

Construction Plans
for

UNIVERSITY BOULEVARD 12-INCH FORCE MAIN (QUADRANGLE BOULEVARD TO ALAFAYA TRAIL) ORANGE COUNTY, FLORIDA

Prepared for

ORANGE COUNTY UTILITIES DEPARTMENT
ORANGE COUNTY, FLORIDA

BOARD OF COUNTY COMMISSIONERS

TERESA JACOBS
Mayor

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District 1

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County Administrator

RAYMOND E. HANSON, PE
Director, Utilities Department



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| UTILITY OWNER | UTILITIES CONTACTS | PHONE |
|----------------------------|--------------------|--------------|
| BRIGHT HOUSE NETWORKS | CABLE | 407-532-8509 |
| COMCAST COMMUNICATIONS | CABLE | 352-315-8528 |
| EMBARQ COMMUNICATIONS | COMMUNICATIONS | 407-920-8981 |
| FPL FIBERNET LLC | COMMUNICATIONS | 305-552-2931 |
| LEVEL 3 COMMUNICATIONS LLC | COMMUNICATIONS | 720-888-2061 |
| MCI | COMMUNICATIONS | 972-729-6016 |
| OCU | WATER/WASTEWATER | 407-836-2777 |
| PROGRESS ENERGY | ELECTRICITY | 800-700-8744 |
| TECO PEOPLES GAS | GAS | 407-420-6609 |
| TW TELECOM | COMMUNICATIONS | 407-215-6895 |

ISSUED FOR BID



REISS ENGINEERING, INC.
CONSULTING ENGINEERS

CERTIFICATE OF AUTHORIZATION No. 8181
1016 SPRING VILLAS PT.
WINTER SPRINGS, FLORIDA 32708
TEL: (407) 679-5358
FAX: (407) 679-5003

OCU SEQUENCE NUMBER: 69845
ORG/SUBORG NUMBERS 1510-35
ENG. CONTRACT NUMBER: Y11-902B

MELANIE D. PECKHAM, P.E.
FLA. REGISTRATION NUMBER: 66487

ENGINEER'S PROJECT No. 110007

GENERAL CONSTRUCTION NOTES

ALL WORK AND REQUIREMENTS FROM THE NOTES IN THIS PAGE SHALL BE A REQUIREMENT OF THE CONTRACT AND EXECUTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO ORANGE COUNTY.

- 1. ALL UTILITIES FACILITIES CONSTRUCTION CONNECTING TO THE ORANGE COUNTY UTILITIES SYSTEM SHALL CONFORM TO THE ORANGE COUNTY UTILITIES STANDARDS AND CONSTRUCTION SPECIFICATIONS MANUAL, AND BE ONE OF THE APPROVED PRODUCTS LISTED IN APPENDIX 'D' OF THE MANUAL.
2. COORDINATION AND COMMUNICATIONS WITH ORANGE COUNTY STAFF SHALL BE MADE THROUGH THE ORANGE COUNTY UTILITIES CONSTRUCTION DIVISION INSPECTOR. CONTACT THE OCU DISPATCH DURING EMERGENCIES.
3. THE ORANGE COUNTY UTILITIES CONSTRUCTION DIVISION SHALL BE NOTIFIED AT LEAST SEVEN (7) DAYS PRIOR TO ANY CONSTRUCTION ACTIVITY, OR PRIOR TO ANY ACTIVITY REQUIRING THE PRESENCE OF OR AN ACTION BY UTILITIES STAFF SUCH AS SCHEDULING VALVE OPERATION, PRESSURE TESTING, PIPE CONNECTION, PUMP STATION OPERATIONS OR SHUTDOWNS, ETC.
4. ORANGE COUNTY UTILITIES DEPARTMENT TELEPHONE NUMBERS:
ORANGE COUNTY UTILITIES DISPATCH 407-836-2777
ORANGE COUNTY UTILITIES CONSTRUCTION DIVISION 407-254-9798
ORANGE COUNTY UTILITIES FIELD SERVICES CENTER 407-836-6818
ORANGE COUNTY UTILITIES WATER DIVISION 407-836-6800
ORANGE COUNTY UTILITIES ENGINEERING DIVISION 407-254-9900
5. WATER, WASTEWATER AND RECLAIMED WATER VALVES, PUMP STATIONS OR OTHER UTILITY INFRASTRUCTURE ARE TO BE OPERATED ONLY BY ORANGE COUNTY UTILITIES PERSONNEL. ALL VALVES BEING INSTALLED ARE TO REMAIN CLOSED DURING CONSTRUCTION.
6. ALL EXISTING WATER MAIN, FORCE MAINS, GRAVITY PIPES AND OTHER UTILITY FACILITIES WITHIN THE LIMITS OF THE PROJECT SHALL BE SUPPORTED AND PROTECTED AGAINST DAMAGE DURING CONSTRUCTION. WHERE STORM DRAINAGE PIPING OR STRUCTURES ARE DAMAGED, THE CONTRACTOR SHALL REPAIR OR REPLACE AT NO ADDITIONAL COST TO THE OWNER.
7. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN EXCAVATING IN PROXIMITY OF WATER MAINS, WASTEWATER FORCE MAINS, GRAVITY MAINS, AND RECLAIMED WATER MAIN. WATER MAINS, FORCE MAINS, GRAVITY MAIN, AND RECLAIMED WATER MAIN LOCATIONS SHOWN ON THE PLANS ARE NOT EXACT OR GUARANTEED. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXISTING UTILITY LOCATIONS.
8. LOCATIONS OF EXISTING UTILITIES AS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY THE EXISTENCE AND LOCATION OF ALL ABOVEGROUND AND UNDERGROUND UTILITIES. CONTRACTOR SHALL CONTACT UTILITY OWNERS, INCLUDING FIBER OPTICS COMPANIES, AT LEAST SEVEN (7) DAYS PRIOR TO CONSTRUCTION AND A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION. EXTREME CAUTION SHALL BE EXERCISED IN AREAS OF FIBER OPTICS, GAS MAINS AND ELECTRICAL CABLES AND CONDUITS.
9. IMMEDIATELY AT ONSET OF CONSTRUCTION, CONTRACTOR SHALL FIELD VERIFY HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING UTILITIES CRITICAL TO COMPLETING THE PROJECT (INCLUDING WATER, SEWER, RECLAIMED WATER, POWER, TELEPHONE, GAS, AND CABLE TV) AND SHALL EVALUATE POTENTIAL CONFLICTS IN A WRITTEN REPORT. ANY CONFLICTS SHALL BE REPORTED TO ENGINEER/OWNER IMMEDIATELY UPON DISCOVERY AND DETAILED IN THE REPORT.
10. CONTRACTOR SHALL COORDINATE WITH ALL OTHER UTILITY OWNERS FOR RESOLUTION OF CONFLICTS. CONTRACTOR SHALL HAVE 48 HOURS TO DETERMINE THE RESOLUTION OF ANY UNKNOWN OR UNFORESEEN CONFLICTS. COSTS INCURRED SHALL BE BORNE BY THE UTILITY OWNER AND/OR CONTRACTOR AND NO CLAIMS MAY BE MADE AGAINST ORANGE COUNTY OR THE ENGINEER FOR THESE CONFLICTS. NO ADDITIONAL COMPENSATION SHALL BE MADE FOR THE PERIOD OF TIME TO RESOLVE ANY CONFLICTS.
11. SUPPORT & PROTECT ALL EXISTING UTILITIES. CONTRACTOR SHALL CONTACT UTILITY OWNERS FOR LOCATION OF ALL EXISTING FACILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH UTILITY OWNERS AND BE RESPONSIBLE FOR PROVIDING TEMPORARY SUPPORT FOR UTILITY POLES AND ALL OTHER UTILITIES DURING CONSTRUCTION.
12. THE UTILITIES IMPROVEMENTS AND ADJUSTMENTS SHOWN ON THESE DRAWINGS ARE INTENDED TO MAINTAIN THE INTEGRITY OF THE ORANGE COUNTY WATER, WASTEWATER, AND RECLAIMED WATER SYSTEMS. THE DRAWINGS DO NOT INCLUDE WORK PERFORMED ON, OR FOR UTILITY SYSTEMS OWNED BY OTHERS, UNLESS STATED OTHERWISE ON THE DRAWINGS.
13. FLUSHING, HYDROSTATIC TESTING AND DISINFECTING OF WATER MAINS SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH AWWA SPECIFICATIONS C-600, C-651 AND APPLICABLE SECTIONS OF THE ORANGE COUNTY STANDARDS AND CONSTRUCTION SPECIFICATIONS MANUAL. FITTINGS AND MINOR REPLACEMENT SEGMENTS REQUIRED TO MAKE CONNECTIONS TO EXISTING WATER LINES SHALL BE THOROUGHLY DISINFECTED BY SWABBING THE ENTIRE INTERIOR WITH A MINIMUM 5% CHLORINE SOLUTION PRIOR TO INSTALLATION. CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT, MATERIALS, AND MANPOWER TO ACCOMPLISH THESE OPERATIONS. AUTHORIZED ORANGE COUNTY UTILITIES PERSONNEL SHALL BE PRESENT DURING THE TEST. COORDINATE WITH ORANGE COUNTY UTILITIES INSPECTOR AT LEAST SEVEN (7) DAYS PRIOR TO START THIS WORK.
14. ALL EXISTING AND NEW OCU WATER AND SEWER VALVES, VALVE BOXES, AND MANHOLES SHALL BE PROTECTED AND ADJUSTED TO FINISHED GRADE WHETHER SHOWN OR NOT. VALVE AND VALVE BOXES SHALL REMAIN ACCESSIBLE AT ALL TIMES. ANY VALVES THAT MIGHT BE COVERED DURING CONSTRUCTION SHALL BE MARKED WITH A MARKER (GREEN FOR SEWER, BLUE FOR WATER, AND PURPLE FOR RECLAIMED WATER MAIN), A MINIMUM OF FOUR (4) FEET BELOW GRADE. ALL VALVES UNDER CONSTRUCTION ARE TO REMAIN CLOSED DURING CONSTRUCTION.
15. SEE DETAIL SHEET FOR SEPARATION REQUIREMENTS BETWEEN WATER MAINS, SEWER MAINS AND OTHER PIPELINES AND MAINS. NO CONCRETE ENCASEMENT OF PIPES WILL BE PERMITTED.
16. ALL WATER AND FORCE MAIN AND RECLAIMED WATER MAINS 12-INCHES IN DIAMETER OR LESS SHALL BE PVC AND CONFORM TO AWWA C900, DR 18. ALL WATER MAIN PIPE AND RECLAIMED WATER MAIN PIPE GREATER THAN 12-INCHES IN DIAMETER SHALL BE DUCTILE IRON AND CONFORM TO ANSI/AWWA A21.51/C151. ALL PVC PRESSURE PIPE SHALL USE DUCTILE IRON FITTINGS. FITTINGS FOR SERVICES SHALL BE BRASS.
17. ALL PIPE, PIPE FITTINGS AND APPURTENANCES INSTALLED UNDER THIS PROJECT WILL BE COLOR CODED OR MARKED IN ACCORDANCE WITH SUBPARAGRAPH 62-555.320 (21) (B) 3, FAS, USING BLUE AS A PREDOMINANT COLOR FOR WATER; GREEN FOR WASTEWATER; PURPLE FOR RECLAIMED WATER.
18. ALL BACKFILL SHALL BE COMPACTED TO NOT LESS THAN 95% OF MAXIMUM DRY DENSITY AS MEASURED BY AASHTO T -180 METHOD 'D' TEST (MODIFIED PROCTOR) IN OPEN AREAS AND TO NOT LESS THAN 98% MAXIMUM DRY DENSITY AS MEASURED BY AASHTO T -180 METHOD 'D' TEST (MODIFIED PROCTOR) UNDER EXISTING OR PROPOSED ASPHALT OR CONCRETE PAVEMENT AND WITHIN 3-FT OF EXISTING OR PROPOSED PAVEMENT. ALL SOIL TESTING TO BE CONDUCTED BY THE COUNTY. THE CONTRACTOR SHALL PROVIDE ALL REASONABLE ASSISTANCE DURING SOIL TESTING.
19. PIPE LENGTHS SHOWN ON PLANS ARE APPROXIMATE. ACTUAL LENGTHS ARE TO BE DETERMINED DURING CONSTRUCTION.

- 20. ALL STATIONS AND OFFSETS REFER TO BASELINE OF STATIONING.
21. ALL MAINS SHALL BE CONSTRUCTED AS SHOWN ON THE PLANS. A MINIMUM COVER OF 48 INCHES SHALL BE MAINTAINED ON ALL MAINS, WHERE IT IS NOT OTHERWISE SPECIFIED ON PLANS OR DIRECTED BY THE ENGINEER. FOR PVC PIPE, NO HORIZONTAL/ VERTICAL PIPE OR JOINT DEFLECTION SHALL BE ALLOWED. CONTRACTOR SHALL USE FITTINGS TO OBTAIN REQUIRED CLEARANCES. ON DUCTILE IRON PIPE, CONTRACTOR SHALL NOT EXCEED 75% OF THE MANUFACTURER'S RECOMMENDATION FOR PIPE DEFLECTION. OTHERWISE USE FITTINGS TO OBTAIN REQUIRED CLEARANCES.
22. ALL DUCTILE IRON AND PVC PIPE JOINTS SHALL BE FULLY RESTRAINED. IN ADDITION, ALL FITTINGS SHALL BE MECHANICAL JOINT RESTRAINED. NO THRUST BLOCKS SHALL BE PERMITTED.
23. VALVES TO BE OPERATED BY OCU. KEEP VALVES ON ALL WET TAPS CLOSED UNTIL CLEARED BY FDEP. DO NOT CONNECT ANY PROPOSED WATER MAIN TO ANY EXISTING WATER MAIN UNLESS CLEARED BY FDEP.
24. ALL CONNECTIONS TO EXISTING MAINS SHALL BE MADE BY THE CONTRACTOR ONLY AFTER THE PROPOSED CONNECTION PROCEDURE AND WORK SCHEDULE HAVE BEEN REVIEWED AND ACCEPTED BY THE OWNER'S RPR. THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST TO THE OWNER A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO SCHEDULING ANY CONNECTION. THE REQUEST SHALL REFERENCE THE PROFESSIONAL LAND SURVEYOR CERTIFIED COMPLETED AS-BUILT RECORD DRAWINGS PREVIOUSLY SUBMITTED AND SHALL OUTLINE THE FOLLOWING:
A. POINTS OF CONNECTION, FITTINGS TO BE USED, METHODS OF FLUSHING AND DISINFECTION AND VERIFICATION OF RESTRAINT ON EXISTING PIPE.
B. ESTIMATED CONSTRUCTION TIME FOR THE CONNECTIONS.
THE OWNER'S RPR SHALL REVIEW THE SUBMITTAL WITHIN FIVE (5) WORKING DAYS AFTER RECEIVING IT AND INFORM THE CONTRACTOR REGARDING APPROVAL OR DENIAL OF THE REQUEST. IF THE OWNER REJECTS THE REQUEST, THE CONTRACTOR SHALL RESUBMIT THE REQUEST MODIFYING IT IN A MANNER ACCEPTABLE TO THE OWNER. ALL CONNECTIONS SHALL ONLY BE MADE ON THE AGREED UPON DATE AND TIME. SHOULD THE CONTRACTOR NOT INITIATE AND COMPLETE THE CONNECTION WORK IN THE AGREED UPON MANNER, HE SHALL BE REQUIRED TO RESCHEDULE THE CONNECTION BY FOLLOWING THE PROCEDURE OUTLINED ABOVE. THE CONTRACTOR SHALL NOT OPERATE ANY VALVES IN THE SYSTEM. MAINS SHALL NOT BE PLACED IN SERVICE UNTIL CLEARANCE IS RECEIVED FROM FDEP. AS-BUILT DRAWINGS MUST BE COMPLETED AND SUBMITTED PRIOR TO WATER MAIN CHLORINATION.
25. PROTECT EXISTING IMPROVEMENTS TO THE MAXIMUM EXTENT POSSIBLE. RESTORE ALL EXISTING IMPROVEMENTS AND DISTURBED AREAS TO ORIGINAL CONDITION. PAVEMENT TO BE RESTORED IN ACCORDANCE WITH THE PAVEMENT RESTORATION DETAILS SHOWN ON THE CONSTRUCTION DETAIL SHEETS. ALL DAMAGED SIDEWALK, ROADWAY PAVEMENT AND OTHER IMPROVEMENTS SHALL BE RESTORED TO ORIGINAL CONDITION.
26. ALL COUNTY ROADS TO BE OPEN CUT SHALL BE APPROVED BY ORANGE COUNTY PUBLIC WORKS PRIOR TO OPEN-CUTS. SUBMIT A MAINTENANCE OF TRAFFIC (MOT) PLAN CONFORMING TO ORANGE COUNTY RIGHT-OF-WAY UTILIZATION REGULATIONS TO ORANGE COUNTY PUBLIC WORKS A MINIMUM OF FOURTEEN (14) DAYS PRIOR TO ANY WORK WITHIN COUNTY RIGHT-OF-WAY. A COPY OF THIS PLAN SHALL ALSO BE SUBMITTED TO THE ENGINEER AND UTILITY COUNTY INSPECTOR. NOTIFY THE COUNTY TRAFFIC ENGINEER 48 HOURS PRIOR TO ANY OPEN CUT OF ROADWAYS OR JACK AND BORE OPERATIONS WITHIN THE COUNTY RIGHT-OF-WAY. TWO WAY TRAFFIC MUST BE MAINTAINED AT ALL TIMES DURING THE COURSE OF CONSTRUCTION. MAINTAIN A SET OF COUNTY APPROVED CONSTRUCTION PLANS AND MOT PLANS AT THE CONSTRUCTION SITE AT ALL TIMES WHEN WORKING WITHIN THE COUNTY RIGHT-OF-WAY.
27. INSTALL AIR RELEASE VALVES (ARV) AT ALL HIGH POINTS IN THE SYSTEM WHERE AIR CAN ACCUMULATE. AIR RELEASE VALVES AND APPURTENANCES SHALL BE COLOR CODED BLUE FOR WATER, GREEN FOR SEWER, AND PURPLE FOR RECLAIMED WATER. STATIONING FOR AIR RELEASE VALVES IS APPROXIMATE. CONTRACTOR TO INSTALL AIR RELEASE VALVES AT HIGH POINTS IN MAIN.
28. BENCHMARK LOCATIONS AND ELEVATION ARE SHOWN IN THE PLANS AS REPRESENTED BY SURVEYOR AT THE TIME OF SURVEY. CONTRACTOR SHALL VERIFY ITS CORRECTNESS AT THE TIME OF CONSTRUCTION AND INSTALL HIS OWN TEMPORARY BENCHMARKS. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OCU UTILITIES INSPECTOR.
29. NO VALVE BOXES, METERS, PORTIONS OF MANHOLES, OR OTHER APPURTENANCES OF ANY KIND RELATING TO ANY UNDERGROUND UTILITIES SHALL BE LOCATED IN ANY PORTION OF A CURB-AND-GUTTER SECTION. CONTRACTOR SHALL ADVISE ENGINEER IMMEDIATELY UPON DISCOVERY OF A POTENTIAL CONFLICT.
30. WHERE REQUIRED, AT NO ADDITIONAL COST TO THE COUNTY, THE CONTRACTOR SHALL USE TEMPORARY SHEETING OR TRENCH BOXES TO MINIMIZE THE SIZE OF EXCAVATIONS AND PROTECT EXISTING ROADWAYS, UTILITIES AND OTHER FACILITIES. OR AS NEEDED TO REMAIN WITHIN THE LIMITS OF CONSTRUCTION. CONTRACTOR TO COMPLY WITH OSHA TRENCH SAFETY REQUIREMENTS AT ALL TIMES.
31. CONTRACTOR TO PROVIDE DETAILED AS-BUILT DRAWINGS OF ALL UTILITIES UNCOVERED IN TRENCHES. THE AS-BUILT SHALL RECORD LOCATION, SIZE, TYPE, ELEVATION AND OWNER OF ALL UTILITY FACILITIES UNCOVERED.
32. WATER PIPE SHALL BE STAMPED BY THE NATIONAL SANITATION FOUNDATION (NSF) FOR POTABLE WATER USE.
33. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY ORANGE COUNTY UTILITIES DISPATCH (EMERGENCY ONLY) IN THE EVENT OF UTILITY MAIN BREAK OR DAMAGE AT (407) 836-2777.
34. ALL MAIN REPAIRS TO BE COMPLETED IMMEDIATELY BY THE CONTRACTOR, AT THE CONTRACTOR'S COST. IF THE MAIN IS NOT REPAIRED IN A TIMELY MANNER, AS DETERMINED BY THE ENGINEER, ORANGE COUNTY UTILITIES PERSONNEL MAY REPAIR THE MAIN AND THE CONTRACTOR WILL BE CHARGED FOR REPAIRS. SHOULD A SPILL OCCUR, THE CONTRACTOR SHALL CONTAIN THE SEWAGE FROM ENTERING SURFACE WATER AREAS AND IMMEDIATELY NOTIFY THE OCU RPR.
35. CONTRACTOR SHALL APPLY FOR AND SECURE ALL NECESSARY PERMITS FROM STATE, COUNTY, AND LOCAL MUNICIPALITIES. PERMITS SHALL INCLUDE, BUT NOT BE LIMITED TO, RIGHT OF WAY USE, CONSTRUCTION, BUSINESS LICENSE, AND DEWATERING.
36. CONTRACTOR SHALL REPAIR, RESET OR REPLACE, AT AN EXPENSE, ALL TREES, SHRUBS AND LANDSCAPING THAT ARE REMOVED OR DAMAGED DURING CONSTRUCTION.
37. ALL MAINS SHALL HAVE A MINIMUM OF 48 INCHES OF COVER & A MAXIMUM OF 6 FEET OF COVER UNLESS SHOWN OTHERWISE. PROVIDE A MINIMUM OF 3 FEET OF COVER UTILITIES AT ALL DITCH CROSSING.
38. CONTRACTOR SHALL SUPPLY CERTAINTIED QUALIFIED REPRESENTATIVES FOR UP TO TWO DAYS OF ONSITE OBSERVATION OF INITIAL INSTALLATION TO ENSURE INSTALLATION IS IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
39. OC PUBLIC WORKS REQUIRES APPLICATION OF A MAINTENANCE OF TRAFFIC PERMIT INCLUDING SIGNED & SEALED, SITE-SPECIFIC MOT PLANS IN ACCORDANCE WITH SECTION 01065. OC TRAFFIC ENGINEERING CONTACT IS GARY RODGERS, 407-836-8085.

SURVEYOR'S NOTES:

- 1. SURVEY PROVIDED BY BUCHHEIT ASSOCIATES, INC., LB #6167.
2. COORDINATE SYSTEM AND NORTH ROTATION SHOWN HEREON ARE BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM (NAD 83/90).
3. ELEVATIONS SHOWN HEREON ARE BASED ON NAVD 88 AS DERIVED FROM ORANGE COUNTY BENCHMARKS S-138-3014, ELEVATION 89.616 AND S-138-3015, ELEVATION 91.774.
4. FIELD WORK FOR THIS SURVEY WAS PERFORMED BETWEEN OCTOBER 12, 2012 AND JULY 15, 2013.
5. UTILITY LOCATIONS SHOWN HEREON ARE LIMITED TO FIELD OBSERVATIONS OF ABOVE GROUND INSTALLATIONS AND THOSE FACILITIES THAT COULD BE ACCESSED FOR OBSERVATION BY FIELD CREW AS WELL AS UNDERGROUND UTILITY LINES DESIGNATED BY SUBCONSULTANT. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR ANY ADDITIONAL UNDERGROUND FACILITIES WHICH MAY EXIST BUT ARE NOT DEPICTED ON THIS DRAWING.
6. NO ATTEMPT WAS MADE TO ABSTRACT THE PROJECT AREA FOR EASEMENTS OF RECORD.

Table with columns: VVH NO., DRAWING, TH NO., STATION, OFFSET, DESCRIPTION, DIAMETER, GROUND ELEV, TOP ELEV. Rows include details for PVC TRAFFIC CONTROL, HDPE ELECTRIC, TRAFFIC CONTROL, WATER MAIN, STEEL GAS MAIN, COMM., RCP, and Water Main.



Table with columns: REV, DATE, DESCRIPTION, LABS BY. Row 0: 11/2014 ISSUED FOR BID

Issue Certification
Melanie D. Peckham, P.E.
Florida P.E. No. 66487
Reiss Engineering, Inc.
Certificate of Authorization No. 8181
1016 Spring Villas Pt.
Winter Springs, FL 32708

Designed MDP
Drawn RLL
Checked TSE
Reviewed CLK
Approved MDP
LINE IS 1" AT FULL SIZE
Date 11/2014

ORANGE COUNTY UTILITIES
UNIVERSITY BOULEVARD 12-INCH FORCE MAIN

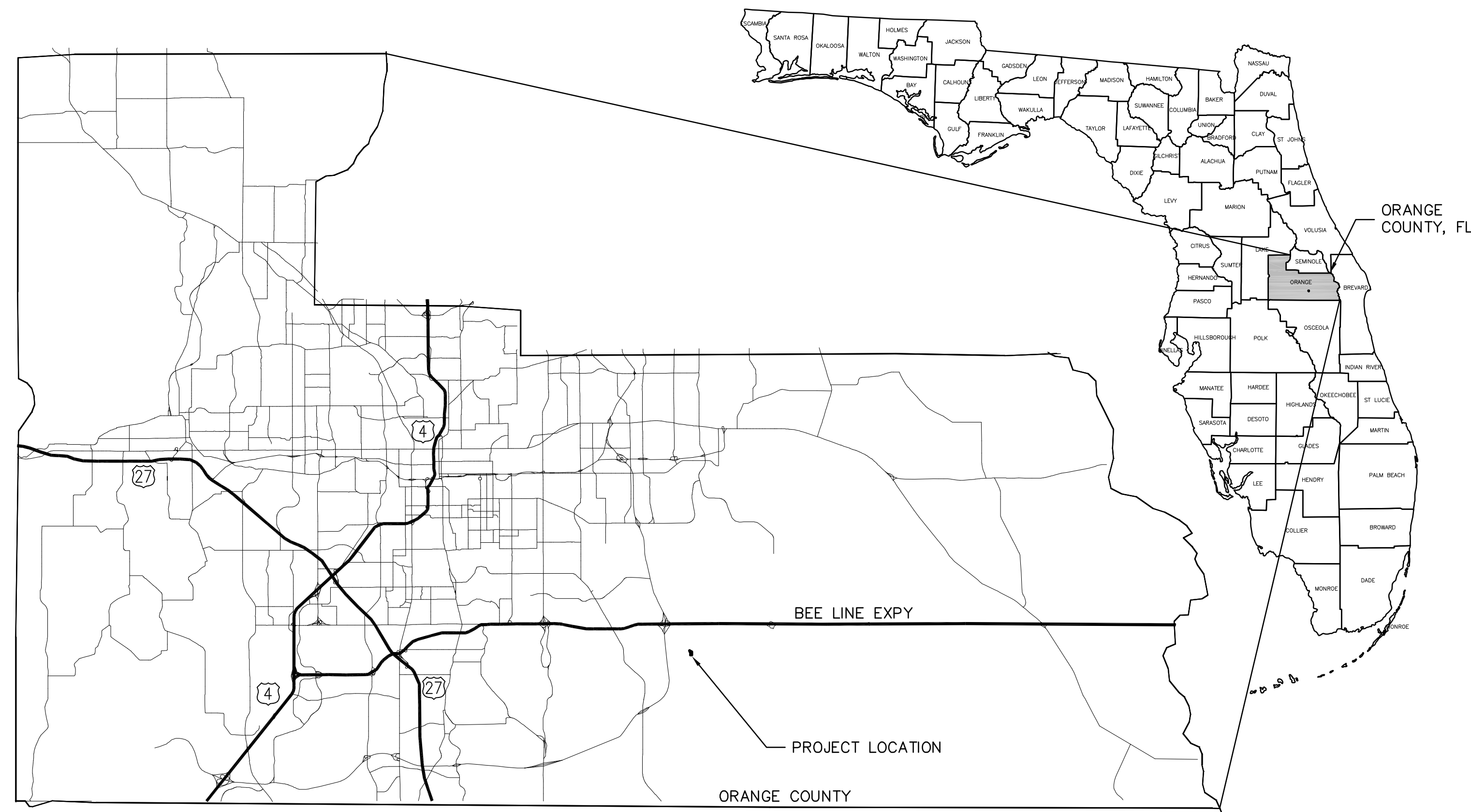
GENERAL
GENERAL NOTES & VVH TABLE

PROJECT NO.: 110007
SCALE: NOTED REVISION: 0
DRAWING NO. G02 SHEET NO.: 02 OF 19



Vertical text on the left margin: Parent Sheet: 110007 - ALAFAYA - UNIVERSITY BOULEVARD - ROBERT L. LUPO Rev. on: 11/27/2014 8:04 AM Individual File Path: R:\PROJECTS\110007-OCU-ALAFAYA-UNIVERSITY-DDWG\FINALDESIGN\02_G02.DWG

Parent: Sheet: Set: 110007 -ALAFAYA-UNIVERSITY; REVISED BY: ROBERT L. LUPO Rev on: 10/28/2014 2:57 PM Individual File Path: \\PROJ\CTS\110007-OCU-ALAFAYA-UNIVERSITY-UV-FM-DESIGN\DESIGN\DRAWINGS\FINAL\DESIGN_03_G03.DWG



LOCATION MAP
SCALE: N.T.S.



KEY SHEET
SCALE: N.T.S.



| REV | DATE | DESCRIPTION | BY |
|-----|---------|----------------|------|
| 0 | 11/2014 | ISSUED FOR BID | LABS |

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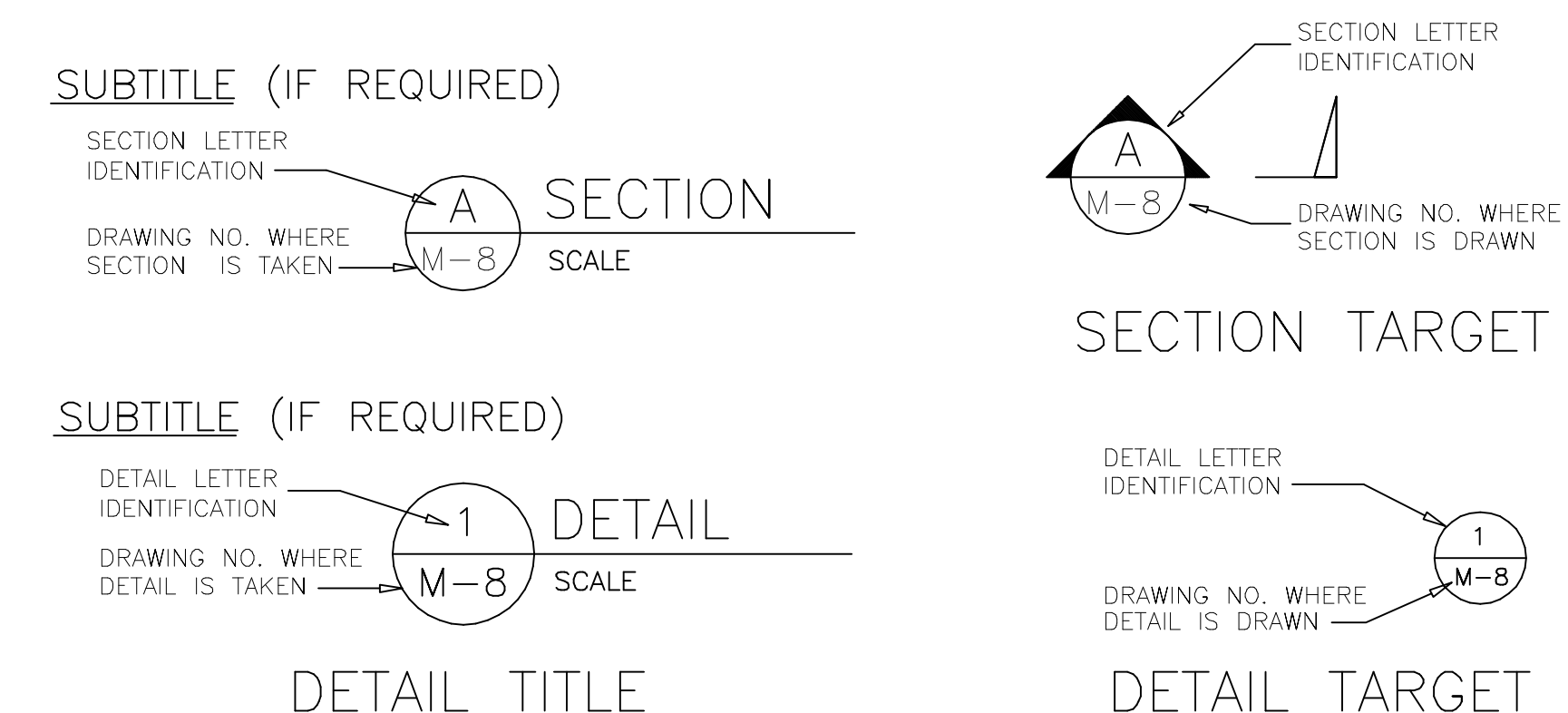
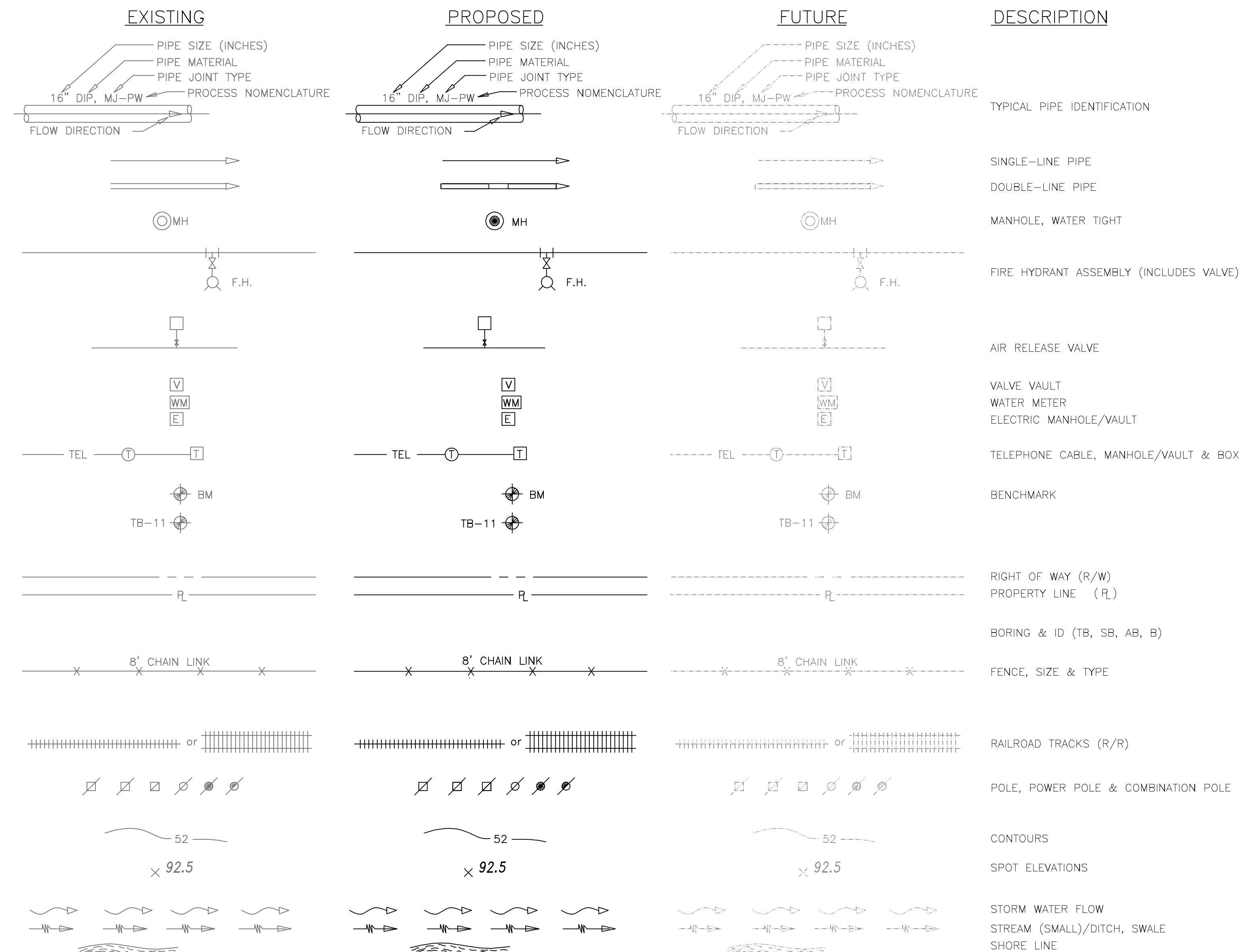
Designed_MDP _____
Drawn_RLL _____
Checked_TSE _____
Reviewed_CIK _____
Approved_MDP _____
Date_11/2014

ORANGE COUNTY UTILITIES
UNIVERSITY BOULEVARD 12-INCH FORCE MAIN
GENERAL
LOCATION MAP & KEY SHEET

| | |
|------------------------|------------------------|
| PROJECT NO.: 110007 | |
| SCALE: N.T.S. | REVISION: 0 |
| DRAWING NO. G03 | SHEET NO.: 03 OF 19 |



SYMBOLS, STRUCTURES & FEATURES



STANDARD LINETYPES

| | |
|----------------|----------------------------------|
| SOLID, BLACK | PROPOSED FEATURES (ABOVE GROUND) |
| HIDDEN, BLACK | PROPOSED FEATURES (BELOW GROUND) |
| SOLID, GRAY | EXISTING FEATURES (ABOVE GROUND) |
| HIDDEN, GRAY | EXISTING FEATURES (BELOW GROUND) |
| DASHDOT2, GRAY | FUTURE FEATURES |

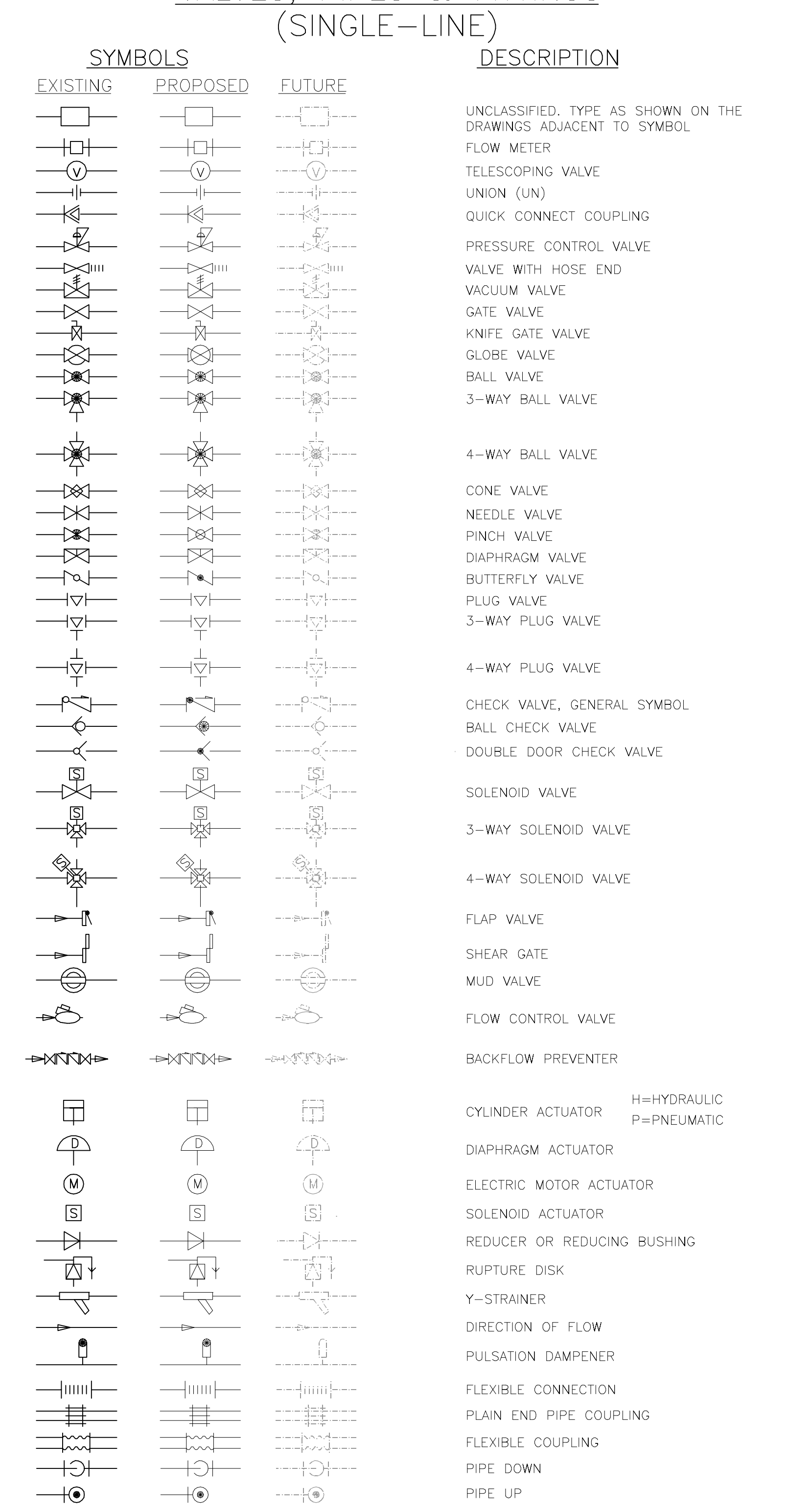
NOTE: THIS GENERAL LEGEND IS FOR GENERAL REFERENCE. NOT ALL ABBREVIATIONS, SYMBOLS, PROCESSES, MATERIALS, OR FITTINGS ARE NECESSARILY USED IN THIS DESIGN.

INDIVIDUAL DISCIPLINE STANDARD LEGENDS MAY SUPERCEDE THIS GENERAL LEGEND.

ABBREVIATIONS

| GENERAL | SYMBOLS | PIPE / JOINTS | SYMBOLS |
|------------------------------|-------------|--------------------------------------|-----------------|
| ADJUSTABLE | ADJ. | BLACK IRON PIPE | BIP |
| ANGLE | ∠ | BLACK STEEL PIPE | BSP |
| ANGLE OF DEFLECTION | AOD | BUTT WELD | BW |
| APPROXIMATE | APPROX. | CAST IRON | CI |
| BACKFLOW PREVENTER | BFP | CAST IRON PIPE | CIP |
| BENCH MARK | BM | CAST IRON SOIL PIPE | CISP |
| BETWEEN | BTWN. | CONCRETE PRESSURE PIPE | CPP |
| BOTTOM OF SLAB | B.O.S. | COPPER PIPE | COP |
| BUILDING | B.LDG. | CORRUGATED METAL PIPE | CMP |
| CAPACITY | CAP. | CHLORINATED POLYVINYL CHLORIDE | CPVC |
| CENTER LINE | CL | DUCTILE IRON PIPE | DI |
| CENTER TO CENTER | C.C. | EXPANSION | EXP |
| CLEANOUT | C.O. | FLANGE | FLG |
| CONCRETE | CONC. | GALVANIZED STEEL PIPE | GS |
| CONDITION | COND. | HIGH-DENSITY POLYETHYLENE | HDPE |
| CONTINUATION | CONT. | JOINT | JT |
| CONNECTION | CONN. | MECHANICAL JOINT | MJ |
| CONSTRUCT | CONSTR. | METAL REINFORCED PLASTIC PIPE | MRPP |
| CONTRACTOR | CONTR. | POLYETHYLENE PIPE | PE |
| CUBIC FOOT | CU. FT. | POLYVINYLCHLORIDE | PVC |
| CUBIC INCH | CU. IN. | POLYVINYLCHLORIDE (DOUBLE CONTAINED) | PVC-D |
| CUBIC YARD | CU. YD. | PUSH-ON JOINT | PJ |
| DEGREE | DEG. | REINFORCED CONCRETE PIPE | RCP |
| DIAMETER | DIA. | RESTRAINED JOINT | RJ |
| DIAGONAL | DIAG. | RESTRAINED MECHANICAL JOINT | RMJ |
| DIMENSION | DIM. | SCHEDULE | SCH |
| DISCHARGE | DISC. | STAINLESS STEEL | S.STL |
| DRAWING | DWG. | STEEL PIPE | STL |
| EACH | EA. | TIED JOINT | TJ |
| EACH WAY | E.A.W. | VITRIFIED CLAY PIPE | VCP |
| EACH FACE | E.F. | WALL SLEEVE | WS |
| ELEVATION | EL., ELEV. | WALL PIPE (WITH WATER STOP) | WP |
| EQUIPMENT | EQUIP. | | |
| EXISTING | EXIST. | VALVES, FITTINGS, ETC. | |
| FINISH | FIN. | ACTUATED BUTTERFLY VALVE | ABFV |
| FINISH FLOOR | F.F. | AIR CUSHION CHECK VALVE | ACCV |
| FIRE PROTECTION | FP | AIR RELEASE VALVE | ARV |
| FLEXIBLE | FLEX. | BALL CHECK VALVE | BACV |
| FLOOR DRAIN | F.D. | BALL VALVE | BV |
| GAUGE | GA. | BLIND FLANGE | BF |
| GRADE | GR. | BUTTERFLY VALVE | BFV |
| HIGH | H. | BURIED GEAR OPERATOR | BGO |
| HIGH POINT | H.P.T. | CHECK VALVE, SWING/GLOBE | CV |
| HIGH WATER LEVEL | H.W.L. | ELBOW | ELL |
| HORIZONTAL | HORIZ. | ELECTRIC VALVE ACTUATOR | EVA |
| HORIZONTAL DIRECTIONAL DRILL | HDD | ELEVATED GEAR OPERATOR | EGO |
| HORSEPOWER | H.P. | EXPANSION JOINT | EJ |
| INSIDE DIAMETER | I.D. | FIRE HYDRANT | FH |
| INTERMEDIATE | INT. | FITTING | FTG |
| LINEAR FOOT | L.F. | FLANGE | FLG |
| LONG | LG., L. | FLANGED ADAPTOR | FA |
| LOW WATER LEVEL | L.W.L. | FLEXIBLE COUPLING | FC |
| LOW POINT | L.P.T. | GATE VALVE | GV |
| MANHOLE | MH | HARNESSED FLANGED COUPLING ADAPTER | HFCA |
| MANUFACTURER | MFR. | HYDRAULIC VALVE ACTUATOR | HVA |
| MATERIAL | MTL. | KNIFE GATE VALVE | KGV |
| MAXIMUM | MAX. | MECHANICAL JOINT | MJ |
| MECHANICAL | MECH. | ORIFICE PLATE | O.P. |
| MINIMUM | MIN. | PLASTIC BALL VALVE | PBAV |
| MOUNTED | MTD. | PLUG VALVE | PV |
| NOMINAL | NOM. | REDUCER | RED |
| NOT IN CONTRACT | N.I.C. | RESTRAINED MECHANICAL JOINT | RMJ |
| NOT TO SCALE | N.T.S. | SILENT CHECK VALVE | SCV |
| NUMBER | NO., # | SOLENOID VALVE | SV |
| ON CENTERS | O.C. | VALVE BOX | VB |
| OPERATOR | OPER. | | |
| OPTION | OPT. | PROCESS NOMENCLATURE | |
| OPPOSITE | OPP. | LIQUID & GAS PROCESS | |
| OPENING | OPNG. | AIR PIPE | AIR |
| OR EQUAL | O/E | AMMONIA GAS | AG |
| OR EQUAL | O.E. | AMMONIA SOLUTION | AS |
| OUTSIDE DIAMETER | O.D. | CHLORINE GAS | CG |
| PLATE | PLT. | CHLORINE SOLUTION | CS |
| POINT | PT. | CONCENTRATE WATER | CONC |
| POUND | LB. | CARBON DIOXIDE | CO ₂ |
| PRESSURE | PRES. | DISINFECTED WATER | DW |
| PROPOSED | PROP. | EFFLUENT | EFF |
| RADIUS | RAD., R. | FILTER EFFLUENT | FE |
| RADIUS OF CURVATURE | ROC | FINISHED WATER | FW |
| REQUIRED | REQ'D. | FORCE MAIN | FM |
| RIGHT OF WAY | R/W, R.O.W. | INFILTRANT | INF |
| ROOM | RM. | INFILTRANT RECYCLE | IR |
| REVOLUTIONS PER MINUTE | R.P.M. | LIQUID AMMONIUM SULFATE | LAS |
| SECTION | SEC. | MICROFILTRATION | MF |
| SHEET | SH., SHT. | MIXED LIQUOR | ML |
| SIDEWALK | SDWK. | SODIUM HYPOCHLORITE | NaOCl |
| SIMILAR | SIM. | NON-POTABLE WATER | NPW |
| SOIL BORING | SB, B, AB | PERMEATE | PERM |
| SPECIFICATIONS | SPECS. | POTABLE WATER | PW |
| SQUARE | SQ. | RAW SEWAGE | RS |
| SQUARE FOOT | SQ. FT. | RAW WATER | RAW |
| SQUARE INCH | SQ. IN. | RECLAIMED WATER/RECLAIMED WATER MAIN | RW/RWM |
| SQUARE YARD | SQ. YD. | RETURN ACTIVATED SLUDGE | RAS |
| STANDARD | STD. | RETURN EFFLUENT WATER | REW |
| STANDARD DIMENSION RATIO | S.D.R. | REUSE EFFLUENT WATER | REUW |
| STATION | STA. | RO REJECT | REJ |
| SYMMETRICAL | SYMM. | SECONDARY EFFLUENT | SE |
| TAPPING SLEEVE | TS | WASTE ACTIVATED SLUDGE | WAS |
| TAPPING VALVE | TV | WATER MAIN | WM |
| TEMPORARY | TEMP. | STORMWATER | |
| TEST BORING | TB | DRAIN/SANITARY SEWER | D |
| TEST HOLE | TH | STORM DRAIN | SD |
| THICK | THK. | STORMWATER/STORMWATER FORCEMAIN | SW/SWFM |
| THREADED | THD. | | |
| TOP OF CONCRETE | T.O.C. | POWER & FUEL | |
| TOP OF SLAB | T.O.S. | ELECTRIC CABLE/DUCT BANK | E |
| TYPICAL | TYP. | FUEL LINE | FL |
| UNLESS NOTED OTHERWISE | U.N.O. | NATURAL GAS LINE | GAS |
| ULTRAVIOLET | UV | COMMUNICATION | |
| VERTICAL | VERT. | FIBER OPTIC | FO, FOC |
| VENT | VT. | TELEVISION CABLE | TV |
| VENT THROUGH ROOF | V.T.R. | EQUIPMENT | |
| WASTE ACTIVATED SLUDGE | W.A.S. | HIGH SERVICE PUMP | HSP |
| WATER LEVEL | W.L. | RECIRCULATION PUMP | RP |
| WEATHERPROOF | WPF. | CHLORINATOR | CHL |
| WIDE | W. | AMMONIATOR | AMM |
| WITH | W/ | FLUORINATOR | FL |
| | | CHLORINE BOOSTER PUMP | CBP |

VALVES, PIPES & FITTINGS (SINGLE-LINE)



| REV | DATE | DESCRIPTION | LABS | BY |
|-----|---------|----------------|------|----|
| 0 | 11/2014 | ISSUED FOR BID | | |

| | |
|---------------------|--|
| Issue Certification | Melanie D. Peckham, P.E. Florida P.E. No. 66487 Reiss Engineering, Inc. Certificate of Authorization No. 8181 1016 Spring Villas Pt. Winter Springs, FL 32708 |
| Designed_MDP | _____ |
| Drawn_RLL | _____ |
| Checked_TSE | _____ |
| Reviewed_CIK | _____ |
| Approved_MDP | _____ |
| Date | 11/2014 |

ORANGE COUNTY UTILITIES
UNIVERSITY BOULEVARD 12-INCH FORCE MAIN

GENERAL

STANDARD LEGEND

| | |
|--------------|----------|
| PROJECT NO.: | 110007 |
| SCALE: | NONE |
| REVISION: | 0 |
| DRAWING NO.: | G04 |
| SHEET NO.: | 04 OF 19 |



Parent: Sheet: 110007 - ALAFAYA - UNIVERSITY BOULEVARD 12-INCH FORCE MAIN - REVISED 11/2014 - 3:02 PM - Individual File Path: \\PROJECTS\110007-OCU - ALAFAYA - UNIVERSITY - WW - FM - DESIGN - DRAWINGS\FINAL\DESIGN_04 - G04.DWG

Parent: Set: 110007 - ALAFAYA - UNIVERSITY BOULEVARD 12-INCH FORCE MAIN - REVISED 11/07/2014 8:17 AM - Individual File Path: R:\PROJECTS\110007-OCU - ALAFAYA - UNIVERSITY - WW - FM - DESIGN - DRAWINGS\FINALDESIGN_05_G05.DWG

| VALVE | | | | | | | | | | | | | | | | |
|-----------|--------------|-----------------|---------|----------|-----------|-------------------|------------|------------|--------------------|---------------|---------------------|---------------|------------|---------------|-----------------------|----------|
| ID NUMBER | PLAN SHEET # | STATIONING | EASTING | NORTHING | ELEVATION | VALVE TYPE | MAIN TYPE | VALVE SIZE | VALVE MANUFACTURER | VALVE MODEL # | # OF TURNS TO CLOSE | GEAR ACTUATOR | GEAR RATIO | SIDE ACTUATOR | ACTUATOR MANUFACTURER | COMMENTS |
| FMV-1 | C01 | 0+24.25, 22'R | | | | ARV - COMBINATION | FORCE MAIN | 2" | | | | | | | | |
| FMV-2 | C02 | 1+10.0 | | | | PLUG | FORCE MAIN | 12" | | | | | | | | |
| FMV-3 | C05 | 16+12 | | | | PLUG | FORCE MAIN | 12" | | | | | | | | |
| FMV-4 | C07 | 26+96.95, 6.5'R | | | | ARV - COMBINATION | FORCE MAIN | 2" | | | | | | | | |
| FMV-5 | C07 | 27+5.26 | | | | TAPPING VALVE | FORCE MAIN | 12" | | | | | | | | |
| FMV-6 | C07 | 26+92.1, 11'L | | | | PLUG | FORCE MAIN | 12" | | | | | | | | |
| FMV-7 | C07 | 27+5.26 | | | | PLUG | FORCE MAIN | 12" | | | | | | | | |

| MANHOLE | | | | | | | | | | | | | | |
|-----------------|--------------|-------------------|---------|----------|---------------|--------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|----------|
| ID NUMBER | PLAN SHEET # | STATIONING | EASTING | NORTHING | RIM ELEVATION | INVERT ELV N | INVERT ELV E | INVERT ELV SE | INVERT ELV S | INVERT ELV SW | INVERT ELV W | INVERT ELV NW | MANUFACTURER | COMMENTS |
| MH-SAN-33660010 | C01 | 0+00.00 | | | | | | | 40.55 | | | | | |
| MH-SAN-33660018 | C07 | 26+81.61, 26.62'L | | | | | | | | | | | | |

| FITTING | | | | | | | | |
|-----------|--------------|------------|---------|----------|-----------|------------|--------------------|----------|
| ID NUMBER | PLAN SHEET # | STATIONING | EASTING | NORTHING | ELEVATION | MAIN TYPE | FITTING TYPE | COMMENTS |
| FMF-1 | C01 | 0+6.36 | | | | FORCE MAIN | 12" BEND 45° | |
| FMF-2 | C01 | 0+16.24 | | | | FORCE MAIN | 12" BEND 45° | |
| FMF-3 | C01 | 0+80.64 | | | | FORCE MAIN | 12" BEND 45° | |
| FMF-4 | C01 | 0+87.71 | | | | FORCE MAIN | 12" BEND 45° | |
| FMF-5 | C02 | 1+21.49 | | | | FORCE MAIN | 12" BEND 11 1/4° | |
| FMF-5A | C02 | 1+35.83 | | | | FORCE MAIN | 12" BEND 11 1/4° | |
| FMF-6 | C03 | 7+81.7 | | | | FORCE MAIN | 12" RJ COUPLING | |
| FMF-7 | C03 | 7+98.2 | | | | FORCE MAIN | 12" RJ COUPLING | |
| FMF-8 | C05 | 16+04 | | | | FORCE MAIN | 12" RJ COUPLING | |
| FMF-9 | C05 | 16+8.81 | | | | FORCE MAIN | 12" BEND 45° | |
| FMF-10 | C05 | 16+15.28 | | | | FORCE MAIN | 12" BEND 45° | |
| FMF-11 | C05 | 16+25.51 | | | | FORCE MAIN | 12" BEND 45° | |
| FMF-12 | C05 | 16+30.5 | | | | FORCE MAIN | 12" BEND 45° | |
| FMF-13 | C05 | 16+39.37 | | | | FORCE MAIN | 12" RJ COUPLING | |
| FMF-14 | C06 | 22+38.92 | | | | FORCE MAIN | 12" BEND 11 1/4° | |
| FMF-15 | C06 | 22+70 | | | | FORCE MAIN | 12" RJ COUPLING | |
| FMF-16 | C07 | 26+69.19 | | | | FORCE MAIN | 12" BEND 22 1/2° | |
| FMF-16A | C07 | 26+82.84 | | | | FORCE MAIN | 12" BEND 22 1/2° | |
| FMF-17 | C07 | 26+94.52 | | | | FORCE MAIN | 12" BEND 45° | |
| FMF-18 | C07 | 26+99.19 | | | | FORCE MAIN | 12" BEND 45° | |
| FMF-19 | C07 | 27+7.55 | | | | FORCE MAIN | 12" TAPPING SLEEVE | |

| PIPE | | | | | | | | | | | | |
|-----------|--------------|------------|---------|----------|-----------|------------|--------------|---------------------|----------|----------------|--------------|----------|
| ID NUMBER | PLAN SHEET # | STATIONING | EASTING | NORTHING | ELEVATION | MAIN TYPE | TYPE OF SHOT | CONSTRUCTION METHOD | MATERIAL | PRESSURE CLASS | MANUFACTURER | COMMENTS |
| FM-1 | C01 | 0+00 | | | | FORCE MAIN | | OPEN CUT | PVC | DR-18 | | |
| FM-2 | C02 | 1+00 | | | | FORCE MAIN | | OPEN CUT | PVC | DR-18 | | |
| FM-3 | C02 | 2+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-4 | C02 | 3+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-5 | C02 | 4+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-6 | C03 | 5+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-7 | C03 | 6+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-8 | C03 | 7+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-9 | C03 | 8+00 | | | | FORCE MAIN | | OPEN CUT | PVC | DR-18 | | |
| FM-10 | C03 | 9+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-11 | C04 | 10+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-12 | C04 | 11+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-13 | C04 | 12+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-14 | C04 | 13+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-15 | C04 | 14+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-16 | C05 | 15+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-17 | C05 | 16+00 | | | | FORCE MAIN | | OPEN CUT | PVC | DR-18 | | |
| FM-18 | C05 | 17+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-19 | C05 | 18+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-20 | C05 | 19+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-21 | C06 | 20+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-22 | C06 | 21+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-23 | C06 | 22+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-24 | C06 | 23+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-25 | C06 | 24+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-26 | C07 | 25+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-27 | C07 | 26+00 | | | | FORCE MAIN | | DIRECTIONAL DRILL | PVC | DR-18 | | |
| FM-28 | C07 | 27+00 | | | | FORCE MAIN | | OPEN CUT | PVC | DR-18 | | |

| EXISTING OC UTILITY CROSSING | | | | | | | | |
|------------------------------|--------------|------------|---------|----------|-------------------------|-----------------------------|--------------------|----------|
| ID NUMBER | PLAN SHEET # | STATIONING | EASTING | NORTHING | EXISTING PIPE ELEVATION | PROPOSED CROSSING ELEVATION | EXISTING MAIN TYPE | COMMENTS |
| WM-1 | C03 | 5+32.98 | | | | 43.64 | WATER MAIN | |



| | | | |
|-----|---------|----------------|------|
| 0 | 11/2014 | ISSUED FOR BID | LABS |
| REV | DATE | DESCRIPTION | BY |

Issue Certification
 Melanie D. Peckham, P.E.
 Florida P.E. No. 66487
 Reiss Engineering, Inc.
 Certificate of Authorization No. 8181
 1016 Spring Villas Pt.
 Winter Springs, FL 32708

Designed_MDP
 Drawn_RLL
 Checked_TSE
 Reviewed_CJK
 Approved_MDP
 Date 11/2014

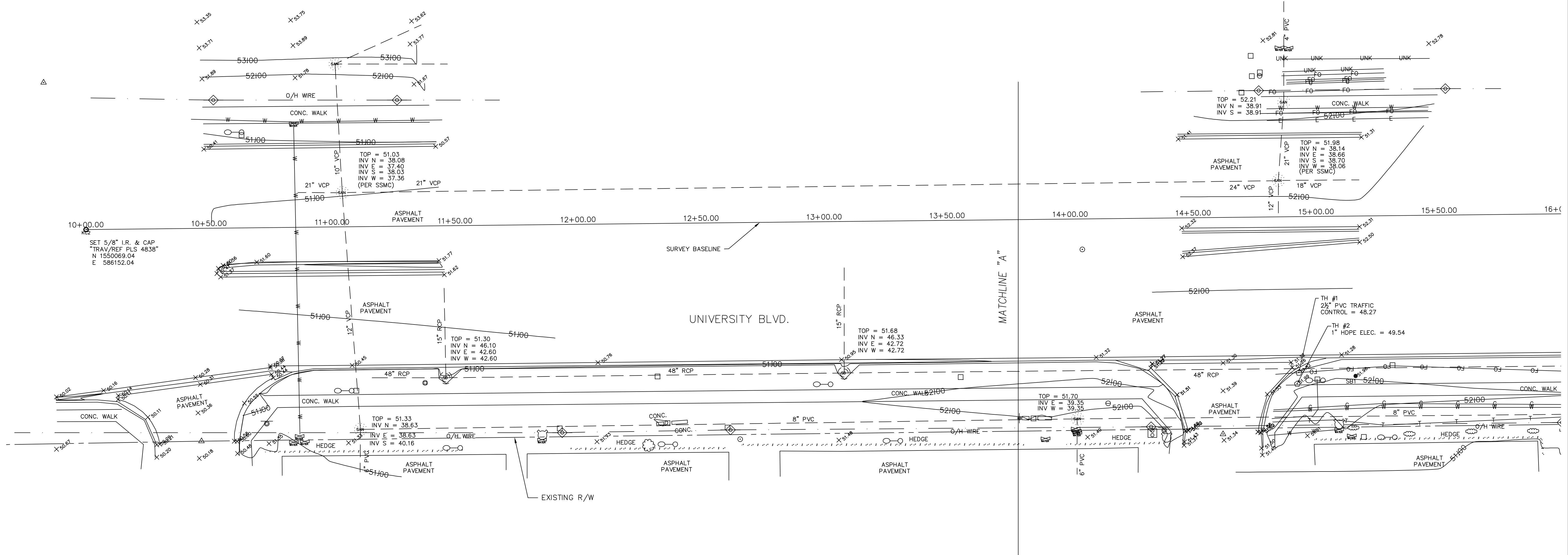
ORANGE COUNTY UTILITIES
 UNIVERSITY BOULEVARD 12-INCH FORCE MAIN

GENERAL
 ASSET TABLES

| | |
|------------------------|------------------------|
| PROJECT NO.: 110007 | |
| SCALE: NONE | REVISION: 0 |
| DRAWING NO. G05 | SHEET NO.: 05 OF 19 |



REISS ENGINEERING, INC.
 1016 SPRING VILLAS PT
 WINTER SPRINGS, FL 32708
 (407) 679-5358



SET 5/8" I.R. & CAP
"TRAV/REF PLS 4838"
N 1550069.04
E 586152.04

UNIVERSITY BLVD.

MATCHLINE "A"

SYMBOL LEGEND

- | | |
|------------------------|---------------------|
| BENCH | POWER POLE |
| CLEAN OUT | SHARED POLE |
| ELECTRIC OUTLET | SHRUB |
| FIRE HYDRANT | SIGNAL BOX |
| FLOOD LIGHT | SIGNAL CONTROLLER |
| GUY ANCHOR | SPAN POLE |
| GUY POLE | SIGNAL MAST ARM |
| LIGHT POLE | MULTI POLE SIGN |
| STORM DRAIN MANHOLE | TREE (UNKNOWN TYPE) |
| ELECTRIC MANHOLE | OAK TREE |
| SANITARY SEWER MANHOLE | PALM TREE |
| GAS MANHOLE | PINE TREE |
| TELEPHONE MANHOLE | TRANSFORMER |
| SEWER VALVE | VALVE BOX |
| WATER VALVE | VALVE |
| WIRE PULL BOX | GAS VALVE |
| | TESTHOLE LOCATION |
| | SOIL BORING |

SURVEYOR'S NOTES:

- COORDINATE SYSTEM AND NORTH ROTATION SHOWN HEREON ARE BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM (NAD 83/90).
- ELEVATIONS SHOWN HEREON ARE BASED ON NAVD 88 AS DERIVED FROM ORANGE COUNTY BENCHMARKS S-138-3014, ELEVATION 89.616 AND S-138-3015, ELEVATION 91.774.
- FIELD WORK FOR THIS SURVEY WAS PERFORMED BETWEEN OCTOBER 12, 2012 AND JANUARY 21, 2013.
- DRAWING IS ALSO BEING SUBMITTED TO CLIENT IN DIGITAL FORMAT.
- UTILITY LOCATIONS SHOWN HEREON ARE LIMITED TO FIELD OBSERVATIONS OF ABOVE GROUND INSTALLATIONS AND THOSE FACILITIES THAT COULD BE ACCESSED FOR OBSERVATION BY FIELD CREW AS WELL AS UNDERGROUND UTILITY LINES DESIGNATED BY SUBCONSULTANT. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR ANY ADDITIONAL UNDERGROUND FACILITIES WHICH MAY EXIST BUT ARE NOT DEPICTED ON THIS DRAWING.
- NO ATTEMPT WAS MADE TO ABSTRACT THE PROJECT AREA FOR EASEMENTS OF RECORD.

UTILITY LEGEND

- | | |
|-----|------------------------|
| G | BURIED GAS LINE |
| E | BURIED ELECTRIC LINE |
| T | BURIED TELEPHONE LINE |
| W | BURIED WATER LINE |
| SS | SANITARY SEWER LINE |
| FO | FIBER OPTIC CABLE |
| UNK | UNKNOWN BURIED UTILITY |

TOPOGRAPHIC SURVEY

PREPARED FOR:

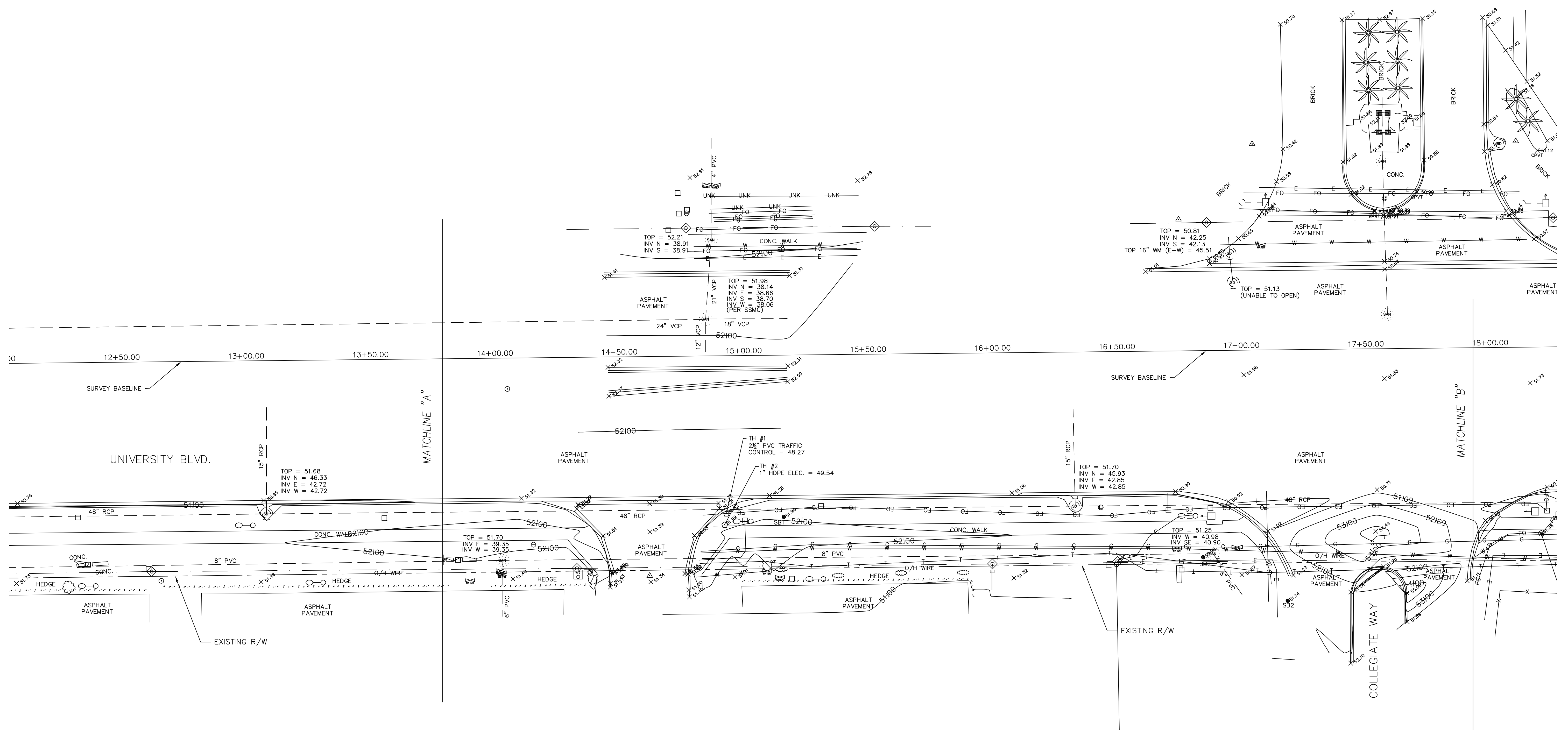
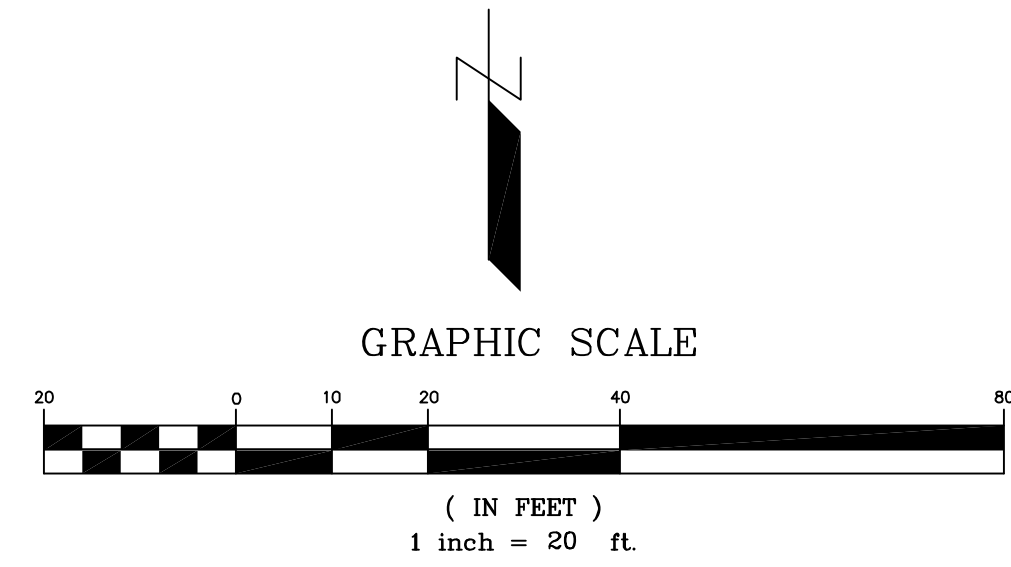
UNIVERSITY BOULEVARD

REISS ENGINEERING, INC.

BUCHHEIT ASSOCIATES, INC.
SURVEYORS & MAPPERS
407 CenterPointe, Suite 1811
Altamonte Springs, Florida 32701
(407) 331-0505 Fax: (407) 331-3266

| | |
|-----------------------|-------------|
| PROJ. NO. | 211011-0002 |
| SCALE | 1"=20' |
| SURVEY DATE: | 2/11/2013 |
| REVISIONS: | |
| ADD TESTHOLES/BORINGS | 9/5/2013 |
| ADD WATER LINE | 10/17/2013 |
| FLD BK. 2013/01 | PG. 5-19 |
| SHEET | 1 OF 4 |

KIMBERLY A. BUCHHEIT, P.L.S., #4838
NOT VALID WITHOUT SIGNATURE AND THE ORIGINAL
RAISED SEAL OF A FLORIDA LICENSED SURVEYOR
AND MAPPER.



TOPOGRAPHIC SURVEY

PREPARED FOR:

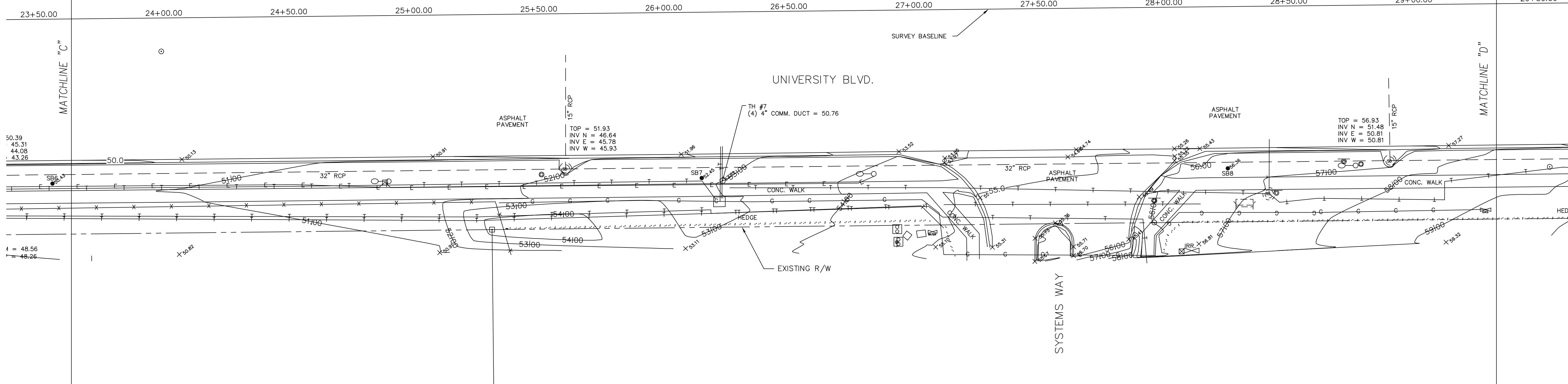
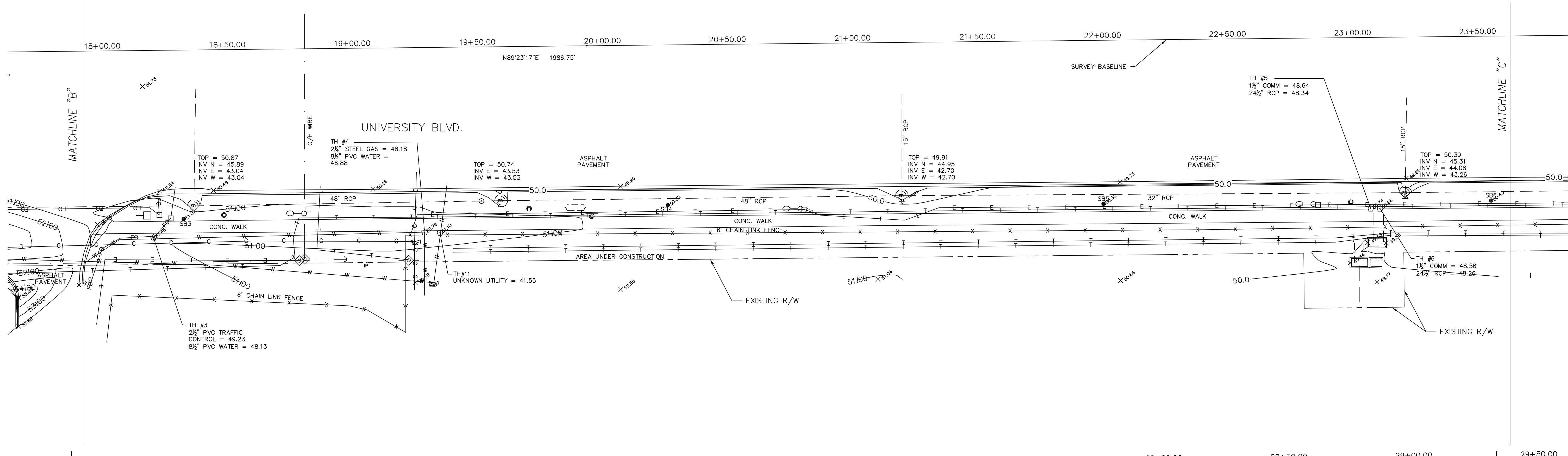
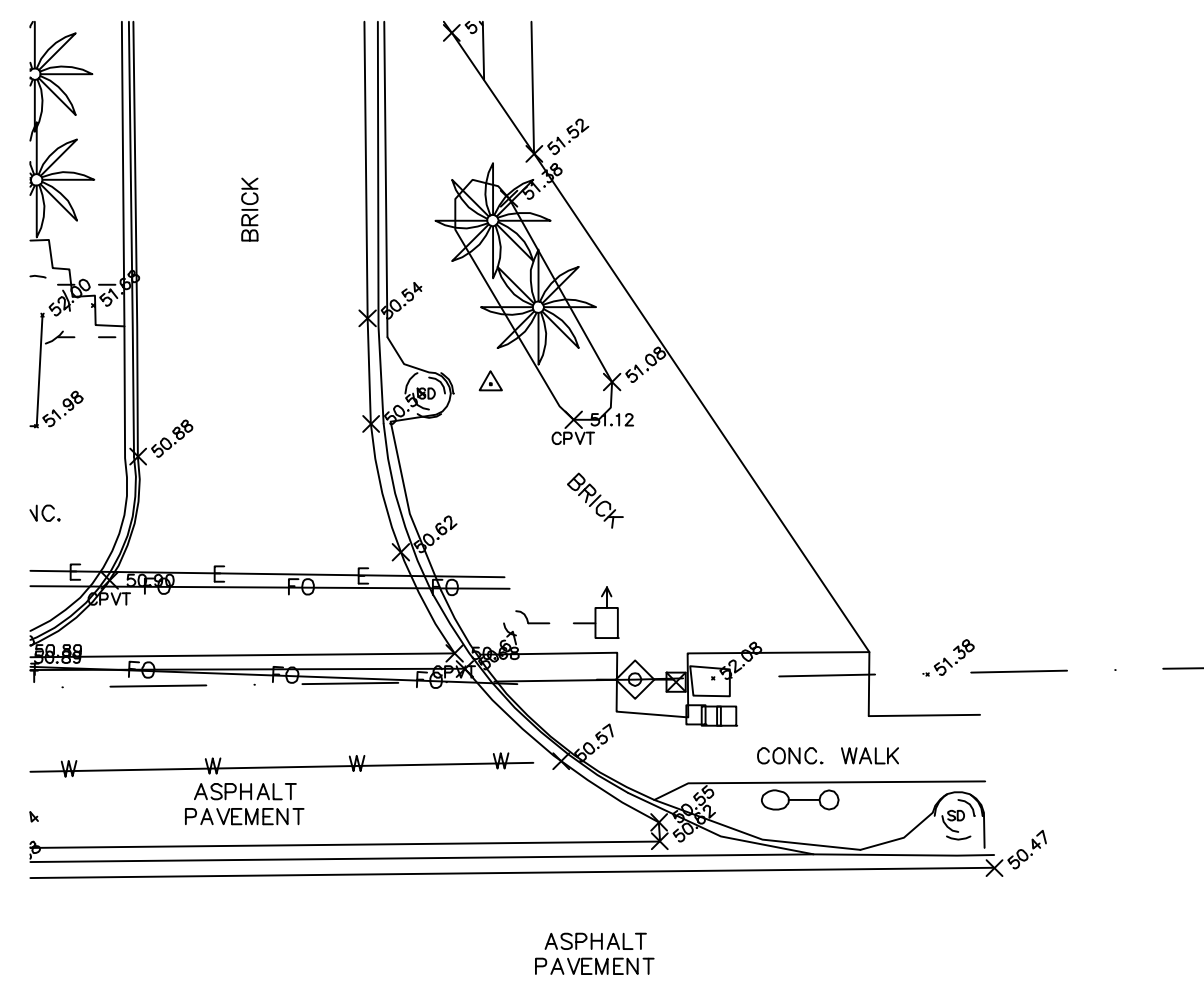
UNIVERSITY BOULEVARD

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KIMBERLY A. BUCHHEIT, P.L.S., #4538
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AND MAPPER.

BUCHHEIT ASSOCIATES, INC.
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Altamonte Springs, Florida 32701
(407) 331-0505 Fax: (407) 331-3266

| | |
|-----------------------|-------------|
| PROJ. NO. | 211011-0002 |
| SCALE | 1"=20' |
| SURVEY DATE: | 2/11/2013 |
| REVISIONS: | |
| ADD TESTHOLES/BORINGS | 9/5/2013 |
| ADD WATER LINE | 10/17/2013 |
| FLD BK. 2013/01 | PG. 5-19 |
| SHEET | 2 OF 4 |



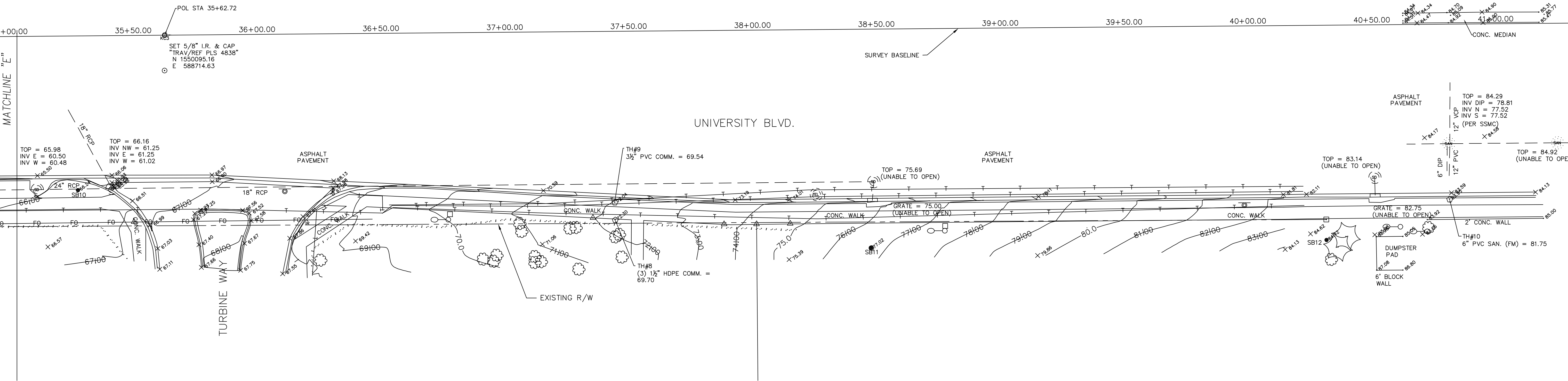
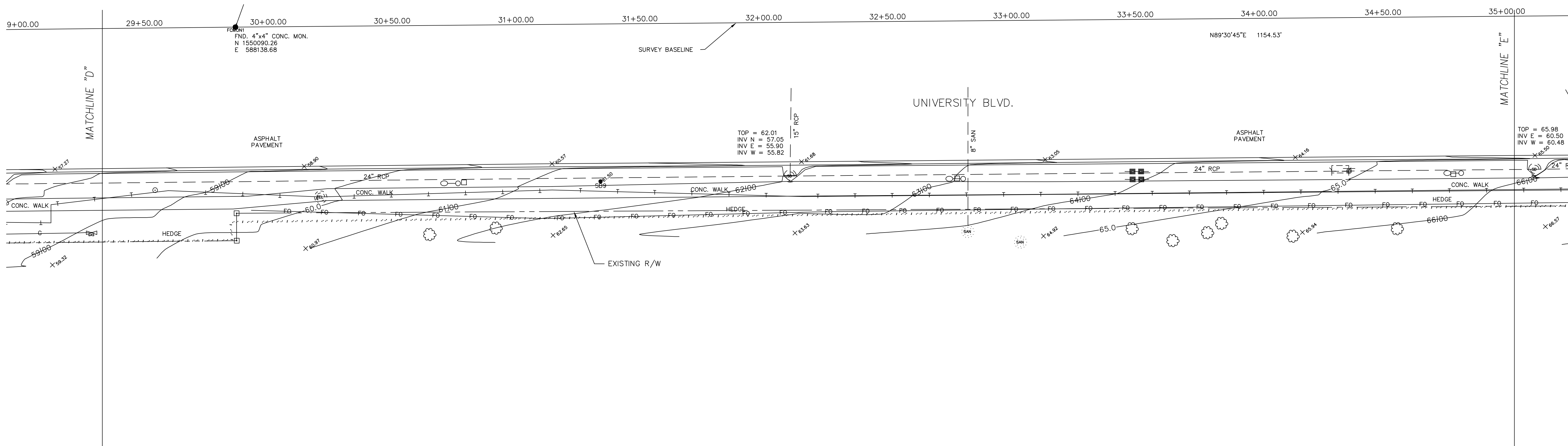
KIMBERLY A. BUCHHEIT, P.L.L.C. #4538
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 RAISED SEAL OF A FLORIDA LICENSED SURVEYOR
 AND MAPPER.

PREPARED FOR:
REISS ENGINEERING, INC.

TOPOGRAPHIC SURVEY
 UNIVERSITY BOULEVARD

BUCHHEIT ASSOCIATES, INC.
 SURVEYORS & MAPPERS
 LB # 616 Suite 1811
 Altamonte Springs, Florida 32701
 (407) 331-0505 Fax: (407) 331-3266

| | |
|-----------------------|-------------|
| PROJ. NO. | 211011-0002 |
| SCALE | 1"=20' |
| SURVEY DATE: | 2/11/2013 |
| REVISIONS: | |
| ADD TESTHOLES/BORINGS | 9/5/2013 |
| ADD WATER LINE | 10/17/2013 |
| FLD BK. 2013/01 | PG. 5-19 |
| SHEET | 3 OF 4 |



PREPARED FOR:

TOPOGRAPHIC SURVEY

BUCHHEIT ASSOCIATES, INC.
 SURVEYORS & MAPPERS
 LB # 6167 Suite 1811
 407 CenterPointe Florida 32701
 Altamonte Springs, Florida
 (407) 331-0505 Fax: (407) 331-3266

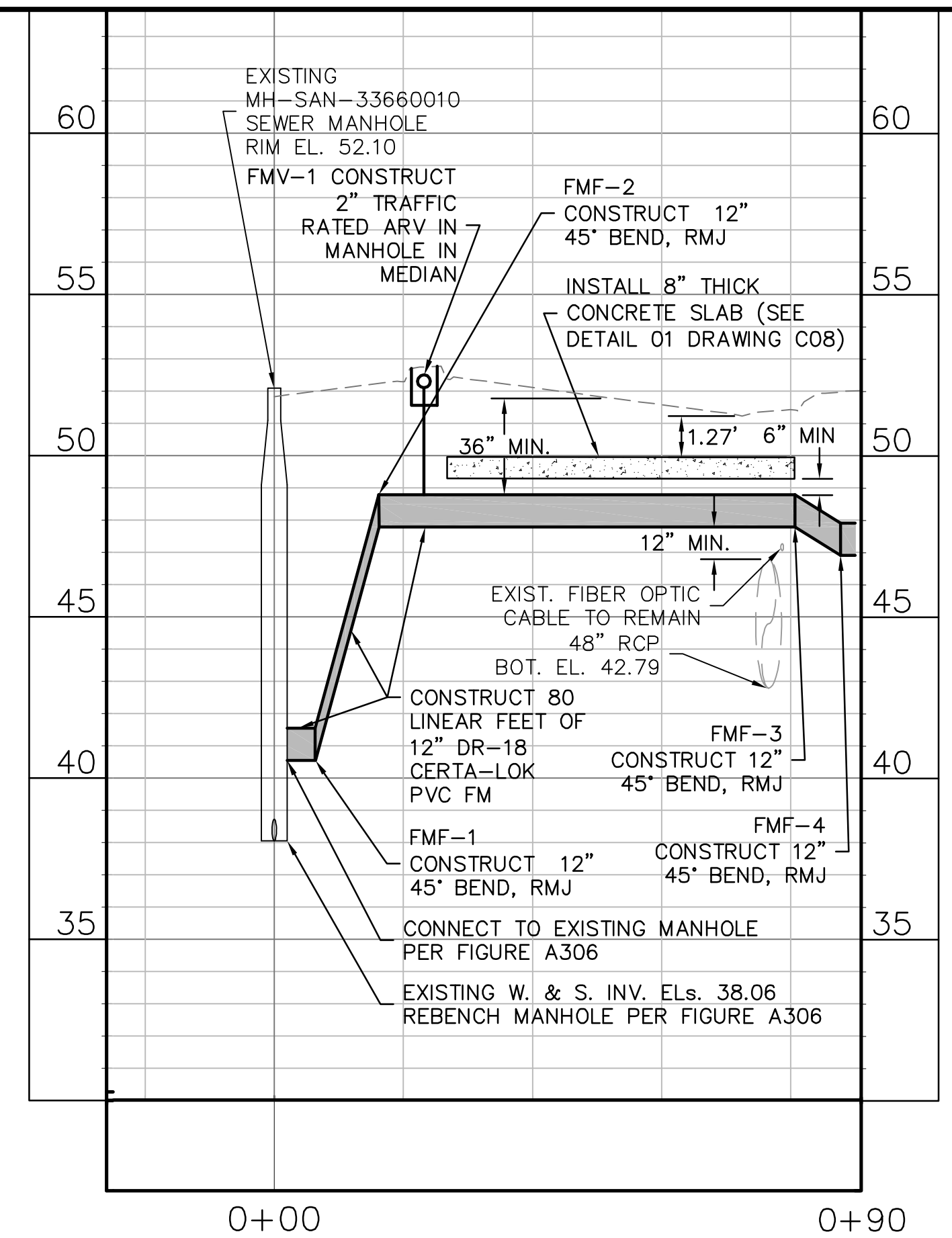
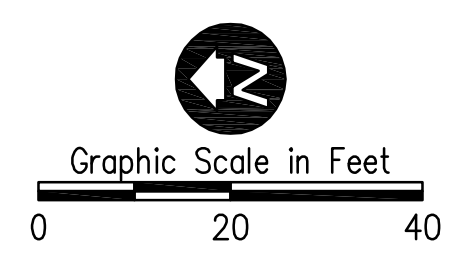
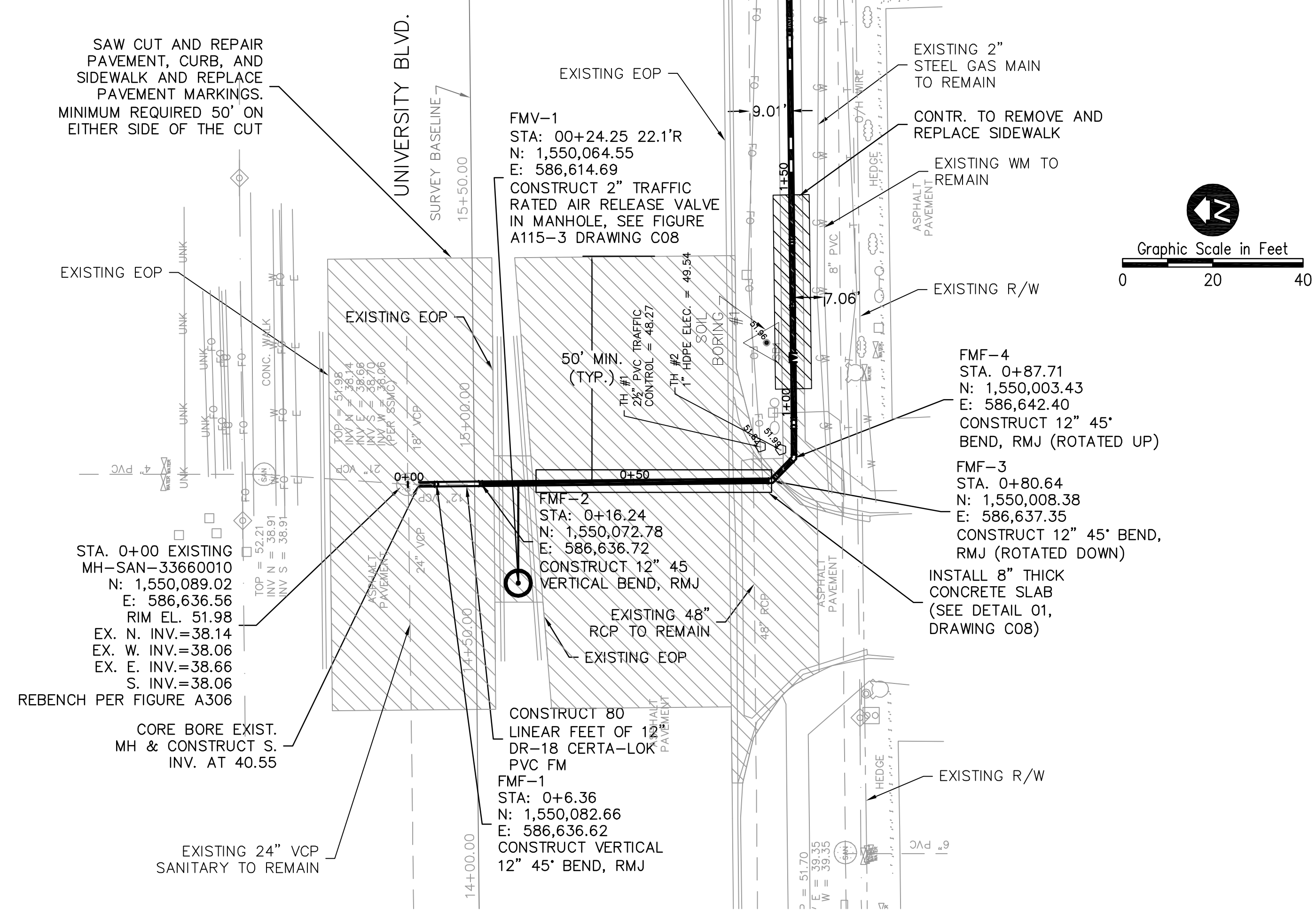
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|-----------------------|-------------|
| PROJ. NO. | 211011-0002 |
| SCALE | 1"=20' |
| SURVEY DATE: | 2/11/2013 |
| REVISIONS: | |
| ADD TESTHOLES/BORINGS | 9/5/2013 |
| ADD WATER LINE | 10/17/2013 |
| FLD BK. 2013/01 | PG. 5-19 |
| SHEET | 4 OF 4 |

KIMBERLY A. BUCHHEIT, P.L.S., #48338
 NOT VALID WITHOUT SIGNATURE AND THE ORIGINAL
 RAISED SEAL OF A FLORIDA LICENSED SURVEYOR
 AND MAPPER.

REISS ENGINEERING, INC.

UNIVERSITY BOULEVARD

Parent Sheet: Set: 110007 - ALAFAYA - UNIFORMITY - ROBERT L. LUPO Rev. on: 10/29/2014 9:45 AM Individual File Path: R:\PROJECTS\110007-OCU - ALAFAYA - UNIVERSITY - WW FM DESIGN\DESIGN\DRAWINGS\FINAL\DESIGN\10_C01.DWG



- NOTES:
1. ALL HORIZONTAL DIRECTIONAL DRILL PITS ARE SHOWN CONCEPTUALLY. CONTRACTOR TO DEVELOP A HDD LAYOUT AND SUBMIT TO OWNER/ENGINEER FOR ACCEPTANCE. ACTUAL LOCATIONS OF PITS MAY REQUIRE EXISTING UTILITIES TO BE RELOCATED.
 2. CONTRACTOR TO PROTECT EXISTING UTILITIES AND ROADWAY VIA SHEETING AND SHORING FOR FULL DEPTH OF EXCAVATION
 3. OPEN CUT OF TRAFFIC LANES TO BE COMPLETED DURING NON-PEAK HOURS.
 4. CONTRACTOR TO PROVIDE ALL MOT IN ACCORDANCE WITH OC PUBLIC WORKS REQUIREMENTS, INCLUDING PEDESTRIAN MOT AS NECESSARY.
 5. REFER TO SPECIFICATION SECTION 02777 FOR CLOSE TOLERANCE HDD REQUIREMENTS.



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 1016 Spring Villas Pt.
 Winter Springs, FL 32708

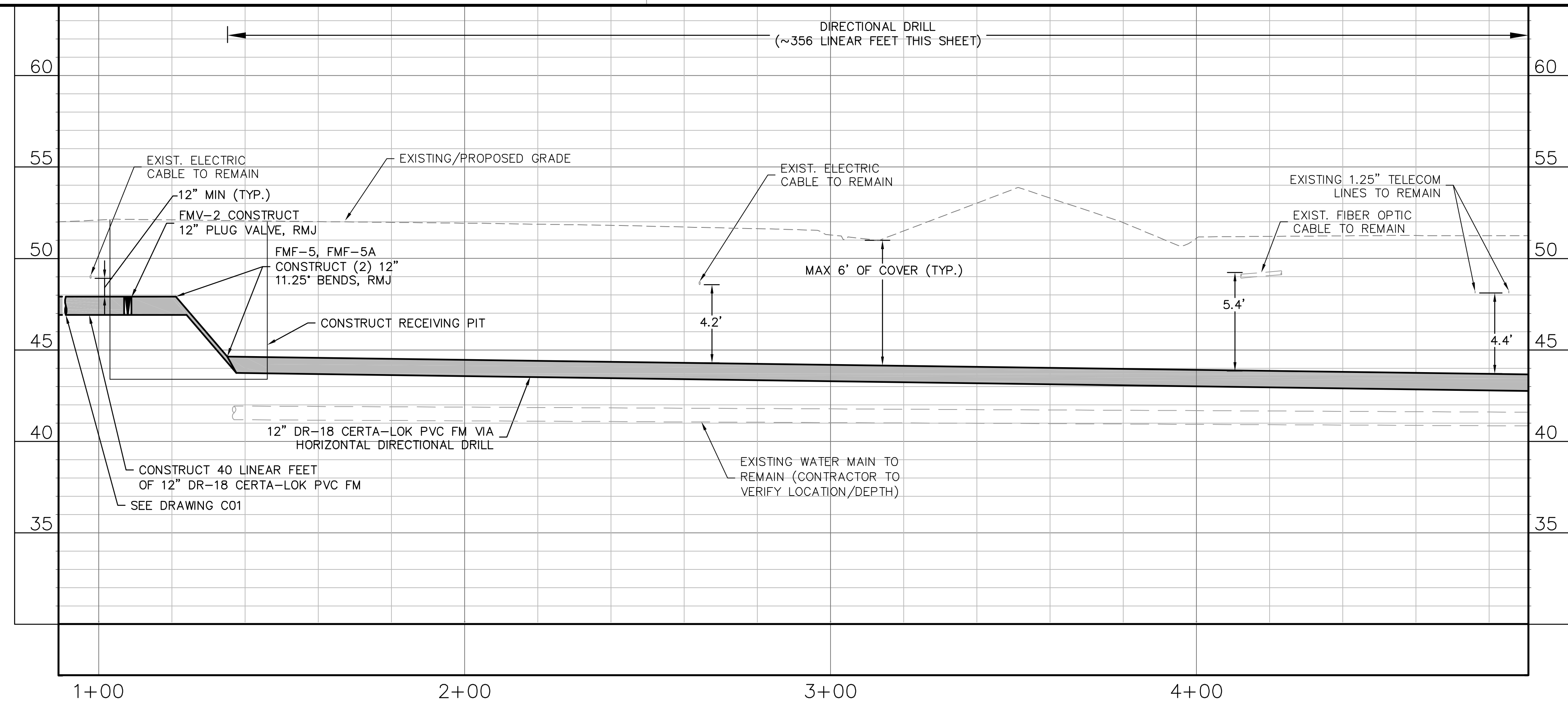
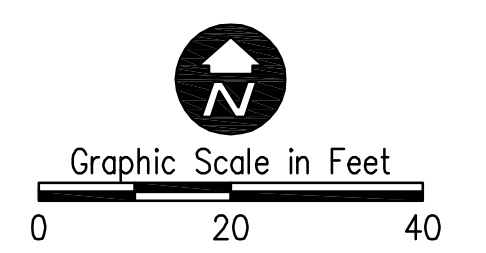
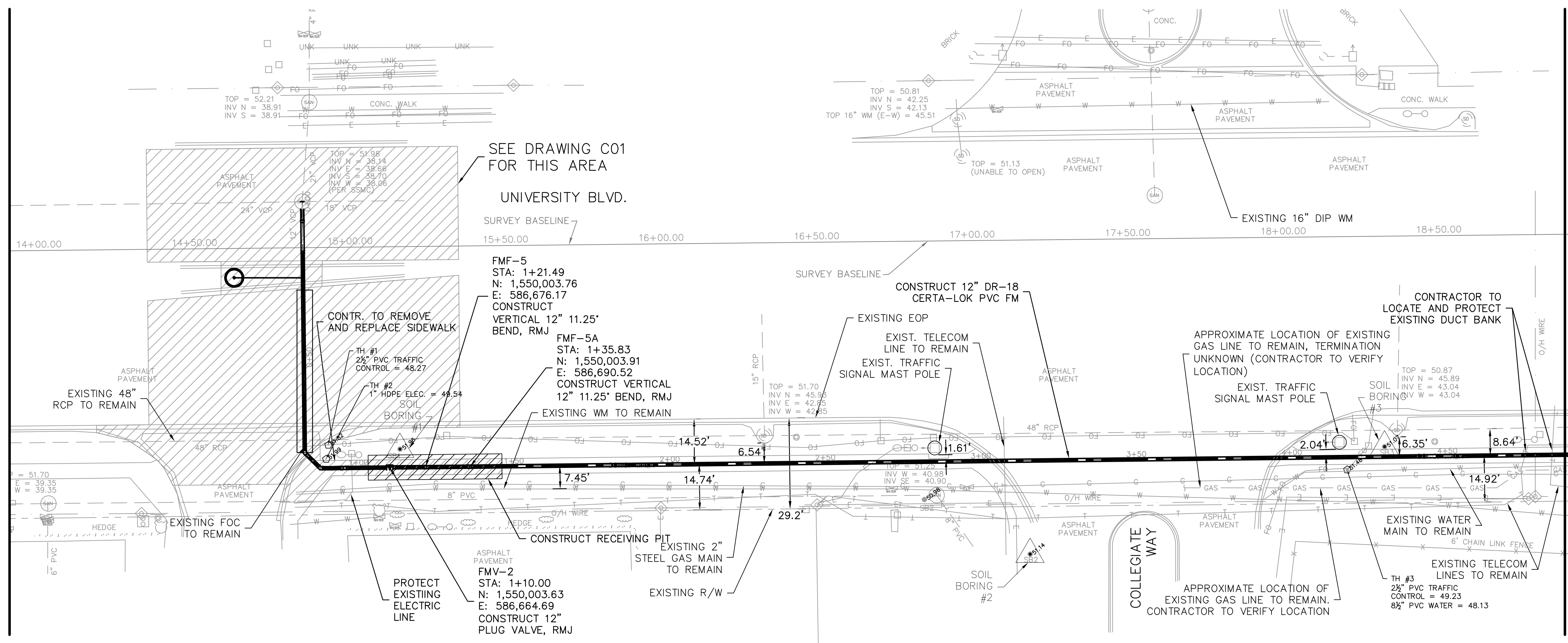
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- NOTES:
1. ALL HORIZONTAL DIRECTIONAL DRILL PITS ARE SHOWN CONCEPTUALLY. CONTRACTOR TO DEVELOP A HDD LAYOUT AND SUBMIT TO OWNER/ENGINEER FOR ACCEPTANCE. ACTUAL LOCATIONS OF PITS MAY REQUIRE EXISTING UTILITIES TO BE RELOCATED.
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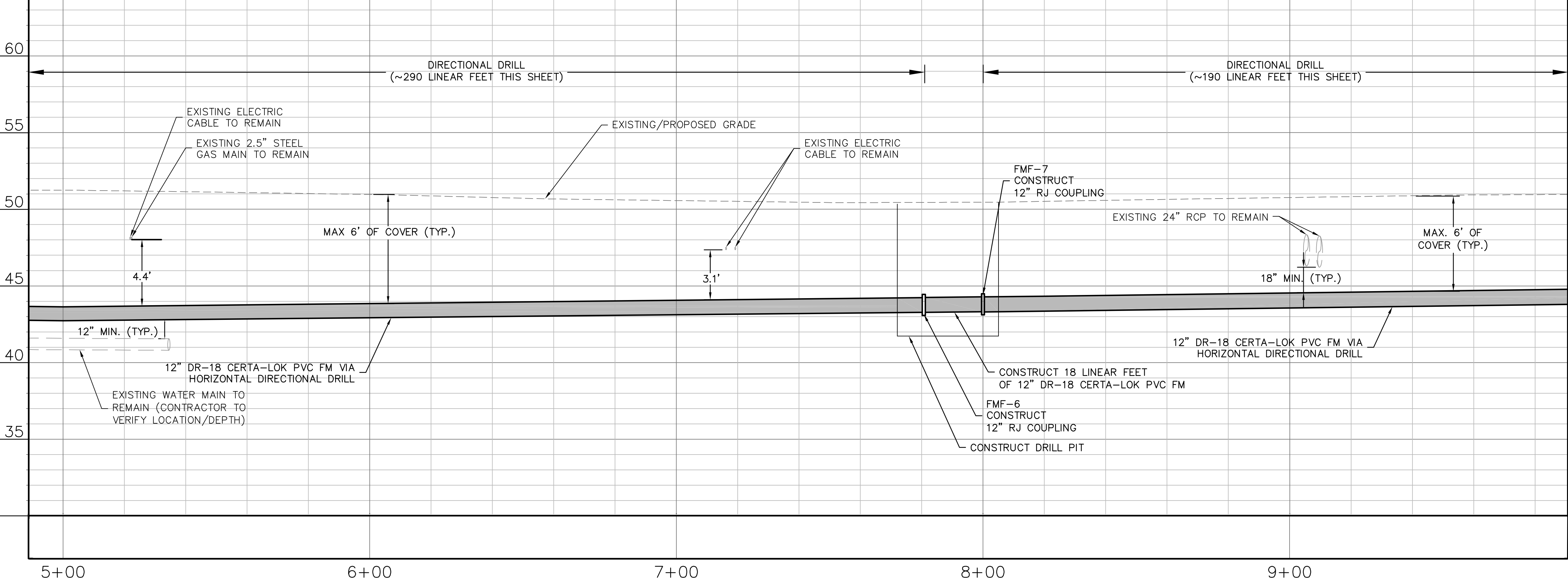
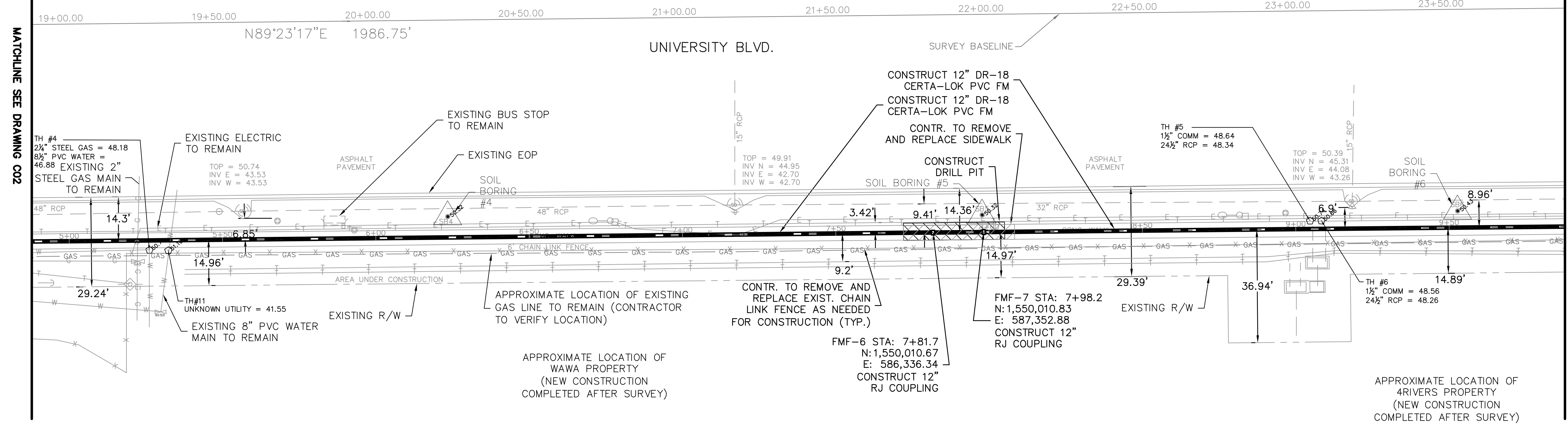
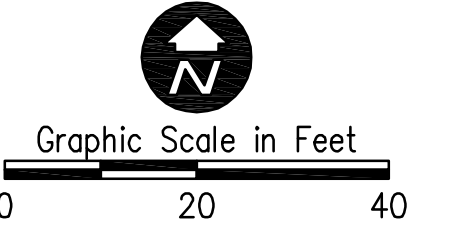
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- NOTES:
- ALL HORIZONTAL DIRECTIONAL DRILL PITS ARE SHOWN CONCEPTUALLY. CONTRACTOR TO DEVELOP A HDD LAYOUT AND SUBMIT TO OWNER/ENGINEER FOR ACCEPTANCE. ACTUAL LOCATIONS OF PITS MAY REQUIRE EXISTING UTILITIES TO BE RELOCATED.
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 - REFER TO SPECIFICATION SECTION 02777 FOR CLOSE TOLERANCE HDD REQUIREMENTS.
 - WAWA AND 4 RIVERS DEVELOPMENTS WERE CONSTRUCTED AFTER SURVEY WAS COMPLETED. CONTRACTOR TO VERIFY EXISTING CONDITIONS IN THE AREA OF THESE PROPERTIES.



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 Winter Springs, FL 32708

Designed_MDP
 Drawn_RLL
 Checked_TSE
 Reviewed_CIK
 Approved_MDP

LINE IS 3" AT FULL SIZE

Date 11/2014

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 UNIVERSITY BOULEVARD 12-INCH FORCE MAIN

CIVIL

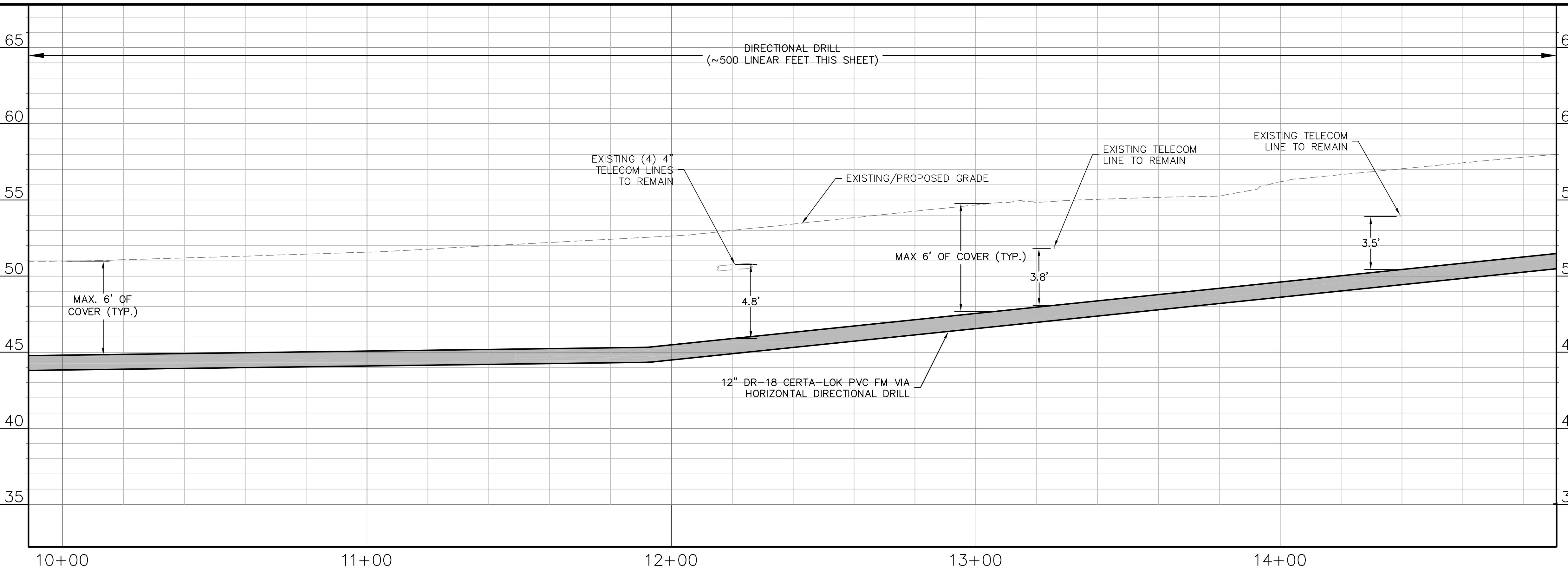
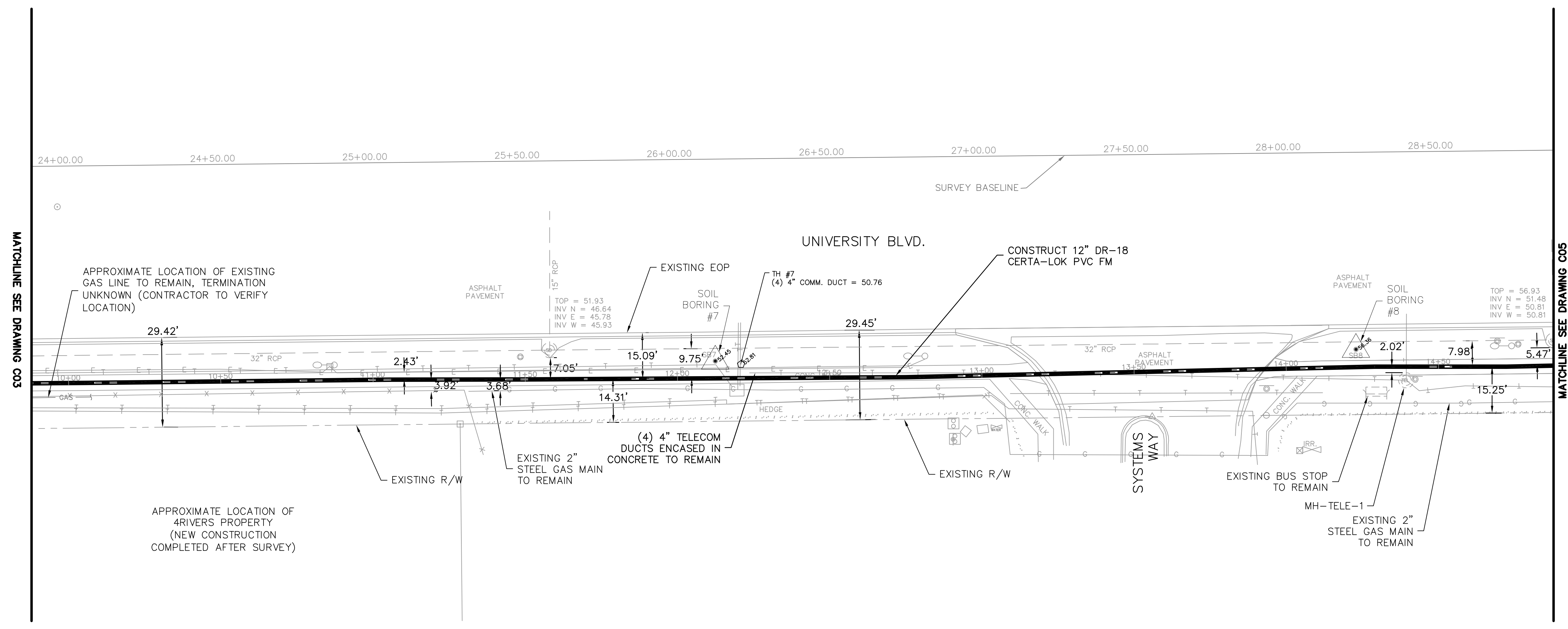
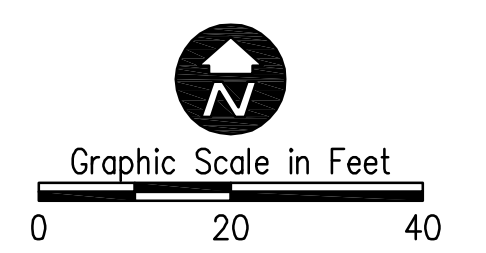
PLAN & PROFILE (STA. 4+90 TO STA. 9+90)

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- NOTES:
1. ALL HORIZONTAL DIRECTIONAL DRILL PITS ARE SHOWN CONCEPTUALLY. CONTRACTOR TO DEVELOP A HDD LAYOUT AND SUBMIT TO OWNER/ENGINEER FOR ACCEPTANCE. ACTUAL LOCATIONS OF PITS MAY REQUIRE EXISTING UTILITIES TO BE RELOCATED.
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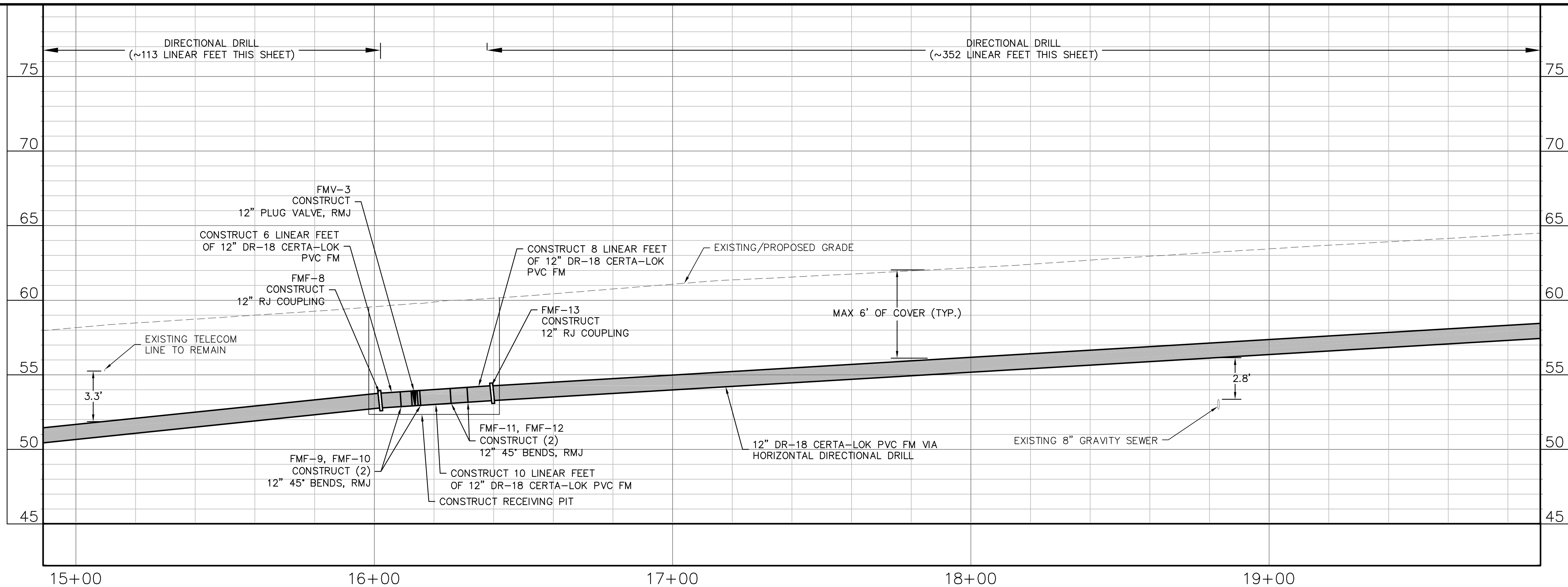
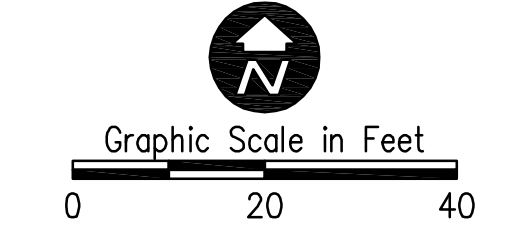
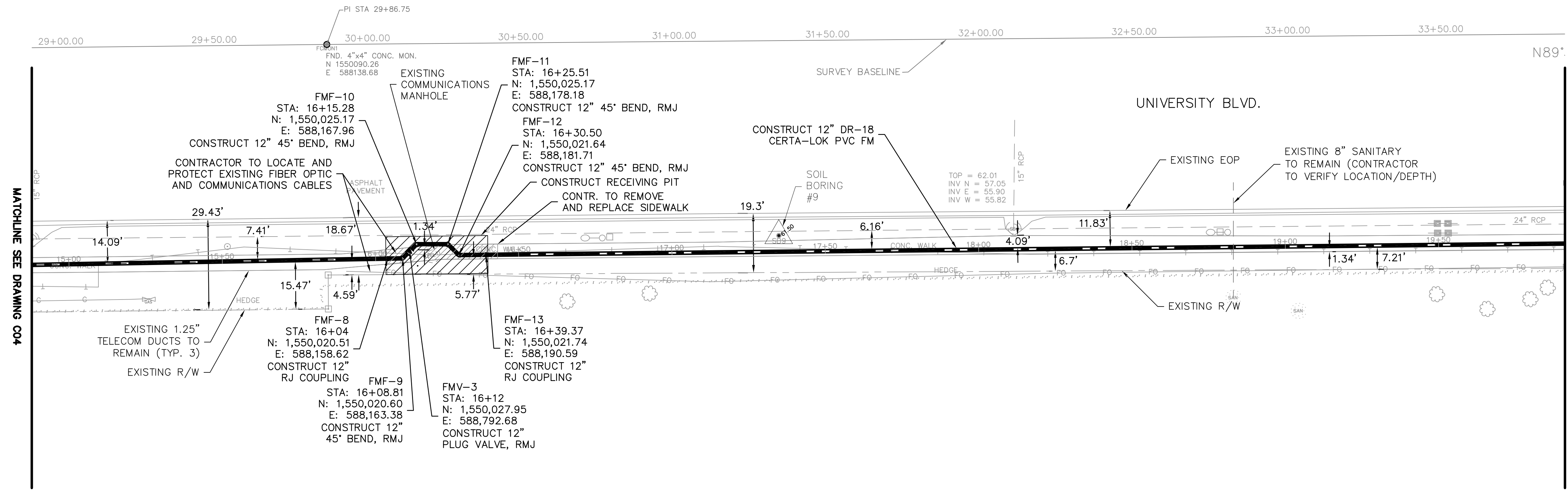
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 1016 Spring Villas Pt.
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- NOTES:
1. ALL HORIZONTAL DIRECTIONAL DRILL PITS ARE SHOWN CONCEPTUALLY. CONTRACTOR TO DEVELOP A HDD LAYOUT AND SUBMIT TO OWNER/ENGINEER FOR ACCEPTANCE. ACTUAL LOCATIONS OF PITS MAY REQUIRE EXISTING UTILITIES TO BE RELOCATED.
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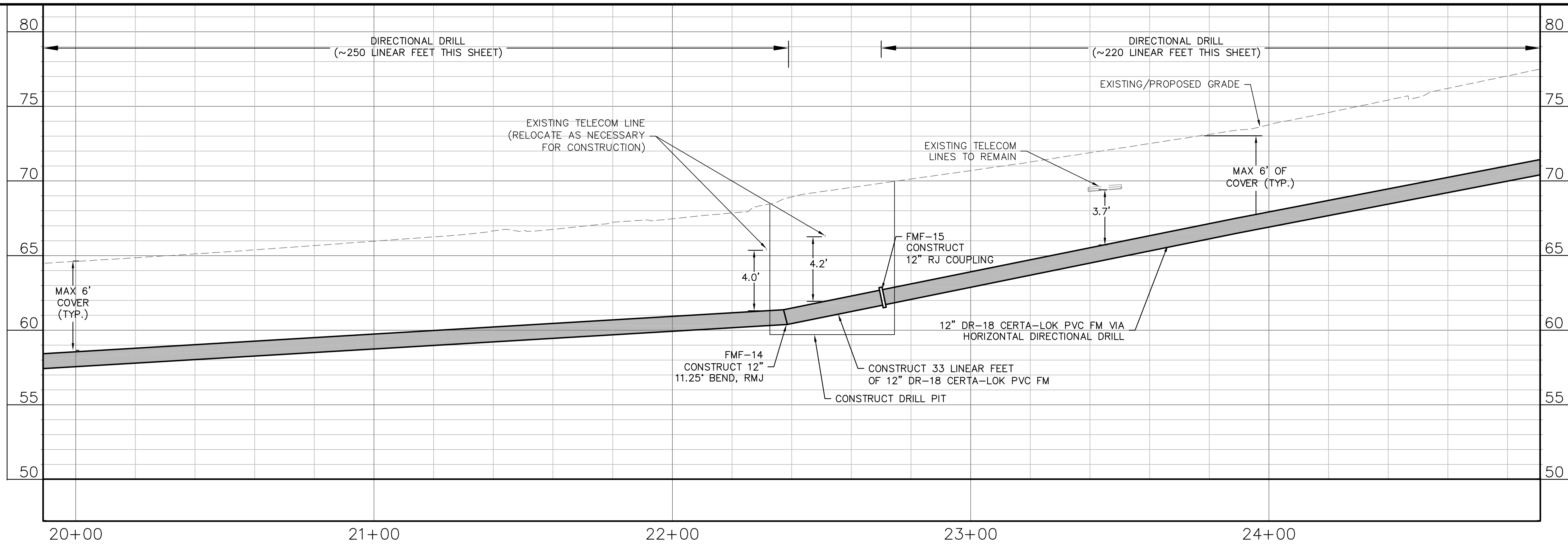
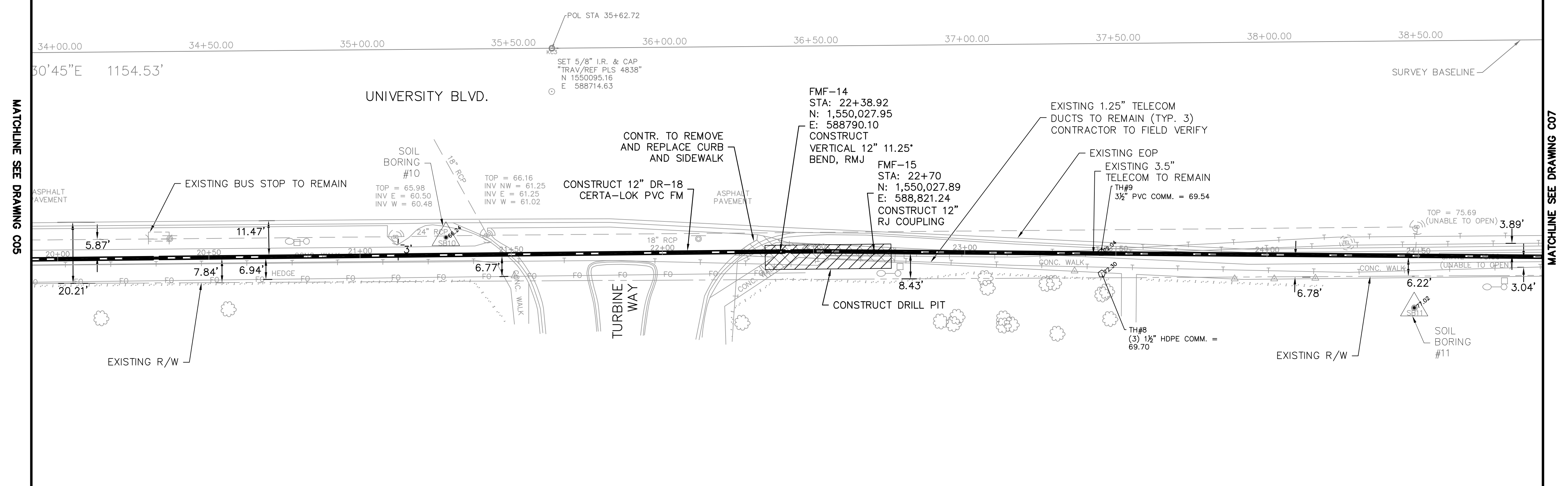
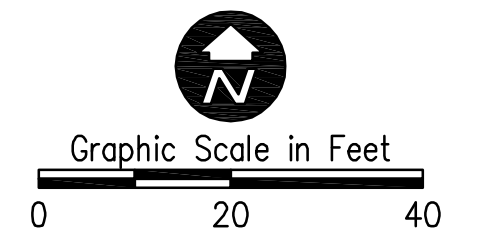
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 Winter Springs, FL 32708

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- NOTES:
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 1016 Spring Villas Pt.
 Winter Springs, FL 32708

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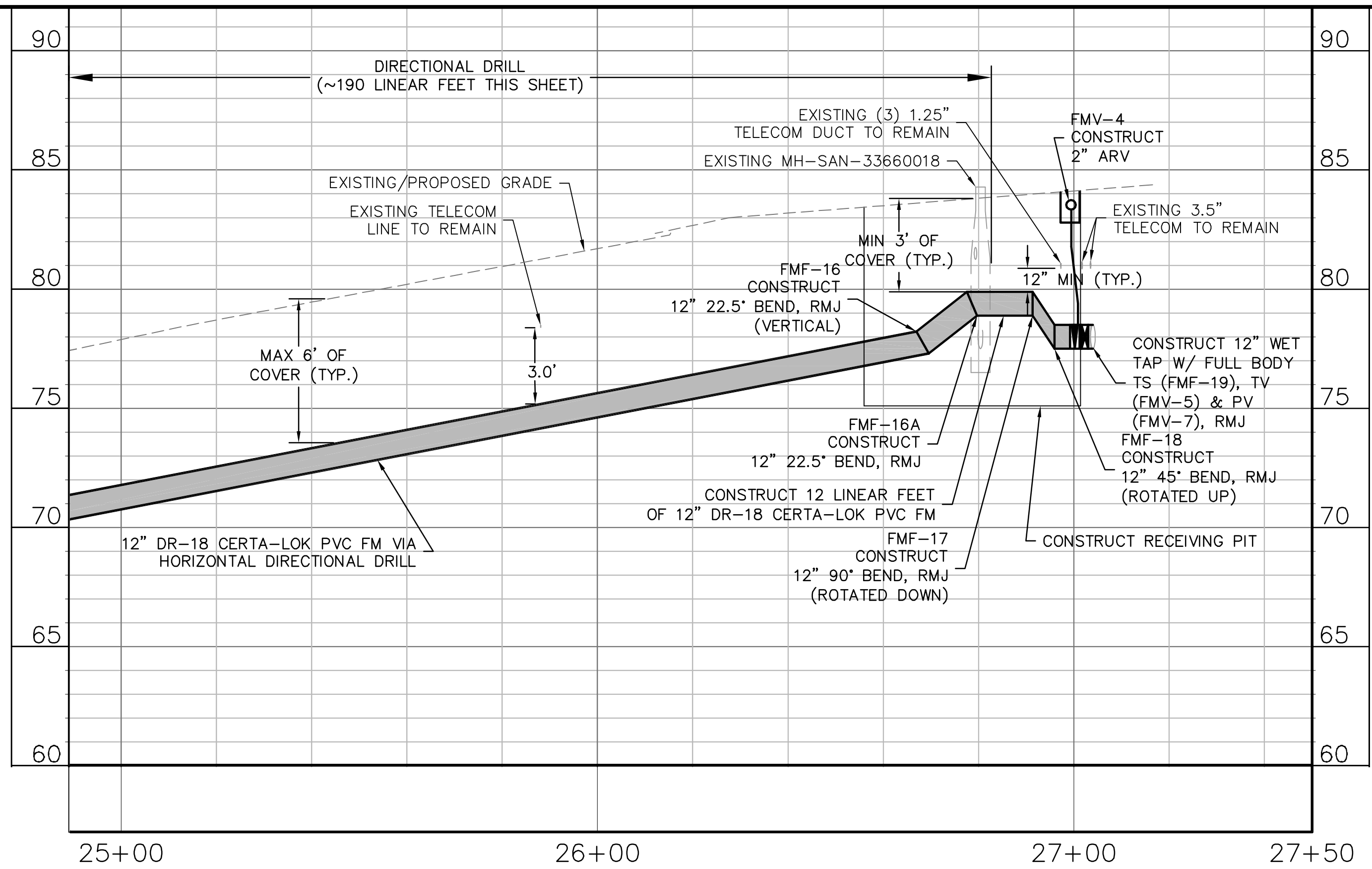
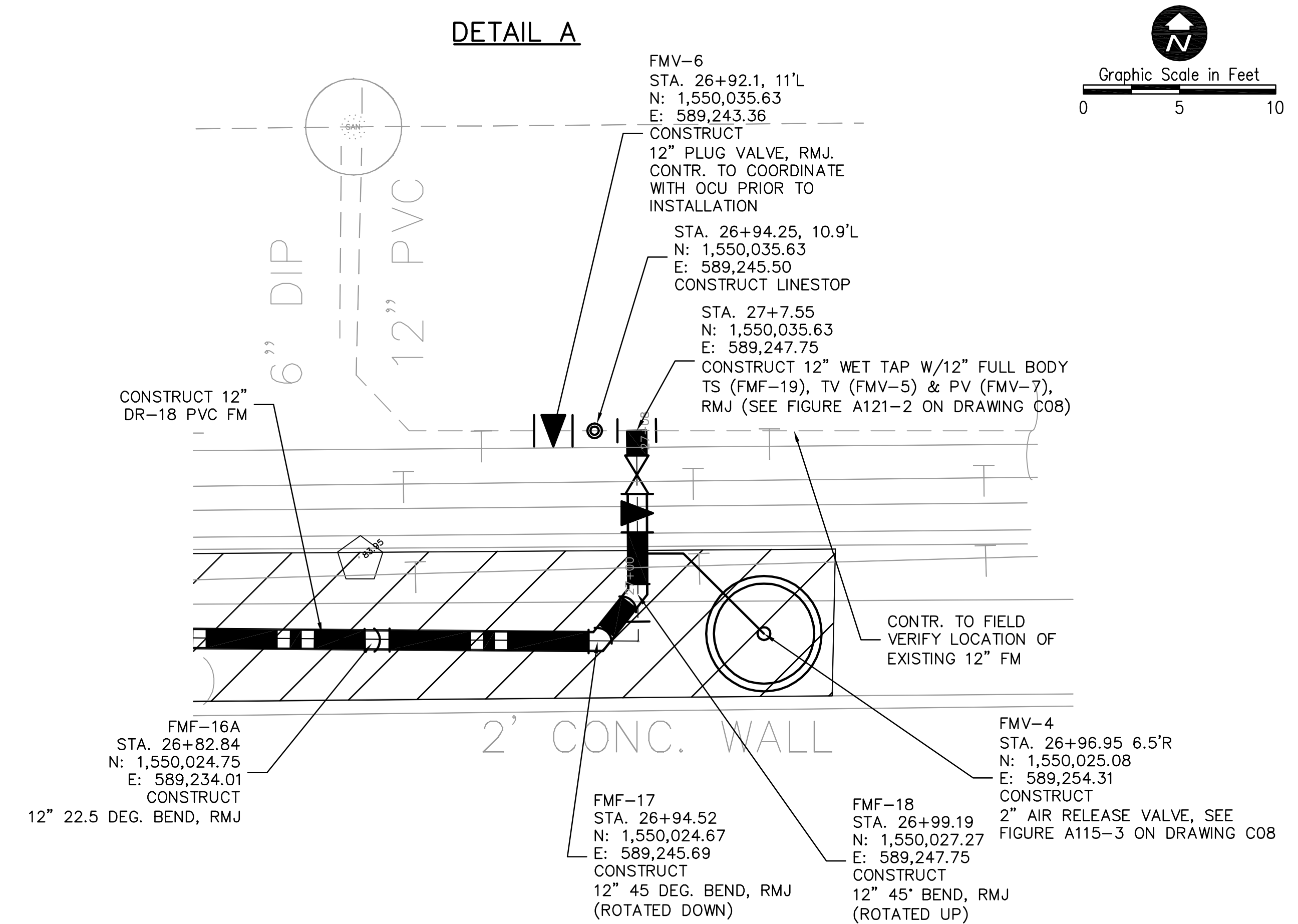
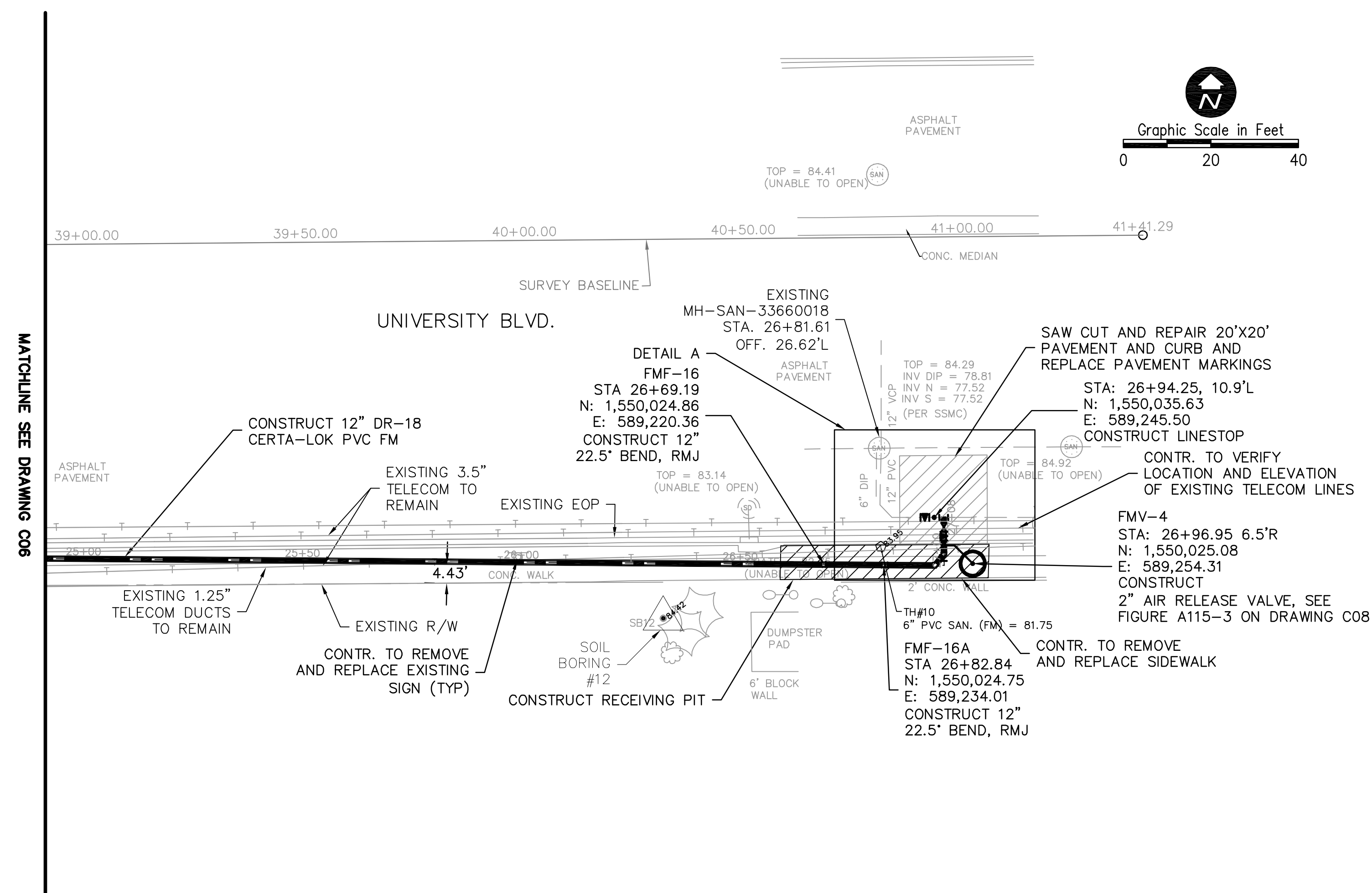
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- NOTES:**
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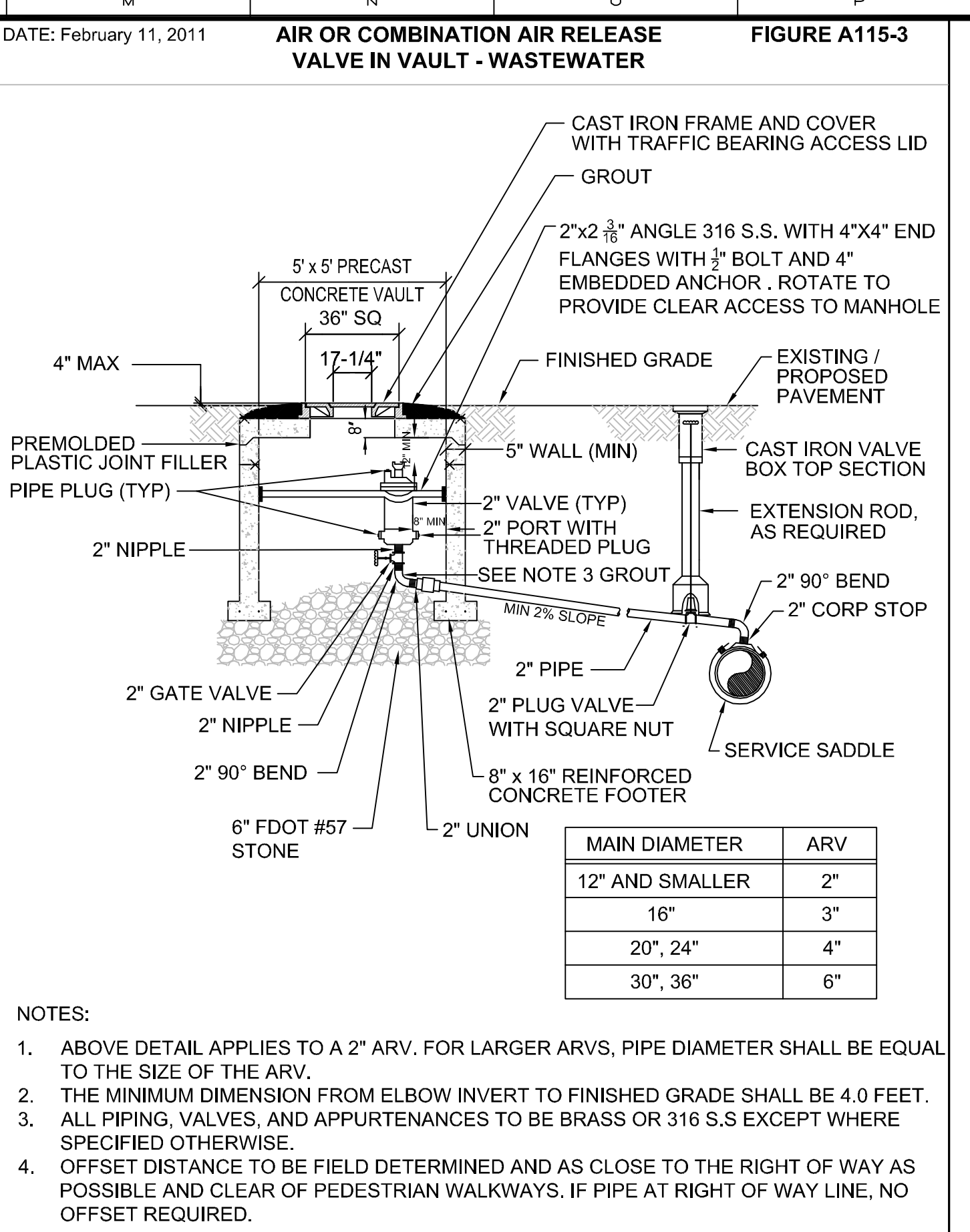
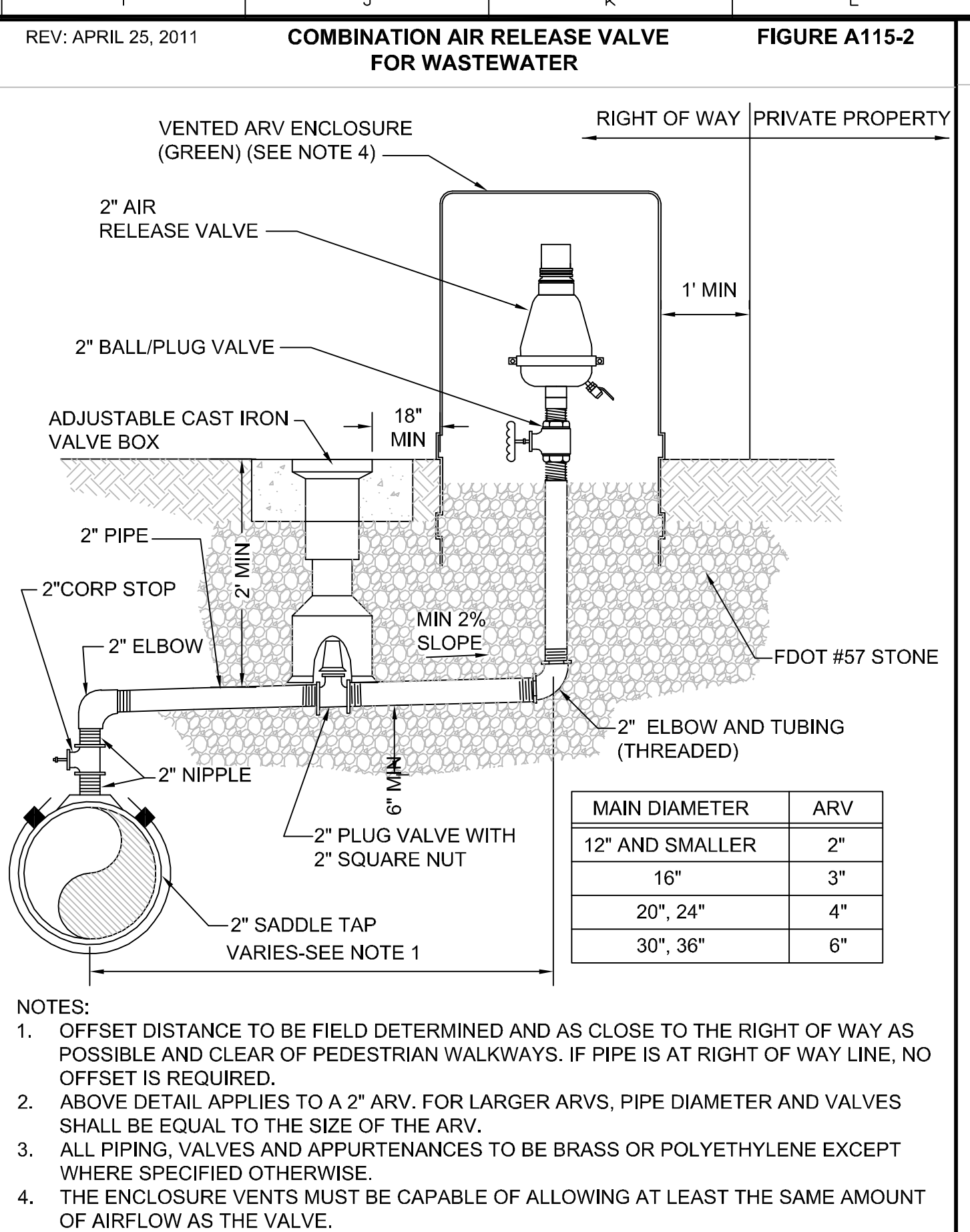
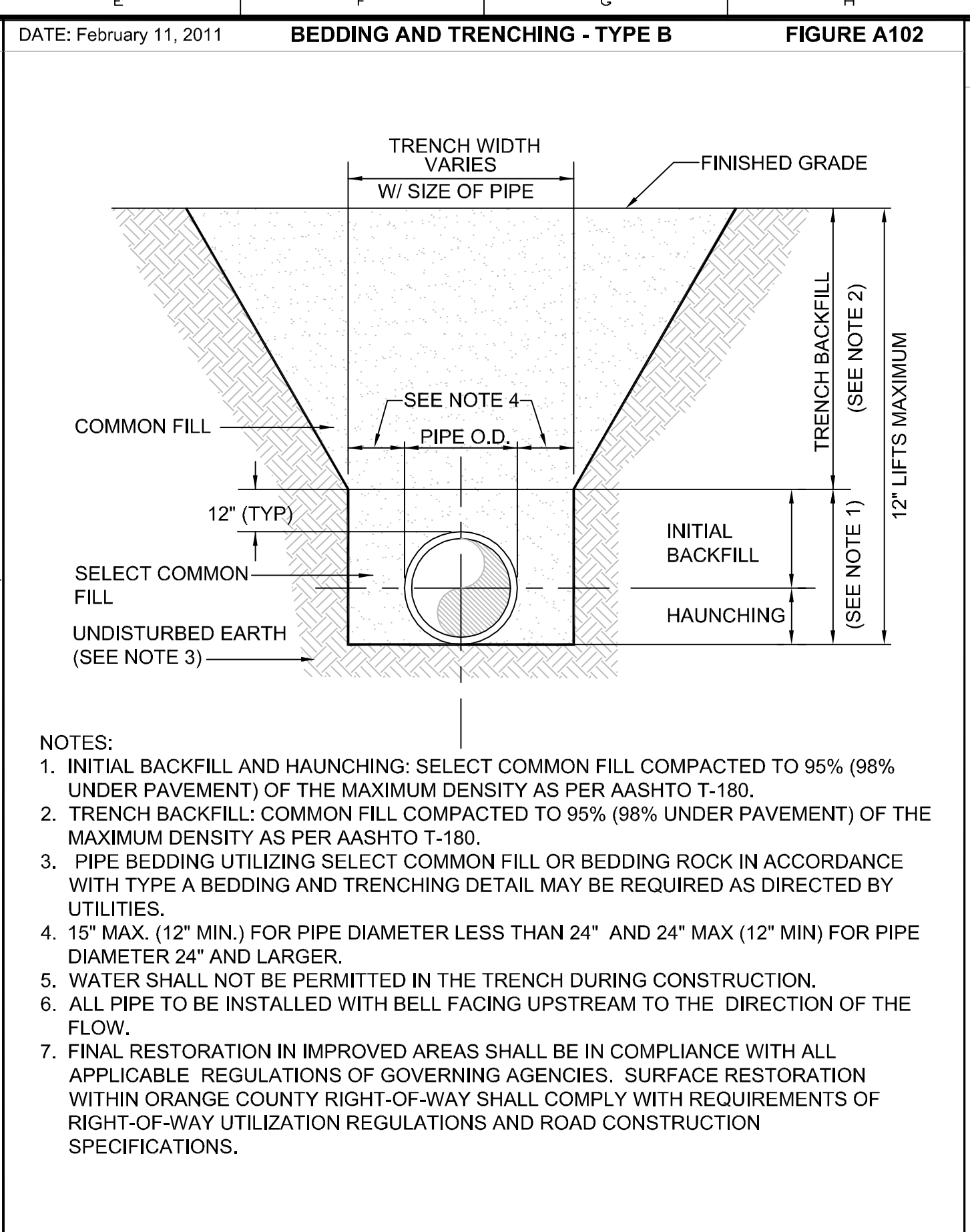
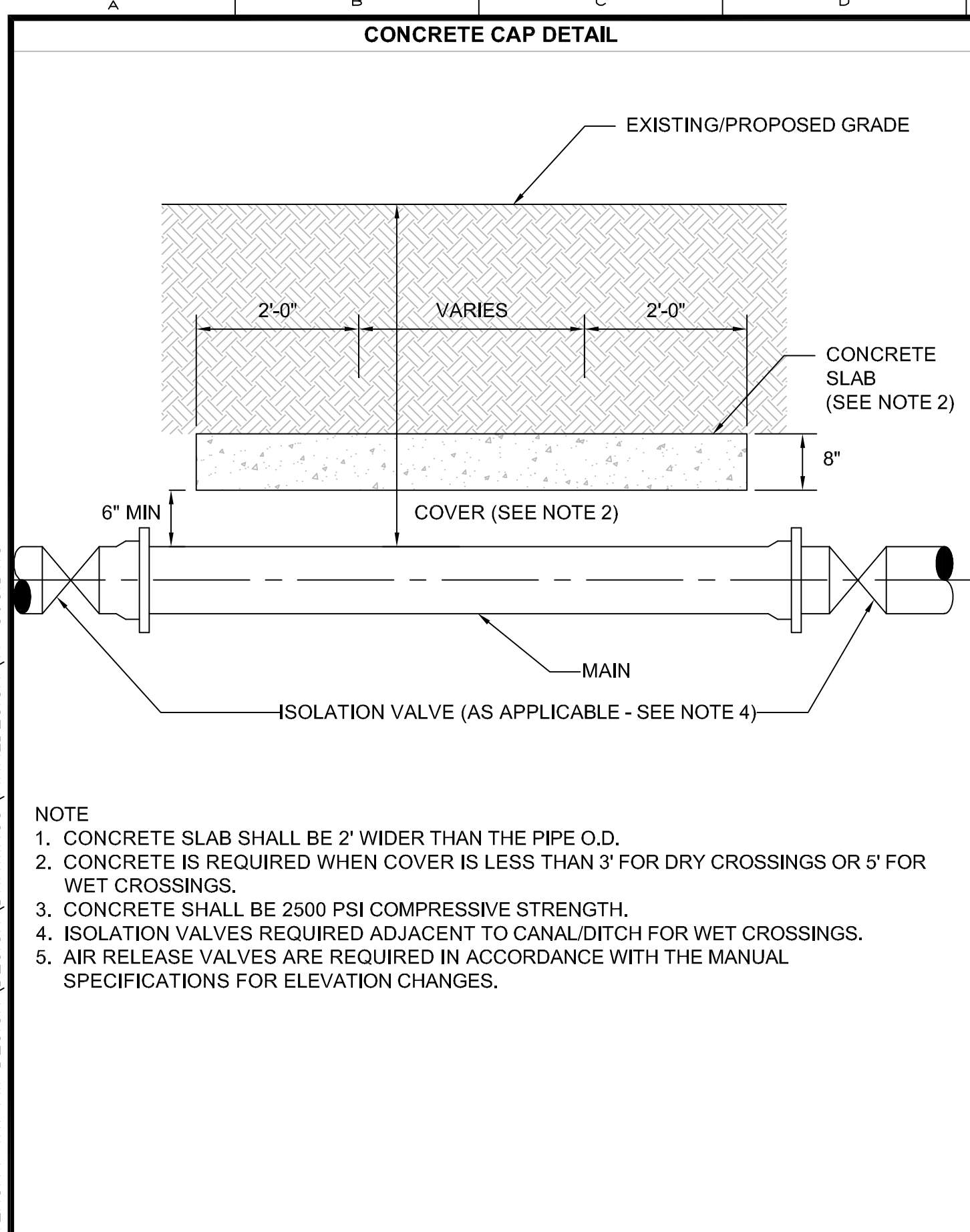
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 1016 Spring Villas Pt.
 Winter Springs, FL 32708

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ORANGE COUNTY UTILITIES
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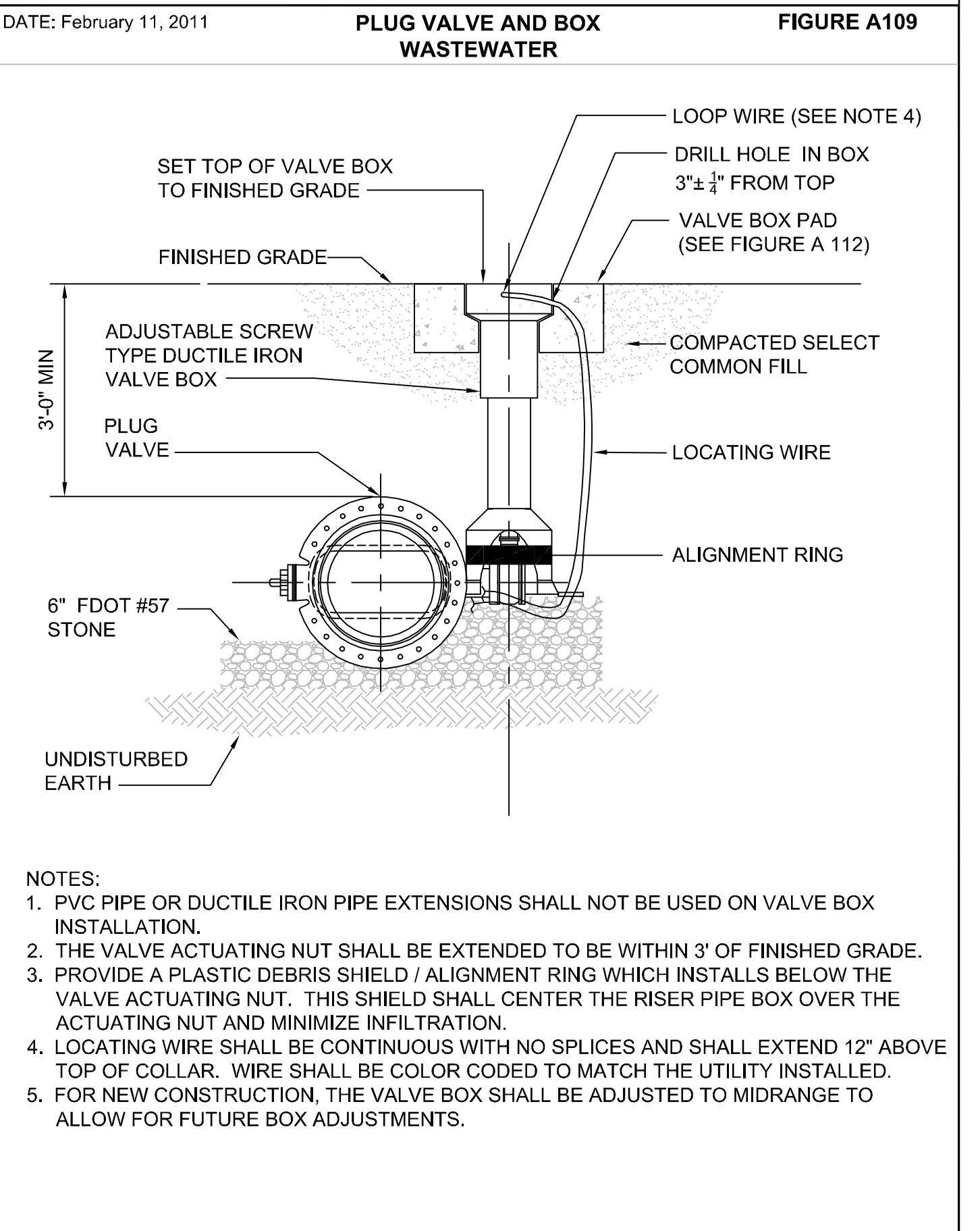
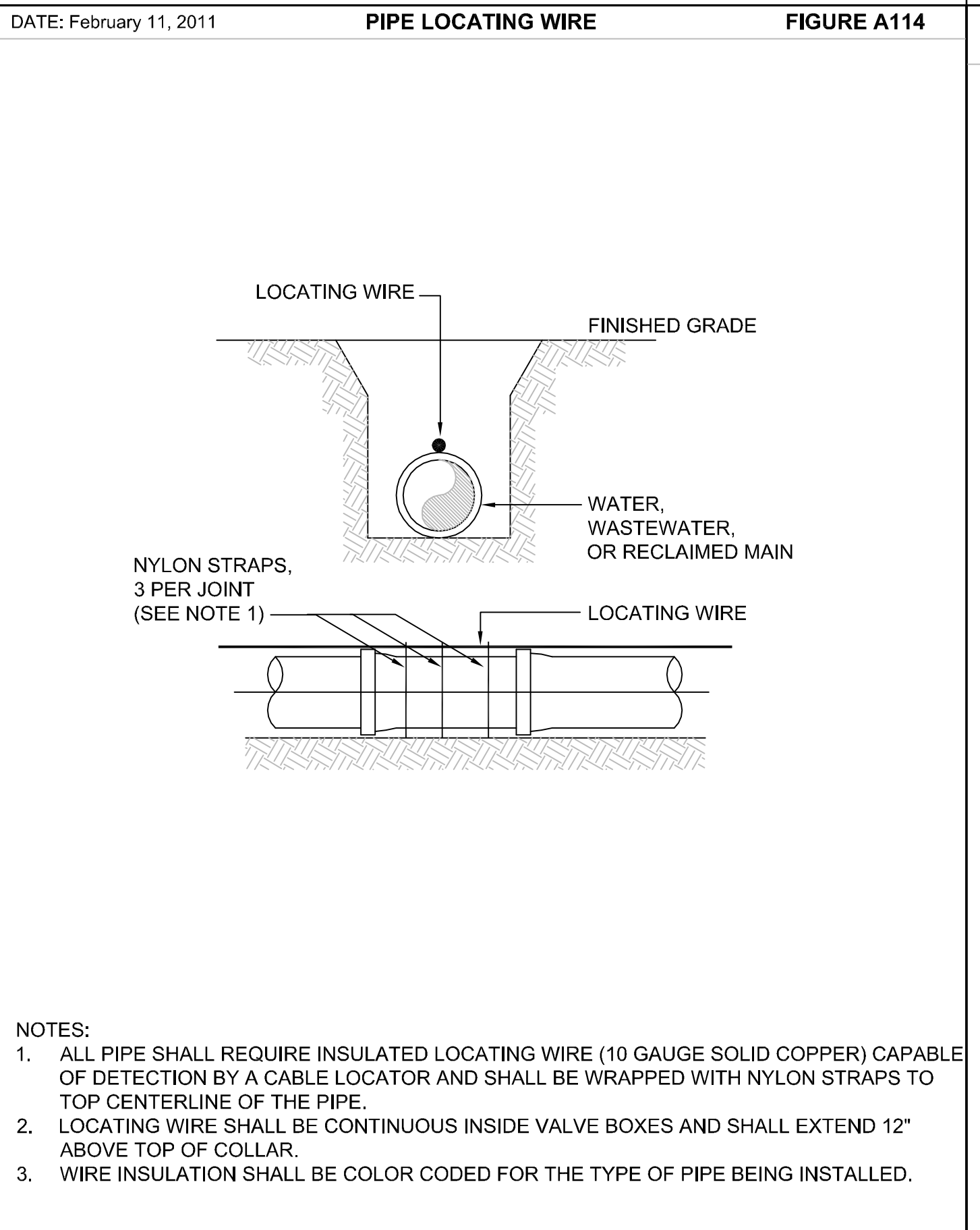
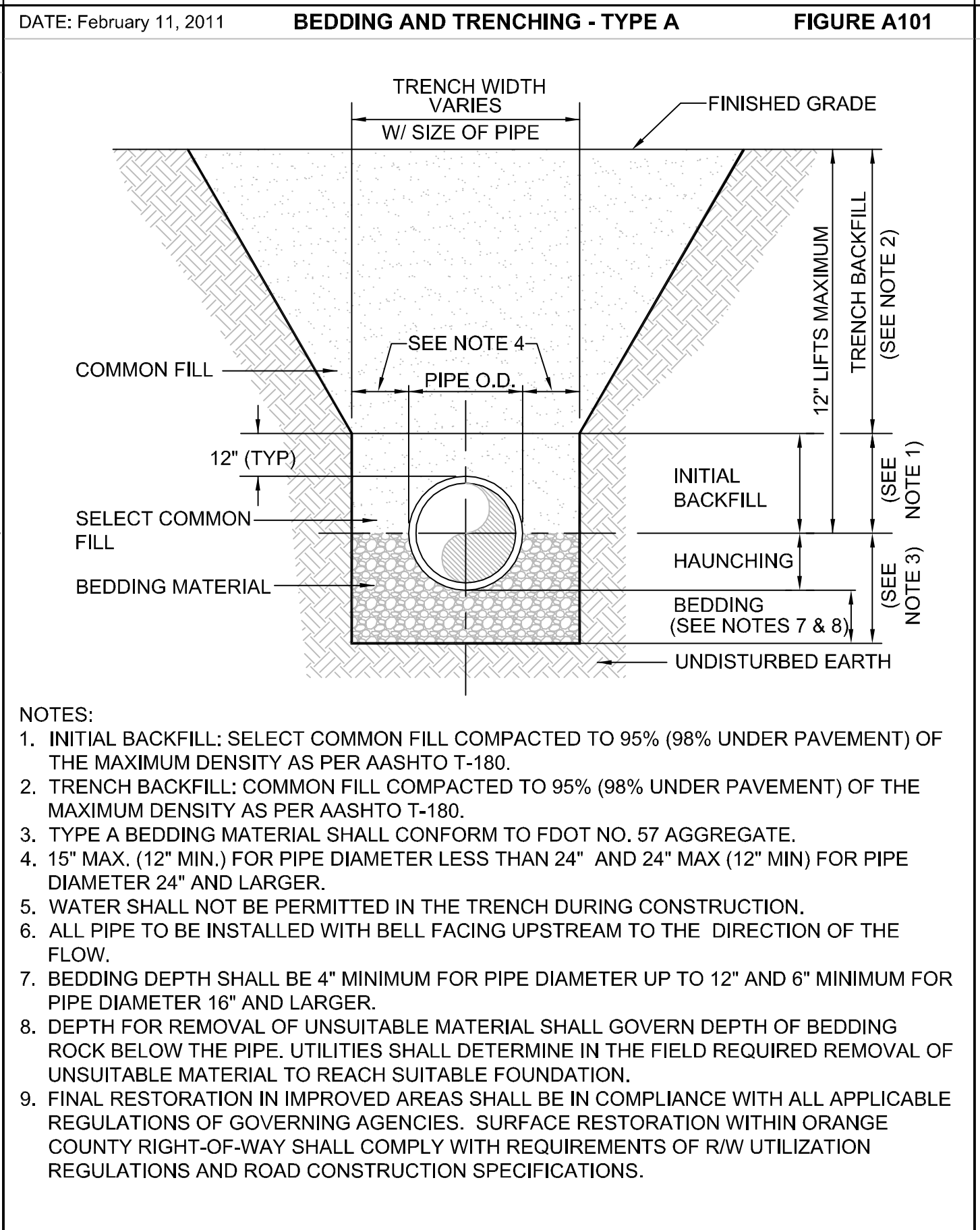
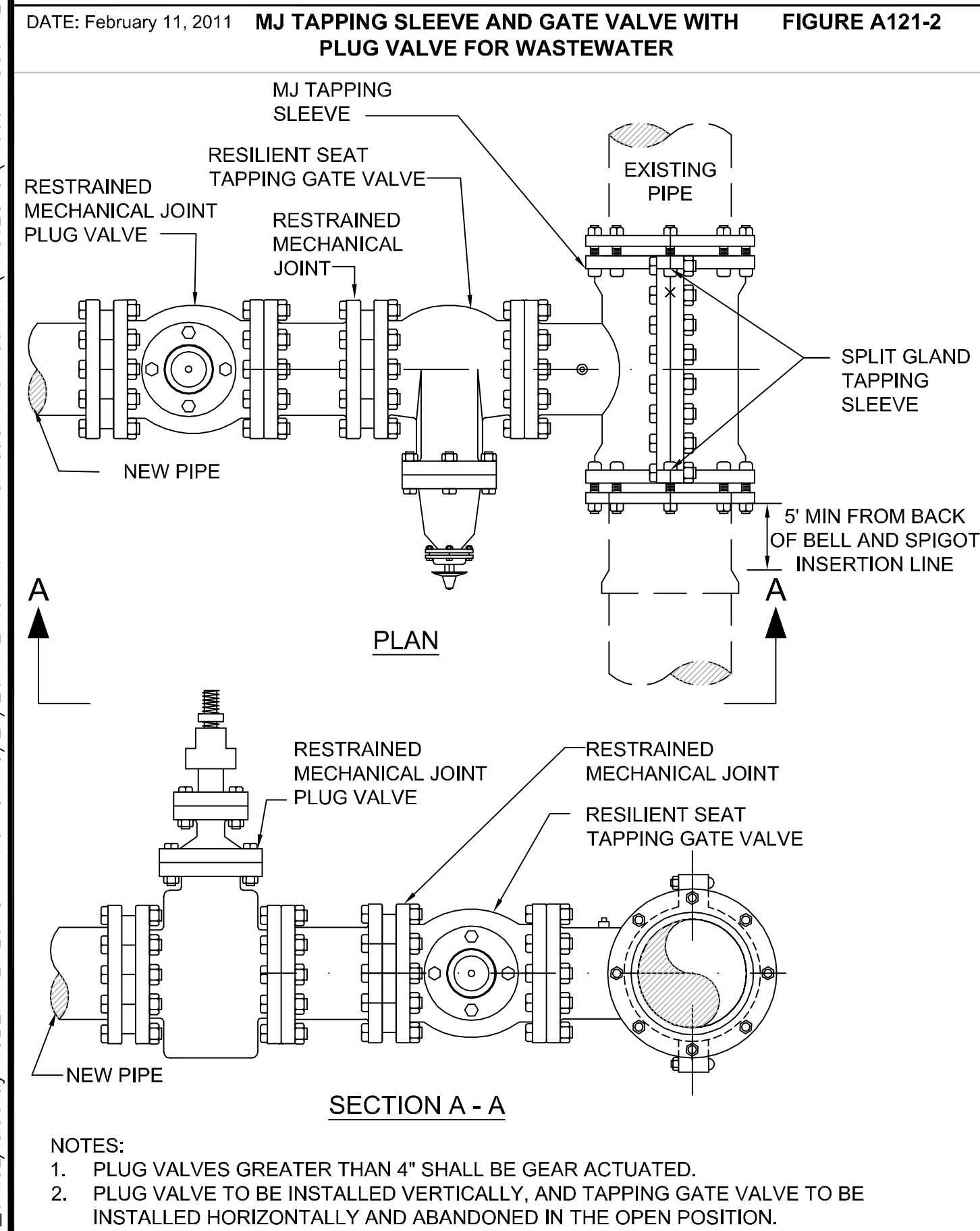


01 DETAIL
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02 DETAIL
SCALE: N.T.S.

03 DETAIL
SCALE: N.T.S.

04 DETAIL
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05 DETAIL
SCALE: N.T.S.

06 DETAIL
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07 DETAIL
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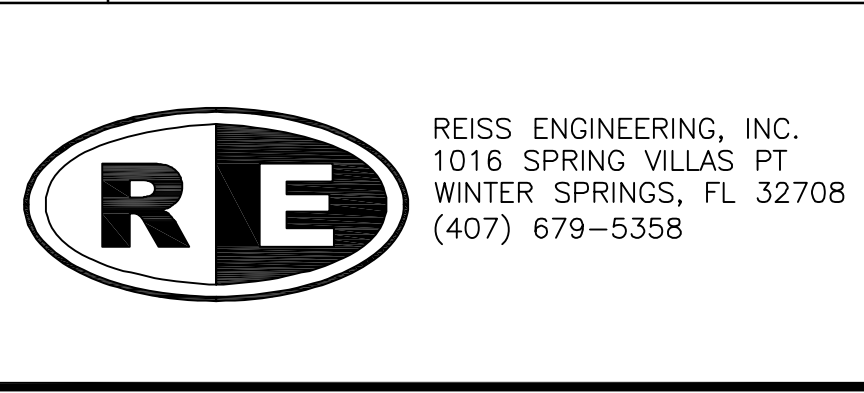


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Winter Springs, FL 32708

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UNIVERSITY BOULEVARD 12-INCH FORCE MAIN
CIVIL
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| DRAWING NO.: | C08 |
| REVISION: | 0 |
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**RESTRAINED PIPE TABLE
WASTEWATER FORCE MAINS**

FIGURE A104-2

| TYPE | PVC PIPE SIZE | | | | | | | | | |
|-----------------------|--|----|----|-----|-----|-----|-----|-----|-----|-----|
| | 4" | 6" | 8" | 10" | 12" | 16" | 20" | 24" | 30" | 36" |
| 90° BEND | 18 | 24 | 31 | 38 | 43 | 55 | 65 | 75 | 88 | 100 |
| 45° BEND | 8 | 10 | 13 | 15 | 18 | 23 | 26 | 31 | 38 | 43 |
| 22-1/2° BEND | 4 | 5 | 6 | 8 | 9 | 11 | 13 | 15 | 18 | 20 |
| 11-1/4° BEND | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 11 | 13 |
| PLUG OR BRANCH OF TEE | 38 | 50 | 65 | 79 | 90 | 117 | 139 | 163 | 194 | 223 |
| VALVE | 19 | 25 | 32 | 40 | 45 | 59 | 70 | 82 | 98 | 112 |
| REDUCER | VARIES BY SIZE; TO BE DETERMINED BY THE DESIGN ENGINEER. | | | | | | | | | |

- NOTES:
- FITTINGS SHALL HAVE RESTRAINED JOINTS UNLESS OTHERWISE INDICATED.
 - INSTALL FULL LENGTH JOINTS WITH TOTAL LENGTH EQUAL TO OR GREATER THAN LENGTH SHOWN IN THE TABLE.
 - WHERE TWO OR MORE FITTINGS ARE IN SERIES, SELECT FITTING RESTRAINT LENGTH THAT YIELDS THE LONGEST RESTRAINT DISTANCE.
 - ALL INLINE VALVES SHALL BE RESTRAINED.
 - WHERE INTERNAL RESTRAINED JOINTS ARE USED, THE ENTIRE BELL SHALL BE PAINTED RED.
 - LENGTHS SHOWN IN THE TABLE WERE CALCULATED IN ACCORDANCE WITH PROCEDURES OUTLINED IN "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE" GUIDELINES PUBLISHED BY DIPRA, USING THE ASSUMPTIONS SHOWN BELOW:

WORKING PRESSURE: 100 PSI
 SOIL DESIGNATION: SM (SAND SILT)
 LAYING CONDITIONS: 3
 DEPTH OF COVER: 3 FT
 SAFETY FACTOR: 1.5
 CONVERSION FACTOR FOR PVC PIPE: 1.25

THE DESIGN ENGINEER SHALL INCREASE THE VALUES IN THE TABLE AS WARRANTED BY SITE-SPECIFIC PARAMETERS, SUCH AS SOIL DESIGNATIONS AND LAYING CONDITIONS.

09 DETAIL
SCALE: N.T.S.

**SEPARATION REQUIREMENTS FOR
WATER, WASTEWATER AND RECLAIMED WATER MAINS**

FIGURE A116

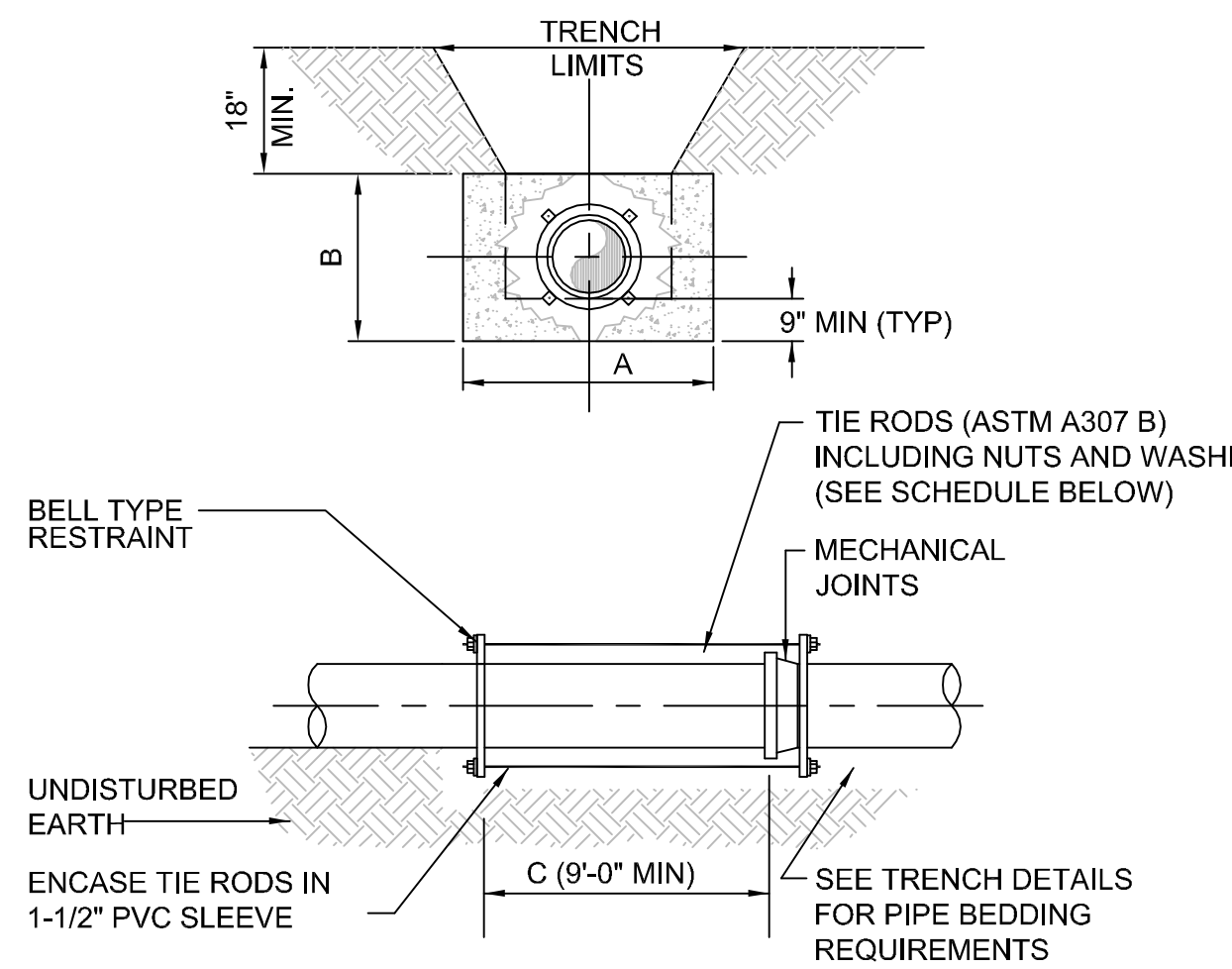
| PROPOSED UTILITY | MINIMUM HORIZONTAL & VERTICAL SEPARATION REQUIREMENTS | | | | | | | | | |
|-------------------------------------|---|-----------------------|------------------|------|---------------------------|------|-----------------------------|-----------------------|-------------|------|
| | POTABLE WATER | | RECLAIMED WATER* | | SANITARY SEWER FORCE MAIN | | SANITARY SEWER GRAVITY MAIN | | STORM SEWER | |
| | HORIZ | VERT | HORIZ | VERT | HORIZ | VERT | HORIZ | VERT | HORIZ | VERT |
| POTABLE WATER | -- | -- | 3' | 12" | 6' | 12" | 6" | 6" ABOVE 12" BELOW | 3' | 6' |
| RECLAIMED WATER | 3' | 12" | -- | -- | 3' | 12" | 3' | 12" | -- | -- |
| SANITARY SEWER FORCE MAIN | 6' | 12" | 3' | 12" | -- | -- | -- | -- | -- | -- |
| SANITARY SEWER GRAVITY MAIN | 6" | 6" ABOVE 12" BELOW | 3' | 12" | -- | -- | -- | -- | -- | -- |
| FIRE HYDRANTS W/ UNDERGROUND DRAINS | -- | -- | 3' | -- | 6' | -- | 6' | -- | 3' | -- |

1. THE TABLE REPRESENTS THE MINIMUM SEPARATION REQUIREMENTS AS DESCRIBED IN F.D.E.P. RULES PER THE FLORIDA ADMINISTRATION CODE (F.A.C.). THESE SEPARATION REQUIREMENTS SHALL APPLY BETWEEN NEWLY PROPOSED UTILITY LINES AND EXISTING OR PROPOSED UTILITY LINES.
2. FOR THE PURPOSE OF THIS TABLE RECLAIMED WATER SHALL MEAN UNRESTRICTED PUBLIC ACCESS REUSE WATER AS DEFINED BY F.A.C. 62-610. OTHER TYPES OF RECLAIMED WATER ARE CONSIDERED RAW SEWAGE AND SEPARATION LISTED FOR SANITARY SEWER SHALL APPLY.
3. ALL SEPARATION DISTANCES ARE FROM OUTSIDE OF PIPE TO OUTSIDE OF PIPE.
4. THE MINIMUM HORIZONTAL SEPARATION BETWEEN POTABLE WATER AND GRAVITY SANITARY SEWER MAY BE REDUCED TO 3 FEET IF THE BOTTOM OF THE WATER MAIN IS LOCATED AT LEAST 6 INCHES ABOVE THE TOP OF THE GRAVITY SEWER.
5. AT UTILITY CROSSINGS ONE FULL LENGTH OF WATER MAIN SHALL BE CENTERED ABOVE OR BELOW THE OTHER UTILITY PIPELINE MAXIMIZING THE SEPARATION OF PIPELINE JOINTS. ALTERNATIVELY, WATER MAIN JOINTS MUST BE:
- AT LEAST 3' FROM ALL JOINTS IN VACUUM SANITARY SEWERS, STORM SEWERS, STORMWATER FORCE MAINS, OR UNRESTRICTED PUBLIC ACCESS RECLAIMED WATER.
 - AT LEAST 6' FROM ALL JOINTS IN GRAVITY OR PRESSURE SANITARY SEWERS, WASTEWATER FORCE MAINS, AND ALL OTHER TYPES OF RECLAIMED WATER.
6. NO WATER PIPE SHALL PASS THROUGH OR BE CONSTRUCTED TOUCHING ANY PART OF A SANITARY OR STORMWATER MANHOLE OR STRUCTURE.
7. NEW OR RELOCATED FIRE HYDRANTS WITH UNDERGROUND DRAINS MUST BE AT LEAST 10 FEET FROM ANY EXISTING OR PROPOSED "ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEM" AS DEFINED IN SECTION 381.0065 (2), F.S., AND RULE 64E-6.002, F.A.C.
8. WHERE IT IS NOT POSSIBLE TO MEET THE SEPARATION REQUIREMENTS, THE FOLLOWING ALTERNATIVE CONSTRUCTION VARIANCES ARE ACCEPTABLE ONLY WITH THE EXPRESSED WRITTEN CONSENT OF THE ENGINEER AND FDEP:
- WHERE A WATER MAIN IS BEING LAD LESS THAN THE REQUIRED MINIMUM HORIZONTAL DISTANCE AND/OR WHERE A WATER MAIN CROSSING HAS LESS THAN THE MINIMUM REQUIRED DISTANCE BETWEEN JOINTS:
 - USE OF PRESSURE RATED PIPE CONFORMING TO AWWA STANDARDS, FOR A GRAVITY OR VACUUM TYPE PIPELINE.
 - USE OF WELDED, FUSED OR OTHERWISE RESTRAINED JOINTS FOR EITHER PIPE.
 - USE OF WATERTIGHT CASING PIPE OR CONCRETE ENCASUREMENT AT LEAST 4" THICK FOR EITHER PIPE.
 - WHERE A WATER MAIN IS BEING LAD LESS THAN 3 FEET HORIZONTALLY FROM ANOTHER PIPELINE AND/OR WHERE A WATER MAIN IS BEING LAD WITH LESS THAN THE REQUIRED MINIMUM VERTICAL SEPARATION:
 - USE OF PIPE OR CASING PIPE, HAVING HIGH IMPACT STRENGTH (AT LEAST EQUAL TO 0.25" THICK D.I.P.), OR CONCRETE ENCASUREMENT AT LEAST 4" THICK FOR THE WATER MAIN AND THE OTHER PIPELINE IF THE OTHER PIPELINE CONVEYS WASTEWATER OR RECLAIMED WATER.

10 DETAIL
SCALE: N.T.S.

**THRUST COLLAR (100 PSI)
WASTEWATER FORCE MAINS**

FIGURE A105-2



NOTES:

- ADDITIONAL REINFORCEMENTS SHALL BE AS SPECIFIED BY THE ENGINEER.
- MINIMUM COMPRESSIVE STRENGTH FOR CONCRETE SHALL BE 3000 PSI.
- BEDDING, BACKFILL, AND COMPACTION SHALL BE AS SPECIFIED ELSEWHERE IN THE STANDARD DRAWINGS.
- ALL FORM BOARDS SHALL BE REMOVED PRIOR TO BACKFILL.
- NO ALLOWANCE SHALL BE MADE FOR FRICTION BETWEEN THE PIPE WALL AND THE THRUST COLLAR.
- DESIGN PRESSURE: 100 PSI.
- REQUIRED FOR LINE STOPS.

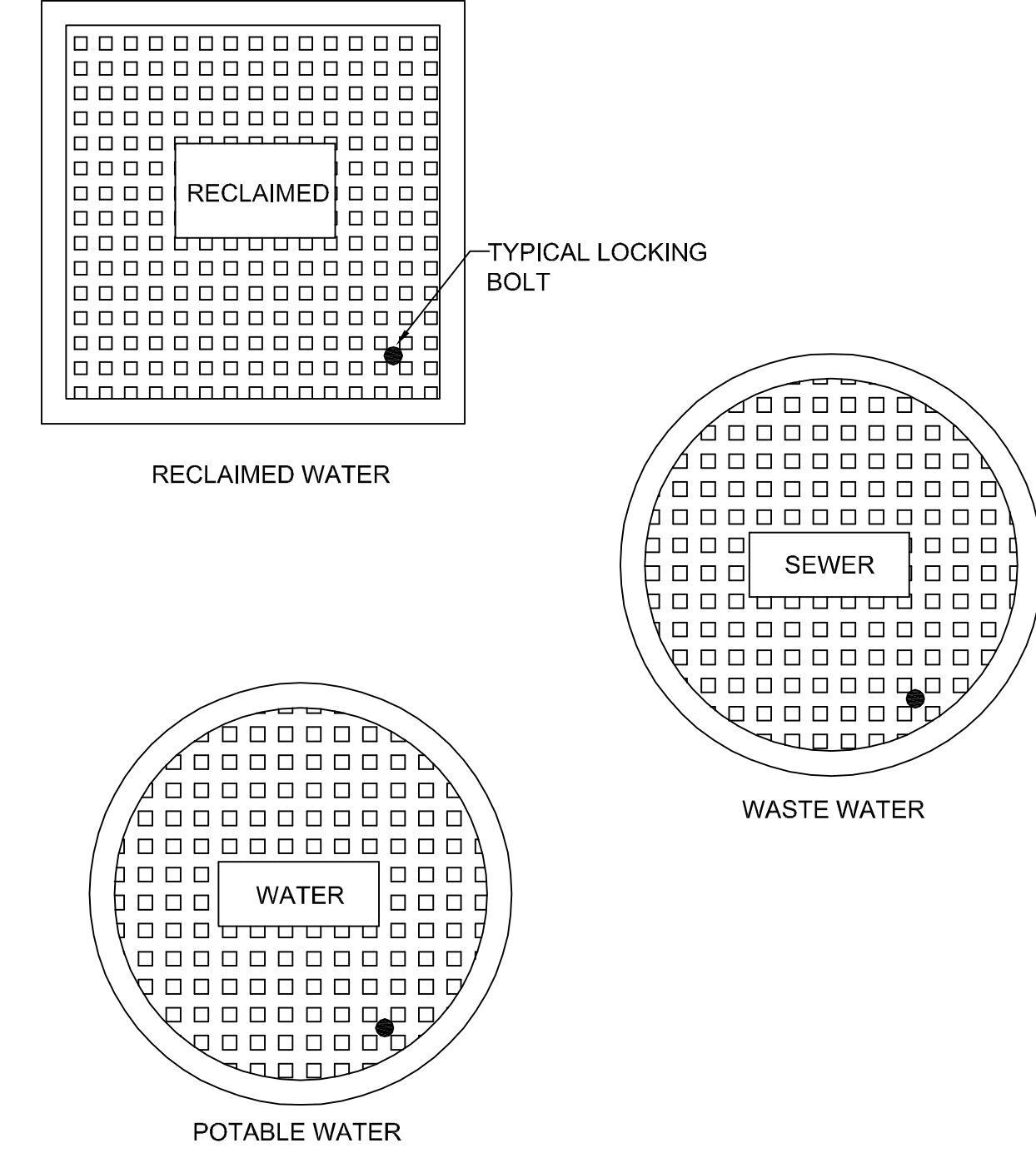
| PIPE SIZE (INCHES) | DIMENSIONS (FT.) | | | TIE RODS REQ'D | |
|--------------------|------------------|-----|---|----------------|-----|
| | A | B | C | DIA. | NO. |
| 6 | 2.0 | 2.0 | | 3/4 | 2 |
| 8 | 2.5 | 2.5 | | 3/4 | 2 |
| 10 | 3.0 | 2.5 | | 3/4 | 4 |
| 12 | 4.0 | 3.0 | | 3/4 | 4 |
| 16 | 5.5 | 3.5 | | 3/4 | 4 |
| 20 | 7.5 | 4.0 | | 3/4 | 4 |
| 24 | 8.5 | 5.0 | | 3/4 | 6 |

NOTE: THRUST COLLAR AREAS TO BE COMPUTED ON BASIS OF 2000 LBS/SF SOIL RESTRAINT BEARING.

11 DETAIL
SCALE: N.T.S.

TYPICAL VALVE BOX COVER

FIGURE A110

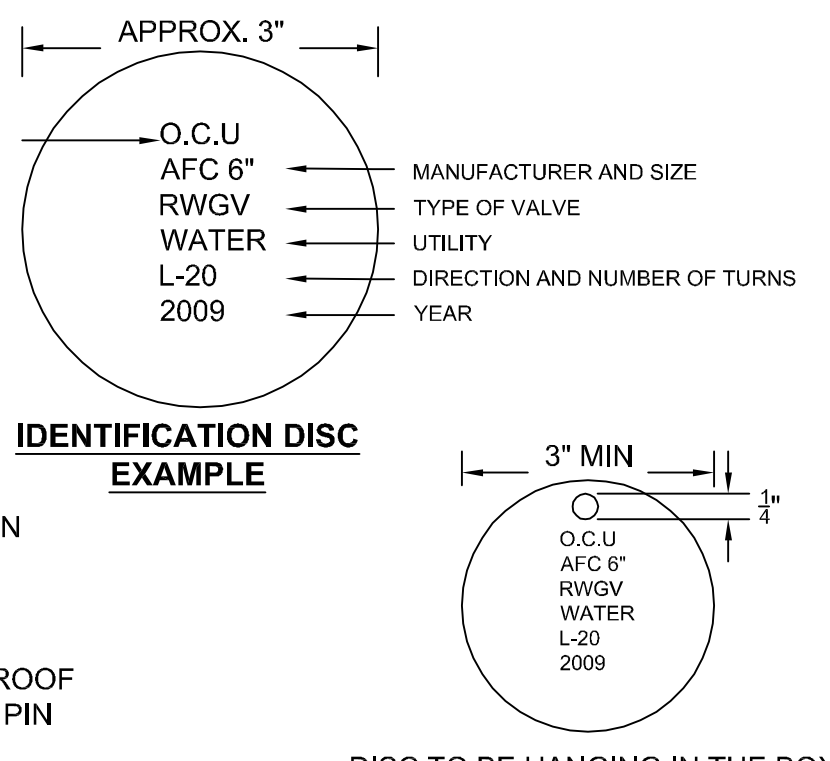
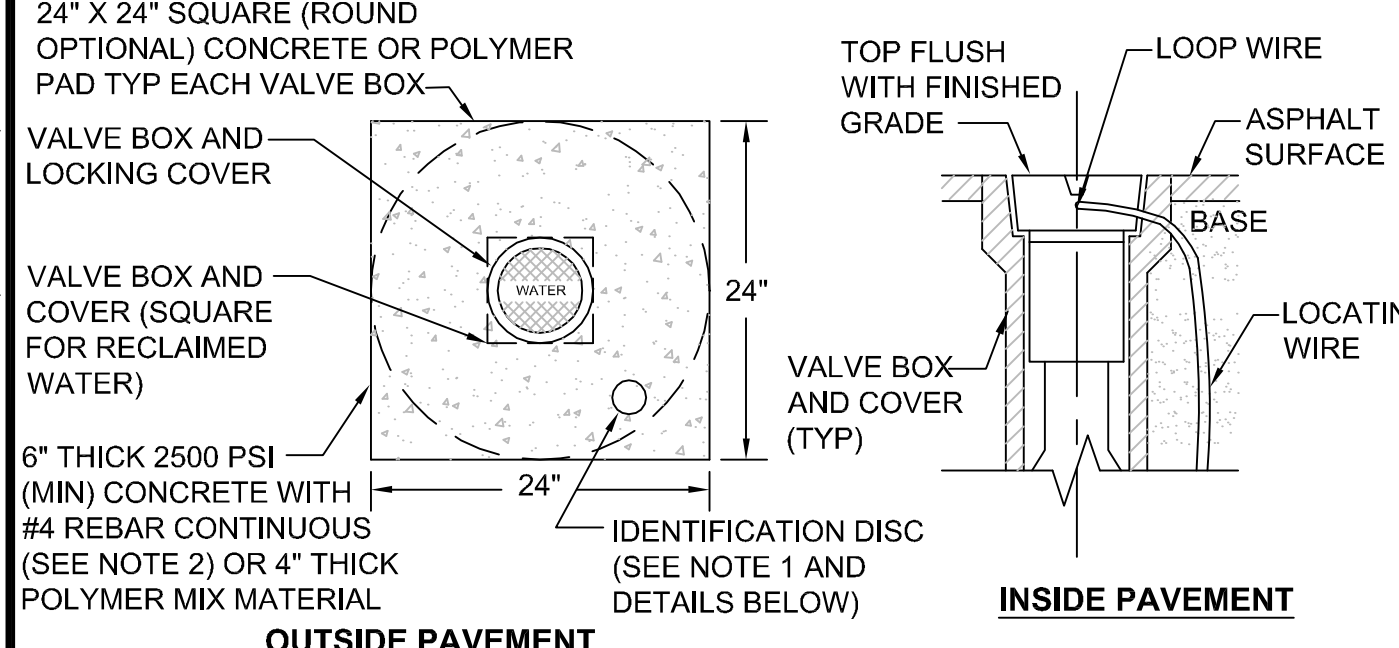


NOTE:
1. LOCKING LIDS ARE REQUIRED ON ALL VALVE BOXES.

12 DETAIL
SCALE: N.T.S.

VALVE BOX PAD

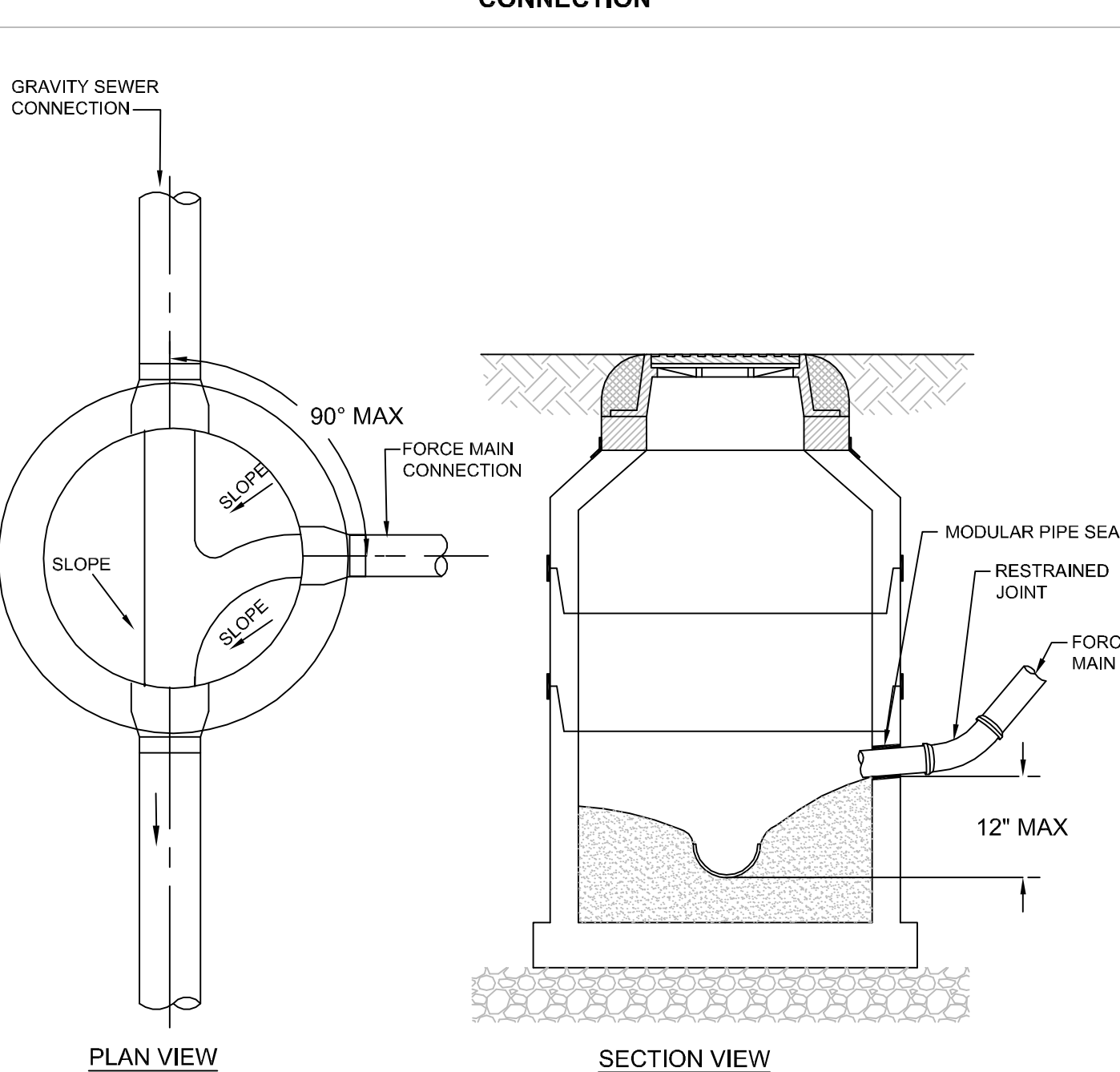
FIGURE A112



13 DETAIL
SCALE: N.T.S.

FORCE MAIN TO GRAVITY SEWER CONNECTION

FIGURE A306



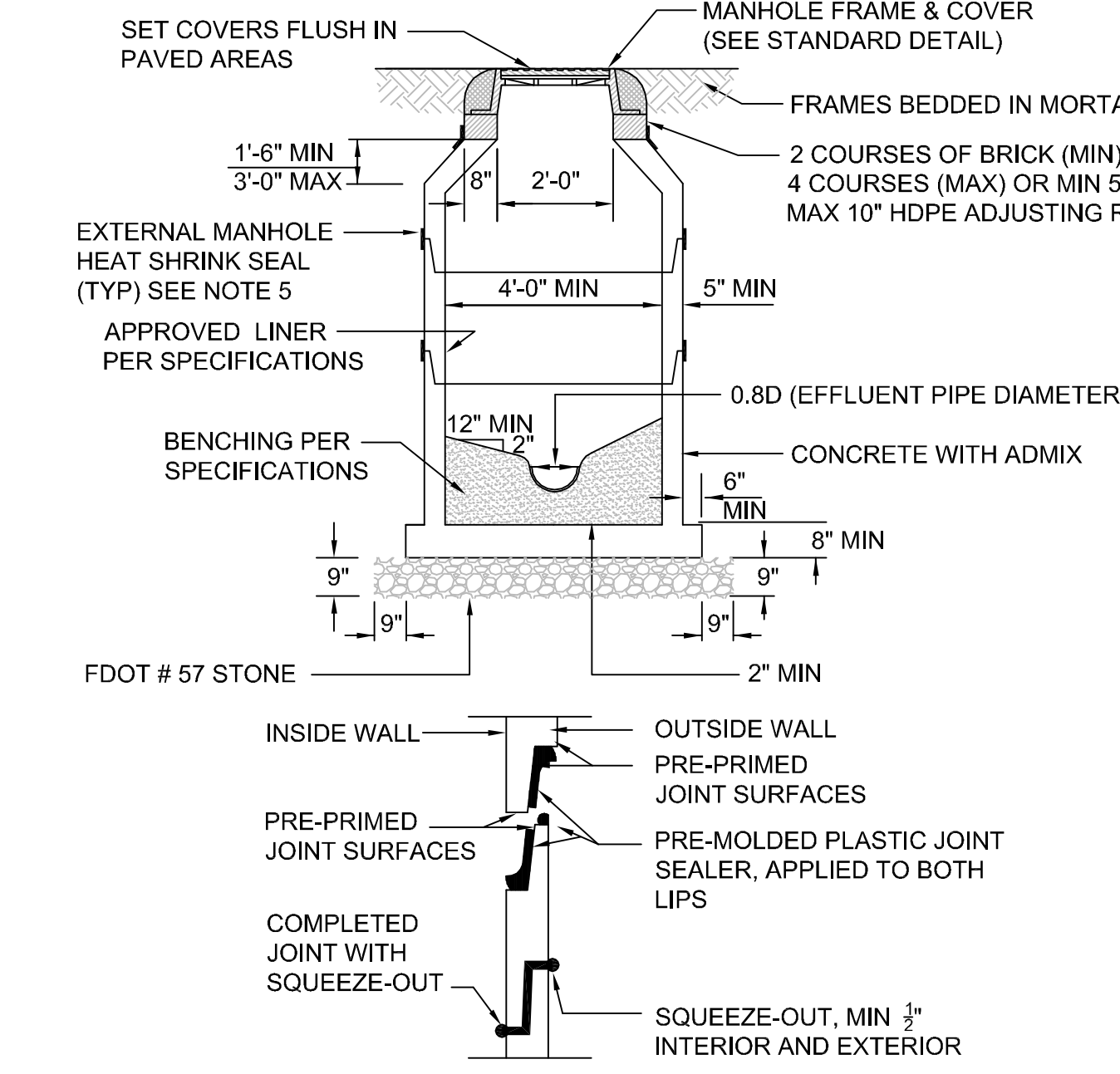
- NOTES:
- FORCE MAIN ORIENTED TO FACILITATE FLOW AND SHALL ENTER MANHOLE WITHIN 1' ABOVE INVERT OF THE EFFLUENT PIPE.
 - BENCH AS REQUIRED FOR NEW FORCE MAIN.
 - MANHOLE RECEIVING FORCE MAIN AND NEXT MANHOLE SHALL BE LINED. FOR CONNECTIONS TO EXISTING MANHOLES, MANHOLE RECEIVING FORCE MAIN AND NEXT MANHOLE SHALL BE COATED OR LINED PER APPENDIX D.
 - CONTRACTOR TO COORDINATE THE PRESENCE OF UTILITIES INSPECTOR DURING CORING AND CONNECTIONS TO EXISTING MANHOLES.

NOTE:
EXISTING MANHOLES ARE COATED

14 DETAIL
SCALE: N.T.S.

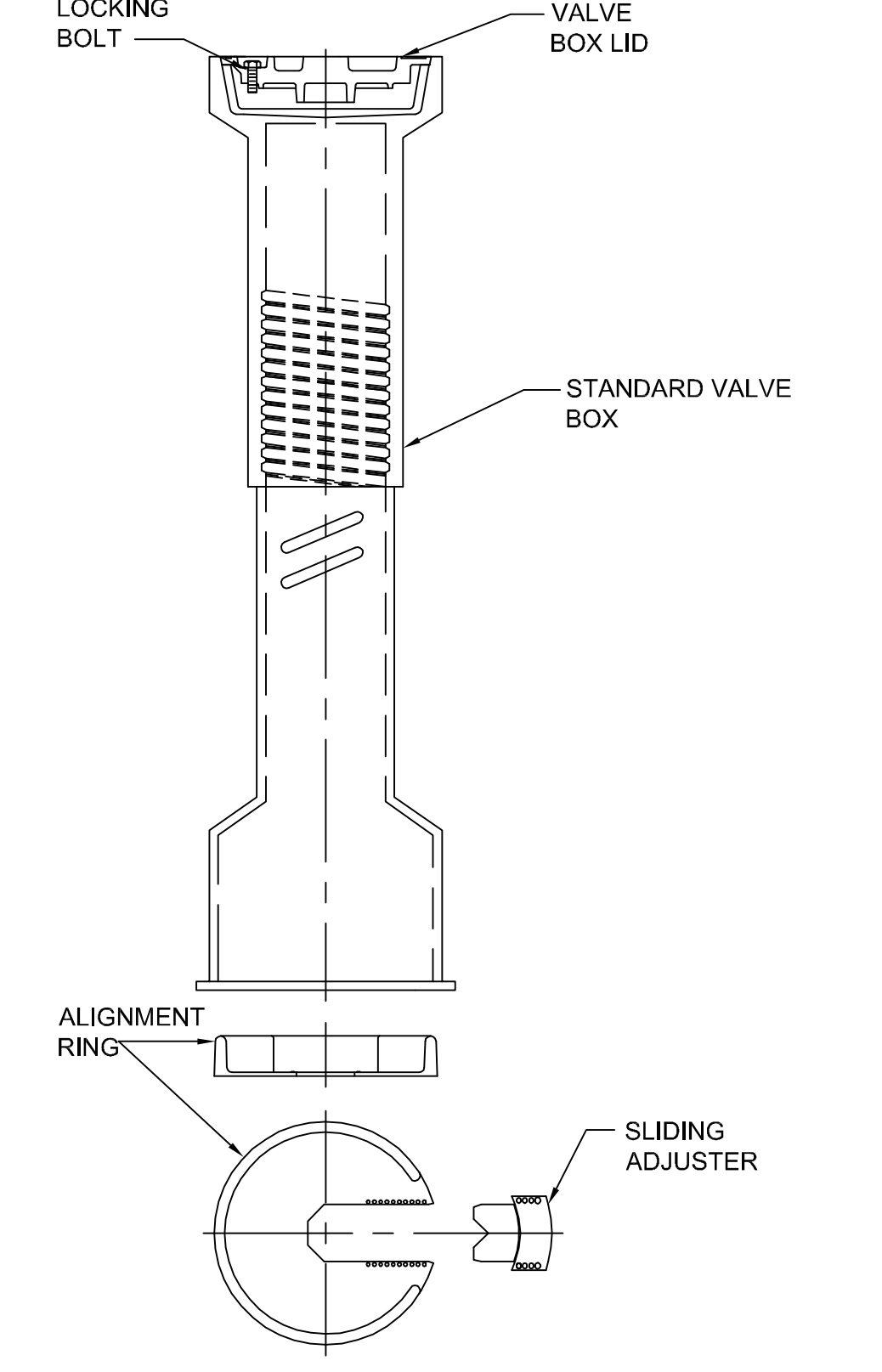
PRECAST CONCRETE MANHOLE

FIGURE A301



- NOTES:
- DROP CONNECTIONS ARE REQUIRED WHENEVER INVERT OF INFLUENT SEWER IS 24" OR MORE ABOVE THE INVERT OF THE MANHOLE. SEE MANHOLE CONNECTION DETAIL.
 - ECCENTRIC CONE DESIGN MAY BE USED FOR CONFLICT RESOLUTION WITH OCU APPROVAL.
 - A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
 - LIFT HOLES THROUGH STRUCTURE ARE NOT PERMITTED.
 - WRAP TIGHTLY AROUND CASTING JOINTS AND APPLY HIGH INTENSITY PROPANE TORCH TO EFFECTIVELY SEAL THEM FROM GROUND WATER INFILTRATION.
 - HDPE ADJUSTING RINGS MAY BE SUBSTITUTED FOR BRICK RISERS.
 - SECTION HEIGHTS VARY AS REQUIRED, AND AS AVAILABLE, FROM APPROVED MANUFACTURERS LISTED IN APPENDIX D.

15 DETAIL
SCALE: N.T.S.



16 TWO-PIECE VALVE BOX
SCALE: N.T.S.



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 Winter Springs, FL 32708

Designed MDP
 Drawn RLL
 Checked TSE
 Reviewed CLK
 Approved MDP
 Date 11/2014

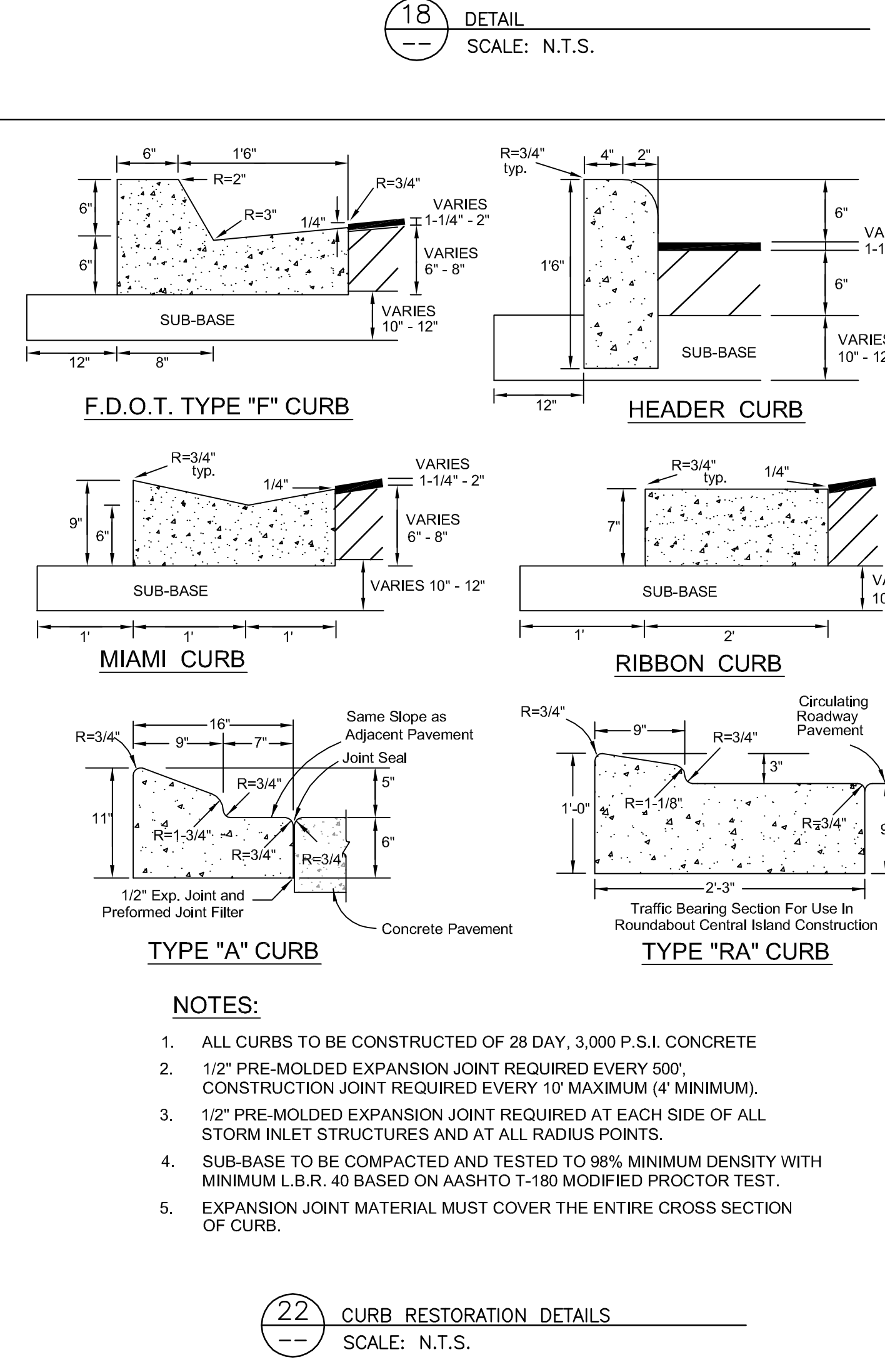
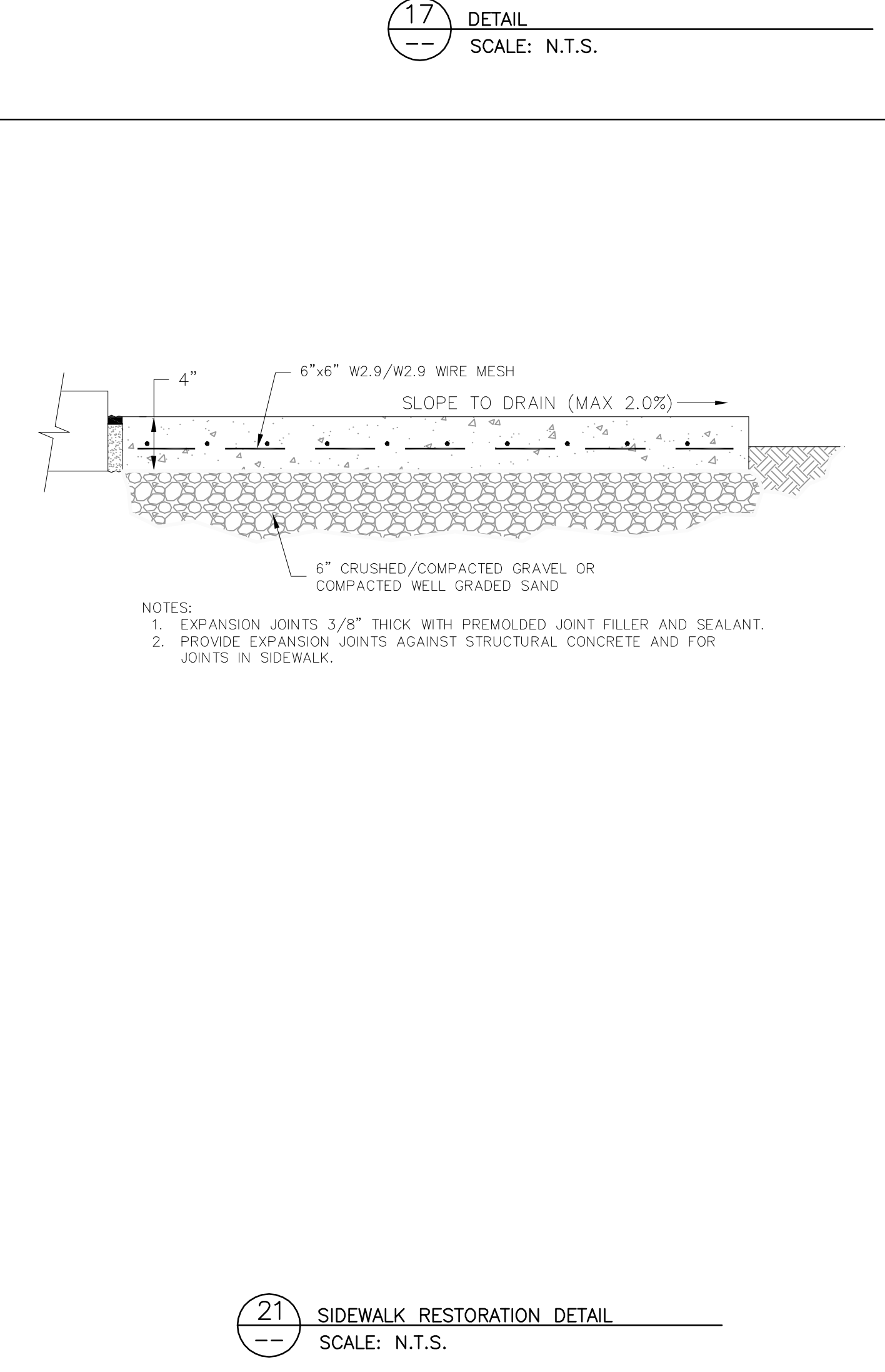
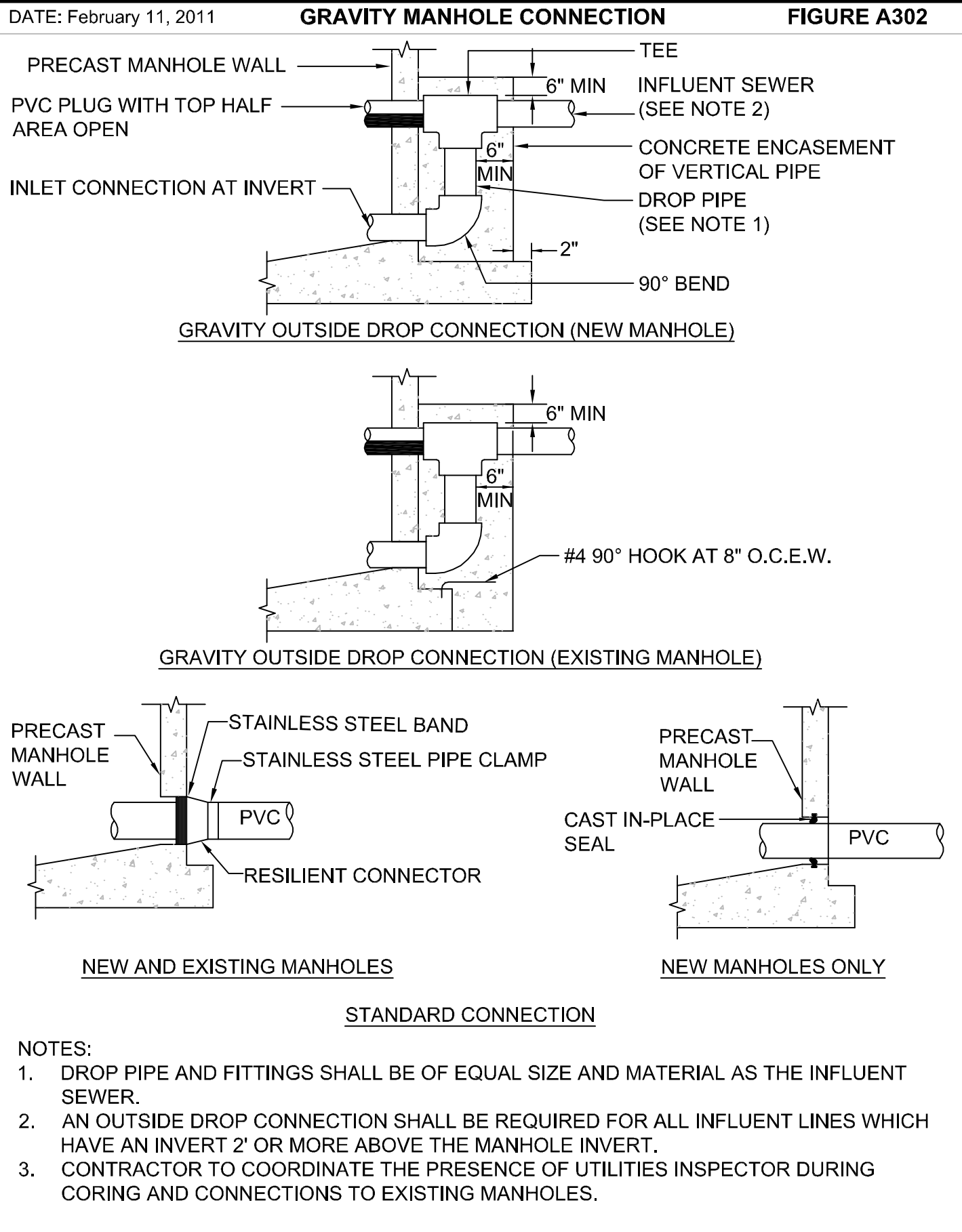
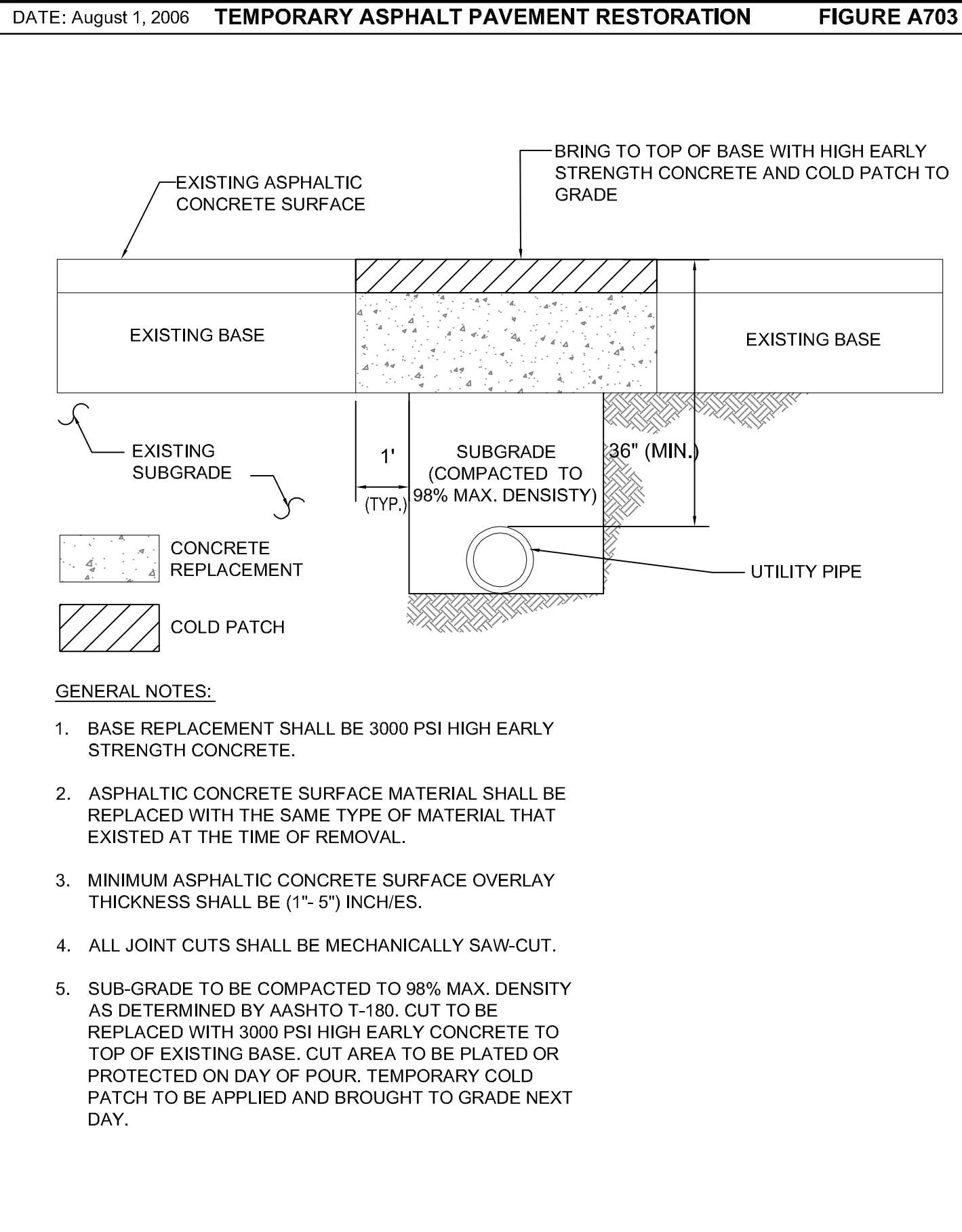
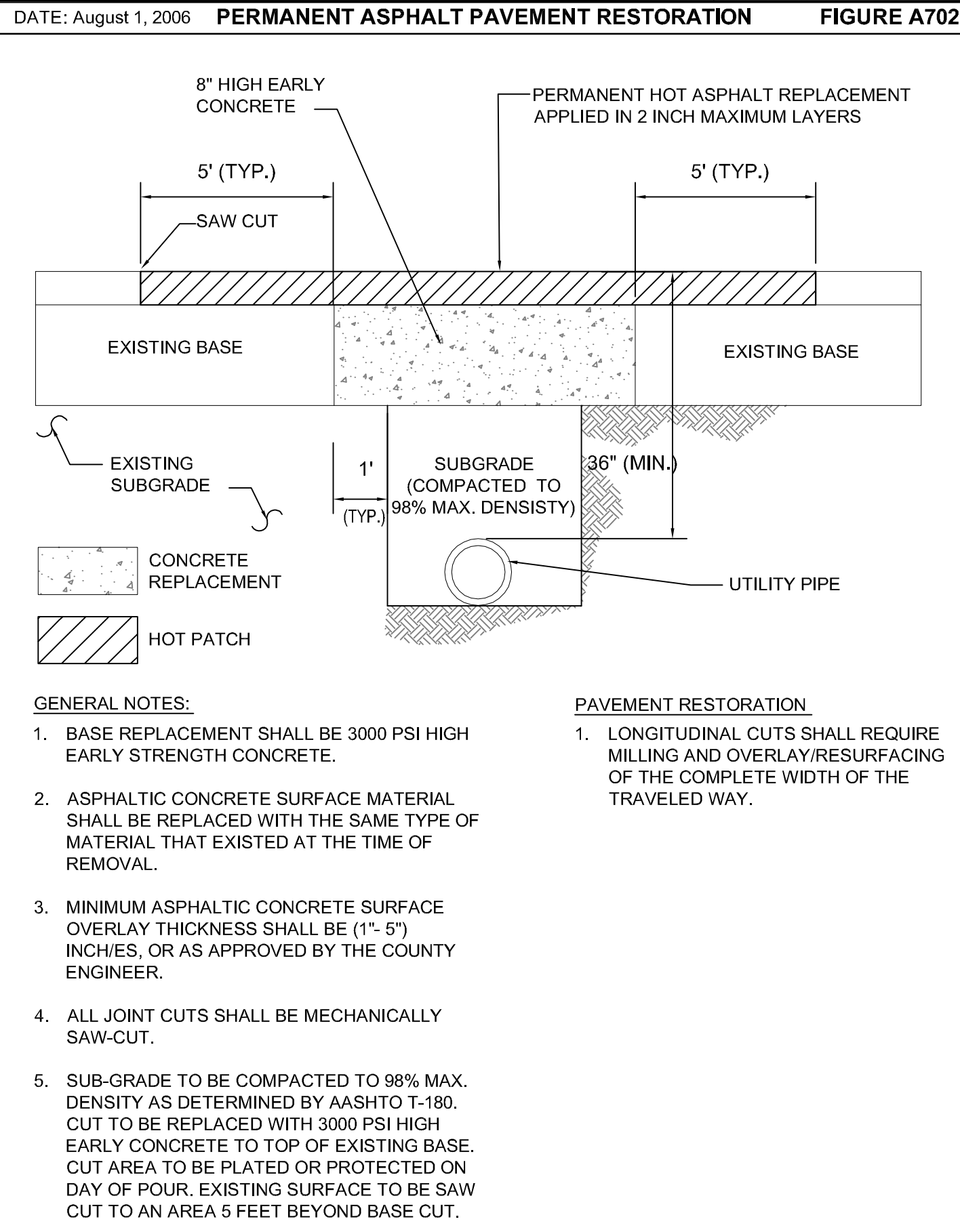
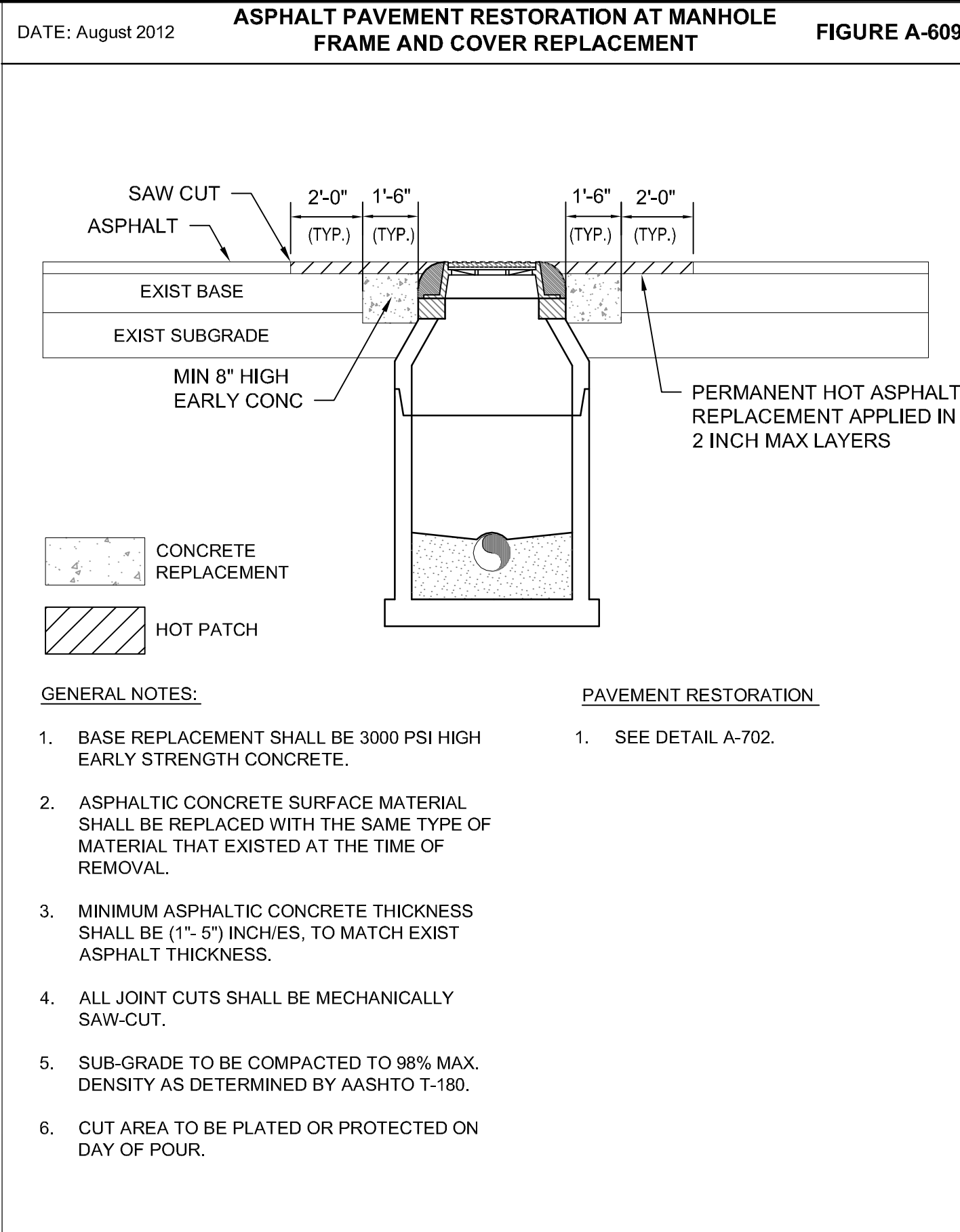
ORANGE COUNTY UTILITIES
 UNIVERSITY BOULEVARD 12-INCH FORCE MAIN
 CIVIL
 UTILITY DETAILS

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ORANGE COUNTY UTILITIES
UNIVERSITY BOULEVARD 12-INCH FORCE MAIN
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UTILITY DETAILS

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