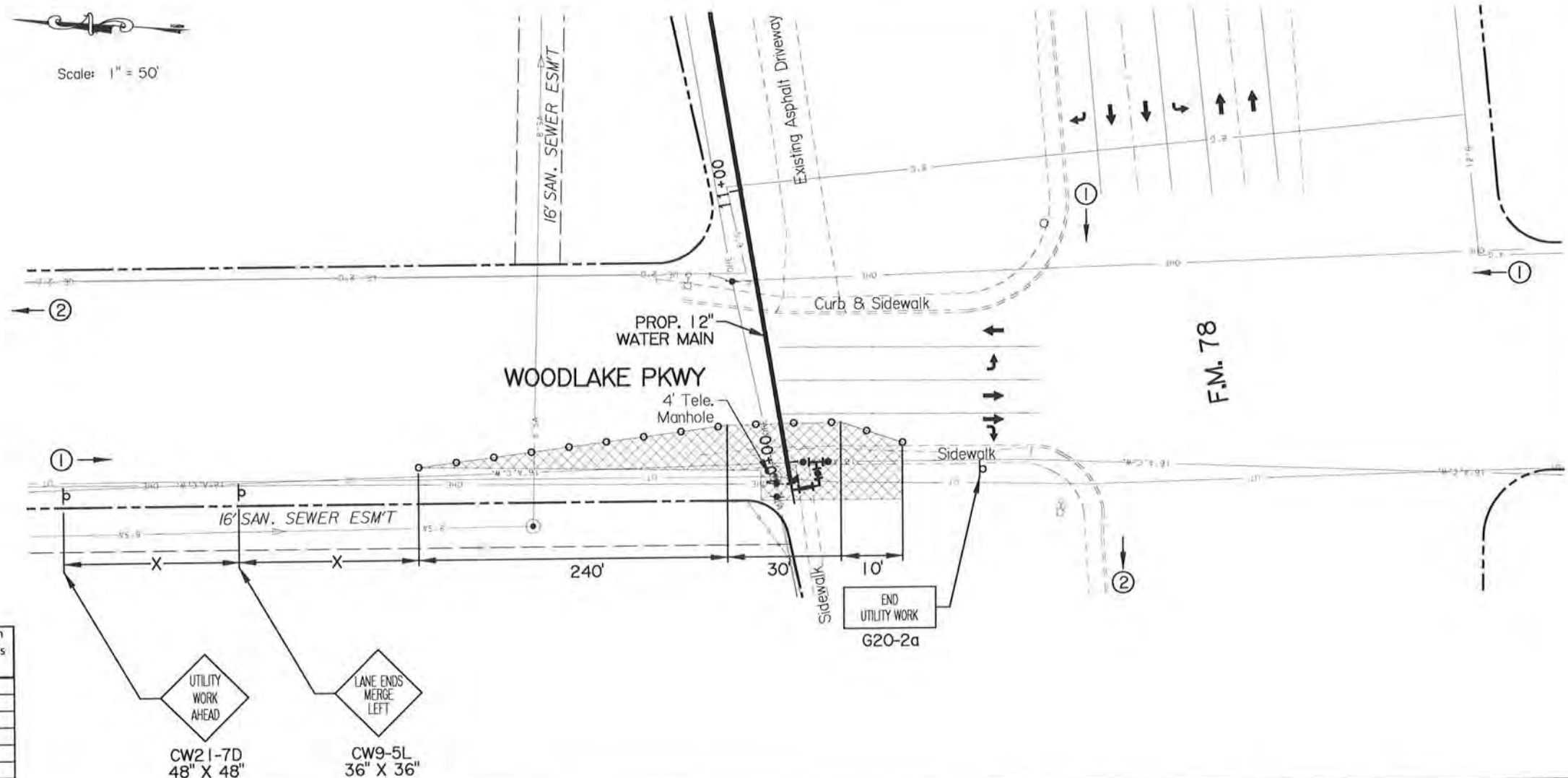


10/6/2011 5:51:13 PM c:\projects\fm78\12inwater\tpa\8018-tcp-dtr-01.dwg

Scale: 1" = 50'



LEGEND	
	CHANNELIZING DEVICES (VERT. PANELS, BARRELS, CONES, ETC.)
	ORANGE FENCING WITH T-POST
	INDICATES DIRECTION OF TRAVEL
	TYPE III BARRICADES
	SIGN
	WORK ZONE

Posted Speed (MPH)	"X" Sign Spacings (feet)
30 or Less	120
35	160
40	240
45	320
50	400
55	500
60	600

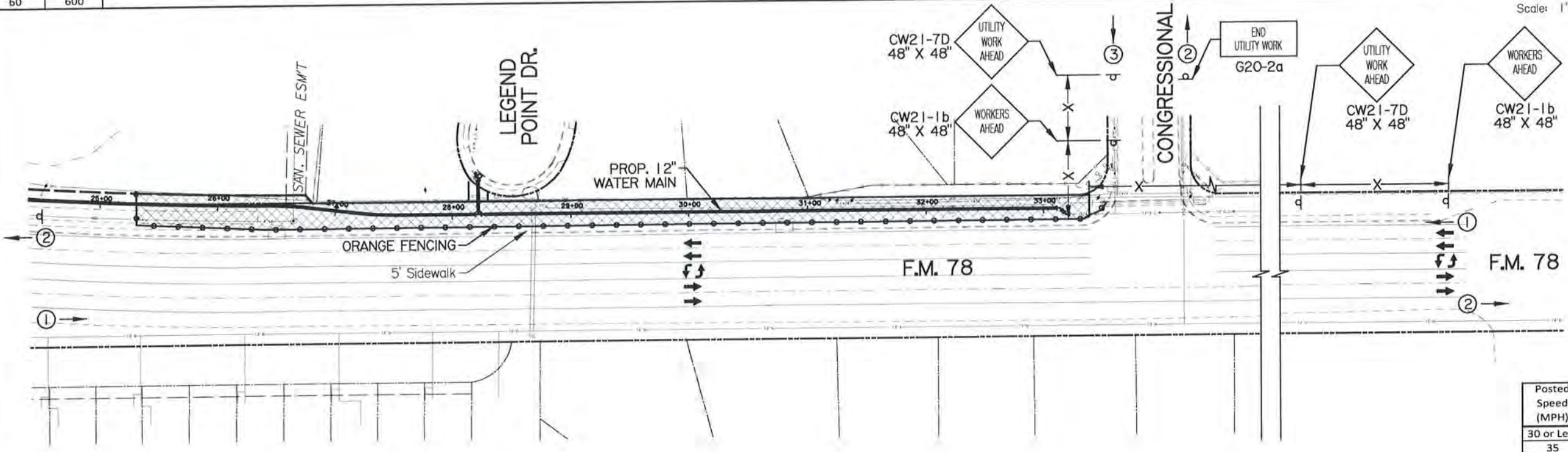
UTILITY WORK AHEAD
 CW21-7D
 48" X 48"

LANE ENDS MERGE LEFT
 CW9-5L
 36" X 36"

Scale: 1" = 100'



Ernest T. Maestas
 THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY ERNEST T. MAESTAS, P.E. 52938 ON 10/6/2011



Posted Speed (MPH)	"X" Sign Spacings (feet)
30 or Less	120
35	160
40	240
45	320
50	400
55	500
60	600

MAESTAS ASSOCIATES INC.
 11550 IH 10 WEST, STE. 320 SAN ANTONIO, TX 78230
 (210) 366-1988 (210) 366-1980 fax TDPE No. F-323

No.	Revision	Drawn	Approved	Date

REVISIONS
 FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL TRAFFIC CONTROL PLAN SHEET 1 OF 1

DEVELOPER: SAN ANTONIO WATER SYSTEM
 CONT. BUDGET PROJ. #
 SUBMITTED
 APPROVED
 MAP No. 206-600, 208-600, 208-602 SHEET 16 OF 32
 SECT. No.
 DR. DHBMM CK. ETM JOB No. 10-4002

Barricade and Construction (BC) Standard Sheets General Notes:

- 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).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign 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.
- Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

Worker Safety Apparel Notes:

- 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" 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.

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

- Texas Department of Transportation
Traffic Operations Division - TX
Phone (512) 416-3134
- WWW ADDRESSES FOR REFERENCED DOCUMENTS
Compliant Work Zone Traffic Control Device List (CWZCL)
http://www.tdot.gov/online/resources/traffic.htm
Texas Manual on Uniform Traffic Control Devices (TMUTCD)
http://www.tdot.gov/online/resources/tmutcd.htm
Standard Highway Sign Designs for Texas (SHSD)
http://www.tdot.gov/online/resources/signs.htm
Traffic Engineering Standard Signs
http://www.tdot.gov/online/resources/signs.htm
Material Producer List
http://www.tdot.gov/online/resources/signs.htm
Departmental Approval Specifications (DAS)
http://www.tdot.gov/online/resources/signs.htm
Removal Sign Manual
http://www.tdot.gov/online/resources/signs.htm

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

**BARRICADE AND CONSTRUCTION
GENERAL NOTES
AND REQUIREMENTS**

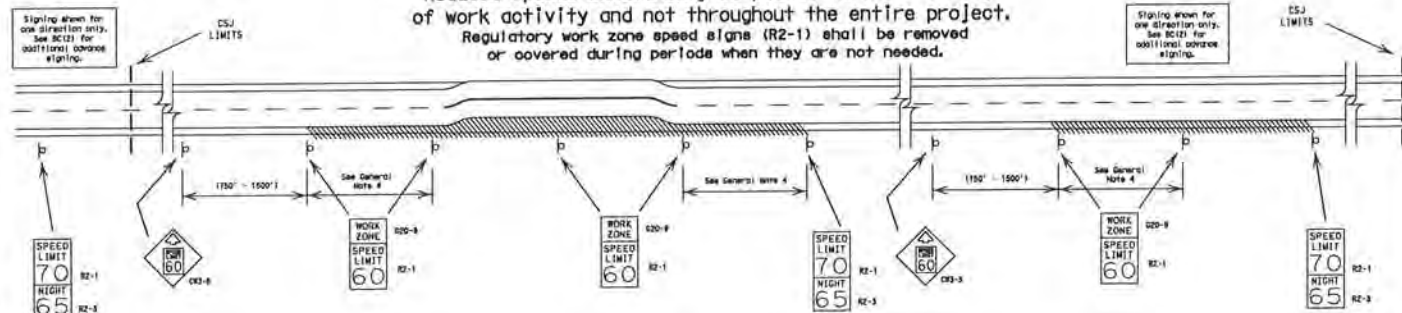
1 OF 12 BC(1)-07

Project: 11-4-07
Sheet: 11-4-07
Scale: 1" = 100'

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 Ordinances when within Incorporated City Limits.

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



GUIDANCE FOR USE:

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

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:
a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver
As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 15 feet of pavement edge or actually on the pavement.
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 of 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:
a) 40 mph and greater: 0.2 to 2 miles
b) 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 CWZ-5 sign, R2-1 plaque and the R2-1 and R2-3 signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
- Turning signs over or down will not be allowed, unless otherwise noted.
- Techniques that may help reduce traffic speeds include but are not limited to:
A. Low enforcement.
B. Flagger stationed next to sign.
C. Portable changeable message sign (PCMS).
D. Low-power (dome) radar transmitter.
E. 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.

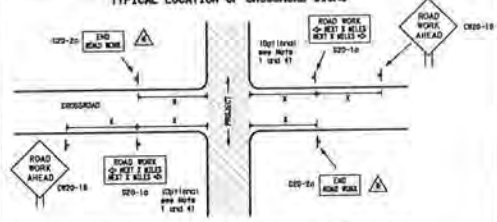
STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

**BARRICADE AND CONSTRUCTION
WORK ZONE SPEED LIMIT
STANDARD**

3 OF 12 BC(3)-07

Project: 11-4-07
Sheet: 11-4-07
Scale: 1" = 100'

TYPICAL LOCATION OF CROSSROAD SIGNS



- May be omitted on back of R2-1 sign with approval of engineer. (See note 2 below)
- The typical advance signing on a crossroad approach would be a R2-1 sign, R2-2 sign and a R2-3 sign. The engineer may use the reduced size 36" x 36" R2-1 sign on low volume crossroads. (See note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information will be shown in the plans.
- Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE BRAVES, or other appropriate signs. When additional signs are required, those signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the order, location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Basic Standard Sheets.
- The R2-1 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



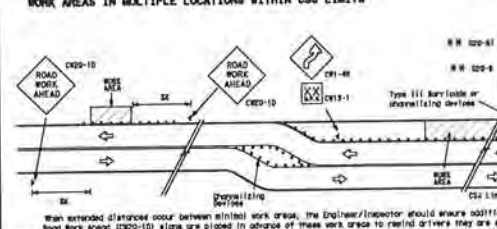
- The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
- If construction closes the road at a T-intersection the Contractor shall place the R2-1 "Contractor Work" sign behind the Type III barrier or the road closure sign (see BC(1) sheet). The R2-1, and R2-2 sign shall be replaced by the advance signing details for the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING

Sign Number or Series	SIZE		Spacing (Approx.)
	Conventional Road	Expressway/Freeway	
CWZ0	48" x 48"	48" x 48"	30-120'
CWZ1	48" x 48"	48" x 48"	30-120'
CWZ2	48" x 48"	48" x 48"	30-120'
CWZ3	48" x 48"	48" x 48"	30-120'
CWZ4	48" x 48"	48" x 48"	30-120'
CWZ5	48" x 48"	48" x 48"	30-120'
CWZ6	48" x 48"	48" x 48"	30-120'
CWZ7	48" x 48"	48" x 48"	30-120'
CWZ8	48" x 48"	48" x 48"	30-120'
CWZ9	48" x 48"	48" x 48"	30-120'
CWZ10	48" x 48"	48" x 48"	30-120'
CWZ11	48" x 48"	48" x 48"	30-120'
CWZ12	48" x 48"	48" x 48"	30-120'

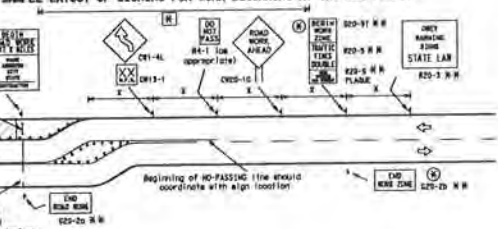
- For typical sign spacings on divided highways, expressways and freeways, see Part 4 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical sign spacings diagrams or TCR Standard Sheets.
- A minimum advance time warning sign shall be placed in advance of the work area to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
- Distance between signs should be increased as required by Item 1) size or work volume warning.
- 36" x 36" R2-1 sign shall be used on low volume crossroads of the discretion of the Engineer. See note 4 under "Typical Location of Crossroad Signs".
- Signs placed ahead of the work area to first advance warning sign shall be the work area work area distance between each additional sign.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



- When extended distance occur between adjacent work areas, the Engineer/Inspector should advise additional R2-1 signs are placed in advance of these work areas to advise drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and delineating devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



- The Contractor shall determine the appropriate distance to be shown on the R2-1 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 definite shall be used.
- The R2-1 and R2-2 signs shall be used when advance signs are required outside the CSJ limits. They inform the motorist of entering or leaving a work zone where traffic fines may double if workers are present.
- Required CSJ limit signing. See note 10 on BC(1).
- Area for placement of "ROAD WORK AHEAD" sign and other signs or devices as called for on the Traffic Control Plan.

LEGEND

- Sign
- Delineating Device
- Type III Barrier
- X Typical Construction Warning Sign Size and Spacing or the TMUTCD for sign spacing requirements.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

**BARRICADE AND CONSTRUCTION
PROJECT LIMIT
STANDARD**

2 OF 12 BC(2)-07

Project: 11-4-07
Sheet: 11-4-07
Scale: 1" = 100'

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THE FOLLOWING SHEETS HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Ernest T. Maestas, PE
DATE: 10-6-11



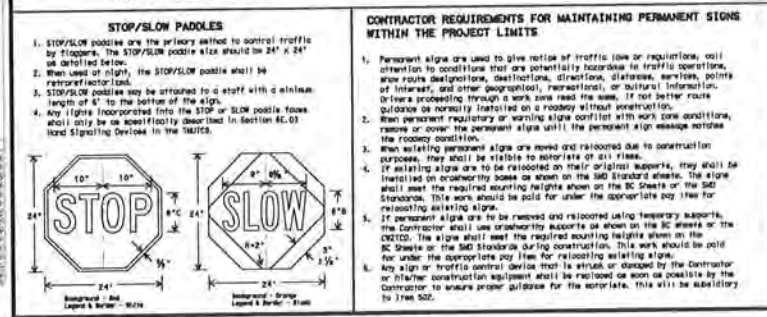
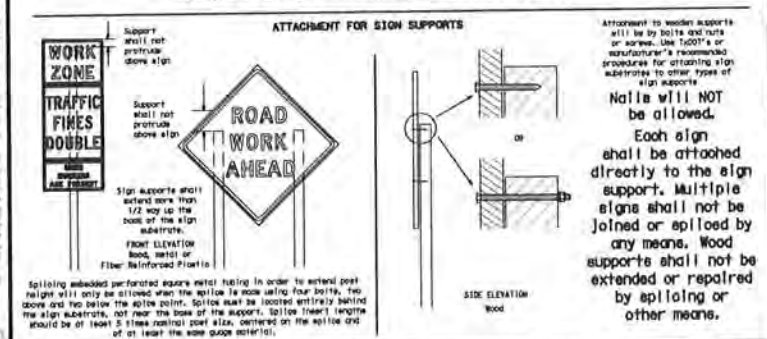
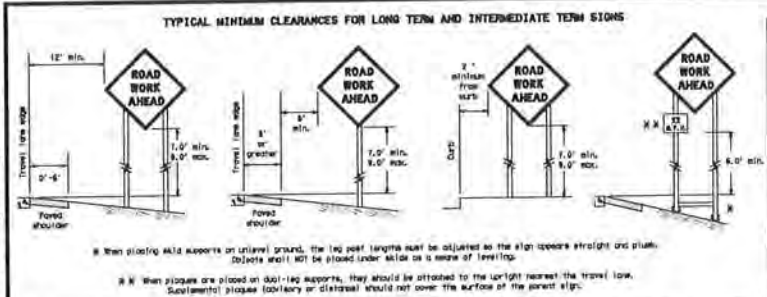
THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY ERNEST T. MAESTAS, P.E. 52938 ON 10/6/2011

MAESTAS ASSOCIATES, PLLC
11550 H I 10 WEST, STE. 320 SAN ANTONIO, TX 78239
(210) 366-1988 (210) 366-1980 FAX TBPE No. F-333

DEVELOPER: SAN ANTONIO WATER SYSTEM
CONT. BUDGET PROJ. #

SUBMITTED: _____
APPROVED: _____

MAP No. 206-600, 208-600, 208-602 SHEET
SECT. No. TCP-17
DR. DRBMM CK. ETM JOB No. 10-4002 OF 32



GENERAL NOTES FOR SIGN SUPPORTS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Signs shall be painted white.
- Signs shall not be used as sign supports.
- Signs shall not be used to support work over the work zone.
- All signs shall be installed in accordance with the plans or as directed by the Engineer.

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are used to give notice of traffic law or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, warnings, points of interest, and other geographical, recreational or cultural information.
- When signs are used to give notice of traffic law or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, warnings, points of interest, and other geographical, recreational or cultural information, or to a proceeding through a work zone, the sign shall be replaced as soon as possible.

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- When signs are used to give notice of traffic law or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, warnings, points of interest, and other geographical, recreational or cultural information, or to a proceeding through a work zone, the sign shall be replaced as soon as possible.
- When signs are used to give notice of traffic law or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, warnings, points of interest, and other geographical, recreational or cultural information, or to a proceeding through a work zone, the sign shall be replaced as soon as possible.

PORTABLE CHANGEABLE MESSAGE SIGNS

The Engineer/Inspector shall approve all message used on portable message signs.

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

The Engineer may approve other messages not specifically covered here.

Phase 1: Condition Lists	Other Condition List	Phase 2: Possible Component Lists
FREWAY CLOSED X MILE	ROADWORK XXXX FT	MERGE RIGHT
ROAD CLOSED AT SH XXX	LANE NARROWS XXXX FT	DETOUR NEXT X EXITS
ROAD CLOSED AT FM XXXX	LANE NARROWS XXXX FT	USE EXIT XXX
ROAD CLOSED AT FM XXXX	LANE NARROWS XXXX FT	USE EXIT XXX
RIGHT X LANES CLOSED	LANE NARROWS XXXX FT	USE EXIT XXX
CENTER LANE CLOSED	LANE NARROWS XXXX FT	USE EXIT XXX
NIGHT LANE CLOSURES	LANE NARROWS XXXX FT	USE EXIT XXX
VARIOUS LANE CLOSURES	LANE NARROWS XXXX FT	USE EXIT XXX
EXIT CLOSED	LANE NARROWS XXXX FT	USE EXIT XXX
MALL DRIVEWAY CLOSED	LANE NARROWS XXXX FT	USE EXIT XXX

APPLICATION GUIDELINES

- Only 1 or 2 phases are to be used on a POMS.
- The last phase (or phase) should be selected from the "Roadwork Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel", "Location", "Warning", or "Advance Notice" lists.

WARRANTY MATRICES

WARRANTY MATRICES FOR POMS SIGNS

1. When Full Matrix POMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Table 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS".

2. When symbol signs, such as the XRS-10 Flag Sign, are represented graphically on the Full Matrix POMS sign, and with the approval of the Engineer, they shall maintain the legibility/visibility requirements listed above.

3. When symbol signs are represented graphically on the Full Matrix POMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.

4. A Full Matrix POMS may be used to eliminate a flashing arrow panel provided it meets the visibility, flash rate and timing requirements as listed in Table 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS".

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WARRANTY MATRICES

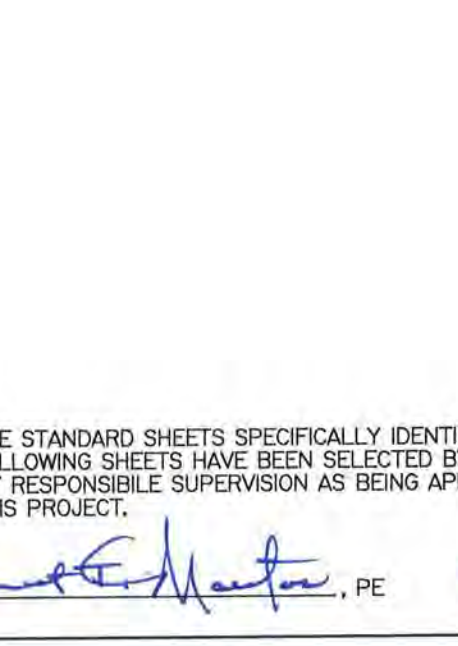
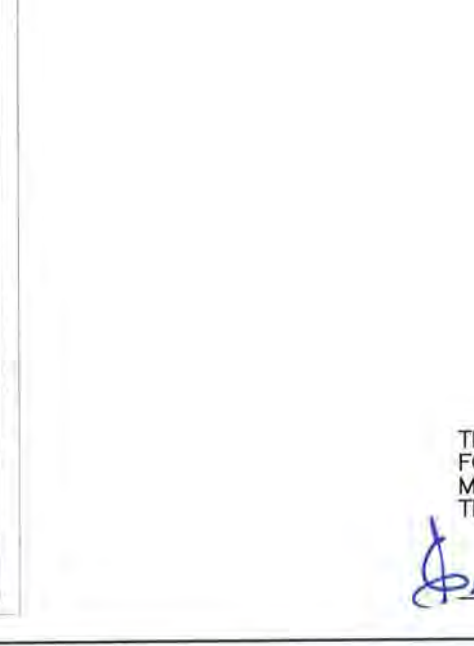
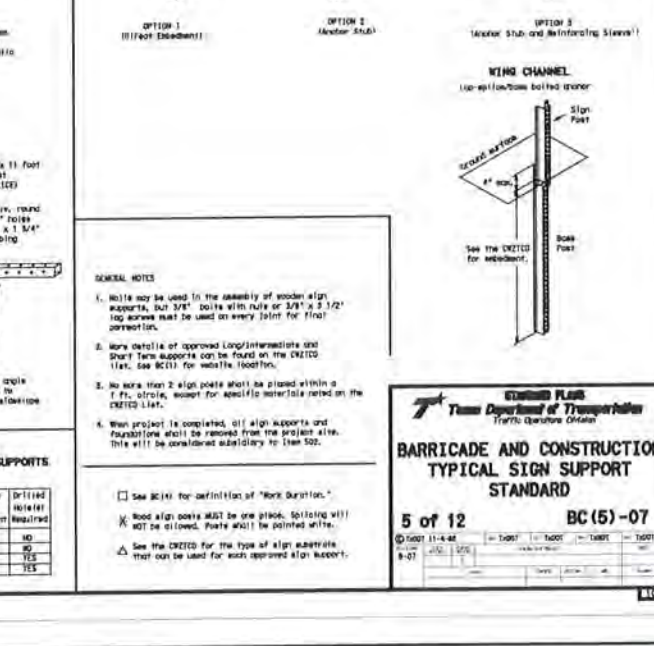
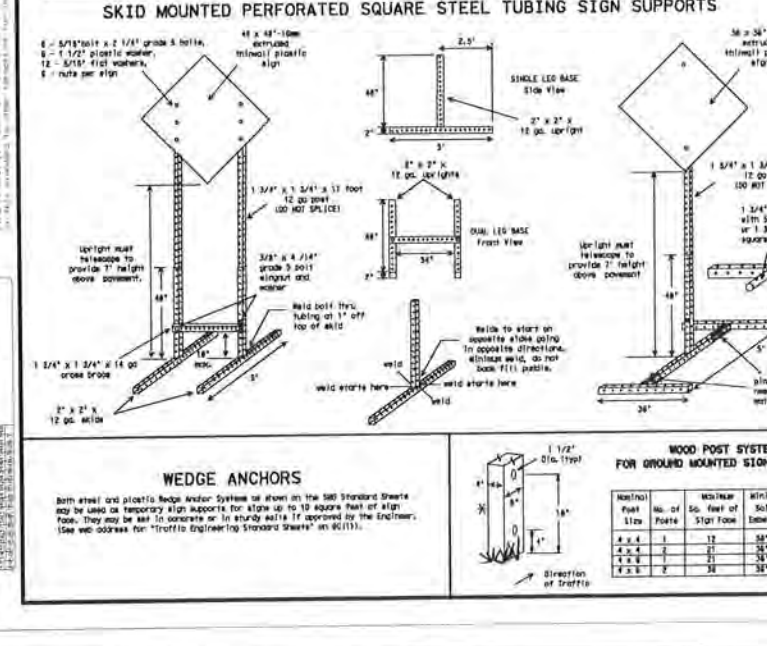
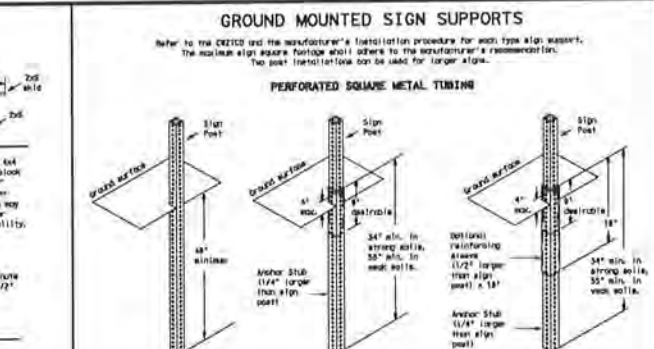
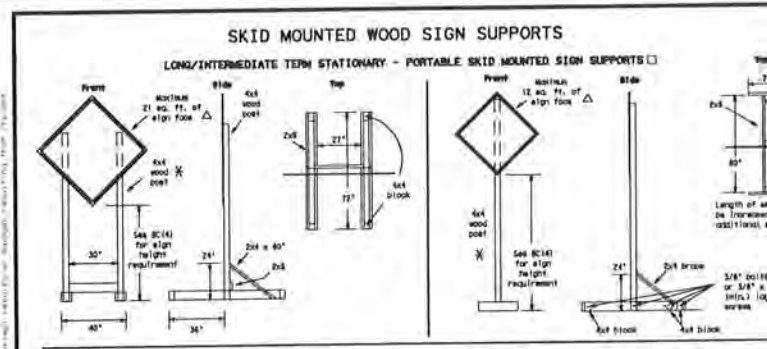
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3. When symbol signs are represented graphically on the Full Matrix POMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.

4. A Full Matrix POMS may be used to eliminate a flashing arrow panel provided it meets the visibility, flash rate and timing requirements as listed in Table 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS".



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ERNEST T. MAESTAS
52938
PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY ERNEST T. MAESTAS, P.E. 52938 ON 10/6/2011

MAESTAS ASSOCIATES, INC.

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REVISIONS

No.	Revision	Drawn	Approved	Date

DEVELOPER: SAN ANTONIO WATER SYSTEM
CONT. BUDGET PROJ. #

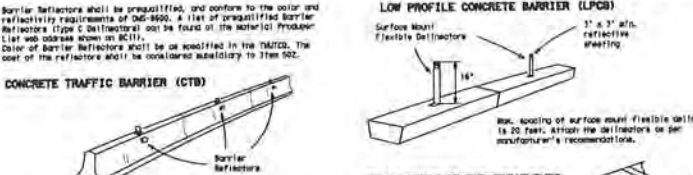
SUBMITTED: _____
APPROVED: _____

MAP No. 206-600, 208-600, 208-602 SHEET TCP-18
SECT. No. _____
DR. DRHMM CK. ETM JOB No. 10-4002 OF 32

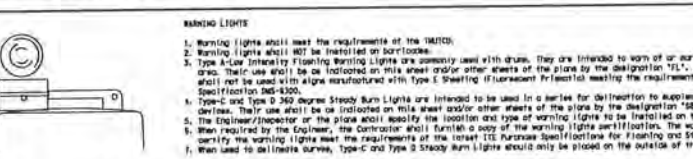
THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THE FOLLOWING SHEETS HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Ernest T. Maestas, PE
DATE 10-6-11

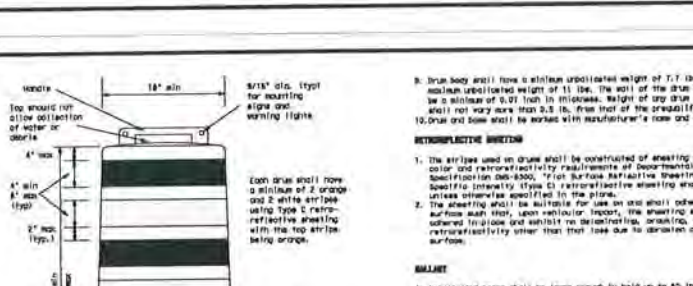
Barrier Reflectors for Concrete Traffic Barrier and Attenuators



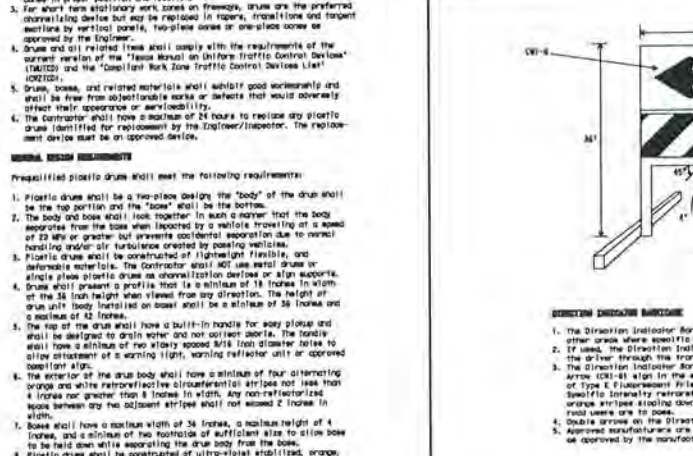
- 1. Barrier reflectors shall be prequalified, and conform to the color and reflectivity requirements of DOT-8690...
2. Color of barrier reflectors shall be as specified in the TMC32...
3. Work traffic is on one side of the CTB...
4. When CTB separates two-way traffic...
5. Work traffic is on both sides of the CTB...
6. When CTB separates traffic flowing in the same direction...
7. Work traffic is on both sides of the CTB...
8. When CTB separates traffic flowing in the same direction...
9. When CTB separates traffic flowing in the same direction...
10. When CTB separates traffic flowing in the same direction...
11. When CTB separates traffic flowing in the same direction...



- 1. Flashing arrow panels shall be used for all work zones...
2. Flashing arrow panels shall be used for all work zones...
3. Flashing arrow panels shall be used for all work zones...
4. Flashing arrow panels shall be used for all work zones...
5. Flashing arrow panels shall be used for all work zones...
6. Flashing arrow panels shall be used for all work zones...
7. Flashing arrow panels shall be used for all work zones...
8. Flashing arrow panels shall be used for all work zones...
9. Flashing arrow panels shall be used for all work zones...
10. Flashing arrow panels shall be used for all work zones...

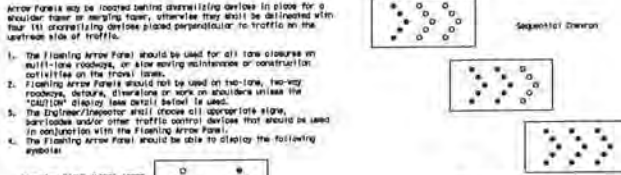


- 1. Truck-mounted attenuators (TMA) shall be used on roadways...
2. Truck-mounted attenuators (TMA) shall be used on roadways...
3. Truck-mounted attenuators (TMA) shall be used on roadways...
4. Truck-mounted attenuators (TMA) shall be used on roadways...
5. Truck-mounted attenuators (TMA) shall be used on roadways...
6. Truck-mounted attenuators (TMA) shall be used on roadways...
7. Truck-mounted attenuators (TMA) shall be used on roadways...
8. Truck-mounted attenuators (TMA) shall be used on roadways...
9. Truck-mounted attenuators (TMA) shall be used on roadways...
10. Truck-mounted attenuators (TMA) shall be used on roadways...



- 1. Attenuator structure shall be constructed of...
2. Attenuator structure shall be constructed of...
3. Attenuator structure shall be constructed of...
4. Attenuator structure shall be constructed of...
5. Attenuator structure shall be constructed of...
6. Attenuator structure shall be constructed of...
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9. Attenuator structure shall be constructed of...
10. Attenuator structure shall be constructed of...

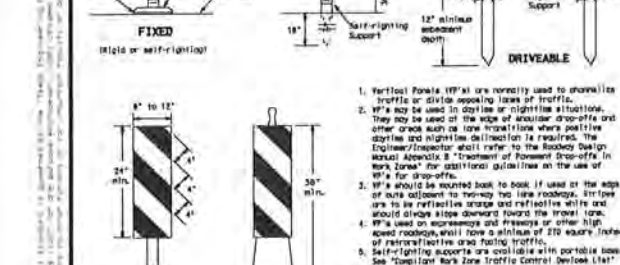
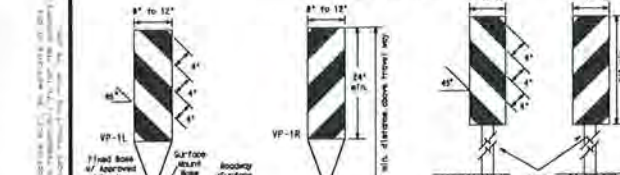
Typical Flashing Arrow Panel



- 1. The Flashing Arrow Panel should be used for all work zones...
2. The Flashing Arrow Panel should be used for all work zones...
3. The Flashing Arrow Panel should be used for all work zones...
4. The Flashing Arrow Panel should be used for all work zones...
5. The Flashing Arrow Panel should be used for all work zones...
6. The Flashing Arrow Panel should be used for all work zones...
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8. The Flashing Arrow Panel should be used for all work zones...
9. The Flashing Arrow Panel should be used for all work zones...
10. The Flashing Arrow Panel should be used for all work zones...

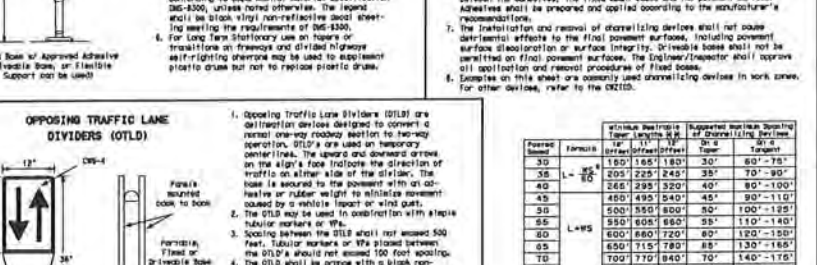
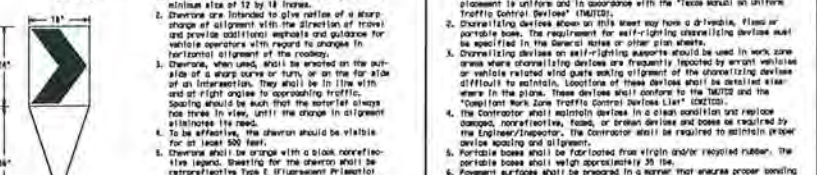
Truck-mounted attenuators (TMA) used on roadways... BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR STANDARD BC (7) - 07

Channelizing Devices



- 1. Channelizing devices shall be used to delineate...
2. Channelizing devices shall be used to delineate...
3. Channelizing devices shall be used to delineate...
4. Channelizing devices shall be used to delineate...
5. Channelizing devices shall be used to delineate...
6. Channelizing devices shall be used to delineate...
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8. Channelizing devices shall be used to delineate...
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10. Channelizing devices shall be used to delineate...

Channelizing Devices



- 1. Channelizing devices shall be used to delineate...
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7. Channelizing devices shall be used to delineate...
8. Channelizing devices shall be used to delineate...
9. Channelizing devices shall be used to delineate...
10. Channelizing devices shall be used to delineate...



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY ERNEST T. MAESTAS, P.E. 52938 ON 10/6/2011

MAESTAS CONSULTING ENGINEERS, P.C. 11550 IH 10 WEST, STE. 330 SAN ANTONIO, TX 78230 (210) 366-1988 (210) 366-1980 FAX (210) 366-1983

REVISIONS table with columns for No, Revision, Drawn, Approved, Date.

DEVELOPER: SAN ANTONIO WATER SYSTEM BUDGET PROJ. # FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL TRAFFIC CONTROL PLAN STANDARDS

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THE FOLLOWING SHEETS HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT. Ernest T. Maestas, PE 10-6-11 DATE

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD BC (8) - 07

TYPE III BARRICADES

- Refer to the Compliance Work Zone Traffic Control Device List (TC2020) for details of the Type III Barricades and a list of all materials used in the construction of Type III Barricades.
- Type III Barricades shall be used at each end of construction projects closed to all traffic.
- Barricades extending across a roadway should have stripes that allow drivers in the direction toward which traffic must turn in detouring, slope downward in both directions toward the center of roadway. Where no turns are provided at a closed road starting point slope downward in both directions toward the center of roadway.
- Striping of rills, 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.
- Identification markings shall be shown only on the back of the barricade rills. The minimum height of letters and/or company logo used for identification shall be 1".
- Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
- Warning lights shall not be installed on barricades.
- Where barricades require the use of weights to keep from turning over, the use of sand, concrete, and reflective white stripes on one side and reflective white stripes on the other side shall be required and to maintain a constant weight. Sand bags shall not be utilized in a barrier that covers any portion of a barricade rill reflective warning, back, corners, iron, steel or other metal 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 faces upon weathered fabric. Rubber boots or fire hoses shall not be used for sandbags. Sandbags shall only be placed along or upon the base portion of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
- Warning for barricades shall be retroreflective Type C (3000) Scientific Industries conforming to Departmental Material Specification DMS-3300 unless otherwise noted.

Barricades shall NOT be used as sign supports.

TYPICAL STRIPING DETAIL FOR BARRICADE RAIL

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

CONES

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 bases.

TRAFFIC CONTROL FOR MATERIAL STOCKPILES

TYPE III BARRICADE (POST AND SKID) TYPICAL APPLICATION

CONCRETE WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

EDGE LINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in travel lanes or lanes.

2. This device shall not be used to separate lanes of traffic (separating or otherwise) or mark objects.

3. This device is based on a 42 inch, two-piece cone with an alternate striking pattern for a 42 inch reflective band, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the adjacent yellow for left turning, white for right turning, and white for the device is substituted for or which it supplements. The reflective band shall be retroreflective Type C (conformable base strip Scientific Industries) conforming to Departmental Material Specification DMS-3300, unless otherwise noted.

4. The base shall weigh a minimum of 30 lbs.

PAVEMENT MARKING PATTERNS

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

EDGE & LANE LINES FOR DIVIDED HIGHWAY

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

TWO-WAY LEFT TURN LANE

Form A is the T2001 Standard, however Form B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectorized pavement markings.

Prefabricated markings may be substituted for reflectorized pavement markings.

Prefabricated markings may be substituted for reflectorized pavement markings.

Prefabricated markings may be substituted for reflectorized pavement markings.

STANDARD WORK ZONE PAVEMENT MARKING DETAILS

SOLID LINES

BROKEN LINE

REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in travel lanes or lanes.

2. This device shall not be used to separate lanes of traffic (separating or otherwise) or mark objects.

3. This device is based on a 42 inch, two-piece cone with an alternate striking pattern for a 42 inch reflective band, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the adjacent yellow for left turning, white for right turning, and white for the device is substituted for or which it supplements. The reflective band shall be retroreflective Type C (conformable base strip Scientific Industries) conforming to Departmental Material Specification DMS-3300, unless otherwise noted.

4. The base shall weigh a minimum of 30 lbs.

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS STANDARD

12 of 12 BC(12)-07

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CD (closed) unless otherwise noted in the plans.

2. Color, pattern and alignment shall be in accordance with the "Manual on Uniform Traffic Control Devices" (MUTCD).

3. Additional, supplementary pavement marking details may be found in the plans or specifications.

4. Pavement markings shall be installed in accordance with the MUTCD and as shown on the plans.

5. When work zone markings are required on the plans, start line markings shall conform with the MUTCD, the plans and details as shown on the Standard Plan Sheet BC(12)-07.

6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PAUSE signs shall be placed at the beginning of the section where parking is prohibited and PASS WITH CARE signs of the beginning of sections where parking is permitted.

7. All work zone pavement markings shall be installed in accordance with the MUTCD, "Work Zone Pavement Markings".

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12)-07.
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 872, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-4201.
2. Removable prefabricated pavement markings (flat back) shall meet the requirements of DMS-4202.

MULTILAYERED ROSE ZONE PAVEMENT MARKINGS

1. The Contractor shall be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspection as required by Item 598.
3. The markings should provide a visible reference for a minimum clearance of 300 feet during normal daylight hours and 100 feet when illuminated by headlights in darkness (at night), unless a sight triangle is restricted by roadway geometry.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor or per Specification Item 882.

TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TUBES

HEIGHT OF MARKING TO BE USED SHALL BE FROM 1/4" AND LESS THAN 1/2".

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

1. Temporary flexible-reflective roadway marker tubes used on guideworks shall meet the requirements of DMS-4202.

2. Tube details on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not necessarily required, however at the option of the Engineer, either "A" or "B" below may be imposed to secure quality before placement on the roadway.

1. Select five (5) or more tubes of random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section for laboratory specification compliance.
2. Select five (5) tubes and perform the following test. Affix five (5) tubes to a 24 inch diameter on an asphalt 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 30 to 40 miles per hour. Four (4) tubes in each direction, no more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between lot manufacturers.
4. See Standard Draw TDP(7-1) for tub placement on seal coat work.

Guideworks shall be designated on YELLOW - two outer reflective surfaces with yellow body. WHITE - two outer reflective surfaces with white body.

1. Raised pavement markers used on guideworks shall be from the approved product list, and meet the requirements of DMS-4200.

2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.

3. Adhesive for guideworks shall be bituminous material not applied or cured under any hot sun, or inappropriate for concrete surfaces.

WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CD (closed) unless otherwise noted in the plans.
2. Color, pattern and alignment shall be in accordance with the "Manual on Uniform Traffic Control Devices" (MUTCD).
3. Additional, supplementary pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the MUTCD and as shown on the plans.
5. When work zone markings are required on the plans, start line markings shall conform with the MUTCD, the plans and details as shown on the Standard Plan Sheet BC(12)-07.
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PAUSE signs shall be placed at the beginning of the section where parking is prohibited and PASS WITH CARE signs of the beginning of sections where parking is permitted.
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DEPARTMENTAL MATERIAL SPECIFICATIONS

PAVEMENT MARKING REFLECTORIZED	DMS-4200
TRAFFIC BUTTONS	DMS-4300
CONCRETE ADHESIVE	DMS-4100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKING	DMS-4130
PREFABRICATED PAVEMENT MARKINGS-REMOVABLE	DMS-4201
PREFABRICATED PAVEMENT MARKINGS-RAISED	DMS-4202
TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TUBES	DMS-4242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadwork marker tubes and other pavement markings can be found at the actual Producer List web address shown on BC(11).

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS STANDARD

11 of 12 BC(11)-07

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STATE OF TEXAS

ERNEST T. MAESTAS
52938
PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY ERNEST T. MAESTAS, P.E. 52938 ON 10/6/2011

MAESTAS & ASSOCIATES, P.C.

11550 IH 10 WEST, STE. 320 SAN ANTONIO, TX 78230
(210) 346-1989 (210) 346-1980 FAX TBPE No. F-333

No.	Revision	Drawn	Approved	Date

REVISIONS

FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL TRAFFIC CONTROL PLAN STANDARDS

DEVELOPER: SAN ANTONIO WATER SYSTEM
CONT. BUDGET PROJ. #

SUBMITTED: _____
APPROVED: _____

MAP No. 206-600, 208-600, 208-602 SHEET TCP-20
SECT. No. _____
DR. DBMM/CK. ETM JOB No. 10-4002 OF 32

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THE FOLLOWING SHEETS HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Ernest T. Maestas, PE 10-6-11
DATE

TCP	MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
1-1		✓	✓		
1-2		✓	✓		
1-3		✓	✓		
1-4		✓	✓		
2-1		✓	✓	✓	
2-2		✓	✓	✓	
2-3		✓	✓	✓	✓ (2-3b only)
2-4		✓	✓	✓	
2-5		✓	✓	✓	
2-6		✓	✓	✓	
2-7		✓	✓	✓	
2-8		✓	✓	✓	
3-1	✓				
3-2	✓				
3-3	✓				
6-1		✓	✓		
6-2		✓	✓		
6-3		✓	✓		
6-4		✓	✓		
6-5		✓	✓		
6-6		✓	✓		
6-7		✓	✓		
6-8		✓	✓		
7-1		✓	✓		

MOBILE
Work that moves continuously or intermittently (stopping for up to approximately 15 minutes).

SHORT DURATION
Work that occupies a location up to 1 hour.

SHORT TERM STATIONARY
Daytime work that occupies a location for more than 1 hour in a single daylight period.

INTERMEDIATE TERM STATIONARY
Work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than 1 hour.

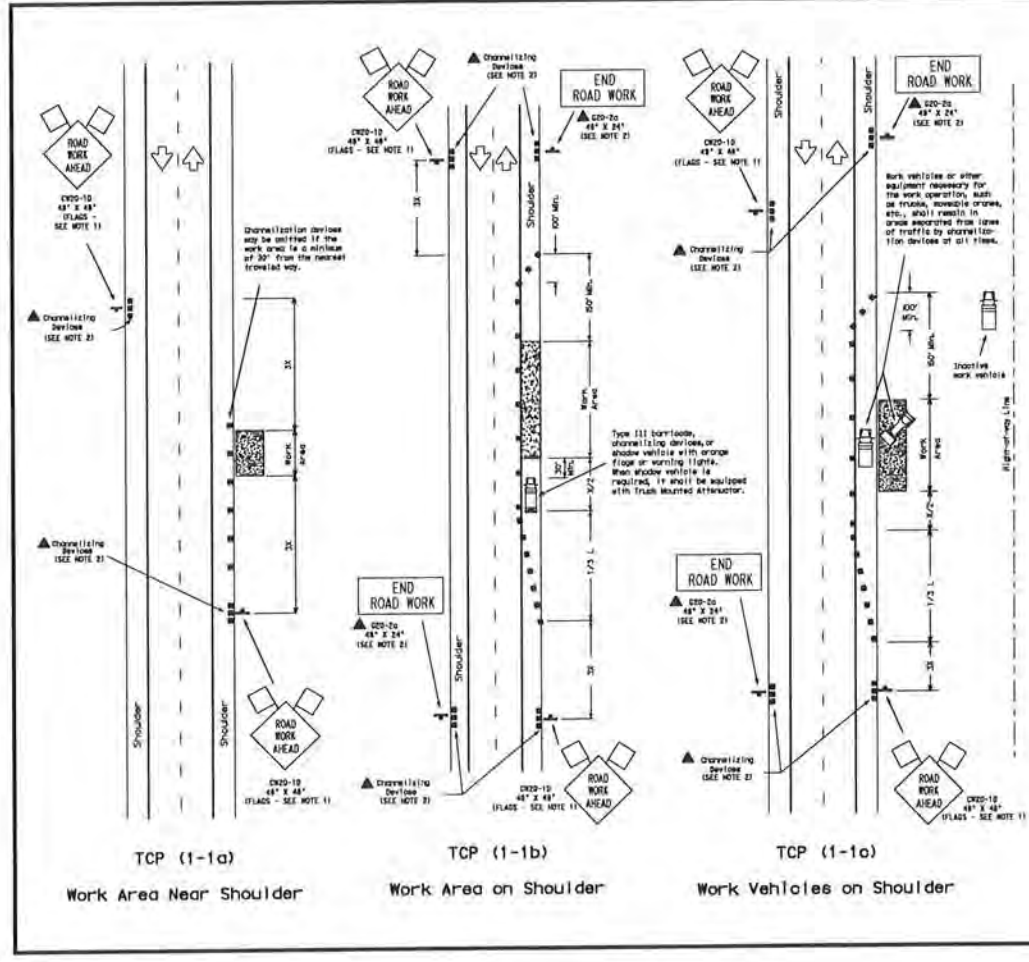
LONG TERM STATIONARY
Work that occupies a location more than 3 days.

NOTE:
THIS SHEET IS A WORKSHEET FOR PLAN PREPARATION ONLY. IT IS NOT TO BE INCLUDED IN P.S. & E'S.

TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

**TRAFFIC CONTROL PLAN
SELECTION WORKSHEET**

©1997 April 1998



LEGEND

Type III Barricade, Channelizing Device, Heavy Work Vehicle, Trailer Mounted Flashing Arrow Panel, Flagger, Sign Post, Portable Changeable Message Sign, Truck Mounted Attenuator, Portable Changeable Message Sign

Vehicle	Minimum Clearance (ft)	Minimum Clearance (ft)	Minimum Clearance (ft)	Minimum Clearance (ft)	Minimum Clearance (ft)
30	150'	165'	180'	30'	60'-75'
35	205'	225'	245'	35'	70'-90'
40	265'	295'	320'	40'	80'-100'
45	450'	495'	540'	45'	90'-110'
50	500'	550'	600'	50'	100'-125'
55	550'	605'	660'	55'	110'-140'
60	600'	660'	720'	60'	120'-150'
65	650'	715'	780'	65'	130'-165'
70	700'	770'	840'	70'	140'-175'

GENERAL NOTES:

- Unless otherwise stated in the plans, flags attached to signs are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those depicted with the triangle symbol may be omitted when stated elsewhere in the plans.
- On high speed facilities advance warning signs should be installed approximately 35' from the work area or from the beginning of a lane or shoulder taper. On low speed facilities the advance warning signs should be placed based on the "X" minimum distance.
- Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked in the paved shoulder.

Only pre-qualified products shall be used. A list of accepted products and their sources may be obtained by writing or faxing:

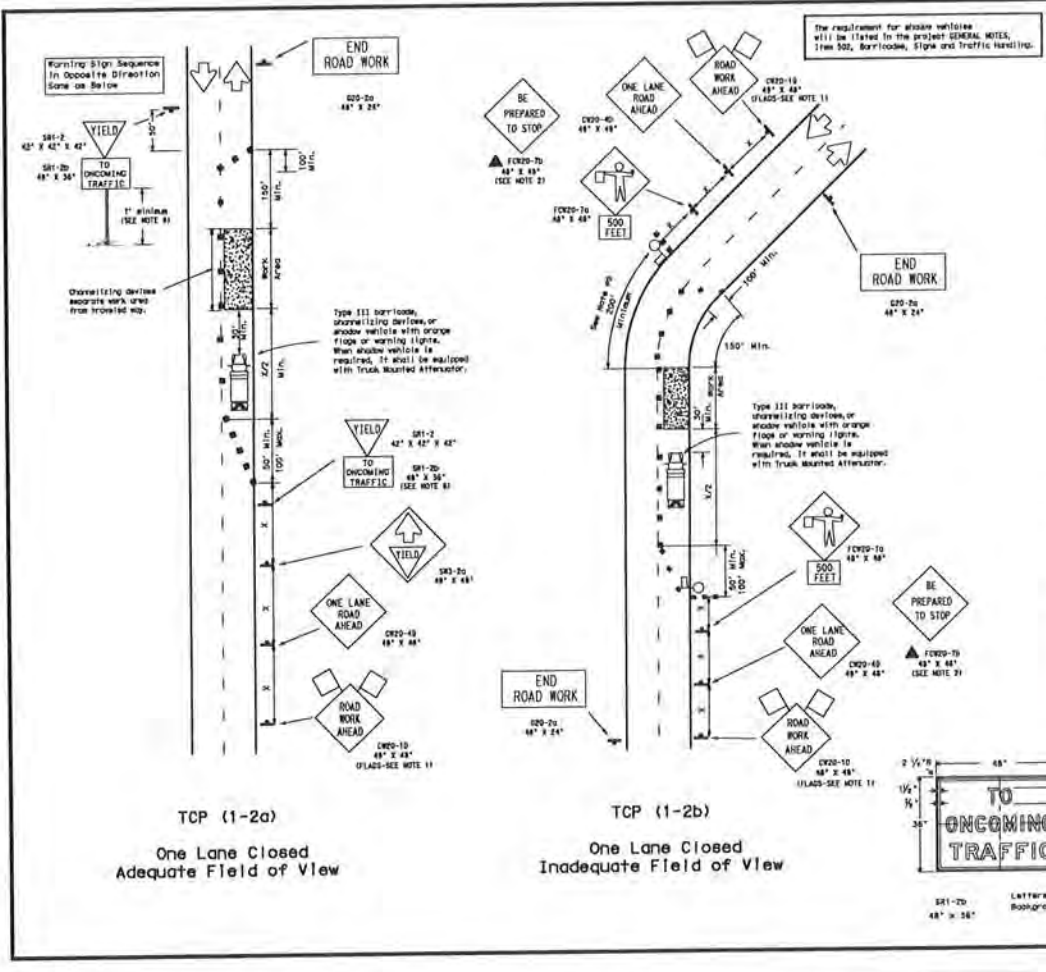
Shirley B. Bunker
Traffic Operations Division - TE
Texas Department of Transportation
130 East 11th Street
Austin, Texas 78701-0001
Phone 512-415-2000
Fax 512-415-2001
E-mail: tcp@dot.state.tx.us

The requirement for active vehicles will be listed in the project GENERAL NOTES, Item 502, Barricades, Signs and Traffic Handling.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

TRAFFIC CONTROL PLAN

TCP (1-1)-98



LEGEND

Type III Barricade, Channelizing Device, Heavy Work Vehicle, Trailer Mounted Flashing Arrow Panel, Flagger, Sign Post, Portable Changeable Message Sign, Truck Mounted Attenuator

Vehicle	Minimum Clearance (ft)	Minimum Clearance (ft)	Minimum Clearance (ft)	Minimum Clearance (ft)	Minimum Clearance (ft)
30	150'	165'	180'	30'	60'-75'
35	205'	225'	245'	35'	70'-90'
40	265'	295'	320'	40'	80'-100'
45	450'	495'	540'	45'	90'-110'
50	500'	550'	600'	50'	100'-125'
55	550'	605'	660'	55'	110'-140'
60	600'	660'	720'	60'	120'-150'
65	650'	715'	780'	65'	130'-165'
70	700'	770'	840'	70'	140'-175'

GENERAL NOTES:

- Flags attached to signs are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those depicted with the triangle symbol may be omitted when stated elsewhere in the plans.
- The BE PREPARED TO STOP sign may be installed after the ONE LANE ROAD AHEAD sign, but proper sign spacing shall be maintained.
- ROAD WORK AHEAD sign may be repeated if the stability of the work zone is less than 1500'.
- YIELD sign traffic control may be used on projects with approaches that have adequate sight triangles. For projects in urban areas, work zones should be no longer than one half mile. On rural areas on roadways with less than 800 ADT, work zones should be no longer than 400'.
- YIELD TO ONCOMING TRAFFIC sign shall be placed on a support at a 1' minimum mounting height.
- Flagger should use two-way radio or other method of communication to control traffic.
- Length of work area should be based on the ability of flaggers to communicate.
- Distance along course of work area should be adequate length for operators to identify and react to flagger signals.

Only pre-qualified products shall be used. A list of accepted products and their sources may be obtained by writing or faxing:

Shirley B. Bunker
Traffic Operations Division - TE
Texas Department of Transportation
130 East 11th Street
Austin, Texas 78701-0001
Phone 512-415-2000
Fax 512-415-2001
E-mail: tcp@dot.state.tx.us

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

TRAFFIC CONTROL PLAN

TCP (1-2)-98

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THE FOLLOWING SHEETS HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Ernest T. Maestas, PE

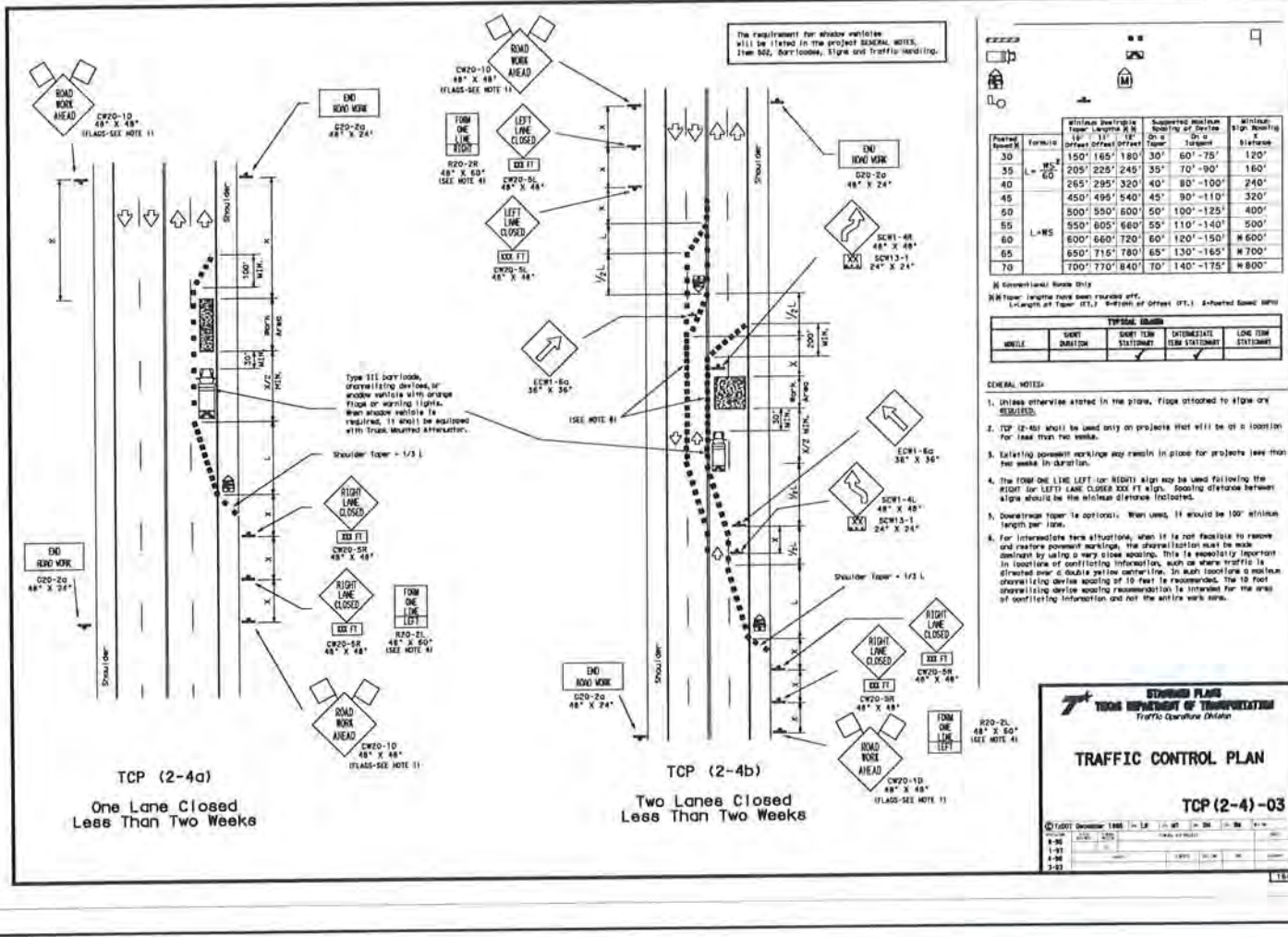
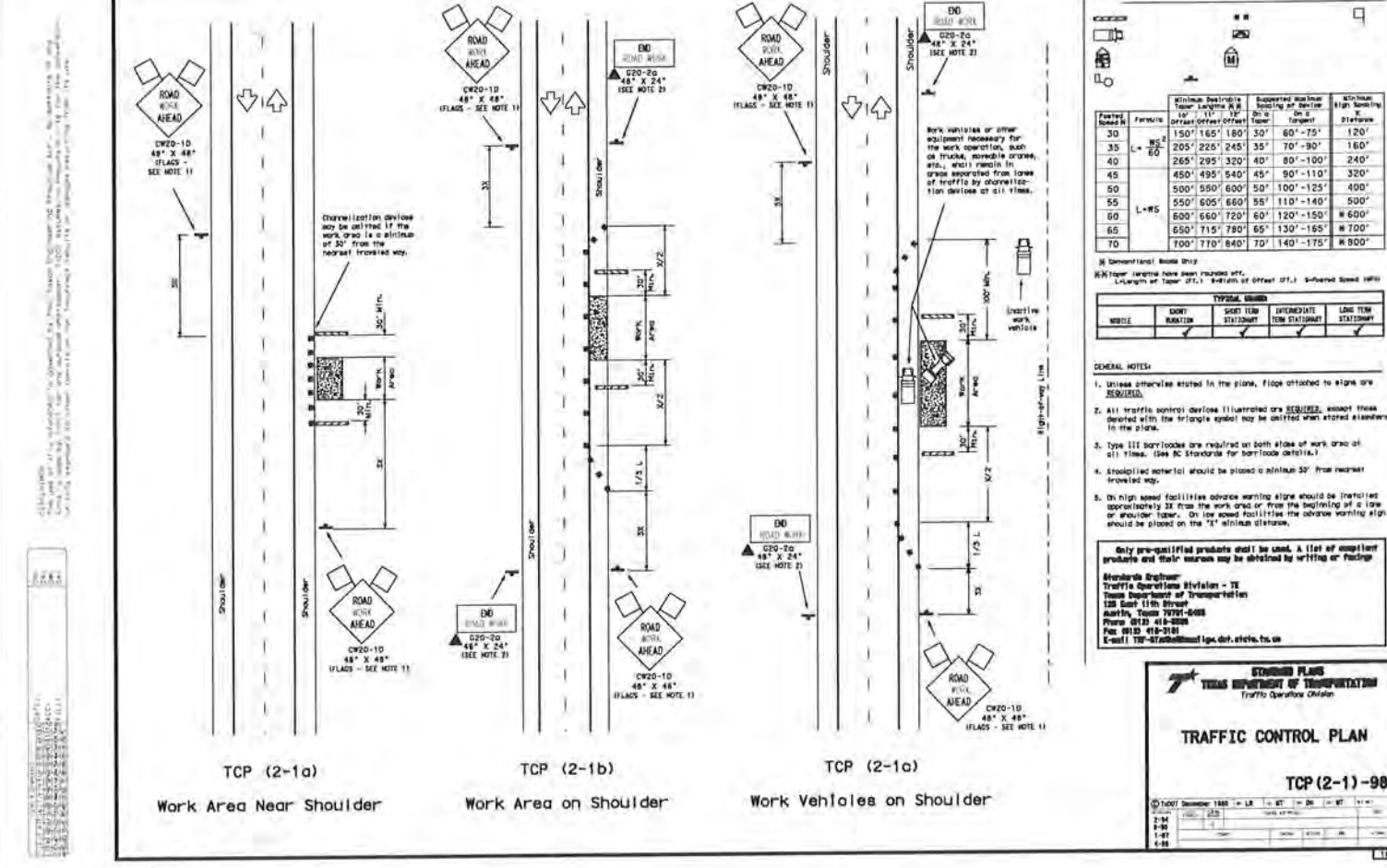
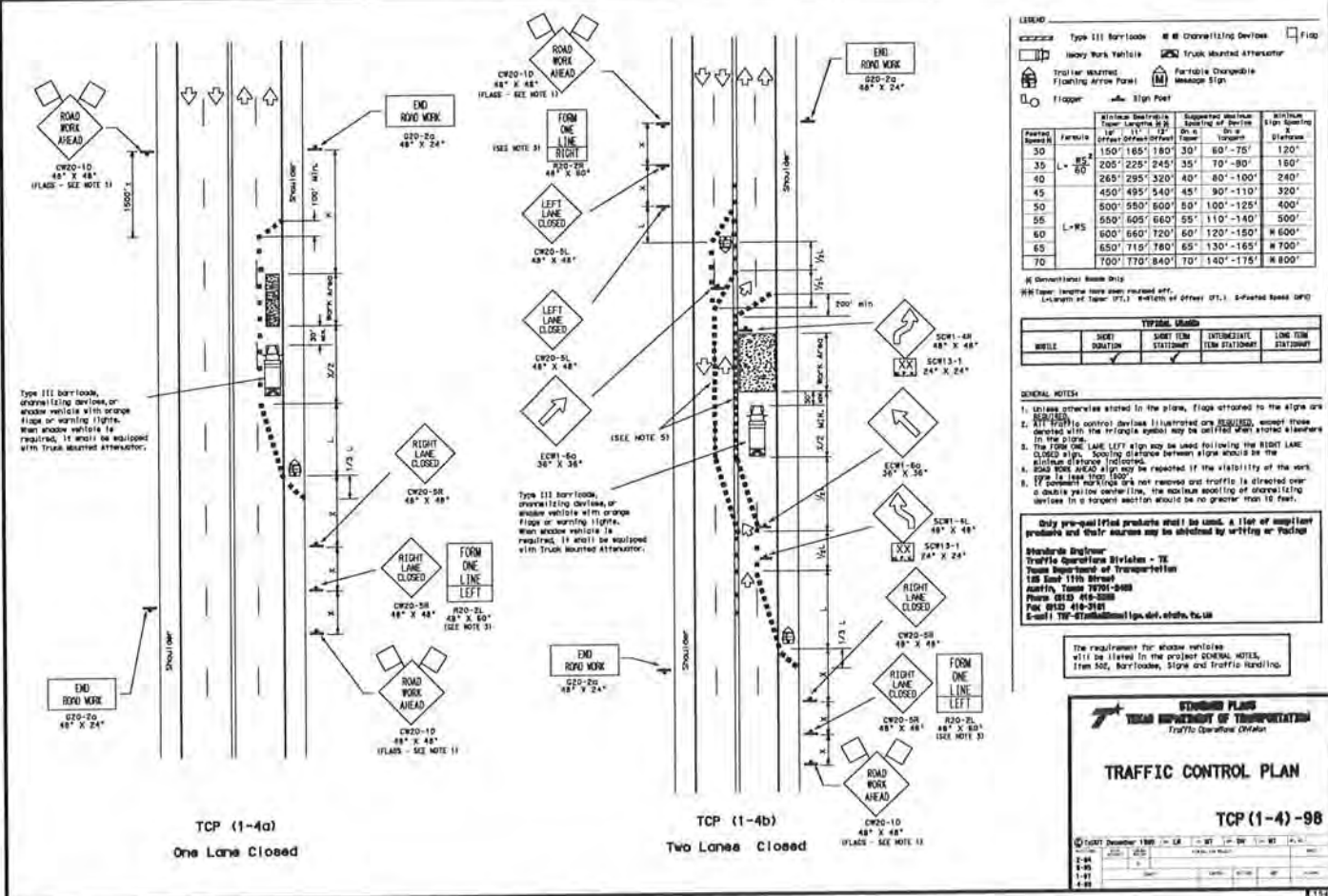
10-6-11
DATE



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY ERNEST T. MAESTAS, P.E. 52938 ON 10/6/2011

MAESTAS ASSOCIATES INC.
15550 IH 10 WEST, STE. 320 SAN ANTONIO, TX 78230
(210) 366-1988 (210) 366-1980 fax TBP# No. P-333

No.	Revision	Drawn	Approved	Date
REVISIONS				
FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL				
TRAFFIC CONTROL PLAN STANDARDS				
DEVELOPER: SAN ANTONIO WATER SYSTEM		CONTRACT: BUDGET PROJ. #		
SUBMITTED: _____				
APPROVED: _____				
MAP No. 206-600, 208-600, 208-602		SHEET		
SECT. No.		TCP-21		
DR. DBMM CK. ETM		JOB No. 10-4002		



STANDARD PLANS
TRAFFIC CONTROL PLAN

Sheet	Station	Station	Station
1-1	200'	200'	200'
1-2	200'	200'	200'
1-3	200'	200'	200'

GENERAL NOTES:

- Unless otherwise stated in the plan, flags attached to signs are required.
- STOP signs shall be used only on projects that will be in a location for less than two weeks.
- Existing pavement markings may remain in place for projects less than two weeks in duration.
- The FORM ONE LINE LEFT (or RIGHT) sign may be used following the STOP sign on LEFT LANE CLOSED 300 FT sign. Spacing distance between signs should be the minimum distance indicated.
- Downstream taper is optional. When used, it should be 100' minimum length per lane.
- For intermediate term situations, when it is not feasible to remove and restore pavement markings, the contractor shall use temporary markings by using a very close spacing. This is especially important in locations of conflicting information, such as where traffic is directed over a double yellow centerline. In such locations a mobile flashing device spacing of 30 feet is recommended. The 30 feet flashing device spacing recommendation is intended for the area of conflicting information and not the entire work zone.

TRAFFIC CONTROL PLAN

TCP (2-4)-03



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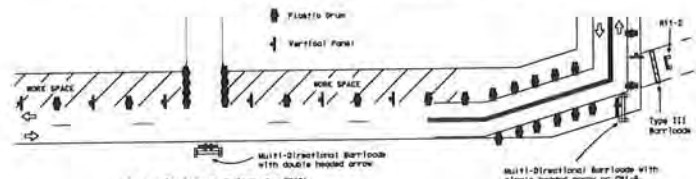
No.	Revision	Drawn	Approved	Date
REVISIONS				
1	FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL			
TRAFFIC CONTROL PLAN STANDARDS				
DEVELOPER: SAN ANTONIO WATER SYSTEM		BUDGET PROJ. #		
SUBMITTED				
APPROVED				
MAP No. 206-600, 208-600, 208-602		SHEET TCP-22		
SECT. No.				
DR. DBMM, CK. ETM		JOB No. 10-4002		

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THE FOLLOWING SHEETS HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Ernest T. Maestas

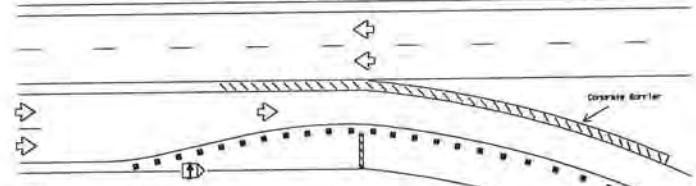
10-6-11 DATE

CHANNELIZING DEVICES FOR URBAN ROADWAY TYPE PROJECT



For spacing between devices, see B314. Use self-righting supports in areas where there is a high potential for overturning devices to be struck.

Barrier Delineation with Safety Glare Fence



- NOTES:**
- Length of Safety Glare Fence will be specified elsewhere in the plan.
 - The cumulative nominal length of the modular units shall equal the length of the individual sections of temporary advance traffic barrier on which they are installed as the joint between barrier sections will not be approved by any one unit.
 - Specifications will be detailed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Flat Surface Reflective Sheeting, Type C (High Specific Intensity), minimum size of 2' (square) by 12' (length) can be attached to the top of the barrier. The sheeting shall be attached to one panel/section per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/section are installed.
 - Modular Glare Screens for road light barrier shall meet the requirements of DMS-8410.

Only pre-qualified products shall be used. A copy of the "Qualified Mark Zone Traffic Control Device List" (QTDCL) shall be provided to the project engineer and their source and may be updated by the project engineer.

Standard Engineer:
Traffic Operations Division - TE
Texas Department of Transportation
100 East 11th Street
Austin, Texas 78701-0001
Phone: (512) 416-8100
Fax: (512) 416-3255

Instructions to locate the "QTDCL" on TxDOT website are:
Start at website - www.tdot.texas.gov
Click on "About TxDOT"
Click on "Regulatory Queue"
Click on "Qualified Mark Zone Traffic Control Device"
Click on "View PDF".
This site is printable.

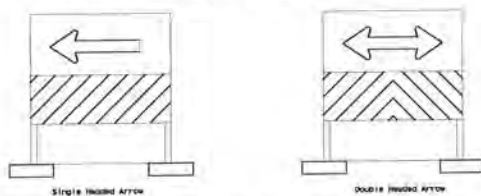
PREQUALIFICATION PROCEDURES ARE OBTAINED FROM:
CONSTRUCTION DIVISION MATERIALS AND TESTS SECTION
TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT)
100 EAST 11TH STREET
AUSTIN, TX 78701-0001

DEPARTMENTAL MATERIAL SPECIFICATIONS:
FLAT SURFACE REFLECTIVE SHEETING DMS-8300
DELINEATION AND GUARDWORKERS DMS-8300
MODULAR GLARE SCREENS DMS-8410

COLOR USAGE:
ORANGE BACKGROUND TYPE C (FLUORESCENT PRISMATIC)
WHITE BACKGROUND TYPE C (HIGH SPECIFIC INTENSITY)
BLACK LEGION & BOLLERS VEHICLE NON-REFLECTIVE SHEETING

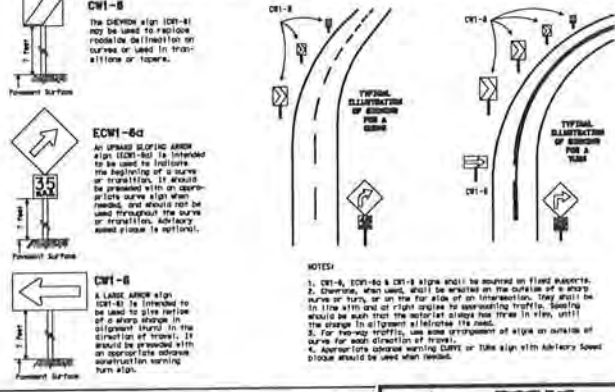
REFER TO THE BC SHEETS FOR SHEETING REQUIREMENTS ON CHANNELIZING DEVICES.

MULTI-DIRECTIONAL BARRICADE



- Multi-directional barricade shall not be used for lane closures.
- May be used for strip changes in alignment, or across roadway from area of "I" intersection.
- Typically used for Informational Lane Stationary, Short Term Stationary or Short Duration work zone operations.
- See the QTDCL List for approved designs.

USAGE OF CW1-6, ECW1-6a AND CW1-8 SIGNS

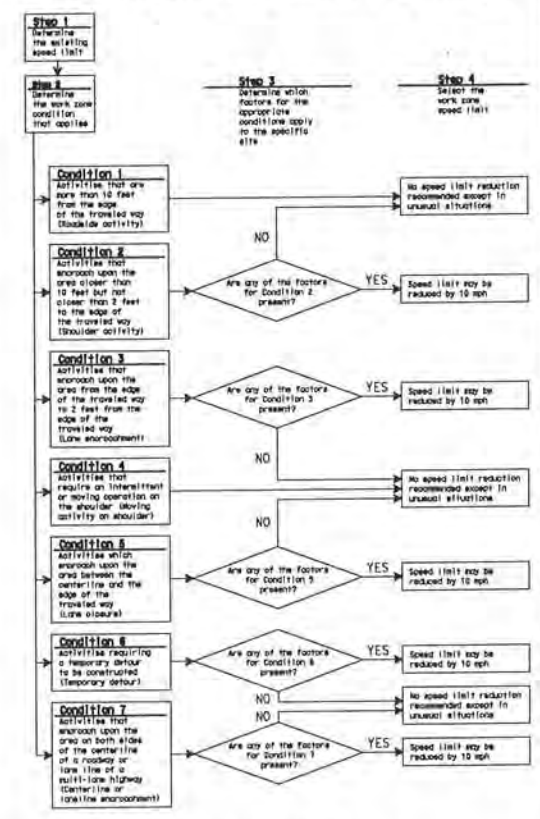


- NOTES:**
- CW1-6, ECW1-6a & CW1-8 signs shall be mounted on flat surfaces.
 - Curves, when used, shall be written on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Signing should be such that the material always face the line of view, until the change in alignment is indicated by the sign.
 - For heavy traffic, use some arrangement of signs on advance of curve for each direction of travel.
 - Apparatus advance warning signs or tabs sign with advance road block should be used when needed.

STANDARD PLAN
TRAFFIC CONTROL PLAN
TYPICAL DETAILS
WZ (TD)-03

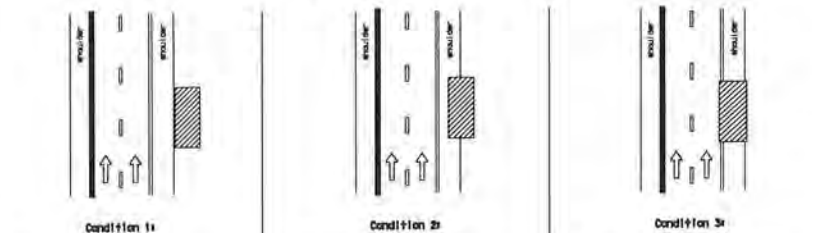
10/01 February 1999

REGULATORY SPEED LIMIT DETERMINATION GUIDELINES



Note: Work zone geometries with reduced design speeds cannot be defined. The work zone speed limit should not exceed the design speed, even if this requires a speed limit reduction greater than 10 mph.

WORK ZONE CONDITIONS

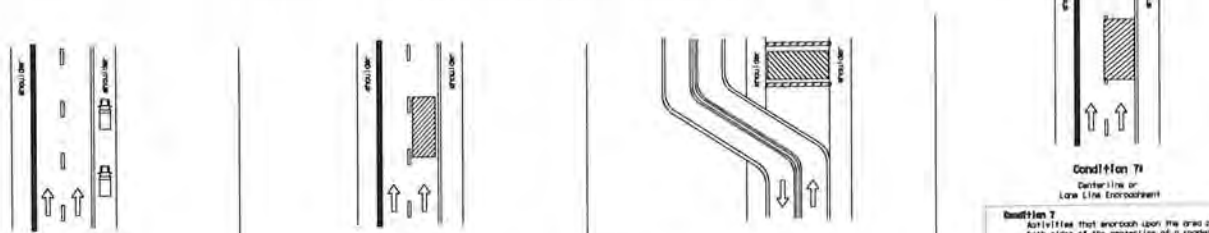


- Condition 1**
Shoulder Activity
Activities that are more than 10 feet from the edge of the traveled way (roadway activity)
- Condition 2**
Shoulder Activity
Activities that encroach upon the area closer than 10 feet but not closer than 2 feet to the edge of the traveled way (roadway activity)
- Condition 3**
Lane Encroachment
Activities that encroach upon the area closer than 10 feet but not closer than 2 feet to the edge of the traveled way (roadway activity)
- Condition 4**
Shoulder Activity
Activities that encroach upon the area between the centerline and the edge of the traveled way (roadway activity)
- Condition 5**
Temporary Diversion
Activities requiring a temporary diversion to be constructed (temporary detour)
- Condition 6**
Low Closure
Activities that encroach upon the area on both sides of the centerline of a roadway or lane line of a multi-lane highway (centerline or lane line encroachment)
- Condition 7**
Centerline or Lane Line Encroachment
Activities that encroach upon the area on both sides of the centerline of a roadway or lane line of a multi-lane highway (centerline or lane line encroachment)

WORK ZONE SPEED LIMIT WORKSHEET

10/01 February 1999

WORK ZONE CONDITIONS (CONTINUED)



- Condition 4**
Moving Activity on Shoulder
Activities that require an intermittent or moving operation on the shoulder (moving activity on shoulder)
- Condition 5**
Shoulder Activity
Activities that encroach upon the area between the centerline and the edge of the traveled way (low closure)
- Condition 6**
Low Closure
Activities requiring a temporary diversion to be constructed (temporary diversion)
- Condition 7**
Centerline or Lane Line Encroachment
Activities that encroach upon the area on both sides of the centerline of a roadway or lane line of a multi-lane highway (centerline or lane line encroachment)

WORK ZONE SPEED LIMIT WORKSHEET

10/01 February 1999



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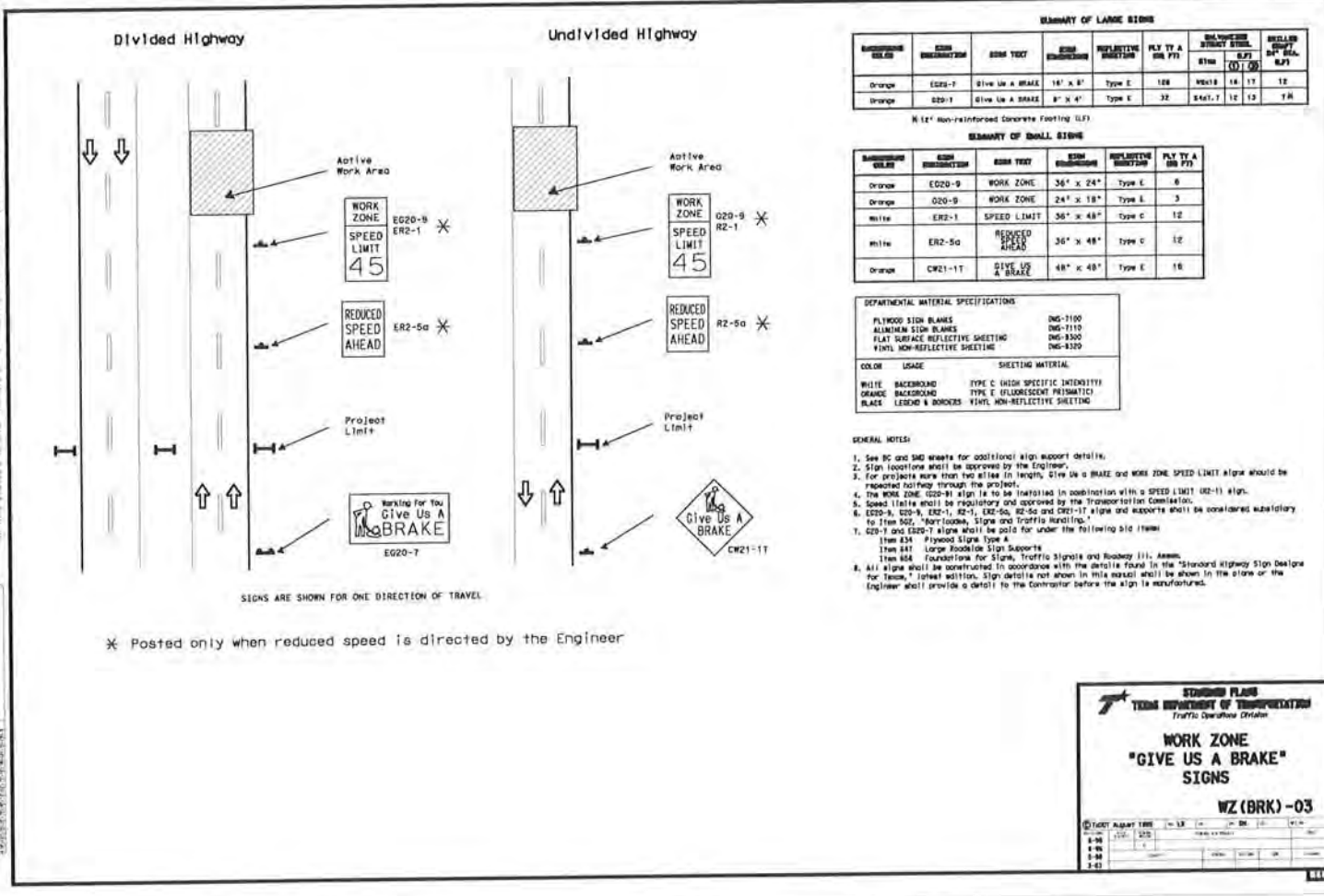
MAESTAS & ASSOCIATES, INC.
11550 IH 10 WEST, STE. 320 SAN ANTONIO, TX 78230
(210) 366-1988 (210) 366-1980 fax T&E No. F-333

No.	Revision	Drawn	Approved	Date
REVISIONS				
FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL				
TRAFFIC CONTROL PLAN STANDARDS				
DEVELOPER: SAN ANTONIO WATER SYSTEM		BUDGET PROJ. #		
SUBMITTED		APPROVED		
MAP No. 206-600, 208-600, 208-602		SHEET		
SECT. No.		TOP-23		
DR. DHBMM CK. ETM		JOB No. 10-4002		
		OF 23		

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THE FOLLOWING SHEETS HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Ernest T. Maestas, PE
10-6-11
DATE

10/6/2011 10:41:37 AM
 J:\projects\10-02-01\10-02-01-03\10-02-01-03-03\10-02-01-03-03-03.dwg
 10/6/2011 10:41:37 AM



STANDARD PLANS
 TEXAS DEPARTMENT OF TRANSPORTATION
 Traffic Operations Division

**WORK ZONE
 "GIVE US A BRAKE"
 SIGNS**

WZ (BRK) - 03

10/6/2011 10:41:37 AM

STATE OF TEXAS
 ERNEST T. MAESTAS
 52938
 REGISTERED PROFESSIONAL ENGINEER

Ernest T. Maestas

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MAESTAS & ASSOCIATES, INC.
 11550 IH 10 WEST, STE. 320 SAN ANTONIO, TX 78230
 (210) 366-1988 (210) 366-1980 fax TBP# No.: F-332

No.	Revision	Drawn	Approved	Date

REVISIONS

FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL TRAFFIC CONTROL PLAN STANDARDS

DEVELOPER: SAN ANTONIO WATER SYSTEM
 CONT. BUDGET PROJ. #

SUBMITTED _____
 APPROVED _____

MAP No. 206-600, 208-600, 208-602 SHEET TCP-24
 SECT. No. _____ OF 32
 DR. DHBMM CK. ETM JOB No. 10-4002

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THE FOLLOWING SHEETS HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Ernest T. Maestas, PE
 10/6/11
 DATE

TREE PROTECTION NOTES (ALSO SEE GENERAL NOTES)

1. ALL TREE PRESERVATION AND TREATMENT MEASURES TO INCLUDE, BUT NOT LIMITED TO, PRUNING, PROTECTING, FENCING, AND REMOVING SHALL BE PAID UNDER PREPARING RIGHT OF WAY; NO SEPARATE PAY ITEM.
2. NO SITE PREPARATION WORK SHALL BEGIN IN AREAS WHERE TREE PRESERVATION AND TREATMENT MEASURES OUTLINED BELOW HAVE NOT BEEN COMPLETED AND APPROVED BY THE ENGINEER.
3. CONTRACTOR WILL NOT BE ALLOWED TO CLEAR CUT EASEMENTS AND WILL BE REQUIRED TO PROTECT AND PRESERVE AS MANY TREES AND TREE GROUPS AS POSSIBLE. A SUBMITTAL IS REQUIRED TO INDICATE TREE PROTECTION PLAN, TREE MARKING, AND HOW PERSONNEL ARE TO BE INSTRUCTED TO SAVE SAID TREES THROUGHOUT THE PROJECT. THE CONTRACTOR WILL BE REQUIRED TO REPLACE TREES THAT ARE APPROVED FOR PROTECTION AND PRESERVATION AT NO COST TO THE OWNER.
4. ALL TREES TO BE PRESERVED AS PART OF THE PROJECT SHALL BE PROTECTED AGAINST INJURY OR DAMAGE, WHETHER BY CUTTING, SOIL COMPACTION, BREAKING, OR SKINNING OF ROOTS, TRUNKS, OR BRANCHES DURING CONSTRUCTION OPERATION. CONTRACTOR SHALL, AT HIS EXPENSE, REPAIR AND REPLACE TREES DAMAGED BY CONSTRUCTION OPERATIONS OR LACK OF ADEQUATE PROTECTION DURING CONSTRUCTION, REPLACE TREES SCHEDULED TO REMAIN AND DAMAGES BEYOND REPAIR BY CONSTRUCTION OPERATIONS, AS DETERMINED BY THE OWNER, WITH TREES OF SIMILAR SIZE AND SPECIES.
5. PROTECT DESIGNATED TREES WITH A TEMPORARY 4 FOOT HIGH (MINIMUM) ENCLOSURE FENCE PER THE PROTECTIVE FENCE AND SIGN PLACEMENT DETAIL. FENCE MAY BE CONSTRUCTED OF CHAIN LINK, ORANGE MESH, OR A DOUBLE-RAIL WOOD FENCE. FENCING SHALL BE PLACED BEFORE ANY EXCAVATING OR GRADING IS BEGUN AND SHALL BE MAINTAINED FOR THE DURATION OF THE CONSTRUCTION WORK. FENCING SHALL ENCOMPASS (AT A MINIMUM) THE ROOT PROTECTION ZONE (RPZ), WHICH IS DEFINED AS THE AREA AROUND THE TREE WITH A DIAMETER IN FEET EQUAL TO THE TREE DIAMETER IN INCHES, OR THE TREE DRIP LINE, WHICHEVER IS GREATER. TREE DIAMETER IS MEASURED 4.5 FEET ABOVE THE GROUND. RPZ OF CLOSE TREES AND CLUSTERS OF TREES MAY OVERLAP.
6. ALL TREES TO BE PROTECTED MUST ALSO BE PROTECTED FROM POSSIBLE DAMAGE DUE TO CONSTRUCTION EQUIPMENT EXHAUST. TEMPORARY REDIRECTION OF EQUIPMENT EXHAUST IS REQUIRED IF NECESSARY.
7. WITHIN THE TREE PROTECTION FENCING AND RPZ, THE CONTRACTOR MUST NOT ALTER THE PERMEABILITY OF THE AREA. HE SHALL NOT STORE ANY MATERIALS, CONDUCT ANY CONSTRUCTION OR MAINTENANCE OPERATIONS, AND SHALL NOT SPREAD, PLACE OR DISPOSE OF ANY SOIL, OR STORE OR DISPOSE OF ANY OTHER MATERIALS (LIQUID OR SOLID) IN THIS AREA.
8. IF TREES ARE DAMAGED BY CONSTRUCTION OPERATIONS, CONTRACTOR SHALL REPAIR DAMAGED TREES PROMPTLY TO PREVENT FURTHER DETERIORATION. ALL BROKEN BRANCHES AND EXPOSED ROOTS OF PROTECTED TREES SHALL BE CUT CLEANLY. FOR OAKS SPECIES, WOUNDS MUST BE PAINTED WITH AN ACCEPTABLE WOUND DRESSING WITH 30 MINUTES IN ORDER TO PREVENT INFECTION BY OAK WILT SPORES.
9. CONTRACTOR SHALL NOT TIE ROPES, GUY WIRES, CHAINS, CABLES OR CLAMP ONTO ANY PROTECTED TREE.
10. CONTRACTOR SHALL PROTECT ALL EXISTING TREES FROM CHANGES TO SOIL CHEMISTRY AND pH FACTOR BY PREVENTING DISPOSAL IN THE PROJECT AREA OF ANY CHEMICAL AGENTS OR pH ALTERING MATERIALS, SUCH AS LIME BASED MATERIALS IN CEMENT, PLASTER, OR SIMILAR MATERIALS.
11. WHEN APPROVED TO WORK WITHIN THE RPZ, CONTRACTOR MAY TRIM INTERFERING BRANCHES OF PRESERVED TREES IN A METHOD ACCEPTABLE TO THE CITY OF SAN ANTONIO.
12. WHEN APPROVED TO WORK WITHIN THE RPZ, CONTRACTOR SHALL BE LIMITED TO A 3 INCH CUT OR FILL. IF MORE THAN 3 INCHES OF GRADING IS REQUIRED, WELLING AND RETAINING METHODS ARE ALLOWED OUTSIDE OF THE ROOT PROTECTION ZONE AND MUST BE APPROVED BY THE CITY OF SAN ANTONIO.
13. NO TREES SHALL BE REMOVED WITHOUT THE PRIOR APPROVAL OF THE CITY OF SAN ANTONIO.
14. ALL TREES, BRUSH AND DEBRIS APPROVED FOR REMOVAL SHALL BE DISPOSED OF BY THE CONTRACTOR AT AN APPROVED OFF SITE LOCATION. NO BURNING WILL BE PERMITTED.
15. WHEN MAKING REQUESTS TO REMOVE TREES, THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST. CONTRACTOR'S REQUEST SHALL INCLUDE THE FOLLOWING INFORMATION.
 - A. REASON FOR REMOVAL OF TREE(S).
 - B. SIZE(S) AND TYPE(S) OF TREE(S) TO BE REMOVED
 - C. LOCATION BY STATION AND OFFSET OF THE TREE(S) TO BE REMOVED.

FM 78 Tree Inventory

Shade Value	Excess Canopy (SF)		
	Sheet 1	Sheet 2	Sheet 3
875	22713	21813	0

Conversion Factor	Diameter Inches			
	Sheet 1	Sheet 2	Sheet 3	Total
875 sf = 16.7 in.	433	416	0	849

Total Number of Trees			
Sheet 1	Sheet 2	Sheet 3	Total
26	25	0	51

Total Trees Removed			
Sheet 1	Sheet 2	Sheet 3	Total
0	0	0	0

Percentage of Trees Preserved			
Sheet 1	Sheet 2	Sheet 3	Total
100%	100%	100%	100%

Note: It was assumed that all trees are hackberry.



MAESTAS ASSOCIATES, INC.
 11550 IH 16 WEST, STE. 320 SAN ANTONIO, TX 78220
 (210) 368-1988 (210) 368-1989 fax (210) 368-1989

No.	Revision	Drawn	Approved	Date

REVISIONS

FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL TREE PROTECTION NOTES & INVENTORY SHEET 1 OF 1

DEVELOPER: SAN ANTONIO WATER SYSTEM
 CONT. BUDGET PROJ. #

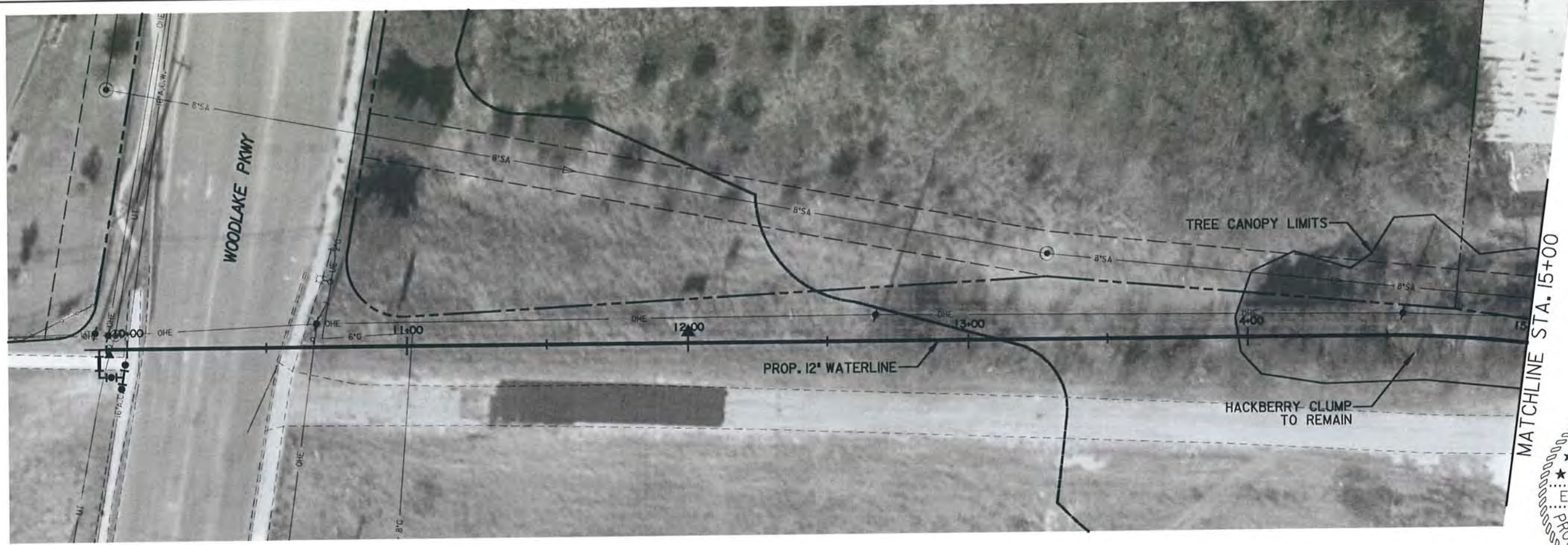
SUBMITTED _____
 APPROVED _____

MAP No. 206-600, 208-600, 208-602 SHEET 25
 SECT. No. _____ OF 32
 DR. DH&MM CK. ETM JOB No. 10-4002

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10/16/2011

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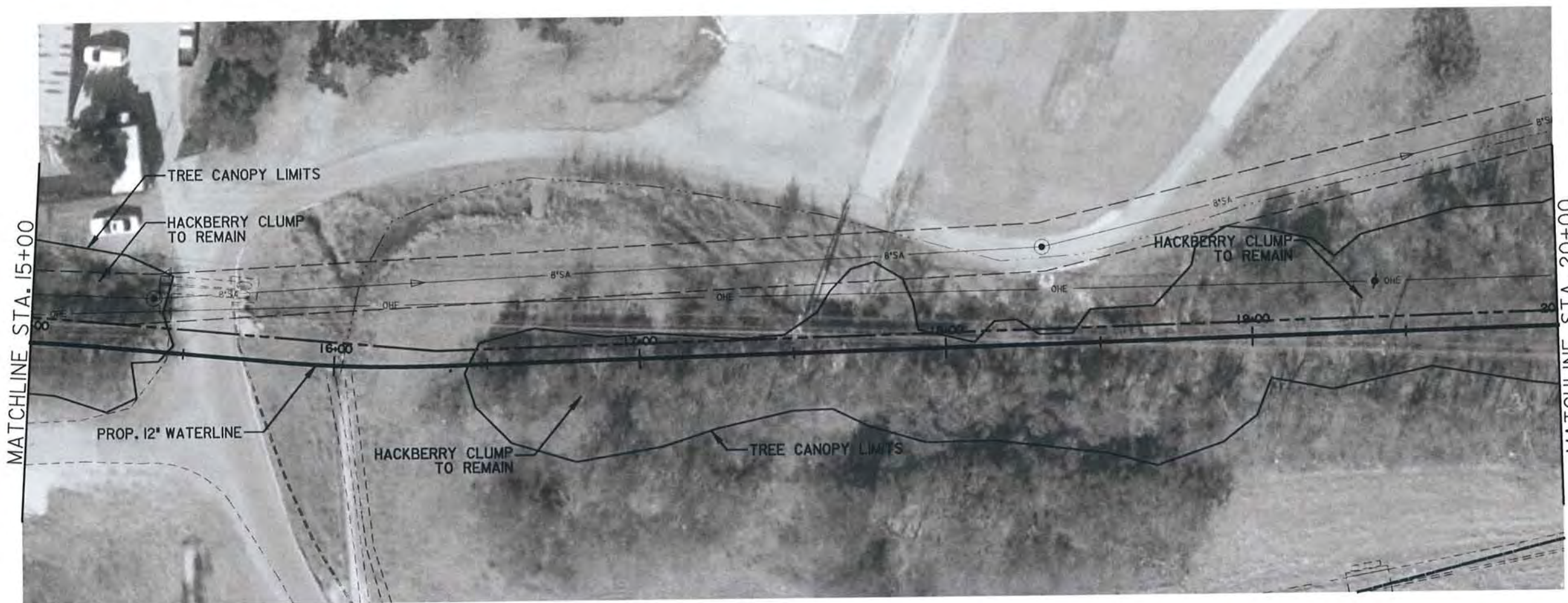


Scale:
1" = 40'

MATCHLINE STA. 15+00



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MATCHLINE STA. 15+00

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 (210) 366-1986 (210) 368-1989 fax TBPE No. F-333

No.	Revision	Drawn	Approved	Date

REVISIONS
FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL TREE PROTECTION PLAN SHEET 1 OF 3

DEVELOPER: SAN ANTONIO WATER SYSTEM
 CONT. BUDGET PROJ. *

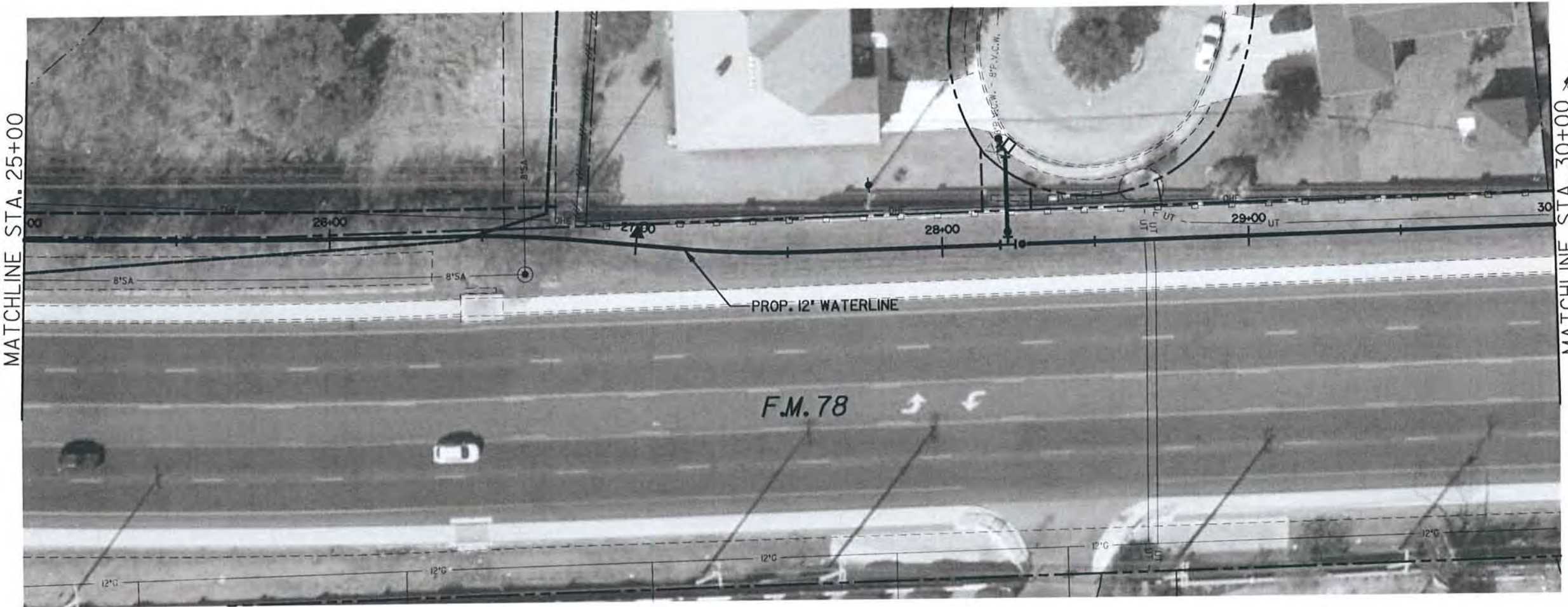
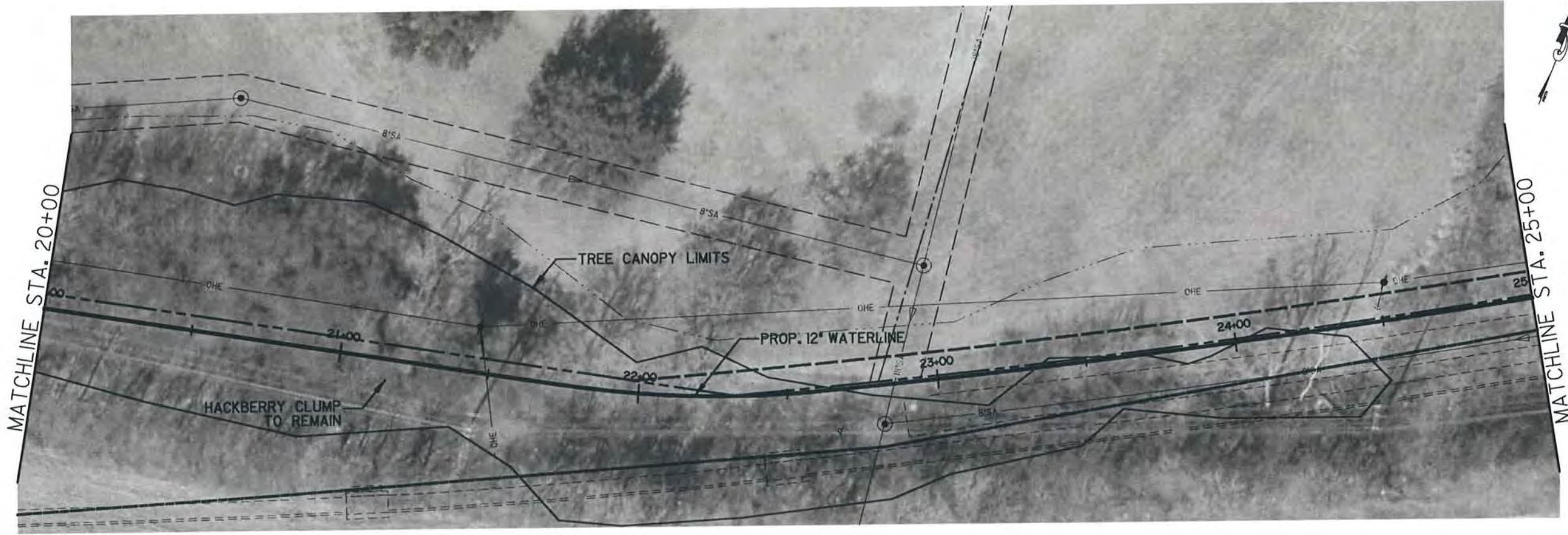
SUBMITTED _____
 APPROVED _____

MAP No. 206-600, 208-600, 208-602	SHEET 26
SECT. No. _____	OF 32
DR. DH&MM CK. ETM	JOB No. 10-4002

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10/6/2011

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Scale:
1" = 40'



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 (210) 366-1980 (210) 366-1980 fax TBPE No.: F-333

No.	Revision	Drawn	Approved	Date

REVISIONS	
	FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL TREE PROTECTION PLAN SHEET 2 OF 3
DEVELOPER:	SAN ANTONIO WATER SYSTEM
CONT.	BUDGET PROJ. #
SUBMITTED	
APPROVED	
MAP No.	206-600, 208-600, 208-602
SECT. No.	
DR. DH&MM	CK. ETM
JOB No.	10-4002
SHEET	27
OF	32

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10/6/2011

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MATCHLINE STA. 30+00



Scale:
1" = 40'



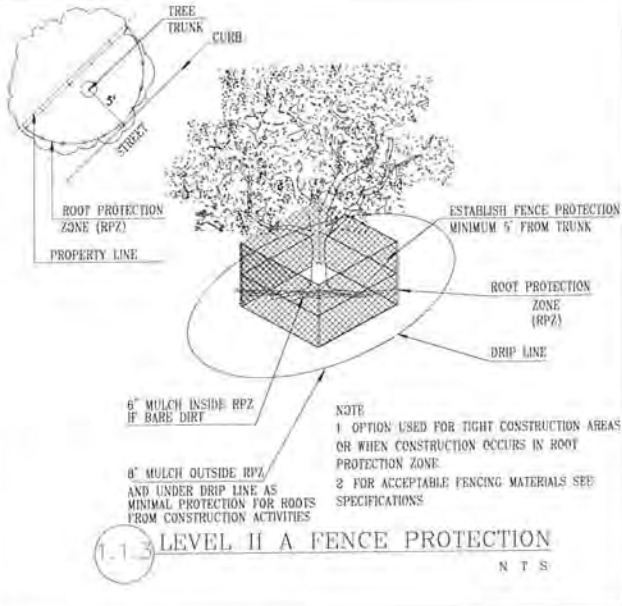
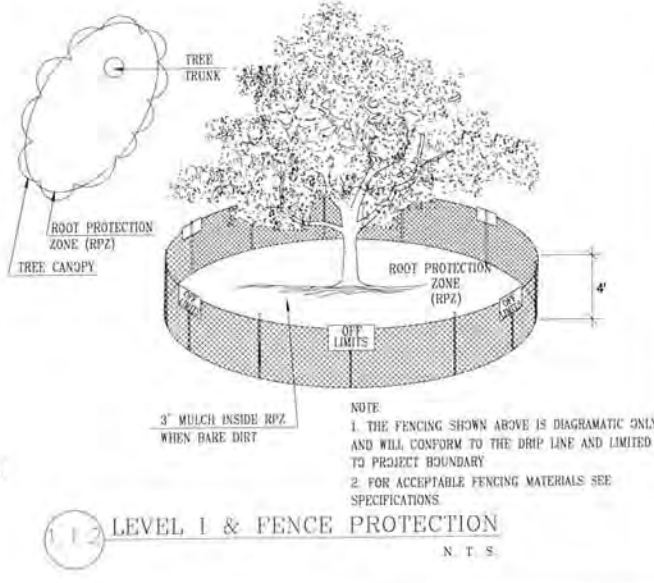
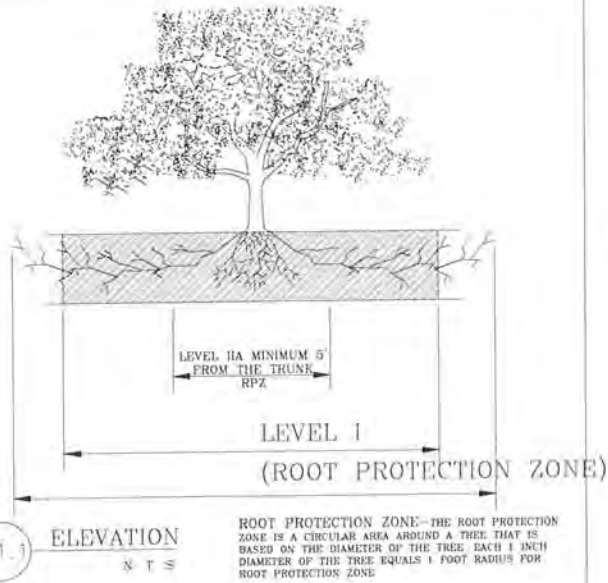
Ernest T. Maestas

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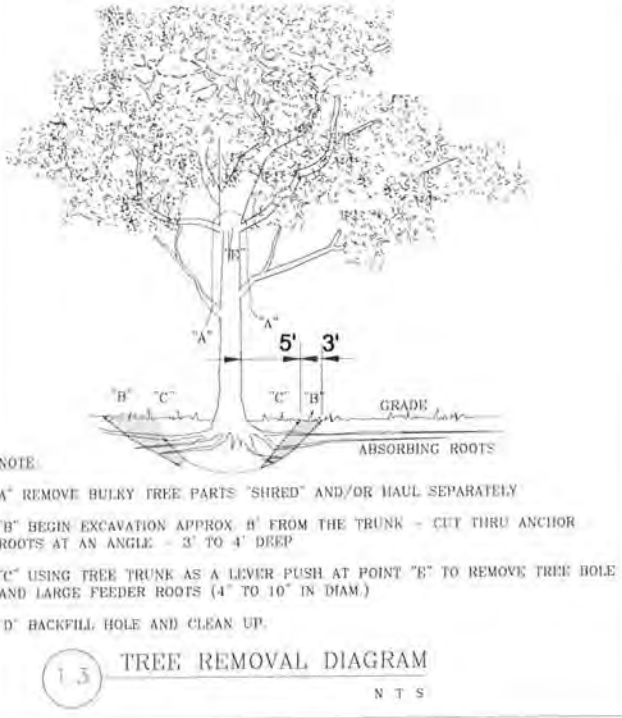
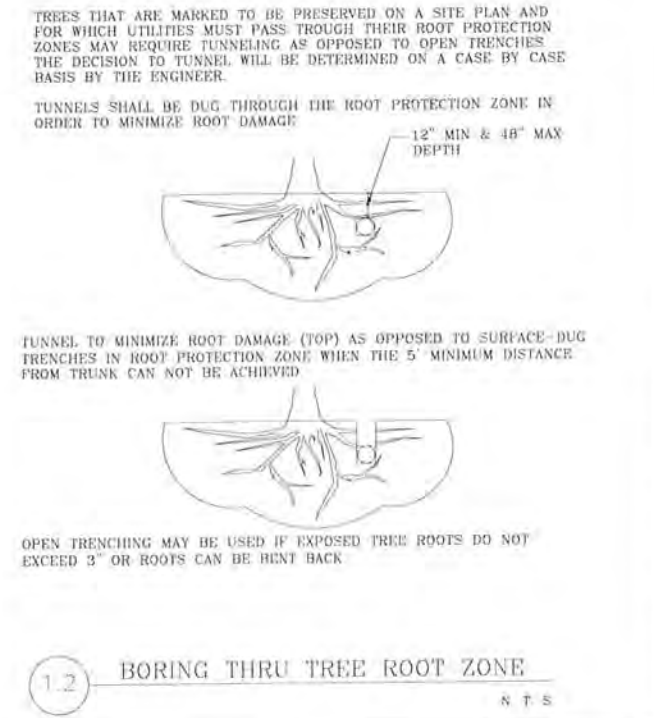
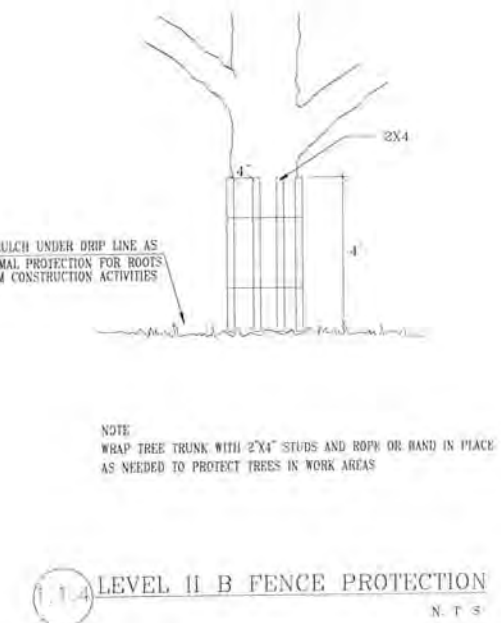
MAESTAS & ASSOCIATES, INC.
 11650 IH 10 WEST, STE. 320 SAN ANTONIO, TX 78230
 (210) 366-1986 (210) 366-1960 fax TBPE No.: F-333

No.	Revision	Drawn	Approved	Date

REVISIONS	
	FM 78 - 12" WATER MAIN WOODLAKE TO CONGRESSIONAL TREE PROTECTION PLAN SHEET 3 OF 3
DEVELOPER:	SAN ANTONIO WATER SYSTEM
CONT.	BUDGET PROJ. *
SUBMITTED	_____
APPROVED	_____
MAP No.	206-600, 208-600, 208-602
SECT. No.	28
DR. DH&MM CK. ETM	JOB No. 10-4002
	OF 32

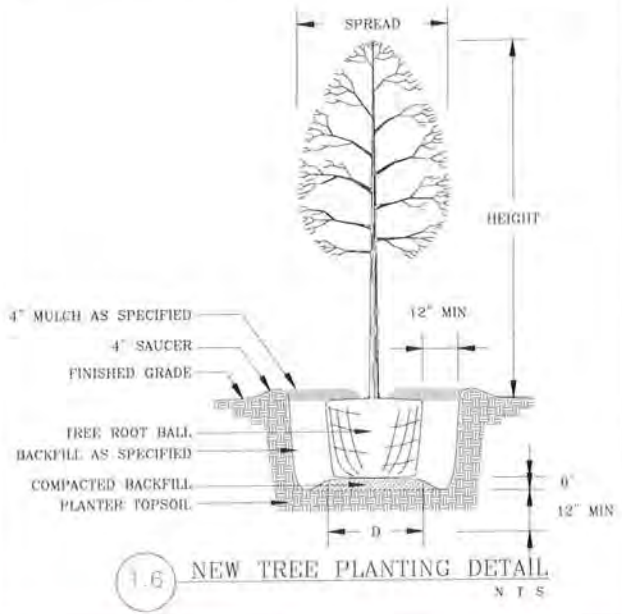
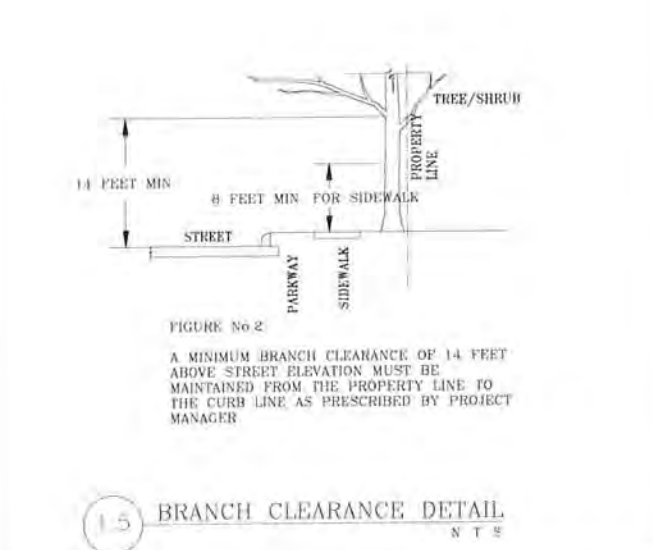
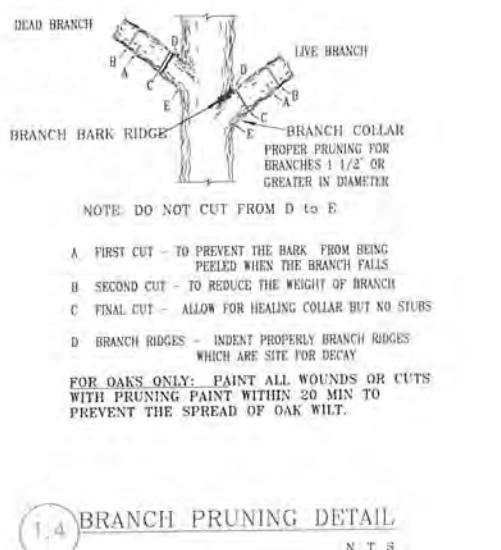


- GENERAL NOTES**
- ALL THE TREES WITH A DIAMETER GREATER THAN 3 INCHES AFFECTED BY CONSTRUCTION SHALL HAVE THE LIMBS AND ROOTS TRIMMED AND PRUNED ACCORDING TO ITEM NO. 802 TREE PRUNING. SOIL AMENDING AND FERTILIZATION, UNLESS SPECIFIED TREES SHALL RECEIVE LEVEL 2 PROTECTION AS PER ITEM NO. 802 TREES TO RECEIVE LEVEL 1 PROTECTION AS PER ITEM NO. 802 ARE SHOWN ON TREE PROTECTION TABLE ON THIS SHEET
 - ALL TREES SHALL REMAIN UNLESS NOTED ON THE PLANS
 - NO SITE PREPARATION WORK SHALL BEGIN IN AREAS WHERE TREE PRESERVATION AND TREATMENT MEASURES HAVE NOT BEEN COMPLETED AND APPROVED
 - TREE PROTECTION FENCING SHALL BE REQUIRED. TREE PROTECTION FENCING SHALL BE INSTALLED, MAINTAINED AND REPAIRED BY THE CONTRACTOR DURING SITE CONSTRUCTION
 - THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THAN THREE INCHES IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN THE VICINITY OF TREES SHALL PROCEED WITH CAUTION. THE CONTRACTOR SHALL CONTACT THE CITY INSPECTOR
 - THE ROOT PROTECTION ZONE IS THAT AREA SURROUNDING A TREE, AS MEASURED BY A RADIUS FROM THE TREE TRUNK, IN WHICH NO EQUIPMENT, VEHICLES OR MATERIALS MAY OPERATE OR BE STORED. THE REQUIRED RADIUS LENGTH IS 1 FOOT PER DIAMETER INCH OF THE TREE. FOR EXAMPLE, A 10-INCH DIAMETER TREE WOULD HAVE A 5-FOOT RADIUS ROOT PROTECTION ZONE AROUND THE TREE. ROOTS OR BRANCHES THAT ARE IN CONFLICT WITH THE CONSTRUCTION SHALL BE CUT CLEANLY ACCORDING TO PROPER PRUNING METHODS. LIVE OAK WOUNDS SHALL BE PAINTED OVER, WITHIN 20 MINUTES TO PREVENT OAK WILT.
 - ACCESS TO FENCED AREAS WILL BE PERMITTED ONLY WITH THE APPROVAL OF THE ENGINEER OR CITY INSPECTOR
 - GRADING, IF REQUIRED, SHALL BE LIMITED TO A 3 INCH CUT OR FILL WITHIN THE FENCED ROOT ZONE AREAS
 - TREES, SHRUBS OR BUSHES TO BE CLEARED FROM PROTECTED ROOT ZONE AREAS SHALL BE REMOVED BY HAND AS DIRECTED BY THE PROJECT MANAGER OR CITY INSPECTOR.
 - TREES DAMAGED OR LOST DUE TO CONTRACTOR'S NEGLIGENCE DURING CONSTRUCTION SHALL BE MITIGATED TO THE ENGINEER'S SATISFACTION.
 - EXPOSED ROOTS SHALL BE COVERED AT THE END OF EACH DAY USING TECHNIQUES SUCH AS COVERING WITH SOIL, MULCH OR WET BURLAP.
 - ANY TREE REMOVAL SHALL BE APPROVED BY THE CITY ARBORIST PRIOR TO ITS REMOVAL.



1.3 GENERAL NOTES

TREE SHEET #	TREE/CALIPER SHEET #	STATION OR NUMBER	LOCATION	PROTECTION MEASURE		REMOVAL SEE GENERAL NOTE No. 2
				ITEM 801	ITEM 802 MAINTENCE/TREATMENTS/PROTECTION	



1.3 TREE PROTECTION TABLE

TREE INVENTORY SUMMARY
(5" DIAMETER AND LARGER)

TOTAL DIAMETER INCHES, R.O.* _____

TOTAL DIAMETER INCHES REMOVED _____

TOTAL DIAMETER INCHES PRESERVED _____

TOTAL PERCENTAGE INCHES PRESERVED _____

TOTAL INCHES TO BE MITIGATED _____

PREPARED BY: FERNANDEZ FRAZER WHITE & ASSOC. INC. & C. F. ZAVALA GROUP **SHEET 28**

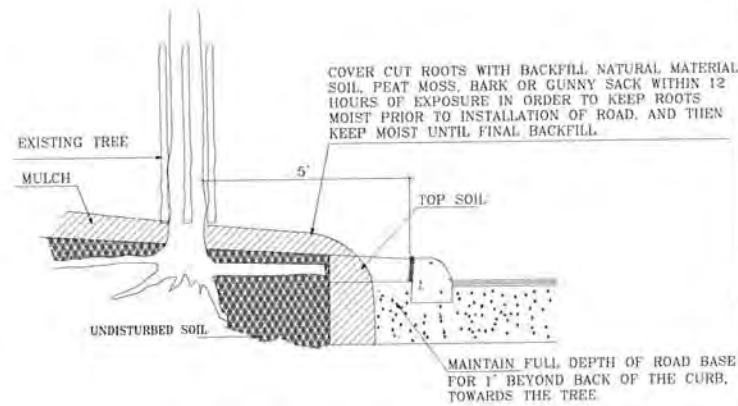
CITY OF SAN ANTONIO

DEPARTMENT OF PUBLIC WORKS

CITY OF SAN ANTONIO TREE PROTECTION DETAILS

TREE PRESERVATION

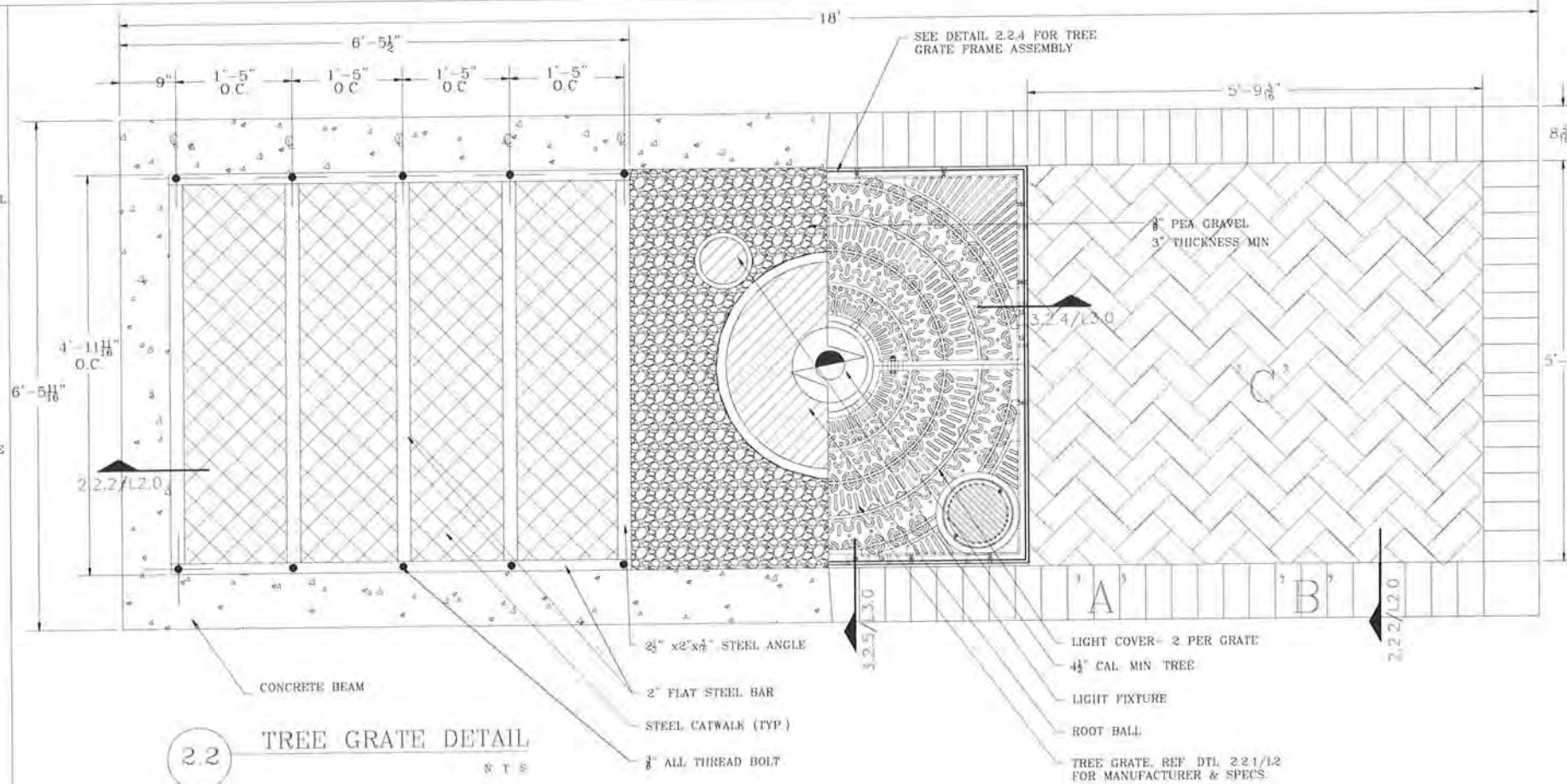
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CHECKED	TEXAS			3 OF 4
DRAWN	STATE DIST. NO.	COUNTY	CONTROL. NO.	SECT. NO.
CHECKED	BRAN. NO.	JOB NO.	HIGHWAY NO.	



NOTE: ROOT ZONE OUTSIDE OF TREE PROTECTION BARRIER SHOULD BE COVERED AT ALL TIMES WITH 8" OF BARK MULCH THROUGHOUT THE CONSTRUCTION PHASE. EXISTING TREES SHOULD BE DEEP WATERED AS SPECIFIED IN ITEM 801 & 802

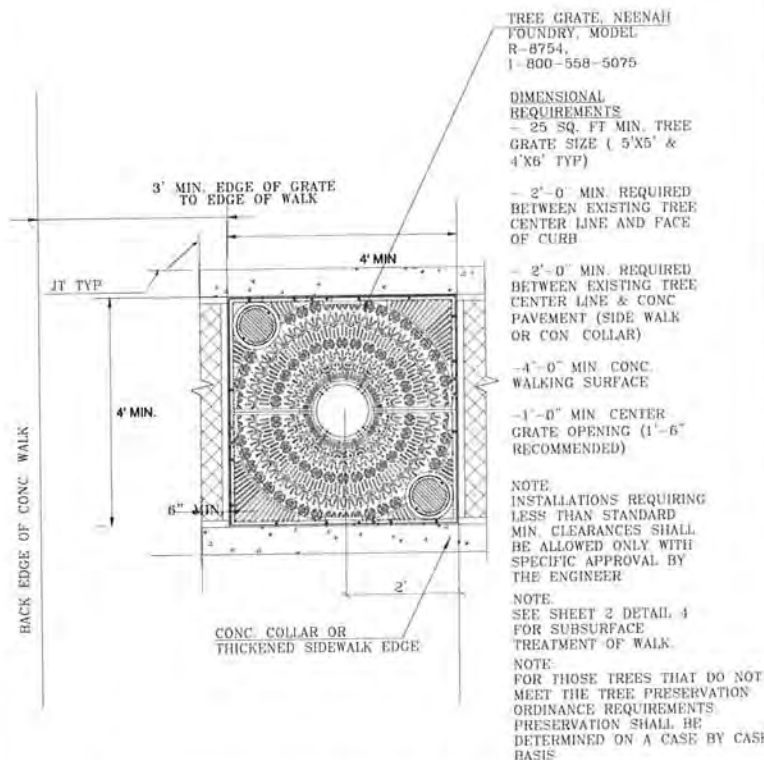
2.1 EXPOSED ROOT PROTECTION DETAIL N T S

NOTE: FOR THOSE TREES THAT DO NOT MEET THE TREE PRESERVATION ORDINANCE REQUIREMENTS PRESERVATION SHALL BE DETERMINED ON A CASE BY CASE BASIS



2.2 TREE GRATE DETAIL N T S

NOTES
 1. PAVER 'A' 8 5/8" x 23"
 THICKNESS CONC PAVER (CITY STONE II) CASTONE COLOR, BY PAVESTONE 1-800-580-PAVE
 2. PAVER 'B' 4 5/8" x 8 5/8" x 23"
 THICKNESS, PATTERN AS SHOWN ON PLAN, CONC PAVER (HOLLAND STONE) CAST STONE COLOR, MANUF BY PAVESTONE
 3. PAVER 'C' 4 5/8" x 8 5/8" x 23"
 THICKNESS, 45° HERRINGBONE PATTERN, CONC. PAVER (HOLLAND STONE), ANTIQUE COLOR, MANUF. BY PAVESTONE



2.2.1 TREE GRATE PLAN VIEW N T S

TREE GRATE, NEENAH FOUNDRY, MODEL R-8754, 1-800-558-5075

DIMENSIONAL REQUIREMENTS
 - 25 SQ. FT MIN. TREE GRATE SIZE (5'X5' & 4'X6' TYP)

- 2'-0" MIN REQUIRED BETWEEN EXISTING TREE CENTER LINE AND FACE OF CURB

- 2'-0" MIN. REQUIRED BETWEEN EXISTING TREE CENTER LINE & CONC PAVEMENT (SIDE WALK OR CON COLLAR)

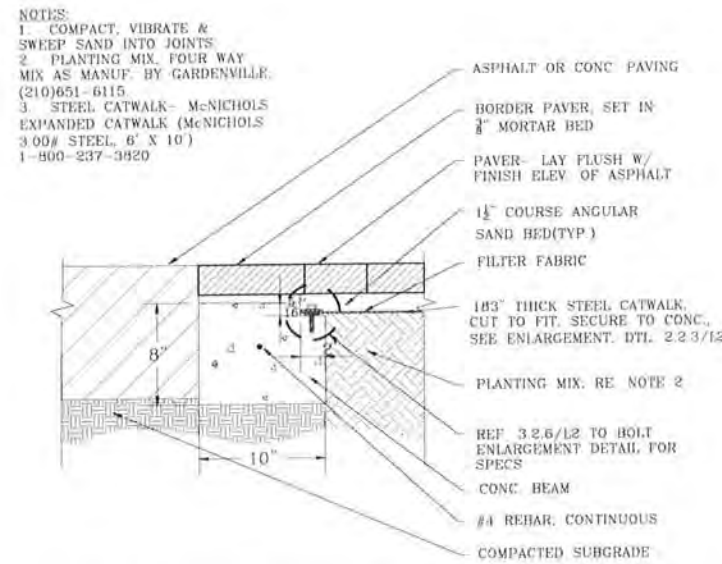
- 4'-0" MIN CONC. WALKING SURFACE

- 1'-0" MIN CENTER GRATE OPENING (1'-6" RECOMMENDED)

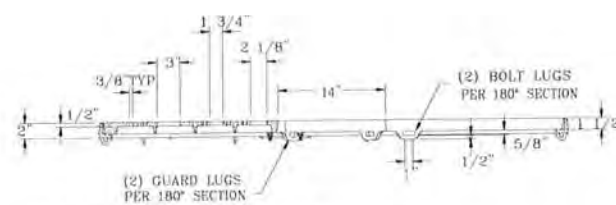
NOTE: INSTALLATIONS REQUIRING LESS THAN STANDARD MIN. CLEARANCES SHALL BE ALLOWED ONLY WITH SPECIFIC APPROVAL BY THE ENGINEER

NOTE: SEE SHEET 2 DETAIL 4 FOR SUBSURFACE TREATMENT OF WALK.

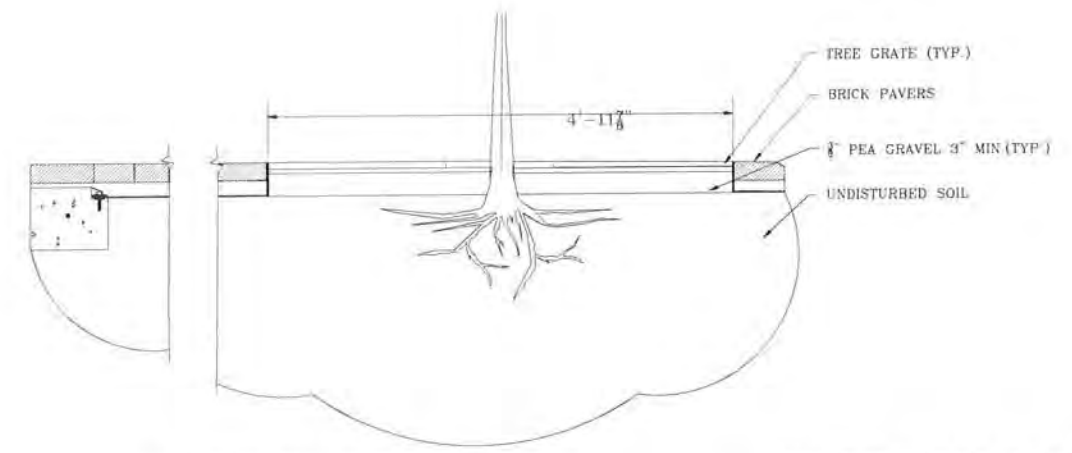
NOTE: FOR THOSE TREES THAT DO NOT MEET THE TREE PRESERVATION ORDINANCE REQUIREMENTS, PRESERVATION SHALL BE DETERMINED ON A CASE BY CASE BASIS



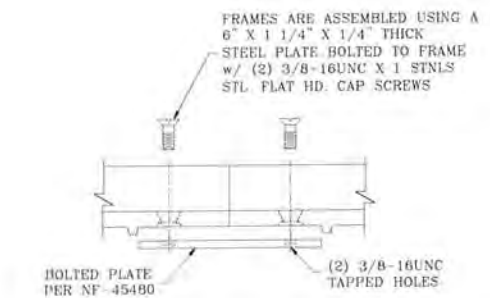
2.2.2 SECTION: PAVER @ ASPHALT N T S



2.2.4 SECTION: TREE GRATE FRAME N T S



2.2.3 TREE WELL SECTION N T S



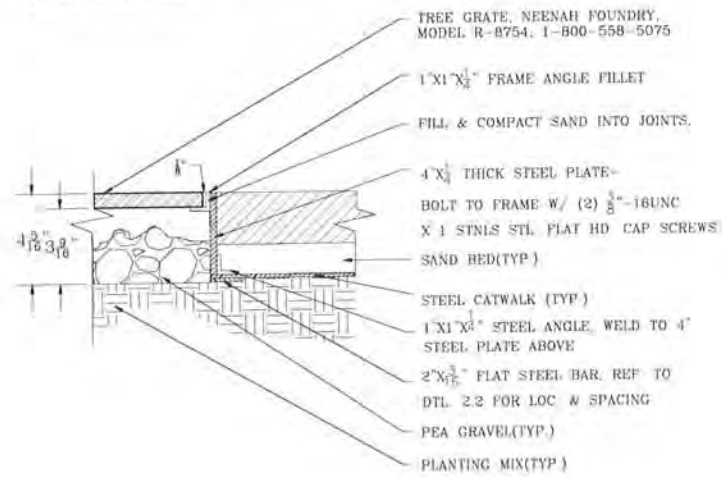
2.2.5 SECTION: GRATE FRAME ASSEMBLY N T S

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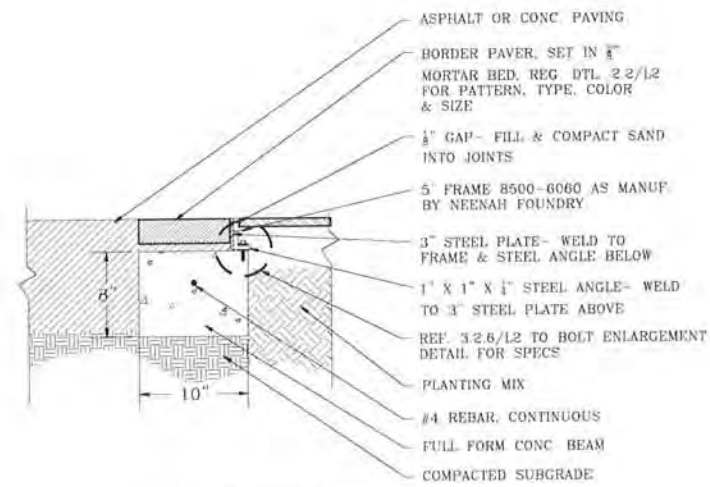
CITY OF SAN ANTONIO
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 TREE PROTECTION DETAILS
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DESIGNED	FED. RD. DIST. NO.	STATE	SHEET NO.
CHECKED	TERMS		2 OF 4
DRAWN	STATE DIST. NO.	COUNTY	CONTROL NO.
CHECKED	SECTION NO.	JOB NO.	HIGHWAY NO.

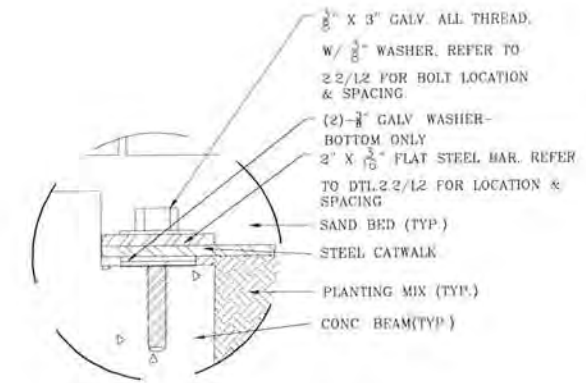
- NOTES
- 5" FRAME 8500-6060 AS MANUFACTURED BY NEENAH FOUNDRY
 - REMOVE CROSSBAR FROM FRAME BEFORE INSTALLATION.



3.2 TREE GRATE/FRAME @ PAVERS

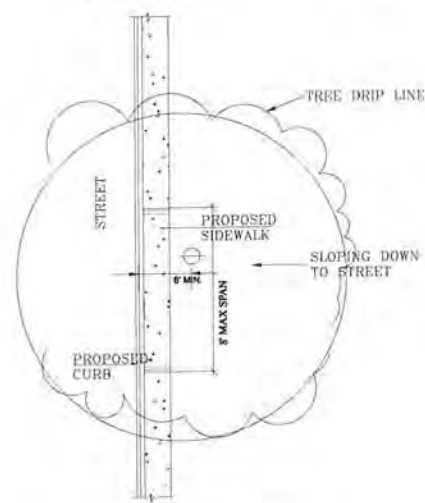


3.2.5 SECTION: PAVER @ TREE GRATE



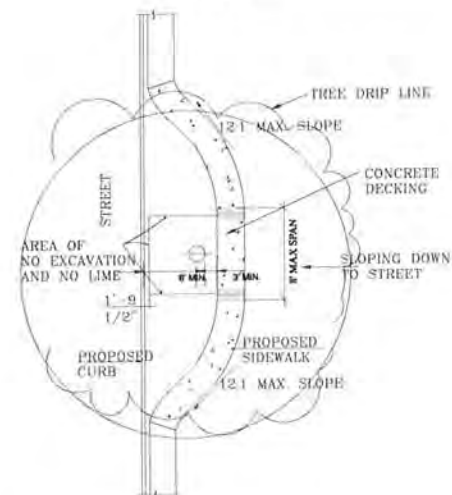
3.2.6 DETAIL: BOLT/CONC CONNECTION

AREA BENEATH PROPOSED SIDEWALKS IN THE DRIP LINE OF AN EXISTING TREE SHALL RECEIVE TREE VENTING AS PER OPTIONS ON THESE SHEETS



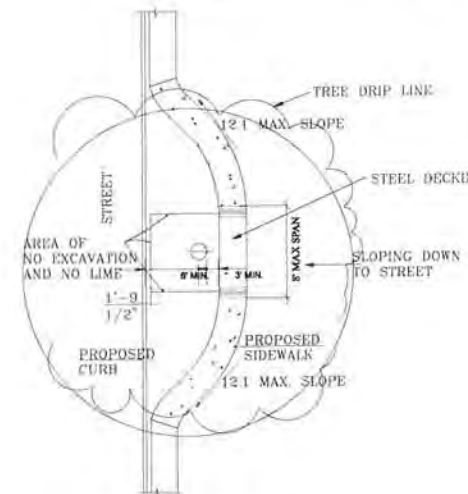
3.3 ELEVATED WALKWAY

AREA BENEATH PROPOSED SIDEWALKS IN THE DRIP LINE OF AN EXISTING TREE SHALL RECEIVE TREE VENTING AS PER OPTIONS ON THESE SHEETS



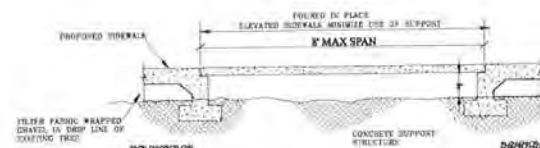
3.3.1 ELEVATED WALKWAY CONCRETE DECKING

AREA BENEATH PROPOSED SIDEWALKS IN THE DRIP LINE OF AN EXISTING TREE SHALL RECEIVE TREE VENTING AS PER OPTIONS ON THESE SHEETS



3.3.2 ELEVATED WALKWAY STEEL DECKING

NOTE: DESIGN STEEL PLATE SUPPORT ACCORDING TO SPECIFIED WIDTH AND LENGTH



3.3.4 ELEVATED WALKWAY SECTION

NOTE: FOR THOSE TREES THAT DO NOT MEET THE TREE PRESERVATION ORDINANCE REQUIREMENTS PRESERVATION SHALL BE DETERMINED ON A CASE BY CASE BASIS

NOTE FOR TREE AERATION SYSTEMS LOCATED UNDER A PRIVATE OR PUBLIC ROADWAY - THE PROJECT ENGINEER SHALL SUBMIT FOR APPROVAL A PAVEMENT DESIGN SUPPORTED BY A GEOTECHNICAL REPORT THAT MEETS THE REQD. STRUCTURAL NUMBERS AND COMPACTION OF THE SUBGRADE, ABOVE THE PROPOSED SYSTEM OF TREE AERATION, IN ACCORDANCE WITH UDC 35-506(P) PAVEMENT STANDARDS, AND CITY OF SAN ANTONIO'S STANDARD SPECS FOR PUBLIC WORKS CONSTRUCTION

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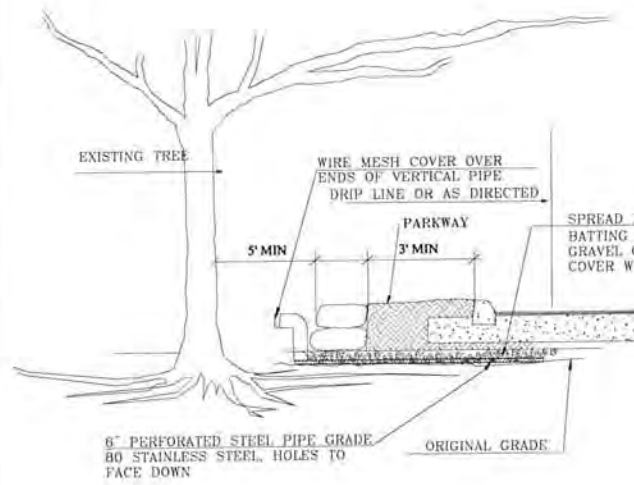
CITY OF SAN ANTONIO



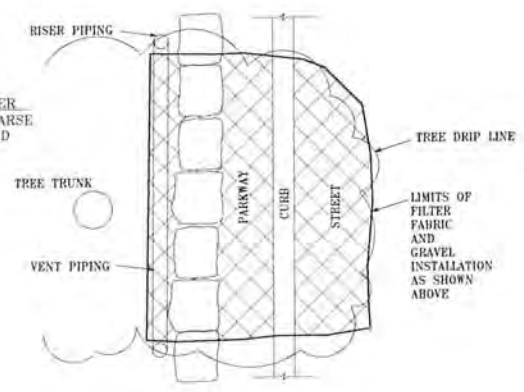
DEPARTMENT OF PUBLIC WORKS

CITY OF SAN ANTONIO TREE PROTECTION

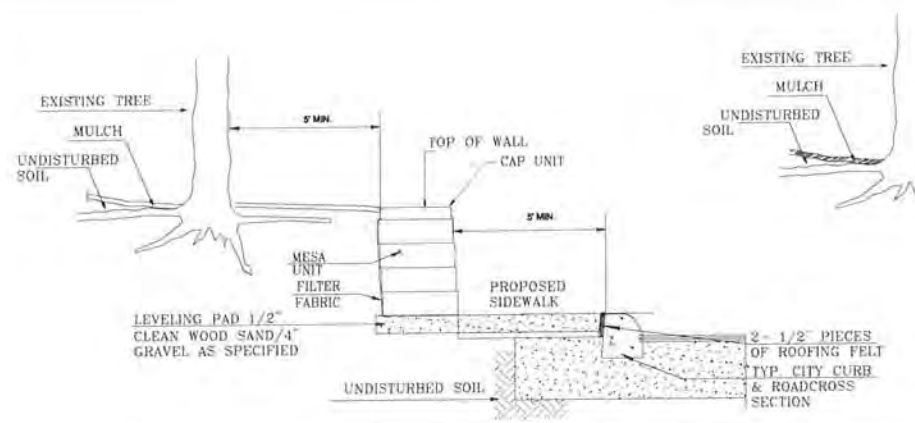
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CHECKED:		TEXAS		1 OF 4
DRAWN: ABW/JR	STATE DIST. NO.	COUNTY	CONTROL. SECT. NO.	JOB NO.
CHECKED:		BEXAR		HIGHWAY NO.



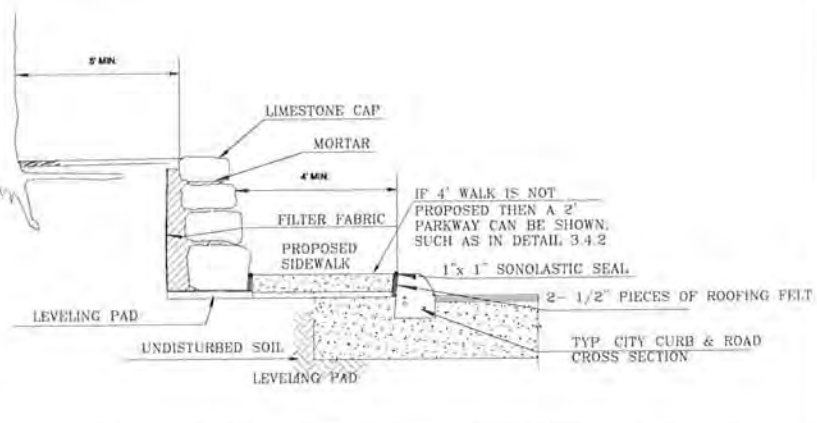
4.2 TREE AERATION DETAIL B
N T S



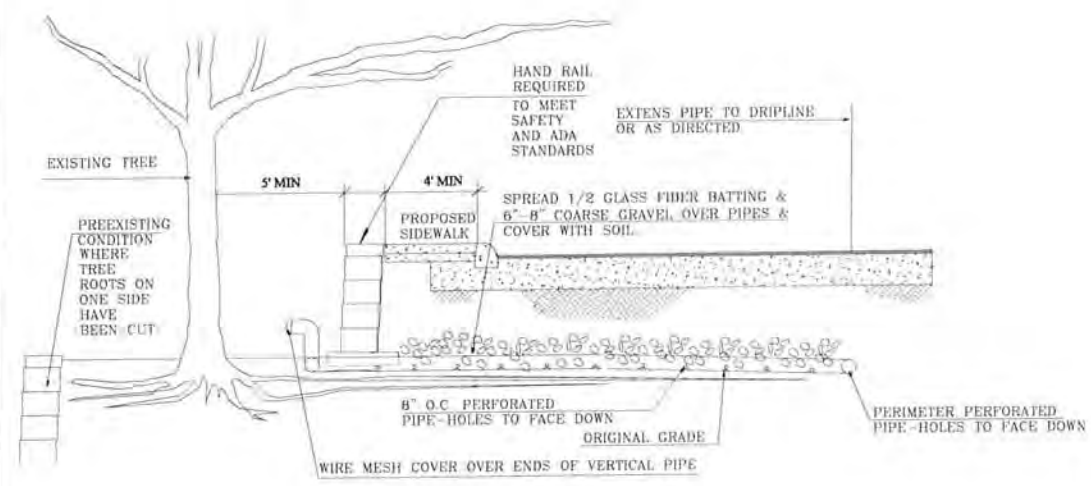
4.2.1 PLAN VIEW B
N T S



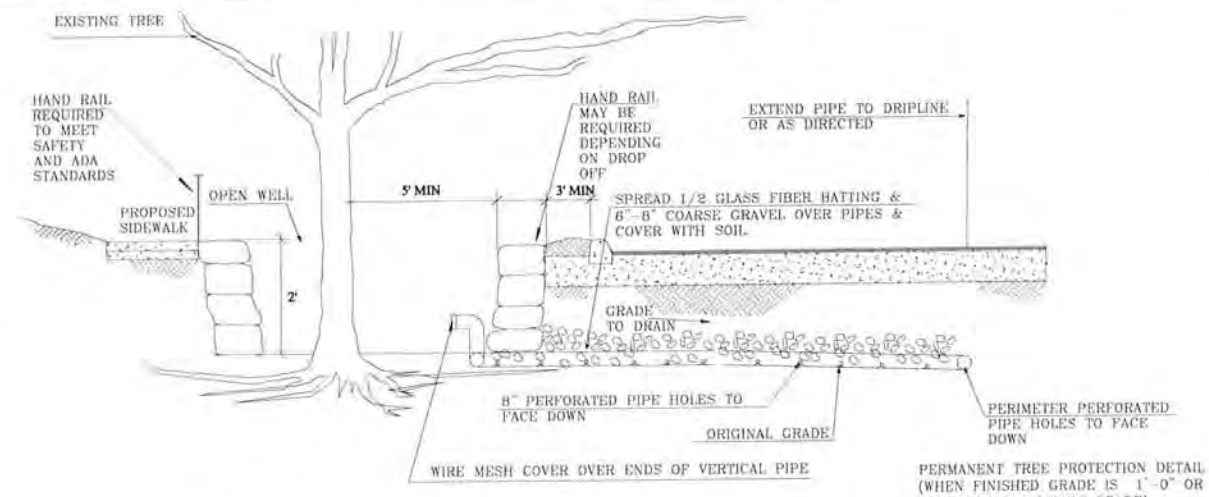
4.3 SEGMENTAL GRAVITY WALL
ADJACENT TO CURB
N T S
NOTE - THIS TYPE OF WALL CAN BE USED ON OTHER APPLICATIONS TREES CANNOT BE PRESERVED IF THEY ARE CLOSER THAN 5 FEET TO THE WALL.



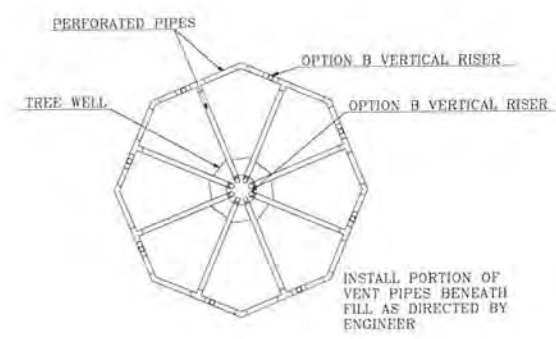
4.3.1 LIMESTONE BOULDER GRAVITY WALL
ADJACENT TO CURB
N T S
NOTE - THIS TYPE OF WALL CAN BE USED ON OTHER APPLICATIONS TREES CANNOT BE PRESERVED IF THEY ARE CLOSER THAN 5 FEET TO THE WALL.



4.4 TREE AERATION DETAIL C
N T S

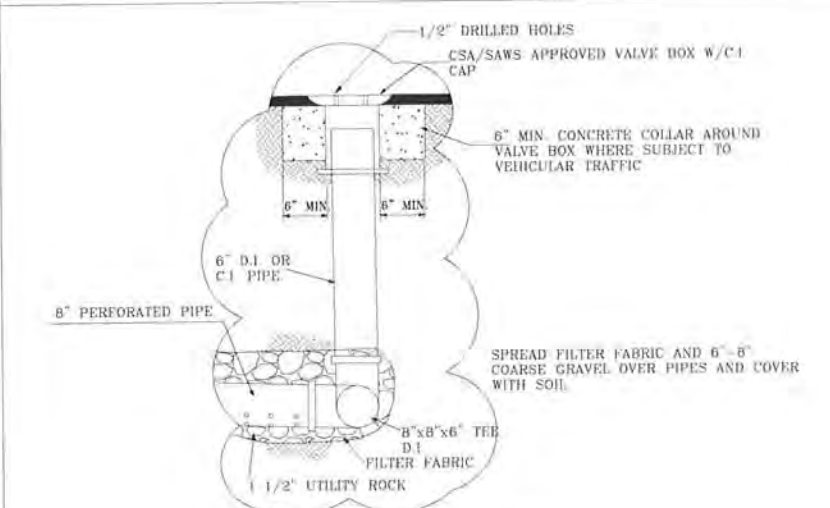


4.4.1 TREE AERATION DETAIL C
N T S
NOTE - THIS AERATION SYSTEM CAN BE USED FOR NEW PROJECTS WHERE FILL IS OCCURRING SUCH AS PARKING LOTS OR CONSTRUCTION DRAIN AWAY FROM EXISTING TREE.

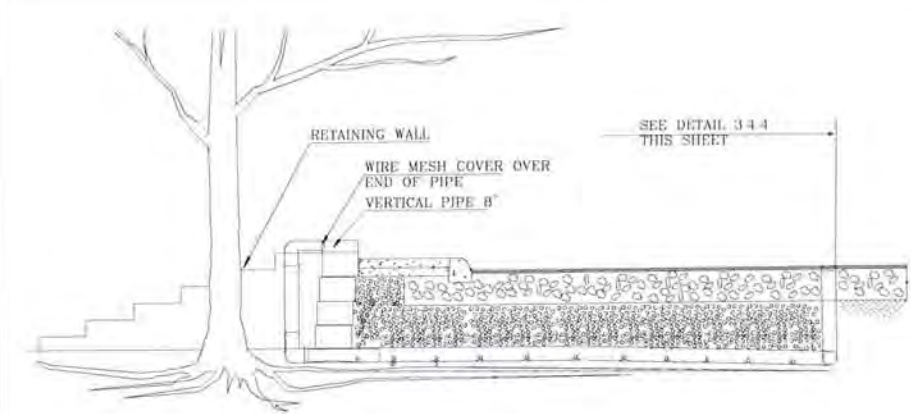


4.4.2 PLAN VIEW C
N T S

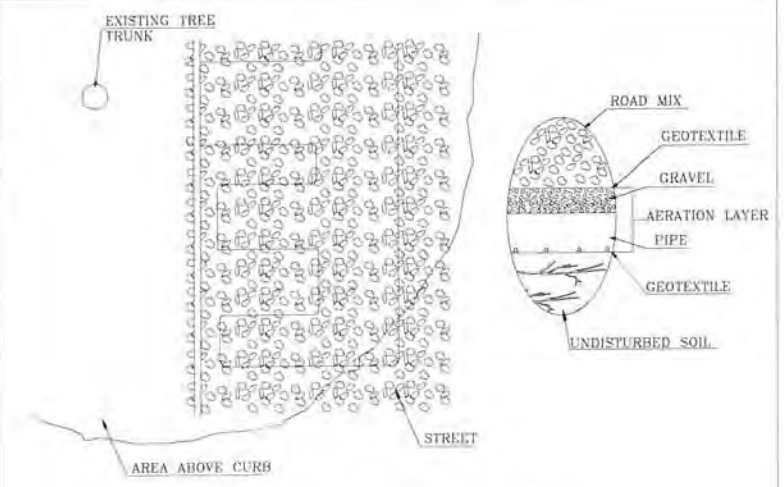
PERMANENT TREE PROTECTION DETAIL (WHEN FINISHED GRADE IS 1'-0" OR MORE ABOVE EXISTING GRADE)
NOTE:
WELL TO BE CONSTRUCTED OF STONE, BLOCK OR BRICK IF BRICK IS USED. VERTICAL JOINTS LEFT OPEN FOR DRAINAGE 1/2" MAXIMUM INSIDE FACE OF WALL.



4.4.4 TREE AERATION SECTION C
N T S



4.4.3 TREE AERATION DETAIL D
N T S
NOTE THIS AERATION SYSTEM CAN BE USED FOR NEW PROJECTS WHERE FILL IS OCCURRING SUCH AS PARKING LOTS OR ROADWAY CONSTRUCTION DRAIN AWAY FROM EXISTING TREE.



4.4.1 TREE AERATION PLAN VIEW D
N T S

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TREE PROTECTION DETAILS
TREE PRESERVATION

DESIGNED	DATE	STATE		SHEET NO.	
CHECKED		TEXAS		4 OF 4	
DRAWN	DATE	COUNTY	CONTROL NO.	JOB NO.	HIGHWAY NO.
CHECKED		BEXAR			