

HISTORIC AND DESIGN REVIEW COMMISSION

March 20, 2024

HDRC CASE NO: 2024-116
COMMON NAME: Market Street Bridge
ADDRESS: 114 MAIN PLAZA
LEGAL DESCRIPTION: NCB 101 BLK LOT 20 & N IRR 17.36 FT OF 19
ZONING: D
CITY COUNCIL DIST.: 1
DISTRICT: Main/Military Plaza Historic District
APPLICANT: Jenny De Leon/City of San Antonio - Public Works - Streets Division
Pothole Patrol
OWNER: City of San Antonio San Antonio/City of San Antonio - Public Works -
Streets Division Pothole Patrol
TYPE OF WORK: Bridge repair and modifications
APPLICATION RECEIVED: January 02, 2024
60-DAY REVIEW: NA
CASE MANAGER: Edward Hall

REQUEST:

The applicant is requesting a Certificate of Appropriateness for approval to replace the historic bridge railing found on the Market Street Bridge with a TxDOT C411 railing.

APPLICABLE CITATIONS:

2. Materials: Masonry and Stucco

A. MAINTENANCE (PRESERVATION)

- i. *Paint*— Avoid painting historically unpainted surfaces. Exceptions may be made for severely deteriorated material where other consolidation or stabilization methods are not appropriate. When painting is acceptable, utilize a water permeable paint to avoid trapping water within the masonry.
- ii. *Clear area*—Keep the area where masonry or stucco meets the ground clear of water, moisture, and vegetation.
- iii. *Vegetation*—Avoid allowing ivy or other vegetation to grow on masonry or stucco walls, as it may loosen mortar and stucco and increase trapped moisture.
- iv. *Cleaning*—Use the gentlest means possible to clean masonry and stucco when needed, as improper cleaning can damage the surface. Avoid the use of any abrasive, strong chemical, sandblasting, or high-pressure cleaning method.

B. ALTERATIONS (REHABILITATION, RESTORATION, AND RECONSTRUCTION)

- i. *Patching*—Repair masonry or stucco by patching or replacing it with in-kind materials whenever possible. Utilize similar materials that are compatible with the original in terms of composition, texture, application technique, color, and detail, when in-kind replacement is not possible. EIFS is not an appropriate patching or replacement material for stucco.
- ii. *Repointing*—The removal of old or deteriorated mortar should be done carefully by a professional to ensure that masonry units are not damaged in the process. Use mortar that matches the original in color, profile, and composition when repointing. Incompatible mortar can exceed the strength of historic masonry and results in deterioration. Ensure that the new joint matches the profile of the old joint when viewed in section. It is recommended that a test panel is prepared to ensure the mortar is the right strength and color.
- iii. *Removing paint*—Take care when removing paint from masonry as the paint may be providing a protectant layer or hiding modifications to the building. Use the gentlest means possible, such as alkaline poultice cleaners and strippers, to remove paint from masonry.
- iv. *Removing stucco*—Remove stucco from masonry surfaces where it is historically inappropriate. Prepare a test panel to ensure that underlying masonry has not been irreversibly damaged before proceeding.

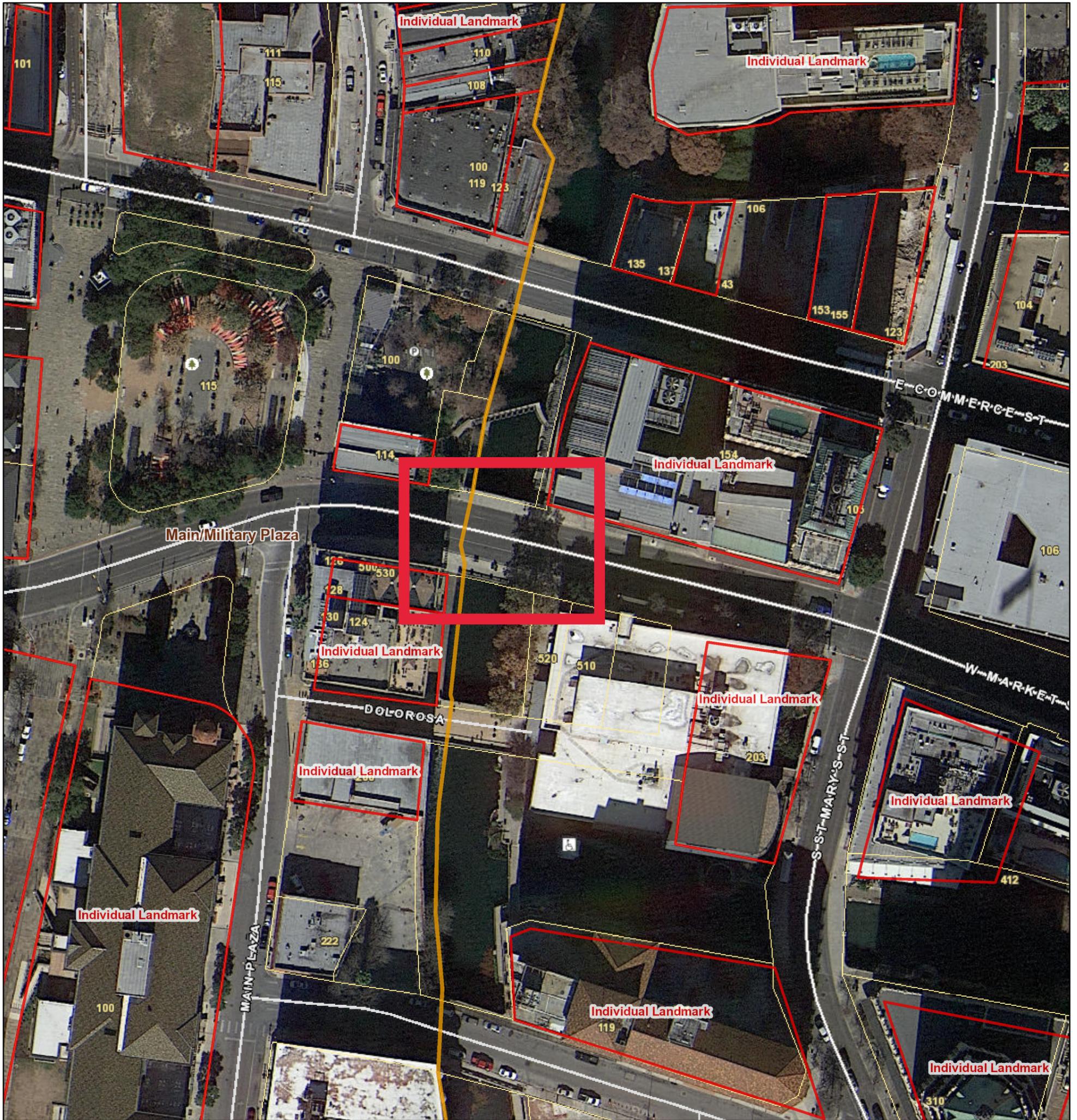
FINDINGS:

- a) **BACKGROUND** - The W Market Street Bridge at this location was constructed in 1926 following the construction of the bypass channel for the San Antonio River. It is listed in the National Register of Historic Places as part of the San Antonio Downtown and River Walk National Register District. Five other historic concrete bridges were constructed in this timeframe and are also designated. All bridges feature unique railing designs. The structure of the bridge is reinforced concrete. The railings consist of pilasters clad in cast stone with concrete spandrels featuring a repetitive arch design that is an assembly of cast stone parts. Lanterns were originally positioned centrally on each railing but have since been removed.
- b) **RAILING DAMAGE** - In recent years, a wrong way driver crashed into the bridge, destroying a section of the north railing. This section is currently missing. According to documentation, the crash also compromised the remaining portions of the north railing. The bridge also has experienced normal deterioration which includes spalling and exposure of rebar in some areas as well as loose and cracked cast stone components.
- c) **STRUCTURAL ASSESSMENT** - TxDOT standards require that vehicular bridge railings be crash rated to prevent a vehicle from breaking through the railing. The recommendation of the structural engineer for the project is to fully replace both the north and south railing with a railing design that is crash tested.
- d) **RAILING REPLACEMENT** – An existing TxDOT rail design (C411) is specified as a replacement rail for this project because it features a similar arched spandrel design as the Market Street Bridge. The design has been modified to more closely mimic the pillar placement and spacing that is present in the current, historic railing. The Historic Design Guidelines state that when original masonry elements cannot be retained, replacement materials should match in design, color, texture, and other visual qualities where possible. Staff is concerned that the modern-day railing design is not a compatible match for the historic, cast-stone design.
- e) **ALTERNATIVES** – The TxDOT railings manual acknowledges that historic bridges present unique and special circumstances. Historic railings are likely not able to meet modern-day vehicular crash ratings. Replacement railings should replicate historic designs to the fullest extent possible. In-board solutions, such as a guardrail or bollard, are also identified as an option to preserve historic railings in place. Staff finds that solutions that minimize the extent of wholesale replacement, such as preserving the south railing in place, should be fully explored and prioritized. Because the project is locally funded, the ultimate solution for the railing is not subject to review and approval by TxDOT.

RECOMMENDATION:

The recommendation for this item is pending a DRC site visit and availability of a mockup.

Print Map

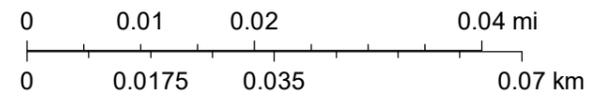


March 15, 2024

1:1,000

Historic Districts

Historic Landmarks





VIEW - SAN ANTONIO RIVER









LA MEXICANA
MEXICAN RESTAURANT

NO PARKING
EXCEPT IN THIS
BLOCK



IN PLAZA
0.225.3188
templereapt.com

West here
BRISCOE

MARKET ST.

Vibrant & THRIVING
SAN ANTONIO
More Things Come Big About





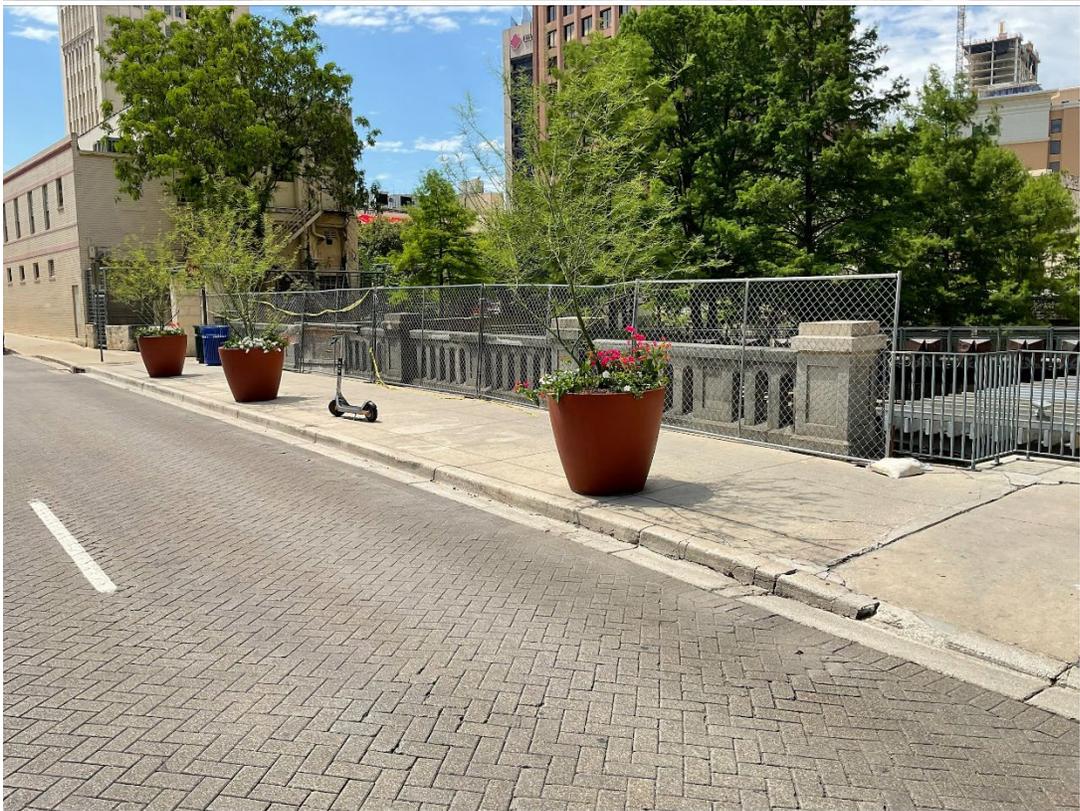


MARKET ST.

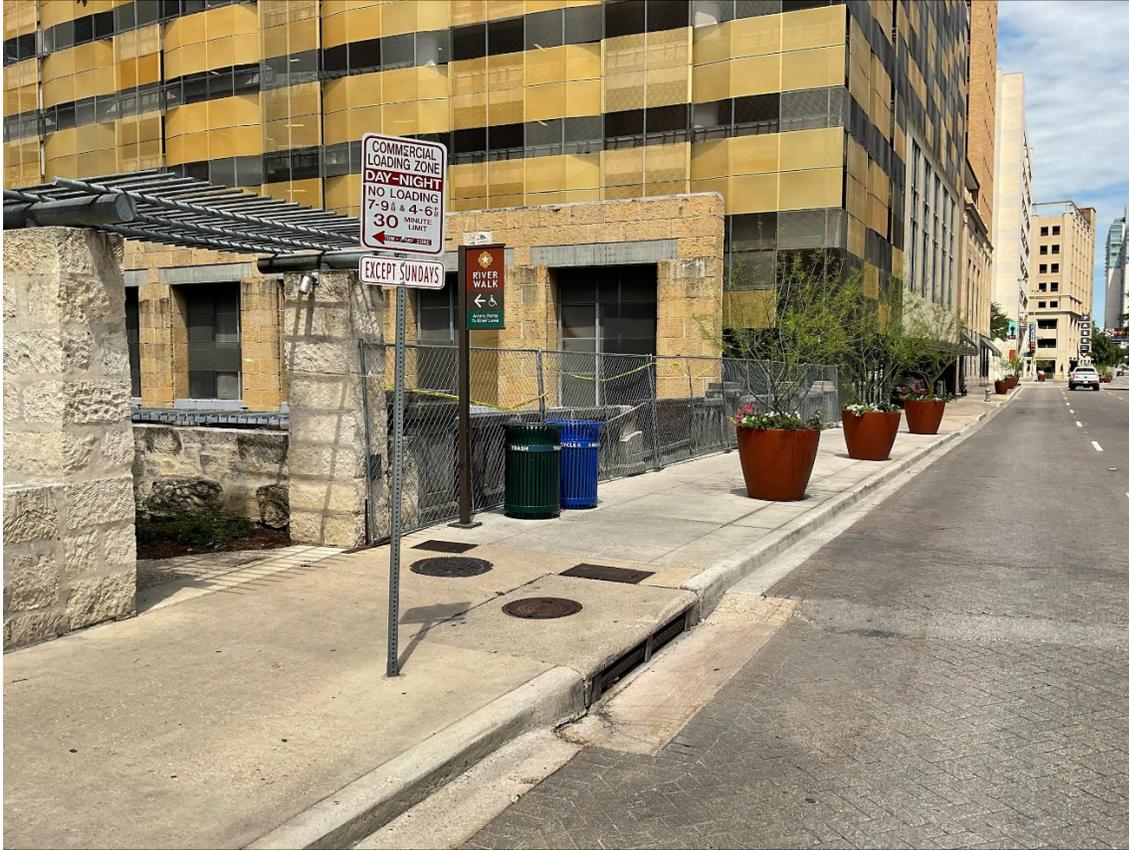




W MARKET BRIDGE DAMAGES



W MARKET BRIDGE DAMAGES



November 8, 2023

Christopher G. Alonso, P.E.
Senior Engineer
Public Works Department
P.O. Box 839966
San Antonio, TX 78205

PROJ: Market Street over San Antonio River Bridge Rail Replacement
RE: **Traffic Rail Replacement**

Dear Mr. Alonso,

SEA conducted a Bridge Condition Survey for the referenced project in April of 2021. The structure's current bridge rail is not crash tested and has a large section, approximately 4 foot in length, missing due to a vehicle impact. From a safety standpoint, traffic rail for this site serves to redirect errant vehicle traffic and provide drop off protection for pedestrians crossing the bridge. The bridge rail also protects pedestrians using the San Antonio Riverwalk below.

Results of the Bridge Condition Survey determined that the current bridge rail is not a TxDOT rail, is not crash tested, contains numerous deficiencies including spalled, deteriorating concrete along with the large 4 foot missing section. This missing section evidences the current traffic rail's poor performance under vehicular impact. From a safety standpoint for vehicle and pedestrian users, SEA's recommendation was and continues to be full replacement for the bridge rail at this site. Prior precedent has followed TxDOT and AASHTO LRFD Bridge Design Code for COSA projects. AASHTO LRFD Code requires new rail construction to be a crash tested rail for public bridge structures used by vehicle traffic and pedestrians. The TxDOT C411 Rail detailed in the construction plans prepared for this bridge is a combination pedestrian and vehicular traffic rail. This proposed rail is crash test rated for the speeds typically seen in this area and satisfies all pedestrian height and maximum opening code requirements. C411 is intended to be an aesthetically pleasing traffic rail and is visually similar to the rail being replaced.

Please reply with any questions.

Sincere Regards,

Farren S. Basse, P.E. | Senior Project Manager



Texas Registered Engineering Firm F-199
3838 NW Loop 410, San Antonio, TX 78229
P: (210)735-9202
E: fbasse@seatx.com



CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

Market Street Bridge over San Antonio River Bridge Condition Survey



STRUCTURAL ENGINEERING
ASSOCIATES, INC.

CONSULTING ENGINEERS

BRIDGE CONDITION SURVEY

City:	San Antonio	Condition Survey By:	Ernest Meche, P.E.
County:	Bexar		John Williamson, EIT
Highway:	Market St.		
Crossing:	San Antonio River	Survey Date:	March 23, 2021
Year Built:	1927	Weather:	Sunny
Design Loading:	Load Posted	Structure No:	15-015-B218-80-004



Overall View of the Market St. Bridge

Structure Description:

Record plans for this bridge were not provided. According to TxDOT's Bridge Inspection Reports provided, the bridge is composed of two span continuous concrete T-beams with an overall length of 72'. Each span is 36' long. The bridge has no skew and is located along Market St over the San Antonio River in San Antonio, Texas. The deck has a width of 45' and carries one-way traffic. The bridge deck has sidewalks at each edge with planters located on the sidewalks. A pedestrian path is suspended from the beams below the bridge. The substructure is comprised of a concrete wall supported on unknown foundations.

The purpose of this condition survey is to assess the current structural condition of the bridge in order to evaluate the structure's rehabilitation needs and adequacy to receive new bridge railing.



Aerial view of the Market St Bridge over San Antonio River

Survey Observations for Market St Bridge over San Antonio River:

General:

Access to the bridge was limited to ground observation. A visual survey was performed, with no special equipment or apparatus utilized. Not all bridge elements were visible. All observations and opinions in this report are limited to the bridge elements that were visually observed at the time of the condition survey. Latent defects of bridge elements may exist. Each bridge element will be rated using the following rating scale.

Bridge Condition Rating Scale:

- 0 = Failed condition – bridge closed but beyond repair
- 1 = Failing condition – bridge closed but repairable
- 2 = Critical condition – bridge should be closed until repaired
- 3 = Serious condition – deterioration seriously affects structural capacity
- 4 = Poor condition – deterioration significantly affects structural capacity
- 5 = Fair condition – minor deterioration of structural elements (extensive)
- 6 = Satisfactory condition – minor deterioration of structural elements (limited)
- 7 = Good condition – some minor problems
- 8 = Very good condition
- 9 = Excellent condition
- N = Not applicable

East Abutment Riprap - Rating = N.

East Abutment - Rating = 7: The abutment wall has minor cracks (Figure 1). Patchwork around utility pipes passing through abutment wall (Figure 2).

Interior Bent - Rating = 6: Moderate spalling with exposed reinforcing found at many locations on east face of wall (Figure 3). Some cracking and spalling was observed on the west face of wall but exposed reinforcing was not observed.

West Abutment Riprap - Rating = N.

West Abutment - Rating = 7: There is not a sidewalk along the west abutment wall so visual observation was limited. No obvious deficiencies were observed.

Beams - Rating = 6: The northernmost beam has moderate spalling with exposed reinforcing mostly near the bent wall (Figure 4) and one location near the east end of the beam (Figure 5). The southernmost beam has multiple locations of moderate spalls with exposed reinforcing and delamination (Figures 6 & 7). The second most southern beam has multiple locations of moderate spalls with exposed reinforcing (Figure 8). Other interior beams have some minor spalling (Figure 9).

Deck - Rating = 6: The bridge riding surface consists of pavers and is in good condition. Major spall with exposed reinforcing on northeast overhang (Figure 10). Multiple locations of minor spalls along the southern overhang (Figures 11 & 12). Major spall with exposed reinforcing in bottom of deck between southernmost beams 1 and 2 (Figure 13). Major spall with exposed reinforcing in bottom of deck between northernmost beams 2 and 3 (Figure 14). Major spall with exposed reinforcing in bottom of deck between northernmost beams 1 and 2 (Figure 15).

Sidewalks - Rating = 7: Minor cracks and spalling (Figure 16 & 17).

Rails - Rating = 3: Major damage from vehicular crash (Figure 18).

Joints - Rating = 7: All joints are covered with pavers. Differential settlement is evident at both abutments with minor rutting (Figure 19).

Roadway Approaches - Rating = 7: Approaches are covered with pavers. Differential settlement is evident at both abutments with minor rutting (Figure 20).

Signs, utilities, and illumination: A weight limit sign is placed just before the bridge showing a posted load of 24,000 pounds (Figure 21). Speed limit for the roadway is 30 MPH. Multiple utilities and a pedestrian path are suspended from the bridge deck and beams (Figure 22). There is no illumination on the structure.

Recommendations: The structure is acceptable for rail replacement. The following rehabilitation is recommended. The repairs should be implemented in accordance with the referenced item number from the latest TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges along with TxDOT's Concrete Repair Manual:

- Replace bridge railing per construction plans which will be submitted later.
- Repair unsound, delaminated, or spalled concrete in interior bent wall, beams, and deck per Item 429, "Concrete Structure Repair".
- Repair all spalls and delaminated concrete greater than 12 square inch in area and 1" in depth found throughout all structure members in accordance with Item 429, "Concrete Structure Repair".
- Repair cracks greater than 1/16" in concrete members per Item 780, "Concrete Crack Repair".
- Repair damaged beams including delamination, surface spalling, section loss and cracking in exterior beams and the second most southern beam per Item 788, "Concrete Beam Repair".

PHOTO DOCUMENTATION:



Figure 1: Minor cracking in east abutment wall



Figure 2: Patchwork around utility pipe in east abutment wall



Figure 3: Moderate spalling with exposed reinforcing at east face of interior bent



Figure 4: Typical moderate spalling with exposed reinforcing at exterior north beam



Figure 5: Typical moderate spalling with exposed reinforcing at exterior north beam



Figure 6: Typical moderate spalling with exposed reinforcing at exterior south beam



Figure 7: Moderate spalling & delamination with exposed reinforcing at exterior south beam



Figure 8: Moderate spalling with exposed reinforcing at second most southern beam



Figure 9: Typical minor spalling at other interior beams



Figure 10: Major spalling with exposed reinforcing on NE overhang



Figure 11: Typical minor spalling along southern overhang



Figure 12: Typical minor spalling along southern overhang



Figure 13: Major spalling with exposed reinforcing in deck between southernmost beams 1 & 2



Figure 14: Major spalling with exposed reinforcing in deck between northernmost beams 2 & 3

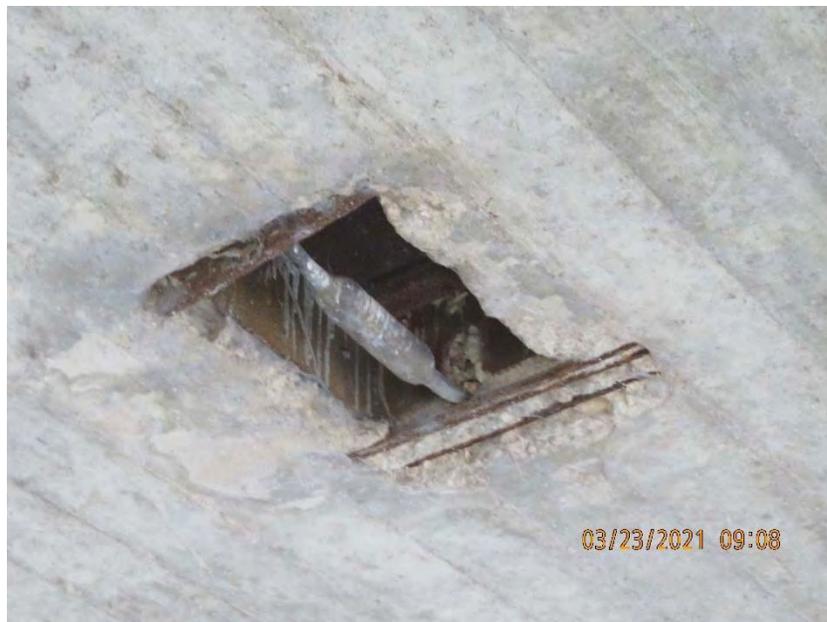


Figure 15: Major spalling with exposed reinforcing in deck between northernmost beams 1 & 2



Figure 16: Typical minor cracking throughout sidewalks



Figure 17: Minor curb spalling



Figure 18: Major rail damage from vehicular crash



Figure 19: Differential settlement and rutting at abutment joints

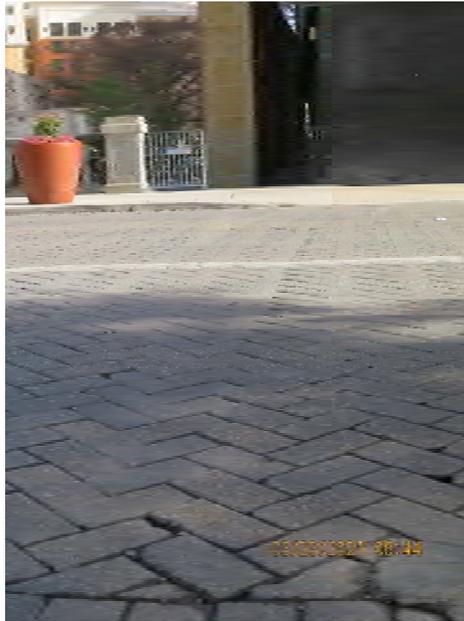


Figure 20: Differential settlement at joints

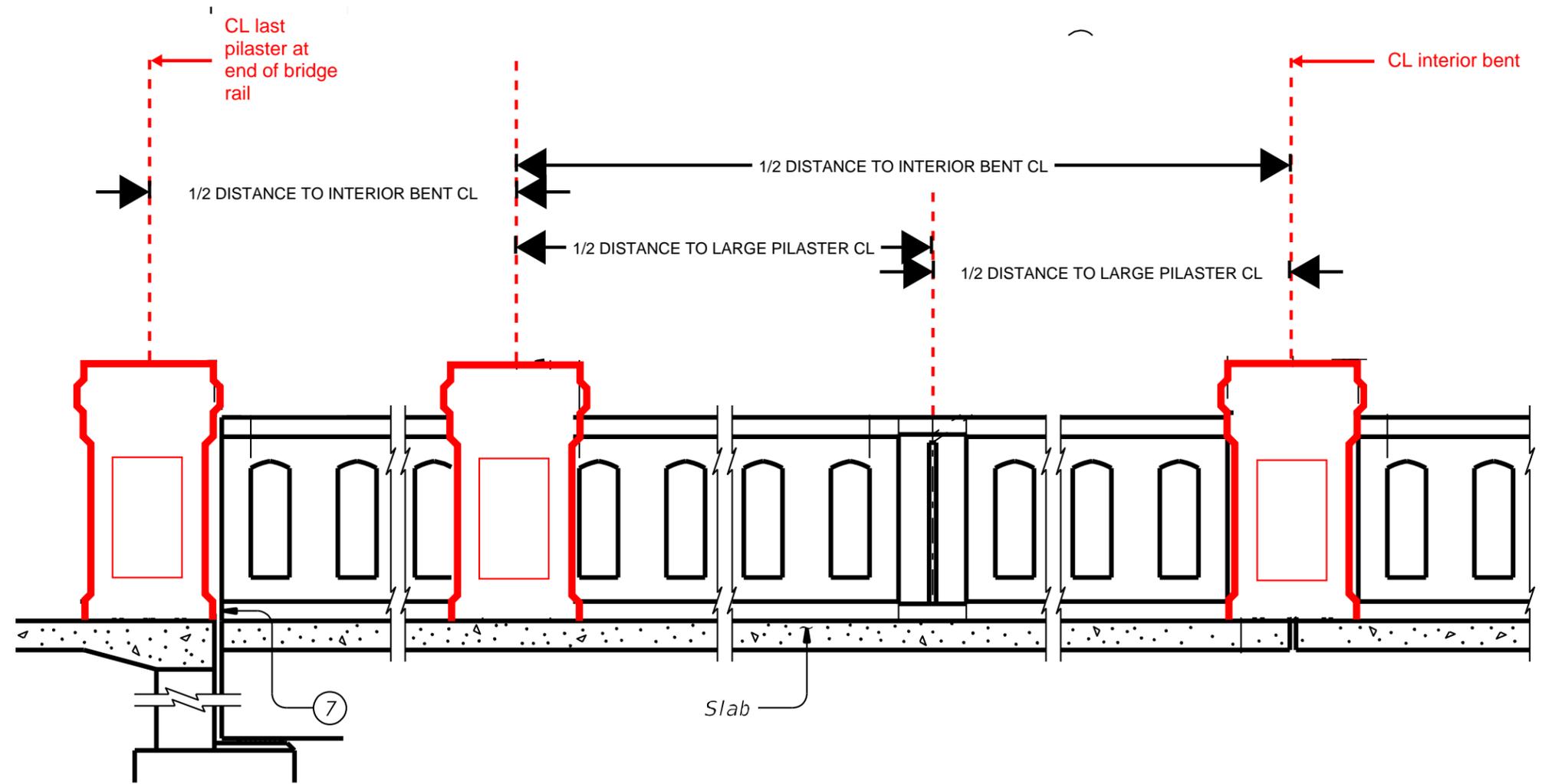


Figure 21: Weight limit sign for bridge



Figure 22: Multiple utilities and pedestrian bridge suspended from slab & beams

THIS DIAGRAM ONLY ILLUSTRATES THE PROPOSED LAYOUT OF THE ORIGINAL PILASTERS IN-RELATION TO THE LENGTH OF THE BRIDGE RAIL. ALL OTHER DETAILS OF THIS BRIDGE RAIL WILL ABIDE BY TXDOT STANDARD C411 RAIL.

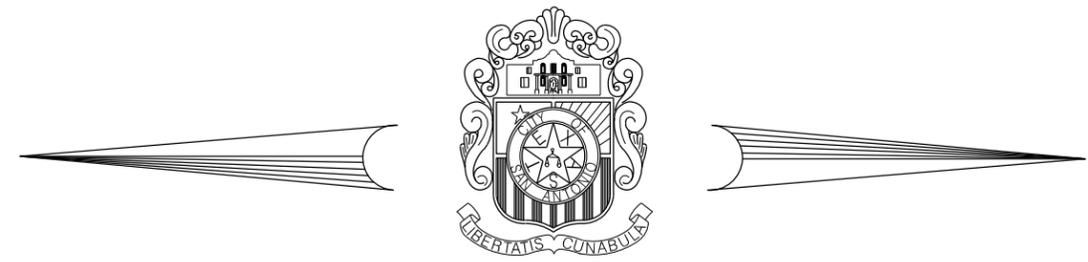






Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\General\1222702-TITLEPAGE.dgn



CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT N. PRESA & E. MARKET BRIDGE REPAIRS

INDEX OF SHEETS

PROJECT NO. WBS 40-00294-01-02-4

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6-7	TRAFFIC CONTROL PLAN PHASE I
8-9	TRAFFIC CONTROL PLAN PHASE II
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14-25	* BC (1-12) - 21 (TXDOT)
26	* TCP (1-2) - 18 (TXDOT)
27	* TCP (1-4) - 18 (TXDOT)
BRIDGE	
28	N PRESA ST - BRIDGE REPAIR LAYOUT
29	W MARKET ST - BRIDGE LAYOUT
30	ESTIMATED QUANTITIES
31	GENERAL REPAIR DETAILS
32	N PRESA ST - REHABILITATION
33	N PRESA ST - PIER REHABILITATION
34	N PRESA ST - RAIL REPLACEMENT
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37-38	* PEDESTRIAN RAIL (PR3) (TXDOT)
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46	SWP3 GENERAL NOTES
47	STORM WATER POLLUTION PREVENTION PLAN NARRATIVE
48	* TEMPORARY EROSION, SEDIMENT & WATER POLLUTION CONTROL MEASURES STANDARDS 1 (COSA)



LOCATION MAP
NOT TO SCALE

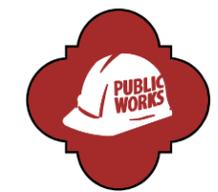
PLANS PREPARED BY:



SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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

Dan Thoma
DAN THOMA, P.E. 12/12/2022
DATE



CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

THROUGH INNOVATION AND DEDICATION, WE BUILD AND MAINTAIN SAN ANTONIO'S INFRASTRUCTURE

GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS FOR CONSTRUCTION JUNE 2008, OR LATEST.
2. NO EXTRA PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS, BUT NOT INCLUDED IN THE BID PROPOSAL. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED IN THE PAY ITEM TO WHICH IT RELATES.
3. THE CONTRACTOR SHALL PROVIDE ACCESS FOR THE DELIVERY OF MAIL BY THE U.S. POSTAL SERVICE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL OR BETTER CONDITION ANY DAMAGE DONE TO EXISTING FENCES, CONCRETE ISLANDS, STREET PAVING, CURBS, SHRUBS, BUSHES OR DRIVEWAYS. (NO SEPARATE PAY ITEM).
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL SIGNS AND BARRICADES ARE PROPERLY INSTALLED AND MAINTAINED. ALL LOCATIONS AND DISTANCES WILL BE DECIDED UPON IN THE FIELD BY THE CONTRACTOR, USING THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES". THE CITY'S CONSTRUCTION INSPECTOR AND TRAFFIC ENGINEERING REPRESENTATIVE WILL ONLY BE RESPONSIBLE TO INSPECT BARRICADES AND SIGNS. IF, IN THE OPINION OF THE TRAFFIC ENGINEERING REPRESENTATIVE AND THE CONSTRUCTION INSPECTOR, THE BARRICADES AND SIGNS DO NOT CONFORM TO ESTABLISHED STANDARDS OR ARE INCORRECTLY PLACED OR ARE INSUFFICIENT IN QUANTITY TO PROTECT THE GENERAL PUBLIC, THE CONSTRUCTION INSPECTOR SHALL HAVE THE OPTION TO STOP OPERATIONS UNTIL SUCH TIME AS THE CONDITIONS ARE CORRECTED.
6. IF THE NEED ARISES, ADDITIONAL BARRICADES AND DIRECTIONAL DEVICES MAY BE ORDERED BY THE TRAFFIC ENGINEERING REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.
7. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.171 C.P.S. MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.
8. CONTRACTOR SHALL NOTIFY THE CITY INSPECTOR TWENTY FOUR (24) HOURS PRIOR TO BACKFILL OF ANY UTILITY TRENCHES TO SCHEDULE FOR DENSITY TEST AS REQUIRED.
9. CONTRACTOR SHALL PRESERVE ALL CONSTRUCTION STAKES, MARKS, ETC. IF ANY ARE DESTROYED OR REMOVED BY THE CONTRACTOR OR HIS EMPLOYEES, THEY SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
10. CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION TO DETERMINE THE LOCATION OF EXISTING UTILITIES. CONTRACTOR SHALL NOTIFY THE FOLLOWING AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO EXCAVATION OPERATION:

SAN ANTONIO WATER SYSTEM (SAWS)	233-2010
BEXAR METROPOLITAN WATER DISTRICT (BEXAR MET)	354-6538 /357-5741
COSA DRAINAGE	207-8048
COSA SIGNAL OPERATIONS	207-7720 /207-7765
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-344-8377

 - CITY PUBLIC SERVICE ENERGY
 - TIME WARNER
 - AT&T
 - MCI
11. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES INDICATED ON THE PLANS ARE TAKEN FROM AVAILABLE RECORDS AND ARE NOT GUARANTEED, BUT SHALL BE INVESTIGATED AND VERIFIED BY THE CONTRACTOR BEFORE STARTING WORK. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE TO AND FOR THE MAINTENANCE AND PROTECTION OF THE EXISTING UTILITIES EVEN IF THEY ARE NOT SHOWN ON THE PLANS. LOCATION AND DEPTH OF EXISTING UTILITIES SHOWN HERE ARE APPROXIMATE ONLY. ACTUAL LOCATIONS AND DEPTHS MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION AND HE SHALL BE RESPONSIBLE FOR PROTECTION OF SAME DURING CONSTRUCTION.
12. ALL WASTE MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE HIS SOLE REponsibility TO DISPOSE OF THIS MATERIAL OFF THE LIMITS OF THE PROJECT. NO WASTE MATERIAL SHALL BE PLACED IN EXISTING LOWS THAT WILL BLOCK OR ALTER FLOW LIMITS OF EXISTING ARTIFICIAL OR NATURAL DRAINAGE.
13. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIAL IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN DEVELOPMENT PERMIT.
14. THE CONTRACTOR SHALL MAINTAIN ALL ADJOINING STREETS AND TRAVELED ROUTES FREE FROM SPILLED AND /OR TRACKED CONSTRUCTION MATERIALS AND /OR DEBRIS.
15. IF THE CONTRACTOR ENCOUNTERS ANY ARCHAEOLOGICAL DEPOSITS DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR MUST STOP EXCAVATION IMMEDIATELY, CONTACT THE CITY INSPECTOR, AND CALL THE CITY HISTORIC PRESERVATION OFFICE AT 207-7306 OR 207-3327 FOR AN ARCHAEOLOGICAL INVESTIGATION. THE CONTRACTOR CANNOT BEGIN EXCAVATION AGAIN WITHOUT WRITTEN PERMISSION FROM THE CITY.
 - IF MORE THAN THREE (3) DAYS ARE REQUIRED FOR INVESTIGATION (NOT INCLUDING HOLIDAY AND WEEKENDS) AND IF THE CONTRACTOR IS UNABLE TO WORK IN OTHER AREAS, THEN THE CONTRACTOR WILL BE ALLOWED TO NEGOTIATE FOR ADDITIONAL CONSTRUCTION TIME UPON WRITTEN REQUEST WITHIN TEN (10) DAYS AFTER THE FIRST NOTICE TO THE CITY OF ARCHAEOLOGICAL INVESTIGATION FOR EACH EVENT.
 - IF THE TIME REQUIRED FOR INVESTIGATION IS LESS THAN OR EQUAL TO THREE (3) DAYS FOR EACH EVENT, CONTRACT DURATION WILL NOT BE EXTENDED.
16. IF SUSPECTED CONTAMINATION IS ENCOUNTERED DURING CONSTRUCTION OPERATIONS, C.O.S.A. SHALL BE NOTIFIED IMMEDIATELY WHEN CONTAMINATED SOILS AND /OR GROUNDWATER ARE ENCOUNTERED AT LOCATIONS NOT IDENTIFIED IN THE PLANS. THE NOTIFICATION SHOULD INCLUDE THE STATION NUMBER, TYPE OF CONTAMINATED MEDIA, EVIDENCE OF CONTAMINATION AND MEASURES TAKEN TO CONTAIN THE CONTAMINATED MEDIA AND PREVENT PUBLIC ACCESS. THE CONTAMINATED SOIL AND /OR GROUNDWATER SHALL NOT BE REMOVED FROM THE LOCATION WITHOUT PRIOR C.O.S.A. APPROVAL.
 - THE CONTRACTOR MUST STOP THE EXCAVATION IMMEDIATELY AND CONTACT THE C.O.S.A. INSPECTOR. THE CONTRACTOR CANNOT BEGIN EXCAVATION ACTIVITIES WITHOUT WRITTEN PERMISSION FROM THE CITY.
17. CONTRACTOR IS TO INCLUDE A MAILBOX POST BLOCKOUT FOR VACANT LOTS AND ALL RESIDENCES WHICH DO NOT HAVE MAILBOXES AT THE CURB. BLOCKOUTS ARE PROVIDED FOR FUTURE USE BY THE POST OFFICE.

18. CONTRACTOR SHALL NOT REMOVE OR ADJUST ANY VIA FACILITIES. THE CONTRACTOR MUST CONTACT VIA FOURTEEN DAYS PRIOR, FOR THE REMOVAL OF BENCHES, STOP POLES OR ANY OTHER VIA FACILITIES THAT MAY BE PRESENT. PLEASE PROVIDE THIRTY DAYS PRIOR NOTICE FOR SHELTER REMOVAL (TELEPHONE NOS: (210) 362-2155 OR (210) 362-2096). THE CONTRACTOR WILL BE LIABLE FOR ANY DAMAGES TO VIA FACILITIES NOT REMOVED BY VIA. THE CONTRACTOR IS REQUIRED TO REPLACE ALL FLATWORK REMOVED OR DAMAGED IN THE COURSE OF EXECUTING THE CONTRACT UNLESS OTHERWISE NOTED BY VIA. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING VIA FACILITIES IF ADJACENT TO WORK AREA.

TREE PROTECTION AND PRESERVATION GENERAL NOTES

1. NO UTILITY OR STREET EXCAVATION WORK SHALL BEGIN IN AREAS WHERE TREE PRESERVATION AND TREATMENT MEASURES HAVE NOT BEEN COMPLETED AND APPROVED.
2. TREE PROTECTION FENCING SHALL BE REQUIRED. TREE PROTECTION FENCING SHALL BE INSTALLED, MAINTAINED AND REPAIRED BY THE CONTRACTOR DURING SITE CONSTRUCTION. DURING CONSTRUCTION ACTIVITY, AT LEAST A SIX-INCH LAYER OF COARSE MULCH SHALL BE PLACED AND MAINTAINED OVER THE ROOT PROTECTION ZONE (NO SEPARATE PAY ITEM).
3. THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THAN ONE INCH IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN THE VICINITY OF TREES SHALL PROCEED WITH CAUTION. THE CONTRACTOR SHALL CONTACT THE CITY INSPECTOR FOR GUIDANCE.
4. ROOTS WILL BE CUT WITH A ROCK SAW OR BY HAND, NOT BY AN EXCAVATOR OR OTHER ROAD CONSTRUCTION EQUIPMENT.
5. ALL CURB AND SIDEWALK WORK SHALL USE ALTERNATIVE CONSTRUCTION METHODS TO MINIMIZE EXTENSIVE ROOT DAMAGE TO TREES (REFER TO DETAILS).
6. EXPOSED ROOTS SHALL BE COVERED AT THE END OF THE DAY USING TECHNIQUES SUCH AS COVERING WITH SOIL, MULCH, OR WET BURLAP.
7. NO EQUIPMENT, VEHICLES OR MATERIALS SHALL OPERATE OR BE STORED WITHIN THE ROOT PROTECTION ZONE OF ANY TREE NEAR THE PROJECT. ROOT PROTECTION ZONE IS 1 FOOT OF RADIUS PER INCH OF TREE'S DIAMETER. A 10-INCH DIAMETER TREE WOULD HAVE A 10 FOOT RADIUS ROOT PROTECTION ZONE AROUND THE TREE. ROOTS OR BRANCHES IN CONFLICT WITH THE CONSTRUCTION SHALL BE CUT CLEANLY ACCORDING TO PROPER PRUNING METHODS. OAK WOUNDS SHALL BE PAINTED OVER WITHIN 30 MINUTES TO PREVENT OAK WILT.
8. SAPLINGS, SHRUBS OR BUSHES TO BE CLEARED FROM THE PROTECTED ROOT ZONE AREA OF A LARGE TREE SHALL BE REMOVED BY HAND AS DESIGNATED BY THE INSPECTOR.
9. NO WIRES, NAILS OR OTHER MATERIAL MAY BE ATTACHED TO PROTECTED TREES.
10. TREES, TREE LIMBS, BUSHES AND SHRUBS LOCATED IN THE CITY STREET OR ALLEY RIGHT-OF-WAY OR PERMANENT EASEMENTS WHICH INTERFERE WITH PROPOSED CONSTRUCTION ACTIVITIES SHALL BE PROPERLY PRUNED FOLLOWING THE ANSIA-300 STANDARDS FOR PRUNING. ALL TREE PRUNING SHALL BE COMPLETED BY A CITY OF SAN ANTONIO TREE MAINTENANCE LICENSED CONTRACTOR (ARTICLE 21-171, CITY CODE) ONLY AFTER APPROVAL FROM THE CAPITAL PROJECTS MANAGEMENT THROUGH THE INSPECTOR.
11. NO EXCESSIVE TREE TRIMMING WILL BE PERMITTED.
12. ALL DEBRIS GENERATED BY THE PRUNING AND TRIMMING OF THE TREES AND /OR BUSHES SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF PROPERLY (NO SEPARATE PAY ITEM).
13. TREES MUST BE MAINTAINED IN GOOD HEALTH THROUGHOUT THE CONSTRUCTION PROCESS. MAINTENANCE MAY INCLUDE, BUT NOT LIMITED TO: WATERING THE ROOT PROTECTION ZONE, WASHING FOLIAGE, FERTILIZATION, PRUNING, ADDITIONAL MULCH APPLICATIONS AND OTHER MAINTENANCE AS NEEDED ON THE PROJECT.
14. ANY TREE REMOVAL SHALL BE APPROVED BY THE CITY ARBORIST. (207-0278)
15. TREES WHICH ARE DAMAGED OR LOST DUE TO THE CONTRACTOR'S NEGLIGENCE DURING CONSTRUCTION SHALL BE MITIGATED TO THE CITY'S SATISFACTION.
16. TREE PLANTING FOR MITIGATION OR ENHANCEMENT: ALL PLANTED TREES SHALL BE MAINTAINED IN A HEALTHY CONDITION AT ALL TIMES. THIS INCLUDES IRRIGATION, FERTILIZING, PRUNING AND OTHER MAINTENANCE AS NEEDED ON THE PROJECT. TREES THAT DIE WITHIN TWELVE (12) MONTHS SHALL BE REPLACED WITH A TREE OF EQUAL SIZE AND SPECIES.

ACCESSIBILITY REQUIREMENTS

1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN VEHICULAR AND PEDESTRIAN ACCESS AT ALL TIMES TO LOCAL RESIDENCES AND BUSINESSES.
2. WHEN THE WORK REQUIRES THE EXCAVATION OF THE STREET AND THE REMOVAL OF THE EXISTING DRIVEWAY APPROACHES AND SIDEWALKS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY ALL-WEATHER ACCESS TO THE BUSINESSES AND RESIDENCES. THE TEMPORARY DRIVEWAY APPROACHES SHALL BE CONSTRUCTED WITH FLEXIBLE BASE OR GRAVEL MATERIAL AT NO SEPARATE COST TO THE CITY.
3. PRIOR TO INITIATING THE CONSTRUCTION OF NEW DRIVEWAY APPROACHES, THE CONTRACTOR SHALL GIVE ADVANCE WARNING IN PERSON, OR IN WRITING, OF AT LEAST 48 HOURS TO EACH RESIDENCE THAT WILL BE IMMEDIATELY AFFECTED, SO THAT ALTERNATE PLANS MAY BE MADE BY THE RESIDENTS.
4. FOR BUSINESSES WITH MORE THAN ONE DRIVEWAY, AT LEAST ONE DRIVEWAY SHALL REMAIN OPEN WHILE THE OTHER NEW DRIVEWAY APPROACHES ARE CONSTRUCTED. FOR BUSINESSES WITH ONLY ONE DRIVEWAY, THE NEW DRIVEWAY APPROACH SHALL BE CONSTRUCTED IN HALF WIDTHS, UNLESS A TEMPORARY ASPHALT DRIVEWAY IS FIRST INSTALLED AT NO SEPARATE COST TO THE CITY.

Plotted on: 12/12/2022

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DECEMBER 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

CITY OF SAN ANTONIO
GENERAL NOTES

% SUBMITTAL	PROJECT NO.:	WBS 40-00294-01-02-4	DATE:	12/12/2022
DRWN. BY:	DSGN. BY:	CHKD. BY:	SHEET NO.: 2	

SUMMARY OF QUANTITIES

COSA ITEM	DESCRIPTION	UNIT	QTY
100.1	MOBILIZATION	LS	1.0
100.2	INSURANCE AND BOND	LS	1.0
101.1	PREPARING RIGHT OF WAY	LS	1.0
530.1	BARRICADES, SIGNS AND TRAFFIC HANDLING	LS	1.0
540.8	SANDBAGS FOR EROSION CONTROL (6")	LF	126

Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\General\1222702_SUMM01.dgn

DESIGN



JJP
 JACOB J. POWELL, P.E.

12/12/2022
 DATE

APPROVAL



Dt
 DAN THOMA, P.E.

12/12/2022
 DATE

REV. NO.	DATE	DESCRIPTION	BY



SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
 2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800



CITY OF SAN ANTONIO
 PUBLIC WORKS DEPARTMENT

N. PRESA & W. MARKET
 BRIDGE REPAIRS
 SUMMARY OF QUANTITIES

XX% SUBMITTAL	PROJECT NO.: WBS 40-00294-01-02-4	DATE: 12/12/2022
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC SHEET NO.: 3

Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\TCP\1222702_TCFNARR01.dgn

TRAFFIC NOTES AND SPECIAL CONDITIONS

1. ENSURE THAT ALL TRAFFIC CONTROL DEVICES ARE PROPERLY INSTALLED AND MAINTAINED AT THE JOB SITE IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, TMUTCD AND RELATED INDUSTRY STANDARDS AND REGULATIONS. THESE NOTES, DO NOT, IN AND OF THEMSELVES, CONSTITUTE A TRAFFIC CONTROL PLAN. IN THE EVENT THAT THESE PLANS DO NOT INCLUDE TRAFFIC CONTROL, OR THAT THE CONTRACTOR WISHES TO VARY FROM TRAFFIC CONTROL INCLUDED WITH THESE PLANS, HE SHALL SUBMIT FOR REVIEW A TRAFFIC CONTROL PLAN SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS, INCLUDING A SIGN AND BARRICADE PLAN CONFORMING TO THE REQUIREMENTS OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. THE CITY'S CONSTRUCTION OBSERVER / INSPECTOR (COI) AND THE TRAFFIC ENGINEERING REPRESENTATIVE WILL ONLY BE RESPONSIBLE TO INSPECT THE TRAFFIC CONTROL DEVICES BEING DEPLOYED. IF, IN THE OPINION OF THE TRAFFIC ENGINEERING REPRESENTATIVE AND THE COI, THE TRAFFIC CONTROL DEVICES DO NOT CONFORM TO ESTABLISHED STANDARDS OR ARE INCORRECTLY PLACED OR ARE INSUFFICIENT IN QUANTITY TO PROTECT THE GENERAL PUBLIC, THE COI SHALL HAVE THE OPTION TO STOP CONSTRUCTION OPERATIONS AT NO EXPENSE TO THE CITY UNTIL SUCH TIME AS THE CONDITIONS ARE CORRECTED BY THE CONTRACTOR.
2. PRIOR TO STARTING CONSTRUCTION, CONTACT THE CITY OF SAN ANTONIO TRAFFIC OPERATIONS SECTION AT 207-7765 FOR A TRAFFIC SIGN AND TRAFFIC SIGNAL INVENTORY. PRIOR TO COMPLETION OF THE CONTRACT AND REMOVAL OF THE BARRICADES, AGAIN CONTACT THE TRAFFIC OPERATIONS SECTION. THE BARRICADES SHALL NOT BE REMOVED UNTIL ALL APPLICABLE PERMANENT TRAFFIC SIGNS AND SIGNALS ARE IN PLACE.
3. OBTAIN AND MAINTAIN TEMPORARY STOP SIGNS AND ALL OTHER TRAFFIC CONTROL DEVICES REQUIRED TO PROTECT THE GENERAL PUBLIC. IF THE CITY OF SAN ANTONIO HAS REMOVED PERMANENT STOP SIGNS, THE CONTRACTOR SHALL REQUEST THAT THE SIGNS BE RETURNED TO THE CONSTRUCTION SITE TO BE REINSTALLED BY THE CONTRACTOR. ALL PERMANENT SIGNS OR TRAFFIC CONTROL DEVICES MISSING OR DAMAGED UPON COMPLETION OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE
4. AS WORK PROGRESSES, LOCATION OF TEMPORARY TRAFFIC CONTROL DEVICES WILL BE ADJUSTED AND MODIFIED, AS NECESSARY BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE.
5. IF THE NEED ARISES, ADDITIONAL TEMPORARY TRAFFIC CONTROL DEVICES, SPECIAL DIRECTIONAL DEVICES, AND/OR BUSINESS NAME SIGNS MAY BE ORDERED BY THE TRAFFIC ENGINEERING REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.
6. TEMPORARY TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE CITY'S "TYPICAL SIGN AND BARRICADE STANDARDS" SHEETS, TxDOT'S STANDARDS, AND TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
7. MAINTAIN ALL STREETS WITHIN PROJECT LIMITS OPEN TO THROUGH TRAFFIC BY REPAIRING TRENCHES, POTHOLES, LEVELING UP WITH ASPHALT, ETC. AT NO DIRECT PAYMENT, WITH THE COST TO BE INCLUDED IN OTHER ITEMS.
8. PROVIDE SUITABLE ACCESS ACCOMMODATIONS FOR SCHOOL CHILDREN AND PEDESTRIANS IF NEEDED.
9. PROVIDE ACCESS FOR DELIVERY OF MAIL BY THE U.S. POSTAL SERVICE.
10. PROVIDE FOR ACCESS TO RESIDENCES AND ALL BUSINESSES AT ALL TIMES WITHIN ALL PHASES OF THE WORK.

11. WHEN CONSTRUCTION WORK NECESSITATES THE UTILIZATION OF VEHICLE PATHS OTHER THAN THE LANES NORMALLY USED, TRAFFIC CONTROL MARKINGS NO LONGER APPLICABLE SHALL BE REMOVED AND APPROVED TEMPORARY PAVEMENT MARKINGS AND SIGNS INSTALLED IN ACCORDANCE WITH PART VI-D OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
12. THE COI WILL MONITOR THE CONTRACTOR'S TRAFFIC CONTROL DEVICES AND WILL BE RESPONSIBLE TO FURNISH ALL RESIDENTS AND BUSINESSES WITH AN INFORMATION FLYER ON ALL JOBS DURING CONSTRUCTION.
13. ANY DAMAGE TO PERMANENT TRAFFIC SIGNALS, THE CONTROLLER BOX, LOOPS OR CONDUITS DURING OR UPON COMPLETION OF THE PROJECT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE. THE DECISION TO REPAIR, AS OPPOSED TO REPLACE, THE DAMAGED EQUIPMENT SHALL BE MADE BY THE CITY'S TRAFFIC ENGINEER.
14. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL STREETS OUTSIDE OF THE PROJECT LIMITS, WHICH ARE DAMAGED DUE TO CONSTRUCTION ACTIVITIES. THE REPLACED SECTION MUST BE APPROVED BY THE CITY'S STREET ENGINEER. THERE WILL BE NO DIRECT PAYMENT FOR THIS WORK. THE COST IS TO BE INCLUDED IN OTHER ITEMS.
15. OFF-DUTY POLICE OFFICERS WILL BE REQUIRED AS DIRECTED BY THE TRAFFIC ENGINEER.
16. PROVIDE THE CITY AN EMERGENCY TELEPHONE NUMBER FOR EVENINGS, WEEKENDS, AND HOLIDAYS BY THE FIRST WORKING DAY OF THE PROJECT. THIS TELEPHONE NUMBER MUST BE A COMMERCIAL ANSWERING SERVICE. THE ANSWERING SERVICE MUST BE ABLE TO CONTACT THE CONTRACTOR AND HAVE THE CONTRACTOR RESPOND TO THE CITY STAFF WITHIN TWO HOURS OF THE INITIAL CONTACT.
17. MAINTAIN CONTINUOUS ACCESS TO ALL INTERSECTING STREETS UNLESS OTHERWISE SHOWN ON THESE PLANS. WHEN CONTINUOUS ACCESS IS SCHEDULED TO BE BLOCKED, CONTACT THE DISPATCHERS FOR THE FIRE DEPARTMENT AND EMS AT (210) 227-8341 AND THE POLICE DEPARTMENT AT (210) 207-2257, TO APPRISE THEM OF THE PENDING STREET CLOSURE AT LEAST FORTY-EIGHT HOURS IN ADVANCE. IF THE CLOSURE FALLS ALONG A BUS ROUTE, CONTACT VIA AT (210) 362-5220.
18. MAINTAIN EITHER THE EXISTING OR TEMPORARY STREET NAME SIGNS AT EACH INTERSECTION ONSITE THROUGHOUT CONSTRUCTION. IF THE EXISTING STREET NAME SIGNS ARE USED, THEY MUST BE MAINTAINED IN THE CONDITION ENCOUNTERED PRIOR TO THE BEGINNING OF CONSTRUCTION, AND THEN BE TURNED IN TO THE CITY INSPECTOR AT THE END OF THE PROJECT. IF TEMPORARY SIGNS ARE USED DURING CONSTRUCTION, THEY SHALL HAVE A MINIMUM OF 4-INCH LETTERS, AND MAY BE FABRICATED WITH CONSTRUCTION ZONE MATERIAL (BLACK LEGEND ON ORANGE BACKGROUND, USING PLYWOOD SUBSTRATE, ETC.).

PHASING AND STAGING NOTES - STREET AND DRAINAGE CONSTRUCTION

DESIGN



Jacob J. Powell, P.E. 12/12/2022
DATE

APPROVAL



Dan Thoma, P.E. 12/12/2022
DATE

REV. NO.	DATE	DESCRIPTION	BY
 PAPE-DAWSON ENGINEERS SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800			
 CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT			
N. PRESA & W. MARKET BRIDGE REPAIRS TRAFFIC CONTROL PLAN NARRATIVE			
SHEET 1 OF 2			
XX% SUBMITTAL	PROJECT NO.: WBS 40-00294-01-02-4	DATE:	12/12/2022
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC	SHEET NO.: 4

Plotted on: 12/12/2022

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1. ANY QUESTIONS REGARDING PHASING OR STAGING WILL BE STRICTLY HANDLED BY THE DEPARTMENT OF PUBLIC WORKS WHICH HAS COMPLETE AUTHORITY TO MAKE FINAL DECISIONS ON ANY CHANGES OR MODIFICATIONS. THE CONTRACTOR MUST CONTACT THE CITY'S CONSTRUCTION INSPECTOR 48 HOURS IN ADVANCE (NOT INCLUDING WEEKENDS OR HOLIDAYS) OF ANY MINOR STREET CLOSURE. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO ADVISE CONSTRUCTION INSPECTIONS TEN (10) DAYS IN ADVANCE OF ANY ARTERIAL STREET CLOSURE. THIS MUCH TIME IS NECESSARY TO INSTALL ADVISORY SIGNS AND GIVE THE MOTORISTS A MINIMUM OF SEVEN (7) DAYS NOTICE BEFORE STREET CLOSURE. THE CONSTRUCTION INSPECTOR, AFTER HAVING BEEN NOTIFIED, WILL CONTACT THE ENGINEERING OFFICE IMMEDIATELY TO MAKE THE NECESSARY ARRANGEMENTS. THE TEMPORARY BARRICADES AND WARNING SIGNS SHALL BE LOCATED SO AS TO AFFORD THE MAXIMUM PROTECTION TO THE PUBLIC AS WELL AS CONSTRUCTION PERSONNEL AND EQUIPMENT AND TO FACILITATE AN EXPEDITIOUS FLOW OF TRAFFIC AT ALL TIMES DURING CONSTRUCTION.

2. IF THERE ARE TWO (2) OR MORE PHASES IN THE PROJECT, NO MORE THAN TWO (2) PHASES OF CONSTRUCTION MAY BE WORKED AT ONE TIME, UNLESS OTHERWISE INDICATED IN THE PLANS. PARTIAL CONSTRUCTION AT DIFFERENT SCATTERED LOCATIONS WITHIN THE PROJECT WILL NOT BE ALLOWED. PROJECTS THAT CONSIST OF DISTINCT AND SEPARATE AREAS MAY BE UNDER CONSTRUCTION AT THE SAME TIME WITH AN APPROVED FIELD ALTERATION. ALL REMAINING STREETS WITHIN THE PROJECT OR SEPARATE AREA SHALL REMAIN OPEN AT ALL TIMES.

3. UNLESS OTHERWISE INDICATED IN THE PLANS, TWO (2) PHASES IN SEQUENCE MAY BE WORKED AT THE SAME TIME, IN PROJECTS WHERE THERE ARE AT LEAST THREE (3) PHASES, SUCH AS PHASE 1 AND PHASE 2 AND BEFORE GOING TO PHASE 3. PHASE 1 MUST BE COMPLETED 100% WITH BASE MATERIAL AND APPROVED DENSITIES (PRIME COATED IF BASE MATERIAL IS ITEM NO. 200 FLEXIBLE BASE) BEFORE BEGINNING PHASE 3. IF THERE ARE ONLY TWO (2) PHASES IN THE PROJECT, PHASE 1 MUST BE COMPLETED 100% WITH BASE MATERIAL AND APPROVED DENSITIES (PRIME COATED IF BASE MATERIAL IS ITEM NO. 200 FLEXIBLE BASE) BEFORE PROCEEDING TO PHASE 2.

4. IF THE PROJECT HAS MORE THAN SIXTEEN (16) PHASES, BEFORE THE CONTRACTOR CAN BEGIN PHASE 17, HE MUST COMPLETELY FINISH WITH TYPE "B" OR TYPE "D" ASPHALT AT LEAST 50% OF THE LOWER PHASES HE HAS WORKED ON. (EXAMPLE: IF THE PROJECT HAS 20 PHASES, BEFORE THE CONTRACTOR CAN START CONSTRUCTION OF PHASE 17, HE MUST FINISH TYPE B OR TYPE D ASPHALT UP TO PHASE 8.).

5. THE PLANS ARE PHASED FOR STREET AND STORM DRAINAGE CONSTRUCTION. NO STORM SEWER CONSTRUCTION WILL TAKE PLACE OUTSIDE OF THE PHASING LIMITS UNDER CONSTRUCTION, UNLESS SPECIFICALLY NOTED ON THE PLANS OR AUTHORIZED IN WRITING BY THE TRAFFIC DIVISION.

6. ALL STORM DRAINAGE PIPES ARE NOT CONSIDERED UTILITIES, REGARDLESS OF SIZE. THIS WORK SHALL BE PART OF THE PHASE.

7. UNLESS OTHERWISE INDICATED IN THE PLANS, INTERSECTING STREETS SHALL BE CONSTRUCTED IN STAGES SO AS TO MAINTAIN ACCESS. INTERSECTION WORK SHALL BE DONE DURING WEEKEND HOURS OR AS DIRECTED BY THE ENGINEER. NO TWO ADJACENT INTERSECTIONS MAY BE CONSTRUCTED SIMULTANEOUSLY. WITH APPROVAL FROM THE ENGINEER, THE CONTRACTOR MAY CLOSE AN ENTIRE INTERSECTION. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE A DETOUR PLAN FOR SUCH A CLOSURE TO THE ENGINEER FOR APPROVAL.

TCP PLAN ADDITIONAL NOTES

1. GENERAL.

A. IF SO PERMITTED BY THE ENGINEER, WORK ACTIVITIES ON SUNDAY SHALL BE APPROVED IN ADVANCE. LANE CLOSURES WILL BE ALLOWED IN ONE DIRECTION ONLY. NOTIFY THE ENGINEER OF IMPENDING/UPCOMING LANE CLOSURES AT LEAST (7) DAYS IN ADVANCE OF LANE CLOSURES. THE LANE CLOSURES SHALL BE IN COMPLIANCE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).

B. LANE CLOSURES OTHER THAN THOSE SHOWN ON THE PHASING PLAN WILL NOT BE ALLOWED DURING NON-WORK HOURS. NO EQUIPMENT SHALL BE LEFT IN A POSITION THAT WILL ENDANGER THE TRAVELING PUBLIC.

C. MAINTAIN ADEQUATE DRAINAGE THROUGHOUT ALL PHASES OF CONSTRUCTION, WITH THE STORM WATER POLLUTION PREVENTION PLAN IN PLACE.

D. ACCESS TO PROPERTIES MUST BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE SHOWN.

E. A MINIMUM 3:1 (H:V) TEMPORARY SAFETY SLOPE OF STABLE COMPACTED MATERIAL WILL BE REQUIRED ADJACENT TO THE EDGE OF PAVEMENT DURING NON-WORKING HOURS.

F. PER COSA SPECIFICATION 533, THE REMOVAL OF CONFLICTING PAVEMENT MARKINGS/MARKERS IS SUBSIDIARY TO THE VARIOUS PAVEMENT MARKING/MARKER PAY ITEMS. NO SEPARATE PAY FOR PAVEMENT MARKING/MARKER REMOVAL IS INCLUDED.

G. ALL SAWS MANHOLES AND WATER VALVES ARE TO REMAIN ACCESSIBLE AT ALL TIMES. VALVES MAY REQUIRE ADDITIONAL ADJUSTMENTS IN AREAS OF TEMPORARY PAVEMENT (NO SEPARATE PAY ITEM.)

H. WORKING DAY CHARGES WILL COMPLY WITH A 6-DAY WORKWEEK. WORKING DAYS WILL BE CHARGED MONDAY THROUGH SATURDAY, SUN UP TO SUN DOWN, EXCLUDING CITY APPROVED HOLIDAYS.

SPECIAL NOTES AND PROVISIONS:

1. ALL CONFLICTING PAVEMENT MARKINGS MUST BE REMOVED.

SEQUENCE OF WORK

N. PRESA BRIDGE REPAIRS

PHASE I

- 1. INSTALL TEMPORARY EROSION CONTROL MEASURES.
2. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES AND CHANNELIZATION DEVICES AND SIGNAGE AS SHOWN ON TRAFFIC CONTROL PLAN LAYOUT. USE TXDOT STANDARD TCP (1-2). REFER TO OTHER APPLICABLE TXDOT STANDARD TCP SHEETS.
3. COMPLETE ALL BRIDGE REPAIRS AND REHABILITATION ALONG EAST SIDE OF BRIDGE BEFORE CONTINUING TO PHASE II.

PHASE II

- 1. INSTALL TEMPORARY EROSION CONTROL MEASURES.
2. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES AND CHANNELIZATION DEVICES AND SIGNAGE AS SHOWN ON TRAFFIC CONTROL PLAN LAYOUT. USE TXDOT STANDARD TCP (1-2). REFER TO OTHER APPLICABLE TXDOT STANDARD TCP SHEETS.
3. COMPLETE ALL BRIDGE REPAIRS AND REHABILITATION ALONG WEST SIDE OF BRIDGE.

4. FINAL CLEAN-UP.

W. MARKET BRIDGE REPAIRS

PHASE I

- 1. INSTALL TEMPORARY EROSION CONTROL MEASURES.
2. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES AND CHANNELIZATION DEVICES AND SIGNAGE AS SHOWN ON TRAFFIC CONTROL PLAN LAYOUT. USE TXDOT STANDARD TCP (1-2). REFER TO OTHER APPLICABLE TXDOT STANDARD TCP SHEETS.
3. COMPLETE ALL BRIDGE REPAIRS AND REHABILITATION ON SOUTH SIDE OF BRIDGE BEFORE CONTINUING TO PHASE II.

PHASE II

- 1. INSTALL TEMPORARY EROSION CONTROL MEASURES.
2. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES AND CHANNELIZATION DEVICES AND SIGNAGE AS SHOWN ON TRAFFIC CONTROL PLAN LAYOUT. USE TXDOT STANDARD TCP (1-2). REFER TO OTHER APPLICABLE TXDOT STANDARD TCP SHEETS.
3. COMPLETE ALL BRIDGE REPAIRS AND REHABILITATION ALONG NORTH SIDE OF BRIDGE.
4. FINAL CLEAN-UP.

DESIGN



Jacob J. Powell, P.E. 12/12/2022 DATE

APPROVAL



Dan Thoma, P.E. 12/12/2022 DATE

Table with 4 columns: REV. NO., DATE, DESCRIPTION, BY

PAPE-DAWSON ENGINEERS logo and address: SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS, 2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000

CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT logo

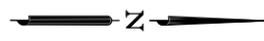
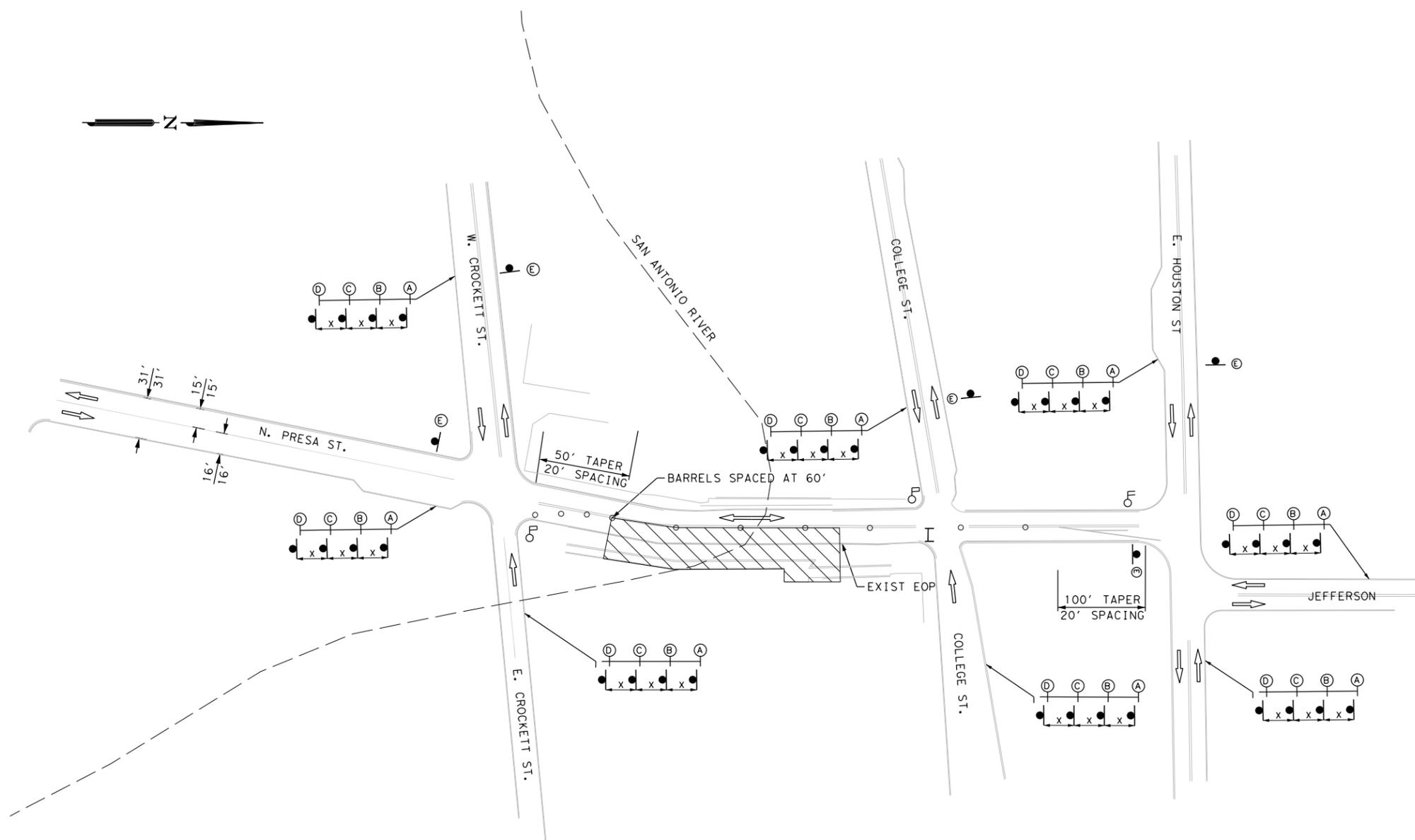
N. PRESA & W. MARKET BRIDGE REPAIRS TRAFFIC CONTROL PLAN NARRATIVE

SHEET 2 OF 2

Table with 4 columns: XX% SUBMITTAL, PROJECT NO., DATE, DRWN. BY, DSGN. BY, CHKD. BY, SHEET NO.

Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\TCP\Phase1\1222702_TCP01.dgn



LEGEND

- CONSTRUCTION AREA
- TYPE III BARRICADE
- PLASTIC DRUMS
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. REFERENCE STRUCTURAL PLANS AND DETAILS FOR SPECIFIC LIMITS OF WORK.
3. CONTRACTOR TO VERIFY LIMITS OF BRIDGE REPAIRS WITH CITY AND ENGINEER.

DESIGN

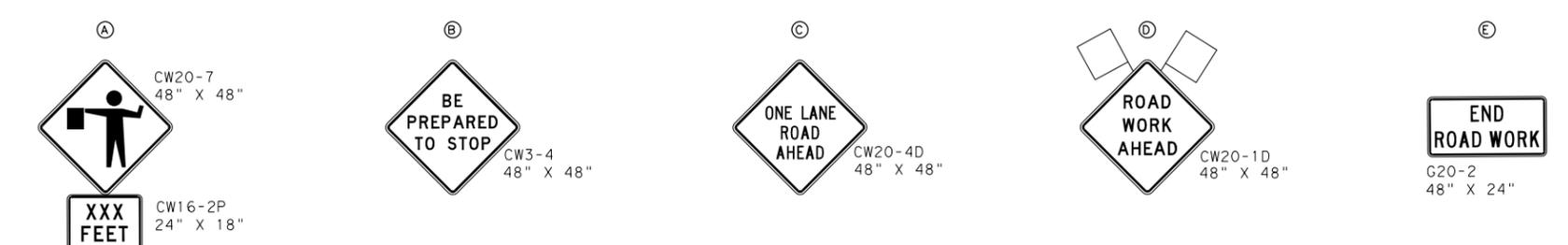


J. Powell
 JACOB J. POWELL, P.E.
 12/12/2022
 DATE

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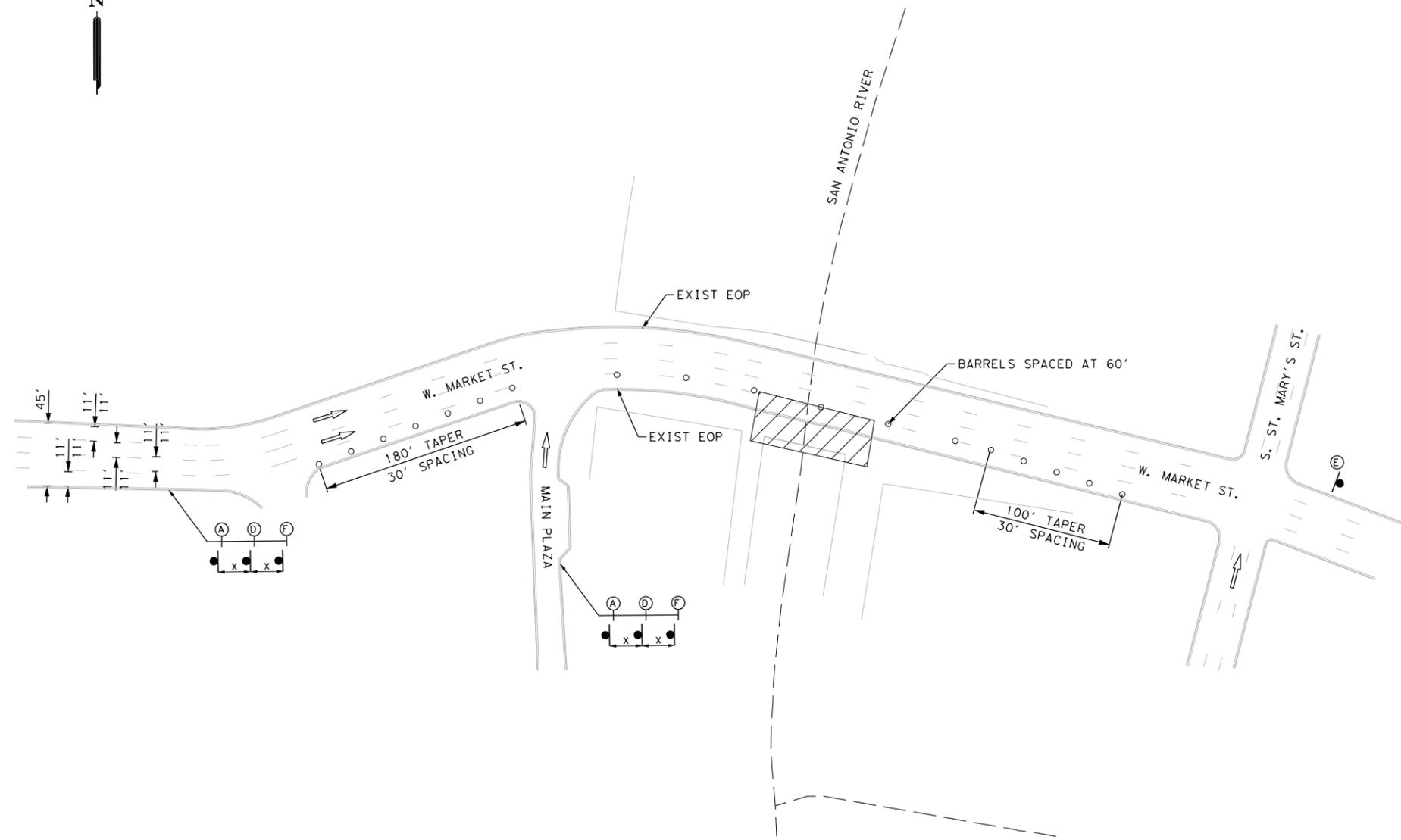
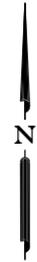
D. Thoma
 DAN THOMA, P.E.
 12/12/2022
 DATE



REV. NO.	DATE	DESCRIPTION	BY
 SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800			
 CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT			
N. PRESA & W. MARKET BRIDGE REPAIRS TRAFFIC CONTROL PLAN LAYOUT PHASE I SHEET 1 OF 2			
XX% SUBMITTAL	PROJECT NO.:	WBS 40-00294-01-02-4	DATE: 12/12/2022
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC	SHEET NO.: 6

Plotted on: 12/12/2022

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LEGEND

- CONSTRUCTION AREA
- TYPE III BARRICADE
- PLASTIC DRUMS
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. REFERENCE STRUCTURAL PLANS AND DETAILS FOR SPECIFIC LIMITS OF WORK.
3. CONTRACTOR TO VERIFY LIMITS OF BRIDGE REPAIRS WITH CITY AND ENGINEER.

DESIGN



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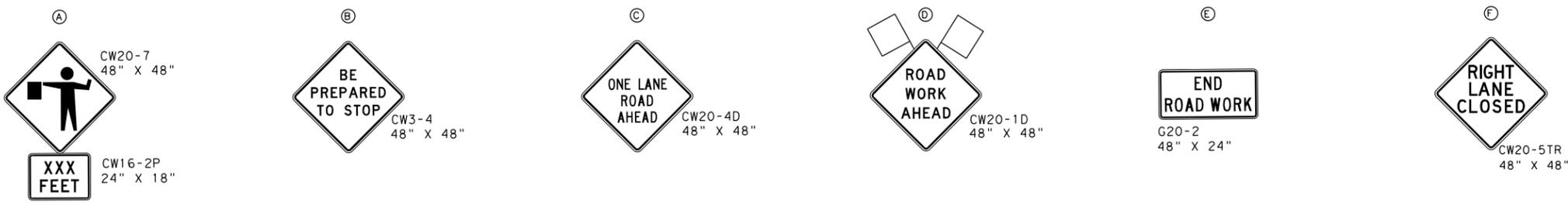
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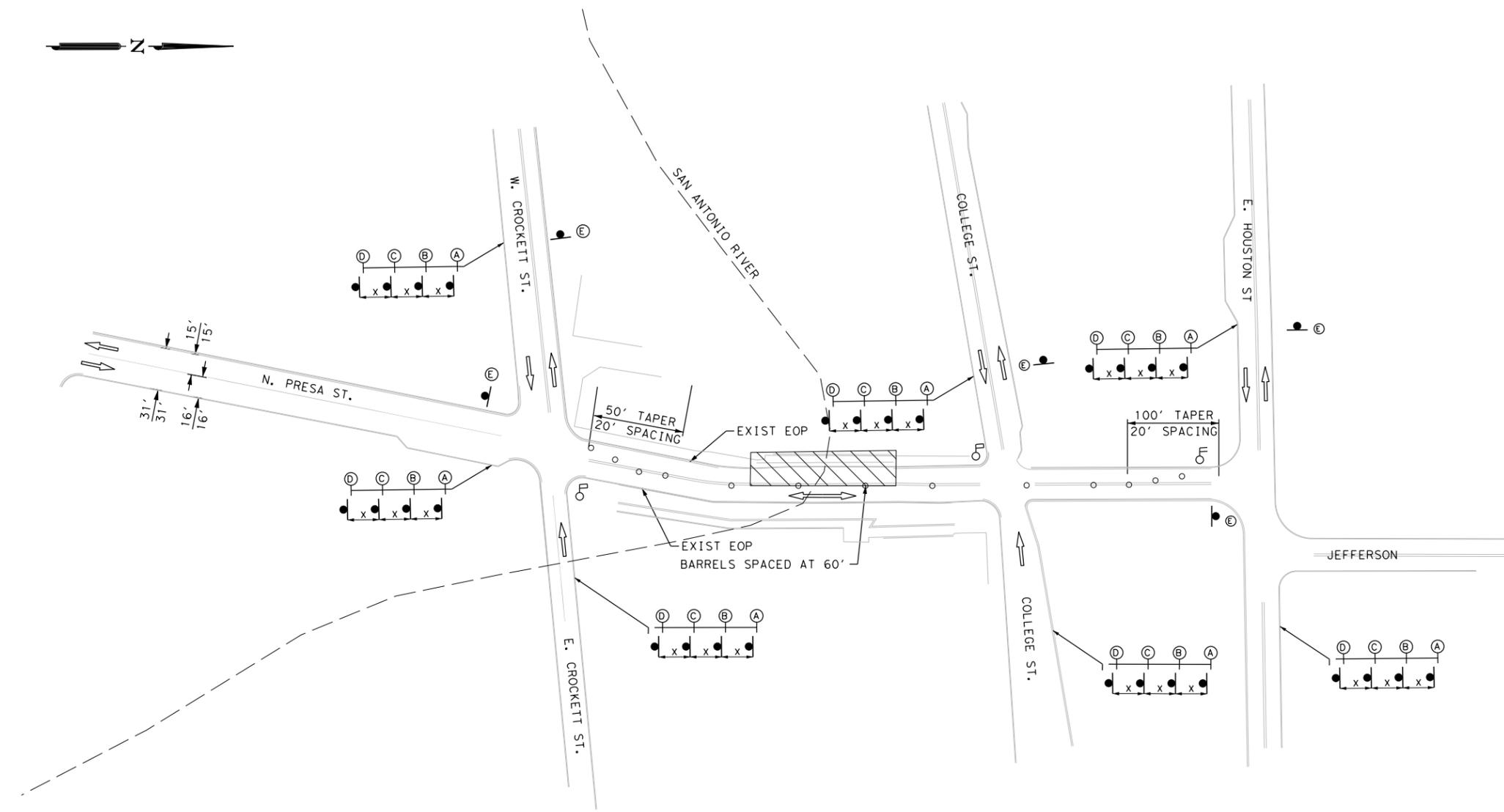
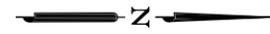
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<p>PAPE-DAWSON ENGINEERS</p> <p>SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800</p>			
<p>CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT</p>			
<p>N. PRESA & W. MARKET BRIDGE REPAIRS</p> <p>TRAFFIC CONTROL PLAN LAYOUT PHASE I</p> <p style="text-align: right;">SHEET 2 OF 2</p>			
XX% SUBMITTAL	PROJECT NO.:	WBS 40-00294-01-02-4	DATE: 12/12/2022
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC	SHEET NO.: 7

Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\TCP\Phase1\1222702_TCP03.dgn



LEGEND

- CONSTRUCTION AREA
- TYPE III BARRICADE
- PLASTIC DRUMS
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. REFERENCE STRUCTURAL PLANS AND DETAILS FOR SPECIFIC LIMITS OF WORK.
3. CONTRACTOR TO VERIFY LIMITS OF BRIDGE REPAIRS WITH CITY AND ENGINEER.

DESIGN

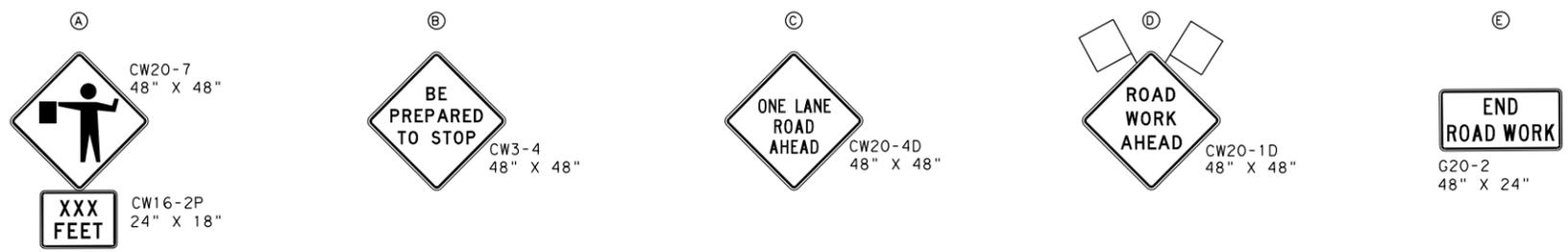


J. Powell
 JACOB J. POWELL, P.E.
 12/12/2022
 DATE

APPROVAL



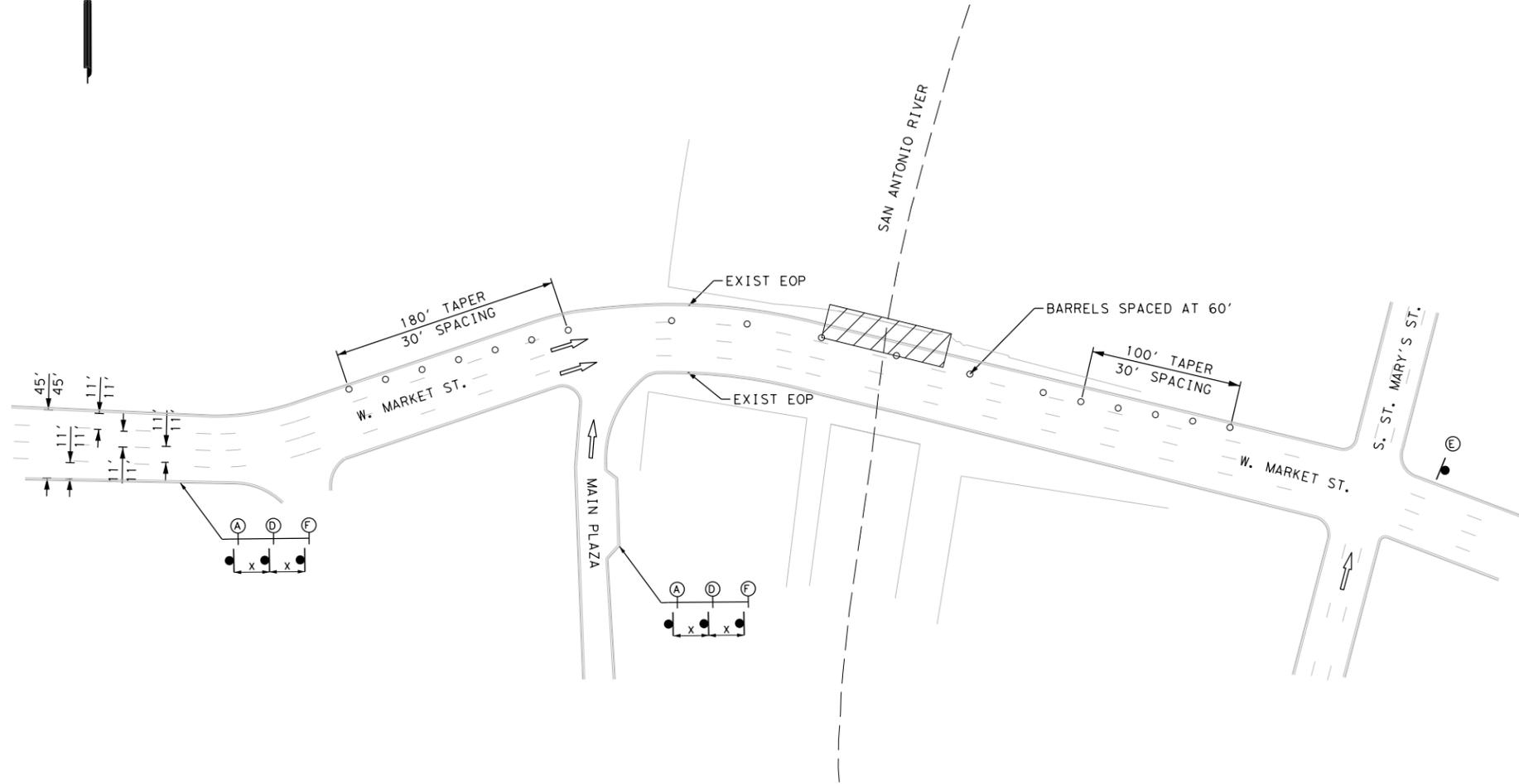
D. Thoma
 DAN THOMA, P.E.
 12/12/2022
 DATE



REV. NO.	DATE	DESCRIPTION	BY
<p>PAPE-DAWSON ENGINEERS</p> <p>SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800</p>			
<p>CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT</p>			
<p>N. PRESA & W. MARKET BRIDGE REPAIRS</p> <p>TRAFFIC CONTROL PLAN LAYOUT PHASE II</p> <p style="text-align: right;">SHEET 1 OF 2</p>			
XX% SUBMITTAL	PROJECT NO.:	WBS 40-00294-01-02-4	DATE: 12/12/2022
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC	SHEET NO.: 8

Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\TCP\Phase I\1222702_TCP04.dgn



LEGEND

-  CONSTRUCTION AREA
-  TYPE III BARRICADE
-  PLASTIC DRUMS
-  VERTICAL PANELS
-  SIGN
-  TRAFFIC FLOW ARROWS

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. REFERENCE STRUCTURAL PLANS AND DETAILS FOR SPECIFIC LIMITS OF WORK.
3. CONTRACTOR TO VERIFY LIMITS OF BRIDGE REPAIRS WITH CITY AND ENGINEER.

DESIGN

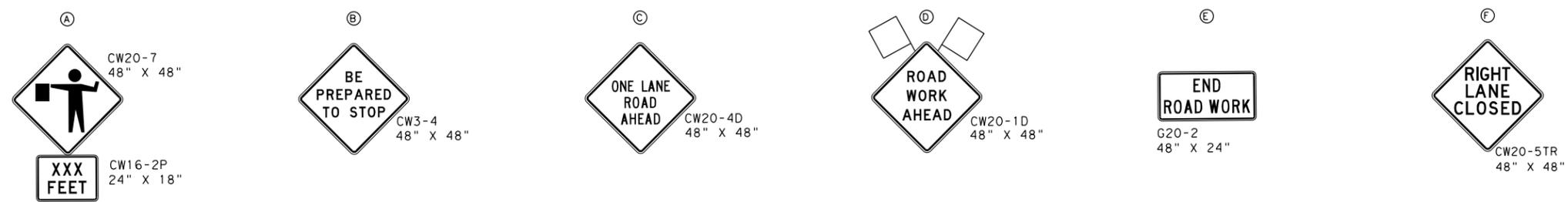


J. Powell
 JACOB J. POWELL, P.E. 12/12/2022
 DATE

APPROVAL



D. Thoma
 DAN THOMA, P.E. 12/12/2022
 DATE



REV. NO.	DATE	DESCRIPTION	BY
 SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800			
 CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT			
N. PRESA & W. MARKET BRIDGE REPAIRS TRAFFIC CONTROL PLAN LAYOUT PHASE II SHEET 2 OF 2			
XX% SUBMITTAL	PROJECT NO.: WBS 40-00294-01-02-4	DATE: 12/12/2022	
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC	SHEET NO.: 9

TRAFFIC NOTES

TRENCHING / EXCAVATING

The following notes shall apply to excavations of trenches or pits that are located in the pavement or are within six (6) feet of the edge of roadway:

- 1.) Trench walls shall not be closer than three (3) feet from the edge of the traveled way at any stage of construction.
- 2.) Traffic control devices shall be in place before starting any excavation.
- 3.) Trenches or pits will not be permitted to be bridged by steel plates and open to traffic unless they are temporarily backfilled to finished street grade.
- 4.) For pits or trenches along or in a roadway that are going to be left open over night that are zero to fifty (0 – 50) feet in length, the following applies. GUARD RAIL OR CONCRETE BARRIER SHALL BE USED.
- 5.) For pits or trenches along or in roadway that are going to be left open over night and are longer than 50 feet in length. CONCRETE BARRIERS MUST BE USED.
- 6.) Plastic construction fencing shall be required for any trench or pit left open over night.
- 7.) When using any guardrail or concrete barrier, protected end must be used as per the TEXAS-M.U.T.C.D.
- 8.) For vertical drop-offs greater than two (2) feet along roadway, low profile concrete with appropriate end protection must be installed.
- 9.) All concrete barriers placed on City R.O.W shall be low profile. No high profile barriers will be allowed.

REFLECTIVE SHEETING

The reflectorized white and reflectorized orange stripes for channelizing devices such as barricade drums and vertical panels shall be constructed of reflective sheeting meeting the color and retro-reflectivity requirements of high intensity, unless otherwise specified in the plans.

MAINTENANCE

- 1.) All traffic signs shall be kept in proper position, clean and legible at all times. Damaged barricades, signs, and other traffic control devices shall be replaced without undue delay.
- 2.) To ensure adequate maintenance, a suitable schedule for inspection, cleaning, and replacement of barricades, lights, and signs shall be established.
- 3.) Special attention and necessary action shall be taken to see that weeds, trees, shrubbery and construction materials do not obscure the face of any sign or barricades.

TRAINING

Each person whose actions affect maintenance and construction zone safety, from the upper-level management personnel through construction and maintenance field personnel, should receive training appropriate to the job decision each individual is required to make. Only those individuals who are qualified by means of adequate training in safe traffic control practices and have a basic understanding of the principles established by applicable standards and regulations, including those of the TEXAS M.U.T.C.D. should supervise the selection, placement, and maintenance of traffic control devices in maintenance and construction areas.

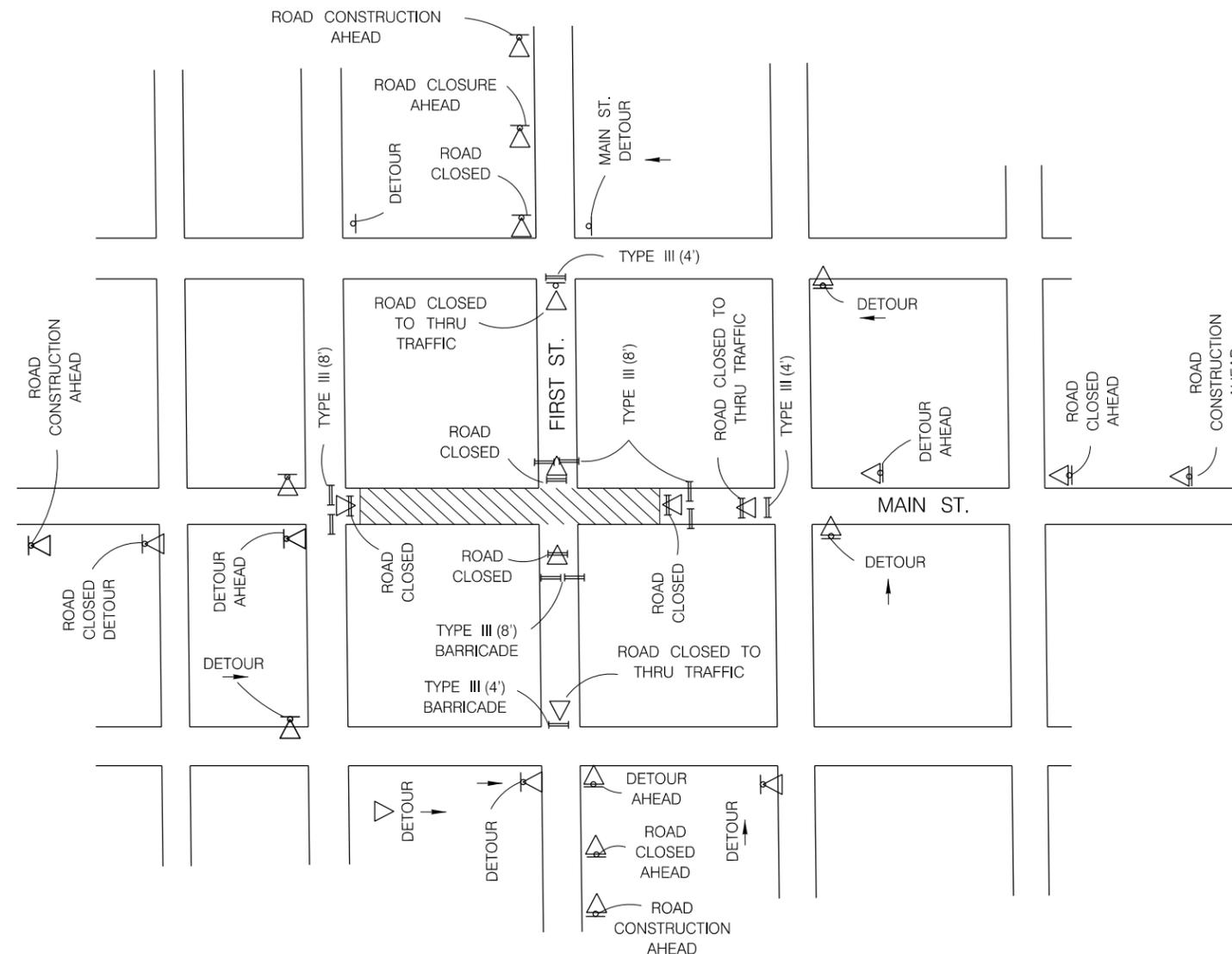
SPECIAL EVENTS BARRICADING

All Type I, (8') barricades used for special events (Dome, Runs, Walks, Parades etc.) shall be a minimum of 42" high and 96" wide. Any necessary signs will require proper sign stands.

USE OF CITY R.O.W.

The City of San Antonio reserves the right to allow contracting and barricading sub-contractors to use the City's R.O.W. The City also reserves the right to advise contractors and barricading sub-contractors to remove stored or unused traffic control devices from the City of San Antonio R.O.W. It is the barricading sub-contractor's responsibility to remove any traffic control device from City's R.O.W. when instructed to do so by a City representative.

CLOSURE DIAGRAMS



TYPICAL INTERSECTING STREET CLOSURE
FOR TWO LANE STREETS

NOTE:
ALL SIGNS WILL BE
MOUNTED ON SIGN
SUPPORTS ONLY

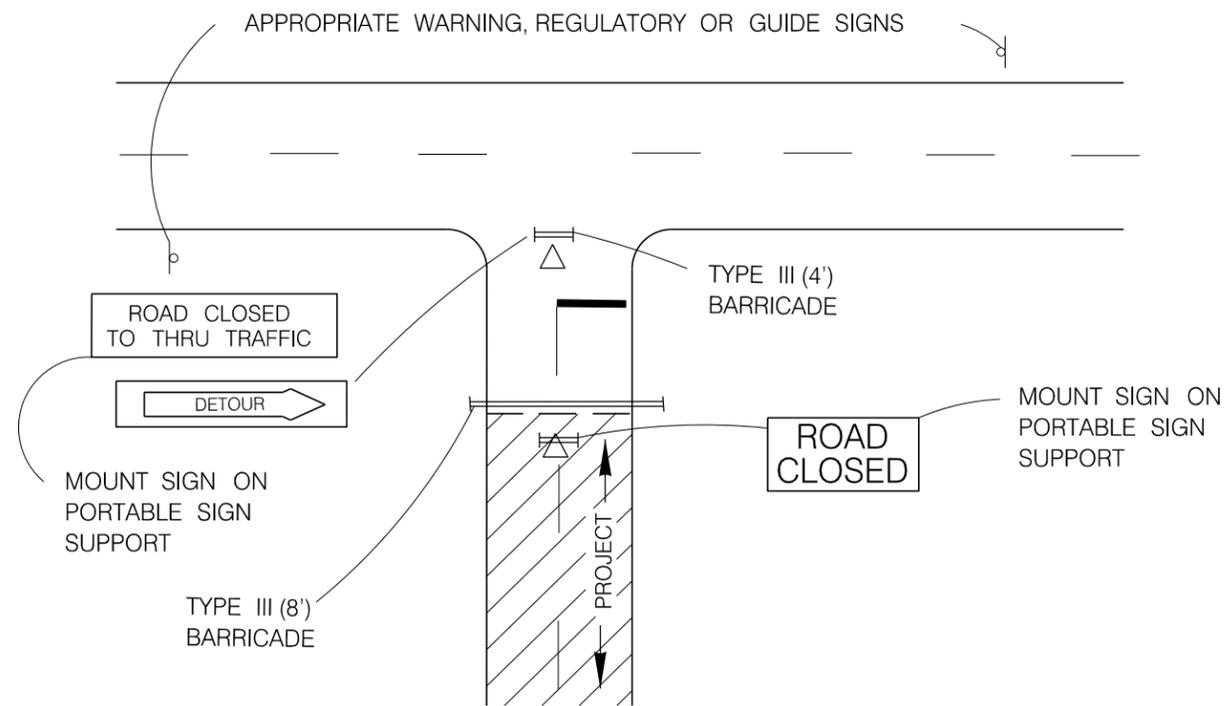
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JUNE 2005

CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS

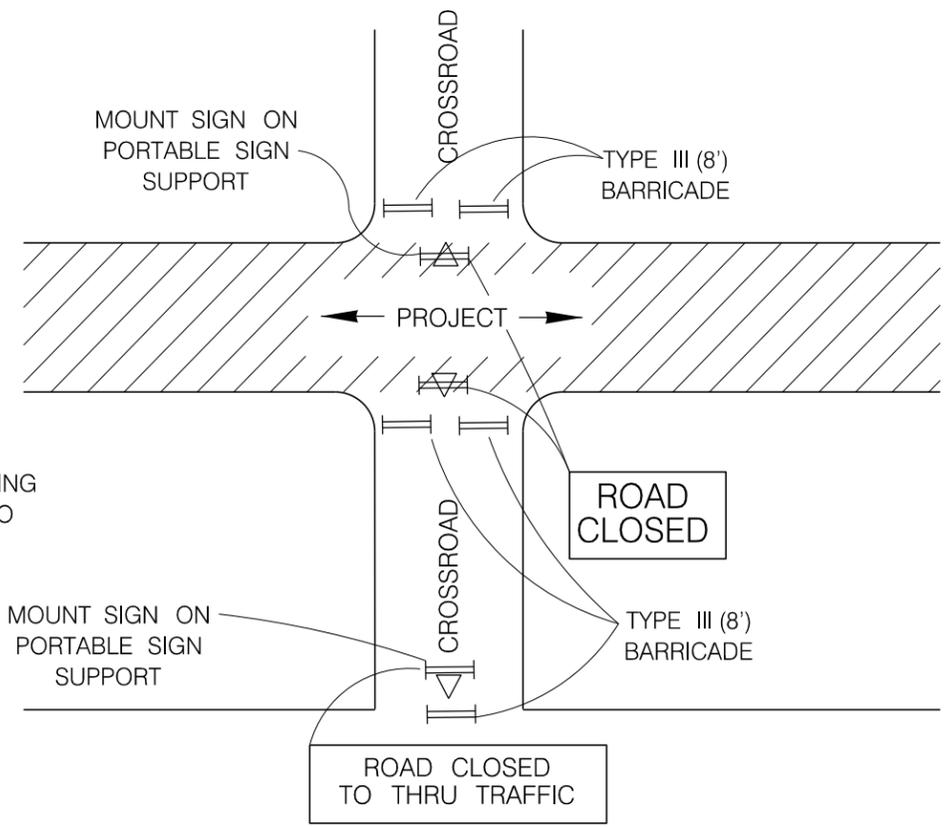
TRAFFIC STANDARDS
**BARRICADE AND CONSTRUCTION
STANDARDS**
SHEET 1 OF 4

% SUBMITTAL	PROJECT NO.:	DATE:
DRWN. BY: A.F.G.	DSGN. BY: E.N.M.	CHKD. BY: J.D.F./E.N.M.
		SHEET NO.: 10

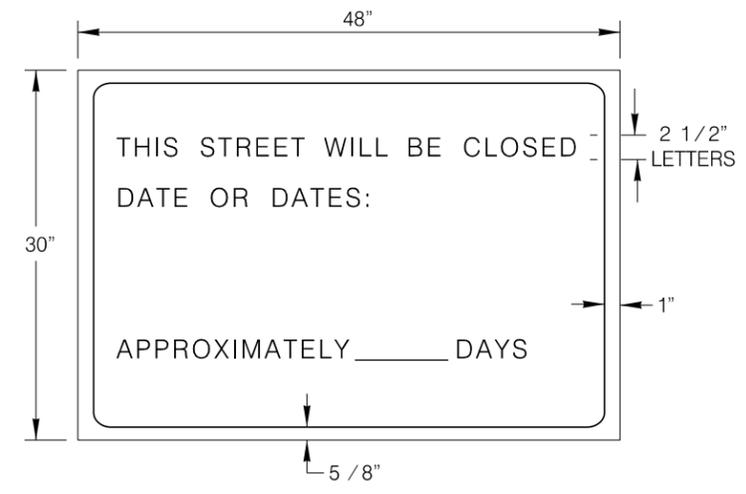


PROJECT LIMITS FOR CLOSED ROADWAY

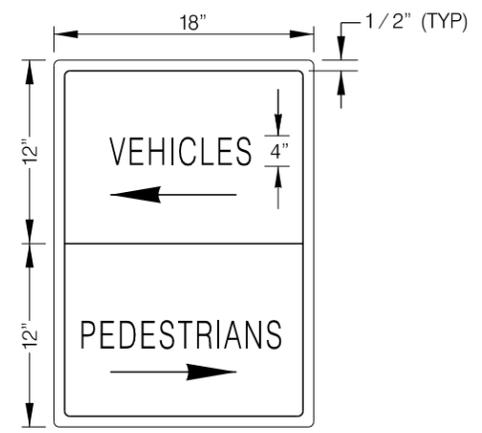
BARRICADES SHALL BE ERECTED COMPLETELY ACROSS ROADWAY. CHANNELIZING DEVICES MAY BE DRUMS, VERTICAL PANELS OR CONES AS SPECIFIED IN THE PLANS



CROSS STREET SIGNING AND BARRICADING TOTALLY CLOSED

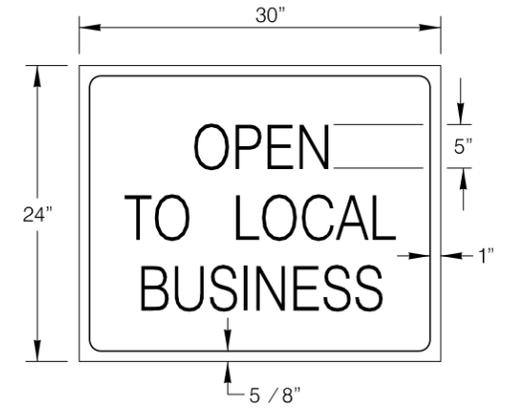


LETTERS- BLACK
BORDER- BLACK
BACKGROUND- ORANGE



LETTERS- BLACK
BORDER- BLACK
BACKGROUND- ORANGE
SPACING-3 SIGNS PER BLOCK

DIRECTION OF ARROWS ARE REVERSIBLE

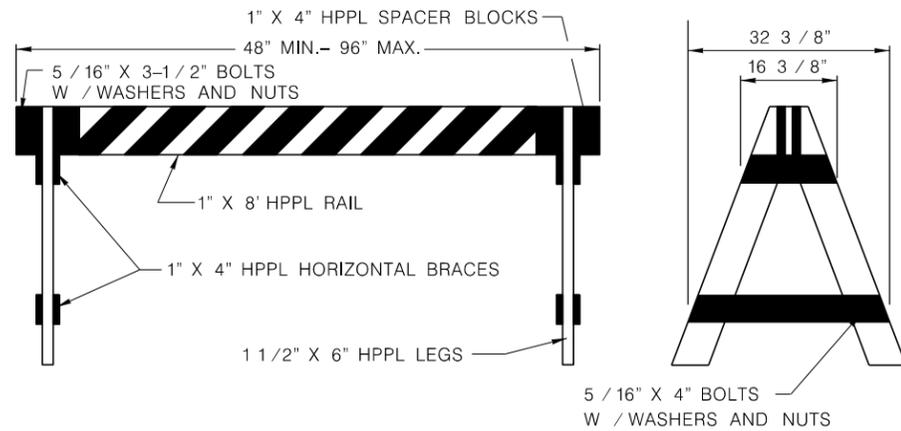


LETTERS- WHITE
BORDER- WHITE
BACKGROUND- BLUE REFLECTIVE

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JUNE 2005			
CITY OF SAN ANTONIO DEPARTMENT OF PUBLIC WORKS			
TRAFFIC STANDARDS BARRICADE AND CONSTRUCTION STANDARDS SHEET 2 OF 4			
% SUBMITTAL	PROJECT NO.:	DATE:	
DRWN. BY: A.F.G.	DSGN. BY: E.N.M.	CHKD. BY: J.D.F./E.N.M.	SHEET NO.: 11

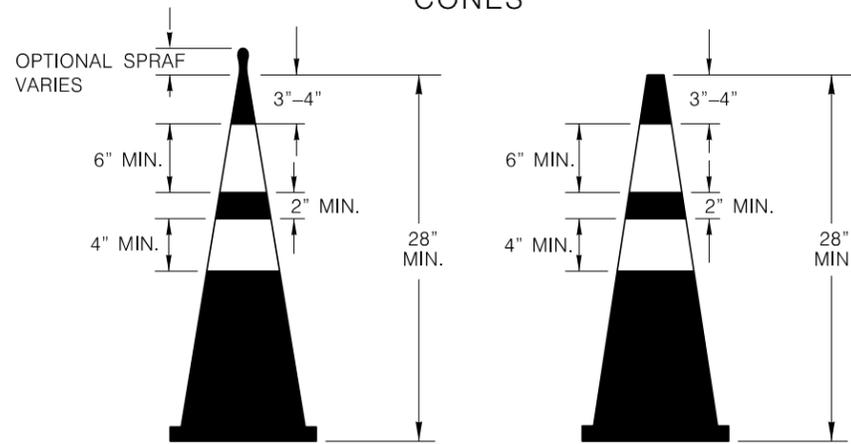
TYPE I BARRICADE



- 1.) Only the following Type I barricade shall be used in the City of San Antonio Right-Of-Way:
 - A. 1" x 8" plastic rail with 2" x 6" wooden legs.
 - B. 1" x 8" wooden rail with plastic legs.
 - C. 1" x 8" wooden rail with 2" x 6" wood legs.
 - D. No screws allowed for assembly of A-legs or rail.
 - E. Warning lights will be used as directed by the Traffic Engineer.
 - F. All Type I (4') barricades will be a minimum of 36" high and 60" wide. (For Construction Use Only)
 - G. All Type I (8') barricades with wooden legs shall be 2" X 6" wood only.
 - H. All Type I (4') barricades with wooden legs shall be 1" X 8" wood only.
- 2.) Type I Barricades shall not be used for partial and total street closures in construction work zones. Only Type III barricades shall be used for this purpose.
- 3.) Warning lights shall not be mounted on Type I barricades.

(See TxDOT BC-03 Sheets for specific construction information)

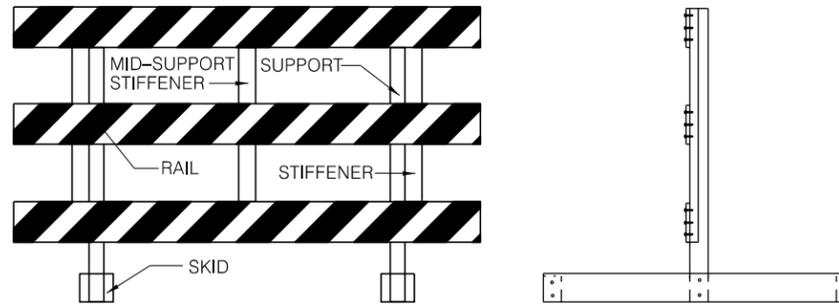
CONES



- 1.) Base for 28" high cones must weigh at least 9.5 lbs.
- 2.) Night time cones must have reflective collars.

(See TxDOT BC-03 Sheets for specific construction information)

Type III BARRICADE



- 1.) Only the following Type III barricade shall be used in the City of San Antonio Right-Of-Way.
 - A. Hollow polyvinyl or fiberglass tubing post with 1" X 8" wooden rails.
 - B. Hollow polyvinyl or fiberglass tubing post with plastic rails.
 - C. Skids must be wood or solid plastic only.
 - D. Warning lights shall not be mounted on Type III barricades.

(See TxDOT BC-03 Sheets for specific construction information)

TEMPORARY MARKINGS

- 1.) Solid double yellow painted lines shall be installed for temporary division of traffic or construction duration longer than five (5) days, with repainting to occur once monthly or at the discretion of the Traffic Engineer. (All cost of upkeep will be at the contractor's expense.)
- 2.) Solid double yellow tabs, or V/P panels shall be installed for temporary division of traffic for construction duration less than five (5) days, with re-tapping to occur at the discretion of the Traffic Engineer. NAILS SHALL NOT BE USED TO FIX TABS TO CEMENT OR BASE (All cost of upkeep will be at the contractor's expense.)

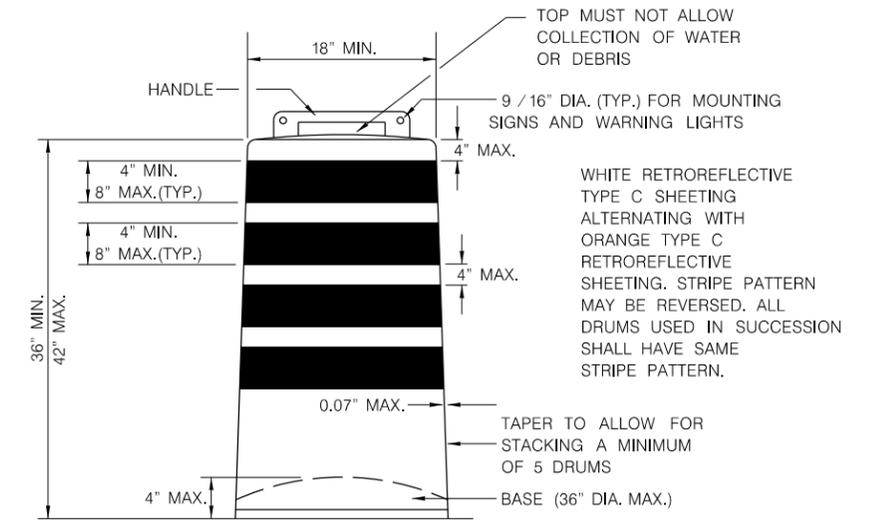
(See TxDOT BC-03 Sheets for specific construction information.)

TEMPORARY CONCRETE BARRIER

- 1.) All concrete barriers placed on City R.O.W. shall be low profile.
- 2.) No high profile barriers will be allowed.
- 3.) Reflectors will be required on each concrete barrier.

(See TxDOT BC-03 Sheets for specific construction information)

PLASTIC DRUMS



- 1.) Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- 2.) Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
- 3.) The Engineer/Inspector shall provide written notice to the Contractor regarding the replacement of drums or other traffic control devices. The Contractor shall have a maximum of 24 hours to replace any plastic drums or other traffic control devices identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.
- 4.) Each drum must have a 40 lb. rubber or plastic snap on.
- 5.) No signs larger than 18" X 24" will be allowed to be mounted on plastic drums.
- 6.) No warning lights will be allowed to be mounted on plastic barrels.
- 7.) In lieu of a warning light, a yellow reflector will be acceptable.

(See TxDOT BC-03 Sheets for specific construction information)

JUNE 2005

CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS

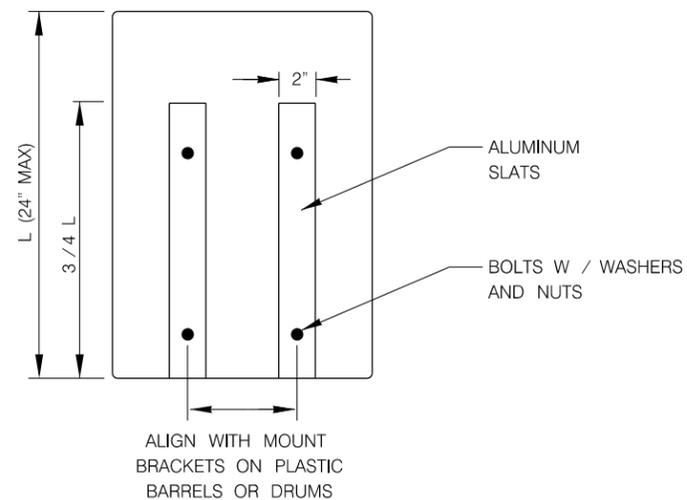
TRAFFIC STANDARDS
BARRICADE AND CONSTRUCTION STANDARDS
SHEET 3 OF 4

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DRWN. BY: A.F.G.	DSGN. BY: E.N.M.	CHKD. BY: J.D.F./E.N.M.	SHEET NO.: 12
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SIGNS

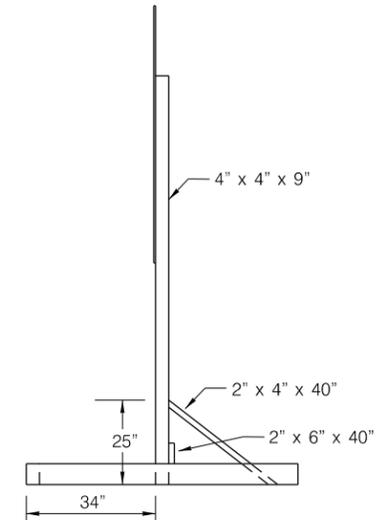
- 1.) A maximum of two signs can be mounted on any one Long / Intermediate Term Stationary Portable Sign Support.
- 2.) 48" X 48" signs shall be mounted separately on the Long / Intermediate Term Stationary Portable Sign Support.
- 3.) For Short Term Stationary Portable Sign Support the distance from the bottom of the vinyl sign to the exiting ground must be one (1) foot.
- 4.) Long / Intermediate Term Stationary Portable Signs must be made of wood or plastic only.
- 5.) No signs shall be mounted to any Type I, Type III, or folding barricades.
- 6.) Signs shall be mounted only on TxDOT approved sign supports.
- 7.) Detour signs will be mounted on single "D" legs w / 7' clearance from the bottom of the sign.
- 8.) WORK DURATION TERMINOLOGY
 Long Term Stationary = occupies a location 3 or more days.
 Intermediate-Term Stationary = occupies a location for overnight to 3 days.
 Short Term Stationary = daylight work that occupies a location from 1 to 12 hours.
 Short Duration = occupies a location up to 1 hour.
- 9.) Signs shall adhere to the following requirements:
 - Signs placed on plastic barrels or drums shall be made of ABS plastic or plywood.
 - Signs placed on skids shall be made of plywood or aluminum.
 - Aluminum signs shall have a minimum thickness of 0.08".
 - Plywood signs shall have a minimum thickness of 1 / 2".
 - ABS Plastic signs shall have a minimum thickness of 0.13".
 Plastic signs cannot exceed 18" by 24" in size and shall be reinforced with 2" wide, 0.08" thick aluminum slats, as depicted below:



- No other material shall be accepted without the express written approval of the Traffic Engineer.

(See TxDOT BC-03 Sheets for specific construction information.)

LONG TERM / INTERMEDIATE TERM SIGN SUPPORT



- 1.) 48" X48" signs must be mounted independently.
- 2.) A maximum of two signs can be mounted on any one long term / intermediate sign support.
- 3.) Sand bag all sign supports.
- 4.) Distance from the bottom of the sign to the existing ground shall be 7'.
- 5.) Distance from the header barricade rail to the face of the sign panel shall be 2' min. and 10' max.
- 6.) Steel tripods shall not be allowed.

(See TxDOT BC-03 Sheets for specific construction information)

JUNE 2005

CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS

TRAFFIC STANDARDS
BARRICADE AND CONSTRUCTION STANDARDS
SHEET 4 OF 4

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		SHEET NO.: 13

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DATE:
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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

SHEET 1 OF 12



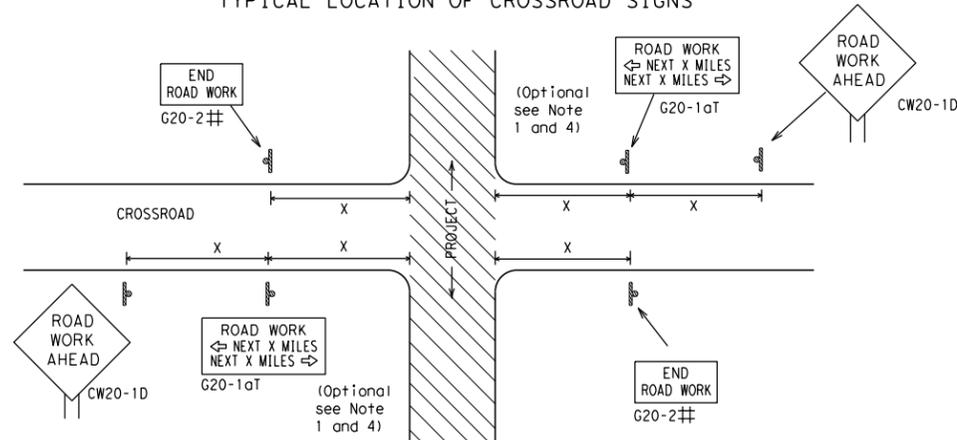
**BARRICADE AND CONSTRUCTION
 GENERAL NOTES
 AND REQUIREMENTS**

BC (1) - 21

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS									
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9-07	8-14								
5-10	5-21	DIST	COUNTY			SHEET NO.			
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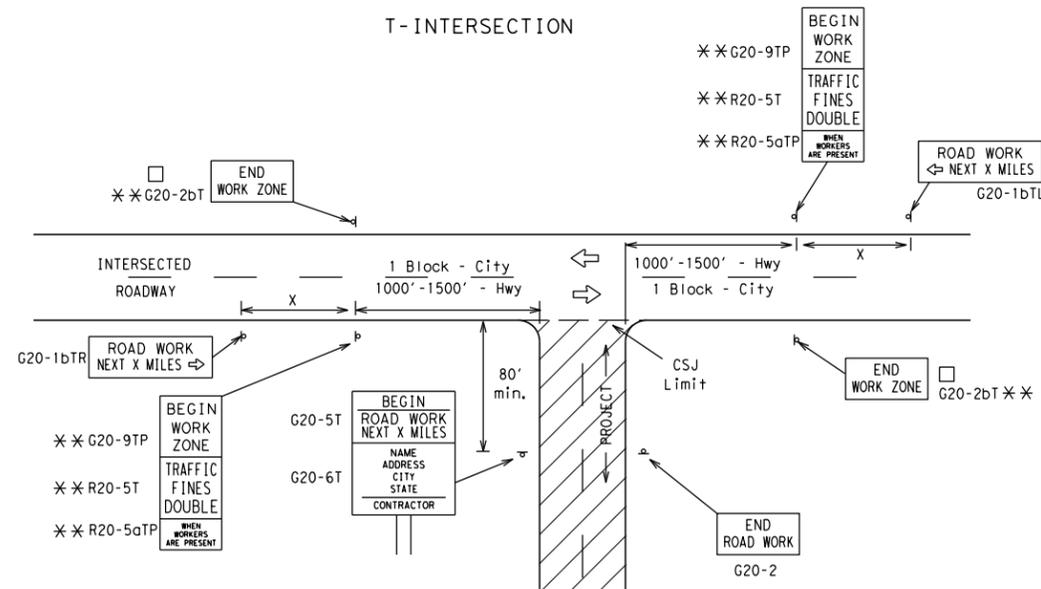
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TYPICAL LOCATION OF CROSSROAD SIGNS



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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING^{1,5,6}

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Δ Spacing "x" Feet (Apprx.)
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	60	600 ²
			65	700 ²
			70	800 ²
			80	1000 ²
*			*	* ³

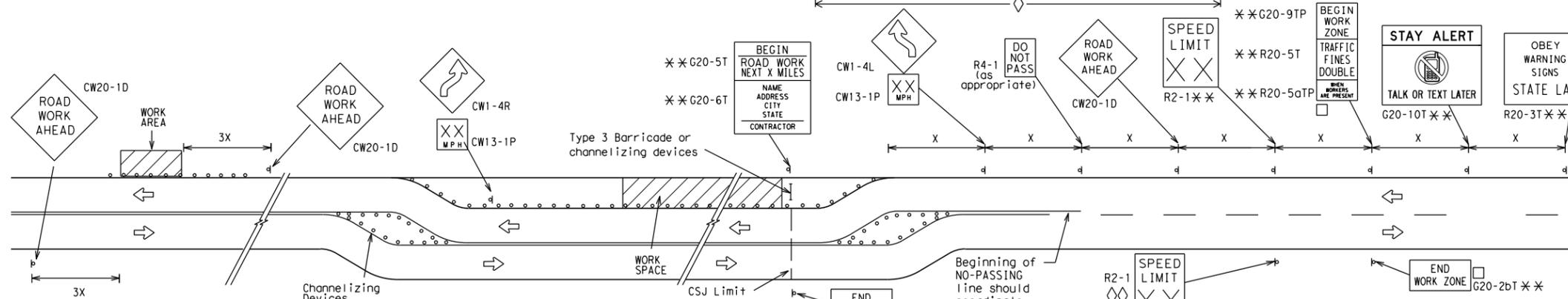
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

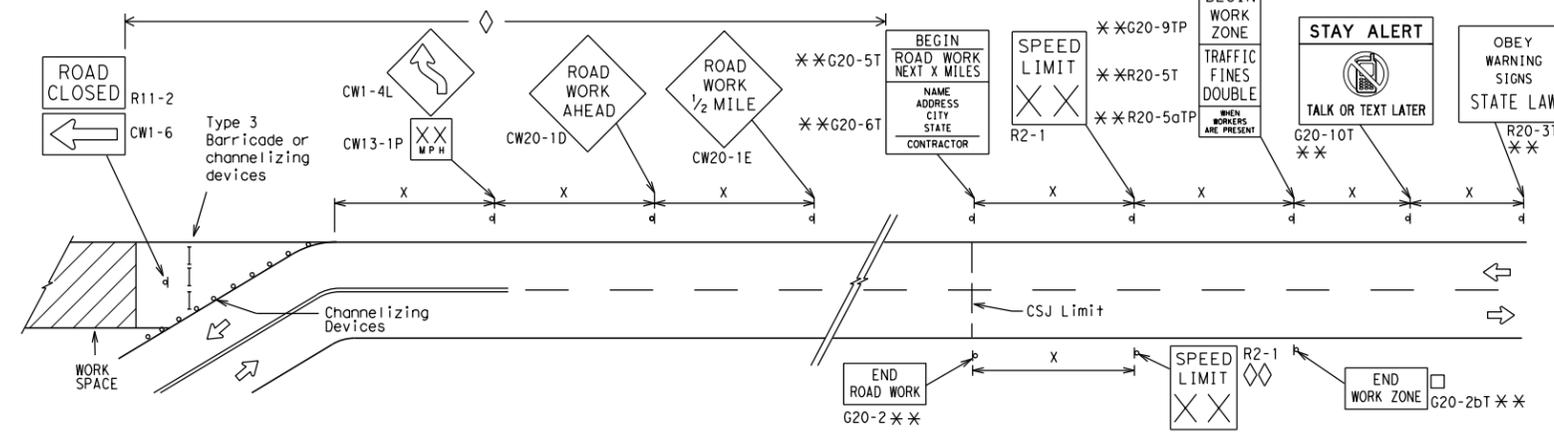
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

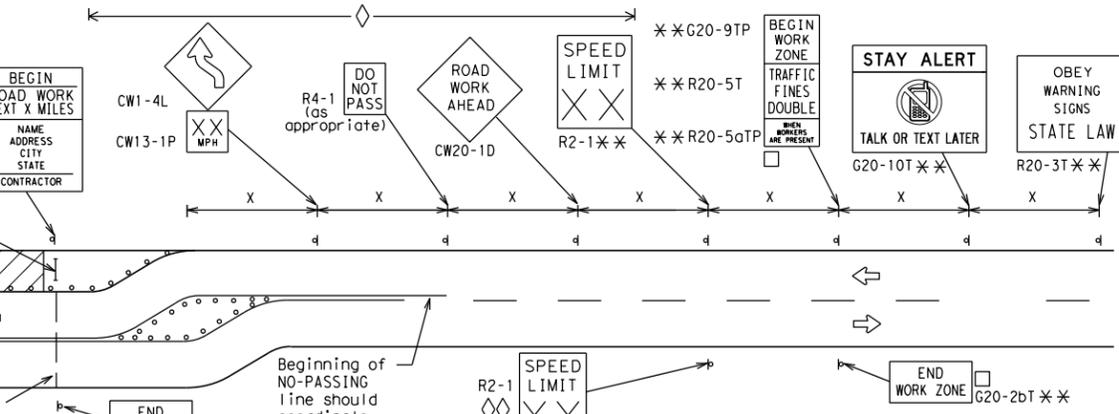


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "x" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
- CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
- Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
- Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND	
—	Type 3 Barricade
○ ○ ○	Channelizing Devices
■	Sign
x	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

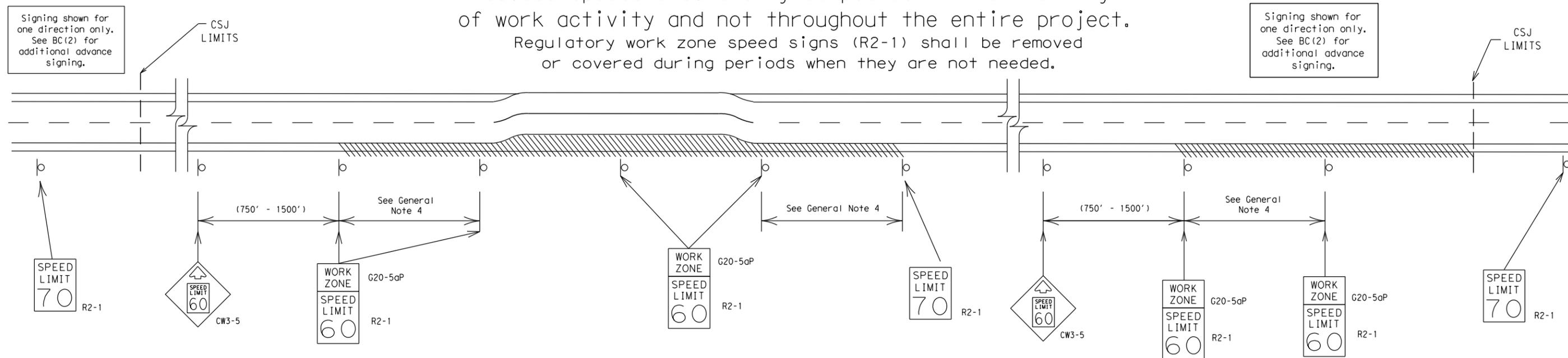
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project. Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- other conditions readily apparent to the driver

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- Frequency of work zone speed limit signs should be:

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

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SHEET 3 OF 12



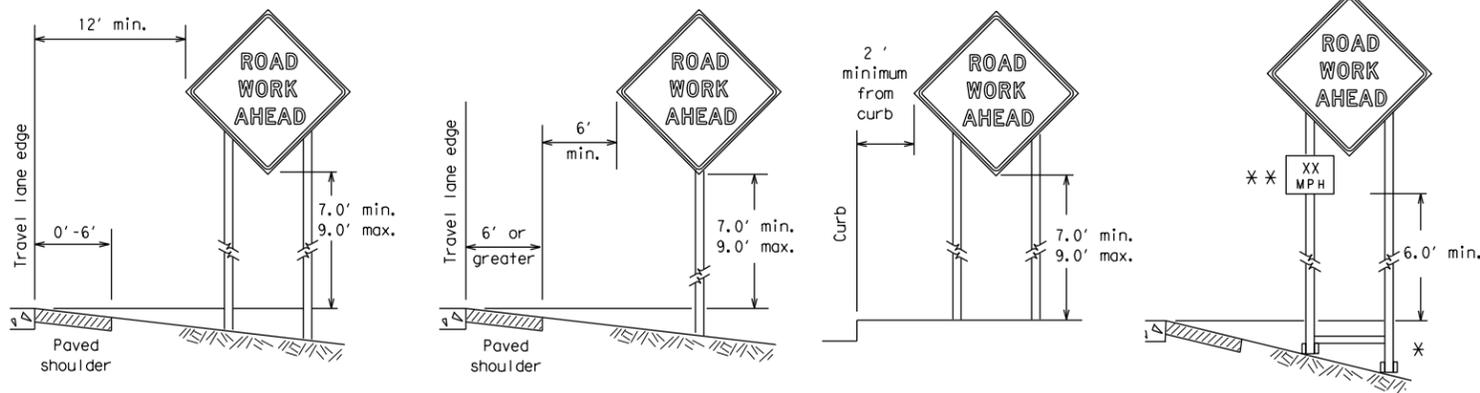
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

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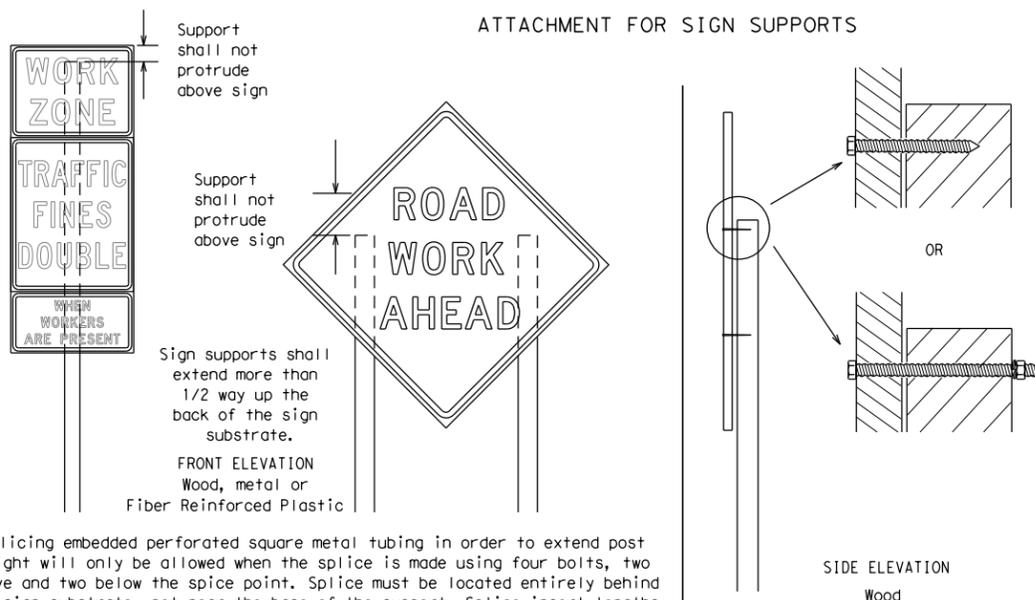
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

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

ATTACHMENT FOR SIGN SUPPORTS



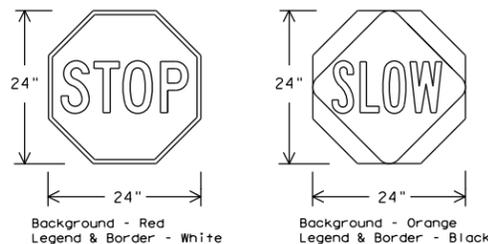
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

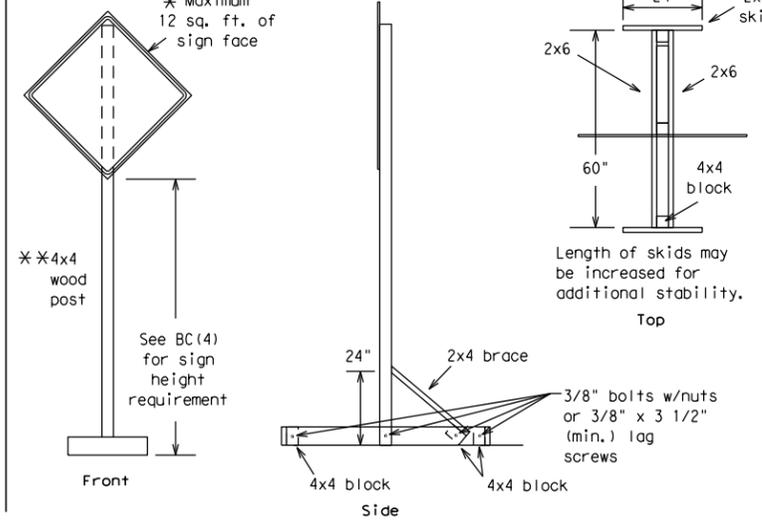
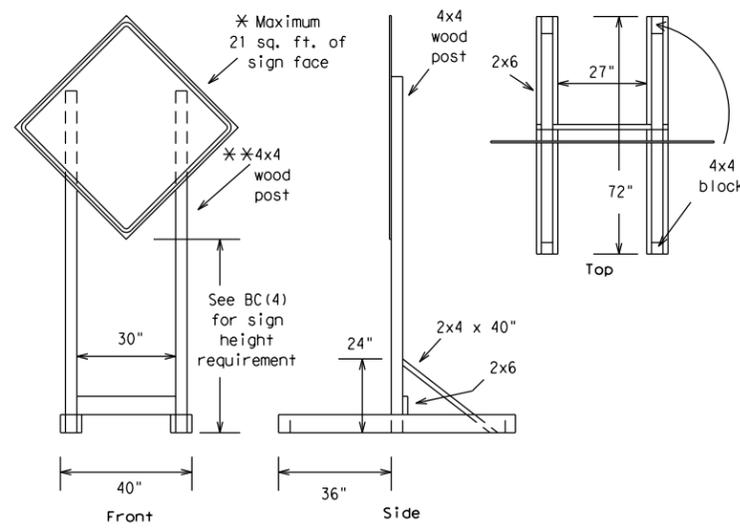


BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

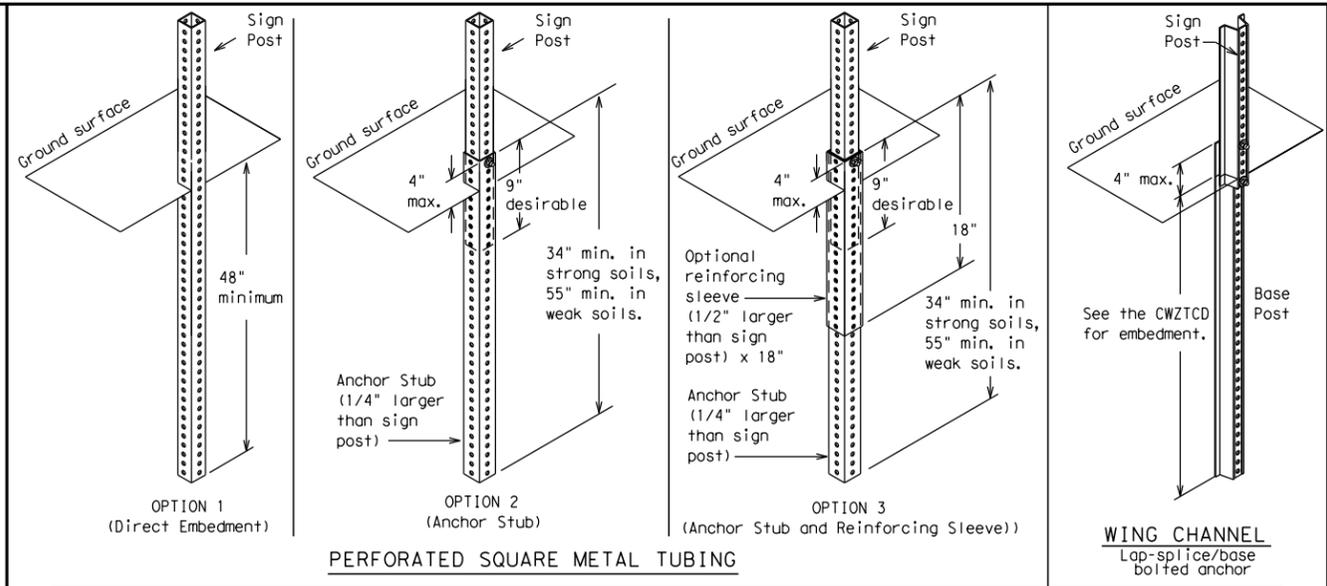
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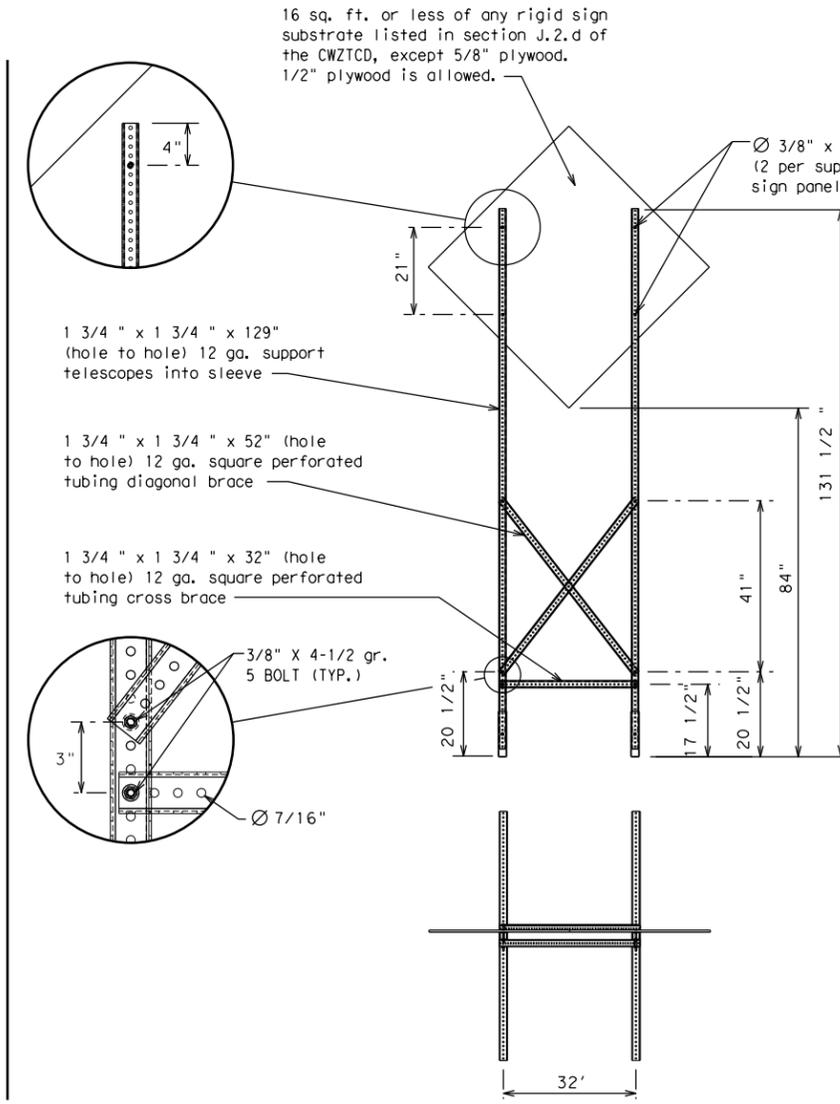
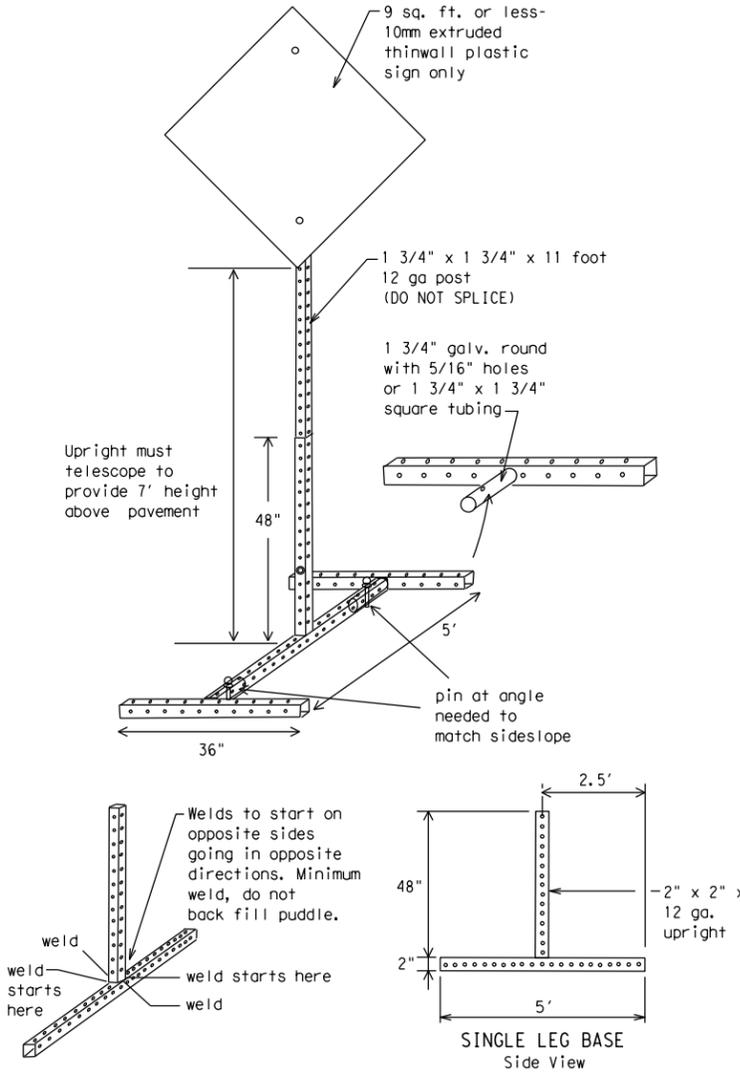
SKID MOUNTED WOOD SIGN SUPPORTS

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



GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

- * See BC(4) for definition of "Work Duration."
- ** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

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BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Cannot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLR
High-Occupancy	HOV	Tuesday	TUES
Vehicle	HWY	Time Minutes	TIME MIN
Highway	HR, HRS	Upper Level	UPR LEVEL
Hour(s)	HR, HRS	Vehicles (s)	VEH, VEHS
Information	INFO	Warning	WARN
It Is	ITS	Wednesday	WED
Junction	JCT	Weight Limit	WT LIMIT
Left	LFT	West	W
Left Lane	LFT LN	Westbound	(route) W
Lane Closed	LN CLOSED	Wet Pavement	WET PVMT
Lower Level	LWR LEVEL	Will Not	WONT
Maintenance	MAINT		

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI
ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT
ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
LANES SHIFT *

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

MERGE RIGHT
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE *

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

SHEET 6 OF 12



BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

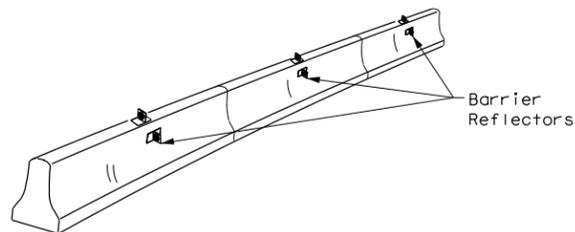
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
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7-13 5-21	DIST	COUNTY	SHEET NO.	19

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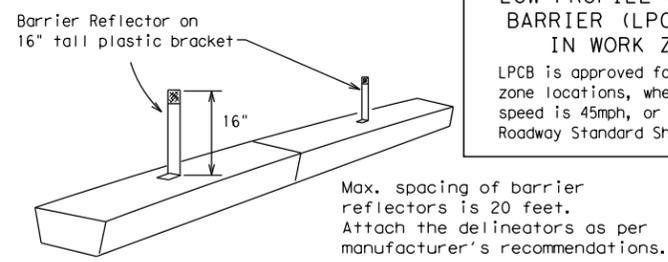
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



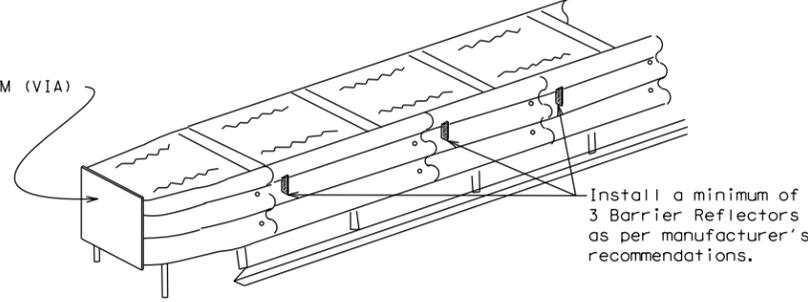
CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES
 LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.
 Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

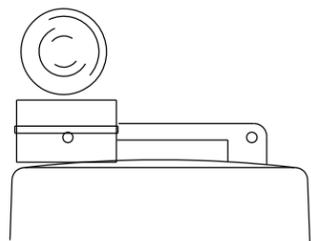
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

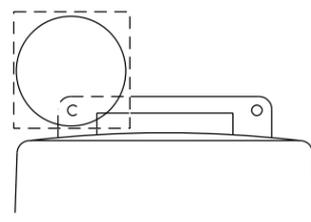
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



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

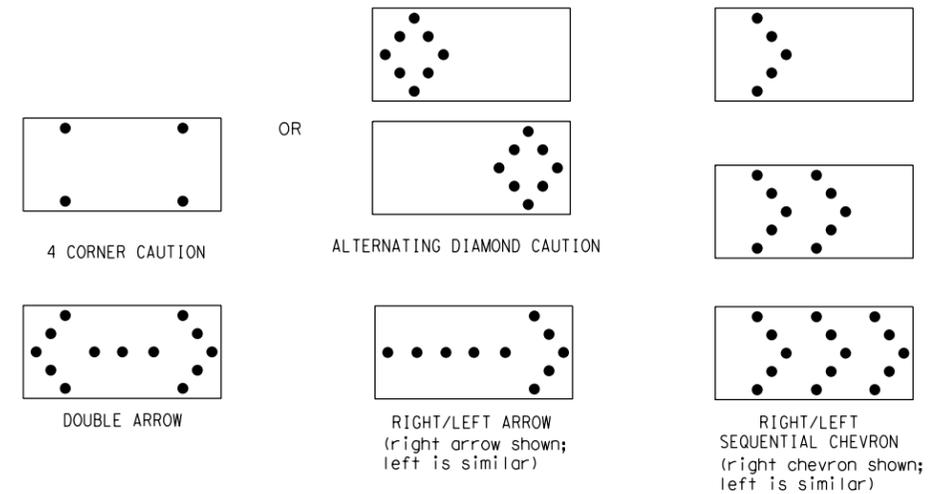


Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

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



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

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.



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

BC (7) - 21

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REVISIONS									
9-07	8-14								
7-13	5-21	DIST	COUNTY		SHEET NO.				
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

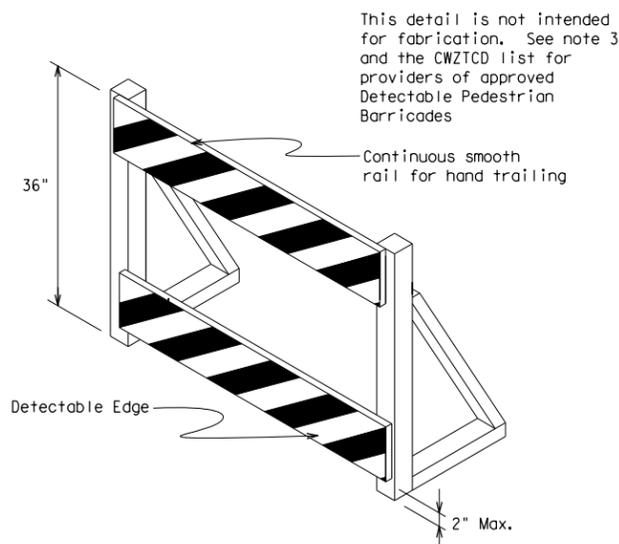
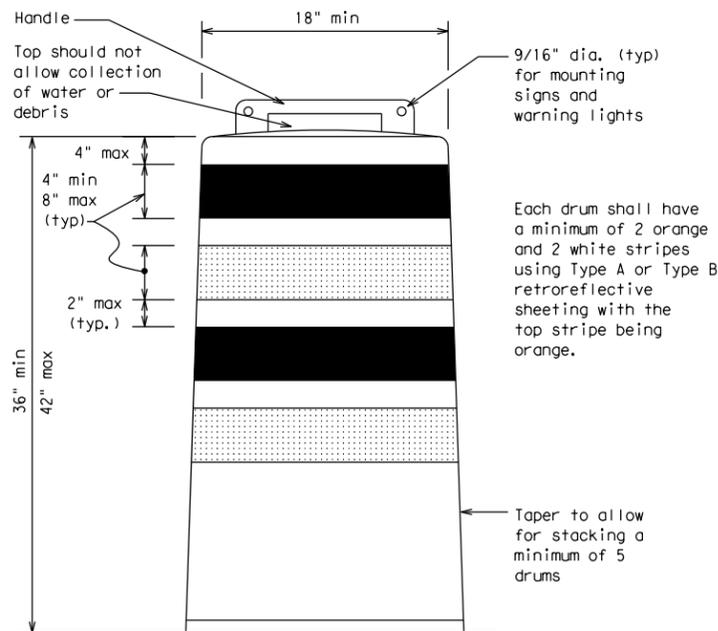
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

RETROREFLECTIVE SHEETING

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

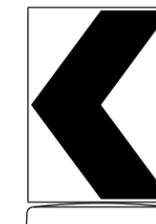
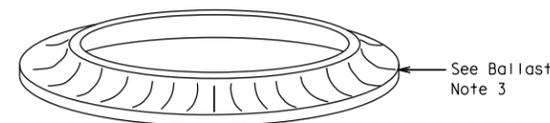
BALLAST

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

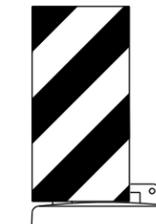


DETECTABLE PEDESTRIAN BARRICADES

- When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
- Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
- Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
- Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
- Warning lights shall not be attached to detectable pedestrian barricades.
- Detectable pedestrian barricades should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



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



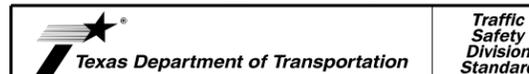
12" x 24"
Vertical Panel
mount with diagonals
sloping down towards
travel way

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12

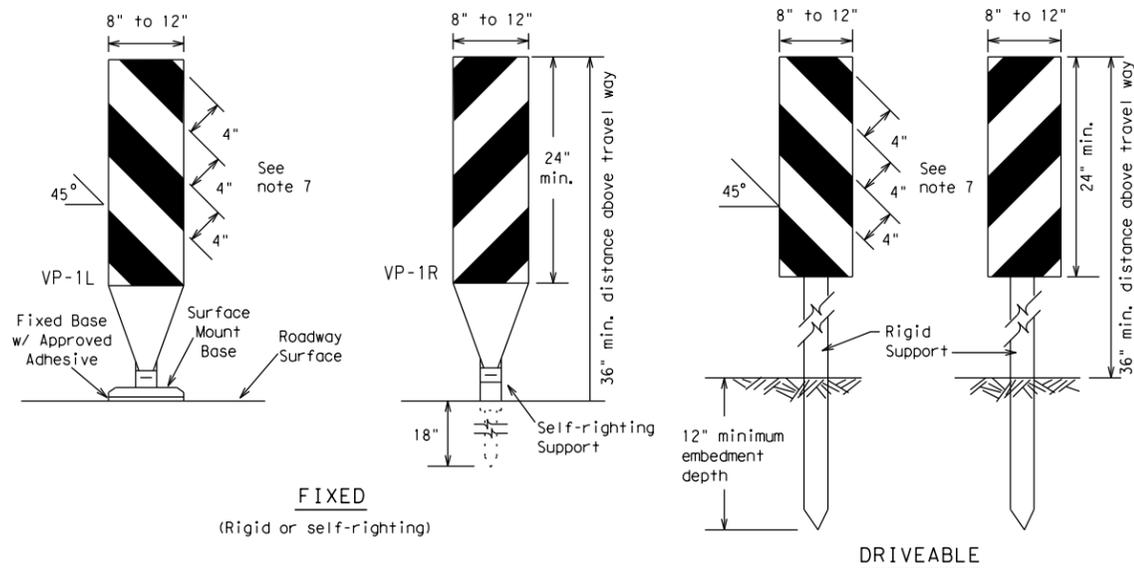


BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

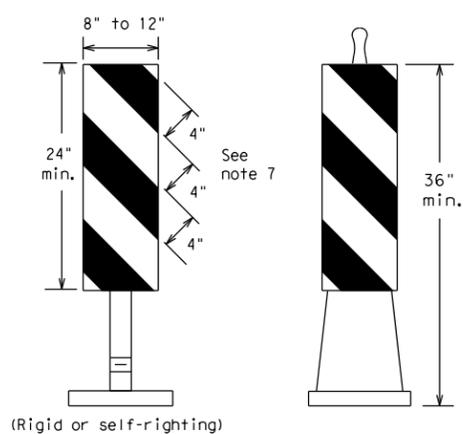
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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
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FIXED
(Rigid or self-righting)

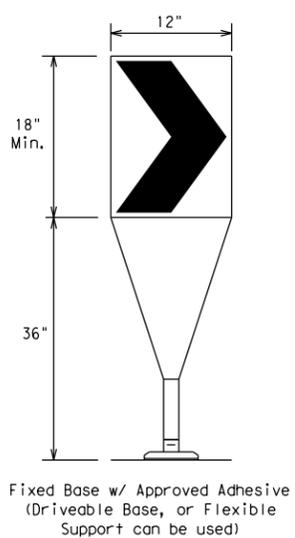
DRIVEABLE



PORTABLE

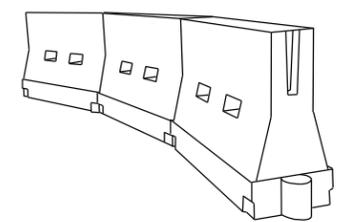
VERTICAL PANELS (VPs)

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



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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

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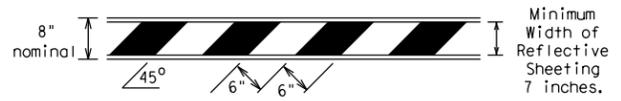
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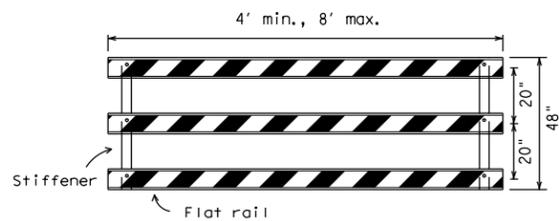
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

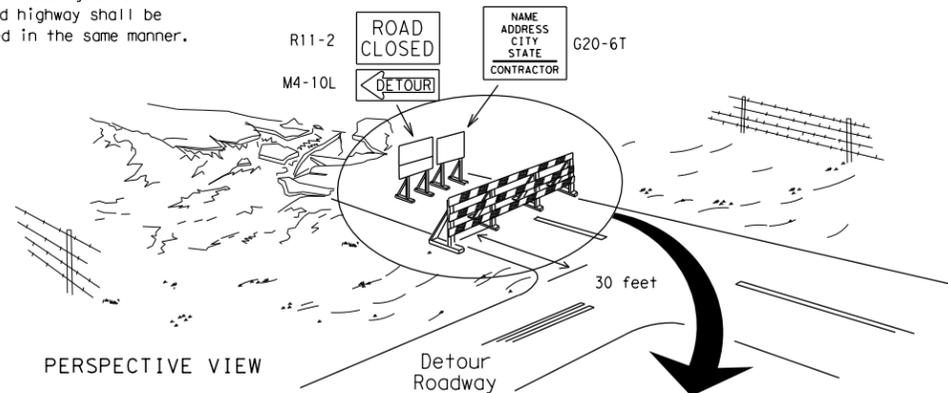


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



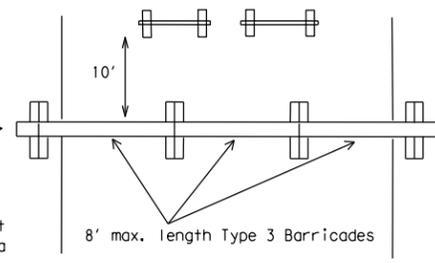
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

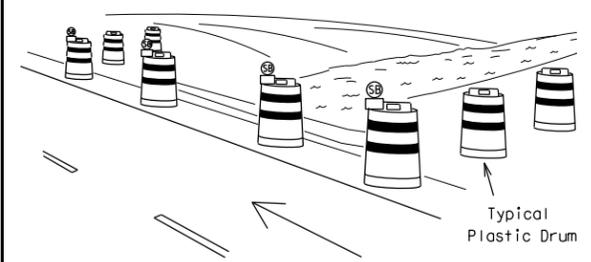
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



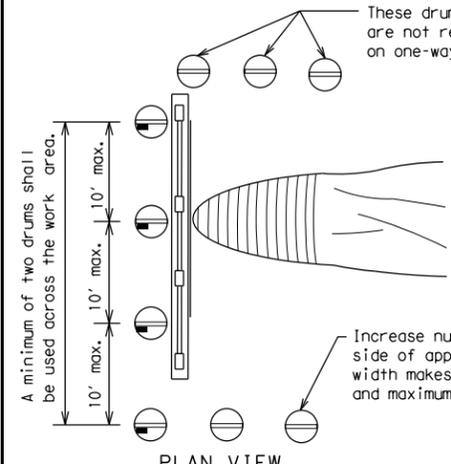
PLAN VIEW

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

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

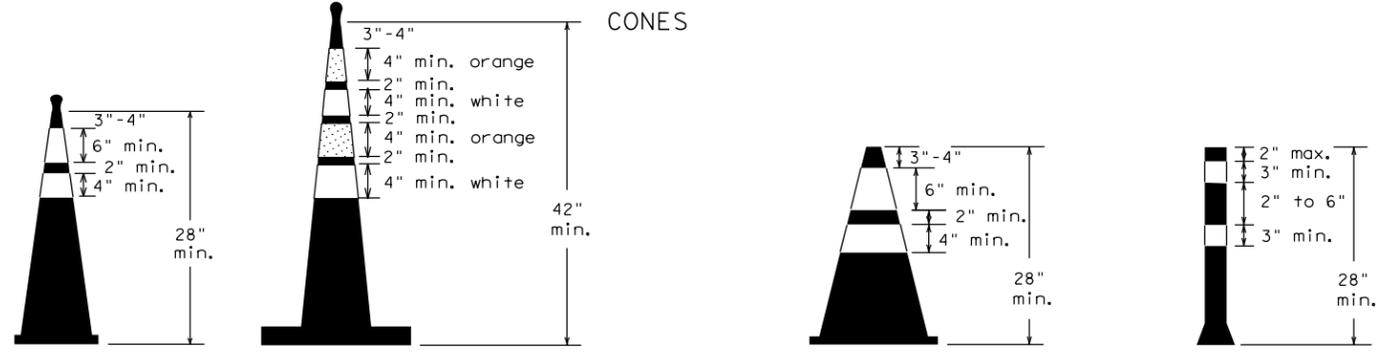


PLAN VIEW

1. Where positive redirection capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.

LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
	Steady burn warning light or yellow warning reflector

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



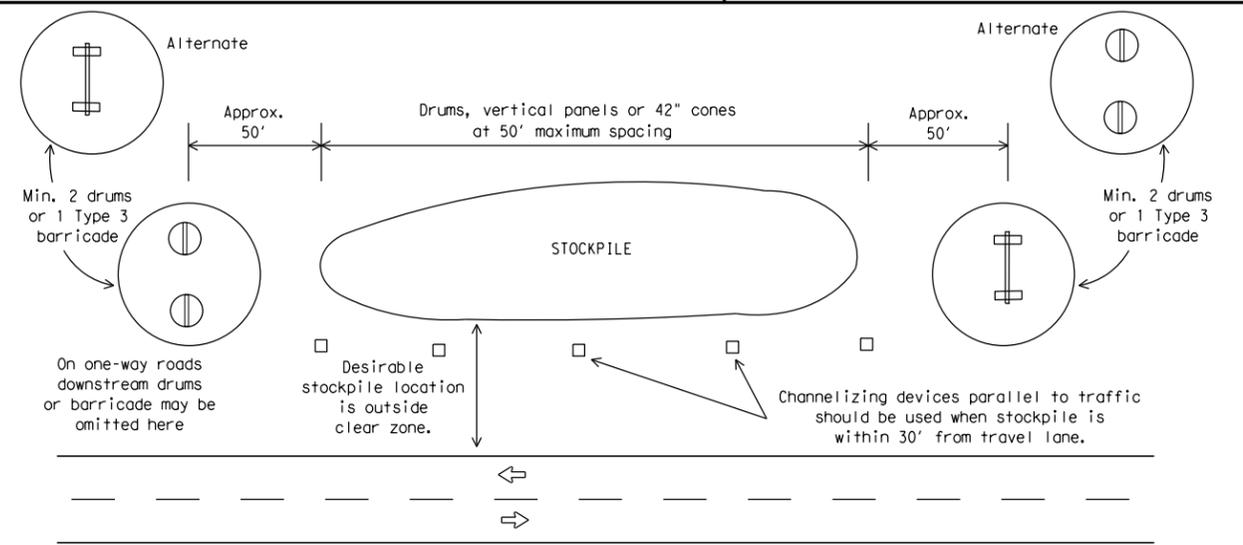
Two-Piece cones

One-Piece cones

Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A or Type B.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

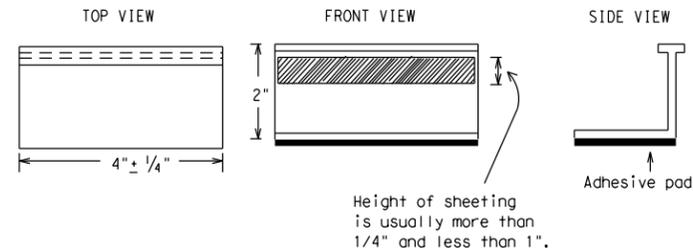
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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11-02	8-14			
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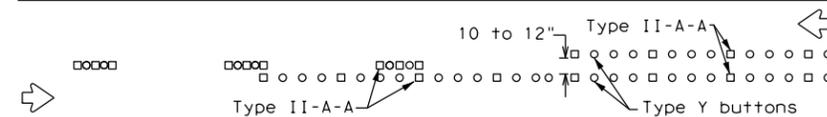
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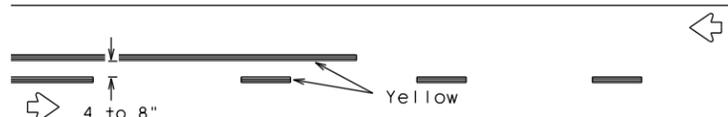
PAVEMENT MARKING PATTERNS



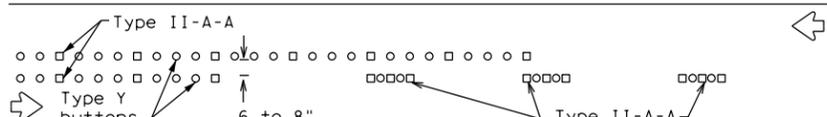
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



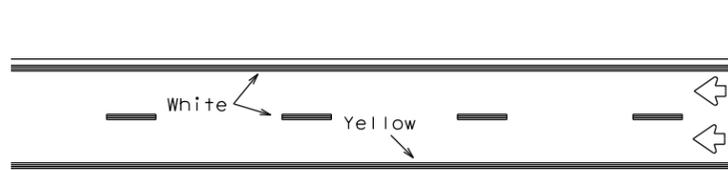
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



RAISED PAVEMENT MARKERS - PATTERN B

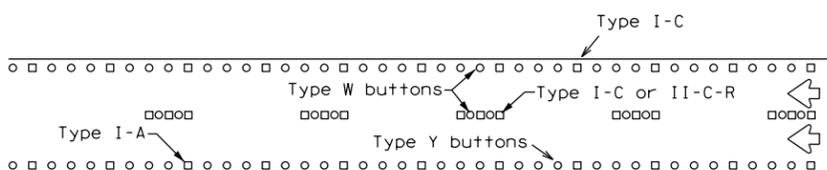
Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

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



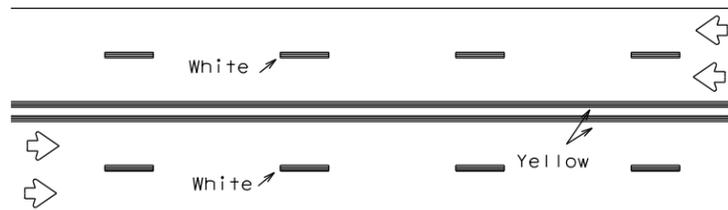
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



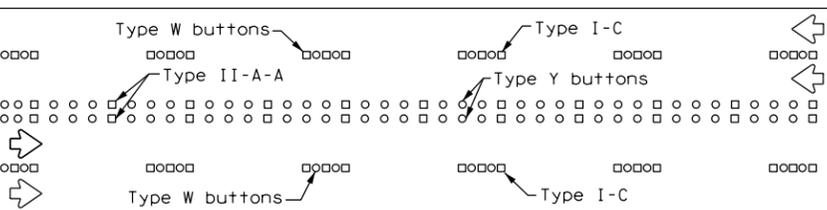
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



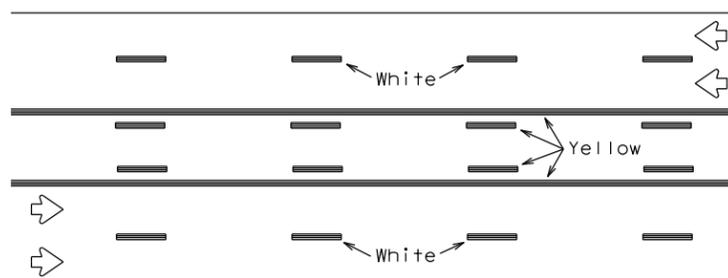
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



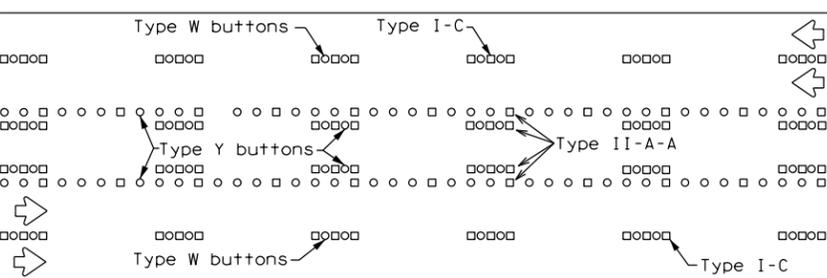
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

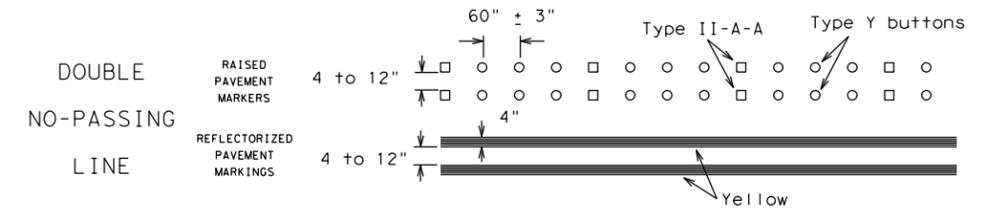
Prefabricated markings may be substituted for reflectORIZED pavement markings.



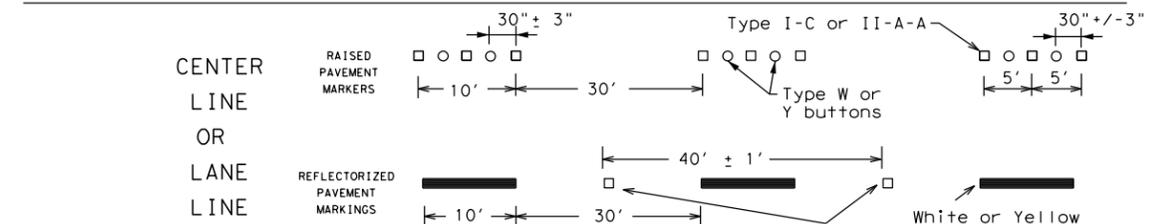
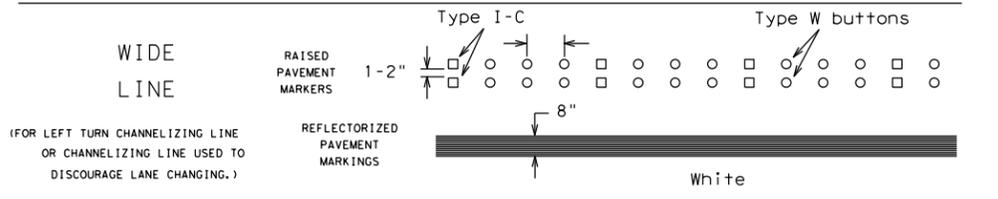
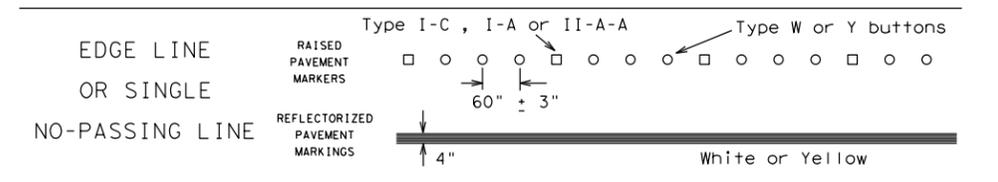
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

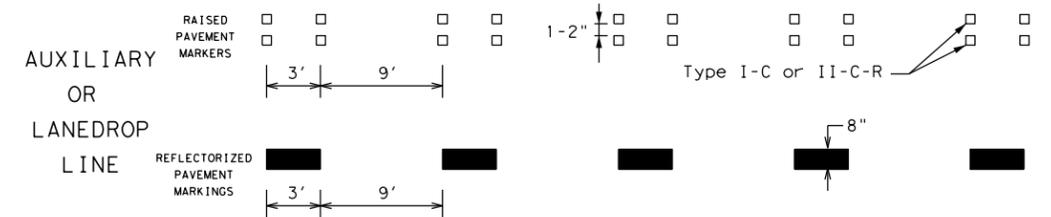
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

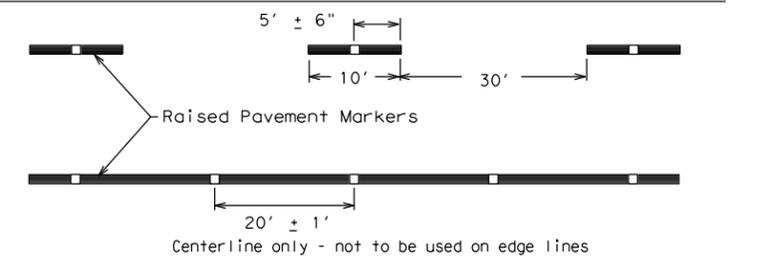


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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			25	

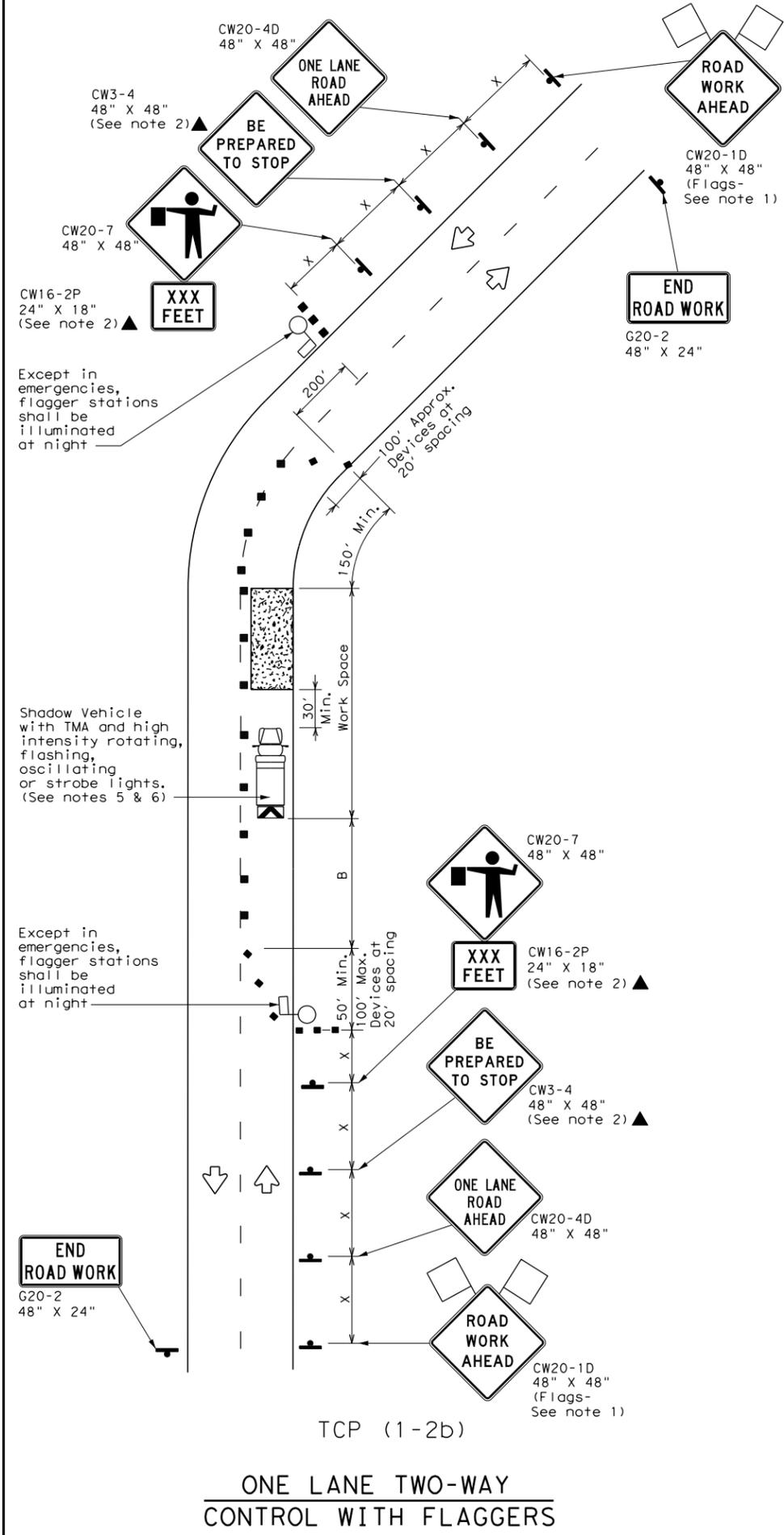
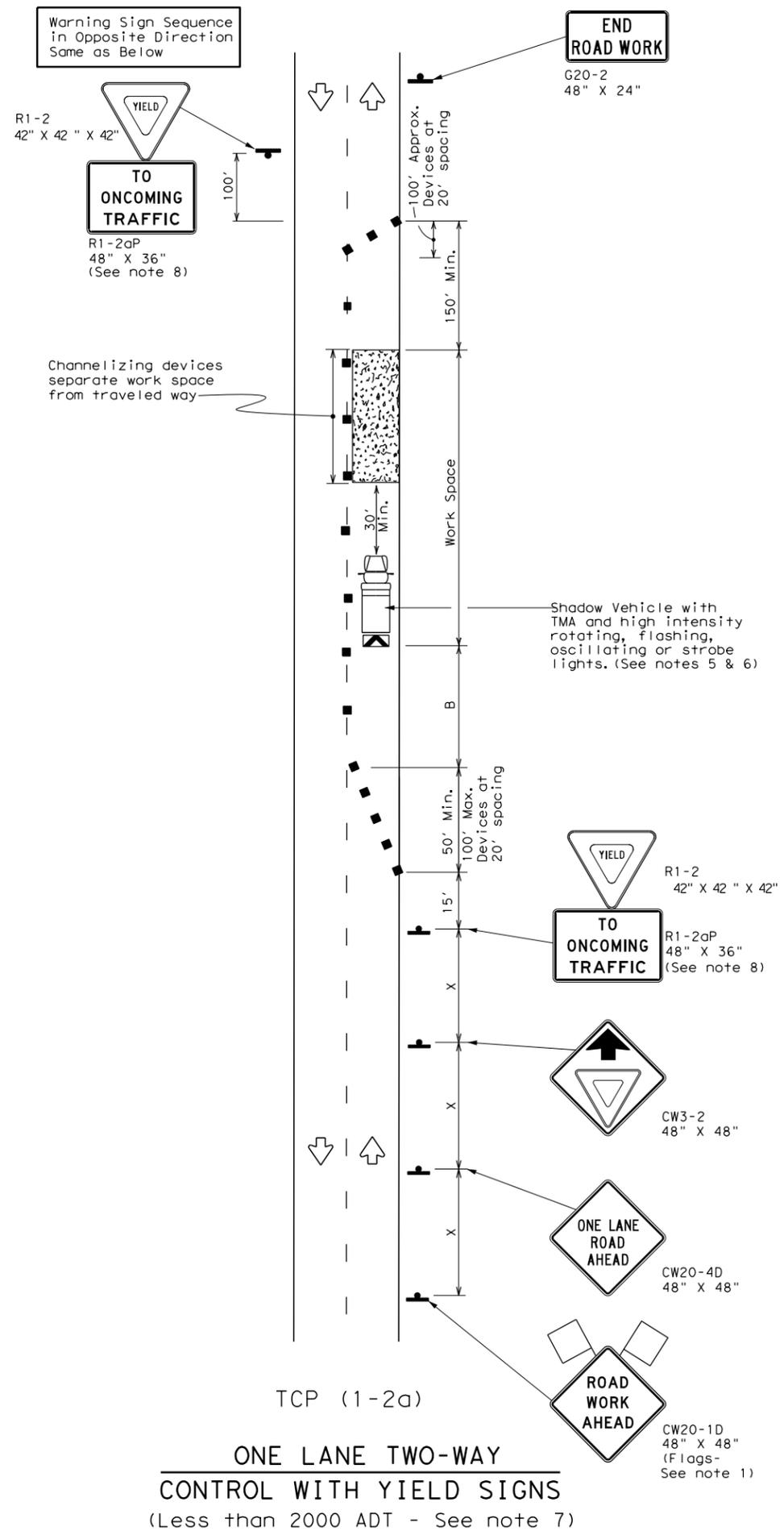
Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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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 * X	Formula L = WS ² / 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 ² / 60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45		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.

Texas Department of Transportation *Traffic Operations Division Standard*

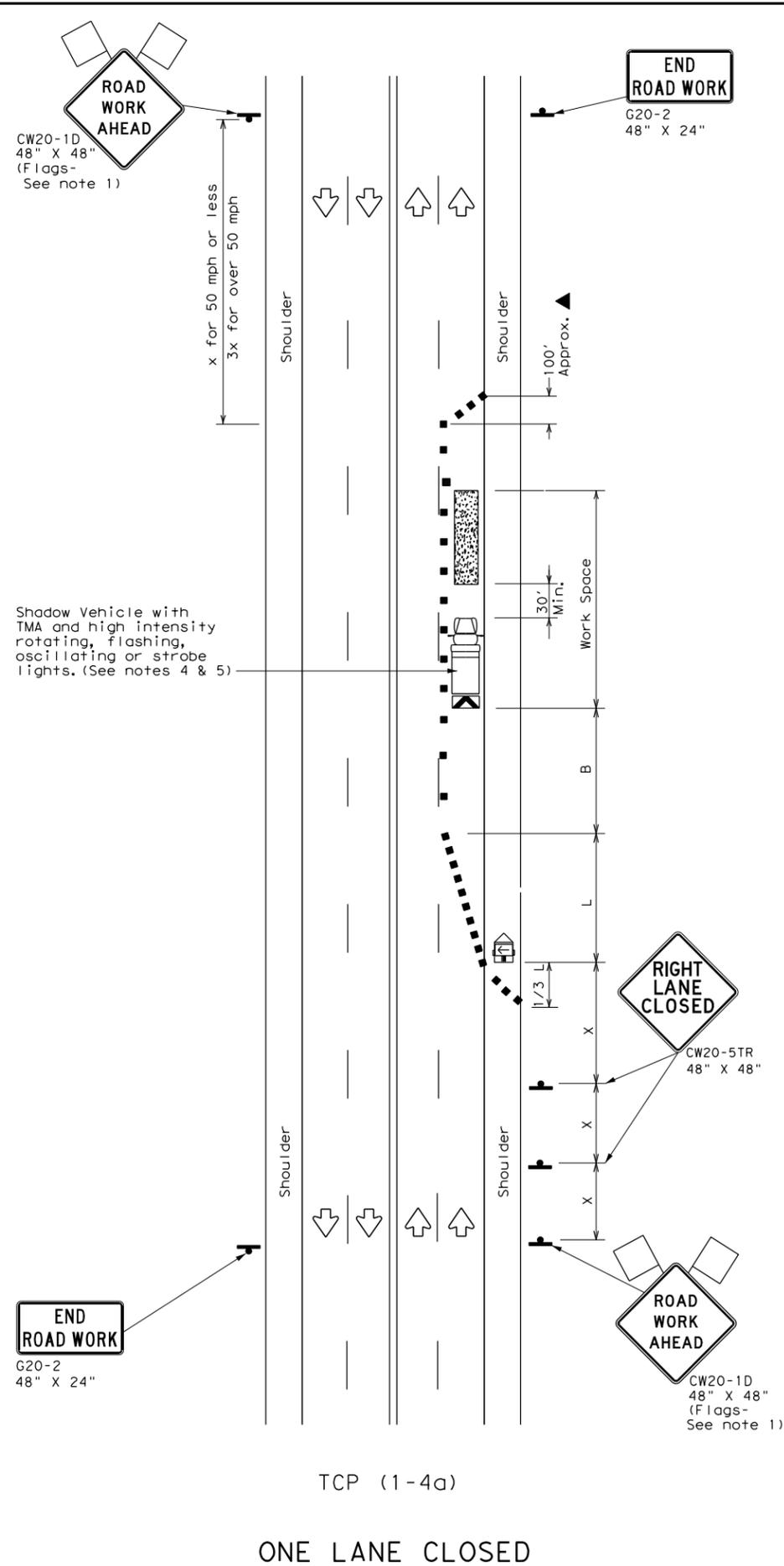
TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP (1-2) - 18

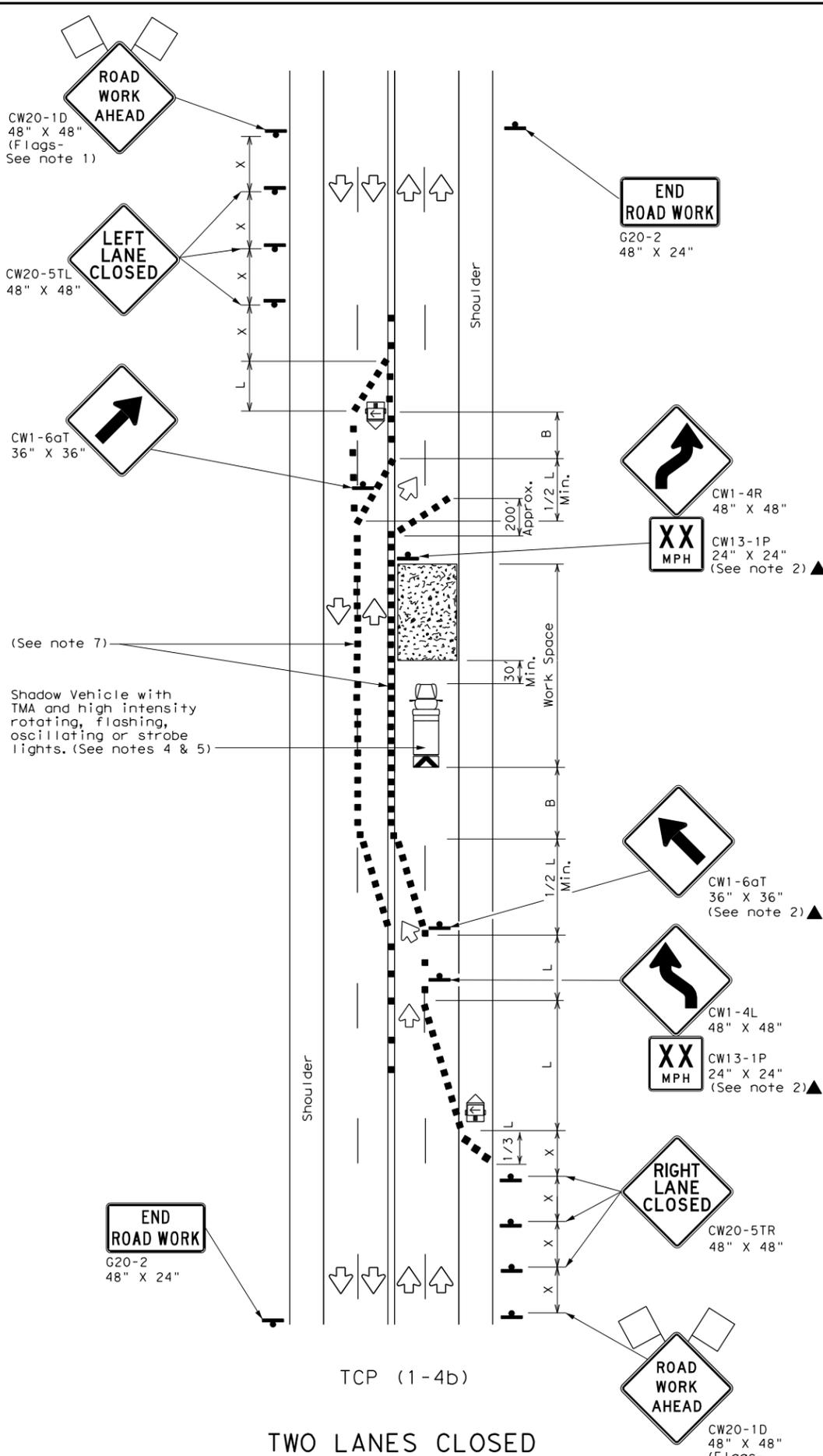
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© TxDOT December 1985	CON:	SECT:	JOB:	HIGHWAY:
REVISIONS				
4-90 4-98				
2-94 2-12				
1-97 2-18				
	DIST:	COUNTY:	SHEET NO. 26	

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DATE: FILE:



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.

		Traffic Operations Division Standard	
TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS			
TCP (1-4) - 18			
FILE: tcp1-4-18.dgn	DN:	CK:	DW:
© TxDOT December 1985	CON:	SECT:	JOB:
REVISIONS		HIGHWAY:	
2-94 4-98	DIST:		COUNTY:
8-95 2-12	SHEET NO.		27
1-97 2-18			

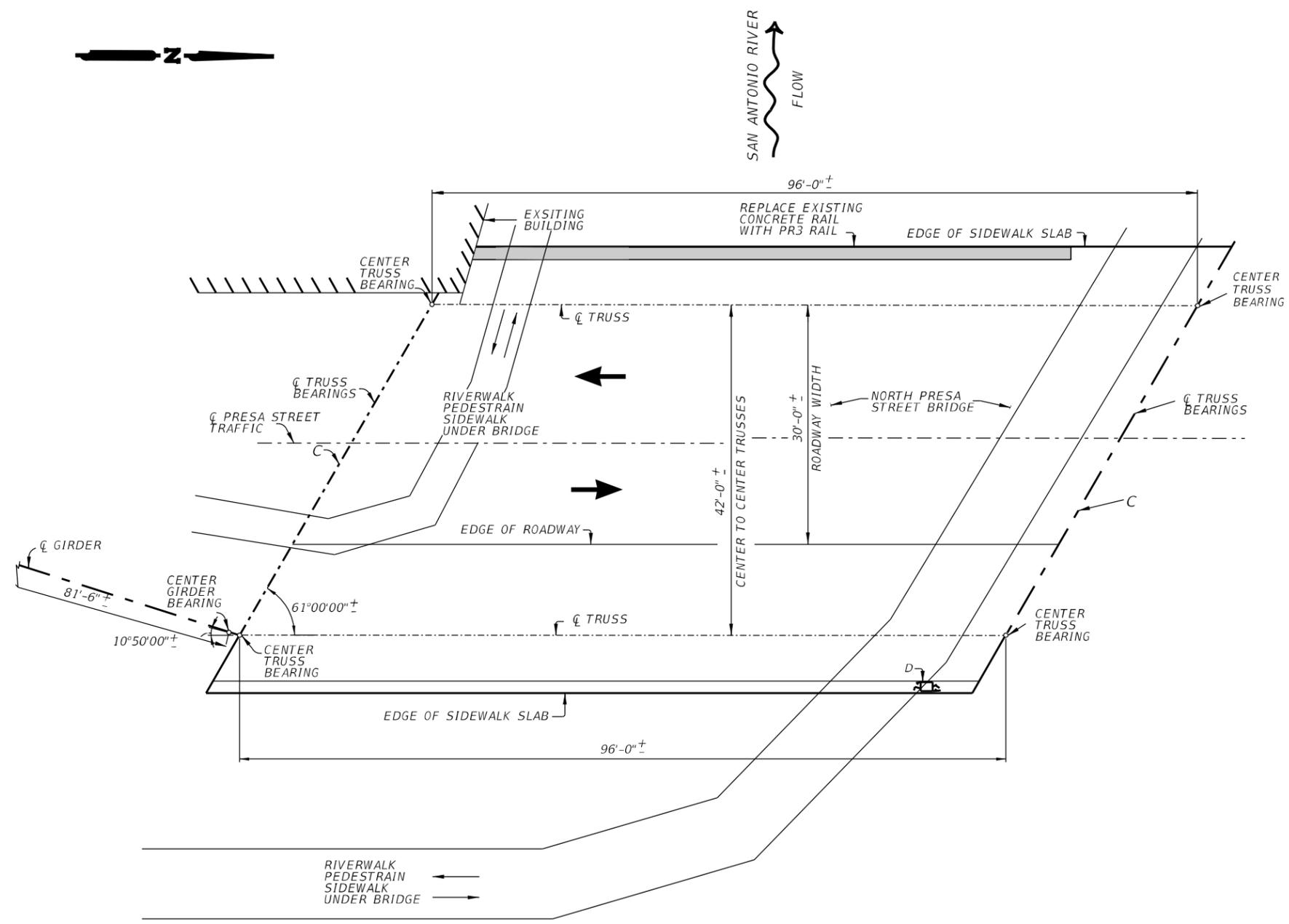
Plotted on: 11/18/2022

Design File name: S:\Transportation\21-169C CoSA Market & Preso St. Bridge Rehab\CAD\01-Sheets\test p1on.dgn

IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS.

PROJECT GENERAL NOTES:

1. UTILIZE TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES. (NOVEMBER 2014) ALONG WITH TxDOT'S CONCRETE REPAIR MANUAL.
2. REMOVE AND REPAIR UNSOUND, DELAMINATED, OR SPALLED CONCRETE PER TxDOT ITEM 429.
3. REPLACE RAILING PER TxDOT ITEM 451.
4. CLEAN AND SEAL JOINTS PER TxDOT ITEM 438. (PRESA STREET BRIDGE)
5. CONCRETE SURFACE FINISH SHALL BE APPLIED TO ALL DESIGNATED SURFACES PER TxDOT ITEM 427. THE APPLICATION SHALL BE AN OPAQUE STAIN.
6. REPAIR CRACKS PER TxDOT ITEM 780.
7. PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR WILL VERIFY ALL EXISTING DIMENSIONS AND LIMITS OF REPAIR BY SOUNDING OR OTHER ACCEPTABLE METHOD AS APPROVED BY THE ENGINEER. REPAIR DAMAGE AREAS NOT IDENTIFIED WITHIN PLANS, INCLUDING HORIZONTAL SPALLS, AS DIRECTED BY THE ENGINEER.
8. ANY DAMAGE TO THE CONCRETE SUBSTRATE, REINFORCING STEEL OR BOND BETWEEN THE TWO WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
9. SIZE AND LOCATION OF REPAIR TYPE IS SCHEMATIC. ACTUAL LOCATION AND SIZE OF REPAIR TYPE MAY VARY. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION.
10. PROTECT PEDESTRIANS FROM FALLING OVERHEAD DEBRIS AND ALL HAZARDS WHERE FACILITIES ARE TO REMAIN OPEN DURING CONSTRUCTION OPERATIONS. THE CONTRACTOR IS RESPONSIBLE FOR CONTAINMENT AND DISPOSAL OF ALL REMOVED MATERIAL. IF CONTAINMENT IS REQUIRED, DEBRIS MAY BE CAPTURED ON TRAPS OR BY OTHER METHODS APPROVED BY THE ENGINEER. MATERIAL WILL BE DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
11. EXISTING BRIDGE INFORMATION ACQUIRED FROM RECORD DRAWINGS DATED DECEMBER 1924.
12. ACCEPTANCE OF CONCRETE REPAIR SHALL BE BY HAMMER TESTING AND VISUAL INSPECTION AFTER THE CONCRETE HAS BEEN APPROPRIATELY CURED AND HAS REACHED MINIMUM REQUIRED STRENGTH AS VERIFIED BY REQUIRED TESTING METHODS.
13. USE PREQUALIFIED MATERIALS IN ACCORDANCE WITH TxDOT DEPARTMENT MATERIAL SPECIFICATION DMS 4655 "CONCRETE REPAIR MATERIALS"
14. THE CONTRACTOR SHALL FIELD VERIFY THE EXISTENCE AND LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL OR BETTER CONDITION ANY DAMAGE DONE TO EXISTING STRUCTURES THAT ARE TO REMAIN.
16. FOR THESE REPAIR PLANS, TRAFFIC AND TRAFFIC CONTROL IS FURTHER DEFINED AS VEHICULAR, BOAT AND PEDESTRIAN.



PLAN

- LEGEND:**
- TYPE "A" - EXCESSIVE SPALLING AND DELAMINATION REPAIR
 - TYPE "B" - SPALLING AND DELAMINATION REPAIR
 - TYPE "D" - EPOXY INJECTION FOR CRACKS
 - TYPE "E" - CONCRETE SURFACE FINISHES

REPAIR TYPE	REPAIR DESCRIPTION	QTY	UNIT
"A"	EXCESSIVE SPALLING AND DELAMINATION REPAIR	-	SF
"B"	SPALLING AND DELAMINATION REPAIR	-	SF
"C"	JOINT CLEAN AND SEAL	105	LF
"D"	EPOXY INJECTION FOR CRACKS	2.5	LF
"E"	CONCRETE SURFACE FINISHES	-	SF
"-"	REMOVE CONCRETE RAIL	75	LF
"-"	PEDESTRIAN RAIL (TYPE PR3)	75	LF

QUANTITY INDICATED IN TABLE MAY VARY FROM THE ACTUAL REPAIR QUANTITY. SEE GENERAL REPAIR DETAILS SHEET FOR ALL CONCRETE REPAIR INFORMATION.



Farren Scott Basse P.E.
11/18/2022

REV. NO.	DATE	DESCRIPTION	BY

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

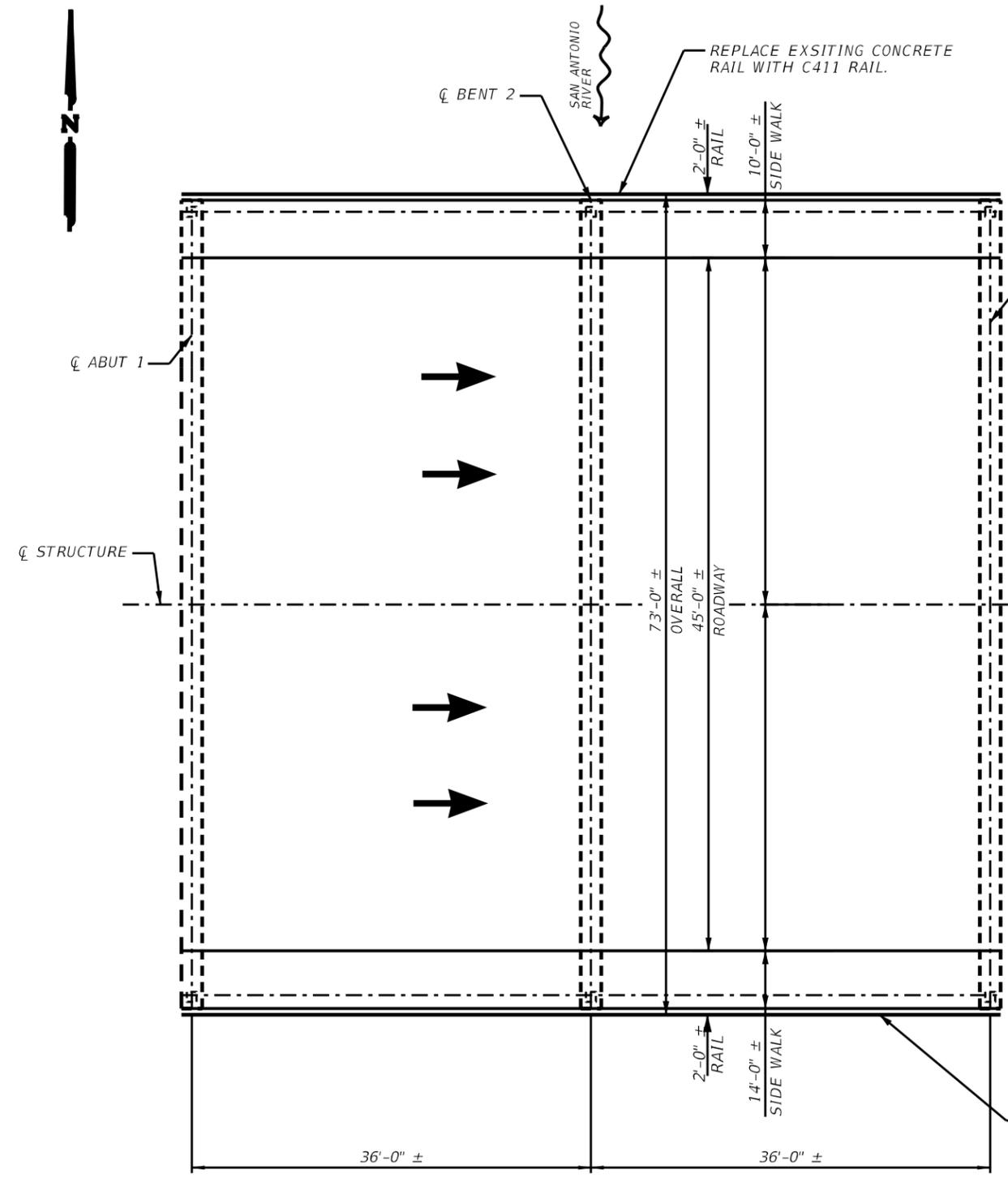
N. PRESA & W. MARKET BRIDGE REPAIRS

100% SUBMITTAL	PROJECT NO.: XX-XXXXX	DATE: 11/18/2022
DRWN. BY: EE	DSGN. BY: JAW	CHKD. BY: FSB
SHEET NO. 28		

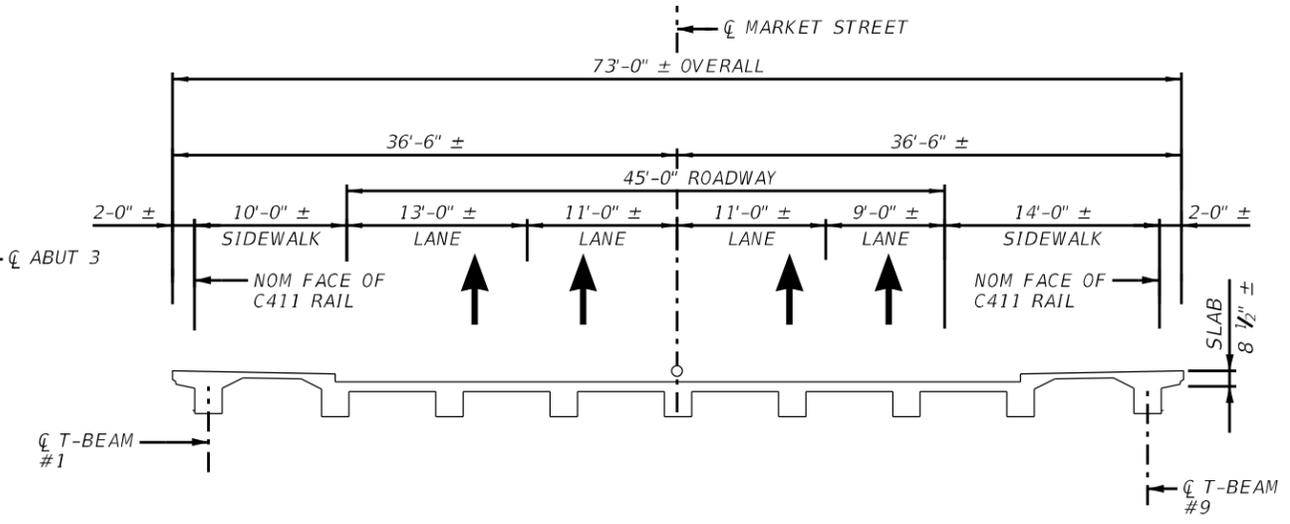
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IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS.



PLAN



TYPICAL TRANSVERSE SECTION
NOT TO SCALE

GENERAL NOTES:

1. SEE N PRESA ST BRIDGE REPAIR LAYOUT SHEET FOR PROJECT GENERAL NOTES.
2. DAMAGED REINFORCING STEEL WILL BE REPLACED, LAP SPLICES FOR ALL MAIN REINFORCEMENT WILL BE REQUIRED BY ITEM 440, REINFORCEMENT FOR CONCRETE.

ALL PRESA AND MARKET STREET BRIDGE REPAIR WORK TO BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING:

- ITEM 420 "CONCRETE SUB STRUCTURES"
 - ITEM 421 "HYDRAULIC CEMENT CONCRETE"
 - ITEM 427 "SURFACE FINISHES FOR CONCRETE"
 - ITEM 429 "CONCRETE STRUCTURE REPAIR"
 - ITEM 431 "PNEUMATICALLY PLACED CONCRETE"
 - DMS 4655 "CONCRETE REPAIR MATERIALS"
 - DMS 6100 "EPOXIES AND ADHESIVES"
- PAYMENT WILL BE AS PER ITEM 429 UNLESS SPECIFIED OTHERWISE IN THE PLANS.
TXDOT'S CURRENT CONCRETE REPAIR MANUAL.

SEE GENERAL REPAIR DETAILS SHEET FOR ALL CONCRETE REPAIR INFORMATION.

REPLACE EXISTING CONCRETE RAIL WITH C411 RAIL



REV. NO.	DATE	DESCRIPTION	BY
<p>PAPE-DAWSON ENGINEERS</p> <p>SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800</p>			
<p>CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT</p>			
<p>N. PRESA & W. MARKET BRIDGE REPAIRS</p>			
100% SUBMITTAL	PROJECT NO.:	XX-XXXXX	DATE: 11/18/2022
DRWN. BY: EE	DSGN. BY: JRW	CHKD. BY: FSB	SHEET NO. : 29

Plotted on: 11/18/2022

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SUMMARY OF ESTIMATED QUANTITIES

IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS.

ITEM NO.	0422-6003	0427-6003	0429-6007	0438-6001	0451-6037	0451-6046
BRIDGE ELEMENT / BID ITEM DESCRIPTION	REINF CONC SLAB (EXTEND SLAB)	OPAQUE SEALER FINISH	CONC STR REPAIR (VERTICAL & OVERHEAD)	CLEANING AND SEALING EXISTING JOINTS	RETROFIT RAIL (TY C411)	RETROFIT RAIL (TY PR3)
	SF	SF	SF	LF	LF	LF
WEST MARKET BRIDGE						
2 - ABUTMENTS						
1 - INTERIOR BENT		730.0	30.0			
1 - 72.000' TEE BEAM UNIT 1	252	1,182.0	40.0		144.0	
TOTAL	252	1,912.0	70.0	146.0	144.0	
NORTH PRESA BRIDGE						
2 - ABUTMENTS						
1 - INTERIOR PIER			10.0			
1 - 96.000' SPAN POLYGONAL WARREN PONY TRUSS		1,030.0	56.0			75.0
TOTAL		1,030.0	66.0	105.0		75.0

PAYMENT FOR HORIZONTAL REPAIRS IS INCLUDED WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

ITEM 427-6003 OPAQUE SEAL ESTIMATED FOR APPLICATION ON PLANE SURFACES CONTAINING REPAIRS. TERMINATE SEAL APPLICATION AT RECTILINEAR/FORMED EDGE BOUNDARIES OF PLANE SURFACES WHERE REPAIR WORK HAS BEEN PERFORMED.



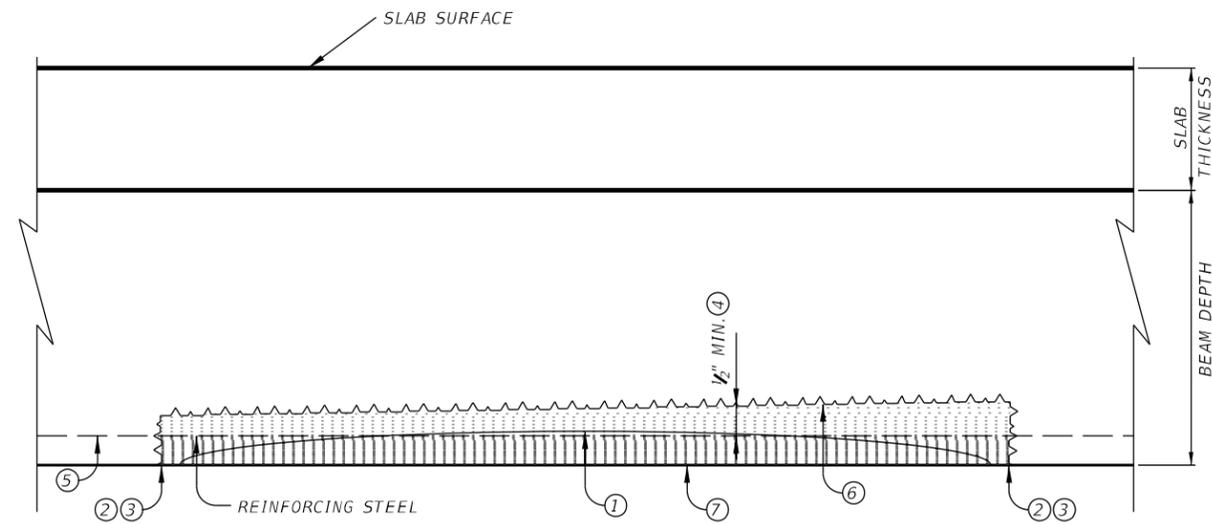
Farren Scott Basse P.E.
11/18/2022

REV. NO.	DATE	DESCRIPTION	BY
 PAPE-DAWSON ENGINEERS <small>SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800</small>			
 CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT			
N. PRESA & W. MARKET BRIDGE REPAIRS			
100% SUBMITTAL	PROJECT NO. : XX-XXXXX	DATE: 11/18/2022	
DRWN. BY: EE	DSGN. BY: JRW	CHKD. BY: FSB	SHEET NO. : 30

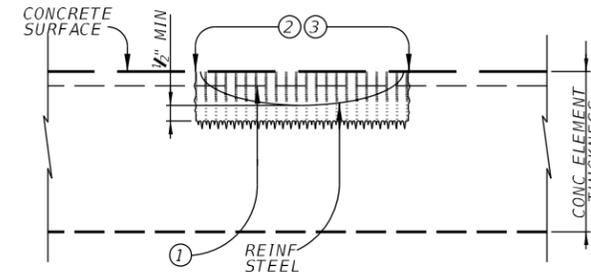
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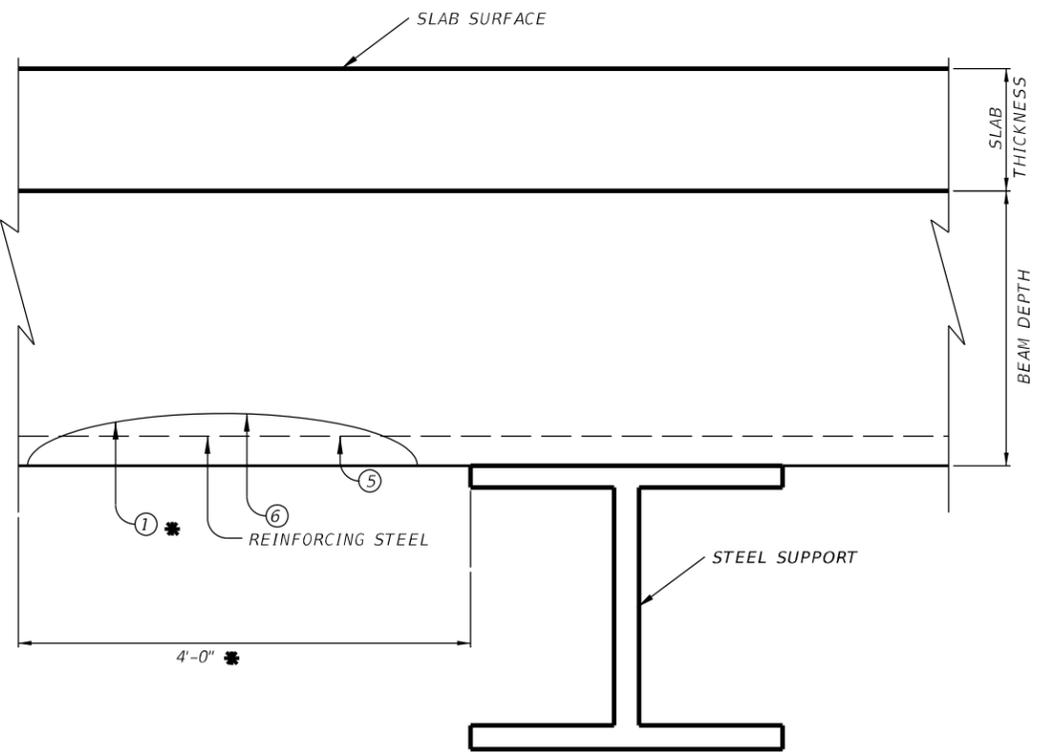
IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS.



TYPICAL CONCRETE BEAM REPAIR

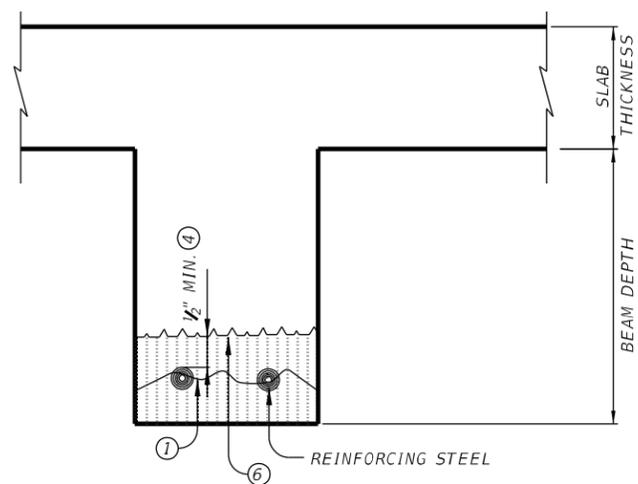


SPALL OR SLAB REPAIR



TYPICAL BEAM REPAIR NEAR SUPPORT

* DO NOT REMOVE OR SAWCUT EXISTING CONCRETE WITHIN LIMITS



BEAM SECTION REPAIR

REPAIR NOTES:

- ① FRACTURE LINE, SHADED PORTION TO BE REMOVED.
- ② LAYOUT A SYMMETRIC SAW CUT LINE OUTSIDE OF EXTREME EDGE OF FRACTURED CONCRETE.
- ③ SAW CUT 1/2" DEEP ALONG THE FRACTURE LINE INTO SOUND CONCRETE.
- ④ PROVIDE 1/2" CLEARANCE BETWEEN THE STEEL AND SURROUNDING CONCRETE. CARE SHALL BE TAKEN NOT TO CUT OR DAMAGE REINFORCING STEEL.
- ⑤ CLEAN ALL EXPOSED REINFORCING STEEL AND CONCRETE VIA WIRE BRUSH AND SAND-BLAST / AIR BLAST. SUPPLEMENT AND SPLICE ANY REINFORCING STEEL THAT HAS BEEN DAMAGED OR EXHIBITS A LOSS OF CROSS-SECTIONAL AREA
- ⑥ CLEAN AND ROUGHEN SUBSTRATE TO 1/4" MAXIMUM DEPTH. MAINTAIN SUBSTRATE IN SATURATED SURFACE DRY CONDITION (SSD) UNTIL PLACEMENT OF REPAIR CONCRETE. IF REQUIRED BY REPAIR MATERIAL MANUFACTURE, APPLY A BONDING AGENT IMMEDIATELY PRIOR TO PLACEMENT OF REPAIR CONCRETE. EXPLICITLY FOLLOW BONDING AGENT DIRECTIONS TO ENSURE MAXIMUM BOND EFFECTIVENESS.
- ⑦ SHAPE OR FORM TO MATCH THE ORIGINAL SURFACE. MAINTAIN 2" CLEAR COVER FOR EXISTING AND ADDITIONAL REINFORCING STEEL. 1/4" CHAMFER ALL EXPOSED CORNERS.

MATERIAL NOTES:

USE A PREQUALIFIED REPAIR MATERIAL MEETING THE REQUIREMENTS OF TXDOT DEPARTMENT MATERIAL SPECIFICATION (DMS) 4655. FOLLOW ALL INSTALLATION DIRECTIONS PROVIDED BY THE REPAIR MATERIAL MANUFACTURER.

PROVIDE CONCRETE REPAIR MATERIAL TYPE C - VERTICAL OR OVERHEAD REPAIR MATERIAL (MAY ALSO BE USED FOR HORIZONTAL REPAIRS)

MINIMUM FINAL REPAIR STRENGTH $f'_c=3600$ psi

SEE ELSEWHERE IN PLANS FOR TRAFFIC CONTROL, PEDESTRIAN TRAFFIC CONTROL, PEDESTRIAN SAFETY MEASURES, ALLOWABLE CLOSURES, AND RETURN TO SERVICE TIMES FOR CLOSURES AND REPAIRED ELEMENTS.

IF ACCELERATED REPAIR IS REQUIRED ELSEWHERE IN PLANS, REPAIR AS PER THE FOLLOWING:
 ULTRA RAPID - 2 HOUR RETURN TO SERVICE ($f'_c=2000$ psi MIN @ 2 HOURS)(DMS 4655 TYPE B)
 RAPID - 8 HOUR RETURN TO SERVICE ($f'_c=3000$ psi MIN @ 8 HOURS)(DMS 4655 TYPE A)

CONCRETE STRUCTURE REPAIR NOTES:

- A) LESS THAN 1" - SHALLOW REPAIRS NOT EXTENDING TO THE REINFORCING STEEL.
- B) 1" TO 6" - MID-DEPTH REPAIR EXTENDING TO OR SLIGHTLY BELOW THE REINFORCING STEEL.
- C) OVER 6" - DEEP REPAIR EXTENDING WELL BEYOND THE REINFORCING STEEL, UP TO FULL DEPTH.

FOR ALL REPAIRS OVER TRAFFIC, WITH OR WITHOUT ADDITIONAL REINFORCEMENT, ANCHORS ARE REQUIRED.

SEE BRIDGE LAYOUTS AND OTHER PLAN DETAILS FOR IDENTIFICATION OF SPECIFIC REPAIR AREAS AND ELEMENTS.

ALL CONCRETE BREAK BACK AND REMOVAL OPERATIONS, DISPOSAL OF REMOVED MATERIAL, CLEANING, SUBSTRATE PREPARATION, REPAIRING AND PLACING ADDITIONAL REINFORCEMENT, PLACING REPAIR MATERIAL LABOR, EQUIPMENT, AND INCIDENTALS WILL BE CONSIDERED SUBSIDIARY FOR PAYMENT TO THE VARIOUS ITEM 429 BID ITEMS.



REV. NO.	DATE	DESCRIPTION	BY
<p>PAPE-DAWSON ENGINEERS</p> <p>SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800</p>			
<p>CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT</p>			
<p>N. PRESA & W. MARKET BRIDGE REPAIRS</p>			
100% SUBMITTAL	PROJECT NO. : XX-XXXXX		

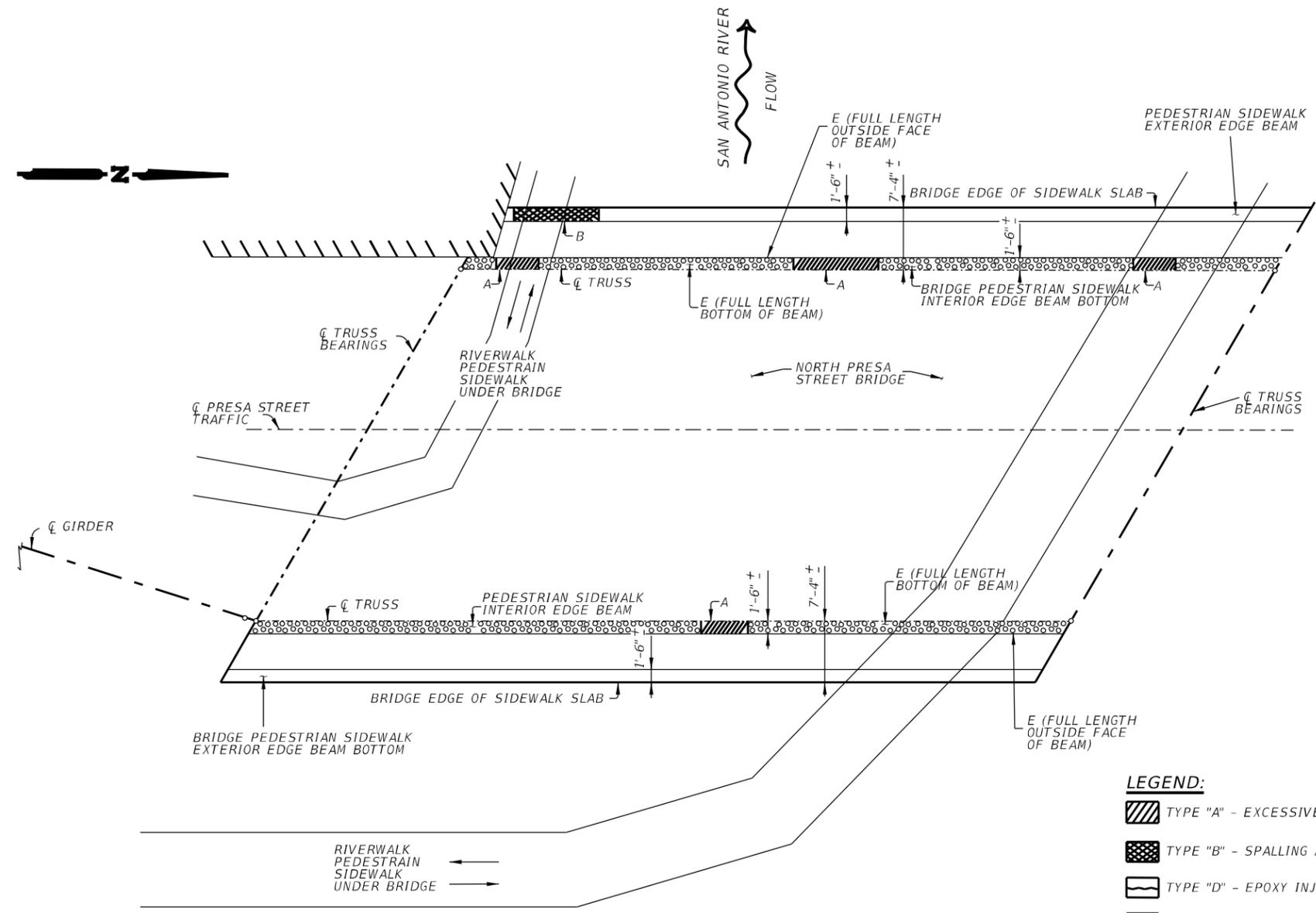
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IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS.

GENERAL NOTES:

1. SEE NORTH PRESA BRIDGE REPAIR LAYOUT FOR PROJECT GENERAL NOTES.
2. SEE GENERAL REPAIR DETAILS SHEET FOR SAWCUT, BREAK-BACK, SUBSTRATE PREPARATION AND CONCRETE REMOVAL INFORMATION.



REFLECTED SOFFIT PLAN

LEGEND:

- TYPE "A" - EXCESSIVE SPALLING AND DELAMINATION REPAIR
- TYPE "B" - SPALLING AND DELAMINATION REPAIR
- TYPE "D" - EPOXY INJECTION FOR CRACKS
- TYPE "E" - CONCRETE SURFACE FINISHES



REPAIR TYPE	REPAIR DESCRIPTION	QTY	UNIT
"A"	EXCESSIVE SPALLING AND DELAMINATION REPAIR	46	SF
"B"	SPALLING AND DELAMINATION REPAIR	10	SF
"C"	JOINT CLEAN AND SEAL	-	LF
"D"	EPOXY INJECTION FOR CRACKS	-	LF
"E"	CONCRETE SURFACE FINISHES	730	SF
"-"	REMOVE CONCRETE RAIL	-	LF
"-"	PEDESTRIAN RAIL (TYPE PR3)	-	LF

QUANTITY INDICATED IN TABLE MAY VARY FROM THE ACTUAL REPAIR QUANTITY. SEE GENERAL REPAIR DETAILS SHEET FOR ALL CONCRETE REPAIR INFORMATION.

REV. NO.	DATE	DESCRIPTION	BY
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 CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT			
N. PRESA & W. MARKET BRIDGE REPAIRS			
100% SUBMITTAL	PROJECT NO. : XX-XXXXX	DATE: 11/18/2022	
DRWN. BY: EE	DSGN. BY: JAW	CHKD. BY: FSB	SHEET NO. : 32

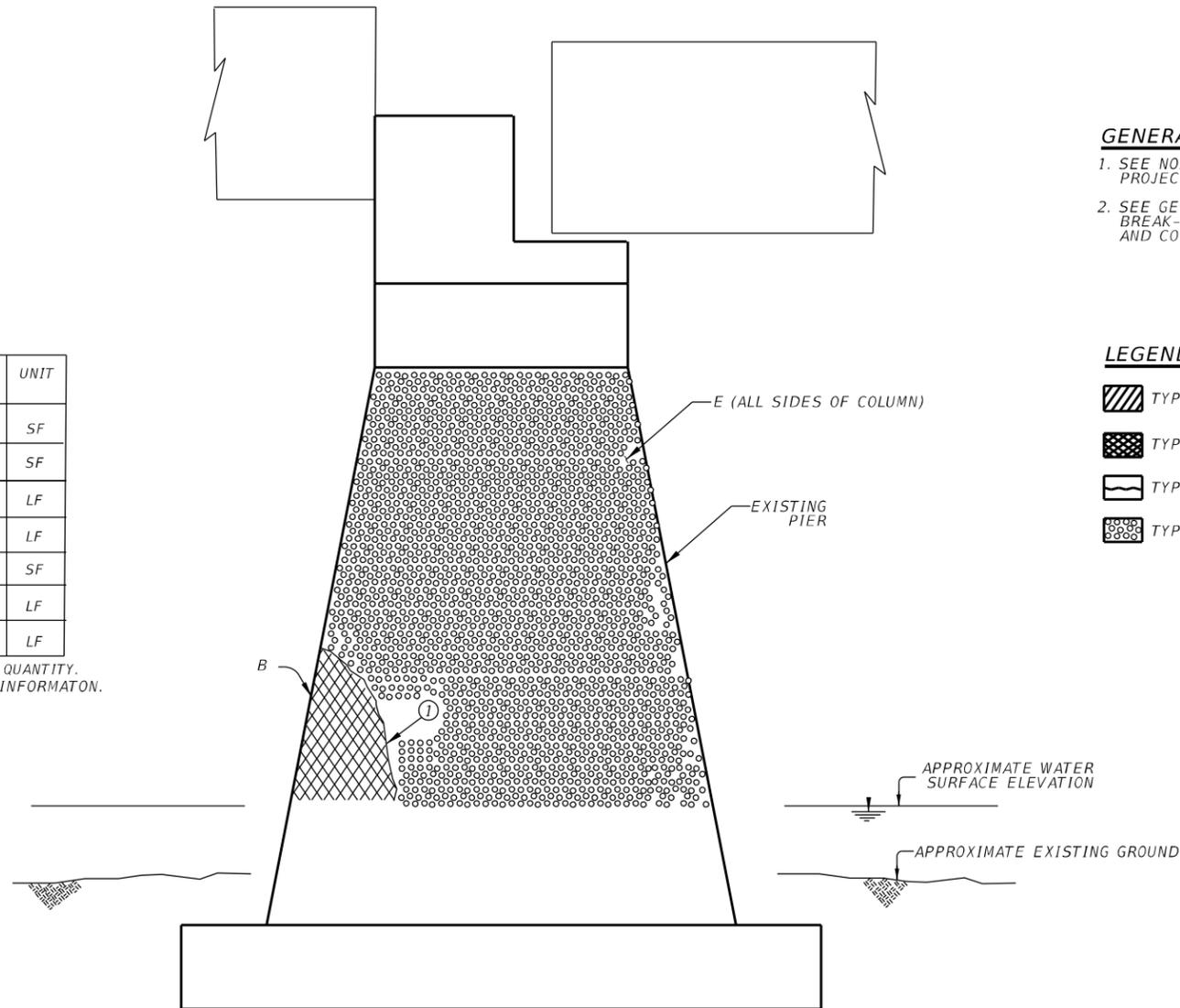
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IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS.

REPAIR TYPE	REPAIR DESCRIPTION	QTY	UNIT
"A"	EXCESSIVE SPALLING AND DELAMINATION REPAIR	-	SF
"B"	SPALLING AND DELAMINATION REPAIR	10	SF
"C"	JOINT CLEAN AND SEAL	-	LF
"D"	EPOXY INJECTION FOR CRACKS	-	LF
"E"	CONCRETE SURFACE FINISHES	300	SF
"-"	REMOVE CONCRETE RAIL	-	LF
"-"	PEDESTRIAN RAIL (TYPE PR3)	-	LF

QUANTITY INDICATED IN TABLE MAY VARY FROM THE ACTUAL REPAIR QUANTITY. SEE GENERAL REPAIR DETAILS SHEET FOR ALL CONCRETE REPAIR INFORMATION.



PIER IN RIVER

(LOOKING SOUTH)

① SAWCUT 1/2" DEEP ALONG THE FRACTURE LINE INTO SOUND CONCRETE.

GENERAL NOTES:

- SEE NORTH PRESA BRIDGE REPAIR LAYOUT FOR PROJECT GENERAL NOTES.
- SEE GENERAL REPAIR DETAILS SHEET FOR BREAK-BACK, SUBSTRATE PREPARATION AND CONCRETE REMOVAL INFORMATION.

LEGEND:

- TYPE "A" - EXCESSIVE SPALLING AND DELAMINATION REPAIR
- TYPE "B" - SPALLING AND DELAMINATION REPAIR
- TYPE "D" - EPOXY INJECTION FOR CRACKS
- TYPE "E" - CONCRETE SURFACE FINISHES



REV. NO.	DATE	DESCRIPTION	BY
 PAPE-DAWSON ENGINEERS <small>SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS</small> <small>2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000</small> <small>TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800</small>			
 CITY OF SAN ANTONIO <small>PUBLIC WORKS DEPARTMENT</small>			
N. PRESA & W. MARKET BRIDGE REPAIRS			
100% SUBMITTAL	PROJECT NO. : XX-XXXXX	DATE: 11/18/2022	
DRWN. BY: EE	DSGN. BY: JRW	CHKD. BY: FSB	SHEET NO. : 33

Plotted on: 11/18/2022

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IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS.

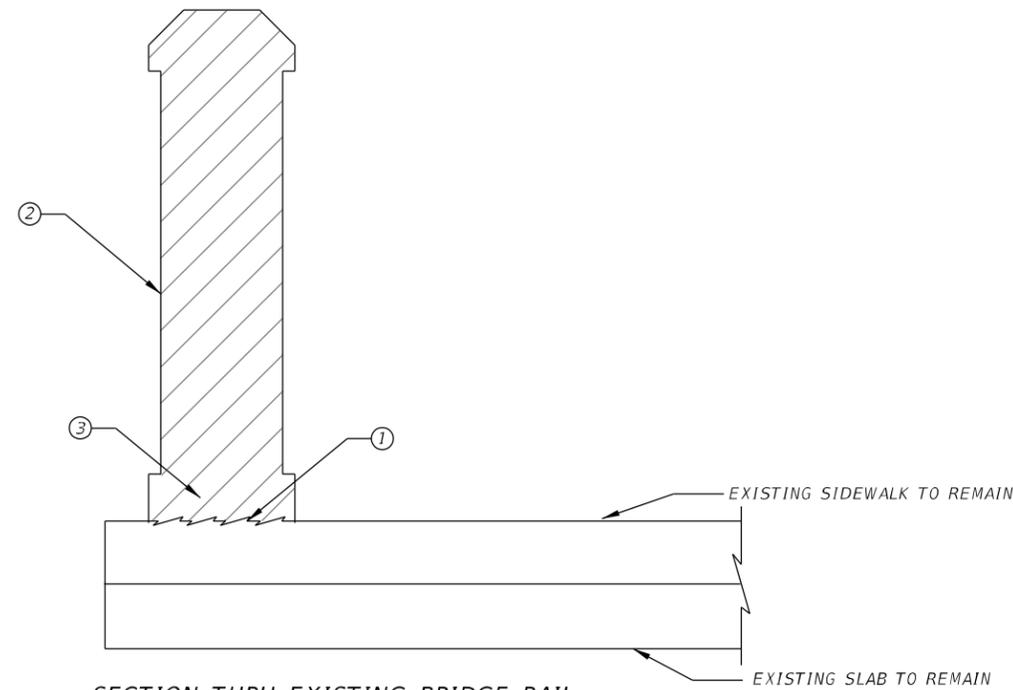
GENERAL NOTES:

- 1. SEE GENERAL REPAIR DETAILS SHEET FOR SAWCUT, BREAK-BACK, SUBSTRATE PREPARATION AND CONCRETE REMOVAL INFORMATION.
- 2. SEE PR3 RAIL STANDARD FOR RAIL ANCHORAGE IN EXISTING SIDEWALK SLAB & ADDITIONAL RAIL INFORMATION.

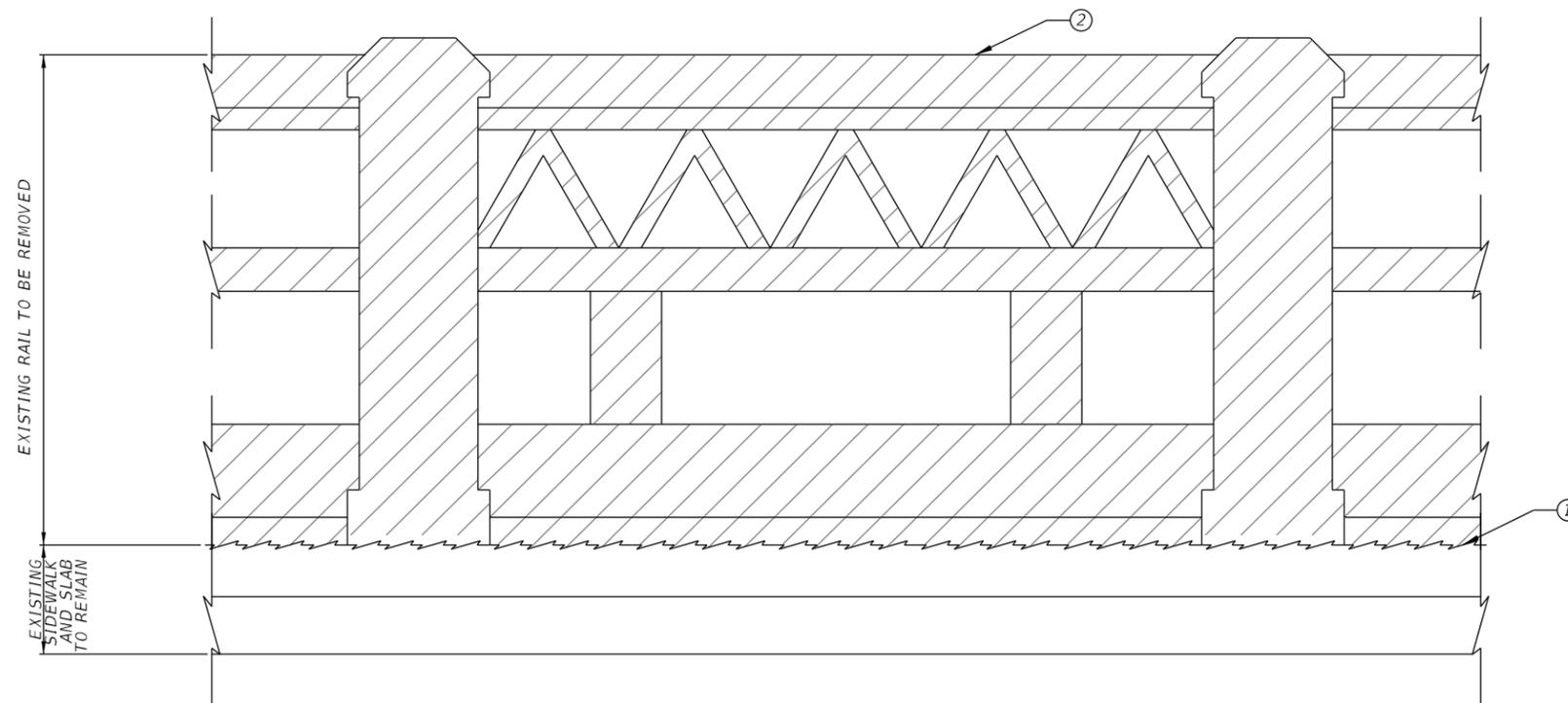
① CARE SHALL BE TAKEN NOT TO DAMAGE EXISTING SIDEWALK. DO NOT REMOVE OR DAMAGE EXISTING REINFORCEMENT THAT EXTENDS OUT FROM EXISTING SIDEWALK.

② REMOVE SHADED PORTION OF EXISTING RAIL.

③ CONTRACTOR SHALL ADD REINFORCEMENT OR CUT EXISTING REINFORCEMENT AS REQUIRED TO PROVIDE (#4) ANCHOR BARS AS SHOWN IN PR3 RAIL STANDARD.



SECTION THRU EXISTING BRIDGE RAIL ON EXISTING BRIDGE SIDEWALK

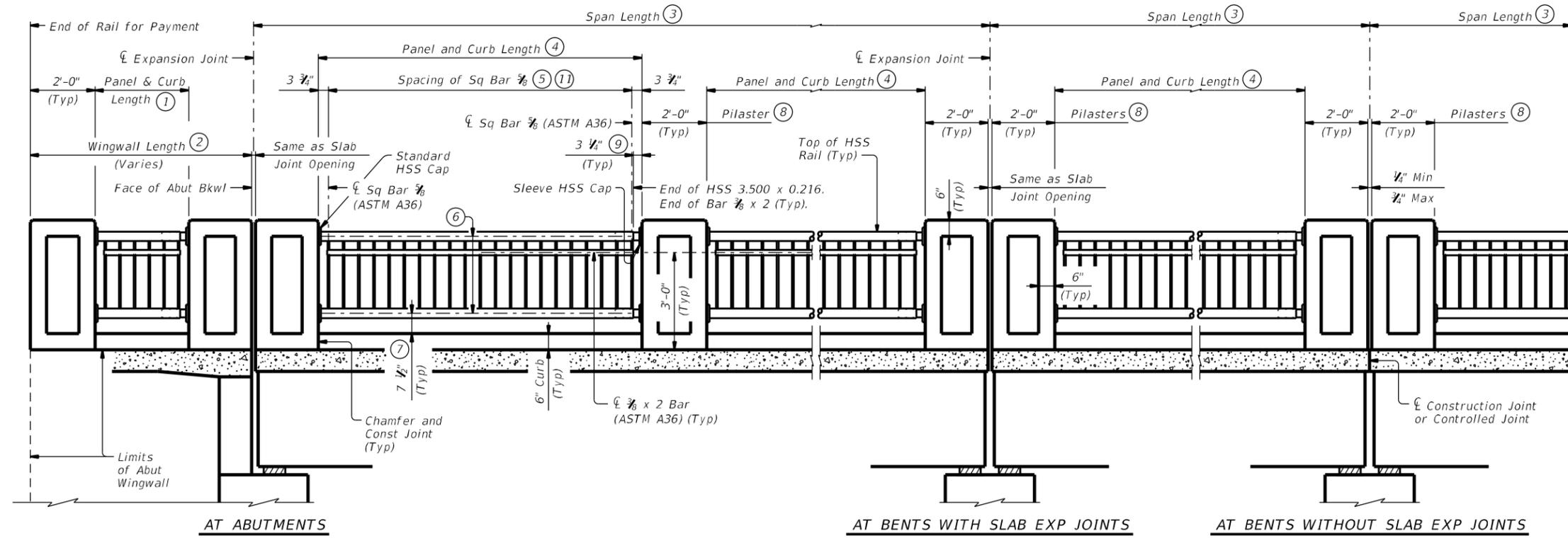


ELEVATION OF EXISTING RAIL



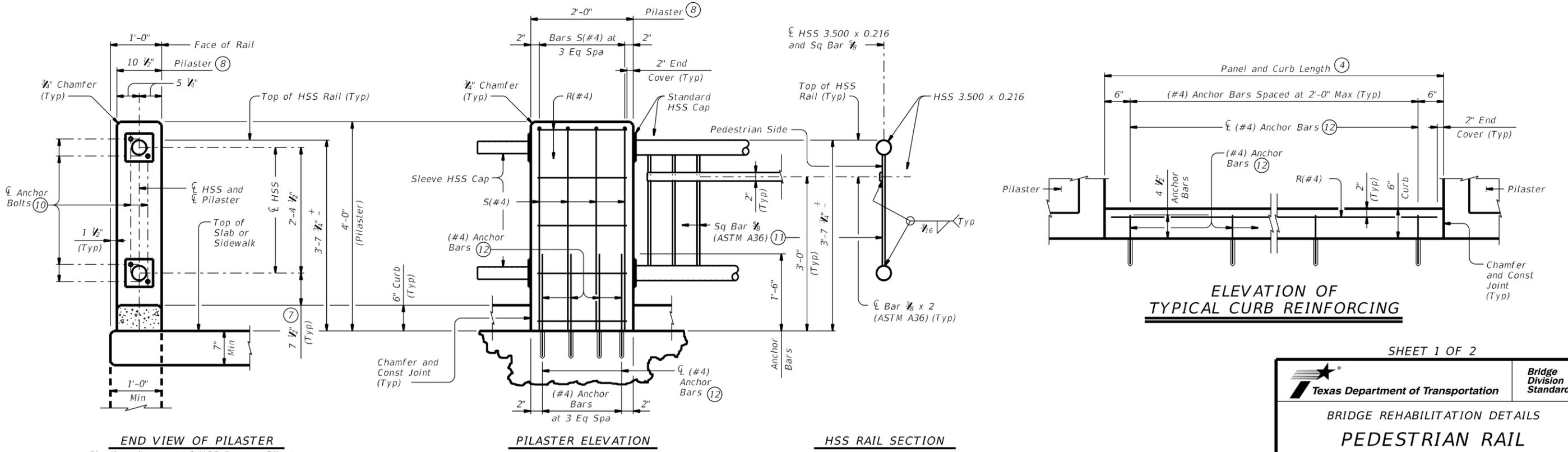
REV. NO.	DATE	DESCRIPTION	BY
 PAPE-DAWSON ENGINEERS <small>SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800</small>			
 CITY OF SAN ANTONIO <small>PUBLIC WORKS DEPARTMENT</small>			
N. PRESA & W. MARKET BRIDGE REPAIRS			
100% SUBMITTAL	PROJECT NO. : XX-XXXXX	DATE: 11/18/2022	
DRWN. BY: EE	DSGN. BY: JAW	CHKD. BY: FSB	SHEET NO. : 34

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ELEVATION OF RAIL

- ① 10'-0" Max Panel and Curb Length.
- ② Wingwall will have pilasters at each end (Typ).
- ③ Span will have a pilaster at each end (Typ).
- ④ 10'-0" Usual and Max Panel and Curb Length.
- ⑤ Space Sq Bar $\frac{3}{8}$ Equally at 5 $\frac{3}{4}$ " Max along center of HSS 3.500 x 0.216 (Typ).
- ⑥ $\bar{\bar{C}}$ HSS 3.500 x 0.216 (Typ).
- ⑦ Parallel to top of curb (Typ).
- ⑧ Pilasters will be plumb on all sides (Typ).
- ⑨ Terminate HSS 3.500 x 0.216 as shown on one end only of each HSS Rail Panel. This allows for future repairs and/or replacement. Terminate Bar $\frac{3}{8}$ x 2 as shown on each end of HSS Rail Panel.
- ⑩ See "Material Notes" for anchor bolt information.
- ⑪ Sq Bar $\frac{3}{8}$ will be Plumb.
- ⑫ Embed (#4) adhesive anchor bars 5" Min. See "Material Notes" for adhesive anchor requirements.



ELEVATION OF TYPICAL REINFORCING WITH HSS RAIL AND PILASTER CONNECTION

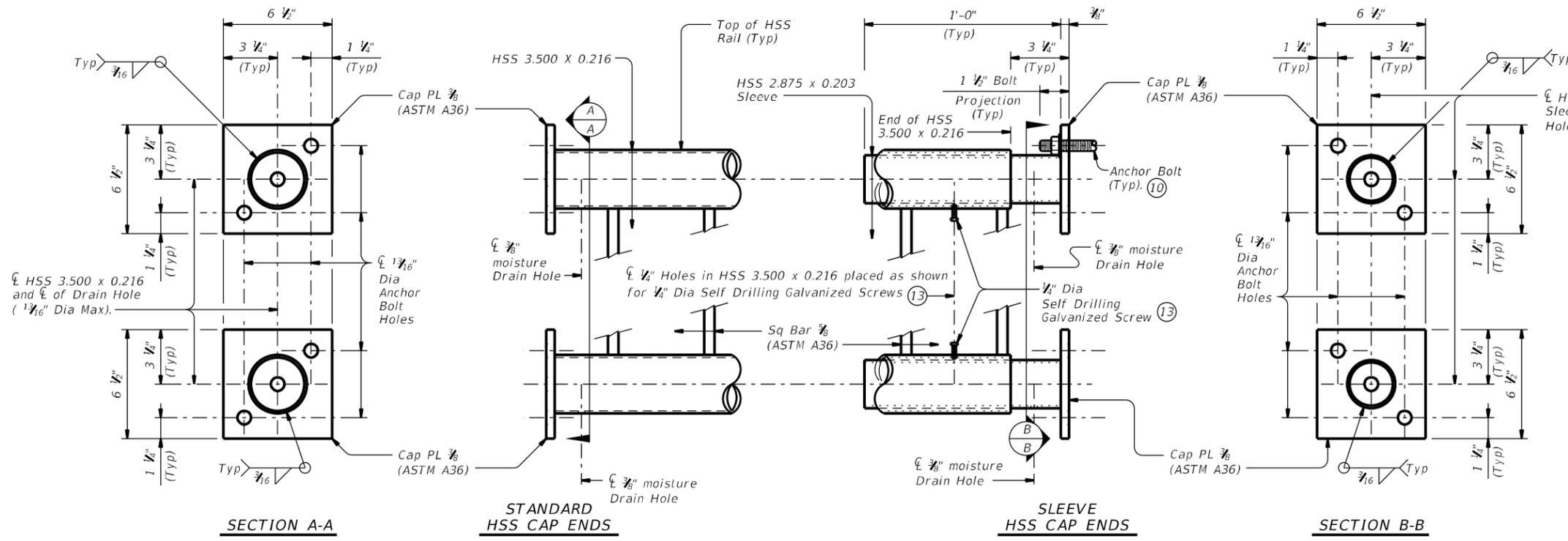
SHEET 1 OF 2

BRIDGE REHABILITATION DETAILS PEDESTRIAN RAIL			
TYPE PR3			
FILE: r1std030-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONTRACT	SECTION	JOB
REVISIONS			HIGHWAY
	DIST	COUNTY	SHEET NO.
			35

DATE: FILE:

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DATE: FILE:

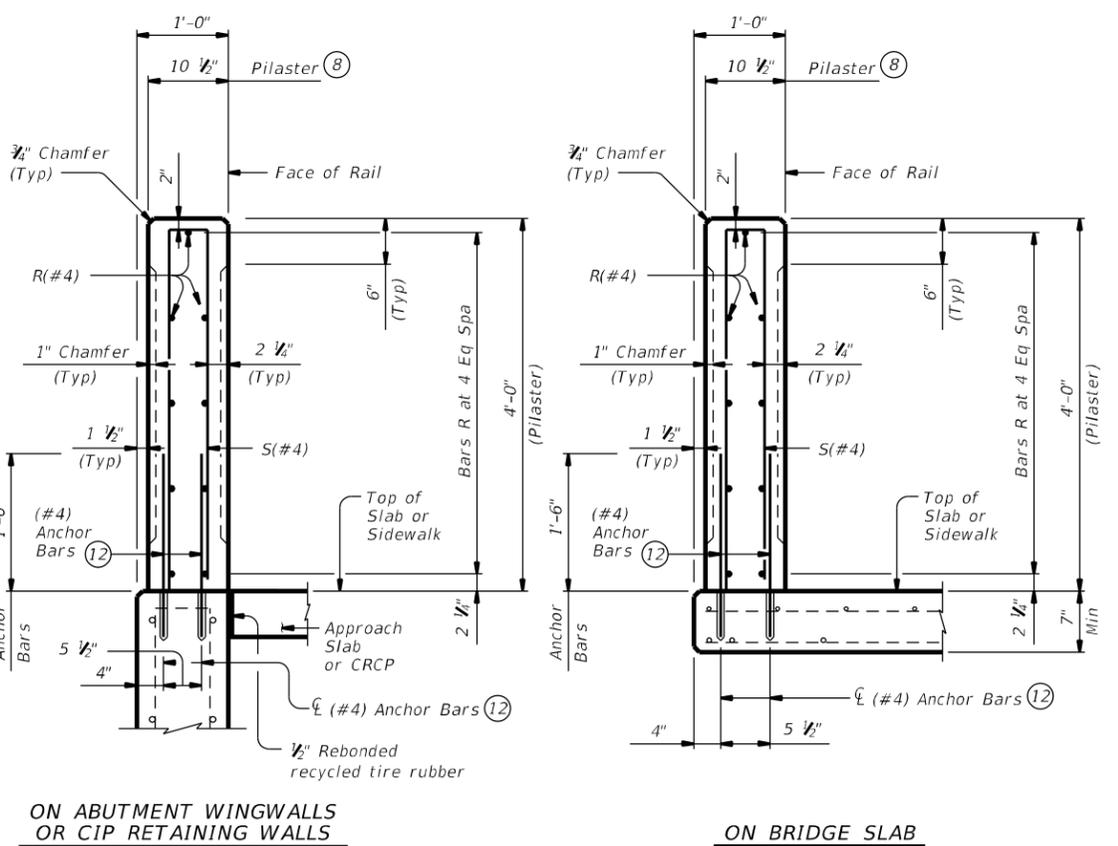


HSS RAIL DETAILS

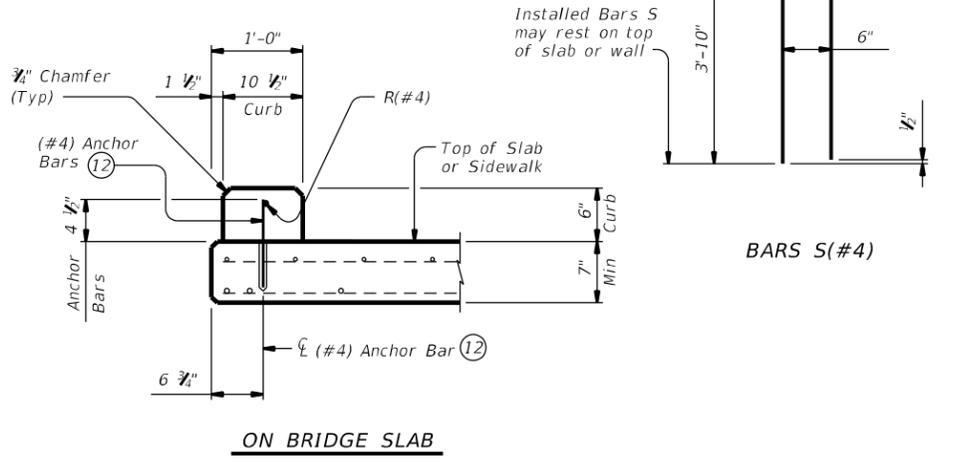
- 8 Pilasters will be plumb on all sides (Typ).
- 10 See "Material Notes" for anchor bolt information.
- 12 Embed (#4) adhesive anchor bars 5" Min. See "Material Notes" for adhesive anchor requirements.
- 13 Firmly tighten Self Drilling Screws after pipe rail has been attached to Pilasters.

CONSTRUCTION NOTES:
 Pilasters must be plumb on all sides.
 For curved railing applications, fabricate the rail to the curve if radius is less than 600 ft. Shop drawings are required when rail is fabricated to the curve.
 Round or Chamfer exposed edges of HSS rail and HSS caps to approximately 1/16" by grinding.
 Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.
 Chamfer all exposed concrete corners.

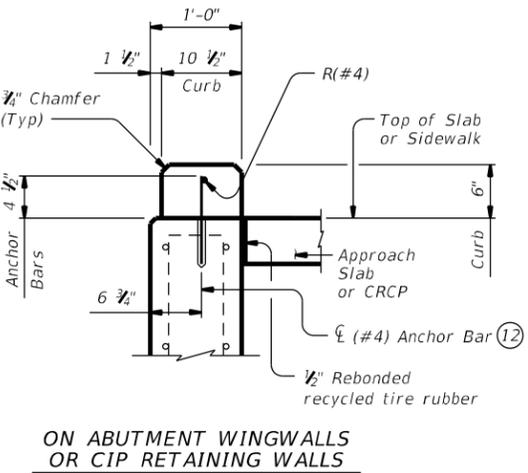
MATERIAL NOTES:
 Provide ASTM A500 Gr B, A1085 or A53 Gr B for all HSS.
 Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over galvanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.
 Provide Grade 60 reinforcing steel.
 Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized. (#4) anchor bar used for the adhesive anchorage system must not be epoxy coated for the embedded portion.
 Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.
 Chamfer all exposed concrete corners.
 Anchor bolts must be 3/8" Dia ASTM A307 Grade A fully threaded rods with one hex head nut and one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements. Embed threaded rods into pilasters with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 3 1/2". Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".
 Embed (#4) anchor bars with a Type III, Class C, D, E, or F anchor adhesive. Anchor adhesive chosen must be able to achieve a basic bond strength in tension, N_{ba}, of 12 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".



SECTIONS THRU PILASTER



ON BRIDGE SLAB



SECTIONS THRU CURB

GENERAL NOTES:
 Designed according to AASHTO LRFD Specifications.
 Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.
 Do not use this railing on bridges with expansion joints providing more than 5" movement.
 Shop drawings are not required unless otherwise noted.
 For all rails, submit erection drawings for approval to ensure proper installation. Drawings must show pilaster spacing, sleeve HSS cap locations on pilasters, and panel lengths with identification showing where each panel goes on the layout.
 Average weight of railing: 158 plf total
 136 plf (Conc)
 22 plf (Steel).

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

SHEET 2 OF 2

		Bridge Division Standard	
BRIDGE REHABILITATION DETAILS			
PEDESTRIAN RAIL			
TYPE PR3			
FILE: r1std030-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONTRACT	SECTION	JOB
REVISIONS		HIGHWAY	
DIST	COUNTY	SHEET NO.	
		36	

Plotted on: 11/18/2022

Design File name: S:\Transportation\21-169C CoSA Market & Preso St. Bridge Rehab\CAD\01-Sheets\typ.dgn

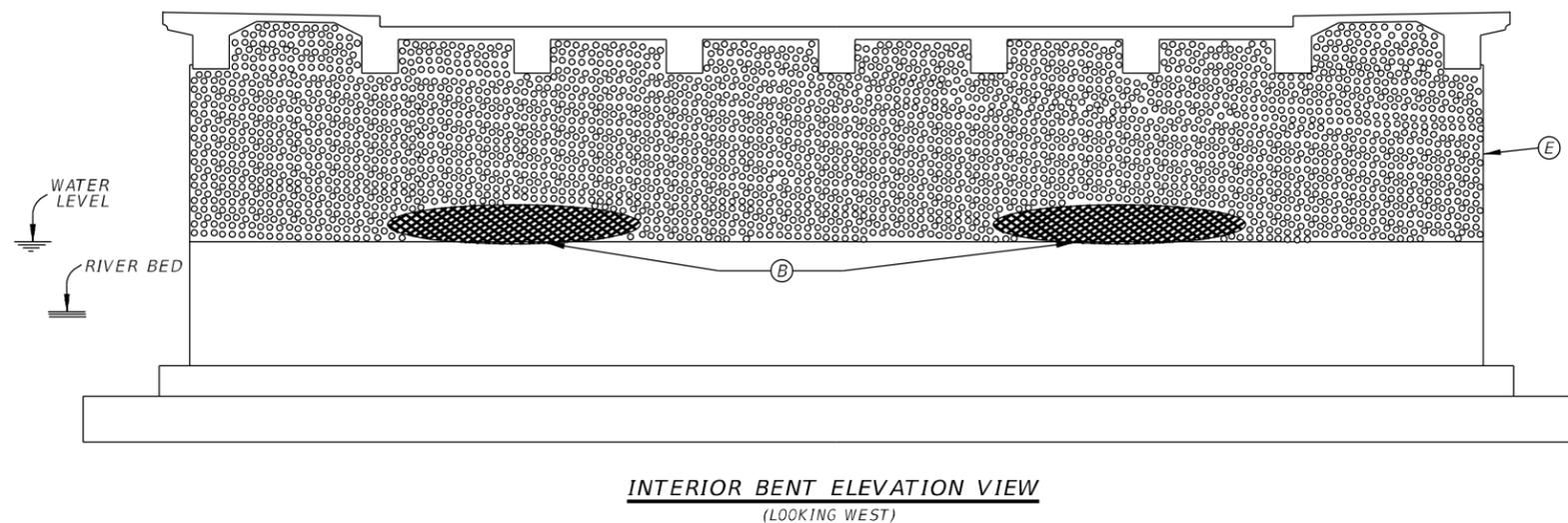
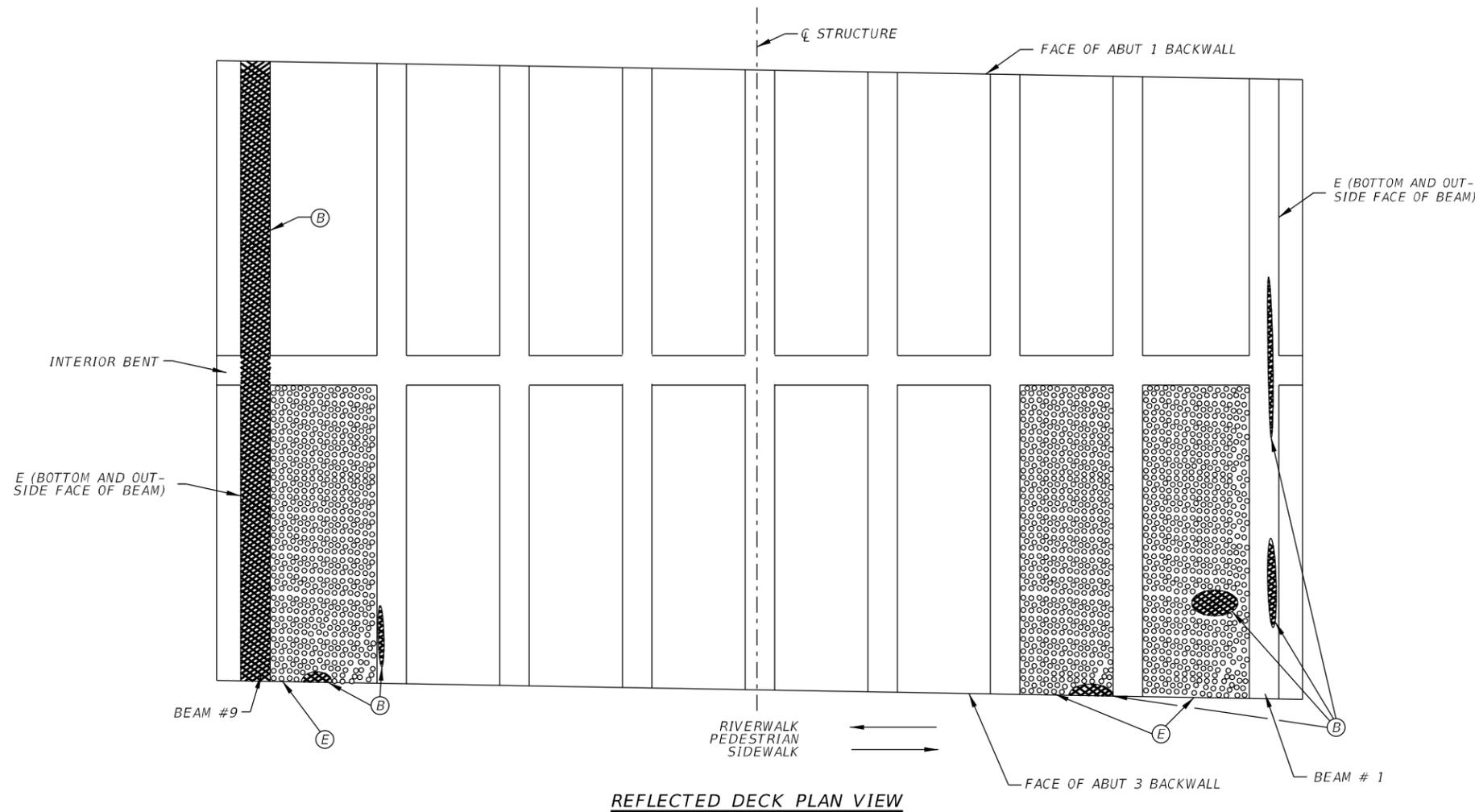
IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS.

-  TYPE "A" - EXCESSIVE SPALLING AND DELAMINATION REPAIR
 -  TYPE "B" - SPALLING AND DELAMINATION REPAIR
 -  TYPE "D" - JOINT CLEAN AND SEAL
 -  TYPE "E" - CONCRETE SURFACE FINISHES
 -  TYPE "F" - STEEL SURFACE FINISHES
- SEE NORTH PRESA BRIDGE REPAIR LAYOUT FOR PROJECT GENERAL NOTES.

SEE GENERAL REPAIR DETAILS SHEET FOR REPAIR NOTES AND INFORMATION.

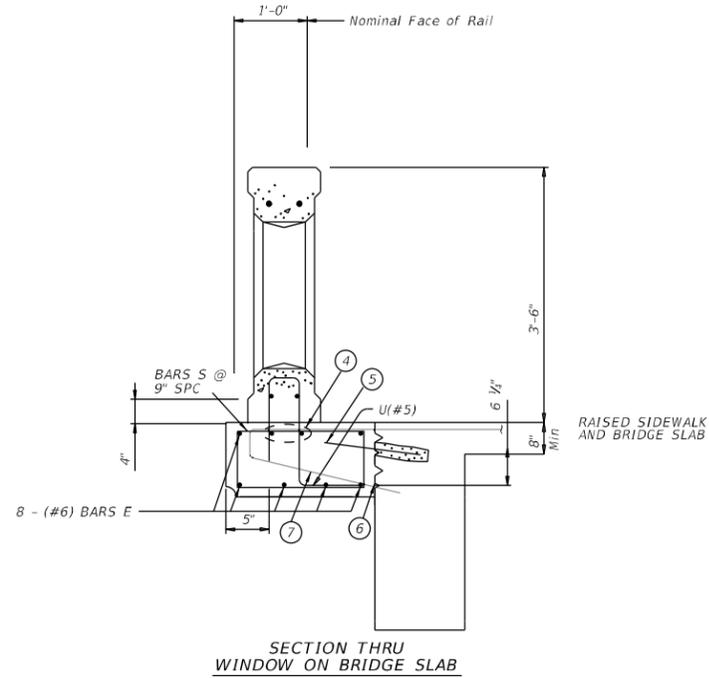
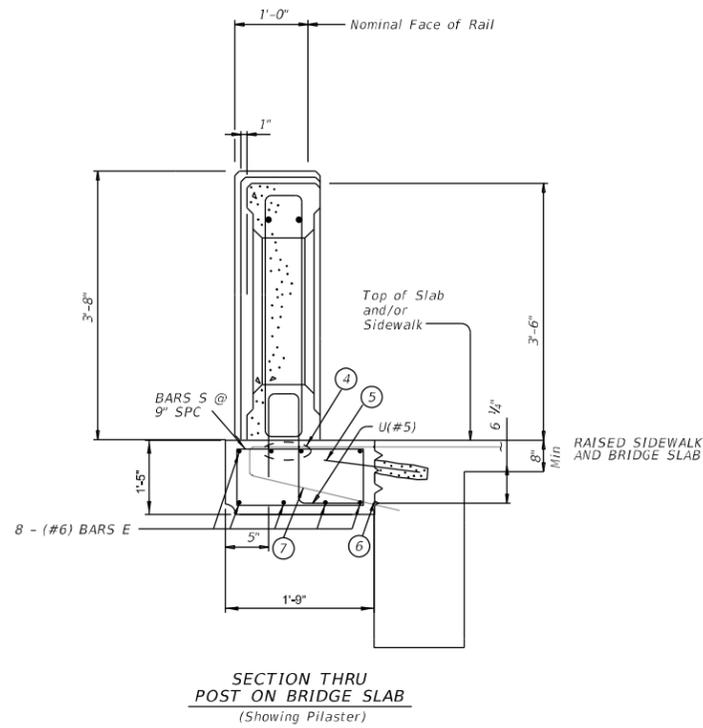
REPAIR TYPE	REPAIR DESCRIPTION	QTY	UNIT
"A"	EXCESSIVE SPALLING AND DELAMINATION REPAIR		SF
"B"	SPALLING AND DELAMINATION REPAIR	70	SF
"C"	JOINT CLEAN AND SEAL		LF
"D"	EPOXY INJECTION FOR CRACKS		LF
"E"	CONCRETE SURFACE FINISHES	1912	SF
"_"	REMOVE CONCRETE RAIL	144.0	LF
"_"	RAIL (TYPE C411)	144.0	LF

QUANTITY INDICATED IN TABLE MAY VARY FROM THE ACTUAL REPAIR QUANTITY.



Farren Scott Basse P.E.
11/18/2022

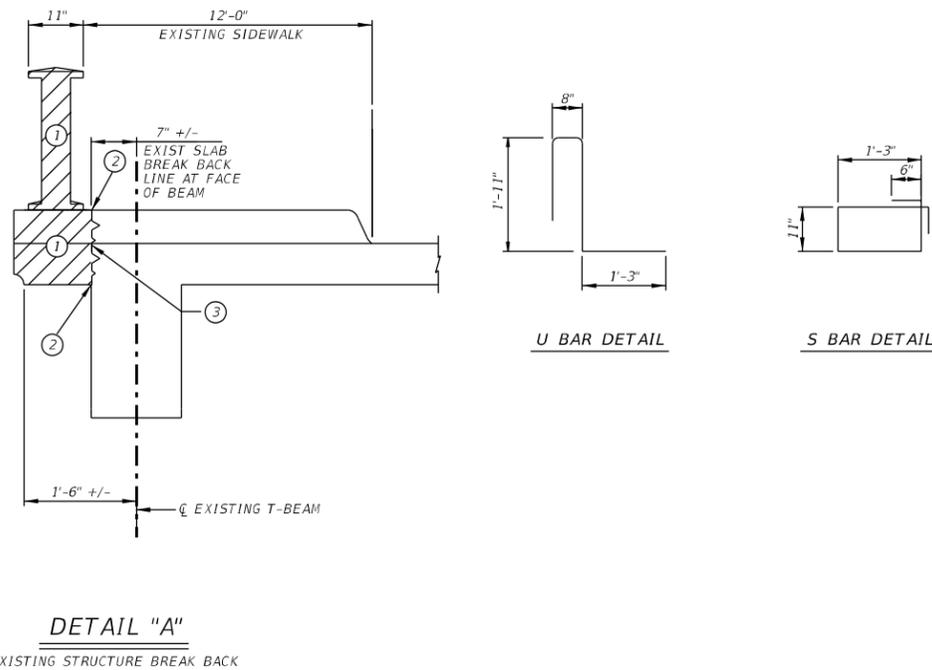
REV. NO.	DATE	DESCRIPTION	BY
 PAPE-DAWSON ENGINEERS <small>SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800</small>			
 CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT			
N. PRESA & W. MARKET BRIDGE REPAIRS			
100% SUBMITTAL	PROJECT NO. : XX-XXXXX	DATE: 11/18/2022	
DRWN. BY: EE	DSGN. BY: JRW	CHKD. BY: FSB	SHEET NO. : 37



IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS.

GENERAL NOTES:

SEE NORTH PRESA BRIDGE REPAIR LAYOUT FOR PROJECT GENERAL NOTES.
 SEE GENERAL REPAIR DETAILS FOR ADDITIONAL INFORMATION.
 CONCRETE WILL BE TxDOT CLASS "S", $f'_c = 4000$ PSI
 CONCRETE CLEAR COVER WILL BE 2" UNLESS NOTED OTHERWISE.
 CHAMFER ALL FORMED CONCRETE CORNERS AT 3/4"
 UNLESS NOTED OTHERWISE.
 REINFORCING BAR DIMENSIONS ARE TO CENTER OF BARS UNLESS NOTED OTHERWISE.
 REINFORCING STEEL WILL BE GRADE 60
 SEE TxDOT STANDARD C411 FOR TRAFFIC RAIL DETAILS



STRUCTURE BREAKBACK NOTES:

- ① REMOVE EXISTING RAIL, SIDEWALK, AND SLAB AS SHOWN.
- ② LAYOUT A SYMMETRIC SAWCUT LINE.
- ③ SAWCUT 1/2" MAXIMUM DEPTH ALONG THE LAYOUT LINE. PROTECT EXISTING REINFORCING STEEL FROM DAMAGE DURING CONCRETE SAWCUT, BREAK BACK, AND REMOVAL OPERATIONS.

HATCHED AREAS INDICATE SECTIONS OF EXISTING STRUCTURE TO BE REMOVED. STRAIGHTEN EXISTING REINFORCING STEEL FOR LAP INTO NEW OVERHANG CONSTRUCTION. REPAIR ANY DAMAGE TO EXISTING CONCRETE OR REINFORCING STEEL REMAINING IN PLACE.

ALL BREAK BACK OPERATIONS INCLUDING SAW CUTTING, BREAK BACK, RAIL AND OVERHANG REMOVAL, SIDEWALK REMOVAL, MEDIAN REMOVAL, SLAB REMOVAL, CLEANING, REMOVED MATERIAL DISPOSAL, FURNISHING AND PLACING REPAIR MATERIAL, FURNISHING ADDITIONAL REINFORCING STEEL, REINFORCING STEEL PREP, LABOR, EQUIPMENT, AND INCIDENTALS IS CONSIDERED SUBSIDIARY TO ITEM 0422-6003 "REINF CONC SLAB (EXTEND SLAB)".

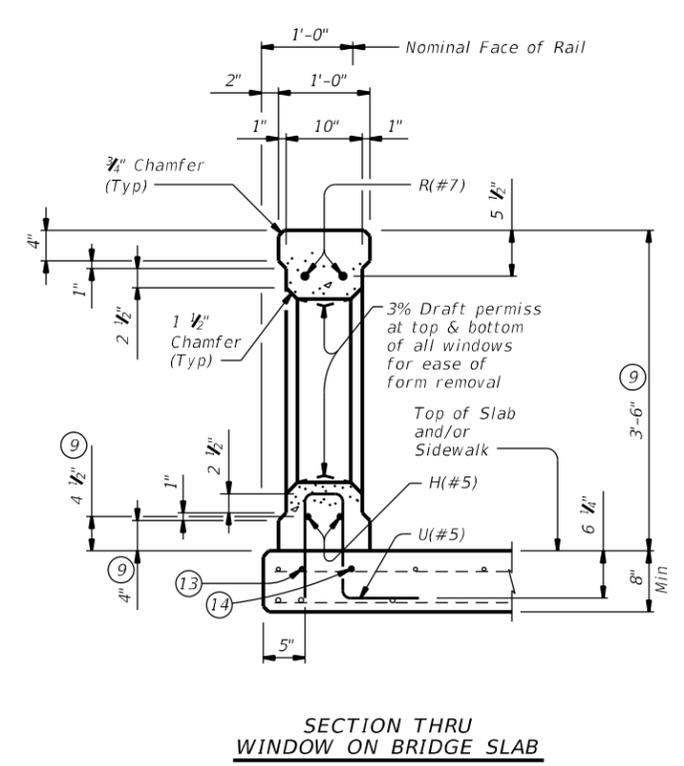
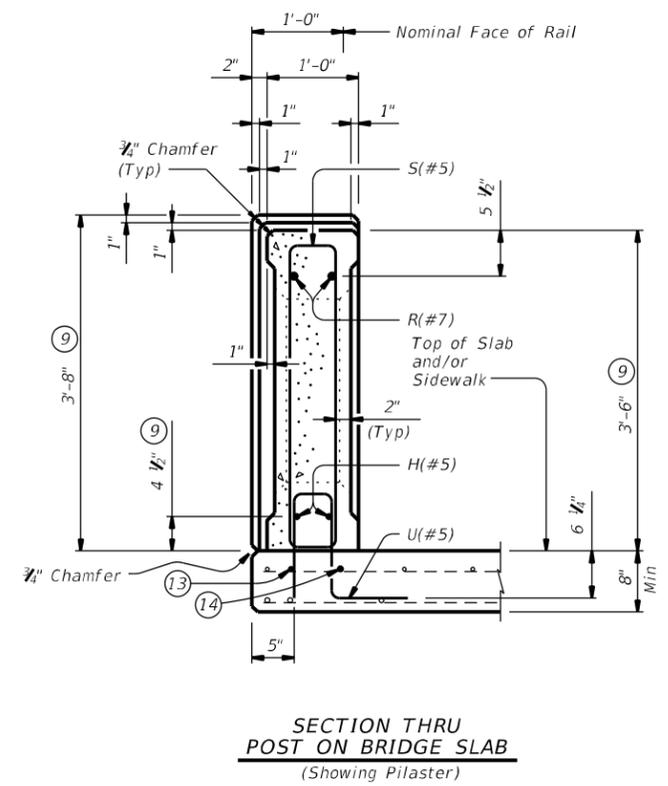
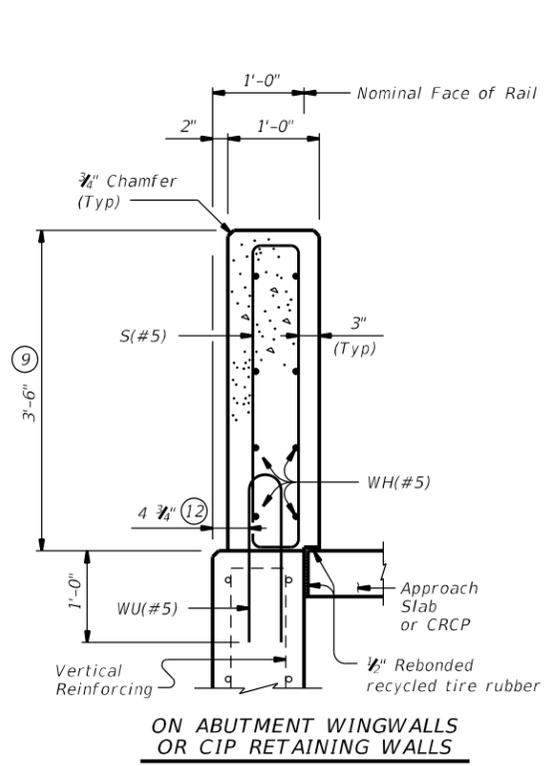
- ④ BARS E MAY BE ADJUSTED AS NEEDED TO SECURE RAIL ANCHORAGE BARS U DURING CONCRETE PLACEMENT
- ⑤ #6 BY 1'-8" LONG DOWELS D AT 9" SPACING. EMBED 10" INTO EXISTING BEAM AS SHOWN WITH A TxDOT DMS 6100 TYPE III CLASS C EPOXY. BATTER @ 6:1 AS SHOWN.
- ⑥ ROUGHEN EXISTING SURFACE TO 1/4" MAXIMUM DEPTH
- ⑦ EXISTING REINFORCING STEEL, IF CONCRETE REMOVAL REVEALS EXISTING STEEL DIFFERING FROM DETAIL, ADDITIONAL STEEL MAY BE REQUIRED AS APPROVED BY THE ENGINEER.



REV. NO.	DATE	DESCRIPTION	BY
<p>PAPE-DAWSON ENGINEERS</p> <p>SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800</p>			
<p>CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT</p>			
<p>N. PRESA & W. MARKET BRIDGE REPAIRS</p>			
100% SUBMITTAL	PROJECT NO. : XX-XXXXX		
			38

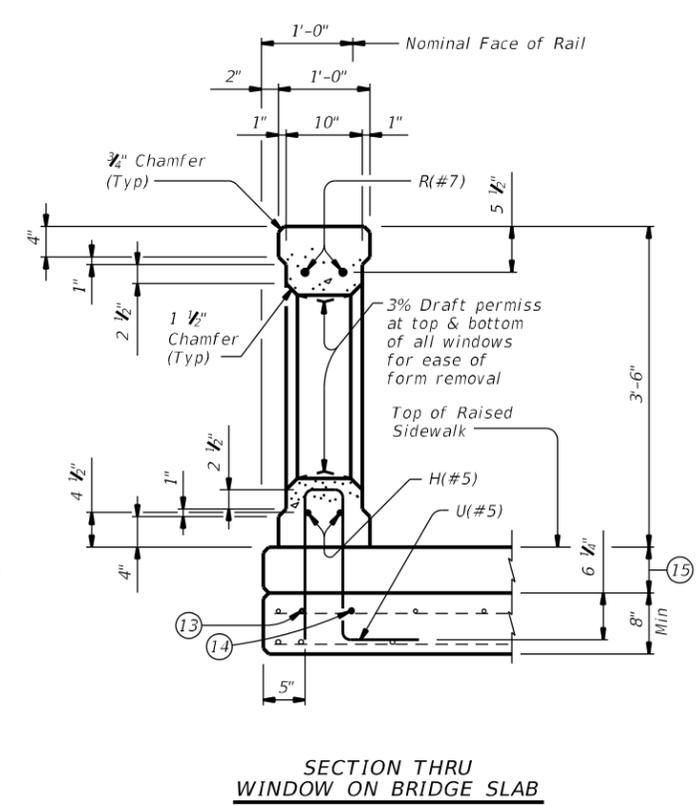
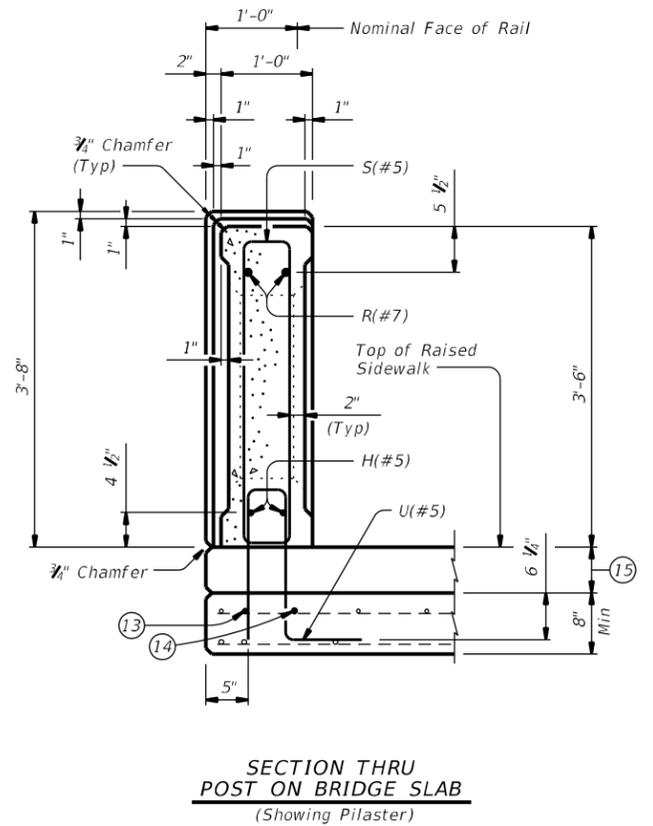
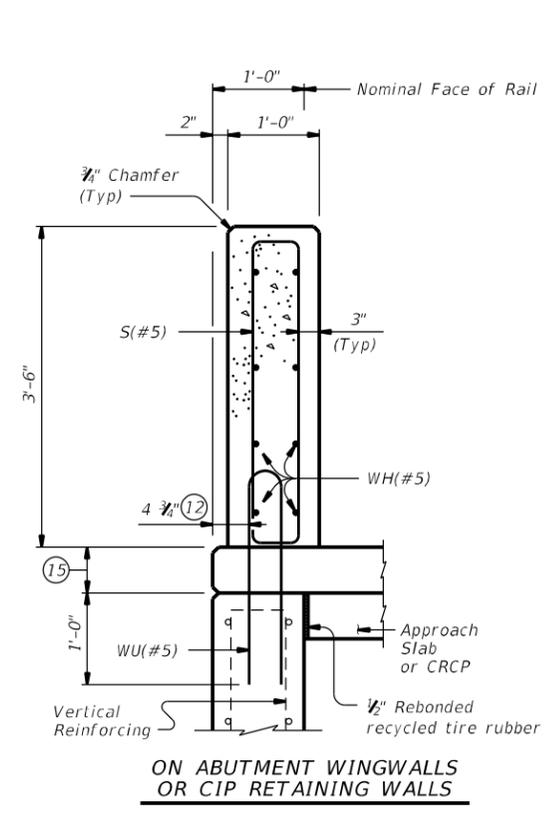
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DATE: FILE:



SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK

- ⑨ Increase 2" for structures with overlay.
- ⑫ 5 1/2" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.
- ⑬ As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractor's expense.
- ⑭ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.
- ⑮ Raised Sidewalk



SECTIONS THRU RAIL WITH RAISED SIDEWALK



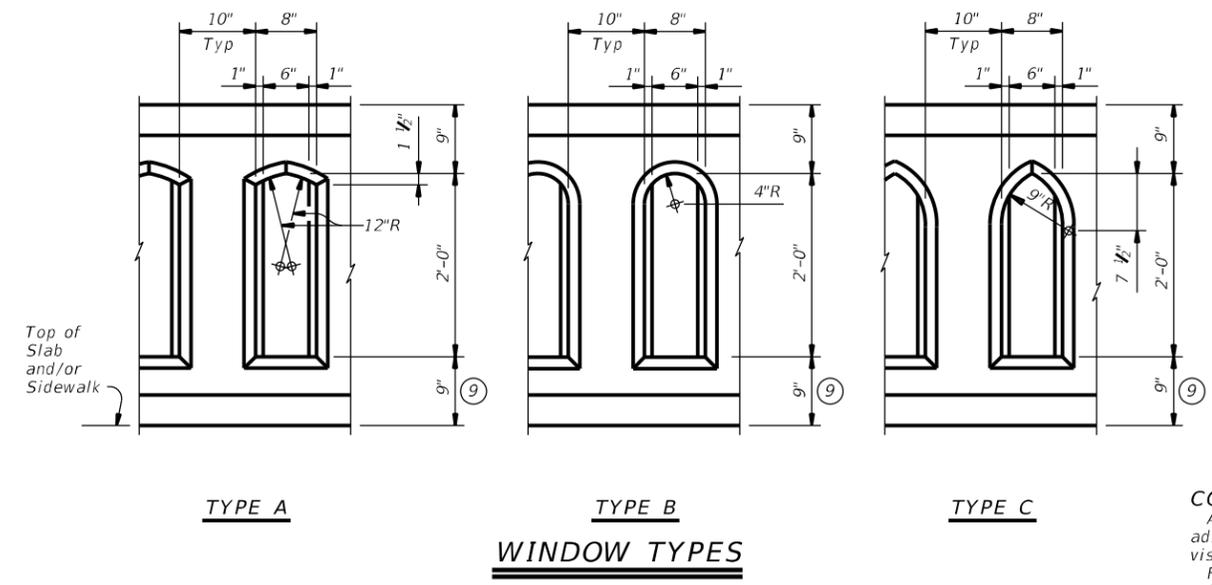
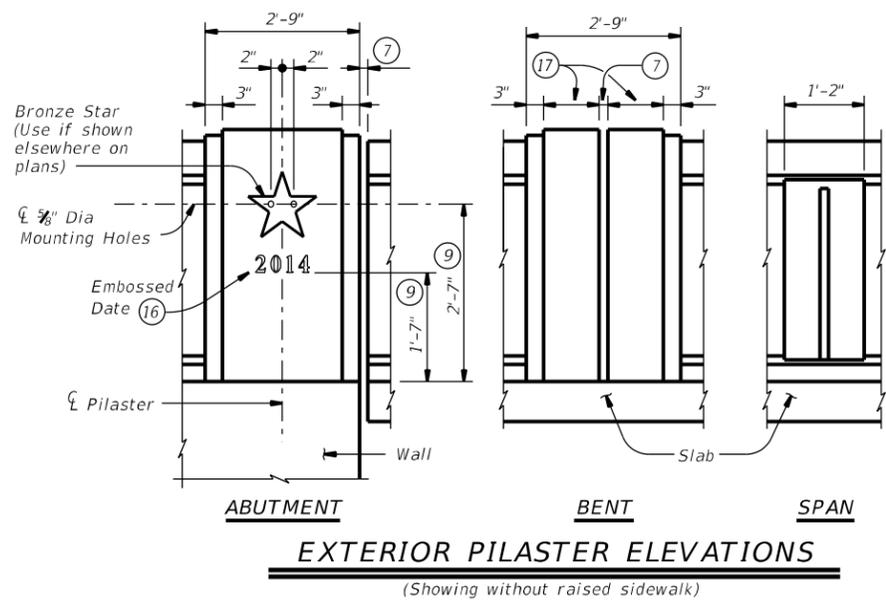
**BRIDGE REHABILITATION DETAILS
COMBINATION RAIL
TEXAS CLASSIC**

TYPE C411

FILE: r1std021-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: TxDOT
©TxDOT September 2019	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS				
7-20: Bronze star change to one manufacturer.	DIST	COUNTY	SHEET NO.	
			40	

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EXTERIOR PILASTER ELEVATIONS
(Showing without raised sidewalk)

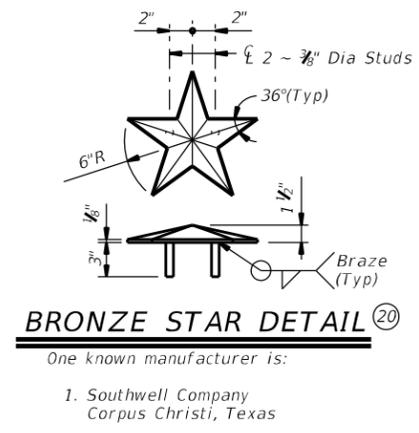
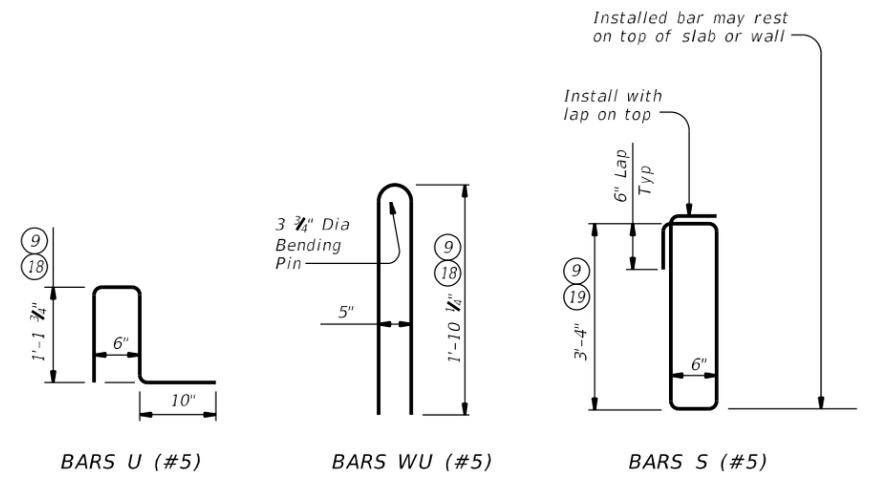
WINDOW TYPES

CONSTRUCTION NOTES:
 Attach Bronze Star with a Type III Class C, D, E, or F epoxy adhesive. Clamp star until epoxy achieves set. Remove any visible epoxy "squeeze out" from under star.
 Face of rail and pilasters, parapet must be plumb unless otherwise approved.
 Apply a one rub finish to all railing surfaces unless otherwise shown elsewhere on the plans.

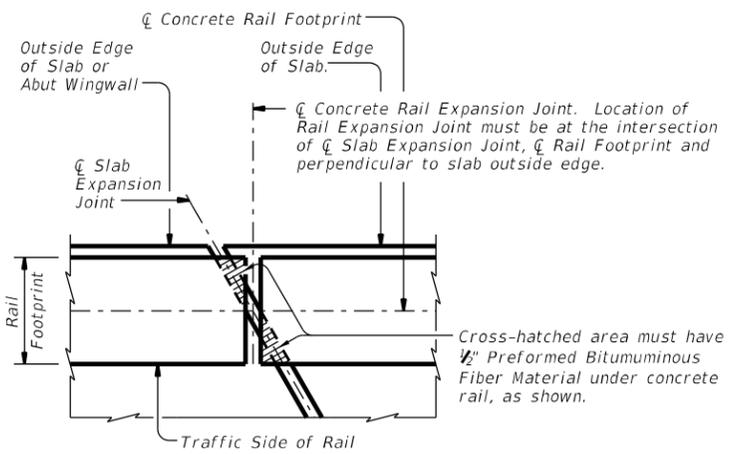
MATERIAL NOTES:
 Provide Class "C" concrete for railing. Provide Class "C" (HPC) concrete if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.
 Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.
 Bronze Star must be cast of architectural bronze having the following composition: Copper 85 %, Tin 5 %, Lead 5 %, Zinc 5 %.
 Provide bar laps, where required, as follows:
 Uncoated or galvanized ~ #5 = 2'-0"
 Uncoated or galvanized ~ #7 = 2'-11"
 Epoxy coated ~ #5 = 3'-0"
 Epoxy coated ~ #7 = 4'-4"

GENERAL NOTES:
 This rail has been successfully evaluated by full-scale crash test to meet MASH TL-2 criteria. This rail can be used for speeds of 45 mph and less when a TL-2 or TL-3 rated guard fence transition is used. This rail is only approved for low speed use, speeds of 45 mph and less.
 Do not use this railing on bridges with expansion joints providing more than 5" movement.
 Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.
 Shop drawings will not be required for this rail.
 See Bridge Layout or other plan sheets for the following: dimensions with the number of span pilasters, dimensions with the number of windows, window type, inclusion of bronze stars, inclusion of construction year with abutment identity.

Submit erection drawings showing span number, span pilaster locations, number of windows between pilasters and spacing to first window (see Note 6) to the Engineer for approval.
 Average weight of railing with no overlay increase and no pilasters is 350 plf.
 Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.



BRONZE STAR DETAIL
 One known manufacturer is:
 1. Southwell Company
 Corpus Christi, Texas



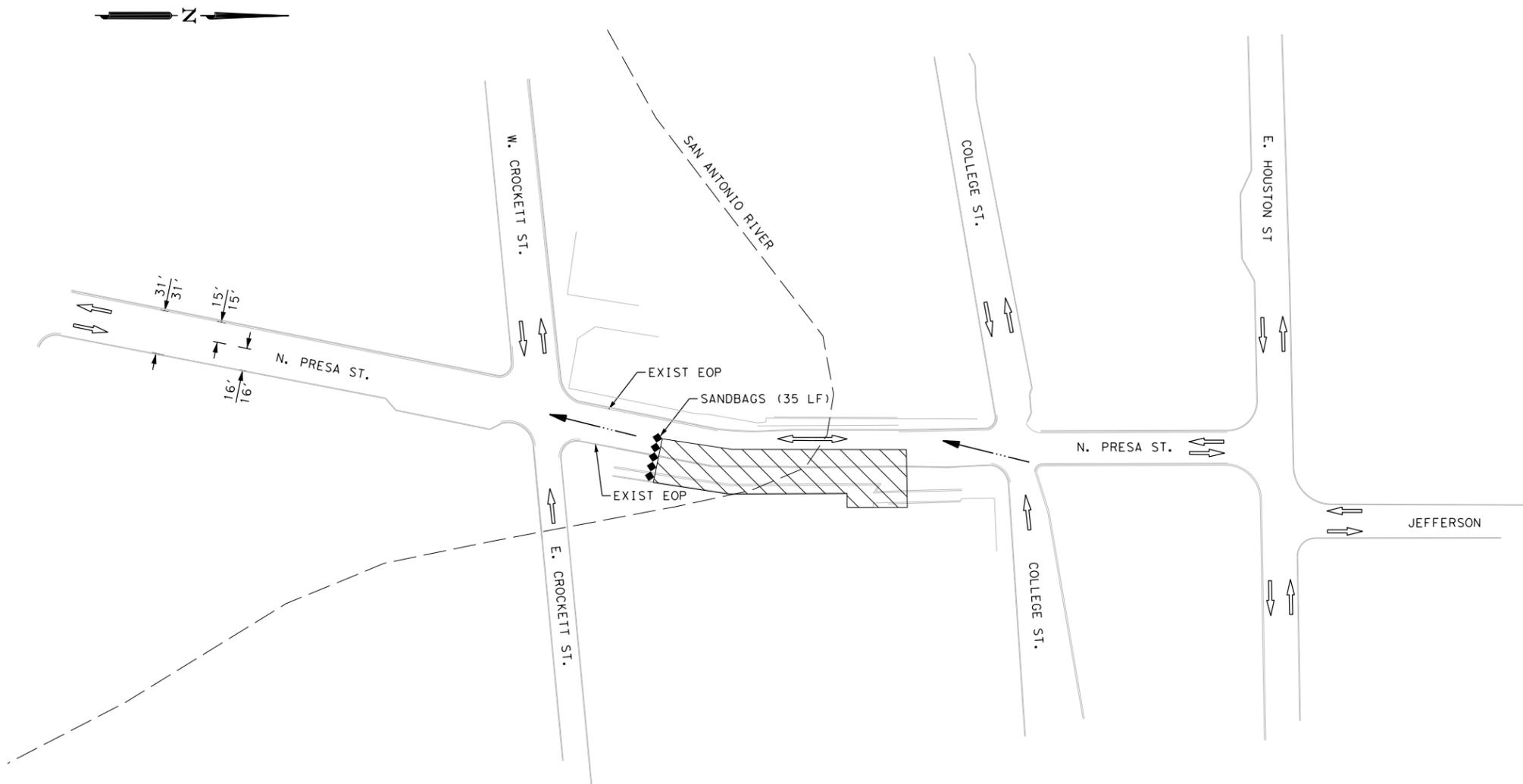
PLAN OF RAIL AT EXPANSION JOINTS
 Example showing Slab Expansion Joints without breakbacks.

- 7 Provide rail joints at ends of all spans the same width as Slab joint opening, except that Rail Joints over construction joints must be 1/4" Min to 3/4" Max in width. Joints must be open if slab joint opening is not sealed. Joints over construction joints and over sealed deck joints must be plugged. Forming material used in joints may be left in place if it is light in color and compressible, such as the following materials: polystyrene, molded cork granules, sponge rubber sheet, etc. If forming material is not left in place, plug the bottom 6" with slab joint sealing compound to prevent drainage and staining.
- 9 Increase 2" for structures with overlay.
- 16 Construction year (use if shown elsewhere on plans) 3" High "Platin Bold" Typeface with 1/4" recess. Placed at one Abutment only or as directed by the Engineer.
- 17 Dimensions must be the same on each side of joint.
- 18 For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.
- 19 Reduce by 2" or field bend over Preformed Bituminous Fiber Material to gain cover.
- 20 Bronze Star dimensions of the final product can be slightly smaller due to shrinkage after casting.

		Bridge Division Standard	
BRIDGE REHABILITATION DETAILS COMBINATION RAIL TEXAS CLASSIC TYPE C411			
FILE: r1std021-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT September 2019	CONTRACT	SECTION	JOB
REVISIONS			
7-20: Bronze star change to one manufacturer.	DIST	COUNTY	SHEET NO.
			41

Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\SW3P\Phase1\1222702_SW3P01.dgn



SW3P LEGEND

- ← FLOW ARROW
- CONSTRUCTION AREA

SW3P NOTES

1. REFER TO TXDOT SW3P STANDARD SHEETS FOR DETAILS.
2. INSTALLED MEASURES SHALL REMAIN IN PLACE AND BE INSPECTED WEEKLY. ALL ITEMS SHALL BE MAINTAINED AND REPAIRED THROUGHOUT DURATION OF USE.
3. SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE SHOWN AND MODIFIED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.

DESIGN



J. Powell
JACOB J. POWELL, P.E.

12/12/2022
DATE

APPROVAL



D. Thoma
DAN THOMA, P.E.

12/12/2022
DATE

REV. NO.	DATE	DESCRIPTION	BY



SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800



CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

**N. PRESA & W. MARKET
BRIDGE REPAIRS**

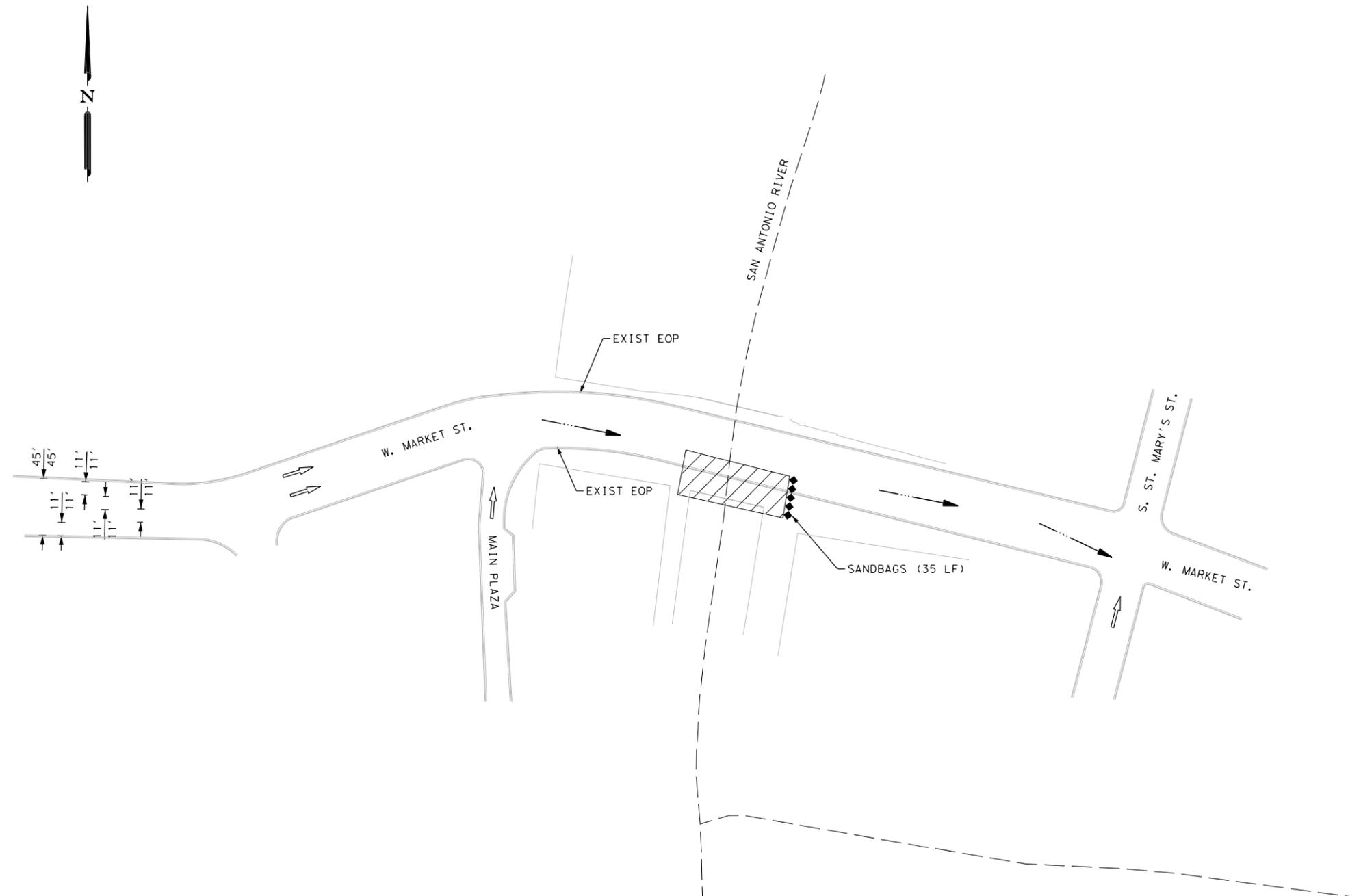
SWP3 LAYOUT
PHASE I

SHEET 1 OF 2

XX% SUBMITTAL	PROJECT NO.: WBS 40-00294-01-02-4	DATE: 12/12/2022
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC
		SHEET NO.: 42

Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\SW3P\Phase1\1222702_SW3P02.dgn



SW3P LEGEND

- ← FLOW ARROW
- CONSTRUCTION AREA

SW3P NOTES

1. REFER TO TXDOT SW3P STANDARD SHEETS FOR DETAILS.
2. INSTALLED MEASURES SHALL REMAIN IN PLACE AND BE INSPECTED WEEKLY. ALL ITEMS SHALL BE MAINTAINED AND REPAIRED THROUGHOUT DURATION OF USE.
3. SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE SHOWN AND MODIFIED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.

DESIGN



JJP
 JACOB J. POWELL, P.E.

12/12/2022
 DATE

APPROVAL



Dt
 DAN THOMA, P.E.

12/12/2022
 DATE

REV. NO.	DATE	DESCRIPTION	BY



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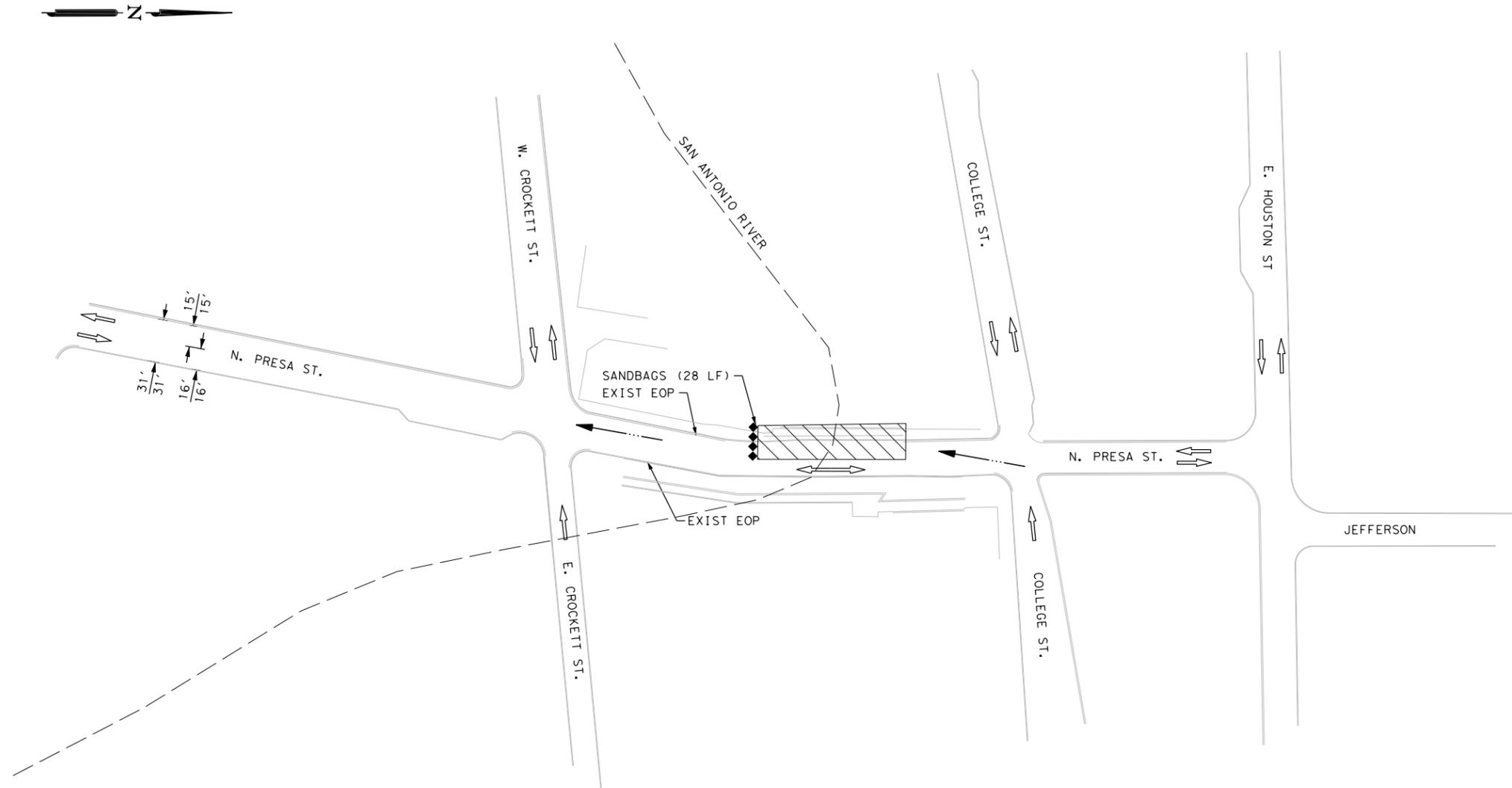
SWP3 LAYOUT
 PHASE I

SHEET 2 OF 2

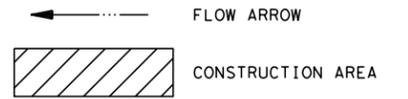
XX% SUBMITTAL	PROJECT NO.: WBS 40-00294-01-02-4	DATE: 12/12/2022
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC
		SHEET NO.: 43

Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\SW3P\Phase2\1222702_SW3P03.dgn



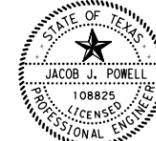
SW3P LEGEND



SW3P NOTES

1. REFER TO TXDOT SW3P STANDARD SHEETS FOR DETAILS.
2. INSTALLED MEASURES SHALL REMAIN IN PLACE AND BE INSPECTED WEEKLY. ALL ITEMS SHALL BE MAINTAINED AND REPAIRED THROUGHOUT DURATION OF USE.
3. SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE SHOWN AND MODIFIED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.

DESIGN



J. Powell
 JACOB J. POWELL, P.E. 12/12/2022
 DATE

APPROVAL



D. Thoma
 DAN THOMA, P.E. 12/12/2022
 DATE

REV. NO.	DATE	DESCRIPTION	BY



SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
 2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800



CITY OF SAN ANTONIO
 PUBLIC WORKS DEPARTMENT

N. PRESA & W. MARKET
 BRIDGE REPAIRS

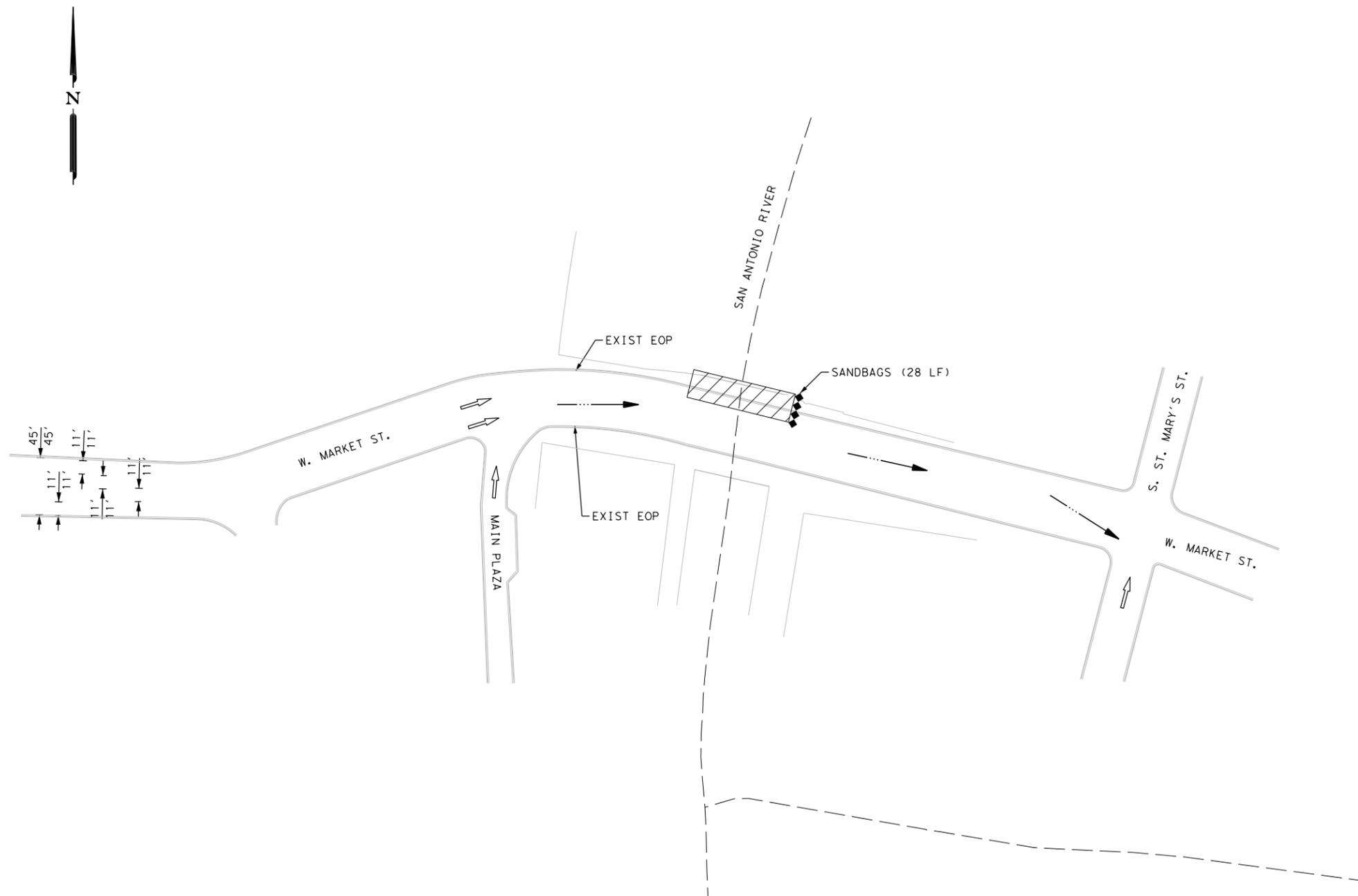
SWP3 LAYOUT
 PHASE II

SHEET 1 OF 2

XX% SUBMITTAL	PROJECT NO.: WBS 40-00294-01-02-4	DATE: 12/12/2022
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC
SHEET NO.: 44		

Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\SW3P\Phase2\1222702_SW3P04.dgn



SW3P LEGEND

- ← FLOW ARROW
- CONSTRUCTION AREA

SW3P NOTES

1. REFER TO TXDOT SW3P STANDARD SHEETS FOR DETAILS.
2. INSTALLED MEASURES SHALL REMAIN IN PLACE AND BE INSPECTED WEEKLY. ALL ITEMS SHALL BE MAINTAINED AND REPAIRED THROUGHOUT DURATION OF USE.
3. SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE SHOWN AND MODIFIED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.

DESIGN



J. Powell
 JACOB J. POWELL, P.E.

12/12/2022
 DATE

APPROVAL



D. Thoma
 DAN THOMA, P.E.

12/12/2022
 DATE

REV. NO.	DATE	DESCRIPTION	BY



SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
 2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800



CITY OF SAN ANTONIO
 PUBLIC WORKS DEPARTMENT

**N. PRESA & W. MARKET
 BRIDGE REPAIRS**

SWP3 LAYOUT
 PHASE II

SHEET 2 OF 2

XX% SUBMITTAL	PROJECT NO.: WBS 40-00294-01-02-4	DATE: 12/12/2022
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC
SHEET NO.: 45		

EPA & TCEQ Construction General Permit - Checklist of Record Keeping Responsibilities City of San Antonio (COSA) - January-2015

ENGINEER

Pre Construction

- Design of structural controls
- Development of SWP3
- Development of SWP3 site diagram(s) including grading plans/contours anticipated at initial, interim and final grade
- Development of project phasing schedule
- Water Pollution Abatement Plan (WPAP) (Edwards Aquifer)
- AST Plan (Edwards Aquifer)
- Environmental Preconstruction Meeting

During Construction

- Evaluation of BMP effectiveness
- Review of SWP3 Modifications

Post Construction

- Close Out Inspection
 - o Ensure removal of temporary BMPs,
 - o Verify correct installation of permanent BMPs,
 - o Assess final stabilization achieved to allow Notice of Termination

COSA CONSTRUCTION PROJECT MANAGER

Pre Construction

- Review SWP3 Plans
- Environmental Preconstruction Meeting
- Conduct SWP3 Training (EPA only)

Construction

- Ensure inspection are performed and document every 7 days
- Ensure maintenance of up to date copies of SWP3 and associated records
 - o Corrective Action Documentation- within 7 days of time of discovery (EPA)
 - o Maintenance- document if unable to fix/install item within 7 days. (EPA)
- Ensure records of rainfall events are being maintained
 - o Rainfall during normal business hours that measures 0.25 inches or greater (EPA)
 - o Rainfall- record of total rainfall measured and the approximate beginning and ending dates of winter or drought conditions resulting in monthly frequency of inspections (TCEQ)
- Follow Up on incidents and spill reports to ensure proper corrective actions
 - o Construction Manager would be responsible for notifying COSA Environmental of a Reportable Quantity Release (e.g., sheen on water, 25 gallons of "oil" to land, etc.)
 - o Provide a description of spills and incidents & information obtained regarding quality and quantity of stormwater discharges to COSA Environmental.
- Ensure completing of the Grading Log (dates when activities start and end) and Construction Activities Log (daily)
 - o Ensure Construction Activities Log includes dates when construction activities temporarily or permanently cease on site (TCEQ) and dates when stabilization measures are initiated
- Ensure upkeep of the on-site Material Inventory
- Coordinate between Contractor, COSA, and Engineer when the SWP3 requires modification and/or when BMPs are not effective, are missing, or need maintenance/repair
- Ensure contractor is noting SWP3 accordingly (Dates of installment of BMPs, removal of BMPs, maintenance of BMPS, concrete washout pits date of install and removal, etc.)

Post Construction

- Close Out Inspection
 - o Ensure removal of temporary BMPs,
 - o Verify correct installation of permanent BMPs,
 - o Assess final stabilization achieved to allow Notice of Termination

COSA ENVIRONMENTAL GROUP

Pre Construction

- Review SWP3 Plans
- File Notice of Intent
- Environmental Preconstruction Meeting
- Conduct SWP3 Training (EPA only)
- Post Construction Site Notice

Construction

- Ensure inspection are performed and document every 7 days
- Ensure maintenance of up to date copies of SWP3 and associated records
 - o Corrective Action Documentation- within 7 days of time of discovery (EPA)
 - o Maintenance- document if unable to fix/install item within 7 days. (EPA)
- Ensure records of rainfall events are being maintained
 - o Rainfall during normal business hours that measures 0.25 inches or greater (EPA)
 - o Rainfall- record of total rainfall measured and the approximate beginning and ending dates of winter or drought conditions resulting in monthly frequency of inspections (TCEQ)
- Follow Up on incidents and spill reports to ensure proper corrective actions
 - o Conduct TCEQ notification as required for spills above a reportable quantity (e.g., sheen on water, 25 gallons of "oil" to land, etc.)
- Ensure completion of the Grading Log (dates when activities start and end) and Construction Activities Log (daily)
 - o Ensure Construction Activities Log includes dates when construction activities temporarily or permanently cease on site (TCEQ) and dates when stabilization measures are initiated
- Ensure upkeep of the on-site Material Inventory
- Coordinate between Construction Project Manager, Contractor, and Engineer when the SWP3 requires modification and/or when BMPs are not effective, are missing, or need maintenance/repair
- Ensure contractor is noting SWP3 accordingly (Dates of installment of BMPs, removal of BMPs, maintenance of BMPS, concrete washout pits date of install and removal, etc.)

Post Construction

- Close Out Inspection
 - o Ensure removal of temporary BMPs,
 - o Verify correct installation of permanent BMPs,
 - o Assess final stabilization achieved to allow Notice of Termination
- Obtain and file all records associated with the TPDES/NPDES Permit activities at the project for 3 years
- File Notice of Termination, when appropriate

CONTRACTOR

Pre Construction

- Review SWP3 Plans
- File Notice of Intent
- Environmental Preconstruction Meeting
- Conduct SWP3 Training (EPA only)
- Post Construction Site Notice

Construction

- Conduct inspections every 7 days and maintain records of inspections and corrective actions
- Maintain up to date copies of SWP3 and associated records
 - o Corrective Action Documentation- within 7 days of time of discovery (EPA)
 - o Maintenance- document if unable to fix/install item within 7 days. (EPA)
- Record rainfall events and maintain documentation with the SWP3
 - o Rainfall during normal business hours that measures 0.25 inches or greater (EPA)
 - o Rainfall- record of total rainfall measured and the approximate beginning and ending dates of winter or drought conditions resulting in monthly frequency of inspections (TCEQ)
- Conduct and record environmental monitoring-
 - o Retain all related records including: TSS (Once per week), Turbidity (Twice per day upstream and downstream) (EPA)
 - o Sampling-(onsite batch plant) document if sampling is not completed within the first 30 minutes of discharge (TCEQ).
- Follow Up on incidents and spill reports to ensure proper corrective actions
 - o Notify Construction Site Project Manager immediately of spills above a reportable quantity (e.g., sheen on water, 25 gallons of "oil" to land, etc.)
 - o Provide a description of spills and incidents & information obtained regarding quality and quantity of stormwater discharges to the Project Manager, as necessary.
- Complete the Grading Log (dates when activities start and end) and Construction Activities Log (daily)
 - o Ensure Construction Activities Log includes dates when construction activities temporarily or permanently cease on site (TCEQ) and dates when stabilization measures are initiated
- Maintain an on-site Material Inventory
- Update SWP3 to depict actual locations and types of BMPs, potential pollutant sources, etc., as the project proceeds.
- Coordinate between Construction Project Manager, COSA Environmental, and Engineer when the SWP3 requires modification and/or when BMPs are not effective, are missing, or need maintenance/repair
- Ensure SWP3 is being noted accordingly (Dates of installment of BMPs, removal of BMPs, maintenance of BMPS, concrete washout pits date of install and removal, etc.)

CONTRACTOR (Cont'd)

Post Construction

- Close Out Inspection
 - o Ensure removal of temporary BMPs,
 - o Verify correct installation of permanent BMPs,
 - o Assess final stabilization achieved to allow Notice of Termination
- Provide COSA Environmental with copies of all records associated with the TPDES/NPDES Permit
- Maintain a copy of these records for Contractor Permit compliance for 3 years following submittal of the Notice of Termination
- File Notice of Termination, when appropriate

Close Out Inspection

- Ensure removal of temporary BMPs,
- Verify correct installation of permanent BMPs,
- Assess final stabilization achieved to allow Notice of Termination
- Obtain and file all records associated with the TPDES/NPDES Permit activities at the project for 3 years
- File Notice of Termination, when appropriate

Plotted on: 12/12/2022

Design File name: P:\122\27\02\Design\Civil\SW3P\1222702_SWP3NOTES.dgn



J. Powell
JACOB J. POWELL, P.E. 12/12/2022
DATE



D. Thoma
DAN THOMA, P.E. 12/12/2022
DATE

REV. NO.	DATE	DESCRIPTION	BY
<p style="text-align: center; font-weight: bold; margin: 0;">PAPE-DAWSON ENGINEERS</p> <p style="text-align: center; font-size: small; margin: 0;">SAN ANTONIO AUSTIN HOUSTON FORT WORTH DALLAS 2000 NW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10028800</p>			
<p style="text-align: center; font-weight: bold; margin: 0;">CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT</p>			
<p style="font-size: large; font-weight: bold; margin: 0;">N. PRESA & W. MARKET BRIDGE REPAIRS</p> <p style="font-weight: bold; margin: 0;">SWP3 GENERAL NOTES</p>			
XX% SUBMITTAL	PROJECT NO.:	WBS 40-00294-01-02-4	DATE: 12/12/2022
DRWN. BY: EC	DSGN. BY: EC	CHKD. BY: AC	SHEET NO.: 46

SITE DESCRIPTION

PROJECT NAME AND LOCATION: N. PRESA AND W. MARKET BRIDGE REPAIRS
SAN ANTONIO, TEXAS
BEXAR COUNTY

CONTACT AND PHONE NO.: _____

PROJECT DESCRIPTION: BRIDGE REPAIRS AND REHABILITATION FOR BRIDGE CROSSINGS
OVER SAN ANTONIO RIVER AT N. PRESA ST AND W. MARKET ST.

MAJOR SOIL DISTURBING ACTIVITIES: NA

TOTAL PROJECT AREA (ACRES): 0.4386 ACRES

TOTAL AREA TO BE DISTURBED: 0.4386 ACRES

WEIGHTED RUNOFF COEFFICIENT: NA
(AFTER CONSTRUCTION)

EXISTING CONDITION OF SOIL, VEGETATIVE COVER AND % OF VEGETATIVE COVER: NA

DESCRIPTION OF WATER DISCHARGED NOT ASSOCIATED WITH CONSTRUCTION: NA

NAME OF RECEIVING WATERS: SAN ANTONIO RIVER

IDENTIFY STORMWATER DISCHARGE POINTS: NA

A DESCRIPTION AND TIME FRAME FOR INSTALLATION OF STABILIZATION PRACTICES IN CONJUNCTION WITH CONSTRUCTION:

SW3P MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES

EROSION AND SEDIMENTATION CONTROLS

SOIL STABILIZATION PRACTICES:

- _____ HYDROMULCHING
- _____ TEMPORARY SEEDING
- _____ PERMANENT PLANTING, SODDING OR SEEDING
- _____ MULCHING
- _____ SOIL RETENTION BLANKET
- _____ BUFFER ZONES
- _____ PRESERVATION OF NATURAL RESOURCES

OTHER:

DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME AND DONE WITHIN 21 DAYS.

STRUCTURAL PRACTICES:

- _____ SILT FENCES
- _____ HAY BALES
- _____ GRAVEL FILTRATION BAGS
- _____ ROCK BERMS
- _____ DIVERSION, INTERCEPTOR OR PERIMETER DIKES
- _____ DIVERSION, INTERCEPTOR OR PERIMETER SWALES
- _____ DIVERSION, DIKE AND SWALE COMBINATIONS
- _____ PAVED FLUMES
- _____ ROCK BEDDING AT CONSTRUCTION EXIT (STABILIZED ENTRANCE)
- _____ TIMBER MATTING AT CONSTRUCTION EXIT (STABILIZED ENTRANCE)
- _____ CHANNEL LINERS
- _____ SEDIMENT TRAPS
- _____ SEDIMENT BASINS
- _____ STORM INLET SEDIMENT TRAP
- _____ STONE OUTLET SEDIMENT STRUCTURES
- _____ CURBS AND GUTTERS
- _____ STORM SEWERS
- _____ VELOCITY CONTROL STRUCTURES
- _____ GEOTEXTILES

OTHER:

SANDBAGS

NARRATIVE – SEQUENCE OF CONSTRUCTION (STORMWATER MANAGEMENT) ACTIVITIES:

THE ORDER OF ACTIVITIES WILL BE AS FOLLOWS: _____

A DESCRIPTION OF MAINTENANCE PROCEDURES FOR CONTROL MEASURES USED: _____

STORMWATER MANAGEMENT: _____

AS PER SW3P PLANS (DURING CONSTRUCTION ACTIVITIES)

A DESCRIPTION OF PERMANENT STORM WATER MANAGEMENT CONTROLS: _____

OTHER EROSION AND SEDIMENTATION CONTROLS

MAINTENANCE:

ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE DONE AT THE EARLIEST DATE POSSIBLE, BUT NO LATER THAN 7 CALENDAR DAYS AFTER THE SURROUNDING EXPOSED GROUND HAS DRIED SUFFICIENTLY TO PREVENT FURTHER DAMAGE FROM HEAVY EQUIPMENT. THE AREAS ADJACENT TO CREEKS AND DRAINAGEWAYS SHALL HAVE PRIORITY, FOLLOWED BY DEVICES PROTECTING STORM SEWER INLETS.

INSPECTION:

AN INSPECTION WILL BE PERFORMED BY THE CONTRACTOR EVERY 14 DAYS AS WELL AS AFTER EVERY 1/2" OR MORE OF RAIN (RECORDED ON A NON-FREEZING RAIN GAUGE TO BE LOCATED AT THE PROJECT SITE). AN INSPECTION AND MAINTENANCE REPORT WILL BE MADE PER INSPECTION. BASED ON THE INSPECTION RESULTS, THE CONTROLS SHALL BE CORRECTED BEFORE THE NEXT SCHEDULED INSPECTION.

WASTE MATERIALS:

ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER. THE DUMPSTER WILL MEET ALL STATE AND LOCAL CITY SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION AND THE TRASH WILL BE HAULED TO A LOCAL DUMP. NO CONSTRUCTION MATERIALS WILL BE BURIED ON SITE.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING):

AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING, MASONRY SURFACES, GASOLINE, MOTOR OIL, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS AND MEETS REPORTING REQUIREMENTS, THE NATIONAL RESPONSE CENTER SHOULD BE CONTACTED AT 800-424-8802, AND ANY REQUIRED CHANGES MADE TO THE SWPPP. IN THE EVENT OF A LIFE THREATENING SPILL THE SAN ANTONIO FIRE DEPARTMENT SHOULD BE NOTIFIED AS WELL AS THE APPROPRIATE CITY INSPECTORS.

SANITARY WASTE _____

OFFSITE EXCAVATION SOURCE LOCATION _____

OFFSITE FILL SOURCE LOCATION _____

OFFSITE VEHICLE TRACKING _____

- _____ HAUL ROADS DAMPENED FOR DUST CONTROL.
- _____ LOADED HAUL TRUCKS TO BE COVERED WITH TARPULIN
- _____ EXCESS DIRT ON ROAD TO BE REMOVED DAILY
- _____ STABILIZED CONSTRUCTION ENTRANCE.

OTHER:

CERTIFICATION THAT SITE DISTURBANCE AND / OR DISCHARGES WILL NOT EFFECT LISTED ENDANGERED SPECIES AND THEIR HABITAT. WHAT METHOD IS USED TO SATISFY THE ENDANGERED SPECIES REQUIREMENTS? _____

REMARKS:

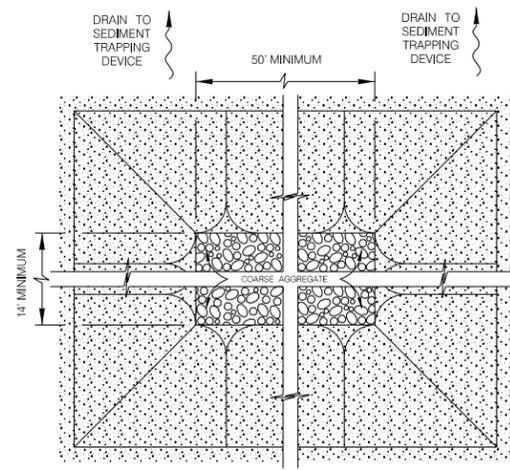
DISPOSAL AREAS, STOCKPILES AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT ENTERS RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, BODY OF WATER, STREAMBED OR FLOODPLAIN. CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS. ALL WATERWAYS SHALL BE CLEARED AS SOON AS POSSIBLE OF TEMPORARY EMBANKMENT, TEMPORARY BRIDGES, MATTING, FALSEWORK, PILING DEBRIS OR OTHER OBSTRUCTION PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT PART OF THE FINISHED WORK.

JANUARY 2005

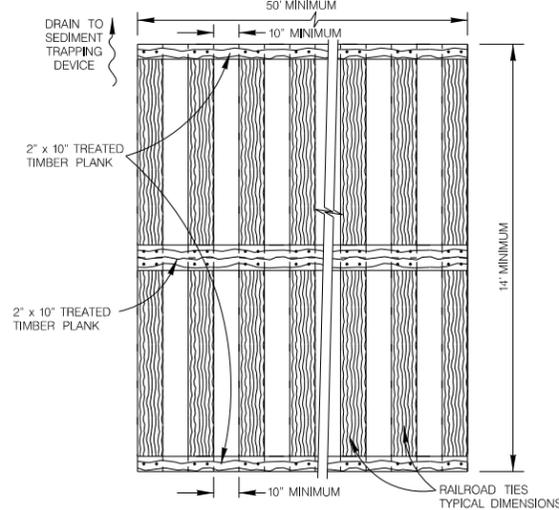
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

STORM WATER POLLUTION PREVENTION PLAN (SWP3) NARRATIVE

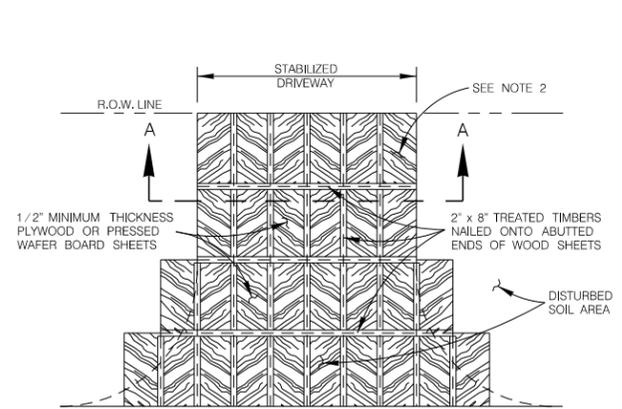
% SUBMITTAL	PROJECT NO.:	DATE:
DRWN. BY: V. VASQUEZ	DSGN. BY:	CHKD. BY:
		SHEET NO.: 47



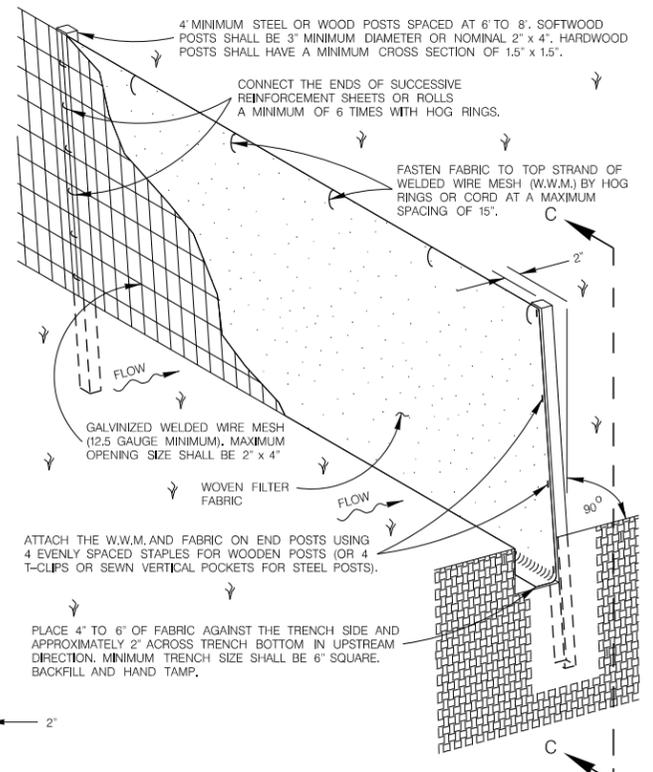
PLAN
SCALE : 1" = 6'



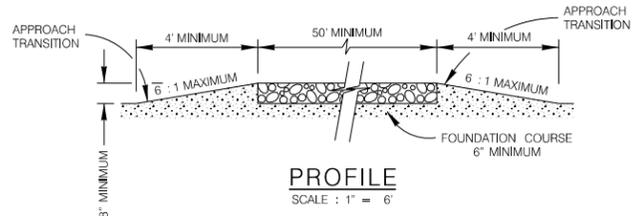
PLAN
SCALE : 1" = 6'



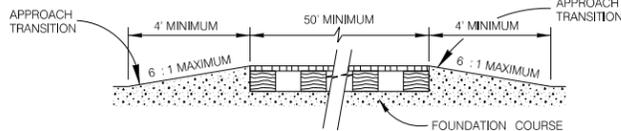
PLAN
SCALE : 1" = 20'



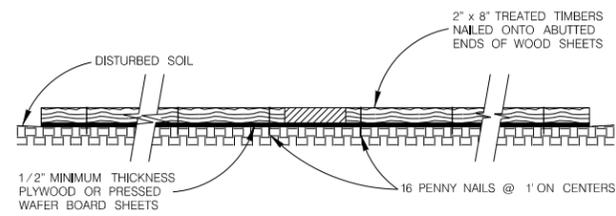
ISOMETRIC VIEW
SCALE : 1" = 2'



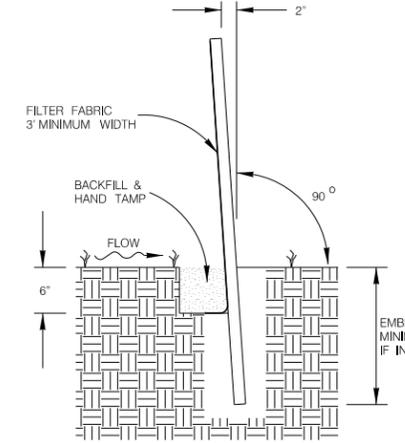
PROFILE
SCALE : 1" = 6'



PROFILE
SCALE : 1" = 6'



SECTION A-A
SCALE : 1" = 2'



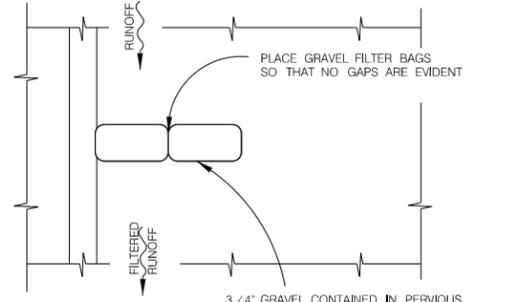
SECTION C-C
SCALE : 1" = 2'

- GENERAL NOTES**
1. THE LENGTH OF THE TYPE 1 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
 2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 4" TO 8".
 3. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6:1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
 4. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
 5. THE CONSTRUCTION EXIT SHALL BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
 6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

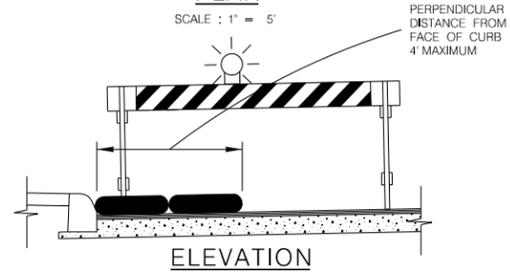
- GENERAL NOTES**
1. THE LENGTH OF THE TYPE 2 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
 2. THE TREATED TIMBER PLANKS SHALL BE ATTACHED TO THE RAILROAD TIES WITH 1/2" x 6" MIN. LAG BOLTS. OTHER FASTENERS MAY BE USED AS APPROVED BY THE ENGINEER.
 3. THE TREATED TIMBER PLANKS SHALL BE #2 GRADE MIN. AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
 4. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6:1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
 5. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
 6. THE CONSTRUCTION EXIT SHOULD BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
 7. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

- GENERAL NOTES**
1. THE LENGTH OF THE TYPE 3 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
 2. THE TYPE 3 CONSTRUCTION EXIT MAY BE CONSTRUCTED FROM OPEN GRADED CRUSHED STONE WITH A SIZE OF 2 TO 4 INCHES SPREAD A MINIMUM OF 4 INCHES THICK TO THE LIMITS SHOWN ON THE PLANS.
 3. THE TREATED TIMBER PLANKS SHALL BE #2 GRADE MIN. AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
 4. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

CONSTRUCTION EXIT - TYPE 1



PLAN
SCALE : 1" = 5'

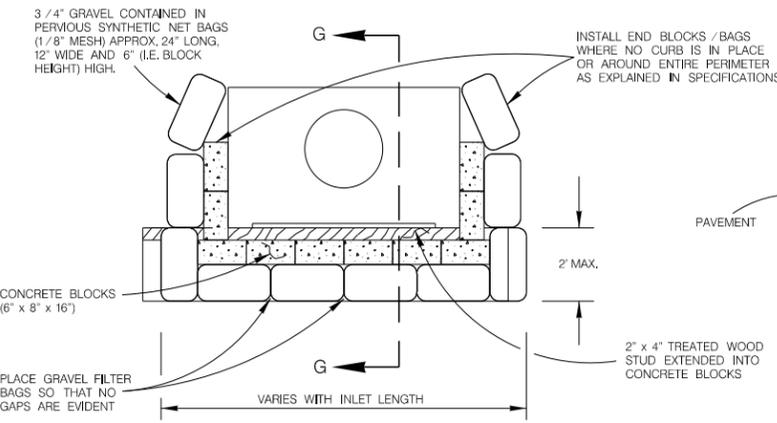


ELEVATION
SCALE : 1" = 5'

NOTE: STRADDLE GRAVEL FILTER BAGS WITH TYPE 1 BARRICADES MOUNTED WITH TYPE "A" FLASHING WARNING LIGHT. SEE BARRICADE CONSTRUCTION SIGN DETAILS. PLACE FLASHING LIGHTS AWAY FROM GUTTER, FLUSH WITH OUTSIDE EDGE OF BAG CONFIGURATION.

GRAVEL FILTER BAGS

CONSTRUCTION EXIT - TYPE 2

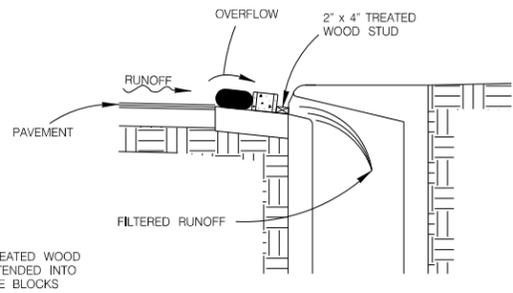


PLAN
SCALE : 1" = 5'

NOTE: GRAVEL FILTERS CAN BE USED ON PAVEMENT OR BARE GROUND.

CURB INLET GRAVEL FILTER

CONSTRUCTION EXIT - TYPE 3



SECTION G-G
SCALE : 1" = 5'

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUN-OFF. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED.

SEDIMENT CONTROL FENCE SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 100 GPM / FT SQUARED. SEDIMENT CONTROL FENCE IS NOT RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA LARGER THAN 2 ACRES.

GENERAL NOTES

1. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

TEMPORARY SEDIMENT CONTROL FENCE

JANUARY 2005

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TEMPORARY EROSION, SEDIMENT & WATER POLLUTION CONTROL MEASURES STANDARDS 1

% SUBMITTAL	PROJECT NO.:	DATE:
DRWN. BY: V. VASQUEZ	DSGN. BY:	CHKD. BY:
		SHEET NO.: 48