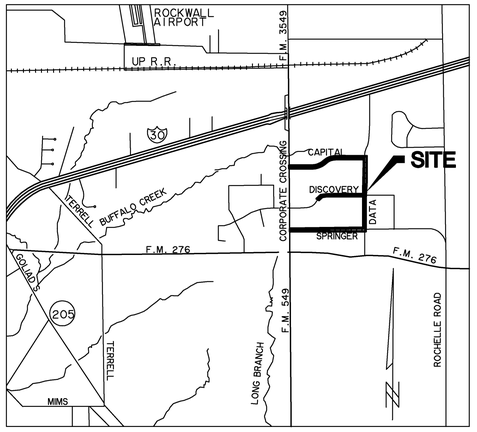
CITY OF ROCKWALL, TEXAS

PAVING, DRAINAGE, WATER & SEWER IMPROVEMENTS

TO SERVE

ROCKWALL TECHNOLOGY PARK PHASE IV



VICINITY MAP
N.T.S

DAVID SWEET - MAYOR

COUNCIL MEMBERS:

DAVID WHITE - Mayor Pro Tem
JIM PRUITT
BENNIE DANIELS
DENNIS LEWIS
SCOTT MILDER
MIKE TOWNSEND

RICK CROWLEY - City Manager

NOTES:

1. ALL REFERENCES TO 'CITY' SHALL MEAN 'CITY OF ROCKWALL'.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF ROCKWALL AND NORTH TEXAS COUNCIL OF GOVERNMENT STANDARD SPECIFICATIONS, 3RD ADDITION.
3. CITY OF ROCKWALL STANDARD DETAIL SHEETS INCORPORATED HEREIN BY REFERENCE.
4. STREET LIGHTS ARE NOT PART OF THIS PROJECT AND WILL BE INSTALLED IN THE FUTURE BY OTHERS

REVISIONS 4/30/14

1 ADDED SHEETS S101 AND S201 TO CONSTRUCTION PLANS

"THE NEW HORIZON"

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

FEBRUARY, 2014

INDEX OF DRAWINGS

RECORD DRAWING 02/02/2015

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: 01-21-2015
W.A. No. 12209

ROCKWALL TECH. PARK, PHASE IV

FILE: A001-COVER-12209-REVISED 4-30-14.dwg
TIME 9:29

PAVEMENT & JOINT SEALING NOTES

1. ALL CONCRETE FOR PAVEMENT SHALL BE CLASS "F" AND HAVE A MINIMUM 4,200 PSI COMPRESSIVE STRENGTH AT 28 DAYS WITH 4 TO 6 PERCENT AIR ENTRAINMENT UNLESS OTHERWISE NOTED. PAVEMENT MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 3RD EDITION" PREPARED BY THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS. SLIP FORMED CONCRETE SHALL HAVE A MAXIMUM SLUMP OF THREE INCHES. HAND-PLACED CONCRETE SHALL HAVE A MAXIMUM FIVE-INCH SLUMP. ALL REINFORCEMENT SHALL BE CHAIRED. 6.5 SACK MIN. FOR MACHINE PLACE OR 7.0 SACK MIN. FOR HAND PLACE.

2. THE JOINTING SHALL CONFORM TO THE LOCATIONS AND DETAILS SHOWN ON THESE PLANS. SPECIFIC SAWED CONTRACTION OR CONSTRUCTION JOINT LOCATIONS ARE NOT SHOWN. THE CONTRACTOR SHALL SUBMIT A LAYOUT INDICATING THE SAWED JOINT LOCATIONS TO BE REVIEWED AND APPROVED BY THE ENGINEER. ISOLATION JOINTS SHALL BE PROVIDED AT ALL MANHOLE RIMS, LIGHT STANDARDS AND OTHER SIMILAR INSTALLATIONS. EXPANSION JOINT LOCATIONS HAVE BEEN INDICATED ON PAVING AND DIMENSIONAL CONTROL PLANS.

3. PROVIDE SAWED JOINTS AT MAXIMUM 15-FOOT SPACING FOR EIGHT-INCH CONCRETE. DO NOT PLACE SAWED JOINT LONGITUDINALLY ALONG LOW POINT OR AT GUTTER LINE. SAWING OF JOINTS SHALL BEGIN AS SOON AS CONCRETE HAS HARDENED SUFFICIENTLY TO PERMIT SAWING WITHOUT EXCESSIVE RAVELING. COMPLETE ALL SAWED JOINTS BEFORE UNCONTROLLED SHRINKAGE CRACKING OCCURS.

4. DO NOT PLACE SAND OR SELECT FILL BENEATH CONCRETE PAVEMENT, SIDEWALKS, DRIVE APPROACHES OR HANDICAP RAMPS FOR LEVEL UP COURSE. UTILIZE COMPACTED NATIVE MATERIALS.

5. BACKFILL ALL CURBS TO EDGE OF SUBGRADE WITH ON-SITE CLAY SOILS. COMPACT TO 95% TO 100% OF STANDARD PROCTOR DENSITY AT OR ABOVE OPTIMUM MOISTURE CONTENT.

6. CONTRACTOR SHALL SAW-CUT TIE-INS AT EXISTING CURBS AS NECESSARY TO INSURE SMOOTH TRANSITIONS. CONTRACTOR SHALL SAW-CUT AND TRANSITION TO MEET EXISTING PAVEMENT AS NECESSARY TO INSURE POSITIVE DRAINAGE. (TYP. ALL INTERSECTIONS)

7. ALL EXPANSION, CONTRACTION AND CONSTRUCTION JOINTS IN PAVED AREAS SHALL BE SEALED IN ACCORDANCE WITH THESE SPECIFICATIONS AND THE JOINT SEALING MANUFACTURERS RECOMMENDATIONS.

8. CLEAN ALL JOINTS PRIOR TO PLACEMENT OF JOINT SEALING MATERIAL IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

9. PROVIDE BACKER RODS FOR JOINTS WITHOUT PRE-MOLDED JOINT MATERIAL IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. INSTALL CERA-ROD MANUFACTURED BY W.R. MEADOWS OR EQUAL.

10. EXPANSION AND ISOLATION JOINT MATERIAL TO BE PRE-MOLDED EXPANSION JOINT MATERIAL AS RECOMMENDED BY JOINT SEALING MANUFACTURER WITH JOINT CAP TO PROTECT SEALANT RESERVOIR.

11. TYPICALLY, JOINT SEALING MATERIAL IS PLACED BELOW SURFACE OF CONCRETE TO NEAR FULL LEVEL. CERTAIN PRODUCTS SUCH AS SOFT SEAL ARE RECOMMENDED TO BE PLACED TO FULL LEVEL. REFER TO MANUFACTURERS RECOMMENDATIONS.

12. THE CONTRACTOR SHALL CONSTRUCT ALL DRIVEWAY APPROACHES IN CONFORMANCE WITH APPLICABLE CITY STANDARD ORDINANCES AND REQUIREMENTS. CONTRACTOR SHALL CONFIRM APPLICABLE DRIVEWAY OR ACCESS PERMITS HAVE BEEN OBTAINED PRIOR TO CONSTRUCTION.

13. ALL DIMENSIONS ARE TO BACK OF CURB, UNLESS NOTED OTHERWISE.

14. ALL COORDINATES ARE TO BACK OF CURB, UNLESS NOTED OTHERWISE.

15. ALL EDGE OF PAVEMENT WITH NO CURB SHALL BE THICKENED EDGE.

16. NOTIFY CITY INSPECTOR 72 HOURS BEFORE WORK BEGINS OR EARLIER IF REQUIRED BY PERMITS.

WALKWAY, MARKING, AND SIGNAGE NOTES

1. ALL PEDESTRIAN WALKWAYS UTILIZED FOR DISABLED ACCESS ROUTE SHALL CONFORM TO LOCAL, STATE, AND FEDERAL REGULATIONS INCLUDING THE "STATE OF TEXAS PROGRAM FOR THE ELIMINATION OF ARCHITECTURAL BARRIERS", "TEXAS ACCESSIBILITY STANDARDS" (TAS) AND THE "AMERICANS WITH DISABILITIES ACT OF 1990" (ADA).

2. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED CITY PERMITS AND NOTIFY THE CITY PRIOR TO CONSTRUCTING PUBLIC SIDEWALKS.

3. UNLESS REQUIRED OTHERWISE BY CITY REGULATIONS, ALL WALKWAYS SHALL BE CONSTRUCTED OF MINIMUM 3,000 PSI CONCRETE AND A MINIMUM CEMENT CONTENT OF 5.5 SACKS PER CUBIC YARD. ALL SIDEWALKS SHALL BE REINFORCED WITH A MINIMUM OF #3 BARS AT 18-INCH CENTERS EACH WAY LOCATED AT THE CENTER OF THE THICKNESS. THE STEEL SHALL BE PLACED ON CHAIR SUPPORTS BEFORE CONCRETE PLACEMENT. IF NECESSARY, DURING CONCRETE PLACEMENT, THE STEEL SHALL BE PULLED UP TO INSURE THE PROPER LOCATION OF REINFORCEMENT.

4. WALKWAYS SHALL BE CONSTRUCTED TO THE LINE AND GRADE INDICATED ON THE PLANS OR THE TYPICAL LOCATIONS SHOWN ON THE PAVING PLANS IN RELATION TO PROPOSED CURB. SEE PAVEMENT NOTE #1 ABOVE.

5. PRIVATE SIDEWALKS SHALL BE CONSTRUCTED ON NATIVE MATERIALS. DO NOT PLACE SAND UNDER PRIVATE SIDEWALKS OR HANDICAP RAMPS FOR LEVEL UP COURSE. PUBLIC SIDEWALKS SHALL BE CONSTRUCTED ACCORDING TO CITY DETAILS.

6. FORMS SET FOR SIDEWALKS SHALL BE TRUE TO LINE AND GRADE AND SHALL PROVIDE A SLOPE OF 1/4 INCH PER FOOT ACROSS THE SIDEWALK UNLESS INDICATED OTHERWISE ON THE PLANS. FORMS SHALL BE SET TO PROVIDE FOR A FULL DEPTH OF CONCRETE INDICATED ON THE PLANS AND FORMS SHALL REMAIN IN PLACE A MINIMUM OF 24 HOURS. UPON REMOVAL OF THE FORM WORK, THE CONTRACTOR SHALL IMMEDIATELY BACKFILL THE EDGES OF THE WALK FOR A MINIMUM OF ONE FOOT (1') EACH SIDE OF THE WALK.

7. 24-INCH BY 3/4-INCH DIAMETER ASPHALT-COATED DOWELS WITH FIVE INCH BY 13/16-INCH DOWEL SLEEVE SHALL BE INSTALLED ON 16-INCH CENTERS, ALONG WITH REDWOOD EXPANSION BOARD AND SEALING COMPOUND AS PER STANDARD EXPANSION JOINT DETAIL SHEET ALONG PERIMETER OF WHEEL CHAIR RAMP AND SIDEWALK.

8. PROVIDE 15-INCH MINIMUM LAP BETWEEN REINFORCING STEEL IN STREET AND REINFORCING STEEL IN WHEEL CHAIR RAMP.

9. SUBGRADE FOR WALKWAYS ABUTTING CURBS, WITHIN PARKING ISLAND AREAS OR BETWEEN THE PARKING AREA AND BUILDING, SHALL BE PLACED ON COMPACTED FILL OR FIRM COMPACTED EXCAVATED GRADE. FILLS FOR SIDEWALKS SHALL CONFORM TO THE SAME REQUIREMENTS AS CONTROLLED DENSITY FILLS IN PARKING AREAS WITH THE COMPACTED MATERIAL EXTENDING A MINIMUM 18 INCHES BEYOND THE WALKWAY.

10. FOR WALKWAYS SIX FEET IN WIDTH OR LESS, GROOVED OR SAWED CONTRACTION JOINTS SHALL BE MADE AT UNIFORM INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK. ON WALKWAYS GREATER THAN SIX FEET IN WIDTH, CONTRACTION JOINTS SHALL BE SAWED. CONTRACTION JOINTS SHALL ONLY BE SEALED WHERE CONCENTRATED RUNOFF OCCURS IN PARKING AREAS, ENTRANCES AND WALKWAYS AT THE BUILDING. SEAL PARKING LOT CONCENTRATED RUNOFF AREAS SAME AS PARKING PAVEMENT. SEAL WALKWAYS WITHIN 50 FEET OF BUILDING WITH "DECK-0-SEAL" AS MANUFACTURED BY W.R. MEADOWS OR EQUAL.

11. CONCRETE FINISH SHALL BE BROOMED FOR ALL WALKWAYS LESS THAN SIX FEET IN WIDTH AND MINOR ACCESS ROUTES GREATER THAN EIGHT FEET IN WIDTH. ALL HANDICAP ACCESS RAMPS SHALL HAVE SURFACE TEXTURE FINISH COMPLYING WITH ADA AND TAS GUIDELINES 302 AND 405.4.

12. JOINT SEALING MATERIAL FOR WALKWAY AND EXPANSION JOINTS IN THE INTERNAL PARKING AREAS AND EXTERNAL OPEN AREAS SHALL BE "HI SPEC" MANUFACTURED BY W.R. MEADOWS OR EQUAL.

13. CLEAN ALL JOINTS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATION PRIOR TO SEALING.

14. ALL SIGNS, PAVEMENT MARKINGS AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

15. ALL PAVEMENT MARKINGS SHALL BE FOUR INCHES WIDE, COLOR WHITE UNLESS INDICATED OTHERWISE ON THE DRAWINGS. STRIPING TO BE TWO COATS OF PAINT. SECOND COAT TO THE APPLIED IMMEDIATELY PRIOR TO OBTAINING A CERTIFICATE OF OCCUPANCY.

16. A MINIMUM CLEARANCE OF TWO (2) FEET SHALL BE MAINTAINED BETWEEN THE FACE OF CURB AND ANY PART OF A TRAFFIC SIGN.

17. CONTRACTOR SHALL FURNISH AND INSTALL ALL PAVEMENT MARKINGS AS SHOWN ON THE PLANS.

18. CONTRACTOR SHALL COORDINATE INSTALLATION OF ALL SIGNS, PAVEMENT MARKINGS AND OTHER TRAFFIC CONTROL DEVICES WITH OTHER CONTRACTORS ON THE SITE.

TESTING

1. REFER TO PROJECT GEOTECHNICAL RECOMMENDATIONS FOR FREQUENCY OF CONCRETE TESTING AND TEST METHODS. ALL CONCRETE SHALL BE TESTED. IF TESTING IS NOT ADDRESSED IN GEOTECHNICAL RECOMMENDATIONS PROVIDE AS PER NCTCOG ITEM 303.7.3 AND ITEM 702.2.4.

UTILITY NOTES

1. THIS SHEET IS FOR SANITARY SEWER, WATER LINE AND STORM DRAINAGE CONSTRUCTION ONLY. DO NOT USE FOR GRADING CONSTRUCTION.

2. ALL PIPE LENGTHS ARE HORIZONTAL DISTANCES AND ARE APPROXIMATE.

3. 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 CITY PRIOR TO BEING COVERED. THE INSPECTOR MUST ALSO BE PRESENT DURING PRESSURE TESTING AND DISINFECTION OF MAINS AND HIS SIGNATURE OF APPROVAL IS REQUIRED.

4. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES, REGULATIONS AND/OR LOCAL STANDARDS IMPOSED BY LOCAL UTILITY AND THE CITY.

5. CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE LOCAL UTILITY AUTHORITY FOR CONNECTION TO THE EXISTING MAINS.

6. ALL FIRE HYDRANTS ARE SIX-INCH DIAMETER WITH A 6-INCH DIAMETER LINE AND A SIX-INCH DIAMETER SHUT OFF VALVE. FIRE HYDRANTS SHALL BE SET SUCH THAT NOZZLE CONNECTIONS FACE THE FIRE LANE. FIRE HYDRANTS SHALL BE SET MAX 8 FEET FROM BACK OF CURB, OR TWO FOOT INSIDE RIGHT-OF-WAY UNLESS OTHERWISE NOTED.

7. ALL WATER LINES SHALL HAVE A MINIMUM COVER OF 48 INCHES ABOVE TOP OF PIPE, UNLESS NOTED OTHERWISE.

8. CONTRACTOR SHALL ADJUST LOCATION OF PROPOSED WATER LINES AS REQUIRED TO AVOID CONFLICTS WITH STORM SEWER OR OTHER UTILITIES.

9. THRUST BLOCKS SHALL BE PROVIDED AT ALL "TEES, ELBOWS AND BENDS" OF SUFFICIENT SIZE TO COMPLY WITH MINIMUM STANDARDS OF N.F.P.A.-24 FOR EXISTING SOIL CONDITIONS.

10. 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.

11. 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. CONTRACTOR SHALL PERFORM ANY SUCH WORK AS DIRECTED BY THE CIVIL ENGINEER AND/OR SOILS ENGINEER AT NO ADDITIONAL COST TO THE OWNER.

12. THE SITE UTILITY CONTRACTOR SHALL COOPERATE AND WORK WITH OTHER CONTRACTORS ON THE SITE.

13. ALL MANHOLES OVER FIVE FEET IN DEPTH SHALL HAVE A STANDARD ECCENTRIC CONE.

14. ALL MATERIALS SHALL BE U.L. LISTED AND FACTORY MUTUAL APPROVED UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

15. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS ARE BASED ON REFERENCE INFORMATION SUPPLIED BY VARIOUS OWNERS OF THE FACILITIES. THE ENGINEER DOES NOT ACCEPT THE RESPONSIBILITY FOR THE GRAPHICAL REPRESENTATION OF THE UTILITIES SHOWN, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES, BOTH HORIZONTALLY AND VERTICALLY, 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.

16. UTILITY CONTRACTOR SHALL VERIFY WITH LOCAL AND STATE AUTHORITIES THAT ALL EXISTING STREET LIGHT AND TRAFFIC SIGNAL WIRES HAVE BEEN LOCATED PRIOR TO CONSTRUCTION.

17. ALL TRENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND THE STANDARDS THEREIN AND APPLICABLE STATE AND LOCAL REGULATIONS.

18. CONTRACTOR SHALL REFER TO SITE GEOTECHNICAL REPORT FOR RECOMMENDATIONS ON COMPACTING AND BACKFILLING TRENCHES. IF NO TRENCH COMPACTION RECOMMENDATIONS ARE PROVIDED, TRENCHES BENEATH OR WITHIN FIVE FEET OF PAVEMENT SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR DENSITY AT A MOISTURE CONTENT BETWEEN OPTIMUM TO FIVE PERCENT ABOVE OPTIMUM. TRENCHES OUTSIDE OF PAVED AREAS SHALL BE COMPACTED TO A MINIMUM 90% OF STANDARD PROCTOR DENSITY AT A MOISTURE CONTENT BETWEEN OPTIMUM TO FIVE PERCENT ABOVE OPTIMUM.

19. TRENCHES SHALL BE TESTED FOR COMPACTION AT A MINIMUM OF ONE TEST PER 300 LINEAR FEET PER LAYER.

20. ALL STORM DRAIN PIPE TO BE CLASS III REINFORCED CONCRETE PIPE (RCP) UNLESS OTHERWISE NOTED IN PLANS.

21. ALL CONSTRUCTION SHALL COMPLY WITH THE CITY STANDARD CONSTRUCTION DETAILS AND THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 3RD EDITION" PREPARED BY THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS.

22. CONTRACTOR SHALL ADJUST ALL EXISTING AND PROPOSED SURFACE UTILITIES TO MATCH FINISHED GRADES.

23. ALL WATER MAINS SHALL BE C900 PVC, CLASS 200 DR-14.

24. 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.

25. BLUE EMS DISCS SHALL BE INSTALLED EVERY 250' AND AT EVERY CHANGE IN DIRECTION, VALVE, AND SERVICE.

26. GREEN EMS DISCS SHALL BE INSTALLED AT EVERY MANHOLE, CLEAN OUT, AND SERVICE.

27. RAVEN EPOXY COATING, OR APPROVED EQUAL, SHALL BE INSTALLED IN ALL NEW MANHOLES AND IN EXISTING MANHOLES BEING MODIFIED.

28. 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 FEE (3'). FOR DEPTHS OF TEN FEET (10') OR GREATER, THE WASTEWATER PIPELINE SHALL BE A MINIMUM OF SDR-26.

SPECIAL NOTES

1. CONTRACTOR SHALL TAKE SPECIAL CARE NOT TO INSTALL A JOINT LONGITUDINALLY WITHIN THE CENTERLINE OF A LOW POINT SWALE.
2. ALL REFERENCES TO THE "CITY" SHALL REFER TO "THE CITY OF ROCKWALL".
3. SEE SHEETS E001–E003 FOR EROSION CONTROL NOTES.

RECORD DRAWING 02/02/2015

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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ROCKWALL TECHNOLOGY PARK PHASE IV

GENERAL NOTES

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

LAST SHEET EDIT DATE 02-14-2014
WA# 12209

SHEET NO. A201

TIME: 16:28 FILE: A201-GENNOTES I-12209.dwg

GENERAL GRADING & DRAINAGE NOTES

1. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS ARE BASED ON REFERENCE INFORMATION SUPPLIED BY VARIOUS OWNERS OF THE FACILITIES. THE ENGINEER DOES NOT ACCEPT THE RESPONSIBILITY FOR THE GRAPHICAL REPRESENTATION OF THE UTILITIES SHOWN, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES, BOTH HORIZONTALLY AND VERTICALLY, 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. EXISTING TOPOGRAPHIC INFORMATION SHOWN IS BASED ON IN-FIELD SURVEY PREPARED BY WIER & ASSOCIATES, INC. DURING THE MONTHS OF JUNE TO AUGUST 2013. (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 PAVING LIMITS SHOWN TO BE SEEDED SHALL RECEIVE MINIMUM FOUR (4) INCHES OF TOPSOIL (OR TO DEPTH INDICATED ON LANDSCAPE ARCHITECT PLANS). THIS TOPSOIL TO BE PLACED AND LEVELED BY THE GRADING CONTRACTOR. THIS MATERIAL MAY BE STOCKPILED DURING STRIPPING OPERATIONS.

4. ROUGH GRADING ELEVATIONS SHALL BE AS FOLLOWS:

   4.A. FOUR INCHES BELOW FINISHED CONTOURS IN SEEDED AREAS.

   4.B. THE DEPTH OF PAVEMENT, TYPICALLY SIX TO EIGHT 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:

   8.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.

   8.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.

   8.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.

   8.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. ALL DISTURBED AREAS WITHIN EXISTING ROAD RIGHT-OF-WAY TO BE SODDED.

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

22. ALL FILL TO BE COMPACTED TO A MIN. 95% USING A SHEEP'S FOOT ROLLER.

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701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

ROCKWALL TECHNOLOGY PARK PHASE IV

GENERAL NOTES

LARRELL J. BOSWORTH 11702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

LAST SHEET EDIT DATE 10-07-2013
WA# 12209

SHEET NO. A202

TIME 11:34 FILE: A202-GENNOTES 2-12209.dwg

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

	PROPOSED CONC. PAVING
	BRICK PAVING
	LANDSCAPING
	COMPACTED FILL PER CITY STANDARDS
	EXISTING ASPHALT TO BE REMOVED
	EXISTING CONCRETE TO BE REMOVED
	EXISTING GRAVEL TO BE REMOVED
	DIRECTION OF TRAFFIC
	DIRECTION OF FLOW

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

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
L2	LINE IDENTIFIED IN LINE TABLE
C2	CURVE IDENTIFIED IN CURVE TABLE
	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 STURCTURE
640	EXISTING CONTOUR LINE
640	PROPOSED CONTOUR LINE
	DRAINAGE AREA DIVIDE

LEGEND

	DRAINAGE AREA DIVIDE
	PROPOSED INLET
	PROP. STORMDRAIN
	PROP. FIELD INLET
	EXIST. INLET
	FUTURE INLET
	FUTURE STORMDRAIN
	DIRECTION OF FLOW

WATER AND SANITARY SEWER PLAN LEGEND

	PROPOSED FIRE HYDRANT
WM	PROPOSED WATER METER
	PROPOSED WATER VALVE
	PROPOSED WATER
	PROPOSED SEWER
	PROPOSED SEWER MANHOLE
	EXISTING WATER LINE
WV	EXISTING WATER VALVE
WM	EXISTING WATER METER BOX
FH	EXISTING FIRE HYDRANT
LP	EXISTING LIGHT POLE
PP	EXISTING POWER POLE
SSMH	EXIST. SANITARY SEWER MANHOLE
	EXISTING SANITARY SEWER
	EXISTING INLET
	PROPOSED INLET
	FUTURE INLET

RECORD DRAWING 02/02/2015

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
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ROCKWALL TECHNOLOGY PARK PHASE IV

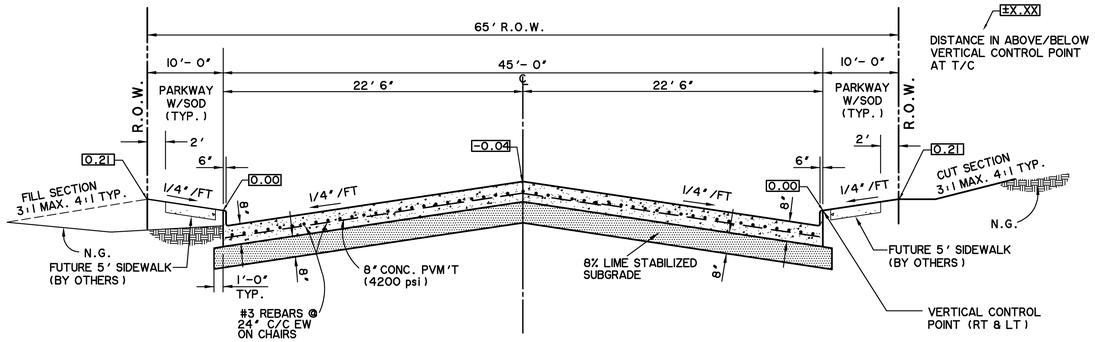
TOPOGRAPHIC LEGEND

RELEASED FOR REVIEW NOT FOR CONSTRUCTION
STATE OF TEXAS
DARRELL J. BOSWORTH
11202
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 08-02-2013
WA# 12209

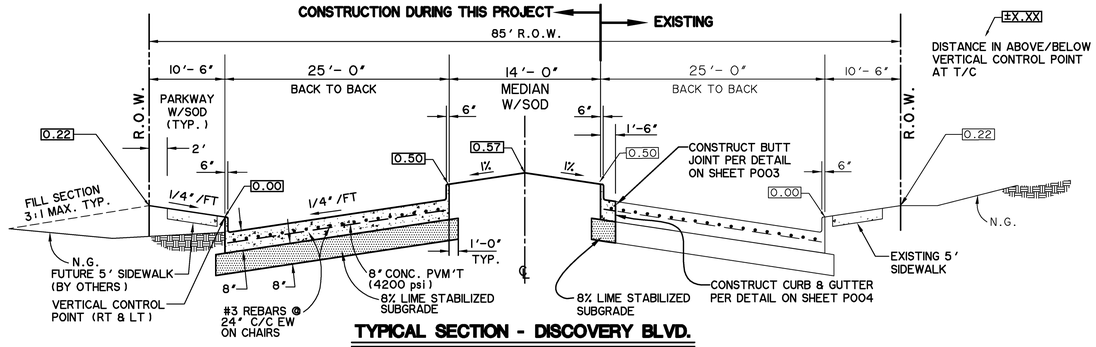
SHEET NO. A203

FILE: A203-LEGEND.dwg
TIME: 14:09



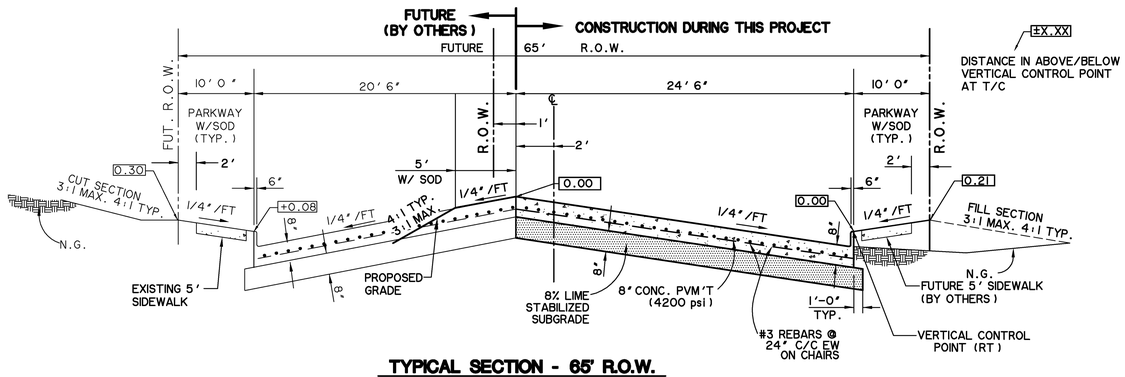
TYPICAL SECTION - 65' R.O.W.

CAPITAL BOULEVARD STA 0+00 TO 12+41.74
DATA DRIVE STA 15+23 TO 31+76
SCALE: NTS



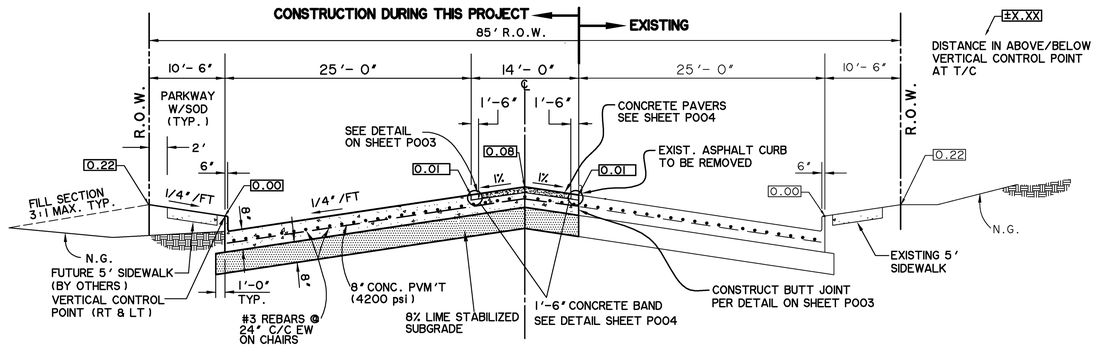
TYPICAL SECTION - DISCOVERY BLVD.

CURBED MEDIAN - LANDSCAPE POD
(DISCOVERY BOULEVARD)
STA 11+36.25 TO 28+08.53
SCALE: NTS



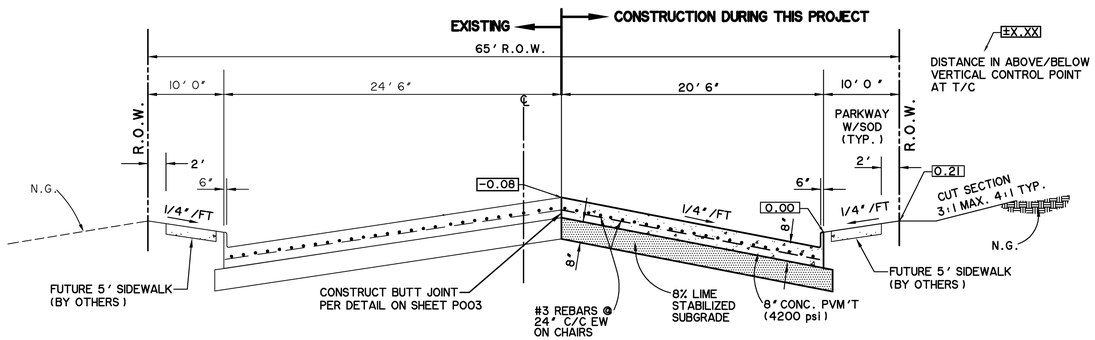
TYPICAL SECTION - 65' R.O.W.

CAPITAL BOULEVARD STA 12+41.74 TO END
SCALE: NTS



TYPICAL SECTION - DISCOVERY BLVD.

TWO-WAY LEFT TURN
WITH CONCRETE PAVERS
STA 11+36.25 TO 28+08.53
SCALE: NTS



TYPICAL SECTION - 65' R.O.W.

DATA DRIVE STA 2+00 TO STA 14+00
SCALE: NTS

ALTERNATE BID

SEE SHEET A201
FOR PAVEMENT NOTES

NOTES:
1. ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF ROCKWALL STANDARD CONSTRUCTION DETAILS AND NCTCOG 3rd EDITION. TYPICAL SECTIONS ARE REPLACED BY THOSE SHOWN ON THIS SHEET.
2. PLACE MIN. 4" TOPSOIL FROM ON SITE SOURCE IN PARK WAYS, SLOPES, AND DISTURBED AREAS. SODDING WILL BE USED ON ALL PARKWAYS. HYDROMULCH SEED WITH BERMUDA GRASS (PER SPECIFICATIONS) WILL BE USED ON ALL SLOPES AND DISTURBED AREAS. TOPSOIL SHALL BE A SUBSIDARY ITEM AND NO SEPERATE MEASUREMENT OR PAYMENT SHALL BE MADE.
3. ALL FILLS SHALL BE COMPACTED TO 95% MIN. PROCTOR DENSITY. FILLS SHALL BE PLACED IN 8" MAXIMUM LIFTS, AND COMPACTION SHALL BE ACCOMPLISHED BY THE USE OF A SHEEPS-FOOT ROLLER.
4. 0.50 DENOTES DISTANCE IN DECIMAL FEET ABOVE VERTICAL CONTROL POINT.

RECORD DRAWING 02/02/2015

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.

"ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN."

PREPARED BY:
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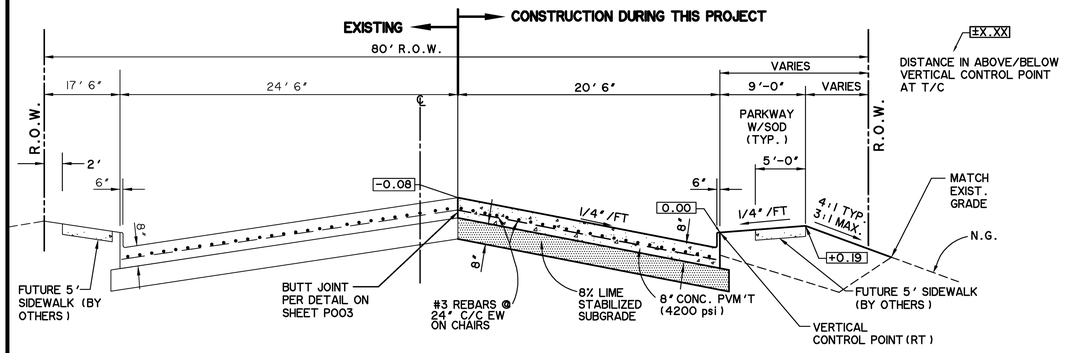
ROCKWALL TECHNOLOGY PARK PHASE IV

TYPICAL SECTIONS

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT
DATE 09-25-2013
WA# 12209
SHEET NO. P001

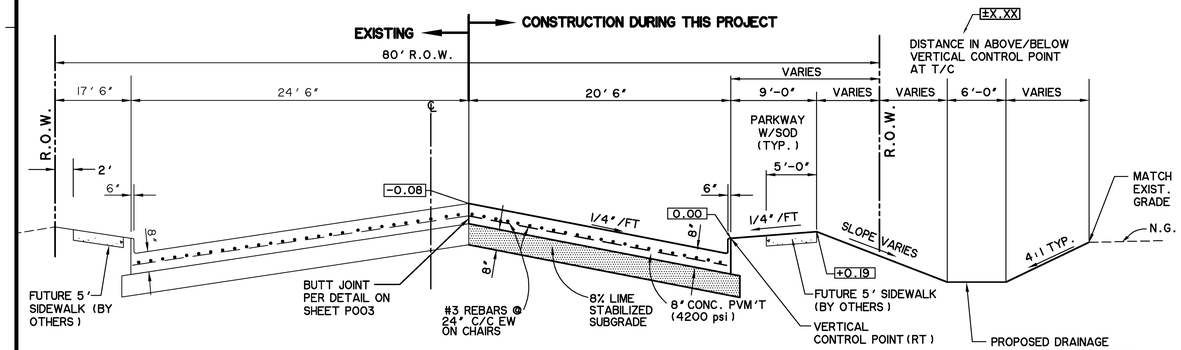
FILE: P001-TYPSEC-12209.dwg
TIME: 15:34



TYPICAL SECTION - SPRINGER ROAD

STA 0+00 TO 6+58

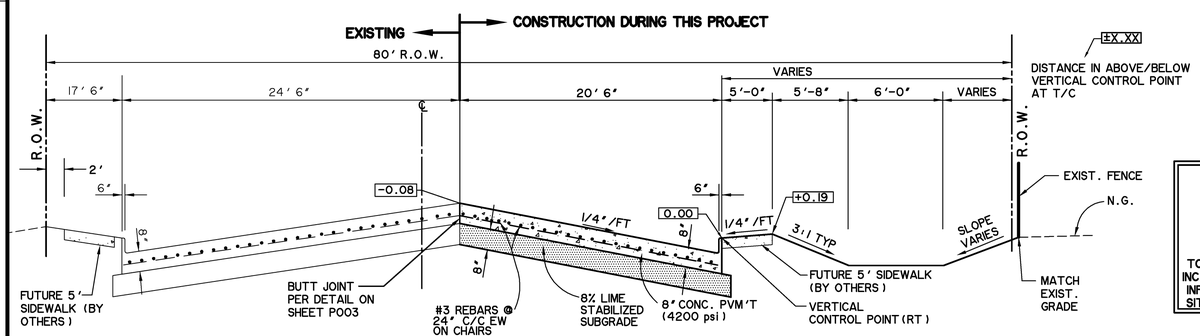
SCALE: NTS



TYPICAL SECTION - SPRINGER ROAD

STA 6+58 TO 9+65

SCALE: NTS



TYPICAL SECTION - SPRINGER ROAD

STA 9+65 TO 11+95

SCALE: NTS

'ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN.'

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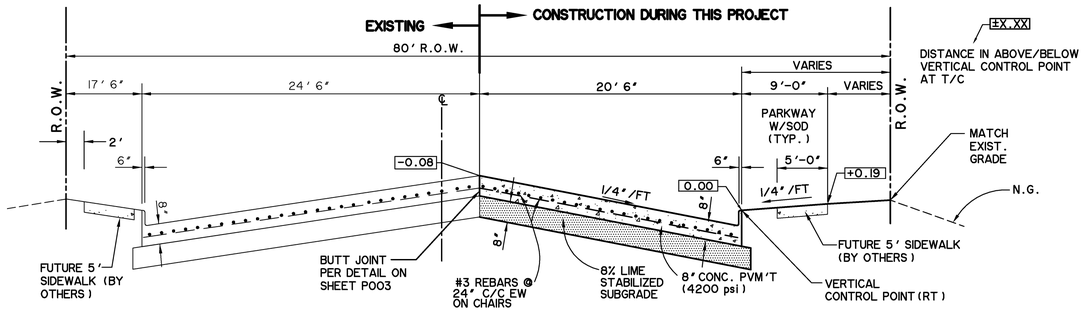
4. [0.50] DENOTES DISTANCE IN DECIMAL FEET ABOVE VERTICAL CONTROL POINT.

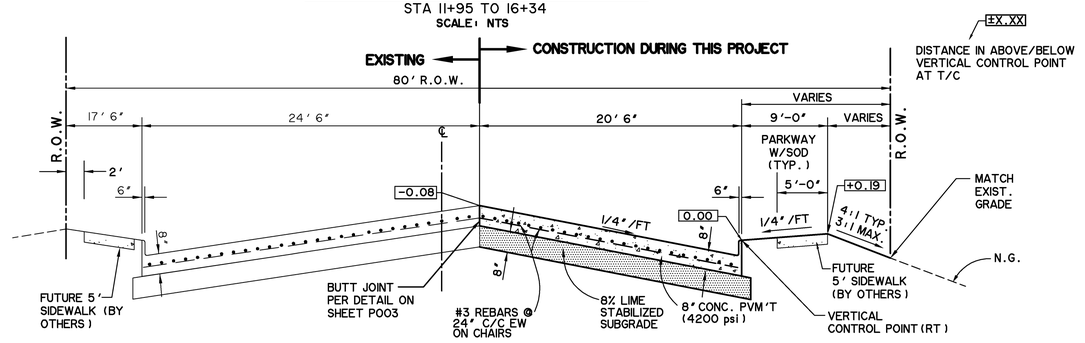
SEE SHEET A201 FOR PAVEMENT NOTES



TYPICAL SECTION - SPRINGER ROAD

STA 11+95 TO 16+34

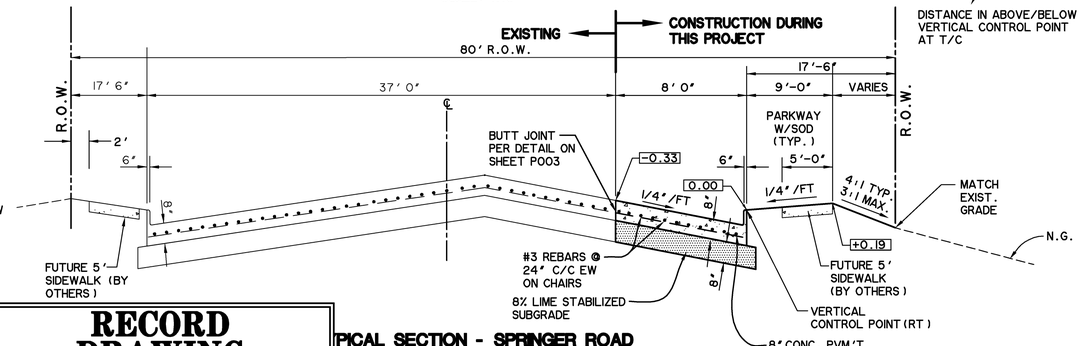
SCALE: NTS



TYPICAL SECTION - SPRINGER ROAD

STA 16+34 TO 24+39

SCALE: NTS



TYPICAL SECTION - SPRINGER ROAD

STA 24+39 TO 25+39

SCALE: NTS

RECORD DRAWING 02/02/2015

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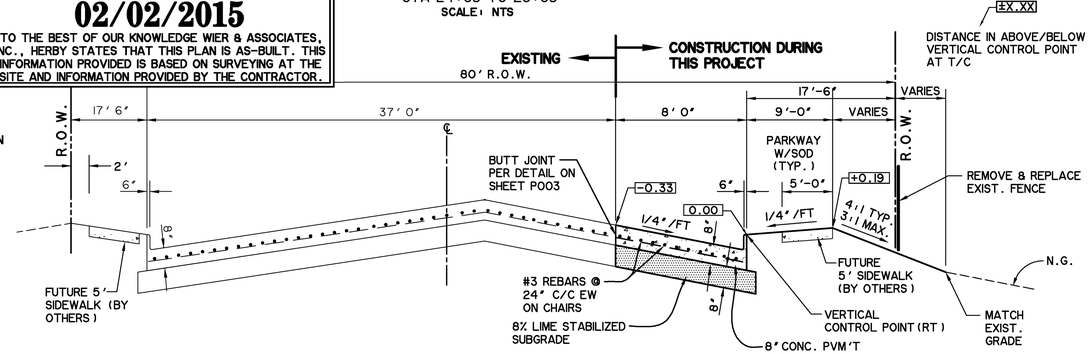

TYPICAL SECTION - SPRINGER ROAD

STA 25+39 TO 27+35

SCALE: NTS

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ENGINEERS SURVEYORS LAND PLANNERS
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ROCKWALL TECHNOLOGY PARK PHASE IV

TYPICAL SECTIONS SPRINGER ROAD

LICENSED STATE OF TEXAS DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 09-19-2013

WA# 12209

SHEET NO. P002

FILE: P002-TYPSEC-SPRINGER-12209.dwg

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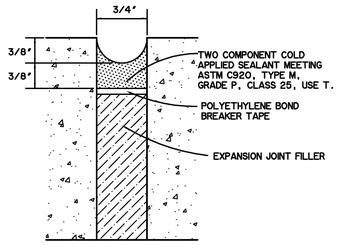
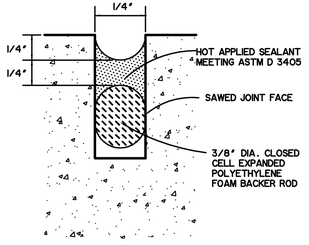


JOINT SEALANT DETAIL No. 1
SEAL FOR EXPANSION JOINT
N.T.S.

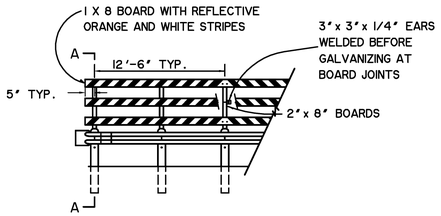


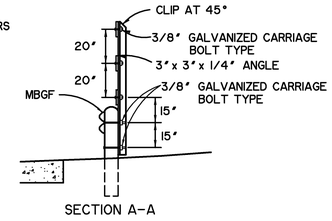
JOINT SEALANT DETAIL No. 2
SEAL FOR SAWED, CONSTRUCTION & BUTT JOINT
N.T.S.

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.





SECTION A-A

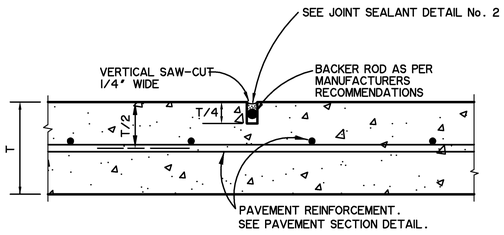
TYPICAL DETAIL FOR BARRICADE RAIL

STRIPING

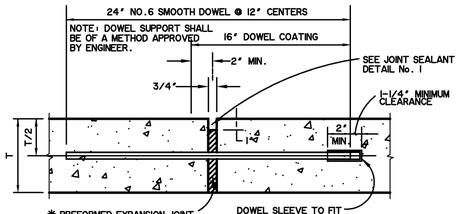
BARICADES SHOULD HAVE STRIPES SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING. WHEN BOTH RIGHT AND LEFT TURNS ARE PROVIDED FOR, OR THERE IS NO TURN PROVIDED FOR, THE CHEVRON STRIPING MAY SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARICADE.

STRIPING OF RAILS, PANELS AND GATES FOR THE RIGHT SIDE OF THE ROADWAY, IS SHOWN ABOVE. FOR THE LEFT SIDE OF THE ROADWAY STRIPING SHOULD SLOPE DOWNWARD TO THE RIGHT. THE REFLECTORIZED WHITE AND REFLECTORIZED ORANGE STRIPES SHALL BE CONSTRUCTED OF RETROREFLECTIVE SHEETING MEETING THE COLOR AND REFLECTIVITY REQUIREMENTS OF TEXAS DEPARTMENT OF TRANSPORTATION MATERIAL SPECIFICATION, D-9-8300, TYPE C.

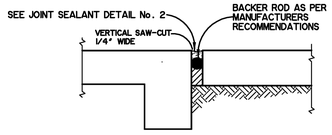
DEAD END BARRICADE
N.T.S.



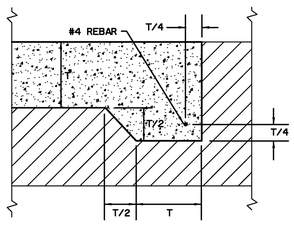
SAWED CONTRACTION JOINT
N.T.S.



EXPANSION JOINT
N.T.S.

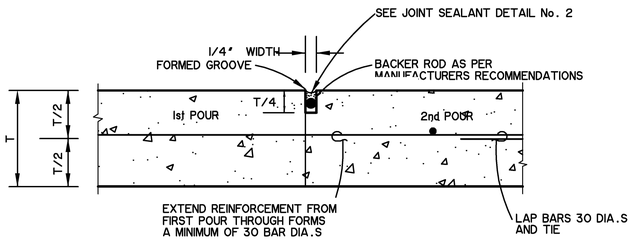


ISOLATION JOINT
N.T.S.



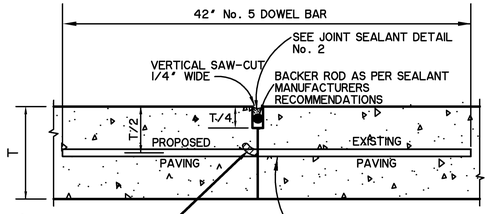
T = PAVEMENT THICKNESS

THICKENED EDGE DETAIL
N. T. S.



CONSTRUCTION JOINT
N.T.S.

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

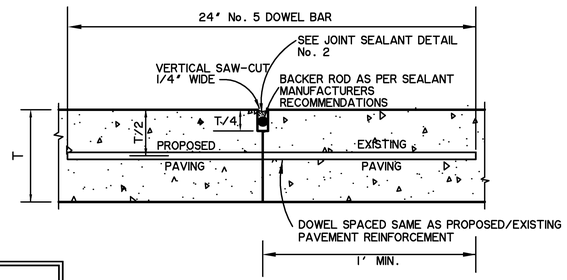


EXISTING REBAR STUB OUT ON DATA, SPRINGER, & DISCOVERY BLVD. TO REMAIN IN PLACE BENT TOWARDS EXISTING PAVEMENT. MAINTAIN A MINIMUM OF 2" CLEARANCE BETWEEN REBAR AND DOWELL LOCATION.

SPECIAL NOTE THIS PROJECT

USE WHERE EXISTING PAVEMENT HAS NOT BEEN SAWCUT.

LONGITUDINAL BUTT JOINT
N.T.S.



USE WHERE EXISTING PAVEMENT HAS BEEN SAWCUT.

BUTT JOINT
N.T.S.

RECORD DRAWING 02/02/2015

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ROCKWALL TECHNOLOGY PARK PHASE IV

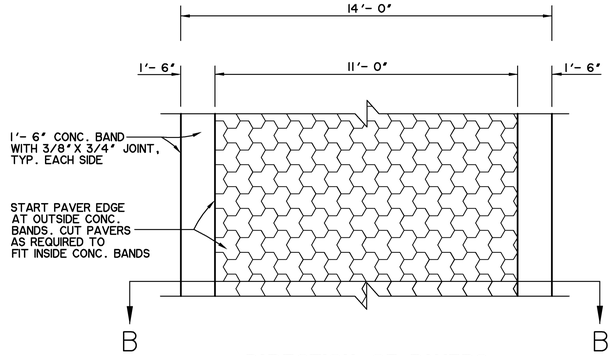
PAVING DETAILS AND CURB DETAILS

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 10-17-2015
WA# 12209

SHEET NO. P003

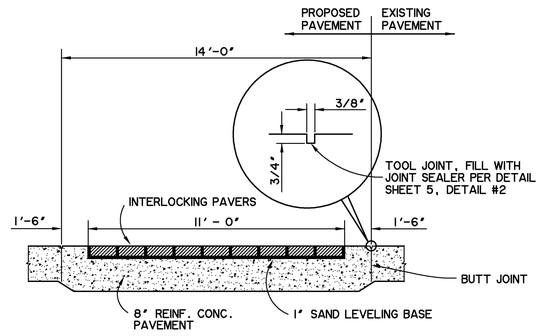
FILE: P003-PAVDETL-12209.dwg
TIME: 12:29



NOTE:
1. CONTRACTOR SHALL COORDINATE COLOR AND TYPE OF PAVER WITH THE OWNER AND ENGINEER. SUBMITTAL TO THE OWNER AND ENGINEER IS REQUIRED PRIOR TO ORDERING THE MATERIAL

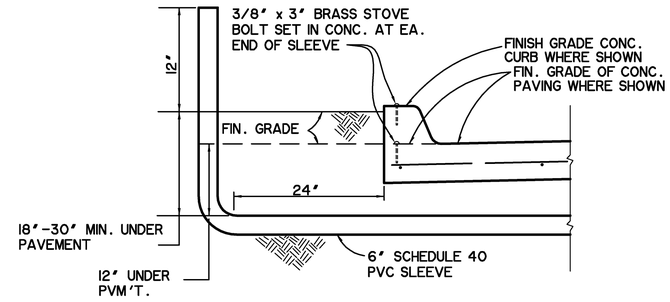
DIRECTION OF PAVERS

DISCOVERY BOULEVARD
SCALE: NTS



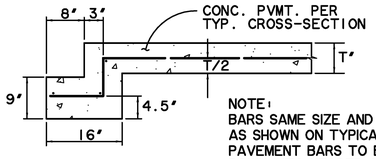
PAVER SECTION B-B

DISCOVERY BOULEVARD
SCALE: NTS



CONDUIT SLEEVE UNDER PAVEMENT

N.T.S.



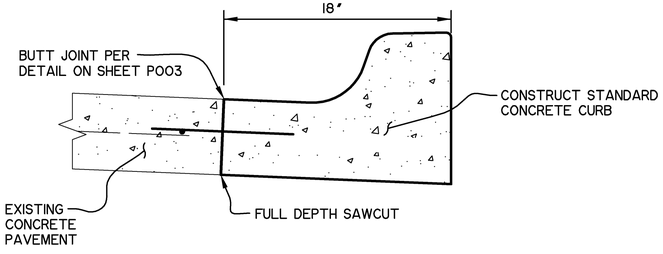
NOTE:
BARS SAME SIZE AND SPACING AS SHOWN ON TYPICAL SECTION. PAVEMENT BARS TO BE BENT DOWN INTO HEADER AND PAVEMENT TO BE MONOLITHIC.

STREET HEADER

N.T.S.

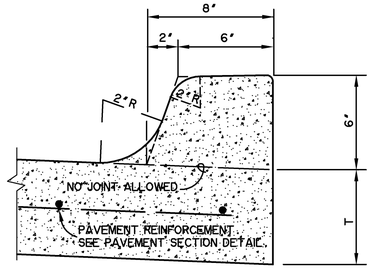
RECORD DRAWING 02/02/2015

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.



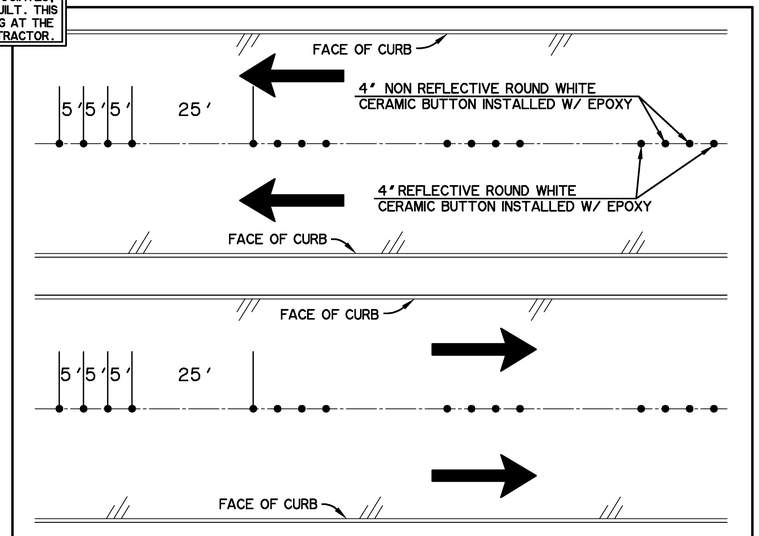
TYPICAL SECTION - STANDARD CONCRETE CURB AND GUTTER

N.T.S.



MONOLITHIC CURB

N.T.S.



BUTTON DETAIL FOR DISCOVERY BLVD

SCALE: NTS

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

ROCKWALL TECHNOLOGY PARK PHASE IV

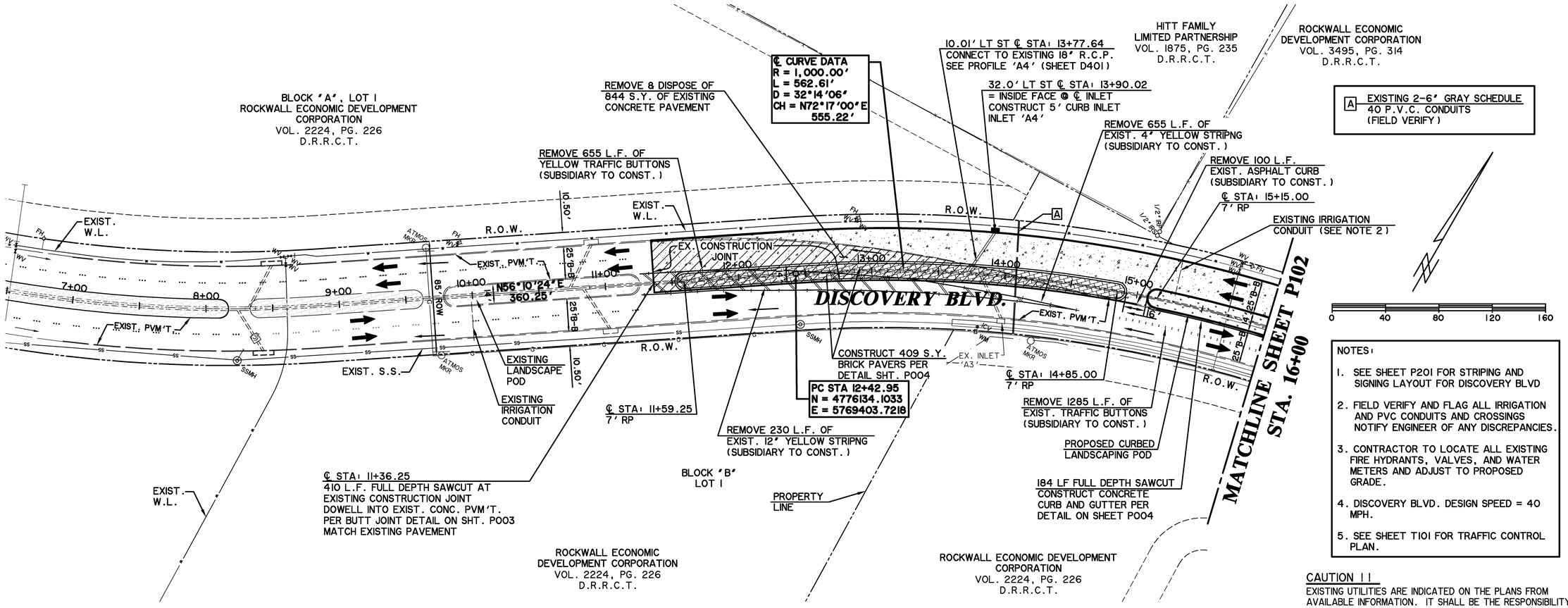
PAVING DETAILS

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 10-23-2013
WA# 12209

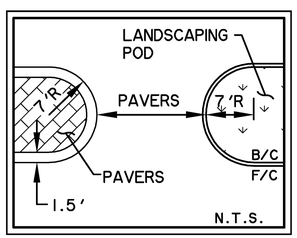
SHEET NO. P004

FILE: P004-PAVDETL-12209.dwg
TIME: 9:52

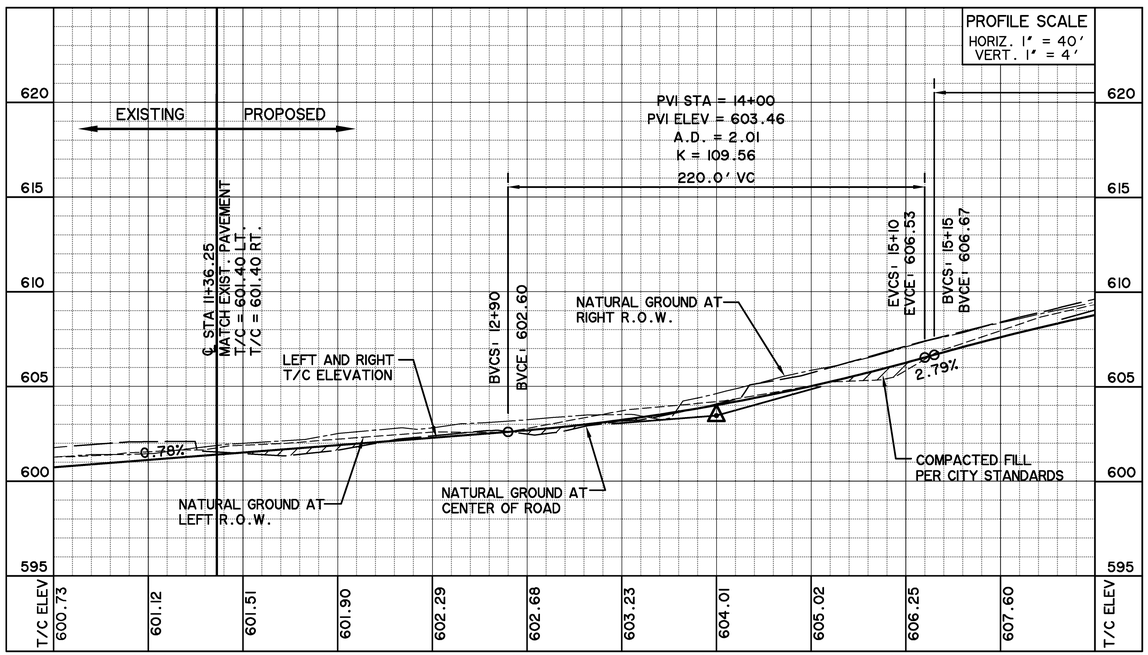


NOTES:

1. SEE SHEET P201 FOR STRIPING AND SIGNING LAYOUT FOR DISCOVERY BLVD
2. FIELD VERIFY AND FLAG ALL IRRIGATION AND PVC CONDUITS AND CROSSINGS NOTIFY ENGINEER OF ANY DISCREPANCIES.
3. CONTRACTOR TO LOCATE ALL EXISTING FIRE HYDRANTS, VALVES, AND WATER METERS AND ADJUST TO PROPOSED GRADE.
4. DISCOVERY BLVD. DESIGN SPEED = 40 MPH.
5. SEE SHEET T101 FOR TRAFFIC CONTROL PLAN.



TYPICAL MEDIAN NOSE SPACING FOR DISCOVERY BLVD.



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.

RECORD DRAWING 02/02/2015

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BM B AN "X" CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C – AN "□" CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

" ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN."

PREPARED BY:
WIER & ASSOCIATES, INC.
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Texas Firm Registration No. F-2776 www.WierAssociates.com

ROCKWALL TECHNOLOGY PARK PHASE IV

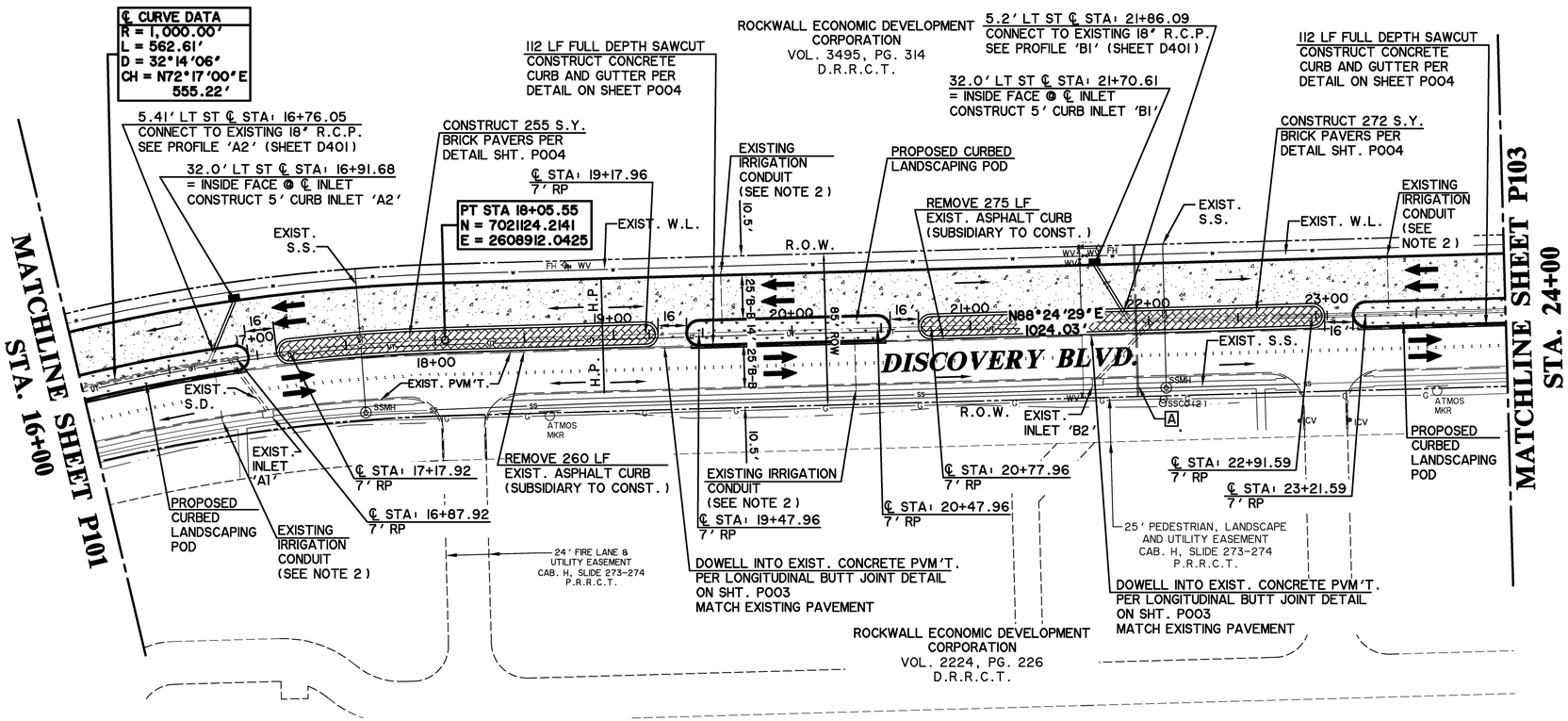
DISCOVERY BLVD. PAVING PLAN AND PROFILE STA 8+30.57 TO STA 16+00

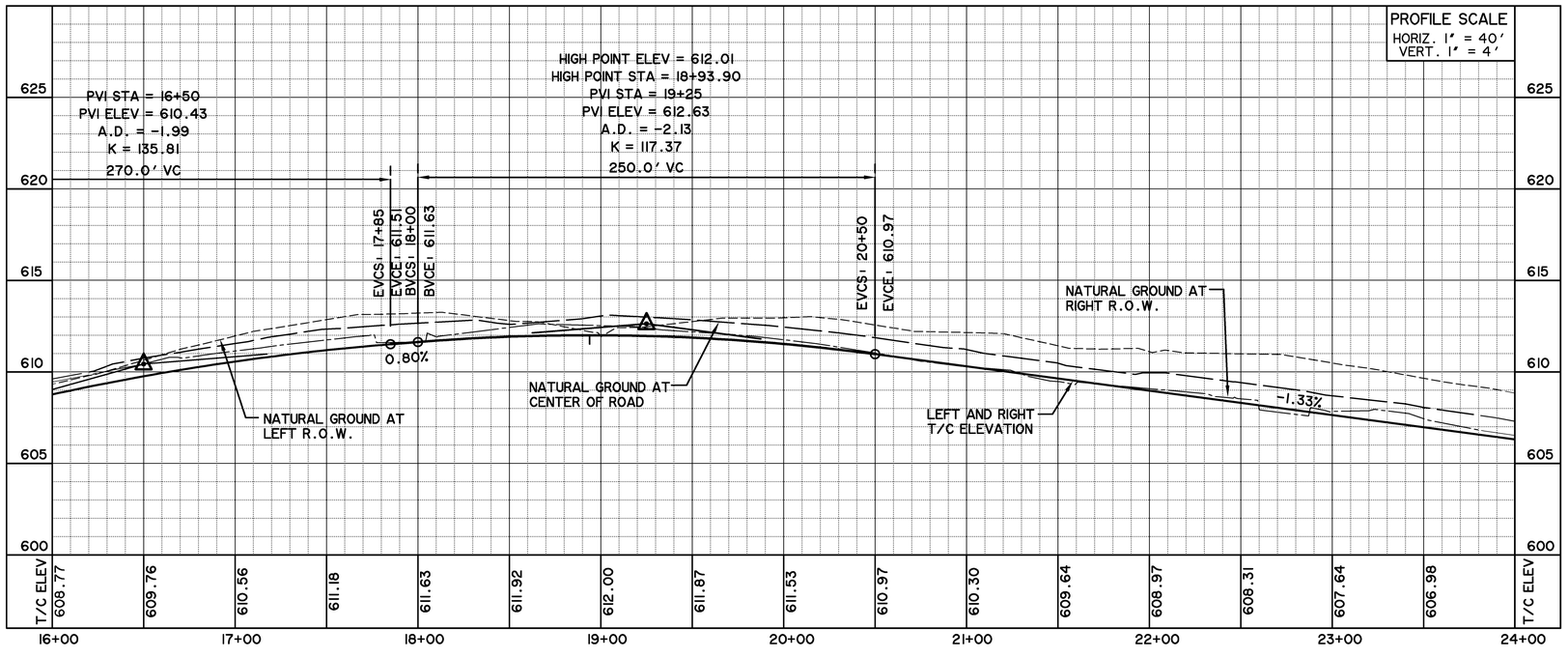
DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 12-26-2013
WA# 12209

SHEET NO. P101

TIME: 15:45 FILE: P101-Pav-Discovery-12209.dwg





A EXISTING 2-6" GRAY SCHEDULE
40 P.V.C. CONDUITS
(FIELD VERIFY)

0 40 80 120 160

CAUTION 11

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NOTES:

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3. CONTRACTOR TO LOCATE ALL EXISTING FIRE HYDRANTS, VALVES, AND WATER METERS AND ADJUST TO PROPOSED GRADE.
4. DISCOVERY BLVD. DESIGN SPEED = 40 MPH.
5. SEE SHEET T101 FOR TRAFFIC CONTROL PLAN.

* BENCH MARKS *

BM A AN 'X' CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

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RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

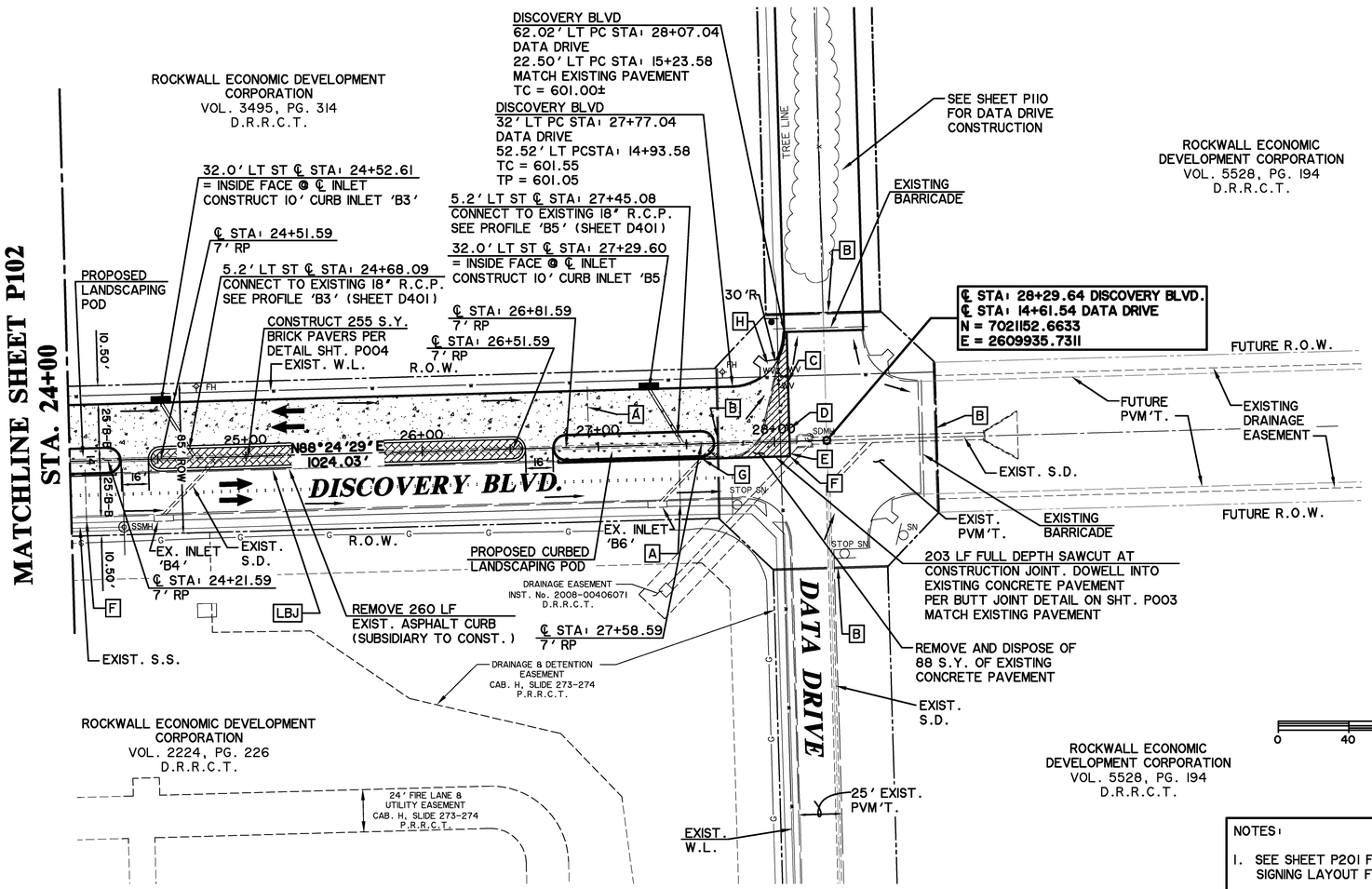
DISCOVERY BLVD. PAVING PLAN AND PROFILE STA 16+00 TO STA 24+00

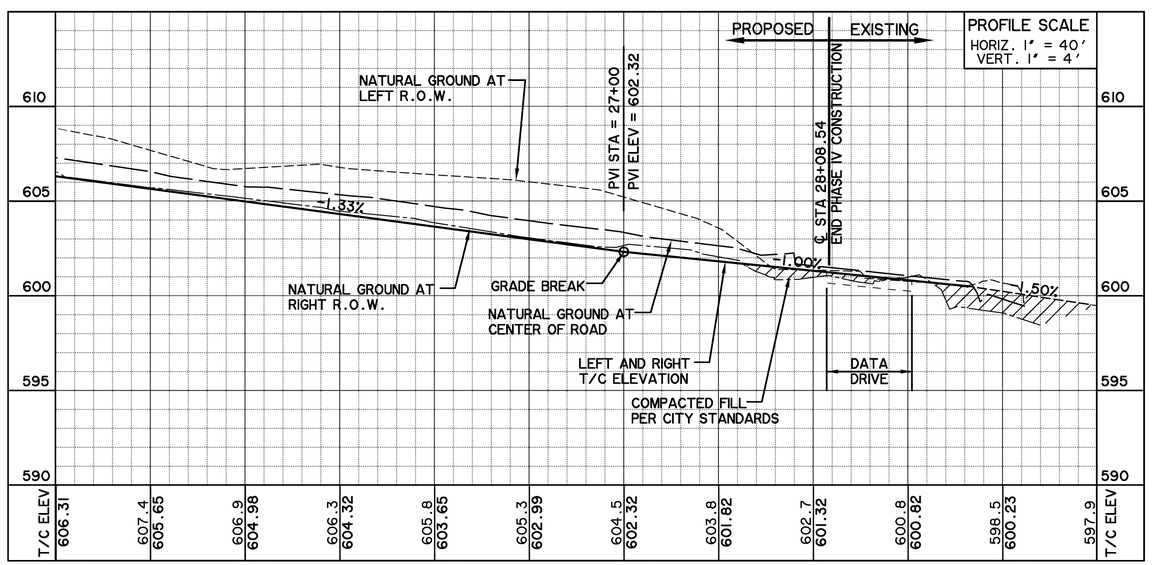
DARRELL J. BOSWORTH
112702
REGISTERED
PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT
DATE 12-26-2013
WA# 12209
SHEET NO.
P102

TIME: 16:02 FILE: P102-Pav-Discovery-12209.dwg

MATCHLINE SHEET P102
STA. 24+00





A	EXISTING IRRIGATION CONDUIT (SEE NOTE 2)
B	EXISTING 2-6" GRAY SCHEDULE 40 P.V.C. CONDUITS (FIELD VERIFY)
C	32.00' LT ℄ STA 28+08.55 DISCOVERY BOULEVARD PI CURBS EX TP = 601.10
D	7.00' LT ℄ STA 28+08.54 DISCOVERY BOULEVARD EX TP = 601.35
E	7.00' RT ℄ STA 28+08.53 DISCOVERY BOULEVARD EX TP = 601.40
F	9.94' RT ℄ STA 28+08.53 DISCOVERY BOULEVARD EX TP = 601.37
G	9.61' RT ℄ STA 27+58.57 DISCOVERY BOULEVARD EX TP = 601.96
H	CONSTRUCT BARRIER FREE RAMP FOR FUTURE 5' WIDE SIDEWALK SEE CITY OF ROCKWALL DETAILS FOR CONSTRUCTION OF RAMPS
LBJ	DOWELL INTO EXIST. CONC. PVM'T. PER LONGITUDINAL BUTT JOINT DETAIL ON SHT. P003 MATCH EXIST. PAVEMENT

CAUTION ! !

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NOTES:

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4. DISCOVERY BLVD. DESIGN SPEED = 40 MPH.
5. SEE SHEET T101 FOR TRAFFIC CONTROL PLAN.

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*** BENCH MARKS ***

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BM C – AN "□" CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

RECORD DRAWING
02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

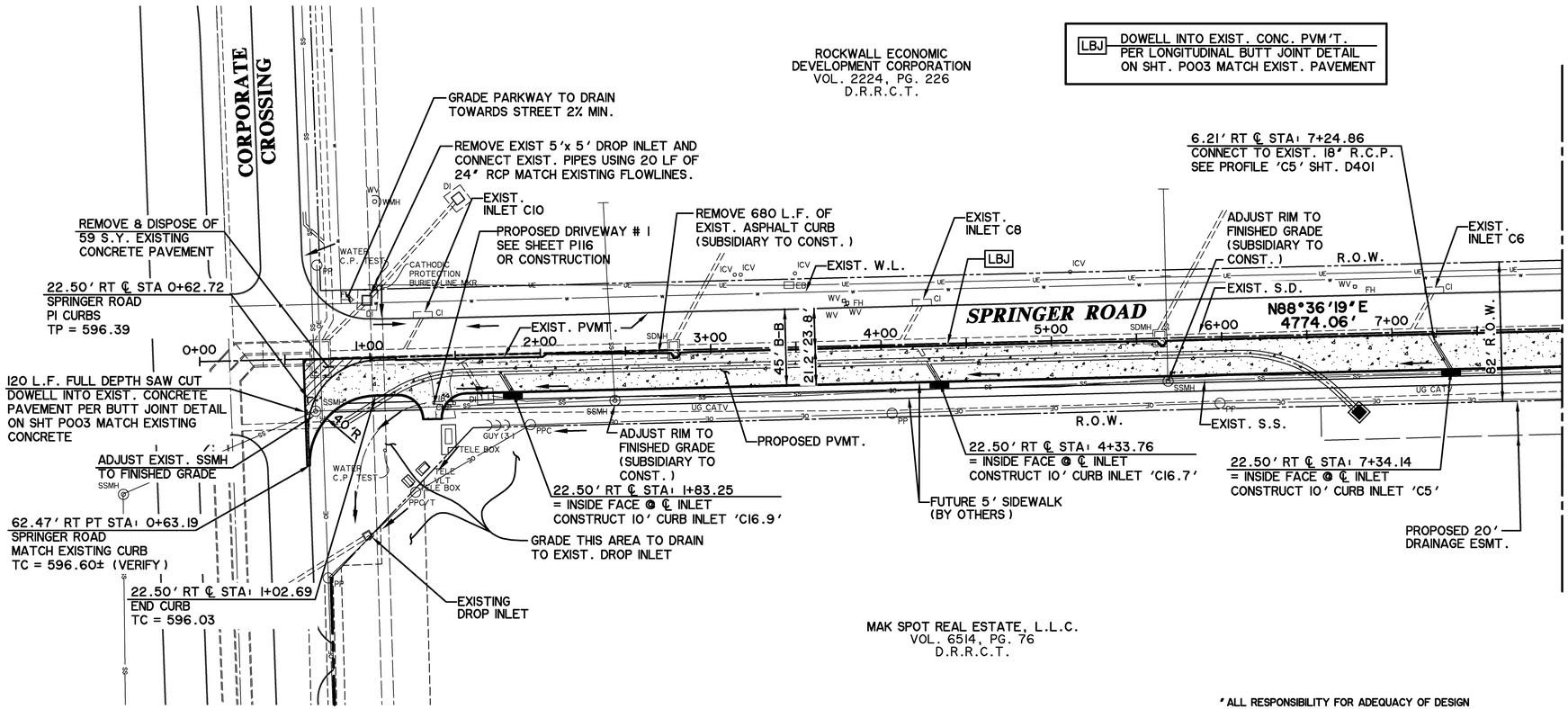
DISCOVERY BLVD. PAVING PLAN AND PROFILE STA 24+00 TO STA 28+29.59

DARRELL J. BOSWORTH
11702
REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
2-2-15

LAST SHEET EDIT DATE 12-26-2013
WA# 12209

SHEET NO. P103

TIME: 16:12 FILE: P103-Pav-Discovery-12209.dwg



NOTE:
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2) STREET DIMENSIONS ARE FROM BACK OF CURB TO EDGE OF EXIST. CONCRETE (BC-EC) UNLESS OTHERWISE NOTED.
3) SEE TYPICAL SECTIONS ON SHEET P002 FOR GRADING ON SOUTH SIDE OF SPRINGER ROAD.
4) FIELD VERIFY AND FLAG ALL IRRIGATION AND PVC CONDUITS AND CROSSINGS. NOTIFY ENGINEER OF ANY DISCREPANCIES.
5) DESIGN SPEED = 35 MPH.
6) SEE SHEET T101 FOR TRAFFIC CONTROL PLAN.

0 40 80 120 160

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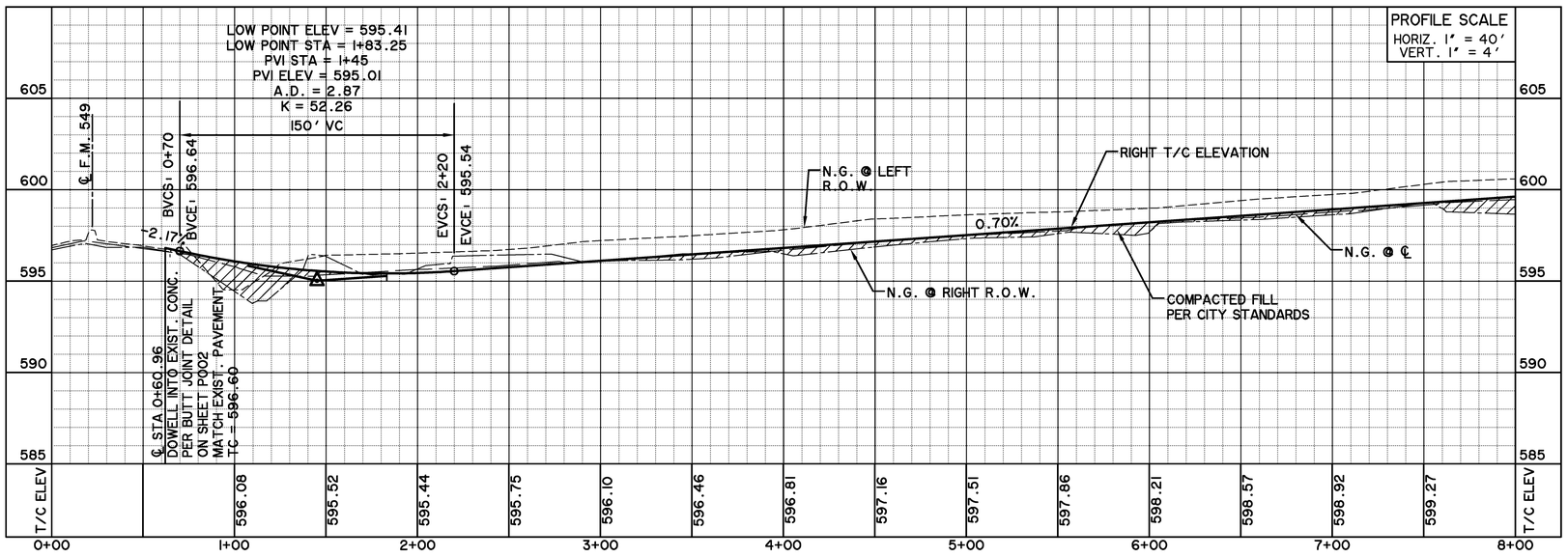

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RECORD DRAWING 02/02/2015
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701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
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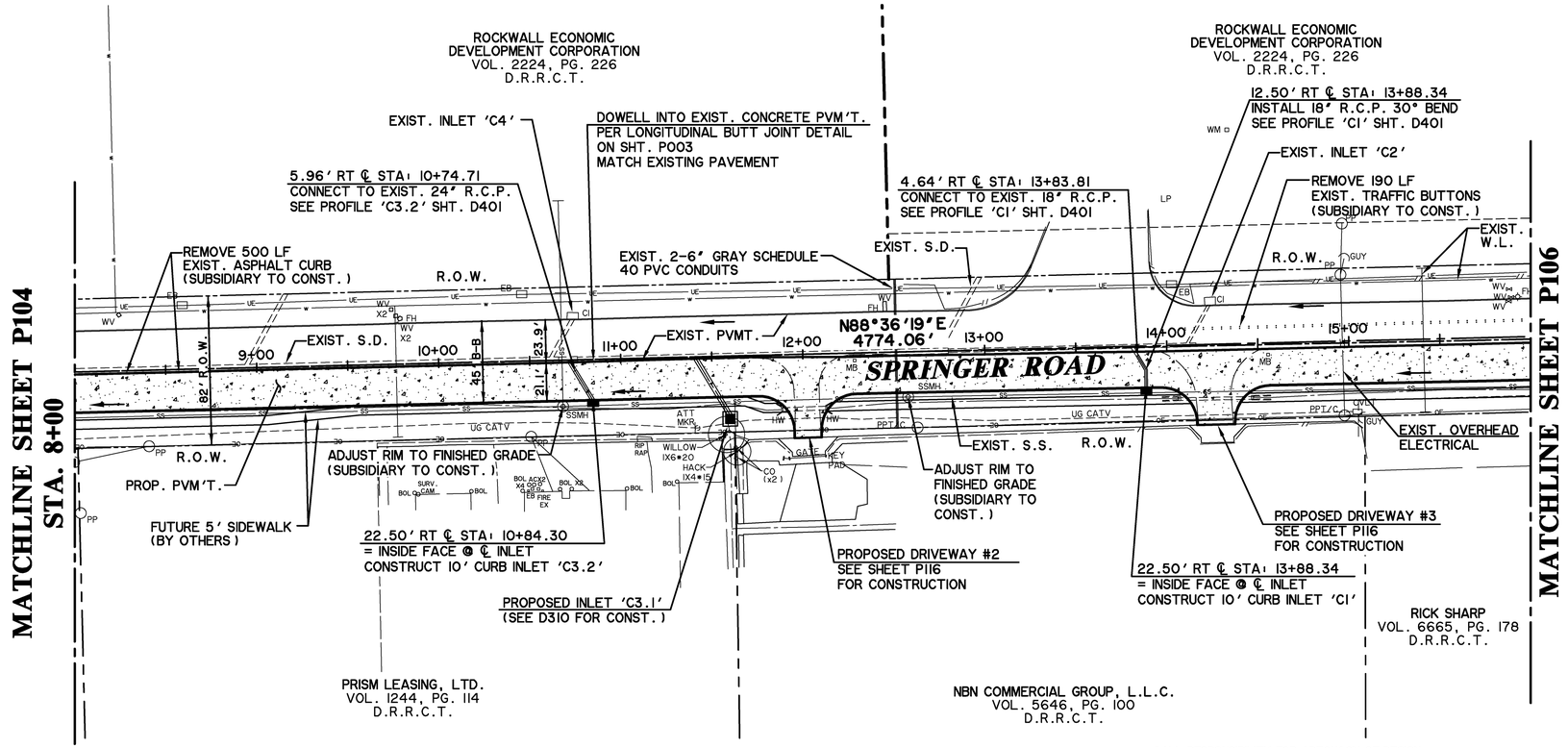
ROCKWALL TECHNOLOGY PARK PHASE IV

SPRINGER RD
PAVING PLAN AND PROFILE
STA 0+60.45 TO STA 8+00

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

LAST SHEET EDIT DATE 10-17-2013
WA# 12209
SHEET NO. P104

TIME 11:10 FILE: P104-Pav-Springer-12209.dwg



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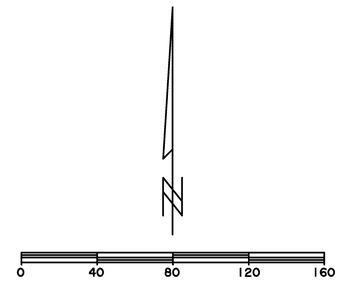

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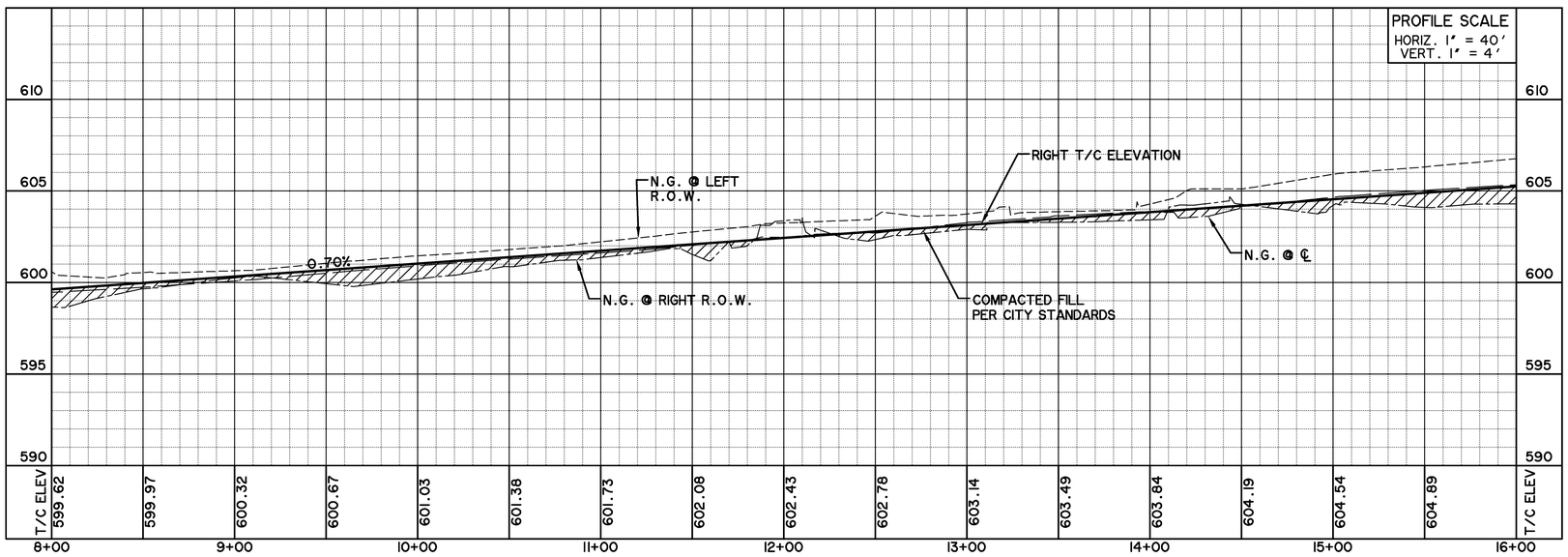

• BENCH MARKS •

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RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

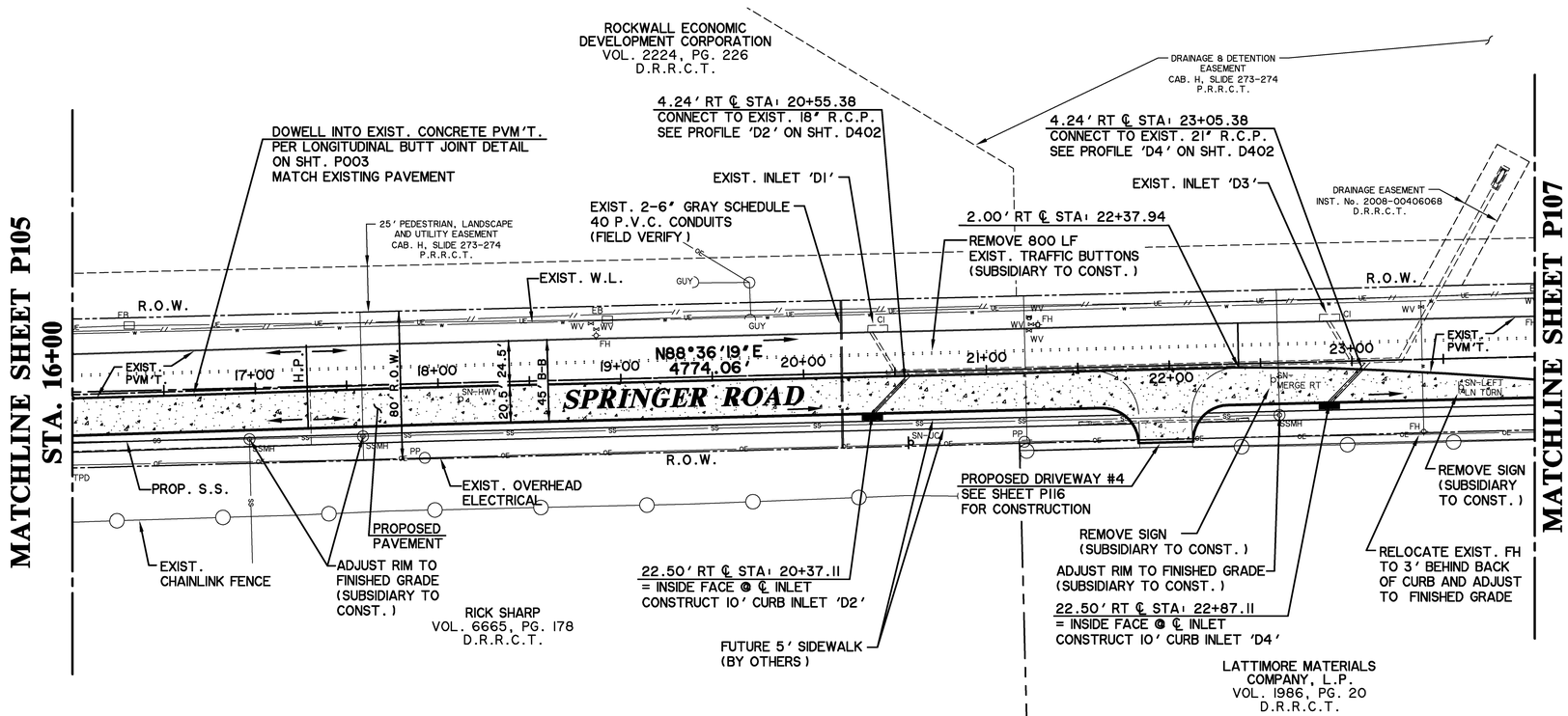
SPRINGER RD
PAVING PLAN AND PROFILE
STA 8+00 TO STA 16+00

DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
2-2-15

LAST SHEET EDIT
DATE 10-15-2013
WA# 12209

SHEET NO.
P105

FILE: P105-Pav-Springer-12209.dwg
TIME: 13:06



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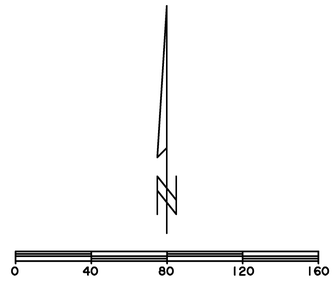

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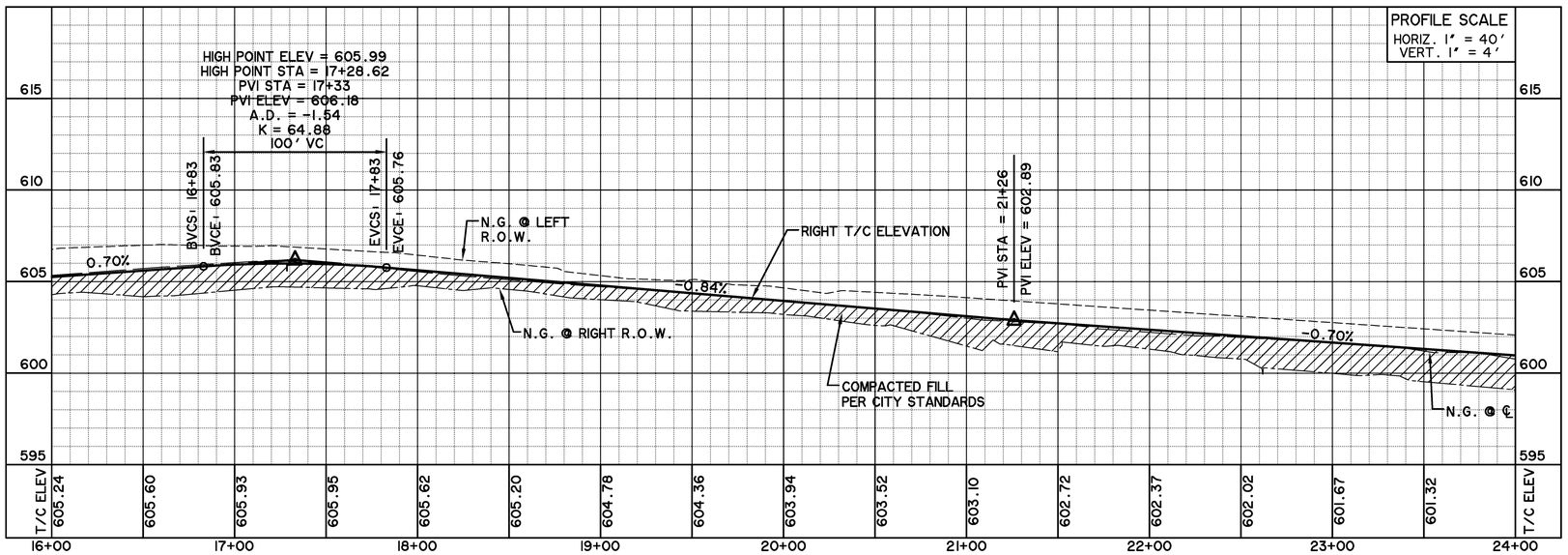

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RECORD DRAWING 02/02/2015

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.

'ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN.'

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

ROCKWALL TECHNOLOGY PARK PHASE IV

SPRINGER RD PAVING PLAN AND PROFILE STA 16+00 TO STA 24+00

DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
2-2-15

LAST SHEET EDIT
DATE 10-17-2013
WA# 12209

SHEET NO.
P106

FILE: P106-Pav-Springer-12209.dwg
TIME: 11:15

MATCHLINE SHEET P106
STA. 24+00

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

DATA DRIVE

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 5528, PG. 194
D.R.R.C.T.

A EXIST. 2-6' GRAY SCHEDULE
40 P.V.C. CONDUITS
(FIELD VERIFY)

REMOVE 240 LF
EXIST. TRAFFIC BUTTONS
(SUBSIDIARY TO CONST.)

DATA DRIVE
℄ STA: 1+59.12
SPRINGER ROAD
℄ STA: 26+88.06

DRAINAGE EASEMENT
INST. No. 2008-00406067
D.R.R.C.T.

DRAINAGE EASEMENT
INST. No. 1998-040898
D.R.R.C.T.

EXIST. INLET 'I-2'

REMOVE SIGN
(SUBSIDIARY
TO CONST.)

EXIST. W.L.

R.O.W.

N88°36'19"E
4774.06'

EXIST. PVM'T.

PROP. S.D.
LINE 'I'

SPRINGER ROAD

EXIST. GRAVEL

78' R.O.W.

80' ROW

55' EXIST. PVM'T.

25+00 26+00 27+00 28+00 29+00 30+00 31+00

17.46'

8'

16.86'

PROPOSED
DRIVEWAY #5
SEE SHEET P117
FOR CONSTRUCTION

REMOVE 210 LF EXIST.
SOLID WHITE STRIPE
(SUBSIDIARY TO CONST.)

PROPOSED DRIVEWAY #6
SEE SHEET P117
FOR CONSTRUCTION

BLACKLAND WATER SUPPLY
VOL. 235, PG. 233
D.R.R.C.T.

22.50' RT ℄ STA: 25+10.31
= INSIDE FACE @ ℄ INLET
CONSTRUCT 10' CURB INLET 'I-I'

HIGHWAY 276 SELF STORAGE
LOT I, BLK. I
CAB. F, SLIDE 125
P.R.R.C.T.

22.50' RT
℄ STA: 27+35.31
END CURB
BEGIN TRANSITION
TC = 601.50
TP = 601.00

15.00' RT
℄ STA: 28+85.49
END CONCRETE
TP = 599.50±
MATCH EXIST. PVM'T.

REMOVE & REPLACE 300 LF
EXIST. CHAINLINK FENCE

DOWELL INTO EXIST. CONCRETE PVM'T.
PER LONGITUDINAL BUTT JOINT DETAIL
ON SHT. P003
MATCH EXISTING PAVEMENT

CITY OF ROCKWALL
VOL. 2219, PG. 187
D.R.R.C.T.

EXIST. DRAINAGE EASEMENT

NATIVE OAKS PROPERTIES, INC.
VOL. 4050, PG. 221
D.R.R.C.T.

NOTE:
1) CONTRACTOR TO LOCATE ALL EXISTING FIRE HYDRANTS, VALVES, AND WATER METERS AND ADJUST TO PROPOSED GRADE.
2) STREET DIMENSIONS ARE FROM BACK OF CURB TO EDGE OF EXIST. CONCRETE (BC-EC) UNLESS OTHERWISE NOTED.
3) SEE TYPICAL SECTIONS ON SHEET P002 FOR GRADING ON SOUTH SIDE OF SPRINGER ROAD.
4) FIELD VERIFY AND FLAG ALL IRRIGATION AND PVC CONDUITS AND CROSSINGS. NOTIFY ENGINEER OF ANY DISCREPANCIES.
5) DESIGN SPEED = 35 MPH.
6) SEE SHEET T101 FOR TRAFFIC CONTROL PLAN.

0 40 80 120 160

CAUTION !!
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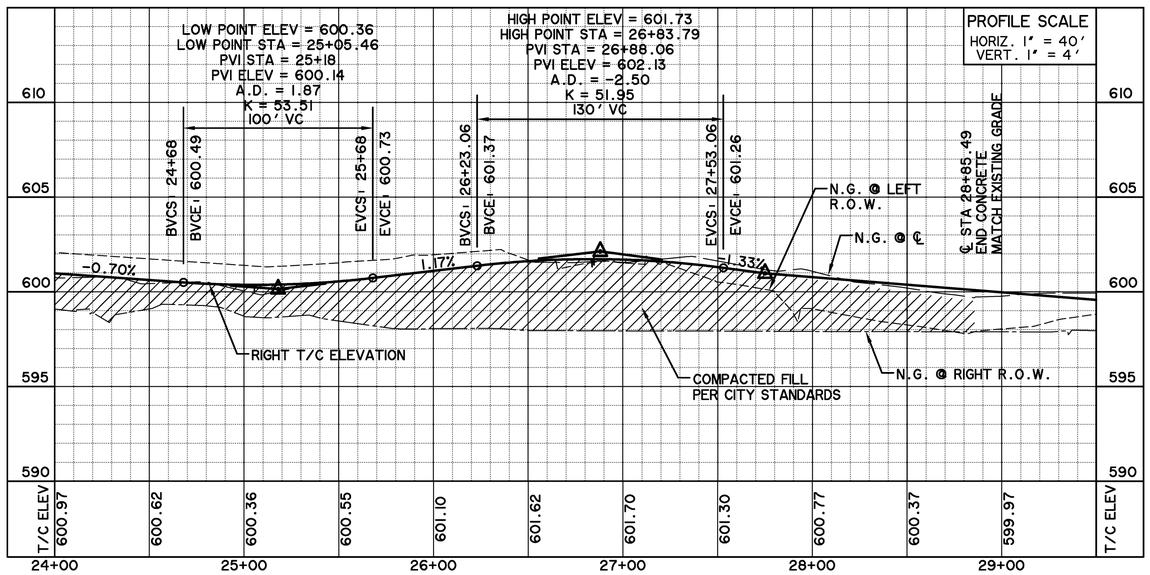

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• BENCH MARKS •

BM A AN "X" CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN "X" CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

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RECORD DRAWING 02/02/2015

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ROCKWALL TECHNOLOGY PARK PHASE IV

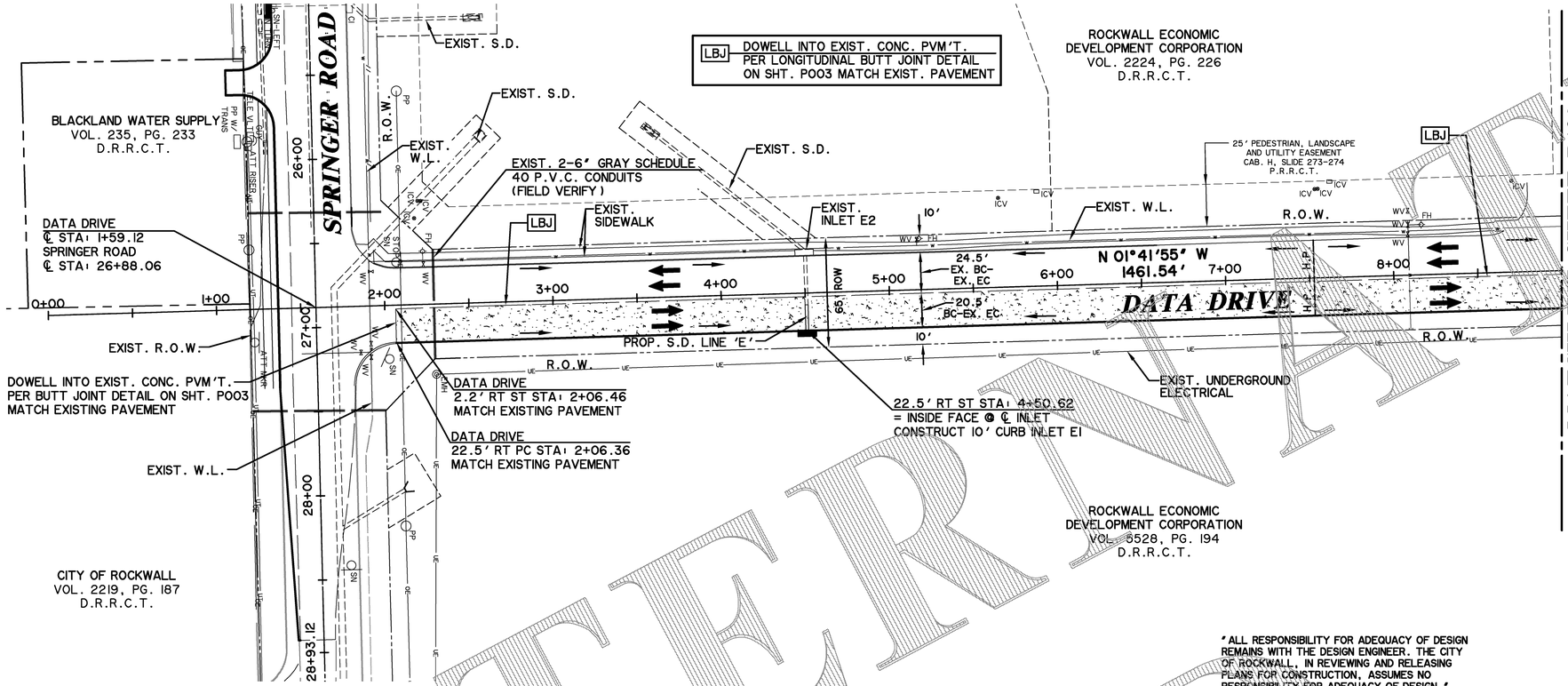
SPRINGER RD
PAVING PLAN AND PROFILE
STA 24+00 TO STA 32+00

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED
PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 10-17-2013
WA# 12209

SHEET NO. P107

FILE: P107-Pav-Springer-12209.dwg
TIME: 11:19



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0 40 80 120

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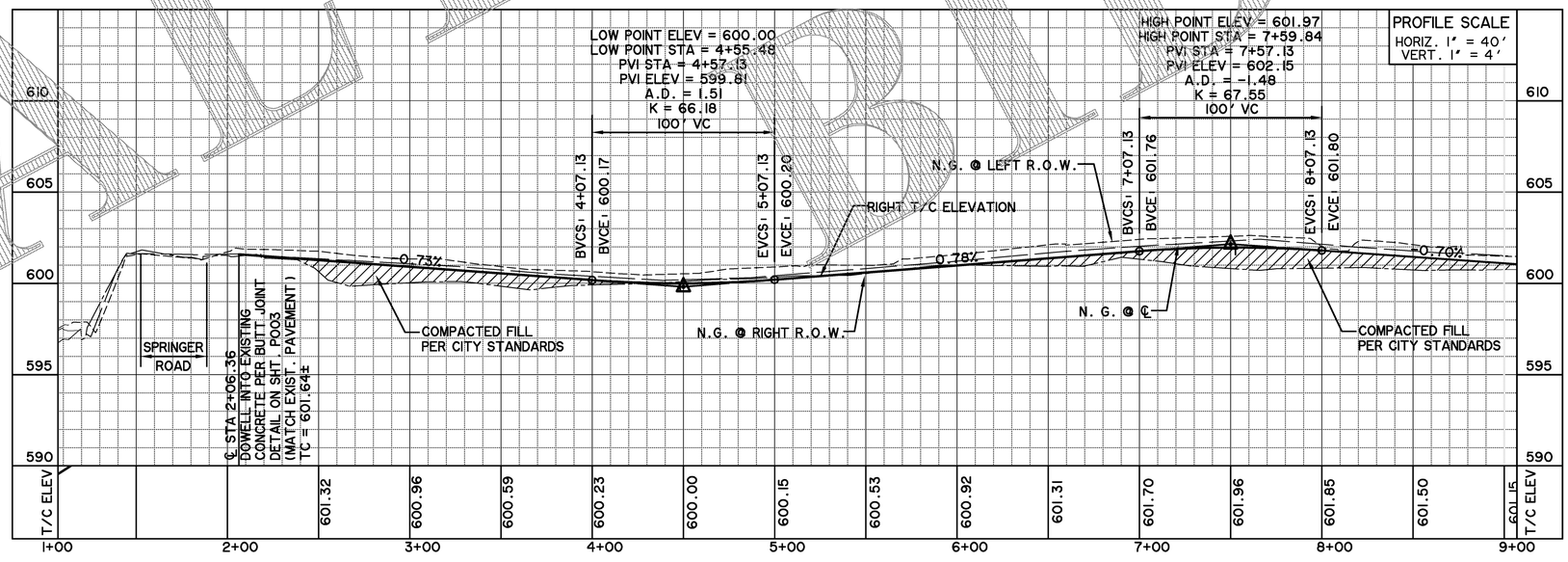

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ROCKWALL TECHNOLOGY PARK PHASE IV

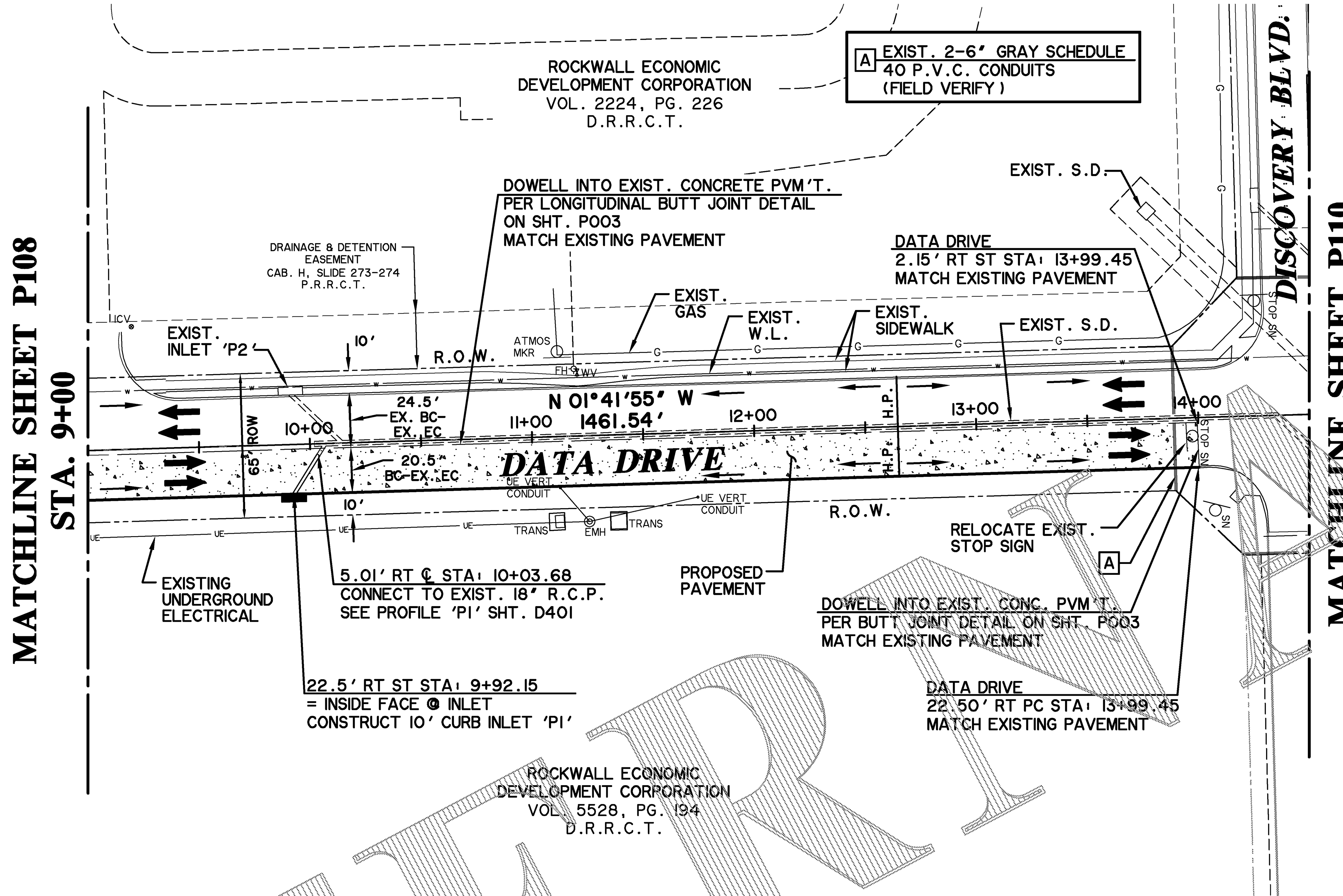
DATA DRIVE PAVING PLAN AND PROFILE STA 1+59.12 TO STA 9+00

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 10-17-2013
WA# 12209

SHEET NO. P108

TIME: 11:23 FILE: P108-Pav-Data Drive-12209.dwg



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0 40 80 120

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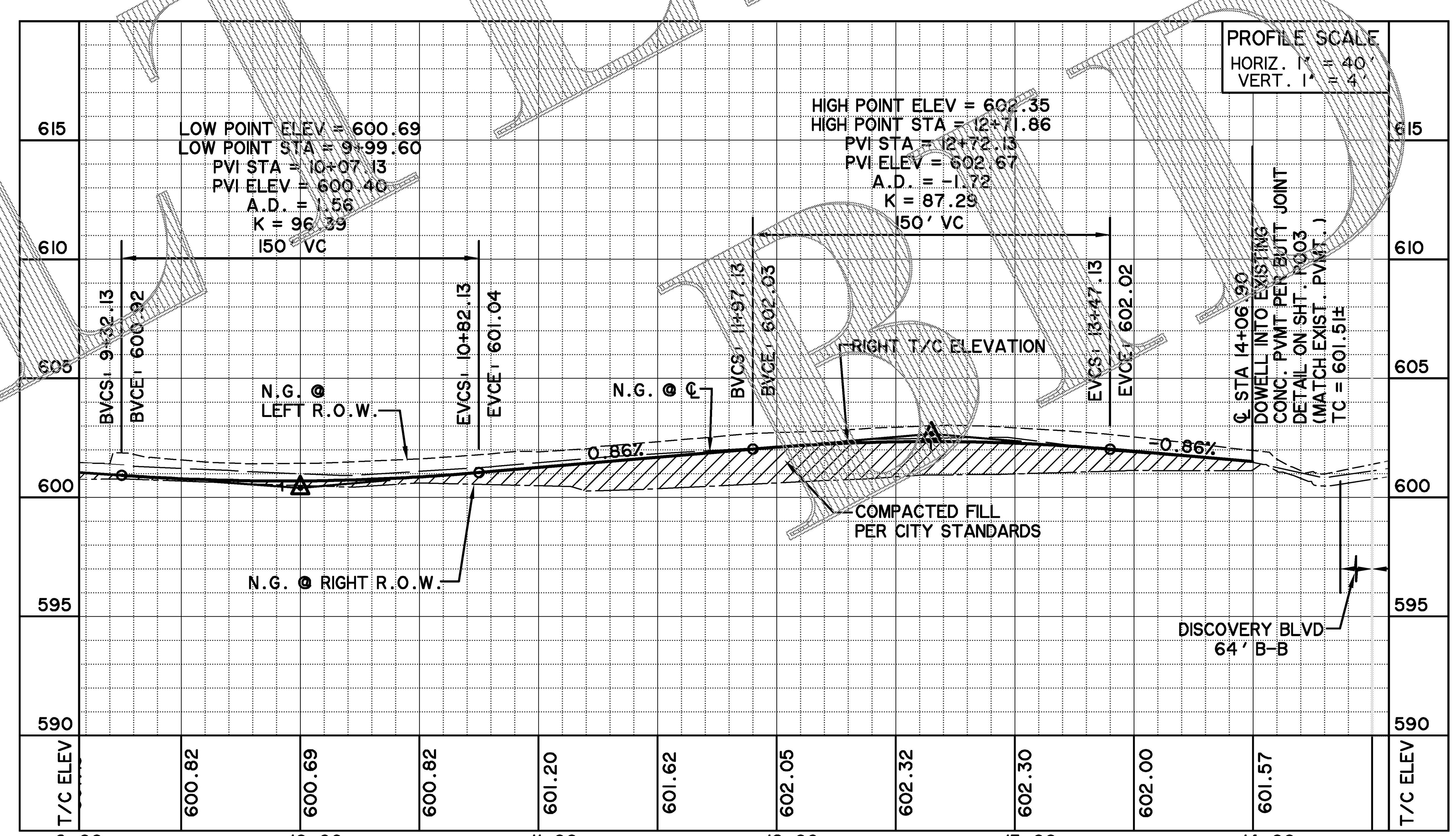

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ROCKWALL TECHNOLOGY PARK PHASE IV

DATA DRIVE PAVING PLAN AND PROFILE STA 9+00 TO STA 14+50

STATE OF TEXAS DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 10-17-2013
WA# 12209

SHEET NO. P109

FILE: P109-Pav-Data Drive-12209.dwg
TIME: 11:32

CAUTION ! !

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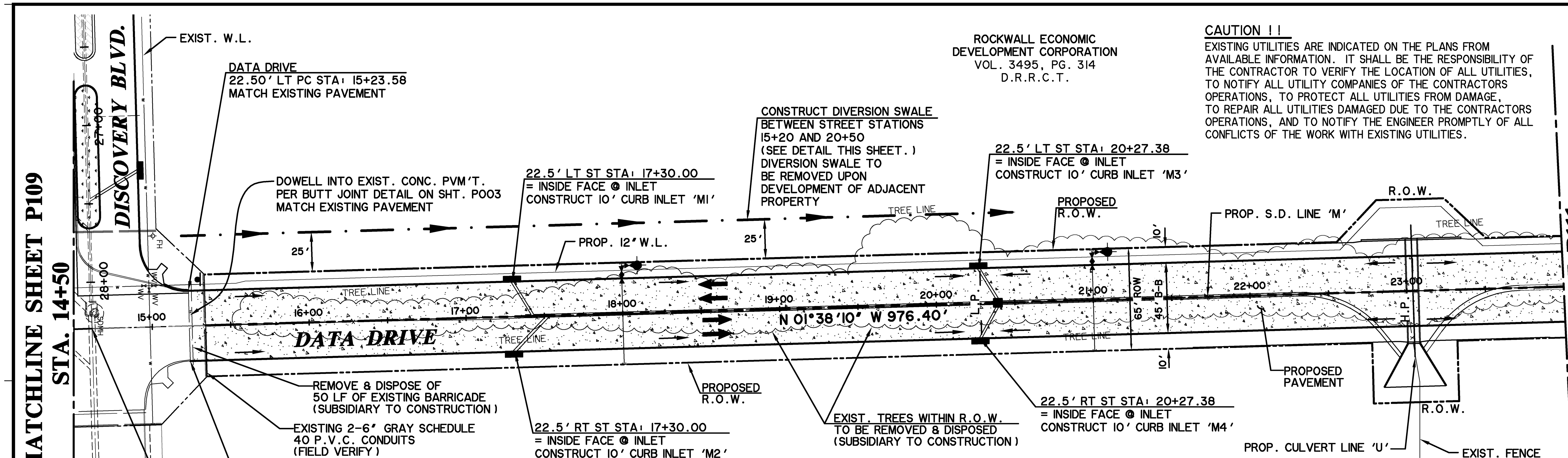

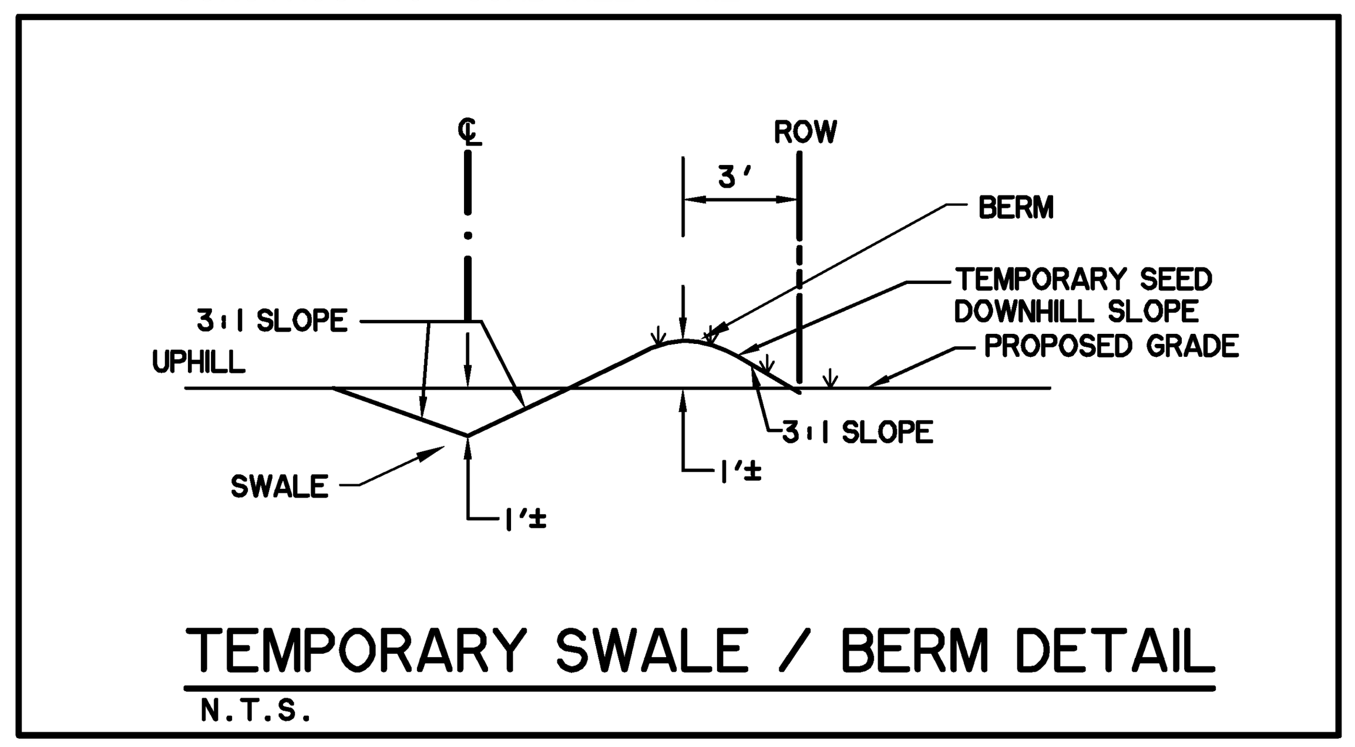

TEMPORARY SWALE / BERM DETAIL

N.T.S.

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5) DATA DRIVE DESIGN SPEED = 35 MPH.

• BENCH MARKS •

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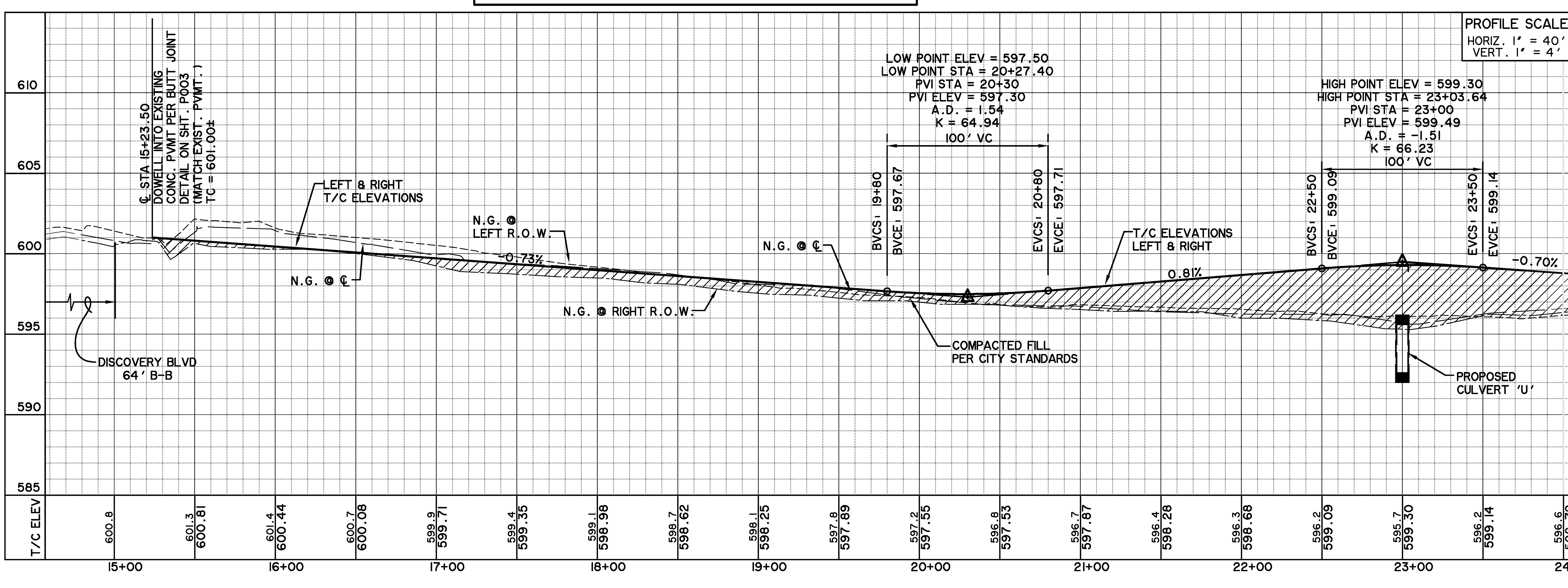

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ROCKWALL TECHNOLOGY PARK PHASE IV

DATA DRIVE PAVING PLAN AND PROFILE STA 14+50 TO STA 25+00

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 10-17-2013
WA# 12209

SHEET NO. P110

FILE: P110-Pav-Data Drive-12209.dwg

TIME: 11:35

MATCHLINE SHEET P110
STA. 24+00

JOHN H. B. JONES SURVEY
ABSTRACT NO. 125

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

SEE SHEET No. P115 FOR PLAN-PROFILE CAPITAL BOULEVARD

PI CURBS
22.50' LT STA: 31+54.03
DATA DRIVE
TP = 603.34

CONSTRUCT BARRIER FREE RAMP FOR FUTURE 5' WIDE SIDEWALK SEE CITY OF ROCKWALL DETAILS FOR CONSTRUCTION OF RAMPS

22.50' LT STA: 31+29.64
DATA DRIVE
TC = 603.57
TP = 603.07

CAPITAL BLVD.

ROBERT BOYD IRVINE SURVEY
ABSTRACT NO. 120

THE WHITMORE MANUFACTURING Co.
VOL. 6473, PG. 93
VOL. 6393, PG. 322
D.R.R.C.T.

46.37' LT STA: 31+55.12
DATA DRIVE
TC = 604.19
TP = 603.69

FUTURE S.D.

A CONSTRUCT 45 L.F. OF BARRICADE
SEE DETAIL SHEET P003 FOR DETAIL

NOTE:
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5) DATA DRIVE DESIGN SPEED = 35 MPH.

22.5' LT ST STA: 25+73.58
= INSIDE FACE @ INLET
CONSTRUCT 10' CURB INLET 'T5'

PI STA: 26+53.72
Δ = 00°02'15" LT.
N = 7022344.35
E = 2609901.64

22.5' LT ST STA: 29+00.00
= INSIDE FACE @ INLET
CONSTRUCT 10' CURB INLET 'T3'

PROPOSED R.O.W.

PROP. 12" WATER

DATA DRIVE

N 01°38'10" W, 1192.17'

N 01°40'25" W, 522.26'

65' ROW
45' B-B
10'
10'

TREE LINE

PROP. S.D. LINE 'T'

PROPOSED R.O.W.

PROPOSED PAVEMENT

STA: 31+25.00 DATA DRIVE
INSTALL 2-6" GRAY SCHEDULE 40 PVC CONDUITS SEE SHEET P004 FOR DETAILS.

DATA DRIVE (FUTURE)

℄ STA: 31+75.98 DATA DRIVE
=℄ STA 27+98.42 CAPITAL BLVD.

CONST. 45 LF CONCRETE HEADER PER DETAIL SHEET P004

PI CURBS
22.50' RT STA: 31+77.93
DATA DRIVE
TC = 603.61

THE WHITMORE MANUFACTURING Co.
VOL. 6473, PG. 93
VOL. 6393, PG. 322
D.R.R.C.T.

0 40 80 120

22.5' RT ST STA: 25+73.58
= INSIDE FACE @ INLET
CONSTRUCT 10' CURB INLET 'T6'

22.5' RT ST STA: 29+00.00
= INSIDE FACE @ INLET
CONSTRUCT 10' CURB INLET 'T4'

EXIST. TREES WITHIN R.O.W. TO BE REMOVED & DISPOSED (SUBSIDIARY TO CONSTRUCTION)

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 5528, PG. 194
D.R.R.C.T.

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 7270, PG. 307
D.R.R.C.T.

APPROXIMATE LOCATION OF SURVEY LINE

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

VEERARAGHAVAN L.P.
VOL. 4766, PG. 107
D.R.R.C.T.

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PROFILE SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'

LOW POINT ELEV = 597.71
LOW POINT STA = 25+73.58
PVI STA = 25+85
PVI ELEV = 597.50
A.D. = 1.81
K = 55.11
100' VC

BVCS: 25+35
BVCE: 597.85
EVCS: 26+35
EVCE: 598.05

N.G. @ ℄
-0.70%
N.G. @ LEFT R.O.W.
N.G. @ ℄
1.11%
N.G. @ RIGHT R.O.W.
RIGHT AND LEFT T/C ELEVATIONS
COMPACTED FILL PER CITY STANDARDS

℄ STA 31+77.93
END CONCRETE PAVEMENT
CONSTRUCT CONC. HEADER
TC = 603.61

T/C ELEV	598.44	598.09	597.76	597.77	598.22	598.78	599.33	599.89	600.45	601.01	601.56	602.12	602.68	603.24	603.79	604.35	T/C ELEV
	25+00		26+00		27+00		28+00		29+00		30+00		31+00		32+00		33+00

610 605 600 595 590 585

* BENCH MARKS *

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RECORD DRAWING 02/02/2015
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ROCKWALL TECHNOLOGY PARK PHASE IV

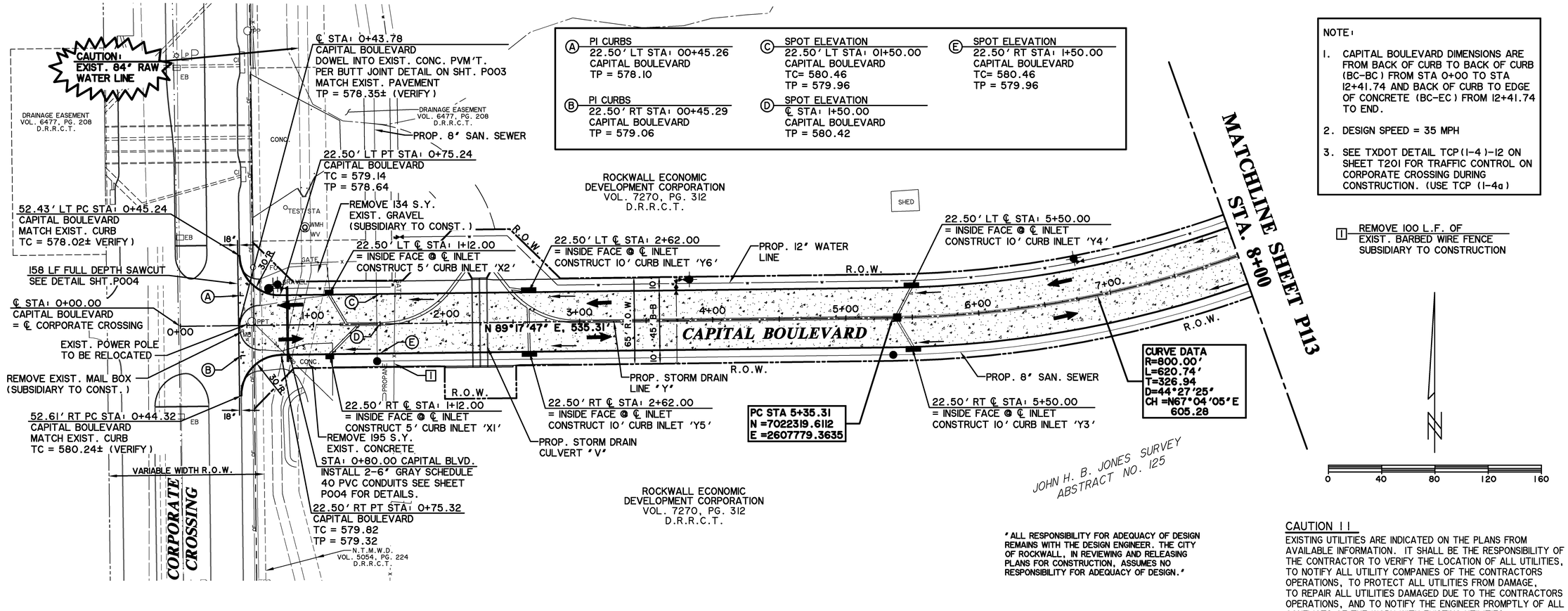
DATA DRIVE
PAVING PLAN AND PROFILE
STA 24+00 TO END

DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
2-2-15

LAST SHEET EDIT
DATE 10-30-2013
WA# 12209

SHEET NO.
P111

FILE: P111-Pav-Data Drive-12209.dwg
TIME: 16:12



Ⓐ PI CURBS 22.50' LT STA: 00+45.26 CAPITAL BOULEVARD TP = 578.10	Ⓒ SPOT ELEVATION 22.50' LT STA: 01+50.00 CAPITAL BOULEVARD TC= 580.46 TP = 579.96	Ⓔ SPOT ELEVATION 22.50' RT STA: 1+50.00 CAPITAL BOULEVARD TC= 580.46 TP = 579.96
Ⓑ PI CURBS 22.50' RT STA: 00+45.29 CAPITAL BOULEVARD TP = 579.06	Ⓓ SPOT ELEVATION ℄ STA: 1+50.00 CAPITAL BOULEVARD TP = 580.42	

NOTE:

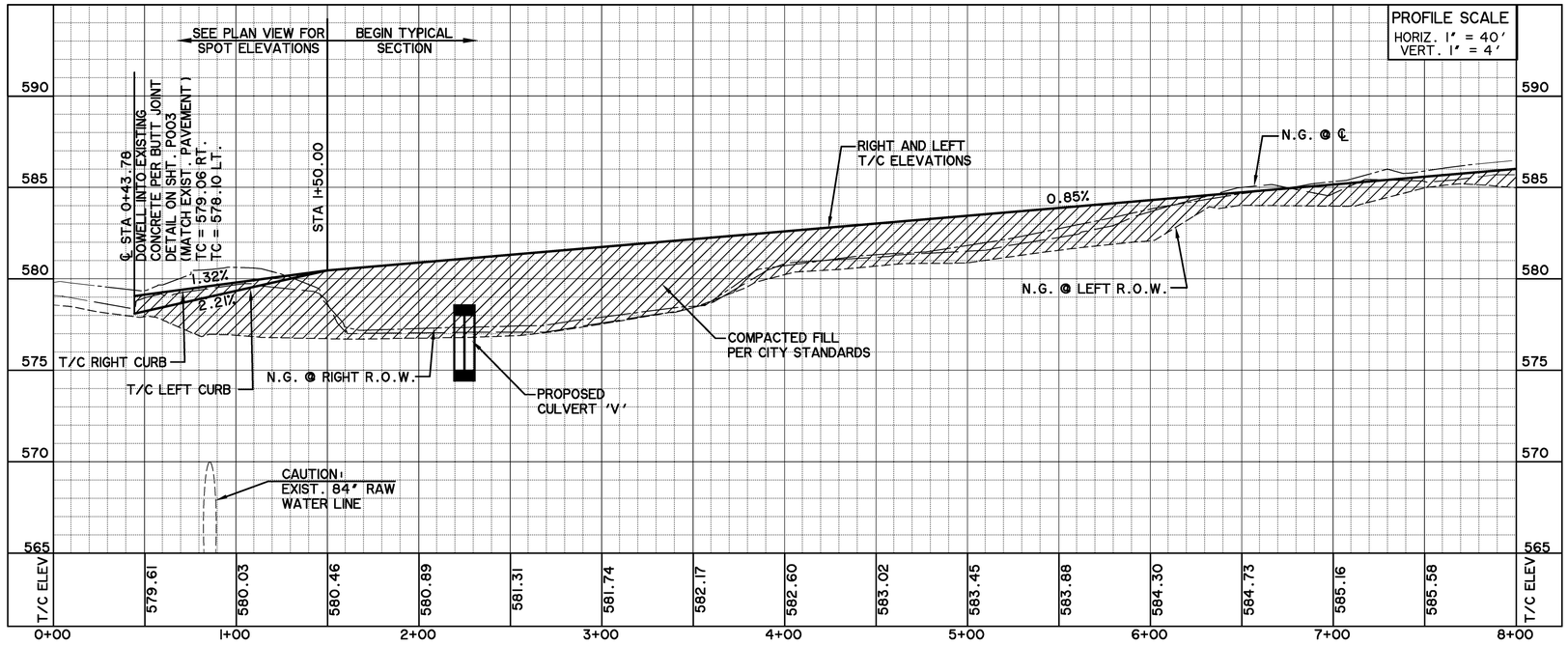
1. CAPITAL BOULEVARD DIMENSIONS ARE FROM BACK OF CURB TO BACK OF CURB (BC-BC) FROM STA 0+00 TO STA 12+41.74 AND BACK OF CURB TO EDGE OF CONCRETE (BC-EC) FROM 12+41.74 TO END.
2. DESIGN SPEED = 35 MPH
3. SEE TXDOT DETAIL TCP(1-4)-12 ON SHEET T201 FOR TRAFFIC CONTROL ON CORPORATE CROSSING DURING CONSTRUCTION. (USE TCP (1-4a)

[1] REMOVE 100 L.F. OF EXIST. BARBED WIRE FENCE SUBSIDIARY TO CONSTRUCTION

"ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN."

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.



• BENCH MARKS •

BM A AN "X" CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN "X" CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C - AN "□" CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

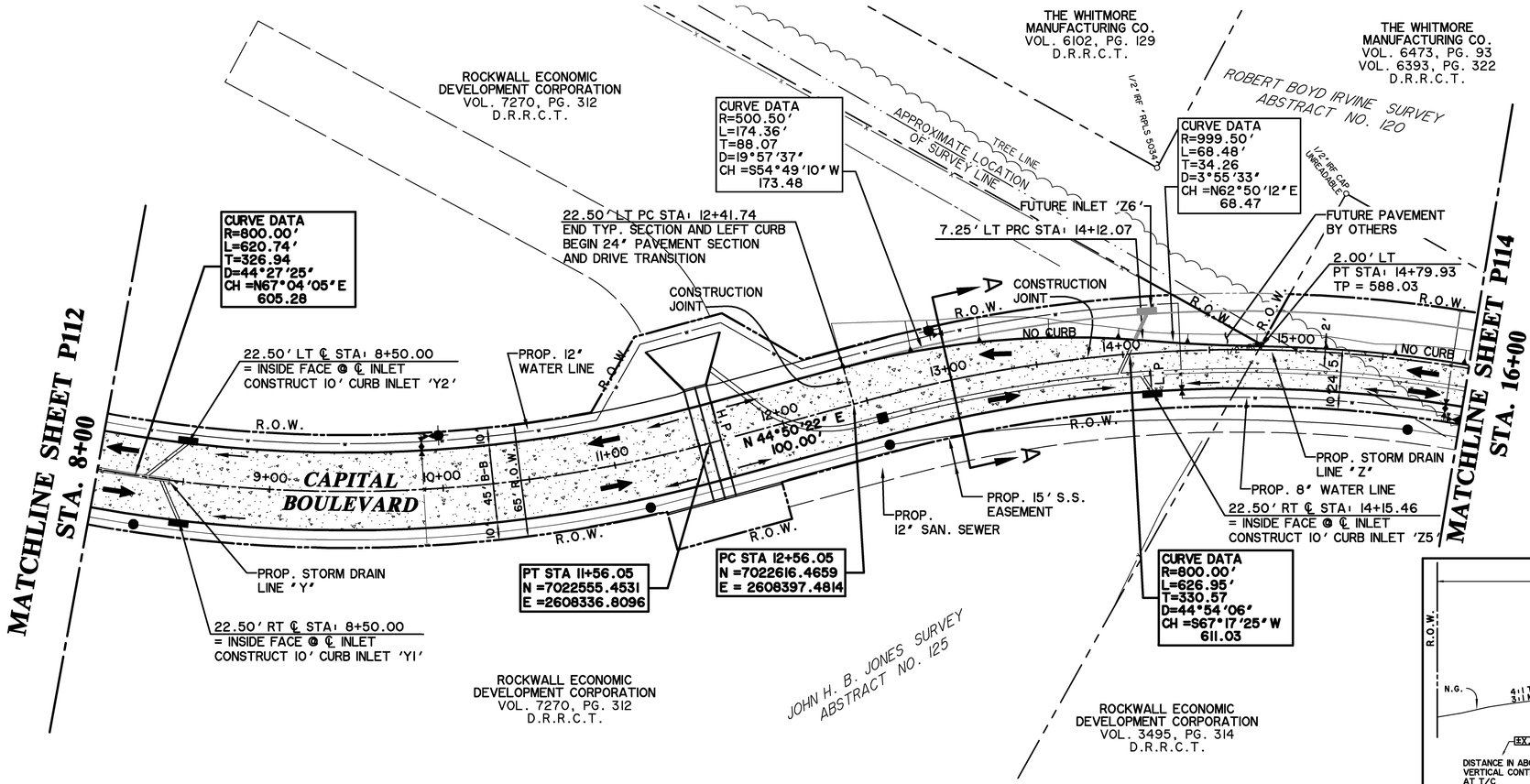
CAPITAL BOULEVARD PAVING PLAN AND PROFILE STA 0+00 TO STA 8+00

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 10-30-2013
WA# 12209

SHEET NO. P112

FILE: P112-Pav-Capitol Blvd-12209.dwg
TIME 16:20



0 40 80 120 160

NOTE:

1. CAPITAL BOULEVARD DIMENSIONS ARE FROM BACK OF CURB TO BACK OF CURB (BC-BC) FROM STA 0+00 TO STA 12+41.74 AND BACK OF CURB TO EDGE OF CONCRETE (BC-EC) FROM 12+41.74 TO END.
2. DESIGN SPEED = 35 MPH

CAUTION !!

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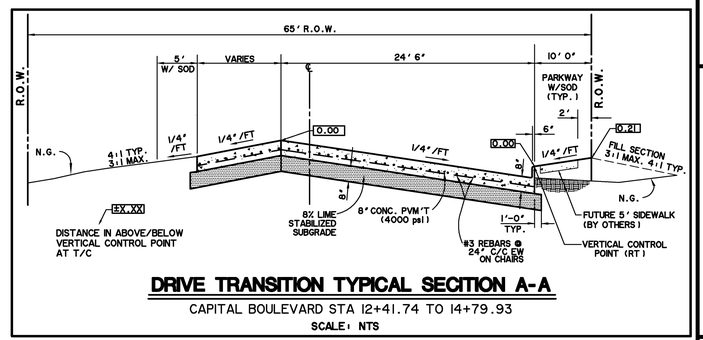
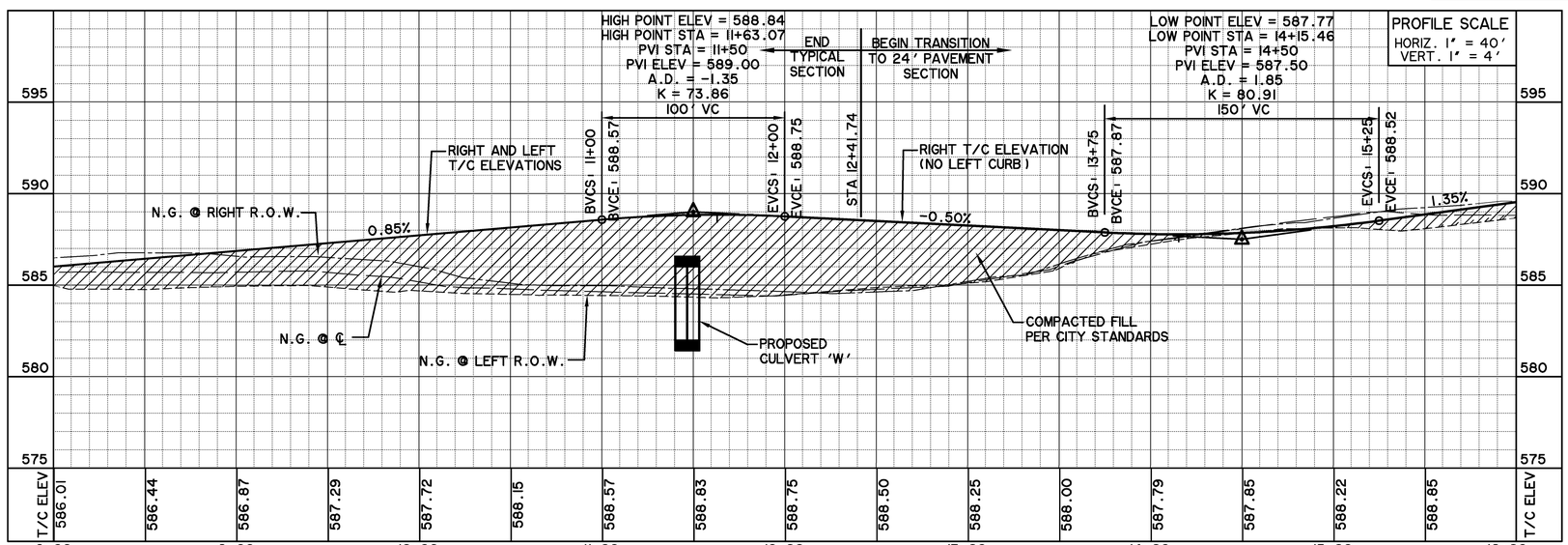


DRIVE TRANSITION TYPICAL SECTION A-A

CAPITAL BOULEVARD STA 12+41.74 TO 14+79.93

SCALE: NTS

" ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN."



*** BENCH MARKS ***

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RECORD DRAWING 02/02/2015

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ROCKWALL TECHNOLOGY PARK PHASE IV

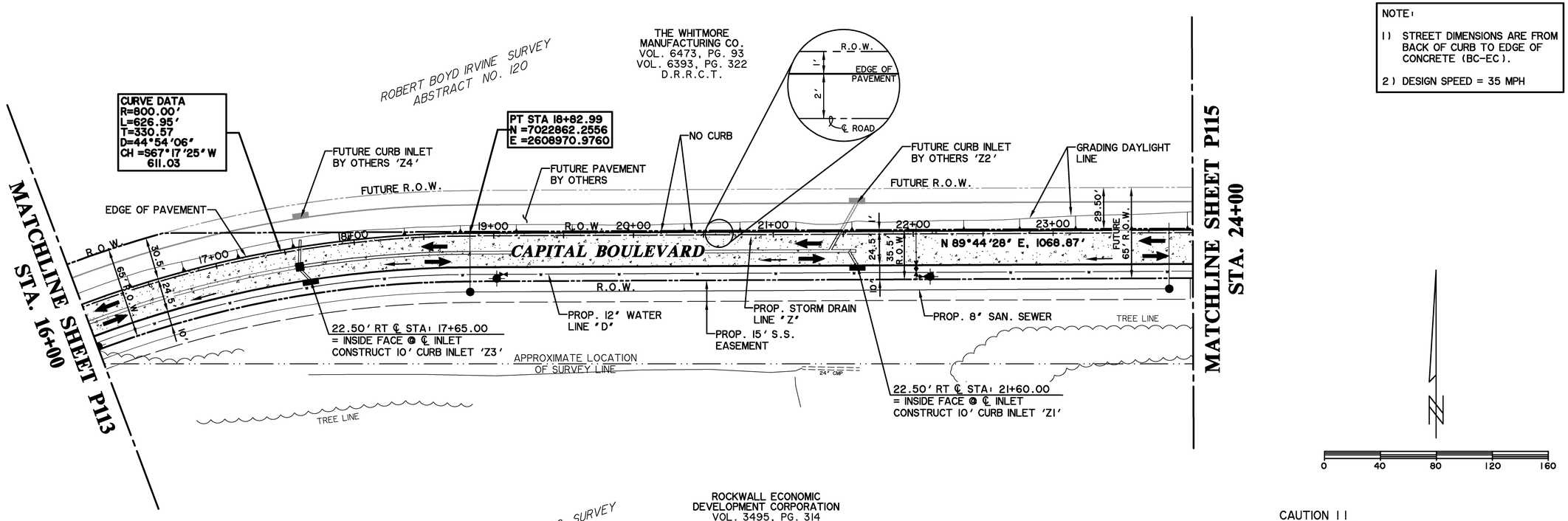
CAPITAL BOULEVARD PAVING PLAN AND PROFILE STA 8+00 TO STA 16+00

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 10-01-2013
WA# 12209

SHEET NO. P113

FILE: P113-Pav-Capitol Blvd-12209.dwg
TIME: 14:40



NOTE:

1) STREET DIMENSIONS ARE FROM BACK OF CURB TO EDGE OF CONCRETE (BC-EC).

2) DESIGN SPEED = 35 MPH

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CAUTION 11

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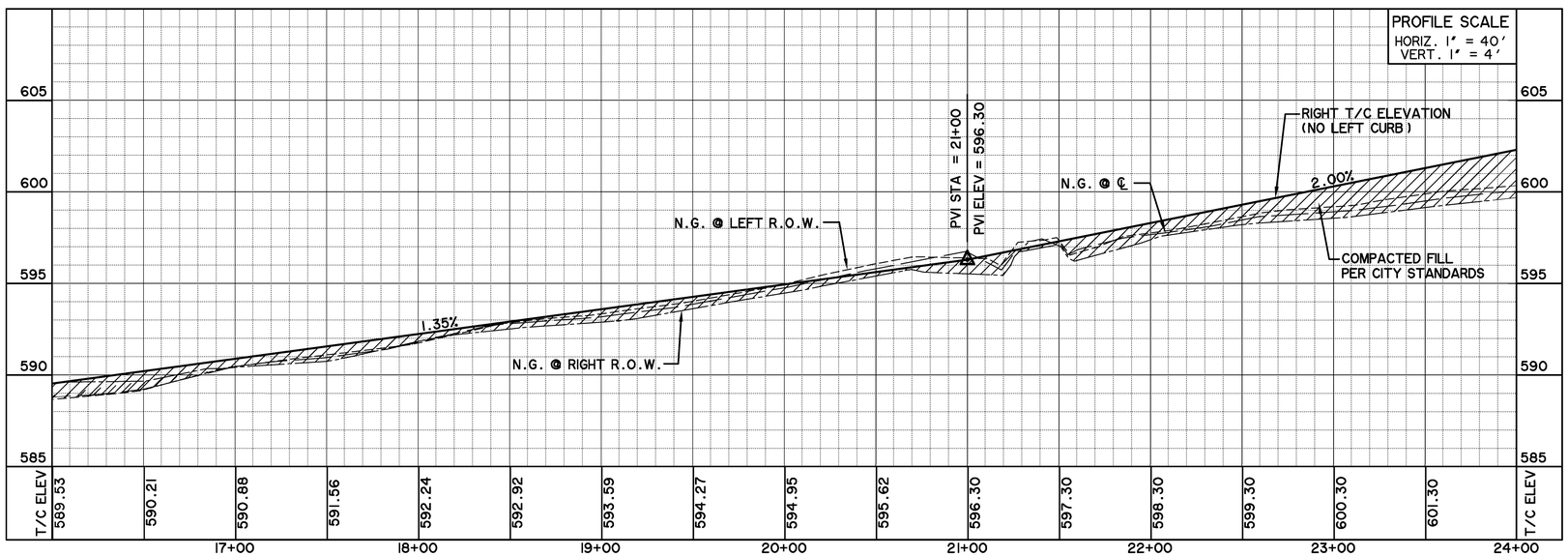

• BENCH MARKS •

BM A AN 'X' CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

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BM C - AN '□' CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

RECORD DRAWING 02/02/2015

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ROCKWALL TECHNOLOGY PARK PHASE IV

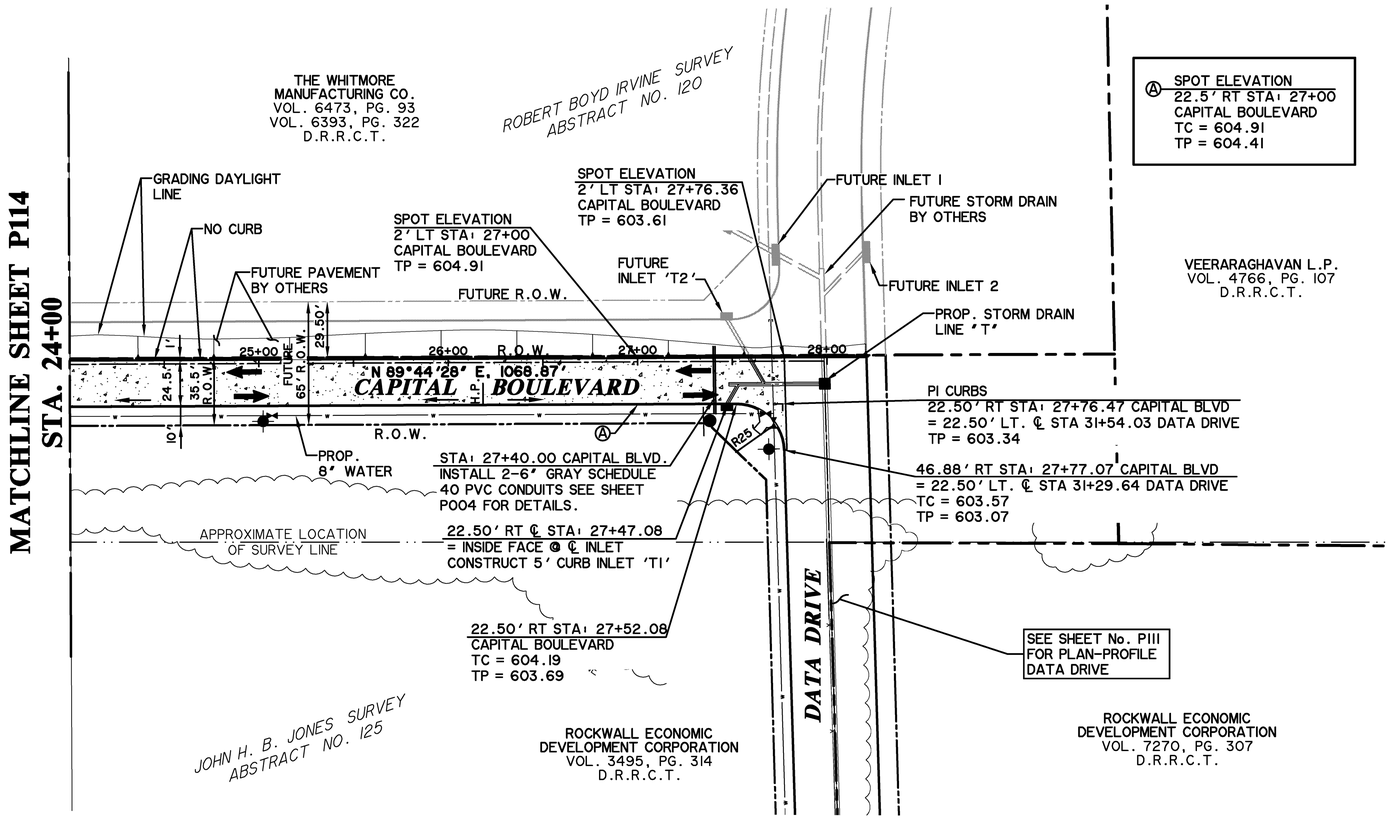
CAPITAL BOULEVARD PAVING PLAN AND PROFILE STA 16+00 TO STA 24+00

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15 RELEASED FOR CONSTRUCTION

LAST SHEET EDIT DATE 10-15-2013
WA# 12209

SHEET NO. P114

TIME: 8:46 FILE: P114-Pav-Capital Blvd-12209.dwg

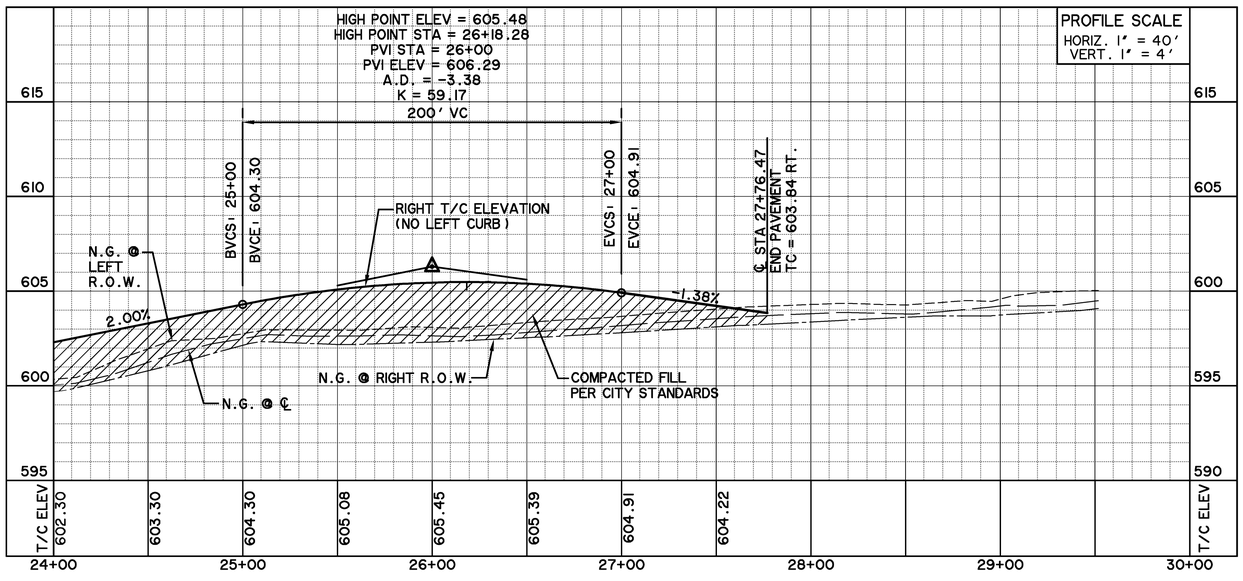


NOTE:

1) STREET DIMENSIONS ARE FROM BACK OF CURB TO EDGE OF CONCRETE (BC-EC).

2) DESIGN SPEED = 35 MPH

0 40 80 120 160



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BENCH MARKS

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BM C – AN "□" CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

RECORD DRAWING 02/02/2015

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701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

ROCKWALL TECHNOLOGY PARK PHASE IV

CAPITAL BOULEVARD PAVING PLAN AND PROFILE STA 24+00 TO END

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 10-17-2013
WA# 12209

SHEET NO. P115

FILE: P115-Pav-Capital Blvd-12209.dwg
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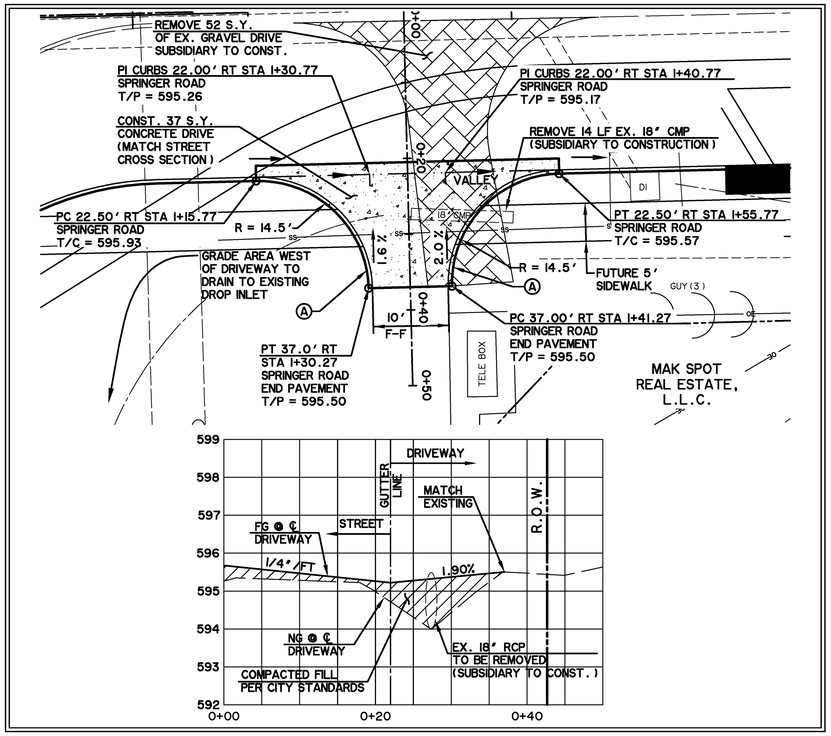
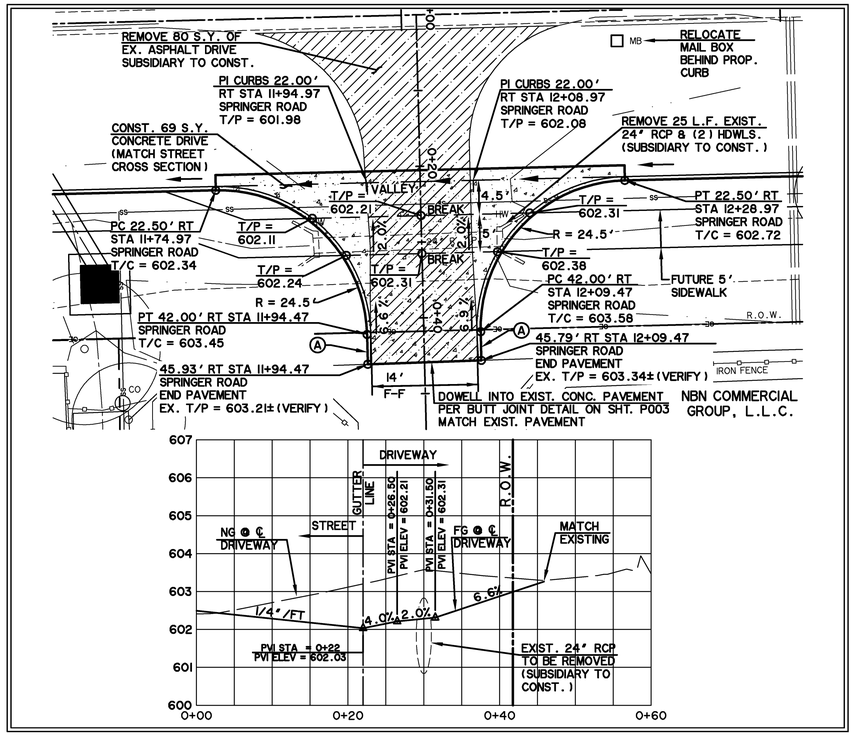


A 5' TRANSITION TO NO CURB

DRIVEWAY 2



A 5' TRANSITION TO NO CURB

CAUTION ! !

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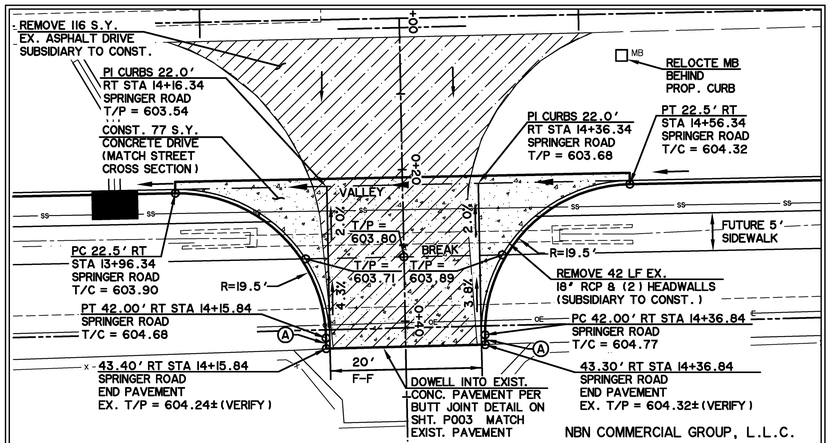
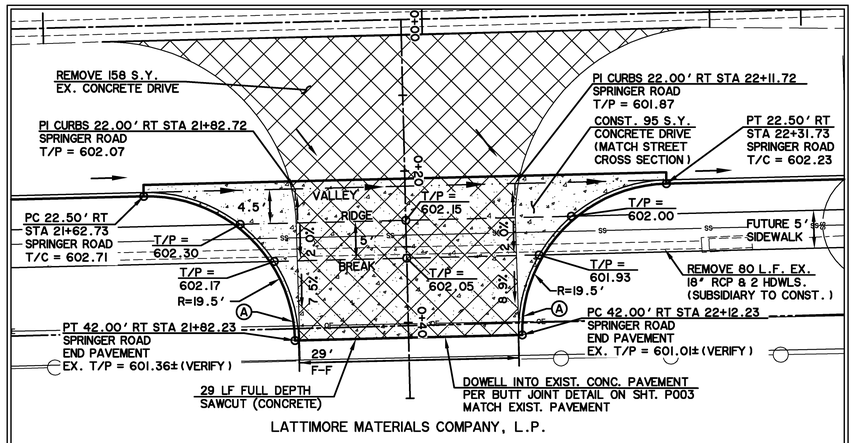
DRIVEWAY 3



A 5' TRANSITION TO NO CURB

DRIVEWAY 4



0 10 20 30

'ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN.'

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ROCKWALL TECHNOLOGY PARK PHASE IV

DRIVEWAYS SOUTH OF SPRINGER ROAD

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT
DATE 10-30-2013
WA# 12209

SHEET NO.
P116

FILE: P116-Driveways-12209.dwg
TIME: 16:28

CAUTION ! !

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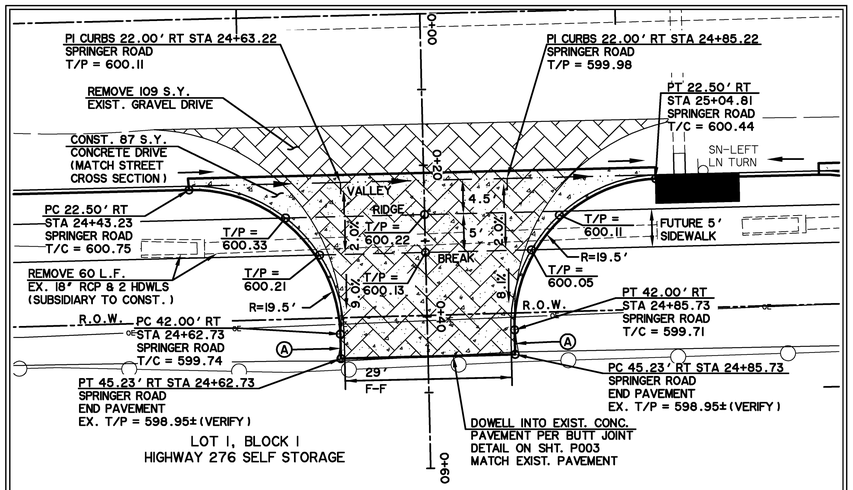
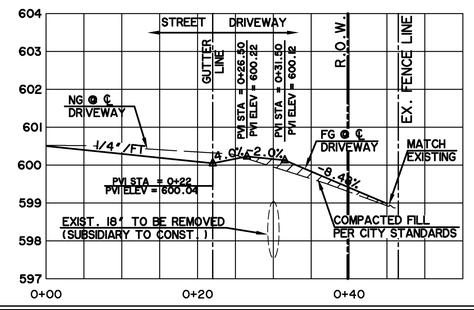
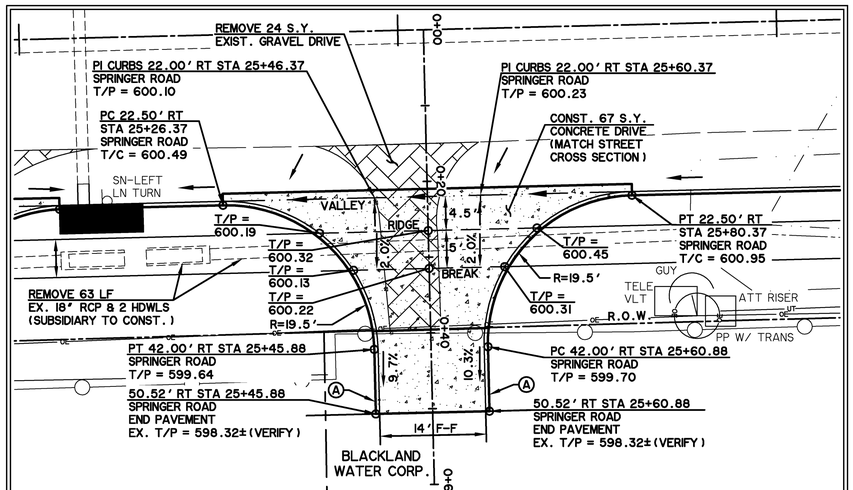
DRIVEWAY 5

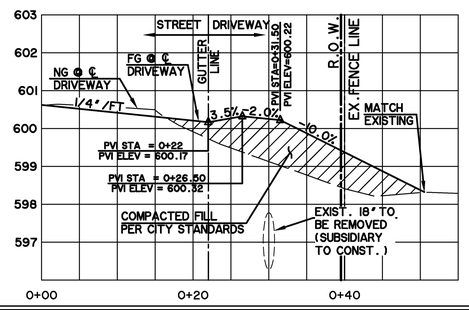


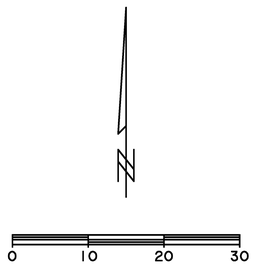
Ⓐ 5' TRANSITON TO NO CURB



DRIVEWAY 6







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RECORD DRAWING 02/02/2015

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ROCKWALL TECHNOLOGY PARK PHASE IV

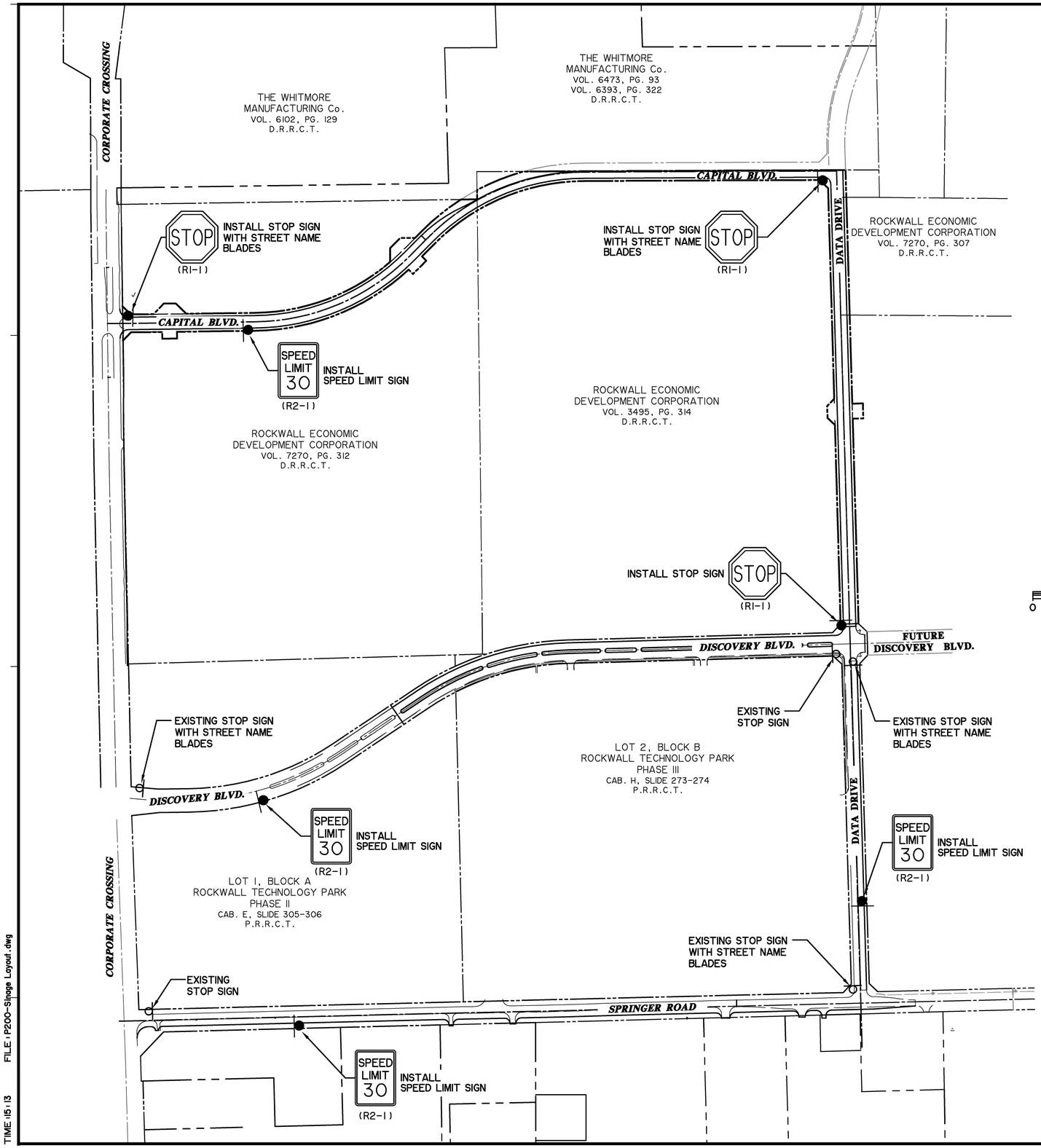
DRIVEWAYS SOUTH OF SPRINGER ROAD

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT
DATE 10-16-2013
WA# 12209

SHEET NO.
P117

TIME 16:24 FILE: P117-Driveways-12209.dwg



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CAUTION I I

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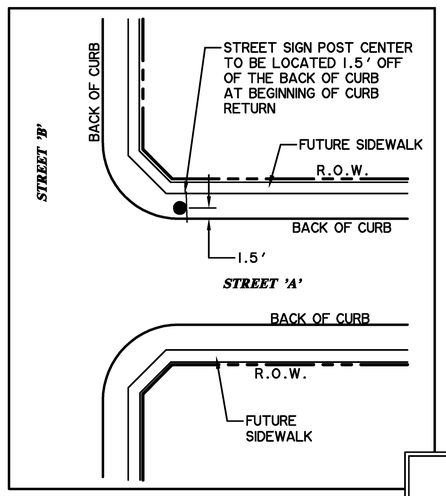
BM C – AN '□' CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

NOTES

1. BLOCK NUMBERS ARE REQUIRED ON ALL STREET NAME BLADES.
2. ALL SIGNAGE INSTALLED SHALL COMPLY WITH THE CURRENT TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
3. STREET NAME BLADES SHALL BE NINE INCHES TALL EXTRUDED ALUMINUM. THE BLADES SHALL BE 0.080 INCHES THICK.
4. HIGH INTENSITY RETROFLECTIVE SHEETING FOR STREET, REGULATORY AND WARNING SIGNS SHALL BE DIAMOND GRADE PRISMATIC TYPE III HIGH INTENSITY.
5. THE LETTERING FOR STREET NAME BLADES SHALL BE HIROAD B-FONT HIGHWAY GOTHIC-8' UPPERCASE 6' TALL LETTERS. LETTERS OF ABBREVIATED STREET DESIGNATIONS SHALL BE 3' TALL AND ALL UPPERCASE (I.E., LN, PKWY, CT,ETC.) BLOCK NUMBERS SHALL BE 3' TALL.
6. THE STREET BACKGROUND SHALL BE GREEN AND THE LEGEND SHALL BE WHITE.
7. STREET BLADE MUST INCORPORATE THE CURRENT CITY OF ROCKWALL LOGO.
8. STREET SIGN POST CENTER SHALL BE LOCATED 1.5' FROM BACK OF CURB.



TYPICAL PLACEMENT DETAIL
N.T.S.

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

ROCKWALL TECHNOLOGY PARK PHASE IV

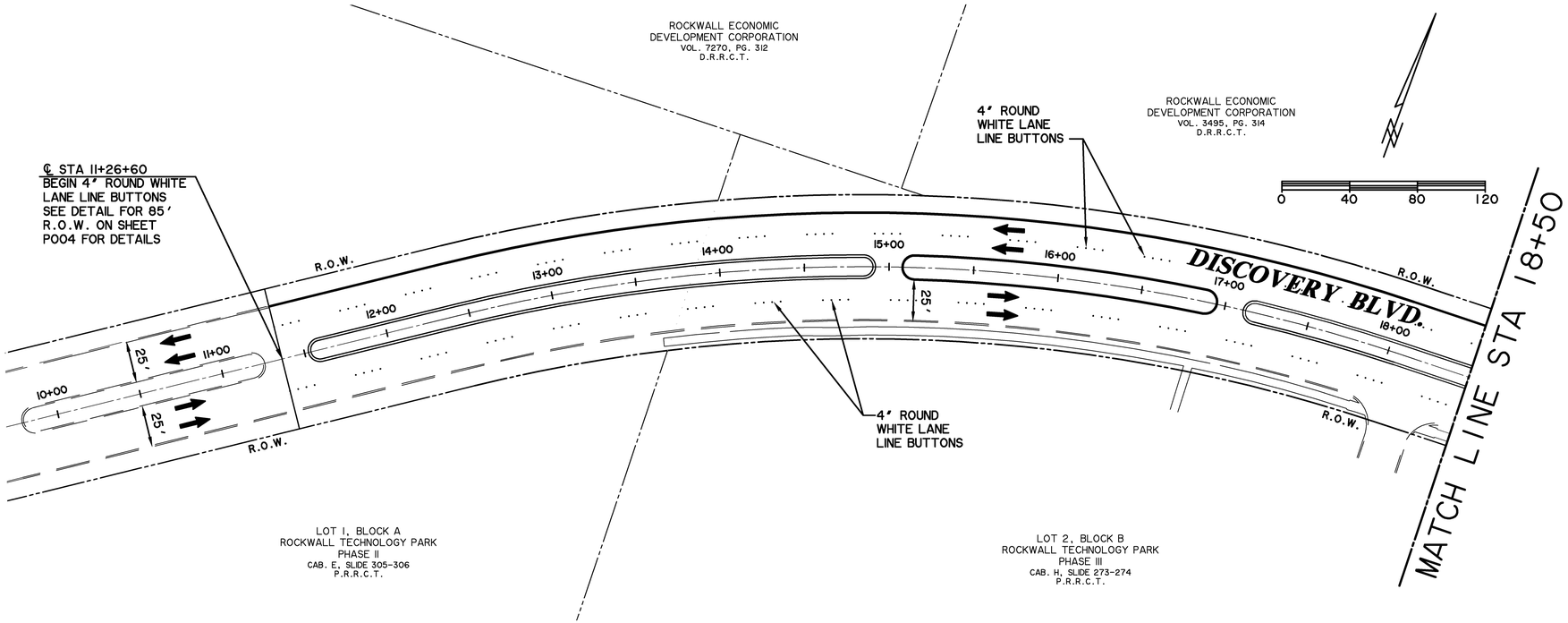
SIGNAGE LAYOUT

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 10-21-2013
WA# 12209

SHEET NO. P200

TIME: 15:13 FILE: P200-Singe Layout.dwg



• BENCH MARKS •

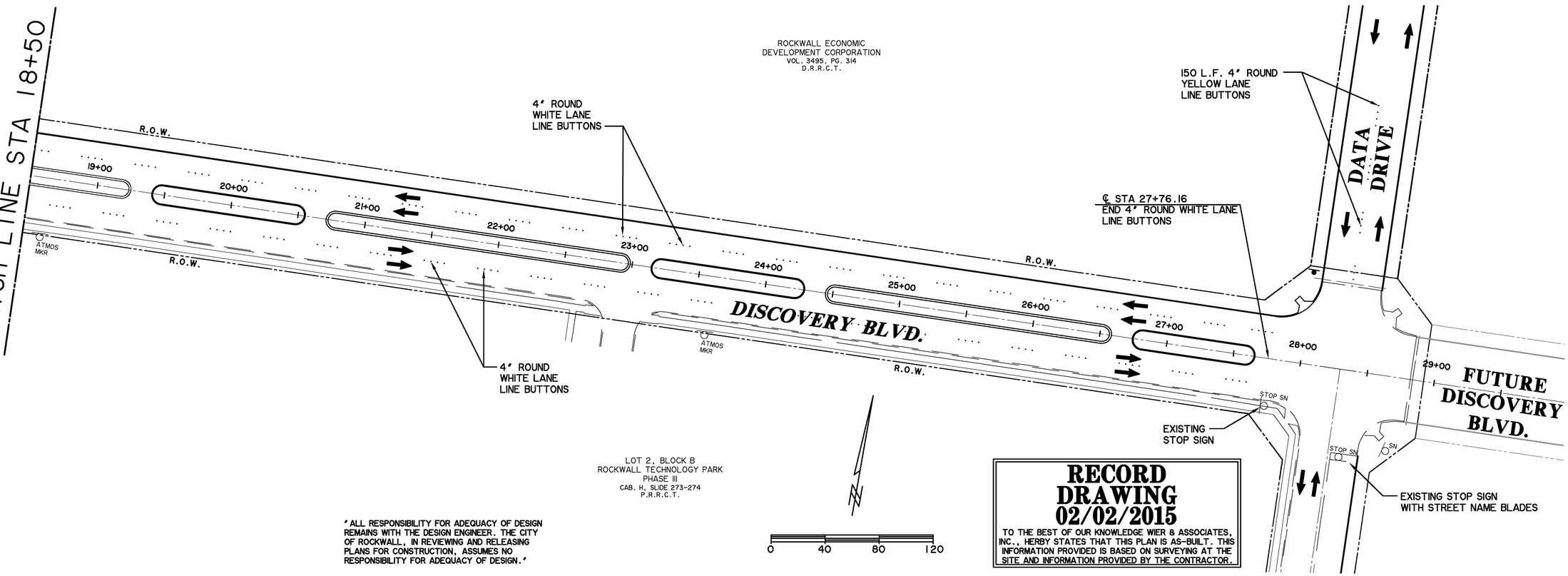
BM A AN "X" CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN "X" CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C – AN "□" CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

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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ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
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ROCKWALL TECHNOLOGY PARK PHASE IV

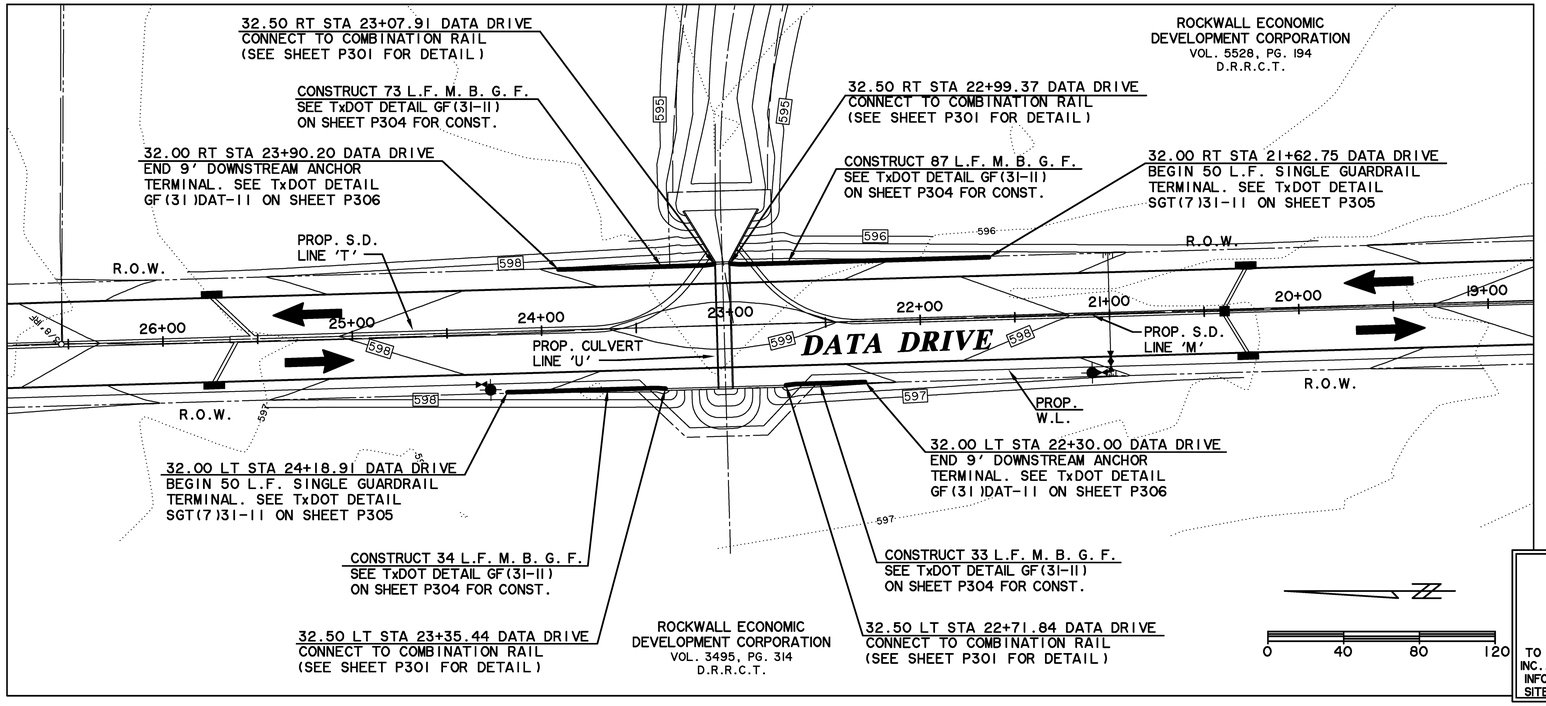
STRIPING PLAN FOR DISCOVERY BLVD & DATA DRIVE

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 10-15-2013
WA# 12209

SHEET NO. P201

FILE: I:P201-Striping Plan Discovery & Data.dwg
TIME: 13:22



TRAFFIC FLOW DIRECTION

• BENCH MARKS •

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BM B AN 'X' CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

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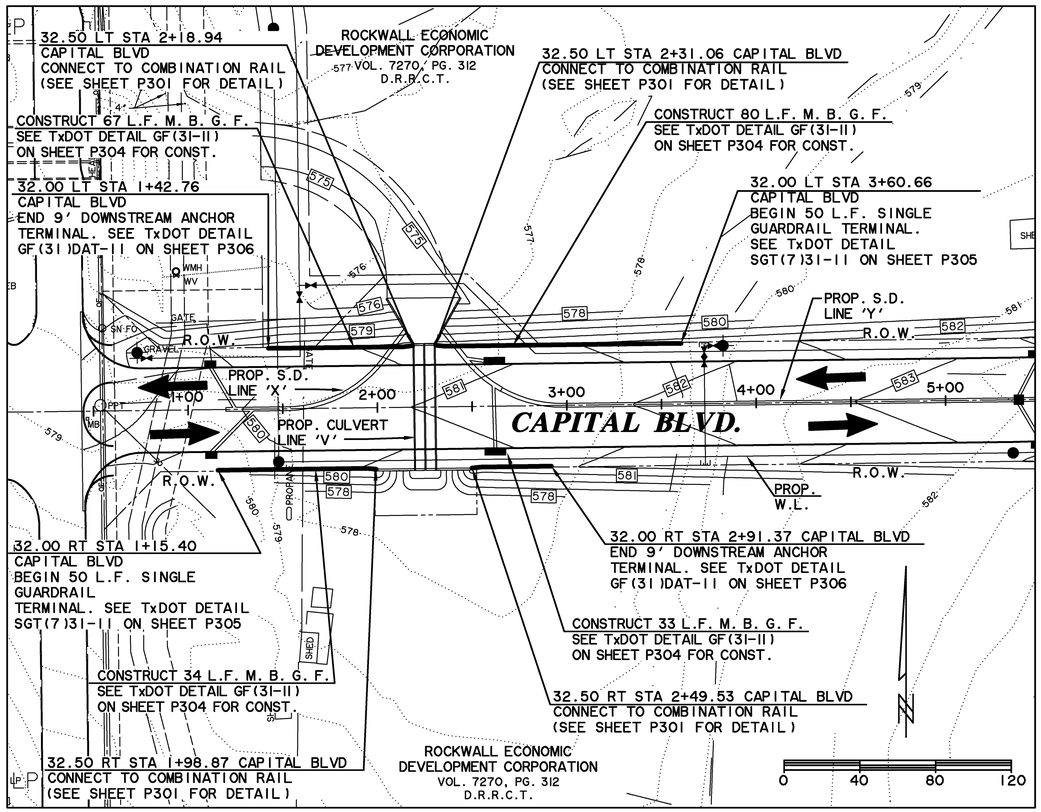

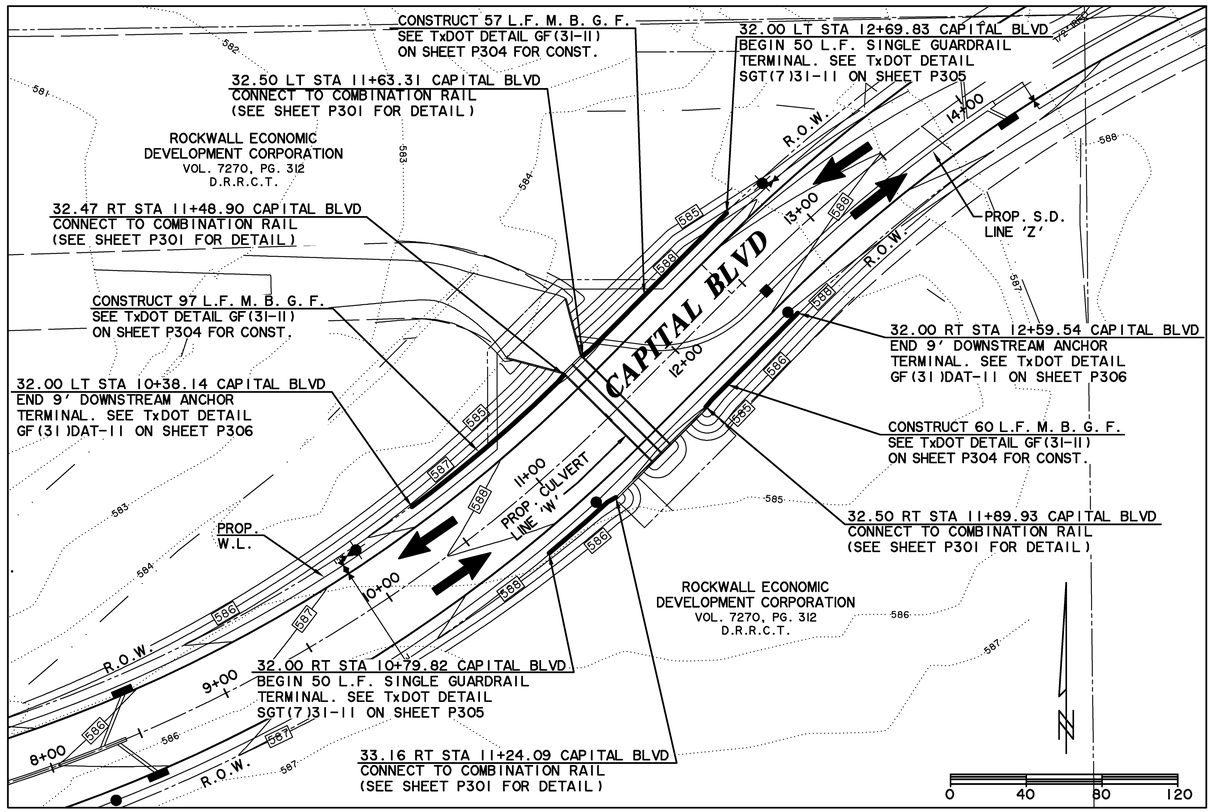

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ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
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ROCKWALL TECHNOLOGY PARK PHASE IV

GUARDRAIL LAYOUT

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED
PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 10-01-2013
WA# 12209

SHEET NO. P202

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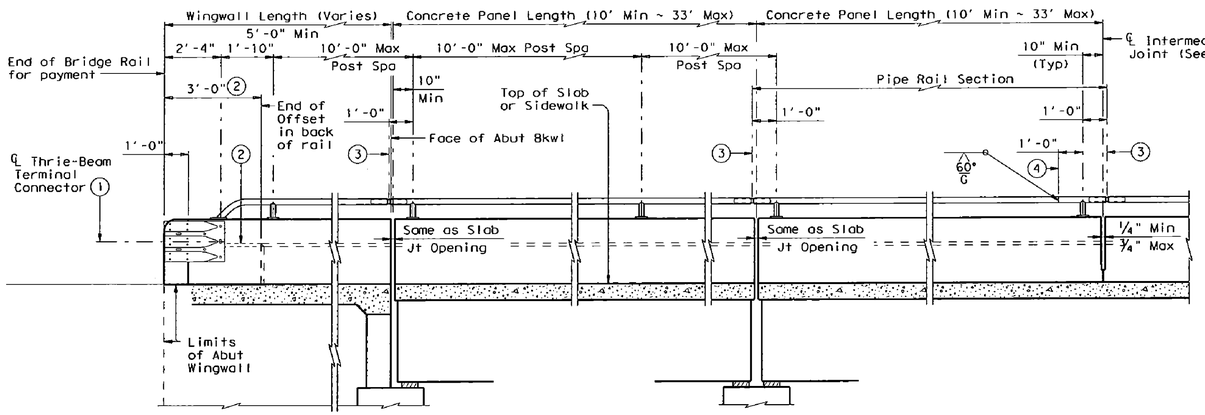
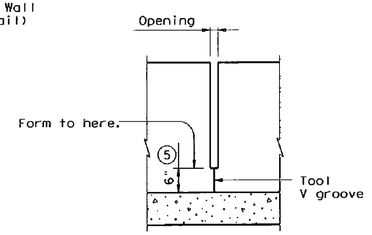
TIME: 15:07



AT ABUTMENT BENTS | AT SLAB EXP JOINTS | AT INTERMEDIATE WALL JOINTS

ROADWAY ELEVATION OF RAIL



INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints. Space equally in between at 33' Max, 10' Min. Location independent of pipe rail splices.

(1) Terminal Connectors and associated hardware are to be paid for under the item "Metal Beam Guard Fence". Metal Beam Guard Fence Transitions must be attached to the bridge rail and extended along the embankment unless otherwise shown in the plans.

(2) Back of rail offset may, with Engineer's approval be continued to the end of the railing.

(3) ℄ Exp Joint or Splice Joint as required.

(4) One shop splice per pipe rail section is permitted with minimum 85 percent penetration. The weld may be square groove, or single vee groove. Grind smooth.

(5) Increase 2" for structures with overlay.

(6) Bolts must be of sufficient length to extend 1/2" to 3/4" beyond nut.

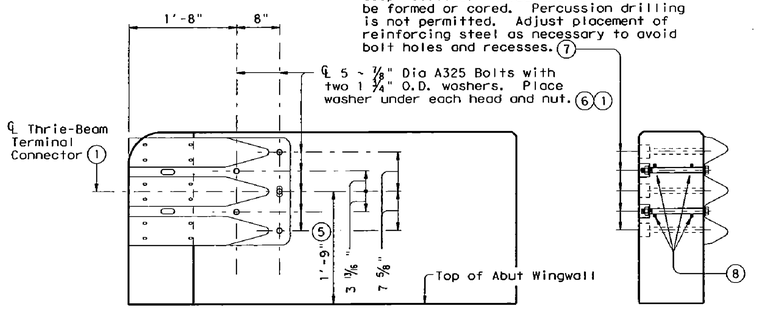
(7) Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail.

(8) 4 additional Bars R(#4) 3'-8" in length must be placed inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.

(9) 2 1/2" Std Pipe (2.875" O.D. 0.203" wall thickness)

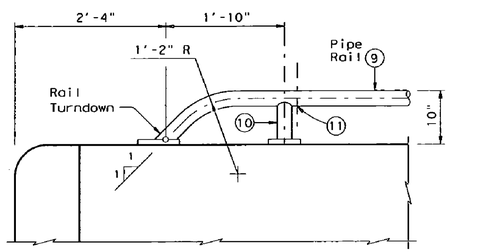
(10) 2" Std Pipe (2.375" O.D., 0.154" wall thickness)

(11) 3/8" Dia Hole in bottom of pipe or tube (Minimum 1 hole between posts ~ Typ)



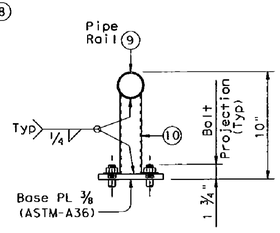
ELEVATION | SECTION

TERMINAL CONNECTION DETAILS

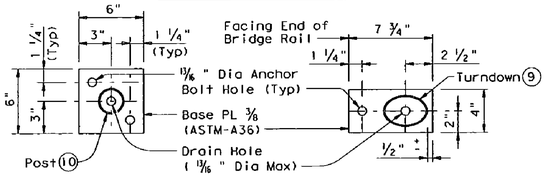


Note that at least two anchor points (as shown) are required for the Bridge Rail on the Abutment Wingwall. Longer Wingwalls may require more than two Rail anchorages.

PIPE RAIL TERMINAL DETAIL

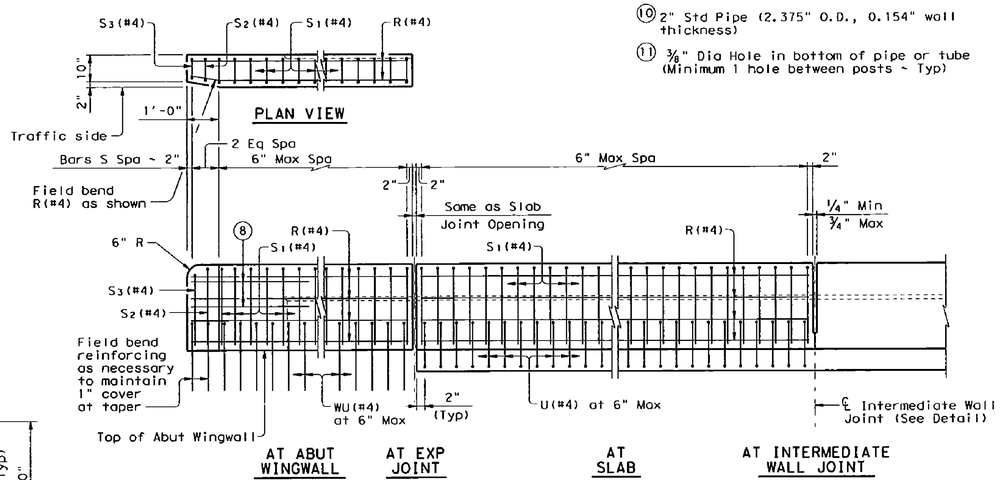


TRANSVERSE SECTION



POST BASE PLATE PLAN | RAIL TURNDOWN BASE PLATE PLAN

PIPE RAIL DETAILS



ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

(Showing without raised sidewalk)

The use of this railing is restricted to design speeds of 45 mph or less.

RECORD DRAWING 02/02/2015

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SHEET 1 OF 3

Texas Department of Transportation
Bridge Division

COMBINATION RAIL

TYPE C221

FILE: rlstd018.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2009	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 05-11: Wall Joint Note. 07-12: Guardrail Transition.	COUNTY	CONTROL	SECT	JOB	HIGHWAY

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701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
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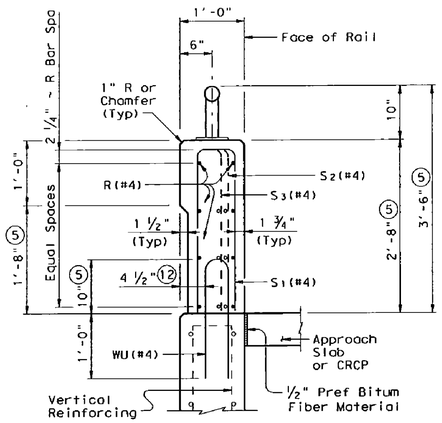
ROCKWALL TECHNOLOGY PARK PHASE IV

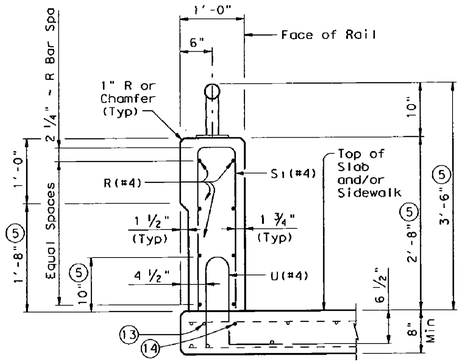
TXDOT COMBINATION RAIL TYPE C221 (1 OF 3)

LAST SHEET EDIT DATE 08-30-2013
WA# 12209

SHEET NO. P301

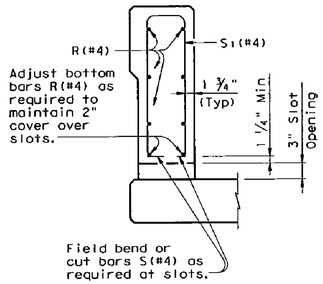


ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS

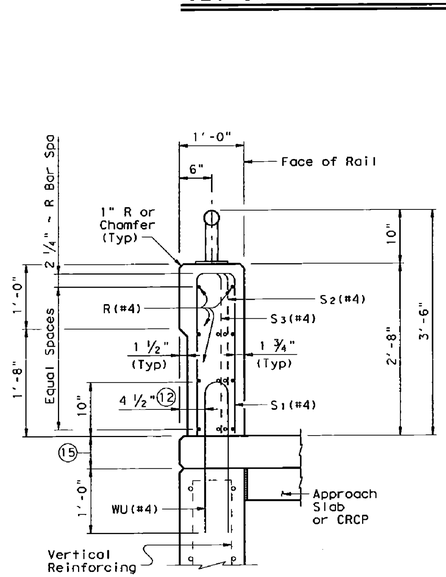


ON BRIDGE SLAB

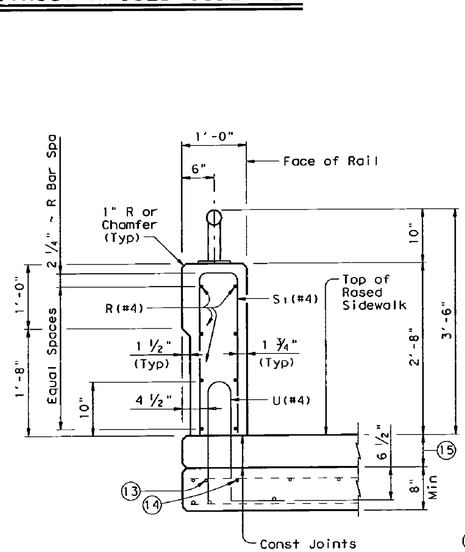
SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK



SECTION THRU OPTIONAL SIDE SLOT DRAIN

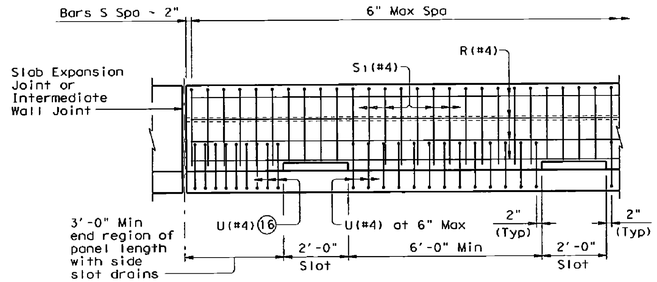


ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



ON BRIDGE SLAB

SECTIONS THRU RAIL WITH RAISED SIDEWALK



OPTIONAL SIDE SLOT DRAIN DETAIL

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.

(5) Increase 2" for structures with overlay.

(12) 5 1/2" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(13) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractors expense.

(14) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(15) Raised Sidewalk

(16) Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greator to side slot drain.

RECORD DRAWING 02/02/2015

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SHEET 2 OF 3

Texas Department of Transportation
Bridge Division

COMBINATION RAIL

TYPE C221

FILE: rlstd018.dgn	DW: TxDOT	CK: TxDOT	DW: JTR	CK: JMH	
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REVISIONS					
05-11: Wall Joint Note. 07-12: Guardrail Transition.	COUNTY		CONTROL	SECT	JOB	HIGHWAY

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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

ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT COMBINATION RAIL TYPE C221 (2 OF 3)

LICENSED STATE OF TEXAS DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

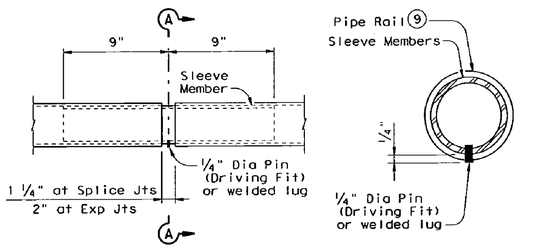
LAST SHEET EDIT DATE 09-30-2015
WA# 12209

SHEET NO. P302

FILE: P302-TXDOT-COMB-RAIL-C221(2)_12209.dwg
TIME: 13:26

RAIL DATA FOR HORIZONTAL CURVES

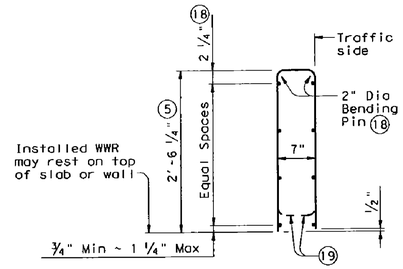
	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
Pipe Rail	Over 2800'	29'-0"	Straight rail panels
	Over 1400' thru 2800'	14'-6"	To required radius or to chords shown (17)
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius (17)



AT SPLICE OR EXP JTS — SECTION A-A

The difference between the outside dimension of sleeve and inside dimension of pipe rail must not exceed 0.167" before galvanizing. Minimum wall thickness of sleeve is 0.120".

PIPE SPLICE DETAILS



OPTIONAL WELDED WIRE REINFORCEMENT (WWR)

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
	No. of Wires	Spacing
Minimum	8	4"
Maximum	10	8"
Maximum Wire Size Differential	The smaller wire must have an area of 40% or more of the larger wire.	

CONSTRUCTION NOTES:

This railing may be constructed with slip-forms when approved by the Engineer, with equipment approved by the Engineer and when epoxy adhesive anchor bolts are used. Slip-forming parapet is not allowed if anchor bolts are cast with parapet wall. Sensor control for both line and grade must be provided. Tack welding to provide bracing for slip-form operations is acceptable. Welding can be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to U, WU and S bars at any location on the cage. If increased bracing is needed, additional anchorage devices must be added and welding must be performed in the upper two thirds of the cage.

Face of rail, parapet must be plumb unless otherwise approved by the Engineer. Pipe rail posts must be square to the top of parapet. Use epoxy mortar under post base plates if gaps larger than 1/16" exist.

Exposed edges of pipe rail and pipe rail posts must be rounded or chamfered to approximately 1/16" by grinding.

At the contractor's option anchor bolts may be cast with the parapet (See Cast-in-Place Anchor Bolt Options).

Pipe rail sections must not include less than two posts, and no more than four (except at Abutment

Chamfer all parapet exposed corners.

MATERIAL NOTES:

All steel components except reinforcing must be galvanized unless otherwise shown on plans.

Use Class "C" concrete. Use Class "C" (HPC) if required elsewhere.

All reinforcing must be Grade 60.

Epoxy coat all rail reinforcement if slab bars are epoxy coated.

Deformed welded wire reinforcement (WWR) may be used as an option to conventional reinforcement and must be made in accordance with ASTM A497 (Deformed Wire). Combinations of Reinforcing Steel and WWR or configurations of WWR other than shown will be permitted when the conditions in the table are satisfied.

Pipe for pipe rail must conform to ASTM A53 Grade B or A500 Grade B.

Anchor bolts must be 5/8" Dia ASTM A36 fully threaded rods with one hex nut and one hardened steel washer at each bolt. Embed threaded rods into parapet wall with a Type III Class C epoxy anchorage system. Minimum embedment depth is 3". Anchorage system chosen must be able to achieve an ultimate tensile resistance of 8.4 kips per bolt. The Contractor must provide evidence to the Engineer that this can be achieved. Evidence of adequate tensile resistance can be based on the manufacturer's published values of ultimate tensile strength (anchor spacing and edge distance must be accounted for). Anchor installation, including hole size, drilling, and clean-out, must be in accordance with the manufacturer's instructions.

Optional cast-in-place anchor bolts must be 5/8" Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt.

GENERAL NOTES:

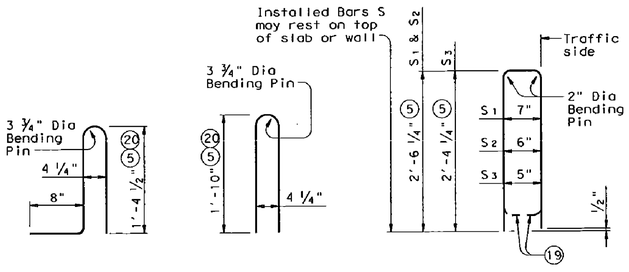
This rail, without the pipe rail, has been evaluated and accepted to be of equal strength to railings with like geometry, which have been crash tested to meet NCHRP Report 350 TL-4 criteria. However, its use is limited to design speeds of 45 mph or less due to the presence of the pipe rail.

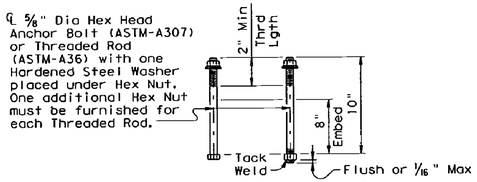
This railing cannot be used on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Erection drawings showing panel lengths, rail post spacing, and anchor bolt setting must be submitted to the Engineer for approval.

Average weight of railing with no overlay: 370 plf (Conc)
10 plf (Steel)





CAST-IN-PLACE (21) ANCHOR BOLT OPTIONS

(5) Increase 2" for structures with overlay.
(9) 2 1/2" Std Pipe (2.875" O.D. 0.203" wall thickness)
(17) Shop drawings for approval required for tubular steel sections.
(18) No longitudinal wires may be in top center of cage.
(19) Bend or cut as required to clear drain slots.
(20) For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.
(21) See "Material Notes" for anchor bolt information.

RECORD DRAWING 02/02/2015

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SHEET 3 OF 3

Texas Department of Transportation
Bridge Division

COMBINATION RAIL

TYPE C221

FILE: ristd018.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2009	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
05-15: Bolt Joint Note. 07-12: Guardrail Transition.	COUNTY	CONTROL	SECT	JOB	HIGHWAY

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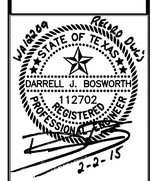
Texas Firm Registration No. F-2776 www.WierAssociates.com

ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT COMBINATION RAIL TYPE C221 (3 OF 3)



LAST SHEET EDIT DATE 09-30-2013
WA# 12209
SHEET NO. P303

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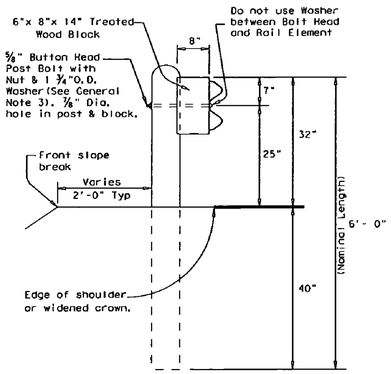
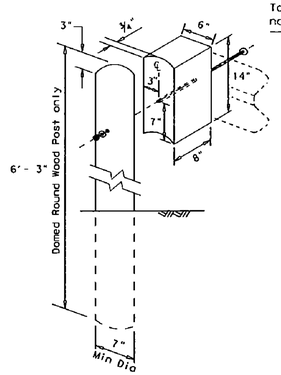
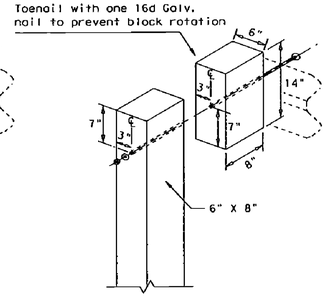


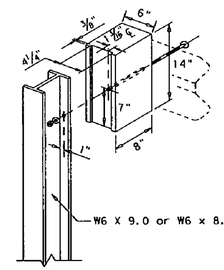
TYPICAL POST



WOOD BLOCK TO ROUND WOOD POST



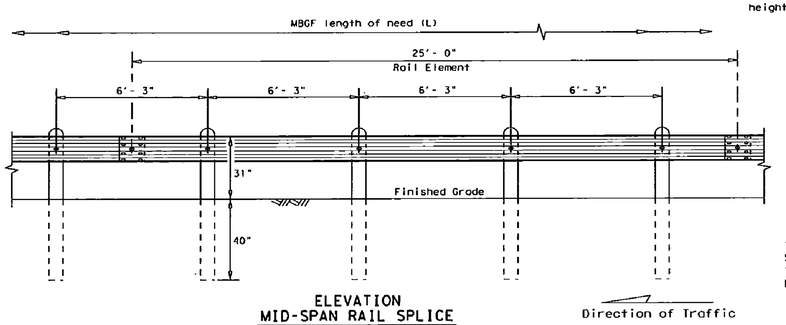
WOOD BLOCK TO RECTANGULAR WOOD POST



WOOD BLOCK TO STEEL POST

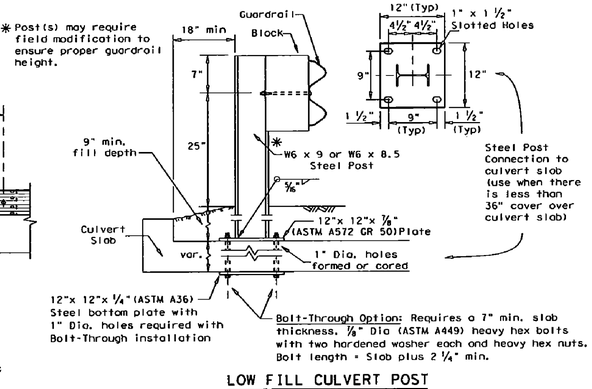
GENERAL NOTES

1. The type of post (round wood post, rectangular wood post, or steel post) will be as shown in the plans. The exact position of MBGF shall be shown in the plans or as directed by the Engineer. Steel posts to be galvanized in accordance with Item 445, "Galvanizing."
2. Rail element shall meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified in the plans. The Contractor may furnish rail elements of 25'- 0", or 12'- 6" (nom.) lengths. Rail elements may have slotted holes at 3'-1½" C-C or 6'-3" C-C. A special length of rail may be manufactured to accommodate the downstream anchor terminal (DAT) and the transition sections of guardrail.
3. Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and Type A (1 ¾" O.D.)washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) are ⅝" x 1 ¼" (or 2" long at triple rail splices) with a ⅝" double recessed nut (ASTM A563). Thrie beam "connection" ⅞" dia. (ASTM A325) hex bolts shall be of sufficient length to extend through the full thickness of the rail, washers, and nuts.
4. Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445, "Galvanizing." Fittings shall be subsidiary to the bid item.
5. Crown shall be widened to accommodate the Metal Beam Guard Fence.
6. The lateral approach to the guard fence, shall have a maximum slope of 1V:10H.
7. If shown elsewhere in the plans or as directed by the Engineer, the guard fence may be flared at a rate of 25:1 or flatter.
8. Unless otherwise shown in the plans, guard fence placed in the vicinity of curbs shall be positioned so that the face of curb is located directly below or behind the face of the rail. Rail placed over curbs shall be installed so that the post bolt is located approximately 25 inches above the gutter pan or edge of shoulder.
9. If solid rock is encountered within 0 to 18" of the finished grade, drill a 22" dia. hole, or drill two 12" dia. front to back overlapping holes, 24" into the rock. If solid rock is encountered below 18", drill a 12" dia. hole, 12" into the rock or to the standard embedment depth, whichever maybe less. Any excess post length, after meeting these depths, may be field cut to ensure proper guardrail mounting height. Backfill with a cohesionless material.
10. Posts shall not be set in concrete, of any depth.
11. Special fabrication will be required at installations having a curvature of less than 150 ft. radius.
12. Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210, "Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or blocks of similar dimensions. The Construction Division, TxDOT maintains a Material Producer List (MPL) for producers of materials conforming to DMS-7210. Only producers on the MPL may furnish composite material posts and/or blocks.
13. For posts located partially or wholly between precast box culvert units, the use of a cast-in-place concrete closure between boxes is required. See Detail "A" on Bridge Standard SCP-MD.



ELEVATION
MID-SPAN RAIL SPLICE

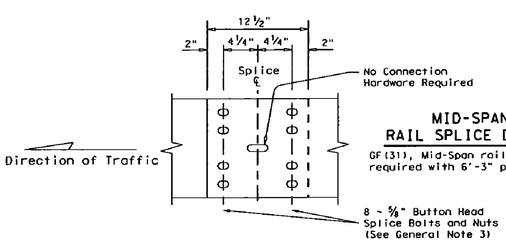
Showing a 25'- 0" section of W-Beam rail, 12'- 6" rail sections may also be supplied (See General Note 2)



LOW FILL CULVERT POST

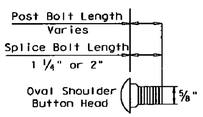
For use on culverts up to 50 ft. in length. Culverts of 25 ft. or less, See GF(31)LS standard for "Long Span" option.

Epoxy Note:
Epoxy Anchor Option: This option may only be used if the culvert slab is 8" min. thick. Threaded anchor rods must be ⅞" Dia. ASTM A449 or A193 Grade B7 with heavy hex nut, and one hardened washer each. Embed anchor rods 6" with Hilti HIT RE 500 epoxy adhesive. Other Type III Class C epoxy adhesives meeting the requirements of DMS-6100, "Epoxies and Adhesives", may be used if it can be demonstrated that they meet or exceed the strength of Hilti HIT RE 500 with the same embedment depth and threaded rod dia. Follow the manufacturer's requirements for installing epoxied threaded rods. Extend rods ¼" min. beyond nut.



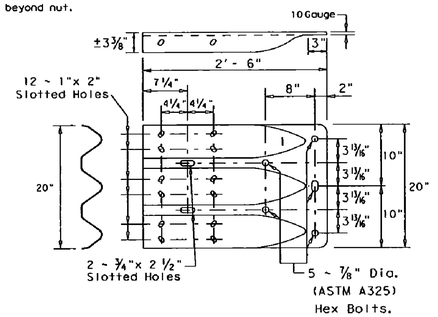
MID-SPAN
RAIL SPLICE DETAIL

GF(31), Mid-Span rail splices are required with 6'-3" post spacings.



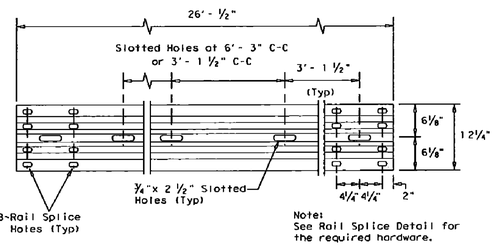
BUTTON HEAD BOLT

Post and Splice Bolts (See General Note 3)



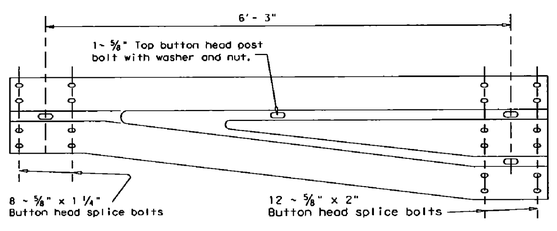
THRIE-BEAM TERMINAL CONNECTION (10 GA.)

(See General Note 3 for required hardware)



ELEVATION 25'- 0"(NOM.) W-BEAM SECTION

12'- 6" rail sections may also be supplied (See General Note 2)



NON-SYMMETRICAL TRANSITION
FROM W-BEAM TO CONCRETE RAIL (10 GA.)

(See GF(31)DAT for Downstream Connection to Concrete Rail)

RECORD DRAWING 02/02/2015

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Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE

GF(31)-11

FILE: gf3111.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
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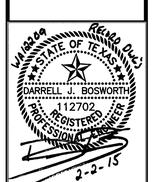
	DIST	COUNTY		SHEET NO.

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

ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT METAL BEAM GUARD RAIL GF (31) - 11



LAST SHEET EDIT DATE 09-30-2015
WA# 12209

SHEET NO. P304

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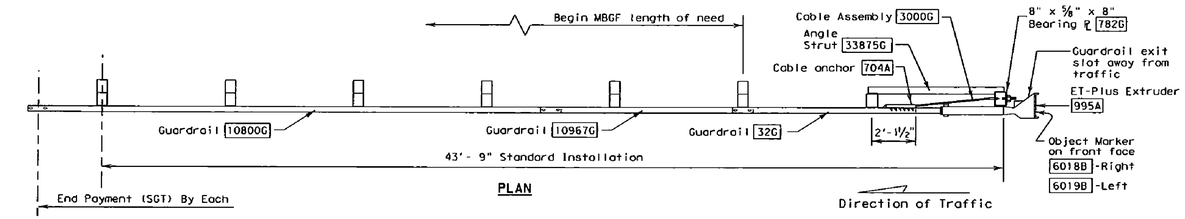
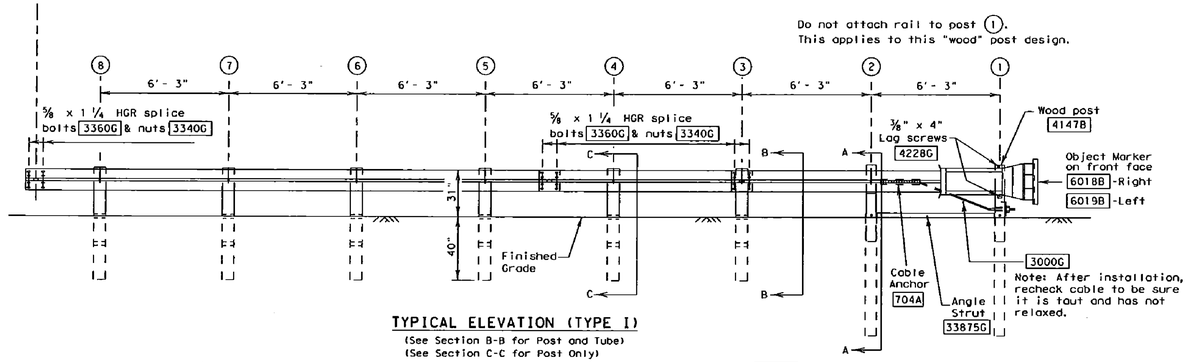
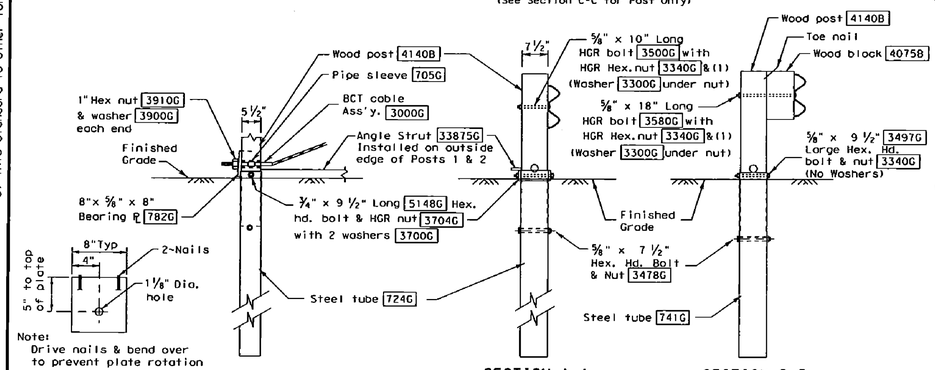
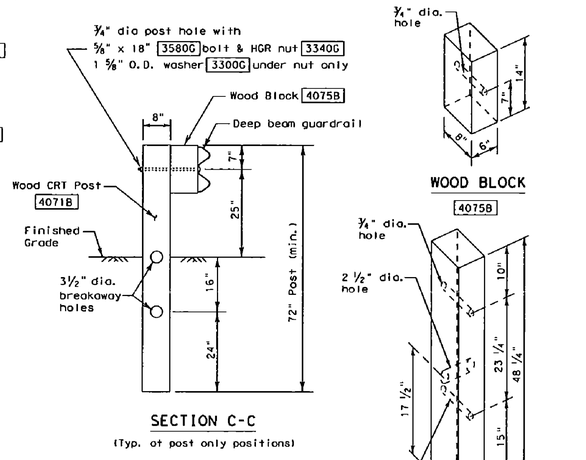
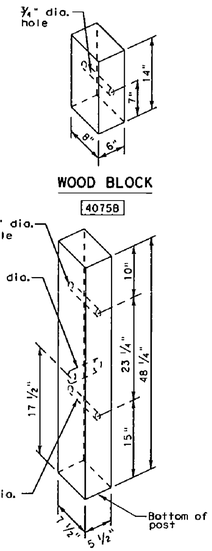




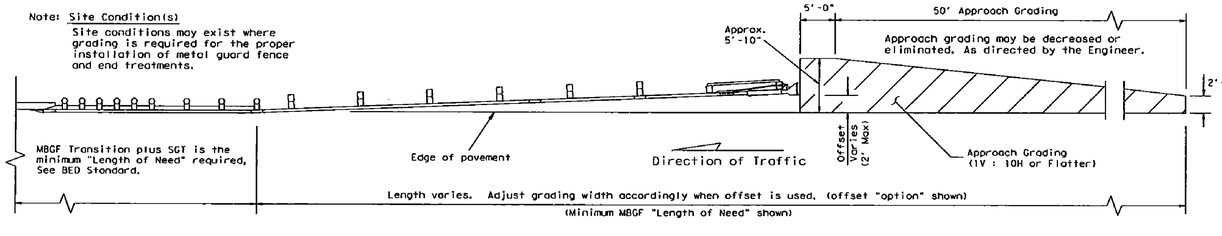
TYPICAL ELEVATION (TYPE I)
(See Section B-B for Post and Tube)
(See Section C-C for Post Only)







POST & TUBE OPTIONS	
Type I	Posts ① thru ②
Type II	Posts ① thru ④
Type III	Posts ① thru ⑧



GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

1. For additional information contact: Trinity Highway Products, 1-800-527-6050.
2. The Type of SGT unit will be specified elsewhere in the plans. Numbers in circles indicate post position. The Type of SGT unit chosen is a maintenance consideration and does not affect the systems performance.

Post & Tube Options		Post Only	
Type I	Posts ① thru ②	Posts ③ thru ⑧	
Type II	Posts ① thru ④	Posts ⑤ thru ⑧	
Type III	Posts ① thru ⑧		

3. SGT's placed within the "minimum" 150 ft. radius, shall be installed straight. Standard rail elements may be installed within the radius, without special fabrication.
4. All bolts, nuts, cable assemblies, cable anchors, steel tubes & bearing plates shall be galvanized.
5. A flare rate of 25:1 may be used to prevent the terminal head from encroaching on the shoulder. The flare may be decreased or eliminated for specific installations, if directed by the Engineer.
6. The steel tubes shall not protrude more than 4 inches above ground. Site grading may be necessary to meet this requirement.
7. The steel tubes may be driven with an approved driving head. They shall not be driven with the wood post in the tube. If the steel tubes are placed in drilled holes, the backfill material must be satisfactorily compacted to prevent tube settlement.
8. If solid rock is encountered. See the manufacturer's installation manual for the proper installation guidance.
9. The breakaway cable assembly must be taut. A locking device, (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening the nuts.
10. The wood blocks shall be "toe nailed" to the rectangular wood posts to prevent them from turning when the wood shrinks.
11. For curb installations, the soil tubes and posts shall be installed at the proper ground elevation behind the curb. The posts will then require field drilling new holes to accommodate the rail to post connection bolt to maintain the proper height of the rail above the gutter pan. The excess post length above the rail will be removed as directed by the Engineer.
12. An object marker shall be installed on the front of the impact head as detailed on D&OM(VIA).
13. A special site evaluation should be considered, prior to using this end treatment where there is less than 25 feet between the extrusion side of the end treatment and any adjacent driving lane.

BILL OF MATERIAL

Code #	POST & TUBE OPTIONS Type I Qty.	Type II Qty.	Type III Qty.	DESCRIPTION
32G	1	1	1	Guardrail (12 Ga) at 12'- 6" (ANC)
10967G	1	1	1	Guardrail (12 Ga) at 9'- 4 ½"
10800G	1	1	1	Guardrail (12 Ga) at 25'- 0"
724G	2	2	2	Steel Tube - 6"x 8"x 72"x ⅛" min
741G	0	2	6	Steel Tube - 6" x 8" x 54" x ⅛" min
4140B	2	4	8	Wood Posts - 5 ½" x 7 ½" x 48 ¼"
4071B	6	4	0	Wood CRT Posts - 6"x 8"x 72"
4075B	6	6	6	Wood Block - 6"x 8"x 14"
705G	1	1	1	Pipe Sleeve - 2" std. pipe x 5 ½"
782G	1	1	1	Bearing Plate - 8"x 8"x ⅝"
704A	1	1	1	Cable Anchor Bracket
3000G	1	1	1	Cable Assembly (¾" x 78")
33875G	1	1	1	Angle Strut
995A	1	1	1	ET-Plus Extruder
5148G	2	2	2	¾" x 9 ½" Hex Hd (Top of tubes 1&2)A325
3300G	7	7	7	⅝" Washers
3478G	2	4	8	⅝" x 7 ½" Hex Bolt
3500G	1	1	1	⅝" x 10" Post Bolt (Post ②)
3580G	6	6	6	⅝" x 18" Post Bolt (Posts ③ thru ⑧)
3360G	24	24	24	⅝" x 1 ¼" Splice Bolt
3340G	33	37	45	⅝" Hex Nut
4228G	2	2	2	⅜" x 4" Lag Screw
3910G	2	2	2	1" Hex Nut
3900G	2	2	2	1" Washer
6018B	1	1	1	Right - Object Marker
6019B	1	1	1	Left - Object Marker
3700G	4	4	4	¾" Washer
3704G	2	2	2	¾" Heavy Hex Nut
3497G	0	2	6	⅝" x 9 ½" Hex Hd (Top of Tubes 3-8)A307

Texas Department of Transportation — Design Division Standard

SINGLE GUARDRAIL TERMINAL (ET-31) (WOOD POST) SGT(7)31-11

FILE: sgt73111.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
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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

ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT SINGLE GUARDRAIL TERMINAL SGT (7) 31 - 11

STATE OF TEXAS — DARRELL J. BOSWORTH — 112702 — REGISTERED PROFESSIONAL ENGINEER — 2-2-15

LAST SHEET EDIT DATE 09-30-2013
WA# 12209

SHEET NO. P305

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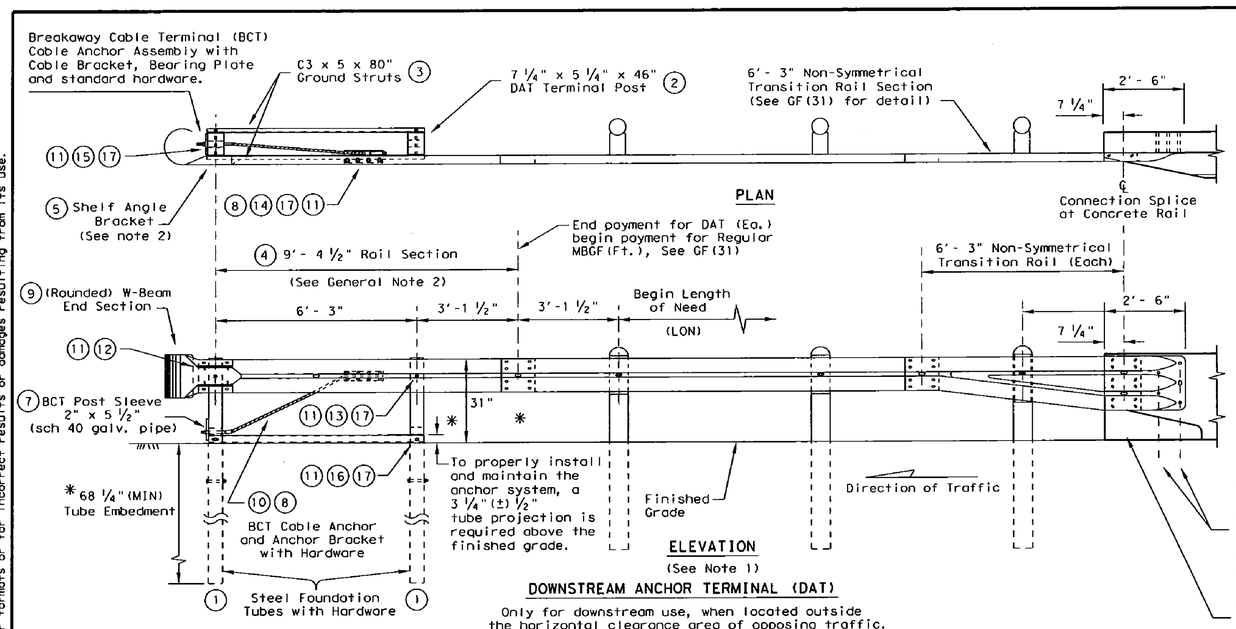
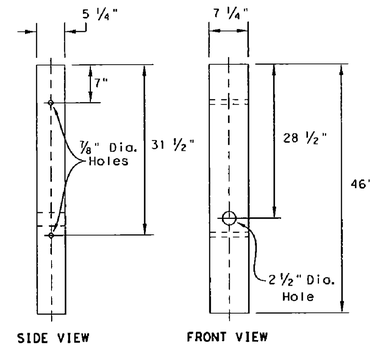


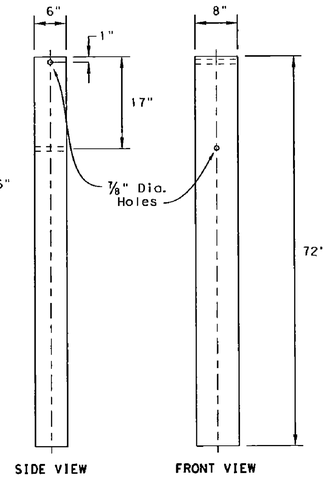
DOWNSTREAM ANCHOR TERMINAL (DAT)

Only for downstream use, when located outside the horizontal clearance area of opposing traffic.



TERMINAL POST

(2) 7 1/4"x 5 1/4"x 46" Wood Post



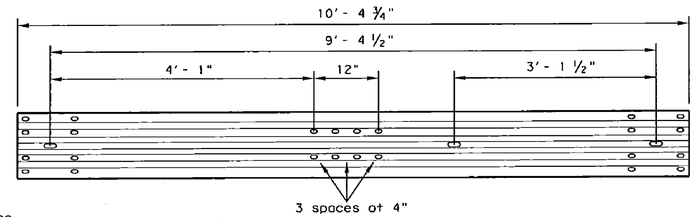
STEEL FOUNDATION TUBE

(1) 6"x 8"x 1/8" x 72" Steel Tube

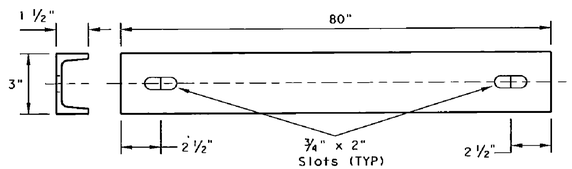
#	(DAT) PARTS LIST	QTY.
(1)	Steel Foundation Tube	2
(2)	DAT Terminal Post	2
(3)	Channel Strut	2
(4)	Terminal Rail Element	1
(5)	Shelf Angle Bracket	1
(6)	BCT Bearing Plate	1
(7)	BCT Post Sleeve	1
(8)	Guardrail Anchor Bracket	1
(9)	(Rounded) W-Beam End Section	1
(10)	BCT Cable Anchor	1
(11)	Recessed Nut, Guardrail	20
(12)	1 1/4" Button Head Bolt	4
(13)	10" Button Head Bolt	2
(14)	5/8" x 2" Hex Head Bolt	8
(15)	5/8" x 8" Hex Head Bolt	4
(16)	5/8" x 10" Hex Head Bolt	2
(17)	5/8" Flat Washer	18

Terminal Connection Note

To ensure a stable connection, (12) Rectangular Washers (FWR03) are required under the recessed nuts at the Terminal Connection splice.

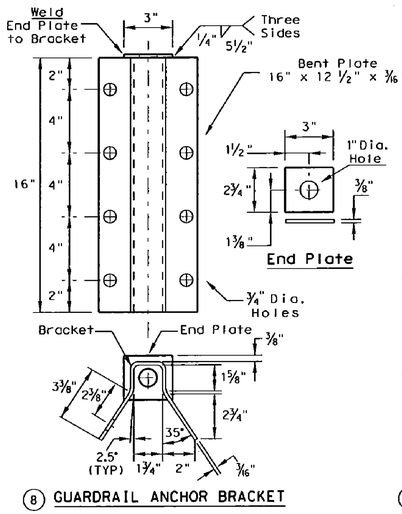


(4) TERMINAL RAIL ELEMENT FOR DAT

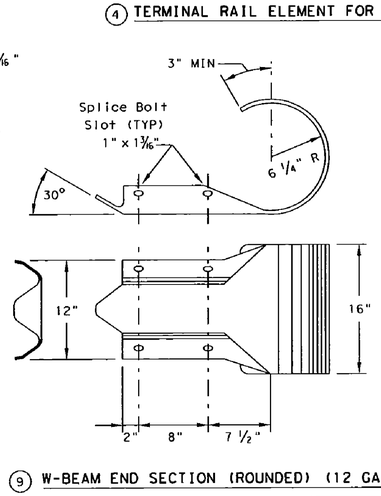


(3) CHANNEL STRUT

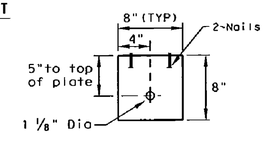
C3 x 5 x 80", Grade A36



(8) GUARDRAIL ANCHOR BRACKET



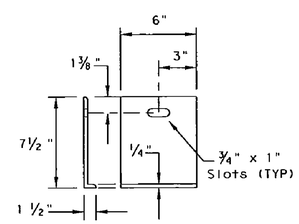
(9) W-BEAM END SECTION (ROUNDED) (12 GA.)



Note: Drive nails and bend over to prevent plate rotation

(6) BEARING PLATE

8"x 8"x 5/8" ℄



(5) SHELF ANGLE BRACKET

GENERAL NOTES

1. The DAT detail shown is the minimum Length of Need (LON) for a DAT connected to a concrete rail.
2. The rail section at the end post is supported by the Shelf Angle Bracket. The rail element is not attached to the end post.
3. The foundation tubes shall not project more than 3 3/4" above the finished grade.
4. All hardware for DAT shall be ASTM A307 unless otherwise shown.
5. Refer to GF(31) sheet for terminal connection details.

MOW STRIP INSTALLATION

If a mow strip is required with the DAT installation the leave-out area around the steel foundation tubes and the two channel struts may be omitted. This will require a full pour at the foundation tubes.

Texas Department of Transportation | Design Division Standard

METAL BEAM GUARD FENCE

(Downstream Anchor Terminal)

GF(31)DAT-11

FILE: gf31dat11.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
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				SHEET NO.

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

ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT METAL BEAM GUARD RAIL GF (31) DAT - 11

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

LAST SHEET EDIT DATE 09-30-2013
WA# 12209

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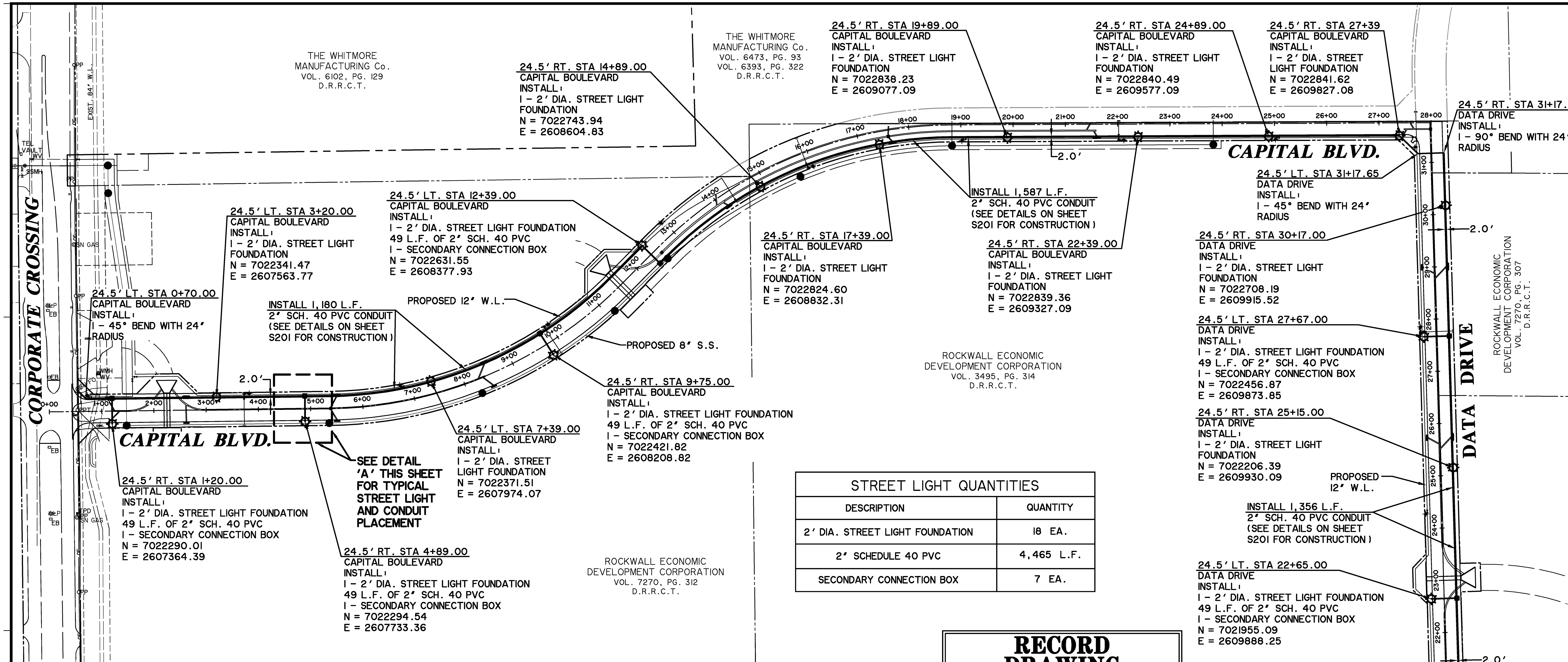

STREET LIGHT QUANTITIES	
DESCRIPTION	QUANTITY
2' DIA. STREET LIGHT FOUNDATION	18 EA.
2" SCHEDULE 40 PVC	4,465 L.F.
SECONDARY CONNECTION BOX	7 EA.

RECORD DRAWING 02/02/2015

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• BENCH MARKS •

BM A AN "☒" CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN "☒" CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C - AN "□" CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

CAUTION !!

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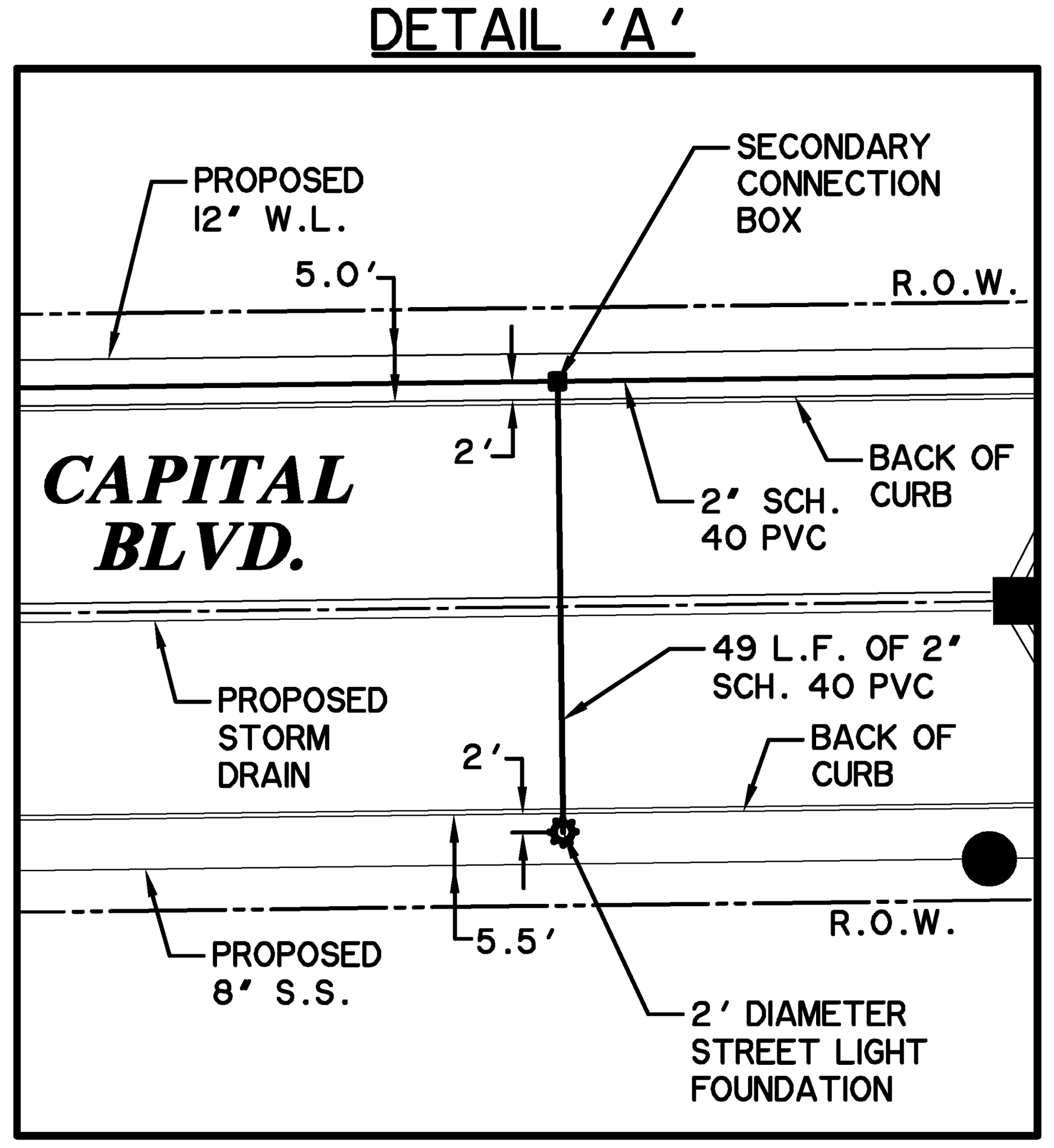
DETAIL 'A'



TYP. STREET LIGHT & CONDUIT PLACEMENT
N.T.S.

LEGEND

✡	STREET LIGHT
■	PULL BOX
——	2" SCH. 40 PVC

NOTES:

1. ALL STREET LIGHT FOUNDATIONS, SECONDARY CONNECTION BOXES, AND 2" SCHEDULE 40 PVC SHALL BE CONSTRUCTED AND INSTALLED PER ONCOR DETAILS AND GENERAL NOTES ON SHEET S201.
2. ALL BENDS SHALL HAVE A RADIUS OF 24".
3. CONDUIT AND STREET LIGHT ASSEMBLY TO BE INSTALLED BY ONCOR (SEPARATE CONTRACT).
4. ALL PVC BENDS AND FITTINGS SHALL BE SUBSIDIARY TO THE INSTALLATION OF THE 2" SCHEDULE 40 PVC.

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

ROCKWALL TECHNOLOGY PARK PHASE IV

STREET LIGHT LAYOUT

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

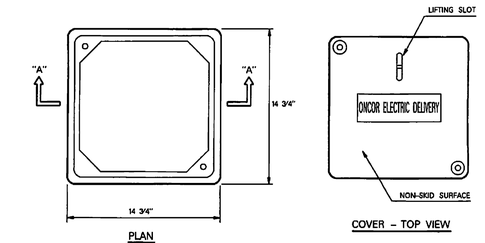
LAST SHEET EDIT DATE 04-30-2014
WA# 12209
SHEET NO. S101

FILE: S101-Street Light Layout.dwg
TIME: 15:09

213 – 120
05 – 09

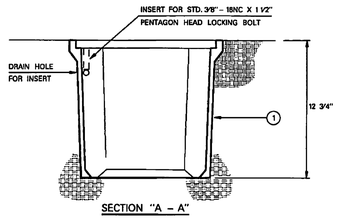
STREET LIGHT SECONDARY CONNECTION BOX

213 – 120
05 – 09



PLAN
WITH COVER REMOVED

COVER – TOP VIEW



SECTION "A – A"

NOTES:

1. FOR USE WHEN CONDUCTOR SIZE AND NUMBER OF TERMINATIONS WARRANT.
2. H-10 (LIGHT VEHICULAR TRAFFIC LOADING).
3. REPLACEMENT COVER TSN IS 326507.

ITEM	QTY	DESCRIPTION	TSN/REF	CU	MU
1		BOX, SECONDARY 12" X 12" X 12"	300308	SLSCB	

APPROVED BY ONCOR

208 – 030
01 – 05

CONDUIT BEND RADIUS AND MATERIAL

208 – 030
01 – 05

CONDUIT NOMINAL SIZE (IN.)	MINIMUM BEND RADIUS (IN.)	TYPE OF BEND MATERIAL FOR PULLS:
1	18	PVC
2	24	PVC
3	24	PVC
4	24	PVC
6	36	PVC

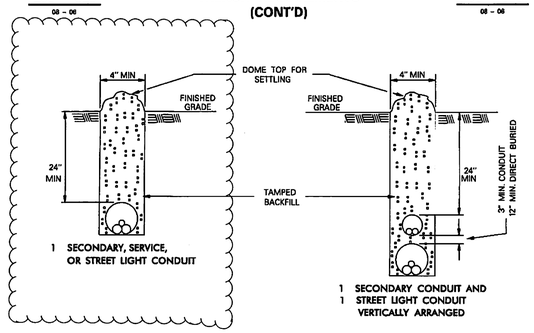
ITEM	QTY	DESCRIPTION	TSN/REF	CU	MU
1	AS REQ'D	FITTING, CONDUIT, PVC, 1 INCH, BEND, SCH. 40, 45°			
2	AS REQ'D	FITTING, CONDUIT, PVC, 1 INCH, BEND, SCH. 40, 90°			
3	AS REQ'D	FITTING, CONDUIT, PVC, 2 INCH, BEND, SCH. 40, 45°	300339	CB46D2P	
4	AS REQ'D	FITTING, CONDUIT, PVC, 2 INCH, BEND, SCH. 40, 90°	300343	CB18R3P	
5	AS REQ'D	FITTING, CONDUIT, PVC, 3 INCH, BEND, SCH. 40, 45°	300338		
6	AS REQ'D	FITTING, CONDUIT, PVC, 3 INCH, BEND, SCH. 40, 90°	300342	CB18R3P	
7	AS REQ'D	FITTING, CONDUIT, PVC, 4 INCH, BEND, SCH. 40, 45°			
8	AS REQ'D	FITTING, CONDUIT, PVC, 4 INCH, BEND, SCH. 40, 90°	287673	CB24R4P	
9	AS REQ'D	FITTING, CONDUIT, PVC, 6 INCH, BEND, SCH. 40, 45°	426798		
10	AS REQ'D	FITTING, CONDUIT, PVC, 6 INCH, BEND, SCH. 40, 90°	308171	CB36R6P	

APPROVED BY TXU Electric Delivery

208 – 325
08 – 06

TRENCH REQUIREMENTS (CONT'D)

208 – 325
08 – 06



NOTE:

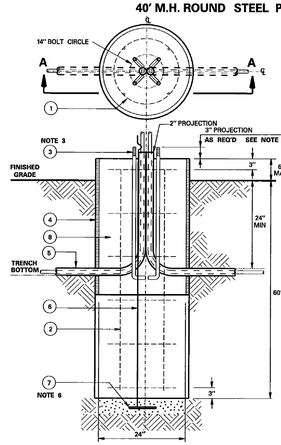
1. SEE 208-310 AND 208-315 FOR NOTES AND INSTRUCTIONS.
2. SEPARATION DIMENSIONS APPLY TO COMPANY CONDUITS OR CABLES ONLY. MAINTAIN 12" SEPARATION BETWEEN COMPANY CONDUITS OR CABLE AND FOREIGN CONDUITS OR CABLE.

APPROVED BY TXU Electric Delivery

213 – 330
07 – 06

STREET LIGHT FOUNDATION 25',30' & 40' SQUARE STEEL POLE 40' M.H. ROUND STEEL POLE

213 – 330
07 – 06



SECTION "A – A"

NOTES:

1. CONCRETE TO BE MINIMUM 3000 PSI AT 28 DAYS. (5 SACK) MAXIMUM AGGREGATE 3/4" TOP OF FOUNDATION TO BE TROWELED TO A FLAT AND LEVEL SURFACE. AVOID EXCESSIVE TROWELING. CONCRETE TO SET A MINIMUM OF 72 HOURS BEFORE POLE INSTALLATION.
2. REBAR HOOPS ARE TIED BEGINNING 3" BELOW TOP OF CONCRETE FORM AND ARE REPEATED AT APPROXIMATE 1' INTERVALS TO BOTTOM OF FOUNDATION.
3. 1" ANCHOR BOLTS TO BE USED WITH 25' & 30' POLE. 1 1/4" ANCHOR BOLTS TO BE USED WITH 40' POLE. USE TEMPLATE FURNISHED BY POLE MANUFACTURER FOR ALIGNING ANCHOR BOLTS. PROJECTION OF 3" ON 25' & 30' SQUARE AND 3 1/2" ON 40' SQUARE AND ROUND POLES.
4. CONCRETE FORM OF SONOTUBE TO EXTEND TO BOTTOM OF TRENCH OR AS NEEDED.
5. PROVIDE MINIMUM 24" GROUND WIRE PIGTAIL OUT OF CONCRETE FOR CONNECTION TO POLE.
6. A MINIMUM OF 12' OF BARE #8 SD CU WIRE TO BE PLACED IN BOTTOM OF HOLE AND COVERED WITH 2' OF DIRT
7. IF SOIL HAS BEEN DISTURBED, EXTEND FOUNDATION BY DEPTH OF DISTURBED SOIL.
8. FOR POLE FOUNDATIONS LARGER THAN 40' NOMINAL MOUNTING HEIGHT, CONTACT DISTRIBUTION STANDARDS.

ITEM	QTY	DESCRIPTION		TSN/REF	CU	MU
1	6	#3 REBAR, 18" DIAMETER HOOP, 3" OVERLAP		314470		
2	4	#5 REBAR, STRAIGHT, 60" LONG		317821		
3	4	ANCHOR BOLT, GALV. 1" FOR 25 & 30' POLES	SEE NOTE 3	318586	SLF25/30	
3	4	ANCHOR BOLT, 1 1/4" GALV FOR 40' POLES	SEE NOTE 3	318586	SLF40	
4	AS REQ'D	CONCRETE FOUNDATION TUBE, 24" DIAMETER		313641		
5	AS REQ'D	CONDUIT, PVC OR PEC (NOT IN FOUNDATION AUM)				
6	.5 LB	WIRE, #6 COPPER, SOLID		303244		
7	1	GROUND, POLE BUTT WIRE COIL				
8	AS REQ'D	CONCRETE				
	1	FND, PRECAST 25' & 30' SQR. POLE, 14" BC, 1" BOLTS		398698	SLFPSQ25/30	
	1	FND, PRECAST 40' SQR, 40' RND POLE, 14" BC, 1.25" BOLTS		398700	SLFP40	

APPROVED BY TXU Electric Delivery

RECORD DRAWING 02/02/2015

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GENERAL NOTES

1. TRENCH ALIGNMENT SHALL BE AS STRAIGHT AS CONDITIONS PERMIT. ANY DEVIATIONS FROM PLANNED ALIGNMENT SHALL HAVE PRIOR APPROVAL BY THE PROJECT ENGINEER/INSPECTOR. ALL TRENCH CUTS SHALL BE IN ACCORDANCE WITH EXISTING SAFETY REGULATIONS IN EFFECT.
2. TRENCH BOTTOM SHOULD BE UNDISTURBED, TAMPED, OR RELATIVELY SMOOTH EARTH. WHERE EXCAVATION IS IN ROCK, THE CONDUIT SHOULD BE LAID ON A LAYER OF CLEAN BACKFILL.
3. ALL BACKFILL SHOULD BE FREE OF DEBRIS OR OTHER MATERIAL THAT MAY DAMAGE THE CONDUIT SYSTEM OR CAUSE SETTLING. THE MATERIAL SHOULD FILL THE VOIDS AROUND THE CONDUIT TO PREVENT HOT SPOTS & SETTLING.
4. BACKFILL SHOULD BE ADEQUATELY COMPACTED. BACKFILL NOT UNDER PAVEMENT SHOULD BE COMPACTED TO THE DENSITY OF THE SURROUNDING UNDISTURBED SOIL. BACKFILL UNDER PAVEMENT SHOULD BE COMPACTED TO NOT LESS THAN 95% OF THE DENSITY OF UNDISTURBED SOIL AS DETERMINED BY ASTM DESIGNATION D-698.
5. SEE 208-315 FOR JOINING PVC CONDUIT & 208-330 FOR JOINING HDPE CONDUIT.
6. A 2500# OR 6000# PULL TAPE SHALL BE LEFT IN EACH CONDUIT. CONDUIT SHALL BE PLUGGED AT BOTH ENDS.
7. ALL CONDUIT THAT IS CONCRETE ENCASED (DUCT BANK) OR IN A CASING BORE THAT IS GROUT FILLED SHALL BE CHECKED BY PULLING A MANDREL THROUGH THE ENTIRE LENGTH OF EACH RUN OF CONDUIT AT THE COMPLETION OF THE CIVIL INSTALLATION.
8. EACH RUN OF CUSTOMER INSTALLED CONDUIT OF ALL TYPES WILL REQUIRE THAT A MANDREL CHECK BE MADE BY PULLING THROUGH THE ENTIRE LENGTH OF ALL CONDUITS IN THE INSTALLATION FOR FINAL CIVIL INSPECTION. (PLEASE SEE THE REQUIREMENTS OF THE TXU ELECTRIC DELIVERY DDS SPECIFICATIONS).
9. IT WILL NOT BE REQUIRED TO MAKE A MANDREL INSPECTION ON ANY TYPE OF COMPANY INSTALLED DIRECT BURIED OR DIRECTIONAL BORE CONDUIT INSTALLATION.

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ROCKWALL TECHNOLOGY PARK PHASE IV

STREET LIGHT DETAILS

LICENSED / REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
DARRELL J. BOSWORTH
112702
2-2-15

LAST SHEET EDIT DATE 04-30-2014
WA# 12209

SHEET NO. S201

TIME: 15:09 FILE: S201-Street Light Details.dwg

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 5528, PG. 194
D.R.R.C.T.

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

LINE HATCHED AREA WITH 5,661 S.Y. OF BIODEGRADABLE EROSION CONTROL BLANKETS (CURLEX BLANKETS OR APPROVED EQUAL).

℄ STA 0+00 CULVERT 'U' DITCH
MATCH EXISTING GROUND
FL = ±588.00
N = 7021774.79
E = 2610586.30

PROP. CULVERT LINE 'U' SEE SHEET D304 FOR CONSTRUCTION

PT ℄ STA 6+58.66
CULVERT 'U' DITCH
EDGE OF APRON
FL = 592.09

PT ℄ STA 6+52.85
CULVERT 'U' DITCH
FL = 592.05
N = 7021996.32
E = 2609978.42

SLOPE OF DITCH = 0.62%

50' WIDE DRAINAGE EASEMENT

PC ℄ STA 4+24.03
CULVERT 'U' DITCH
FL = 590.63
N = 7021951.20
E = 2610200.71

℄ CURVE DATA
R=500.00'
L=228.82'
D=26°13'14"
T=116.45
CH =S78°31'33"E
226.83

HYDROMULCH ALL DISTURBED AREAS IMMEDIATELY AFTER GRADING CHANNEL AND PRIOR TO INSTALLING EROSION BLANKETS. (HYDROMULCH TO BE WATERED REGULARLY UNTIL A STAND OF GRASS IS ESTABLISHED AND IS TO BE SUBSIDIARY TO CONSTRUCTION)

CONSTRUCT 43 S.Y. OF 12" NOMINAL DIA. GROUTED ROCK RIP-RAP MIN. 18" THICKNESS.

PROP. S.D. LINE 'M'

PROP. W.L.

R.O.W

PROP. S.D. LINE 'T'

DATA DRIVE

TREE LINE

FG = 599.51

LINE HATCHED AREA WITH 116 S.Y. OF BIODEGRADABLE EROSION CONTROL BLANKETS (CURLEX BLANKETS OR APPROVED EQUAL).

FG = 596.28

6:1 ℄ FL

FG = 596.25

4:1 SIDE

FL = 592.50

HYDROMULCH ALL DISTURBED AREAS IMMEDIATELY AFTER GRADING CHANNEL AND PRIOR TO INSTALLING EROSION BLANKETS. (HYDROMULCH TO BE WATERED REGULARLY UNTIL A STAND OF GRASS IS ESTABLISHED AND IS TO BE SUBSIDIARY TO CONSTRUCTION)

CONSTRUCT 67 S.Y. OF 12" NOMINAL DIA. GROUTED ROCK RIP-RAP MIN. 18" THICKNESS.

FG = 599.51

0 40 80 120

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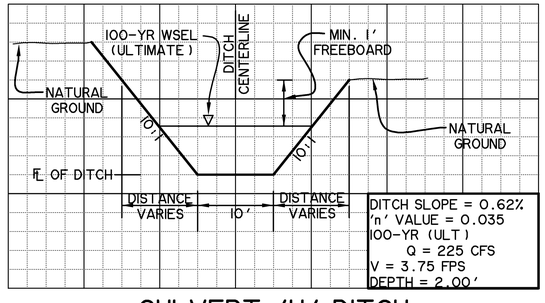

CULVERT 'U' DITCH
TYPICAL SECTION A-A
(N.T.S)

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RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN DITCHOUT GRADING FOR CULVERT 'U'

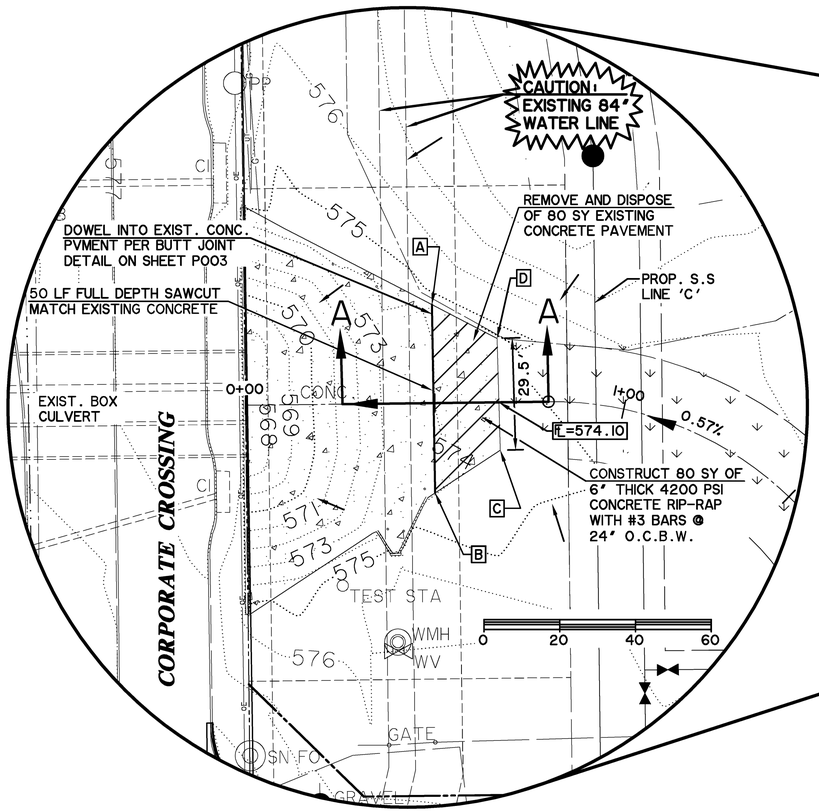
STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 09-27-2013
WA# 12209

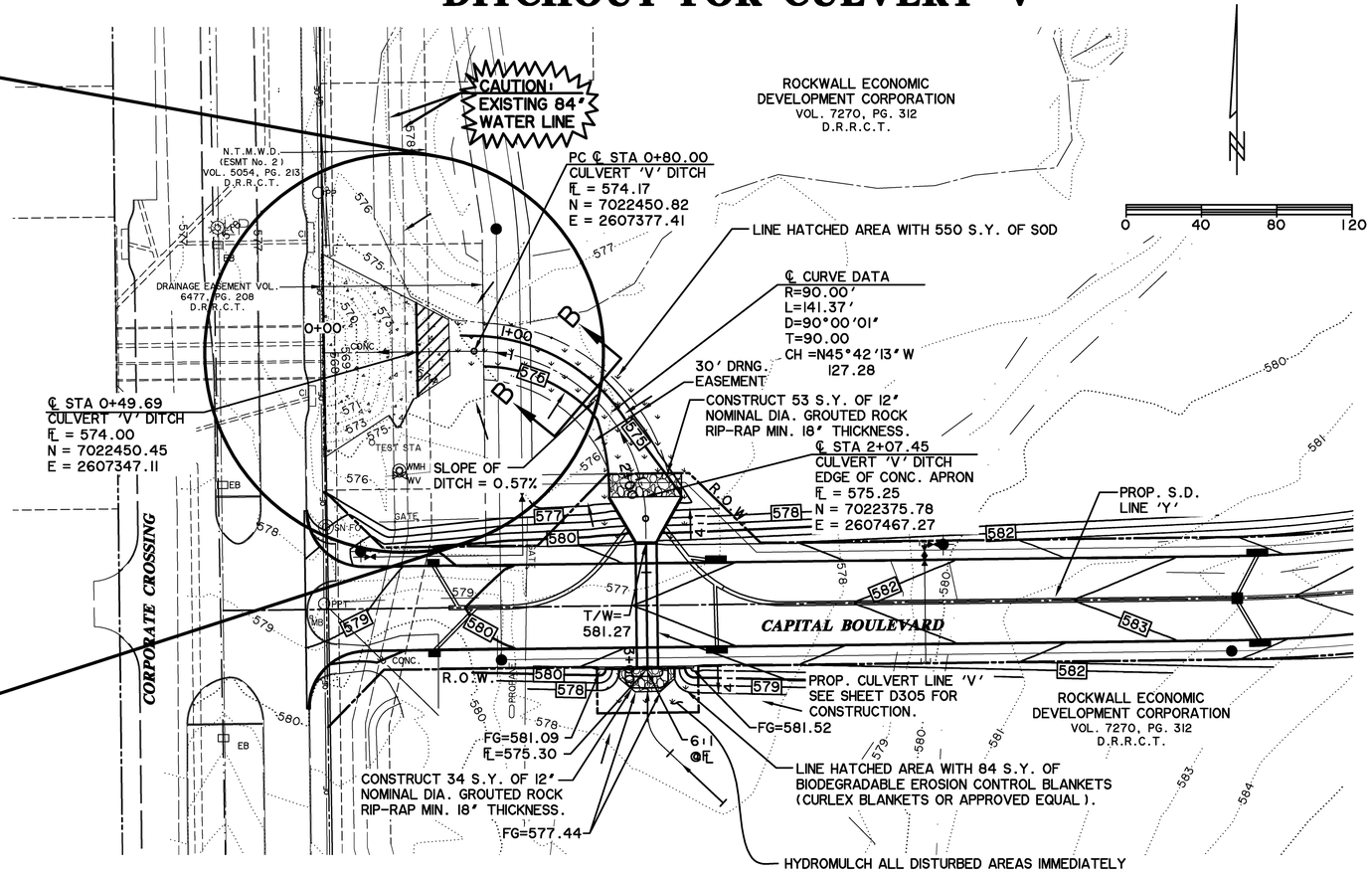
SHEET NO.
G101

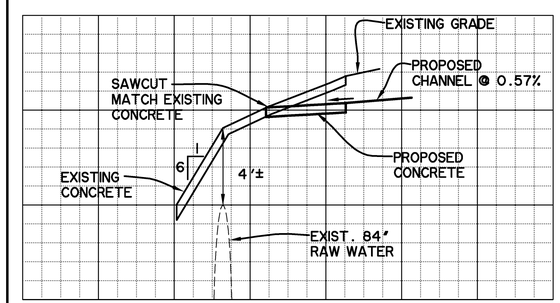
TIME 16:15 FILE: G101-SD-GRADING-LN-U-12209.dwg

DITCHOUT FOR CULVERT 'V'



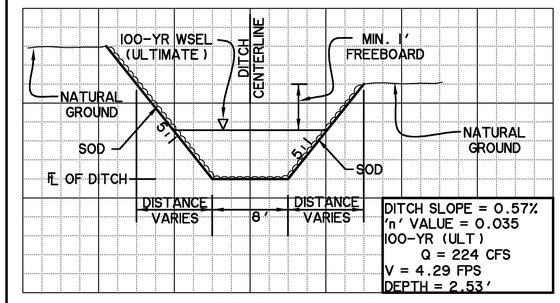
A	MATCH EXISTING CONCRETE TP = 574.00 N= 7022476.46 E= 2607346.62	C	TOP OF CONCRETE TP = 574.10 N= 7022438.00 E= 2607364.70
B	MATCH EXISTING CONCRETE TP = 574.00 N= 7022426.75 E= 2607347.50	D	TOP OF CONCRETE TP = 574.10 N= 7022467.52 E= 2607363.82





CONCRETE APRON REPAIR TYPICAL SECTION A-A

(N.T.S)



CULVERT 'V' DITCH TYPICAL SECTION B-B

(N.T.S)

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ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN DITCHOUT GRADING CULVERT 'V'

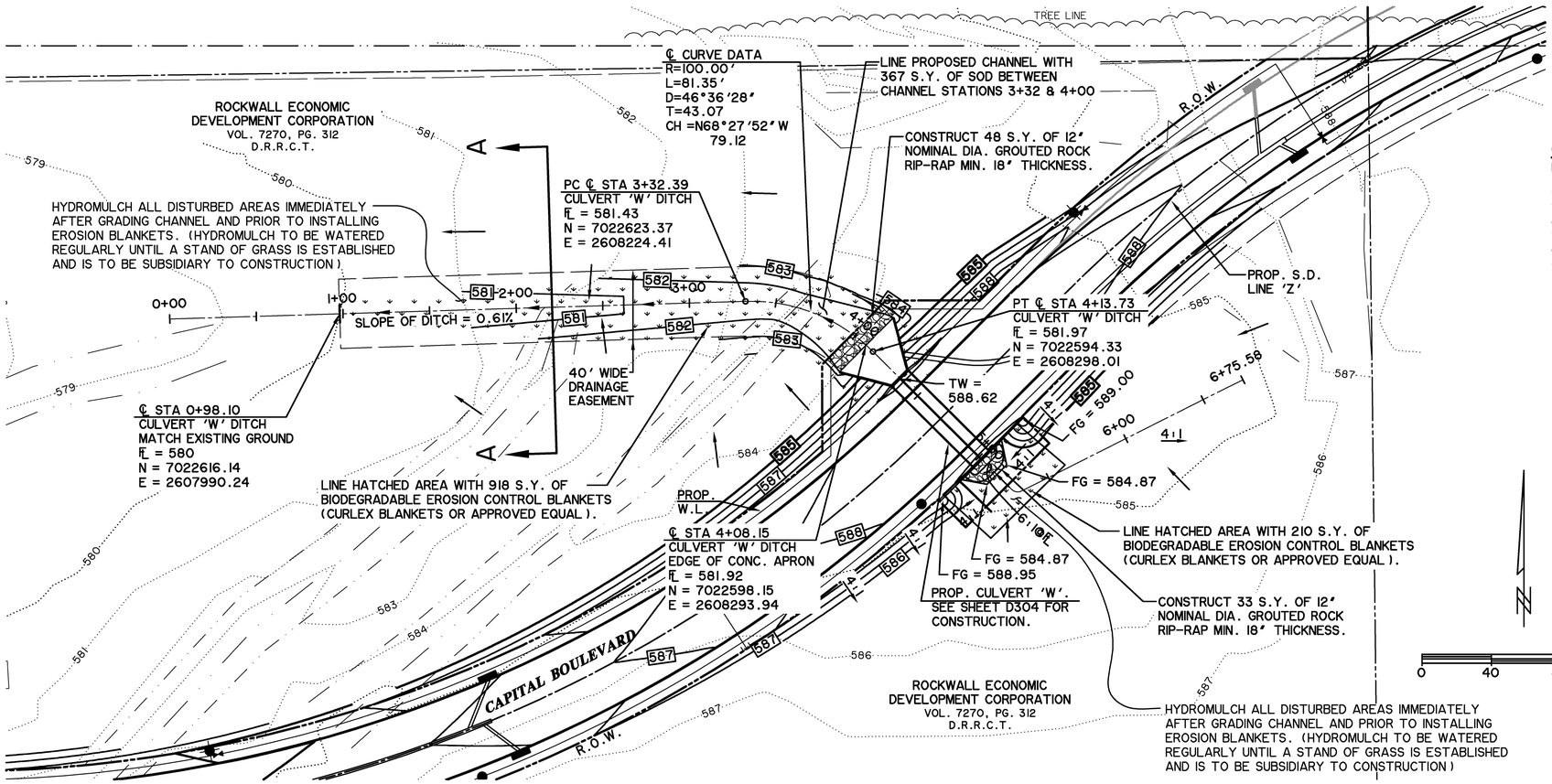
DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

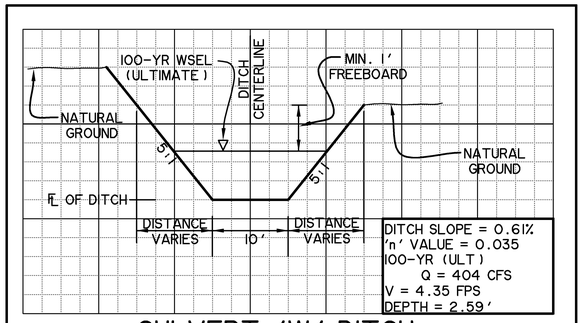
LAST SHEET EDIT DATE 01-21-2015
WA# 12209

SHEET NO. G102

FILE: G102-SD-GRADING-LN-V-12209.dwg
TIME 18:16

DITCHOUT FOR CULVERT 'W'





CULVERT 'W' DITCH
TYPICAL SECTION A-A
(N.T.S)

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ROCKWALL TECHNOLOGY PARK PHASE IV

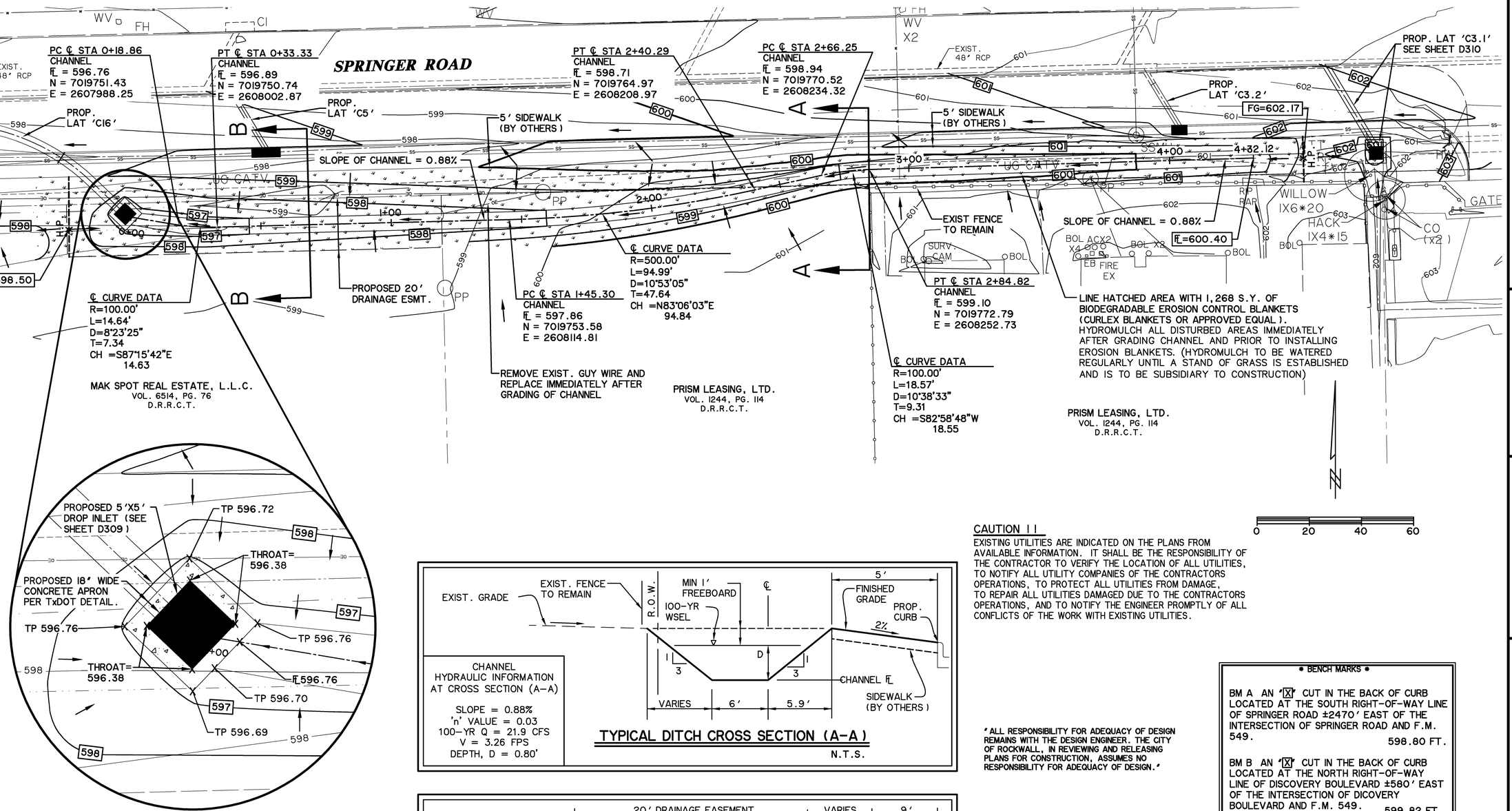
STORM DRAIN DITCHOUT GRADING CULVERT 'W'

DARRELL J. BOSWORTH
112702
REGISTERED
PROFESSIONAL ENGINEER
STATE OF TEXAS
2-2-15

LAST SHEET EDIT
DATE 01-21-2015
WA# 12209

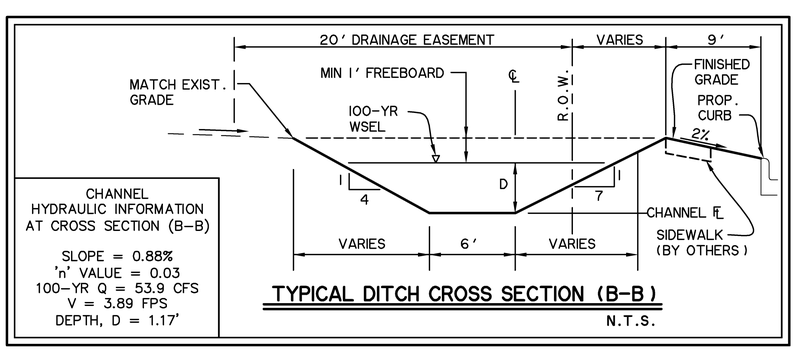
SHEET NO.
G103

TIME:9:13 FILE:\G103-SD-GRADING-LN-W-12209.dwg



TYPICAL DITCH CROSS SECTION (A-A)

N.T.S.



TYPICAL DITCH CROSS SECTION (B-B)

N.T.S.

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 'X' CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN 'X' CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C - AN '□' CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

'ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN.'

RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

GRADING PLAN SOUTH SIDE OF SPRINGER ROAD TO LATERAL 'C16'

LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 01-21-2015
WA# 12209

SHEET NO. G104

FILE: G104-SD-GRADING-LN-C16-12209.dwg
TIME: 8:20

*** BENCH MARKS ***

BM A AN '☒' CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN '☒' CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C – AN '□' CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

DISCOVERY BLVD

CORPORATE CROSSING

DATA DRIVE

SPRINGER ROAD

MATCH LINE SHEET D102

LOT 2, BLOCK B
ROCKWALL TECHNOLOGY PARK
PHASE III
CAB. H, SLIDE 273-274
P.R.R.C.T.

LOT 1, BLOCK A
ROCKWALL TECHNOLOGY PARK
PHASE II
CAB. E, SLIDE 305-306
P.R.R.C.T.

0 100 200 300 400

DA H-1 (10.41 Ac.) REMOVED FROM PH-III PLANS DA H-2 INCREASED FROM 7.40 Ac TO 8.53 AC DUE TO SITE GRADING. SEE BIMBO SITE PLANS FOR GRADING AND DETAILS.

F-1 2.91 Ac.
A-6 0.47 Ac.
A-1 0.28 Ac.
B-2 0.44 Ac.
B-4 0.44 Ac.
B-6 0.44 Ac.
N-1 0.09 Ac.
A-3 0.45 Ac.
N-2 0.45 Ac.
K-1 7.40 Ac. TO DETENTION POND
A-7 0.63 Ac.
A-5 0.46 Ac.
P-2 1.02 Ac.
P-1 0.38 Ac.
A-8 0.67 Ac.
A-9 0.46 Ac.
A-12 0.50 Ac.
J-1 27.10 Ac. TO DETENTION POND
E-2 1.05 Ac.
E-1 0.44 Ac.
G-1 2.99 Ac.
H-4 5.53 Ac.
H-3 5.16 Ac.
H-2 8.53 Ac.
C-10 0.51 Ac.
C-8 0.62 Ac.
C-6 0.73 Ac.
C-4 0.72 Ac.
C-2 0.57 Ac.
D-1 0.66 Ac.
D-3 0.53 Ac.
I-2 0.74 Ac.
C-5 0.24 Ac.
C-3.2 0.27 Ac.
C-1 0.29 Ac.
D-2 0.21 Ac.
D-4 0.18 Ac.
I-1 0.28 Ac.
C-16.9 0.61 Ac.
C-16.7 0.48 Ac.
C-16.1B 3.63 Ac.
C-3.1 3.34 Ac.
C-16.1A 2.48 Ac.

DETENTION POND

TO SD STUB

TO 5'x5' FIELD INLET

TO DITCH THEN TO 5'x5' FIELD INLET

TO 4'x4' FIELD INLET

NBN COMMERCIAL GROUP, L.L.C.
VOL. 5646, PG. 100
D.R.R.C.T.

MAK SPOT REAL ESTATE, L.L.C.
VOL. 6514, PG. 76
D.R.R.C.T.

PRISM LEASING, LTD.
VOL. 1244, PG. 114
D.R.R.C.T.

SAVE & EXCEPT TO JOHN W. SHARP
VOL. 6665, PG. 178
D.R.R.C.T.

RICK SHARP
VOL. 6665, PG. 178
D.R.R.C.T.

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

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 5528, PG. 184
D.R.R.C.T.

BLACKLAND WATER CORP
VOL. 235, PG. 233
D.R.R.C.T.

CITY OF ROCKWALL
VOL. 2219, PG. 187
D.R.R.C.T.

LOT 1, BLOCK I
HIGHWAY 276
SELF STORAGE

RECORD DRAWING 02/02/2015

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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PREPARED BY:
WIER & ASSOCIATES, INC.
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Texas Firm Registration No. F-2776 www.WierAssociates.com

ROCKWALL TECHNOLOGY PARK PHASE IV

OVERALL DRAINAGE AREA MAP

DARRELL J. BOSWORTH
112702
REGISTERED
PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT
DATE 10-07-2013
WA# 12209

SHEET NO. D101

TIME 12:00 FILE I:\D101-DAMAP-12209.dwg

• BENCH MARKS •

BM A AN '[X]' CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN '[X]' CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C – AN '[ ]' CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

0 100 200 300 400

MATCH LINE SHEET D103

MATCH LINE SHEET D101

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 7270, PG. 312 D.R.R.C.T.

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

VOL. 5528, PG. 194 D.R.R.C.T.

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 5528, PG. 194 D.R.R.C.T.

LOT 1, BLOCK A
ROCKWALL TECHNOLOGY PARK
PHASE II
CAB. E, SLIDE 305-306 P.R.R.C.T.

LOT 2, BLOCK B
ROCKWALL TECHNOLOGY PARK
PHASE III
CAB. H, SLIDE 273-274 P.R.R.C.T.

DISCOVERY BLVD

CORPORATE CROSSING

DATA DRIVE

SPRINGER ROAD

DETENTION POND

TO SD STUB

TO DETENTION POND

V-1 22.63Ac.
W-1 41.90Ac.
U-1 18.75 Ac.
F-1 2.91 Ac.
F-2 5.39 Ac.
G-1 2.99 Ac.
H-1 (10.41 Ac.) REMOVED
H-2 8.53Ac.
H-3 5.16 Ac.
H-4 5.53 Ac.
J-1 27.10 Ac.
K-1 7.40 Ac.
A-1 0.28 Ac.
A-2 0.31 Ac.
A-3 0.45 Ac.
A-4 0.49 Ac.
A-5 0.46 Ac.
A-6 0.47 Ac.
A-7 0.63 Ac.
A-8 0.67 Ac.
A-9 0.46 Ac.
A-10 0.42 Ac.
A-11 0.52 Ac.
A-12 0.50 Ac.
B-1 0.44 Ac.
B-2 0.44 Ac.
B-3 0.44 Ac.
B-4 0.44 Ac.
B-5 0.44 Ac.
B-6 0.44 Ac.
C-2 0.57 Ac.
C-4 0.72 Ac.
C-6 0.73 Ac.
C-8 0.62 Ac.
C-10 0.51 Ac.
D-1 0.66 Ac.
D-3 0.53 Ac.
E-1 0.44 Ac.
E-2 1.05 Ac.
I-2 0.74 Ac.
M-1 0.40 Ac.
M-2 0.30 Ac.
M-3 0.76 Ac.
M-4 0.76 Ac.
N-1 0.09 Ac.
N-2 0.45 Ac.
P-1 0.38 Ac.
P-2 1.02 Ac.

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DA H-1 (10.41 Ac.) REMOVED FROM PH-III PLANS DA H-2 INCREASED FROM 7.40 Ac TO 8.53 AC DUE TO SITE GRADING. SEE BIMBO SITE PLANS FOR GRADING AND DETAILS.

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ROCKWALL TECHNOLOGY PARK PHASE IV

OVERALL DRAINAGE AREA MAP

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 10-07-2013
WA# 12209

SHEET NO. D102

FILE: D102-DAMAP-12209.dwg
TIME: 12:01

• BENCH MARKS •

BM A AN 'X' CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

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0 100 200 300 400

THE WHITMORE MANUFACTURING Co.
VOL. 6102, PG. 129 D.R.R.C.T.

THE WHITMORE MANUFACTURING Co.
VOL. 6473, PG. 93
VOL. 6393, PG. 322
D.R.R.C.T.

VEERARAGHAVAN L.P.
VOL. 4765, PG. 107
D.R.R.C.T.

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 7270, PG. 312 D.R.R.C.T.

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

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 7270, PG. 307 D.R.R.C.T.

ROCKWALL ECONOMIC DEVELOPMENT CORPORATION
VOL. 5528, PG. 194 D.R.R.C.T.

CAPITAL BOULEVARD

CORPORATE CROSSING

FUTURE DATA DRIVE

FUTURE DATA DRIVE

EX-A3 0.45 Ac.
EXIST. (3) 8X6 BOX CULVERT
EX-B6 1.19 Ac.
X-1 0.19 Ac.
X-2 0.19 Ac.
Y-1 0.43 Ac.
Y-2 0.39 Ac.
Y-3 0.41 Ac.
Y-4 0.38 Ac.
Y-5 0.38 Ac.
Y-6 0.38 Ac.
Z-1 0.60 Ac.
Z-2 0.60 Ac.
Z-3 0.52 Ac.
Z-4 0.53 Ac.
Z-5 0.78 Ac.
Z-6 0.82 Ac.
V-1 22.63 Ac.
W-1 41.90 Ac.
U-1 18.75 Ac.
FUT-1 0.42 Ac.
FUT-2 0.40 Ac.
FUT-3 0.25 Ac.
FUT-3.2 1.30 Ac.
FUT-4 0.23 Ac.
T-1 0.17 Ac.
T-2 0.17 Ac.
T-3 0.43 Ac.
T-4 0.44 Ac.
T-5 0.79 Ac.
T-6 0.79 Ac.
M-3 0.76 Ac.
M-4 0.76 Ac.

TO (2) 6'X4' CULVERTS
TO (2)5'X3' CULVERTS
TO FUT. INLET
TO 7'X3' CULVERT

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MATCH LINE SHEET D102

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ROCKWALL TECHNOLOGY PARK PHASE IV

OVERALL DRAINAGE AREA MAP

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 10-07-2013
WA# 12209

SHEET NO. D103

FILE: D103-DAMAP-12209.dwg
TIME: 12:01

Fully Developed Drainage Area Calculations

Drainage Area Designation	Acreage (ac)	C Factor	C x A	Time of Concentration (min)	I (in\hr) 100 Yr	Q (cfs) 100 Yr
A-1	0.28	0.90	0.25	10	9.80	2.5
A-2	0.31	0.90	0.28	10	9.80	2.7
A-3	0.45	0.90	0.41	10	9.80	4.0
A-4	0.49	0.90	0.44	10	9.80	4.3
A-5	0.46	0.90	0.41	10	9.80	4.1
A-6	0.47	0.90	0.42	10	9.80	4.1
A-7	0.63	0.90	0.57	10	9.80	5.6
A-8	0.67	0.90	0.60	10	9.80	5.9
A-9	0.46	0.90	0.41	10	9.80	4.1
A-10	0.42	0.90	0.38	10	9.80	3.7
A-11	0.52	0.90	0.47	10	9.80	4.6
A-12	0.50	0.90	0.45	10	9.80	4.4
B-1	0.44	0.90	0.40	10	9.80	3.9
B-2	0.44	0.90	0.40	10	9.80	3.9
B-3	0.44	0.90	0.40	10	9.80	3.9
B-4	0.44	0.90	0.40	10	9.80	3.9
B-5	0.44	0.90	0.40	10	9.80	3.9
B-6	0.44	0.90	0.40	10	9.80	3.9
C-1	0.29	0.90	0.26	10	9.80	2.6
C-2	0.57	0.90	0.51	10	9.80	5.0
C-3.1	3.34	0.90	3.01	10	9.80	29.5
C-3.2	0.27	0.90	0.24	10	9.80	2.4
C-4	0.72	0.90	0.65	10	9.80	6.4
C-5	0.24	0.90	0.22	10	9.80	2.1
C-6	0.73	0.90	0.66	10	9.80	6.4
C-8	0.62	0.90	0.56	10	9.80	5.5
C-10	0.51	0.90	0.46	10	9.80	4.5
C-16.1A	2.48	0.90	2.23	10	9.80	21.9
C-16.1B	3.63	0.90	3.27	10	9.80	32.0
C-16.7	0.48	0.90	0.43	10	9.80	4.2
C-16.9	0.61	0.90	0.55	10	9.80	5.4
D-1*	0.66	0.90	0.59	10	9.80	5.8
D-2*	0.21	0.90	0.19	10	9.80	1.9
D-3*	0.53	0.90	0.48	10	9.80	4.7
D-4*	0.18	0.90	0.16	10	9.80	1.6
E-1*	0.44	0.90	0.40	10	9.80	3.9
E-2*	1.05	0.90	0.95	10	9.80	9.3
F-1**	2.91	0.90	2.62	10	9.80	25.7
F-2**	5.39	0.90	4.85	10	9.80	47.5
G-1**	2.99	0.90	2.69	10	9.80	26.4
H-2**	8.53	0.90	7.68	10	9.80	75.2
H-3**	5.16	0.90	4.64	10	9.80	45.5
H-4**	5.53	0.90	4.98	10	9.80	48.8
I-1*	0.28	0.90	0.25	10	9.80	2.5
I-2*	0.74	0.90	0.67	10	9.80	6.5
J-1*	27.10	0.90	24.39	10	9.80	239.0
K-1*	7.40	0.90	6.66	10	9.80	65.3
M-1	0.40	0.90	0.36	10	9.80	3.5
M-2	0.30	0.90	0.27	10	9.80	2.6
M-3	0.76	0.90	0.68	10	9.80	6.7
M-4	0.76	0.90	0.68	10	9.80	6.7
N-1	0.09	0.90	0.08	10	9.80	0.8
N-2	0.45	0.90	0.41	10	9.80	4.0
P-1	0.38	0.90	0.34	10	9.80	3.4
P-2	1.02	0.90	0.92	10	9.80	9.0
FUT-1	0.42	0.90	0.38	10	9.80	3.7
FUT-2	0.40	0.90	0.36	10	9.80	3.5
FUT-3	0.25	0.90	0.23	10	9.80	2.2
FUT-3.2	1.30	0.90	1.17	10	9.80	11.5
FUT-4	0.23	0.90	0.21	10	9.80	2.0
T-1	0.17	0.90	0.15	10	9.80	1.5
T-2	0.17	0.90	0.15	10	9.80	1.5
T-3	0.43	0.90	0.39	10	9.80	3.8
T-4	0.44	0.90	0.40	10	9.80	3.9
T-5	0.79	0.90	0.71	10	9.80	7.0
T-6	0.79	0.90	0.71	10	9.80	7.0
U-1	18.75	0.90	16.88	10	9.80	165.4
V-1**	22.63	0.90	20.37	10	9.80	199.6
W-1**	41.90	0.90	37.71	10	9.80	369.6
X-1	0.19	0.90	0.17	10	9.80	1.7
X-2	0.19	0.90	0.17	10	9.80	1.7
Y-1	0.43	0.90	0.39	10	9.80	3.8
Y-2	0.39	0.90	0.35	10	9.80	3.4
Y-3	0.41	0.90	0.37	10	9.80	3.6
Y-4	0.38	0.90	0.34	10	9.80	3.4
Y-5	0.38	0.90	0.34	10	9.80	3.4
Y-6	0.38	0.90	0.34	10	9.80	3.4
Z-1	0.60	0.90	0.54	10	9.80	5.3
Z-2	0.60	0.90	0.54	10	9.80	5.3
Z-3	0.52	0.90	0.47	10	9.80	4.6
Z-4	0.53	0.90	0.48	10	9.80	4.7
Z-5	0.78	0.90	0.70	10	9.80	6.9
Z-6	0.82	0.90	0.74	10	9.80	7.2
EX-B6	1.19	0.90	1.07	10	9.80	10.5
EX-A3	0.45	0.90	0.41	10	9.80	4.0

Remarks:
*DRAINAGE AREAS "D", "E", "I", "J" & "K" DRAIN TO EXISTING DETENTION PONDS
**DETENTION REQUIRED, FLOWS MUST BE DETAINED TO PREDEVELOPED (C = 0.35, Tc = 20 min, I100 = 8.3)

RECORD DRAWING 02/02/2015
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ROCKWALL TECHNOLOGY PARK PHASE IV

DRAINAGE AREA CALCULATIONS

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED
PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 09-26-2013
WA# 12209
SHEET NO. D201

TIME: 8:23 FILE: I:\D201-DRAINCALC-12209.dwg

100 YR. STORM INLET AND STREET FLOW CALCULATIONS

STREET STA	INLET NO.	CONTRIBUTING DRAINAGE AREA	DESIGN STORM FREQUENCY (yr)	TIME OF CONC (min)	RAINFALL INTENSITY (in/hr)	DRAINAGE AREA (Ac)	C' FACTOR	CxA	CA INTERCEPTED	Q FROM DA (cfs)	UPSTREAM CARRY-OVER (cfs)	GUTTER FLOW (cfs)	GUTTER SLOPE (%)	STREET SECTION	CROWN	DEPTH OF FLOW AT INLET (ft)	WIDTH OF FLOW IN STREET @ GUTTER (ft)	INLET LENGTH (ft)	INLET CAPACITY (cfs)	FLOW COLLECTED (cfs)	FLOW BYPASSED (cfs)	REMARKS
17+07.40 DISCOVERY	A1	A1	100	10	9.80	0.28	0.90	0.25	0.25	2.5	0.0	2.5	1.42	TRIANGULAR	0.5	0.18	8.8	5	2.4	2.4	0.1	EXISTING INLET BYPASS TO A3
16+91.39 DISCOVERY	A2	A2	100	10	9.80	0.31	0.90	0.28	0.26	2.7	0.0	2.7	1.42	TRIANGULAR	0.5	0.18	9.1	5	2.5	2.5	0.2	ON GRADE INLET / PH IV BYPASS TO A4
13+99.75 DISCOVERY	A3	A3	100	10	9.80	0.45	0.90	0.41	0.30	4.0	0.1	4.0	1.8	TRIANGULAR	0.5	0.20	10.1	5	2.9	2.9	1.1	EXISTING INLET BYPASS TO A5
13+90.02 DISCOVERY	A4	A4	100	10	9.80	0.49	0.90	0.44	0.31	4.3	0.2	4.6	1.7	TRIANGULAR	0.5	0.21	10.7	5	3.0	3.0	1.6	ON GRADE INLET / PH IV BYPASS TO A6
11+01.17 DISCOVERY	A5	A5	100	10	9.80	0.46	0.90	0.41	0.53	4.1	1.1	5.2	0.78	TRIANGULAR	0.5	0.26	13	10	5.5	5.2	0.0	EXISTING INLET
10+91.17 DISCOVERY	A6	A6	100	10	9.80	0.47	0.90	0.42	0.58	4.2	1.6	5.7	0.78	TRIANGULAR	0.5	0.27	13.5	10	5.7	5.7	0.0	EXISTING INLET
8+49.97 DISCOVERY	A7	A7	100	10	9.80	0.63	0.90	0.57	0.57	5.6	0.0	5.6	-	TRIANGULAR	0.5	0.27	-	15	-	5.6	0.0	EXISTING SUMP INLET
8+41.98 DISCOVERY	A8	A8	100	10	9.80	0.67	0.90	0.60	0.60	5.9	0.0	5.9	-	TRIANGULAR	0.5	0.28	-	15	-	5.9	0.0	EXISTING SUMP INLET
3+85.00 DISCOVERY	A9	A9	100	10	9.80	0.46	0.90	0.41	0.31	4.1	0.0	4.1	1.09	TRIANGULAR	0.5	0.22	11.1	5	3.0	3.0	1.1	EXISTING INLET BYPASS TO A12
3+75.00 DISCOVERY	A10	A10	100	10	9.80	0.42	0.90	0.38	0.30	3.7	0.0	3.7	1.09	TRIANGULAR	0.5	0.21	10.7	5	2.9	2.9	0.8	EXISTING INLET BYPASS TO A11
2+26.92 DISCOVERY	A11	A11	100	10	9.80	0.52	0.90	0.47	0.55	4.6	0.8	5.4	-	TRIANGULAR	0.5	0.27	-	20	-	5.4	0.0	EXISTING SUMP INLET
2+18.92 DISCOVERY	A12	A12	100	10	9.80	0.50	0.90	0.45	0.56	4.4	1.1	5.5	-	TRIANGULAR	0.5	0.27	-	20	-	5.5	0.0	EXISTING SUMP INLET
21+70.90 DISCOVERY	B1	B1	100	10	9.80	0.44	0.90	0.40	0.31	3.9	0.0	3.9	1.33	TRIANGULAR	0.5	0.23	11.7	5	3.0	3.0	0.9	ON GRADE INLET / PH IV BYPASS TO B3
21+70.90 DISCOVERY	B2	B2	100	10	9.80	0.44	0.90	0.40	0.31	3.9	0.0	3.9	1.33	TRIANGULAR	0.5	0.23	11.7	5	3.0	3.0	0.9	EXISTING INLET BYPASS TO B4
24+52.90 DISCOVERY	B3	B3	100	10	9.80	0.44	0.90	0.40	0.49	3.9	0.9	4.8	1.33	TRIANGULAR	0.5	0.25	12.7	10	5.4	4.8	0.0	ON GRADE INLET / PH IV
24+52.90 DISCOVERY	B4	B4	100	10	9.80	0.44	0.90	0.40	0.49	3.9	0.9	4.8	1.33	TRIANGULAR	0.5	0.25	12.7	10	5.4	4.8	0.0	EXISTING INLET
27+29.60 DISCOVERY	B5	B5	100	10	9.80	0.44	0.90	0.40	0.40	3.9	0.0	3.9	1.33	TRIANGULAR	0.5	0.23	11.7	10	5.2	3.9	0.0	ON GRADE INLET / PH IV
27+34.89 DISCOVERY	B6	B6	100	10	9.80	0.44	0.90	0.40	0.40	3.9	0.0	3.9	1.33	TRIANGULAR	0.5	0.23	11.7	10	5.2	3.9	0.0	EXISTING INLET
13+88.34 SPRINGER	C1	C1	100	10	9.80	0.29	0.90	0.26	0.26	2.6	0.0	2.6	0.6	TRIANGULAR	0.5	0.22	11.1	5	2.6	2.6	0.0	ON GRADE INLET / PH IV
14+23.86 SPRINGER	C2	C2	100	10	9.80	0.57	0.90	0.51	0.36	5.0	0.0	5.0	0.6	TRIANGULAR	0.5	0.28	14.2	5	3.5	3.5	1.5	EXISTING INLET BYPASS TO C4
11+59.11 SPRINGER	C3.1	C3.1	100	10	9.80	3.34	0.90	3.01	3.01	-	-	-	-	-	-	0.84	-	4'x4'	50.2	29.5	0.0	OFFSITE TYPE IL-H-L DROP INLET
10+84.30 SPRINGER	C3.2	C3.2	100	10	9.80	0.27	0.90	0.24	0.24	2.4	0.0	2.4	0.7	TRIANGULAR	0.5	0.21	10.4	5	2.6	2.4	0.0	ON GRADE INLET / PH IV
10+73.86 SPRINGER	C4	C4	100	10	9.80	0.72	0.90	0.65	0.71	6.4	1.5	7.9	0.7	TRIANGULAR	0.5	0.33	16.3	10	7.0	7.0	0.9	EXISTING INLET BYPASS TO C6
7+34.14 SPRINGER	C5	C5	100	10	9.80	0.24	0.90	0.22	0.22	2.1	0.0	2.1	0.7	TRIANGULAR	0.5	0.20	9.9	5	2.5	2.1	0.0	ON GRADE INLET / PH IV
7+23.86 SPRINGER	C6	C6	100	10	9.80	0.73	0.90	0.66	0.68	6.4	0.9	7.3	0.7	TRIANGULAR	0.5	0.32	15.9	10	6.7	6.7	0.6	EXISTING INLET BYPASS TO C8
4+23.48 SPRINGER	C8	C8	100	10	9.80	0.62	0.90	0.56	0.61	5.5	0.6	6.1	0.7	TRIANGULAR	0.5	0.30	14.9	10	6.0	6.0	0.1	EXISTING INLET BYPASS TO C10
4+23.48 SPRINGER	C10	C10	100	10	9.80	0.51	0.90	0.46	0.47	4.5	0.1	4.6	-	TRIANGULAR	1.5	0.27	-	10	-	4.6	0.0	EXISTING SAG INLET
6+77.83 SPRINGER	C16.1	C16.1	100	10	9.80	6.11	0.90	5.50	5.50	-	-	-	-	-	-	1.50	-	5'x5'	70.6	53.9	0.0	OFFSITE TYPE IL-H-L DROP INLET
4+33.76 SPRINGER	C16.7	C16.7	100	10	9.80	0.48	0.90	0.43	0.43	4.2	0.0	4.2	0.7	TRIANGULAR	0.5	0.26	12.9	10	5.5	4.2	0.0	ON GRADE INLET / PH IV
1+83.25 SPRINGER	C16.9	C16.9	100	10	9.80	0.61	0.90	0.55	0.55	5.4	0.0	5.4	-	TRIANGULAR	1.5	0.28	-	10	-	5.4	0.0	SAG INLET / PH IV
20+37.61 SPRINGER	D1	D1	100	10	9.80	0.66	0.90	0.59	0.59	5.8	0.0	5.8	0.84	TRIANGULAR	0.5	0.30	15	10	5.9	5.8	0.0	EXISTING INLET
20+37.61 SPRINGER	D2	D2	100	10	9.80	0.21	0.90	0.19	0.19	1.9	0.0	1.9	0.84	TRIANGULAR	0.5	0.20	9.8	10	5.0	1.9	0.0	ON GRADE INLET / PH IV
22+87.61 SPRINGER	D3	D3	100	10	9.80	0.53	0.90	0.48	0.48	4.7	0.0	4.7	0.7	TRIANGULAR	0.5	0.29	14.3	10	5.8	4.7	0.0	EXISTING INLET
22+87.61 SPRINGER	D4	D4	100	10	9.80	0.18	0.90	0.16	0.16	1.6	0.0	1.6	0.7	TRIANGULAR	0.5	0.19	9.6	10	4.9	1.6	0.0	ON GRADE INLET / PH IV
4+50.62 DATA	E1	E1	100	10	9.80	0.44	0.90	0.40	0.40	3.9	0.0	3.9	-	TRIANGULAR	0.5	0.27	-	10	-	3.9	0.0	SAG INLET / PH IV
4+50.62 DATA	E2	E2	100	10	9.80	1.05	0.90	0.94	0.94	9.3	0.0	9.3	-	TRIANGULAR	0.5	0.37	-	10	-	9.3	0.0	EXISTING SAG INLET
25+10.31SPRINGER	I1	I1	100	10	9.80	0.28	0.90	0.25	0.25	2.5	0.0	2.5	-	TRIANGULAR	0.5	0.22	-	10	-	2.5	0.0	SAG INLET / PH IV
25+08.01 SPRINGER	I2	I2	100	10	9.80	0.74	0.90	0.67	0.67	6.5	0.0	6.5	-	TRIANGULAR	0.5	0.32	-	10	-	6.5	0.0	EXISTING SAG INLET
9+92.15 DATA	P1	P1	100	10	9.80	0.38	0.90	0.34	0.34	3.3	0.0	3.3	-	TRIANGULAR	0.5	0.25	-	10	-	3.3	0.0	SAG INLET / PH IV
9+92.15 DATA	P2	P2	100	10	9.80	1.02	0.90	0.92	0.92	9.0	0.0	9.0	-	TRIANGULAR	0.5	0.36	-	10	-	9.0	0.0	EXISTING SAG INLET
17+30.00 DATA	M1	M1	100	10	9.80	0.40	0.90	0.36	0.36	3.5	0.0	3.5	0.73	TRIANGULAR	0.5	0.24	11.7	10	5.3	3.5	0.0	ON GRADE INLET / PH IV
17+30.00 DATA	M2	M2	100	10	9.80	0.30	0.90	0.27	0.27	2.6	0.0	2.6	0.73	TRIANGULAR	0.5	0.22	10.4	10	5.1	2.6	0.0	ON GRADE INLET / PH IV
20+27.38 DATA	M3	M3	100	10	9.80	0.76	0.90	0.68	0.68	6.7	0.0	6.7	-	TRIANGULAR	0.5	0.33	-	10	-	6.7	0.0	SAG INLET / PH IV
20+27.38 DATA	M4	M4	100	10	9.80	0.76	0.90	0.68	0.68	6.7	0.0	6.7	-	TRIANGULAR	0.5	0.33	-	10	-	6.7	0.0	SAG INLET / PH IV
34+70 DATA	FUT1	FUT1	100	10	9.80	0.42	0.90	0.38	0.38	3.7	0.0	3.7	1.06	TRIANGULAR	0.5	0.23	11.1	10	-	3.7	0.0	ON GRADE INLET / FUTURE
34+70 DATA	FUT2	FUT2	100	10	9.80	0.40	0.90	0.36	0.36	3.5	0.0	3.5	1.06	TRIANGULAR	0.5	0.23	10.9	10	-	3.5	0.0	ON GRADE INLET / FUTURE
32+32 DATA	FUT3	FUT3	100	10	9.80	0.25	0.90	0.22	0.22	2.2	0.0	2.2	1.06	TRIANGULAR	0.5	0.19	9.1	10	-	2.2	0.0	ON GRADE INLET / FUTURE
32+32 DATA	FUT4	FUT4	100	10	9.80	0.23	0.90	0.21	0.21	2.0	0.0	2.0	1.06	TRIANGULAR	0.5	0.18	8.8	10	-	2.0	0.0	ON GRADE INLET / FUTURE
27+47.08 CAPITAL	T1	T1	100	10	9.80	0.17	0.90	0.15	0.15	1.5	0.0	1.5	1.55	TRIANGULAR	0.5	0.15	7.4	5	2.3	1.5	0.0	ON GRADE INLET / PH IV
27+47.08 CAPITAL	T2	T2	100	10	9.80	0.17	0.90	0.15	0.15	1.5	0.0	1.5	1.55	TRIANGULAR	0.5	0.15	7.4	5	2.3	1.5	0.0	ON GRADE INLET / PH IV
29+00 DATA	T3	T3	100	10	9.80	0.43	0.90	0.39	0.39	3.8	0.0	3.8	1.06	TRIANGULAR	0.5	0.23	11.2	10	5.2	3.8	0.0	ON GRADE INLET / PH IV
29+00 DATA	T4	T4	100	10	9.80	0.44	0.90	0.40	0.40	3.9	0.0	3.9	1.06	TRIANGULAR	0.5	0.24	11.3	10	5.3	3.9	0.0	ON GRADE INLET / PH IV
25.73.58 DATA	T5	T5	100	10	9.80	0.79	0.90	0.71	0.71	7.0	0.0	7.0	-	TRIANGULAR	0.5	0.29	-	10	-	7.0	0.0	SAG INLET / PH IV
25.73.58 DATA	T6	T6	100	10	9.80	0.79	0.90	0.71	0.71	7.0	0.0	7.0	-	TRIANGULAR	0.5	0.29	-	10	-	7.0	0.0	SAG INLET / PH IV
1+12 CAPITAL	X1	X1	100	10	9.80	0.19	0.90	0.17	0.17	1.7	0.0	1.7	0.85	TRIANGULAR	0.5	0.18	8.6	5	2.4	1.7	0.0	ON GRADE INLET / PH IV
1+12 CAPITAL	X2	X2	100	10	9.80	0.19	0.90	0.17	0.17	1.7	0.0	1.7	0.85	TRIANGULAR	0.5	0.18	8.6	5	2.4	1.7	0.0	ON GRADE INLET / PH IV
8+50 CAPITAL	Y1	Y1	100	10	9.80	0.43	0.90	0.39	0.39	3.8	0.0	3.8	0.85	TRIANGULAR	0.5	0.24	11.7	10	5.3	3.8	0.0	ON GRADE INLET / PH IV
8+50 CAPITAL	Y2	Y2	100	10	9.80	0.39	0.90	0.35	0.35	3.4	0.0	3.4	0.85	TRIANGULAR	0.5	0.23	11.2	10	5.2	3.4	0.0	ON GRADE INLET / PH IV
5+50 CAPITAL	Y3	Y3	100	10	9.80	0.41	0.90	0.37	0.37	3.6	0.0	3.6	0.85	TRIANGULAR	0.5	0.24	11.5	10	5.3	3.6	0.0	ON GRADE INLET / PH IV
5+50 CAPITAL	Y4	Y4	100	10	9.80	0.38	0.90	0.34	0.34	3.4	0.0	3.4	0.85	TRIANGULAR	0.5	0.23	11.2	10	5.2	3.4	0.0	ON GRADE INLET / PH IV
2+62 CAPITAL	Y5	Y5	100	10	9.80	0.38	0.90	0.34	0.34	3.5	0.0	3.5	0.85	TRIANGULAR	0.5	0.24	11.3	10	5.3	3.5	0.0	ON GRADE INLET / PH IV
2+62 CAPITAL	Y6	Y6	100	10	9.80	0.38	0.90	0.34	0.34	3.5	0.0	3.5	0.85	TRIANGULAR	0.5	0.24	11.3	10	5.3	3.5	0.0	ON GRADE INLET / PH IV
21+60 CAPITAL	Z1	Z1	100	10	9.80	0.60	0.90	0.54	0.54	5.3	0.0	5.3	2	TRIANGULAR	0.5	0.23	11.3	10	5.3	5.3	0.0	ON GRADE INLET / PH IV
21+60 CAPITAL	Z2	Z2	100	10	9.80	0.60	0.90	0.54	0.54	5.3	0.0	5.3	2	TRIANGULAR	0.5	0.23	11.3	10	5.3	5.3	0.0	ON GRADE INLET / FUTURE
17+65 CAPITAL	Z3	Z3	100	10	9.80	0.52	0.90	0.47	0.47	4.6	0.0	4.6	1.35	TRIANGULAR	0.5	0.24	11.5	10	5.3	4.6	0.0	ON GRADE INLET / PH IV
17+65 CAPITAL	Z4	Z4	100	10	9.80	0.53	0.90	0.48	0.48	4.7	0.0	4.7	1.35	TRIANGULAR	0.5	0.24	11.6	10	5.3	4.7	0.0	ON GRADE INLET / FUTURE
14+15.46 CAPITAL	Z5	Z5	100	10	9.80	0.78	0.90	0.70	0.70	6.9	0.0	6.9	-	TRIANGULAR	0.5	0.28	-	10	-	6.9	0.0	SAG INLET / PH IV
14+15.46 CAPITAL	Z6	Z6	100	10	9.80	0.82	0.90	0.74	0.74	7.2	0.0	7.2	-	TRIANGULAR	0.5	0.28	-	10	-	7.2	0.0	SAG INLET / FUTURE
CORPORATE CROSSING	EX-B6	EX-B6	100	10	9.80	1.19	0.90	1.07	0.82	10.5	0.0	10.5	0.85	TRIANGULAR	0.5	0.37	17.5					EXISTING INLET BYPASS TO EX-A3
CORPORATE CROSSING	EX-A3	EX-A3	100	10	9.80	0.45	0.90	0.41	0.66	4.0	2.5	6.5	-	TRIANGULAR	0.5	0.42	-					EXISTING SAG INLET

RECORD DRAWING 02/02/2015

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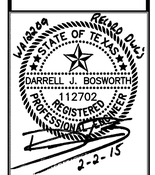
WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
Texas Firm Registration No. F-2776 www.WierAssociates.com

ROCKWALL TECHNOLOGY PARK PHASE IV

100 YR INLET CALCULATIONS



LAST SHEET EDIT DATE 10-15-2013
WA# 12209

SHEET NO. D202

FILE: I:\D202-DRAINCALC\2-I2209.dwg
TIME: 10:31

STORM DRAIN CALCULATIONS FOR EXISTING 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
INLET A1	17+12.81	35.8	0.24	10	0.24	10.0	100	9.80	2.4	18	1.4	0.0005	1.25	0.04	0.1	10.1	608.12	
17+12.81	17+00.81	12	-	-	0.24	10.1	100	9.78	2.3	18	1.3	0.0005	0.5	0.01	0.0	10.1	605.02	
INLET A2	17+00.81	36.75	0.26	10	0.26	10.0	100	9.80	2.5	18	1.4	0.0006	1.25	0.04	0.1	10.1	607.98	PROPOSED INLET
17+00.81	14+14.48	286.33	-	-	0.50	10.1	100	9.78	4.9	18	2.8	0.0022	0.5	0.11	0.7	10.8	604.98	
14+14.48	14+09.48	5	-	-	0.50	10.8	100	9.64	4.8	24	1.5	0.0005	0.5	0.00	0.1	10.9	601.33	
INLET A3	14+09.48	36.3	0.30	10	0.30	10.0	100	9.80	2.9	18	1.6	0.0008	1.25	0.05	0.1	10.1	601.56	
14+09.48	13+99.85	9.63	-	-	0.80	10.9	100	9.62	7.7	24	2.5	0.0012	0.5	0.08	0.1	11.0	601.33	
INLET A4	13+99.85	36.39	0.31	10	0.31	10.0	100	9.80	3.0	18	1.7	0.0008	1.25	0.06	0.1	10.1	601.39	PROPOSED INLET
13+99.85	13+89.53	10.32	-	-	1.11	11.0	100	9.61	10.7	24	3.4	0.0022	0.5	0.13	0.0	11.0	601.24	
13+89.53	12+50	139.53	-	-	1.11	11.0	100	9.61	10.7	24	3.4	0.0022	0.5	0.09	0.3	11.3	601.07	
12+50	11+11.04	138.96	-	-	1.11	11.3	100	9.55	10.6	24	3.4	0.0022	0.25	0.04	0.7	12.0	599.32	
INLET A5	11+11.04	36.37	0.53	10	0.53	10.0	100	9.80	5.2	18	2.9	0.0025	1.25	0.17	0.2	10.2	599.23	
11+11.04	11+01.04	10	-	-	1.64	12.0	100	9.43	15.5	33	2.6	0.0009	0.5	0.02	0.1	12.1	598.97	
INLET A6	11+01.04	36.37	0.58	10	0.58	10.0	100	9.80	5.7	18	3.2	0.0029	1.25	0.20	0.2	10.2	599.25	
11+01.04	8+59.98	241.06	-	-	2.22	12.1	100	9.42	20.9	33	3.5	0.0016	0.5	0.14	0.8	12.9	598.94	
INLET A7	8+59.98	36.16	0.57	10	0.57	10.0	100	9.80	5.6	24	1.8	0.0006	1.25	0.06	0.3	10.3	598.45	
8+59.98	8+51.35	8.63	-	-	2.79	12.9	100	9.29	25.9	36	3.7	0.0015	0.5	0.12	0.0	12.9	598.37	
INLET A8	0+23.05	14.27	0.60	10	0.60	10.0	100	9.80	5.9	24	1.9	0.0007	1.25	0.07	0.1	10.1	598.34	
0+23.05	8+51.35	23.05	-	-	0.60	10.1	100	9.78	5.9	24	1.9	0.0007	0	0.00	0.2	10.3	598.26	
8+51.35	4+00.84	450.51	-	-	3.39	12.9	100	9.29	31.5	36	4.5	0.0022	0.5	0.21	1.0	13.9	598.24	
4+00.84	3+95.72	5.12	-	-	3.39	13.9	100	9.15	31.0	36	4.4	0.0022	0	0.00	0.0	13.9	596.36	
INLET A9	3+95.72	36.03	0.31	10	0.31	10.0	100	9.80	3.0	18	1.7	0.0008	1.25	0.06	0.4	10.4	596.44	
3+95.72	3+84.43	11.29	-	-	3.70	13.9	100	9.15	33.9	36	4.8	0.0026	0.5	0.21	0.0	13.9	596.35	
INLET A10	3+84.43	36.27	0.30	10	0.30	10.0	100	9.80	2.9	18	1.6	0.0008	1.25	0.05	0.4	10.4	596.19	
3+84.43	2+45.79	138.64	-	-	4.00	13.9	100	9.15	36.6	36	5.2	0.0030	0.5	0.24	0.4	14.3	596.11	
2+45.79	2+36.79	9	-	-	4.00	14.3	100	9.09	36.4	4x3	3.0	0.0009	0.5	0.07	0.1	14.4	595.45	
INLET A11	2+36.79	36.37	0.55	10	0.55	10.0	100	9.80	5.4	24	1.7	0.0006	1.25	0.06	0.4	10.4	595.45	
2+36.79	2+28.79	8	-	-	4.55	14.4	100	9.08	41.3	4x3	3.4	0.0011	0.5	0.11	0.0	14.4	595.37	
INLET A12	2+28.79	36.37	0.56	10	0.56	10.0	100	9.80	5.5	24	1.8	0.0006	1.25	0.06	0.3	10.3	595.33	
2+28.79	1+88.57	40.22	-	-	5.11	14.4	100	9.08	46.4	4x3	3.9	0.0014	0.5	0.15	0.1	14.5	595.25	CALCS UPDATED FROM PH-III PLANS BY WIER & ASSOCIATES DATED 4/19/09 WITH NEW STARTING HG = 584.80 ('LAT C1+03' IN SD LINE 'C')
1+88.57	1+03.24	85.33	-	-	5.11	14.5	100	9.06	46.3	4x3	3.9	0.0014	0.5	0.12	0.2	14.7	595.04	

STORM DRAIN CALCULATIONS FOR EXISTING 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
INLET B1	6+30.19	36.37	0.31	10	0.31	10.0	100	9.80	3.0	18	1.7	0.0008	1.25	0.06	0.4	10.4	607.08	PROPOSED INLET
6+30.19	6+16.88	13.31	-	-	0.31	10.4	100	9.72	3.0	24	1.0	0.0002	0.35	0.00	0.0	10.4	606.99	
INLET B2	6+16.88	44.55	0.31	10	0.31	10.0	100	9.80	3.0	18	1.7	0.0008	1.25	0.06	0.4	10.4	606.93	
6+16.88	3+48.19	268.69	-	-	0.62	10.4	100	9.72	6.0	24	1.9	0.0007	0.75	0.04	0.6	11.0	606.83	
INLET B3	3+48.19	36.37	0.49	10	0.49	10.0	100	9.80	4.8	18	2.7	0.0021	1.25	0.14	0.1	10.1	603.25	PROPOSED INLET
3+48.19	3+34.88	13.31	-	-	1.11	11.0	100	9.61	10.7	24	3.4	0.0022	0.75	0.14	0.1	11.1	603.01	
INLET B4	3+34.88	44.55	0.49	10	0.49	10.0	100	9.80	4.8	18	2.7	0.0021	1.25	0.14	0.1	10.1	603.25	
3+34.88	0+71.20	263.68	-	-	1.60	11.1	100	9.59	15.3	24	4.9	0.0046	0.75	0.24	0.5	11.6	602.84	
INLET B5	0+71.20	36.37	0.40	10	0.40	10.0	100	9.80	3.9	18	2.2	0.0014	1.25	0.09	0.3	10.3	600.48	PROPOSED INLET
0+71.20	0+52.39	18.81	-	-	2.00	11.6	100	9.50	19.0	24	6.1	0.0071	0.75	0.30	0.1	11.7	600.34	
INLET B6	0+52.39	45.25	0.40	10	0.40	10.0	100	9.80	3.9	18	2.2	0.0014	1.25	0.09	0.3	10.3	600.06	
0+52.39	1+49.97	52.39	-	-	2.40	11.7	100	9.48	22.8	24	7.3	0.0102	0.75	0.41	0.1	11.8	599.91	

STORM DRAIN CALCULATIONS FOR EXISTING 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 C2	14+50.75	25.48	0.36	10	0.36	10.0	100	9.80	3.5	18	2.0	0.0011	1.25	0.08	0.0	10.0	601.60	EXISTING INLET
14+50.75	14+20.56	30.19	-	-	0.36	10.0	100	9.80	3.5	24	1.1	0.0002	0.5	0.00	0.1	10.1	600.59	
INLET C1	0+14.43	10.00	0.26	10	0.26	10.0	100	9.80	2.5	18	1.4	0.0006	1.25	0.04	0.0	10.0	601.38	PROPOSED INLET
0+14.43	14+20.56	14.43	-	-	0.26	10.0	100	9.80	2.5	18	1.4	0.0006	0.45	0.01	0.0	10.0	600.87	
14+20.56	13+14.68	105.88	-	-	0.62	10.1	100	9.78	6.1	24	1.9	0.0007	0.5	0.05	0.3	10.4	600.46	
13+14.68	11+80.50	134.18	-	-	0.62	10.4	100	9.72	6.0	36	0.8	0.0001	0.5	0.00	0.5	10.9	599.77	
INLET C3.1	11+80.50	37.43	3.01	10	3.01	10.0	100	9.80	29.5	30	6.0	0.0052	1.25	0.70	0.1	10.1	600.24	PROPOSED DROP INLET
11+80.50	11+16.07	64.43	-	-	3.63	10.9	100	9.62	34.9	36	4.9	0.0027	0.5	0.37	0.1	11.0	599.34	
11+16.07	11+11.07	5.00	-	-	3.63	11.0	100	9.61	34.9	42	3.6	0.0012	0.5	0.01	0.0	11.0	598.79	
INLET C3.2	11+11.07	25.33	0.24	10	0.24	10.0	100	9.80	2.4	24	0.8	0.0001	0	0.00	0.0	10.0	599.64	PROPOSED INLET
11+11.07	11+00.76	10.31	-	-	3.87	11.0	100	9.61	37.2	42	3.9	0.0014	0.5	0.14	0.0	11.0	598.77	
INLET C4	11+00.76	25.48	0.71	10	0.71	10.0	100	9.80	7.0	24	2.2	0.0010	1.25	0.10	0.0	10.0	599.17	EXISTING INLET
11+00.76	10+64.76	36.00	-	-	4.58	11.0	100	9.61	44.0	45	4.0	0.0013	0.5	0.13	0.1	11.1	598.62	
10+64.76	9+38.52	126.24	-	-	4.58	11.1	100	9.59	43.9	45	4.0	0.0013	0.5	0.12	0.2	11.3	598.39	
9+38.52	9+33.52	5.00	-	-	4.58	11.3	100	9.55	43.7	45	4.0	0.0013	0.5	0.12	0.0	11.3	598.07	
LAT H2	9+33.52	35.00	2.99	10	2.99	10.0	100	9.80	29.3	27	7.4	0.0090	1.25	1.05	0.0	10.0	599.44	EXISTING STUBOUT
9+33.52	7+61.07	172.45	-	-	7.57	11.3	100	9.55	72.3	45	6.5	0.0036	0.5	0.53	0.4	11.7	597.94	
INLET C5	7+61.07	25.33	0.21	10	0.21	10.0	100	9.80	2.1	24	0.7	0.0001	1.25	0.01	0.6	10.6	596.80	PROPOSED INLET
7+61.07	7+50.76	10.31	-	-	7.78	11.7	100	9.48	73.8	48	5.9	0.0026	0.5	0.21	0.0	11.7	596.79	
INLET C6	7+50.76	25.48	0.68	10	0.68	10.0	100	9.80	6.7	24	2.1	0.0009	1.25	0.09	0.0	10.0	596.71	EXISTING INLET
7+50.76	6+00.51	150.25	-	-	8.46	11.7	100	9.48	80.2	48	6.4	0.0031	0.5	0.37	0.3	12.0	596.55	
LAT H3	6+00.51	35.00	1.81	10	1.81	10.0	100	9.80	17.7	24	5.6	0.0061	1.25	0.62	0.0	10.0	596.12	EXISTING STUBOUT
6+00.51	5+05.45	95.06	-	-	10.27	12.0	100	9.43	96.8	6x3	5.4	0.0022	0.5	0.13	0.3	12.3	594.67	
5+05.45	4+50.37	55.08	-	-	10.27	12.3	100	9.38	96.3	6x3	5.4	0.0022	0.5	0.23	0.2	12.5	594.33	
INLET C8	4+50.37	25.48	0.61	10	0.61	10.0	100	9.80	6.0	24	1.9	0.0007	1.25	0.07	0.0	10.0	594.58	EXISTING INLET
4+50.37	3+20.61	129.76	-	-	10.88	12.5	100	9.35	101.7	6x3	5.7	0.0024	0.5	0.28	0.4	12.9	593.98	
3+20.61	3+15.61	5.00	-	-	10.88	12.9	100	9.29	101.1	8x3	4.2	0.0012	0.5	0.02	0.0	12.9	593.39	
LAT H4	3+15.61	35.00	1.94	10	1.94	10.0	100	9.80	19.0	24	6.0	0.0071	1.25	0.71	0.0	10.0	594.76	EXISTING STUBOUT
3+15.61	1+57.73	157.88	-	-	12.82	12.9	100	9.29	119.1	8x3	5.0	0.0017	0.5	0.25	0.5	13.4	593.36	
INLET C10	1+57.73	25.48	0.47	10	0.47	10.0	100	9.80	4.6	18	2.6	0.0019	1.25	0.13	0.2	10.2	593.02	EXISTING INLET
1+57.73	1+15.65	42.08	-	-	13.29	13.4	100	9.22	122.5	8x3	5.1	0.0018	0.5	0.21	0.1	13.5	592.84	
1+15.65	1+05.65	5.00	-	-	13.29	13.5	100	9.20	122.3	18x3	2.3	0.0003	0.5	0.00	0.0	13.5	592.55	
LAT C1+03	1+05.65	725.18	6.01	16.6	6.01	16.6	100	8.75	52.6	45	4.8	0.0019	0.5	0.18	2.0	18.6	594.80	CA FROM PLANS FOR CORPORATE CR
1+05.65	7+62.43	30.95	-	-	19.30	18.6	100	8.47	163.5	6x3	4.5	0.0016	0	0.00	0.1	18.7	592.55	
7+62.43	7+51.85	10.58	-	-	19.30	18.7	100	8.46	163.3	6x4	3.4	0.0007	0	0.00	0.1	18.8	592.50	
7+51.85	7+49.15	2.70	-	-	19.30	18.8	100	8.45	163.1	8x4	2.5	0.0003	0.5	0.05	0.0	18.8	592.49	
LAT C3+14	7+49.15	302.50	1.88	10.6	1.88	10.6	100	9.68	18.2	33	3.1	0.0012	0.33	0.05	1.6	12.2	592.85	CA FROM PLANS FOR CORPORATE CR
7+49.15	7+35.08	14.07	-	-	21.18	18.8	100	8.45	179.0	8x4	2.8	0.0004	0.5	0.07	0.1	18.9	592.44	
7+35.08	7+04.08	31.00	-	-	21.18	18.9	100	8.43	178.5	8x4	2.8	0.0004	0.5	0.06	0.2	19.1	592.36	
LAT C16	7+04.08	54.28	-	-	6.48	11.4	100	9.53	61.8	45	5.6	0.0026	0	0.00	0.2	11.6	592.45	EXISTING STUBOUT, SEE
7+04.08	5+91.96	112.12	-	-	27.66	19.1	100	8.41	232.6	8x4	3.6	0.0007	0.5	0.14	0.5	19.6	592.29	STARTING HG, SEE PLANS FOR CORPORA

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WIER & ASSOCIATES, INC.
ENGINEERS SURVEYORS LAND PLANNERS
701 HIGHLANDER BLVD., SUITE 300 ARLINGTON, TEXAS 76015 METRO (817)467-7700
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ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN HYDRAULIC CALCULATIONS

LAST SHEET EDIT DATE 09-26-2013
WA# I2209

SHEET NO. D203

FILE: I:\2203-DRAINCALC\3-I2209.dwg
TIME: 8:43

STORM DRAIN CALCULATIONS FOR STORM DRAIN LAT C16

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 C16.1	4+18.06	262.10	5.50	10	5.50	10.0	100	9.80	53.9	42	5.6	0.0029	1.25	0.61	0.4	10.4	596.71	
INLET C16.7	4+18.06	14.43	0.43	10	0.43	10.0	100	9.80	4.2	18	2.4	0.0016	1.25	0.11	0.1	10.1	595.10	
4+18.06	1+67.55	250.51	-	-	5.93	10.4	100	9.72	57.6	42	6.0	0.0033	0.2	0.46	0.7	11.1	594.97	
INLET C16.9	1+67.55	14.43	0.55	10	0.55	10.0	100	9.80	5.4	18	3.1	0.0026	1.25	0.18	0.1	10.1	593.90	
1+67.55	0+67.61	100.06	-	-	6.48	11.1	100	9.59	62.1	42	6.5	0.0038	0.2	0.54	0.3	11.4	593.68	
0+67.61	0+62.61	5.00	-	-	6.48	11.4	100	9.53	61.8	42	6.4	0.0038	0.45	0.29	0.0	11.4	592.76	
0+62.61	7+04.08	54.28	-	-	6.48	11.4	100	9.53	61.8	45	5.6	0.0026	0	0.00	0.2	11.6	592.45	EXISTING STUBOUT

STORM DRAIN CALCULATIONS FOR EXISTING STORM DRAIN LINE D

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 D1	4+30.15	25.40	0.59	10	0.59	10.0	100	9.80	5.8	18	3.3	0.0030	1.25	0.21	0.1	10.1	601.34	
4+30.15	4+20.85	9.3	-	-	0.59	10.1	100	9.78	5.8	24	1.8	0.0007	0.35	0.02	0.1	10.2	600.95	
INLET D2	4+20.85	31.11	0.19	10	0.19	10.0	100	9.80	1.9	18	1.1	0.0003	1.25	0.02	0.1	10.1	601.23	PROPOSED INLET, UPDATED CA FROM PH-III PLANS BY WIER & ASSOCIATES DATED 4/19/09
4+20.85	1+80.15	240.7	-	-	0.78	10.2	100	9.76	7.6	24	2.4	0.0011	0.75	0.05	0.8	11.0	600.92	
INLET D3	1+80.15	31.11	0.48	10	0.48	10.0	100	9.80	4.7	21	2.0	0.0009	1.25	0.07	0.3	10.3	599.76	
1+80.15	1+70.85	9.3	-	-	1.26	11.0	100	9.61	12.1	27	3.0	0.0015	0.75	0.07	0.1	11.1	599.66	
INLET D4	1+70.85	31.11	0.16	10	0.16	10.0	100	9.80	1.6	21	0.7	0.0001	1.25	0.01	0.7	10.7	599.59	PROPOSED INLET, UPDATED CA FROM PH-III PLANS BY WIER & ASSOCIATES DATED 4/19/09
1+70.85	1+53.92	16.93	-	-	1.42	11.1	100	9.59	13.6	27	3.4	0.0019	0.75	0.07	0.1	11.2	599.58	
1+53.92	0+35	118.92	-	-	1.42	11.2	100	9.57	13.6	27	3.4	0.0019	0.35	0.06	0.3	11.5	599.48	STARTING HG USED FROM PH-III PLANS BY WIER & ASSOCIATES DATED 4/19/09

STORM DRAIN CALCULATIONS FOR EXISTING STORM DRAIN LINE E

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 E1	INLET E2	45	0.40	10	0.40	10.0	100	9.80	3.9	21	1.6	0.0006	1.25	0.05	0.5	10.5	598.59	PROPOSED INLET
INLET E2	0+35.33	120.66	0.94	10	1.34	10.5	100	9.70	13.0	21	5.4	0.0067	0.35	0.16	0.4	10.9	598.51	

STORM DRAIN CALCULATIONS FOR EXISTING STORM DRAIN LINE I

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 I1	INLET I2	45	0.25	10	0.25	10.0	100	9.80	2.5	18	1.4	0.0006	1.25	0.04	0.2	10.2	598.37	PROPOSED INLET, UPDATED CA FROM PH-III PLANS BY WIER & ASSOCIATES DATED 4/19/09
INLET I2	0+34.30	80.45	0.67	10	0.92	10.2	100	9.76	9.0	21	3.7	0.0032	0.35	0.08	0.2	10.4	598.21	

STORM DRAIN CALCULATIONS FOR STORM DRAIN LINE M

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 M1	6+73.00	25.98	0.36	10	0.36	10.0	100	9.80	3.5	18	2.0	0.0011	1.25	0.08	0.1	10.1	597.07	
6+73.00	6+63.49	9.51	-	-	0.36	10.1	100	9.78	3.5	24	1.1	0.0002	0.6	0.00	0.0	10.1	596.78	
INLET M2	6+63.49	31.82	0.27	10	0.27	10.0	100	9.80	2.6	18	1.5	0.0006	1.25	0.04	0.1	10.1	597.03	
6+63.49	3+76.79	286.7	-	-	0.63	10.1	100	9.78	6.2	24	2.0	0.0008	0.4	0.05	0.9	11.0	596.77	
INLET M3	3+76.79	23.66	0.68	10	0.68	10.0	100	9.80	6.7	18	3.8	0.0041	1.25	0.28	0.1	10.1	596.39	
INLET M4	3+76.79	23.66	0.68	10	0.68	10.0	100	9.80	6.7	18	3.8	0.0041	1.25	0.28	0.1	10.1	596.39	
3+76.79	1+04.57	272.22	-	-	2.00	11.0	100	9.61	19.2	27	4.8	0.0038	0.5	0.33	1.0	12.0	596.01	

STORM DRAIN CALCULATIONS FOR EXISTING STORM DRAIN LINE P

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 P1	4+65.42	26.35	0.34	10	0.34	10.0	100	9.80	3.3	18	1.9	0.0010	1.25	0.07	0.2	10.2	599.14	PROPOSED INLET
4+65.42	4+57.92	7.5	-	-	0.34	10.2	100	9.76	3.3	27	0.8	0.0001	0.75	0.00	0.2	10.4	599.04	
INLET P2	4+57.92	31.11	0.92	10	0.92	10.0	100	9.80	9.0	21	3.7	0.0032	1.25	0.27	0.1	10.1	599.41	
4+57.92	1+13.35	457.92	-	-	1.26	10.4	100	9.72	12.2	27	3.1	0.0016	0.75	0.14	2.5	12.9	599.04	

STORM DRAIN CALCULATIONS FOR STORM DRAIN LINE T

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 FUT1	2+61.86	25.98	0.38	10	0.38	10.0	100	9.80	3.7	18	2.1	0.0012	1.25	0.09	0.0	10.0	604.32	
2+61.86	2+52.35	9.51	-	-	0.38	10.0	100	9.80	3.7	24	1.2	0.0003	0.6	0.00	0.0	10.0	602.76	
INLET FUT2	2+52.35	31.32	0.36	10	0.36	10.0	100	9.80	3.5	18	2.0	0.0011	1.25	0.08	0.1	10.1	604.31	
2+52.35	0+53.85	198.5	-	-	0.74	10.1	100	9.78	7.2	24	2.3	0.0010	0.4	0.07	0.5	10.6	602.71	
FI FUT5	INLET FUT3	25	1.17	10	1.17	10.0	100	9.80	11.5	24	3.7	0.0026	1.25	0.26	0.1	10.1	602.07	
INLET FUT3	0+53.85	25.98	0.22	10	1.40	10.1	100	9.78	13.6	24	4.3	0.0036	0.5	0.18	0.1	10.2	601.74	
0+53.85	0+44.34	9.51	-	-	2.13	10.6	100	9.68	20.6	27	5.2	0.0044	0.6	0.37	0.0	10.6	601.47	
INLET FUT4	0+44.34	31.82	0.21	10	0.21	10.0	100	9.80	2.0	18	1.1	0.0004	1.25	0.02	0.1	10.1	602.23	
0+44.34	JBOX	44.34	-	-	2.34	10.6	100	9.68	22.7	27	5.7	0.0054	0.2	0.42	0.1	10.7	601.06	
INLET T1	9+31.07	11.55	0.15	10	0.15	10.0	100	9.80	1.5	18	0.8	0.0002	1.25	0.01	0.0	10.0	601.77	
9+31.07	9+17.21	13.86	-	-	0.15	10.0	100	9.80	1.5	24	0.5	0.0000	0.6	0.00	0.1	10.1	600.99	
INLET T2	9+17.21	40.41	0.15	10	0.15	10.0	100	9.80	1.5	18	0.8	0.0002	1.25	0.01	0.1	10.1	601.77	
9+17.21	JBOX W	29.71	-	-	0.31	10.1	100	9.78	3.0	24	1.0	0.0002	0.6	0.01	0.1	10.2	600.86	
JBOX	6+08.53	276.97	-	-	2.65	10.7	100	9.66	25.6	30	5.2	0.0039	0.5	0.41	0.6	11.3	600.40	
INLET T3	6+08.53	25.98	0.39	10	0.39	10.0	100	9.80	3.8	18	2.2	0.0013	1.25	0.09	0.0	10.0	598.60	
6+08.53	5+99.02	9.51	-	-	3.03	11.3	100	9.55	29.0	33	4.9	0.0030	0.5	0.16	0.0	11.3	598.31	
INLET T4	5+99.02	31.82	0.40	10	0.40	10.0	100	9.80	3.9	18	2.2	0.0014	1.25	0.09	0.1	10.1	598.60	
5+99.02	3+72.85	226.17	-	-	3.43	11.3	100	9.55	32.7	33	5.5	0.0038	0.5	0.28	0.4	11.7	598.12	
3+72.85	2+82.11	90.74	-	-	3.43	11.7	100	9.48	32.5	33	5.5	0.0038	0	0.00	0.3	12.0	596.67	
INLET T5	2+82.11	25.98	0.71	10	0.71	10.0	100	9.80	7.0	21	2.9	0.0020	1.25	0.16	0.1	10.1	596.54	
2+82.11	2+72.60	9.51	-	-	4.14	12.0	100	9.43	39.0	39	4.7	0.0022	0.5	0.11	0.0	12.0	596.33	
INLET T6	2+72.60	31.82	0.71	10	0.71	10.0	100	9.80	7.0	21	2.9	0.0020	1.25	0.16	0.2	10.2	596.42	
2+72.60	0+17.11	255.19	-	-	4.85	12.0	100	9.43	45.7	39	5.5	0.0031	0.75	0.21	0.8	12.8	596.20	

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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

ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN HYDRAULIC CALCULATIONS

REVISED DWG.

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
2-2-15

LAST SHEET EDIT DATE 09-26-2013
WA# I2209

SHEET NO. D204

TIME:8:45 FILE: D204-DRAINCALC4-I2209.dwg

STORM DRAIN CALCULATIONS FOR STORM DRAIN LINE X

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 X1	2+09.72	25.98	0.17	10	0.17	10.0	100	9.80	1.7	18	1.0	0.0003	1.25	0.02	0.4	10.4	577.80	
2+09.72	2+00.21	9.51	-	-	0.17	10.4	100	9.72	1.7	24	0.5	0.0001	0.6	0.00	0.0	10.4	577.77	
INLET X2	2+00.21	31.82	0.17	10	0.17	10.0	100	9.80	1.7	18	1.0	0.0003	1.25	0.02	0.5	10.5	577.75	
2+00.21	1+03.65	95.96	-	-	0.34	10.5	100	9.70	3.3	24	1.1	0.0002	0.4	0.02	0.4	10.9	577.72	

STORM DRAIN CALCULATIONS FOR STORM DRAIN LINE Y

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 Y1	7+21.65	26.11	0.39	10	0.39	10.0	100	9.80	3.8	18	2.2	0.0013	1.25	0.09	0.0	10.0	584.03	
7+21.65	7+12.52	9.13	-	-	0.39	10.0	100	9.80	3.8	24	1.2	0.0003	0.6	0.00	0.0	10.0	583.24	
INLET Y2	7+12.52	31.37	0.35	10	0.35	10.0	100	9.80	3.4	18	1.9	0.0010	1.25	0.07	0.1	10.1	584.01	
7+12.52	4+23.33	289.19	-	-	0.74	10.1	100	9.78	7.2	24	2.3	0.0010	0.4	0.07	0.8	10.9	583.22	
INLET Y3	4+23.33	25.52	0.37	10	0.37	10.0	100	9.80	3.6	18	2.0	0.0012	1.25	0.08	0.0	10.0	581.46	
INLET Y4	4+23.33	25.38	0.34	10	0.34	10.0	100	9.80	3.4	18	1.9	0.0010	1.25	0.07	0.0	10.0	581.45	
4+23.33	1+43.68	279.65	-	-	1.45	10.9	100	9.62	13.9	24	4.4	0.0038	0.25	0.28	0.6	11.5	580.54	
INLET Y5	1+43.68	34.03	0.34	10	0.34	10.0	100	9.80	3.4	18	1.9	0.0010	1.25	0.07	0.1	10.1	578.99	
1+43.68	1+23.42	20.26	-	-	1.79	11.5	100	9.52	17.1	27	4.3	0.0030	0.3	0.20	0.1	11.6	578.17	
INLET Y6	1+23.42	10.41	0.34	10	0.34	10.0	100	9.80	3.4	18	1.9	0.0010	1.25	0.07	0.0	10.0	578.99	
1+23.42	1+03.67	20.3	-	-	2.13	11.6	100	9.50	20.3	27	5.1	0.0043	0.4	0.29	0.1	11.7	577.91	

STORM DRAIN CALCULATIONS FOR STORM DRAIN LINE Z

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 Z1	11+04.06	12.12	0.54	10	0.54	10.0	100	9.80	5.3	18	3.0	0.0025	1.25	0.17	0.0	10.0	595.17	
11+04.06	10+90.20	13.86	-	-	0.54	10.0	100	9.80	5.3	24	1.7	0.0005	0.6	0.00	0.0	10.0	593.70	
INLET Z2	10+90.20	39.84	0.54	10	0.54	10.0	100	9.80	5.3	18	3.0	0.0025	1.25	0.17	0.1	10.1	595.17	
10+90.20	7+10.85	379.35	-	-	1.08	10.1	100	9.78	10.6	24	3.4	0.0022	0.4	0.16	0.8	10.9	593.67	
INLET Z3	7+10.85	12.4	0.47	10	0.47	10.0	100	9.80	4.6	18	2.6	0.0019	1.25	0.13	0.0	10.0	589.40	
INLET Z4	7+10.85	35.08	0.48	10	0.48	10.0	100	9.80	4.7	18	2.7	0.0020	1.25	0.14	0.1	10.1	589.41	
7+10.85	4+98.53	212.15	-	-	2.03	10.9	100	9.62	19.5	27	4.9	0.0040	0.25	0.33	0.4	11.3	588.72	
4+98.53	3+66.67	132.03	-	-	2.03	11.3	100	9.55	19.3	30	3.9	0.0022	0	0.00	0.6	11.9	586.42	
INLET Z5	3+66.67	12.04	0.70	10	0.70	10.0	100	9.80	6.9	18	3.9	0.0043	1.25	0.30	0.1	10.1	586.48	
3+66.67	3+53.64	13.03	-	-	2.73	11.9	100	9.45	25.8	36	3.6	0.0015	0.5	0.08	0.1	12.0	586.13	
INLET Z6	3+53.64	39.56	0.74	10	0.74	10.0	100	9.80	7.2	18	4.1	0.0047	1.25	0.32	0.2	10.2	586.54	
3+53.64	2+15.58	138.06	-	-	3.47	12.0	100	9.43	32.7	36	4.6	0.0024	0.3	0.27	0.5	12.5	586.03	
2+15.58	1+04.87	110.71	-	-	3.47	12.5	100	9.35	32.4	36	4.6	0.0024	0.5	0.16	0.4	12.9	585.43	

STORM DRAIN CALCULATIONS FOR EXISTING STORM DRAIN LATERAL EX-B6

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 B6	1+67.38	80.07	0.82	10	0.82	10.0	100	9.80	8.0	18	4.5	0.0058	1.25	0.40	0.1	10.1	574.94	SEE SD LINE B IN PLANS FOR CORPORATE CROSSING BY WIER & ASSOCIATES DATED 05/17/12

STORM DRAIN CALCULATIONS FOR EXISTING STORM DRAIN LATERAL EX-A3

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 A3	1+83.83	70.48	0.67	10	0.67	10.0	100	9.80	6.6	21	2.7	0.0017	1.25	0.15	0.1	10.1	574.58	SEE SD LINE B IN PLANS FOR CORPORATE CROSSING BY WIER & ASSOCIATES DATED 05/17/12

RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN HYDRAULIC CALCULATIONS

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

LAST SHEET EDIT DATE 09-26-2013
WA# I2209

SHEET NO. D205

TIME: 8:47 FILE: D205-DRAINCALC5-I2209.dwg

CULVERT - LINE 'U' DESIGN CALCULATIONS

Culvert Location:	Culvert - Line 'U'			RDWY. Elev.	599.50	U.S. Culv. F.L.	592.5
				U.S. Culv. F.L.	592.90	D.S. Culv. F.L.	592.2
Total Discharge, Q (cfs)	165.4	Design Storm Freq.	100 yr	Difference	6.60 ft	Difference	0.3
Roughness Coeff., n	0.015	Max. Vel. (ft/s)	12.0	Req'd Freeboard	1.00 ft	Length (ft)	67
Tailwater (ft)	2.0	D.S. Channel Width (ft)	12.0	Allow. Headwater	5.60 ft	Culv. Slope, $S_o = \frac{\text{Diff.Ft}}{\text{Length Ft}}$	
Entrance Description:	Type 2A, 90° Headwall					So=	0.45%

TRIAL CULVERT										HEADWATER CALCULATION																				
		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	"HW" (feet)	Entrance Coeff, Ke	"H" (feet)	"TW" (feet)	LxSo (feet)	"HW" (feet)	"H" (feet)	dc (feet)	dc+D/2 (feet)	TW (feet)	ho (feet)	LxSo	"HW" (feet)	The Greater Controlling Head Water (Inlet or Outlet) (feet)	Selected Conduit Size (feet)		
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		
13.78	12.00	1.15	5.60	3.00	1.00	7.00	3.00	21.00	165.40	Type 2A	Case 2	23.63	1.60	4.80	0.50	1.80	2.00	0.30	3.50	1.80	2.60	2.80	2.00	2.80	0.30	4.30	4.80	7'x3' Box		

CULVERT - LINE 'V' DESIGN CALCULATIONS

Culvert Location:	Culvert - Line 'V'			RDWY. Elev.	581.31	U.S. Culv. F.L.	575.3
				U.S. Culv. F.L.	575.30	D.S. Culv. F.L.	575
Total Discharge, Q (cfs)	199.6	Design Storm Freq.	100 yr	Difference	6.01 ft	Difference	0.3
Roughness Coeff., n	0.015	Max. Vel. (ft/s)	12.0	Req'd Freeboard	1.00 ft	Length (ft)	67
Tailwater (ft)	2.5	D.S. Channel Width (ft)	12.0	Allow. Headwater	5.01 ft	Culv. Slope, $S_o = \frac{\text{Diff.Ft}}{\text{Length Ft}}$	
Entrance Description:	Type 2A, 90° Headwall					So=	0.45%

TRIAL CULVERT										HEADWATER CALCULATION																				
		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	"HW" (feet)	Entrance Coeff, Ke	"H" (feet)	"TW" (feet)	LxSo (feet)	"HW" (feet)	"H" (feet)	dc (feet)	dc+D/2 (feet)	TW (feet)	ho (feet)	LxSo	"HW" (feet)	The Greater Controlling Head Water (Inlet or Outlet) (feet)	Selected Conduit Size (feet)		
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		
16.63	12.00	1.39	5.01	3.00	2.00	5.00	3.00	30.00	99.80	Type 2A	Case 2	19.96	1.36	4.08	0.50	1.20	2.53	0.30	3.43	1.20	2.30	2.65	2.53	2.65	0.30	3.55	4.08	(2) 5'x3' Box		

CULVERT - LINE 'W' DESIGN CALCULATIONS

Culvert Location:	Culvert - Line 'W'			RDWY. Elev.	589.05	U.S. Culv. F.L.	582.3
				U.S. Culv. F.L.	582.30	D.S. Culv. F.L.	582
Total Discharge, Q (cfs)	369.6	Design Storm Freq.	100 yr	Difference	6.75 ft	Difference	0.3
Roughness Coeff., n	0.015	Max. Vel. (ft/s)	12.0	Req'd Freeboard	1.00 ft	Length (ft)	67
Tailwater (ft)	2.6	D.S. Channel Width (ft)	12.0	Allow. Headwater	5.75 ft	Culv. Slope, $S_o = \frac{\text{Diff.Ft}}{\text{Length Ft}}$	
Entrance Description:	Type 2A, 90° Headwall					So=	0.45%

TRIAL CULVERT										HEADWATER CALCULATION																				
		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	"HW" (feet)	Entrance Coeff, Ke	"H" (feet)	"TW" (feet)	LxSo (feet)	"HW" (feet)	"H" (feet)	dc (feet)	dc+D/2 (feet)	TW (feet)	ho (feet)	LxSo	"HW" (feet)	The Greater Controlling Head Water (Inlet or Outlet) (feet)	Selected Conduit Size (feet)		
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		
30.80	12.00	2.57	5.75	3.00	2.00	6.00	4.00	48.00	184.80	Type 2A	Case 2	30.80	1.38	5.52	0.50	1.50	2.59	0.30	3.79	1.50	3.20	3.60	2.59	3.60	0.30	4.80	5.52	(2) 6'x4' Box		

RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

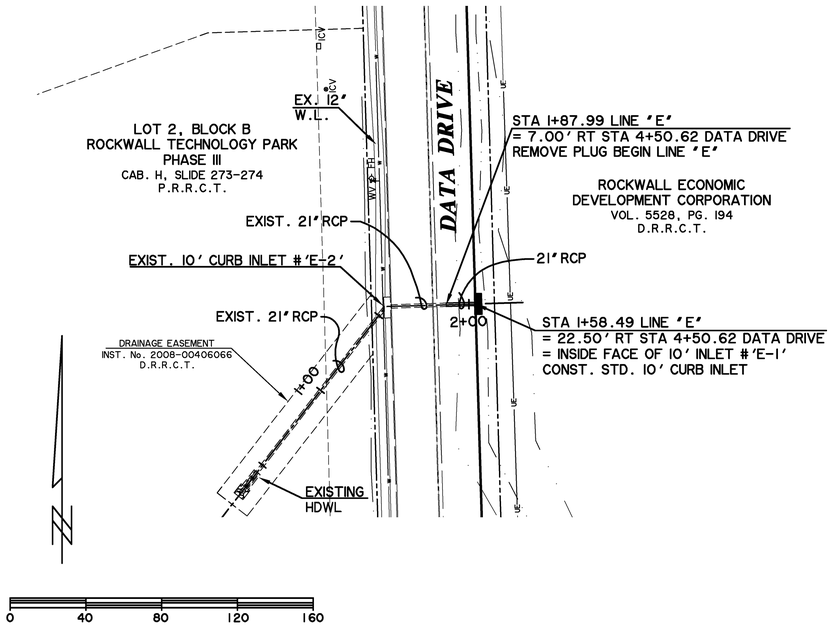
CULVERT HYDRAULIC CALCULATIONS

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

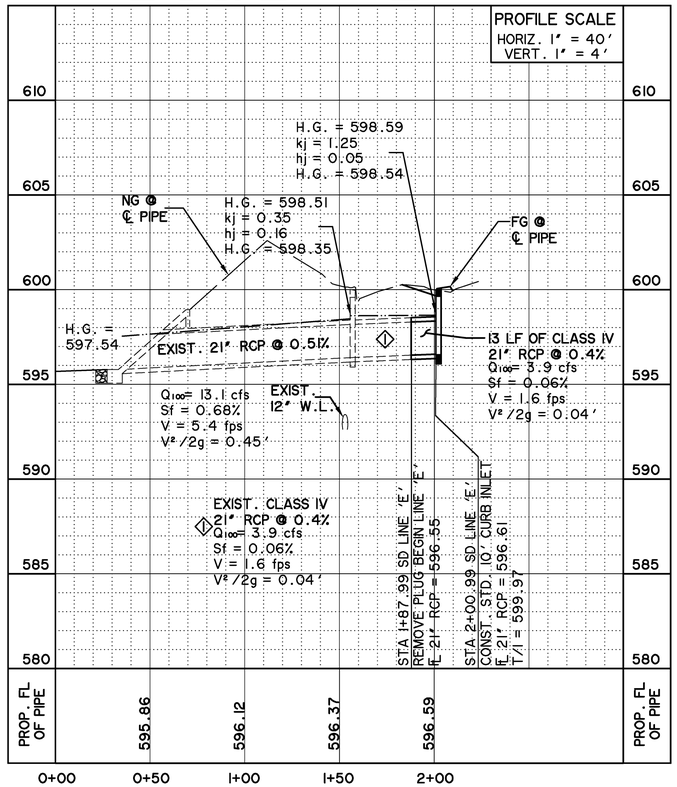
LAST SHEET EDIT DATE 08-26-2013
WA# 12209

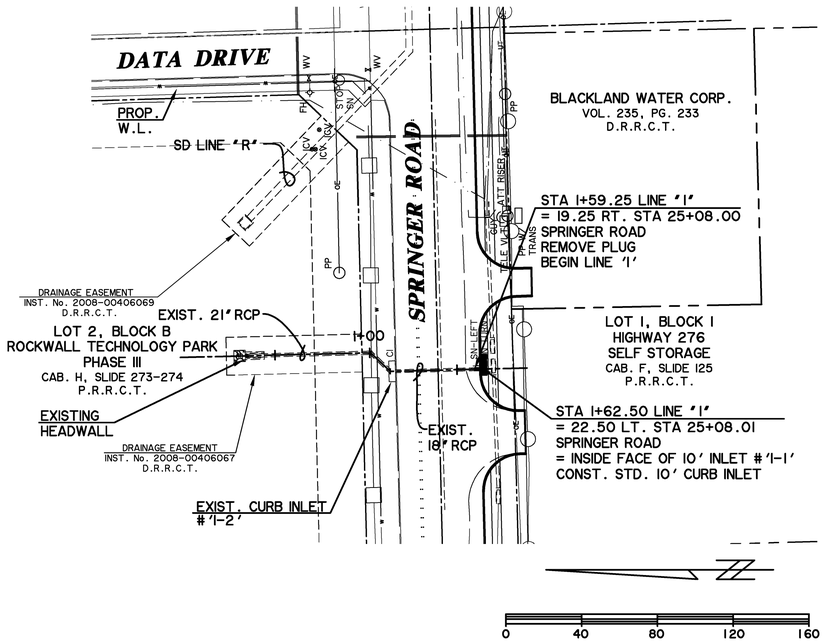
SHEET NO. D206

FILE: D206-DRAINCALC6-12209.dwg
TIME: 8:47



STORM DRAIN LINE 'E'





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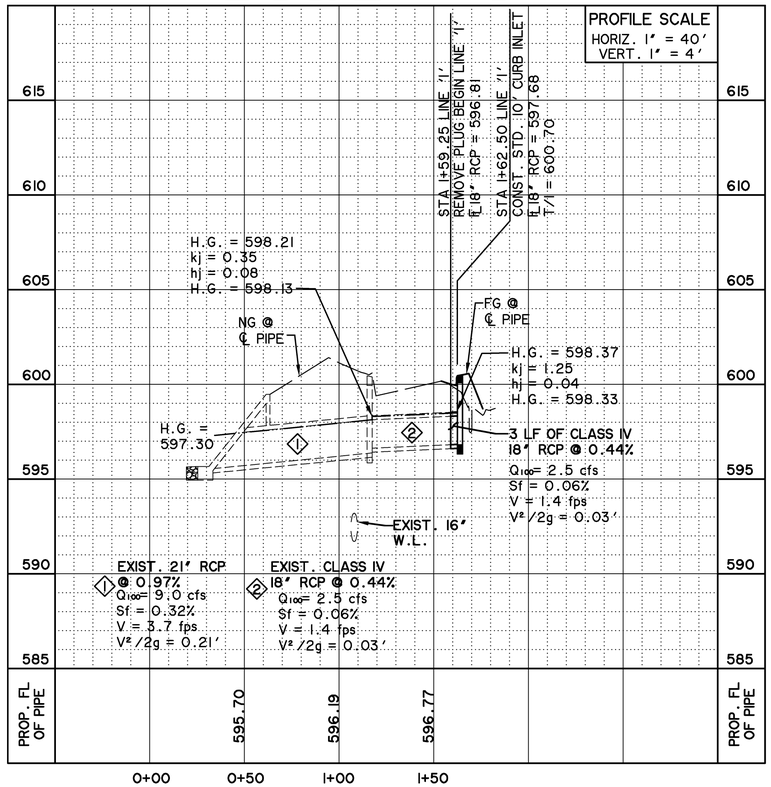

CAUTION 11

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• BENCH MARKS •

BM A AN '[X]' CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN '[X]' CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C - AN '□' CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

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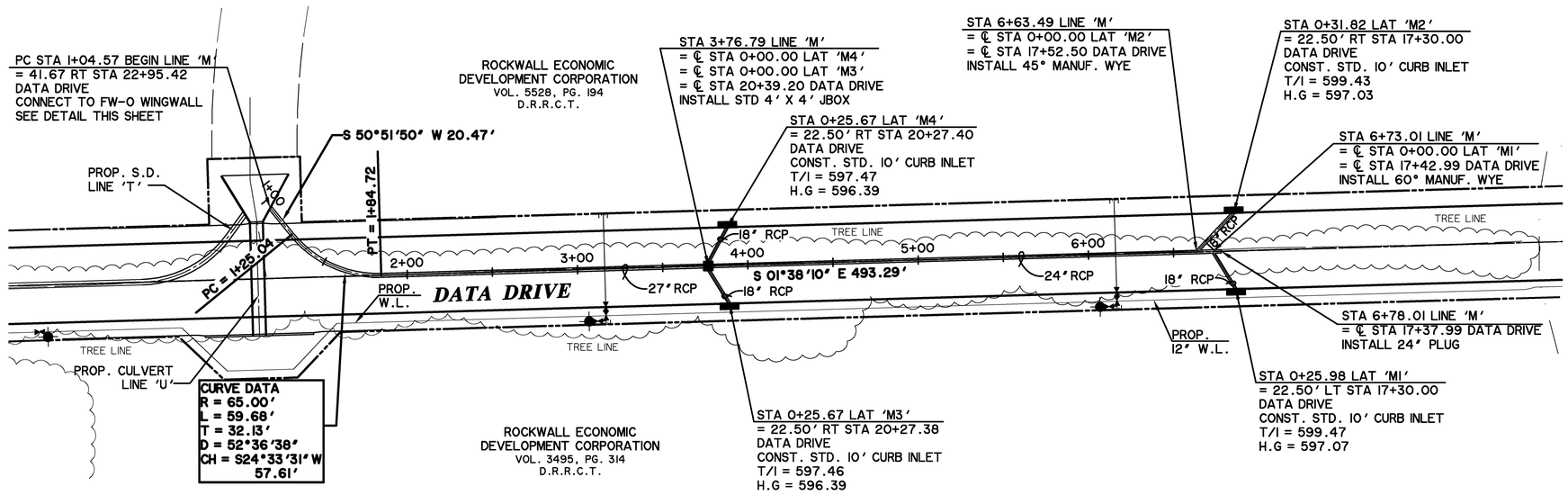
ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN PLAN AND PROFILE LINE 'E' & 'I'

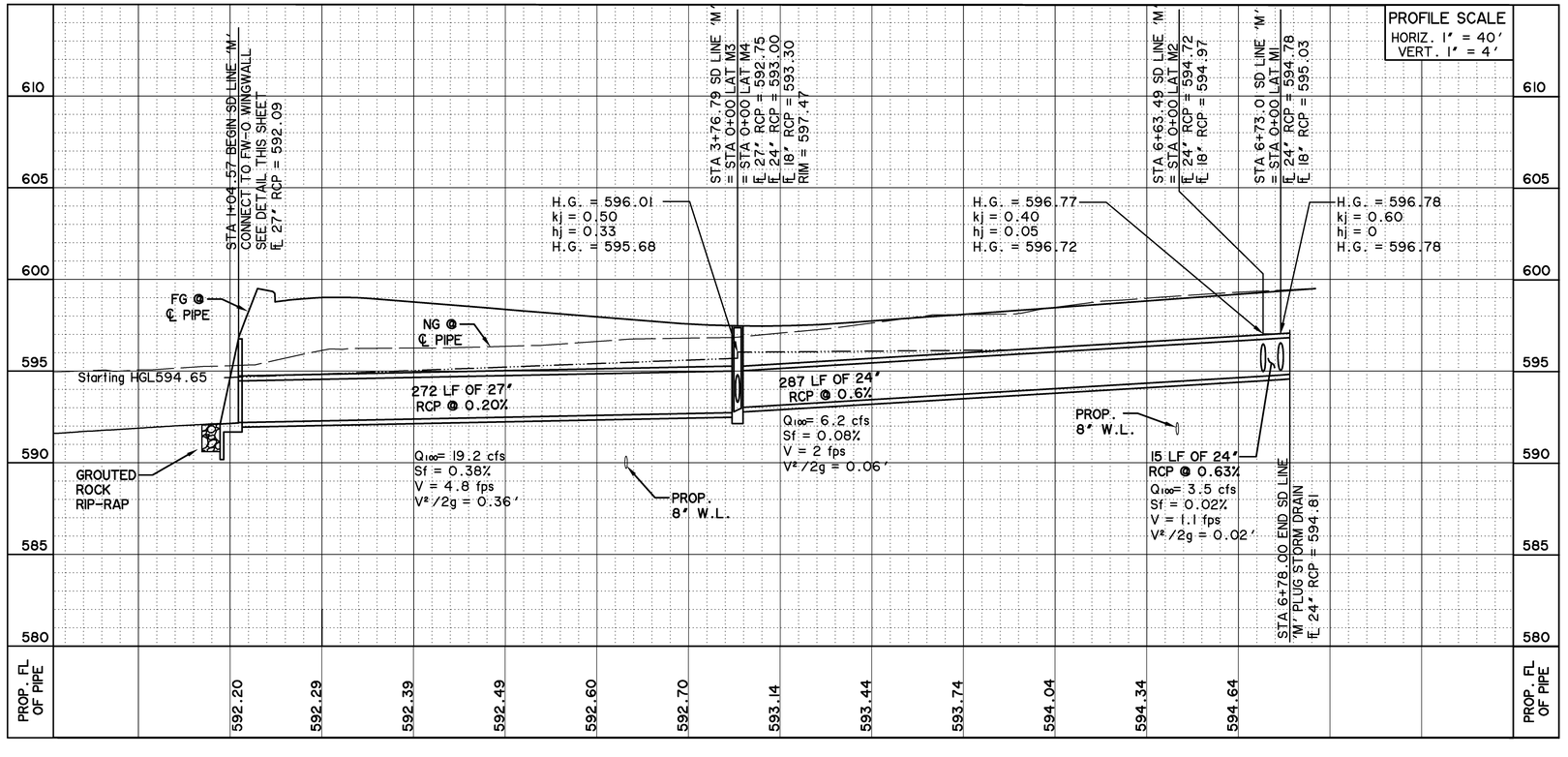
LAST SHEET EDIT DATE 01-19-2015
WA# 12209

SHEET NO. D301

TIME: 15:60 FILE: I:\D301-SD-LN-E-&-I-12209.dwg



STORM DRAIN LINE 'M'



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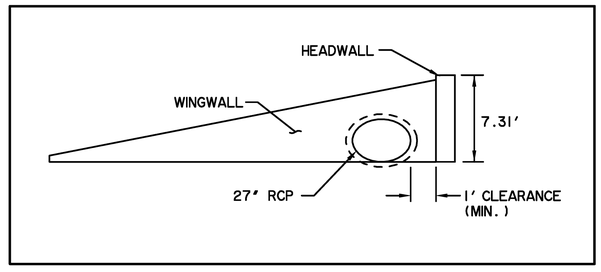

WINGWALL CONNECTION DETAIL
N.T.S.

"ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN."

RECORD DRAWING 02/02/2015

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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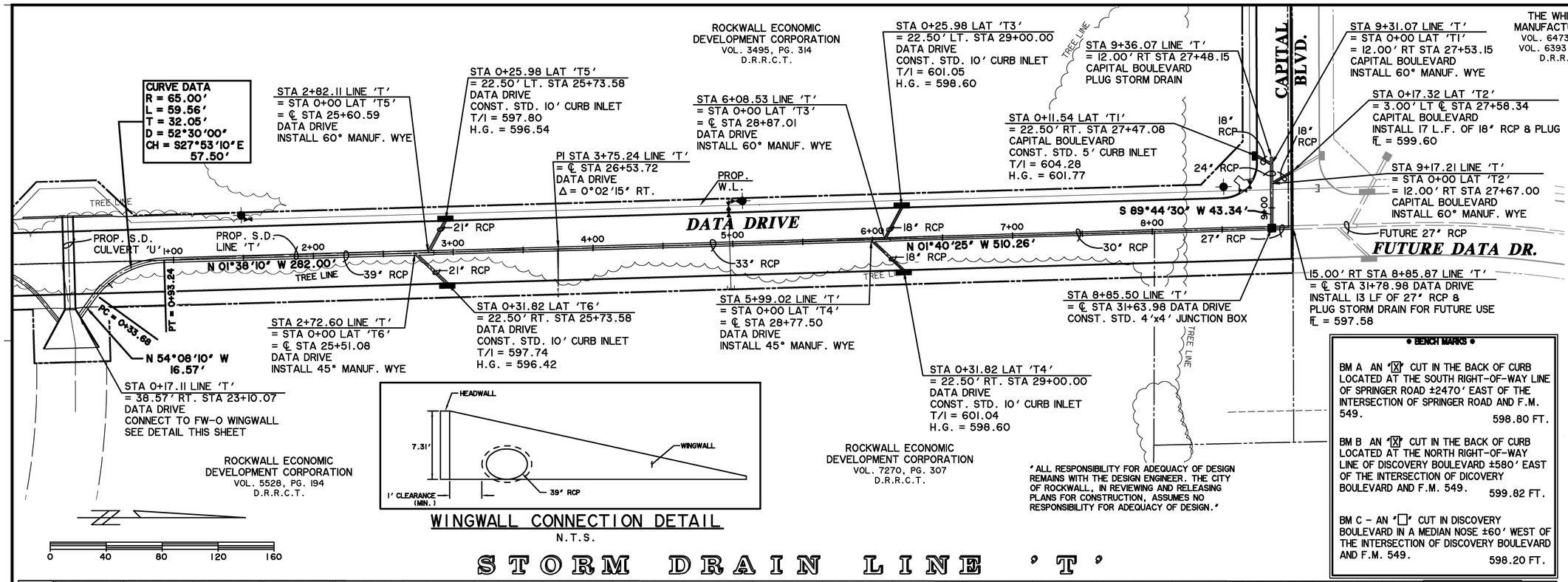
ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN PLAN AND PROFILE LINE 'M'

LAST SHEET EDIT DATE 10-23-2013
WA# 12209

SHEET NO. D302

FILE: D302-SD-LN-M-12209.dwg
TIME: 9:50



BENCH MARKS

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RECORD DRAWING 02/02/2015

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ROCKWALL TECHNOLOGY PARK PHASE IV

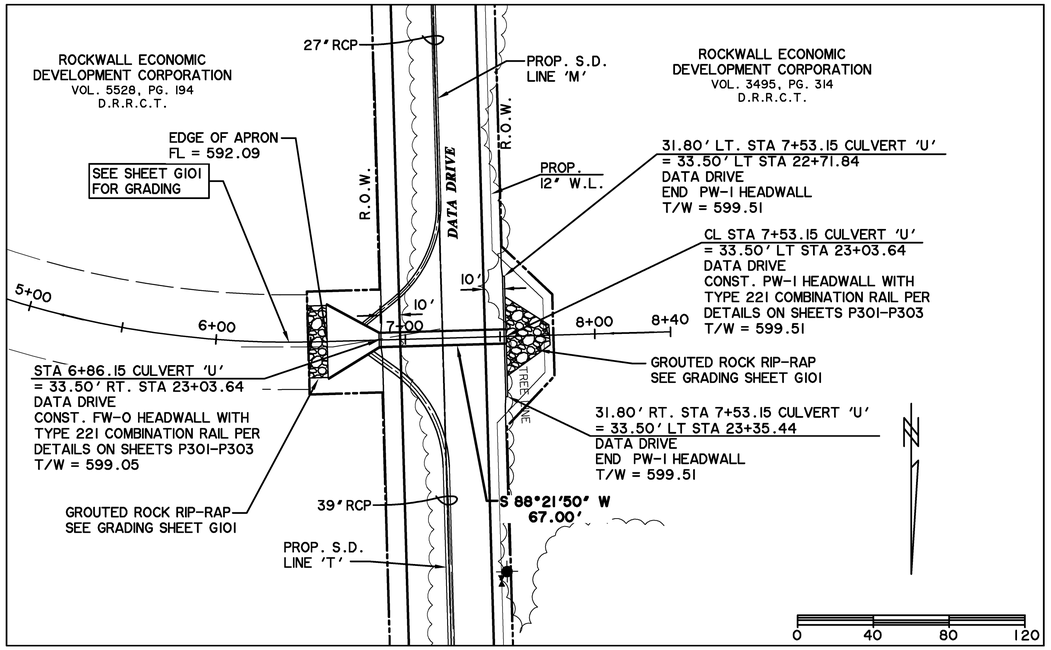
STORM DRAIN PLAN AND PROFILE LINE 'T'

DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
2-2-15

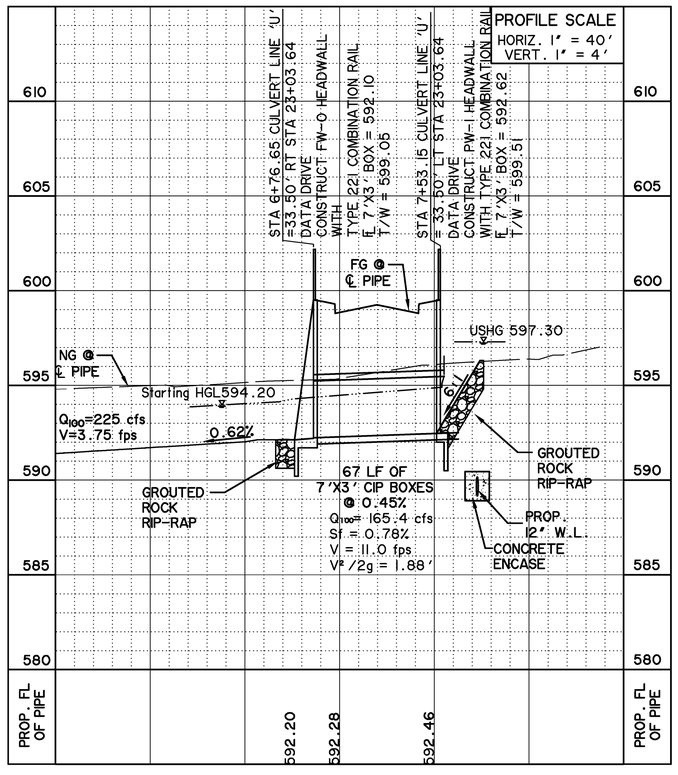
LAST SHEET EDIT
DATE 01-21-2015
WA# 12209

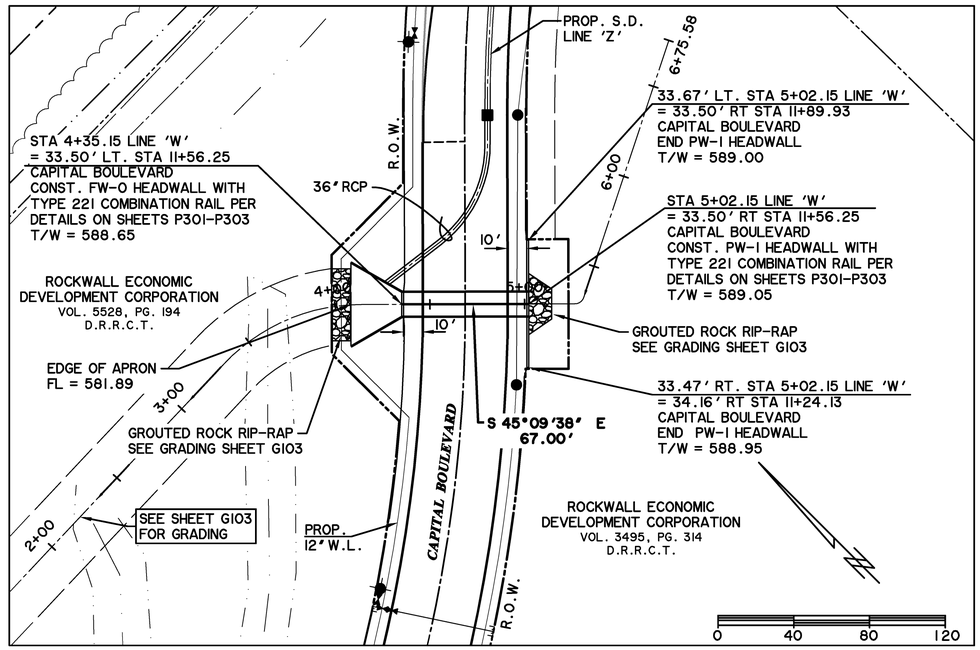
SHEET NO.
D303

TIME 9:19 FILE: D303-SD-LN-T-12209.dwg



CULVERT LINE 'U'





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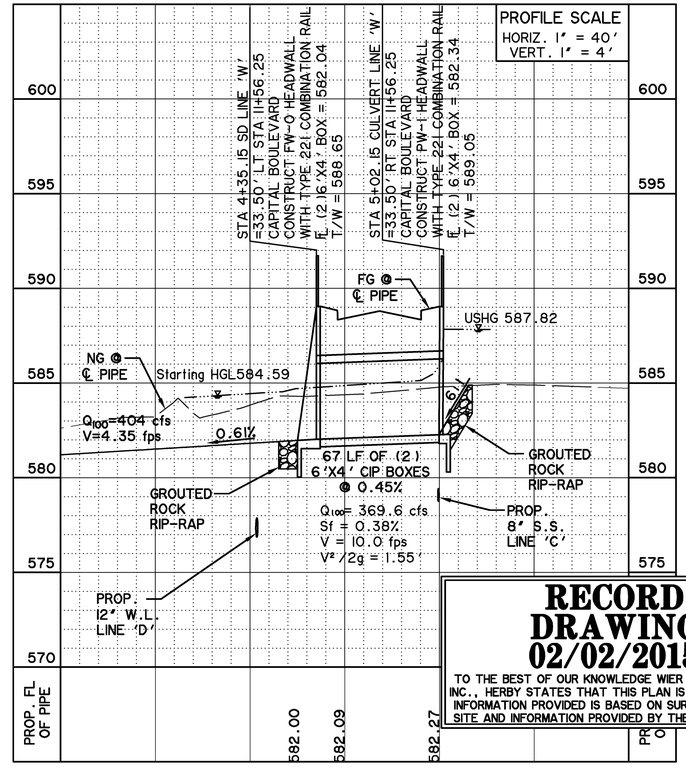

CAUTION 11

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598.80 FT.

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599.82 FT.

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ROCKWALL TECHNOLOGY PARK PHASE IV

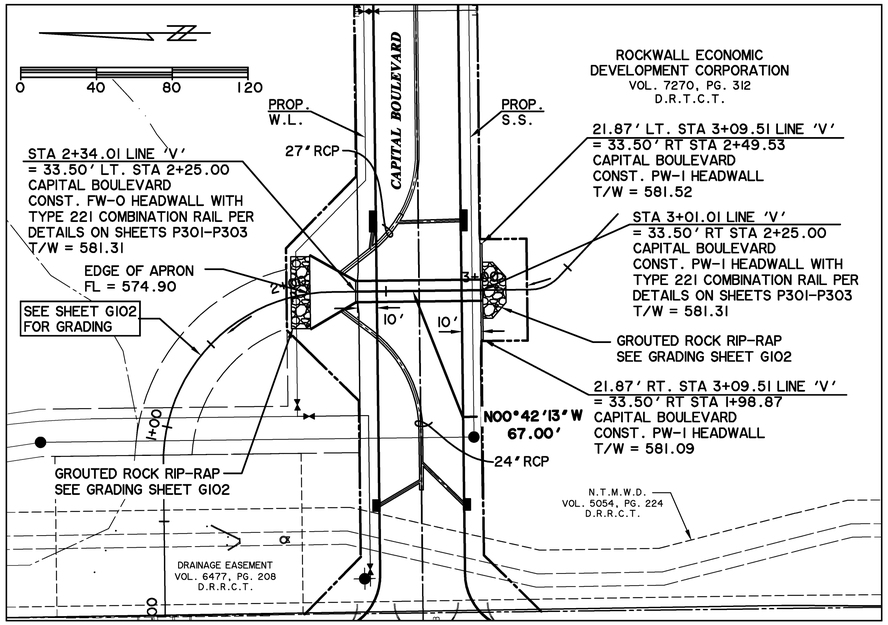
STORM DRAIN PLAN AND PROFILE CULVERTS 'U' & 'W'

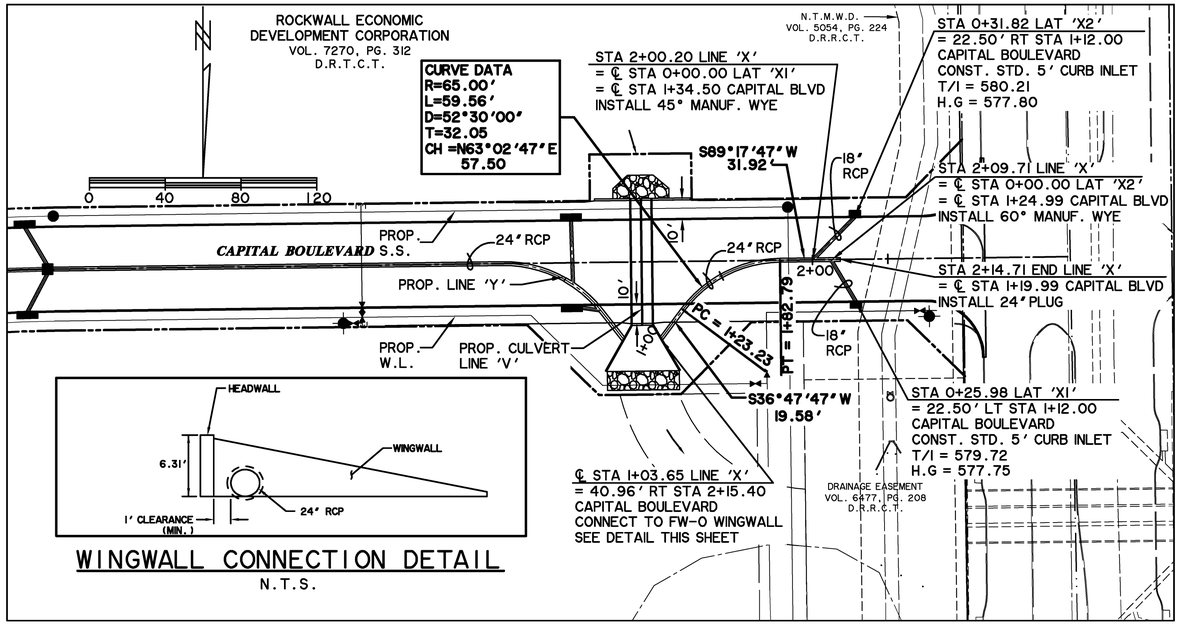
DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 01-19-2015
WA# 12209

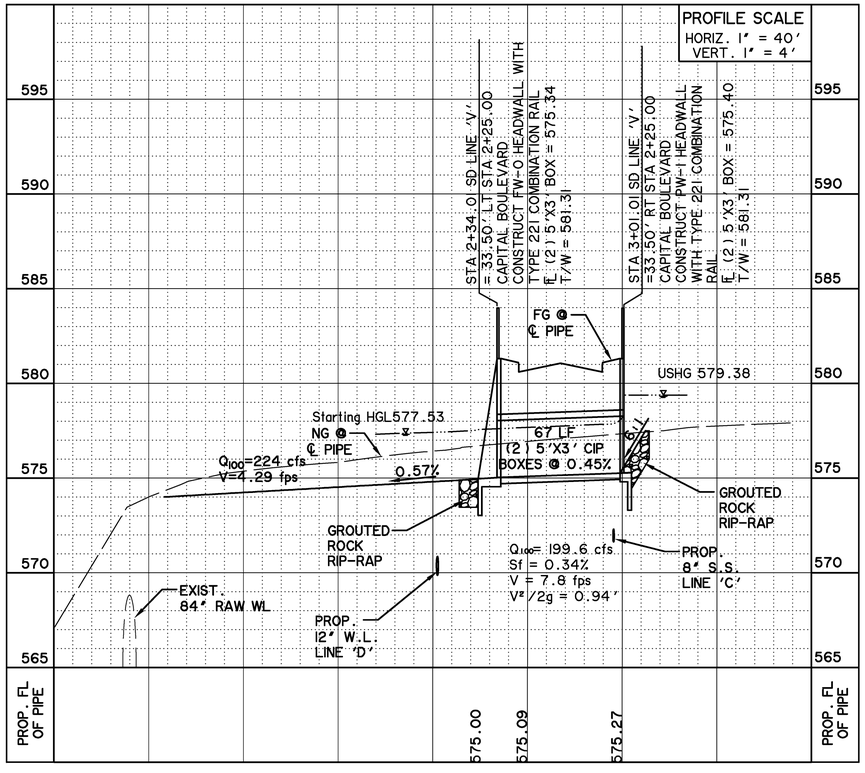
SHEET NO. D304

TIME: 16:14 FILE: D304-SD-LN-U-&-W-12209.dwg





CULVERT LINE 'V'



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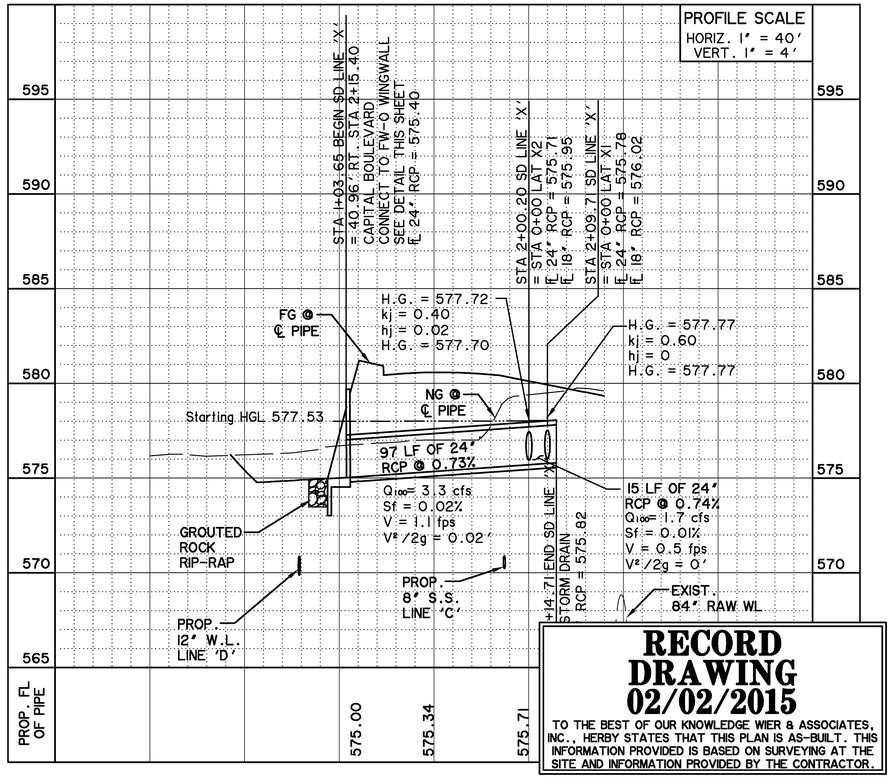
STORM DRAIN LINE 'X'



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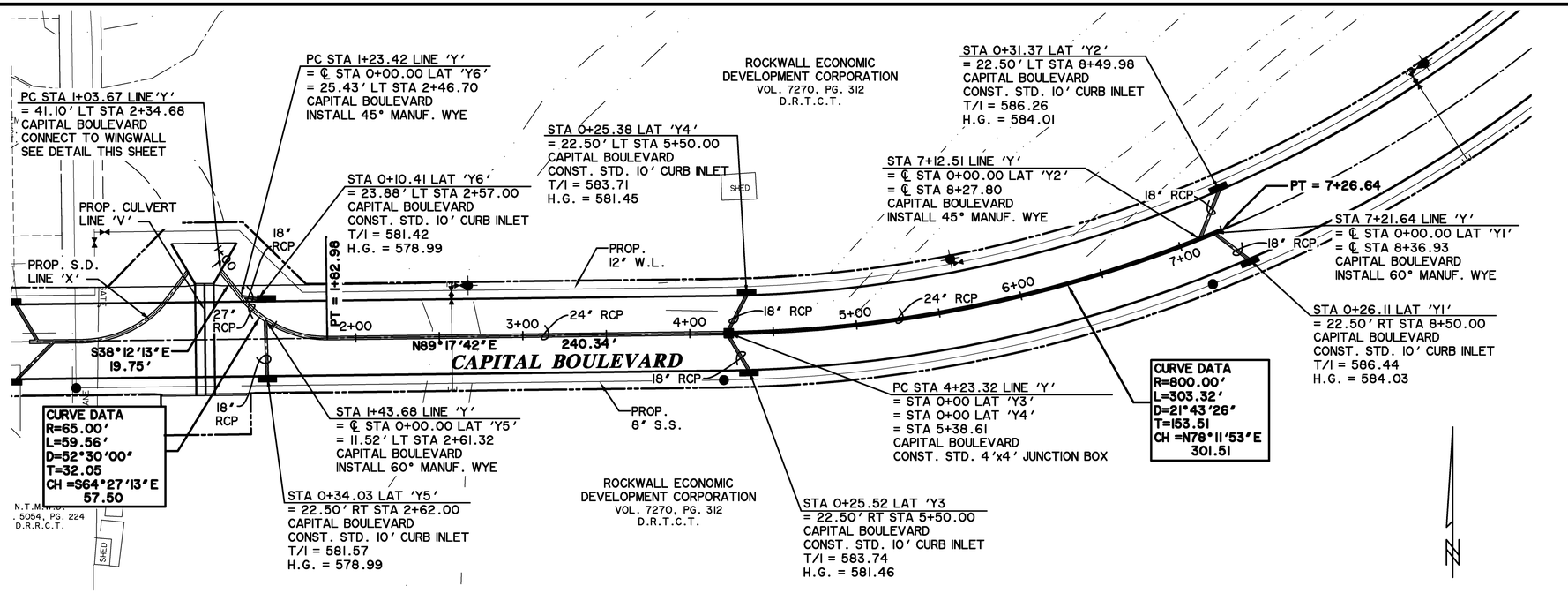
ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN PLAN AND PROFILE LINES 'V' & 'X'

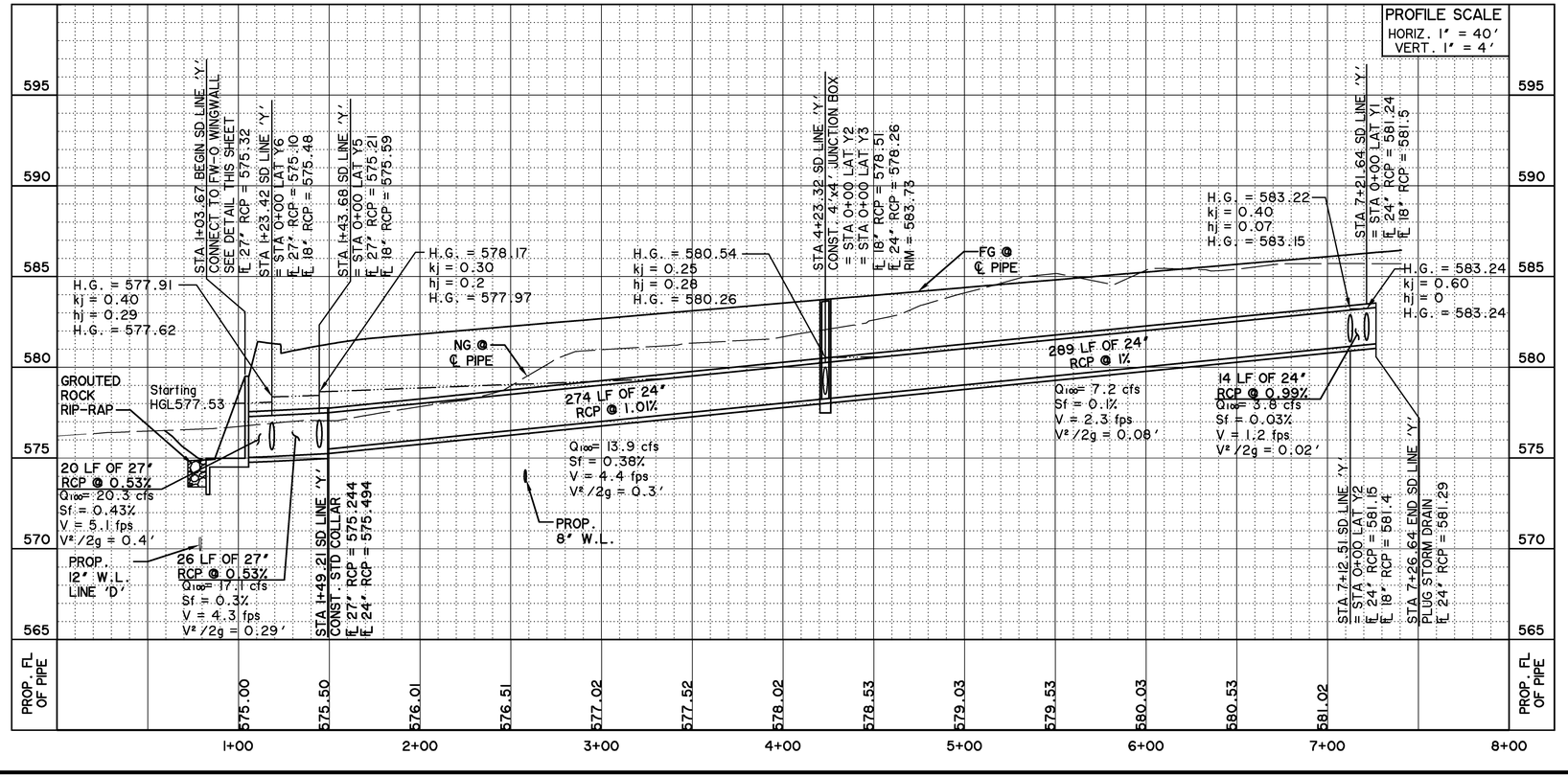
LAST SHEET EDIT
DATE 01-19-2015
WA# 12209

SHEET NO.
D305

FILE: D305-SD_LN-V-&-X-12209.dwg
TIME: 16:25



STORM DRAIN LINE 'Y'



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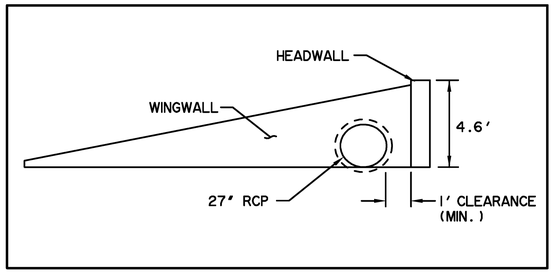

WINGWALL CONNECTION DETAIL
N.T.S.

RECORD DRAWING 02/02/2015

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ROCKWALL TECHNOLOGY PARK PHASE IV

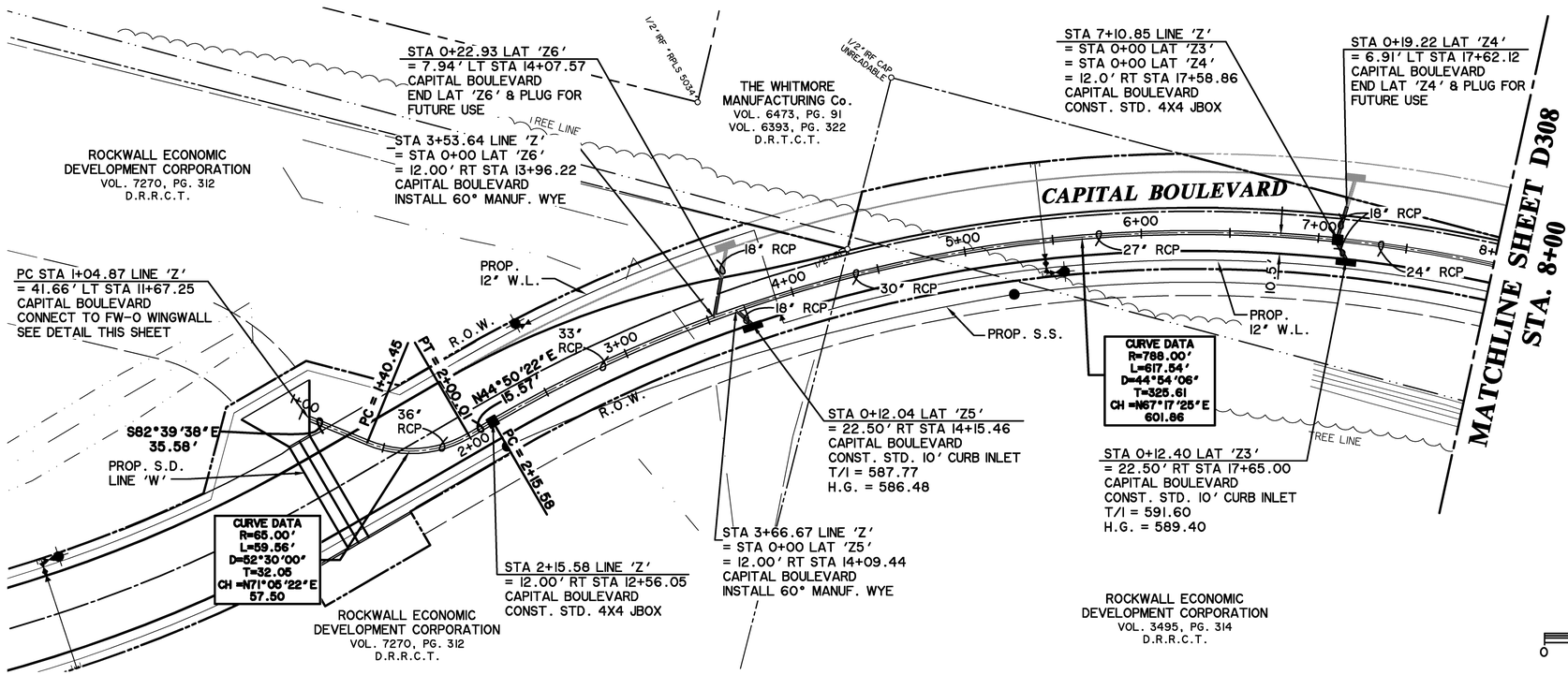
STORM DRAIN PLAN AND PROFILE LINE 'Y'

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED
PROFESSIONAL ENGINEER
2-2-15

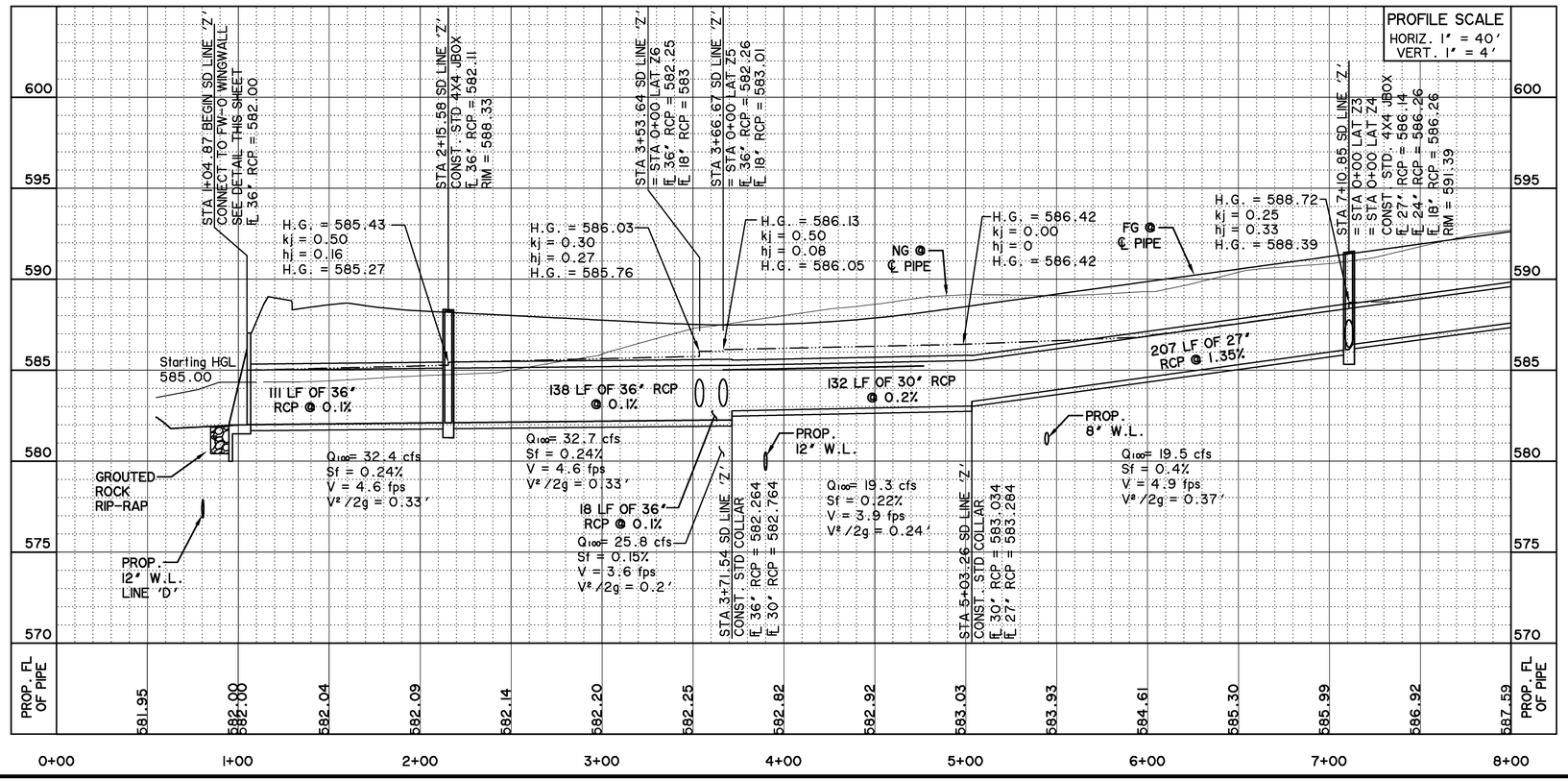
LAST SHEET EDIT DATE 01-19-2015
WA# 12209

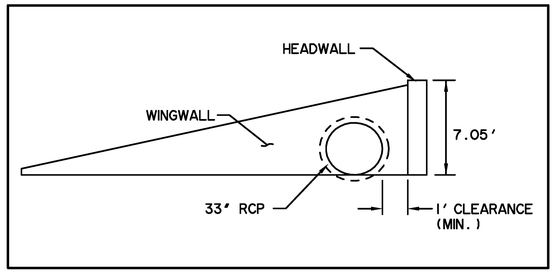
SHEET NO. D306

FILE: D306-SD-LN-Y-12209.dwg
TIME: 16:30



STORM DRAIN LINE 'Z'





WINGWALL CONNECTION DETAIL
N.T.S.

CAUTION !!

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• BENCH MARKS •

BM A AN '[X]' CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN '[X]' CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C – AN '□' CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

'ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN.'

RECORD DRAWING
02/02/2015
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

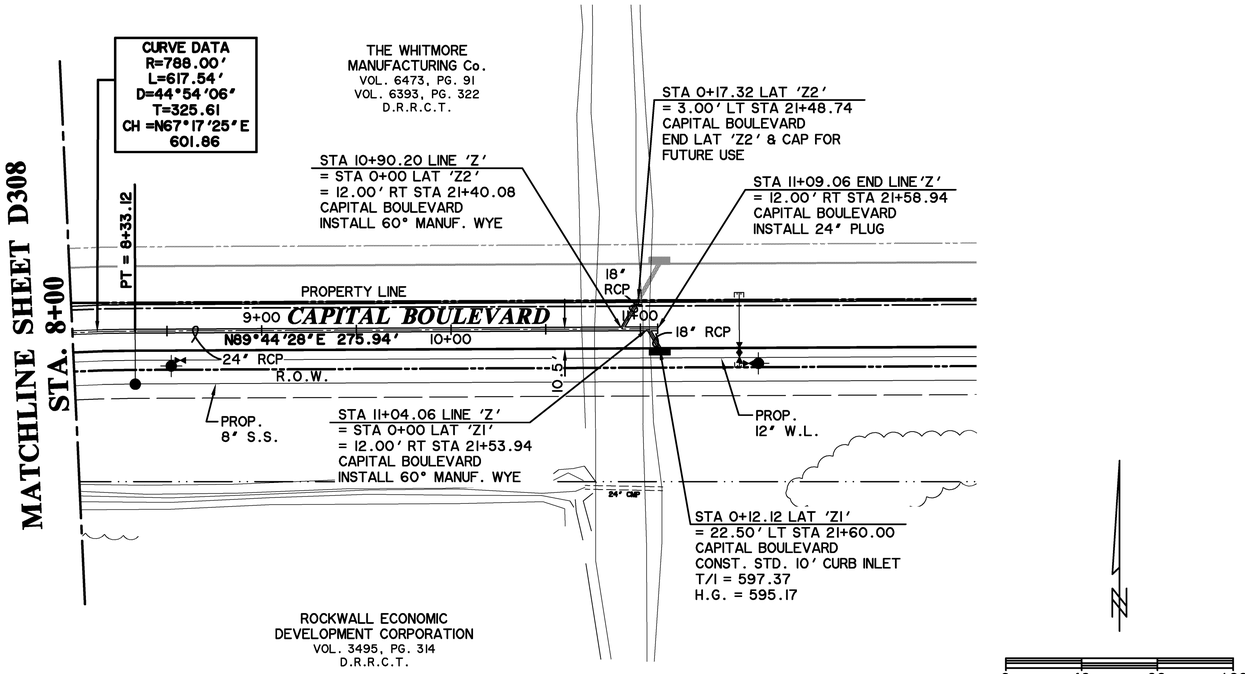
ROCKWALL TECHNOLOGY PARK PHASE IV

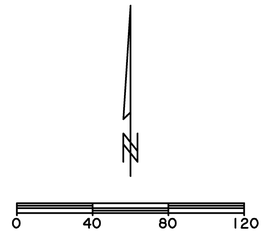
STORM DRAIN PLAN AND PROFILE LINE 'Z'

LAST SHEET EDIT DATE 01-19-2015
WA# 12209

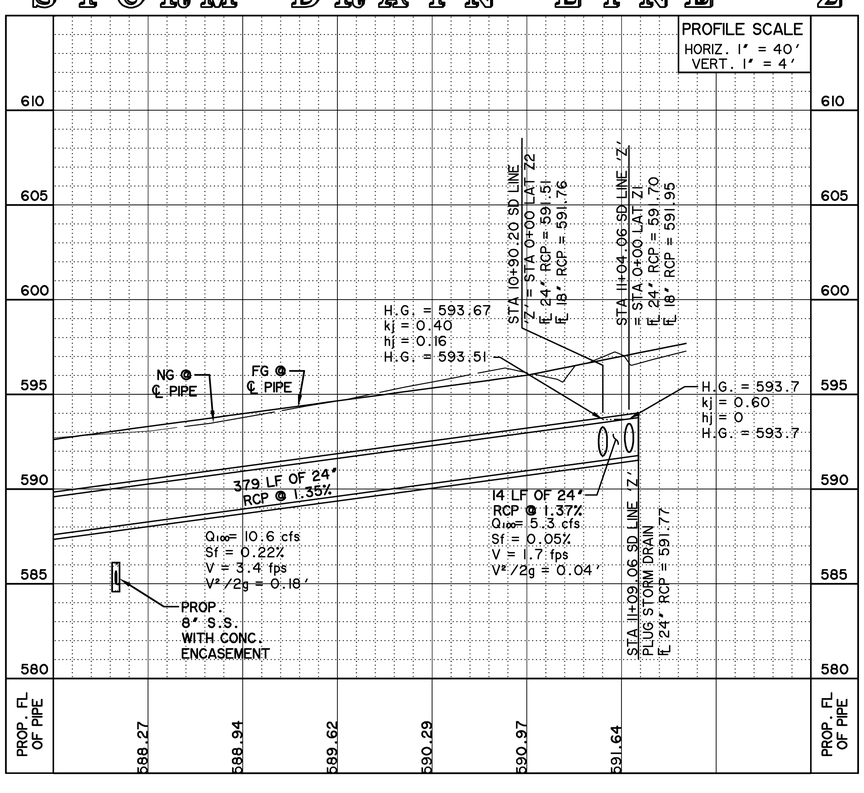
SHEET NO. D307

FILE: D307-SD-LN-Z-I-12209.dwg
TIME: 16:33





STORM DRAIN LINE 'Z'



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RECORD DRAWING 02/02/2015

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ROCKWALL TECHNOLOGY PARK PHASE IV

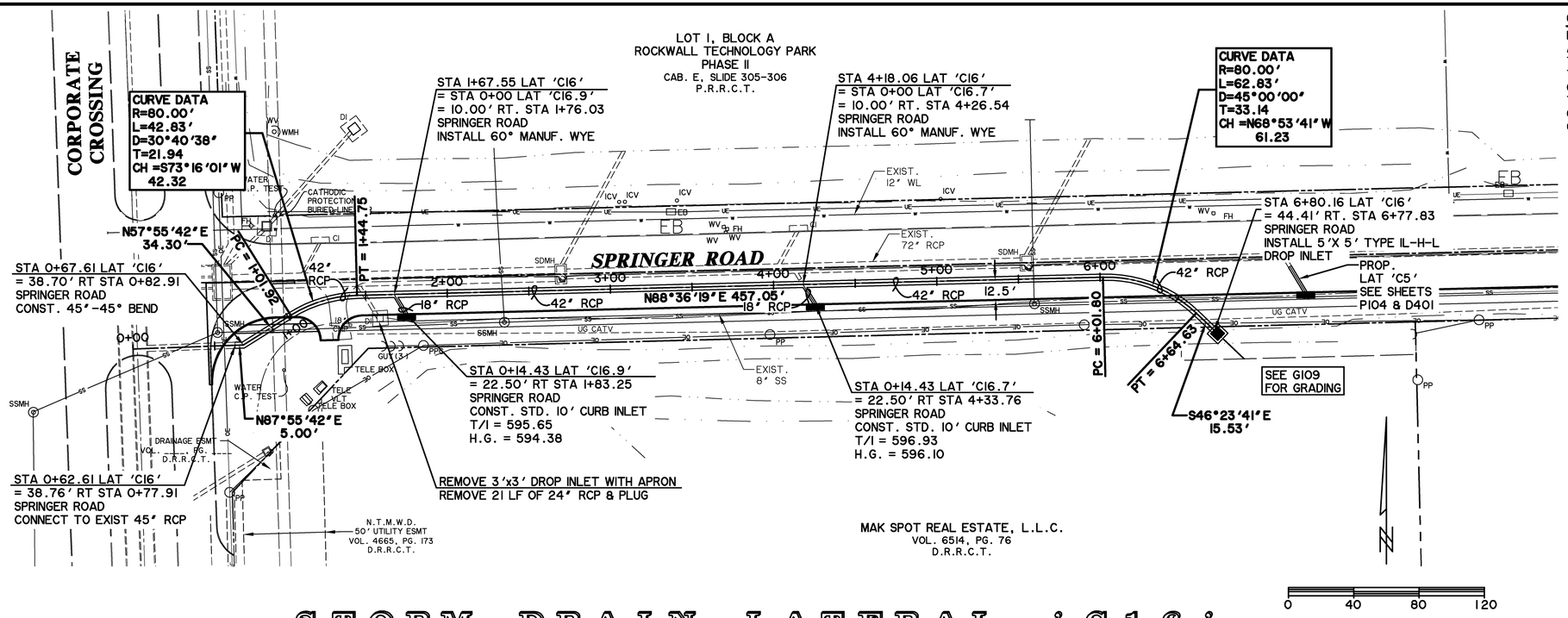
STORM DRAIN PLAN AND PROFILE LINE 'Z'

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

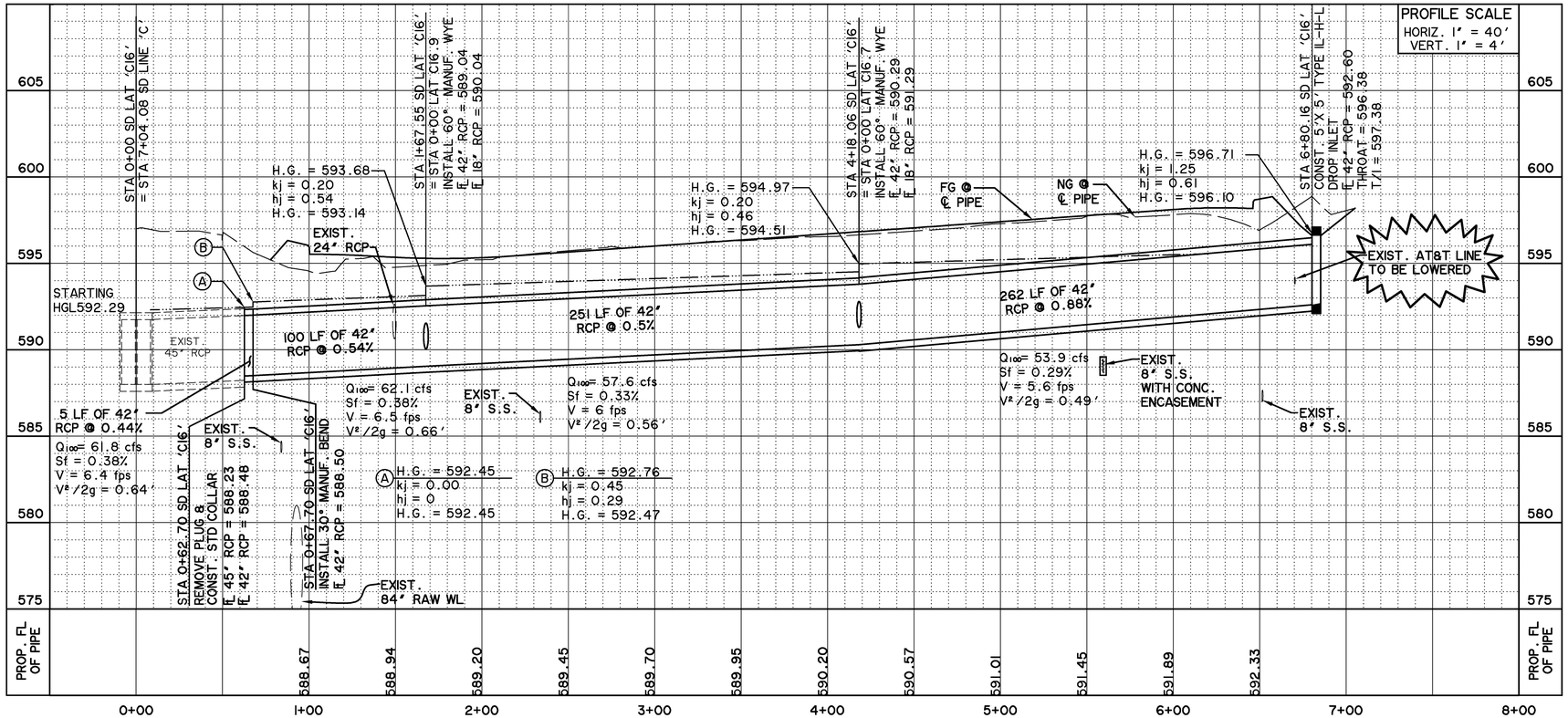
LAST SHEET EDIT
DATE 10-15-2013
WA# 12209

SHEET NO. D308

TIME: 11:37 FILE: D308-SD-LN-Z-2-12209.dwg



STORM DRAIN LATERAL 'C16'



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CAUTION 11

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ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN PLAN AND PROFILE LATERAL 'C16'

STATE OF TEXAS DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 01-19-2015
WA# 12209

SHEET NO. D309

TIME: 16:37 FILE: D309-SD-LAT-C16-12209.dwg

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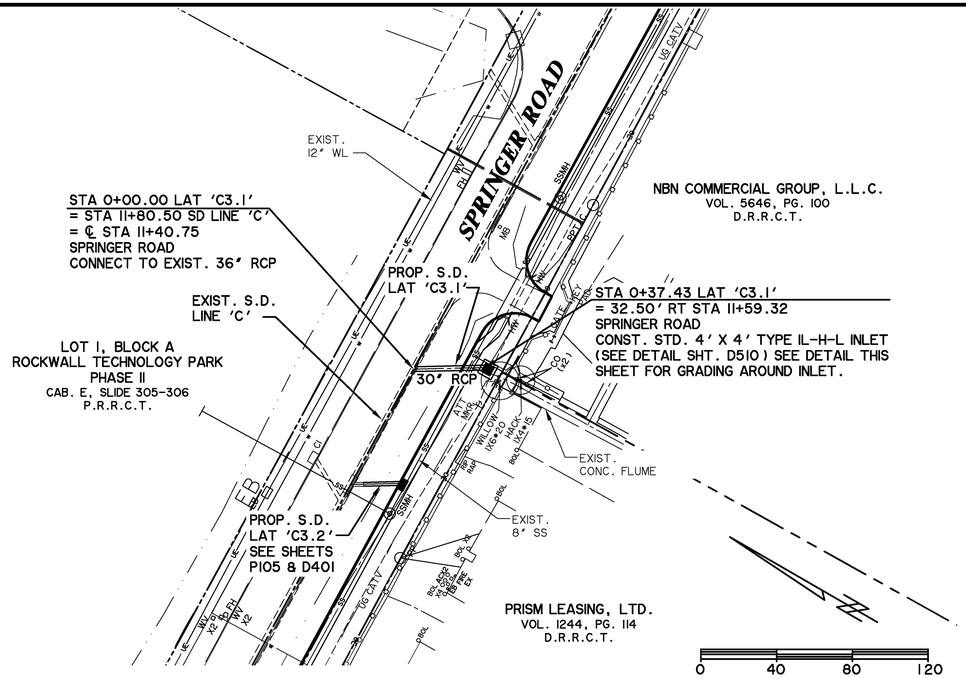
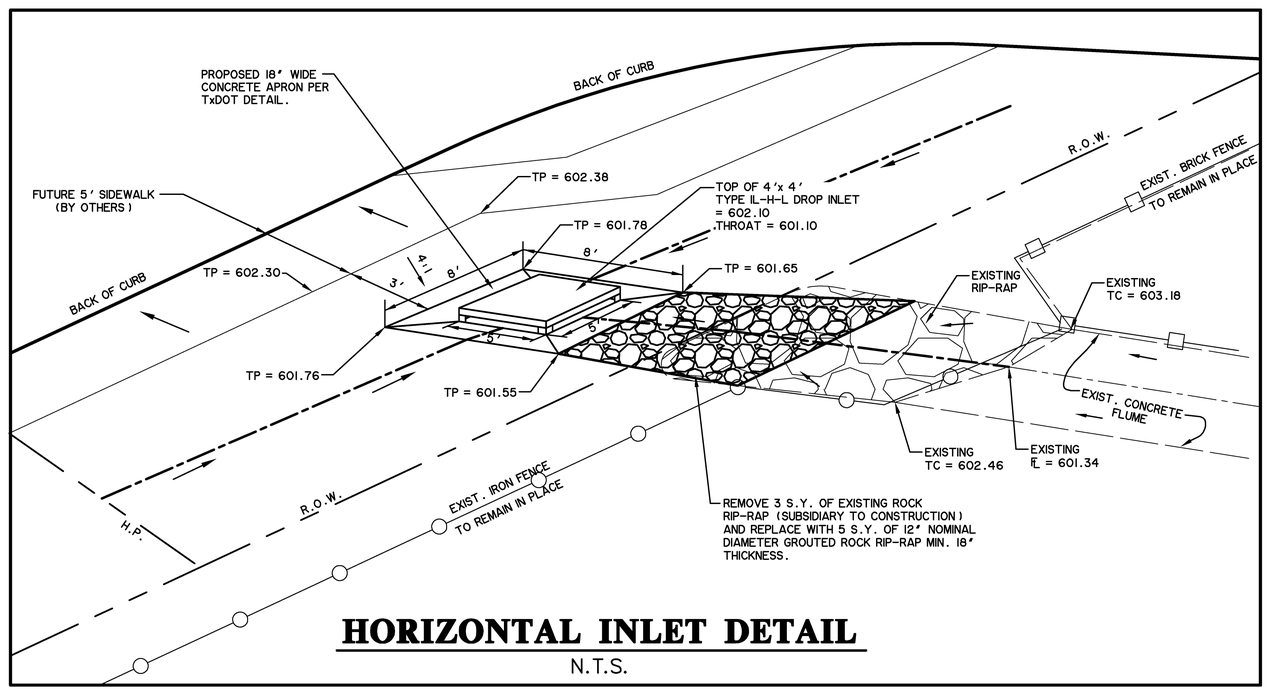
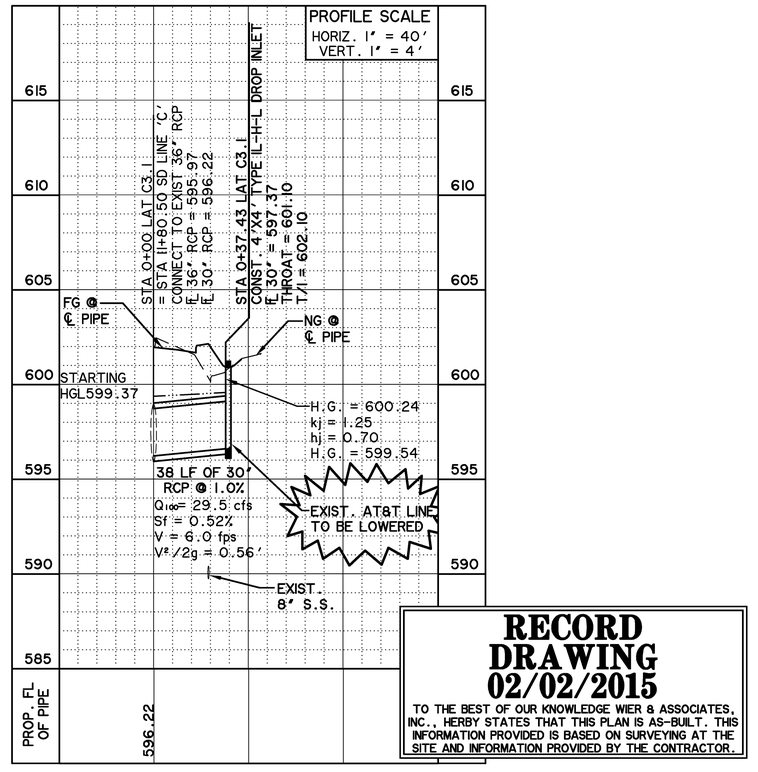


STORM DRAIN LATERAL 'C3.1'



HORIZONTAL INLET DETAIL

N.T.S.



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

ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN PLAN AND PROFILE LATERAL 'C3.1'

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT
DATE 01-19-2015
WA# 12209

SHEET NO. D310

TIME: 16:43 FILE: D310-SD-LAT-C3.1-12209.dwg

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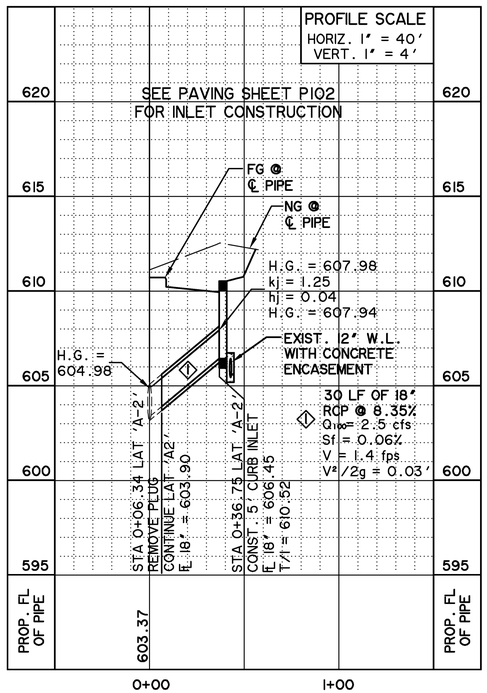

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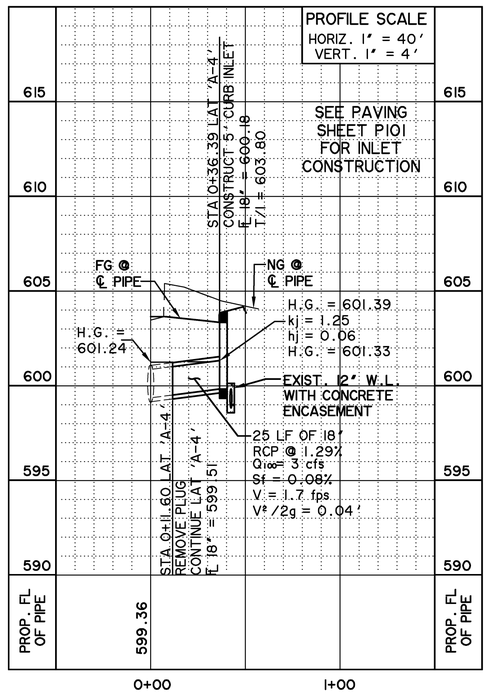

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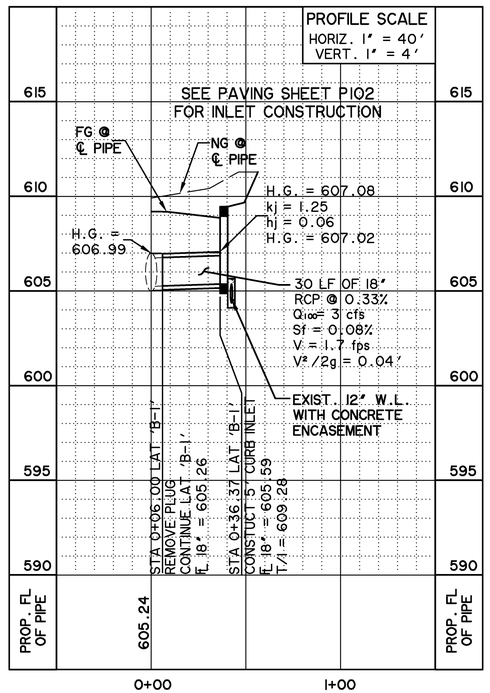

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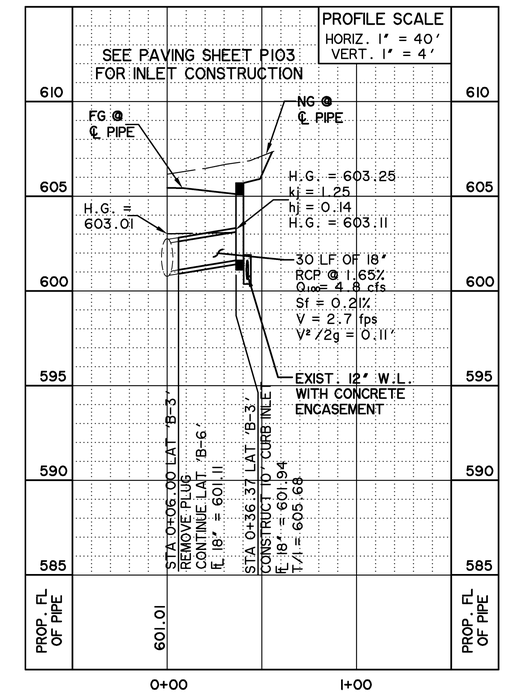

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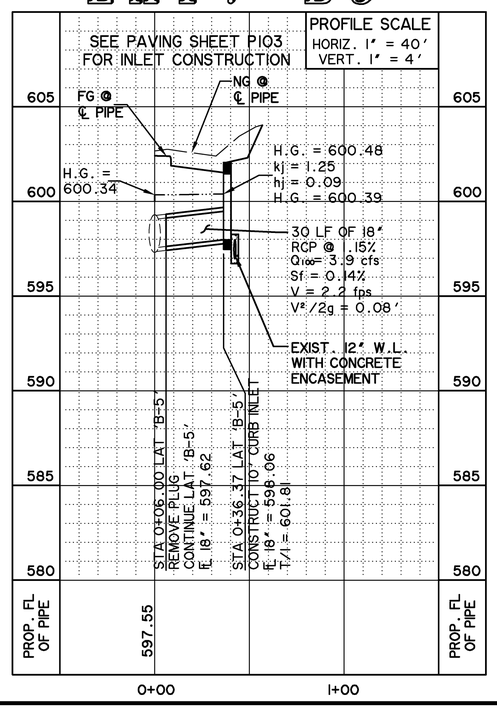
LAT. 'B5'



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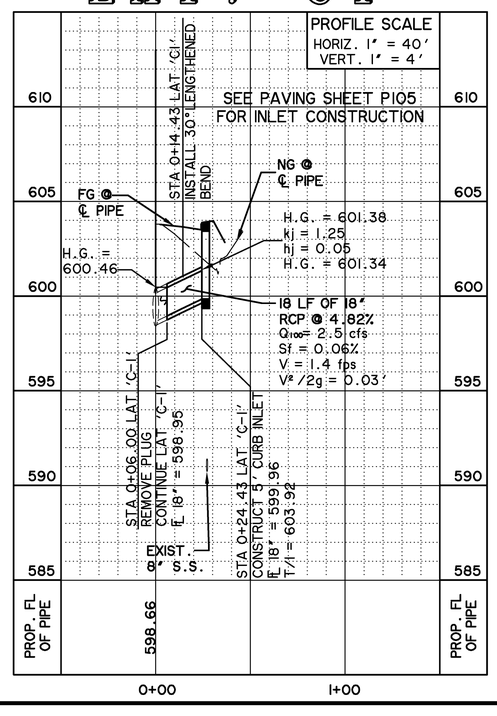

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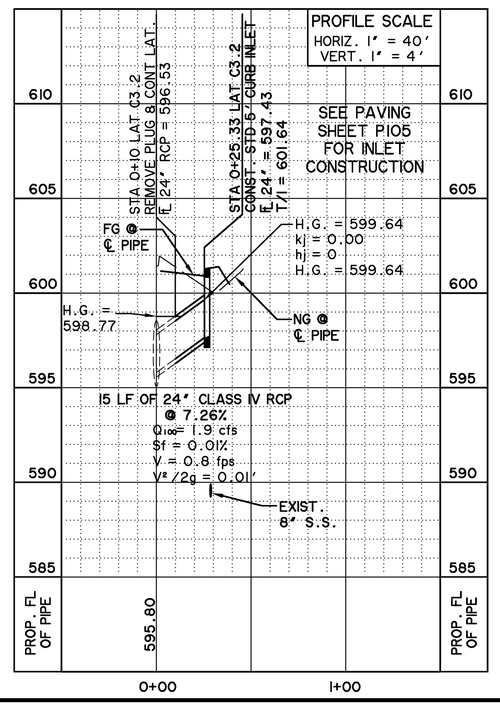

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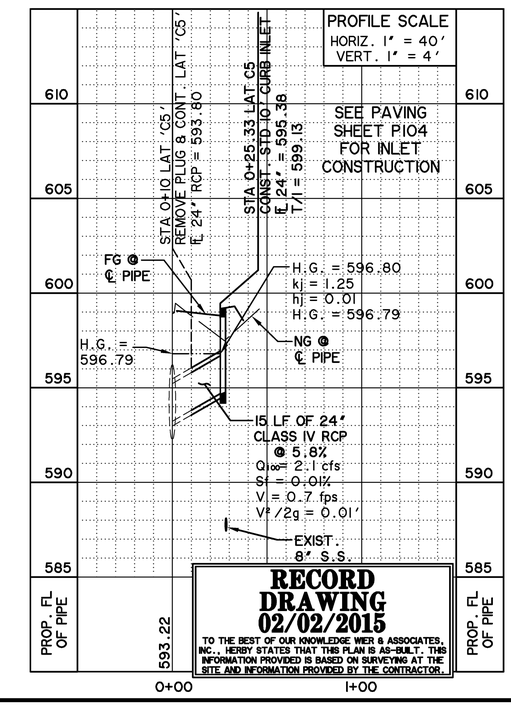

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02/02/2015
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ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN LATERALS LINES 'A', 'B', & 'C'

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 01-22-2015
WA# 12209

SHEET NO. D401

TIME: 10:31 FILE: D401-SD-LAT1-12209.dwg

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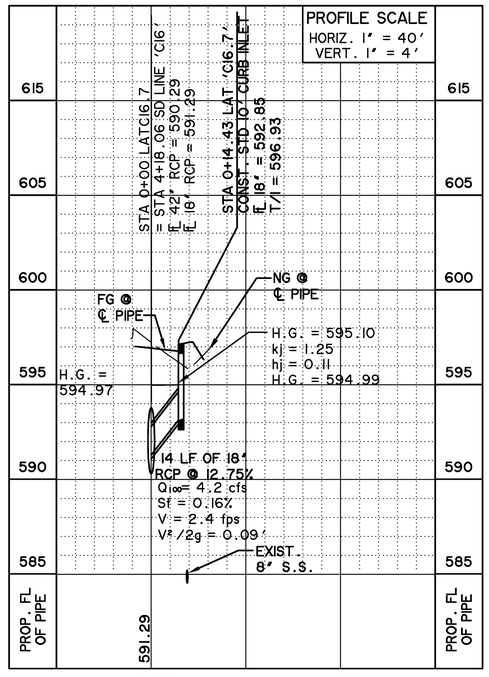

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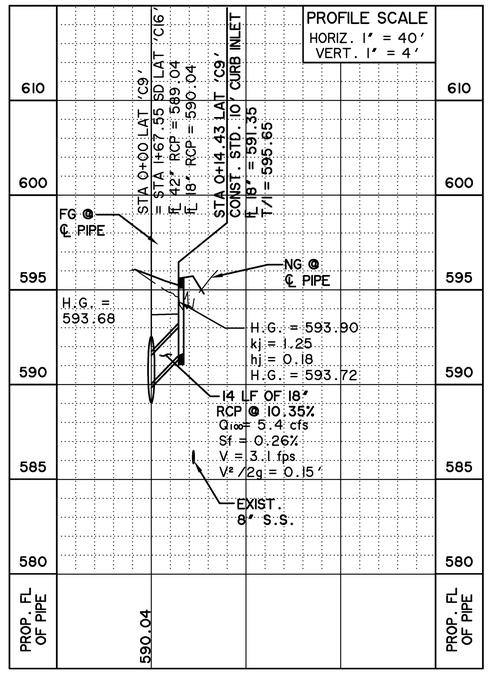

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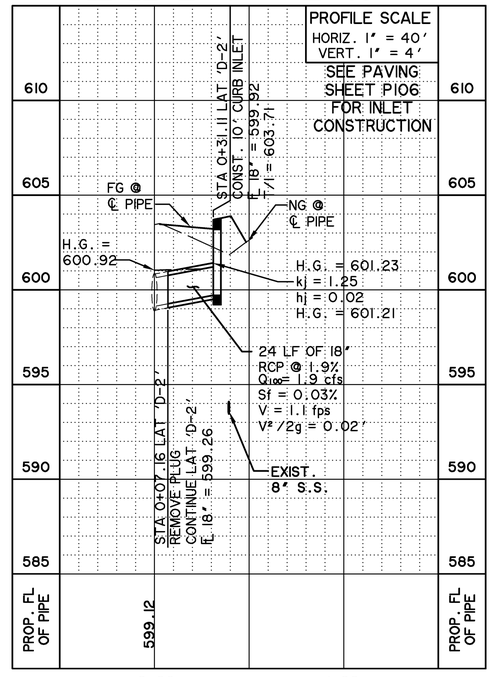

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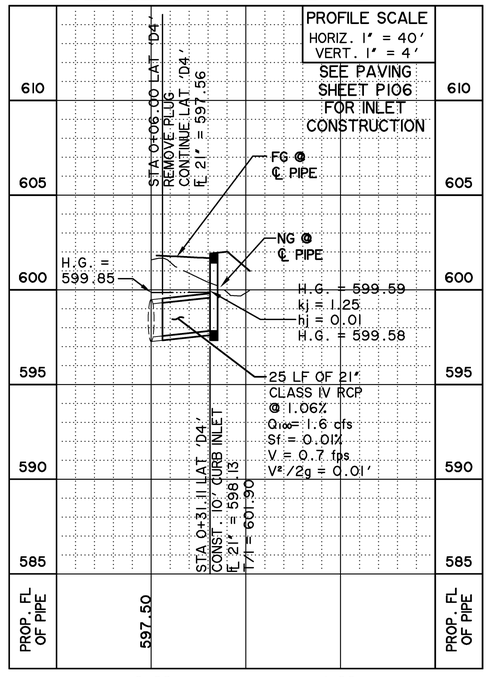

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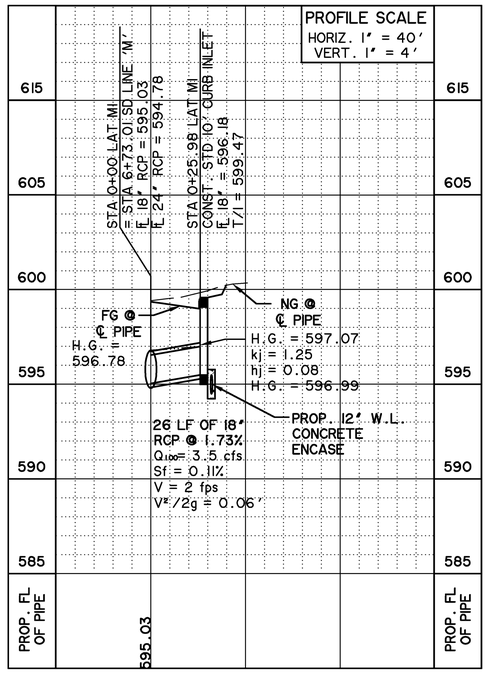
LAT. 'M1'



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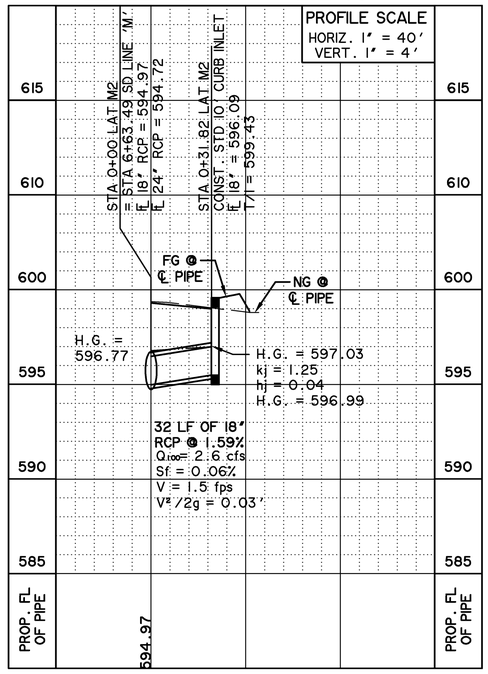

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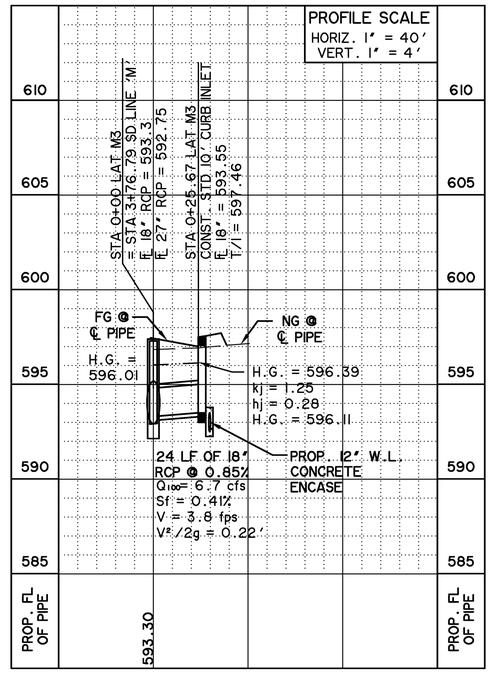

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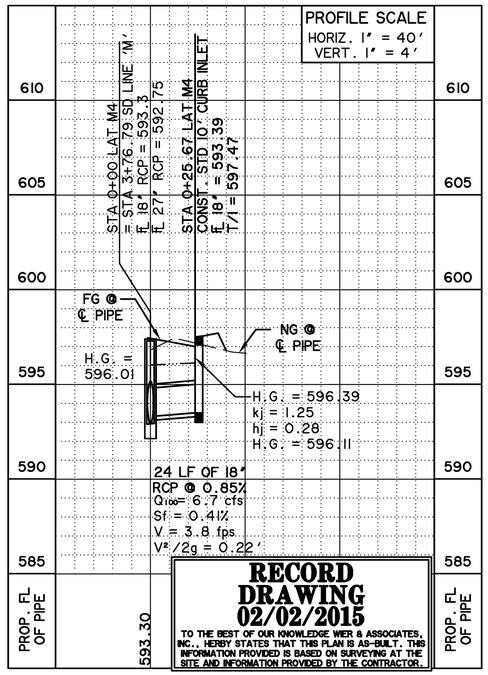

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ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN LATERALS LINES 'C', 'D', & 'M'

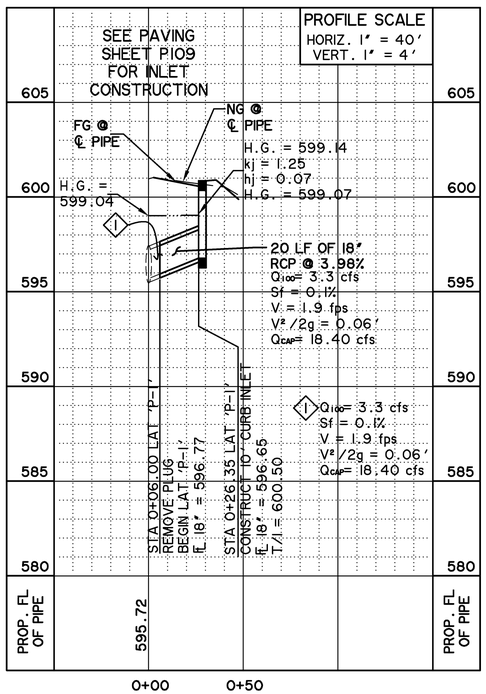
DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

LAST SHEET EDIT DATE 10-02-2013
WA# 12209

SHEET NO. D402

TIME: 10:43 FILE: D402-SD-LAT2-12209.dwg

LAT. 'P1'



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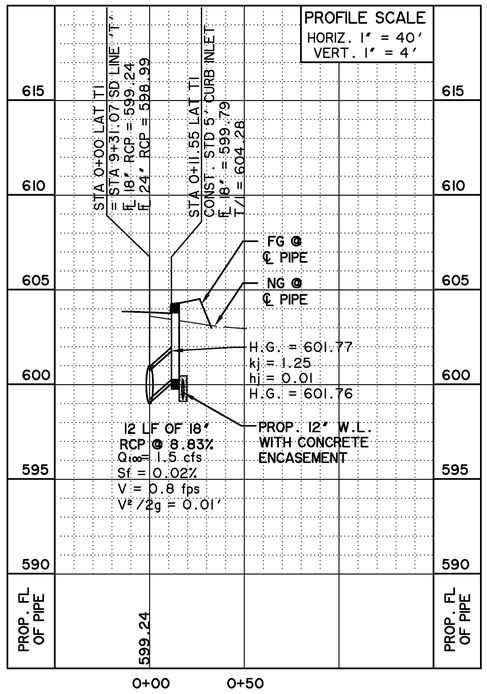

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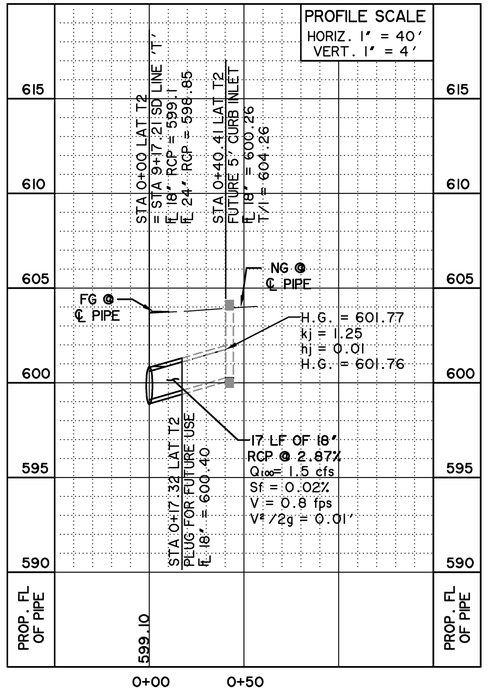

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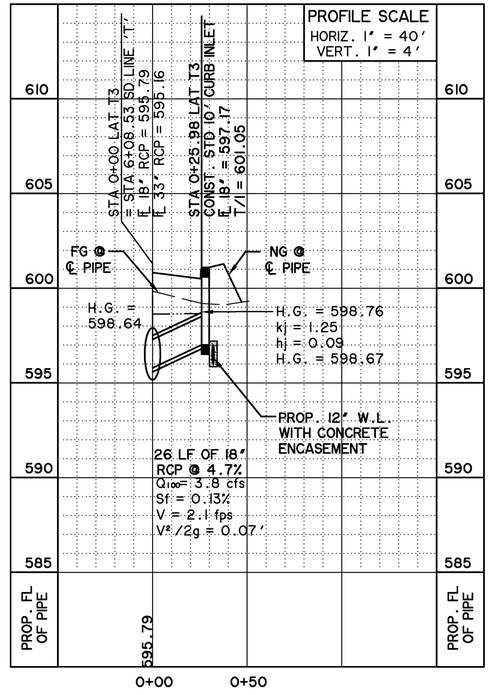

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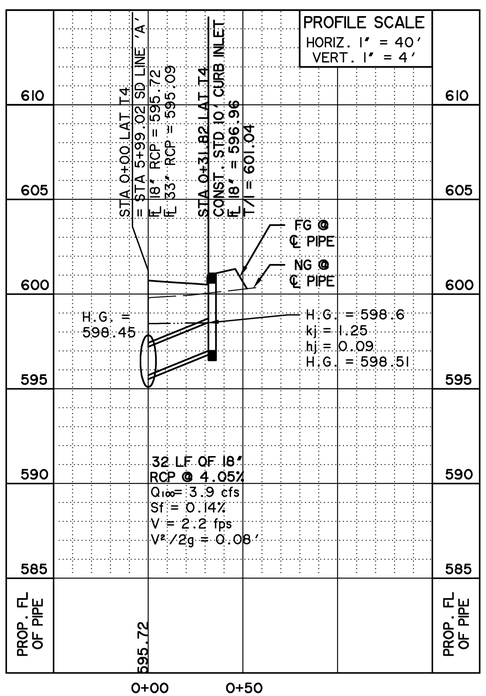

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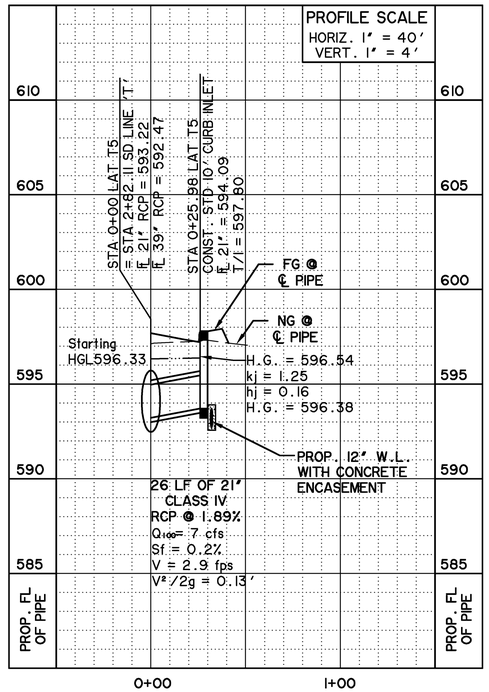

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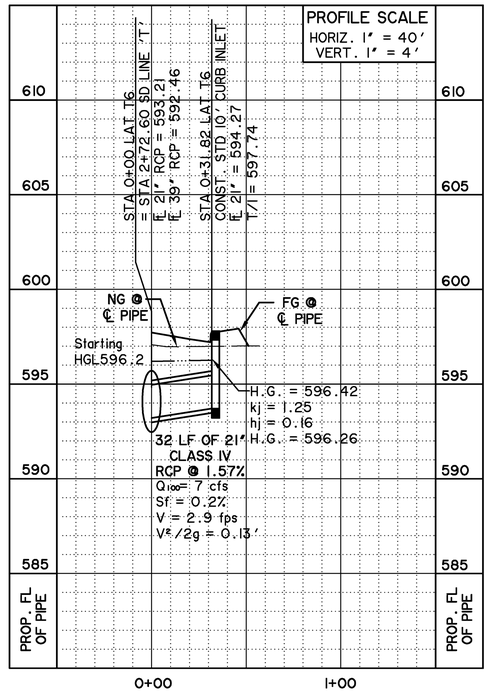

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ROCKWALL TECHNOLOGY PARK PHASE IV

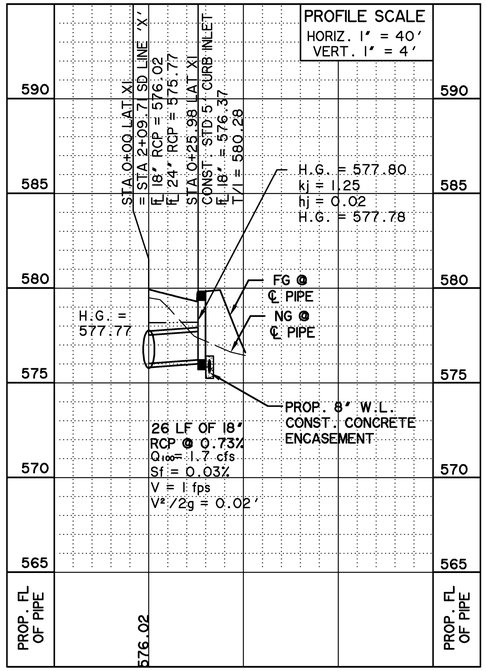
STORM DRAIN LATERALS LINES 'P' & 'T'

LAST SHEET EDIT DATE 01-21-2015
WA# 12209

SHEET NO. D403

TIME 8:51 FILE: D403-SD-LAT3-12209.dwg

LAT. 'X1'



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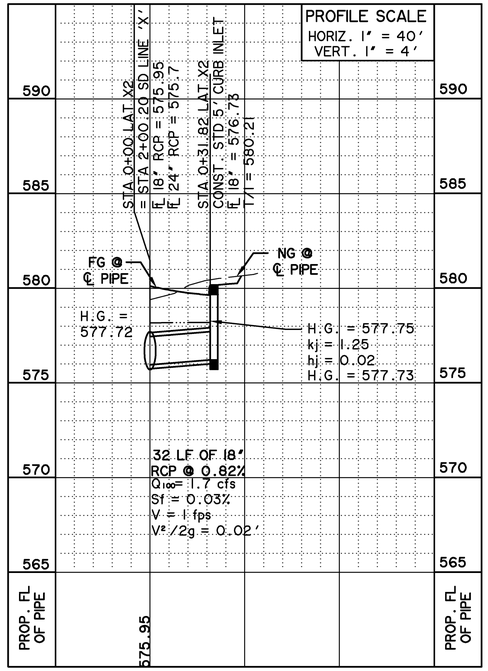

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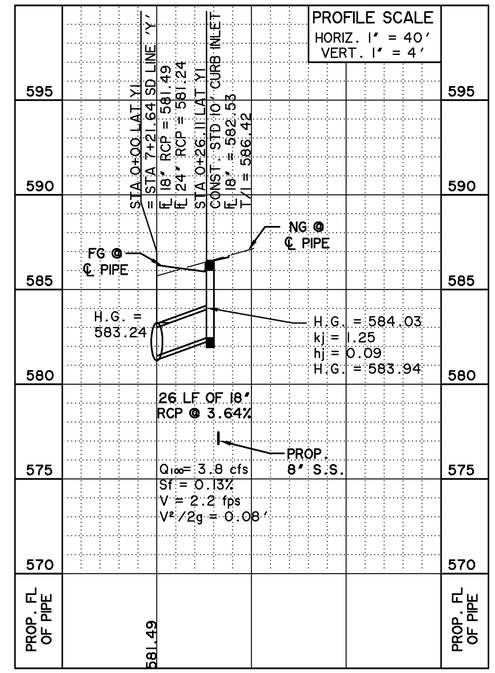

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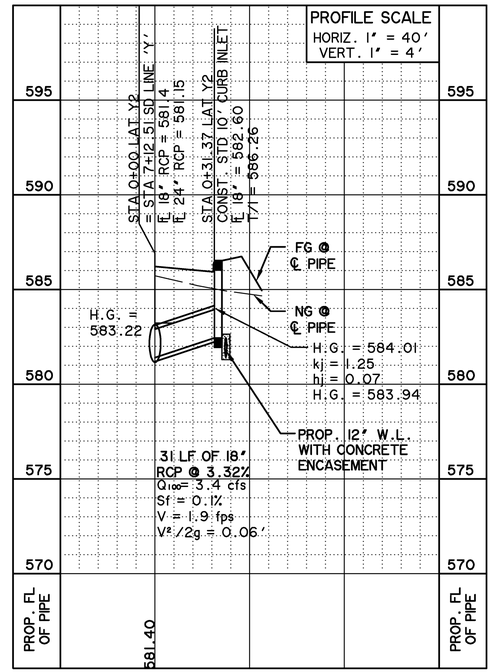

'ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN."

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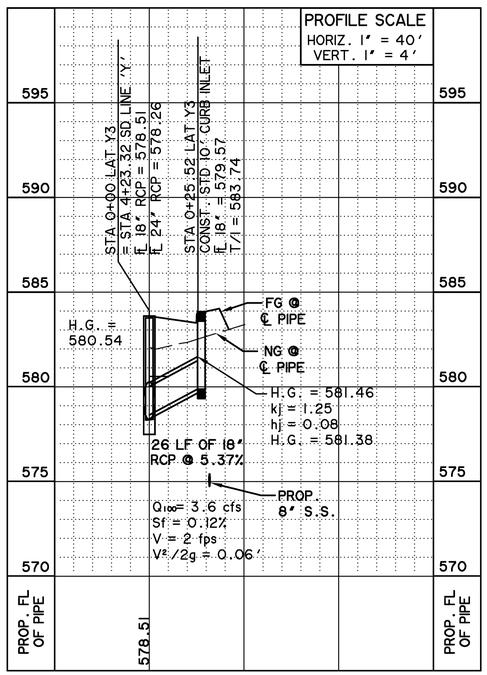

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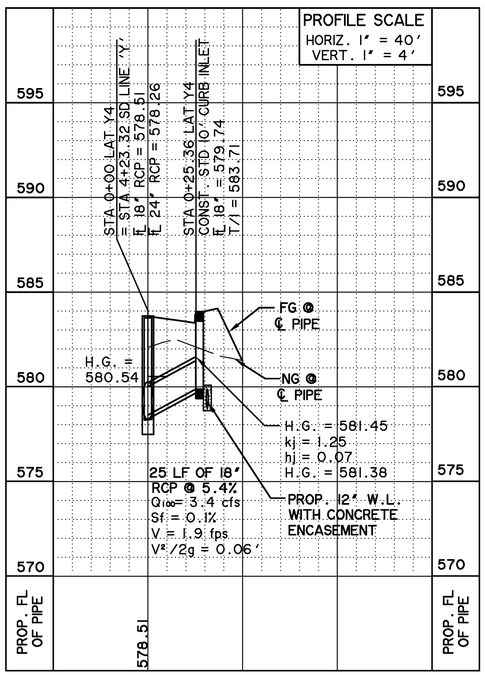

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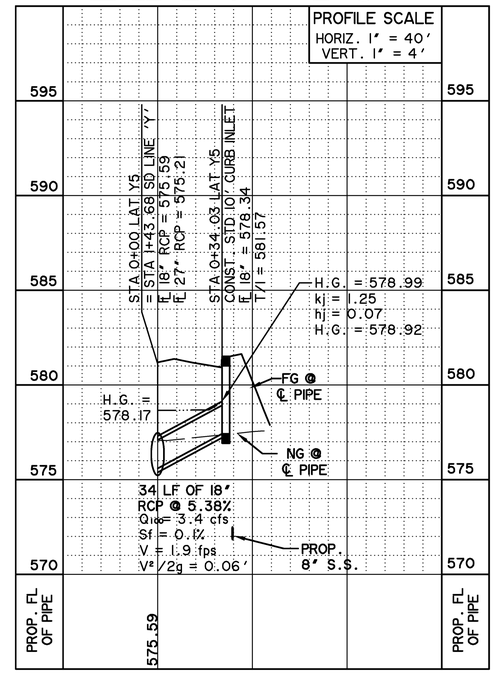

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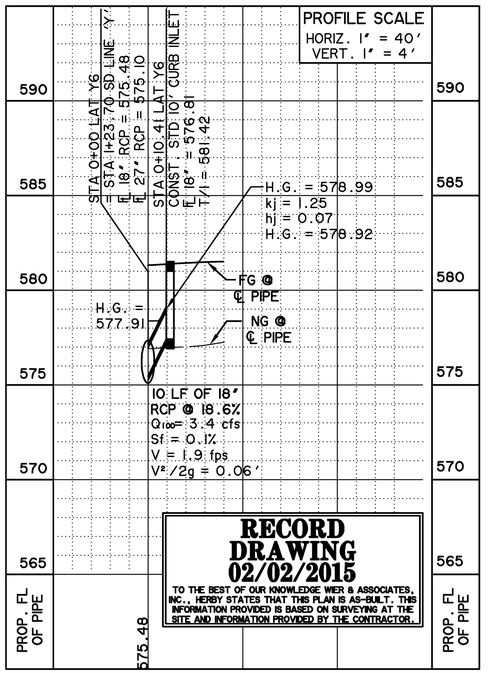

RECORD DRAWING 02/02/2015

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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

ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN LATERALS LINES 'X' & 'Y'

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 01-21-2015
WA# 12209

SHEET NO. D404

TIME:9:04 FILE:\D404-SD-LAT4-12209.dwg

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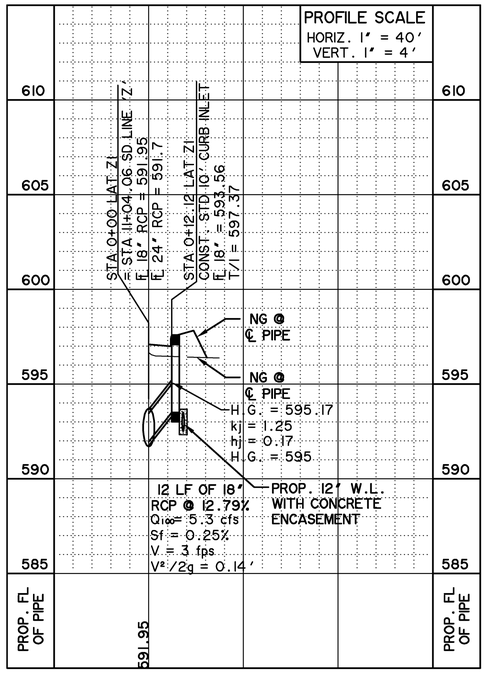

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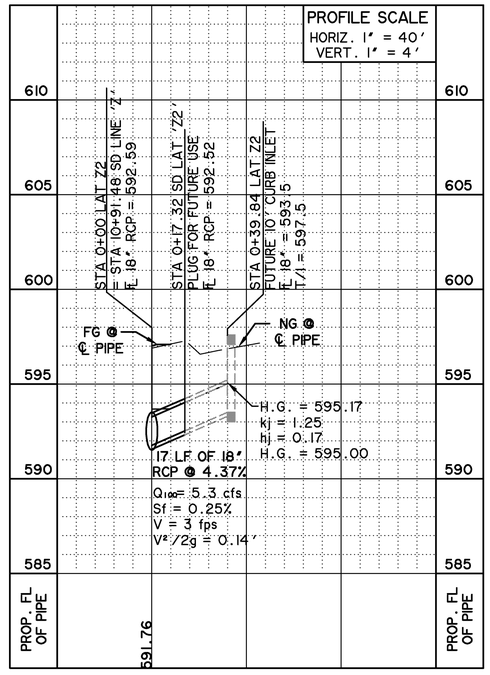

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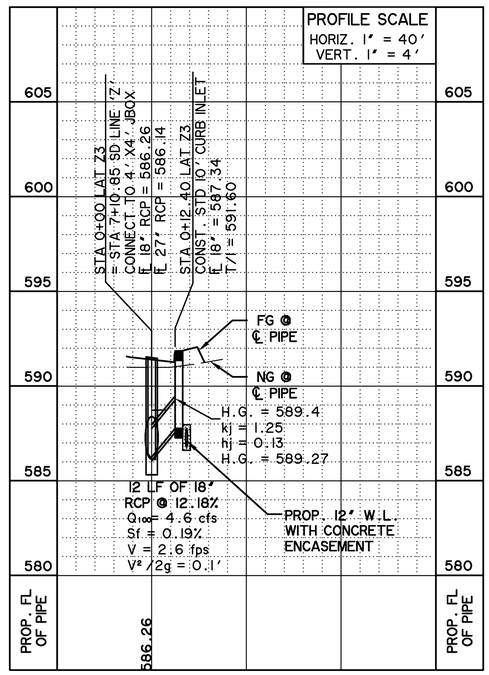

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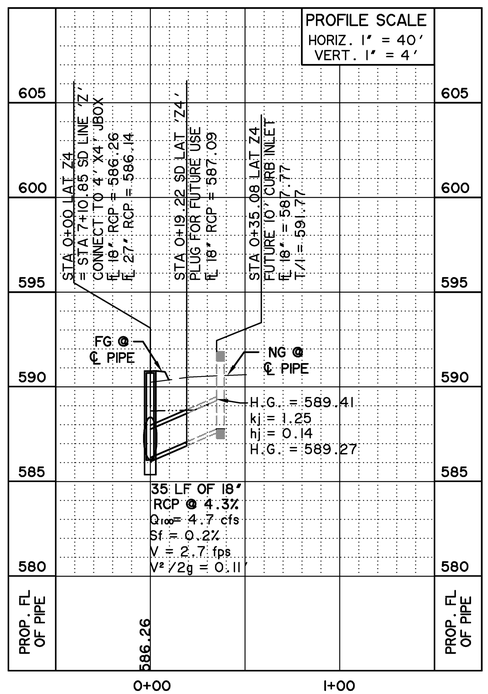

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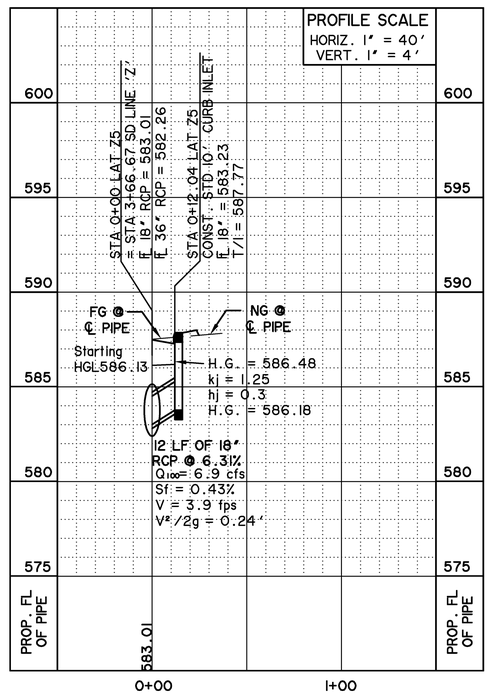

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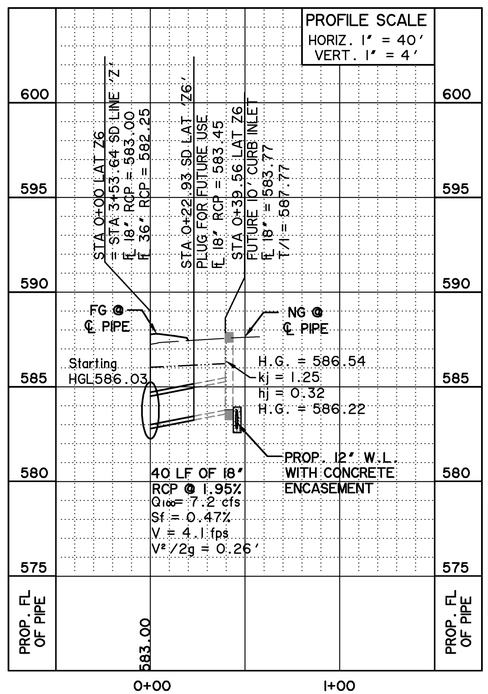

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02/02/2015
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ROCKWALL TECHNOLOGY PARK PHASE IV

STORM DRAIN LATERALS LINE 'Z'

LAST SHEET EDIT DATE 10-02-2013
WA# 12209

SHEET NO. D405

TIME: 10:53 FILE: D405-SD-LAT5-12209.dwg

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

Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing length (2-Wings) ③	
					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'
A = (Hw - 0.333') (SL)
B = (A) Tangent (30°)
Lw = (A) ÷ Cosine (30°)

For Cast-in-place culverts:

Ltw = (N) (S) + (N+1) (U)

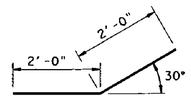
For Precast culverts:

Ltw = (N) (2U+S) + (N-1) (0.500')

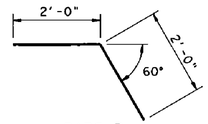
Total Wingwall Area (Two Wings ~ S.F.) = (Hw + 0.333') (Lw)

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

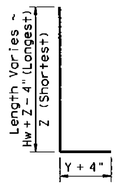
See applicable box culvert standard for H, S, T, and U values.



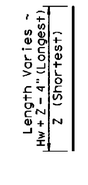
BARS D



BARS R



BARS J1



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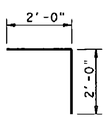
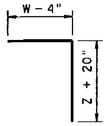
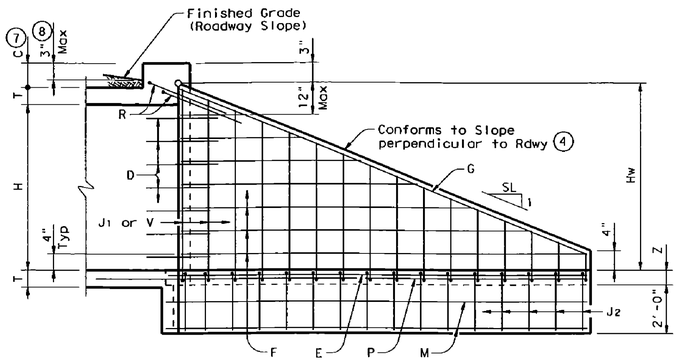


BARS L



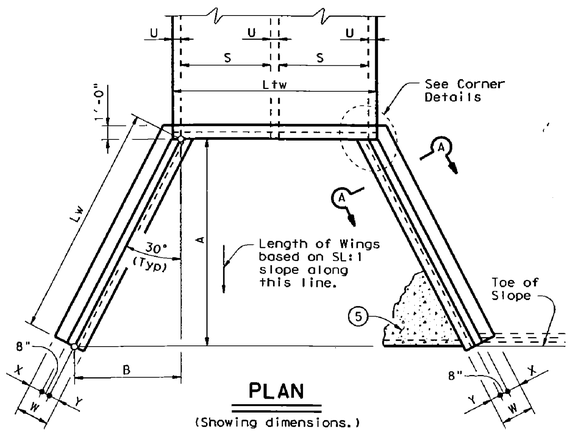
BARS J2

1. Extend Bars P 3'-0" minimum into bottom slab of Box Culvert.
2. Adjust to fit as necessary to maintain 1 ¼" 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. Payment for riprap shall be as required by Item 432, "Riprap". 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.
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. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
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.



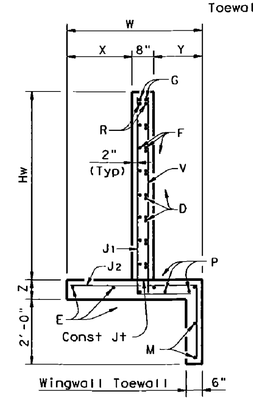
INSIDE ELEVATION

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

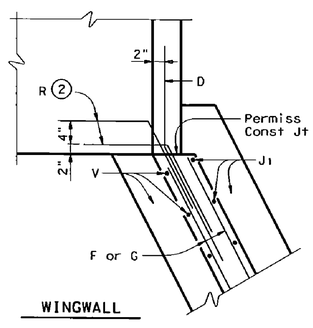


PLAN

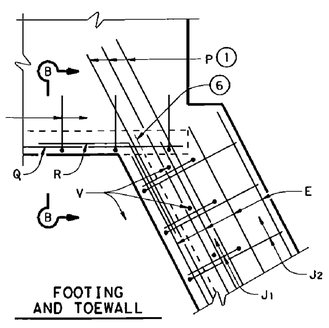
(Showing dimensions.)



SECTION A-A



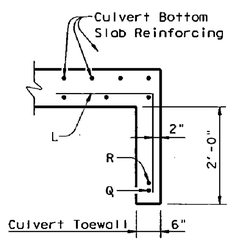
WINGWALL



FOOTING AND TOEWALL

CORNER DETAILS

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



SECTION B-B ⑤

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.
All reinforcing steel shall be Grade 60.
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.
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 02/02/2015

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Texas Department of Transportation
Bridge Division

CONCRETE WINGWALLS WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

FW-0

FILE: fw-0std.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 11-10: Add note for synthetic fibers.	COUNTY	CONTROL	SECT	JOB	HIGHWAY

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COMMENTS:

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ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT CONCRETE WINGWALLS (FW-0)

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 09-23-2013
WA# 12209

SHEET NO. D501

FILE: D501-TXDOT-FW-0-HDWL_12209.dwg
TIME: 11:33

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

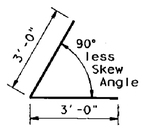
Dimensions					Variable Reinforcing				Estimated ④ Quantities per ft of wing (2~Wings)		Estimated Quantities per ft of Toewall (1~Toewall)	
					Bars J1		Bars J2					
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'- 2"	1'- 2"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'- 2"	1'- 2"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'- 9"	1'- 7"	1'- 2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'- 9"	1'- 7"	1'- 2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'- 4"	2'- 0"	1'- 4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'- 4"	2'- 0"	1'- 4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'- 0"	2'- 3"	1'- 9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'- 0"	2'- 3"	1'- 9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'- 6"	2'- 8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'- 6"	2'- 8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'- 0"	2'-10"	2'- 2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'- 5"	3'- 0"	2'- 5"	9"	#6	6"	#6	6"	196.27	1.234	8.57	0.117
11'-6"	7'- 2"	3'- 6"	2'- 8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'- 8"	3'- 9"	2'-11"	1'- 0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'- 2"	4'- 0"	3'- 2"	1'- 2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'- 5"	3'- 5"	1'- 4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'- 6"	4'-10"	3'- 8"	1'- 6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'- 0"	3'-11"	1'- 7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2~Wings)

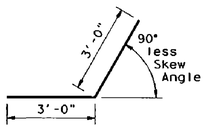
Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

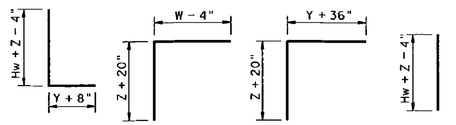
Bar	Size	No	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



BARS D1



BARS D2



BARS J1 BARS J2 BARS J3 BARS V

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

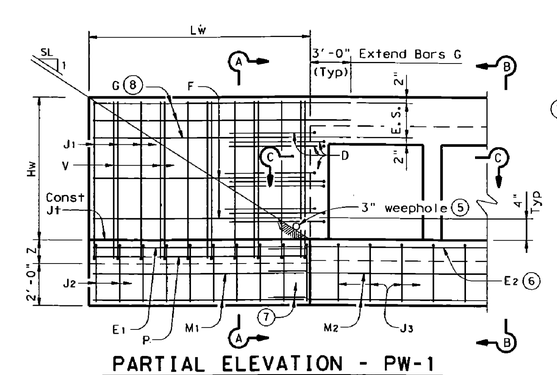
Hw = H + T + C
Lw = (Hw) (SL) ÷ Cosine θ for Ty PW-1
= (Hw - 1') (SL) ÷ Cosine θ for Ty PW-2 and Hw ≥ 4'
= (Hw - 0.5') (SL) ÷ Cosine θ for Ty PW-2 and Hw < 4'

For Cast-in-place culverts:
Ltw = [(N) (S) + (N + 1) (U)] ÷ Cosine θ

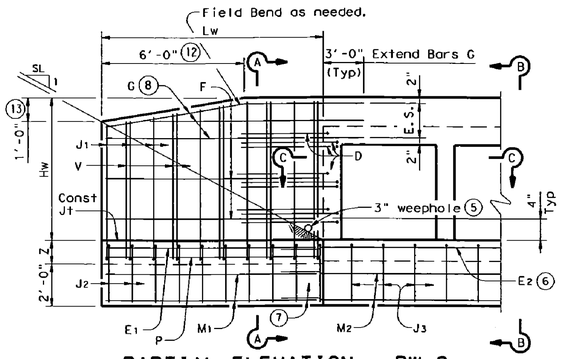
For Precast culverts:
Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ Cosine θ
Total Wingwall Area (Two Wings ~ SF)
= (2) (Hw) (Lw) for Ty PW-1
= (2) (Hw) (Lw) - 6 SF for Ty PW-2 and Hw ≥ 4'
= (2) (Hw) (Lw) - 1.5 SF for Ty PW-2 and Hw < 4'

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)
θ = Culvert Skew

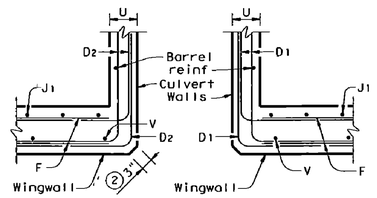
See applicable box culvert standard for S, H, T and U values.



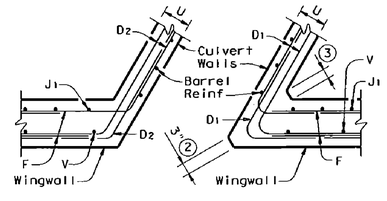
PARTIAL ELEVATION - PW-1



PARTIAL ELEVATION - PW-2



SECTION C-C



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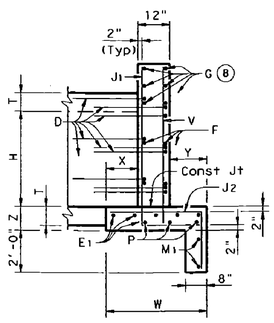
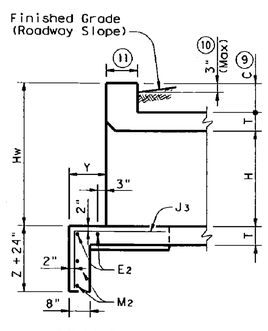
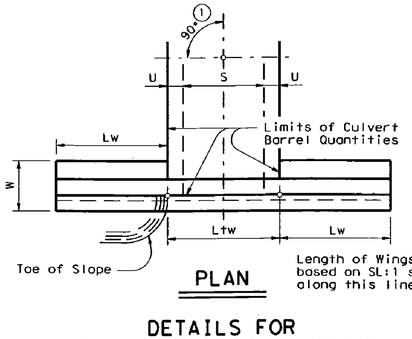


SECTION A-A
(Showing Wing Reinf)

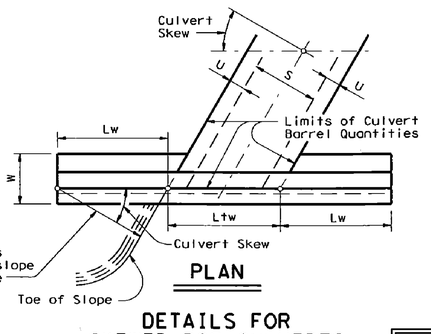


SECTION B-B
(Showing Wing Reinf)



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 Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.

⑤ Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.

⑥ Extend Bars E2 1'-6" minimum into the wingwall footing.

⑦ Lap Bars M1 1'-6" minimum with Bars M2.

⑧ Bars G equally spaced at 8" maximum, place as shown. Provide at least two pair Bars G per wing.

⑨ 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

⑩ For vehicle safety, the following requirements must be met:
- For structures without bridge rail, curbs cannot project more than 3" above finished grade.
- For structures with bridge rail, build curbs flush with finished grade.
Reduce curb heights, 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.

⑫ 3'-0" for Hw < 4'.

⑬ 6" for Hw < 4'.

GENERAL NOTES:
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Provide Class "C" Concrete (f'c = 3,600 psi Min) and Grade 60 reinforcing steel.
Provide 1 ½" Min clear cover to reinforcing steel.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See BCS sheet for wingwall type and additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

DESIGNER NOTES:
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
Type PW-2 can only be used for applications without a railing mounted to the wingwall.

Texas Department of Transportation
Bridge Division

CONCRETE WINGWALLS
WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

PW

FILE: pwstde01.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF
	DISTRICT	FEDERAL AID PROJECT		SHEET
	COUNTY	CONTROL	SECT	JOB	HIGHWAY

RECORD DRAWING 02/02/2015
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DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No liability of any kind is assumed by TxDOT for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

LEVELS DISPLAYED ACC:

FILE: D502-WINGWALLS-TYPE-PW_I2209.dwg
TIME: 11:53

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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

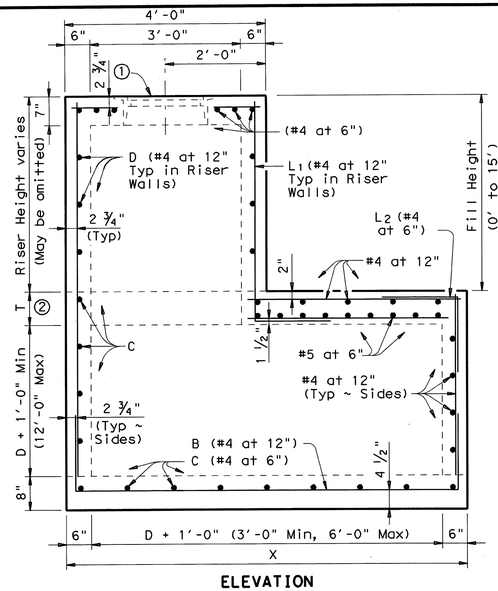
ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT CONCRETE WINGWALLS (PW)

RICHARD DUKE
STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

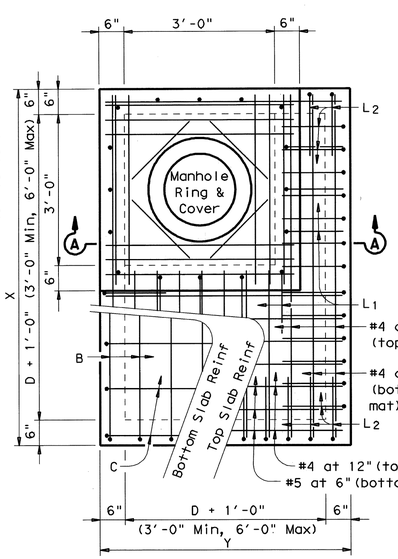
LAST SHEET EDIT DATE 09-23-2013
WA# I2209

SHEET NO.
D502



ELEVATION

D = Maximum inside diameter of any Pipe entering the side shown or the opposite side



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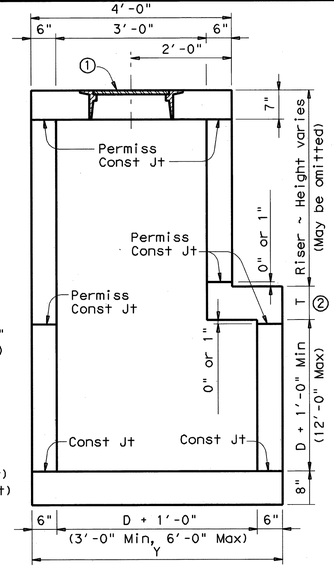
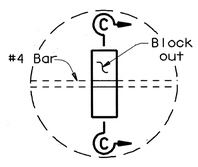


SECTION A-A

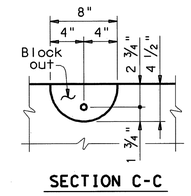
MANHOLE WITH CAST-IN-PLACE RISER

① See Ring and Cover Details

② For Fill Height less than or equal to 10', T=8".
For Fill Height between 10' and 15', T=10".

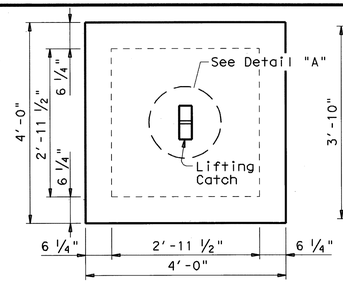


DETAIL "A"



SECTION C-C

LIFTING CATCH



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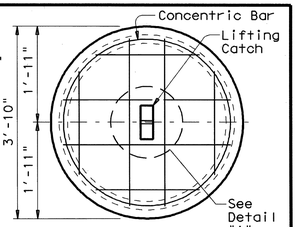
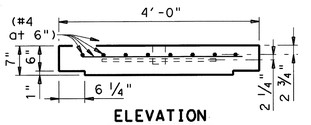
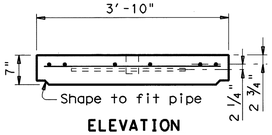


PLAN



ELEVATION

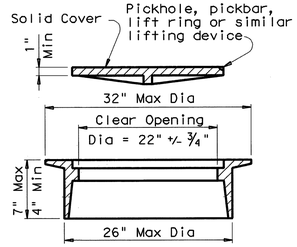
CAST-IN-PLACE RISER COVER



ELEVATION

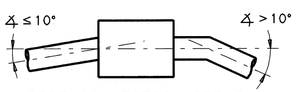
CONCRETE PIPE RISER COVER

OPTIONAL PRECAST CONCRETE LIFT-OFF COVERS



RING AND COVER DETAILS

Approximate Weight = 245 lb



PIPE CONNECTION DETAIL

Connecting pipes should enter within 10° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.

GENERAL NOTES:

Unless otherwise shown in the plans, payment will be made for each manhole of the Type M.

When approved, precast inlets with equivalent structural capacity may be furnished. Sealed engineering calculations and drawings shall be submitted for approval prior to construction.

Shop drawings will not be required.

In areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

The riser may be constructed of reinforced concrete as shown or of Reinforced Concrete Pipe, Class III, in accordance with ASTM Designation C-76. If pipe is used, joints shall conform to the Item "Reinforced Concrete Pipe Culverts". Precast Concrete Lift-Off Cover may be substituted for Ring and Cover.

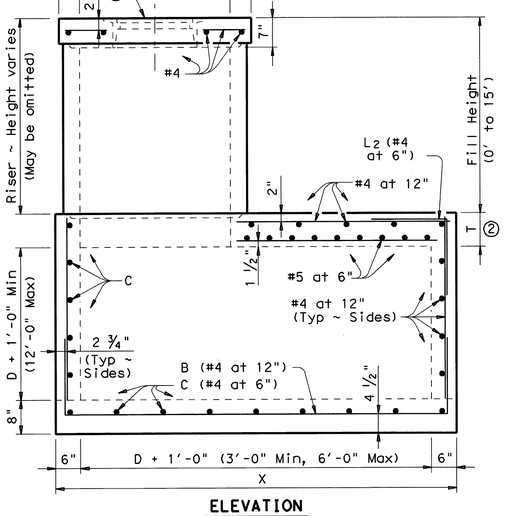
The riser, either cast-in-place or concrete pipe, may be located in any corner.

All reinforcing steel shall be #4 unless otherwise noted.

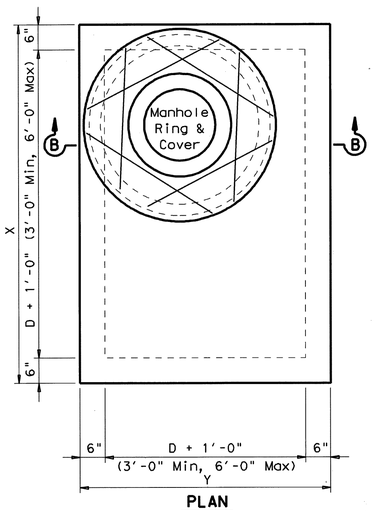
Pipes may enter any or all walls. The maximum size of pipe that can be accommodated is 60". More than one pipe may enter a side, subject to the maximum box dimension shown. The clear distance between adjacent pipes should be 9" minimum.

Ring and cover shall conform to the requirements of AASHTO M306, "Standard Specification for Drainage Structure Castings". Materials shall conform to ASTM A48, Class 35B for gray iron castings or ASTM A536, Grade 65-45-12 for ductile iron castings. Aluminum alloy castings shall not be permitted.

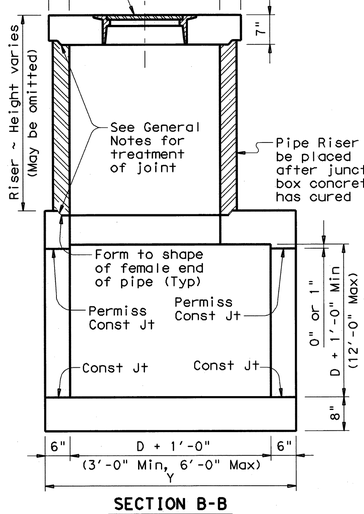
All concrete shall be Class "A" (f'c = 3000 psi).



ELEVATION

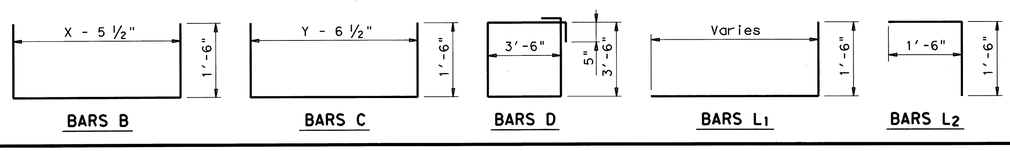


PLAN



SECTION B-B

OPTIONAL MANHOLE WITH CONCRETE PIPE RISER



Texas Department of Transportation
Bridge Division

MANHOLE TYPE M
(JUNCTION BOX WITH ACCESS)
15' MAX FILL

MH-M

FILE: mh-mstde.dgn	DN: TxDOT	CK: TER	DW: MCB	CK: TER/GAF
© TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
	COUNTY	CONTROL	SECT	JOB	HIGHWAY

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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

ROCKWALL TECHNOLOGY PARK PHASE IV

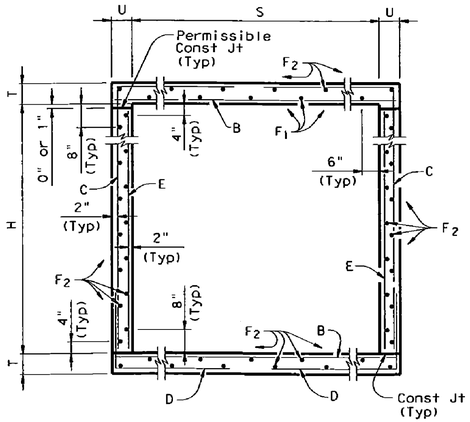
TXDOT MANHOLE TYPE M (MH-M)

LAST SHEET EDIT
DATE 09-23-2013
WA# 12209

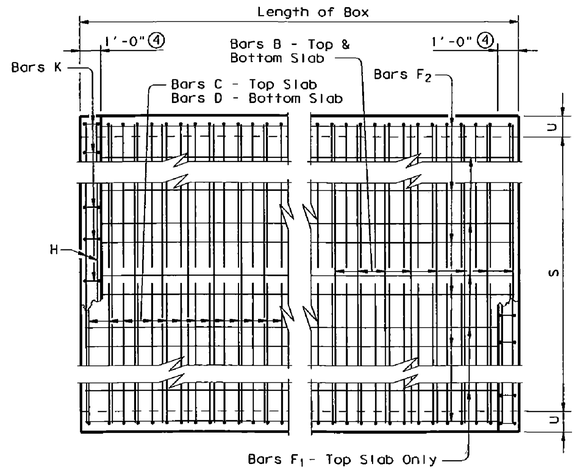
SHEET NO.
D503

ACC:
LEVELS DISPLAYED

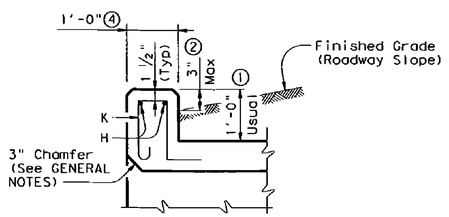
TIME: 13:20 FILE: D503-MANHOLE-TYPE-M-JUNCTION BOX WITH ACCESS-MH-M_12209.dwg



TYPICAL SECTION



PLAN OF REINF STEEL



SECTION THRU CURB

① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic 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.

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).

GENERAL NOTES:
Designed according to AASHTO LRFD 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 E may be cut off or raised, and Bars C and D may be reversed.
See standard SCC-MD for skewed ends, angle sections and lengthening details.

RECORD DRAWING 02/02/2015
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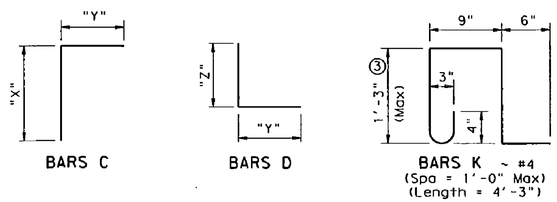

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation
Bridge Division

SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL

SCC-7

FILE: scc07ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF		
© TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT			SHEET	
REVISIONS						
10-12: Added WWR	COUNTY		CONTROL	SECT	JOB	HIGHWAY

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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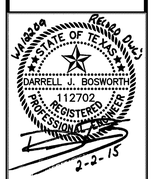
ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT SINGLE BOX CULVERTS (SCC-7)



LAST SHEET EDIT DATE 09-23-2013
WA# 12209
SHEET NO. D504

ACC:
LEVELS DISPLAYED

TIME 13:08 FILE: D504-SINGLE BOX-CULVERTS-L_12209.dwg

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

SECTION DIMENSIONS				FILL HEIGHT ⑤	Bars B					Bars C							Bars D							Bars E~#4 at 18" Max			Bars F1~#4				Bars F2~#4 at 18" Max			Bars H 4~#4		Bars K		QUANTITIES					
																																						Per foot of Barrel		Curb		Total	
S	H	T	U		No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	"X"	"Y"	No.	Size	Spa	Length	Weight	"Y"	"Z"	No.	Length	Wt	No.	Spa	Length	Wt	No.	Length	Wt	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
7'-0"	3'-0"	7"	7"	16'	162	#6	6"	7'-11"	1,926	194	#5	5"	6'-11"	1,400	3'-5"	3'-6"	194	#5	5"	6'-1"	1,231	3'-6"	2'-7"	56	3'-0"	112	12	7"	39'-9"	319	31	39'-9"	823	7'-11"	21	18	51	0.483	145.3	0.6	72	19.9	5,883
7'-0"	3'-0"	8"	7"	20'	162	#6	6"	7'-11"	1,926	194	#5	5"	7'-0"	1,416	3'-6"	3'-6"	194	#5	5"	6'-2"	1,248	3'-6"	2'-8"	56	3'-0"	112	5	18"	39'-9"	133	31	39'-9"	823	7'-11"	21	18	51	0.533	141.5	0.6	72	21.9	5,730
7'-0"	3'-0"	9"	8"	23'	162	#6	6"	8'-1"	1,967	194	#5	5"	7'-1"	1,433	3'-7"	3'-6"	194	#5	5"	6'-3"	1,265	3'-6"	2'-9"	56	3'-0"	112	5	18"	39'-9"	133	31	39'-9"	823	8'-1"	22	20	57	0.611	143.3	0.6	79	25.0	5,812
7'-0"	3'-0"	10"	8"	30'	194	#6	5"	8'-1"	2,355	194	#5	5"	7'-2"	1,450	3'-8"	3'-6"	194	#5	5"	6'-4"	1,281	3'-6"	2'-10"	56	3'-0"	112	5	18"	39'-9"	133	31	39'-9"	823	8'-1"	22	20	57	0.663	153.9	0.6	79	27.1	6,233
7'-0"	4'-0"	7"	7"	16'	162	#6	6"	7'-11"	1,926	162	#5	6"	7'-11"	1,338	4'-5"	3'-6"	162	#5	6"	6'-1"	1,028	3'-6"	2'-7"	56	4'-0"	150	12	7"	39'-9"	319	31	39'-9"	823	7'-11"	21	18	51	0.526	139.6	0.6	72	21.6	5,656
7'-0"	4'-0"	8"	7"	20'	194	#6	5"	7'-11"	2,307	162	#5	6"	8'-0"	1,352	4'-6"	3'-6"	162	#5	6"	6'-2"	1,042	3'-6"	2'-8"	56	4'-0"	150	5	18"	39'-9"	133	31	39'-9"	823	7'-11"	21	18	51	0.576	145.2	0.6	72	23.6	5,879
7'-0"	4'-0"	9"	8"	23'	194	#6	5"	8'-1"	2,355	162	#5	6"	8'-1"	1,366	4'-7"	3'-6"	162	#5	6"	6'-3"	1,056	3'-6"	2'-9"	56	4'-0"	150	5	18"	39'-9"	133	31	39'-9"	823	8'-1"	22	20	57	0.660	147.1	0.6	79	27.0	5,962
7'-0"	4'-0"	10"	8"	30'	194	#6	5"	8'-1"	2,355	194	#5	5"	8'-2"	1,652	4'-8"	3'-6"	194	#5	5"	6'-4"	1,281	3'-6"	2'-10"	56	4'-0"	150	5	18"	39'-9"	133	31	39'-9"	823	8'-1"	22	20	57	0.712	159.9	0.6	79	29.1	6,473
7'-0"	5'-0"	7"	7"	16'	162	#6	6"	7'-11"	1,926	162	#5	6"	8'-11"	1,507	5'-5"	3'-6"	162	#5	6"	6'-1"	1,028	3'-6"	2'-7"	56	5'-0"	187	12	7"	39'-9"	319	35	39'-9"	929	7'-11"	21	18	51	0.569	147.4	0.6	72	23.4	5,968
7'-0"	5'-0"	8"	7"	20'	194	#6	5"	7'-11"	2,307	162	#5	6"	9'-0"	1,521	5'-6"	3'-6"	162	#5	6"	6'-2"	1,042	3'-6"	2'-8"	56	5'-0"	187	5	18"	39'-9"	133	35	39'-9"	929	7'-11"	21	18	51	0.619	153.0	0.6	72	25.4	6,191
7'-0"	5'-0"	9"	8"	23'	194	#6	5"	8'-1"	2,355	162	#5	6"	9'-1"	1,535	5'-7"	3'-6"	162	#5	6"	6'-3"	1,056	3'-6"	2'-9"	56	5'-0"	187	5	18"	39'-9"	133	35	39'-9"	929	8'-1"	22	20	57	0.710	154.9	0.6	79	29.0	6,274
7'-0"	5'-0"	10"	8"	30'	194	#6	5"	8'-1"	2,355	194	#5	5"	9'-2"	1,855	5'-8"	3'-6"	194	#5	5"	6'-4"	1,281	3'-6"	2'-10"	56	5'-0"	187	5	18"	39'-9"	133	35	39'-9"	929	8'-1"	22	20	57	0.761	168.5	0.6	79	31.0	6,819
7'-0"	6'-0"	7"	7"	16'	194	#6	5"	7'-11"	2,307	162	#5	6"	9'-11"	1,676	6'-5"	3'-6"	162	#5	6"	6'-1"	1,028	3'-6"	2'-7"	56	6'-0"	224	12	7"	39'-9"	319	39	39'-9"	1,036	7'-11"	21	18	51	0.612	164.8	0.6	72	25.1	6,662
7'-0"	6'-0"	8"	7"	20'	194	#6	5"	7'-11"	2,307	162	#5	6"	10'-0"	1,690	6'-6"	3'-6"	162	#5	6"	6'-2"	1,042	3'-6"	2'-8"	56	6'-0"	224	5	18"	39'-9"	133	39	39'-9"	1,036	7'-11"	21	18	51	0.663	160.8	0.6	72	27.1	6,504
7'-0"	6'-0"	9"	8"	23'	194	#6	5"	8'-1"	2,355	162	#5	6"	10'-1"	1,704	6'-7"	3'-6"	162	#5	6"	6'-3"	1,056	3'-6"	2'-9"	56	6'-0"	224	5	18"	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	57	0.759	162.7	0.6	79	31.0	6,587
7'-0"	6'-0"	10"	8"	30'	194	#6	5"	8'-1"	2,355	194	#5	5"	10'-2"	2,057	6'-8"	3'-6"	194	#5	5"	6'-4"	1,281	3'-6"	2'-10"	56	6'-0"	224	5	18"	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	57	0.811	177.2	0.6	79	33.0	7,165
7'-0"	7'-0"	7"	7"	16'	194	#6	5"	7'-11"	2,307	162	#5	6"	10'-11"	1,845	7'-5"	3'-6"	162	#5	6"	6'-1"	1,028	3'-6"	2'-7"	56	7'-0"	262	12	7"	39'-9"	319	39	39'-9"	1,036	7'-11"	21	18	51	0.655	169.9	0.6	72	26.8	6,869
7'-0"	7'-0"	8"	7"	20'	194	#6	5"	7'-11"	2,307	194	#5	5"	11'-0"	2,226	7'-6"	3'-6"	194	#5	5"	6'-2"	1,248	3'-6"	2'-8"	56	7'-0"	262	5	18"	39'-9"	133	39	39'-9"	1,036	7'-11"	21	18	51	0.706	180.3	0.6	72	28.8	7,284
7'-0"	7'-0"	9"	8"	23'	194	#6	5"	8'-1"	2,355	162	#5	6"	11'-1"	1,873	7'-7"	3'-6"	162	#5	6"	6'-3"	1,056	3'-6"	2'-9"	56	7'-0"	262	5	18"	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	57	0.809	167.9	0.6	79	33.0	6,794
7'-0"	7'-0"	10"	8"	30'	194	#6	5"	8'-1"	2,355	194	#5	5"	11'-2"	2,259	7'-8"	3'-6"	194	#5	5"	6'-4"	1,281	3'-6"	2'-10"	56	7'-0"	262	5	18"	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	57	0.860	183.2	0.6	79	35.0	7,405

⑤ For each box size, minimum fill height shown shall be used for all culverts with less than 2'-0" of fill.

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).

HL93 LOADING SHEET 2 OF 2

RECORD DRAWING 02/02/2015

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

SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL

SCC-7

FILE: scc07ste.dgn	DN: GAF	CK: LNM	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
10-12: Added WWR	COUNTY	CONTROL	SECT	JOB	HIGHWAY

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LEVELS DISPLAYED ACC:

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

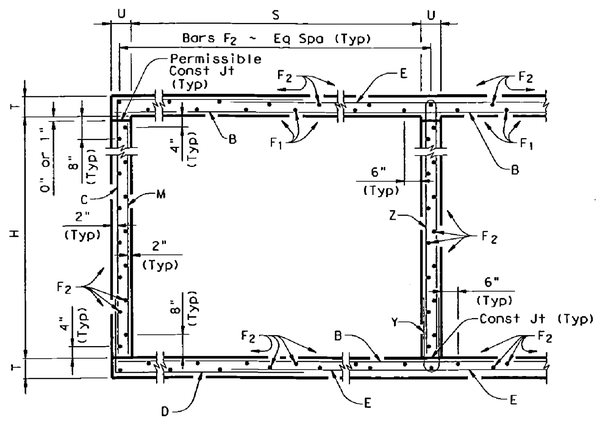
ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT SINGLE BOX CULVERTS (SCC-7)

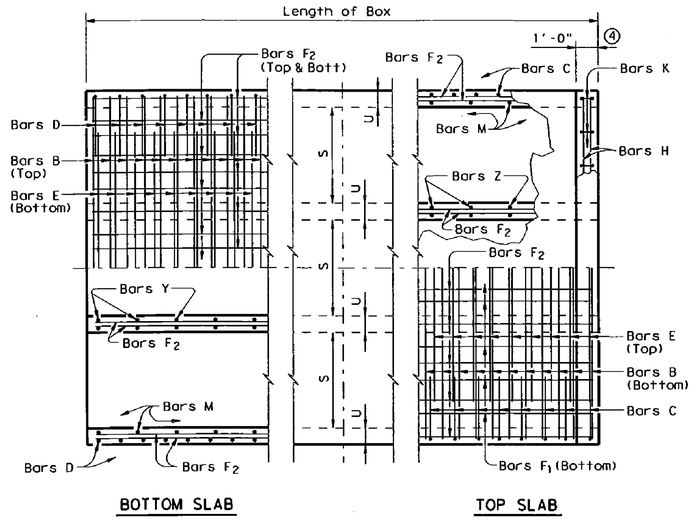
DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 12-16-2014
WA# 12209
SHEET NO. D505

TIME: 12:09 FILE: D505-SINGLE BOX-CULVERTS-2_12209.dwg



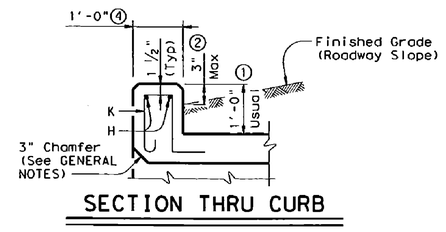
TYPICAL SECTION



BOTTOM SLAB

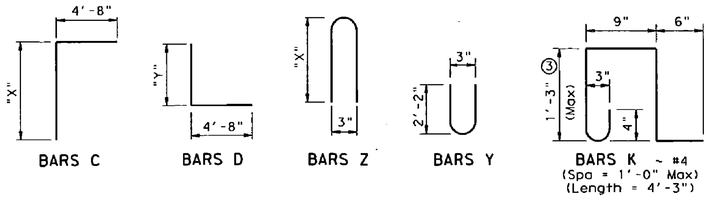
TOP SLAB

PART PLANS



SECTION THRU CURB

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



① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic 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.

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncooted No. 5 bars, as shown in Item 440).

GENERAL NOTES:
Designed according to AASHTO LRFD 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 ¼" 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 02/02/2015
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.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation
Bridge Division

MULTIPLE BOX CULVERTS CAST-IN-PLACE 5'-0" SPAN 0' TO 20' FILL

MC-5-20

FILE: mc520ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF		
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT			SHEET	
REVISIONS 10-12: Added WWR						
	COUNTY		CONTROL	SECT	JOB	HIGHWAY

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LEVELS DISPLAYED
ACC:

TIME: 11:11:09 FILE: D506-5FT-MULTIPLE BOX-CULVERTS-I_12209.dwg

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

ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT MULTIPLE BOX CULVERTS (MC-5-20)

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

LAST SHEET EDIT DATE 09-23-2015
WA# 12209
SHEET NO. D506

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					
													Bar C		Bar D																											Per foot of Barrel		Curb		Total	
	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	5'-0"	2'-0"	7"	7"	194	#4	5"	11'- 6"	1,490	162	#4	6"	7'- 1"	767	6'-10"	739	162	#5	6"	5'- 8"	957	14	8"	39'-9"	372	38	39'-9"	1,009	56	2'- 0"	75	41	4'- 6"	123	5'- 0"	137	11'- 6"	31	26	74	0.637	141.7	0.9	105	26.4	5,774
3	5'-0"	2'-0"	7"	7"	194	#4	5"	17'- 1"	2,214	162	#4	6"	7'- 1"	767	6'-10"	739	162	#5	6"	11'- 3"	1,901	21	8"	39'-9"	558	54	39'-9"	1,434	56	2'- 0"	75	82	4'- 6"	246	5'- 0"	274	17'- 1"	46	36	102	0.922	205.2	1.3	148	38.2	8,356
4	5'-0"	2'-0"	7"	7"	194	#4	5"	22'- 8"	2,937	162	#4	6"	7'- 1"	767	6'-10"	739	162	#5	6"	16'-10"	2,844	28	8"	39'-9"	743	70	39'-9"	1,859	56	2'- 0"	75	123	4'- 6"	370	5'- 0"	411	22'- 8"	61	48	136	1.206	268.6	1.7	197	49.9	10,942
5	5'-0"	2'-0"	7"	7"	194	#4	5"	28'- 3"	3,661	162	#4	6"	7'- 1"	767	6'-10"	739	162	#5	6"	22'- 5"	3,788	35	8"	39'-9"	929	86	39'-9"	2,284	56	2'- 0"	75	164	4'- 6"	493	5'- 0"	548	28'- 3"	75	60	170	1.491	332.1	2.1	245	61.7	13,529
6	5'-0"	2'-0"	7"	7"	194	#4	5"	33'-10"	4,385	162	#4	6"	7'- 1"	767	6'-10"	739	162	#5	6"	28'- 0"	4,731	42	8"	39'-9"	1,115	102	39'-9"	2,708	56	2'- 0"	75	205	4'- 6"	616	5'- 0"	685	33'-10"	90	70	199	1.775	395.5	2.5	289	73.5	16,110
2	5'-0"	3'-0"	7"	7"	194	#4	5"	11'- 6"	1,490	138	#4	7"	8'- 1"	745	6'-10"	630	162	#5	6"	5'- 8"	957	14	8"	39'-9"	372	44	39'-9"	1,168	56	3'- 0"	112	41	4'- 6"	123	7'- 0"	192	11'- 6"	31	26	74	0.702	144.7	0.9	105	29.0	5,894
3	5'-0"	3'-0"	7"	7"	194	#4	5"	17'- 1"	2,214	138	#4	7"	8'- 1"	745	6'-10"	630	162	#5	6"	11'- 3"	1,901	21	8"	39'-9"	558	62	39'-9"	1,646	56	3'- 0"	112	82	4'- 6"	246	7'- 0"	383	17'- 1"	46	36	102	1.008	210.9	1.3	148	41.6	8,583
4	5'-0"	3'-0"	7"	7"	194	#4	5"	22'- 8"	2,937	138	#4	7"	8'- 1"	745	6'-10"	630	162	#5	6"	16'-10"	2,844	28	8"	39'-9"	743	80	39'-9"	2,124	56	3'- 0"	112	123	4'- 6"	370	7'- 0"	575	22'- 8"	61	48	136	1.314	277.0	1.7	197	54.3	11,277
5	5'-0"	3'-0"	7"	7"	194	#4	5"	28'- 3"	3,661	138	#4	7"	8'- 1"	745	6'-10"	630	162	#5	6"	22'- 5"	3,788	35	8"	39'-9"	929	98	39'-9"	2,602	56	3'- 0"	112	164	4'- 6"	493	7'- 0"	767	28'- 3"	75	60	170	1.620	343.2	2.1	245	66.9	13,972
6	5'-0"	3'-0"	7"	7"	194	#4	5"	33'-10"	4,385	138	#4	7"	8'- 1"	745	6'-10"	630	162	#5	6"	28'- 0"	4,731	42	8"	39'-9"	1,115	116	39'-9"	3,080	56	3'- 0"	112	205	4'- 6"	616	7'- 0"	959	33'-10"	90	70	199	1.926	409.3	2.5	289	79.5	16,662
2	5'-0"	4'-0"	7"	7"	194	#4	5"	11'- 6"	1,490	138	#4	7"	9'- 1"	837	6'-10"	630	162	#5	6"	5'- 8"	957	14	8"	39'-9"	372	44	39'-9"	1,168	56	4'- 0"	150	41	4'- 6"	123	9'- 0"	246	11'- 6"	31	26	74	0.767	149.3	0.9	105	31.6	6,078
3	5'-0"	4'-0"	7"	7"	194	#4	5"	17'- 1"	2,214	138	#4	7"	9'- 1"	837	6'-10"	630	162	#5	6"	11'- 3"	1,901	21	8"	39'-9"	558	62	39'-9"	1,646	56	4'- 0"	150	82	4'- 6"	246	9'- 0"	493	17'- 1"	46	36	102	1.095	216.9	1.3	148	45.1	8,823
4	5'-0"	4'-0"	7"	7"	194	#4	5"	22'- 8"	2,937	138	#4	7"	9'- 1"	837	6'-10"	630	162	#5	6"	16'-10"	2,844	28	8"	39'-9"	743	80	39'-9"	2,124	56	4'- 0"	150	123	4'- 6"	370	9'- 0"	739	22'- 8"	61	48	136	1.422	284.4	1.7	197	58.6	11,571
5	5'-0"	4'-0"	7"	7"	194	#4	5"	28'- 3"	3,661	138	#4	7"	9'- 1"	837	6'-10"	630	162	#5	6"	22'- 5"	3,788	35	8"	39'-9"	929	98	39'-9"	2,602	56	4'- 0"	150	164	4'- 6"	493	9'- 0"	986	28'- 3"	75	60	170	1.750	351.9	2.1	245	72.1	14,321
6	5'-0"	4'-0"	7"	7"	194	#4	5"	33'-10"	4,385	138	#4	7"	9'- 1"	837	6'-10"	630	162	#5	6"	28'- 0"	4,731	42	8"	39'-9"	1,115	116	39'-9"	3,080	56	4'- 0"	150	205	4'- 6"	616	9'- 0"	1,232	33'-10"	90	70	199	2.078	419.4	2.5	289	85.6	17,065
2	5'-0"	5'-0"	7"	7"	194	#4	5"	11'- 6"	1,490	138	#4	7"	10'- 1"	930	6'-10"	630	162	#5	6"	5'- 8"	957	14	8"	39'-9"	372	50	39'-9"	1,328	56	5'- 0"	187	41	4'- 6"	123	11'- 0"	301	11'- 6"	31	26	74	0.832	158.0	0.9	105	34.2	6,423
3	5'-0"	5'-0"	7"	7"	194	#4	5"	17'- 1"	2,214	138	#4	7"	10'- 1"	930	6'-10"	630	162	#5	6"	11'- 3"	1,901	21	8"	39'-9"	558	70	39'-9"	1,859	56	5'- 0"	187	82	4'- 6"	246	11'- 0"	603	17'- 1"	46	36	102	1.181	228.2	1.3	148	48.5	9,276
4	5'-0"	5'-0"	7"	7"	194	#4	5"	22'- 8"	2,937	138	#4	7"	10'- 1"	930	6'-10"	630	162	#5	6"	16'-10"	2,844	28	8"	39'-9"	743	90	39'-9"	2,390	56	5'- 0"	187	123	4'- 6"	370	11'- 0"	904	22'- 8"	61	48	136	1.530	298.4	1.7	197	62.9	12,132
5	5'-0"	5'-0"	7"	7"	194	#4	5"	28'- 3"	3,661	138	#4	7"	10'- 1"	930	6'-10"	630	162	#5	6"	22'- 5"	3,788	35	8"	39'-9"	929	110	39'-9"	2,921	56	5'- 0"	187	164	4'- 6"	493	11'- 0"	1,205	28'- 3"	75	60	170	1.880	368.6	2.1	245	77.3	14,989
6	5'-0"	5'-0"	7"	7"	194	#4	5"	33'-10"	4,385	138	#4	7"	10'- 1"	930	6'-10"	630	162	#5	6"	28'- 0"	4,731	42	8"	39'-9"	1,115	130	39'-9"	3,452	56	5'- 0"	187	205	4'- 6"	616	11'- 0"	1,506	33'-10"	90	70	199	2.229	438.8	2.5	289	91.7	17,841

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 compos resulting from its use.

LEVELS DISPLAYED

ACC:

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).

HL93 LOADING SHEET 2 OF 2

RECORD DRAWING 02/02/2015
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

MULTIPLE BOX CULVERTS CAST-IN-PLACE 5'-0" SPAN 0' TO 20' FILL

MC-5-20

FILE: mc520ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF	
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT			SHEET
REVISIONS					
10-12: Added WWR	COUNTY		CONTROL	SECT	JOB	HIGHWAY

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

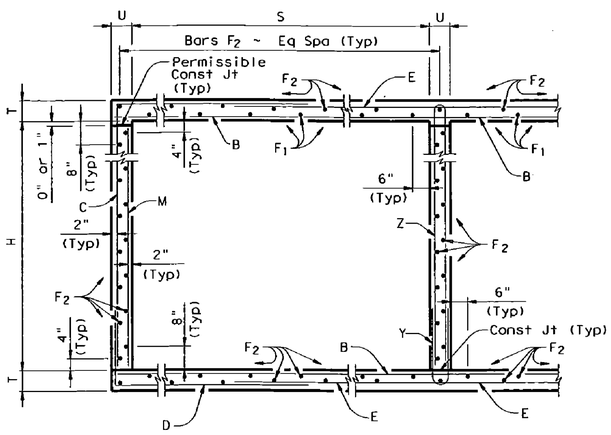
ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT MULTIPLE BOX CULVERTS (MC-5-20)

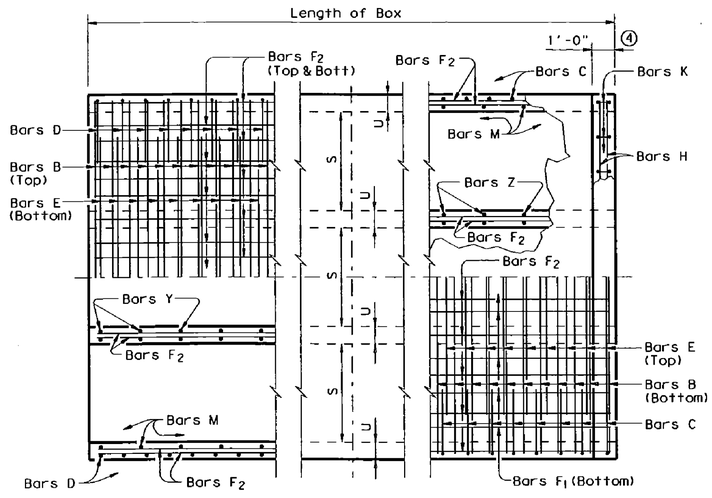
LAST SHEET EDIT DATE 09-23-2015
WA# 12209

SHEET NO. D507

TIME:12:56 FILE:D507-5FT-MULTIPLE BOX-CULVERTS-2_12209.dwg

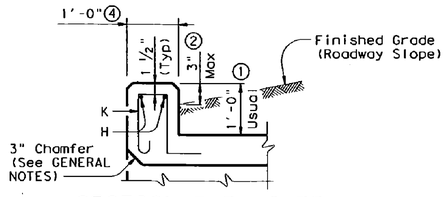


TYPICAL SECTION



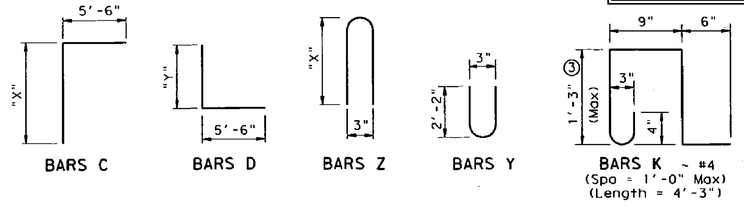
BOTTOM SLAB TOP SLAB

PART PLANS



SECTION THRU CURB

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"



① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic 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.

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).

GENERAL NOTES:
Designed according to AASHTO LRFD 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 ¼" 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 02/02/2015
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.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation
Bridge Division

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

MC-6-16

FILE: mc616ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 10-12: Added WWR	COUNTY	CONTROL	SECT	JOB	HIGHWAY

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

ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT MULTIPLE BOX CULVERTS (MC-6-16)

DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

LAST SHEET EDIT DATE 09-23-2013
WA# 12209

SHEET NO. D508

LEVELS DISPLAYED ACC:

FILE: D508-6FT-MULTIPLE BOX-CULVERTS-L_12209.dwg
TIME: 13:11

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					
													Bar C		Bar D																																Per foot of Barrel		Curb		Total	
	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

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Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).

LEVELS DISPLAYED
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HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation
Bridge Division

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

MC-6-16

FILE: mc616ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 10-12: Added WWR	COUNTY	CONTROL	SECT	JOB	HIGHWAY

PREPARED BY:
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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

ROCKWALL TECHNOLOGY PARK PHASE IV

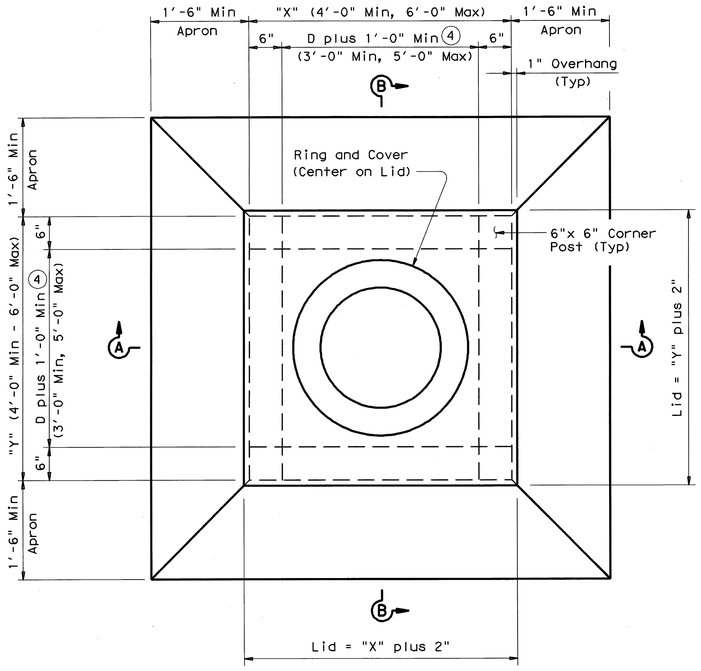
TXDOT MULTIPLE BOX CULVERTS (MC-6-16)

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

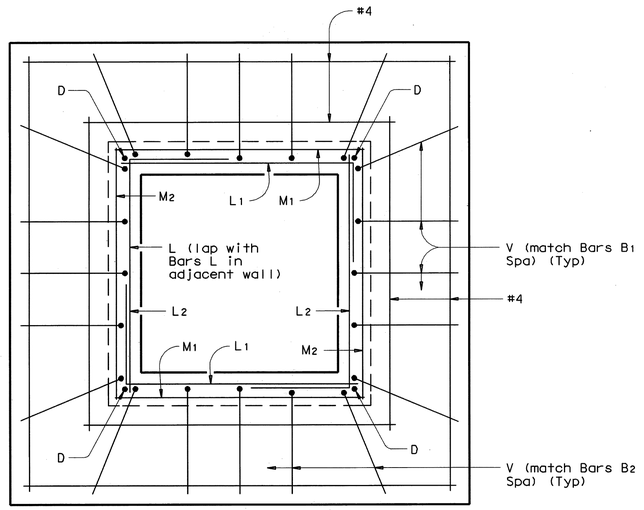
LAST SHEET EDIT DATE 09-23-2013
WA# 12209

SHEET NO. D509

TIME: 13:11 FILE: D509-6FT-MULTIPLE BOX-CULVERTS-2_12209.dwg

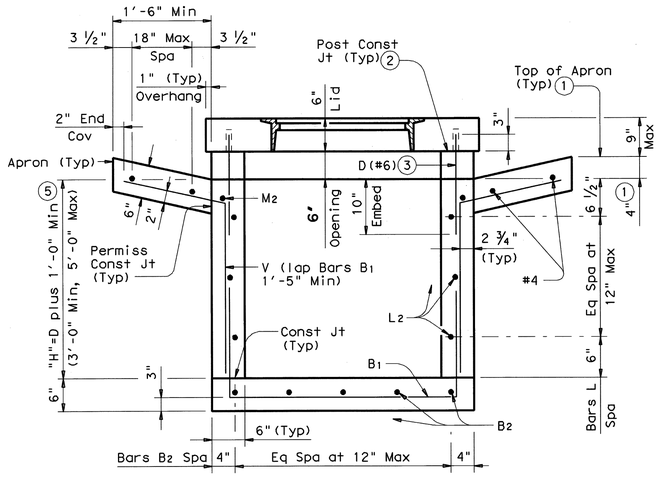


PLAN

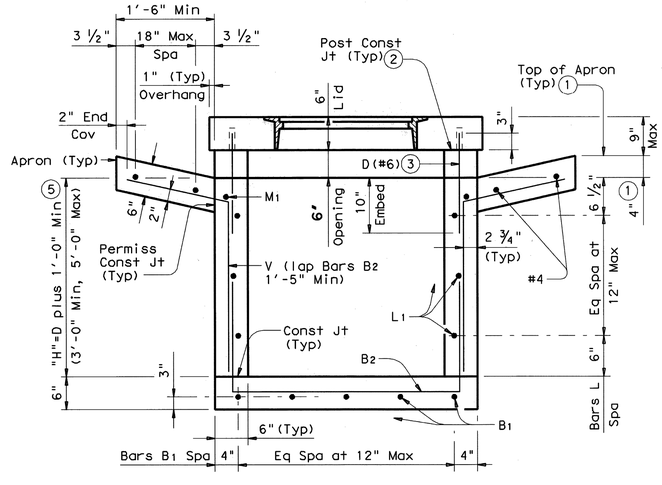


TYPICAL APRON PLAN

(Lid not shown for clarity. Showing reinforcing in walls and in apron.)



SECTION A-A



SECTION B-B

(1) May be changed as directed by the Engineer.

(2) Place layer of grout between lid and corner posts to provide stable seating of lid.

(3) Center Dowels D in corner posts. (Typ)

(4) D equals the maximum inside diameter of any pipe entering the wall shown or the opposite wall.

(5) D equals the maximum inside diameter of any pipe entering the inlet.

RECORD DRAWING 02/02/2015

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.

SHEET 1 OF 2

Texas Department of Transportation
Bridge Division

HORIZONTAL INLET TYPE H WITH LID (MAX 48" DIA PIPES)

IL-H-L

FILE: ilhste02.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
	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.

LEVELS DISPLAYED
PATH:

TIME: 10:22 FILE: D510-TYPE H INLET-L_I2209.dwg

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

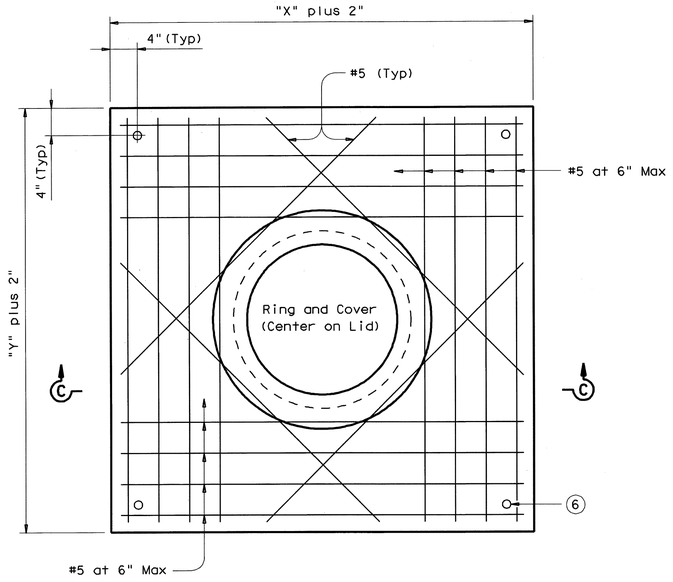
ROCKWALL TECHNOLOGY PARK PHASE IV

TXDOT HORIZONTAL INLET (IL-H-L)

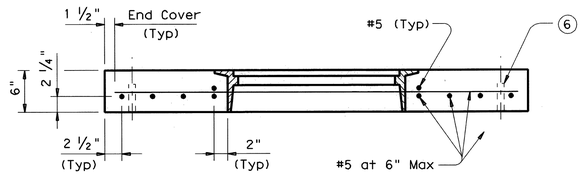
STATE OF TEXAS DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 09-26-2013
WA# I2209

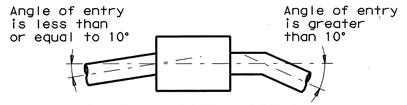
SHEET NO. D510



TYPICAL PRECAST LID PLAN

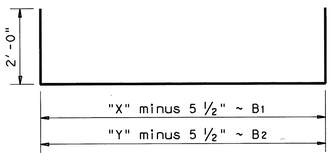


SECTION C-C

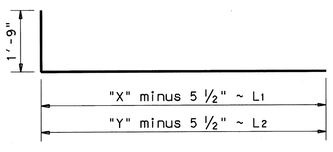


PIPE CONNECTION DETAIL

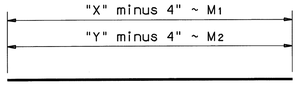
Connecting pipes should enter within 10° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.



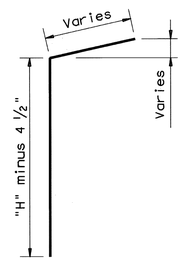
BARS B (#4)



BARS L (#4)

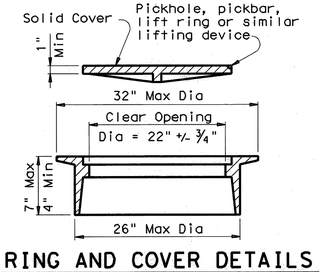


BARS M (#4)



BARS V (#4)

⑥ Form holes in lid for Dowels D using 1" Dia x 4" PVC Pipe (SCH 40) (Typ)



RING AND COVER DETAILS

Approximate Weight = 245 lb

GENERAL NOTES:

When approved, precast inlets with equivalent structural capacity may be furnished. Sealed engineering calculations and drawings shall be submitted for approval prior to construction.

Shop drawings will not be required.

Apron will be cast-in-place.

Lid will be precast.

In areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

Structural Steel for grates shall conform to the requirements of ASTM Designation A-36 or AISI Designation M1010-M1020.

All reinforcing steel shall be Grade 60 unless otherwise noted.

All concrete shall be Class "A" (f'c = 3,000 psi).

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

Inlet is to used in ditches and medians away from the roadway.

RECORD DRAWING 02/02/2015

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.

LEVELS DISPLAYED
PATH:

SHEET 2 OF 2

Texas Department of Transportation
Bridge Division

HORIZONTAL INLET TYPE H WITH LID (MAX 48" DIA PIPES)

IL-H-L

FILE: ilhste02.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
	COUNTY	CONTROL	SECT	JOB	HIGHWAY

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

ROCKWALL TECHNOLOGY PARK PHASE IV

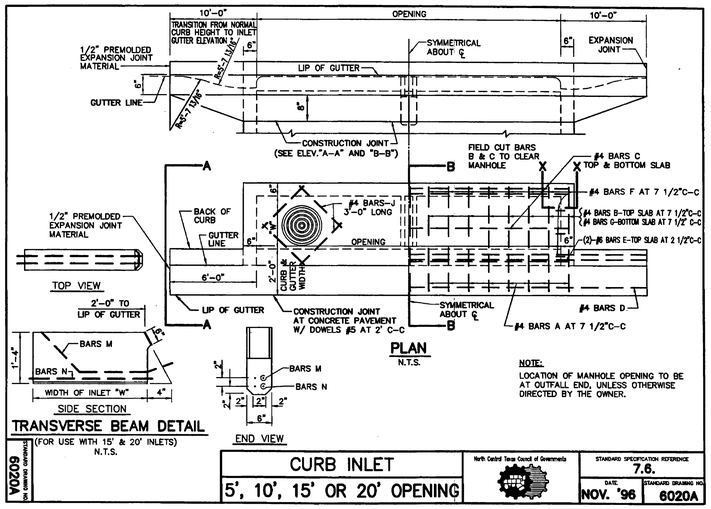
TXDOT HORIZONTAL INLET (IL-H-L)

LICENSED DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

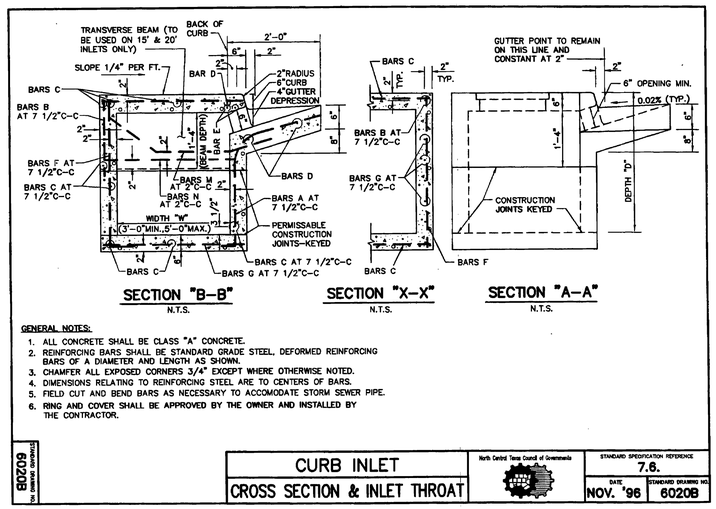
LAST SHEET EDIT DATE 09-26-2013
WA# 12209

SHEET NO. D511

FILE: D511-TYPE H INLET-2_12209.dwg
TIME: 10:25



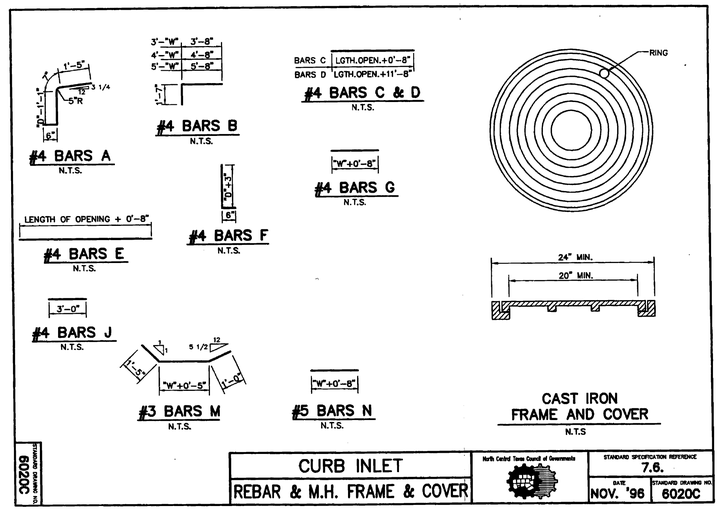
6020A	CURB INLET	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 7.6.	
	5', 10', 15' OR 20' OPENING		DATE NOV. '96	STANDARD DRAWING NO. 6020A



GENERAL NOTES:

1. ALL CONCRETE SHALL BE CLASS "A" CONCRETE.
2. REINFORCING BARS SHALL BE STANDARD GRADE STEEL, DEFORMED REINFORCING BARS OF A DIAMETER AND LENGTH AS SHOWN.
3. CHAMFER ALL EXPOSED CORNERS 3/4" EXCEPT WHERE OTHERWISE NOTED.
4. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTERS OF BARS.
5. FIELD CUT AND BEND BARS AS NECESSARY TO ACCOMODATE STORM SEWER PIPE.
6. RING AND COVER SHALL BE APPROVED BY THE OWNER AND INSTALLED BY THE CONTRACTOR.

6020B	CURB INLET	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 7.6.	
	CROSS SECTION & INLET THROAT		DATE NOV. '96	STANDARD DRAWING NO. 6020B



6020C	CURB INLET	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 7.6.	
	REBAR & M.H. FRAME & COVER		DATE NOV. '96	STANDARD DRAWING NO. 6020C

BILL OF REINFORCING STEEL

DEPTH "D"	ALL WIDTHS AND LENGTHS	OPENING LENGTH "L" = 5ft Widths "W" 3ft	4ft	5ft						OPENING LENGTH "L" = 10ft Widths "W" 3ft	4ft	5ft						OPENING LENGTH "L" = 15 ft Widths "W" 3ft	4ft	5ft						OPENING LENGTH "L" = 20 ft Widths "W" 3ft	4ft	5ft					
	BARS C	BARS D	BARS E	BARS J	BARS F	BARS F	BARS A	BARS B	BARS G	BARS C	BARS D	BARS E	BARS J	BARS F	BARS F	BARS A	BARS B	BARS G	BARS C	BARS D	BARS E	BARS J	BARS F	BARS F	BARS A	BARS B	BARS G	BARS C	BARS D	BARS E	BARS J	BARS F	BARS F	BARS A	BARS B	BARS G	BARS C	BARS M	BARS N
3'-6"	17	3	2	4	20	24	28	10	10	20	28	32	36	18	18	28	36	40	44	26	26	36	2	2	44	48	52	34	34	44	2	2							
3'-9"	18	*	*	*	*	*	*	*	*	20	*	*	*	*	*	28	*	*	*	*	*	36	*	*	*	*	*	*	*	44	*	*							
4'-0"	19	*	*	*	*	*	*	*	*	24	*	*	*	*	*	32	*	*	*	*	*	40	*	*	*	*	*	*	*	48	*	*							
4'-3"	19	*	*	*	*	*	*	*	*	24	*	*	*	*	*	32	*	*	*	*	*	40	*	*	*	*	*	*	*	48	*	*							
4'-6"	21	*	*	*	*	*	*	*	*	26	*	*	*	*	*	34	*	*	*	*	*	42	*	*	*	*	*	*	*	50	*	*							
4'-9"	21	*	*	*	*	*	*	*	*	26	*	*	*	*	*	34	*	*	*	*	*	42	*	*	*	*	*	*	*	50	*	*							
5'-0"	21	*	*	*	*	*	*	*	*	26	*	*	*	*	*	34	*	*	*	*	*	42	*	*	*	*	*	*	*	50	*	*							
5'-3"	23	*	*	*	*	*	*	*	*	28	*	*	*	*	*	36	*	*	*	*	*	44	*	*	*	*	*	*	*	52	*	*							
5'-6"	23	*	*	*	*	*	*	*	*	28	*	*	*	*	*	36	*	*	*	*	*	44	*	*	*	*	*	*	*	52	*	*							
5'-9"	25	*	*	*	*	*	*	*	*	30	*	*	*	*	*	38	*	*	*	*	*	46	*	*	*	*	*	*	*	54	*	*							
6'-0"	25	*	*	*	*	*	*	*	*	30	*	*	*	*	*	38	*	*	*	*	*	46	*	*	*	*	*	*	*	54	*	*							
6'-3"	26	*	*	*	*	*	*	*	*	30	*	*	*	*	*	38	*	*	*	*	*	46	*	*	*	*	*	*	*	54	*	*							
6'-6"	27	*	*	*	*	*	*	*	*	32	*	*	*	*	*	40	*	*	*	*	*	48	*	*	*	*	*	*	*	56	*	*							
6'-9"	27	*	*	*	*	*	*	*	*	32	*	*	*	*	*	40	*	*	*	*	*	48	*	*	*	*	*	*	*	56	*	*							
7'-0"	29	*	*	*	*	*	*	*	*	34	*	*	*	*	*	42	*	*	*	*	*	50	*	*	*	*	*	*	*	58	*	*							
7'-3"	29	*	*	*	*	*	*	*	*	34	*	*	*	*	*	42	*	*	*	*	*	50	*	*	*	*	*	*	*	58	*	*							
7'-6"	30	*	*	*	*	*	*	*	*	34	*	*	*	*	*	42	*	*	*	*	*	50	*	*	*	*	*	*	*	58	*	*							
7'-9"	31	*	*	*	*	*	*	*	*	36	*	*	*	*	*	44	*	*	*	*	*	52	*	*	*	*	*	*	*	60	*	*							
8'-0"	31	*	*	*	*	*	*	*	*	36	*	*	*	*	*	44	*	*	*	*	*	52	*	*	*	*	*	*	*	60	*	*							
8'-3"	32	*	*	*	*	*	*	*	*	36	*	*	*	*	*	44	*	*	*	*	*	52	*	*	*	*	*	*	*	60	*	*							
8'-6"	33	*	*	*	*	*	*	*	*	38	*	*	*	*	*	46	*	*	*	*	*	54	*	*	*	*	*	*	*	62	*	*							
8'-9"	34	*	*	*	*	*	*	*	*	38	*	*	*	*	*	46	*	*	*	*	*	54	*	*	*	*	*	*	*	62	*	*							
9'-0"	35	*	*	*	*	*	*	*	*	40	*	*	*	*	*	48	*	*	*	*	*	56	*	*	*	*	*	*	*	64	*	*							
9'-3"	36	*	*	*	*	*	*	*	*	40	*	*	*	*	*	48	*	*	*	*	*	56	*	*	*	*	*	*	*	64	*	*							
9'-6"	37	*	*	*	*	*	*	*	*	42	*	*	*	*	*	50	*	*	*	*	*	58	*	*	*	*	*	*	*	66	*	*							
10'-0"	38	*	*	*	*	*	*	*	*	42	*	*	*	*	*	50	*	*	*	*	*	58	*	*	*	*	*	*	*	66	*	*							

NOTE:
FOR CONVENIENCE, DEPTHS OF INLETS SHOWN IN ABOVE TABLES ARE IN INCREMENTS OF 3 INCHES BUT ANY DEPTHS OTHER THAN THOSE SHOWN ABOVE MAY BE USED WHEREVER DEEMED NECESSARY. QUANTITIES FOR OTHER DEPTHS FALLING WITHIN THE LIMITS OF THE TABLE MAY BE FOUND BY INTERPOLATION.

6020D	CURB INLET	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 7.6.	
	BILL OF REINFORCING STEEL		DATE NOV. '96	STANDARD DRAWING NO. 6020D

SUMMARY OF QUANTITIES FOR CURB INLETS

DEPTH "D"	5'-0" OPENING						10'-0" OPENING						15'-0" OPENING						20'-0" OPENING					
	WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"		WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"		WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"		WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"	
	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.
3'-6"	2.62	306	2.95	332	3.28	373	4.12	479	4.64	521	5.20	564	5.69	667	6.40	721	7.10	775	7.20	846	8.11	909	9.03	976
3'-9"	2.70	309	3.04	341	3.39	373	4.25	494	4.78	536	5.34	579	5.87	687	6.58	741	7.30	796	7.42	874	8.34	937	9.27	1010
4'-0"	2.78	328	3.14	364	3.49	399	4.38	518	4.92	565	5.49	610	6.05	718	6.77	776	7.49	835	7.64	909	8.58	976	9.51	1046
4'-3"	2.87	334	3.23	370	3.59	406	4.51	526	5.06	573	5.64	619	6.22	729	6.95	787	7.69	847	7.87	922	8.81	990	9.75	1061
4'-6"	2.95	356	3.32	394	3.69	431	4.64	558	5.20	607	5.79	656	6.40	770	7.14	830	7.88	891	8.09	973	9.04	1043	9.99	1115
4'-9"	3.03	361	3.41	410	3.79	438	4.77	566	5.34	616	5.94	665	6.57	780	7.32	841	8.07	903	8.31	986	9.27	1056	10.23	1129
5'-0"	3.12	367	3.51	416	3.90	445	4.90	574	5.47	624	6.09	674	6.75	791	7.51	853	8.27	915	8.53	999	9.50	1070	10.47	1144
5'-3"	3.20	383	3.60	424	4.00	465	5.03	600	5.61	652	6.23	704	6.93	827	7.69	890	8.46	955	8.76	1044	9.73	1118	10.71	1194
5'-6"	3.28	389	3.69	430	4.10	472	5.16	608	5.75	661	6.38	713	7.11	837	7.88	901	8.66	967	8.98	1057	9.97	1131	10.95	1208
5'-9"	3.37	405	3.78	451	4.20	495	5.29	635	5.89	690	6.53	744	7.28	874	8.07	940	8.85	1007	9.20	1102	10.20	1178	11.19	1258
6'-0"	3.45	415	3.88	460	4.30	504	5.42	646	6.03	702	6.68	757	7.45	888	8.25	954	9.05	1022	9.42	1119	10.43	1196	11.43	1276
6'-3"	3.53	425	3.97	470	4.41	515	5.55	661	6.17	718	6.83	773	7.63	908	8.44	975	9.24	1044	9.64	1147	10.66	1223	11.67	1305
6'-6"	3.62	437	4.06	488	4.51	532	5.68	681	6.31	739	6.97	797	7.81	935	8.62	1005	9.43	1057	9.87	1178	10.89	1258	11.92	1340
6'-9"	3.70	441	4.15	490	4.61	537	5.81	688	6.45	747	7.12	806	7.98	945	8.81	1015	9.63	1066	10.09	1191	11.12	1272	12.15	1355
7'-0"	3.78	460	4.25	510	4.71	560	5.94	716	6.59	777	7.27	837	8.16	981	8.99	1053	9.82	1126	10.31	1237	11.35	1319	12.40	1404
7'-3"	3.86	465	4.34	516	4.81	567	6.07	724	6.72	785	7.42	846	8.33	992	9.18	1065	10.02	1138	10.53	1249	11.59	1333	12.64	1418
7'-6"	3.95	477	4.43	529	4.91	570	6.20	742	6.86	804	7.57	866	8.51	1016	9.36	1089	10.21	1163	10.75	1290	11.82	1365	12.88	1451
7'-9"	4.03	491	4.53	544	5.02	597	6.33	782	7.00	826	7.71	890	8.67	1040	9.55	1116	10.41	1193	10.98	1313	12.05	1399	13.12	1498
8'-0"	4.12	496	4.62	550	5.12	604	6.46	770	7.14	834	7.86	899	8.86	1051	9.73	1129	10.60	1205	11.20	1325	12.28	1412	13.36	1510
8'-3"	4.20	504	4.71	559	5.22	613	6.59	784	7.28	849	8.01	915	9.04	1069	9.92	1149	10.80	1228	11.42	1353	12.51	1440	13.60	1529
8'-6"	4.28	519	4.80	576	5.32	632	6.71	804	7.42	871	8.16	938	9.21	1107	10.10	1176	10.99	1257	11.64	1385	12.74	1474	13.84	1565
8'-9"	4.37	528	4.90	586	5.42	643	6.84	819	7.56	886	8.31	954	9.39	1119	10.29	1199	11.18	1280	11.87	1410	12.97	1500	14.08	1592
9'-0"	4.45	545	4.99	605	5.53	664	6.97	842	7.70	912	8.46	982	9.56	1148	10.47	1231	11.38	1313	12.09	1447	13.21	1539	14.32	1631
9'-3"	4.53	554	5.08	614	5.63	674	7.10	858	7.84	929	8.60	999	9.74	1169	10.66	1252	11.57	1335	12.31	1474	13.44	1563	14.56	1650
9'-6"	4.62	568	5.17	630	5.73	692	7.23	878	7.97	950	8.75	1022	9.92	1195	10.84	1280	11.77	1365	12.53	1505	13.67	1600	14.80	1696
10'-0"	4.78	582	5.36	645	5.93	708	7.49	900	8.11	974	9.05	1048	10.27	1227	11.21	1312	12.16	1399	12.98	1546	14.13	1642	15.29	1739

NOTE:
FOR CONVENIENCE, DEPTHS OF INLETS SHOWN IN ABOVE TABLES ARE IN INCREMENTS OF 3 INCHES BUT ANY DEPTHS OTHER THAN THOSE SHOWN ABOVE MAY BE USED WHEREVER DEEMED NECESSARY. QUANTITIES FOR OTHER DEPTHS FALLING WITHIN THE LIMITS OF THE TABLE MAY BE FOUND BY INTERPOLATION.

6020E	CURB INLET	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 7.6.	
	SUMMARY OF QUANTITIES		DATE NOV. '96	STANDARD DRAWING NO. 6020E

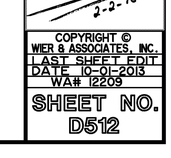
RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

CURB INLET DETAILS



LAST SHEET EDIT DATE 10-01-2013
WA# I2209

SHEET NO. D512

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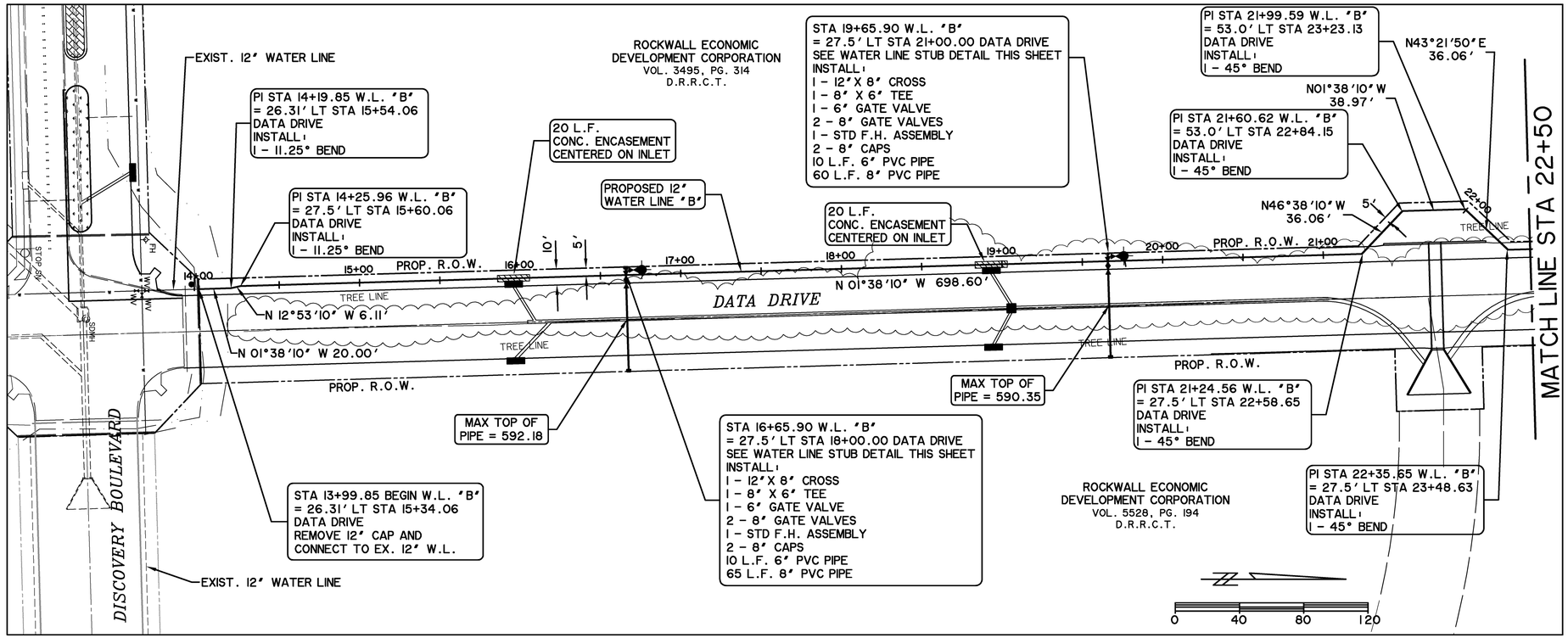

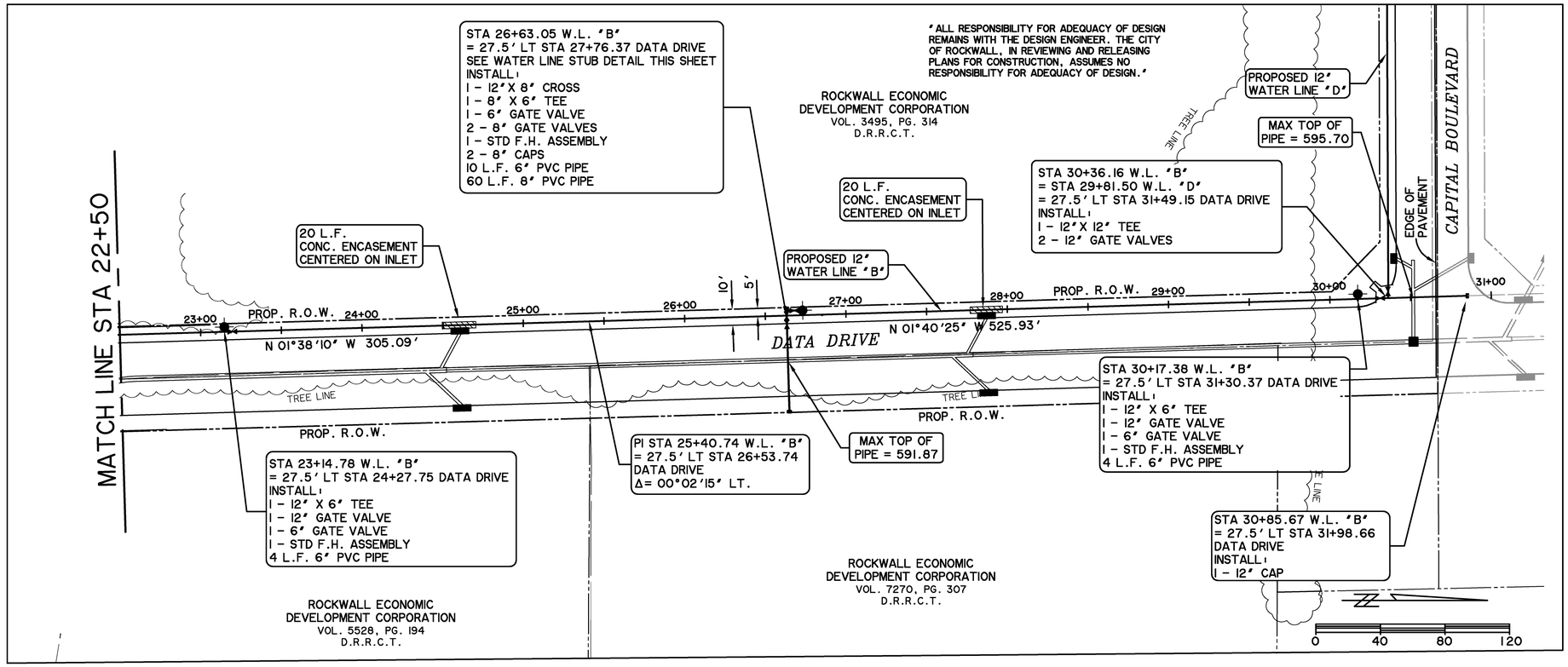

NOTES:

1. CONTRACTOR SHALL ADJUST LOCATION OF PROPOSED WATER LINES AS REQUIRED TO AVOID CONFLICTS WITH STORM SEWER OR OTHER UTILITIES.
2. ALL WATER LINES SHALL HAVE A MINIMUM COVER OF 48" MEASURED FROM TOP OF PIPE UNLESS A GREATER DEPTH IS REQUIRED BY CITY STANDARDS.
3. INSTALL FIRE HYDRANTS 8' FROM BACK OF CURB.

CAUTION 11

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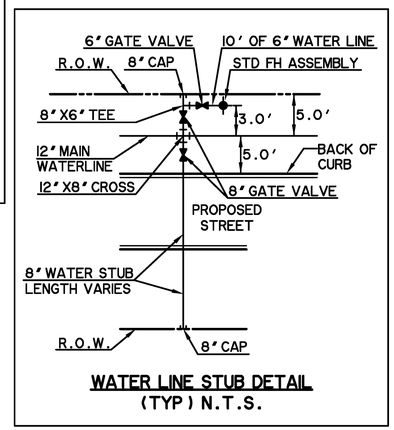

WATER LINE STUB DETAIL
(TYP) N.T.S.

*** BENCH MARKS ***

BM A AN "X" CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN "X" CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C - AN "□" CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

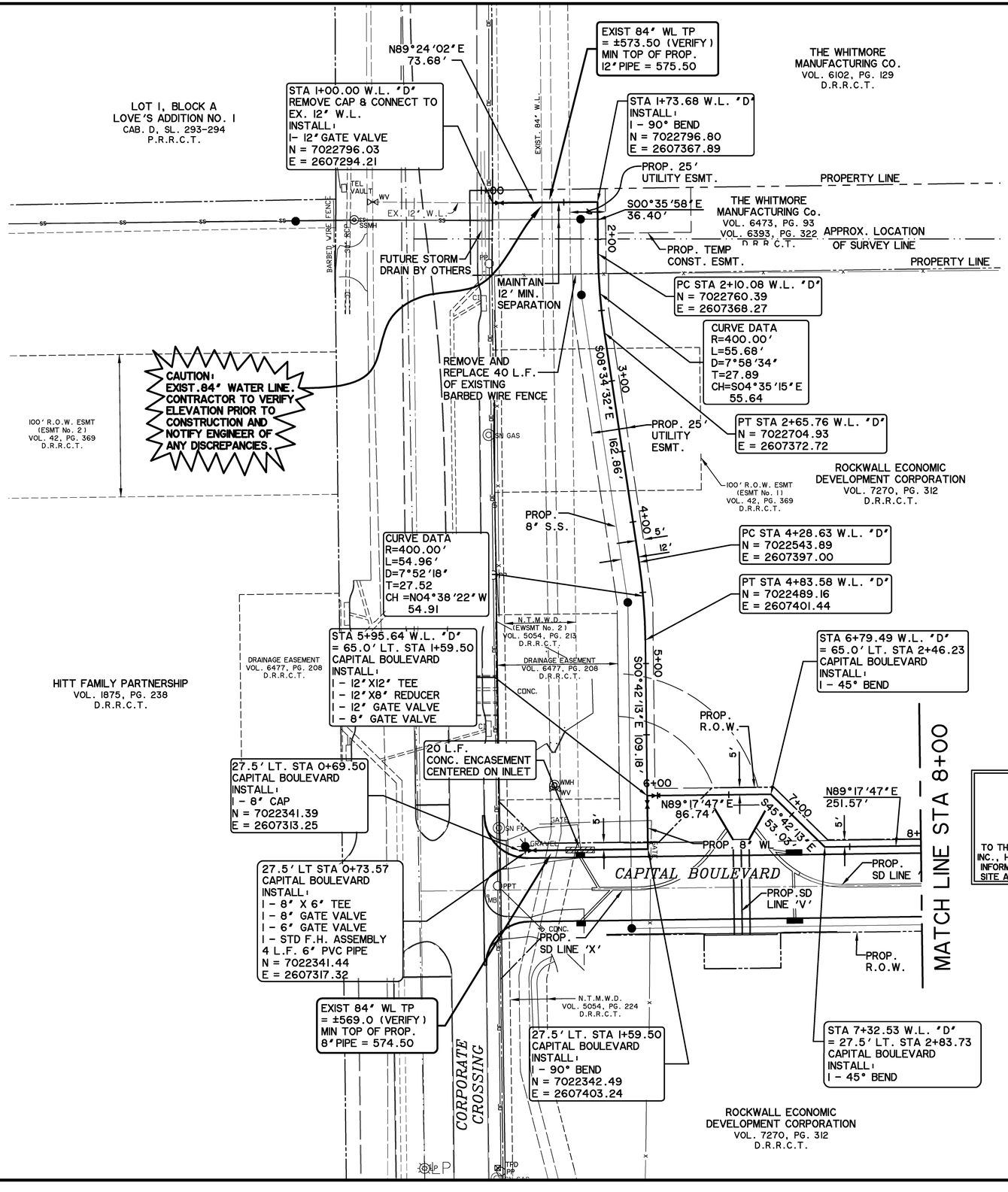
WATER LINE 'B' PLAN VIEW STA 13+99.85 TO END

STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED
PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT
DATE 10-15-2013
WA# 12209

SHEET NO.
U101

FILE: U101-WATER LINE B-12209.dwg
TIME: 11:51



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' ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN.'

NOTES:

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2. ALL WATER LINES SHALL HAVE A MINIMUM COVER OF 48" MEASURED FROM TOP OF PIPE UNLESS NOTED OTHERWISE OR A GREATER DEPTH IS REQUIRED BY CITY STANDARDS.
3. INSTALL FIRE HYDRANTS 8' FROM BACK OF CURB.

RECORD DRAWING
02/02/2015

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.

* BENCH MARKS *

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BM C - AN "□" CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

PREPARED BY:
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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

ROCKWALL TECHNOLOGY PARK PHASE IV

WATER LINE 'D' PLAN VIEW STA 0+00 TO STA 8+00

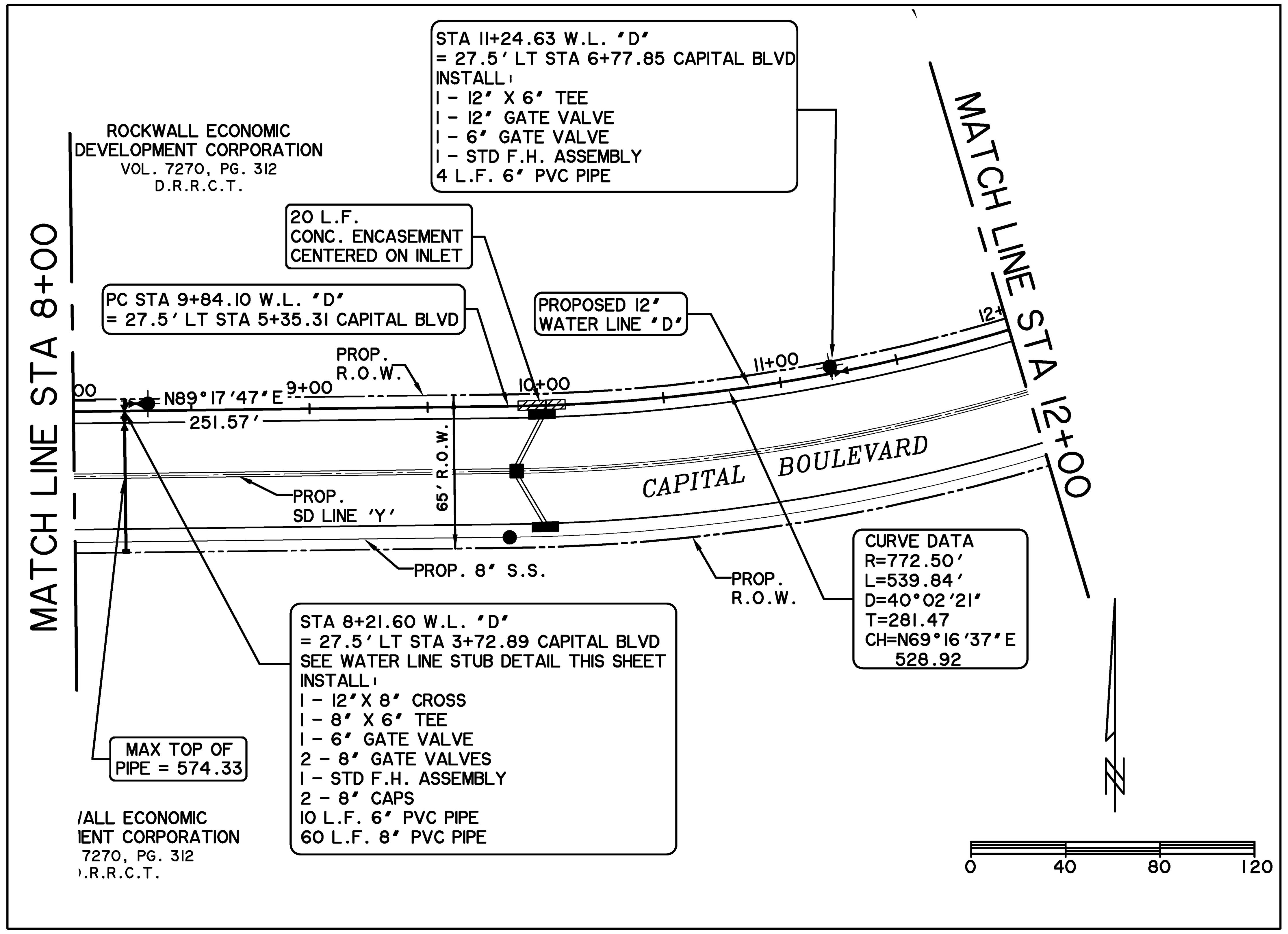
STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED
PROFESSIONAL ENGINEER
2-2-15

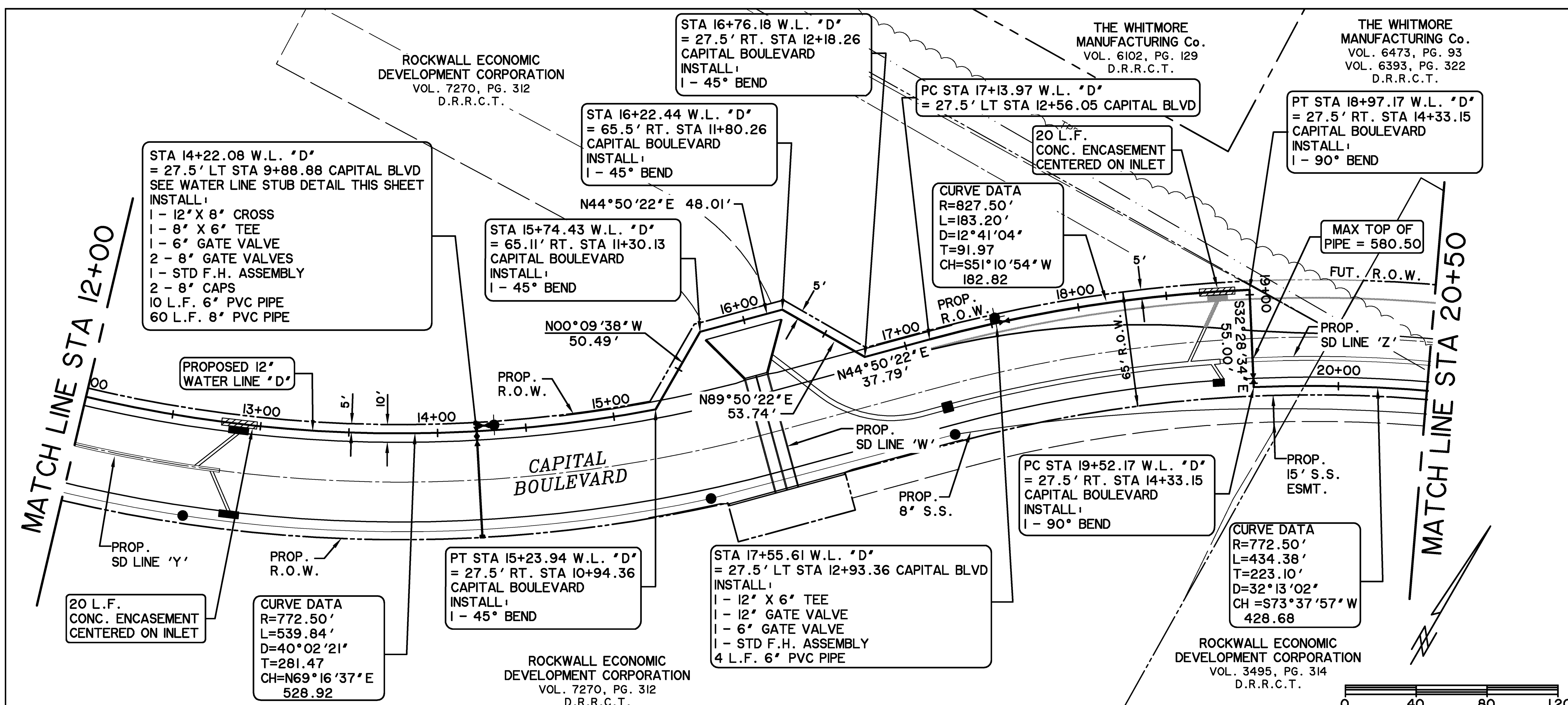
LAST SHEET EDIT DATE 10-30-2013
WA# 12209

SHEET NO. U102

TIME 16:49 FILE: U102-WATER LINE D-1-12209.dwg

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF DESIGN.





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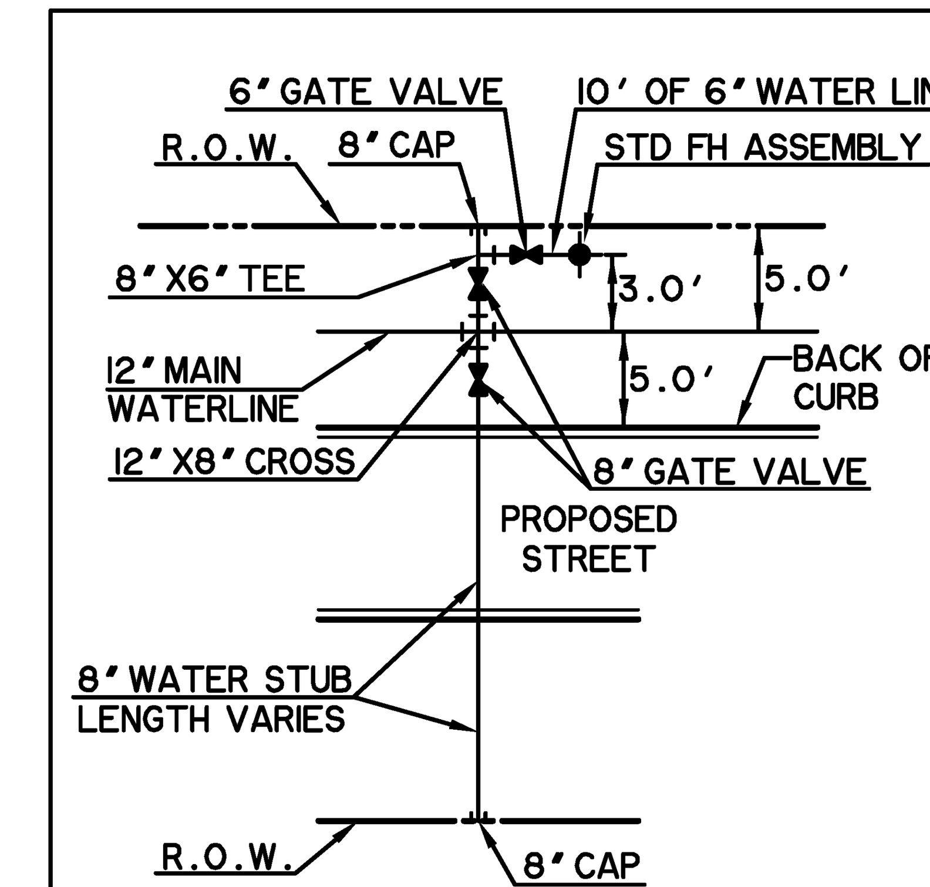
NOTES:

1. CONTRACTOR SHALL ADJUST LOCATION OF PROPOSED WATER LINES AS REQUIRED TO AVOID CONFLICTS WITH STORM SEWER OR OTHER UTILITIES.
2. ALL WATER LINES SHALL HAVE A MINIMUM COVER OF 48" MEASURED FROM TOP OF PIPE UNLESS A GREATER DEPTH IS REQUIRED BY CITY STANDARDS.
3. ON THE NORTH SIDE OF CAPITAL BOULEVARD, BETWEEN STA 13+50 & 15+50, THE WATER LINE SHALL BE INSTALLED AT A DEPTH THAT WILL PROVIDE AT LEAST 48" OF COVER BOTH NOW AND IN THE FUTURE WHEN THE NORTH SIDE OF CAPITAL BOULEVARD IS CONSTRUCTED. SEE TYPICAL SECTION ON SHEET P001 FOR CAPITAL BOULEVARD.
4. INSTALL FIRE HYDRANTS 8' FROM BACK OF CURB.



WATER LINE STUB DETAIL
(TYP) N.T.S.

• BENCH MARKS •

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RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

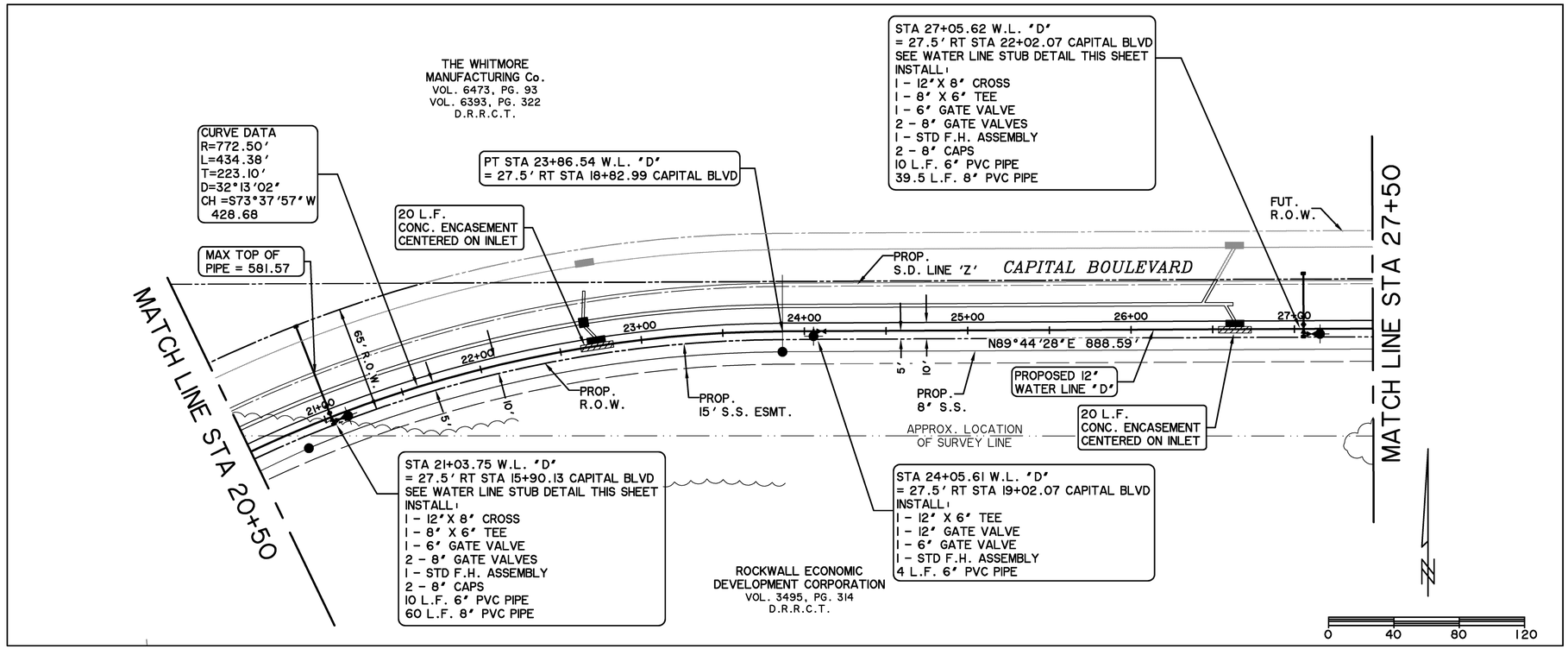
WATER LINE 'D' PLAN VIEW STA 8+00 TO STA 20+50

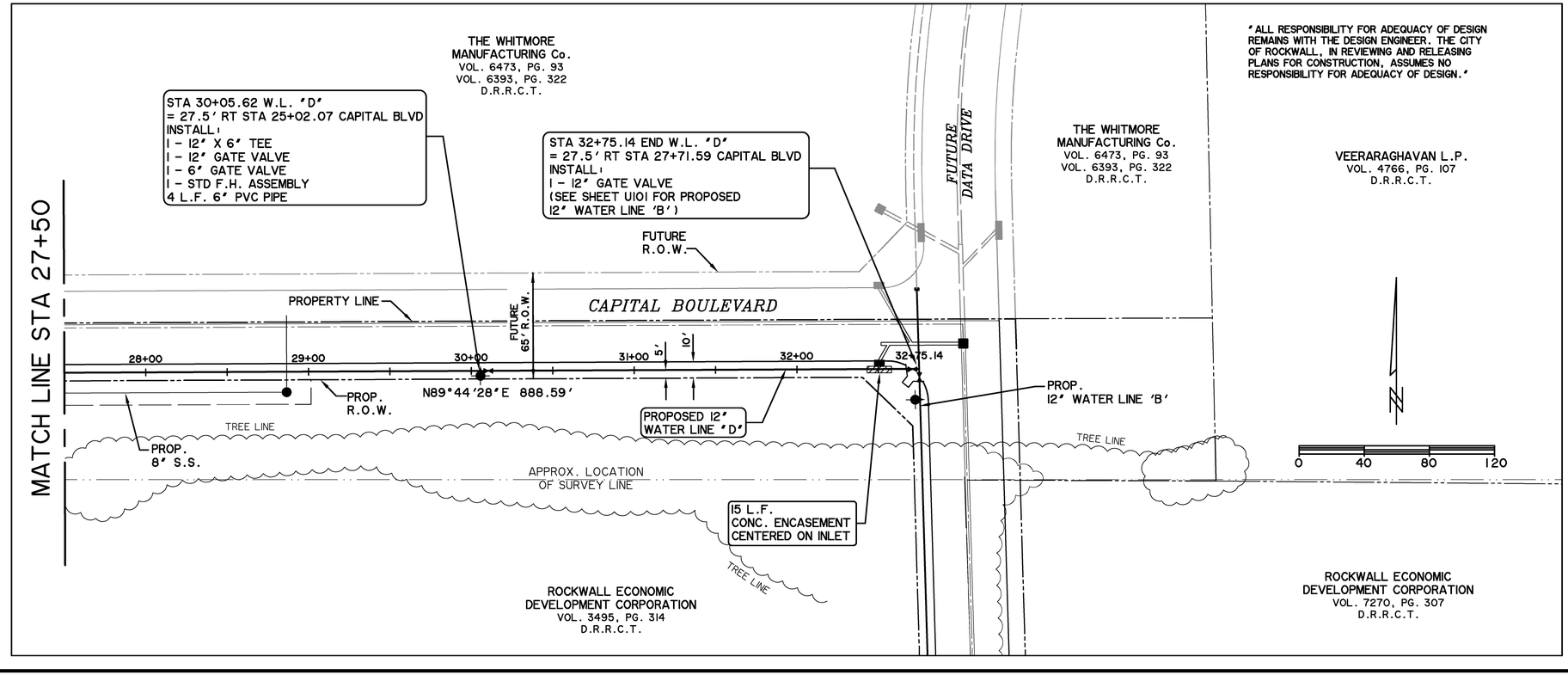
STATE OF TEXAS DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 10-02-2013
WA# 12209

SHEET NO. U103

FILE: U103-WATER LINE D-2-12209.dwg
TIME: 12:17





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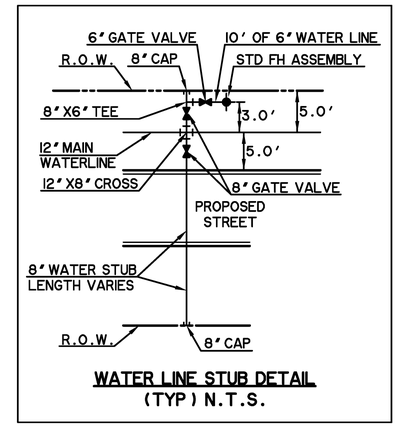
3. INSTALL FIRE HYDRANTS 8' FROM BACK OF CURB.



WATER LINE STUB DETAIL
(TYP) N.T.S.

* BENCH MARKS *

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RECORD DRAWING 02/02/2015

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PREPARED BY:
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ROCKWALL TECHNOLOGY PARK PHASE IV

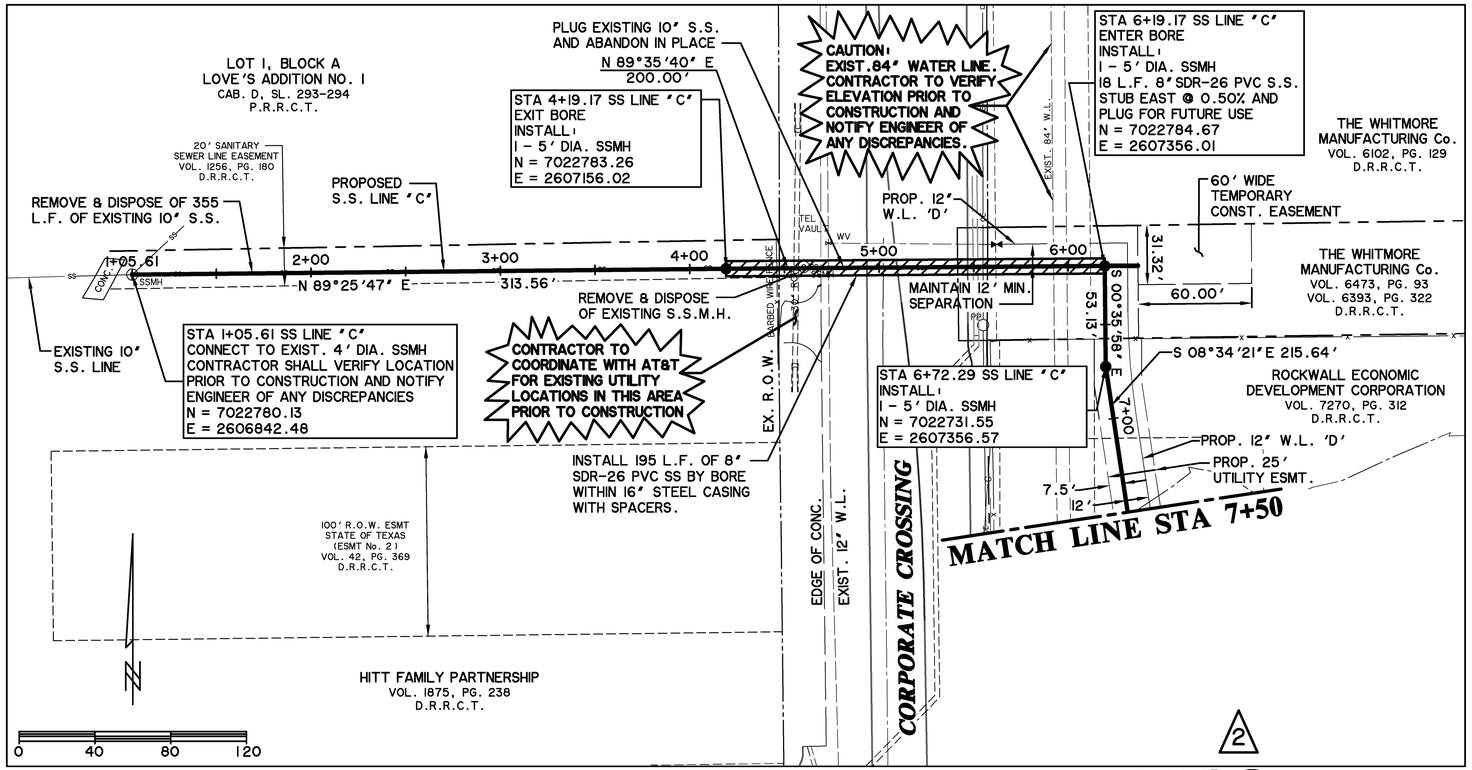
WATER LINE 'D' PLAN VIEW STA 20+50 TO END

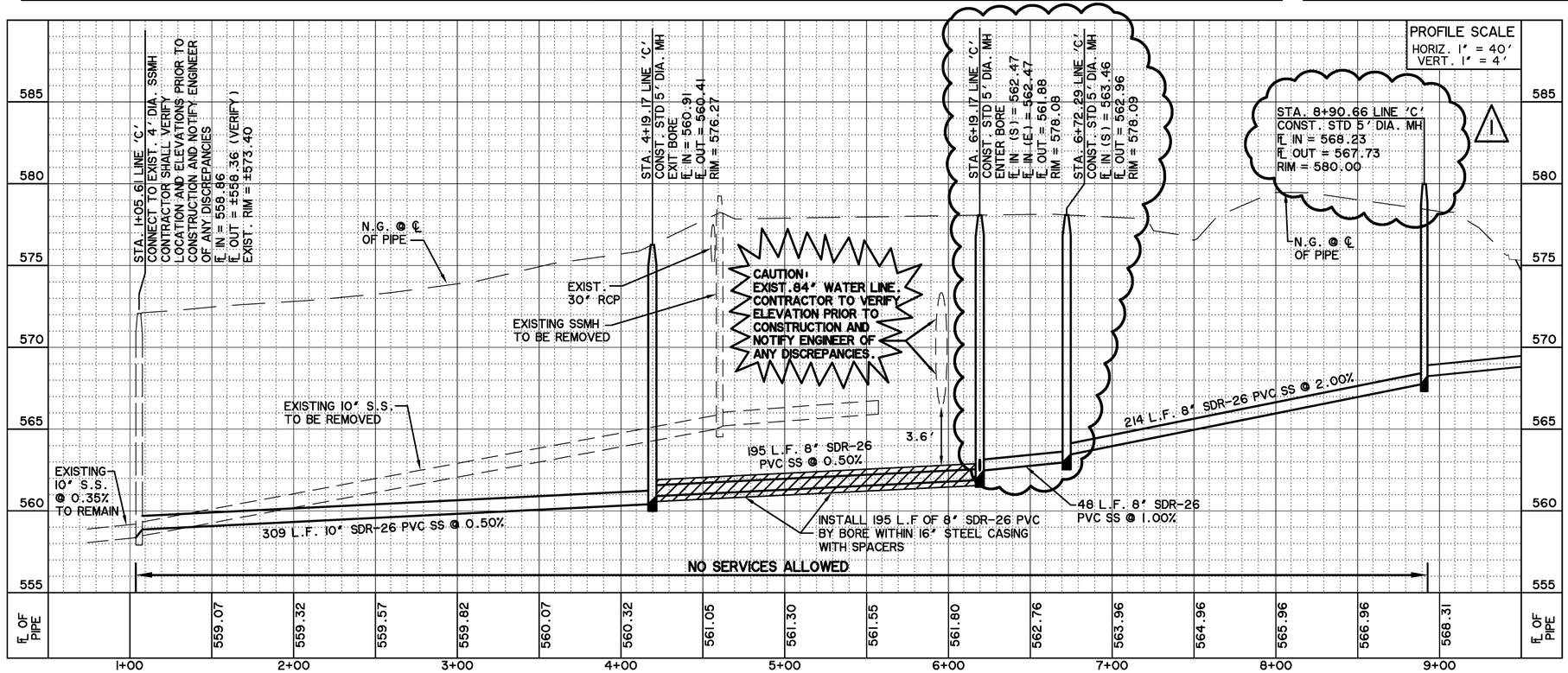
DARRELL J. BOSWORTH 11702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

LAST SHEET EDIT DATE 10-02-2013
WA# 12209

SHEET NO. U104

FILE: U104-WATER LINE D-3-12209.dwg
TIME: 12:30





REVISIONS

1 4/10/2014:
CHANGED S.S.M.H. RIM ELEVATION to 580.00

2 4/10/2014:
REMOVED ℄ FOR 8" STUB TO THE EAST AND ADDED TO S.S.M.H. @ STA 6+19.17

CAUTION 11

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RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

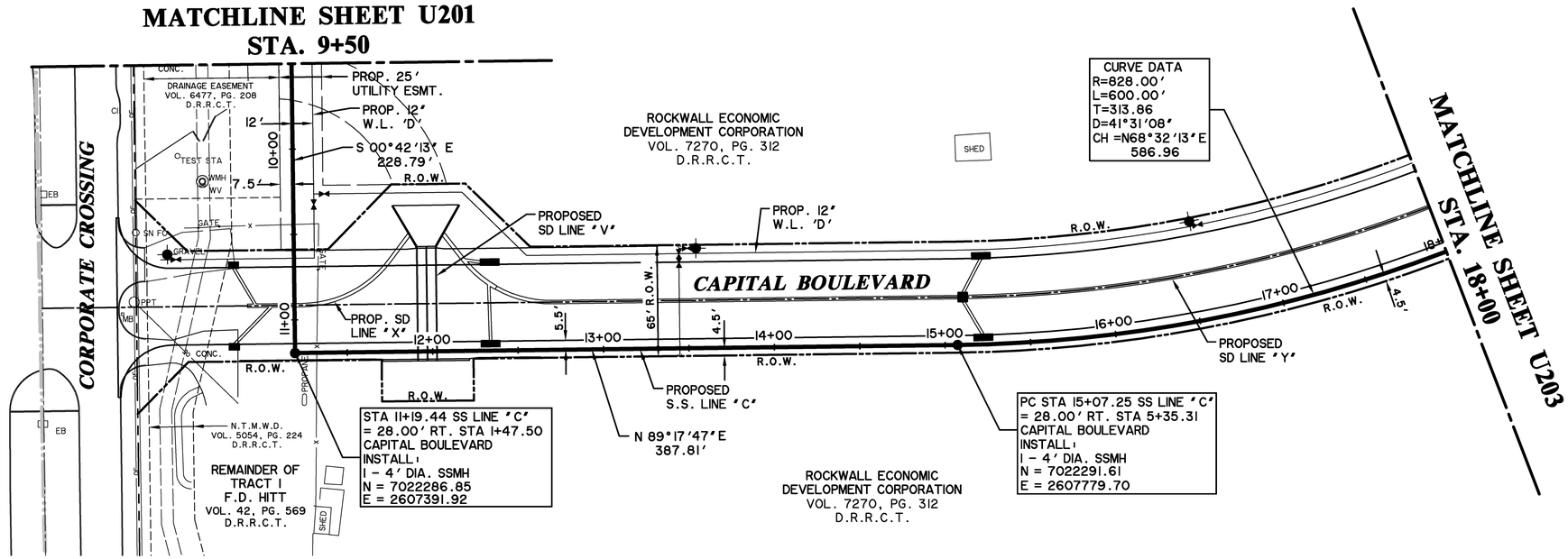
SANITARY SEWER LINE 'C' PLAN AND PROFILE STA 0+00 TO STA 9+50

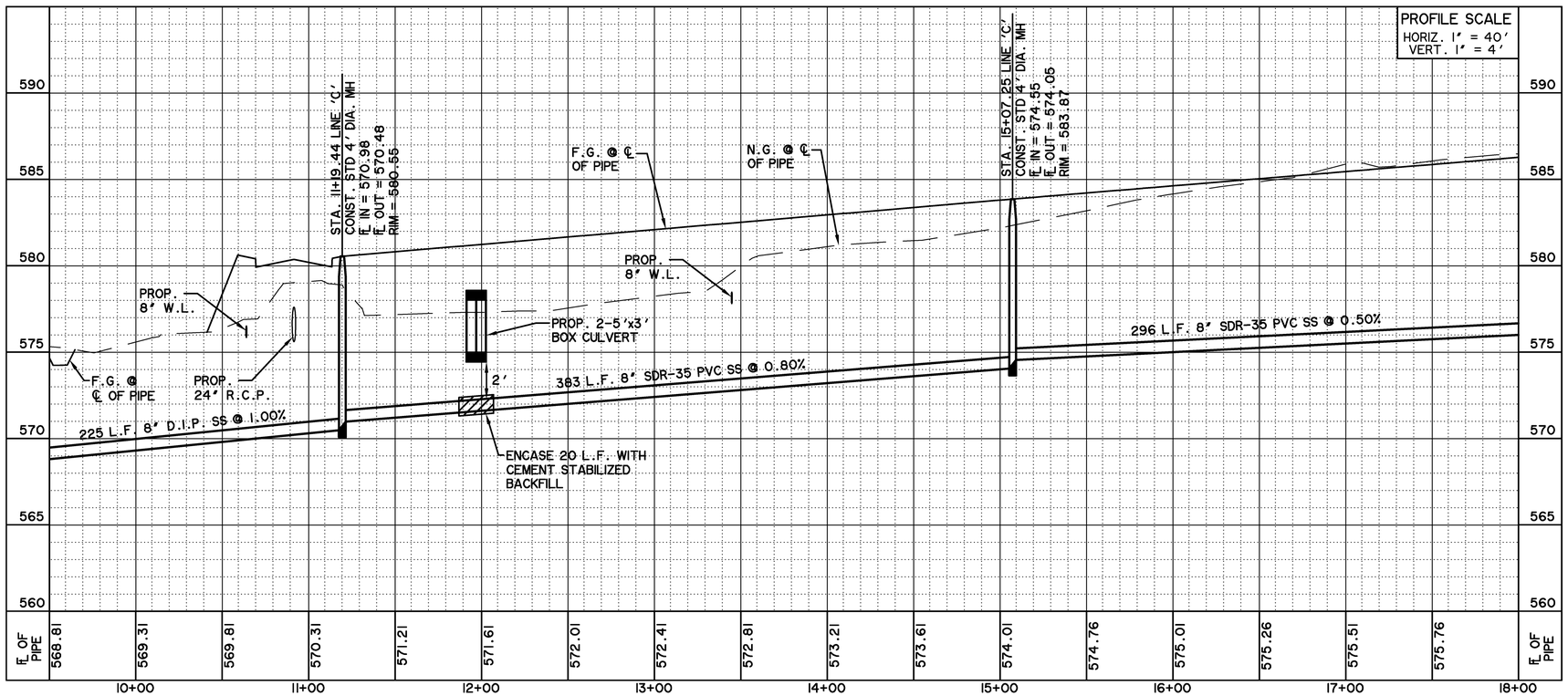
STATE OF TEXAS
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
2-2-15

LAST SHEET EDIT DATE 04-10-2014
WA# 12209

SHEET NO. U201

FILE: U201-SS PLAN PROFILE LINE C-1-12209_REV1.dwg
TIME: 13:25





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RECORD DRAWING 02/02/2015

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

ROCKWALL TECHNOLOGY PARK PHASE IV

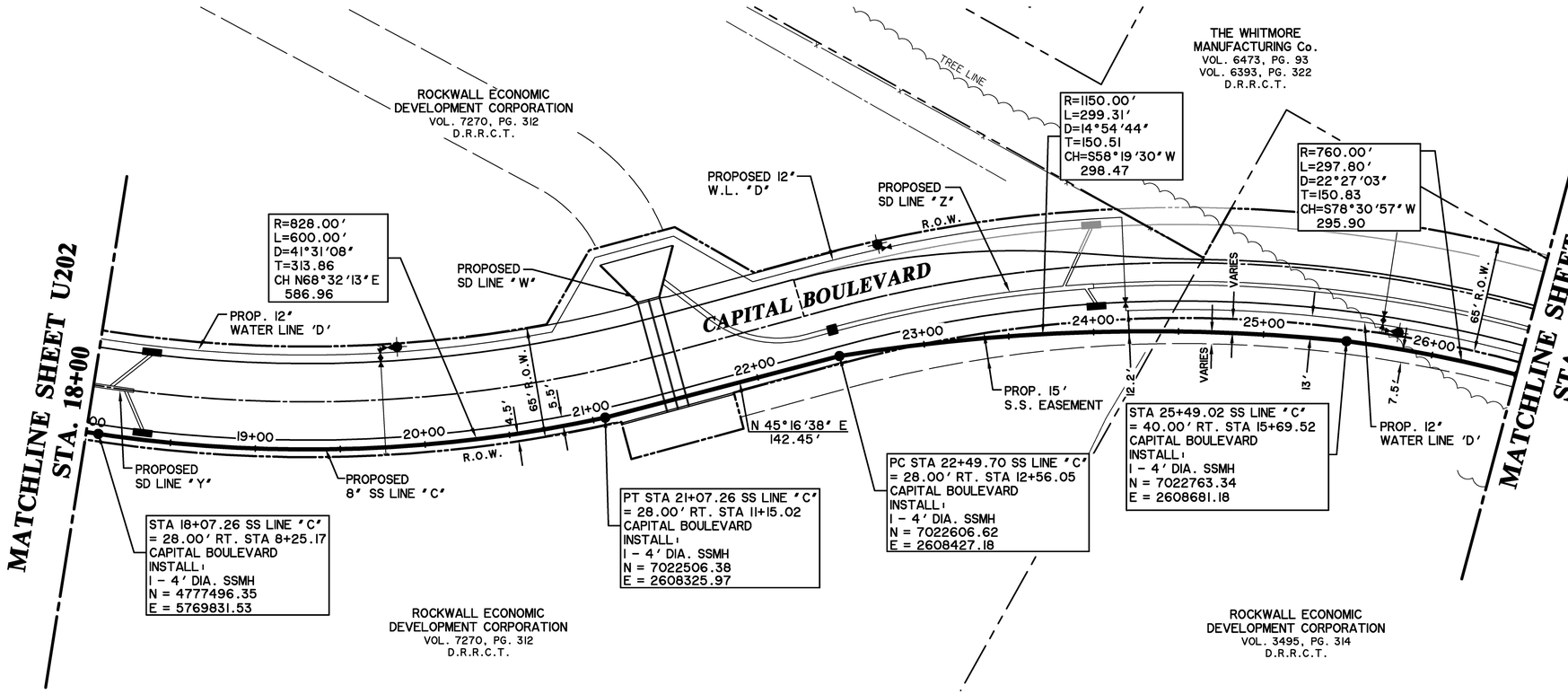
SANITARY SEWER LINE 'C' PLAN AND PROFILE STA 9+50 TO STA 18+00

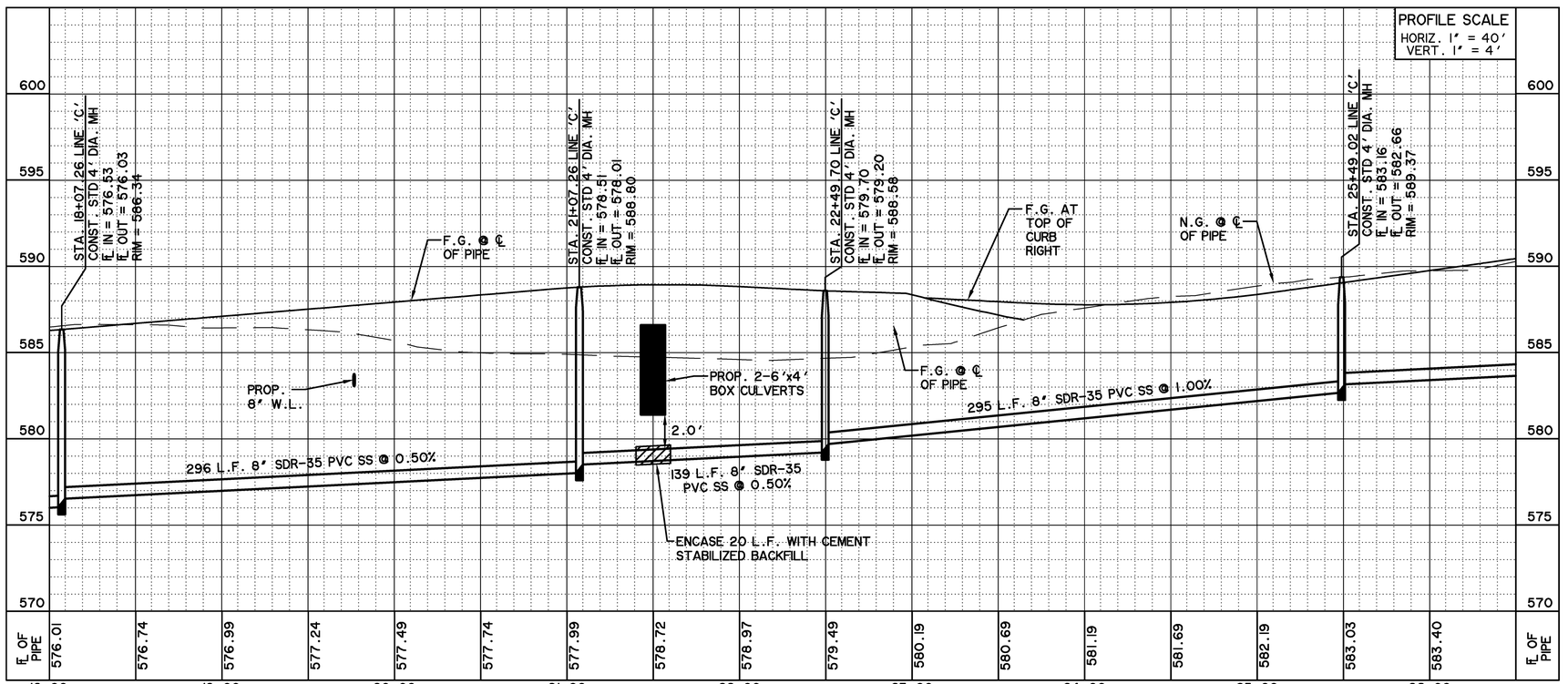
DARRELL J. BOSWORTH 112702 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 2-2-15

LAST SHEET EDIT DATE 10-02-2013
WA# 12209

SHEET NO. U202

FILE: U202-SS PLAN PROFILE LINE C-2-12209.dwg
TIME 14:04





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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

ROCKWALL TECHNOLOGY PARK PHASE IV

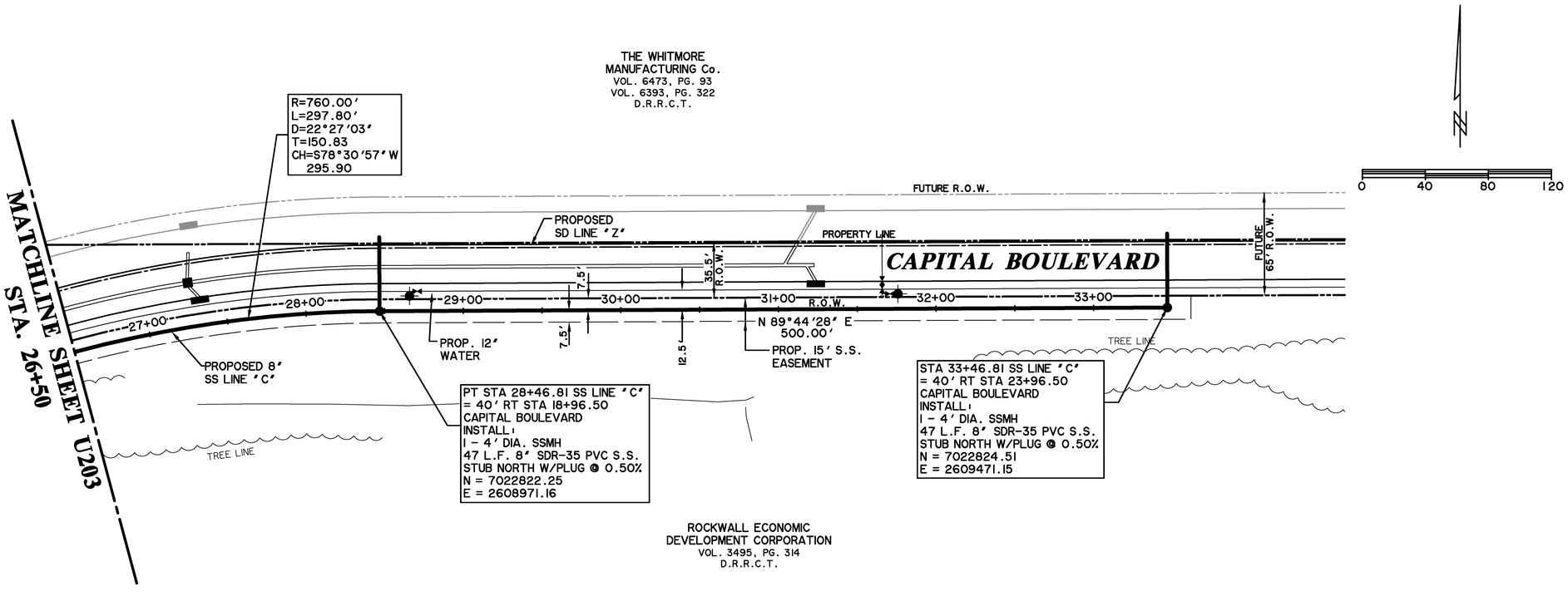
SANITARY SEWER LINE 'C' PLAN AND PROFILE STA 18+00 TO STA 26+50

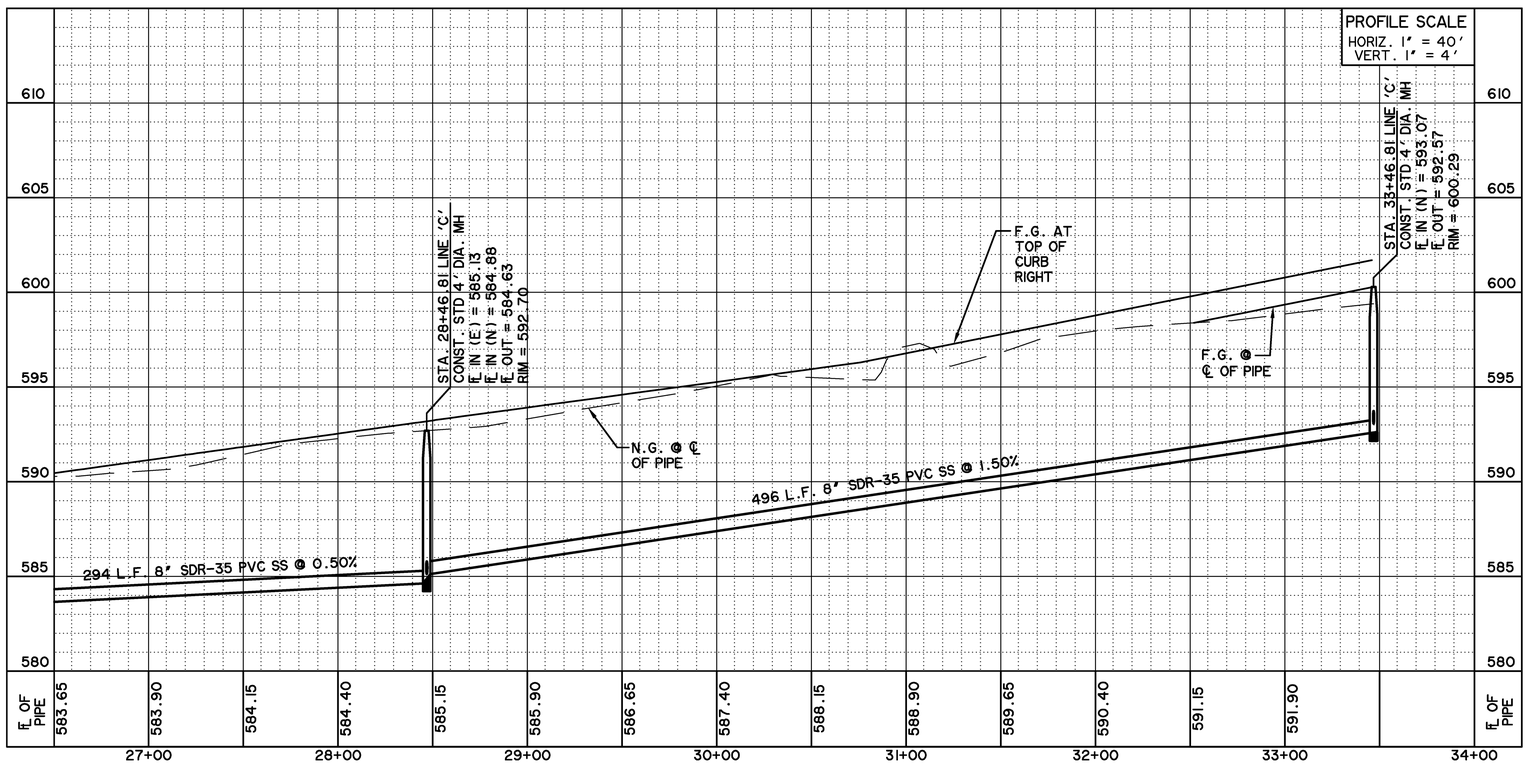
DARRELL J. BOSWORTH
112702
REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
2-2-15

LAST SHEET EDIT
DATE 10-02-2013
WA# 12209

SHEET NO.
U203

FILE: U203-SS PLAN PROFILE LINE C-3-12209.dwg
TIME: 14:08





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 '[X]' CUT IN THE BACK OF CURB LOCATED AT THE SOUTH RIGHT-OF-WAY LINE OF SPRINGER ROAD ±2470' EAST OF THE INTERSECTION OF SPRINGER ROAD AND F.M. 549. 598.80 FT.

BM B AN '[X]' CUT IN THE BACK OF CURB LOCATED AT THE NORTH RIGHT-OF-WAY LINE OF DISCOVERY BOULEVARD ±580' EAST OF THE INTERSECTION OF DICOVERY BOULEVARD AND F.M. 549. 599.82 FT.

BM C - AN '[ ]' CUT IN DISCOVERY BOULEVARD IN A MEDIAN NOSE ±60' WEST OF THE INTERSECTION OF DISCOVERY BOULEVARD AND F.M. 549. 598.20 FT.

RECORD DRAWING 02/02/2015

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
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ROCKWALL TECHNOLOGY PARK PHASE IV

SANITARY SEWER LINE 'C' PLAN AND PROFILE STA 26+50 TO END

DARRELL J. BOSWORTH 11702 REGISTERED PROFESSIONAL ENGINEER 2-2-15

LAST SHEET EDIT DATE 10-22-2013
WA# 12209

SHEET NO. U204

FILE: U204-SS PLAN PROFILE LINE C-4-12209.dwg
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