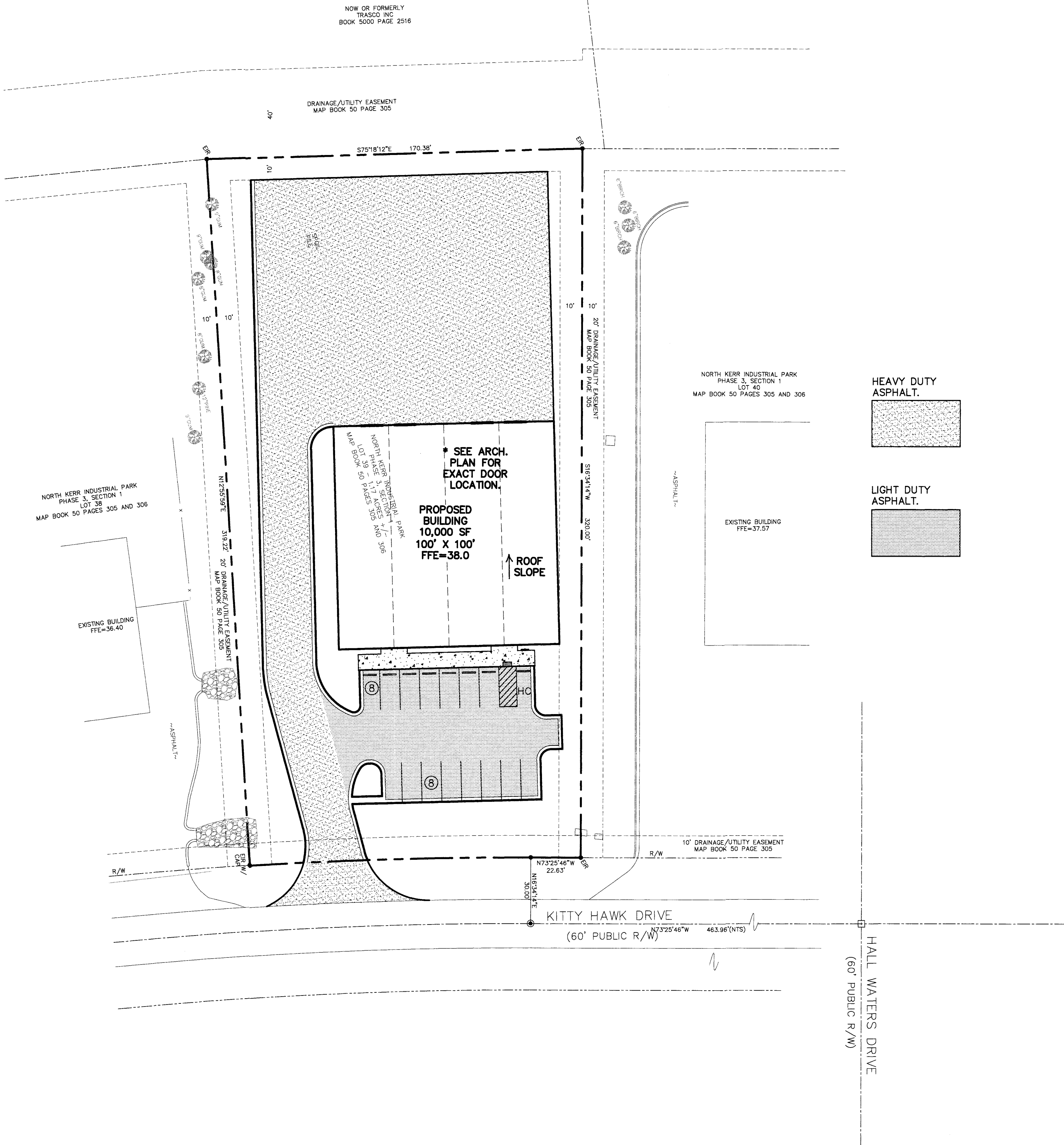


VICINITY MAP NTS



LEGEND

	PROPERTY LINE
	DISTURBED AREA LIMITS
	PROPOSED CONTOUR
	TEMPORARY SILT FENCE
	PROPOSED STORMDRAIN PIPE
	PROPOSED WATERLINE
	PROPOSED SANITARY SEWER
	PROPOSED FINISH GRADE SPOT ELEVATION
	FLARED END SECTION WITH RIP-RAP ENERGY DISSIPATOR
	DROP INLET WITH INLET PROTECTION (DI)
	CURB INLET WITH INLET PROTECTION (CI)
	EXISTING CONTOUR
	LIGHT DUTY ASPHALT
	HEAVY DUTY ASPHALT
	CONCRETE

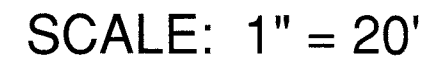
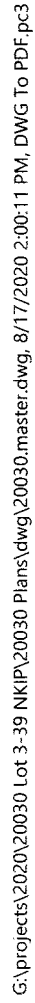


SITE DATA	
BUILDING USE:	WAREHOUSE
TOTAL SITE AREA:	1.17± AC (50,965 SF)
DISTURBED AREA:	1.11AC
ZONING:	I-2 (HEAVY INDUSTRIAL)
PARCEL NUMBER:	R03400-001-095-000
MAP ID NUMBER:	313906.29.7886.000
ADDRESS:	3313 KITTY HAWK RD.
BUILDING SETBACKS:	FRONT = 50'
BUILDING HEIGHT:	24'
BUILDING AREA:	10,000 SF
CAMA LAND CLASSIFICATION:	WETLAND RESOURCE PROTECTION AREA
REQUIRED PARKING:	
WAREHOUSE	
1.5 SPACES FOR EVERY 2 EMPLOYEES=	(14/2)(1.5) = 11 SP.
1 SPACE FOR EVERY MANAGER=	4 MAN. = 4 SP.
1 VISITOR SPACE FOR EVERY 10 MANAGERS=	1 SP.
1 SPACE FOR EVERY BUSINESS VEHICLE=	N/A = 0 SP.
TOTAL PARKING REQUIRED:	16 SPACES (INCLUDING 1 HANDICAP)
TOTAL PARKING PROVIDED:	16 (INCLUDES 1 HC SPACES)
IMPERVIOUS AREAS:	
BUILDING:	10,000 SF (ROOF AREA)
ASPHALT, CONCRETE, CURB & GUTTER:	25,430 SF
SIDEWALK:	617 SF
TOTAL IMPERVIOUS AREA:	36,047 SF
% IMPERVIOUS LOT COVERAGE:	71%
LANDSCAPING: (SEE LANDSCAPE PLAN)	
INTERIOR (8%) OF 18,874±=1,510 SF REQUIRED PROVIDED: 1,582 SF	
FOUNDATION PLANTINGS:	
PROPOSED BUILDING FRONT AND SIDE:	
(24) X (100) X (.12)=288 SF REQUIRED	288 SF PROVIDED
(24) X (100) X (.12)=288 SF REQUIRED	288 SF PROVIDED
STREETYARD FACTOR .25	
PRIMARY: KITTY HAWK RD.	
(150) - (30) X 25 = 3,000 SF REQUIRED	3,000 SF PROVIDED
NO REGULATED OR SIGNIFICANT TREES EXIST ON SITE	

SCALE: 1" = 30'



BY	DESCRIPTION	REVISIONS
DATE		
SYMBOL		
© 2016 NORRIS & TUNSTALL		
OVERALL SITE PLAN		
LOT 3-39 3313 KITTY HAWK ROAD		
NORTH KERR INDUSTRIAL PARK		
WILMINGTON, N. C.		
OWNER:	BAT COMPANY LLC 3705-A RESTON COURT WILMINGTON, NC 28403 910-616-6020	
NORRIS & TUNSTALL CONSULTING ENGINEERS P.C. 2602 IRON GATE DR., SUITE 102 WILMINGTON, NC 28412 PHONE (910) 343-9653		
Licence #C-3641		
20030		
DES.	JST	
CHKD.	JPN	
DRWN.	NKS	
DATE	8/17/20	
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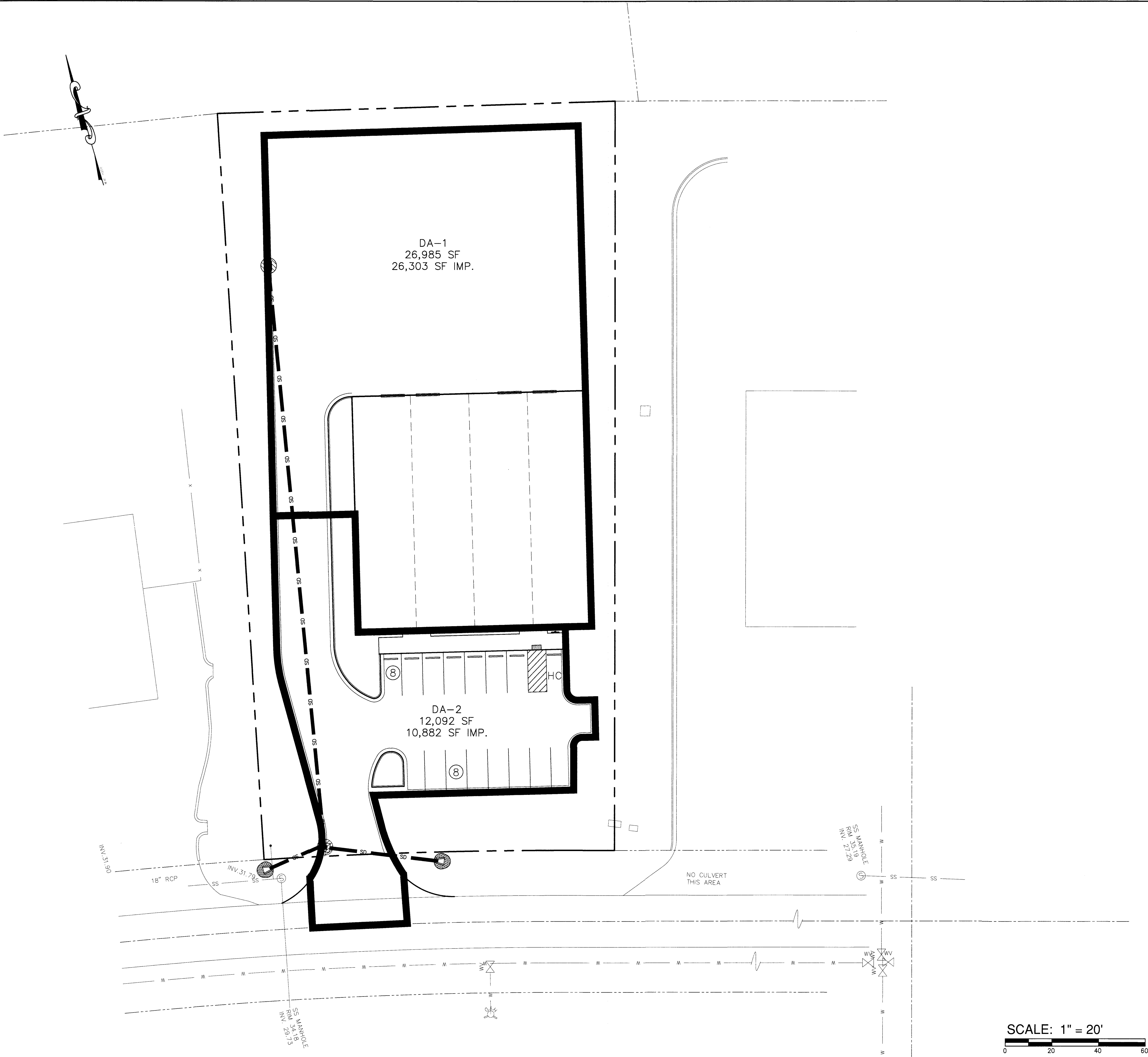
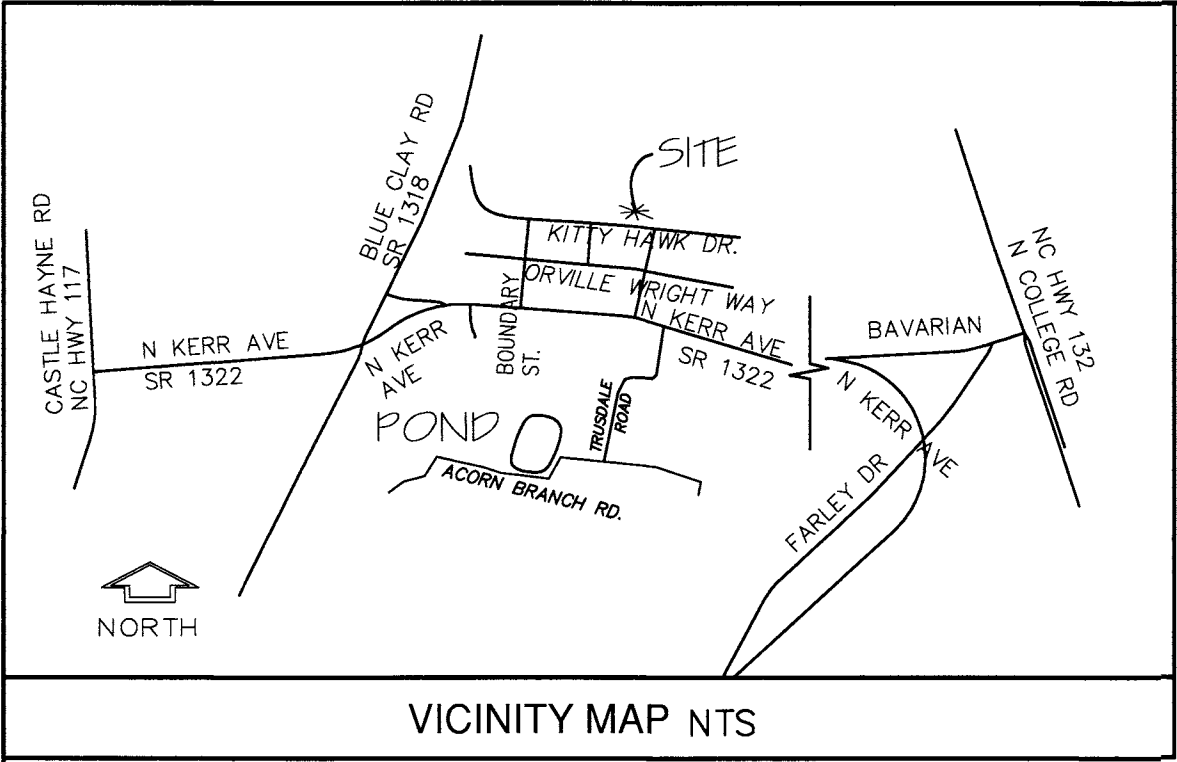
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DES.	JST
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DATE	8/17/20



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SYMBOL	DATE	DESCRIPTION	BY
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DRAINAGE AREA PLAN

OWNER:
BNT COMPANY, LLC
3705-A RESTON COURT
WILMINGTON, NC 28403
910-616-6020

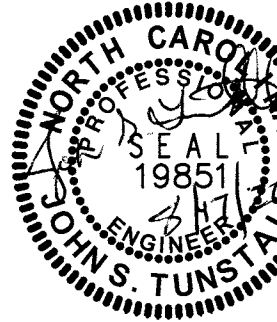
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CONSULTING ENGINEERS P.C.
2602 IRON GATE DR., SUITE 102
WILMINGTON, NC 28412
PHONE (910) 343-9653

Licence #C-3641

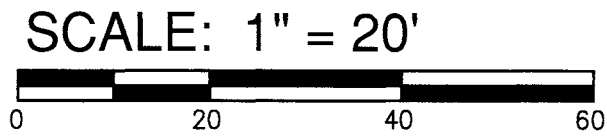
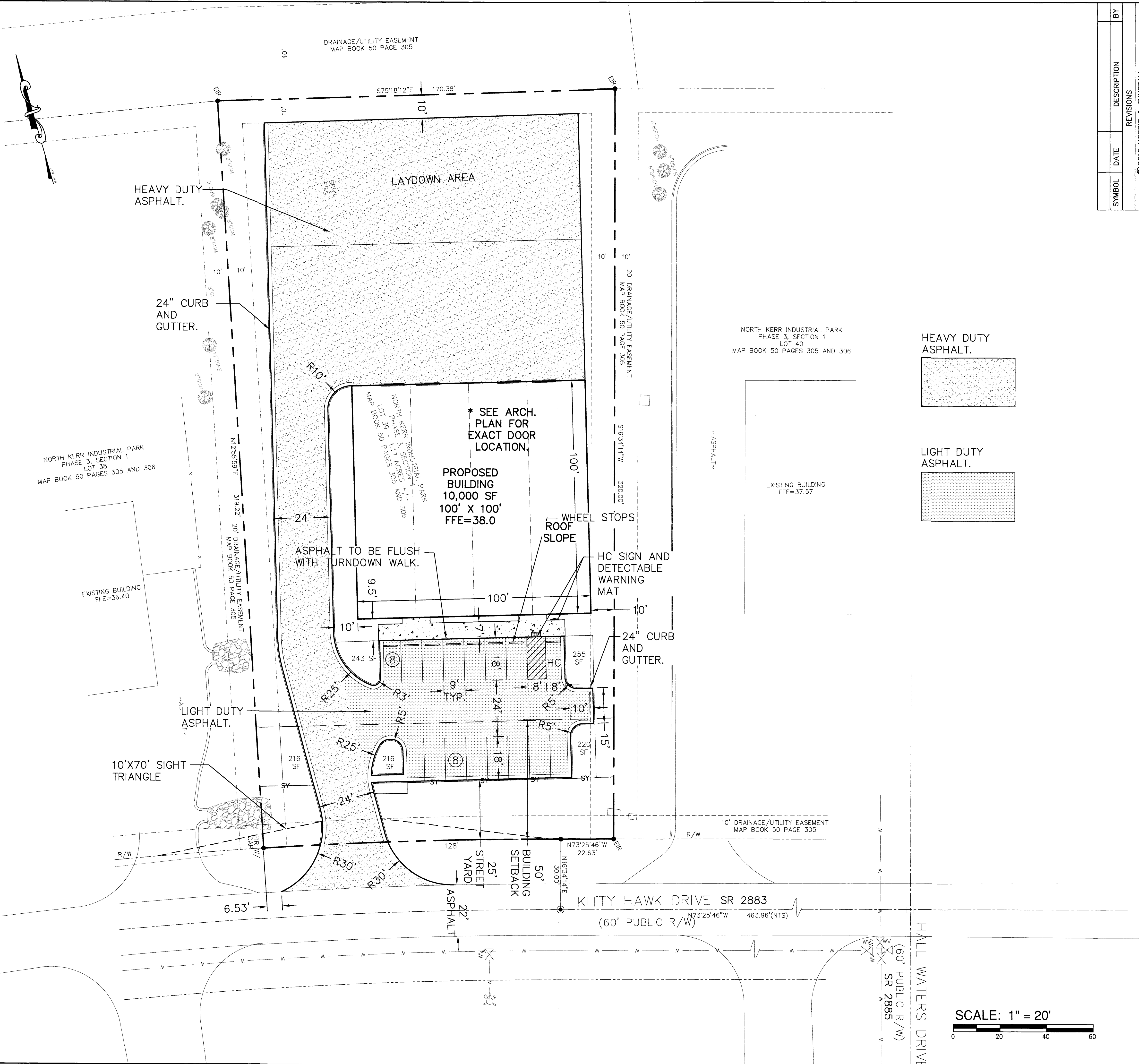
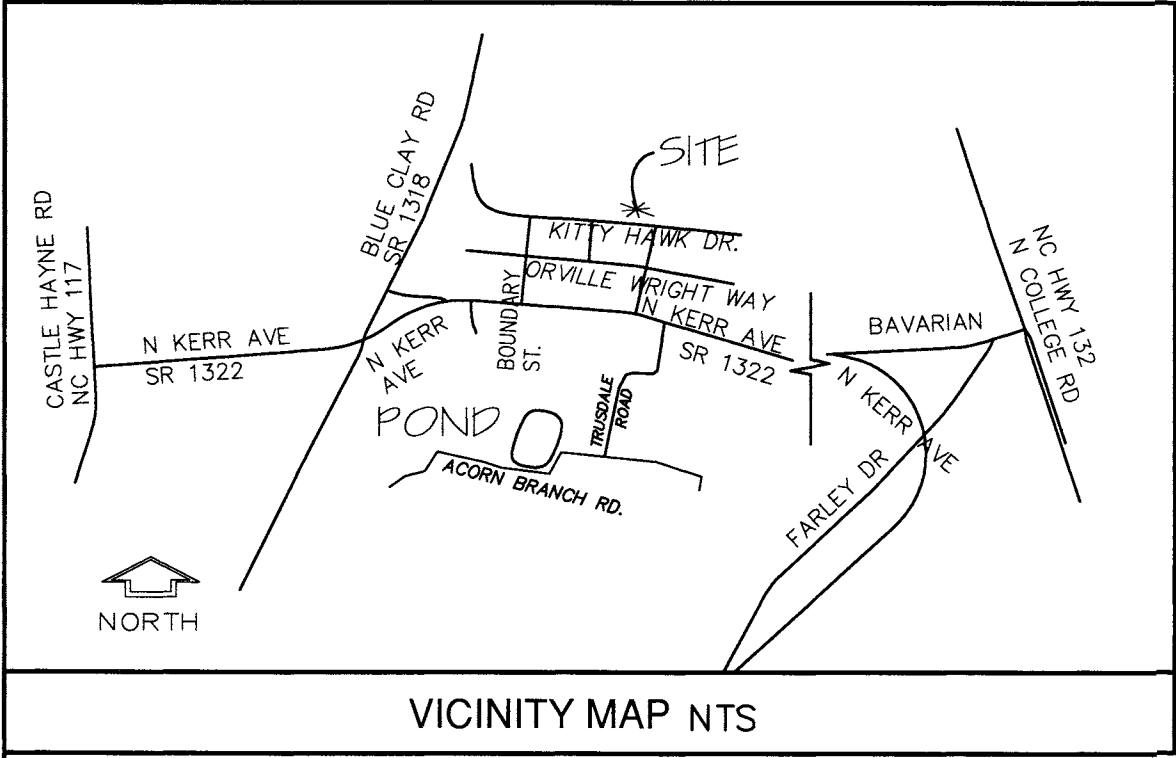
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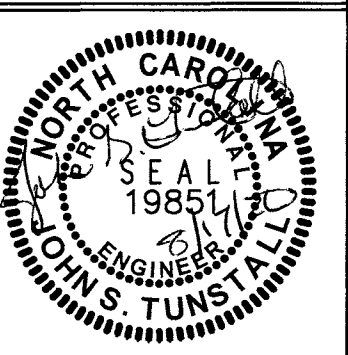
SYMBOL	DATE	DESCRIPTION	BY
REVISIONS			
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LAYOUT PLAN
LOT 3-39 3313 KITTY HAWK ROAD
NORTH KERR INDUSTRIAL PARK
WILMINGTON, N. C.

OWNER:
BNT COMPANY, LLC
3705-A PESTON COURT
WILMINGTON, NC 28403
910-616-6020

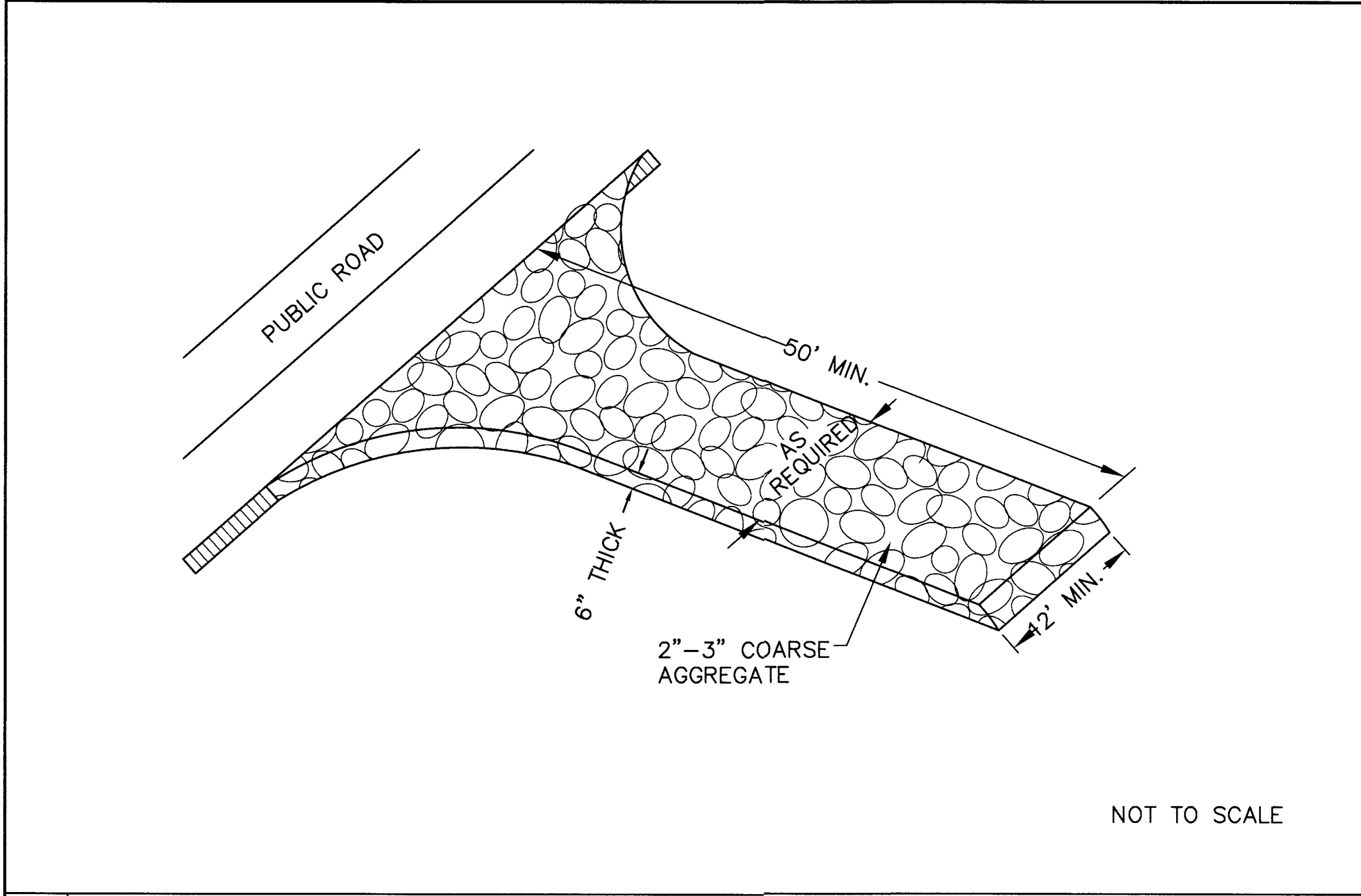
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2602 IRON GATE DR., SUITE 102
WILMINGTON, NC 28412
PHONE: (910) 343-9653
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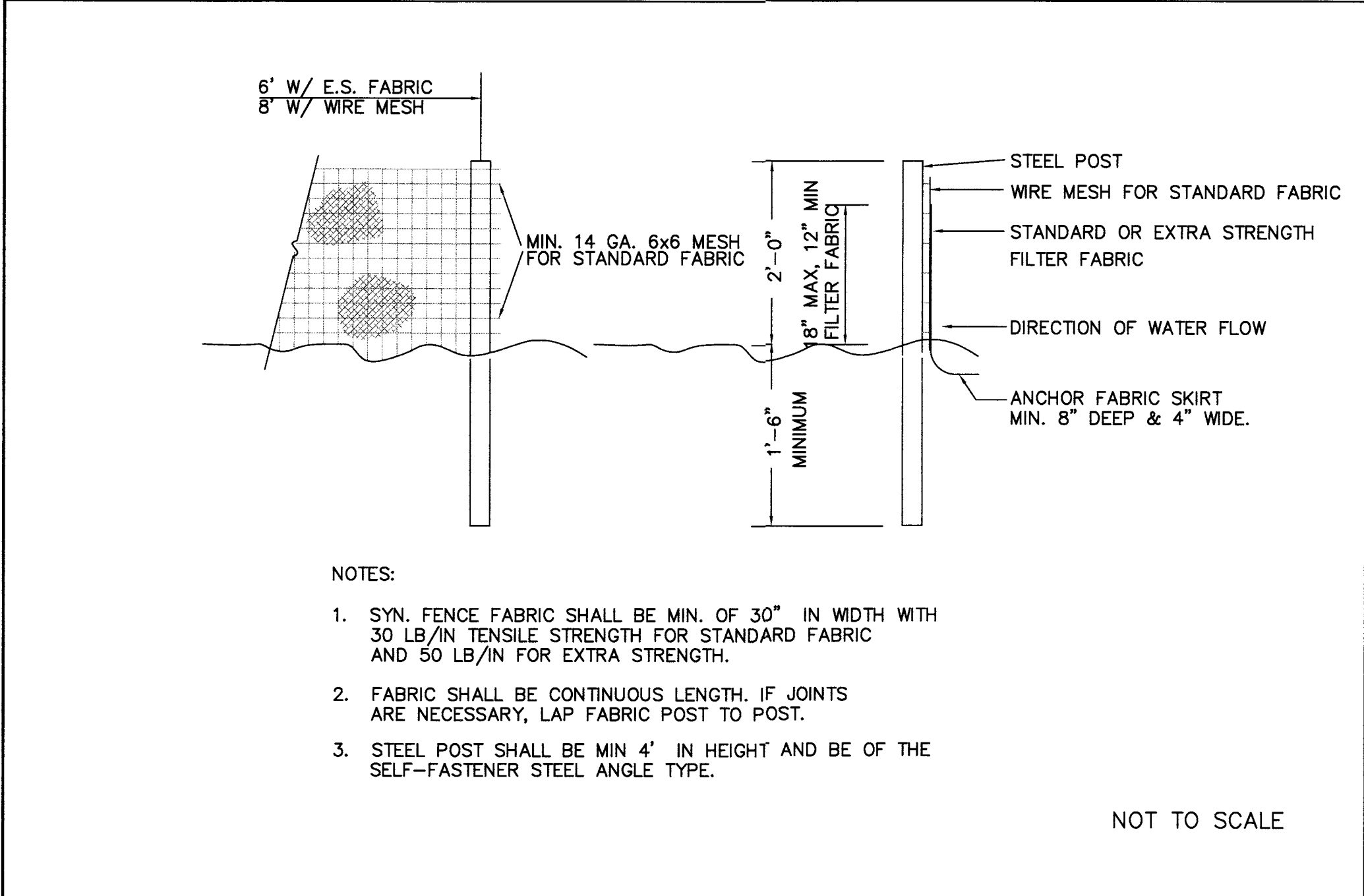


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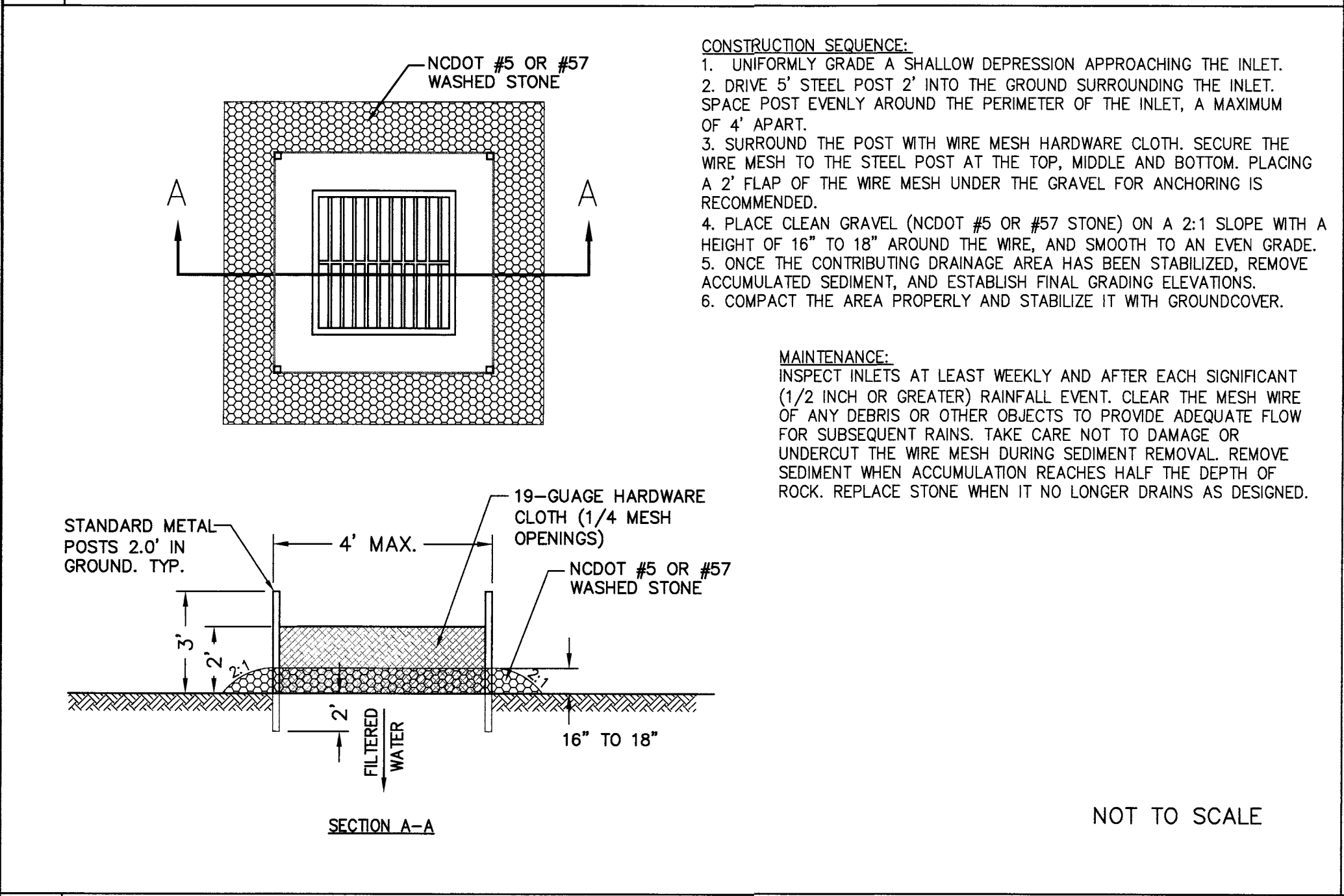
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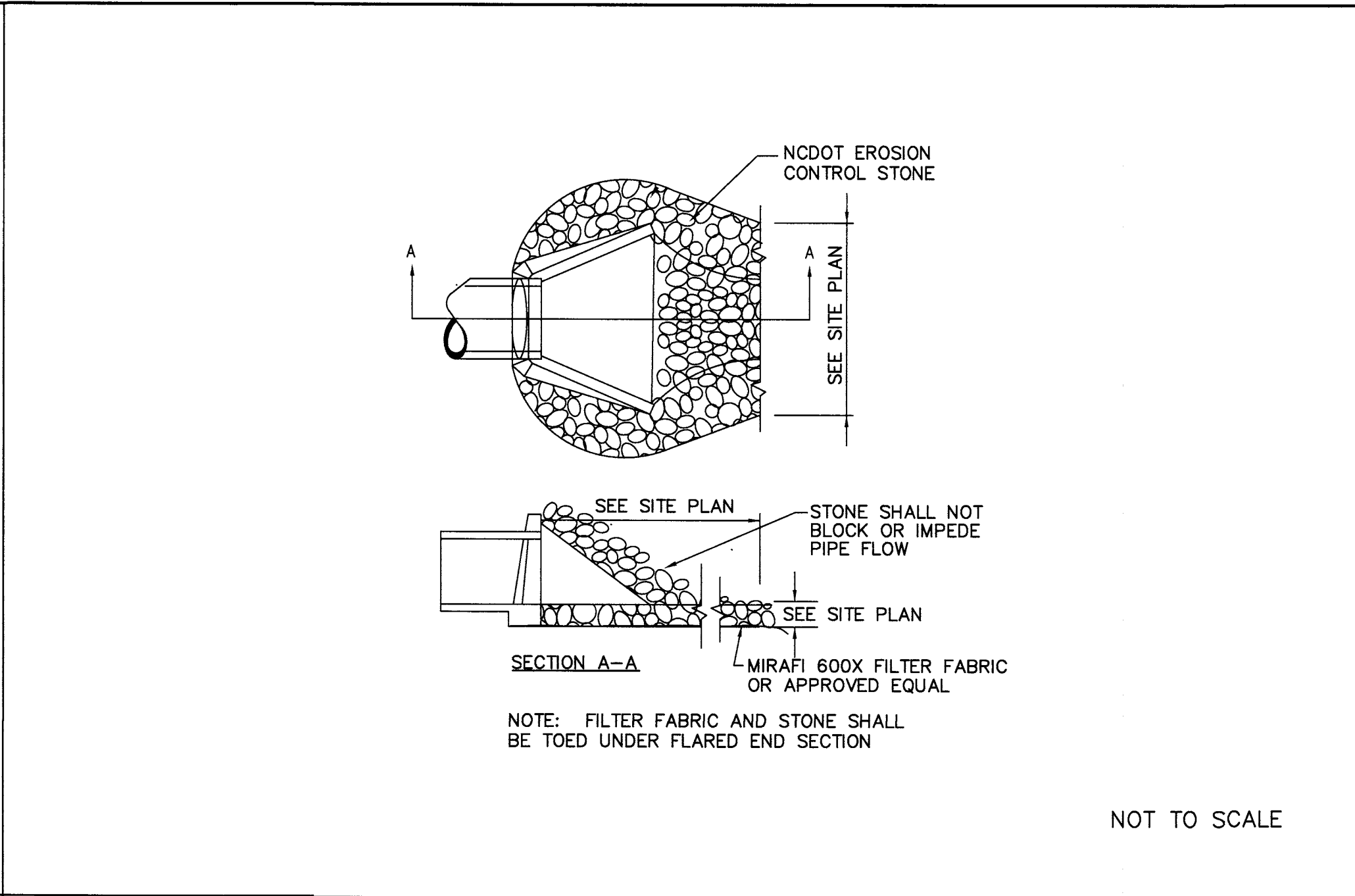
1 TEMPORARY GRAVELLED CONSTRUCTION ENTRANCE



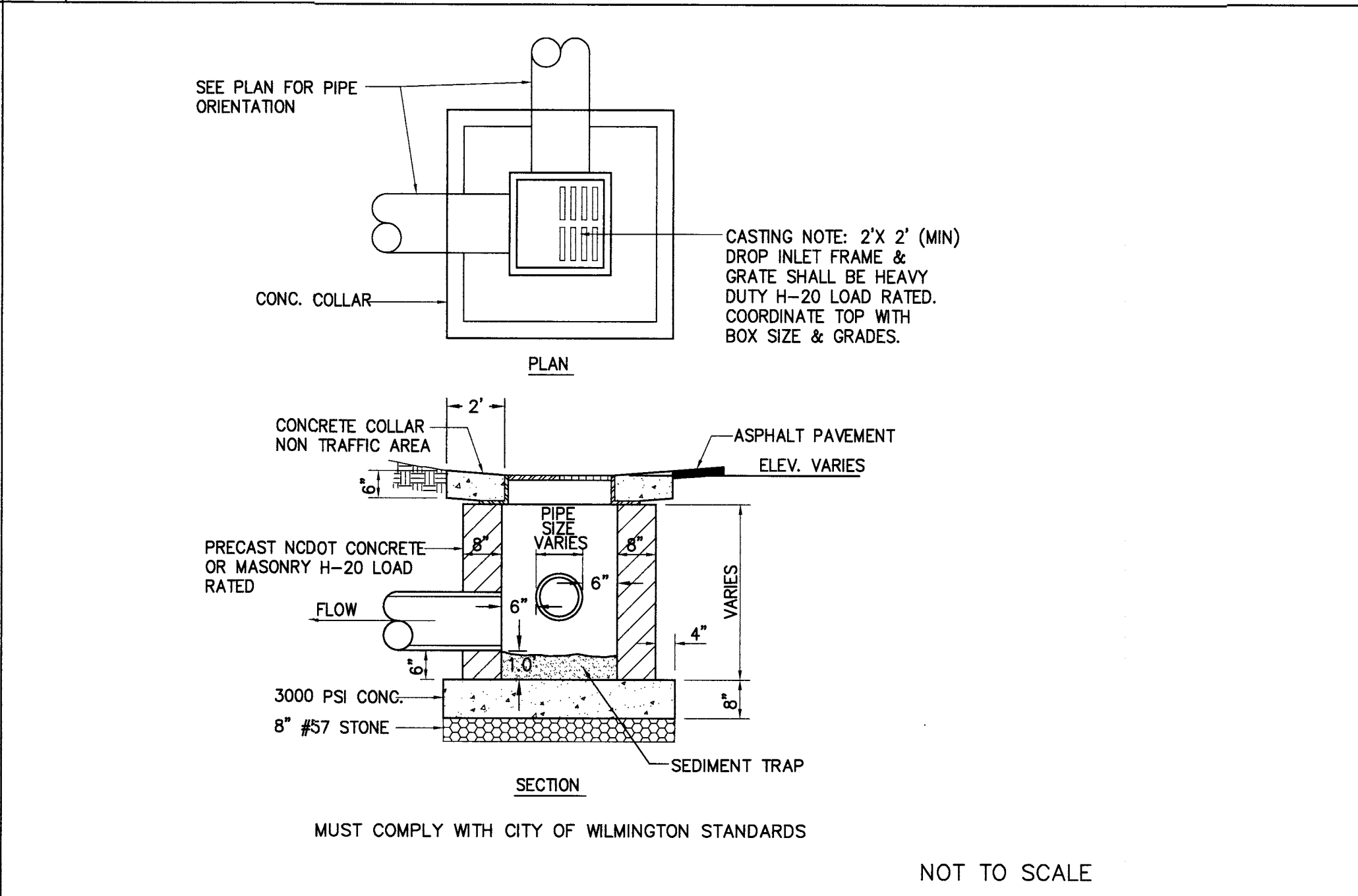
3 TEMPORARY SILT FENCE



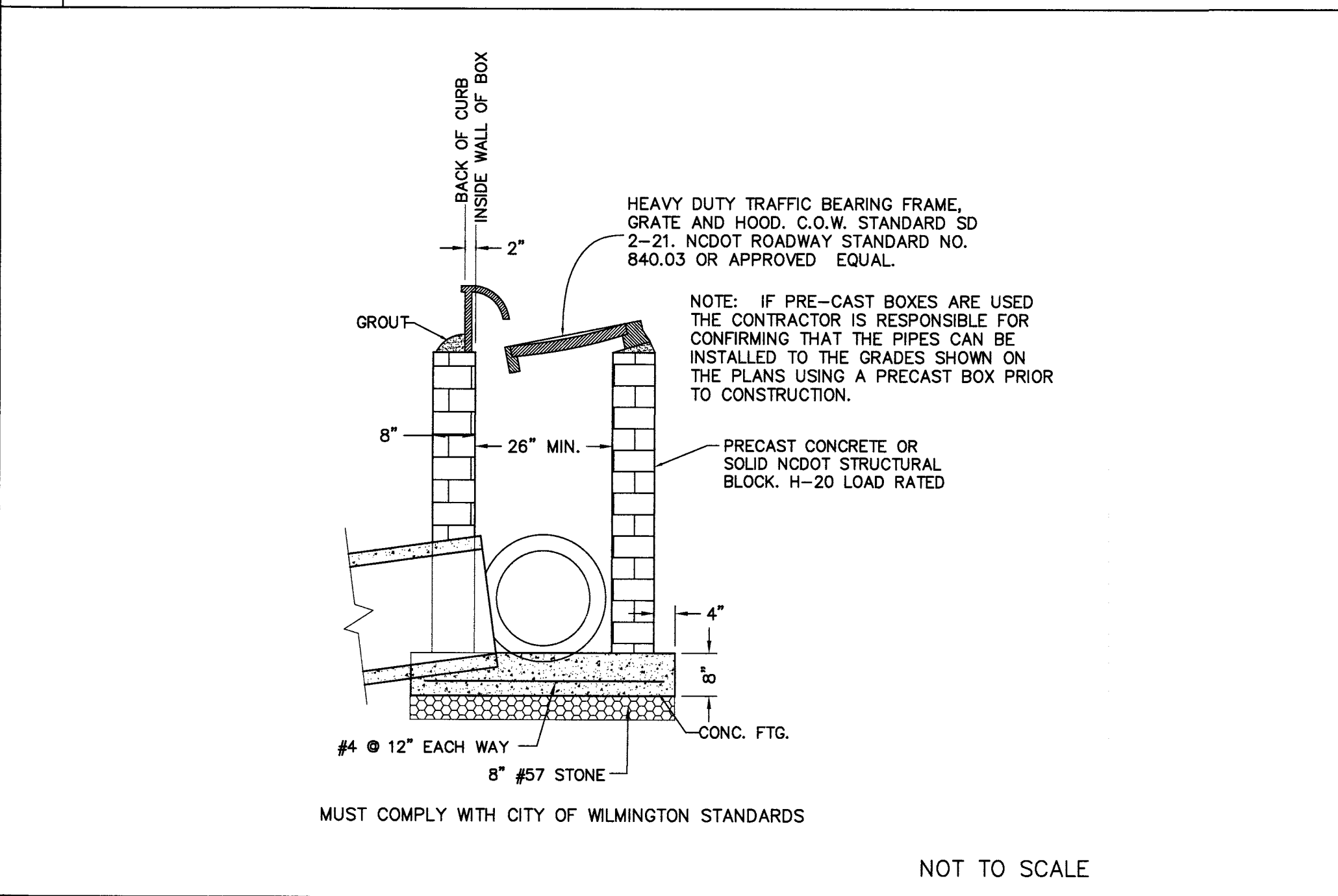
5 HARDWARE CLOTH AND GRAVEL INLET PROTECTION



2 ENERGY DISSIPATOR



4 DROP INLET DETAIL



6 CATCH BASIN DETAIL

EROSION CONTROL NOTES AND MAINTENANCE PLAN:

- ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY RUNOFF-PRODUCING RAINFALL, BUT IN NO CASE, LESS THAN ONCE EVERY WEEK AND WITHIN 24 HOURS OF EVERY HALF-INCH RAINFALL.
- ALL POINTS OF EGRESS WILL HAVE CONSTRUCTION ENTRANCES THAT WILL BE PERIODICALLY TOP-DRESSED WITH AN ADDITIONAL 2 INCHES OF #4 STONE TO MAINTAIN PROPER DEPTH. THEY WILL BE MAINTAINED IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE SITE. IMMEDIATELY REMOVE OBJECTIONABLE MATERIAL SPILLED WASHED OR TRACKED ONTO THE CONSTRUCTION ENTRANCE OR ROADWAYS.
- SEDIMENT WILL BE REMOVED FROM HARDWARE CLOTH AND GRAVEL INLET PROTECTION, BLOCK AND GRAVEL INLET PROTECTION, ROCK DOUGHNUT INLET PROTECTION AND ROCK PIPE INLET PROTECTION WHEN THE DESIGNED STORAGE CAPACITY HAS BEEN HALF FILLED WITH SEDIMENT. ROCK WILL BE CLEANED OR REPLACED WHEN THE SEDIMENT POOL NO LONGER DRAINS AS DESIGNED. DEBRIS WILL BE REMOVED FROM THE ROCK AND HARDWARE CLOTH TO ALLOW PROPER DRAINAGE. SILT SACKS WILL BE EMPTIED ONCE A WEEK AND AFTER EVERY RAIN EVENT. SEDIMENT WILL BE REMOVED FROM AROUND WATTLES, BEAVER DAMS, DANDY SACKS AND SOCKS ONCE A WEEK AND AFTER EVERY RAIN EVENT.
- DIVERSION DITCHES WILL BE CLEANED OUT IMMEDIATELY TO REMOVE SEDIMENT OR OBSTRUCTIONS FROM THE FLOW AREA. THE DIVERSION RIDGES WILL ALSO BE REPAIRED. SWALES MUST BE TEMPORARILY STABILIZED WITHIN 21 CALENDAR DAYS OF CEASE OF ANY PHASE OF ACTIVITY ASSOCIATED WITH A SWALE.
- SEDIMENT WILL BE REMOVED FROM BEHIND THE SEDIMENT FENCE WHEN IT BECOMES HALF FILLED. THE SEDIMENT FENCE WILL BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER. STAKES MUST BE STEEL. STAKE SPACING WILL BE 6 FEET MAX. WITH THE USE OF EXTRA STRENGTH FABRIC, WITHOUT WIRE BACKING. STAKE SPACING WILL BE 8 FEET MAX. WHEN STANDARD STRENGTH FABRIC AND WIRE BACKING ARE USED. IF ROCK FILTERS ARE DESIGNED AT LOW POINTS IN THE SEDIMENT FENCE, THE ROCK WILL BE REPAIRED OR REPLACED IF IT BECOMES HALF-FULL OF SEDIMENT, NO LONGER DRAINS AS DESIGNED OR IS DAMAGED.
- LAND QUALITY REQUIRES:
ALL SEEDED AREAS WILL BE FERTILIZED, RESEEDING AS NECESSARY, AND MULCHED, ACCORDING TO SPECIFICATIONS IN THE VEGETATIVE PLAN, TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER. ALL SLOPES WILL BE STABILIZED WITHIN 21 CALENDAR DAYS. ALL OTHER AREAS WILL BE STABILIZED WITHIN 15 WORKING DAYS.
WATER QUALITY REQUIRES:
ALL SEEDED AREAS WILL BE FERTILIZED, RESEEDING AS NECESSARY AND MULCHED ACCORDING TO SPECIFICATIONS IN THE VEGETATIVE PLAN TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER. ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, ALL SLOPES STEEPER THAN 3:1 HORIZONTAL TO 1:1 VERTICAL (3:1) AND ALL HIGH QUALITY WATER (HOW) ZONES SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN SEVEN (7) CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
- FLOCCULANTS WILL BE USED TO ADDRESS TURBIDITY ISSUES. THE PUMPS, TANKS, HOSES AND INJECT SYSTEMS WILL BE CHECKED FOR PROBLEMS OR TURBID DISCHARGES DAILY.
- CONCRETE WASHOUTS SHOULD BE INSPECTED DAILY AND AFTER HEAVY RAINS. DAMAGES SHOULD BE REPAIRED PROMPTLY. IF FILLED TO OVER 75% CAPACITY WITH RAIN WATER IT SHOULD BE VACUUMED OR ALLOWED TO EVAPORATE TO AVOID OVERFLOWS. BEFORE HEAVY RAINS THE CONTAINERS LIQUID LEVEL SHOULD BE LOWERED OR THE CONTAINER COVERED TO AVOID AN OVER FLOW DURING RAIN. WHEN SOLIDS HAVE HARDENED THEY SHOULD BE REMOVED AND RECYCLED.

SITE WORK NOTES:

- THE CONTRACTOR SHALL VISIT THE SITE TO BECOME FAMILIAR WITH FIELD CONSTRUCTION CONDITIONS.
- CONTRACTOR SHALL COORDINATE WORK WITHIN NCDOT AND LOCAL RIGHT OF WAYS WITH PROPER AUTHORITIES AND SHALL MEET ANY REQUIREMENTS AS TO TRAFFIC CONTROL AND CONNECTION TO EXISTING STREETS.
- CLEARING AND GRUBBING: REMOVE ALL TREES AS REQUIRED UNLESS OTHERWISE NOTED TO REMAIN, STUMPS, ROOTS, SHRUBBERY, ASPHALT, CONCRETE, STRUCTURES, BURIED UTILITIES, STORAGE TANKS, ETC. WITHIN LIMITS OF CONSTRUCTION.
- STRIPPING: BEFORE EXCAVATING OR FILLING, REMOVE ALL TOPSOIL, WOOD, LEAVES, AND ANY OTHER UNSUITABLE MATERIAL.
- MUCKING: REMOVE ANY SOFT, ORGANIC SILT MATERIALS AND EXISTING BURIED CONSTRUCTION DEBRIS AS REQUIRED AND FILL TO SUBGRADE ELEVATIONS WITH A CLEAN SELECT-FILL COMPACTED AS SPECIFIED.
- DISPOSAL: CLEARED, GRUBBED, STRIPPED OR EXCAVATED SPOIL SHALL BE REMOVED FROM SITE AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE CODES.
- BORROW MATERIAL: THE CONTRACTOR SHALL FURNISH BORROW MATERIAL REQUIRED FROM OFF SITE AND OBTAIN ALL REQUIRED PERMITS ASSOCIATED WITH BORROW OPERATIONS.
- FILL AND COMPACTION: AFTER STRIPPING THOSE AREAS DESIGNATED TO RECEIVE FILL SHOULD BE PROOFROLLED. THE TOP 8" OF SUBGRADE SHALL BE COMPACTED TO AT LEAST 98% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT. ANY AREA WHICH PUMPS OR RUTS EXCESSIVELY SHOULD BE UNDERCUT AND REPLACED WITH A CLEAN, SILTY OR CLAYEY SAND HAVING A UNIFIED SOIL CLASSIFICATION OF SP, SM, OR SC. FILL MATERIAL 5" OUTSIDE OF BUILDING AREAS SHALL THEN BE PLACED IN LAYERS NOT TO EXCEED 8" AND COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698) WITH THE UPPER 12 INCHES OF SUBGRADE BEING COMPACTED TO 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. FILL MATERIALS WITHIN BUILDING AREAS TO A LINE OUTSIDE THE BUILDING AREAS SHALL BE PLACED IN LAYERS NOT TO EXCEED 8" AND COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698) WITH THE UPPER 12 INCHES OF SUBGRADE BEING COMPACTED IN 6 INCH LAYERS TO 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. IN AREAS WHERE NO STRUCTURAL FILL IS TO BE PLACED THE UPPER 12 INCHES OF IN-PLACE SUBGRADE SHOULD BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. IF THE MATERIAL IS TOO DRY TO COMPACT TO THE REQUIRED DENSITY EACH LAYER SHALL BE WETTED IN ACCORDANCE WITH COMPACTION REQUIREMENTS. IF THE MATERIAL IS TOO WET TO SECURE PROPER COMPACTION, IT SHALL BE HARROWED REPEATEDLY OR OTHERWISE AERATED WITH SUITABLE EQUIPMENT UNTIL OPTIMUM MOISTURE CONTENT IS OBTAINED. FILL SHALL BE PLACED IN SUCH A MANNER THAT THE SURFACE WILL DRAIN READILY AT ALL TIMES. SEE STRUCTURAL NOTES AND SOILS REPORT FOR ADDITIONAL REQUIREMENTS.
- LAYOUT: THE CONTRACTOR SHALL PROVIDE ALL LAYOUT REQUIRED TO CONSTRUCT HIS WORK.
- THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION AND PROTECTION OF EXISTING UTILITIES DURING CONSTRUCTION.
- EXISTING BOUNDARY AND TOPOGRAPHIC INFORMATION FROM SURVEY BY MICHAEL UNDERWOOD AND ASSOCIATES, PA AND PROVIDED BY OWNER.
- THE CONTRACTOR SHALL VERIFY DIMENSIONS AT JOBSITE.
- THE CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF RELOCATION OR DISCONNECTION OF ALL EXISTING UTILITIES WITH APPLICABLE AGENCIES AND AUTHORITIES.
- ALL PAVEMENT AND BASE MATERIALS AND WORKMANSHIP SHALL CONFORM TO NCDOT STANDARDS.
- WATER AND SEWER SERVICES SHALL BE INSTALLED TO MEET LOCAL AND STATE PLUMBING CODES. METER AND TAPS SHALL MEET ALL LOCAL REQUIREMENTS.
- ALL AREAS SHALL BE GRADED FOR POSITIVE DRAINAGE.
- SEE SOILS REPORT FOR ADDITIONAL REQUIREMENTS.
- CONTRACTOR SHALL NOTE THAT EARTHWORK QUANTITIES ARE HIS RESPONSIBILITY. PLANS DO NOT REPRESENT A BALANCED EARTHWORK CONDITION.
- REINF. CONC. PIPE SHALL BE CLASS III W/RUBBER GASKETED JOINT OR "RAM NECK". INSTALL PER MANUFACTURER'S REQUIREMENTS.
- USE WHITE LANE MARKING PAINT FOR ALL PAVEMENT MARKINGS. PAINT SHALL BE A CHLORINATED RUBBER ALKYL, FS TT-P-115, TYPE III, FACTORY MIXED, QUICK DRYING, NON-BLEEDING.
- REFER TO THE PLUMBING DRAWINGS FOR LOCATION AND INVERTS OF NEW WASTE, WATER AND ROOF DRAIN LINES.

CALL 811 (3) WORKING DAYS BEFORE YOU DIG.

NOTES AND DETAILS

LOT 3-39 3313 KITTY HAWK ROAD
NORTH KERR INDUSTRIAL PARK
WILMINGTON, N. C.

OWNER:

BNT COMPANY, LLC
3705-A RESTON COURT
WILMINGTON, NC 28403
910-616-6020

NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.

2602 IRON GATE DR., SUITE 102
WILMINGTON, NC 28412
PHONE (910) 543-5653

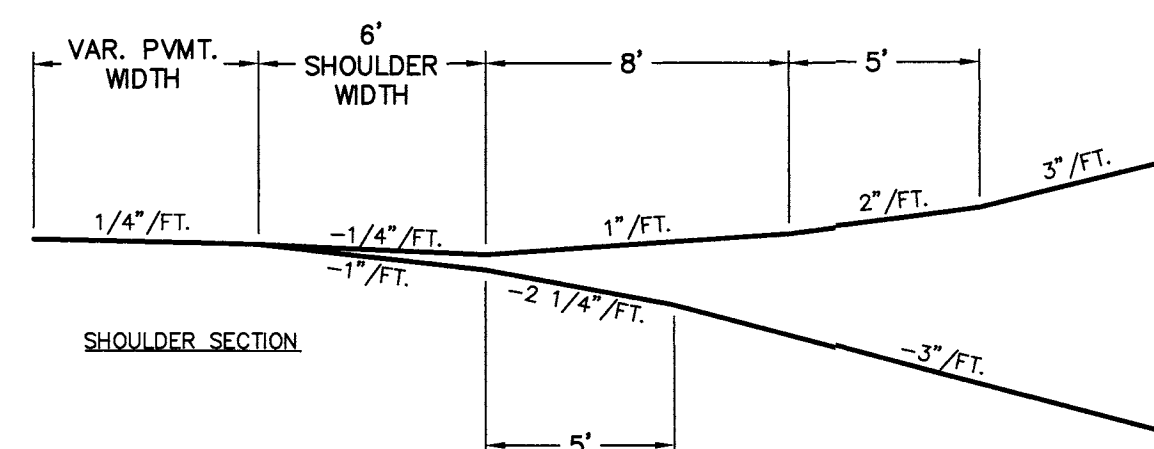
Licence #C-3641

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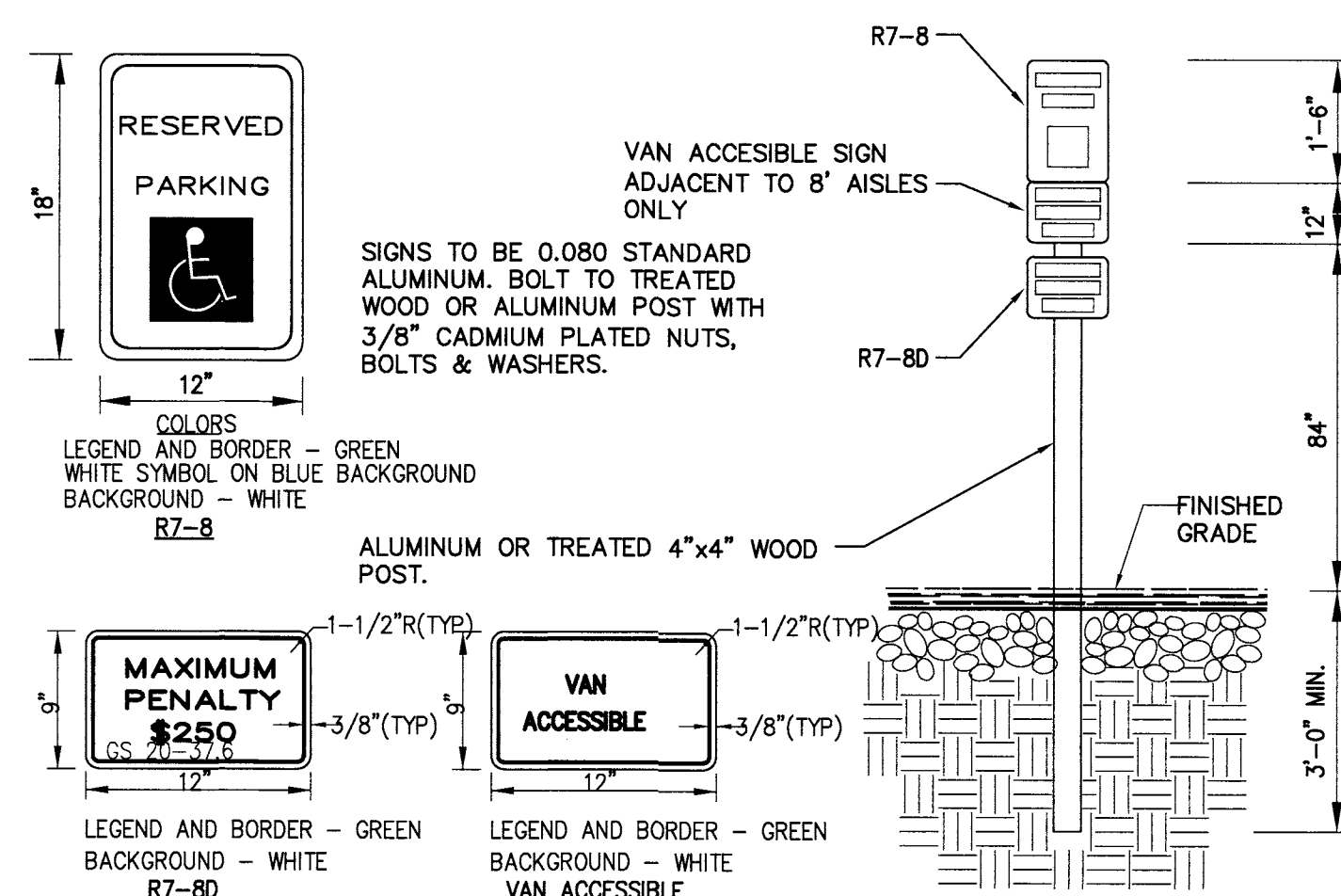
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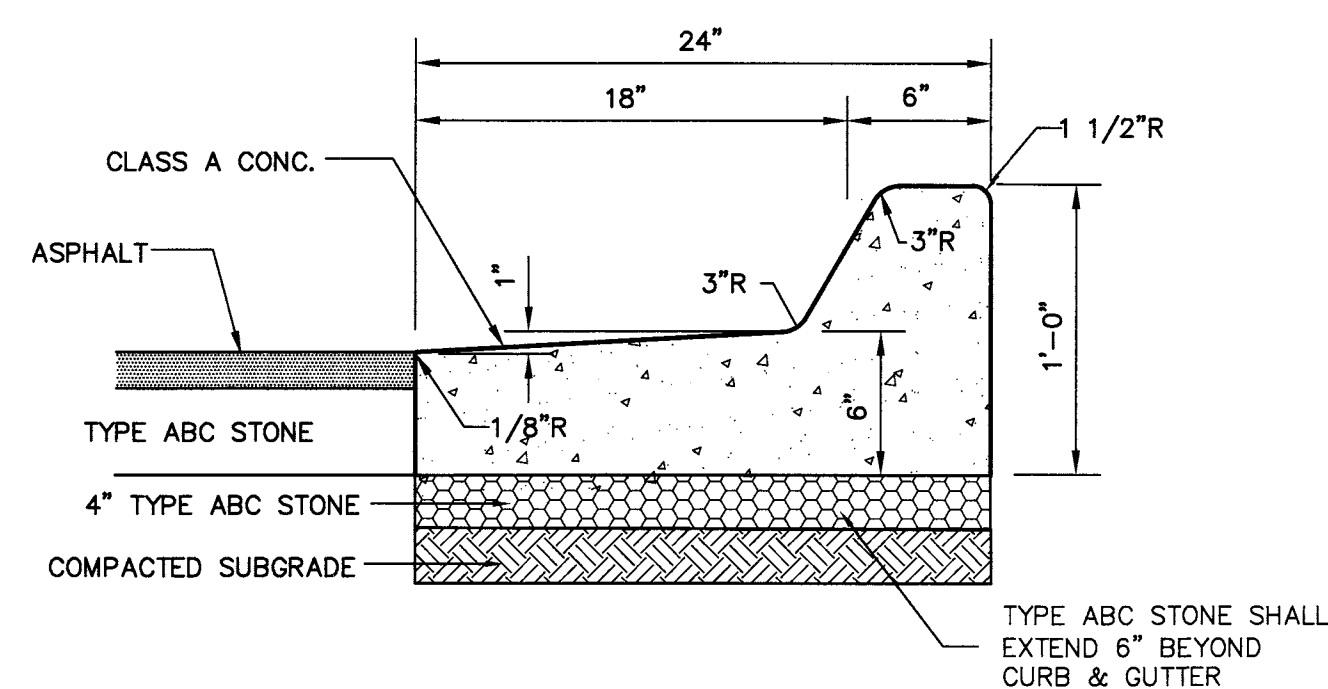


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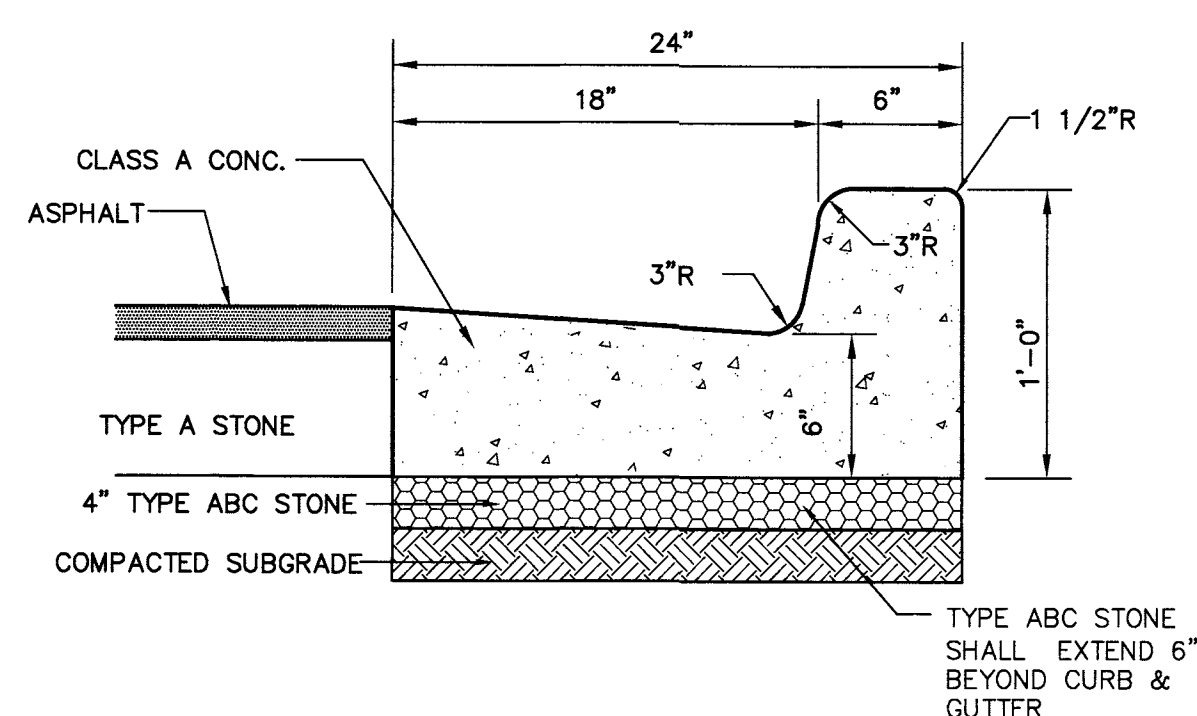
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- NOTE:
1. RAMP SHALL HAVE A DETECTABLE WARNING COMPLYING WITH ADA GUIDELINES:
2. THE DETECTABLE WARNINGS AT CURB RAMPS SHALL BE 24 INCHES MINIMUM IN WIDTH, THE DIRECTION OF TRAVEL AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR FLUSH SURFACE.
3. MARKED CROSSINGS THAT ARE RAISED TO THE SAME LEVEL AS THE ADJOINING SIDEWALK SHALL BE PRECEDED BY A 24 INCH DEEP DETECTABLE WARNING EXTENDING THE FULL WIDTH OF THE MARKED CROSSING.
4. DETECTABLE WARNINGS SHALL CONSIST OF RAISED TRUNCATED DOMES WITH A DIAMETER OF NOMINAL 0.9 IN (23 MM), A HEIGHT OF NOMINAL 0.2 IN (5 MM) AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.35 IN (60 MM) AND SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER BY BEING LIGHTER OR DARKER-ON-LIGHT THE MATERIAL USED TO PROVIDE CONTRAST SHOULD CONTRAST BY AT LEAST 70% — REFER TO ADA GUIDELINES FOR DEFINITION OF "CONTRAST".
5. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. DETECTABLE WARNINGS USED ON INTERIOR SURFACES SHALL DIFFER FROM ADJOINING WALKING SURFACES IN RESILIENCY OR SOUND-ON-CANE CONTACT.



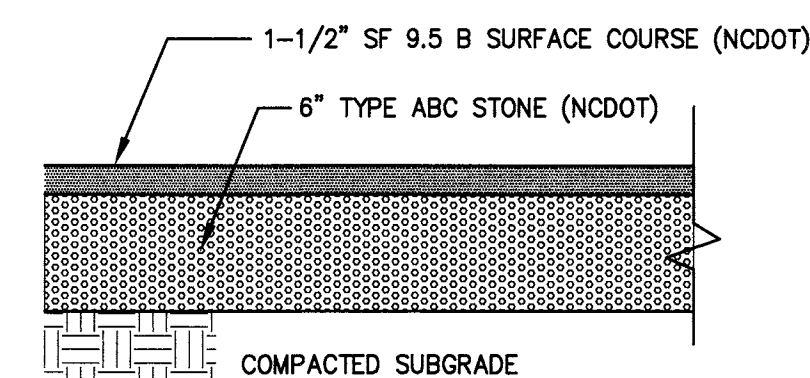
NOTE: CURB TYPE DEPENDS ON GRADES SHOWN ON GRADING PLAN. GRADES INDICATING FALL AWAY FROM CURB SHALL BE SPILL OFF TYPE CURB. GRADES INDICATING CURB ACCEPTING FLOW SHALL BE FLOW LINE TYPE.

NOT TO SCALE



NOTE: CURB TYPE DEPENDS ON GRADES SHOWN ON GRADING PLAN. GRADES INDICATING FALL AWAY FROM CURB SHALL BE SPILL OFF TYPE CURB. GRADES INDICATING CURB ACCEPTING FLOW SHALL BE FLOW LINE TYPE.

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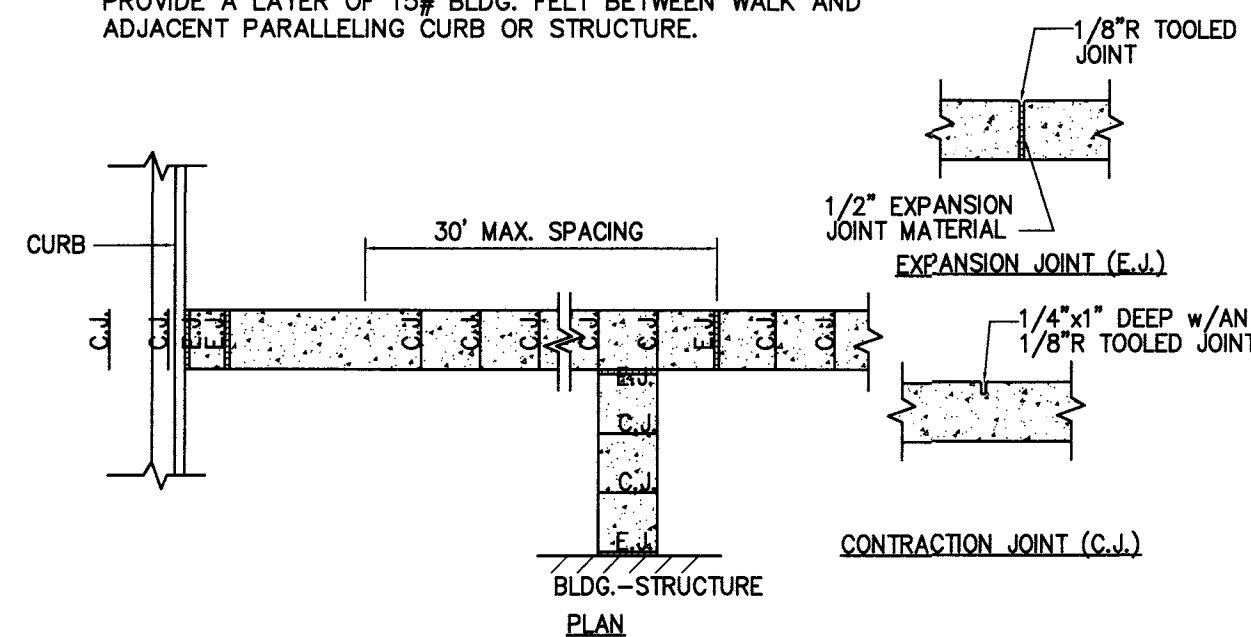


NOTE: PAVEMENT SECTION MAY VARY DEPENDING
UPON FIELD CONDITIONS. CONTRACTOR SHALL
COORDINATE w/OWNER & GEOTECHNICAL ENGINEER
TO DETERMINE ACTUAL PAVEMENT SECTION.

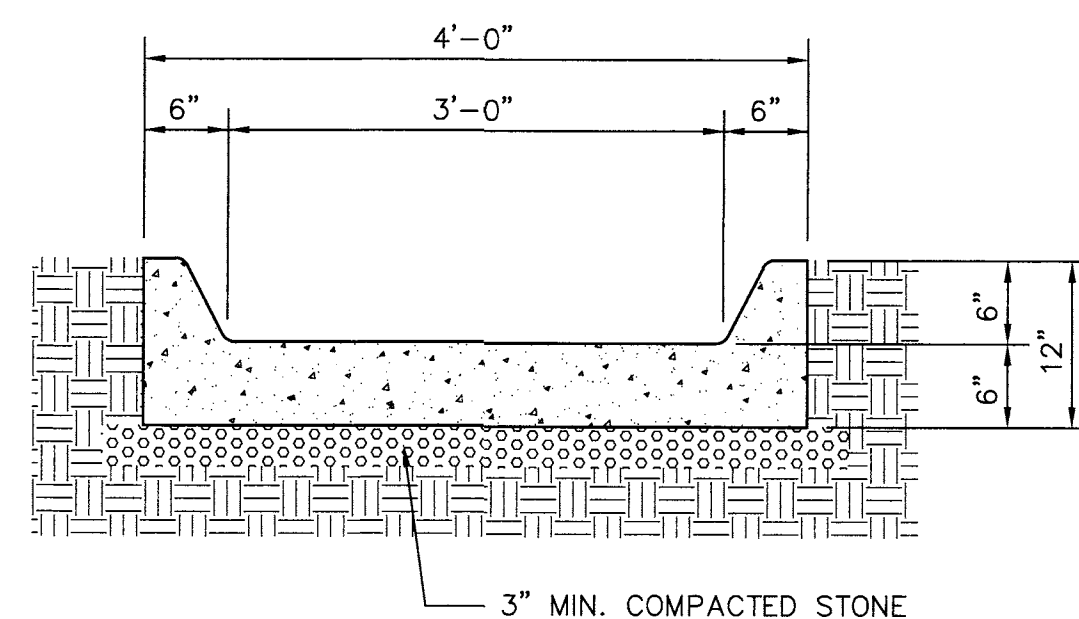
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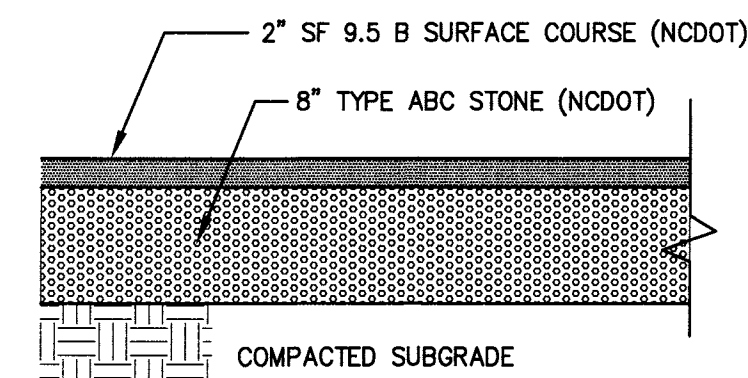
1. SIDEWALK THICKNESS SHALL BE 4" UNLESS NOTED OTHERWISE
2. CONTRACTION JOINTS (C.J.) SPACE SAME AS SIDEWALK WIDTH.
3. THICKEN SIDEWALK TO 6" AT DRIVEWAYS.
4. THICKEN SIDEWALK TO 6" IN LAST 3' WHERE IT ABUTS PAVEMENT WITH NO CURB.
5. 1/2" EXPANSION JOINT (E.J.) AND SNAP CAP EXPANSION JOINT COVERS ARE REQUIRED AT 50' MAX. AT SIDEWALK TERMINATIONS, AT STRUCTURES, AND AS NOTED ON SITE PLAN.
6. PROVIDE A LAYER OF 15# BLDG. FELT BETWEEN WALK AND ADJACENT PARALLEL CURB OR STRUCTURE.



NOT TO SCALE

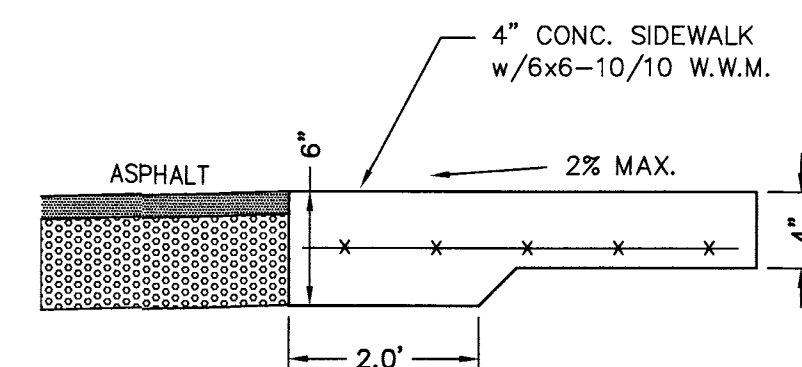


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NOTE: PAVEMENT SECTION MAY VARY DEPENDING UPON FIELD CONDITIONS. CONTRACTOR SHALL COORDINATE w/OWNER & GEOTECHNICAL ENGINEER TO DETERMINE ACTUAL PAVEMENT SECTION.

NOT TO SCALE



NOT TO SCALE

10	TURN DOWN WALK SECTION
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SYMBOL	DATE	DESCRIPTION	BY
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NOTES AND DETAILS

LOT 3-39 3313 KITTY HAWK ROAD
NORTH KERR INDUSTRIAL PARK
WILMINGTON, N. C.

OWNER:

BNT COMPANY, LLC
3705-A RESTON COURT
WILMINGTON, NC 28403
910-616-6020

NORRIS & TUNSTALL
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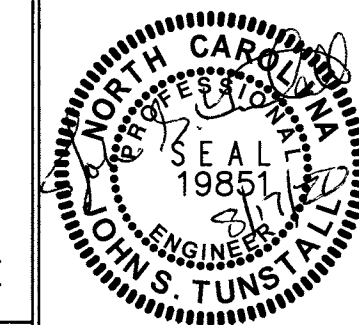
2602 IRON GATE DR., SUITE 102
WILMINGTON, NC 28412
PHONE (910) 343-9653

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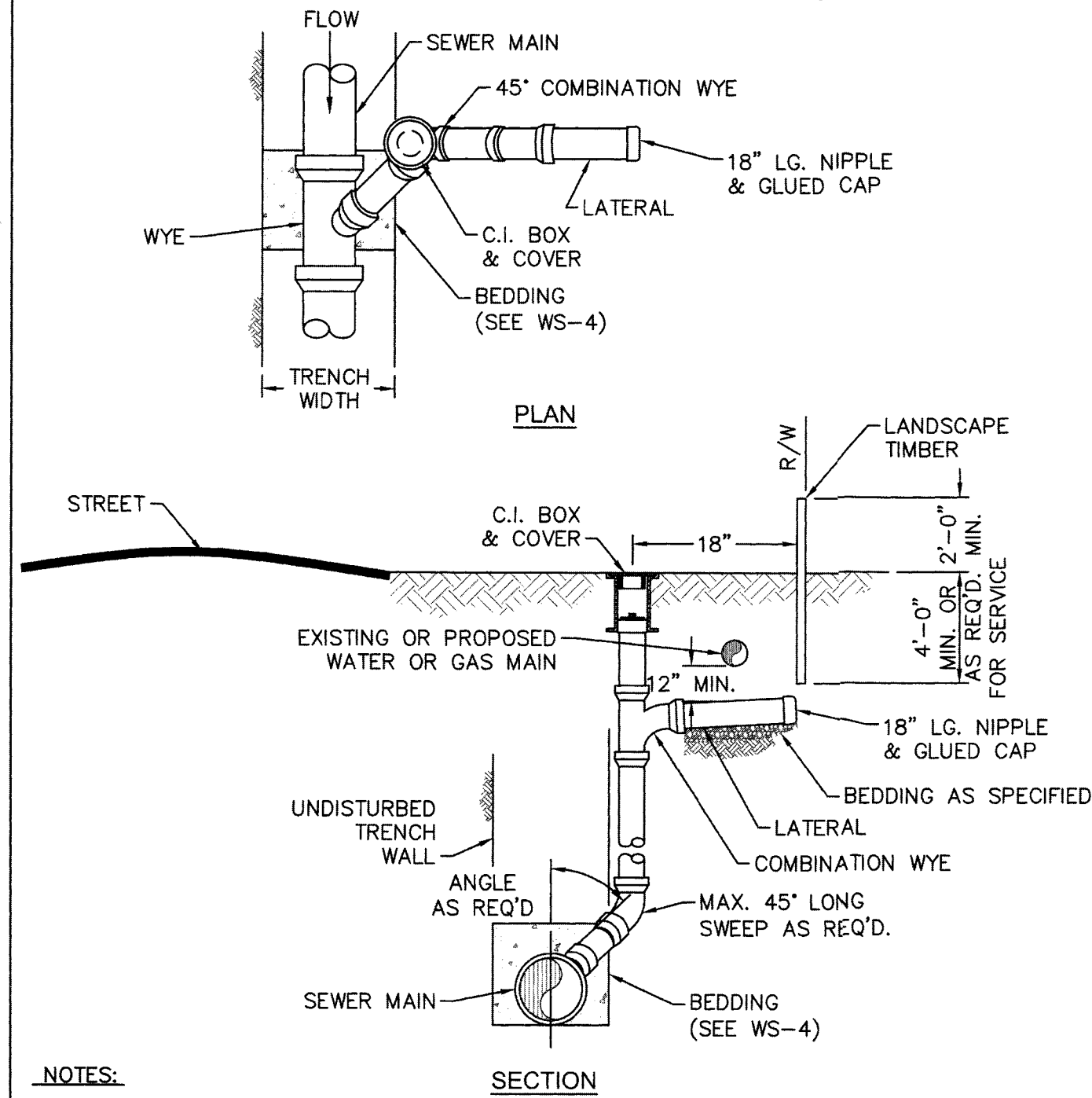
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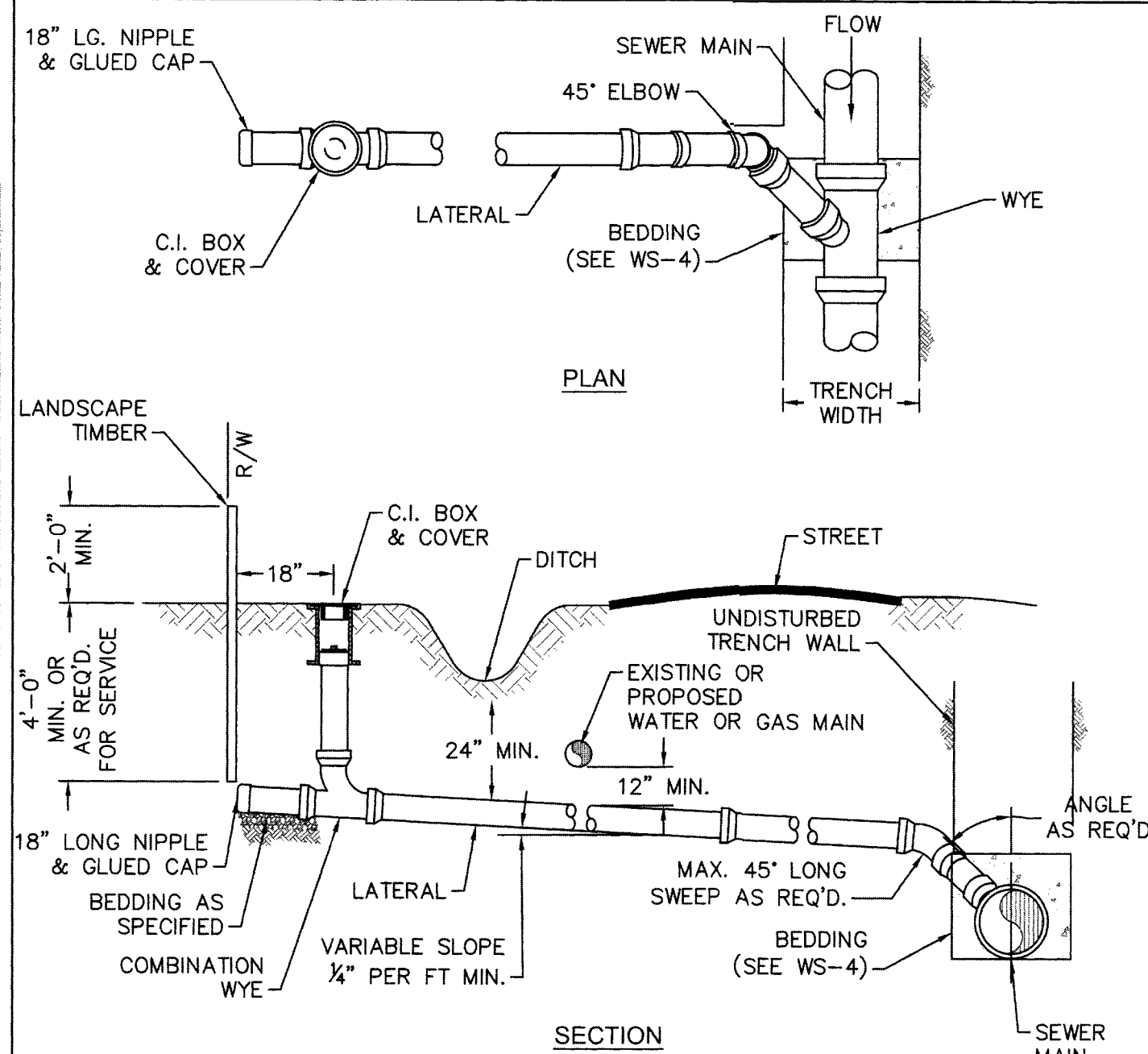
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NOTES:

1. SEWER SERVICES SHALL BE PERPENDICULAR TO MAIN. 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.
2. ALL SERVICES CONNECTING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF DIP, WITH PROTECTIVE LINING.
3. CLEANOUTS SHALL BE LOCATED A MINIMUM OF 12 FEET FROM ALL PROPERTY CORNERS.
4. FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO MAIN.
5. A MINIMUM PIPING LENGTH OF 1' 6" SHALL BE USED BETWEEN FITTINGS.

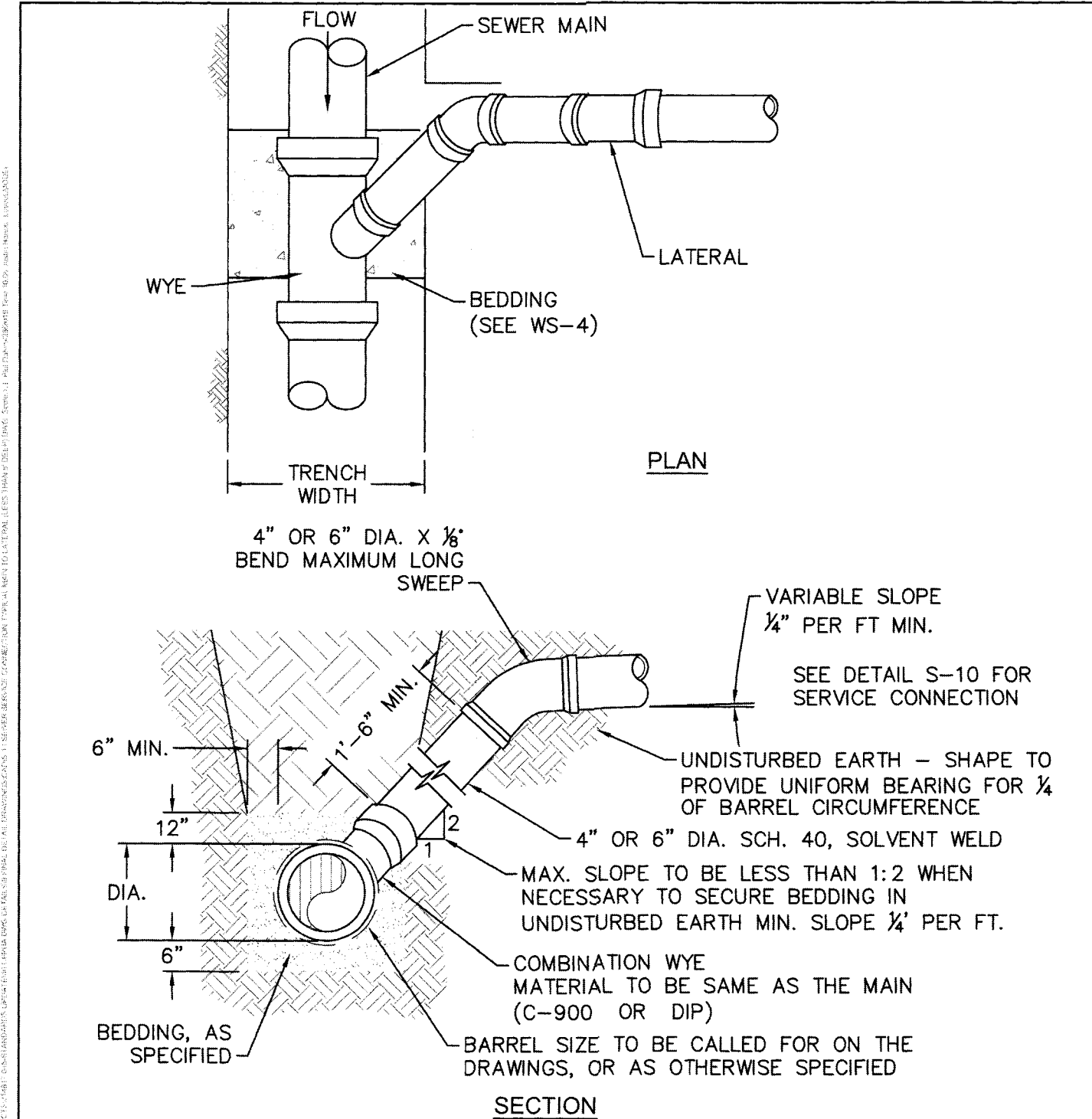
DETAIL: SEWER SERVICE CONNECTION - SHORT-SIDE	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: S-9
SCALE: NOT TO SCALE CFPUA REV. No: 2	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -



NOTES:

1. SEWER SERVICES SHALL BE PERPENDICULAR TO MAIN. 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.
2. ALL SERVICES CONNECTING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF DIP, WITH PROTECTIVE LINING.
3. CLEANOUTS SHALL BE LOCATED A MINIMUM OF 12 FEET FROM ALL PROPERTY CORNERS.
4. MINIMUM 1'-6" NIPPLE SPACING BETWEEN FITTINGS.
5. FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO MAIN.

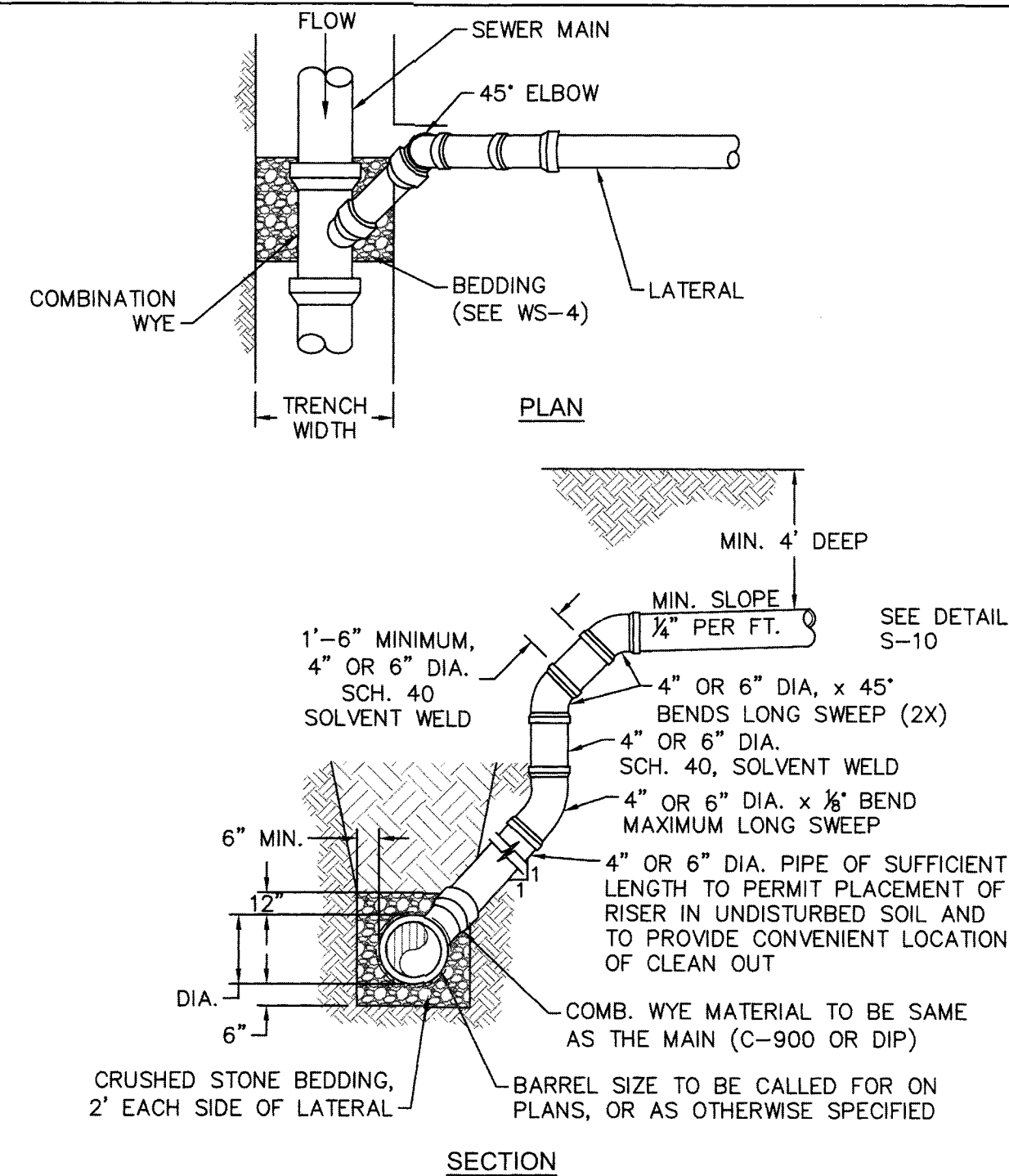
DETAIL: SEWER SERVICE CONNECTION - LONG-SIDE	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: S-10
SCALE: NOT TO SCALE CFPUA REV. No: 2	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -



NOTES:

1. FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.
2. ALL SERVICES CONNECTING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF DIP, WITH PROTECTIVE LINING.

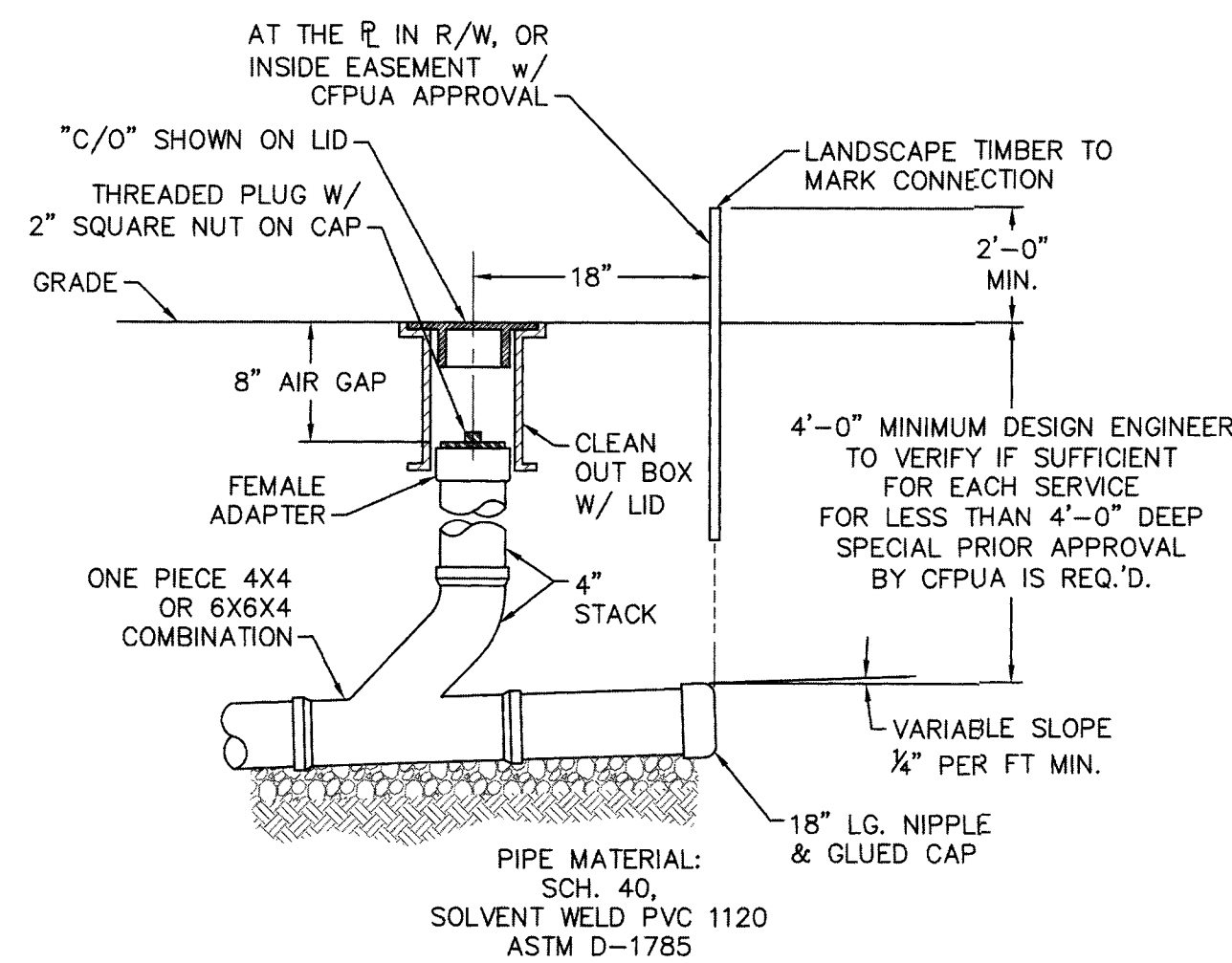
DETAIL: SEWER SERVICE CONNECTION - MAIN TO LATERAL (LESS THAN 8' DEEP)	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: S-11
SCALE: NOT TO SCALE CFPUA REV. No: 2	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -



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.
3. ALL SERVICES CONNECTING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF DIP, WITH PROTECTIVE LINING.
4. 1'-6" MINIMUM NIPPLE SPACING BETWEEN FITTINGS.

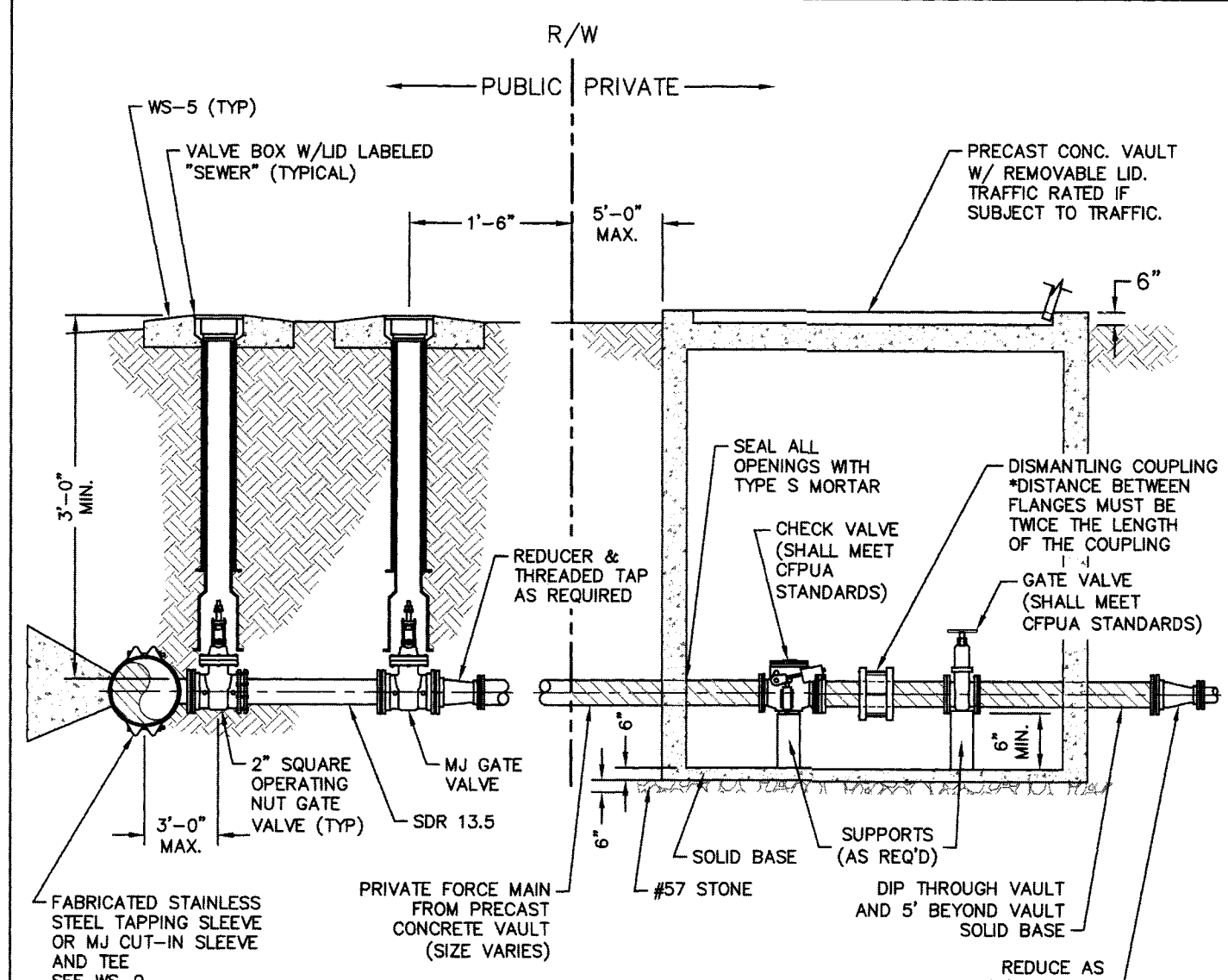
DETAIL: SEWER SERVICE CONNECTION - MAIN TO LATERAL (GREATER THAN 8' DEEP)	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: S-12
SCALE: NOT TO SCALE CFPUA REV. No: 2	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -



NOTES:

1. FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.
2. CLEANOUTS SHALL BE LOCATED A MINIMUM OF 12 FEET FROM ALL PROPERTY CORNERS.

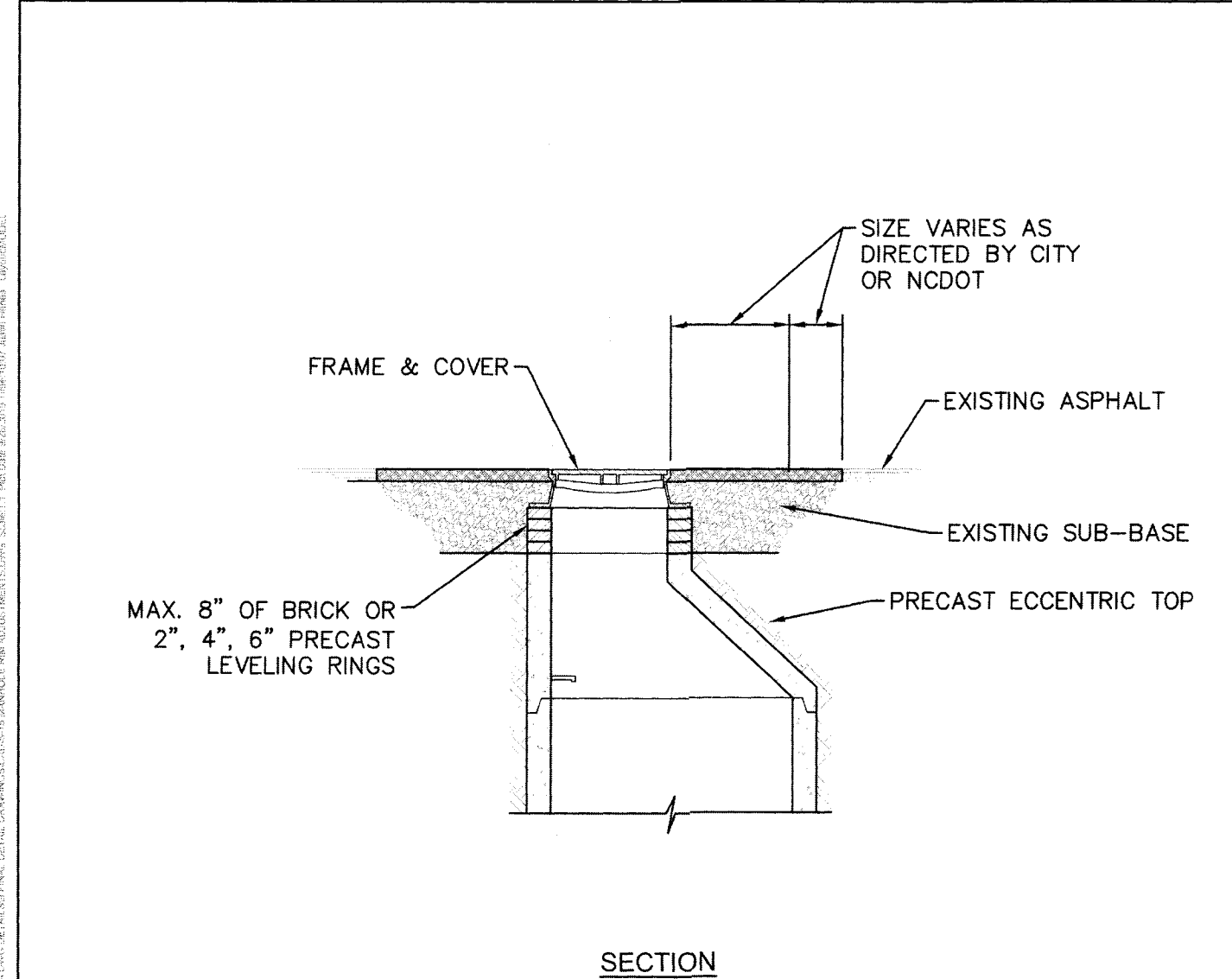
DETAIL: SEWER SERVICE CONNECTION - TYPICAL CLEAN-OUT	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: S-13
SCALE: NOT TO SCALE CFPUA REV. No: 2	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -



NOTES:

1. FOR 2-INCH FORCE MAINS, CFPUA ACCEPTS SDR 13.5 OR SDR-21 PVC INSTALLED BY OPEN TRENCH OR SDR-9 HDPE BY HORIZONTAL DIRECTIONAL DRILLING.
2. A GATE VALVE IS REQUIRED AT THE CFPUA FORCE MAIN TAP LOCATION.
3. WHEN PRIVATE MAIN IS FROM OPPOSITE SIDE OF NC-DOT ROAD OR CITY STREET, A SECOND VALVE IS REQUIRED 18" INSIDE PUBLIC R/W.
4. IF TAPPING VALVE IS LESS THAN 5'-6" FROM R/W (or EASEMENT) THEN SECOND VALVE AT R/W (or EASEMENT) IS NOT REQUIRED.

DETAIL: FORCE MAIN CONNECTION - PRIVATE TO PUBLIC	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: S-14
SCALE: NOT TO SCALE CFPUA REV. No: 2	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -



DETAIL: MANHOLE RIM ADJUSTMENTS	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: S-15
SCALE: NOT TO SCALE CFPUA REV. No: 2	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -

UTILITY DETAILS - SEWER
CAPE FEAR PUBLIC UTILITY AUTHORITY
235 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

DISCLAIMER:
THESE DETAILS ARE A WORK OF
CFPUA FOR UTILITY SYSTEMS
DESIGN AND CONSTRUCTION
AND ARE NOT TO BE USED FOR
GENERAL CONFORMANCE WITH
THE SEWER DESIGN FOR THIS
PROJECT.

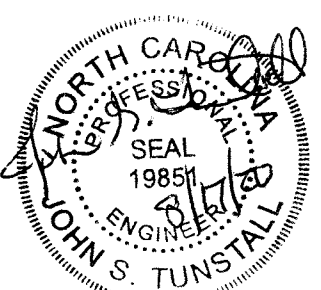
NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
1900 EASTWOOD RD., SUITE #11
WILMINGTON, NC 28403
PHONE (910) 343-9653
1429 ASH-LITTLE RIVER RD. NW
ASH, NC 28420
PHONE (910) 287-5900

Licence #C-3641

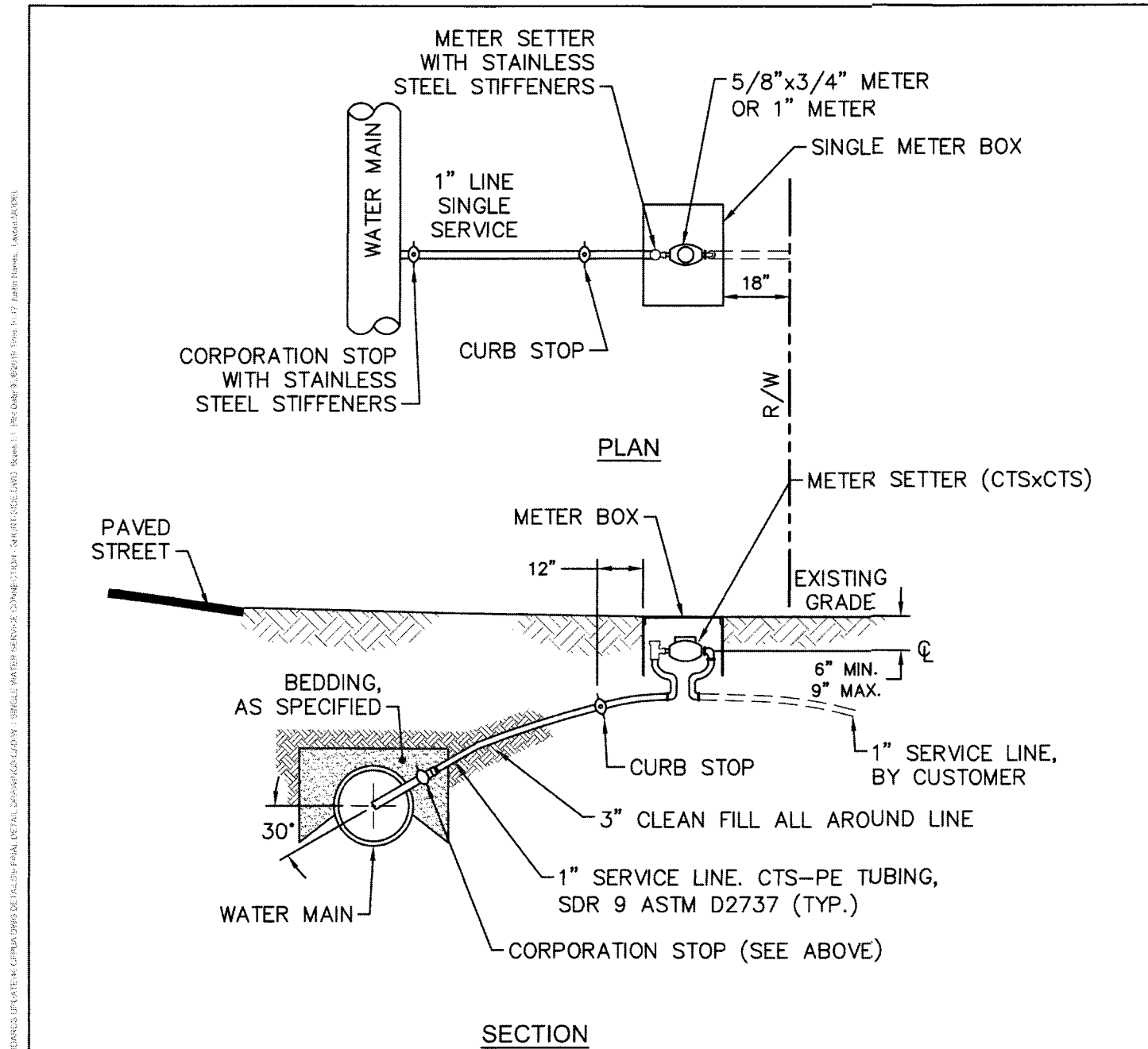
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DES. JST
CHK. JPN
DRWN. NKS

DATE 8/17/20

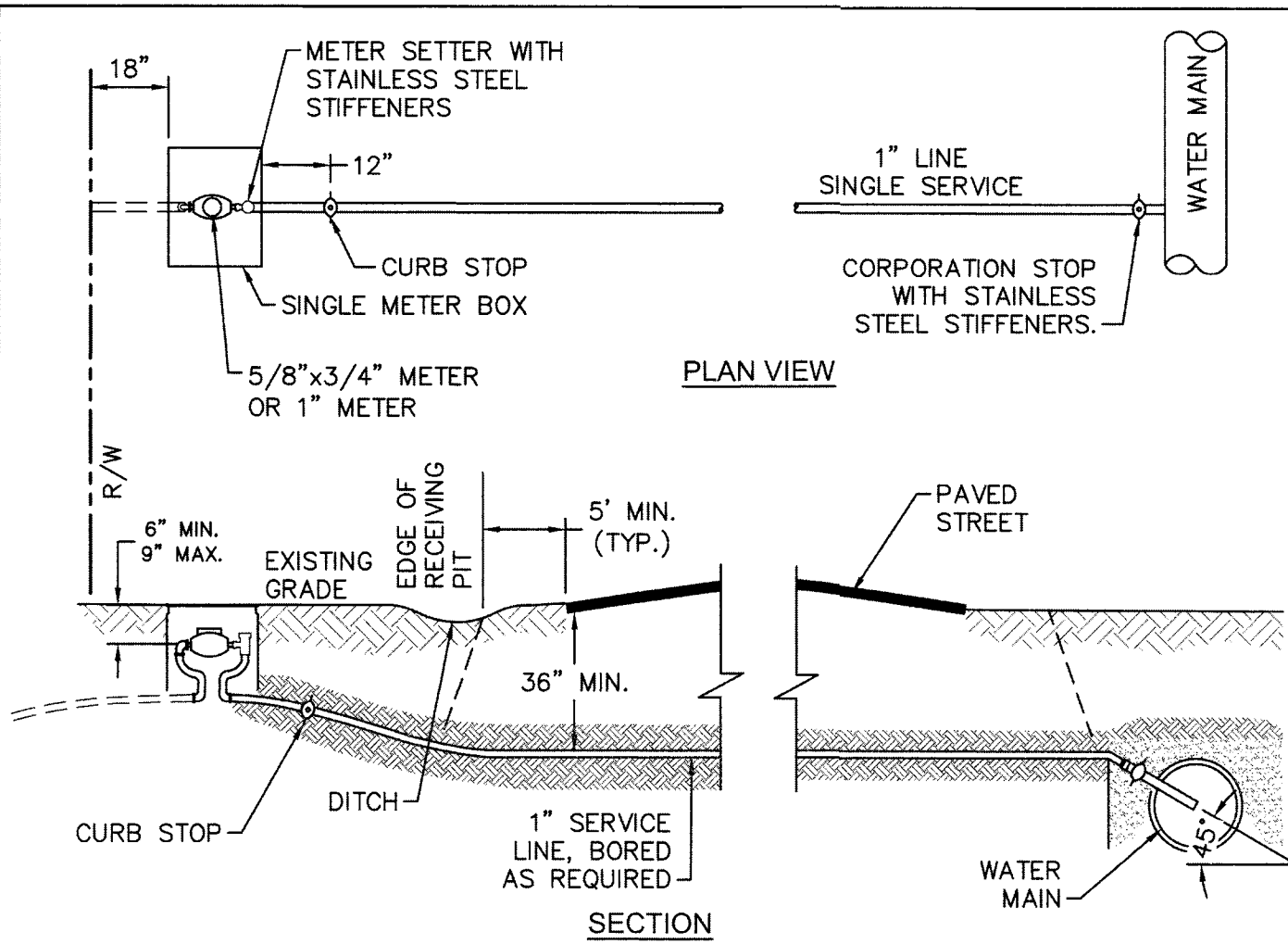


SS2



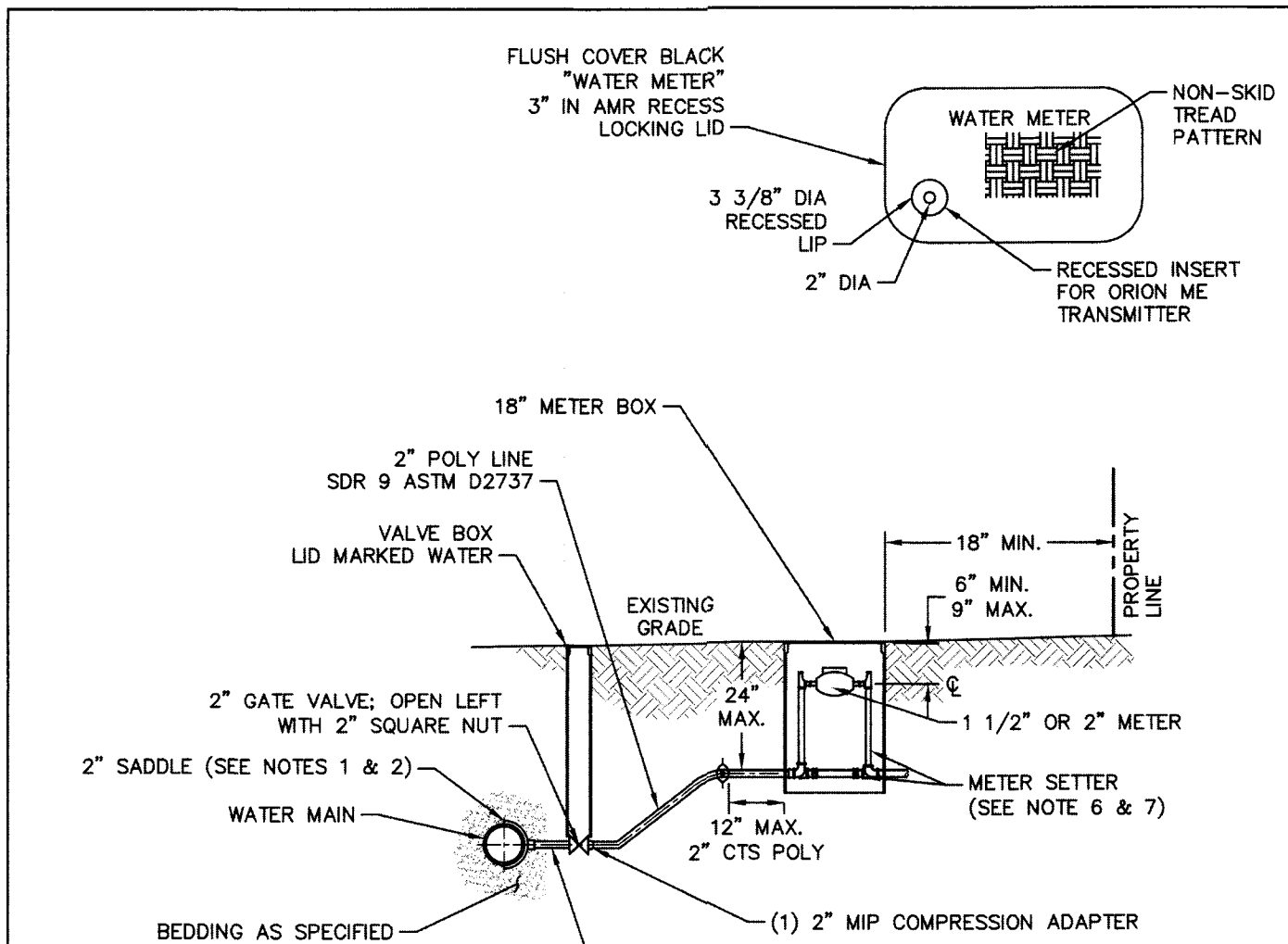
- NOTES:**
1. NO JOINT SHALL BE INSTALLED BETWEEN THE MAIN SERVICE TAP AND THE METER STOP. ALL SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN.
 2. SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY.
 3. METER BOXES SUBJECT TO TRAFFIC LOADS SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS.
 4. WATER SERVICE LINE SHALL TERMINATE 18" WITHIN RIGHT-OF-WAY LINE.
 5. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.
 6. SERVICE PIPING AND METER SETTER TO BE CENTERED IN THE METER BOX.

DETAIL: SINGLE WATER SERVICE CONNECTION - TYPICAL SHORT-SIDE CONNECTION		 CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560 Stewardship, Sustainability, Service.	DETAIL NO: W-1 SHEET NO: -
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20		
CFPUA REV. No: 2			



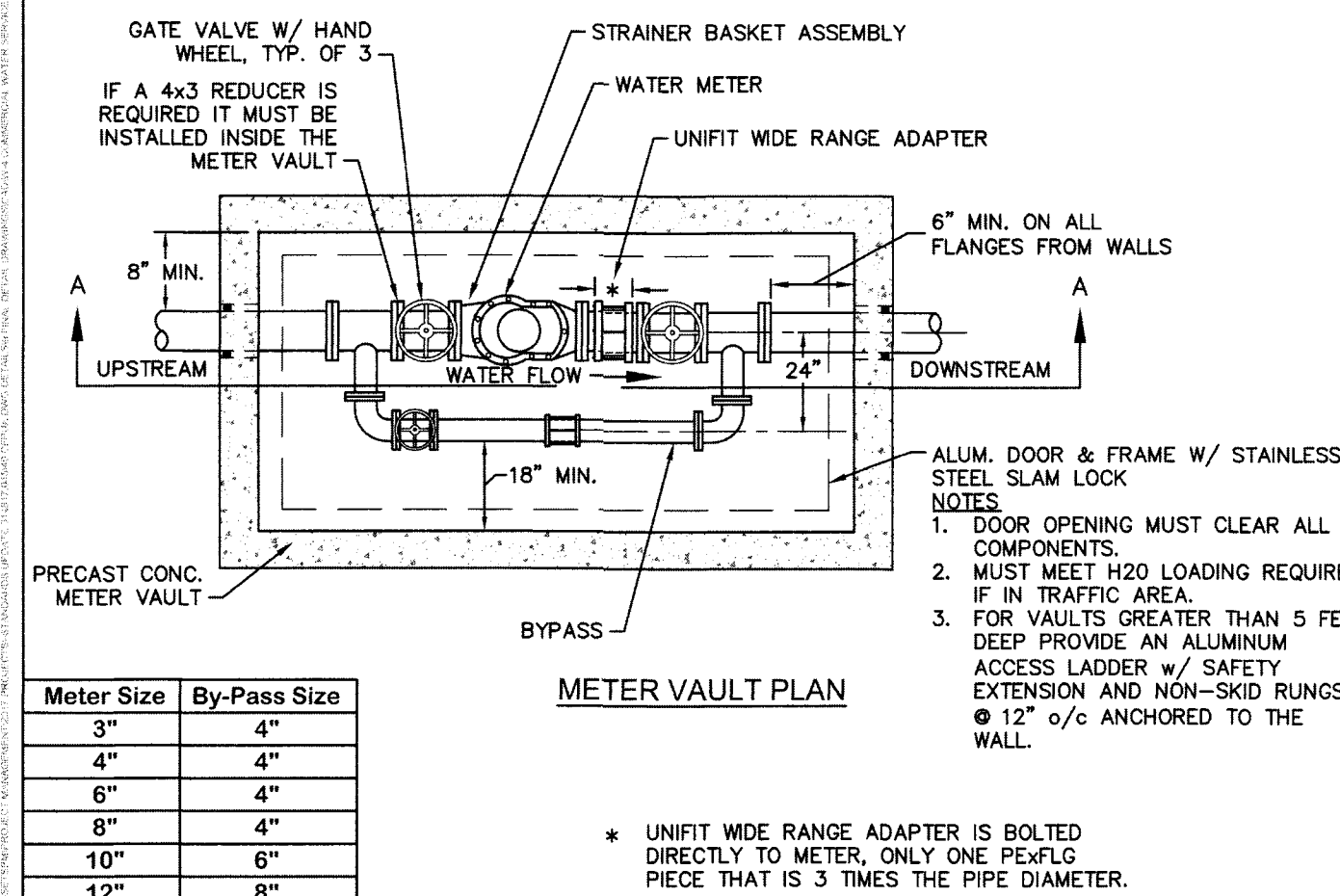
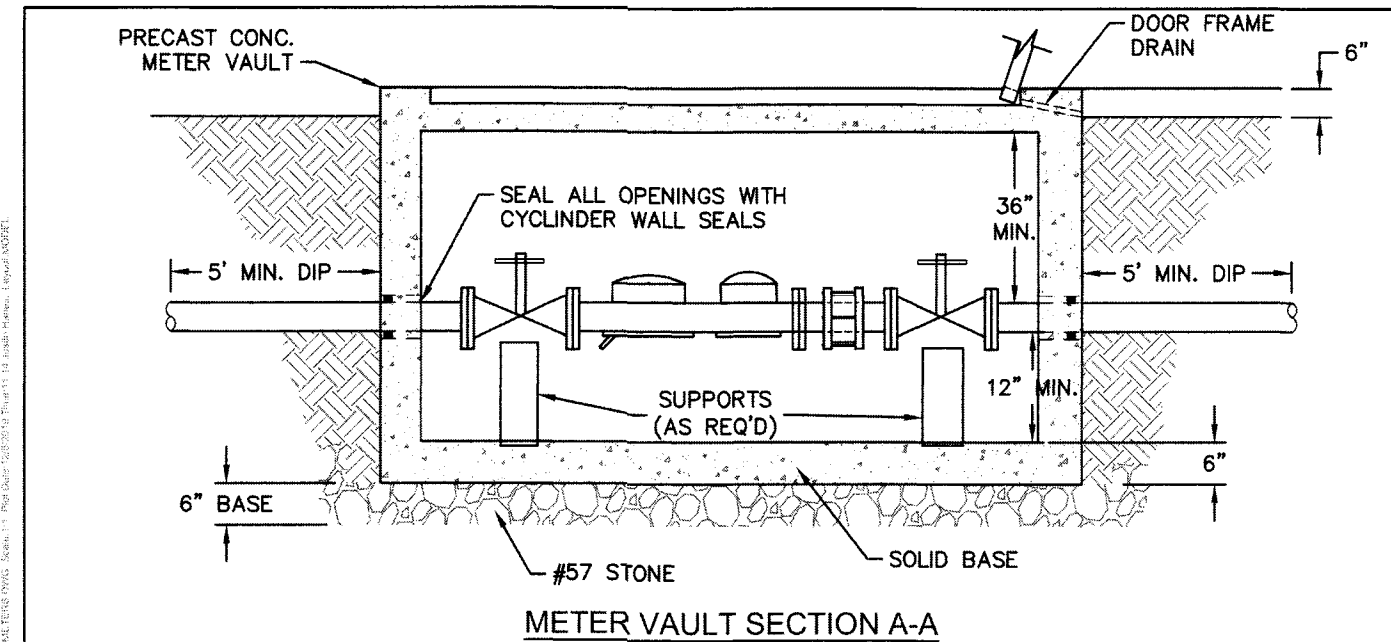
- NOTES:**
1. NO JOINT SHALL BE INSTALLED BETWEEN THE MAIN SERVICE TAP AND THE METER STOP. ALL SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN.
 2. SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY.
 3. METER BOXES SUBJECT TO TRAFFIC LOADS SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS.
 4. WATER SERVICE LINE SHALL BE PERPENDICULAR TO MAIN AND TERMINATE 18" WITHIN RIGHT-OF-WAY LINE.
 5. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.
 6. SERVICE PIPING AND METER SETTER TO BE CENTERED IN THE METER BOX.

DETAIL: SINGLE WATER SERVICE CONNECTION - LONG-SIDE		 CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560 Stewardship, Sustainability, Service.	DETAIL NO: W-2 SHEET NO: -
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20		
CFPUA REV. No: 2			



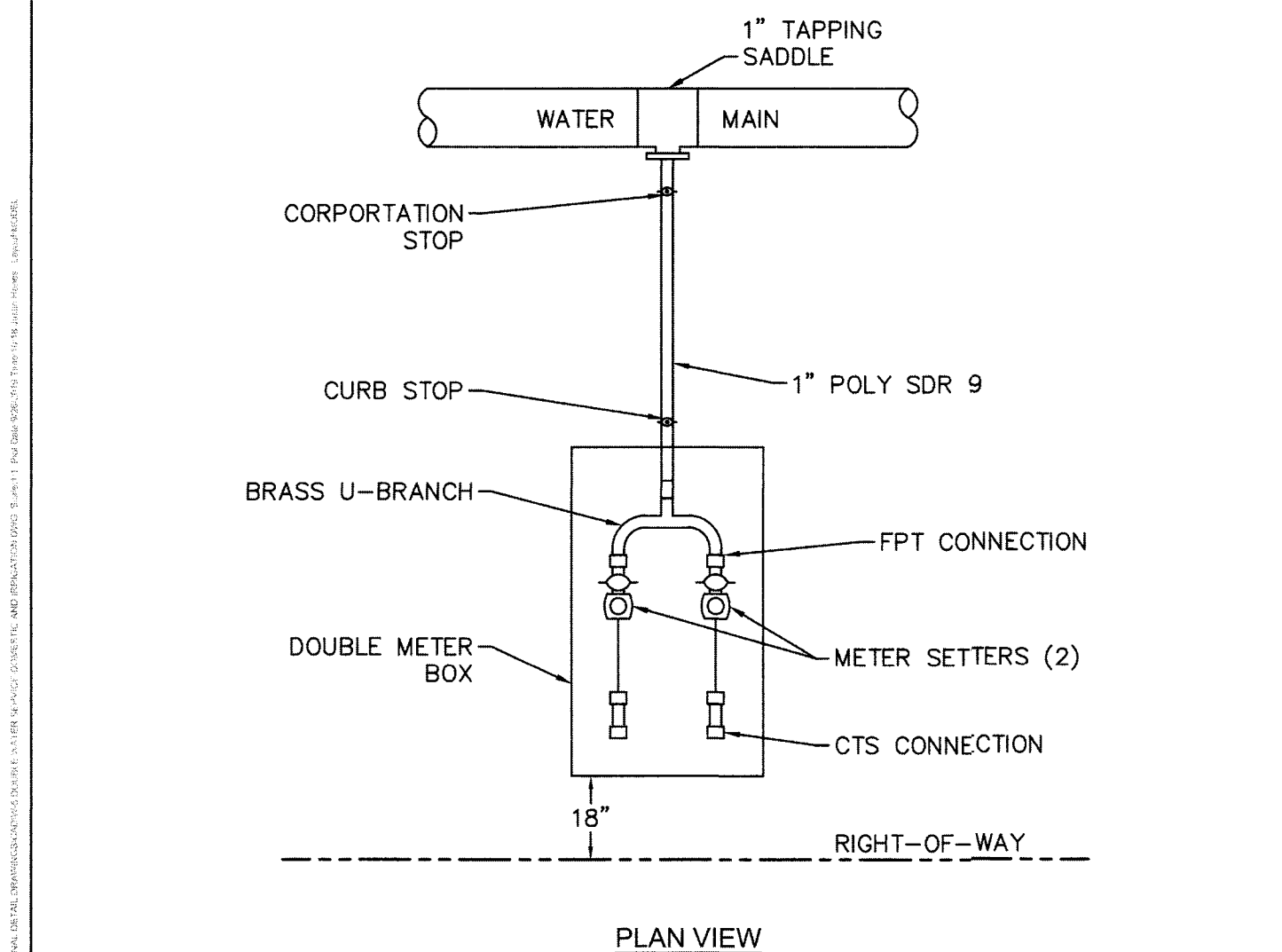
- NOTES:**
1. WATER SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN AND TERMINATE 18" INSIDE THE RIGHT-OF-WAY LINE.
 2. SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY.
 3. METER BOXES SUSCEPTIBLE TO TRAFFIC SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS.
 4. NON-TRAFFIC METER BOXES SHALL BE PER CFPUA STANDARD MATERIAL.
 5. 3" CLEAN FILL REQUIRED ALL AROUND 2" POLY SERVICE LINE.
 6. 1 1/2" METER - NL METER SETTER SHALL BE PER CFPUA STANDARD MATERIAL.
 7. 2" METER - NL METER SETTER SHALL BE PER CFPUA STANDARD MATERIAL.
 8. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNERS.
 9. SERVICE PIPING AND METER SETTER TO BE CENTERED IN THE METER BOX.

DETAIL: COMMERCIAL WATER SERVICE - 1 1/2 OR 2-INCH METERS		 CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560 Stewardship, Sustainability, Service.	DETAIL NO: W-3 SHEET NO: -
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20		
CFPUA REV. No: 2			



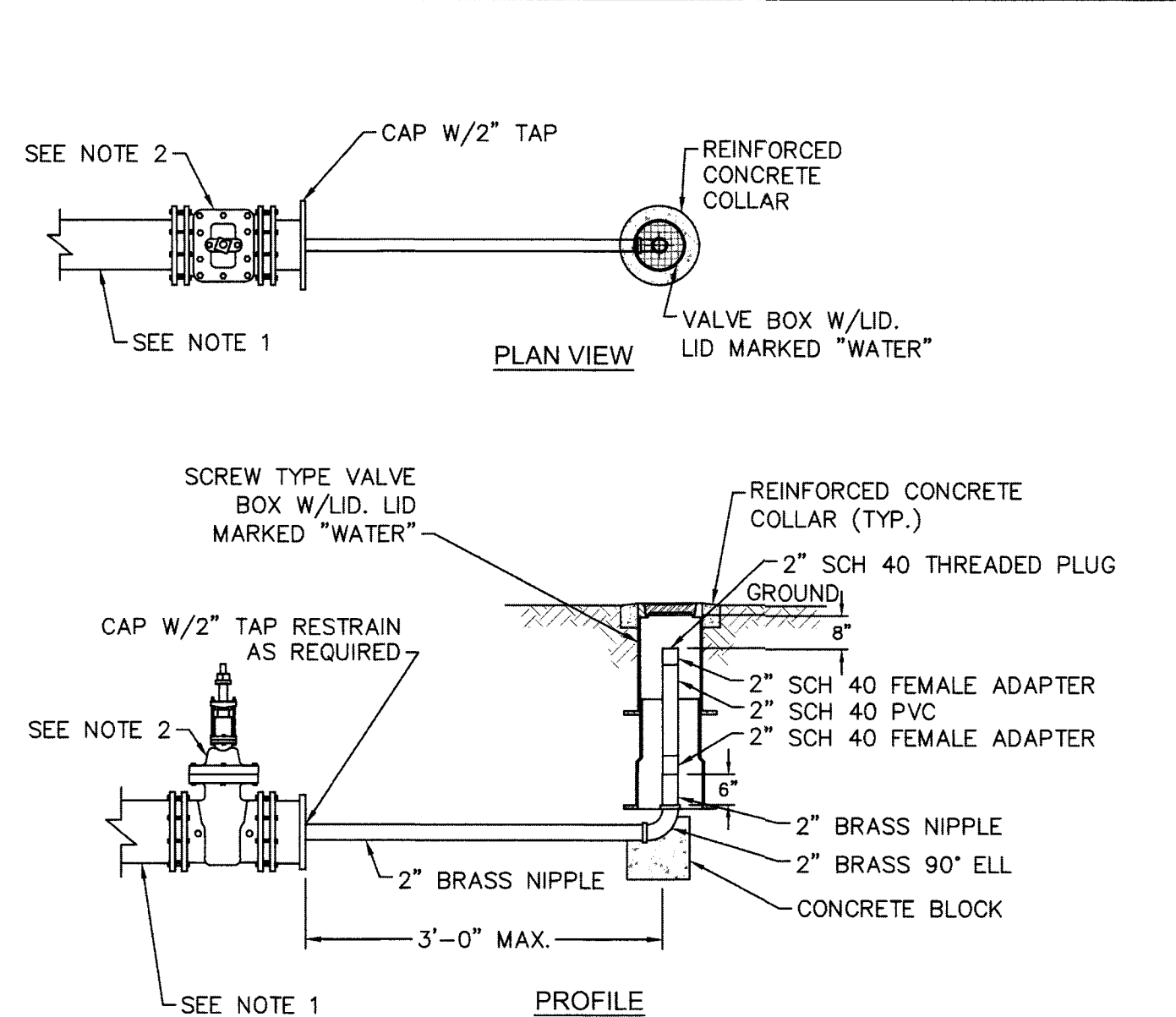
Meter Size	By-Pass Size
3"	4"
4"	4"
6"	4"
8"	4"
10"	6"
12"	8"

DETAIL: COMMERCIAL WATER SERVICE - 3-INCH AND LARGER METERS		 CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560 Stewardship, Sustainability, Service.	DETAIL NO: W-4 SHEET NO: -
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20		
CFPUA REV. No: 2			



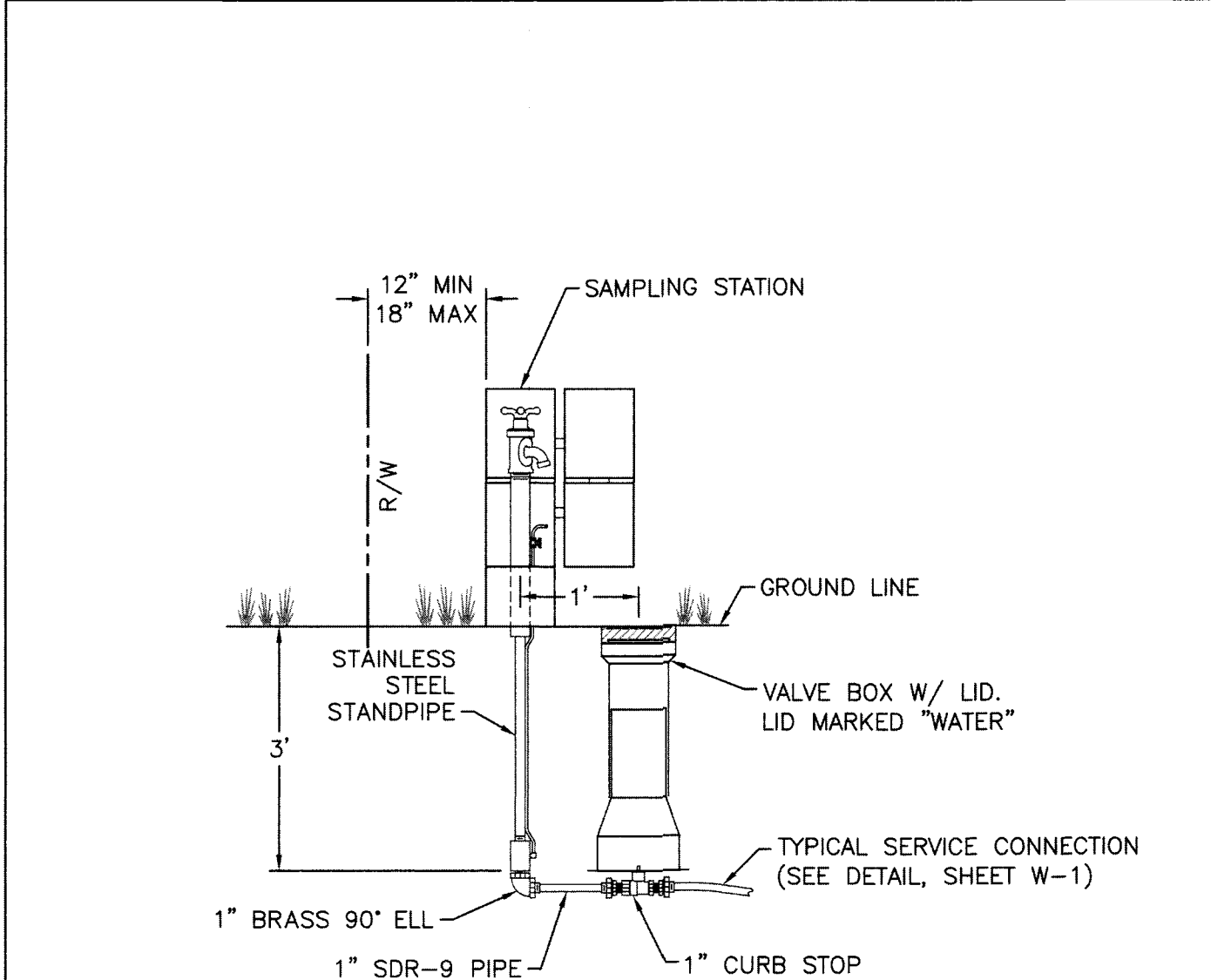
- NOTES:**
1. ALL WATER SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN AND TERMINATE 18" INSIDE THE RIGHT OF WAY.
 2. WATER SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY.
 3. METER BOXES SUBJECT TO TRAFFIC SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS.
 4. 3" CLEAN FILL REQUIRED ALL AROUND 1" POLY SERVICE LINE.
 5. JOINT RESTRAINT SYSTEMS SHALL BE WEDGE ACTION STYLE FOR DI OR C-900 PVC PIPE.
 6. METER BOXES SHALL BE LOCATED MINIMUM 5- FEET FROM THE PROPERTY CORNER.
 7. ASSEMBLY TO BE CENTERED IN THE METER BOX.

DETAIL: DOUBLE WATER SERVICE - DOMESTIC AND IRRIGATION SPLIT		 CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560 Stewardship, Sustainability, Service.	DETAIL NO: W-5 SHEET NO: -
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20		
CFPUA REV. No: 2			

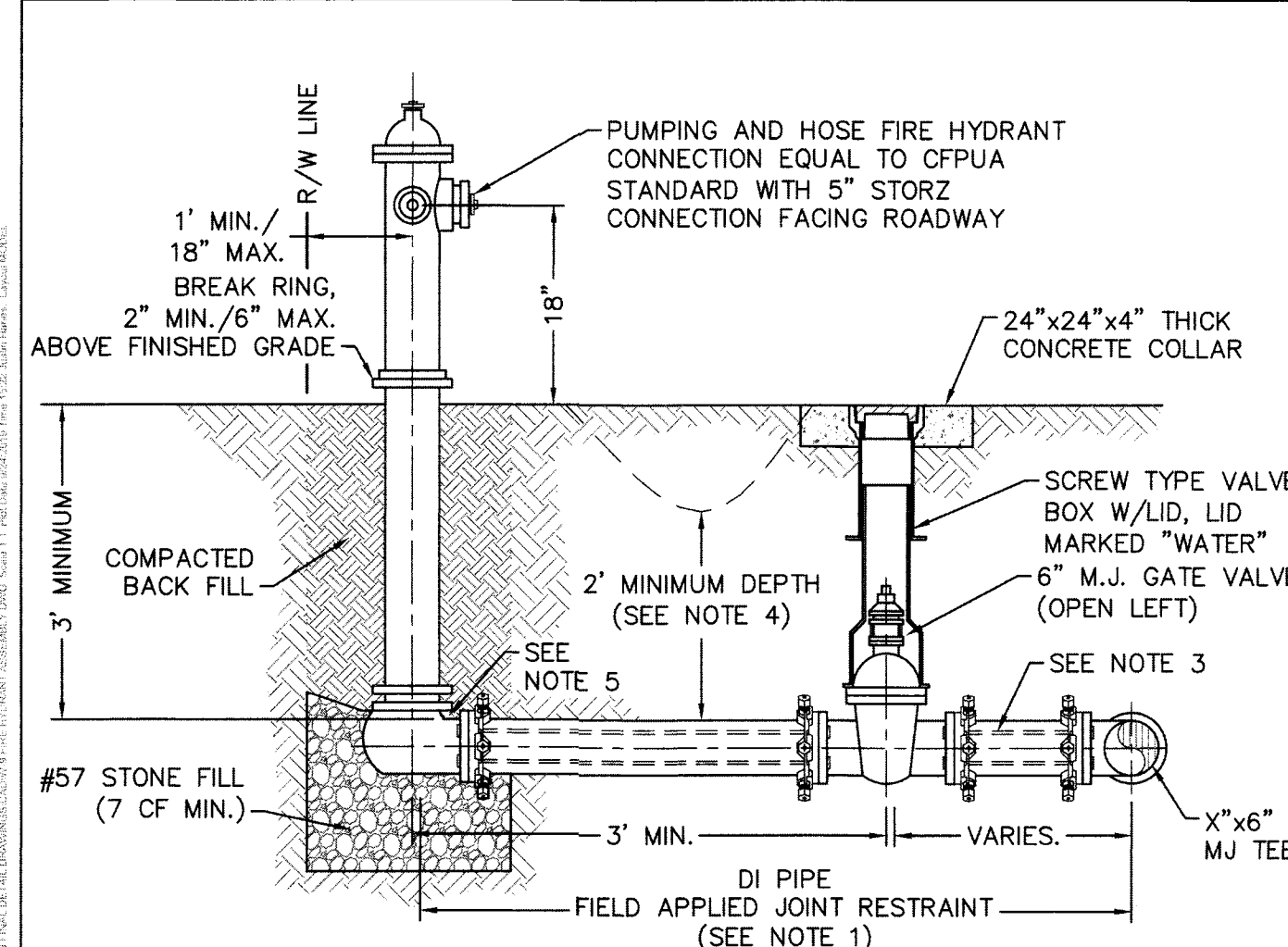


- NOTES:**
1. PROVIDE TOTAL LENGTH OF RESTRAINED JOINTS UPSTREAM AS REQUIRED FOR MAIN DIAMETER AT 150 psi TEST PRESSURE. WHEN UPSTREAM BENDS ARE WITHIN THE DEAD LENGTH, ADD TOTAL BEND RESTRAINT FOR EACH BEND TO DEAD-IN LENGTH.
 2. IF MAIN IS LARGER THAN 2", END WITH A VALVE SIZED FOR THE MAIN, THREADED CAP SIZED ON VALVE FOR THE 2" BLOW-OFF.

DETAIL: 2 INCH BLOW-OFF		 CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560 Stewardship, Sustainability, Service.	DETAIL NO: W-7 SHEET NO: -
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/19		
CFPUA REV. No: 1			



DETAIL: SAMPLING STATION		 CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560 Stewardship, Sustainability, Service.	DETAIL NO: W-8 SHEET NO: -
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20		
CFPUA REV. No: 2			



- NOTES:**
1. JOINT RESTRAINT SYSTEMS SHALL BE WEDGE ACTION STYLE FOR DI.
 2. WHEN HYDRANT LEGS REQUIRE FULL LENGTH PIPE SECTIONS, OVER BELL RESTRAINT SYSTEM SHALL HAVE 316 STAINLESS STEEL HARNESS AND FASTENERS.
 3. 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.
 4. HYDRANT AND VALVE SHALL BE PLACED OUTSIDE DITCH LIMITS.
 5. WEEP HOLES OPEN AND UNBLOCKED TO DRAIN.
 6. MJ TEE SHALL BE RESTRAINED ON EACH SIDE OF MAIN PLUS MAIN VALVES, FITTING, OR JOINTS WITHIN 10'-FEET OF MJ TEE.
 7. TRACING WIRE SHALL EXTEND ALONG HYDRANT LATERAL AND UP TO FINISHED GRADE WITH 2'-FEET EXTENDED ABOVE THE BREAK RING OF HYDRANT.

DETAIL: FIRE HYDRANT ASSEMBLY		 CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560 Stewardship, Sustainability, Service.	DETAIL NO: W-9 SHEET NO: -
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20		
CFPUA REV. No: 2			

DISCLAIMER:

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AND CONSTRUCTION AND
HAVE BEEN REVIEWED AND
APPROVED FOR CONTENT AND
GENERAL CONFORMANCE WITH
THE SEWER DESIGN FOR THIS
PROJECT.

NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.

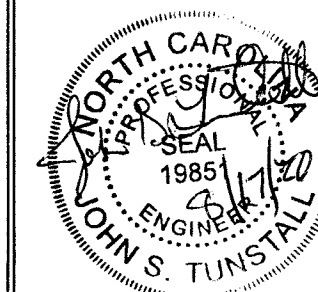
1900 EASTWOOD RD., SUITE #11
WILMINGTON, NC 28403
PHONE (910) 343-9653

Licence #C-3641

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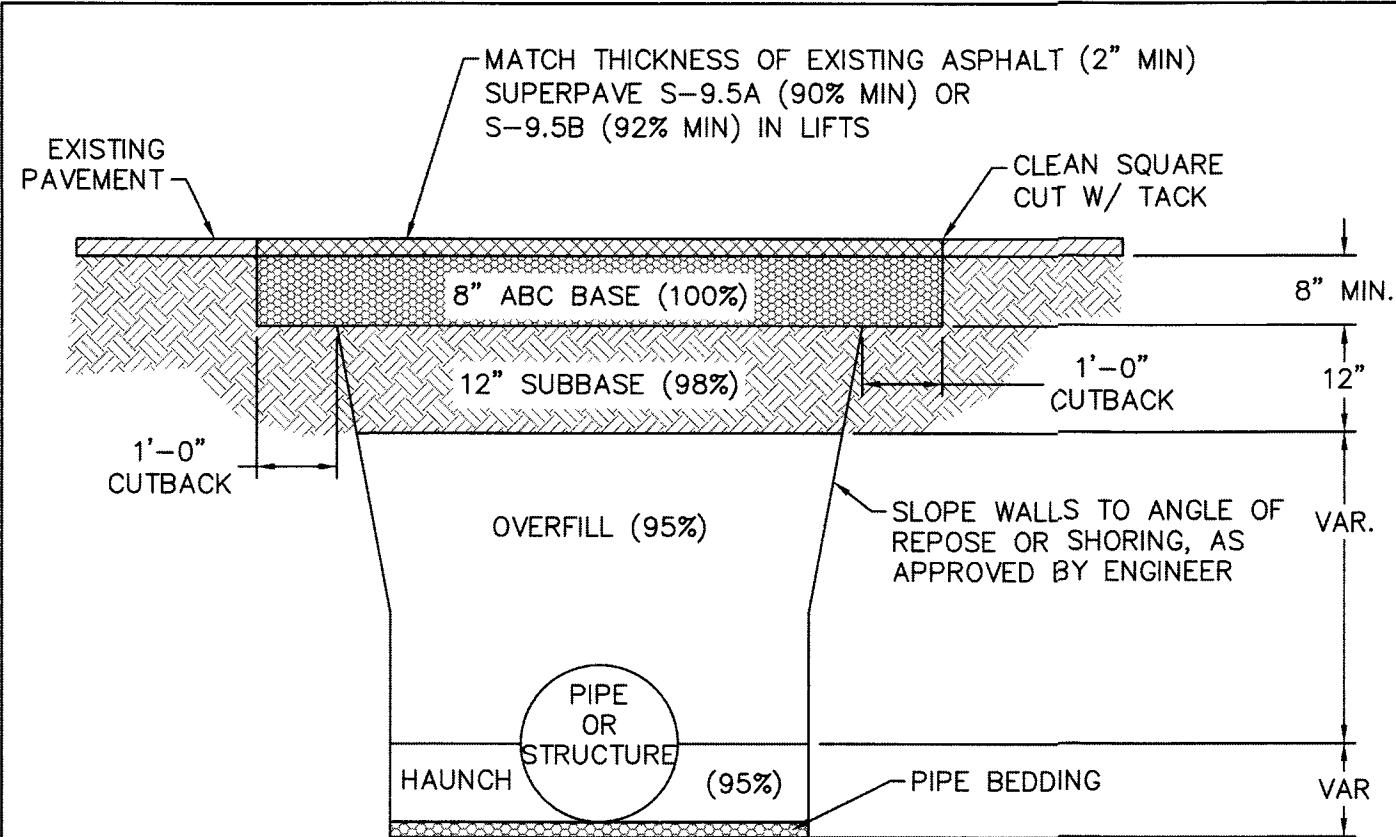
DES. JST
CHK. JPN
DRWN. NKS

DATE 8/17/20



W1

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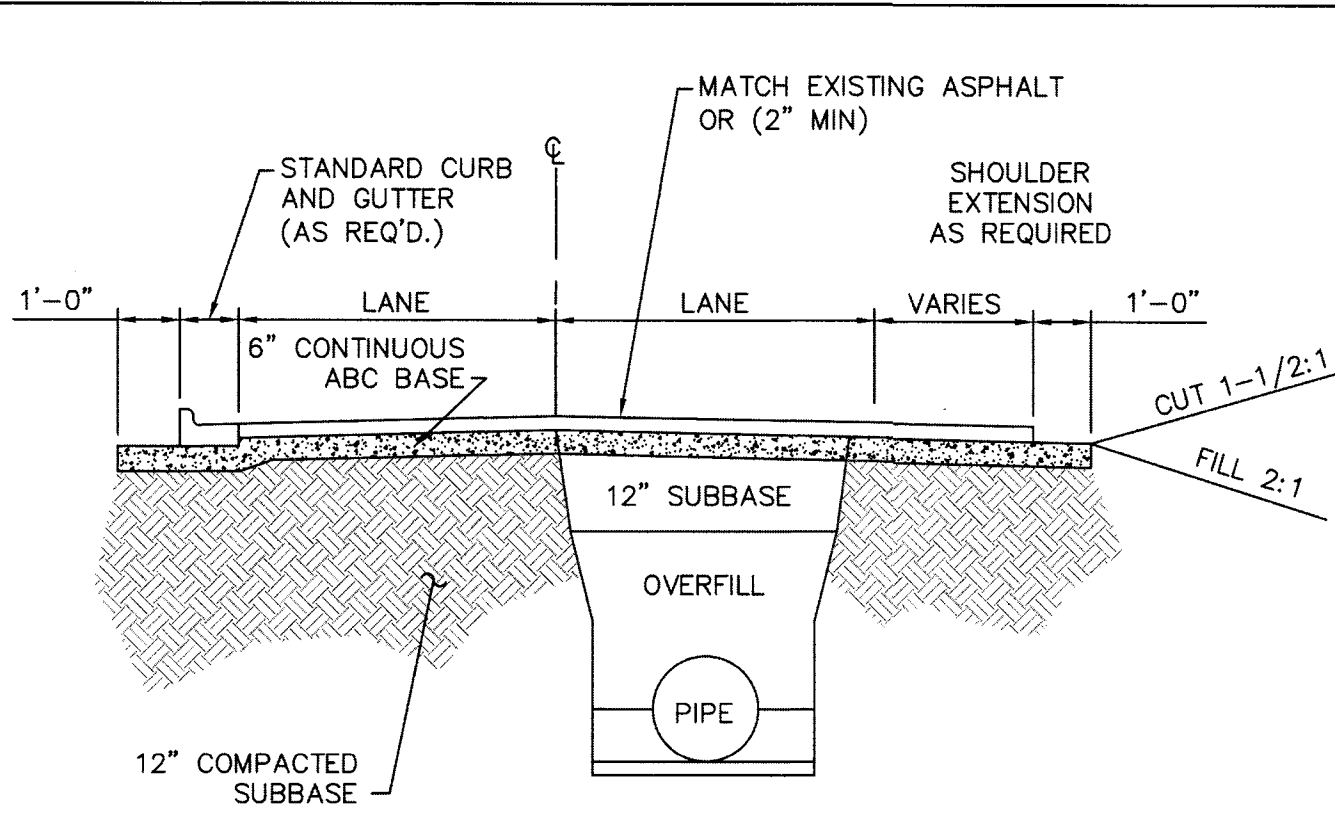


NOTES:

- CONTRACTOR SHALL ENSURE BOTTOM OF TRENCH IS SUITABLE FOR INSTALLATION AND DOES NOT REQUIRE FOUNDATION CONDITIONING STONE.
- FILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBS, DEBRIS, ORGANICS AND LITTLE TO NO EXCESSIVE MOISTURE.
- SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CITY TO ACHIEVE COMPACTION, (I.E. #57 STONE, ABC, CRUSHED LIMESTONE, CLEAN SAND, FLOWABLE FILL, ETC.).
- SOIL SHALL BE INSTALLED IN 6"-8" LIFTS AND COMPACTIONED 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.
- ALL APPROVED CASTINGS SHALL BE SET FLUSH TO GRADE AND SUPPORTED IF APPLICABLE.
- COMPACT MATERIALS TO MINIMUM % DENSITY SHOWN IN DIAGRAM AS DETERMINED BY THE STANDARD PROCTOR METHOD ASTM D-698-A FOR SOILS, AND ASTM D-698-C FOR ABC STONE, AND BY NUCLEAR GAGE OR CORE SAMPLE FOR ASPHALT.
- OUTBACKS OF ASPHALT SHALL BE PREPARED ON EDGE OF EXCAVATION OVER TOP OF UNDISTURBED SOIL.

(FOR PRIVATE ROADS AND PAVED AREAS, CONTRACTOR TO MEET MINIMUM REQUIREMENTS AS DEFINED BY RIGHT-OF-WAY OWNER FOR PUBLIC ROAD REPAIRS)

DETAIL:	CITY OF WILMINGTON PAVEMENT REPAIRS-UTILITY CUTS	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-1
SCALE:	NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -
CFPUA REV. No:	2		

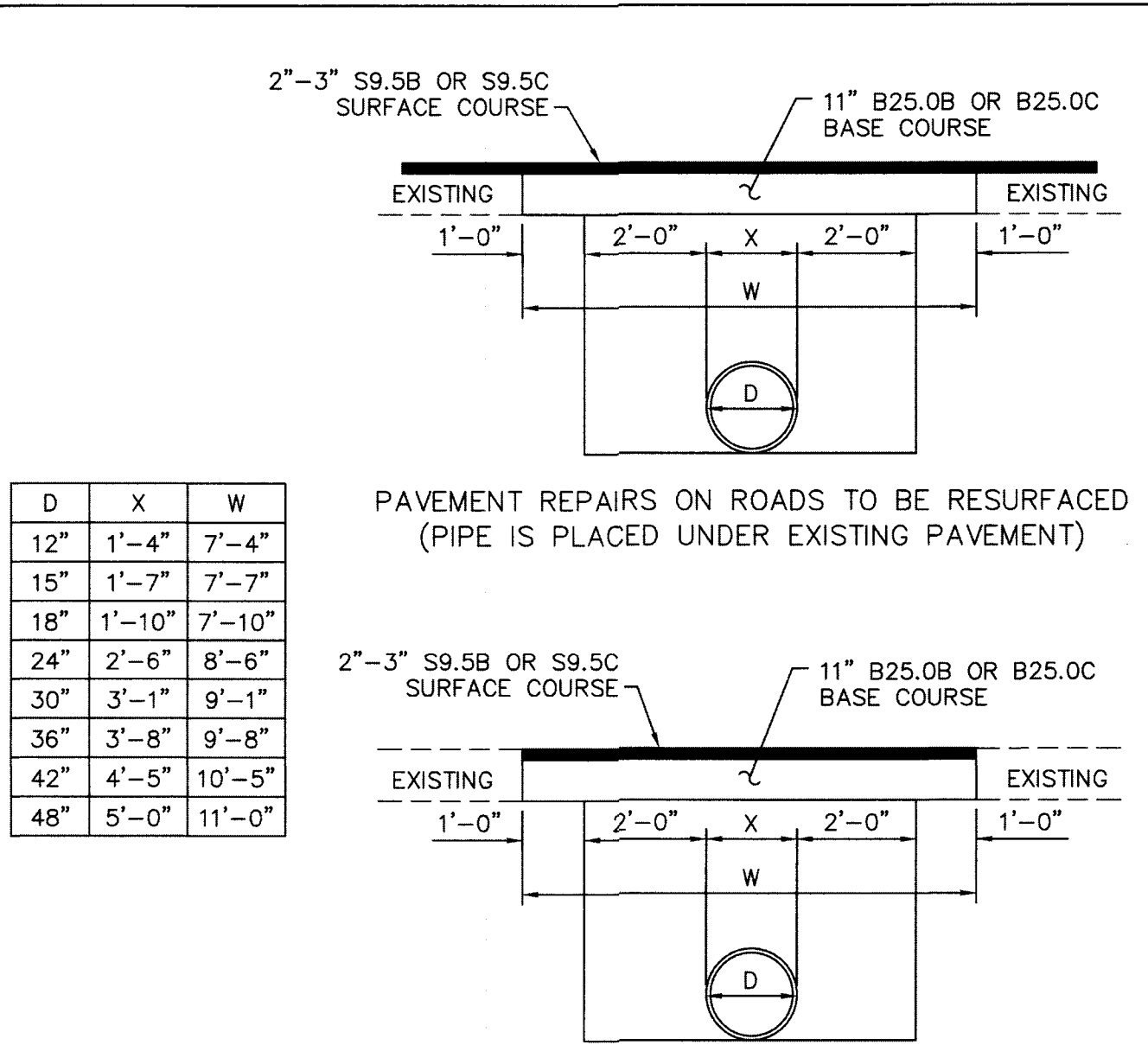


NOTES:

- PAVEMENT RESTORATION DESIGN IS DEPENDENT ON CITY OF WILMINGTON STREET CUT POLICY AND PERMITTED CONDITIONS.
- PIPE TRENCH AND COMPACTION REQUIREMENTS PER SPECIFICATIONS. SEE WS-1.

(FOR PRIVATE ROADS AND PAVED AREAS, CONTRACTOR TO MEET MINIMUM REQUIREMENTS AS DEFINED BY RIGHT-OF-WAY OWNER FOR PUBLIC ROAD REPAIRS)

DETAIL:	CITY OF WILMINGTON TYPICAL ROAD REBUILD	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-2
SCALE:	NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -
CFPUA REV. No:	2		

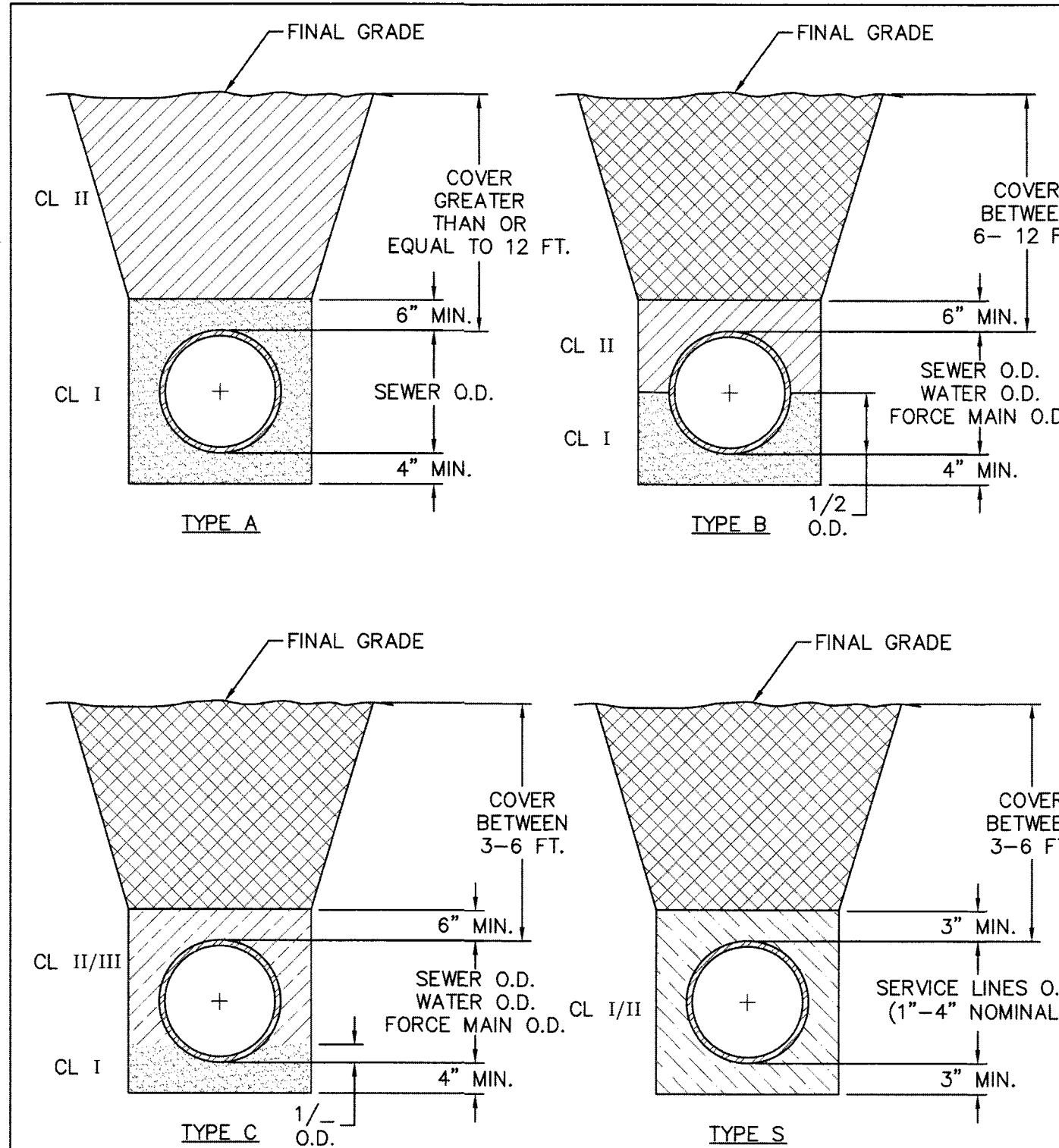


D	X	W
12"	1'-4"	7'-4"
15"	1'-7"	7'-7"
18"	1'-10"	7'-10"
24"	2'-6"	8'-6"
30"	3'-1"	9'-1"
36"	3'-8"	9'-8"
42"	4'-5"	10'-5"
48"	5'-0"	11'-0"

NOTE:

- FOR REFERENCE, SEE NCDOT STANDARD 654.01

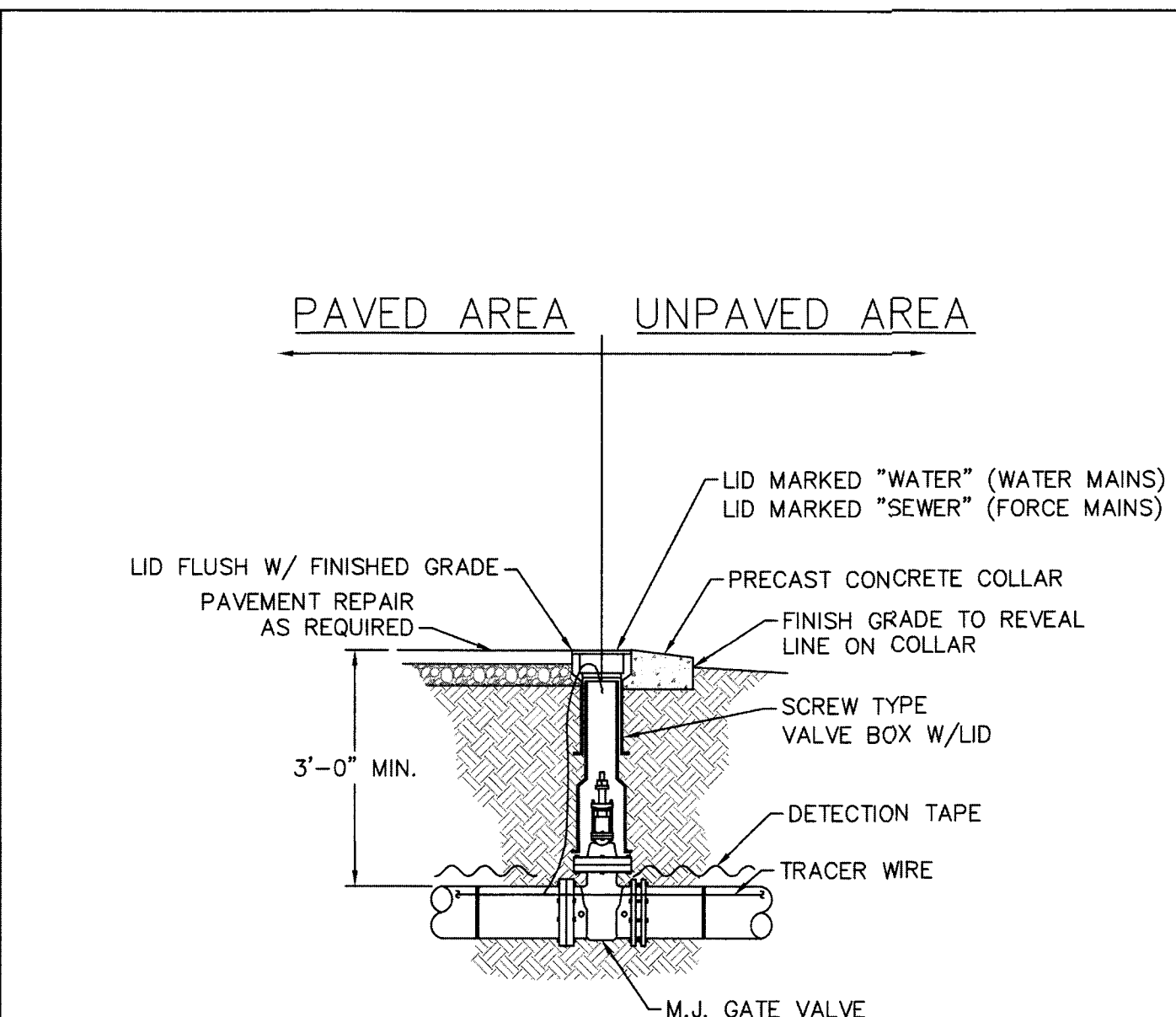
DETAIL:	NCDOT-PAVEMENT REPAIRS	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-3
SCALE:	NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -
CFPUA REV. No:	2		



COMPACTION NOTES:

- ALL ZONES: 95% STD EFFORT PER ASTM D698, EXCEPT AS STATED IN COMPACTION NOTE 2.
- 12" SUBGRADE UNDER PAVEMENT: 98% STD EFFORT PER ASTM D698.

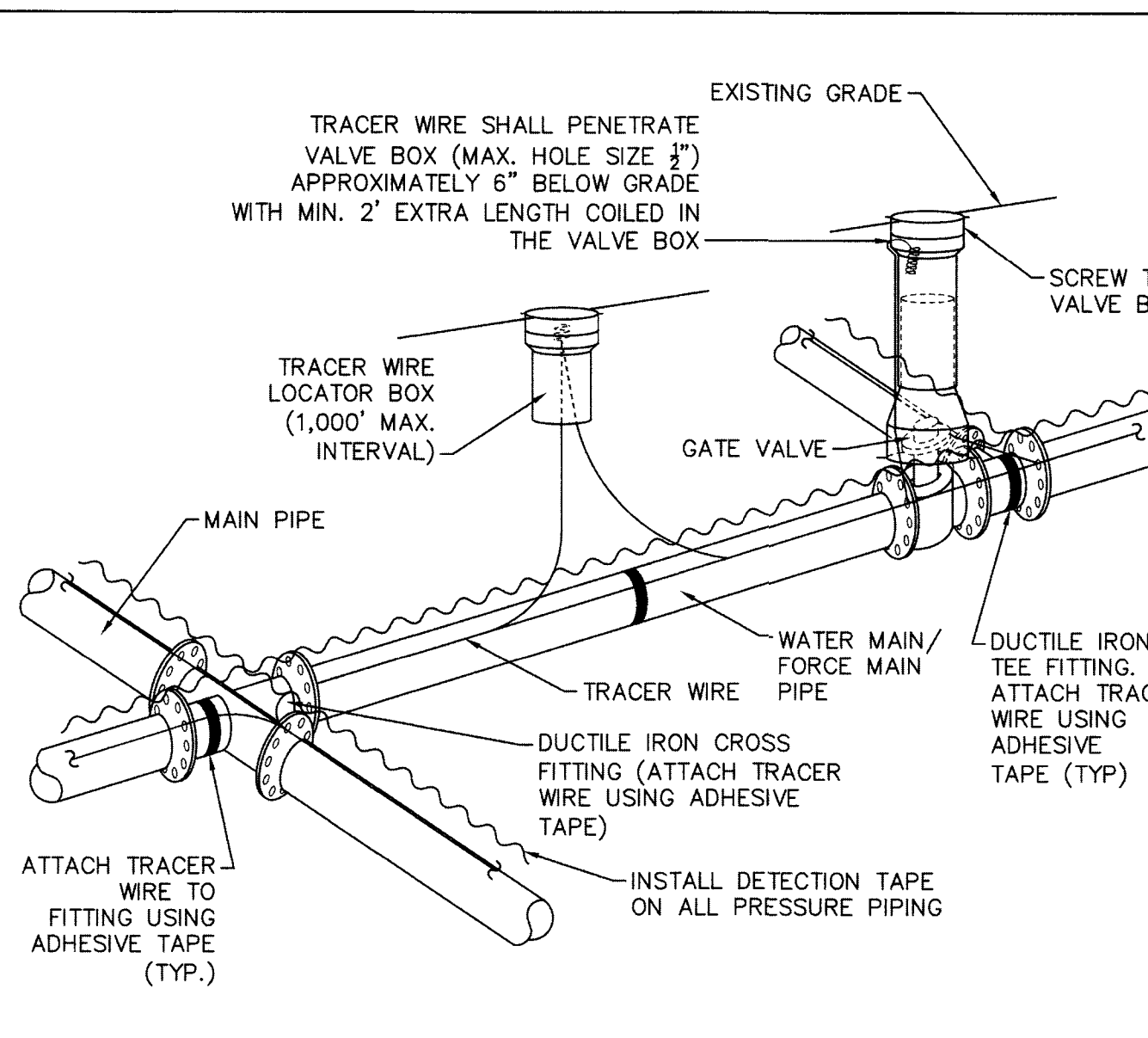
DETAIL:	PIPE EMBEDMENT TYPES	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-4
SCALE:	NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -
CFPUA REV. No:	2		



NOTES:

- TRACER WIRE SHALL PENETRATE VALVE BOX THROUGH DRILLED HOLE APPROX. 6" BELOW GRADE WITH MINIMUM 2-FOOT EXTRA LENGTH COILED IN THE VALVE BOX. SEE WS-6.

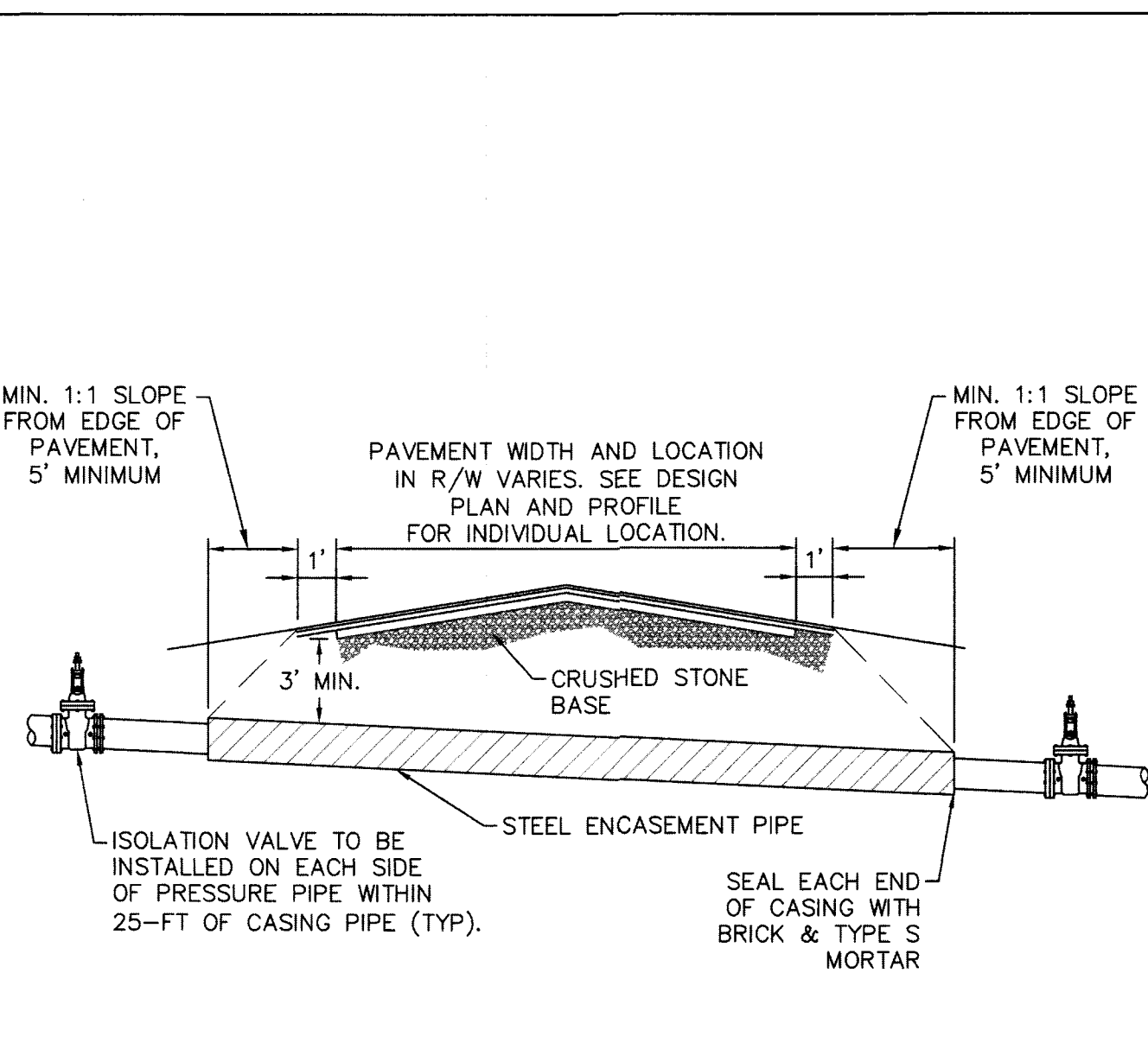
DETAIL:	VALVE DETAIL	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-5
SCALE:	NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -
CFPUA REV. No:	2		



NOTES:

- TRACER WIRE SHALL BE INSTALLED PER THE CPDUA MSM.
- WIRE SHALL BE STRAPPED TO ALL PVC PIPING WITH ADHESIVE TAPE AT 12 FOOT INTERVALS.
- SECURE WIRE TO ALL TEE AND CROSS FITTINGS WITH ADHESIVE TAPE.
- ALL SPLICES IN THE WIRE SHALL BE MADE WITH 3M DBR DIRECT BURY SPLICE KITS.

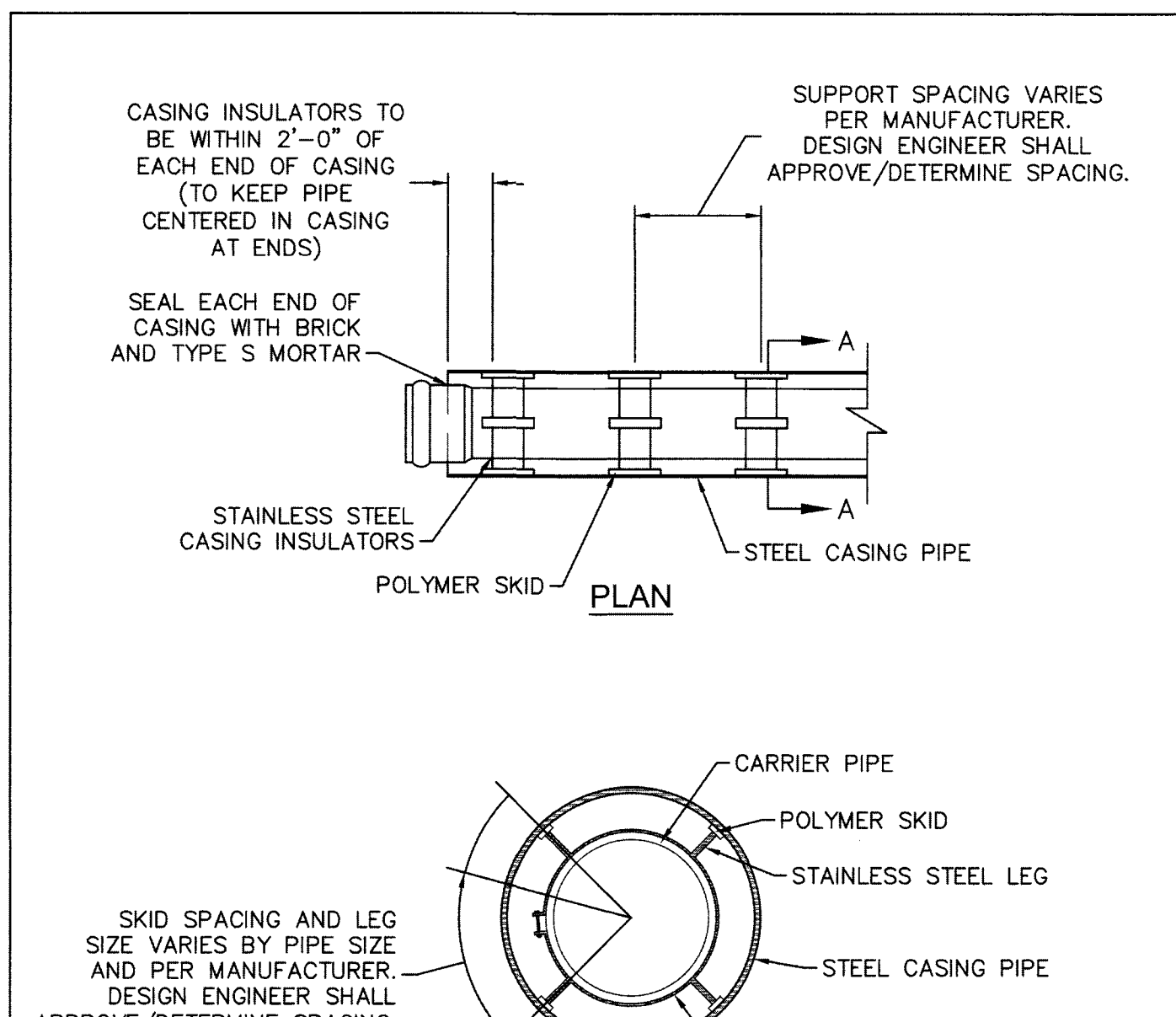
DETAIL:	TRACER WIRE DETAIL	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-6
SCALE:	NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -
CFPUA REV. No:	2		



NOTES:

- CASING WILL BE INSTALLED AT LINE AND GRADE SHOWN ON INDIVIDUAL PROFILE FOR EACH CROSSING. BORING/JACKING TO LINE AND GRADE IS REQUIRED.
- TRACER WIRE SHALL BE TAPED AT 12' INTERVALS THROUGHOUT THE CASING.
- PRESSURE AND NON-PRESSURE PIPING THROUGH CASING SHALL BE RESTRAINED JOINT.
- SEE DETAIL WS-8 FOR PIPE CASING SUPPORT DETAILS.

DETAIL:	TYPICAL BORING & JACKING DETAIL	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-7
SCALE:	NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -
CFPUA REV. No:	2		



NOTES:

- PIPE SUPPORTS TO BE PLACED TO PROVIDE PROPER SPACING, ALIGNMENT, AND GRADE AS SPECIFIED. OIL, GREASE, OR PETROLEUM PRODUCT MAY NOT BE USED AS LUBRICANT.

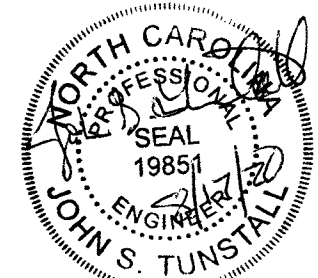
DETAIL:	PIPE CASING SUPPORT DETAIL	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-8
SCALE:	NOT TO SCALE	CFPUA DETAIL DATE: 01/01/20	SHEET NO: -
CFPUA REV. No:	2		

UTILITY DETAILS
TYPICAL WATER AND SEWER
CAPE FEAR PUBLIC UTILITY AUTHORITY
235 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

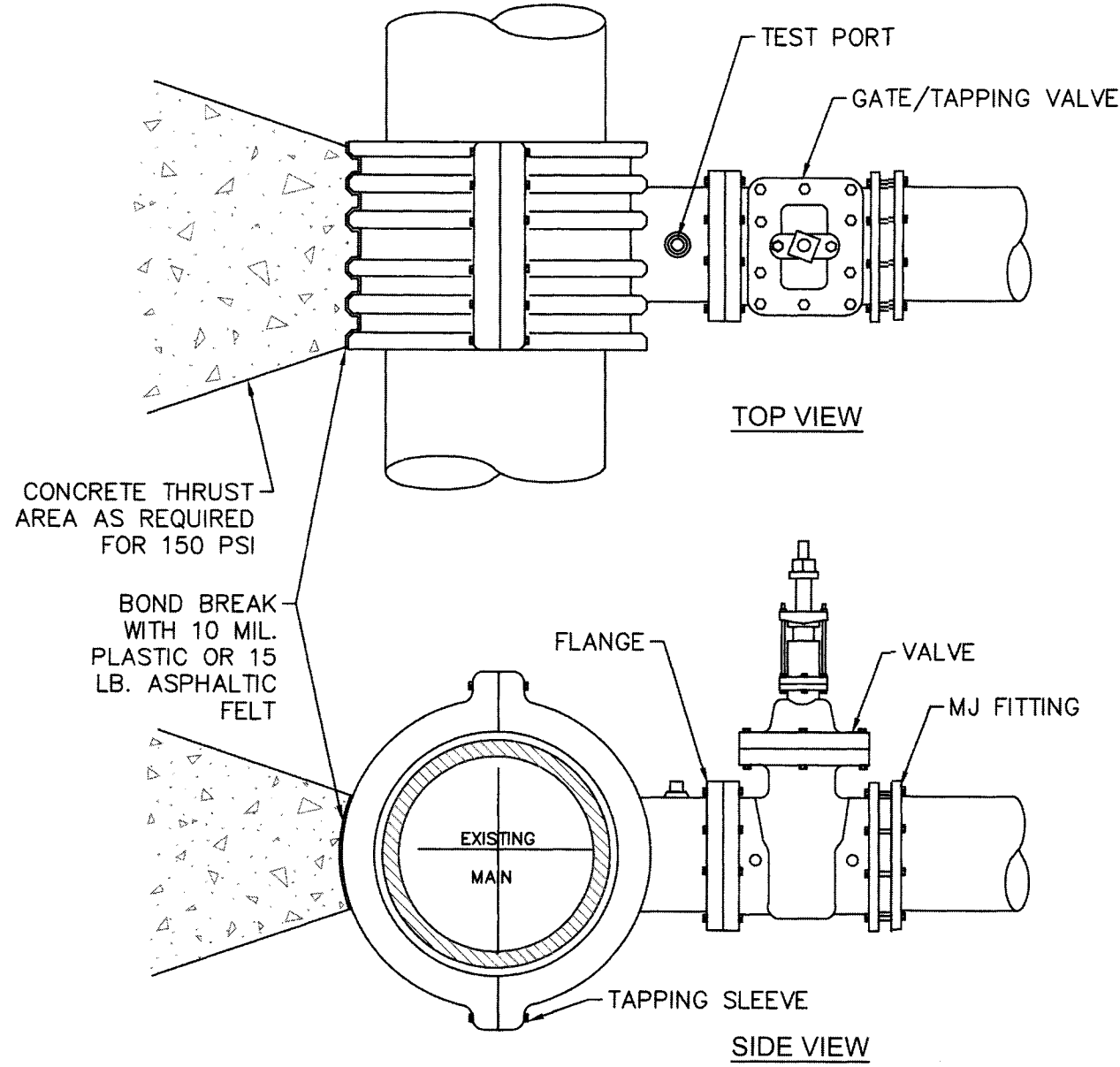
DISCLAIMER:
THESE DETAILS ARE A WORK OF
ENGINEERING AND DESIGN
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AND HAVE BEEN REVIEWED AND
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PROJECT.

NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
1900 EASTWOOD RD., SUITE #11
WILMINGTON, NC 28403
PHONE (910) 343-9653
1429 ASH LITTLE RIVER RD. NW
ASH, NC 28420
PHONE (910) 287-5900

Licence #C-3641
20030
DES. JST
CHK. JPN
DRWN. NKS
DATE 8/17/20



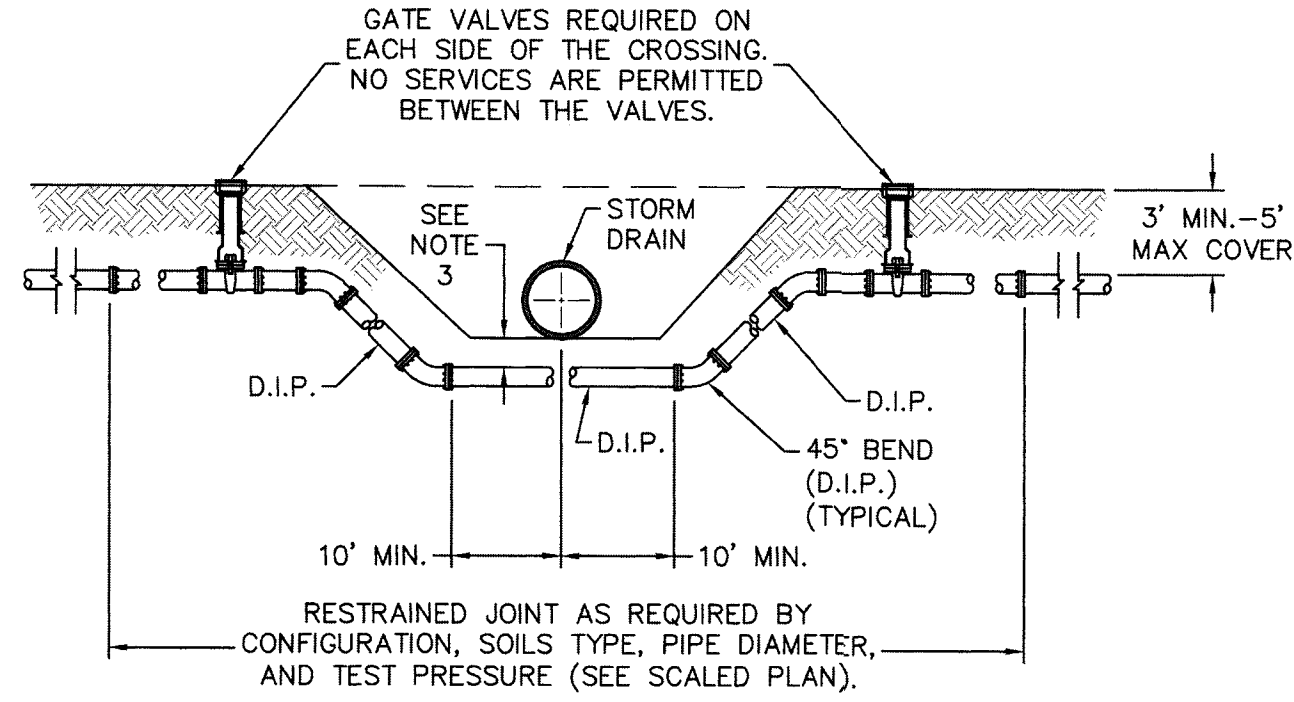
WS1



- NOTES:**
- CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
 - PIPE & FITTING TO BE WRAPPED IN 10 MIL. PLASTIC OR 15 LB. ASPHALTIC FELT PRIOR TO THRUST BLOCK BEING POURED.
 - TEST PRESSURE SHALL NOT BE APPLIED FOR A MINIMUM OF 7 DAYS AFTER THRUST BLOCK PLACEMENT.
 - BRANCH SHALL NOT EQUAL RUN DIAMETER UNLESS APPROVED BY CFPUA ENGINEERING.

DETAIL:
TAPPING SLEEVE AND VALVE ASSEMBLY
(4"-24")
SCALE: NOT TO SCALE CFPUA DETAIL DATE:
01/01/20
CFPUA REV. No: 2

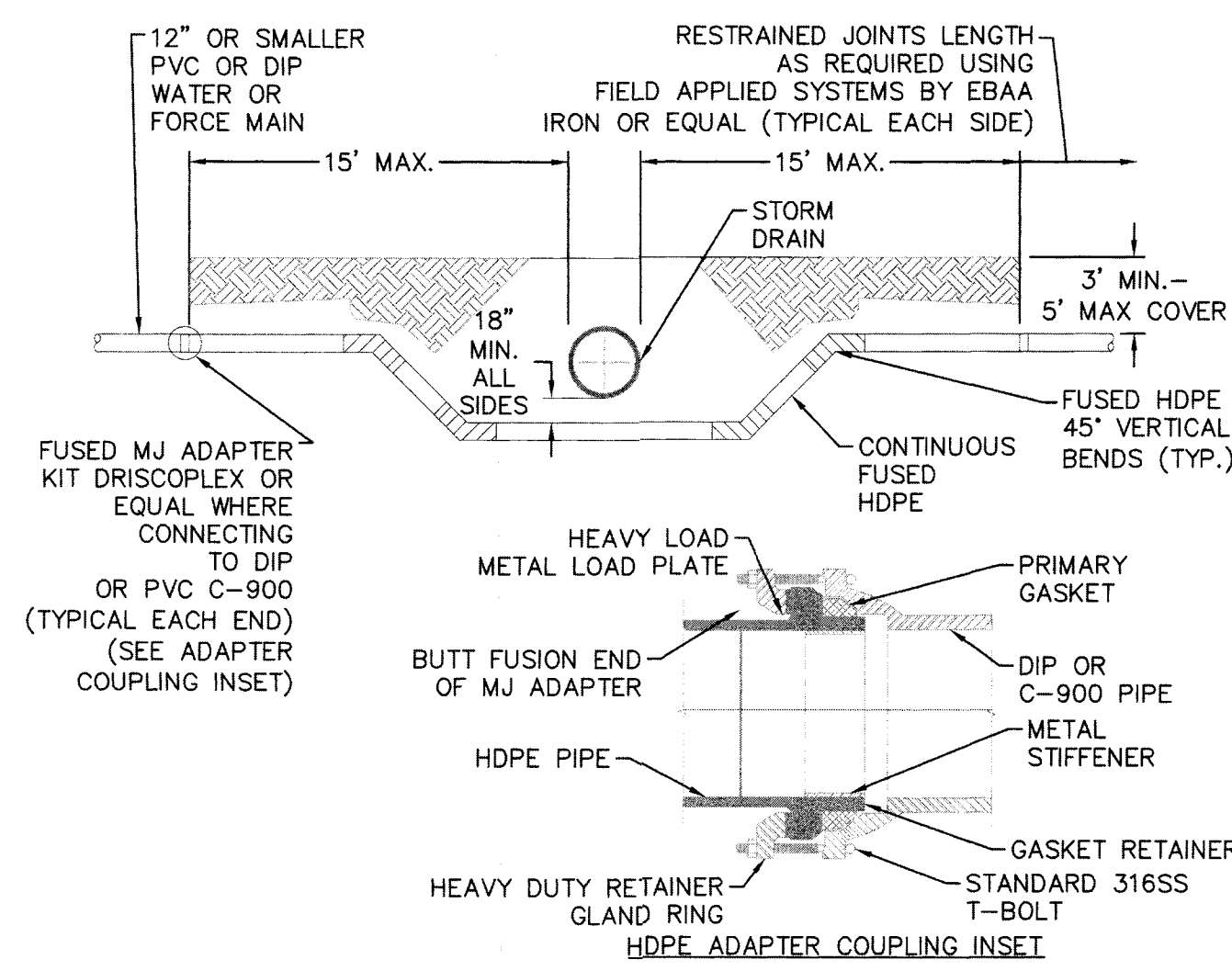
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DETAIL NO:
WS-9
SHEET NO:
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- NOTES:**
- USE PRESSURE CLASS 350 DIP, UNLESS SPECIFIED OTHERWISE.
 - ALL BURIED PIPES, VALVES AND FITTINGS SHALL BE RESTRAINED.
 - MINIMUM DEPTH REQUIRED, UNLESS SPECIFIED OTHERWISE BY CFPUA:
 - IN DOT R/W, 36" MIN. TYPICAL, OR 24" MIN. WHEN CROSSING A DITCH LINE.
 - ALL OTHER LOCATIONS, 30" MIN.
 - WHEN STORM DRAIN INVERT IS BURIED AT OR BELOW ABOVE DEPTHS, WATER MAIN AND STORM DRAIN SHALL BE CONSTRUCTED OF FERROUS MATERIALS WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10'-FEET EACH SIDE OF THE POINT OF CROSSING.

DETAIL:
PRESSURE MAIN DITCH AND
STORM DRAIN CROSSING-DIP
SCALE: NOT TO SCALE CFPUA DETAIL DATE:
01/01/20
CFPUA REV. No: 2

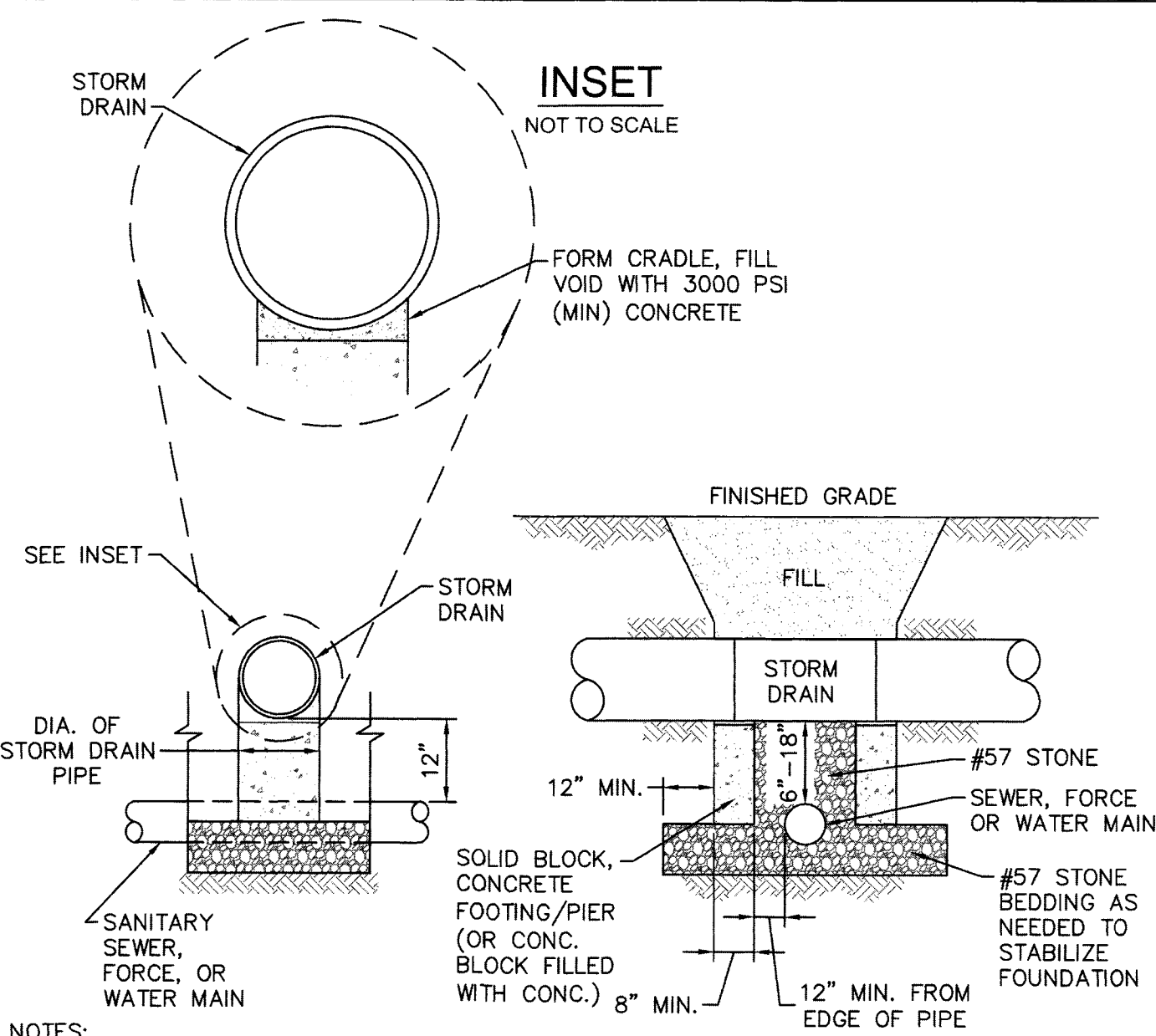
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OFFICE: (910)332-6560
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DETAIL NO:
WS-10
SHEET NO:
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- NOTES:**
- MAY BE USED AS AN ALTERNATIVE TO CFPUA STANDARD DETAIL WS-10 (STORM CROSSING) WITH APPROVAL BY CFPUA. SHALL NOT BE USED FOR DITCH CROSSINGS.
 - NO SERVICE CONNECTIONS, VALVES, TEES, ADDITIONAL FITTINGS OR APPURTENANCES SHALL BE INSTALLED ON HDPE.
 - 45° VERTICAL BENDS MAY BE ELIMINATED IF OFFSET CAN BE ACHIEVED BY DEFLECTING PIPE WITHIN MANUFACTURER'S MAXIMUM BENDING RADIUS.
 - HDPE SHALL BE MINIMUM OF DR-11 (200 PSI), DIPS, PE 4710, BLUE POTABLE WATER MAINS AND GREEN SEWER FORCE MAINS. INSTALLATIONS IN PUBLIC RIGHT-OF-WAY ARE SUBJECT TO NC DOT REQUIREMENTS, WHICH MAY INCLUDE USE OF DR-9 HDPE.
 - 45° VERTICAL BENDS MAY BE FUSED BY SUPPLIER PRIOR TO DELIVERY TO SITE.
 - THE HDPE CROSSING ASSEMBLY SHALL BE PRESSURE TESTED PRIOR TO ACTIVATING. ABOVE GROUND PRESSURE TEST MAY BE ALLOWED WITH APPROVAL BY CFPUA.

DETAIL:
PRESSURE MAIN AND
STORM DRAIN CROSSING-HDPE
SCALE: NOT TO SCALE CFPUA DETAIL DATE:
01/01/20
CFPUA REV. No: 2

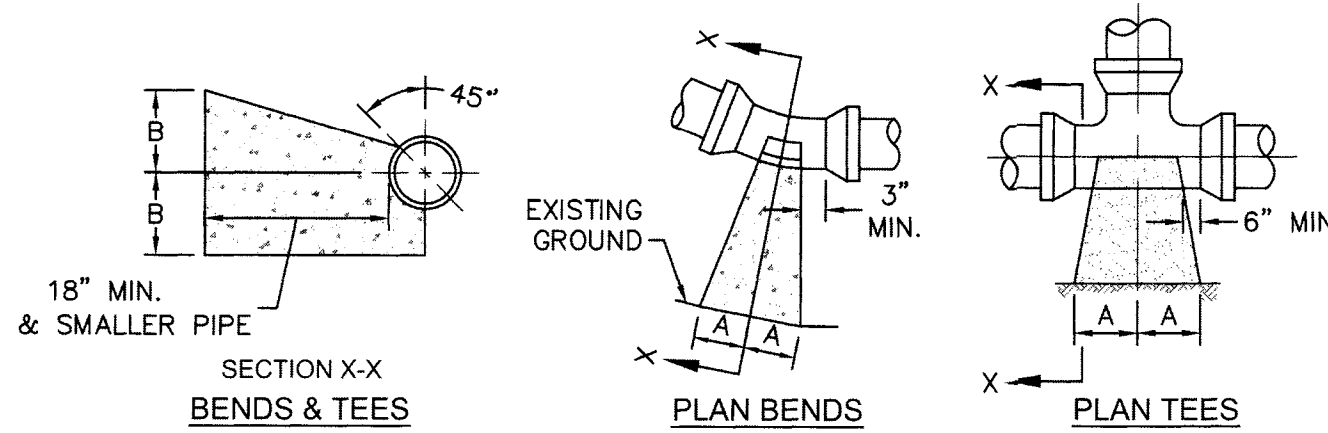
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DETAIL NO:
WS-11
SHEET NO:
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- NOTES:**
- PIPELINE BRIDGING REQUIRED FOR VERTICAL SEPARATION LESS THAN 18" PER STATE STANDARDS.
 - NO PIPE JOINTS ON STORM DRAINS BETWEEN PIERS.

DETAIL:
STRUCTURAL BRIDGING OVER
WATER & SEWER PIPELINES
SCALE: NOT TO SCALE CFPUA DETAIL DATE:
01/01/20
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DETAIL NO:
WS-12
SHEET NO:
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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:**
- THRUST BLOCKING IS NOT PERMITTED EXCEPT IN SPECIAL INSTALLATIONS WHERE DESIGNED BY ENGINEER AND APPROVED BY CFPUA.
 - ALLOW 7-DAY MINIMUM CONCRETE CURE TIME BEFORE PLACING LOAD ON THRUST BLOCK
 - BASED ON 160 PSI TEST PRESSURE AND 2,000 PSF SOIL BEARING CAPACITY.
 - ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.
 - PIPE & FITTINGS TO BE WRAPPED IN 10 MIL PLASTIC PRIOR TO THRUST BLOCK BEING POURED.

DETAIL:
THRUST BLOCK
SCALE: NOT TO SCALE CFPUA DETAIL DATE:
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CFPUA REV. No: 2

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WS-13
SHEET NO:
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CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD NOTES:

- ALL PROPOSED ADDITIONS TO THE CAPE FEAR PUBLIC UTILITY AUTHORITY (CFPUA) WATER DISTRIBUTION AND SANITARY SEWER COLLECTION SYSTEMS, AS SHOWN AND SPECIFIED HEREIN, SHALL BE DESIGNED AND CONSTRUCTED TO CONFORM TO STATE RULES AND THE CFPUA'S MINIMUM TECHNICAL STANDARDS. THE CFPUA MINIMUM TECHNICAL STANDARDS ARE CONTAINED IN THE CURRENT DESIGN GUIDANCE MANUAL, MATERIAL SPECIFICATION MANUAL, TECHNICAL SPECIFICATIONS FOR CONSTRUCTION, AND STANDARD DRAWING DETAILS.
- 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 18" INSIDE 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 18" INSIDE RIGHT-OF-WAY LINE.
- ALL SEWER SERVICES CONNECTING INTO DUCTILE IRON MAINS SHALL ALSO BE CONSTRUCTED OF DIP.
- 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 TYPE 316.
- CLEANOUTS SHALL BE LOCATED A MINIMUM OF 6 FEET FROM ALL PROPERTY CORNERS.
- WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.
- UNUSED SERVICES SHALL BE ABANDONED. ABANDONED WATER SERVICES SHALL BE DISCONNECTED FROM MAIN.
- A MINIMUM OF 10' OF MAIN LINE, 5' UPSTREAM AND 5' DOWNSTREAM SHALL BE REPLACED FOR NEW SEWER SERVICE CONNECTIONS TO EXISTING CLAY GRAVITY SEWER MAINS.
- A MINIMUM OF 20' OF MAIN LINE, 10' UPSTREAM AND 10' DOWNSTREAM SHALL BE REPLACED FOR NEW CUT IN MANHOLES ON EXISTING CLAY GRAVITY SEWER MAINS.
- PROVIDE A MINIMUM DISTANCE OF SIX (6) INCHES BETWEEN EDGE OF MANHOLE CORE HOLES AND MANHOLE BARREL JOINTS. PROVIDE A MINIMUM DISTANCE OF SIX (6) INCHES BETWEEN EDGES OF CORE HOLES. CORING THE MANHOLE CONE IS NOT PERMITTED.
- WATER MAIN AND FORCE MAIN PIPE INSTALLED BY OPEN CUT SHALL BE BURIED AT A MINIMUM OF THREE (3) FEET AND A MAXIMUM OF FIVE (5) FEET BELOW FINISHED GRADE. DEPTHS GREATER THAN FIVE (5) FEET MUST BE APPROVED BY CFPUA.
- ALL MANHOLE MAIN LINE AND SERVICE PIPING TO BE INSTALLED AT A MINIMUM OF CROWN TO CROWN OF THE LARGEST DIAMETER PIPE.

DETAIL:
STANDARD NOTES
(REQUIRED ON ALL PLAN AND PROFILE SHEETS)
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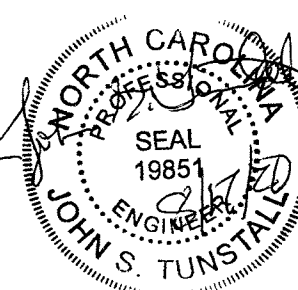
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Licence #C-3641

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WS2