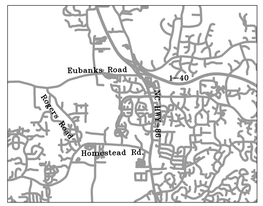
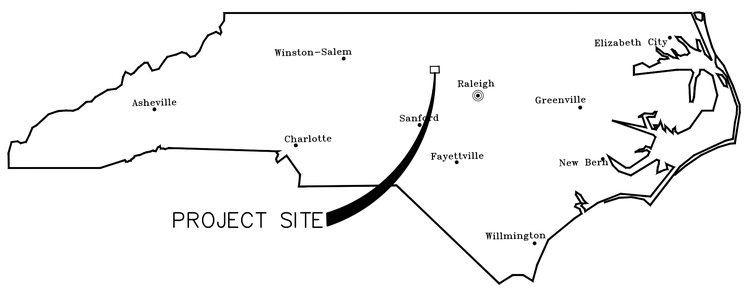
HISTORIC ROGERS ROAD SEWER EXPANSION

FOR

ORANGE WATER AND SEWER AUTHORITY



MAY 2016



VICINITY MAP

SUMMARY OF WORK:

- 3,050 LF OF 12-INCH DIP GRAVITY SANITARY SEWER
- 15,050 LF OF 8-INCH DIP GRAVITY SANITARY SEWER
- 101 SANITARY SEWER SERVICES
- 1 INDIVIDUAL GRINDER PUMP

90 % REVIEW SET
PRELIMINARY - DO NOT USE FOR CONSTRUCTION

OWASA

PROJECT CONTACTS

OWNER/UTILITY:

JEREMY L. FIRELINE, PE
ORANGE WATER AND SEWER AUTHORITY
400 JONES FERRY ROAD
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jfireline@owasa.org
www.owasa.org

ENGINEER:

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URS CORPORATION – NORTH CAROLINA
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REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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NCBELS LIC. NO. C-2243

SHEET TITLE: COVER SHEET

SCALE: AS SHOWN

DATE: 5/25/2016

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54

URS PROJ. NO. 31829996

SHEET I.D. G-000

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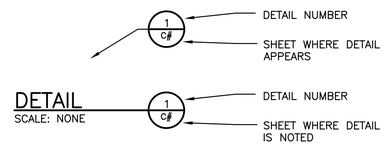
LEGEND

	EXISTING	NEW
CONTOURS (1' & 2')	802	802
CONTOURS (5' & 10')	800	800
EDGE OF PAVEMENT		
CURB & GUTTER		
CENTERLINE OF ROADWAY		
PROPERTY LINE	PL	
RIGHT-OF-WAY	ROW	
EXISTING PROPERTY CORNER		
EXISTING BENCHMARK		
BOREHOLE LOCATION/NUMBER		
PERMANENT EASEMENT		
PERMANENT WATER EASEMENT		
PERMANENT SEWER EASEMENT		PUE
TEMP CONSTRUCTION ESMT		TCE
LIMITS OF DISTURBANCE		LOD LOD
SILT FENCE		SF SF
WETLANDS		
FENCE LINE	X X X X X	X X X X X
GUARD RAIL	T T T	T T T
TREES (WITH SIZE)	16" OAK	
TREE LINE		
STORM DRAINAGE	18" RCP	R18SD
CATCH BASIN	CB	CB
DROP INLET	DI	DI
YARD INLET	YI	YI
JUNCTION BOX	JB	JB
SANITARY SEWER	SS	N8S
SANITARY SEWER LATERAL		SSL
SEWER FORCE MAIN	FM	N8FM
SEWER MANHOLE	S	
SEWER VALVE		SV
AIR RELEASE MANHOLE	ARV	ARV
SEWER CLEANOUT		CO
WATER LINE	W	
FIRE HYDRANT		
WATER METER	W	
WATER VALVE		
WATER MANHOLE	W	
WATER BLOW-OFF	BFP	
WATER WELL	W	
GAS LINE	G	
GAS VALVE	GV	
UNDERGROUND ELECTRIC	UE	
OVERHEAD ELECTRIC	OHE	
SIGN		
UTILITY POLE		
GUY WIRE		
ELECTRIC MANHOLE	E	
ELECTRIC TRANSFORMER		
ELECTRIC BOX	EBOX	
OVERHEAD TELEPHONE	OHT	
TELEPHONE PEDESTAL		
UNDERGROUND CABLE TV	CTV	
TELEPHONE MANHOLE	T TMH	
CABLE TV PEDESTAL		
MAIL BOX		
UNDERGROUND FIBER OPTIC LINE	FO	
ZONE 1 BUFFER	Z-1 Z-1	
ZONE 2 BUFFER	Z-2 Z-2	

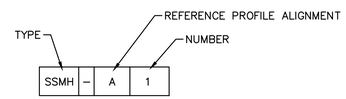
DETAIL REFERENCES



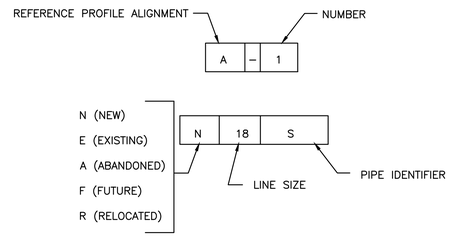
TYP — USED TO INDICATE THAT DETAIL IS TYPICAL AT MULTIPLE PLACES.

NOTE REFERENCES

STRUCTURE



PIPING

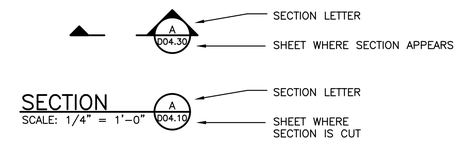


IDENTIFIER	DESCRIPTION
SD	STORM DRAIN
S	SANITARY SEWER
W	WATER
FM	FORCEMAIN
DI	DROP INLET

DEMOLITION LEGEND

	ASPHALT CUT/REPLACEMENT
	CONCRETE CUT
	GRAVEL CUT
X	ITEM DEMOLITION

SECTION REFERENCES



OPH USED TO INDICATE THAT SECTION SHOWN IS OPPOSITE HAND.

SIM USED TO INDICATE THAT DETAIL SHOWN IS SIMILAR.

EROSION CONTROL LEGEND

CONSTRUCTION ENTRANCE/EXIT	
TEMPORARY SILT FENCE	SF SF
SILT FENCE OUTLET	
HARDWARE CLOTH & GRAVEL INLET PROTECTION	
CULVERT INLET PROTECTION	
CHECK DAM	
STRAW NET TEMPORARY LINER	

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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PRAWINGS\5.1-DWG\5.1.5-SHEETS\31829996_G-001-GENERAL NOTES.DWG 5/26/2016 8:54:28 AM

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL COMPLY WITH APPLICABLE STANDARDS, ORDINANCES, REGULATIONS, AND OTHER REQUIREMENTS OF ORANGE WATER AND SEWER AUTHORITY (OWASA), TOWN OF CARRBORO, TOWN OF CHAPEL HILL, ORANGE COUNTY, AND THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NCDEQ), THE U.S. ARMY CORPS OF ENGINEERS (USACE), THE U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA), THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT), THE NORTH CAROLINA DEPARTMENT OF LABOR AND THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, AND ALL OTHER LOCAL, STATE AND FEDERAL AGENCIES, HAVING JURISDICTION OVER ANY OF THE PORTIONS OF WORK ASSOCIATED WITH THIS PROJECT. AGENTS OF EACH OF THESE AGENCIES HAVE LEGAL RIGHT TO ACCESS AND INSPECTION OF ANY AND ALL PORTIONS OF THE WORK AND SITE AT ANY TIME, SCHEDULED OR UNSCHEDULED. ANY PENALTIES, FINES OR VIOLATIONS SHALL BE AT THE EXPENSE OF THE CONTRACTOR, UNLESS THE RESULT OF THE ACTIONS OF OTHERS.

2. URS CORPORATION – NORTH CAROLINA (URS), A SUBSIDIARY OF AECOM, WAIVES ANY AND ALL RESPONSIBILITY AND/OR LIABILITY FOR PROBLEMS ARISING FROM DEVIATION FROM THESE DOCUMENTS AND THEIR DESIGN INTENT, AND/OR FROM PROBLEMS ARISING FROM THE FAILURE OF OTHERS TO NOTIFY URS AND/OR FOLLOW URS GUIDANCE CONCERNING ANY ERRORS, OMISSIONS, OR INCONSISTENCIES WHICH MAY HAVE BEEN FOUND HEREIN. ANY PROPOSED ALTERATION OR DEVIATION ON NCDOT RIGHT-OF-WAY REQUIRES AN APPROVED REVISION.

3. ALL DISTURBED AREAS, INCLUDING BUT NOT LIMITED TO, PAVEMENT, DITCHES, HEAD WALLS, END WALLS, CULVERT PIPES, CURB-AND-GUTTER, SIDEWALKS, UTILITIES (PRIVATE AND PUBLIC), DRIVEWAYS, SIGNS, MAILBOXES, FENCES, LANDSCAPING, ELECTRIC FENCING, IRRIGATION SYSTEMS, ETC., SHALL BE REPAIRED TO A CONDITION EQUAL TO OR BETTER THAN THOSE EXISTING PRIOR TO CONSTRUCTION. CONTRACTOR SHALL DOCUMENT ALL QUESTIONABLE AREAS/PRE-EXISTING CONDITIONS/DISTURBANCES PRIOR TO CONSTRUCTION. IF IT IS DETERMINED BY THE OWNER THAT A REPAIR WOULD BE INSUFFICIENT, THEN REPLACEMENT OF THE DISTURBED FEATURE WILL BE REQUIRED. ANY SUCH REPLACEMENT SHALL BE AT NO ADDITIONAL EXPENSE TO THE OWNER.

4. THE CONTRACTOR SHALL CONSTRUCT THE IMPROVEMENTS IN SUCH A MANNER AS TO MINIMIZE DAMAGE TO EXISTING TREES, SHRUBS, AND LANDSCAPING LOCATED IN THE PUBLIC RIGHTS-OF-WAY AND ROADWAY PAVEMENTS. THE CONTRACTOR SHALL PROVIDE THE HOMEOWNER WITH AT LEAST 14 CALENDAR DAYS PRIOR NOTICE OF REMOVAL OF THE LANDSCAPING IN THE RIGHTS-OF-WAY SO THAT THEY MAY MOVE IT AT THEIR OWN EXPENSE. LANDSCAPING PLANTS LOCATED IN THE RIGHT-OF-WAY WILL NOT BE REPLACED AND SHALL BE DISPOSED OF PROPERLY BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.

5. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES IN EXISTING CONDITIONS OR DESIGN PRIOR TO CONSTRUCTION.

6. DISTURBED MAIL AND PAPER BOXES AND DRIVEWAYS SHALL BE REPAIRED AND/OR RESTORED ON THE SAME DAY. ACCESS FOR SCHOOL BUSES AND ALL EMERGENCY VEHICLES, MAIL, TRASH AND RECYCLING COLLECTION, OTHER UTILITY OWNERS, PAPER DELIVERY VEHICLES, ETC., SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

7. INGRESS AND EGRESS SHALL BE MAINTAINED TO ALL BUSINESSES AND DWELLINGS AFFECTED BY THE PROJECT. SPECIAL ATTENTION SHALL BE PAID TO CHURCHES AND FIRE HYDRANTS.

8. PROPER TRAFFIC CONTROL DEVICES, SIGNS, ETC. SHALL BE INSTALLED TO ENSURE PUBLIC SAFETY IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND ANY SUPPLEMENTS THERETO. TRAFFIC DETECTION AND SIGNALIZATION LOOPS SHALL BE PROTECTED DURING CONSTRUCTION. ANY DISTURBANCE OF SUCH CONTROLS SHALL BE REINSTATED BY THE CONTRACTOR TO THE SATISFACTION OF NCDOT, TOWN OF CARRBORO, TOWN OF CHAPEL HILL, OR ORANGE COUNTY AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL KEEP ONE LANE OF TRAFFIC OPEN ON ROGERS ROAD, TALLYHO TRAIL, LAIR COURT, PRISCILLA LANE, SANDBERG LANE, PUREFOY ROAD AND RUSCH ROAD. CONTRACTOR SHALL PROVIDE TEMPORARY ACCESS/TRAVEL LANE FOR RUCSH ROAD AND LAIR COURT. CONTRACTOR SHALL NOTIFY ALL EMERGENCY AGENCIES (I.E. FIRE DEPARTMENT, SHERIFF, PARAMEDICS, POLICE, ETC.) OF CONSTRUCTION AND TEMPORARY ACCESS LANES TWO WEEKS AND THEN 48 HOURS PRIOR TO CONSTRUCTION ACTIVITIES.

9. ALL WORK SHALL BE CONFINED TO WITHIN THE NCDOT RIGHT-OF-WAY, TOWN/CITY/COUNTY RIGHT OF WAY, AND/OR ANY OWNER PERMANENT EASEMENTS, AND TEMPORARY EASEMENTS UNLESS SHOWN OTHERWISE ON THE PLANS. CONTRACTOR SHALL PROVIDE OWASA, NCDOT, TOWN OF CARRBORO, TOWN OF CHAPEL HILL, OR ORANGE COUNTY A MINIMUM OF 48 HOURS NOTICE PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES WITHIN THE RESPECTIVE RIGHT-OF-WAY OR EASEMENTS.

10. THE CONTRACTOR SHALL KEEP ONE RECORD COPY OF THE DRAWINGS, SPECIFICATIONS, ADDENDA, MODIFICATIONS, AND SHOP DRAWINGS AT THE SITE IN GOOD ORDER AND ANNOTATED AT LEAST DAILY TO SHOW ALL CHANGES MADE DURING THE CONSTRUCTION PROCESS. AS-BUILT INFORMATION (INCLUDING DIMENSIONS, MATERIALS, EXISTING UTILITIES) SHALL ALSO BE INCLUDED ON THESE DRAWINGS.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE PROPERTY OWNER(S) AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITIES TAKING PLACE AT, ON, OR IN THE IMMEDIATE VICINITY OF THEIR PROPERTY SUCH THAT ACCESS TO THEIR PROPERTY WOULD BE IMPAIRED. IN NO CASE SHALL THE COMPLETION OF WORK PREVENT THE OWNER(S) ACCESS TO THEIR PROPERTY.

12. TEMPORARY PAVEMENT CUTS SHALL BE MAINTAINED WITH 6" OF CRUSHER RUN STONE UNTIL INSTALLATION OF PERMANENT PAVEMENT RESTORATION, BUT NO LONGER THAN 45 DAYS FROM TIME OF ORIGINAL CUT. THE CONTRACTOR SHALL USE THE APPROPRIATE TYPE OF PAVEMENT PATCH CONSISTENT WITH THE EXISTING PAVEMENT SECTION OR IN ACCORDANCE WITH TEMPORARY PAVEMENT DETAIL, WHICH EVER IS GREATER.

13. WHERE NEW CONCRETE OR PAVEMENT IS REQUIRED, EXISTING PAVEMENT SHALL BE SAW-CUT ONLY BY MECHANICAL MEANS. ALL SAW-CUTTING SHALL BE DONE IN STRAIGHT LINES, PERPENDICULAR AND/OR PARALLEL TO EXISTING PAVEMENT. SAW-CUT EXISTING CONCRETE OR PAVEMENT TO 1 FT. MINIMUM BEYOND LIMITS OF EXCAVATION AND REMOVE EXISTING MATERIAL AS REQUIRED. CURB AND GUTTER AND SIDEWALKS SHALL BE REMOVED AT JOINTS UNLESS OTHERWISE APPROVED BY OWNER AND ENGINEER.

14. IN THE EVENT OF AN UNSCHEDULED WATER OR SEWER SERVICE INTERRUPTION, NOTIFY IMMEDIATELY THE ON-CALL EMERGENCY HOTLINE, 919-968-4421. ADDITIONALLY, NOTIFY THE PROJECT REPRESENTATIVE AND THE OWASA PROJECT CONTACT OF THE INTERRUPTION.

15. ALL SCHEDULED INTERRUPTIONS OF WATER AND SEWER SERVICE TO OWNER'S CUSTOMERS SHALL BE COORDINATED WITH THE ENGINEER AND OWNER. NOTICES OF ALL SCHEDULED INTERRUPTIONS SHALL BE PROVIDED IN WRITING TO PROJECT REPRESENTATIVE. THE CONTRACTOR WILL BE REQUIRED TO HAVE ALL MATERIALS AND EQUIPMENT ON THE JOB SITE 72 HOURS PRIOR TO ANY PLANNED SERVICE INTERRUPTION.

16. NO SANITARY SEWER FLOW DISRUPTIONS WILL BE ALLOWED. THIS APPLIES TO INDIVIDUAL SERVICE LATERALS AS WELL AS MAINS. IN CASES WHERE CONSTRUCTION WILL DISRUPT THE EXISTING SEWER FLOW, PRIOR TO BEGINNING ANY WORK, THE CONTRACTOR SHALL PREPARE AND SUBMIT A PLAN AND SCHEDULE TO THE ENGINEER FOR APPROVAL, INDICATING HOW THE EXISTING FLOW WILL BE HANDLED AND THE TIME FRAME IN WHICH THE CONTRACTOR INTENDS TO WORK. FLOW DISRUPTION SHALL NOT COMMENCE WITHOUT REVIEW AND ACCEPTANCE OF THE PLAN BY THE ENGINEER. THE OWNER SHALL PROVIDE WRITTEN NOTIFICATIONS TO ALL CUSTOMERS AFFECTED BY AN INTERRUPTION, AND NO SCHEDULED INTERRUPTIONS SHALL OCCUR WITHOUT THAT WRITTEN NOTIFICATION. INTERRUPTIONS SHALL BE SCHEDULED BY THE OWNER AT A TIME MOST CONVENIENT TO THE PUBLIC. WORK MAY BE REQUIRED AT NIGHT, WEEKENDS AND/OR HOLIDAYS, AS DETERMINED BY THE OWNER. CUSTOMERS SHALL BE NOTIFIED AT LEAST 72 HOURS (NOT INCLUDING WEEKENDS/HOLIDAYS) PRIOR TO ANY INTERRUPTIONS OF SERVICE. ALL COSTS, INCLUDING MAINTENANCE OF SEWER FLOW, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS OF THE PROPOSAL. WHERE BYPASS PUMPING IS REQUIRED, AN IDENTICAL STANDBY PUMP SHALL BE ON SITE IN THE EVENT OF FAILURE OF THE PRIMARY PUMP. IF, AT ANY TIME DURING CONSTRUCTION, EFFLUENT FROM THE EXISTING SEWER IS NOT FULLY CONTAINED BY THE BYPASS SYSTEM, GRAVITY SERVICE WILL BE RESTORED BY A TEMPORARY TIE TO THE NEW CONSTRUCTION AND WORK SHALL BE SUSPENDED UNTIL THE PROBLEM IS RESOLVED TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES LEVIED AS A RESULT OF EFFLUENT REACHING A SURFACE WATER BODY. THE CONTRACTOR WILL BE REQUIRED TO VERIFY THE METHOD OF HANDLING SEWER FLOWS DURING CONSTRUCTION BY PUMPING AT PEAK FLOWS FOR 1 HOUR AS APPROVED BY THE ENGINEER. MAINTENANCE OF THE EXISTING FLOW IS CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE SEWER MAINS AND APPURTENANCES, AND SHALL NOT BE MEASURED OR PAID SEPARATELY.

17. ALL NEW SANITARY SEWER MANHOLES WITH ASSOCIATED PIPE DIAMETERS 16-INCHES OR LARGER SHALL BE A MINIMUM 5-FOOT INNER DIAMETER. SEWER MANHOLES WITH ASSOCIATED PIPE DIAMETERS 12-INCH OR SMALLER SHALL BE A MINIMUM 4-FOOT INNER DIAMETER. ALL MANHOLES WITH A DEPTH OF 10 FEET OR LESS SHALL BE A MINIMUM 4-FOOT INNER DIAMETER. ALL MANHOLES WITH A DEPTH GREATER THAN 10 FEET SHALL BE A MINIMUM OF 5-FOOT INNER DIAMETER.

18. TREES MARKED WITH AN "X" ON THE CONSTRUCTION PLANS ARE THOSE LARGE DIAMETER TREES THAT WERE SURVEYED AND ARE MEANT TO BE DEMOLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL SMALL TREES AND BRUSH LOCATED WITHIN THE PROPOSED PERMANENT SEWER OR TEMPORARY CONSTRUCTION EASEMENT WHETHER MARKED BY AN "X" OR NOT.

19. CONTRACTOR SHALL GRADE AND COMPACT AREAS WITHIN PERMANENT EASEMENTS TO A SLOPE NOT GREATER THAN 4:1. MAINTENANCE VEHICLES SHALL BE ABLE TO ACCESS ALL MANHOLES WITHIN PROJECT AREA.

20. THE RECEIVING WATER BODY FOR STORMWATER DISCHARGES IS BOLIN CREEK (CLASSIFICATION WS-V; NSW), WHICH IS PART OF THE CAPE FEAR RIVER BASIN.

21. THE TOTAL AREA OF DISTURBANCE IS 15.1 ACRES (DETERMINED BY SITE MAP).

UTILITIES

1. THIS CONSTRUCTION IS TO BE IN STRICT COMPLIANCE WITH THE "NORTH CAROLINA POLICIES AND PROCEDURES FOR ACCOMMODATING UTILITIES ON HIGHWAY RIGHTS OF WAY" MANUAL, LATEST EDITION.

2. THE CONTRACTOR SHALL CALL "NORTH CAROLINA ONE CALL" AT 1-800-632-4949 AT LEAST 48 HOURS PRIOR TO BEGINNING ANY EXCAVATION.

3. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS AND REQUIREMENTS OF THE NORTH CAROLINA OVERHEAD HIGH VOLTAGE LINES SAFETY ACT. AS A MINIMUM, THE CONTRACTOR SHALL:

   A. CONTACT THE ELECTRIC UTILITY 48 HOURS PRIOR TO COMMENCING WORK IF THE CONTRACTOR'S TOOLS OR MATERIALS WILL INTRUDE TO WITHIN SIX (6) FEET OF AN OVERHEAD POWER LINE.

   B. CONTACT THE ELECTRIC UTILITY 48 HOURS PRIOR TO COMMENCING WORK IF COVERED EQUIPMENT SUCH AS CRANES OR DERRICKS WILL BE OPERATED WITHIN TEN (10) FEET OF AN OVERHEAD POWER LINE.

   C. POST AND MAINTAIN WARNING SIGNS WITHIN AND ON THE OUTSIDE OF EQUIPMENT OPERATING NEAR AN OVERHEAD HIGH VOLTAGE LINE.

4. THE DEPTH OF THE UNDERGROUND UTILITIES IS UNKNOWN. THE CONTRACTOR SHALL PERFORM SUFFICIENT NUMBER OF POTHOLES TO VERIFY LOCATION AND DEPTH OF ALL UTILITIES. THE ENGINEER OR OWNER MAY REQUEST ADDITIONAL POTHOLES AT THEIR DISCRETION, UP TO 20 POTHOLES, WHERE THE COST OF POTHOLING IS CONSIDERED TO BE INCIDENTAL. ANY ADDITIONAL POTHOLING AT THE DIRECTION OF THE OWNER SHALL BE CONSIDERED AS ADDITIONAL COMPENSATION. POTHOLING IS NOT ALLOWED IN THE PAVEMENT SECTION FOR NCDOT RIGHT-OF-WAYS, EXCEPT WHEN EXPLICITLY APPROVED BY NCDOT.

5. HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE ONLY AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL SCHEDULE THIS EFFORT TO ALLOW SUFFICIENT TIME TO COORDINATE WITH THE UTILITY COMPANIES. ANY ERRORS OR DISCREPANCIES FOUND SHALL BE REPORTED TO THE OWNER BEFORE PROCEEDING WITH THE WORK.

6. THE CONTRACTOR SHALL DETERMINE THE UTILITY COMPANIES AFFECTED BY THIS PROJECT AND REVIEW THE PLANS WITH THEM TO CONFIRM THE PRESENCE OF UTILITIES OR LACK THEREOF ON ANY PORTION OF THE SITE(S). THE CONTRACTOR SHALL MAKE SATISFACTORY ARRANGEMENTS WITH THE UTILITY OWNERS TO ADJUST THE UTILITIES, TEMPORARILY BRACE POLES, RELOCATE GUY WIRES, PROVIDE TEMPORARY SERVICES OR OTHER ITEMS OF WORK REQUIRED. THESE REQUIREMENTS SHALL BE COMPLETED PRIOR TO THE CONTRACTOR PERFORMING WORK IN THOSE AREAS. WORK ASSOCIATED WITH THIS ITEM IS CONSIDERED TO BE INCIDENTAL, AND SUCH COSTS SHALL BE INCLUDED IN OTHER ITEMS OF WORK.

7. WHERE EXISTING UTILITIES AND STRUCTURES ARE INDICATED AS BEING IN THE LINE OF THE PROPOSED IMPROVEMENT, THE CONTRACTOR SHALL EXPOSE THEM, AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THIS WORK IS TO BE DONE SUFFICIENTLY IN ADVANCE OF THE CONSTRUCTION OPERATIONS TO PERMIT ADJUSTMENTS IN LINE OF GRADE, IF REQUIRED, TO ELIMINATE INTERFERENCES. EXISTING PIPES OR CONDUITS CROSSING THE TRENCH, OR OTHERWISE EXPOSED SHALL BE ADEQUATELY BRACED AND SUPPORTED TO PREVENT DAMAGE. UTILITY SERVICES BROKEN OR DAMAGED SHALL BE REPAIRED AT ONCE TO AVOID INCONVENIENCE TO CUSTOMERS. STORM SEWERS SHALL NOT BE INTERRUPTED OVERNIGHT.

8. IN AREAS WHERE THE CONTRACTOR'S OPERATIONS ARE ADJACENT TO OR NEAR A UTILITY, BUT NOT IN DIRECT CONFLICT, AND SUCH OPERATIONS MAY CAUSE DAMAGE WHICH MIGHT RESULT IN CONSIDERABLE EXPENSE, LOSS AND INCONVENIENCE, THE CONTRACTOR'S OPERATION SHALL BE SUSPENDED UNTIL ALL ARRANGEMENTS NECESSARY FOR THE PROTECTION THEREOF HAVE BEEN MADE BY THE CONTRACTOR.

9. NOT ALL HOUSE UTILITY SERVICE LINES ARE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL LIKEWISE MAKE ARRANGEMENTS TO HAVE EACH UTILITY LINE LOCATED PRIOR TO EXCAVATING IN FRONT OF A RESIDENCE. ANY HOUSE SERVICE UTILITY DAMAGED OR BROKEN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE UNLESS THE UTILITY WAS NOT ACCURATELY LOCATED BY THE UTILITY COMPANY.

10. WHEN EXCAVATING THE JACKING AND RECEIVING PITS, THE CONTRACTOR SHALL TAKE CARE AS TO NOT DISRUPT EXISTING UTILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING UTILITIES AND SHALL RESTORE ANY DAMAGED UTILITIES TO ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.

11. CONTRACTOR'S COST FOR UTILITY COORDINATION, INCLUDING BUT NOT LIMITED TO, THE FOLLOWING SHALL BE CONSIDERED INCIDENTAL AND SUCH COSTS SHALL BE INCLUDED IN OTHER ITEMS OF WORK.

   A. COST OF UTILITIES REPLACEMENT, RELOCATION AND/OR MAINTENANCE.

   B. COMPACTION OF ALL UTILITY TRENCHES.

   C. COSTS TO REPAIR ALL UTILITIES DAMAGED BY CONSTRUCTION.

   D. COSTS ASSOCIATED WITH COORDINATION WITH UTILITY COMPANIES.

   E. MEASURES REQUIRED BY THE UTILITY COMPANY, AND COSTS INVOICED BY THE UTILITY COMPANY FOR WORK PERFORMED BY THEM.

12. THE CONTRACTOR SHALL PROVIDE NEW SANITARY SEWER SERVICES TO ALL PROPERTIES ADJACENT TO THE NEW SEWER LINES, PER THE STANDARD DETAILS. FOR NEW SEWER CUSTOMERS, PROVIDE SERVICE LATERALS TO THE AGREED UPON LOCATION AT THE PROPERTY LINE. CONTRACTOR SHALL COORDINATE THE FINAL LOCATION OF THE SERVICES WITH ALL NEW CUSTOMERS, AND VERIFY WITH ENGINEER PRIOR TO ANY CHANGES.

13. GRAVITY SEWER SERVICE LATERALS TO NEW OWASA CUSTOMERS SHALL BE 4"ø, PER DETAILS (TYP.), UNLESS OTHERWISE STATED ON THE DRAWINGS.

SURVEY DATUM INFORMATION

1. UTILITY ROUTE SURVEY AND TOPOGRAPHIC SURVEY PERFORMED BY CH ENGINEERING, PLLC (NC PROFESSIONAL LICENSE P-0189), DATED SEPTEMBER & OCTOBER 2015.

2. THE HORIZONTAL AND VERTICAL DATUM WAS ESTABLISHED, USING THE NC RTK NETWORK. THE HORIZONTAL DATUM IS NAD 83'/NSRS 2007. THE VERTICAL DATUM IS NAVD 88.

3. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES UNLESS OTHERWISE NOTED.

4. UNITS ARE U.S. SURVEY FEET UNLESS OTHERWISE NOTED.

5. TIE TO NC GRID MONUMENTS AS SHOWN HEREON.

6. EASEMENTS SHOWN PER RECORDS FOUND. THIS SURVEY SUBJECT TO ANY FACTS AND EASEMENTS WHICH MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH.

7. THE PARCEL INFORMATION SHOWN HEREON ARE SUBJECT TO ANY AND ALL EASEMENTS, RIGHTS OF WAY AND RESTRICTIONS OF RECORD. THE PARCELS AS SHOWN WERE DRAWN FROM FIELD TIES MADE TO PROPERTY CORNERS ALONG THE RIGHT OF WAY AND USING RECORDED DEED AND PLAT INFORMATION TO PLOT THE ENTIRE PARCEL. THESE PARCELS AS DRAWN ARE NOT CONSIDERED TO BE BOUNDARY SURVEYS AND SHOULD NOT BE USED AS SUCH.

8. FLOOD NOTE: AS DETERMINED BY GRAPHIC PLOTTING, THIS PROPERTY IS NOT LOCATED IN A SPECIAL FLOOD HAZARD ZONE PER FEMA FLOOD INSURANCE RATE MAPS 3710987000J, EFFECTIVE 02/02/2007 AS NOTED HEREON.

9. UTILITY STATEMENT: THE UNDERGROUND UTILITIES SHOWN (IF ANY) HAVE BEEN LOCATED FROM COUNTY GIS INFORMATION, EXISTING DRAWINGS, AND FIELD SURVEY INFORMATION. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED, OR THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

10. CONTRACTOR TO VERIFY UTILITY LOCATIONS AND ELEVATIONS BEFORE CONSTRUCTION. IF CONDITIONS DIFFER SIGNIFICANTLY FROM THOSE SHOWN ON THE PLANS, NOTIFY THE ENGINEER IMMEDIATELY.

11. ALL WORK FOR THE PROJECT SHALL CONFORM TO THE PROJECT SPECIFICATIONS FOUND IN THE PROJECT MANUAL AS WELL AS THE NCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, LATEST EDITION. IN THE EVENT CONFLICT IN SPECIFICATIONS EXIST, THE NCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION SHALL GOVERN.

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG:	KKP
DESIGNED BY:	JLL
DRAWN BY:	TS/KTP
CHECKED BY:	JDP/RLF
APPROVED BY:	JLL

FINAL DRAWING – FOR REVIEW PURPOSES ONLY

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NCBELS LIC. NO. C-2243

SHEET TITLE: GENERAL NOTES

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. G-002

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ABBREVIATION / WORD

ABBREVIATION	WORD
A	
ABND	ABANDONED
AGGR	AGGREGATE
&	AND
APPD	APPROVED
APPROX	APPROXIMATE
A	AREA
ASPH	ASPHALT
@	AT
AUTH	AUTHORIZED
AVE	AVENUE
AVG	AVERAGE
AZ	AZIMUTH
B	
BL	BASE LINE
BRG	BEARING
BM	BENCH MARK
BES	BEVELED END SECTION
BET.	BETWEEN
BS	BOTH SIDES
BOT	BOTTOM
B/	BOTTOM OF
BC	BOTTOM CHORD
BDY	BOUNDARY
BRK	BREAK
BRDG	BRIDGE
BLDG	BUILDING
BV	BALL VALVE
BFV	BUTTERFLY VALVE
C	
CALC	CALCULATE
CB	CATCH BASIN
CIP	CAST-IN-PLACE
CI	CAST IRON
CAT.	CATALOG
CEM	CEMENT
CTR	CENTER
CL	CENTERLINE
C to C	CENTER TO CENTER
CHAM	CHAMFER
CO	CHANGE ORDER
CHAN	CHANNEL
CHK	CHECK
CV	CHECK VALVE
CHD	CHORD
CIR	CIRCLE
CIR	CIRCULAR
CIRC	CIRCUMFERENCE
CO	CLEANOUT
CW	CLOCKWISE
CTD	COATED
COL	COLUMN
COMB.	COMBINATION
CO	COMPANY
CONC	CONCRETE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
COND	CONDITION
CONN	CONNECT
CONT	CONTINUOUS
CD	CORD
CORP	CORPORATION
XSECT	CROSS SECTION
CU	CUBIC
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CU FT	CUBIC FOOT
CU IN.	CUBIC INCH
CU YD	CUBIC YARD
CUR	CURRENT
D	
DEC	DECIMAL
DEG (OR °)	DEGREE
DEPT	DEPARTMENT
DSGN	DESIGN
DET	DETAIL
DEV	DEVELOP
DI	DROP INLET
DIAG	DIAGONAL
DIA (OR ø)	DIAMETER
DIM.	DIMENSION
DISCH	DISCHARGE
DIST	DISTANCE
DN	DOWN
DFTG	DRAFTING
DWG	DRAWING
DR	DRIVE
DI	DUCTILE IRON
DIP	DUCTILE IRON PIPE
E	
EA	EACH
EF	EACH FACE
ES	EACH SIDE
EW	EACH WAY
E	EAST
EFF	EFFECTIVE
ELL	ELBOW
ELEC	ELECTRIC
ELEV	ELEVATION
ENGR	ENGINEER
EQ	EQUAL
EQUIP. (OR EQ)	EQUIPMENT
EQUIV	EQUIVALENT
E CONTINUED	
EST	ESTIMATE
EX	EXISTING
EXP	EXPANSION
EJ	EXPANSION JOINT
EXT	EXTERIOR
F	
FES	FLARED END SECTION
F to F	FACE TO FACE
FT (OR ')	FEET
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED PLASTIC
FLD	FIELD
FIG.	FIGURE
FIL	FILLET
FLT	FILTER
FIN.	FINISH
FF	FINISH FLOOR
FH	FIRE HYDRANT
FE	FLANGE
FL	FLUID
FWD	FORWARD
FDN	FOUNDATION
FREQ	FREQUENCY
FR	FRONT
G	
GAL	GALLON
GALV	GALVANIZE
GEN	GENERAL
GR	GRADE
GL	GRADE LINE
GRD	GROUND
H	
HDPE	HIGH DENSITY POLYETHYLENE
H.P.	HIGH POINT
HORIZ	HORIZONTAL
HR	HOUR
HW	HANDWHEEL OR HEADWALL
HYD	HYDRAULIC
I	
IN	INCH
IPS	INCHES PER SECOND
INCL	INCLUDE
IND	INDUSTRIAL
INFO	INFORMATION
ID	INSIDE DIAMETER
IF	INSIDE FACE
IINT	INTERSECT
INV	INVERT
I	IRON
J	
JCT	JUNCTION
JB	JUNCTION BOX
L	
LAT	LATITUDE
LT	LEFT
LF	LINEAR FEET OR FOOR
L.P.	LOW POINT
M	
MH	MANHOLE
MAN.	MANUAL
MFR	MANUFACTURE
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MED	MEDIAN
MET.	METAL
MI	MILES
MPH	MILE PER HOUR
MIN	MINIMUM
MIN (OR ')	MINUTE
MISC	MISCELLANEOUS
MOD	MODEL
MULT	MULTIPLE
N	
NEG	NEGATIVE
NA	NOT AVAILABLE
NIC	NOT IN CONTRACT
NOM	NEUTRAL
NOR	NORMAL
N	NORTH
NTS	NOT TO SCALE
NO. (OR #)	NUMBER
O	
O.C.	ON CENTER
O/S	OFFSET
OP'NG	OPENING
OPP	OPPOSITE
OWASA	ORANGE WATER SEWER AUTHORITY
ORIG	ORIGINAL
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OA	OVERALL
OHP	OVERHEAD POWER
OVF	OVERFLOW
P	
PERM	PERMANENT
PERP	PERPENDICULAR
PL	PROPERTY LINE
LB (OR #)	POUND
PSI	POUNDS PER SQUARE INCH
PWR	POWER
PFD	PREFERRED
PREP	PREPARE
PRESS.	PRESSURE
PCO	PRESSURE CLEANOUT
PT	PRESSURE TREATED
PROC	PROCESS
PROD	PRODUCTION
PF	PROFILE
PROJ	PROJECT
R	
R	RADIUS
RR	RAILROAD
RECD	RECEIVED
REC	RECORD
REF	REFERENCE
REF L	REFERENCE LINE
RCP	REINFORCED CONCRETE PIPE
REINF	REINFORCING
REM	REMOVE
REQ	REQUIRE
REQD	REQUIRED
RES	RESIDENTIAL
REV	REVISION(REVISED)
RJ	RESTRAINED JOINT
RRMP	RAILROAD MILE POST
RT	RIGHT
RH	RIGHT HAND
R/W	RIGHT OF WAY
S	
SCH	SCHEDULE
SL	SEA LEVEL
SEC (OR ")	SECOND
SECT	SECTION
SD	STORM DRAIN
SHW	STRAIGHT HEADWALL
SIM	SIMILAR
S	SOUTH
SQ	SQUARE
STD	STANDARD
STA	STATION
SUR	SURFACE
SY	SQUARE YARD
SYM	SYMBOL
SW	SIDEWALK
T	
TAN.	TANGENT
TPR	TAPER
THK	THICK
KIP	THOUSAND POUND
T/	TOP OF
TOT	TOTAL
TYP	TYPICAL
U	
U	UNIT
UNO	UNLESS NOTED OTHERWISE
V	
V	VALVE
VAR	VARIABLE
VERT	VERTICAL
VOL	VOLUME
W	
WT	WEIGHT
W	WEST
W	WIDTH
W/	WITH
W/O	WITHOUT
Y	
YD	YARD
YH	YARD HYDRANT
YI	YARD INLET
YR	YEAR

NCDOT GENERAL NOTES

1. ALL DRY EXCAVATIONS INSIDE THE THEORETICAL 1:1 SLOPE FROM THE EXISTING EDGE OF PAVEMENT TO THE BOTTOM OF THE NEAREST EXCAVATION WALL SHOULD BE MADE IN ACCORDANCE WITH THE FOLLOWING CONDITIONS:
   - A. MOVE TRAFFIC TO A TRAVEL LANE OUTSIDE THE LIMITS OF A THEORETICAL 1:1 SLOPE FROM THE BOTTOM OF THE NEAREST TRENCH WALL TO THE PAVEMENT SURFACE.
   - B. USE ACTIVE EXCAVATION SUPPORT SYSTEMS SUCH AS SHEETING, SHORING OR BRACING FOR INSTALLATION OF PIPE AND APPURTENANCES, OR AS NOTED ON THE DRAWINGS. DESIGN OF SHEETING, SHORING AND BRACING SHALL INCLUDE THE EFFECTS OF TRAFFIC LOADS. AN ENGINEER LICENSED IN NORTH CAROLINA SHALL SEAL THE DESIGN AS APPLICABLE TO THE SPECIFIC SITE. SHEETING, SHORING OR BRACING PLANS AND DESIGN CALCULATION SHALL BE SUBMITTED TO THE NCDOT DIVISION ENGINEER AND THE OWNER'S ENGINEER FOR REVIEW AND COMMENT PRIOR TO CONSTRUCTION. CONTRACTOR SHALL ALLOW A MINIMUM OF 60 CALENDAR DAYS IN THE SCHEDULE FOR REVIEW AND COMMENT OF SHEETING, SHORING AND BRACING. ALL SHEETING, SHORING OR BRACING SHALL COMPLY WITH NCDOT STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, AND REQUIREMENTS. SHEETING, SHORING OR BRACING SHALL COMPLY WITH SPECIFICATION SECTIONS 31 23 16.13. TRENCH BOXES ARE NOT ACCEPTABLE AS ACTIVE EXCAVATION SUPPORT SYSTEMS.
   - C. THE TRENCH BACKFILL MATERIAL SHALL MEET THE STATEWIDE BORROW CRITERIA. BACKFILL THE TRENCH IN ACCORDANCE WITH SECTION 300-6 OF THE LATEST EDITION OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES. THIS REQUIRES THE BACKFILL MATERIAL TO BE PLACED IN LAYERS NOT TO EXCEED 6 INCHES LOOSE AND COMPACTED TO AT LEAST 100% OF THE DENSITY OBTAINED BY COMPACTING A SAMPLE IN ACCORDANCE WITH AASHTO T99 AS MODIFIED BY NCDOT.
   - D. AT THE FIRST SIGN OF A TRENCH FAILURE, IMMEDIATELY BACKFILL THE TRENCH WITH MATERIALS CONSISTING OF A-1, A-3, A-2-4 SOILS, OR A-4 SOILS HAVING A MAXIMUM OF 45% PASSING A NO.200 SIEVE AND A MAXIMUM P.I. OF 6. CEASE ALL WORK AND CONTACT THE DIVISION ENGINEER. THE CONTRACTOR IS REQUIRED TO REPAIR ANY DAMAGE TO THE PAVEMENT CAUSED BY THE EXCAVATION OF A NCDOT APPROVED DESIGN FOR HS-20 LOADING, AT NO ADDITIONAL COST TO THE OWNER.
   - E. ALL TRENCH EXCAVATION INSIDE THE LIMITS OF THE THEORETICAL 1:1 SLOPE, AS DEFINED BY THE POLICY, SHOULD BE COMPLETELY BACKFILLED AND COMPACTED AT THE END OF EACH CONSTRUCTION DAY. NO PORTION OF THE TRENCH SHOULD BE LEFT OPEN OVERNIGHT.
   - F. THE LENGTH OF PARALLEL EXCAVATION SHOULD BE LIMITED TO THE LENGTH NECESSARY TO INSTALL AND BACKFILL ONE JOINT OF PIPE AT A TIME, NOT TO EXCEED TWENTY FIVE (25) FEET.
   - G. AN APPROPRIATE PERFORMANCE BOND SHOULD BE POSTED FOR A PERIOD OF TWO (2) TO FIVE (5) YEARS TO COVER ANY LONG TERM PAVEMENT REPAIRS WHICH MAY BE REQUIRED AS A RESULT OF THE INSTALLATION.
   - H. GROUNDWATER SHALL BE REMOVED SUFFICIENTLY TO BE A DRY EXCAVATION PRIOR TO EXCAVATING.
2. AN EXECUTED COPY OF A NCDOT ENCROACHMENT AGREEMENT WILL BE PRESENT AT THE CONSTRUCTION SITE AT ALL TIMES DURING CONSTRUCTION. IF SAFETY OR TRAFFIC CONDITIONS WARRANT SUCH AN ACTION, NCDOT RESERVES THE RIGHT TO FURTHER LIMIT, RESTRICT, OR SUSPEND OPERATIONS WITHIN THE RIGHT OF WAY.
3. NCDOT DOES NOT GUARANTEE THE RIGHT OF WAY ON THIS ROAD, NOR WILL IT BE RESPONSIBLE FOR ANY CLAIM FOR DAMAGES BROUGHT ABOUT BY ANY PROPERTY OWNER BY REASON OF THIS INSTALLATION.
4. THE CONTRACTOR IS REQUIRED TO CONTACT THE APPROPRIATE UTILITY COMPANIES INVOLVED AND MAKE SATISFACTORY ARRANGEMENTS TO ADJUST THE UTILITIES IN CONFLICT WITH THE PROPOSED WORK PRIOR TO BEGINNING CONSTRUCTION.
5. THE CONTRACTOR SHALL NOT BEGIN THE CONSTRUCTION UNTIL AFTER THE TRAFFIC CONTROL AND EROSION CONTROL DEVICES HAVE BEEN INSTALLED TO THE SATISFACTION OF THE DISTRICT ENGINEER.
6. TRENCHING, BORE PITS, AND/OR OTHER EXCAVATIONS SHALL NOT BE LEFT OPEN OR UNSAFE OVERNIGHT. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AND PROVIDE A COMPETENT PERSON, KNOWLEDGEABLE OF ALL APPLICABLE OSHA RULES AND REGULATIONS ON SITE TO SUPERVISE EXCAVATION AT ALL TIMES.
7. ALL FILL AREAS/BACKFILL SHALL BE COMPACTED IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS AND LATEST NCDOT STANDARDS.
8. VEGETATIVE COVER SHALL BE ESTABLISHED ON ALL DISTURBED AREAS IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE DIVISION ROADSIDE ENVIRONMENTAL ENGINEER.
9. PROPER TEMPORARY AND PERMANENT MEASURES SHALL BE USED TO CONTROL EROSION AND SEDIMENTATION IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.
10. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S STANDARDS AND SPECIFICATIONS MANUALS (LATEST EDITION).
11. STRICT COMPLIANCE WITH THE POLICIES AND PROCEDURES FOR ACCOMMODATING UTILITIES ON HIGHWAY RIGHTS OF WAY MANUAL (LATEST EDITION) SHALL BE REQUIRED.
12. ANY DRAINAGE STRUCTURE DISTURBED OR DAMAGED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AS DIRECTED BY THE DISTRICT ENGINEER.
13. ALL DRIVEWAYS ALTERED DURING CONSTRUCTION SHALL BE RETURNED TO A STATE EQUAL TO OR BETTER THAN THE CONDITION OF THE DRIVEWAYS PRIOR TO CONSTRUCTION.
14. RIGHT OF WAY MONUMENTS DISTURBED DURING CONSTRUCTION SHALL BE REFERENCED BY A NORTH CAROLINA REGISTERED LAND SURVEYOR AND RESET AFTER CONSTRUCTION.
15. PROPER TRAFFIC CONTROL DEVICES, SIGNS, ETC. SHALL BE INSTALLED TO ENSURE PUBLIC SAFETY IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND ANY SUPPLEMENTS THERETO.
16. TRAFFIC WILL BE MAINTAINED AT ALL TIMES.
17. INGRESS AND EGRESS SHALL BE MAINTAINED TO ALL BUSINESSES AND DWELLINGS AFFECTED BY THE PROJECT. SPECIAL ATTENTION SHALL BE PAID TO CHURCHES AND FIRE HYDRANTS.
18. ANY WORK REQUIRING EQUIPMENT OR PERSONNEL WITHIN 5' OF THE EDGE OF ANY TRAVEL LANE SHALL REQUIRE A LANE CLOSURE WITH APPROPRIATE TAPERS.
19. DURING NON-WORKING HOURS, EQUIPMENT SHALL BE PARKED AS CLOSE TO THE RIGHT-OF-WAY LINE AS POSSIBLE AND BE PROPERLY BARRICADED IN ORDER NOT TO HAVE ANY EQUIPMENT OBSTRUCTION WITHIN THE CLEAR RECOVERY AREA.
20. ALL ROADWAY SIGNS THAT ARE REMOVED DUE TO CONSTRUCTION SHALL BE REINSTALLED AS SOON AS POSSIBLE.
21. EXCAVATION MATERIAL SHALL NOT BE PLACED ON THE PAVEMENT. DRAINAGE STRUCTURES SHALL NOT BE BLOCKED WITH EXCAVATION MATERIALS.
22. MANHOLE RINGS AND COVERS, VALVE COVERS, AND STORM DRAIN GRATES AND FRAMES SHALL BE OF THE TRAFFIC BEARING TYPES APPROVED BY NCDOT FOR USE WITHIN HIGHWAY RIGHTS OF WAY.
23. PROPOSED TRAFFIC-BEARING MANHOLE SHALL BE FLUSH MOUNTED AND SHALL BE OF A NCDOT APPROVED DESIGN FOR HS-20 LOADING.
24. BORE PIT DIMENSIONS SHOWN ON THE PLANS REPRESENT THE BASE AREA OF THE PIT. CONTRACTOR SHALL FOLLOW ALL NCDOT AND OSHA REQUIREMENTS, INCLUDING, BUT NOT LIMITED TO, BORE PIT SLOPING REQUIREMENTS.
25. NCDOT SHALL ALLOW ONE LANE TO BE CLOSED ON ROGERS ROAD, EUBANKS ROAD, AND HOMESTEAD ROAD BETWEEN THE HOURS OF 9:00 AM AND 4:00 PM ONLY. ON PUREFOY DRIVE AND RUSCH ROAD, ONE LANE SHALL BE ALLOWED TO BE CLOSED AT ANYTIME. LANE CLOSURE RESTRICTIONS ARE SUBJECT TO CHANGE AS DIRECTED BY NCDOT DISTRICT ENGINEER. TRAFFIC WILL BE MAINTAINED AT ALL TIMES. ONLY ONE LANE CLOSURE SHALL BE ALLOWED. NO LANE CLOSURES SHALL TAKE PLACE ON HOLIDAYS OR LOCAL EVENTS.
26. NCDOT RESERVES THE RIGHT TO CHANGE THE TIMES OF LANE CLOSURE ALLOWED ON NCDOT ROADS BASED ON TRAFFIC CONDITIONS. ALLOWABLE HOURS OF CONSTRUCTION MAY BE ADJUSTED TO PROVIDE A MINIMUM OF 7 HOURS PER DAY, NOT NECESSARILY CONTINUOUS, OF WORKING TIME ON NCDOT ROADS.

PROHIBITED CONSTRUCTION ACTIVITIES

1. USING ANY SUBSTANCE OTHER THAN WATER TO CONTROL DUST.
2. OPEN BURNING OF PROJECT DEBRIS WITHOUT A PERMIT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE PERMIT OR DISPOSING OF THE TREES AND STUMPS.
3. PUMPING OF SEDIMENT-LADEN WATER FROM TRENCHES OR OTHER EXCAVATIONS INTO ANY SURFACE WATERS, ANY STREAM CORRIDORS, ANY WETLANDS, OR STORM SEWERS.
4. DISCHARGING POLLUTANTS – SUCH AS CHEMICALS, FUELS, LUBRICANTS, BITUMINOUS MATERIALS, RAW SEWAGE – AND OTHER HARMFUL WASTE INTO OR ALONGSIDE RIVERS, STREAMS, IMPOUNDMENTS OR INTO NATURAL OR MAN-MADE CHANNELS LEADING THERETO.
5. STORING CONSTRUCTION EQUIPMENT AND VEHICLES AND/OR STOCKPILING CONSTRUCTION MATERIALS ON PROPERTY, PUBLIC OR PRIVATE, NOT PREVIOUSLY SPECIFIED BY THE OWNER FOR SAID PURPOSES.
6. DISPOSING OF EXCESS OR UNSUITABLE EXCAVATED MATERIAL IN WETLANDS OR FLOOD PLAINS, EVEN WITH THE PERMISSION OF THE PROPERTY OWNER.
7. INDISCRIMINATE, ARBITRARY, OR CAPRICIOUS OPERATION OF EQUIPMENT IN ANY STREAM CORRIDORS, WETLAND SURFACE WATERS, OR OUTSIDE THE EASEMENT AREA.
8. PERMANENT OR UNSPECIFIED ALTERATION OF THE FLOW LINE OF A STREAM.
9. DAMAGING VEGETATION OUTSIDE OF THE CONSTRUCTION AREA.
10. DISPOSAL OF TREES, BRUSH, AND OTHER DEBRIS IN ANY STREAM CORRIDORS, WETLANDS, ANY SURFACE WATERS, OR AT UNSPECIFIED LOCATIONS.

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REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

FINAL DESIGN – FOR REVIEW PURPOSES ONLY – NORTH CAROLINA PROFESSIONAL ENGINEER

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SHEET TITLE: ABBREVIATIONS & NOTES

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. G-003

OUTFALL 1 PROP NETWORK MANHOLE COORDINATES

MANHOLE NO.	NORTHING	EASTING
OUTFALL 1	1973748.57	801988.96
SSMH-A1	1973823.08	802114.14
SSMH-A2	1973757.15	802206.44
SSMH-A3	1973815.62	802431.87
SSMH-A4	1973795.53	802541.37
SSMH-A5	1973787.92	802813.70
SSMH-A6	1973728.98	802998.68
SSMH-A7	1973672.89	803174.70
SSMH-A8	1973896.15	803252.74
SSMH-A9	1973898.79	803516.42
SSMH-A10	1973987.62	803516.42
SSMH-A11	1973987.62	803723.94
SSMH-A12	1974188.35	803942.33
SSMH-A13	1974304.90	804268.13
SSMH-A14	1974386.95	804510.75
SSMH-A15	1974464.43	804580.55
SSMH-A16	1974522.26	804632.72
SSMH-A17	1974553.40	804692.18
SSMH-A18	1974553.49	804813.41
SSMH-A19	1974577.18	804933.24
SSMH-A20	1974580.04	805082.86
SSMH-A21	1974591.12	805234.92
SSMH-A22	1974893.83	805215.53
SSMH-A23	1974895.40	805079.98
SSMH-A24	1974953.39	805081.08
SSMH-A25	1975193.76	805085.64
SSMH-A26	1975457.26	805090.65
SSMH-A27	1975447.73	805356.15
SSMH-A28	1975441.13	805539.81
SSMH-A29	1975443.01	805742.01
SSMH-A30	1975189.11	805742.01
SSMH-B1	1974061.35	803515.20
SSMH-B2	1974296.54	803511.31
SSMH-B3	1974362.11	803498.97
SSMH-B4	1974410.56	803473.33
SSMH-B5	1974509.99	803388.84
SSMH-B6	1974686.93	803506.34
SSMH-B7	1974591.59	803687.41
SSMH-B8	1974627.19	803746.17
SSMH-B9	1974843.26	803749.86
SSMH-C3	1974242.90	804918.62
SSMH-C4	1974136.22	805058.87
SSMH-C5	1974070.91	805229.91
SSMH-C6	1973999.15	805523.44
SSMH-C7	1973949.85	805625.64
SSMH-D1	1974378.47	804675.97
SSMH-D2	1974114.12	804677.54
SSMH-D3	1973848.22	804679.13
SSMH-D4	1973844.38	804997.30
SSMH-D5	1973781.69	805240.43
SSMH-D6	1973777.04	805452.01
SSMH-E1	1974687.35	804464.07
SSMH-E2	1974942.66	804206.02
SSMH-E3	1975126.16	804018.59
SSMH-E4	1975355.97	803781.06
SSMH-E5	1975547.72	803541.85
SSMH-F1	1974707.85	804484.01
SSMH-F2	1974739.96	804554.07
SSMH-F3	1974737.45	804610.77
SSMH-G1	1975219.00	804089.31
SSMH-G2	1975292.29	804116.85
SSMH-G3	1975602.07	804195.43
SSMH-H1	1973953.59	805695.91
SSMH-H2	1973949.92	805836.25
SSMH-I1	1974153.87	805685.24

OUTFALL 1 PROP NETWORK MANHOLE COORDINATES

MANHOLE NO.	NORTHING	EASTING
SSMH-I2	1974341.04	805685.34
SSMH-J1	1973961.25	803738.87
SSMH-K1	1975770.88	805550.59
SSMH-S1	1975508.51	805091.63

OUTFALL 2 PROP NETWORK MANHOLE COORDINATES

MANHOLE NO.	NORTHING	EASTING
OUTFALL 2A	1976332.05	801551.31
OUTFALL 2B	1975833.84	803548.94
OUTFALL 2C	1976115.93	804228.68
SSMH-L1	1976322.74	801528.43
SSMH-L2	1976429.16	801513.50
SSMH-L3	1976522.15	801531.58
SSMH-L4	1976563.81	801869.08
SSMH-L5	1976515.04	801977.45
SSMH-L6	1976608.08	802366.48
SSMH-L7	1976804.23	802471.46
SSMH-L8	1976917.16	802603.98
SSMH-L9	1976924.23	802927.43
SSMH-L10	1976931.30	803250.88
SSMH-L11	1976749.07	803329.90
SSMH-L12	1976747.62	803552.94
SSMH-L13	1976744.68	803773.80
SSMH-M1	1976546.39	803827.49
SSMH-M2	1976407.43	803837.51
SSMH-N1	1976546.64	803880.05
SSMH-O1	1976401.79	804232.34
SSMH-O2	1976537.16	804234.04
SSMH-P1	1975765.43	803513.34

OUTFALL 3 PROP NETWORK MANHOLE COORDINATES

MANHOLE NO.	NORTHING	EASTING
OUTFALL 3	1979006.82	802437.21
SSMH-Q1	1979024.79	802432.37
SSMH-Q2	1979054.05	802540.83
SSMH-Q3	1979215.51	802906.78
SSMH-Q4	1979327.59	803185.58

OUTFALL 4 PROP NETWORK MANHOLE COORDINATES

MANHOLE NO.	NORTHING	EASTING
OUTFALL 4	1977287.08	807806.93
SSMH-R1	1977279.63	807772.73
SSMH-R2	1977270.44	807642.27
SSMH-R3	1977285.85	807263.24
SSMH-R4	1977300.36	806910.97

OUTFALL 5 PROP NETWORK MANHOLE COORDINATES

MANHOLE NO.	NORTHING	EASTING
OUTFALL 5	1978371.88	801292.56
SSMH-T1	1978374.76	801369.43

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027361 RICHARD L. FRANKLIN
FINAL DRAWING - FOR REVIEW PURPOSES ONLY
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Telephone (919) 461-1100, FAX (919) 461-1415
www.aecom.com
NCBELS LIC. NO. C-2243

SHEET TITLE: INDEX SHEET

SCALE: AS SHOWN

DATE: 5/25/2016

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54

URS PROJ. NO. 31829996

SHEET I.D. G-004

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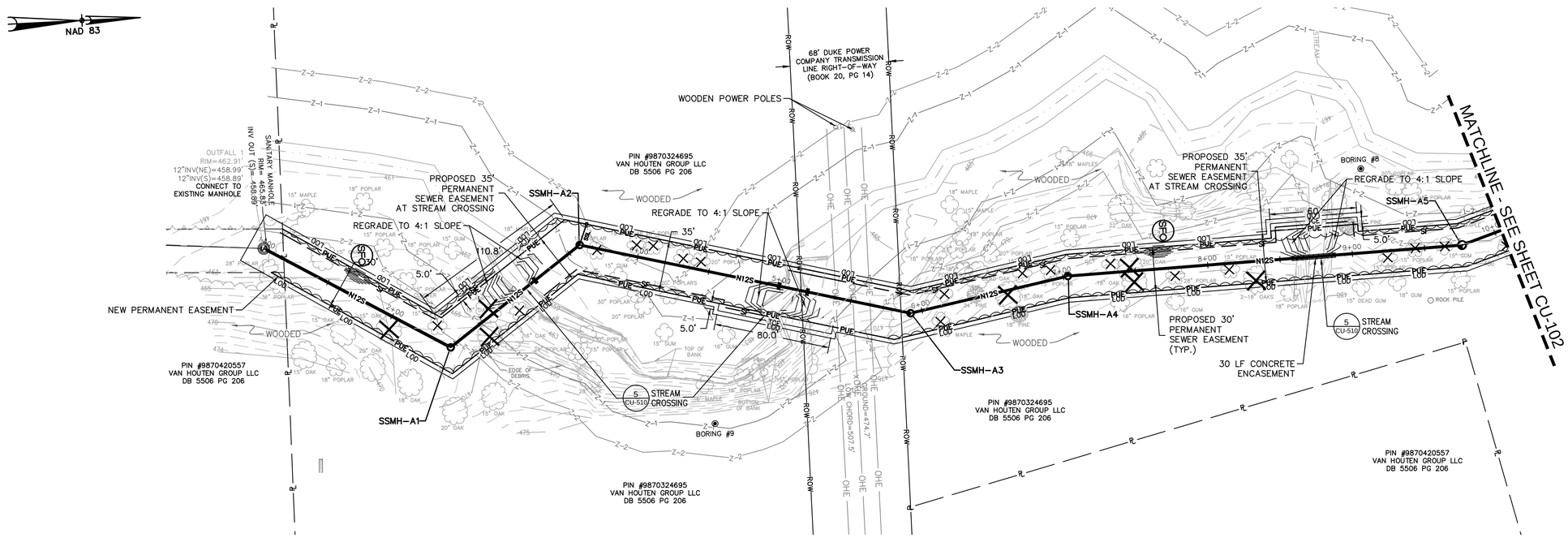
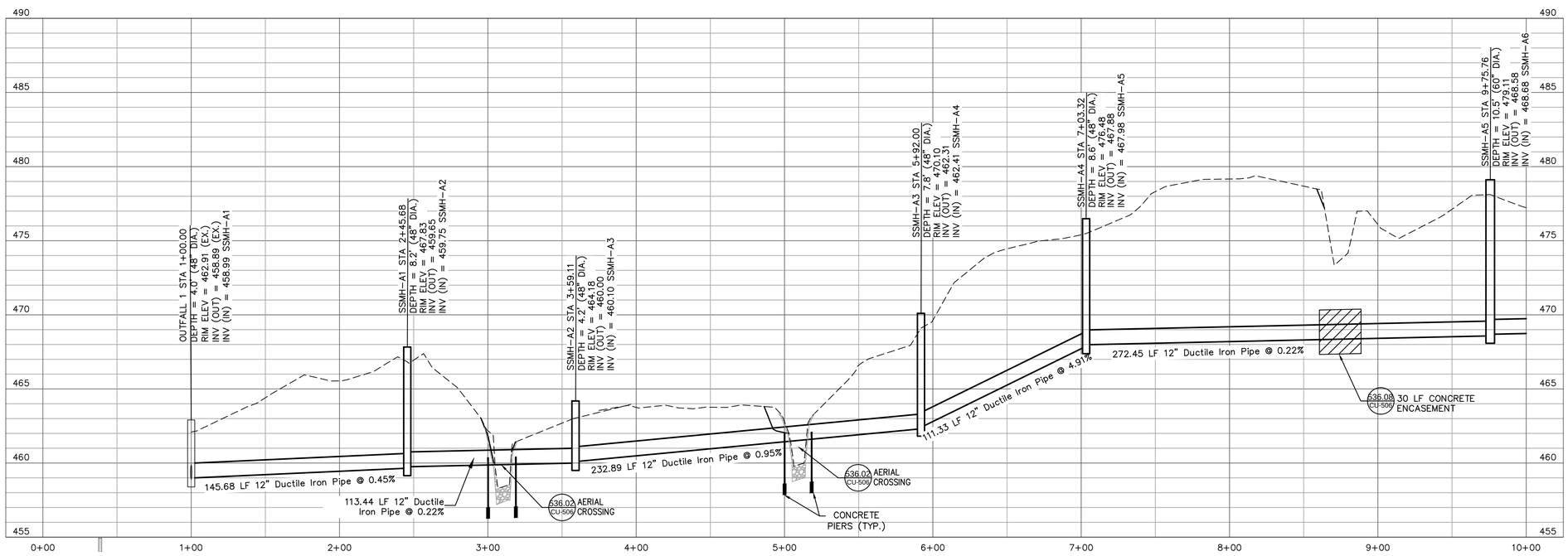


OUTFALL "A" PLAN VIEW
SCALE: 1" = 40'

NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'



OUTFALL-A
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS		
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE:
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DATE: 5/25/2016
SCALE: AS SHOWN

PROJECT:
HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-101
6 OF 39

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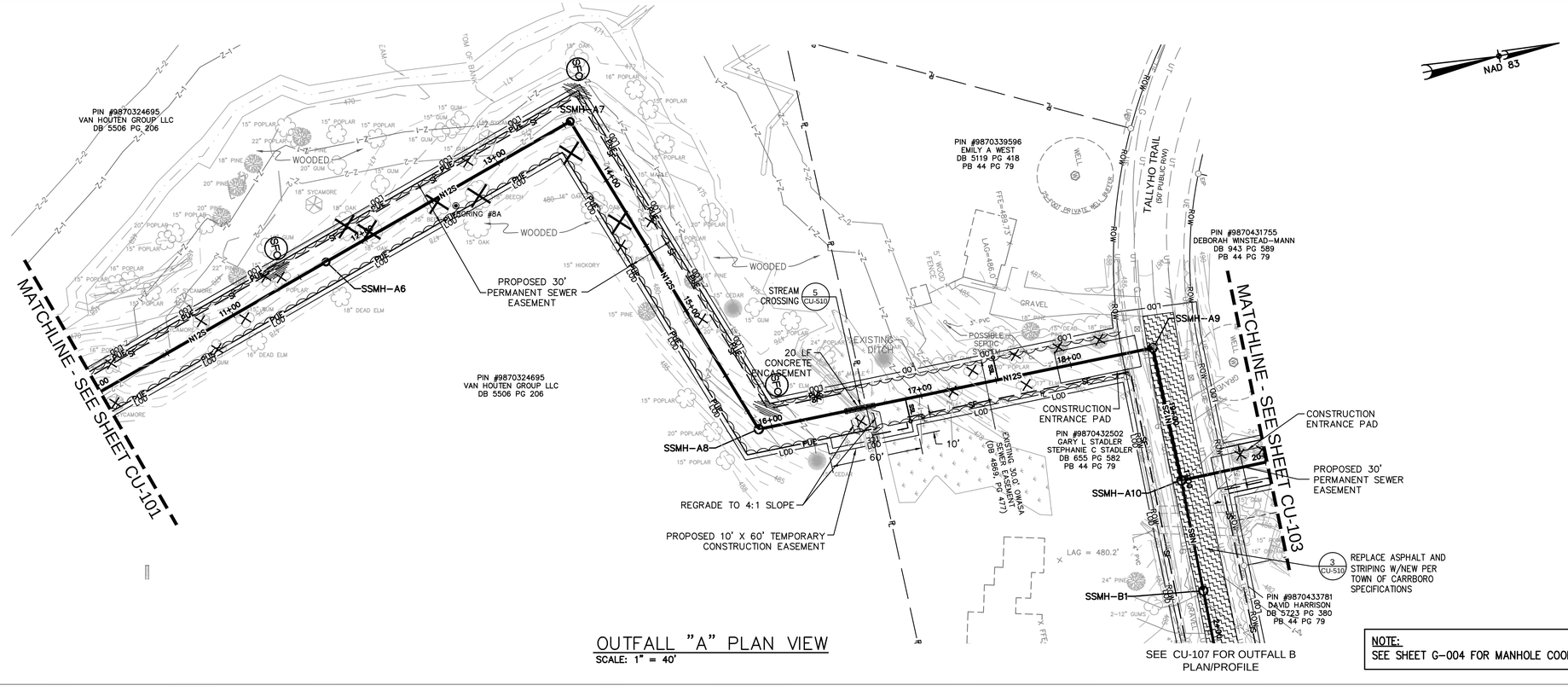
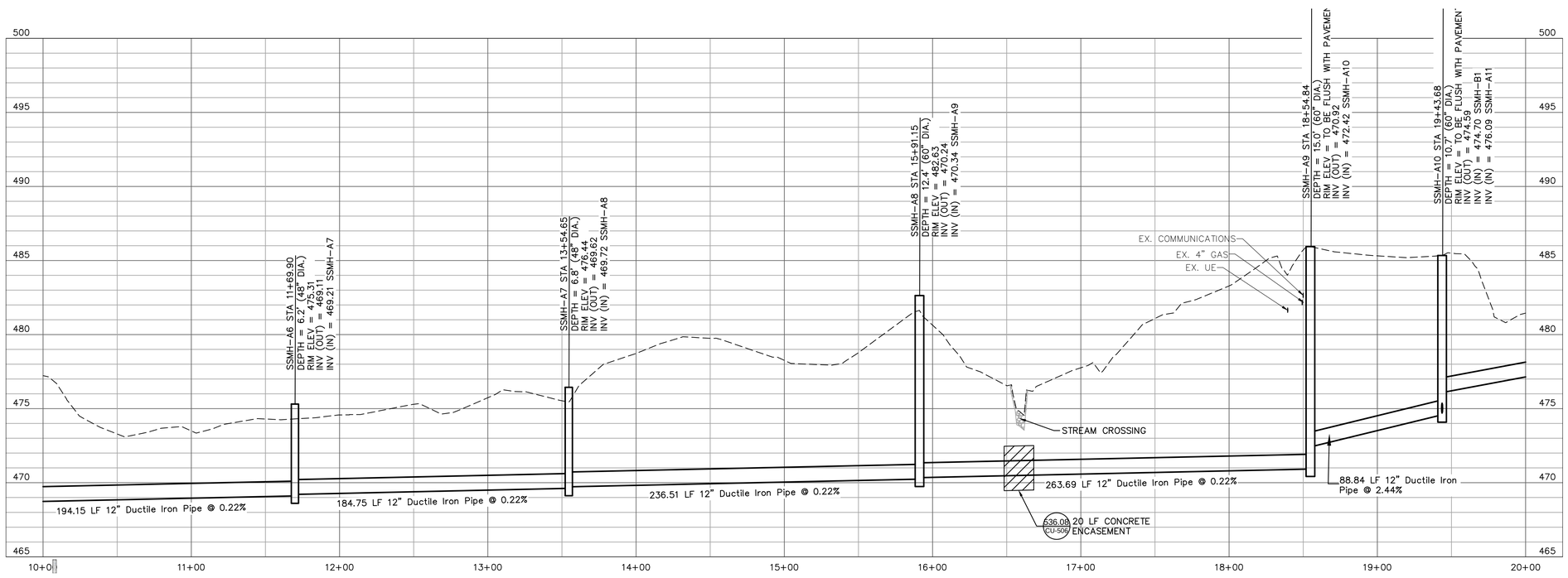


NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'

OUTFALL "A" PLAN VIEW
SCALE: 1" = 40'



OUTFALL-A
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE:
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DATE: 5/25/2016
SCALE: AS SHOWN

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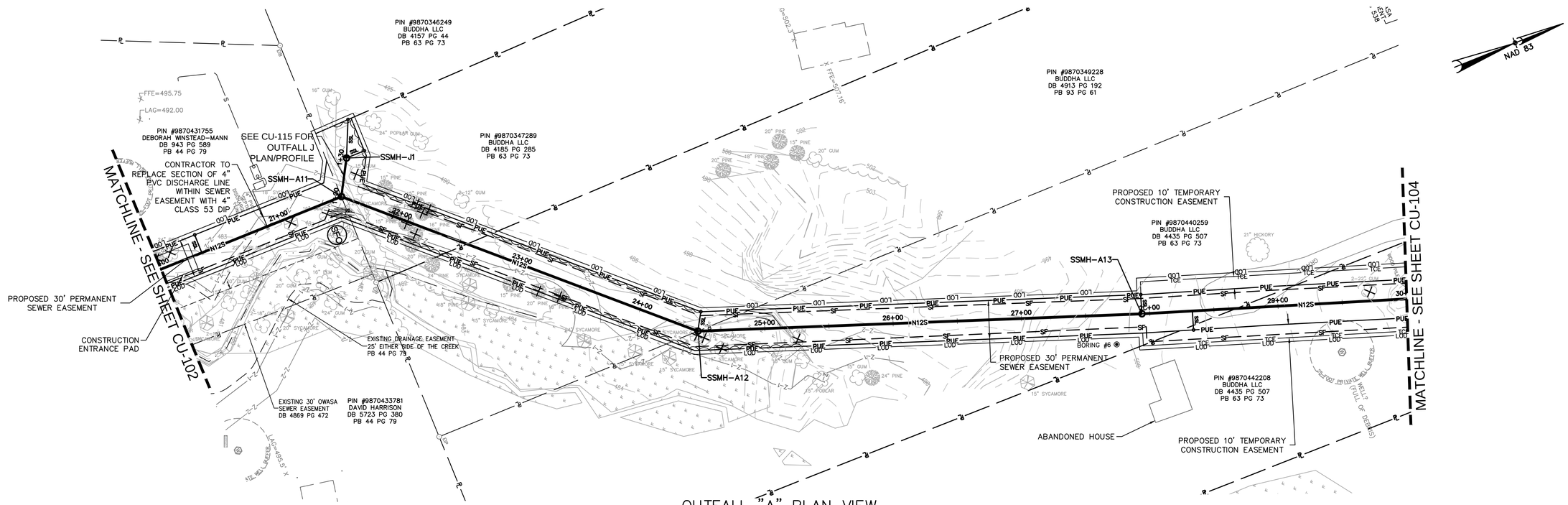

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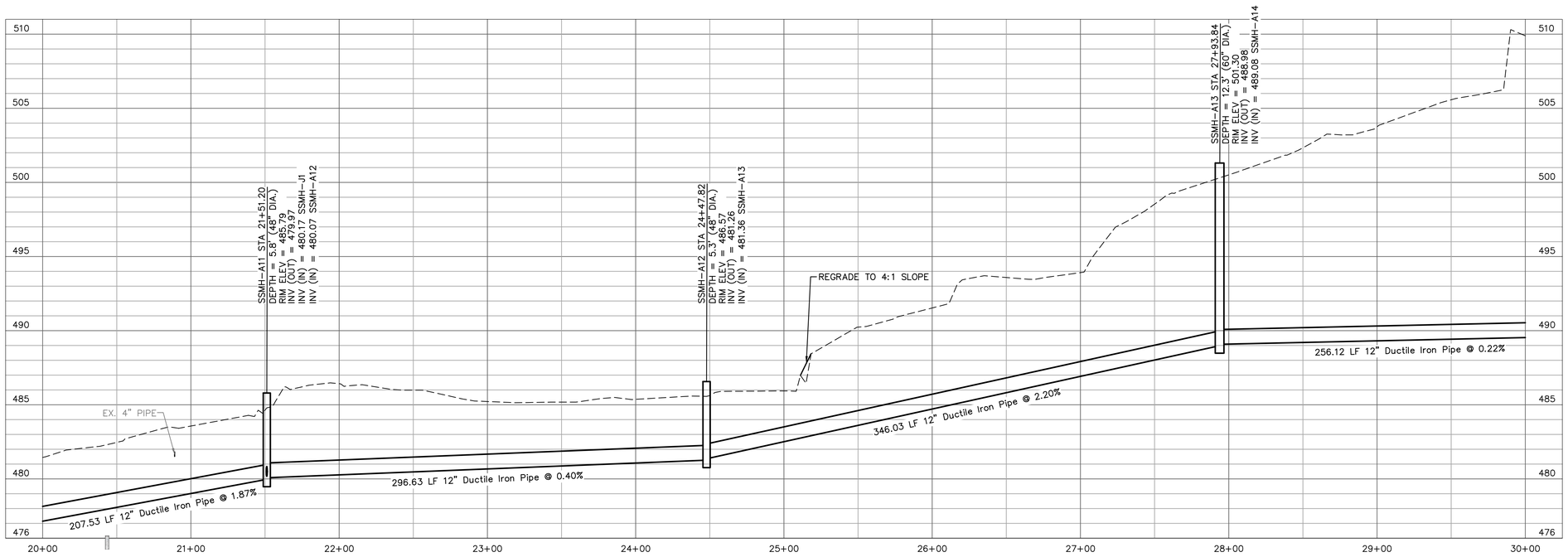
OUTFALL "A" PLAN VIEW
SCALE: 1" = 40'



OUTFALL-A
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
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APPROVED BY: JLL

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SEWER PLAN & PROFILE
– OUTFALL A

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PROJECT:
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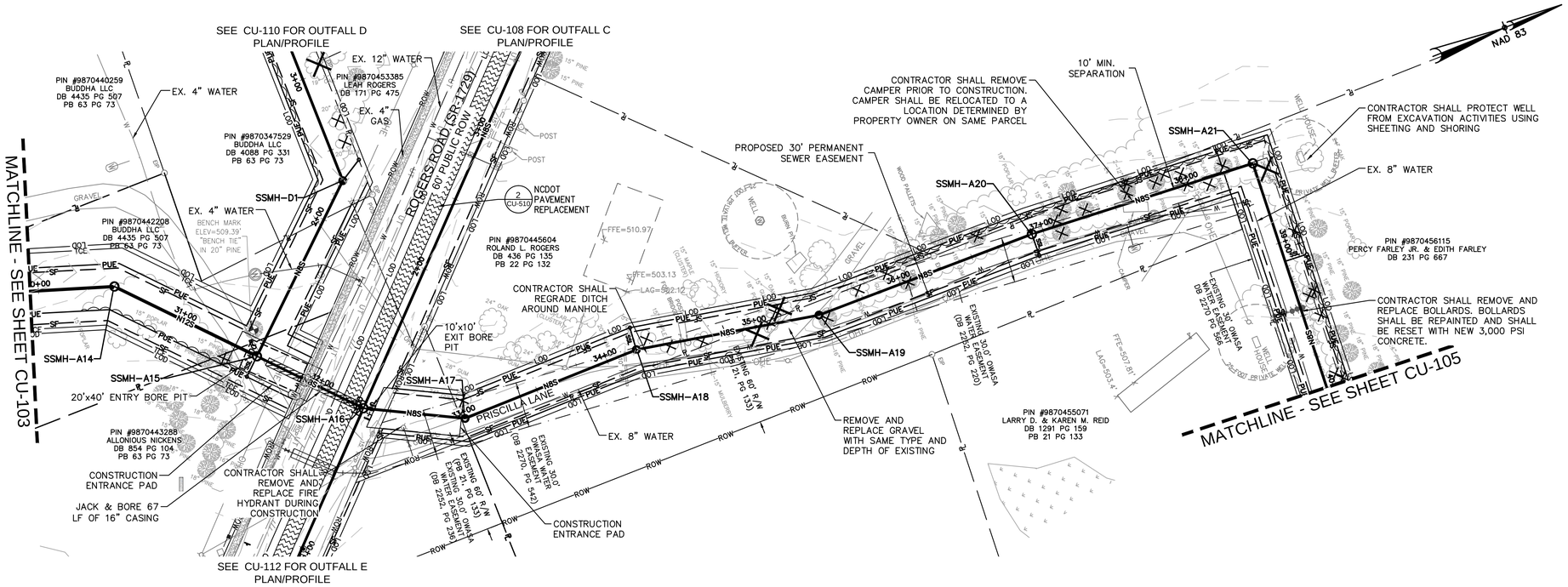
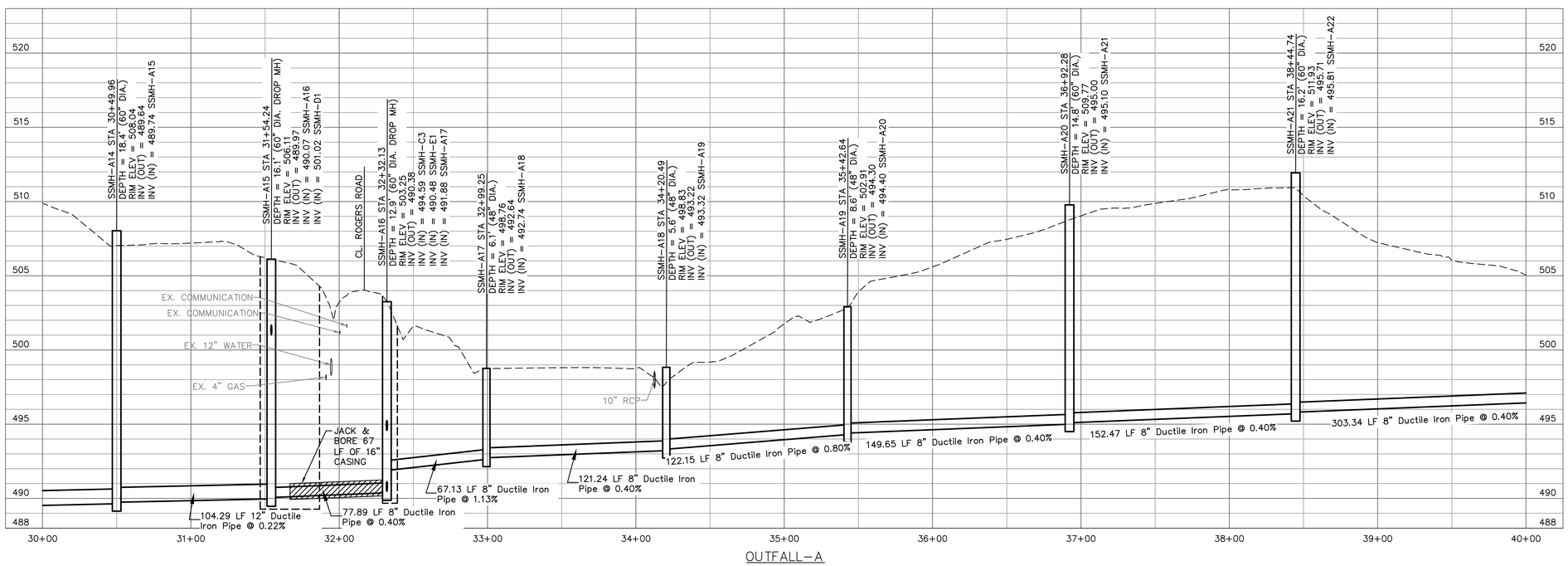


OUTFALL "A" PLAN VIEW

SCALE: 1" = 40'

HORIZ. SCALE: 1" = 40'

VERT. SCALE: 1" = 4'



OUTFALL-A

SCALE: HORIZ. 1" = 40'

VERT. 1" = 4'

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
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SHEET TITLE: SEWER PLAN & PROFILE – OUTFALL A

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
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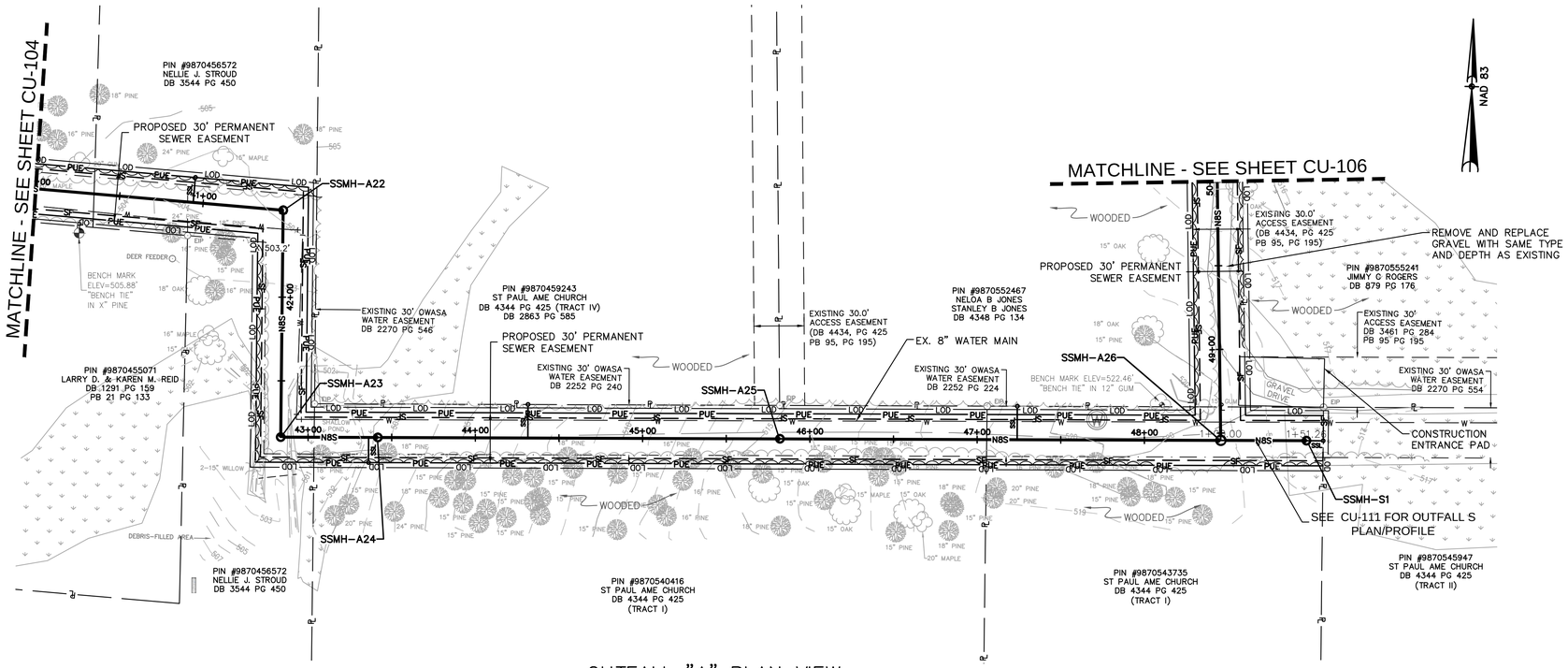

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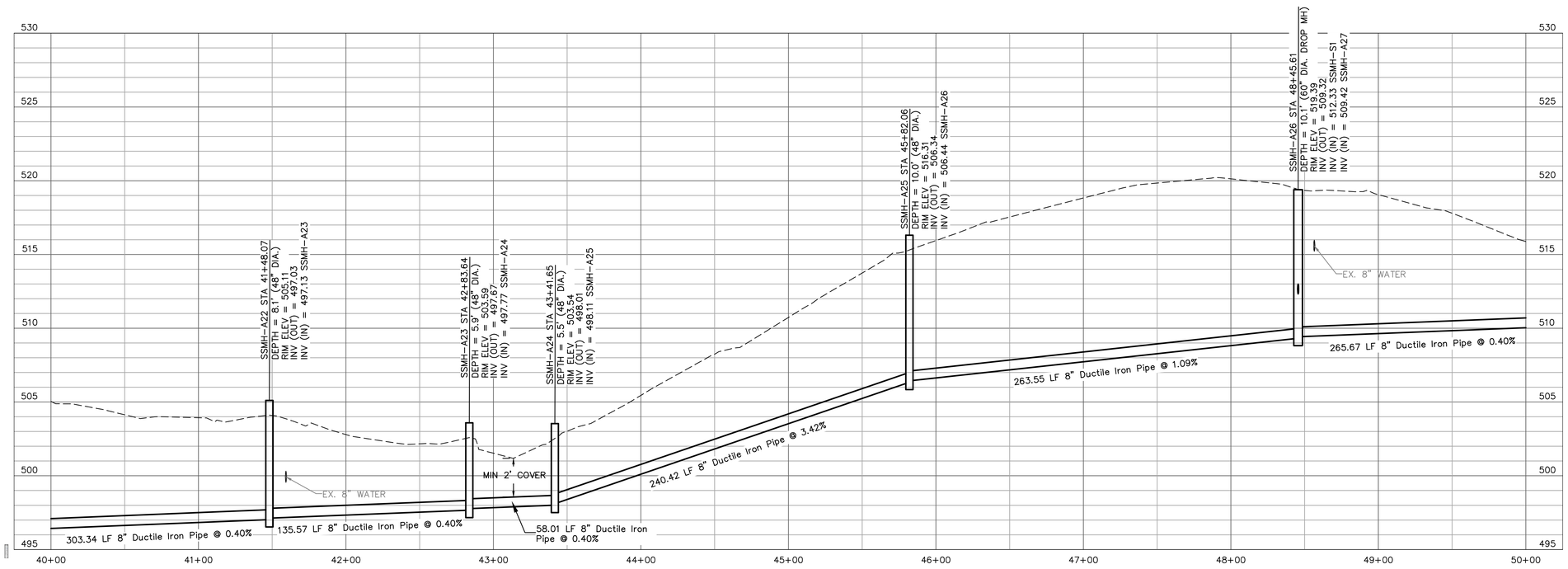
OUTFALL "A" PLAN VIEW
SCALE: 1" = 40'



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PROJECT ENG: KKP
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DATE: 5/25/2016
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PROJECT:
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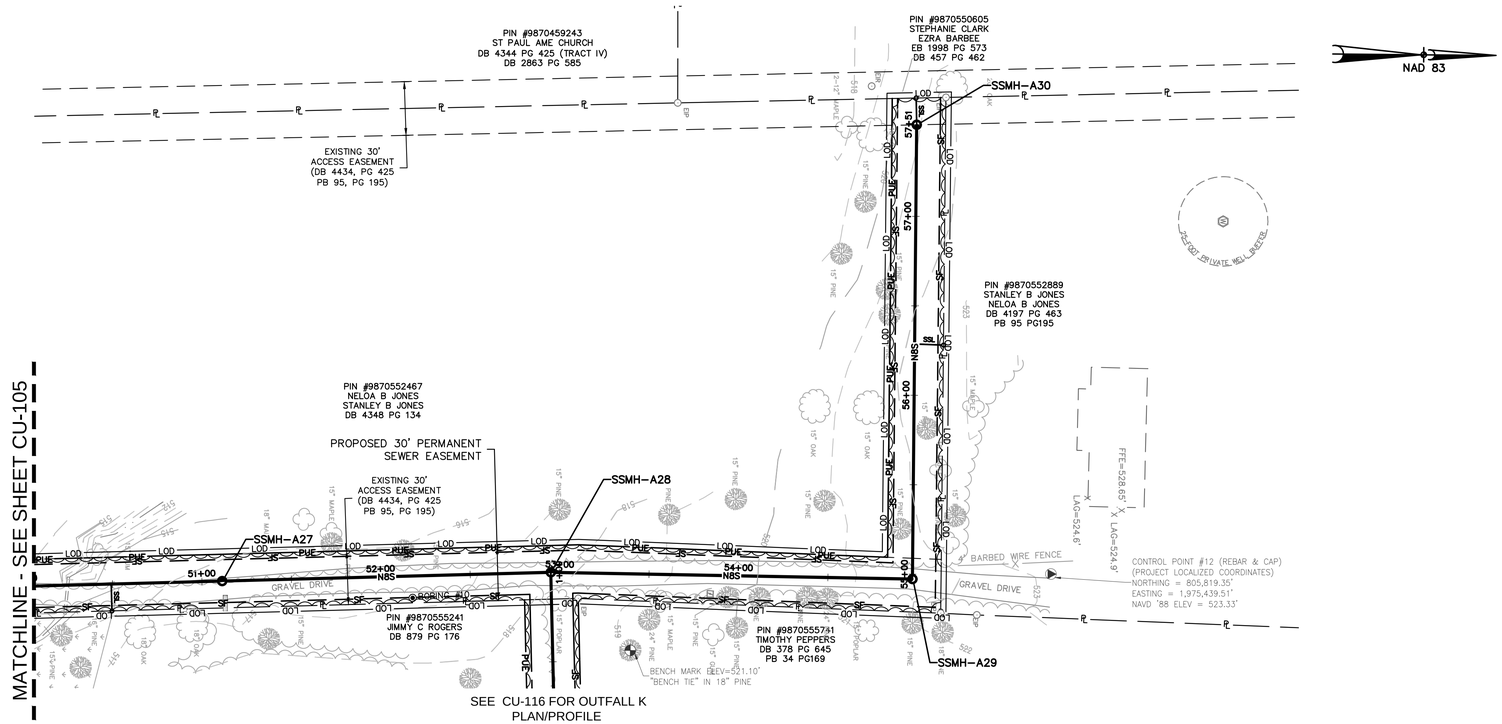

OUTFALL "A" PLAN VIEW
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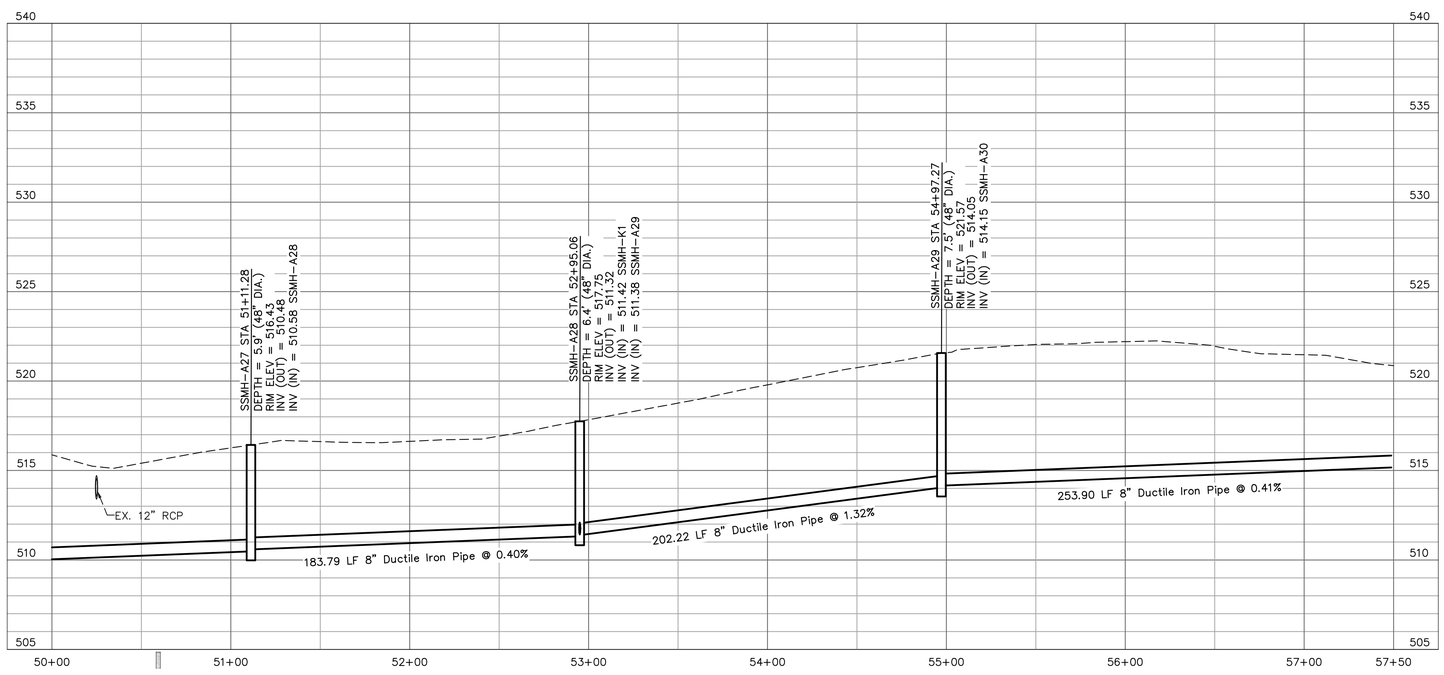

OUTFALL-A
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

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PROJECT ENG: KKP
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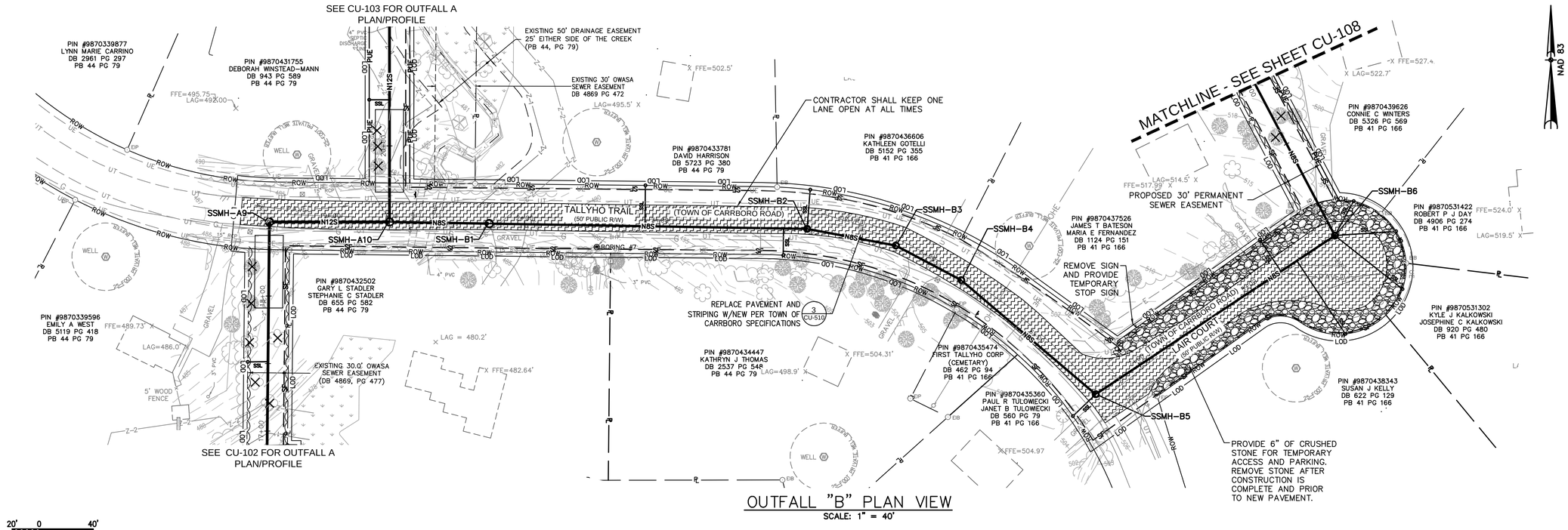

OUTFALL "B" PLAN VIEW
SCALE: 1" = 40'

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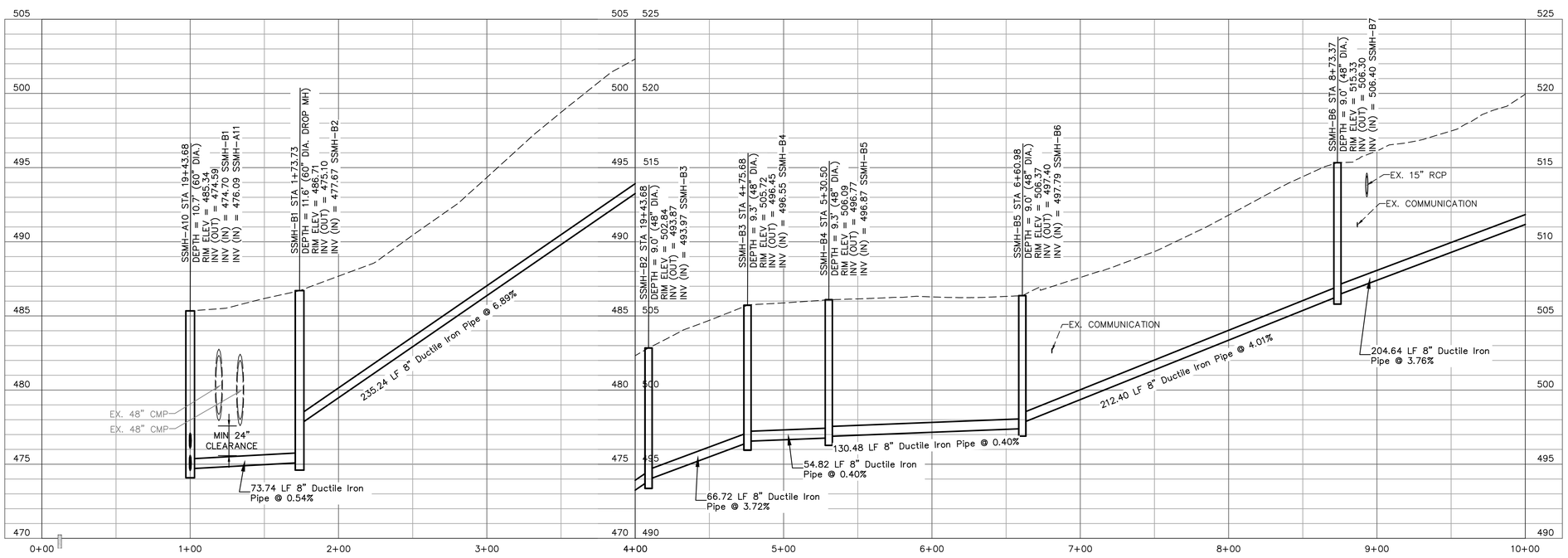
VERT. SCALE: 1" = 4'



OUTFALL-B
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS			
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DESIGNED BY: JLL
DRAWN BY: TS/KTP
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APPROVED BY: JLL

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SHEET TITLE: SEWER PLAN & PROFILE – OUTFALL B

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

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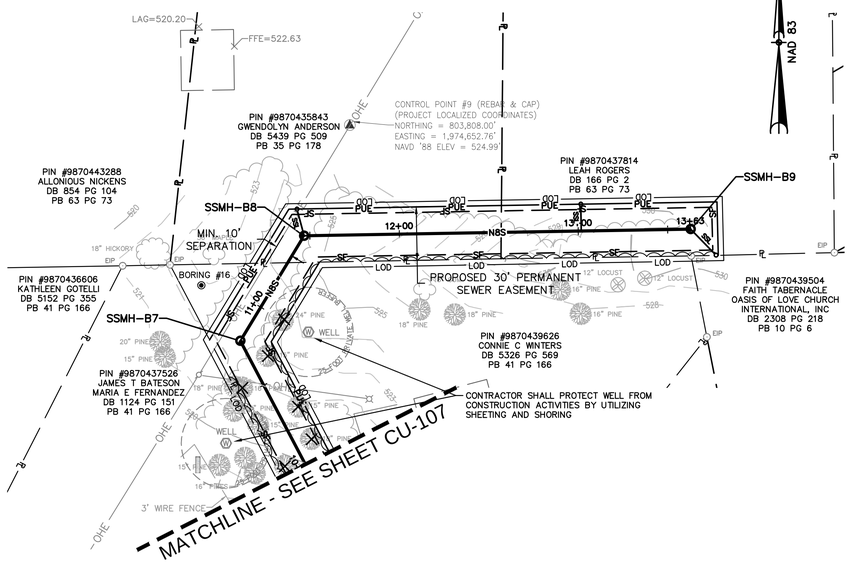
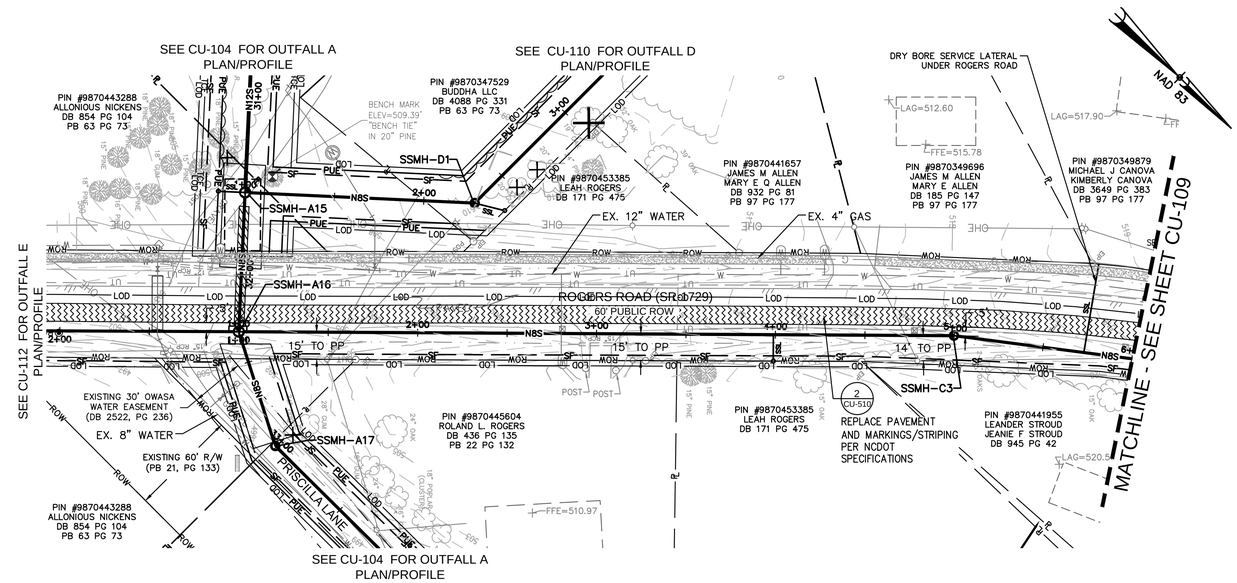


OUTFALL "B" PLAN VIEW

SCALE: 1" = 40'



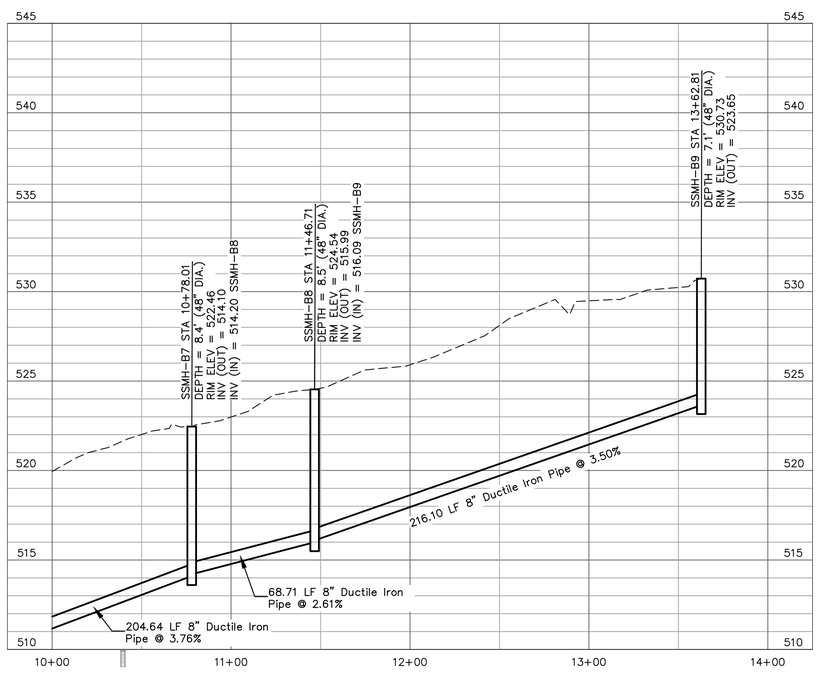
OUTFALL "C" PLAN VIEW

SCALE: 1" = 40'

NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES

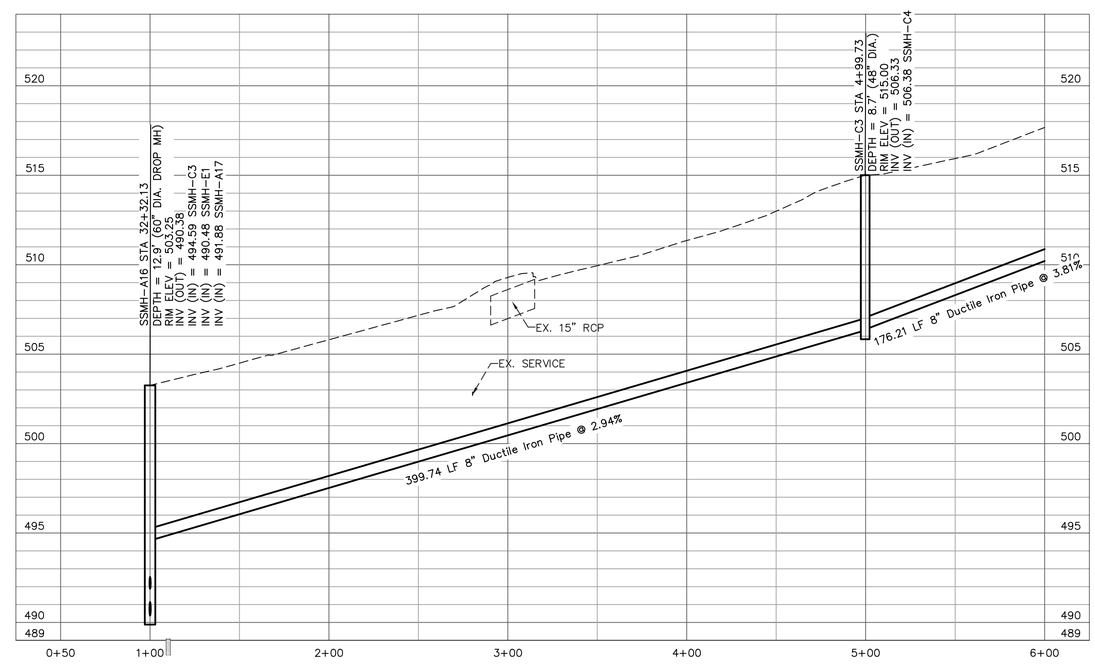
20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'



OUTFALL-B

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



OUTFALL-C

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

NO.	DESCRIPTION	DATE	BY

REVISIONS

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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NCBELS LIC. NO. C-2243

SHEET TITLE:
SEWER PLAN & PROFILE – OUTFALL B & C

SCALE: AS SHOWN
DATE: 5/25/2016

PROJECT:
HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-108
13 OF 39

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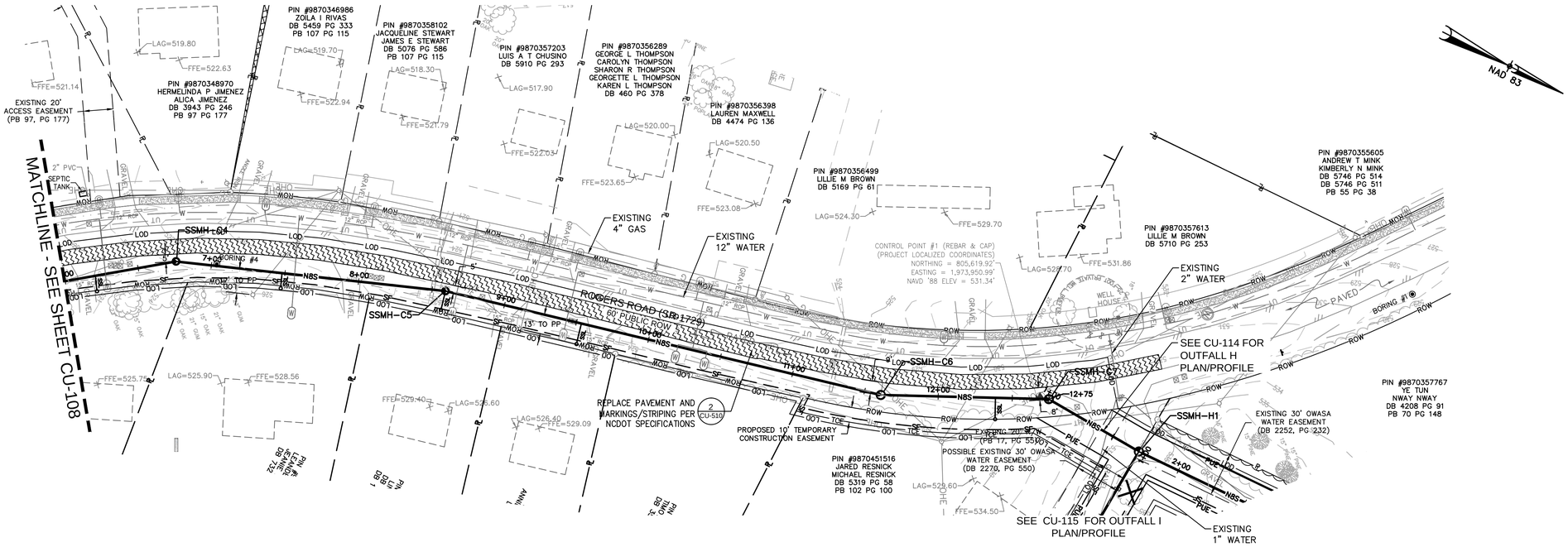


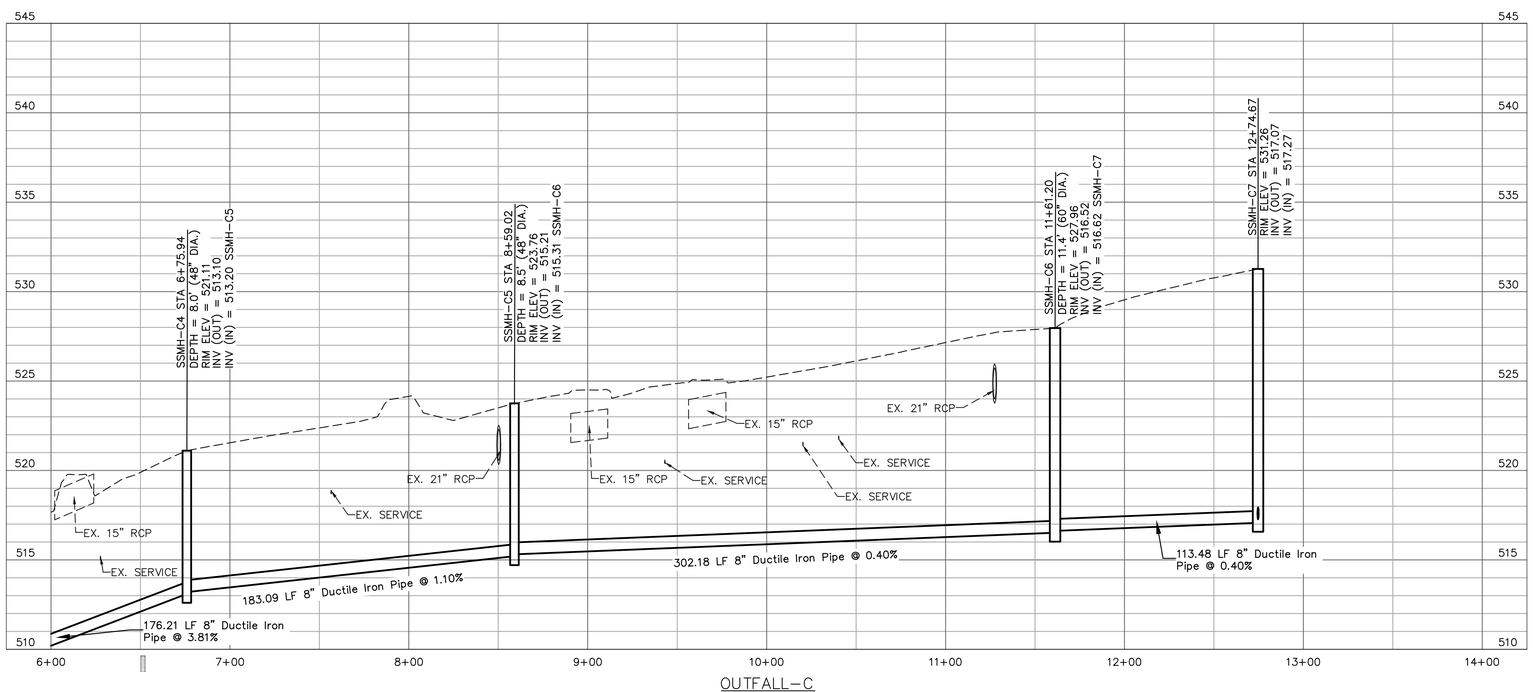
OUTFALL "C" PLAN VIEW

SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'

NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES



OUTFALL-C

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

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE:
SEWER PLAN & PROFILE – OUTFALL C

SCALE: AS SHOWN
DATE: 5/25/2016

PROJECT:
HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC

ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

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URS PROJ. NO. 31829996
SHEET I.D. CU-109
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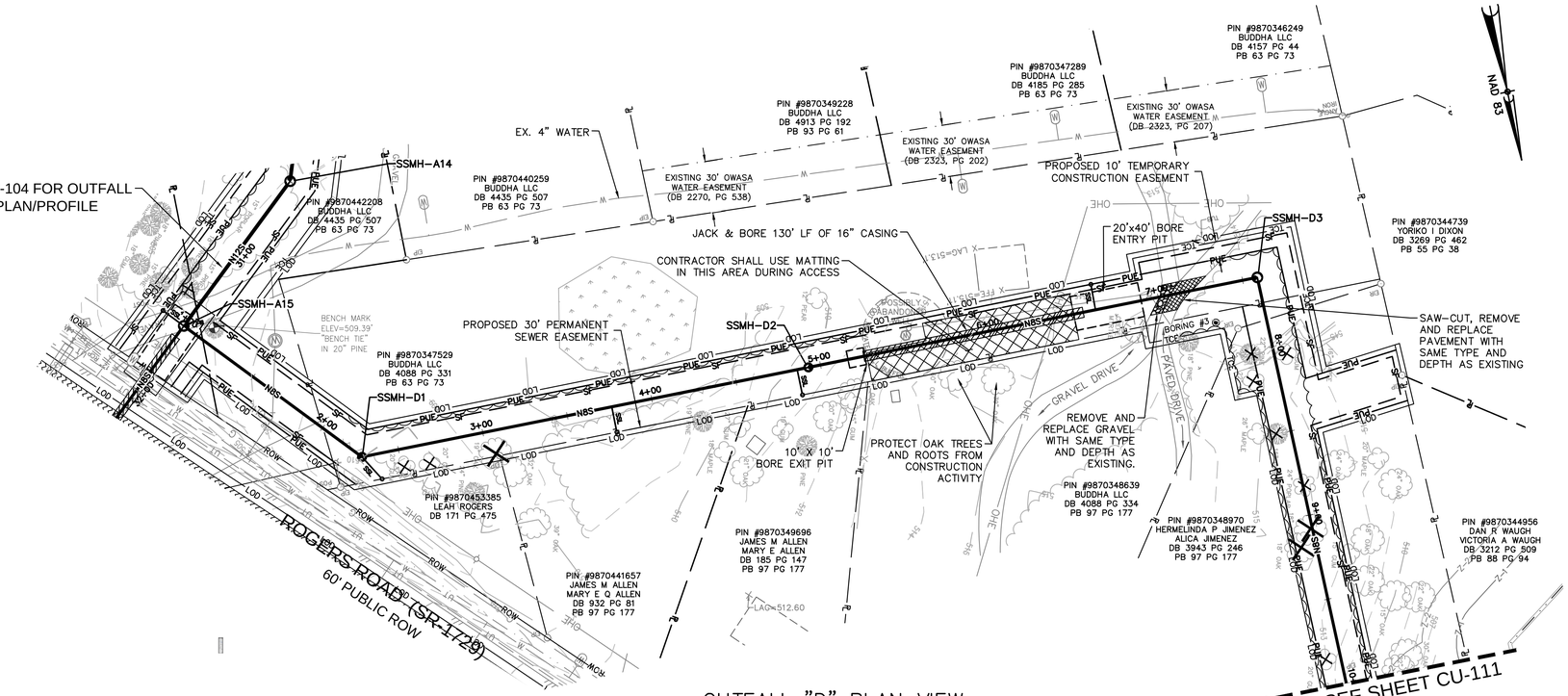
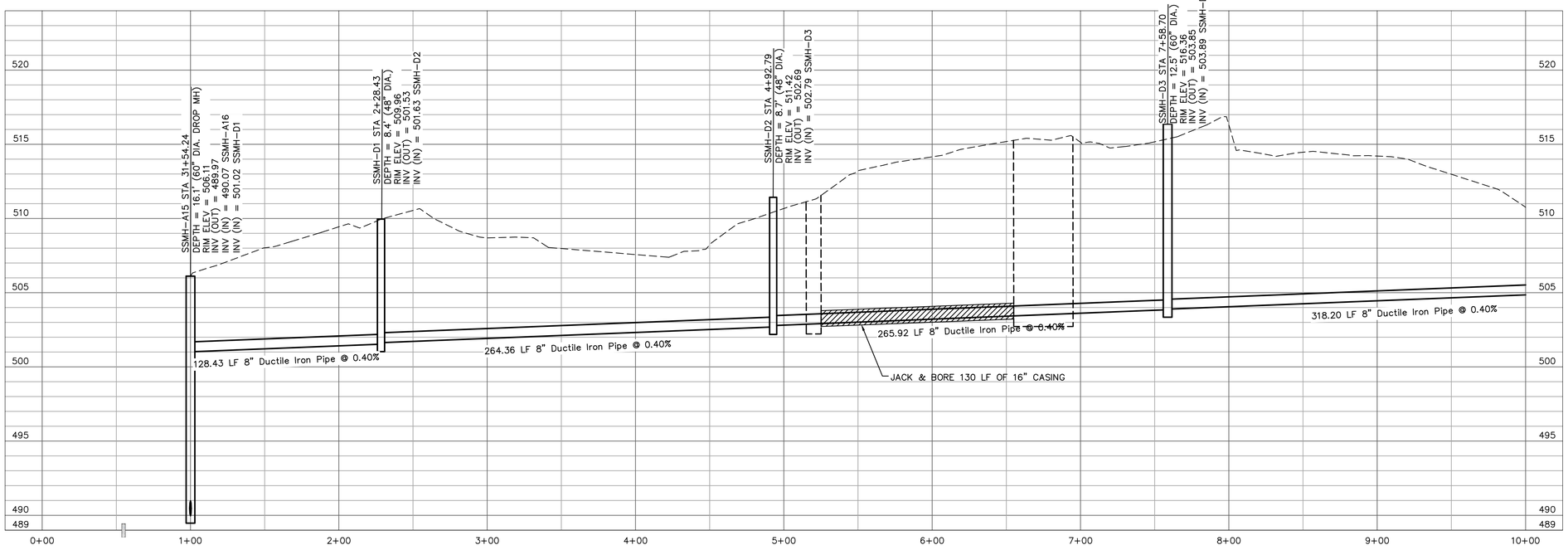


OUTFALL "D" PLAN VIEW
SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'

NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES



OUTFALL-D
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE:
SEWER PLAN & PROFILE – OUTFALL D

DATE: 5/25/2016
SCALE: AS SHOWN

PROJECT:
HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

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URS PROJ. NO. 31829996
SHEET I.D. CU-110
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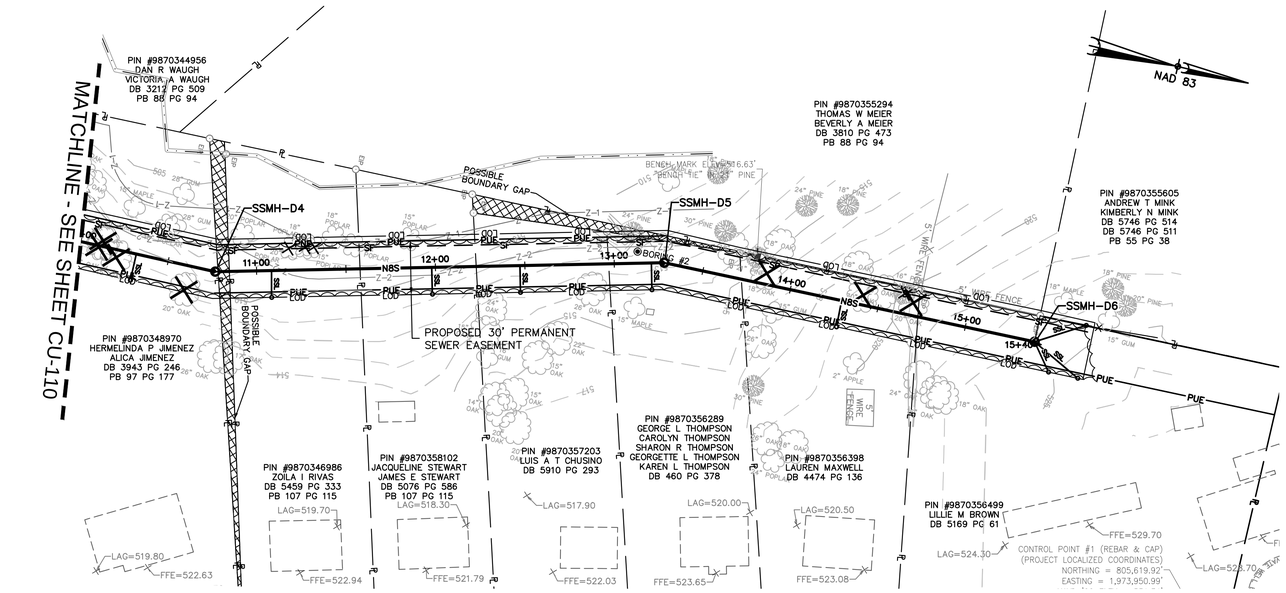
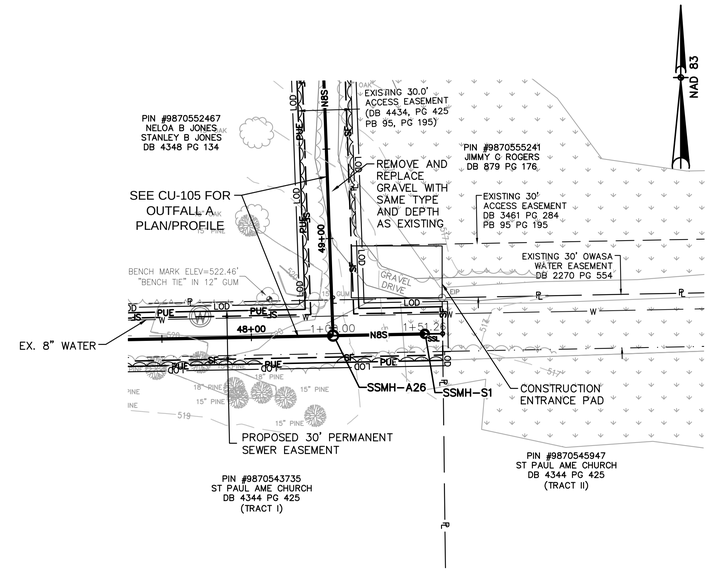
NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES



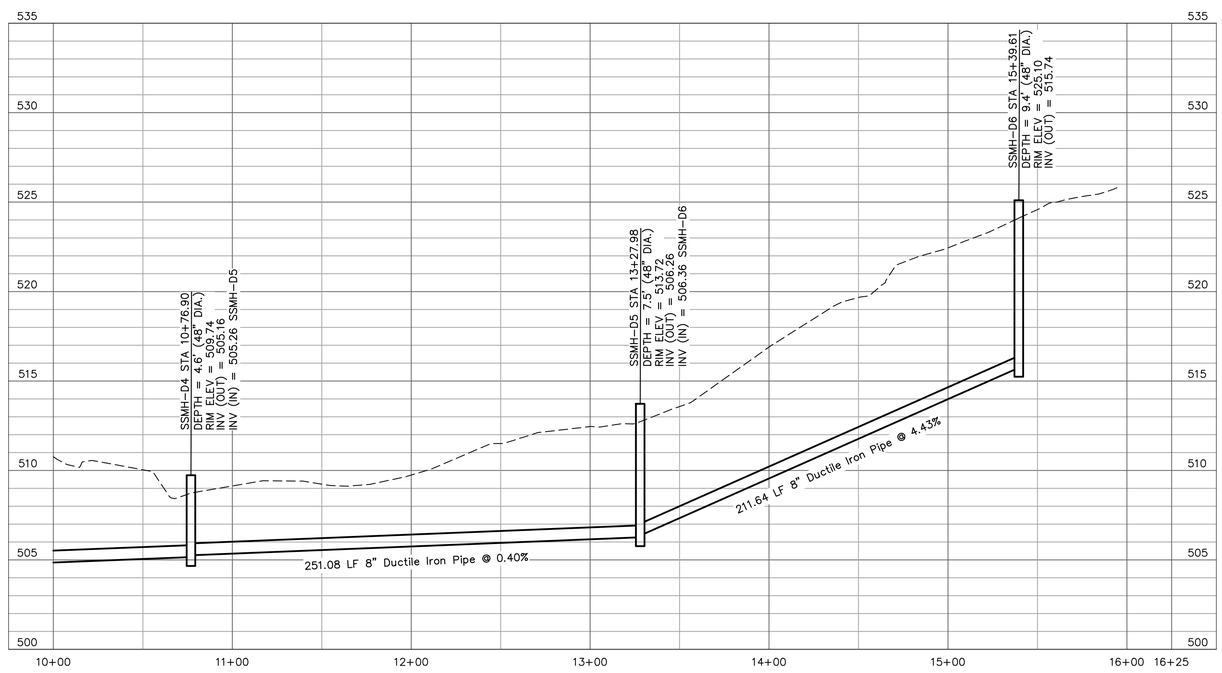
OUTFALL "D" PLAN VIEW
SCALE: 1" = 40'



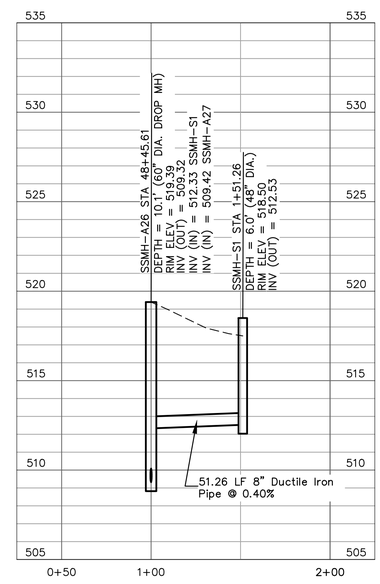
OUTFALL "S" PLAN VIEW
SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'



OUTFALL-D
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'



OUTFALL-S
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE:
SEWER PLAN & PROFILE
– OUTFALL D & S

SCALE: AS SHOWN
DATE: 5/25/2016

PROJECT:
HISTORIC ROGERS ROAD
SEWER EXPANSION
ORANGE COUNTY, NC

ORANGE WATER AND SEWER AUTHORITY

ISSUE:

CLIENT PROJ. NO. 276-54
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SHEET I.D. CU-111
16 OF 39

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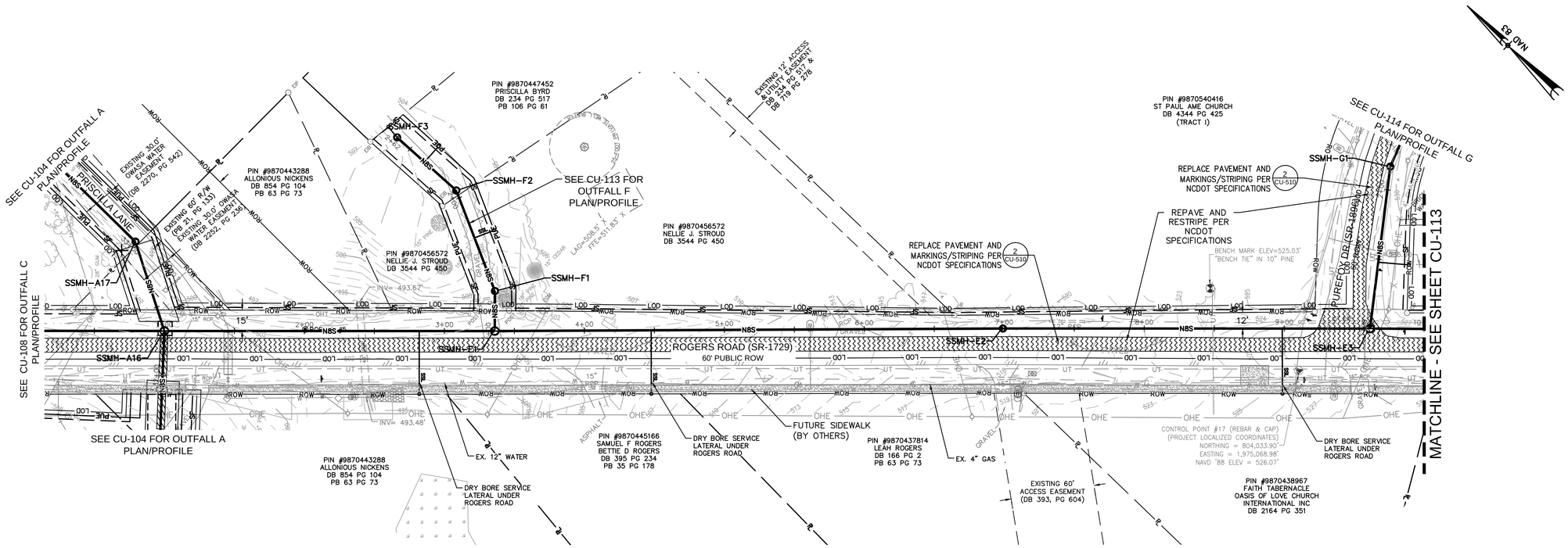


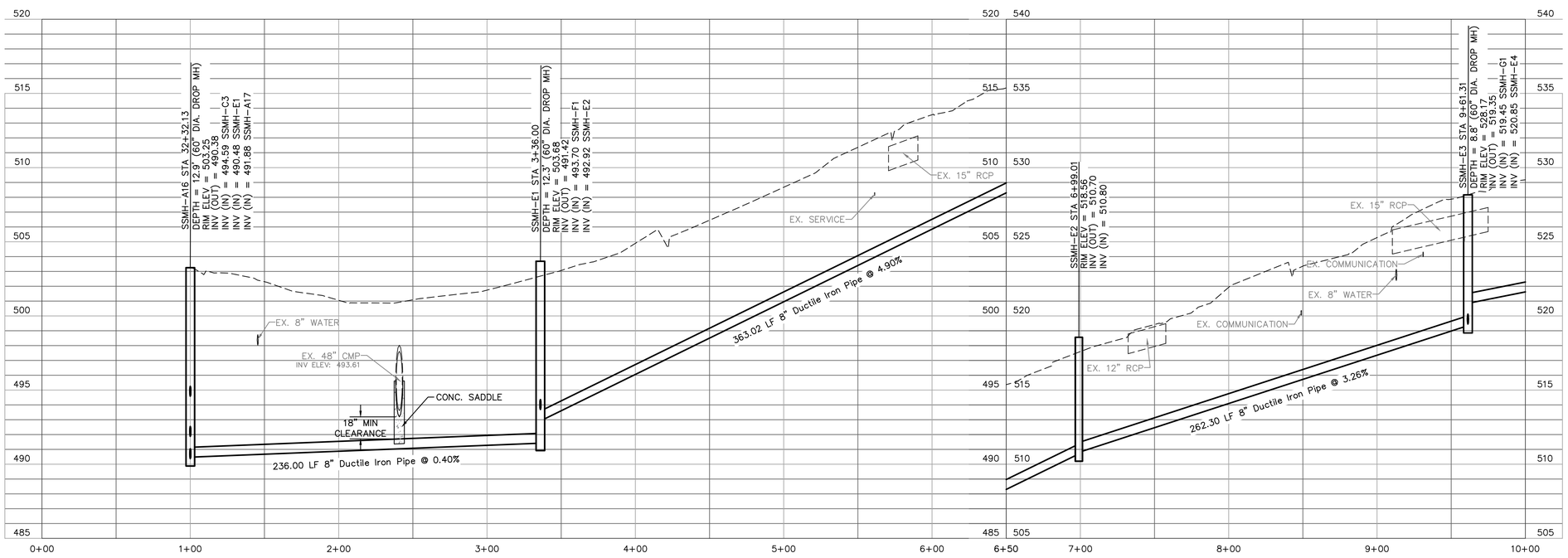
OUTFALL "E" PLAN VIEW

SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'

NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES



OUTFALL-E

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

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE:
SEWER PLAN & PROFILE – OUTFALL E

DATE: 5/25/2016
SCALE: AS SHOWN

PROJECT:
HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

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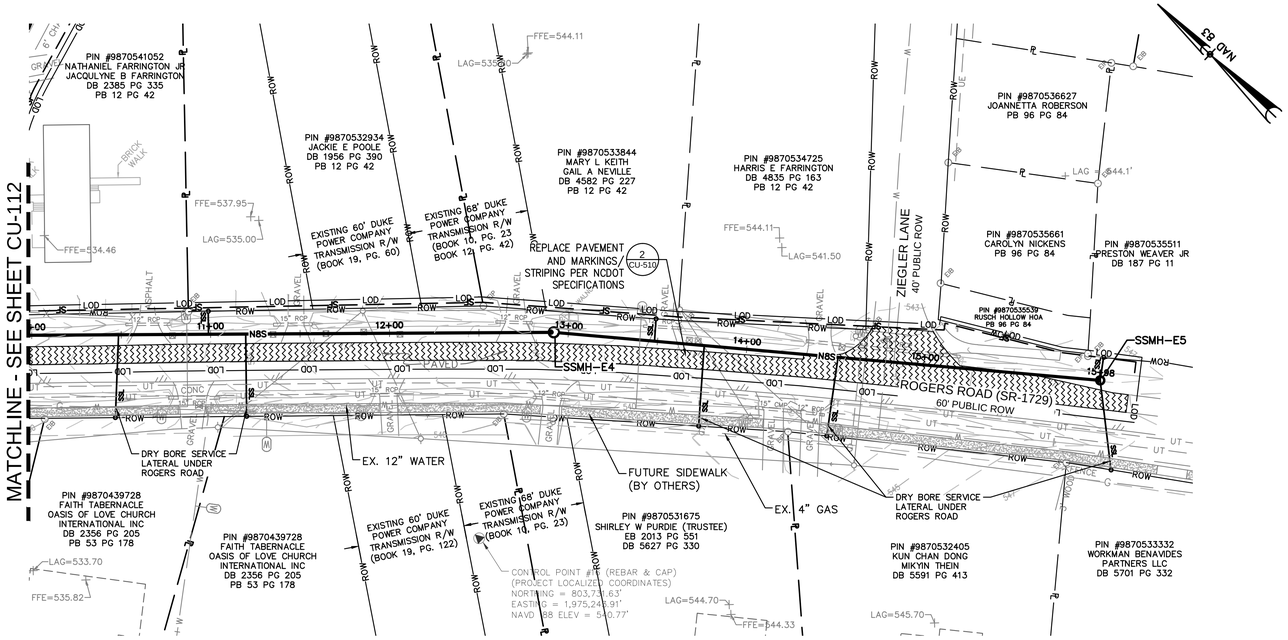
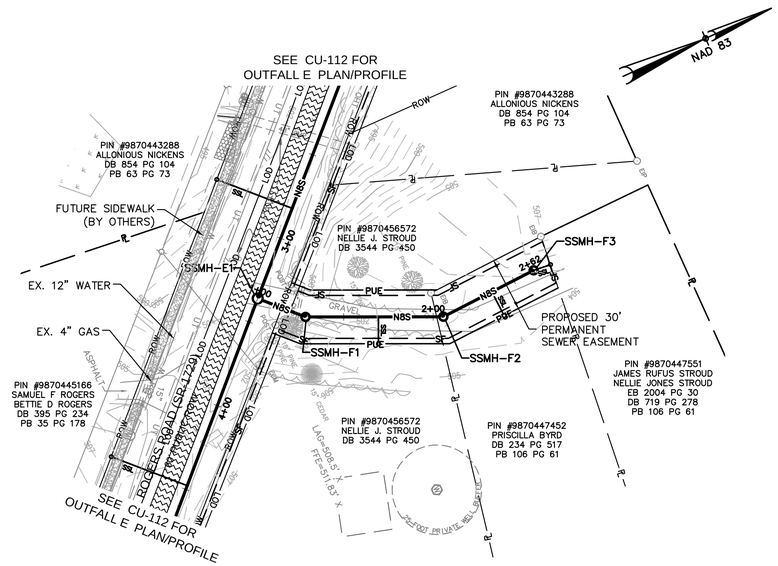
NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES



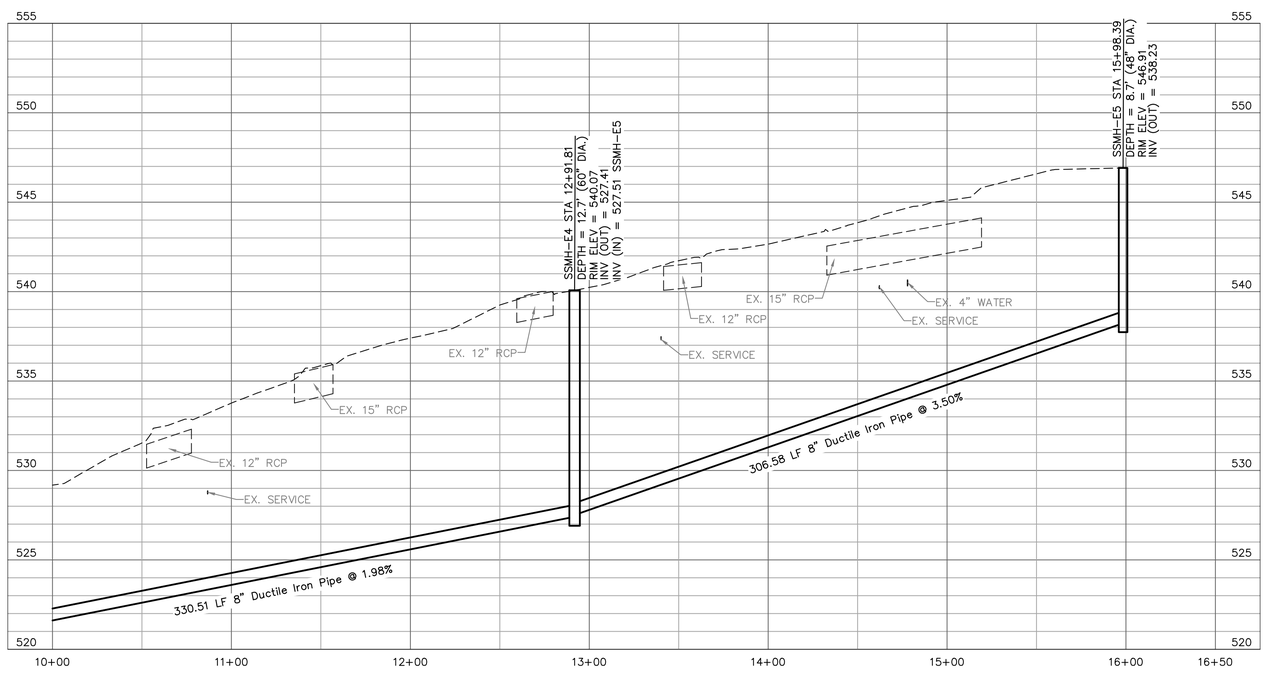
OUTFALL "E" PLAN VIEW
SCALE: 1" = 40'



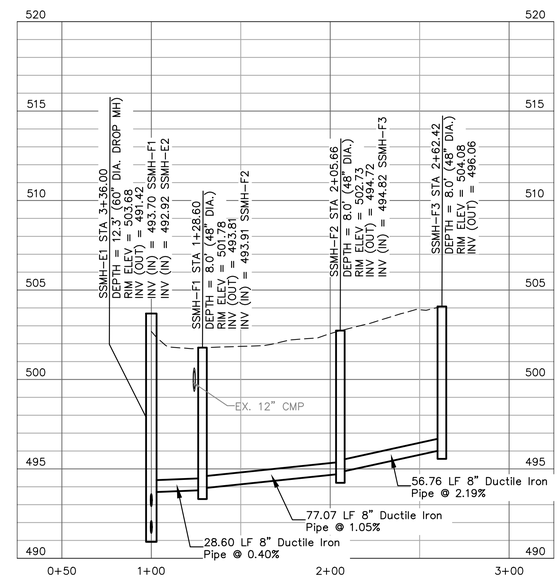
OUTFALL "F" PLAN VIEW
SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'



OUTFALL-E
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'



OUTFALL-F
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY:
CHECKED BY: TS/KTP
APPROVED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE: SEWER PLAN & PROFILE – OUTFALL E & F

SCALE: AS SHOWN
DATE: 5/25/2016

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

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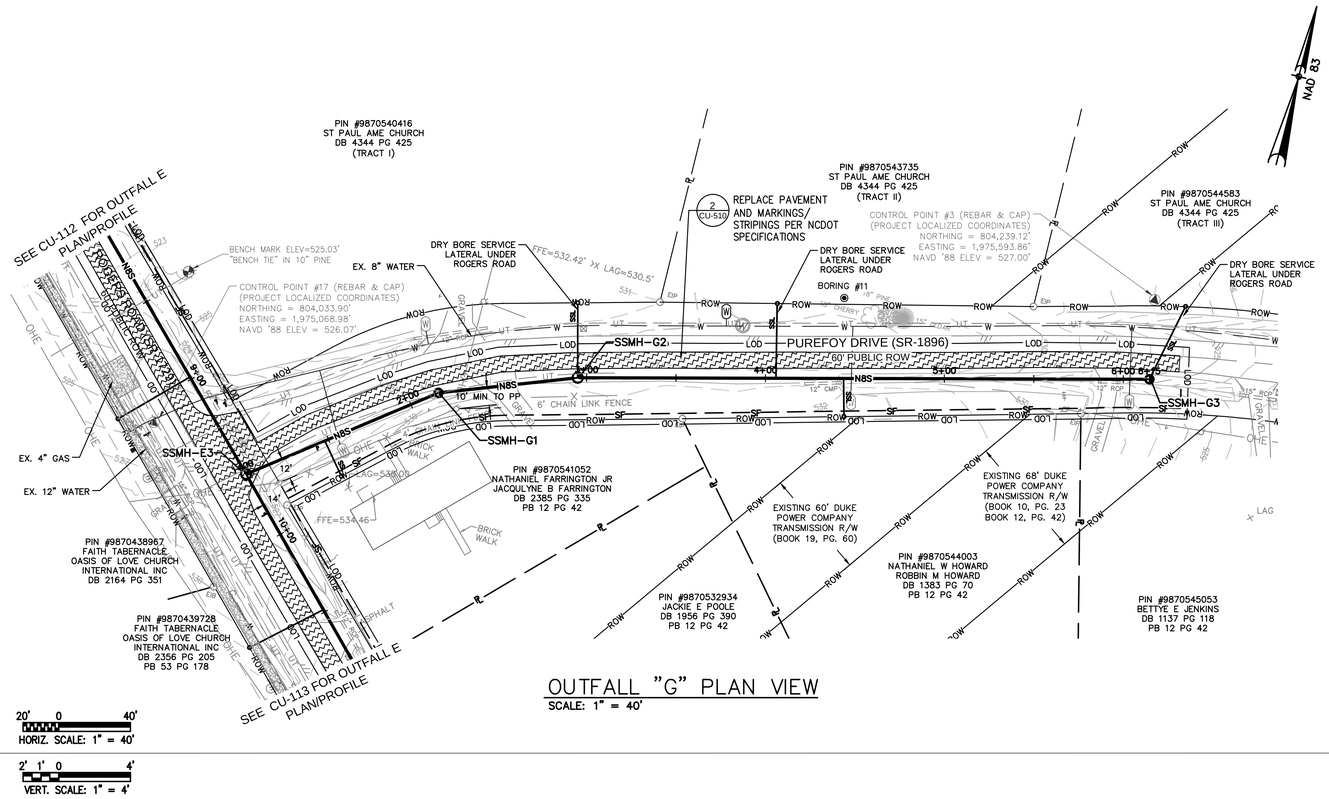
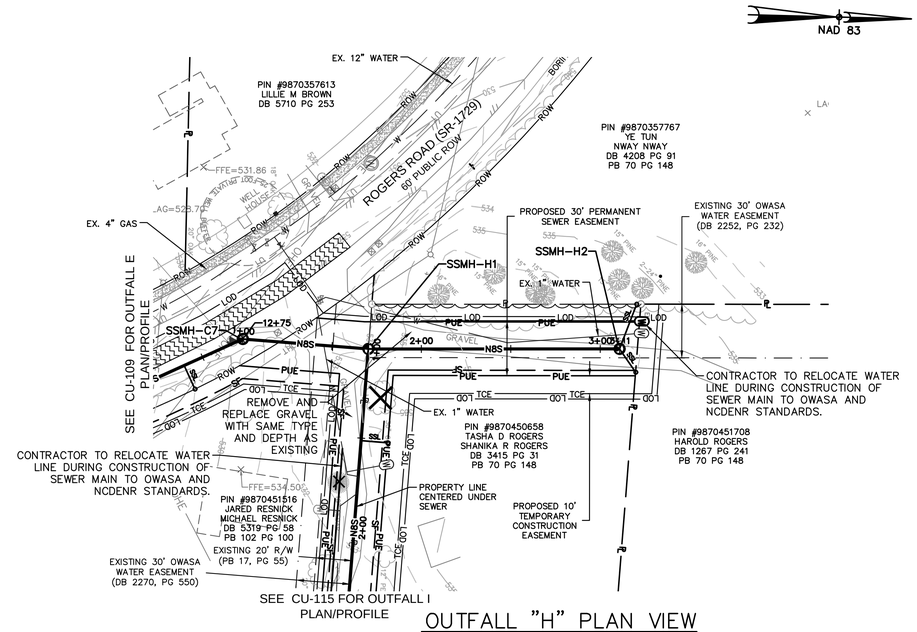
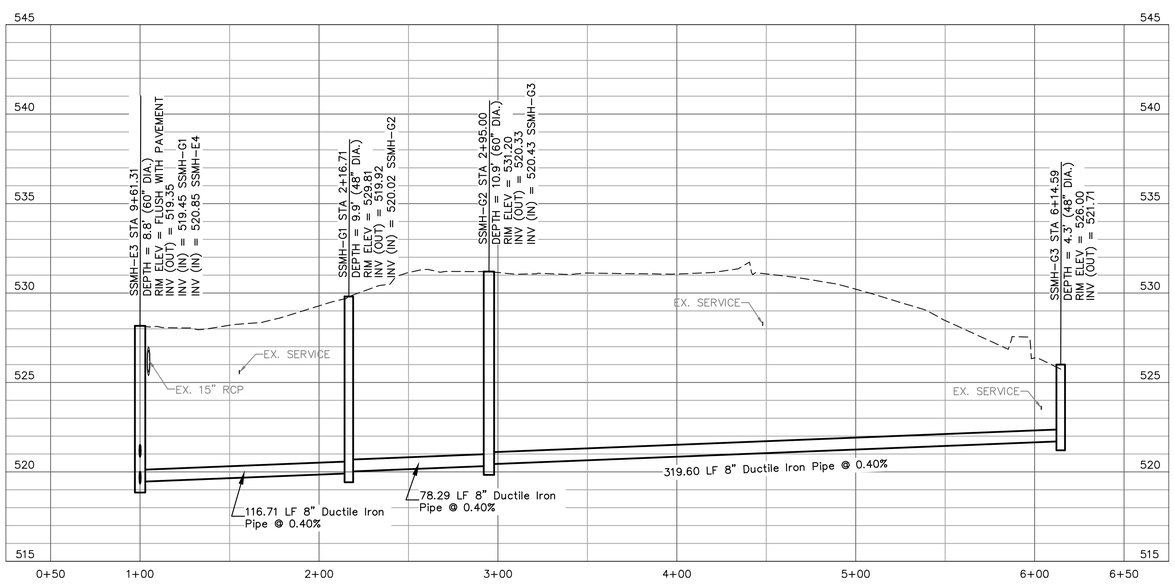
NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES



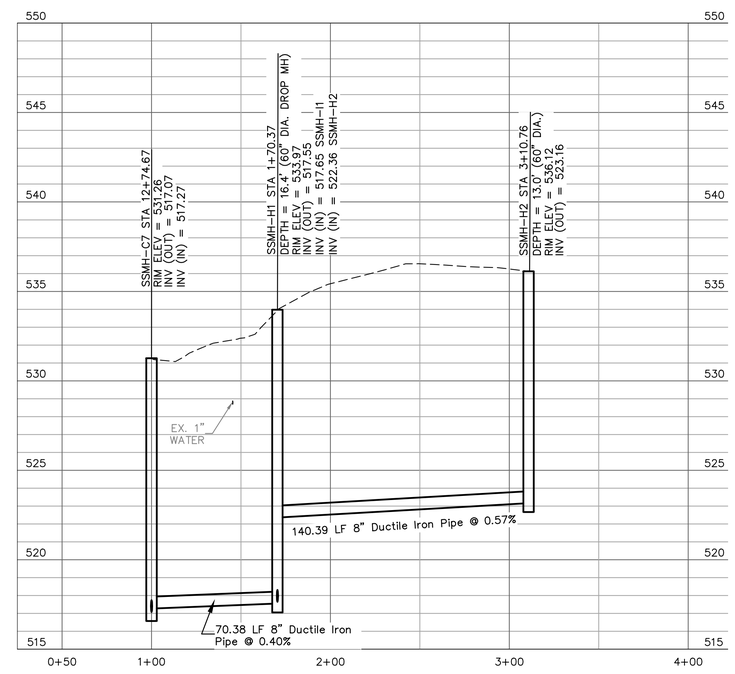
OUTFALL "G" PLAN VIEW
SCALE: 1" = 40'



OUTFALL "H" PLAN VIEW
SCALE: 1" = 40'



OUTFALL-G
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'



OUTFALL-H
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE:
SEWER PLAN & PROFILE – OUTFALL G & H

DATE: 5/25/2016
SCALE: AS SHOWN

PROJECT:
HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC

ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

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SHEET I.D. CU-114
URS PROJ. NO. 31829996

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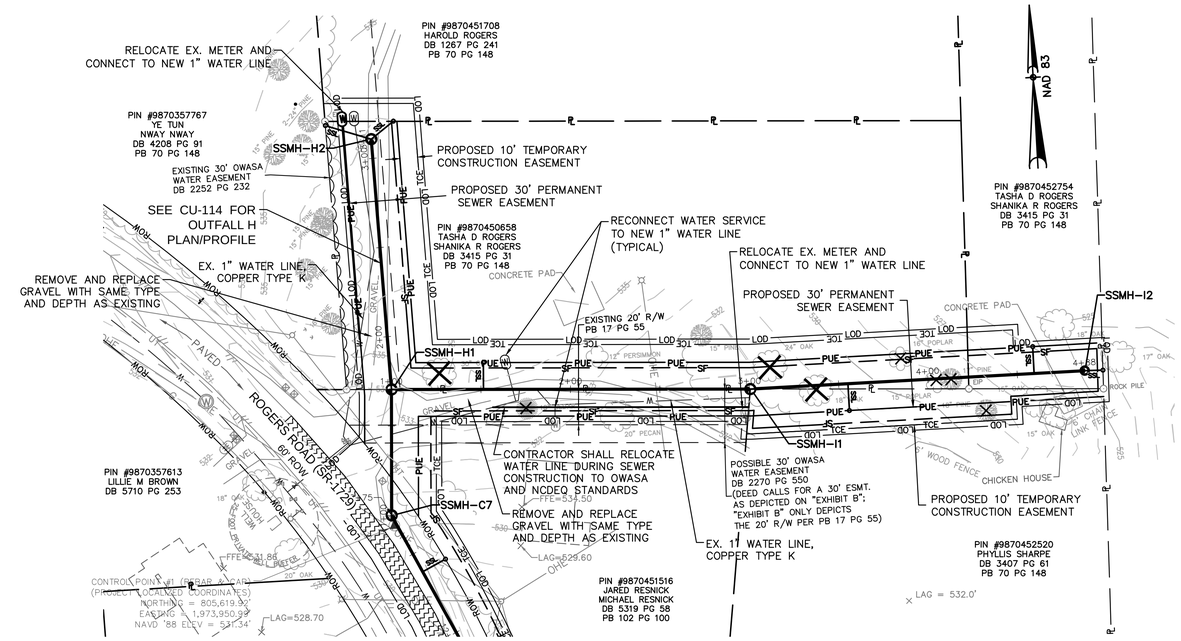
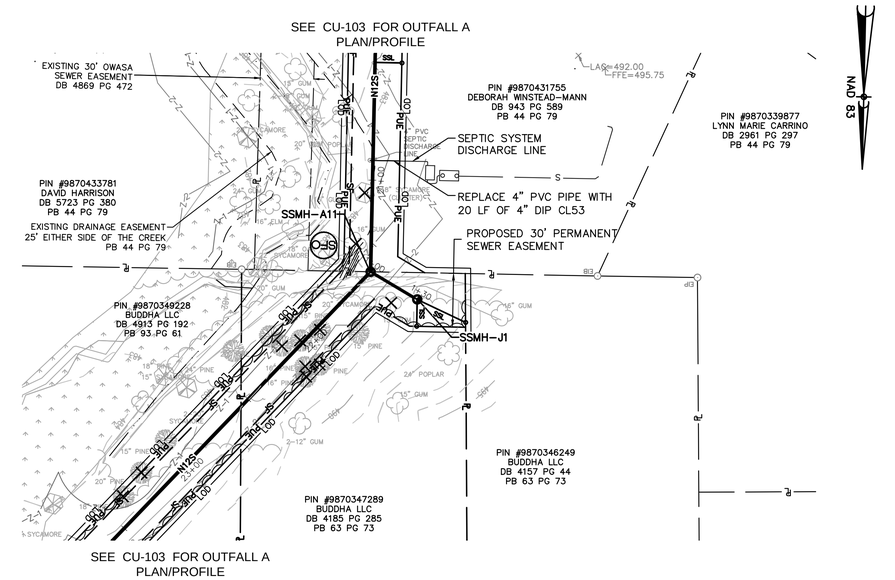
NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES



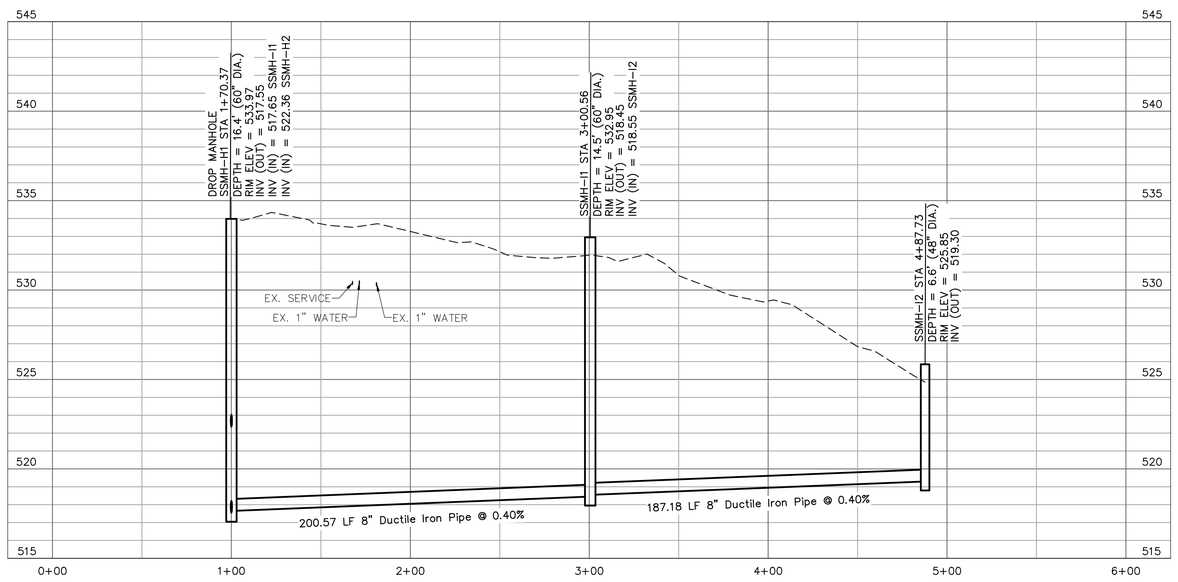
OUTFALL "I" PLAN VIEW
SCALE: 1" = 40'



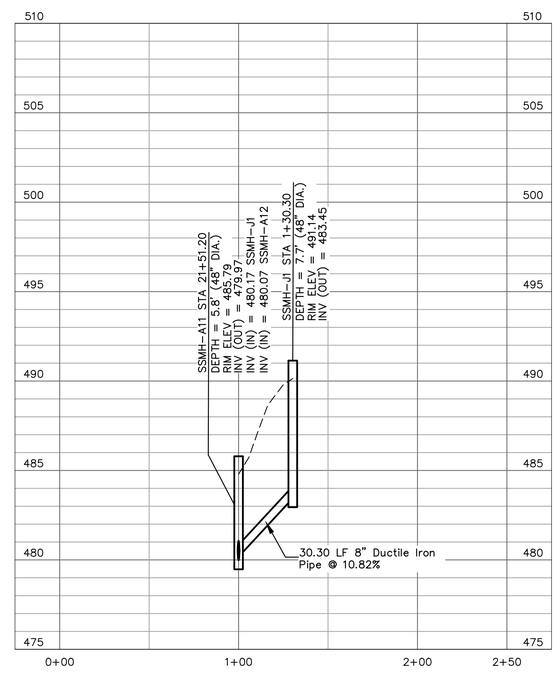
OUTFALL "J" PLAN VIEW
SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'



OUTFALL-I
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'



OUTFALL-J
SCALE: HORIZ. 1" = 40'
VFRT 1" = 4'

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE: SEWER PLAN & PROFILE – OUTFALL I & J

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

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NOTE:
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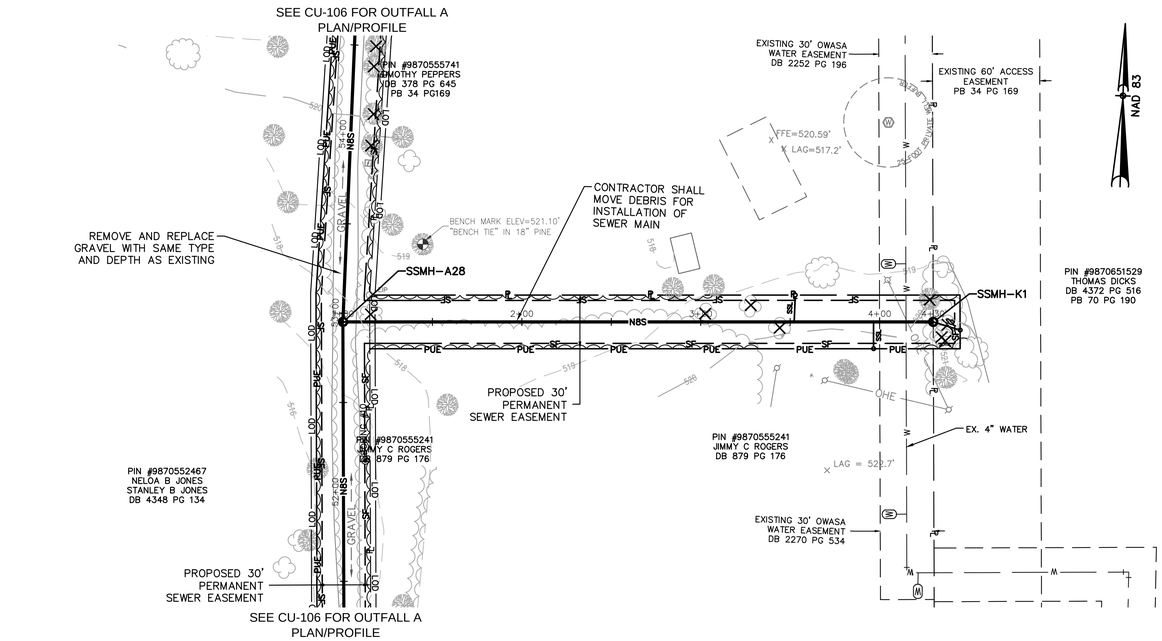
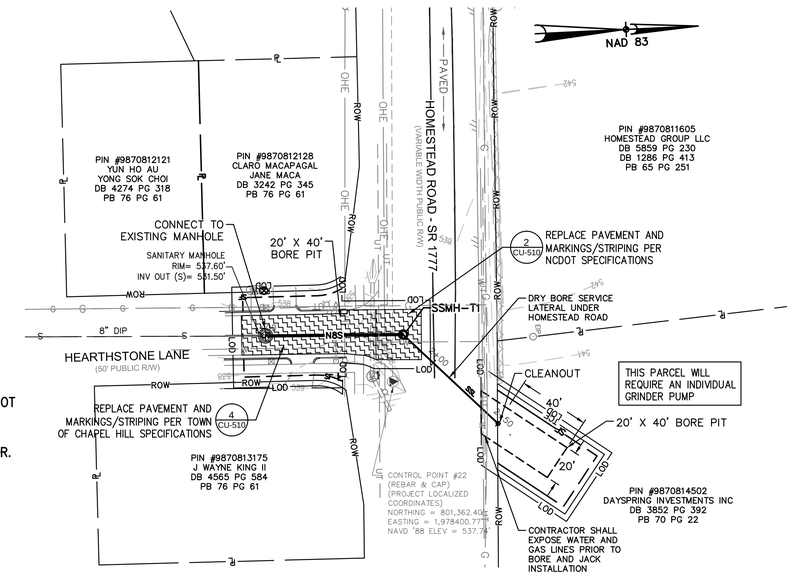


OUTFALL "K" PLAN VIEW
SCALE: 1" = 40'

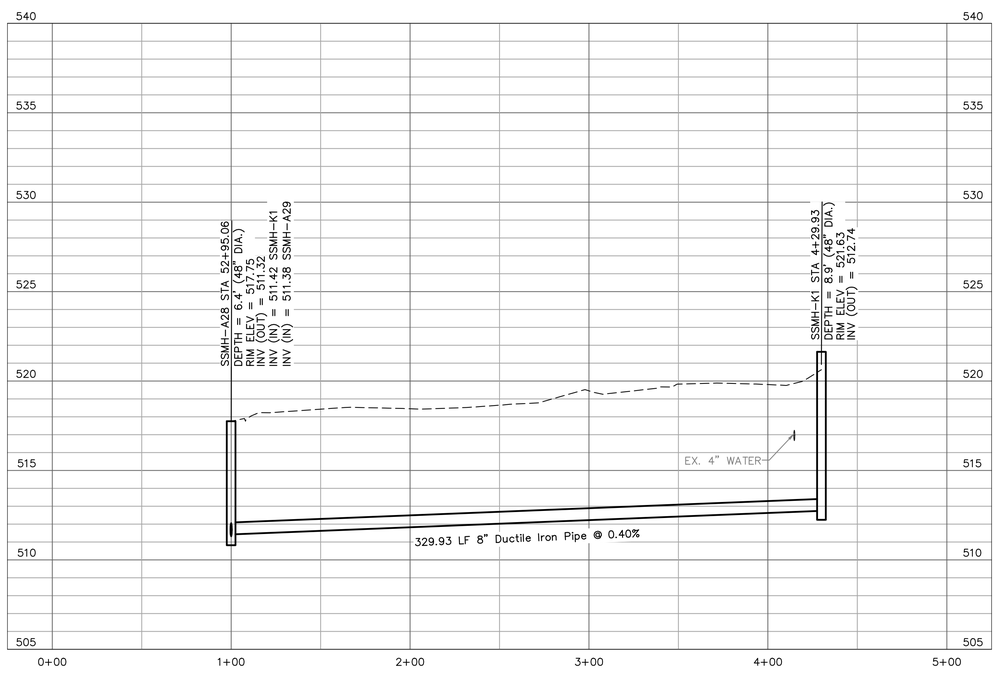
NOTE:
PROVIDE TRAFFIC CONTROL SIGNAGE, BARRICADES, AND FLAGMEN AS NECESSARY PER TOWN OF CHAPEL HILL AND NCDOT SPECIFICATIONS. TEMPORARY PARKING AREA TO BE PROVIDED AND MAINTAINED BY CONTRACTOR.



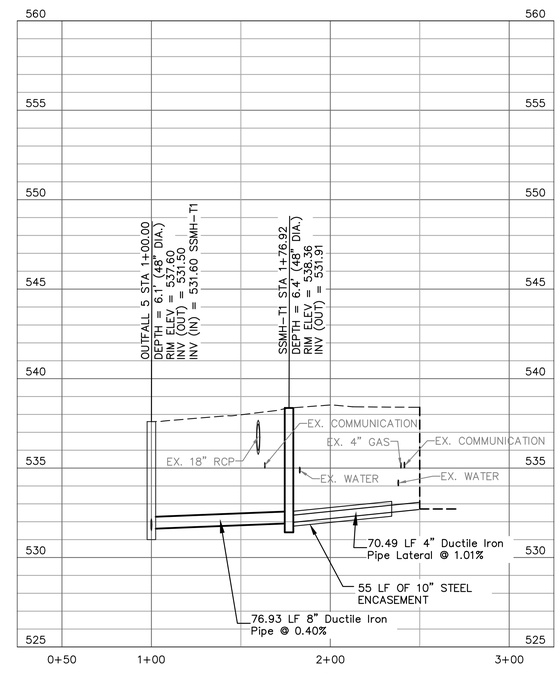
OUTFALL "T" PLAN VIEW
SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'



OUTFALL-K
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'



OUTFALL-T
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

CAROLINA DESIGN FINAL DRAWING - FOR REVIEW PURPOSES ONLY DO NOT LAYOUT
DATE:

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Morrisville, North Carolina 27560
Telephone (919) 461-1100, FAX (919) 461-1415
www.aecom.com
NCBELS LIC. NO. C-2243

SHEET TITLE:
SEWER PLAN & PROFILE – OUTFALL K & T

SCALE: AS SHOWN
DATE: 5/25/2016

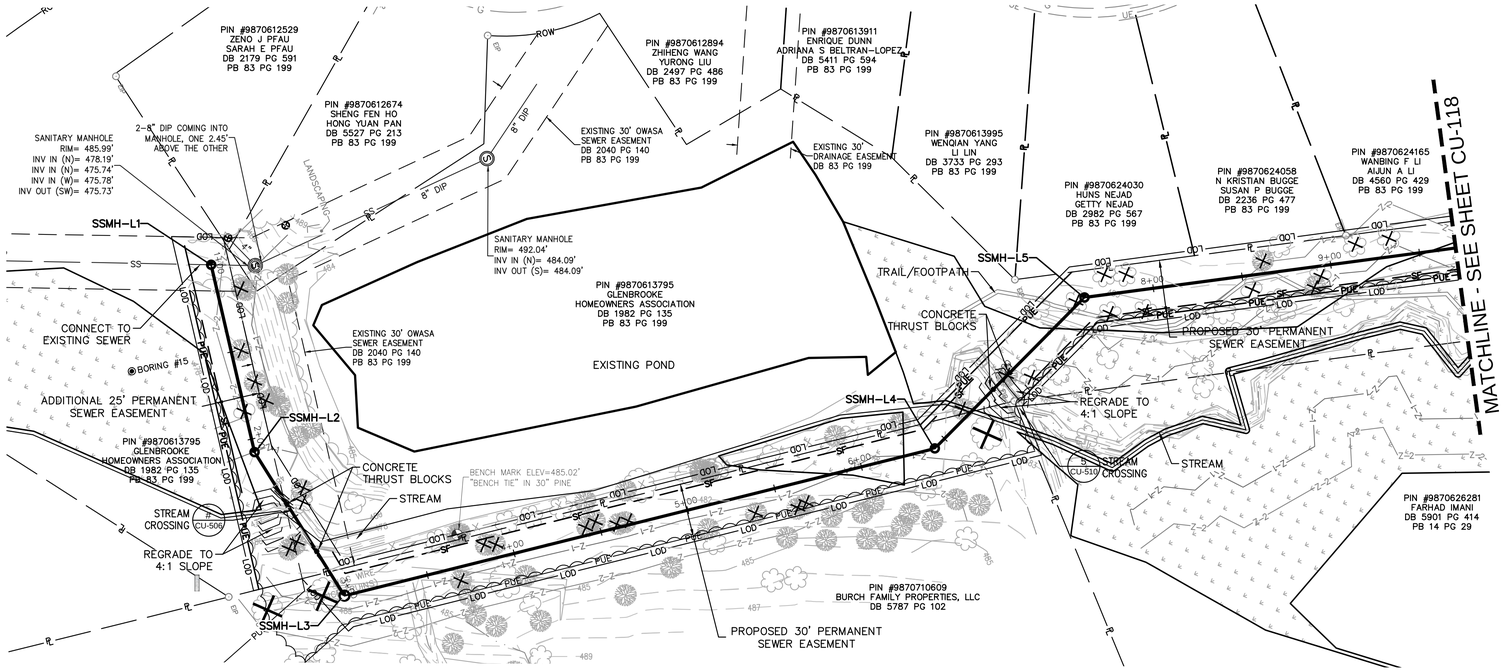
PROJECT:
HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC

ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-116
21 OF 39

P:\COMMON_PROJECTS\MUNICIPAL\WATER_PROJECTS\OWASA\31829996_ROGERS ROAD SEWER EXPANSION\5-DESIGN DRAWINGS\5.3-DWGS\5.3-SHEETS\31829996-CU-116.DWG 5/25/2016 4:14:17 PM



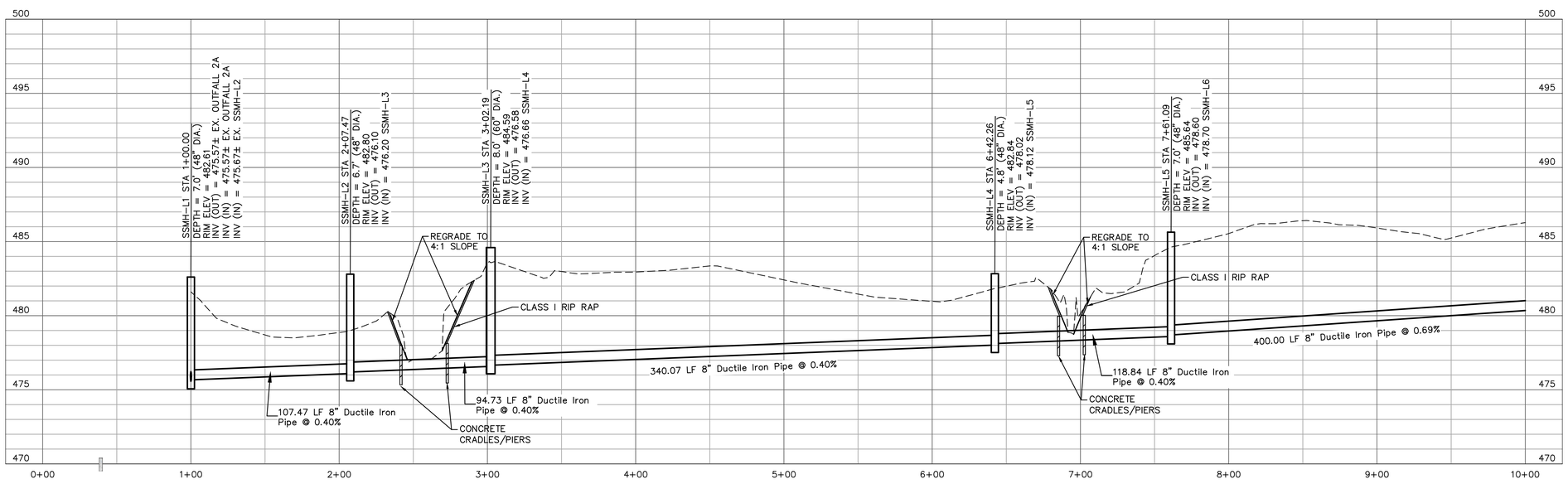
OUTFALL "L" PLAN VIEW

SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'

NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES



OUTFALL-L

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

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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NCBELS LIC. NO. C-2243

SHEET TITLE: SEWER PLAN & PROFILE – OUTFALL L

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-117
22 OF 39

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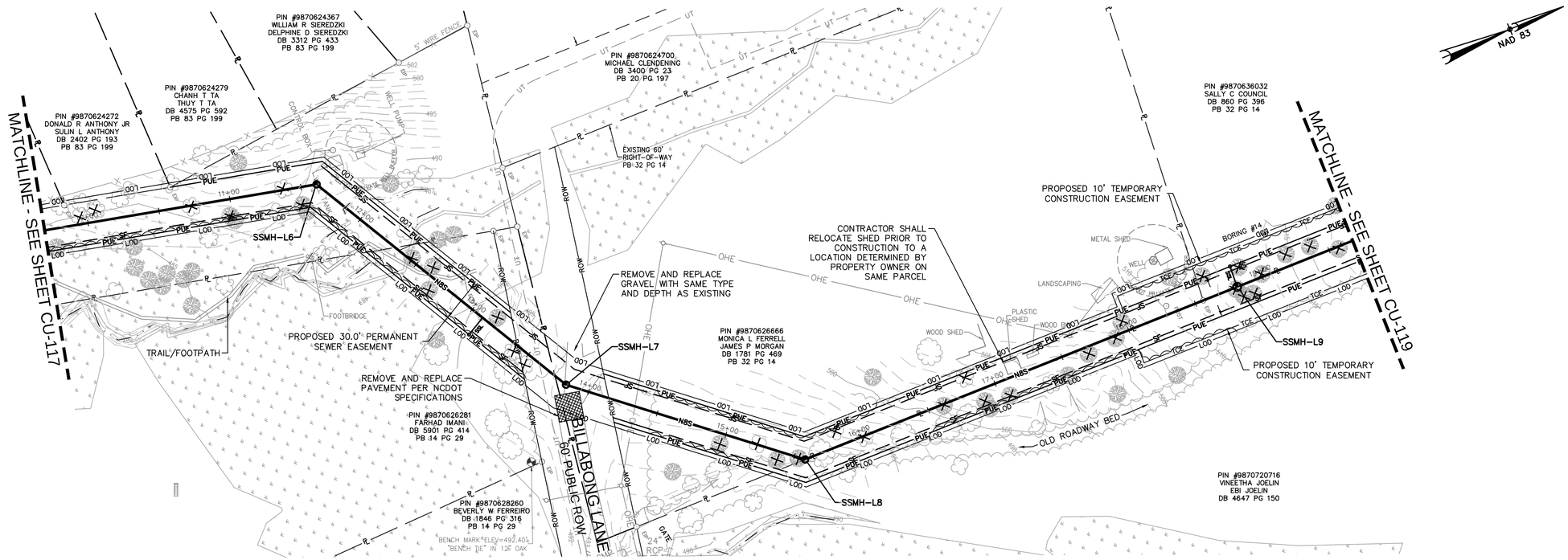


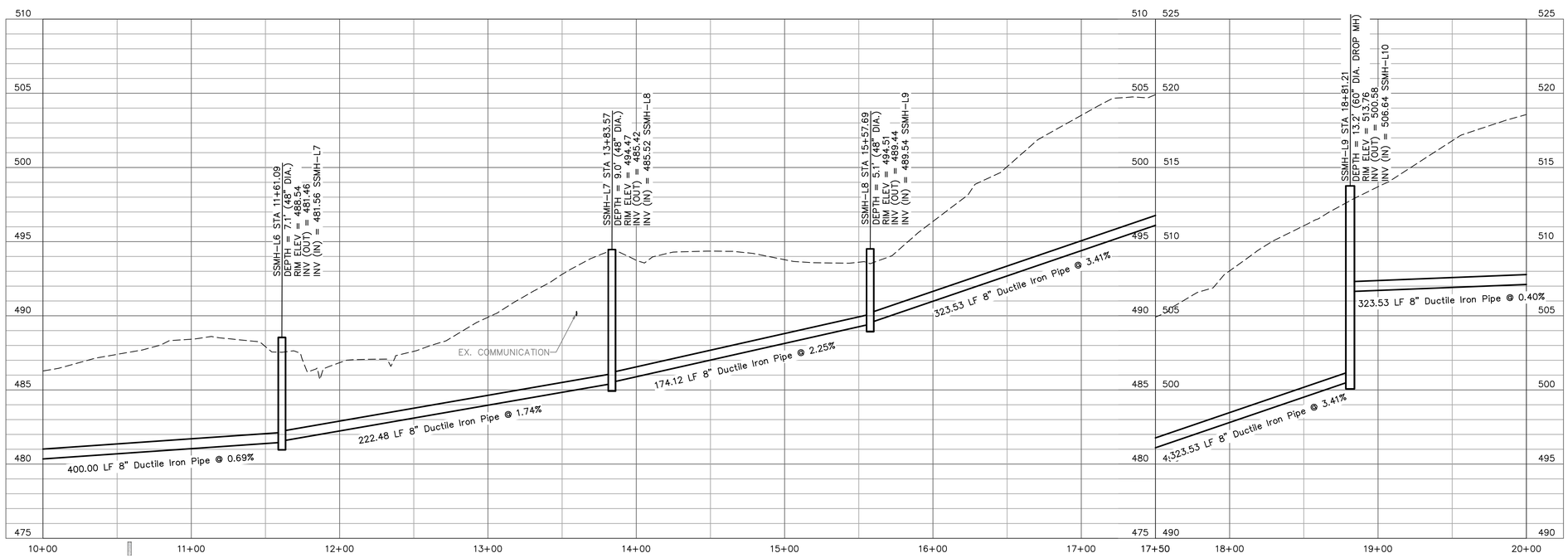
OUTFALL "L" PLAN VIEW

SCALE: 1" = 40'

NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'



OUTFALL-L

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

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

CAROLINA DESIGNS FINAL DRAWING - FOR REVIEW PURPOSES ONLY DAVID L. PAGE PROFESSIONAL ENGINEER SEAL 025441 NORTH CAROLINA
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Morrisville, North Carolina 27560
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NCBELS LIC. NO. C-2243

SHEET TITLE: SEWER PLAN & PROFILE – OUTFALL L

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

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SHEET I.D. CU-118
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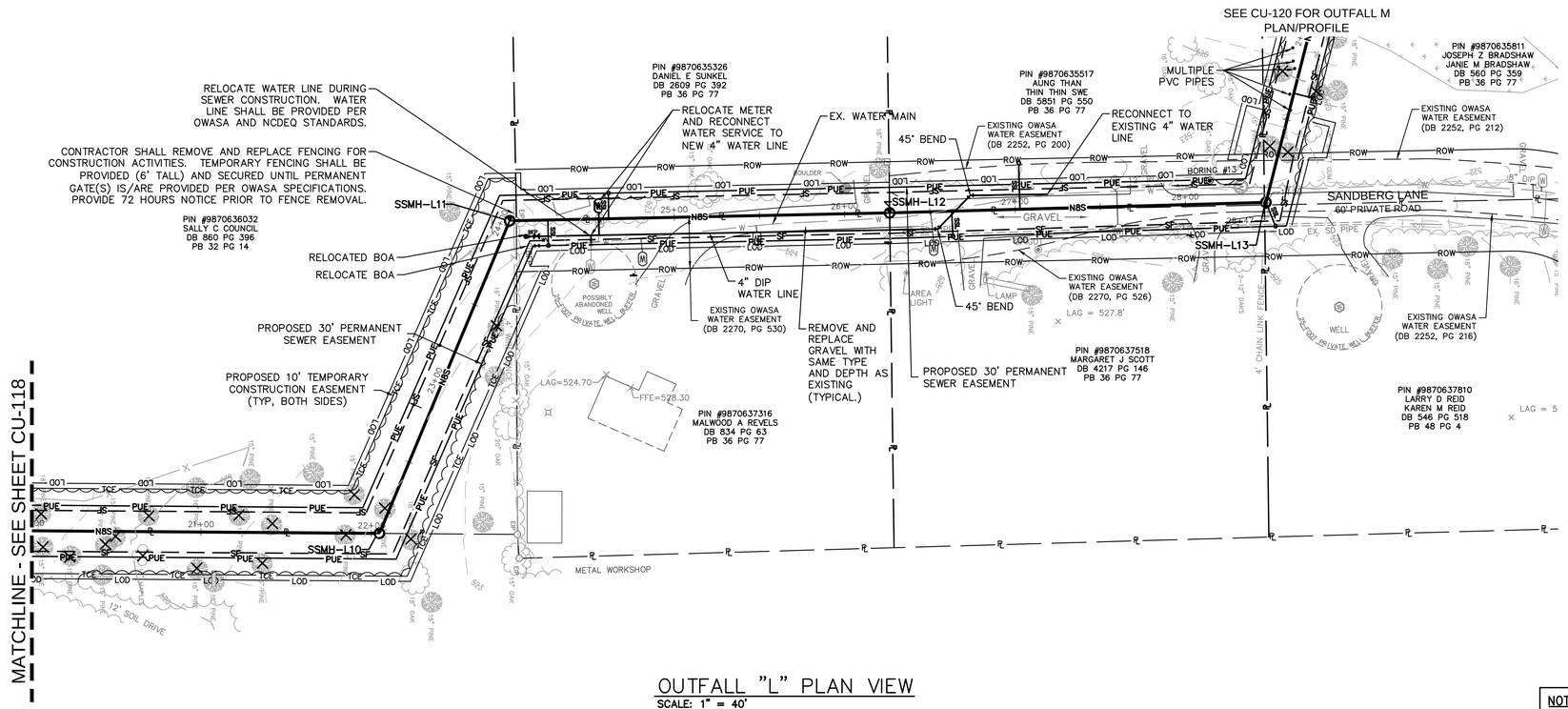
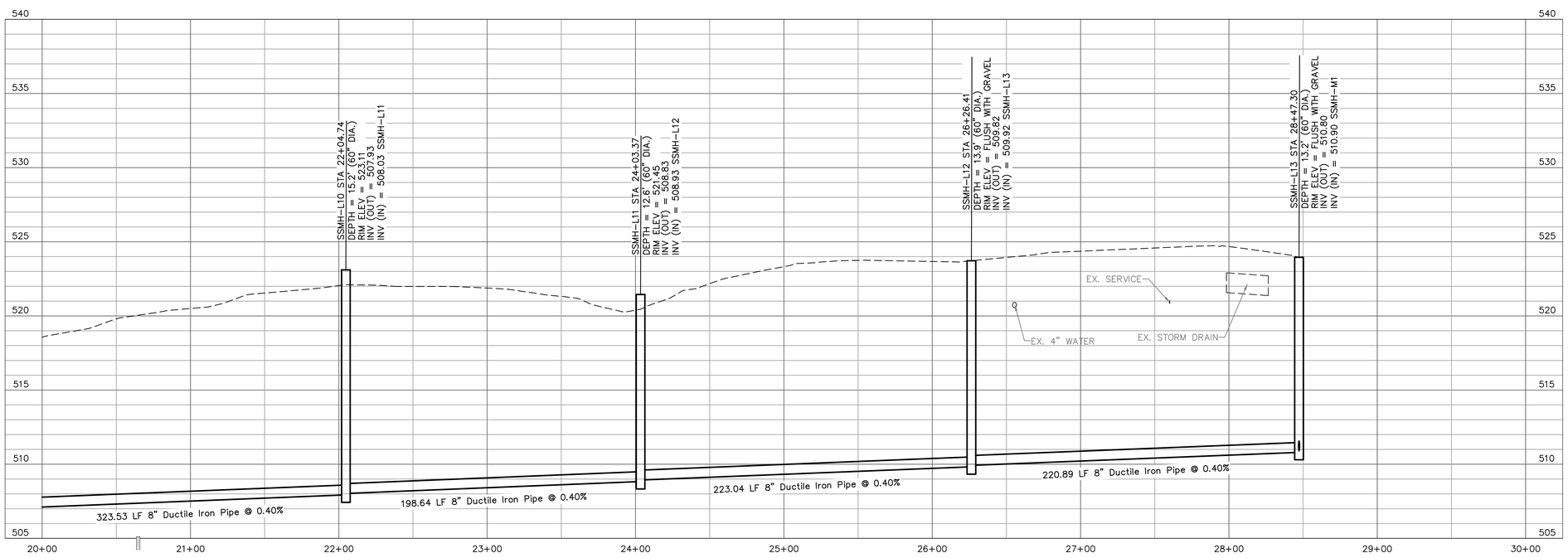


OUTFALL "L" PLAN VIEW

SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'



OUTFALL-L

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

NOTE:
CONTRACTOR SHALL PROVIDE TEMPORARY WATER SERVICE DURING CONSTRUCTION.

NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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www.aecom.com
NCBELS LIC. NO. C-2243

SHEET TITLE: SEWER PLAN & PROFILE – OUTFALL L

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-119
24 OF 39

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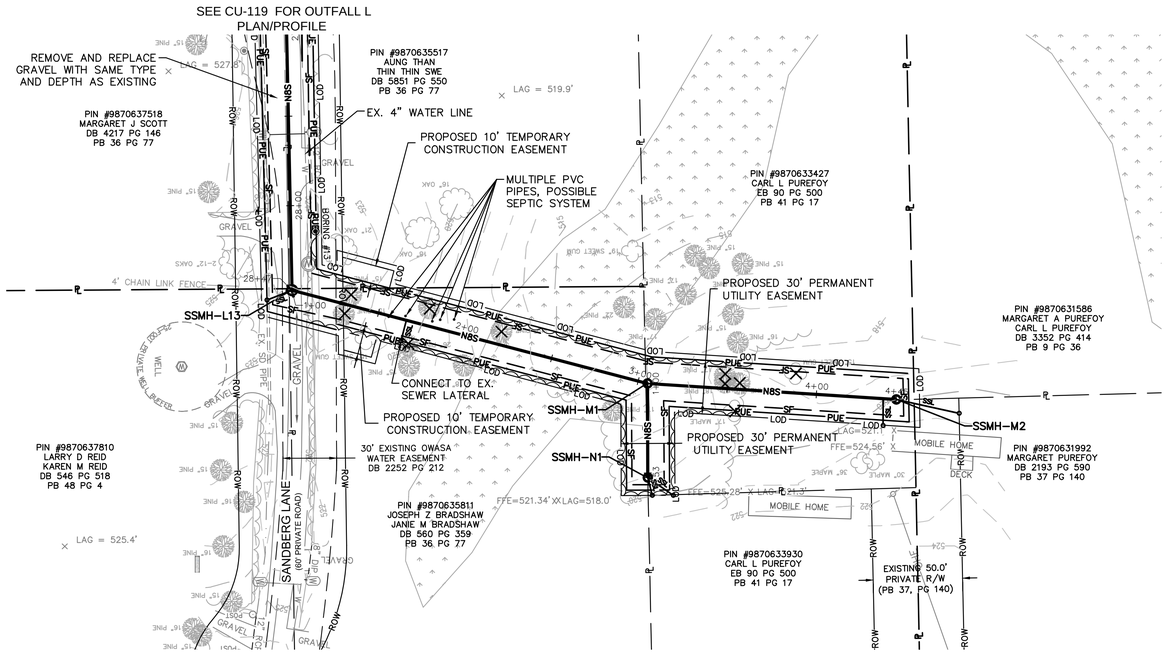
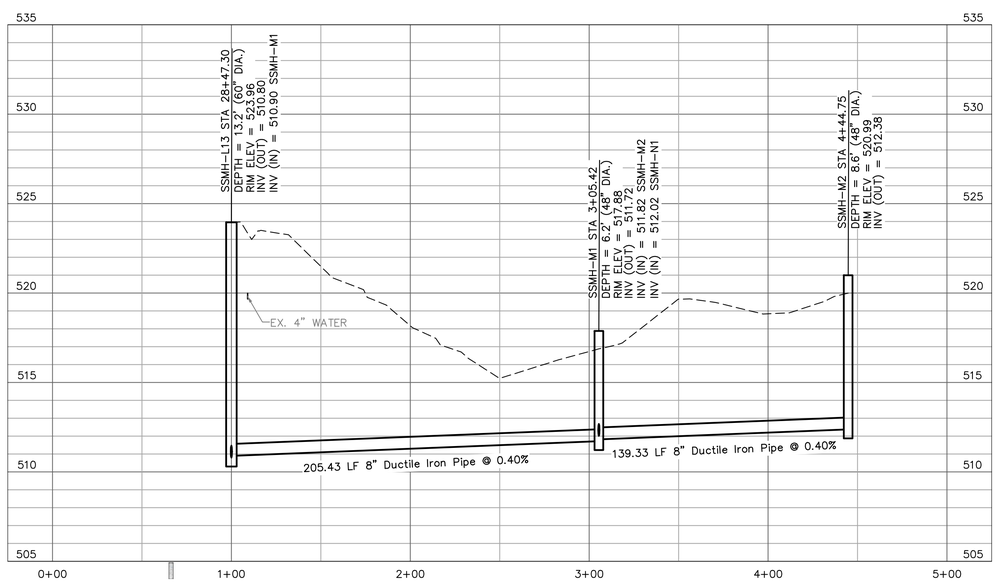


OUTFALL "M" & "N" PLAN VIEW
SCALE: 1" = 40'

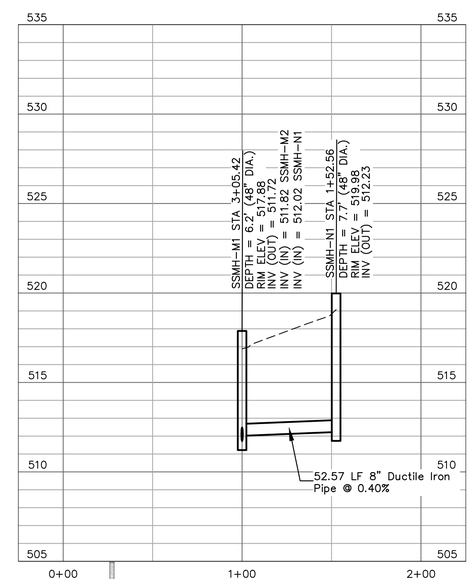
NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'



OUTFALL-M
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'



OUTFALL-N
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY:
CHECKED BY: TS/KTP
APPROVED BY: JDP/RLF
APPROVED BY: JLL

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Morrisville, North Carolina 27560
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www.aecom.com
NCBELS LIC. NO. C-2243

SHEET TITLE: SEWER PLAN & PROFILE – OUTFALL M & N
SCALE: AS SHOWN
DATE: 5/25/2016

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-120
25 OF 39

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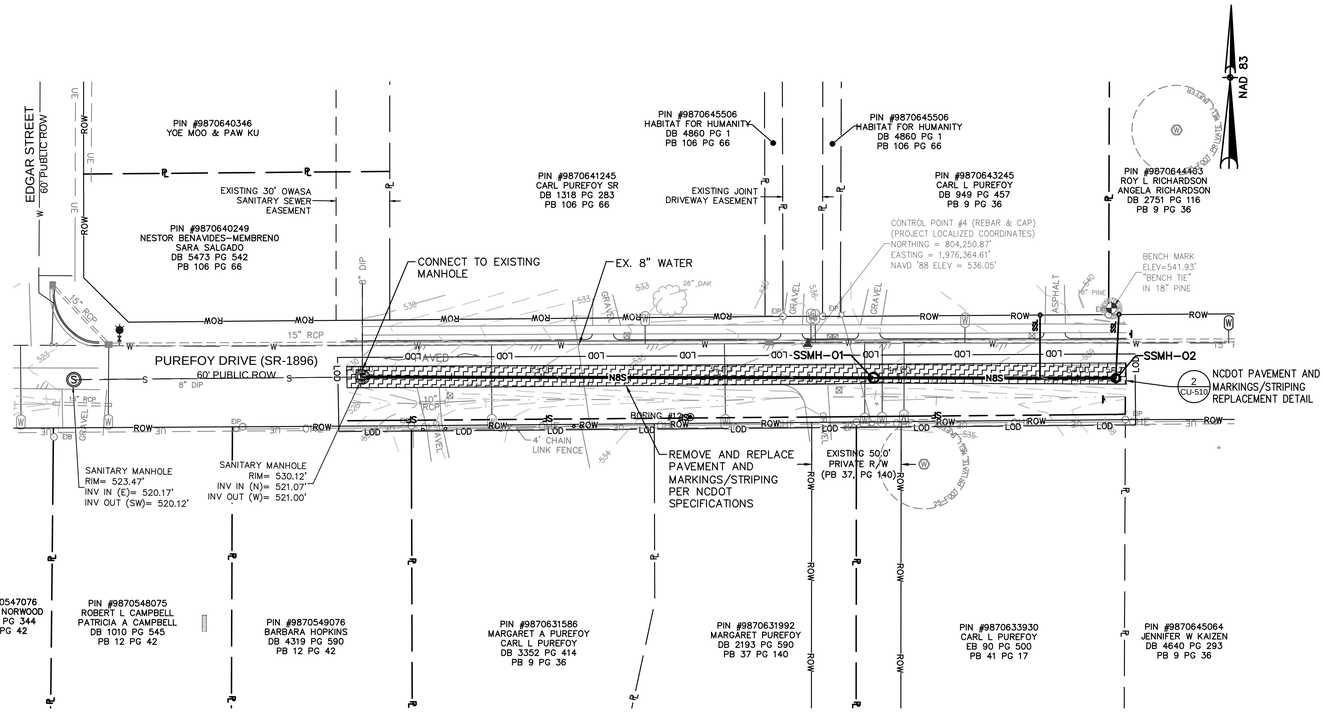
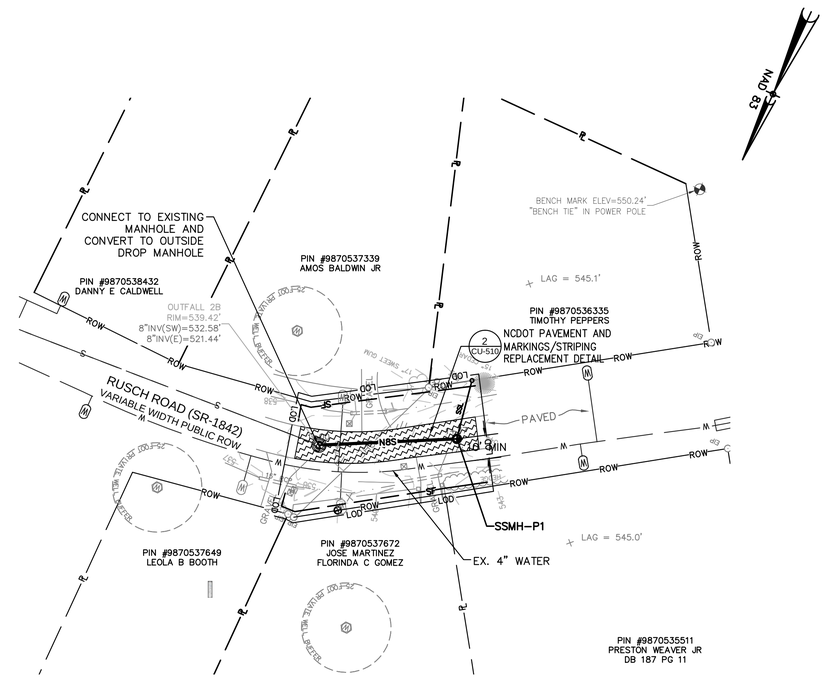


OUTFALL "O" PLAN VIEW
SCALE: 1" = 40'

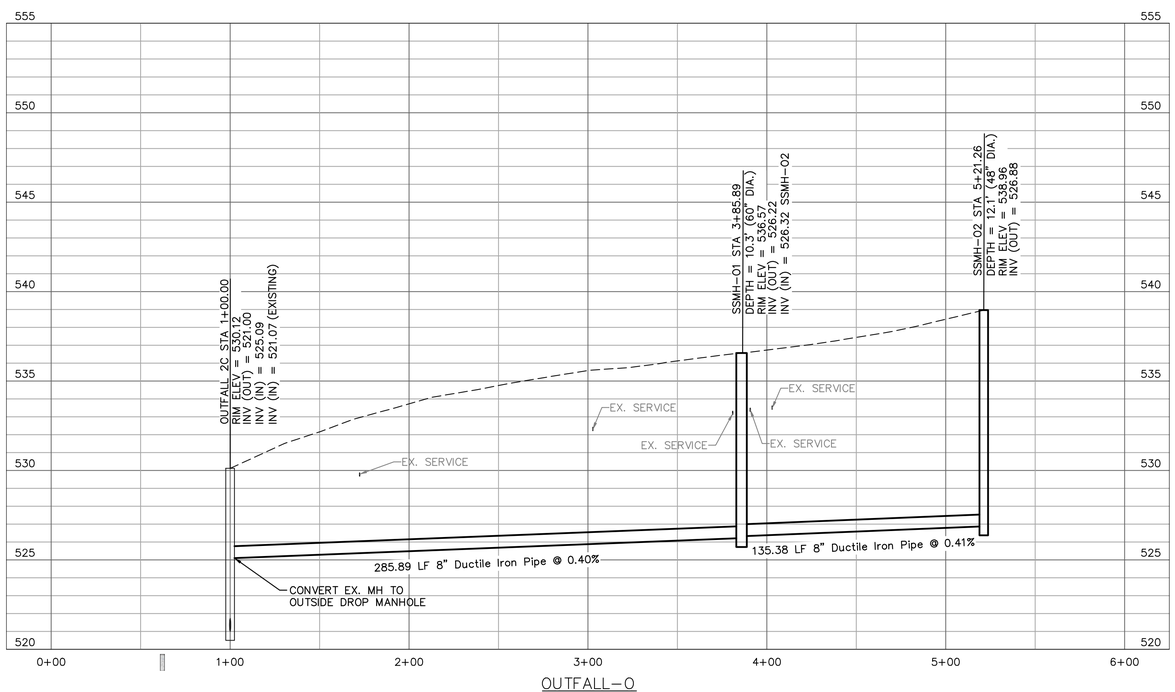


OUTFALL "P" PLAN VIEW
SCALE: 1" = 40'

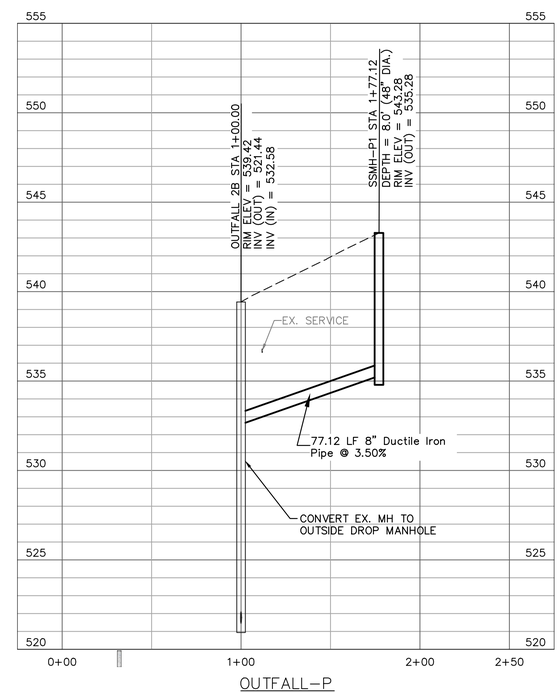
NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'



OUTFALL-O
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'



OUTFALL-P
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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Morrisville, North Carolina 27560
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NCBELS LIC. NO. C-2243

SHEET TITLE: SEWER PLAN & PROFILE – OUTFALL O & P

SCALE: AS SHOWN
DATE: 5/25/2016

PROJECT:
HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

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URS PROJ. NO. 31829996
SHEET I.D. CU-121
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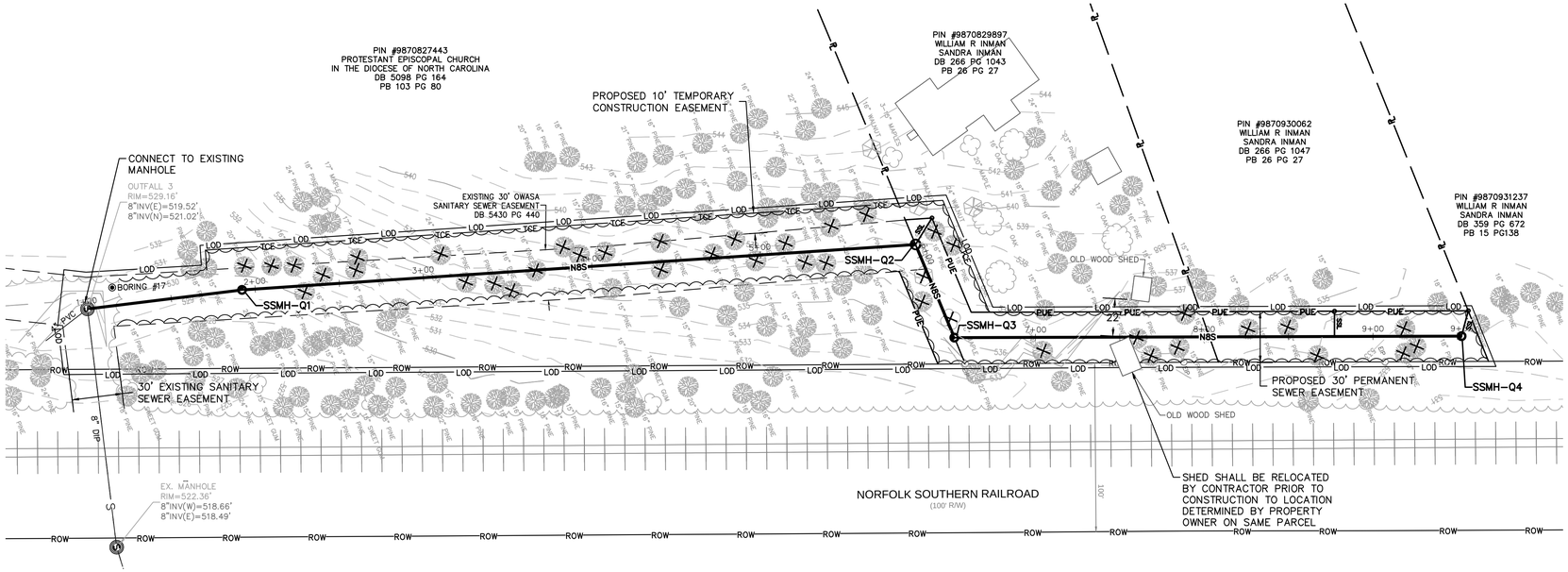


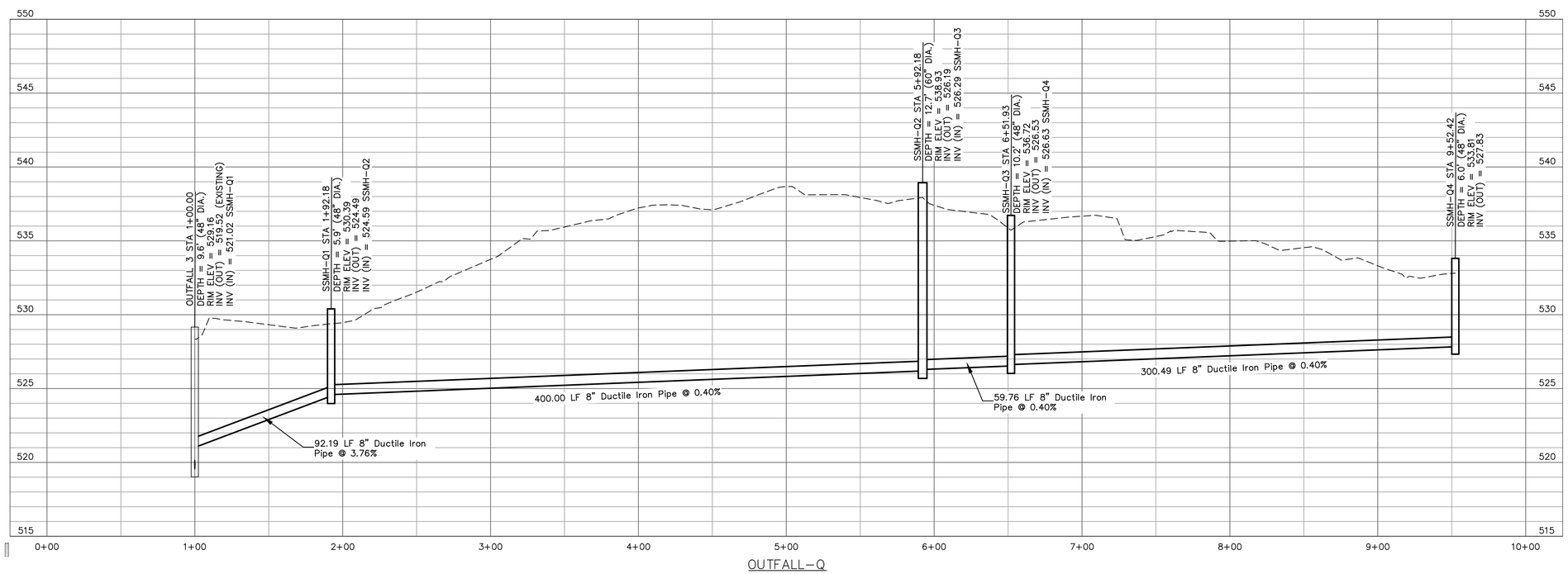
OUTFALL "Q" PLAN VIEW

SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'

NOTES:
- SEE SHEET G-004 FOR MANHOLE COORDINATES
- NO ACTIVITIES ARE PERMITTED ON RAILROAD RIGHT-OF-WAY



OUTFALL-Q

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

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE: SEWER PLAN & PROFILE – OUTFALL Q

DATE: 5/25/2016 | SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

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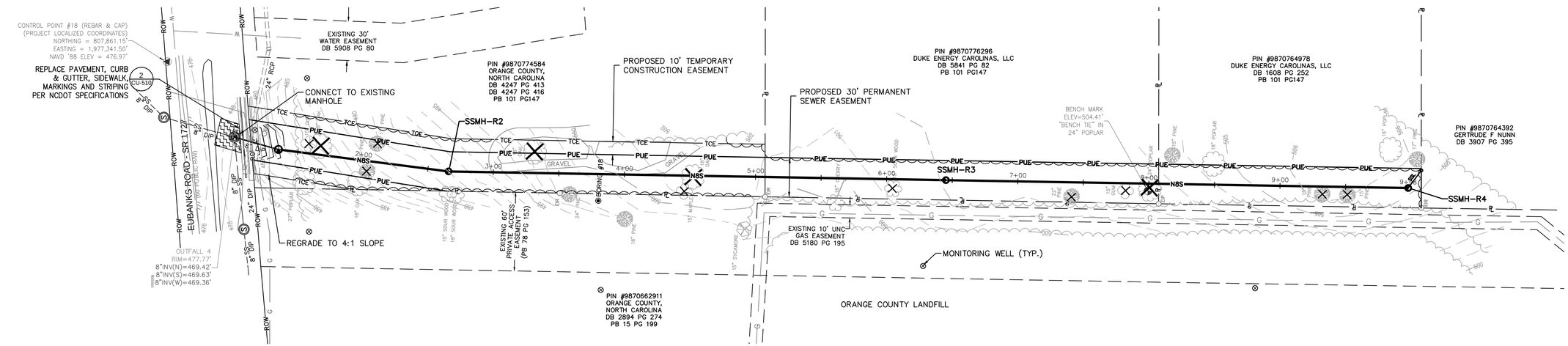
DRAWINGS\5.3-DWGS\5.3.5-SHEETS\31829996-C0-122-PAP.DWG 5/26/2016 4:42:2 PM



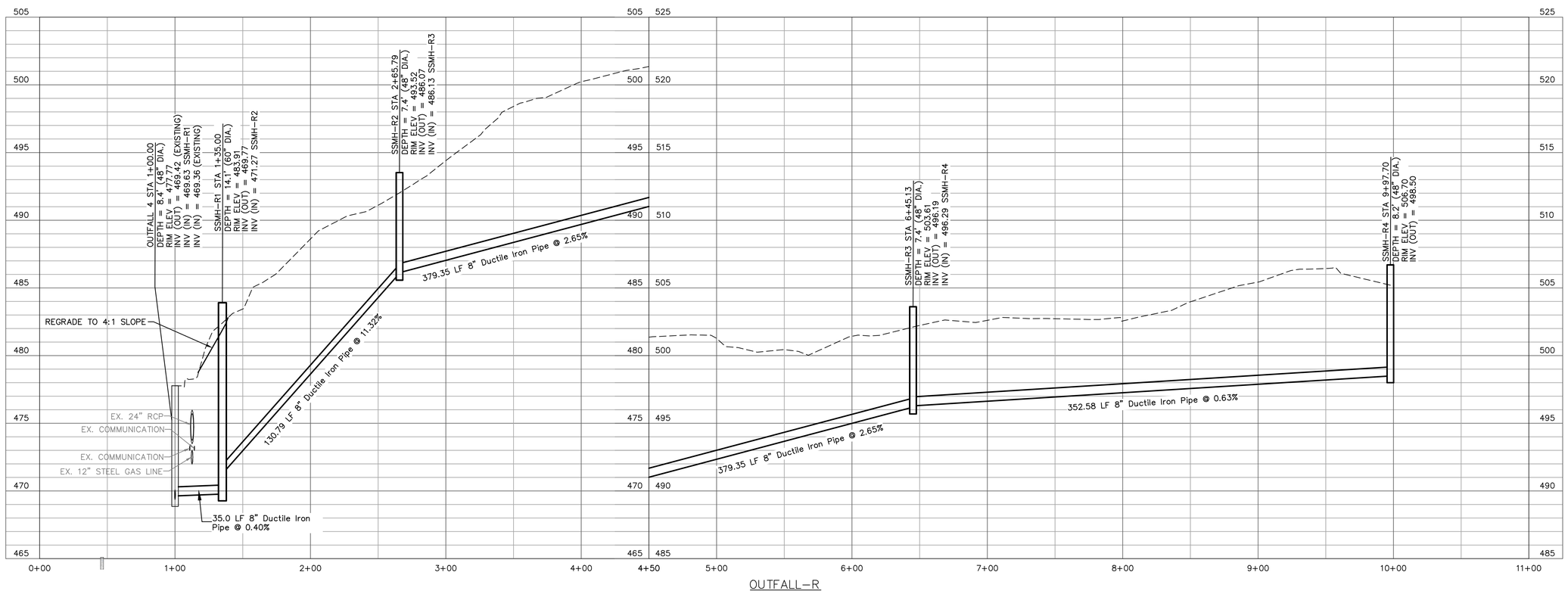
OUTFALL "R" PLAN VIEW

SCALE: 1" = 40'

20' 0 40'
HORIZ. SCALE: 1" = 40'

2' 1' 0 4'
VERT. SCALE: 1" = 4'

NOTE:
SEE SHEET G-004 FOR MANHOLE COORDINATES



OUTFALL-R

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

REVISIONS			
NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/KTP
CHECKED BY: JDP/RLF
APPROVED BY: JLL

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SHEET TITLE:
SEWER PLAN & PROFILE – OUTFALL R

DATE: 5/25/2016
SCALE: AS SHOWN

PROJECT:
HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

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URS PROJ. NO. 31829996
SHEET I.D. CU-123
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DRAWINGS\X_1-DWG\X1X5-SHEETS\31829996_CU-123_PRP.DWG 5/25/2016 4:19:23 PM

SEDIMENT AND EROSION CONTROL NOTES:

UNLESS OTHERWISE INDICATED, ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE EROSION CONTROL LAWS OF THE STATE OF NORTH CAROLINA, SPECIFICALLY THE SEDIMENT POLLUTION CONTROL ACT OF 1973, AS AMENDED, AND THE LOCAL EROSION AND SEDIMENT CONTROL ORDINANCES.

THE FOLLOWING SEQUENCE OF EVENTS AND EROSION CONTROL MEASURES SHALL BE INCORPORATED INTO THE CONSTRUCTION SCHEDULE FOR THIS PROJECT AND SHALL APPLY TO ALL CONSTRUCTION ACTIVITIES WITHIN PROJECT LIMITS:

1. PRIOR TO ANY LAND DISTURBING ACTIVITIES INSTALL ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS DEPICTED ON DRAWINGS AND IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.
2.
3. THE EROSION CONTROL REVIEW AND INSPECTION WILL BE ADDRESSED BY NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NCDEQ), DIVISION OF ENERGY, MINERAL AND LAND RESOURCES, LAND QUALITY SECTION.
4. AREAS WHICH ARE NOT TO BE DISTURBED SHALL BE CLEARLY MARKED BY FENCING, FLAGS, SIGNS, ETC.
5. UPON ACCEPTANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, COMMENCE EXCAVATION AND/OR GRADING ACTIVITIES. THE CONTRACTOR WILL BE RESTRICTED TO A 30 FOOT WIDE AREA FOR EXCAVATION, EQUIPMENT STAGING ACTIVITIES AND TEMPORARY STOCKPILING OF EXCAVATED SOIL ALONG THE LENGTH OF PIPELINES. ALONG ROGERS ROAD, PUREFOY DRIVE, TALLYHO TRAIL, LAIR COURT, RUSCH ROAD, HOMESTEAD ROAD, HEARTHSTONE LANE THE AREA WILL BE RESTRICTED WITHIN RIGHT OF WAY AND CONFORMING TO APPROVED PERMITS FROM NCDOT, TOWN OF CARRBORO, AND TOWN OF CHAPEL HILL. NO WORK OUTSIDE RIGHT OF WAY SHALL BE ALLOWED UNLESS WRITTEN PERMISSION AND/OR TEMPORARY CONSTRUCTION EASEMENT WAS OBTAINED PRIOR TO CONSTRUCTION. TEMPORARILY STOCKPILED MATERIAL SHALL BE PLACED UPSLOPE OF THE EXCAVATION. FOR ANY DEMOLITION OR OTHER ACTIVITIES DESIRED PRIOR TO COMPLETION OF ALL EROSION AND SEDIMENT CONTROL MEASURES, INTERIM MEASURES ACCEPTABLE TO AND PRE-APPROVED BY ENGINEER, AND NCDEQ DIVISION OF ENERGY, MINERAL AND LAND RESOURCES, LAND QUALITY SECTION MUST BE PROVIDED. AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS, ALL OPERATIONS SHALL BE CONFINED TO THE RIGHT-OF-WAYS OR DESIGNATED EASEMENTS. **TOTAL DISTURBED AREAS NOT TO BE GREATER THAN 5.0 ACRES AT ANY GIVEN TIME.**
6. LIMIT CLEARING AND GRUBBING OF THE TRENCH TO THE AMOUNT OF PIPE THAT CAN BE CONSTRUCTED IN ONE DAY. LIMIT TRENCH EXCAVATION TO THE AMOUNT OF PIPE THAT CAN BE CONSTRUCTED AND BACKFILLED IN ONE DAY, OR 50 LINEAL FEET, WHICHEVER IS LESS. EXCAVATED TRENCH MATERIAL MUST BE STOCKPILED UPSLOPE OF THE TRENCH. OPEN TRENCHES SHALL BE BACKFILLED AND STABILIZED AT THE CESSATION OF EACH WORK DAY. ALL DISTURBED SURFACES MUST RECEIVE TEMPORARY STABILIZATION AT THE END OF EACH WORK DAY. PROVIDE PUMP FILTER BAGS OR OTHER APPROVED DEWATERING DEVICES FOR DEWATERING OF TRENCH EXCAVATION AS NEEDED. SOIL SUPPLEMENTS, SEED AND MULCH, IF APPLICABLE, SHOULD BE APPLIED WITHIN SEVEN DAYS AFTER THE PIPELINE/UTILITY LINE IS CONSTRUCTED. ANY TEMPORARY ACCESS CONSTRUCTED FOR PIPELINE WORK MUST BE STABILIZED WITH A NON-GRADE AGGREGATE.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE. INSPECT ALL EROSION AND SEDIMENT CONTROL DEVICES ONCE PER SEVEN DAYS, AND IMMEDIATELY FOLLOWING ANY RAINFALL OF 0.5" OR MORE IN A 24-HOUR PERIOD. MAINTAIN AN "EROSION AND SEDIMENT CONTROL LOG" OF ALL INSPECTION DATES ALONG WITH DESCRIPTION OF ALL CORRECTIVE ACTIONS TAKEN. SEDIMENT ACCUMULATIONS ALONG SILT FENCE AND OTHER EROSION CONTROL MEASURES SHALL BE PROMPTLY REMOVED. THE PROJECT SUPERINTENDENT SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES.
5. EACH EROSION AND SEDIMENT CONTROL MEASURE SHALL BE INSPECTED ON A WEEKLY BASIS AND WITHIN 24 HOURS FOLLOWING A STORM EVENT GREATER THAN ONE-HALF INCH. EACH MEASURE SHALL BE MAINTAINED PER THE REQUIREMENTS OF THE NORTH CAROLINA SEDIMENT CONTROL PLANNING AND DESIGN MANUAL
6. ANY AREAS WHICH ARE NOT TO BE FURTHER GRADED WITHIN A 14-DAY PERIOD, OR WHICH HAVE NOT BEEN GRADED WITHIN 14 DAYS SHALL BE SEEDED IN ACCORDANCE WITH THE FOLLOWING:

STABILIZATION REQUIREMENTS

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES, AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES

7. TEMPORARY SEEDING SHALL ADHERE TO THE FOLLOWING SPECIES AND APPLICATION RATES:

TEMPORARY SEEDING MIXTURES

PLANTING DATE	SPECIES	APPLICATION RATE
AUGUST 15 – APRIL 15	RYE GRAIN	50 LBS/ACRE
	FERTILIZER (10-20-20)	400 LBS/ACRE
	LIMESTONE	2,000 LBS/ACRE
	MULCH	4,000 LBS/ACRE
APRIL 15 – AUGUST 15	SWEET SUDAN GRASS	50 LBS/ACRE
	GERMAN MILLET	50 LBS/ACRE
	BROWNTOP MILLET	50 LBS/ACRE
	FERTILIZER (10-20-20)	400 LBS/ACRE
	LIMESTONE	2,000 LBS/ACRE
	MULCH	4,000 LBS/ACRE

8. TACK MULCH BY APPLYING ASPHALT TACK AT A RATE OF 0.10 GAL/SQ. YDS (10 GAL/1,000 SQ. FT.)
9. CONSULT CONSERVATION ENGINEER OR SOIL CONSERVATION SERVICE FOR ADDITIONAL INFORMATION CONCERNING OTHER ALTERNATIVES FOR VEGETATION OF DENUDED AREAS. THE ABOVE VEGETATION RATES ARE THOSE WHICH DO WELL UNDER LOCAL CONDITIONS; OTHER SEEDING RATE COMBINATIONS ARE POSSIBLE.
10. PERMANENTLY SEEDING SHALL ADHERE TO THE FOLLOWING SPECIES AND APPLICATION RATES:

PERMANENT SEEDING MIXTURES

PLANTING DATE	SPECIES	APPLICATION RATE
MARCH 1 – AUGUST 31	TALL FESCUE	75 LBS/ACRE
	BERMUDAGRASS (HULLED)	25 LBS/ACRE
	FERTILIZER (10-20-20)	500 LBS/ACRE
	LIMESTONE	4,000 LBS/ACRE
	MULCH	4,000 LBS/ACRE
SEPT. 1 – FEBRUARY 28	TALL FESCUE	75 LBS/ACRE
	BERMUDAGRASS (UNHULLED)	35 LBS/ACRE
	FERTILIZER (10-20-20)	500 LBS/ACRE
	LIMESTONE	4,000 LBS/ACRE
	MULCH	4,000 LBS/ACRE

11. CONTRACTOR SHALL PREPARE ALL AREAS TO RECEIVE TEMPORARY OR PERMANENT SEEDING MEASURES PRIOR TO PLANTING.
12. TOPSOIL SHALL BE PLACED IN AREAS TO BE SEEDED AND ROUGHENED WITH TRACKED EQUIPMENT OR OTHER SUITABLE MEASURES. SLOPES STEEPER THAN 3:1 MAY BE ROUGHENED BY GROOVING, FURROWING, TRACKING, OR STAIRSTEP GRADING. SLOPES FLATTER THAN 3:1 SHOULD BE GROOVED BY DISKING, HARROWING, RAKING, OR OPERATING PLANTING EQUIPMENT ON THE CONTOUR.
13. SOIL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, LIME AND FERTILIZER SHALL BE SPREAD AS NECESSARY, AND AT THE RATES SHOWN IN THE SEEDING SCHEDULE. SEEDING SHALL BE AS PER TYPE AND RATES SHOWN IN THE SEEDING SCHEDULE. SEED SHALL BE BROADCAST AS SOON AS POSSIBLE FOLLOWING ROUGHENING, BEFORE SURFACE HAS BEEN SEALED BY RAINFALL.
14. MULCH MUST COVER A MINIMUM OF 80 PERCENT OF THE SOIL SURFACE AND MUST BE SECURED BY TACKING, CRIMPING, OR NETTING.
15. WOOD CELLULOSE FIBER MULCH SHALL BE USED IN HYDROSEEDING GRASS SEED IN COMBINATION WITH FERTILIZERS AND OTHER APPROVED ADDITIONS.
16. NETTING WITH PLASTIC MESH AND/OR PLASTIC TWINE SHALL NOT BE USED IN WETLAND AND RIPARIAN BUFFERS TO PROTECT SMALL ANIMALS.
17. HYDROSEEDING SHALL BE CARRIED OUT IN THREE STEPS. STEP ONE SHALL CONSIST OF THE APPLICATION OF LIME. IN STEP TWO, THE SEED MIXTURE SHALL BE MIXED WITH THE FERTILIZER, WOOD CELLULOSE FIBER MULCH, AND ANY REQUIRED INOCULANTS AND APPLIED TO THE SEED BED. STEP THREE SHALL CONSIST OF APPLICATION OF TOP DRESSING DURING THE FIRST SPRING OR FALL, WHICHEVER COMES FIRST, AFTER STEP TWO.
18. INGREDIENTS FOR THE MIXTURE AND STEPS SHOULD BE EMPTIED INTO A TANK OF WATER AND THOROUGHLY MIXED TO A HOMOGENEOUS SLURRY AND SPRAYED OUT UNDER SUFFICIENT PRESSURE, IN SUITABLE PROPORTIONS TO ACCOMMODATE THE TYPE AND CAPACITY OF THE HYDRAULIC MACHINE USED. APPLICATIONS SHALL BE EVENLY SPRAYED OVER THE GROUND SURFACE. THE CONTRACTOR SHALL FREE THE TOPSOIL OF STONES, ROOTS, RUBBISH AND OTHER DELETERIOUS MATERIALS AND DISPOSE OF SAME OFF THE SITE. THE BARE SOIL, EXCEPT EXISTING STEEP EMBANKMENT AREA, SHALL BE ROUGH RAKED TO REMOVE STONES, ROOTS, AND RUBBISH OVER 4 INCHES IN SIZE, AND OTHER DELETERIOUS MATERIALS AND DISPOSE OF SAME OFF THE SITE.
19. NO SEEDING SHOULD BE UNDERTAKEN IN WINDY OR UNFAVORABLE WEATHER, WHEN THE GROUND IS TOO WET TO RAKE EASILY, WHEN IT IS IN FROZEN CONDITIONS, OR WHEN IT IS TOO DRY. ANY BARE SPOTS SHOWN IN TWO TO THREE WEEKS SHALL BE RECULTIVATED, FERTILIZED AT HALF THE RATE, RAKED, SEEDED, AND MULCHED AGAIN BY MECHANICAL OR HAND BROADCAST METHOD ACCEPTABLE TO THE OWNER.
20. ALL SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND OF GRASS IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RESEEDED AS NEEDED. UPON FINAL ACCEPTANCE OF COMPLETE STABILIZATION OF THE SITE BY THE ENGINEER AND NCDEQ, REMAINING TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY BE REMOVED. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES TO BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL PROGRAM ADMINISTRATOR.
21. UPON COMPLETION OF PROJECT, THE "EROSION AND SEDIMENT CONTROL LOG" SHALL BE SUBMITTED TO THE ENGINEER FOR CONVEYANCE TO THE OWNER FOR REGULATORY RECORD MAINTENANCE TIME PERIOD.
22. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT WITH PAVED PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING, AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA (STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER).
23. SITES UTILIZED BY THE CONTRACTOR FOR THE PURPOSE OF STORING EQUIPMENT, EXCESS EXCAVATED MATERIALS, STRIPPED TOPSOIL, ETC, SHALL BE ENVIRONMENTALLY SUITABLE FOR SUCH PURPOSES AND SHALL BE APPROVED IN ADVANCE BY THE OWNER. ENVIRONMENTALLY SUITABLE SITES SHALL BE LEVEL, DEVOID OF MATURE STANDS OF TREES, AND ISOLATED FROM DRAINAGE FACILITIES AND FEATURES, WETLANDS STREAMS, AND STREAM CORRIDORS. SITES SHALL COMPLY WITH ALL EROSION AND SEDIMENT CONTROL REQUIREMENTS OF THE CITY OF WILMINGTON OR NEW HANOVER COUNTY, WHOEVER HAS JURISDICTION.
24. THE CLEANUP AND DISPOSAL OF EXCESS EXCAVATED MATERIALS SHALL BE DONE AS SOON AS PRACTICAL AND AS THE OWNER MAY DIRECT.
25. CHECK DAMS, SILT FENCE, OR OTHER FILTERING DEVICES SHALL BE MAINTAINED AT AREAS OF STOCKPILED MATERIALS, EXCAVATED AREAS, CATCH BASINS, AND OTHER STORM WATER INLET STRUCTURES IN CONSTRUCTION AREAS TO CONTROL SILT RUNOFF.
26. ALL DEWATERING FLOWS SHALL BE KEPT FREE OF SILT, SEDIMENT, DEBRIS, AND OTHER POLLUTANTS THROUGH APPROPRIATE MEANS (SETTLING BASINS, FILTER, ETC.). FOLLOWING THIS, THE FLOWS SHALL ONLY BE RELEASED DIRECTLY INTO STORM SEWERS, STREAM CHANNELS, TO OTHER STABILIZED DRAINAGE COURSES AND NOT INTO EXPOSED SOILS, STEEP SLOPES, OR ANY OTHER SITE WHERE FLOWS COULD CAUSE FURTHER DAMAGE.
27. CUT AND FILL SLOPES ARE TO BE VERTICALLY TRACKED, HORIZONTALLY SCARIFIED, MATTED, OR OTHERWISE CONSTRUCTED TO ENHANCE VEGETATIVE GROWTH AND EXPEDITE STABILIZATION. SEEDING SHALL BE INSTALLED AS PORTIONS OF THESE SLOPES ARE COMPLETED.
28. WHEN THE EXISTING EROSION CONTROL FEATURES SUCH AS ROCK CHECK DAMS AND RIP RAP WITHIN THE PROJECT AREA MUST BE REMOVED, IT SHALL BE REPLACED TO A CONDITION EQUIVALENT OR BETTER THAN PRE-CONSTRUCTION.
29. IF AT ANY TIME BEFORE THE EXPIRATION OF THE CONTRACT BOND ANY PART OF THE SEEDED AREA IS NOT IN GOOD CONDITION, THE CONTRACTOR SHALL FERTILIZE AND RESEED AS OFTEN AS NECESSARY TO GET A GOOD STAND OF GRASS.
30. CONTRACTOR SHALL NOT CROSS ANY DITCH WHEN FLOWING WATER IS PRESENT OR DURING WET WEATHER UNLESS A TEMPORARY PUMP AROUND SYSTEM IS PROVIDED DURING INSTALLATION OF PIPELINE (SEE DETAIL 10 ON CU-502). PRIOR TO CROSSING A DITCH, CONTRACTOR SHALL VERIFY THAT A TEMPORARY SEDIMENT TRAP OR CHECK DAM EXISTS DOWNSTREAM OF CROSSING PRIOR TO INSTALLATION OF PIPELINE. IMMEDIATELY AFTER BACKFILLING OF PIPELINE, DITCH SHALL BE RESTORED TO ORIGINAL GRADE AND STABILIZED. USE EXCELSIOR MATTING OR RIP RAP AS NECESSARY TO STABILIZE ALL DITCHES IMPACTED BY CONSTRUCTION. INSPECT DITCHES IMMEDIATELY AFTER WET WEATHER EVENT FOR STABILIZATION.
31. ALL CHECK DAMS SHOULD APPROPRIATELY FILL THE DITCH THEY ARE PLACED IN, SO THAT DRAINAGE IS FORCED THROUGH THE STRUCTURE. THE ENGINEER WILL NOTIFY THE CONTRACTOR IN WRITING IF ANY CHECK DAM IS INSUFFICIENTLY SIZED BASED ON THE ENGINEER'S JUDGEMENT. CONTRACTOR WILL REMEDY THE PROBLEM WITHIN 3 DAYS OR BEFORE THE NEXT FORECASTED RAIN EVENT..
32. IF EXCAVATED SOIL IS PLACED ON ANY ROADWAY PAVEMENT DURING CONSTRUCTION, CONTRACTOR SHALL PROVIDE SAND OR SCREENING FINES ALONG PAVEMENT SURFACE FOR SUFFICIENT REMOVAL OF SEDIMENT.
33. IN THE EVENT THAT SEEDING IS PERFORMED AFTER EXCELSIOR MATTING IS PLACED AS A STABILIZING FEATURE, IT WILL BE NECESSARY TO REMOVE THE MATTING WHEN APPLYING GRASS SEED AND FERTILIZER. CONTRACTOR MUST REPLACE THE MATTING AT THE END OF EACH DAY TO STABILIZE THE SOILS.
34. NOTIFICATION OF LAND RESOURCES SEDIMENT AND EROSION CONTROL SELF-INSPECTION PROGRAM:
35. THE SEDIMENTATION POLLUTION CONTROL ACT WAS AMENDED IN 2006 TO REQUIRE THAT PERSONS RESPONSIBLE (THE CONTRACTOR) FOR LAND-DISTURBING ACTIVITIES INSPECT A PROJECT AFTER EACH PHASE OF THE PROJECT TO MAKE SURE THAT THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN IS BEING FOLLOWED. RULES DETAILING THE DOCUMENTATION OF THESE INSPECTIONS TOOK EFFECT OCTOBER 1, 2010. THE SELF-INSPECTION PROGRAM IS SEPARATE FROM THE WEEKLY SELF-MONITORING PROGRAM OF THE NPDES STORMWATER PERMIT FOR CONSTRUCTION ACTIVITIES. THE FOCUS OF THE SELF-INSPECTION REPORT IS THE INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROL MEASURES ACCORDING TO THE APPROVED PLAN. THE INSPECTIONS MUST BE CONDUCTED AFTER EACH PHASE OF THE PROJECT, AND CONTINUED UNTIL PERMANENT GROUND COVER IS ESTABLISHED IN ACCORDANCE WITH THE LATEST VERSION AND MODIFICATIONS TO NCGS 113A-54.1 AND 15A NCAC 4B.0131. THE SELF-INSPECTION REPORT FORM IS AVAILABLE AS AN EXCEL SPREADSHEET FROM HTTP://WWW.DLR.ENR.STATE.NC.US/PAGES/SEDIMENTATION_NEW.HTML. THE CONTRACTOR SHALL CALL (919) 791-4200 WITH ANY QUESTIONS OR IF THE FORM CANNOT BE ACCESSED.

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REVISIONS: NO. | DESCRIPTION | DATE | BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: CWO
CHECKED BY: RLF
APPROVED BY: JLL

FINAL DRAWING – FOR REVIEW PURPOSES ONLY

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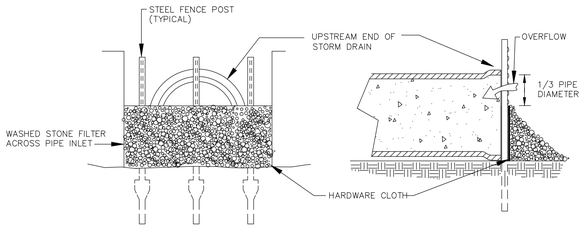
SHEET TITLE: E&SC NOTES

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-501

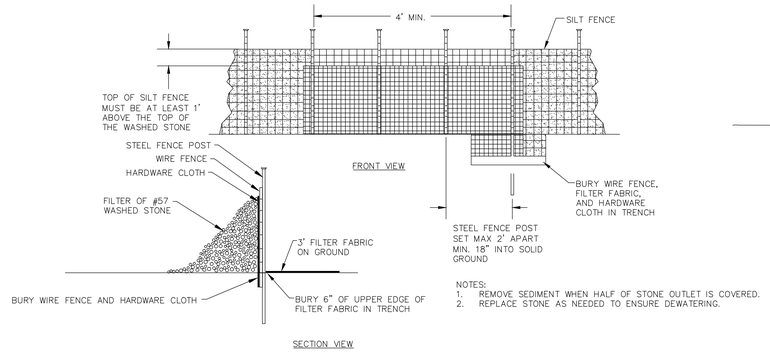


STONE FILTER INLET PROTECTION

NOTE:
ALL PARTIALLY COMPLETED STORM DRAINS SHALL BE PROTECTED AT THE END OF EACH DAY IN ACCORDANCE WITH THESE DETAILS.

1 CULVERT INLET PROTECTION - CIP

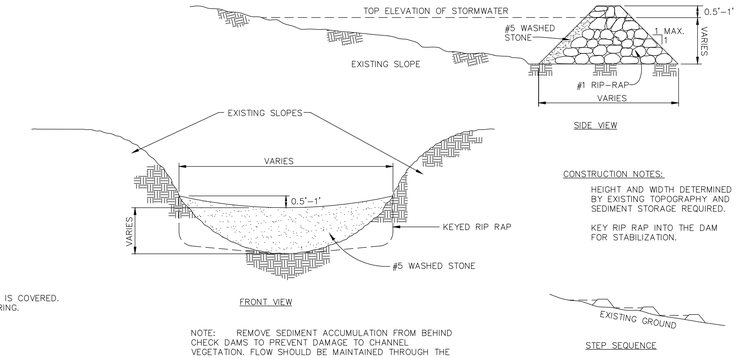
NOT TO SCALE



NOTES:
1. REMOVE SEDIMENT WHEN HALF OF STONE OUTLET IS COVERED.
2. REPLACE STONE AS NEEDED TO ENSURE DEWATERING.

2 STANDARD SILT FENCE OUTLET - SFO

NOT TO SCALE



CONSTRUCTION NOTES:
HEIGHT AND WIDTH DETERMINED BY EXISTING TOPOGRAPHY AND SEDIMENT STORAGE REQUIRED.

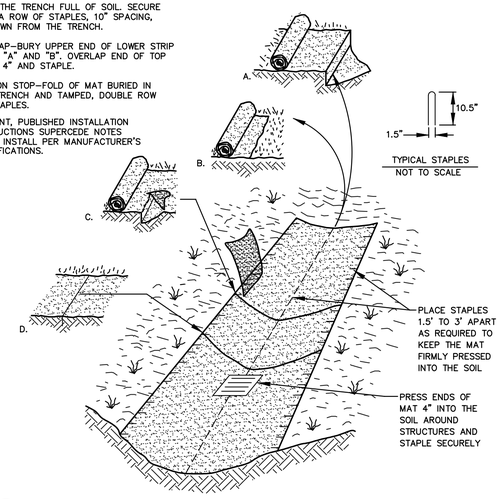
KEY RIP RAP INTO THE DAM FOR STABILIZATION.

NOTE: REMOVE SEDIMENT ACCUMULATION FROM BEHIND CHECK DAMS TO PREVENT DAMAGE TO CHANNEL VEGETATION. FLOW SHOULD BE MAINTAINED THROUGH THE DAM.

3 STANDARD CHECK DAM - CD

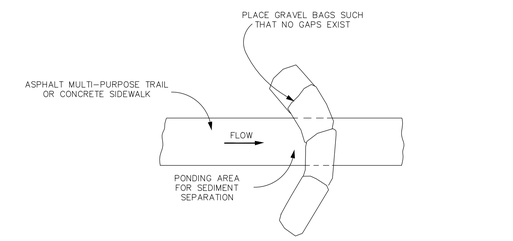
NOT TO SCALE

NOTES:
A. BURY THE TOP END OF THE MAT IN A TRENCH 4" OR MORE IN DEPTH.
B. TAMP THE TRENCH FULL OF SOIL. SECURE WITH A ROW OF STAPLES, 10" SPACING, 4" DOWN FROM THE TRENCH.
C. OVERLAP-BURY UPPER END OF LOWER STRIP AS IN "A" AND "B". OVERLAP END OF TOP STRIP 4" AND STAPLE.
D. EROSION STOP-FOLD OF MAT BURIED IN SILT TRENCH AND TAMPED, DOUBLE ROW OF STAPLES.
E. CURRENT, PUBLISHED INSTALLATION INSTRUCTIONS SUPERCEDE NOTES HERE. INSTALL PER MANUFACTURER'S SPECIFICATIONS.



4 STABILIZATION OF SOIL/CHANNELS WITH STRAW NET MAT

NOT TO SCALE

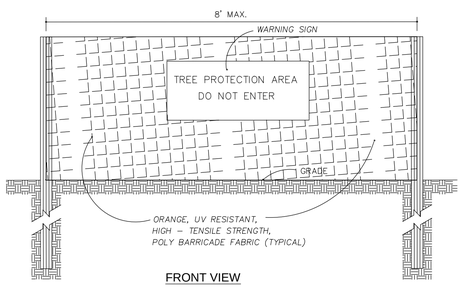


PLAN VIEW

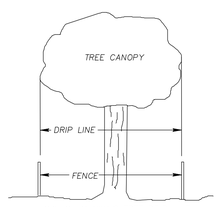
NOTES:
1. PLACE GRAVEL BAG BARRIER ON GENTLY SLOPING ASPHALT TRAIL, OR CONCRETE WALK WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. USE SAND BAGS OF WOVEN GEOTEXTILE FABRIC (NOT BURLAP) AND FILL WITH 1/2 INCH (OR SMALLER) GRAVEL. BAGS MUST BE LAYERED SUCH THAT NO GAPS ARE EVIDENT.
3. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT; SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

5 SAND BAG PROTECTION - SB

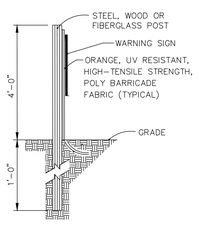
NOT TO SCALE



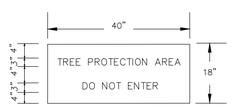
FRONT VIEW



SKETCH SHOWING TREE DRIP LINE IN RELATION TO FENCE LOCATION FOR CHAMPION TREE



SIDE VIEW



WARNING SIGN DETAIL

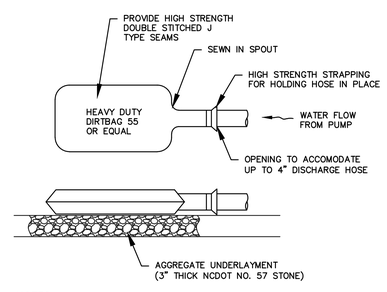
NOTE: FOR TREE PROTECTION ONLY

NOTES:

1. *WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.*
2. *LETTERS TO BE 3" HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.*
3. *SIGNS SHALL BE PLACED AT 500' MAXIMUM INTERVALS.*
4. *PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 300' ON CENTER THEREAFTER.*
5. *FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.*
6. *ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.*
7. *MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.*
8. *ADDITIONAL SIGNS MAY BE REQUIRED BASED ON ACTUAL FIELD CONDITIONS.*
9. *MODIFICATIONS TO THE ABOVE FENCE SPECIFICATIONS MAY BE ALLOWED BUT MUST BE APPROVED BY THE ENGINEER.*
10. *INSTALL TREE PROTECTION FENCING PRIOR TO ANY OTHER WORK.*
11. *INSTALL TREE PROTECTION FENCING AS SHOWN ON DRAWINGS AT EDGE OF CONSTRUCTION ZONE, AND AROUND DESIGNATED TREES. DUE TO LINE OVERLAP, TREE PROTECTION FENCING IS ROUTINELY DISPLAYED ON THE OUTSIDE EDGE OF CONSTRUCTION BOUNDARY LINES (IE: RIGHT-OF-WAY AND PERMANENT/TEMPORARY UTILITY EASEMENTS). WHEN SHOWN THIS WAY, INSTALL TREE PROTECTION FENCE WITHIN THE CONSTRUCTION LIMITS.*

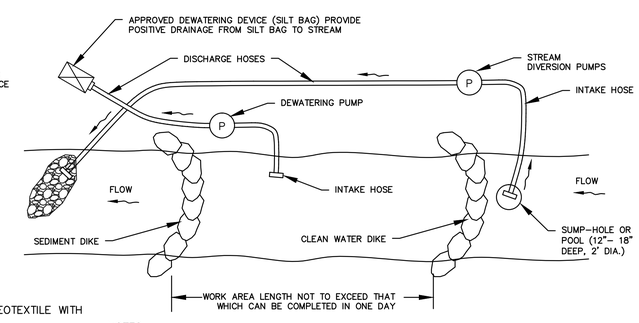
6 STANDARD TREE PROTECTION FENCE - TPF

NOT TO SCALE



NOTES:
1. THE DEWATERING BAG SHALL BE MADE OF NON-WOVEN GEOTEXTILE WITH A MIN. SURFACE ARE OF 225 SQUARE FEET.
2. ALL STRUCTURAL SEAMS SHALL BE SEWN WITH A DOUBLE STITCH USING A DOUBLE NEEDLE MACHINE WITH HIGH STRENGTH THREAD.
3. THE SEAM STRENGTH SHALL WITHSTAND 100 LB/IN USING ASTM D-4884 TEST METHOD.
4. THE GEOTEXTILE FABRIC SHALL BE A 10 OZ NON-WOVEN FABRIC.
5. DISCHARGE FROM THE DEWATERING BAG SHALL BE DIRECTED SUCH THAT PRE-DISTURBANCE HYDROLOGY IS NOT CHANGED.

DEWATERING BAG



NOTES:
1. SANDBAG DIKES SHALL BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA AND STREAM FLOW SHALL BE PUMPED AROUND THE WORK AREA. THE PUMP SHOULD DISCHARGE INTO A STABLE VELOCITY DISSIPATER CONSTRUCTED OF RIP RAP OR SANDBAGS.
2. WATER FROM THE WORK AREA SHALL BE PUMPED TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN, SEDIMENT BAG, OR OTHER APPROVED DEVICE. THE MEASURE SHALL BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM SANDBAG DIKE WITHOUT CAUSING OUTLET EROSION BETWEEN THE SILT BAG AND CHANNEL.
3. AT THE END OF EACH WORK DAY, THE DISTURBED CHANNEL SHALL BE MATTED.
4. WHEN REPLACING THE CULVERTS ON REACH 5, THE CONTRACTOR SHALL PLACE SAND BAGS ACROSS THE ENTIRE DOWNSTREAM FACE OF EACH PIPE TO PREVENT BACKFLOW DURING PUMP AROUND ACTIVITIES.

7 TEMPORARY PUMP AROUND

NOT TO SCALE

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: KKP
CHECKED BY: RLF
APPROVED BY: JLL

NORTH CAROLINA PROFESSIONAL SEAL — FINAL DRAWING - FOR REVIEW PURPOSES ONLY — NOT FOR CONSTRUCTION — DATE:

URS Corporation - North Carolina
1600 Perimeter Park Dr., Suite 400
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Telephone (919) 461-1100, FAX (919) 461-1415
www.aecom.com
NCBELS LIC. NO. C-2243

SHEET TITLE: E&SC DETAILS

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-502
30 OF 39

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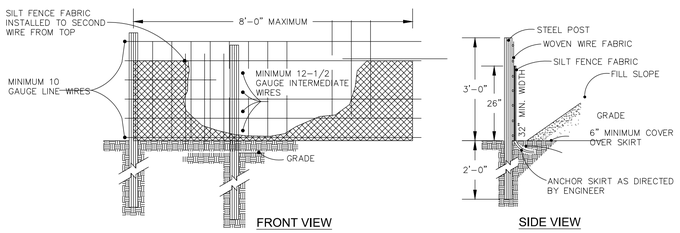
P:\CHAMPION_PROJECTS\MUNICIPAL\WATER\PROJECTS\ORWSA\31829996_ROGERS ROAD SEWER EXPANSION\5-DESIGN DRAWINGS\3-DWGS\5-SHEETS\31829996-CU-502_E&SC-DETAILS.DWG 5/26/2016 8:59:43 AM



NOTES:

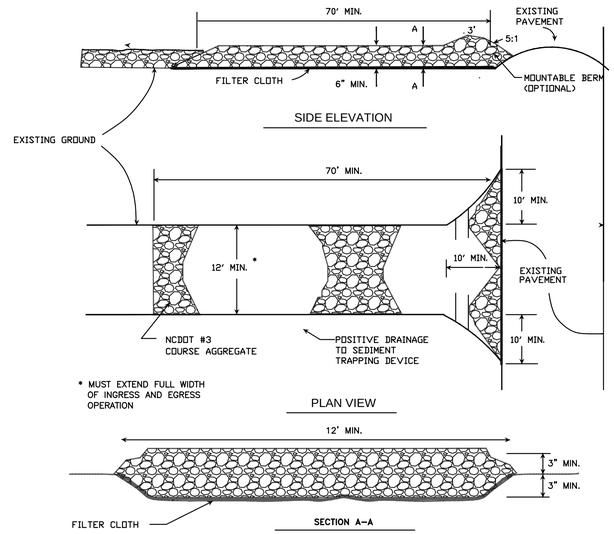
1. USE SILT FENCE ONLY WHEN DRAINAGE AREA DOES NOT EXCEED 1/4 ACRE AND NEVER IN AREAS OF CONCENTRATED FLOW.

2. REMOVE SEDIMENT DEPOSITED AS NEEDED TO PROVIDE STORAGE VOLUME FOR THE NEXT RAIN AND TO REMOVE PRESSURE ON THE SILT FENCE.

3. SILT FENCE IS ROUTINELY DISPLAYED ON THE PLANS AT THE OUTSIDE EDGE OF CONSTRUCTION BOUNDARY LINES (IE: RIGHT OF WAY AND PERMANENT/TEMPORARY UTILITY EASEMENTS) IN ORDER TO PREVENT LINE OVERLAP. WHEN SHOWN THIS WAY, INSTALL SILT FENCE WITHIN THE CONSTRUCTION LIMITS. SILT FENCE IS NEVER TO BE INSTALLED ON PROPERTY NOT PERMITTED FOR CONSTRUCTION.

8 STANDARD TEMPORARY SILT FENCE - SF

NOT TO SCALE

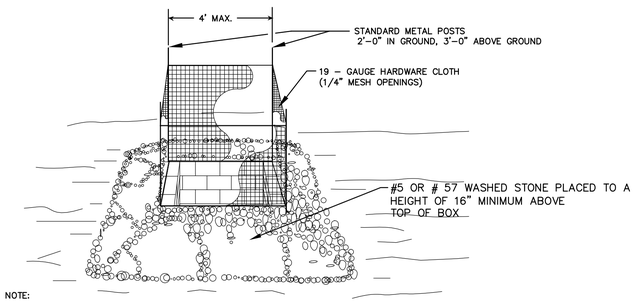


TO BE USED AT A CENTRAL MATERIALS STORAGE LOCATION

CE DENOTES CONSTRUCTION ENTERANCE LOCATIONS ON THE PLANS

9 CONSTRUCTION ENTRANCE

NOT TO SCALE



NOTE:

1. INSPECT INLET PROTECTION AND REMOVE SEDIMENT AFTER EACH RAIN EVENT. GRAVEL SHOULD BE REPLACED AND REPAIRS MADE AS NEEDED.

IP DENOTES INLET PROTECTION LOCATIONS ON THE PLANS

10 HARDWARE CLOTH & GRAVEL INLET PROTECTION

NOT TO SCALE

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: KKP
CHECKED BY: RLF
APPROVED BY: JLL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — FINAL DRAWING - FOR REVIEW PURPOSES ONLY — DO NOT USE FOR CONSTRUCTION

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www.atecom.com
NCBELS LIC. NO. C-2243

SHEET TITLE: E&SC DETAILS

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-503
31 OF 39

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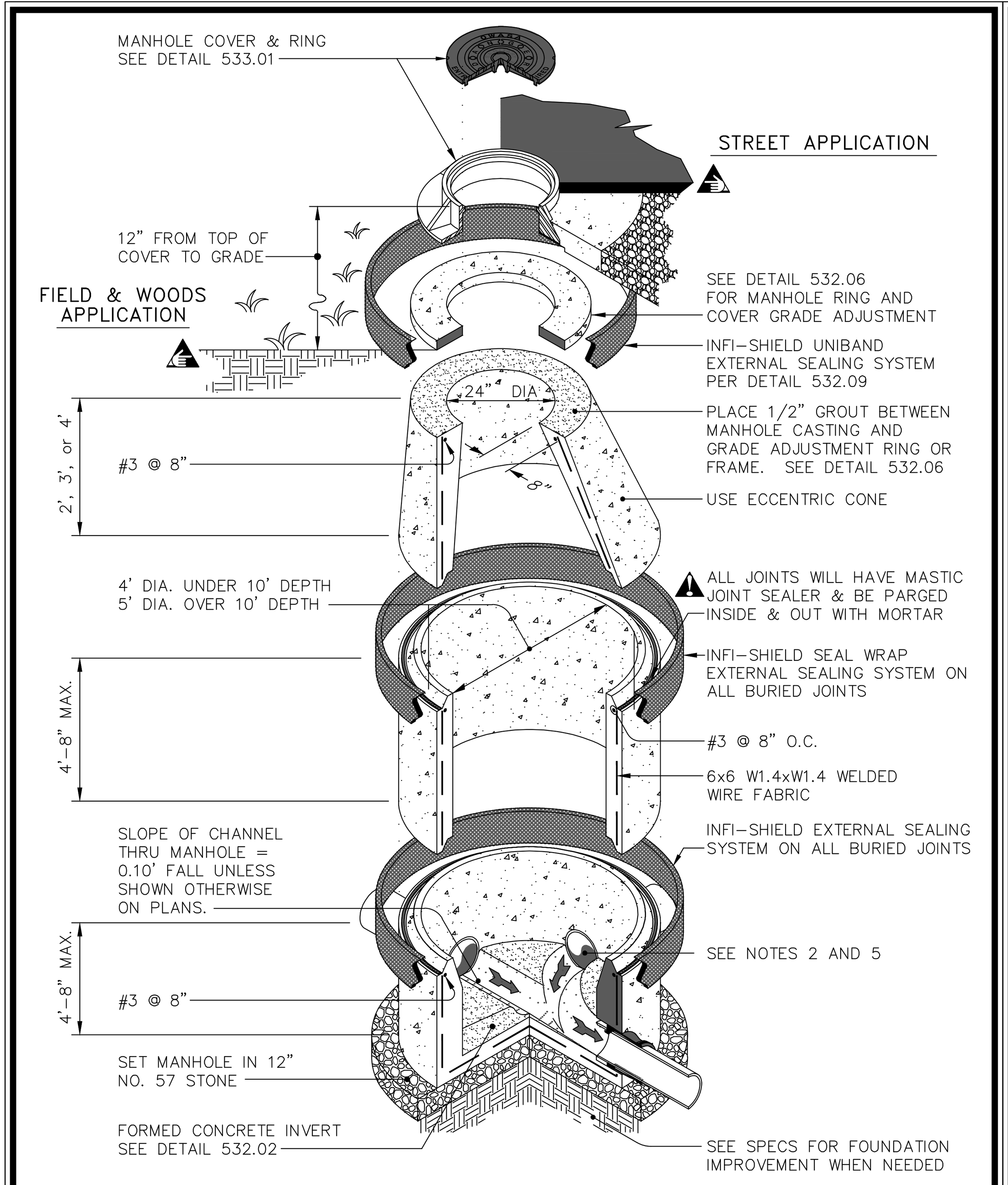
P:\CHANGIL PROJECT\MUNICIPAL\MUTP\PROJECTS\ORWSA 31829996 ROGERS ROAD SEWER EXPANSION\5-DESIGN DRAWINGS\5.1-DWGS\5.1.4-SHEETS\31829996-CU-503 E&SC-DETAILS.DWG 5/26/2016 9:50:14 AM

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:00:29 AM



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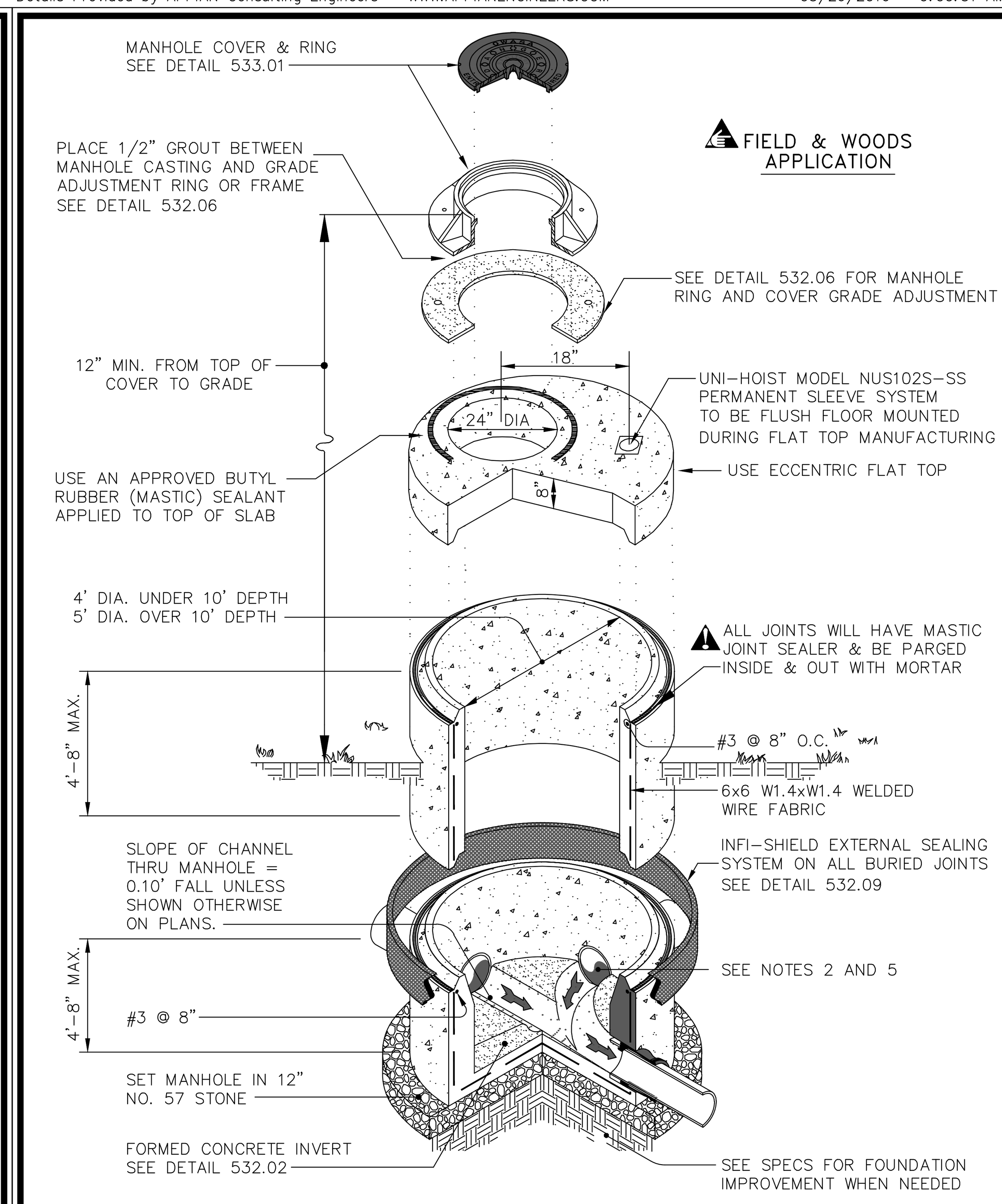
STANDARD ECCENTRIC CONE MANHOLE DETAIL — SCALE: Not To Scale — DETAIL #: 532.01 — REVISION DATE: April 13, 2007 — SHEET #: 1 of 3

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:00:31 AM



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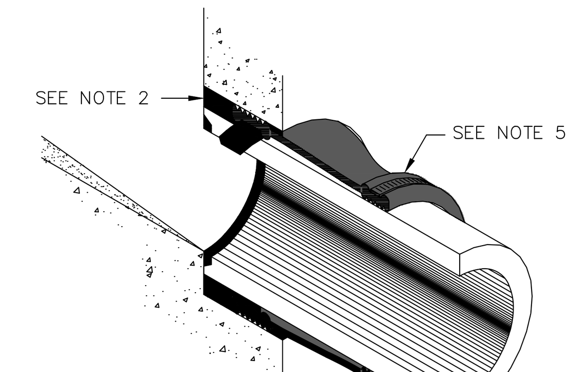
STANDARD ECCENTRIC FLAT TOP MANHOLE DETAIL — SCALE: Not To Scale — DETAIL #: 532.01 — REVISION DATE: MAY 21, 2013 — SHEET #: 2 of 3

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:00:32 AM

PART	MANUFACTURER MODEL / Cat. No.
SLEEVE BOOTS	KOR-N-SEAL or PSX



NOTES:

1. Concrete strength to be 4,000 PSI minimum.
2. Pipes will be grouted inside and out.
3. Joints will have mastic joint sealer and be parged inside and out with mortar.
4. Reinforcement design to conform to the requirements of ASTM C478.
5. Flexible sleeve boots cast in place or installed with stainless steel expander rings as manufactured by Kor-N-Seal or PSX shall be used for pipe connections. Boots shall be secured to pipe using (2) stainless steel bands. Precast inverts will not be accepted, unless otherwise directed by OWASA's inspectors.

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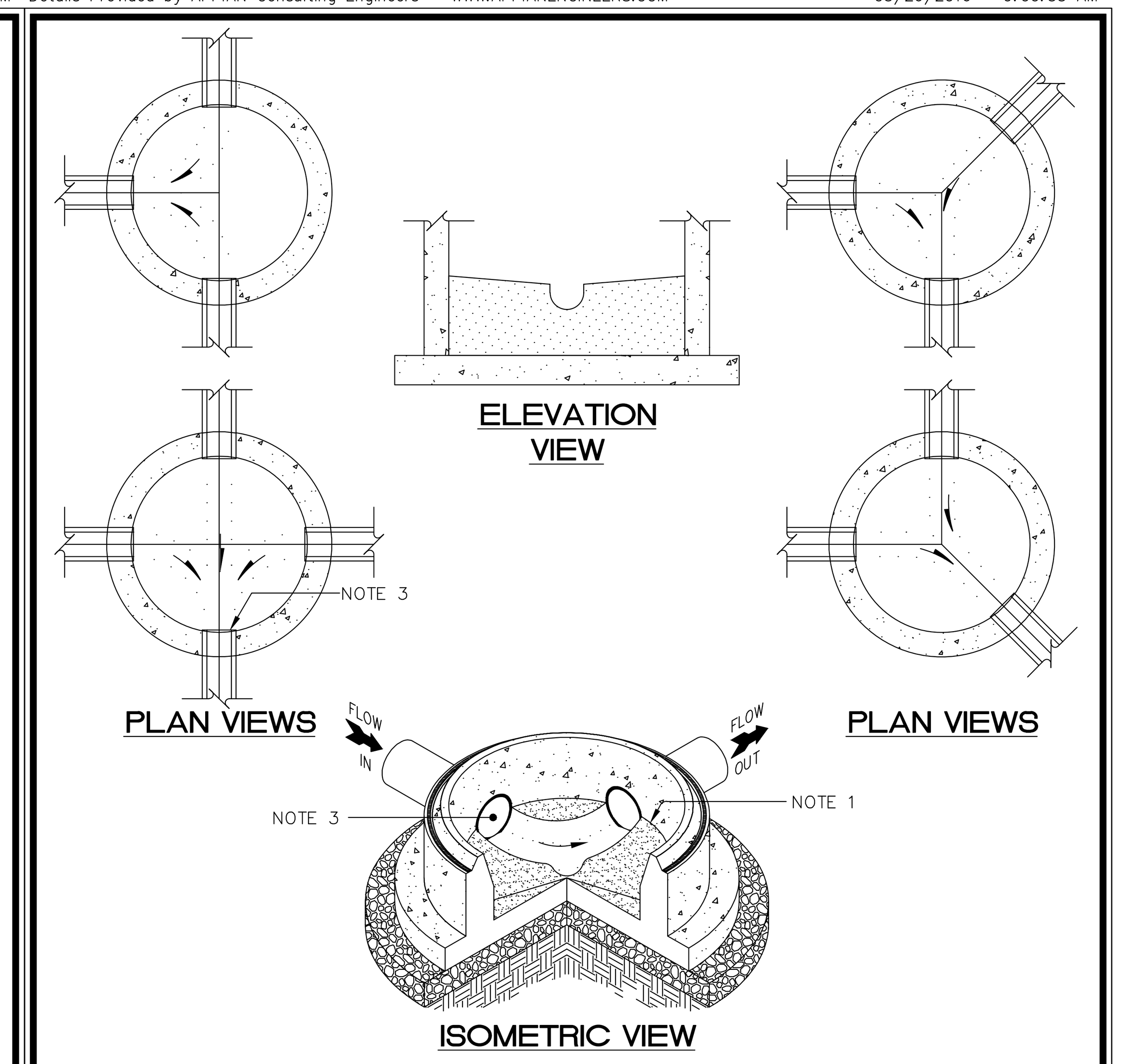
STANDARD ECCENTRIC MANHOLE DETAIL — SCALE: Not To Scale — DETAIL #: 532.01 — REVISION DATE: April 13, 2007 — SHEET #: 3 of 3

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:00:33 AM



NOTES:

1. Benches shall be sloped at 1/2 inch per foot (4 percent). Inverts shall be 3/4 the height of crown for outlet pipe and uniformly shaped to match outlet pipe.
2. Precast inverts are not permitted.
3. Radius of invert must have enough room to be able to insert air plugs and TV equipment.

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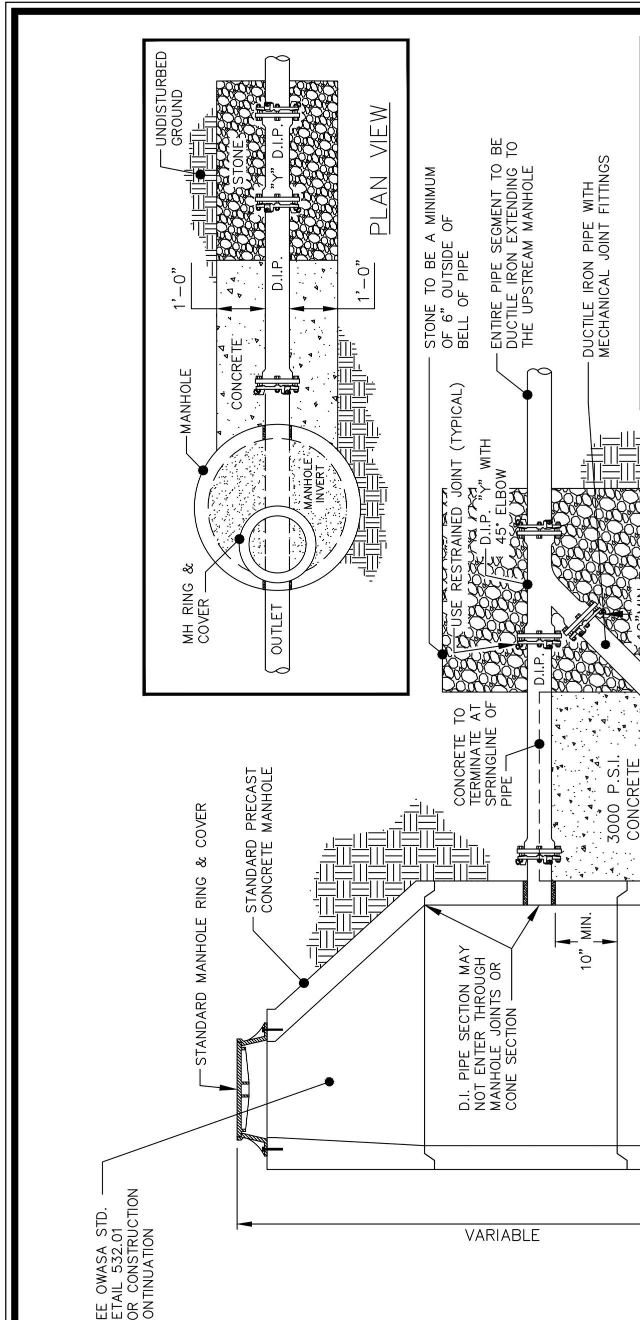
STANDARD SEWER INVERT PLANS FOR MANHOLE — SCALE: Not To Scale — DETAIL #: 532.02 — REVISION DATE: December 4, 2009 — SHEET #: 1 of 1

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:00:33 AM



NOTES:

1. ALL MANHOLE CONNECTIONS SHALL BE CORED WITH A CONCRETE CORING MACHINE AND PROVIDED WITH WATERTIGHT BOOT CONNECTIONS.
2. CONCRETE IS TO BE MINIMUM 4,000 PSI
3. FLEXIBLE SLEEVE BOOTS CAST IN PLACE OR INSTALLED WITH STAINLESS STEEL EXPANDER RINGS AS MANUFACTURED BY KOR-N-SEAL OR PSX SHALL BE USED FOR PIPE CONNECTIONS. BOOTS SHALL BE SECURED TO PIPE USING TWO (2) STAINLESS STEEL BANDS. PRECAST INVERTS WILL NOT BE ACCEPTED.
4. INSIDE DROPS ARE NOT APPROVED FOR THE OWASA WASTEWATER COLLECTION SYSTEM.
5. THIS DETAIL IS APPLICABLE FOR SERVICES AND FOR DROP CONNECTIONS TO EXISTING BRICK MANHOLES.
6. AN OUTSIDE DROP MUST BE A MINIMUM OF 18" IN LENGTH.

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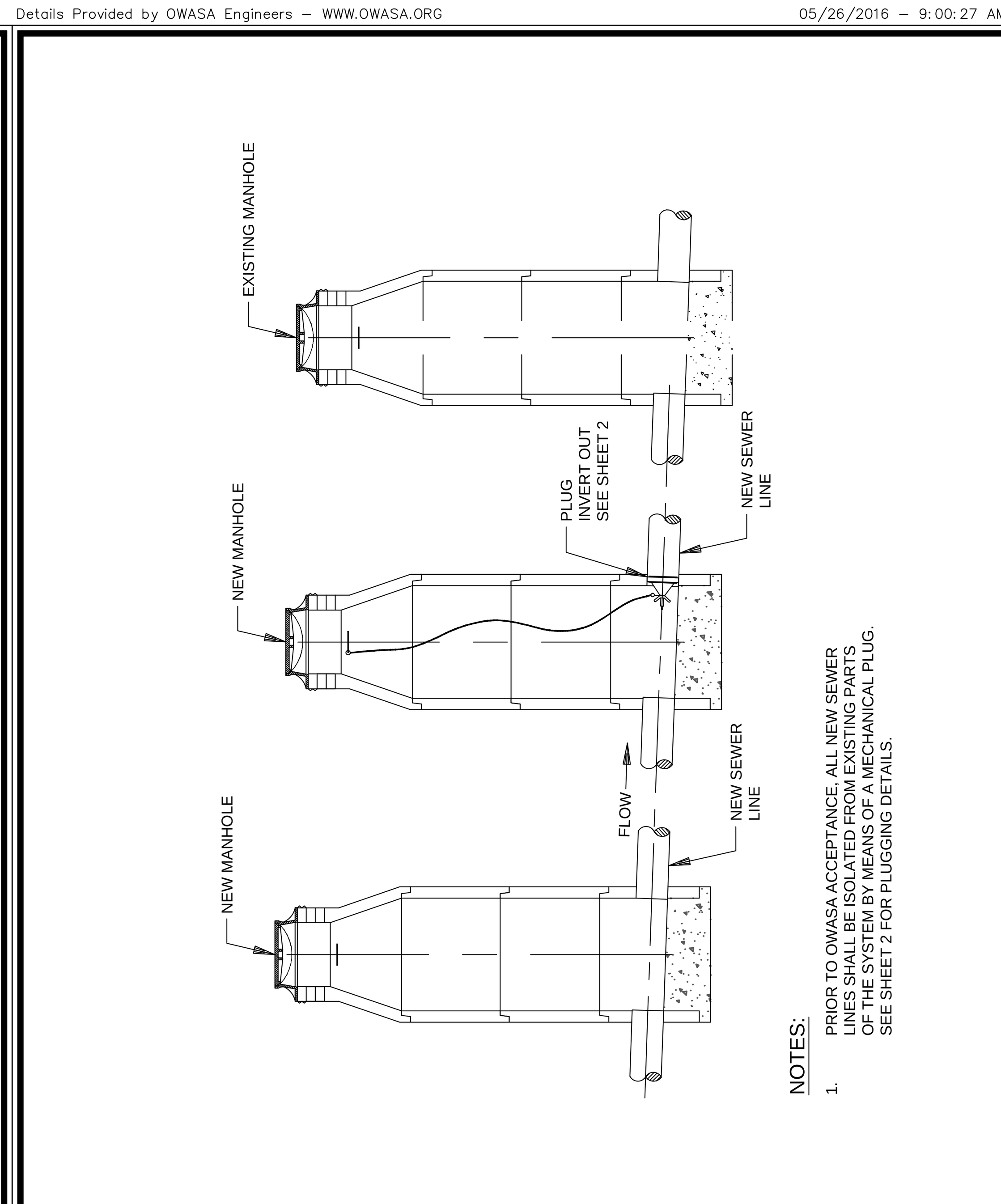
STANDARD OUTSIDE DROP MANHOLE DETAIL — SCALE: Not To Scale — DETAIL #: 532.03 — REVISION DATE: June 13, 2013 — SHEET #: 1 of 1

Details Provided by OWASA Engineers – WWW.OWASA.ORG 05/26/2016 – 9:00:27 AM



NOTES:

1. PRIOR TO OWASA ACCEPTANCE, ALL NEW SEWER LINES SHALL BE ISOLATED FROM EXISTING PARTS OF THE SYSTEM BY MEANS OF A MECHANICAL PLUG. SEE SHEET 2 FOR PLUGGING DETAILS.

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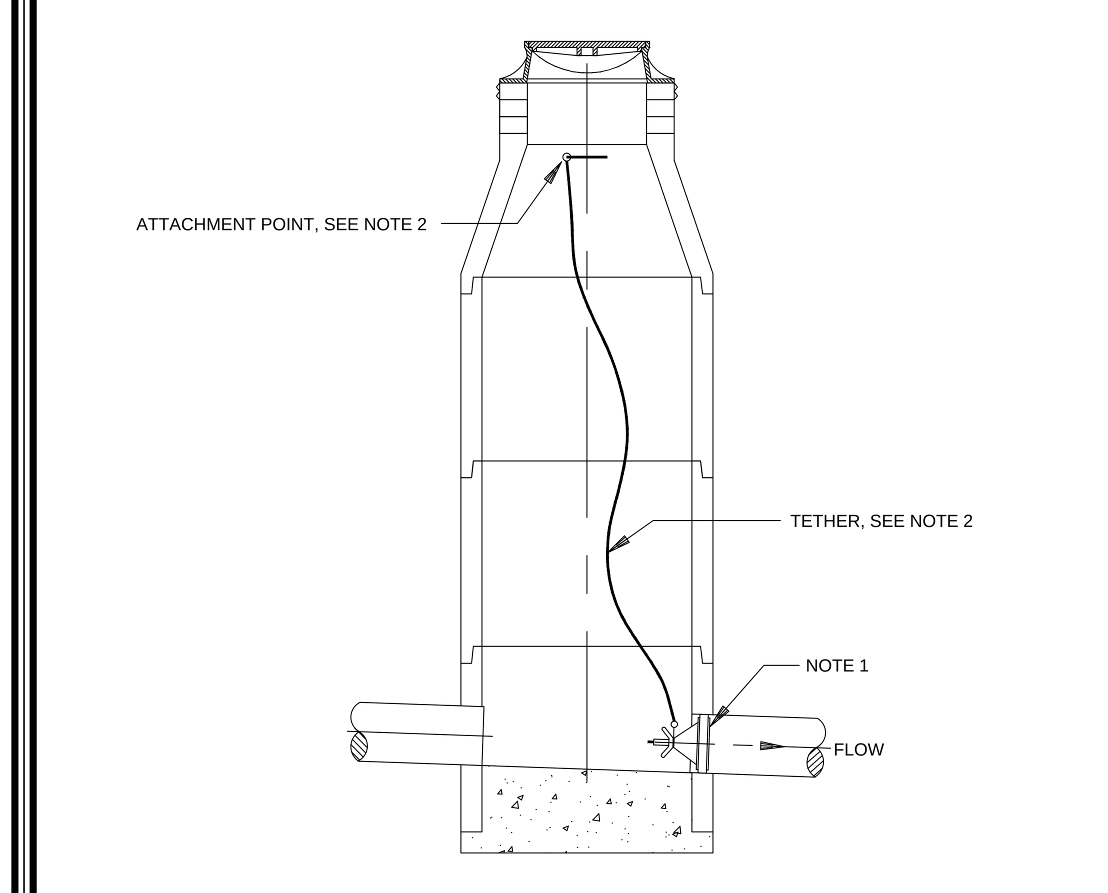
SANITARY SEWER MANHOLE PLUGGING DETAIL — SCALE: Not To Scale — DETAIL #: 532.04 — REVISION DATE: February 28, 2005 — SHEET #: 1 of 2

Details Provided by OWASA Engineers – WWW.OWASA.ORG 05/26/2016 – 9:00:35 AM



NOTES:

1. PIPE PLUG SHALL BE A "CHERNE" IRON-GRIP BY-PASS STYLE MECHANICAL PLUG OR APPROVED EQUAL.
2. PIPE PLUG SHALL BE TETHERED TO THE MANHOLE TOP STEP OR OTHER PERMANENT ANCHOR POINT WITH A CORROSION AND ABRASION RESISTANT STAINLESS STEEL CABLE. ATTACHED TO THE CABLE SHALL BE A CORROSION RESISTANT METAL TAG WITH THE PLUG OWNERS NAME, ADDRESS AND 24-HOUR CONTACT INFORMATION.

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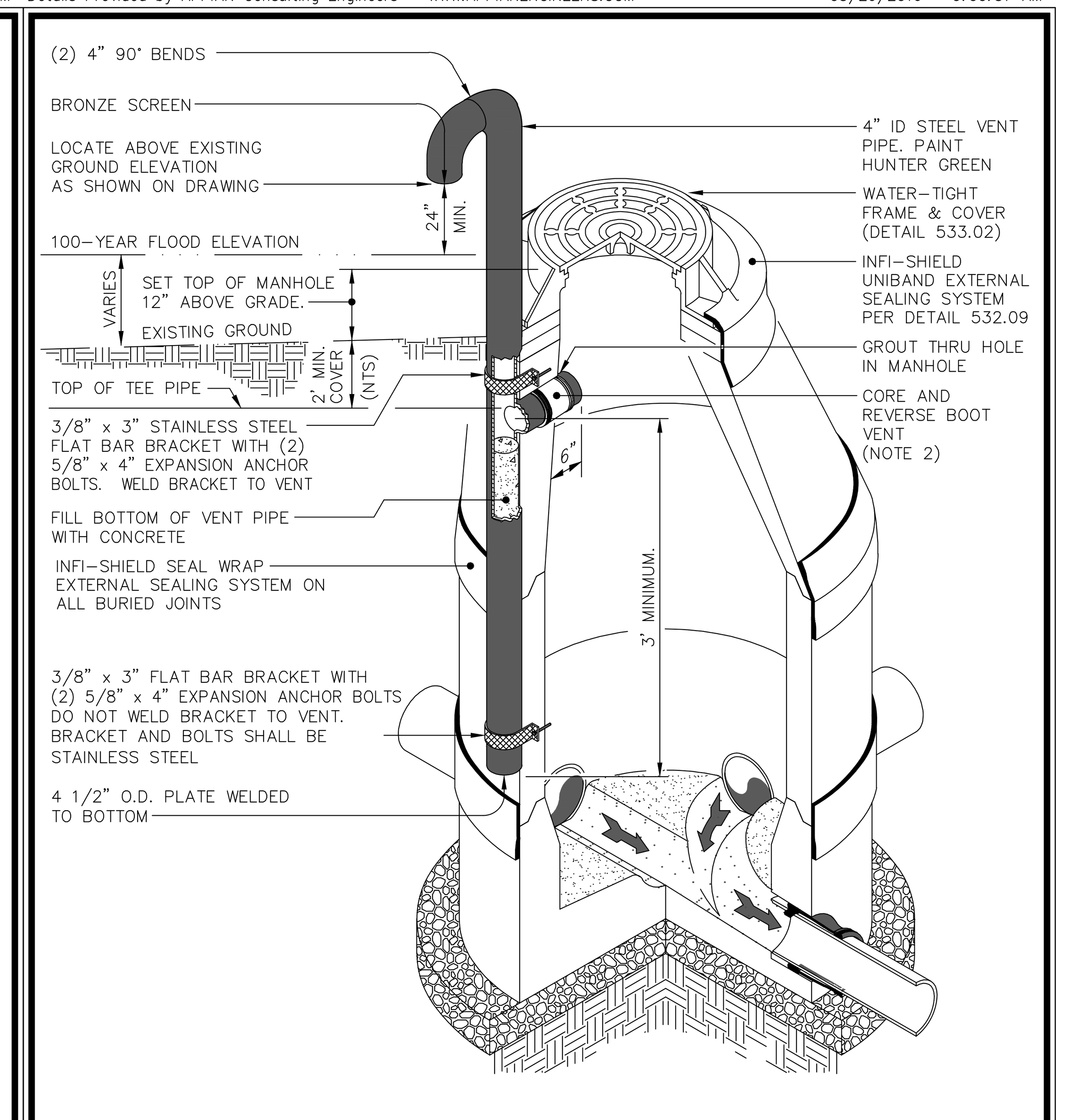
SANITARY SEWER MANHOLE PLUGGING DETAIL — SCALE: Not To Scale — DETAIL #: 532.04 — REVISION DATE: February 28, 2005 — SHEET #: 2 of 2

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:00:37 AM



NOTES:

1. Locate vent pipe as shown or as directed by OWASA.
2. Connect 4" steel vent pipe to manhole with flexible boot.

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STANDARD MANHOLE VENTING DETAIL — SCALE: Not To Scale — DETAIL #: 532.05 — REVISION DATE: December 3, 2009 — SHEET #: 1 of 1

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: OWASA
CHECKED BY: RLF
APPROVED BY: JLL

FINAL DRAWING – FOR REVIEW PURPOSES ONLY
DATE:

URS Corporation - North Carolina
1600 Perimeter Park Dr., Suite 400
Morrisville, North Carolina 27560
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SHEET TITLE: OWASA DETAILS
DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-504
32 OF 39

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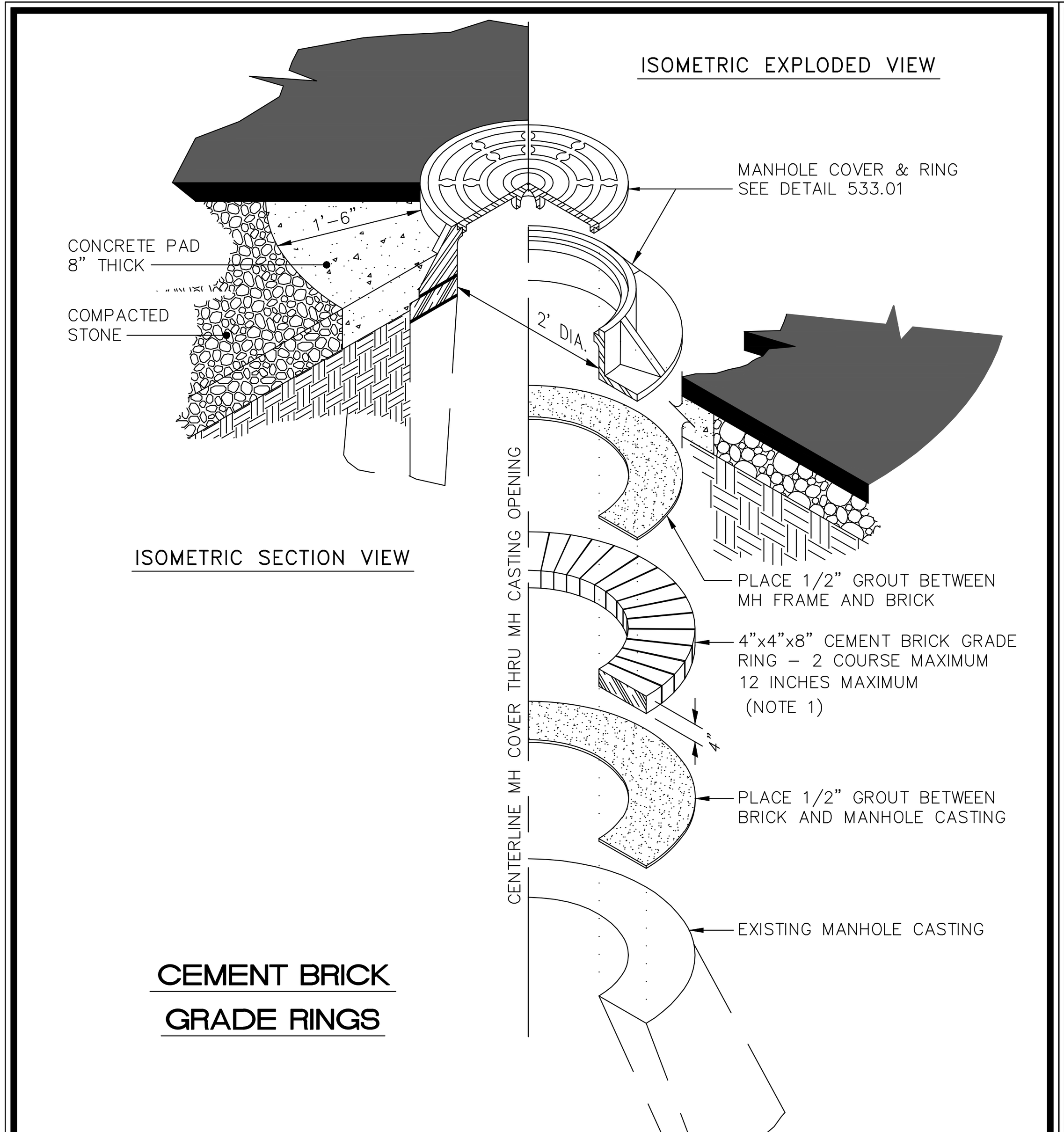

NOTES:

1. Mortar seal inside & out on brick course.
2. Install Infi-Shield Uni-Band as manufactured by Sealing Systems, Inc. per detail 532.09.

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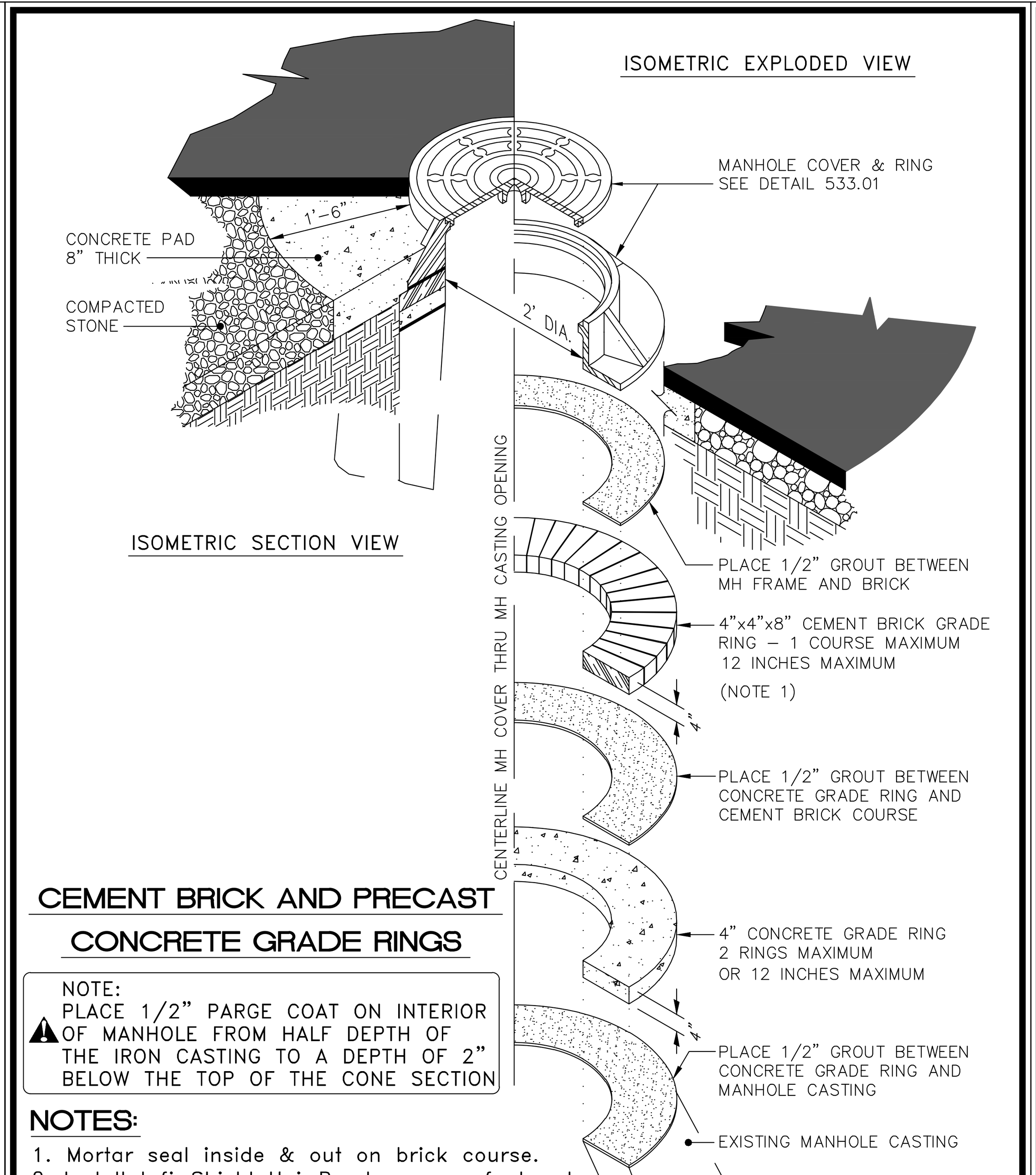
MANHOLE RING AND COVER GRADE ADJUSTMENT

SCALE: Not To Scale | DETAIL #: 532.06 | REVISION DATE: December 1, 2009 | SHEET #: 1 of 3



NOTES:

1. Mortar seal inside & out on brick course.
2. Install Infi-Shield Uni-Band as manufactured by Sealing Systems, Inc. per detail 532.09.

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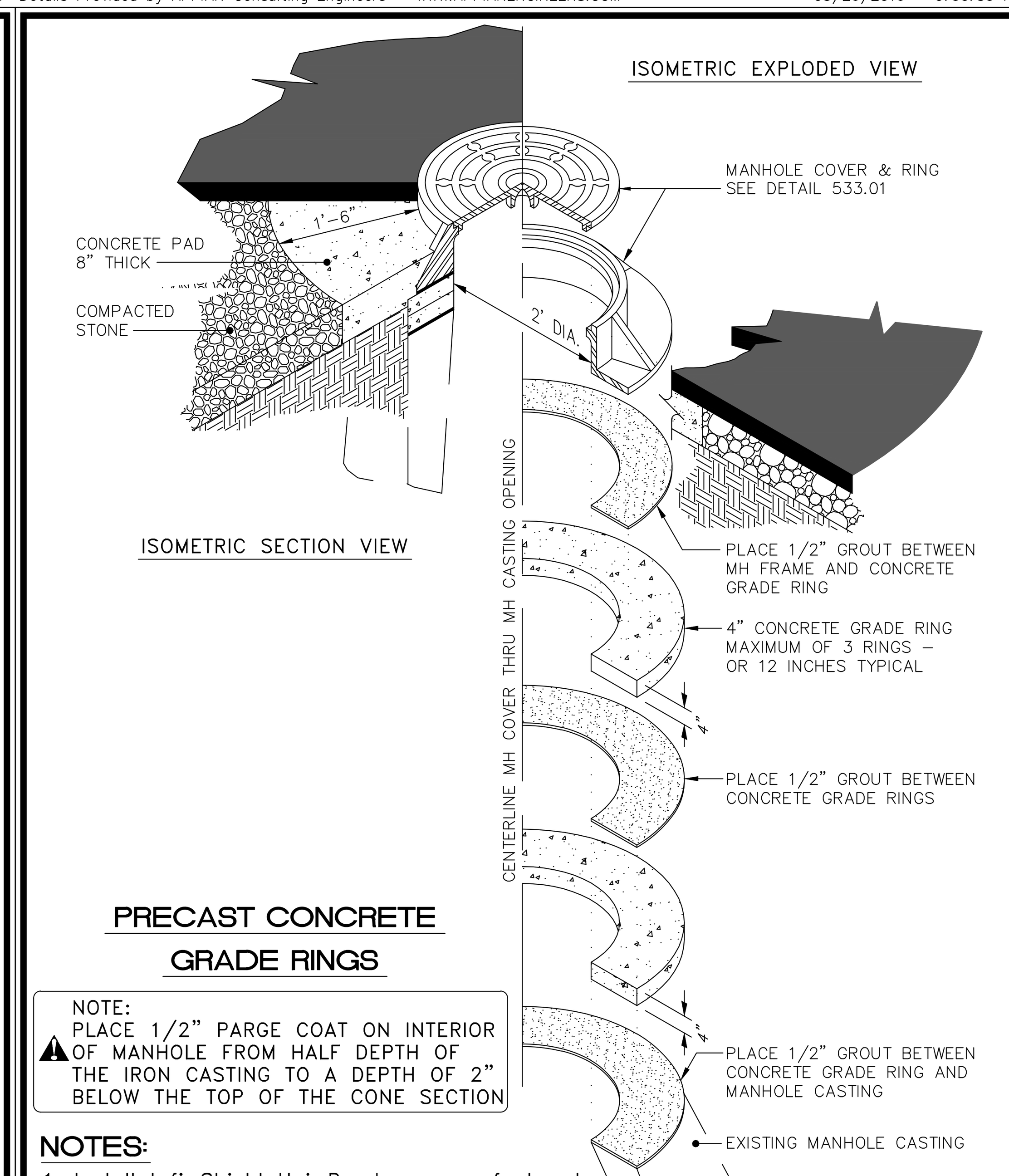
MANHOLE RING AND COVER GRADE ADJUSTMENT

SCALE: Not To Scale | DETAIL #: 532.06 | REVISION DATE: December 1, 2009 | SHEET #: 2 of 3



NOTES:

1. Install Infi-Shield Uni-Band as manufactured by Sealing Systems, Inc. per detail 532.09.

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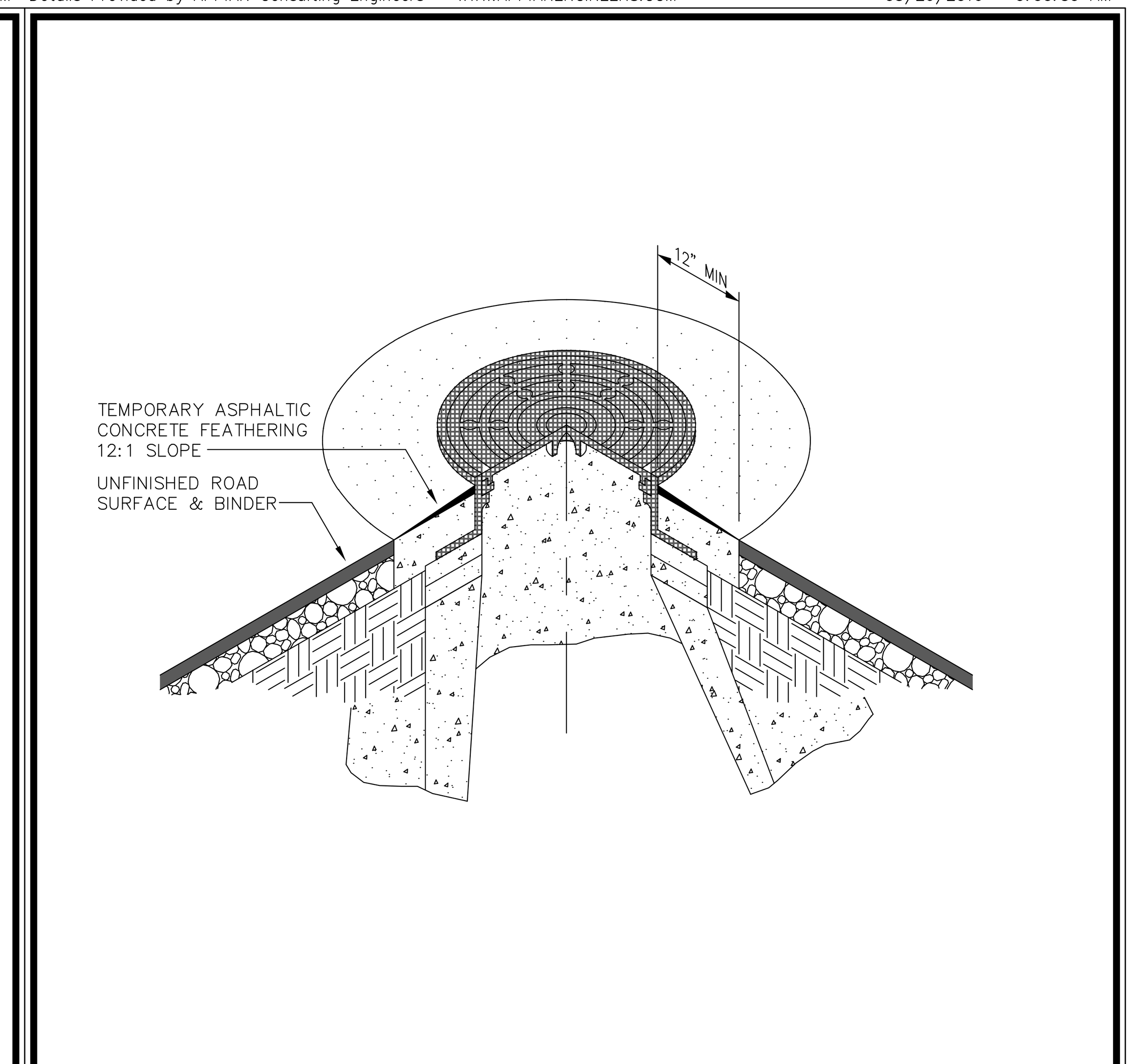
MANHOLE RING AND COVER GRADE ADJUSTMENT

SCALE: Not To Scale | DETAIL #: 532.06 | REVISION DATE: December 12, 2012 | SHEET #: 3 of 3



NOTES:

1. When the rim & cover of a manhole or a valve box extends more than 1" above an unfinished road surface, a temporary layer of asphaltic concrete feathering shall be required to provide a smooth transition from 1" below the edge of the rim & cover to the unfinished road surface. A 12 to 1 slope ratio shall be used. The exposed sides of the valve box and/or manhole cover shall be painted bright orange or as specified by OWASA inspector.
2. Prior to final paving contractor shall remove feathering, completely, & apply asphalt tack coat to binder to insure proper asphalt adhesion.

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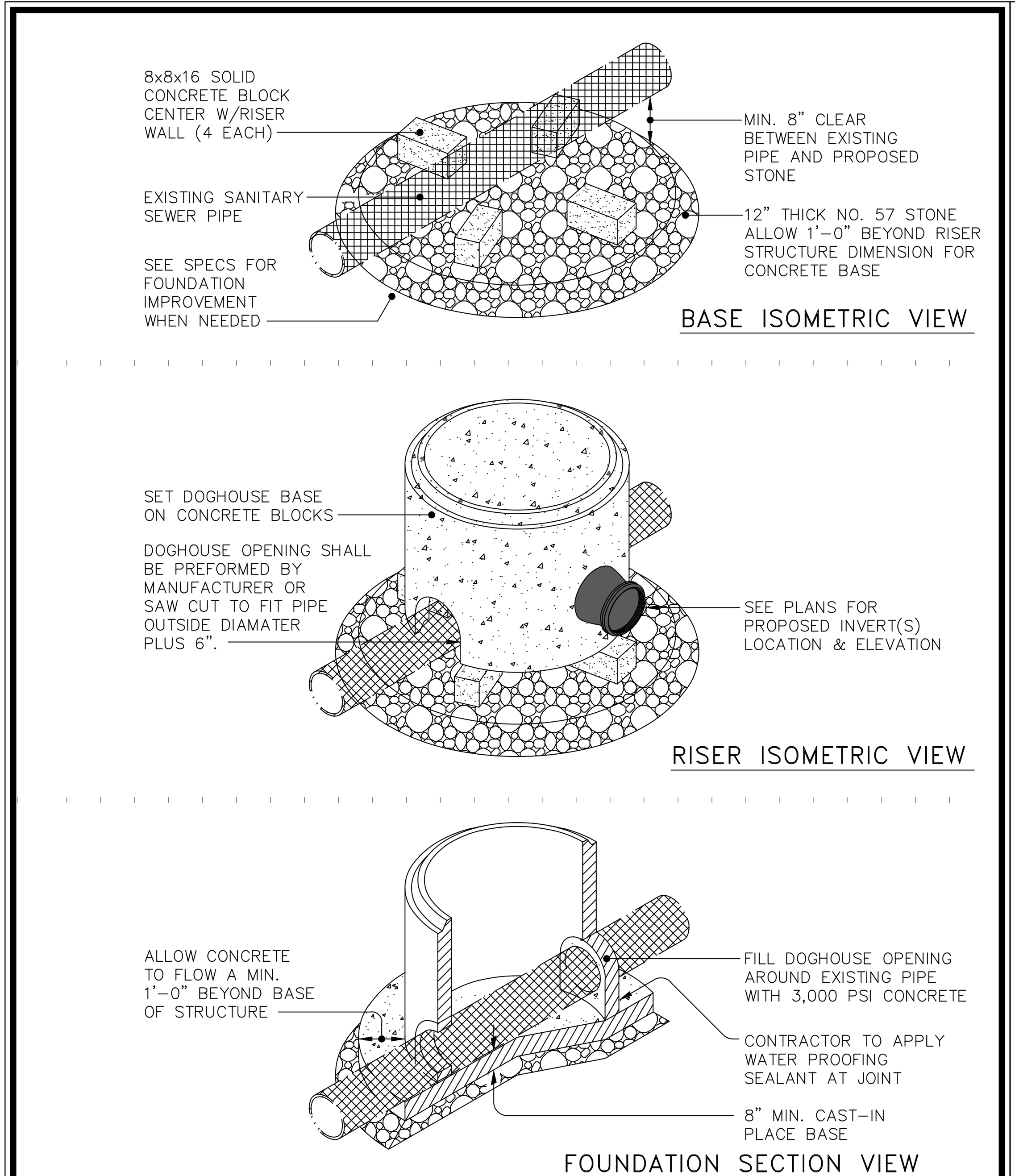
STRUCTURE PROTECTION UNFINISHED ROAD GRADE

SCALE: Not To Scale | DETAIL #: 532.07 | REVISION DATE: August 15, 2003 | SHEET #: 1 of 1



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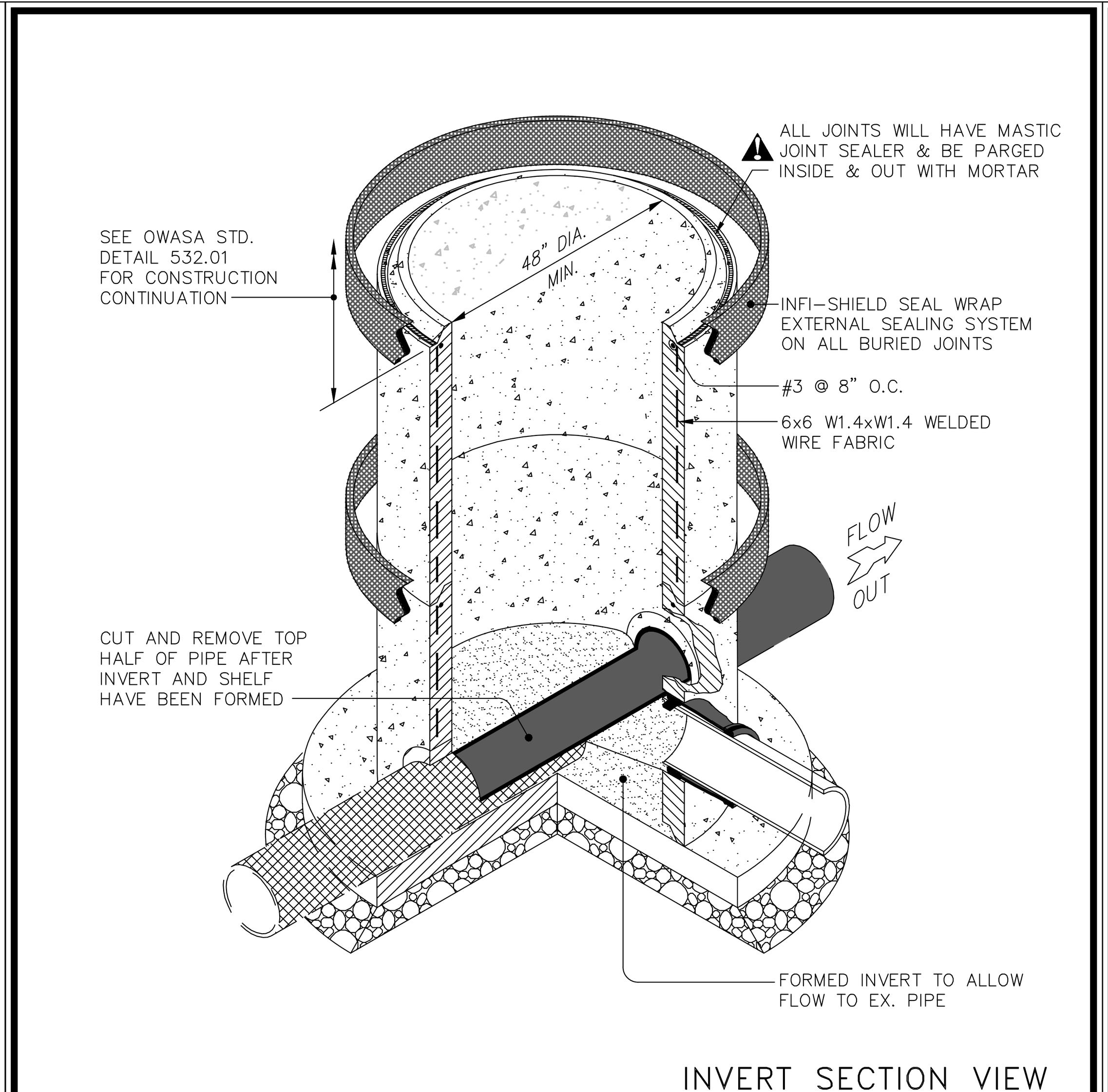
PRECAST CONCRETE DOGHOUSE MANHOLE

SCALE: Not To Scale | DETAIL #: 532.08 | REVISION DATE: April 13, 2007 | SHEET #: 1 of 2



NOTES:

1. All service laterals into manhole to be core drilled and booted.
2. Maximum depth 4' dia. manhole = 10' (see specifications). Use 5' dia. manhole for depth greater than 10'.

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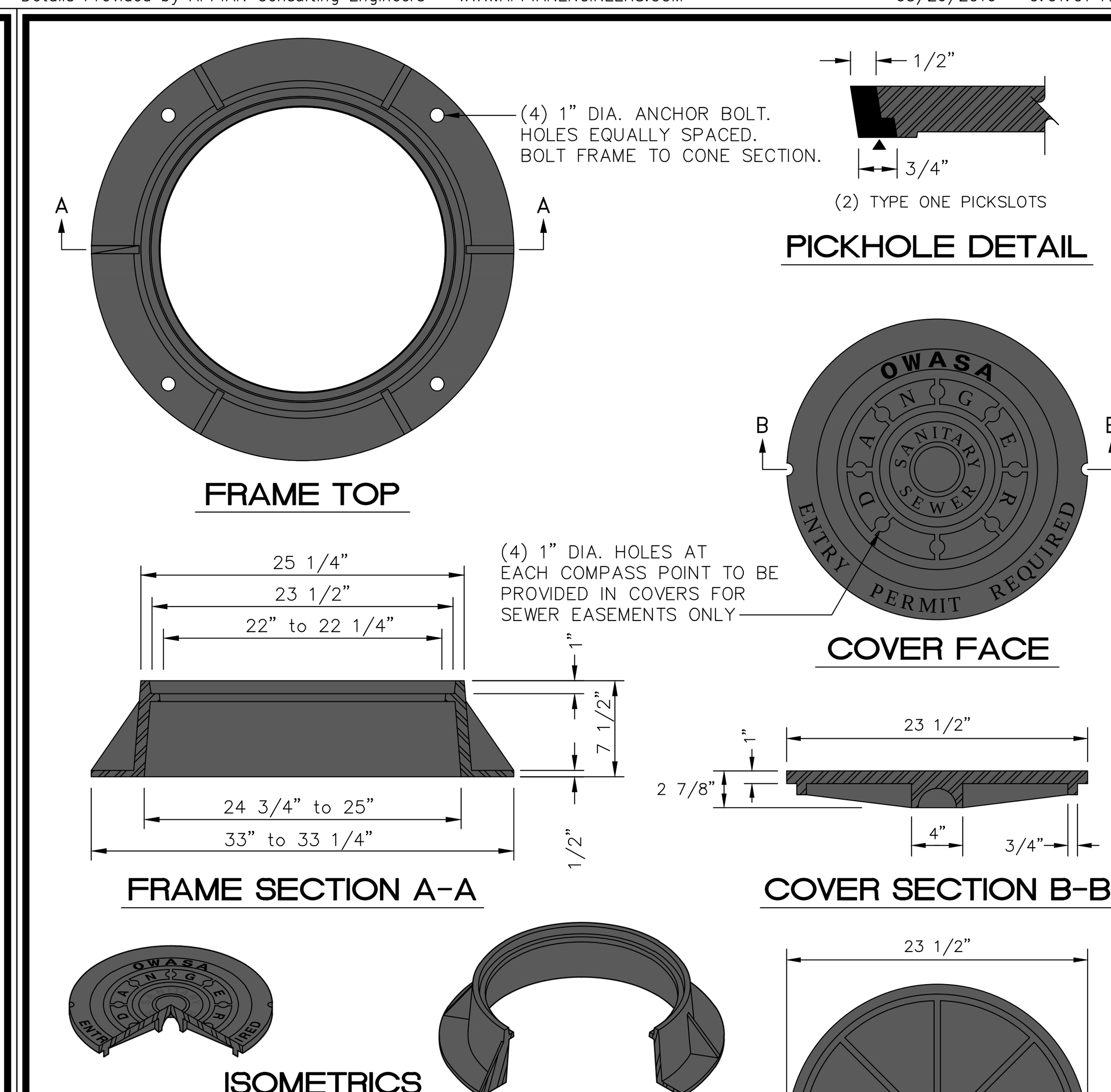
PRECAST CONCRETE DOGHOUSE MANHOLE

SCALE: Not To Scale | DETAIL #: 532.08 | REVISION DATE: April 13, 2007 | SHEET #: 2 of 2



APPROVED MODELS	EAST JORDAN IRON WORKS V–1384	US FOUNDRY USF–669	CAPITOL FOUNDRY MH–2001
COVER WEIGHT	135 Lbs.	125 Lbs.	120 Lbs.
FRAME WEIGHT	180 Lbs.	190 Lbs.	190 Lbs.
LOAD RATING	HEAVY DUTY	HEAVY DUTY	HEAVY DUTY
MATERIAL	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B
FINISH	UNCOATED	UNCOATED	UNCOATED

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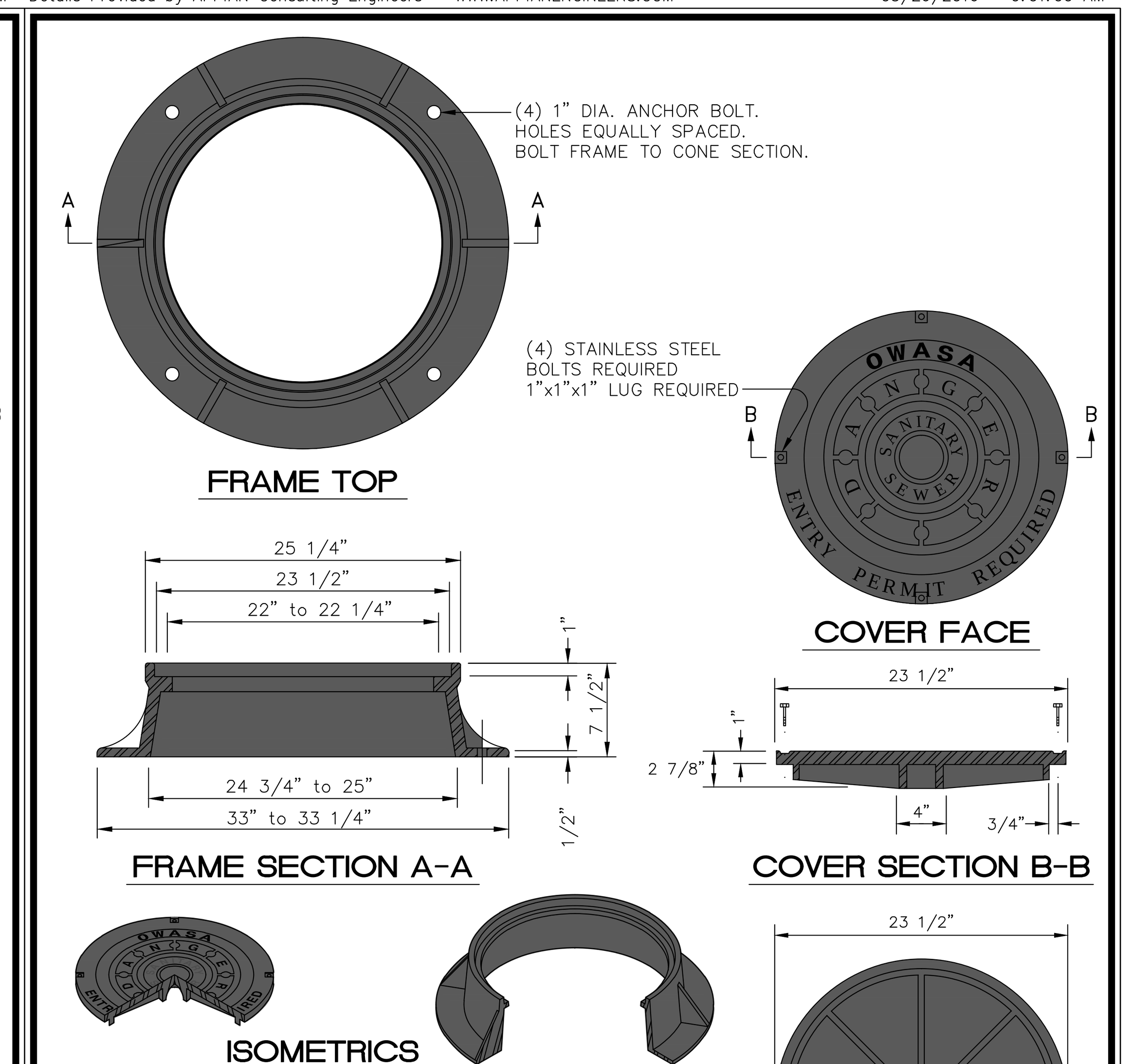
SANITARY SEWER MANHOLE FRAME and COVER

SCALE: Not To Scale | DETAIL #: 533.01 | REVISION DATE: April 13, 2007 | SHEET #: 1 of 1



APPROVED MODELS	EAST JORDAN IRON WORKS BOLT–DOWN V–2384	US FOUNDRY 669–KL–BWT	CAPITOL FOUNDRY MH–2001–WT
COVER WEIGHT	135 Lbs.	125 Lbs.	120 Lbs.
FRAME WEIGHT	180 Lbs.	190 Lbs.	190 Lbs.
LOAD RATING	HEAVY DUTY	HEAVY DUTY	HEAVY DUTY
MATERIAL	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B
FINISH	UNCOATED	UNCOATED	UNCOATED

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SANITARY SEWER WATERTIGHT MANHOLE FRAME and COVER

SCALE: Not To Scale | DETAIL #: 533.02 | REVISION DATE: April 13, 2007 | SHEET #: 1 of 1

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: OWASA
CHECKED BY: RLF
APPROVED BY: JLL

FINAL DRAWING – FOR REVIEW PURPOSES ONLY
DATE:

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www.aecom.com
NCBELS LIC. NO. C-2243

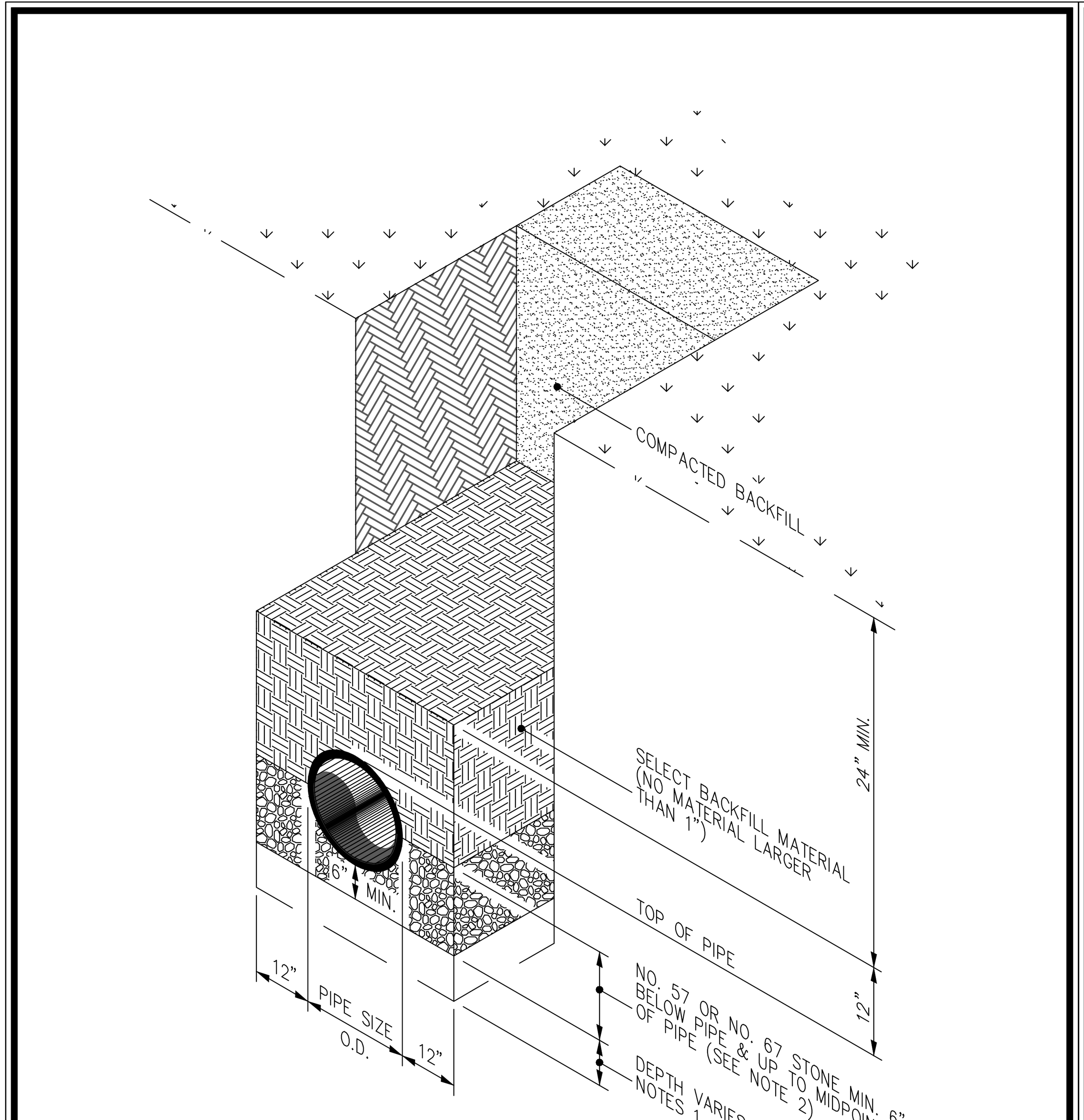
SHEET TITLE: OWASA DETAILS

DATE: 5/25/2016 | SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-505



NOTES:
1. Foundation stone shall be required when soil conditions are unsuitable.
2. An additional 1 inch depth of cushioning material will be required for each additional 2 feet of trench depth in excess of 16 feet up to a maximum of 12 inches of cushioning material.

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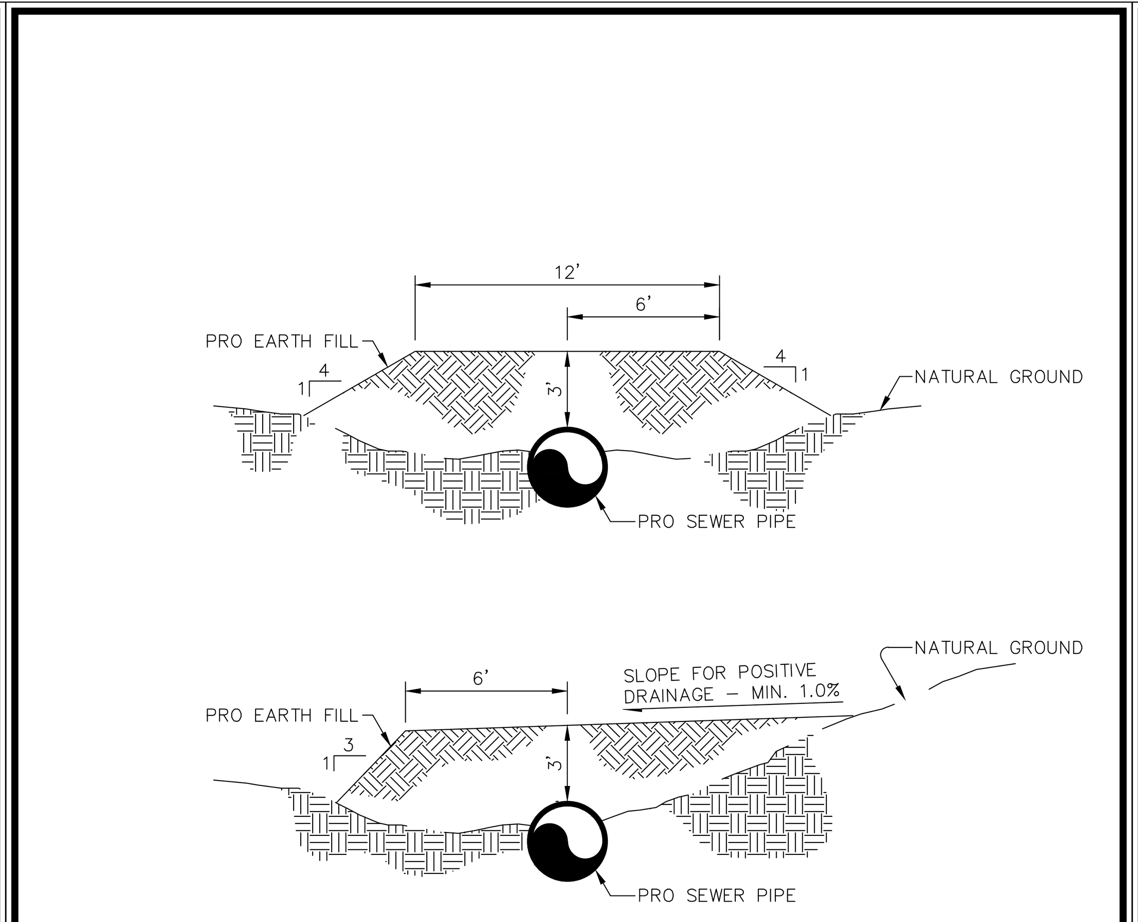
SANITARY SEWER BEDDING DETAIL

SCALE: Not To Scale — DETAIL #: 531.01 — REVISION DATE: August 15, 2003 — SHEET #: 1 of 1



NOTES:
1. Sewer pipe to be bedded and backfilled in accordance with detail 531.01 and specification Section 02530, Part 3, Execution.
2. 4" top soil to be placed over earthfill and seeded in accordance with standard specifications.
3. Ground is to be graded for proper drainage.

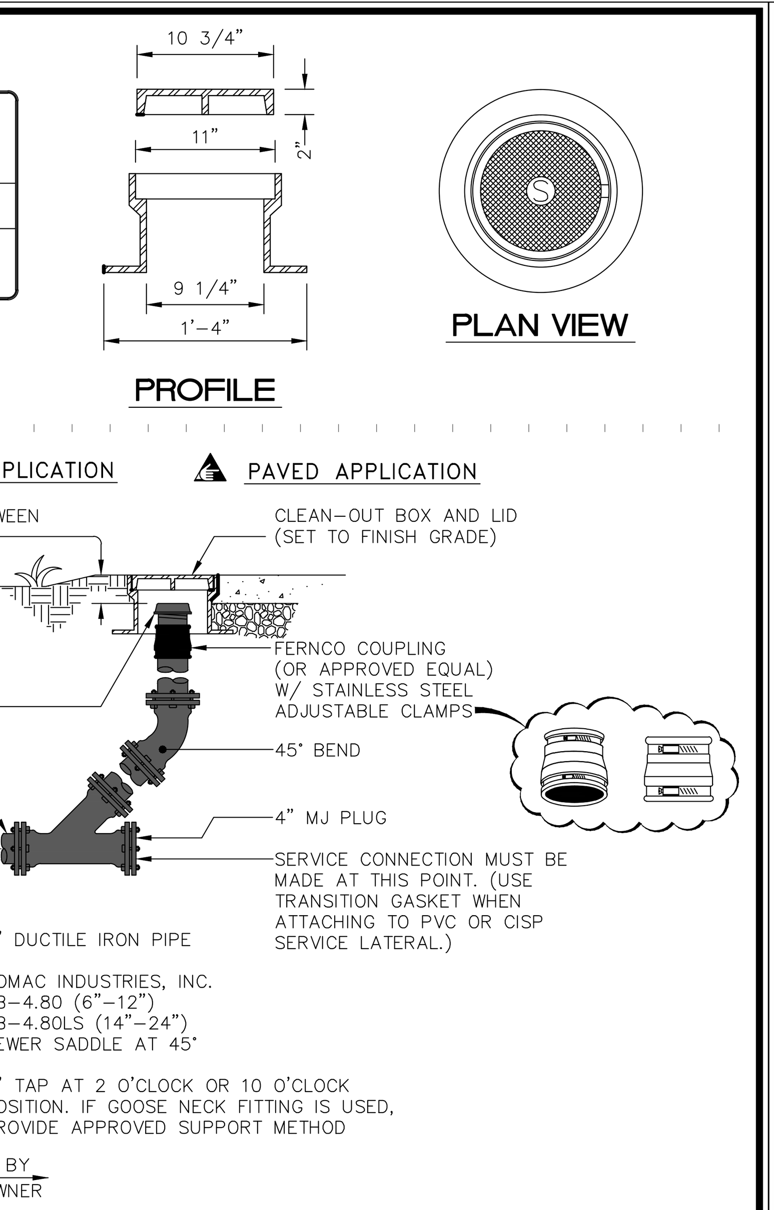
OWASA — ORANGE WATER AND SEWER AUTHORITY — USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY

EARTH FILL OVER SEWER PIPE DETAIL

SCALE: Not To Scale — DETAIL #: 531.02 — REVISION DATE: August 15, 2003 — SHEET #: 1 of 1

US FOUNDRY 7610 FC or CAPITOL FOUNDRY VB-9 BY-PASS VALVE BOX ITEM NUMBER VB-9*S

MATERIAL SPECIFICATION	COATING
GRAY IRON ASTM A48 CLASS 30	BITUMEN

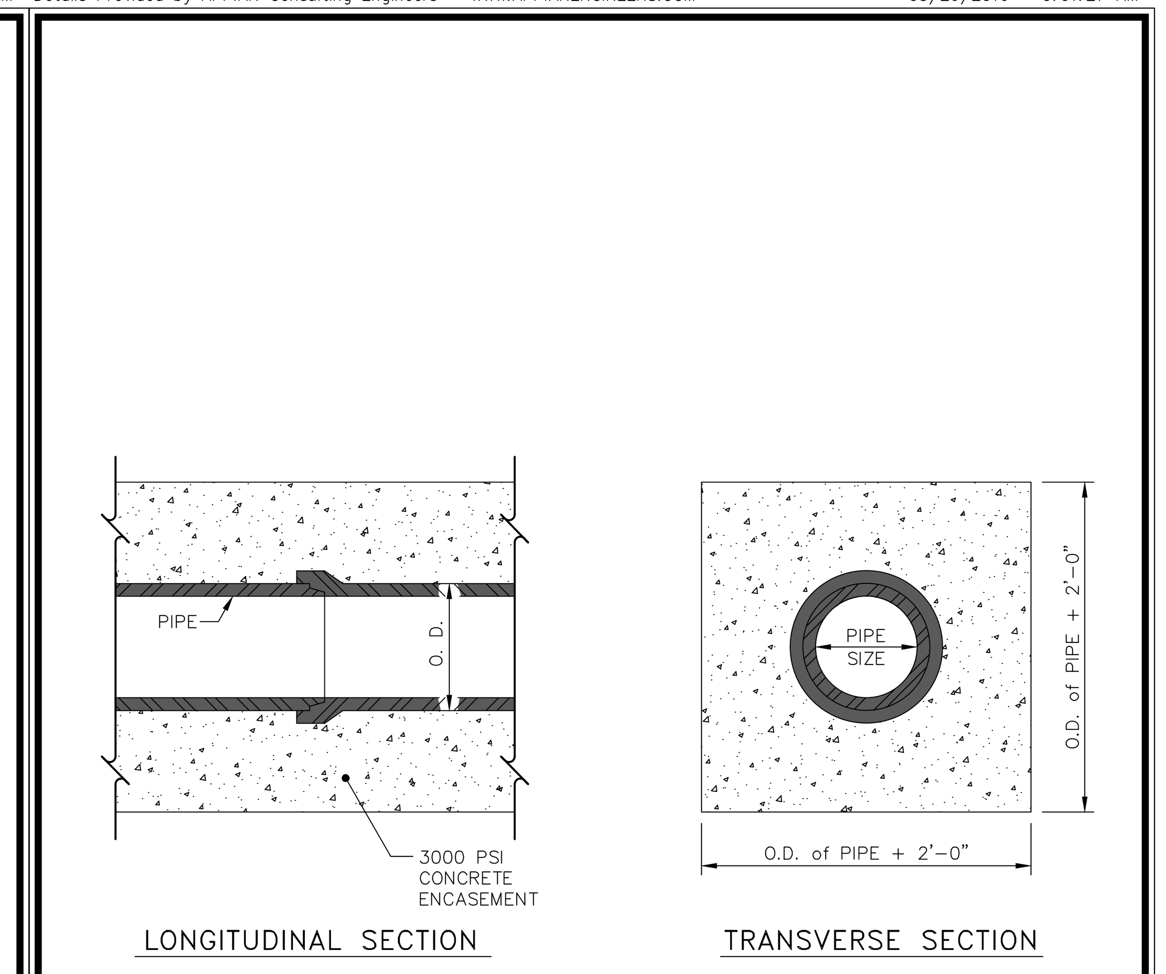


NOTES:
1. This detail depicts a typical layout. Variations may be approved.
2. Service saddles may be used only on existing sewer mains. Tees / Wyes shall be used for new construction.

OWASA — ORANGE WATER AND SEWER AUTHORITY — USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY

4" SEWER TAP and STUB-OUT PAVED APPLICATION CLEAN OUT

SCALE: Not To Scale — DETAIL #: 534.01 — REVISION DATE: April 13, 2007 — SHEET #: 1 of 1

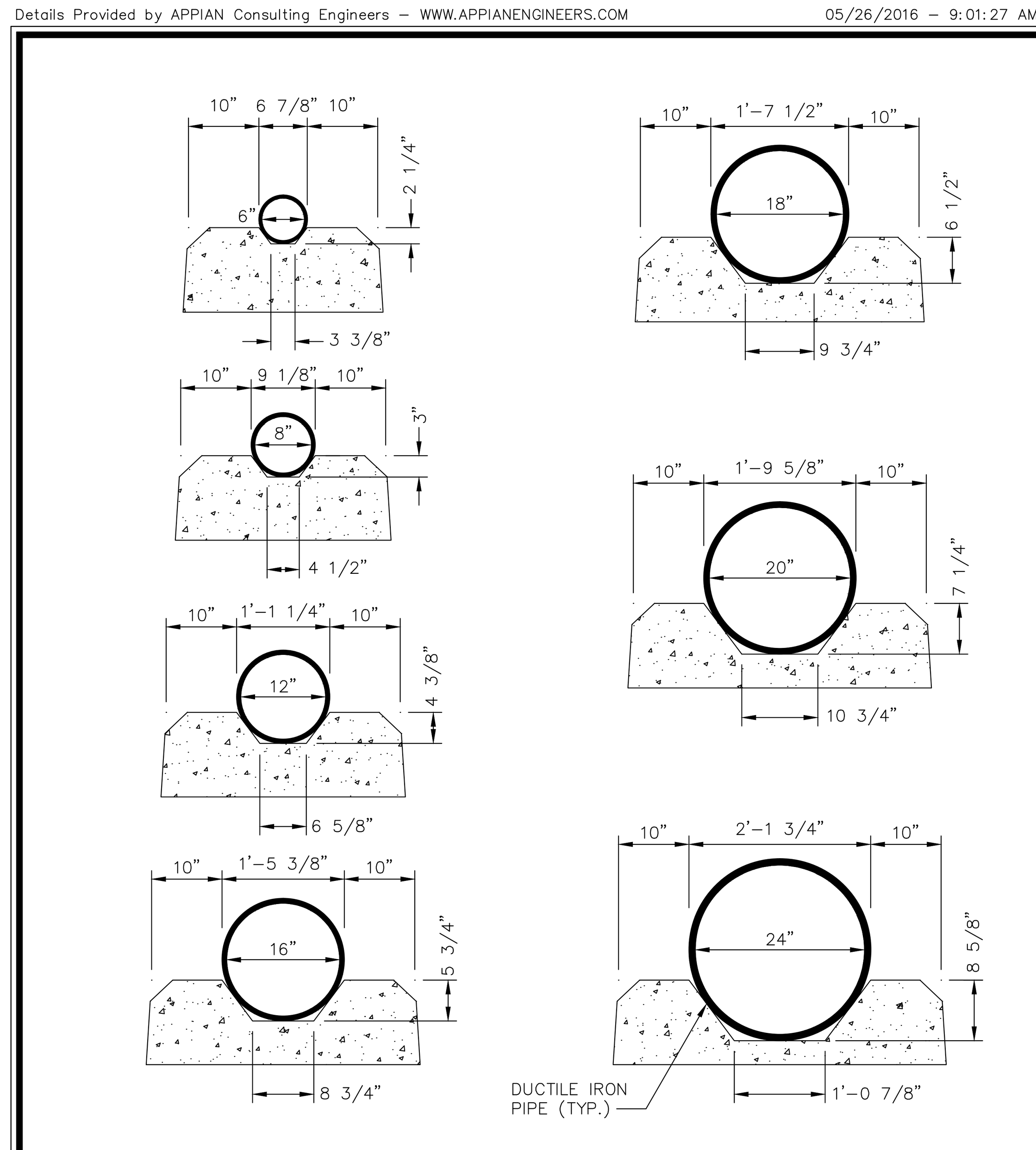


NOTES:
1. Concrete to be 3,000 psi.
2. Encasement to be used only where specified on plans.

OWASA — ORANGE WATER AND SEWER AUTHORITY — USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY

SEWER LINE CROSSING BENEATH STREAM BED

SCALE: Not To Scale — DETAIL #: 536.08 — REVISION DATE: August 15, 2003 — SHEET #: 2 of 2

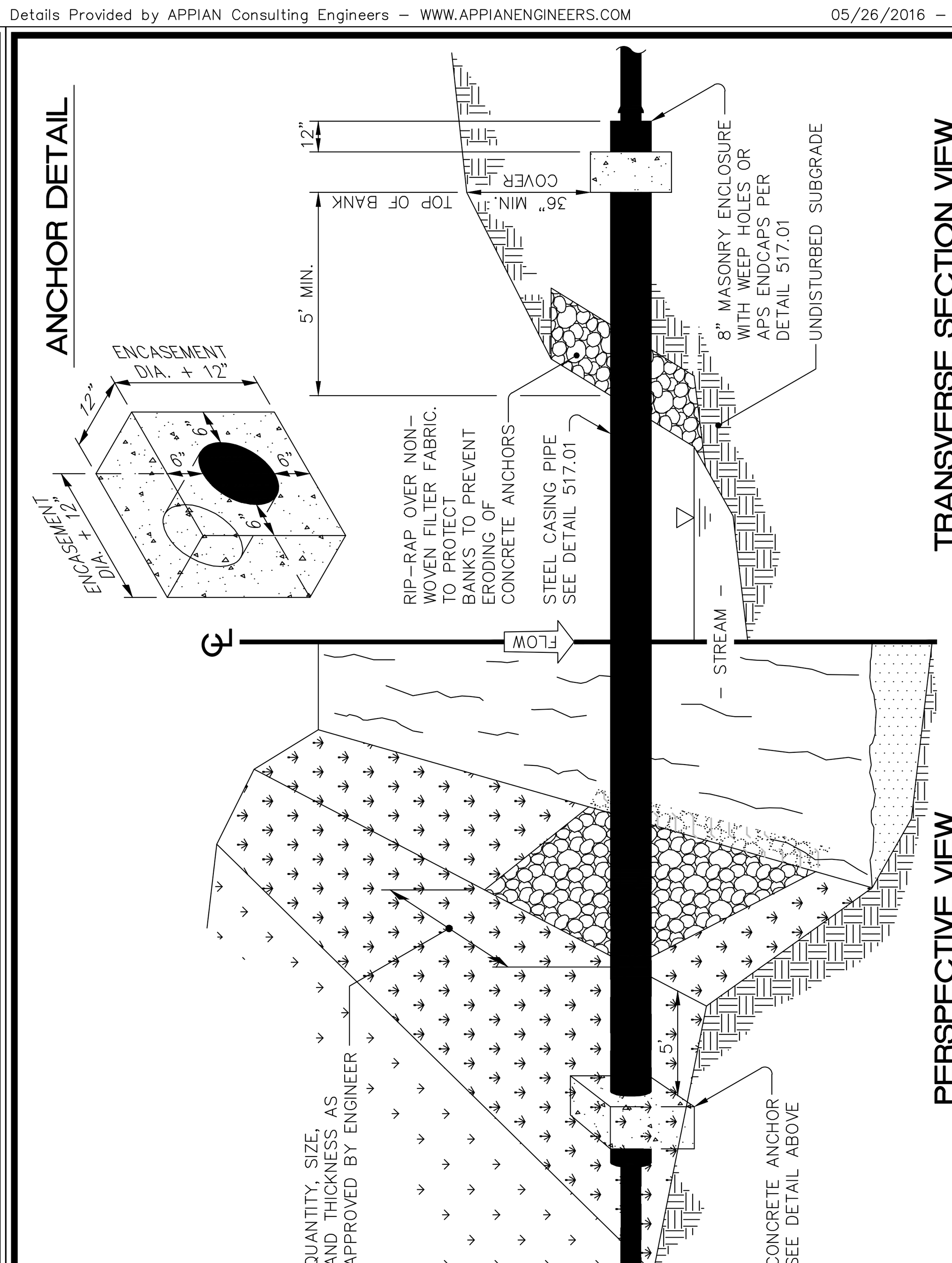


NOTES:
1. Dimensions were calculated to the nearest 1/8".
2. For complete pier detail, see detail 536.02

OWASA — ORANGE WATER AND SEWER AUTHORITY — USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY

CONCRETE PIER SADDLES DETAIL

SCALE: Not To Scale — DETAIL #: 536.03 — REVISION DATE: August 15, 2003 — SHEET #: 1 of 1

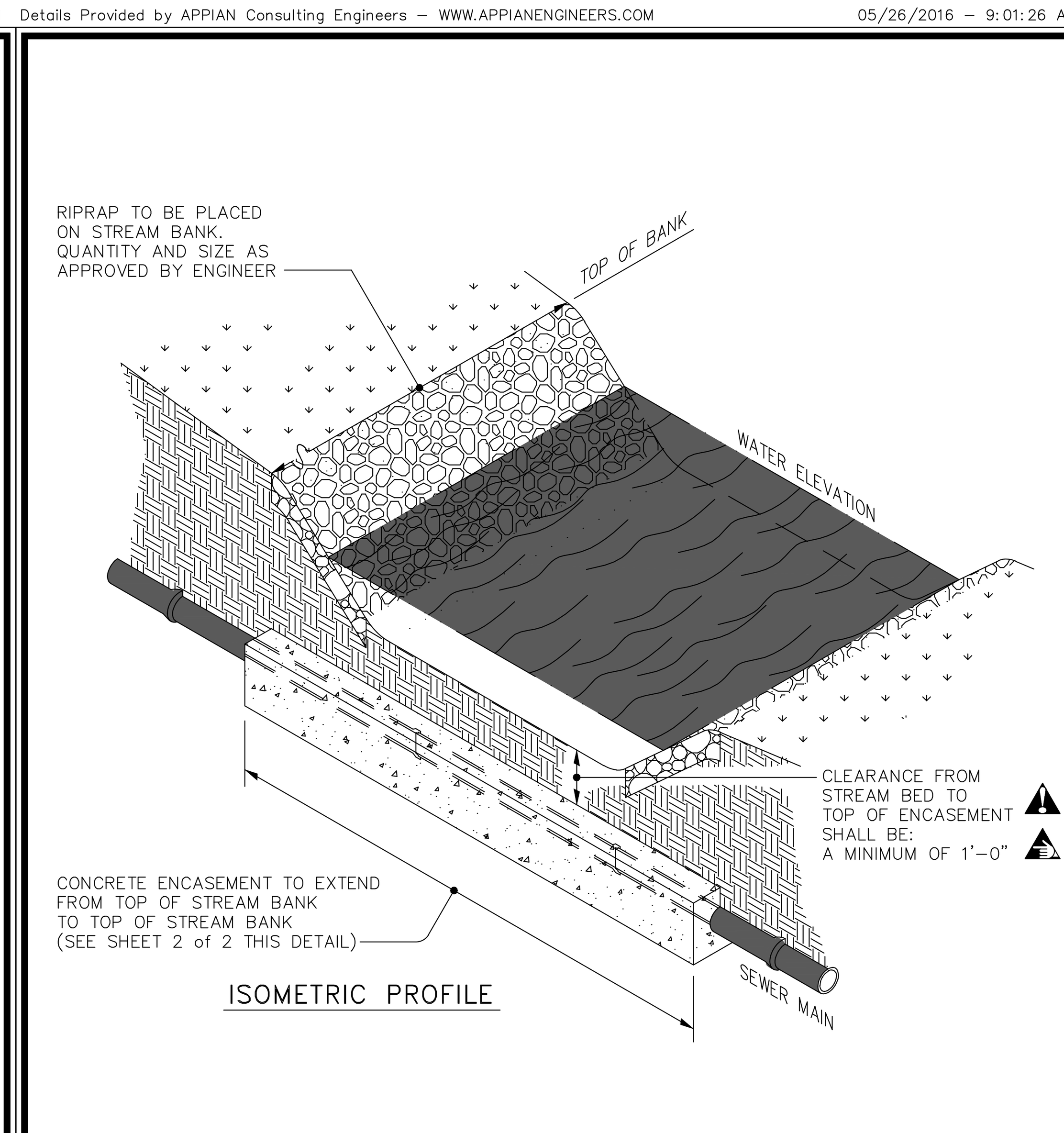


NOTES:
1. Concrete anchor to be minimum 3,000 psi @ 28 days.

OWASA — ORANGE WATER AND SEWER AUTHORITY — USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY

STREAM CROSSINGS for PRIVATE SERVICE LINES

SCALE: Not To Scale — DETAIL #: 536.06 — REVISION DATE: August 15, 2003 — SHEET #: 1 of 1

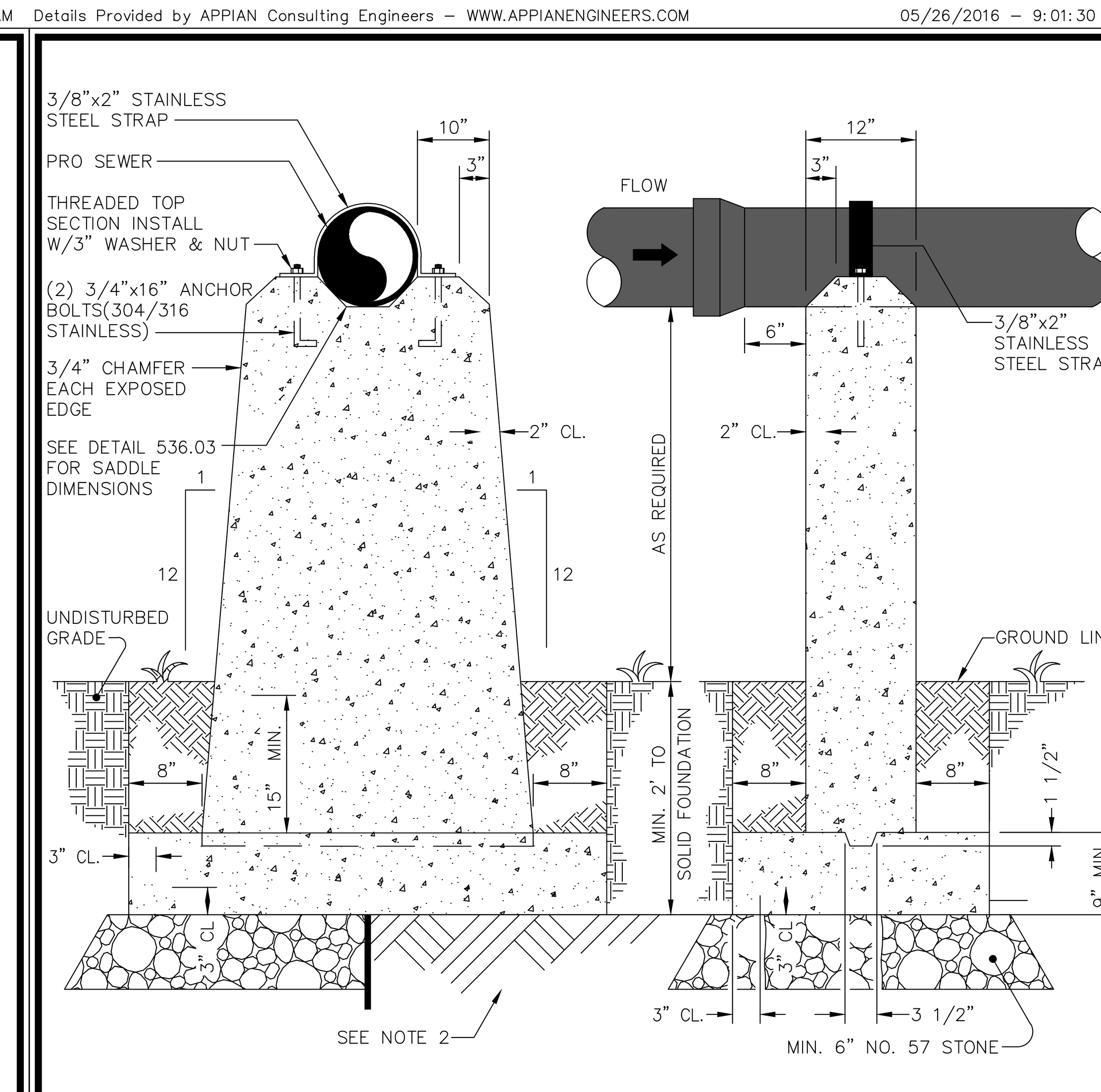


NOTES:
1. Concrete to be 3,000 psi.
2. Encasement to be used only where specified on plans.
3. Pipe shall be ductile iron pipe.
4. Filter fabric to be placed under rip-rap and keyed into embankment.

OWASA — ORANGE WATER AND SEWER AUTHORITY — USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY

SEWER LINE CROSSING BENEATH STREAM BED

SCALE: Not To Scale — DETAIL #: 536.08 — REVISION DATE: August 15, 2003 — SHEET #: 1 of 2



NOTES:
1. All hardware to be stainless steel.
2. A North Carolina Professional Engineer shall provide the necessary structural design for the pier sufficient to resist the forces acting on the pier/pipe system. Where shallow rock is found to exist, pin footing to rock by drilling & epoxying dowels into the rock. Provide computations to OWASA w/design parameters, assumptions, and safety factors used in the design of the piers.
3. See detail 536.04 for steel I beam.
4. All concrete to be 4,000 psi @ 28 days.

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CONCRETE PIER DETAIL

SCALE: Not To Scale — DETAIL #: 536.02 — REVISION DATE: August 15, 2003 — SHEET #: 1 of 1

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG.: KKP — DESIGNED BY: JLL — DRAWN BY: OWASA — CHECKED BY: RLF — APPROVED BY: JLL

FINAL DRAWING – FOR REVIEW PURPOSES ONLY — NORTH CAROLINA — JOE L. LANE — DATE:

URS Corporation - North Carolina
1600 Perimeter Park Dr., Suite 400
Morrisville, North Carolina 27560
Telephone (919) 461-1100, FAX (919) 461-1415
www.aecom.com
NCBELS LIC. NO. C-2243

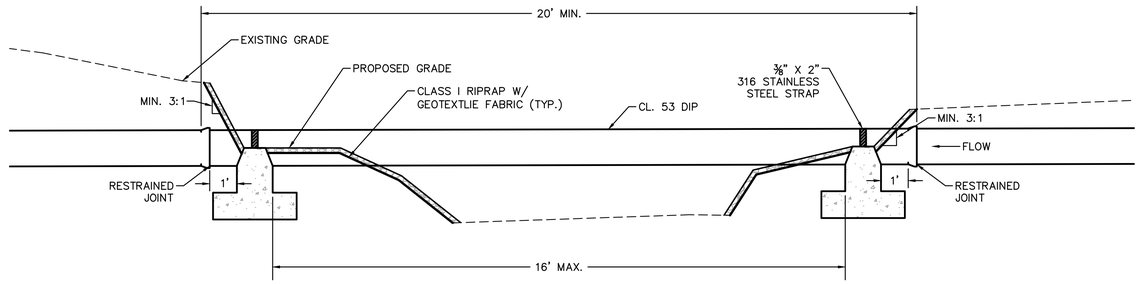
SHEET TITLE: OWASA DETAILS

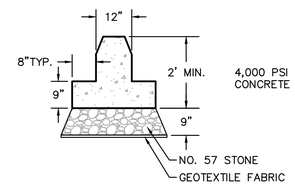
DATE: 5/25/2016 — SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION — ORANGE COUNTY, NC — ORANGE WATER AND SEWER AUTHORITY

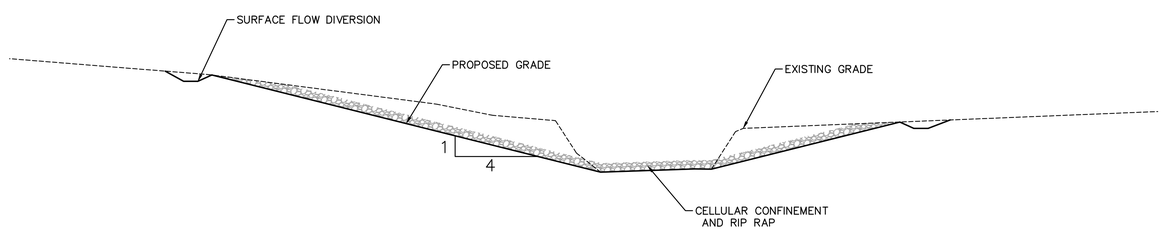
ISSUE: ----

CLIENT PROJ. NO.: 276-54 — URS PROJ. NO.: 31829996 — SHEET I.D.: CU-506





1 STREAM CROSSING WITHOUT CASING
SCALE: N.T.S.



2 PERMANENT STREAM CROSSING DETAIL
SCALE: N.T.S.

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P:\CLOMAN_PROJECTS\MUNICIPAL\WATER\PROJECTS\OWASA\31829996_ROGERS ROAD SEWER EXPANSION\5-DESIGN
DRAWINGS\5.5-DWGS\5.5-SHEETS\31829996_CU-507_MISC_DETAILS.DWG 5/26/2016 9:39:51 AM

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/DG
CHECKED BY: MTB
APPROVED BY: JLL

NORTH CAROLINA PROFESSIONAL SEAL FINAL DRAWING - FOR REVIEW PURPOSES ONLY
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SHEET TITLE:
MISCELLANEOUS SEWER DETAILS

DATE: 5/25/2016
SCALE: AS SHOWN

PROJECT:
HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-507
35 OF 39

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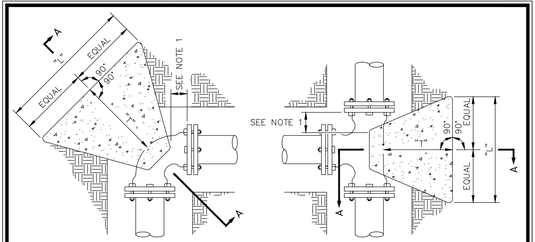
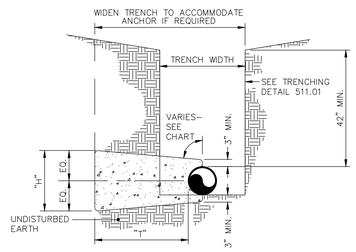


FOR ALL BEND FITTINGS

FOR TEE FITTING



SECTION A–A

NOTES:

1. Concrete blocking is to be formed to ensure accessibility to fittings and poured against undisturbed earth.
2. Fittings are to be completely wrapped with plastic, prior to pouring concrete.
3. Concrete to be minimum 3,000 psi. @ 28 days.

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BLOCKING DETAIL for HORIZONTAL BENDS AND TEE

SCALE: Not To Scale | DETAIL #: 512.02 | REVISION DATE: August 15, 2003 | SHEET #: 1 of 4

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:02:11 AM

TEST PRESSURE = 150 P.S.I.

PIPE SIZE	TYPE FITTING	DIMENSIONS (Ft.) "L"	"H"	"T"	VOLUME, CONCRETE CU. YD.
<4 INCHES	11 1/4°	---	---	---	---
	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.00	1.00	2.50	0.09
	TEE / PLUG	1.00	1.00	2.00	0.07
4 INCHES	11 1/4°	1.00	1.00	2.50	0.09
	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.00	1.00	2.50	0.09
	90°	1.50	1.50	2.50	0.15
	TEE / PLUG	1.50	1.50	2.00	0.12
6 INCHES	11 1/4°	1.50	1.50	2.50	0.15
	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.00	2.00	3.00	0.28
	TEE / PLUG	2.00	2.00	2.50	0.23
8 INCHES	11 1/4°	2.00	2.00	2.50	0.23
	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.75	0.25
	90°	3.00	2.00	3.00	0.39
	TEE / PLUG	3.00	2.00	2.50	0.32
12 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	2.00	2.00	3.00	0.28
	45°	3.00	2.50	3.00	0.47
	90°	4.50	3.00	3.50	0.94
	TEE / PLUG	4.50	3.00	3.00	0.81
16 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	3.00	2.00	3.00	0.39
	45°	4.00	3.00	3.50	0.84
	90°	6.50	3.50	3.50	1.54
	TEE / PLUG	6.50	3.50	3.00	1.32

CHART NOTES:

1. If blocking excavation is in lightly compacted fill areas, or in areas where boulders or stumps have been removed, blocking size must be re–sized for the specific location/circumstance by a NC licensed Professional Engineer.
2. Blocking sizes shown in these tables assume the following:
   a. Blocking is constructed in residual soils as shown in detail
   b. Soil bearing pressure = 2000 psf
   c. Velocity of flow = 15 fps
3. This detail not applicable to reducing bends.
4. Neither the weight of the concrete blocking nor friction between concrete blocking and soil was added into blocking sizes computation. Therefore, blocking size is conservative.

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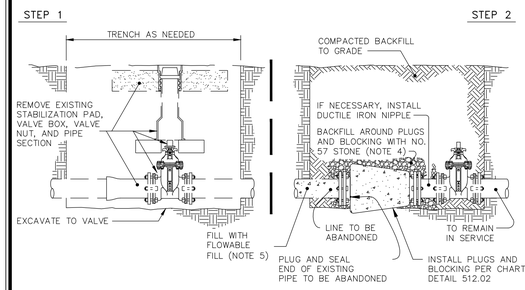
BLOCKING DETAIL for HORIZONTAL BENDS AND TEE

SCALE: Not To Scale | DETAIL #: 512.02 | REVISION DATE: August 15, 2003 | SHEET #: 2 of 4

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:02:12 AM



NOTES:

1. Concrete blocking is to be formed to ensure accessibility to fittings.
2. Fittings attached to in service lines are to be completely wrapped with plastic, prior to pouring concrete.
3. Concrete to be minimum 3,000 psi. @ 28 days.
4. Backfill with No. 57 stone compacted in place or with flowable fill concrete (50 psi minimum/ 150 psi maximum).
5. Remove or fill pipes with flowable fill concrete (50 psi minimum/ 150 psi maximum) in accordance with the following criteria:
   a. Pipes larger than 24–inches diameter.
   b. Pipes located within roadway section and meeting one of the following conditions:
      i. pipes that are 12–inches diameter up to and including pipes that are 24–inches diameter and are buried less than 20 feet below finished grade.
      ii. pipes that are 6–inches diameter up to 12–inches diameter that are not cast iron, ductile iron, PVC, or HDPE and are buried less than 12 feet below finished grade.
   c. Pipes located below groundwater table that could become a conduit for water movement.

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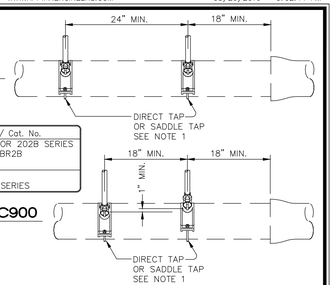
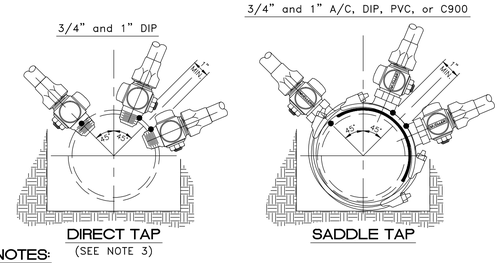
LINE ABANDONMENT DETAIL FOR UNPAVED AREAS

SCALE: Not To Scale | DETAIL #: 512.05 | REVISION DATE: June 13, 2012 | SHEET #: 1 of 2

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:02:14 AM



PART	MANUFACTURER MODEL / Cat. No.
SADDLE	FORD / 101B SERIES OR 202B SERIES MUELLER / BR1B OR BR2B
CORP. STOP	FORD / F600 SERIES MUELLER / H–15000 SERIES



DIRECT TAP (SEE NOTE 3)

SADDLE TAP

NOTES:

1. All bronze saddle (Single or double strap for 3/4" and 1")
2. If 2 taps are made on each side of the main there shall be a minimum of 18" horizontal separation. Multiple taps on the same side shall have a minimum 18" horizontal separation and staggered a minimum of 1" vertically to prevent damage to the main.
3. Bronze service saddles shall be used on all service connections. Direct taps shall be made only as directed by an OWASA representative.

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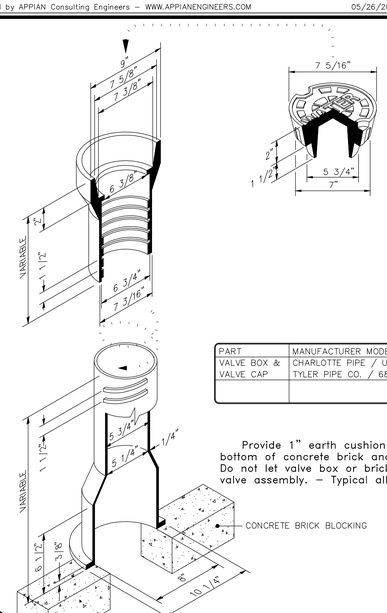
STANDARD 3/4" and 1" WATER TAPPING DETAIL

SCALE: Not To Scale | DETAIL #: 512.06 | REVISION DATE: April 13, 2007 | SHEET #: 1 of 1

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:02:13 AM



PART	MANUFACTURER MODEL / Cat. No.
VALVE BOX & VALVE CAP	CHARLOTTE PIPE / UTL–273 TYLER PIPE CO. / 6850

Provide 1" earth cushion between bottom of concrete brick and valve. Do not let valve box or brick rest on valve assembly. – Typical all valves.

NOTES:

1. Use heavy duty traffic lid marked "WATER".

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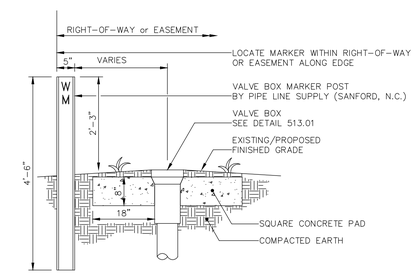
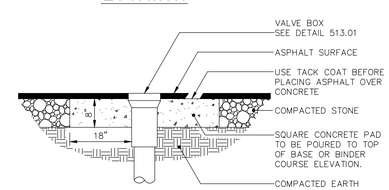
STANDARD SCREW VALVE BOX DETAIL

SCALE: Not To Scale | DETAIL #: 513.01 | REVISION DATE: August 15, 2012 | SHEET #: 1 of 1

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM 05/26/2016 – 9:02:13 AM



FIELD AND EASEMENT OR SIDE OF ROAD LOCATION



IN STREET LOCATION

NOTES:

1. Concrete to be minimum 3,000 PSI @ 28 days.

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VALVE BOX STABILIZING PAD DETAILS

SCALE: Not To Scale | DETAIL #: 513.02 | REVISION DATE: August 15, 2003 | SHEET #: 1 of 1

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP | DESIGNED BY: JLL | DRAWN BY: TS/DG | CHECKED BY: MTB | APPROVED BY: JLL

FINAL DRAWING – FOR REVIEW PURPOSES ONLY — NORTH CAROLINA PROFESSIONAL SEAL — DO NOT USE FOR CONSTRUCTION

DATE:

URS Corporation - North Carolina
1600 Perimeter Park Dr., Suite 400
Morrisville, North Carolina 27560
Telephone (919) 461-1100, FAX (919) 461-1415
www.aecom.com
NCBELS LIC. NO. C-2243

SHEET TITLE: OWASA WATER DETAILS

DATE: 5/25/2016 | SCALE: AS SHOWN

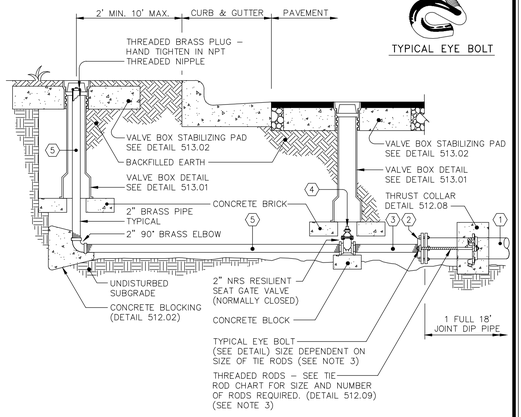
PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276–54 | SHEET I.D. CU–508

URS PROJ. NO. 31829996 | 36 OF 39

P:\CORPORAL PROJECTS\MUNICIPAL\WATER\PROJECTS\OWASA\31829996 ROGERS ROAD SEWER EXPANSION\5-DESIGN DRAWINGS\5-3-DWGS\5-3-SHEETS\1829996-CU-508_OWASA WATER DETAILS.DWG 5/26/2016 9:02:15 AM



1 MAIN	2 MJ PLUG	3 NIPPLE	4 GATE VALVE	5 BLOW-OFF ASSEMBLY
4"	4" TAPPED FOR 2"	2" x 6"L BRASS	2" NRS	2" BRASS
6"	6" TAPPED FOR 2"	2" x 6"L BRASS	2" NRS	2" BRASS
8"	8" TAPPED FOR 2"	2" x 6"L BRASS	2" NRS	2" BRASS

NOTES:

1. No discharge from blow-off should go directly into a creek. OWASA must declorinate discharge before it enters a body of water.
2. Provide erosion and sedementation control for discharge.
3. In lieu of rodded fittings, contractor may use a wedge action restrained gland joint restraint on fittings.

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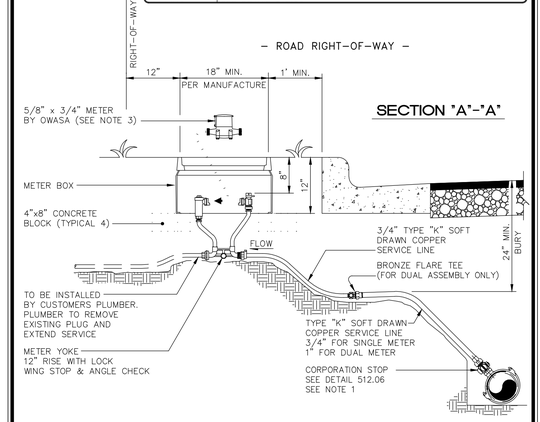
PERMANENT 2" BLOW-OFF ASSEMBLY FOR MAINS UP TO 8"

SCALE: Not To Scale | DETAIL # 514.04 | REVISION DATE: August 15, 2003 | SHEET # 1 of 1

PART	MANUFACTURER MODEL / Cat. No.
METER BOX	CDR SYSTEMS CORP. / WA04-1118-12C MID-STATES PLASTICS, INC. / MSBCF 1118-12
METER SETTER	FORD (3/4") / VBHH72-12W-11-33-NL FORD (1") / VBHH74-12W-11-44-NL MUELLER (3/4" & 1") / H-2404N-2A & TWO H-14222N COUPLINGS
METER	INSTALLED BY OWASA UPON PAYMENT OF FEES
TAPPING	SEE DETAIL 512.06



NOTES:

1. Bronze service saddles shall be used on all service connections. Direct taps shall be made only as directed by an OWASA representative. See tapping detail 512.06.
2. Omitted
3. If installation is for stub-out meter, meter should be purchased from OWASA. (At applicants expense)
4. Meter must be level across meter connections.
5. Substitution requires approval by OWASA's Director of Engineering.

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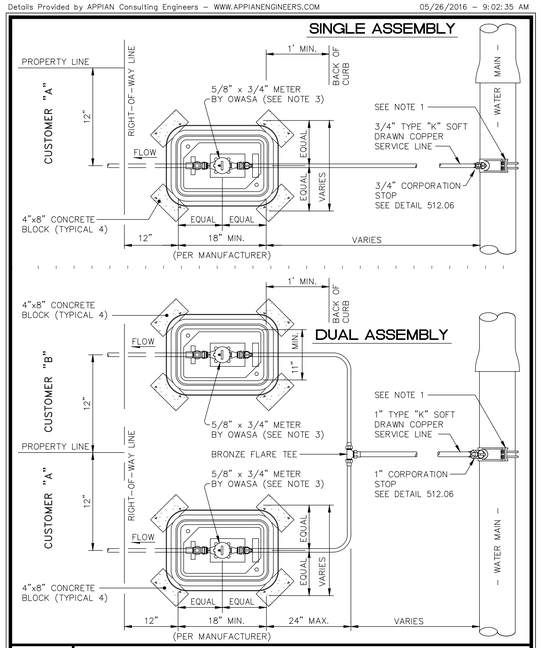
3/4" SINGLE & 1" DUAL SERVICE INSTALLATION

SCALE: Not To Scale | DETAIL # 515.01 | REVISION DATE: June 28, 2012 | SHEET # 1 of 2



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3/4" SINGLE & 1" DUAL SERVICE INSTALLATION

SCALE: Not To Scale | DETAIL # 515.01 | REVISION DATE: April 13, 2007 | SHEET # 2 of 2

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP | DESIGNED BY: JLL | DRAWN BY: TS/DG | CHECKED BY: MTB | APPROVED BY: JLL

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SHEET TITLE: OWASA WATER DETAILS

DATE: 5/25/2016 | SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54 | SHEET I.D. CU-509

URS PROJ. NO. 31829996 | 37 OF 39

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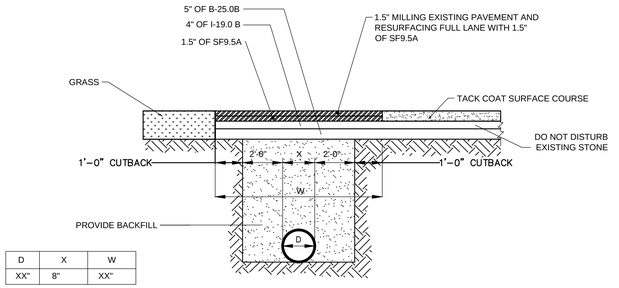


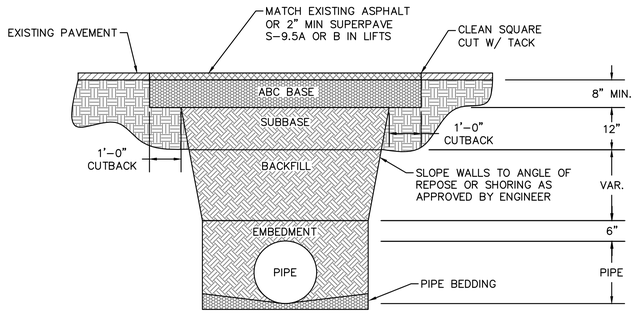
D	X	W
XX"	8"	XX"

PAVEMENT REPAIRS ON ROADS TO BE RESURFACED
(PIPE IS PLACED UNDER EXISTING PAVEMENT)

NOTES

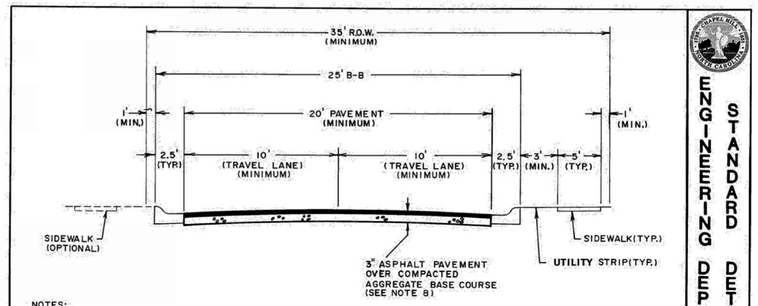
1. BITUMINOUS OVERLAY SHALL BE ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A.
2. WHERE ASPHALT ROADWAY HAS BEEN IMPACTED BY THE WORK, A PERMANENT PATCH REPAIR WILL BE REQUIRED. PERMANENT PAVEMENT REPAIR IS REQUIRED PRIOR TO ASPHALT OVERLAY OF THE ABOVE MENTIONED AREAS.
3. TAPER OVERLAY EDGES TO TIE INTO EXISTING GRADE AT THE SIDES, START, AND END OF OVERLAY RUNS.
4. IN THE EVENT OF A CONFLICT OR OMISSION, ALL REQUIREMENTS SET FORTH IN THE NCDOT ENCROACHMENT AGREEMENT FOR THIS PROJECT SHALL SUPERCEDE THIS DETAIL.

1 NCDOT ROAD REPLACEMENT DETAIL
SCALE: N.T.S.



NOTES:
1. BACKFILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBOS, DEBRIS, ORGANICS AND HAVING LITTLE TO NO EXCESSIVE MOISTURE.
2. SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CLIENT TO ACHIEVE COMPACTION (I.E. #57, ABC, CRUSHED LIMESTONE, CLEAN SAND, FLOWABLE FILL, ETC.).
3. 8 INCHES OF ABC BASE MATERIAL SHALL BE USED ON CITY STREETS.
4. BACKFILL AND BASE MATERIALS SHALL BE COMPACTED IN 12" MINIMUM LIFTS.
5. SOIL SHALL BE COMPACTED BY A MECHANIZED TAMPER (I.E. JUMPING JACK), HOWEVER, VIBRATORY ROLLERS >18" WIDTH MAY BE USED FOR LARGER EXCAVATIONS. THE PLATE TAMP METHOD SHALL NOT BE USED.
6. ALL APPROVED CASTINGS SHALL BE SET FLUSH TO GRADE AND SUPPORTED IF APPLICABLE.
7. ABC BASE AND SUBBASE SHALL BE COMPACTED TO 98% AND BACKFILL AND EMBEDMENT COMPACTED TO 90% AS DETERMINED BY THE MODIFIED PROCTOR AASHTO METHOD T-99.
8. 1-FOOT CUTBACKS OF ASPHALT SHALL BE PREPARED ON UNDISTURBED SOIL. MINIMUM ASPHALT DENSITY IS 90%.

2 CARRBORO ROAD REPLACEMENT DETAIL
SCALE: N.T.S.



NOTES:
1. NO ON-STREET PARKING PERMITTED (TYPICALLY).
2. UTILITY STRIP WIDTH MAY VARY DEPENDING ON APPROVED LANDSCAPING DESIGNS.
3. ALTERNATIVE PAVEMENT DESIGNS MAY BE REQUIRED BASED UPON SITE-SPECIFIC SOIL AND DRAINAGE CONDITIONS.
4. ADDITIONAL RIGHT-OF-WAY MAY BE REQUIRED FOR UTILITY INSTALLATION.
5. ADDITIONAL TRAVEL LANE WIDTH MAY BE REQUIRED ON STREETS EXPECTED TO CONVEY HIGH TRAFFIC VOLUMES AND/OR TRUCK TRAFFIC.
6. SIDEWALK MAY BE REQUIRED ON BOTH SIDES OF STREET.
7. ADD 9' (MINIMUM) OF ADDITIONAL PAVEMENT WIDTH IF TURN LANE IS REQUIRED
8. AGGREGATE BASE COURSE THICKNESS SHALL BE 8" IN TYPE I AREA; 10" IN TYPE II AREA.

NO SCALE

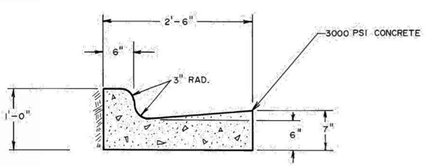
TITLE: LOCAL STREET (WITHOUT ON-STREET PARKING)

REVISIONS: NO | DATE | BY

DET.NO. ST-1C SH. 4 of 8

ENGINEERING DEPARTMENT STANDARD DETAILS

3 CHAPEL HILL ROAD REPLACEMENT DETAIL
SCALE: N.T.S.



SCALE: 1"=1'-0"

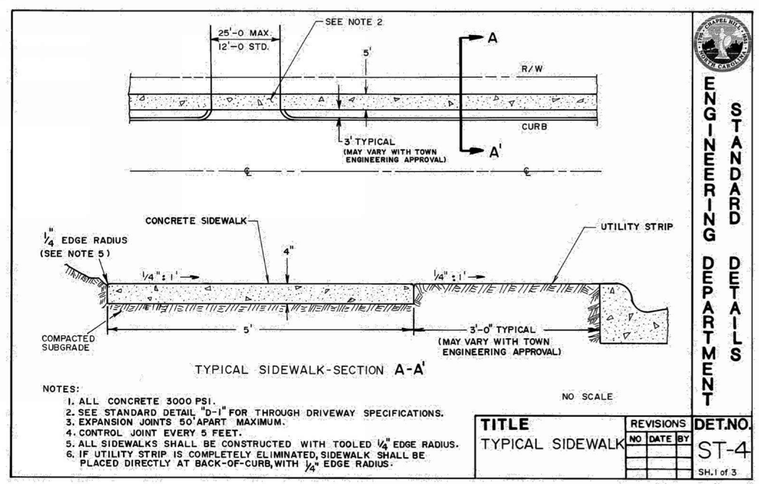
TITLE: CURB & GUTTER SECTION

REVISIONS: NO | DATE | BY

DET.NO. ST-2

ENGINEERING DEPARTMENT STANDARD DETAILS

4 CHAPEL HILL CURB & GUTTER DETAIL
SCALE: N.T.S.



TYPICAL SIDEWALK-SECTION A-A'

NOTES:
1. ALL CONCRETE 3000 PSI.
2. SEE STANDARD DETAIL "D-1" FOR THROUGH DRIVEWAY SPECIFICATIONS.
3. EXPANSION JOINTS 50' APART MAXIMUM.
4. CONTROL JOINT EVERY 5 FEET.
5. ALL SIDEWALKS SHALL BE CONSTRUCTED WITH TOOLED 1/4" EDGE RADIUS.
6. IF UTILITY STRIP IS COMPLETELY ELIMINATED, SIDEWALK SHALL BE PLACED DIRECTLY AT BACK-OF-CURB, WITH 1/4" EDGE RADIUS.

NO SCALE

TITLE: TYPICAL SIDEWALK

REVISIONS: NO | DATE | BY

DET.NO. ST-4 SH. 1 of 3

ENGINEERING DEPARTMENT STANDARD DETAILS

5 CHAPEL HILL SIDEWALK DETAIL
SCALE: N.T.S.

REVISIONS: NO | DESCRIPTION | DATE | BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: TS/DG
CHECKED BY: MTB
APPROVED BY: JLL

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NCBELS LIC. NO. C-2243

SHEET TITLE: MISCELLANEOUS DETAILS

DATE: 5/25/2016 SCALE: AS SHOWN

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
SHEET I.D. CU-510
URS PROJ. NO. 31829996
38 OF 39

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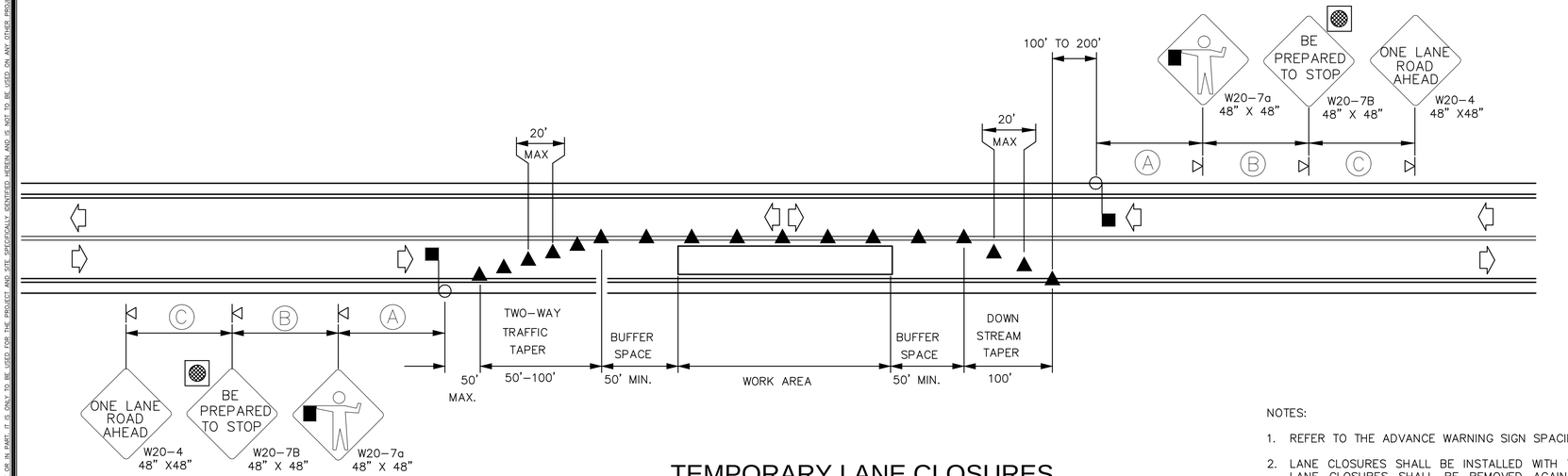


LEGEND

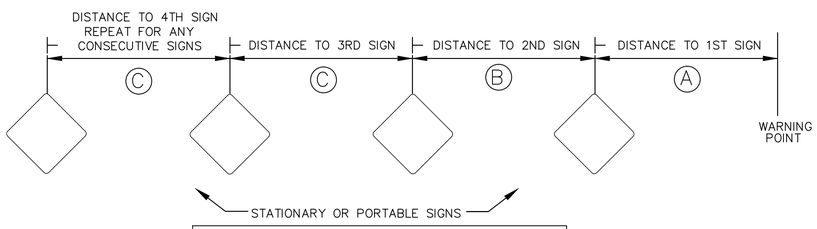
- WARNING FLAGS
- CONE
- PORTABLE SIGN
- FLAGGER
- TYPE B WARNING LIGHT (FOR NIGHT USE)
- DIRECTION OF TRAFFIC FLOW

TEMPORARY LANE CLOSURES
2-LANE, 2-WAY ROADWAY - 1 LANE CLOSED

NOT TO SCALE

NOTES:

1. REFER TO THE ADVANCE WARNING SIGN SPACING CHART, THIS SHEET, FOR SIGN SPACING.
2. LANE CLOSURES SHALL BE INSTALLED WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC. LANE CLOSURES SHALL BE REMOVED AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.
3. USE THE MAXIMUM SPACING OF CONES THRU THE WORK AREA SHALL BE EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.
4. LANE CLOSURES SHALL BE EXTENDED AT THE BUFFER SPACE SUCH THAT STOPPING SIGHTDISTANCE IS PROVIDED TO THE FLAGGER.
5.
6. TRAFFIC SHOULD NOT BE STOPPED IN ANY ONE DIRECTION FOR MORE THAN 5 MINUTES AT A TIME.
7. PILOT CARS SHALL BE USED WHEN DIRECTED BY THE ENGINEER.
8. FLAGGERS SHALL BE USED TO CONTROL TRAFFIC AT INTERSECTIONS AFFECTED BY THE LANE CLOSURE. FLAGGERS UTILIZED AT INTERSECTIONS SHALL BE ACCOMPANIED BY FLAGGER AHEAD SIGNS (W20-7a) PLACED APPROXIMATELY 250 FT. IN ADVANCE OF THE FLAGGER. WHERE INTERSECTIONS ARE SIGNALIZED, SIGNALS SHOULD BE PLACED IN THE FLASH MODE.



ADVANCE WARNING SIGN SPACING CHART			
POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS (FEET)		
	A	B	C
≤ 35	200	200	200
40–50	350	350	350
55	500	500	500
CONTROLLED ACCESS ROADS (≥ 55)	1000	1600	2600

NOTE:

THE ADVANCE WARNING SIGN SPACING CHART IS TO BE APPLIED WHERE A SERIES OF 2 OR MORE SIGNS ARE USED. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE AND MAY BE FIELD ADJUSTED AS VARIOUS CONDITIONS OCCUR, SUCH AS LIMITED SIGHT DISTANCE, OBSTRUCTION INTERFERENCE, ETC.

TRAFFIC CONTROL DESIGN TABLES
SPACING OF TEMPORARY SIGNS IN SERIES

POSTED SPEED LIMIT (MPH)	MINIMUM LONGITUDINAL BUFFER SPACE (FEET)
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

MINIMUM SIGHT DISTANCE		
POSTED SPEED LIMIT (MPH)	STOPPING SIGHT DISTANCE (FEET)	PASSING SIGHT DISTANCE (FEET)
30	200	500
35	250	550
40	325	600
45	400	700
50	475	800
55	550	900
60	650	1000
65	725	1100

NOTES:

1. TABLES ARE BASED ON THE AASHTO GREEN BOOK "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS" AND THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES". MINIMUM SIGHT DISTANCE VALUES ARE FOR PASSENGER CAR VEHICLES ON WET AND LEVEL ROADWAYS. AASHTO GREEN BOOK SHOULD BE CONSULTED TO MAKE FINAL DETERMINATION OF STOPPING SIGHT DISTANCE REQUIREMENTS.
2. BUFFER SPACE TABLE IS BASED ON THE BRAKING DISTANCE PORTION OF STOPPING SIGHT DISTANCE FOR WET AND LEVEL PAVEMENTS.
3. USE OF STOPPING SIGHT DISTANCE IN TRAFFIC CONTROL PLAN APPLICATIONS INCLUDES PROVIDING SIGHT DISTANCE FOR TRAFFIC APPROACHING A LANE CLOSURE. FOR 2-LANE, 2-WAY ROADWAYS STOPPING SIGHT DISTANCE SHOULD BE PROVIDED TO THE FLAGGER. FOR LANE CLOSURES ON MULTILANE ROADWAYS STOPPING SIGHT DISTANCE SHOULD BE PROVIDED TO THE BEGINNING OF THE LANE CLOSURE MERGE TAPER, OR FLASHING ARROW PANEL. LANE CLOSURES SHOULD BE EXTENDED AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED.
4. USE OF MINIMUM PASSING SIGHT DISTANCE TABLE IN TRAFFIC CONTROL PLAN APPLICATIONS INCLUDES PROVIDING SIGHT DISTANCE REQUIREMENTS FOR PLACEMENT OF PAVEMENT MARKING PASSING/NO-PASSING ZONES FOR 2-LANE, 2-WAY ROADWAYS.

TRAFFIC CONTROL DESIGN TABLES
BUFFER SPACE & SIGHT DISTANCE

REVISIONS

NO.	DESCRIPTION	DATE	BY

PROJECT ENG: KKP
DESIGNED BY: JLL
DRAWN BY: KKP
CHECKED BY: RLF
APPROVED BY: JLL

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NCBELS LIC. NO. C-2243

SHEET TITLE: TRAFFIC CONTROL PLAN

SCALE: AS SHOWN

DATE: 5/25/2016

PROJECT: HISTORIC ROGERS ROAD SEWER EXPANSION
ORANGE COUNTY, NC
ORANGE WATER AND SEWER AUTHORITY

ISSUE: ----

CLIENT PROJ. NO. 276-54
URS PROJ. NO. 31829996
SHEET I.D. CU-511
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