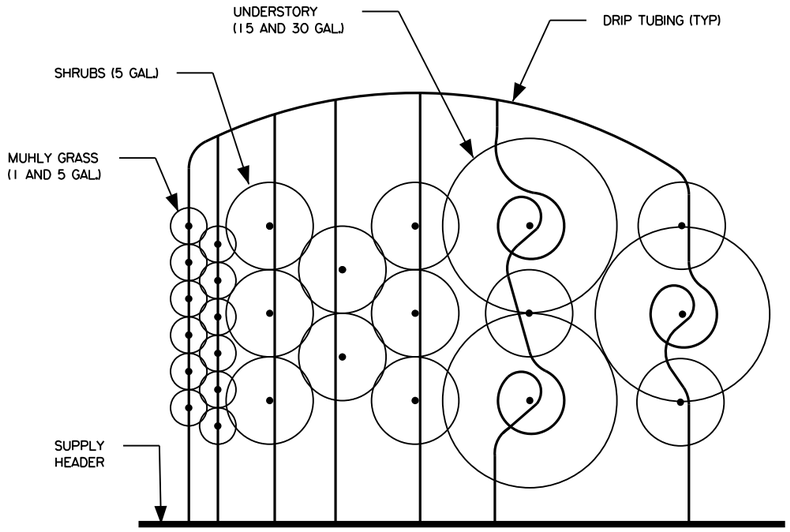
NTS

IRRIGATION MATERIALS SPECIFICATIONS

DESCRIPTION	* EXAMPLE OR EQUAL	SIZE	REMARKS
RPZ BACKFLOW PREVENTER	AS APPROVED BY LOCAL CODE	as required	
VALVE ASSEMBLY:	RAINBIRD XCZ-PRB-100-COM or XCZ-PRB-150-COM w/ PRESSURE REGULATING QUICK-CHECK BASKET FILTER and BALL VALVE	as required as required	Ensure that all parts and devices are compatible and provide rates, flows, and other factors that are within acceptable limits according to the guidelines of the manufacturer.
BATTERY OPERATED CONTROLLER W/ RAIN SENSOR	HUNTER NODE OR EQUAL (single or multiple zone)	compatible solenoids	Install new batteries before installation.
RAIN SHUT-OFF SENSOR	HUNTER RFC or EQUAL		Attach to post as shown in plans.
DRIP TUBING	XT-700 OR EQUAL		Ensure all flow rates, pressures, filtration mesh and other items comply with the guidelines of the manufacturer.
DRIP EMITTERS	XERI-BUG or EQUAL	2.0 GPH	Pressure compensating
QUICK COUPLERS	RAINBIRD OR EQUAL	as required	slotted key w/ swivel hose attachment
PVC PIPE -	USE SCHD. 40 FOR ALL UNDERGROUND MAIN LINES, LATERAL LINES, AND CASED BORE. USE SCHD. 80 FOR ABOVE GROUND PURPOSES.		

- ALTERNATE MATERIALS AND DEVICES MUST BE EQUIVALENT SUBSTITUTIONS AND MUST BE APPROVED BY ENGINEER, PRIOR TO INSTALLATION.

THIS IS ONLY A PARTIAL LIST OF COMPONENTS AND MATERIALS. PROVIDE ALL COMPONENTS AND MATERIALS NEEDED TO COMPLETE A FULLY FUNCTIONING IRRIGATION SYSTEM. ENSURE THAT ALL COMPONENTS ARE COMPATIBLE.



DRIP TUBING LAYOUT

NTS

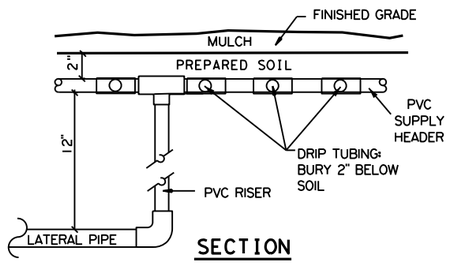
NOTE:
LAYOUTS SHOWN ARE FOR EXAMPLE ONLY. ACTUAL DRIP LAYOUTS MAY DIFFER DEPENDING ON BED FORMS AND SITE CONSTRAINTS.

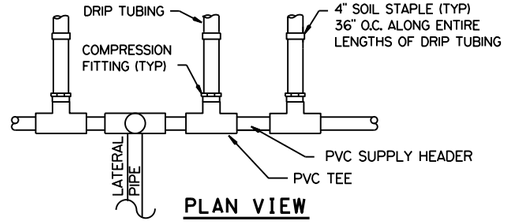
KEEP TUBING LENGTH AND FLOW WITHIN MAXIMUM LIMITS AND KEEP DRIP SECTIONS SIMILAR IN SIZE.

DRIP TUBING SECTION (TYP) SHALL BE APPROX. EQUAL TO OTHER SECTION SIZES.

EMITTER PLACEMENT SCHEDULE		
PLANT CONTAINER SIZE	EMITTER	
	QTY	NOMINAL FLOW
30 GAL. CONTAINER	8	2 GPH
15 GAL. CONTAINER	5	2 GPH
5 GAL. CONTAINER	2	2 GPH

IRRIGATION SCHEDULE *		
WEEK AFTER PLANTING	IRRIGATION INTERVAL	RUN TIME
1 THRU 6	2 DAYS	45 MINUTES
7 THRU 12	3 DAYS	45 MINUTES
13 THRU 104	7 DAYS	45 MINUTES
105 AND BEYOND	AS NEEDED	2 GPH





RISER DETAIL FOR SUPPLY HEADER TO DRIP TUBING

NTS

- THE IRRIGATION SCHEDULE SHOWN, IS A SUGGESTED BASELINE STARTING SCHEDULE AFTER ALL PLANTS HAVE BEEN THOROUGHLY WATERED AND TREES HAVE BEEN WATERED TO THE BOTTOM OF ROOT ZONES ON THE SAME DAY AS THEY ARE PLANTED.

ADJUST THIS SCHEDULE TO ACCOMMODATE SEASONAL WEATHER CONDITIONS AND LOCAL WATERING RESTRICTIONS.

BE RESPONSIBLE FOR MONITORING PLANT MATERIAL TO ENSURE IT RECEIVES PROPER DISTRIBUTION OF WATER FOR THRIVING GROWTH AND ADJUST SCHEDULE ACCORDINGLY.

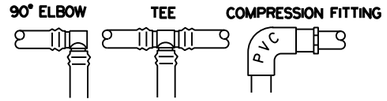
CHECK SOIL MOISTURE FREQUENTLY TO ENSURE THAT BED AREA IS DRAINING PROPERLY AND PLANTS ARE NOT BEING OVER-WATERED, OR UNDER-WATERED.

DRIP IRRIGATION NOTES:

1. TOTAL NUMBER OF EMITTERS AND LATERALS SHALL NOT ALLOW FOR GPM (GALLONS PER MINUTE) FLOWING THROUGH ONE SECTION AND ONE FILTER TO EXCEED 20 GPM. STAKE REMOTE CONTROL VALVE ASSEMBLY AND QUICK COUPLER LOCATIONS FOR ENGINEER'S APPROVAL.

2. PLACE VALVE ASSEMBLIES AND QUICK COUPLER VALVES IN ACCESSIBLE LOCATIONS, AS DIRECTED. SURROUND VALVES WITH CONCRETE APRON. (SEE DETAIL)

MAKE ALL DRIP TUBING CONNECTIONS WITH MANUFACTURER'S FITTINGS: 90° ELBOWS, TEES, SPLICES, CAPS, COMPRESSION FITTINGS, ETC. (DO NOT BEND TUBING AT CORNERS).



REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

DocuSigned by:
Alisa West
B5ED8BB569EE470...
12/7/2020

Texas Department of Transportation

WILLIAMSON

IRRIGATION DETAILS

SHEET 2 OF 2

© 2021		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0914	05	209	VARIOUS
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		23

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ITEM 193 LANDSCAPE ESTABLISHMENT

AFTER COMPLETION OF THE ITEM 192 MAINTENANCE PERIOD, AS SHOWN IN THE PLANS AND APPROVED BY THE ENGINEER, BEGIN ITEM 193 ESTABLISHMENT ACTIVITIES FOR A PERIOD OF 24 MONTHS.
REFERENCE ITEM 193 OF THE TEXAS STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS AND BRIDGES 2014 FOR SPECIFICATIONS, DIMENSION, VOLUMES AND MEASUREMENTS THAT ARE NOT SHOWN.
ALL ESTABLISHMENT WORK IS PAID FOR SEPARATELY IN ACCORDANCE WITH ITEM 193 UNLESS OTHERWISE SHOWN ON PLANS.
NOTIFY THE ENGINEER THREE DAYS PRIOR TO EACH SITE VISIT. DETERMINATION OF THE COMPLETENESS OF WORK FOR EACH SITE VISIT WILL BE DONE IN THE PRESENCE OF BOTH THE ENGINEER AND THE CONTRACTOR.

			DESCRIPTION OF WORK	TIMELINE (Days) Repeat as Necessary
				1 thru 7 | 8 thru 15 | 16 thru 22 | 23 thru 30 | 31 thru 37 | 38 thru 45 | 46 thru 52 | 53 thru 60 | 61 thru 67 | 68 thru 75 | 76 thru 82 | 83 thru 90 | 91 thru 97 | 98 thru 105 | 106 thru 112 | 113 thru 120 | 121 thru 127 | 128 thru 135 | 136 thru 142 | 143 thru 150 | 151 thru 157 | 158 thru 165 | 166 thru 172 | 173 thru 180 | 181 thru 187 | 188 thru 195 | 196 thru 202 | 203 thru 210 | 211 thru 217 | 218 thru 225 | 226 thru 232 | 233 thru 240 | 241 thru 247 | 248 thru 255 | 256 thru 262 | 263 thru 270 | 271 thru 277 | 278 thru 285 | 286 thru 292 | 293 thru 300 | 301 thru 307 | 308 thru 315 | 316 thru 322 | 323 thru 330 | 331 thru 338 | 339 thru 346 | 347 thru 354 | 355 thru 365
PLANT MAINTENANCE	EVERY TWO WEEKS	INSPECT & TREAT	NOTIFY THE ENGINEER AT FIRST SIGN OF INSECT, DISEASE, ANIMAL DAMAGE, THEFT, VANDALISM, OR GRAFFITI.	EVERY 2 WEEKS
		WEEDING	KEEP PLANTING BEDS FREE OF WEEDS AND INVASIVES. DO NOT USE STRING TRIMMERS NEAR PLANTS/TREES. ONLY USE WICKING METHOD TO APPLY HERBICIDE IN BED AREAS. REMOVE DEAD PLANTS FROM PROJECT SITE.	EVERY 2 WEEKS
		REMOVE LITTER	REMOVE LITTER FROM PLANTING BEDS, INCLUDING ANY MATERIAL CLINGING TO BRANCHES.	EVERY 2 WEEKS
	EVERY TWO TO FOUR WEEKS - SEASONAL	MOWING	PRIOR TO MOWING, REMOVE LITTER FROM MOWING AREA. MOW A 5 FOOT BORDER AROUND PLANT BEDS. MOW TO A HEIGHT OF 4 INCHES. - MOW EVERY TWO WEEKS FROM MAR. 1 TO OCT. 31. - MOW ONCE A MONTH FROM NOV. 1 TO FEB. 28.	EVERY 2 WEEKS MARCH 1 TO OCTOBER 31 EVERY 4 WEEKS NOVEMBER 1 TO FEBRUARY 28
	EVERY FOUR WEEKS	PLANT SUPPORTS	INSPECT AND REPAIR, ADJUST, OR ADD PLANT SUPPORTS TO KEEP TREES IN UPRIGHT POSITION. REPLACE TREES DAMAGED BY STAKING NEGLECT, AT CONTRACTOR'S EXPENSE.	EVERY 4 WEEKS
			REMOVE ALL TREE SUPPORTS AT THE END OF THE CONTRACT. (AT THE END OF ITEM 193).	REMOVE PLANT SUPPORTS AND SUPPORT MATERIALS AT END OF CONTRACT.
		PRUNING	MAINTAIN A NATURAL SHAPE. REMOVE SUCKER GROWTH FROM TRUNKS. TRIM TO REMOVE LIMBS THAT MAY IMPAIR VEHICLE, BICYCLE, OR PEDESTRIAN SAFETY.	EVERY 4 WEEKS
	EVERY 12 WEEKS	MULCH	APPLY MULCH AS REQUIRED TO MAINTAIN THE SPECIFIED DEPTH. KEEP MULCH 3" AWAY FROM TRUNKS.	EVERY 12 WEEKS
PLANT REPLACEMENT	AS DIRECTED	INSPECT & REPLACE	REPLACE DEAD, DAMAGED, OR MISSING PLANTS WITH THE SAME SIZE AND TYPE SPECIFIED IN THE PLANS, AS DIRECTED. PLANTS THAT ARE DEAD, DAMAGED, OR MISSING AS A RESULT OF THEFT, CONTRACTOR'S NEGLIGENCE, OR CONSTRUCTION ACTIVITIES WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE.	SCHEDULE PLANT REPLACEMENT AS DETERMINED BY THE ENGINEER.
IRRIGATION OPER. & MAINT.	EVERY TWO WEEKS	INSPECT	MONITOR IRRIGATION FOR LEAKS AND PROPER OPERATION. CHECK WATER DISTRIBUTION, SOIL MOISTURE, AND DRAINAGE.	EVERY 2 WEEKS
		MAINT.	MAINTAIN IRRIGATION SYSTEM ACCORDING TO ITEM 193. RE-BURY EXPOSED DRIP TUBING. REPLACE STRESSED, DAMAGED, OR DEAD PLANTS RESULTING FROM NEGLECT AT CONTRACTOR'S EXPENSE. IMMEDIATELY SHUT-DOWN THE SYSTEM IF DAMAGE OR LEAKS OCCUR. MAKE REPAIRS WITHIN TWO WEEKS OF SHUT DOWN. NOTIFY ENGINEER WHEN REPAIRS ARE MADE. REPLACE BATTERIES AS NEEDED.	EVERY 2 WEEKS

* = WORK REQUIRED DURING DEFINED PERIOD OF TIMELINE. ALL WORK MUST BE COMPLETED OVER ENTIRE PROJECT TO BE CONSIDERED COMPLETE.

IRRIGATION NOTES:

1. SUBMIT "AS-BUILT" IRRIGATION DRAWINGS BY MARKING IN RED, ALL LOCATIONS OF VALVES AND IRRIGATION DEVICES. SHOW ANY CHANGES IN PIPE ROUTING. PROVIDE "AS-BUILT" DRAWINGS ON 11"X17" PLAN SHEETS, PRODUCED AND SEALED BY A LICENSED IRRIGATOR, AND SUBMIT TO THE ENGINEER PRIOR TO CLOSING OUT PROJECT AND RECEIVING FINAL RETAINAGE.
2. BE AWARE OF TIME LIMITATIONS AND OTHER INFORMATION ON THE TEMPORARY HYDRANT WATER METER PERMITS ACQUIRED THROUGH LOCAL WATER AUTHORITIES. RE-APPLY FOR NEW PERMIT PRIOR TO THE EXPIRATION DATE, AS STATED ON THE PERMIT.

PLANTING NOTES:

1. ASSUME RESPONSIBILITY FOR KEEPING PLANTS AND TREES IN A HEALTHY, GROWING CONDITION AND THE IRRIGATION SYSTEM FUNCTIONING.
2. REPLACE DEAD OR UNACCEPTABLE PLANT MATERIAL, CORRECT IRRIGATION PROBLEMS, REPLACE DAMAGED, FAILED, OR DEFICIENT EQUIPMENT AND/OR MATERIALS, AND CORRECT UNACCEPTABLE WORKMANSHIP, AS DIRECTED. FAILURE TO COMPLY WILL RESULT IN FORFEITED PAYMENTS.
3. PLANT MATERIAL THAT IS IN DORMANCY WILL NOT BE EVALUATED UNTIL OTHER PLANTS OF SAME SPECIES ARE LEAFED-OUT. REMOVAL AND DISPOSAL OF DAMAGED OR REJECTED MATERIAL IS INCIDENTAL TO ITEM 192.
4. PLANTS OR WORK THAT IS DAMAGED BY ACTIONS DESCRIBED IN ITEM 7.18.1. WILL BE REIMBURSED IN ACCORDANCE WITH THAT ITEM, AS DIRECTED. THEFT IS NOT A REIMBURSABLE REPAIR.
5. CHEMICAL FERTILIZATION IS NOT INCLUDED AS PART OF THIS CONTRACT.
6. REMOVAL AND DISPOSAL OF DAMAGED OR REJECTED MATERIAL IS INCIDENTAL TO THE VARIOUS BID ITEMS.

REGISTERED LANDSCAPE ARCHITECT ALISA M. WEST 3187 STATE OF TEXAS

DocuSigned by: Alisa West 25ED9BD569EE470...
12/7/2020

Texas Department of Transportation

WILLIAMSON

LANDSCAPE ESTABLISHMENT

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	0914	05	209	VARIOUS
		DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		24

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DATE:
FILE:

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 848-9545
Crossing Type:** AT GRADE
RR Company Owning Track at Crossing: GEORGETOWN RAILROAD COMPANY (GRR)
Operating RR Company at Track: GRR
RR MP: 7.80
RR Subdivision: SYSTEM
City: GEORGETOWN
County: WILLIAMSON
CSJ at this Crossing: 0914-05-209
Highway/Roadway name crossing the railroad: IH 35 NBFR
# of regularly scheduled trains per day at this crossing: 2
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:

LANDSCAPE WORK OFF ROW

Scope of Work at this Crossing to Be Performed by Railroad Company:

NONE

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

NONE

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 0
On this project, night or weekend flagging is:

☐ Expected
☒ Not Expected

Flagging services will be provided by:

☐ Railroad Company: TxDOT will pay flagging invoices
☒ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☒ OTHERS Mark Dixon
512-496-5131 CELL ; 512-863-2538
5300 I-35, Georgetown, TX 78626
gtownrailroad@msn.com

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

☐ Required
☒ Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit

Railroad Protective Liability

☒ Not Required
☐ Non - Bridge Projects $2,000,000 / $6,000,000
☐ Bridge Projects $5,000,000 / $10,000,000
☐ Other

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

☒ Not Required
☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
☐ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: _____

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

http://www.txdot.gov/inside-txdot/division/rail/samples.html

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☒ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call GEORGETOWN RAILROAD EMERGENCY LINE
AT 512-863-2538
IH 35 NBFR AT SE INNER LOOP
DOT# : 848-9545
RR MO: 7.8
RR Subdivision: NONE

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	05	209	VA
3/2020	DIST	COUNTY		SHEET NO.
	14	WILLIAMSON		25

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0914	05	209	VARIOUS
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		26

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0914	05	209	VARIOUS
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		27

DATE: 12/9/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\0914052094 - Design\Plan Set\9. Environmental\WILLIAMSON_ENV_EPIC.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. AUSTIN NOI

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000

2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.

3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.

4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

IV. VEGETATION RESOURCES

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

☐ No Action Required ☒ Required Action

Action No.

1. During construction, the Contractor should avoid impacts to woody vegetation. Tree and brush trimming, cutting, and removal will be kept to a minimum and implemented only when necessary to complete project work.

2. Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided to the greatest extent practicable. This includes areas within the existing ROW, but outside construction limits.

3. If revegetation is needed, disturbed areas would be revegated according to TXDOT's standard practices, which to the extent practicable, complies with Executive Memorandum on Environmentally and Economically Beneficial Landscaping.

4. Any revegetation of disturbed areas would be in compliance with the Executive Order on Invasive Species (EO 13112). Regionally native and non-invasive plants will be used to the extent practable in landscaping and revegetation.

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. Since this project involves vegetation which could contain nesting birds, the following general note for migratory birds should also be added to the plans:

The contractor's attention is directed to the fact that there is the possibility that migratory birds may be nesting in any woody vegetation or existing structures within the project limits. The contractor shall remove all woody vegetation, and old migratory bird nests from any structures, between September 16 and February 28 while any nests are not occupied by a bird. In addition, the contractor must be prepared to prevent migratory birds from re-nesting on any structures between March 1 and September 15. All methods must be approved by a qualified professional well in advance of planned use.

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

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

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

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

☐ Yes ☒ No

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

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

☐ Yes ☒ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1. This site is located over the Edwards Aquifer Contributing Zone. The protected turf areas are designated water quality treatment areas. No soil disturbing activities, such as excavation, storing, or stockpiling of materials, or any other activities are authorized, which will prevent the protected turf area to function as designed. While work at the site is occurring, the borders of the protected turf ares should be deliniated using flagging, stakes, mulch rolls, or any other barrier to prevent accidental encroachment.

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)	0914	05	209	VARIOUS
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	AUS	WILLIAMSON		28

A. GENERAL SITE DATA

1. PROJECT LIMITS:
IH 35 @ SE INNER LOOP
RM 1460 @ QUAIL VALLEY DR.
US 79 FROM A.W. GRIMES BLVD TO SH 130

PROJECT LOCATION:
IH 35- LAT: 30.60805556 LONG: -97.68583333
RM 1460- LAT: 30.62138889 LONG: -97.67166667

2. PROJECT SITE MAPS:
* PROJECT LOCATION MAP: **TITLE SHEET**
* DRAINAGE PATTERNS: **SITE LAYOUT SHEET**
* SLOPES ANTICIPATED AFTER MAJOR GRADINGS OR AREAS OF SOIL DISTURBANCE: **NO CHANGES TO EXISTING GRADE**
* LOCATION OF EROSION AND SEDIMENT CONTROLS: **SITE LAYOUT SHEET**
* SURFACE WATERS AND DISCHARGE LOCATIONS: **SITE LAYOUT SHEET**
* PROJECT SPECIFIC LOCATIONS: TO BE SPECIFIED BY THE PROJECT FIELD OFFICE DURING CONSTRUCTION AND LOCATED IN THE PROJECT SW3P FILE. REFERENCE ITEM #10 BELOW

3. PROJECT DESCRIPTION: **LANDSCAPE AND IRRIGATION**

4. MAJOR SOIL DISTURBING ACTIVITIES:
INSTALL PLANTING BEDS, INSTALL IRRIGATION SYSTEM, WILDFLOWER SEEDING.

5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:
N/A

6. TOTAL PROJECT AREA: **2.94 ACRES**

7. TOTAL AREA TO BE DISTURBED: **0.80 ACRES**

8. WEIGHTED RUNOFF COEFFICIENT
BEFORE CONSTRUCTION: **N/A**
AFTER CONSTRUCTION: **N/A**

9. NAME OF RECEIVING WATERS: (SEGMENT NUMBER OF RECEIVING WATERS)
N/A

10. PROJECT SW3P FILE: FOR PROJECTS DISTURBING ONE ACRE OR MORE, TXDOT WILL MAINTAIN AN SW3P FILE WITH ALL PERTINENT ENVIRONMENTAL DOCUMENTS, CORRESPONDENCE, ETC. AT THE PROJECT FIELD OFFICE. IF NO FIELD OFFICE IS AVAILABLE THEN THE SW3P FILE SHALL BE KEPT IN THE INSPECTOR'S TRUCK.

B. EROSION AND SEDIMENT CONTROLS

1. SOIL STABILIZATION PRACTICES:

___ TEMPORARY SEEDING
__X__ PERMANENT PLANTING, SODDING, OR SEEDING
___ MULCHING
___ SOIL RETENTION BLANKET
___ BUFFER ZONES
__X__ PRESERVATION OF NATURAL RESOURCES

OTHER:

2. STRUCTURAL PRACTICES:

__X__ SILT FENCES
___ ROCK FILTER DAMS
___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
___ DIVERSION DIKE AND SWALE COMBINATIONS
___ PIPE SLOPE DRAINS
___ PAVED FLUMES
___ ROCK BEDDING AT CONSTRUCTION EXIT
___ TIMBER MATTING AT CONSTRUCTION EXIT
___ CHANNEL LINERS
___ SEDIMENT TRAPS
___ SEDIMENT BASINS
___ STORM INLET SEDIMENT TRAP
___ STONE OUTLET STRUCTURES
___ CURBS AND GUTTERS
___ STORM SEWERS
___ VELOCITY CONTROL DEVICES

OTHER: **SAND BAGS AT CURB INLETS**
BIODEGRADABLE EROSION CONTROL LOGS

3. STORM WATER MANAGEMENT:
STORM WATER DRAINAGE WILL BE PROVIDED BY **SHEET FLOW**
THIS SYSTEM WILL CARRY THE DRAINAGE WITHIN THE RIGHT-OF-WAY TO **CURB**

4. STORM WATER MANAGEMENT ACTIVITIES: (SEQUENCE OF CONSTRUCTION)
1. **PLACE EROSION CONTROL DEVICES**
2. **MAINTAIN EROSION CONTROL DEVICES**
3. **REMOVE EROSION CONTROL DEVICES AFTER CONSTRUCTION**

5. NON-STORM WATER DISCHARGES:
FILTER NON-STORM WATER DISCHARGES, OR HOLD RETENTION BASINS, BEFORE BEING ALLOWED TO MIX WITH STORM WATER. THESE DISCHARGES CONSIST OF NON-POLLUTED GROUND WATER, SPRING WATER, FOUNDATION AND/OR FOOTING DRAIN WATER; AND WATER USED FOR DUST CONTROL, PAVEMENT WASHING AND VEHICLE WASHWATER CONTAINING NO DETERGENTS.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:
MAINTENANCE WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.

2. INSPECTION:
INSPECTION WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.

3. WASTE MATERIALS:
ALL WASTE MATERIALS WILL BE COLLECTED, STORED AND DISPOSED OF IN A LEGAL AND PROPER MANNER. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE.

4. HAZARDOUS WASTE (INCLUDING SPILL REPORTING):
AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS. PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR MUST BE CONTACTED IMMEDIATELY.

5. SANITARY WASTE:
ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

OFFSITE VEHICLE TRACKING:

__X__ HAUL ROADS DAMPENED FOR DUST CONTROL
__X__ LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
__X__ EXCESS DIRT ON ROAD REMOVED DAILY
__X__ STABILIZED CONSTRUCTION ENTRANCE

OTHER:

REMARKS: DISPOSAL AREAS, STOCKPILES AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL SEDIMENT FROM ENTERING RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WATERBODY OR STREAMBED.

CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED TO MINIMIZE THE RUNOFF OF POLLUTANTS.

REGISTERED LANDSCAPE ARCHITECT
ALISA M. WEST
3187
STATE OF TEXAS

Digitally Signed by:
Alisa West
B5ED8BB569EE470...
12/10/2020

Texas Department of Transportation

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	0914	05	209	VARIOUS
		DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		29

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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.

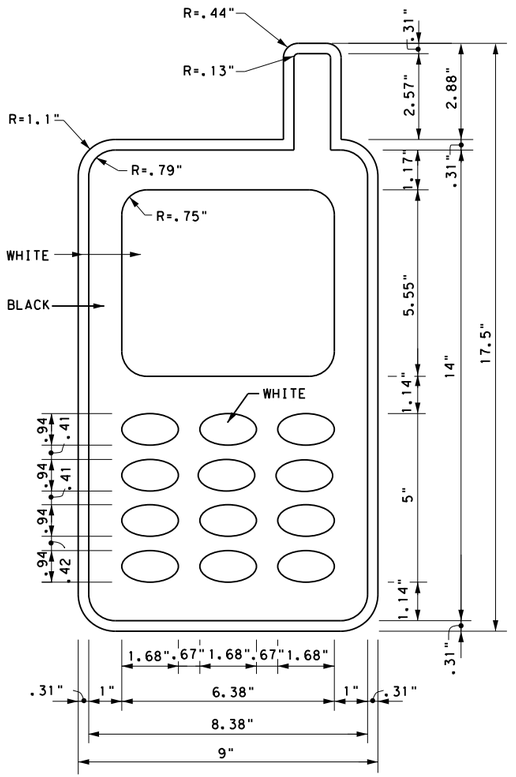
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

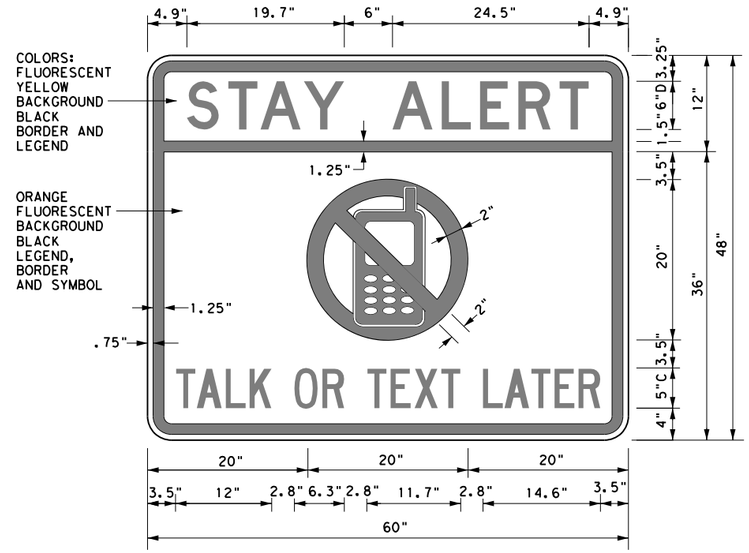
12. The Engineer has the final decision on the location of all traffic control devices.

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	0914	05	209	VARIOUS
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13	AUS	WILLIAMSON		30

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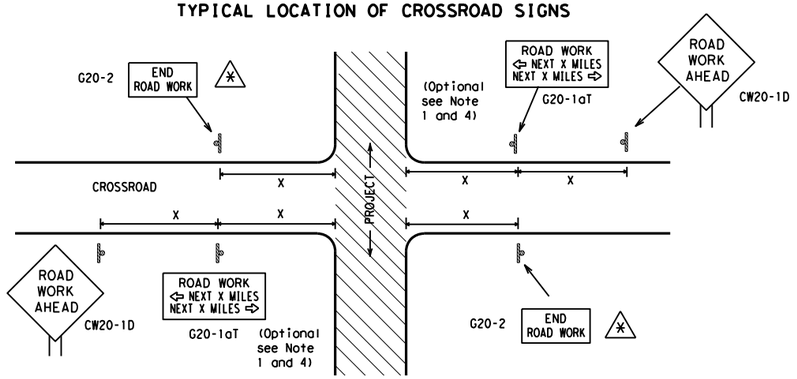
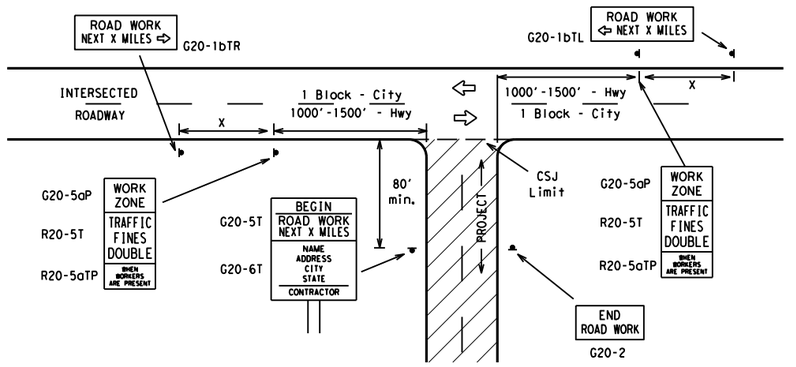
TYPICAL LOCATION OF CROSSROAD SIGNS



(*) 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" (Δ)
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]

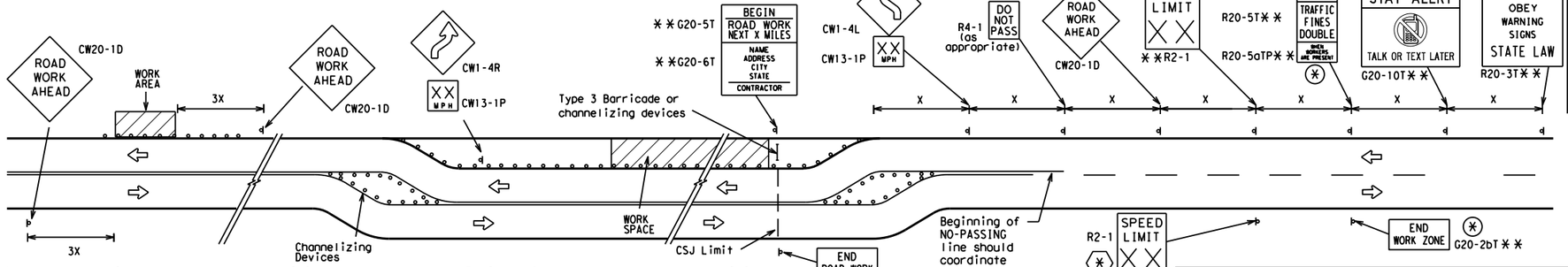
(*) For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

Δ 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.

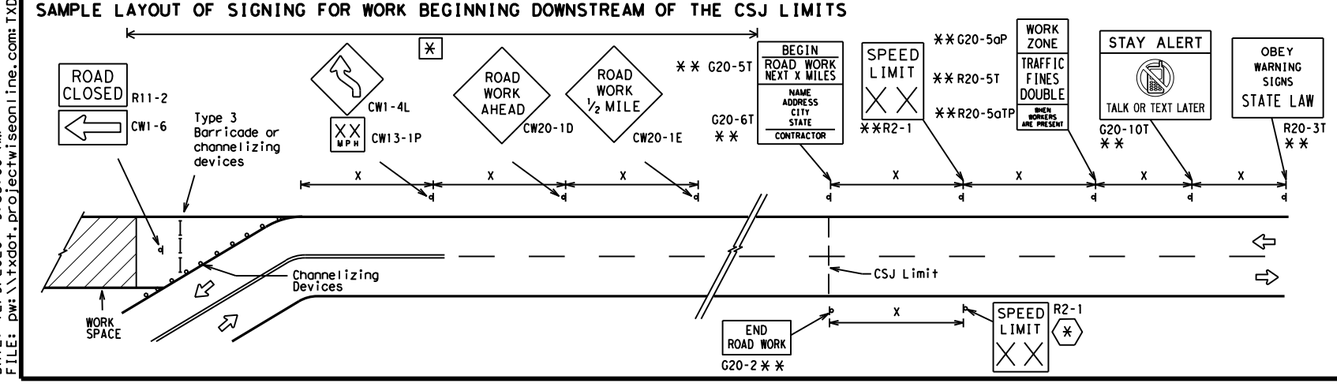
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

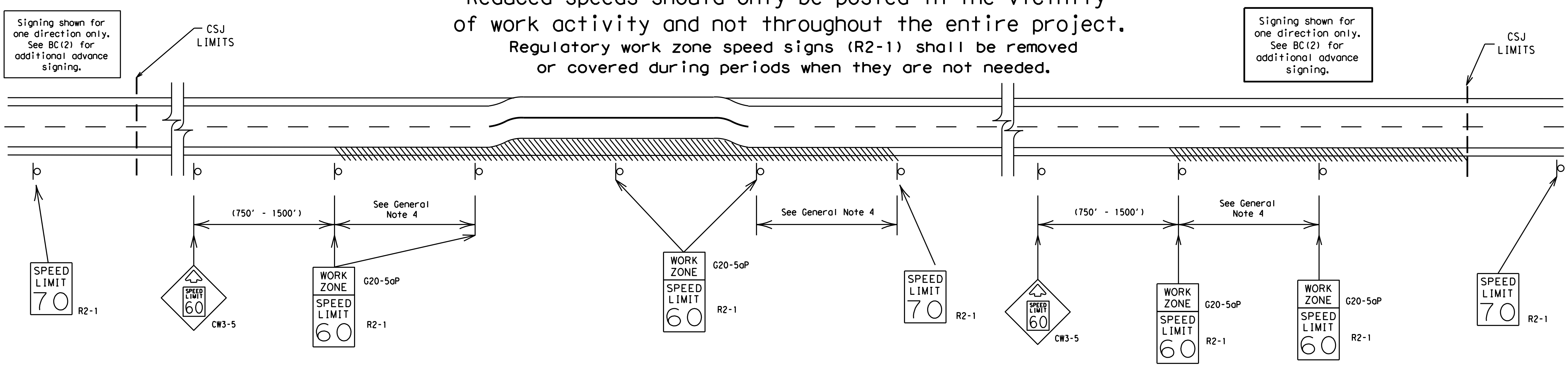
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	05	209	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	WILLIAMSON		31

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the travelled way.

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

GENERAL NOTES

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

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

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© TxDOT November 2002	CONT 0914	SECT 05	JOB 209	HIGHWAY VARIOUS
REVISIONS 9-07 8-14 7-13	DIST AUS	COUNTY WILLIAMSON		SHEET NO. 32

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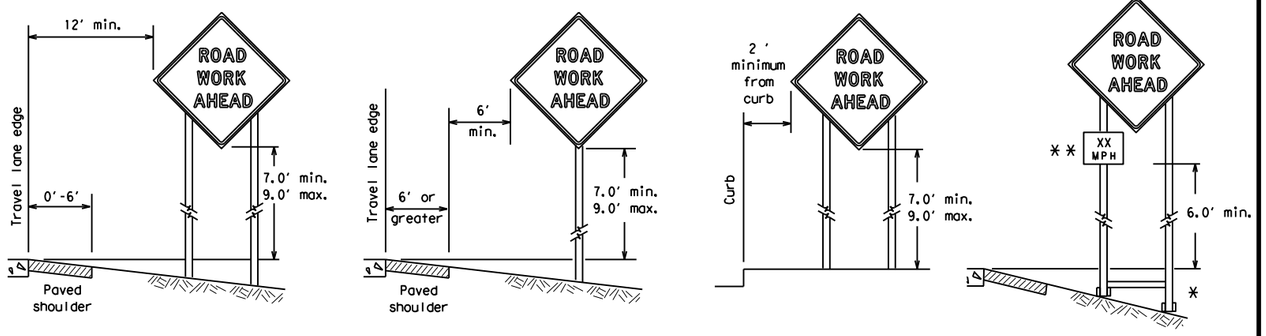
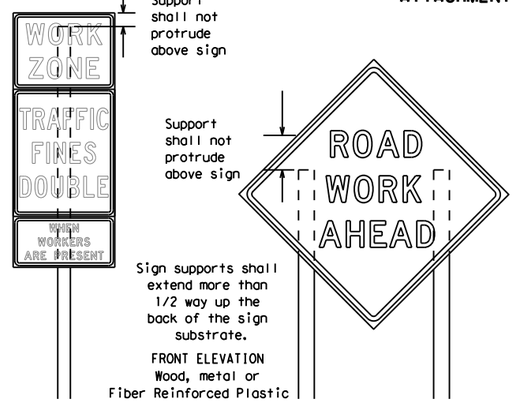
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



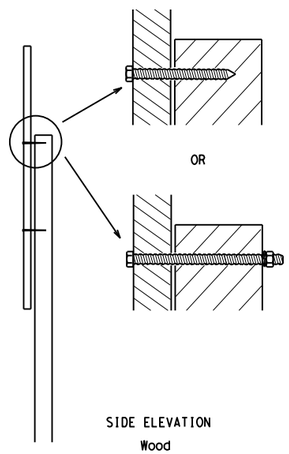
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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.

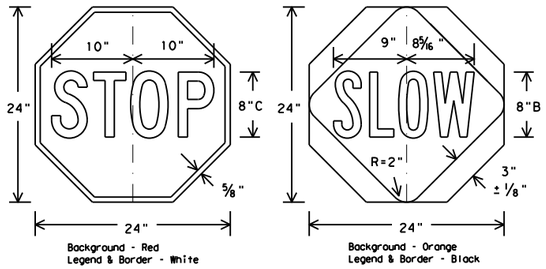


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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
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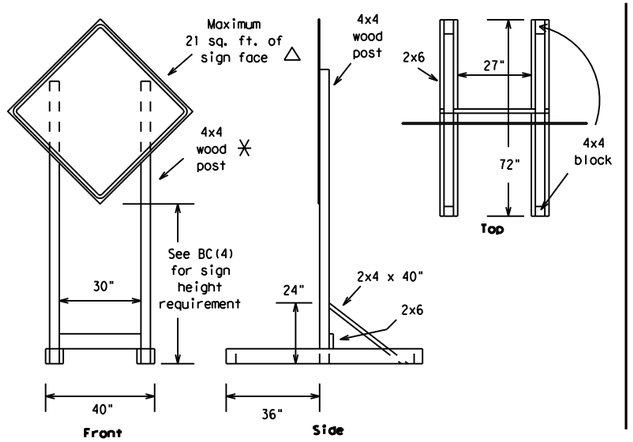
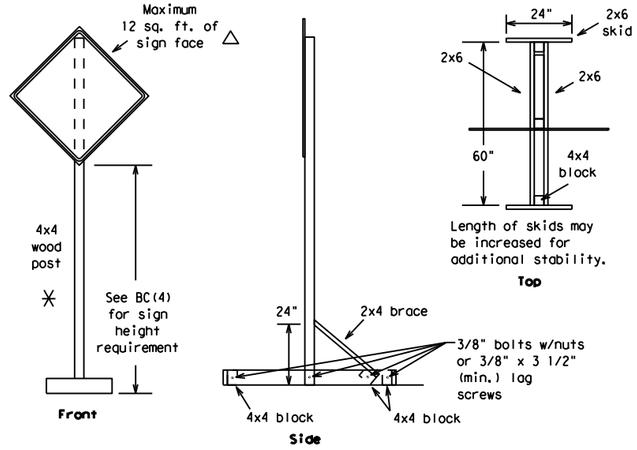
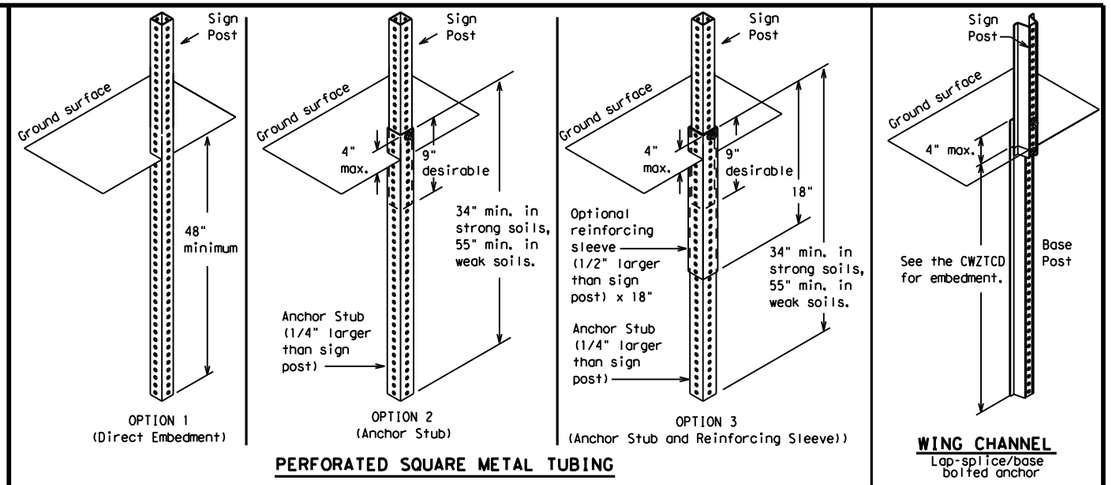




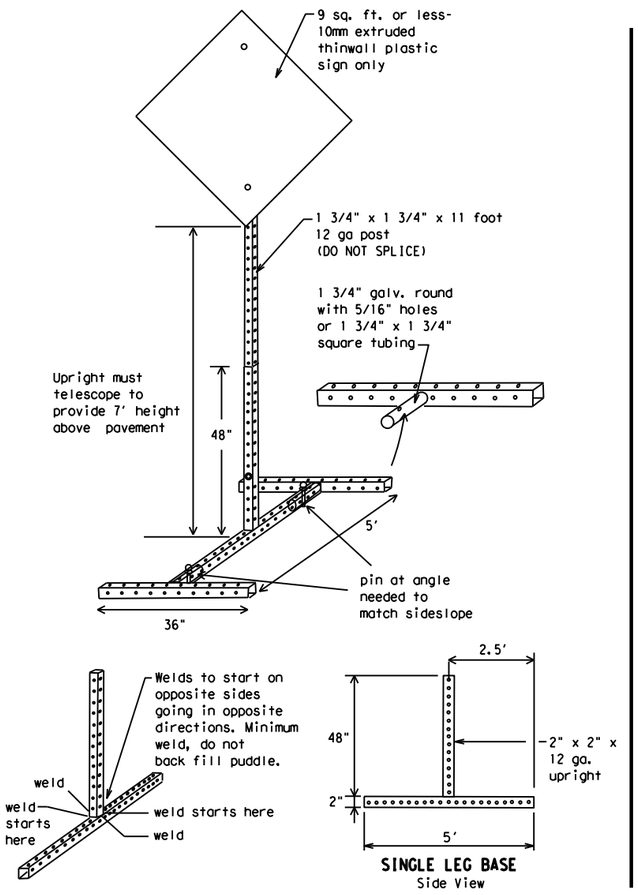
SKID MOUNTED WOOD SIGN SUPPORTS

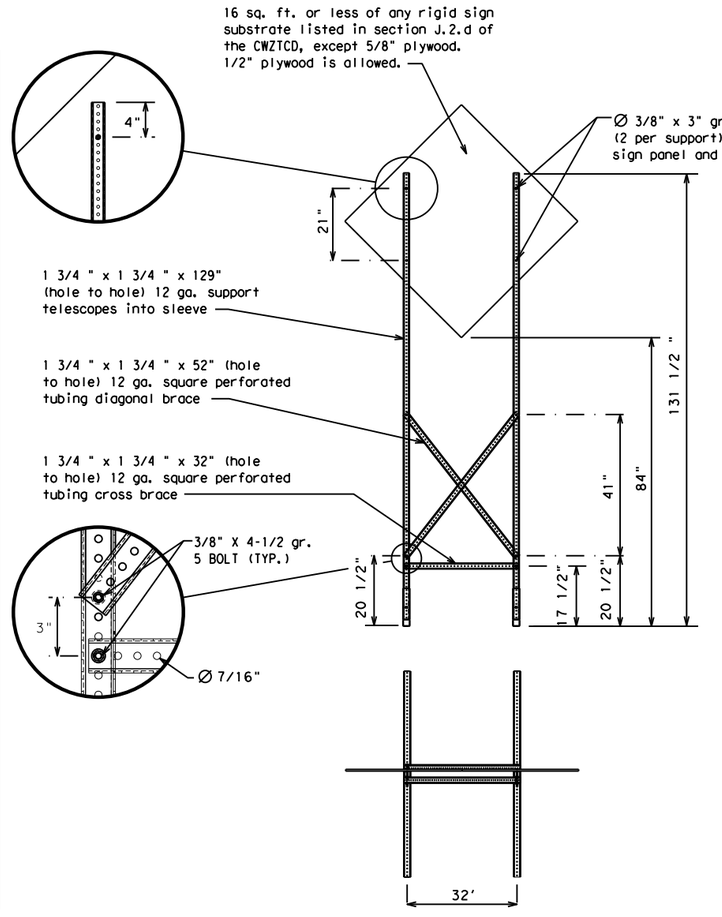
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

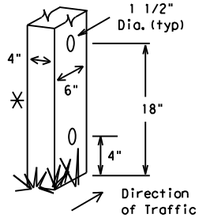


GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.

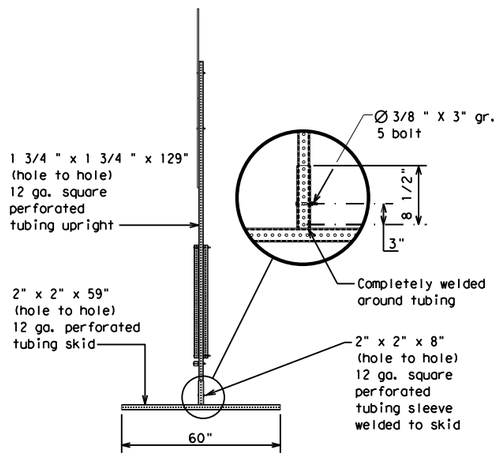






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation — Traffic Operations Division Standard

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	WILLIAMSON		34

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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

Roadway designation * IH-number, US-number, SH-number, FM-number

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- FREEWAY CLOSED X MILE
- FRONTAGE ROAD CLOSED
- ROAD CLOSED AT SH XXX
- SHOULDER CLOSED XXX FT
- ROAD CLSD AT FM XXXX
- RIGHT LN CLOSED XXX FT
- RIGHT X LANES CLOSED
- RIGHT X LANES OPEN
- CENTER LANE CLOSED
- DAYTIME LANE CLOSURES
- NIGHT LANE CLOSURES
- I-XX SOUTH EXIT CLOSED
- VARIOUS LANES CLOSED
- EXIT XXX CLOSED X MILE
- EXIT CLOSED
- RIGHT LN TO BE CLOSED
- MALL DRIVEWAY CLOSED
- X LANES CLOSED TUE - FRI
- XXXXXXXX BLVD CLOSED

Other Condition List

- ROADWORK XXX FT
- ROAD REPAIRS XXXX FT
- FLAGGER XXXX FT
- LANE NARROWS XXXX FT
- RIGHT LN NARROWS XXXX FT
- TWO-WAY TRAFFIC XX MILE
- MERGING TRAFFIC XXXX FT
- CONST TRAFFIC XXX FT
- LOOSE GRAVEL XXXX FT
- UNEVEN LANES XXXX FT
- DETOUR X MILE
- ROUGH ROAD XXXX FT
- ROADWORK PAST SH XXXX
- ROADWORK NEXT FRI-SUN
- BUMP XXXX FT
- US XXX EXIT X MILES
- TRAFFIC SIGNAL XXXX FT
- LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

- MERGE RIGHT
- FORM X LINES RIGHT
- DETOUR NEXT X EXITS
- USE XXXXX RD EXIT
- USE EXIT XXX
- USE EXIT I-XX NORTH
- STAY ON US XXX SOUTH
- USE I-XX E TO I-XX N
- TRUCKS USE US XXX N
- WATCH FOR TRUCKS
- WATCH FOR TRUCKS
- EXPECT DELAYS
- EXPECT DELAYS
- PREPARE TO STOP
- REDUCE SPEED XXX FT
- END SHOULDER USE
- USE OTHER ROUTES
- WATCH FOR WORKERS
- STAY IN LANE *

Location List

- AT FM XXXX
- BEFORE RAILROAD CROSSING
- NEXT X MILES
- PAST US XXX EXIT
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

- SPEED LIMIT XX MPH
- MAXIMUM SPEED XX MPH
- MINIMUM SPEED XX MPH
- ADVISORY SPEED XX MPH
- RIGHT LANE EXIT
- USE CAUTION
- DRIVE SAFELY
- DRIVE WITH CARE

** Advance Notice List

- TUE-FRI XX AM- X PM
- APR XX-XX X PM-X AM
- BEGINS MONDAY
- BEGINS MAY XX
- MAY X-X XX PM - XX AM
- NEXT FRI-SUN
- XX AM TO XX PM
- NEXT TUE AUG XX
- TONIGHT XX PM- XX AM

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

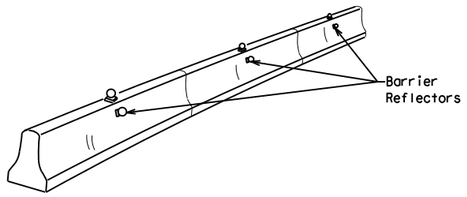
BC(6)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	05	209	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	WILLIAMSON		35

100

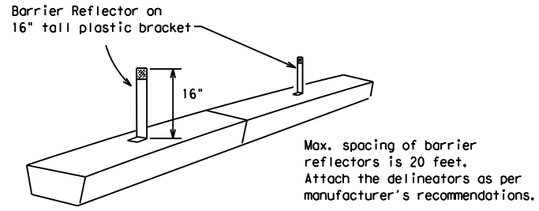
DATE: 12/9/2020 9:35:08 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\091405209\4 - Design\Plan Set\10. Miscellaneous\Standard Sheets\bc-14.dgn

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

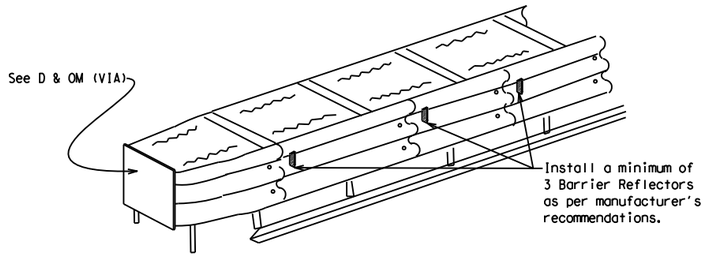


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

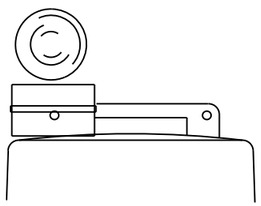


DELINEATION OF END TREATMENTS

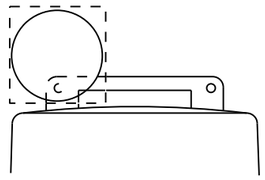
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

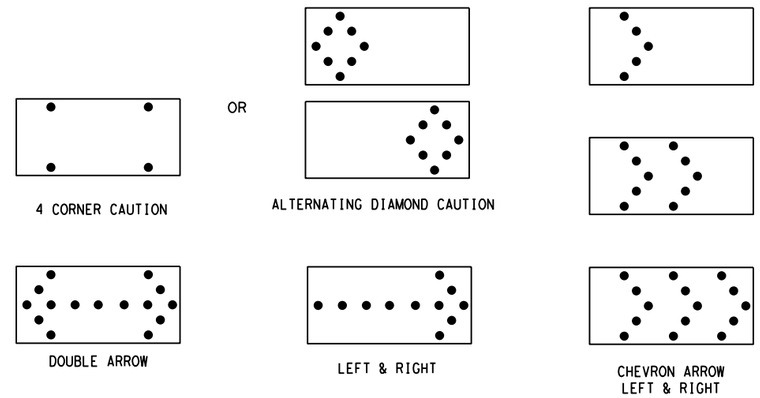
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Operations Division Standard

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

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	05	209	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	WILLIAMSON		36

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FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\091405209\14 - Design\Plan Set\10. Miscellaneous\Standard Sheets\bc-14.dgn

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:

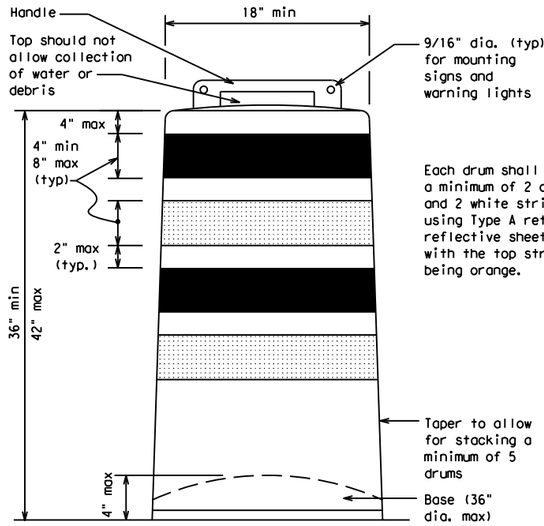
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

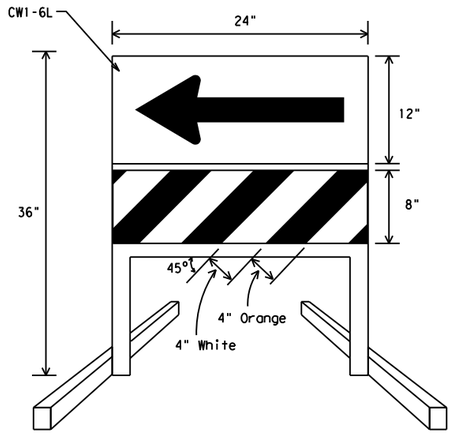
RETROREFLECTIVE SHEETING

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

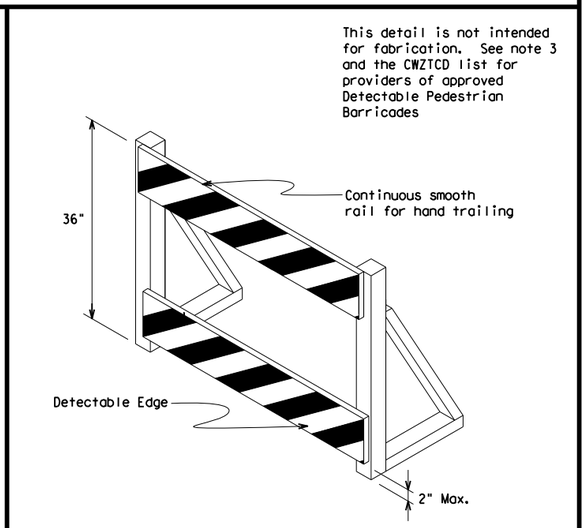
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other 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.





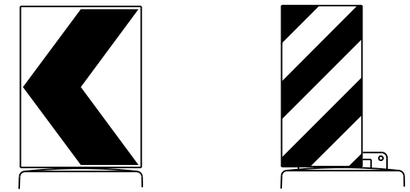
DIRECTION INDICATOR BARRICADE

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

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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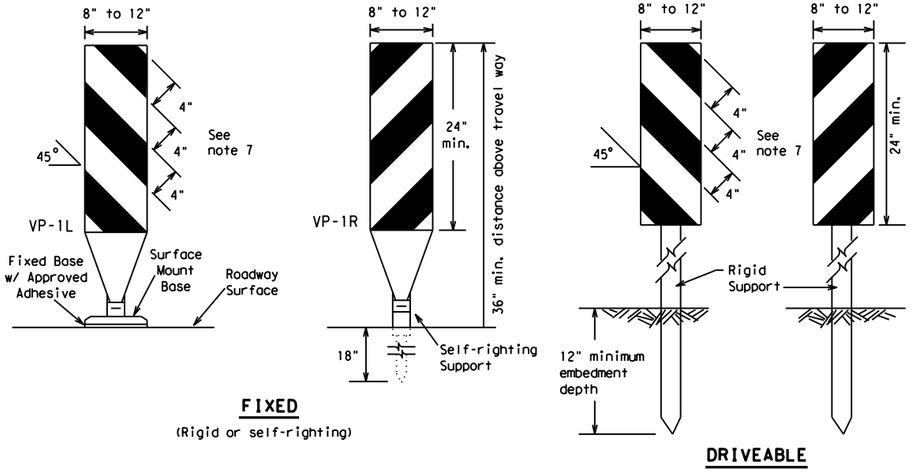
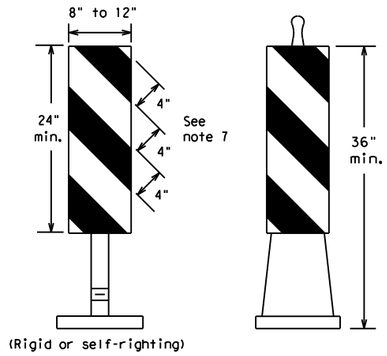


FIXED
(Rigid or self-righting)

DRIVEABLE

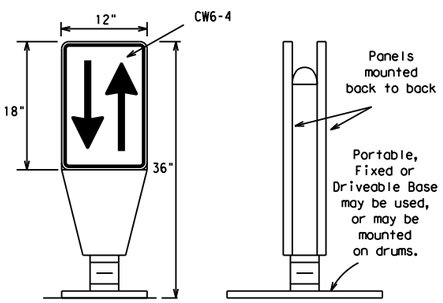


(Rigid or self-righting)

PORTABLE

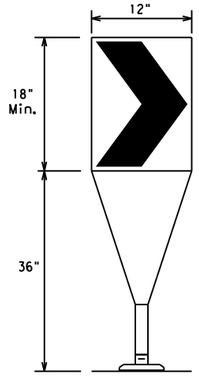
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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)



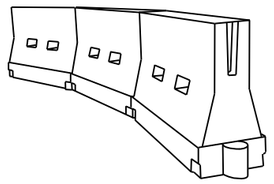
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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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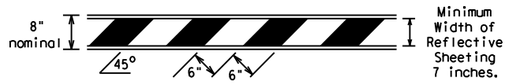
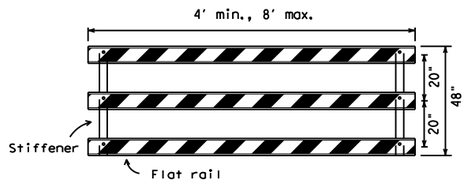
TYPE 3 BARRICADES

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.



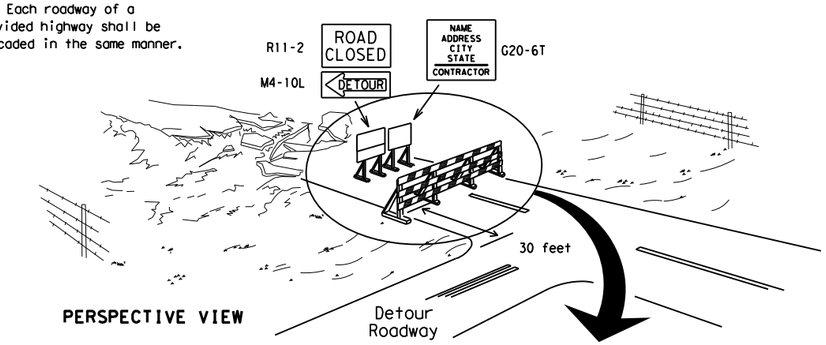
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

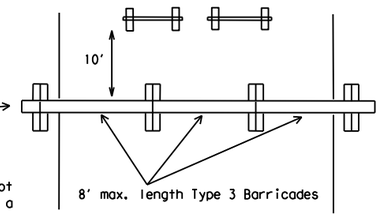
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

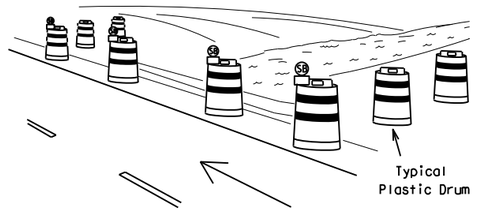
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

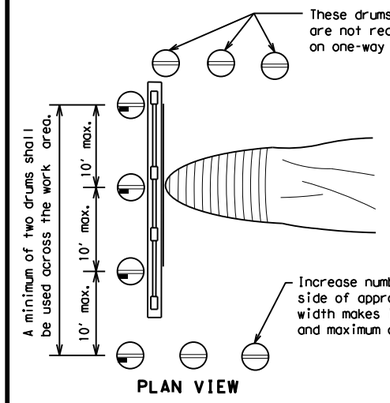
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

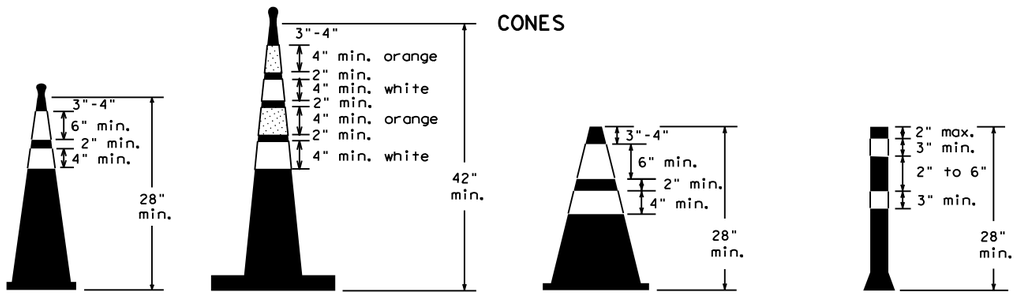
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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

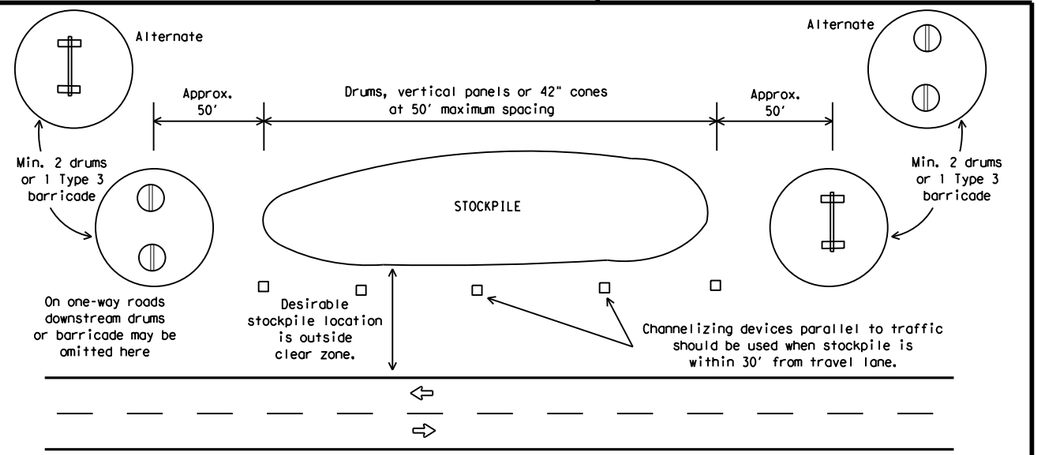
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

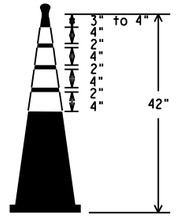
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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.

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BC(10)-14

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	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		39

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.

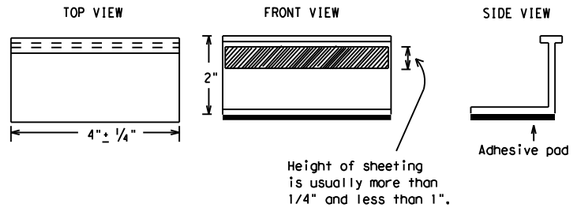
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

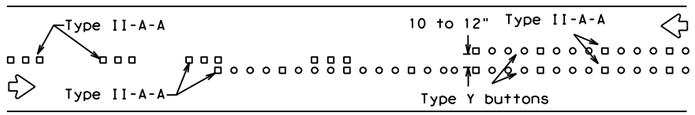
BC(11)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	05	209	VARIOUS
2-98 9-07	DIST	COUNTY		SHEET NO.
1-02 7-13	AUS	WILLIAMSON		40
11-02 8-14				

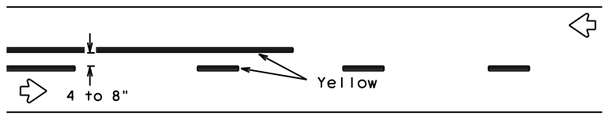
105

PAVEMENT MARKING PATTERNS

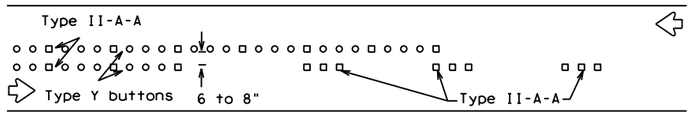
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



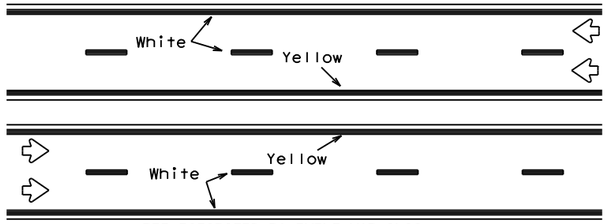
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



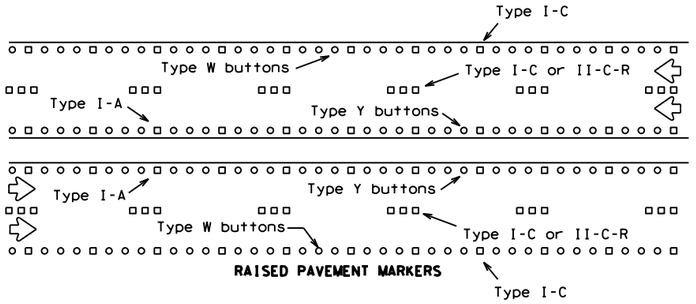
RAISED PAVEMENT MARKERS - PATTERN B

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

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



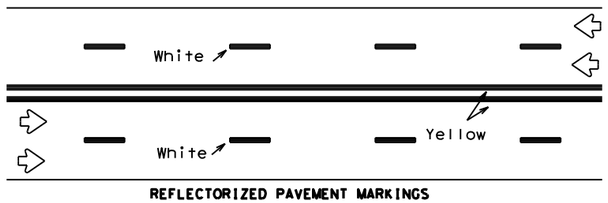
REFLECTORIZED PAVEMENT MARKINGS



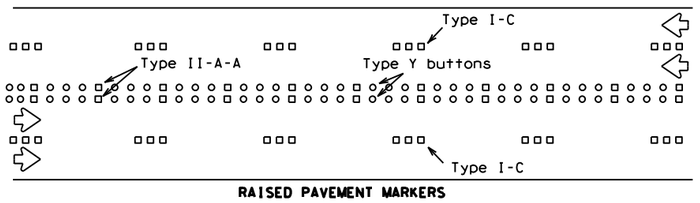
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



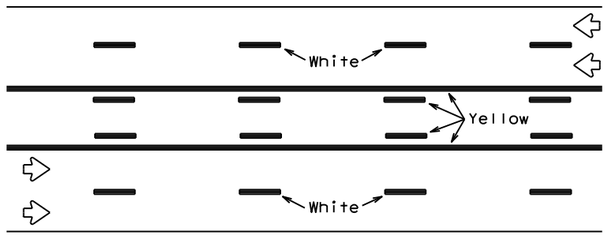
REFLECTORIZED PAVEMENT MARKINGS



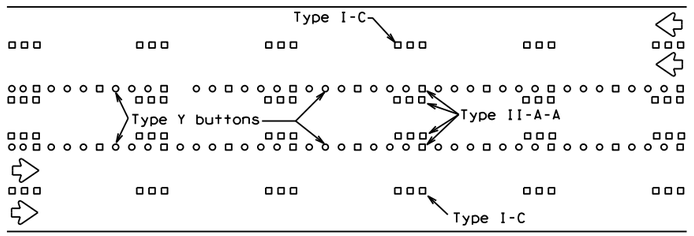
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

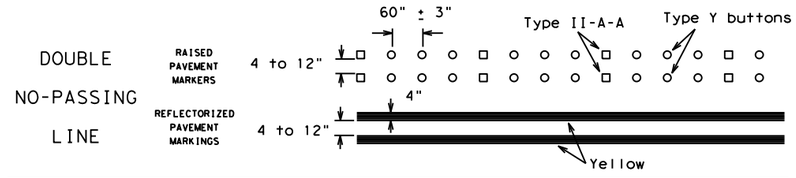
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

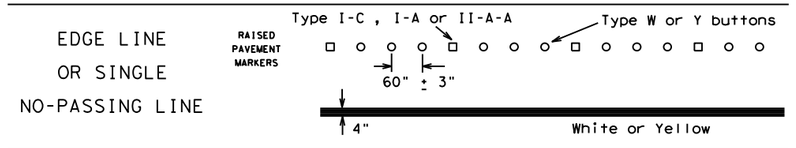
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

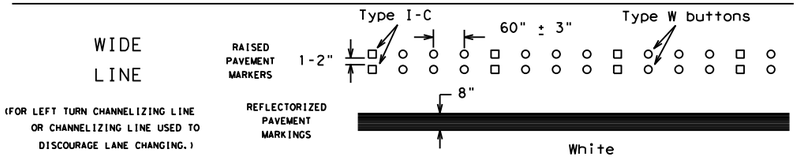


EDGE LINE OR SINGLE NO-PASSING LINE



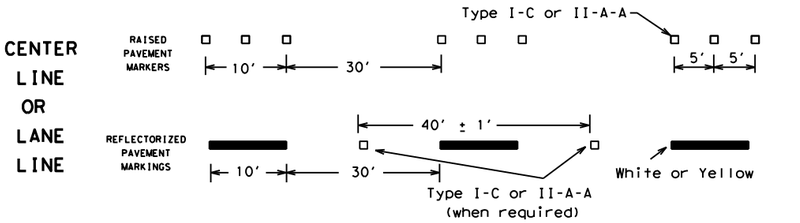
WIDE LINE

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

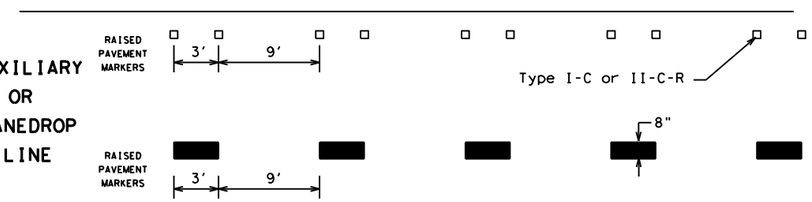


BROKEN LINES

CENTER LINE OR LANE LINE

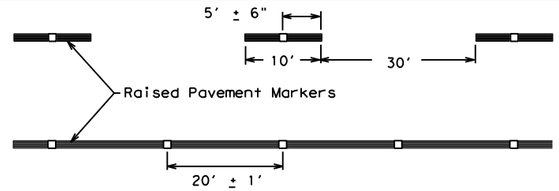


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	05	209	VARIOUS
1-97 9-07	DIST	COUNTY		SHEET NO.
2-98 7-13	AUS	WILLIAMSON		41
11-02 8-14				

DATE: 12/9/2020 9:35:24 AM
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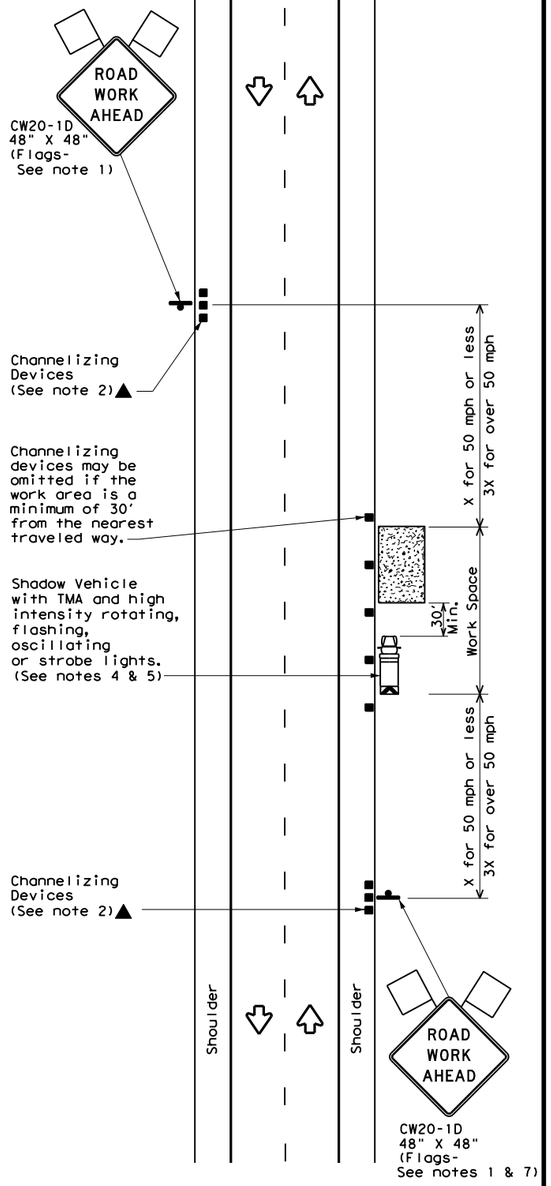
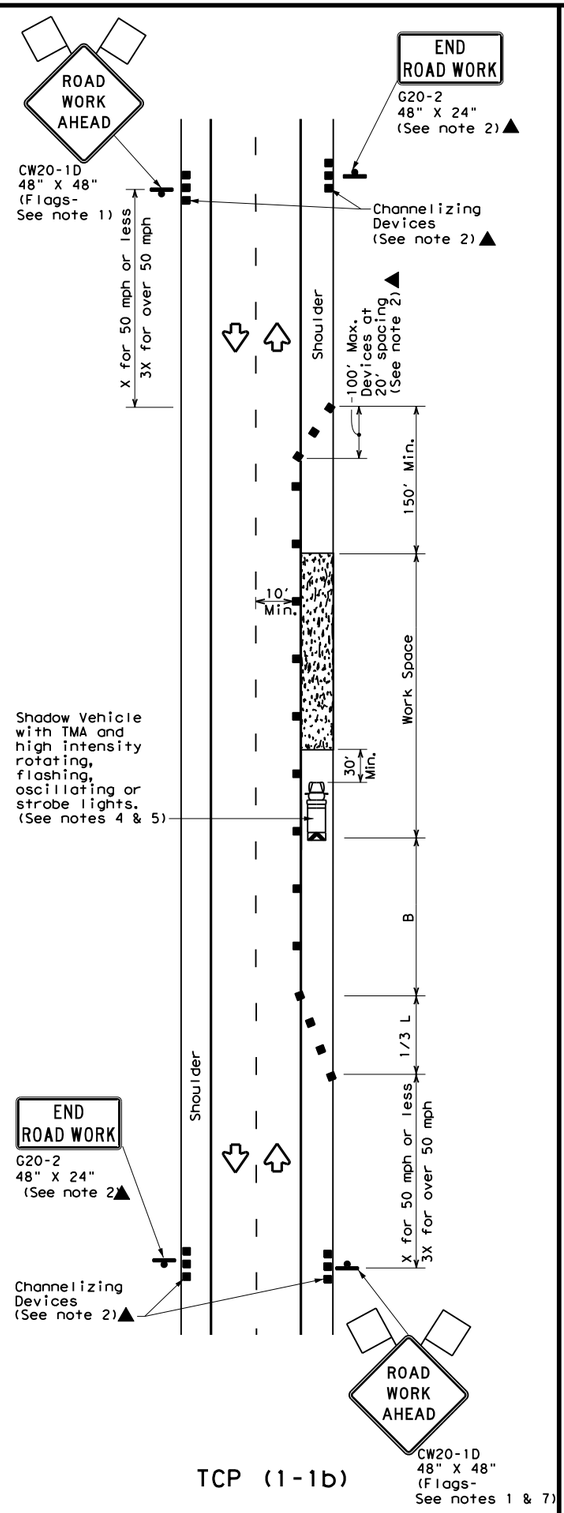


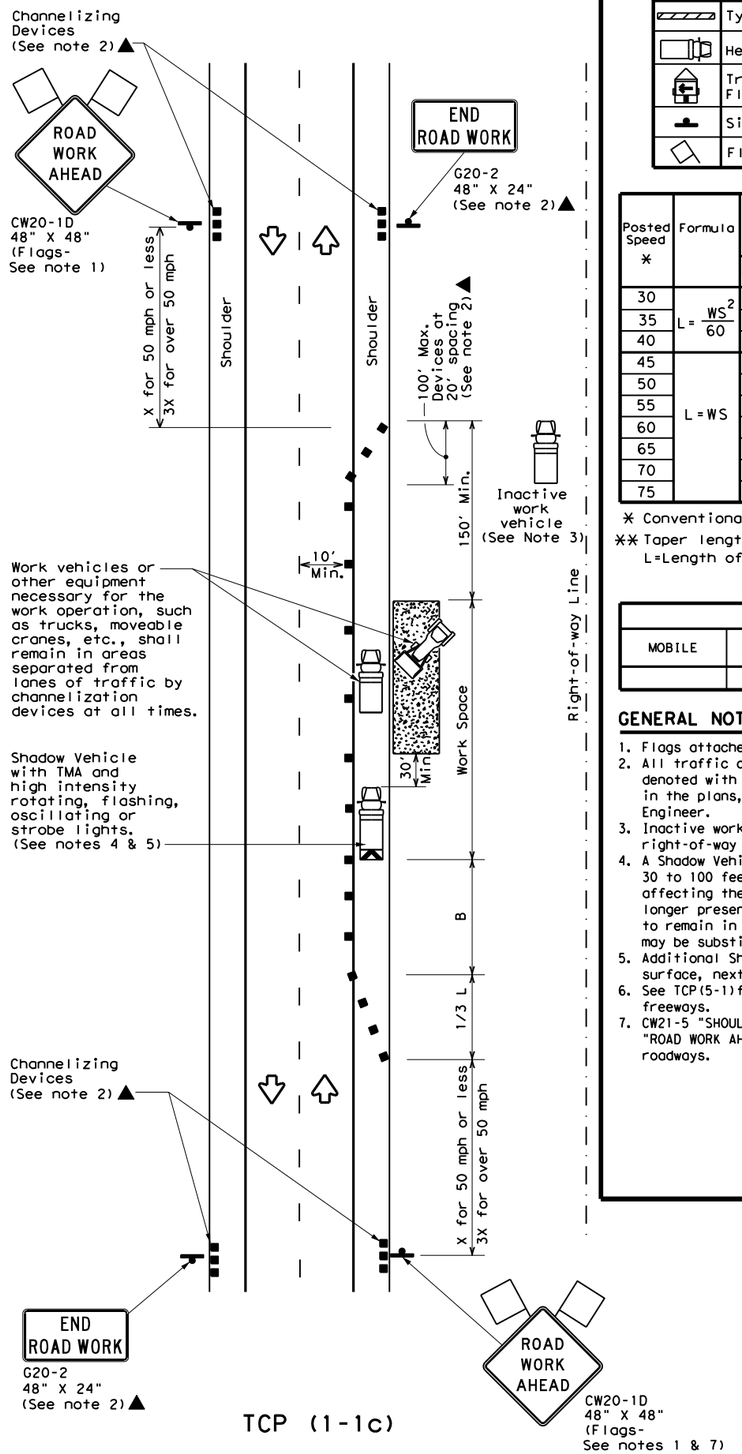
TCP (1-1a)

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 2-94 4-98	0914	05	209	VARIOUS
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	AUS	WILLIAMSON		42

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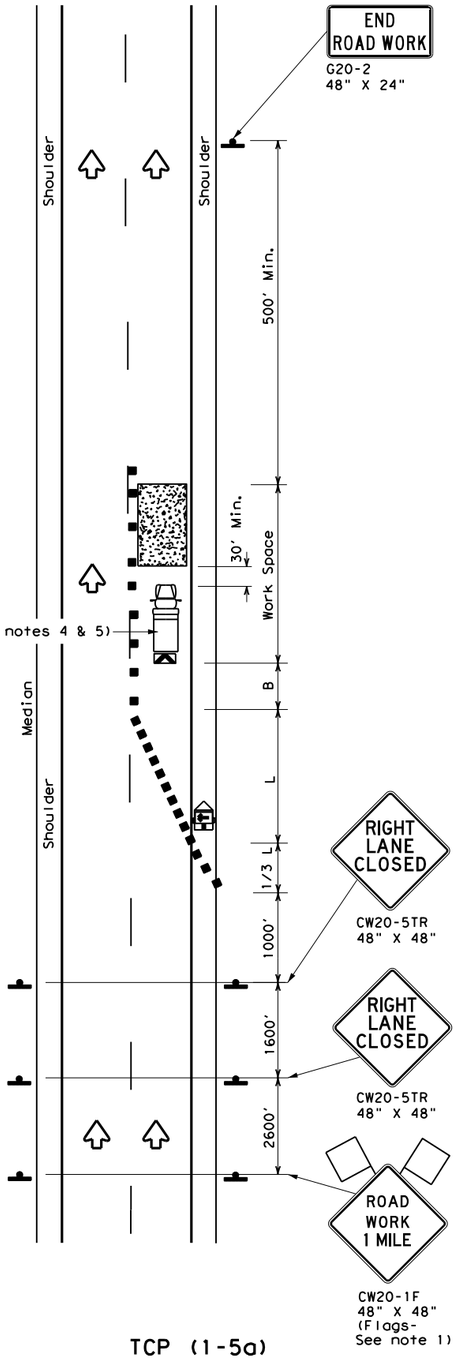
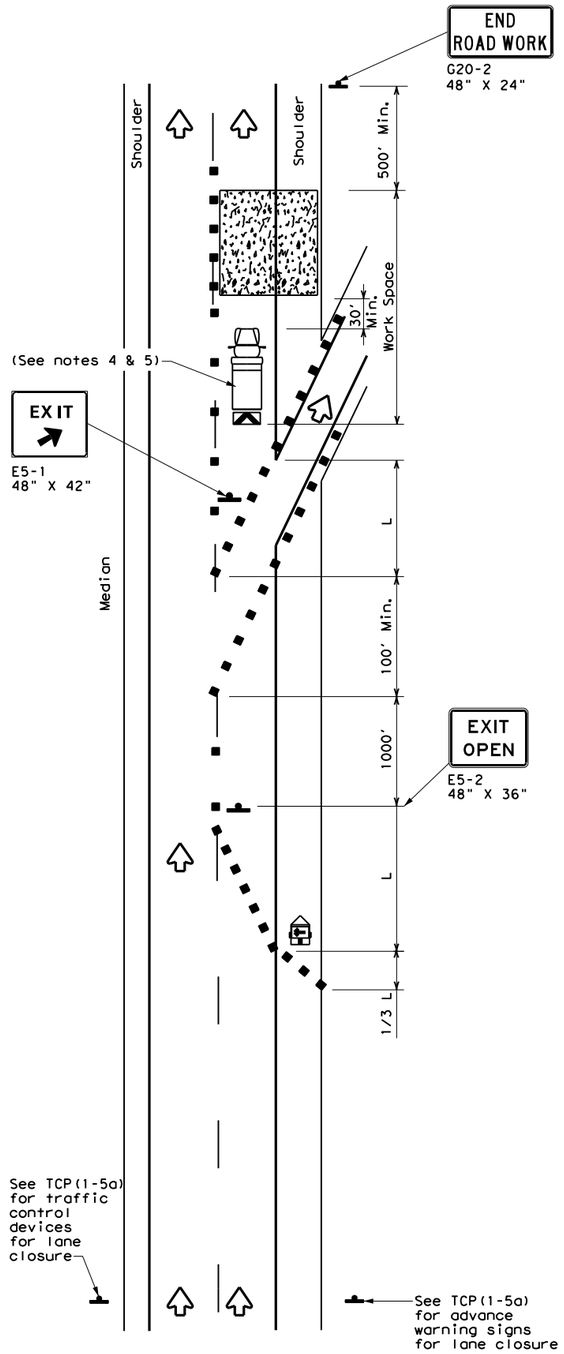


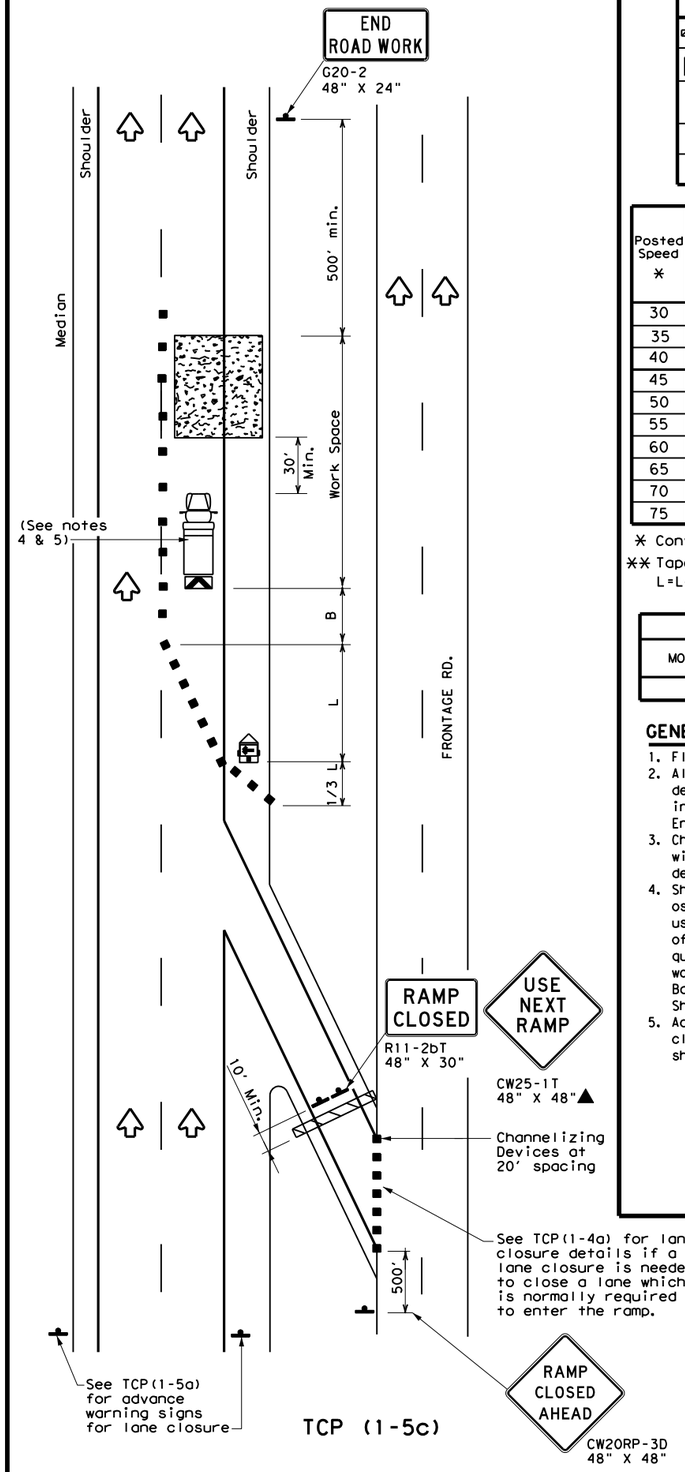
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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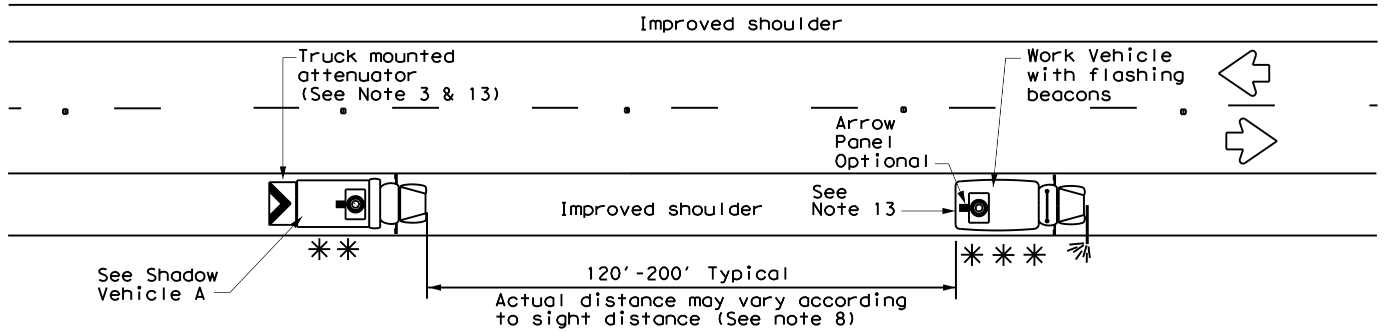
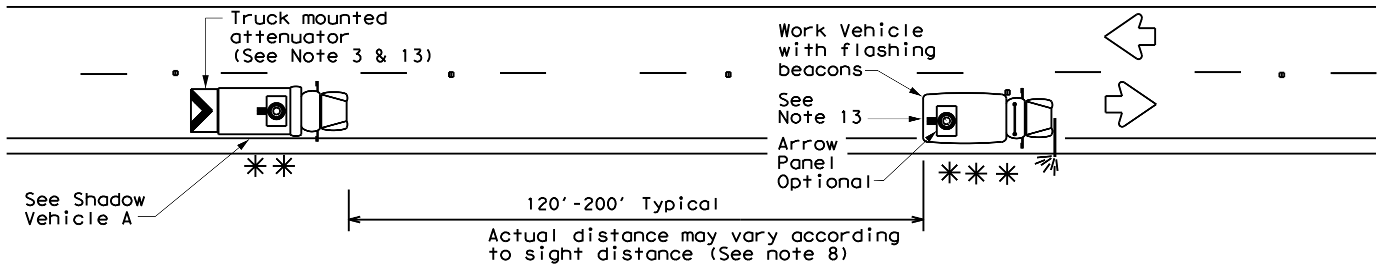
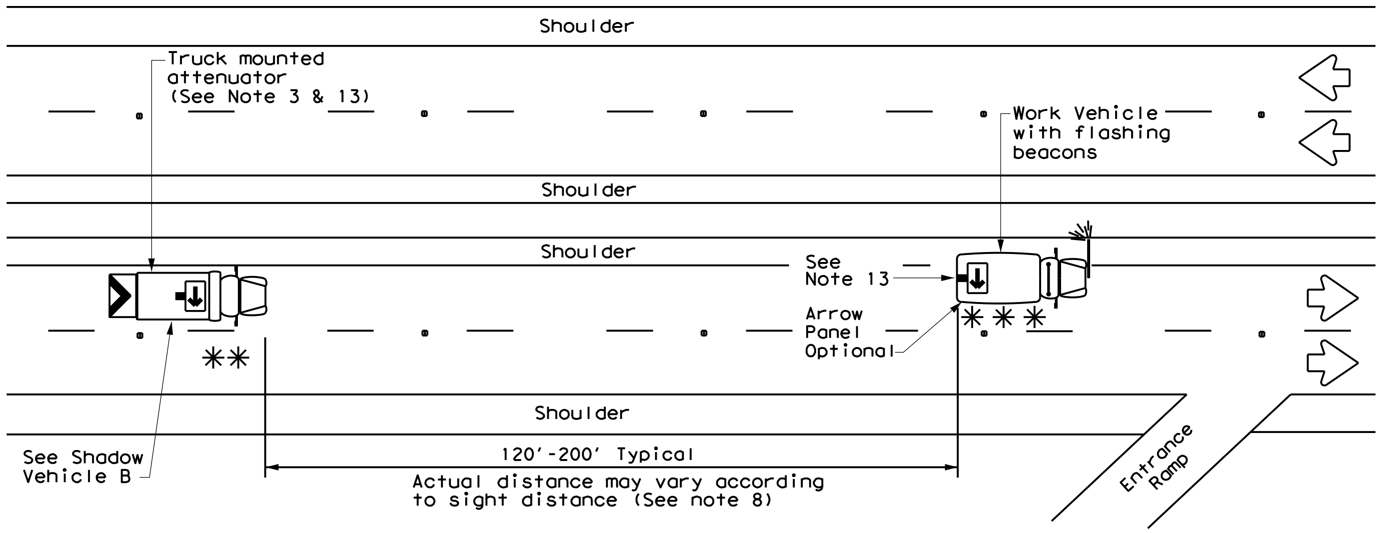
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		43



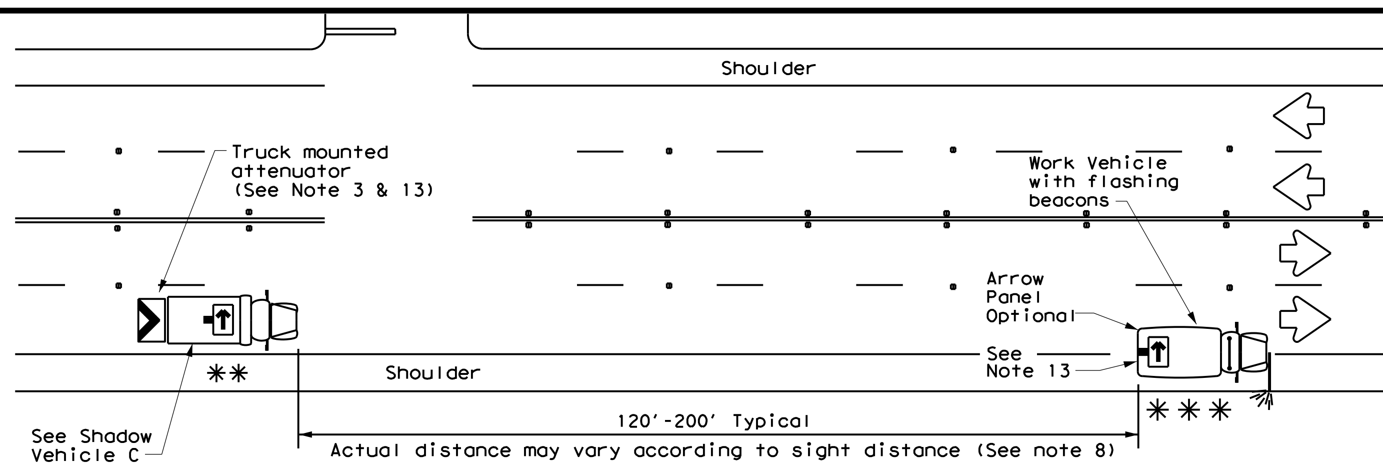
TWO LANE HIGHWAY WITH PAVED SHOULDERS MINIMUM 8'



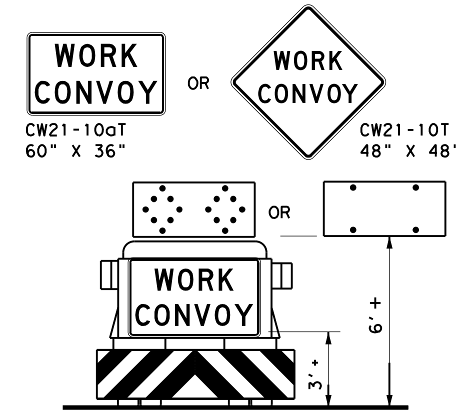
TWO LANE HIGHWAY WITH NO SHOULDER OR NARROW SHOULDER



MULTILANE HIGHWAY

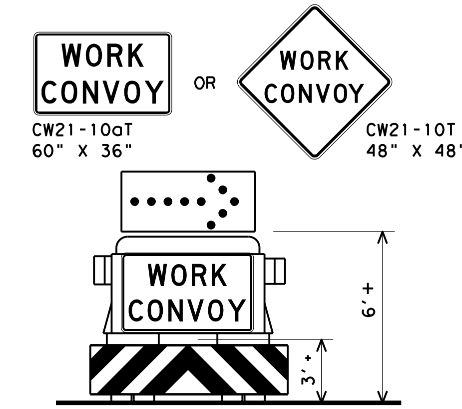


MULTILANE HIGHWAY



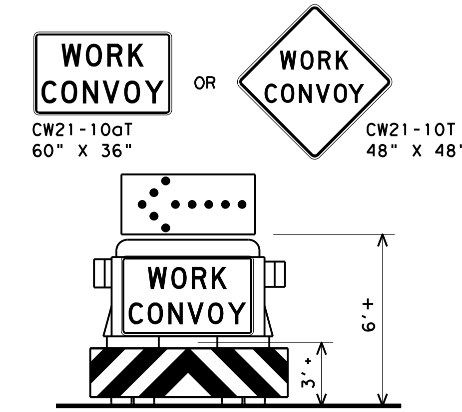
SHADOW VEHICLE A

with Flashing Arrow Board in Caution Mode



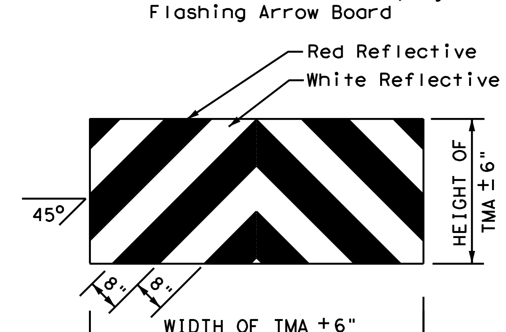
TYPICAL SHADOW VEHICLE B

with RIGHT Directional display Flashing Arrow Board



TYPICAL SHADOW VEHICLE C

with LEFT Directional display Flashing Arrow Board



STRIPING FOR TMA

LEGEND

Symbol	Description	Arrow Board Display	Description
✱✱	Shadow Vehicle		ARROW BOARD DISPLAY
✱✱✱	Work Vehicle		
	Sign		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Traffic Flow		Double Arrow
	Truck Mounted Attenuator (TMA) or Trailer Attenuator (TA)		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the Shadow Vehicle is required.
4. Striping on the back panel of all TMAs shall be 8" red reflective sheeting with white background, placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS-8300, TYPE A.
5. Flashing Arrow Panels shall be Type B or Type C as per BC Standards. The panel operation shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When the work convoy must change lanes, the Shadow Vehicle should change lanes first to protect the Work Vehicle.
8. Spacing between Shadow and Work Vehicle will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the Shadow Vehicle in time to slow down and/or change lanes as they approach the Work Convoy.
9. Use of an arrow panel on the Work Vehicle is optional except as provided in note 13, but may be required by the Engineer. If an arrow panel is not used, dual flashing beacons, mounted as high and as widely separated as practicable at the rear of the Work Vehicle shall be required.
10. On two-lane two-way roadways, the Work and Shadow Vehicles should pull over periodically to allow motor vehicle traffic to pass.
11. Work and Shadow Vehicles should stay on the shoulder of highways having 8' or wider shoulders when possible.
12. A Trail Vehicle may be added to the operation when approved by the Engineer. See TCP(3) series standards.
13. The shadow vehicle may be omitted on conventional roadways when a TMA or TA and arrow panel is mounted to the herbicide vehicle. A separate shadow vehicle will be required on expressways and Freeways.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS HERBICIDE TRUCK OPERATIONS

TCP(3-5)-18

FILE: tcp3-5.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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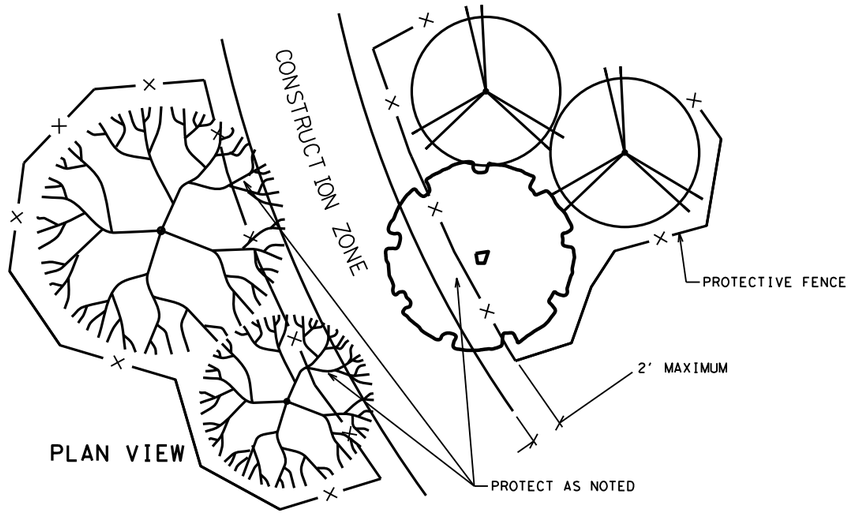
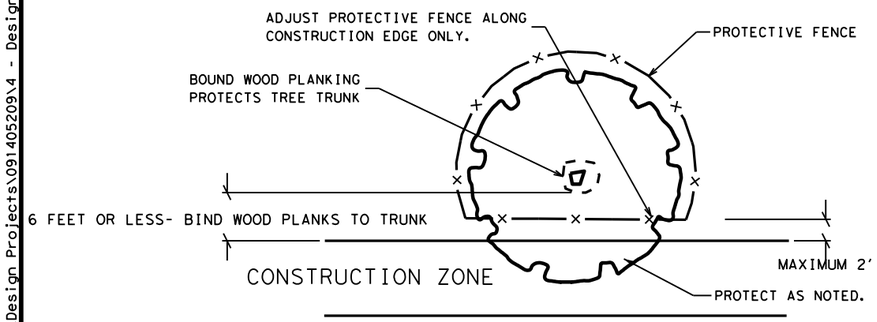
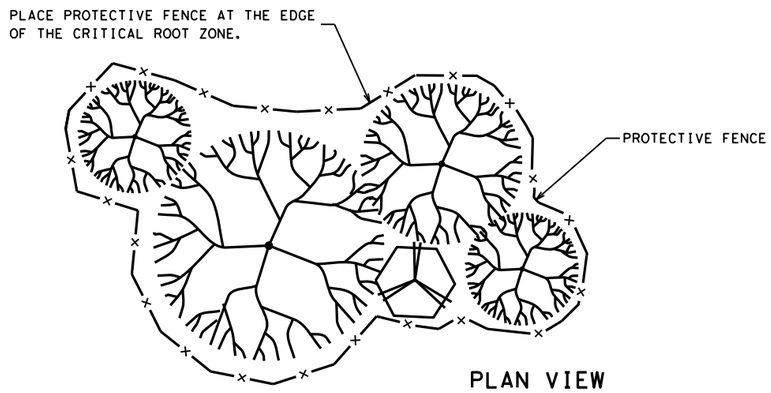
	AUS		WILLIAMSON	44



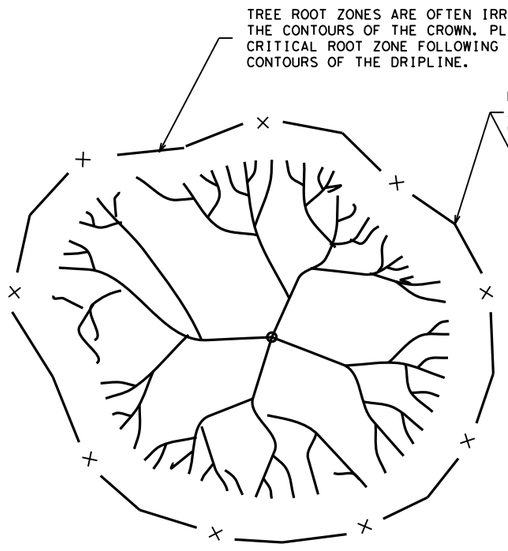
LINEAR CONSTRUCTION THROUGH STAND OF TREES

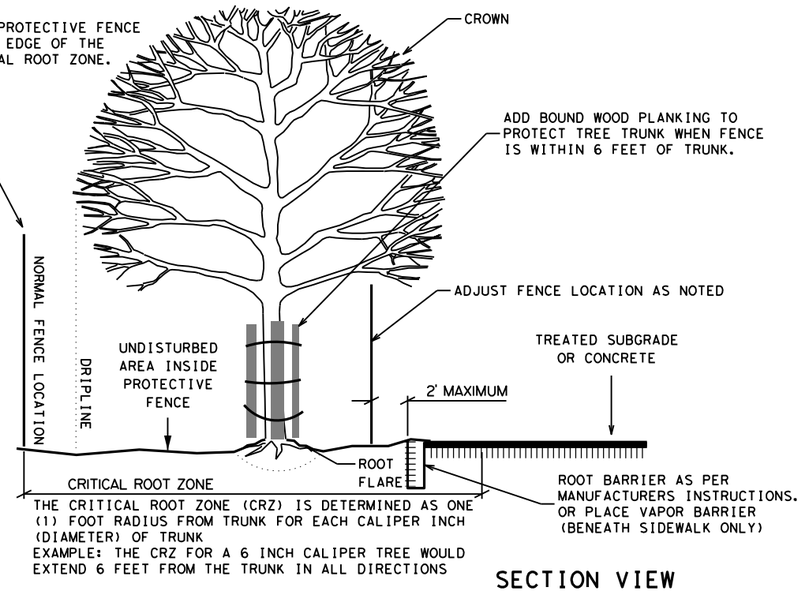


PLAN VIEW
PAVING UNDER TREES



TYPICAL TREE GROUPING PROTECTION





TYPICAL TREE PROTECTION

NOTES:

CRITICAL ROOT ZONE IS 1 FT. AWAY FROM TREE TRUNK FOR EVERY 1 IN. OF TREE DIAMETER MEASURED AT 4 FT. HEIGHT.

WATER TREES EVERY 2 WEEKS WITH A MINIMUM OF 100 GALLONS PER TREE.

SPRAY TREE WITH WATER TO REMOVE CONSTRUCTION DUST WHEN DIRECTED.

CONSTRUCTION FENCE SHALL BE 4 FT. TALL.

DO NOT PERFORM WORK OR STORE EQUIPMENT WITHIN PROTECTED AREA.

COVER THE CRITICAL ROOT ZONE BETWEEN THE PROTECTED AREA AND THE CONSTRUCTION ZONE WITH 4 IN. OF MULCH

PERFORM TREE TRIMMING AND WOUND REPAIR PER STANDARD SPECIFICATIONS.

DAMAGED AND EXPOSED ROOTS SHALL BE TRIMMED AND TREATED PER STANDARD SPECIFICATIONS. BACKFILL EXPOSED ROOTS WITH TOPSOIL WITHIN 24 HOURS OF EXPOSURE.

PLACE PLASTIC UNDER CONCRETE PLACED IN THE CRITICAL ROOT ZONE.

PLACE A ROOT BARRIER IN THE CRITICAL ROOT ZONE AT THE EDGE OF TREATED SUBGRADE TO THE DEPTH OF THE SUBGRADE.

ALL WORK IS SUBSIDIARY TO BID ITEM.

Texas Department of Transportation | Austin District Standard

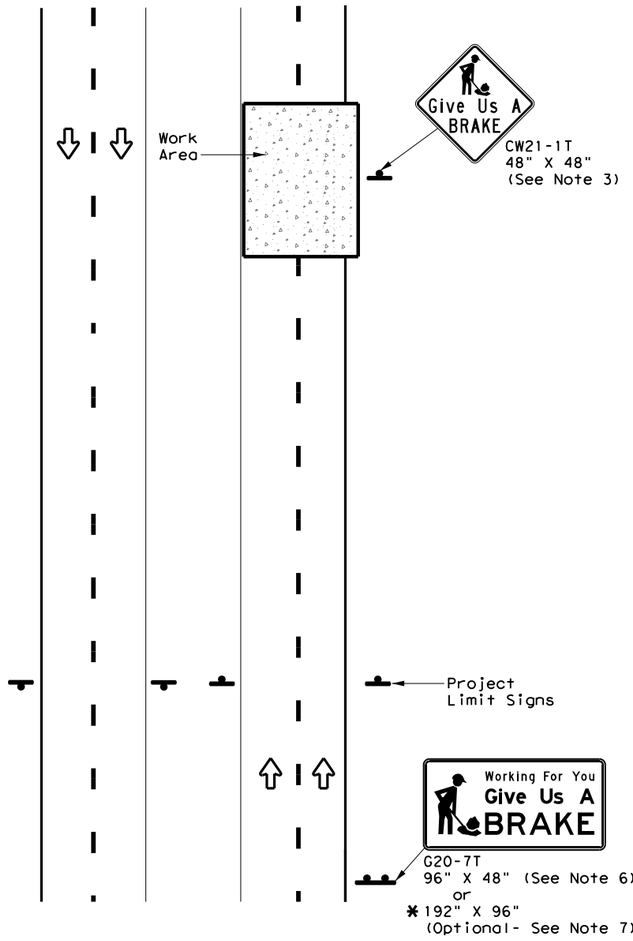
TREE PROTECTION DETAILS

TPD-19(AUS)

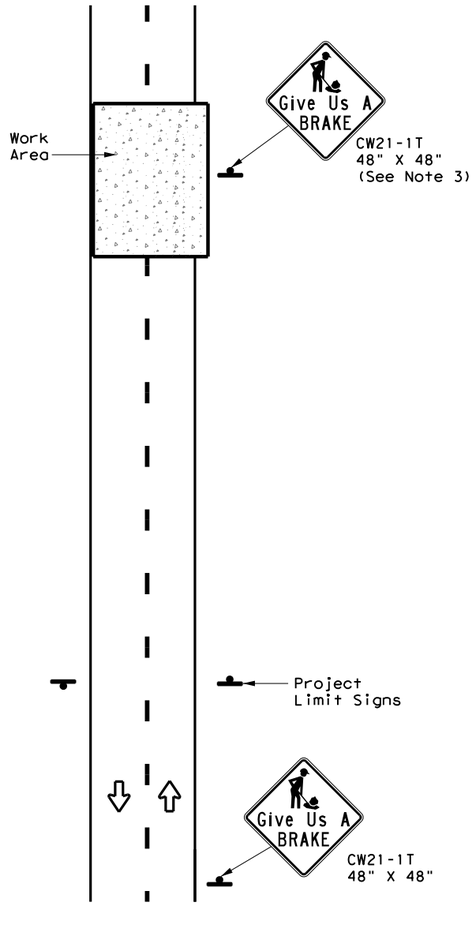
REVISIONS
06/16: SHEET CREATED
04/19: APPROVED

CONT	SECT	JOB	HIGHWAY
0914	05	209	VARIOUS
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		45

DATE: 12/9/2020 9:35:55 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\091405209\4 - Design\Plan Set\10. Miscellaneous\Standard Sheets\TPD-19(AUS).dgn



DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

DATE:
FILE:

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	05	209	VARIOUS
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	AUS	WILLIAMSON		46

DATE:
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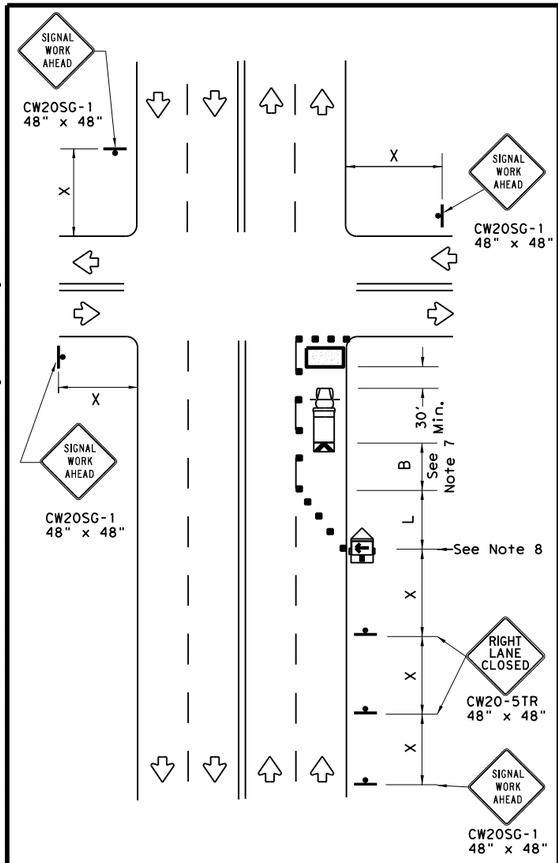
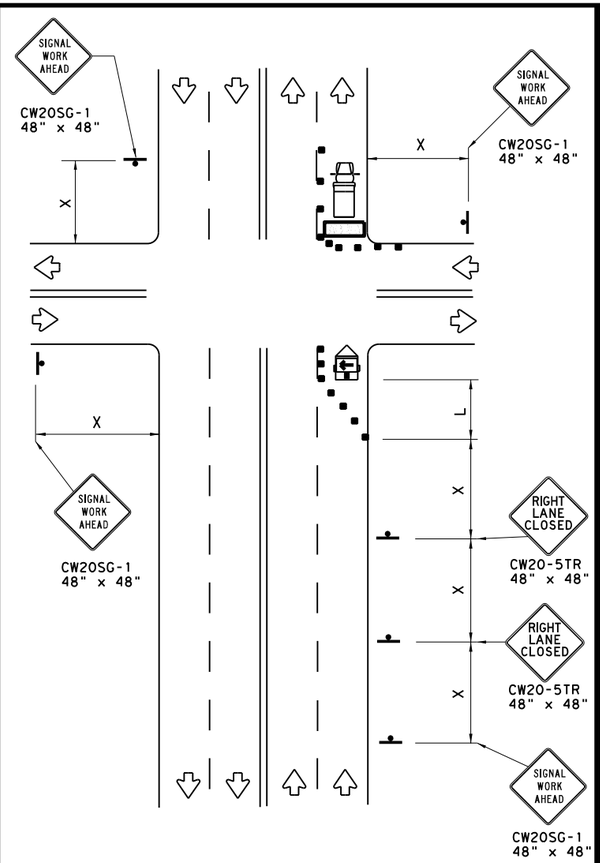


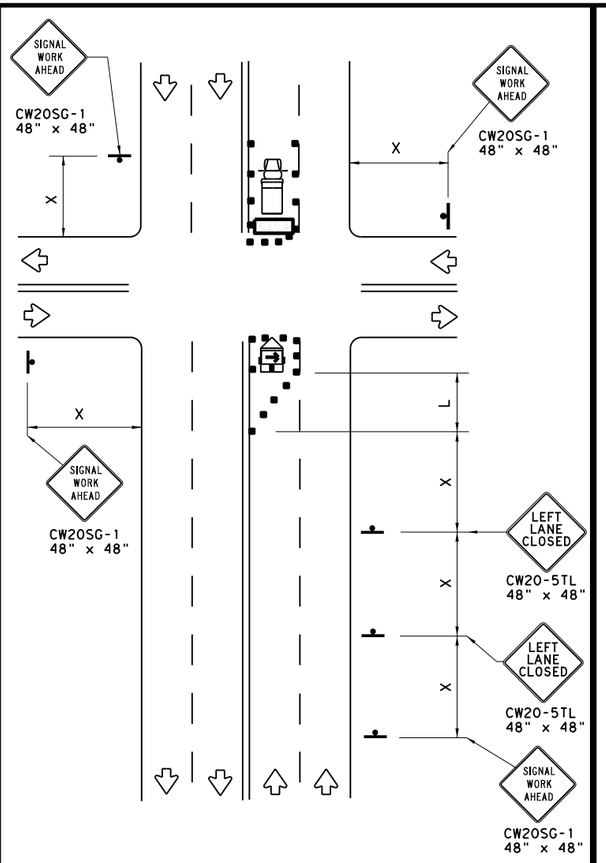
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



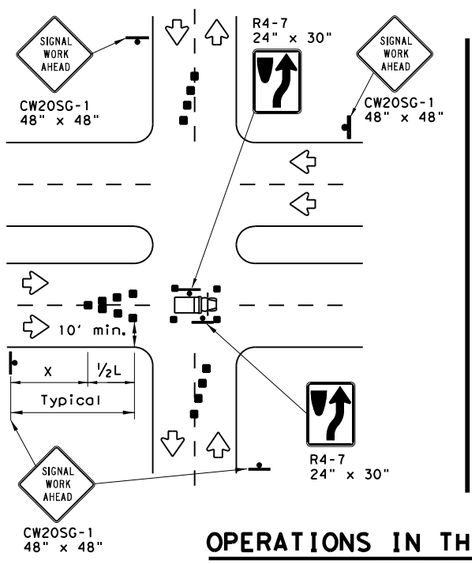
FAR SIDE RIGHT LANE CLOSURE

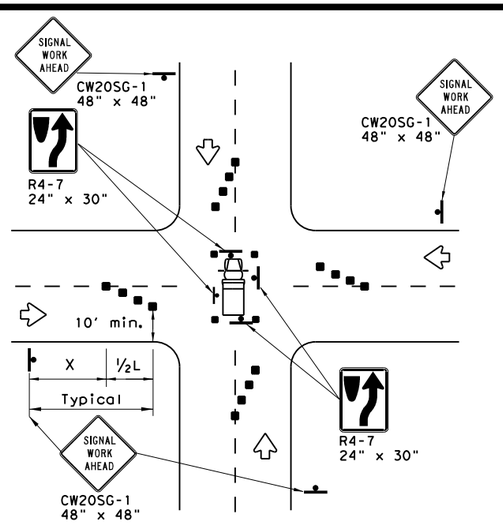
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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)

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.

GENERAL NOTES

1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	05	209	VARIOUS
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	AUS	WILLIAMSON		47

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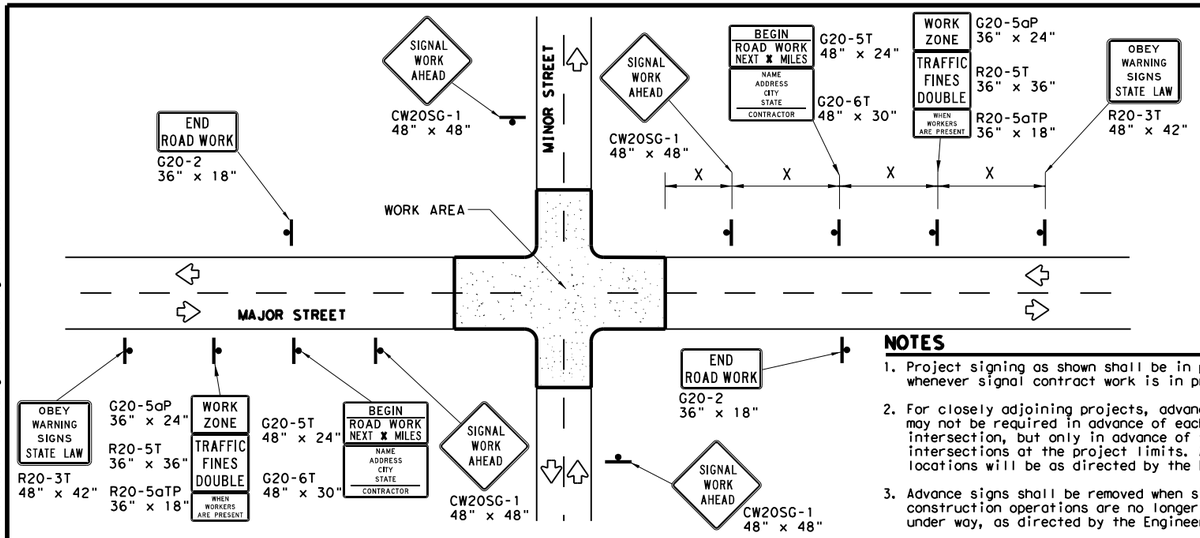


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. 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".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. 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. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

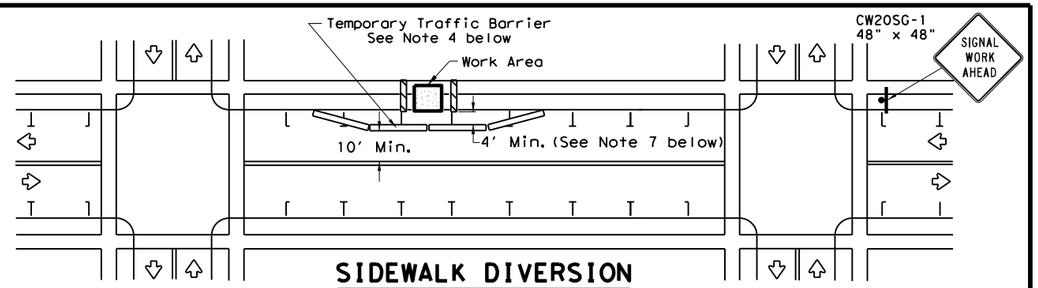
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support 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 fastners. 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.

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

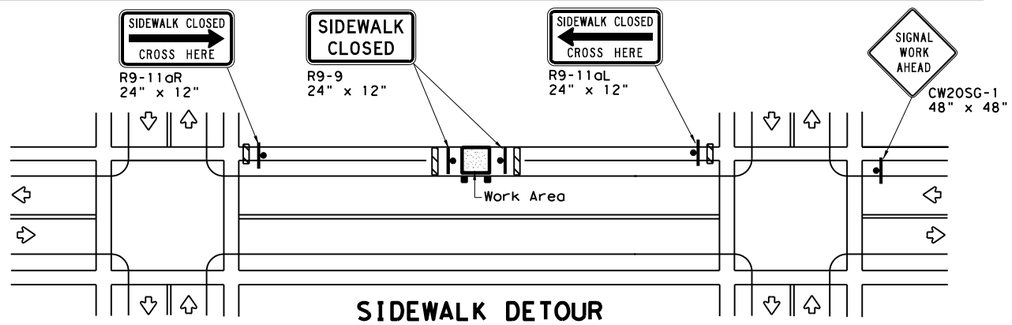
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

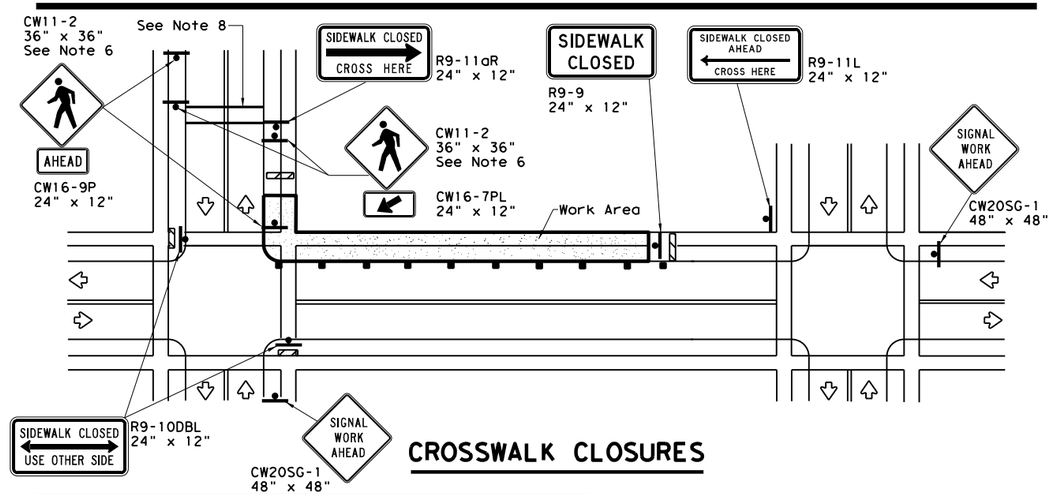
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	05	209	VARIOUS
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	AUS	WILLIAMSON		48

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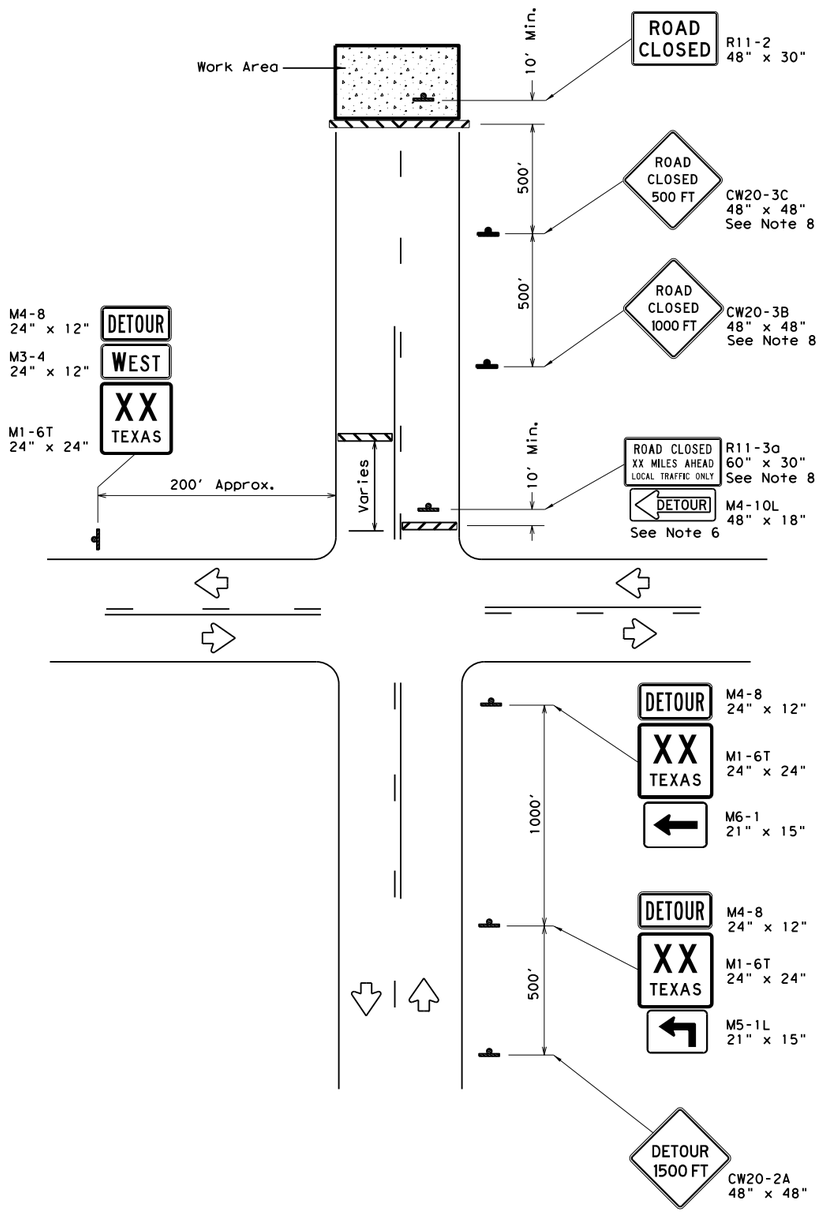
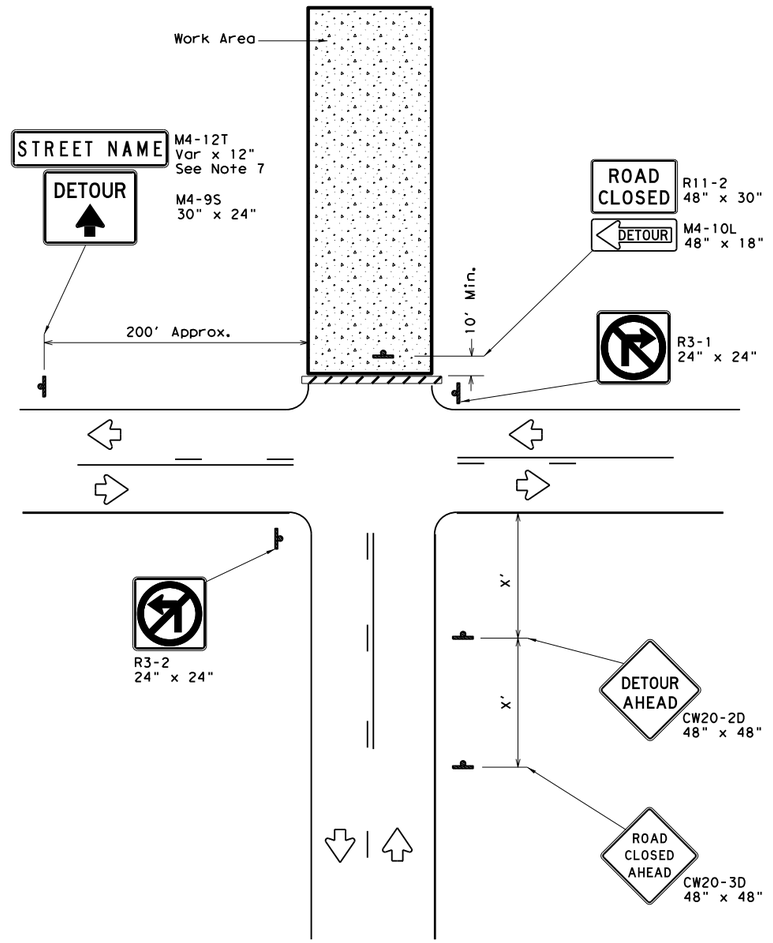


ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

Posted Speed *	Minimum Sign Spacing "X" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

* Conventional Roads Only

GENERAL NOTES

1. This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
2. Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
3. Stockpiled materials shall not be placed on the traffic side of barricades.
4. Barricades at the road closure should extend from pavement edge to pavement edge.
5. Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
6. If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
7. The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
8. For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
9. Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0914	05	209	VARIOUS
1-97 4-98 7-13	DIST	COUNTY		SHEET NO.
2-98 3-03	AUS	WILLIAMSON		49

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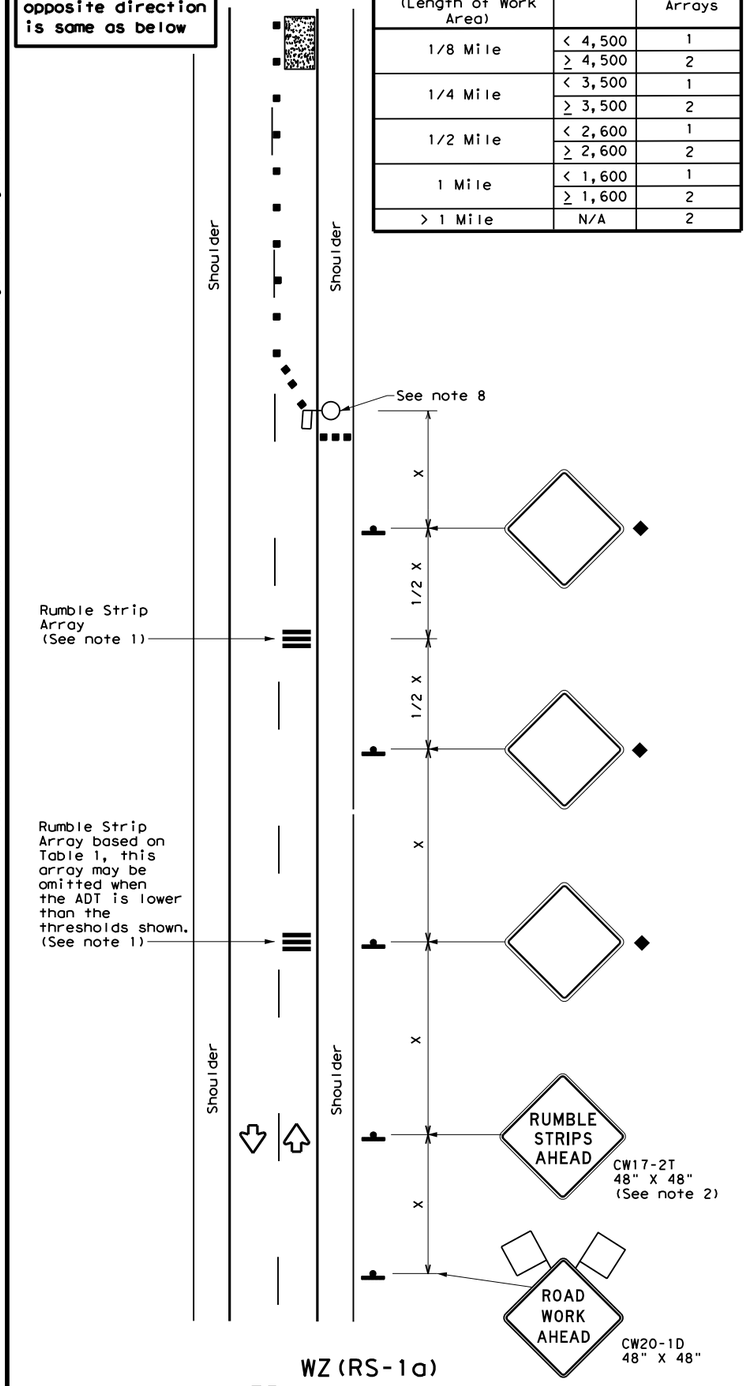
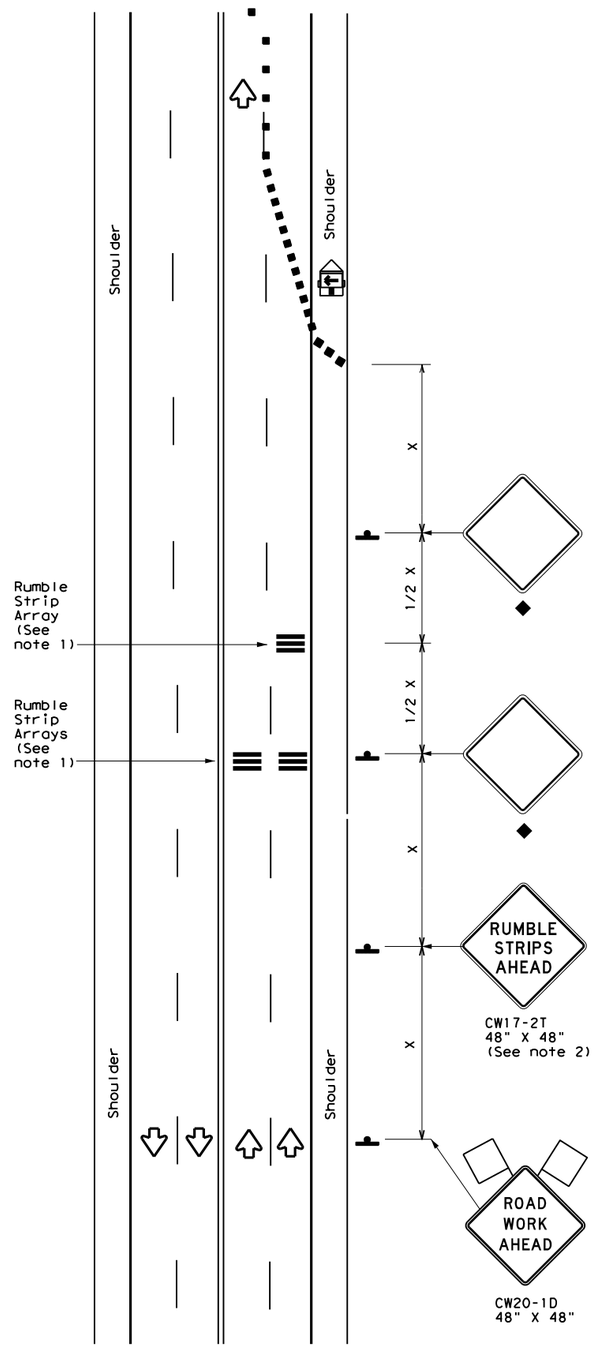
Warning sign and rumble strip sequence in opposite direction is same as below

TABLE 1		
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)
75 mph or Less

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
2. The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Removal of the Temporary Rumble Strips should be accomplished before removing the advance warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an AFAD or a portable traffic signal.
9. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment.

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Panel	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
	✓	✓		

◆ **Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.**

TABLE 2	
Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	05	209	VARIOUS
2-14	DIST	COUNTY		SHEET NO.
4-16	AUS	WILLIAMSON		50

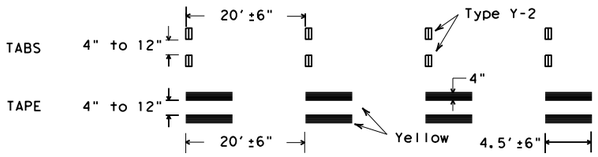
DATE:
FILE:

DATE:
FILE:

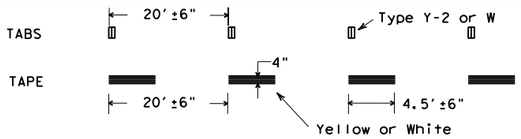
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

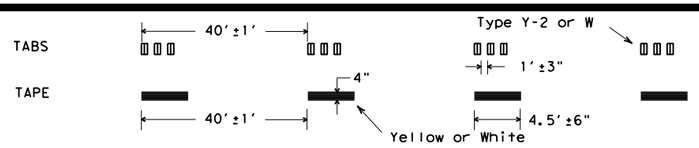


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



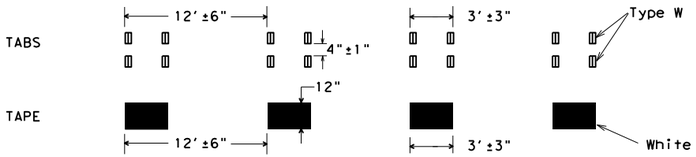
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

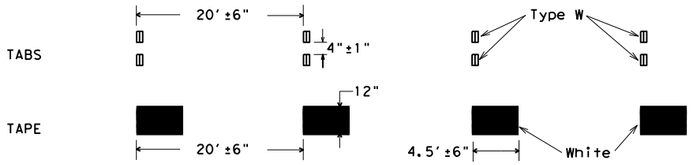


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



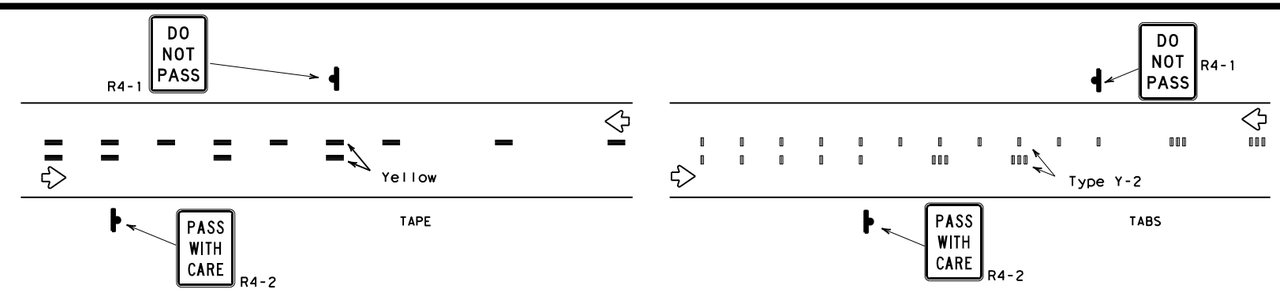
NOTES:

1. Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
4. Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
5. No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
6. For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
7. For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
8. For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

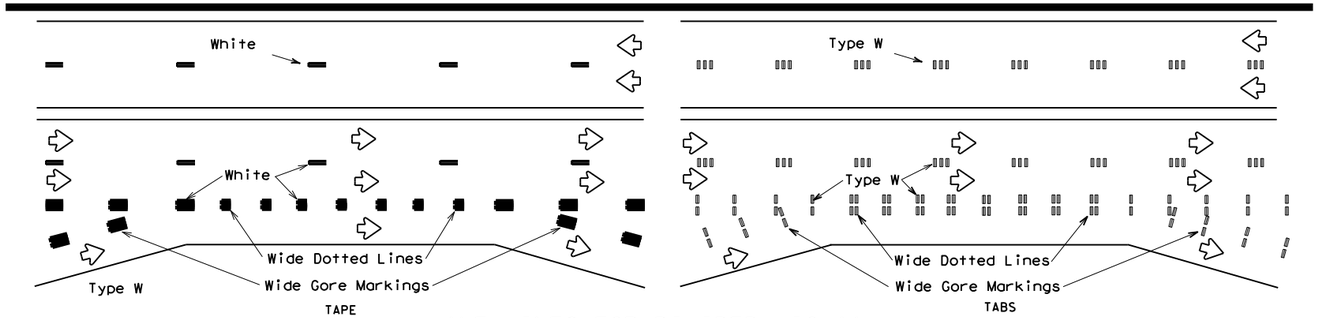
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
2. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
3. When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
4. No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

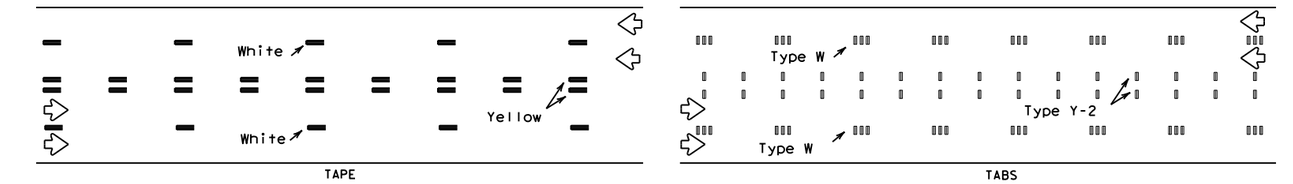
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



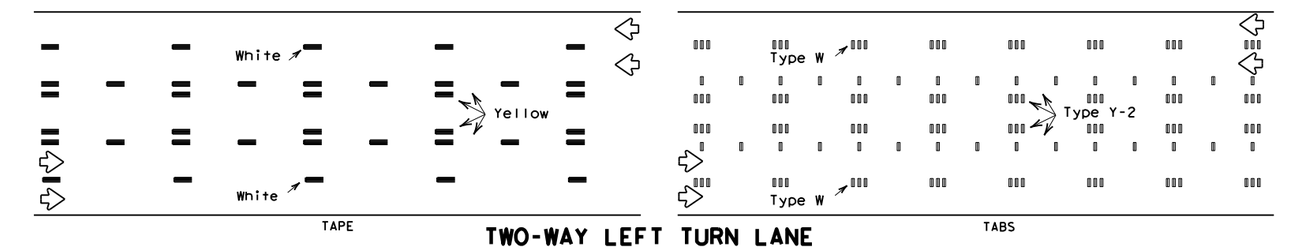
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



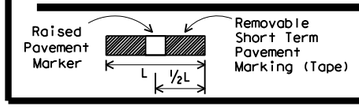
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

PREFABRICATED PAVEMENT MARKINGS

1. Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
2. Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Costruction-Grade Prefabricated Pavement Markings."

RAISED PAVEMENT MARKERS

1. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:
   http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

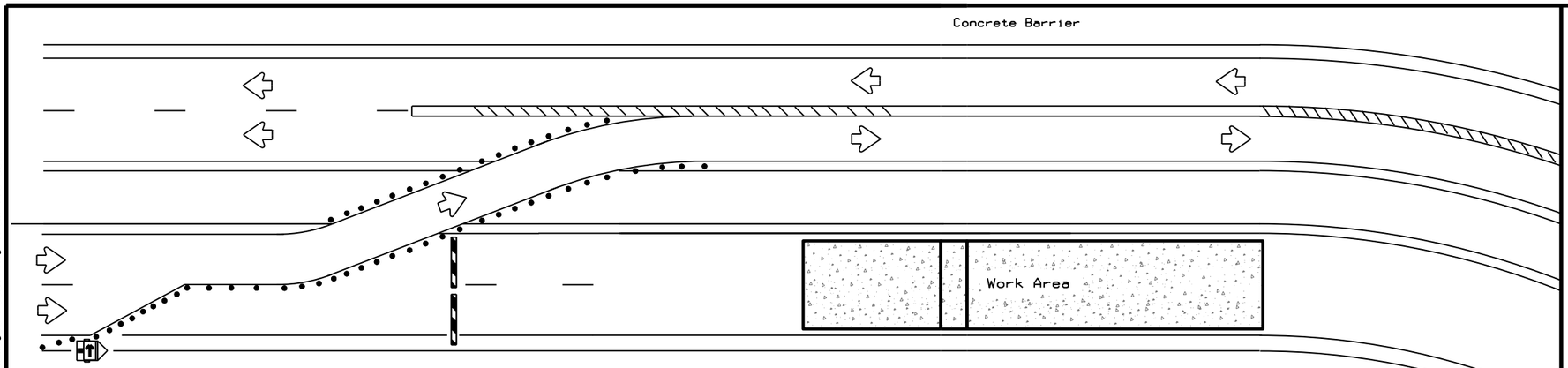
Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		0914	05	209	VARIOUS
1-97		DIST	COUNTY		SHEET NO.
3-03		AUS	WILLIAMSON		51
7-13					



NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

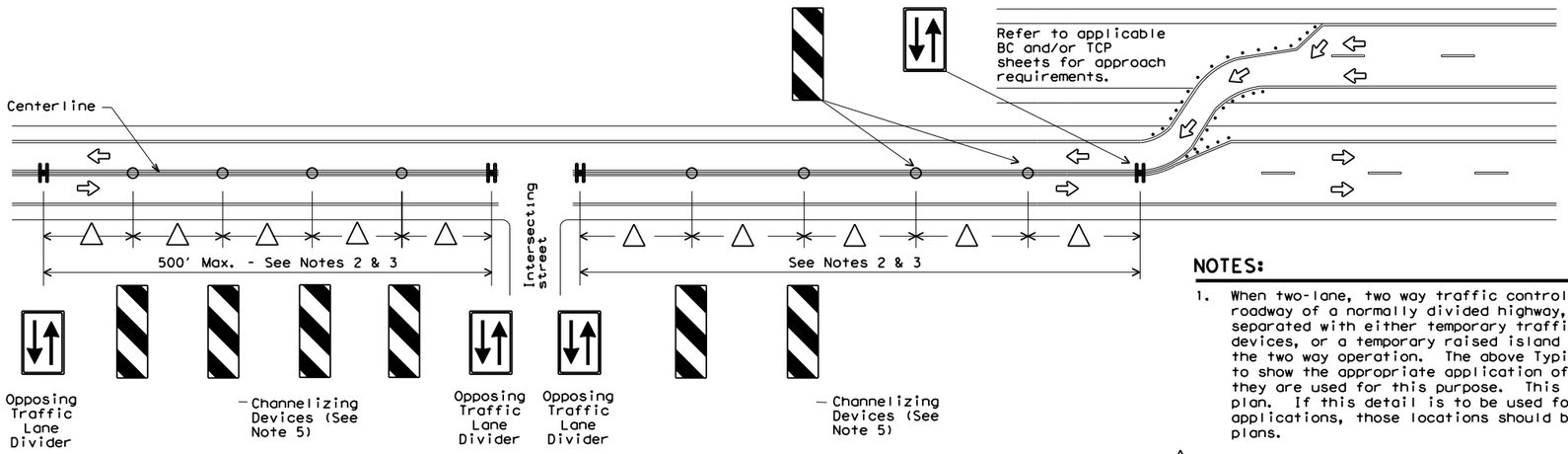
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
\\\\	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List" CWZTCD)describes pre-qualified products and their sources and may be found at the following web address:

http://www.txdot.gov/business/resources/producer-list.html



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.

△2. Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.

3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-17	0914	05	209	VARIOUS
4-98 3-03 7-13	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		52

DATE:
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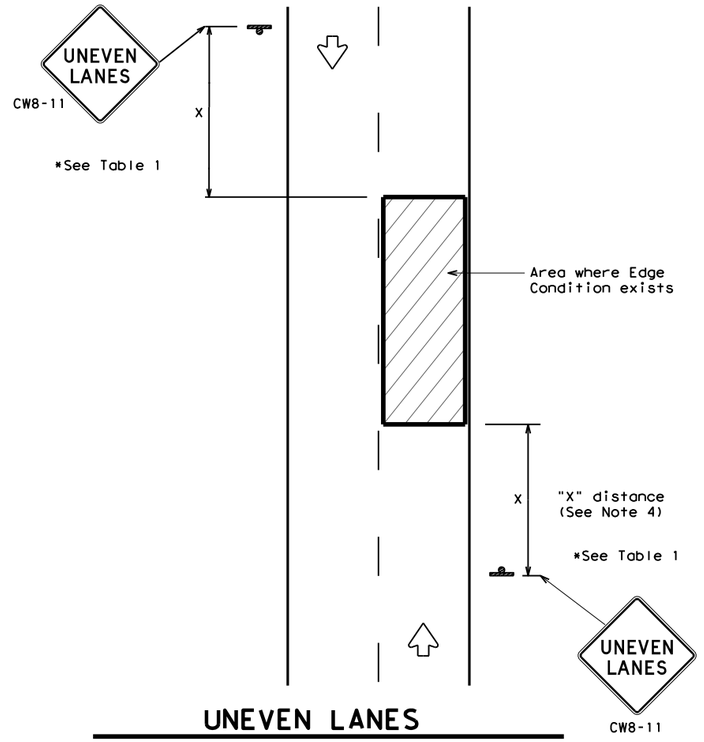
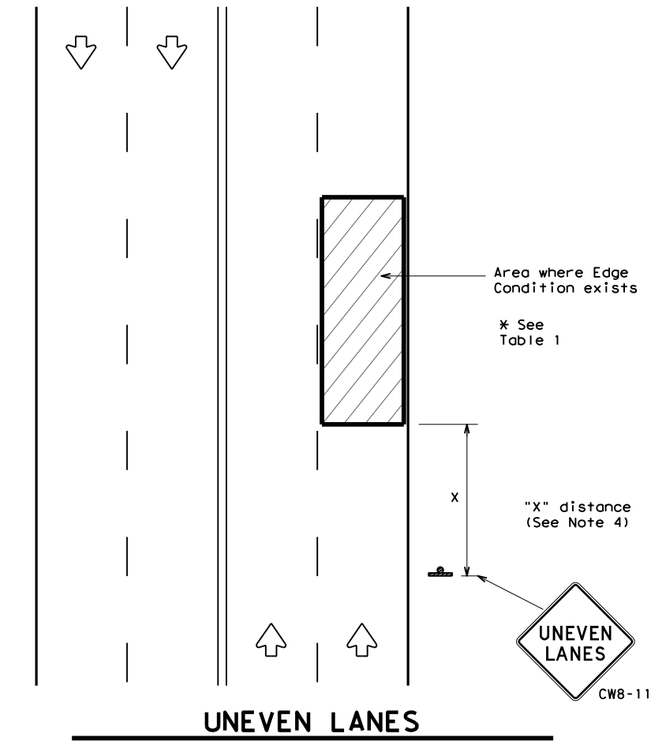
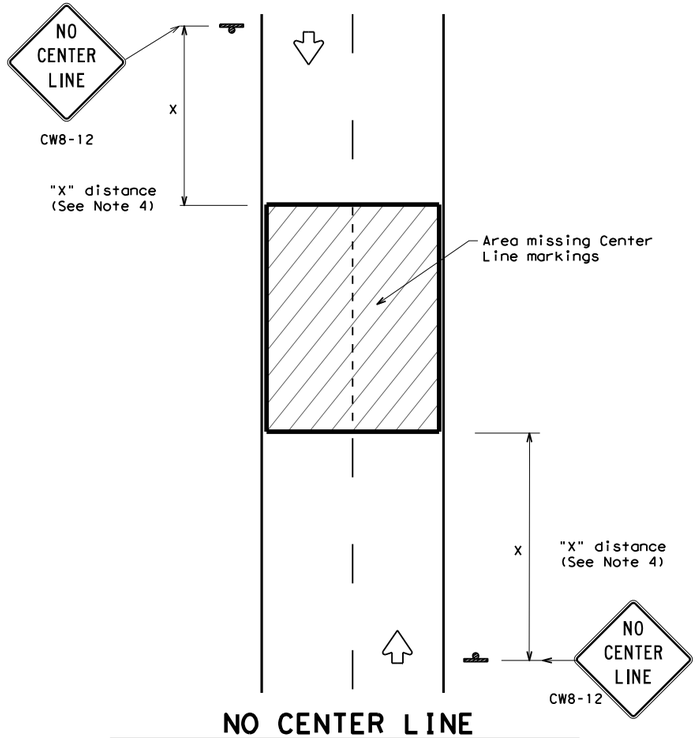


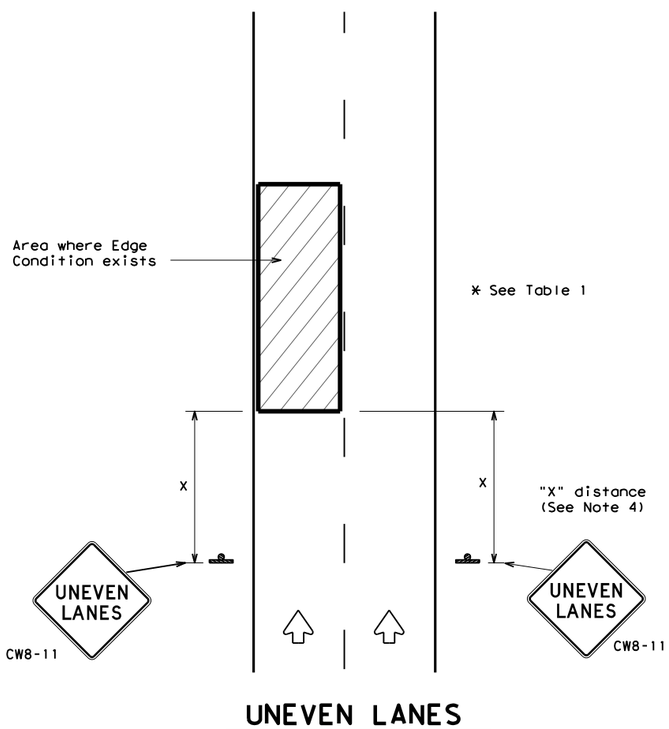
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

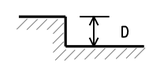
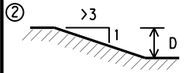
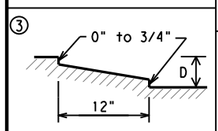
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

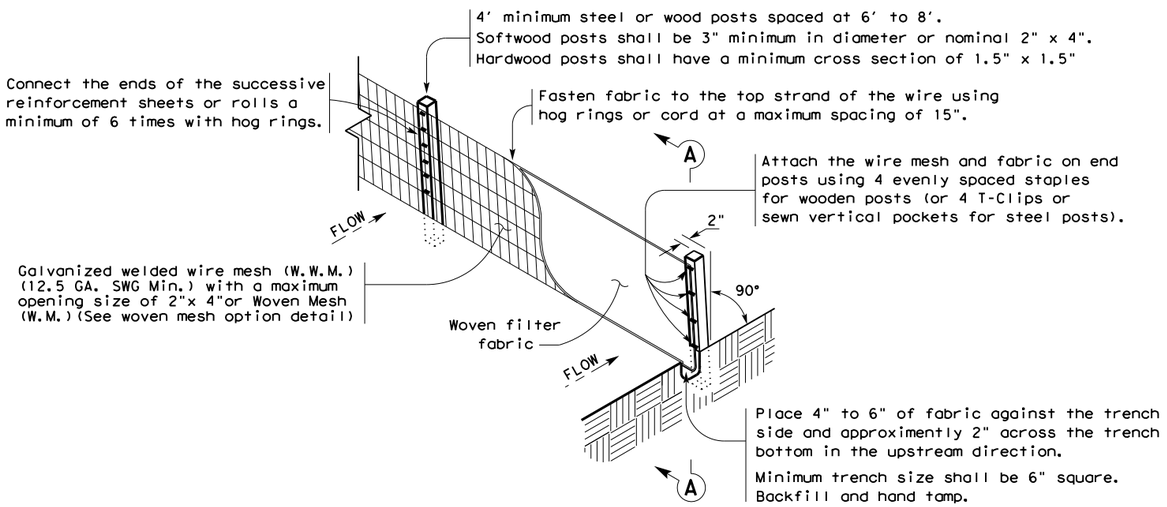
Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

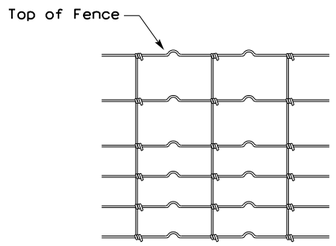
WZ(UL)-13

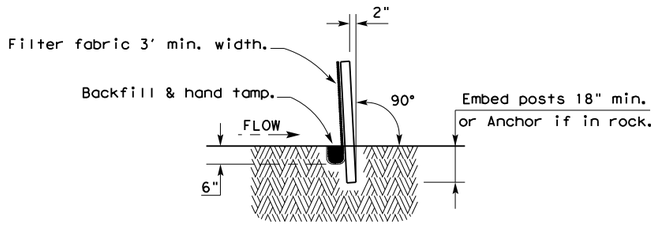
FILE:	wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		0914	05	209	VARIOUS
8-95 2-98 7-13		DIST	COUNTY		SHEET NO.
1-97 3-03		AUS	WILLIAMSON		53



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.

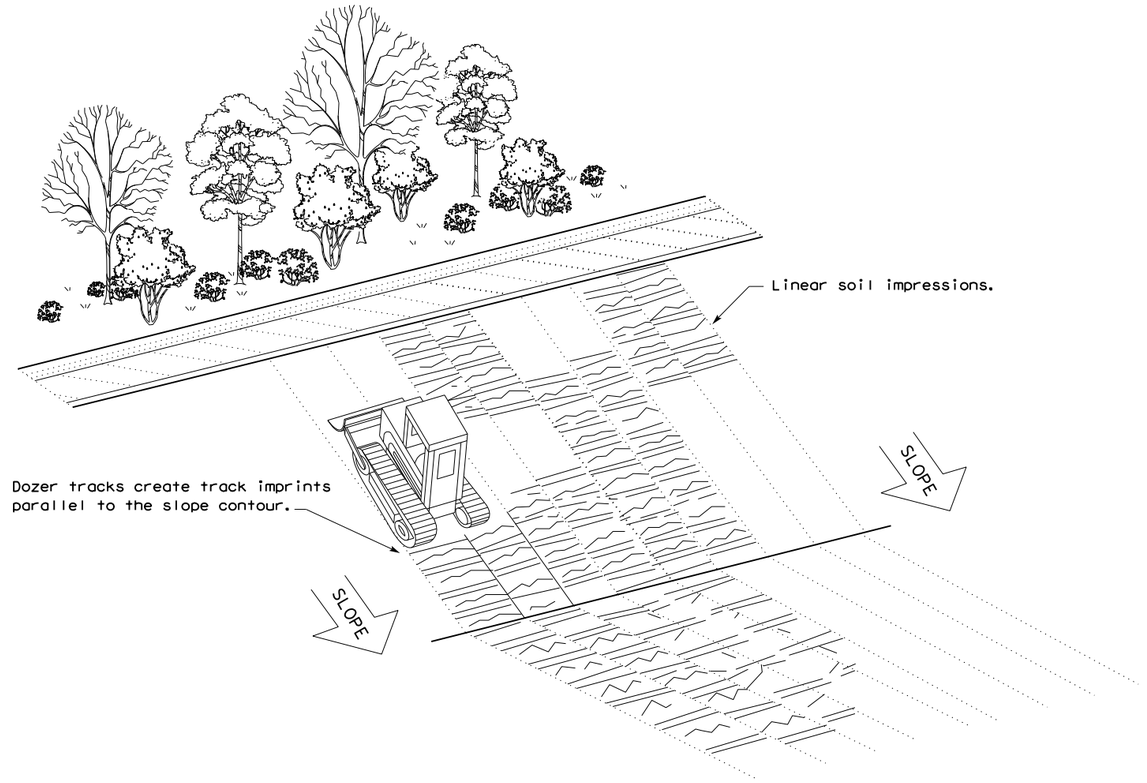
LEGEND

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	
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	DIST	COUNTY		SHEET NO.	
	AUS	WILLIAMSON		54	

DATE
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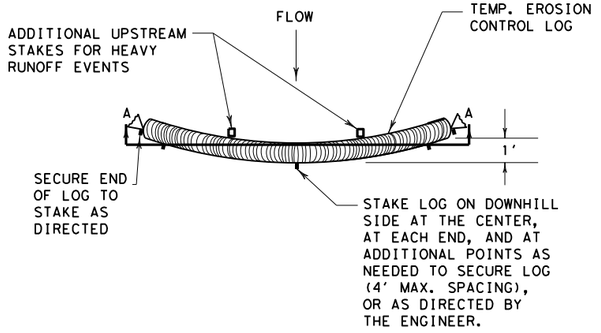
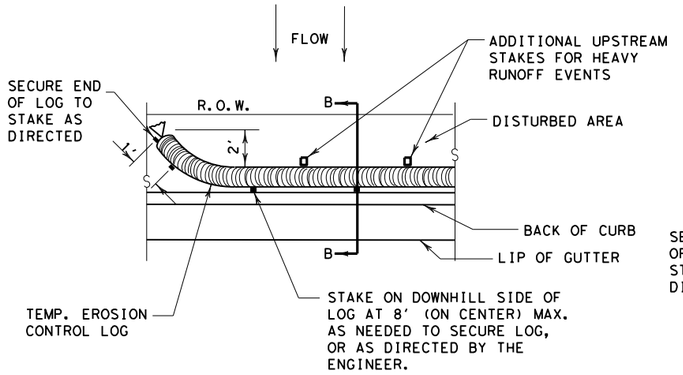
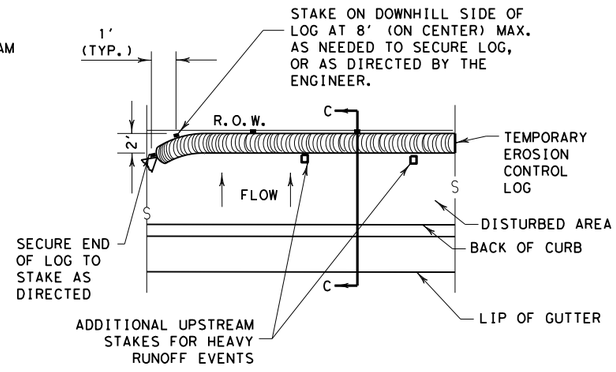


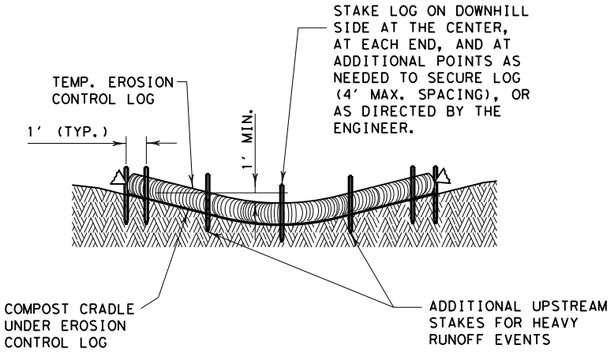
PLAN VIEW



PLAN VIEW



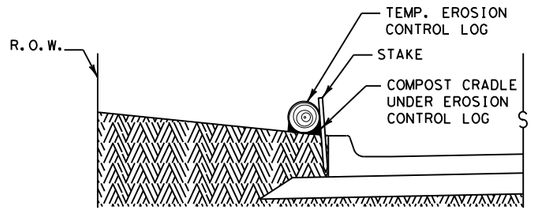
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

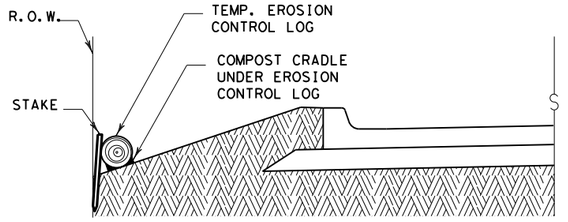
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

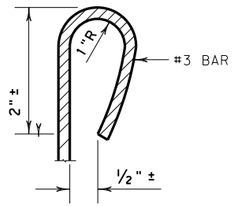
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

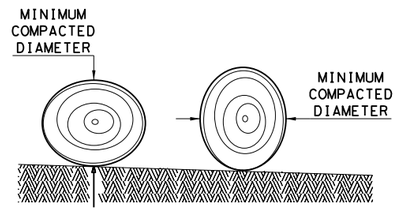
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

DATE:
FILE:

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
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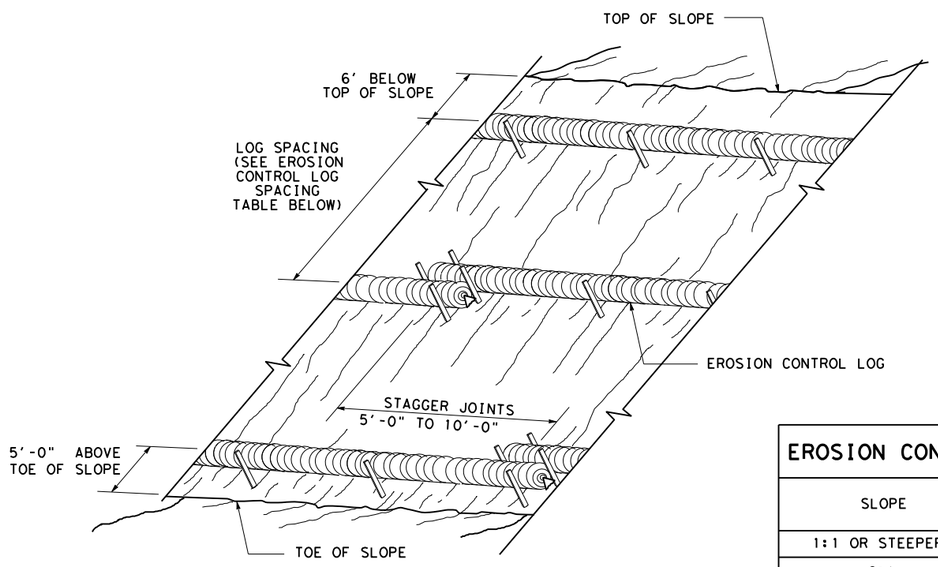
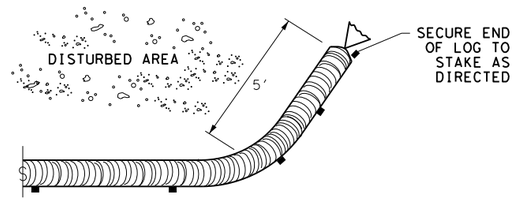
	DIST	COUNTY			SHEET NO.	
	AUS	WILLIAMSON			55	

DATE:
FILE:



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

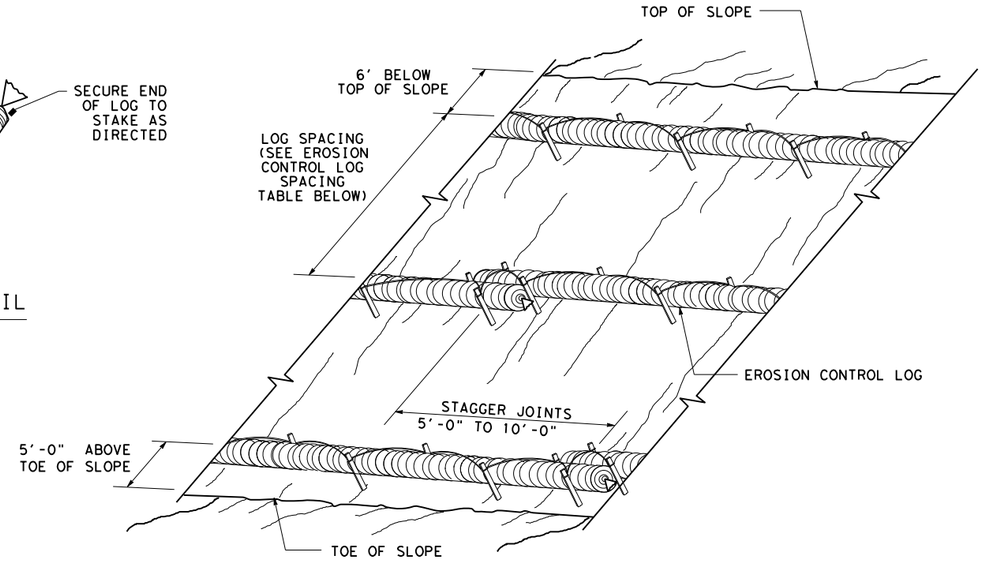
CL-SST



END SECTION RAP DETAIL

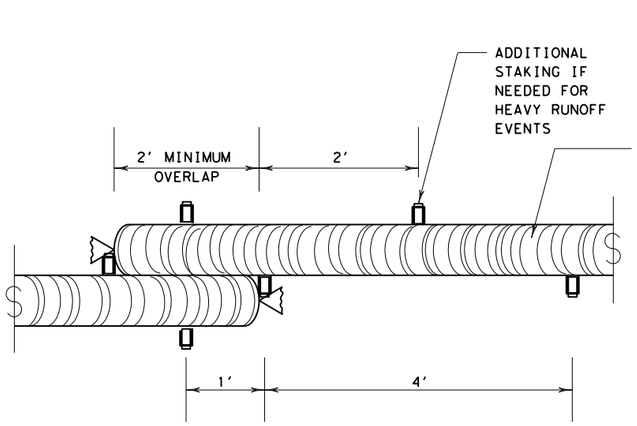
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

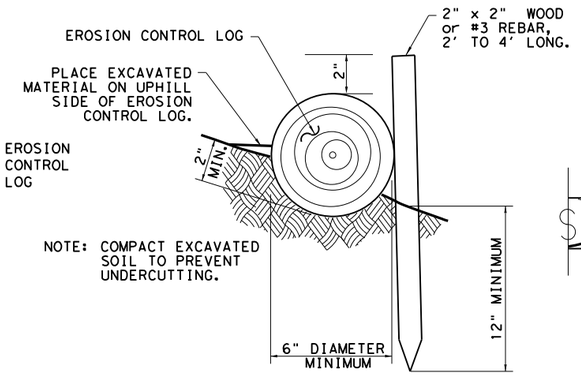
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

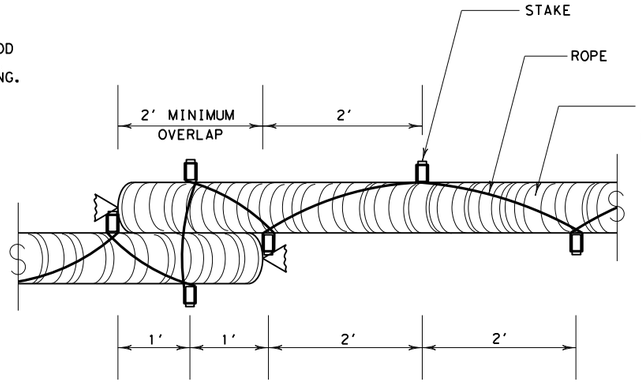


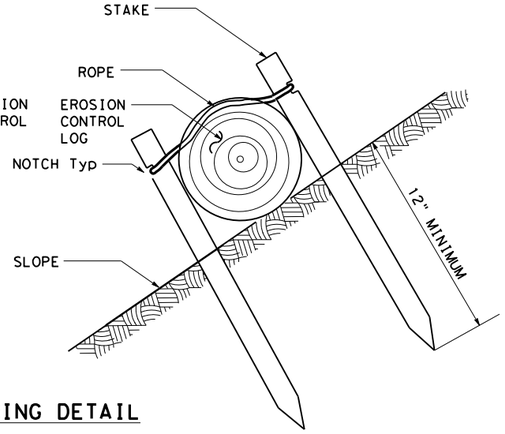


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

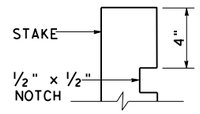
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

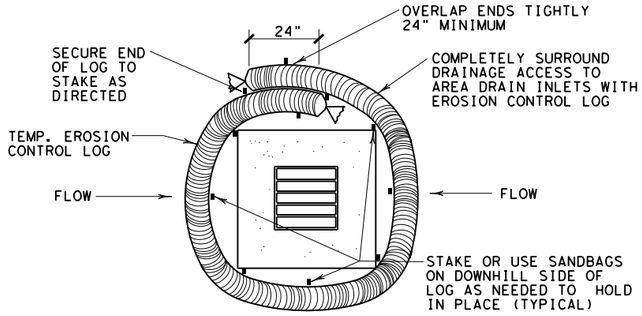
Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

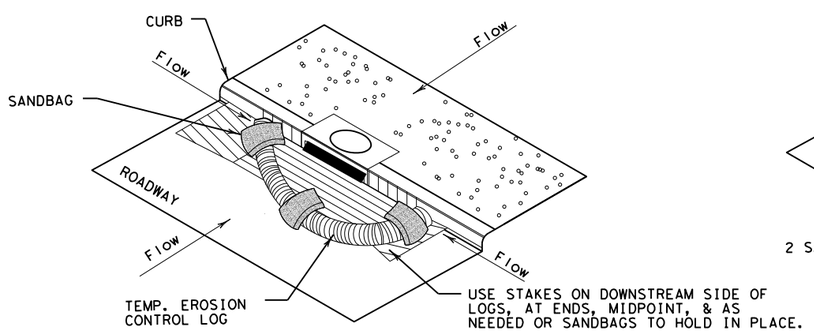
FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0914	05	209		VARIOUS	
	DIST	COUNTY			SHEET NO.	
	AUS	WILLIAMSON			56	

DATE:
FILE:



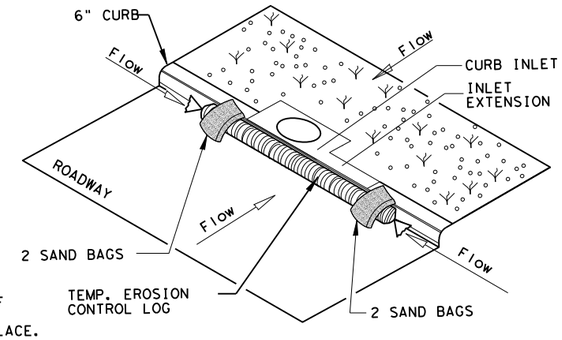
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

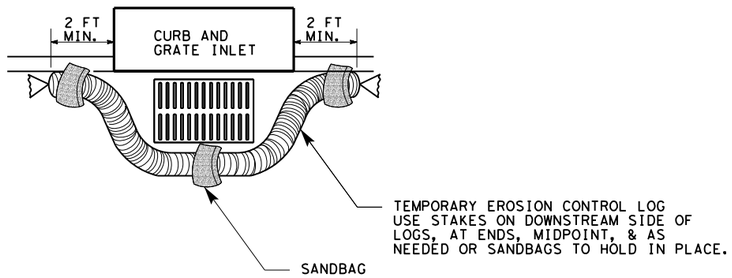
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

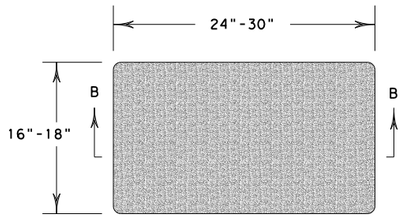
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



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

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REVISIONS	0914	05	209		VARIOUS	
	DIST	COUNTY				SHEET NO.
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