

- NOTES:**
- EXISTING TREES AND EXISTING VEGETATION SHALL BE SAVED TO THE EXTENT POSSIBLE. THE SITE PERMITTING AND CONSTRUCTION PLANS WILL BE SPECIFIC AND SHOWN ON PROPOSED PROPERTY LINES SHOWN.
 - ALL CONSTRUCTION AND WORK WILL BE IN ACCORDANCE WITH THE APPLICABLE AND NO WETLANDS, TRIBUTARIES OR WATERS OF THE US EXIST WITHIN THE EXISTING AND PROPOSED PROPERTY LINES SHOWN.
 - THE EXISTING OVERHEAD POWER WILL BE CONVERTED TO UNDERGROUND POWER BY DUNE ENERGY. THE OWNER AND ENGINEER ARE COORDINATING THIS WORK WITH DUNE ENERGY. STREET LIGHTS WILL BE PROVIDED BY DUNE ENERGY IN ACCORDANCE WITH THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET LIGHTS WILL BE PROVIDED BY DUNE ENERGY IN ACCORDANCE WITH THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.
 - STREET TREES AND SHRUBS SHALL BE PROVIDED BY THE CITY OF WILMINGTON AND OTHER UTILITY PROVIDERS.

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	
©2016 KUSKE3 ENGINEERING, PLLC			

SITE INVENTORY DATA

- PREPARED BY: MUSKES ENGINEERING, PLLC
- APPLICANT NAME: M & M DEVELOPMENT, INC.
- PROJECT ADDRESS: SEE PLAN TO BE DETERMINED
- PROPERTY OWNER: M & M DEVELOPMENT, INC.
- DEVELOPER: M & M DEVELOPMENT, INC.
- PROPERTY BOUNDARY: SEE PLAN
- ZONING: R-15
- ADJACENT PROPERTY: SEE PLAN
- VICINITY MAP: SEE PLAN
- TOPOGRAPHY: SEE PLAN
- 100 YEAR FLOOD PLAIN: PROPERTY IS NOT LOCATED WITHIN THE 100 YEAR FLOOD PLAIN
- LOCATION OF EXISTING DITCHES, CREEKS, AND STREAMS: SEE PLAN AND US ACEE JURISDICTIONAL DETERMINATION APPROVAL DATED NO. 03/20/16
- TYPES OF SOIL: USES SR, M1, AND SM SOILS. SEE REPORT OF TESTING BY EGS CAROLINAS, LLP DATED JULY 11, 2016.
- CAMA SETBACKS: N/A
- CAMA LAND CLASSIFICATION: DEVELOPED

SITE INVENTORY DATA

- CONSERVATION RESOURCES AND ASSOCIATED SETBACKS: N/A
- IS SITE RECOGNIZED AS A LOCAL, STATE, OR FEDERALLY DESIGNATED HISTORIC OR ARCHAEOLOGICAL SITE? N/A
- GENERAL BURIAL SITES, OR BURIAL GROUNDS: N/A
- PROTECTED SPECIES OR HABITAT: N/A
- BIKE ROUTES AND SIDEWALKS: SEE PLAN

LEGEND

- PROPOSED PROPERTY LINE
- EXISTING LOT PROPERTY LINE
- GRASSY AREA TO PROPOSED STORMWATER MANAGEMENT AREA. SEE SHEET
- LAND DISTURBANCE LIMITS. SEE SHEET
- TEMPORARY SILT FENCE FOR EROSION CONTROL AND TREE PROTECTION. SEE SHEET
- TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE
- EXISTING SPOT ELEVATION
- EXISTING CONTOUR
- EXISTING SANITARY SEWER LINE
- EXISTING WATER LINE
- PROPOSED DRAIN INLETS / CATCH BASINS / PIPES
- EXISTING STORMWATER LINE
- EXISTING TREE. SEE NOTE 1.

LEGEND

- PROPOSED CONCRETE
- EXISTING CONCRETE
- EXISTING ASPHALT ROAD
- EXISTING GRAVELLED CONSTRUCTION ENTRANCE
- EXISTING ASPHALT PAVEMENT AND CURB AND GUTTER SHOWN AS REQUIRED TO INSTALL THE NEW IMPROVEMENTS.

PROPERTY Owner/Developer:
M & M Developers, Inc.
 PO BOX 2251
 Long Beach TownShip, NJ 08008

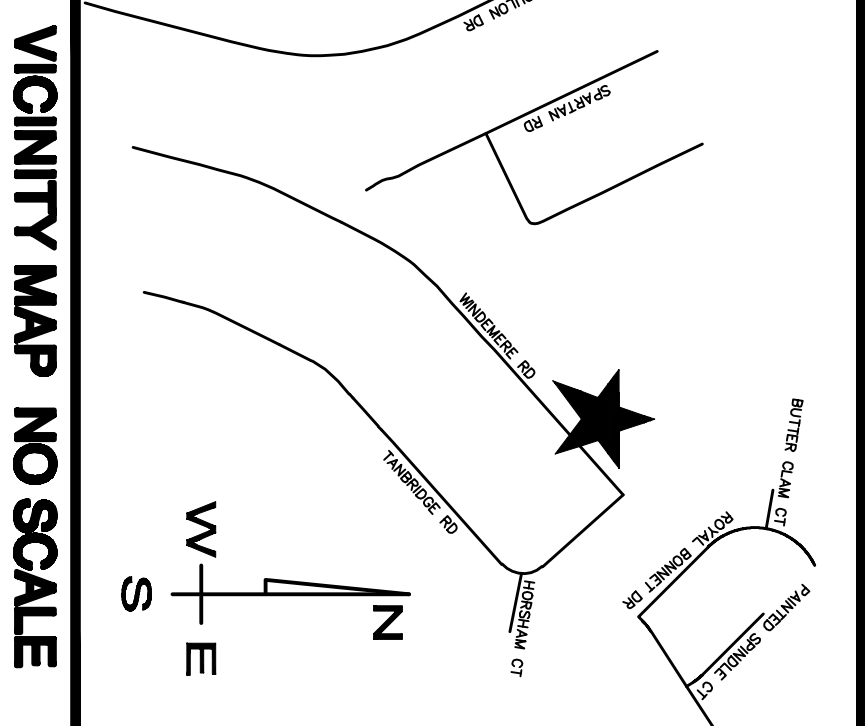
EXISTING SITE CONDITIONS, DEMOLITION, REMOVAL AND EROSION CONTROL PLAN
WINDEMERE PARK SUBDIVISION - WINDEMERE ROAD
WILMINGTON, NEW HANOVER COUNTY, NC

Kuske3 Engineering, PLLC
 LICENSE No. F0809
 John A. Kuske, III P.E.
 OWNER

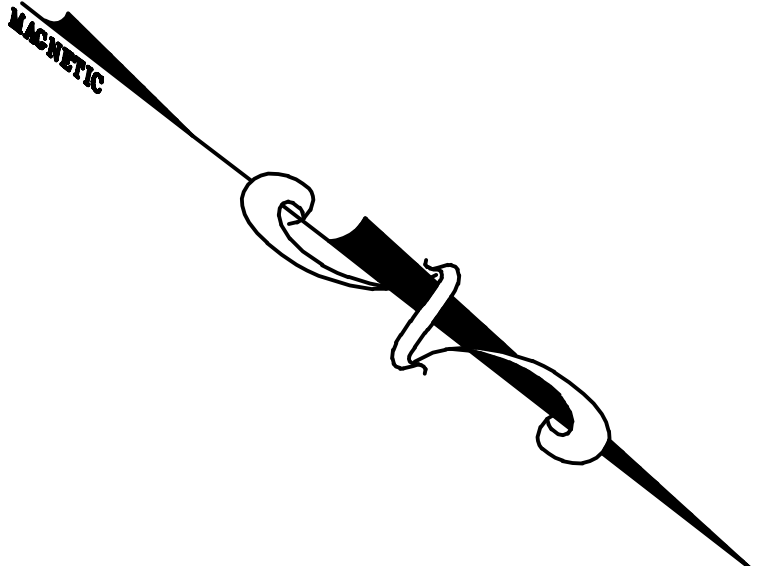
PROJECT: 150110
 DATE: 09/07/16
 PREPARED BY: JAK III
 CHECKED BY: JAK III
 DRAWN BY: JAK III

PRELIMINARY - DO NOT USE FOR CONSTRUCTION

C1



VICINITY MAP NO SCALE

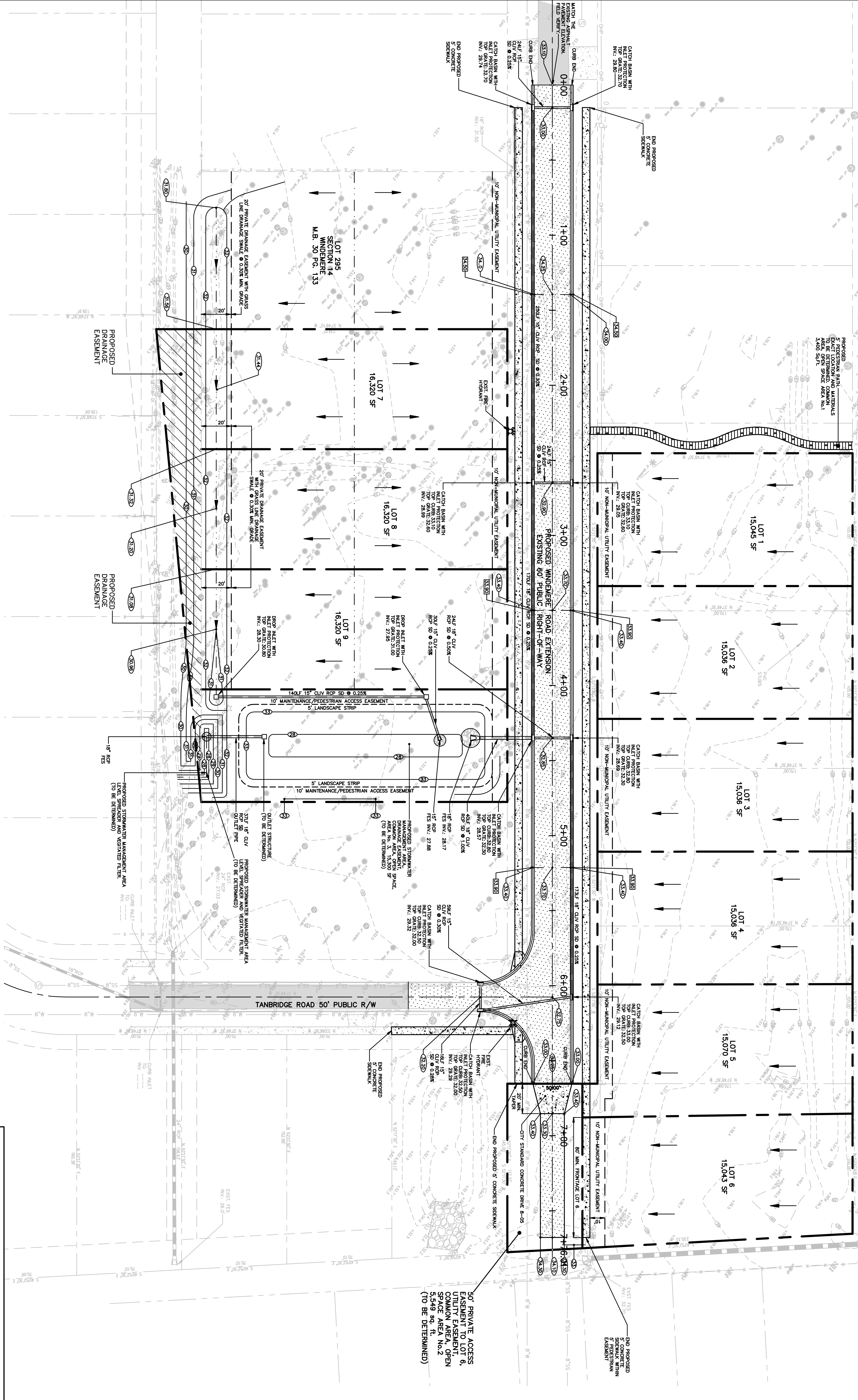


For each open utility cut of City streets, a \$325 permit shall be required from the utility provider occupying and/or project responsibility.

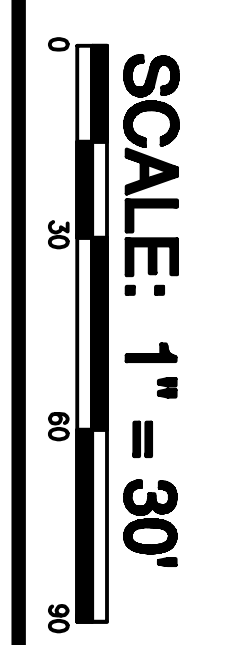
FOR EACH OPEN UTILITY CUT OF CITY STREETS, A \$325 PERMIT SHALL BE REQUIRED FROM THE UTILITY PROVIDER OCCUPYING AND/OR PROJECT RESPONSIBILITY.

APPROVED CONSTRUCTION PLAN
 Name: _____ Date: _____
 Permitting: _____
 Public Utilities: _____
 Title: _____
 File: _____

STORMWATER MANAGEMENT PLAN
 APPROVED
 CITY OF WILMINGTON
 ENGINEERING DEPARTMENT
 DATE: _____ PERMIT # _____
 SIGNED: _____



SCALE: 1" = 30'



LEGEND	
	PROPERTY LINE / DRAINAGE AREA TO EXISTING STORMWATER INFILTRATION BASIN
	DRAINAGE AREA TO EXISTING STORMWATER INFILTRATION BASIN
	LAND DISTURBANCE LIMITS
	TEMPORARY SILT FENCE FOR EROSION CONTROL AND TREE PROTECTION
	EXISTING SPOT ELEVATION
	PROPOSED CONTOURS
	PROPOSED TOP OF CURB, TOP OF WALK, FINISH FLOOR OR TOP OF RETAINING WALL SPOT ELEVATION
	PROPOSED FINISHED GRADE SPOT ELEVATION ON GROUND, CONCRETE OR ASPHALT
	DRAINAGE SWALE
	DRAINAGE FLOW BREAK
	DRAINAGE SWALE
	EXISTING TREE, SEE NOTE 1.
	NEW CONCRETE
	EXISTING ASPHALT ROAD
	NEW ASPHALT PAVEMENT
	PROPOSED STORMWATER BASIN
	PROPOSED PUBLIC DRAINAGE EASEMENT
	FLARED END SECTION WITH ENERGY DISSIPATOR, 6000' DRAINAGE AREA TO EXISTING STORMWATER INFILTRATION BASIN
	EROSION CONTROL INLET PROTECTION AROUND EXISTING / PROPOSED STORMWATER INFILTRATION BASIN
	EXISTING STORMWATER LINE
	PROPOSED STORMWATER LINE, SEE PLAN FOR SIZE
	EXISTING SANITARY SEWER LINE
	NEW SANITARY SEWER LINE
	EXISTING WATER LINE
	PROPOSED WATER LINE

PRELIMINARY - DO NOT USE FOR CONSTRUCTION

DATE: 08/15/16

DES: JAK III
 CHK: JAK III
 DRWN: WC

15010

Kuske3 Engineering, PLLC
 LICENSE No. F-0009
 John A. Kuske, III P.E.
 OWNER

Property Owner/Developer:
 M & M Developers, Inc.
 PO BOX 2251
 Long Beach Township, NJ 08008

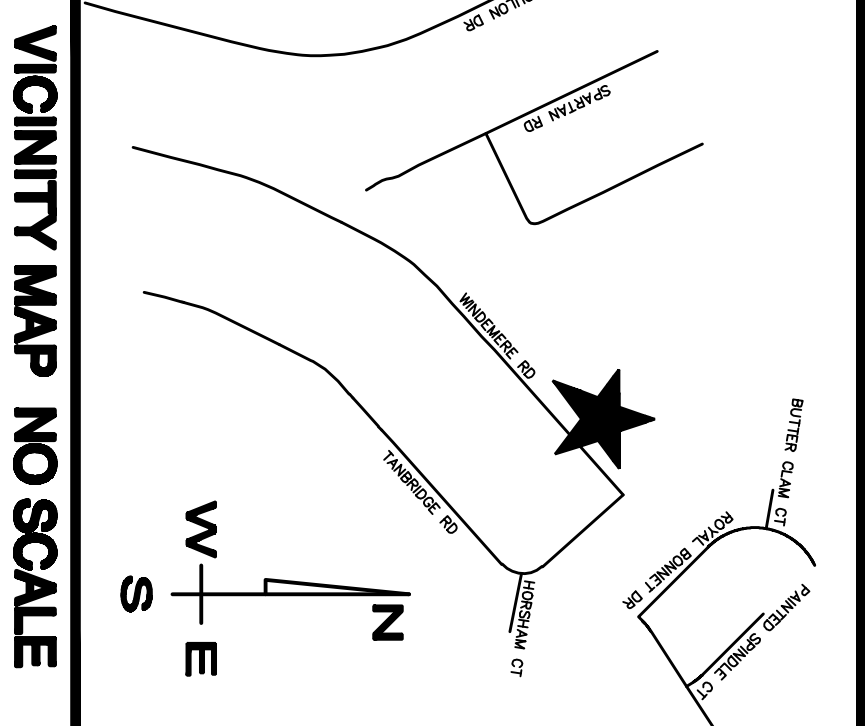
GRADING, DRAINAGE, EROSION CONTROL AND STORMWATER MANAGEMENT PLAN
 WINDEMERE PARK SUBDIVISION - WINDEMERE ROAD
 WILMINGTON, NC, NEW HANOVER COUNTY, NC

North Carolina 811
 www.nc811.org

SYMBOL	DATE	DESCRIPTION	BY

©2016 KUSKE3 ENGINEERING, PLLC

C2



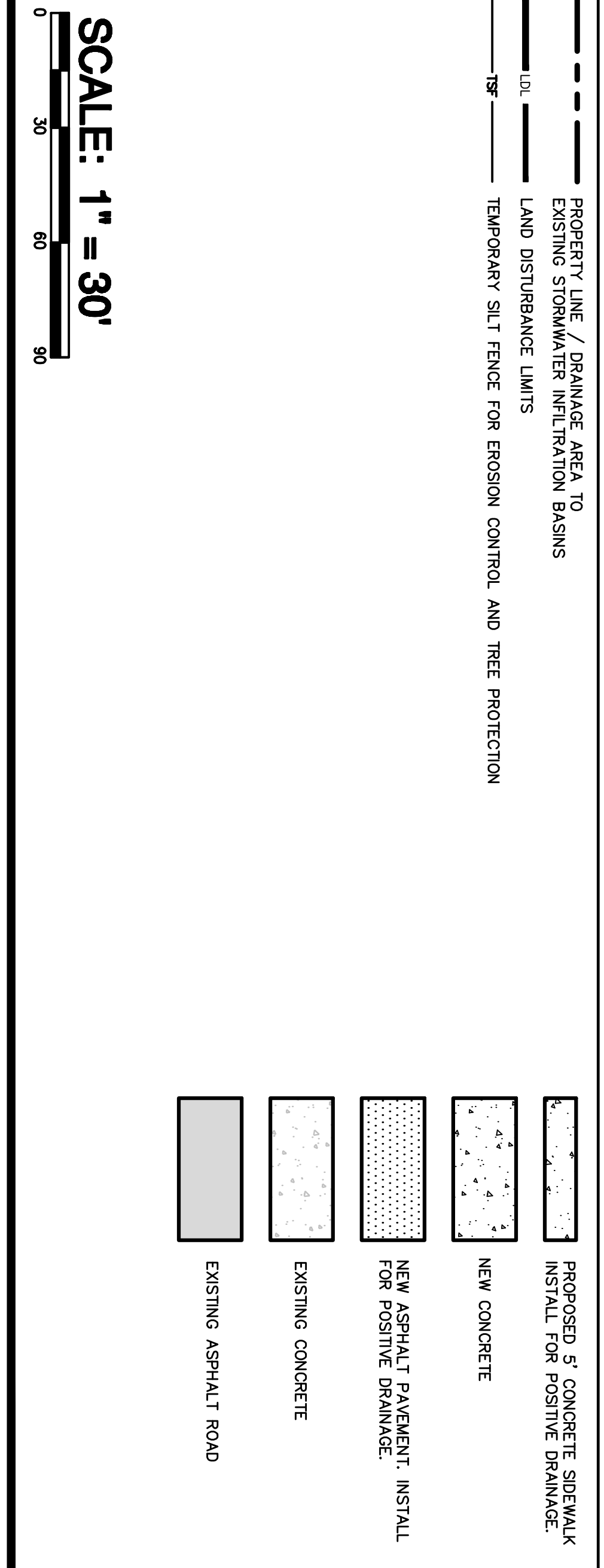
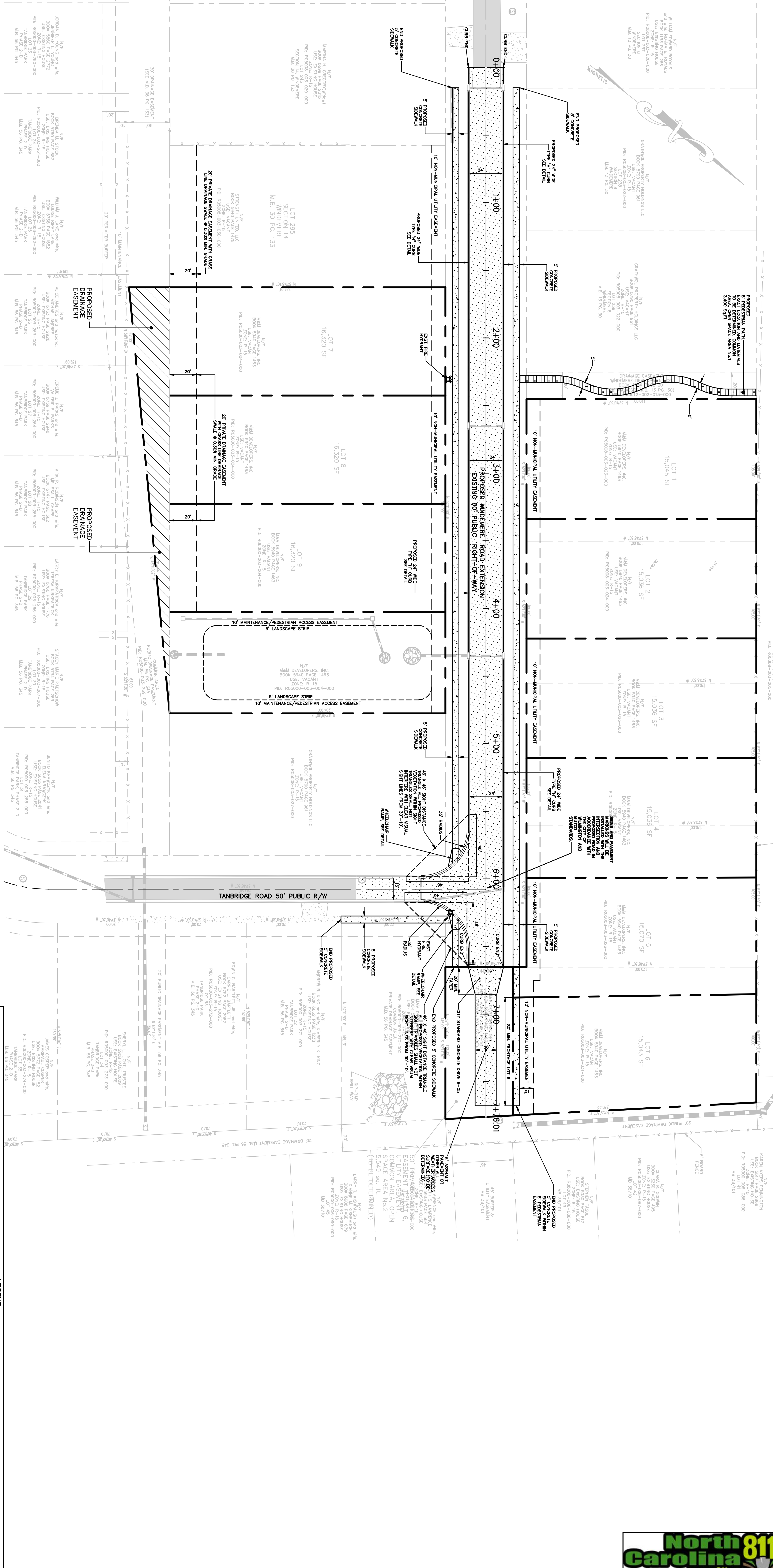
For each open utility cut of any depth, the City of Wilmington shall be required from the City prior to occupancy, and/or project completion.

PROPOSED FLOW THROUGH: YES or NO (CHECK ONE)
SEWER CHIEF & AMPLIFIER: YES or NO (CHECK ONE)
SEWER PERMIT #: _____
SEWER CHIEF: _____
SEWER AMPLIFIER: _____

Approved Construction Plan
 Name: _____
 Date: _____
 Permitting: _____
 Public Utilities: _____
 Date: _____

STORMWATER MANAGEMENT PLAN
APPROVED
 CITY OF WILMINGTON
 ENGINEERING DEPARTMENT
 PERMIT # _____
 DATE _____
 SIGNED _____

VICINITY MAP NO SCALE



15010
 DATE: 08/15/16
 PRELIMINARY - DO NOT USE FOR CONSTRUCTION
 PRELIMINARY PLAT - CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON SITE

Kuske3 Engineering, PLLC
 LICENSE No. F-0009
 John A. Kuske, III P.E.
 OWNER
 PO BOX 4881 WILMINGTON, NC 28406
 PHONE (910) 711-4611
 jkuske@kuske3eng.com
 CIVIL ENGINEERING - LAND PLANNING CONSULTING - PROJECT MANAGEMENT

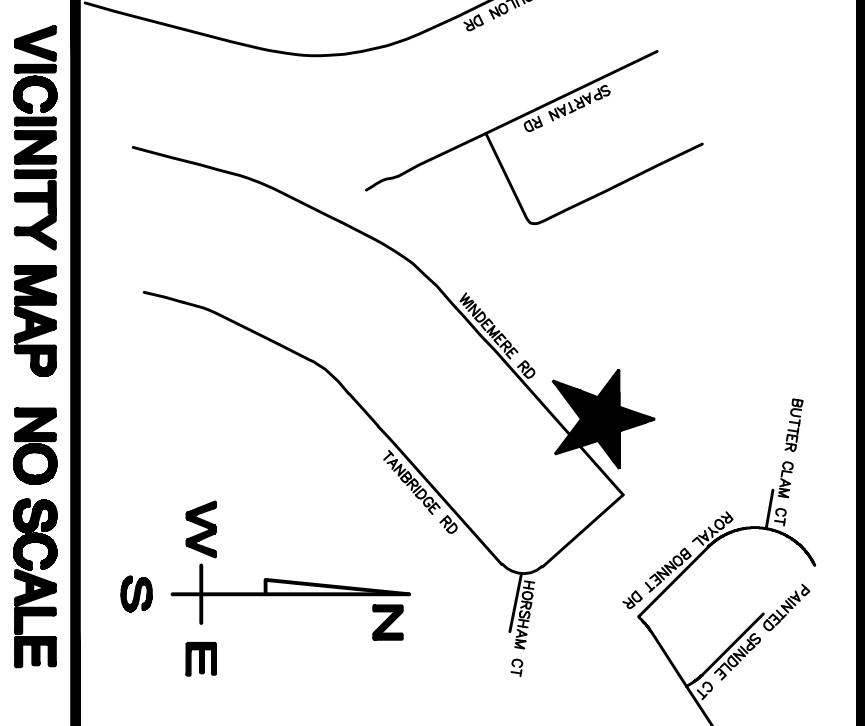
Property Owner/Developer:
M & M Developers, Inc.
 PO BOX 2251
 Long Beach TownShip, NJ 08008

LAYOUT PLAN
WINDEMERE PARK SUBDIVISION - WINDEMERE ROAD
WILMINGTON, NC
NEW HANOVER COUNTY, NC

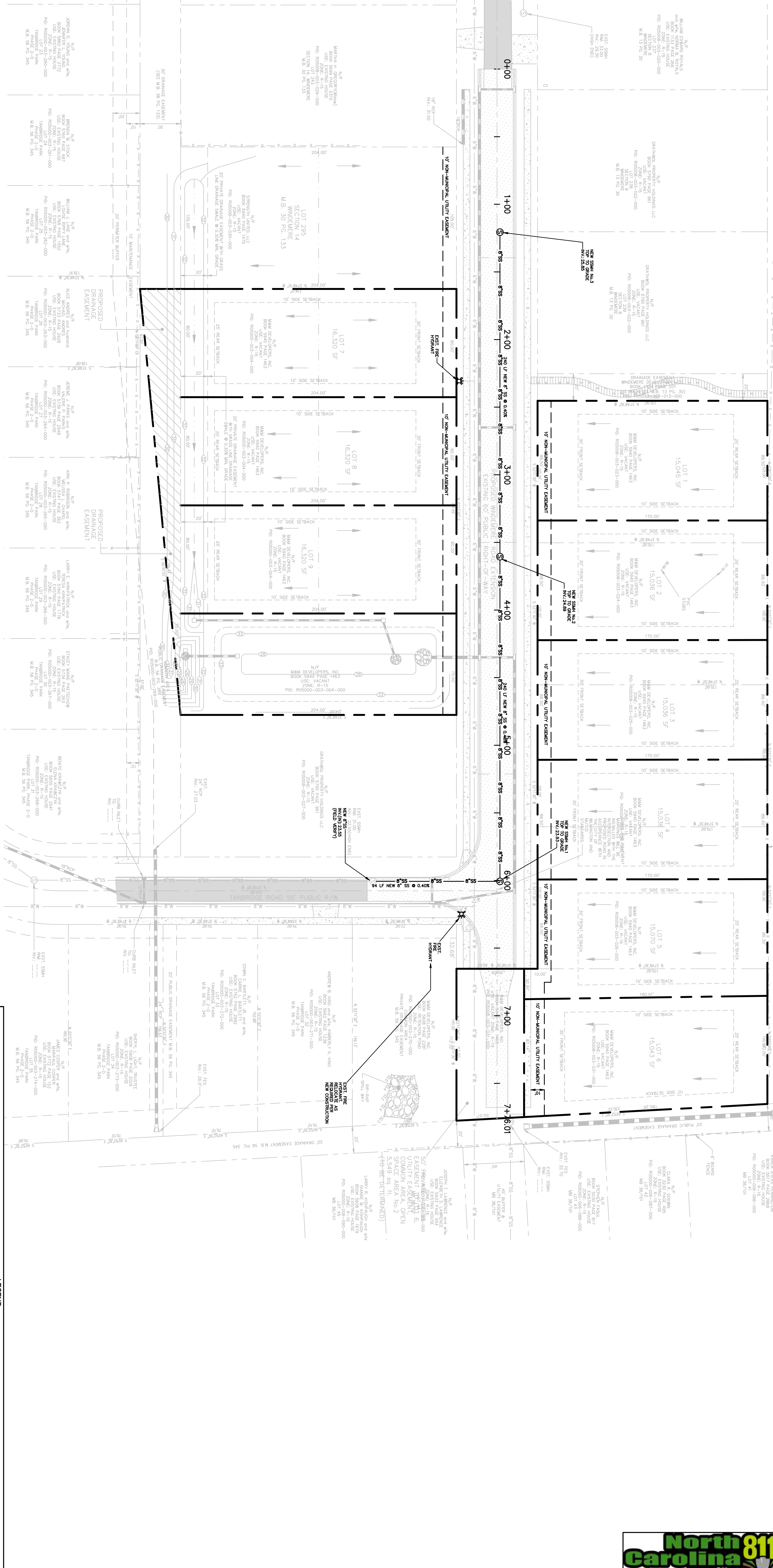
North 811
 Carolina
 www.nc811.org

SYMBOL	DATE	DESCRIPTION	BY
REVISIONS			
©2016 KUSKE3 ENGINEERING, PLLC			

C3



VICINITY MAP NO SCALE



SCALE: 1" = 30'

LEGEND	
	PROPERTY LINE TO EXISTING STORMWATER INFILTRATION BASIN
	DRAINAGE AREA TO EXISTING STORMWATER INFILTRATION BASIN
	LAND DISTURBANCE LIMITS
	TEMPORARY SIT FENCE FOR EROSION CONTROL AND TREE PROTECTION
	EXISTING SPOT ELEVATION
	PROPOSED CONTOURS
	PROPOSED TOP OF CURB, TOP OF WALK, FINISH FLOOR OR TOP OF RETAINING WALL SPOT ELEVATION
	PROPOSED FINISHED GRADE SPOT ELEVATION ON GROUND, CONCRETE OR ASPHALT
	DRAINAGE SWALE
	DRAINAGE FLOW BREAK
	DRAINAGE SWALE
	EXISTING TREE, SEE NOTE 1.
	NEW CONCRETE
	EXISTING ASPHALT ROAD
	NEW ASPHALT PAVEMENT, INSTALL
	PROPOSED PUBLIC DRAINAGE EASEMENT
	FLARED END SECTION WITH ENERGY DISSIPATOR, RCDDOT
	FILTER FABRIC ON EQUAL, SEE PLAN FOR SIZE
	EROSION CONTROL INLET PROTECTION AROUND EXISTING / PROPOSED STORMDRAIN LINE
	EXISTING STORMDRAIN LINE
	PROPOSED STORMDRAIN LINE, SEE PLAN FOR SIZE
	EXISTING SANITARY SEWER LINE
	NEW SANITARY SEWER LINE
	EXISTING WATER LINE
	PROPOSED WATER LINE
	PROPOSED 5" CONCRETE SIDEWALK
	INSTALL FOR POSITIVE DRAINAGE
	PROPOSED PUBLIC DRAINAGE EASEMENT

15010

DATE: 08/15/16

PRELIMINARY - DO NOT USE FOR CONSTRUCTION

PRELIMINARY PLAT - CONTRACTS OR BILLS

Kuske3 Engineering, PLLC
 LICENSE No. F0009
 John A. Kuske, III P.E.
 OWNER

PO BOX 4811 FERRIS (919) 471-4611
 WILMINGTON, NC 28406 kuske3@kuske3eng.com

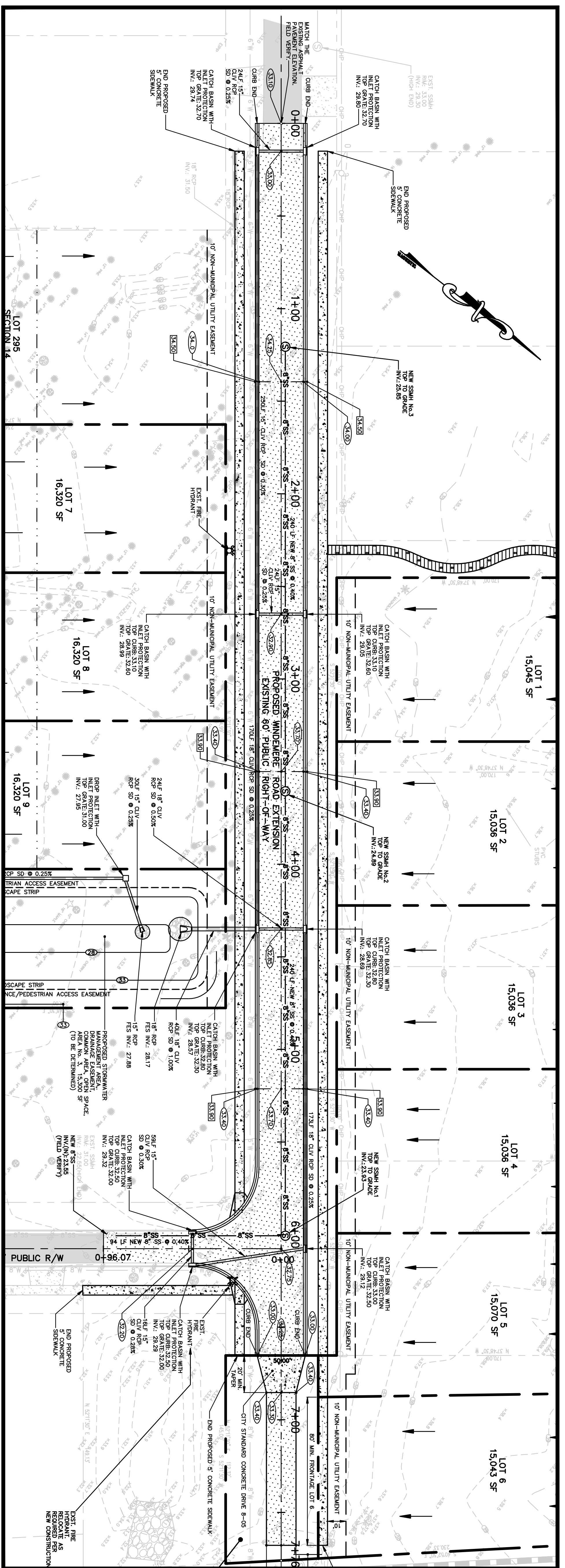
Property Owner/Developer:
M & M Developers, Inc.
 PO BOX 2251
 Long Beach Township, NJ 08008

WATER AND SEWER UTILITY LAYOUT PLAN
WINDEMERE PARK SUBDIVISION - WINDEMERE ROAD
WILMINGTON, NC
NEW HANOVER COUNTY, NC



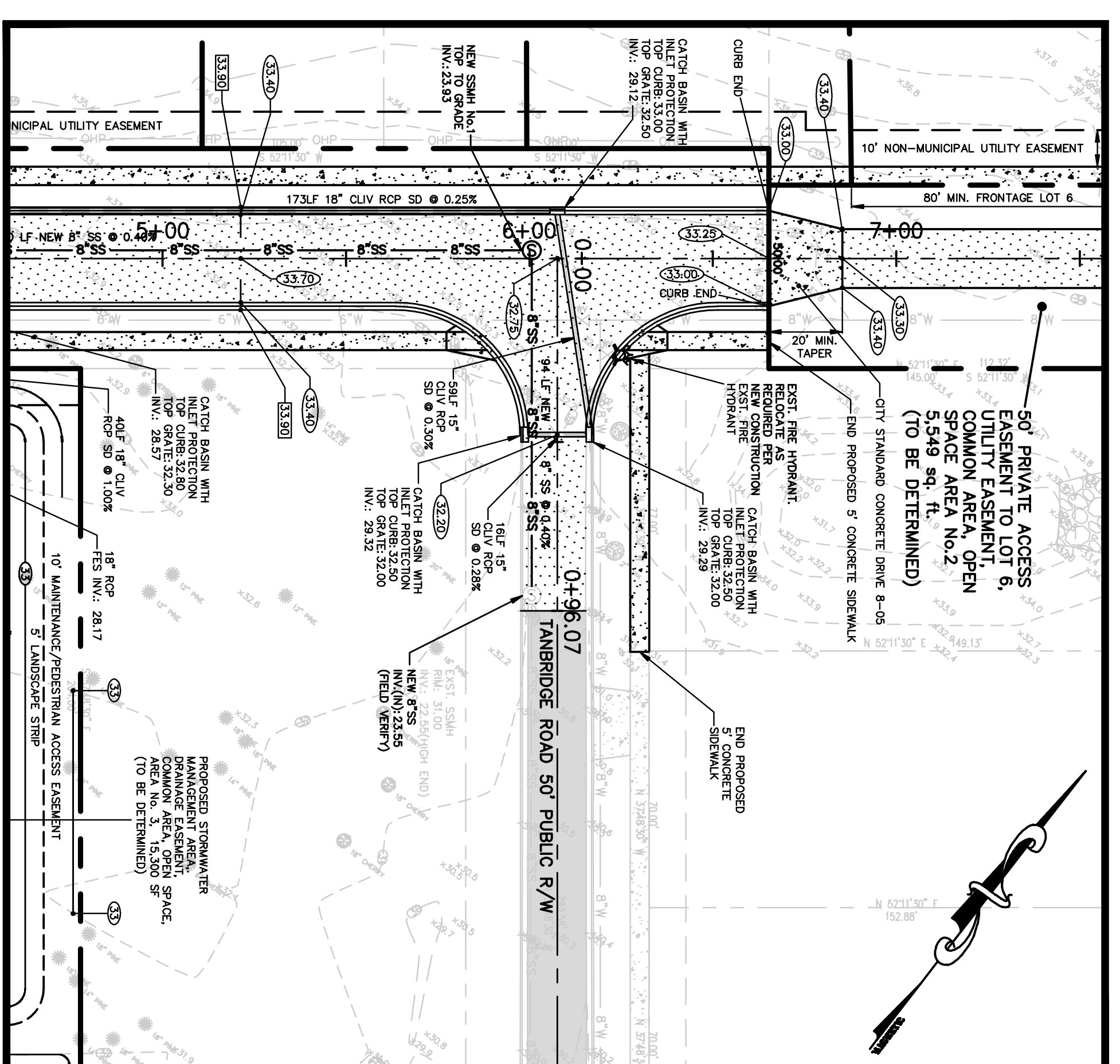
SYMBOL	DATE	DESCRIPTION	BY
REVISIONS			
©2016 KUSKE3 ENGINEERING, PLLC			

PLAN VIEW WINDEMERE ROAD



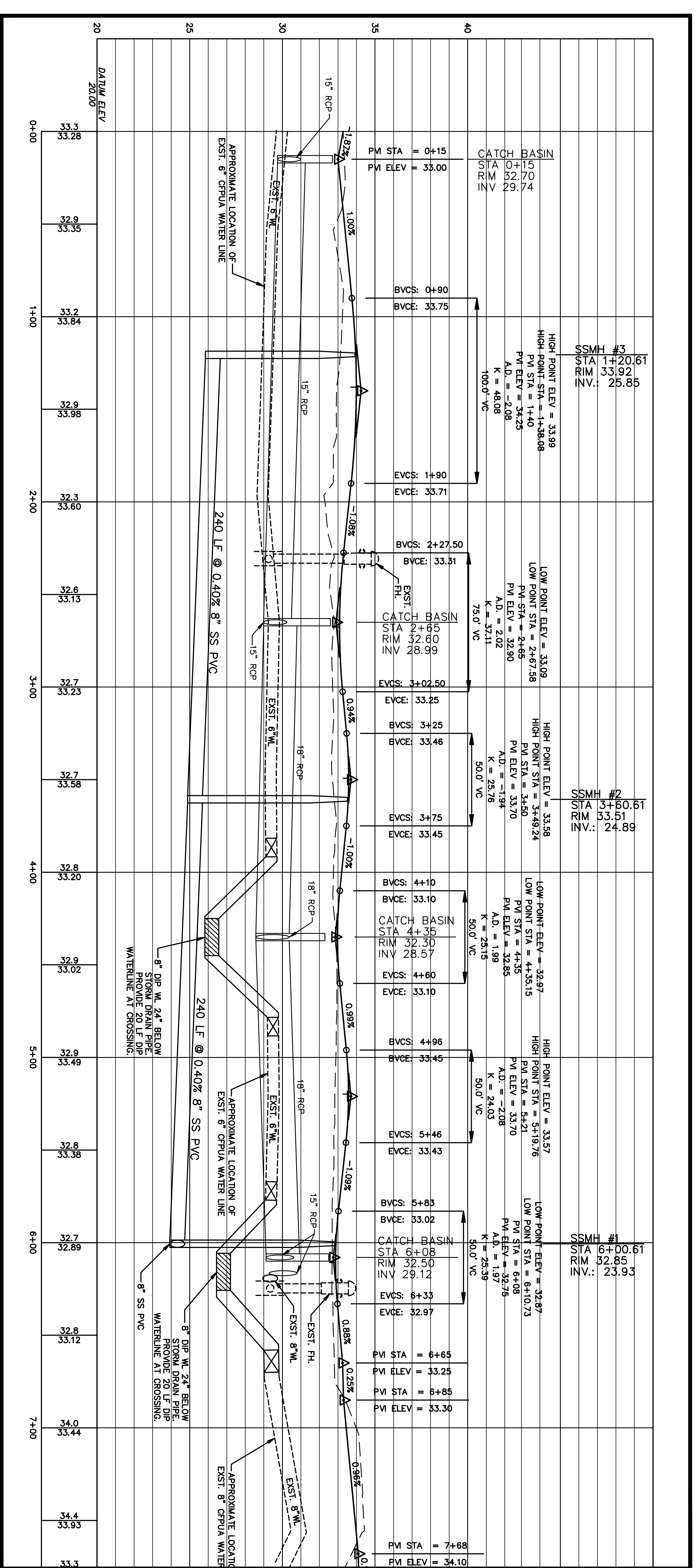
SCALE: 1" = 30'

PLAN VIEW TANBRIDGE ROAD



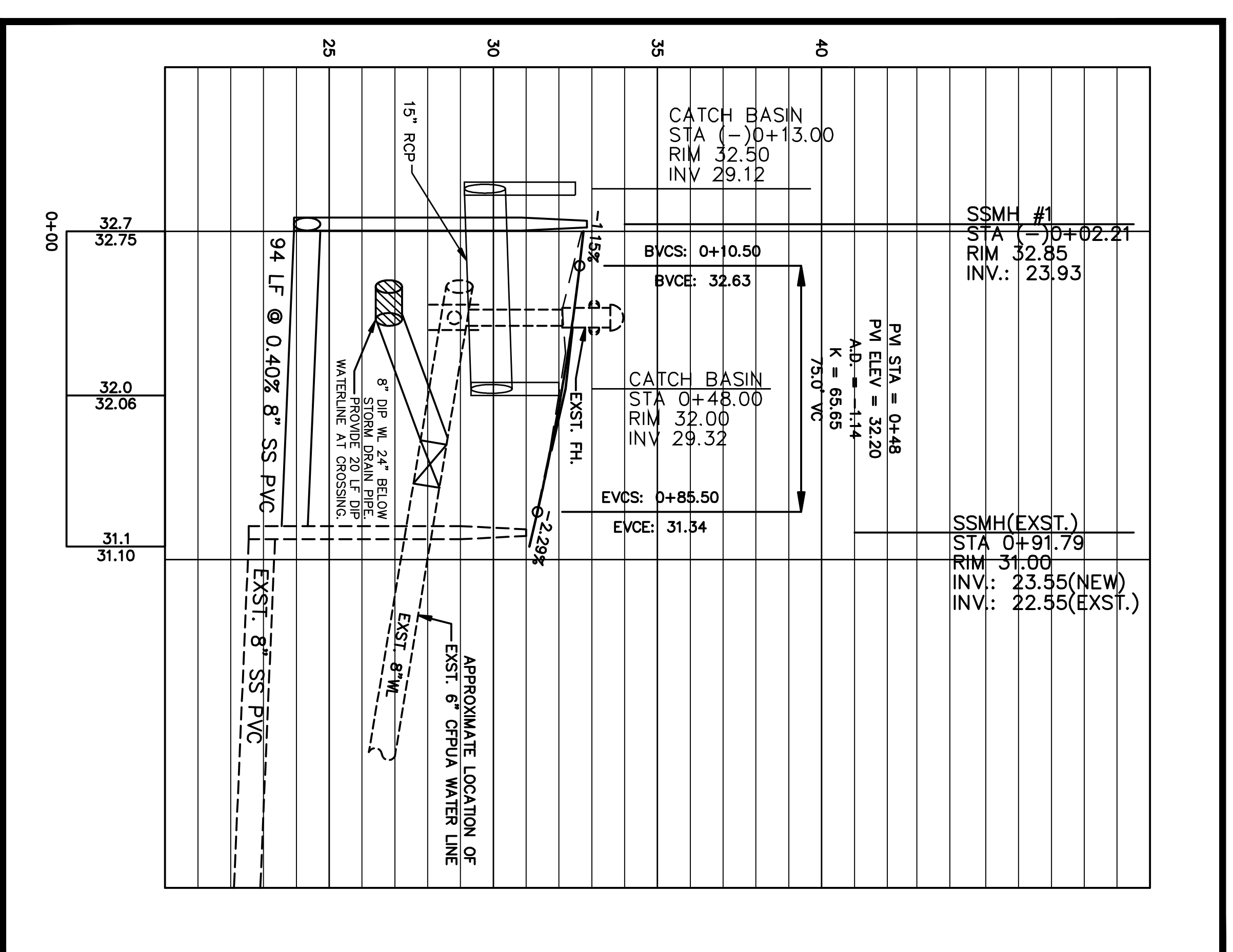
SCALE: 1" = 30'

PROFILE VIEW WINDEMERE ROAD



SCALE
HORZ.: 1" = 30'
VERT.: 1" = 3'

PROFILE VIEW TANBRIDGE ROAD



SCALE
HORZ.: 1" = 30'
VERT.: 1" = 3'

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	
		©2016 KUSKE3 ENGINEERING, PLLC	

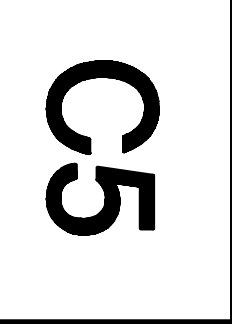


UTILITY AND ROAD PROFILE PLAN
WINDEMERE PARK SUBDIVISION
WINDEMERE ROAD AND TANBRIDGE ROAD
WILMINGTON, NC, NEW HANOVER COUNTY, NC

Property Owner/Developer:
M & M Developers, Inc.
PO BOX 2251
Long Beach TownShip, NJ 08008

Kuske3 Engineering, PLLC
 LICENSE No. P-0899
John A. Kuske, III P.E.
 OWNER
 PO BOX 481 PHONE (919) 71-4611
 WILMINGTON, NC 28406 john@kuske3eng.com
CIVIL ENGINEERING - LAND PLANNING
CONSULTING - PROJECT MANAGEMENT

15010
 DCS: JAK III
 DRWN: JAC III
 DATE: 08/15/16
PRELIMINARY PLAN - DO NOT USE FOR CONSTRUCTION
 PREPARED BY: JAK III
 CHECKED BY: JAC III
 APPROVED BY: JAC III



City of Wilmington	City of Wilmington
City Engineer	City Engineer
City Manager	City Manager
City Clerk	City Clerk
City Treasurer	City Treasurer
City Attorney	City Attorney
City Public Works Director	City Public Works Director
City Public Works Engineer	City Public Works Engineer
City Public Works Inspector	City Public Works Inspector
City Public Works Assistant	City Public Works Assistant
City Public Works Office	City Public Works Office
City Public Works Building	City Public Works Building
City Public Works Phone	City Public Works Phone
City Public Works Fax	City Public Works Fax
City Public Works Website	City Public Works Website
City Public Works Email	City Public Works Email
City Public Works Address	City Public Works Address
City Public Works State	City Public Works State
City Public Works Zip	City Public Works Zip
City Public Works Country	City Public Works Country

Approved Construction Plan	Name	Date
APPROVED	City of Wilmington	DATE
ENGINEERING DEPARTMENT	PERMIT #	SIGNED

BY	DESCRIPTION	DATE	SYMBOL
	REVISIONS		

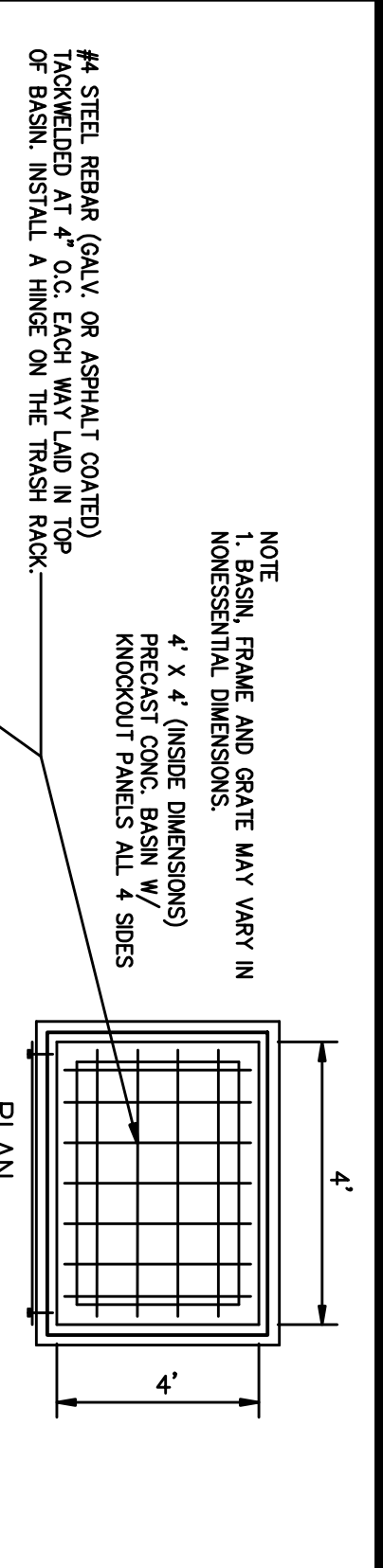
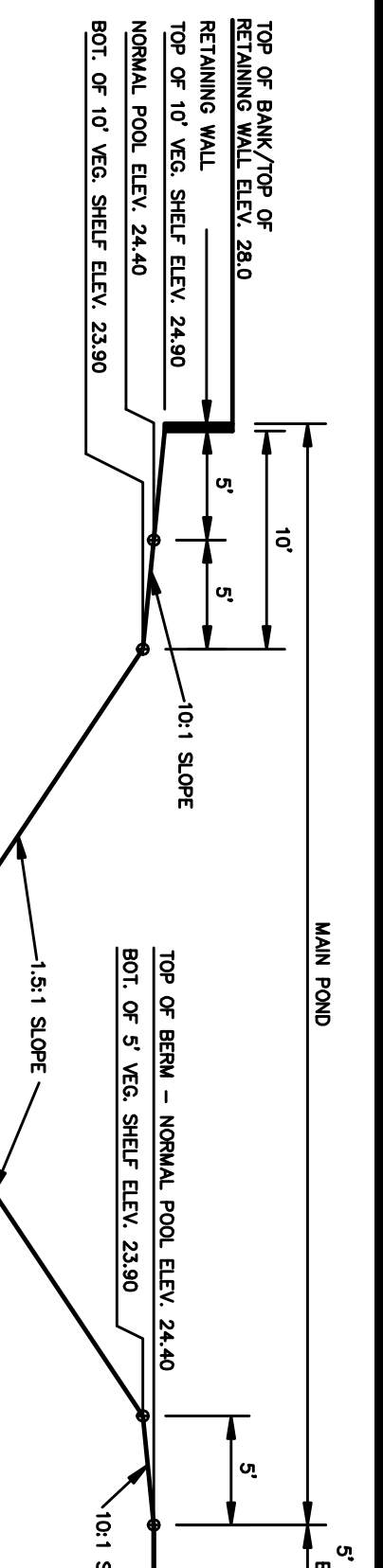
©2016 KUSKE3 ENGINEERING, PLLC



WATER PERMIT #	_____
SEWER PERMIT #	_____
SEWER CROSS AND PLANT	_____
YES OR NO (CHECK ONE)	_____

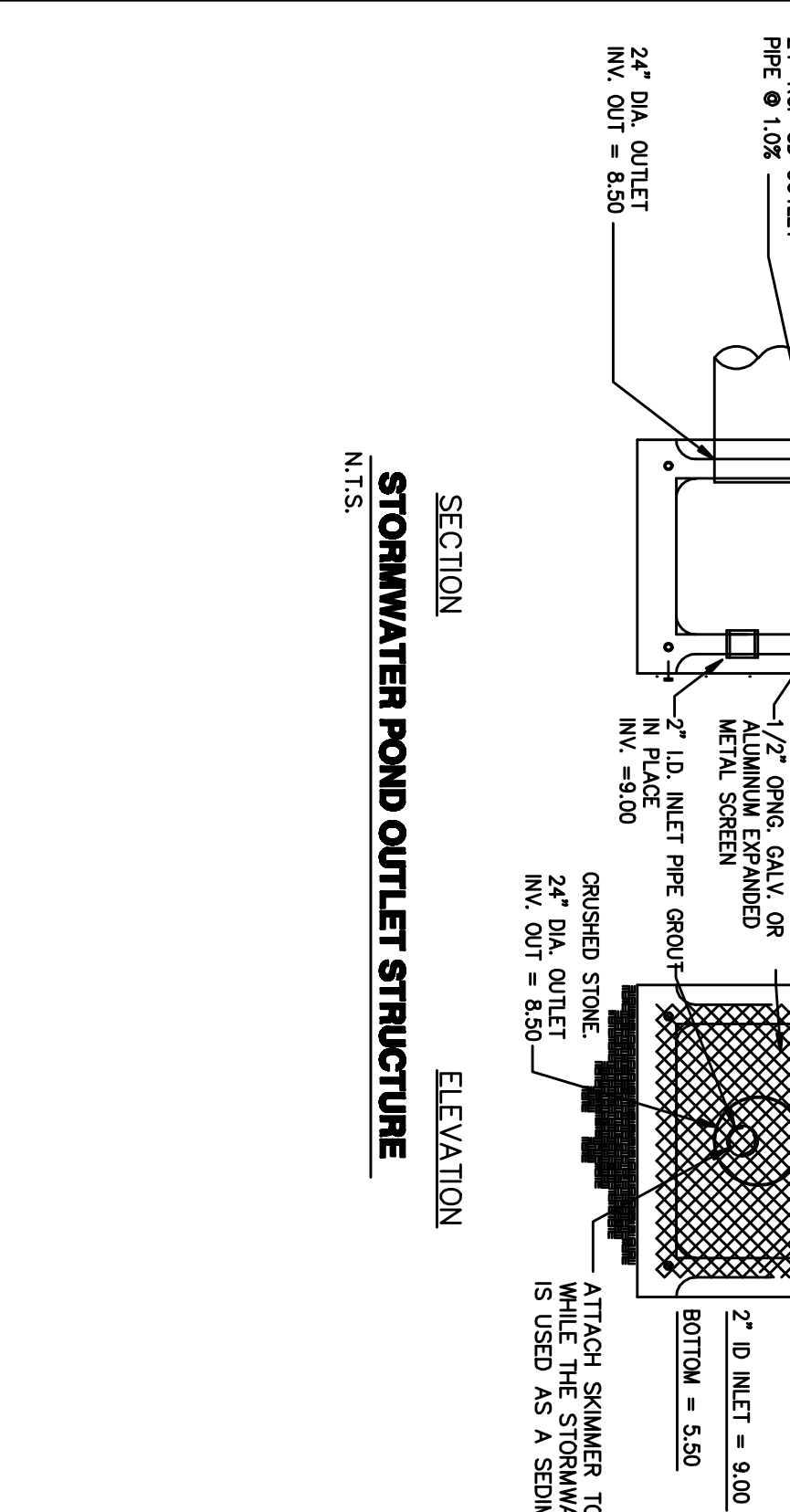
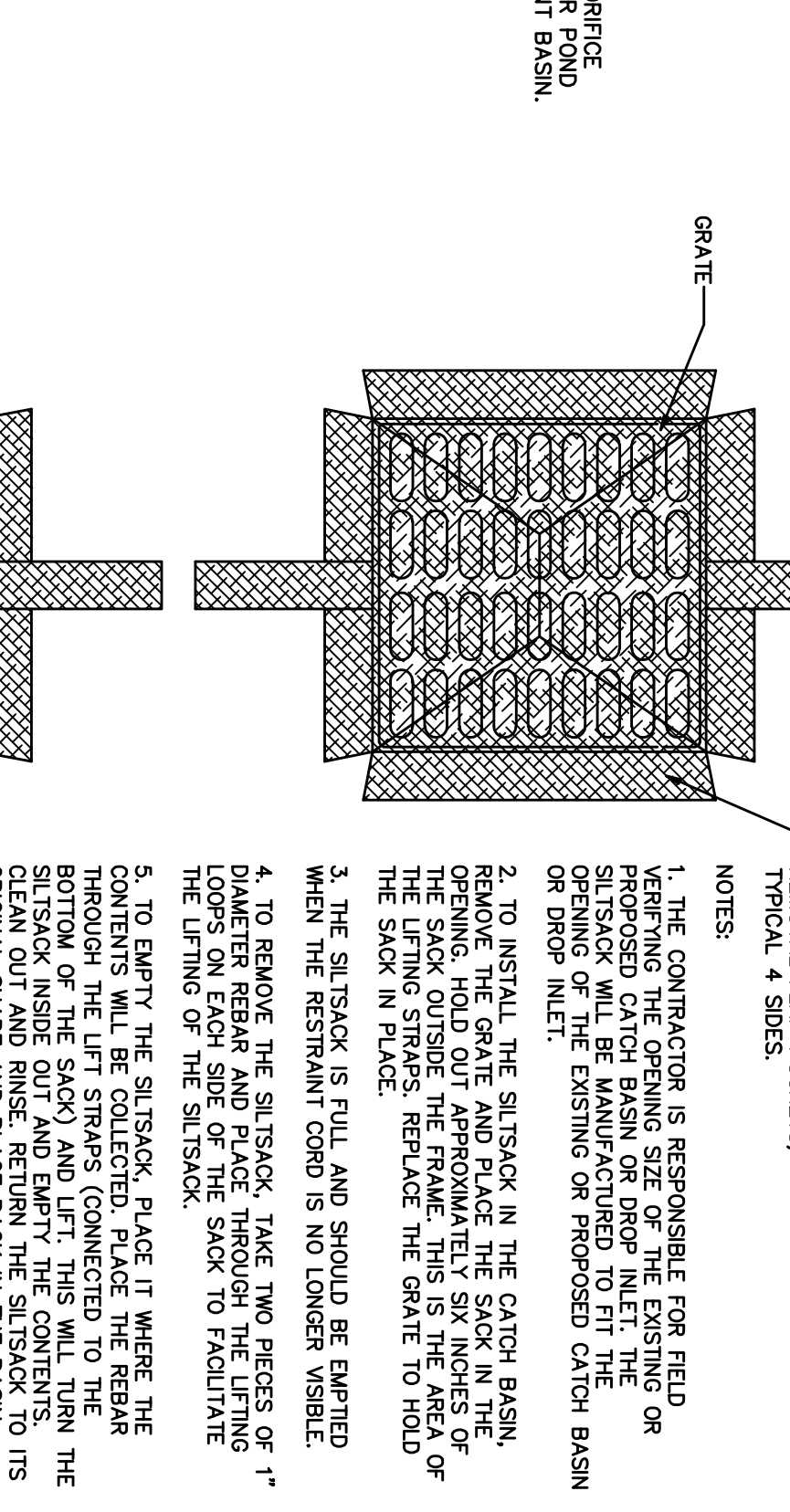
For each open utility out of City streets, a \$325 permit shall be required from the City prior to occupancy under project completion.

WATER PERMIT # _____
SEWER PERMIT # _____
SEWER CROSS AND PLANT _____
YES OR NO (CHECK ONE) _____



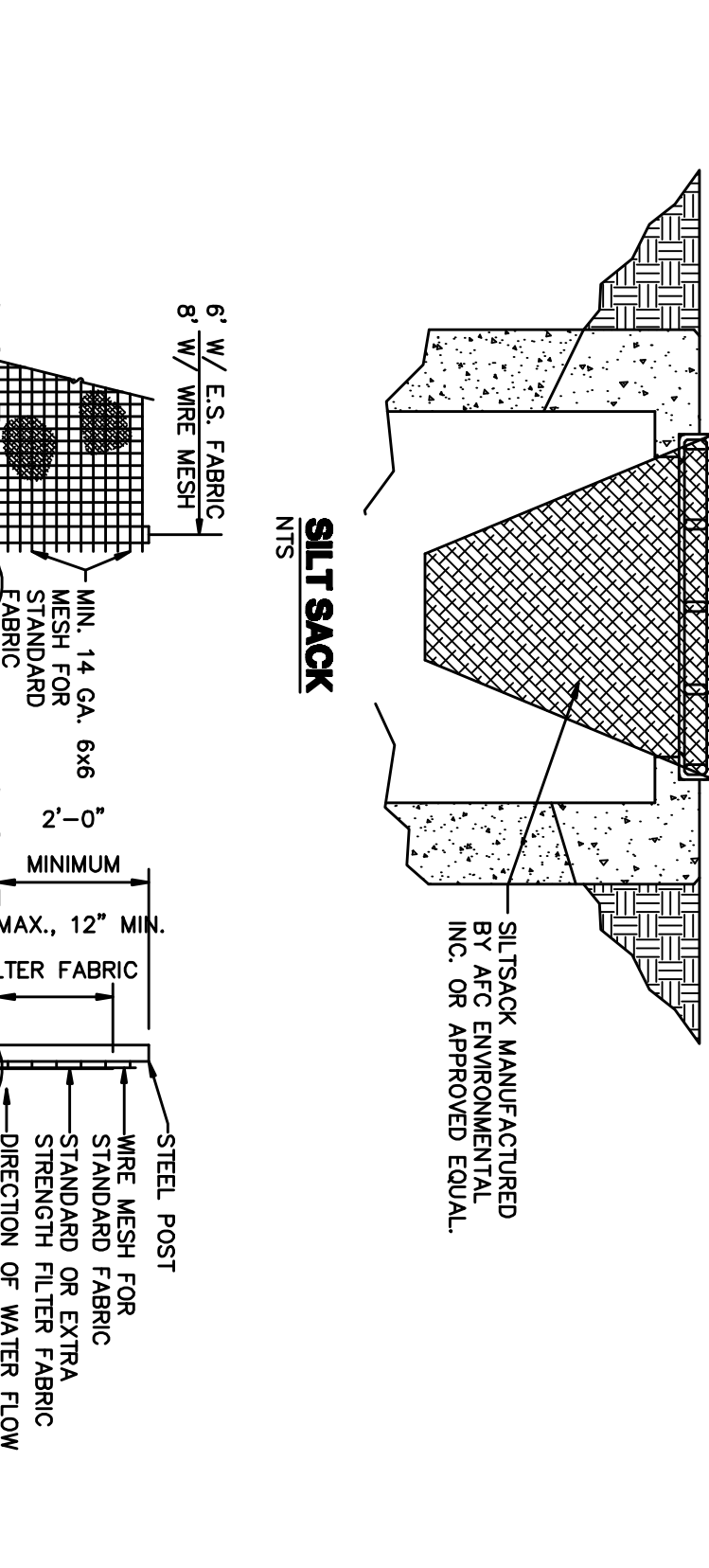
STORMWATER POND OUTLET STRUCTURE
SECTION
ELEVATION
PLAN

STORMWATER POND OUTLET STRUCTURE
SECTION
ELEVATION
PLAN



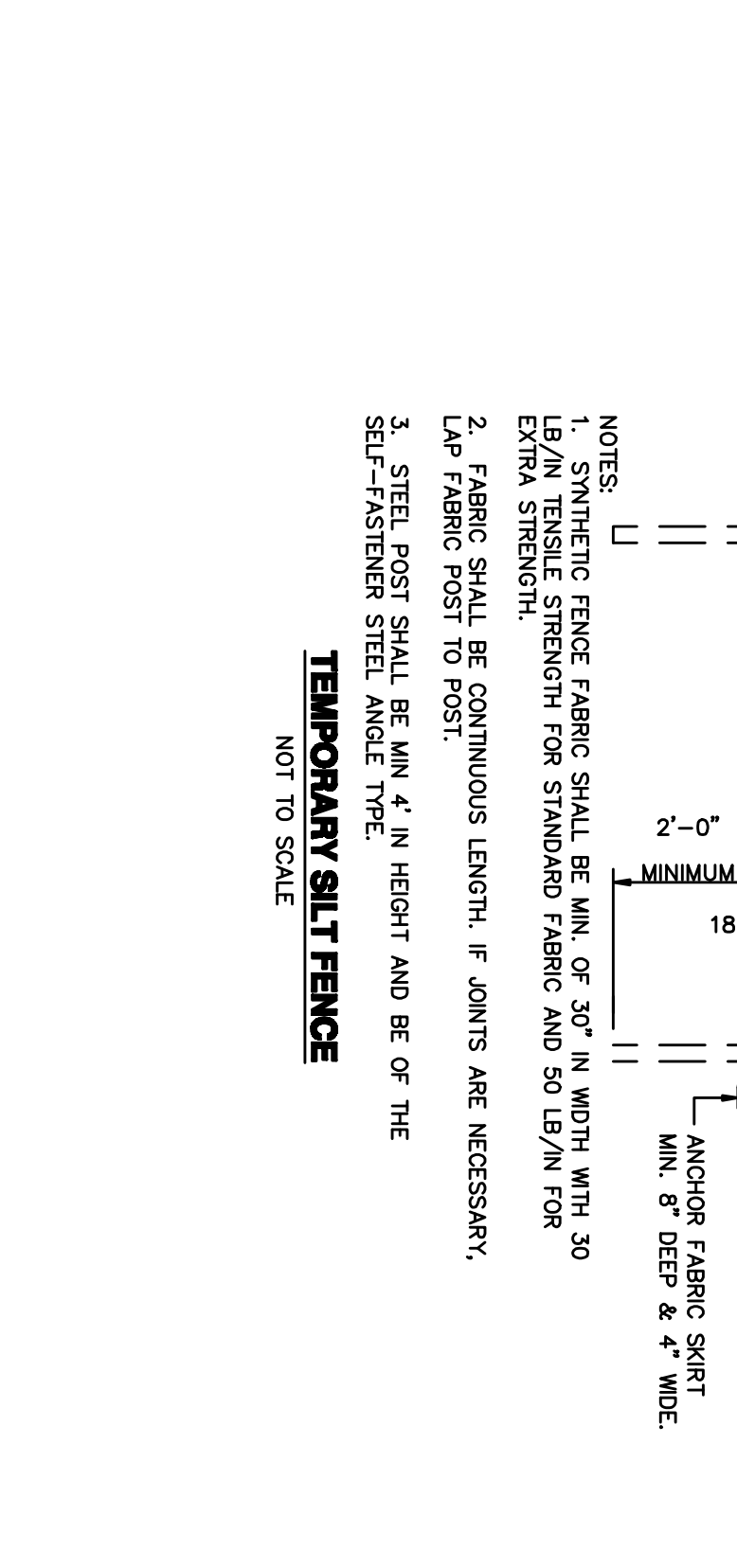
SILT SACK
NOTES:
1. SILT SACK SHALL BE MANUFACTURED BY A REPUTABLE MANUFACTURER.
2. SILT SACK SHALL BE MADE OF 100% POLYPROPYLENE.
3. SILT SACK SHALL BE 18" WIDE BY 12" HIGH.
4. SILT SACK SHALL BE 12" LONG.
5. SILT SACK SHALL BE 1/2" THICK.
6. SILT SACK SHALL BE 1/2" THICK.
7. SILT SACK SHALL BE 1/2" THICK.
8. SILT SACK SHALL BE 1/2" THICK.
9. SILT SACK SHALL BE 1/2" THICK.
10. SILT SACK SHALL BE 1/2" THICK.

SILT SACK
NOTES:
1. SILT SACK SHALL BE MANUFACTURED BY A REPUTABLE MANUFACTURER.
2. SILT SACK SHALL BE MADE OF 100% POLYPROPYLENE.
3. SILT SACK SHALL BE 18" WIDE BY 12" HIGH.
4. SILT SACK SHALL BE 12" LONG.
5. SILT SACK SHALL BE 1/2" THICK.
6. SILT SACK SHALL BE 1/2" THICK.
7. SILT SACK SHALL BE 1/2" THICK.
8. SILT SACK SHALL BE 1/2" THICK.
9. SILT SACK SHALL BE 1/2" THICK.
10. SILT SACK SHALL BE 1/2" THICK.



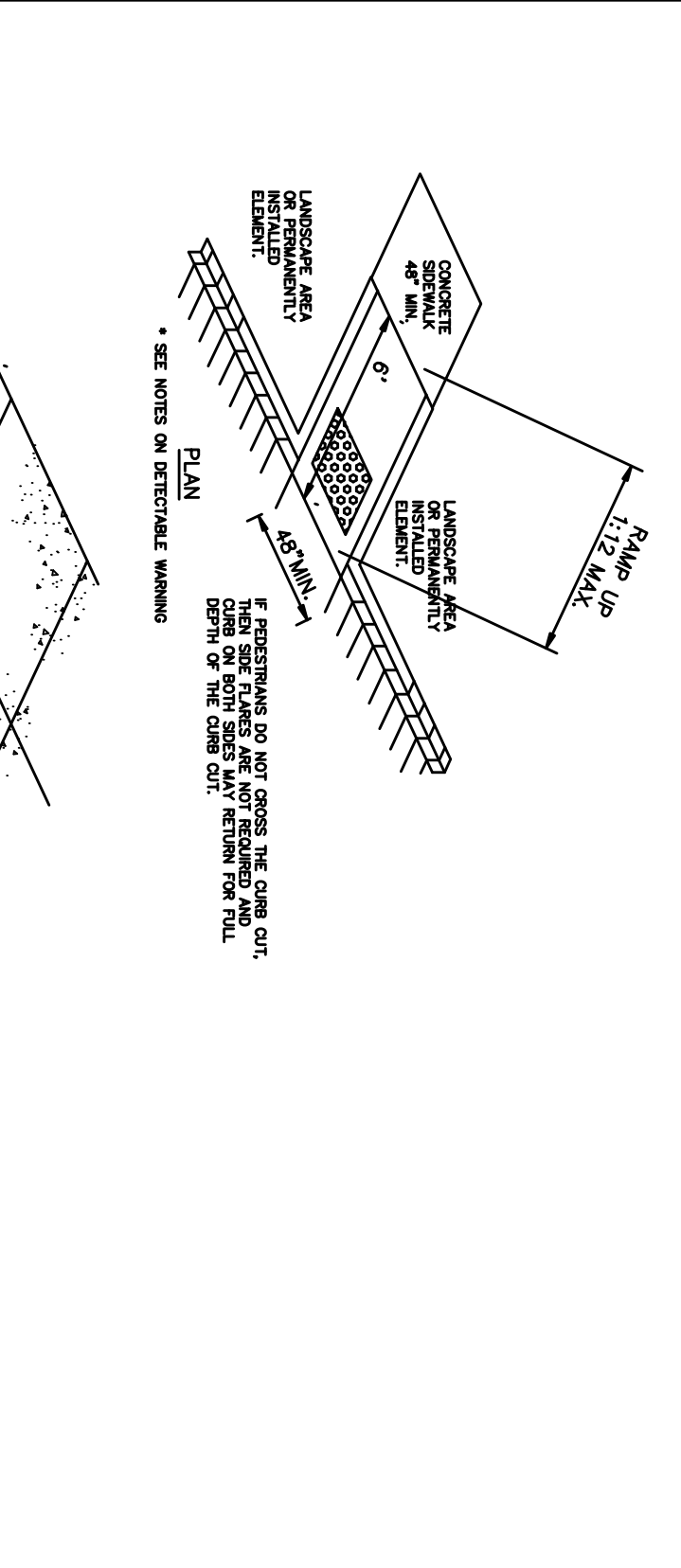
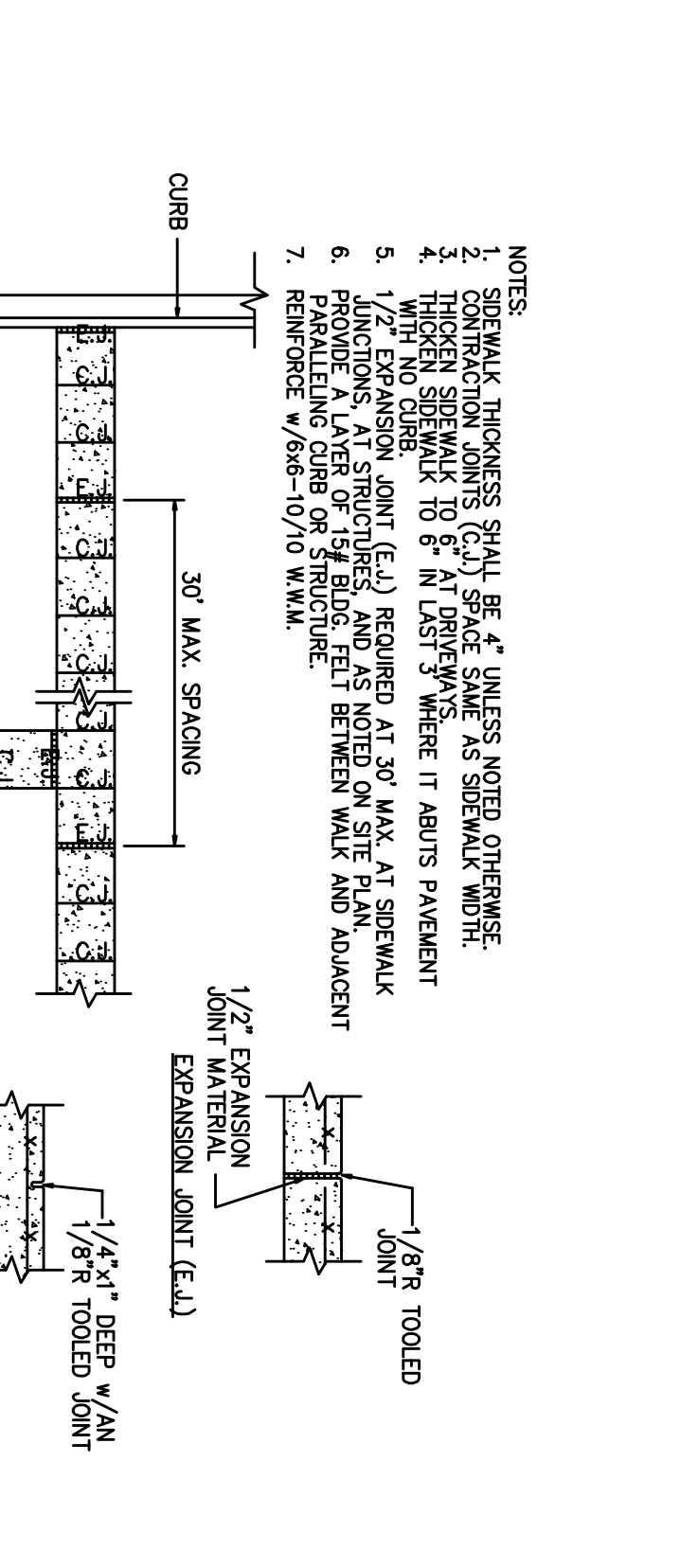
METHOD OF TREE PROTECTION
NOTES:
1. CLEARLY MARK THE TREE TO BE PROTECTED.
2. ERECT A PROTECTIVE BARRIER AT THE DRIPLINE.
3. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
4. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
5. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
6. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
7. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
8. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
9. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
10. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.

METHOD OF TREE PROTECTION
NOTES:
1. CLEARLY MARK THE TREE TO BE PROTECTED.
2. ERECT A PROTECTIVE BARRIER AT THE DRIPLINE.
3. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
4. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
5. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
6. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
7. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
8. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
9. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.
10. THE BARRIER SHALL BE 1/2" HIGH ABOVE GROUND.



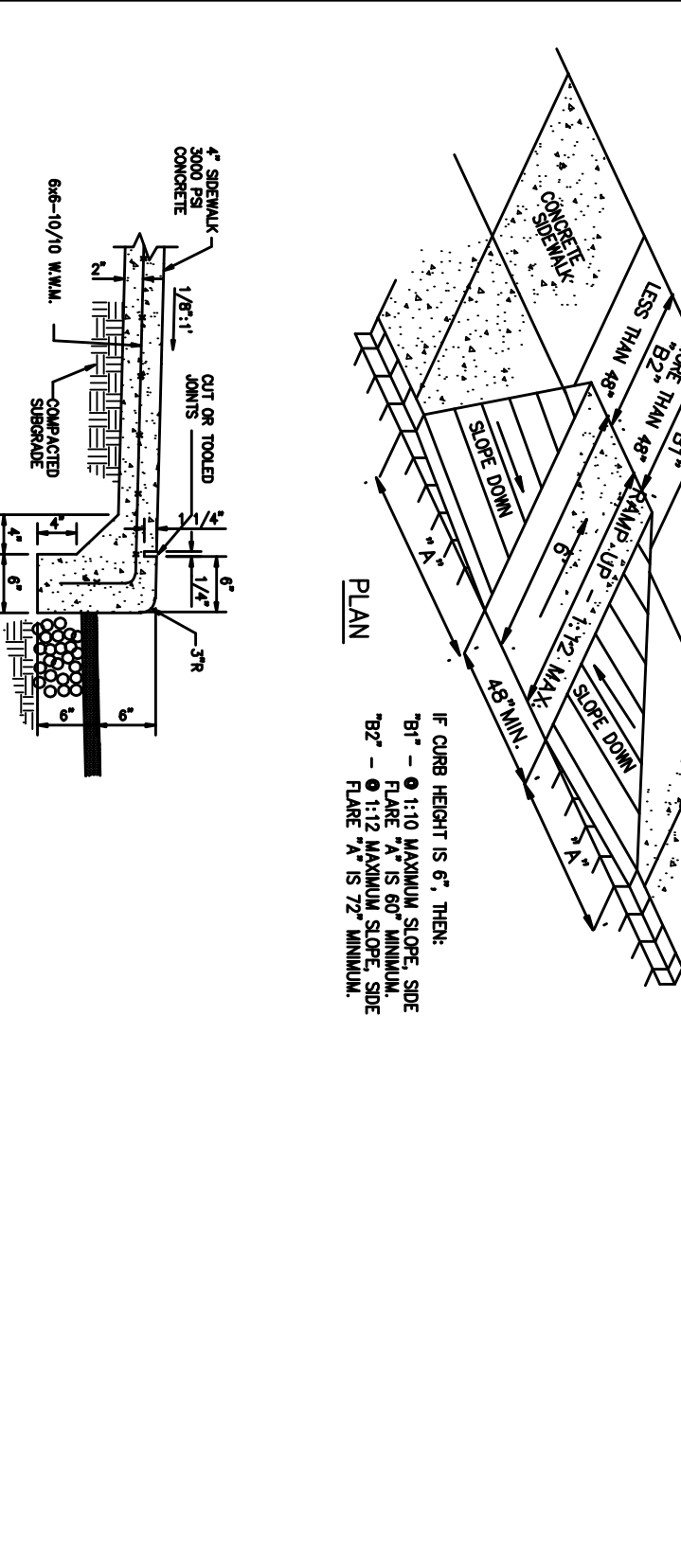
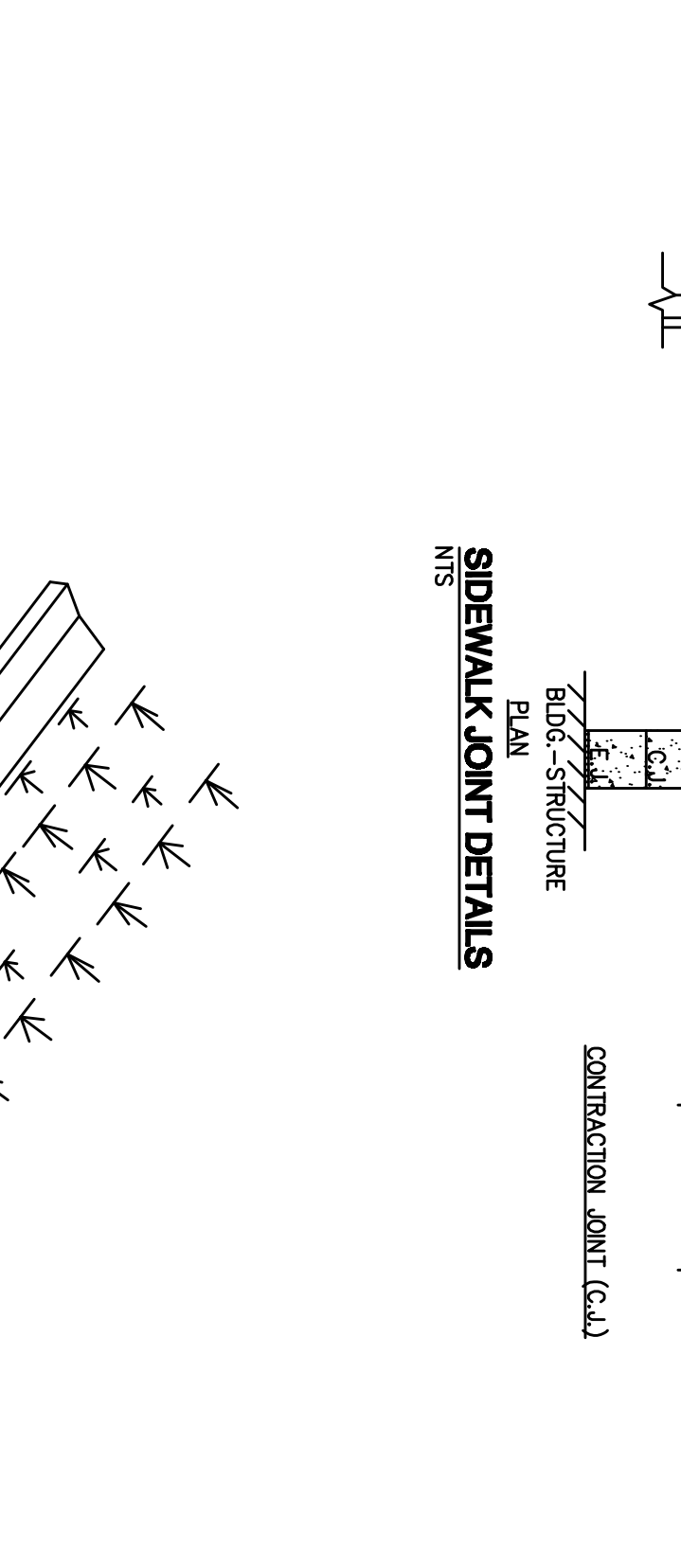
ASPHALT PAVEMENT REPAIR DETAIL FOR UTILITY INSTALLATIONS
NOTES:
1. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
2. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
3. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
4. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
5. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
6. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
7. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
8. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
9. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
10. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.

ASPHALT PAVEMENT REPAIR DETAIL
NOTES:
1. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
2. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
3. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
4. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
5. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
6. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
7. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
8. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
9. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.
10. ASPHALT PAVEMENT REPAIR SHALL BE COMPLETED WITHIN THE SAME DAY.



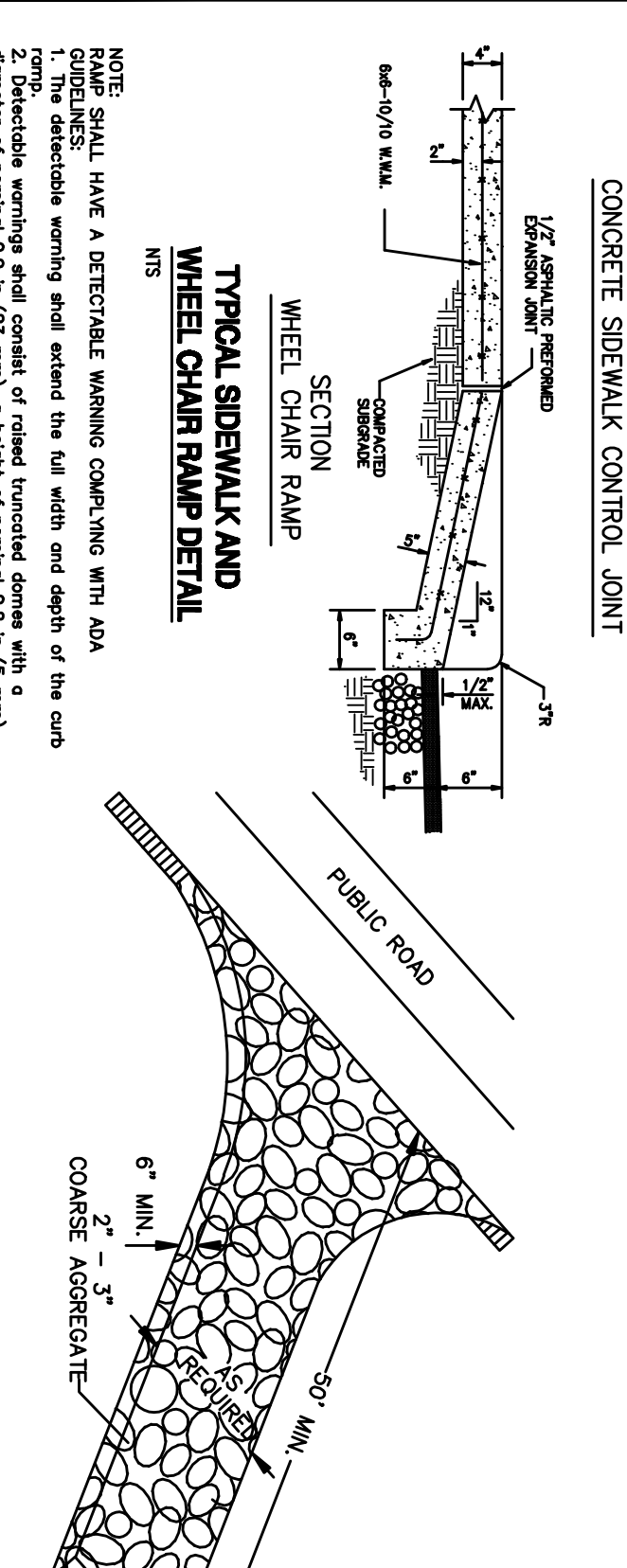
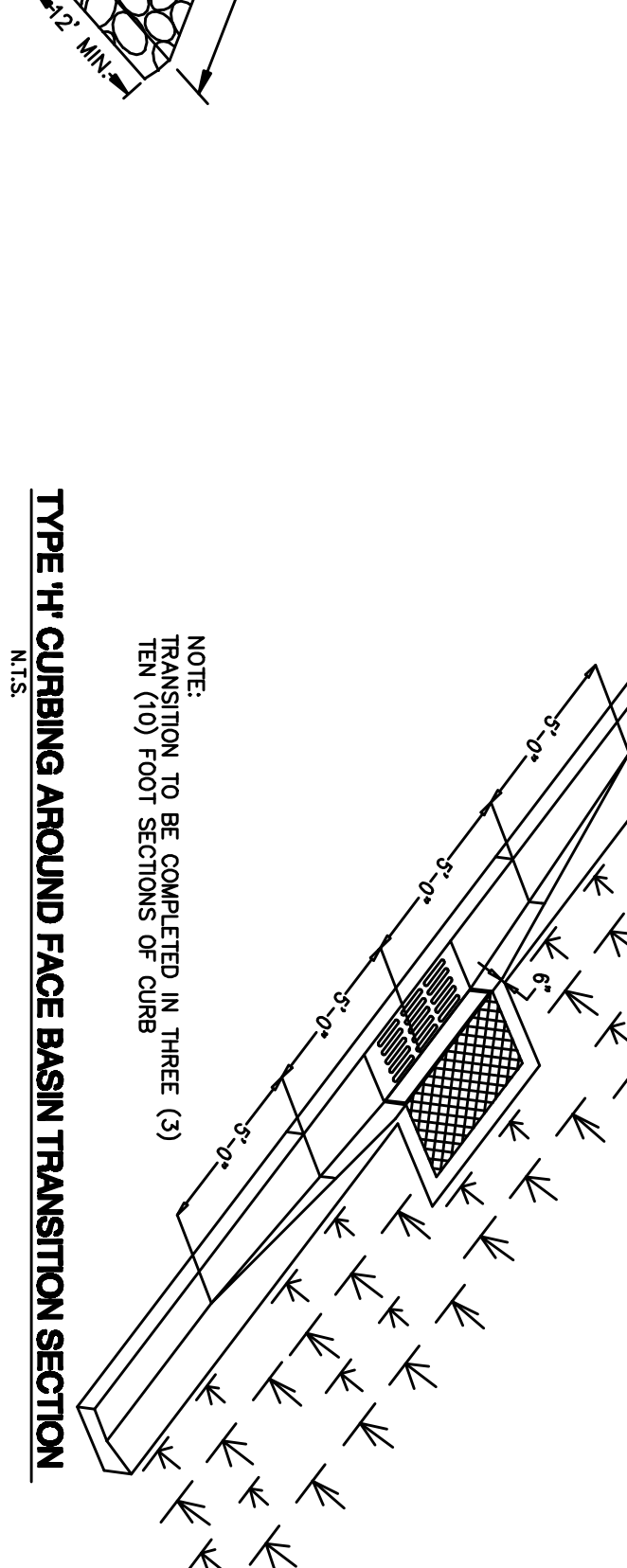
SIDEWALK JOINT DETAILS
NOTES:
1. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
2. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
3. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
4. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
5. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
6. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
7. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
8. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
9. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
10. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.

SIDEWALK JOINT DETAILS
NOTES:
1. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
2. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
3. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
4. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
5. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
6. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
7. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
8. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
9. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.
10. SIDEWALK JOINTS SHALL BE COMPLETED WITHIN THE SAME DAY.



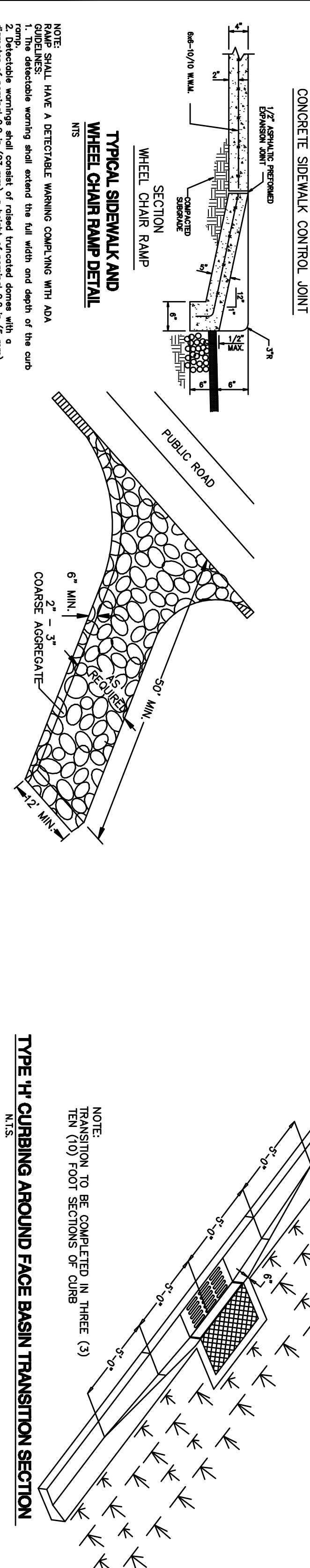
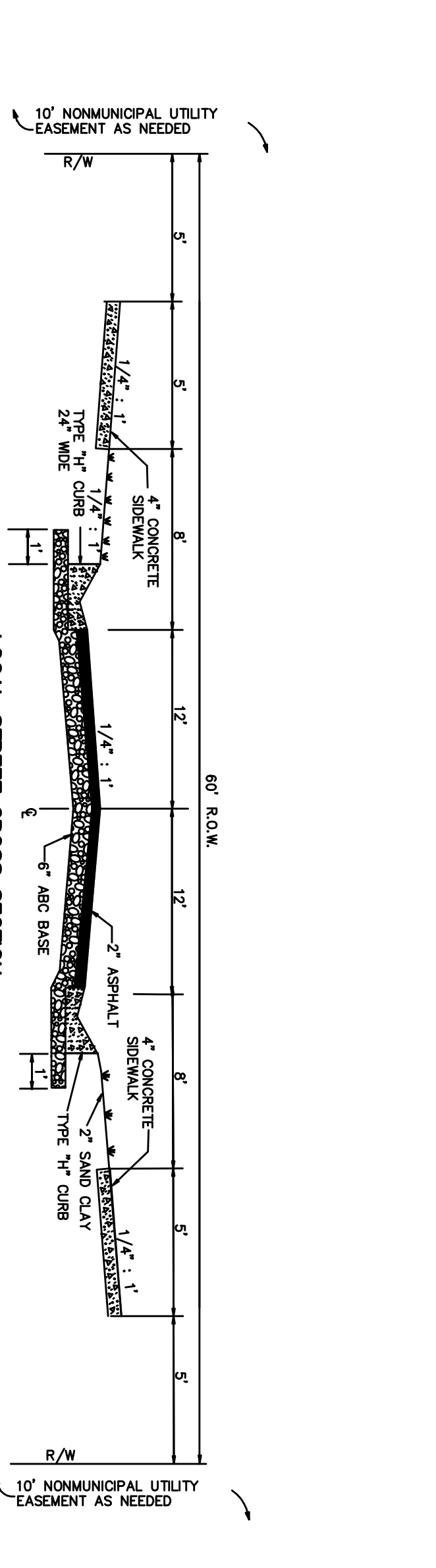
TYPICAL SIDEWALK AND WHEEL CHAIR RAMP DETAIL
NOTES:
1. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
2. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
3. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
4. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
5. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
6. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
7. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
8. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
9. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
10. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.

TYPICAL SIDEWALK AND WHEEL CHAIR RAMP DETAIL
NOTES:
1. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
2. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
3. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
4. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
5. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
6. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
7. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
8. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
9. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.
10. WHEEL CHAIR RAMP SHALL BE COMPLETED WITHIN THE SAME DAY.



TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE
NOTES:
1. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
2. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
3. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
4. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
5. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
6. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
7. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
8. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
9. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
10. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.

TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE
NOTES:
1. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
2. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
3. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
4. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
5. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
6. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
7. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
8. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
9. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.
10. TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE SHALL BE COMPLETED WITHIN THE SAME DAY.



LOCAL STREET CROSS SECTION MODIFIED FROM CITY SP 1-01
NOTES:
1. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
2. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
3. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
4. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
5. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
6. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
7. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
8. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
9. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
10. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.

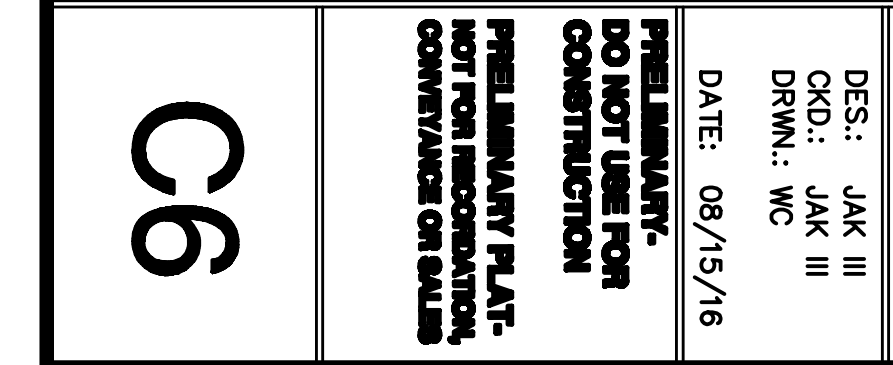
LOCAL STREET CROSS SECTION MODIFIED FROM CITY SP 1-01
NOTES:
1. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
2. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
3. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
4. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
5. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
6. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
7. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
8. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
9. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.
10. LOCAL STREET CROSS SECTION SHALL BE COMPLETED WITHIN THE SAME DAY.

15010
DATE: 08/15/16
DRW: JAK III
CHK: JAK III
APP: JAK III
DO NOT USE FOR CONSTRUCTION
PRELIMINARY PLAN - FOR CONSTRUCTION ONLY

Kuske3 Engineering, PLLC
LICENSE No. P-0809
John A. Kuske, III P.E.
OWNER
PO BOX 481 FERRIS (919) 471-4611
WILMINGTON, NC 28406 kuske3@kuske3eng.com
CIVIL ENGINEERING - LAND PLANNING
CONSULTING - PROJECT MANAGEMENT

Property Owner/Developer:
M & M Developers, Inc.
PO BOX 2251
Long Beach Township, NJ 08008

NOTES AND DETAIL SHEET
WINDEMERE PARK SUBDIVISION - WINDEMERE ROAD
WILMINGTON, NC
NEW HANOVER COUNTY, NC



City of Wilmington
City Engineer
City Manager
City Clerk
City Treasurer
City Attorney
City Public Works Director
City Public Works Engineer
City Public Works Inspector
City Public Works Assistant
City Public Works Office
City Public Works Building
City Public Works Phone
City Public Works Fax
City Public Works Website
City Public Works Email
City Public Works Address
City Public Works State
City Public Works Zip
City Public Works Country

For each open utility cut of City streets, a \$225 permit shall be required from the City prior to occupying any street project occupation.

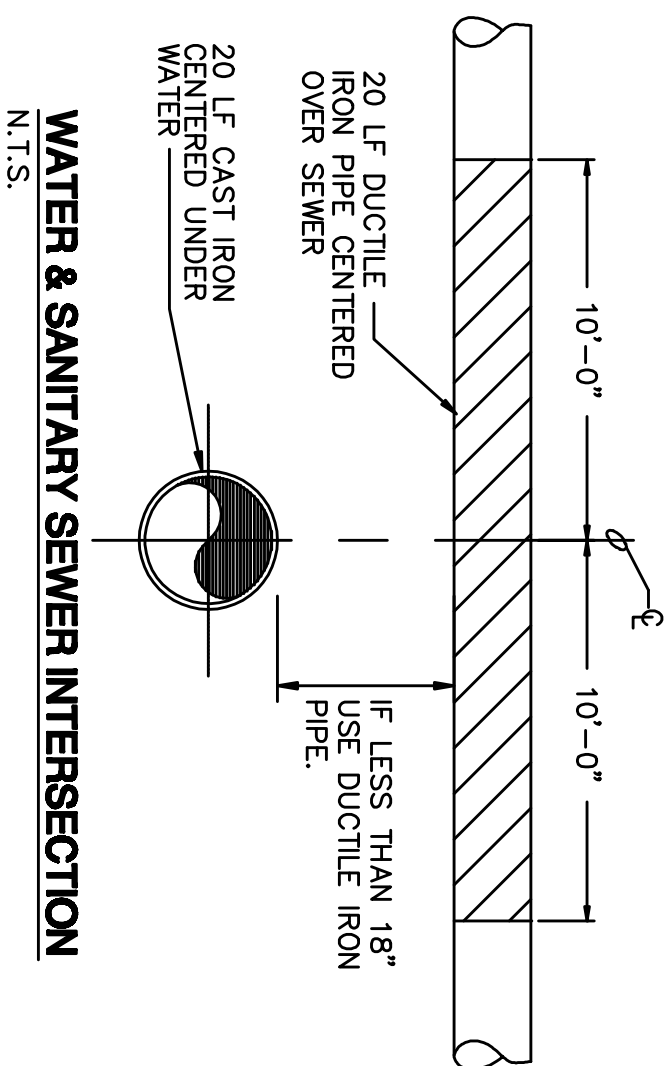
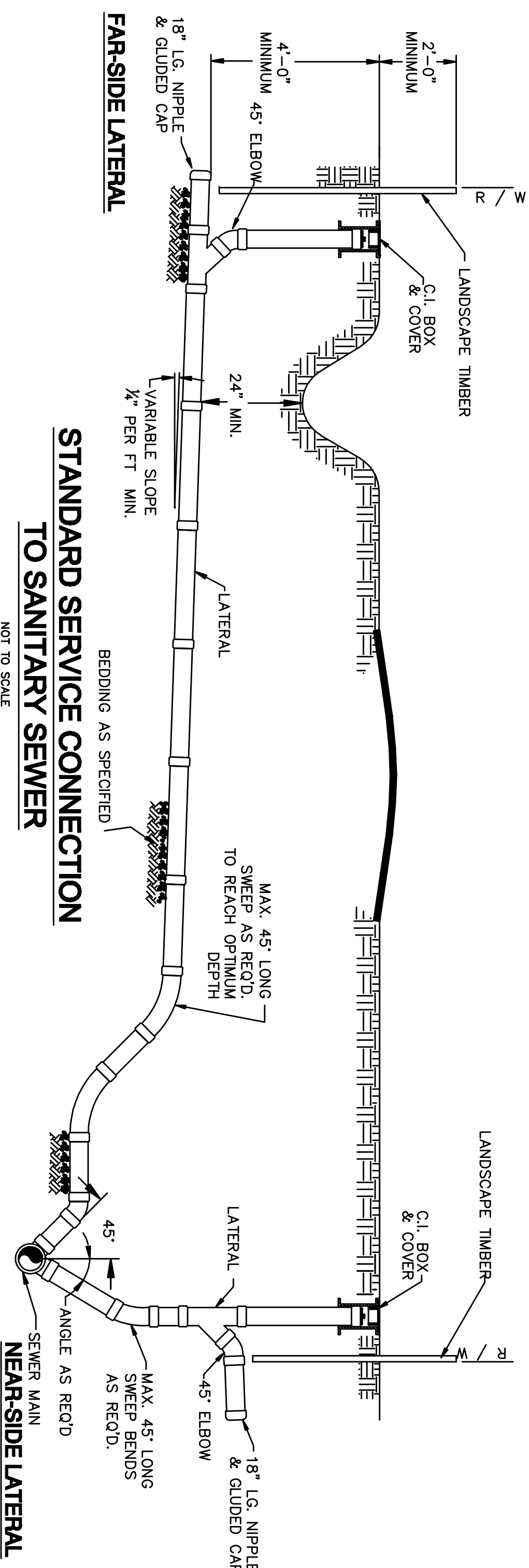
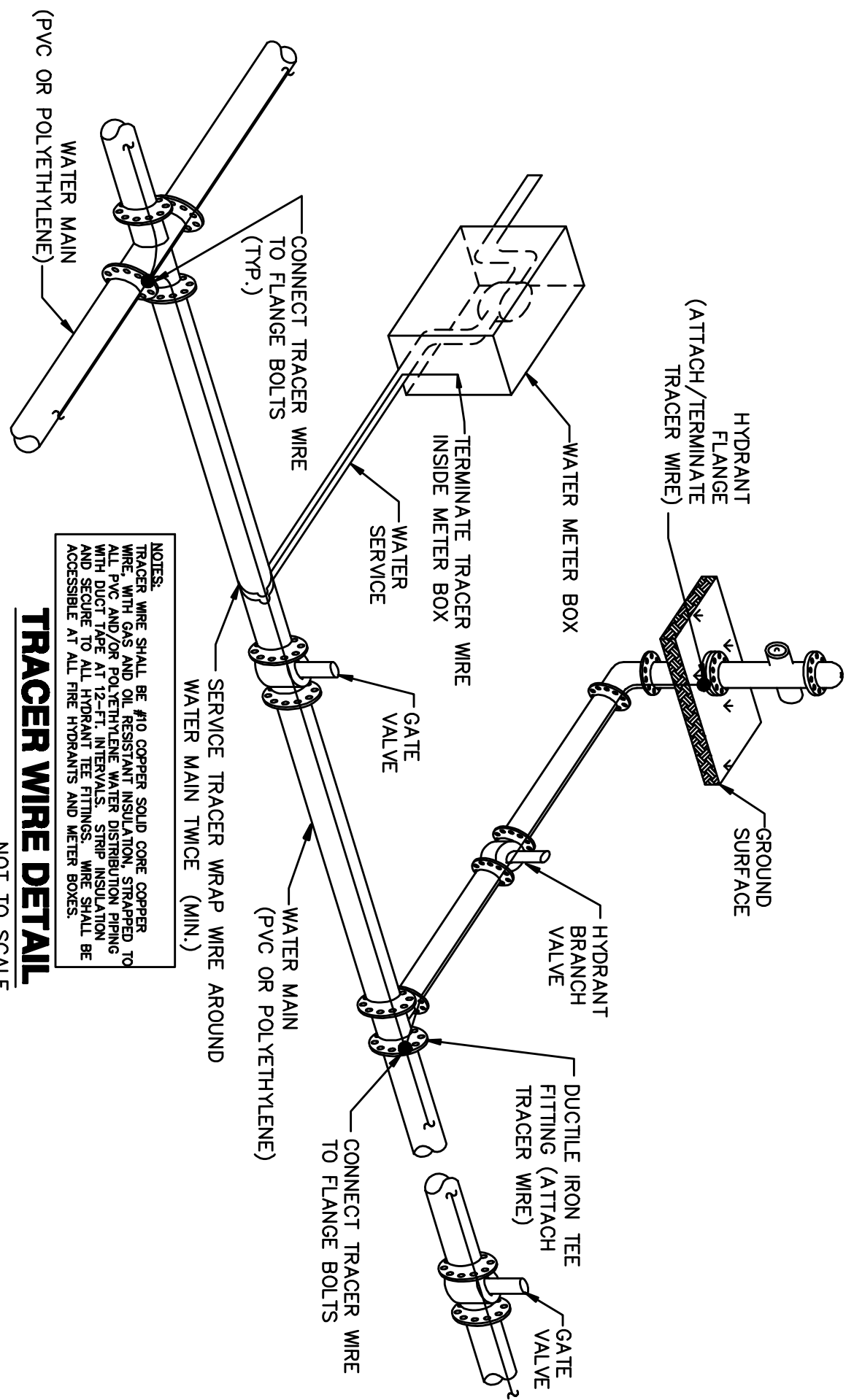
INDUSTRIAL PIPES WATER PERMIT # _____ DATE _____
 WATER CATCHMENT _____ DATE _____
 DWG SEWER PERMIT # _____ DATE _____
 SEWER CATCHMENT _____ DATE _____
 SEWER SCHED # AND PLAN: _____
 SEWER TO LOW THROUGH LINES: YES or NO (CIRCLE ONE)

Approved Construction Plan
 Name _____ Date _____
 Permit # _____
 Public Utilities _____
 Title _____

STORMWATER MANAGEMENT PLAN
 APPROVED
 CITY OF WILMINGTON
 ENGINEERING DEPARTMENT
 DATE _____ PERMIT # _____
 SIGNED _____



SYMBOL	DATE	DESCRIPTION	BY
REVISIONS			
©2016 KUSKE3 ENGINEERING, PLLC			



Kuske3 Engineering, PLLC
 LICENSE No. P-0009
 John A. Kuske, III P.E.
 OWNER

PO BOX 481 FERRIS (919) 711-4941
 WILMINGTON, NC 28406 jkuske@kuske3eng.com
 CIVIL ENGINEERING - LAND PLANNING
 CONSULTING - PROJECT MANAGEMENT

Property Owner/Developer:
M & M Developers, Inc.
 PO BOX 2251
 Long Beach Township, NJ 08008

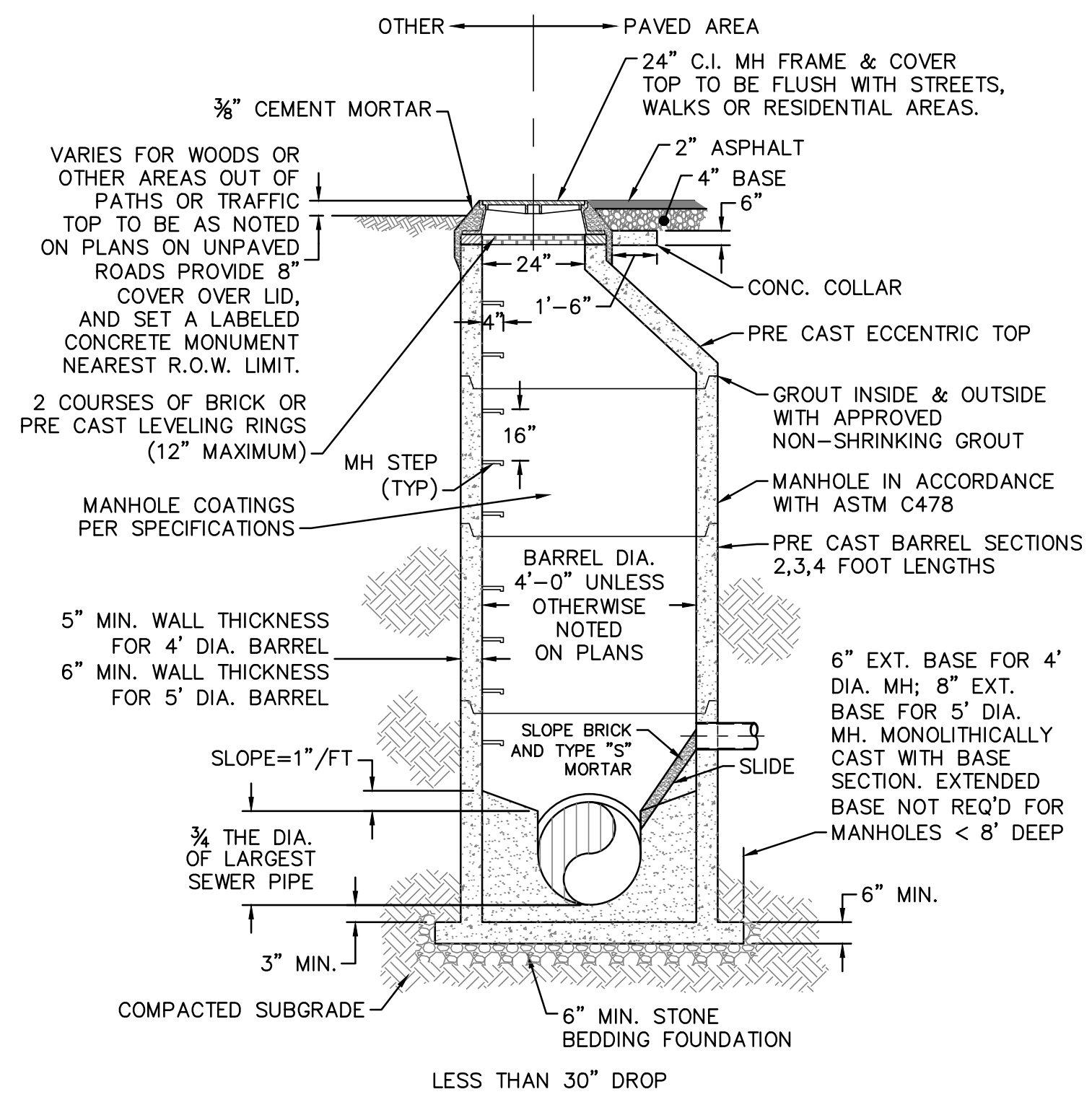
WATER AND SEWER DETAIL SHEETS
WINDEMERE PARK SUBDIVISION - WINDEMERE ROAD
WILMINGTON, NC
NEW HANOVER COUNTY, NC

15010

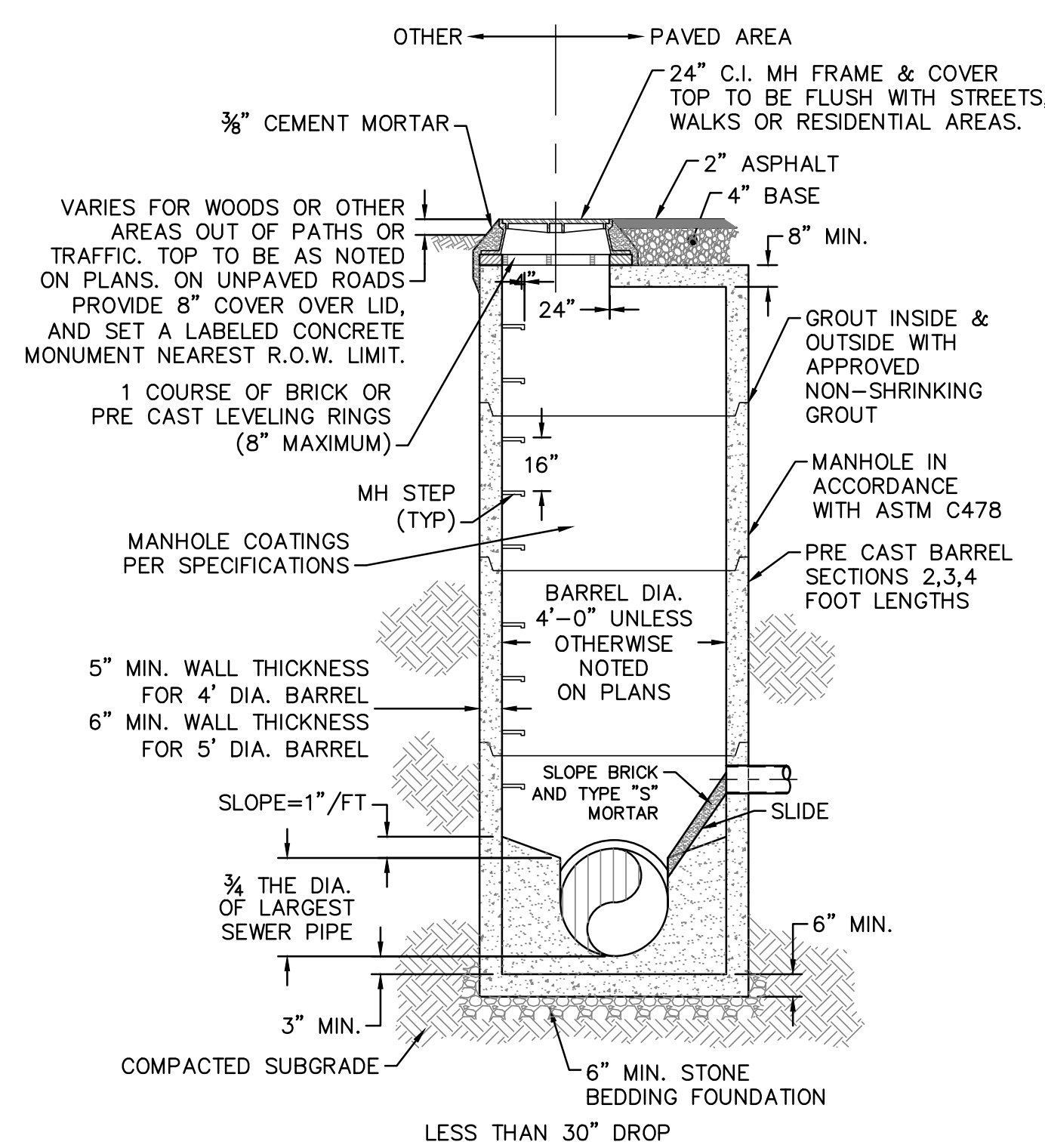
DES: JAK III
 DRWN: JAK III
 DATE: 08/15/16

PRELIMINARY - DO NOT USE FOR CONSTRUCTION
FINAL SEWER PLAN - CONSTRUCTION ONLY

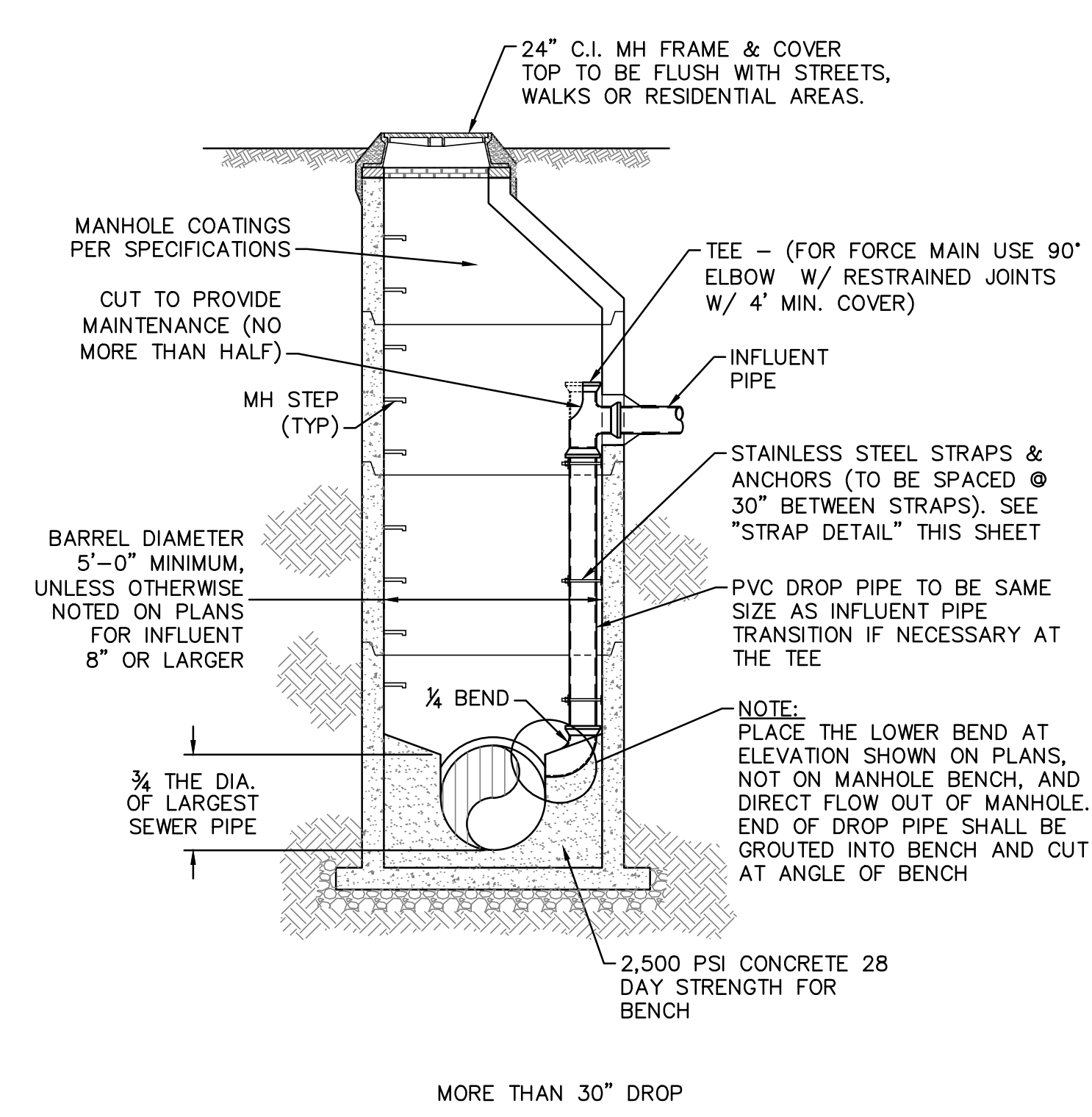
C7



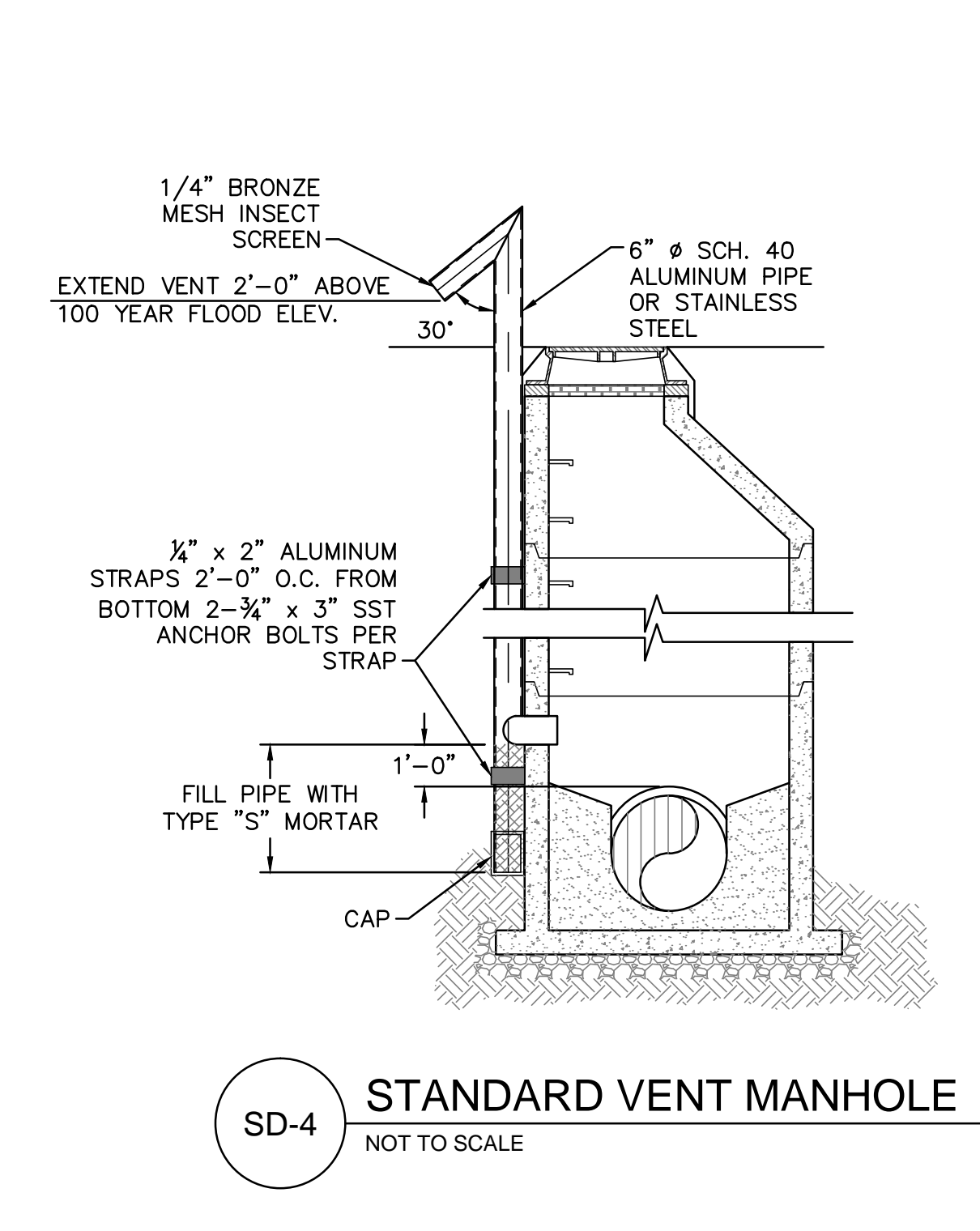
SD-1 PRECAST CONCRETE OFFSET MANHOLE TYPICAL
NOT TO SCALE



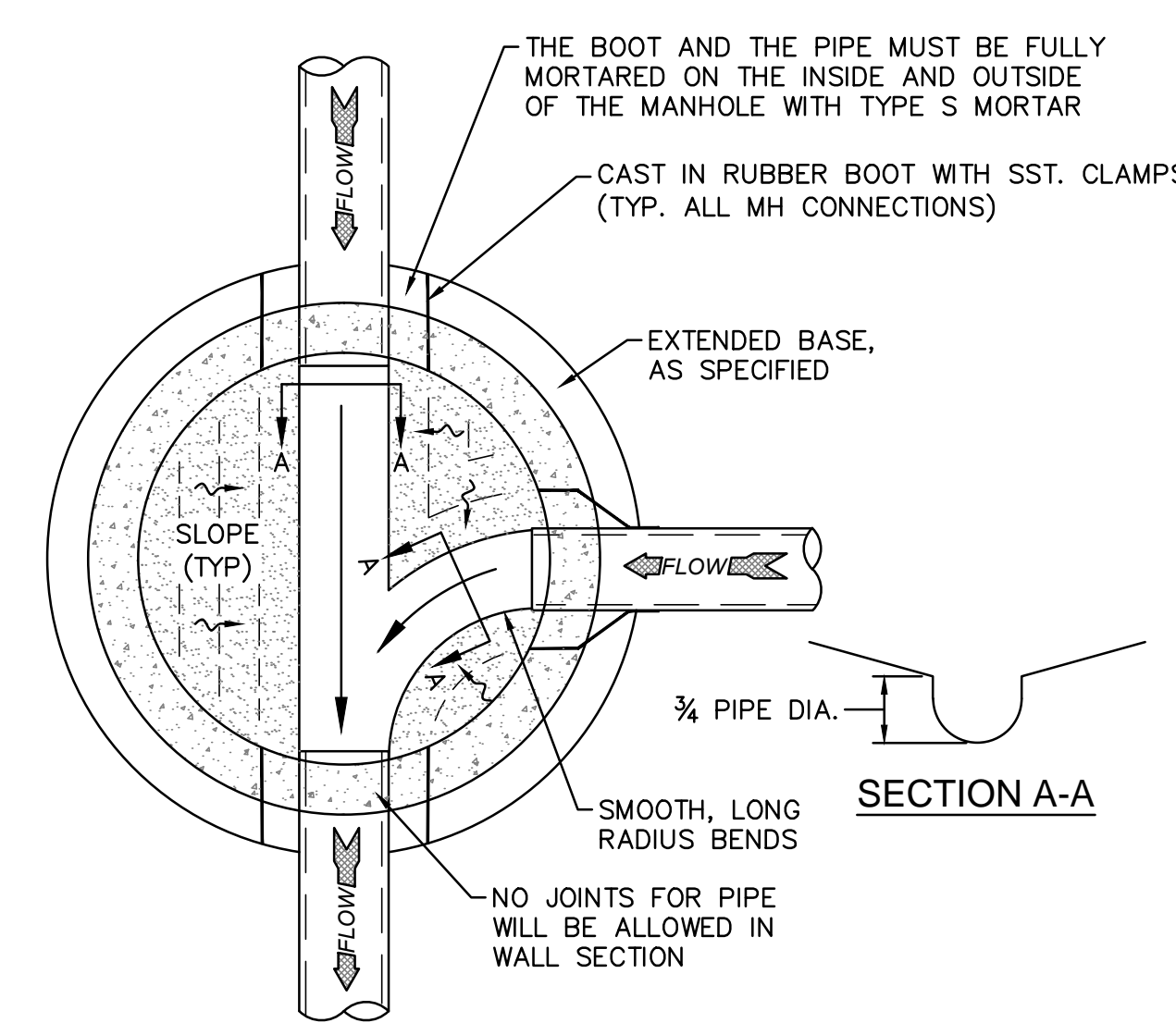
SD-2 PRECAST CONCRETE FLAT TOP MANHOLE TYPICAL
NOT TO SCALE



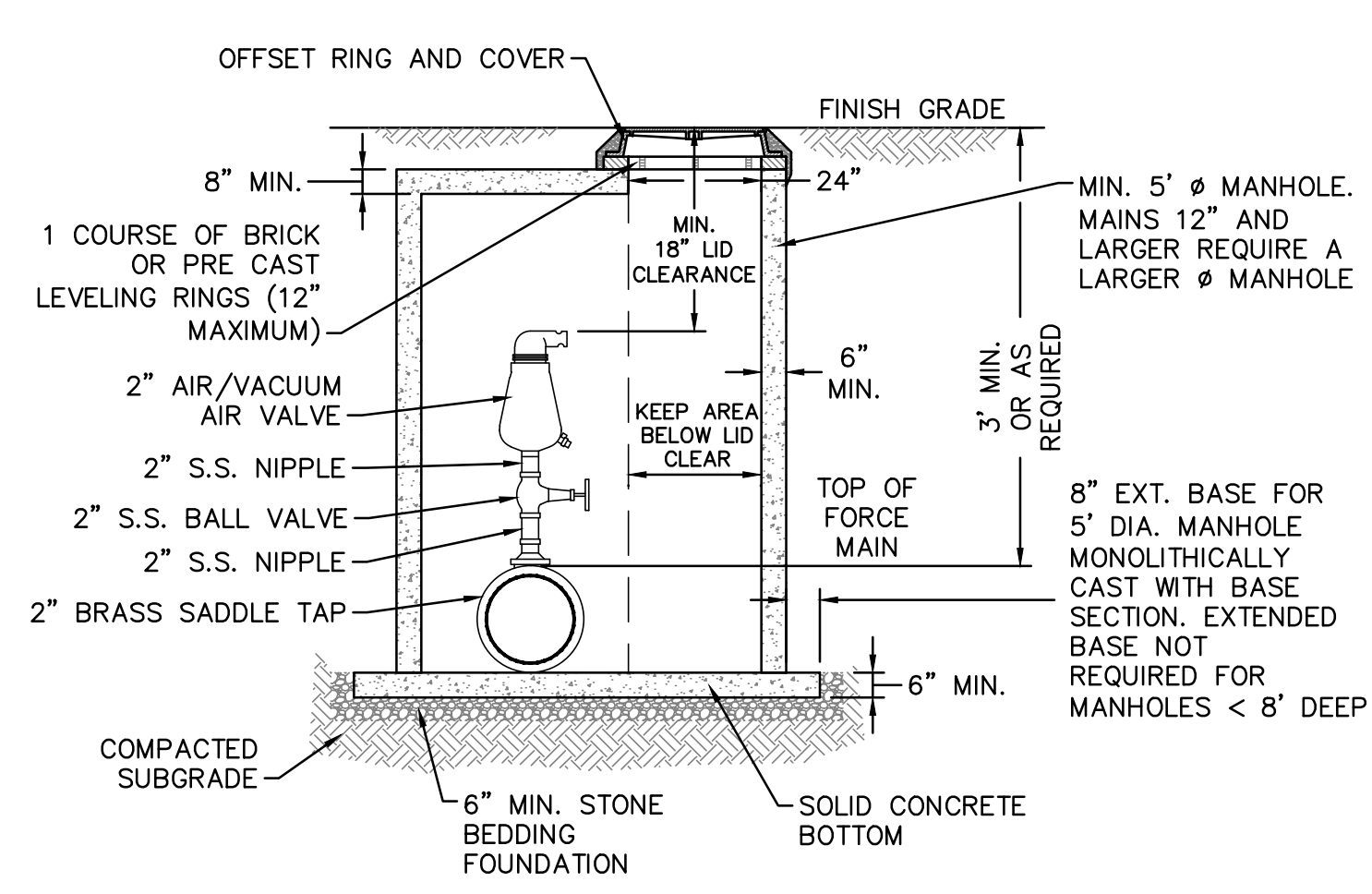
SD-3 DROP MANHOLE
NOT TO SCALE



SD-4 STANDARD VENT MANHOLE
NOT TO SCALE

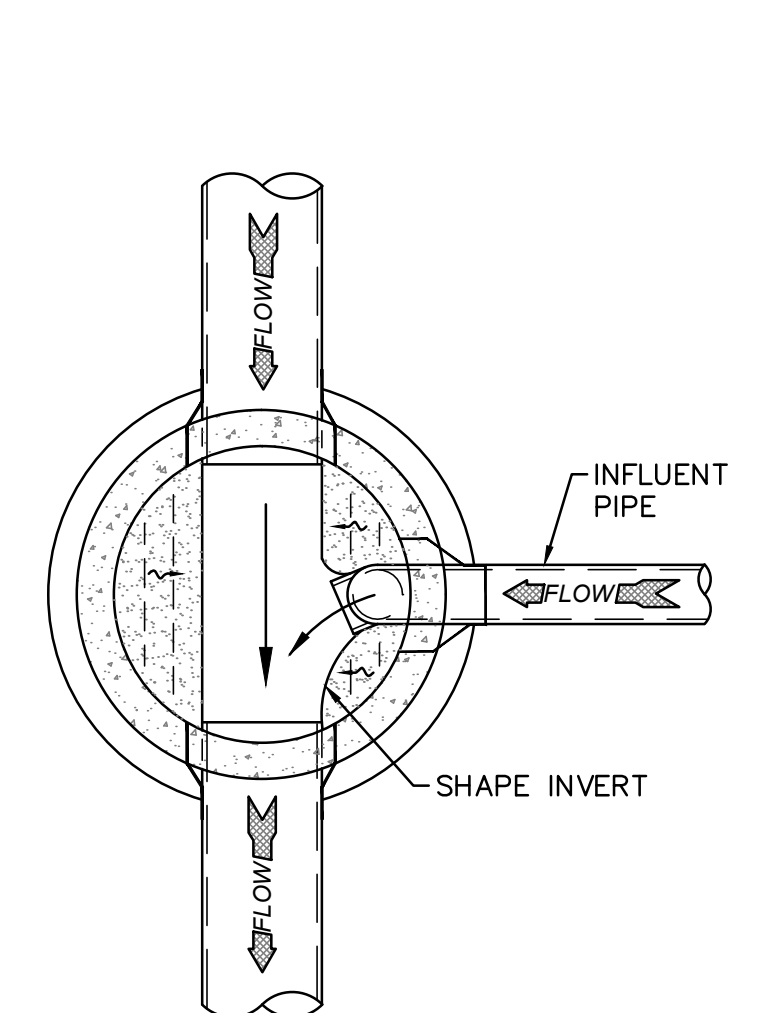


SD-5 MANHOLE FLOOR PLAN
NOT TO SCALE

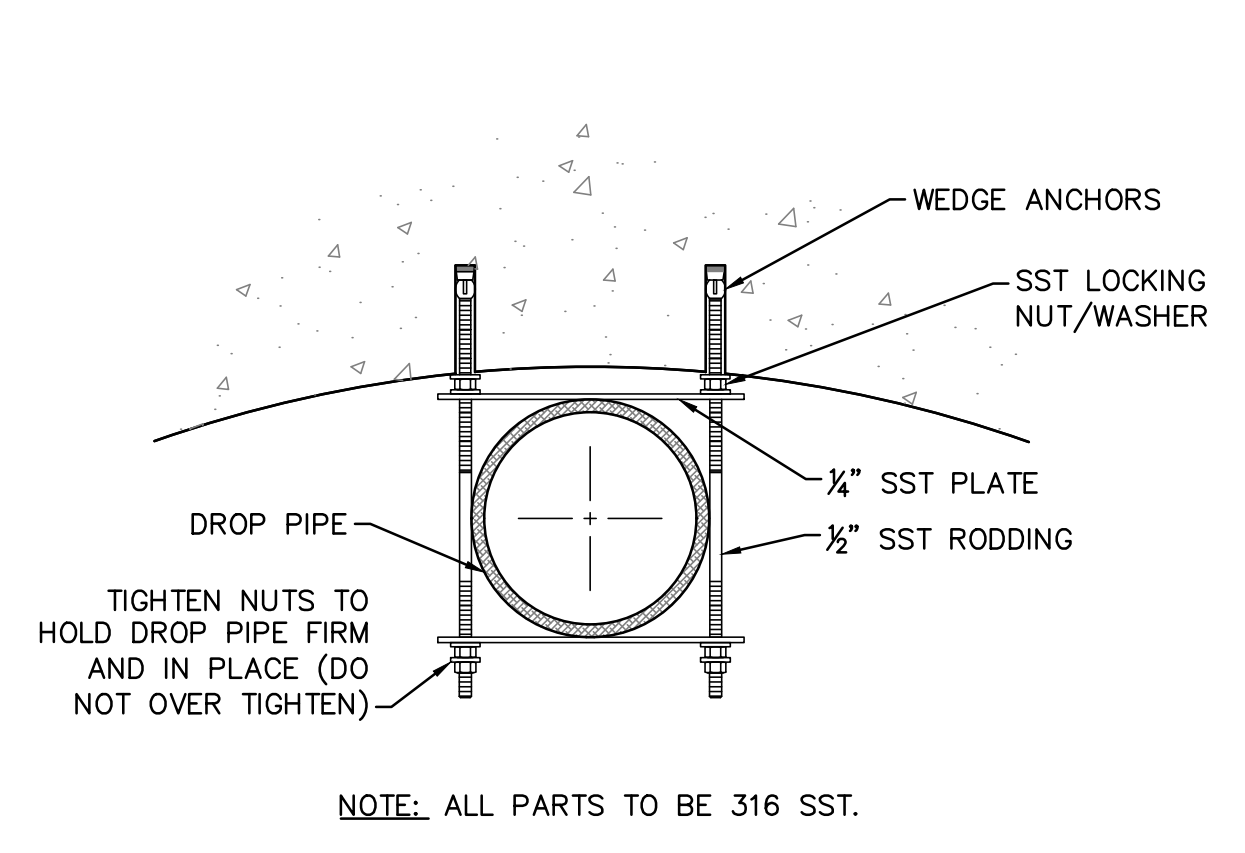


NOTES:
 1. CONTRACTOR TO INSTALL VALVE AND MANHOLE AT SUFFICIENT DEPTH TO ALLOW FOR ACCESS.
 2. FORCE MAIN TO BE OFFSET IN MANHOLE TO KEEP AREA BELOW LID CLEAR.
 3. REFER TO SPECIFICATIONS FOR ADDITIONAL DETAILS.
 4. USE CAST IN RUBBER BOOT WITH SST. CLAMPS FOR ALL MH CONNECTIONS, INCLUDING FORCE MAIN.

SD-6 AIR/ VACUUM AND AIR RELEASE COMBINATION VALVE
NOT TO SCALE



SD-7 DROP MANHOLE FLOOR PLAN
NOT TO SCALE



SD-8 STRAP DETAIL
NOT TO SCALE

- CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD NOTES:**
- SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
 - WATER AND SEWER SERVICES SHALL BE PERPENDICULAR TO MAIN AND TERMINATE AT RIGHT-OF-WAY LINE. SEWER SERVICES IN CUL-DE-SACS ARE REQUIRED TO BE PERPENDICULAR, OR MUST ORIGINATE IN END OF LINE MANHOLE AND TERMINATE AT RIGHT-WAY LINE.
 - ALL SERVICES TYING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF CLASS 50, DIP, WITH PROTECTO 401 CERAMIC EPOXY LINING.
 - MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
 - NO FLEXIBLE COUPLINGS SHALL BE USED.
 - ALL STAINLESS STEEL FASTENERS SHALL BE 316.
 - CLEANOUTS SHALL BE LOCATED A MINIMUM OF 12 FEET FROM ALL PROPERTY CORNERS. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.

SD-9 STANDARD NOTES
(REQUIRED ON ALL PLAN AND PROFILE SHEETS)

- GENERAL NOTES:**
- NO EXCAVATED MATERIAL SHALL BE PLACED IN ANY STREAM, DITCH OR DRAINAGE-WAY.
 - THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES BEFORE ANY CONSTRUCTION BEGINS.
 - THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES WHILE CONSTRUCTION IS IN PROGRESS.
 - THE CONTRACTOR IS RESPONSIBLE FOR STABILIZATION OF ALL DISTURBED AREAS.
 - THE CONTRACTOR IS RESPONSIBLE FOR LAY DOWN AND STOCKPILE AREAS (TO ARRANGE AND ENSURE COMPLIANCE WITH ALL LOCAL AND STATE REGULATIONS).

THE DETAILS SHOWN HEREON SUPERCEDE CFPUA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04

THESE DETAILS ARE A WORK PRODUCT OF CFPUA FOR SEWER SYSTEM DESIGN AND CONSTRUCTION AND HAVE BEEN REVIEWED AND APPROVED FOR CONTENT AND GENERAL CONFORMANCE WITH THE SEWER DESIGN FOR THIS PROJECT.

REV:	DESCRIPTION:	DATE:
1	AIR / VACUUM AND AIR RELEASE COMBINATION VALVE REVISED	10/26/12
2	STANDARD SEWER NOTE #6 REVISED	12/10/12
3	REVISED STANDARD VENT MANHOLE TO EXTEND VENT 2'-0" ABOVE 100 YR FLOOD	11/20/14
4	Revised Multiple Details	02/15/16

CFPUA SANITARY SEWER

STANDARD DETAILS

CAPE FEAR PUBLIC UTILITY AUTHORITY
235 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403
OFFICE: (910)332-6560

Stewardship. Sustainability. Service.

DATE:
1/9/12

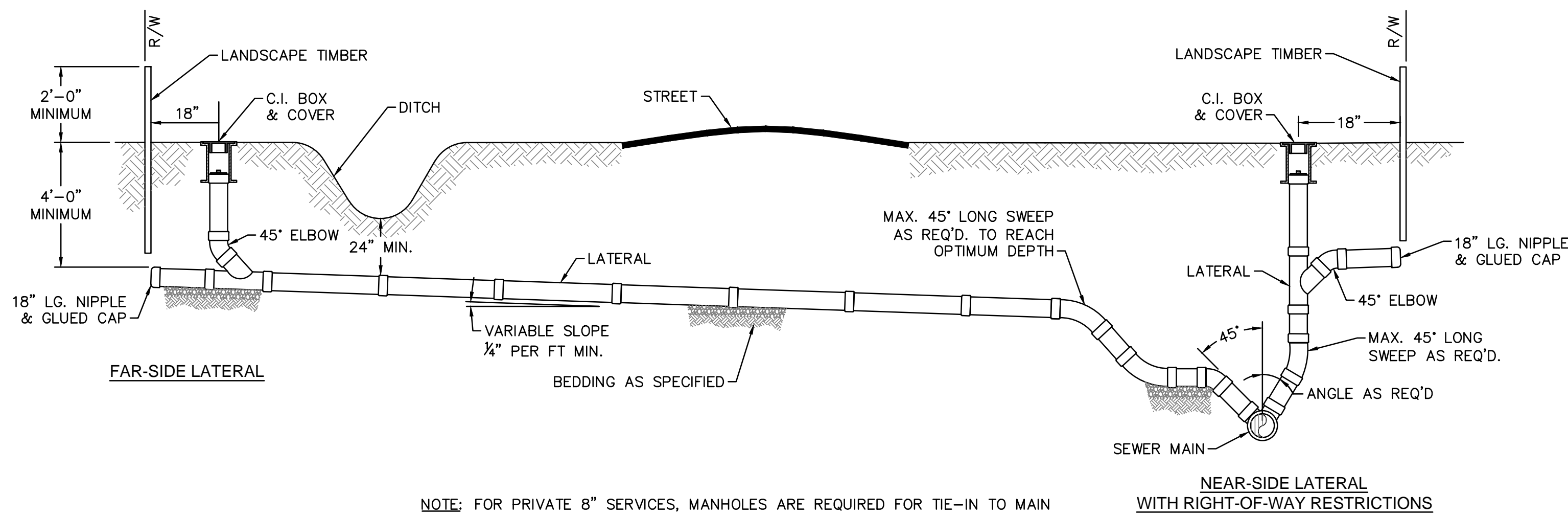
SCALE:
N/A

DRAWN BY:
CFPUA

CHECKED BY:
CFPUA

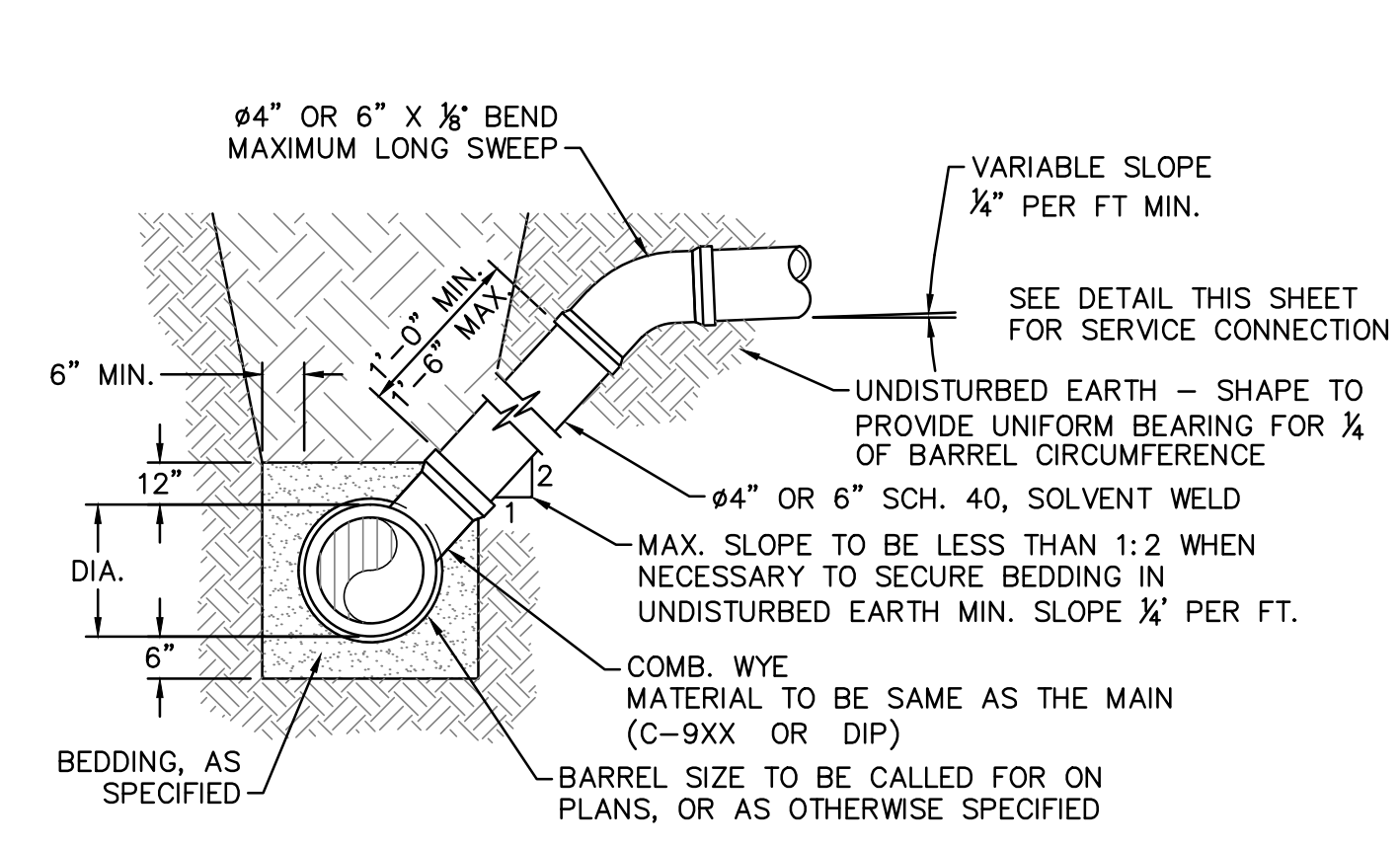
PROJECT NO.:

SHEET NO:
SSD-1



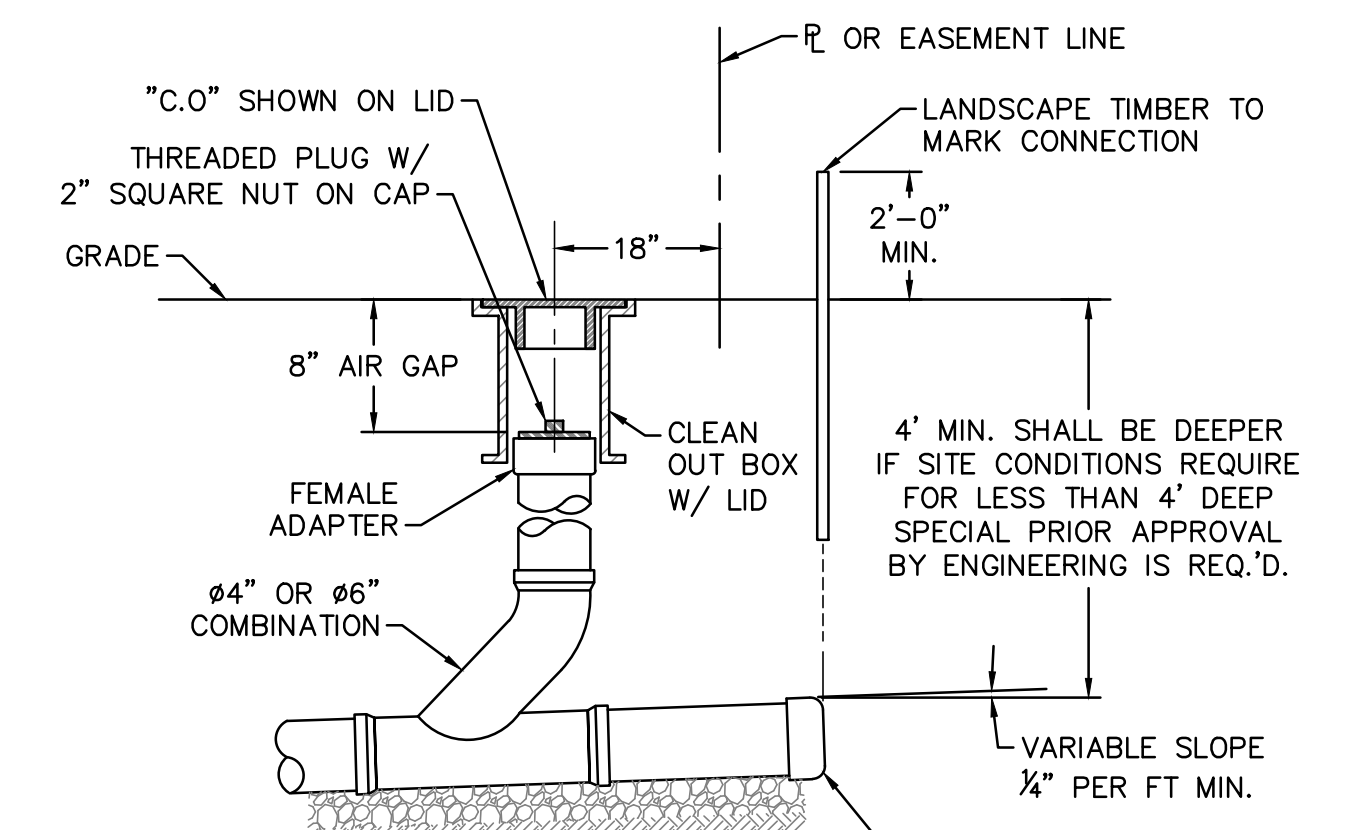
NOTE: FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR TIE-IN TO MAIN

SD-19 STANDARD SERVICE CONNECTION TO SANITARY SEWER
NOT TO SCALE



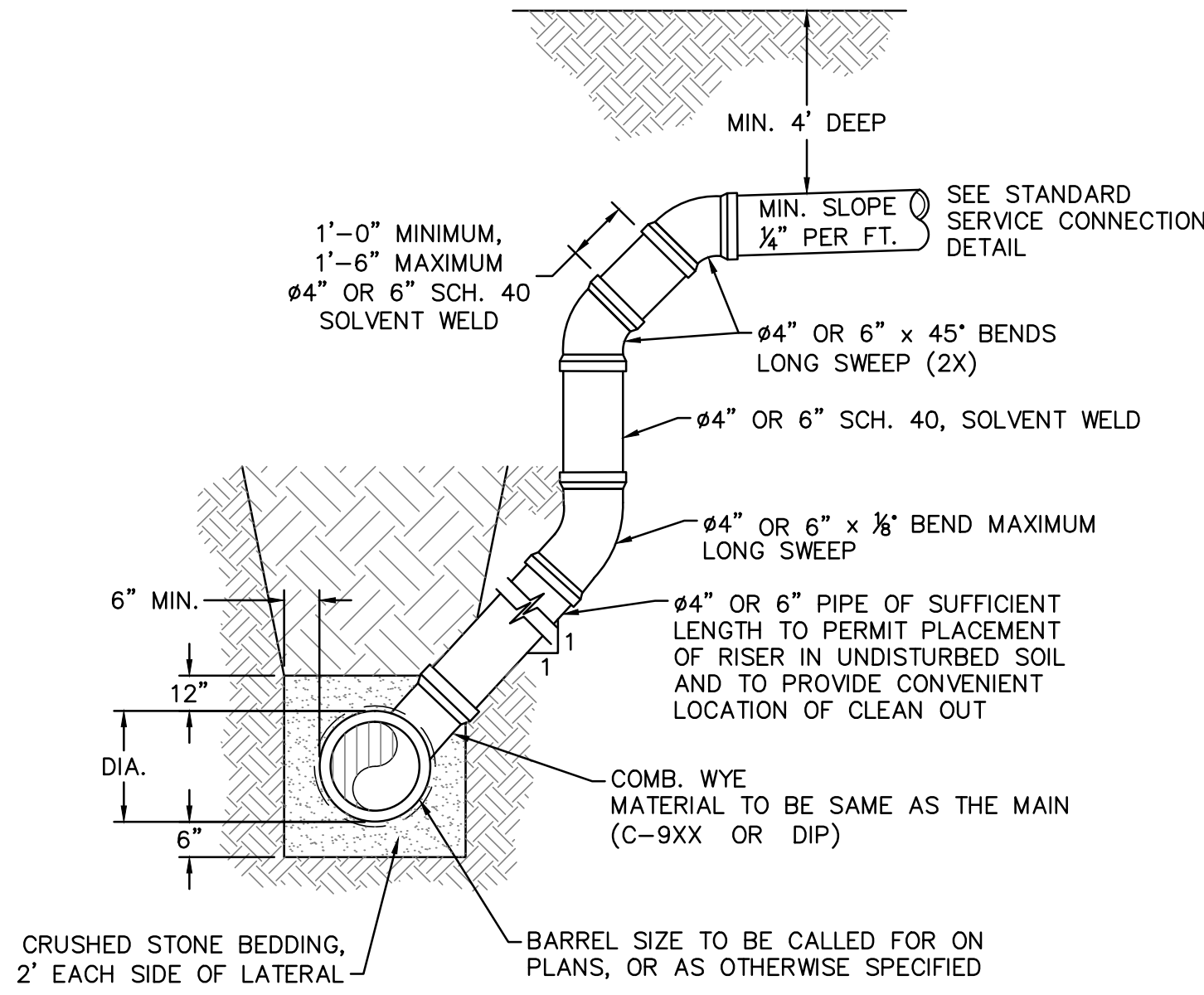
NOTE: FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.

SD-10 STANDARD SERVICE LATERAL
NOT TO SCALE



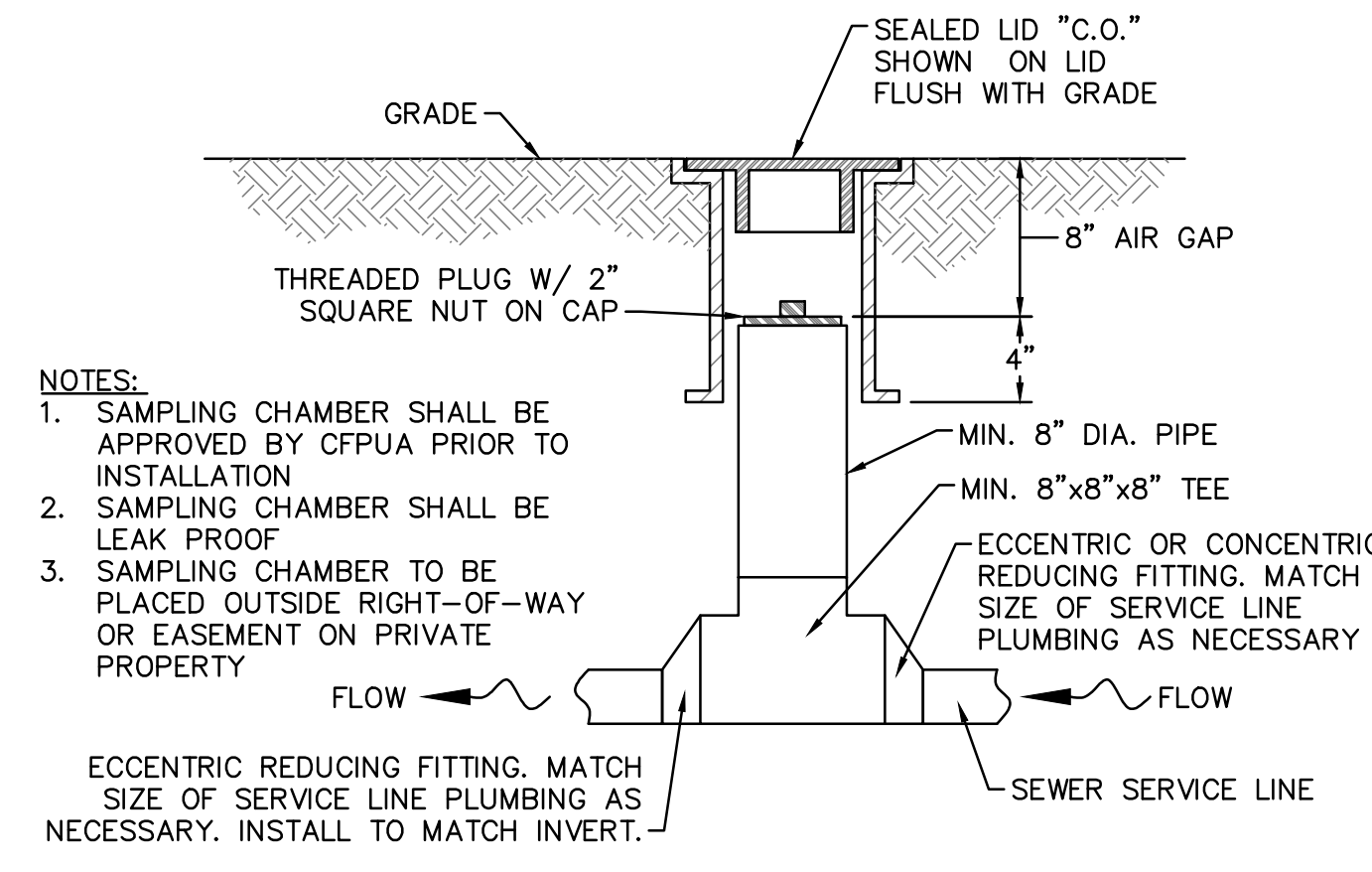
NOTE: FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.

SD-11 SERVICE CONNECTION AND CLEAN-OUT
NOT TO SCALE



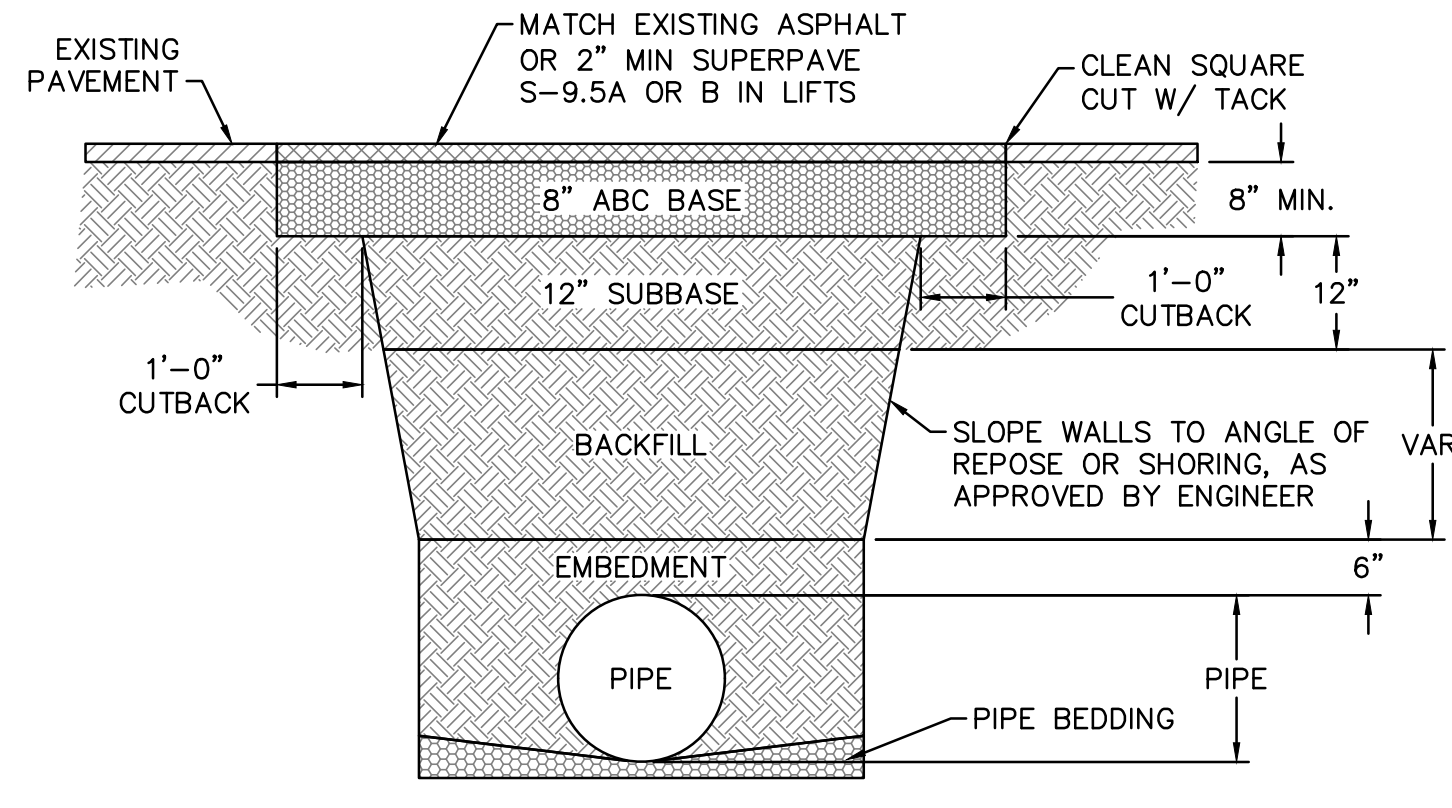
NOTES:
1. SPECIAL CARE SHALL BE TAKEN DURING BACKFILL OPERATIONS. THE RISER SHALL BE PLUMB AND TRUE AT ALL TIMES, AND REST ON FIRM, STABLE FOUNDATION.
2. FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.

SD-12 DEEP SERVICE LATERAL
NOT TO SCALE



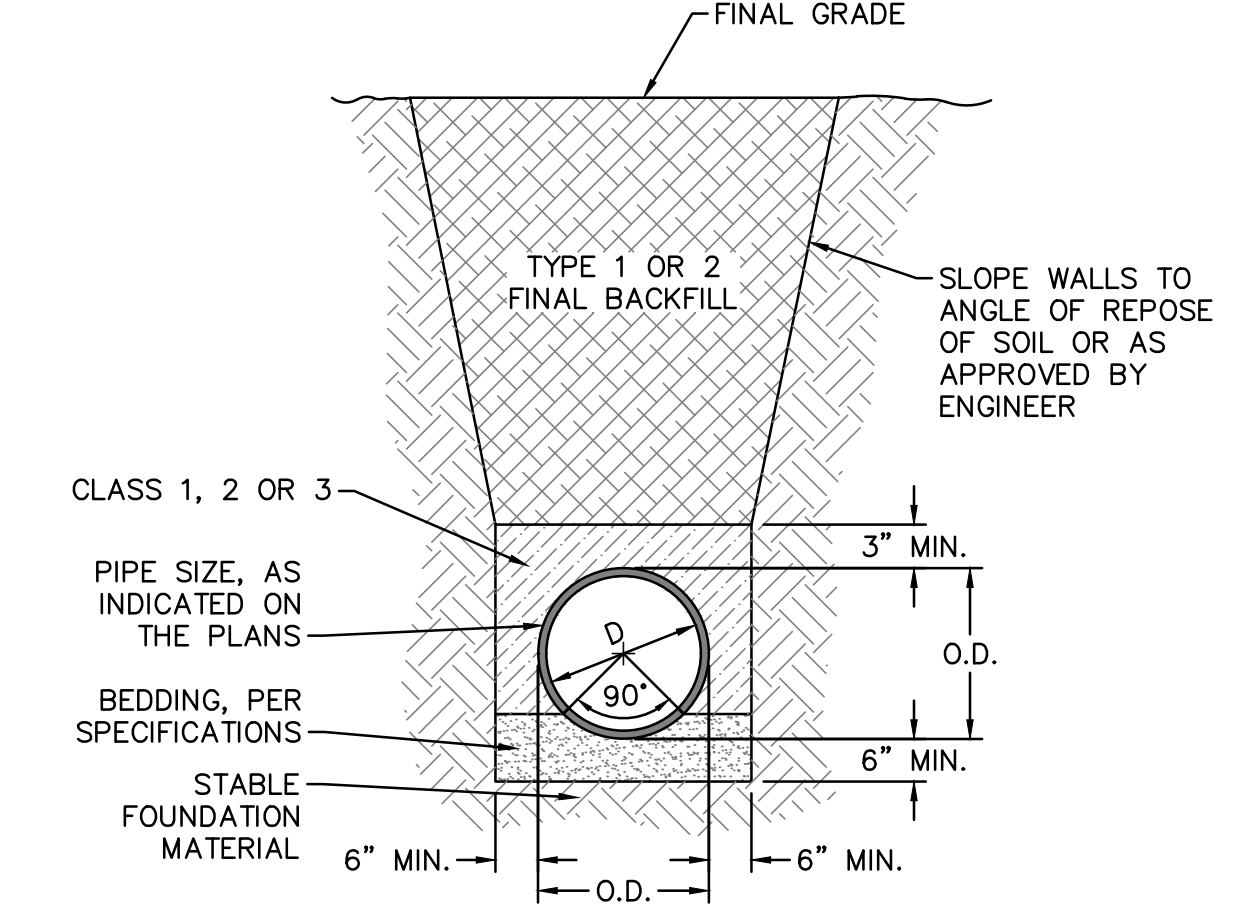
NOTES:
1. SAMPLING CHAMBER SHALL BE APPROVED BY CFPUA PRIOR TO INSTALLATION.
2. SAMPLING CHAMBER SHALL BE LEAK PROOF.
3. SAMPLING CHAMBER TO BE PLACED OUTSIDE RIGHT-OF-WAY OR EASEMENT ON PRIVATE PROPERTY.
ECCENTRIC REDUCING FITTING. MATCH SIZE OF SERVICE LINE PLUMBING AS NECESSARY. INSTALL TO MATCH INVERT.

SD-13 SAMPLING CHAMBER
NOT TO SCALE

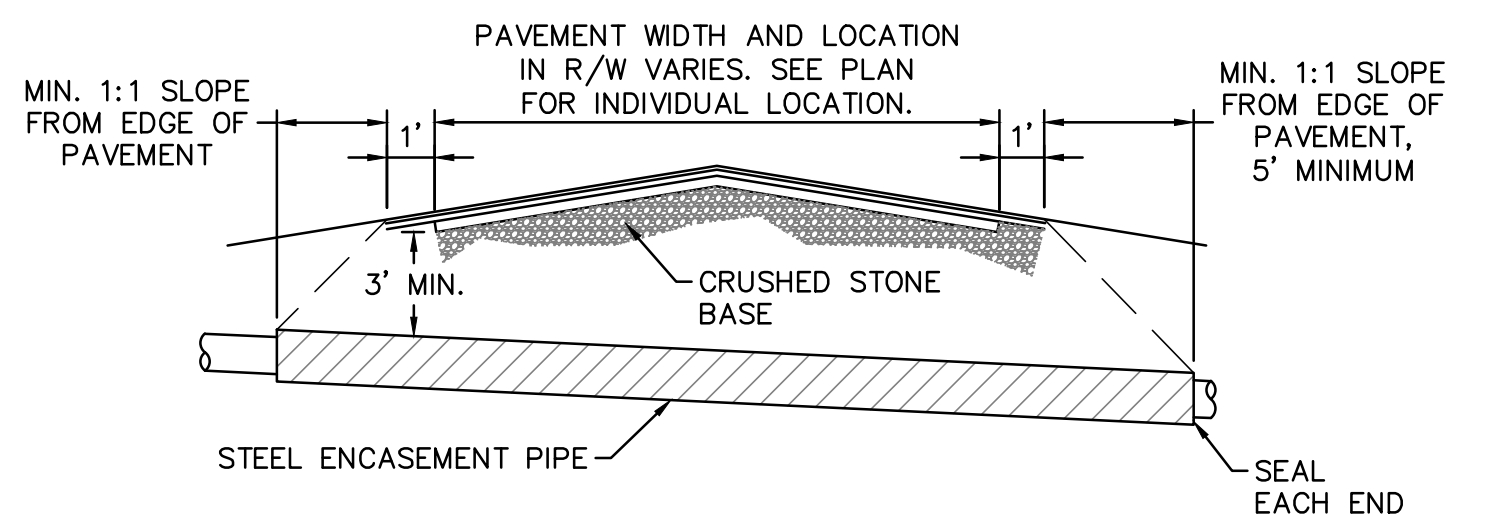


NOTES:
1. BACKFILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBOS, DEBRIS, ORGANICS AND LITTLE TO NO EXCESSIVE MOISTURE.
2. SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CITY TO ACHIEVE COMPACTION, (I.E. #57, ABC, CRUSHED LIMESTONE, CLEAN SAND, FLOWABLE FILL, ETC).
3. 8-INCH OF ABC BASE MATERIAL SHALL BE USED ON CITY STREETS.
4. BACKFILL AND BASE MATERIALS SHALL BE COMPACTED 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 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%.

SD-14 PAVEMENT REPAIR WHERE PIPE INSTALLED
NOT TO SCALE

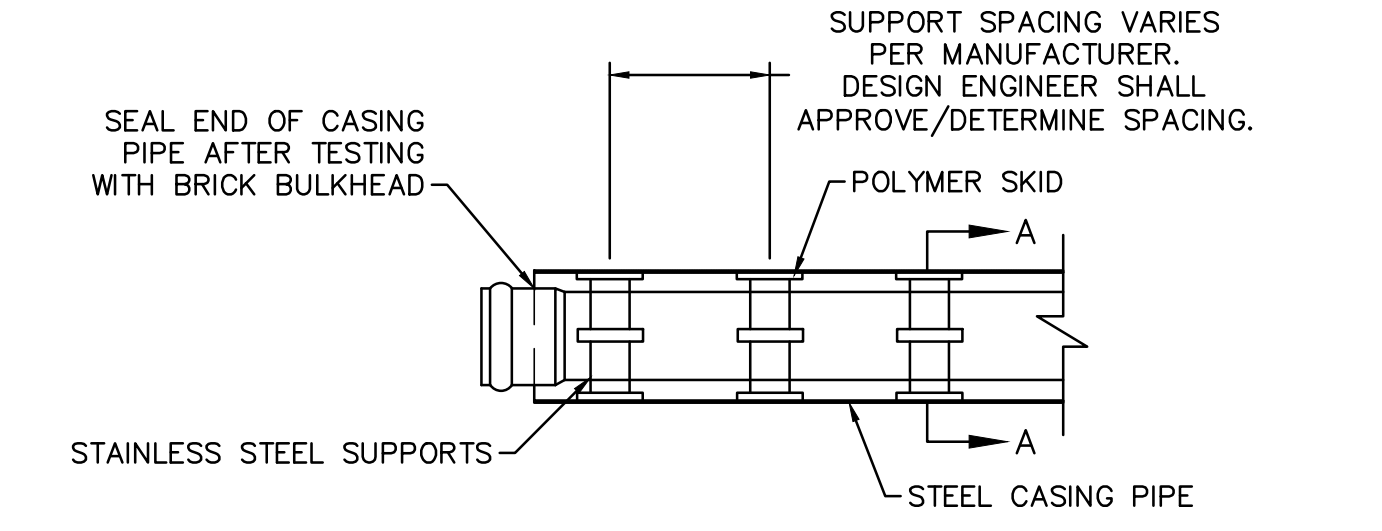


SD-15 TYPICAL TRENCH DETAIL
NOT TO SCALE

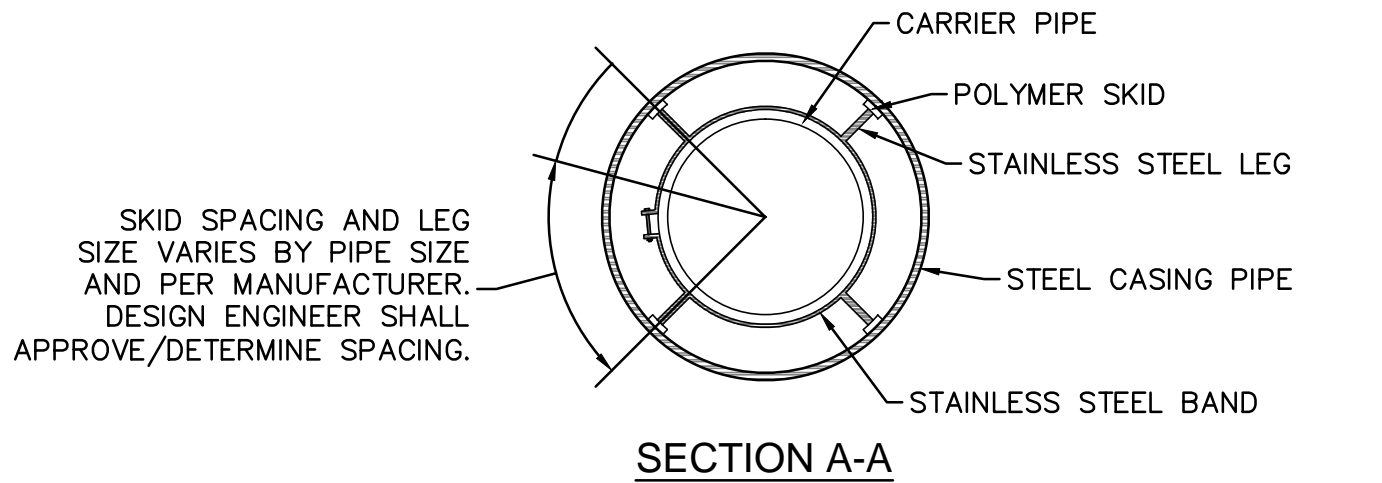


NOTES:
1. CASING WILL BE INSTALLED AT LINE AND GRADE SHOWN ON INDIVIDUAL PROFILE FOR EACH CROSSING. BORING/JACKING TO LINE AND GRADE IS REQUIRED.
2. TRACER WIRE SHALL BE CONTINUED THROUGH CASING.

SD-16 TYPICAL BORING/ JACKING DETAIL
NOT TO SCALE



NOTE: PIPE SUPPORT TO BE PLACED TO PROVIDE PROPER SUPPORT, ALIGNMENT, AND GRADE AS SPECIFIED. CONTINUOUS SUPPORTS MAY BE USED AS ALTERNATIVE. OIL, GREASE, OR PETROLEUM PRODUCT MAY NOT BE USED AS LUBRICANT.



NOTE: ALL STAINLESS STEEL PARTS TO BE 316 SST.
SD-17 PIPE CASING SUPPORT DETAIL
NOT TO SCALE

THESE DETAILS ARE A WORK PRODUCT OF CFPUA FOR SEWER SYSTEM DESIGN AND CONSTRUCTION AND HAVE BEEN REVIEWED AND APPROVED FOR CONTENT AND GENERAL CONFORMANCE WITH THE SEWER DESIGN FOR THIS PROJECT.

REV:	DESCRIPTION:	DATE:
1	SAMPLING CHAMBER REVISED	10/26/12
2	Revised Multiple Details	02/15/16

GENERAL NOTES:
1. NO EXCAVATED MATERIAL SHALL BE PLACED IN ANY STREAM, DITCH OR DRAINAGE-WAY.
2. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES BEFORE ANY CONSTRUCTION BEGINS.
3. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES WHILE CONSTRUCTION IS IN PROGRESS.
4. THE CONTRACTOR IS RESPONSIBLE FOR STABILIZATION OF ALL DISTURBED AREAS.
5. THE CONTRACTOR IS RESPONSIBLE FOR LAY DOWN AND STOCKPILE AREAS (TO ARRANGE AND ENSURE COMPLIANCE WITH ALL LOCAL AND STATE REGULATIONS).

THE DETAILS SHOWN HEREON SUPERCEDE CFPUA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04

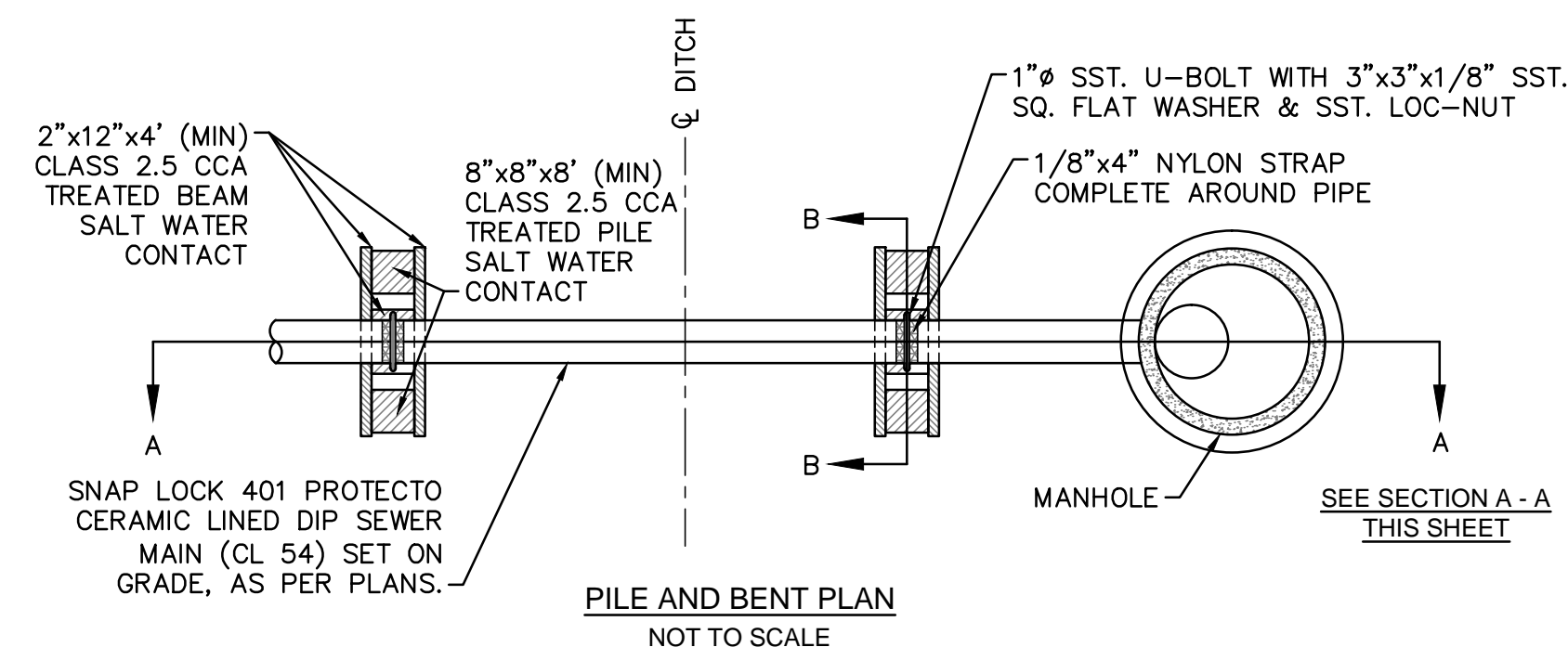
CFPUA SANITARY SEWER

STANDARD DETAILS

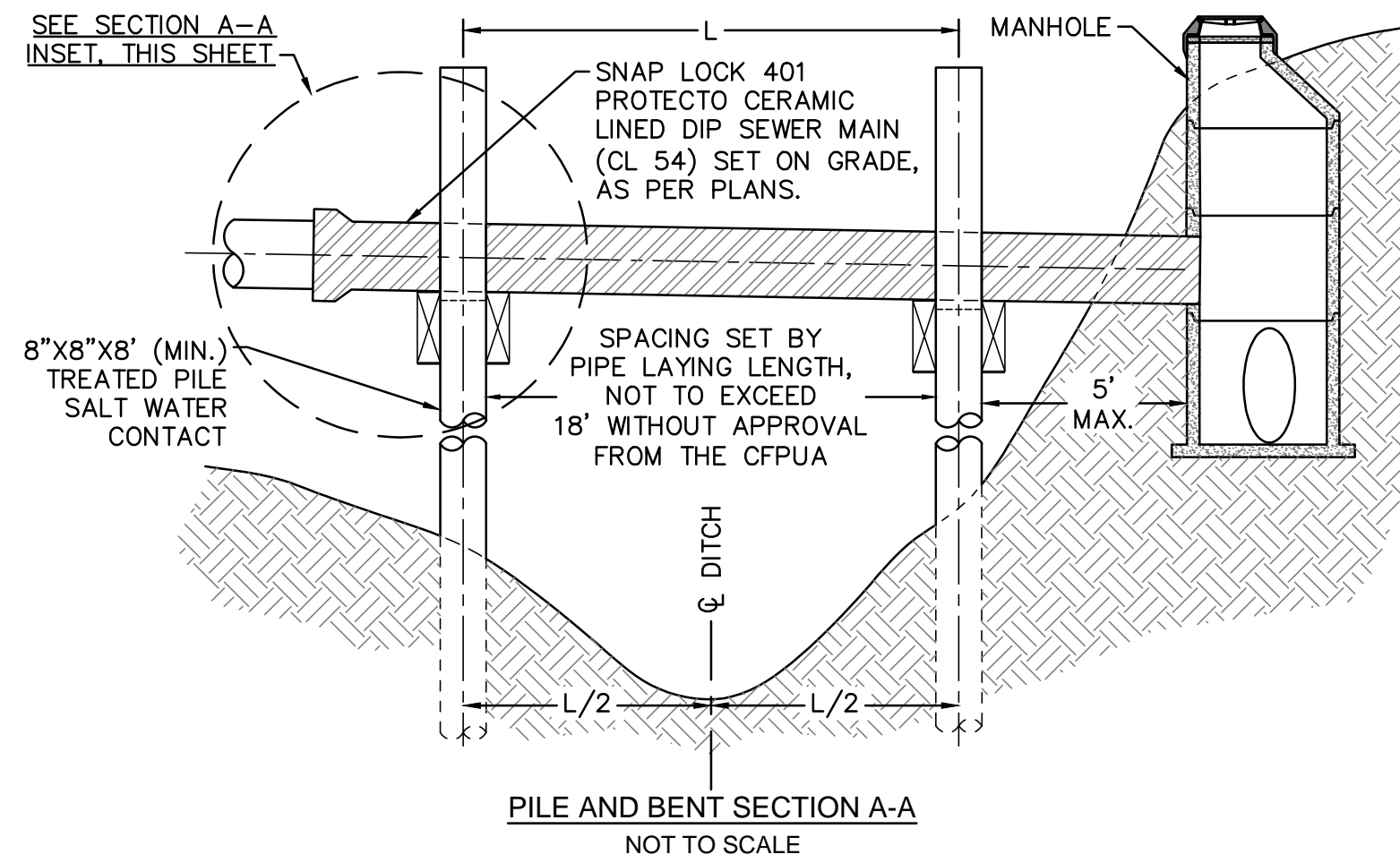
CAPE FEAR PUBLIC UTILITY AUTHORITY
235 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403
OFFICE: (910)332-6560

DATE:
1/9/12
SCALE:
N/A
DRAWN BY:
CFPUA
CHECKED BY:
CFPUA
PROJECT NO.:

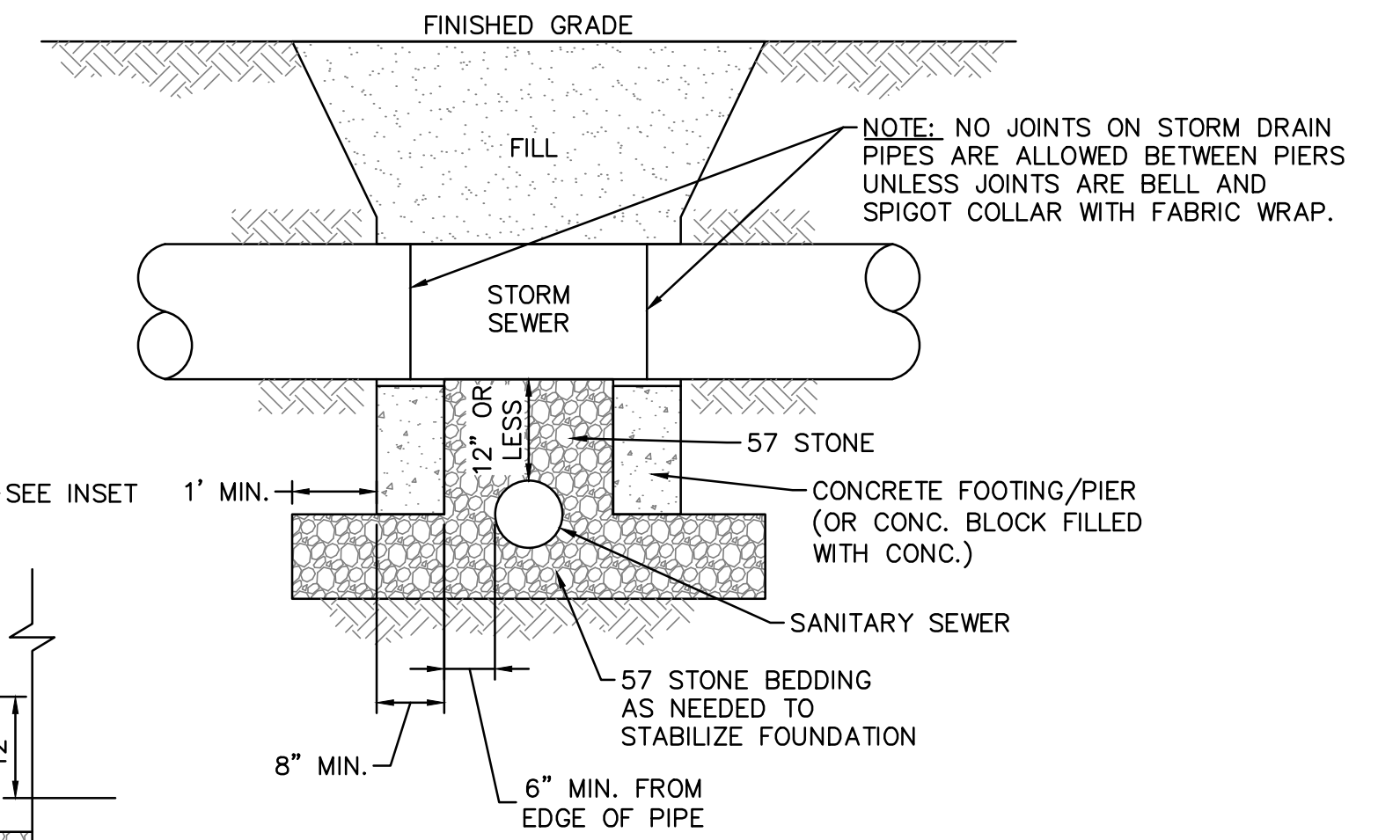
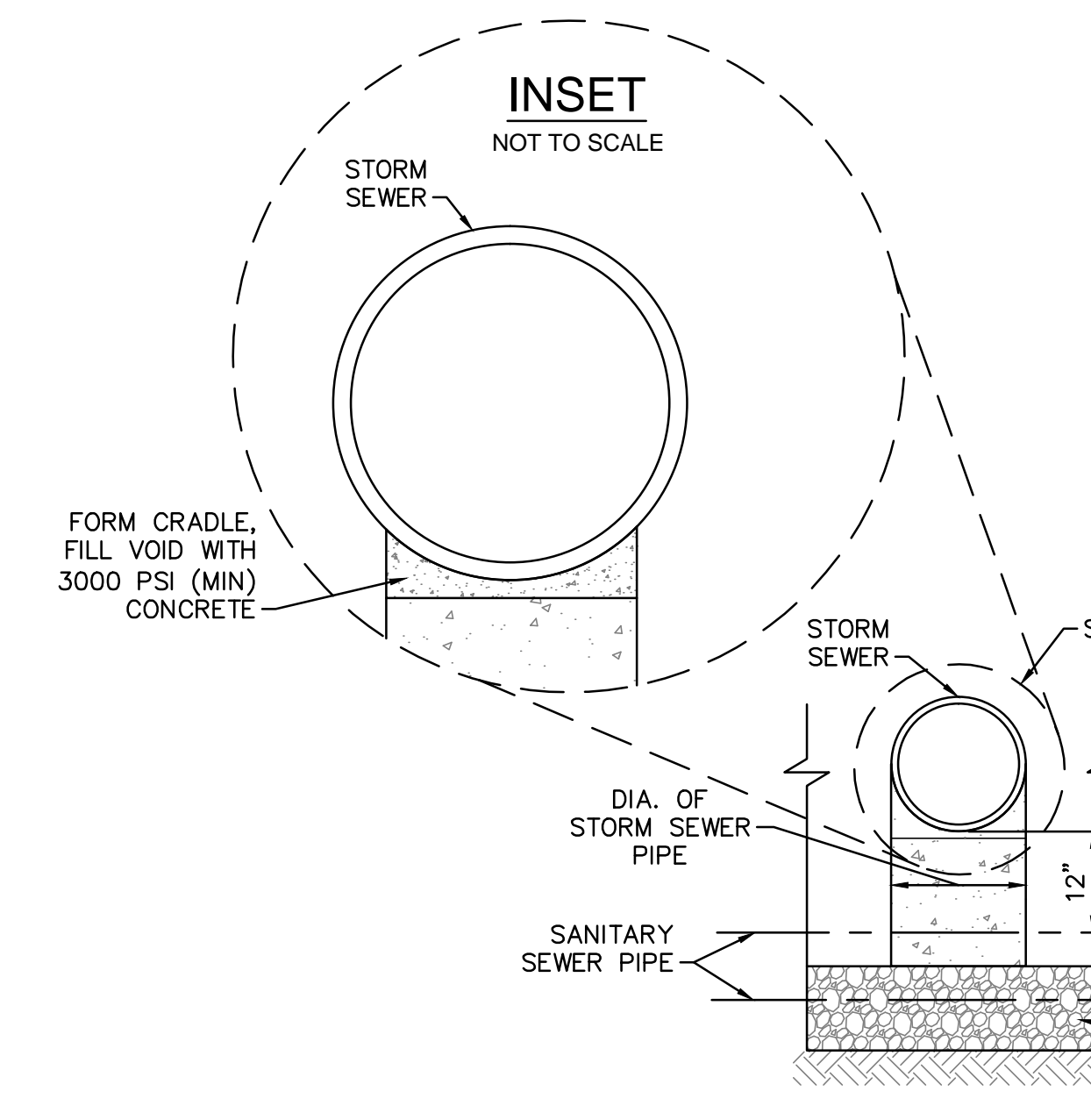
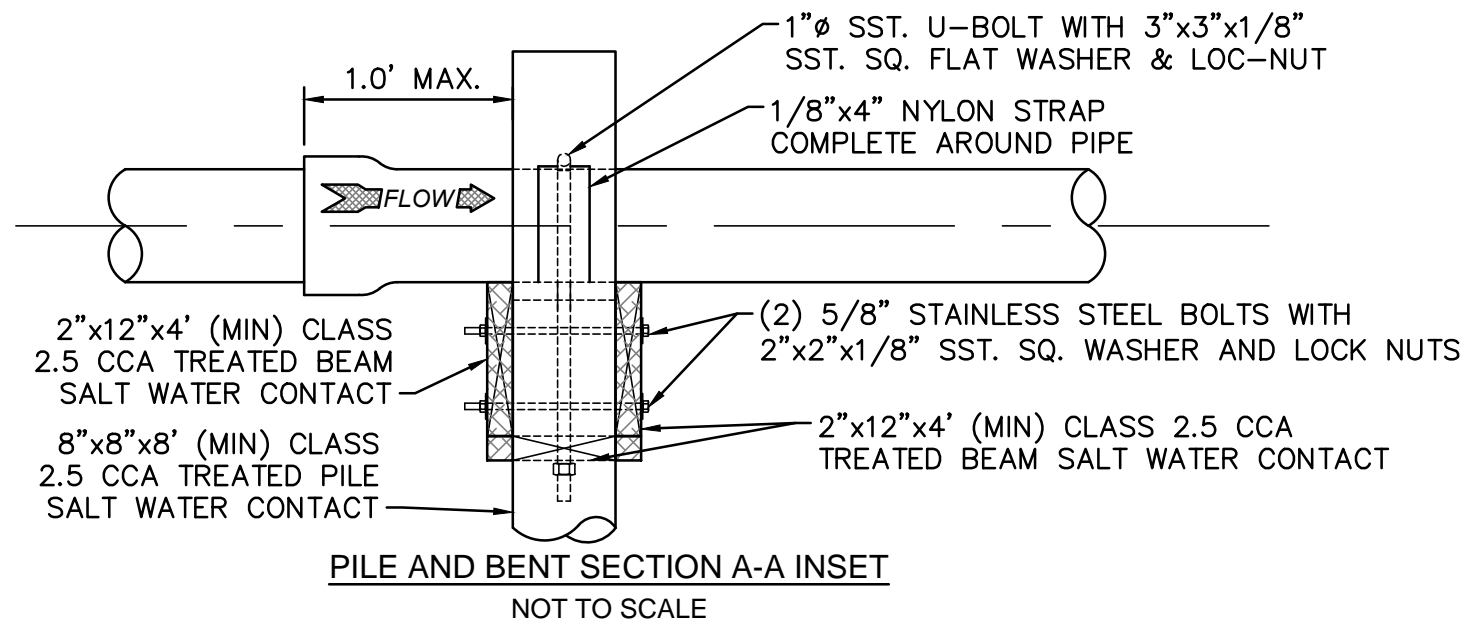
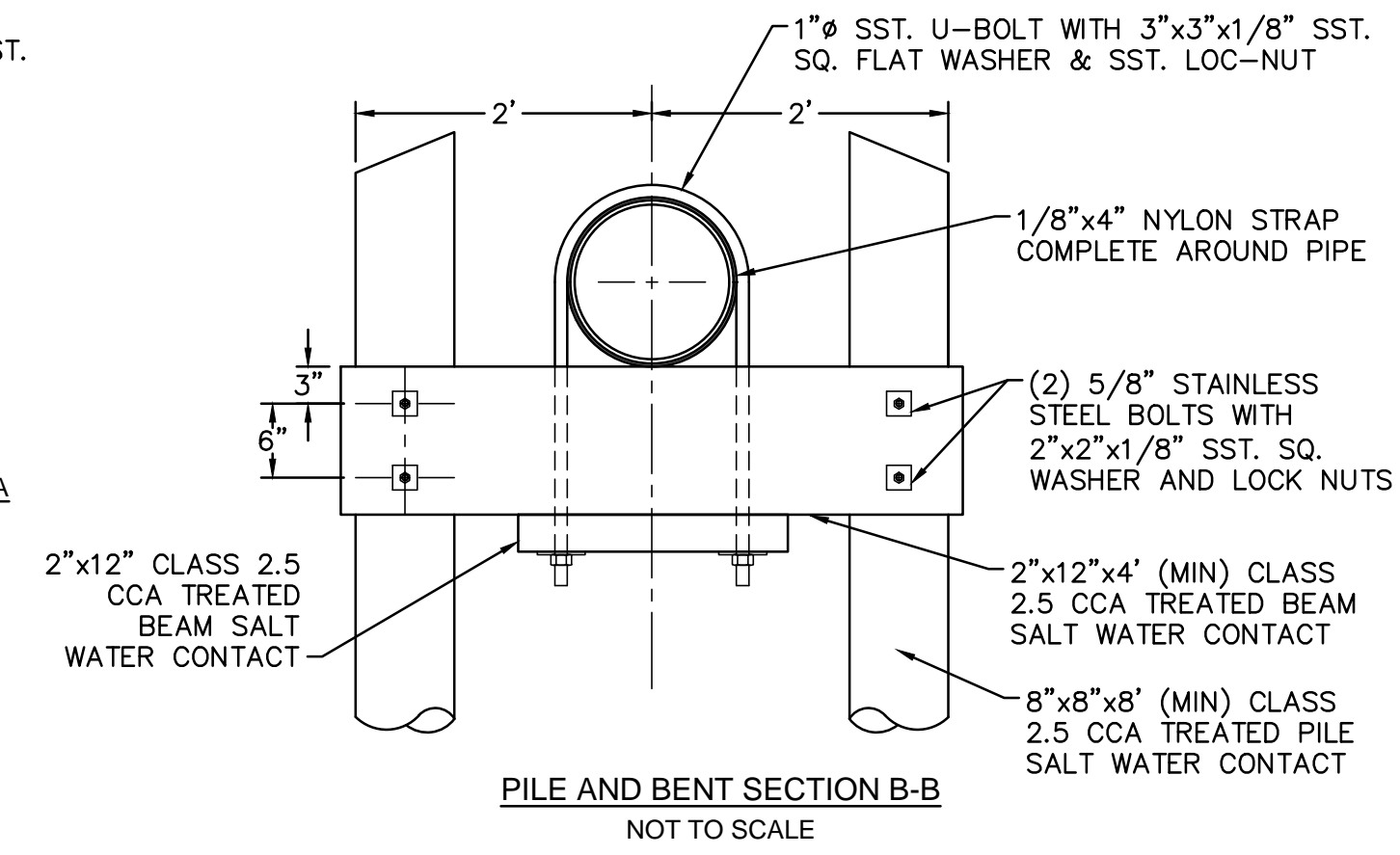
SHEET NO:
SSD-2



- NOTES:**
- PILES AND PILE DRIVING SHALL CONFORM TO NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, JANUARY 2002, SECTIONS 445, 450, 1082-2 & 1084-2.
 - CENTERLINE OF BOLTS TO BE A MINIMUM OF 3" FROM OUTSIDE EDGE OF TIMBER. BOLTS TO BE A MINIMUM OF 3" CENTERLINE TO CENTERLINE.
 - ALL STAINLESS STEEL SHALL BE 316. STAINLESS STRAP TO BE COLD FORMED.
 - PILE SHALL NOT OBSTRUCT FLOW OR CAUSE EROSION OF DITCH/STREAM BANK.
 - MIN. CLASS 54 DIP-ENGINEER MUST DESIGN LOADING.
 - DESIGN SHALL BE APPROVED BY CFPUA.

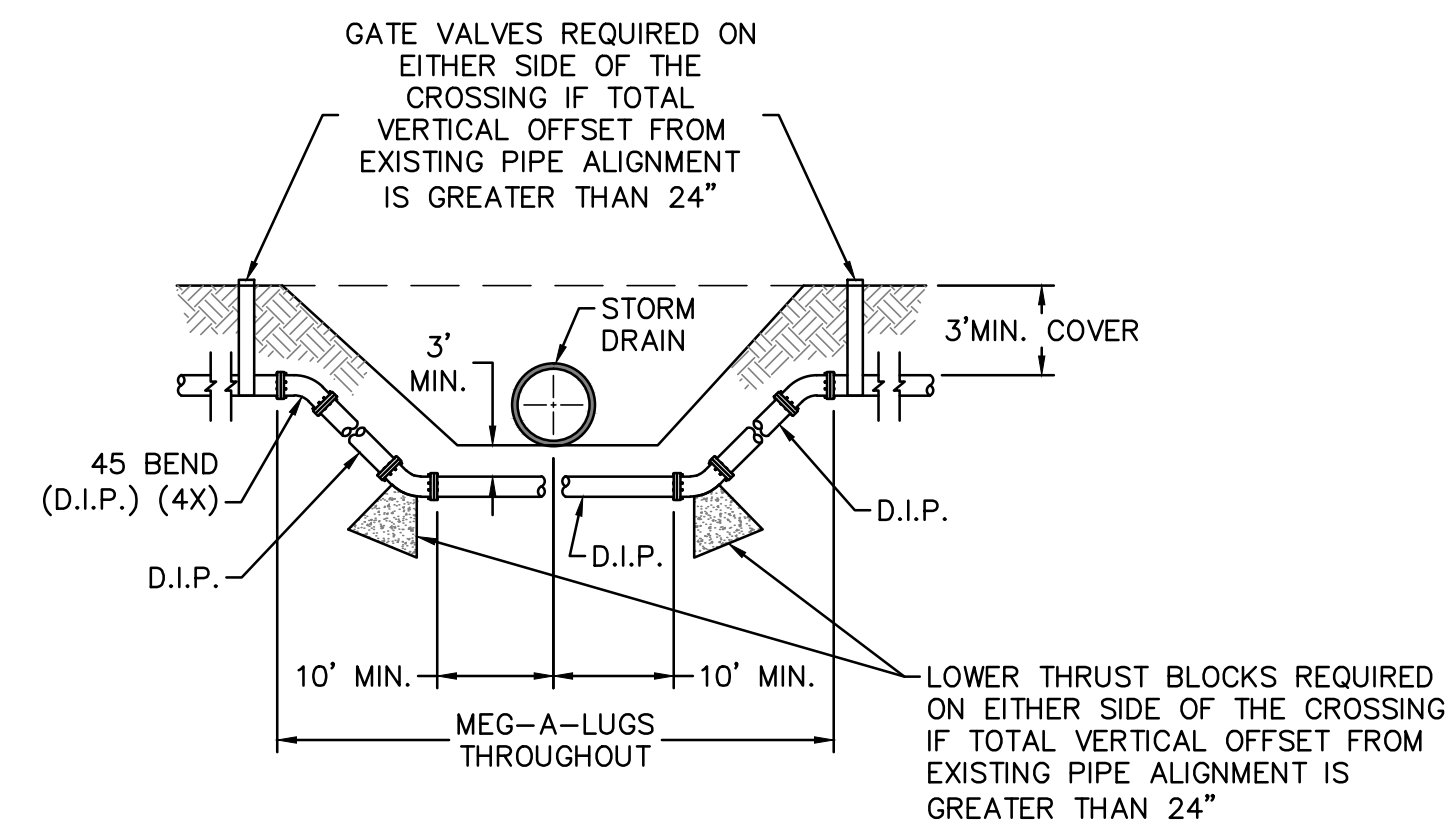


SD-20 PILE AND BENT DETAIL
NOT TO SCALE



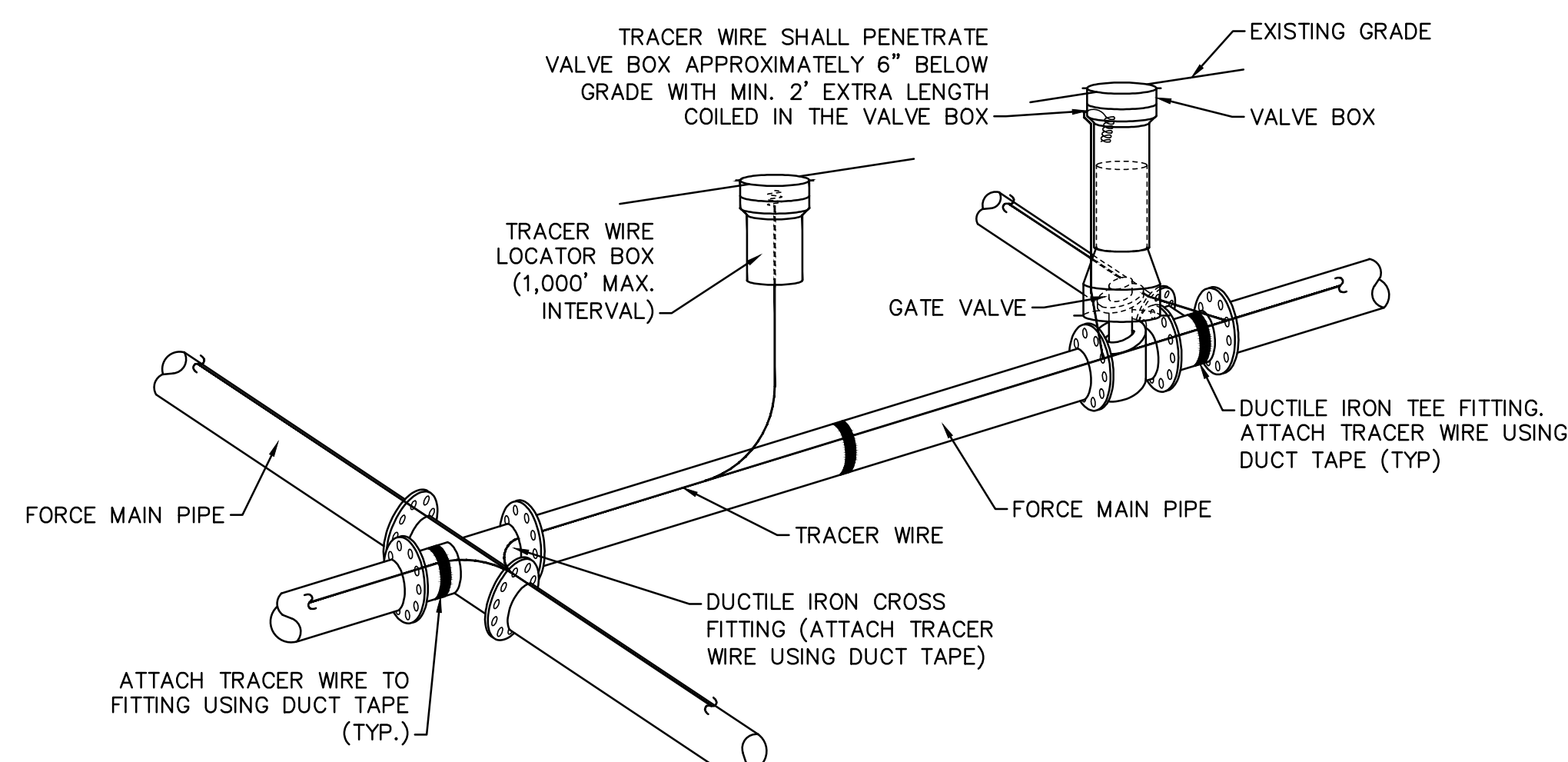
- THE FOLLOWING MUST BE FOLLOWED IN THE CASES OF GRAVITY SEWER UNDER STORM DRAIN:**
- A SEPARATION OF LESS THAN 12' BETWEEN STORM DRAIN AND GRAVITY SEWER, STORM DRAIN MUST BE BRIDGED.
 - A SEPARATION OF 12' TO LESS THAN 24' BETWEEN STORM DRAIN AND GRAVITY SEWER, GRAVITY SEWER CAN BE DIP OR STORM DRAIN CAN BE BRIDGED. (PER DWR REGULATIONS)
 - A SEPARATION OF 24' OR GREATER BETWEEN STORM DRAIN AND GRAVITY SEWER REQUIRES NO BRIDGING OR DIP.

SD-24 STRUCTURAL BRIDGING DETAIL FOR STORMWATER OVER GRAVITY SEWER INSTALLATIONS WITH LESS THAN 12" SEPARATION
NOT TO SCALE



NOTE: USE D.I.P. (CL50 OR BETTER)

SD-18 FORCE MAIN DITCH AND STORM DRAIN CROSSING
NOT TO SCALE



- NOTES:**
- TRACER WIRE SHALL BE #10 COPPER SOLID CORE COPPER WIRE WITH GAS AND OIL RESISTANT INSULATION.
 - WIRE SHALL BE STRAPPED TO ALL PVC FORCE MAIN PIPING WITH DUCT TAPE AT 12 FOOT INTERVALS ALONG THE PIPE.
 - SECURE WIRE TO ALL TEE AND CROSS FITTINGS WITH DUCT TAPE.
 - ALL SPLICES IN THE WIRE SHALL BE MADE WITH 3M DBR DIRECT BURY SPLICE KIT AN UNDERGROUND RATED, WATERTIGHT, AND APPROVED SPLICE CONNECTOR OR APPROVED EQUAL.

SD-21 TRACER WIRE DETAIL
NOT TO SCALE

- GENERAL NOTES:**
- NO EXCAVATED MATERIAL SHALL BE PLACED IN ANY STREAM, DITCH OR DRAINAGE-WAY.
 - THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES BEFORE ANY CONSTRUCTION BEGINS.
 - THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES WHILE CONSTRUCTION IS IN PROGRESS.
 - THE CONTRACTOR IS RESPONSIBLE FOR STABILIZATION OF ALL DISTURBED AREAS.
 - THE CONTRACTOR IS RESPONSIBLE FOR LAY DOWN AND STOCKPILE AREAS (TO ARRANGE AND ENSURE COMPLIANCE WITH ALL LOCAL AND STATE REGULATIONS).

THE DETAILS SHOWN HEREON SUPERCEDE CFPUA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04

THESE DETAILS ARE A WORK PRODUCT OF CFPUA FOR SEWER SYSTEM DESIGN AND CONSTRUCTION AND HAVE BEEN REVIEWED AND APPROVED FOR CONTENT AND GENERAL CONFORMANCE WITH THE SEWER DESIGN FOR THIS PROJECT.

REV:	DESCRIPTION:	DATE:
1	ADDED NOTES TO THE STRUCTURAL BRIDGING DETAIL	03/11/15
2	Revised Tracer Wire Detail	10/20/15
3	Revised Force Main Ditch and Storm Drain Crossing Detail	02/15/16

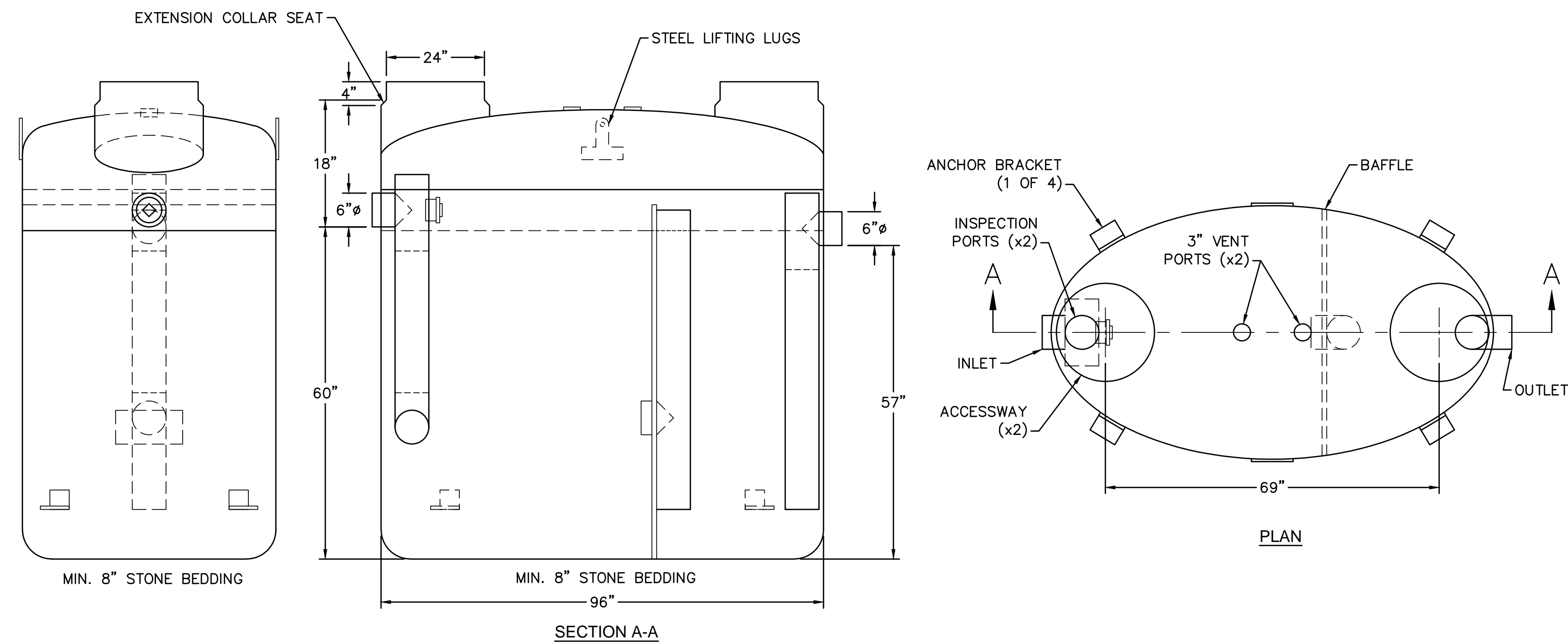
CFPUA SANITARY SEWER

STANDARD DETAILS

CAPE FEAR PUBLIC UTILITY AUTHORITY
235 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403
OFFICE: (910)332-6560

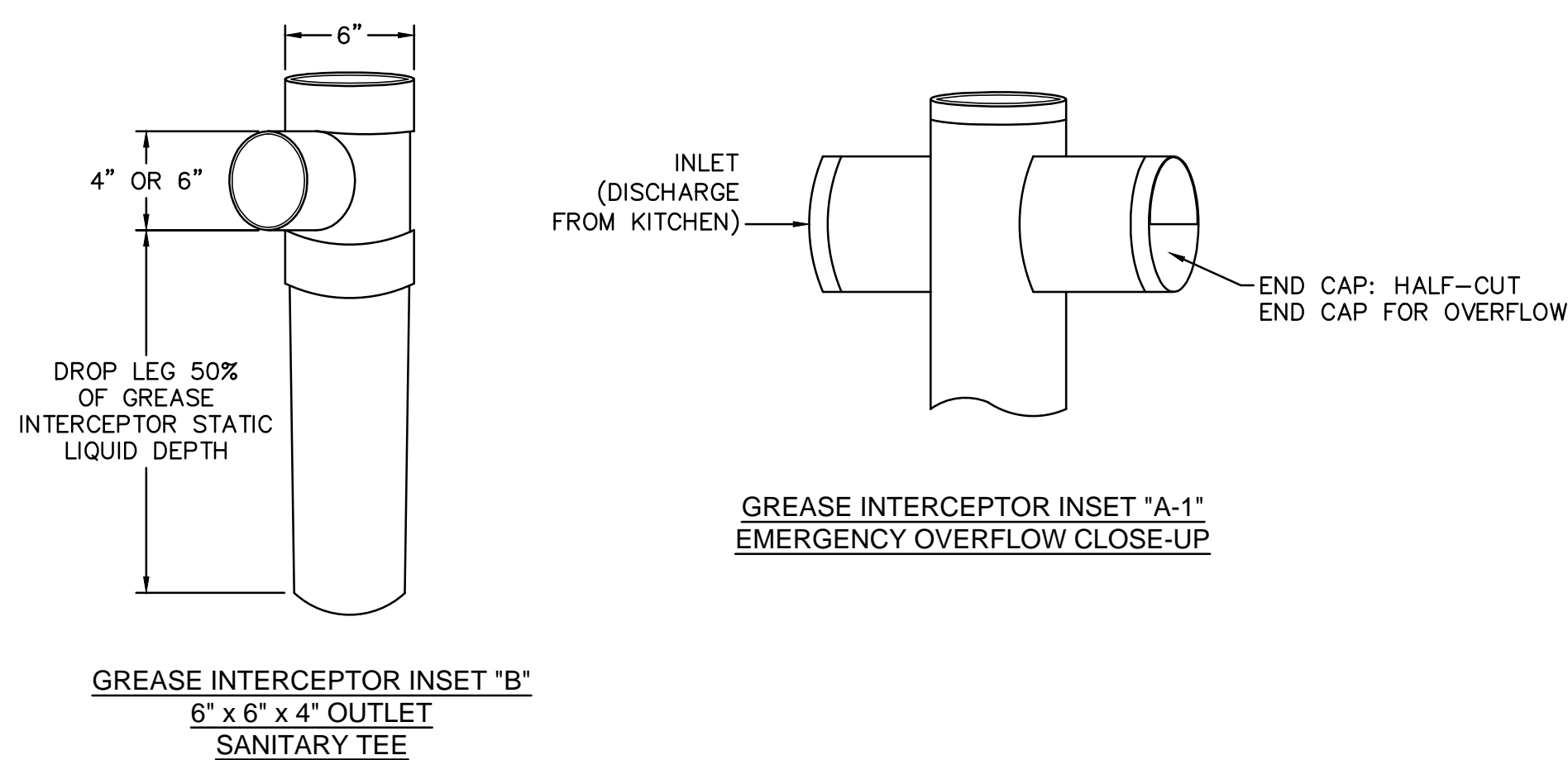
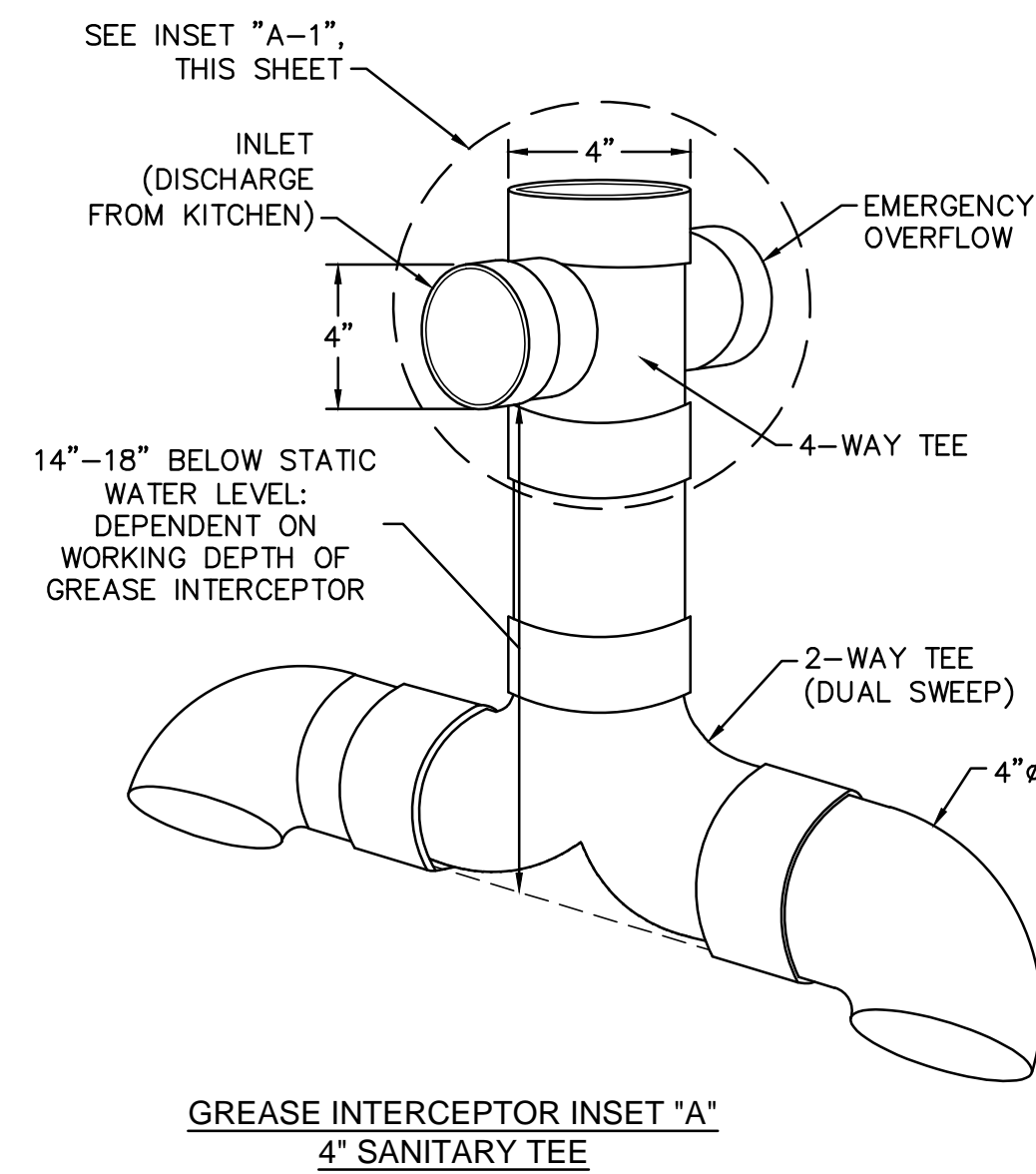
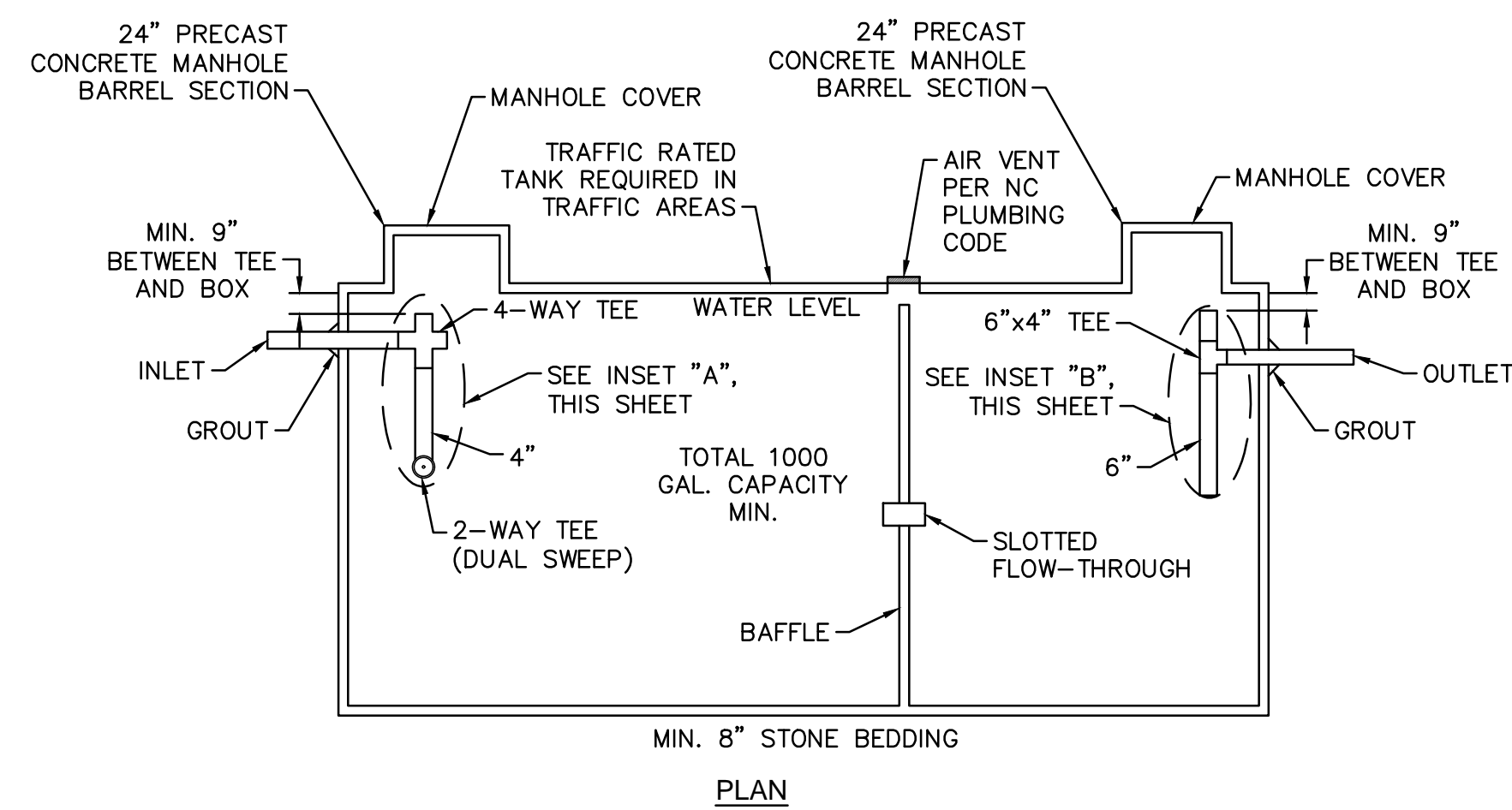
DATE:
1/9/12
SCALE:
N/A
DRAWN BY:
CFPUA
CHECKED BY:
CFPUA
PROJECT NO.:

SHEET NO:
SSD-3



- NOTES:**
1. FOR GRAVITY APPLICATIONS ONLY.
 2. MIN. THICKNESS: 1/4" WALL AND 3/8" TOP AND BOTTOM BOWLS.
 3. STANDARD PIPE STUBS ARE SOCKET SDR 35 PVC.
 4. EXTENSION COLLARS SHALL BE CAULKED WITH SIKAFLEX OR EQUIVALENT FOR WATERTIGHT SEAL.
 5. FOLLOW MANUFACTURE'S SPECS FOR TRAFFIC OR PEDESTRIAN LOADING.

SD-22 FIBERGLASS GREASE INTERCEPTOR
NOT TO SCALE



SD-23 CONCRETE GREASE INTERCEPTOR
NOT TO SCALE

- GENERAL NOTES:**
1. NO EXCAVATED MATERIAL SHALL BE PLACED IN ANY STREAM, DITCH OR DRAINAGE-WAY.
 2. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES BEFORE ANY CONSTRUCTION BEGINS.
 3. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES WHILE CONSTRUCTION IS IN PROGRESS.
 4. THE CONTRACTOR IS RESPONSIBLE FOR STABILIZATION OF ALL DISTURBED AREAS.
 5. THE CONTRACTOR IS RESPONSIBLE FOR LAY DOWN AND STOCKPILE AREAS (TO ARRANGE AND ENSURE COMPLIANCE WITH ALL LOCAL AND STATE REGULATIONS).

THE DETAILS SHOWN HEREON SUPERCEDE CFPUA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04

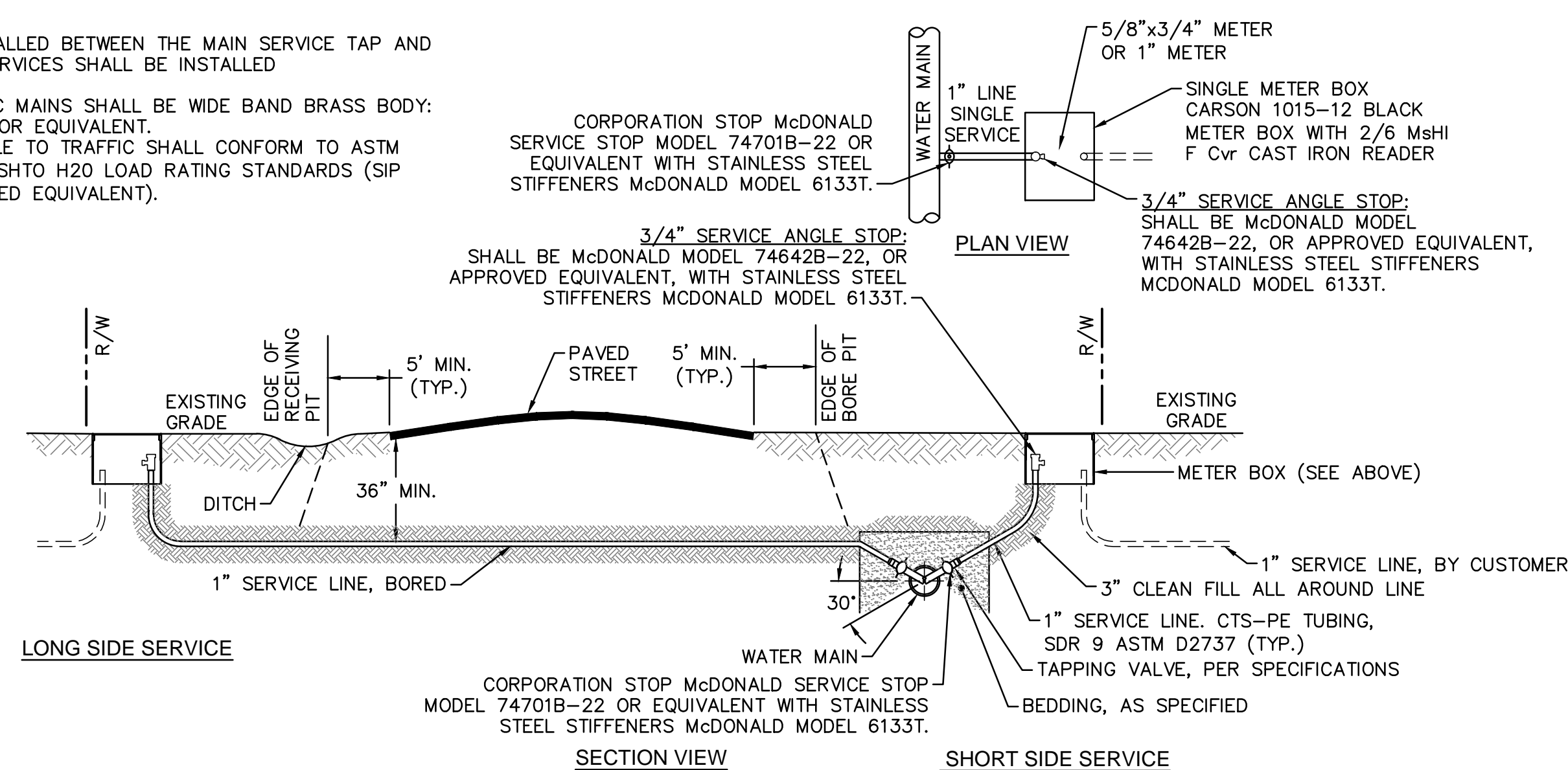
THESE DETAILS ARE A WORK PRODUCT OF CFPUA FOR SEWER SYSTEM DESIGN AND CONSTRUCTION AND HAVE BEEN REVIEWED AND APPROVED FOR CONTENT AND GENERAL CONFORMANCE WITH THE SEWER DESIGN FOR THIS PROJECT.

REV:	DESCRIPTION:	DATE:

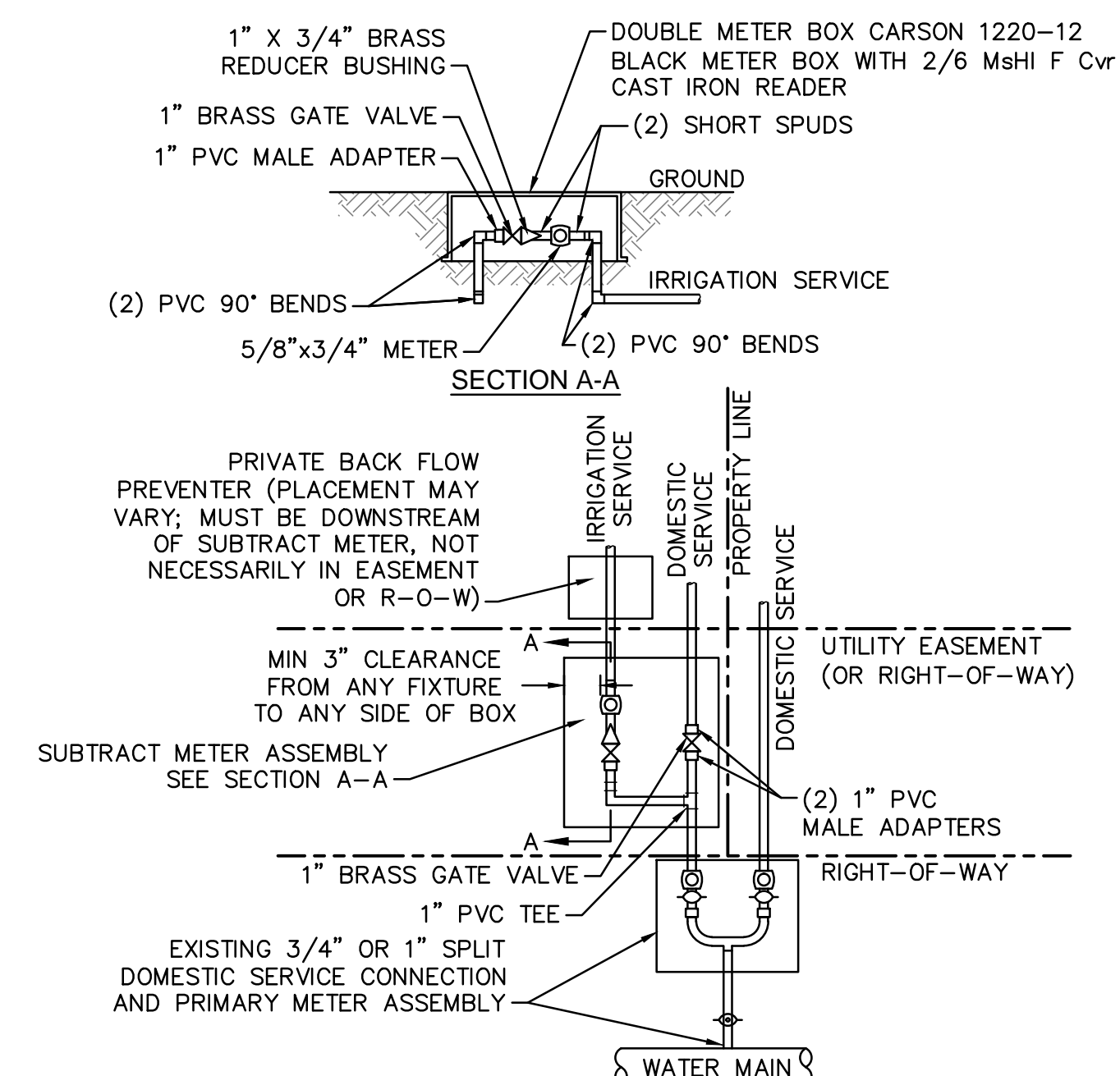
CFPUA SANITARY SEWER		DATE: 1/9/12
STANDARD DETAILS		SCALE: N/A
 CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560		DRAWN BY: CFPUA
Stewardship. Sustainability. Service.		CHECKED BY: CFPUA
		PROJECT NO.:
		SHEET NO: SSD-4

S:\Engineering\2012\Training and Design\Standard Details\Standard Details\CFPUA Sewer Detail.dwg, 1/2/2015 11:13 AM, johnson

- NOTES:**
- NO JOINT SHALL BE INSTALLED BETWEEN THE MAIN SERVICE TAP AND THE METER STOP. ALL SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN.
 - SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY: SADDLE McDONALD 3801 OR EQUIVALENT.
 - METER BOXES SUSCEPTIBLE TO TRAFFIC SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS (SIP MODEL 4242, OR APPROVED EQUIVALENT).



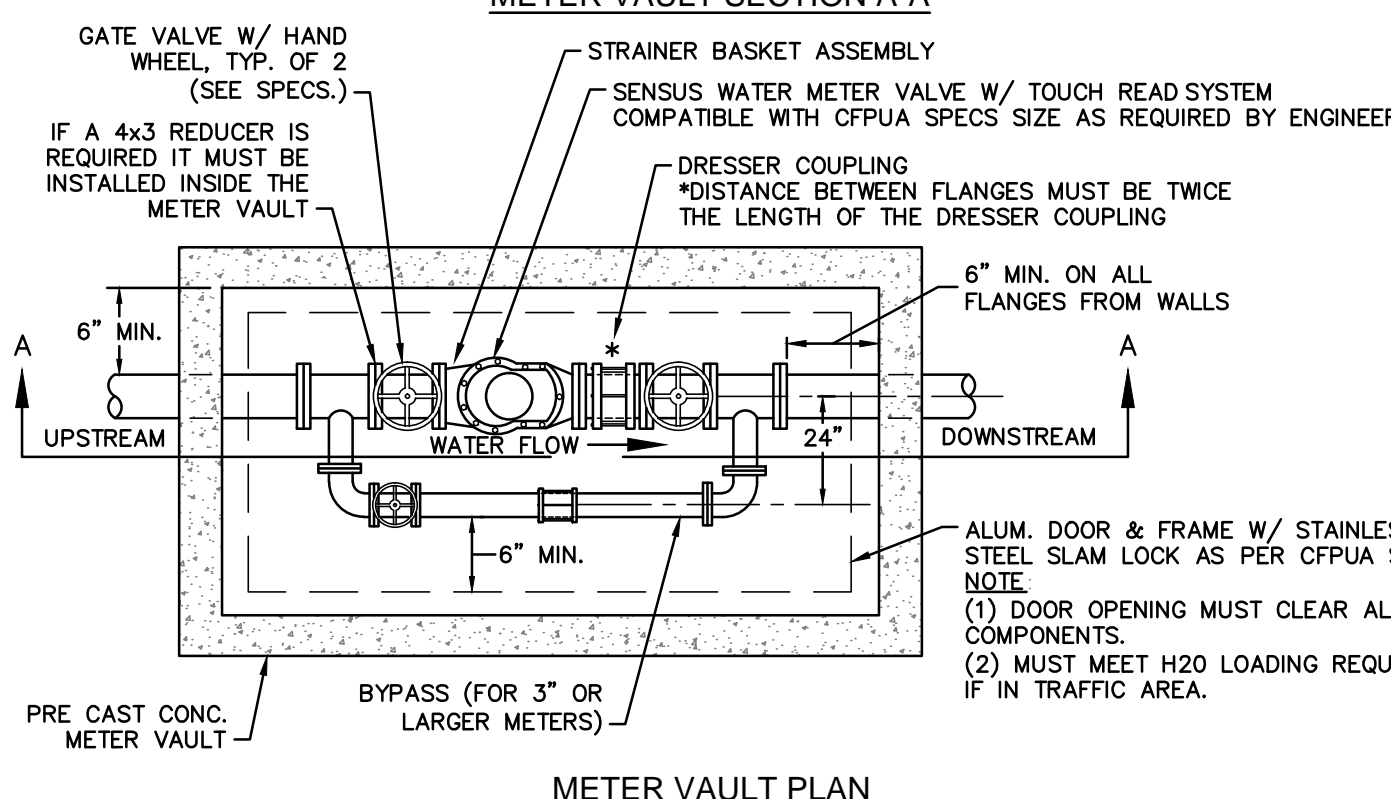
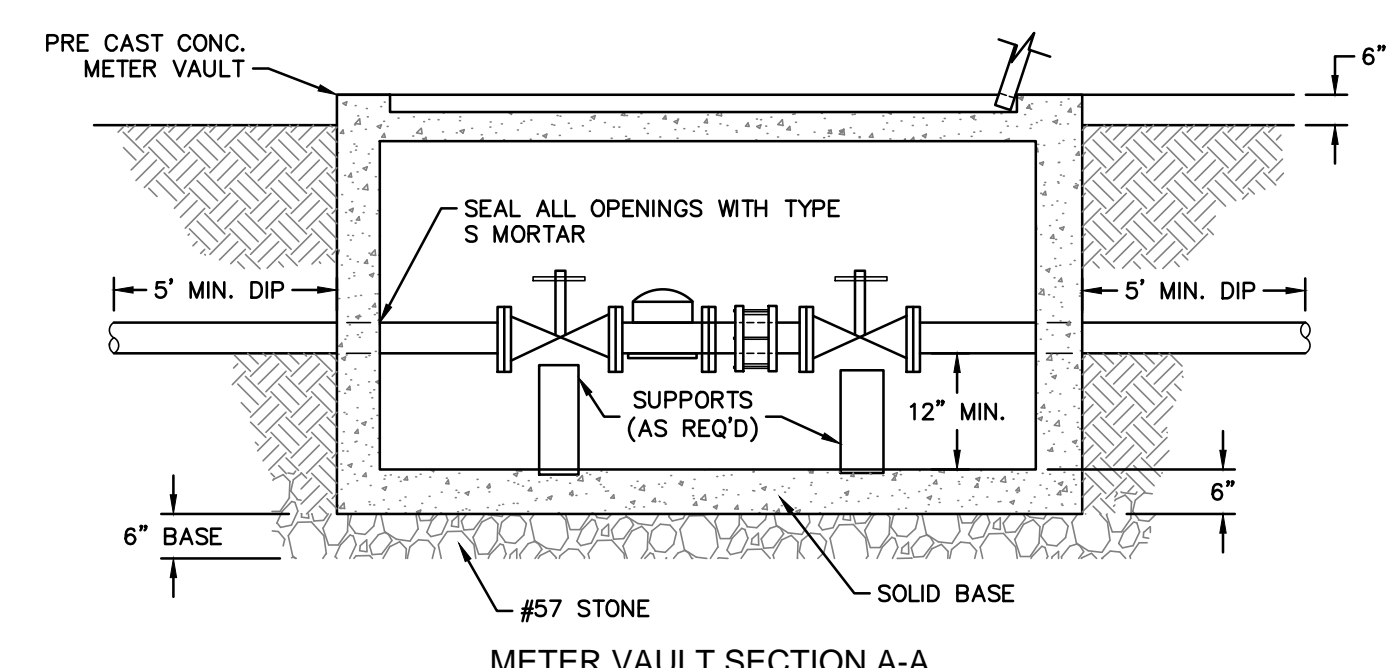
WD-18 SINGLE SERVICE CONNECTION
NOT TO SCALE



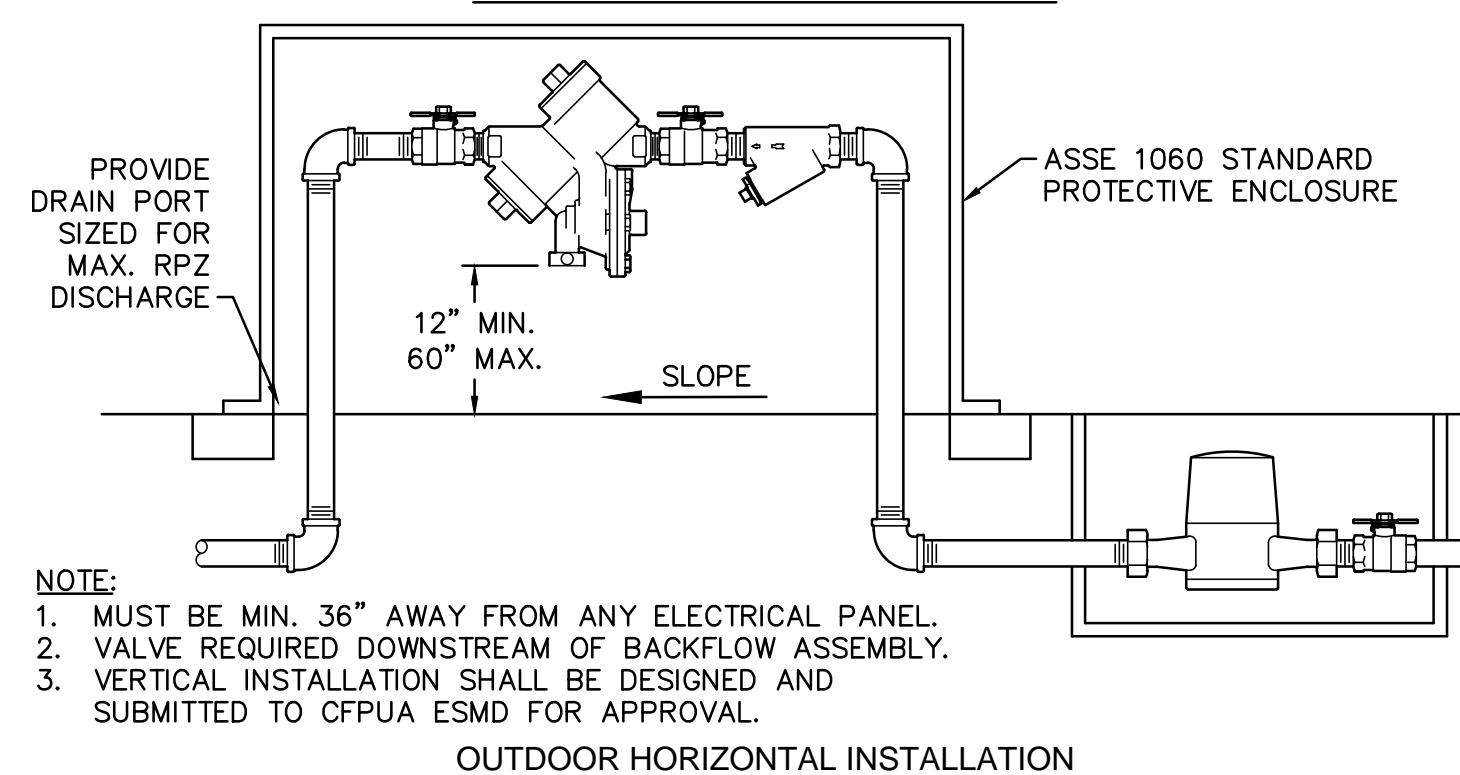
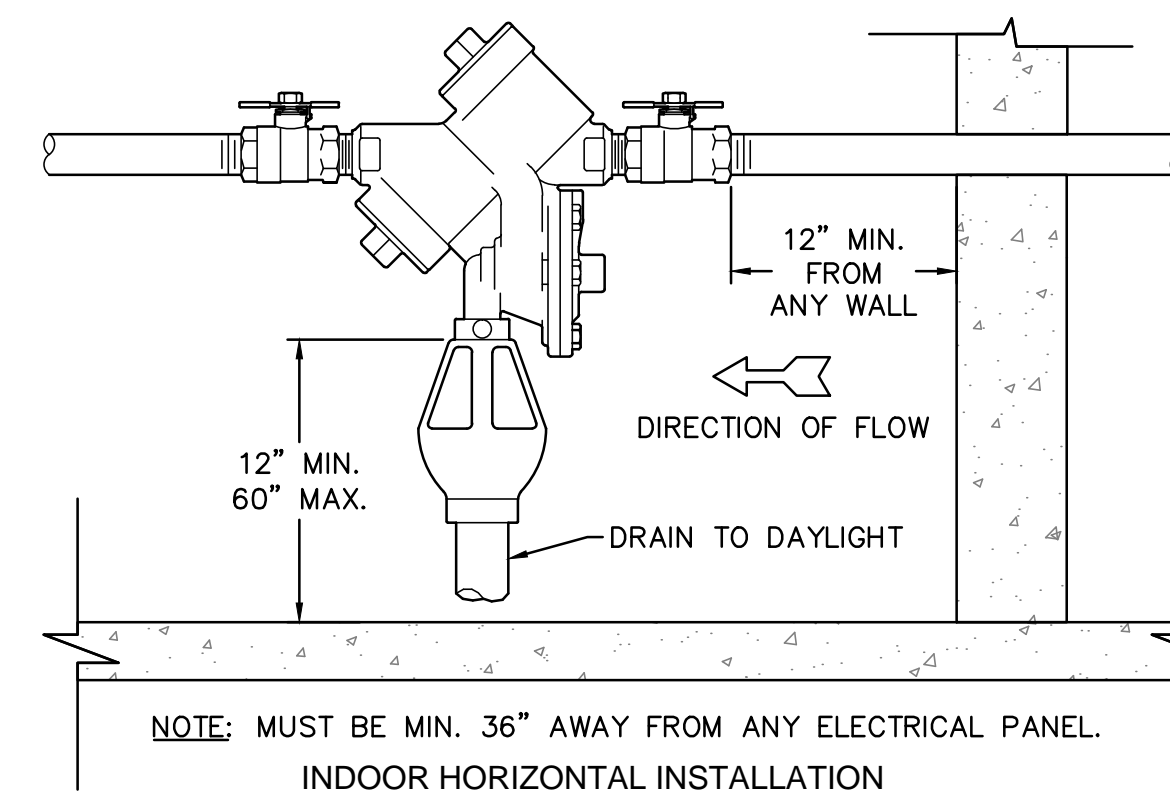
- NOTES:**
- BEYOND THE PRIMARY DOMESTIC METER ASSEMBLY, CFPUA IS ONLY RESPONSIBLE FOR METER AND WASHERS OF SUBTRACT METER ASSEMBLY.
 - ALL PIPE AND FITTINGS UP TO FINAL SERVICE LINE TO BE 1" EXCLUDING METERS.

WD-8 DOUBLE SERVICE CONNECTION USING SUBTRACT METER
NOT TO SCALE

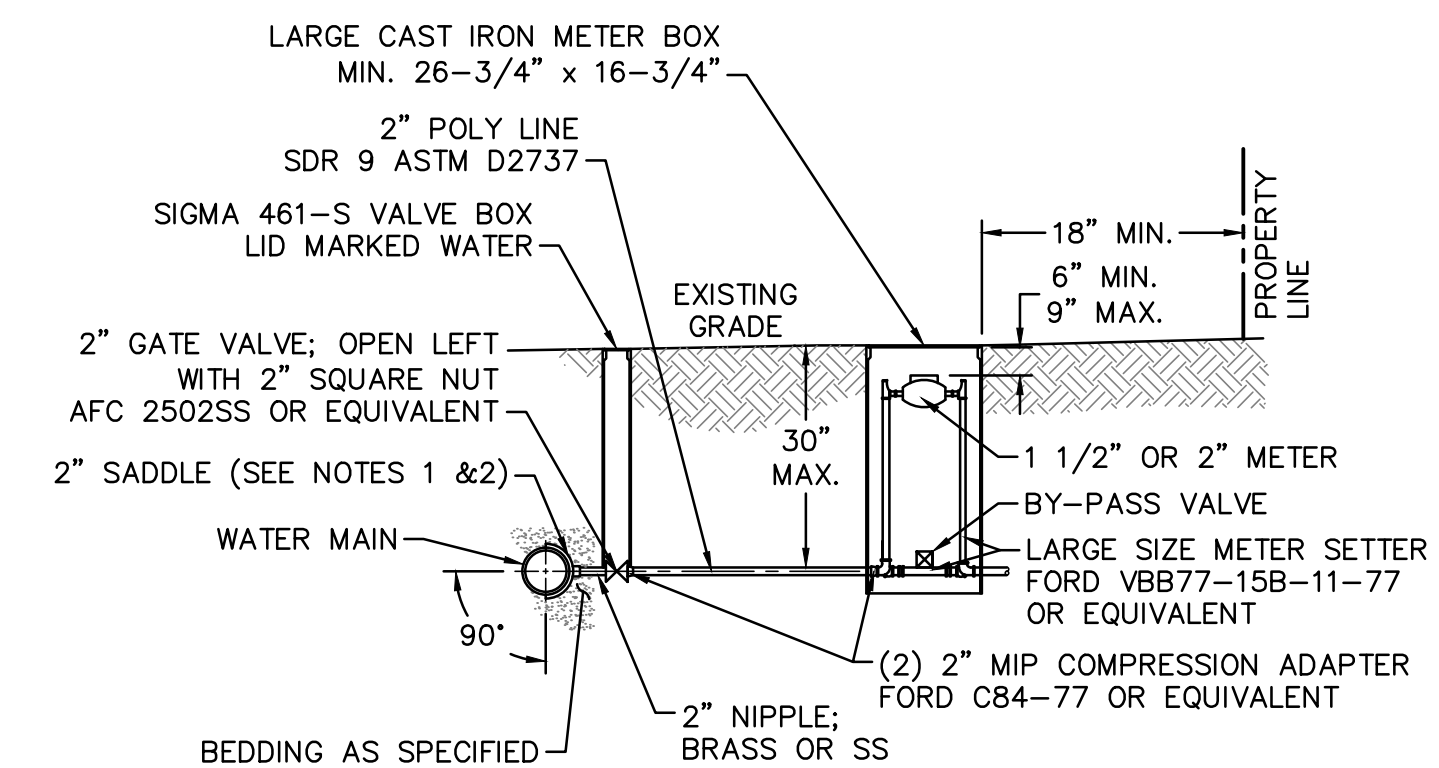
NOTE:
TYPICAL WATER SERVICE CONNECTION FOR RESIDENTIAL SINGLE FAMILY HOME ON CFPUA WATER SYSTEM



WD-1 WATER METER VAULT
NOT TO SCALE



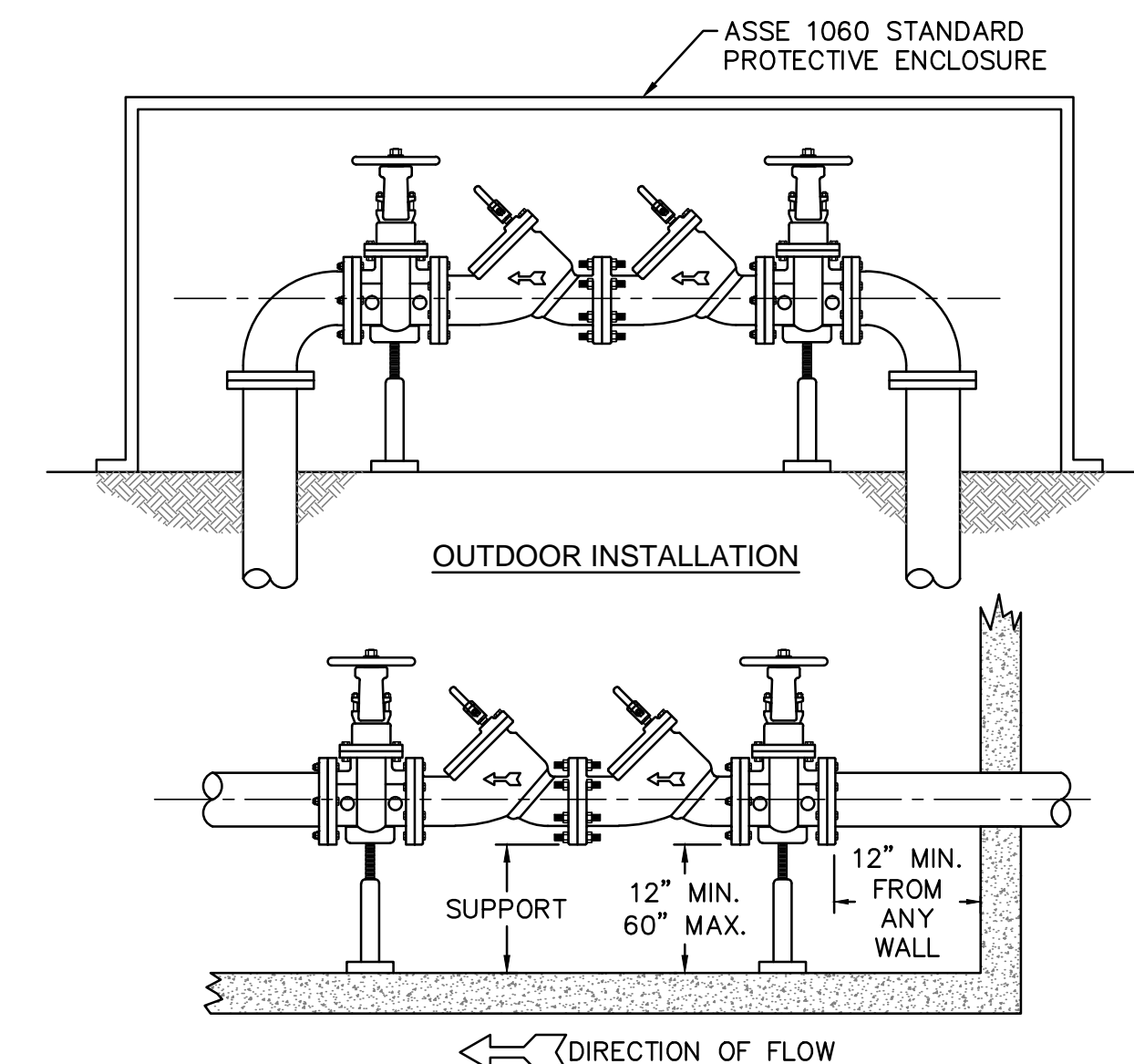
WD-12 REDUCED PRESSURE PRINCIPLE ASSEMBLY
NOT TO SCALE



- NOTES:**
- ALL SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN.
 - SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY: McDONALD 3800, FORD S90 (DOUBLE STRAP) OR EQUIVALENT.
 - METER BOXES SUSCEPTIBLE TO TRAFFIC SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS (OLDCASTLE PRECAST MODEL B1730 OR APPROVED EQUIVALENT).
 - METER BOXES SUSCEPTIBLE TO INCIDENTAL, NON-DELIBERATE TRAFFIC SHALL CONFORM TO ANSI/SCTE 77 TIER 15 LOAD RATING STANDARDS (SYNERTECH MODEL DUO 17x30 OR APPROVED EQUIVALENT).
 - NON-TRAFFIC METER BOXES SHALL BE SIGMA MB2203 OR APPROVED EQUIVALENT.
 - 3" CLEAN FILL REQUIRED ALL AROUND 2" POLY SERVICE LINE.

FOR 1-1/2" OR 2" WATER SERVICES

WD-11 LARGE METER
NOT TO SCALE



- NOTE:**
- MUST BE MIN. 36" AWAY FROM ANY ELECTRICAL PANEL.
 - VALVE REQUIRED DOWNSTREAM OF BACKFLOW ASSEMBLY.
 - VERTICAL INSTALLATION SHALL BE DESIGNED AND SUBMITTED TO CFPUA ESDM FOR APPROVAL.

WD-7 DOUBLE CHECK VALVE ASSEMBLY
NOT TO SCALE

- GENERAL NOTES:**
- NO EXCAVATED MATERIAL SHALL BE PLACED IN ANY STREAM, DITCH OR DRAINAGE-WAY.
 - THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES BEFORE ANY CONSTRUCTION BEGINS.
 - THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES WHILE CONSTRUCTION IS IN PROGRESS.
 - THE CONTRACTOR IS RESPONSIBLE FOR STABILIZATION OF ALL DISTURBED AREAS.
 - THE CONTRACTOR IS RESPONSIBLE FOR LAY DOWN AND STOCKPILE AREAS (TO ARRANGE AND ENSURE COMPLIANCE WITH ALL LOCAL AND STATE REGULATIONS).

THE DETAILS SHOWN HEREON SUPERCEDE CFPUA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04

- NOTES:**
- JOINT RESTRAINT SYSTEMS SHALL BE WEDGE ACTION STYLE FOR DI PIPE AS MANUFACTURED BY EBAA IRON, SIGMA, STAR PIPE PRODUCTS OR APPROVED EQUAL.
 - WHEN HYDRANT LEGS REQUIRE FULL LENGTH PIPE SECTIONS, OVER BELL RESTRAINT SYSTEM SHALL HAVE 316 STAINLESS STEEL HARNESS AND FASTENERS.
 - CONTINUOUS 316 STAINLESS STEEL RODS (TEE TO VALVE AND VALVE TO HYDRANT) MAY BE USED WITH COR-BLUE MJ T-BOLT AND GASKET KITS, AS AN ALTERNATIVE.
 - HYDRANT AND VALVE SHALL BE PLACED OUTSIDE DITCH LIMITS.
 - WEEP HOLES OPEN AND UNBLOCKED TO DRAIN.

WD-10 FIRE HYDRANT ASSEMBLY
NOT TO SCALE

CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD NOTES:

- SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
- WATER AND SEWER SERVICES SHALL BE PERPENDICULAR TO MAIN AND TERMINATE AT RIGHT-OF-WAY LINE. SEWER SERVICES IN CUL-DE-SACS ARE REQUIRED TO BE PERPENDICULAR, OR MUST ORIGINATE IN END OF LINE MANHOLE AND TERMINATE AT RIGHT-OF-WAY LINE.
- ALL SERVICES TYING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF CLASS 50, DIP, WITH PROTECTO 401 CERAMIC EPOXY LINING.
- MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
- NO FLEXIBLE COUPLINGS SHALL BE USED.
- ALL STAINLESS STEEL FASTENERS SHALL BE 316.
- CLEANOUTS SHALL BE LOCATED A MINIMUM OF 12 FEET FROM ALL PROPERTY CORNERS. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.

WD-19 STANDARD NOTES
(REQUIRED ON ALL PLAN AND PROFILE SHEETS)

THESE DETAILS ARE A WORK PRODUCT OF CFPUA FOR SEWER SYSTEM DESIGN AND CONSTRUCTION AND HAVE BEEN REVIEWED AND APPROVED FOR CONTENT AND GENERAL CONFORMANCE WITH THE SEWER DESIGN FOR THIS PROJECT.

REV:	DESCRIPTION:	DATE:
1	Single Service Connection, Double Service Connection, and Large Meter Revised	10/26/12
2	Single Service Connection and Fire Hydrant Details Revised	7/23/13
3	Fire Hydrant Detail Revised	01/03/14
4	Revised Fire Hydrant Assembly To Show 5" STORZ Connection	04/10/15
5	Revised Fire Hydrant Assembly To Show Full Dip Hydrant Leg	01/19/16
6	Revised Water Meter Vault and Large Meter Details, Added Standard Notes	02/15/16

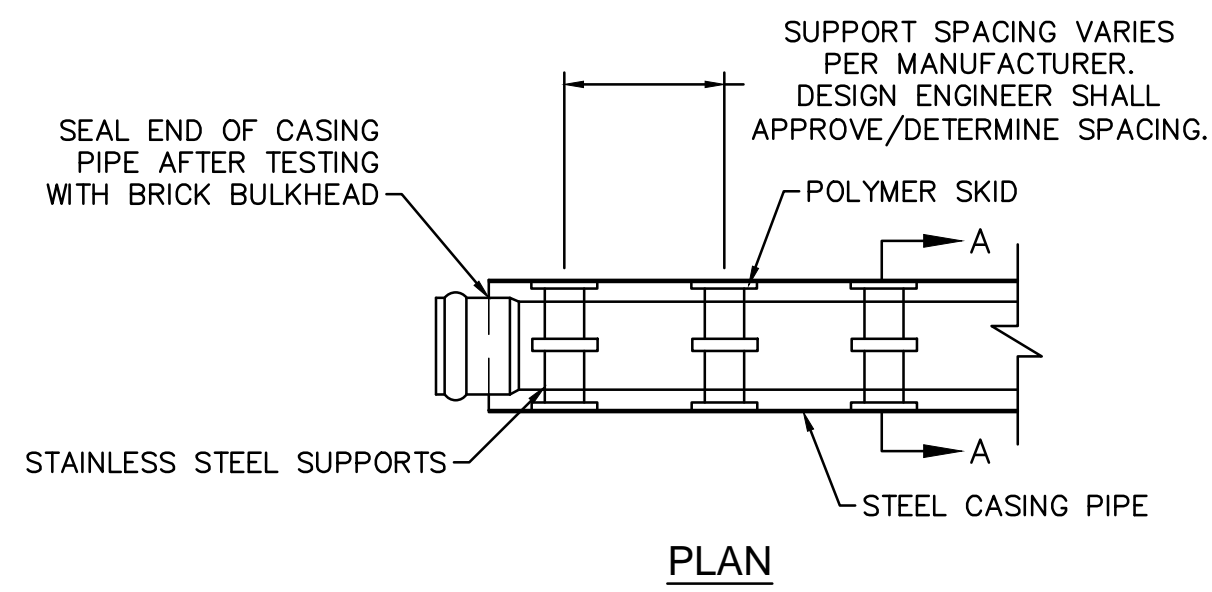
CFPUA WATER DISTRIBUTION SYSTEM

STANDARD DETAILS

CAPE FEAR PUBLIC UTILITY AUTHORITY
235 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403
OFFICE: (910)332-6560

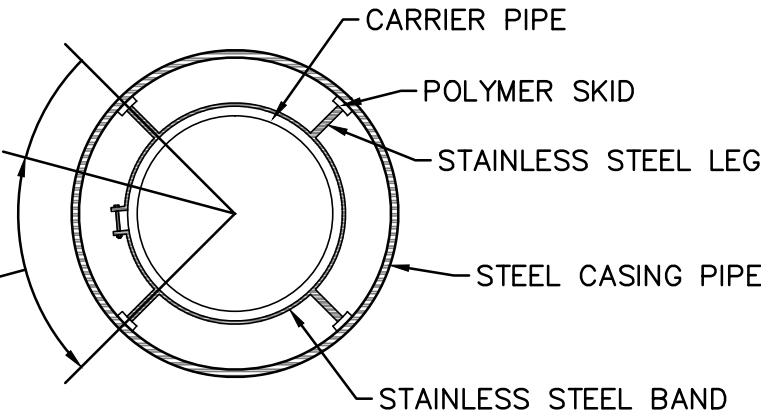
DATE:
1/9/12
SCALE:
N/A
DRAWN BY:
CFPUA
CHECKED BY:
CFPUA
PROJECT NO.:

SHEET NO:
WSD-1



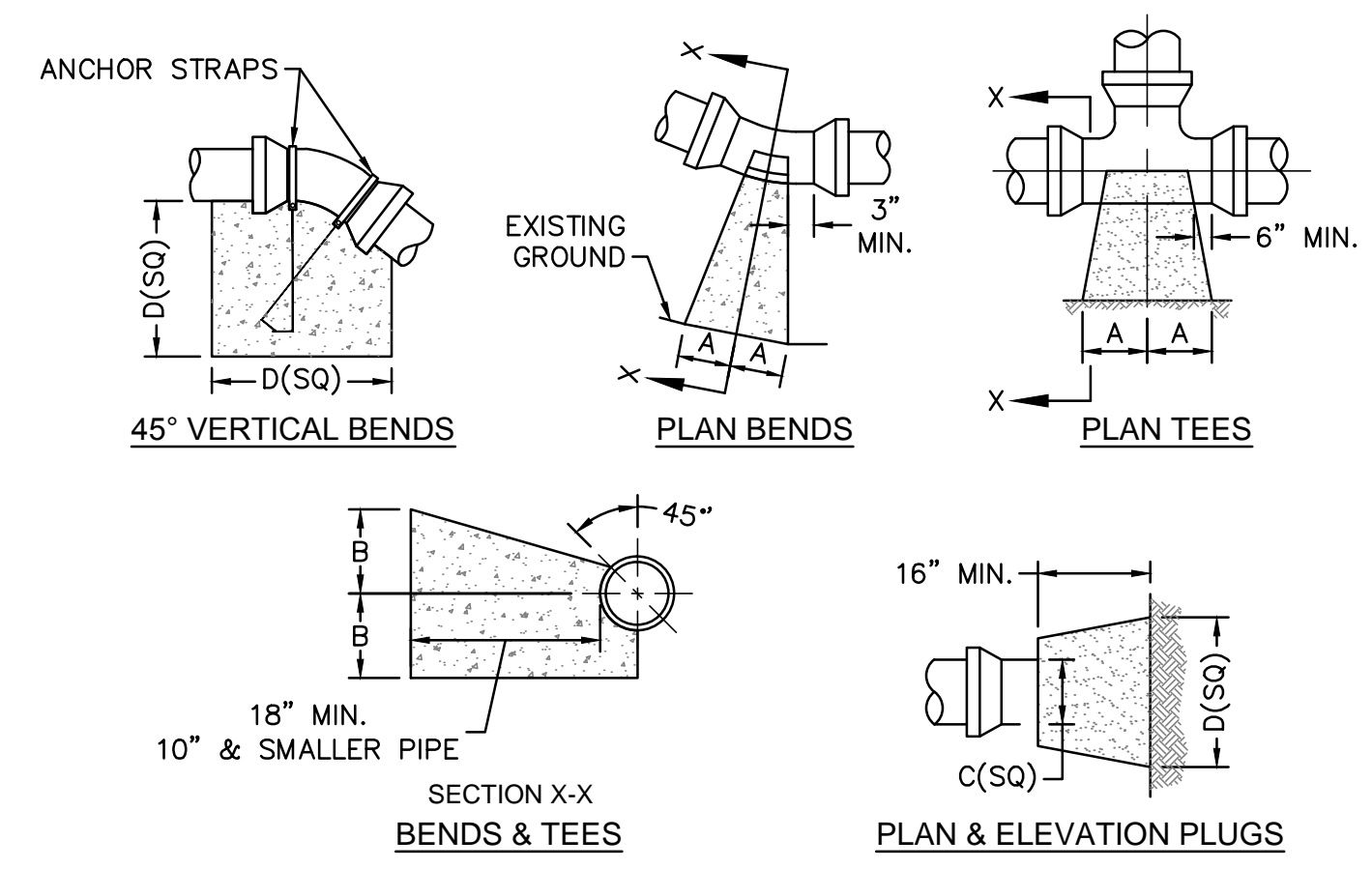
PLAN

NOTE: PIPE SUPPORT TO BE PLACED TO PROVIDE PROPER SUPPORT, ALIGNMENT, AND GRADE AS SPECIFIED. CONTINUOUS SUPPORTS MAY BE USED AS ALTERNATIVE. OIL, GREASE, OR PETROLEUM PRODUCT MAY NOT BE USED AS LUBRICANT.



SECTION A-A

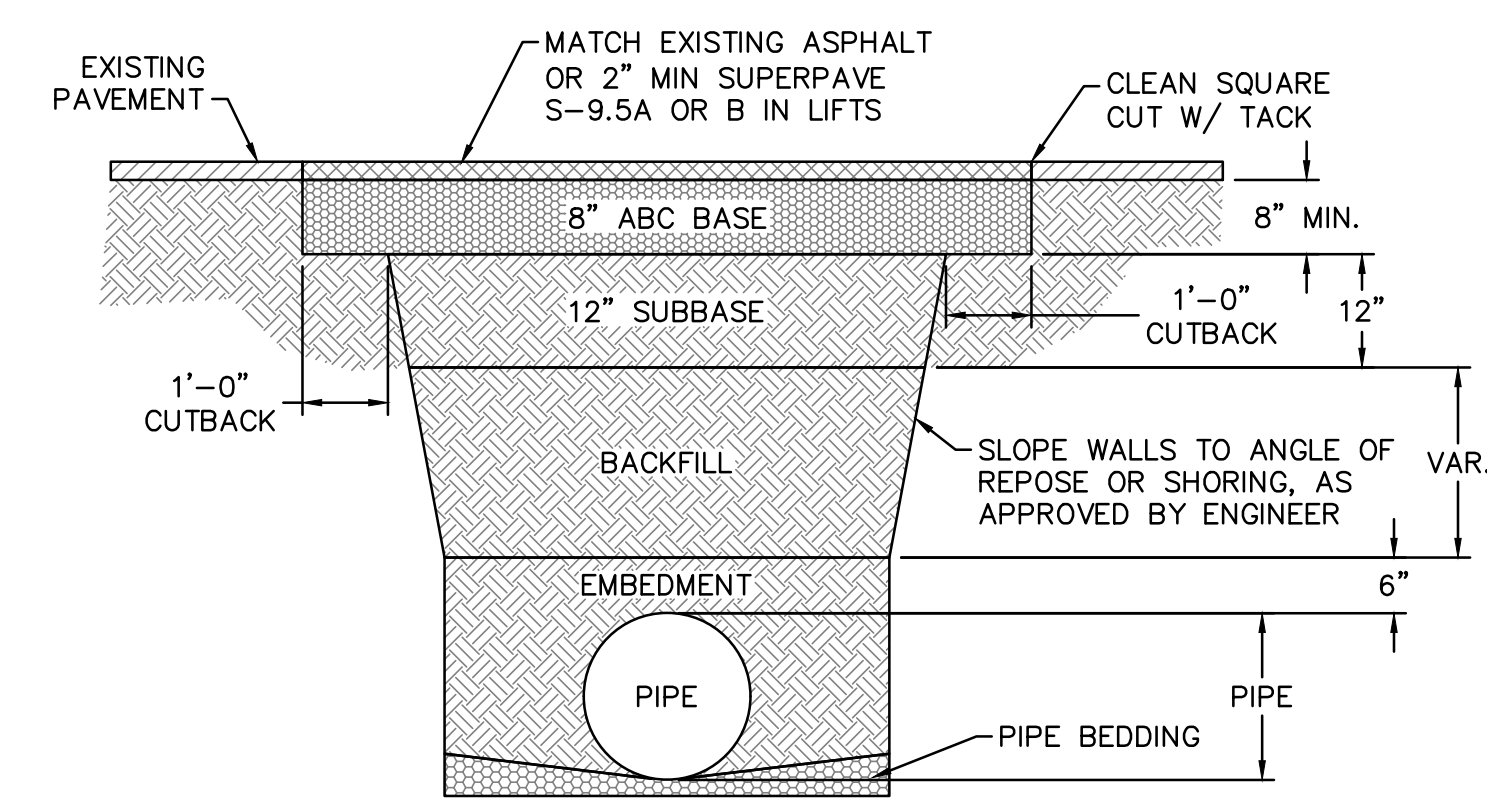
WD-15 PIPE CASING SUPPORT DETAIL NOT TO SCALE



SIZE	90 BENDS		45 BENDS		22-1/2 BENDS		TEES/PLUGS		45 VERT. BENDS
	A	B	A	B	A	B	A	B	
3"	8"	6"	5"	6"	3"	7"	6"	8"	27"
4"	8"	9"	5"	8"	3"	11"	6"	9"	28"
6"	14"	11"	9"	9"	8"	8"	12"	9"	36"
8"	16"	16"	12"	12"	10"	13"	14"	13"	42"
10"	18"	22"	15"	14"	14"	16"	18"	15"	50"
12"	20"	28"	18"	17"	16"	16"	22"	18"	62"
14"	26"	29"	21"	19"	18"	18"	26"	20"	72"
16"	33"	29"	25"	21"	20"	21"	32"	21"	83"
18"	40"	30"	28"	24"	22"	23"	36"	24"	88"

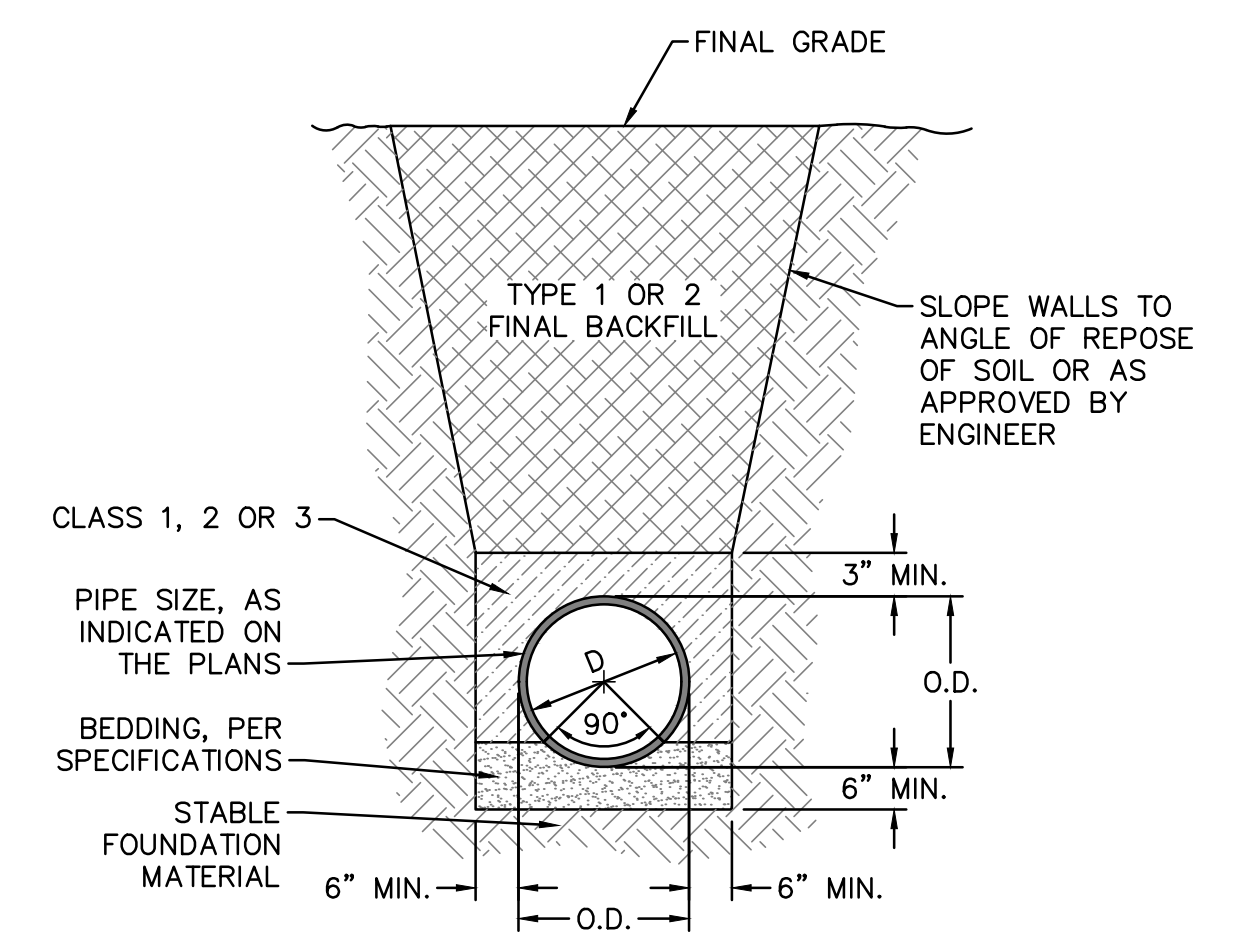
NOTES:
 1. BASED ON 160 PSI TEST PRESSURE AND 2000 PSF SOIL BEARING CAPACITY.
 2. ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.
 3. USE MEG-A-LUG (PREFERRED) IN LIEU OF BLOCKING AND RODDING.

WD-4 THRUST BLOCK DETAIL NOT TO SCALE

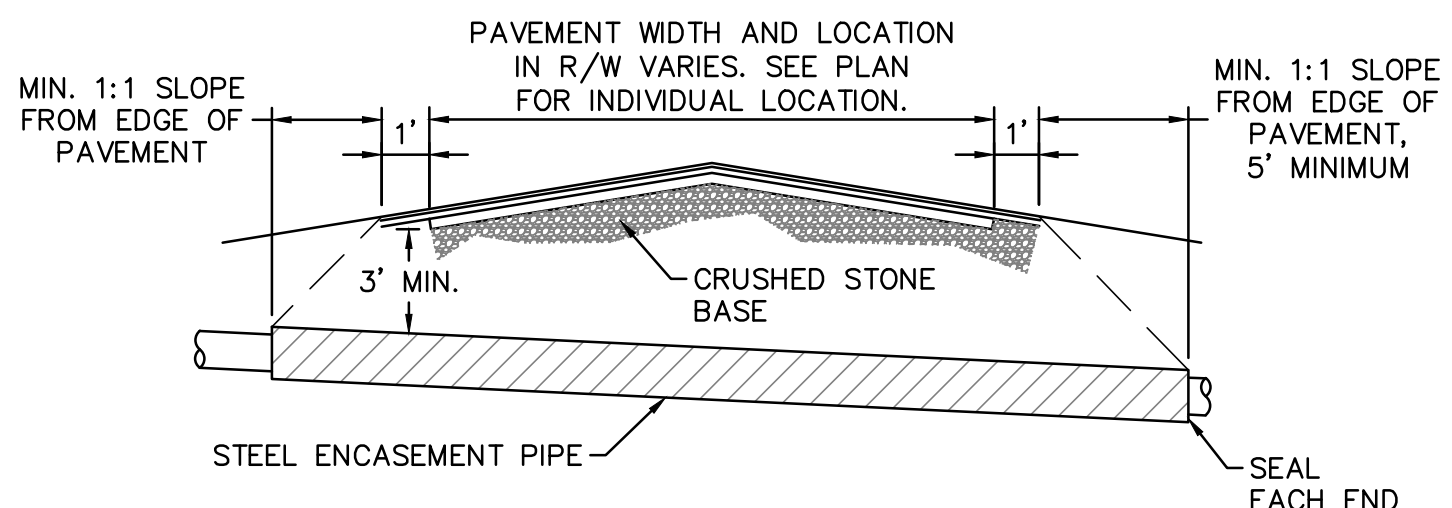


NOTES:
 1. BACKFILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBS, DEBRIS, ORGANICS AND LITTLE TO NO EXCESSIVE MOISTURE.
 2. SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CITY TO ACHIEVE COMPACTION, (I.E. #57, ABC, CRUSHED LIMESTONE, CLEAN SAND, FLOWABLE FILL, ETC).
 3. 8-INCH OF ABC BASE MATERIAL SHALL BE USED ON CITY STREETS.
 4. BACKFILL AND BASE MATERIALS SHALL BE COMPACTED 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 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%.

WD-14 PAVEMENT REPAIR WHERE PIPE INSTALLED NOT TO SCALE

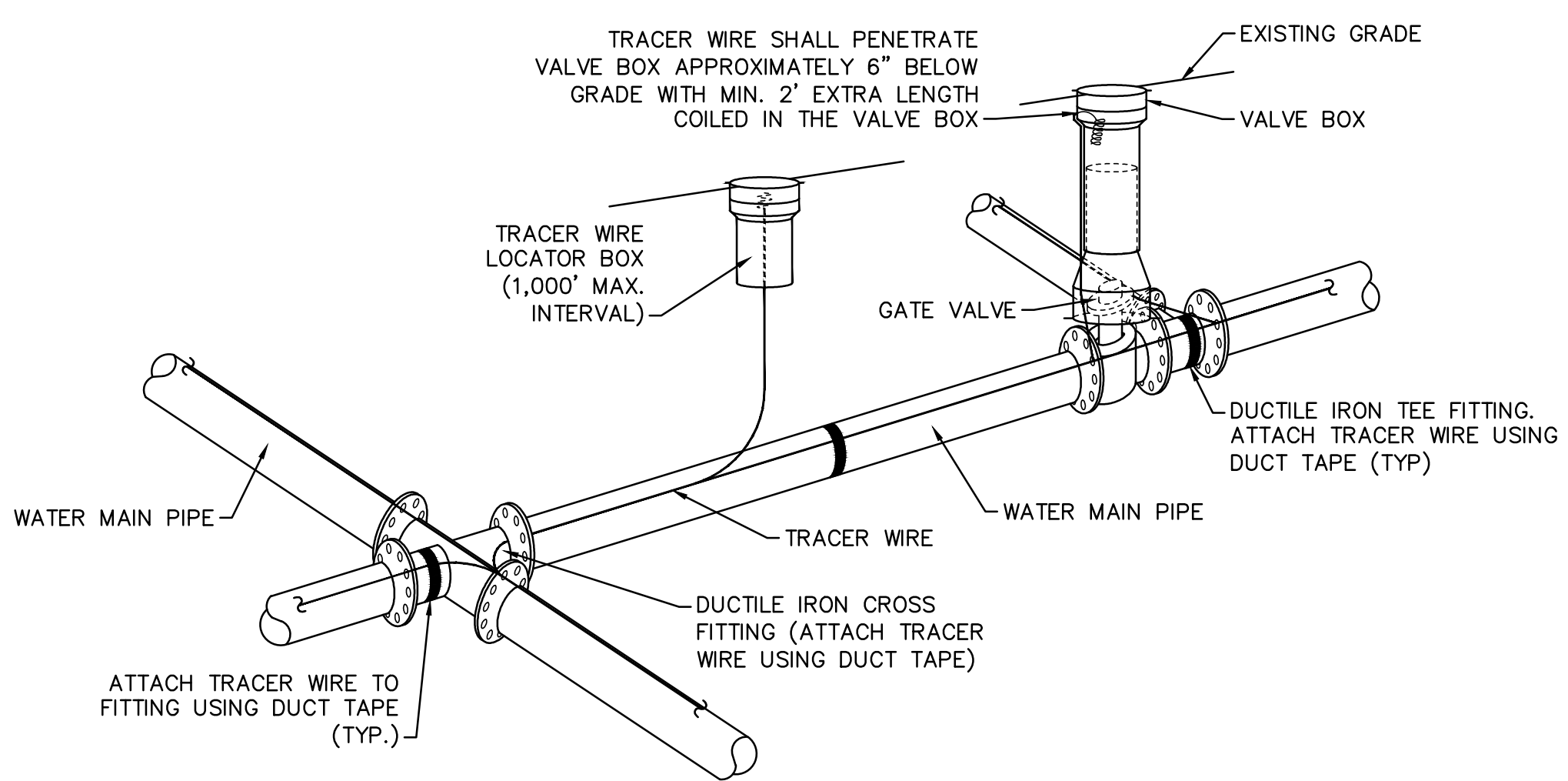


WD-13 TYPICAL TRENCH DETAIL NOT TO SCALE



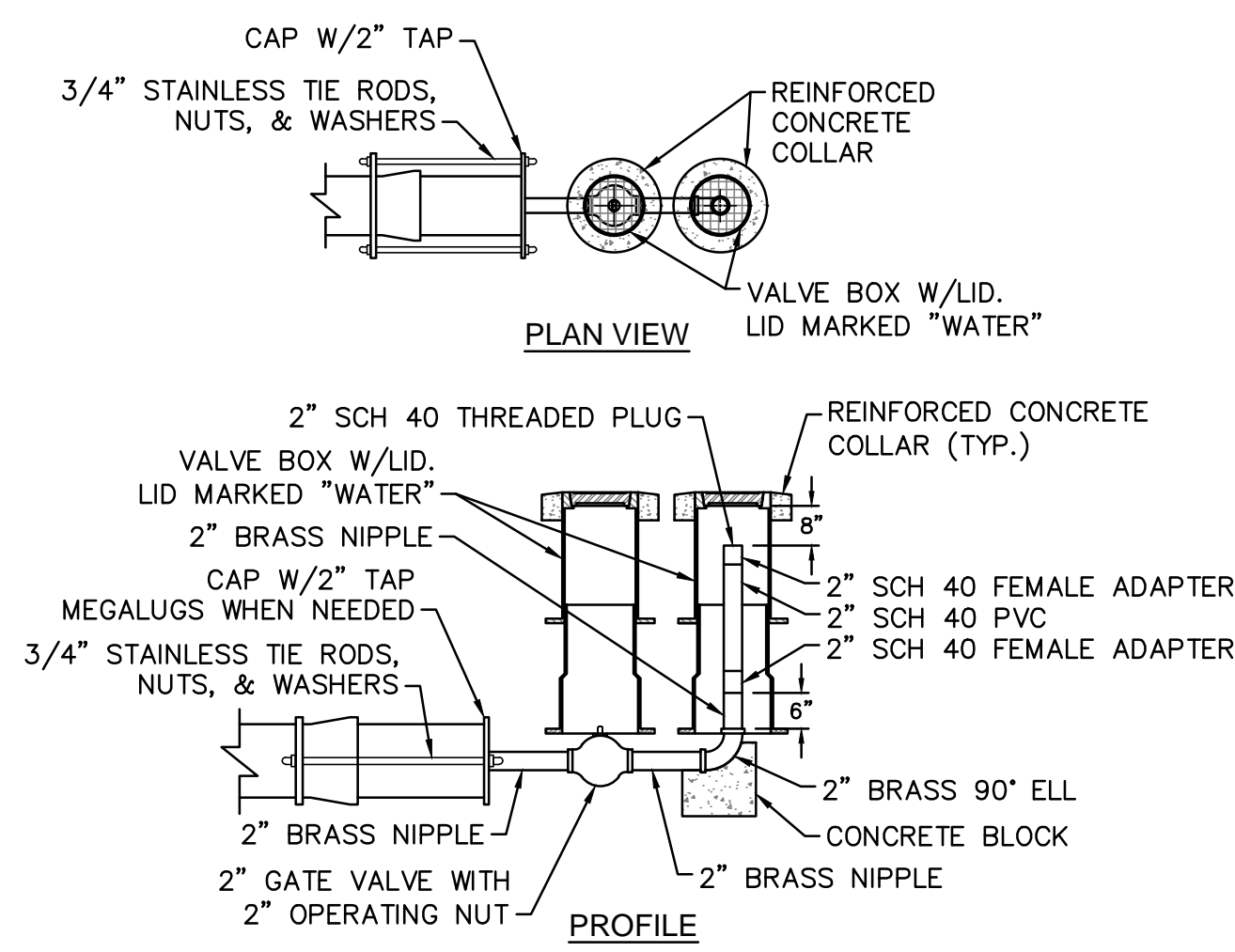
NOTES:
 1. CASING WILL BE INSTALLED AT LINE AND GRADE SHOWN ON INDIVIDUAL PROFILE FOR EACH CROSSING. BORING/JACKING TO LINE AND GRADE IS REQUIRED.
 2. TRACER WIRE SHALL BE CONTINUED THROUGH CASING.

WD-16 TYPICAL BORING/ JACKING DETAIL NOT TO SCALE

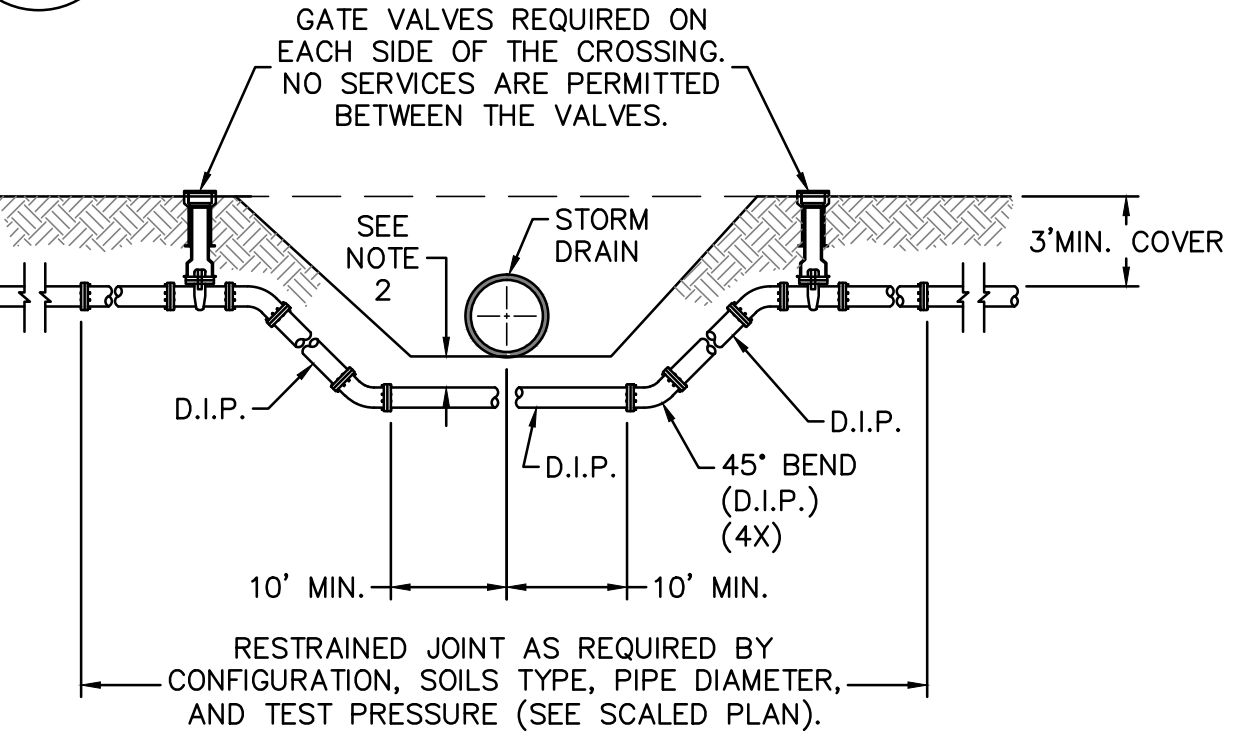


NOTES:
 1. TRACER WIRE SHALL BE #10 COPPER SOLID CORE COPPER WIRE WITH GAS AND OIL RESISTANT INSULATION.
 2. WIRE SHALL BE STRAPPED TO ALL PVC WATER MAIN PIPING WITH DUCT TAPE AT 12 FOOT INTERVALS ALONG THE PIPE.
 3. SECURE WIRE TO ALL TEE AND CROSS FITTINGS WITH DUCT TAPE.
 4. ALL SPLICES IN THE WIRE SHALL BE MADE WITH 3M DBR DIRECT BURY SPLICE KIT AN UNDERGROUND RATED, WATERTIGHT, AND APPROVED SPLICE CONNECTOR OR APPROVED EQUAL.

WD-17 TRACER WIRE DETAIL NOT TO SCALE

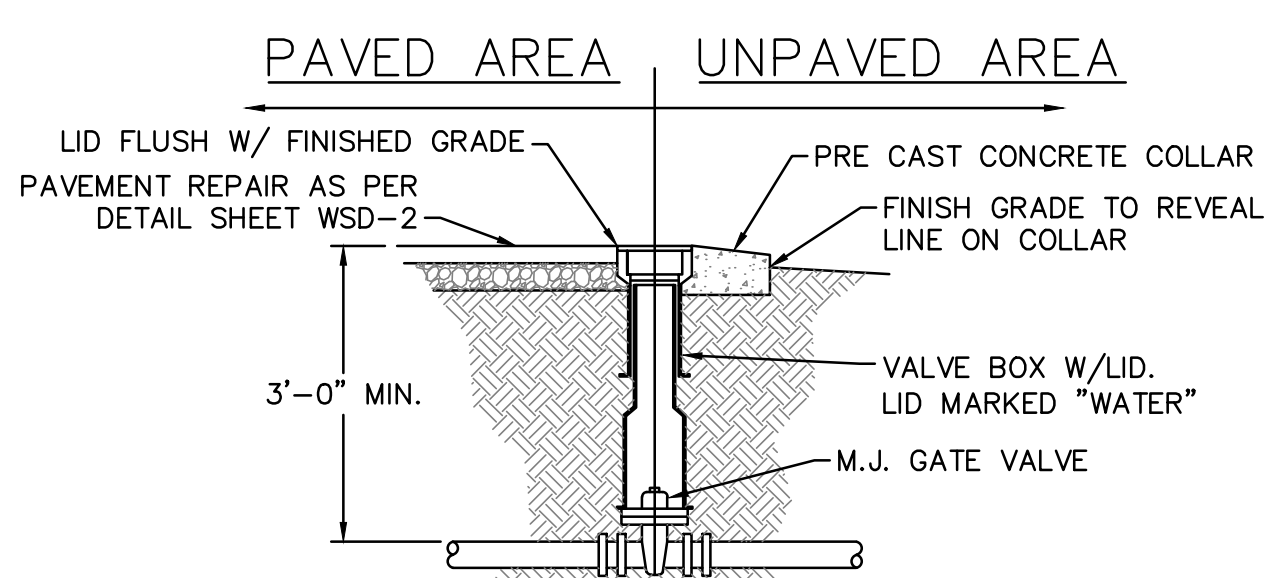


WD-5 2" BLOW-OFF NOT TO SCALE

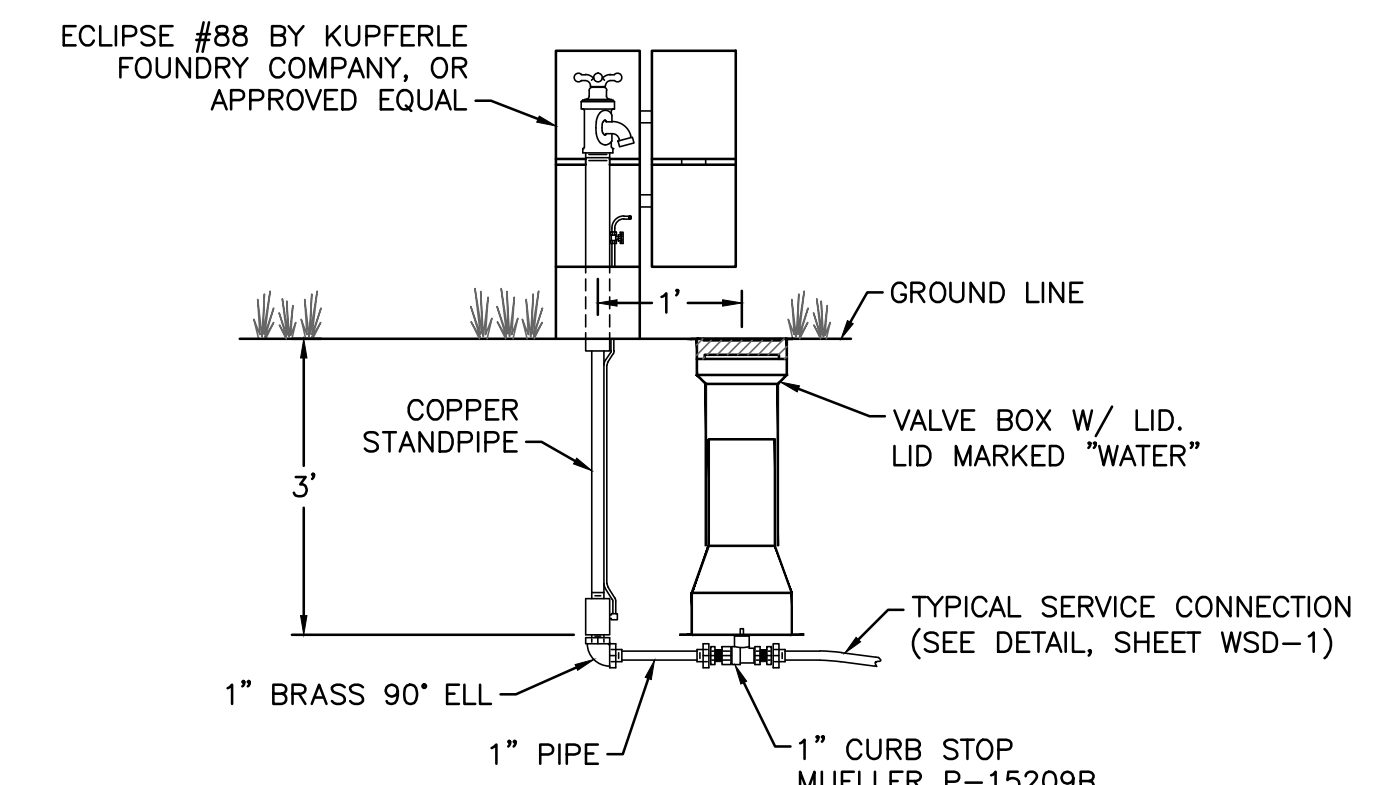


NOTES:
 1. USE PRESSURE CLASS 350 DIP, UNLESS SPECIFIED OTHERWISE.
 2. MINIMUM DEPTH REQUIRED, UNLESS SPECIFIED OTHERWISE BY CFPUA:
 a. IN DOT R/W, 36" MIN. TYPICAL, OR 24" MIN. WHEN CROSSING A DITCH LINE.
 b. ALL OTHER LOCATIONS, 30" MIN.
 c. WHEN STORM DRAIN INVERT IS BURIED AT OR BELOW ABOVE DEPTHS, 18" MIN. CLEARANCE IS REQUIRED.

WD-2 WATER MAIN DITCH AND STORM DRAIN CROSSING NOT TO SCALE



WD-3 VALVE DETAIL NOT TO SCALE



WD-6 SAMPLING STATION NOT TO SCALE

THESE DETAILS ARE A WORK PRODUCT OF CFPUA FOR SEWER SYSTEM DESIGN AND CONSTRUCTION AND HAVE BEEN REVIEWED AND APPROVED FOR CONTENT AND GENERAL CONFORMANCE WITH THE SEWER DESIGN FOR THIS PROJECT.

REV:	DESCRIPTION:	DATE:
1	Revised Water Main Ditch and Storm Crossing Detail	11/12/13
2	Revised Water Main Ditch and Storm Crossing Detail	05/05/14
3	Revised Tracer Wire Detail	10/20/15
4	Added Backflow Preventer to Double Service Connection Detail	02/01/16
5	Revised Sampling Station Detail	02/15/16

GENERAL NOTES:
 1. NO EXCAVATED MATERIAL SHALL BE PLACED IN ANY STREAM, DITCH OR DRAINAGE-WAY.
 2. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES BEFORE ANY CONSTRUCTION BEGINS.
 3. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES WHILE CONSTRUCTION IS IN PROGRESS.
 4. THE CONTRACTOR IS RESPONSIBLE FOR STABILIZATION OF ALL DISTURBED AREAS.
 5. THE CONTRACTOR IS RESPONSIBLE FOR LAY DOWN AND STOCKPILE AREAS (TO ARRANGE AND ENSURE COMPLIANCE WITH ALL LOCAL AND STATE REGULATIONS).

THE DETAILS SHOWN HEREON SUPERCEDE CFPUA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04

CFPUA WATER DISTRIBUTION SYSTEM

STANDARD DETAILS

CAPE FEAR PUBLIC UTILITY AUTHORITY
 235 GOVERNMENT CENTER DRIVE
 WILMINGTON, NC 28403
 OFFICE: (910)332-6560

DATE: 1/9/12
 SCALE: N/A
 DRAWN BY: CFPUA
 CHECKED BY: CFPUA
 PROJECT NO.:

SHEET NO: WSD-2