

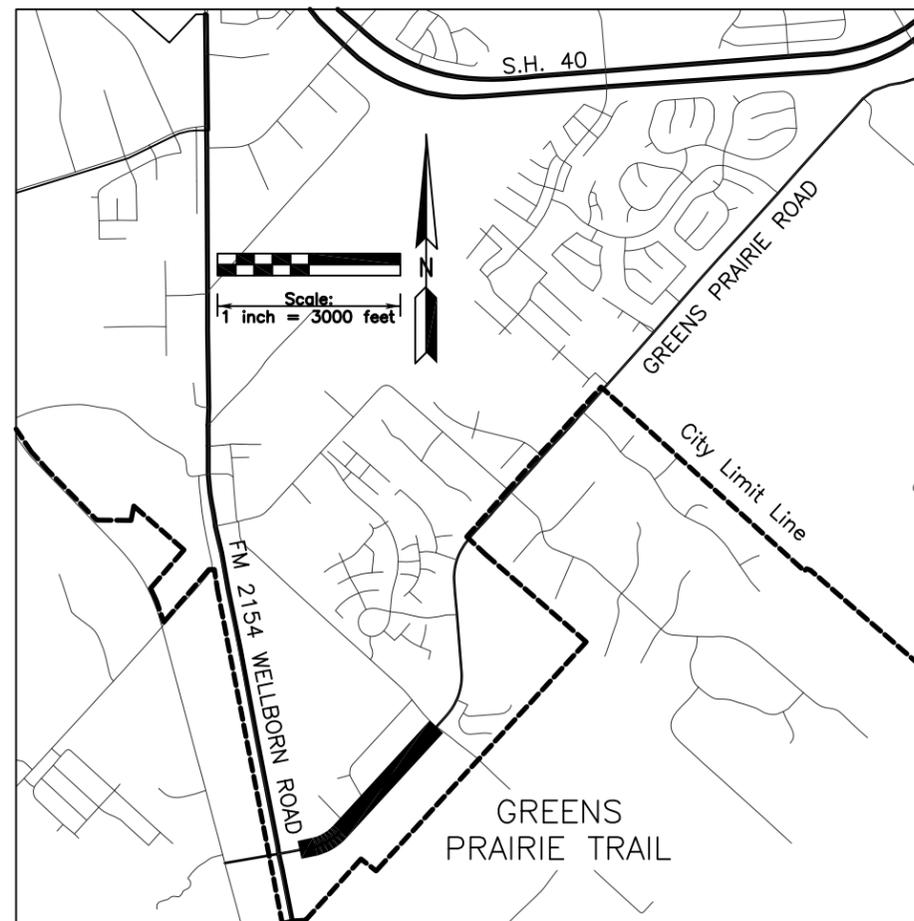
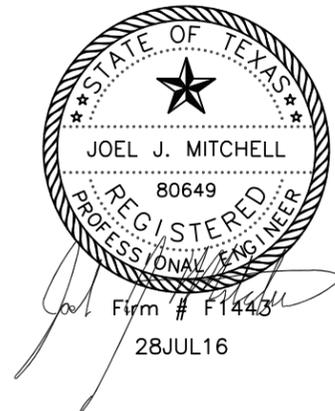
# PLANS FOR THE CONSTRUCTION OF GREENS PRAIRIE TRAIL

## CITY OF COLLEGE STATION CONSTRUCTION DOCUMENTS

*City of College Station*  
Public Works Department  
310 Krenak Tap Rd  
College Station, TX  
77840

JULY, 2016

**ENGINEER:**  
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511 UNIVERSITY DRIVE E., STE 204  
COLLEGE STATION, TEXAS 77840  
(979) 260-6963



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PROJECT BENCHMARK: SURVEY CONTROL POINT #533  
 1/2" IRON ROD W/ CAP Located along north side of Right of way  
 between Ledgestone Trail and Royder Road at Station 31+19.12 and  
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.

stabilized sand.

**SC15 EXISTING DRIVEWAYS & ROADWAYS:** No citizen / property owner shall be denied access to their driveway. Driveways shall be worked in half sections to facilitate access. The contractor shall provide an access route using gravel or RAP. All existing driveways shall be replaced as shown on the plans. The existing concrete shall be saw cut and an expansion joint shall be provided at this joint. The driveway should be graded according to the plans with the appropriate ramp connections to facilitate the construction of the sidewalk. The only connection which may be closed during construction is Ledgestone Drive and the residence with three driveways. Ledgestone Trail shall not be closed for more than 7 calendar days. Flagstone Ct and the school driveways shall have a route through the median during construction. The residential driveways need not have a route through the median during construction.

**SC16 SELECT FILL:** Because of the gypsum in the soil between Station 12+75 and 20+00, 8" deep select fill (PI 10-30) shall be imported and compacted to 98% standard proctor density. Material excavated from this area shall not be used as fill under the roadway. When timing becomes an issue, the contractor may utilize cement stabilized sand in lieu of the select fill without any additional correspondence. The contractor shall receive no additional pay when using cement stabilized sand. When cement stabilized sand is used, the area shall be generous and include the full width of the concrete roadway.

**SC17 LIME STABILIZED SUBGRADE (LSSG):** In areas other than Station 12+75 and 20+00, the contractor shall adhere to the LSSG specification as MODIFIED BY THIS PROVISION. This provision is intended to require additional inspection, moisture, and time. This provision requires that the contractor excavate to the top of the proposed pavement subgrade and rip (or disk) the pavement subgrade to the full 8" depth. When this has occurred, the Geotechnical Engineer shall walk the area to look for gypsum crystals in the churned up soil. Where Gypsum Crystals are found, the area shall be converted to select fill. ALL LSSG on this project will be required to be mixed and compacted three (3) times (two days apart) at +3% moisture (+2 to +4%) during a four (4) day mellowing period. The contractor shall be required to provide additional water to maintain the area at the correct moisture. This work shall be included in the LSSB unit price. The owner may elect to perform periodic sulfate concentration testing of the subgrade soils in conjunction with the optimum lime series testing at the time of construction. Should these test indicate the presents of gypsum, the contractor shall be directed to use the select fill option and the quantities shall be adjusted accordingly.

**SC18 EROSION CONTROL:** The Contractor is responsible for providing and implementing the Storm Water Pollution Prevention Plan (SWPPP) and submitting the "Notice of Intent" (NOI) and "Notice of Termination" (NOT) applications to comply with the terms and conditions of the General Texas Pollutant Discharge Elimination System (TPDES, TCEQ Construction General Permit No. TXR 150000.) Additional requirements and links for these forms are provided in the specification 106, Erosion and Sediment Control. Base sheets will be provided at the request of the contractor.

**SC19 SUBMITTALS:** The Contractor shall submit to the City's Project Manager for review and approval all items required in the specification and the following items prior to beginning work:

- Work Plan indicating sequence and schedule
- Material Storage Location(s)
- Subcontractors to be used if applicable
- Traffic Control Plan
- Erosion Control Plan & NOI
- Trench box certifications and / or Trench Safety Plan
- Concrete Mix Design and Materials
- Stamped colored concrete median (photos of existing examples of the color and stamp pattern) plus a mock up (minimum 5'x5'). The product is intended to match the actual pavers at the Greens Prairie Trail RR Crossing.
- Retaining wall materials
- Other submittals as required by BCS United Specifications.

**SC20 RETAINING WALL REQUIREMENTS:** The retaining wall shall be cast concrete. The contractor shall provide at least 6" of permeable material behind the wall and a perforate 4" storm drain through the permeable material. The storm drains shall be routed to the public storm drain system provided on the plans or drained through the wall as approved by the owner.

**SC21 WATER UTILITIES:** Some water customers may be affected by this construction. The Contractor will insure that no utility customer has their water service eliminated for more than 6 hours. The Contractor shall coordinate with Wellborn SUD 72 hours' notice prior to system shut downs (closing any gate valve) and to notify all customers affected by construction 24 hours in advance of any shut downs.

**SC22 REINFORCED CONCRETE PIPE:** All reinforced concrete pipe shall be C76 class III with rubber gasketed joints per ASTM C443.

**SC23 CONCRETE JOINT SEALANT:** Sonneborn SL-1 will be required in all joints. Material shall be placed in accordance with all manufacturers' specifications.

**SC24 IDENTIFICATION OF EXISTING UTILITY CONFLICTS:** The contractor shall excavate and identify conflicts with existing utilities at least 7 calendar days in advance of the scheduled work at the conflict location. The engineer will provide revisions in a timely fashion to keep the project on schedule. No change orders will be considered based on additional time required for utility adjustment.

**SC25 REPLACEMENT OF MAIL BOXES:** Mailboxes along the route of construction will require adjustment. During construction, the contractor shall provide temporary mailboxes for all impacted residents at the intersection of Flagstone and Greens Prairie Trail. At the completion of construction, all mailboxes will be adjusted to provide 10" clear between the face of curb and the door of the mailbox. Mailboxes will be replaced in kind: Mailboxes in a brick enclosure shall be replaced with a mailbox in a brick enclosure. Free standing mailboxes will be replaced with freestanding mailboxes. When the existing brick mailbox can be moved and re-set in the proper location the contractor may collect the full unit price for simply moving the mailbox. If the contractor damages a brick mailbox he shall replace the entire structure including a matching brick façade for the unit price. When a freestanding mailbox is replaced a "First Class Seville" and "Mayne Bradford Mail Post Black" (both available from Lowe's) or approved equal shall be provided and installed by the contractor. All mailboxes must have the address on the box. Address lettering to be approved by city representative. When a mailbox is set in the sidewalk, the ADA path behind the mailbox must be at least 4' wide. If the path is not 4' wide, additional sidewalk shall be placed to provide this path. The inspector shall track any such extension of quantities.

**SC26 WASTE COLLECTION:** Construction is not to impede weekly waste collection. Residential waste collection, including recycling and brush and bulky service occurs once a week on Friday within the project limits. Anytime that city garbage collection trucks are denied vehicular access to residential curb side pickup the contractor must collect the filled cans from each property and locate them in an area accessible to the collection truck prior to scheduled pick up. The contractor must also return the empty cans that day. Cans that are not addressed are interchangeable amongst properties. The contractor may want to include a note about garbage collection in their required door hanger notifications to emphasize that cans need to be out by 7:00am for collection to occur. Contractor shall coordinate all solid waste collection issues with Wally Urrutia @ 979 764 3841.

**SC27 RESIDENTIAL NOTIFICATION:** Prior to beginning construction, the residents and within the affected work zone shall be notified by the Contractor at least 48 hours in advance. Notification shall be written and hand delivered to each residence. Notices are not to be placed in mailboxes. All written notices shall be approved by the City prior to distribution. Residents shall be similarly notified when access to their drives will be blocked. The Contractor shall accommodate special needs that residents may have such as access for handicap, etc.

**SC28 REINFORCEMENT FOR CONCRETE PAVEMENT:** All CSCP shall be conventional concrete pavements shall be reinforced with #5 Bars at 16" OCEW. Longitudinal Construction Joints shall use Multiple Piece Tie Bars (See TxDOT DMS-4515 "Multiple Piece Tie Bars for Concrete Pavements). The stabbing of dowel bars into green concrete shall NOT be allowed. See the College Station Concrete Pavement (CSCP) Detail Sheet for the full requirements.

**SC29 PURNING OF EXSISTING TREES:** Tree limbs and roots along the edge of the Right of Way must be pruned for Construction. All pruning shall be completed under the direction of a certified arborist. Payment for the arborist shall be hourly and authorized by the CoCS inspector.

**SC30 PEACH CREEK SOUTH CULVERT CONSTRUCTION:** The construction of the 3x10'x8' culvert at Peach Creek South shall be completed in halves using flagmen to control traffic. All work shall occur during working hours. The contractor shall divert all traffic the north side of the roadway and place the boxes in the southern half of the roadway. The contractor shall backfill and place a temporary driving surface over the newly placed boxes. Then divert all traffic to the south half of the



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Job No. 1511  
 Drawn By: JM

Prepared For:  
 City of College Station  
 Public Works Department  
 310 Krenek Tap Rd  
 College Station, TX  
 77840

	Revisions

**SPECIAL CONDITIONS  
 GREENS PRAIRIE TRAIL  
 ROADWAY CAPACITY IMPROVEMENTS**

PROJECT BENCHMARK: SURVEY CONTROL POINT #533  
 1/2" IRON ROD W/ CAP Located along north side of Right of way  
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 Offset 45.13 Elev=299.26. Contractor shall move/protect control.

roadway and place the culvert in the north half. At no time shall the roadway be completely closed down for more than five minutes. All backfill shall be cement stabilized sand. Should the soil below the culvert be found unsuitable, the soil shall be excavated and replaced with cement stabilized sand. This extra work should be recorded by the owner's inspector for payment. Note that the time limitation will likely require more equipment than would normally be found on a utility crew. This additional equipment shall be include in the bid pricing of the culvert items. The contractor may elect to complete this work during a weekend but shall receive no additional pay and shall provide notice to the owner 30 days in advance of the work.

**SC31 CONSTRUCTION OF UTILITES:** Existing utilities to be replaced shall be physically removed from the ground and disposed of by the contractor. The construction of various utilities (storm, potable water, electrical, etc) shall be phased by the contractor with the following limitations:

- No resident shall be removed from service for more than six hours, and
- Residents shall be notified of all service interruptions 24 hours in advance of the interruption.

**SC32 TEMPORARY DRIVING SURFACE DURING CONSTRUCTION:** The construction of the various utilities shall require open cutting of the existing roadway. The contractor shall utilize cement stabilized sand up to 6" below the driving surface. The contractor may place 6" of RAP for a driving surface for up to 60 days. The contractor shall be required to maintain this driving surface for any duration which it exists. Should the construction sequence require that the temporary driving surface remain in place for more than 60 days, the contractor shall place 2" of asphalt on the trench for traffic at his convenience during the 60 days. Under no circumstances shall the proposed concrete roadway be open cut. The contractor may elect to bore any utility to facilitate the schedule with the knowledge that no extra payment is available for this work.

**SC33 DIFFERING SITE CONDITIONS:** Existing site conditions shall be determined through a combination of the improvement plans and visual evidence in the field. Surface facilities such as valves or linear patches shall be considered sufficient evidence that an underground facility exists in that location. The Contractor shall pothole and physically verify the location and depths of all underground utilities and structures prior to work in that area of the project.

Damage to structures or facilities shown on the improvement plans, marked in the field, or surmised from visual evidence shall be the sole responsibility of the Contractor.

Relocation of or damage to structures or facilities which have been found in the field to be in conflict with the proposed improvements and could have been surmised from the plans or visual evidence in the field shall be performed by the Contractor at no extra expense as they are considered subsidiary to the item of work being performed. Relocation of or damage to structure or facilities which have been found to be in conflict with the proposed improvements and were clearly not evident through thorough field investigation shall be performed by the Contractor as Extra Work or by the Owner of the facility under the City Franchise rights, as determined and decided by the City's Representative.

Contractor shall notify engineer if a discrepancy exists between field observations and construction documents.

**SC34 PROTECTION OF EXISTING FACILITIES AND STRUCTURES**

It shall be the sole responsibility of the Contractor to protect all existing facilities from damage caused by or arising out of the work. The Contractor shall utilize such methods as he deems necessary to progress with the work without causing damage to facilities or structures both above and below ground.

Methods employed by the Contractor which, in the opinion of the City's Representative, are causing or will cause damage to existing structures or facilities will be modified or terminated upon written notice of such damage to the Contractor by the City's Representative, with no delay or damage charges payable to the Contractor for compliance with this section.

Information and data reflected in the Bidding Documents with respect to underground facilities at or contiguous to the site is based upon information and data from the City's files for its underground facilities and information and data furnished by Owners of other underground facilities.

Before submitting a Bid, each Bidder will be responsible to make or obtain such explorations, tests and data concerning physical conditions (surface, subsurface, and underground facilities) at or contiguous to the site, or otherwise which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the terms and conditions of the Bidding Documents.

A significant number or existing utilities exist along the project construction route, including overhead power lines. It is the responsibility of the contractor to identify and avoid all existing utilities.

**SC35 MOBILIZATION AND PROJECT OVERHEAD:** The bid item "Mobilization and Project Overhead" shall include and not be limited to the following: cost to mobilize and demobilize equipment to the project site, construction staking, the cost of bonds and insurance and all other incidental costs associated with the project.

**SC36 DIGITAL PHOTO DOCUMENTATION OF PROJECT:** Contractor shall take digital photos of the work on a daily basis throughout the entire duration of the project. Hard copy digital photo images shall be printed in color on a daily basis and stored with "As Built" drawings in a catalog that is kept orderly, labeled, and indexed using dates and locations (i.e. stations). Contractor shall also record two (2) complete sets of all digital photos taken during a week onto separate compact diskettes (CD). At the end of each week, one CD will be given to the Owner's representative immediately after it is recorded and one CD will be retained in a protective case with the "As-Built" Drawings. The complete set of compact diskettes retained with the "As-Built" Drawings and the hard copy catalog will be given to the Owner at the end of the project such that the Owner will end up with two (2) complete sets of digital photos on CDs and a catalog of hard copies. Contractor shall take a sufficient number of digital photos to adequately document the work and shall work closely with Owner's representative to determine the number and location of digital photos to be taken each day. Digital photos should generally include such items as fittings, major crossings of other utilities or petroleum pipelines, any unmapped utilities or pipelines, and items that may be the subject of future controversy, or any items related to extra work claims. No additional compensation will be provided for digital photo documentation. Include all costs in related items of work.



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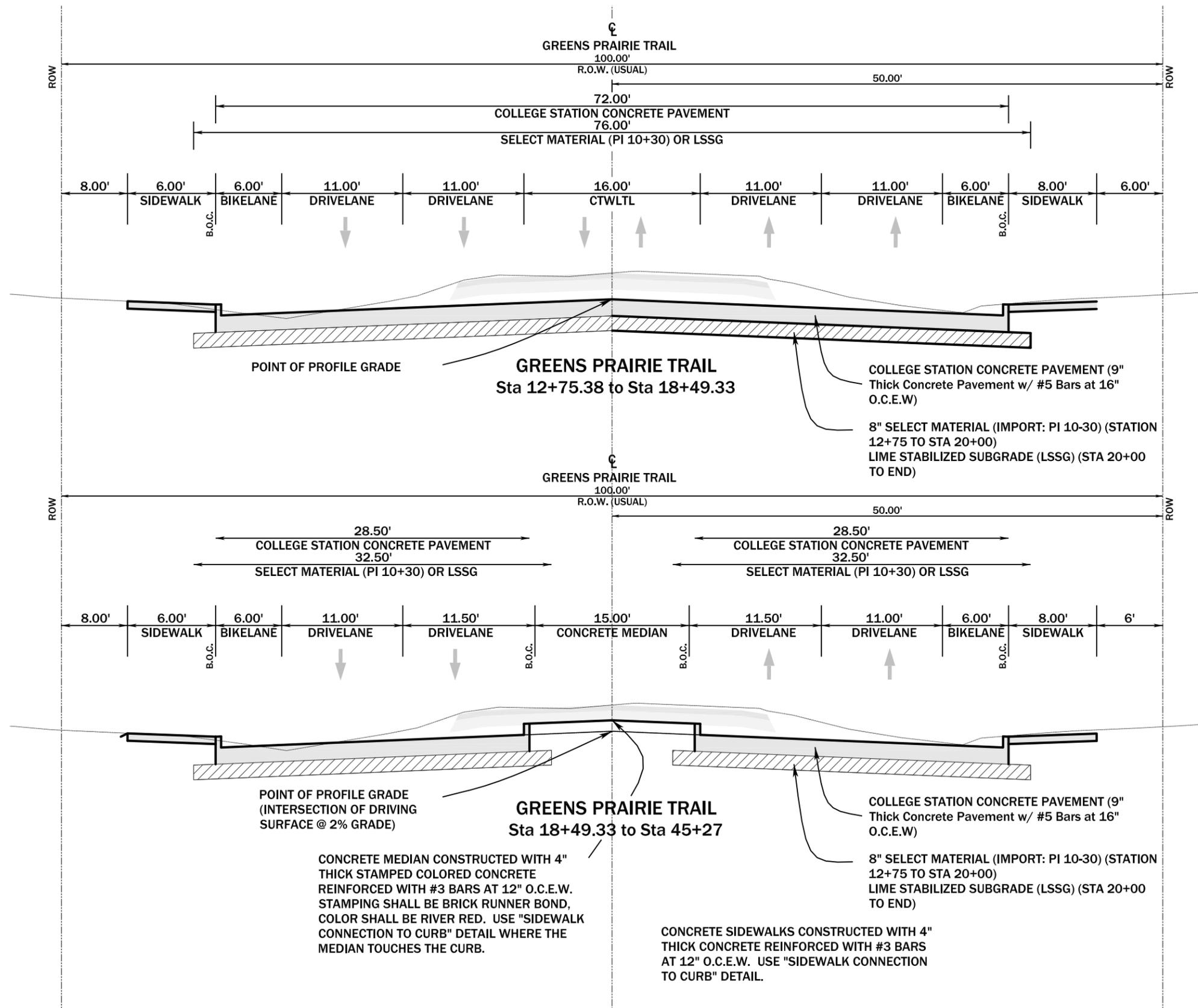
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 Public Works Department  
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 77840

Revisions

**SPECIAL CONDITIONS**  
**GREENS PRAIRIE TRAIL**  
**ROADWAY CAPACITY IMPROVEMENTS**



PROJECT BENCHMARK: SURVEY CONTROL POINT #533  
 1/2" IRON ROD W/ CAP Located along north side of Right of way  
 between Ledgestone Trail and Royder Road at Station 31+19.12 and  
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.



See Special Conditions SC15 & SC16 for additional information about Select Fill and Lime Stabilized Subbase.

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 JOEL J. MITCHELL  
 80649  
 REGISTERED PROFESSIONAL ENGINEER

July 2016  
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 Drawn by: JMM

Prepared For:  
 City of College Station  
 Public Works Department  
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Revisions

**TYPICAL ROADWAY SECTIONS**  
**GREENS PRAIRIE TRAIL**  
**ROADWAY CAPACITY IMPROVEMENTS**

7

Of 190 Sheets

FILENAME: E533-1100-Road Sections.dwg  
 PLOTTED: 26 Jul 2016 - 4:15 pm

Horizontal Scale: 1"=10'  
 Vertical Scale: 1"=5'

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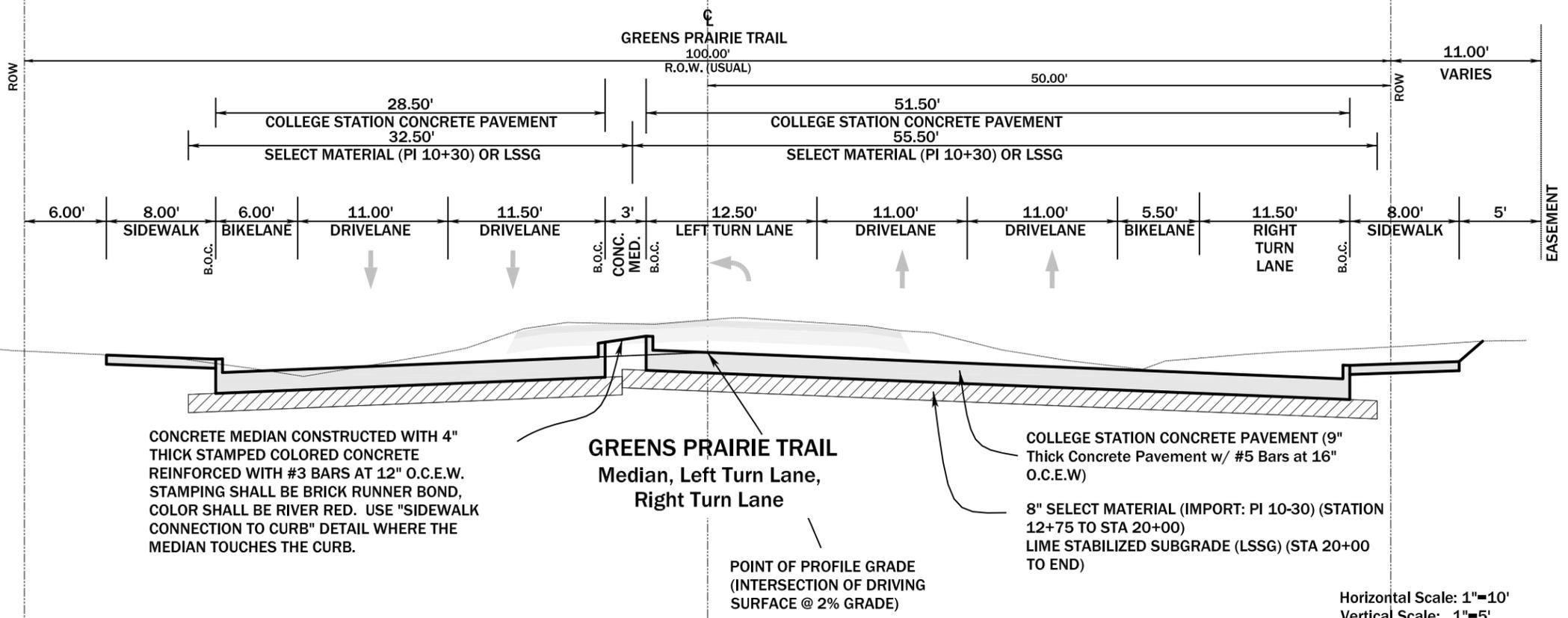
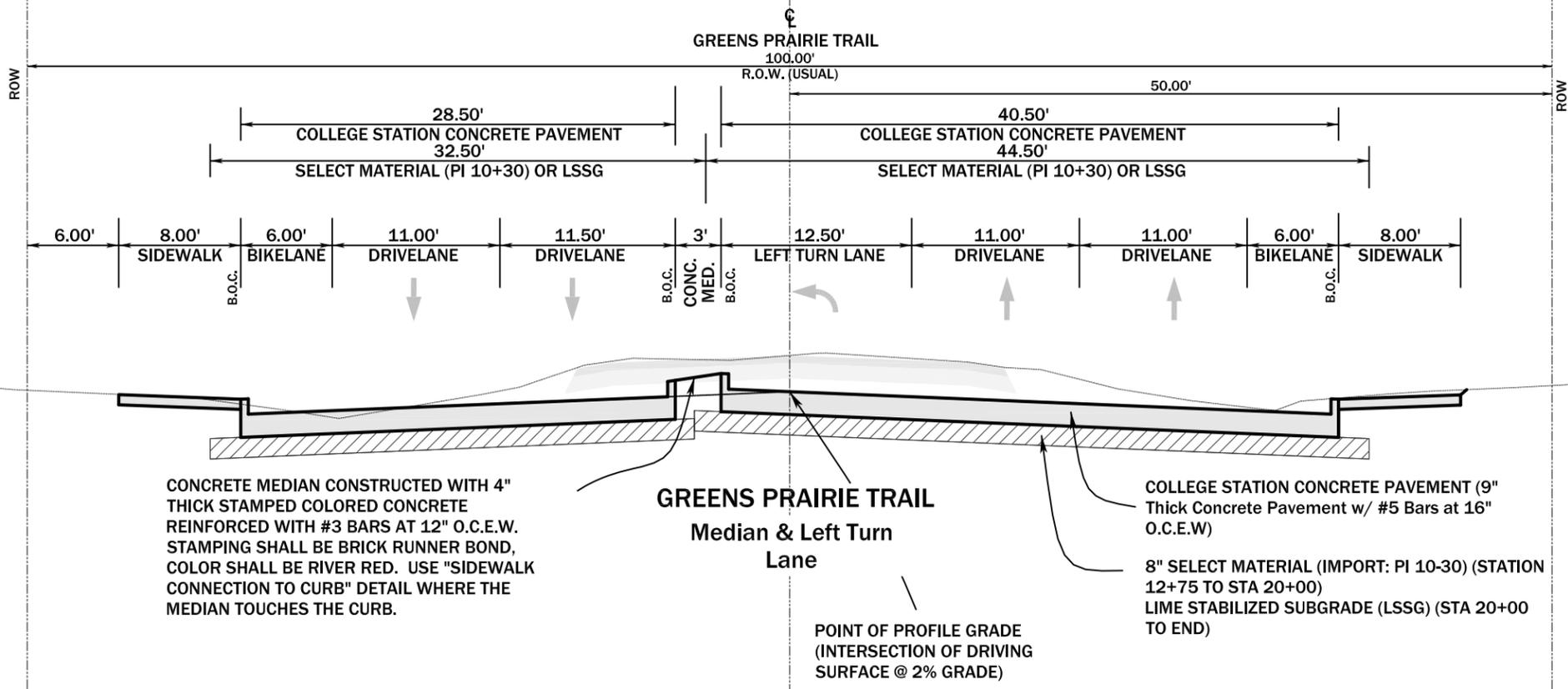
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**TURN LANE SECTIONS  
 GREENS PRAIRIE TRAIL  
 ROADWAY CAPACITY IMPROVEMENTS**

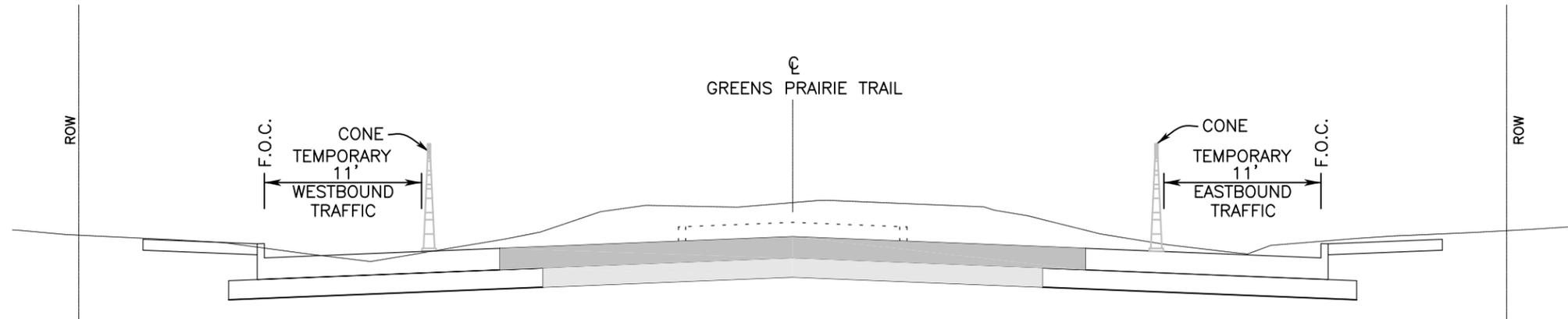
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Horizontal Scale: 1"=10'  
 Vertical Scale: 1"=5'

FILENAME: E533-1.00-Roadway Sections.dwg  
 PLOTTED: 26 Jul 2016 - 4:55 pm





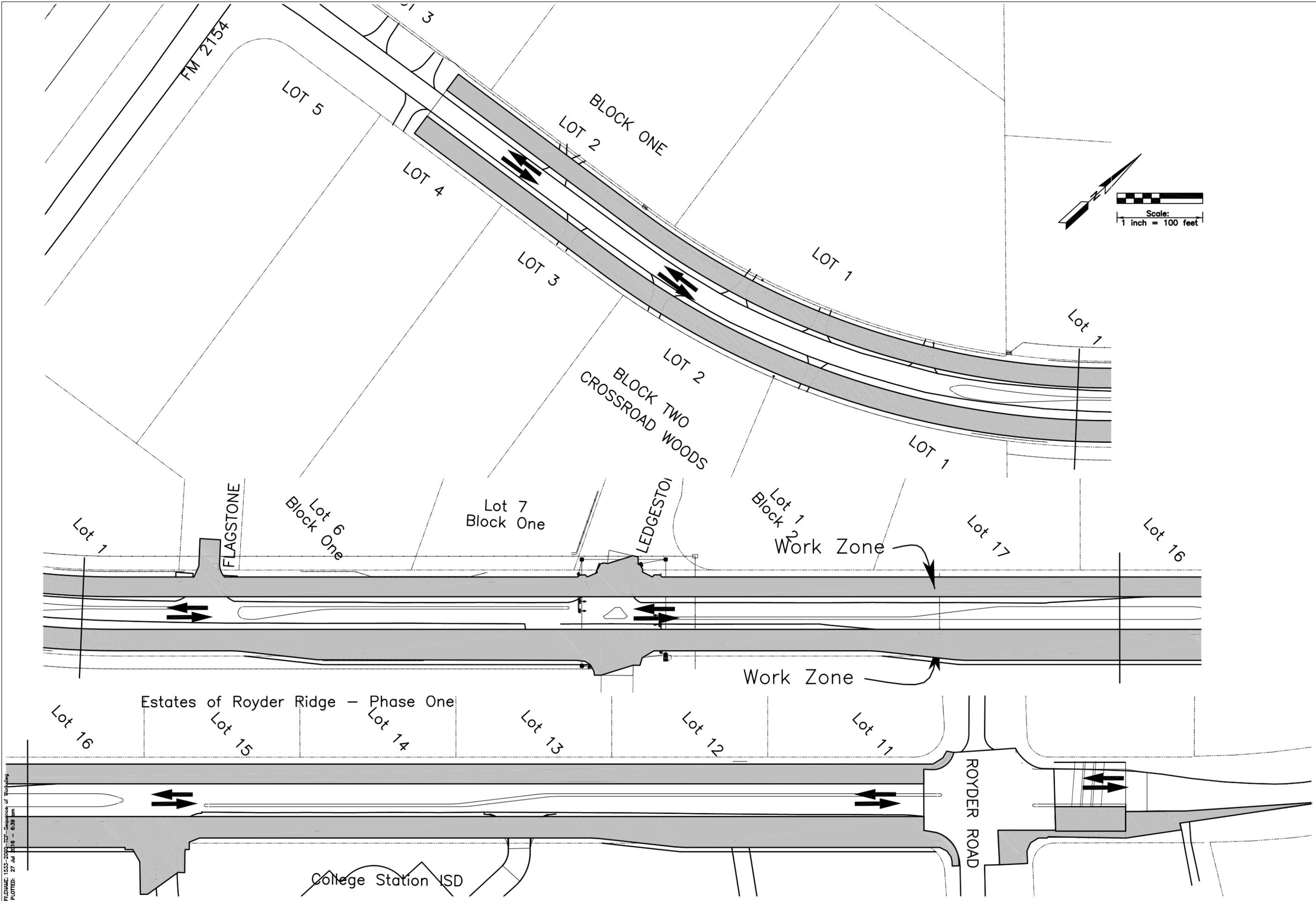
**GREENS PRAIRIE TRAIL  
PHASE 2 TCP**

Phase 2 work shifts the traffic to the two new 17' strips of concrete pavement placed with Phase 1.  
Construct:

- The Pavement (Excavation, Select Fill, Lime Stabilized Subgrade, and Concrete Pavement) between the outside lanes and the medians.
- TCP consists of:
  - Shift traffic along Greens Prairie Trail onto the newly placed pavement. Traffic shall remain in the shifted state at the close of business each day.
  - Contractor shall place cones along the edge of travel lane to push vehicles away from the work zone
  - Contractor shall select and delineate work area based on progress and implement standard TCP (2-1) and standard TCP (1-2) using Flag men as required. The work area and traffic control may be modified daily to move with the progress of the work.
  - TMA's will be required where work is taking place.
  - Contractor shall ensure that the edge of traveled way is backfilled (3:1 Max Safety Slope, see "Treatment for Various Edge Conditions" sheet)

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**PHASE TWO TCP  
GREENS PRAIRIE TRAIL  
ROADWAY CAPACITY IMPROVEMENTS**



FILENAME: 1537-2000-TCP-Sequence of Workings  
 PLOTTED: 27 Jul 2016 - 6:39 am



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July 2016  
 Designed by: JMM  
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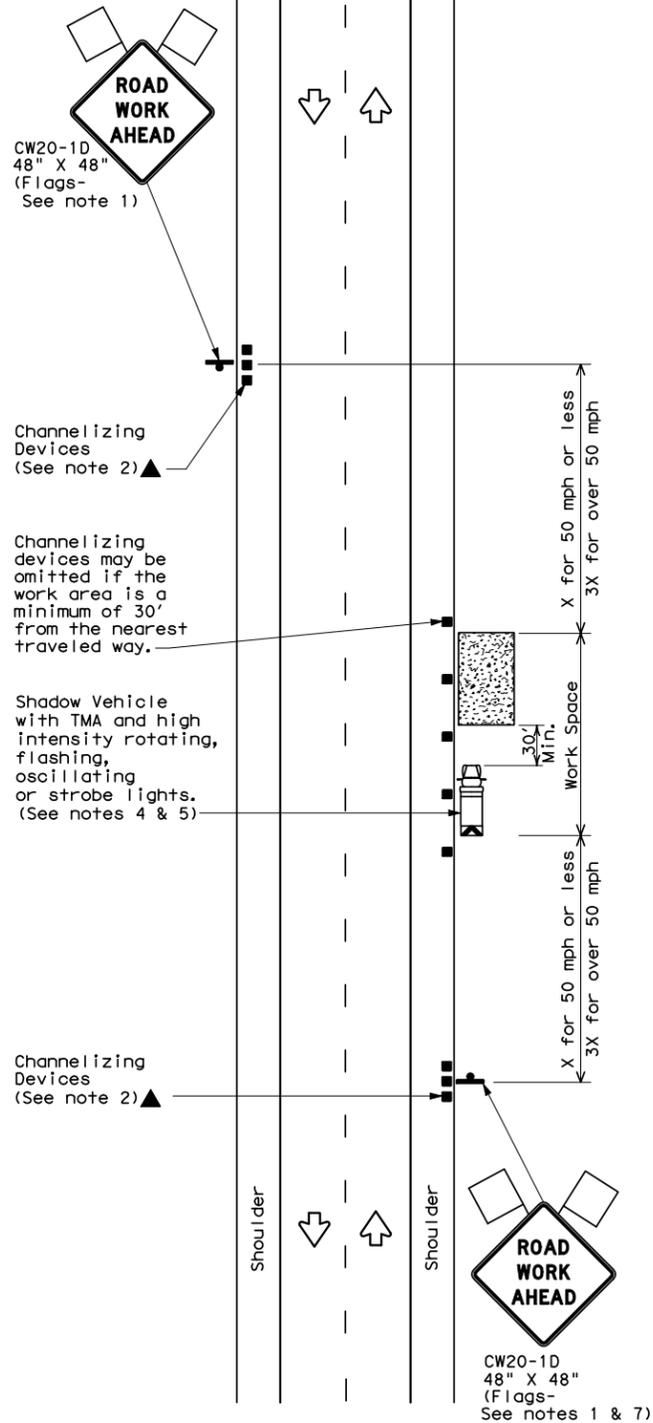
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**TCP PHASE ONE LAYOUT**  
**GREENS PRAIRIE TRAIL**  
**ROADWAY CAPACITY IMPROVEMENTS**



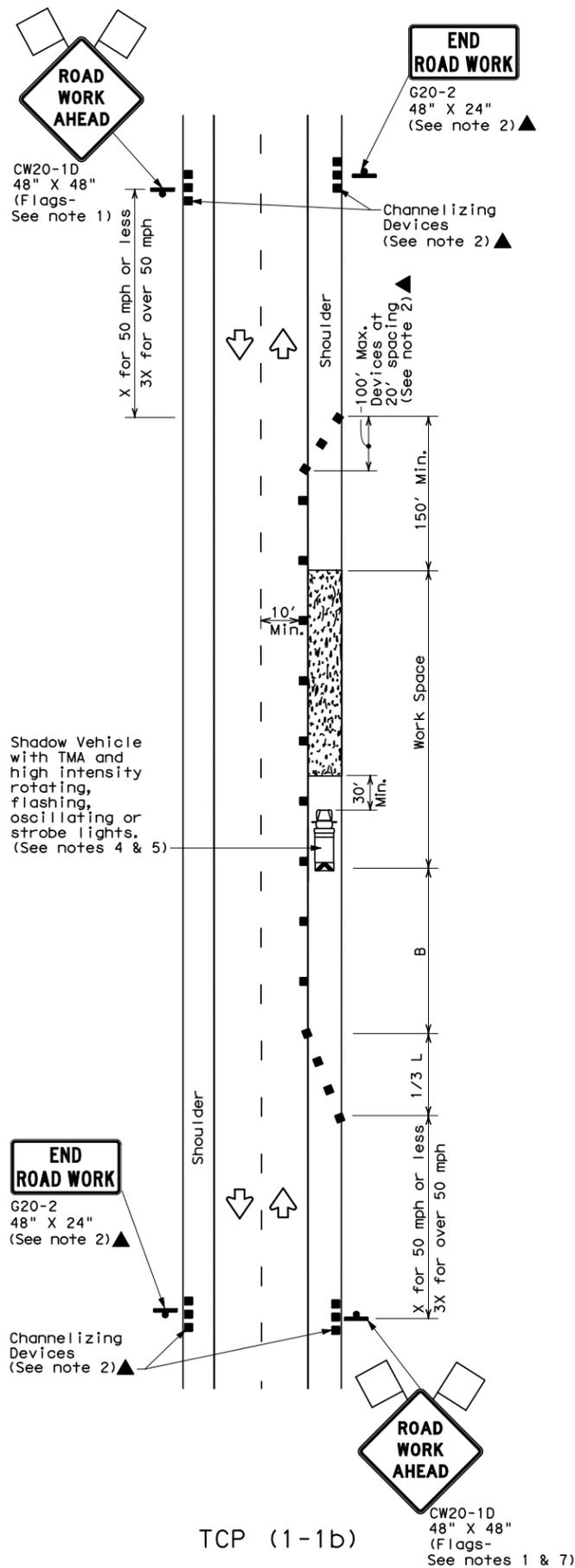
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DATE: FILE:



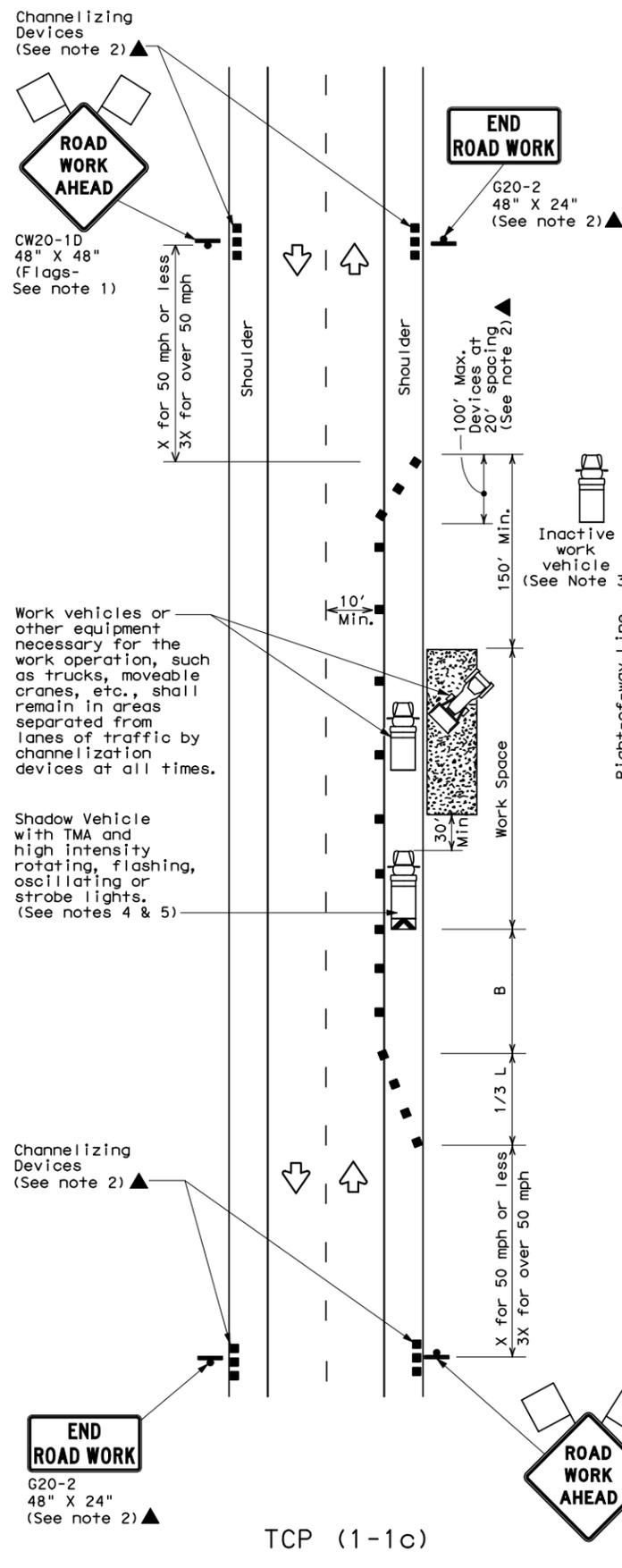
TCP (1-1a)

**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		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = WS <sup>2</sup> / 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**

- Flags attached to signs where shown are REQUIRED.
- 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.
- Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
- 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.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
- CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

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Traffic Operations Division

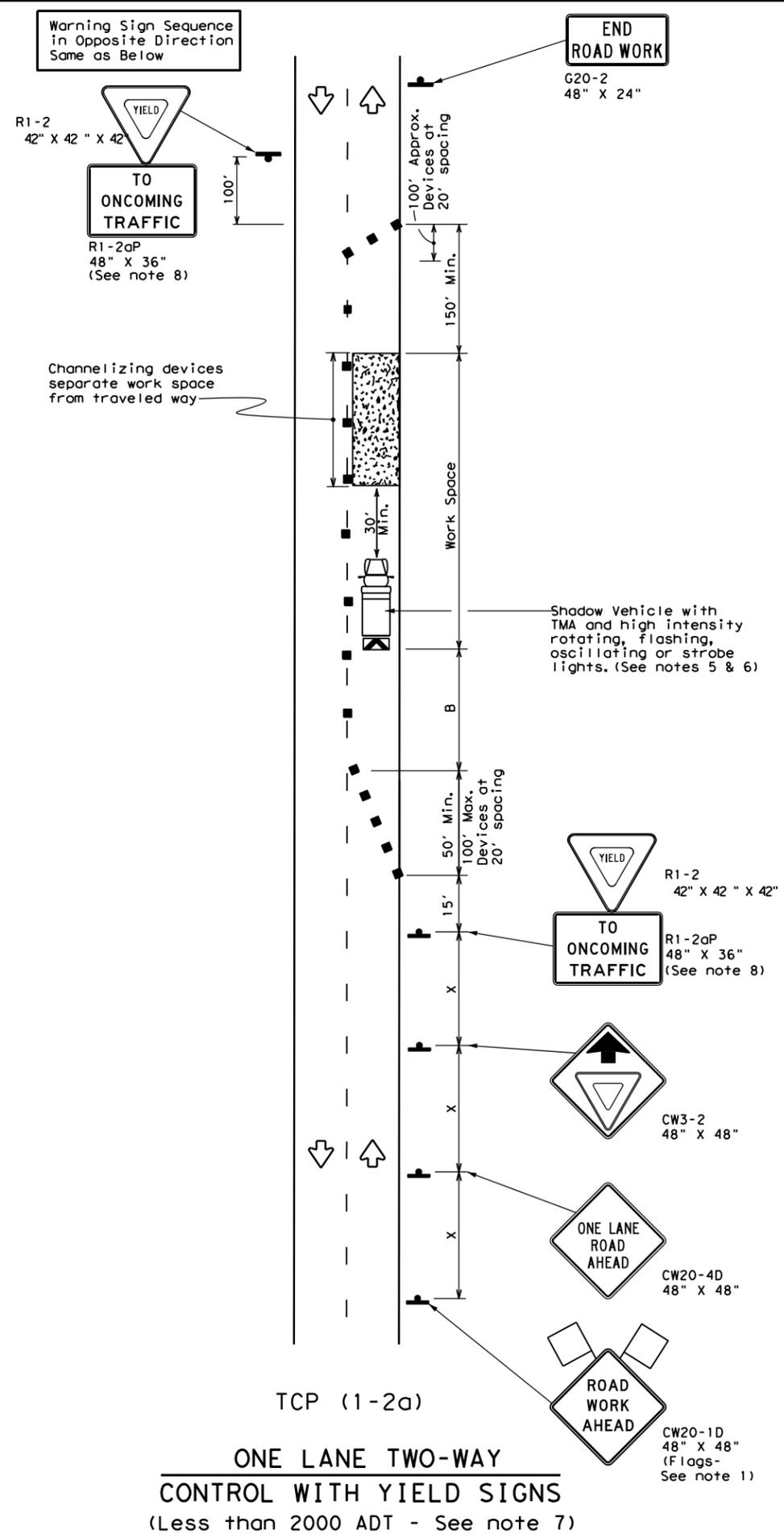
**TRAFFIC CONTROL PLAN**  
CONVENTIONAL ROAD  
SHOULDER WORK

TCP (1-1) -12

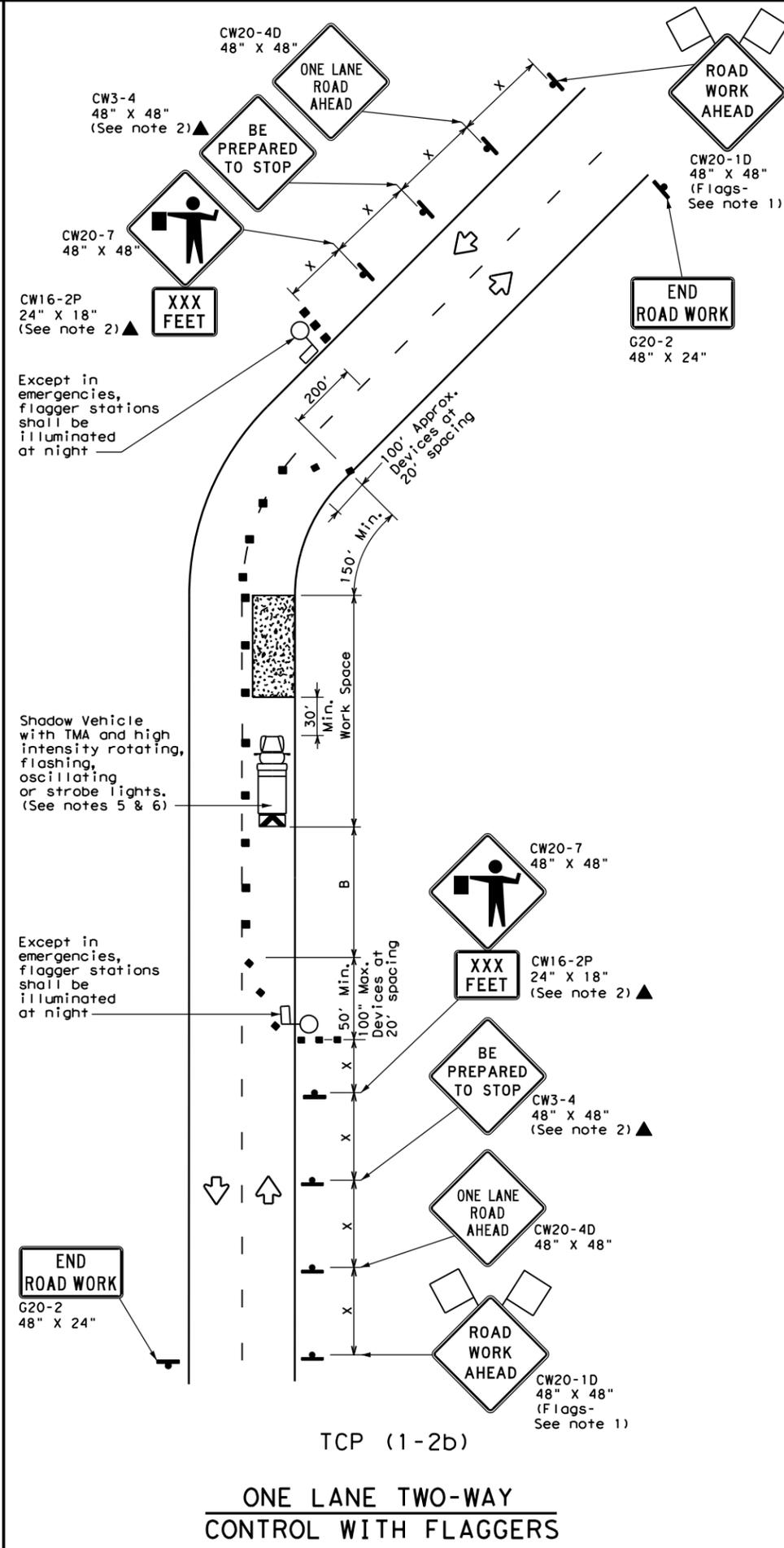
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REVISIONS		CONT	SECT	JOB	HIGHWAY
2-94	2-12	0540	04	0540-04-072	FM 2154
8-95					
1-97					
4-98					
		DIST	COUNTY		SHEET NO.
		BRYAN	BRAZOS		036

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**ONE LANE TWO-WAY  
CONTROL WITH YIELD SIGNS**  
(Less than 2000 ADT - See note 7)



**ONE LANE TWO-WAY  
CONTROL WITH FLAGGERS**

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

Posted Speed * X	Formula L = WS <sup>2</sup> / 60	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = WS <sup>2</sup> / 60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L = WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

**GENERAL NOTES**

- Flags attached to signs where shown are REQUIRED.
- 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.
- The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
- Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
- 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.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

**TCP (1-2a)**

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

**TCP (1-2b)**

- Flaggers should use two-way radios or other methods of communication to control traffic.
- Length of work space should be based on the ability of flaggers to communicate.
- If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
- Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
- Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.



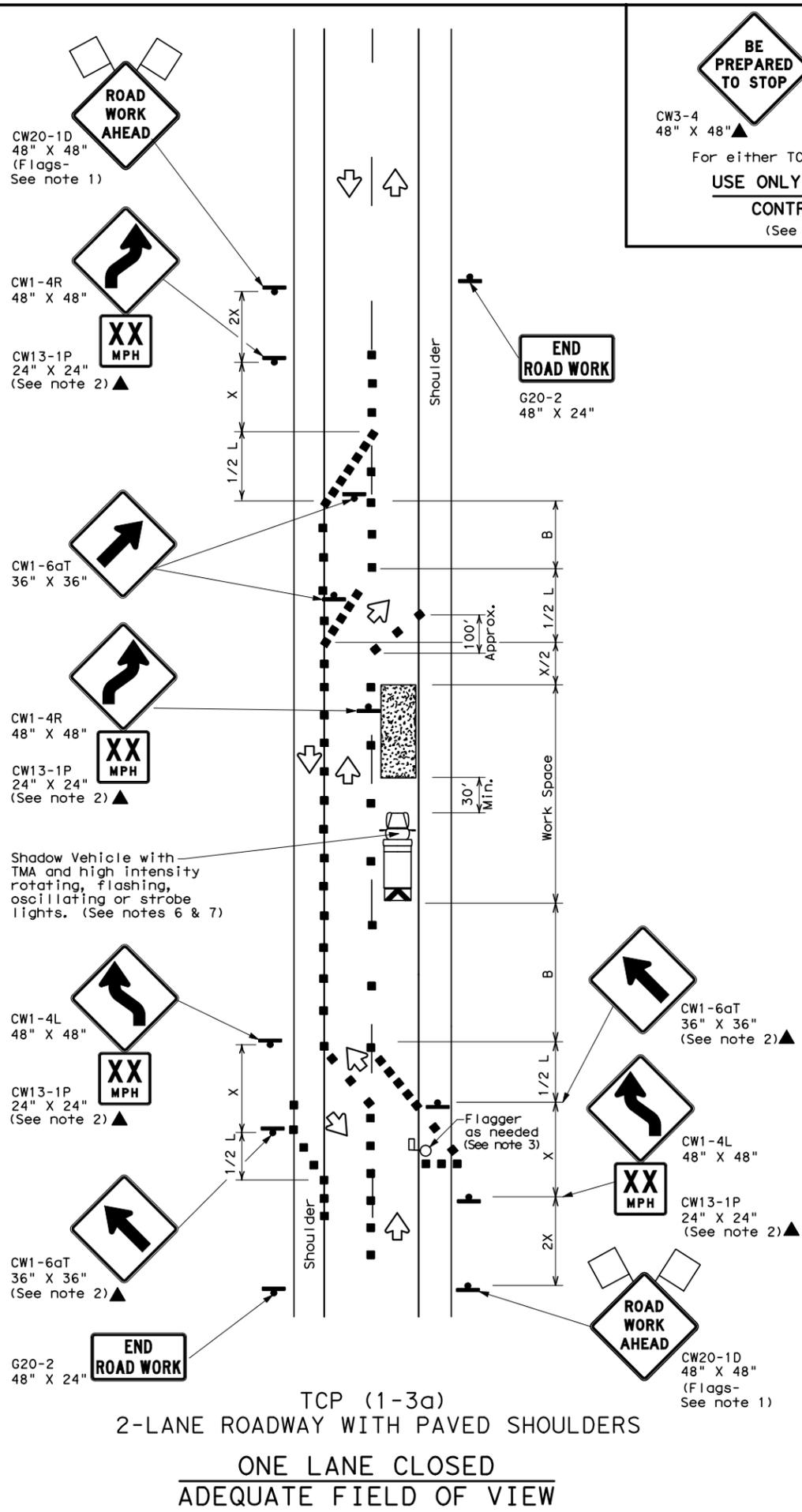
**TRAFFIC CONTROL PLAN  
ONE-LANE TWO-WAY  
TRAFFIC CONTROL**

TCP (1-2) - 12

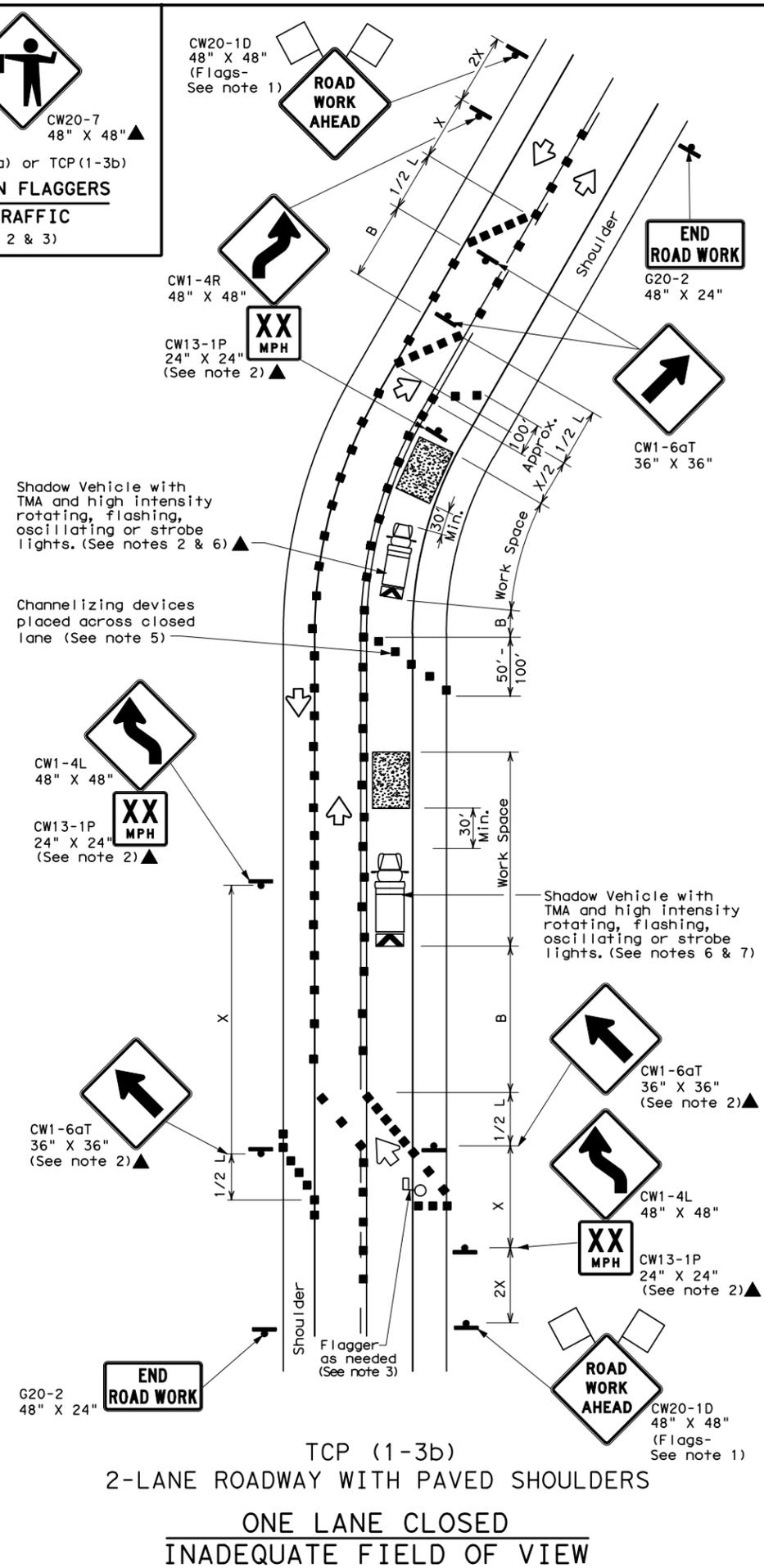
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		BRYAN	BRAZOS		037

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**BE PREPARED TO STOP**  
CW3-4 48" X 48"▲ CW20-7 48" X 48"▲  
For either TCP(1-3a) or TCP(1-3b)  
**USE ONLY WHEN FLAGGERS CONTROL TRAFFIC**  
(See Notes 2 & 3)



**LEGEND**

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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**
- Flags attached to signs where shown are REQUIRED.
  - 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.
  - Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
  - DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
  - When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
  - 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.
  - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
  - Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20', or 15' if posted speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

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Traffic Operations Division

**TRAFFIC CONTROL PLAN**  
**TRAFFIC SHIFTS ON**  
**TWO LANE ROADS**

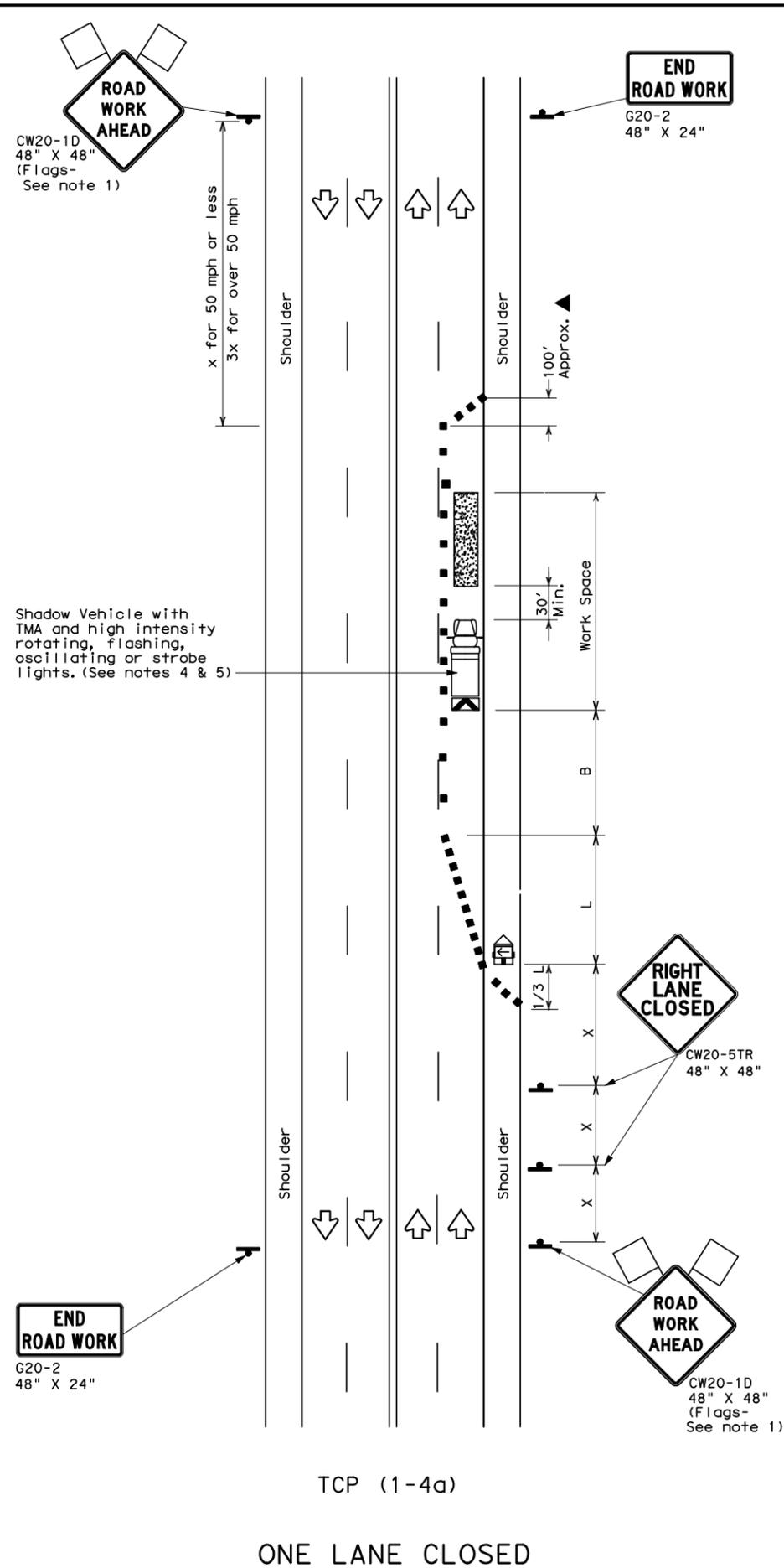
TCP (1-3) - 12

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REVISIONS					
2-94	2-12	0540	04	0540-04-072	FM 2154
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		BRYAN	BRAZOS	038	

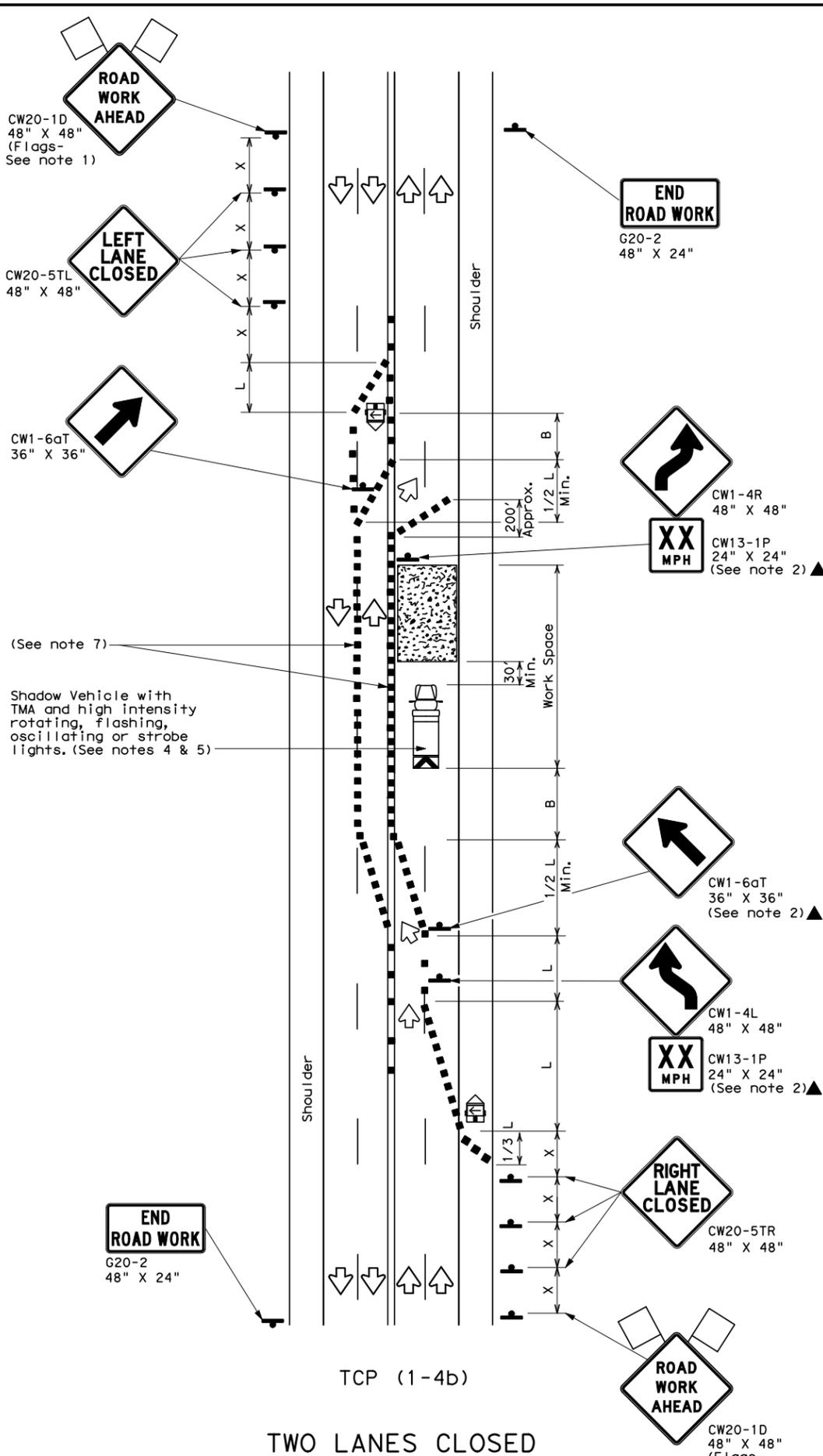
153

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TCP (1-4a)  
ONE LANE CLOSED



TCP (1-4b)  
TWO LANES CLOSED

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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

- Flags attached to signs where shown are REQUIRED.
- 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.
- The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
- 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.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

- Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

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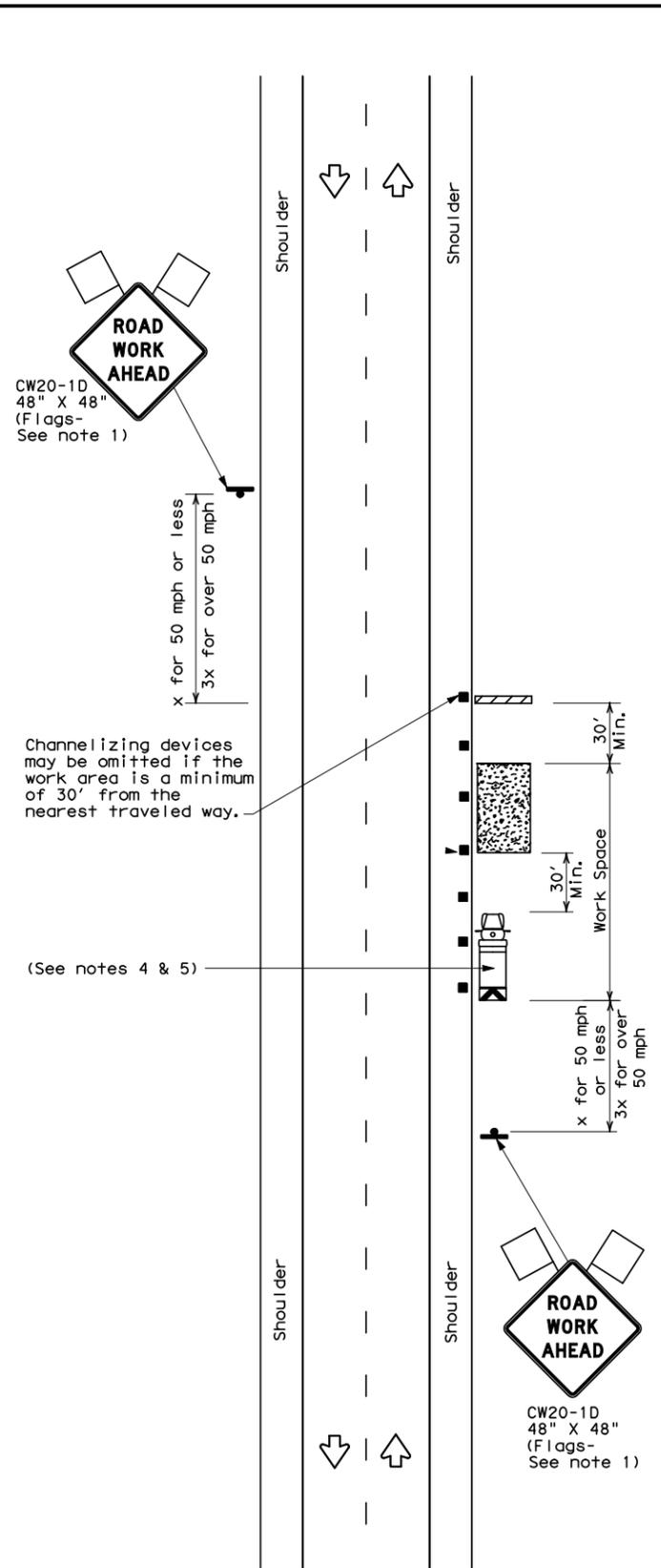
TRAFFIC CONTROL PLAN  
LANE CLOSURES ON MULTILANE  
CONVENTIONAL ROADS

TCP (1-4) -12

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REVISIONS					
2-94	2-12	CONT	SECT	JOB	HIGHWAY
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4-98		BRYAN	BRAZOS		039

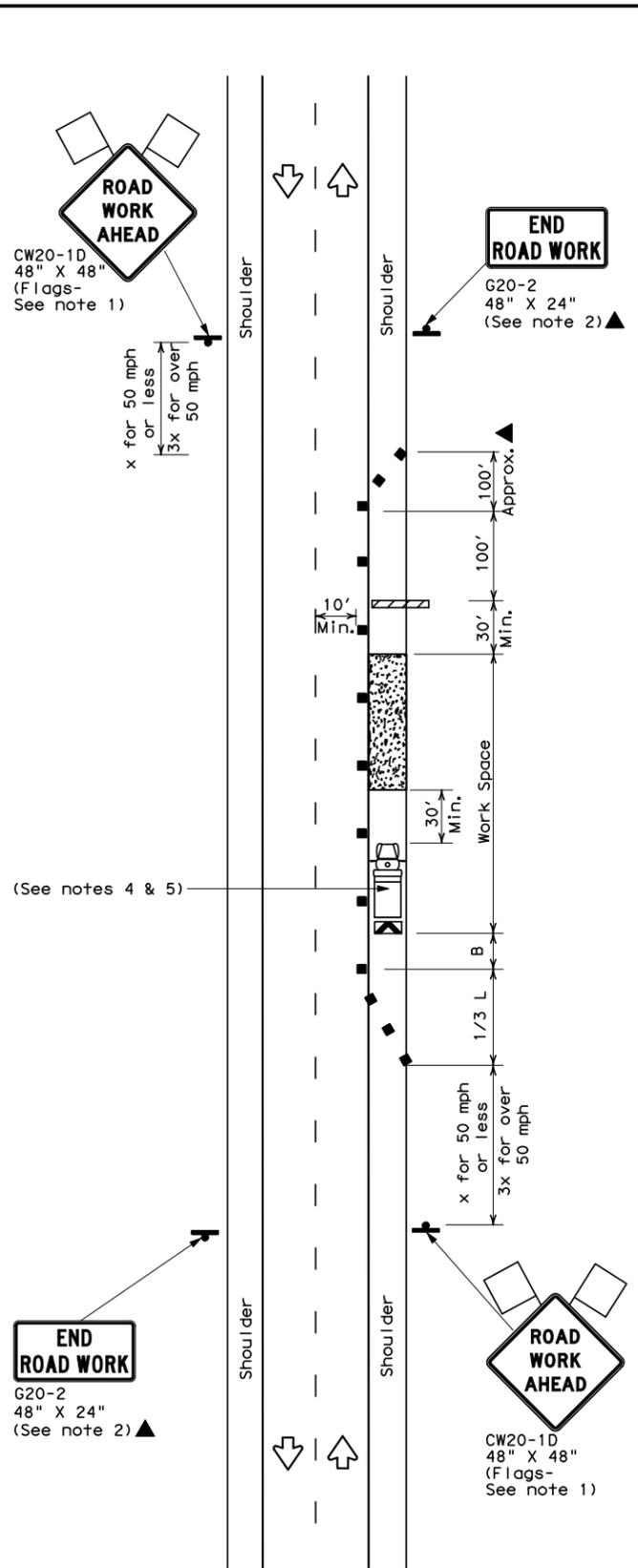
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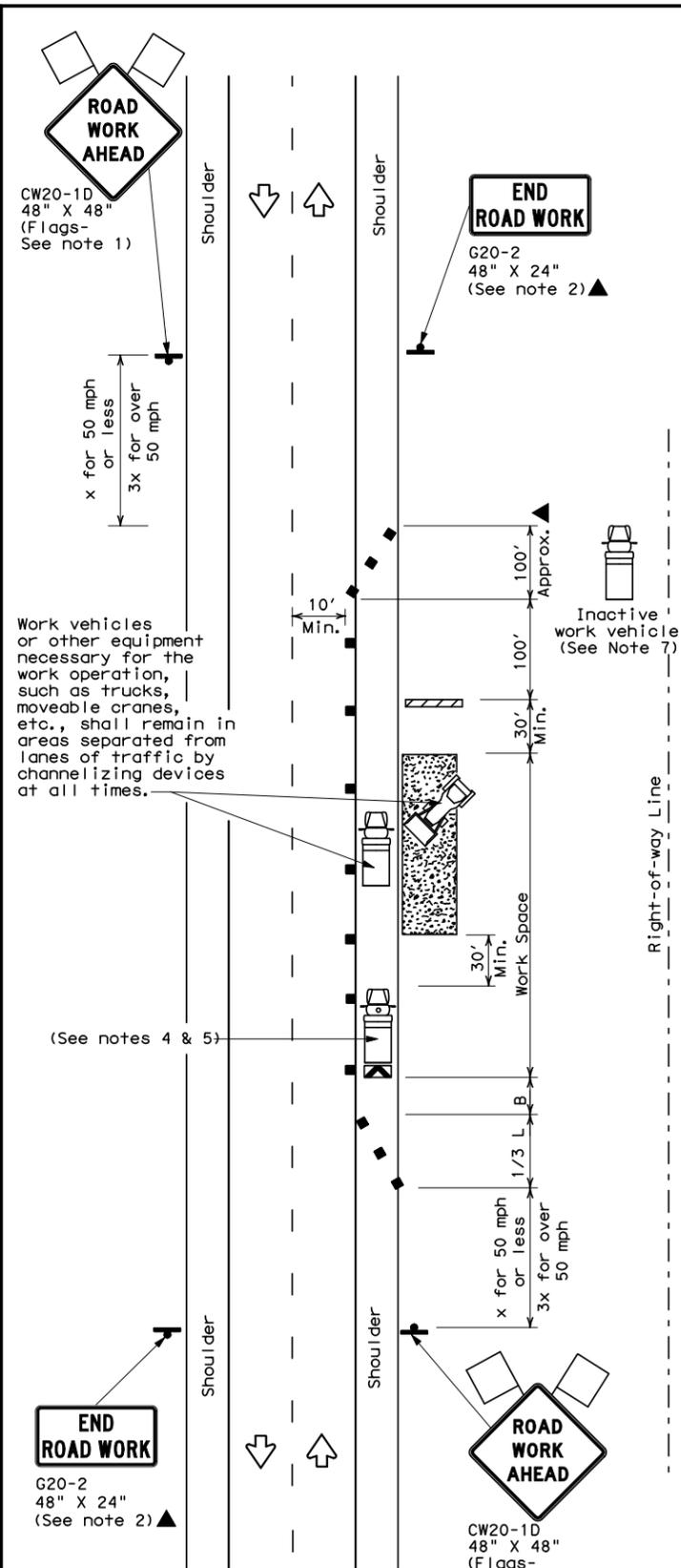
TCP (2-1a)

**WORK SPACE NEAR SHOULDER**  
Conventional Roads



TCP (2-1b)

**WORK SPACE ON SHOULDER**  
Conventional Roads



TCP (2-1c)

**WORK VEHICLES ON SHOULDER**  
Conventional Roads

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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**

- Flags attached to signs where shown, are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
- Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
- 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.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
- Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
- CW21-5 "SHOULDER WORK" signs may be used in place of CW21-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

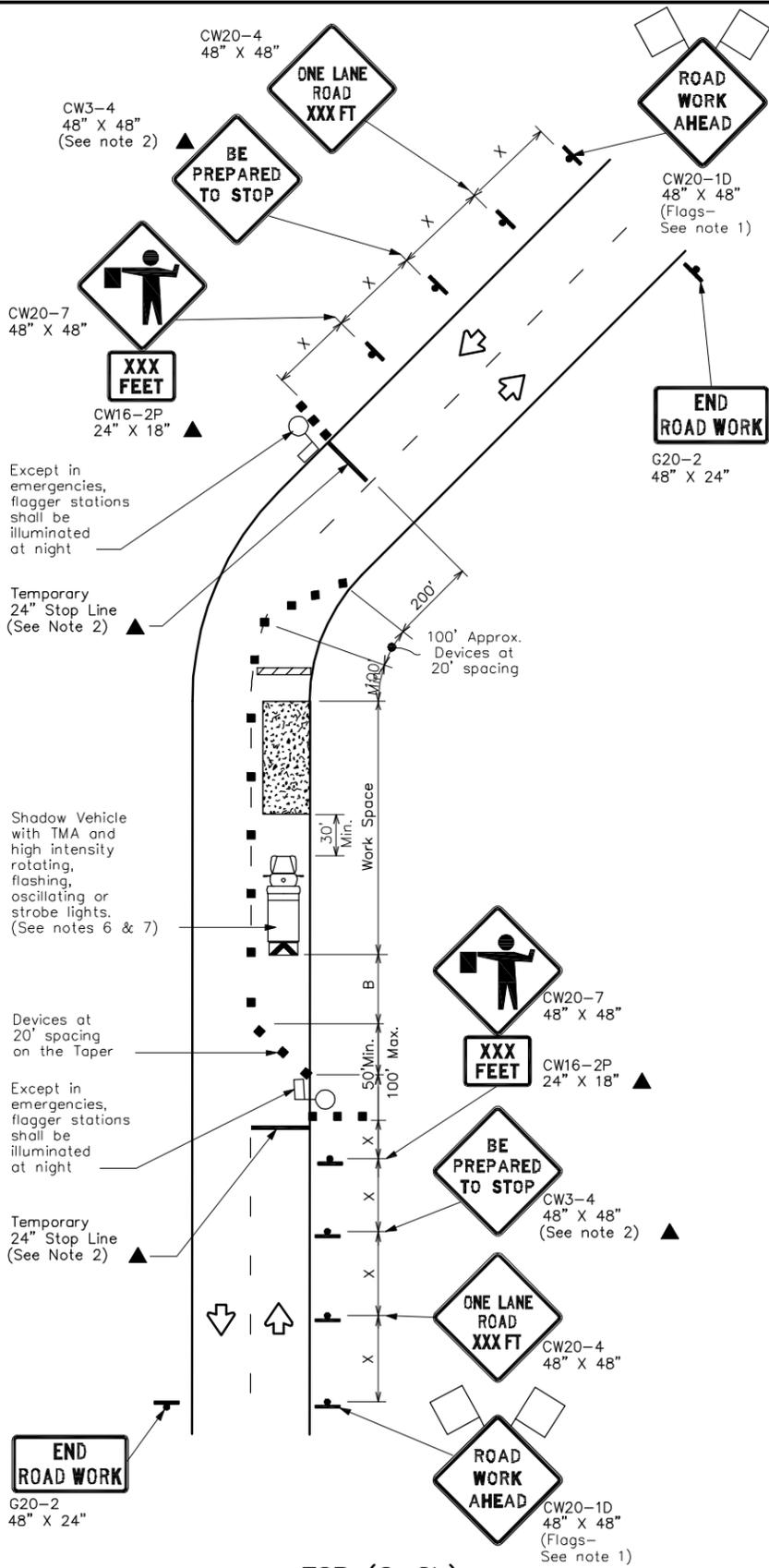
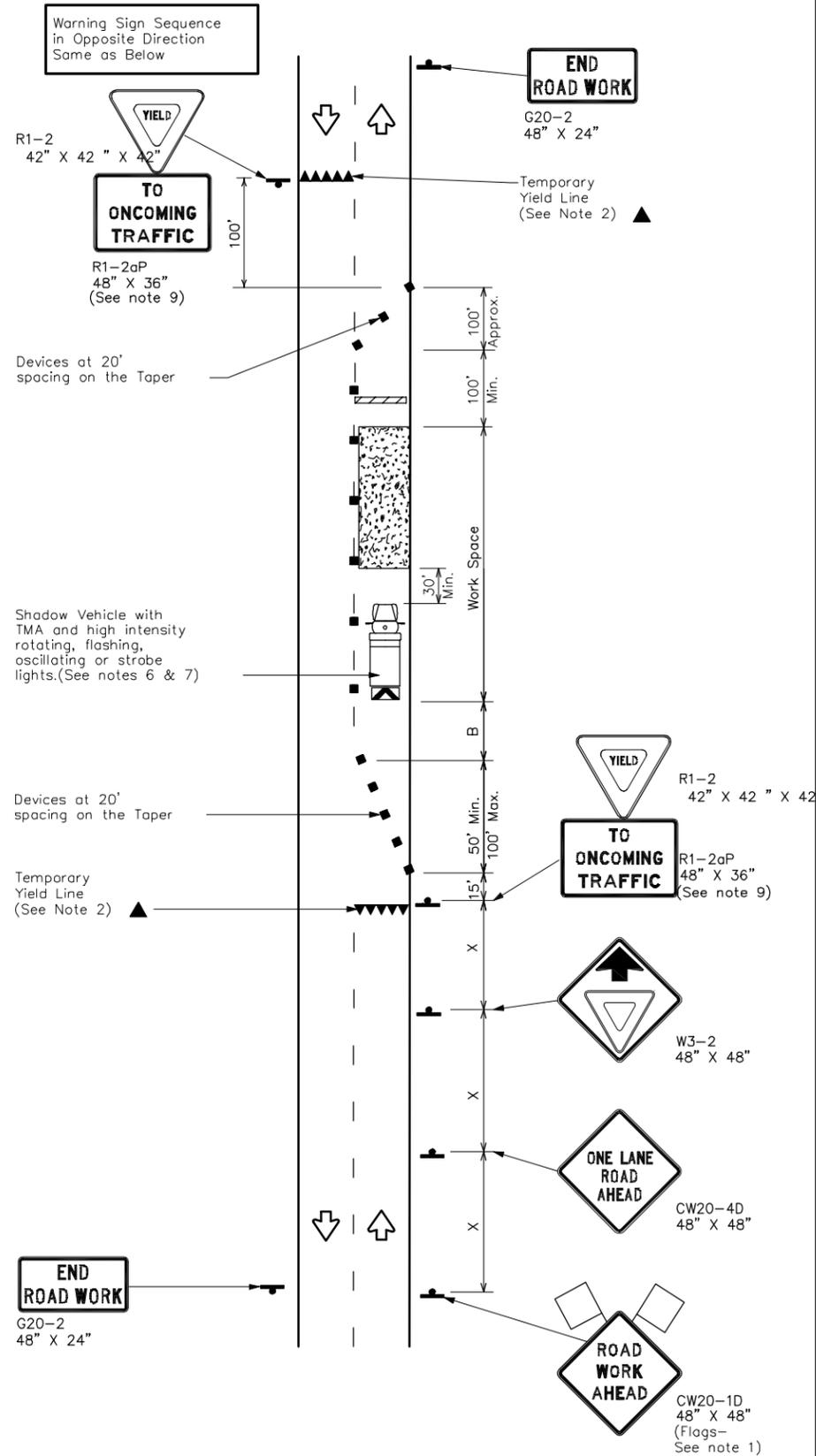


**TRAFFIC CONTROL PLAN**  
**CONVENTIONAL ROAD**  
**SHOULDER WORK**

TCP (2-1) - 12

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REVISIONS					
2-94	2-12	CONT	SECT	JOB	HIGHWAY
8-95		0540	04	0540-04-072	FM 2154
1-97		DIST	COUNTY		SHEET NO.
4-98		BRYAN	BRAZOS		042

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	WS <sup>2</sup> 60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

GENERAL NOTES

- Flags attached to signs where shown, are REQUIRED.
- 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.
- The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
- Flaggers should use two-way radios or other methods of communication to control traffic.
- Length of work space should be based on the ability of flaggers to communicate.
- 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.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
- The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
- If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
- Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

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Traffic Operations Division

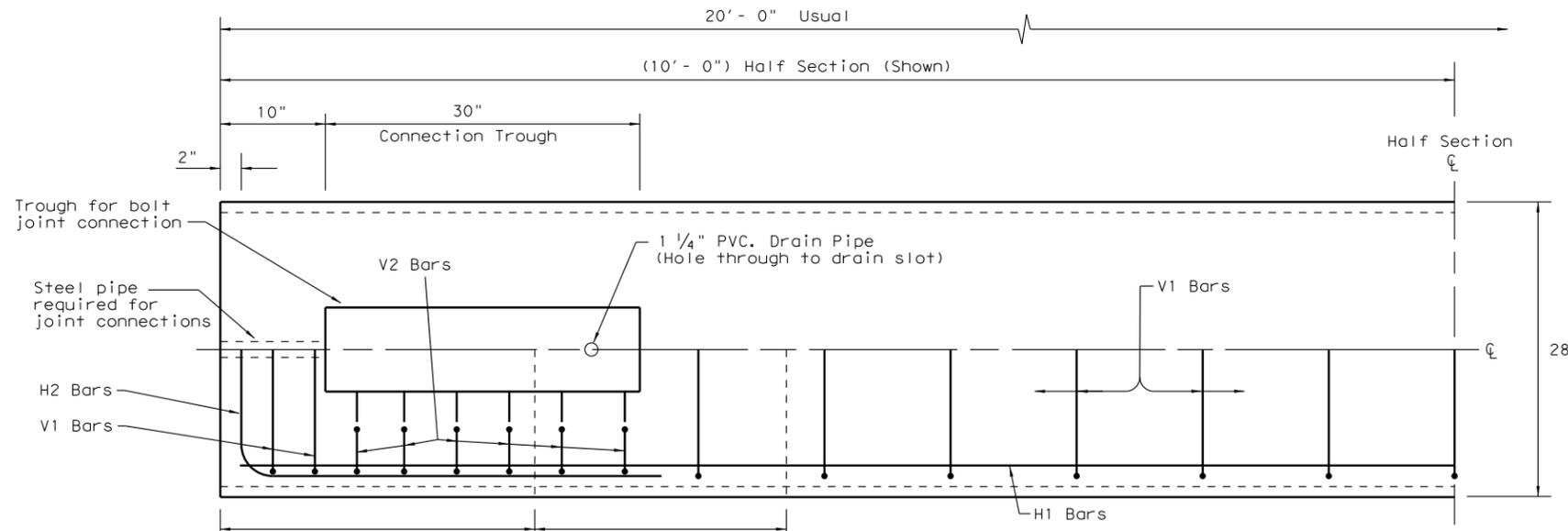
TRAFFIC CONTROL PLAN  
ONE-LANE TWO-WAY  
TRAFFIC CONTROL

TCP(2-2)-12

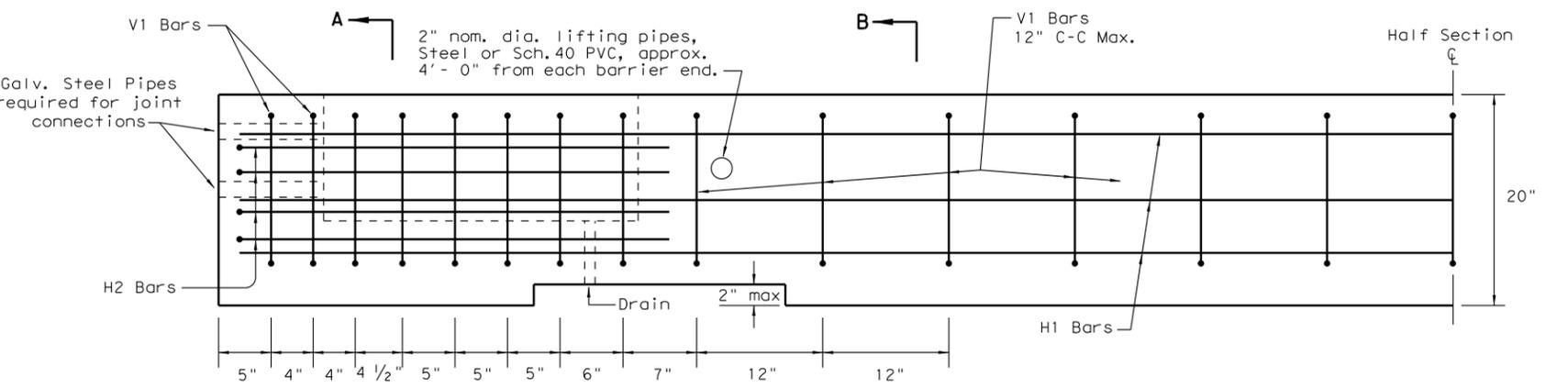
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3-03	BRYAN		BRAZOS	043

162

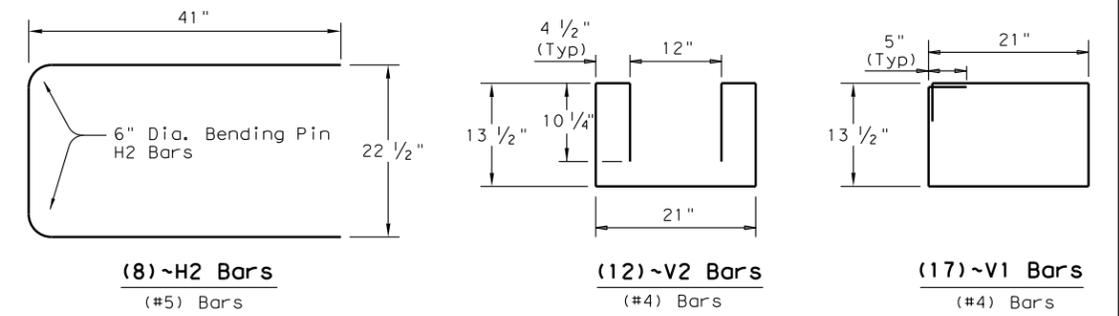
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**PLAN  
(TYPE 1) BARRIER SEGMENT**  
(SYMMETRICAL ABOUT CENTER LINES)

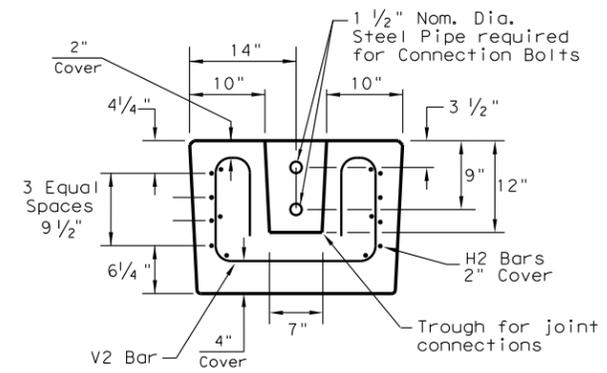


**ELEVATION  
(TYPE 1) BARRIER SEGMENT**  
(SYMMETRICAL ABOUT CENTER LINES)

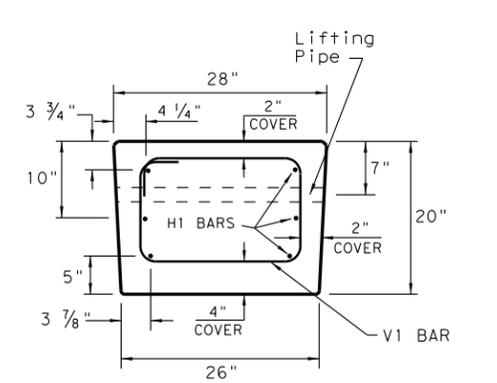


**REINFORCING STEEL DETAILS**  
TYPE 1 - BARRIER SEGMENT

Note: Use 2" Dia. Bending Pin, unless otherwise shown



**SECTION A-A**



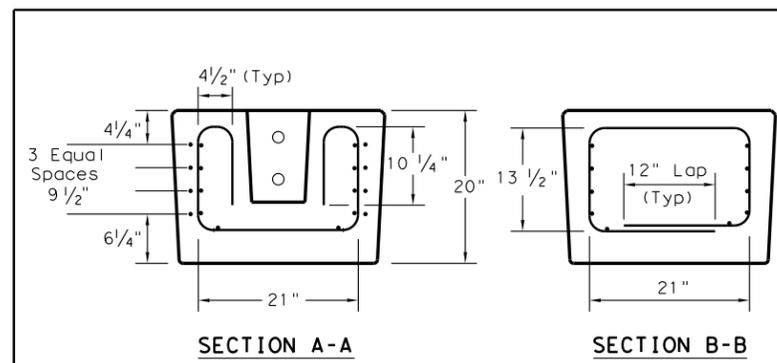
**SECTION B-B**

**GENERAL NOTES**

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have 3/4" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts." and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445, "Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

**FOR CONTRACTORS INFORMATION ONLY**

(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000



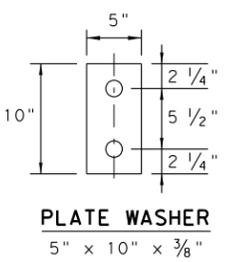
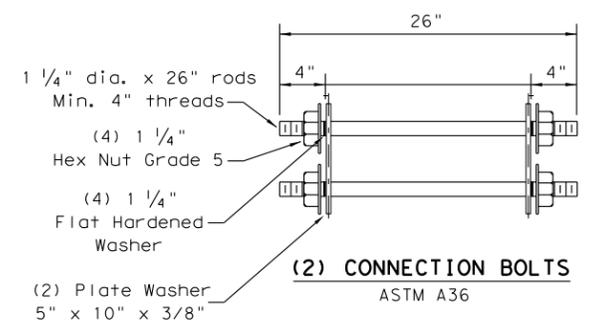
**WELDED WIRE REINFORCEMENT (WWR) - OPTIONAL REINFORCING**

**(WWR) GENERAL NOTES**

1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

**REQUIRED (WWR) WIRE DESIGN**

- 8 ~ (D31) Horizontal Wires (Equally spaced)
- 10 ~ (D20) Horizontal Wires (Equally spaced)
- 29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)

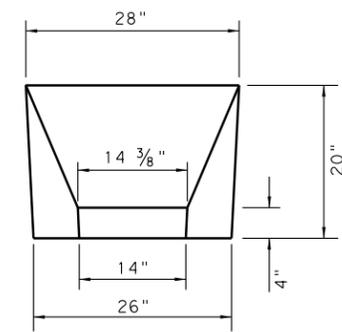
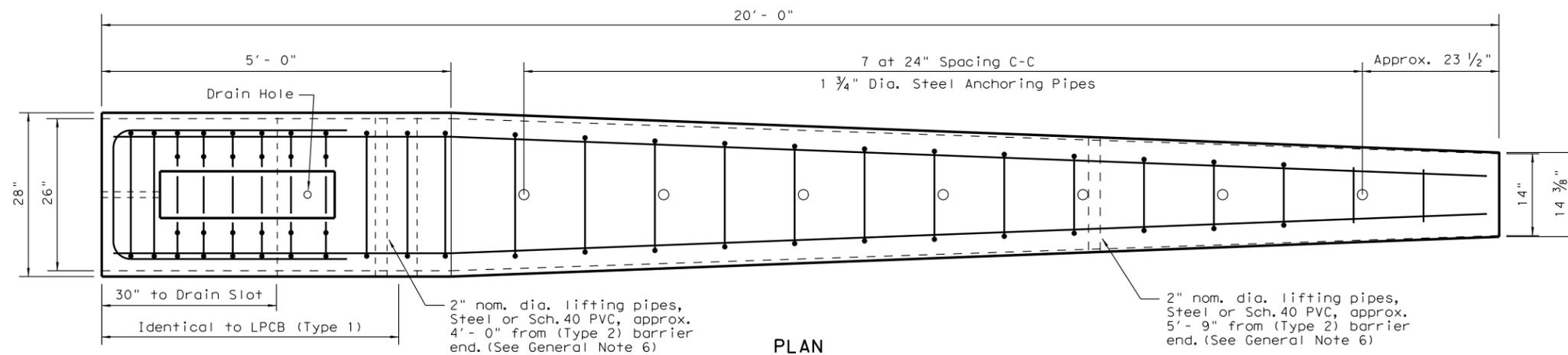


**LOW PROFILE  
CONCRETE BARRIER  
PRECAST BARRIER  
(TYPE 1)  
LPCB-13**

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY			SHEET NO.

DATE:  
FILE:

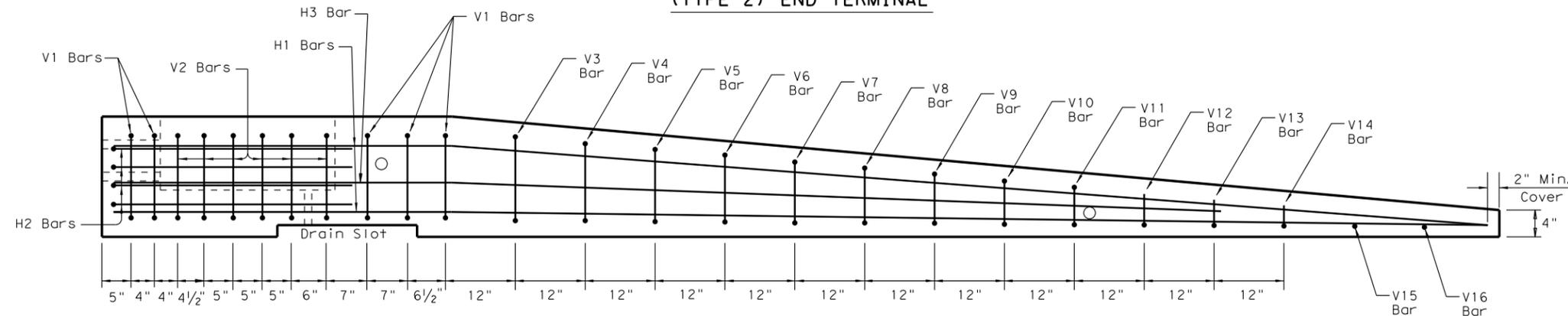
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APPROACH VIEW

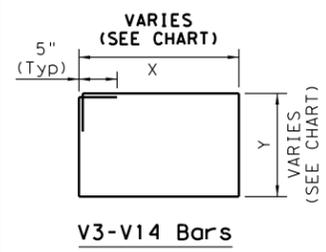
**TYPE 2 - NOTES**

1. Welded wire reinforcement (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.

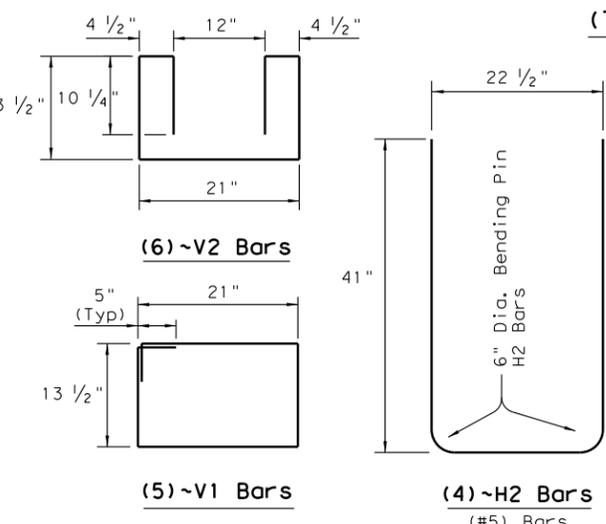


**ELEVATION (TYPE 2) END TERMINAL**

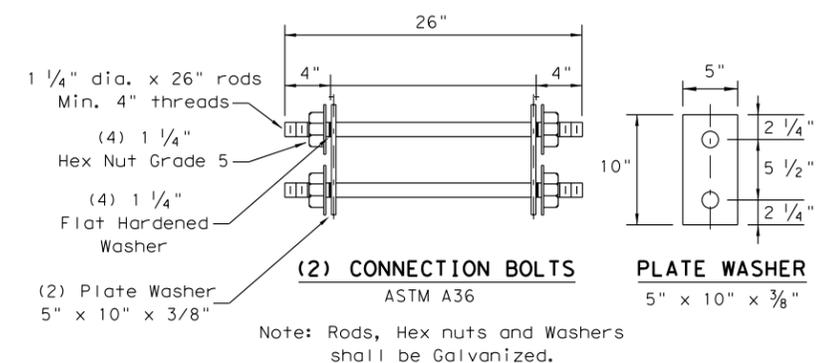
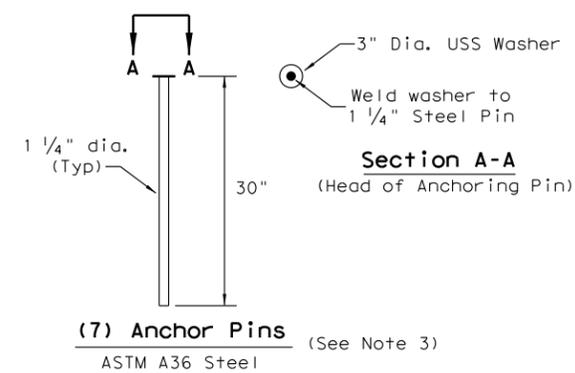
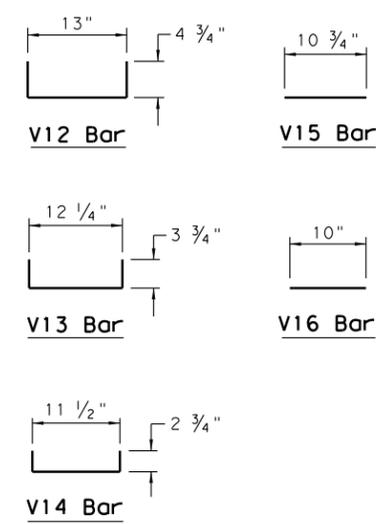
Note: Anchoring pipes not shown in Elevation View



BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 1/4	14 1/2
V4 BAR	19 1/2	13 1/2
V5 BAR	18 1/2	12 1/4
V6 BAR	17 1/2	11 1/4
V7 BAR	17	10 1/4
V8 BAR	16 1/4	9
V9 BAR	15 1/2	8
V10 BAR	14 1/2	7
V11 BAR	13 3/4	6



**REINFORCING STEEL DETAILS**  
TYPE 2 - END TERMINAL



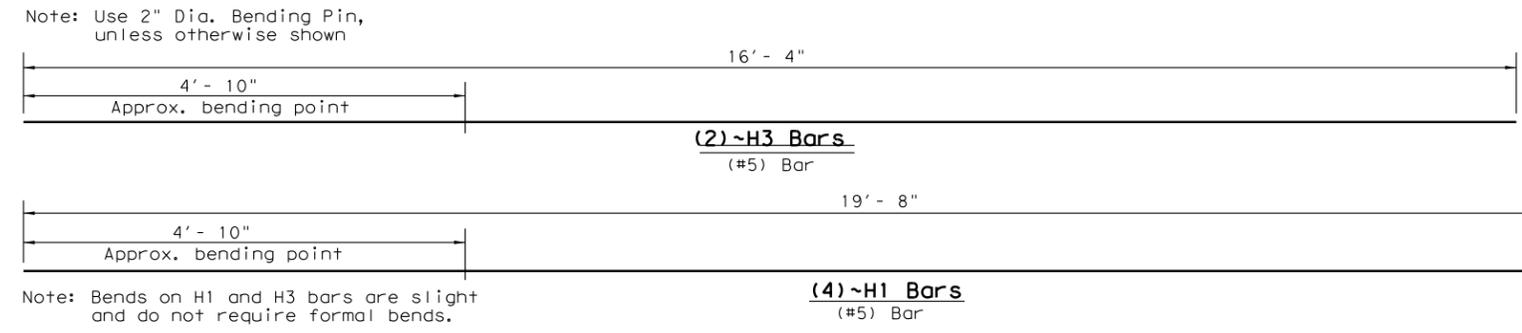
**FOR CONTRACTORS INFORMATION ONLY**

(TYPE 2)		
APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000



**LOW PROFILE CONCRETE BARRIER PRECAST BARRIER (TYPE 2) LPCB-13**

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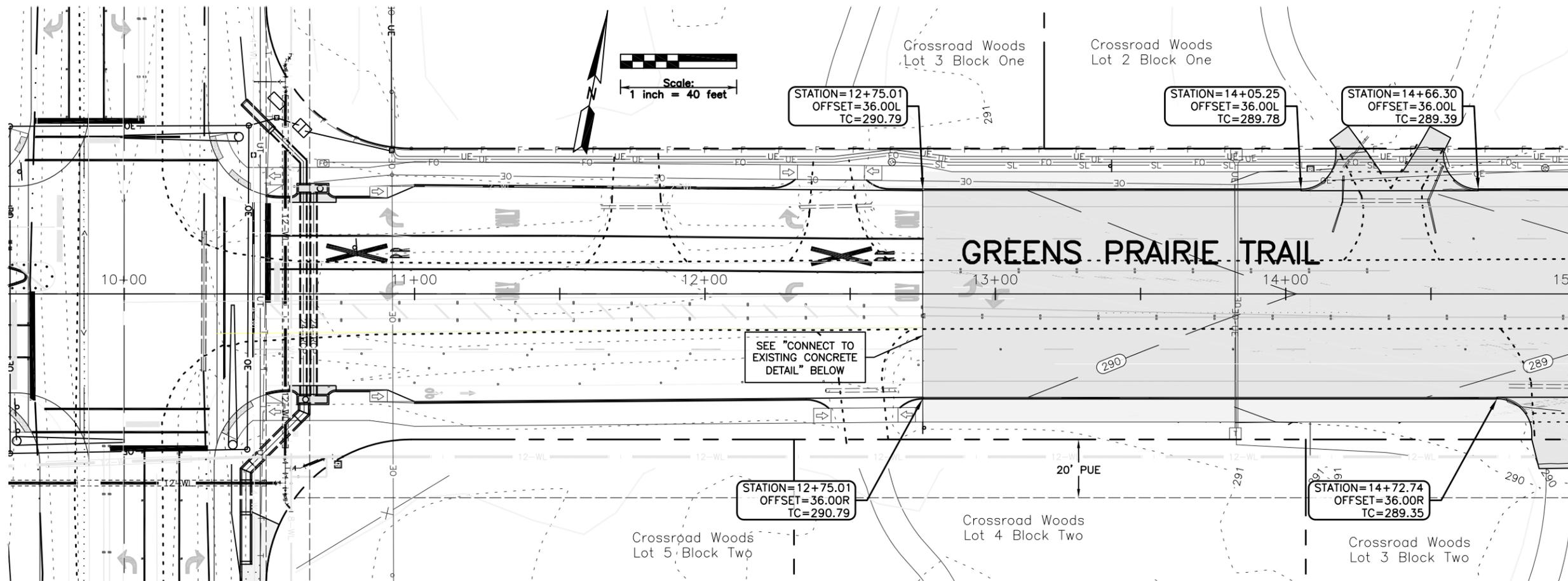


Note: All V Bars are (#4)

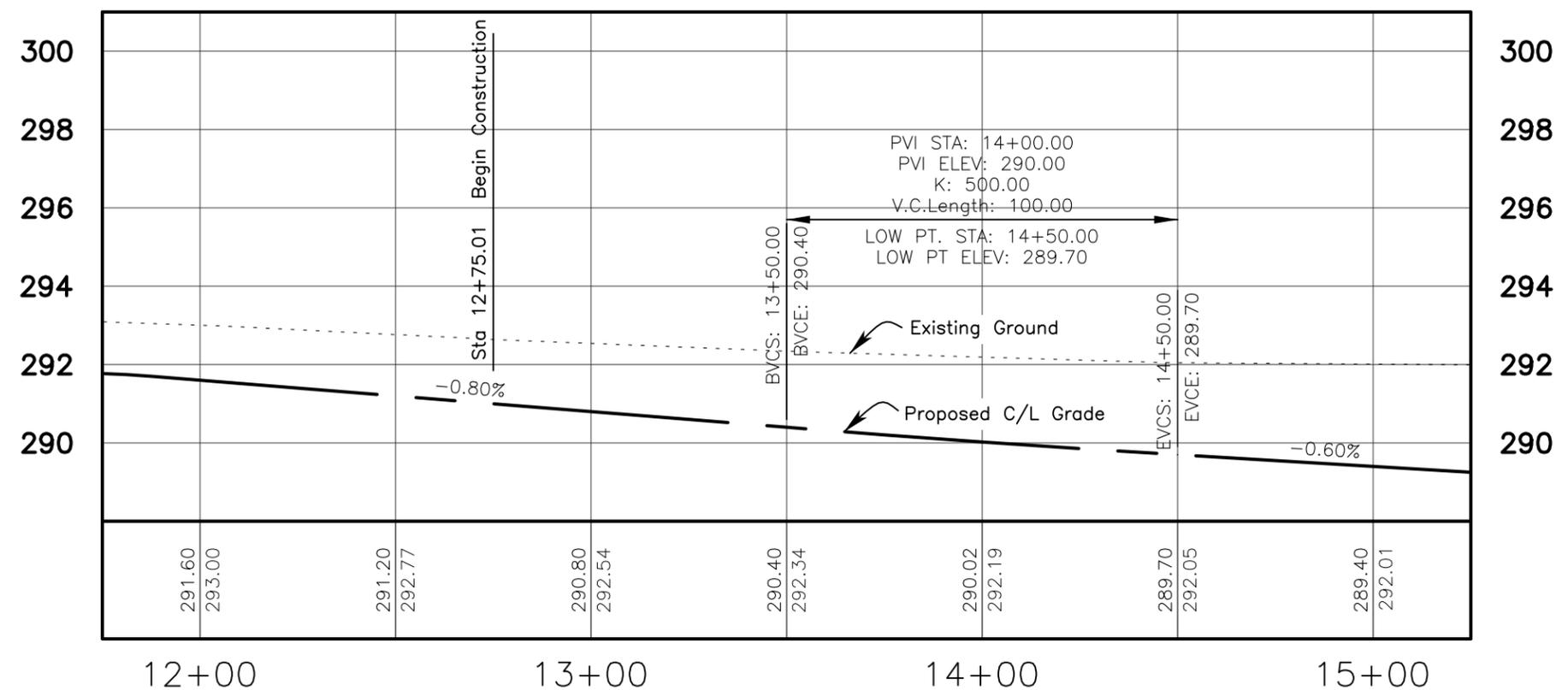
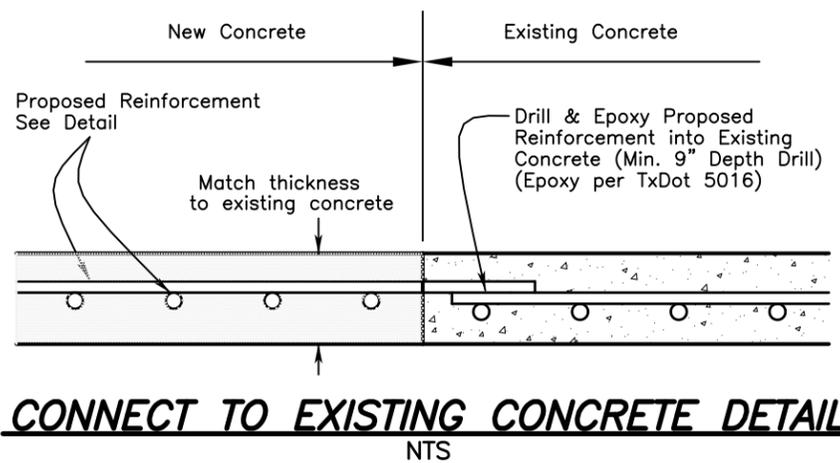
Note: Bends on H1 and H3 bars are slight and do not require formal bends.

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MATCH LINE - 1  
 AT STATION - 15+00.00



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 Drawn By: JM

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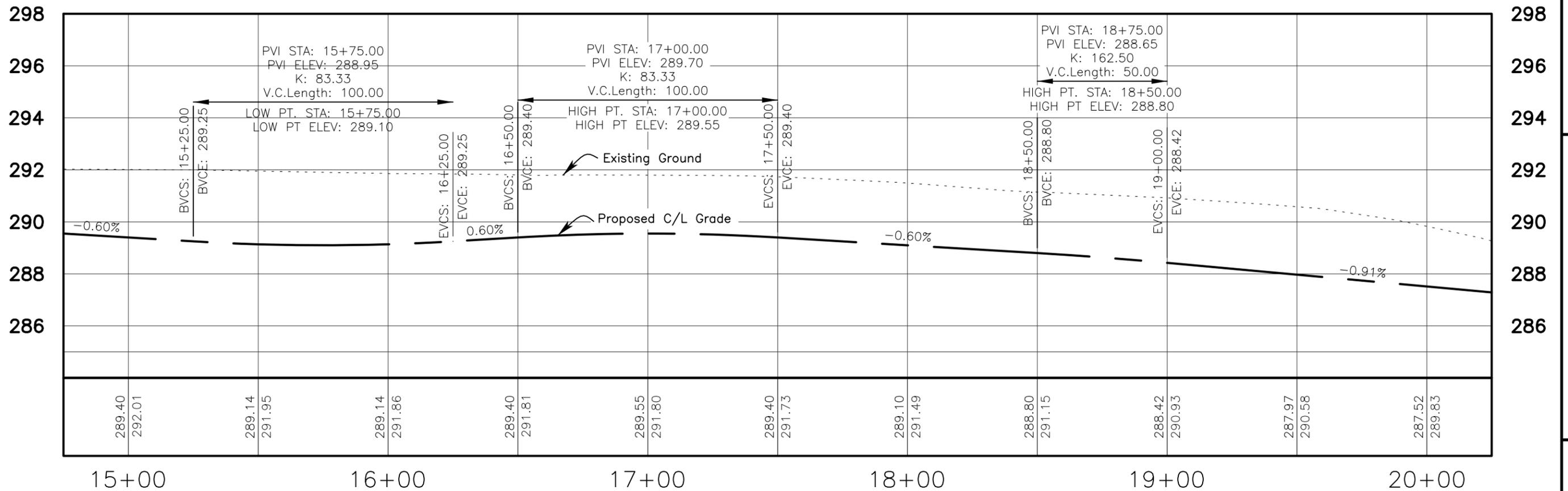
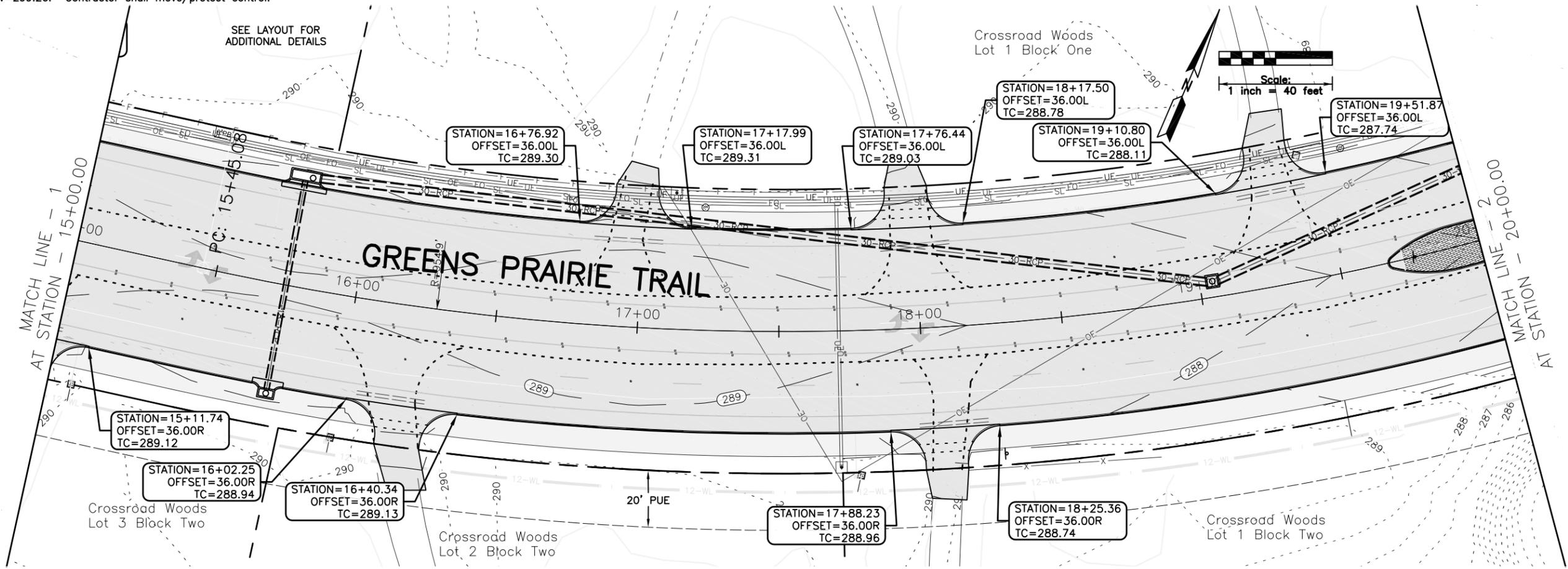
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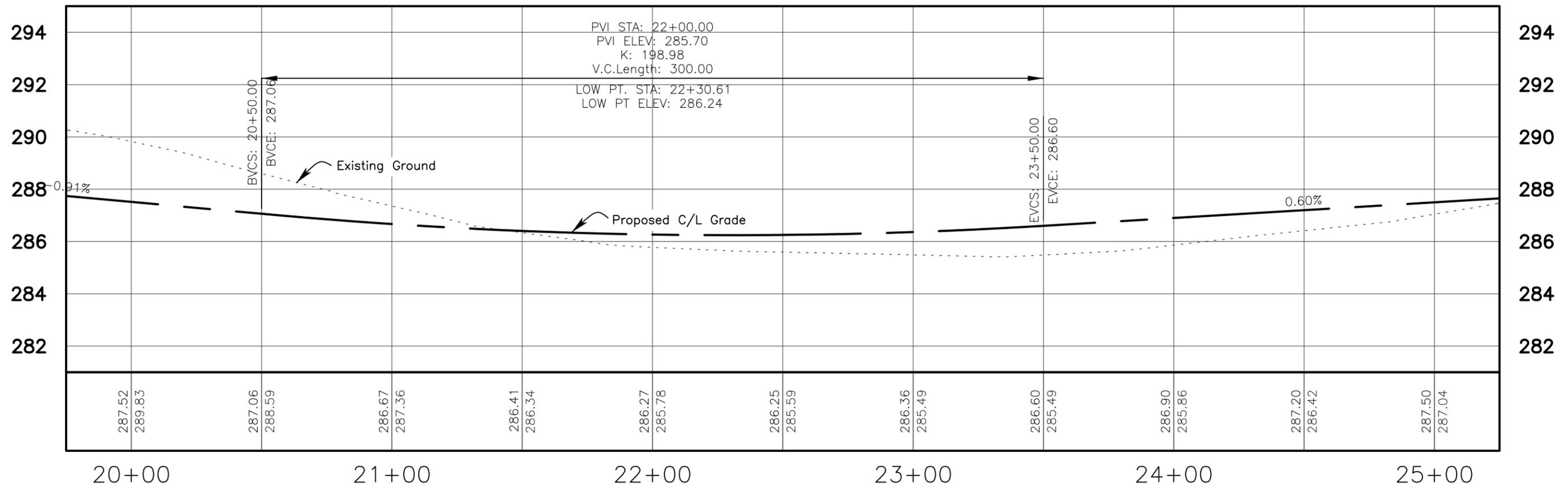
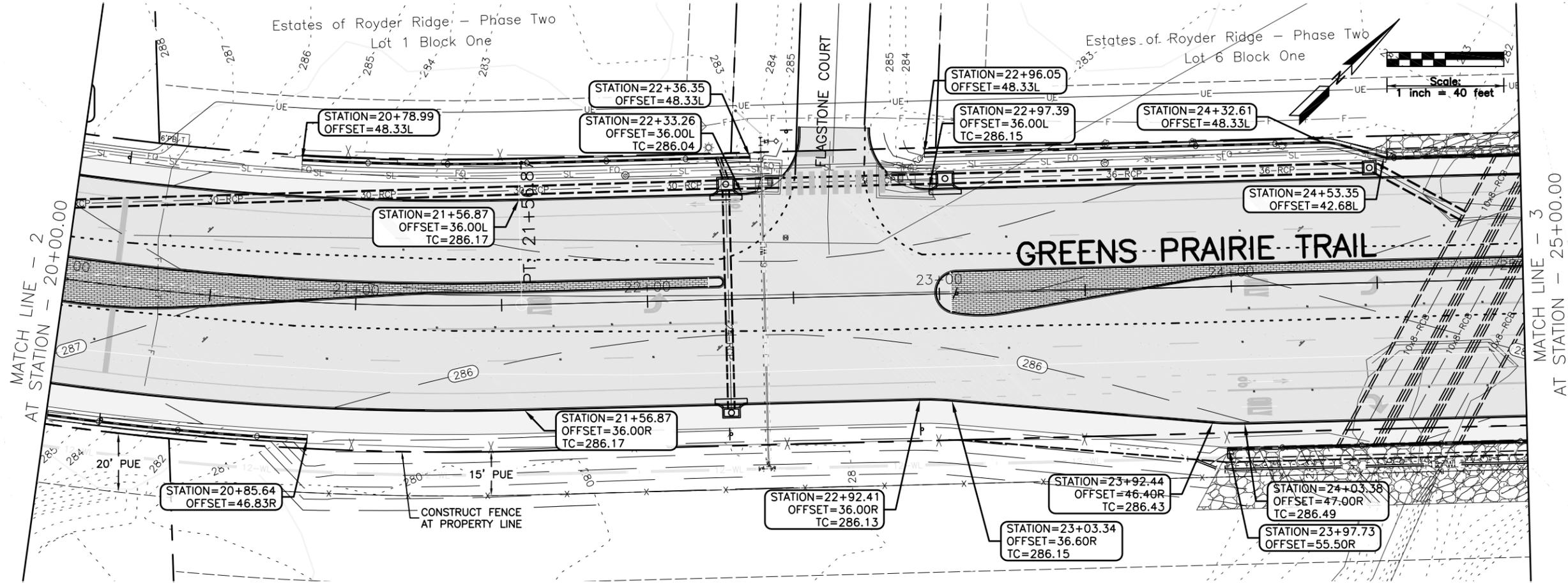
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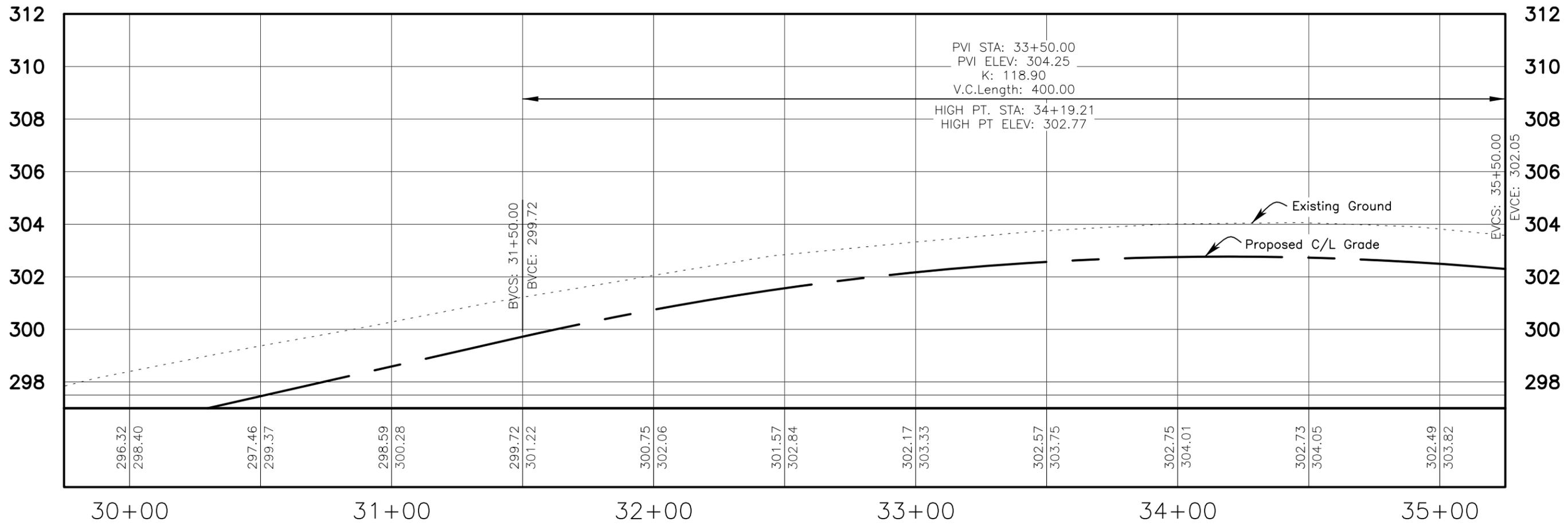
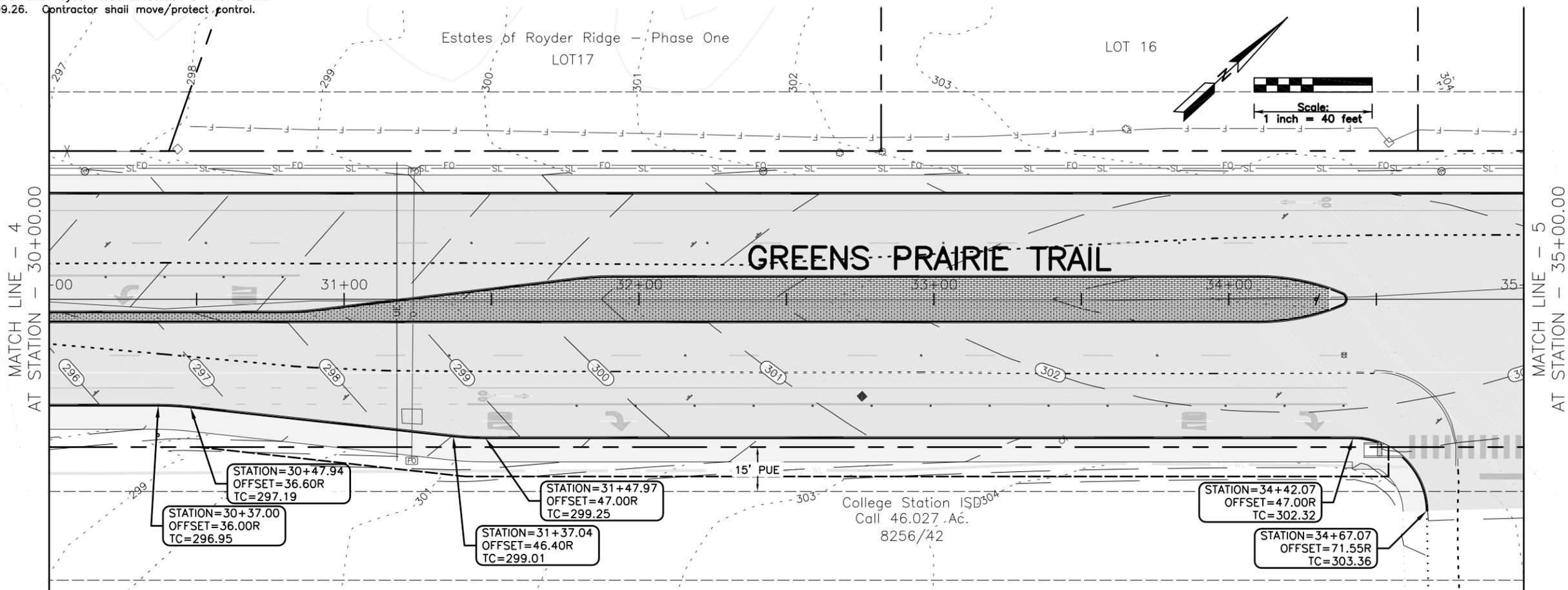
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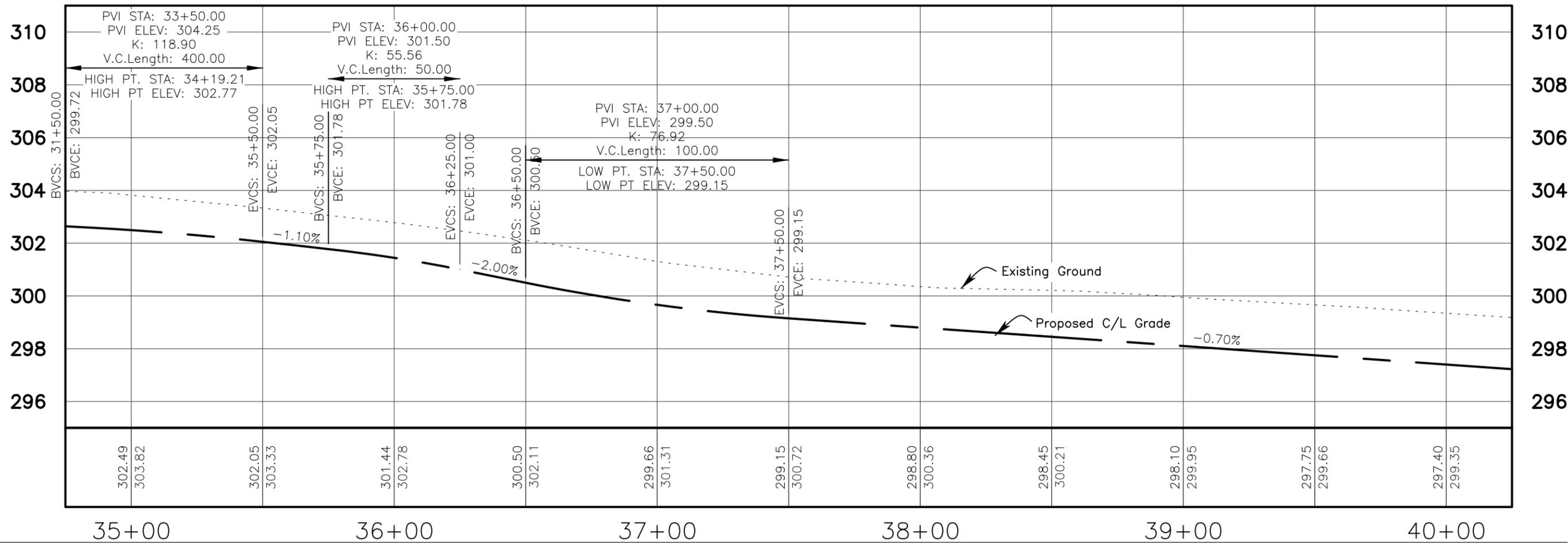
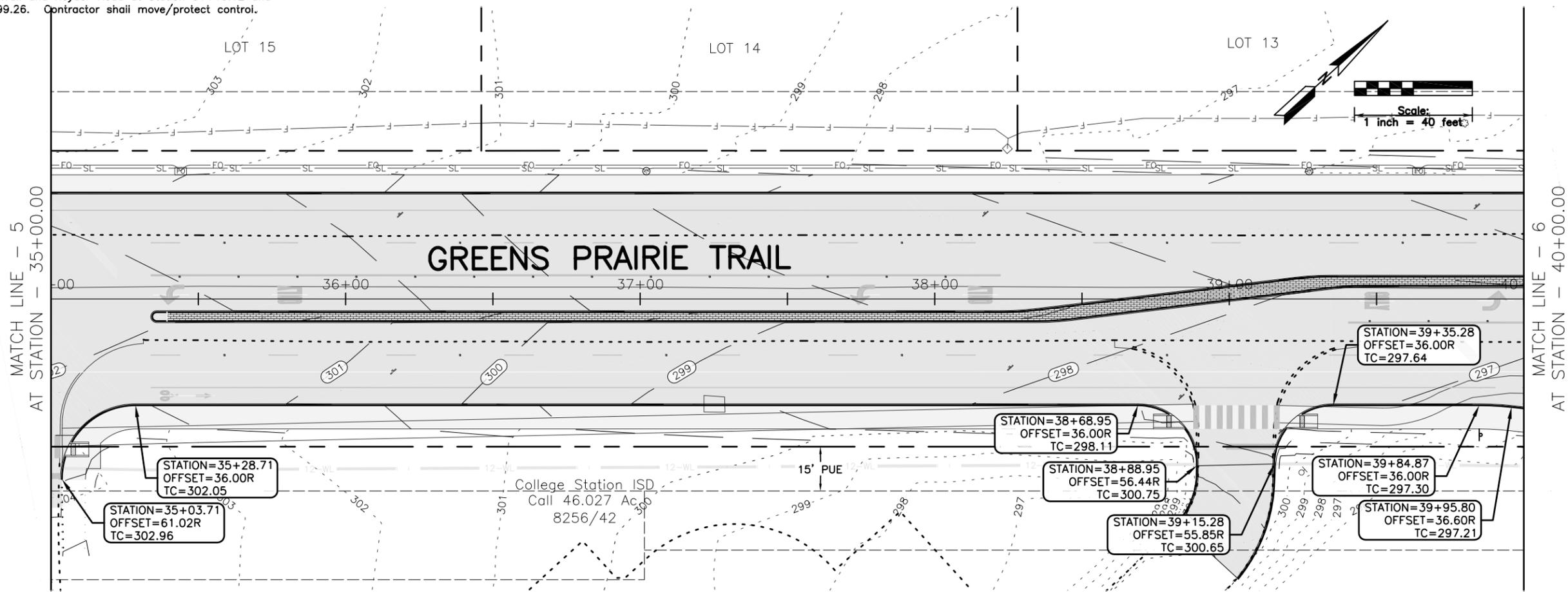
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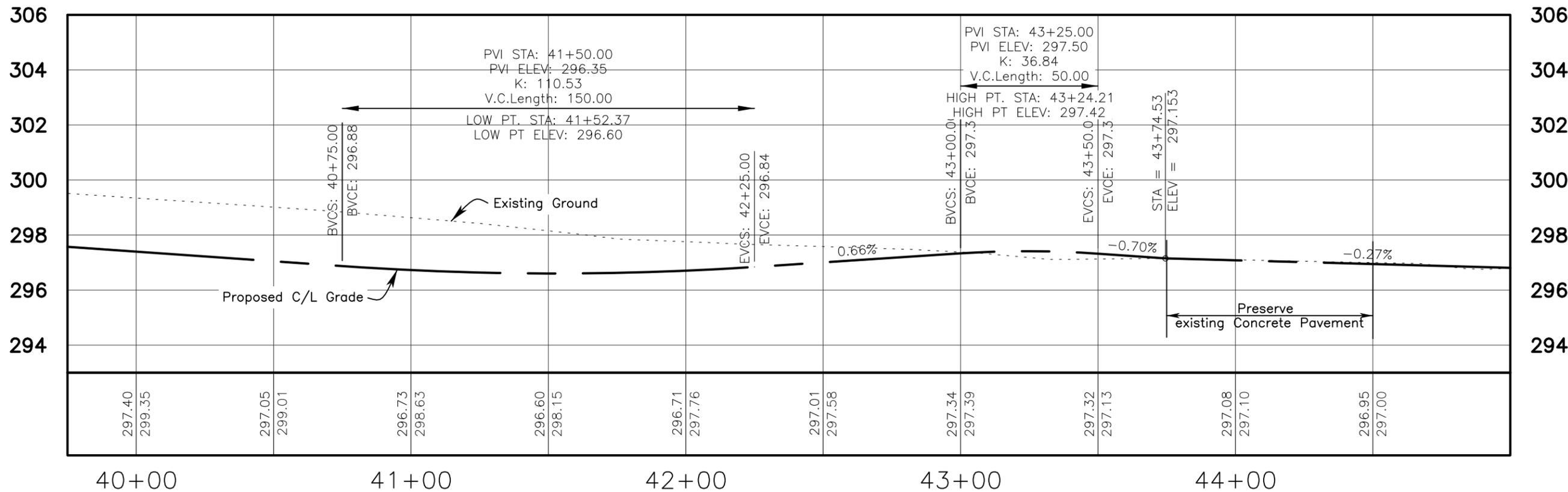
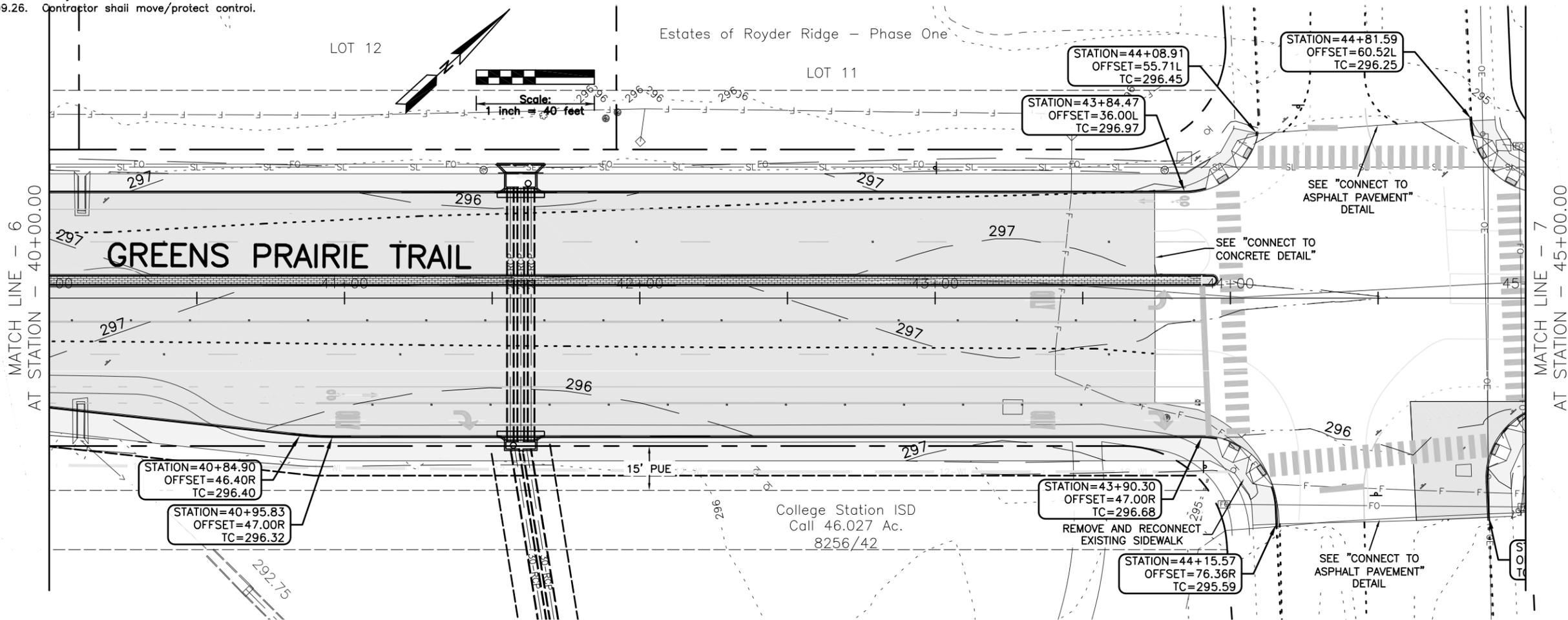
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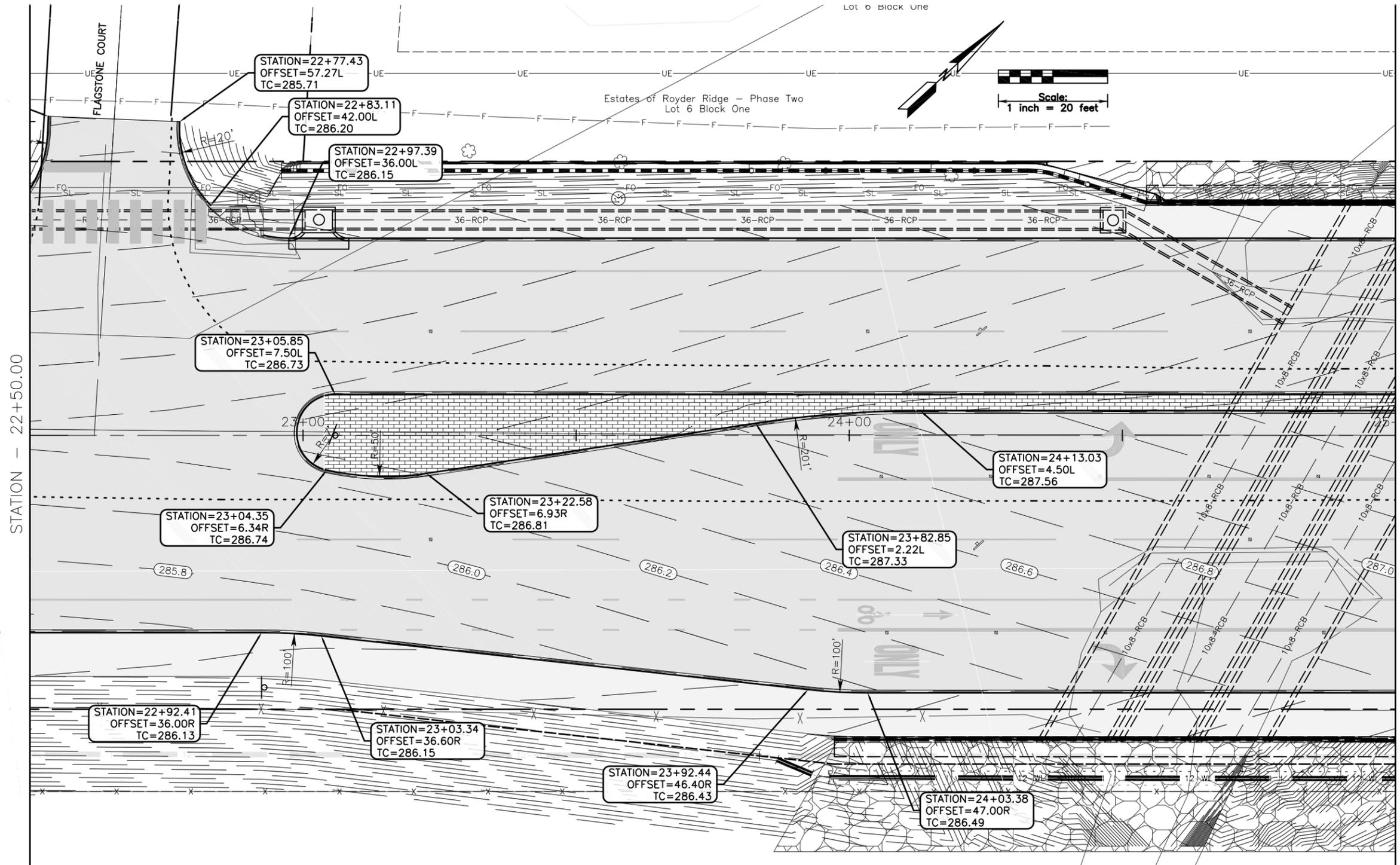


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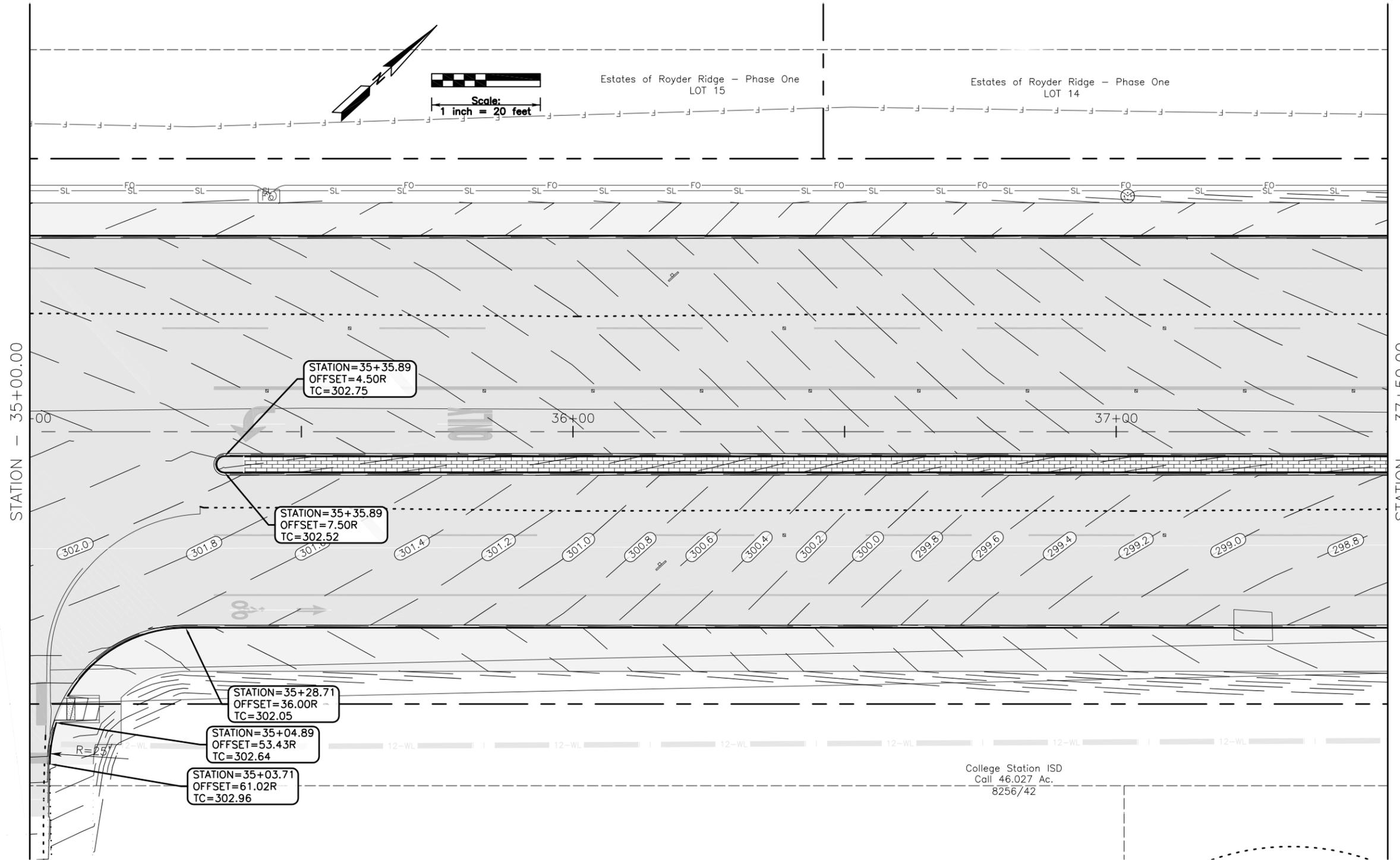


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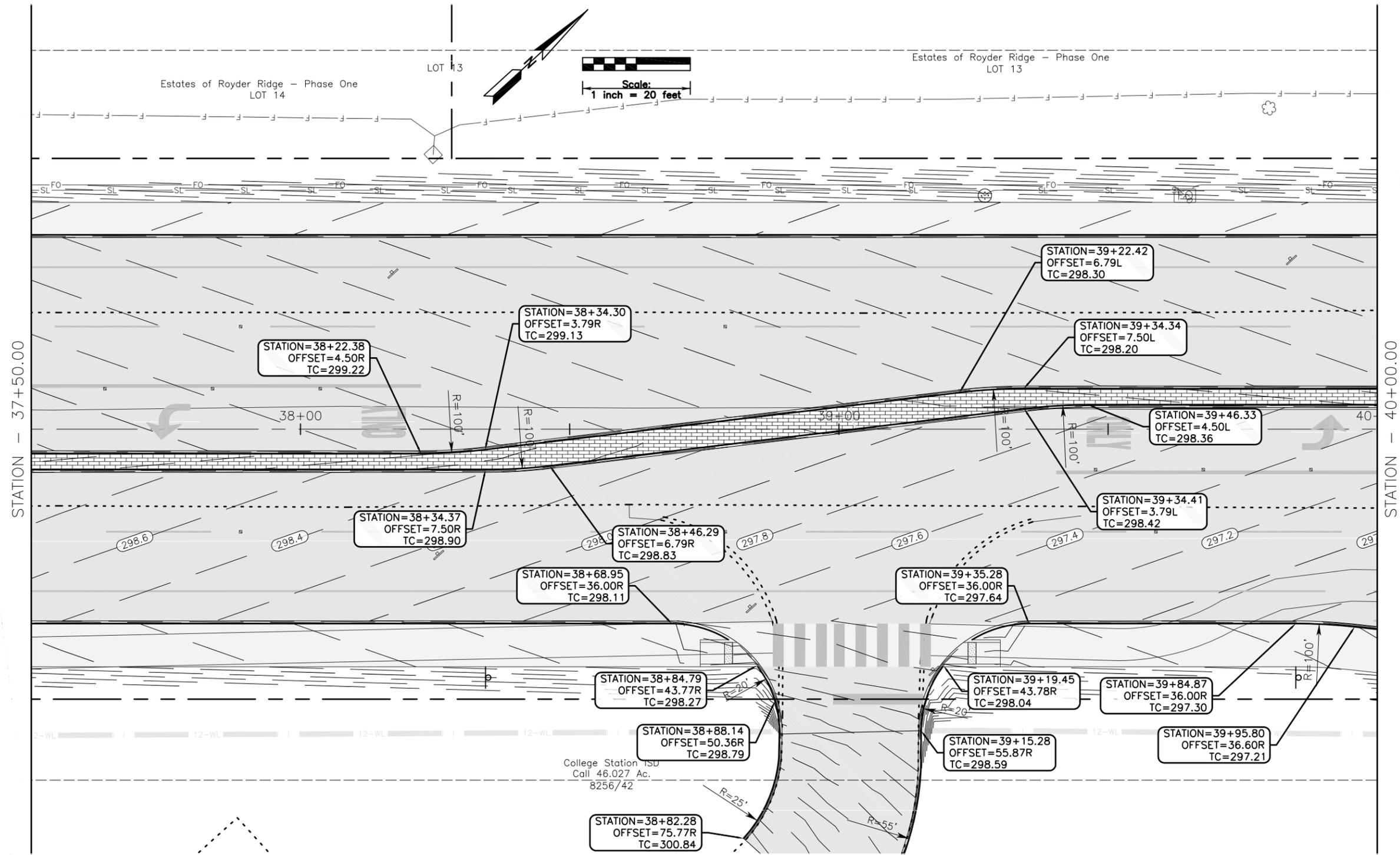
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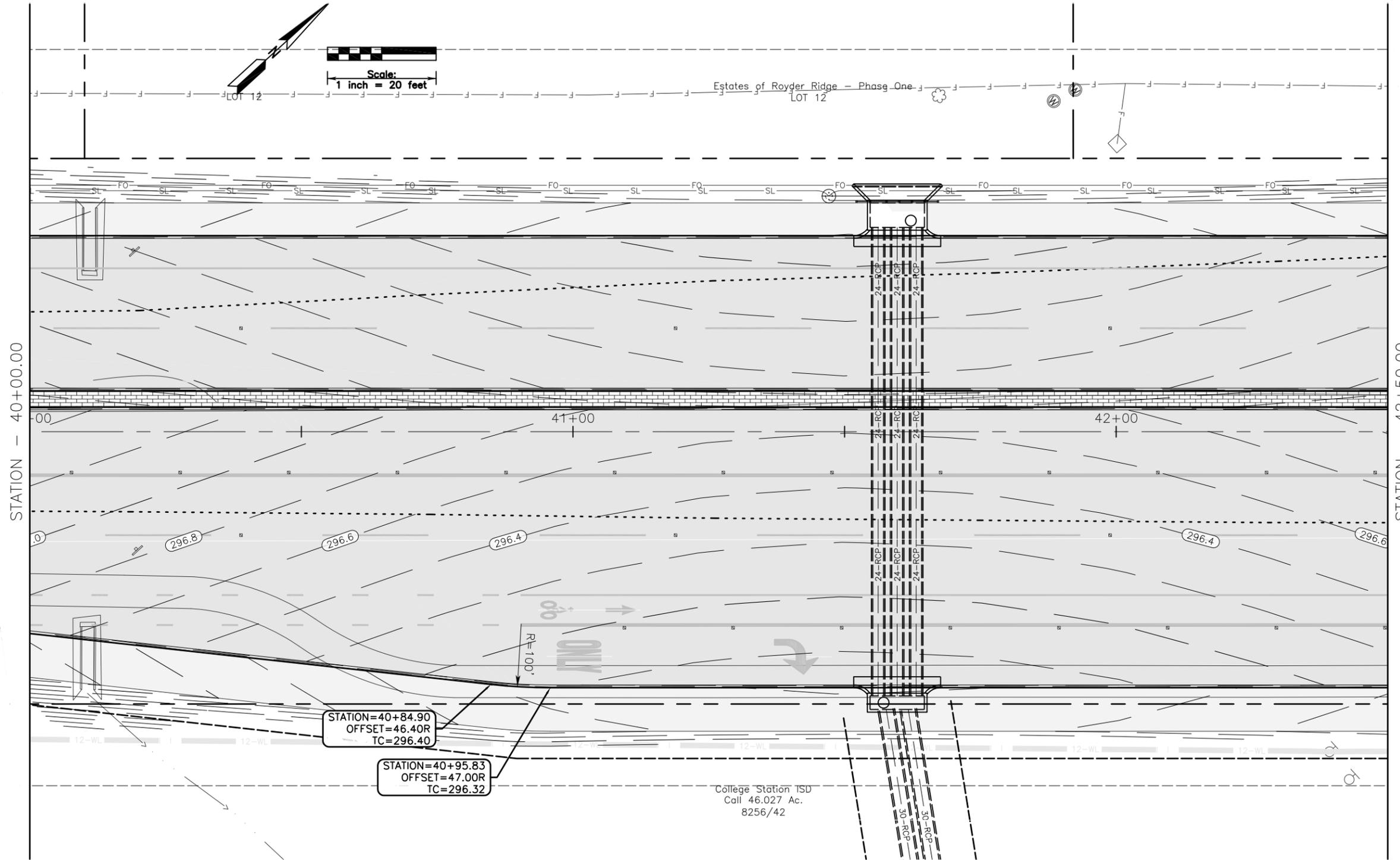


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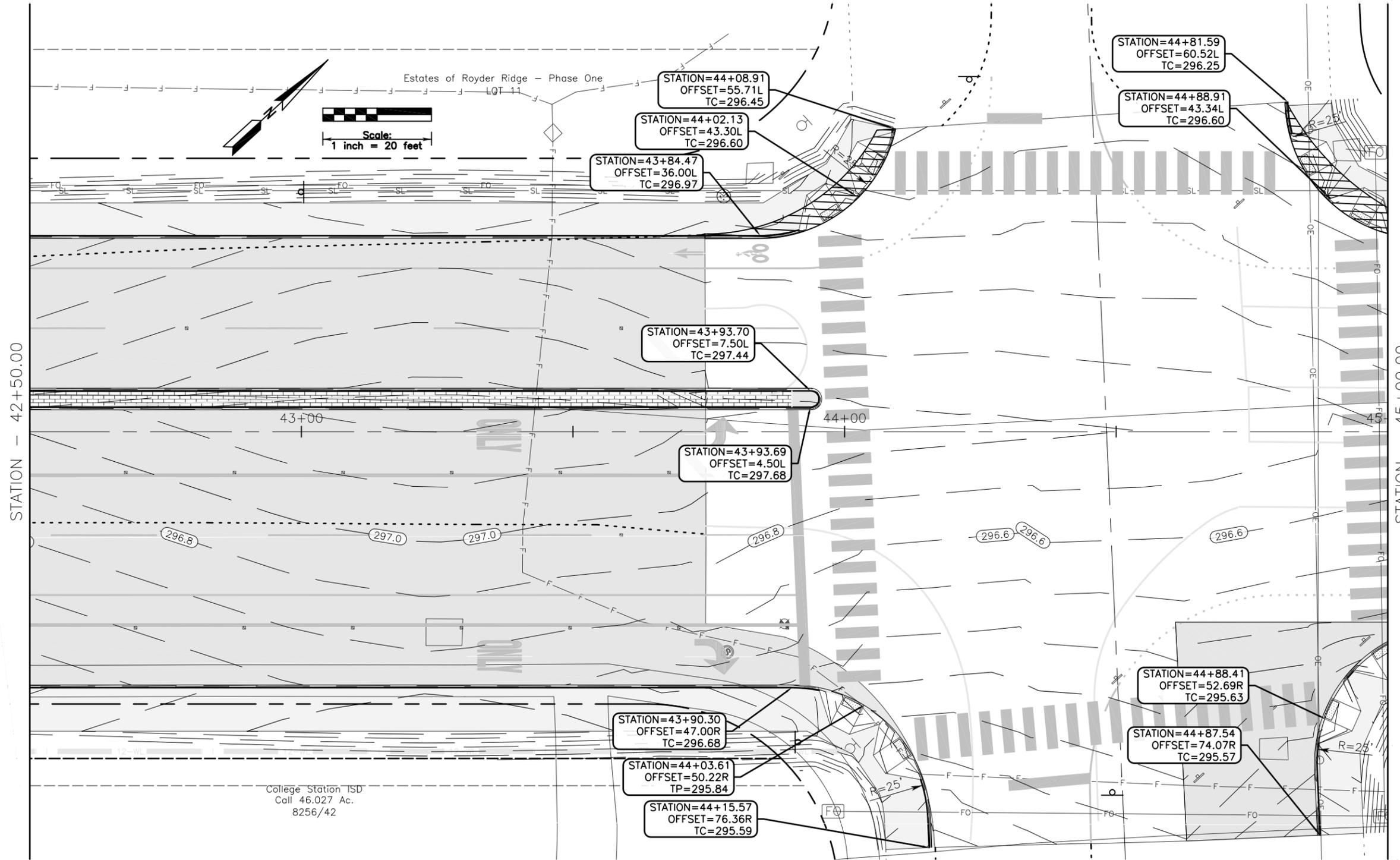


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**ROADWAY CAPACITY IMPROVEMENTS**

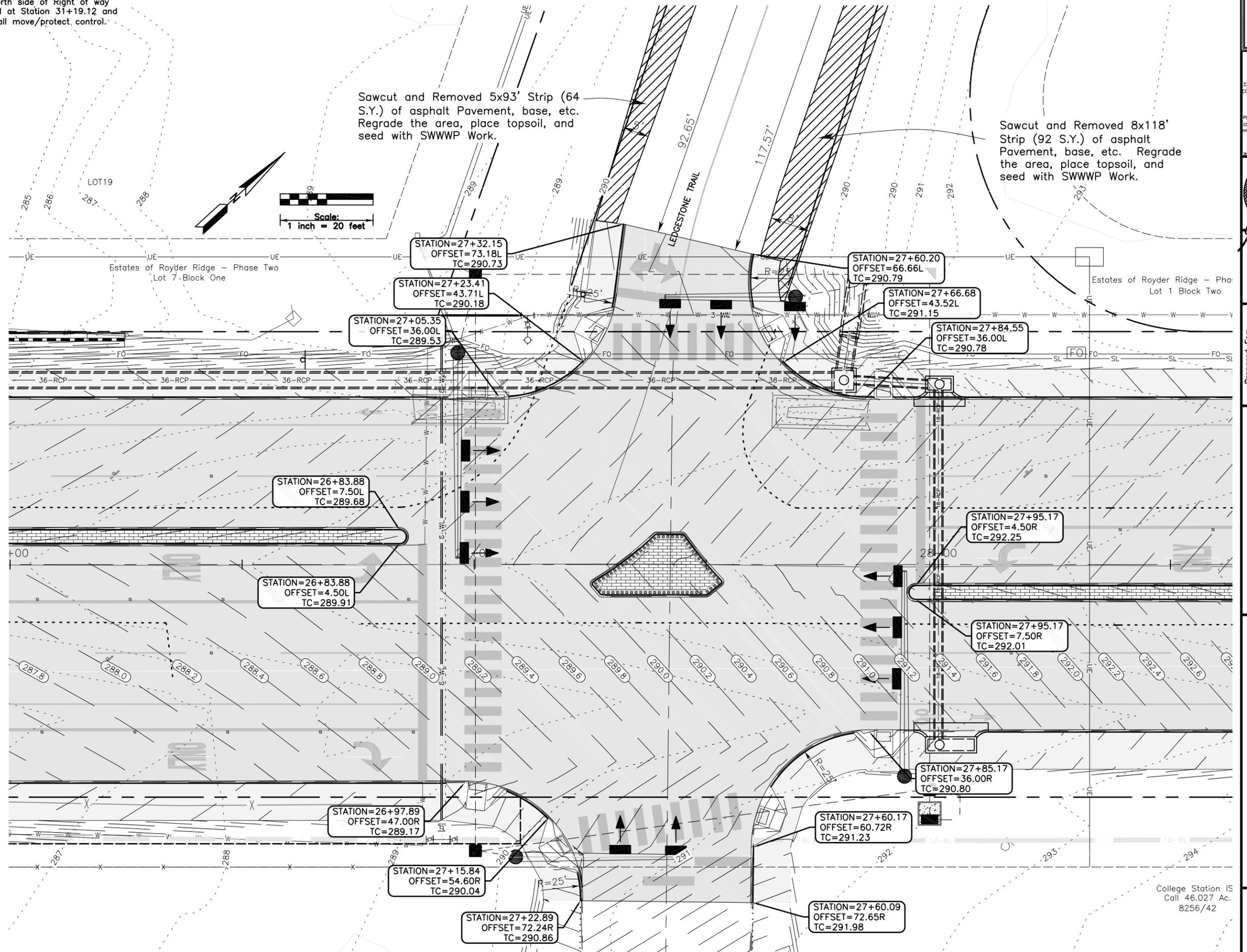


FILENAME: 1533-3402-Roadway\_Layout.dwg  
 PLOTTED: 28 Jul 2016 - 9:06 am





PROJECT BENCHMARK: SURVEY CONTROL POINT #533  
 1/2" IRON ROD W/ CAP Located along north side of Right of way  
 between Ledgestone Trail and Royder Road at Station 31+19.12 and  
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.



**MITCHELL MORGAN**  
 T.979.260.6963  
 F.979.260.3564  
 FIRM# F-1443  
 3204 EARL RUDDER FWY S.  
 COLLEGE STATION, TX 77845

PLAN & DESIGN SPECIALISTS IN  
 CIVIL ENGINEERING • HYDRAULICS  
 HYDROLOGY • UTILITIES • STREETS  
 SITE PLANS • SUBDIVISIONS

www.mitchellandmorgan.com

STATE OF TEXAS  
 JOEL J. MITCHELL  
 80649  
 REGISTERED PROFESSIONAL ENGINEER

Prepared For:  
 City of College Station  
 Public Works Department  
 310 Krenek Tap Rd  
 College Station, TX  
 77840

Revisions

**LEDGESTONE INTERSECTION  
 GREENS PRAIRIE TRAIL  
 ROADWAY CAPACITY IMPROVEMENTS**

44  
 Of 190 Sheets

FILENAME: 1533-3405-INTERSECTIONS.dwg  
 PLOTTED: 27 Jul 2016 - 10:09 am

PROJECT BENCHMARK: SURVEY CONTROL POINT #533  
 1/2" IRON ROD W/ CAP Located along north side of Right of way  
 between Ledgestone Trail and Royder Road at Station 31+19.12 and  
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.



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 F.979.260.3564  
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 SITE PLANS + SUBDIVISIONS

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July 2016  
 Designed by: JMM  
 Drawn by: JMM

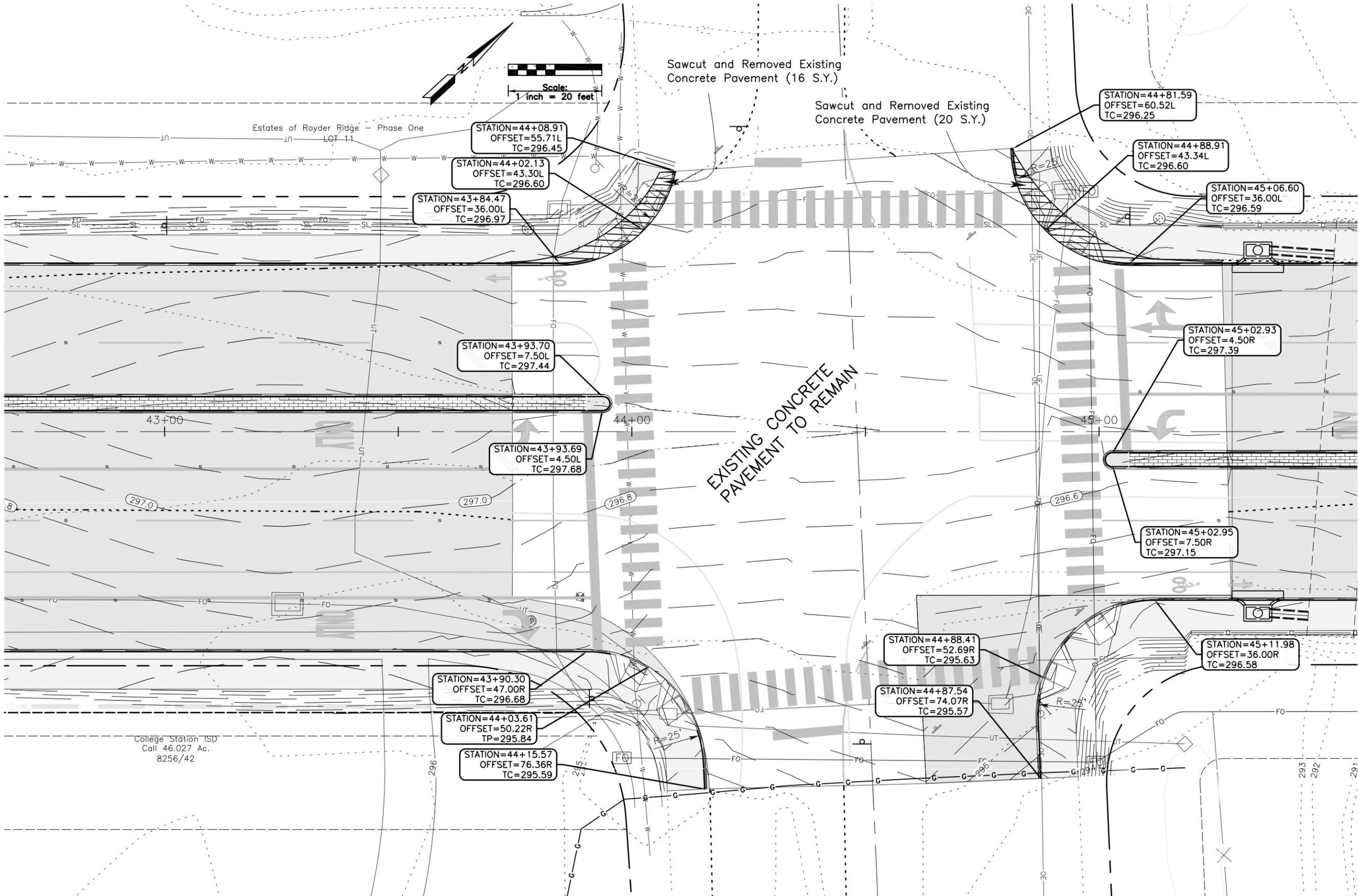
Prepared For:  
 City of College Station  
 Public Works Department  
 310 Krenek Tap Rd.  
 College Station, TX  
 77840

Revisions

**ROYDER INTERSECTION  
 GREENS PRAIRIE TRAIL  
 ROADWAY CAPACITY IMPROVEMENTS**

45

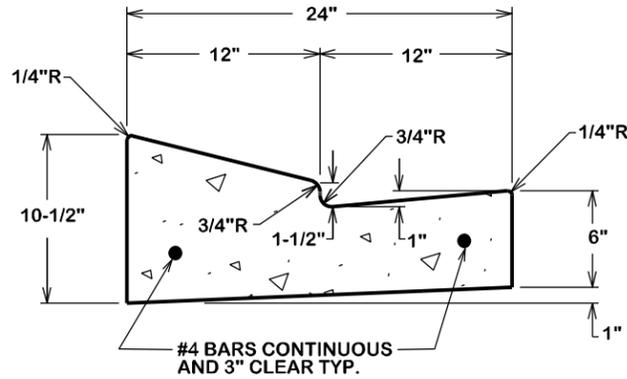
Of 190 Sheets



FILENAME: 1533-3405-INTERSECTIONS.dwg  
 PLOTTED: 27 Jul 2016 - 10:09 am

**NOTE:**

TYPE "G" EXPANSION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAXIMUM DISTANCE OF 40' APART AND AT ALL RADIUS POINTS, P.T.'S AND P.C.'S. TYPE "B" CONTRACTION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAXIMUM DISTANCE OF 10' APART.

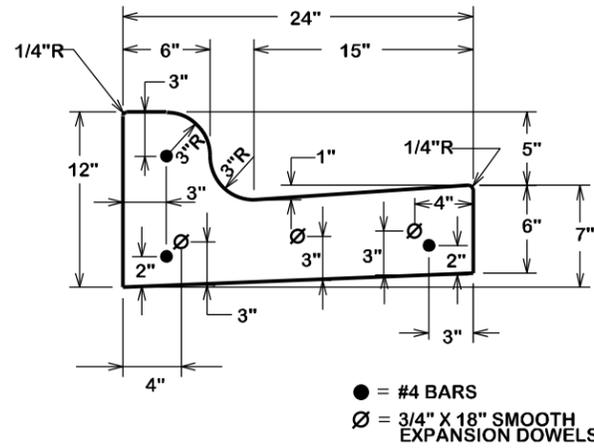


**24" LAY DOWN  
GUTTER SECTION**

ST1-00

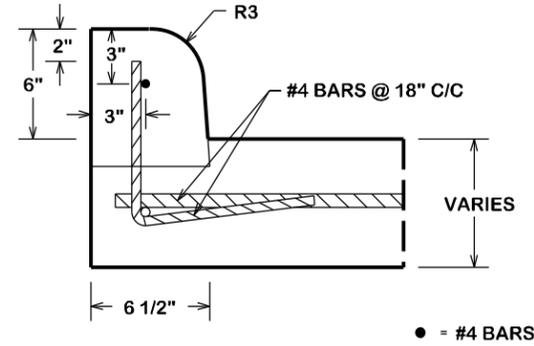
**NOTE:**

TYPE "G" EXPANSION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAXIMUM DISTANCE OF 40' APART AND AT ALL RADIUS POINTS, P.T.'S AND P.C.'S. TYPE "B" CONTRACTION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAXIMUM DISTANCE OF 10' APART.



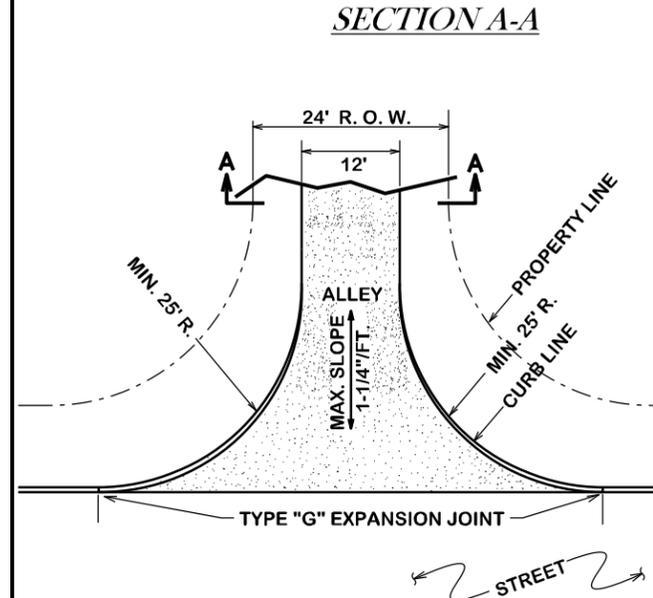
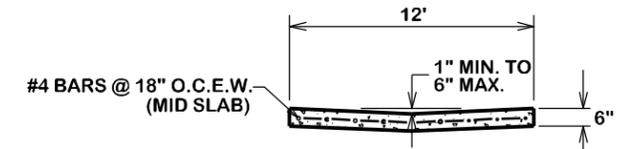
**TYPICAL COMBINED  
CURB & GUTTER SECTION**

ST1-01



**DOWELLED IN CURBS  
DETAIL**

ST1-02



**ALLEY PAVING**

ST1-06

**GENERAL NOTES:**

ALL AREAS WHERE EXISTING VEGETATION AND GRASS COVER HAVE BEEN BARED BY CONSTRUCTION SHALL BE ADEQUATELY BLOCK SODDED OR HYDROMULCHED AND WATERED UNTIL GROWTH IS ESTABLISHED. IN DEVELOPED AREAS WHERE GRASS IS PRESENT, BLOCK SOD WILL BE REQUIRED. BARED AREAS SHALL BE SEEDDED OR SODDED WITHIN 14 CALENDAR DAYS OF LAST DISTURBANCE.

APPROVED EROSION CONTROL MEASURES MUST BE INSTALLED DURING THE ENTIRE TIME THAT EARTH HAS BEEN BARED BY CONSTRUCTION AND SHALL STAY IN PLACE UNTIL ACCEPTABLE VEGETATIVE GROWTH IS ESTABLISHED AFTER CONSTRUCTION IS COMPLETE AND THEN REMOVED BY CONTRACTOR.

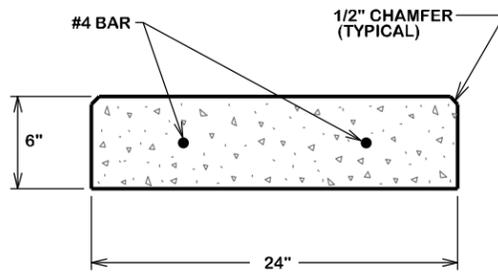
ALL EROSION CONTROL MEASURES SHOULD BE CLEANED OF SILT AFTER EVERY RAIN.

ALL TRAFFIC SIGNALS AND APPURTENANCES, AND ALL PAVEMENT MARKINGS AND MARKERS SHALL BE IN ACCORDANCE WITH TXDOT STANDARDS

REFER TO SPEC 31 17 23.23 (PAVEMENT MARKINGS) FOR ADDITIONAL LOCAL REQUIREMENTS.

**NOTE:**

TYPE "G" EXPANSION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAXIMUM DISTANCE OF 40' APART AND AT ALL RADIUS POINTS, P.T.'S, AND P.C.'S. TYPE "B" CONTRACTION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAXIMUM DISTANCE OF 10' APART



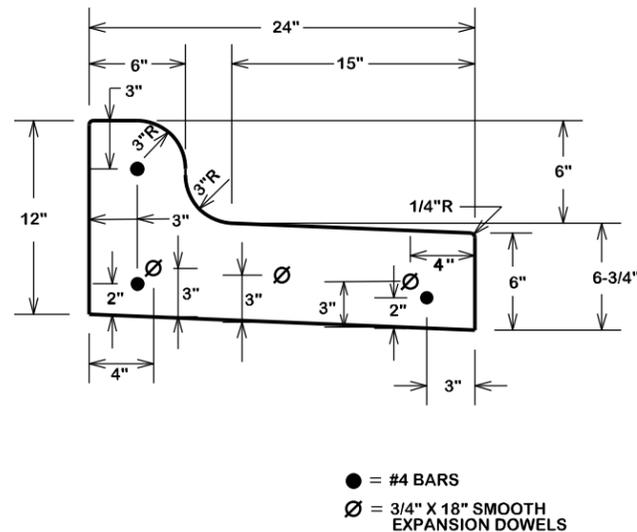
28-DAY CONCRETE  
STRENGTH=3500 psi.

**TYPICAL  
RIBBON CURB**

ST1-03

**NOTE:**

TYPE "G" EXPANSION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAXIMUM DISTANCE OF 40' APART AND AT ALL RADIUS POINTS, P.T.'S, AND P.C.'S. TYPE "B" CONTRACTION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAXIMUM DISTANCE OF 10' APART

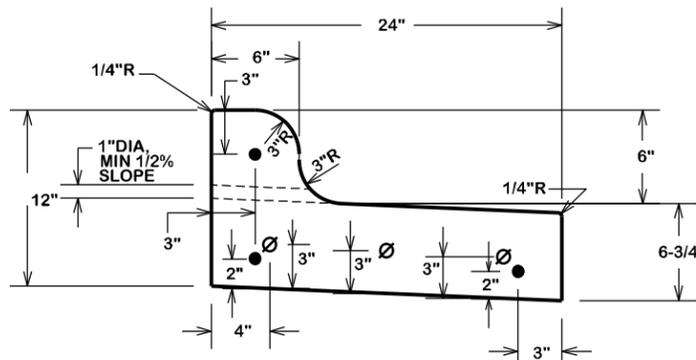


**TYPICAL COMBINED  
SPILL CURB**

ST1-04

**NOTE:**

- TYPE "G" EXPANSION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAXIMUM DISTANCE OF 40' APART AND AT ALL RADIUS POINTS, P.T.'S, AND P.C.'S. TYPE "B" CONTRACTION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAXIMUM DISTANCE OF 10' APART
- PIPE EXTENDED 1"-2" FROM BOC TO BE COVERED WITH FABRIC AND TIED IN PLACE



● = #4 BARS  
∅ = 3/4" X 18" SMOOTH  
EXPANSION DOWELS

**TYPICAL WEEPHOLE CURB**

ST1-05

REVISIONS

BRYAN - COLLEGE STATION  
STANDARD STREET DETAILS

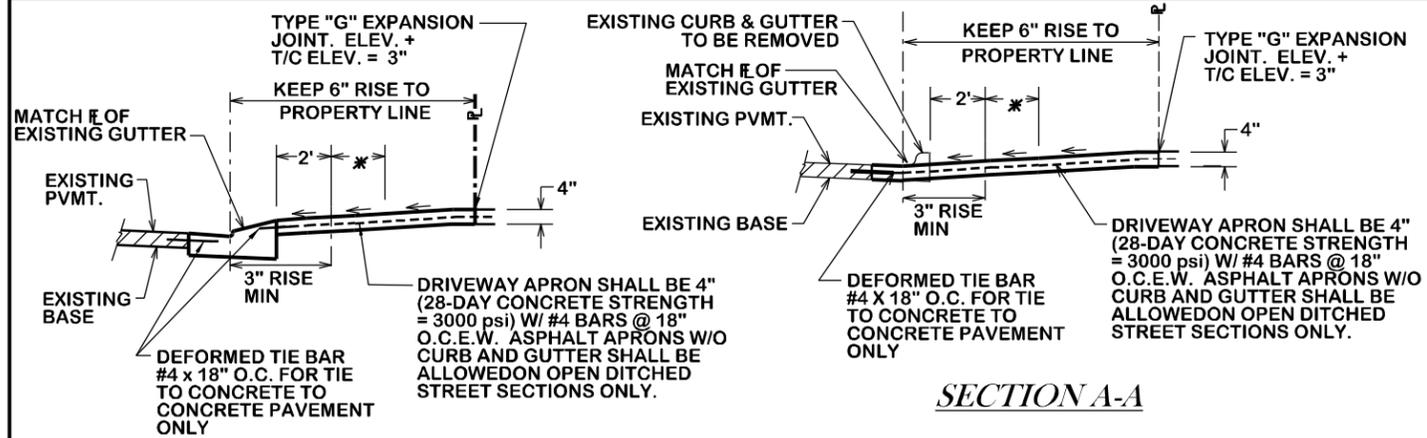


CITY OF BRYAN  
The Good Life, Texas Style!

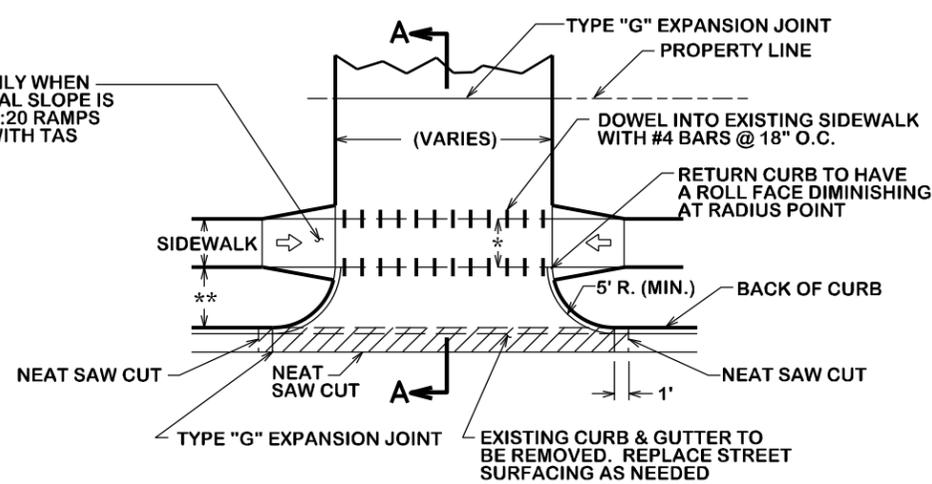
DRAWN BY: C.L.M.  
DATE: 08-01-12  
SCALE: N T S  
APPROVED: W.P.K.

FIGURE:

ST1  
SHEET 1 OF 4

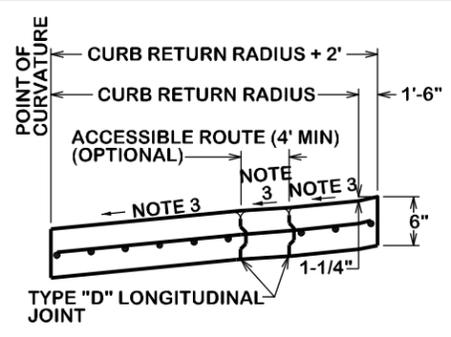


**SECTION A-A  
WITH LAYDOWN CURB**



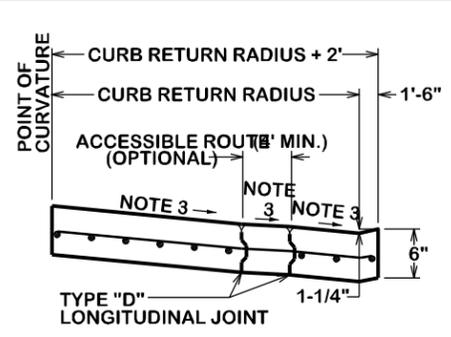
**RESIDENTIAL DRIVEWAY**

ST2-00

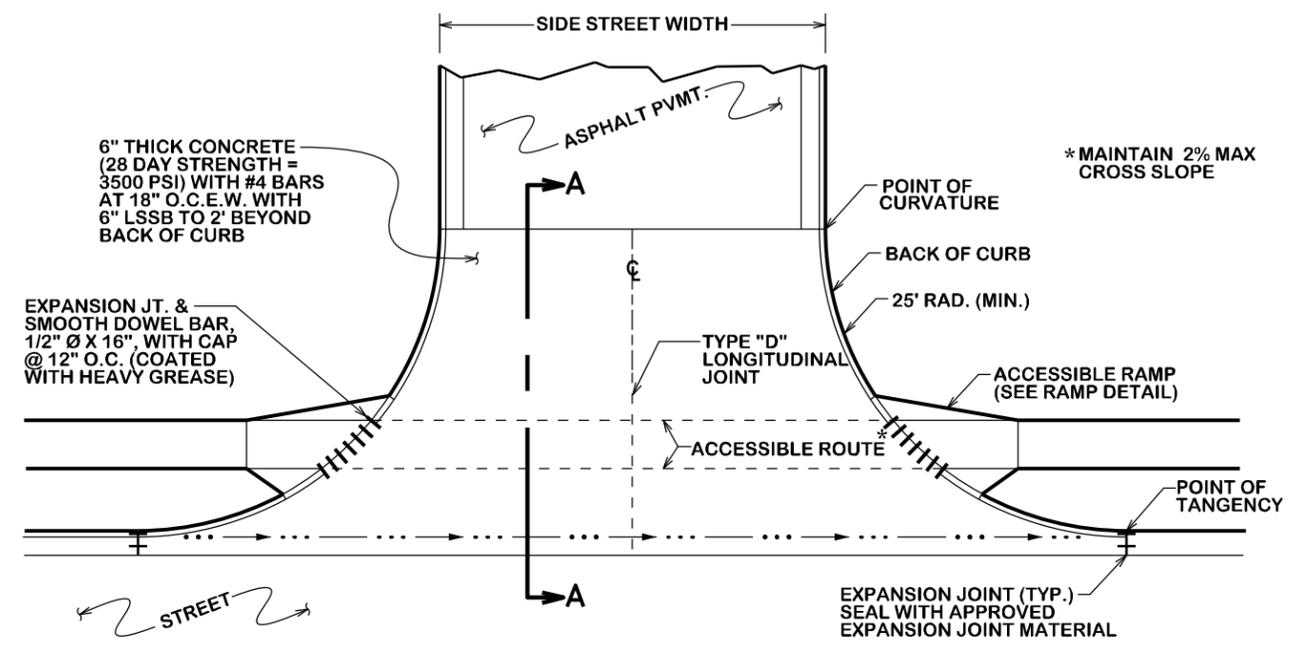


**SECTION A-A  
SLOPING AWAY FROM INTERSECTION**

**NOTES:**  
 1. IF THERE IS A VALLEY GUTTER, THEN TRANSITION CROWN AT VALLEY GUTTER TO FULL CROWN IN 50'.  
 2. TYPE "G" EXPANSION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAX. DISTANCE OF 40' APART AND AT ALL RADIUS POINTS, P.T.'S & P.C.'S. TYPE "B" CONTRACTION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MAX. DISTANCE OF 10' APART.  
 3. 2% MAX SLOPE.  
 4. 5' MIN TRANSITION TO LAY DOWN CURB BEGIN AT P.T.

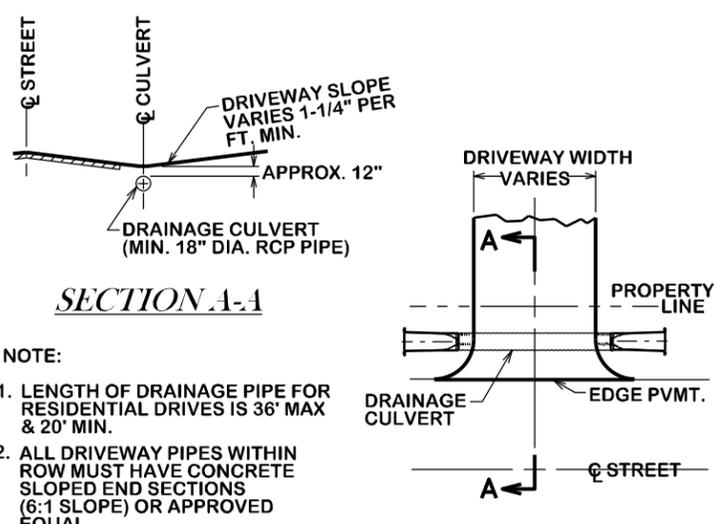


**SECTION A-A  
SLOPING TOWARD INTERSECTION**



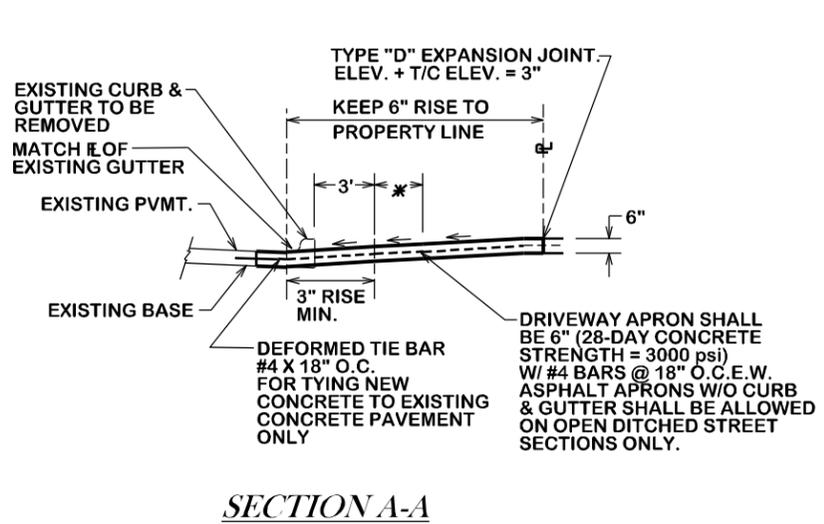
**TYPICAL STREET CONCRETE APRON**

ST2-01

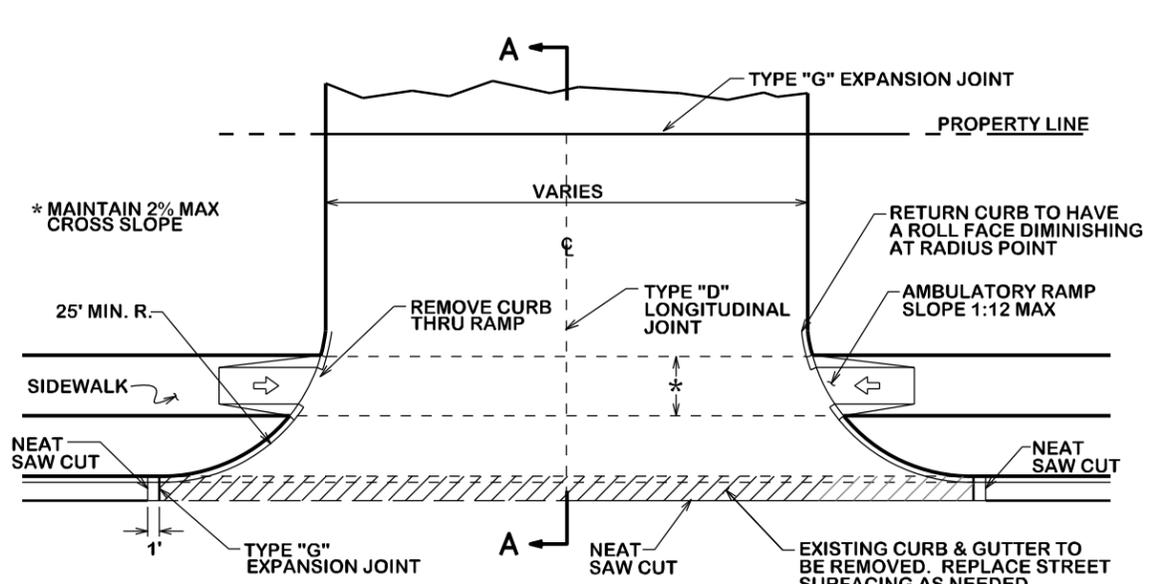


**TYPICAL DRIVEWAY ENTRANCE  
WITH CULVERT**

ST2-02



**SECTION A-A**



**COMMERCIAL DRIVEWAY**

ST2-03

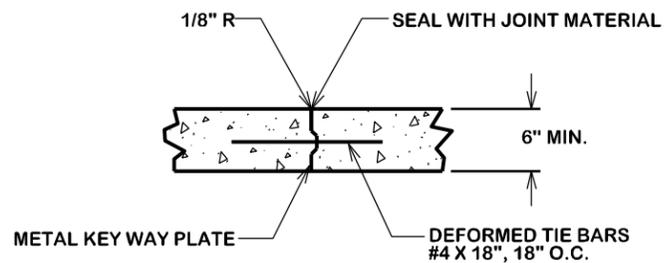
REVISIONS


**BRYAN - COLLEGE STATION  
STANDARD STREET DETAILS**



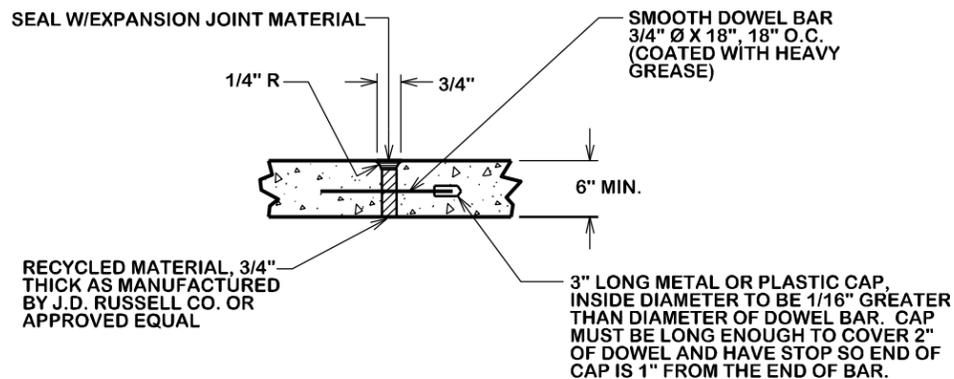
DRAWN BY: C.L.M.  
 DATE: 08-01-12  
 SCALE: N.T.S.  
 APPROVED: W.P.K.

FIGURE:  
**ST2**  
 SHEET 2 OF 4

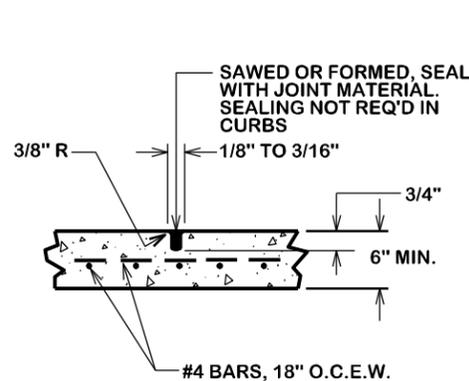


**TYPE "D"**  
**LONGITUDINAL JOINT**

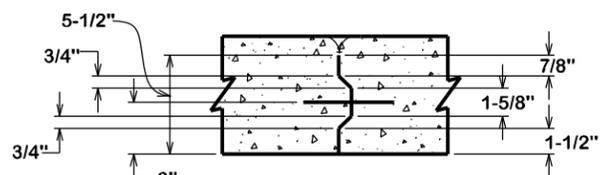
LONGITUDINAL JOINTS SHALL BE REQUIRED ONLY ON THE CENTERLINE OF THE PAVEMENT & IN INTERSECTIONS AS DETAILED



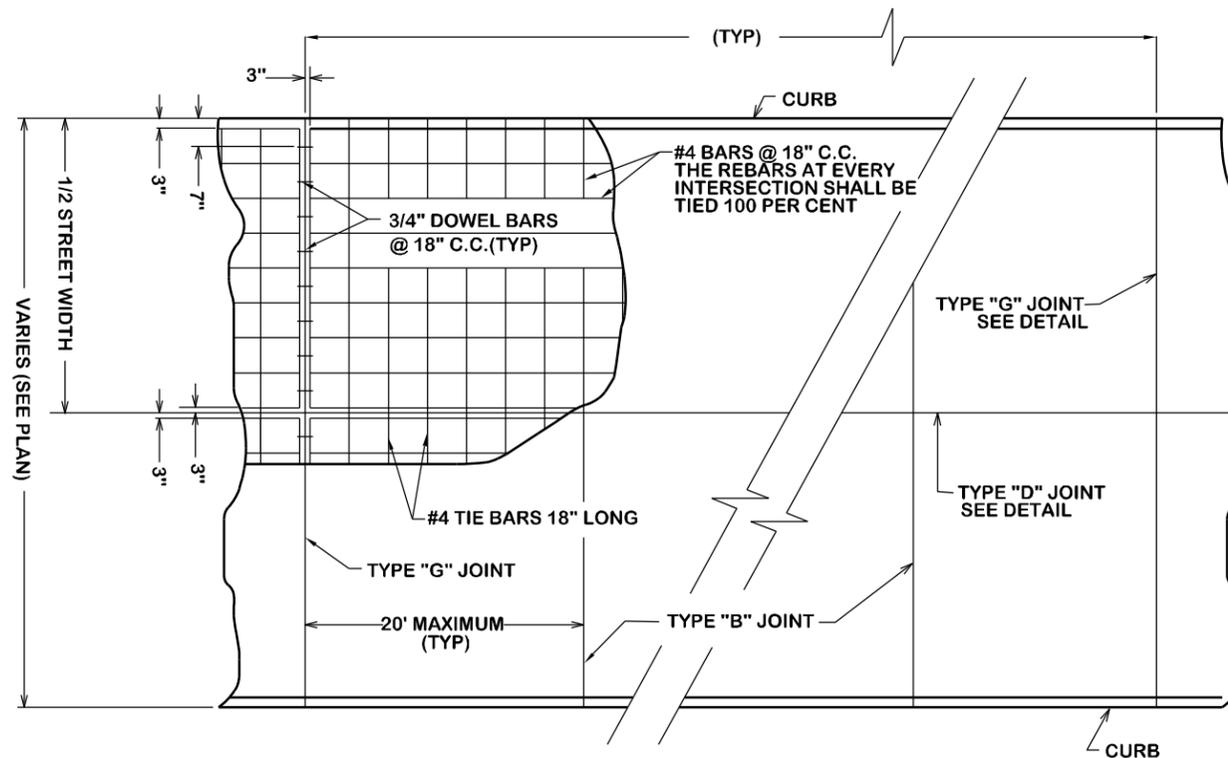
**TYPE "G"**  
**EXPANSION & CONSTRUCTION JOINT**



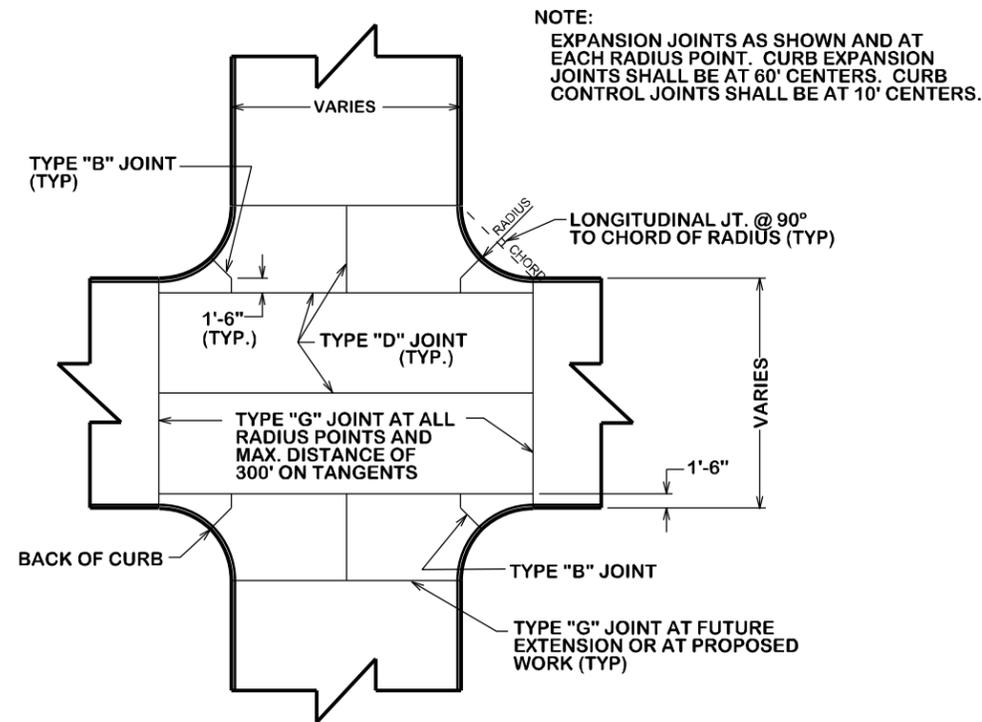
**TYPE "B"**  
**CONTRACTION JOINT**



**METAL KEYWAY PLATE**



**TYPICAL JOINT & REINFORCEMENT LAYOUT**  
**FOR CONCRETE PAVEMENT**



**TYPICAL JOINT LAYOUT AT**  
**CONCRETE INTERSECTION**

REVISIONS

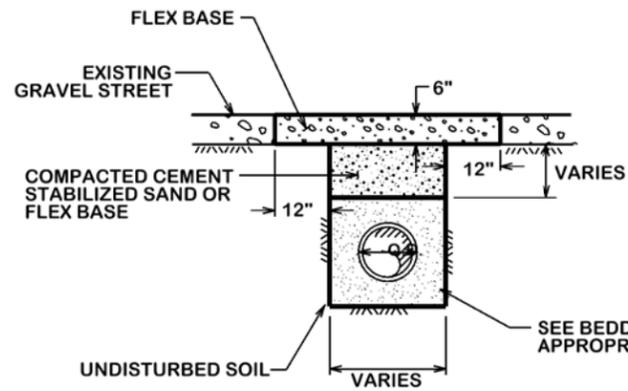
BRYAN - COLLEGE STATION  
STANDARD STREET DETAILS



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DATE: 08-01-12  
SCALE: N T S  
APPROVED: W.P.K.

FIGURE:  
**ST3**  
SHEET 3 OF 4

ST3-00

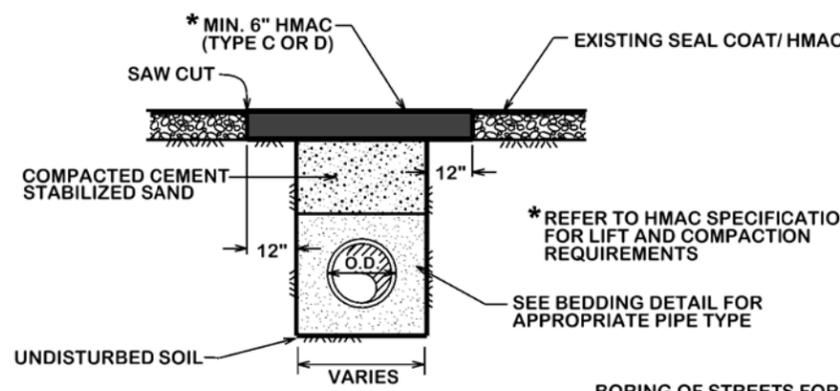


BORING OF STREETS FOR UTILITY PIPE IS THE CITY STANDARD. OPEN CUTTING OF STREETS SHALL BE BY APPROVAL OF THE CITY ENGINEER ONLY.

SEE BEDDING DETAIL FOR APPROPRIATE PIPE TYPE

### OPEN CUT GRAVEL STREET

ST4-00

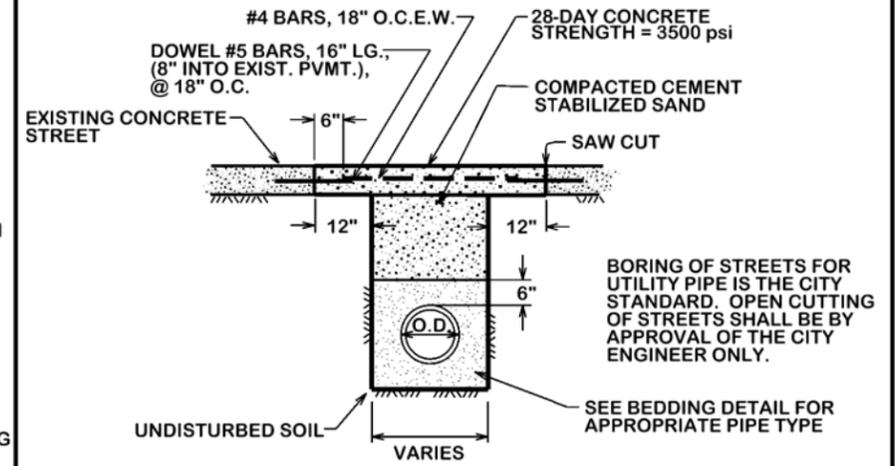


\* REFER TO HMAC SPECIFICATION FOR LIFT AND COMPACTION REQUIREMENTS

BORING OF STREETS FOR UTILITY PIPE IS THE CITY STANDARD. OPEN CUTTING OF STREETS SHALL BE BY APPROVAL OF THE CITY ENGINEER ONLY.

### OPEN CUT SEAL COAT/ OVERLAY STREET

ST4-01



BORING OF STREETS FOR UTILITY PIPE IS THE CITY STANDARD. OPEN CUTTING OF STREETS SHALL BE BY APPROVAL OF THE CITY ENGINEER ONLY.

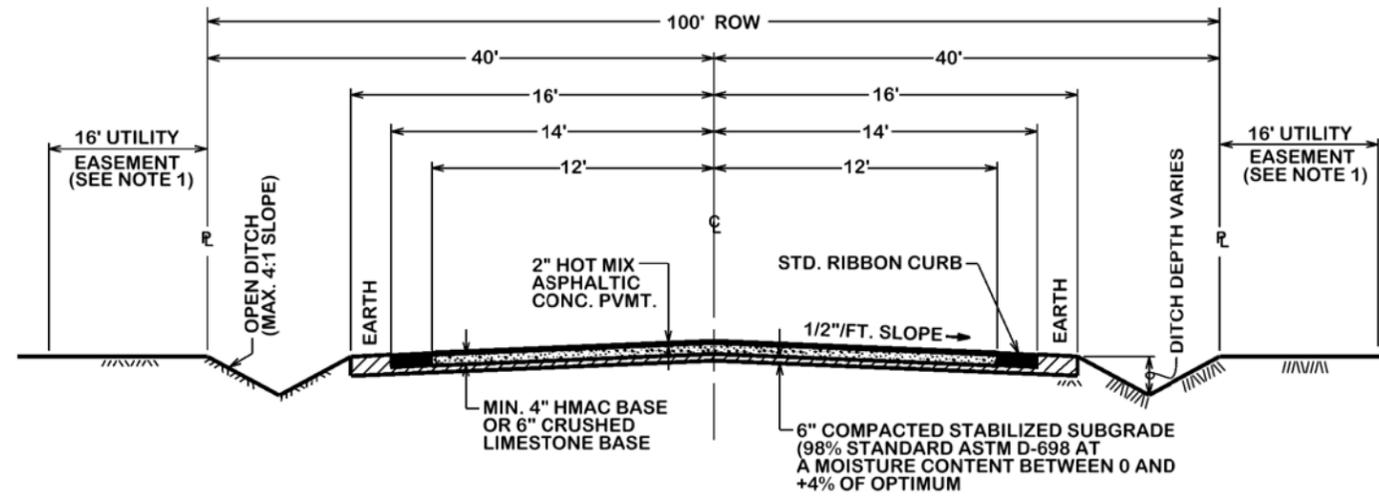
### OPEN CUT CONCRETE STREET

ST4-02

	RESIDENTIAL SECTION	COLLECTOR SECTION
PAVEMENT WIDTH	24	30
R.O.W WIDTH	70	100

NOTES:

1. RURAL SECTIONS WILL NOT REQUIRE 16' EASEMENTS PARALLEL TO ROW WITHIN CITY LIMITS.
2. WITHIN ETJ AREA, RURAL SECTIONS SHALL FOLLOW COUNTY SPECS AND STANDARDS

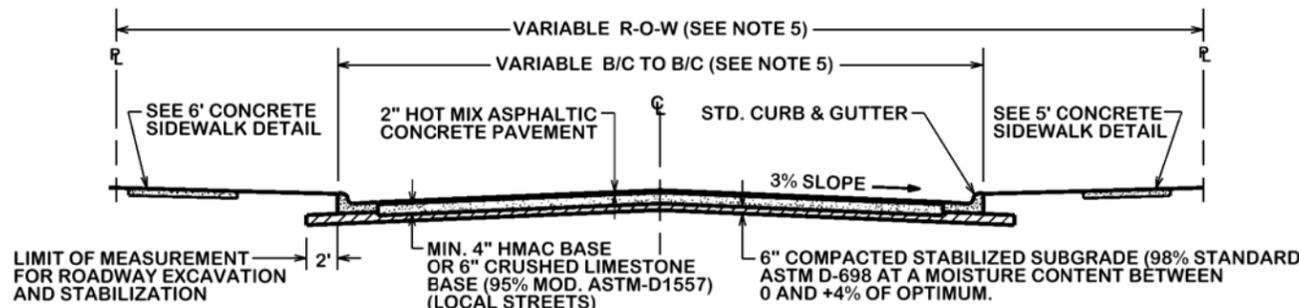


### TYPICAL RURAL ROAD RIBBON CURB SECTION

ST4-03

NOTES:

1. ALL SUBGRADES SHALL BE STABILIZED.
2. FOR SUBGRADES WITH PI > 15 AND % PASSING THE #200 SIEVE ≥ 35%, USE LIME STABILIZATION.
3. FOR SUBGRADES WITH PI < 15 AND % PASSING THE #200 SIEVE < 35%, USE PORTLAND CEMENT STABILIZATION.
4. SIDEWALK PLACEMENT VARIES WITH EACH LOCATION AND WILL BE DETERMINED BY THE ENGINEER.
5. REFER TO B/C'S UNIFIED DESIGN GUIDELINE MANUAL FOR ACCEPTED RIGHT OF WAY AND PAVEMENT WIDTH.
6. COLLECTOR STREETS WILL BE REQUIRED TO USE 5" HMAC BASE OR 8" CRUSHED LIMESTONE BASE AND STABILIZED SUBGRADE IN ACCORDANCE WITH THE B/C'S UNIFIED DESIGN GUIDELINE MANUAL OR AS DIRECTED BY CITY ENGINEER.



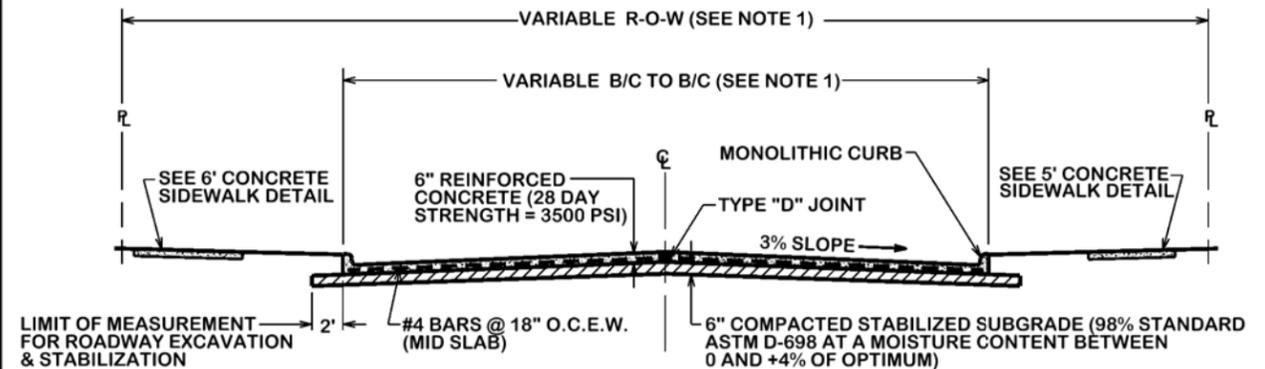
### TYPICAL STREET SECTION

ASPHALTIC CONCRETE PAVEMENT

ST4-04

NOTES:

1. REFER TO B/C'S UNIFIED DESIGN GUIDELINE MANUAL FOR ACCEPTED RIGHT OF WAY AND PAVEMENT WIDTH.
2. COLLECTOR STREETS WILL BE REQUIRED TO USE 8" REINFORCED CONCRETE ( 28 DAY STRENGTH = 3500 PSI)



### TYPICAL STREET SECTION

REINFORCED CONCRETE PAVEMENT

ST4-05

REVISIONS

BRYAN - COLLEGE STATION  
STANDARD STREET DETAILS



DRAWN BY: C.L.M.  
DATE: 08-01-12  
SCALE: N T S  
APPROVED: W.P.K.

FIGURE:

ST4  
SHEET 4 OF 4

REVISIONS
-----------

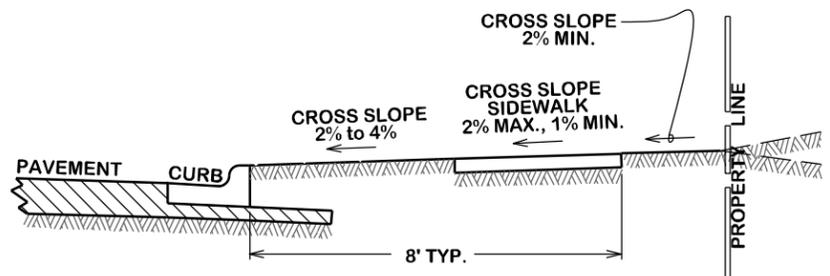
BRYAN - COLLEGE STATION  
STANDARD SIDEWALK DETAILS



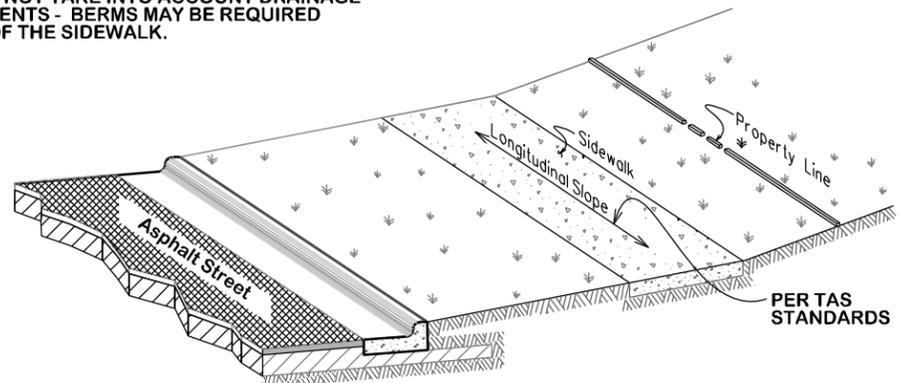
CITY OF BRYAN  
The Good Life, Texas Style™

DRAWN BY: C.J.M.  
DATE: 08-01-12  
SCALE: N T S  
APPROVED: W.P.K.

FIGURE:  
**SW1**  
SHEET 1 OF 3



NOTE:  
THIS DOES NOT TAKE INTO ACCOUNT DRAINAGE REQUIREMENTS - BERMS MAY BE REQUIRED OUTSIDE OF THE SIDEWALK.

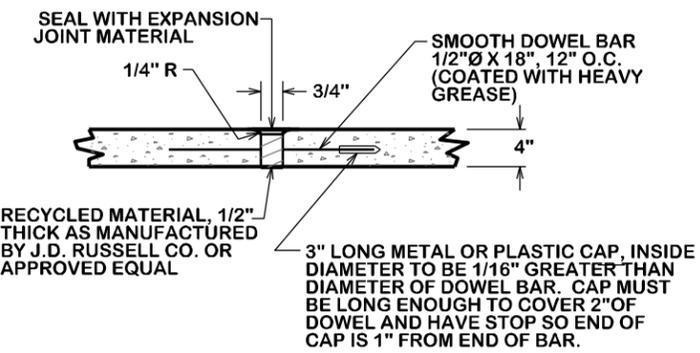


**SIDEWALK SLOPE REQUIREMENTS**

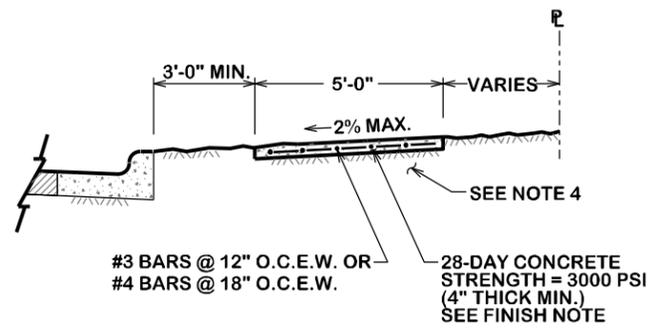
SW1-00

NOTES:

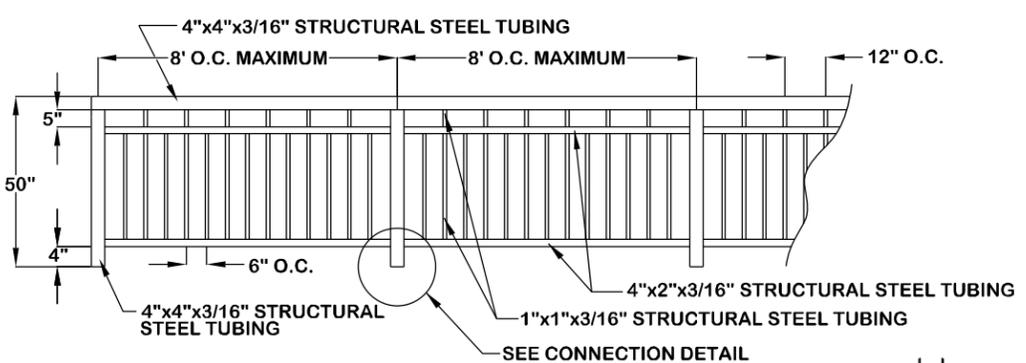
1. SIDEWALK PLACEMENT SHALL BE IN ACCORDANCE WITH B/C/S UNIFIED DESIGN GUIDELINES.
2. FINISH: LIGHT BROOM FINISH. JOINTS TO BE TOOLED 1" DEEP AT AN INTERVAL EQUAL TO THE SIDEWALK WIDTH. EXPANSION JOINTS @ 40' O.C., CONTRACTION JOINTS @ 4' O.C.
3. DOWEL IN AND TIE TO ANY CONCRETE STRUCTURE ADJACENT TO SIDEWALK (DRIVEWAY, INLET BOX, CURB, JUNCTION BOX, ETC.) WITH #3 x 12" BARS @ 12" O.C. OR #4 x 12" BARS @ 18" O.C.
4. COMPACTION: COMPACTED SUBGRADE MATERIAL COMPACTED TO A DENSITY AT LEAST 98% OF MAXIMUM DRY DENSITY AS DETERMINED BY PROCTOR COMPACTION TEST ASTM D698 (STANDARD) AND SHALL BE 0-4% WET OF THE OPTIMUM MOISTURE CONTENT
5. A MINIMUM CLEAR PEDESTRIAN WIDTH AS DEFINED BY TAS AND ADA SHALL BE PROVIDED FOR ENTIRE LENGTH OF SIDEWALK.



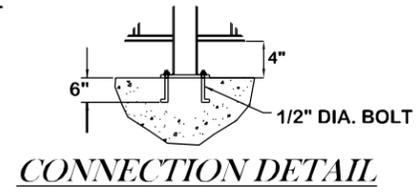
**SIDEWALK EXPANSION & CONTRACTION JOINT**



**ALONG LOCAL STREETS**



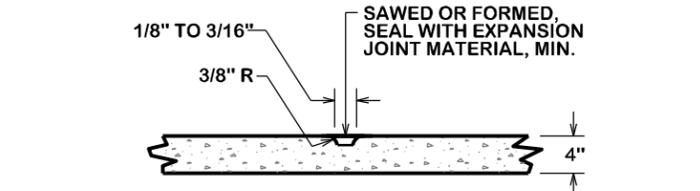
**TYPICAL PEDESTRIAN GUARDRAIL**



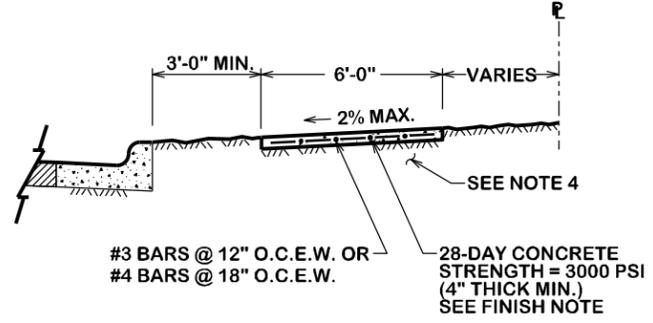
SW1-01

**GENERAL NOTES:**

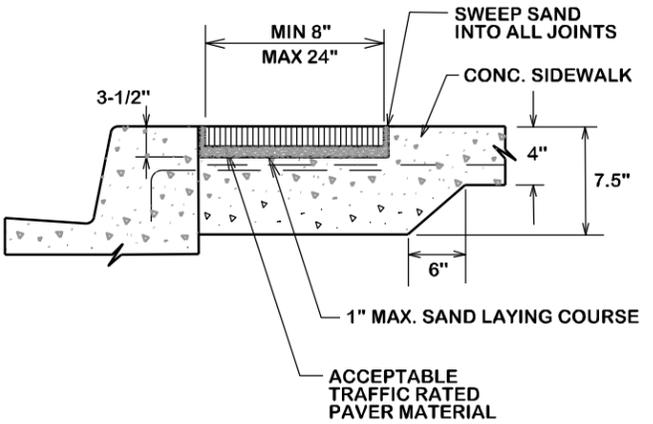
- ALL AREAS WHERE EXISTING VEGETATION AND GRASS COVER HAVE BEEN BARED BY CONSTRUCTION SHALL BE ADEQUATELY BLOCK SODDED OR HYDROMULCHED AND WATERED UNTIL GROWTH IS ESTABLISHED. IN DEVELOPED AREAS WHERE GRASS IS PRESENT, BLOCK SOD WILL BE REQUIRED. BARED AREAS SHALL BE SEED OR SODDED WITHIN 14 DAYS OF LAST DISTURBANCE.
- APPROVED EROSION CONTROL MEASURES MUST BE INSTALLED DURING THE ENTIRE TIME THAT EARTH HAS BEEN BARED BY CONSTRUCTION AND SHALL STAY IN PLACE UNTIL ACCEPTABLE VEGETATIVE GROWTH IS ESTABLISHED AFTER CONSTRUCTION IS COMPLETE AND THEN REMOVED BY CONTRACTOR.
- ALL EROSION CONTROL MEASURES SHOULD BE CLEANED OF SILT AFTER EVERY RAIN.
- ALL TRAFFIC SIGNALS AND APPURTENANCES, AND ALL PAVEMENT MARKINGS AND MARKERS SHALL BE IN ACCORDANCE WITH TXDOT STANDARDS
- REFER TO SPEC 31 17 23.23 (PAVEMENT MARKINGS) FOR ADDITIONAL LOCAL REQUIREMENTS.



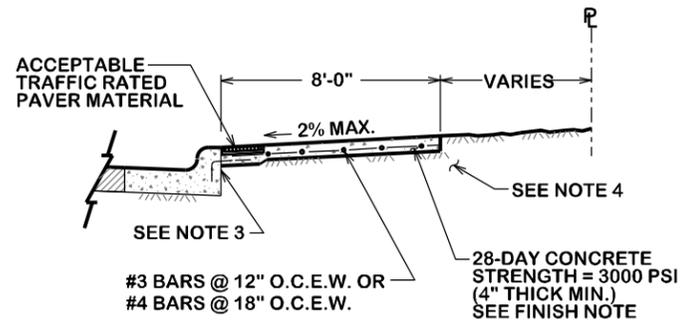
**SIDEWALK CONTRACTION JOINT**



**ALONG MINOR COLLECTORS AND LARGER**

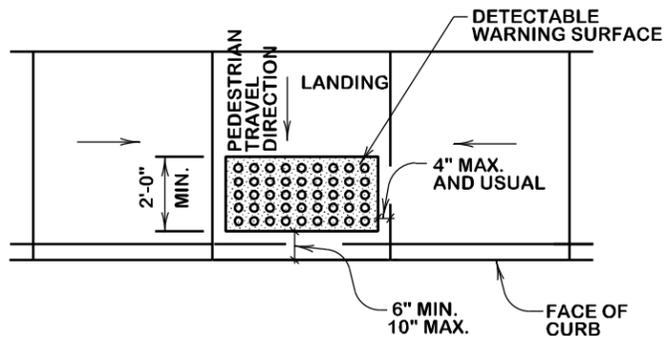


**SIDEWALK PAVER SECTION CONCRETE SIDEWALK**



**ALONG MINOR COLLECTORS AND LARGER**

SW1-02



**TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE**

SW2-00

**CROSSWALKS:**

CROSSWALK MARKINGS ARE IMPORTANT TRAFFIC CONTROL DEVICES AT CONTROLLED INTERSECTIONS. THESE DEVICES IDENTIFY THE APPROPRIATE LOCATION FOR PEDESTRIANS TO CROSS THE INTERSECTION AS WELL AS INFORMING DRIVERS WHERE PEDESTRIANS MAYBE PRESENT. NOT ALL LOCATIONS NEED THE CROSSWALKS MARKED; HOWEVER, TYPICALLY COLLECTOR AND ARTERIAL STREETS DO. AS STATED IN THE TMUTCD, AN ENGINEERING STUDY SHOULD BE PERFORMED BEFORE CROSSWALKS ARE INSTALLED AT LOCATIONS OTHER THAN CONTROLLED INTERSECTIONS.

THE CITY OF BRYAN'S PREFERENCE FOR MARKING CROSSWALKS IS THE LONGITUDINAL (OR "LADDER" STYLE). THE CITY OF COLLEGE STATION'S PREFERENCE IS THE TYPICAL "TRANSVERSE" STYLE; HOWEVER, IN THE NORTHGATE AREA, ADJACENT TO SCHOOL OR SCHOOL ZONES, AND OTHER HIGH PEDESTRIAN CROSSINGS, THE LONGITUDINAL (OR "LADDER" STYLE) IS PREFERRED. DEVIATION FROM THESE PREFERENCES WILL BE ALLOWED ONLY WITH THE APPROVAL OF THE CITY ENGINEER.

THE LONGITUDINAL STYLE MARKING SHALL BE 24" WIDE AND 8 FEET IN LENGTH, SPACED 48-INCHES APART. THE TRANSVERSE MARKINGS SHALL CONSIST OF TWO 12-INCH WIDE LINES SEPARATED BY 6 FEET OF UNMARKED PAVEMENT. ALL CROSSWALK PAVEMENT MARKINGS SHALL ALWAYS MEET TxDOT'S SPECIFICATION FOR TYPE I MARKINGS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.

ADDITIONAL INFORMATION ABOUT CROSSWALK MARKINGS CAN BE FOUND IN THE TMUTCD.

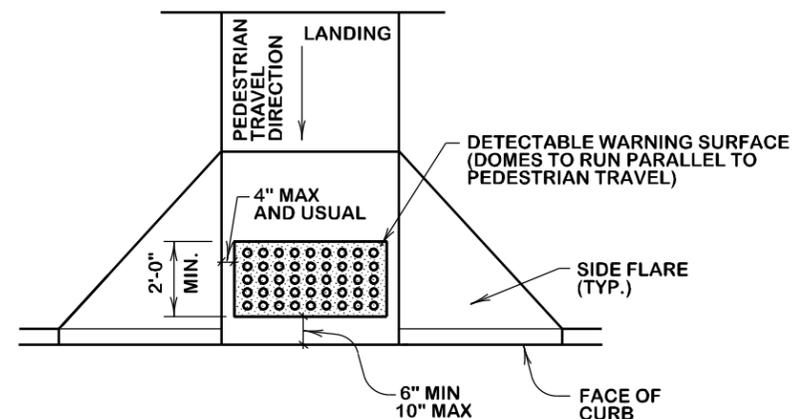
CROSSWALKS WITH BRICK PAVERS, STAMPED ASPHALT, STAMPED CONCRETE, ETC., SHALL ALSO REQUIRE RETRO-REFLECTIVE, THERMOPLASTIC TRANSVERSE STRIPING.

**DETECTABLE WARNINGS  
GENERAL NOTES:**

1. CURB RAMPS MUST CONTAIN A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES COMPLYING WITH SECTION 4.29 OF THE TEXAS ACCESSIBILITY STANDARDS (TAS). THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACES, INCLUDING SIDE FLARES. FURNISH DARK BROWN OR DARK RED DETECTABLE WARNING SURFACE ADJACENT TO UNCOLORED CONCRETE, UNLESS SPECIFIED ELSEWHERE IN THE PLANS.
2. DETECTABLE WARNING SURFACES MUST BE SLIP RESISTANT AND NOT ALLOW WATER TO ACCUMULATE.
3. ALIGN TRUNCATED DOMES IN THE DIRECTION OF PEDESTRIAN TRAVEL WHEN ENTERING THE STREET.
4. SHADED AREAS ON SHEETS 3 AND 4 INDICATE THE APPROXIMATE LOCATION FOR THE DETECABLE WARNING SURFACE FOR EACH CURB RAMP TYPE.
5. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
6. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS A MINIMUM OF 6" AND A MAXIMUM OF 10" FROM THE EXTENSION OF THE FACE OF CURB. DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.
7. ACCEPTABLE PAVER MATERIAL SHALL BE CLAY, VITRIFIED POLYMER COMPOSITE, PRECAST POLYMER CONCRETE, AND CONCRETE.

**PEDESTRIAN FACILITIES  
GENERAL NOTES:**

1. ALL SLOPES ARE MAXIMUM ALLOWABLE. THE LEAST POSSIBLE SLOPE THAT WILL STILL DRAIN PROPERLY SHOULD BE USED. ADJUST CURB RAMP LENGTH OR GRADE OF APPROACH SIDEWALKS AS DIRECTED.
2. LANDINGS SHALL BE A 5' X 5' MINIMUM WITH A MAXIMUM 2% SLOPE IN ANY DIRECTION.
3. MANEUVERING SPACE AT THE BOTTOM OF CURB RAMPS SHALL BE A MINIMUM OF 4' X 4' WHOLLY CONTAINED WITHIN THE CROSSWALK AND WHOLLY OUTSIDE THE PARALLEL VEHICULAR TRAVEL PATH.
4. MAXIMUM ALLOWABLE CROSS SLOPE ON SIDEWALK AND CURB RAMP IS 2%.
5. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP, EITHER BECAUSE THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR BECAUSE THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED. OTHERWISE, PROVIDE FLARED SIDES.
6. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, LIGHT RELECTIVE VALUE AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) AND 16 TAC 68.102.
7. TO SERVE AS A PEDESTRIAN REFUGE AREA, THE MEDIAN SHOULD BE A MINIMUM OF 5' WIDE. MEDIANS SHOULD BE DESIGNED TO PROVIDE ACCESSIBLE PASSAGE OVER OR THROUGH THEM.
8. CROSSWALK DIMENSIONS, CROSSWALK MARKINGS AND STOP BAR LOCATIONS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS. AT INTERSECTIONS WHERE CROSSWALK MARKINGS ARE NOT REQUIRED, CURB RAMPS SHALL BE ALIGNED WITH THEORETICAL CROSSWALKS, OR AS DIRECTED BY THE ENGINEER.
9. EXISTING FEATURES THAT COMPLY WITH TAS MAY REMAIN IN PLACE UNLESS OTHERWISE SHOWN ON THE PLANS.
10. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. PROVIDE CURB RAMPS WHEREVER ON ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB.
11. SEPARATE CURB RAMP AND LANDINGS FROM ADJACENT SIDEWALK AND ANY OTHER ELEMENTS WITH PREMOLD OR BOARD JOINT OF 3/4" UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
12. PROVIDE A SMOOTH TRANSITION WHERE THE CURB RAMPS CONNECT TO THE STREET.
13. FLARE SLOPE SHALL NOT EXCEED 10% MEASURED ALONG CURB LINE.



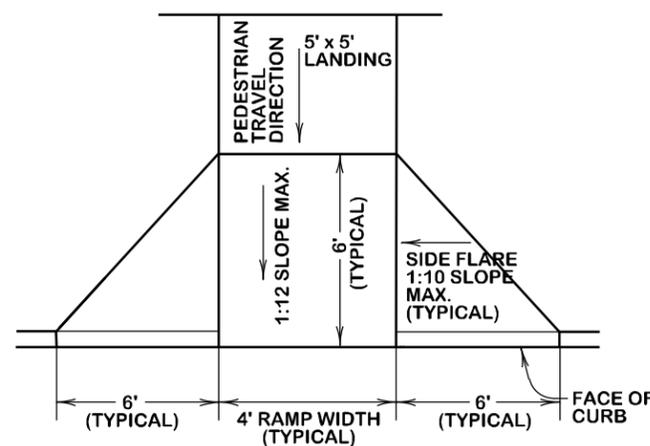
**TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN**

SW2-01

**GENERAL NOTES (PAVERS)**

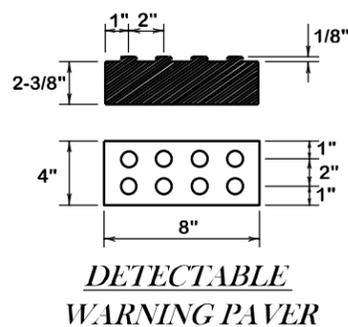
FURNISH DETECTABLE WARNING PAVER UNITS MEETING ALL REQUIREMENTS OF ASTM C-936, C-33. LAY IN A TWO BY TWO UNIT BASKET WEAVE PATTERN OR AS DIRECTED.

LAY FULL-SIZE UNITS FIRST FOLLOWED BY CLOSURE UNITS CONSISTING OF AT LEAST 25 PERCENT OF A FULL UNIT. CUT DETECTABLE WARNING PAVER UNITS USING A POWER SAW.

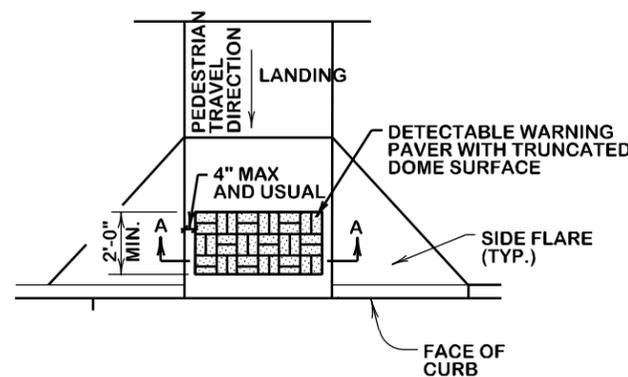


**TYPICAL AMBULATORY RAMP W/  
FLARED WINGS**

SW2-02

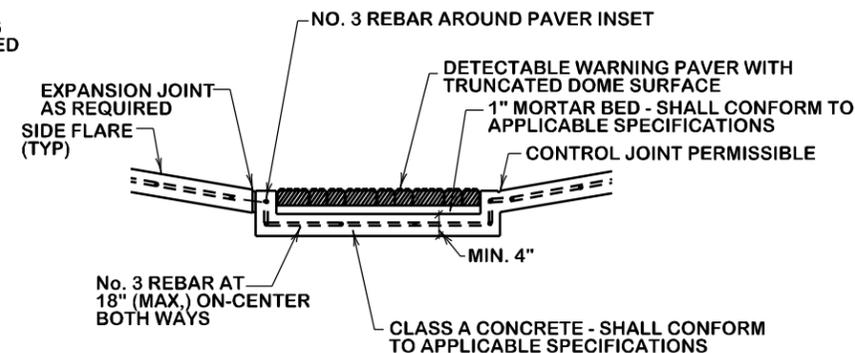


**DETECTABLE  
WARNING PAVER**



**TRUNCATED DOME PATTERN  
CURB RAMP**

**DETECTABLE WARNING PAVER**



**SECTION A-A**

SW2-03

REVISIONS

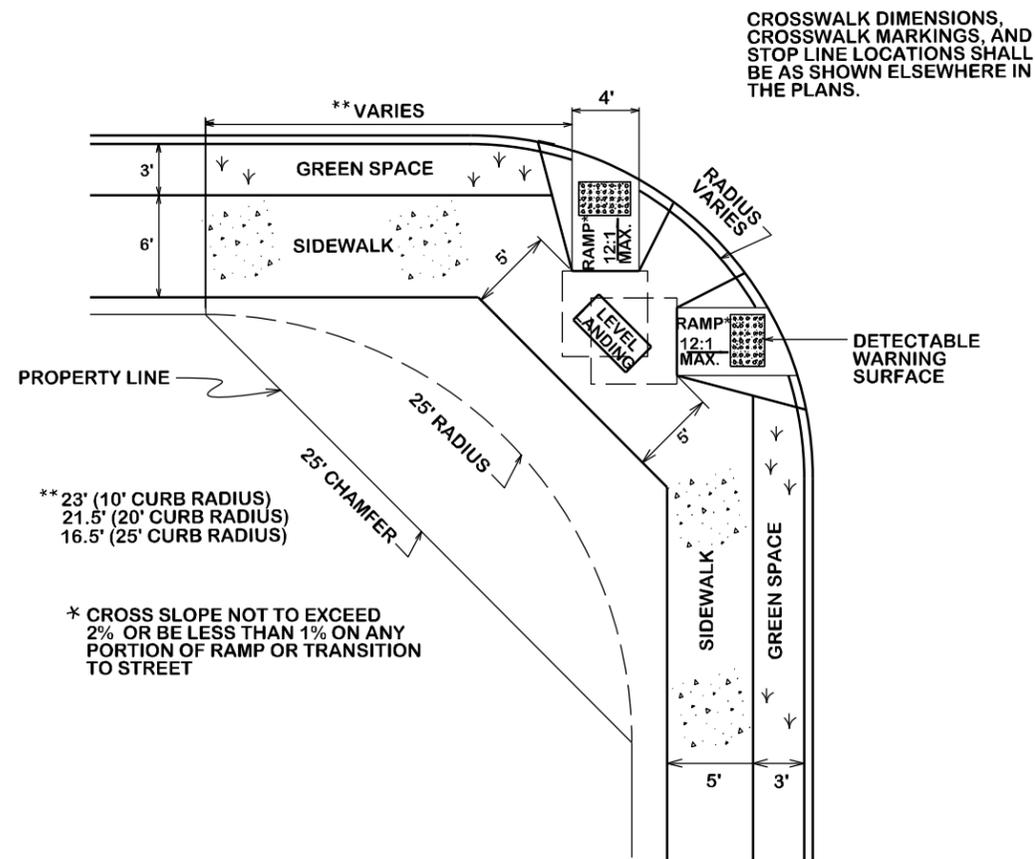
BRYAN - COLLEGE STATION  
STANDARD SIDEWALK DETAILS



CITY OF BRYAN  
The Good Life, Texas Style.

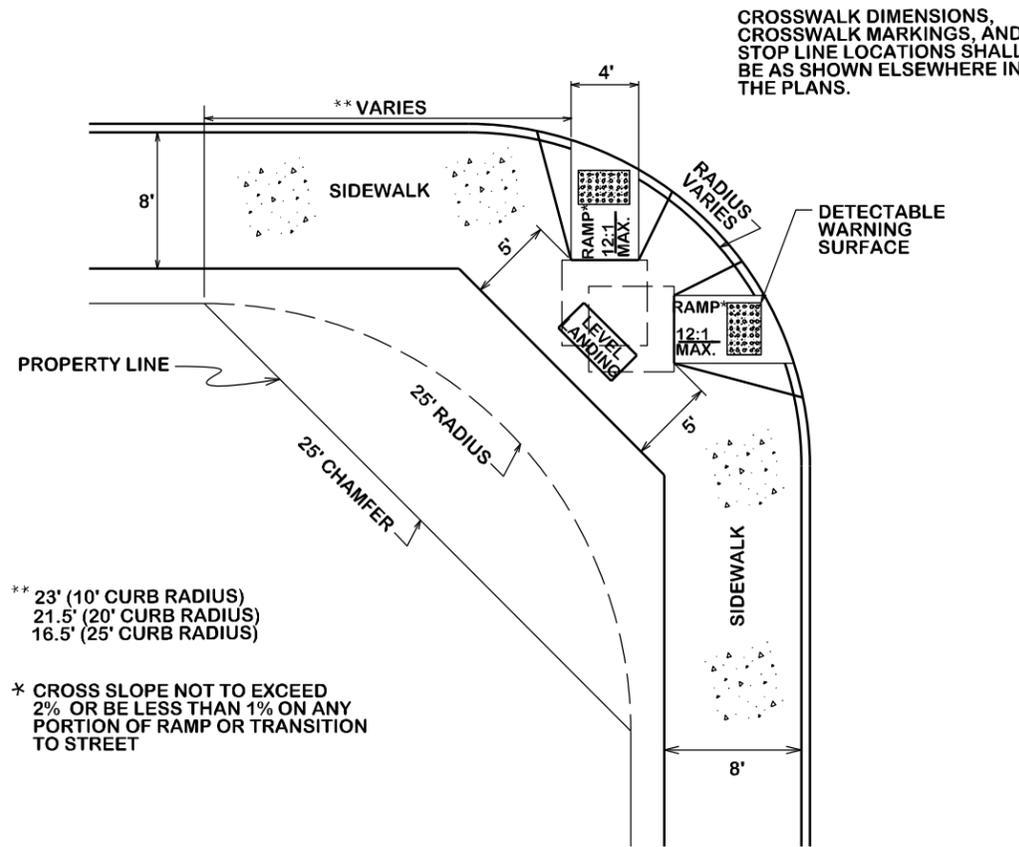
DRAWN BY: C.J.M.  
DATE: 08-01-12  
SCALE: N T S  
APPROVED: W.P.K.

FIGURE:  
**SW2**  
SHEET 2 OF 3



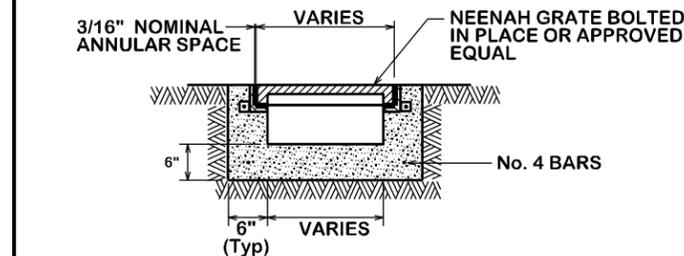
**5/6' SIDEWALK AMBULATORY RAMP AT STREET INTERSECTION**

SW3-00

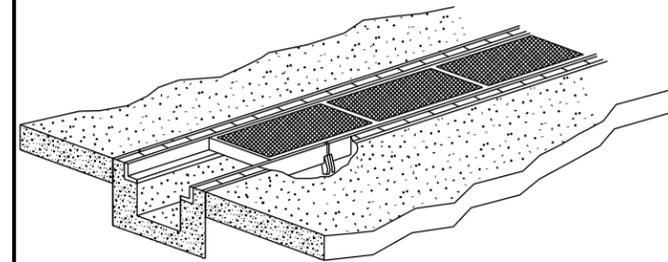


**8' SIDEWALK AMBULATORY RAMP AT STREET INTERSECTION**

SW3-01



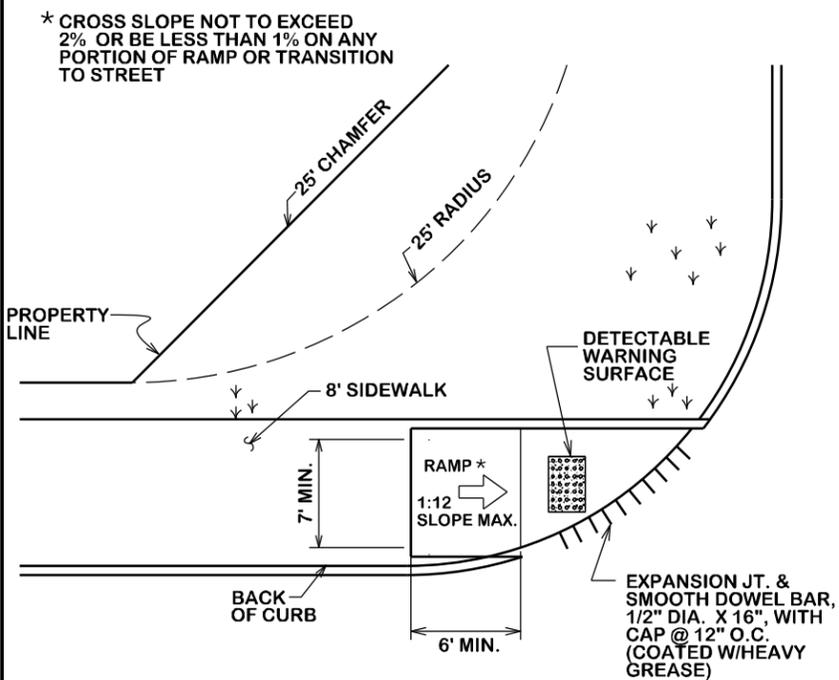
TRENCH GRATE MAY ONLY BE ALLOWED WITH PRIOR APPROVAL FROM THE CITY ENGINEER AND WHERE THERE IS NO OTHER STORM SEWER SYSTEM AVAILABLE.



*Isometric View*

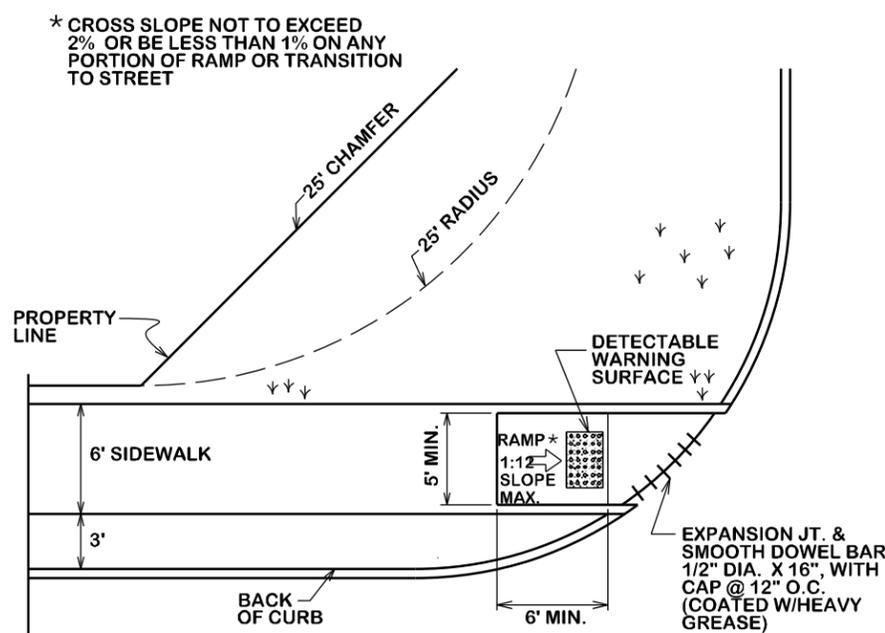
**SIDEWALK DRAINAGE TRENCH GRATE**

SW3-02



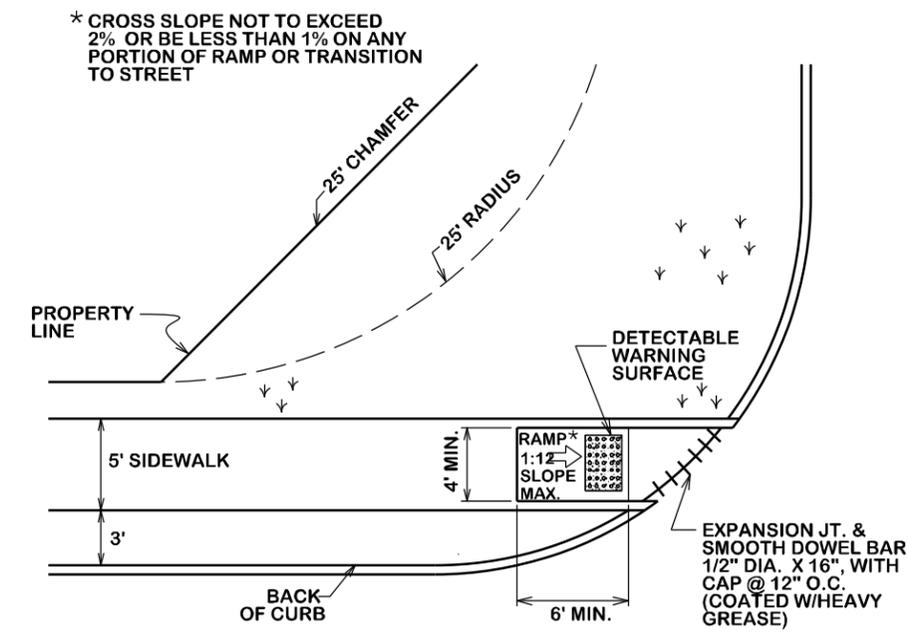
**8' SIDEWALK AMBULATORY RAMP AT STREET INTERSECTION & DRIVES**

SW3-03



**6' SIDEWALK AMBULATORY RAMP AT STREET INTERSECTION & DRIVES**

SW3-04



**5' SIDEWALK AMBULATORY RAMP AT STREET INTERSECTION & DRIVES**

SW3-05

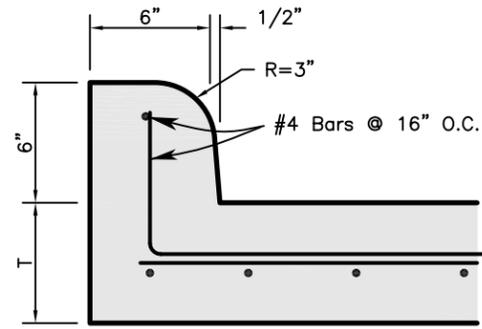
REVISIONS

BRYAN - COLLEGE STATION  
STANDARD SIDEWALK DETAILS



DRAWN BY: C.L.M.  
DATE: 08-01-12  
SCALE: N T S  
APPROVED: W.P.K.  
FIGURE:  
**SW3**  
SHEET 3 OF 3

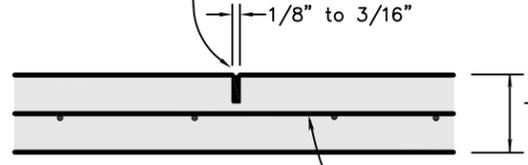
PROJECT BENCHMARK: SURVEY CONTROL POINT #533  
 1/2" IRON ROD W/ CAP Located along north side of Right of way  
 between Ledgestone Trail and Royder Road at Station 31+19.12 and  
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.



### TYPE II CURB

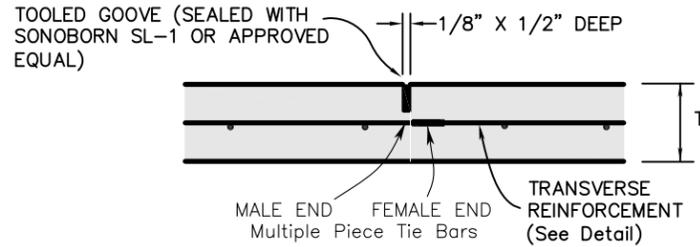
FOR USE WITH CONCRETE PAVEMENT OR APRON  
 ALL CURBS SHALL BE CAST MONOLITHICALLY WITH CONCRETE PAVEMENT  
 EXCEPT IN INTERSECTION RADII WHERE REBAR SHALL BE LEFT  
 PROTRUDING FROM THIS INITIAL POUR.

SEAL W/ EXPANSION JOINT MATERIAL  
 (SONOBORN SL-1 OR APPROVED EQUAL)  
 Install per Manufacture's Specifications  
 Min. Depth = T/4  
 1-1/2" for Sidewalks



### CONTRACTION JOINT

See detail for spacing

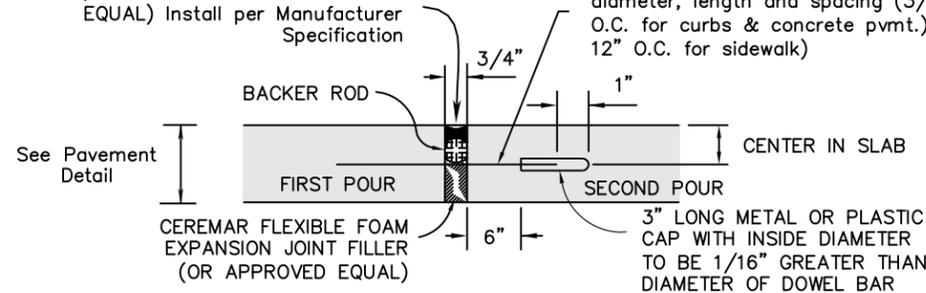


### LONGITUDINAL CONSTRUCTION JOINT

See detail for spacing

SEAL W/ EXPANSION JOINT MATERIAL  
 (SONOBORN SL-1 OR APPROVED  
 EQUAL) Install per Manufacturer  
 Specification

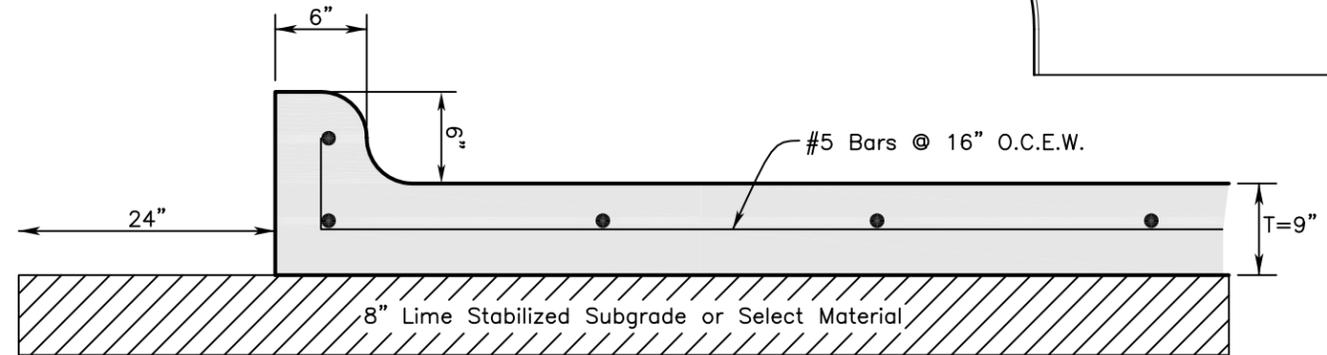
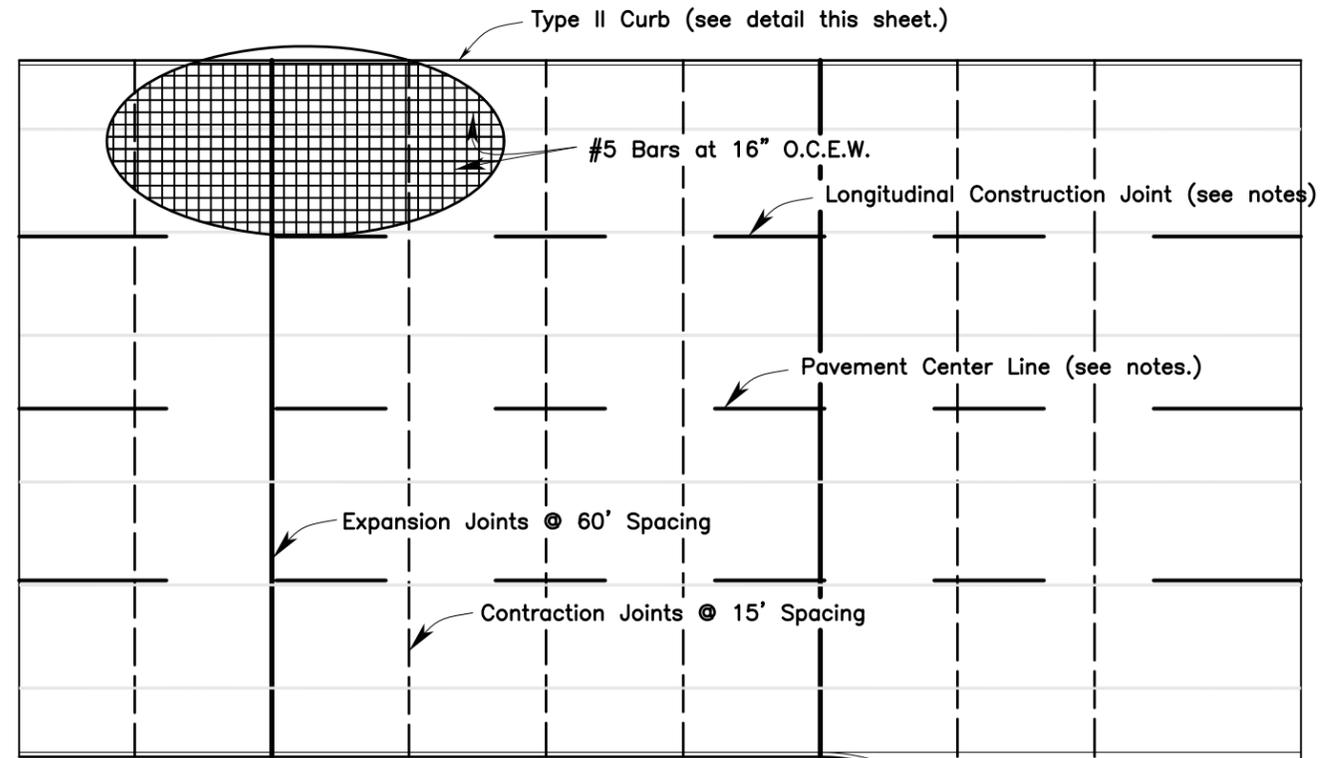
SMOOTH DOWEL BAR, See detail for  
 diameter, length and spacing (3/4"x18" @ 12"  
 O.C. for curbs & concrete pvmt.) (1/2"x18" @  
 12" O.C. for sidewalk)



NOTE: 1. CAP MUST BE LONG ENOUGH TO COVER 2" OF THE DOWEL WITH ONE CLOSED END AND WITH A SUITABLE STOP TO HOLD THE END OF THE CAP AT LEAST 1" FROM THE END OF THE DOWEL BAR. 2. EXPANSION JOINT WIDTH SHOWN IS THE MINIMUM. SHOULD THE SEALANT OR PLACEMENT CONDITIONS REQUIRE A GREATER WIDTH, THE GREATER WIDTH SHALL BE PROVIDED AT THE EXPENSE OF THE CONTRACTOR. 3. GREENSTREAK G-SEAL 626 MODIFIED PVC MATERIAL AND WOLMANIZED LUMBER MAY BE SUBSTITUTED FOR SL-1 AND CEREMAR FOAM. INSTALL PER MANUFACTURERS RECOMMENDATIONS. THIS MATERIAL MAY ALSO BE USED IN CONTRACTION AND LONGITUDINAL JOINTS.

### EXPANSION JOINT

(60' MAX. SPACING UNLESS  
 OTHERWISE INDICATED IN PLANS)



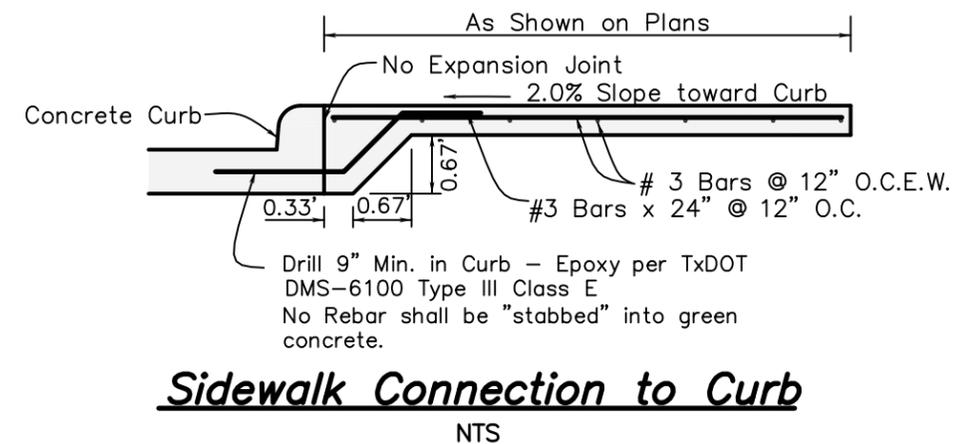
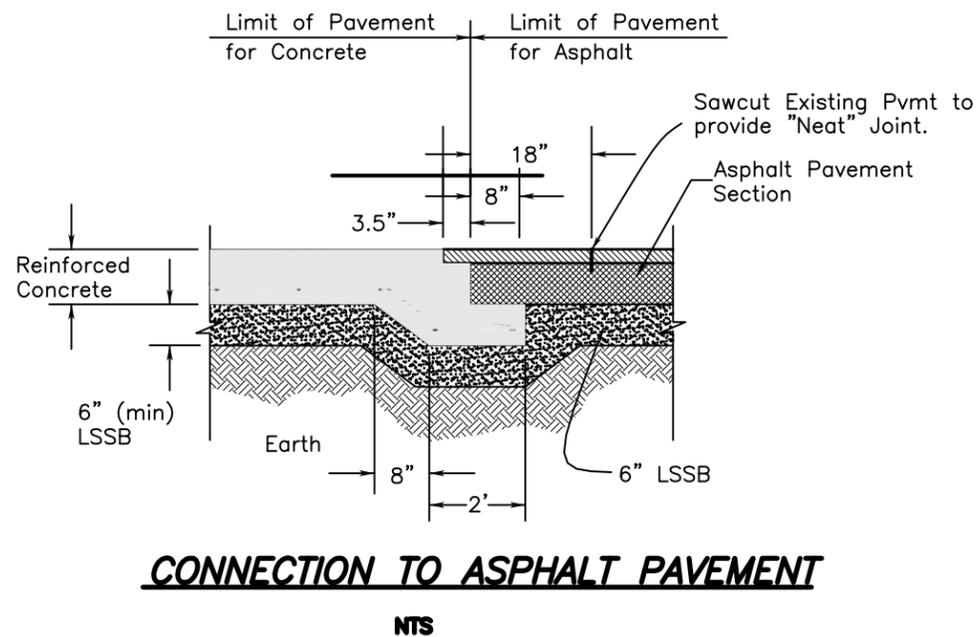
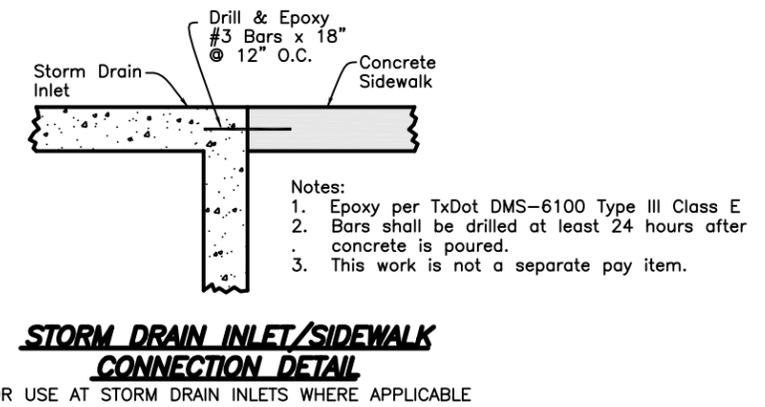
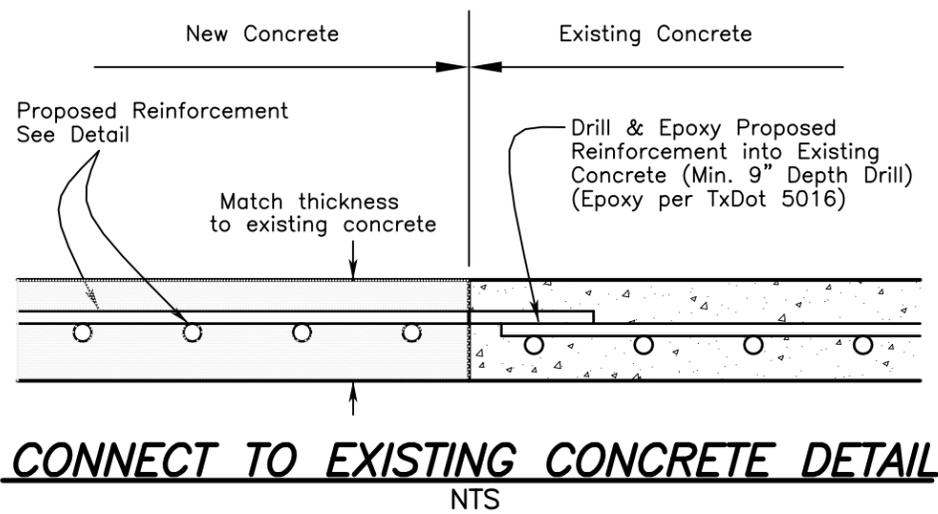
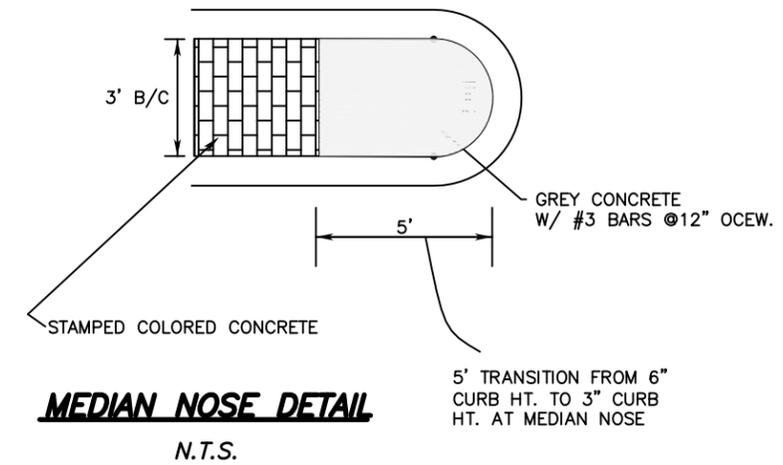
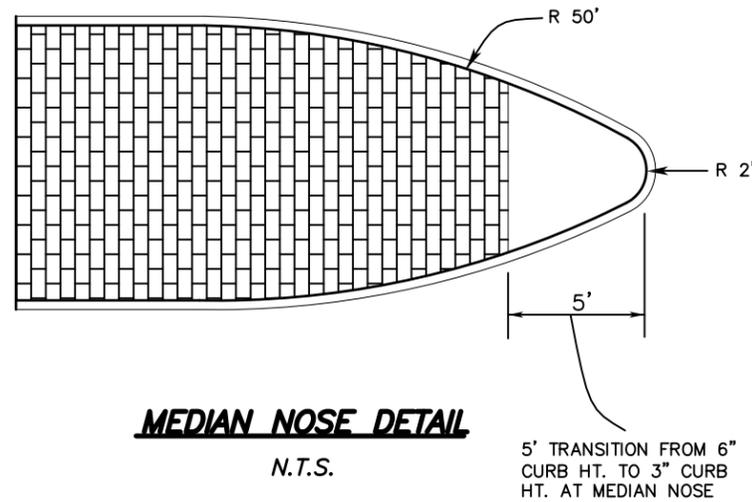
## STANDARD CONCRETE PAVEMENT DETAIL

NTS

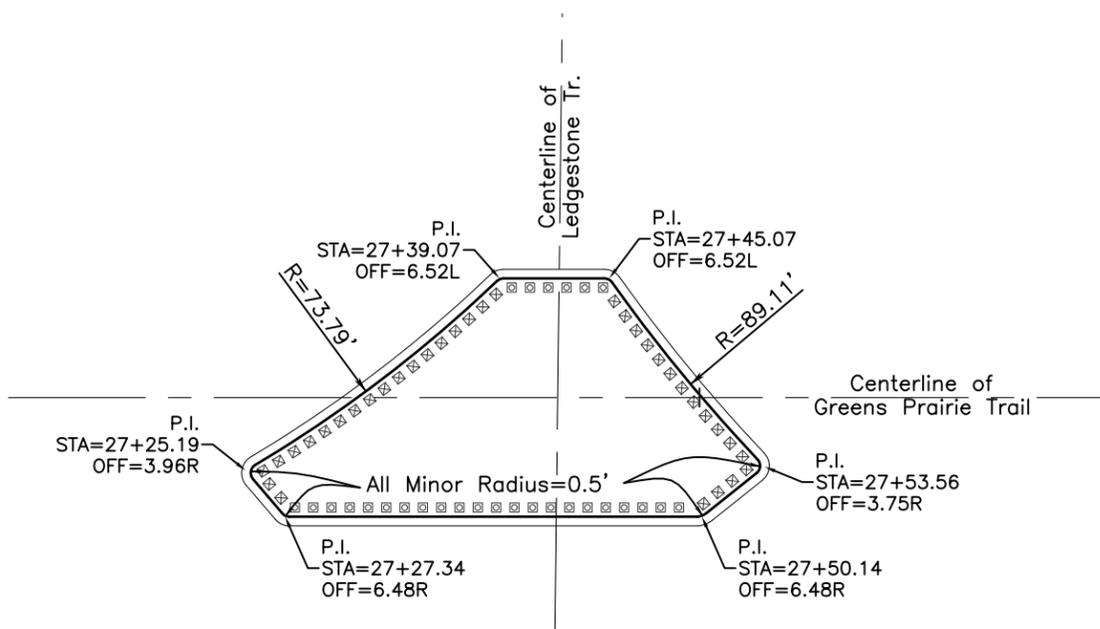
Notes:

1. Longitudinal Construction Joint Locations shall be defined by the contractor based upon the capabilities of his equipment AND shall be placed 1" to 4" away from the intended location of a painted line. Longitudinal Construction Joints shall use Multiple Piece Tie Bars. The stabbing of dowel bars into green concrete shall NOT be allowed.
2. Multiple Piece Tie Bars shall provide at least 24" of development length in each pour. The tie bars shall be placed and tied to the reinforcement mat with the female threaded end 1/2"-3/4" away from the intended longitudinal construction joint. The female threaded end shall be covered with duct tape. The location of the Tie Bars shall be marked on the ground using paint. After the slip form paver has moved past the tie bar, a coupon of concrete shall be knocked away to reveal the threaded end for connection. Use multiple piece tie bars from the list of "prequalified multiple piece tie bar producers" maintained by the construction division of TxDOT.
3. Type II curbs must be cast monolithically. No scab on curb will be allowed.
4. The Pavement Centerline usually includes a significant grade break but no longitudinal construction joint is required if the paving equipment can accommodate the grade break without a cold joint.
5. The Finished Surface of the concrete pavement must be smooth. Perform sufficient checks with long-handled 10-ft. and 15-ft. straightedges on the plastic concrete to ensure the final surface is within the tolerances specified in Surface Test A in TxDOT Item 585, "Ride Quality for Pavement Surfaces." Check with the straightedge parallel to the centerline.
6. The concrete pavement shall be placed with approved self-propelled paving equipment that uniformly distributes the concrete with minimal segregation and provides a smooth machine-finished consolidated concrete pavement conforming to plan line and grade with an approved automatic grade control system.

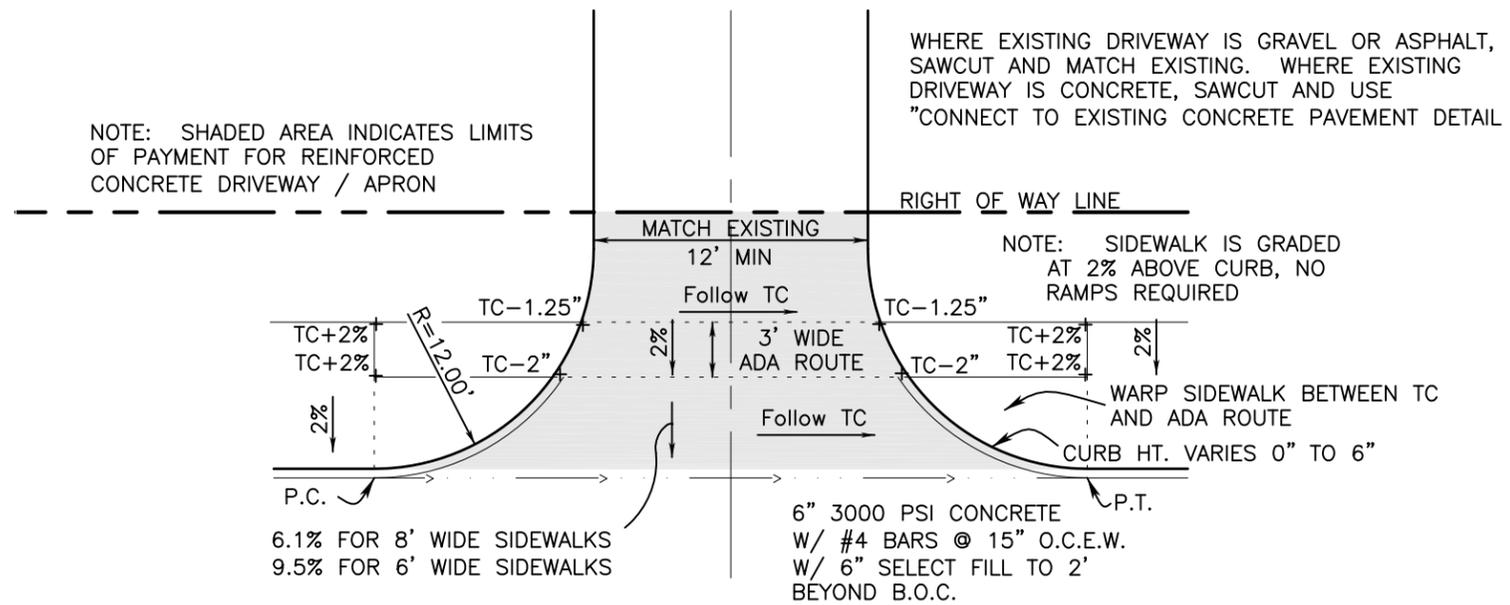
PROJECT BENCHMARK: SURVEY CONTROL POINT #533  
 1/2" IRON ROD W/ CAP Located along north side of Right of way  
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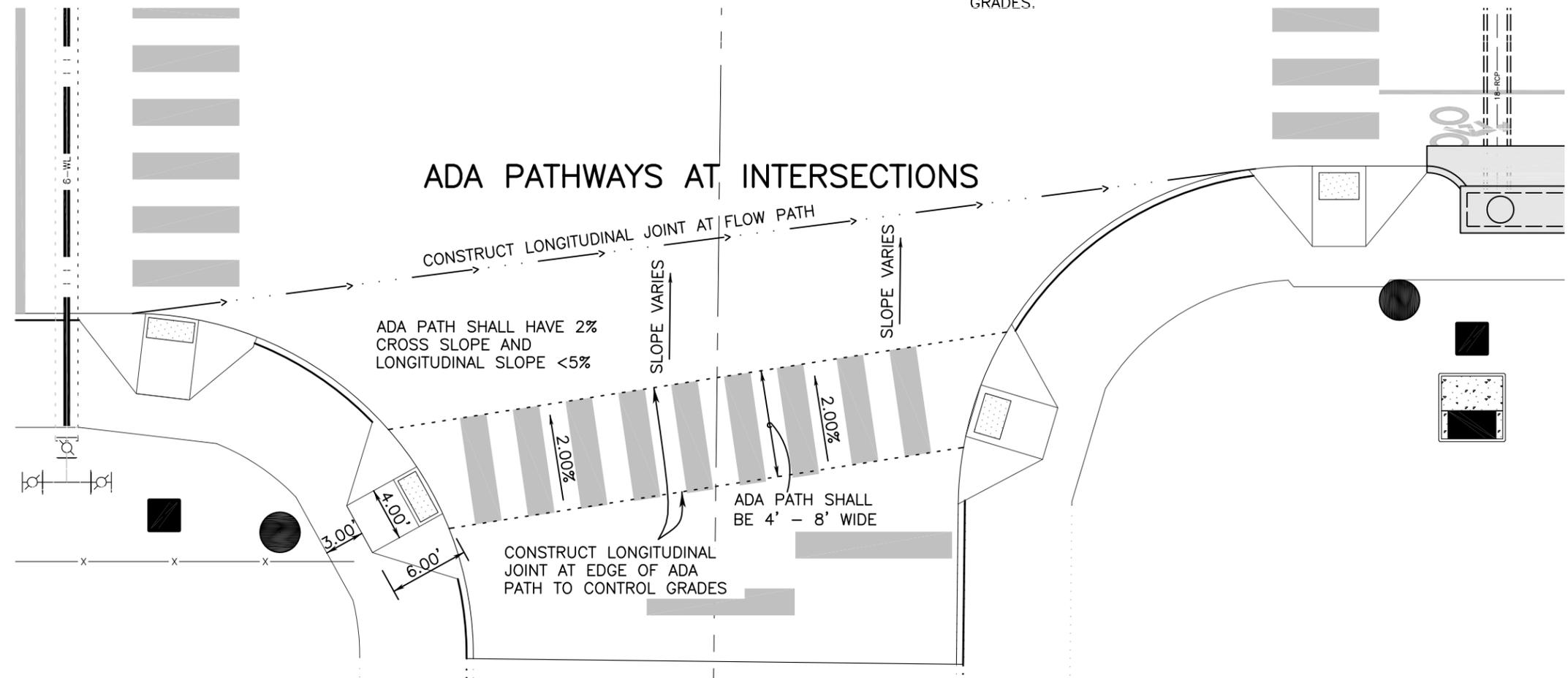
MEDIAN ISLAND AT LEDGESTONE



RESIDENTIAL DRIVEWAYS

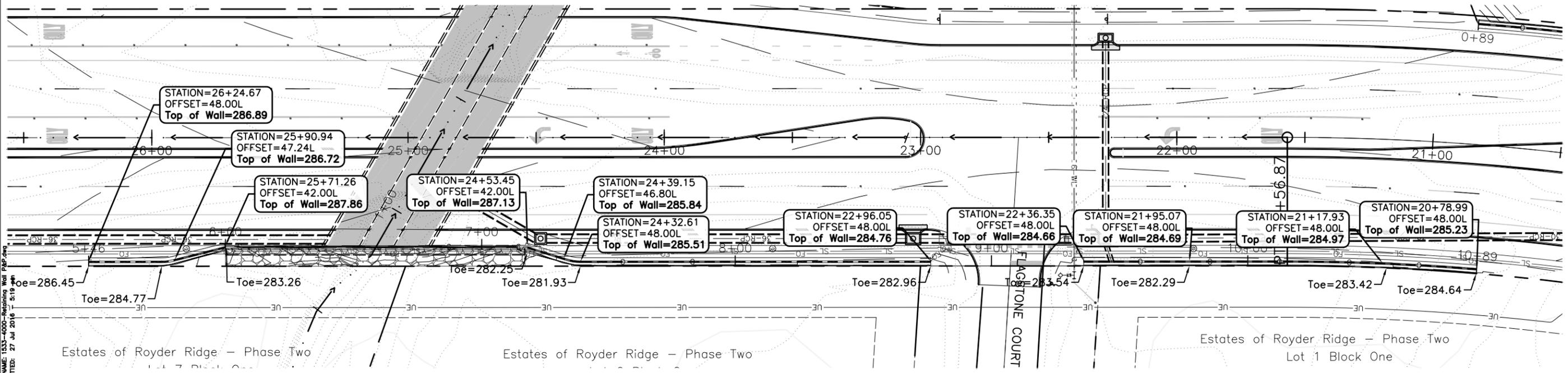
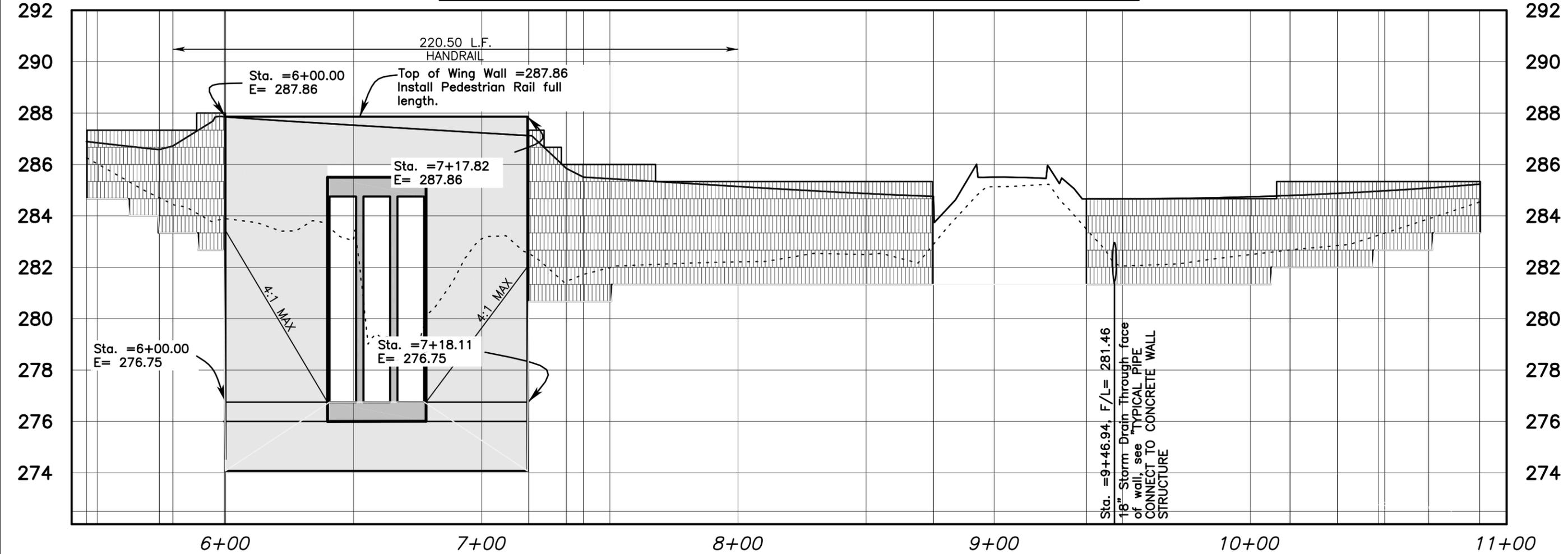
THE ADA PATH SHALL FOLLOW THE TOP OF CURB (TC) ELEVATION EXCEPT WHERE IT FALLS WITHIN 12' OF A RESIDENTIAL DRIVEWAY. WHERE THE ADA PATH APPROACHES A DRIVEWAY, THE PATH SHALL SLOPE SHALL BE REDUCED BY ROUGHLY 2% TO MATCH THE DRIVEWAY GRADES.

WHERE THE ADA PATH CROSSES A DRIVEWAY, THE NEAR EDGE OF THE PATH SHALL BE 4" ABOVE THE GUTTER GRADES.



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# North Side Retaining Walls Profile



T.979.260.6963  
 F.979.260.3564  
 FIRM# F-1443  
 3204 EARL RUDDER FWY S.  
 COLLEGE STATION, TX 77845

PLAN & DESIGN SPECIALISTS IN  
 CIVIL ENGINEERING • HYDRAULICS  
 HYDROLOGY • UTILITIES • STREETS  
 SITE PLANS • SUBDIVISIONS



Job No. 2016-0016  
 Designed By: JM  
 Drawn By: JM

Prepared For:  
 City of College Station  
 Public Works Department  
 310 Krenek Tap Rd  
 College Station, TX  
 77840

Revisions

**NORTH SIDE RETAINING WALLS  
 GREENS PRAIRIE TRAIL  
 ROADWAY CAPACITY IMPROVEMENTS**

FILENAME: 1533-000-Retaining Wall P&P.dwg  
 PLOTTED: 27 Jul 2016 5:19 pm









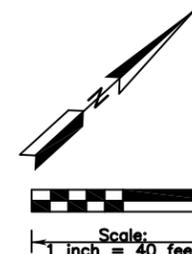


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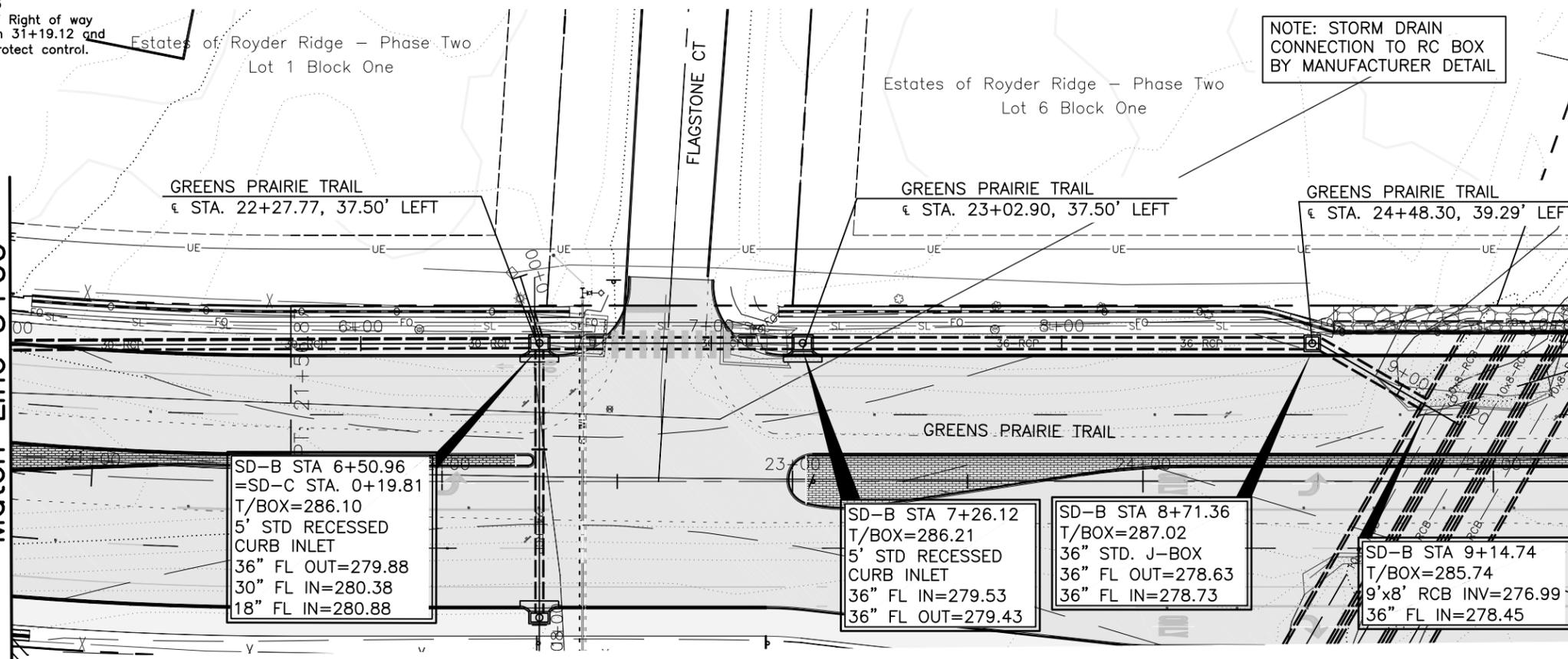
Estates of Royder Ridge - Phase Two  
 Lot 1 Block One

Estates of Royder Ridge - Phase Two  
 Lot 6 Block One

NOTE: STORM DRAIN  
 CONNECTION TO RC BOX  
 BY MANUFACTURER DETAIL



Match Line 5+00



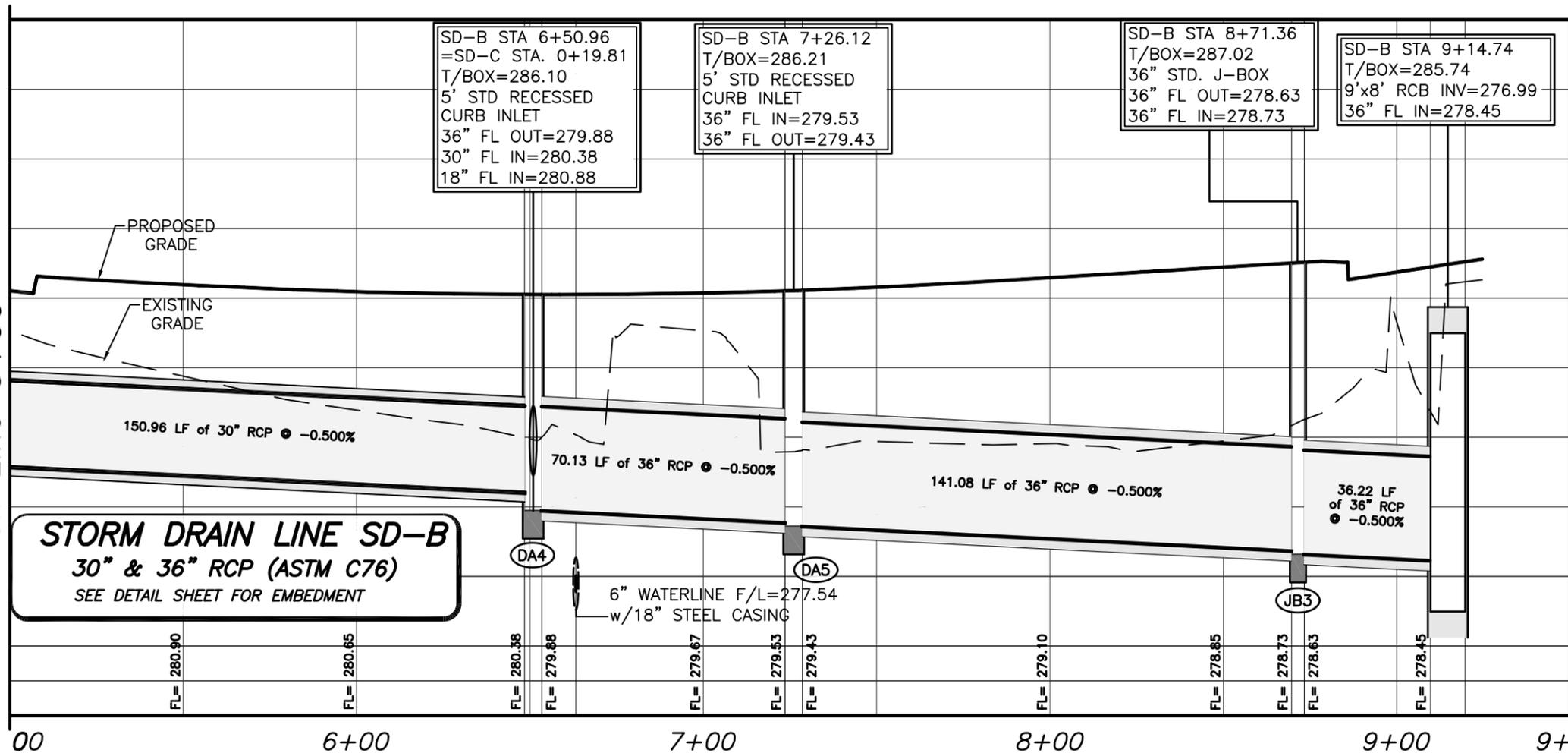
SD-B STA 6+50.96  
 =SD-C STA. 0+19.81  
 T/BOX=286.10  
 5' STD RECESSED  
 CURB INLET  
 36" FL OUT=279.88  
 30" FL IN=280.38  
 18" FL IN=280.88

SD-B STA 7+26.12  
 T/BOX=286.21  
 5' STD RECESSED  
 CURB INLET  
 36" FL IN=279.53  
 36" FL OUT=279.43

SD-B STA 8+71.36  
 T/BOX=287.02  
 36" STD. J-BOX  
 36" FL OUT=278.63  
 36" FL IN=278.73

SD-B STA 9+14.74  
 T/BOX=285.74  
 9'x8' RCB INV=276.99  
 36" FL IN=278.45

Match Line 5+00



**STORM DRAIN LINE SD-B**  
 30" & 36" RCP (ASTM C76)  
 SEE DETAIL SHEET FOR EMBEDMENT

FILENAME: 1533-000-Storm\_Drain\_P&P.dwg  
 PLOTTED: 27 Jul 2016 - 5:03 pm

**MITCHELL MORGAN**  
 T.979.260.6963  
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 FIRM# F-1443  
 3204 EARL RUDDER FWY S.  
 COLLEGE STATION, TX 77845

PLAN & DESIGN SPECIALISTS IN  
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 SITE PLANS • SUBDIVISIONS

www.mitchellandmorgan.com

STATE OF TEXAS  
 JOEL J. MITCHELL  
 80649  
 REGISTERED PROFESSIONAL ENGINEER

Job 2016  
 Designed By: JM  
 Drawn By: JM

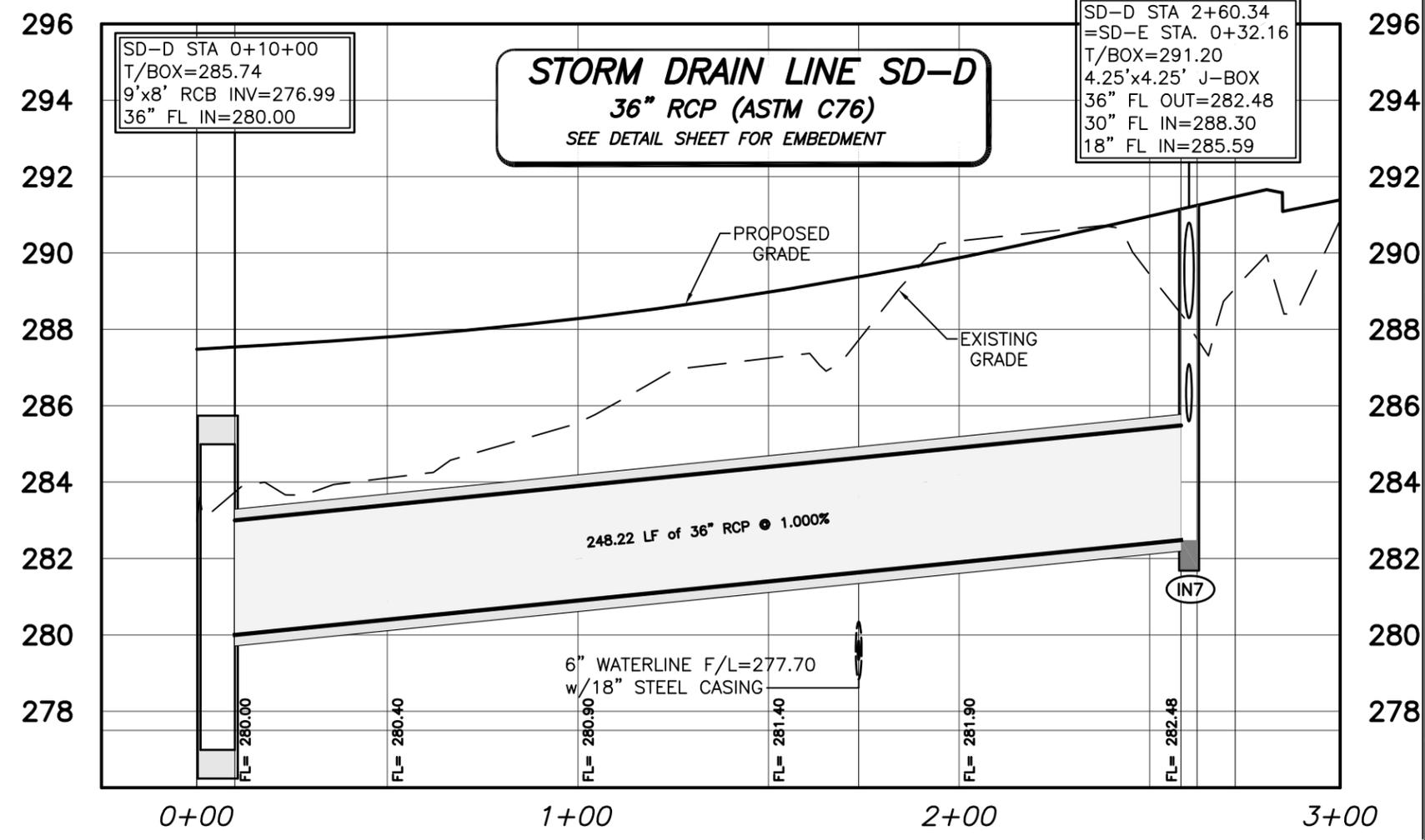
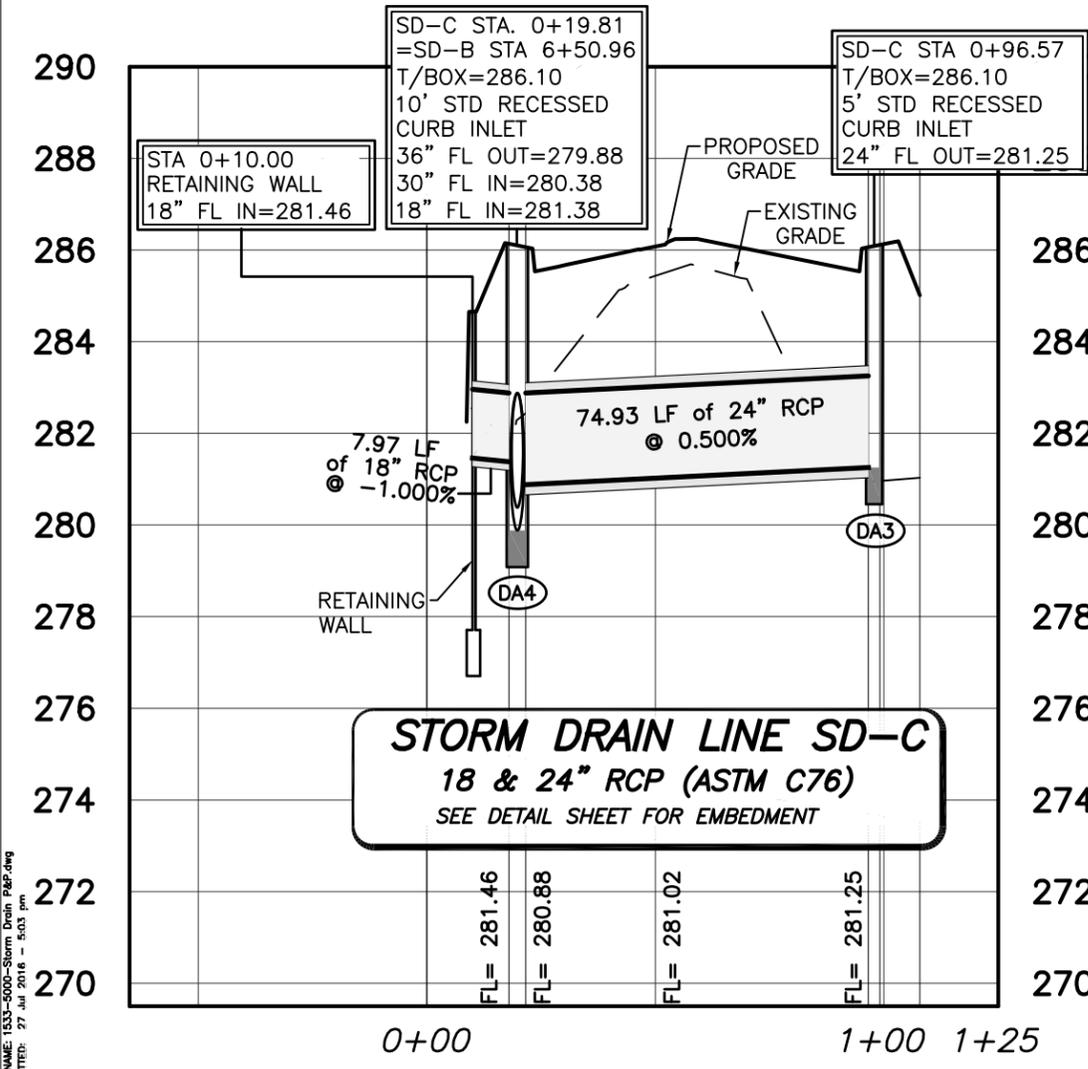
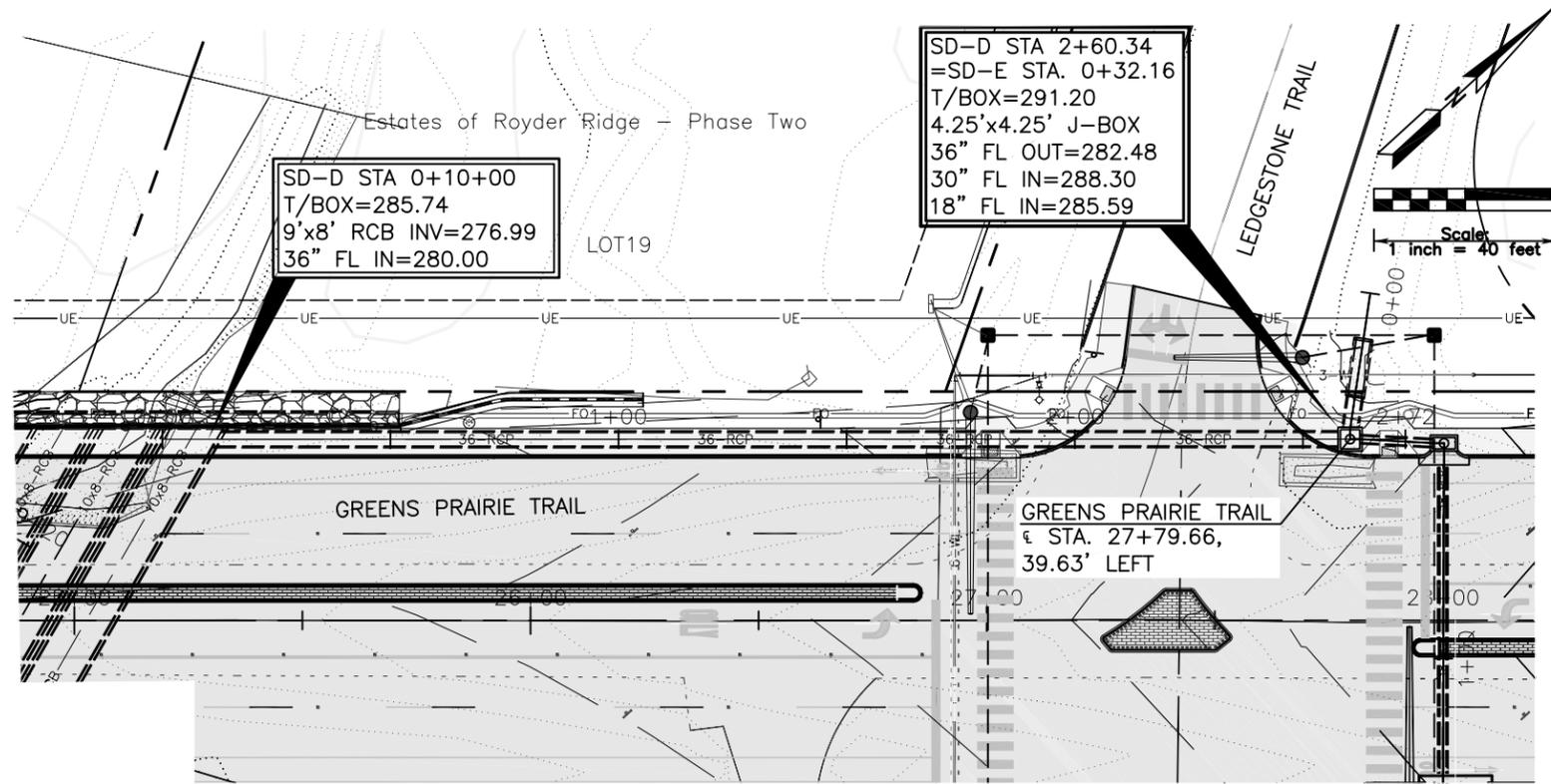
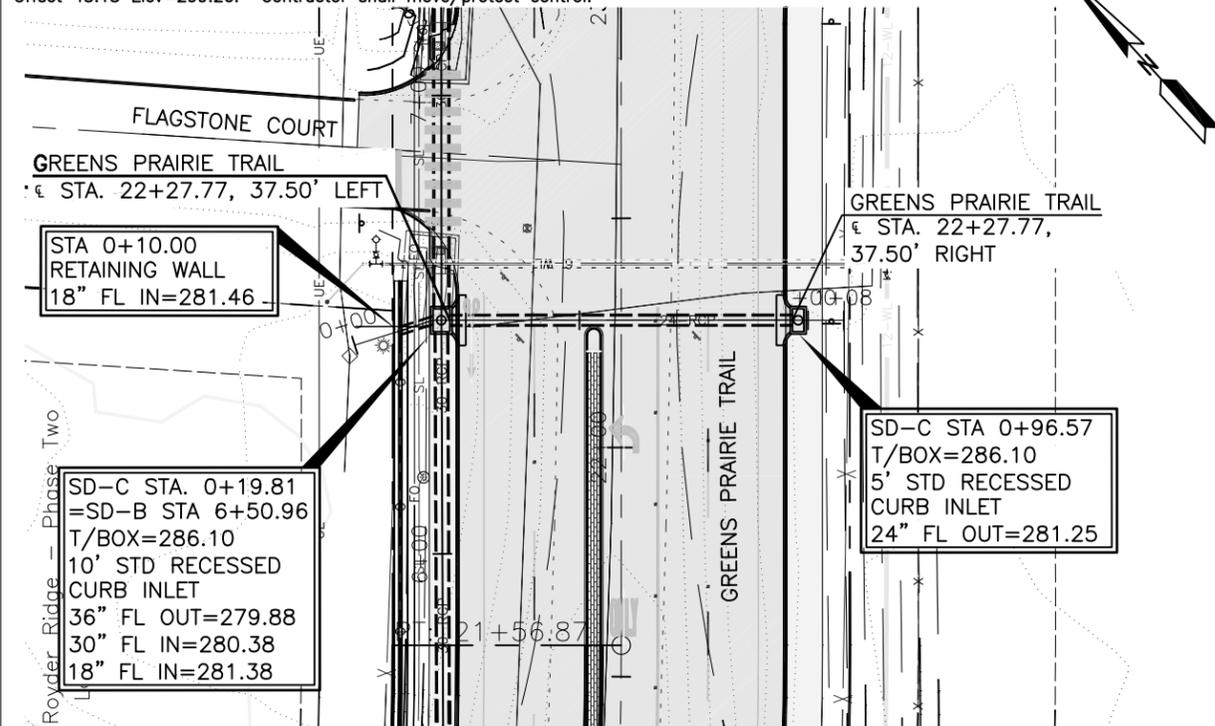
Prepared For:  
 City of College Station  
 Public Works Department  
 310 Krenek Tap Rd  
 College Station, TX  
 77840

Revisions

**STORM DRAIN B-P&P**  
**GREENS PRAIRIE TRAIL**  
**ROADWAY CAPACITY IMPROVEMENTS**

62  
 Of 190 Sheets

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STATE OF TEXAS  
 JOEL J. MITCHELL  
 80649  
 REGISTERED PROFESSIONAL ENGINEER  
 Job No. 2016-001  
 Drawn By: JM

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 310 Krenek Tap Rd  
 College Station, TX  
 77840

Revisions

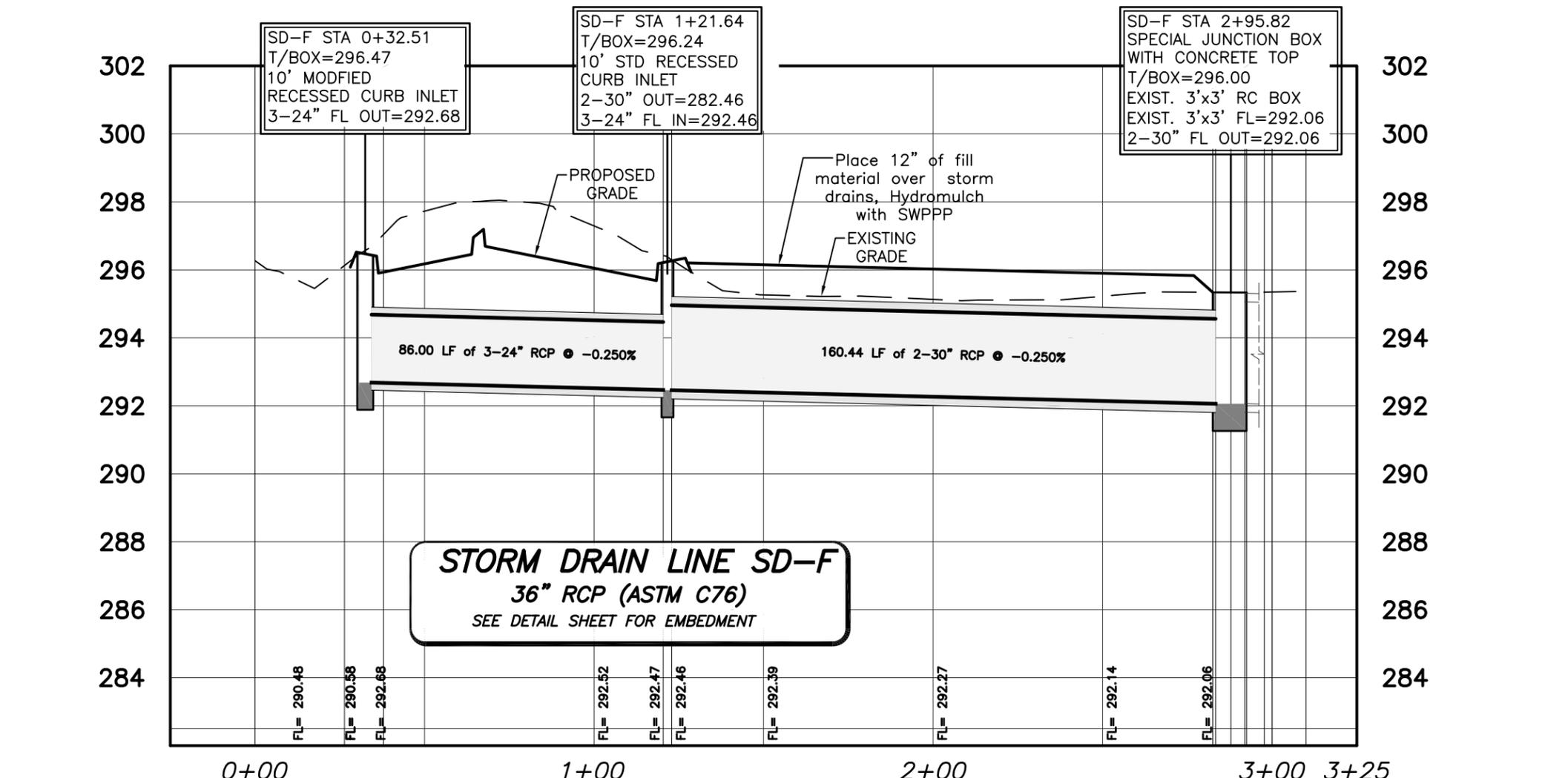
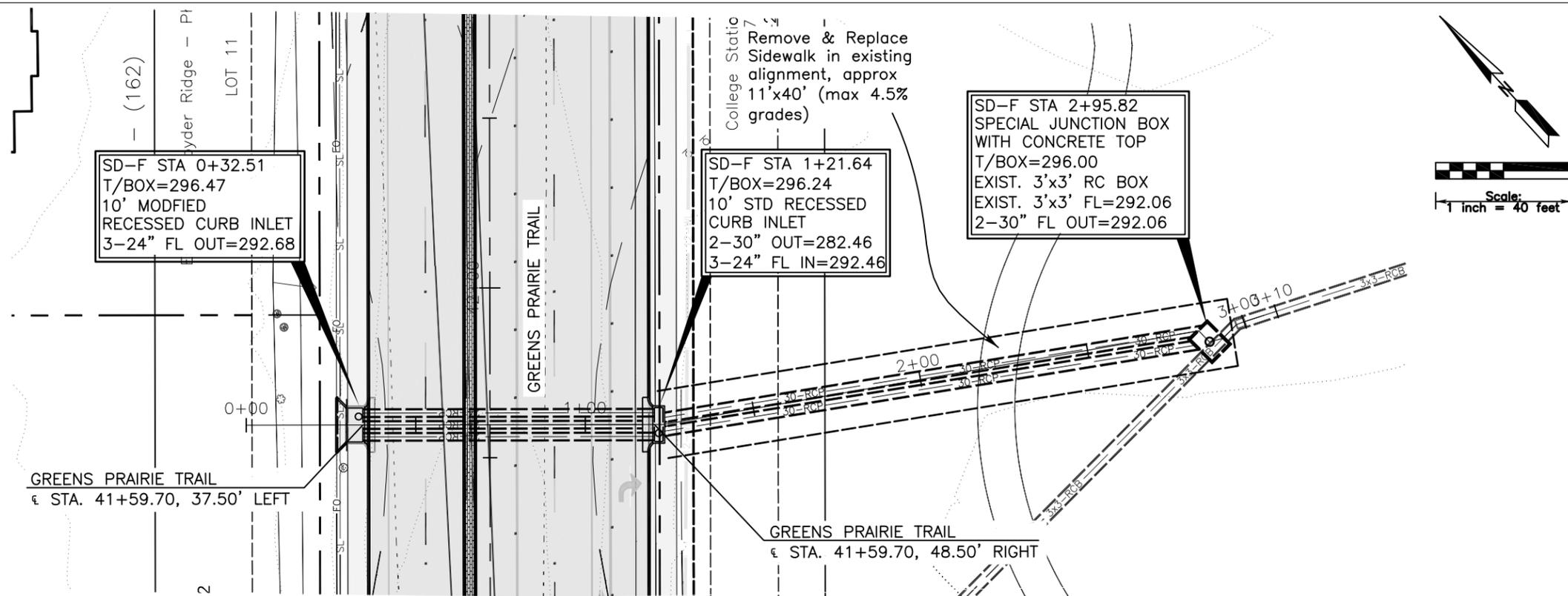
**STORM DRAIN C & D-P&P**  
**GREENS PRAIRIE TRAIL**  
**ROADWAY CAPACITY IMPROVEMENTS**

63  
 Of 190 Sheets

FILENAME: 1533-0000-Storm Drain P&P.dwg  
 PLOTTER: 27 Jul 2016 - 5:03 pm



PROJECT BENCHMARK: SURVEY CONTROL POINT #533  
 1/2" IRON ROD W/ CAP Located along north side of Right of way  
 between Ledgestone Trail and Royder Road at Station 31+19.12 and  
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.



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STATE OF TEXAS  
 JOEL J. MITCHELL  
 80649  
 REGISTERED PROFESSIONAL ENGINEER

Job No. 2016-01  
 Designed By: JM  
 Drawn By: JM

Prepared For:  
 City of College Station  
 Public Works Department  
 310 Krenek Tap Rd  
 College Station, TX  
 77840

Revisions

**STORM DRAIN F-P&P  
 GREENS PRAIRIE TRAIL  
 ROADWAY CAPACITY IMPROVEMENTS**

65  
 Of 190 Sheets

FILENAME: 1533-5000-Storm Drain F&P.dwg  
 PLOTTED: 27 Jul 2016 - 5:03 pm

PROJECT BENCHMARK: SURVEY CONTROL POINT #533  
 1/2" IRON ROD W/ CAP Located along north side of Right of way  
 between Ledgestone Trail and Royder Road at Station 31+19.12 and  
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.

MITCHELL  
 M&M  
 MORGAN

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Job No. 2016-01  
 Designed By: JM  
 Drawn By: JM

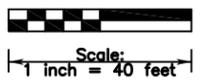
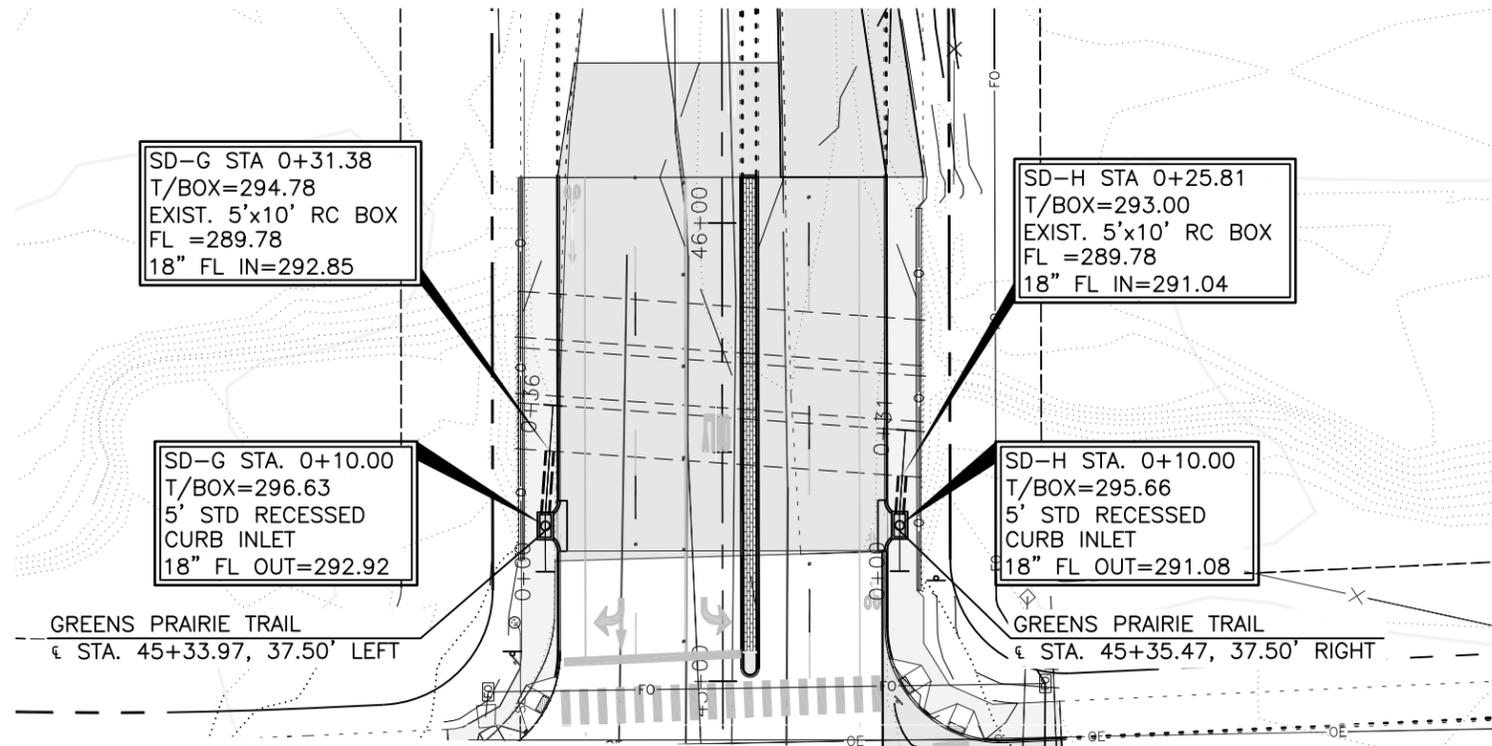
Prepared For:  
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STORM DRAIN G&H-P&P  
 GREENS PRAIRIE TRAIL  
 ROADWAY CAPACITY IMPROVEMENTS

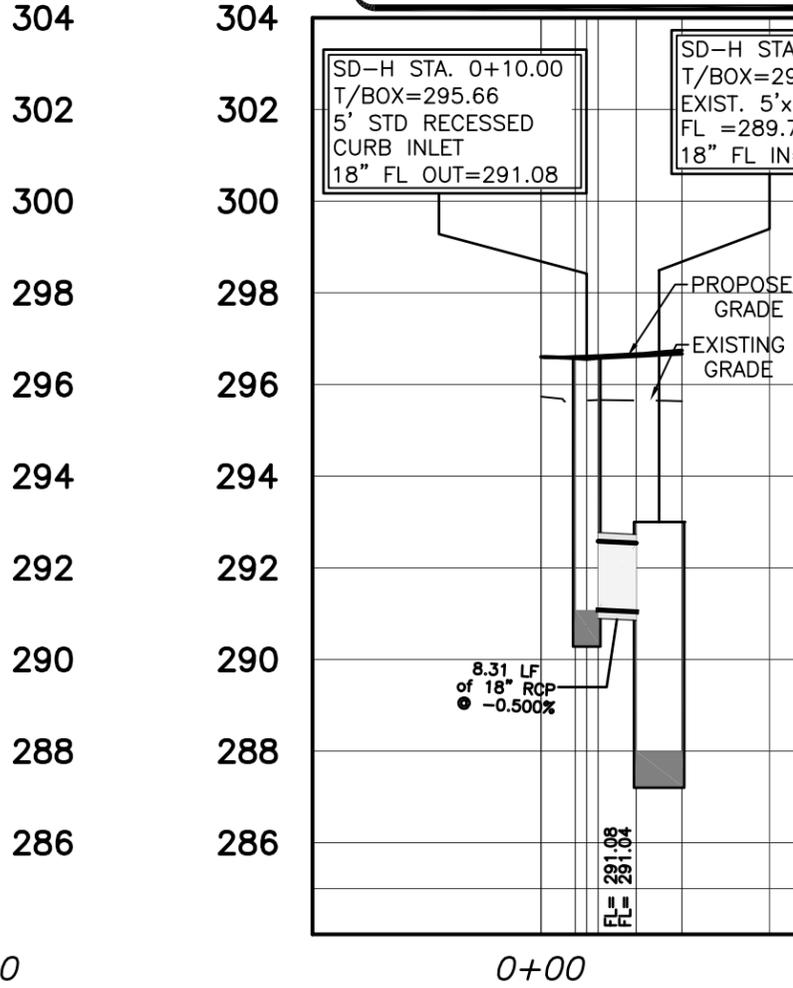
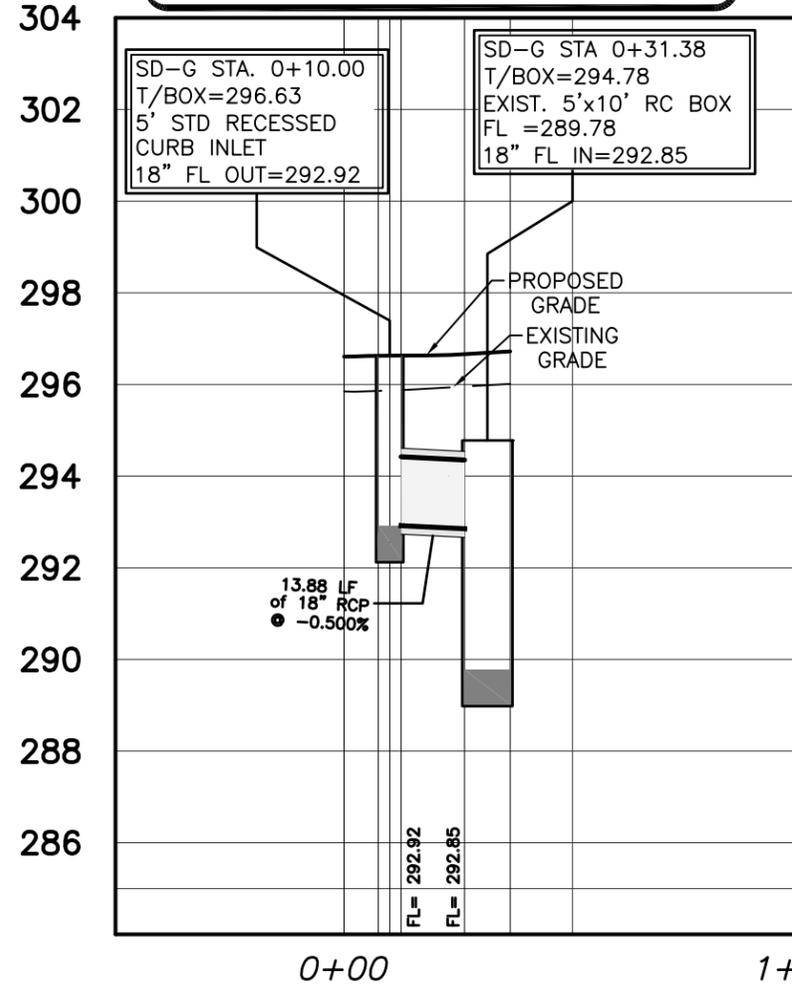
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Of 190 Sheets



**STORM DRAIN LINE SD-G**  
 18" RCP (ASTM C76)  
 SEE DETAIL SHEET FOR EMBEDMENT

**STORM DRAIN LINE SD-H**  
 18" RCP (ASTM C76)  
 SEE DETAIL SHEET FOR EMBEDMENT



FILENAME: 1533-5000-Storm Drain P&P.dwg  
 PLOTTED: 27 Jul 2016 - 5:03 pm

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 Offset 45.13 Elev=299.26. Contractor shall move/protect control.

**Culvert Construction Notes:**  
 The plans and details for the construction of this culvert utilized the TxDOT "Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges" dated November 1, 2014. The pay items for this culvert shall be per the B/CS United Drainage Specifications 2012. The contractor shall include the costs of the various sub-items from the TxDOT Specifications in the cost of the more general pay items from the B/CS specifications. No change orders will be considered based on TxDOT pay items.

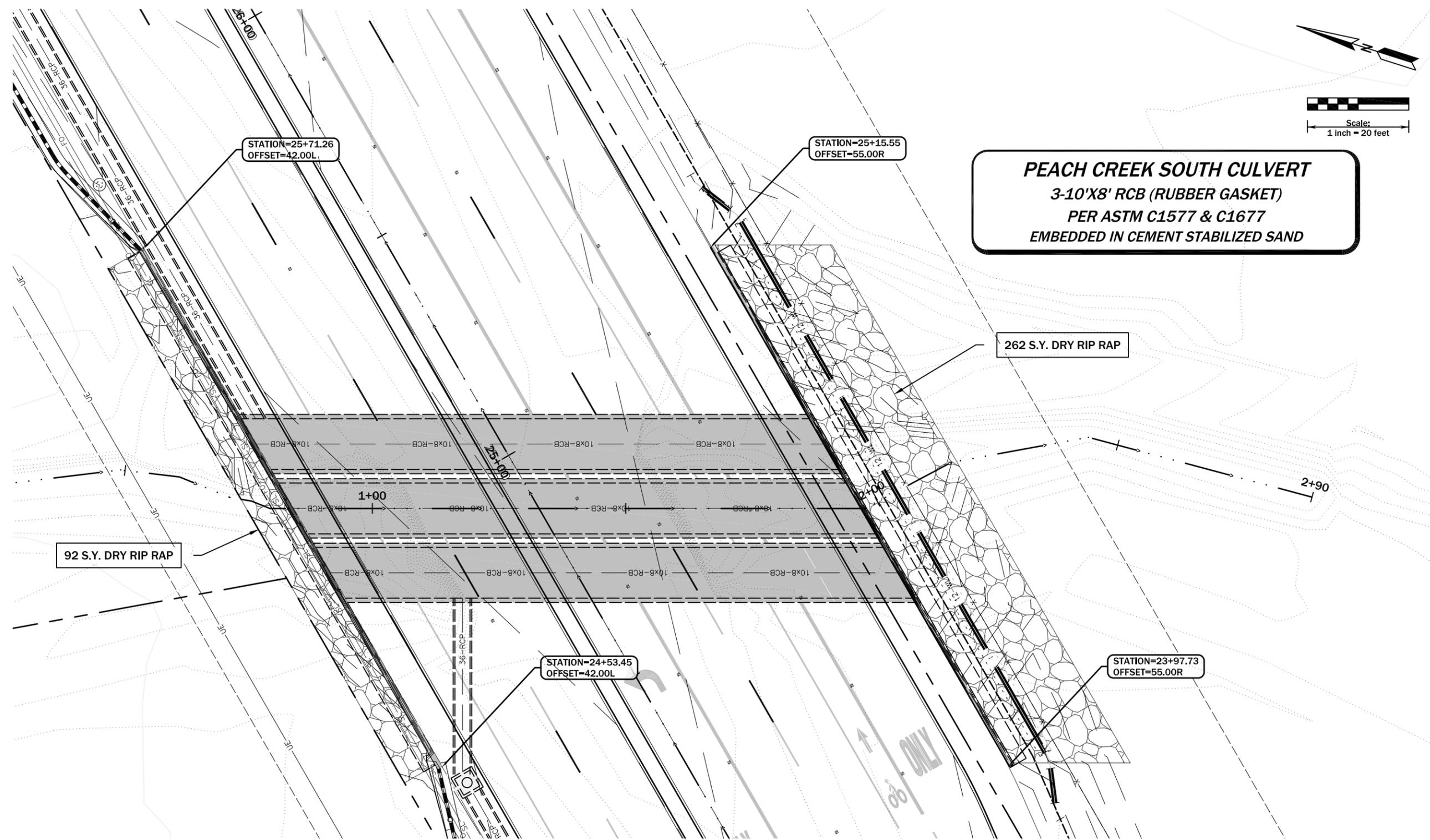
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 Job No. 15  
 Drawn By: JM

Prepared For:  
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 77840



Revisions

**PEACH CULVERT PLAN**  
**GREENS PRAIRIE TRAIL**  
**ROADWAY CAPACITY IMPROVEMENTS**

FILENAME: 1533-5100-Peach Creek Culvert P&P.dwg  
 PLOTTED: 28 JUN 2016 - 11:15 am



PROJECT BENCHMARK: SURVEY CONTROL POINT #533  
 1/2" IRON ROD W/ CAP Located along north side of Right of way  
 between Ledgestone Trail and Royder Road at Station 31+19.12 and  
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.



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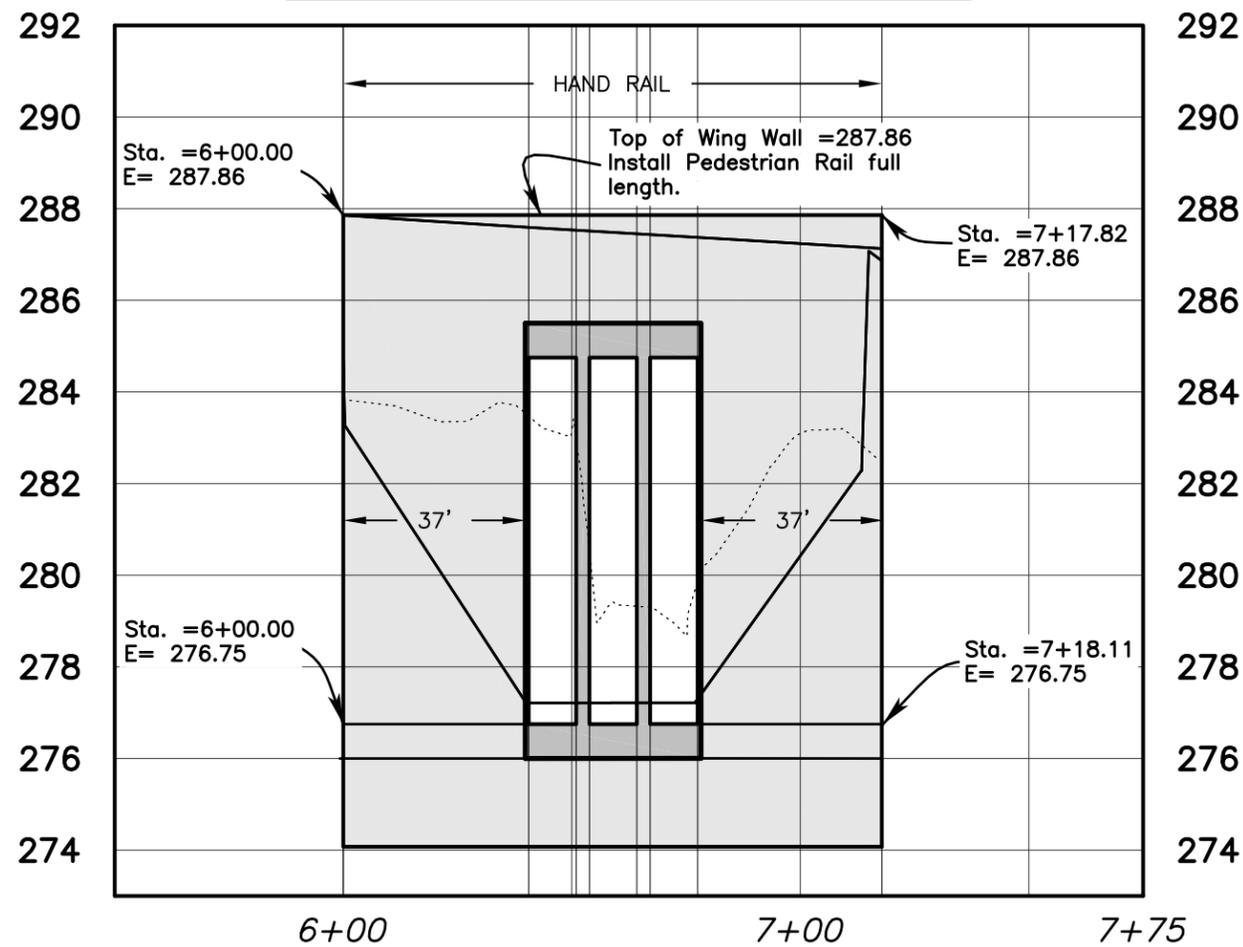
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Job No. 16  
 Designed By: JM  
 Drawn By: JM

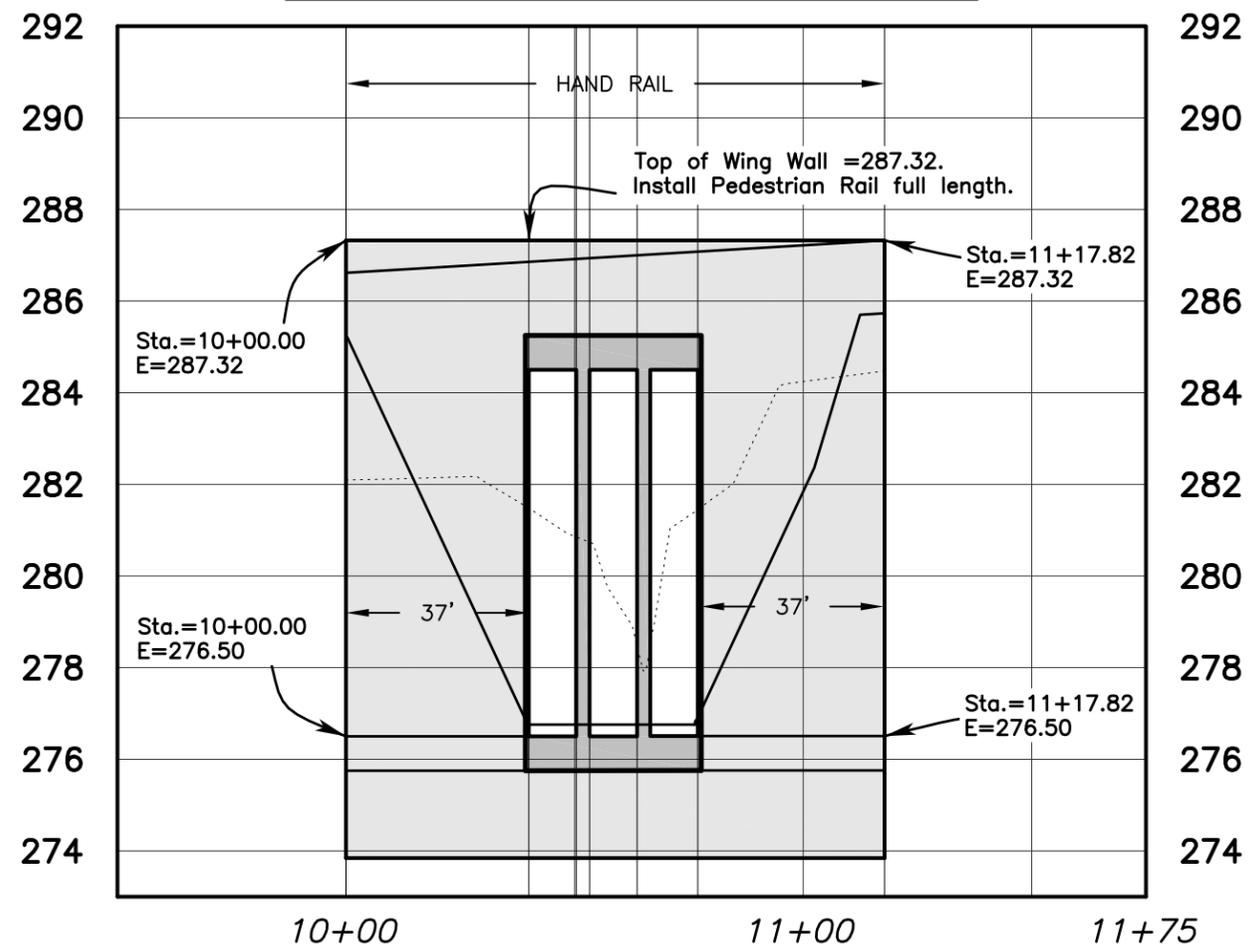
Prepared For:  
 City of College Station  
 Public Works Department  
 310 Krenek Tap Rd  
 College Station, TX  
 77840

Revisions

### North Wing Wall Profile



### South Wing Wall Profile



Dimension Table		
	North	South
Hw	11.11	10.82
Lw	37	37
LTW	42.72	42.72
N	3	3
SL:1:	4	4
∅	30°	30°

NOTE:  
 Use "Concrete Wing Walls with Parallel Wing Walls for Box Culverts Type PW-1 and PW-2" standards (TXDOT STD PW) for all details

FILENAME: 1533-5100-Peach Creek Culvert P&P.dwg  
 PLOTTED: 27 Jul 2016 - 5:15 pm

**PEACH CULVERT HEADWALLS**  
**GREENS PRAIRIE TRAIL**  
**ROADWAY CAPACITY IMPROVEMENTS**



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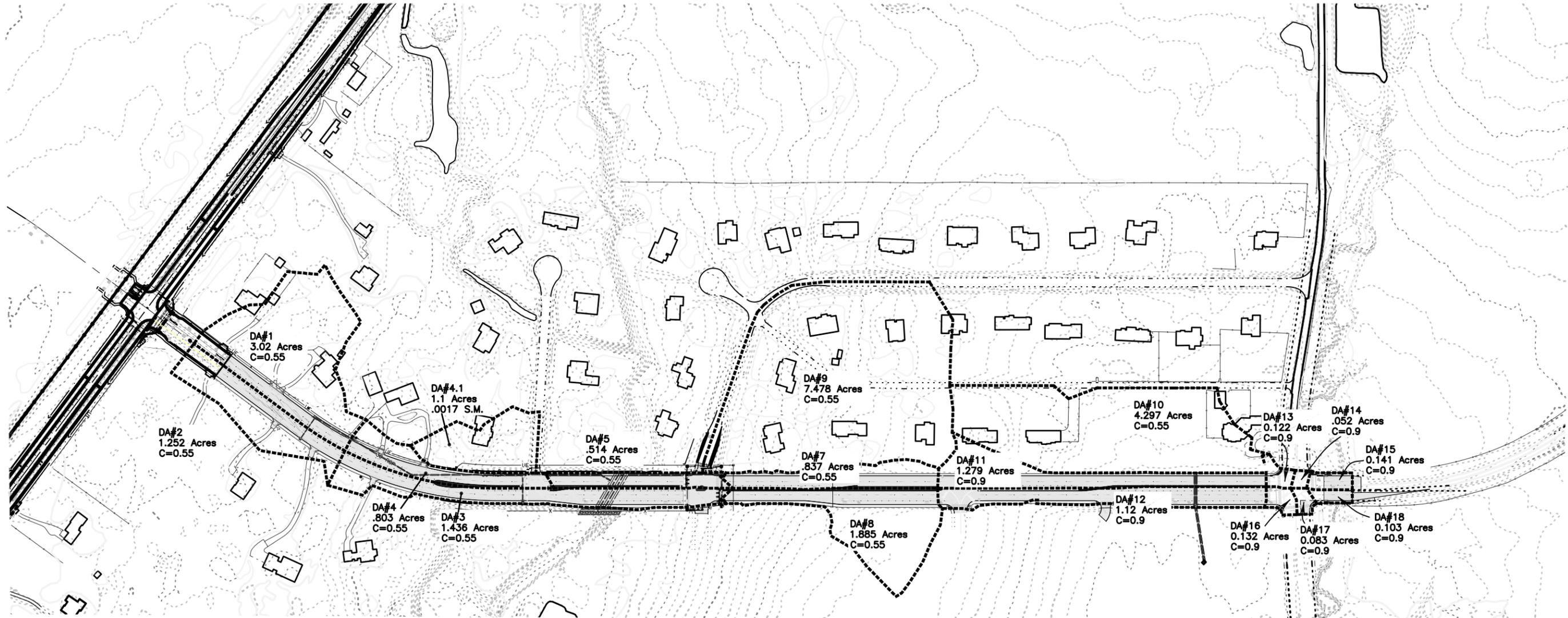
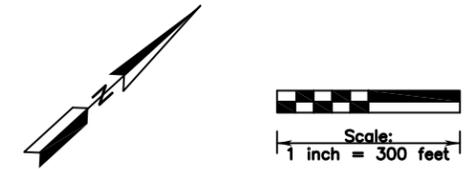


EXHIBIT 4  
 Rational Formula Drainage Area Calculations  
 Greens Prairie Trail

DRAINAGE AREA NO.	TOTAL AREA AC.	GRASSLAND			MIXED PAVEMENT			TOTAL CA	OVERLAND FLOW LENGTH ft.	OVERLAND FLOW FALL ft.	GUTTER FLOW LENGTH ft.	GUTTER FLOW FALL ft.	VELOCITY ft/s	Calc. Tc		USE Tc		I <sub>2</sub>	Q <sub>2</sub>	I <sub>6</sub>	Q <sub>6</sub>	I <sub>10</sub>	Q <sub>10</sub>	I <sub>25</sub>	Q <sub>25</sub>	I <sub>50</sub>	Q <sub>50</sub>	I <sub>100</sub>	Q <sub>100</sub>
		0.45	0.55	0.9	min	min	min							min															
DA1	3.02	0.00	3.02	0.00	1.66	20.0	0.2	3000.0	3.0	1.8	3.0	10.0	6.33	10.5	7.7	12.8	8.6	14.3	9.9	16.4	11.1	18.5	12.5	20.8					
DA2	1.25	0.00	1.25	0.00	0.89	3000.0	4.0	500.0	0.5	0.9	6.5	10.0	6.33	4.4	7.7	5.3	8.6	5.9	9.9	6.8	11.1	7.7	12.5	8.6					
DA3	1.44	0.00	0.00	1.44	1.29	3000.0	4.0	3000.0	3.0	1.2	8.7	10.0	6.33	8.2	7.7	9.9	8.6	11.2	9.9	12.7	11.1	14.4	12.5	16.2					
DA4	0.80	0.00	0.80	0.00	0.44	3000.0	4.0	500.0	0.5	0.9	6.5	10.0	6.33	2.8	7.7	3.4	8.6	3.8	9.9	4.4	11.1	4.9	12.5	5.5					
DA4.1	1.10	0.00	1.10	0.00	0.61	3000.0	4.0	500.0	0.5	0.9	6.5	10.0	6.33	3.8	7.7	4.7	8.6	5.2	9.9	6.0	11.1	6.7	12.5	7.6					
DA5	0.51	0.00	0.00	0.51	0.46	3000.0	4.0	500.0	0.5	0.9	6.5	10.0	6.33	2.9	7.7	3.6	8.6	4.0	9.9	4.6	11.1	5.2	12.5	5.8					
DA7	0.84	0.00	0.84	0.00	0.46	3000.0	4.0	500.0	0.5	0.9	6.5	10.0	6.33	2.9	7.7	3.5	8.6	4.0	9.9	4.5	11.1	5.1	12.5	5.8					
DA8	1.89	0.00	1.89	0.00	1.04	3000.0	4.0	500.0	0.5	0.9	6.5	10.0	6.33	6.6	7.7	8.0	8.6	9.0	9.9	10.2	11.1	11.6	12.5	13.0					
DA9	7.48	0.00	7.48	0.00	4.11	3000.0	5.0	7450.0	10.0	1.6	10.9	10.9	6.08	25.0	7.4	30.5	8.3	34.3	9.5	39.1	10.8	44.3	12.1	49.8					
DA10	4.30	0.00	4.30	0.00	2.36	3000.0	4.0	3000.0	3.0	1.2	8.7	10.0	6.33	15.0	7.7	18.2	8.6	20.4	9.9	23.3	11.1	26.3	12.5	29.6					
DA11	1.28	0.00	0.00	1.28	1.15	3000.0	4.0	1000.0	1.0	1.0	7.0	10.0	6.33	7.3	7.7	8.9	8.6	9.9	9.9	11.4	11.1	12.8	12.5	14.4					
DA12	1.12	0.00	0.00	1.12	1.01	3000.0	4.0	1000.0	1.0	1.0	7.0	10.0	6.33	6.4	7.7	7.8	8.6	8.7	9.9	9.9	11.1	11.2	12.5	12.6					
DA13	0.12	0.00	0.02	0.10	0.10	1.0	1.0	1.0	1.0	1.0	10.4	0.0	6.33	0.6	7.7	0.8	8.6	0.9	9.9	1.0	11.1	1.1	12.5	1.3					
DA14	0.05	0.00	0.00	0.05	0.05	1.0	1.0	1.0	1.0	1.0	10.4	0.0	6.33	0.3	7.7	0.4	8.6	0.4	9.9	0.5	11.1	0.5	12.5	0.6					
DA15	0.14	0.00	0.00	0.14	0.13	1.0	1.0	1.0	1.0	1.0	10.4	0.0	6.33	0.8	7.7	1.0	8.6	1.1	9.9	1.3	11.1	1.4	12.5	1.6					
DA16	0.13	0.00	0.00	0.13	0.12	1.0	1.0	1.0	1.0	1.0	10.4	0.0	6.33	0.8	7.7	0.9	8.6	1.0	9.9	1.2	11.1	1.3	12.5	1.5					
DA17	0.08	0.00	0.00	0.08	0.07	1.0	1.0	1.0	1.0	1.0	10.4	0.0	6.33	0.5	7.7	0.6	8.6	0.6	9.9	0.7	11.1	0.8	12.5	0.9					
DA18	0.10	0.00	0.00	0.10	0.09	1.0	1.0	1.0	1.0	1.0	10.4	0.0	6.33	0.6	7.7	0.7	8.6	0.8	9.9	0.9	11.1	1.0	12.5	1.2					

EXHIBIT 5  
 PIPE SIZE CALCULATIONS  
 Greens Prairie Trail

INLET NO.	TO INLET	TOTAL CA	Tc	Design Storm	Unadjusted Design Flow	Adjusted Design Flow*	No. of Pipes	Flow Per Pipe	Friction Slope**	SIZE	VEL.	LENGTH	Travel Time	Tc @ End	Design Slope	Design Pipe Size
#	#	Ac.	min	yr	cfs	cfs	%	"	fps	'	min	min	%	"		
DA1	DA4	2.3	10.3	10	20.0	20.0	1	20.0	0.28	30	4.1	250	1.02	11.31	0.50	30
DA2	DA1	0.7	10.0	10	5.9	7.4	1	7.4	0.58	18	4.2	74	0.29	10.29	0.60	18
DA3	DA4	1.3	10.0	10	11.2	13.9	1	13.9	2.03	18	7.9	74	0.16	10.16	0.50	24
DA4	DA5	4.7	11.3	10	38.4	38.4	1	38.4	1.01	30	7.8	60	0.13	11.44	0.50	36
DA4.1	DA4	0.6	10.0	10	5.2	6.5	1	6.5	1.18	15	5.3	5	0.02	10.02	0.50	36
DA5	CR	5.2	11.4	10	42.0	42.0	1	42.0	0.20	42	4.4	20	0.08	11.52	3.00	18
DA7	JB1	1.5	10.3	10	12.7	15.9	1	15.9	0.57	24	5.1	15	0.05	10.40	1.50	18
DA8	DA7	1.0	10.0	10	9.0	11.2	1	11.2	0.28	24	3.6	74	0.35	10.35	1.00	30
DA9	JB1	4.1	10.9	10	34.3	34.3	1	34.3	0.30	36	4.8	6	0.02	10.91	0.25	24
DA10	DA11	2.4	10.0	10	20.4	25.2	2	12.8	0.37	24	4.1	15	0.06	10.06	0.25	24
DA11	DA12	3.5	10.1	10	30.3	37.8	3	12.6	0.36	24	4.0	74	0.31	10.37	0.25	30
DA12	BOX	4.5	10.4	10	38.5	38.5	2	19.2	0.25	30	3.9	150	0.64	11.01	-	-
DA13	DITCH	0.1	10.0	10	0.9	1.1	1	1.1	0.01	18	0.6	0.00	0.00	10.00	-	-
DA14	DITCH	0.0	10.0	10	0.4	0.5	1	0.5	0.00	18	0.3	0.00	0.00	10.00	0.50	18
DA15	CULV	0.1	10.0	10	1.1	1.4	1	1.4	0.02	18	0.8	0.00	0.22	10.22	-	-
DA16	DITCH	0.1	10.0	10	1.0	1.3	1	1.3	0.02	18	0.7	0.00	0.00	10.00	-	-
DA17	DITCH	0.1	10.0	10	0.6	0.8	1	0.8	0.01	18	0.5	0.00	0.00	10.00	0.50	18
DA18	CULV	0.1	10.0	10	0.8	1.0	1	1.0	0.01	18	0.6	10	0.29	10.29	1.00	36