CITY OF ROCKWALL, TEXAS

PAVING, DRAINAGE & WATER IMPROVEMENTS

TO SERVE

CORPORATE CROSSING

FROM I-30 TO S.H. 276

(DESIGN SPEED : 45 MPH)

DAVID SWEET - MAYOR

COUNCIL MEMBERS:

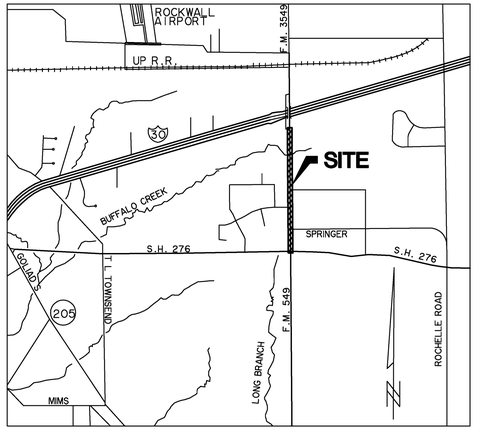
DAVID WHITE
MARK RUSSO - Mayor Pro Tem
BERNIE DANIELS
CLIFF SEVIER
MICHELLE SMITH
MARGO NIELSON

RICK CROWLEY - Interim City Manager

NOTE:

1. ALL REFERENCES TO 'CITY' SHALL MEAN 'CITY OF ROCKWALL'.
2. ALL CONSTRUCTION WITHIN AND ALONG TXDOT RIGHTS-OF-WAY SHALL CONFORM TO TXDOT STANDARD SPECIFICATIONS. ALL OTHER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY OF ROCKWALL AND NORTH TEXAS COUNCIL OF GOVERNMENT STANDARD SPECIFICATIONS, (THIRD EDITION, 1998).
3. (*) THE STANDARD SHEETS SPECIFICALLY IDENTIFIED IN THIS INDEX OF SHEETS HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.
4. SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, JUNE 1, 2004, AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT, FOR ALL WORK WITHIN THE STATE RIGHT-OF-WAY.
5. ALL CONSTRUCTION WITHIN THE STATE RIGHT-OF-WAY WILL REQUIRE COMPLIANCE TO TXDOT STANDARD SPECIFICATIONS, STANDARD PLANS, AND TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

CITY OF ROCKWALL
STANDARD DETAIL SHEETS
INCORPORATED HEREIN
BY REFERENCE



VICINITY MAP

N.T.S

"THE NEW HORIZON"

OCTOBER 2013

INDEX OF DRAWINGS

A100	COVER SHEET
A101	GENERAL NOTES
A102	LEGEND SHEET
A103	COORDINATE CONTROL PLAN
R101	DEMOLITION PLAN BEGINNING TO STA 7+50
R102	DEMOLITION PLAN STA 7+50 TO STA 17+50
R103	DEMOLITION PLAN STA 17+50 TO STA 23+00
R104	DEMOLITION PLAN STA 23+00 TO STA 34+00
R105	DEMOLITION PLAN STA 34+00 TO STA 45+00
R106	DEMOLITION PLAN STA 45+00 TO END
P001	PAVING DETAILS
P002	TYPICAL SECTIONS
P003	PAVER AND BUTTON DETAILS
P101	PAVING PLAN & PROFILE STA 5+00 TO STA 10+00
P102	PAVING PLAN & PROFILE STA 10+00 TO STA 15+50
P103	PAVING PLAN & PROFILE STA 15+50 TO STA 21+00
P104	PAVING PLAN & PROFILE STA 21+00 TO STA 26+50
P105	PAVING PLAN & PROFILE STA 26+50 TO STA 32+00
P106	PAVING PLAN & PROFILE STA 32+00 TO STA 37+50
P107	PAVING PLAN & PROFILE STA 37+50 TO STA 43+00
P108	PAVING PLAN & PROFILE STA 43+00 TO STA 48+00
P109	PAVING INTERSECTION PLAN AT CORPORATE CROSSING & S.H. 276
P110	DRIVEWAY PLANS FOR DRIVES 2-5
P111	DRIVEWAY PLANS FOR DRIVES 6 & 7
P112	DRIVEWAY PLANS FOR DRIVES 8-12
P113	DRIVEWAY PLANS FOR DRIVES 13 & 14
P114	DRIVEWAY PLANS FOR DRIVES 1 & 15
M101	PAVEMENT MARKING PLAN BEGINNING TO STA 22+50
M102	PAVEMENT MARKING PLAN STA 22+50 TO END
M103	PAVEMENT MARKING PLAN S.H. 276 TURN LANES
*M201	TxDOT PAVEMENT MARKINGS PM (4)-10
*M202	TxDOT PAVEMENT MARKINGS PM (6)-01
I101	STREET LIGHT & CONDUIT INSTALLATION BEGINNING TO STA 27+50
I102	STREET LIGHT & CONDUIT INSTALLATION STA 27+50 TO END
G101	GRADING PLAN BEGINNING TO STA 10+00
G102	GRADING PLAN STA 10+00 TO STA 33+00
G103	GRADING PLAN STA 33+00 TO END
D001	DRAINAGE AREA MAP
D002	DRAINAGE AREA MAP
D003	DRAINAGE AREA MAP
D004	INTERIM DRAINAGE AREA MAP
D005	DRAINAGE AREA CALCULATIONS
D006	DRAINAGE CALCULATIONS
D007	DRAINAGE CALCULATIONS
D101	STORM DRAIN LINE 'A' PLAN & PROFILE
D102	STORM DRAIN LINE 'B' PLAN & PROFILE STA 1+00 TO STA 6+00
D103	STORM DRAIN LINE 'B' PLAN & PROFILE STA 6+00 TO STA 11+00
D104	STORM DRAIN LINE 'B' PLAN & PROFILE STA 11+00 TO END
D105	STORM DRAIN LINE 'C' PLAN & PROFILE STA 0+50 TO STA 5+00
D106	STORM DRAIN LINE 'C' PLAN & PROFILE STA 5+00 TO END
D107	STORM DRAIN LINE 'D' PLAN & PROFILE
D108	STORM DRAIN LATERAL 'C' PLAN & PROFILE
D109	STORM DRAIN LATERAL PROFILES
D110	STORM DRAIN LATERAL PROFILES
D111	STORM DRAIN LATERAL PROFILES
D112	STORM DRAIN CULVERTS
D113	EXISTING CULVERT CROSSING S.H. 276
*D201	MULTIPLE BOX CULVERT DETAIL MC-6-16
*D202	MULTIPLE BOX CULVERT DETAIL MC-8-13
*D203	HEADWALL DETAIL CH-FW-0
*D204	WINGWALL DETAIL PW
*D205	WINGWALL DETAIL SW-0
*D206	SAFETY END TREATMENT DETAIL SETP-CD
*D207	SAFETY END TREATMENT DETAIL SETP-CD
*D208	SAFETY END TREATMENT DETAIL SETP-PD
D209	OUTFALL STRUCTURE DETAILS
U101	WATER RELOCATION LAYOUT
U102	UTILITY PLAN
*T201	TxDOT TRAFFIC CONTROL PLAN TCP (2-1)-12
*T202	TxDOT TRAFFIC CONTROL PLAN TCP (2-2)-12
*T203	TxDOT TRAFFIC CONTROL PLAN TCP (2-3)-12
*T204	TxDOT TRAFFIC CONTROL PLAN TCP (2-4)-12
*T205	TxDOT TRAFFIC CONTROL PLAN TCP (2-5)-12
*T206	TxDOT TRAFFIC CONTROL DETAILS WZ(TD)-03
*T207	BARRICADE/CONSTRUCTION DETAILS BC(1)-07
*T208	BARRICADE/CONSTRUCTION DETAILS BC(2)-07
*T209	BARRICADE/CONSTRUCTION DETAILS BC(3)-07
*T210	BARRICADE/CONSTRUCTION DETAILS BC(4)-07
*T211	BARRICADE/CONSTRUCTION DETAILS BC(5)-07
*T212	BARRICADE/CONSTRUCTION DETAILS BC(6)-07
*T213	BARRICADE/CONSTRUCTION DETAILS BC(7)-07
*T214	BARRICADE/CONSTRUCTION DETAILS BC(8)-07
*T215	BARRICADE/CONSTRUCTION DETAILS BC(9)-07
*T216	BARRICADE/CONSTRUCTION DETAILS BC(10)-07
*T217	BARRICADE/CONSTRUCTION DETAILS BC(11)-07
*T218	BARRICADE/CONSTRUCTION DETAILS BC(12)-07

W.A. 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED
PROFESSIONAL ENGINEER

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

DATE: 09-13-2013
W.A. No. 08029

FILE: A100-Cover-08029.dwg
TIME: 12:44

PAVEMENT NOTES

1. ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, AND THE REQUIREMENTS OF OF THE CITY OF ROCKWALL OR THE TEXAS DEPARTMENT OF TRANSPORTATION, AS APPLICABLE.
2. THE CONTRACTOR SHALL CONSTRUCT AND STATE ALL DRIVEWAY APPROACHES IN CONFORMANCE WITH APPLICABLE CITY STANDARD ORDINANCES AND REQUIREMENTS. CONTRACTOR SHALL OBTAIN APPLICABLE DRIVEWAY OR ACCESS PERMITS PRIOR TO CONSTRUCTION OR SHALL CONFIRM THAT SUCH PERMITS HAVE BEEN OBTAINED BY OTHERS. THIS INCLUDES WORK AT THE INTERSECTION OF CORPORATE COSSING AND BOTH S.H. 276 AND I-30.
3. CONTRACTOR SHALL SAW-CUT TO PROVIDE SMOOTH TRANSITION AT TIE-IN TO EXISTING EDGE OF PAVEMENT.
4. NOTIFY CITY INSPECTOR 72 HOURS BEFORE WORK BEGINS OR EARLIER IF REQUIRED BY PERMITS.
5. JOINTS OR SCORE MARKS ARE TO BE SHARP AND CLEAN WITHOUT SHOWING EDGES OF JOINTING TOOL.
6. DO NOT POUR ANY CONCRETE BEFORE FORMS ARE INSPECTED AND APPROVED BY THE GENERAL CONTRACTOR AND CITY INSPECTOR.
7. ALL CONCRETE FOR PAVEMENT AND RIPRAP SHALL BE CLASS F 4200 P.S.I. UNLESS NOTED OTHERWISE. REFER TO CITY STANDARDS AND THE APPLICABLE VERSION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PREPARED BY NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS.
8. CONTRACTOR SHALL SAW-CUT TIE-INS AT EXISTING CURBS AS NECESSARY TO ENSURE SMOOTH TRANSITIONS. CONTRACTOR SHALL SAW-CUT AND TRANSITION TO MEET EXISTING PAVEMENT AS NECESSARY TO ENSURE POSITIVE DRAINAGE. (TYP. ALL INTERSECTIONS)
9. REFER TO SITE WATER AND SEWER PLAN FOR EXISTING UNDERGROUND UTILITIES AND PROVISIONS FOR UTILITY VERIFICATION PRIOR TO CONSTRUCTION.
10. JOINT SHALL INTERSECT CURBS PERPENDICULARLY ± 15 DEGREES. JOINTS SKEWED TO CURBS SHALL STOP AT A JOINT INTERSECTION OR 2 FT. FROM FACE OF CURB AND CONTINUE PERPENDICULAR TO THE CURB.
11. CONTINUE JOINTS THROUGH CURBS AND PAVEMENT UNDER PAVERS.
12. CONTRACTOR SHALL SEAL ALL JOINTS IN ACCORDANCE WITH THE JOINT DETAILS ON SHEET P001, THE MANUFACTURER'S RECOMMENDATIONS, AND THE SPECIFICATIONS.
13. INSTALL 4" DIA. SCHEDULE 40 PVC SLEEVES WHERE REQUIRED (SEE SHEETS I101 & I102) BENEATH PAVING (18" - 30" DEEP) BETWEEN LANDSCAPE AREAS FOR THE INSTALLATION OF LANDSCAPE IRRIGATION. TURN UP ENDS 24" ABOVE GRADE AND MARK.
14. ALL DIMENSIONS ARE TO BACK OF CURB, UNLESS NOTED OTHERWISE.
15. ALL PAVEMENT MARKINGS SHALL BE FOUR (4) INCHES WIDE AND COLOR WHITE UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS. STRIPING SHALL CONSIST OF TWO (2) APPLICATIONS OF PAINT.
16. CONTRACTOR SHALL FURNISH AND INSTALL ALL PAVEMENT MARKINGS AS INDICATED ON THE PLANS.
17. CONTRACTOR SHALL COORDINATE INSTALLATION OF ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES WITH OTHER CONTRACTORS ON SITE. PAYMENT FOR THESE ITEMS SHALL BE INCIDENTAL TO CONSTRUCTION UNLESS SPECIFIED OTHERWISE.
18. CONTRACTOR SHALL SUBMIT A JOINTING PLAN FOR APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION.
19. ALL HANDICAP RAMPS SHALL BE A LAYDOWN CURB TYPE AS SPECIFIED IN THE CITY STANDARD CONSTRUCTION DETAILS. HANDICAP RAMPS SHALL HAVE CONTRASTING COLOR PER REQUIREMENTS OF ADA AND TAS.
20. CONTRACTOR SHALL TAKE SPECIAL CARE NOT TO INSTALL A JOINT LONGITUDINALLY ON THE CENTERLINE LOW-POINT OF A SWALE.

UTILITY NOTES

1. ALL PIPE LENGTHS ARE HORIZONTAL DISTANCES AND ARE APPROXIMATE.
2. CONTRACTOR SHALL PROVIDE ALL THE MATERIALS AND APPURTENANCES NECESSARY FOR THE COMPLETE INSTALLATION OF THE UTILITIES. ALL PIPE AND FITTINGS SHALL BE INSPECTED BY THE WATER DEPARTMENT INSPECTOR PRIOR TO BEING COVERED. THE INSPECTOR MUST ALSO BE PRESENT DURING PRESSURE TESTING AND DISINFECTION OF MAINS AND HIS SIGNATURE OF APPROVAL IS REQUIRED.
3. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES, REGULATIONS, AND/OR LOCAL STANDARDS IMPOSED BY LOCAL UTILITY AND THE CITY.
4. THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE LOCAL UTILITY AUTHORITY FOR CONNECTION TO THE EXISTING MAINS.
5. ALL FIRE HYDRANTS ARE 6" DIAMETER WITH A 6" DIAMETER LINE AND A 6" DIAMETER SHUT OFF VALVE. FIRE HYDRANTS SHALL BE SET SUCH THAT NOZZLE CONNECTIONS FACE THE BUILDING, STREET, OR FIRE LANE. FIRE HYDRANTS SHALL BE SET 4' TO 8' BEHIND BACK OF CURB UNLESS OTHERWISE NOTED.
6. ALL WATER LINES SHALL HAVE A MINIMUM COVER OF 48" MEASURED FROM TOP OF PIPE TO TOP OF FINISHED PAVEMENT UNLESS A GREATER DEPTH IS REQUIRED BY CITY STANDARDS.
7. CONTRACTOR SHALL ADJUST LOCATION OF PROPOSED WATER LINES AS REQUIRED TO AVOID CONFLICTS WITH STORM SEWER OR OTHER UTILITIES. A MINIMUM OF 2' OF CLEARANCE SHALL BE MAINTAINED WITH STORM DRAIN AND SANITARY SEWER CROSSINGS.
8. THRUST BLOCKS SHALL BE PROVIDED AT ALL "TEES, ELBOWS, CAPS, PLUGS, FIRE HYDRANTS AND BENDS" OF SUFFICIENT SIZE TO COMPLY WITH MINIMUM STANDARDS OF N.F.P.A. - 24 FOR EXISTING SOIL CONDITIONS.
9. ALL GATE VALVES TO BE PROVIDED WITH CAST IRON BOXES. SIZE OF GATE VALVE WHERE TAP IS MADE INTO EXISTING WATER LINE WILL BE DETERMINED BY THE WATER DEPARTMENT.
10. SHOULD LATENT SOIL CONDITIONS NECESSITATE, CONTRACTOR SHALL INSTALL SPECIAL SUPPORTS FOR PIPING AND/OR APPURTENANCES INCLUDING THE REMOVAL OF UNSUITABLE MATERIAL AND BACKFILLING WITH GRAVEL OR OTHER MATERIAL.
11. ALL STORM DRAIN PIPE TO BE CLASS III REINFORCED CONCRETE PIPE (RCP) UNLESS OTHERWISE NOTED IN PLANS.
12. ALL MANHOLES OVER FIVE (5) FEET IN DEPTH SHALL HAVE A STANDARD CONCENTRIC CONE.
13. ALL MATERIALS SHALL BE U.L. LISTED AND FACTORY MUTUAL APPROVED UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
14. CAST IRON FITTINGS SHALL BE MADE IN THE USA.
15. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION SUPPLIED BY VARIOUS OWNERS OF THE FACILITIES. THE ENGINEER DOES NOT ACCEPT RESPONSIBILITY FOR THE UTILITY LOCATIONS SHOWN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION, TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING FACILITIES. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION. ANY DAMAGES BY THE CONTRACTOR TO EXISTING UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
16. CONTRACTOR SHALL REFER TO SITE GEOTECHNICAL REPORT FOR DETAILS ON COMPACTING, BACKFILL, PROOFROLLING AND TESTING. IF NO COMPACTION DATA IS PROVIDED, TRENCHES BENEATH PAVEMENT SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY AND TRENCHES OUTSIDE OF PAVED AREAS SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
17. COORDINATE WITH PUBLIC ELECTRIC UTILITY COMPANY TO STABILIZE EXISTING POWER POLES DURING TRENCH CONSTRUCTION.
18. ALL TRENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL APPLICABLE STATE AND LOCAL REGULATIONS.
19. ALL CONSTRUCTION SHALL COMPLY WITH THE CITY STANDARD CONSTRUCTION DETAILS AND NCTCOG 3rd EDITION.
20. CONTRACTOR SHALL ADJUST ALL EXISTING AND PROPOSED SURFACE UTILITIES TO MATCH FINISHED GRADES.
21. ALL WATER MAINS SHALL BE C900 PVC, CLASS 200.
22. CONCRETE ENCASEMENT SHALL BE INSTALLED WHERE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER OR THE INSPECTOR. THIS WORK SHALL BE SUBSIDIARY TO THE COST OF THE UTILITY AND NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE.
23. BLUE EMS DISKS SHALL BE INSTALLED AT EVERY CHANGE IN DIRECTION, VALVE, AND SERVICE.
24. GREEN EMS DISCS SHALL BE INSTALLED AT EVERY MANHOLE, CLEAN OUT, AND SERVICE.
25. PIPE USED FOR WASTEWATER COLLECTION SYSTEMS SHALL BE PVC PIPE CONFORMING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. THE WASTEWATER PIPELINE SHALL BE SDR-35, AND SHALL HAVE A MINIMUM EARTH COVER OF THREE FEET (3'). FOR DEPTHS OF TEN FEET (10') OR GREATER, THE WASTEWATER PIPELINE SHALL BE A MINIMUM OF SDR-26.

GENERAL GRADING & DRAINAGE NOTES

1. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION SUPPLIED BY VARIOUS OWNERS OF THE FACILITIES. THE ENGINEER DOES NOT ACCEPT RESPONSIBILITY FOR THE UTILITY LOCATIONS SHOWN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION, TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING FACILITIES. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION. ANY DAMAGES BY THE CONTRACTOR TO EXISTING UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE. EXISTING TOPOGRAPHIC INFORMATION SHOWN IS BASED ON IN-FIELD SURVEY PREPARED BY WIER & ASSOCIATES, INC. IN AUGUST, 2008. (EXCLUDES BELOW GRADE PUBLIC UTILITY LOCATIONS PROVIDED BY UTILITY COMPANY AS DESCRIBED ABOVE.)
2. NEW FINISHED CONTOURS SHOWN ARE TOP OF PAVING IN AREAS TO RECEIVE PAVEMENT AND TOP OF TOPSOIL IN AREAS TO BE SEEDED.
3. AREAS OUTSIDE OF THE PAVING PERIMETERS SHOWN TO BE SEEDED, OR SODDED SHALL RECEIVE MINIMUM FOUR (4) INCHES OF TOPSOIL (OR TO DEPTH INDICATED ON LANDSCAPE ARCHITECT PLANS, IF APPLICABLE). THIS TOPSOIL TO BE PLACED AND LEVELED BY THE GRADING CONTRACTOR. THIS MATERIAL MAY BE STOCKPILED DURING STRIPPING OPERATIONS. ALL TOPSOIL SHALL BE IMPORTED AND SHALL BE APPROVED BY THE CITY PRIOR TO PLACEMENT. TOPSOIL SHALL BE SUBSIDIARY TO THE SEEDING OR SODDING BID ITEM(S).
4. ROUGH GRADING ELEVATIONS SHALL BE AS FOLLOWS:

   FOUR INCHES BELOW FINISHED CONTOURS IN SEEDED AREAS.
   SIX INCHES BELOW FINISHED CONTOURS IN PAVED AREAS, UNLESS OTHERWISE NOTED.
5. GRADING CONTRACTOR SHALL NOTIFY AND COOPERATE WITH ALL UTILITY COMPANIES OR FIRMS HAVING FACILITIES ON OR ADJACENT TO THE SITE BEFORE DISTURBING, ALTERING, REMOVING, RELOCATING, ADJUSTING, OR CONNECTING TO SAID FACILITIES. CONTRACTOR SHALL PAY ALL COSTS IN CONNECTION WITH THE ALTERATION OF OR RELOCATION OF THE FACILITIES. CONTRACTOR SHALL RAISE OR LOWER TOPS OF EXISTING MANHOLES AS REQUIRED TO MATCH FINISHED GRADES IN CONFORMANCE WITH CITY STANDARDS.
6. GRADING CONTRACTOR SHALL COOPERATE AND WORK WITH ALL OTHER CONTRACTORS PERFORMING WORK ON THIS PROJECT TO INSURE PROPER AND TIMELY COMPLETION OF THIS PROJECT.
7. THE GRADING CONTRACTOR SHALL USE WHATEVER MEASURES ARE REQUIRED TO PREVENT SILT AND CONSTRUCTION DEBRIS FROM FLOWING ONTO ADJACENT PROPERTIES. THIS CAN BE ACCOMPLISHED BY SMALL TEMPORARY SEDIMENT PONDS, SILT FENCES OF STEEL WIRE AND BURLAP OR BARRIERS OF CEDAR TREES AND/OR BALES OF STRAW. CONTRACTOR SHALL COMPLY WITH ALL LOCAL EROSION, CONSERVATION AND SILTATION ORDINANCES. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL STRUCTURES UPON COMPLETION OF PERMANENT DRAINAGE FACILITIES AND THE ESTABLISHMENT OF A STAND OF GRASS SUFFICIENT TO PREVENT EROSION.
8. FOR THE WORK ON THE STATE OR CITY RIGHT-OF-WAY, THE GRADING CONTRACTOR SHALL:

   A. NOT STORE MATERIAL, EXCESS DIRT OR EQUIPMENT ON THE SHOULDERS OF PAVEMENT, IN CASE OF MULTI-LANE HIGHWAYS, IN THE MEDIAN STRIPS. THE PAVEMENT SHALL BE KEPT FREE FROM ANY MUD OR EXCAVATION WASTE FROM TRUCKS OR OTHER EQUIPMENT. ON COMPLETION OF THE WORK, ALL EXCESS MATERIAL SHALL BE REMOVED FROM THE RIGHT-OF-WAY.

   B. SHALL PROVIDE ALL NECESSARY AND ADEQUATE SAFETY PRECAUTIONS SUCH AS SIGNS, FLAGS, LIGHTS, BARRICADES AND FLAGMEN AS REQUIRED BY THE LOCAL AUTHORITIES AND IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. THE GRADING CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND HOLD HARMLESS THE TEXAS DEPARTMENT OF TRANSPORTATION, THE CITY, AND THE OWNER FROM ANY CLAIMS FOR DAMAGE DONE TO EXISTING PRIVATE PROPERTY, PUBLIC UTILITIES OR TO THE TRAVELING PUBLIC.

   C. SHALL COMPLETE THE WORK TO THE SATISFACTION OF THE CITY PUBLIC WORKS DEPARTMENT AND OBTAIN A LETTER FROM THE DEPARTMENT STATING THAT THE WORK UNDER PUBLIC JURISDICTION IS ACCEPTABLE.

   D. POST NECESSARY BONDS AS REQUIRED BY THE CITY AND/OR STATE.
9. GRADING CONTRACTOR SHALL TAKE ALL AVAILABLE PRECAUTIONS TO CONTROL DUST. CONTRACTOR SHALL CONTROL DUST BY SPRINKLING, BY APPLYING CALCIUM CHLORIDE OR BY OTHER METHODS AS DIRECTED BY ENGINEER AND/OR OWNER'S REPRESENTATIVE AT NO ADDITIONAL COST TO OWNER.
10. REFER TO PAVING DETAILS FOR TYPE OF PAVING AND BASE TO BE USED.
11. GRADING CONTRACTOR IS RESPONSIBLE FOR REMOVING ANY EXISTING STRUCTURES, FENCES, DEBRIS OR TREES REMAINING ON SITE, UNLESS NOTED OTHERWISE ON PLANS AND SHALL COORDINATE WITH GENERAL CONTRACTOR.
12. GRADING CONTRACTOR TO COMPLY WITH ALL STATE AND LOCAL SEDIMENT CONTROL AND AIR POLLUTION ORDINANCES OR RULES.
13. A QUALIFIED SOILS LABORATORY SHALL DETERMINE THE SUITABILITY OF THE EXISTING SUBGRADE AND EXISTING ON-SITE MATERIAL PRIOR TO BEGINNING ANY FILLING OPERATION.
14. UNSUITABLE EXCAVATED MATERIALS AND ALL WASTE RESULTING FROM CLEARING AND GRUBBING SHALL BE DISPOSED OF OFF-SITE BY GRADING CONTRACTOR.
15. ALL EXCAVATING IS UNCLASSIFIED AND SHALL INCLUDE ALL MATERIALS ENCOUNTERED.
16. BEFORE ANY MACHINE WORK IS DONE, CONTRACTOR SHALL STAKE OUT AND MARK THE ITEMS ESTABLISHED BY THE SITE PLAN. CONTROL POINTS SHALL BE PRESERVED AT ALL TIMES DURING THE COURSE OF THE PROJECT. LACK OF PROPER WORKING POINTS AND GRADE STAKES MAY REQUIRE CESSATION OF OPERATIONS UNTIL SUCH POINTS AND GRADES HAVE BEEN PLACED TO THE OWNER'S SATISFACTION. NO EXTENSION OF TIME WILL BE GRANTED FOR THE ABOVE.
17. TEMPORARY EROSION CONTROL DEVICES TO BE INSTALLED PRIOR TO BEGINNING OF GRADING. CONTRACTOR SHALL MAINTAIN ALL TEMPORARY EROSION CONTROL DEVICES AND SHALL REMOVE SILT FROM BERM DITCHES, SILT DAMS AND SILT FENCES AS NEEDED.
18. ALL DISTURBED AREAS SHALL BE HYDROMULCH SEEDED UNLESS OTHERWISE NOTED.
19. THE CONTRACTOR SHALL PREVENT SOIL STABILIZATION TREATMENT FROM LEAVING THE SITE BY WAY OF STORMWATER RUNOFF WHICH MAY DAMAGE DOWNSTREAM WATER COURSES, LAKES OR PONDS. ANY DAMAGE TO WILDLIFE OR FISH KILLS SHALL BE CORRECTED BY THE CONTRACTOR AT HIS EXPENSE.
20. MAINTAIN AS MUCH EXISTING VEGETATION AS POSSIBLE AS WELL AS RE-ESTABLISHING THE GROUND COVER AS EARLY AS POSSIBLE. GRASS BUFFER STRIPS SHALL BE LEFT AROUND THE PERIMETER TO AID IN FILTERING SEDIMENTATION. A DENSITY OF TEMPORARY OR PERMANENT GROUND COVER SUFFICIENT TO PREVENT EROSION SHALL BE ESTABLISHED ON ALL BERMS, SWALES AND SLOPES.
21. ALL SITE GRADING AND EARTHWORK CONSTRUCTION SHALL COMPLY TO THE GEOTECHNICAL REPORT RECOMMENDATIONS. ALL SOIL COMPACTION SHALL BE ACCOMPLISHED BY THE USE OF A SHEEPS FOOT ROLLER.
22. A STRAND OF GRASS WITH AT LEAST 80% COVERAGE MUST BE ESTABLISHED PRIOR TO PROJECT ACCEPTANCE BY THE CITY.

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

SPECIAL NOTES

1. ALL REFERENCES TO 'CITY' SHALL REFER TO THE CITY OF ROCKWALL.
2. THE CITY OF ROCKWALL UTILIZES THE STANDARDS FOR PUBLIC WORKS CONSTRUCTION PREPARED BY THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS, AND AMENDMENTS TO SAME. CONTRACTOR SHALL OBTAIN COPIES OF THE CITY STANDARDS, THE COUNCIL OF GOVERNMENTS STANDARDS, AND THE CITY AMENDMENTS PRIOR TO BIDDING AND CONSTRUCTION.
3. ALL CONSTRUCTION SHALL COMPLY WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER, AS STATED IN REPORT NUMBER G080734 PREPARED BY ALPHA TESTING ON SEPTEMBER 16, 2008. CONTRACTOR SHALL OBTAIN A COPY OF THIS REPORT PRIOR TO BIDDING AND CONSTRUCTION.
4. SEE SHEETS E001 – E003 FOR STORMWATER POLLUTION PREVENTION NOTES.

PREPARED BY:
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Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO I.H. 30)

GENERAL NOTES

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/16/13

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LAST SHEET EDIT DATE 09-12-2013
WA# 08029
SHEET NO. A101

FILE: A101-General-Notes-08029.dwg
TIME 16:20

EXISTING TOPOGRAPHIC LEGEND

	ASPHALT PAVEMENT
BOL/GP	BOLLARD/GUARD POST
B/C	DIMENSION TO BACK OF CURB
CATV	CABLE TV
CM	CONTROL MONUMENT
CONC.	CONCRETE
EAP	EDGE OF ASPHALT PAVEMENT
EB	ELEC BOX (GROUND)
EM	ELEC METER
FH	FIRE HYDRANT
FO	FIBER OPTIC CABLE
GM	GAS METER
GMH	GAS MANHOLE
GTS	GAS TEST STATION
GUY	GUY WIRE
HDWL.	CONCRETE HEADWALL
ICV	IRRIGATION CONTROL VALVE
IRF	IRON ROD FOUND
IRS	IRON ROD SET
LP	LIGHT POLE
PP	POWER POLE
PP/LP	POWER POLE W/LIGHT
SDMH	STORM DRAIN MANHOLE
SHD	SPRINKLER HEAD
SN	SIGN
SSMH	SANITARY SEWER MANHOLE
SSCO	SANITARY SEWER CLEANOUT
SWBT	SOUTH WESTERN BELL TELEPHONE
TPD	TELEPHONE PEDESTAL
TSG	TELEPHONE SWITCH GEAR
TSB	TRAFFIC SIGNAL BOX
TSP	TRAFFIC SIGNAL POLE
TSC	TRAFFIC SIGNAL CONTROLLER
	TRANSFORMER PAD
WM	WATER METER
WV	WATER VALVE
OE	OVERHEAD ELECTRIC LINE
UE	UNDERGROUND ELECTRIC LINE
W	WATER LINE
SS	SANITARY SEWER LINE
FO	FIBER OPTIC LINE
UT	UNDERGROUND TELEPHONE
OT	OVERHEAD TELEPHONE
G	UNDERGROUND GAS
24" RCP	EXISTING CONCRETE STORM DRAIN LINE
24" CMP	EXISTING CORREGATED METAL STORM DRAIN LINE
	EXISTING FLOWLINE
BARBED WIRE FENCE	BARBED WIRE FENCE
CHAIN LINK FENCE	CHAIN LINK FENCE
WOOD FENCE	WOOD FENCE
	GUARD RAIL / BARRICADE
	EXISTING TREE LINE
	EXISTING TREE

PAVING PLAN LEGEND

	* 4200 PSI. CONC. PAVING
	ASPHALT PAVEMENT
	GRAVEL
	SIDEWALK
	COMPACTED FILL PER CITY STANDARDS
	BRICK PAVING
	LANDSCAPING
	COMPACTED FILL PER CITY STANDARDS
	EXISTING ASPHALT TO BE REMOVED
	EXISTING CONCRETE TO BE REMOVED
	EXISTING GRAVEL TO BE REMOVED
L2	LINE IDENTIFIED IN LINE TABLE
C2	CURVE IDENTIFIED IN CURVE TABLE
	DIRECTION OF TRAFFIC
	THERMOPLASTIC DIRECTIONAL INDICATOR MARKINGS
	DIRECTION OF FLOW

* NOTE: MIN 6.5 SACK FOR MACHINE POUR AND 7 SACK FOR HAND POUR IN CONCRETE STREET PAVING. 3600 PSI FOR TYPICAL DRIVEWAYS

GRADING PLAN LEGEND

XXX	PROPOSED CONTOURS
XXX	EXISTING CONTOURS
XXX.XX	PROPOSED SPOT GRADES
	PROPOSED STORM DRAIN
	FLOW ARROWS
T/C	TOP OF CURB
T/P	TOP OF PAVEMENT
H.P.	HIGH POINT

STREET LIGHT LEGEND

	PULL BOX
	PROPOSED STREET LIGHT AS PER CITY OF FORT WORTH STANDARDS
	FUTURE STREET LIGHT
	PROPOSED SCHEDULE 80 ELECTRIC CONDUIT UNDER PAVEMENT

DRAINAGE PLAN LEGEND

A-1 / 2.00	DRAINAGE AREA DESIGNATION DRAINAGE AREA (ACRES)
	WATERSHED LIMITS
	MAJOR DRAINAGE AREA DIVIDE
	MAJOR DRAINAGE AREA SUB-DIVIDE
	ZONING BOUNDARY
	FLOW DIRECTION ARROW
	INDICATES PROPOSED RECESSED CURB INLET
	INDICATES PROPOSED STANDARD CURB INLET
	INDICATES FUTURE INLET
	INDICATES EXISTING INLET
	INDICATES PROPOSED DROP INLET
	INDICATES PROPOSED JUNCTION BOX
27" RCP	PROPOSED STORM DRAIN
27" RCP	FUTURE STORM DRAIN
	PROPOSED SWALE

EROSION CONTROL LEGEND

	LIMITS OF OPERATOR DAY TO DAY OPERATIONAL CONTROL
	PROPOSED SWALE
	INDICATES STABILIZED CONSTRUCTION ENTRANCE
	INDICATES REINFORCED SILT FENCE
	INDICATES ROCK BERM
	INDICATES DROP INLET PROTECTION
	INDICATES PROPOSED INLET TREATMENT
	STONE OVERFLOW STRUCTURE
640	EXISTING CONTOUR LINE
640	PROPOSED CONTOUR LINE

WATER AND SANITARY SEWER PLAN LEGEND

	PROPOSED FIRE HYDRANT
WM	PROPOSED WATER METER
	PROPOSED WATER VALVE
	PROPOSED WATER
	PROPOSED SEWER
	PROPOSED SEWER MANHOLE

CONSTRUCTION SEQUENCE LEGEND

	TRAFFIC DIRECTIONAL ARROW
	STRIPING
	CHANNELIZING VERTICAL PROPOSED PANELS
	TRAFFIC SIGN
	TYPE III BARRICADE
	CONCRETE TRAFFIC BARRIER
	TEMP ASPHALT PAVEMENT TO BE CONSTRUCTED IN CURRENT SEQUENCE
	TEMP ASPHALT PAVEMENT CONSTRUCTED IN PREVIOUS SEQUENCE
	CONCRETE PAVEMENT TO BE CONSTRUCTED IN CURRENT SEQUENCE
	CONCRETE PAVEMENT CONSTRUCTED IN PREVIOUS SEQUENCE
	GRAVEL DRIVE TO BE CONSTRUCTED IN CURRENT SEQUENCE
	GRAVEL DRIVE CONSTRUCTED IN PREVIOUS SEQUENCE
	BRICK PAVERS TO BE CONSTRUCTED IN CURRENT SEQUENCE
	BRICK PAVERS CONSTRUCTED IN PREVIOUS SEQUENCE

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO L.H. 30)

LEGENDS

WA 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
10/11/13

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LAST SHEET EDIT DATE 09-12-2013
WA# 08029

SHEET NO. A102

FILE: A102-Legend-08029.dwg
TIME: 14:17

LEGEND

- PROPOSED R.O.W. DEDICATION
- PROPOSED DRAINAGE ESMT DEDICATION
- PROPOSED TEMP. CONSTRUCTION ESMT DEDICATION

• BENCH MARKS •

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

RECORD DRAWING 10/11/2013

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CL STA 0+00 FM 549
N=7018532.00
E=2607343.32

PI CL STA 8+11.43
CORPORATE CROSSING
N=7019243.17
E=2607324.09

PI CL STA 13+93.93
CORPORATE CROSSING
N=7019825.29
E=2607303.04

PI CL STA 20+95.47
CORPORATE CROSSING
N=7020526.36
E=2607277.22

PI CL STA 26+48.06
CORPORATE CROSSING
N=7021078.82
E=2607265.57

PI CL STA 33+66.22
CORPORATE CROSSING
N=7021796.83
E=2607250.43

PI CL STA 43+14.10
CORPORATE CROSSING
N=7022744.64
E=2607238.79

CL STA 52+16.43 CORPORATE CROSSING
N=7023646.95
E= 2607235.87

LOFLAND FARMS
VOL. 1392, PG. 271
D.R.R.C.T.

LOT 8, BLOCK A
REDC

LOT 7, BLOCK A
REDC

LOT 3, BLOCK E
REDC
CAB. D, SL. 175 & 176
P.R.R.C.T.

FM 549

SH 276

DFW DISTRIBUTOR
VOL. 1799, PG. 302
D.R.T.C.T.

SUBWAY/GATEWAY/HEALTH FOOD STORE
CAB G., SL. 105-106
P.R.R.C.T.

LOT 1, BLOCK A PARNELL ADDITION
CAB B., SL. 365
P.R.R.C.T.

RONALD A. HAMILTON (ESTATE OF ANN HAMILTON)
VOL. 4797, PG. 260
D.R.R.C.T.

SPRINGER RD.

CORPORATE CROSSING

DISCOVERY BLVD

LOT 1, BLOCK B
REDC

LOT 1, BLOCK A
REDC

MATCHLINE STA 25+25

1+00 5+00 10+00 15+00 20+00 25+00

TCE '11A' ROW '1A' DE '9A' TCE '12A'

LOT 3, BLOCK E
REDC
CAB. D, SL. 175 & 176
P.R.R.C.T.

LOT 2, BLOCK E
REDC
CAB. D, SL. 175 & 176
P.R.R.C.T.

HITT FAMILY PARTNERSHIP
VOL.1875, PG. 238
D.R.R.C.T.

GIANLUCA ROBINO AND MARY C. GOSS
VOL. 4997, PG. 247
D.R.R.C.T.

LOT 1, BLOCK A
LOVE'S ADDITION NO. 1
CAB. D, SL. 293-294
P.R.R.C.T.

INTERSTATE 30

TCE '14A' DE '8A' TCE '16A'

MATCHLINE STA 25+25

LOT 1, BLOCK A
REDC

30+00 35+00 40+00 45+00 50+00

ROW '3A' ROW '2A' ROW '5A' ROW '6A' ROW '4A'

CORPORATE CROSSING

TCE '13A' TCE '17A' DE '7A' TCE '18A' TCE '15A' ROW '19A' TCE '20A'

HITT FAMILY PARTNERSHIP
VOL.1875, PG. 235
D.R.R.C.T.

MARIAH BAY DEVELOPMENT, INC.
VOL. 2358, PG. 265
D.R.T.C.T.

THE WHITMORE MANUFACTURING COMPANY
INST #D2010-00432707
D.R.R.C.T.

0 100 200 300

PREPARED BY:
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701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO I.H. 30)

COORDINATE CONTROL PLAN

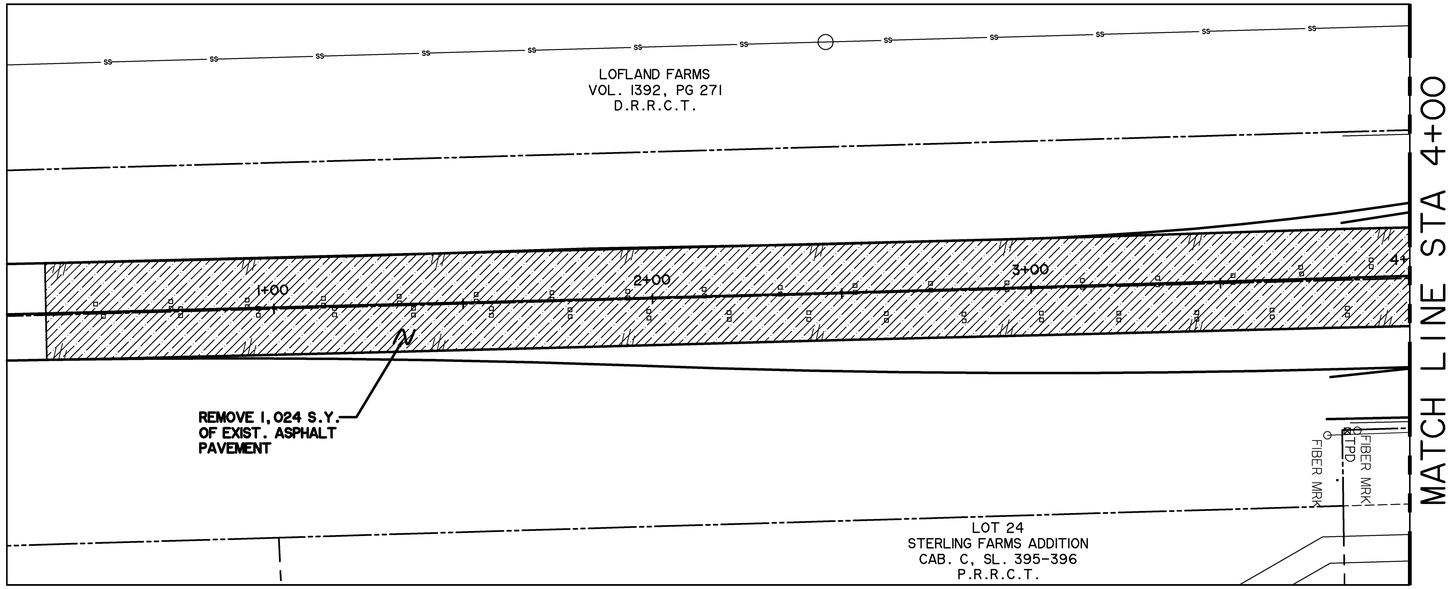
WA 05829
STATE OF TEXAS
RONALD RAMIREZ
81621
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

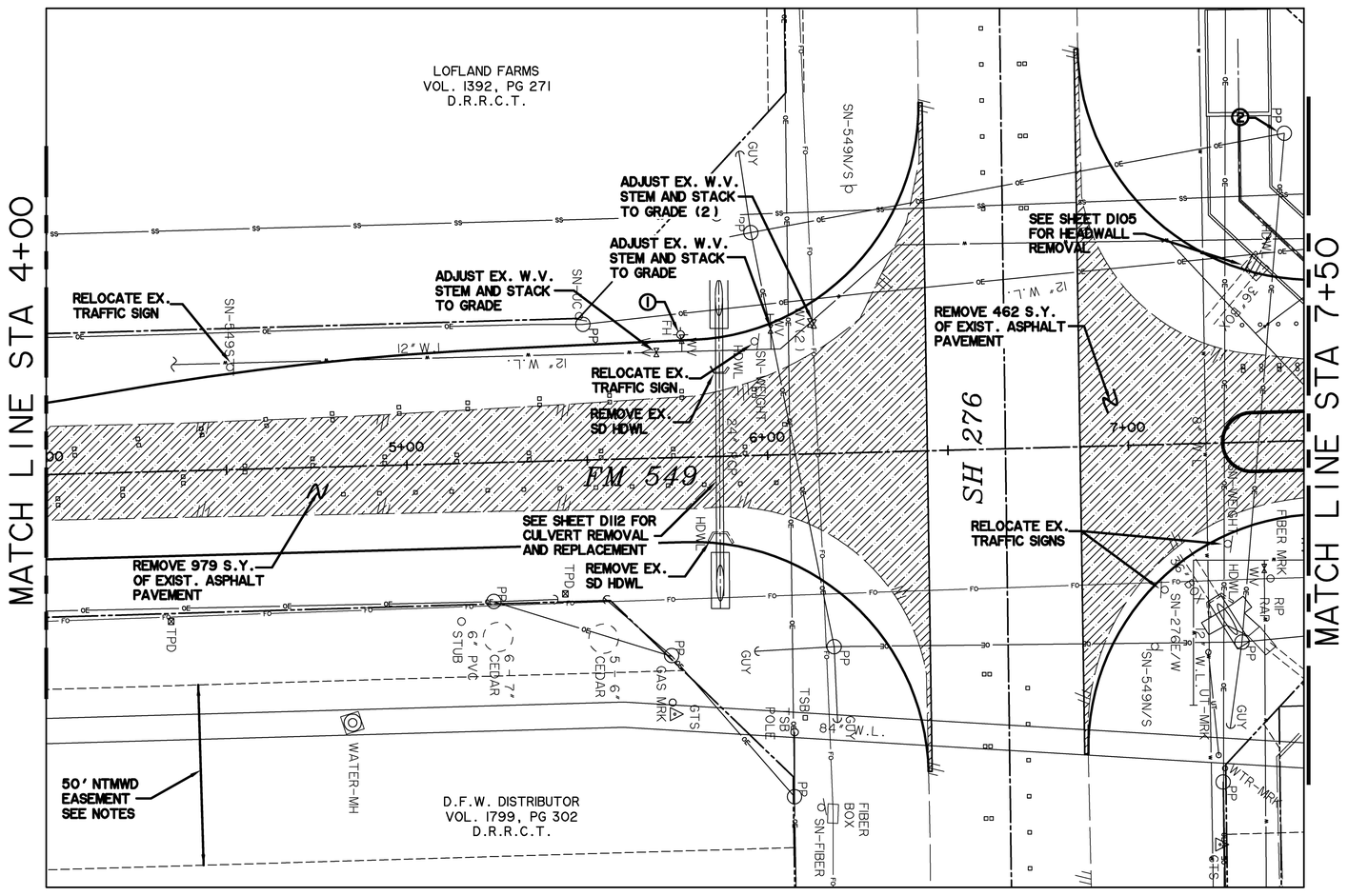
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WA# 05829

SHEET NO. A103

FILE: A103-CoordinateControl-05029.dwg
TIME: 9:56





CAUTION !!

EXISTING UTILITIES ARE INDICATED ON THE PLANS FROM AVAILABLE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES, TO NOTIFY ALL UTILITY COMPANIES OF THE CONTRACTORS OPERATIONS, TO PROTECT ALL UTILITIES FROM DAMAGE, TO REPAIR ALL UTILITIES DAMAGED DUE TO THE CONTRACTORS OPERATIONS, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING UTILITIES.

0 20 40 60

NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
3. CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.

WATER VALVE NOTES:

1. WATER VALVES ADJUSTED TO GRADE IN PAVING SHALL RECEIVE CONCRETE COLLARS (SUBSIDIARY TO CONSTRUCTION).

REMOVAL NOTES:

① RELOCATE FIRE HYDRANT AND GATE VALVE AND PROVIDE WATER LINE EXTENSION AS NEEDED SUCH THAT FIRE HYDRANT SHALL BE 3' BEHIND BACK OF CURB.

② POWER POLES AND GUY WIRES TO BE RELOCATED (BY OTHERS)

RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

DEMOLITION PLAN
BEGINNING TO STA 7+50

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT DATE 09-13-2013
WA# 08029
SHEET NO. R101

TIME:10:15 FILE:R101-DEMO.dwg

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CAUTION 11

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NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
3. CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.

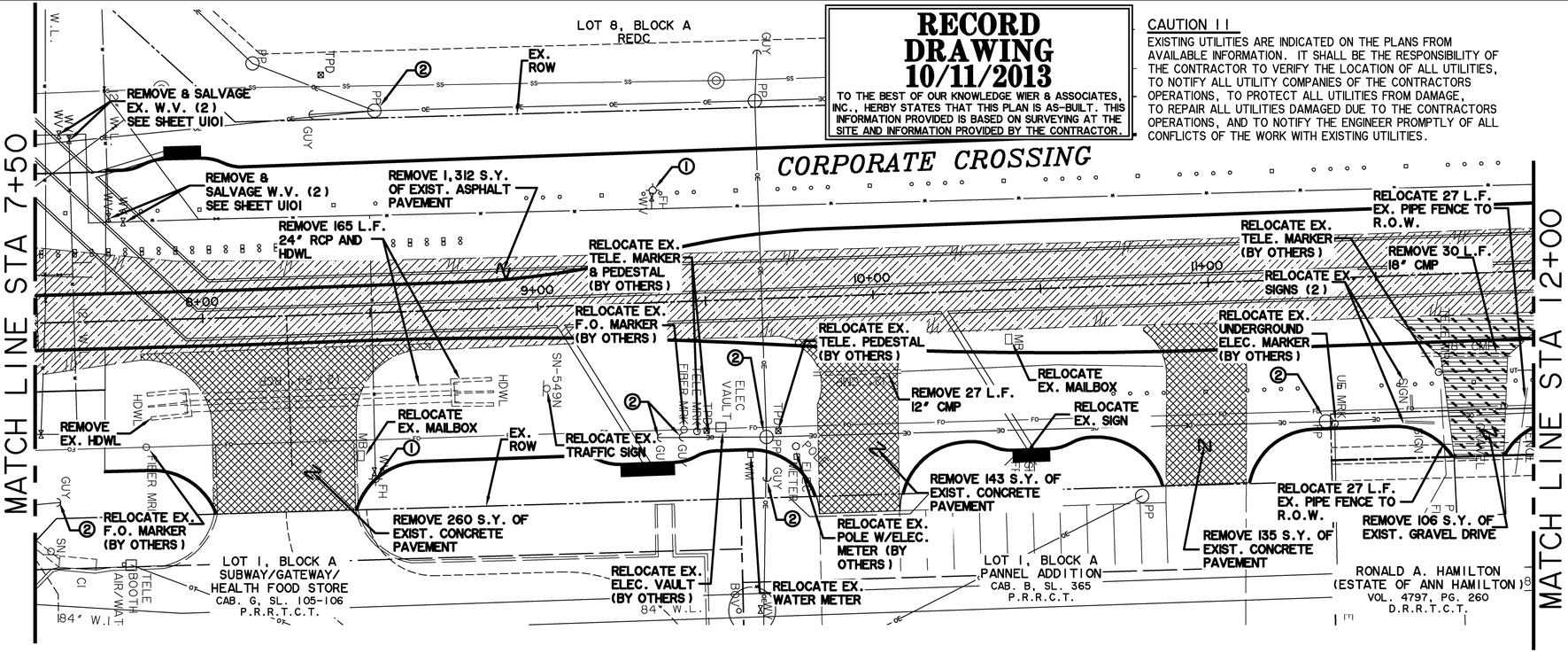
WATER VALVE NOTES:

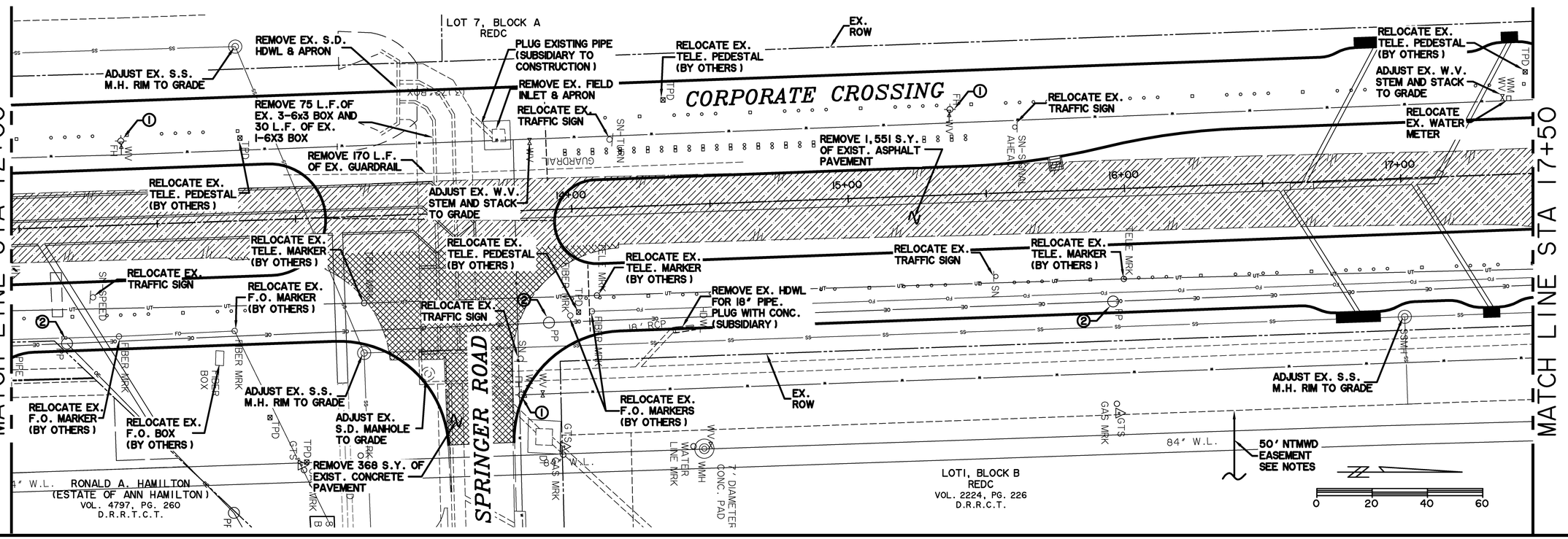
1. WATER VALVES ADJUSTED TO GRADE IN PAVING SHALL RECEIVE CONCRETE COLLARS (SUBSIDIARY TO CONSTRUCTION).

REMOVAL NOTES:

① RELOCATE FIRE HYDRANT AND GATE VALVE AND PROVIDE WATER LINE EXTENSION AS NEEDED SUCH THAT FIRE HYDRANT SHALL BE 3' BEHIND BACK OF CURB.

② POWER POLES AND GUY WIRES TO BE RELOCATED (BY OTHERS)





PREPARED BY:
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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

DEMOLITION PLAN

STA 7+50 TO STA 17+50

WA# 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT DATE 08-13-2013

SHEET NO. R102

TIME 10:15 FILE: R102-DEMO.dwg

NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
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REMOVAL NOTES:

① RELOCATE FIRE HYDRANT AND GATE VALVE AND PROVIDE WATER LINE EXTENSION AS NEEDED SUCH THAT FIRE HYDRANT SHALL BE 3' BEHIND BACK OF CURB.

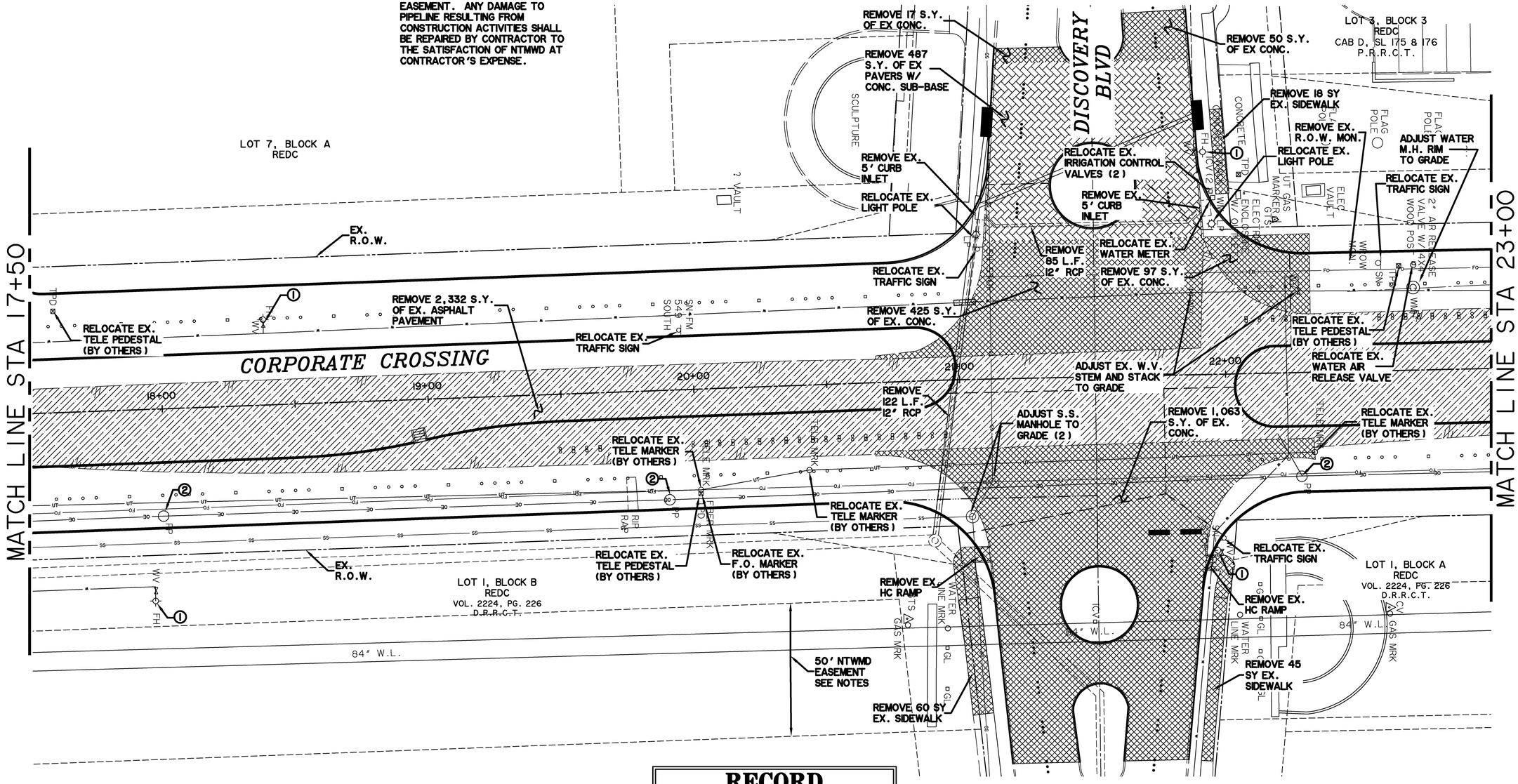
② POWER POLES AND GUY WIRES TO BE RELOCATED (BY OTHERS)

WATER VALVE NOTES:

1. WATER VALVES ADJUSTED TO GRADE IN PAVING SHALL RECEIVE CONCRETE COLLARS (SUBSIDIARY TO CONSTRUCTION).

CAUTION 11

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RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO L.H. 30)

DEMOLITION PLAN

STA 17+50 TO STA 23+00

WA# 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER

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LAST SHEET EDIT
DATE 09-13-2013
WA# 08029

SHEET NO.
R103

FILE: r:\R103-DEMO.dwg
TIME: 10:15

WATER VALVE NOTES:

1. WATER VALVES ADJUSTED TO GRADE IN PAVING SHALL RECEIVE CONCRETE COLLARS (SUBSIDIARY TO CONSTRUCTION).

REMOVAL NOTES:

① RELOCATE FIRE HYDRANT AND GATE VALVE AND PROVIDE WATER LINE EXTENSION AS NEEDED SUCH THAT FIRE HYDRANT SHALL BE 3' BEHIND BACK OF CURB.

② POWER POLES AND GUY WIRES TO BE RELOCATED (BY OTHERS)

CAUTION ! !

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MATCH LINE STA 23+00

MATCH LINE STA 28+50

MATCH LINE STA 28+50

MATCH LINE STA 34+00

CORPORATE CROSSING

LOT 3, BLOCK E
REDC
CAB. D, SL. 175 & 176
P.R.R.C.T.

LOT 2, BLOCK E
REDC
CAB. D, SL. 175 & 176
P.R.R.C.T.

LOT 1, BLOCK A
REDC
VOL. 2224, PG. 226
D.R.R.C.T.

HITT FAMILY PARTNERSHIP
~~VOL. 1875, PG 235~~
D.R.R.C.T.

RELOCATE EX. TRAFFIC SIGN

RELOCATE EX. TELE PEDESTAL (BY OTHERS)

RELOCATE EX. F.O. SIGN (BY OTHERS)

REMOVE 1,762 S.Y. OF EX. ASPHALT PAVEMENT

ADJUST EX. W.V. STEM AND STACK TO GRADE

RELOCATE EX. TELE PEDESTAL (BY OTHERS)

RELOCATE 212 L.F. OF EX. WIRE FENCE TO R.O.W.

RELOCATE EX. F.O. MARKER (BY OTHERS)

ADJUST EXISTING IRRIGATION VALVES (4) TO GRADE

EX ROW

PROPOSED ROW

50' NTMWD EASEMENT SEE NOTES

84" W.L.

REMOVE 1,533 S.Y. OF EX. ASPHALT PAVEMENT

RELOCATE EX. SIGN

RELOCATE EX. F.O. SIGN (BY OTHERS)

REMOVE EX. HEADWALL

RELOCATE EX. WATER AIR RELEASE VALVE

ADJUST WATER M.H. RIM TO GRADE

RELOCATE 50 L.F. OF EX. IRON FENCE TO R.O.W.

ADJUST EX. ELEC. VAULT TO GRADE (BY OTHERS)

RELOCATE EX. TELE. PEDESTAL (BY OTHERS)

ADJUST EX. W.V. STEM AND STACK TO GRADE (3)

RELOCATE W.M. TO R.O.W. (2)

REMOVE 165 LF 24" CMP

REMOVE 95 S.Y. OF EX. CONCRETE

RELOCATE EX. TELE. VAULT AND PEDESTAL (BY OTHERS)

REMOVE EX. HEADWALL

RELOCATE EX. UT SIGN (BY OTHERS)

RELOCATE 550 L.F. OF EX. WIRE FENCE TO R.O.W.

RELOCATE EX. TRAFFIC SIGN

NOTES FOR WORK IN NTMWD EASEMENT:

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RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

DEMOLITION PLAN
STA 23+00 TO STA 34+00

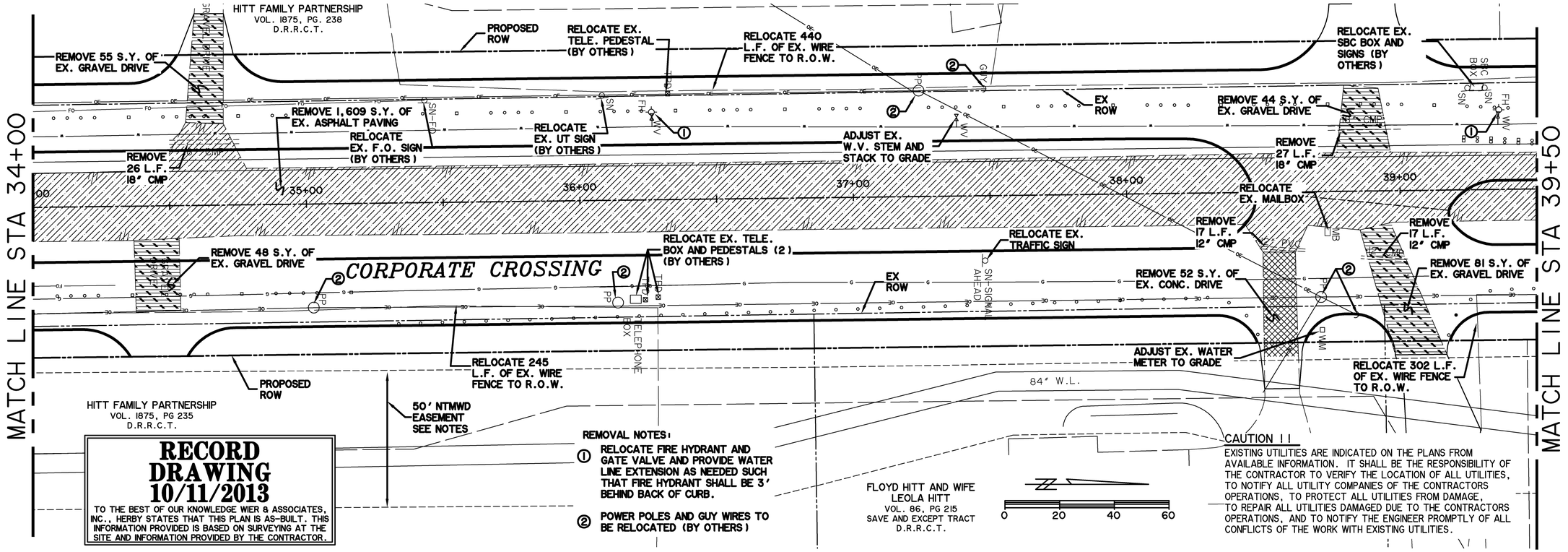
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STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED
PROFESSIONAL ENGINEER
10/11/13

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RECORD DRAWING 10/11/2013

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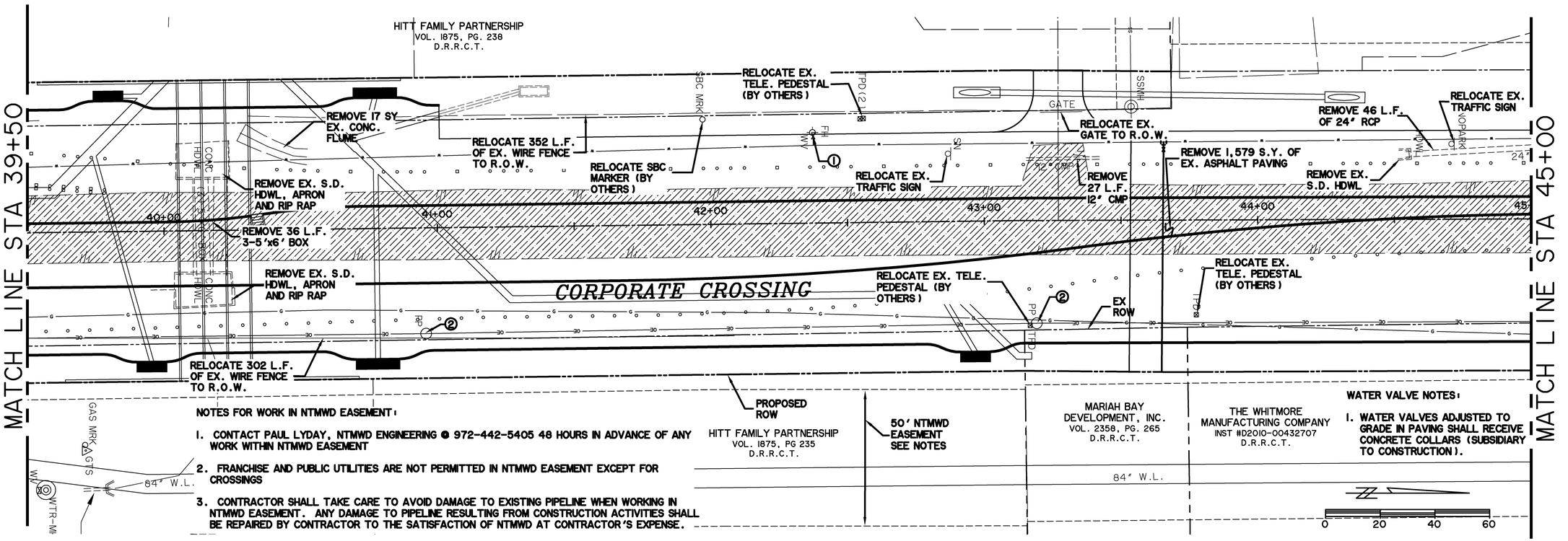
REMOVAL NOTES:

① RELOCATE FIRE HYDRANT AND GATE VALVE AND PROVIDE WATER LINE EXTENSION AS NEEDED SUCH THAT FIRE HYDRANT SHALL BE 3' BEHIND BACK OF CURB.

② POWER POLES AND GUY WIRES TO BE RELOCATED (BY OTHERS)

CAUTION !!

EXISTING UTILITIES ARE INDICATED ON THE PLANS FROM AVAILABLE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES, TO NOTIFY ALL UTILITY COMPANIES OF THE CONTRACTORS OPERATIONS, TO PROTECT ALL UTILITIES FROM DAMAGE, TO REPAIR ALL UTILITIES DAMAGED DUE TO THE CONTRACTORS OPERATIONS, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING UTILITIES.



NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
3. CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.

WATER VALVE NOTES:

1. WATER VALVES ADJUSTED TO GRADE IN PAVING SHALL RECEIVE CONCRETE COLLARS (SUBSIDIARY TO CONSTRUCTION).

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

DEMOLITION PLAN
STA 34+00 TO STA 45+00

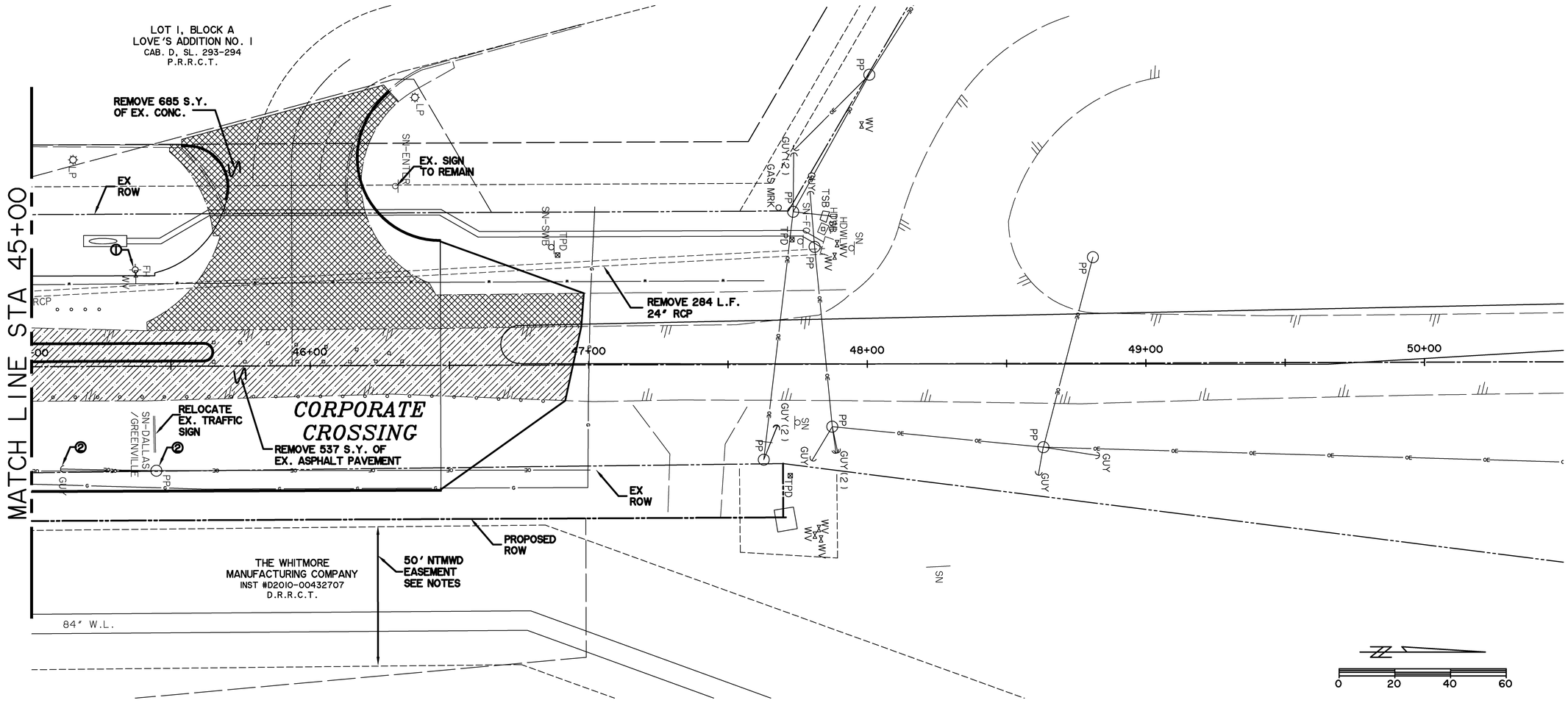
WA 51529
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
10/11/13

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LAST SHEET EDIT DATE 09-13-2013
WA# 08029

SHEET NO. R105

FILE: R105-DEMO.dwg
TIME: 10:16



NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
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RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

DEMOLITION PLAN
STA 45+00 TO END

WA# 08029

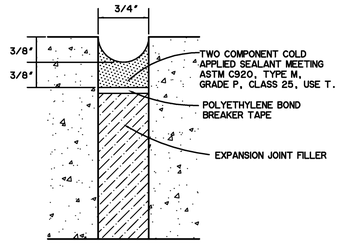
STATE OF TEXAS
RONALD RAMIREZ
81821
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10/11/13

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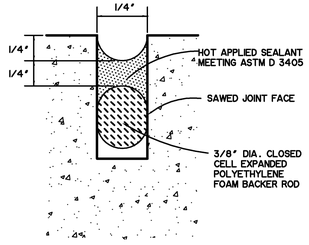
SHEET NO. R106

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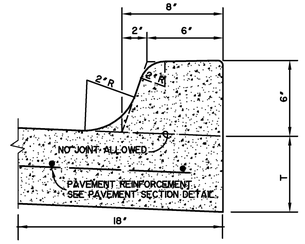
JOINT SEALANT DETAIL No. 1
SEAL FOR EXPANSION JOINT

N.T.S.



JOINT SEALANT DETAIL No. 2
SEAL FOR SAWED, CONSTRUCTION & BUTT JOINT

N.T.S.



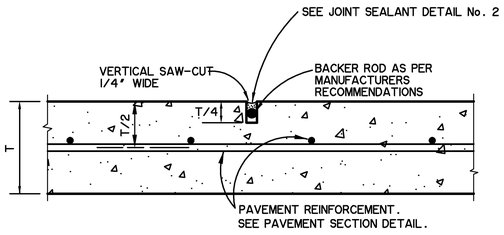
STANDARD CURB

N.T.S.

JOINT NOTES:

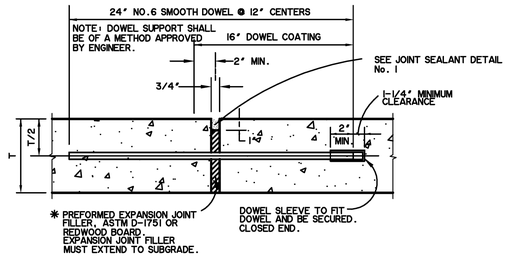
T = PAVEMENT THICKNESS

1. DOWEL BARS PLACED INTO EXISTING PAVEMENT SHALL BE DRILLED INTO PAVEMENT HORIZONTALLY BY USE OF A MECHANICAL RIG. DRILLING BY HAND IS NOT ACCEPTABLE. PUSHING DOWEL BARS INTO GREEN CONCRETE IS NOT ACCEPTABLE. SECURE DOWEL BARS IN EXISTING PAVING WITH EPOXY GROUT.
2. POLYETHYLENE FOAM BACKER ROD DOES NOT SIT ON BOTTOM OF SAW-CUT JOINT. PLACE AT DEPTH INDICATED IN DETAIL.
3. IF SEALANT PROTRUDES ABOVE THE SURFACE OF THE PAVEMENT, IT MUST BE REMOVED AND REPLACED.
4. SUBMIT MANUFACTURER'S LITERATURE FOR SEALANT, DOCUMENTING PRODUCT COMPLIES WITH ASTM SPECIFICATIONS AND PROVIDING MANUFACTURER'S RECOMMENDATIONS FOR APPLICATION. FOLLOW MANUFACTURER'S RECOMMENDATIONS ON USE OF THE PRODUCT.
5. THE CONSTRUCTION JOINT IS TO BE USED BETWEEN SEPARATE POURS OF PROPOSED PAVEMENT. NOTE THAT IT REQUIRES THE REINFORCEMENT TO BE EXTENDED THROUGH THE FORM TO TIE TO THE NEXT POUR. THE BUTT JOINT IS TO BE USED BETWEEN EXISTING CONCRETE PAVEMENT (STREET OR DRIVEWAY) AND PROPOSED PAVEMENT, UNLESS AN EXPANSION JOINT IS CALLED FOR.
6. JOINT SEALANTS SHALL BE INSTALLED SOON AFTER JOINTS ARE SAWED AND/OR COMPLETED. THE JOINTS SHALL BE SEALED BEFORE A RAIN EVENT OCCURS AFTER SAWING OR COMPLETING JOINT.



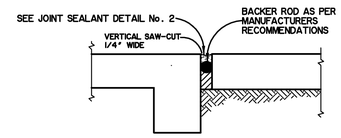
SAWED CONTRACTION JOINT

N.T.S.



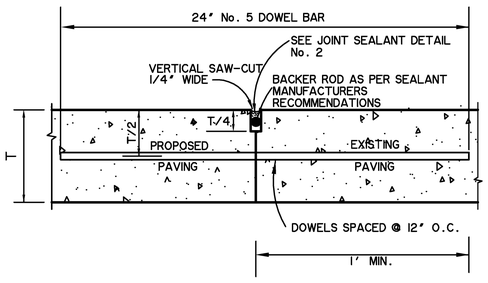
EXPANSION JOINT

N.T.S.



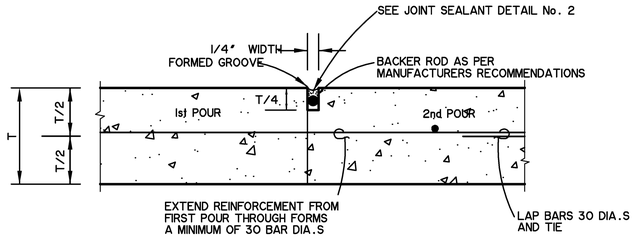
ISOLATION JOINT

N.T.S.



BUTT JOINT

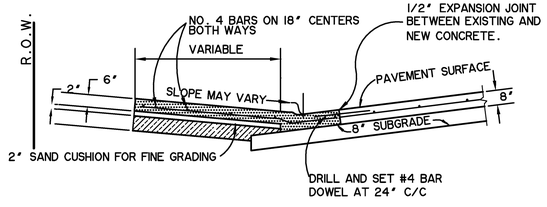
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CONSTRUCTION JOINT

N.T.S.

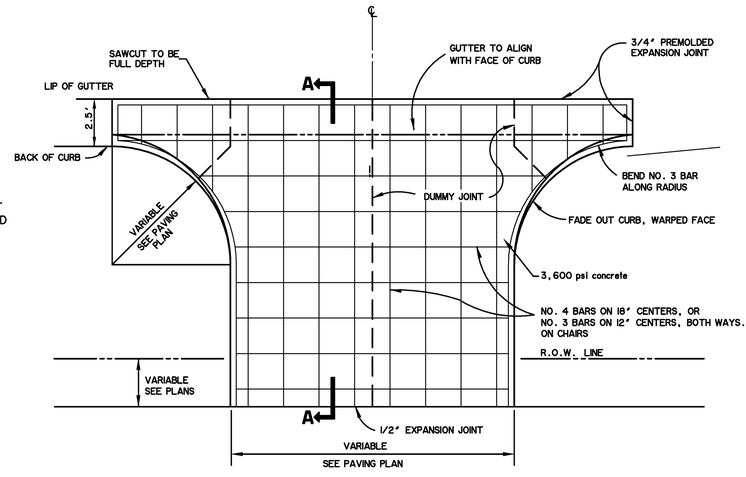
USE CONSTRUCTION JOINT BETWEEN PAVEMENT POURS IF CONCRETE PLACEMENT IS INTERRUPTED OR STOPPED FOR MORE THAN 30 MINUTES.



SECTION A-A

DRIVE APPROACH DETAILS

N. T. S.



TYPICAL DRIVE APPROACH

N. T. S.

RECORD DRAWING 10/11/2013

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NOTE:
DRIVE APPROACHES MUST HAVE A MINIMUM 6" SLAB. NO EXPOSED AGGREGATE FINISH SHALL BE PERMITTED ON SIDEWALKS OR DRIVEWAYS IN CITY RIGHT-OF-WAY. MINIMUM REINFORCING STEEL IN DRIVEWAYS SHALL BE 1/2" ON 18" CENTERS, 3/8" ON 12" CENTERS. THE DRIVEWAY SHALL ALSO CONFORM TO ALL OTHER DESIGN STANDARDS AS SET FORTH IN THE CITY OF ROCKWALL STANDARD CONSTRUCTION DETAILS.

PREPARED BY:
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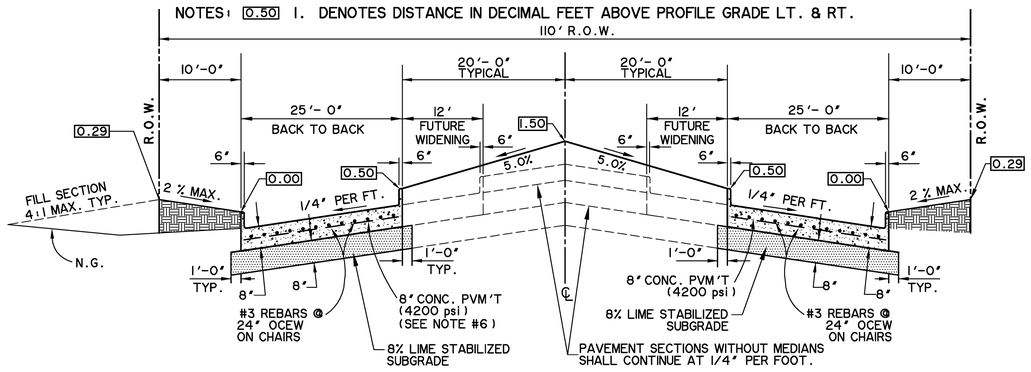
CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

PAVING DETAILS

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

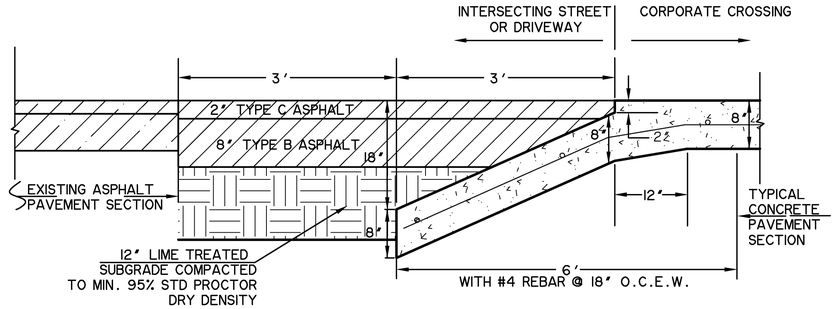
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LAST SHEET EDIT DATE 09-12-2013
WA# 08029
SHEET NO. P001

FILE: I:\PO\I-Pav-Details-08029.dwg
TIME: 13:46



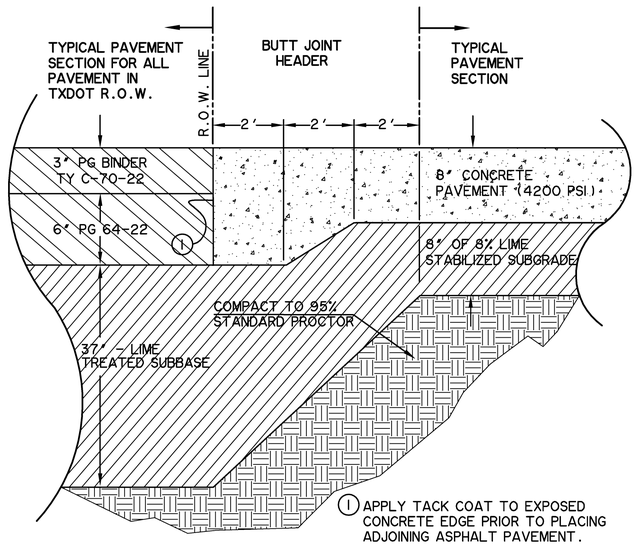
CORPORATE CROSSING DIVIDED SECTION

MAJOR DIVIDED ARTERIAL
SCALE: NTS



CONCRETE/ASPHALT TRANSITION BUTT JOINT WITHIN CITY R.O.W.

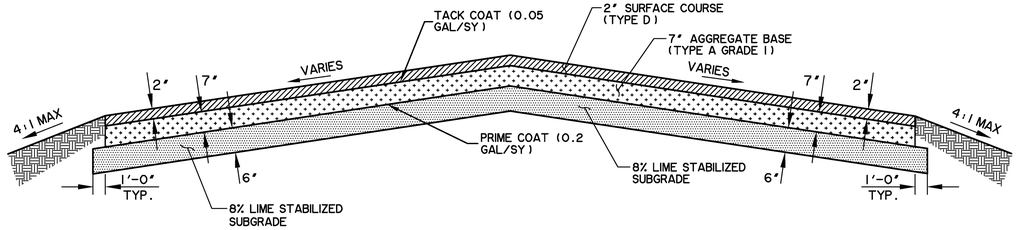
N. T. S.



BUTT JOINT ADJACENT TO TXDOT R.O.W.

N. T. S.

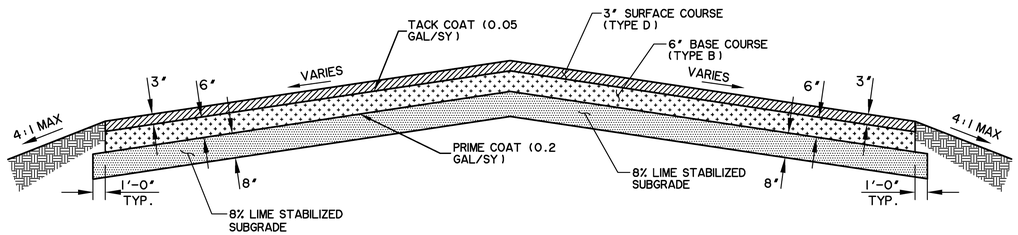
LOCATED AT INTERSECTION OF SH 276 AND CORPORATE CROSSING AND ON CORPORATE CROSSING NEAR INTERSTATE HWY 30



TEMPORARY ASPHALT SECTION

(FOR USE IN CONSTRUCTION SEQUENCING ONLY)

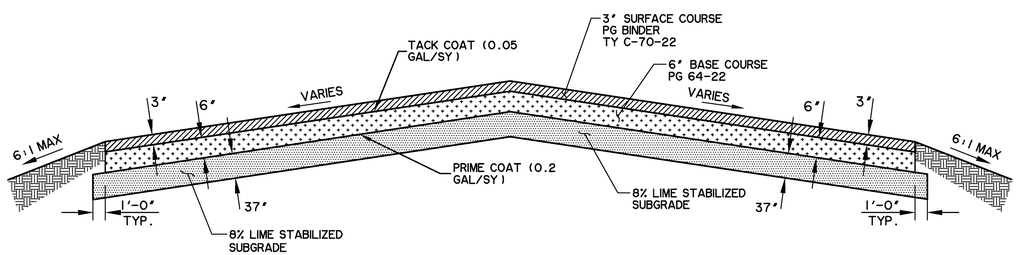
SCALE: NTS



PERMANENT ASPHALT SECTION

(WITHIN CITY RIGHT-OF-WAY)

SCALE: NTS



PERMANENT ASPHALT SECTION

(WITHIN TXDOT RIGHT-OF-WAY)

SCALE: NTS

NOTES:
1. ALL CONSTRUCTION WITHIN TXDOT RIGHTS-OF-WAY SHALL CONFORM TO TXDOT STANDARD SPECIFICATIONS. ALL OTHER CONSTRUCTION SHALL CONFORM TO THE CITY OF ROCKWALL STANDARD CONSTRUCTION DETAILS. TYPICAL SECTIONS ARE REPLACED BY THOSE SHOWN ON THIS SHEET.
2. PLACE MIN. 4" OF CITY APPROVED, IMPORTED TOPSOIL IN PARKWAYS, SLOPES, AND DISTURBED AREAS. SOD PARKWAYS PER CITY STANDARDS.
3. ALL FILLS SHALL BE COMPACTED TO 95 PROCTOR DENSITY. FILLS SHALL BE PLACED IN 8" MAXIMUM LIFTS, AND COMPACTION SHALL BE ACCOMPLISHED BY THE USE OF A SHEEPS-FOOT ROLLER. SUBGRADE PREPARATION SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT #G080734 PREPARED BY ALPHA TESTING, DATED SEPT. 16, 2008.
4. REFER TO SHEET P001 FOR JOINT DETAILS, SPACING AND JOINT MATERIALS.
5. REFER TO SHEET P002 FOR CURB, SIDEWALK AND CURB RAMP DETAILS.
6. CONCRETE FOR STREET PAVEMENT SHALL BE 4200 PSI AND SHALL HAVE A MINIMUM 6.5 SACK PER CUBIC YARD (7.0 PER CUBIC YARD FOR NON-SLIP FORM).
7. GRAVEL DRIVEWAYS SHALL CONSIST OF 8" THICK TYPE A GRADE 1 AGGREGATE BASE.

RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO I.H. 30)

TYPICAL SECTIONS

WA# 8029

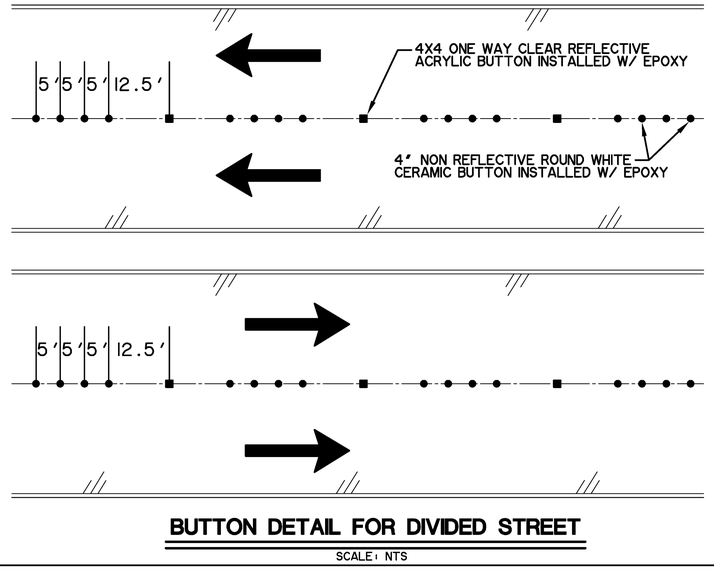
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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WA# 08029

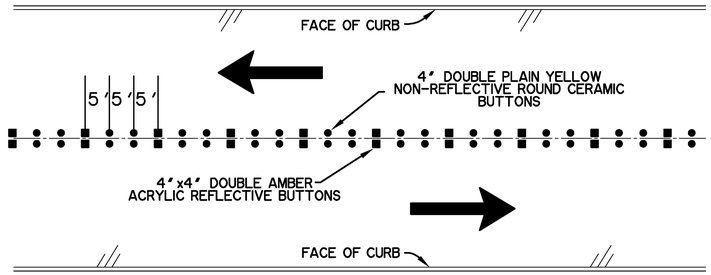
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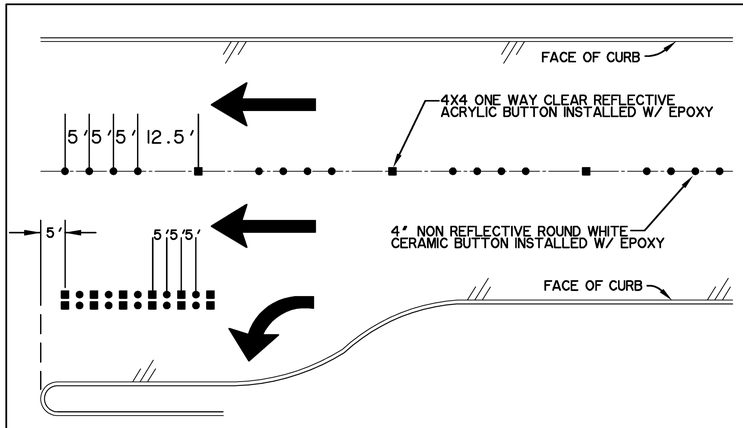
BUTTON DETAIL FOR DIVIDED STREET

SCALE: NTS



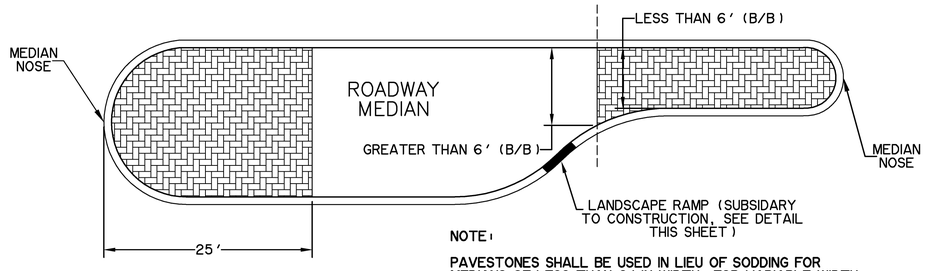
BUTTON DETAIL FOR UNDIVIDED STREET

SCALE: NTS



BUTTON DETAIL FOR LEFT/RIGHT TURN

SCALE: NTS

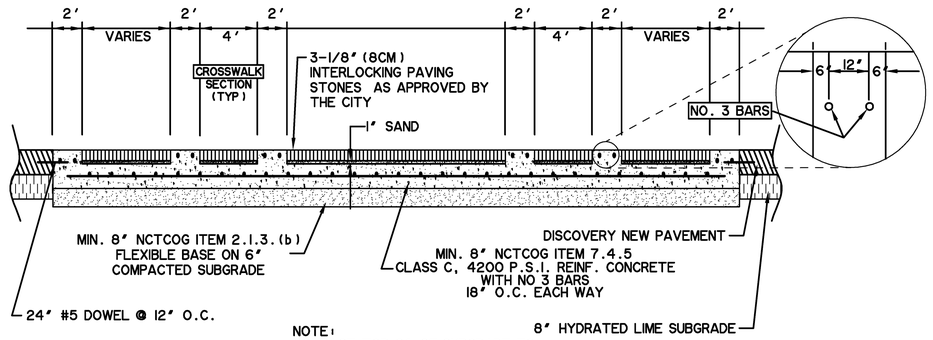


NOTE:

PAVESTONES SHALL BE USED IN LIEU OF SODDING FOR MEDIANS OF LESS THAN 6' IN WIDTH. FOR VARIABLE WIDTH MEDIANS, PAVESTONES SHALL BE USED FOR THAT PORTION OF THE MEDIAN THAT IS LESS THAN 6' IN WIDTH. FOR MEDIAN NOSES GREATER THAN 6' IN WIDTH, PAVESTONES SHALL EXTEND 25' FROM THE END OF THE NOSE.

LAYOUT FOR PAVER STONES IN MEDIAN

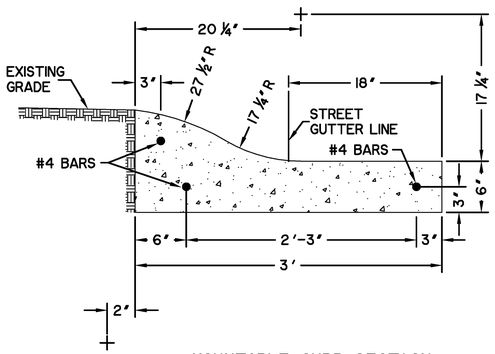
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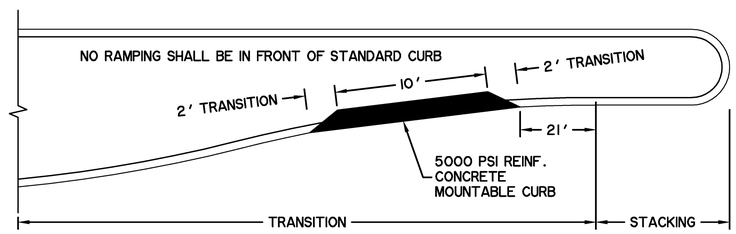
NOTE:
COMPACT TOP 6" OF SUBGRADE TO MINIMUM 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY

A P003 PAVESTONE SECTION

DISCOVERY BLVD



MOUNTABLE CURB SECTION



MOUNTABLE CURB DETAIL - PLAN VIEW

LANDSCAPE MAINTENANCE RAMP

SCALE: NTS

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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

PAVER AND BUTTON DETAILS

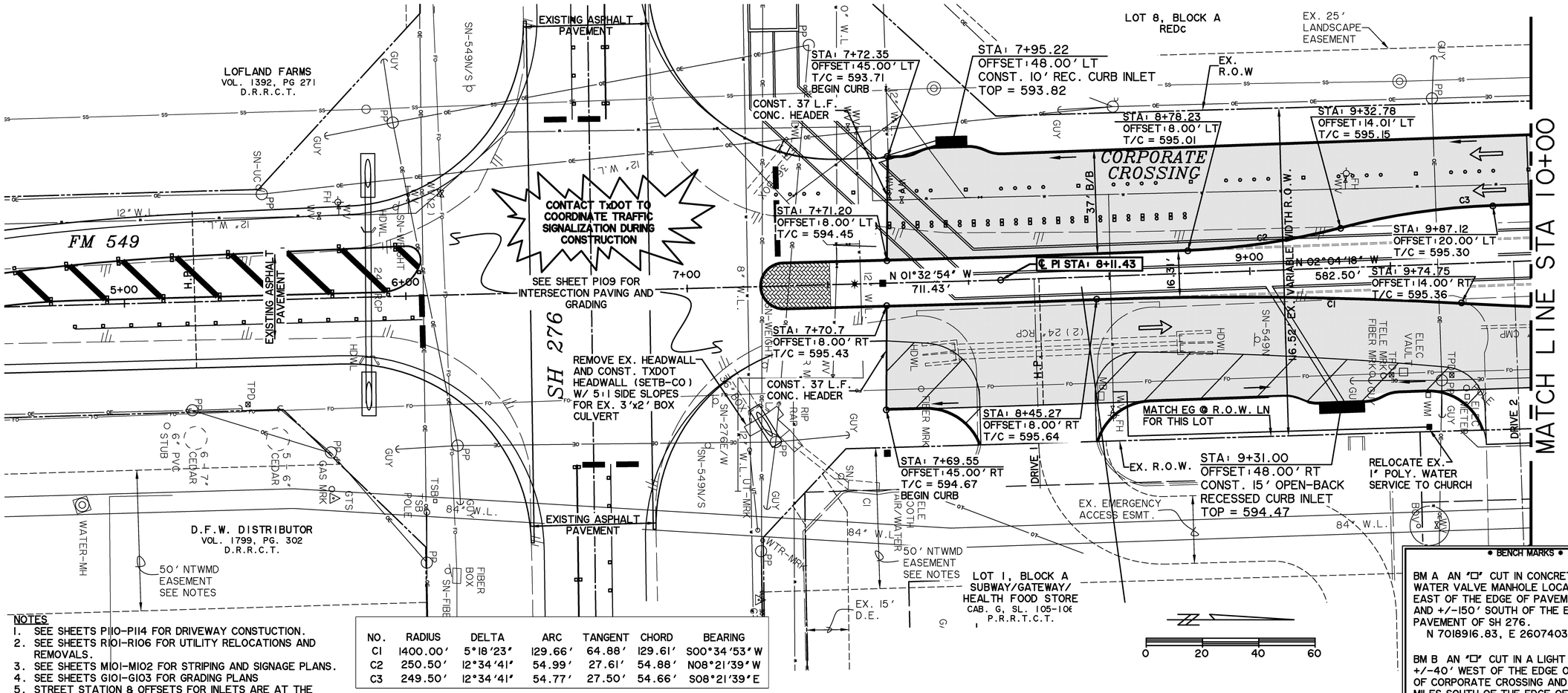
WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
10/11/13

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LAST SHEET EDIT DATE 09-12-2013
WA# 08029

SHEET NO. P003

FILE: P003-Button Details-08029.dwg
TIME: 13:48



NOTES

1. SEE SHEETS PI10-PI14 FOR DRIVEWAY CONSTUCTION.
2. SEE SHEETS RI01-RI06 FOR UTILITY RELOCATIONS AND REMOVALS.
3. SEE SHEETS MI01-MI02 FOR STRIPING AND SIGNAGE PLANS.
4. SEE SHEETS GI01-GI03 FOR GRADING PLANS
5. STREET STATION & OFFSETS FOR INLETS ARE AT THE CENTERLINE OF THE INLET, INSIDE FACE AT THE BACK OF CURB.

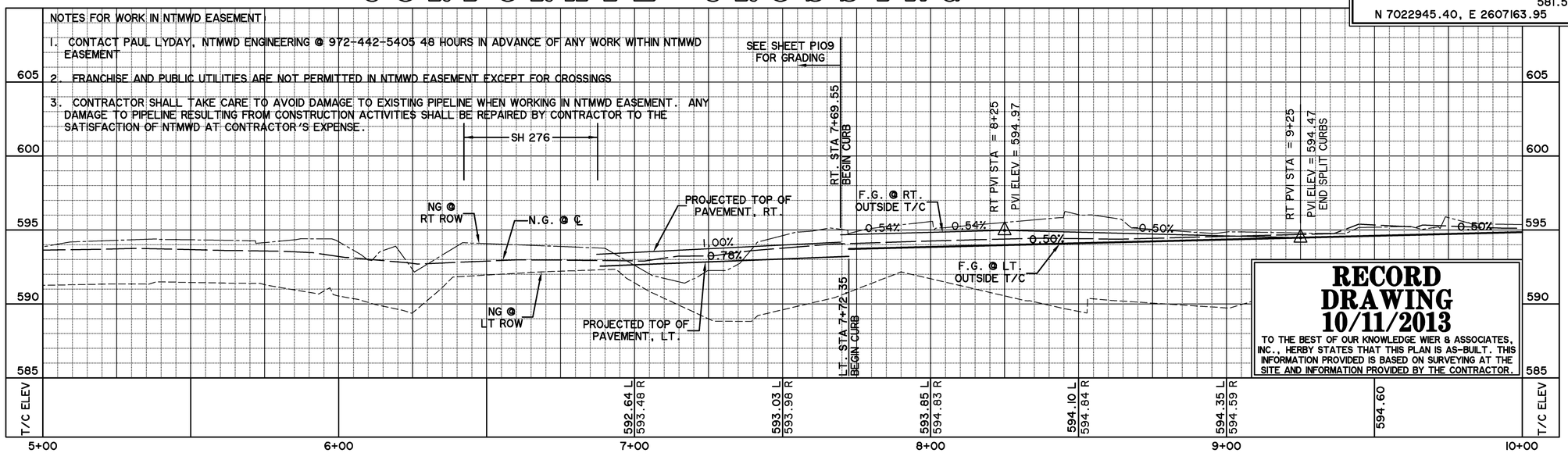
NO.	RADIUS	DELTA	ARC	TANGENT	CHORD	BEARING
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C2	250.50'	12°34'41"	54.99'	27.61'	54.88'	N08°21'39" W
C3	249.50'	12°34'41"	54.77'	27.50'	54.66'	S08°21'39" E

• BENCH MARKS •

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

CORPORATE CROSSING



RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

PAVING PLAN & PROFILE
STA 5+00 TO STA 10+00

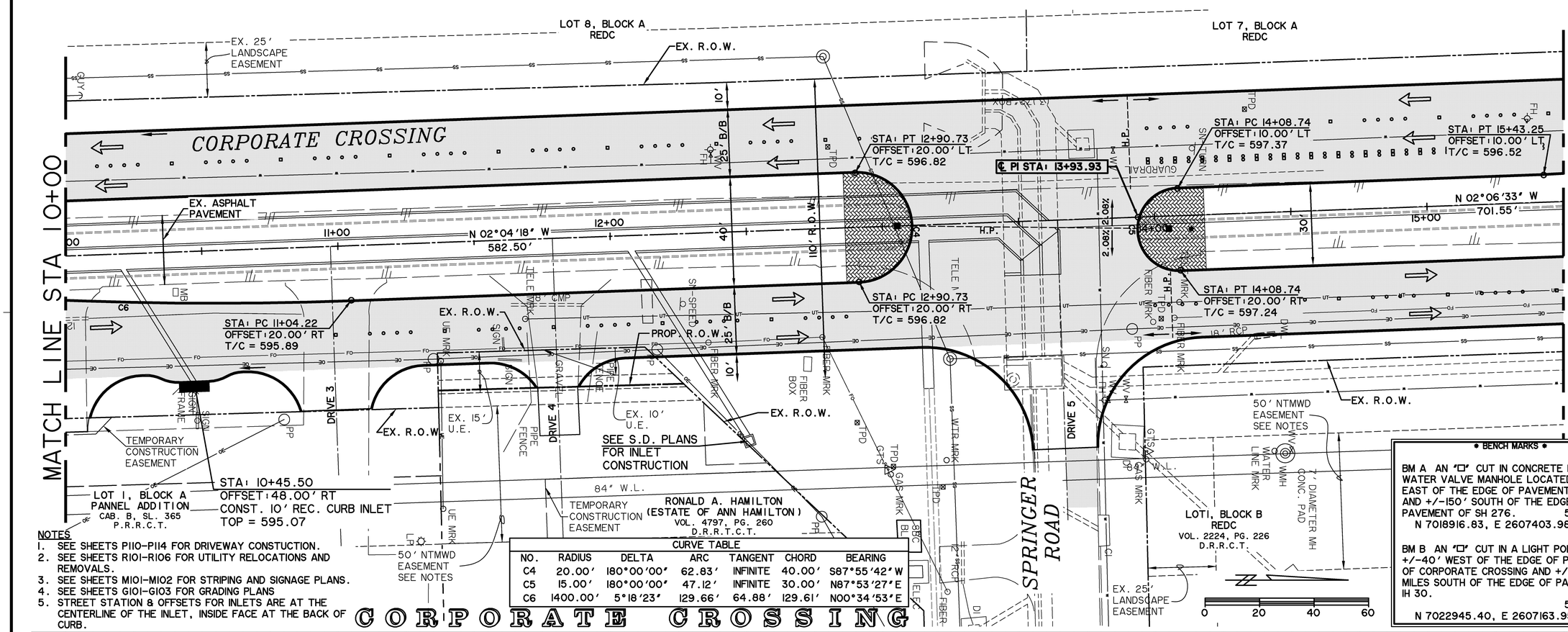
RONALD RAMIREZ 81821 REGISTERED PROFESSIONAL ENGINEER
WA# 08029

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LAST SHEET EDIT DATE 10-02-2013
WA# 08029

SHEET NO. P101

FILE: PI01-PAVING.dwg
TIME: 9:20



NOTES

1. SEE SHEETS P110-P114 FOR DRIVEWAY CONSTUCTION.
2. SEE SHEETS R101-R106 FOR UTILITY RELOCATIONS AND REMOVALS.
3. SEE SHEETS M101-M102 FOR STRIPING AND SIGNAGE PLANS.
4. SEE SHEETS G101-G103 FOR GRADING PLANS
5. STREET STATION & OFFSETS FOR INLETS ARE AT THE CENTERLINE OF THE INLET, INSIDE FACE AT THE BACK OF CURB.

CURVE TABLE

NO.	RADIUS	DELTA	ARC	TANGENT	CHORD	BEARING
C4	20.00'	180°00'00"	62.83'	INFINITE	40.00'	S87°55'42"W
C5	15.00'	180°00'00"	47.12'	INFINITE	30.00'	N87°53'27"E
C6	1400.00'	5°18'23"	129.66'	64.88'	129.61'	N00°34'53"E

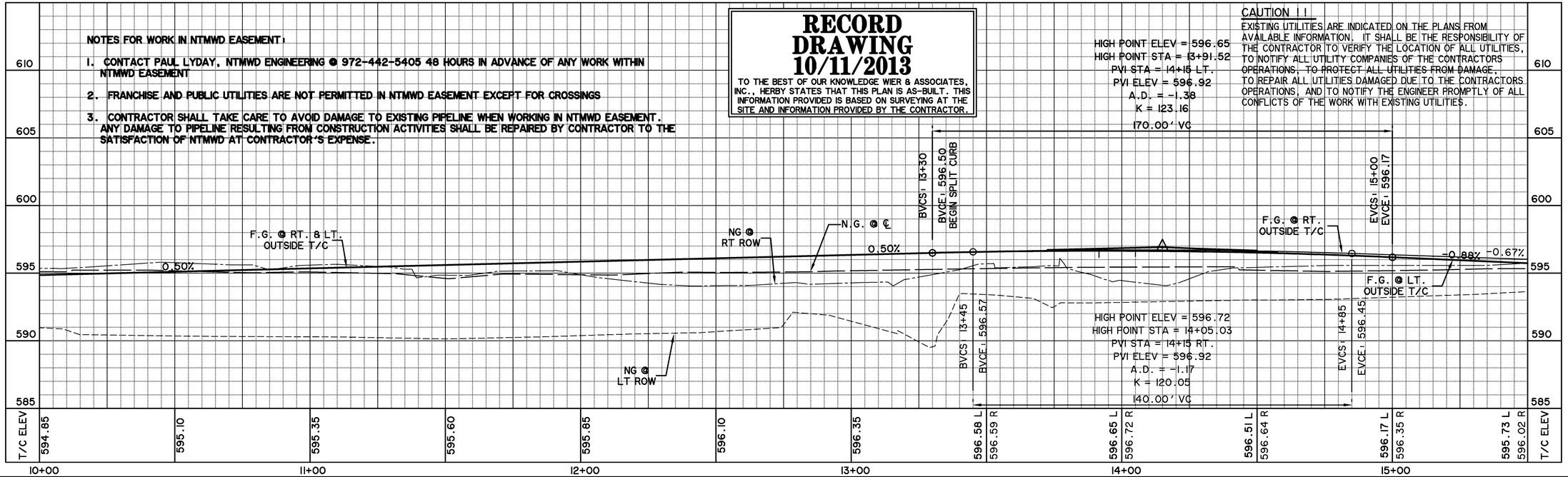
CORPORATE CROSSING

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
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CAUTION !!

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• BENCH MARKS •

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N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

PREPARED BY:
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Texas Firm Registration No. F-2776 www.Wierassociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

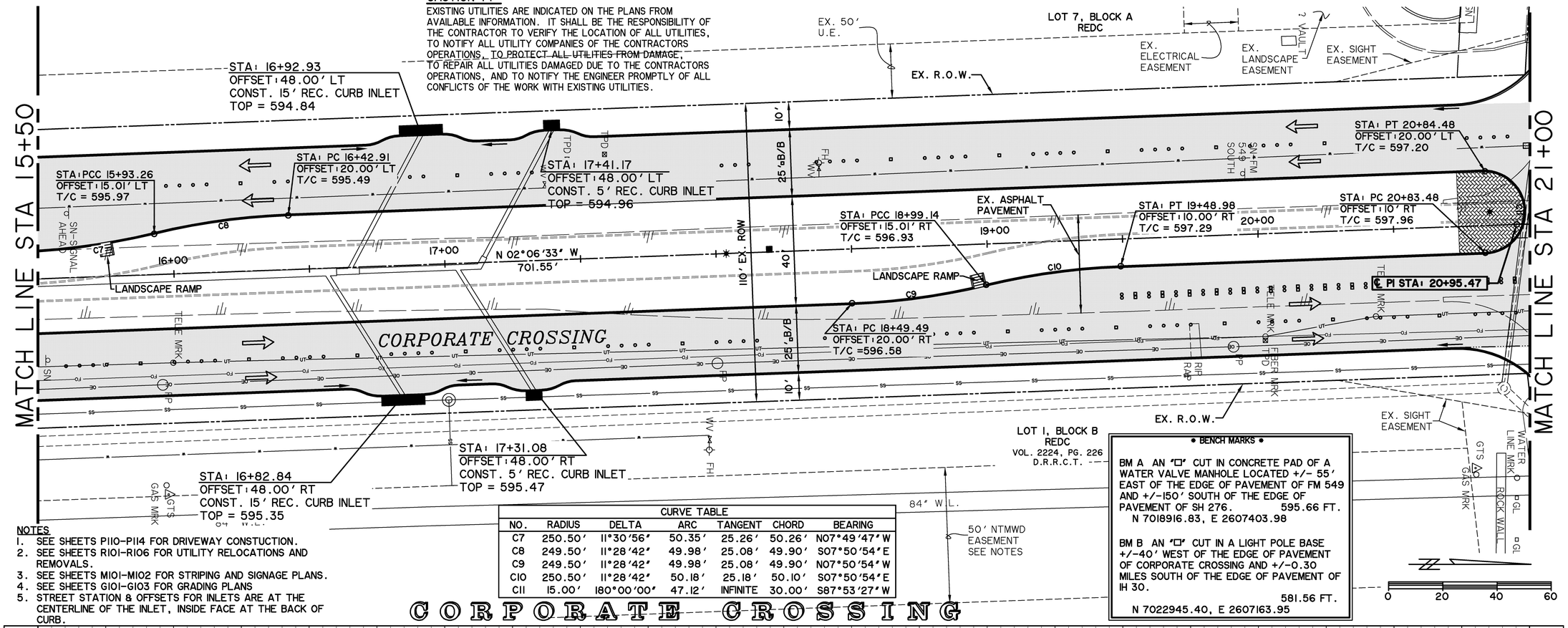
PAVING PLAN & PROFILE
STA 10+00 TO STA 15+50

WA# 01529
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/16/13

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LAST SHEET EDIT DATE: 09-18-2013
WA# 08029

SHEET NO. P102

FILE: P102-PAVING.dwg
TIME: 16:54



NOTES
1. SEE SHEETS P110-P114 FOR DRIVEWAY CONSTUCTION.
2. SEE SHEETS R101-R106 FOR UTILITY RELOCATIONS AND REMOVALS.
3. SEE SHEETS M101-M102 FOR STRIPING AND SIGNAGE PLANS.
4. SEE SHEETS G101-G103 FOR GRADING PLANS
5. STREET STATION & OFFSETS FOR INLETS ARE AT THE CENTERLINE OF THE INLET, INSIDE FACE AT THE BACK OF CURB.

CURVE TABLE						
NO.	RADIUS	DELTA	ARC	TANGENT	CHORD	BEARING
C7	250.50'	11°30'56"	50.35'	25.26'	50.26'	N07°49'47"W
C8	249.50'	11°28'42"	49.98'	25.08'	49.90'	S07°50'54"E
C9	249.50'	11°28'42"	49.98'	25.08'	49.90'	N07°50'54"W
C10	250.50'	11°28'42"	50.18'	25.18'	50.10'	S07°50'54"E
C11	15.00'	180°00'00"	47.12'	INFINITE	30.00'	S87°53'27"W

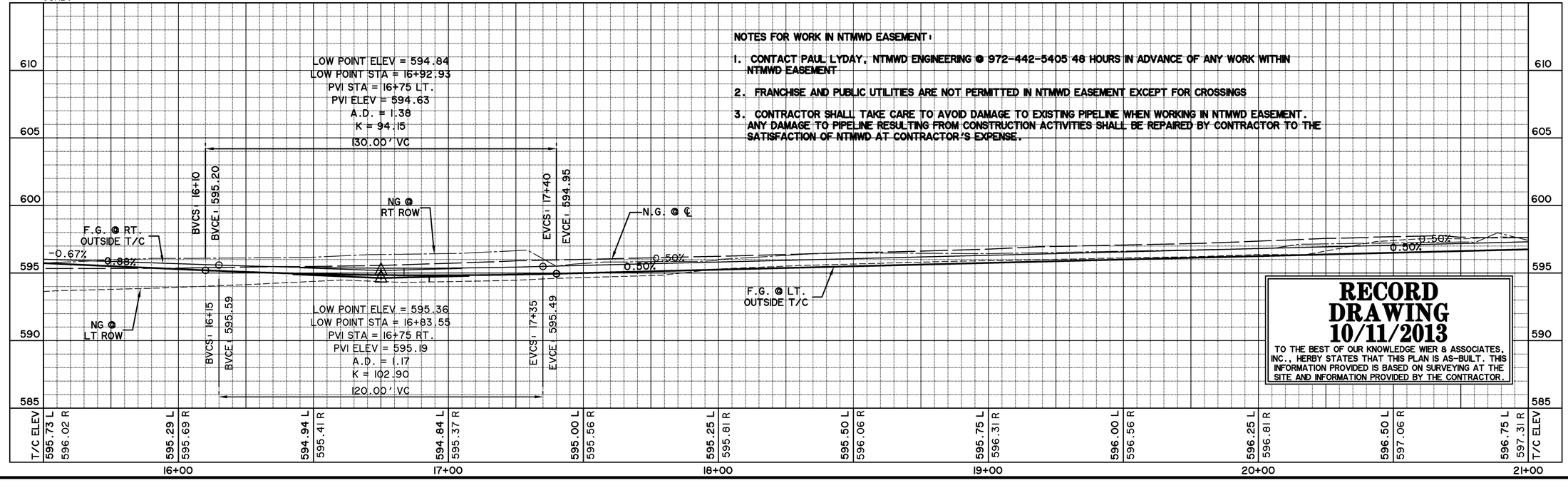
• BENCH MARKS •

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

0 20 40 60

CORPORATE CROSSING



NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
3. CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

PREPARED BY:
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ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

PAVING PLAN & PROFILE
STA 15+50 TO STA 21+00

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
10/11/13

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LAST SHEET EDIT DATE 09-13-2013
WA# 08029

SHEET NO. P103

FILE: P103-PAVING.dwg
TIME: 10:06

CAUTION !!

EXISTING UTILITIES ARE INDICATED ON THE PLANS FROM AVAILABLE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES, TO NOTIFY ALL UTILITY COMPANIES OF THE CONTRACTORS OPERATIONS, TO PROTECT ALL UTILITIES FROM DAMAGE, TO REPAIR ALL UTILITIES DAMAGED DUE TO THE CONTRACTORS OPERATIONS, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING UTILITIES.

MATCH LINE STA 21+00

MATCH LINE STA 26+50

LOT 1 BLOCK E
REDC
CAB. D, SL 175-176
P.R.R.C.T.

EX. ENTRY EASEMENT

EX. 25' LANDSCAPE EASEMENT

CONTRACTOR SHALL PRESERVE TREES, SHRUBS, AND LANDSCAPING IN THIS AREA DURING GRADING

EX. SIGHT EASEMENT

EX. R.O.W.

53.00' LT STA 25+20
CORPORATE CROSSING
=INSIDE FACE OF INLET @ ℄ PIPE
CONST. 2'x2' GRATE INLET & BOX
(SEE SHEET D210 FOR DETAIL)
T/I = 595.50 (CONFIRM IN FIELD)
℄ 6' PVC = 592.75
N = 7020949.67
E = 2607215.28

53.00' LT STA 26+49.70 CORPORATE CROSSING
=INSIDE FACE OF INLET @ ℄ PIPE
CONNECT TO EXISTING OUTFALL STRUCTURE AND PROVIDE WATERTIGHT SEAL
℄ 6' PVC = 591.50 (CONFIRM IN FIELD)
N = 7020949.67
E = 2607215.28

INSTALL 127 LF OF 6' PVC PIPE @ 1.0%
(PROVIDE ALTERNATE BID FOR 6' ADS CORRUGATED HDPE PIPE.)

EX. FLUME

GRADE TO DRAIN

GRADE TO DRAIN

STA: PCC 24+03.02
OFFSET: 15.01' LT
T/C = 597.11

STA: PT 24+52.67
OFFSET: 20.00' LT
T/C = 596.76

STA: PT 22+18.67
OFFSET: 10.00' LT
T/C = 597.83

STA: PC 23+53.17
OFFSET: 10.00' LT
T/C = 597.47

SEE SHEET P111 FOR INTERSECTION GRADING

LANDSCAPE RAMP

N 01°12'28" W
552.59'

EX. ASPHALT PAVEMENT

℄ PI STA: 26+48.06

CORPORATE CROSSING

STA: PC 22+18.67
OFFSET: 20.00' RT
T/C = 597.99

DISCOVERY BLVD

EX. SIGHT EASEMENT

50' NTMWD EASEMENT SEE NOTES

LOT 1, BLOCK A
REDC
VOL. 2224, PG. 226
D.R.R.C.T.

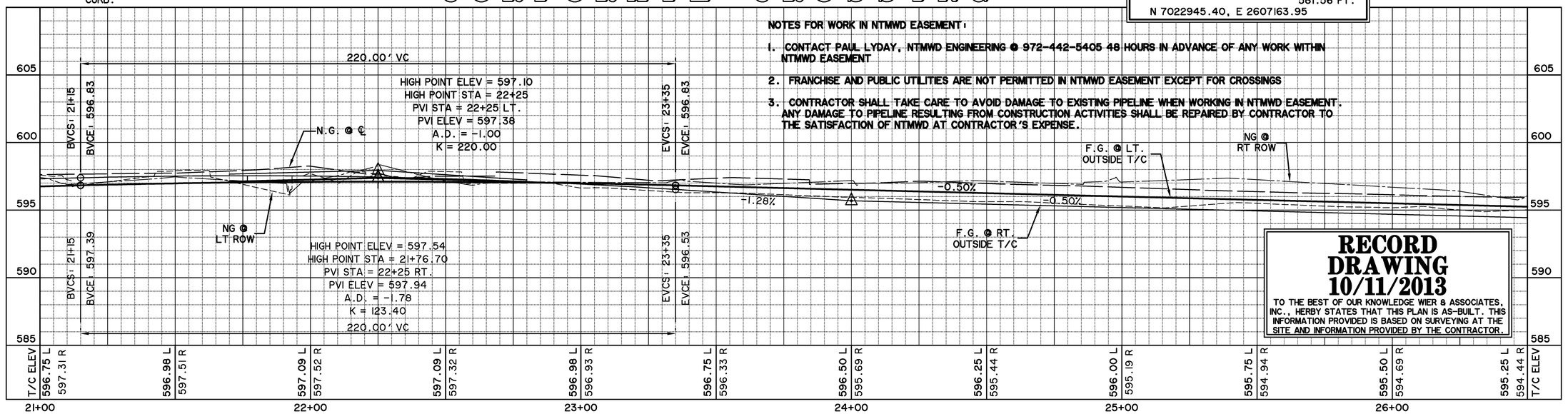
84" W.L.

EX. LANDSCAPE EASEMENT

NOTES
1. SEE SHEETS P110-P114 FOR DRIVEWAY CONSTUCTION.
2. SEE SHEETS R101-R106 FOR UTILITY RELOCATIONS AND REMOVALS.
3. SEE SHEETS M101-M102 FOR STRIPING AND SIGNAGE PLANS.
4. SEE SHEETS G101-G103 FOR GRADING PLANS
5. STREET STATION & OFFSETS FOR INLETS ARE AT THE CENTERLINE OF THE INLET, INSIDE FACE AT THE BACK OF CURB.

CURVE TABLE						
NO.	RADIUS	DELTA	ARC	TANGENT	CHORD	BEARING
C12	15.00'	180°00'00"	47.12	INFINITE	30.00'	N88°47'32"E
C13	250.50'	11°28'42"	50.18'	25.18'	50.10'	N06°56'49"W
C14	249.50'	11°28'42"	49.98'	25.08'	49.90'	S06°56'49"E

CORPORATE CROSSING



NOTES FOR WORK IN NTMWD EASEMENT:

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N 7022945.40, E 2607163.95

REVISIONS

1 5/21/2013:
ADDED THE CONSTRUCTION OF 1 -16"x16" GRATE INLET AND 127 LF OF PVC PIPE.

0 20 40 60

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

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Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

PAVING PLAN & PROFILE
STA 21+00 TO STA 26+50

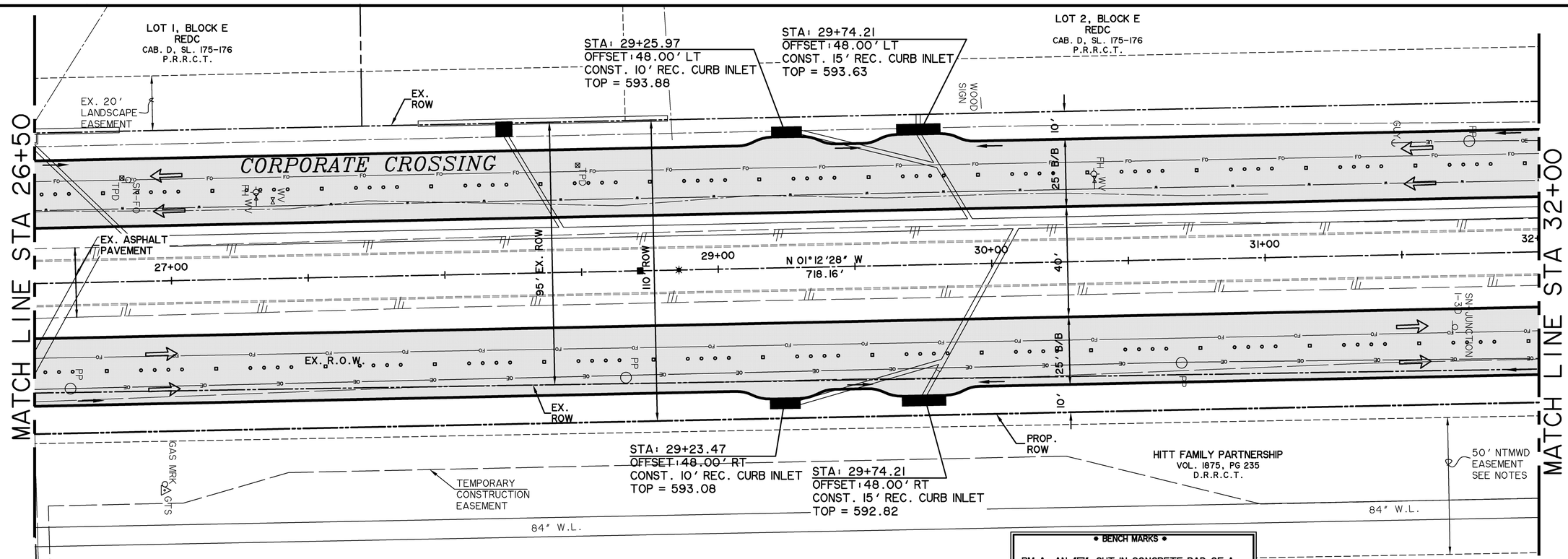
WA# 81821
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
10/11/13

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LAST SHEET EDIT
DATE 09-19-2013
WA# 08029

SHEET NO.
P104

FILE: P104-PAVING-REVISED 5-21-13.dwg
TIME: 8:35



NOTES

1. SEE SHEETS P110-P114 FOR DRIVEWAY CONSTUCTION.
2. SEE SHEETS R101-R106 FOR UTILITY RELOCATIONS AND REMOVALS.
3. SEE SHEETS M101-M102 FOR STRIPING AND SIGNAGE PLANS.
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N 7022945.40, E 2607163.95

0 20 40 60

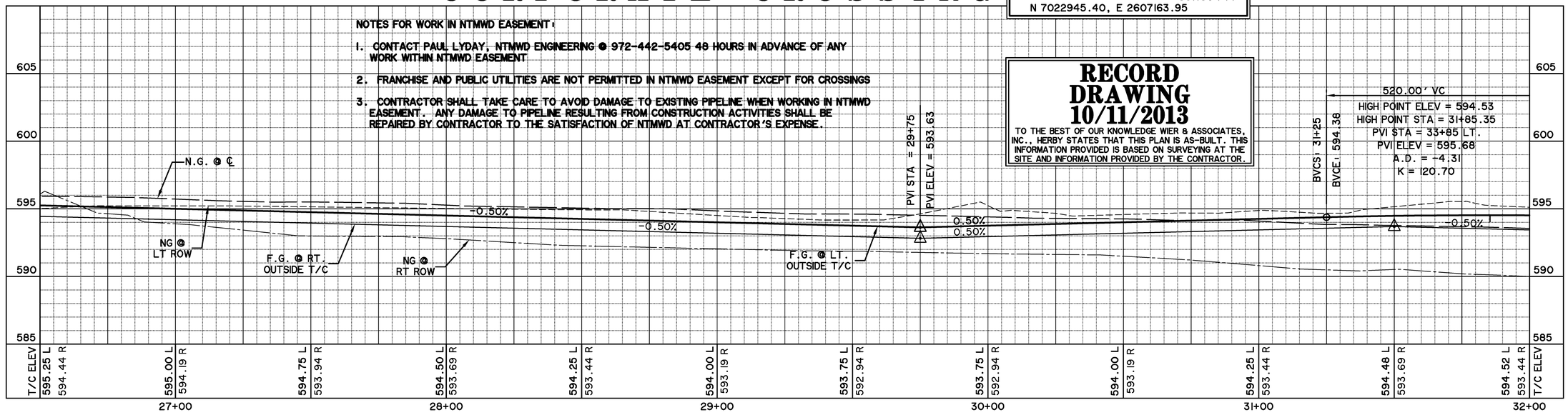
CORPORATE CROSSING

NOTES FOR WORK IN NTMWD EASEMENT:

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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

PAVING
PLAN & PROFILE
STA 26+50 TO STA 32+00

WA# 08029

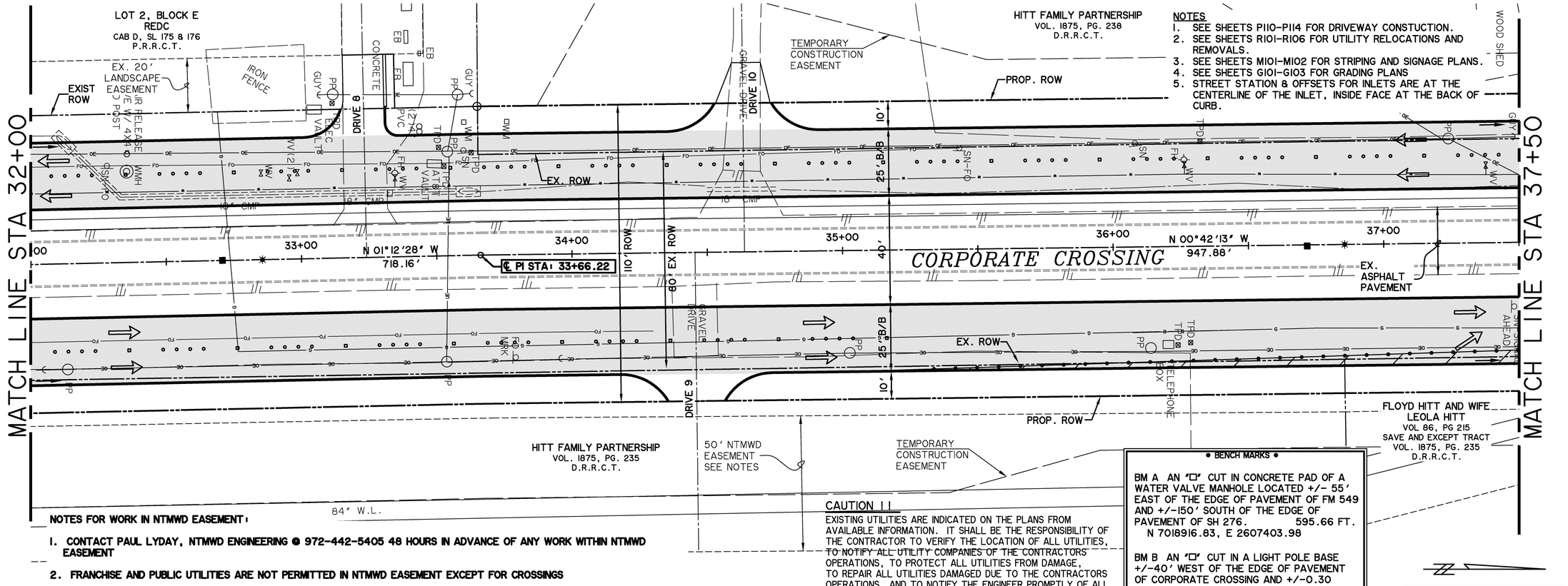
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
10/11/13

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LAST SHEET EDIT
DATE 09-15-2013
WA# 08029

SHEET NO.
P105

FILE: P105-PAVING.dwg
TIME: 10:07



NOTES

1. SEE SHEETS P110-P114 FOR DRIVEWAY CONSTUCTION.
2. SEE SHEETS R101-R106 FOR UTILITY RELOCATIONS AND REMOVALS.
3. SEE SHEETS M101-M102 FOR STRIPING AND SIGNAGE PLANS.
4. SEE SHEETS G101-G103 FOR GRADING PLANS
5. STREET STATION & OFFSETS FOR INLETS ARE AT THE CENTERLINE OF THE INLET, INSIDE FACE AT THE BACK OF CURB.

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1. **CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT**
2. **FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS**
3. **CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.**

CAUTION !!

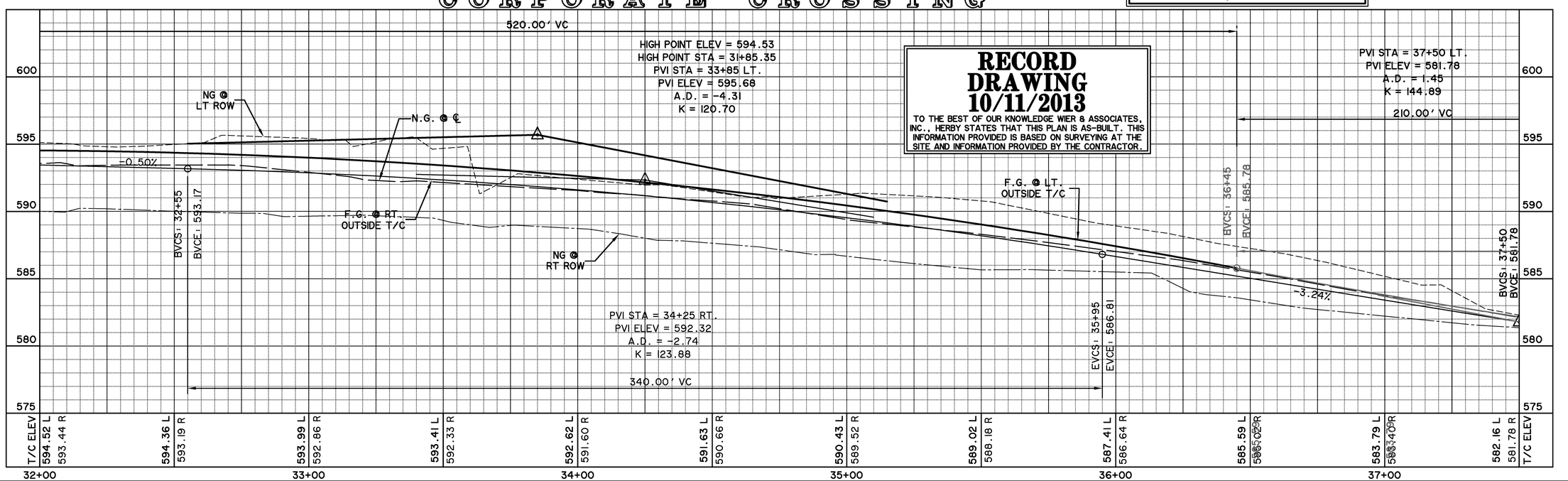
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N 7018916.83, E 2607403.98

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CORPORATE CROSSING



RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO I.H. 30)

PAVING PLAN & PROFILE
STA 32+00 TO STA 37+50

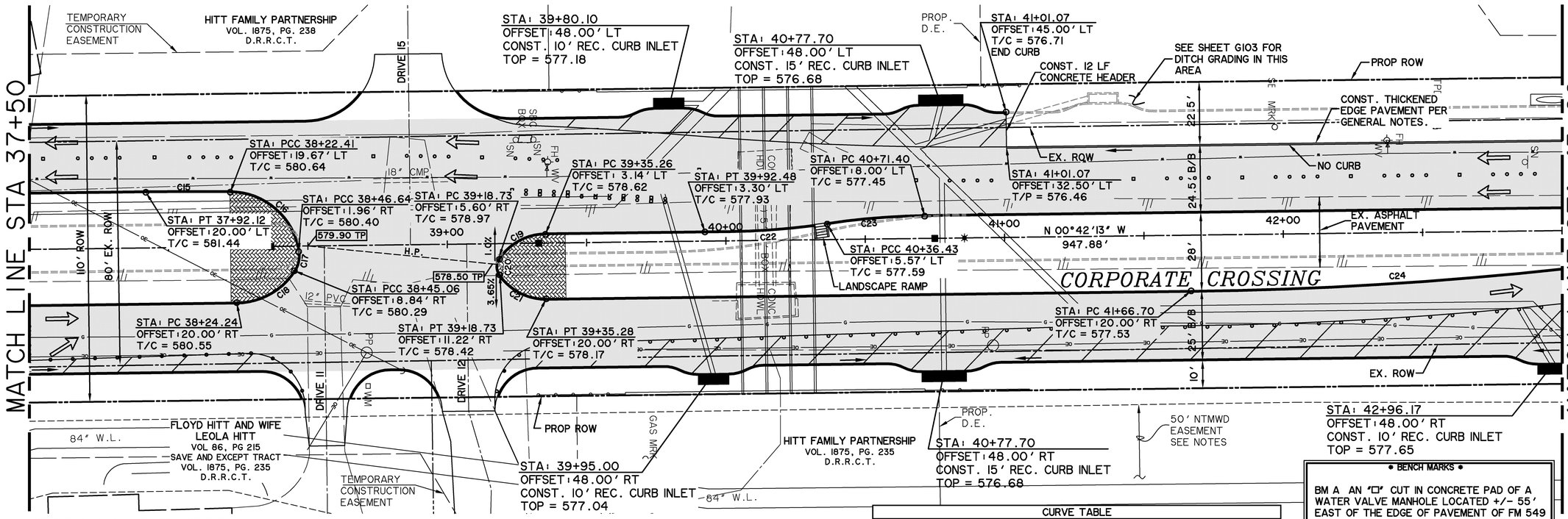
WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT
DATE 09-12-2013
WA# 08029

SHEET NO.
P106

FILE: P106-PAVING.dwg
TIME: 13:53



NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
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0 20 40 60

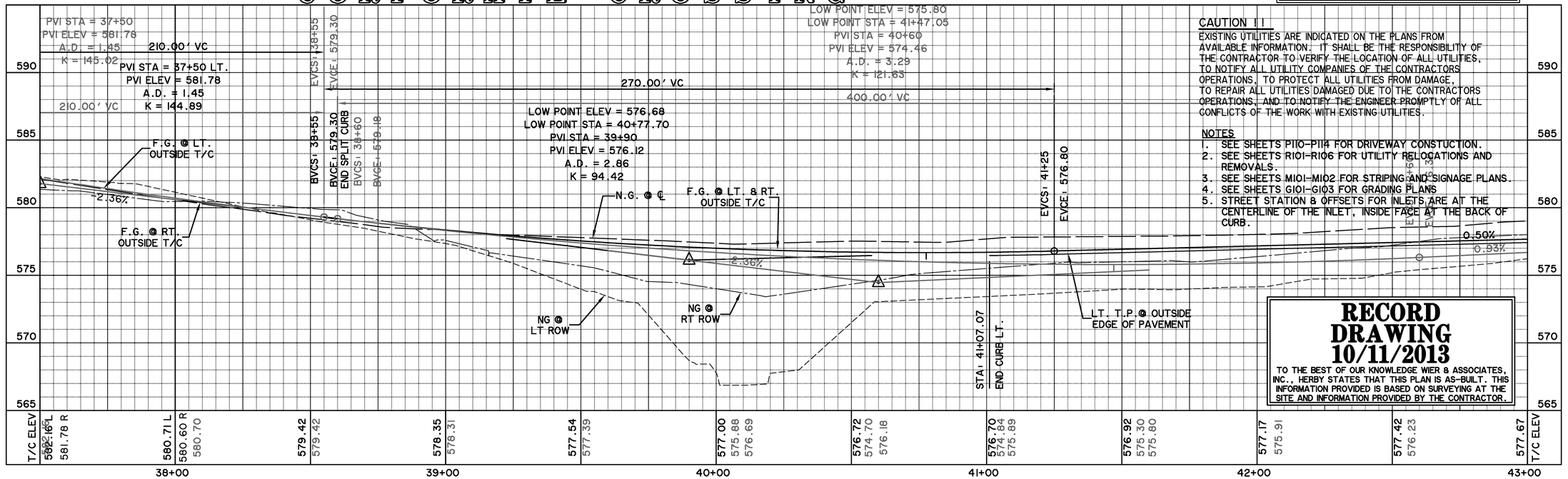
CURVE TABLE						
NO.	RADIUS	DELTA	ARC	TANGENT	CHORD	BEARING
C15	1399.50'	1°14'25"	30.29'	15.15'	30.29'	S00°05'01"E
C16	25.00'	81°01'26"	35.35'	21.36'	32.48'	S41°02'54"W
C17	10.00'	41°20'42"	7.22'	3.77'	7.06'	N77°46'02"W
C18	25.00'	56°23'28"	24.61'	13.40'	23.62'	N28°53'57"W
C19	20.00'	55°43'47"	19.45'	10.57'	18.70'	S28°34'07"E
C20	5.00'	68°21'23"	5.97'	3.40'	5.62'	N89°21'48"E
C21	20.00'	55°51'50"	19.50'	10.60'	18.74'	N27°13'42"E
C22	250.50'	10°04'43"	44.06'	22.09'	44.01'	N03°39'46"W
C23	249.50'	8°03'21"	35.08'	17.57'	35.05'	S04°40'27"E
C24	1399.50'	6°53'34"	168.37'	84.28'	168.26'	N04°09'00"W

• BENCH MARKS •

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

CORPORATE CROSSING



CAUTION !!

EXISTING UTILITIES ARE INDICATED ON THE PLANS FROM AVAILABLE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES, TO NOTIFY ALL UTILITY COMPANIES OF THE CONTRACTORS OPERATIONS, TO PROTECT ALL UTILITIES FROM DAMAGE, TO REPAIR ALL UTILITIES DAMAGED DUE TO THE CONTRACTORS OPERATIONS, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING UTILITIES.

NOTES

1. SEE SHEETS P110-P114 FOR DRIVEWAY CONSTUCTION.
2. SEE SHEETS R101-R106 FOR UTILITY RELOCATIONS AND REMOVALS.
3. SEE SHEETS M101-M102 FOR STRIPING AND SIGNAGE PLANS.
4. SEE SHEETS G101-G103 FOR GRADING PLANS
5. STREET STATION & OFFSETS FOR INLETS ARE AT THE CENTERLINE OF THE INLET, INSIDE FACE AT THE BACK OF CURB.

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

PAVING PLAN & PROFILE
STA 37+50 TO STA 43+00

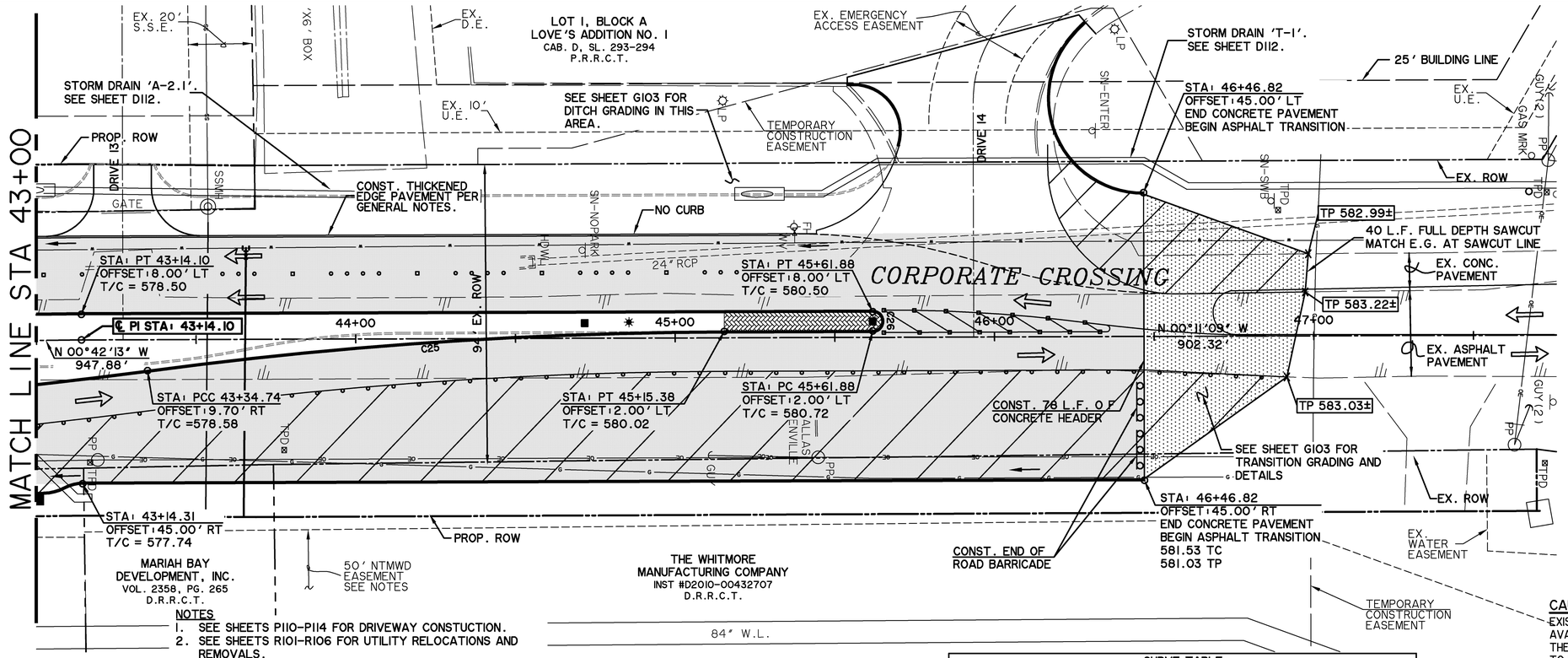
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13
WA# 08029

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LAST SHEET EDIT DATE 09-19-2013
WA# 08029

SHEET NO. P107

FILE: P107-PAVING.dwg
TIME 8:38



BENCH MARKS

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
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BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

NOTES FOR WORK IN NTMWD EASEMENT:

1. **CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT**
2. **FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS**
3. **CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.**

NOTES

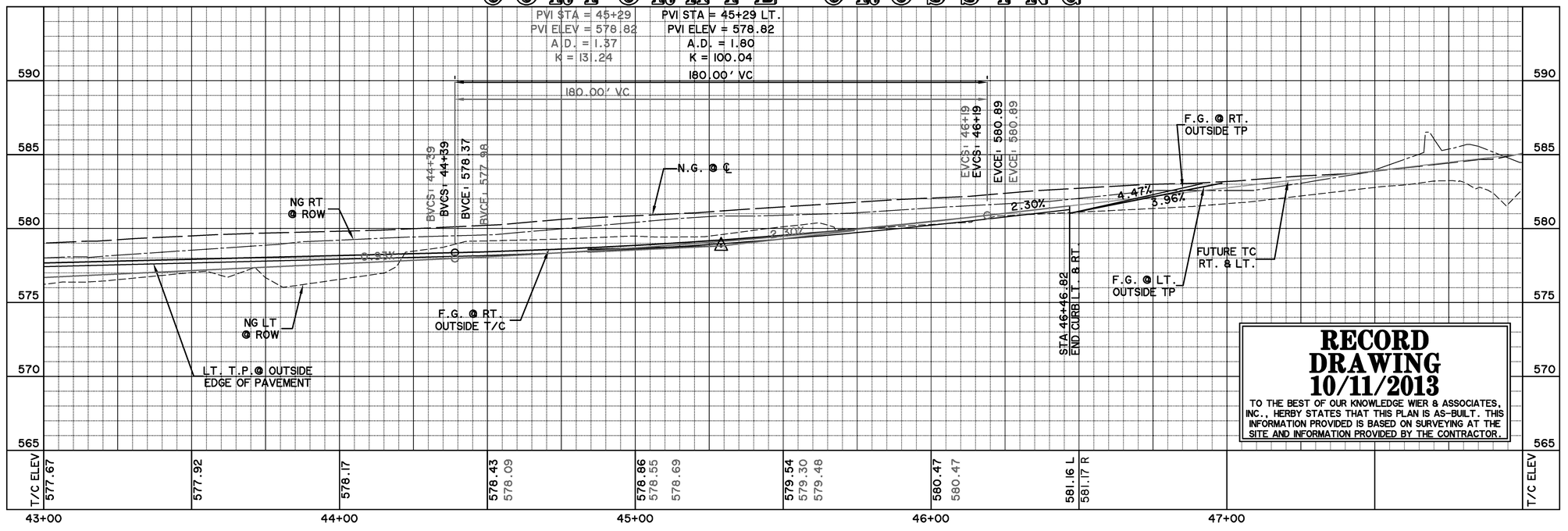
1. SEE SHEETS P110-P114 FOR DRIVEWAY CONSTUCTION.
2. SEE SHEETS R101-R106 FOR UTILITY RELOCATIONS AND REMOVALS.
3. SEE SHEETS M101-M102 FOR STRIPING AND SIGNAGE PLANS.
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5. STREET STATION & OFFSETS FOR INLETS ARE AT THE CENTERLINE OF THE INLET, INSIDE FACE AT THE BACK OF CURB.

CAUTION !!

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CURVE TABLE						
NO.	RADIUS	DELTA	ARC	TANGENT	CHORD	BEARING
C25	1400.50'	7°24'39"	181.14'	90.70'	181.02'	S03°53'28"E
C26	3.00'	180°00'00"	9.42'	INFINITE	6.00'	S89°48'51"W

CORPORATE CROSSING



RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

PREPARED BY:
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CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO I.H. 30)

PAVING PLAN & PROFILE STA 43+00 TO STA 48+00

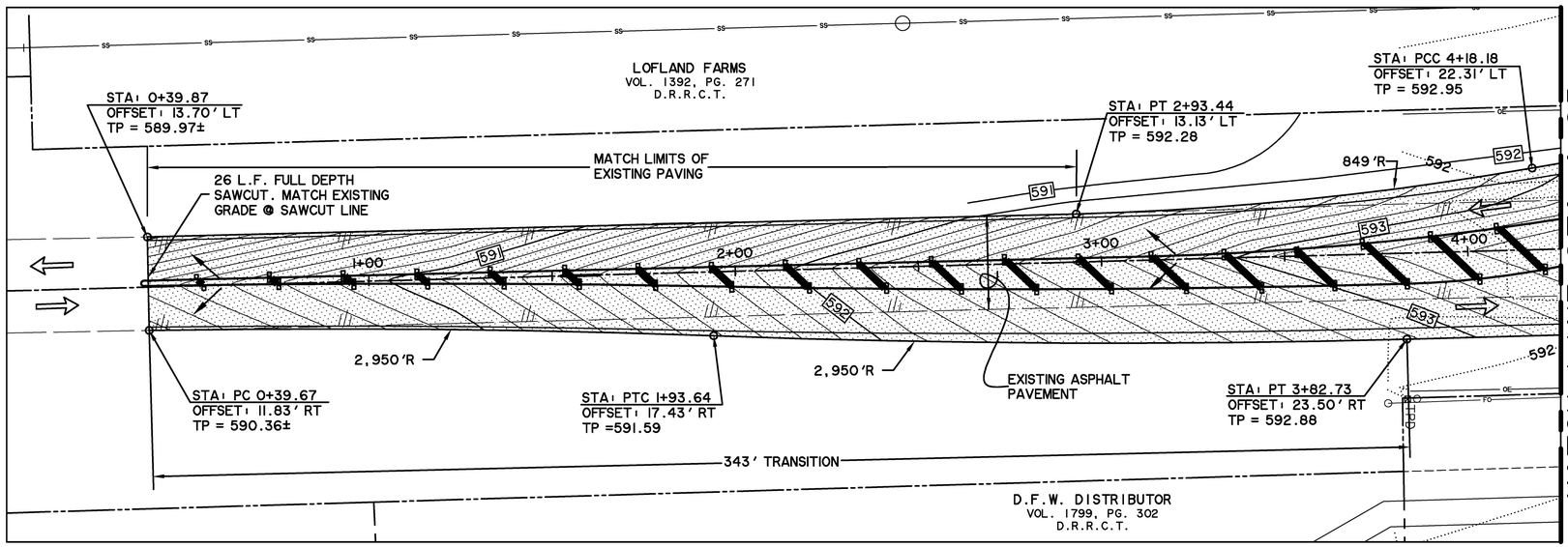
WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

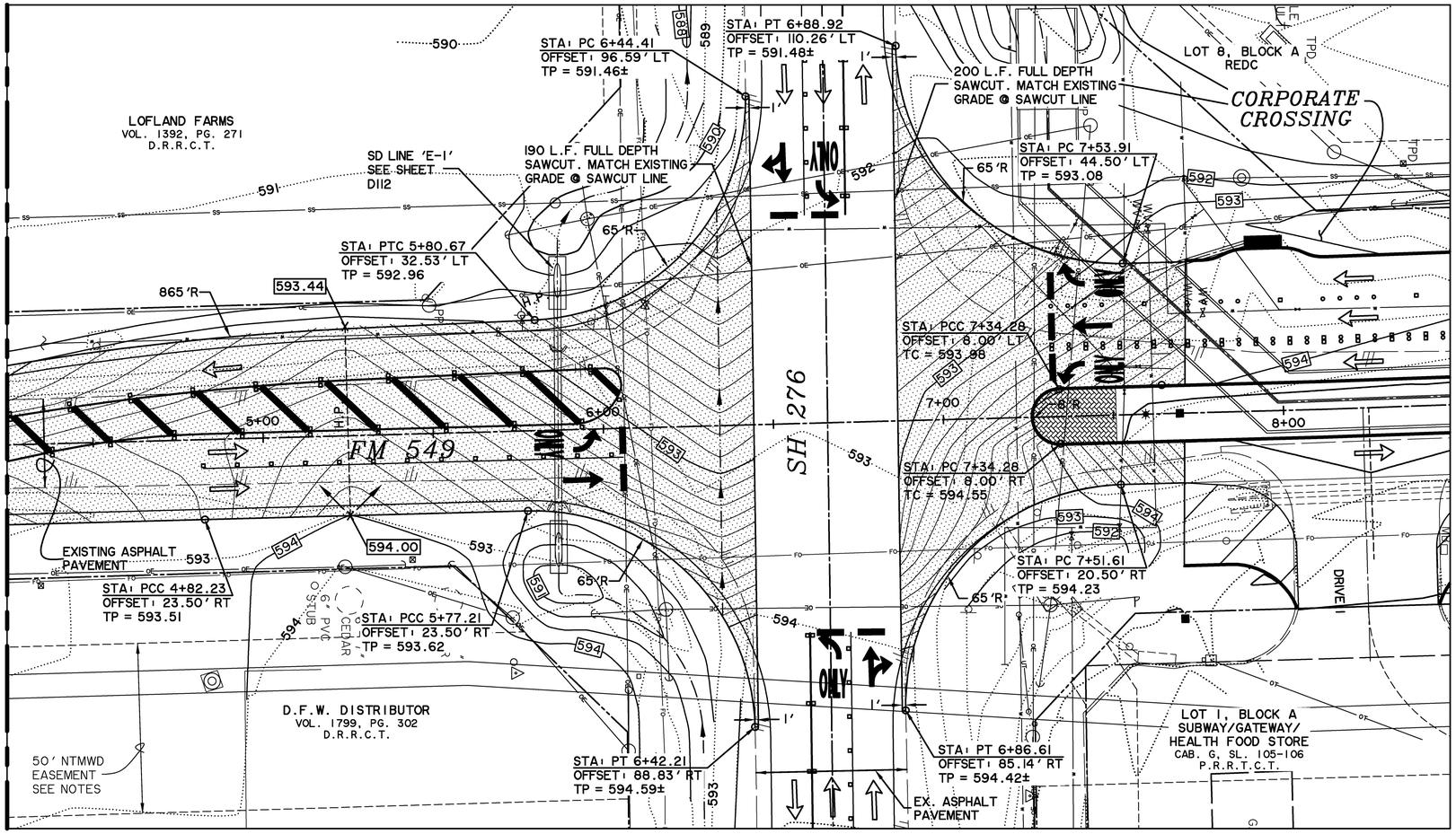
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LAST SHEET EDIT DATE 09-13-2013
WA# 08029

SHEET NO. P108

FILE: P108-PAVING.dwg
TIME: 10:08





CAUTION !!

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0 20 40 60

NOTE:

1. ALL RADIUS DIMENSIONS ARE TO EDGE OF PAVEMENT OR FACE OF CURB, UNLESS OTHERWISE NOTED.
2. CONTACT NTMWD 48 HOURS IN ADVANCE OF ANY WORK WITHIN EASEMENT @ 972-442-5405

NOTES FOR WORK IN NTMWD EASEMENT:

1. **CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT**
2. **FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS**
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• BENCH MARKS •

BM A AN 'D' CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN 'D' CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

INTERSECTION PLAN

RONALD RAMIREZ 81821 REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS

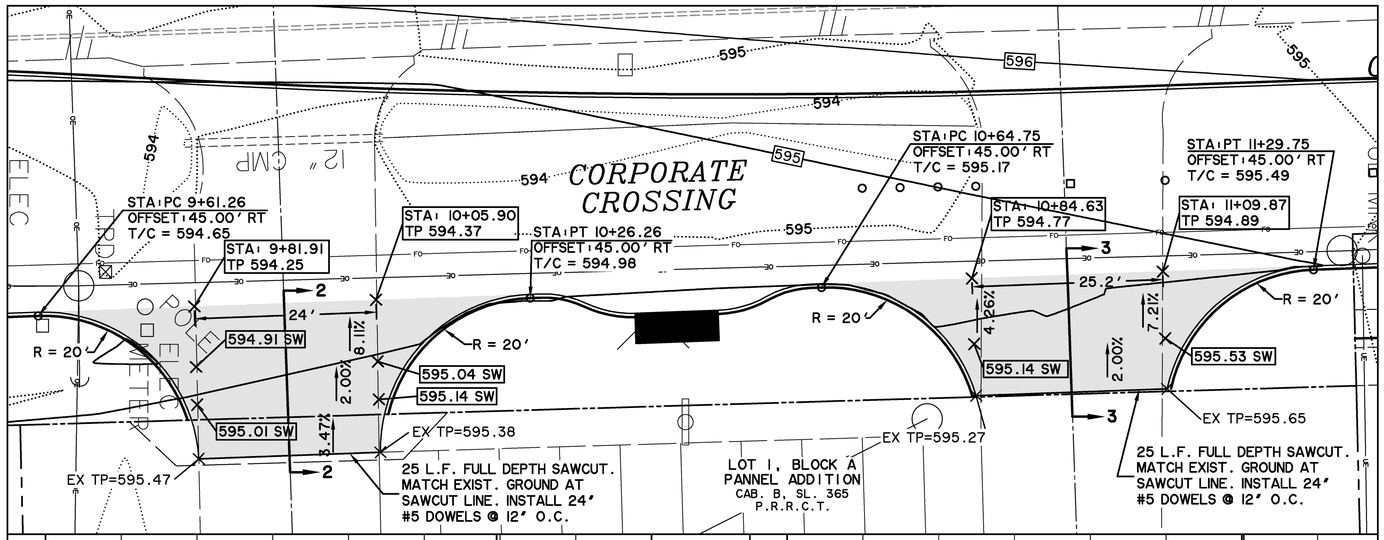
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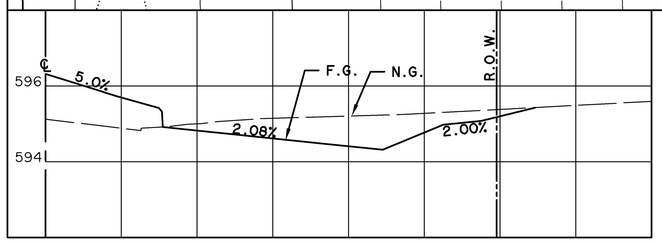
LAST SHEET EDIT DATE 09-13-2013
WA# 08029

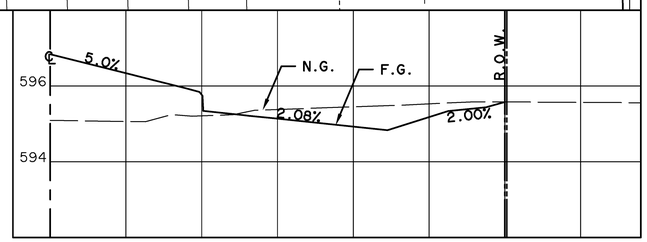
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TIME: 10:09 FILE: P109-FM-276-INTERSECTION.dwg

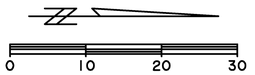
DRIVE 2







DRIVE 3



• BENCH MARKS •

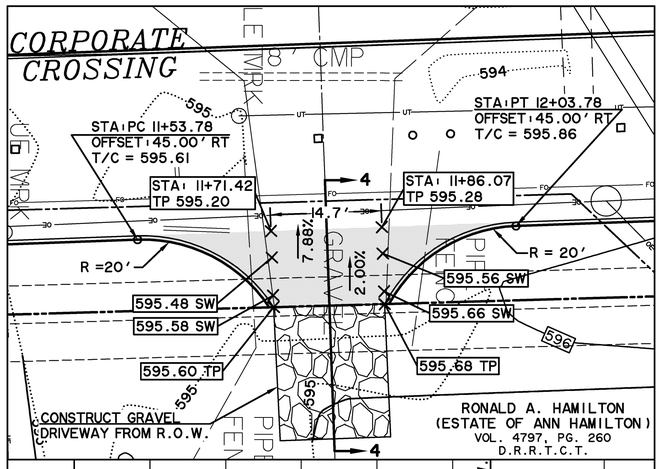
BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
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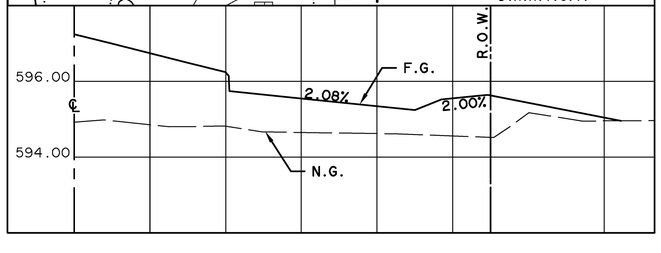
BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

CAUTION 11

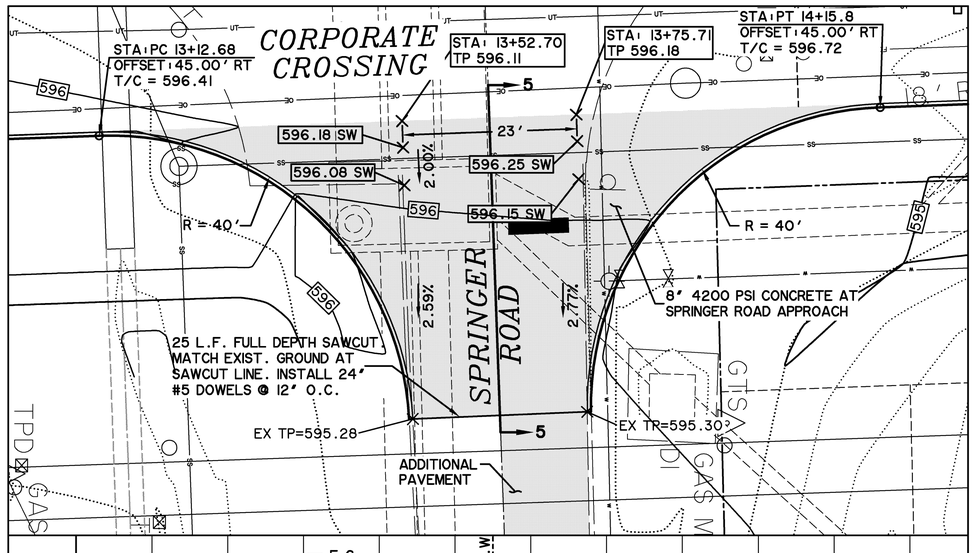
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DRIVE 4





DRIVE 5





DRIVEWAY NOTES:

1. SEE SHEETS R101 TO R106 FOR REMOVALS
2. GRAVEL SHALL MEET N.C.T.C.O.G. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 2.1.3, AND BE A MINIMUM OF 6' IN THICKNESS.

NOTES FOR WORK IN NTMWD EASEMENT:

1. **CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT**
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RECORD DRAWING 10/11/2013

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Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO I.H. 30)

DRIVEWAY PLANS

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez (with)

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LAST SHEET EDIT DATE 09-19-2013
WA# 08029

SHEET NO. P110

FILE: P110-DRIVEWAYS.dwg
TIME: 9:43

RECORD DRAWING 10/11/2013

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N 7022945.40, E 2607163.95

53 S.Y. OF 8' 4200 PSI CONCRETE PAVEMENT WITH 8' LIME TREATED SUBGRADE AND #3 BARS @ 24' C/C E.W. FOR DISCOVERY BLVD.

STA: 21+87.73
OFFSET: 137.48' LT
CONNECT TO EX. CURB
T/C = 597.51±

STA: PC 21+91.01
OFFSET: 82.16' LT
T/C = 597.22

STA: PT 22+30.49
OFFSET: 45.00' LT
T/C = 597.20

TP 596.88 · TP 596.77 · TP 597.02 · TP 597.84 · TP 596.71 · TP 597.87 · TP 596.60 · TP 596.43 · TP 596.32 · TP 597.62 · TP 596.87 · TP 597.00 · TP 597.03 · TP 597.54 · TP 597.04 · TP 597.20 · TP 597.35 · TP 597.10

597.98 SW · 598.03 SW · 597.50 SW · 597.45 SW · 596.86 · 596.64 · 597.55 SW · 596.37 SW · 596.61 SW · 596.68 SW · 597.26 SW · 596.87 SW · 597.33 SW

5 LF SAWCUT · 5' SIDEWALK · EX. SIDEWALK

STA: 21+83.17
OFFSET: 144.61' RT
CONNECT TO EX. CURB
T/C = 596.44 ±

25 L.F. FULL DEPTH SAWCUT. MATCH EXIST. GROUND AT SAWCUT LINE. INSTALL 24' #5 DOWELS @ 12' O.C.

469 S.Y. OF PAVERS W/ CONCRETE SUB-BASE SEE DETAIL SHEET P003.

STA: 21+63.77
OFFSET: 136.45' LT
CONNECT TO EX. CURB
T/C = 598.24±

597.41 · 597.14 · 597.24 · 597.39 · 597.50 · 597.34 · 597.36 · 597.24 · 597.50

0.9% · 0.5% · 0.6% · 0.95%

RECONSTRUCT MEDIAN CURBS AND REPLACE VEGETATION

RECONSTRUCT MEDIAN CURBS AND REPLACE LANDSCAPING

134 S.Y. OF 8' 4200 PSI CONCRETE PAVEMENT WITH 8' LIME TREATED SUBGRADE AND #3 BARS @ 24' C/C E.W. FOR DISCOVERY BLVD.

PAVERS TO BE LOCATED AT DISCOVERY DRIVE SHALL MATCH COLOR AND PATTERN OF EXISTING PAVERS.

NOTES FOR WORK IN NTMWD EASEMENT:

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CORPORATE CROSSING

DISCOVERY BLVD

STA: PT 22+29.34
OFFSET: 45.00' RT
T/C = 597.43

773 S.Y. OF 8' 4200 PSI CONCRETE PAVEMENT WITH 8' LIME TREATED SUBGRADE AND #3 BARS @ 24' C/C E.W. FOR DISCOVERY BLVD.

25 L.F. FULL DEPTH SAWCUT. MATCH EXIST. GROUND AT SAWCUT LINE. INSTALL 24' #5 DOWELS @ 12' O.C.

STA: 21+58.79
OFFSET: 144.67' RT
CONNECT TO EX. CURB
T/C = 597.08±

ADDITIONAL PAVEMENT PER CITY

RECONSTRUCT MEDIAN CURBS AND REPLACE VEGETATION

RECONSTRUCT MEDIAN CURBS AND REPLACE LANDSCAPING

STA: 21+42.25
OFFSET: 144.71' RT
CONNECT TO EX CURB
T/C = 597.06±

26 L.F. FULL DEPTH SAWCUT. MATCH EXIST. GROUND AT SAWCUT LINE. INSTALL 24' #5 DOWELS @ 12' O.C.

STA: PT 21+11.41
OFFSET: 81.37' RT
T/C = 597.15

1.1% · 2.7% · 1.4%

8 LF SAWCUT · 9 LF SAWCUT

STA: 21+17.04
OFFSET: 144.77' RT
CONNECT TO EX CURB
T/C = 596.26±

STA: PT 21+12.24
OFFSET: 81.19' LT
T/C = 597.50

19 S.Y. OF 8' 4200 PSI CONCRETE PAVEMENT WITH 8' LIME TREATED SUBGRADE AND #3 BARS @ 24' C/C E.W. FOR DISCOVERY BLVD.

STA: PC 20+74.14
OFFSET: 45.00' LT
T/C = 596.63

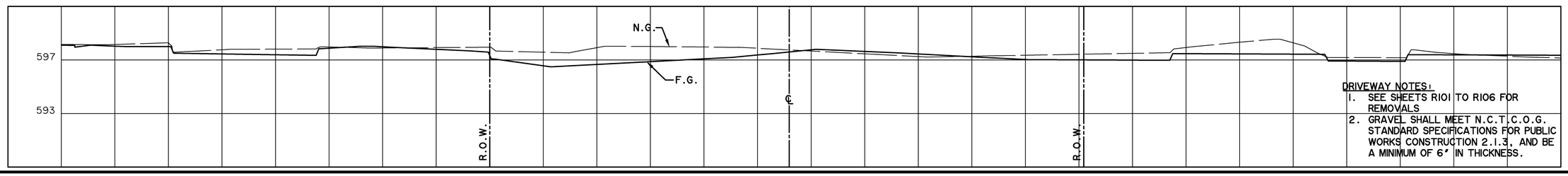
STA: PC 20+70.74
OFFSET: 45.00' RT
T/C = 597.17

40' R

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0 10 20 30



DRIVEWAY NOTES:

1. SEE SHEETS R101 TO R106 FOR REMOVALS
2. GRAVEL SHALL MEET N.C.T.C.O.G. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 2.1.3, AND BE A MINIMUM OF 6' IN THICKNESS.

PREPARED BY:
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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

DRIVEWAY PLANS

WA# 08029

STATE OF TEXAS · RONALD RAMIREZ · 81821 · REGISTERED PROFESSIONAL ENGINEER

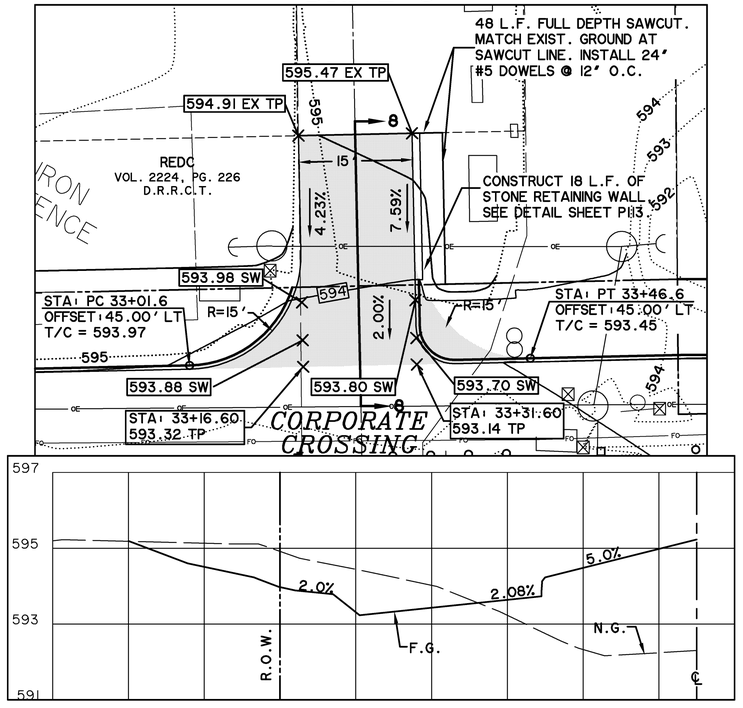
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LAST SHEET EDIT DATE 09-19-2013
WA# 08029

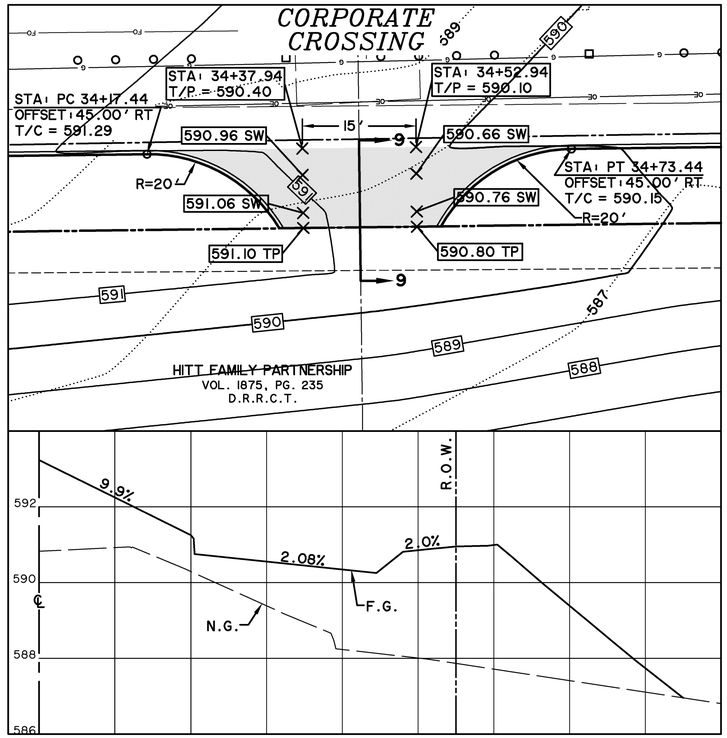
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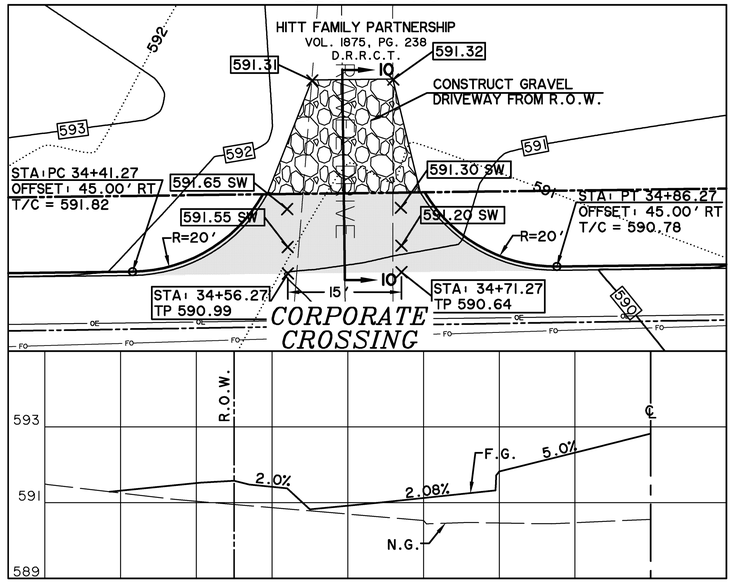
DRIVE 8



DRIVE 9



DRIVE 10



CAUTION !!

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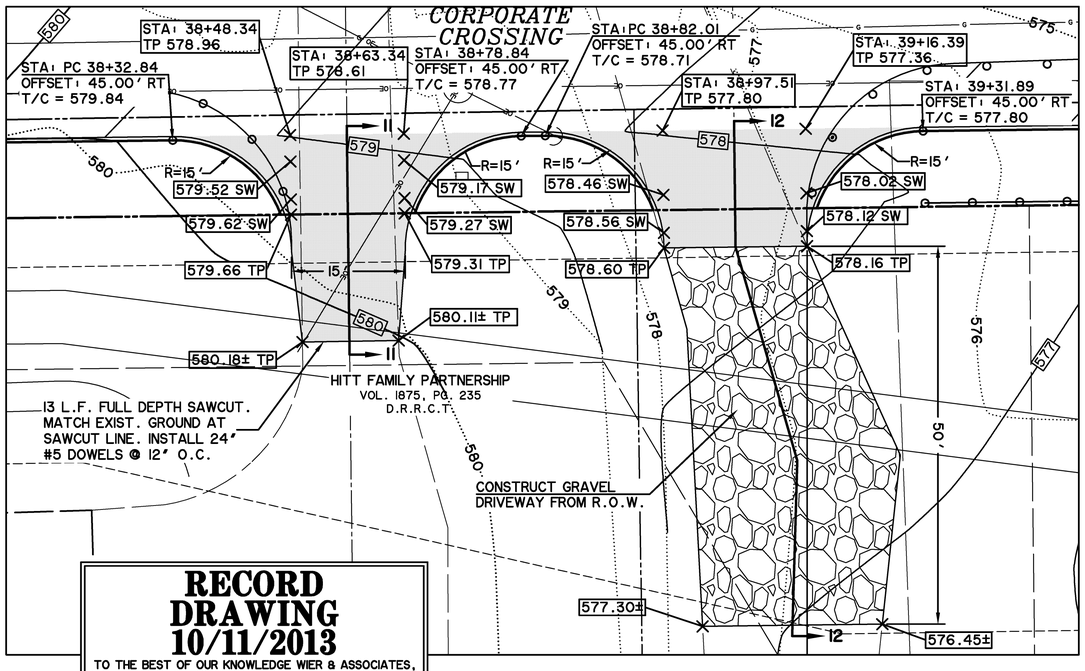
• BENCH MARKS •

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

DRIVE 11

DRIVE 12



NOTES FOR WORK IN NTMWD EASEMENT:

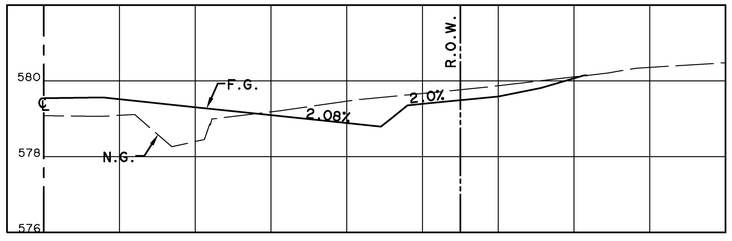
1. **CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT**
2. **FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS**
3. **CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.**

DRIVEWAY NOTES:

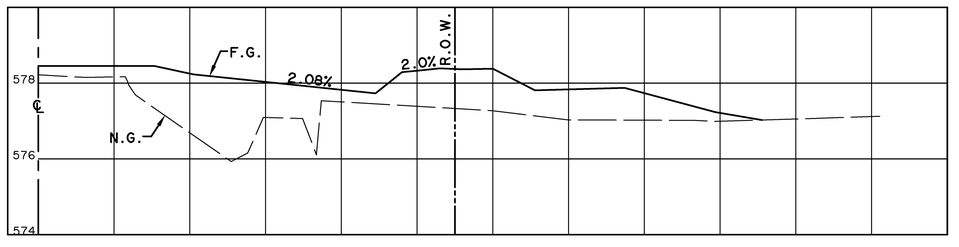
1. SEE SHEETS R101 TO R106 FOR REMOVALS
2. GRAVEL SHALL MEET N.C.T.C.O.G. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 2.1.3, AND BE A MINIMUM OF 6" IN THICKNESS.

0 10 20 30

DRIVE 11



DRIVE 12



RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

FM 549
FM 276 TO I-30
DRIVEWAY PLANS

WA# 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER

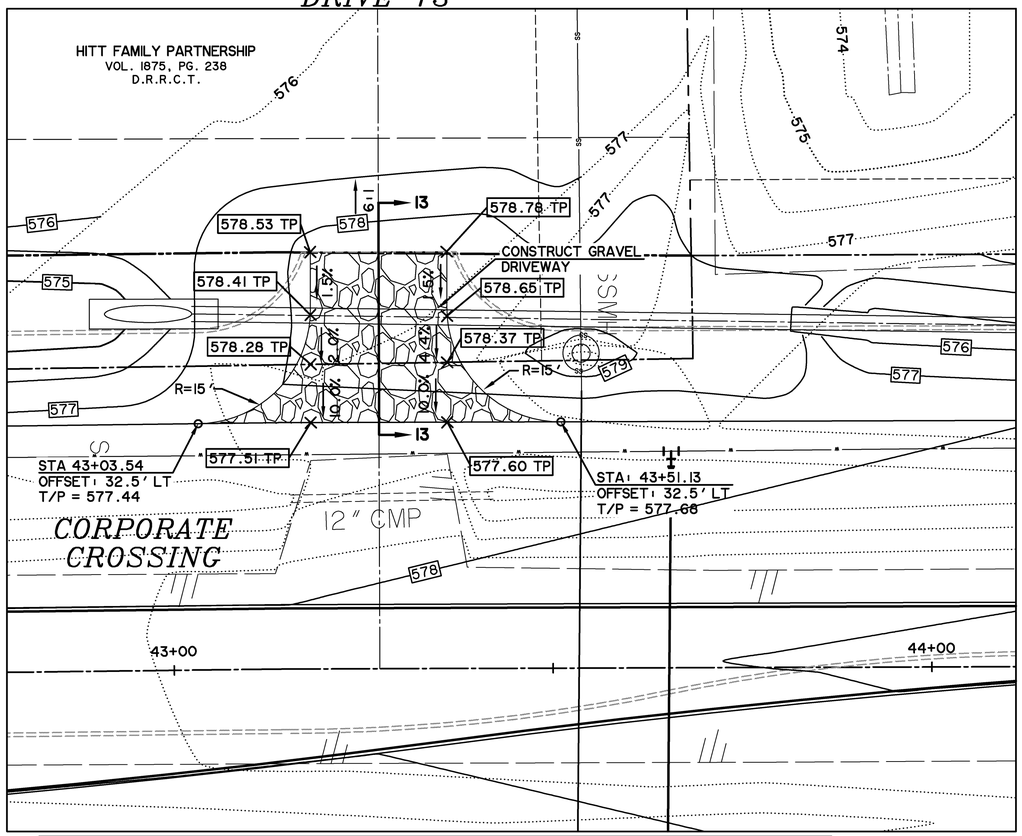
COPYRIGHT © WIER & ASSOCIATES, INC.

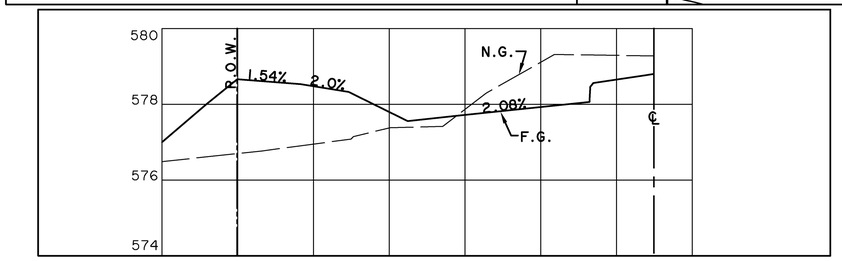
LAST SHEET EDIT DATE 09-17-2013
WA# 08029

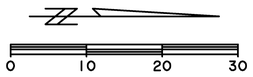
SHEET NO. P112

FILE: P112-DRIVEWAYS.dwg
TIME: 15:29

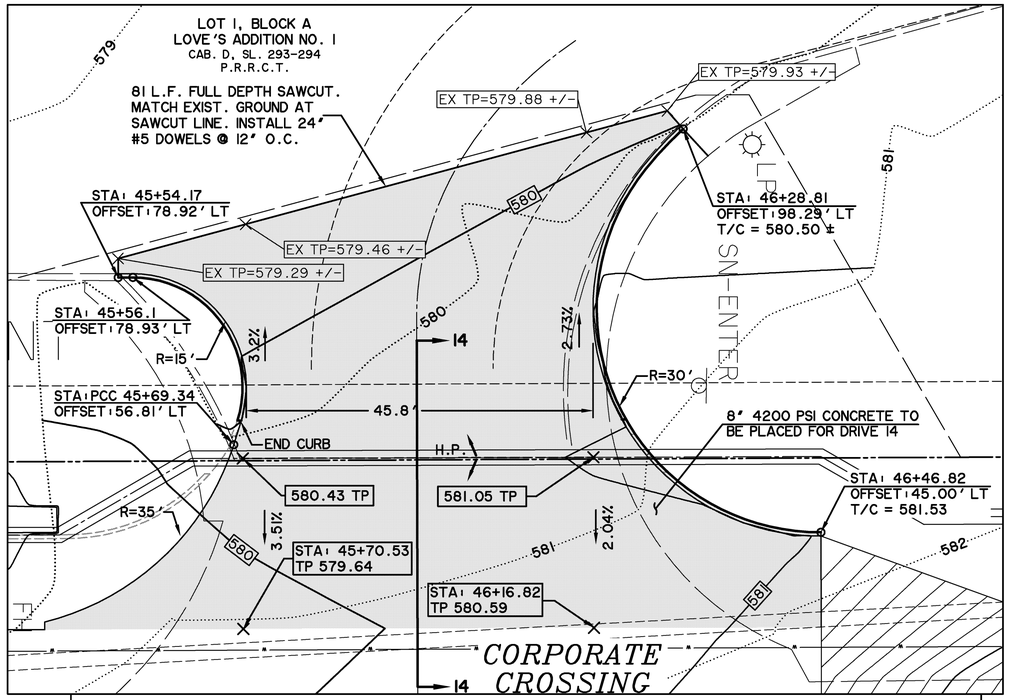
DRIVE 13

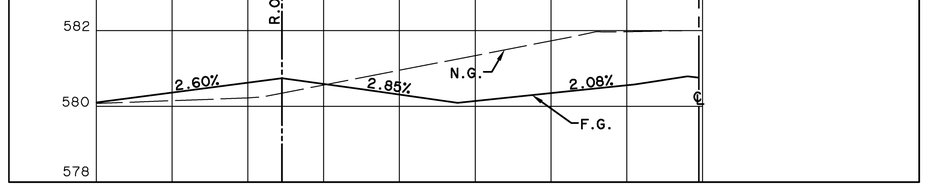






DRIVE 14





DRIVEWAY NOTES:
1. SEE SHEETS R101 TO R106 FOR REMOVALS
2. GRAVEL SHALL MEET N.C.T.C.O.G. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 2.1.3, AND BE A MINIMUM OF 6" IN THICKNESS.

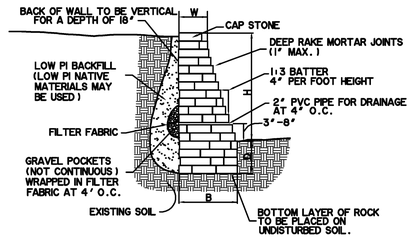
NOTES FOR WORK IN NTMWD EASEMENT:

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RECORD DRAWING 10/11/2013

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NOTES:
1. CONTRACTOR SHALL TAKE ALL NECESSARY CONSTRUCTION MEASURES TO PRESERVE THE EXISTING TREES, INCLUDING THE INSTALLATION OF GEOGRID/FABRIC AND ALL BACKFILL.
2. ALL FILL AND BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95 % OF THE STANDARD PROCTOR MAXIMUM
3. ALL STONE SHALL BE BLOCKS OF 8" IN HEIGHT.
4. CONTRACTOR SHALL COORDINATE WITH CITY INSPECTOR ON COLOR AVALIABILITY AND SELECTION PRIOR TO ORDERING MATERIALS.
5. CONTRACTOR SHALL SUBMIT MATERIALS AND CONSTRUCTION METHODS TO ENGINEER FOR APPROVAL.



WALL DESIGN DIMENSIONS			
WALL HEIGHTS - H	B	D	W
0' TO 4'	16" MIN.	12" MIN.	12" MIN.

STONEWALL SECTION
N.T.S.

CAUTION 11

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N 7022945.40, E 2607163.95

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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

DRIVEWAY PLANS

RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
WA# 08029

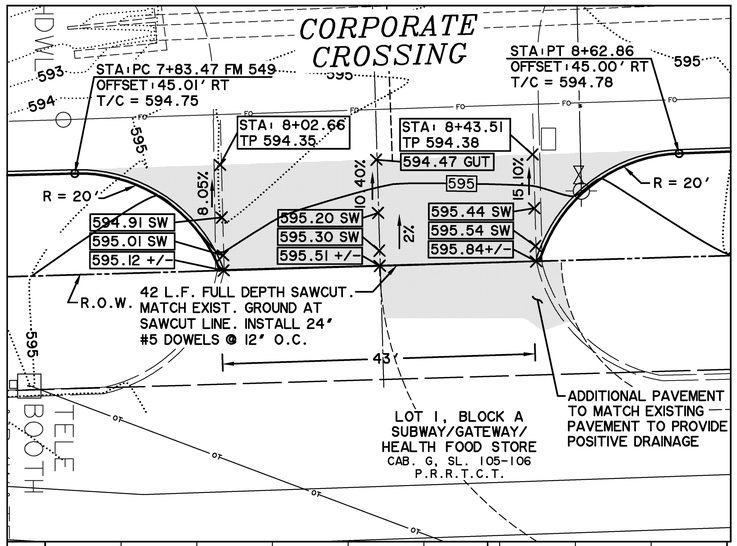
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LAST SHEET EDIT DATE 09-13-2013
WA# 08029

SHEET NO. P113

FILE: P113-DRIVEWAYS.dwg
TIME: 10:11

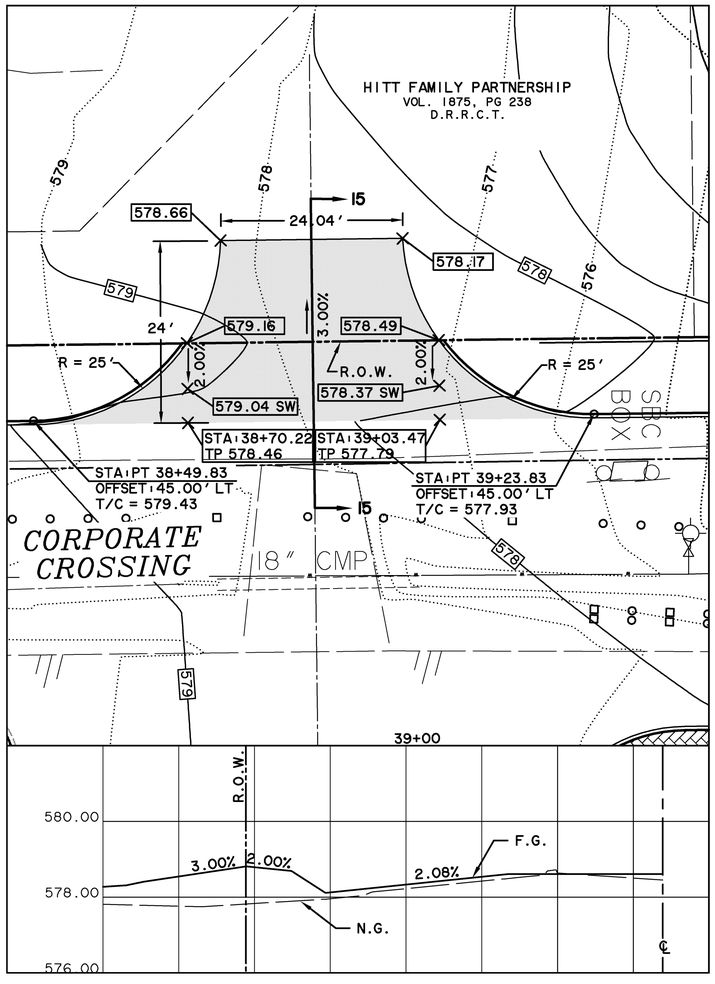
DRIVE 1



NOTE FOR DRIVEWAY 1:

DO NOT GRADE OR DISTURB LANDSCAPING BEYOND THE RIGHT-OF-WAY LINE FOR THIS LOT.

DRIVE 15



DRIVEWAY NOTES:

1. SEE SHEETS R101 TO R106 FOR REMOVALS
2. GRAVEL SHALL MEET N.C.T.C.O.G. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 2.1.3, AND BE A MINIMUM OF 6" IN THICKNESS.

0 10 20 30

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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

DRIVEWAY PLANS

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
09/19/13

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LAST SHEET EDIT DATE 09-19-2013
WA# 08029

SHEET NO. P114

FILE: P114-DRIVEWAYS.dwg
TIME 19:49

LOFLAND FARMS
VOL. 1392, PG 271
D.R.R.C.T.

0 40 80 120

WITHIN TXDOT RIGHT-OF-WAY INSTALL MARKINGS PER DETAIL SHEETS M201 AND M202.

3' SHOULDER

MATCH EXISTING STRIPING

F. M. 549

R=850'

R=862'

R=4050'

343' TRANSITION

R=4050'

3' SHOULDER

1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00

S. H. 276

INSTALL 24' THERMOPLASTIC STOP BARS

INSTALL THERMOPLASTIC DIRECTIONAL INDICATORS AS SHOWN

INSTALL 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

INSTALL 4'x4' ONE WAY CLEAR REFLECTIVE ACRYLIC BUTTONS. SEE DETAIL, SHEET P003

LOT 8, BLOCK A
REDC

175' 175'

SIGN #1

SIGN #2

CORPORATE CROSSING

INSTALL 4' SOLID WHITE CROSSHATCH STRIPE

INSTALL 4' SOLID WHITE STIPE

INSTALL 4' SOLID WHITE STIPE

D.F.W. DISTRIBUTOR
VOL. 1799, PG. 302
D.R.R.C.T.

LOT 1, BLOCK A
SUBWAY/GATEWAY/
HEALTH FOOD STORE
CAB. G, SL. 105-106
P.R.R.T.C.T.

LOT 1, BLOCK A
PANNEL ADDITION
CAB. B, SL. 365
P.R.R.C.T.

MATCH LINE STA 11+50

MATCH LINE STA 11+50

LOT 8, BLOCK A
REDC

LOT 7, BLOCK A
REDC

INSTALL THERMOPLASTIC LEFT TURN ONLY INDICATOR

INSTALL 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

INSTALL 4'x4' ONE WAY CLEAR REFLECTIVE ACRYLIC BUTTONS. SEE DETAIL, SHEET P003

REPLACE EXIST. TRAFFIC BUTTONS (WHITE) IN RECONSTRUCTED AREAS OF DISCOVERY

INSTALL THERMOPLASTIC LEFT TURN ONLY INDICATOR

CORPORATE CROSSING

12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00

INSTALL 24' THERMOPLASTIC STOP BARS

INSTALL 24' THERMOPLASTIC STOP BAR

SPRINGER ROAD

DISCOVERY BLVD.

INSTALL 4'x4' ONE WAY CLEAR REFLECTIVE ACRYLIC BUTTONS & 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

INSTALL THERMOPLASTIC LEFT TURN ONLY INDICATOR

REPLACE EXIST. TRAFFIC BUTTONS (WHITE) IN RECONSTRUCTED AREAS OF SPRINGER

REPLACE EXIST. TRAFFIC BUTTONS (WHITE) IN RECONSTRUCTED AREAS OF DISCOVERY

RONALD A. HAMILTON (ESTATE OF ANN HAMILTON)
VOL. 4797, PG. 260
D.R.R.C.T.

LOT 1, BLOCK B
REDC
VOL. 2224, PG. 226
D.R.R.C.T.

MATCH LINE STA 22+50

SIGN #1



R3-5(r)
30"x36"

SIGN #2



R3-7(r)
36"x36"

RECORD DRAWING 10/11/2013

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Texas Firm Registration No. F-2776 www.Wierassociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

PAVEMENT MARKINGS BEGINNING TO STA 22+50

WA# 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT DATE 09-13-2013

SHEET NO. M101

FILE: M101-PAV-MARKINGS.dwg
TIME: 11:21

MATCH LINE STA 22+50

INSTALL 4'x4' ONE WAY CLEAR REFLECTIVE ACRYLIC BUTTONS & 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

LOT 1, BLOCK E REDC CAB. D, SL. 175-176 P.R.R.C.T.

INSTALL 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

INSTALL 4'x4' ONE WAY CLEAR REFLECTIVE ACRYLIC BUTTONS. SEE DETAIL, SHEET P003

LOT 2, BLOCK E REDC CAB. D, SL. 175-176 P.R.R.C.T.

CORPORATE CROSSING

23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00

LOT 1, BLOCK A REDC VOL. 2224, PG. 226 D.R.R.C.T.

HITT FAMILY PARTNERSHIP VOL. 1875, PG 235 D.R.R.C.T.

MATCH LINE STA 32+50

MATCH LINE STA 32+50

HITT FAMILY PARTNERSHIP VOL. 1875, PG. 238 D.R.R.C.T.

INSTALL 4'x4' ONE WAY CLEAR REFLECTIVE ACRYLIC BUTTONS. SEE DETAIL, SHEET P003

INSTALL 4'x4' ONE WAY CLEAR REFLECTIVE ACRYLIC BUTTONS & 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

R=1254'

INSTALL 4' SOLID WHITE STRIPE

R=1176'

HITT FAMILY PARTNERSHIP VOL. 1875, PG. 238 D.R.R.C.T.

CORPORATE CROSSING

33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00

INSTALL 4' SOLID WHITE STRIPE

SIGN #1

175'

INSTALL 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

START OF PROPOSED STRIPING

HITT FAMILY PARTNERSHIP VOL. 1875, PG. 235 D.R.R.C.T.

INSTALL 4' SOLID WHITE STRIPE

FLOYD HITT AND WIFE LEOLA HITT VOL 86, PG 215 SAVE AND EXCEPT TRACT VOL. 1875, PG. 235 D.R.R.C.T.

INSTALL 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

HITT FAMILY PARTNERSHIP VOL. 1875, PG. 235 D.R.R.C.T.

INSTALL 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

MATCH LINE STA 42+50

MATCH LINE STA 42+50

LOT 1, BLOCK A LOVE'S ADDITION NO. 1 CAB. D, SL. 293-294 P.R.R.C.T.

INSTALL 4'x4' ONE WAY CLEAR REFLECTIVE ACRYLIC BUTTONS. SEE DETAIL, SHEET P003

INSTALL 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

INSTALL 4' DOTTED WHITE STRIPE

INSTALL 4' SOLID WHITE STRIPE

INSTALL 4' SOLID WHITE STRIPE

GATE

CORPORATE CROSSING

43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00

INSTALL 4'X4' DOUBLE AMBER ACRYLIC REFLECTIVE BUTTONS

4' SOLID WHITE STRIPE

MARIAH BAY INC. DEVELOPMENT, VOL. 2358, PG. 265 D.R.R.C.T.

INSTALL 4' NON-REFLECTIVE ROUND WHITE CERAMIC BUTTONS. SEE DETAIL, SHEET P003

THE WHITMORE MANUFACTURING COMPANY INST #D2010-00432707 D.R.R.C.T.

INSTALL 4' SOLID YELLOW STRIPE

0 40 80 120

SIGN #1

LANE ENDS MERGE LEFT

W9-2T 36'x36'

*** BENCH MARKS ***

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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

PAVEMENT MARKINGS
STA 22+50 TO END

WA# 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER

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LAST SHEET EDIT DATE 09-13-2013

SHEET NO. M102

FILE: M102-PAV-MARKINGS.dwg
TIME 15:38

LOT 8, BLOCK A
REDC

CORPORATE CROSSING

PP

0 20 40 60

REMOVE EXISTING STRIPING ALONG S.H. 276 IN AREAS TO BE RESTRIPED

WITHIN TXDOT RIGHT-OF-WAY INSTALL MARKINGS PER DETAIL SHEETS M201 AND M202.

REMOVE EXISTING RUMBLE STRIPS AND OVERLAY W/ HMAC PER TXDOT STANDARD. 6.5' WIDE

MATCH EXISTING STRIPING

1800' R

1800' R

1800' R

1800' R

250' R

250' R

1800' R

1800' R

MATCH EXISTING STRIPING

S.H. 276

ONLY

ONLY

4' SHOULDER (TYP.)

100' DECELERATION

300' STORAGE

LOFLAND FARMS
VOL. 1392, PG 271
D.R.R.C.T.

LOT 1, BLOCK A
SUBWAY/GATEWAY/
HEALTH FOOD STORE
CAB. G, SL. 105-106
P.R.R.C.T.

PRISM LEASING, LTD
VOL. 1244, PG. 111
D.R.R.C.T.

CORPORATE CROSSING

TREE 4*8 TREE 4*8
TREE 4*8

TREE 3*5
TREE 3*5

CO

REMOVE EXISTING RUMBLE STRIPS AND OVERLAY W/ HMAC PER TXDOT STANDARD. 6.5' WIDE

300' STORAGE

100' DECELERATION

MATCH EXISTING STRIPING

1800' R

1800' R

250' R

250' R

1800' R

1800' R

MATCH EXISTING STRIPING

S.H. 276

ONLY

ONLY

4' SHOULDER (TYP)

SN

NOTE:
COORDINATE WITH CITY & STATE FOR ADJUSTMENTS TO TRAFFIC SIGNAL

WITHIN TXDOT RIGHT-OF-WAY INSTALL MARKINGS PER DETAIL SHEETS M201 AND M202.

REMOVE EXISTING STRIPING ALONG S.H. 276 IN AREAS TO BE RESTRIPED

D.F.W. DISTRIBUTOR
VOL. 1799, PG. 302
D.R.R.C.T.

• BENCH MARKS •

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

PAVEMENT MARKINGS
FM 276 TURN LANES

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER

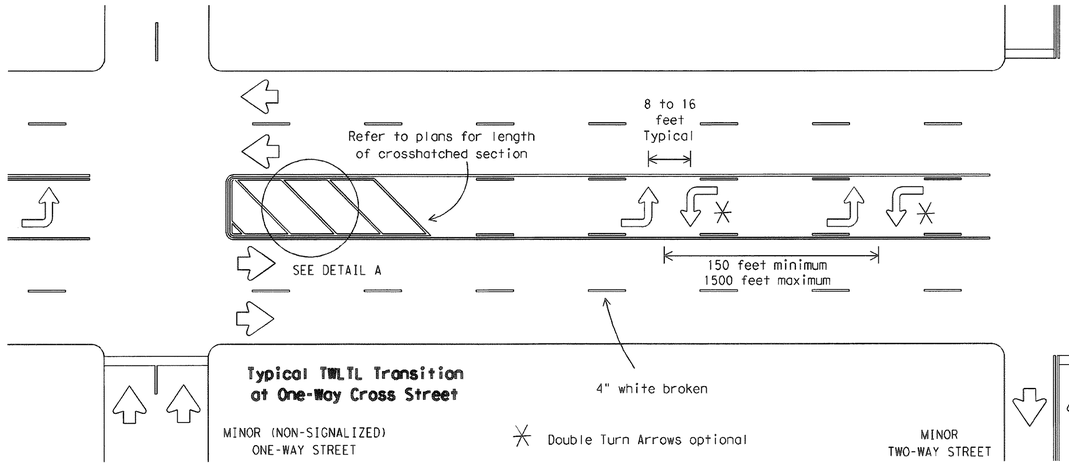
COPYRIGHT © WIER & ASSOCIATES, INC.

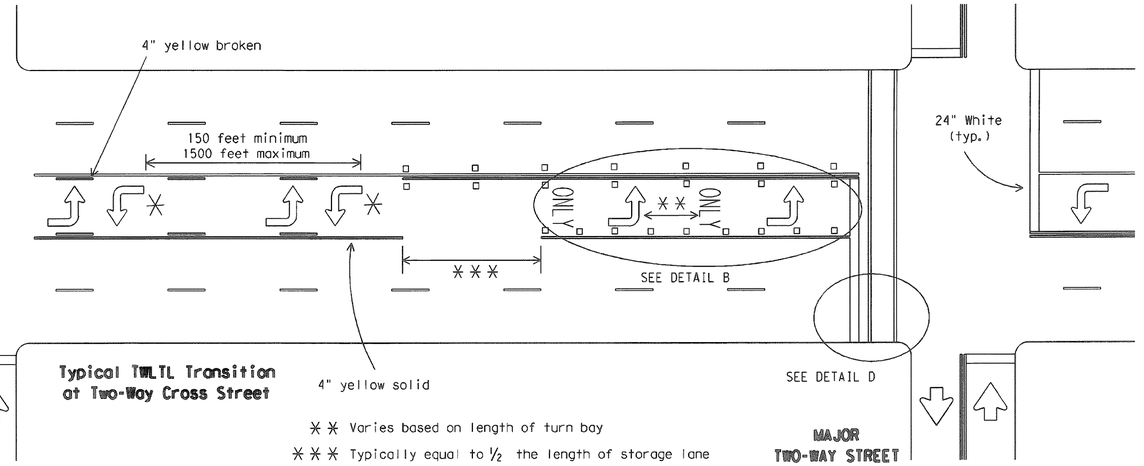
LAST SHEET EDIT DATE 09-19-2013
WA# 08029

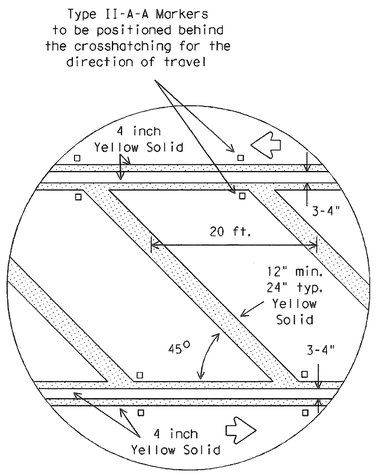
SHEET NO.
M103

FILE: M103-PAV-MARKINGS.dwg
TIME: 8:43

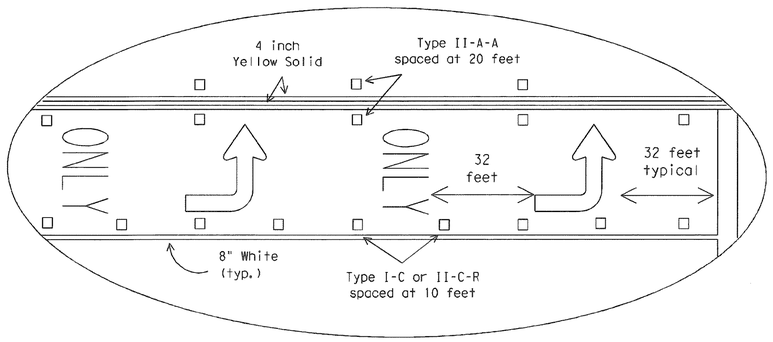
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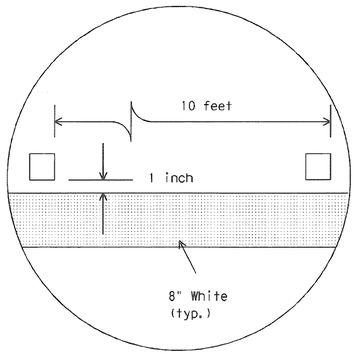




DETAIL A

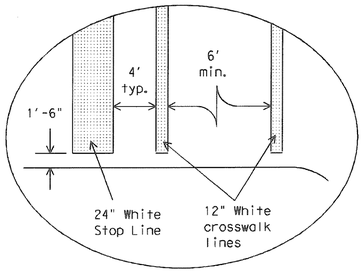


DETAIL B



DETAIL C

Raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes.
Raised pavement marker Type II-C-R with divided highways and raised medians.

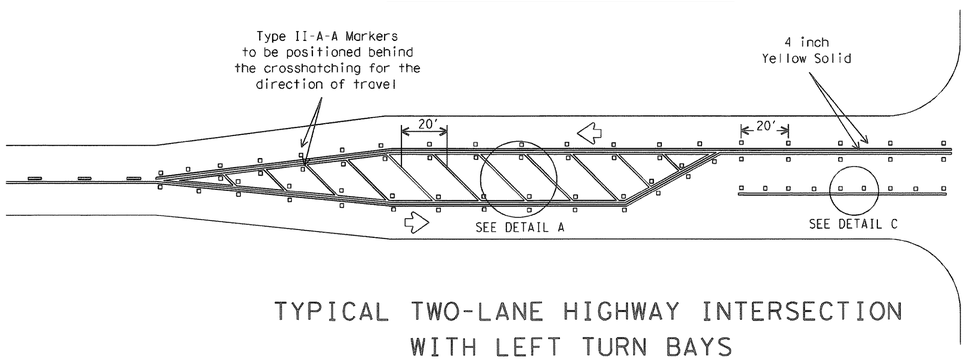


DETAIL D

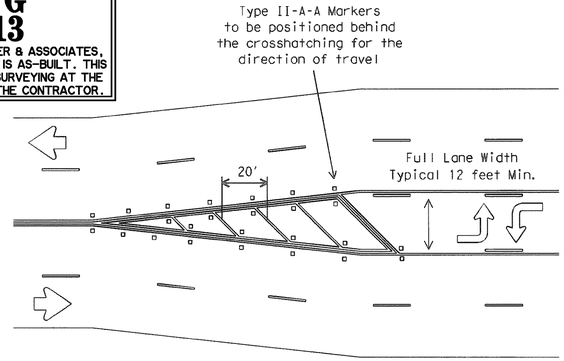
Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

RECORD DRAWING 10/11/2013
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TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

Refer elsewhere in plans for additional RPM placement and details.

Details for words and arrows as shown on other sheets.

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

For a left turn bay, two sets of words and arrows shall be used if the length of the bay is equal to or greater than 180 feet. The bottom of the first ONLY shall be placed at the beginning of the turn bay lane line as shown above.

Other crosswalk paterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used.

SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVE. MKS.	DMS-6130

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

PAVEMENT MARKINGS FOR TWO-WAY LEFT TURN LANES DIVIDED HIGHWAYS AND RURAL LEFT TURN BAYS

PM(4)-03

© TxDOT April 1998

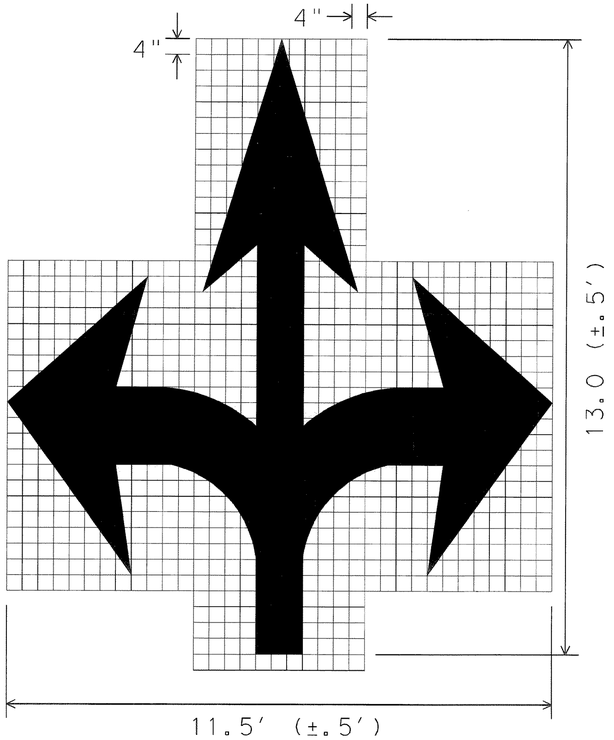
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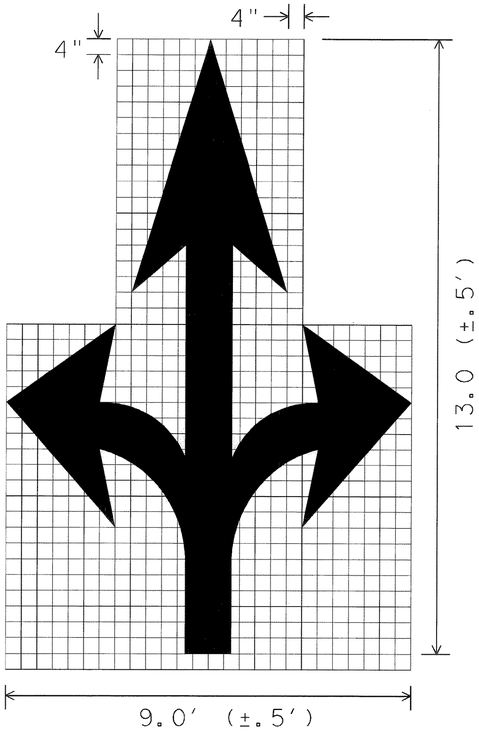
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
5-00		6		M201
8-00				
3-03	COUNTY	CONTROL	SECTION	JOB / HIGHWAY

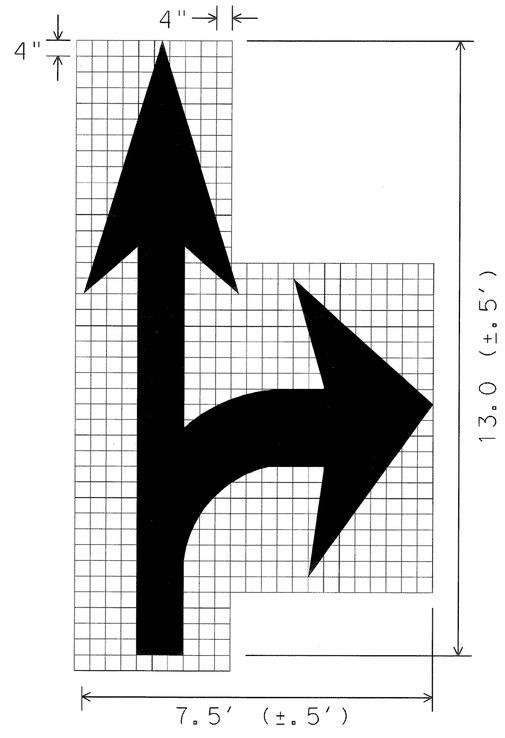
LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 21 31 41 51 61
71 81 91 92 01 02 12 22 32 42 52 62 72 82 92 03 13 23
33 43 53 63 73 83 93 04 14 24 34 44 54 64 74 84
95 05 15 25 35 45 55 65 75 85 96 06 16 26 36

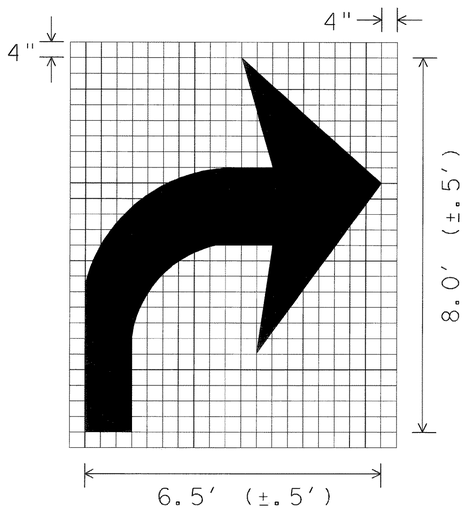
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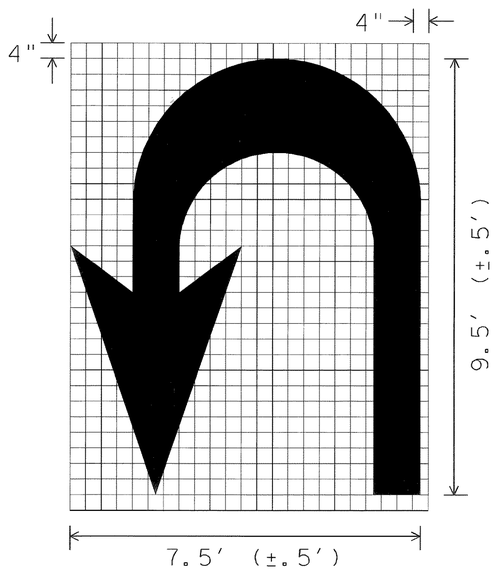
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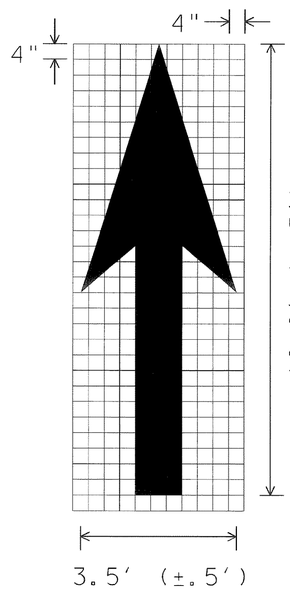


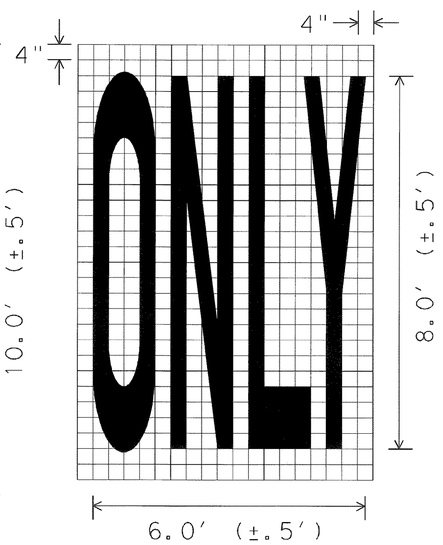












GENERAL NOTES;

1. Minimum 8 foot white markings should be used, unless otherwise noted. If message consists of more than one word, it should be placed with first word nearest the driver.
2. These details are standard size for normal installation; sizes may be reduced approximately one-third for low speed urban conditions; larger sizes may be needed for freeways, above average speed conditions or other critical locations.
3. The longitudinal space between markings should be at least four times the height of the markings, on low speed roads, but should not exceed ten times the height under any condition.
4. Markings considered appropriate for use when warranted include the following:
   A. Regulatory
      STOP
      RIGHT (LEFT) TURN ONLY
      25 MPH
      SYMBOL ARROWS
   B. Warning
      STOP AHEAD
      SIGNAL AHEAD
      SCHOOL
      SCHOOL X-ING
      PED X-ING
      R X R (see RCPM standard)
   C. Guide
      US XXX
      ROUTE XXX
      STATE XXX
      Other words or symbols may be necessary under certain conditions
5. Uncontrolled use of pavement markings can result in driver confusion. Word and symbol markings should be no more than three lines.
6. The word "STOP" shall not be used on the pavement unless accompanied by a Stop line and Stop sign. The word "STOP" shall not be placed on the pavement in advance to a stop line, unless every vehicle is required to stop at all times.
7. Pavement markings should generally be no more than one lane in width, with School messages being the exception. For details of School and School crossing pavement markings, refer to Part VII of the "Texas Manual on Uniform Traffic Control Devices".
8. Spacing between letters should be approximately 4 inches. The width of letters may vary depending on the width of the travel lanes.
9. Lane-Use arrow markings may be used to convey either guidance or mandatory messages. Arrows used to convey a mandatory movement must be accompanied by standard signs and the pavement marking word "ONLY".
10. Pavement markings are to be located as specified elsewhere in the plans.

SPACING BETWEEN LINES OF PAVEMENT MARKINGS	
MPH	SPACING
≤45	MINIMUM 4 TIMES THE LETTER HEIGHT
>45	MINIMUM - 4 TIMES THE LETTER HEIGHT MAXIMUM - 10 TIMES THE LETTER HEIGHT

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64
ACC:

RECORD DRAWING 10/11/2013

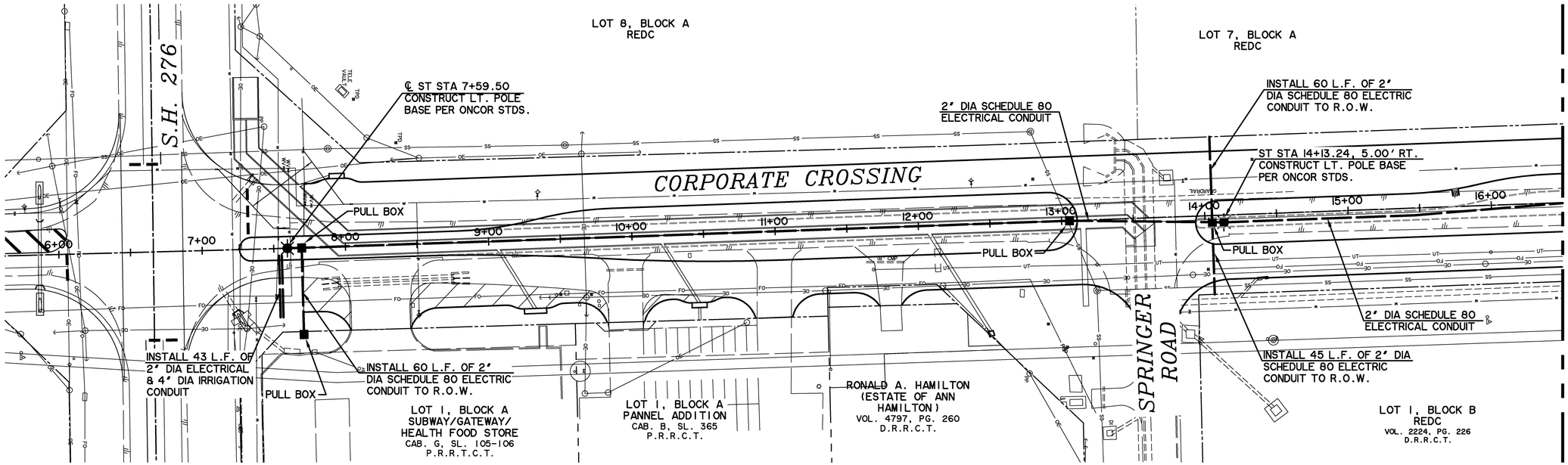
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STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

STANDARD PAVEMENT MARKINGS (ARROWS)

PM(6)-01

© TxDOT March 2001	DN:	CK: GRB	DW: FDN	CK: CAL
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
		6		M202
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY



CAUTION !!

EXISTING UTILITIES ARE INDICATED ON THE PLANS FROM AVAILABLE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES, TO NOTIFY ALL UTILITY COMPANIES OF THE CONTRACTORS OPERATIONS, TO PROTECT ALL UTILITIES FROM DAMAGE, TO REPAIR ALL UTILITIES DAMAGED DUE TO THE CONTRACTORS OPERATIONS, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING UTILITIES.

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CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO L.H. 30)

STREET LIGHTING & CONDUIT INSTALLATION PLAN

BEGINNING TO STA 27+50

WA# 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER

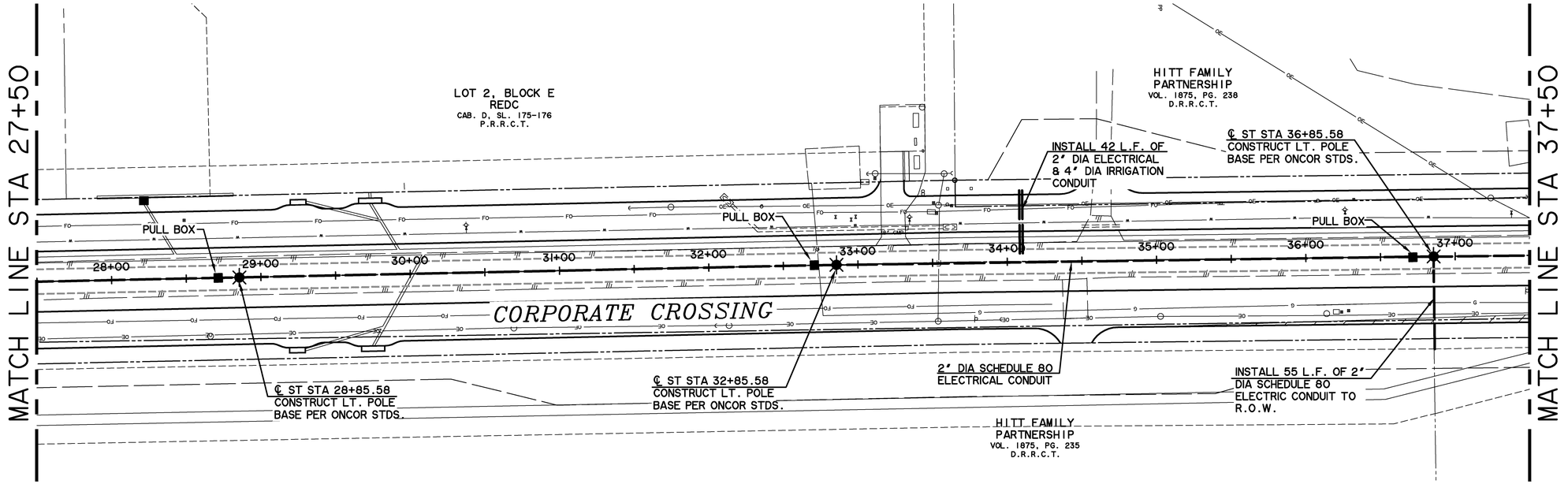
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LAST SHEET EDIT DATE 09-12-2013

WA# 08029

SHEET NO. 1101

TIME 16:45 FILE: 1101-ST-LIGHTING.dwg



CAUTION ! !

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RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO L.H. 30)

STREET LIGHTING & CONDUIT INSTALLATION PLAN
STA 27+50 TO END

WA# 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT DATE 09-12-2013

SHEET NO. 1102

TIME:16:48 FILE:1102-ST_LIGHTING.dwg

MATCH LINE SHEET G102

• BENCH MARKS •

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

LOT 8, BLOCK A
REDC

CORPORATE CROSSING

15' BUILDING LINE

MATCH EXISTING GRADE AT
R.O.W. LINE FOR THIS LOT.
DO NOT DISTURB LANDSCAPING
BEYOND R.O.W. LINE.

LOT 1, BLOCK A
SUBWAY/GATEWAY/HEALTH FOOD STORE
CAB. G, SL. 105-106
P.R.R.C.T.

50' NTMWD
EASEMENT
SEE NOTES

EX LANDSCAPE
& UTILITY
EASEMENT

15' BUILDING LINE

SH 276

LOFLAND FARMS
VOL. 1392, PG. 271
D.R.R.C.T.

D.F.W. DISTRIBUTOR
VOL. 1799, PG. 302
D.R.R.C.T.

50' NTMWD
EASEMENT
SEE NOTES

FM 549

MATCH LINE THIS SHEET

MATCH LINE THIS SHEET

0 40 80 120

0 40 80 120

CAUTION !!

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NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
3. CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.

RECORD DRAWING 10/11/2013

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Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

GRADING PLAN
BEGINNING TO STA 10+00

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED
PROFESSIONAL ENGINEER
10/11/13

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LAST SHEET EDIT
DATE 09-13-2013
WA# 08029

SHEET NO.
G101

FILE: I:\G101-GRADING.dwg
TIME: 10:04

MATCH LINE SHEET G101

MATCH LINE THIS SHEET

LOT 8, BLOCK A
REDC

LOT 7, BLOCK A
REDC

CORPORATE CROSSING

SPRINGER ROAD

DISCOVERY BLVD

25' BUILDING LINE

TEMPORARY CONSTRUCTION EASEMENT

PERMANENT DRAINAGE EASEMENT

TEMPORARY CONSTRUCTION EASEMENT

RONALD A. HAMILTON
(ESTATE OF ANN HAMILTON)
VOL. 4797, PG. 260
D.R.R.C.T.

50' NTMWD EASEMENT
SEE NOTE 1

RECORD DRAWING 10/11/2013

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LOT 3, BLOCK E,
REDC
CAB D, SL 175-176
P.R.R.C.T.

LOT 2, BLOCK E,
REDC
CAB D, SL 175-176
P.R.R.C.T.

LOT 1, BLOCK A
ROCKWALL ECONOMIC
DEVELOPMENT CORPORATION
VOL. 2224, PG. 226
D.R.R.C.T.

HITT FAMILY PARTNERSHIP
VOL. 1875, PG. 235
D.R.R.C.T.

50' NTMWD EASEMENT SEE NOTES

TEMPORARY CONSTRUCTION EASEMENT

NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
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0 40 80 120

MATCH LINE THIS SHEET

MATCH LINE SHEET G103

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

GRADING PLAN
STA 10+00 TO STA 33+00

WA# 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED
PROFESSIONAL ENGINEER

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LAST SHEET EDIT DATE 09-13-2013
WA# 08029

SHEET NO. G102

TIME: 10:04 FILE: G102-GRADING.dwg

MATCH LINE SHEET G102

REDC

HITT FAMILY PARTNERSHIIP
VOL. 1875, PG. 238
D.R.R.C.T.

TEMPORARY CONSTRUCTION EASEMENT

PERMANENT DRAINAGE EASEMENT

595 590 585 580 575 570 565

34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00

CORPORATE CROSSING

RIDGE

50' NTMWD EASEMENT SEE NOTES

HITT FAMILY PARTNERSHIIP
VOL. 1875, PG. 235
D.R.R.C.T.

TEMPORARY CONSTRUCTION EASEMENT

FLOYD HITT AND WIFE LEOLA HITT
VOL. 86, PG. 215
SAVE & EXCEPT TRACT
VOL. 1875, PG 235
D.R.R.C.T.

PERMANENT DRAINAGE EASEMENT

HITT FAMILY PARTNERSHIIP
VOL. 1875, PG. 235
D.R.R.C.T.

MARIAH BAY DEVELOPMENT, INC.
VOL. 2358, PG. 268
D.R.R.C.T.

MATCH LINE THIS SHEET

MATCH LINE THIS SHEET

LOT 1, BLOCK A
LOVE'S ADDITION NO. 1
CAB. D, SL. 293-294
P.R.R.C.T.

TEMPORARY CONSTRUCTION EASEMENT

25' BUILDING LINE

46+00 47+00 48+00

CORPORATE CROSSING

RIDGE

TEMPORARY CONSTRUCTION EASEMENT

50' NTMWD EASEMENT SEE NOTES

THE WHITMORE MANUFACTURING COMPANY
INST #D2010-00432707
D.R.R.C.T.

DRAIN TO CULVERT CROSSING

0 40 80 120

NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
3. CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.

CAUTION ! !

EXISTING UTILITIES ARE INDICATED ON THE PLANS FROM AVAILABLE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES, TO NOTIFY ALL UTILITY COMPANIES OF THE CONTRACTORS OPERATIONS, TO PROTECT ALL UTILITIES FROM DAMAGE, TO REPAIR ALL UTILITIES DAMAGED DUE TO THE CONTRACTORS OPERATIONS, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING UTILITIES.

• BENCH MARKS •

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

GRADING PLAN

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT DATE 09-13-2013
WA# 08029

SHEET NO. G103

TIME: 10:04 FILE: G103-GRADING.dwg

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

NOTES:

1. THE DRAINAGE AREAS AND PATTERNS ILLUSTRATED ON THIS DRAINAGE MAP REPRESENT THE DRAINAGE AREAS AS THEY WILL EXIST AFTER THE CONSTRUCTION OF INTERSTATE 30 IMPROVEMENTS, WHICH IS UNDER DESIGN BY CP&Y. SEE THE INTERIM DRAINAGE AREA MAP, SHEET D004, FOR THE DRAINAGE AREAS AND PATTERNS AS THEY WILL EXIST AFTER CONSTRUCTION OF THE IMPROVEMENTS TO CORPORATE CROSSING (WITHIN THIS PLAN SET), BUT PRIOR TO THE CONSTRUCTION THE THE IMPROVEMENTS TO INTERSTATE 30.
2. SEE PLANS FOR IMPROVEMENTS TO I-30 AND FM 3549 PREPARED BY CP&Y FOR DRAINAGE AREAS AND CALCULATIONS FOR THESE AREAS.
3. AREA C-16 SHALL DRAIN TO LATERAL C16, WHICH WILL BE EXTENDED UPON FUTURE CONSTRUCTION OF SPRINGER ROAD. CURRENTLY DRAINED BY DITCH.
4. AREA C-5 IS DESIGNED TO BE COLLECTED BY INLET C-6 UPON SITE DEVELOPMENT.
5. AREA C-8 DRAINS TO STREET. AREA C-7 IS DESIGNED TO BE COLLECTED BY A STORM DRAIN SYSTEM WHICH WILL CONNECT TO STUB C9 UPON SITE DEVELOPMENT.
6. AREA B-8.1 BOUNDARY IS BASED ON PLANS FOR LOT 3, BLOCK E, ROCKWALL TECHNOLOGY PARK, DATED FEBRUARY 2009. AREA B-8.1 DRAINS TO A POND WITH TWO OUTFALL STRUCTURES. THE RELEASE OF EACH STRUCTURE WAS TAKEN FROM THE REFERENCED PLANS DATED 2/9/09.
7. AREA B-8.2 BOUNDARY IS BASED ON PLANS FOR ROCKWALL TECHNOLOGY PARK, PHASE I, DATED JANUARY 1999. AREA B-8.2 IS DESIGNED TO BE COLLECTED UPON SITE DEVELOPMENT BY A STUB OUT WHICH CONNECTS TO INLET B-5.

LOFLAND FARMS
VOL. 1392, PG. 271
D.R.R.C.T.

HITT FAMILY PARTNERSHIP
VOL. 1875, PG. 238
D.R.R.C.T.

GIANLUCA ROBINO AND MARY C. GOSS
VOL. 4997, PG. 247
D.R.R.C.T.

LOT 1, BLOCK A
LOVE'S ADDITION NO. 1
CAB. D, SL. 293-294
P.R.R.C.T.

ROCKWALL 549/I-30 PARTNERS
VOL. 4924, PG. 273
D.R.R.C.T.

WHITMORE MANUFACTURING COMPANY
VOL. 543, PG. 241
D.R.T.C.T.

DFW DISTRIBUTOR
VOL. 1799, PG. 302
D.R.T.C.T.

JOWERS
VOL. 2687, PG. 33
D.R.T.C.T.

SEE SHEETS D002 & D003 FOR BLOW UP OF MAP AND MORE DETAILED INFORMATION

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 2224, PG. 226
D.R.R.C.T.

HITT FAMILY PARTNERSHIP
VOL. 1875, PG. 235
D.R.R.C.T.

THE WHITMORE MANUFACTURING COMPANY
INST #D2010-00432707
D.R.R.C.T.

JOWERS INC.
VOL. 1215, PG. 155
D.R.T.C.T.

MARIAH BAY DEVELOPMENT, INC.
VOL. 2358, PG. 265
D.R.T.C.T.

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 3495, PG. 314
D.R.R.C.T.

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 2224, PG. 226
D.R.R.C.T.

LATTIMORE MATERIALS COMPANY, L.P.
VOL. 1986, PG. 20
D.R.R.C.T.

①	LOT 1, BLOCK A SUBWAY/GATEWAY/ HEALTH FOOD STORE CAB. G, SL. 105-106 P.R.R.C.T.
②	LOT 1, BLOCK A PARNELL ADDITION CAB. B, SL. 365 P.R.R.C.T.
③	PRISM LEASING LTD VOL. 1244, PG. 111 D.R.R.C.T.
④	RONALD A. HAMILTON (ESTATE OF ANN HAMILTON) VOL. 4797, PG. 260 D.R.R.C.T.

0 200 400 600

PREPARED BY:
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701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
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CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO I.H. 30)

DRAINAGE AREA MAP OVERVIEW

WA 05829
STATE OF TEXAS
RONALD RAMIREZ
81621
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT
DATE 09-15-2013
WA# 05829

SHEET NO.
D001

FILE: D001-Damap-05029.dwg
TIME: 9:57

SEE SHEET D001 FOR DRAINAGE AREA OVERVIEW

MATCH LINE THIS SHEET

MATCH LINE THIS SHEET D003

TO EX. 2-3x6 BOX CULVERT

EXISTING 20' LANDSCAPE, PEDESTRIAN & UTILITY EASEMENT

PROP. S.D. 'C'

PROP. CULVERT 'E-1'

LOFLAND FARMS
VOL. 1392, PG. 271
D.R.R.C.T.

DFW DISTRIBUTOR
VOL. 1799, PG. 302
D.R.T.C.T.

SUBWAY/GATEWAY HEALTH FOOD STORE
CAB G., SL. 105-106
P.R.R.C.T.

LOT 1, BLOCK A
PARNELL ADDITION
CAB B., SL. 365
P.R.R.C.T.

RONALD A. HAMILTON
(ESTATE OF ANN HAMILTON)
VOL. 4797, PG. 260
D.R.R.C.T.

LOT 8, BLOCK A
REDC

LOT 7, BLOCK A
REDC

LOT 1, BLOCK B
REDC

PROPOSED 25' x 30' DRAINAGE EASEMENT

EX. 2-4x3 BOX

S.H. 276

F.M. 549

CORPORATE CROSSING

SPRINGER RD.

X-2 31.1 | C-11 0.77 | C-10 0.32 | C-9 0.51 | C-4 0.45 | C-3 0.45 | X-1 4.33 | C-10a 0.32 | C-8 0.89 | C-6 0.88 | E-1 3.82 | C-15 6.3

LOT 7, BLOCK A
REDC

LOT 3, BLOCK E
REDC
CAB. D, SL. 175 & 176
P.R.R.C.T.

EXISTING DRAINAGE & DETENTION EASEMENT

LOT 2, BLOCK E
REDC
CAB. D, SL. 175 & 176
P.R.R.C.T.

PROP. S.D. 'B'

EXISTING 25' PEDESTRIAN, LANDSCAPE & UTILITY EASEMENT

HITT FAMILY PARTNERSHIP
VOL. 1875, PG. 235
D.R.R.C.T.

EX. 45' S.D.

LOT 1, BLOCK B
REDC

LOT 1, BLOCK A
REDC

DISCOVERY BLVD.

CORPORATE CROSSING

X-2 31.1 | C-12 1.08 | B-8.1 2.30 | B-8.2 1.60 | B-5 0.34 | B-3 1.20 | C-2 0.59 | C-1 0.59 | B-2 0.96 | B-4 0.37 | C-14 30.7 | C-13 5.6 | B-1 8.13 | D-1 152.1

0 50 100 150

RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

DRAINAGE AREA MAP

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT DATE 09-13-2013
WA# 08029

SHEET NO. D002

FILE: D002-Dmap1-08029.dwg
TIME: 9:57

LOT 2, BLOCK E
CAB D, SL 175 & 176
P.R.R.C.T.

HITT FAMILY PARTNERSHIP
VOL.1875, PG. 238
D.R.R.C.T.

PROPOSED 155'x70'
DRAINAGE EASEMENT

LOT 1, BLOCK A
LOVE'S ADDITION NO. 1
CAB. D, SL. 293-294
P.R.R.C.T.

MATCH LINE SHEET D002

MATCH LINE THIS SHEET

B-8.2
1.89

B-7
1.09

B-6
1.09

PROP. S.D. LINE 'B'

PROP. S.D. LINE 'A'

PROP. 24' CULVERT 'A-2.1'

A-4
0.21

A-2
0.76

A-3
0.45

A-1
0.47

CORPORATE CROSSING

PROP. S.D. BOX 'D'

D-1
152.1

PROPOSED 130'x85'
DRAINAGE
EASEMENT

HITT FAMILY PARTNERSHIP
VOL.1875, PG. 235
D.R.R.C.T.

MARIAH BAY DEVELOPMENT, INC.
VOL. 2358, PG. 265
D.R.T.C.T.

THE WHITMORE
MANUFACTURING COMPANY
INST #D2010-00432707
D.R.R.C.T.

0 50 100 150

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LOT 1, BLOCK A
LOVE'S ADDITION NO. 1
CAB. D, SL. 293-294
P.R.R.C.T.

ROCKWALL 549/I-30 PARTNERS
VOL. 4924, PG. 273
D.R.R.C.T.

MATCH LINE THIS SHEET

NOTE:
1. PLANS FOR INTERSTATE 30 IMPROVEMENTS ARE CURRENTLY BEING PREPARED BY CP&Y. AS PART OF THOSE PLANS, A PORTION OF THE DRAINAGE IS TO BE COLLECTED AND CONVEYED TO POINTS ON STORM DRAIN LINE 'A' OF THIS PLAN SET (SEE REMARKS FOR STORM DRAIN LINE 'A' ON CALCULATION SHEETS D005 AND D006 OF THIS PLAN SET). SEE PLANS FOR I-30 AND FM 3549 PREPARED BY CP&Y FOR DRAINAGE AREAS AND CALCULATIONS FOR THESE AREAS.

SEE SHEET D001 FOR DRAINAGE AREA OVERVIEW

PROP. 24' CULVERT 'T-1'

EX. 24' S.D.

SEE NOTE 1 THIS SHEET

INTERSTATE 30

INTERSTATE 30

F.M. 3549

SEE NOTE 1 THIS SHEET

EX. 24' S.D.

WHITMORE MANUFACTURING COMPANY
VOL. 543, PG. 241
D.R.T.C.T.

THE WHITMORE
MANUFACTURING COMPANY
INST #D2010-00432707
D.R.R.C.T.

PREPARED BY:
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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

DRAINAGE AREA MAP

WA# 08029

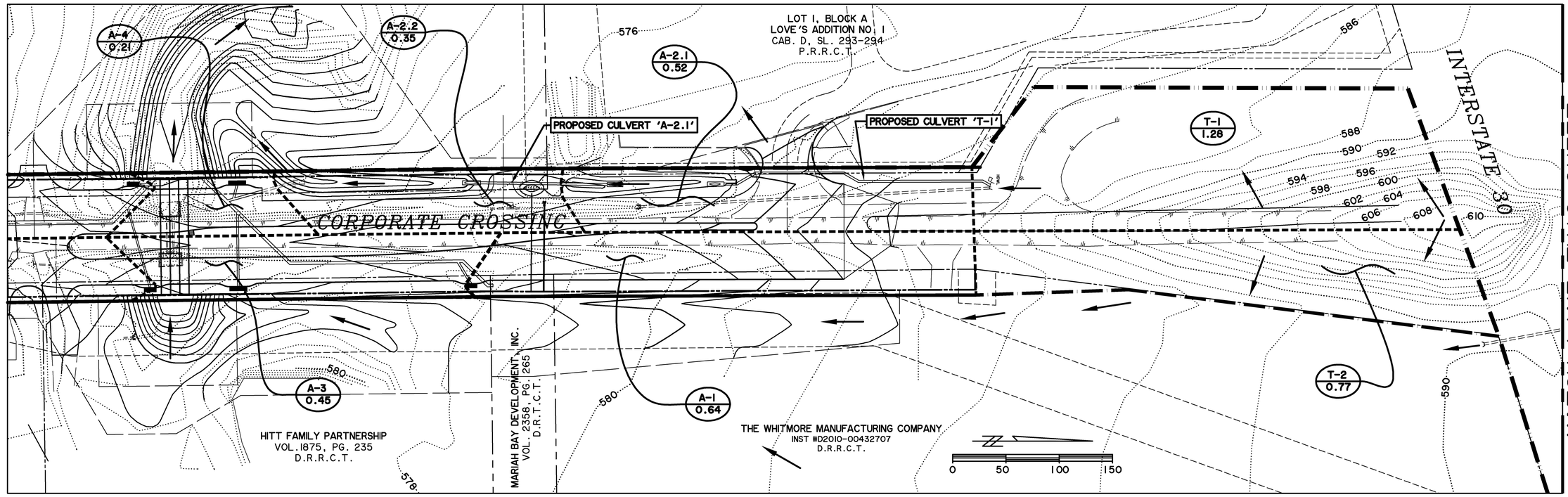
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER

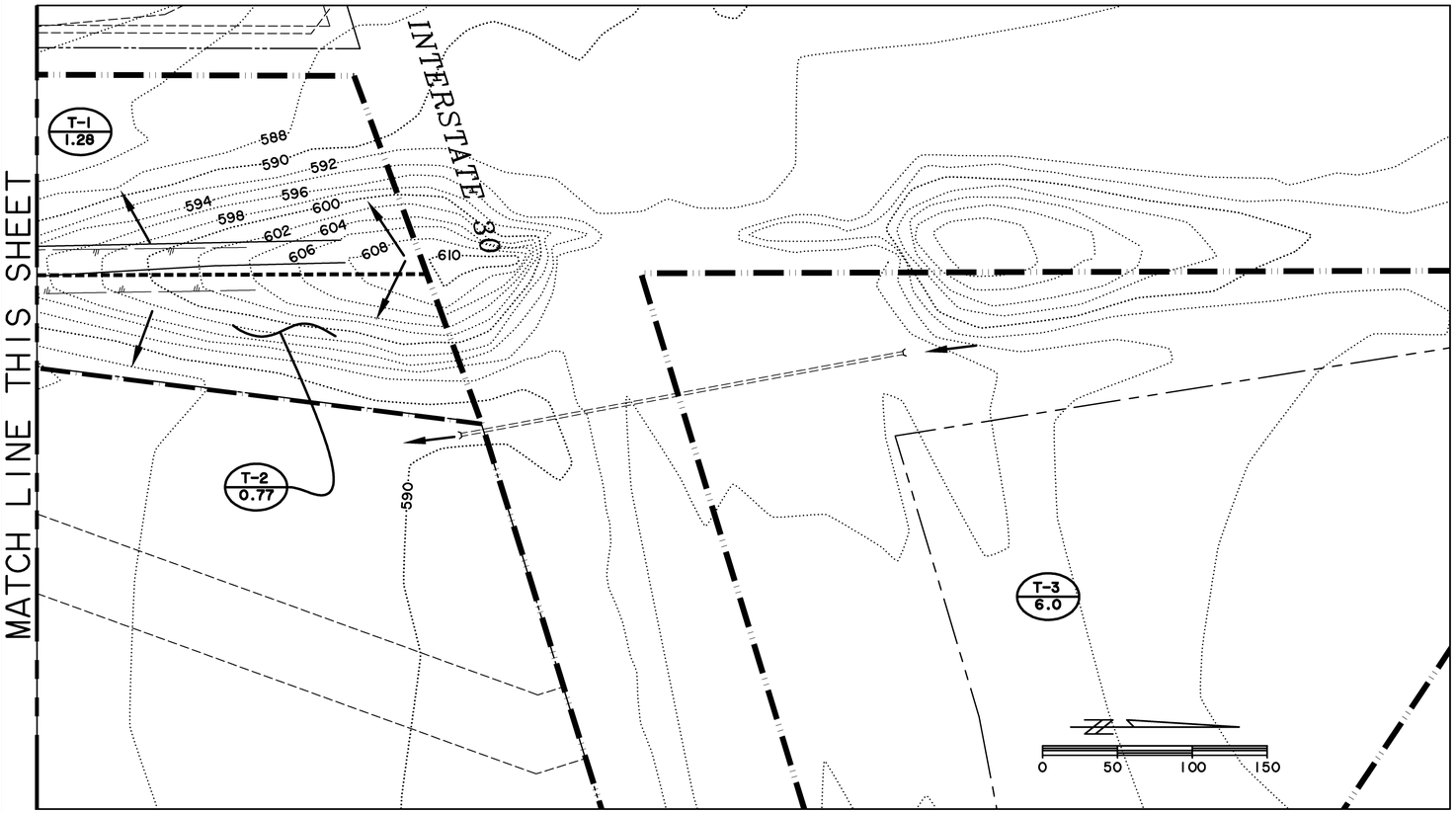
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WA# 08029

SHEET NO. D003

FILE: D003-Dqmap2-08029.dwg
TIME: 9:57





INTERIM DRAINAGE AREA CALCULATIONS

Area Designation	Acreage	Runoff Coefficient Existing	Runoff Coefficient Developed	'CxA' Existing	'CxA' Developed	Time of Concentration (min)	Rainfall Intensity (in/hr) 100 Yr	Runoff 100 Year Existing	Runoff 100 Year Developed
A-1	0.64	0.9	0.9	0.58	0.58	10	9.8	5.64	5.64
A-2.1	0.52	0.9	0.9	0.47	0.47	10	9.8	4.59	4.59
A-2.2	0.35	0.9	0.9	0.32	0.32	10	9.8	3.09	3.09
A-3	0.45	0.9	0.9	0.41	0.41	10	9.8	3.97	3.97
A-4	0.21	0.9	0.9	0.19	0.19	10	9.8	1.85	1.85
	2.17			1.95	1.95			19.14	19.14
T-1	1.28	0.9	0.9	1.15	1.15	10	9.8	11.29	11.29
T-2	0.77	0.9	0.9	0.69	0.69	10	9.8	6.79	6.79
T-3*	6.00	0.9	0.9	5.40	5.40	10	9.8	52.92	52.92
	8.05			7.25	7.25			71.00	71.00

* Drainage Area from North of Interstate 30.

THIS DRAINAGE AREA MAP ILLUSTRATES THE DRAINAGE PATTERNS AND AREAS THAT WILL EXIST AFTER COMPLETION OF THE CONSTRUCTION IDENTIFIED IN THIS PLAN SET. THE DESIGN DRAINAGE AREA MAP (D001) ILLUSTRATES THE DRAINAGE PATTERNS AND AREAS UPON WHICH THE DRAINAGE DESIGN IS BASED, AND WHICH WILL EXIST AFTER FUTURE IMPROVEMENTS ARE CONSTRUCTED.

RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO I.H. 30)

INTERIM DRAINAGE AREA MAP

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT DATE 09-12-2013
WA# 08029

SHEET NO. D004

FILE: D004-Dgmap-interim-08029.dwg
TIME: 14:26

DRAINAGE AREA CALCULATIONS

Area Designation	Acreage	Runoff Coefficient		'CxA'		Time of Concentration (min)	2 Year Frequency			100 Year Frequency			Remarks
							Intensity (in/hr)	Runoff (cfs)		Intensity (in/hr)	Runoff (cfs)		
		Existing	Developed	Existing	Developed			Existing	Developed		Existing	Developed	
A-1	0.47	0.9	0.9	0.42	0.42	10	5.21	2.2	2.2	9.8	4.1	4.1	
A-2	0.76	0.9	0.9	0.68	0.68	10	5.21	3.6	3.6	9.8	6.7	6.7	
A-3	0.45	0.9	0.9	0.41	0.41	10	5.21	2.1	2.1	9.8	4.0	4.0	
A-4	0.21	0.9	0.9	0.19	0.19	10	5.21	1.0	1.0	9.8	1.9	1.9	
	1.89			*1.70*	*1.70*			*8.9*	*8.9*		*16.7*	*16.7*	
B-1	8.13	0.35	0.9	2.85	7.32	10	5.21	14.8	38.1	9.8	27.9	71.7	**
B-2	0.96	0.9	0.9	0.86	0.86	10	5.21	4.5	4.5	9.8	8.5	8.5	
B-3	1.2	0.9	0.9	1.08	1.08	10	5.21	5.6	5.6	9.8	10.6	10.6	
B-4	0.37	0.9	0.9	0.33	0.33	10	5.21	1.7	1.7	9.8	3.3	3.3	
B-5	0.34	0.9	0.9	0.31	0.31	10	5.21	1.6	1.6	9.8	3.0	3.0	
B-6	1.09	0.9	0.9	0.98	0.98	10	5.21	5.1	5.1	9.8	9.6	9.6	
B-7	1.09	0.9	0.9	0.98	0.98	10	5.21	5.1	5.1	9.8	9.6	9.6	
B-8.1	2.3	0.35	0.9	0.81	2.07	10	5.21	4.2	10.8	9.8	7.9	20.3	*
B-8.2	1.6	0.35	0.9	0.56	1.44	10	5.21	2.9	7.5	9.8	5.5	14.1	*
	17.08			*8.76*	*15.37*			*45.6*	*80.1*		*85.8*	*150.6*	
C-1	0.59	0.9	0.9	0.53	0.53	10	5.21	2.8	2.8	9.8	5.2	5.2	
C-2	0.59	0.9	0.9	0.53	0.53	10	5.21	2.8	2.8	9.8	5.2	5.2	
C-3	0.45	0.9	0.9	0.41	0.41	10	5.21	2.1	2.1	9.8	4.0	4.0	
C-4	0.45	0.9	0.9	0.41	0.41	10	5.21	2.1	2.1	9.8	4.0	4.0	
C-5	1.48	0.35	0.35	0.52	0.52	10	5.21	2.7	2.7	9.8	5.1	5.1	*
C-6	0.88	0.35	0.35	0.31	0.31	10	5.21	1.6	1.6	9.8	3.0	3.0	*
C-7	1.72	0.35	0.35	0.60	0.60	10	5.21	3.1	3.1	9.8	5.9	5.9	*
C-8	0.89	0.8	0.8	0.71	0.71	10	5.21	3.7	3.7	9.8	7.0	7.0	Designed to drain into inlet C-9
C-9	0.51	0.9	0.9	0.46	0.46	10	5.21	2.4	2.4	9.8	4.5	4.5	
C-10	0.32	0.9	0.9	0.29	0.29	10	5.21	1.5	1.5	9.8	2.8	2.8	
C-10a	0.32	0.9	0.9	0.29	0.29	10	5.21	1.5	1.5	9.8	2.8	2.8	Designed to drain to stubout from C-10
C-11	0.77	0.9	0.9	0.69	0.69	10	5.21	3.6	3.6	9.8	6.8	6.8	
C-12	1.08	0.9	0.9	0.97	0.97	10	5.21	5.1	5.1	9.8	9.5	9.5	
C-13	5.6	0.9	0.9	5.04	5.04	10	5.21	26.3	26.3	9.8	49.4	49.4	Collected by ex. S.D system in Discovery
C-14	30.7	0.35	0.35	10.75	10.75	10	5.21	56.0	56.0	9.8	105.3	105.3	*
C-15	6.3	0.9	0.9	5.67	5.67	10	5.21	29.5	29.5	9.8	55.6	55.6	Collected by ex. S.D system in Springer
C-16	8.32	0.9	0.9	7.49	7.49	10	5.21	39.0	39.0	9.8	73.4	73.4	Designed to drain to stubout
	60.97			*35.66*	*35.66*			*185.8*	*185.8*		*349.4*	*349.4*	
D-1	152.1	0.35	0.9	53.24	136.89	10	5.21	277.4	713.2	9.8	521.7	1341.5	
E-1	3.82	0.35	0.35	1.34	1.34	10	5.21	7.0	7.0	9.8	13.1	13.1	
X-1	4.3	0.9	0.35	3.87	1.51	10	5.21	20.2	7.8	9.8	37.9	14.7	Drains to existing inlet
X-2	31.1	0.35	0.35	10.89	10.89	10	5.21	56.7	56.7	9.8	106.7	106.7	*
	35.4			*14.76*	*12.39*			*76.9*	*64.6*		*144.6*	*121.4*	

* Detention to existing runoff is required
** Detention required but crossing is designed for undetained flow

RECORD DRAWING 10/11/2013
TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

100 YR. STORM INLET AND STREET FLOW CALCULATIONS

STREET STA	INLET NO.	CONTRIBUTING DRAINAGE AREAS	DESIGN STORM FREQUENCY (yr)	TIME OF CONC (min)	RAINFALL INTENSITY (in/hr)	DRAINAGE AREA (Ac)	C' FACTOR	CxA	CA INTERCEPTED	GUTTER FLOW (cfs)	GUTTER SLOPE (%)	STREET SECTION	CROWN	DEPTH OF FLOW AT INLET (ft)	WIDTH OF FLOW IN STREET @ GUTTER (ft)	INLET LENGTH (ft)	FLOW COLLECTED (cfs)	FLOW BYPASSED (cfs)	REMARKS
42+96.17	A1	A1	100	10	9.8	0.47	0.9	0.42	0.43	4.2	0.5	TRIANGULAR	0.5	0.29	13.7	10	4.2	0.0	*
41+33.36	A2	A2	100	10	9.8	0.76	0.9	0.68	0.67	6.7	0.5	TRIANGULAR	0.5	0.34	16.3	10	6.6	0.1	*
40+77.70	A3	A3	100	10	9.8	0.45	0.9	0.41	0.41	4.0	-	TRIANGULAR	0.5	0.35	-	15	4.0	0.0	
40+77.70	A4	A4	100	10	9.8	0.21	0.9	0.19	0.20	2.0	-	TRIANGULAR	0.5	0.27	-	15	2.0	0.0	
29+25.97	B2	B2	100	10	9.8	0.96	0.9	0.86	0.78	8.5	0.5	TRIANGULAR	0.5	0.37	17.9	10	7.6	0.9	
29+25.97	B3	B3	100	10	9.8	1.2	0.9	1.08	0.86	10.6	0.5	TRIANGULAR	0.5	0.40	19.4	10	8.4	2.2	
29+74.21	B4	B4	100	10	9.8	0.37	0.9	0.33	0.43	4.2	-	TRIANGULAR	0.5	0.36	-	15	4.2	0.0	
29+74.21	B5	B5	100	10	9.8	0.34	0.9	0.31	0.53	5.2	-	TRIANGULAR	0.5	0.39	-	15	5.2	0.0	
39+95	B6	B6	100	10	9.8	1.09	0.9	0.98	0.98	9.6	0.85	TRIANGULAR	0.5	0.35	17.0	15	9.6	0.0	
39+87.60	B7	B7	100	10	9.8	1.09	0.9	0.98	0.98	9.6	0.85	TRIANGULAR	0.5	0.35	17.0	15	9.6	0.0	
17+31.08	C1	C1	100	10	9.8	0.59	0.9	0.53	0.37	5.2	0.5	TRIANGULAR	0.5	0.31	14.9	5	3.6	1.6	
17+41.17	C2	C2	100	10	9.8	0.59	0.9	0.53	0.37	5.2	0.5	TRIANGULAR	0.5	0.31	14.9	5	3.6	1.6	
16+82.84	C3	C3	100	10	9.8	0.45	0.9	0.41	0.57	5.6	-	TRIANGULAR	0.5	0.40	-	15	5.6	0.0	
16+92.93	C4	C4	100	10	9.8	0.45	0.9	0.41	0.57	5.6	-	TRIANGULAR	0.5	0.40	-	15	5.6	0.0	
10+45.50	C9	C9	100	10	9.8	0.51	0.9	0.46	0.46	4.5	0.5	TRIANGULAR	0.5	0.29	14.1	10	4.5	0.0	
9+25	C10	C10	100	10	9.8	0.32	0.9	0.29	1.00	9.8	-	TRIANGULAR	0.5	0.49	-	15	9.8	0.0	
7+95.22	C11	C11	100	10	9.8	0.77	0.9	0.69	0.67	6.8	0.54	TRIANGULAR	0.5	0.34	16.2	10	6.6	0.2	
21+89.96	C12A	C12A	100	10	9.8	0.58	0.9	0.52	0.52	5.1	-	TRIANGULAR	0.5	0.42	-	10	5.1	0.0	
21+14.21	C12B	C12B	100	10	9.8	0.5	0.9	0.45	0.45	4.4	0.95	TRIANGULAR	0.5	0.26	12.4	10	4.4	0.0	

* PER I-30 AND FM3549 PLANS BY CP&Y, ZERO BYPASS WILL BE COLLECTED BY INLETS A1 AND A2. THE ONLY FLOW THAT WILL BE COLLECTED BY INLETS A1 AND A2 WILL BE FROM DRAINAGE AREAS 'A-1' AND 'A-2' RESPECTIVELY.

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Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

DRAINAGE AREA CALCULATIONS

WA 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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STORM DRAIN CALCULATIONS FOR STORM DRAIN LINE A

FROM	TO	LENGTH (FT)	CxA	INLET TIME (min.)	TOTAL INTERCEPTED CxA	TIME AT UPSTREAM OF REACH (min)	DESIGN STORM FREQUENCY (yrs)	RAINFALL INTENSITY (in/hr)	INTERCEPTED FLOW (cfs)	STORM DRAIN DIAMETER (in)	VELOCITY (ft/s)	SLOPE OF FRICTION GRADIENT (ft/ft)	STRUCTURE LOSS COEFFICIENT	STRUCTURE LOSS AT UPSTREAM OF REACH	FLOW TIME IN DRAIN (min)	TIME AT DOWNSTREAM OF REACH (min)	H.G. AT UPSTREAM OF REACH (ft)	REMARKS
4+52.71	4+47.71	5.00	-	-	0.00	10.0	100	9.80	30.6	30	6.2	0.0056	0.00	0.00	0.0	10.0	576.88	*
4+47.71	4+15.18	32.53	-	-	0.00	10.0	100	9.80	30.6	30	6.2	0.0056	0.50	0.30	0.1	10.1	576.85	
4+15.18	4+10.18	5.00	-	-	0.00	10.1	100	9.78	30.6	30	6.2	0.0056	0.50	0.30	0.0	10.1	576.37	
INLET A1	4+10.18	24.82	0.42	10	0.42	10.0	100	9.80	4.1	21	1.7	0.0007	1.25	0.06	0.2	10.2	576.12	
4+10.18	2+53.09	157.09	-	-	0.42	10.2	100	9.76	34.6	30	7	0.0071	0.50	0.46	0.4	10.6	576.04	
2+53.09	1+96.50	56.59	-	-	0.42	10.6	100	9.68	34.6	30	7	0.0071	0.50	0.39	0.1	10.7	574.46	
INLET A3	1+83.83	70.48	0.41	10	0.41	10.0	100	9.80	4	21	1.7	0.0006	1.25	0.05	0.1	10.1	574.48	
1+96.50	1+83.83	12.67	-	-	0.42	10.7	100	9.66	34.6	30	7	0.0071	0.00	0.00	0.0	10.7	573.67	
1+83.83	1+69.58	14.25	-	-	0.83	10.7	100	9.66	38.6	30	7.9	0.0089	0.30	0.74	0.0	10.7	573.58	
INLET A2	A2 6.62	58.85	-	-	0.00	10.0	100	9.80	17.6	24	5.6	0.0061	1.25	0.61	0.1	10.1	575.45	**
INLET A4	A2 6.62	14.22	0.20	10	0.20	10.0	100	9.80	2	21	0.8	0.0002	1.25	0.01	0.0	10.0	574.44	
A2 6.62	1+69.58	6.62	-	-	0.20	10.1	100	9.78	19.5	24	6.2	0.0074	0.50	0.35	0.0	10.1	573.11	
1+69.58	1+57.84	11.74	-	-	1.03	10.7	100	9.66	58.1	36	8.2	0.0076	0.50	0.56	0.0	10.7	572.71	
1+57.84	1+37.84	20.00	-	-	1.03	10.7	100	9.66	58.1	36	8.2	0.0076	0.00	0.00	0.0	10.7	572.06	

* UPON COMPLETION OF IMPRROVEMENTS TO I-30 AND FM 3549 (DESIGNED BY CP&Y) AN ADDITIONAL Q OF 30.6 CFS WILL BE INTRODUCED INTO SD LN 'A' AT STA 4+52.71. THIS ADDITIONAL FLOW HAS BEEN ACCOUNTED FOR AND THE PIPES WERE SIZED ACCORDINGLY.

** UPON COMPLETION OF IMPRROVEMENTS TO I-30 AND FM 3549 (DESIGNED BY CP&Y) AND AFTER THE NORTH SIDE OF CORPORATE CROSSING IS BUILT BETWEEN STREET STATIONS 41+01.07 AND 46+46.82, AN ADDITIONAL Q OF 11.0 CFS WILL BE INTRODUCED INTO SD LN 'A' AT INLET A2. THIS ADDITIONAL FLOW HAS BEEN ACCOUNTED FOR AND THE PIPES WERE SIZED ACCORDINGLY. PRIOR TO THE NORTH SIDE OF COROPORATE CROSSING BEING BUILT, BUT AFTER IMPROVEMENTS TO I-30 AND FM 3549 ARE COMPLETE, THE ADDITIONAL Q OF 11.0 CFS WILL DRAIN TO PROPOSED CULVERT 'A-2.1' AND THEN INTO AN OVERLAND SWALE DRAINING TO THE WEST.

STORM DRAIN CALCULATIONS FOR STORM DRAIN LINE B

FROM	TO	LENGTH (FT)	CxA	INLET TIME (min.)	TOTAL INTERCEPTED CxA	TIME AT UPSTREAM OF REACH (min)	DESIGN STORM FREQUENCY (yrs)	RAINFALL INTENSITY (in/hr)	INTERCEPTED FLOW (cfs)	STORM DRAIN DIAMETER (in)	VELOCITY (ft/s)	SLOPE OF FRICTION GRADIENT (ft/ft)	STRUCTURE LOSS COEFFICIENT	STRUCTURE LOSS AT UPSTREAM OF REACH	FLOW TIME IN DRAIN (min)	TIME AT DOWNSTREAM OF REACH (min)	H.G. AT UPSTREAM OF REACH (ft)	REMARKS
15+69.21	14+73.46	95.75	7.32	10	7.32	10.00	100	9.80	71.7	48	5.7	0.0025	1.25	0.63	0.3	10.3	591.81	
14+73.46	14+61.72	11.74	-	-	7.32	10.30	100	9.74	71.3	48	5.7	0.0025	0.60	0.30	0.0	10.3	590.94	
LAT 8.1A	LAT 8.1A 0+2	27.33	0.30	10	0.30	10.00	100	9.80	2.9	18	1.6	0.0008	1.25	0.05	0.0	10.0	592.55	
LAT 8.1A 0+2	14+61.72	25.00	-	-	0.30	10.00	100	9.80	2.9	18	1.6	0.0008	0.00	0.00	0.3	10.3	590.63	
14+61.72	13+03.87	157.85	-	-	7.62	10.30	100	9.74	74.2	48	5.9	0.0027	0.75	0.16	0.4	10.7	590.61	
LAT 8.1B	LAT 8.1B 0+2	17.72	0.51	10	0.51	10.00	100	9.80	5.0	18	2.8	0.0023	1.25	0.16	0.0	10.0	592.66	
LAT 8.1B 0+2	13+03.87	25.00	-	-	0.51	10.00	100	9.80	5.0	18	2.8	0.0023	0.00	0.00	0.1	10.1	590.08	
13+03.87	11+54.38	149.49	-	-	8.13	10.70	100	9.66	78.5	48	6.2	0.0030	0.50	0.33	0.4	11.1	590.02	
STUB B8.2	INLET B5	7.00	0.56	10	0.56	10.00	100	9.80	5.5	18	3.1	0.0027	0.00	0.00	0.0	10.0	591.98	
INLET B5	B5 24.91	13.78	0.53	10	1.09	10.00	100	9.80	10.7	18	6	0.0104	0.50	0.28	0.0	10.0	591.96	
INLET B3	B5 24.91	51.90	0.86	10	0.86	10.00	100	9.80	8.4	18	4.7	0.0064	1.25	0.44	0.2	10.2	592.31	
B5 24.91	11+54.38	24.91	-	-	1.95	10.20	100	9.76	19.0	18	10.7	0.0327	0.50	1.49	0.0	10.2	591.54	
11+54.38	11+37.63	16.75	-	-	10.08	11.10	100	9.59	96.7	48	7.7	0.0045	0.50	0.62	0.0	11.1	589.24	
INLET B4	LAT B4 57.48	14.69	0.43	10	0.43	10.00	100	9.80	4.2	18	2.4	0.0016	1.25	0.11	0.0	10.0	590.43	
INLET B2	LAT B4 57.48	54.96	0.78	10	0.78	10.00	100	9.80	7.6	18	4.3	0.0052	1.25	0.36	0.1	10.1	590.92	
LAT B4 57.48	11+37.63	57.48	-	-	1.21	10.10	100	9.78	11.8	21	4.9	0.0055	0.50	0.33	0.1	10.2	590.01	
11+37.63	7+00	437.63	-	-	11.29	11.10	100	9.59	108.3	48	8.6	0.0057	0.50	0.69	0.8	11.9	588.54	
7+00	1+88.37	511.63	-	-	11.29	11.90	100	9.45	106.7	48	8.5	0.0055	0.00	0.00	0.5	12.4	585.36	
1+88.37	1+67.38	20.99	-	-	11.29	12.40	100	9.37	105.8	48	8.4	0.0054	0.50	0.55	0.0	12.4	574.41	
INLET B6	1+67.38	80.07	0.98	10	0.98	10.00	100	9.80	9.6	18	5.4	0.0084	1.25	0.57	0.1	10.1	575.11	
1+67.38	1+38.87	28.51	-	-	12.27	12.40	100	9.37	115.0	48	9.1	0.0064	0.50	0.74	0.1	12.5	573.75	
INLET B7	1+38.87	9.33	0.98	10	0.98	10.00	100	9.80	9.6	18	5.4	0.0084	1.25	0.57	0.0	10.0	575.25	
1+38.87	1+31.09	7.78	-	-	13.25	12.50	100	9.35	123.9	48	9.9	0.0074	0.50	0.86	0.0	12.5	572.83	

STORM DRAIN CALCULATIONS FOR STORM DRAIN LINE C

FROM	TO	LENGTH (FT)	CxA	INLET TIME (min.)	TOTAL INTERCEPTED CxA	TIME AT UPSTREAM OF REACH (min)	DESIGN STORM FREQUENCY (yrs)	RAINFALL INTENSITY (in/hr)	INTERCEPTED FLOW (cfs)	STORM DRAIN DIAMETER (in)	VELOCITY (ft/s)	SLOPE OF FRICTION GRADIENT (ft/ft)	STRUCTURE LOSS COEFFICIENT	STRUCTURE LOSS AT UPSTREAM OF REACH	FLOW TIME IN DRAIN (min)	TIME AT DOWNSTREAM OF REACH (min)	H.G. AT UPSTREAM OF REACH (ft)	REMARKS
INLET C12A	C12 1+26.64	88.27	0.52	10	0.52	10.0	100	9.80	5.1	18	2.9	0.0024	1.25	0.16	0.5	10.5	595.47	
INLET C12B	C12 1+26.64	27.00	0.45	10	0.45	10.0	100	9.80	4.4	18	2.5	0.0018	1.25	0.12	0.2	10.2	595.27	
C12 1+26.64	EX 1+03.24	126.64	-	-	0.97	10.5	100	9.70	9.4	24	3.0	0.0017	0.50	0.07	0.7	11.2	595.10	
EX 1+03.24	EX 1+5.65	725.18	5.04	14.5	6.01	14.5	100	9.06	54.5	45	4.9	0.0020	0.50	0.19	2.0	16.5	594.81	
EX 1+5.65	7+62.43	30.95	16.42	15.1	22.43	16.5	100	8.76	196.5	6x3	5.5	0.0023	0.00	0.00	0.1	16.6	592.74	
7+62.43	7+51.85	10.58	-	-	22.43	16.6	100	8.75	196.3	6x4	4.1	0.0010	0.00	0.00	0.0	16.6	592.67	
7+51.85	7+49.15	2.70	-	-	22.43	16.6	100	8.75	196.3	8x4	3.1	0.0005	0.50	0.07	0.0	16.6	592.66	
INLET C2	LATC 3+70.93	57.09	0.50	10	0.50	10.0	100	9.80	4.9	18	2.8	0.0022	1.25	0.15	0.3	10.3	593.64	
LATC 3+70.93	LATC 3+62.51	8.42	-	-	0.50	10.3	100	9.74	4.9	24	1.6	0.0005	0.60	0.02	0.1	10.4	593.36	
INLET C1	LATC 3+62.51	53.76	0.50	10	0.50	10.0	100	9.80	4.9	18	2.8	0.0022	1.25	0.15	0.3	10.3	593.61	
LATC 3+62.51	LATC 3+22.70	39.81	-	-	1.00	10.4	100	9.72	9.7	24	3.1	0.0018	0.50	0.13	0.2	10.6	593.34	
INLET C4	LATC 3+22.70	57.09	0.44	10	0.44	10.0	100	9.80	4.3	18	2.4	0.0017	1.25	0.11	0.4	10.4	593.35	
LATC 3+22.70	LATC 3+14.27	8.43	-	-	1.44	10.6	100	9.68	13.9	27	3.5	0.0020	0.50	0.12	0.0	10.6	593.14	
INLET C3	LATC 3+14.27	53.76	0.44	10	0.44	10.0	100	9.80	4.3	18	2.4	0.0017	1.25	0.11	0.4	10.4	593.20	
LATC 3+14.27	7+49.15	302.50	-	-	1.88	10.6	100	9.68	18.2	33	3.1	0.0012	0.50	0.05	1.6	12.2	593.00	
7+49.15	7+35.08	14.07	-	-	24.31	16.6	100	8.75	212.7	8x4	3.3	0.0006	0.50	0.09	0.1	16.7	592.59	
7+35.08	7+04.08	31.00	-	-	24.31	16.7	100	8.73	212.2	8x4	3.3	0.0006	0.50	0.09	0.2	16.9	592.49	
STUB C16	7+04.08	62.61	7.49	10	7.49	10.0	100	9.80	73.4	45	6.6	0.0037	0.00	0.00	0.2	10.2	592.61	
7+04.08	5+91.96	112.12	-	-	31.80	16.9	100	8.70	276.7	8x4	4.3	0.0010	0.50	0.20	0.4	17.3	592.38	
INLET C6	5+91.96	90.11	0.83	10	0.83	10.0	100	9.80	8.1	18	4.6	0.0059	1.25	0.41	0.3	10.3	593.01	
5+91.96	4+05.41	186.55	-	-	32.63	17.3	100	8.65	282.2	8x4	4.4	0.0010	0.50	0.16	0.7	18.0	592.07	
STUB C7	INLET C9	11.90	0.60	10	0.60	10.0	100	9.80	5.9	18	3.3	0.0032	0.00	0.00	0.1	10.1	593.07	
INLET C9	4+05.41	58.44	0.46	10	1.06	10.1	100	9.78	10.4	18	5.9	0.0098	0.50	0.46	0.1	10.2	593.03	
4+05.41	2+90.91	114.50	-	-	33.69	18.0	100	8.55	288.0	8x4	4.5	0.0011	0.50	0.16	0.4	18.4	591.72	
INLET C10	2+90.91	58.44	1.29	10	1.29	10.0	100	9.80	12.6	18	7.1	0.0144	1.25	0.99	0.1	10.1	593.26	
2+90.91	1+87.66	103.25	-	-	34.98	18.4	100	8.50	297.3	8x4	4.6	0.0011	0.50	0.17	0.4	18.8	591.43	
1+87.66	1+32.81	54.85	-	-	34.98	18.8	100	8.45	295.6	8x4	4.6	0.0011	0.50	0.17	0.2	19.0	591.15	
INLET C11	1+32.81	32.02	0.69	10	0.69	10.0	100	9.80	6.8	18	3.8	0.0042	1.25	0.29	0.0	10.0	591.61	
1+32.81	1+07.65	25.16	-	-	35.67	19.0	100	8.42	300.3	8x4	4.7	0.0011	0.50	0.18	0.1	19.1	590.92	
STUB X1	1+07.65	13.72	3.90	10	3.90	10.0	100	9.80	38.2	3x2	6.4	0.0061	0.20	0.13	0.0	10.0	590.92	
1+07.65	0+95.53	12.12	-	-	39.57	19.1	100	8.41	332.8	8x4	5.2	0.0014	0.20	0.35	0.0	19.1	590.71	
0+95.53	0+72.13	23.40	-	-	39.57	19.1	100	8.41	332.8	8x4	5.2	0.0014	0.50	0.21	0.1	19.2	590.34	

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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

STORM DRAIN
HYDRAULIC
CALCULATIONS

WA 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED
PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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CULVERT DESIGN CALCULATIONS

Culvert Location: Storm Drain 'T-1'
Length, L: 255.70
Total Discharge, Q: 11.3 c.f.s.
Design Storm Freq.: 100 yr
Roughness Coeff., n: 0.013
Max. Vel.: 8 ft/s
Tailwater: 1.00 ft.
D.S. Channel Width: 2.0 ft
Entrance Description: Type 4, Spigot End with Headwall

RDWY. Elev.: 582.60
U.S. Culv. F.L.: 580.64
D.S. Culv. F.L.: 577.40
Difference: 1.96
Difference: 3.24
Req'd Freeboard: 0.5 FT.
Culv. Slope, $S_o = \frac{\text{Diff. Ft}}{\text{Length Ft.}}$
Allow. Headwater: 1.46 FT.
So= 1.40%

TRIAL CULVERT										HEADWATER CALCULATION																		The Greater Controlling Head Water (Inlet or Outlet) (feet)	Selected Conduit Size (inches)
		DEPTH RANGE			POSSIBLE CULVERT SIZES					INLET CONTROL					OUTLET CONTROL														
																CASE III					CASE IV								
																					ho=dc+D/2 or ho=TW (use larger)								
Trial Area of Opening T*A=Q/V (sq. ft.)	Channel Width "W" (feet)	T*Ac/W (feet)	AHW (feet)	Trial Depth "D" (feet)	No. Openings	Width of Box "B" (feet)	Box Depth or Pipe Diameter "D" (feet)	Total Culvert Area "Ac" (sq.ft.)	"Q" Each Opening (c.f.s.)	Entrance Type	Case NO.	Q/B (c.f.s.)	HW/D (figure 25&26)	HW	Entrance Coeff Ke	"H" (feet)	"TW" (feet)	LxSo (feet)	"HW" (feet)	"H" (feet)	dc (feet)	dc+D/2 (feet)	TW	ho	LxSo	"HW"		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1.41	2.00	0.71	1.46	2.00	1.00	2.00	2.00	3.14	11.30	Type 4	Case 1	5.65	0.95	1.90	0.50	0.94	1.00	3.24	-1.30	0.94	1.18	1.59	1.00	1.59	3.24	-0.71	1.90	24.00

CULVERT DESIGN CALCULATIONS

Culvert Location: Storm Drain 'A-2.1'
Length, L: 78.74 ft.
Total Discharge, Q: 15.89 c.f.s.
Design Storm Freq.: 100 yr
Roughness Coeff., n: 0.013
Max. Vel.: 8 ft/s
Tailwater: 1.00 ft.
D.S. Channel Width: 2.0 ft.
Entrance Description: Type 4, Spigot End with Headwall

RDWY. Elev.: 577.83
U.S. Culv. F.L.: 575.58
D.S. Culv. F.L.: 574.41
Difference: 2.25 ft.
Difference: 1.17 ft
Req'd Freeboard: 0.50 ft.
Culv. Slope, $S_o = \frac{\text{Diff. Ft}}{\text{Length Ft.}}$
Allow. Headwater: 1.75 ft.
So= 1.48%

TRIAL CULVERT										HEADWATER CALCULATION																		The Greater Controlling Head Water (Inlet or Outlet) (feet)	Selected Conduit Size (inches)
		DEPTH RANGE			POSSIBLE CULVERT SIZES					INLET CONTROL					OUTLET CONTROL													
																CASE III					CASE IV							
																					ho=(dc+D)/2 or ho=TW (use larger)							
TRIAL AREA OF OPENING T*A=Q/V (sq. ft.)	Channel Width "W" (feet)	T*Ac/W (feet)	AHW (feet)	Trial Depth "D" (feet)	No. Openings	Width of Box "B" (feet)	Box Depth or Pipe Diameter "D" (feet)	Total Culvert Area "Ac" (sq.ft.)	"Q" Each Opening (c.f.s.)	Entrance Type	Case NO.	Q/B (c.f.s.)	HW/D (figure 25&26)	HW	Entrance Coeff Ke	"H" (feet)	"TW" (feet)	LxSo (feet)	"HW" (feet)	"H" (feet)	dc	dc+D/2	TW	ho	LxSo	"HW"		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1.99	2.00	0.99	1.75	2.25	1.00	2.25	2.25	3.98	15.89	Type 4	Case 1	7.06	0.94	2.12	0.50	0.54	1.00	1.17	0.37	0.54	1.35	1.80	1.00	1.80	1.17	1.17	2.12	27.00

CULVERT DESIGN CALCULATIONS

Culvert Location: Storm Drain 'E-1'
Length, L: 69.17 ft.
Total Discharge, Q: 13.10 c.f.s.
Design Storm Freq.: 100 yr
Roughness Coeff., n: 0.013
Max. Vel.: 8 ft/s
Tailwater: 1.00 ft.
D.S. Channel Width: 2.0 ft.
Entrance Description: Type 4, Spigot End with Headwall

RDWY. Elev.: 593.58
U.S. Culv. F.L.: 590.25
D.S. Culv. F.L.: 589.90
Difference: 3.33 ft.
Difference: 1.17 ft
Req'd Freeboard: 0.50 ft.
Culv. Slope, $S_o = \frac{\text{Diff. Ft}}{\text{Length Ft.}}$
Allow. Headwater: 2.83 ft.
So= 0.50%

TRIAL CULVERT										HEADWATER CALCULATION																		The Greater Controlling Head Water (Inlet or Outlet) (feet)	Selected Conduit Size (inches)
		DEPTH RANGE			POSSIBLE CULVERT SIZES					INLET CONTROL					OUTLET CONTROL													
																CASE III					CASE IV							
																					ho=(dc+D)/2 or ho=TW (use larger)							
TRIAL AREA OF OPENING T*A=Q/V (sq. ft.)	Channel Width "W" (feet)	T*Ac/W (feet)	AHW (feet)	Trial Depth "D" (feet)	No. Openings	Width of Box "B" (feet)	Box Depth or Pipe Diameter "D" (feet)	Total Culvert Area "Ac" (sq.ft.)	"Q" Each Opening (c.f.s.)	Entrance Type	Case NO.	Q/B (c.f.s.)	HW/D (figure 25&26)	HW	Entrance Coeff Ke	"H" (feet)	"TW" (feet)	LxSo (feet)	"HW" (feet)	"H" (feet)	dc	dc+D/2	TW	ho	LxSo	"HW"		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1.64	2.00	0.82	2.83	2.00	1.00	2.00	2.00	3.14	13.10	Type 4	Case 2	6.55	1.04	2.08	0.50	0.74	1.00	0.35	1.39	0.74	2.05	2.03	1.00	2.03	0.35	2.42	2.42	24.00

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

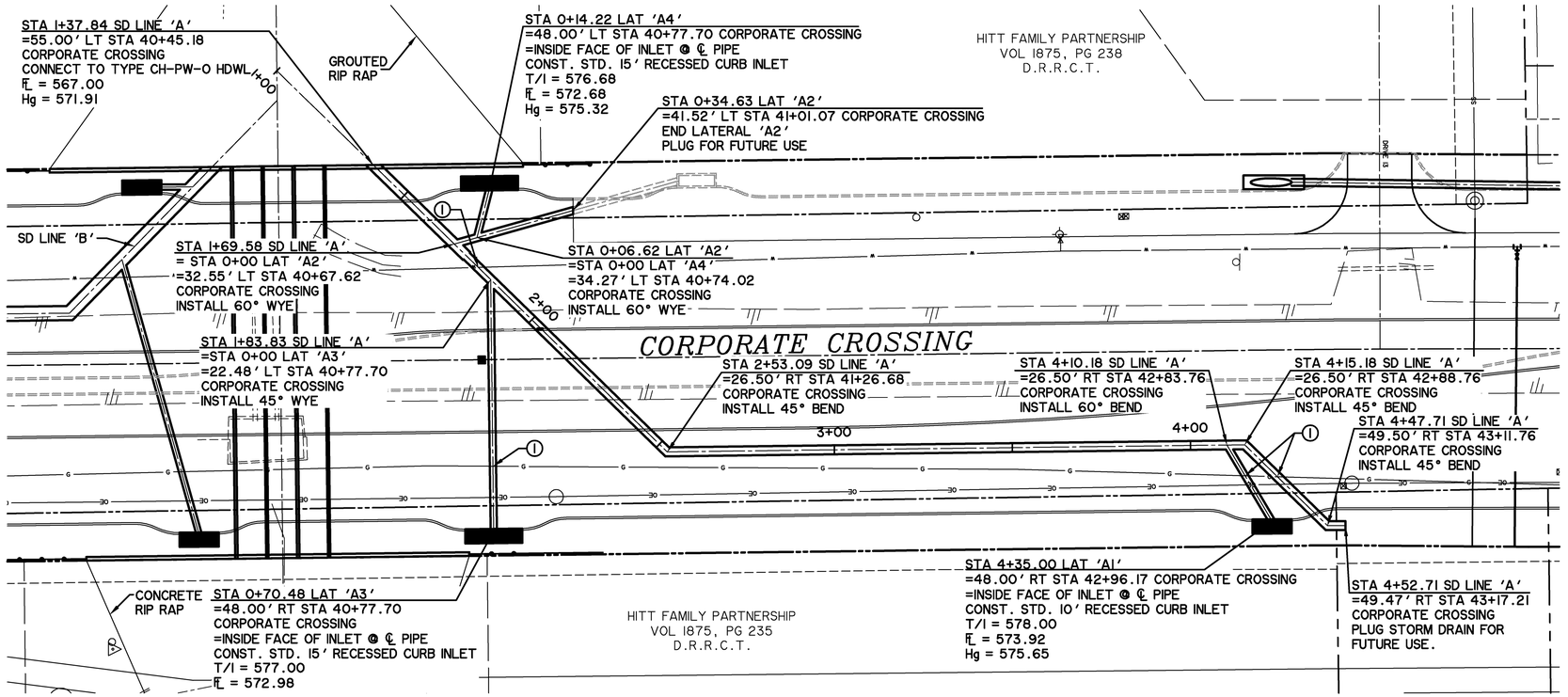
CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

CULVERT CALCULATIONS

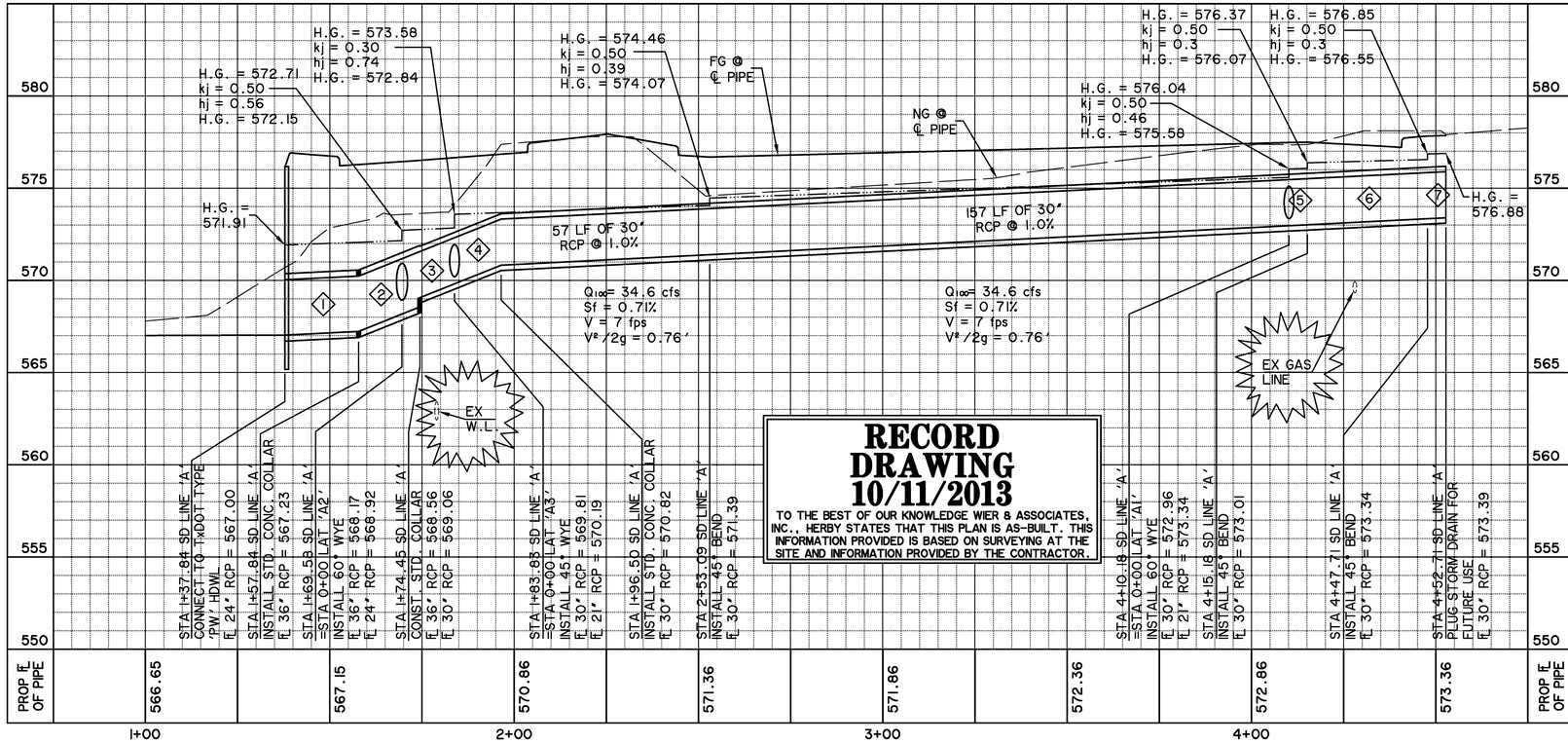
WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
10/11/13

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STORM DRAIN LINE 'A'



RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

1. 20 LF OF 36" RCP @ 1.0%
   Q_{100}= 58.1 cfs
   Q_c= 66.7 cfs
   Sf = 0.76%
   V = 8.2 fps
   $V^2/2g$ = 1.04'
2. 17 LF OF 36" RCP @ 8.01%
   Q_{100}= 58.1 cfs
   Q_c= 188.80 cfs
   Sf = 0.76%
   V = 8.2 fps
   $V^2/2g$ = 1.04'
3. 9 LF OF 30" RCP @ 8.0%
   Q_{100}= 38.6 cfs
   Q_c= 116.00 cfs
   Sf = 0.89%
   V = 7.9 fps
   $V^2/2g$ = 0.97'
4. 13 LF OF 30" RCP @ 7.97%
   Q_{100}= 34.6 cfs
   Q_c= 115.80 cfs
   Sf = 0.71%
   V = 7 fps
   $V^2/2g$ = 0.76'
5. 5 LF OF 30" RCP @ 1.0%
   Q_{100}= 30.6 cfs
   Q_c= 41.0 cfs
   Sf = 0.56%
   V = 6.2 fps
   $V^2/2g$ = 0.6'
6. 33 LF OF 30" RCP @ 1.0%
   Q_{100}= 30.6 cfs
   Q_c= 41.0 cfs
   Sf = 0.56%
   V = 6.2 fps
   $V^2/2g$ = 0.6'
7. 5 LF OF 30" RCP @ 1.0%
   Q_{100}= 30.6 cfs
   Q_c= 41.0 cfs
   Sf = 0.56%
   V = 6.2 fps
   $V^2/2g$ = 0.6'

CAUTION ! !

EXISTING UTILITIES ARE INDICATED ON THE PLANS FROM AVAILABLE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES, TO NOTIFY ALL UTILITY COMPANIES OF THE CONTRACTORS OPERATIONS, TO PROTECT ALL UTILITIES FROM DAMAGE, TO REPAIR ALL UTILITIES DAMAGED DUE TO THE CONTRACTORS OPERATIONS, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING UTILITIES.

NOTES:

① CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES IMMEDIATELY.

0 20 40 60

*** BENCH MARKS ***

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

NOTES FOR WORK IN NTMWD EASEMENT:

1. **CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT**
2. **FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS**
3. **CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.**

PREPARED BY:
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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

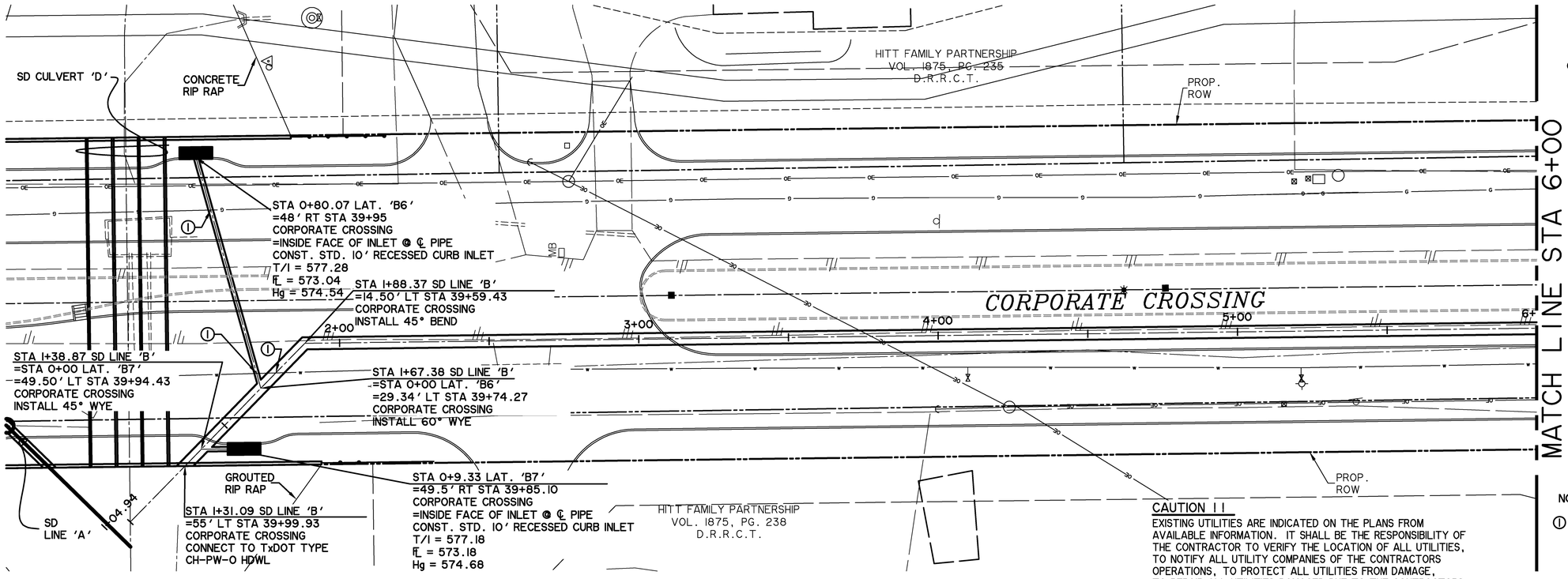
STORM DRAIN LINE 'A' PLAN & PROFILE

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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STORM DRAIN LINE 'B'

CAUTION !!

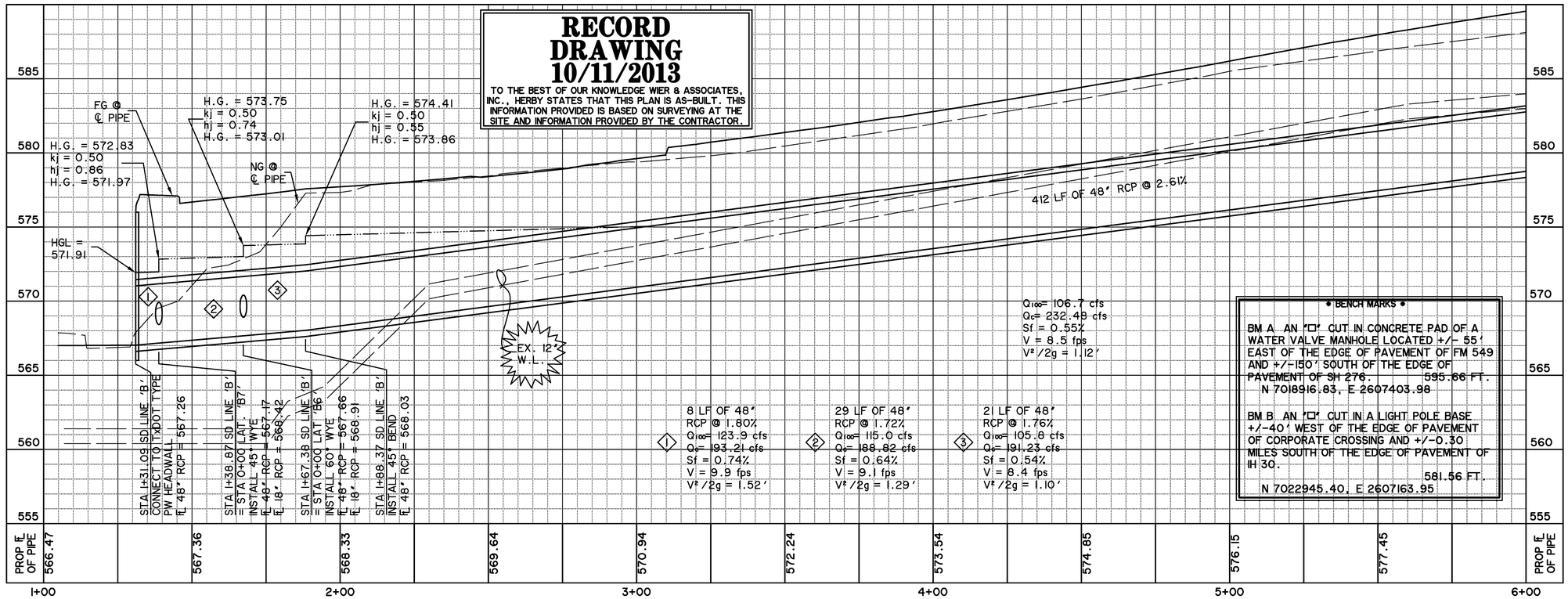
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RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.



① 8 LF OF 48" RCP @ 1.80%
Q_{100}= 123.9 cfs
Q_c= 193.21 cfs
Sf = 0.74%
V = 9.9 fps
$V^2/2g$ = 1.52'

② 29 LF OF 48" RCP @ 1.72%
Q_{100}= 115.0 cfs
Q_c= 188.82 cfs
Sf = 0.64%
V = 9.1 fps
$V^2/2g$ = 1.29'

③ 21 LF OF 48" RCP @ 1.76%
Q_{100}= 105.8 cfs
Q_c= 191.23 cfs
Sf = 0.54%
V = 8.4 fps
$V^2/2g$ = 1.10'

Q_{100}= 106.7 cfs
Q_c= 232.48 cfs
Sf = 0.55%
V = 8.5 fps
$V^2/2g$ = 1.12'

• BENCH MARKS •

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

NOTES FOR WORK IN NTMWD EASEMENT:

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2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

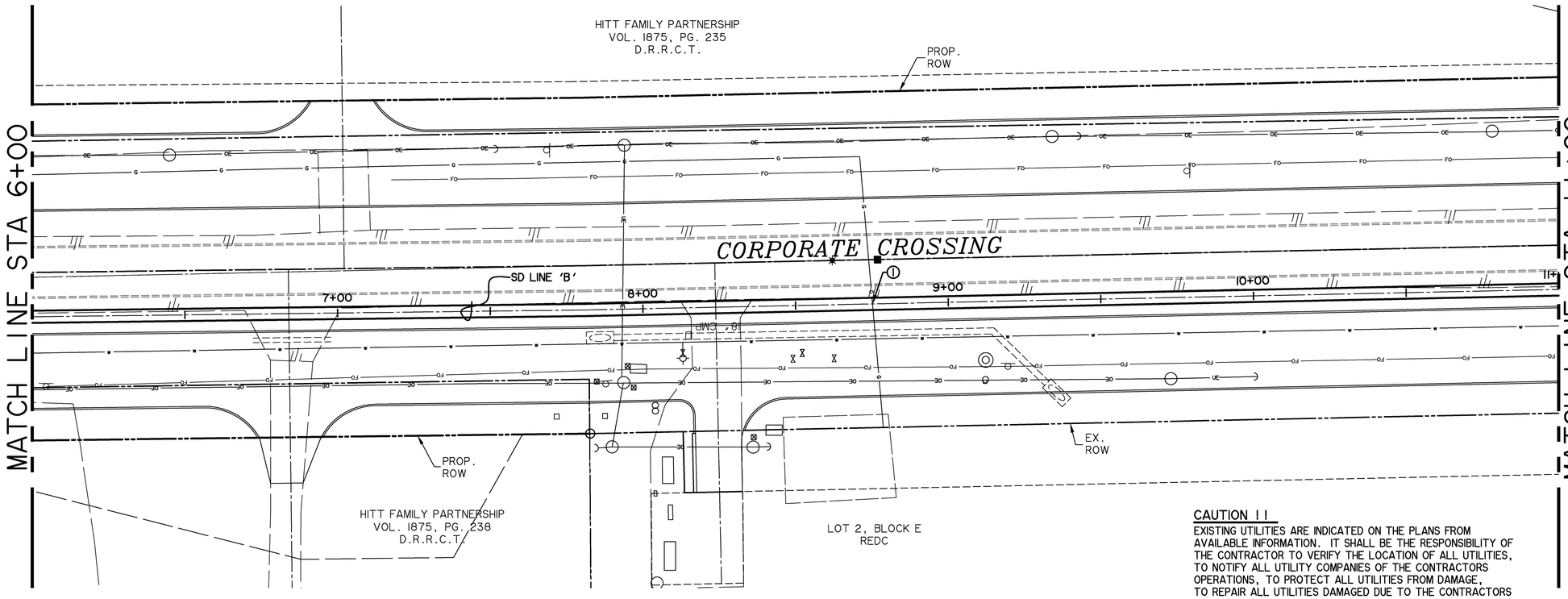
STORM DRAIN LINE 'B'
STA 1+00 TO STA 6+00

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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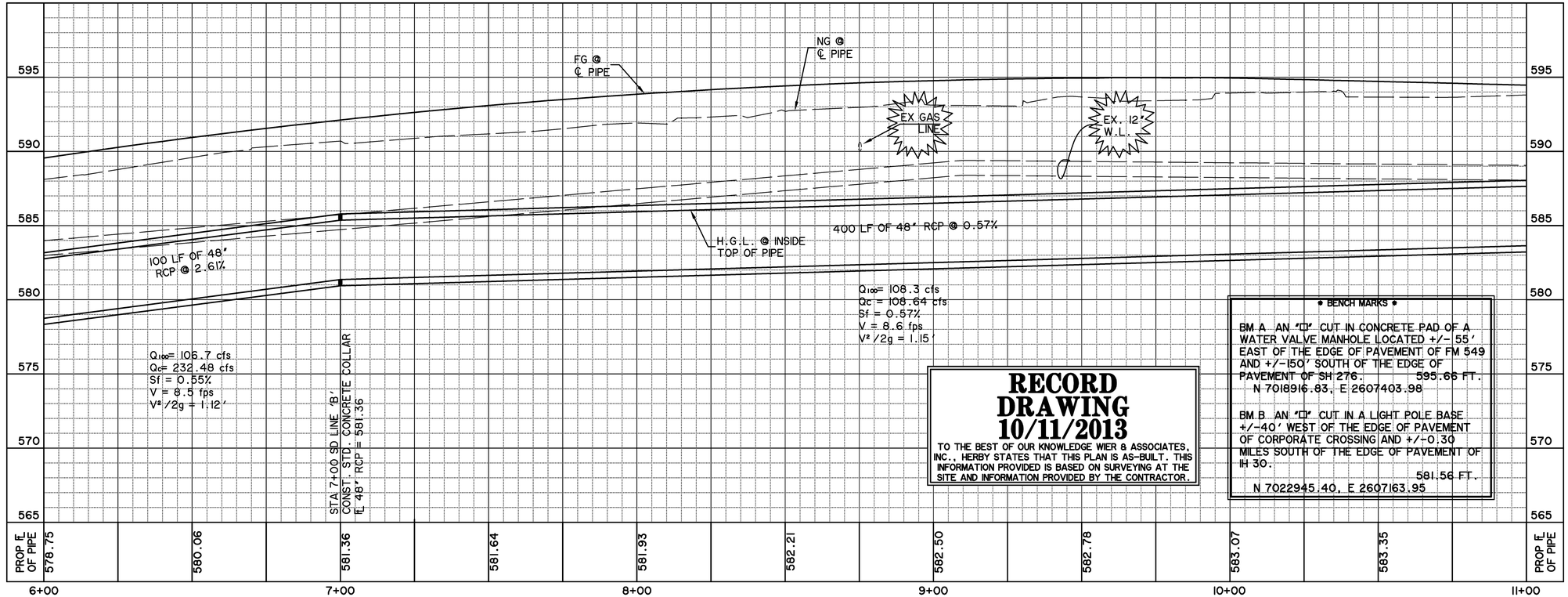
CAUTION 11

EXISTING UTILITIES ARE INDICATED ON THE PLANS FROM AVAILABLE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES, TO NOTIFY ALL UTILITY COMPANIES OF THE CONTRACTORS OPERATIONS, TO PROTECT ALL UTILITIES FROM DAMAGE, TO REPAIR ALL UTILITIES DAMAGED DUE TO THE CONTRACTORS OPERATIONS, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING UTILITIES.

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STORM DRAIN LINE 'B'



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• BENCH MARKS •

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N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

NOTES FOR WORK IN NTMWD EASEMENT:

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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

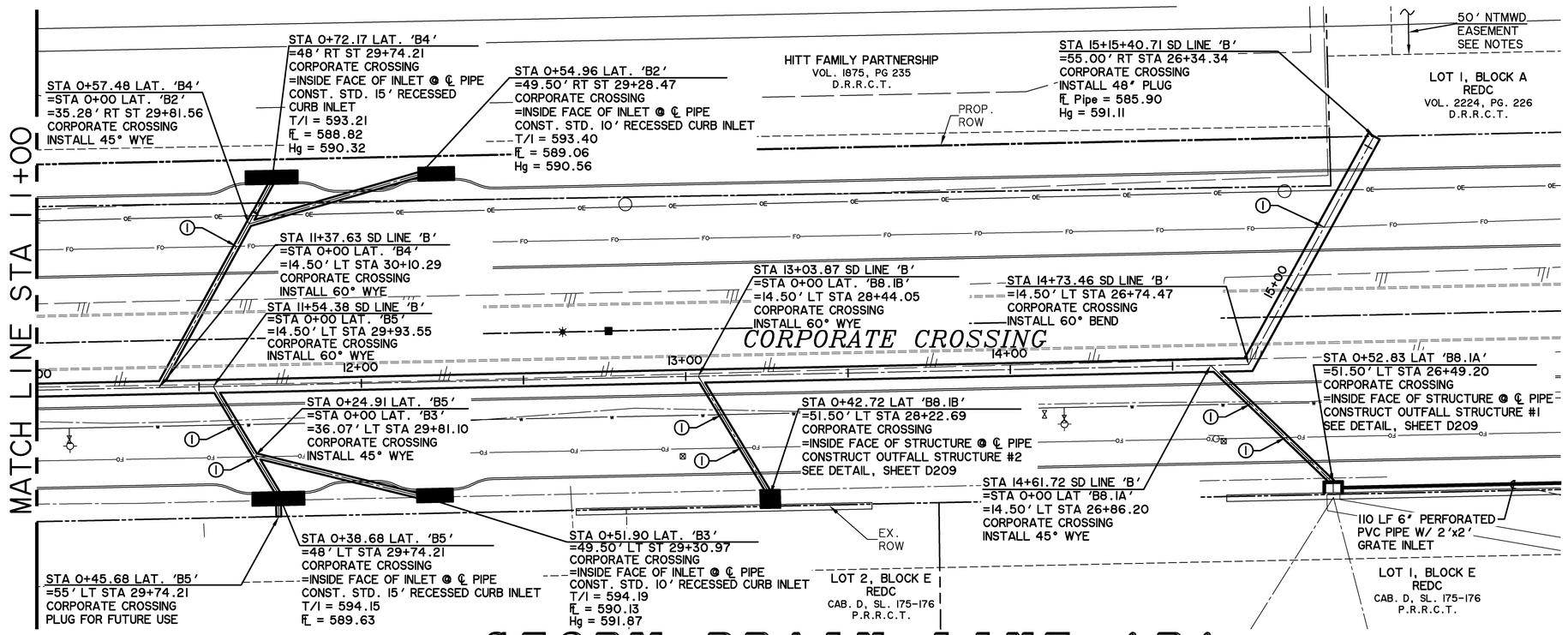
STORM DRAIN LINE 'B'
STA 6+00 TO STA 11+00

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

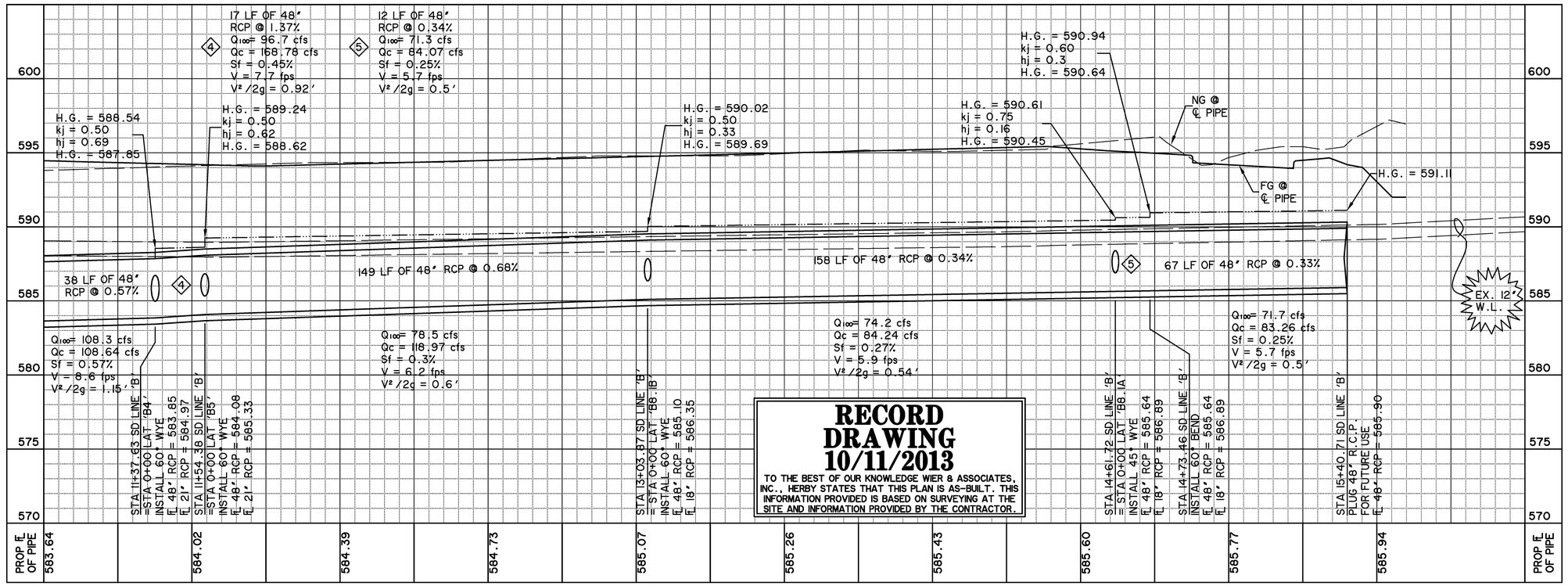
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D103

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STORM DRAIN LINE 'B'



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• BENCH MARKS •

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N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

NOTES:

① CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES IMMEDIATELY.

NOTES FOR WORK IN NTMWD EASEMENT:

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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

STORM DRAIN LINE 'B'
STA 11+00 TO END

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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SHEET NO. D104

FILE: D104-SD-LN-B.dwg
TIME: 12:14

EXISTING 20' LANDSCAPE, PEDESTRIAN & UTILITY EASEMENT

TELE VAULT

TPD

LOT 8, BLOCK A
REDC

SEE SHEET U101 FOR WATERLINE ADJUSTMENTS IN THIS AREA.

STA 1+07.65 SD LINE 'C'
=STA 0+00 LAT 'X1'
=58.55' LT ST 7+41.42
CORPORATE CROSSING

SEE SHEET U101 FOR W.L. RELOCATES

STA 0+72.13 SD LINE 'C'
=90.45' LT ST 7+33.88
CORPORATE CROSSING
CONSTRUCT TxDOT TYPE
SET B-PD

STA 0+32.02 LAT. 'C11'
=49.50' LT ST 7+90.22
CORPORATE CROSSING
=INSIDE FACE OF INLET @ ℄ PIPE
CONST. STD. 10' RECESSED CURB INLET
T/I = 594.09
℄ = 589.82
Hg = 591.61

STA 0+95.53 SD LINE 'C'
=67.04' LT ST 7+32.77
CORPORATE CROSSING
INSTALL 45° BEND

STA 0+13.71 LAT 'X1'
=46.61' LT ST 7+34.67
CORPORATE CROSSING
REMOVE EXISTING HEADWALL, EXTEND 2x3 BOX AND CONNECT TO SD LINE 'C'

STA 2+90.91 SD LINE 'C'
=STA 0+00 LAT. 'C10'
=2.61' LT ST 9+01.78 CORPORATE CROSSING

STA 4+05.41 SD LINE 'C'
=STA 0+00 LAT. 'C9'
=2.61' LT ST 10+16.28
CORPORATE CROSSING

STA 1+32.81 SD LINE 'C'
=STA 0+00 LAT. 'C11'
=40.93' LT ST 7+59.37
CORPORATE CROSSING

CORPORATE CROSSING

MATCH LINE STA 5+00

S.H. 276

STA 0+58.44 LAT. 'C10'
=48.00' RT ST 9+31.00
CORPORATE CROSSING
=INSIDE FACE OF INLET @ ℄ PIPE
CONST. 15' OPEN-BACK RECESSED CURB INLET WITH 3' CONC APRON. SEE DETAIL, SHEET D 206.
T/I = 594.75
℄ = 590.47
Hg = 593.26

STA 0+70.35 LAT. 'C9'
=59.90' RT ST 10+45.42
CORPORATE CROSSING
PLUG FOR FUTURE USE

STA 1+87.66 SD LINE 'C'
=2.50' LT ST 7+98.51
CORPORATE CROSSING
INSTALL 45° BEND

STA 0+58.44 LAT. 'C9'
=48.00' RT ST 10+45.50
CORPORATE CROSSING
=INSIDE FACE OF INLET @ ℄ PIPE
CONST. STD. 10' RECESSED CURB INLET
T/I = 595.32
℄ = 591.07
Hg = 592.03

LOT 1, BLOCK A
SUBWAY/GATEWAY/HEALTH FOOD STORE
CAB. G, SL. 105-106
P.R.R.C.T.

LOT 1, BLOCK A
PARNELL ADDITION
CAB. B, SL. 365
P.R.R.C.T.

NOTES:

① CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES IMMEDIATELY.

② INSTALL 2'x2' FLOW EQUILIZATION WINDOWS EVERY 25' ON INTERIOR WALLS OF 2-8x4 BOX.

0 20 40 60

CAUTION 11

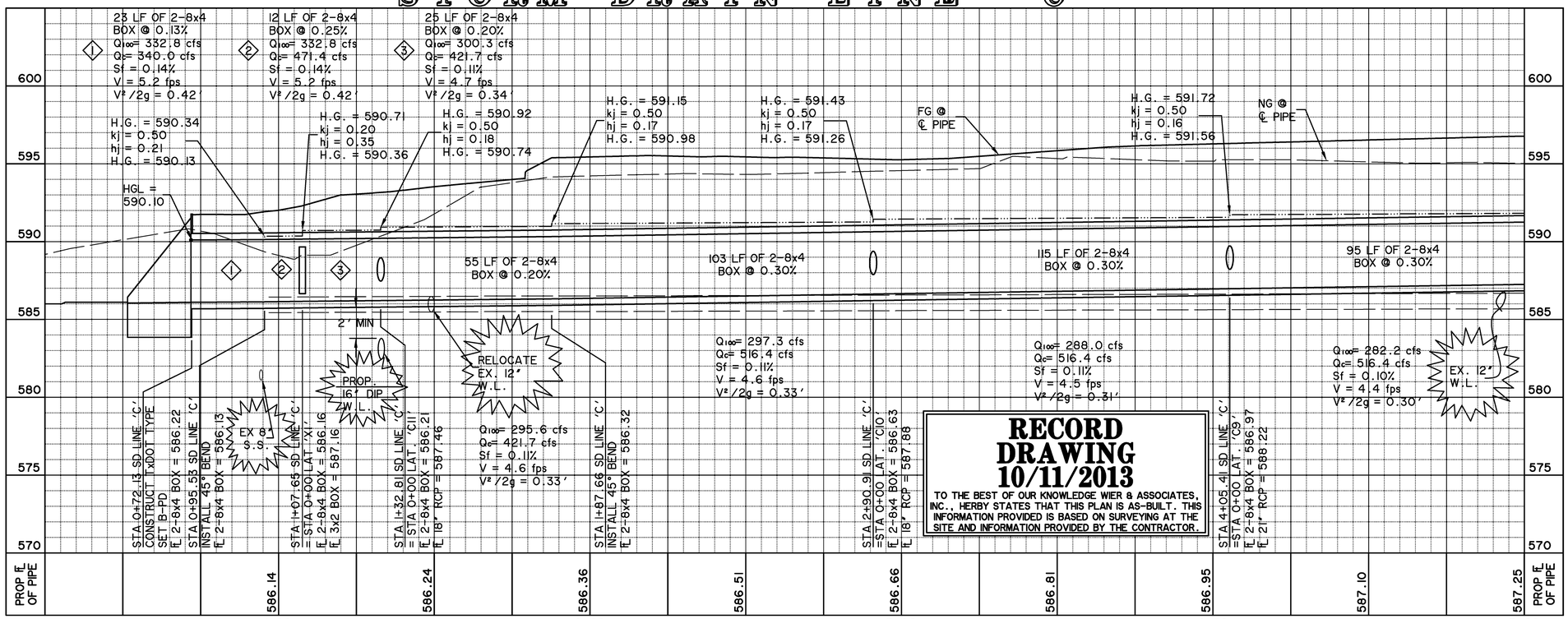
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• BENCH MARKS •

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N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

STORM DRAIN LINE 'C'



RECORD DRAWING 10/11/2013

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PREPARED BY:
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ENGINEERS SURVEYORS LAND PLANNERS
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Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

STORM DRAIN LINE 'C'
STA 0+50 TO STA 5+00

WA# 08029

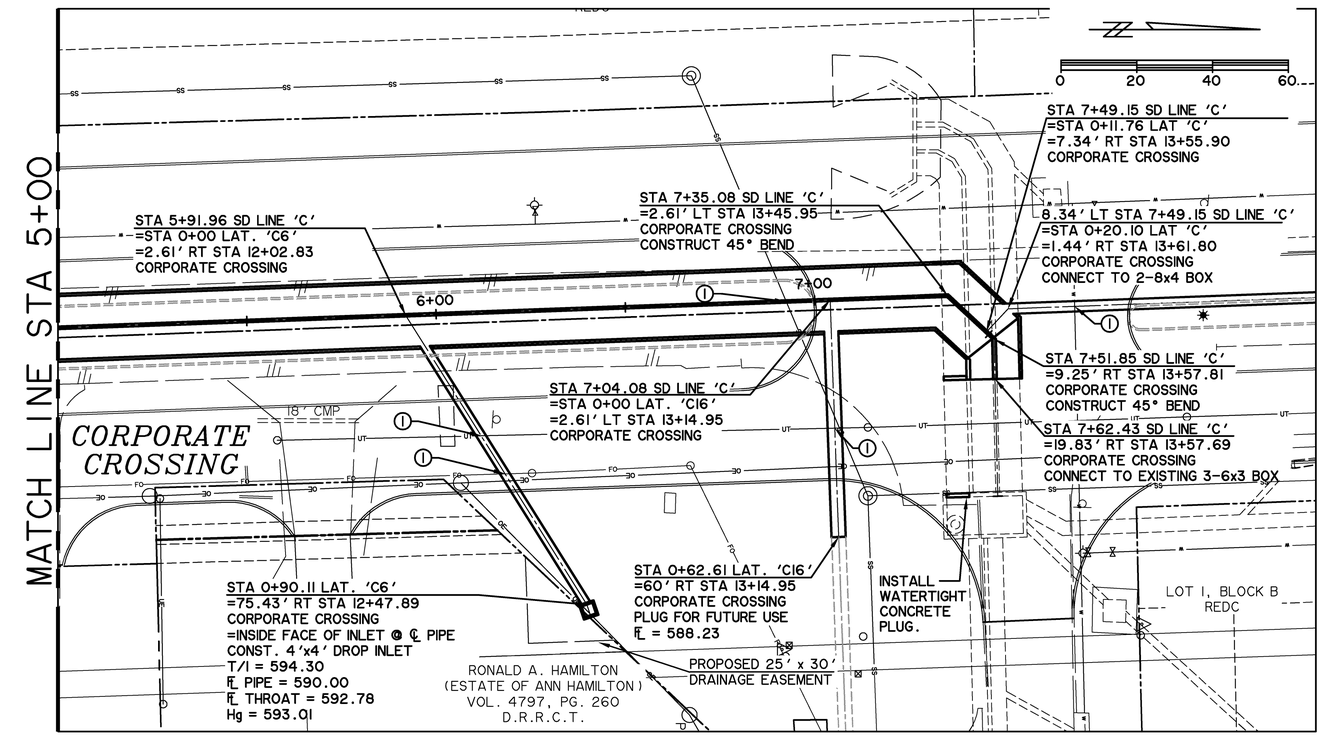
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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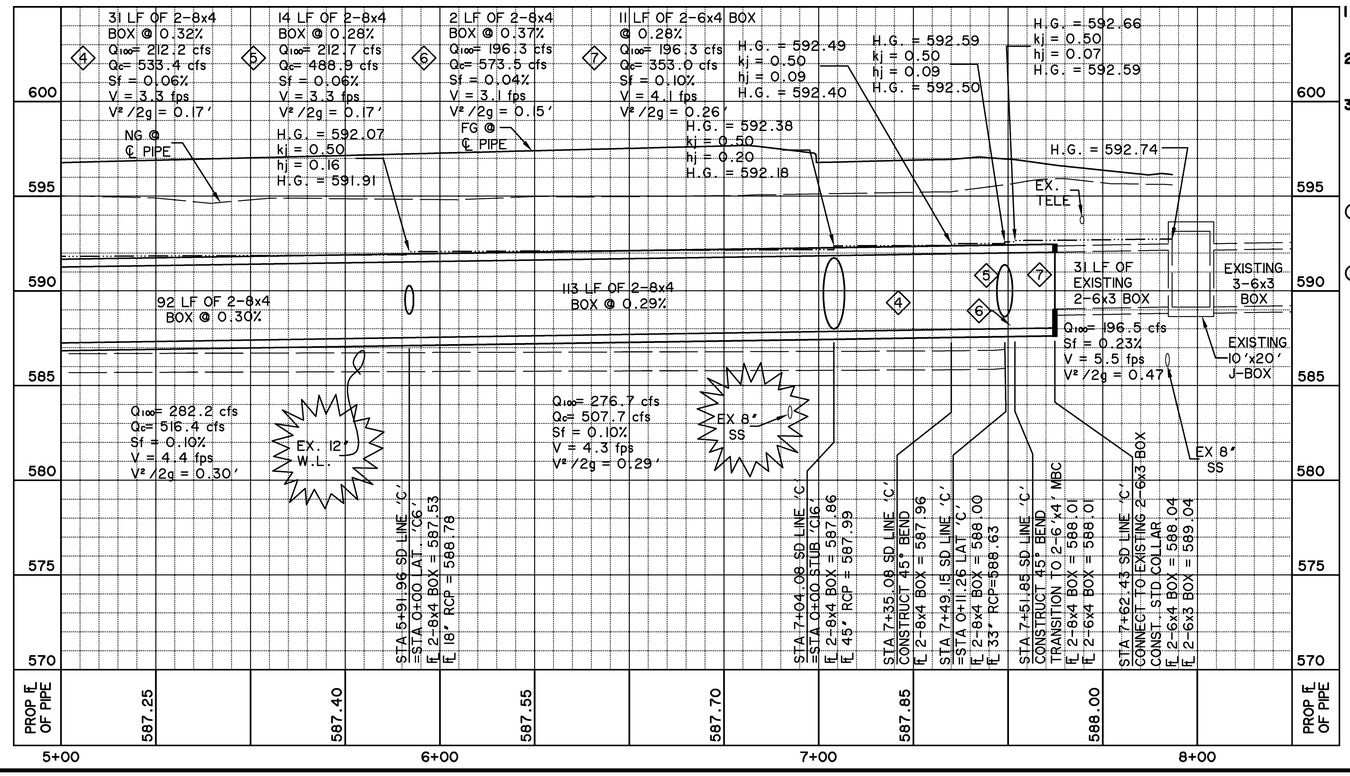
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SHEET NO. D105

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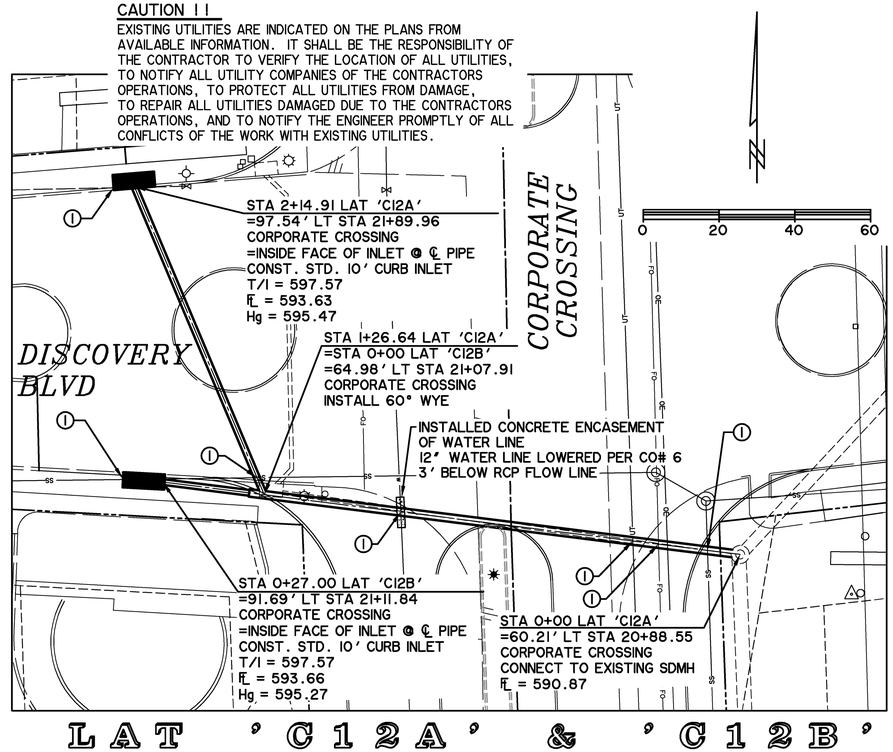
STORM DRAIN LINE 'C'



LAT 'C6'

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LAT 'C12A' & 'C12B'

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NOTES:

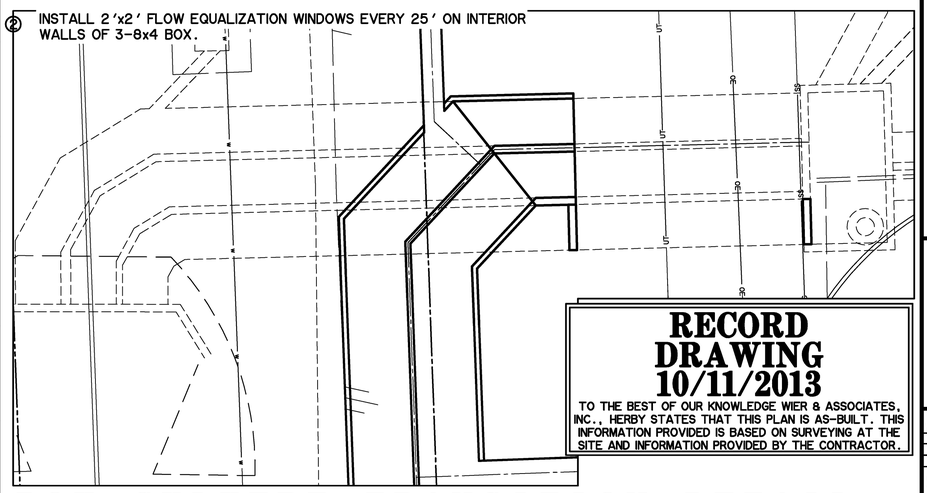
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② INSTALL 2'x2' FLOW EQUALIZATION WINDOWS EVERY 25' ON INTERIOR WALLS OF 3-8x4 BOX.



BOX CULVERT TRANSITION DETAIL

RECORD DRAWING 10/11/2013

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ENGINEERS SURVEYORS LAND PLANNERS
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Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

STORM DRAIN LINE 'C'
STA 5+00 TO END

WA# 08029

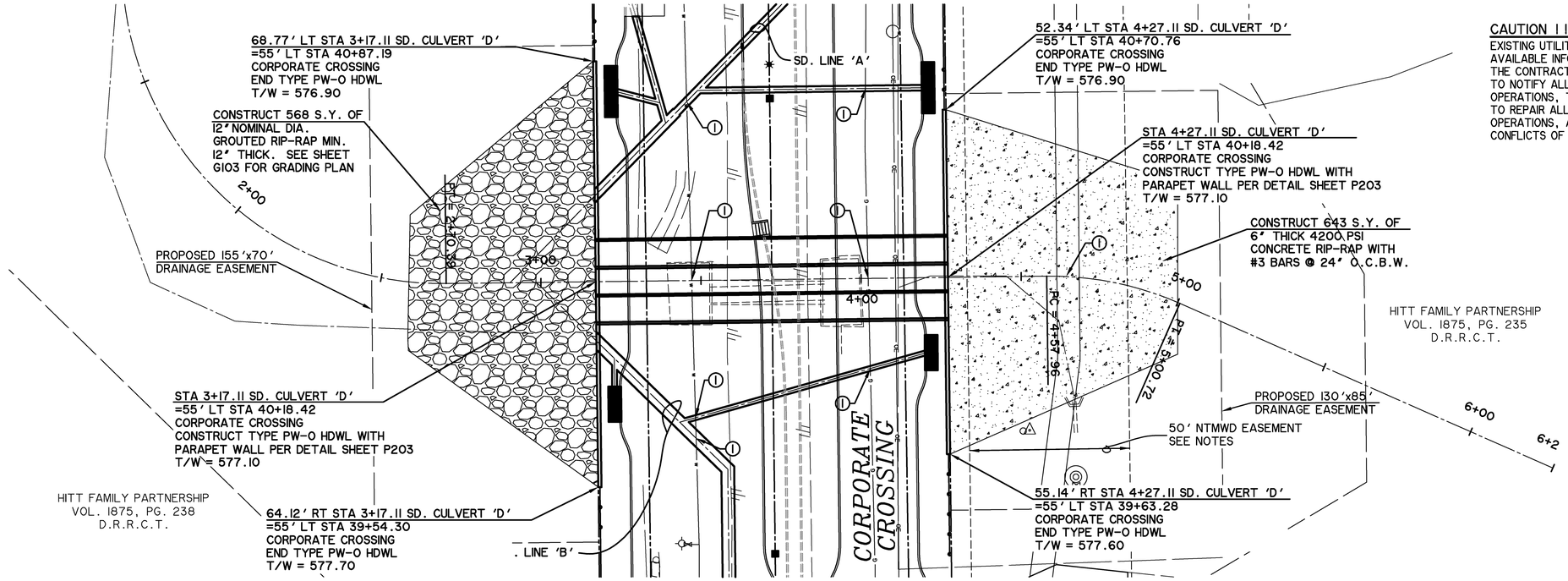
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER

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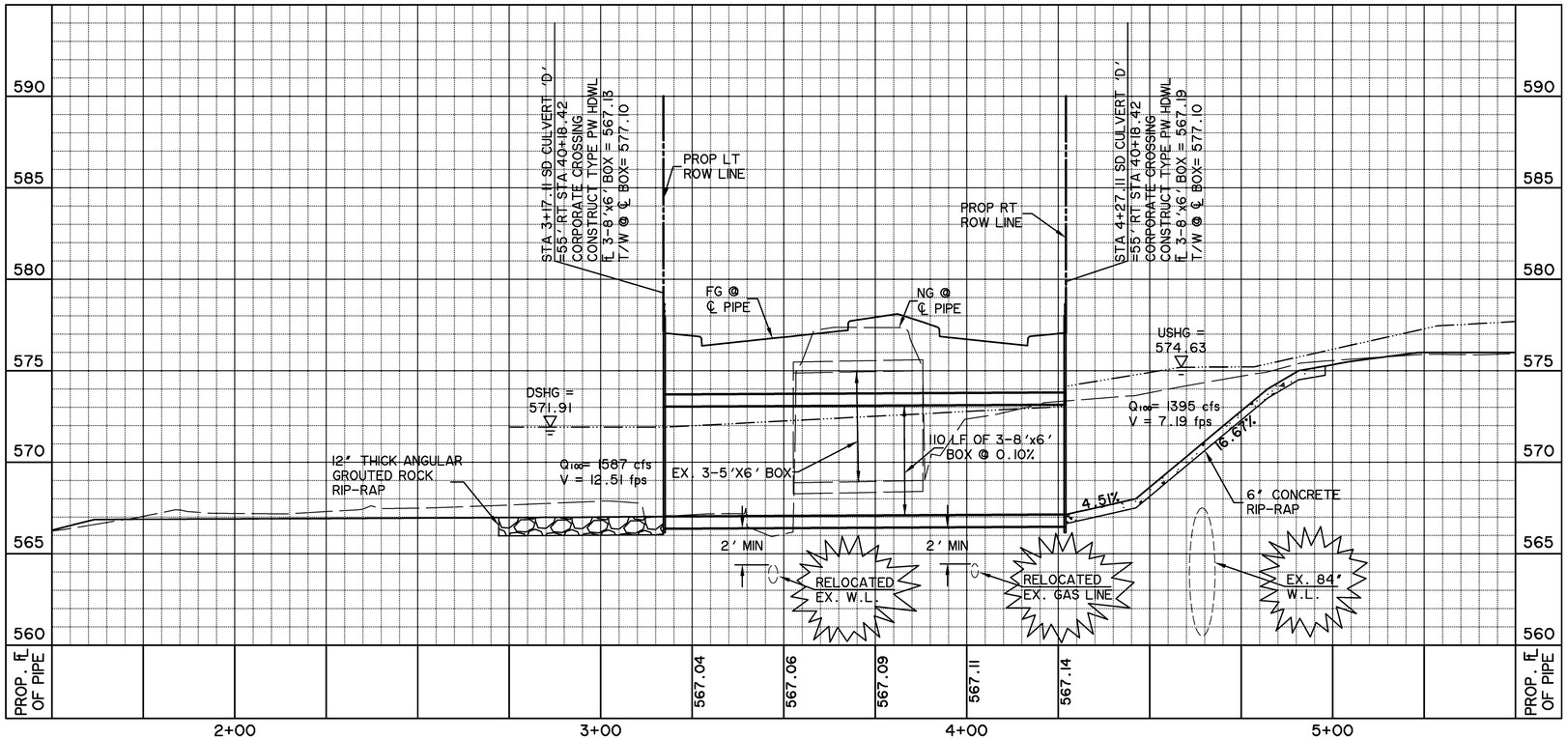
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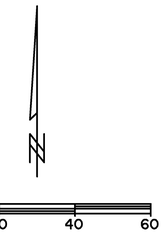
SHEET NO.
D106

FILE: D106-SD-LN-C.dwg
TIME: 10:42



CULVERT - LINE 'D'





CAUTION ! !

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RECORD DRAWING 10/11/2013

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CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

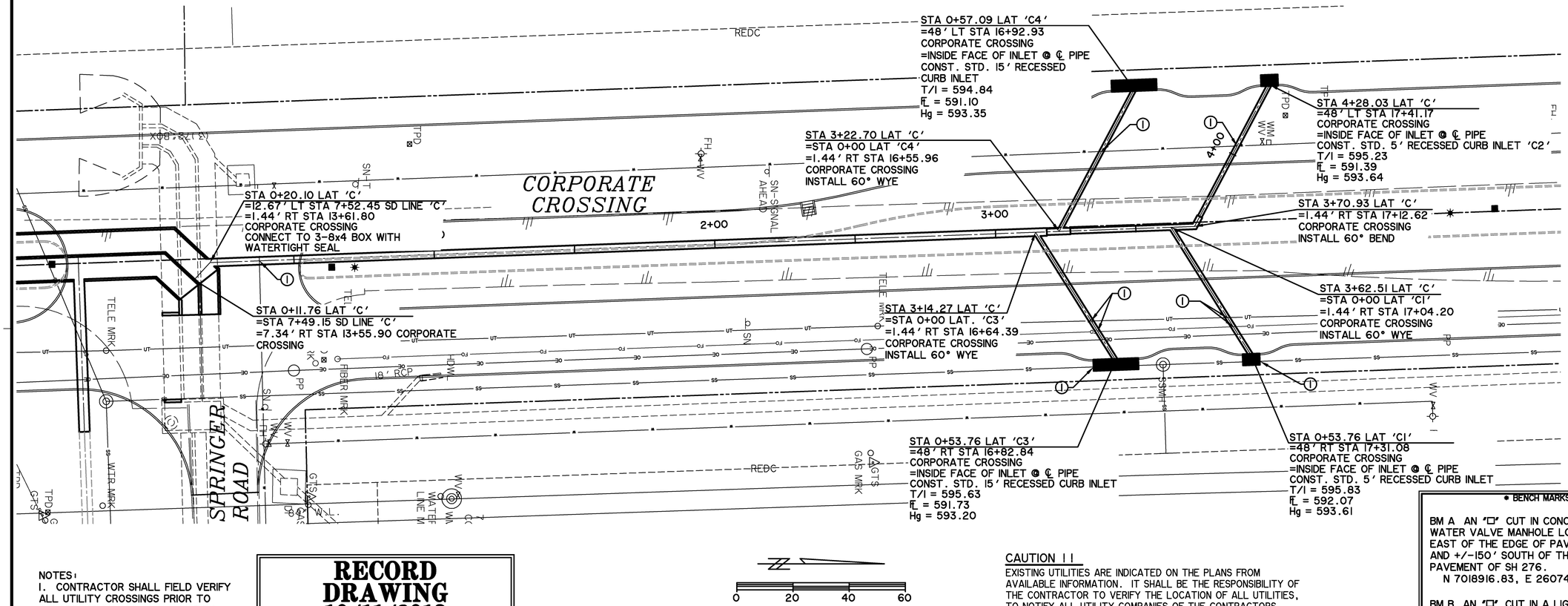
CULVERT - LINE 'D'
PLAN & PROFILE

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT DATE 09-15-2013
WA# 08029
SHEET NO. D107

TIME: 10:10:1 FILE: D107-SD-LN-D-CULVERT.dwg



NOTES:
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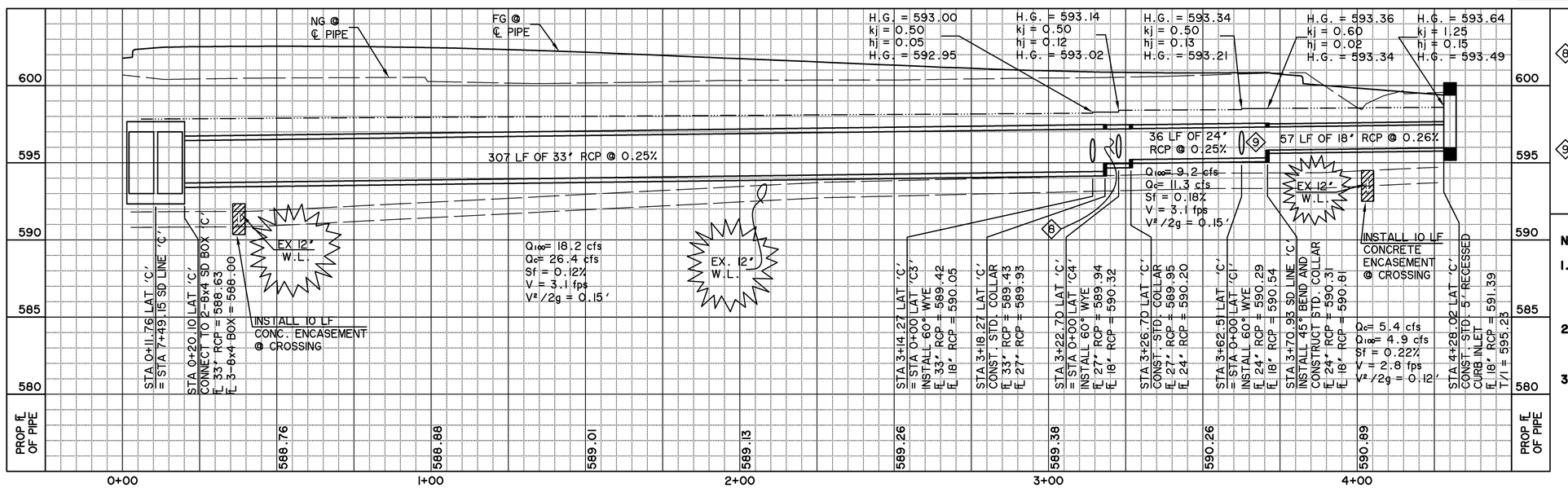
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LATERAL 'C'



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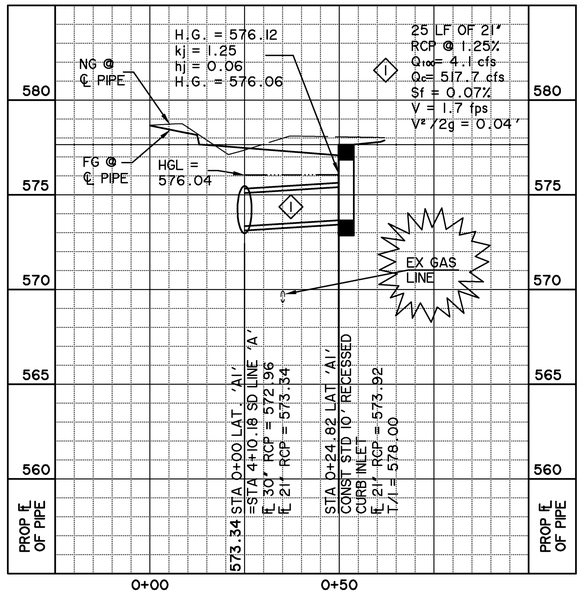
CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO I.H. 30)

STORM DRAIN LATERAL 'C'

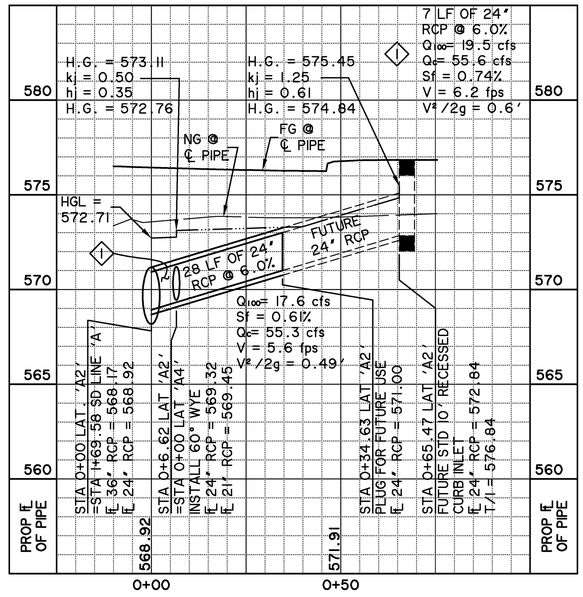
WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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LAST SHEET EDIT DATE 09-16-2013
WA# 08029
SHEET NO. D108

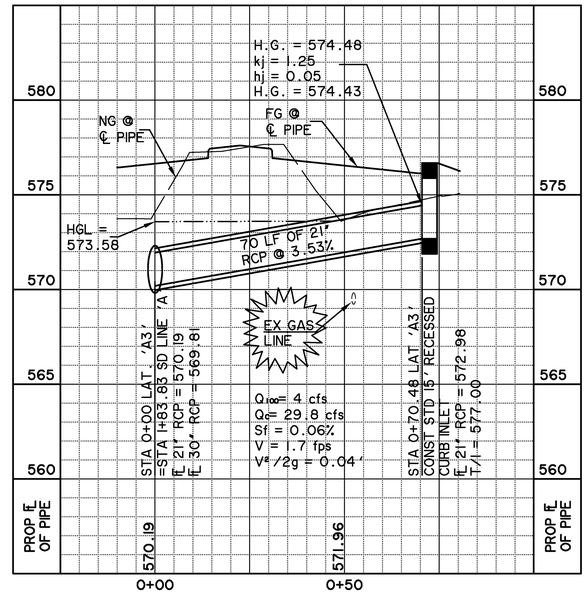
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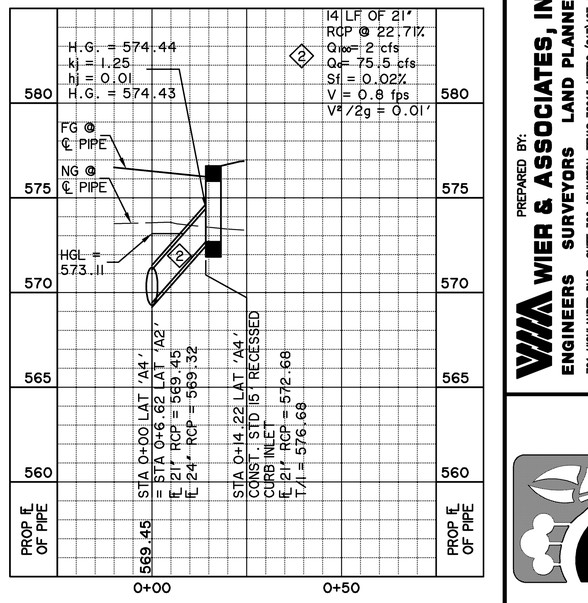
L A T ' A 1 '



L A T ' A 2 '



L A T ' A 3 '



L A T ' A 4 '

RECORD DRAWING 10/11/2013

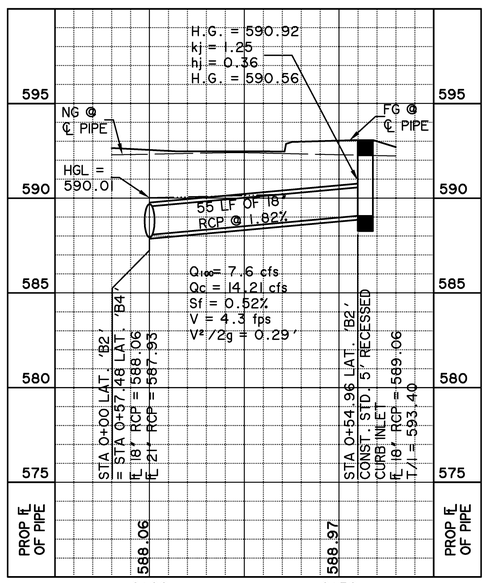
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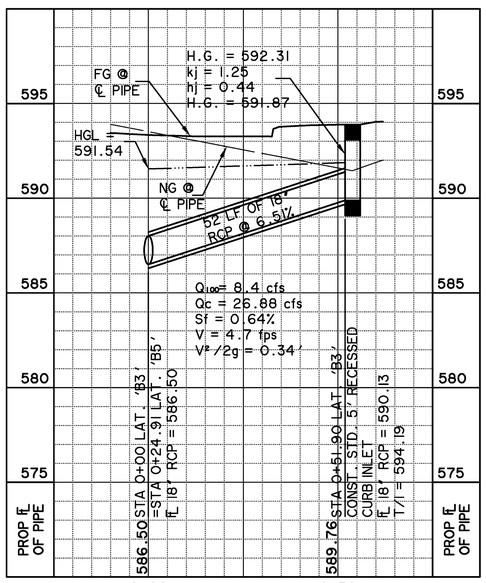
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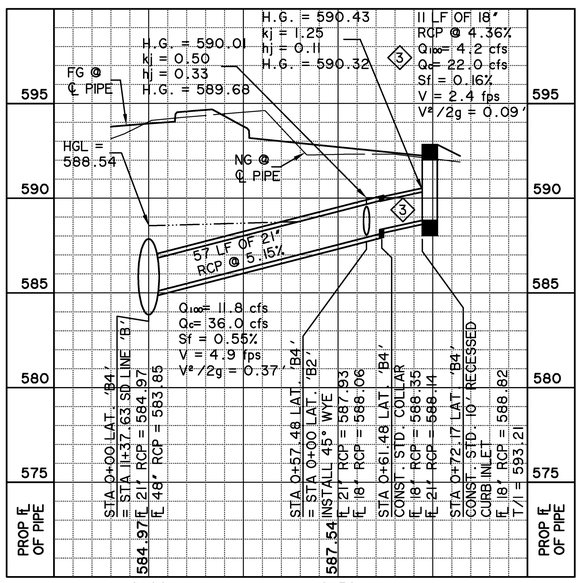
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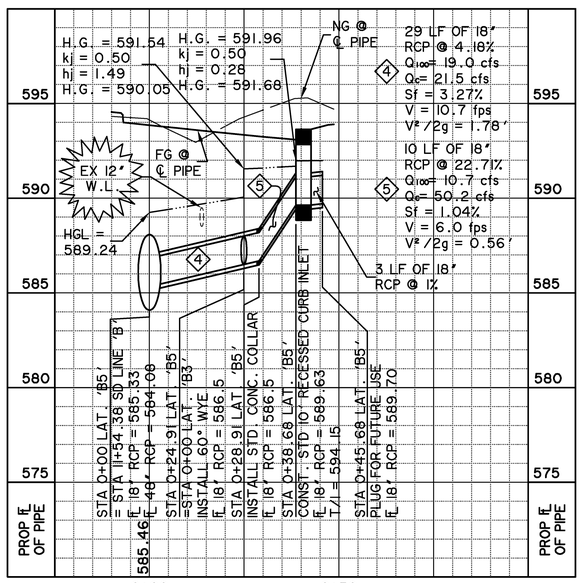
L A T ' B 2 '



L A T ' B 3 '



L A T ' B 4 '



L A T ' B 5 '

PREPARED BY:
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CITY OF ROCKWALL IMPROVEMENTS TO CORPORATE CROSSING (FROM S.H. 276 TO L.H. 30)

STORM DRAIN LATERALS

WA# 08029

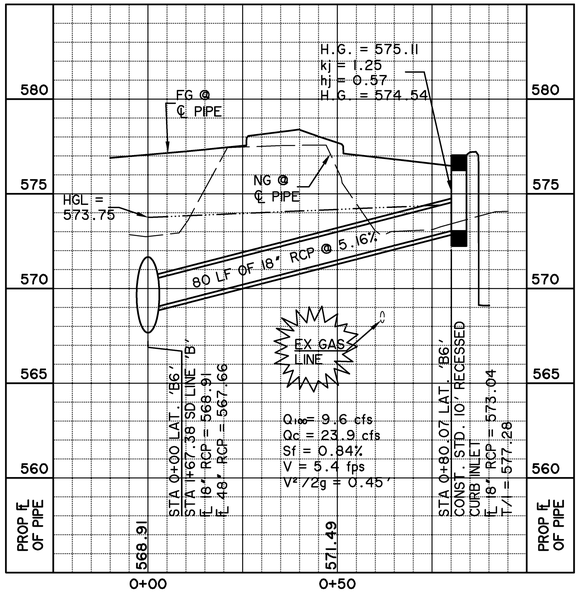
STATE OF TEXAS
RONALD RAMIREZ
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10/11/13

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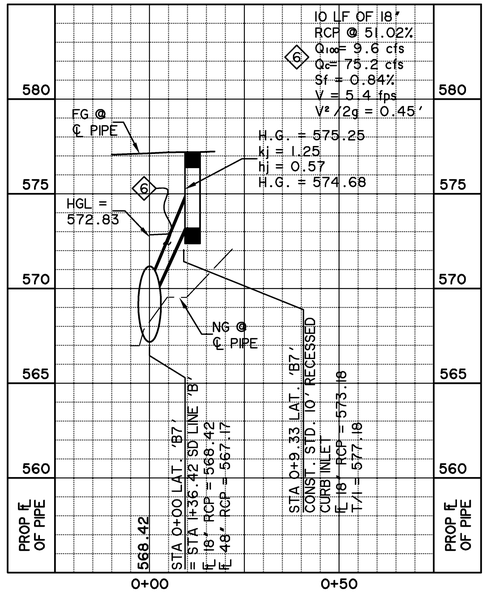
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WA# 08029

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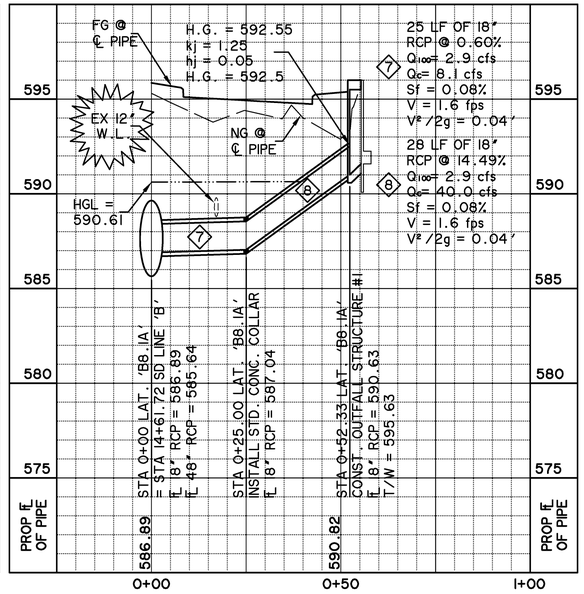
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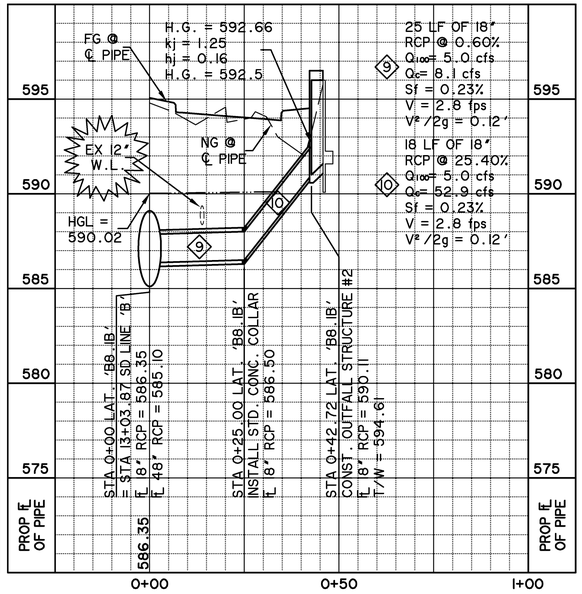
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LAT 'B7'



LAT 'B8.1A'



LAT 'B8.1B'

RECORD DRAWING 10/11/2013

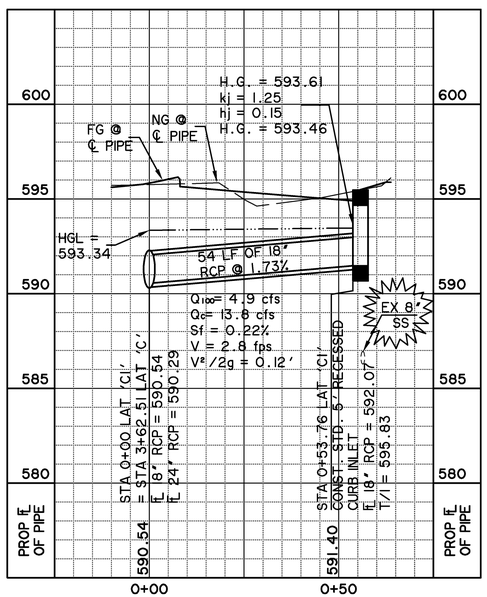
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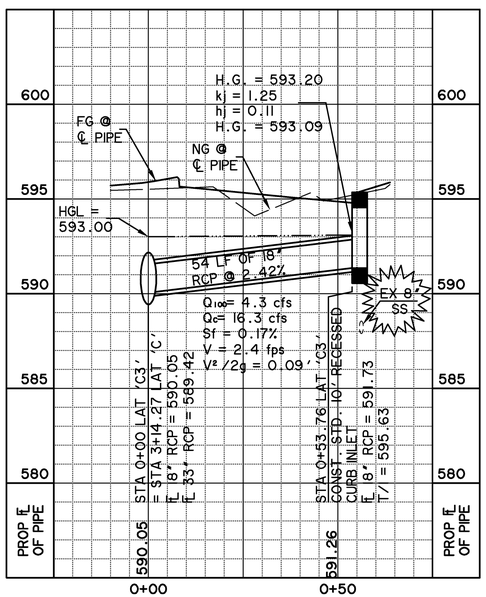
1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
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CAUTION !!

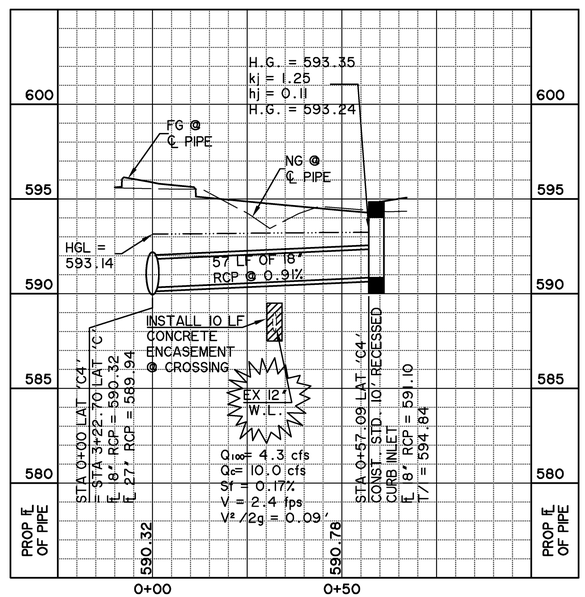
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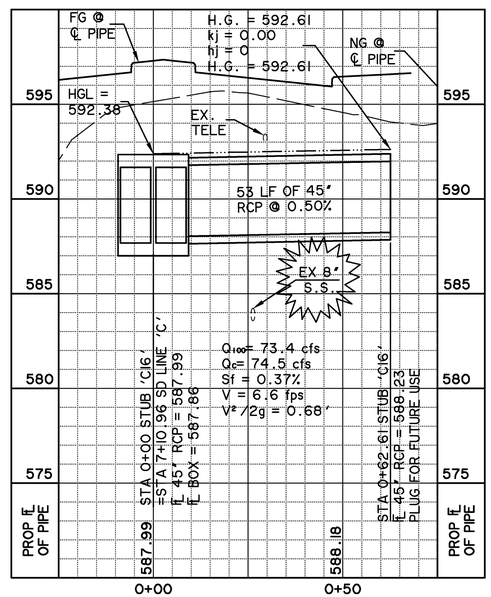
LAT 'C1'



LAT 'C3'



LAT 'C4'



LAT 'C16'

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

STORM DRAIN
LATERALS

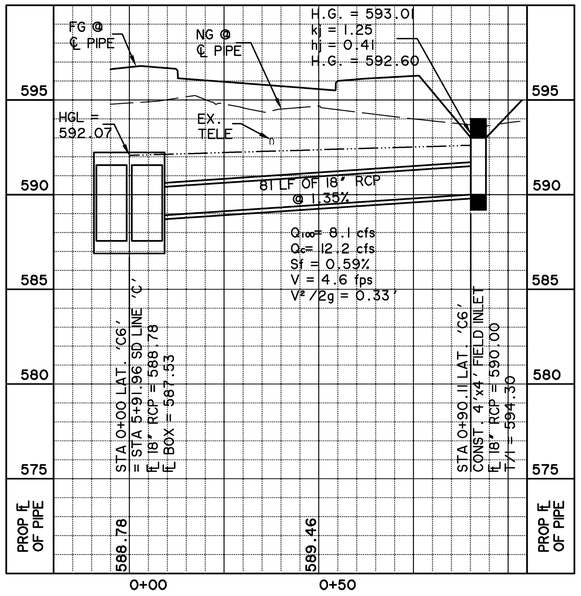
WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED
PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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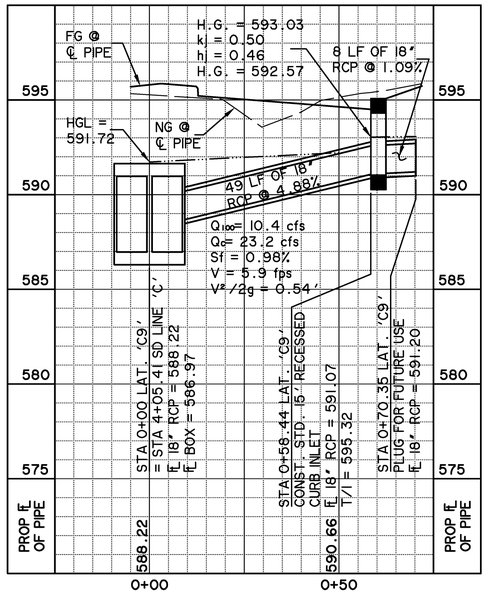
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DATE 09-16-2013
WA# 08029

SHEET NO.
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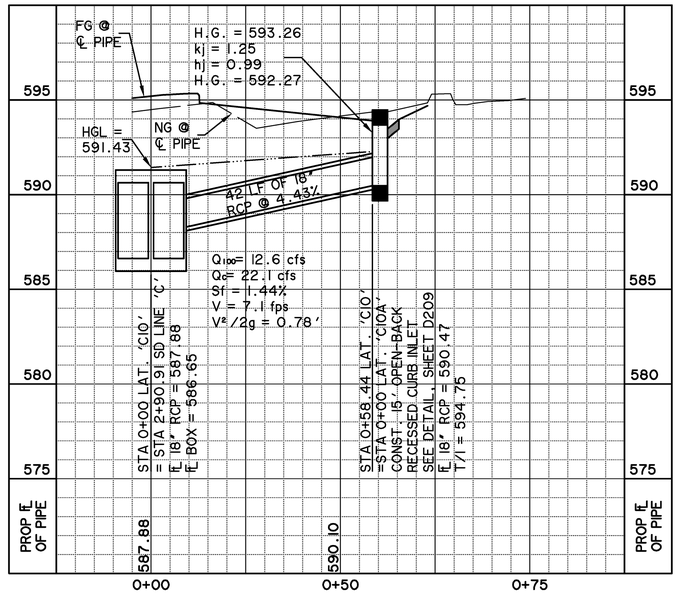
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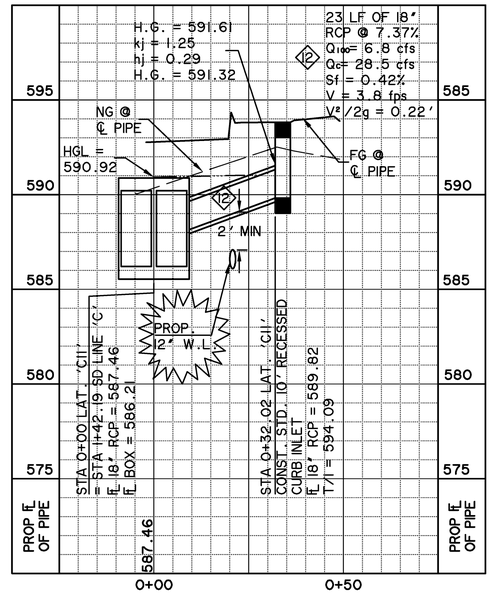
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LAT 'C9'



LAT 'C10'



LAT 'C11'

RECORD DRAWING 10/11/2013

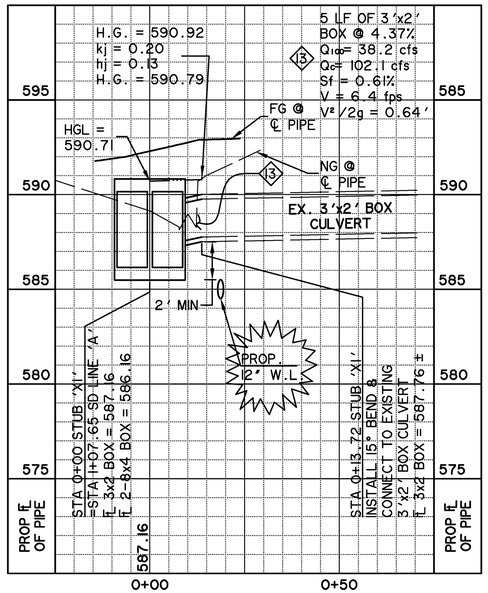
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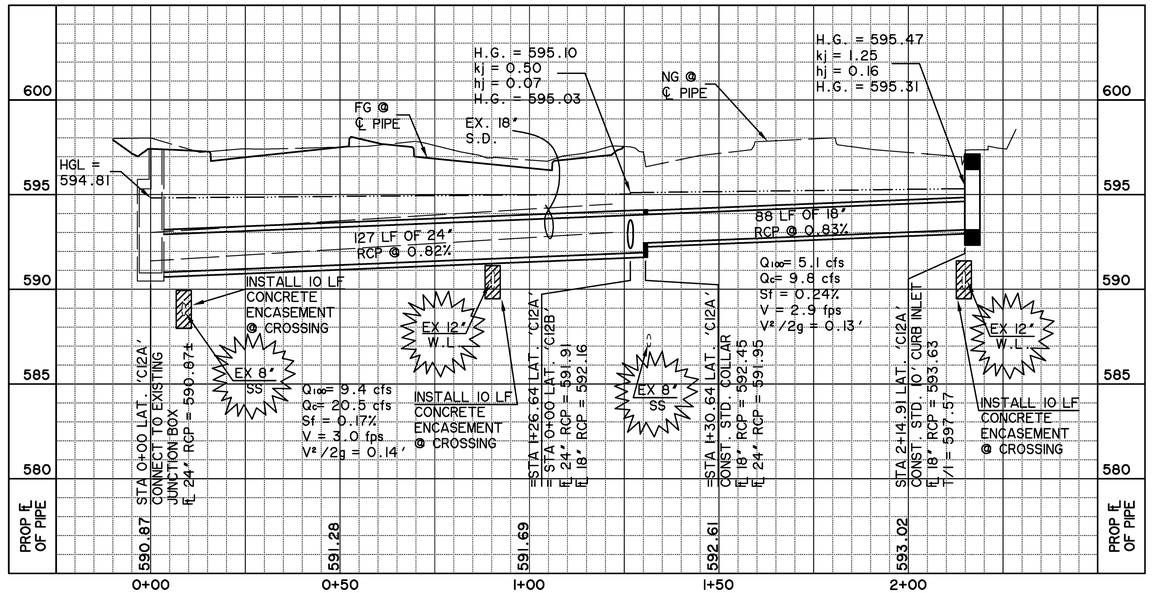
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CAUTION !!

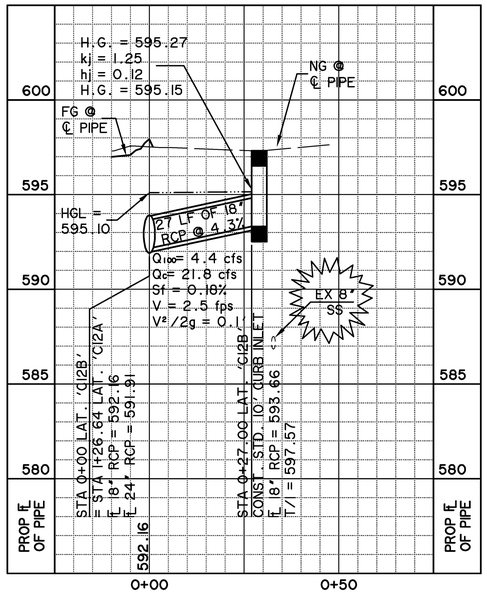
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LAT 'X1'



LAT 'C12A'



LAT 'C12B'

PREPARED BY:
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ENGINEERS SURVEYORS LAND PLANNERS
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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

STORM DRAIN LATERALS

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
10/11/13

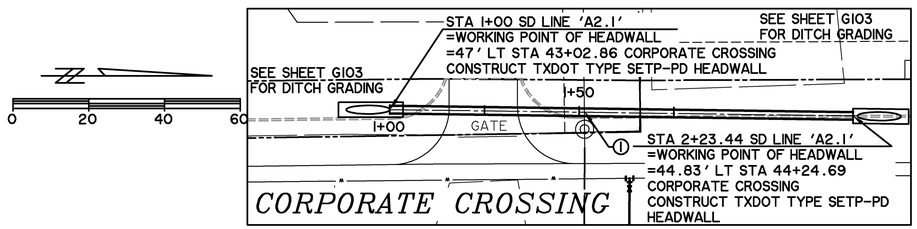
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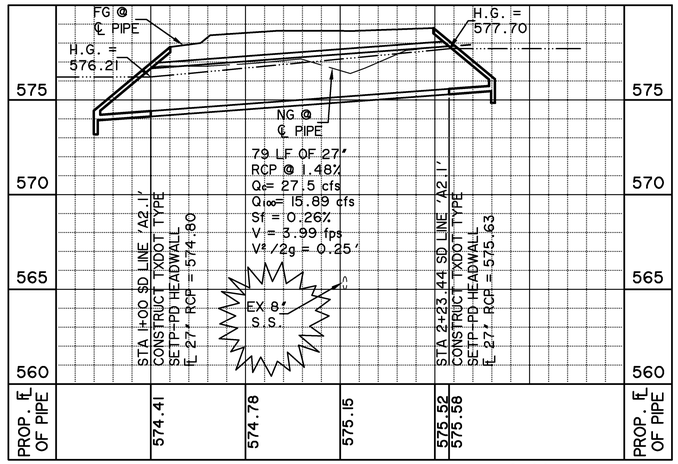
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WA# 08029

SHEET NO. D111

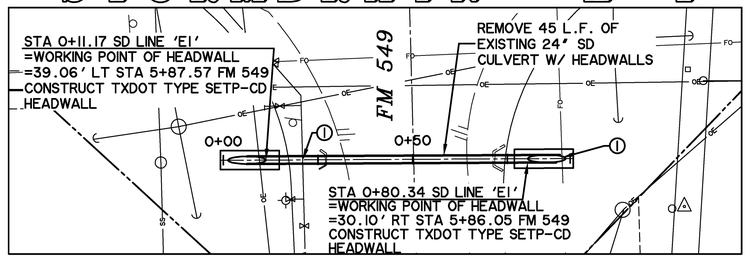
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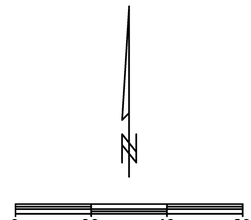
STORMDRAIN 'A-2.1'

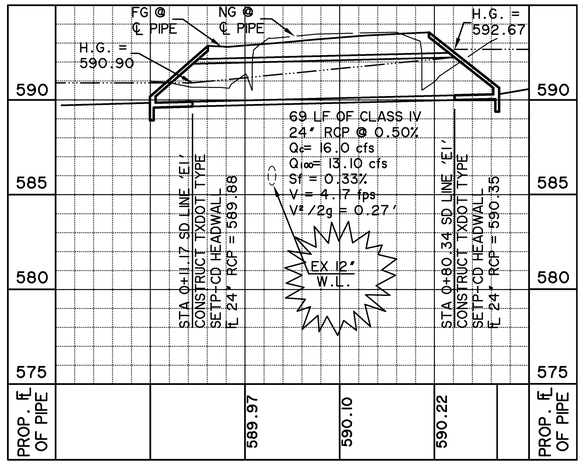




STORMDRAIN 'E-1'







*** BENCH MARKS ***

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

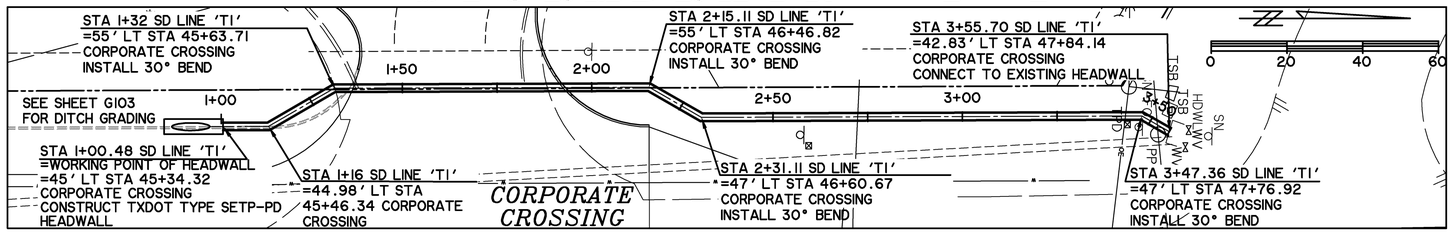
FOR TxDOT DESIGN CRITERIA:

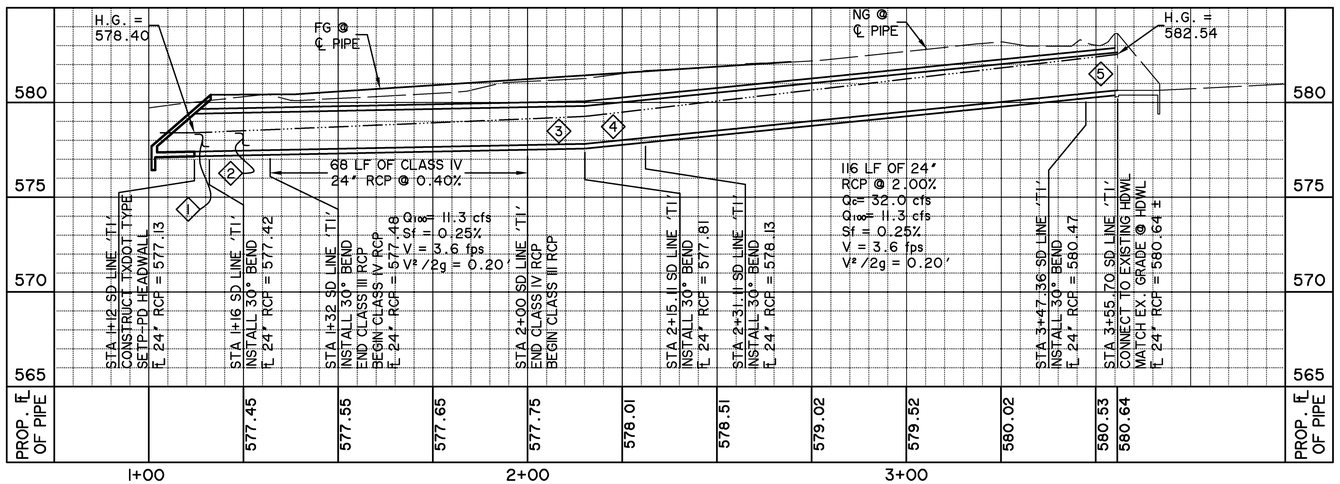
Tc=10 MIN
I100=9.4 IN/HR
Q100=12.4 CFS

THE CALCULATED HEADWATER FOR THE CULVERT IS 2.99 FEET, WHICH CORRESPONDS TO AN ELEVATION OF 593.24. THE PROPOSED STREET ELEVATION AT THIS LOCATION IS 593.55.

HEADWATER CALCULATION FOR 24" CULVERT - S.D. LINE 'E-1'	
a	0.108786
b	0.662381
c	-0.2338
d	0.057959
e	-0.00558
f	0.000205
D	2
S0	0.005
W	2
Q	12.4
F	3.97042579
HW	2.99

STORMDRAIN 'T-1'





① 4 LF OF 24" RCP @ 0.40%
Qc= 14.3 cfs
Q100= 11.3 cfs
Sf = 0.25%
V = 3.6 fps
V²/2g = 0.20'

② 16 LF OF 24" RCP @ 0.40%
Qc= 14.3 cfs
Q100= 11.3 cfs
Sf = 0.25%
V = 3.6 fps
V²/2g = 0.20'

③ 15 LF OF 24" RCP @ 0.40%
Qc= 14.3 cfs
Q100= 11.3 cfs
Sf = 0.25%
V = 3.6 fps
V²/2g = 0.20'

④ 16 LF OF 24" RCP @ 2.00%
Qc= 32.0 cfs
Q100= 11.3 cfs
Sf = 0.25%
V = 3.6 fps
V²/2g = 0.20'

⑤ 9 LF OF 24" RCP @ 2.00%
Qc= 32.0 cfs
Q100= 11.3 cfs
Sf = 0.25%
V = 3.6 fps
V²/2g = 0.20'

NOTES:

① CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES IMMEDIATELY.

CAUTION !!!
UNDERGROUND UTILITIES

EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION SUPPLIED BY VARIOUS OWNERS OF THE FACILITIES. THE ENGINEER DOES NOT ACCEPT THE RESPONSIBILITY FOR THE UTILITY LOCATIONS SHOWN, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION, TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING FACILITIES. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION. ANY DAMAGE BY THE CONTRACTOR TO EXISTING UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.

RECORD DRAWING 10/11/2013
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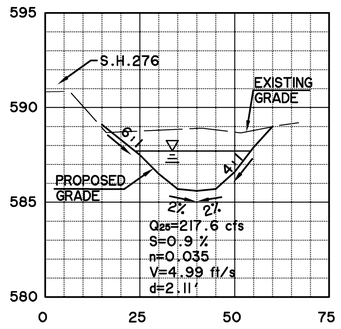
CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

CULVERTS
PLAN & PROFILE

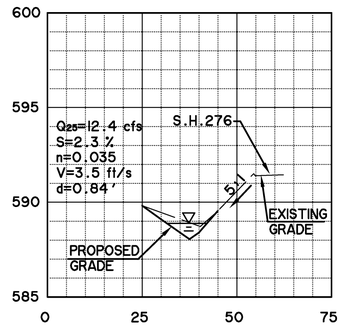
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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WA# 08029
SHEET NO. D112

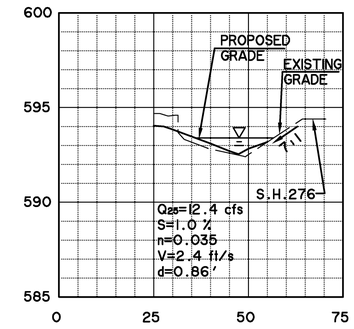
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SECTION 'A-A'



SECTION 'B-B'



SECTION 'C-C'

DRAINAGE AREA CALCULATIONS FOR AREAS DRAINING TO 3-6'x3' CULVERT CROSSING S.H. 276			
DRAINAGE AREA DESIGNATION	ACREAGE 'A'	RUNOFF COEFFICIENT 'C'	CxA'
C-1	0.59	0.90	0.53
C-2	0.59	0.90	0.53
C-3	0.45	0.90	0.41
C-4	0.45	0.90	0.41
C-5	1.48	0.35	0.52
C-6	0.88	0.35	0.31
C-7	1.72	0.35	0.60
C-8	0.89	0.80	0.71
C-9	0.51	0.90	0.46
C-10	0.32	0.90	0.29
C-10a	0.32	0.90	0.29
C-11	0.77	0.90	0.69
C-12	1.08	0.90	0.97
C-13	5.60	0.90	5.04
C-14	30.70	0.35	10.75
C-15	6.30	0.90	5.67
C-16	8.32	0.90	7.49
X-1	4.30	0.90	3.87
X-2	31.10	0.35	10.89
	96.37		50.41

HEADWATER CALCULATION FOR 3-6'x3' CULVERT CROSSING S.H. 276	
a	0.156609
b	0.398935
c	-0.06404
d	0.011201
e	-0.00064
f	0.000015
D	3
S0	0.017286
W	12
Q	277.3
F	8.055214852
HW	8.62

• BENCH MARKS •

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BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
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RECORD DRAWING 10/11/2013

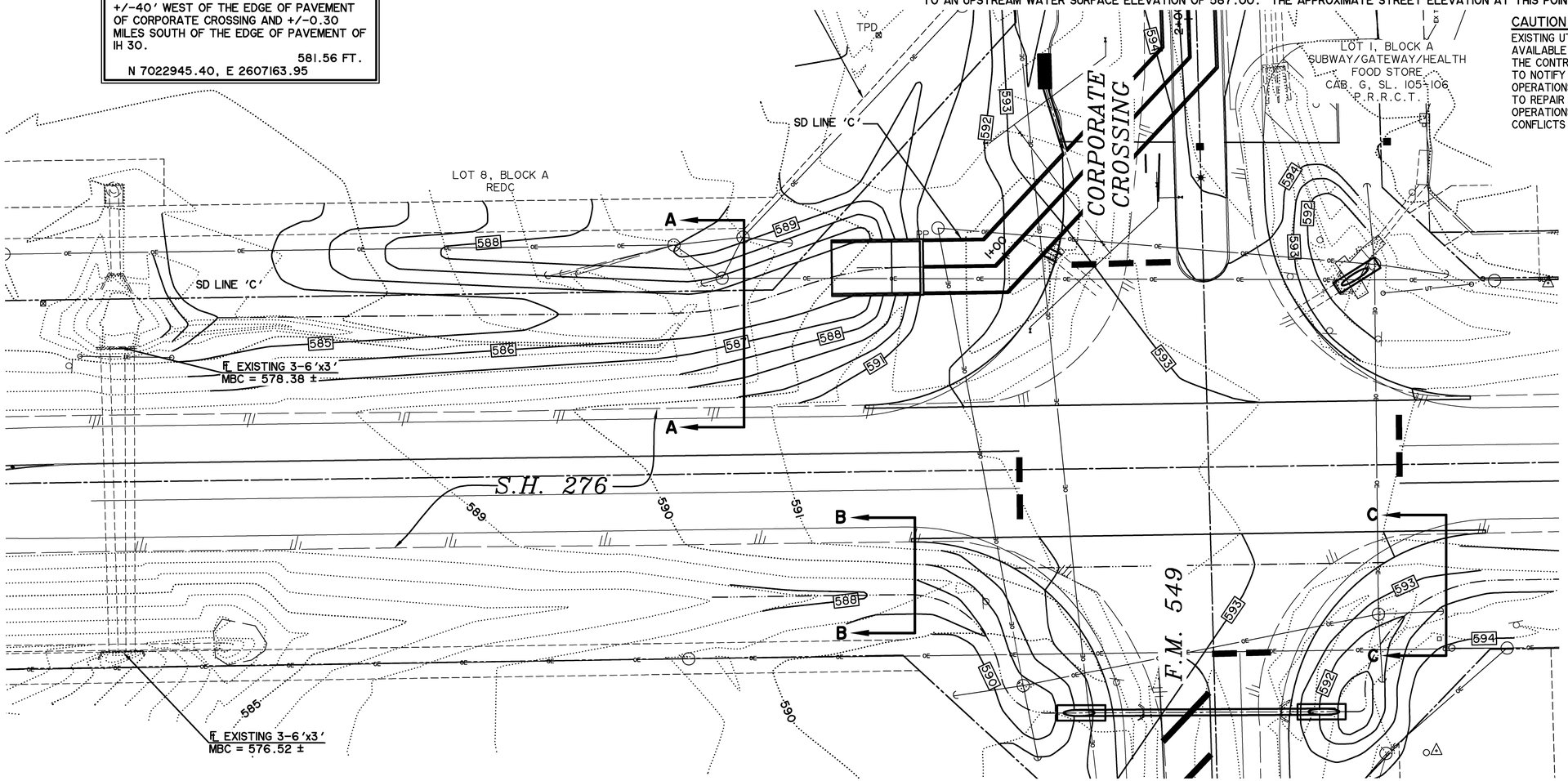
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FROM THE STORMDRAIN CALCULATIONS FOR LINE 'C', THE TOTAL CxA CONVEYED BY THE SYSTEM IS 39.57, AND THE TRAVEL TIME TO REACH THE OUTFALL IS 19.1 MINUTES.

USING THE HYDRAULIC DESIGN MANUAL FOR TxDOT, THIS CULVERT WOULD TYPICALLY BE DESIGNED FOR A 25 YEAR (4%) AEP, AND THE ESTIMATED RAINFALL INTENSITY FOR A DURATION OF 19.1 MINUTES IS 5.5 IN/HR.

USING THE TxDOT INTENSITY OF 5.5 IN/HR, STORMDRAIN LINE 'C' WILL CONVEY 217.6 CFS, AND THE EXISTING CULVERT CROSSING S.H. 276 WILL CONVEY 277.3 CFS.

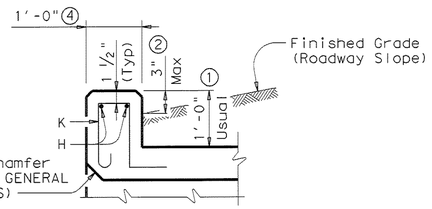
USING A FLOW OF 277.3 CFS, THE CALCULATED HEADWATER OF THE 3-6'x3' CULVERT CROSSING S.H. 276 IS 8.62'. THIS CORRESPONDS TO AN UPSTREAM WATER SURFACE ELEVATION OF 587.00. THE APPROXIMATE STREET ELEVATION AT THIS POINT IS 588.32.



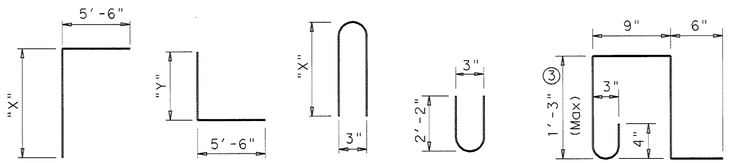
BILLS OF REINFORCING STEEL (For Box Length = 40 feet)

NUMBER OF SPANS	SECTION DIMENSIONS				Bars B				Bars C & D							Bars E					Bars F_1 ~#4				Bars F_2 ~#4 at 1'-6" Max			Bars M~#4 at 1'-6" Max			Bars Y & Z~#4 at 1'-0" Max					Bars H 4~#4		Bars K		QUANTITIES: Per foot of Barrel		Curb		Total	
												Bar C		Bar D																																
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	Length	Wt	No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Length	Wt	No.	Length	Wt	No.	Bar Y Length	Bar Y Wt	Bar Z Length	Bar Z Wt	Length	Weight	No.	Weight	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
2	6'-0"	3'-0"	7"	7"	162	#5	6"	13'- 6"	2,281	162	#4	6"	8'-11"	965	7'- 8"	830	194	#5	5"	6'- 0"	1,214	16	9"	39'-9"	425	50	39'-9"	1,328	56	3'- 0"	112	41	4'- 6"	123	7'- 0"	192	13'- 6"	36	30	85	0.789	186.8	1.0	121	32.6	7,591
3	6'-0"	3'-0"	7"	7"	162	#5	6"	20'- 1"	3,393	162	#4	6"	8'-11"	965	7'- 8"	830	194	#5	5"	12'- 7"	2,546	24	9"	39'-9"	637	71	39'-9"	1,885	56	3'- 0"	112	82	4'- 6"	246	7'- 0"	383	20'- 1"	54	42	119	1.138	274.9	1.5	173	47.0	11,170
4	6'-0"	3'-0"	7"	7"	162	#5	6"	26'- 8"	4,506	162	#4	6"	8'-11"	965	7'- 8"	830	194	#5	5"	19'- 2"	3,878	32	9"	39'-9"	850	92	39'-9"	2,443	56	3'- 0"	112	123	4'- 6"	370	7'- 0"	575	26'- 8"	71	56	159	1.487	363.2	2.0	230	61.5	14,759
5	6'-0"	3'-0"	7"	7"	162	#5	6"	33'- 3"	5,618	162	#4	6"	8'-11"	965	7'- 8"	830	194	#5	5"	25'- 9"	5,210	40	9"	39'-9"	1,062	113	39'-9"	3,000	56	3'- 0"	112	164	4'- 6"	493	7'- 0"	767	33'- 3"	89	70	199	1.836	451.4	2.5	288	75.9	18,345
6	6'-0"	3'-0"	7"	7"	162	#5	6"	39'-10"	6,730	162	#4	6"	8'-11"	965	7'- 8"	830	194	#5	5"	32'- 4"	6,542	48	9"	39'-9"	1,275	134	39'-9"	3,558	56	3'- 0"	112	205	4'- 6"	616	7'- 0"	959	39'-10"	106	82	233	2.186	539.7	3.0	339	90.4	21,926
2	6'-0"	4'-0"	7"	7"	162	#5	6"	13'- 6"	2,281	162	#4	6"	9'-11"	1,073	7'- 8"	830	194	#5	5"	6'- 0"	1,214	16	9"	39'-9"	425	50	39'-9"	1,328	56	4'- 0"	150	41	4'- 6"	123	9'- 0"	246	13'- 6"	36	30	85	0.853	191.8	1.0	121	35.1	7,791
3	6'-0"	4'-0"	7"	7"	162	#5	6"	20'- 1"	3,393	162	#4	6"	9'-11"	1,073	7'- 8"	830	194	#5	5"	12'- 7"	2,546	24	9"	39'-9"	637	71	39'-9"	1,885	56	4'- 0"	150	82	4'- 6"	246	9'- 0"	493	20'- 1"	54	42	119	1.224	281.3	1.5	173	50.5	11,426
4	6'-0"	4'-0"	7"	7"	162	#5	6"	26'- 8"	4,506	162	#4	6"	9'-11"	1,073	7'- 8"	830	194	#5	5"	19'- 2"	3,878	32	9"	39'-9"	850	92	39'-9"	2,443	56	4'- 0"	150	123	4'- 6"	370	9'- 0"	739	26'- 8"	71	56	159	1.595	371.0	2.0	230	65.8	15,069
5	6'-0"	4'-0"	7"	7"	162	#5	6"	33'- 3"	5,618	162	#4	6"	9'-11"	1,073	7'- 8"	830	194	#5	5"	25'- 9"	5,210	40	9"	39'-9"	1,062	113	39'-9"	3,000	56	4'- 0"	150	164	4'- 6"	493	9'- 0"	986	33'- 3"	89	70	199	1.966	460.6	2.5	288	81.1	18,710
6	6'-0"	4'-0"	7"	7"	162	#5	6"	39'-10"	6,730	162	#4	6"	9'-11"	1,073	7'- 8"	830	194	#5	5"	32'- 4"	6,542	48	9"	39'-9"	1,275	134	39'-9"	3,558	56	4'- 0"	150	205	4'- 6"	616	9'- 0"	1,232	39'-10"	106	82	233	2.337	550.2	3.0	339	96.5	22,345
2	6'-0"	5'-0"	7"	7"	162	#5	6"	13'- 6"	2,281	162	#4	6"	10'-11"	1,181	7'- 8"	830	194	#5	5"	6'- 0"	1,214	16	9"	39'-9"	425	56	39'-9"	1,487	56	5'- 0"	187	41	4'- 6"	123	11'- 0"	301	13'- 6"	36	30	85	0.918	200.7	1.0	121	37.7	8,150
3	6'-0"	5'-0"	7"	7"	162	#5	6"	20'- 1"	3,393	162	#4	6"	10'-11"	1,181	7'- 8"	830	194	#5	5"	12'- 7"	2,546	24	9"	39'-9"	637	79	39'-9"	2,098	56	5'- 0"	187	82	4'- 6"	246	11'- 0"	603	20'- 1"	54	42	119	1.311	293.0	1.5	173	53.9	11,894
4	6'-0"	5'-0"	7"	7"	162	#5	6"	26'- 8"	4,506	162	#4	6"	10'-11"	1,181	7'- 8"	830	194	#5	5"	19'- 2"	3,878	32	9"	39'-9"	850	102	39'-9"	2,708	56	5'- 0"	187	123	4'- 6"	370	11'- 0"	904	26'- 8"	71	56	159	1.703	385.4	2.0	230	70.1	15,644
5	6'-0"	5'-0"	7"	7"	162	#5	6"	33'- 3"	5,618	162	#4	6"	10'-11"	1,181	7'- 8"	830	194	#5	5"	25'- 9"	5,210	40	9"	39'-9"	1,062	125	39'-9"	3,319	56	5'- 0"	187	164	4'- 6"	493	11'- 0"	1,205	33'- 3"	89	70	199	2.096	477.6	2.5	288	86.3	19,393
6	6'-0"	5'-0"	7"	7"	162	#5	6"	39'-10"	6,730	162	#4	6"	10'-11"	1,181	7'- 8"	830	194	#5	5"	32'- 4"	6,542	48	9"	39'-9"	1,275	148	39'-9"	3,930	56	5'- 0"	187	205	4'- 6"	616	11'- 0"	1,506	39'-10"	106	82	233	2.488	569.9	3.0	339	102.5	23,136
2	6'-0"	6'-0"	7"	7"	162	#5	6"	13'- 6"	2,281	194	#4	5"	11'-11"	1,544	7'- 8"	994	194	#5	5"	6'- 0"	1,214	16	9"	39'-9"	425	62	39'-9"	1,646	56	6'- 0"	224	41	4'- 6"	123	13'- 0"	356	13'- 6"	36	30	85	0.983	220.2	1.0	121	40.3	8,928
3	6'-0"	6'-0"	7"	7"	162	#5	6"	20'- 1"	3,393	194	#4	5"	11'-11"	1,544	7'- 8"	994	194	#5	5"	12'- 7"	2,546	24	9"	39'-9"	637	87	39'-9"	2,310	56	6'- 0"	224	82	4'- 6"	246	13'- 0"	712	20'- 1"	54	42	119	1.397	315.2	1.5	173	57.4	12,779
4	6'-0"	6'-0"	7"	7"	162	#5	6"	26'- 8"	4,506	194	#4	5"	11'-11"	1,544	7'- 8"	994	194	#5	5"	19'- 2"	3,878	32	9"	39'-9"	850	112	39'-9"	2,974	56	6'- 0"	224	123	4'- 6"	370	13'- 0"	1,068	26'- 8"	71	56	159	1.811	410.2	2.0	230	74.4	16,638
5	6'-0"	6'-0"	7"	7"	162	#5	6"	33'- 3"	5,618	194	#4	5"	11'-11"	1,544	7'- 8"	994	194	#5	5"	25'- 9"	5,210	40	9"	39'-9"	1,062	137	39'-9"	3,638	56	6'- 0"	224	164	4'- 6"	493	13'- 0"	1,424	33'- 3"	89	70	199	2.225	505.2	2.5	288	91.5	20,495
6	6'-0"	6'-0"	7"	7"	162	#5	6"	39'-10"	6,730	194	#4	5"	11'-11"	1,544	7'- 8"	994	194	#5	5"	32'- 4"	6,542	48	9"	39'-9"	1,275	162	39'-9"	4,302	56	6'- 0"	224	205	4'- 6"	616	13'- 0"	1,780	39'-10"	106	82	233	2.639	600.2	3.0	339	108.6	24,346

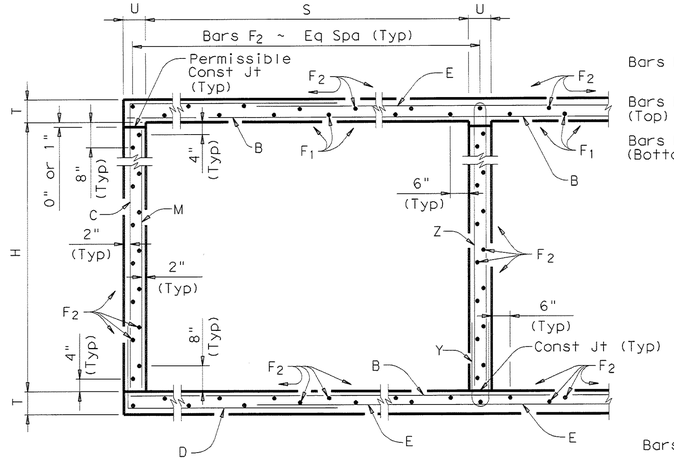
H	Bar Dimensions	
	"X"	"Y"
3'-0"	3'-5"	2'-2"
4'-0"	4'-5"	2'-2"
5'-0"	5'-5"	2'-2"
6'-0"	6'-5"	2'-2"



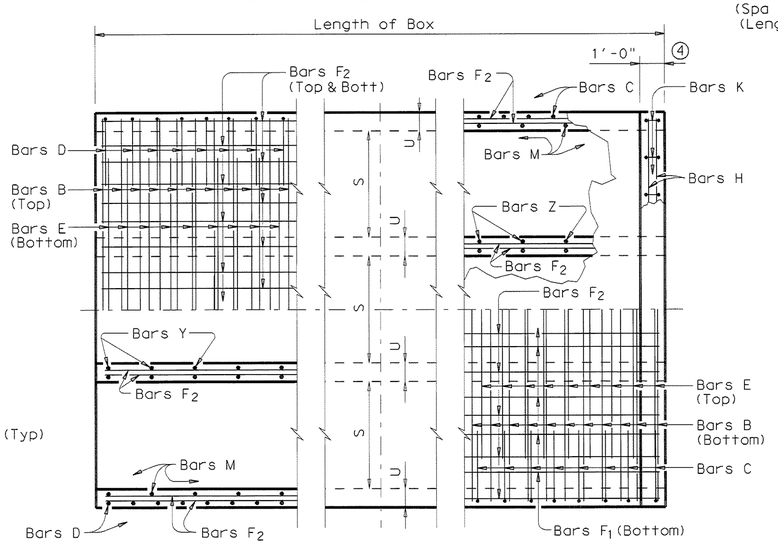
SECTION THRU CURB



BARS C | BARS D | BARS Z | BARS Y | BARS K ~ #4 (Spa = 1'-0" Max) (Length = 4'-3")



TYPICAL SECTION



BOTTOM SLAB | PART PLANS | TOP SLAB

① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with bridge rail, other than T6, refer to RAC standard.

② For vehicle safety, the following requirements must be met:
- For structures without bridge rail, curbs shall project no more than 3" above finished grade.
- For structures with bridge rail, curbs shall be flush with finished grade.

Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

③ For curbs less than 1'-0" high, tilt bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, bars K may be omitted.

④ 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

GENERAL NOTES:

Designed according to current AASHTO Standard and Interim Specifications.
Designed to the maximum fill height shown.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" with these exceptions: use Class "S" for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.
Class "C" concrete shall have a minimum compressive strength of 3,600 psi. Class "S" concrete shall have a minimum compressive strength of 4,000 psi.
The use of permanent forms is not allowed.
The bottom edge of the top slab shall be chamfered 3" at the entrance.
Reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
Construction joints shown at the flow line may be raised a maximum of 6" at the Contractor's option. If this option is used, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.
See standard MC-MD for skewed ends, angle sections and lengthening details.

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

HS20 LOADING

Texas Department of Transportation
Bridge Division

MULTIPLE BOX CULVERTS CAST-IN-PLACE 6'-0" SPAN 0' TO 16' FILL

MC-6-16

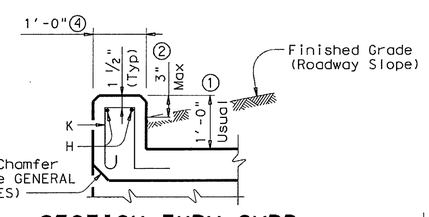
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© TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				D201
	COUNTY		CONTROL SECT JOB	HIGHWAY

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

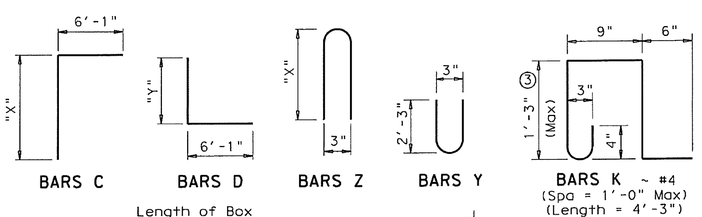
BILLS OF REINFORCING STEEL (For Box Length = 40 feet)

NUMBER OF SPANS	SECTION DIMENSIONS				Bars B					Bars C & D									Bars E					Bars F_1 ~#4				Bars F_2 ~#4 at 1'-6" Max			Bars M~#4 at 1'-6" Max			Bars Y & Z~#4 at 10" Max					Bars H 4~#4		Bars K		QUANTITIES Per foot of Barrel		Curb		Total	
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Bar C Length	Bar C Wt	Bar D Length	Bar D Wt	No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Length	Wt	No.	Spa	Length	Wt	No.	Length	Wt	No.	Bar Y Length	Bar Y Wt	Bar Z Length	Bar Z Wt	Length	Weight	No.	Weight	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
2	8'-0"	4'-0"	8"	7"	162	#5	6"	17'- 6"	2,957	194	#4	5"	10'- 7"	1,372	8'- 4"	1,080	194	#6	5"	8'-10"	2,574	22	9"	39'-9"	584	56	39'-9"	1,487	56	4'- 0"	150	49	4'- 8"	153	9'- 2"	300	17'- 6"	47	38	108	1.136	266.4	1.3	155	46.7	10,812
3	8'-0"	4'-0"	8"	7"	162	#5	6"	26'- 1"	4,407	194	#4	5"	10'- 7"	1,372	8'- 4"	1,080	194	#6	5"	17'- 5"	5,075	36	8"	39'-9"	956	80	39'-9"	2,124	56	4'- 0"	150	98	4'- 8"	305	9'- 2"	600	26'- 1"	70	54	153	1.646	401.7	2.0	223	67.8	16,292
4	8'-0"	4'-0"	8"	7"	162	#5	6"	34'- 8"	5,857	194	#4	5"	10'- 7"	1,372	8'- 4"	1,080	194	#6	5"	26'- 0"	7,576	48	8"	39'-9"	1,275	104	39'-9"	2,762	56	4'- 0"	150	147	4'- 8"	458	9'- 2"	900	34'- 8"	93	72	204	2.156	535.8	2.6	297	88.8	21,727
5	8'-0"	4'-0"	8"	7"	162	#5	6"	43'- 3"	7,308	194	#4	5"	10'- 7"	1,372	8'- 4"	1,080	194	#6	5"	34'- 7"	10,077	60	8"	39'-9"	1,593	128	39'-9"	3,399	56	4'- 0"	150	196	4'- 8"	611	9'- 2"	1,200	43'- 3"	116	90	256	2.667	669.8	3.2	372	109.9	27,162
6	8'-0"	4'-0"	8"	7"	162	#5	6"	51'-10"	8,758	194	#4	5"	10'- 7"	1,372	8'- 4"	1,080	194	#6	5"	43'- 2"	12,578	72	8"	39'-9"	1,912	152	39'-9"	4,036	56	4'- 0"	150	245	4'- 8"	764	9'- 2"	1,500	51'-10"	138	106	301	3.177	803.8	3.9	439	131.0	32,589
2	8'-0"	5'-0"	8"	7"	194	#5	5"	17'- 6"	3,541	194	#4	5"	11'- 7"	1,501	8'- 4"	1,080	194	#6	5"	8'-10"	2,574	22	9"	39'-9"	584	62	39'-9"	1,646	56	5'- 0"	187	49	4'- 8"	153	11'- 2"	366	17'- 6"	47	38	108	1.201	290.8	1.3	155	49.3	11,787
3	8'-0"	5'-0"	8"	7"	194	#5	5"	26'- 1"	5,278	194	#4	5"	11'- 7"	1,501	8'- 4"	1,080	194	#6	5"	17'- 5"	5,075	36	8"	39'-9"	956	88	39'-9"	2,337	56	5'- 0"	187	98	4'- 8"	305	11'- 2"	731	26'- 1"	70	54	153	1.733	436.3	2.0	223	71.3	17,673
4	8'-0"	5'-0"	8"	7"	194	#5	5"	34'- 8"	7,015	194	#4	5"	11'- 7"	1,501	8'- 4"	1,080	194	#6	5"	26'- 0"	7,576	48	8"	39'-9"	1,275	114	39'-9"	3,027	56	5'- 0"	187	147	4'- 8"	458	11'- 2"	1,097	34'- 8"	93	72	204	2.264	580.4	2.6	297	93.2	23,513
5	8'-0"	5'-0"	8"	7"	194	#5	5"	43'- 3"	8,751	194	#4	5"	11'- 7"	1,501	8'- 4"	1,080	194	#6	5"	34'- 7"	10,077	60	8"	39'-9"	1,593	140	39'-9"	3,717	56	5'- 0"	187	196	4'- 8"	611	11'- 2"	1,462	43'- 3"	116	90	256	2.796	724.5	3.2	372	115.0	29,351
6	8'-0"	5'-0"	8"	7"	194	#5	5"	51'-10"	10,488	194	#4	5"	11'- 7"	1,501	8'- 4"	1,080	194	#6	5"	43'- 2"	12,578	72	8"	39'-9"	1,912	166	39'-9"	4,408	56	5'- 0"	187	245	4'- 8"	764	11'- 2"	1,828	51'-10"	138	106	301	3.328	868.7	3.9	439	137.0	35,185
2	8'-0"	6'-0"	8"	7"	194	#5	5"	17'- 6"	3,541	194	#4	5"	12'- 7"	1,631	8'- 4"	1,080	194	#6	5"	8'-10"	2,574	22	9"	39'-9"	584	68	39'-9"	1,806	56	6'- 0"	224	49	4'- 8"	153	13'- 2"	431	17'- 6"	47	38	108	1.265	300.6	1.3	155	51.9	12,179
3	8'-0"	6'-0"	8"	7"	194	#5	5"	26'- 1"	5,278	194	#4	5"	12'- 7"	1,631	8'- 4"	1,080	194	#6	5"	17'- 5"	5,075	36	8"	39'-9"	956	96	39'-9"	2,549	56	6'- 0"	224	98	4'- 8"	305	13'- 2"	862	26'- 1"	70	54	153	1.819	449.0	2.0	223	74.8	18,183
4	8'-0"	6'-0"	8"	7"	194	#5	5"	34'- 8"	7,015	194	#4	5"	12'- 7"	1,631	8'- 4"	1,080	194	#6	5"	26'- 0"	7,576	48	8"	39'-9"	1,275	124	39'-9"	3,293	56	6'- 0"	224	147	4'- 8"	458	13'- 2"	1,293	34'- 8"	93	72	204	2.372	596.1	2.6	297	97.5	24,142
5	8'-0"	6'-0"	8"	7"	194	#5	5"	43'- 3"	8,751	194	#4	5"	12'- 7"	1,631	8'- 4"	1,080	194	#6	5"	34'- 7"	10,077	60	8"	39'-9"	1,593	152	39'-9"	4,036	56	6'- 0"	224	196	4'- 8"	611	13'- 2"	1,724	43'- 3"	116	90	256	2.926	743.2	3.2	372	120.2	30,099
6	8'-0"	6'-0"	8"	7"	194	#5	5"	51'-10"	10,488	194	#4	5"	12'- 7"	1,631	8'- 4"	1,080	194	#6	5"	43'- 2"	12,578	72	8"	39'-9"	1,912	180	39'-9"	4,780	56	6'- 0"	224	245	4'- 8"	764	13'- 2"	2,155	51'-10"	138	106	301	3.479	890.3	3.9	439	143.1	36,051
2	8'-0"	7'-0"	8"	7"	194	#5	5"	17'- 6"	3,541	194	#4	5"	13'- 7"	1,760	8'- 4"	1,080	194	#6	5"	8'-10"	2,574	22	9"	39'-9"	584	68	39'-9"	1,806	56	7'- 0"	262	49	4'- 8"	153	15'- 2"	496	17'- 6"	47	38	108	1.330	306.4	1.3	155	54.5	12,411
3	8'-0"	7'-0"	8"	7"	194	#5	5"	26'- 1"	5,278	194	#4	5"	13'- 7"	1,760	8'- 4"	1,080	194	#6	5"	17'- 5"	5,075	36	8"	39'-9"	956	96	39'-9"	2,549	56	7'- 0"	262	98	4'- 8"	305	15'- 2"	993	26'- 1"	70	54	153	1.905	456.5	2.0	223	78.2	18,481
4	8'-0"	7'-0"	8"	7"	194	#5	5"	34'- 8"	7,015	194	#4	5"	13'- 7"	1,760	8'- 4"	1,080	194	#6	5"	26'- 0"	7,576	48	8"	39'-9"	1,275	124	39'-9"	3,293	56	7'- 0"	262	147	4'- 8"	458	15'- 2"	1,489	34'- 8"	93	72	204	2.480	605.2	2.6	297	101.8	24,505
5	8'-0"	7'-0"	8"	7"	194	#5	5"	43'- 3"	8,751	194	#4	5"	13'- 7"	1,760	8'- 4"	1,080	194	#6	5"	34'- 7"	10,077	60	8"	39'-9"	1,593	152	39'-9"	4,036	56	7'- 0"	262	196	4'- 8"	611	15'- 2"	1,986	43'- 3"	116	90	256	3.056	753.9	3.2	372	125.4	30,528
6	8'-0"	7'-0"	8"	7"	194	#5	5"	51'-10"	10,488	194	#4	5"	13'- 7"	1,760	8'- 4"	1,080	194	#6	5"	43'- 2"	12,578	72	8"	39'-9"	1,912	180	39'-9"	4,780	56	7'- 0"	262	245	4'- 8"	764	15'- 2"	2,482	51'-10"	138	106	301	3.631	902.7	3.9	439	149.1	36,545
2	8'-0"	8'-0"	8"	7"	194	#5	5"	17'- 6"	3,541	162	#5	6"	14'- 7"	2,464	8'- 9"	1,478	194	#6	5"	8'-10"	2,574	22	9"	39'-9"	584	74	39'-9"	1,965	56	8'- 0"	299	49	4'- 8"	153	17'- 2"	562	17'- 6"	47	38	108	1.395	340.5	1.3	155	57.1	13,775
3	8'-0"	8'-0"	8"	7"	194	#5	5"	26'- 1"	5,278	162	#5	6"	14'- 7"	2,464	8'- 9"	1,478	194	#6	5"	17'- 5"	5,075	36	8"	39'-9"	956	104	39'-9"	2,762	56	8'- 0"	299	98	4'- 8"	305	17'- 2"	1,124	26'- 1"	70	54	153	1.992	493.5	2.0	223	81.7	19,964
4	8'-0"	8'-0"	8"	7"	194	#5	5"	34'- 8"	7,015	162	#5	6"	14'- 7"	2,464	8'- 9"	1,478	194	#6	5"	26'- 0"	7,576	48	8"	39'-9"	1,275	134	39'-9"	3,558	56	8'- 0"	299	147	4'- 8"	458	17'- 2"	1,686	34'- 8"	93	72	204	2.588	645.2	2.6	297	106.1	26,106
5	8'-0"	8'-0"	8"	7"	194	#5	5"	43'- 3"	8,751	162	#5	6"	14'- 7"	2,464	8'- 9"	1,478	194	#6	5"	34'- 7"	10,077	60	8"	39'-9"	1,593	164	39'-9"	4,355	56	8'- 0"	299	196	4'- 8"	611	17'- 2"	2,248	43'- 3"	116	90	256	3.185	796.9	3.2	372	130.6	32,248
6	8'-0"	8'-0"	8"	7"	194	#5	5"	51'-10"	10,488	162	#5	6"	14'- 7"	2,464	8'- 9"	1,478	194	#6	5"	43'- 2"	12,578	72	8"	39'-9"	1,912	194	39'-9"	5,151	56	8'- 0"	299	245	4'- 8"	764	17'- 2"	2,809	51'-10"	138	106	301	3.782	948.6	3.9	439	155.2	38,382

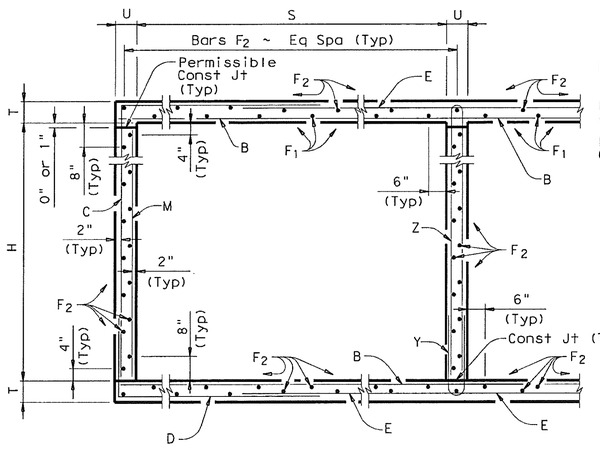
H	Bar Dimensions "X"	"Y"
4'-0"	4'-6"	2'-3"
5'-0"	5'-6"	2'-3"
6'-0"	6'-6"	2'-3"
7'-0"	7'-6"	2'-3"
8'-0"	8'-6"	2'-8"



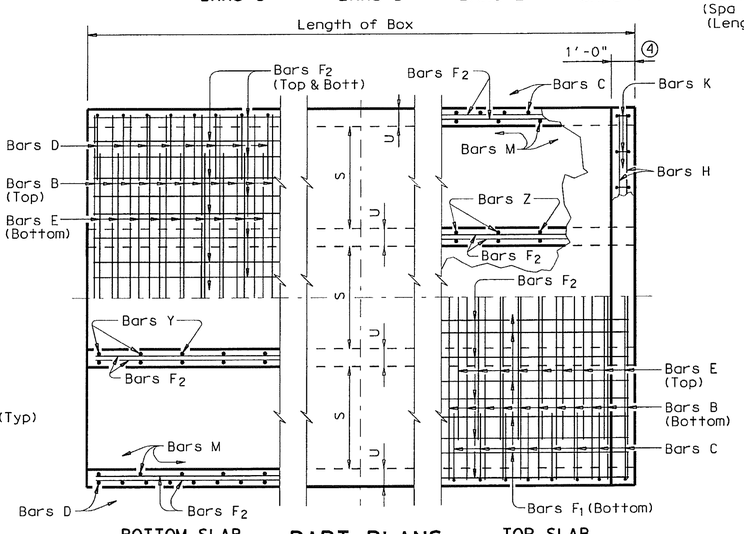
SECTION THRU CURB



BARS C BARS D BARS Z BARS Y BARS K ~ #4 (Spa = 1'-0" Max) (Length = 4'-3")



TYPICAL SECTION



BOTTOM SLAB PART PLANS TOP SLAB

GENERAL NOTES:

Designed according to current AASHTO Standard and Interim Specifications.
Designed to the maximum fill height shown.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" with these exceptions: use Class "S" for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.
Class "C" concrete shall have a minimum compressive strength of 3,600 psi. Class "S" concrete shall have a minimum compressive strength of 4,000 psi.
The use of permanent forms is not allowed.
The bottom edge of the top slab shall be chamfered 3" at the entrance.
Reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
Construction joints shown at the flow line may be raised a maximum of 6" at the Contractor's option. If this option is used, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.
See standard MC-MD for skewed ends, angle sections and lengthening details.

① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with bridge rail, other than T6, refer to RAC standard.

② For vehicle safety, the following requirements must be met:
- For structures without bridge rail, curbs shall project no more than 3" above finished grade.
- For structures with bridge rail, curbs shall be flush with finished grade.

Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

③ For curbs less than 1'-0" high, tilt bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, bars K may be omitted.

④ 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

HS20 LOADING

Texas Department of Transportation
Bridge Division

MULTIPLE BOX CULVERTS CAST-IN-PLACE 8'-0" SPAN 0' TO 13' FILL

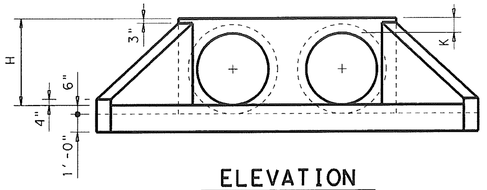
MC-8-13

FILE: mc813ste.dgn	DN: CAF	CK: LMW	DW: BWH/TxDOT	CK: CAF
© TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				D202
	COUNTY		CONTROL SECT	JOB HIGHWAY

ACC:
LEVELS DISPLAYED
1

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (4)

SLOPE	DIA OF PIPE, D	Values for one Pipe W	X	Y	L	Reinf (Lbs)	Conc (CY) (1)	Values to be added for each addt'l Pipe X and W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	4'- 7 ½"	2'- 6"	2'-10"	3'- 3 ¼"	84	0.6	1'- 9"	20	0.2
	15"	5'- 5 ¾"	2'- 9 ½"	3'- 4"	3'-10 ¼"	99	0.7	2'- 2"	24	0.3
	18"	6'- 4 ¼"	3'- 1"	3'-10"	4'- 5"	120	0.9	2'- 8"	32	0.3
	21"	7'- 2 ¾"	3'- 4 ½"	4'- 4"	5'- 0"	137	1.1	3'- 1"	43	0.4
	24"	8'- 2 ½"	3'- 9 ½"	4'-10"	5'- 7"	158	1.3	3'- 7"	50	0.5
	27"	9'- 1"	4'- 1"	5'- 4"	6'- 2"	173	1.5	3'-11"	56	0.6
	30"	9'-11 ½"	4'- 4 ½"	5'-10"	6'- 8 ¾"	197	1.7	4'- 4"	65	0.8
	33"	10'-10"	4'- 8"	6'- 4"	7'- 3 ¾"	216	2.0	4'- 8"	71	0.9
	36"	11'- 8 ¼"	4'-11 ½"	6'-10"	7'-10 ¾"	241	2.2	5'- 1"	81	1.0
	42"	13'- 5 ¼"	5'- 6 ½"	7'-10"	9'- 0 ½"	290	2.8	5'-10"	97	1.3
	48"	15'- 9"	6'- 1 ½"	9'- 4"	10'- 9 ¼"	350	3.8	6'- 7"	117	1.7
	54"	17'- 5 ¾"	6'- 8 ½"	10'- 4"	11'-11 ¼"	415	4.5	7'- 6"	151	2.1
	60"	19'- 2 ¾"	7'- 3 ½"	11'- 4"	13'- 1"	469	5.3	8'- 3"	174	2.5
	66"	20'-11 ½"	7'-10 ½"	12'- 4"	14'- 3"	530	6.2	8'- 9"	194	2.9
	72"	22'- 8 ½"	8'- 5 ½"	13'- 4"	15'- 4 ¾"	587	7.1	9'- 4"	213	3.3
3:1	12"	6'- 3"	2'- 6"	4'- 3"	4'-11"	114	0.8	1'- 9"	22	0.2
	15"	7'- 5"	2'- 9 ½"	5'- 0"	5'- 9 ¼"	133	1.1	2'- 2"	28	0.3
	18"	8'- 6 ¾"	3'- 1"	5'- 9"	6'- 7 ¾"	166	1.3	2'- 8"	37	0.5
	21"	9'- 8 ¾"	3'- 4 ½"	6'- 6"	7'- 6"	189	1.6	3'- 1"	48	0.6
	24"	11'- 0"	3'- 9 ½"	7'- 3"	8'- 4 ½"	221	2.0	3'- 7"	58	0.7
	27"	12'- 2"	4'- 1"	8'- 0"	9'- 2 ¾"	245	2.3	3'-11"	67	0.8
	30"	13'- 4"	4'- 4 ½"	8'- 9"	10'- 1 ¼"	287	2.7	4'- 4"	77	1.0
	33"	14'- 5 ¾"	4'- 8"	9'- 6"	10'-11 ¾"	310	3.1	4'- 8"	84	1.2
	36"	15'- 7 ¾"	4'-11 ½"	10'- 3"	11'-10"	343	3.5	5'- 1"	96	1.4
	42"	17'-11 ½"	5'- 6 ½"	11'- 9"	13'- 6 ¾"	424	4.5	5'-10"	119	1.7
	48"	21'- 1 ¾"	6'- 1 ½"	14'- 0"	16'- 2"	527	6.1	6'- 7"	146	2.3
	54"	23'- 5 ½"	6'- 8 ½"	15'- 6"	17'-10 ¾"	618	7.3	7'- 6"	186	2.9
	60"	25'- 9 ¼"	7'- 3 ½"	17'- 0"	19'- 7 ½"	707	8.7	8'- 3"	219	3.4
	66"	28'- 1"	7'-10 ½"	18'- 6"	21'- 4 ¼"	797	10.1	8'- 9"	242	3.9
	72"	30'- 4 ¾"	8'- 5 ½"	20'- 0"	23'- 1 ¼"	910	11.7	9'- 4"	272	4.4
4:1	12"	7'-10 ¾"	2'- 6"	5'- 8"	6'- 6 ½"	144	1.1	1'- 9"	24	0.3
	15"	9'- 4"	2'- 9 ½"	6'- 8"	7'- 8 ½"	177	1.5	2'- 2"	32	0.4
	18"	10'- 9 ½"	3'- 1"	7'- 8"	8'-10 ¼"	217	1.9	2'- 8"	42	0.5
	21"	12'- 2 ¾"	3'- 4 ½"	8'- 8"	10'- 0"	254	2.3	3'- 1"	57	0.7
	24"	13'- 9 ½"	3'- 9 ½"	9'- 8"	11'- 2"	295	2.8	3'- 7"	67	0.9
	27"	15'- 3"	4'- 1"	10'- 8"	12'- 3 ¾"	328	3.3	3'-11"	77	1.0
	30"	16'- 8 ¼"	4'- 4 ½"	11'- 8"	13'- 5 ¾"	379	3.8	4'- 4"	89	1.3
	33"	18'- 1 ¾"	4'- 8"	12'- 8"	14'- 7 ½"	417	4.5	4'- 8"	101	1.4
	36"	19'- 7"	4'-11 ½"	13'- 8"	15'- 9 ¼"	464	5.1	5'-1"	115	1.7
	42"	22'- 5 ¾"	5'- 6 ½"	15'- 8"	18'- 1"	575	6.5	5'-10"	141	2.1
	48"	26'- 6 ¼"	6'- 1 ½"	18'- 8"	21'- 6 ¾"	720	8.9	6'- 7"	175	2.8
	54"	29'- 5"	6'- 8 ½"	20'- 8"	23'-10 ¼"	863	10.7	7'- 6"	226	3.6
	60"	32'- 3 ¾"	7'- 3 ½"	22'- 8"	26'- 2"	984	12.7	8'- 3"	264	4.3
	66"	35'- 2 ½"	7'-10 ½"	24'- 8"	28'- 5 ¾"	1126	14.9	8'- 9"	300	4.9
	72"	38'- 1 ¼"	8'- 5 ½"	26'- 8"	30'- 9 ½"	1283	17.3	9'- 4"	334	5.6
6:1	12"	11'- 2"	2'- 6"	8'- 6"	9'- 9 ¾"	220	1.9	1'- 9"	28	0.4
	15"	13'- 2 ¼"	2'- 9 ½"	10'- 0"	11'- 6 ½"	264	2.5	2'- 2"	37	0.5
	18"	15'- 2 ½"	3'- 1"	11'- 6"	13'- 3 ¼"	326	3.2	2'- 8"	50	0.7
	21"	17'- 2 ¾"	3'- 4 ½"	13'- 0"	15'- 0 ¼"	381	3.9	3'- 1"	69	0.9
	24"	19'- 4 ½"	3'- 9 ½"	14'- 6"	16'- 9"	447	4.8	3'- 7"	80	1.2
	27"	21'- 4 ¾"	4'- 1"	16'- 0"	18'- 5 ¾"	506	5.7	3'-11"	96	1.4
	30"	23'- 5 ¼"	4'- 4 ½"	17'- 6"	20'- 2 ½"	587	6.7	4'- 4"	110	1.7
	33"	25'- 5 ½"	4'- 8"	19'- 0"	21'-11 ¼"	667	7.8	4'- 8"	127	2.0
	36"	27'- 5 ¾"	4'-11 ½"	20'- 6"	23'- 8"	727	9.0	5'- 1"	144	2.3
	42"	31'- 6 ¼"	5'- 6 ½"	23'- 6"	27'- 1 ½"	914	11.5	5'-10"	179	3.0
	48"	37'- 3 ½"	6'- 1 ½"	28'- 0"	32'- 4"	1181	15.9	6'- 7"	231	4.0
	54"	41'- 4 ¼"	6'- 8 ½"	31'- 0"	35'- 9 ½"	1412	19.2	7'- 6"	300	5.0
	60"	45'- 4 ¾"	7'- 3 ½"	34'- 0"	39'- 3"	1619	22.9	8'- 3"	353	6.0



ELEVATION

Showing dimensions

(1) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(2) For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(3) Provide a 1'-0" footing as shown where required to maintain 4" Min cover for pipes.

(4) Quantities shown are for one structure end only (one headwall).

(5) Min Length = $6" + 3" \times \left(\frac{12 \times H - 7}{12 \times L}\right)$

Max Length = $12 \times H - 3" \times \left(\frac{12 \times H - 7}{12 \times L}\right) - 1"$

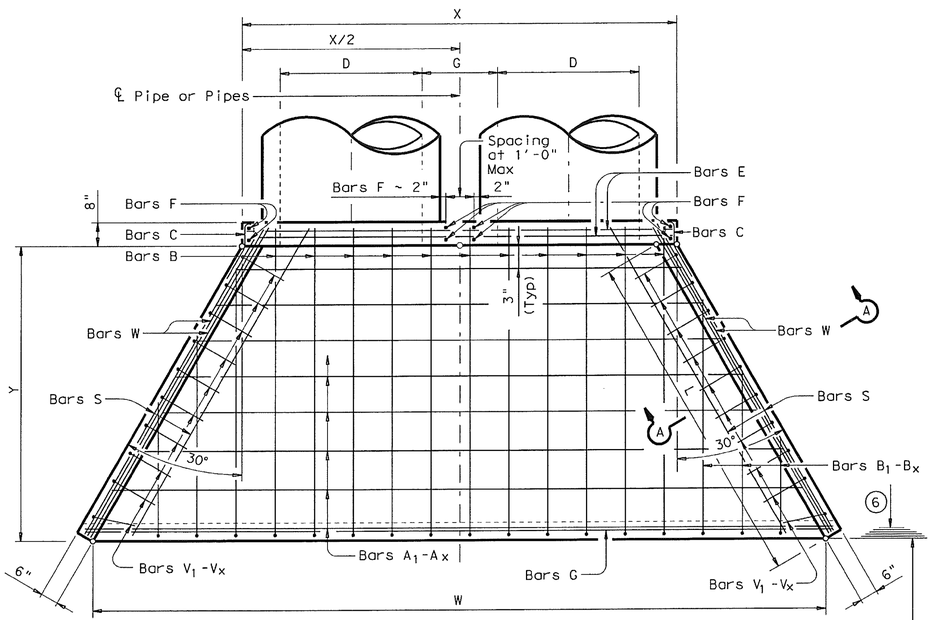
(6) Lengths of wings based on SL:1 Slope along this line.

TABLE OF REINFORCING STEEL (4)

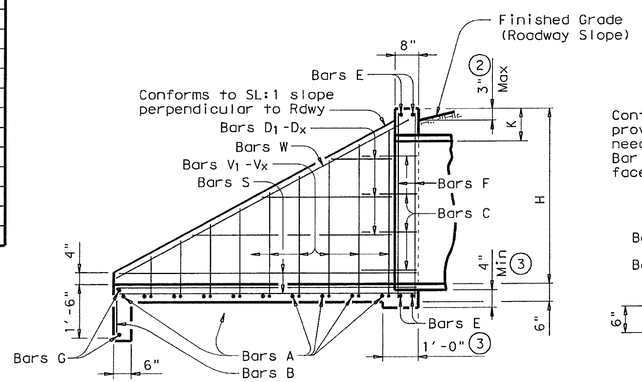
Bar	Size	Spa	No.
A	# 4	1'-0"	~
B	# 3	1'-6"	~
C	# 4	1'-0"	~
D	# 3	1'-0"	~
E	# 5	~	4
F	# 5	~	~
G	# 3	~	2
S	# 4	~	6
V	# 4	1'-0"	~
W	# 5	~	4

TABLE OF CONSTANT DIMENSIONS

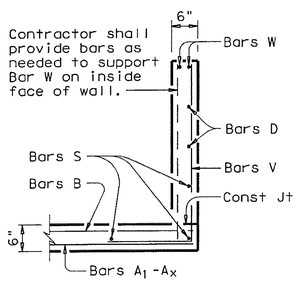
DIA OF PIPE, D	G	K	H
12"	9"	1'- 0"	2'- 0"
15"	11"	1'- 0"	2'- 3"
18"	1'- 2"	1'- 0"	2'- 6"
21"	1'- 4"	1'- 0"	2'- 9"
24"	1'- 7"	1'- 0"	3'- 0"
27"	1'- 8"	1'- 0"	3'- 3"
30"	1'-10"	1'- 0"	3'- 6"
33"	1'-11"	1'- 0"	3'- 9"
36"	2'- 1"	1'- 0"	4'- 0"
42"	2'- 4"	1'- 0"	4'- 6"
48"	2'- 7"	1'- 3"	5'- 3"
54"	3'- 0"	1'- 3"	5'- 9"
60"	3'- 3"	1'- 3"	6'- 3"
66"	3'- 3"	1'- 3"	6'- 9"
72"	3'- 4"	1'- 3"	7'- 3"



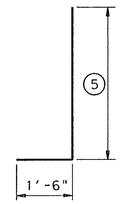
PLAN



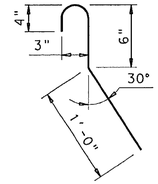
TYPICAL WING ELEVATION



SECTION A-A

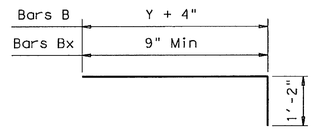


BARS V



BARS C

(2'-0" long)



BARS B & B1-Bx

GENERAL NOTES:

Designed according to current AASHTO Standard and Interim Specifications.

Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.

All reinforcing steel shall be Grade 60.

All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.

No bridge rails of any type may be mounted directly to these culvert headwalls.

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

Texas Department of Transportation
Bridge Division

CONCRETE HEADWALLS WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS

CH-FW-0

FILE: chfw00se.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				D203
	COUNTY	CONTROL	SECT	JOB	HIGHWAY

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LEVELS DISPLAYED ACC:

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LEVELS DISPLAYED ACC:

TABLE OF DIMENSIONS & REINFORCING STEEL
(Wings for One Structure End)

Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing (2~Wings) ④		Estimated Quantities per ft of Toewall (1~Toewall)	
					Bars J1		Bars J2					
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	43.13	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	43.80	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	44.47	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	47.81	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	48.48	0.480	6.85	0.071
4'-0"	3'- 2"	1'- 2"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	50.26	0.532	6.85	0.071
4'-6"	3'- 2"	1'- 2"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	54.27	0.568	6.85	0.071
5'-0"	3'- 9"	1'- 7"	1'- 2"	7"	#4	1'-0"	#4	1'-0"	57.94	0.632	6.96	0.075
5'-6"	3'- 9"	1'- 7"	1'- 2"	7"	#4	1'-0"	#4	1'-0"	61.95	0.668	6.96	0.075
6'-0"	4'- 4"	2'- 0"	1'- 4"	7"	#5	1'-0"	#5	1'-0"	75.16	0.730	7.07	0.078
6'-6"	4'- 4"	2'- 0"	1'- 4"	7"	#5	1'-0"	#5	1'-0"	79.54	0.768	7.07	0.078
7'-0"	5'- 0"	2'- 3"	1'- 9"	8"	#5	1'-0"	#5	1'-0"	86.65	0.864	8.07	0.093
7'-6"	5'- 0"	2'- 3"	1'- 9"	8"	#5	1'-0"	#5	1'-0"	91.03	0.902	8.07	0.093
8'-0"	5'- 6"	2'- 8"	1'-10"	8"	#5	6"	#5	6"	133.54	0.962	8.13	0.095
8'-6"	5'- 6"	2'- 8"	1'-10"	8"	#5	6"	#5	6"	138.96	1.000	8.13	0.095
9'-6"	6'- 0"	2'-10"	2'- 2"	9"	#5	6"	#5	6"	151.43	1.136	8.41	0.110
10'-6"	6'- 5"	3'- 0"	2'- 5"	9"	#6	6"	#5	6"	190.76	1.234	8.57	0.117
11'-6"	7'- 2"	3'- 6"	2'- 8"	11"	#6	6"	#6	6"	224.62	1.438	9.52	0.140
12'-6"	7'- 8"	3'- 9"	2'-11"	1'- 0"	#7	6"	#6	6"	277.90	1.592	9.74	0.157
13'-6"	8'- 2"	4'- 0"	3'- 2"	1'- 2"	#8	6"	#6	6"	343.21	1.804	10.02	0.186
14'-6"	8'-10"	4'- 5"	3'- 5"	1'- 4"	#9	6"	#6	6"	427.43	2.046	10.30	0.218
15'-6"	9'- 6"	4'-10"	3'- 8"	1'- 6"	#9	6"	#7	6"	484.01	2.302	11.24	0.253
16'-0"	9'-11"	5'- 0"	3'-11"	1'- 7"	#9	6"	#7	6"	500.21	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2~Wings)

Bar	Size	No.	Spa
D1	#5	~	1'-0"
D2	#5	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#5	~	1'-0"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

Hw = H + T + C

Lw = (Hw) (SL) ÷ Cosine (Φ)

For Cast-in-place culverts:

Ltw = [(N) (S) + (N + 1) (U)] ÷ (Cosine Φ)

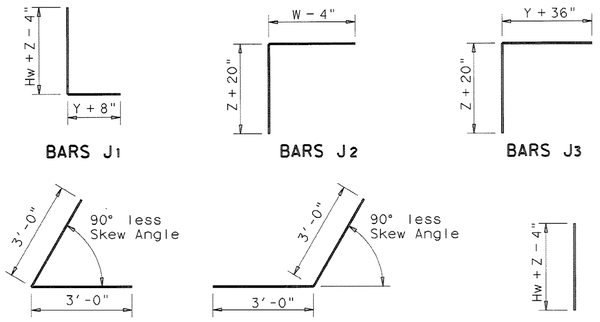
For Precast culverts:

Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ (Cosine Φ)

Total Wingwall Area (Two Wings ~ S.F.) = (2) (Hw) (Lw)

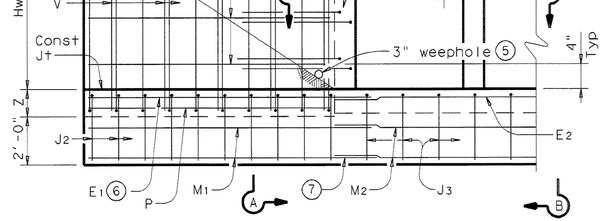
Hw = Height of Wingwall
Lw = Length of Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans
SL:1 = Channel Slope ratio. (Horizontal: 1 Vertical, Usual value is 2:1)
Φ = Culvert Skew

See applicable box culvert standard for S, H, T and U values.

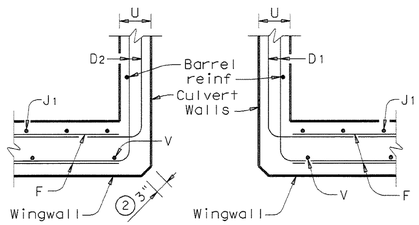


BARS J1 | BARS J2 | BARS J3

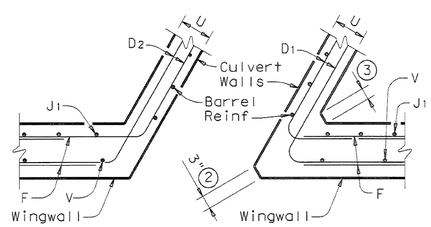
BARS D1 | BARS D2 | BARS V



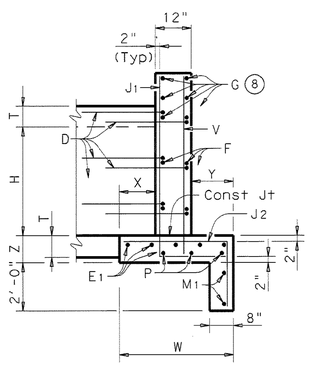
PARTIAL ELEVATION



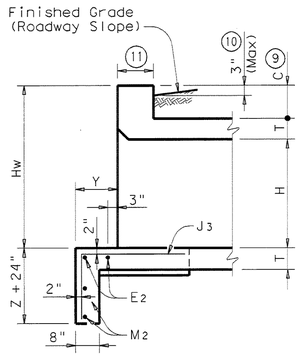
SECTION C-C



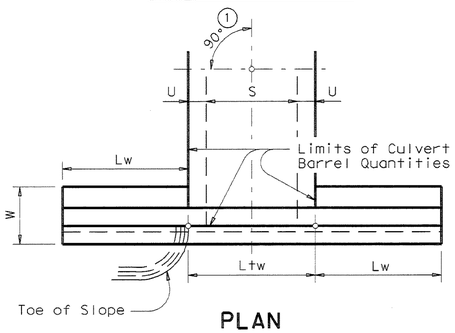
SECTION C-C



SECTION A-A
(Showing Wing Reinf)

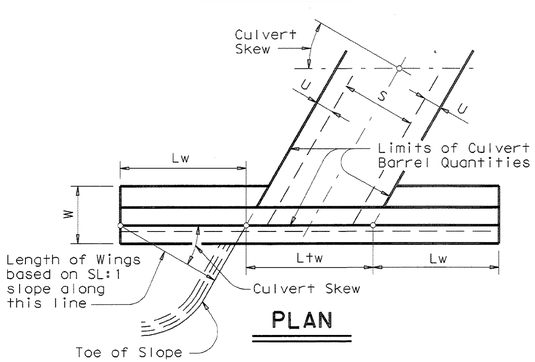


SECTION B-B
(Showing Toewall Reinf)



PLAN

DETAILS FOR NON-SKEWED BOX CULVERTS



PLAN

DETAILS FOR SKEWED BOX CULVERTS
(Showing 30° Skew)

1. Skew Angle = 0°
2. At discharge end, chamfer may be ¾".
3. For 15° Skew ~ 1"
   For 30° Skew ~ 2"
   For 45° Skew ~ 3"
4. Quantities shown are for two wings. To determine total quantities for two wings, multiply the tabulated values by Lw.
5. Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
6. Extend Bars E1 1'-6" minimum into the bottom slab of the culvert.
7. Lap Bars M1 1'-6" minimum with Bars M2.
8. Bars G shall be equally spaced at 1'-0" maximum, placed as shown. There shall be at least 4 Bars G per wing.
9. 0" min to 5'-0" max. For T6 or C6 Rail, see T6-CM standard for additional details. For all other rail types, refer to the RAC standard. For curbs without rail and greater than 1'-0" high, see ECD standard for additional details. Estimated curb heights are shown elsewhere in the plans.
10. For vehicle safety, the following requirements must be met:
    - For structures without bridge rail, curbs shall project no more than 3" above finished grade.
    - For structures with bridge rail, curbs shall be flush with finished grade.

    Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
11. 1'-0" typical. 2'-0" typical when RAC standard is referenced elsewhere in the plans.

GENERAL NOTES:

Designed according to current AASHTO Standard and Interim Specifications.

All reinforcing steel shall be Grade 60.

All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.

All reinforcing bars shall be adjusted to provide a minimum of 1 ¼" clear cover.

When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.

See BCS sheet for additional dimensions and information.

The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

RECORD DRAWING 10/11/2013
TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

Texas Department of Transportation
Bridge Division

CONCRETE WINGWALLS
WITH PARALLEL WINGS FOR SKEWED AND NON-SKEWED BOX CULVERTS

PW

FILE: dwstde01.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF	
© TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT			SHEET
REVISIONS					D204
	COUNTY		CONTROL	SECT	JOB	HIGHWAY

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TABLE OF DIMENSIONS & REINFORCING STEEL
(Wings for One Structure End)

Dimensions					Variable Reinforcing				Estimated Quantities (3) per ft of wing length (2~Wings)	
					Bars J1		Bars J2			
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'- 8"	1'- 9"	1'- 3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'- 2"	2'- 0"	1'- 6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'- 8"	2'- 3"	1'- 9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'- 2"	2'- 6"	2'- 0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'- 8"	2'- 9"	2'- 3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'- 2"	3'- 0"	2'- 6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'- 8"	3'- 3"	2'- 9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'- 2"	3'- 6"	3'- 0"	1'- 0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'- 8"	4'- 0"	3'- 0"	1'- 1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'- 2"	4'- 6"	3'- 0"	1'- 3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING (2~Wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

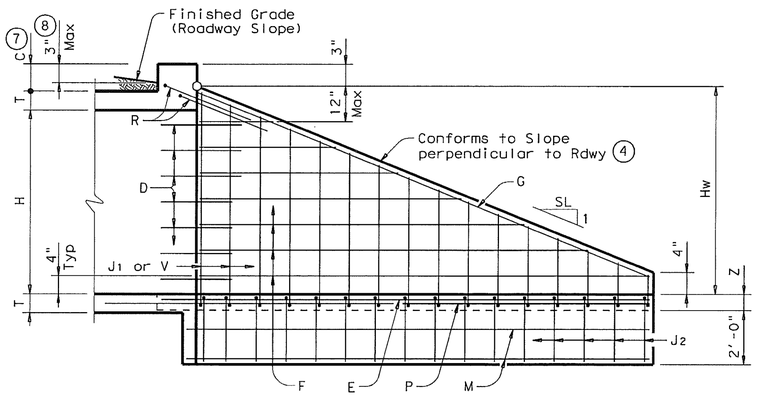
Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)
Hw = H + T + C - 0.250'
Lw = (Hw - 0.333') (SL)
For Cast-in-place culverts:
Ltw = (N) (S) + (N+1) (U)
For Precast culverts:
Ltw = (N) (2U + S) + (N - 1) (0.5')
Total Wingwall Area (Two Wings ~ S.F.) = (Hw + 0.333') (Lw)

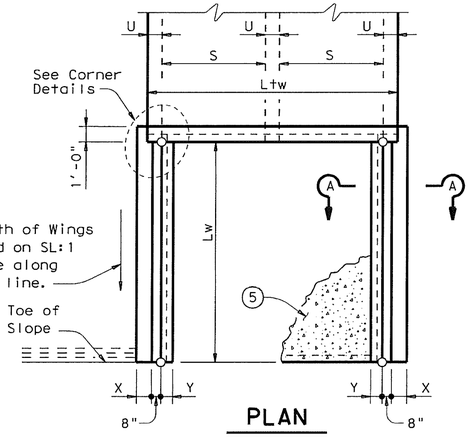
Hw = Height of Wingwall
SL:1 = Side Slope Ratio (Horizontal:1 Vertical)
Lw = Length of Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans

See applicable box culvert standard for H, S, T, and U values.



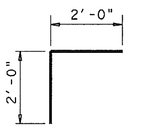
INSIDE ELEVATION

(Showing reinforcing. Culvert and Culvert Toewall reinforcing not shown for clarity.)

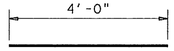


PLAN

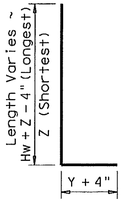
(Showing Dimensions)



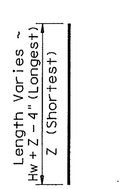
BARS R



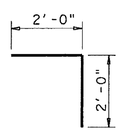
BARS D



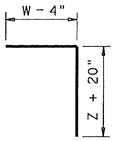
BARS J1



BARS V



BARS L

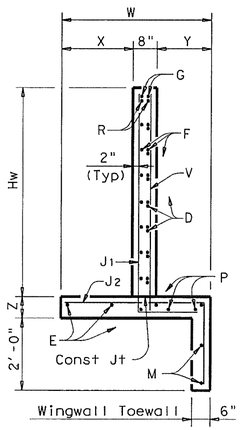


BARS J2

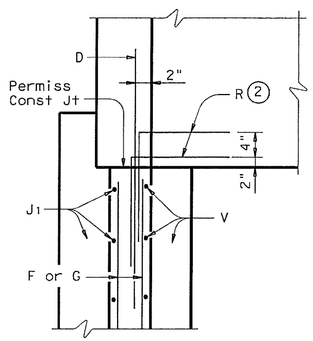
1. Extend Bars P 3'-0" minimum into bottom slab of Box Culvert.
2. Adjust to fit as necessary to maintain 1 1/4" clear cover and 4" minimum between bars.
3. Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings multiply the tabulated values by Lw.
4. Recommended values of Slope are: 2:1, 3:1, 4:1, & 6:1.
5. When shown elsewhere on the plans, a 5" deep concrete riprap shall be constructed. Unless otherwise shown on the plans or directed by the Engineer, the riprap shall have a 6" wide by 1'-6" deep reinforced concrete toewall along all edges adjacent to natural ground; the toewall shall be reinforced by extending typical riprap reinforcing into the toewall; construction joints or grooved joints, oriented in the direction of flow, shall extend across the full distance of the riprap, at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required. Payment for riprap shall be as required by Item 432, "Riprap".
6. At Contractor's option, Culvert Toewall may be ended flush with Wingwall Toewall. Adjust reinforcing from that shown as necessary.
7. 0" min to 5'-0" max. For T6 or C6 Rail, see T6-CM standard for additional details. For all other rail types, refer to the RAC standard. For curbs without rail and greater than 1'-0" high, see ECD standard for additional details. Estimated curb heights are shown elsewhere in the plans.
8. For vehicle safety, curb heights and wall heights shall be reduced, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.

GENERAL NOTES:

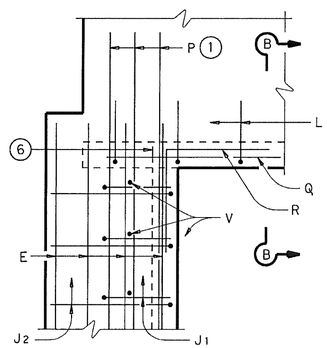
Designed according to current AASHTO Standard and Interim Specifications.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
All reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See BCS sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.



SECTION A-A



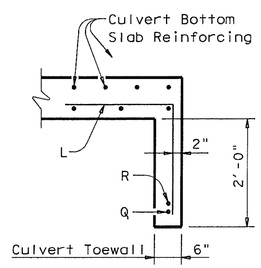
WINGWALL



FOOTING AND TOEWALL

CORNER DETAILS

(Culvert and Culvert Toewall reinforcing not shown for clarity.)



SECTION B-B (5)

RECORD DRAWING 10/11/2013

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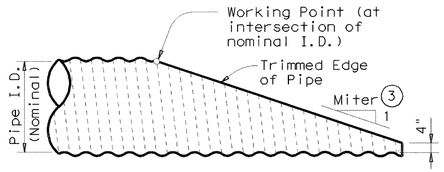
Texas Department of Transportation
Bridge Division

CONCRETE WINGWALLS WITH STRAIGHT WINGS FOR 0° SKEW BOX CULVERTS

SW-0

FILE: sw-0std e.dgn	DN: CAF	CK: CAT	DW: TxDOT	CK: GAF
©TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				D205
	COUNTY	CONTROL	SECT	JOB	HIGHWAY

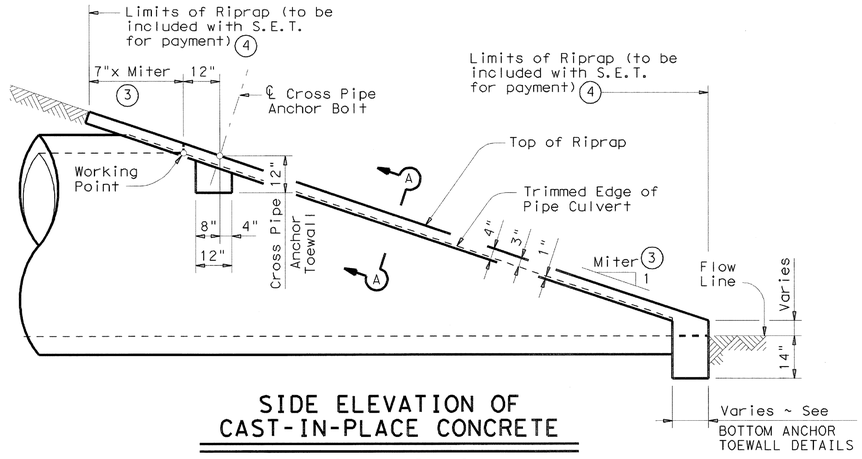
LEVELS DISPLAYED
COMMENTS:
1



NOTE: All Pipe Runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

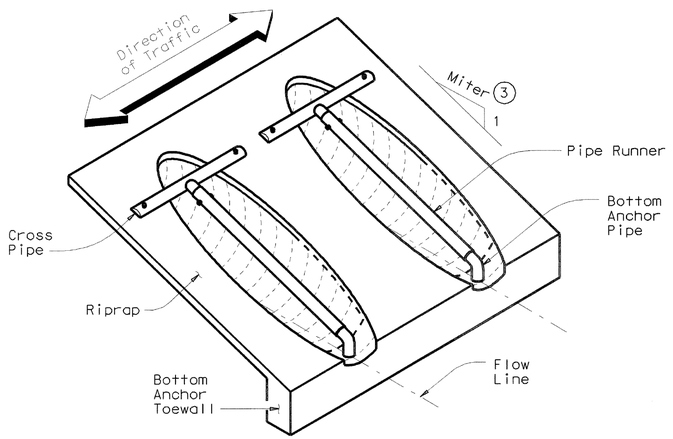
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing Corrugated Metal Pipe Culvert.
Details of Concrete Pipe Culvert are similar.)



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing Concrete Pipe Culvert.
Details of Corrugated Metal Pipe Culvert are similar.
Pipe Runners not shown for clarity)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)

CROSS PIPE LENGTHS & PIPE RUNNER LENGTHS (1) (2)

Nominal Culvert I.D.	Pipe Culvert Spa ~ G	Cross Pipe Length	Pipe Runner Length											
			3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
			0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
24"	1'- 7"	3'- 5"	N/A	N/A	N/A	5'-10"	N/A	N/A	N/A	8'- 1"	N/A	N/A	N/A	12'- 9"
27"	1'- 8"	3'- 8"	N/A	N/A	5'- 5"	6'-11"	N/A	N/A	7'- 7"	9'- 7"	N/A	N/A	11'-11"	14'-11"
30"	1'-10"	3'-11"	N/A	N/A	6'- 4"	8'- 0"	N/A	N/A	8'- 9"	11'- 0"	N/A	N/A	13'- 8"	17'- 0"
33"	1'-11"	4'- 2"	6'- 2"	6'- 5"	7'- 3"	9'- 1"	8'- 6"	8'-10"	10'- 0"	12'- 5"	13'- 3"	13'- 9"	15'- 5"	19'- 2"
36"	2'- 1"	4'- 5"	6'-11"	7'- 3"	8'- 2"	10'- 2"	9'- 6"	9'-11"	11'- 2"	13'-10"	14'- 9"	15'- 3"	17'- 2"	21'- 3"
42"	2'- 4"	4'-11"	8'- 6"	8'-10"	9'-11"	12'- 4"	11'- 7"	12'- 0"	13'- 6"	16'- 8"	17'- 9"	18'- 5"	20'- 8"	25'- 7"
48"	2'- 7"	5'- 5"	10'- 1"	10'- 5"	11'- 9"	N/A	13'- 7"	14'- 2"	15'-10"	N/A	20'- 9"	21'- 6"	24'- 2"	N/A
54"	3'- 0"	5'-11"	11'- 8"	12'- 1"	N/A	N/A	15'- 8"	16'- 3"	N/A	N/A	23'-10"	24'- 8"	N/A	N/A
60"	3'- 3"	6'- 5"	13'- 3"	N/A	N/A	N/A	17'- 9"	N/A	N/A	N/A	26'-10"	N/A	N/A	N/A

TYPICAL PIPE CULVERT MITERS (3)

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3.106:1	3.464:1	4.243:1
4:1	4:1	4.141:1	4.619:1	5.657:1
6:1	6:1	6.212:1	6.928:1	8.485:1

CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED (2)

Nominal Culvert I.D.	Single Pipe Culvert	Multiple Pipe Culverts
12" thru 21"	Skews thru 45°	Skews thru 45°
24"	Skews thru 45°	Skews thru 30°
27"	Skews thru 30°	Skews thru 15°
30"	Skews thru 15°	Skews thru 15°
33"	Skews thru 15°	Always required
36"	Normal (No Skew)	Always required
42" to 60"	Always required	Always required

STANDARD PIPE SIZES & MAX PIPE RUNNER LENGTHS (1)

Pipe Size	Pipe O.D.	Pipe I.D.	Max Pipe Runner Length
2" STD	2.375"	2.067"	N/A
3" STD	3.500"	3.068"	10'- 0"
4" STD	4.500"	4.026"	19'- 8"
5" STD	5.563"	5.047"	34'- 2"

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) (5)

Nominal Culvert I.D.	3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
12"	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8
15"	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
18"	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0
21"	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2
24"	0.6	0.7	0.7	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.1	1.3
27"	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.1	1.1	1.1	1.2	1.4
30"	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.3	1.6
33"	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.7
36"	0.9	0.9	0.9	1.1	1.1	1.1	1.2	1.4	1.4	1.5	1.6	1.8
42"	1.0	1.0	1.1	1.3	1.2	1.3	1.3	1.6	1.6	1.7	1.8	2.1
48"	1.1	1.1	1.2	N/A	1.4	1.4	1.5	N/A	1.9	1.9	2.1	N/A
54"	1.3	1.3	N/A	N/A	1.6	1.6	N/A	N/A	2.1	2.1	N/A	N/A
60"	1.4	N/A	N/A	N/A	1.7	N/A	N/A	N/A	2.3	N/A	N/A	N/A

(1) Size of Pipe Runner shall be as shown in the tables. Cross Pipe shall be the same size as the Pipe Runner. Cross Pipe Stub Out and Bottom Anchor Pipe shall be the next smaller size pipe as shown in the STANDARD PIPE SIZES table.

(2) This standard allows for the placement of only one pipe runner across each culvert pipe opening. In order to limit the clear opening to be traversed by an errant vehicle, the following conditions must be met:

For 60" culvert pipes, the skew must not exceed 0°.
For 54" culvert pipes, the skew must not exceed 15°.
For 48" culvert pipes, the skew must not exceed 30°.
For all culvert pipe sizes 42" and less, the skew must not exceed 45°.

If the above conditions cannot be met, the designer should consider using a safety end treatment with flared wings. For further information, refer to the TxDOT "Roadway Design Manual".

(3) Miter = Slope of Mitered Pipe Culvert End

(4) Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".

(5) Quantities shown are for one end of one reinforced Concrete Pipe Culvert. For multiple Pipe Culverts or for Corrugated Metal Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

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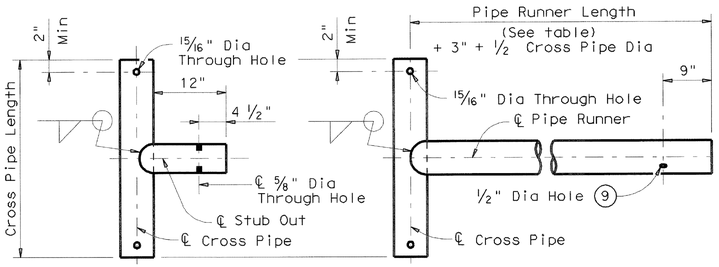
Texas Department of Transportation
Bridge Division

SAFETY END TREATMENT
FOR 12" DIA TO 60" DIA PIPE CULVERTS TYPE II ~ CROSS DRAINAGE

SETP-CD

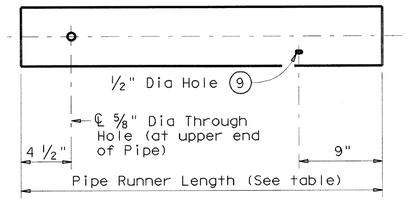
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REVISIONS				D206
11-10: Add note for synthetic fibers.	COUNTY		CONTROL SECT	JOB HIGHWAY

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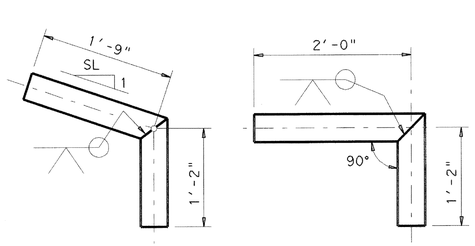
OPTION A1 OPTION A2

CROSS PIPE AND CONNECTIONS DETAILS



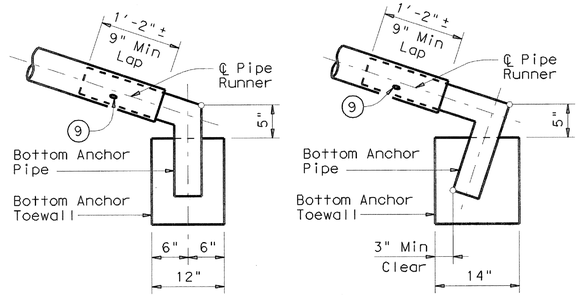
NOTE: The separate Pipe Runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS



OPTION B1 OPTION B2

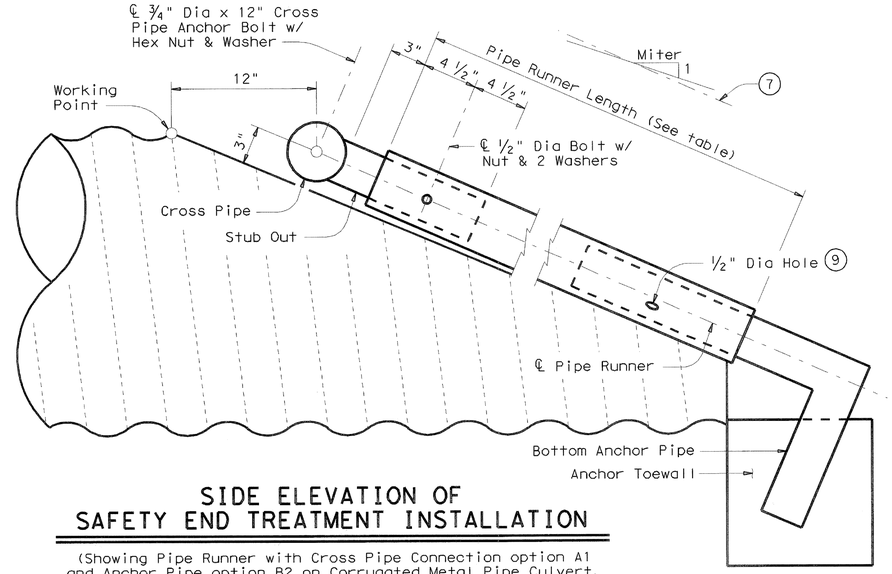
BOTTOM ANCHOR PIPE DETAILS (10)



OPTION B1 OPTION B2

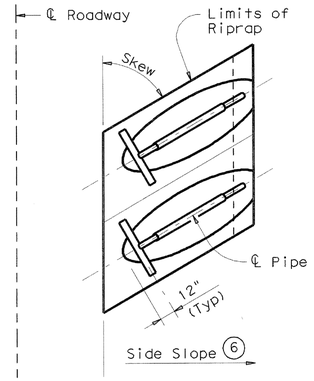
BOTTOM ANCHOR TOEWALL DETAILS

(Culvert & Riprap not shown for clarity)

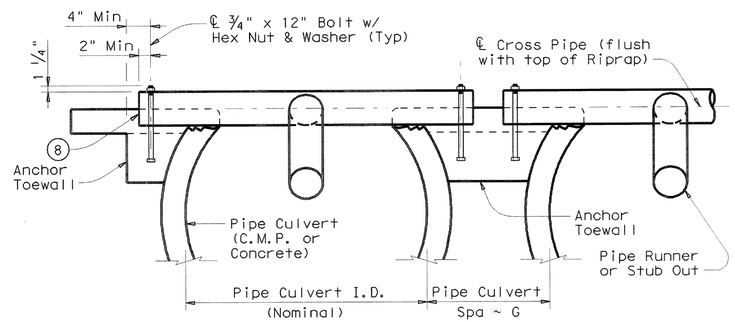


SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION

(Showing Pipe Runner with Cross Pipe Connection option A1 and Anchor Pipe option B2 on Corrugated Metal Pipe Culvert. Concrete Pipe Culvert details are similar. Riprap not shown for clarity)



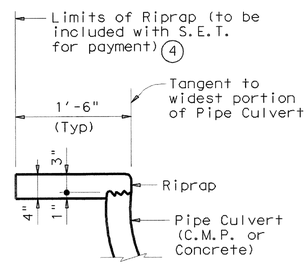
PLAN OF SKEWED INSTALLATION



SHOWING CROSS PIPE & ANCHOR TOEWALL

SECTION A-A

SHOWING TYPICAL PIPE CULVERT & RIPRAP



(4) Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".

(6) Recommended values of side slope are 3:1, 4:1, & 6:1. All quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.

(7) Note that actual slope of Pipe Runner may vary slightly from Side Slope of Riprap and trimmed Culvert Pipe edge.

(8) Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access.

(9) After installation, the 1/2" hole shall be inspected to ensure that the lap of the Pipe Runner with the Bottom Anchor Pipe is adequate.

(10) At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the Runner) may be substituted for the mitered and welded joint in the Bottom Anchor Pipe.

GENERAL NOTES:

Pipe Runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

The Safety End Treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Pipe Runners.

Riprap and all necessary inverts shall be Concrete Riprap conforming to the requirements of Item 432, "Riprap".

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

Pipe Runners, Cross Pipes, and Anchor Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Bolts and nuts shall conform to ASTM A307.

All steel components, except concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

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Texas Department of Transportation
Bridge Division

SAFETY END TREATMENT

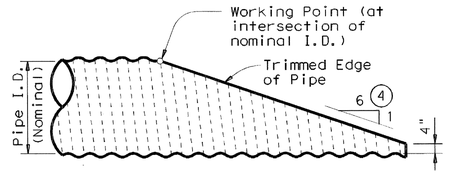
FOR 12" DIA TO 60" DIA
PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD

FILE: setpcdse.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
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REVISIONS				D207
11-10: Add note for synthetic fibers.	COUNTY	CONTROL	SECT	JOB	HIGHWAY

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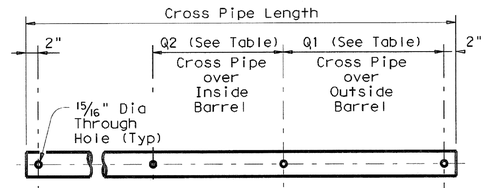
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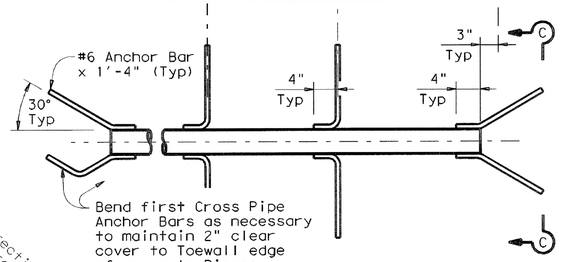
NOTE: All Cross Pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

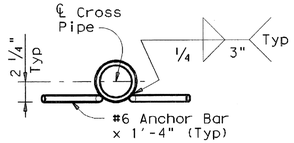
(Showing Corrugated Metal Pipe Culvert.)
(Details at Concrete Pipe Culvert are similar.)



PIPE W/ BOLTED ANCHOR

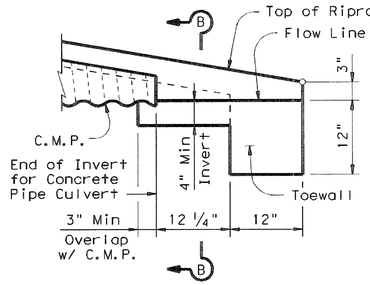


PIPE W/ ANCHOR BARS



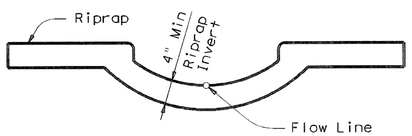
SECTION C-C

CROSS PIPE DETAILS



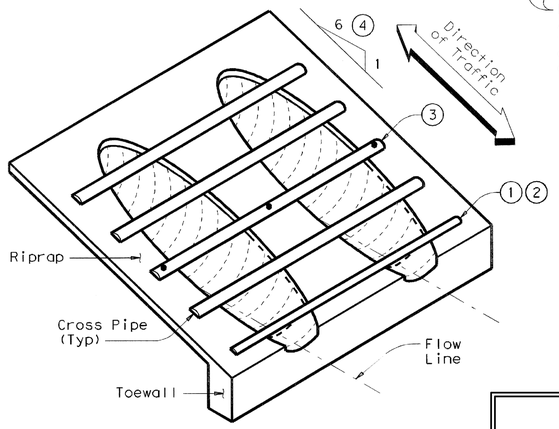
DETAIL "A"

(Showing Invert with Corrugated Metal Pipe Culvert. Concrete Pipe Culvert details are similar. Cross Pipes not shown for clarity.)



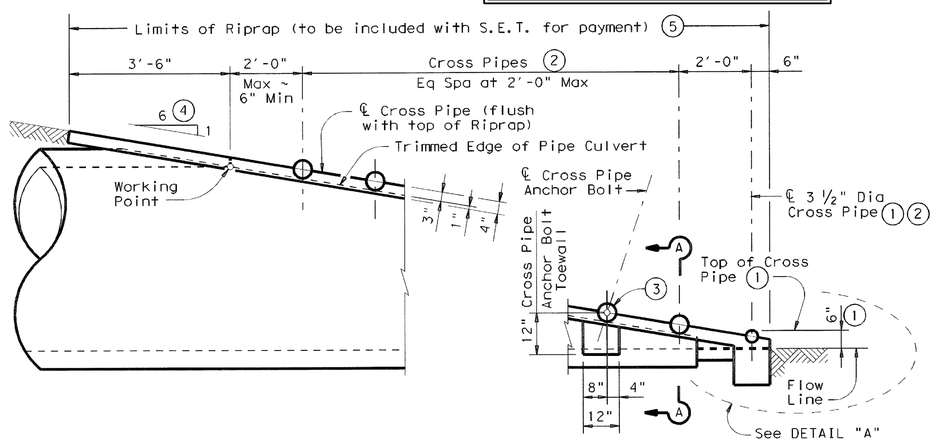
SECTION B-B

(Cross Pipes not shown for clarity.)



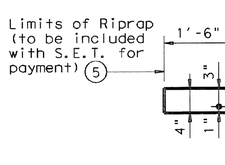
ISOMETRIC VIEW OF TYPICAL INSTALLATION

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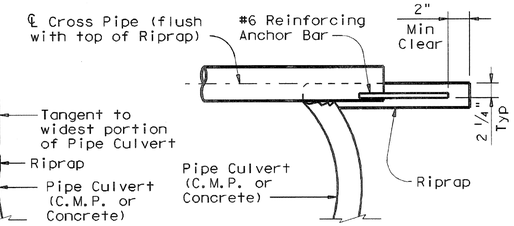


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

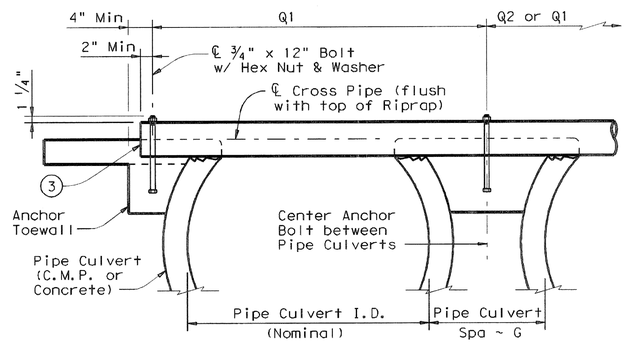
(Showing Concrete Pipe Culvert.)
(Details at Corrugated Metal Pipe Culvert are similar.)



SHOWING TYPICAL PIPE CULVERT & RIPRAP



SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, & RIPRAP QUANTITIES 2

Nominal Culvert I.D.	Conc Riprap (CY) 6	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for use of Cross Pipes	Cross Pipe Size
12"	0.6	9"	N/A	2'- 1"	1'- 9"	3 or more Pipe Culverts	3" Std (3.500" O.D.)
15"	0.7	11"	N/A	2'- 5"	2'- 2"		
18"	0.8	1'- 2"	N/A	2'-10"	2'- 8"		
21"	0.9	1'- 4"	N/A	3'- 2"	3'- 1"		
24"	0.9	1'- 7"	N/A	3'- 6"	3'- 7"		
27"	1.0	1'- 8"	N/A	3'-10"	3'-11"	3 or more Pipe Culverts	3 1/2" Std (4.000" O.D.)
30"	1.1	1'-10"	N/A	4'- 2"	4'- 4"	2 or more Pipe Culverts	
33"	1.2	1'-11"	4'- 2"	4'- 5"	4'- 8"	All Pipe Culverts	
36"	1.3	2'- 1"	4'- 5"	4'- 9"	5'- 1"	All Pipe Culverts	4" Std (4.500" O.D.)
42"	1.5	2'- 4"	4'-11"	5'- 5"	5'-10"		
48"	1.7	2'- 7"	5'- 5"	6'- 0"	6'- 7"	All Pipe Culverts	5" Std (5.563" O.D.)
54"	2.0	3'- 0"	5'-11"	6'- 9"	7'- 6"		
60"	2.2	3'- 3"	6'- 5"	7'- 4"	8'- 3"		
66"	2.4	3'- 3"	6'-11"	7'-10"	8'- 9"		
72"	2.7	3'- 4"	7'- 5"	8'- 5"	9'- 4"		

1. The proper installation of the first Cross Pipe is critical for vehicle safety. The top of the first Cross Pipe must be placed at no more than 6" above the flow line.
2. Size of Cross Pipes, except the first bottom pipe, shall be as shown in the PIPE SIZE table. The first bottom pipe shall be 3 1/2" Standard Pipe (4" O.D.).
3. The third Cross Pipe from the bottom of the Culvert shall always be installed using a bolted connection. Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, all other Cross Pipes may also be installed using the bolted connection details.
4. Match Cross Slope as shown elsewhere in the plans. Cross Slope of 6:1 or flatter is required for vehicle safety.
5. Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".
6. Quantities shown are for one end of one reinforced Concrete Pipe Culvert. For multiple pipe culverts or for Corrugated Metal Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

GENERAL NOTES:

Cross Pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Safety End Treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Cross Pipes.

Riprap and all necessary inverts shall be Concrete Riprap conforming to the requirements of Item 432, "Riprap".

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

Cross Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Bolts and nuts shall conform to ASTM A307.

All steel components, except concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

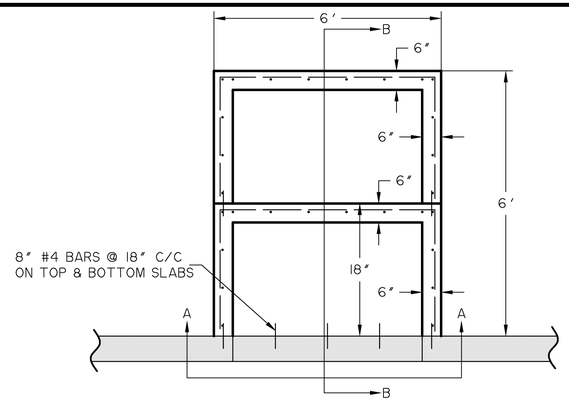
Texas Department of Transportation
Bridge Division

SAFETY END TREATMENT
FOR 12" DIA TO 72" DIA PIPE CULVERTS TYPE II ~ PARALLEL DRAINAGE

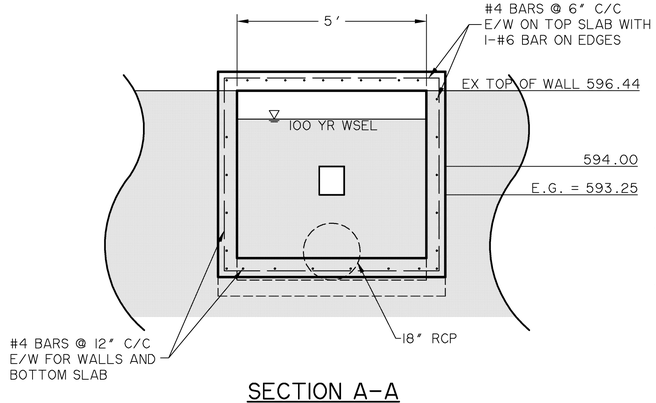
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©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT				SHEET
REVISIONS						D208
11-10: Add note for synthetic fibers.	COUNTY		CONTROL	SECT	JOB	HIGHWAY

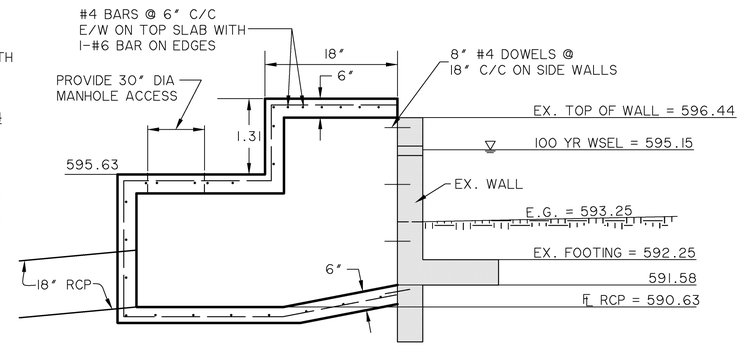
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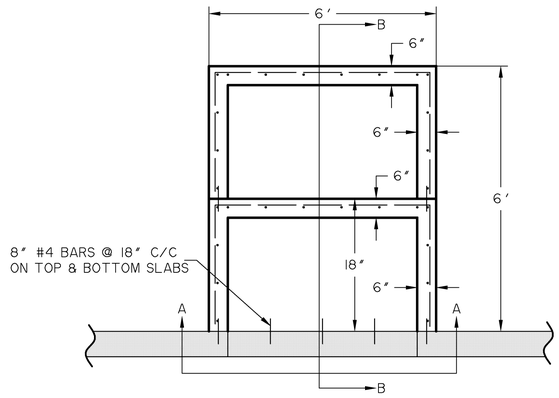
WALL I PLAN VIEW



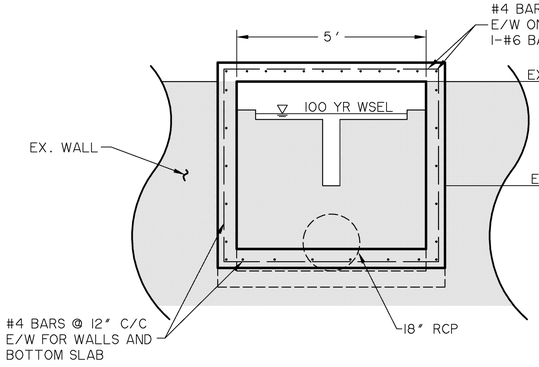
SECTION A-A



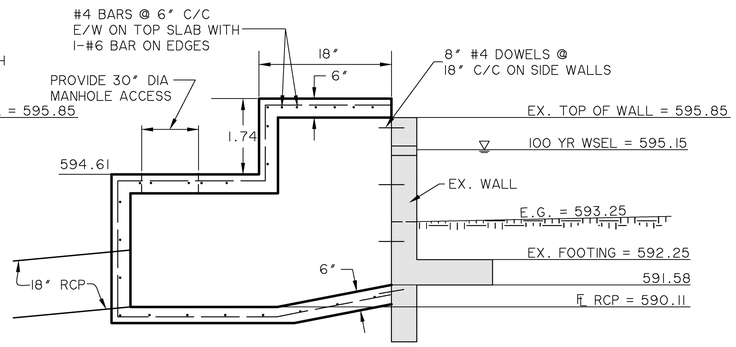
SECTION B-B



WALL I PLAN VIEW

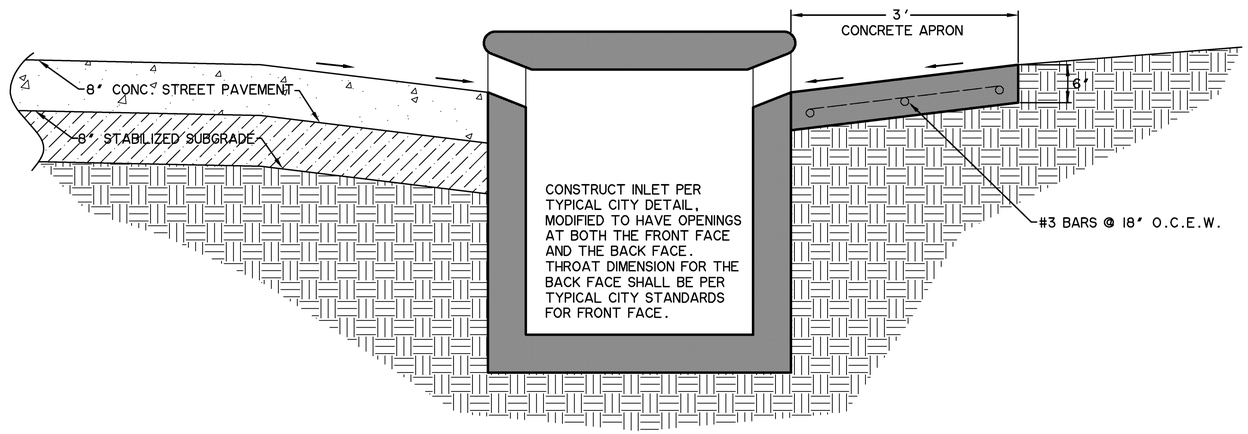


SECTION A-A



SECTION B-B

OUTFALL STRUCTURE DETAILS



OPEN-BACK INLET DETAIL

RECORD DRAWING 10/11/2013

TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

PREPARED BY:
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO L.H. 30)

DRAINAGE DETAILS

WA# 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED
PROFESSIONAL ENGINEER

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LAST SHEET EDIT DATE 10-10-2013
WA# 08029

SHEET NO. D209

FILE: D209-DR-DETAILS.dwg
TIME: 13:00

LOT 8, BLOCK A
REDC

TPD

TPD

TELE
VAULT

EX. 12" PVC WATER LINE PER TURNER COLLIE & BRADEN PLANS DATED FEBUARY 1999 JOB NO. 15-98925-200

CORPORATE CROSSING

EX. 12" W.L.

29.57' LT ST STA 8+04.78
CONNECT TO EXISTING 12" W.L.
INSTALL:
1 - 12" GATE VALVE
1 - 12" 45° BEND

PROP. 12" W.L.

8+00

59.84' LT ST STA 7+78.22
INSTALL:
1 - 12"x12" TEE
1 - 16" GATE VALVE
1 - 16"x12" REDUCER

EX. 12" W.L.

67.87 ' LT ST STA 7+72.56
CONNECT TO EXISTING 12" W.L.
INSTALL:
1 - 12" GATE VALVE
1 - 12" 45° BEND

WV

WV

WV

PROP. 16" W.L.

PROP. 12" W.L.

SEE NOTE 1

EX. 10" W.L.

14.22' LT ST STA 7+61.64
CONNECT TO EXISTING 12" W.L.
INSTALL:
1 - 12" 90° BEND
1 - 12" GATE VALVE

EX. 12" W.L.

6.74' LT ST STA 7+53.37
CONNECT TO EXISTING 10" W.L.
INSTALL:
1 - 10" GATE VALVE

14.21' LT ST STA 7+53.37
INSTALL:
1-12"x12" TEE
1-12"x10" REDUCER

14.21' LT ST STA 7+50.17
INSTALL:
1-12" 45° BEND

94.86' LT ST STA 7+55.59
EXISTING 10" W.L. CAPPED

R.O.W.

PP

44.19' LT ST STA 7+56.04
CONSTRUCT 25 LF OF
CONCRETE ENCASEMENT CENTERED
ON BOX CULVERT CROSSING PER
DETAIL ON SHEET U102.

PROP. 12" W.L.

30.10' LT ST STA 7+36.08
INSTALL:
1 - 12"x12" TEE
1 - 16" GATE VALVE
1 - 16"x12" REDUCER

56.42' LT ST STA 7+12.73
CONNECT TO EXISTING 12" W.L.
INSTALL:
1 - 12" GATE VALVE
1 - 12" 45° BEND

7+00

EX. 12" W.L.

SH 276

LOT 1, BLOCK A
SUBWAY/GATEWAY/HEALTH
FOOD STORE
CAB. G. SL. 105-106
P.R.R.C.T.

R.O.W.

OE

FO

UT

CAUTION !!

EXISTING UTILITIES ARE INDICATED ON THE PLANS FROM AVAILABLE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES, TO NOTIFY ALL UTILITY COMPANIES OF THE CONTRACTORS OPERATIONS, TO PROTECT ALL UTILITIES FROM DAMAGE, TO REPAIR ALL UTILITIES DAMAGED DUE TO THE CONTRACTORS OPERATIONS, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING UTILITIES.

0 10 20 30

* BENCH MARKS *

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

NOTES FOR WORK IN NTMWD EASEMENT:

1. CONTACT PAUL LYDAY, NTMWD ENGINEERING @ 972-442-5405 48 HOURS IN ADVANCE OF ANY WORK WITHIN NTMWD EASEMENT
2. FRANCHISE AND PUBLIC UTILITIES ARE NOT PERMITTED IN NTMWD EASEMENT EXCEPT FOR CROSSINGS
3. CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PIPELINE WHEN WORKING IN NTMWD EASEMENT. ANY DAMAGE TO PIPELINE RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF NTMWD AT CONTRACTOR'S EXPENSE.

RECORD DRAWING 10/11/2013

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PREPARED BY:
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Texas Firm Registration No. F-2776 www.WierAssociates.com

CITY OF ROCKWALL
IMPROVEMENTS TO CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

WATER LINE RELOCATION PLAN

WA# 08029

STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED PROFESSIONAL ENGINEER

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LAST SHEET EDIT
DATE 10-10-2013
WA# 08029

SHEET NO.
U101

FILE: U101-WL_Relocate.dwg
TIME: 10:32

LOT 1, BLOCK A
LOVE'S ADDITION NO. 1
CAB. D, SL. 293-294
P.R.R.C.T.

28.57' LT ST STA 43+65.67
CONNECT TO EXISTING 12" W.L.
INSTALL:
1 - 12"x12" TAPPING SLEEVE & VALVE
PLUS THRUST BLOCK
N = 7022796.11
E = 2607210.05

36.56' LT ST STA 43+53.84
CONNECT TO EXISTING
10" SANITARY SEWER STUB
℄ = 565.00 ±
N = 7022784.28
E = 2607202.10

EX. 12" W.L.

CORPORATE CROSSING

44+00

R.O.W.

EXISTING 84' W.L.

THE WHITMORE
MANUFACTURING COMPANY
INST#D2010-00432707
D.R.R.C.T.

49.12' RT ST STA 43+64.76
℄ (FUTURE 30') = 573.63±
MAX. TOP OF PROPOSED
12" W.L. = 571.00

55.58' RT ST STA 43+64.69
END PROPOSED 12" W.L.
INSTALL:
1 - 12" CAP W\RETAINER GLANDS
N = 7022795.40
E = 2607294.21

PROPOSED 84 LF
12" CLASS 200
PVC WATER LINE

EX. 10" S.S.

SSMH

EX. SSMH
℄ = 565.0(±)

PROPOSED 92 LF
10" SDR-26
PVC S.S. @ 1.00%

55.44' RT ST STA 43+52.79
END PROPOSED 10" S.S.
℄ = 565.92
INSTALL:
1 - 10" PLUG
N = 7022783.50
E = 2607294.11

33.50' LT ST STA 43+53.83
CONSTRUCT 10 LF OF CONCRETE
ENCASEMENT PER DETAIL THIS SHEET
CENTERED ON W.L. CROSSING
N = 7022784.21
E = 2607210.17

GATE

MARIAH BAY
DEVELOPMENT, INC.
VOL. 2358, PG. 265
D.R.R.C.T.

FUTURE 30" RCP
BY C.P. & Y.

HITT FAMILY
LIMITED PARTNERSHIP
VOL. 1875, PG. 238
D.R.R.C.T.

R.O.W.

EX. 12" W.L.

℄ RIGHT-OF-WAY

43+00

PROPOSED
S.D. LINE 'A'

R.O.W.

HITT FAMILY PARTNERSHIP
VOL. 1875, PG. 235
D.R.R.C.T.

PROPOSED
CURB INLET

SN

CAUTION !!

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0 10 20 30

• BENCH MARKS •

BM A AN "□" CUT IN CONCRETE PAD OF A WATER VALVE MANHOLE LOCATED +/- 55' EAST OF THE EDGE OF PAVEMENT OF FM 549 AND +/-150' SOUTH OF THE EDGE OF PAVEMENT OF SH 276. 595.66 FT.
N 7018916.83, E 2607403.98

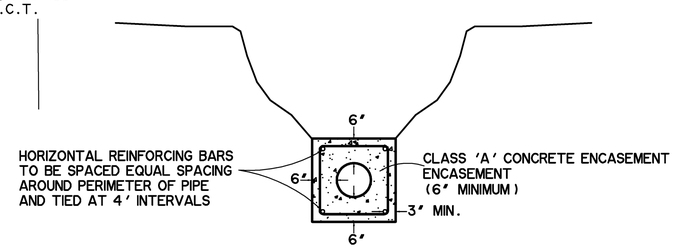
BM B AN "□" CUT IN A LIGHT POLE BASE +/-40' WEST OF THE EDGE OF PAVEMENT OF CORPORATE CROSSING AND +/-0.30 MILES SOUTH OF THE EDGE OF PAVEMENT OF IH 30. 581.56 FT.
N 7022945.40, E 2607163.95

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

RECORD DRAWING 10/11/2013

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6' & 8' PIPE: 4 - #4 HORIZONTAL REINFORCING BARS WITH TIE RODS
10' & 12' PIPE: 4 - #5 HORIZONTAL REINFORCING BARS WITH TIE RODS
15', 16' & 18' PIPE: 8 - #5 HORIZONTAL REINFORCING BARS WITH TIE RODS
20', 21', 24', 27' & 30' PIPE: 8 - #6 HORIZONTAL REINFORCING BARS WITH TIE RODS

CONCRETE ENCASEMENT
N.T.S.

PREPARED BY:
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CITY OF ROCKWALL
IMPROVEMENTS TO
CORPORATE CROSSING
(FROM S.H. 276 TO I.H. 30)

UTILITY PLAN

WA# 08029
STATE OF TEXAS
RONALD RAMIREZ
81821
REGISTERED
PROFESSIONAL ENGINEER
Ron Ramirez 10/11/13

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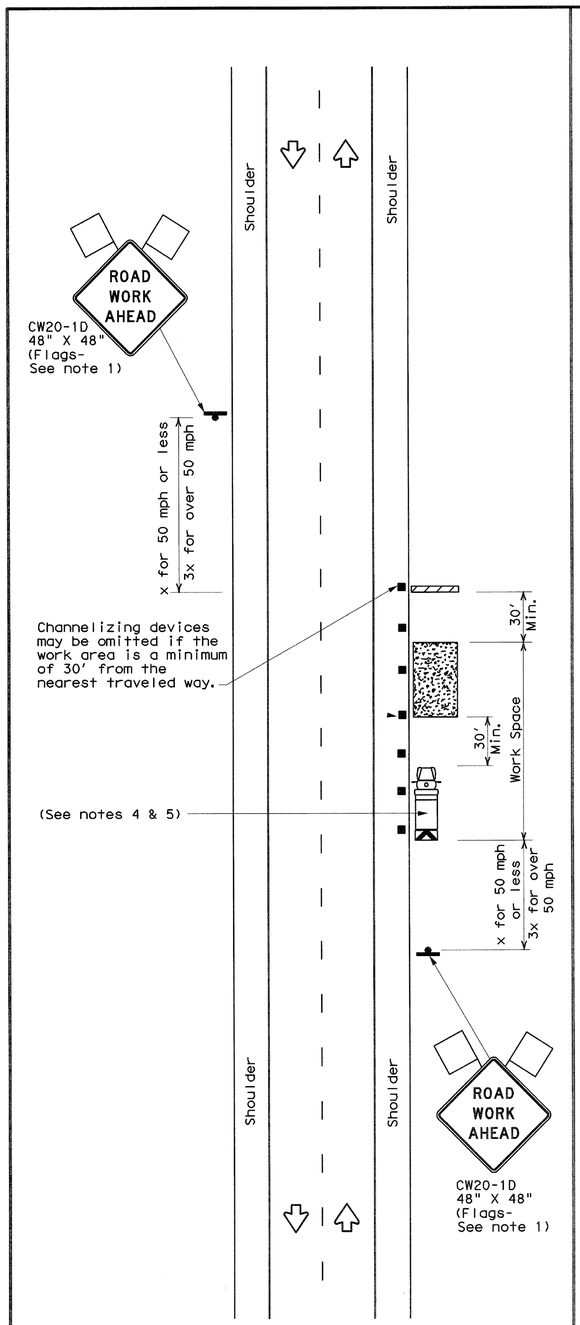
LAST SHEET EDIT
DATE 09-13-2013
WA# 08029

SHEET NO.
U102

TIME: 10:17 FILE: U102-Utility Plan.dwg

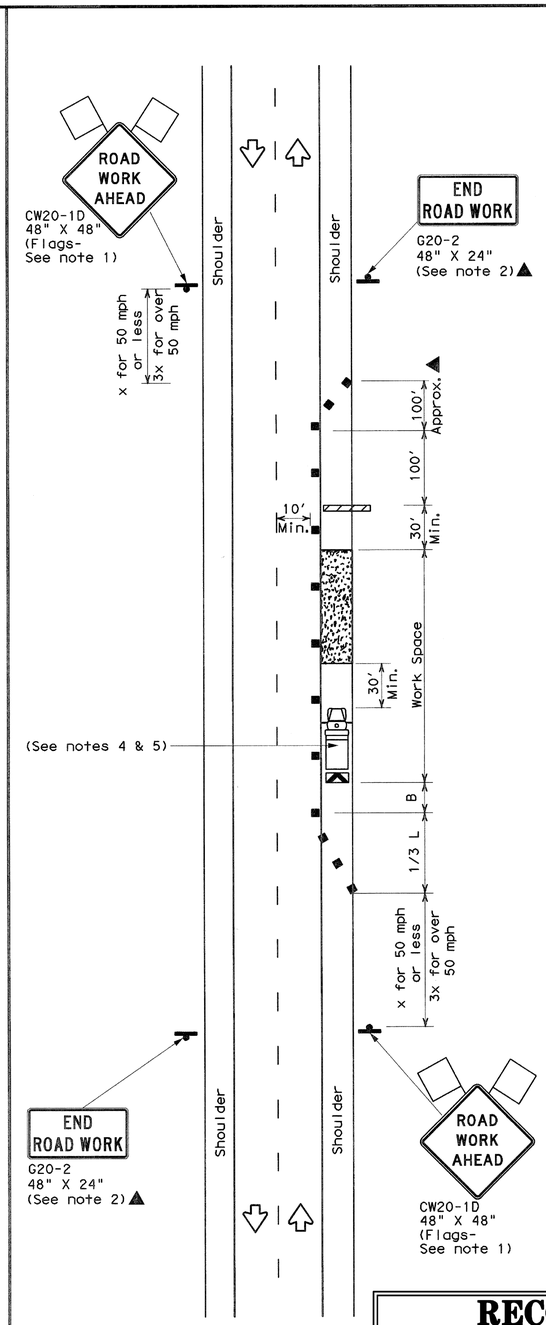
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DATE:
FILE:



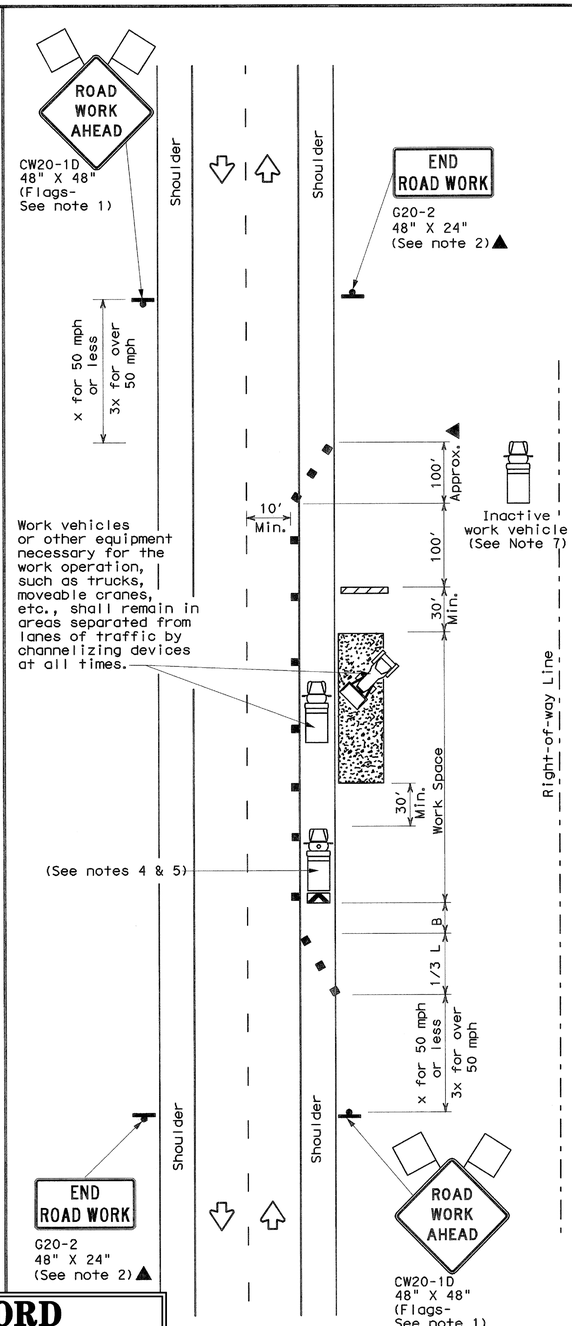
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

RECORD DRAWING 10/11/2013

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW21-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-12

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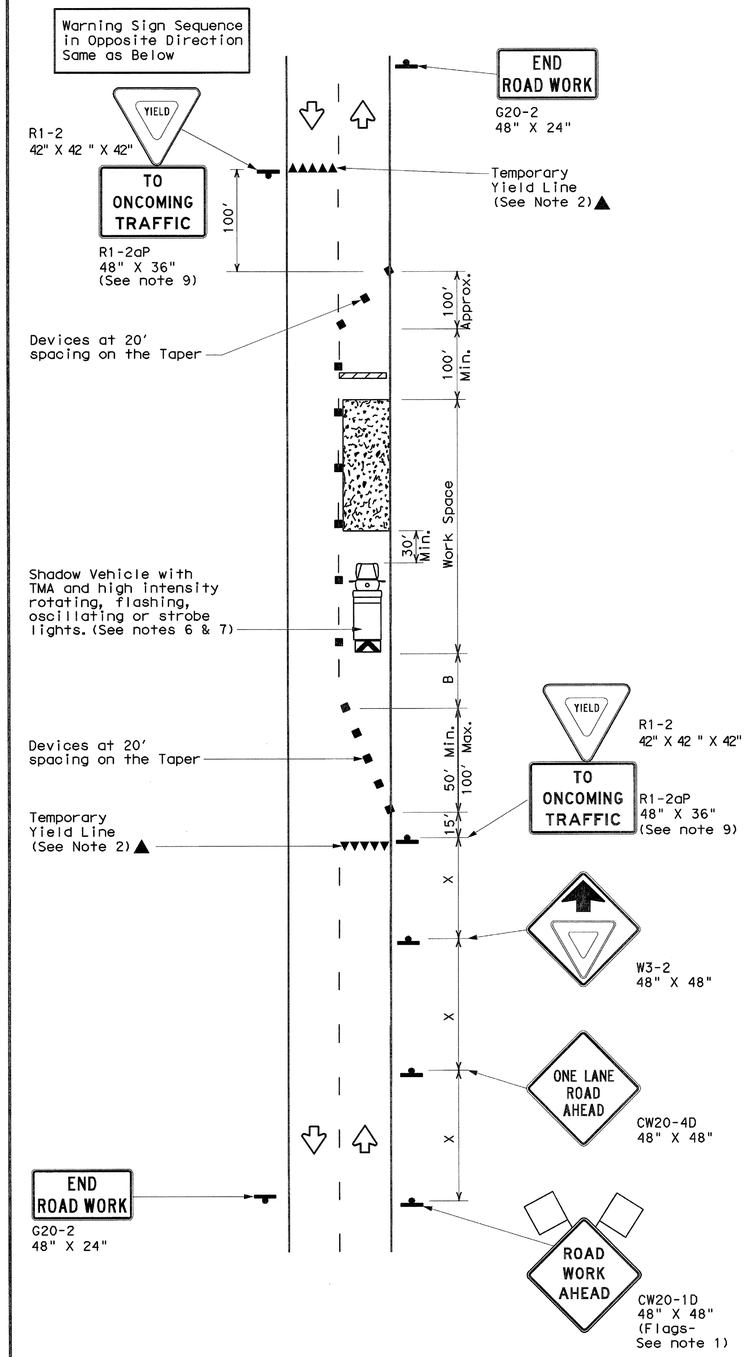
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
			T201

REVISIONS
2-94 2-12
8-95
1-97
4-98

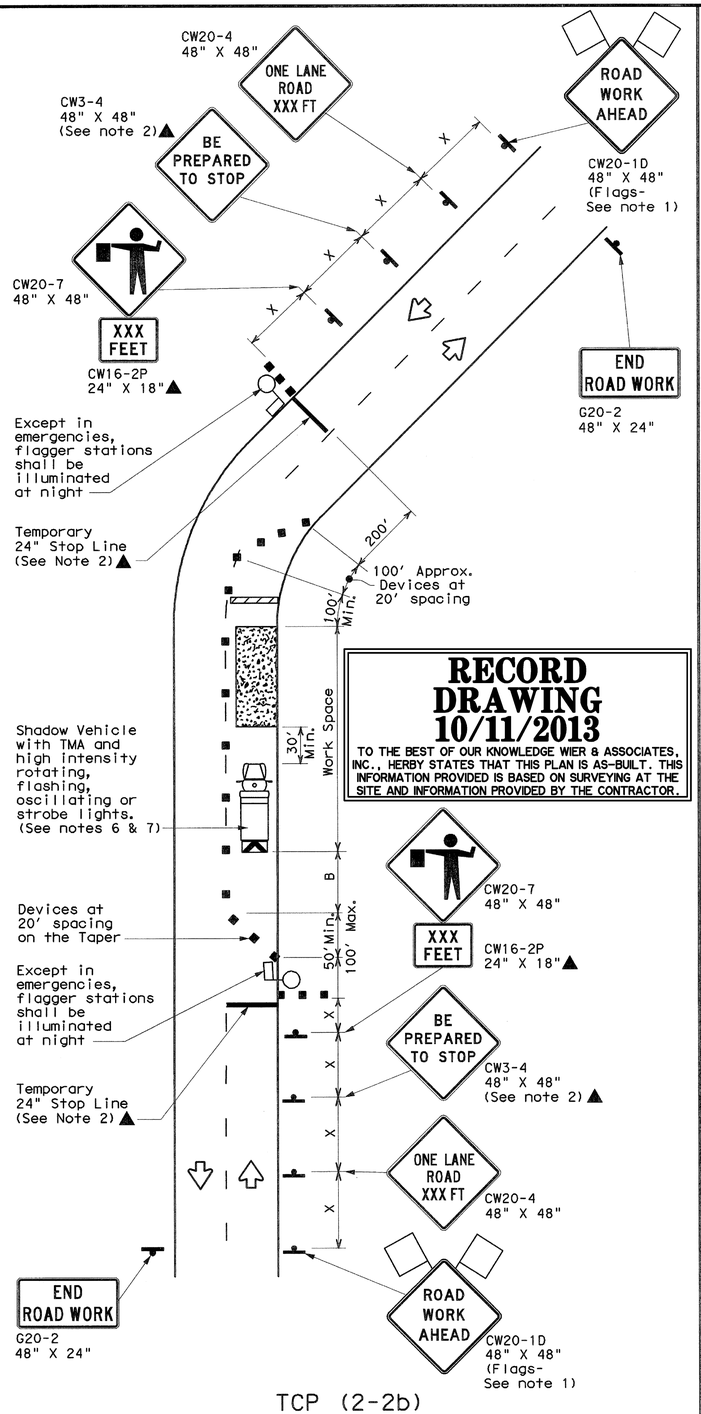
161

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DATE:
FILE:



TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



RECORD DRAWING 10/11/2013

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TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	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	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. 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. 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.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

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

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

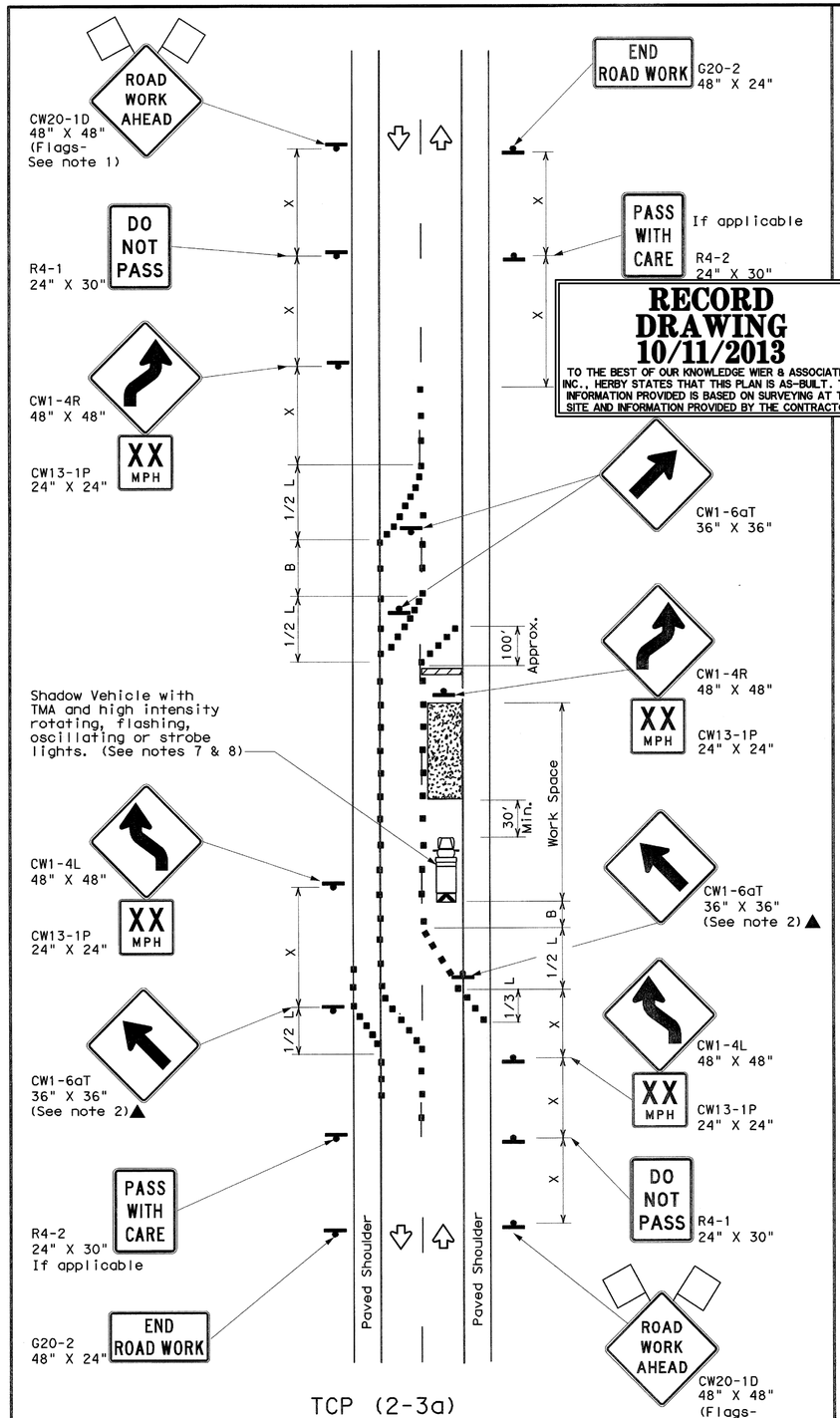
TCP(2-2)-12

©TxDOT December 1985

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

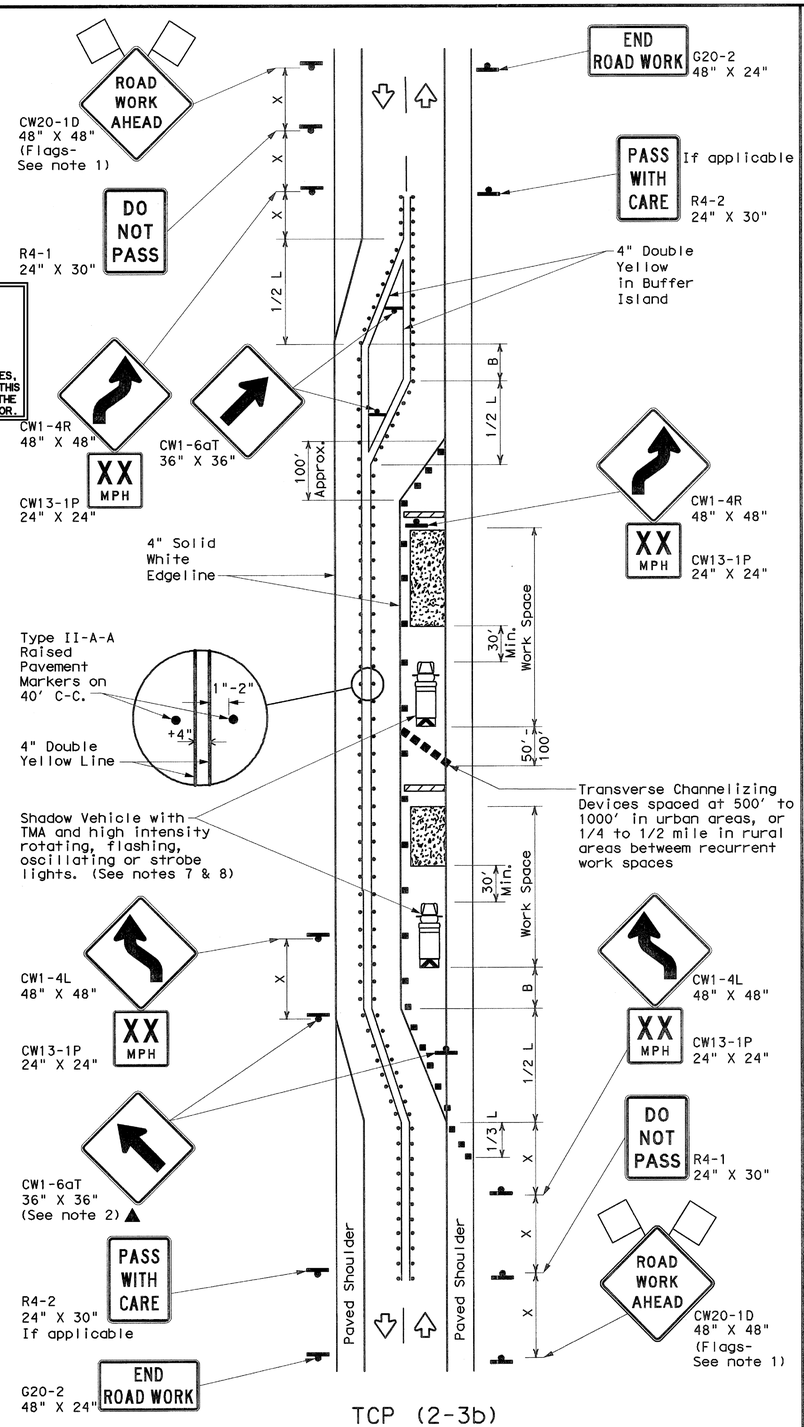
REVISIONS	CONT	SECT	JOB	HIGHWAY
8-95 2-12				
1-97	DIST	COUNTY		SHEET NO.
4-98				T202
3-03				

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TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
				TCP(2-3b) ONLY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. 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.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

9. Conflicting pavement markings shall be removed for long-term projects. For shorter durations 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 1/2(S) where S is the speed in mph. This tighter device spacing is intended for the area of the conflicting markings, not the entire work zone.

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-12

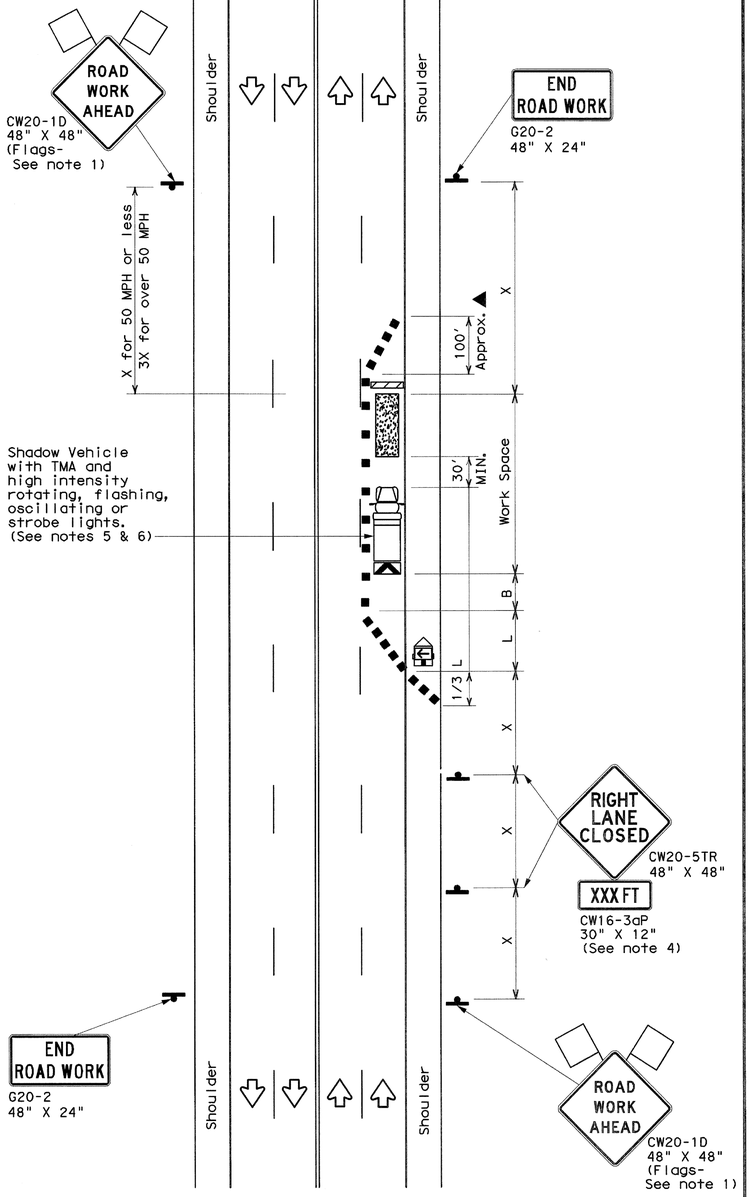
© TxDOT December 1985

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
8-95 2-12				
1-97				
4-98	DIST	COUNTY		SHEET NO.
3-03				T203

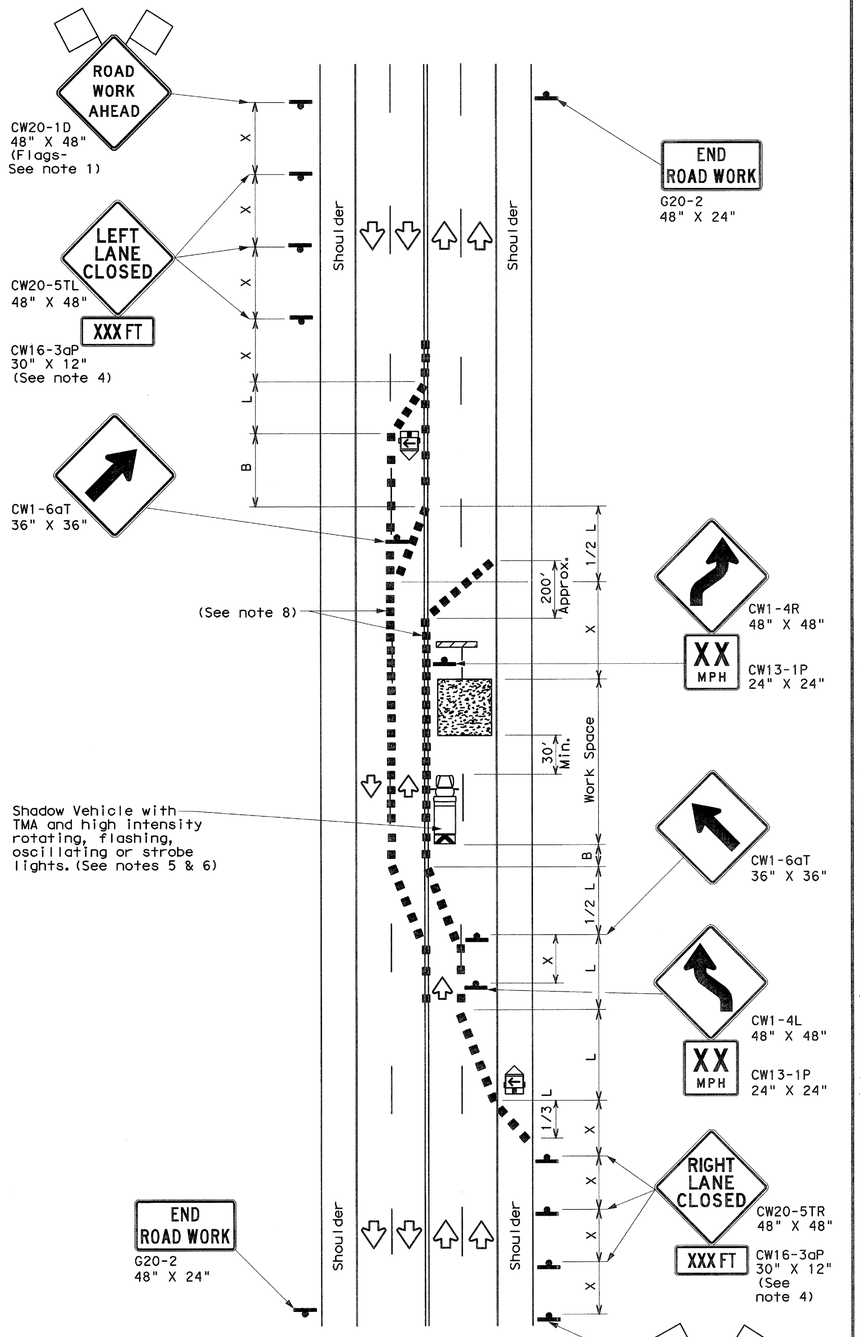
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TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. 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.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. 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 to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. For shorter durations 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 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-12

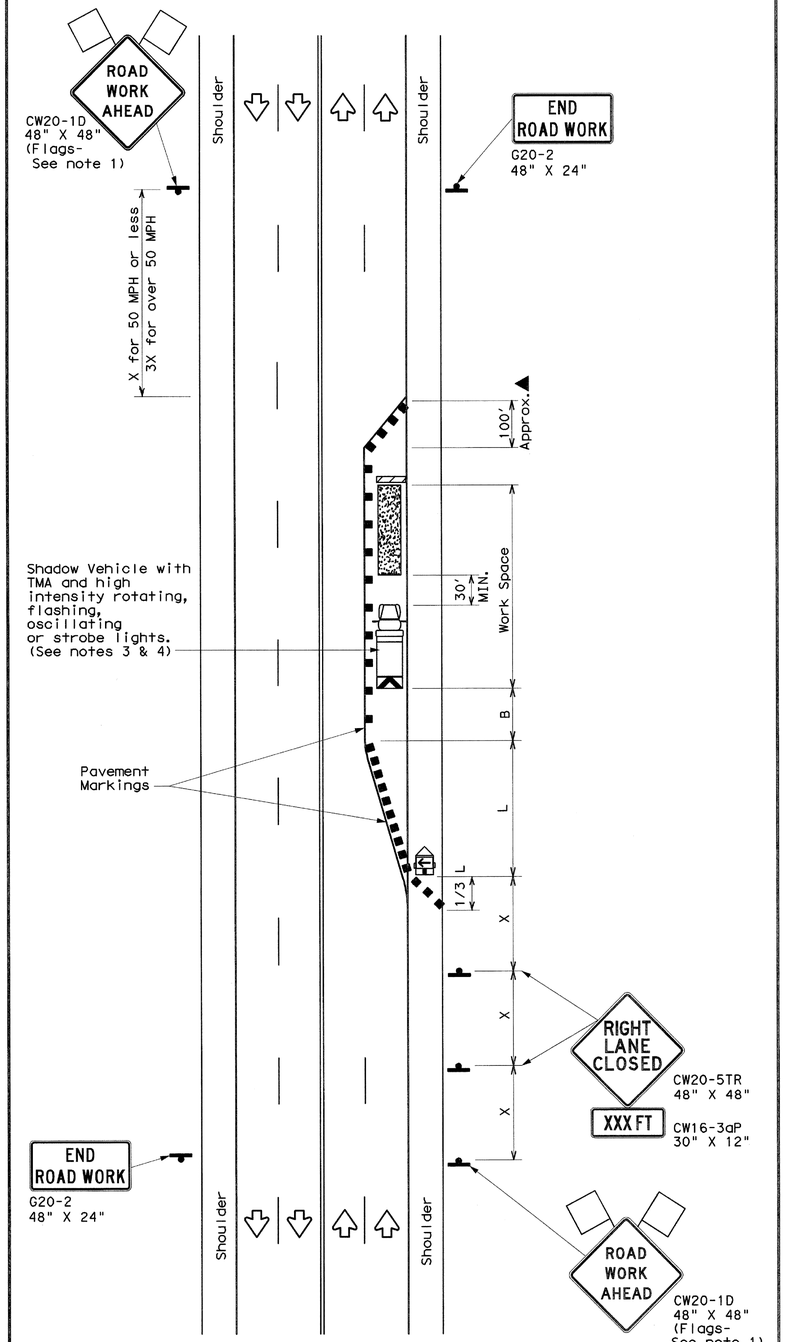
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REVISIONS	CONT	SECT	JOB	HIGHWAY
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1-97				
4-98	DIST	COUNTY		SHEET NO.
3-03				T204

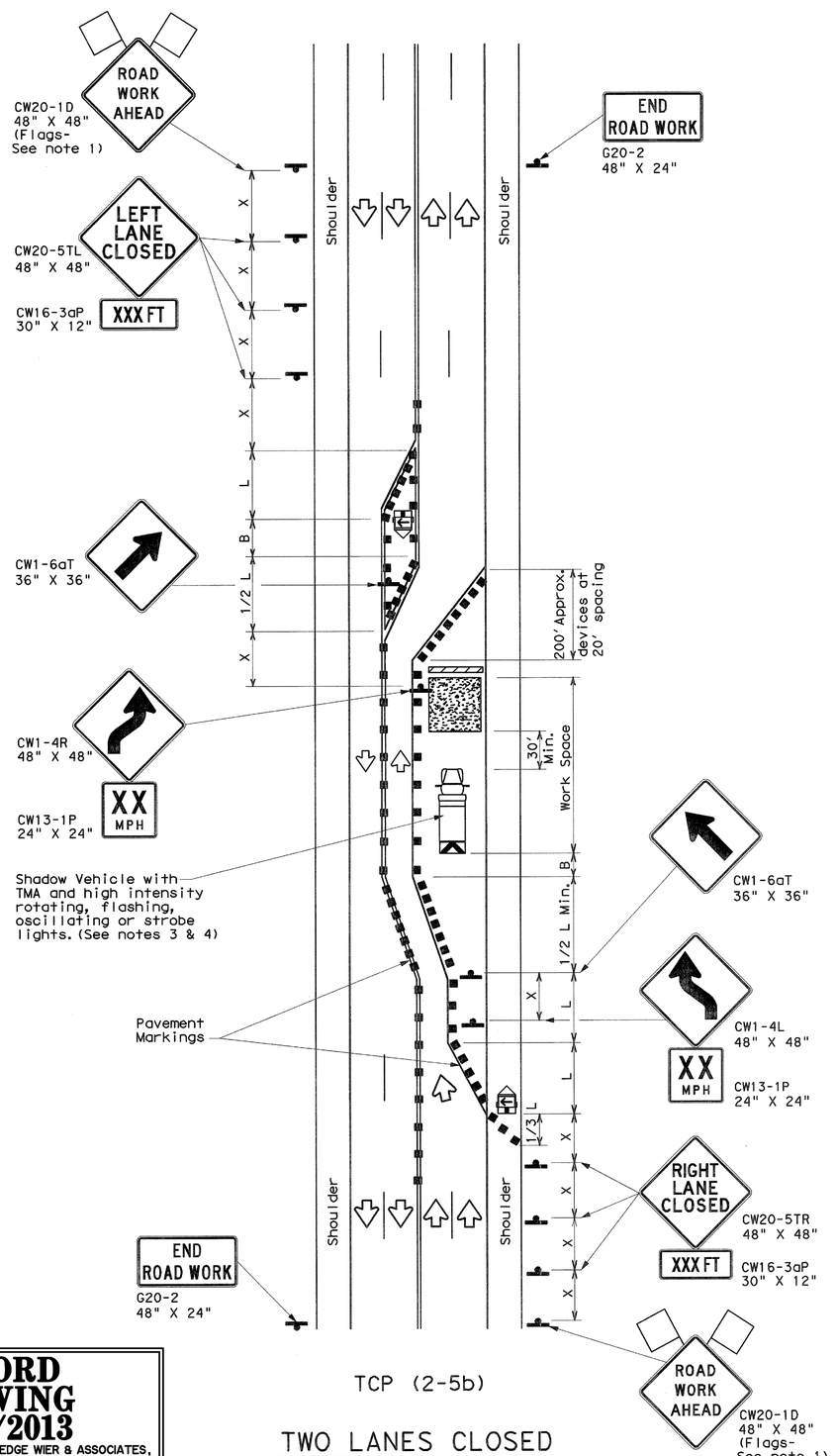
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FILE:

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TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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DATE:
FILE:

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. 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 eposure 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.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

6. 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 to protect the work space from opposing traffic, with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-5b)

7. Conflicting pavement markings shall be removed for long-term projects.

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-12

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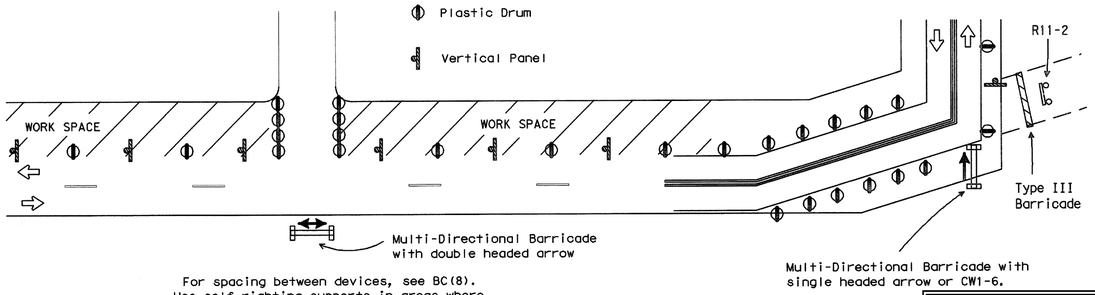
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CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
			T205

REVISIONS
8-95 2-12
1-97
4-98
3-03

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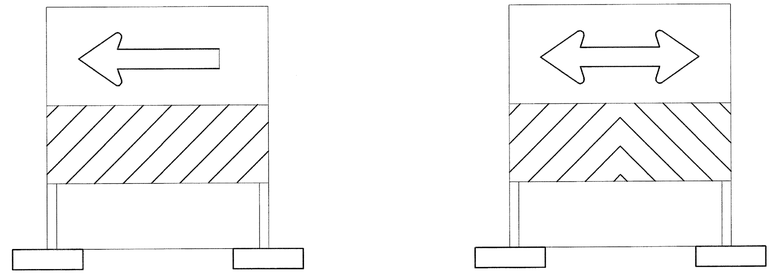
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FILE:

CHANNELIZING DEVICES FOR URBAN ROADWAY TYPE PROJECT



For spacing between devices, see BC(8). Use self-righting supports in areas where there is a high potential for channelizing devices to be struck.

MULTI-DIRECTIONAL BARRICADE



Single Headed Arrow

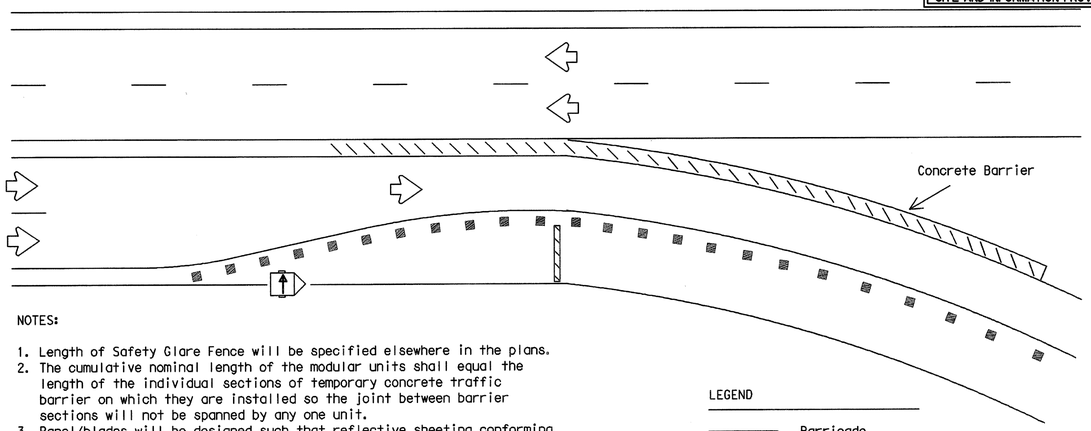
Double Headed Arrow

1. Multi-directional barricade shall not be used for lane closures.
2. May be used for sharp changes in alignment, or across roadway from stem of "T" intersection.
3. Typically used for Intermediate Term Stationary, Short Term Stationary or Short Duration work zone operations.
4. See the CWZTCD List for approved designs.

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BARRIER DELINEATION WITH SAFETY GLARE FENCE



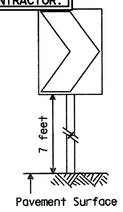
NOTES:

1. Length of Safety Glare Fence will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one unit.
3. Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Flat Surface Reflective Sheeting, Type C (High Specific Intensity), minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed.
4. Moduler Glare Screens for head light barrier shall meet the requirements of DMS-8610.

LEGEND

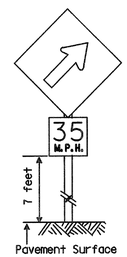
- Barricade
- Channelizing devices
- Trailer mounted flashing arrow panel
- Safety glare fence

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



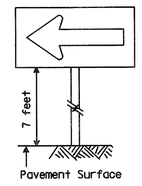
CW1-8

The CHEVRON sign (CW1-8) may be used to replace roadside delineation on curves or used in transitions or tapers.



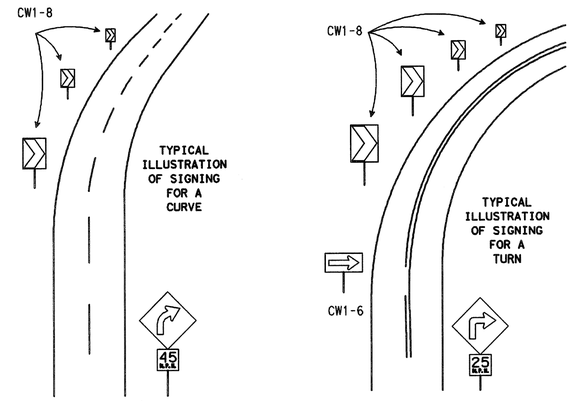
ECW1-6a

An UPWARD SLOPING ARROW sign (ECW1-6a) is intended to be used to indicate the beginning of a curve or transition. It should be preceded with an appropriate curve sign when needed, and should not be used throughout the curve or transition. Advisory speed plaque is optional.



CW1-6

A LARGE ARROW sign (CW1-6) is intended to be used to give notice of a sharp change in alignment (turn) in the direction of travel. It should be preceded with an appropriate advance construction warning turn sign.



NOTES:

1. CW1-6, ECW1-6a & CW1-8 signs shall be mounted on fixed supports.
2. 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.
3. For two-way traffic, use same arrangement of signs on outside of curve for each direction of travel.
4. Appropriate advance warning CURVE or TURN sign with Advisory Speed plaque should be used when needed.

Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be obtained by contacting:

Standards Engineer
Traffic Operations Division - TE
Texas Department of Transportation
125 East 11th Street
Austin, Texas 78701-2483
Phone (512) 416-3120
Fax (512) 416-3299

Instructions to locate the "CWZTCD" on TxDOT website are:

Start at website - www.dot.state.tx.us
Click on "About TxDOT",
Click on "Organizational Chart",
Click on Traffic Operations Box,
Click on "Compliant Work Zone Traffic Control Devices",
Click on "View PDF".
This site is printable.

PREQUALIFICATION PROCEDURES ARE OBTAINED FROM:

CONSTRUCTION DIVISION-MATERIALS AND TESTS SECTION
TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT)
125 EAST 11th STREET
AUSTIN, TX 78701-2483

DEPARTMENTAL MATERIAL SPECIFICATIONS

FLAT SURFACE REFLECTIVE SHEETING	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULER GLARE SCREENS	DMS-8610

COLOR	USAGE	SIGN SHEETING
ORANGE	BACKGROUND	TYPE E (FLUORESCENT PRISMATIC)
WHITE	BACKGROUND	TYPE C (HIGH SPECIFIC INTENSITY)
BLACK	LEGEND & BORDERS	VINYL NON-REFLECTIVE SHEETING

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

The five categories of work duration and their time at a location shall be:

A. Long-term stationary is work that occupies a location more than 3 days.

B. Intermediate-term stationary is work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than 1 hour.

C. Short-term stationary is daytime work that occupies a location for more than 1 hour, but less than 12 hours.

D. Short duration is work that occupies a location up to 1 hour.

E. Mobile is work that moves intermittently or continuously.

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Traffic Operations Division

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-03

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REVISIONS
4-98
3-03

DW: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
			T206

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Barricade and Construction (BC) Standard Sheets General Notes:

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

Worker Safety Apparel Notes:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel" 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 Devices List" (CWZTCD) describes prequalified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3134

WEB ADDRESSES FOR REFERENCED DOCUMENTS

Compliant Work Zone Traffic Control Devices List (CWZTCD)
http://www.txdot.gov/publications/traffic.htm

Texas Manual on Uniform Traffic Control Devices (TMUTCD)
http://www.txdot.gov/publications/traffic.htm

Standard Highway Sign Designs for Texas (SHSD)
http://www.txdot.gov/publications/traffic.htm

Traffic Engineering Standard Sheets
http://www.txdot.gov/business/disclaim.htm

Material Producer List
http://www.txdot.gov/business/producer*list.htm

Departmental Material Specifications (DMS)
http://www.txdot.gov/services/construction/material*specifications/

Roadway Design Manual
http://www.txdot.gov/services/general*services/manuals.htm

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Traffic Operations Division

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

1 of 12 BC(1)-07

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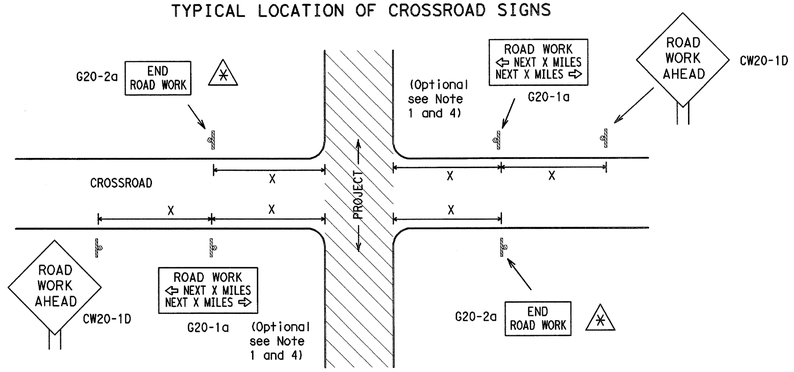
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CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
			T207

REVISIONS
4-03
9-07

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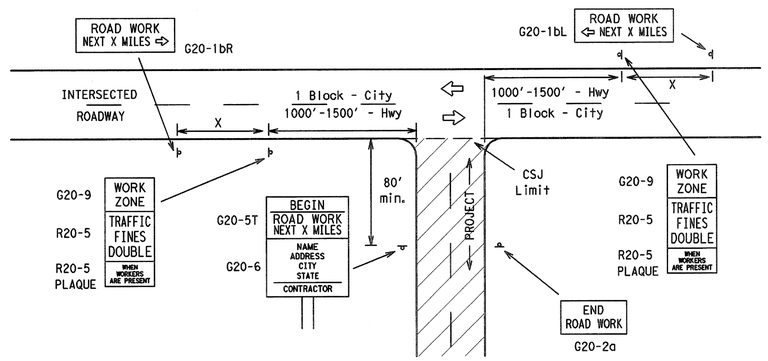
TYPICAL LOCATION OF CROSSROAD SIGNS



⁂ May be mounted on back of CW20-1D sign with approval of engineer. (See note 2 below)

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

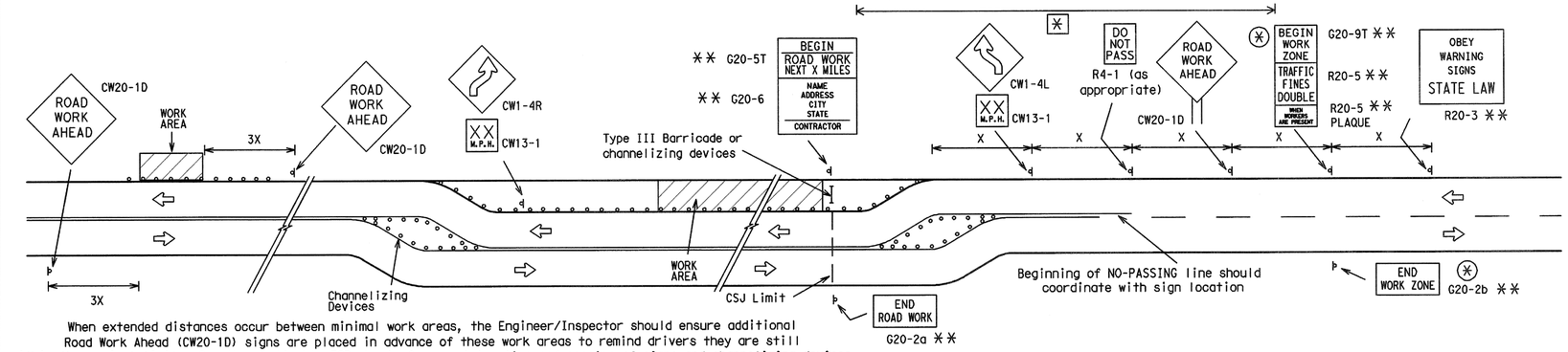
⁕ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

General Notes:

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have ½ mile or more advance warning.
4. 36" x 36" ROAD WORK AHEAD (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

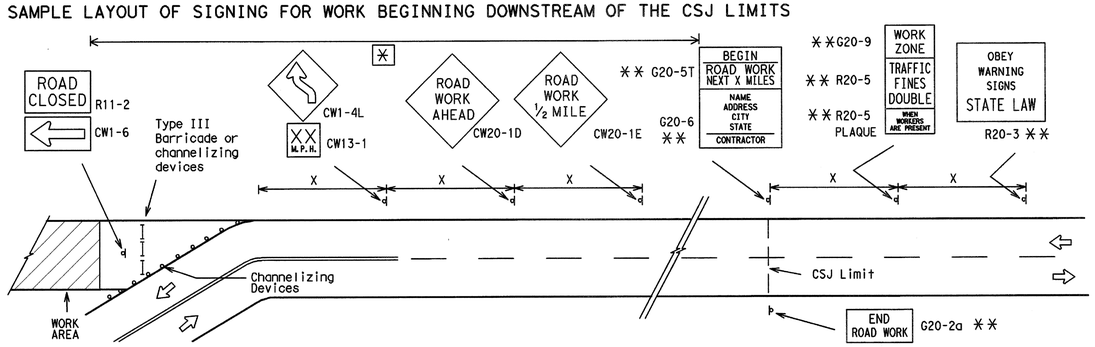
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



When extended distances occur between minimal work areas, 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



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and 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.

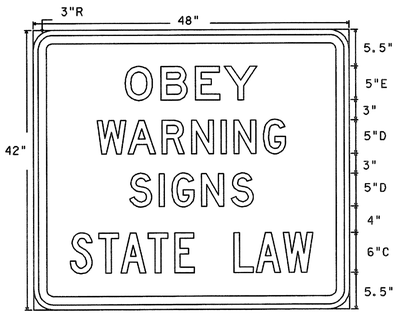
⁕ The G20-9T and G20-2b shall be used when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a work zone where traffic fines may double if workers are present.

⁂ 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
- ○ ○ Channelizing Devices
- I Type III Barricade
- X See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.



R20-3
Legend/Border - Black
Background - White

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Traffic Operations Division

BARRICADE AND CONSTRUCTION PROJECT LIMIT STANDARD

2 of 12 BC(2)-07

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				T208

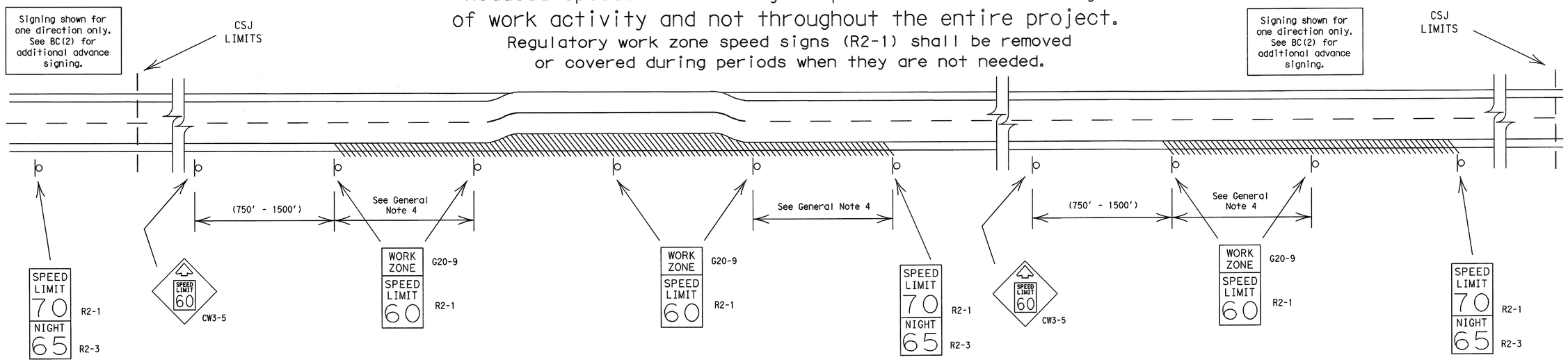
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit 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:

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

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Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT STANDARD

3 of 12 BC(3)-07

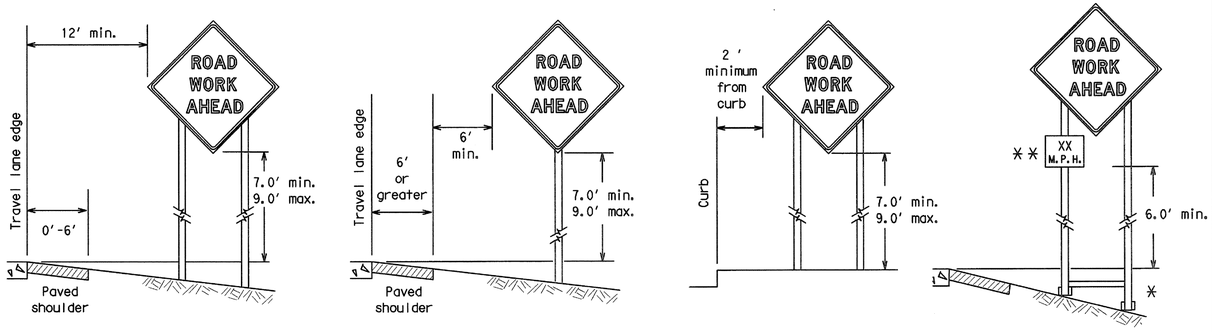
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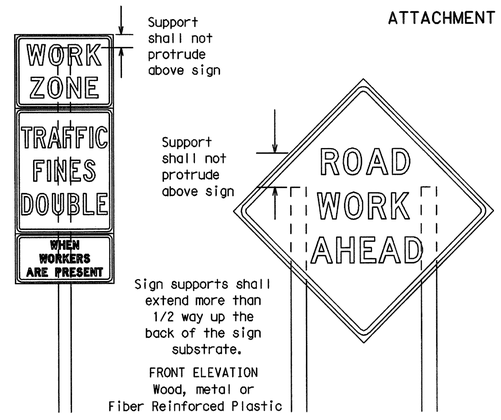
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

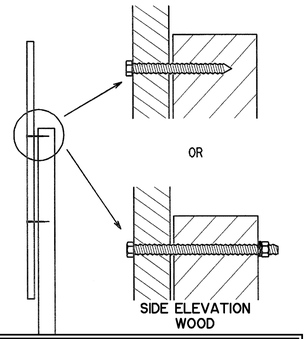


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ 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 will 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.

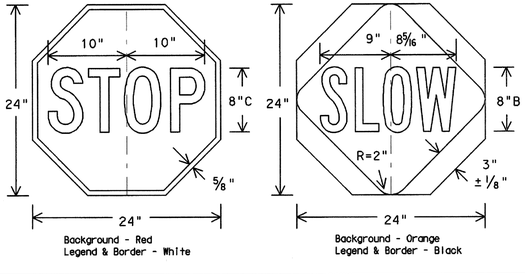
Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should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

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STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
6. 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.
7. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
8. 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.
9. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
10. 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 Engineer may allow the use of smaller size construction warning signs on secondary roads or city streets where speeds are low if the sign size is listed as an option on the "Typical Construction Warning Sign Size and Spacing" chart shown on BC(2).
2. The Contractor shall furnish the sign sizes shown in plans, the BC Sheets, the TCP sheets 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 C (High Specific Intensity), shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type E (Fluorescent Prismatic), 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 type of sign support meets the crashworthiness standards regardless of the direction of impact. 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. These materials can damage the retroreflectivity of sheeting.
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 is recommended.
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.
6. Rubber (such as tire inner tubes) shall NOT be used for sandbags.
7. 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.
8. 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.
9. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES STANDARD

4 of 12 BC(4)-07

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				T210

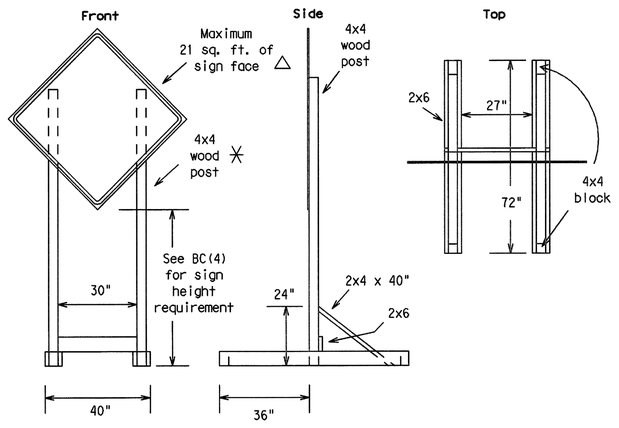
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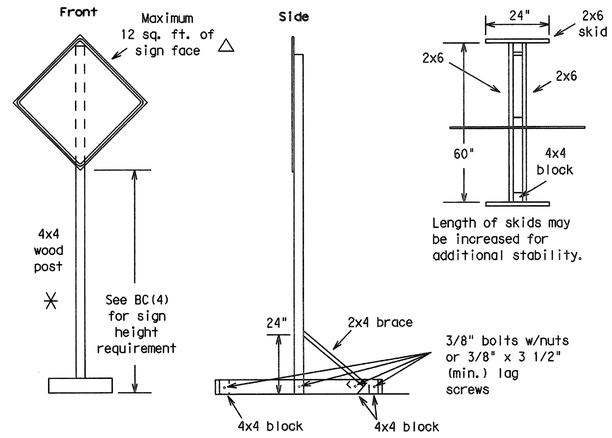
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DATE:
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SKID MOUNTED WOOD SIGN SUPPORTS

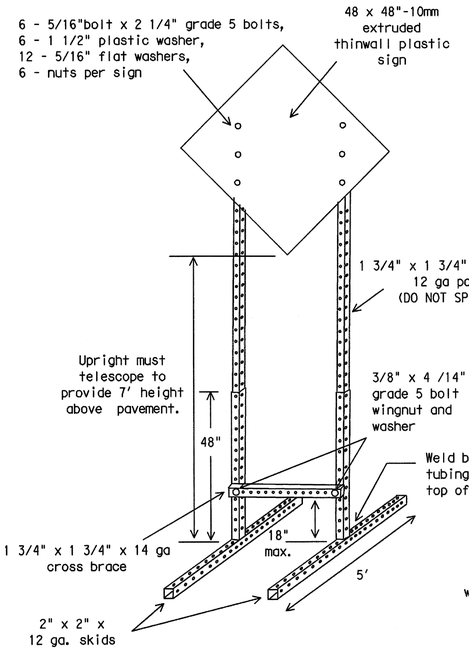
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

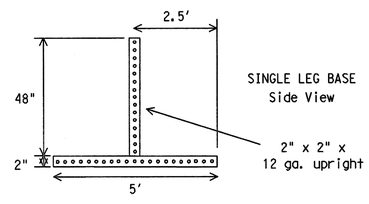


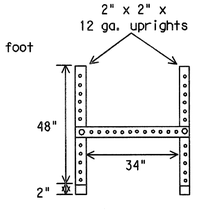


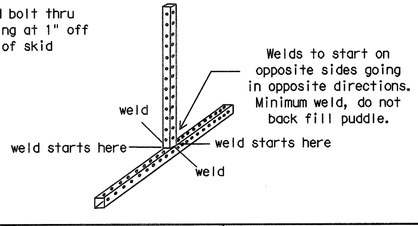
Length of skids may be increased for additional stability.

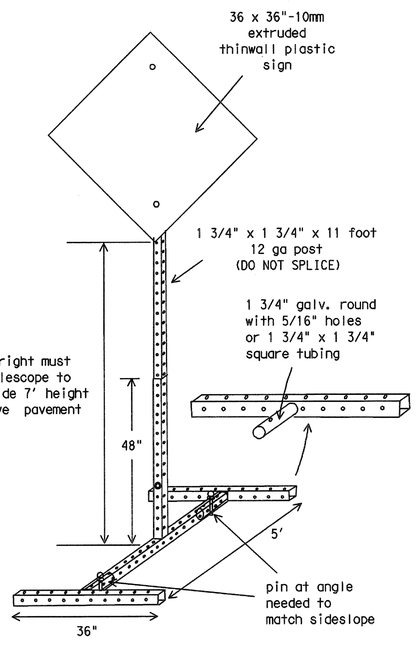
SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS







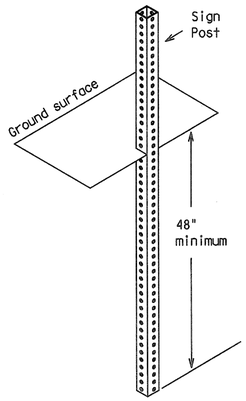




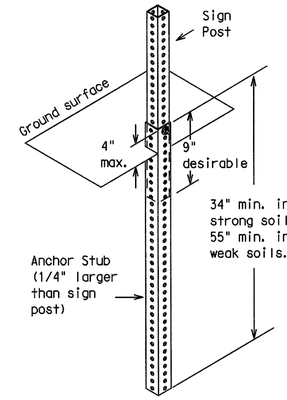
GROUND MOUNTED SIGN SUPPORTS

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.

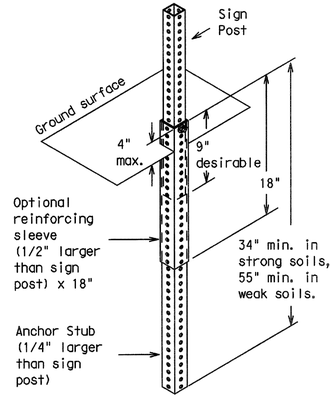
PERFORATED SQUARE METAL TUBING



OPTION 1
(Direct Embedment)



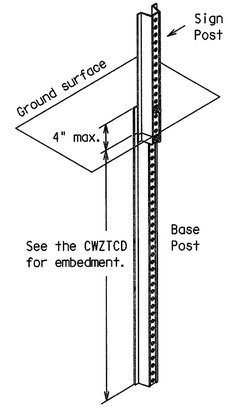
OPTION 2
(Anchor Stub)



OPTION 3
(Anchor Stub and Reinforcing Sleeve))

WING CHANNEL

Lap-splice/base bolted anchor



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GENERAL NOTES

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

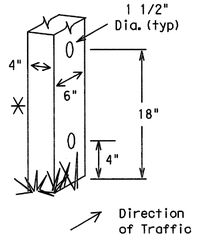
□ See BC(4) for definition of "Work Duration."

✳ 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.

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)).



WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS

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

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BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT STANDARD

5 of 12 BC(5)-07

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9-07 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.
				T211

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PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 720 feet. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

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

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

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.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

Application Guidelines

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

Wording Alternatives

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

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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.

FULL MATRIX PCMS SIGNS

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

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Traffic Operations Division

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) STANDARD

6 of 12

BC(6)-07

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CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
			T212

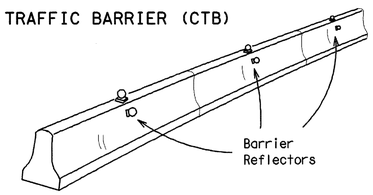
9-07 REVISIONS

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BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

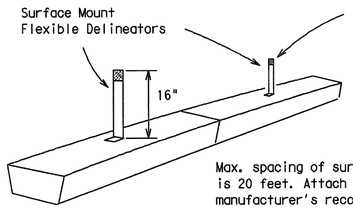
1. Barrier Reflectors shall be prequalified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors (Type C Delineators) can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 502.

CONCRETE TRAFFIC BARRIER (CTB)



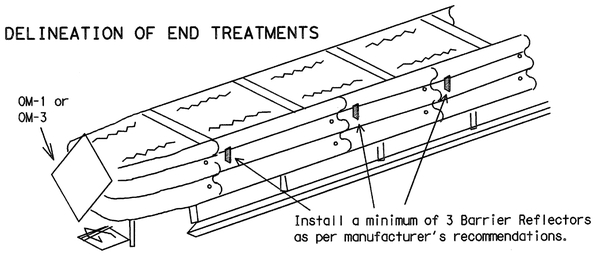
3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector.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

LOW PROFILE CONCRETE BARRIER (LPCB)



Max. spacing of surface mount flexible delineators is 20 feet. Attach the delineators as per manufacturer's recommendations.

DELINEATION OF END TREATMENTS



	APPROACHING TRAFFIC	
	BOTH SIDES	ONE SIDE
DELINEATION	OM-1	OM-3 or Vertical Panel

END TREATMENTS FOR CTB'S USED IN WORK ZONES

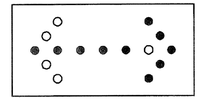
End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

TYPICAL FLASHING ARROW PANEL

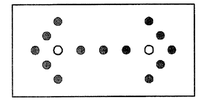
Arrow Panels may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

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

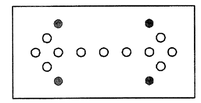
Flashing RIGHT (LEFT) ARROW



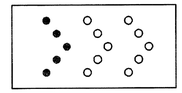
Flashing DOUBLE ARROW



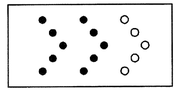
Flashing CAUTION

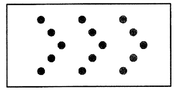


5. The "CAUTION" display consists of four corner lamps flashing simultaneously.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Panel shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.



Sequential Chevron





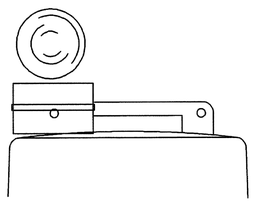
REQUIREMENTS

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

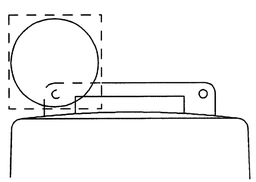
ATTENTION: Flashing Arrow Panels shall be equipped with automatic dimming devices.

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

11. The Flashing Arrow Panel shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Panel SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Panel provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted arrow panels should be 7 feet from roadway to bottom of panel.



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

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

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

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

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the dates shown in the CWZTCD to ensure that the TMA meets the age requirements and the crashworthiness criteria established by the Federal Highway Administration (FHWA) for TMAs.
4. Refer to the CWZTCD for a list of approved TMAs.
5. TMAs are required on freeways unless otherwise noted in the plans.
6. A TMA should be used anytime that it can be positioned approximately 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
7. 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.

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TO THE BEST OF OUR KNOWLEDGE WIER & ASSOCIATES, INC., HERBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

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Traffic Operations Division

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

BC(7)-07

7 of 12

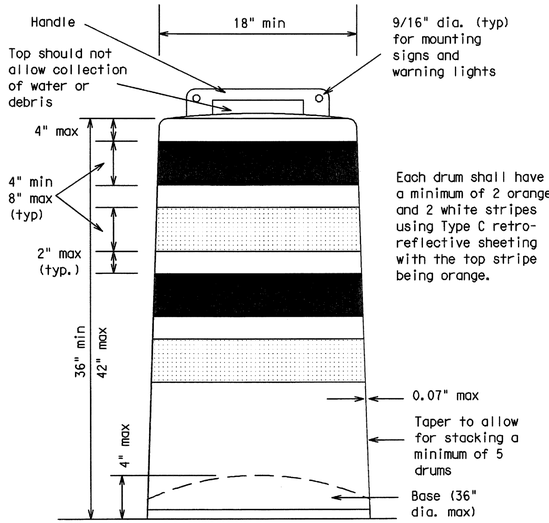
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9-07 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY	SHEET NO.
			T213

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Prequalified plastic drums shall meet the following requirements:

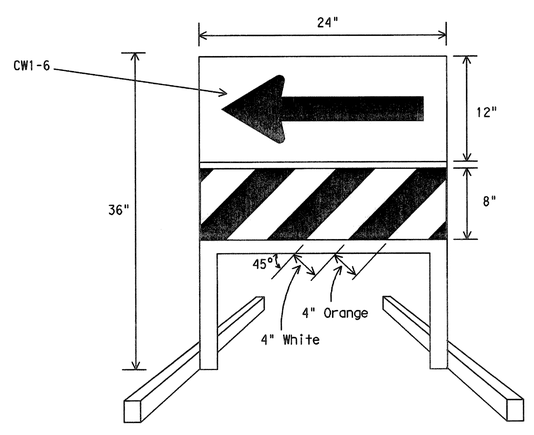
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a minimum unballasted weight of 7.7 lbs. and maximum unballasted weight of 11 lbs. The wall of the drum body shall be a minimum of 0.07 inch in thickness. Weight of any drum supplied shall not vary more than 0.5 lb. from that of the prequalified sample.
10. Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Flat Surface Reflective Sheeting." High Specific Intensity (Type C) retroreflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

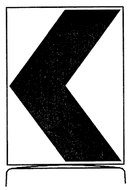
BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. 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.
4. 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.
5. Ballast shall not be placed on top of drums.
6. Adhesives may be used to secure base of drums to pavement.

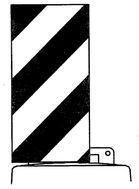


DIRECTION INDICATOR BARRICADE

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

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Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

8 of 12 BC(8)-07

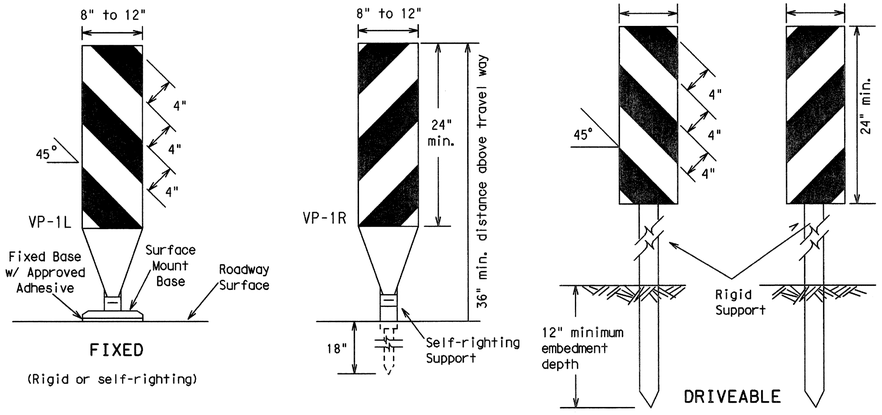
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9-07				
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				T214

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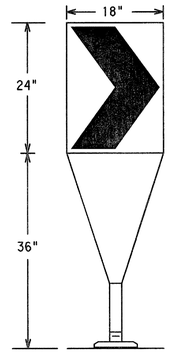
CHANNELIZING DEVICES

VERTICAL PANELS (VPs)



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

CHEVRONS

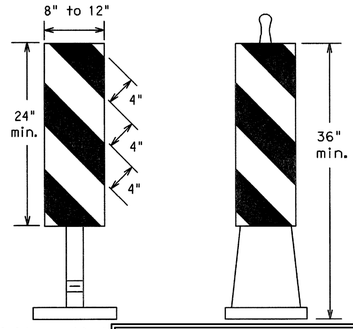


Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

GENERAL NOTES:

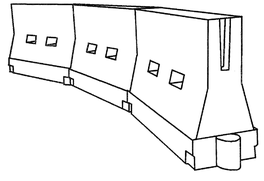
1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh approximately 35 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.
8. Examples on this sheet are commonly used channelizing devices in work zones. For other devices, refer to the CWZTCD.



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



LONGITUDINAL CHANNELIZING DEVICES

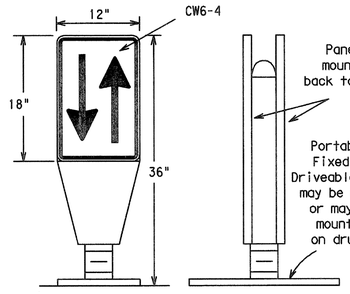
1. Longitudinal channelizing devices are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. **They are not designed to contain or redirect a vehicle on impact.**
2. Longitudinal channelizing devices may be used instead of a line of cones or drums.
3. Longitudinal channelizing devices shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Longitudinal channelizing devices should not be used to provide positive protection for obstacles, pedestrians or workers.
5. Longitudinal channelizing devices shall be retroreflective, or supplemented with retroreflective delineation as required for temporary barriers on BC(7)-07.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to 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 be not less than 32 inches in height.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

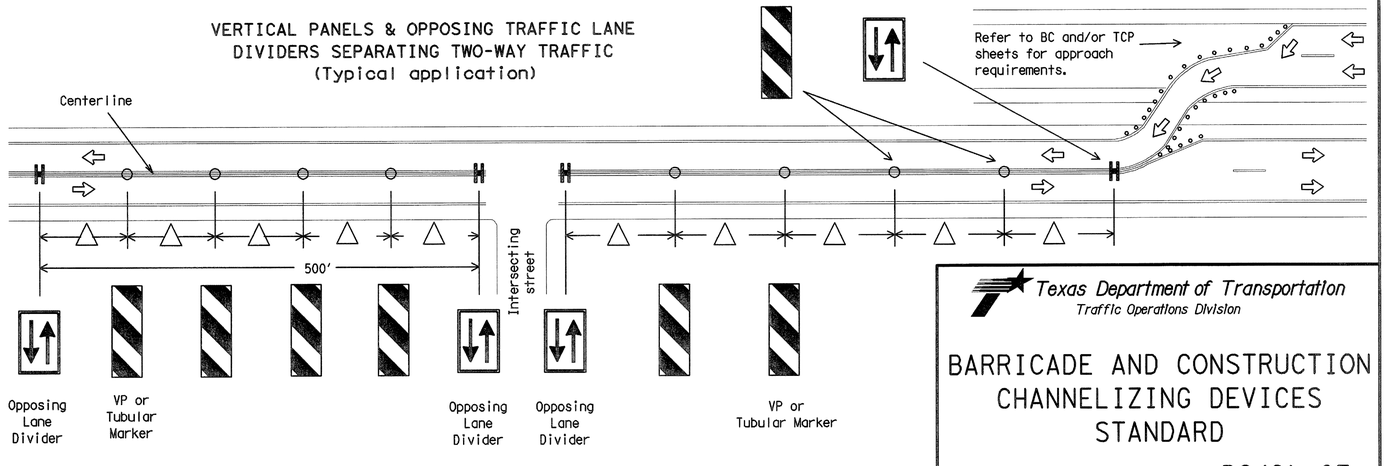


1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The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

Posted Speed	Formula	Minimum Desirable Taper Lengths ✻✻ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'
35		205'	225'	245'	35'	70'-90'
40		265'	295'	320'	40'	80'-100'
45	L=WS	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'
75		750'	825'	900'	75'	150'-185'
80		800'	880'	960'	80'	160'-195'

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

VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS SEPARATING TWO-WAY TRAFFIC (Typical application)



△ Spacing between the VP's or tubular markers shall not exceed 100 feet. On roadways with speeds less than 45 MPH, spacing between the tubular markers or VP's shall be as shown on the channelizing spacing table shown on this page. If the table shows spacing greater than 100 feet based on the roadway speed, then use a maximum of 100 feet spacing between the tubular markers or VP's. Every fifth channelizing device shall be an OTLD, except when the OLTD must be spaced closer to accomodate an intersection. Spacing between the OTLD shall not exceed 500 feet.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

9 of 12 BC(9)-07

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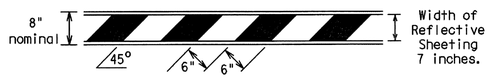
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TYPE III BARRICADES

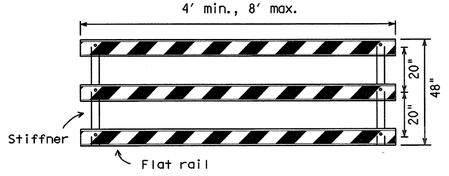
1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type III Barricades and a list of all materials used in the construction of Type III Baricades.
2. Type III Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending 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 C (High Specific Intensity) conforming to Departmental Material Specfication DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



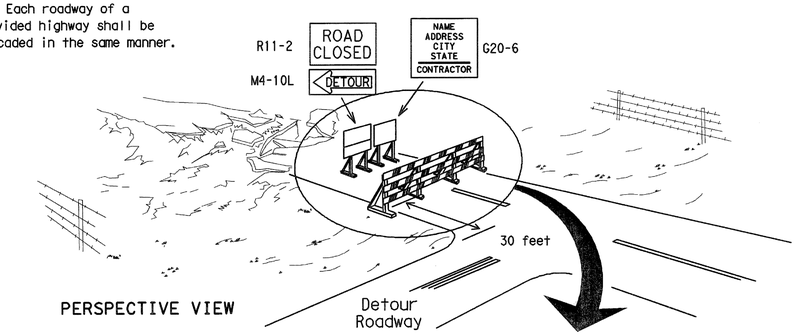
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



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

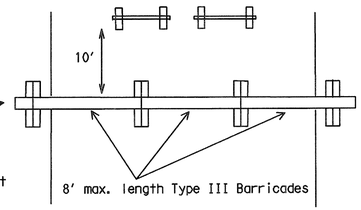
TYPE III BARRICADE (POST AND SKID) TYPICAL APPLICATION

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



PERSPECTIVE VIEW

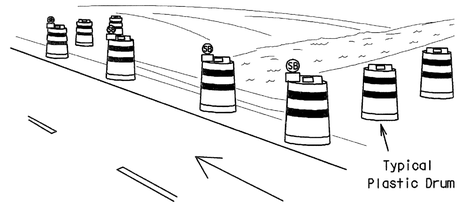
The three rails on Type III barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

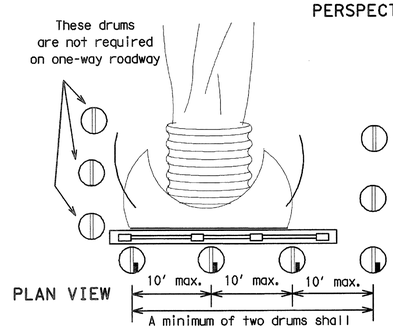
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type III Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



PERSPECTIVE VIEW

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



PLAN VIEW

Increase number of plastic drums on the side of approaching traffic if the crown width makes it necessary. (minimum of 2 and maximum of 4 drums)

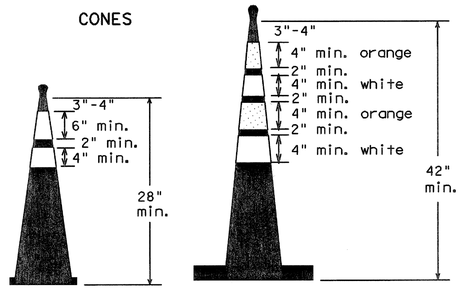
Legend

- Plastic drum
- Plastic drum with steady burn light or yellow warning reflector
- (SB) Steady burn warning light or yellow warning reflector

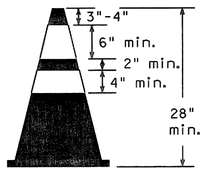
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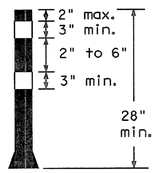
CONES



Two-Piece cones



One-Piece cones

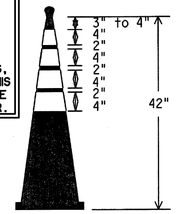


Tubular Marker

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.

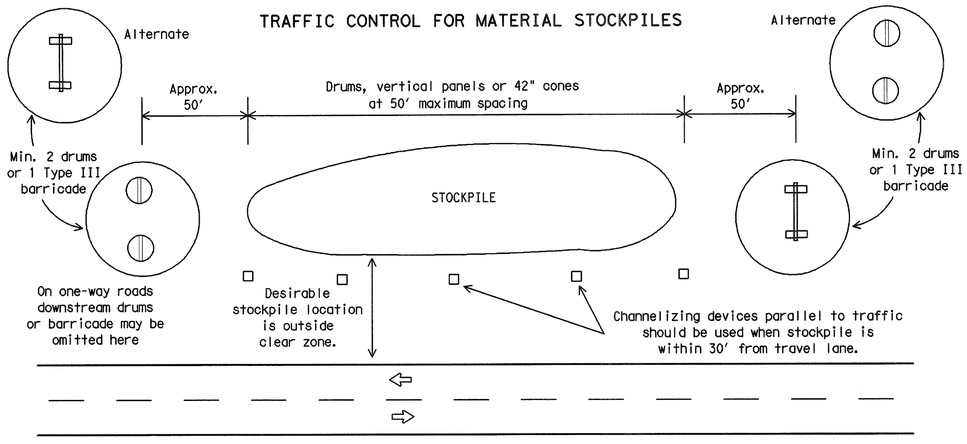
1. Traffic cones and tubular markers shall be a minimum of 28 inches in height when used either on freeways or at nighttime.
2. Cones or tubular markers shall be predominantly orange, fluorescent red-orange, or fluorescent yellow-orange. They should be kept clean and bright for maximum visibility.
3. Cones used only for daytime operations do not require the reflectorized bands.
4. Cones and tubular markers used for nighttime operations shall be reflectorized. Reflectorized material shall have a smooth, sealed outer surface that displays the same approximate color during the day and night. The reflectorized bands shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
5. When used at night, appropriate personnel shall ensure that cones and tubular markers remain in their proper location and in an upright position.
6. Reflectorization of 28"cones shall consist of a minimum 6 inch band placed at least 3 inches but not more than 4 inches from the top, supplemented by a minimum 4 inch band spaced a minimum of 2 inches below the 6 inch band.
7. Reflectorization of 42" cones shall be provided by alternating 4 to 6" orange and white stripes with orange on top.
8. Reflectorization of tubular markers shall be a minimum of two 3 inch bands placed a maximum of 2 inches from the top with a maximum of 6 inches between bands.
9. One-piece cones or tubular markers are generally suitable for temporary usage (up to 8 hours) with other channelization devices such as vertical panels, drums or two-piece cones for long term usage. Care should be taken to ensure they remain in their proper location and in an upright position.
10. Cones or tubular markers used on each project shall be of the same size and shape.
11. The handle may be designed as a hook or other shape, fabricated from non-rigid materials similar to the cone material, and may extend up to a maximum of 8 inches above the top of cone. Length of the handle shall not be considered with regard to the overall height of the cone.



EDGELINE CHANNELIZER

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

TRAFFIC CONTROL FOR MATERIAL STOCKPILES



Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

10 of 12 BC(10)-07

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

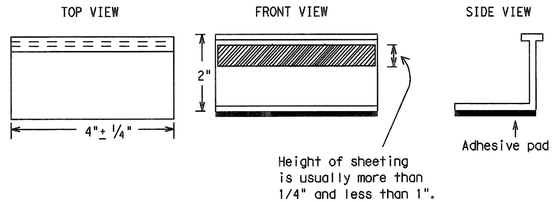
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

Raised Pavement Markers used as Guidemarks

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

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

DEPARTMENTAL MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PREFABRICATED PAVEMENT MARKINGS-PERMANENT	DMS-8240
PREFABRICATED PAVEMENT MARKINGS-REMOVABLE	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).

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Traffic Operations Division

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS STANDARD

11 of 12 BC(11)-07

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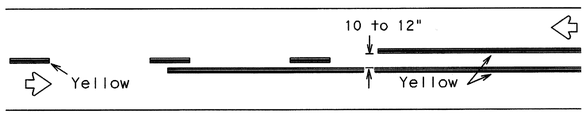
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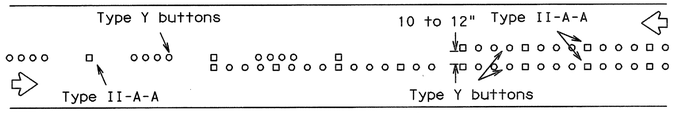
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PAVEMENT MARKING PATTERNS

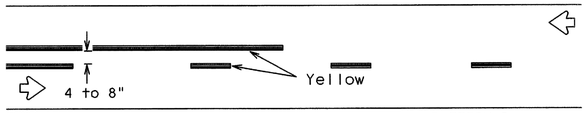
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



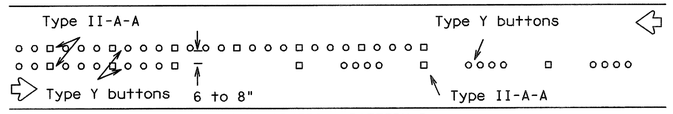
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



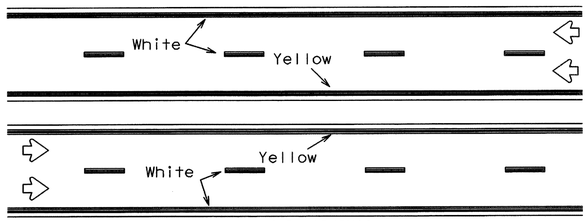
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



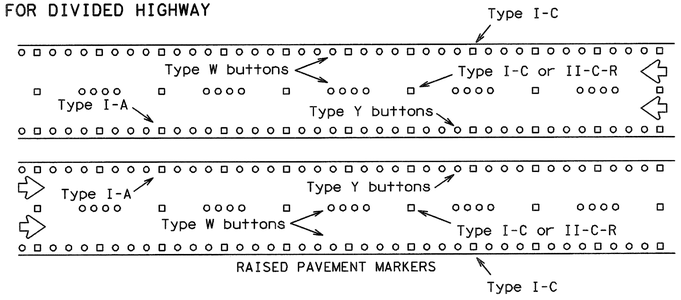
RAISED PAVEMENT MARKERS - PATTERN B

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.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



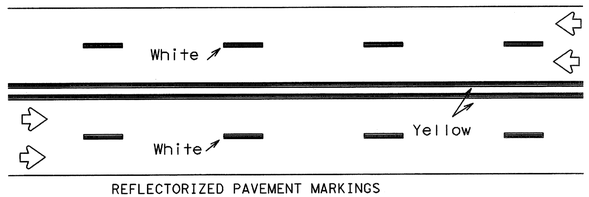
REFLECTORIZED PAVEMENT MARKINGS



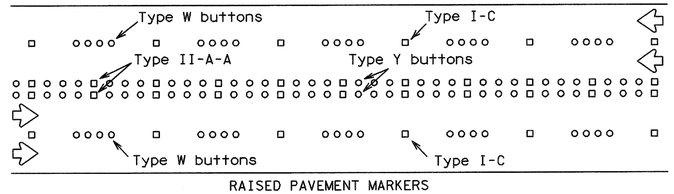
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



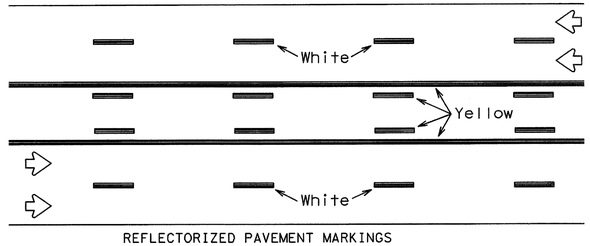
REFLECTORIZED PAVEMENT MARKINGS



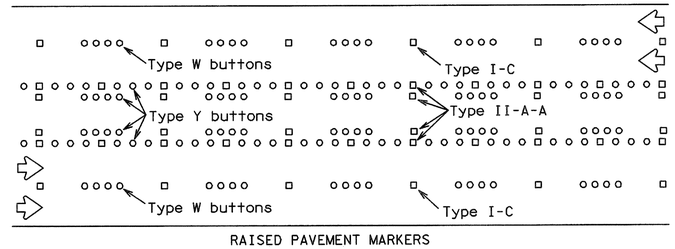
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

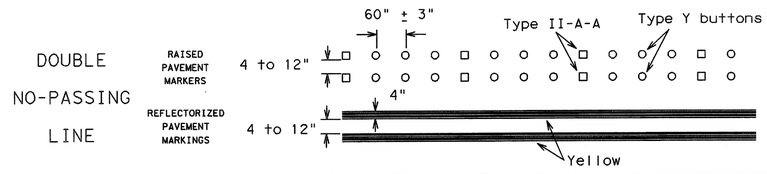
Prefabricated markings may be substituted for reflectorized pavement markings.

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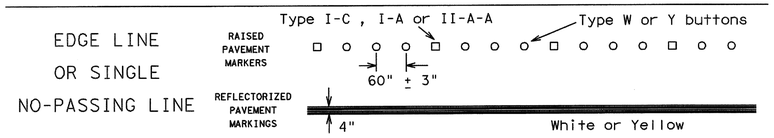
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

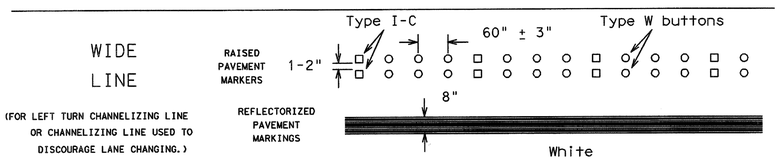


EDGE LINE OR SINGLE NO-PASSING LINE



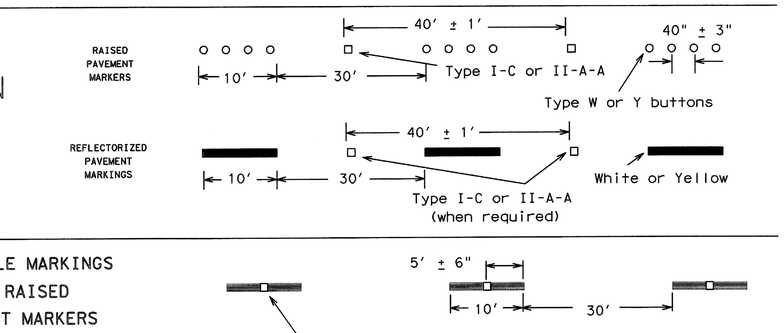
WIDE LINE

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



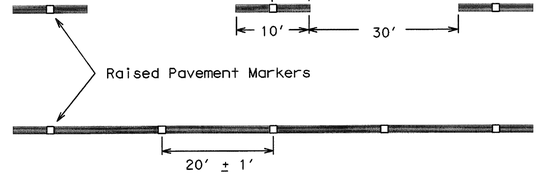
BROKEN LINE

(FOR CENTER LINE OR LANE LINE.)



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

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BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS STANDARD

12 of 12 BC(12)-07

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