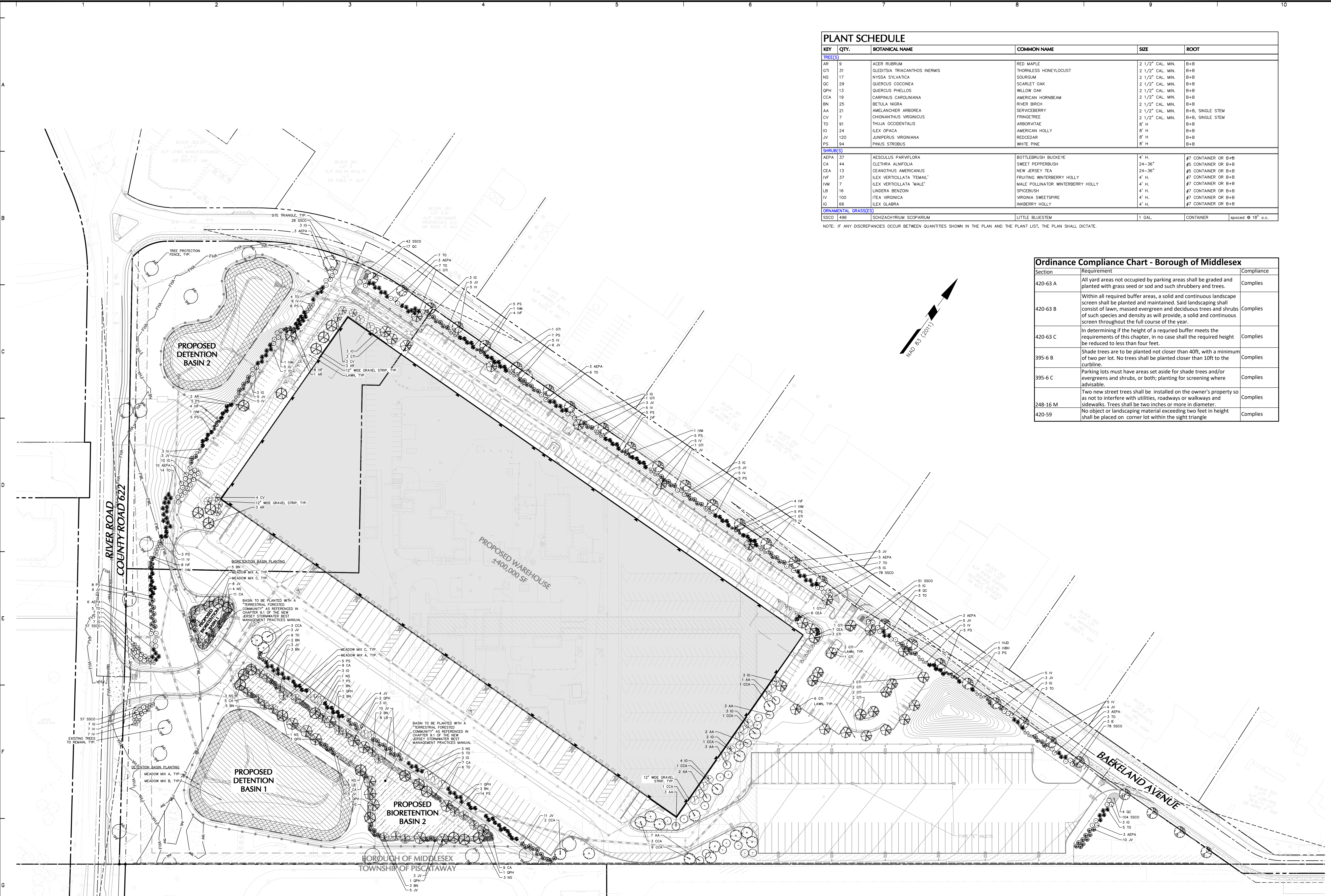



PLANT SCHEDULE					
KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
<b>TREE(S)</b>					
AR	9	ACER RUBRUM	RED MAPLE	2 1/2" CAL. MIN.	B+B
GT	31	GLEDTISIA TRIACANTHOS INERMIS	THORNLESS HONEYLOCUST	2 1/2" CAL. MIN.	B+B
NS	17	NYSSA SILVATICA	SOURGUM	2 1/2" CAL. MIN.	B+B
OC	29	QUERCUS COCCINEA	SCARLET OAK	2 1/2" CAL. MIN.	B+B
QPH	13	QUERCUS PHELLOS	WILLOW OAK	2 1/2" CAL. MIN.	B+B
CCA	19	CARPINUS CAROLINIANA	AMERICAN HORNEBAM	2 1/2" CAL. MIN.	B+B
BN	25	BETULA NIGRA	RIVER BIRCH	2 1/2" CAL. MIN.	B+B
AA	21	AMELANCHIER ARBOREA	SERVICEBERRY	2 1/2" CAL. MIN.	B+B, SINGLE STEM
CV	7	CHIONANTHUS VIRGINICUS	FRINGETREE	2 1/2" CAL. MIN.	B+B, SINGLE STEM
TD	91	THUJA OCCIDENTALIS	ARBORVITAE	8" H	B+B
IO	24	ILEX OPACA	AMERICAN HOLLY	8" H	B+B
JV	120	JUNIPERUS VIRGINIANA	RED CEDAR	8" H	B+B
PS	94	PINUS STROBUS	WHITE PINE	8" H	B+B
<b>SHRUB(S)</b>					
AEPA	37	AESULUS PARVIFLORA	BOTTLEBRUSH BUCKEYE	4" H.	#7 CONTAINER OR B+B
CA	44	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	24-36"	#5 CONTAINER OR B+B
CEA	13	CEANOTHUS AMERICANUS	NEW JERSEY TEA	24-36"	#5 CONTAINER OR B+B
IVF	37	ILEX VERTICILLATA 'EMAIL'	FRUITING WINTERBERRY HOLLY	4" H.	#7 CONTAINER OR B+B
IWM	7	ILEX VERTICILLATA 'MALE'	MALE POLLINATOR WINTERBERRY HOLLY	4" H.	#7 CONTAINER OR B+B
LB	16	LINDERA BENZONI	SPICEBUSH	4" H.	#7 CONTAINER OR B+B
IV	100	ITEA VIRGINICA	VIRGINIA SHEETSPIRE	4" H.	#7 CONTAINER OR B+B
IG	66	ILEX GLABRA	INKBERRY HOLLY	4" H.	#7 CONTAINER OR B+B
<b>ORNAMENTAL GRASS(ES)</b>					
SSCO	496	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	1 GAL.	CONTAINER spaced @ 18" o.c.

NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN QUANTITIES SHOWN IN THE PLAN AND THE PLANT LIST, THE PLAN SHALL DICTATE.

Ordinance Compliance Chart - Borough of Middlesex		
Section	Requirement	Compliance
420-63 A	All yard areas not occupied by parking areas shall be graded and planted with grass seed or sod and such shrubbery and trees.	Complies
420-63 B	Within all required buffer areas, a solid and continuous landscape screen shall be planted and maintained. Said landscaping shall consist of lawn, massed evergreen and deciduous trees and shrubs of such species and density as will provide, a solid and continuous screen throughout the full course of the year.	Complies
420-63 C	In determining if the height of a required buffer meets the requirements of this chapter, in no case shall the required height be reduced to less than four feet.	Complies
395-6 B	Shade trees are to be planted not closer than 40ft, with a minimum of two per lot. No trees shall be planted closer than 10ft to the curbline.	Complies
395-6 C	Parking lots must have areas set aside for shade trees and/or evergreens and shrubs, or both; planting for screening where advisable.	Complies
248-16 M	Two new street trees shall be installed on the owner's property so as not to interfere with utilities, roadways or walkways and sidewalks. Trees shall be two inches or more in diameter.	Complies
420-59	No object or landscaping material exceeding two feet in height shall be placed on corner lot within the sight triangle	Complies



Date	Description	No.
3/27/2020	REVISED FOR BOROUGH, COUNTY, AND NJDEP COMMENTS	3
1/30/2020	REVISED FOR BOROUGH ENGINEER AND NJDEP COMMENTS	2
9/4/19	REVISED FOR FSCD COMMENTS AND PLANNING BOARD SUBMISSION	1


  
 SIGNATURE: JAYNE O. SPECTOR DATE SIGNED: 04/08/2020
   
 PROFESSIONAL LANDSCAPE ARCHITECT
   
 NJ LICENSE No. 21AS00045700

**LANGAN**
  
 Langan Engineering and Environmental Services, Inc.
   
 300 Kimball Drive
   
 Parsippany, NJ 07054
   
 T: 973.560.4900 F: 973.560.4901 www.langan.com
   
 NJ CERTIFICATE OF AUTHORIZATION No. 24624796620

Project: **MIDDLESEX BOROUGH WAREHOUSE PROJECT**
  
 BLOCK No. 353, LOTS No. 1.01 AND 1.02
   
 BOROUGH OF MIDDLESEX
   
 MIDDLESEX COUNTY NEW JERSEY

Drawing Title: **LANDSCAPE PLAN**

Project No. **100594413**
  
 Date: **7/8/2019**
  
 Scale: **1" = 60'**
  
 Drawing No. **LP101**
  
 Drawn By: **YW** Checked By: **JS**
  
 Sheet 12 of 22

## GENERAL LANDSCAPE PLANTING NOTES

1. NAMES OF PLANTS AS DESCRIBED IN THIS PLAN CONFORM TO THOSE IN "STANDARDIZED NURSERY NAMES", 1942 EDITION, PREPARED BY THE AMERICAN JOINT COMMITTEE ON HORTICULTURAL NOMENCLATURE. NAMES OF PLANT VARIETIES NOT INCLUDED THEREIN CONFORM TO NAMES GENERALLY ACCEPTED IN NURSERY TRADE.
2. STANDARDS FOR TREE, SHRUB, HEIGHT, ROOT BALL AND QUALITY OF NEW PLANT MATERIAL SHALL BE IN ACCORDANCE WITH GUIDELINES AS SET FORTH IN THE AMERICAN STANDARDS FOR NURSERY STOCK PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION. PLANT MATERIAL SHALL HAVE NORMAL HABIT OF GROWTH AND BE HEALTHY, VIGOROUS, AND FREE FROM DISEASES AND INSECT INFESTATION.
3. NEW PLANT MATERIAL SHALL BE NURSERY GROWN UNLESS SPECIFIED OTHERWISE. ALL PLANTS SHALL BE SET PLUMED AND SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS THE PLANTS' ORIGINAL GRADE BEFORE DIGGING. PLANT MATERIAL OF THE SAME SPECIES AND SPECIFIED AS THE SAME SIZE SHOULD BE SIMILAR IN SHAPE, COLOR, AND HABIT. THE ARCHITECT HAS THE RIGHT TO REJECT PLANT MATERIAL THAT DOES NOT CONFORM TO THE TYPICAL OR SPECIFIED HABIT OF THAT SPECIES. ALL TREES SHALL HAVE A STRAIGHT MAIN LEADER AND MEET ALL REQUIREMENTS SPECIFIED. ANY TREE THAT LOSES THE MAIN LEADER SHALL BE REPLACED.
4. THE BACKFILL MIXTURE AND SOIL MIXES TO BE INSTALLED PER THE SPECIFICATIONS.
5. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE SITE AND SUBGRADE DRAINAGE OR PERCOLATION CHARACTERISTICS, WHETHER THE SUBGRADE SOILS ARE EXISTING TO REMAIN OR IMPORTED AND PLACED. CONTRACTOR TO ENSURE POSITIVE VERTICAL DRAINAGE THROUGH PLANTED AREAS. DISPERSEANCES SHALL ADDRESS WITH THE PROJECT LANDSCAPE ARCHITECT PRIOR TO PURCHASING PLANT MATERIAL.
6. NO PLANT SHALL BE PUT INTO THE GROUND BEFORE FINISH GRADING HAS BEEN COMPLETED AND APPROVED BY THE PROJECT LANDSCAPE ARCHITECT OR PROJECT ENGINEER.
7. ALL PLANT INSTALLATIONS SHALL BE COMPLETED EITHER BETWEEN APRIL 1 - JUNE 15 OR AUGUST 15 - NOVEMBER 15 UNLESS OTHERWISE DIRECTED BY THE PROJECT LANDSCAPE ARCHITECT. SEE LAWN SEEDING DATES IN SEEDING NOTES.
8. ALL FENCE AND GUARD RAIL INSTALLATIONS SHALL BE COMPLETED PRIOR TO COMMENCEMENT OF ANY LANDSCAPE PLANTING, LAWN SEEDING, OR IRRIGATION WORK.
9. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITY AND SENER LINES AND SHALL AVOID DAMAGE TO ALL UTILITIES DURING THE COURSE OF CONSTRUCTION. NOTES AND OTHER MATERIALS OF RECORD SHALL BE KEPT ON SITE WITH PROPOSED PLANTING LOCATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE.
10. LOCATIONS OF EXISTING BURIED UTILITY LINES SHOWN ON THE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AND ARE TO BE CONSIDERED AS APPROXIMATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR 1) TO VERIFY THE LOCATIONS OF UTILITY LINES AND ADJACENT TO THE WORK AREA 2) TO PROTECT ALL UTILITY LINES DURING THE CONSTRUCTION PERIOD. ANY DAMAGE TO UTILITIES, STRUCTURES, SITE APPURTENANCES, ETC. WHICH OCCURS AS A RESULT OF THE CONSTRUCTION.
11. THE CONTRACTOR SHALL NOT MAKE SUBSTITUTIONS. IF THE SPECIFIED PLANTING MATERIAL IS NOT OBTAINABLE, THE CONTRACTOR SHALL SUBMIT PROOF OF NON-AVAILABILITY TO THE LANDSCAPE ARCHITECT AND OWNER, TOGETHER WITH A WRITTEN PROPOSAL FOR USE OF AN EQUIVALENT MATERIAL. APPROVED EQUIVALENT MATERIALS SHALL BE IDENTIFIED ON THE PLANS.
12. LANDSCAPE CONTRACTOR TO STAKE OUT PLANTING LOCATIONS, FOR REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT AND/OR OWNER BEFORE PLANTING WORK BEGINS. THE LANDSCAPE ARCHITECT AND/OR OWNER SHALL DIRECT THE CONTRACTOR IN THE FINAL PLACEMENT OF PLANT MATERIAL AND LOCATION OF PLANTING BEDS TO ENSURE COMPLIANCE WITH DESIGN INTENT UNLESS OTHERWISE INSTRUCTED.
13. ALL MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT BEFORE DURING AND AFTER INSTALLATION. THE LANDSCAPE ARCHITECT MAY REVIEW PLANT MATERIALS AT THE SITE FOR COMPLIANCE WITH THE SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LANDSCAPE ARCHITECT RETAINING THE RIGHT TO FURTHER REVIEW PLANT MATERIALS FOR SIZE AND CONDITION OF BALLS AND ROOT SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LANDSCAPE ARCHITECT IDENTIFYING DEFECTIVE MATERIAL AT ANY TIME DURING PROGRESS OF WORK. THE CONTRACTOR SHALL REMOVE DEFECTIVE PLANT MATERIALS IMMEDIATELY FROM PROJECT SITE AS DIRECTED BY THE LANDSCAPE ARCHITECT OR OWNER.
14. ALL PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, AND FREE OF PESTS AND DISEASE. ANY PLANT MATERIAL WHICH IS DISEASED, 25% OR MORE DEAD, WHICH DOES NOT DEVELOP FROM PLANTING STOCK, THAT APPEAR UNHEALTHY OR UNSIGHTLY AND/OR HAVE LOST THEIR NATURAL SHAPE DUE TO DEAD BRANCHES DEAD, OR OTHERWISE UNDESIRABLE FOR ANY REASON (PENDING COMPLETION) SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUANTITY, AND SIZE AND MEETING THE SPECIFICATIONS.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY SCHEDULE AND PROTECTION BETWEEN DELIVERY AND PLANTING PER SPECIFICATIONS TO MAINTAIN HEALTHY PLANT CONDITIONS.
16. DELIVERY, STORAGE, AND HANDLING  
A. PACKAGED MATERIALS SHALL BE DELIVERED IN CONTAINERS SHOWING HEIGHT, ANALYSIS, AND NAME OF MANUFACTURER. MATERIALS SHALL BE PROTECTED FROM DETRIORATION DURING DELIVERY AND WHILE STORED.  
B. TREES AND SHRUBS - THE CONTRACTOR SHALL PROVIDE TREES AND SHRUBS DUG FOR THE GROWING SEASON FOR WHICH THEY WILL BE PLANTED, DO NOT PLANT PRIOR TO DELIVERY UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE ARCHITECT. DO NOT BIND OR BRACE TREES OR SHRUBS IN SUCH A MANNER AS TO DAMAGE BARK, BREAK BRANCHES, OR DESTROY NATURAL SHAPE. PROVIDE PROTECTIVE COVERING DURING TRANSPORT. DO NOT DRIP BALLED AND BURGLAPPED STOCK DURING DELIVERY OR HANDLING.  
C. ALL PLANTS SHALL BE BALLED AND BURGLAPPED OR CONTAINER GROWN AS SPECIFIED. NO CONTAINER GROWN STOCK WILL BE ACCEPTED IF IT IS ROOT BOUND. ALL ROOTBALL WRAPPING AND BRACING MATERIAL MADE OF SYNTHETIC OR FOLDED SHALL BE REMOVED FROM THE TOP OF THE BALL AT THE TIME OF PLANTING. IF THE PLANT IS SHIPPED WITH A WIRE BASKET AROUND THE ROOT BALL, THE WIRE BASKET SHALL BE CUT AND PLASTICED 8 INCHES INTO THE PLANTING HOLE, WITH CONTAINER GROWN STOCK, THE CONTAINER SHALL BE REMOVED AND THE ROOT BALL SHALL BE CUT THROUGH THE SURFACE IN TWO LOCATIONS.  
D. THE CONTRACTOR SHALL HAVE TREES AND SHRUBS DELIVERED TO SITE AFTER PREPARATIONS FOR PLANTING HAVE BEEN COMPLETED AND PLANTING IS DELAYED MORE THAN 48 HOURS AFTER DELIVERY, THE CONTRACTOR SHALL SET TREES AND SHRUBS IN SHADE, PROTECT FROM WEATHER AND MECHANICAL DAMAGE, AND COVER WITH MULCH, BURLAP OR OTHER ACCEPTABLE MEANS OF RETAINING MOISTURE.

17. ALL LANDSCAPE AREAS TO BE CLEARED OF ROOTS, STUMPS, TRASH AND OTHER UNSIGHTLY DEBRIS. ALL FINE GRASS AREAS SHOULD BE HAND RAKED, STUMP ELIMINATING AND UNCLEAN SURFACES PREPARED PRIOR TO PLANTING OR MULCHING.
18. ALL PLANT MATERIAL SHALL BE INSTALLED AS PER DETAILS, NOTES AND CONTRACT SPECIFICATIONS. THE LANDSCAPE ARCHITECT MAY REVERSE INSTALLATION AND MAINTENANCE PROCEDURES.
19. CONTRACTOR'S GUARANTEE: ALL PLANTINGS AND PLANTING AREAS SHALL BE PERMANENTLY MAINTAINED. NEW PLANT MATERIAL SHALL BE GUARANTEED TO BE ALIVE AND IN VIGOROUS GROWING CONDITION FOR A PERIOD OF TWO YEARS FOLLOWING ACCEPTANCE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FULL MAINTAINING (INCLUDING BUT NOT LIMITED TO: WATERING, PRUNING, SPRAYING, MULCHING, FERTILIZING, ETC.) ALL OF THE PLANT MATERIALS AND LAWN FOR THE DURATION OF THE GUARANTEED PERIOD. PLANT MATERIAL FOUND TO BE UNHEALTHY, DYING OR DEAD DURING THIS PERIOD, SHALL BE REMOVED AND REPLACED IN KIND BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
20. THE CONTRACTOR SHALL KEEP AREA CLEAN DURING DELIVERY AND INSTALLATION OF PLANT MATERIALS. REMOVE AND DISPOSE OF OFF-SITE ANY ACCUMULATED DEBRIS OR UNUSED MATERIALS. REPAIR DAMAGE TO ADJACENT AREAS CAUSED BY LANDSCAPE INSTALLATION OPERATIONS.
21. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 2-4 HOUR PERIOD AFTER PLANTING. PLANTS SHALL BE WATERED HEAVILY AS REQUIRED BY SITE AND WEATHER CONDITIONS TO MAINTAIN MOISTURE AND PLANT GROWTH.
22. AFTER PLANT IS PLACED IN TREE PIT LOCATION, ALL THREE HOLDING ROOT BALL TOGETHER SHOULD BE COMPLETELY REMOVED AND THE BURLAP SHOULD BE PULLED DOWN 1/3 THE ROOT BALL IS EXPOSED. SYNTHETIC BURLAP SHOULD BE COMPLETELY REMOVED AND PLASTICED 8 INCHES INTO PLANTING HOLE.
23. ALL TREES MUST BE CUTTED OR STAKED AS SHOWN IN THE DETAILS. ALL TREE WRAP AND ANCHORING SHALL BE REMOVED AFTER ONE YEAR FROM DATE OF INSTALLATION. AFTER THE FIRST GROWING SEASON, WHICHEVER IS SOONER, ALL STRAPS/ANCHORING SHOULD ALLOW THE TREE TRUNK TO MOVE 2-3" BEFORE CATCHING SO PROPER TRUNK TAPER CAN BE ESTABLISHED.
24. ALL EXPOSED BOUND SURFACES THAT ARE NOT COVERED WITHIN THE CONTRACT LIMIT LINE, AND THAT ARE NOT COVERED BY LANDSCAPE PLANTING OR SEEDING AS SPECIFIED, SHALL BE COVERED BY A NATURAL MULCH PERMANENTLY MAINTAINED IN A SUSTAINABLE MANNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND THE EMANATION OF DUST. MULCH SHALL BE A FIBROUS SHREDED HARDWOOD MULCH. MULCH SHOULD NOT BE PLACED ON TOP OF PLANT MATERIAL. NO MULCH OR TOPSOIL SHOULD BE TOUCHING THE BASE OF THE TRUNK ABOVE THE ROOT COLLAR.
25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON THESE PLANS BEFORE BEGINNING THE WORK. FOR ANY DISCREPANCIES BETWEEN THE PLANT SCHEDULE AND PLANTING PLAN THE GRAPHIC QUANTITY SHOWN SHALL GOVERN.

26. LANDSCAPE PUNCH LIST SITE VISITS TO BE PERFORMED BY THE PROJECT LANDSCAPE ARCHITECT, IF UNDER CONTRACT FOR SUCH WORK, WILL NOT BE SCHEDULED UNTIL COMPLETION IS REACHED THAT ALL PROPOSED LANDSCAPE ITEMS HAVE BEEN INSTALLED, OR DEFICIENCIES NOTED IN THE PUNCH LIST REPORT HAVE BEEN CORRECTED. THE PUNCH LIST SITE VISIT WILL BE PERFORMED WITHIN 10 BUSINESS DAYS.

## LANDSCAPE MAINTENANCE NOTES

1. MAINTENANCE OPERATIONS BEFORE APPROVAL:
  - A. PLANT CARE SHALL BEGON IMMEDIATELY AFTER EACH PLANT IS SATISFACTORILY INSTALLED AND SHALL CONTINUE THROUGHOUT THE LIFE OF THE CONTRACT UNTIL FINAL ACCEPTANCE OF THE PROJECT.
  - B. CARE SHALL INCLUDE, BUT NOT BE LIMITED TO, REPLACING MULCH THAT HAS BEEN DISPLACED BY EROSION OR OTHER MEANS, REPAIRING AND RESPARING WATER RINKS OR SAUCERS, MAINTAINING STAKES AND DIVES AS ORIGINALLY INSTALLED, WATERING WHEN NEEDED OR DIRECTED, AND PERFORMING ANY OTHER WORK REQUIRED TO KEEP THE PLANTS IN A HEALTHY CONDITION.
  - C. CONTRACTOR SHALL REMOVE AND REPLACE ALL DEAD, DEFECTIVE AND/OR REJECTED PLANTS AS REQUIRED BEFORE FINAL ACCEPTANCE.
2. MAINTENANCE DURING CONSTRUCTION:
  - A. MAINTENANCE SHALL BEGON IMMEDIATELY AFTER PLANTING. PLANTS SHALL BE WATERED, MULCHED, WEEDED, PRUNED, SPRAYED, FERTILIZED, CULTIVATED, AND OTHERWISE MAINTAINED AND PROTECTED UNTIL PROVISIONAL ACCEPTANCE. SETTLING PLANTS SHALL BE RESET TO PROPER GRADE AND POSITION, PLANTING SAUCER RESTORED AND DEAD MATERIAL REMOVED. STAKES AND WRAPS SHALL BE TIGHTENED AND REPAIRED. DEFECTIVE PLANTS SHALL BE CORRECTED AS SOON AS POSSIBLE AFTER IT BECOMES APPARENT AND WEATHER AND SEASON PERMIT.
  - B. IF A SUBSTANTIAL NUMBER OF PLANTS ARE SICKLY OR DEAD AT THE TIME OF INSPECTION, ACCEPTANCE SHALL NOT BE GRANTED AND THE CONTRACTOR'S RESPONSIBILITY FOR MAINTENANCE OF ALL PLANTS SHALL BE EXTENDED FROM THE TIME REPLACEMENTS ARE MADE OR EXISTING PLANTS ARE SEEMED ACCEPTABLE BY THE LANDSCAPE ARCHITECT.
  - C. ALL REPLACEMENTS SHALL BE PLANTS OF THE SAME KIND AND SIZE SPECIFIED ON THE PLANT LIST OR THAT WHICH WAS TO REMAIN OR BE RELOCATED. THEY SHALL BE FURNISHED AND PLANTED AS SPECIFIED. THE COST SHALL BE BORNE BY THE CONTRACTOR. REPLACEMENTS RESULTING FROM REMOVAL, LOSS, OR DAMAGE DUE TO OCCUPANCY OF THE PROJECT IN ANY PART, VANDALISM, PHYSICAL DAMAGE BY ANIMALS, VEHICLES, ETC. AND LOSSES DUE TO CONTAMINATION OF WATER BY LOCAL AUTHORITIES SHALL BE APPROVED AND PAID FOR BY THE OWNER.
  - D. PLANTS SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR AFTER INSPECTION AND PROVISIONAL ACCEPTANCE.
  - E. AT THE END OF THE ESTABLISHMENT PERIOD, INSPECTION SHALL BE MADE AGAIN. ANY PLANT REQUIRED UNDER THIS CONTRACT THAT IS DEAD OR UNSATISFACTORY TO THE LANDSCAPE ARCHITECT OR OWNER SHALL BE REMOVED FROM THE SITE AND REPLACED DURING THE NORMAL PLANTING SEASON.
3. LAWN MAINTENANCE:
  - A. BEGON MAINTENANCE IMMEDIATELY AFTER EACH PORTION OF LAWN IS PLANTED AND CONTINUE FOR 8 WEEKS AFTER ALL LAWN PLANTING IS COMPLETED.
  - B. WATER TO KEEP SURFACE SOIL MOIST, REPAIR WASHED OUT AREAS BY FILLING WITH TOPSOIL, LIMING, FERTILIZING AND RE-SEEDING. MOW TO 2 - 3 INCHES AFTER GRASS REACHES 3 1/2 TO 4 INCHES IN HEIGHT, AND MOW FREQUENTLY ENOUGH TO KEEP GRASS FROM EXCEEDING 3 1/2 INCHES. NEED BY LOCAL SPOT APPLICATION OF SELECTIVE HERBICIDE ONLY AFTER GRASS IS WELL-ESTABLISHED.

## PLANTING BED PREPARATION

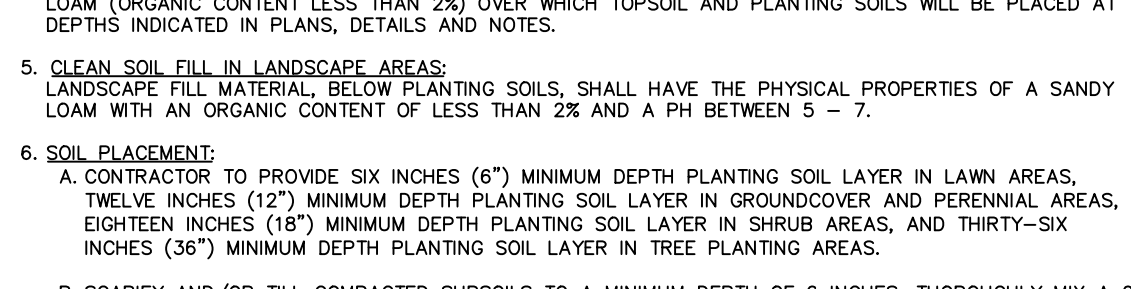
DUE TO COMPACTION REQUIREMENTS FOR PREVIOUSLY PAVED AREAS, SUBGRADE SOILS WITHIN PROPOSED PLANTING AREAS SHALL BE REMOVED TO 48 INCHES BELOW GRADE AND BACKFILLED WITH PLANTING SOIL. IN ORDER TO CREATE A HEALTHY GROWTH MEDIUM TO ALLOW PROPOSED PLANTINGS TO ESTABLISH A VIGOROUS ROOT MASS. IN ADDITION, PLANTING SOILS SHALL BE MIXED WITH SUBGRADE SOILS WHERE THEY MEET IN ORDER TO CREATE A TRANSITIONAL GRADIENT TO ALLOW FOR PROPER DRAINAGE. SUBGRADE WITHIN 2'-6" OF FINISH GRADE IN PLANTING AREAS SHALL CONSIST OF FINE DRAINING SANDY SOIL FILL.

## PLANTING SOIL SPECIFICATIONS

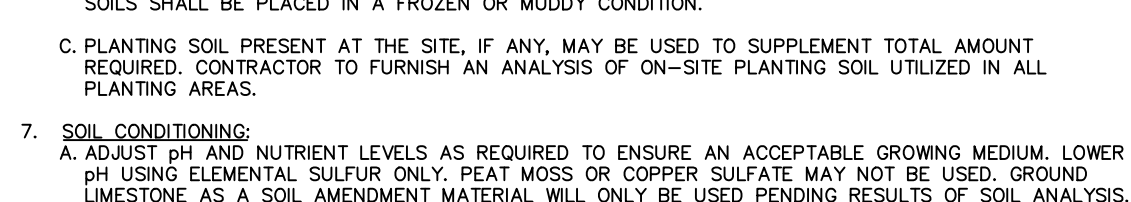
1. PLANTING SOIL, ALTERNATIVELY MAY BE REFERRED TO AS TOPSOIL, SHOULD BE FRABLE, FERTILE, WELL DRAINED, FREE OF DEBRIS, STONES, TRASH AND STONES OVER 1/2" DIA. IT SHOULD HAVE A HIGH ORGANIC CONTENT SUITABLE TO SUSTAIN HEALTHY PLANT GROWTH AND SHOULD LOCK UP NITROGEN AND PHOSPHORUS HAVING NO NOXIOUS ODORS.
2. EXISTING SOIL:
  - A. REUSE SURFACE SOIL STOCKPILED ON SITE, VERIFYING COMPLIANCE WITH PLANTING SOIL AND TOPSOIL CRITERIA IN THIS SPECIFICATION THROUGH TESTING. CLEAN SURFACE SOIL OF ALL ROOTS, PLANTS, SOIL AND GRAVEL OVER 1/2" DIA. AND OTHER UNDESIRABLE MATERIALS. ON-SITE SOILS ARE TO BE USED FOR PROPOSED PLANTING. THE CONTRACTOR SHALL MONITOR THROUGHOUT SOIL TESTING THAT ON-SITE SOILS MEET THE SAME CRITERIA AS INDICATED IN NOTES PLANTS AND SPECIFICATIONS.
  - B. SUPPLEMENT WITH IMPORTED OR MANUFACTURED TOPSOIL FROM OFF-SITE SOURCES WHEN TOPSOIL AND PLANTING SOIL QUANTITIES ARE INSUFFICIENT. OBTAIN SOIL DISPLACED FROM NATURALLY WELL-DRAINED SITES WHERE TOPSOIL OCCURS AT LEAST 4" DEEP. DO NOT OBTAIN FROM AGRICULTURAL LAND, BOGS, MARSHES OR CONTAMINATED SITES.
  - C. CONTRACTOR SHALL TEST SOILS AND FURNISH SAMPLES UPON REQUEST. PACKAGED MATERIALS SHALL BE UNOPENED BAGS OR CONTAINERS EACH BEARING A NAME, GUARANTEE, AND TRADEMARK OF THE PRODUCER. MATERIAL COMPOSITION, MANUFACTURER'S CERTIFIED ANALYSIS, AND THE WEIGHT OF THE MATERIALS SOIL OR AMENDMENT MATERIALS SHALL BE STATED ON SITE TEMPORALY IN STOCKPILES PRIOR TO PLACEMENT AND SHALL BE PROTECTED FROM INFILTRATION OF CONTAMINANTS AND EROSION. AFTER MIXING, MATERIALS SHALL BE COVERED WITH A TARP UNTIL THE NEXT ACTUAL USE.
  - D. ALL PLANTING SOILS SHALL BE SUBMITTED FOR TESTING TO THE STATE COOPERATIVE EXTENSION SERVICE OR APPROVED EQUIVALENT PRIOR TO DELIVERY TO THE SITE. CONTRACTOR SHALL FURNISH SOIL SAMPLES AND SOIL TEST RESULTS TO LANDSCAPE ARCHITECT FOR REVIEW. IF TESTING AGENCY SPECIFICS THAT THE SOILS ARE DEFICIENT IN ANY MANNER AND MAY BE CORRECTED BY ADDING AMENDMENTS, THE CONTRACTOR SHALL FOLLOW WRITTEN RECOMMENDATIONS FOR SOIL IMPROVEMENT AND FURNISH SUBMITTALS FOR ALL AMENDMENTS PRIOR TO DELIVERY OF SOIL TO THE PROJECT SITE.

- A. THE FOLLOWING TESTING SHOULD BE PERFORMED AND RESULTS GIVEN TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO PLANTING:
  - a. PARTICULATE SIZE ANALYSIS - LOAMY SAND: 60-75% SAND, 25-40% SILT, AND 5-15% CLAY.
  - b. PHOSPHATE ANALYSIS - PH (4.5-5.5), SOLUBLE SALTS (LESS THAN 2 MM/NO./DIA), NITRATE, AND AMMONIUM BY NON-MECHANICAL METHODS, PROTECTING ROOT MASS AGAINST DAMAGE.
  - c. TOXIC SUBSTANCE ANALYSIS
  - d. MATERIAL DRAINAGE: 100% PASSING IN 3 MINUTES, 40% RETAINED
  - f. NOT MORE THAN 1% OF MATERIAL SHALL BE RETAINED BY A # 10 SIEVE
3. SOIL AMENDMENT FOR PLANT MATERIAL:
  - a. IF SOIL QUALITY CRITERIA IN THIS SPECIFICATION ARE NOT MET, SOIL SHALL BE AMENDED WITH COMPOST OR ORGANIC WEEF. FRESH ORGANIC MATTER, ORGANIC AMENDMENT SHALL BE WELL COMPOSTED, PH RANGE OF 6-8, MOISTURE CONTENT 30-50% BY WEIGHT, 100% PASSING THROUGH 1" SIEVE, SOLUBLE SALT CONTENT LESS THAN 0.5 MM HOS/CM MEETING ALL APPLICABLE ENVIRONMENTAL CRITERIA FOR CLEAN FILL.
  - b. ORGANIC MATTER AS A SOIL AMENDMENT: LEAF MOULD WITH 60-80% ORGANIC CONTENT BY WEIGHT, SHREDED LEAF LITTER FOR A MINIMUM OF 1-YR. SHOULD BE FREE OF DEBRIS, STONES OVER 1/2", WOOD CHIPS OVER 1".
  - c. SOIL IN BEDS AND PLANTING ISLANDS OTHER THAN BACKFILL MATERIAL AND TOPSOIL, SHOULD BE FRABLE, WELL DRAINED, AND FREE OF DEBRIS, INCLUDING STONES AND TRASH.
  - d. AMENDMENTS FOR BACK FILL IN TREE AND SHRUB TITS:
    - a. GROUND LIMESTONE (WITH A MIN. OF 88% OF CALCIUM AND MAGNESIUM CARBONATES) USED - BRING PH LEVELS TO 6.5 MIN. TO 6.5 FOR NON-ERIGACIOUS PLANTS
    - b. TERESA-SORS BY "PLANT HEALTH CARE" 800-421-9051 (SEE MANUFACTURER RECOMMENDATIONS) USED IN PLANTER BACKFILL MIXTURE WITH TREES AND SHRUBS.
    - c. MYCOR-RHIZO SAKER BY "PLANT HEALTH CARE" 800-421-9051 (SEE MANUFACTURER RECOMMENDATIONS) USED IN BACKFILL MIXTURE WITH TREES.
4. WHERE PLANTING AREAS ARE PROPOSED FOR FORMER PAVED OR GRAVEL AREAS, BEDS SHALL BE EXCAVATED TO A MINIMUM 30" DEPTH AND A 1" MINIMUM BE BACKFILLED WITH BOTTOM LAYER OF SANDY LOAM ORGANIC CONTENT LESS THAN 2% OVER WHICH TOPSOIL AND PLANTING SOILS WILL BE PLACED AT DEPTHS INDICATED IN PLANS, DETAILS AND NOTES.
5. CLEAN SOIL FILL IN LANDSCAPE AREAS:
  - a. LANDSCAPE FILL MATERIAL BELOW PLANTING SOILS SHALL HAVE THE PHYSICAL PROPERTIES OF A SANDY CLAY WITH AN ORGANIC CONTENT OF LESS THAN 2% AND A PH BETWEEN 5 - 7.
6. SOIL PLACEMENT:
  - a. CONTRACTOR TO PROVIDE SIX INCHES (6") MINIMUM DEPTH PLANTING SOIL LAYER IN LAWN AREAS, TWELVE INCHES (12") MINIMUM DEPTH PLANTING SOIL LAYER IN GROUNDCOVER AND PERENNIAL AREAS, EIGHTEEN INCHES (18") MINIMUM DEPTH PLANTING SOIL LAYER IN SHRUB AREAS, AND THIRTY-SIX INCHES (36") MINIMUM DEPTH PLANTING SOIL LAYER IN TREE PLANTING AREAS.
  - b. SCARPING AND/OR TILL COMPACTED SUBSOILS TO A MINIMUM DEPTH OF 6" INCHES, THROUGHOUT MIX A 6 INCH DEPTH LAYER OF PLANTING SOIL INTO THE SUBSOIL PRIOR TO PLANTING. PRIOR TO PLANTING, THE DEPTHS INDICATED ABOVE, PLANTING SOIL SHALL BE PLACED IN 12-18" LIFTS AND WATER THOROUGHLY BEFORE INSTALLING NEXT LIFT. REPEAT UNTIL DEPTHS AND FINISH GRADING HAVE BEEN ACHIEVED. NO SOILS SHALL BE PLACED IN A FROZEN OR MOIST CONDITION.

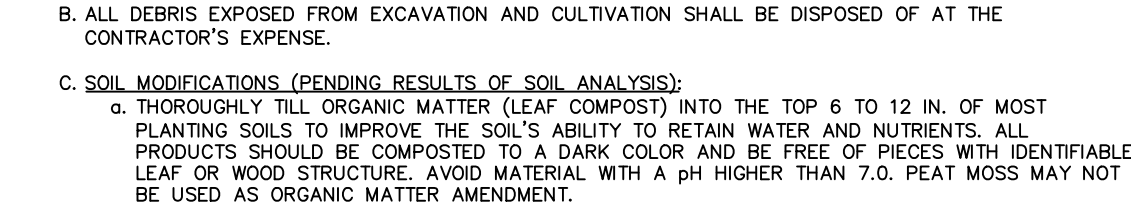
## 1 PLANTING SOIL



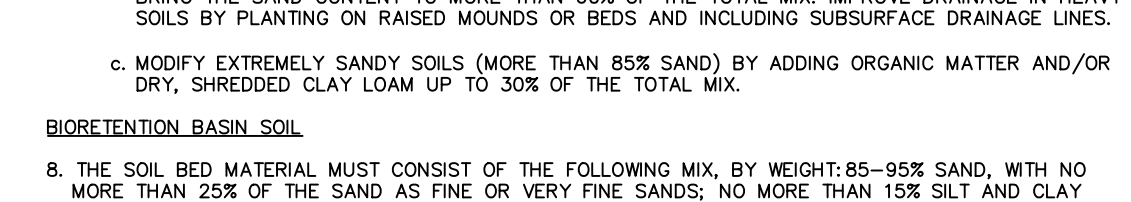
## 2 SHRUB PLANTING



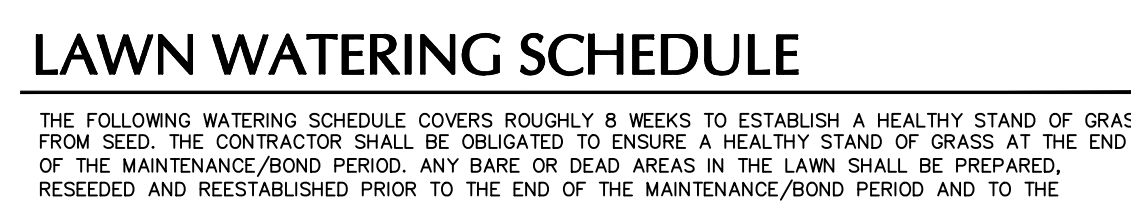
## 3 GROUND COVER/PERENNIAL PLANTING



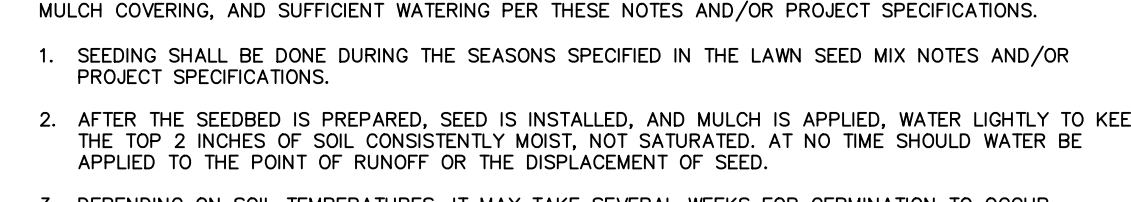
## 4 GRAVEL STRIP



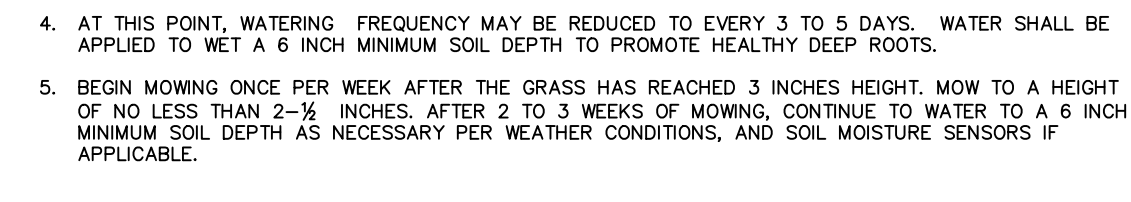
## 5 PARKING ISLAND PLANTING



## 6 BIORETENTION BASIN CROSS SECTION



## 7 DECIDUOUS TREE PLANTING



## 8 EVERGREEN TREE PLANTING



## 9 TREE PROTECTION FENCE

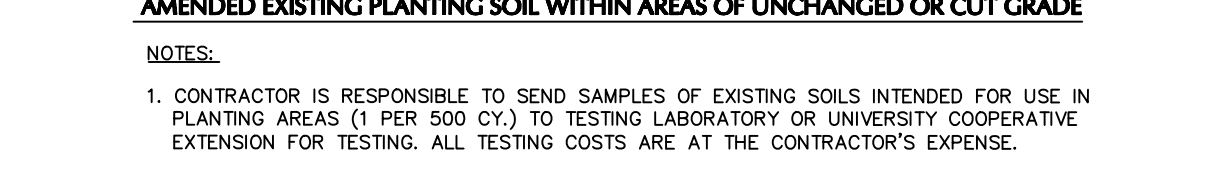


## GENERAL NOTES

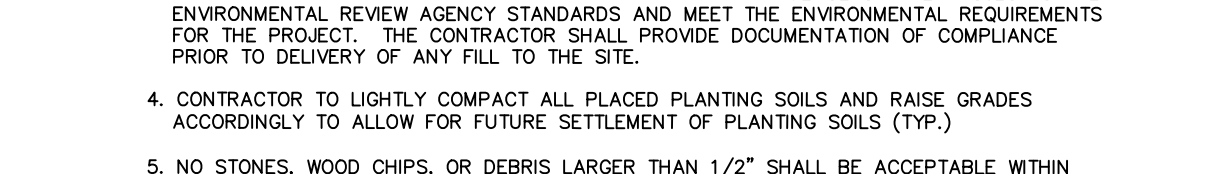
1. DUE TO GENERAL CONSTRUCTION ACTIVITIES AND ADJACENT SITE COMPACTION REQUIREMENTS, SUBGRADE SOILS WITHIN PROPOSED PLANTING AREAS SHOULD BE REMOVED AND REPLACED WITH PLANTING SOIL. IN ORDER TO CREATE A HEALTHY GROWTH MEDIUM TO ALLOW PROPOSED PLANTINGS TO ESTABLISH A VIGOROUS ROOT MASS, THIS SUBGRADE SOIL MUST UNDERGO A RESTORATION PROCESS. IN ADDITION, IMPORTED OR AMENDED EXISTING SOILS SHALL BE MIXED WITH SUBGRADE SOILS WHERE THEY MEET IN ORDER TO CREATE A TRANSITIONAL GRADIENT TO ALLOW FOR PROPER DRAINAGE.
2. REMOVE ALL TREE, ROPE AND WIRE, AND BURLAP FROM TOP HALF OF ROOT BALL AND ALL NON-BIODEGRADABLE MATERIAL. IF PLANT IS SHIPPED WITH A WIRE BASKET AROUND THE ROOT BALL, CUT THE WIRE BASKET IN FOUR PLACES AND FOLD DOWN 6" INTO PLANTING HOLE.
3. 3" MULCH LAYER, KEEP MULCH AWAY FROM SHRUB BASE AND TOP OF ROOTBALL (TYP.).
4. 4" HIGH EARTH SAUCER BEYOND EDGE OF ROOT BALL TO DIRECT WATER INTO ROOTBALL (TYP.).
5. REMOVE PLASTIC CONTAINER.
6. PLANTING SOIL AS SPECIFIED.
7. TAMP SOIL AROUND ROOT BALL BASE FIRMLY WITH FOOT PRESSURE SO THAT ROOT BALL DOES NOT SHIFT (TYP.).
8. SET ROOT BALL ON UNEXCAVATED OR TAMPED SOIL.
9. COMPACTED SUBGRADE.
10. UNDISTURBED SUBGRADE.

1. ALL SHRUBS TO BE SET PLUMED.
2. REFER TO LANDSCAPE PLAN FOR SPACING OF INDIVIDUAL PLANTS.
3. REMOVE ALL WIRE, PLASTIC, TAGS OR SYNTHETIC MATERIAL FROM PLANTS PRIOR TO PLANTING.

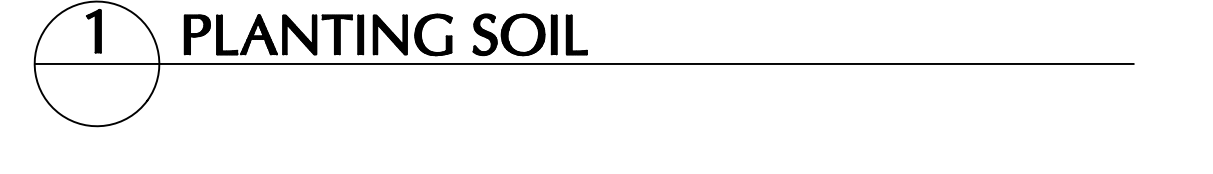
## 1 PLANTING SOIL



## 2 SHRUB PLANTING



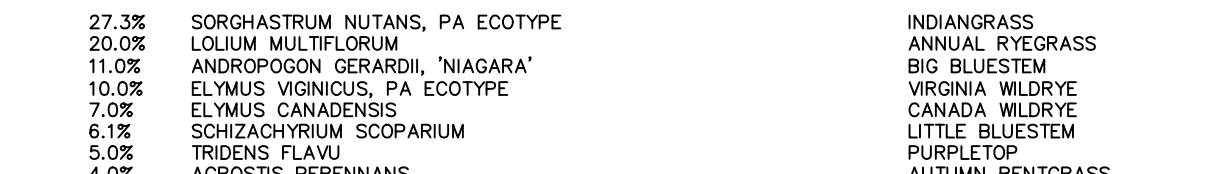
## 3 GROUND COVER/PERENNIAL PLANTING



## 4 GRAVEL STRIP



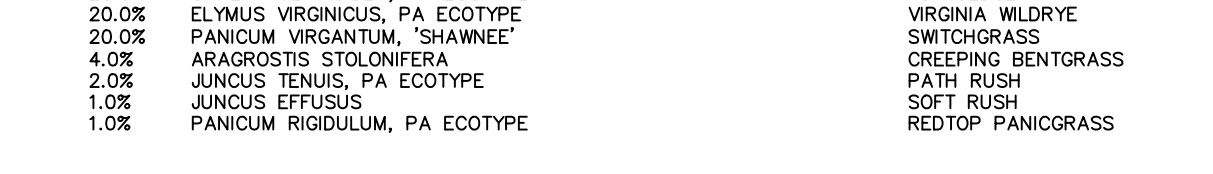
## 5 PARKING ISLAND PLANTING



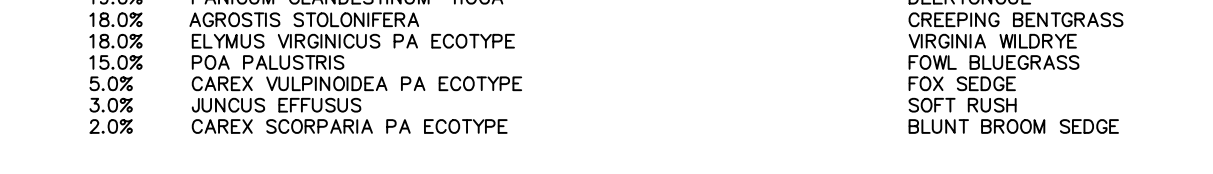
## 6 BIORETENTION BASIN CROSS SECTION



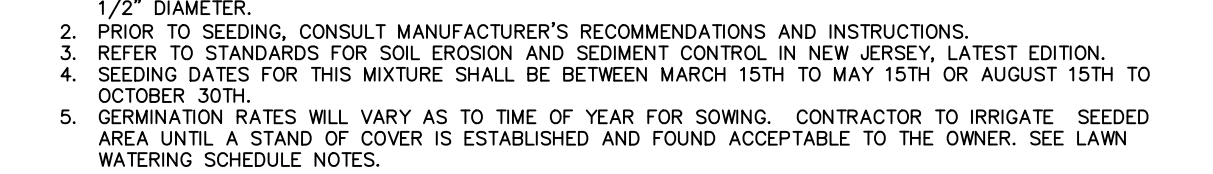
## 7 DECIDUOUS TREE PLANTING



## 8 EVERGREEN TREE PLANTING



## 9 TREE PROTECTION FENCE



## GENERAL NOTES

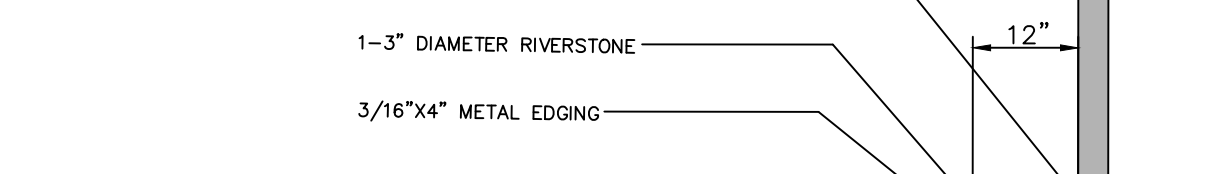
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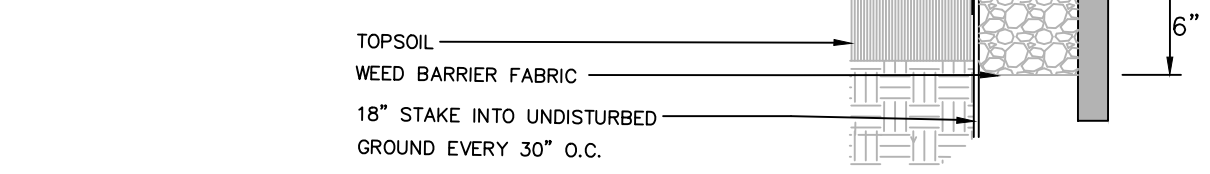
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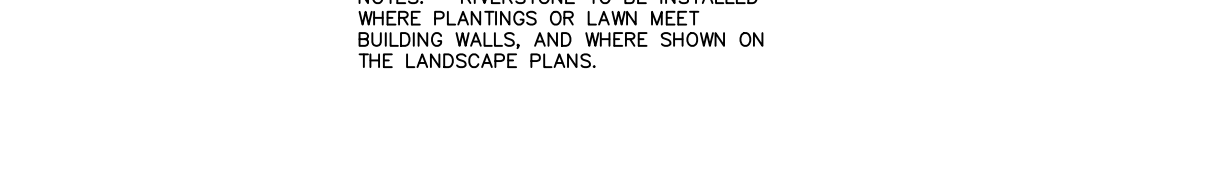
## 2 SHRUB PLANTING



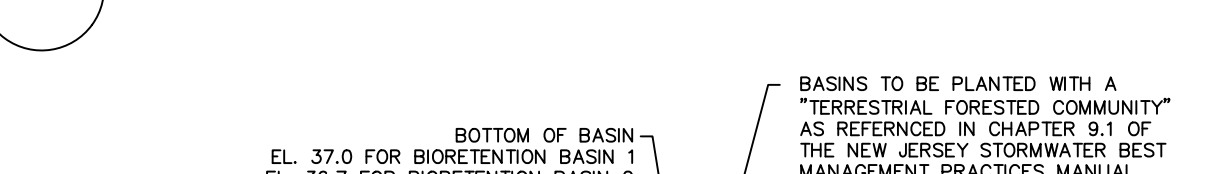
## 3 GROUND COVER/PERENNIAL PLANTING



## 4 GRAVEL STRIP



## 5 PARKING ISLAND PLANTING



**SITE LIGHTING SCHEDULE**

SYMBOL	KEY	QTY.	FIXTURE MANUFACTURER	FIXTURE MODEL	FIXTURE DESCRIPTION	FIXTURE MOUNTING HEIGHT	LAMP	OPTICS	LUMENS	LLF	TILT ANGLE	ORIENTATION	IES FILE	FIXTURE CATALOGUE NO.	POLE MANUFACTURER	POLE DESCRIPTION	POLE LENGTH	POLE CATALOGUE NO.
A	3	EATON - MCGRAW-EDISON	GLEON GALLEON LED	POLE MOUNTED SINGLE AREA LIGHT FIXTURE, COLOR - BLACK	25'	279W LED	TYPE II WITH SPILL CONTROL		29,813	0.90	0°	0°	GLEON-AF-05-LED-E1-SL2-HSS-IES	GLEON-AF-05-LED-VOLTS-SL2-BK-HSS	UNITED LIGHTING STANDARDS	SQUARE STRAIGHT STEEL	22'	RPSQ-25-4-11 (FACTORY CUT TO 22')
B	5	EATON - MCGRAW-EDISON	GLEON GALLEON LED	POLE MOUNTED SINGLE AREA LIGHT FIXTURE, COLOR - BLACK	25'	279W LED	TYPE III WITH SPILL CONTROL		30,436	0.90	0°	0°	GLEON-AF-05-LED-E1-SL3-HSS-IES	GLEON-AF-05-LED-VOLTS-SL3-BK-HSS	UNITED LIGHTING STANDARDS	SQUARE STRAIGHT STEEL	22'	RPSQ-25-4-11 (FACTORY CUT TO 22')
C	16	EATON - MCGRAW-EDISON	GLEON GALLEON LED	POLE MOUNTED SINGLE AREA LIGHT FIXTURE, COLOR - BLACK	25'	279W LED	TYPE IV WITH SPILL CONTROL		28,918	0.90	0°	0°	GLEON-AF-05-LED-E1-SL4-HSS-IES	GLEON-AF-05-LED-VOLTS-SL4-BK-HSS	UNITED LIGHTING STANDARDS	SQUARE STRAIGHT STEEL	22'	RPSQ-25-4-11 (FACTORY CUT TO 22')
D	7	EATON - MCGRAW-EDISON	GLEON GALLEON LED	POLE MOUNTED SINGLE AREA LIGHT FIXTURE, COLOR - BLACK	25'	333W LED	TYPE IV WITH SPILL CONTROL		34,605	0.90	0°	0°	GLEON-AF-06-LED-E1-SL4-HSS-IES	GLEON-AF-06-LED-VOLTS-SL4-BK-HSS	UNITED LIGHTING STANDARDS	SQUARE STRAIGHT STEEL	22'	RPSQ-25-4-11 (FACTORY CUT TO 22')
E	6	EATON - MCGRAW-EDISON	GLEON GALLEON LED	POLE MOUNTED SINGLE AREA LIGHT FIXTURE, COLOR - BLACK	25'	391W LED	TYPE IV WITH SPILL CONTROL		40,924	0.90	0°	0°	GLEON-AF-07-LED-E1-SL4-HSS-IES	GLEON-AF-07-LED-VOLTS-SL4-BK-HSS	UNITED LIGHTING STANDARDS	SQUARE STRAIGHT STEEL	22'	RPSQ-25-4-11 (FACTORY CUT TO 22')
F	11	EATON - MCGRAW-EDISON	GLEON GALLEON LED	WALL MOUNTED SINGLE AREA LIGHT FIXTURE, COLOR - BLACK	25' ABOVE FFE	575W LED	TYPE IV WITH SPILL CONTROL		56,743	0.90	0°	0°	GLEON-AF-09-LED-E1-SL4-HSS-IES	GLEON-AF-09-LED-VOLTS-SL4-BK-HSS	N.A.	N.A.	N.A.	N.A.
G	6	EATON - MCGRAW-EDISON	GLEON GALLEON LED	POLE MOUNTED SINGLE AREA LIGHT FIXTURE, COLOR - BLACK	25'	511W LED	TYPE IV WITH SPILL CONTROL		50,868	0.90	0°	0°	GLEON-AF-08-LED-E1-SL4-HSS-IES	GLEON-AF-08-LED-VOLTS-SL4-BK-HSS	UNITED LIGHTING STANDARDS	SQUARE STRAIGHT STEEL	22'	RPSQ-25-4-11 (FACTORY CUT TO 22')

NOTE:  
 1. REFER TO ELECTRICAL DRAWINGS FOR SITE LIGHTING VOLTAGES.  
 2. ALL POLES SHALL BE BLACK FINISH AND INCLUDE FACTORY INSTALLED VIBRATION DAMPENERS.  
 3. DURING NON-OPERATING HOURS OF THE BUSINESS ON SITE ALL OUTDOOR LIGHTING NOT NECESSARY FOR SAFETY AND SECURITY PURPOSES SHALL BE REDUCED, ACTIVATED BY MOTION-SENSOR DEVICES OR TURNED OFF.  
 4. ALL LIGHT FIXTURES SHOULD BE EQUIPPED WITH AN AUTOMATIC TIMING DEVICE.  
 5. ALL LIGHTS SHALL BE SHIELDED/FULL CUT-OFF FIXTURES; UNSHIELDED SPOTLIGHT OR FLOODLIGHT FIXTURES ARE PROHIBITED.

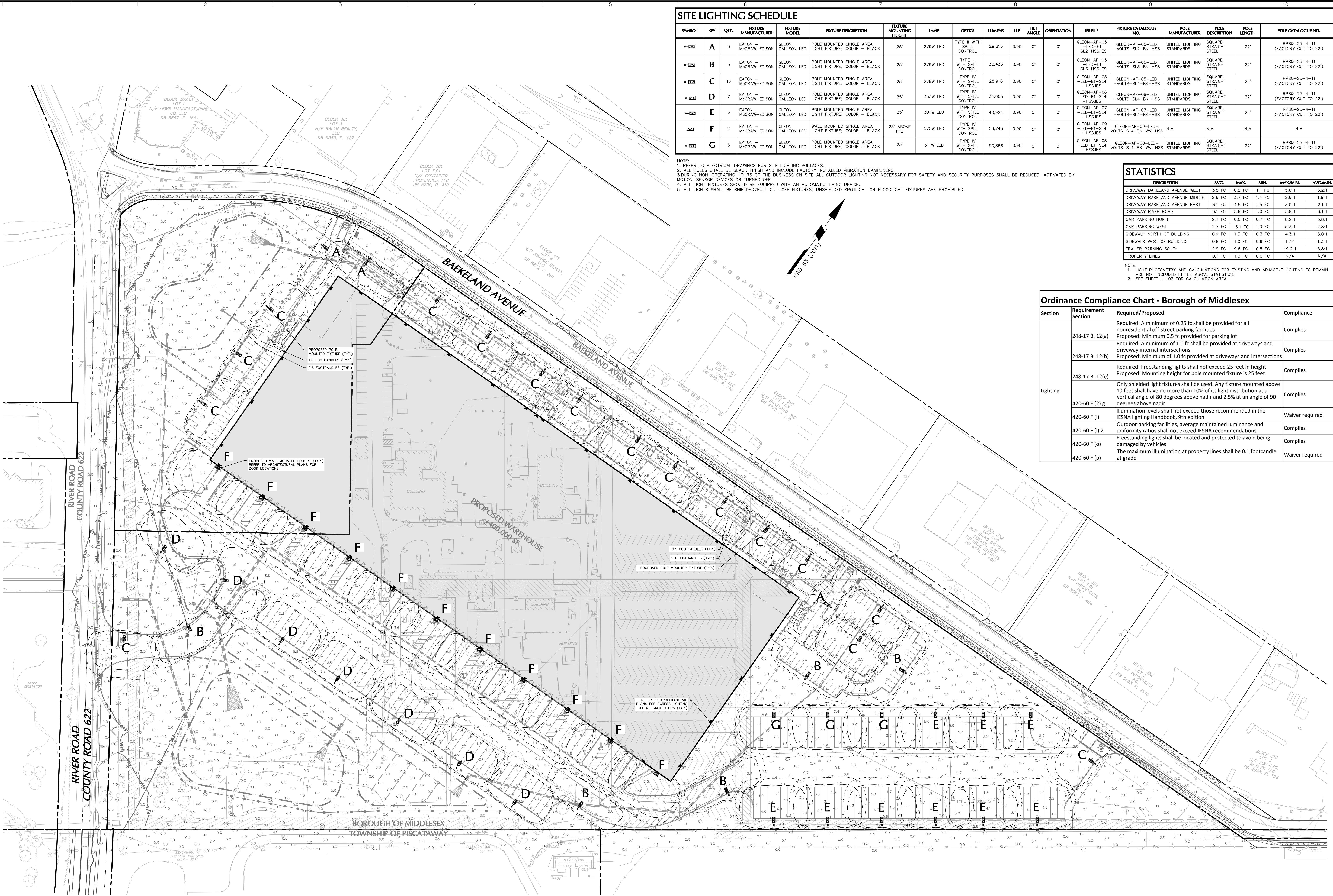
**STATISTICS**

DESCRIPTION	AVG.	MAX.	MIN.	MAX./MIN.	AVG./MIN.
DRIVEWAY BAKELAND AVENUE WEST	3.5 FC	6.2 FC	1.1 FC	5.6:1	3.2:1
DRIVEWAY BAKELAND AVENUE MIDDLE	2.6 FC	3.7 FC	1.4 FC	2.6:1	1.9:1
DRIVEWAY BAKELAND AVENUE EAST	3.1 FC	4.5 FC	1.5 FC	3.0:1	2.1:1
DRIVEWAY RIVER ROAD	3.1 FC	5.8 FC	1.0 FC	5.8:1	3.1:1
CAR PARKING NORTH	2.7 FC	6.0 FC	0.7 FC	8.2:1	3.8:1
CAR PARKING WEST	2.7 FC	5.1 FC	1.0 FC	5.3:1	2.8:1
SIDEWALK NORTH OF BUILDING	0.9 FC	1.3 FC	0.3 FC	4.3:1	3.0:1
SIDEWALK WEST OF BUILDING	0.8 FC	1.0 FC	0.6 FC	1.7:1	1.3:1
TRAILER PARKING SOUTH	2.9 FC	9.6 FC	0.5 FC	19.2:1	5.8:1
PROPERTY LINES	0.1 FC	1.0 FC	0.0 FC	N/A	N/A

NOTE:  
 1. LIGHT PHOTOMETRY AND CALCULATIONS FOR EXISTING AND ADJACENT LIGHTING TO REMAIN ARE NOT INCLUDED IN THE ABOVE STATISTICS.  
 2. SEE SHEET L-102 FOR CALCULATION AREA.

**Ordinance Compliance Chart - Borough of Middlesex**

Section	Requirement Section	Required/Proposed	Compliance
Lighting	248-17 B. 12(a)	Required: A minimum of 0.25 fc shall be provided for all nonresidential off-street parking facilities Proposed: Minimum 0.5 fc provided for parking lot	Complies
	248-17 B. 12(b)	Required: A minimum of 1.0 fc shall be provided at driveways and driveway internal intersections Proposed: Minimum of 1.0 fc provided at driveways and intersections	Complies
	248-17 B. 12(e)	Required: Freestanding lights shall not exceed 25 feet in height Proposed: Mounting height for pole mounted fixture is 25 feet	Complies
	420-60 F (2) g	Only shielded light fixtures shall be used. Any fixture mounted above 10 feet shall have no more than 10% of its light distribution at a vertical angle of 80 degrees above nadir and 2.5% at an angle of 90 degrees above nadir	Complies
	420-60 F (i)	Illumination levels shall not exceed those recommended in the IESNA Lighting Handbook, 9th edition	Waiver required
	420-60 F (l) 2	Outdoor parking facilities, average maintained luminance and uniformity ratios shall not exceed IESNA recommendations	Complies
	420-60 F (o)	Freestanding lights shall be located and protected to avoid being damaged by vehicles	Complies
420-60 F (p)	The maximum illumination at property lines shall be 0.1 footcandle at grade	Waiver required	



Date	Description	No.
3/27/2020	REVISED FOR BOROUGH, COUNTY, AND NJDEP COMMENTS	2
1/30/2020	REVISED FOR BOROUGH ENGINEER AND NJDEP COMMENTS	1

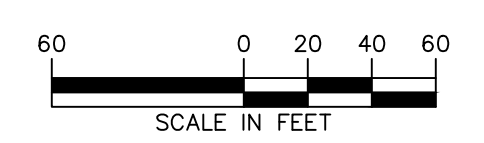
04/08/2020  
 SIGNATURE: JAYNE O. SPECTOR DATE SIGNED  
 PROFESSIONAL LANDSCAPE ARCHITECT  
 NJ LICENSE No. 21AS00045700

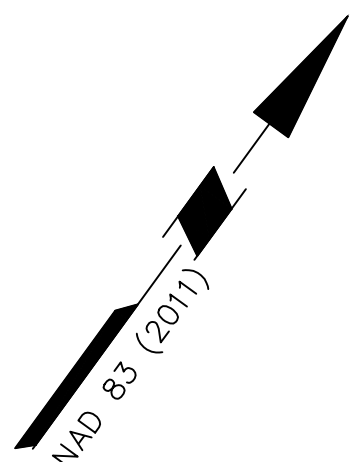
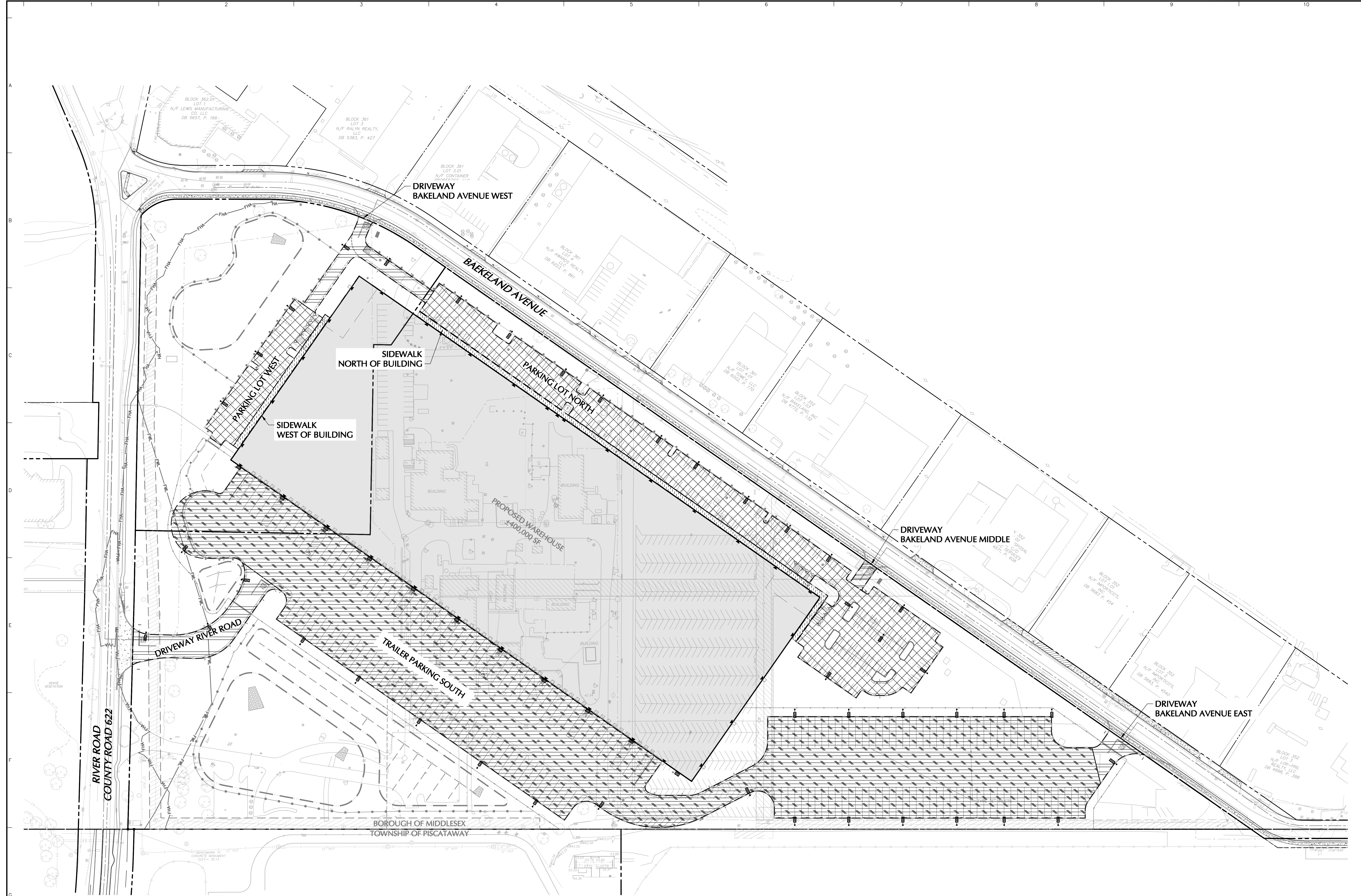
**LANGAN**  
 Langan Engineering and Environmental Services, Inc.  
 300 Kimball Drive  
 Parsippany, NJ 07054  
 T: 973.560.4900 F: 973.560.4901 www.langan.com  
 NJ CERTIFICATE OF AUTHORIZATION No. 24624796620

Project: **MIDDLESEX BOROUGH WAREHOUSE PROJECT**  
 BLOCK No. 353, LOTS No. 1.01 AND 1.02  
 BOROUGH OF MIDDLESEX  
 MIDDLESEX COUNTY NEW JERSEY

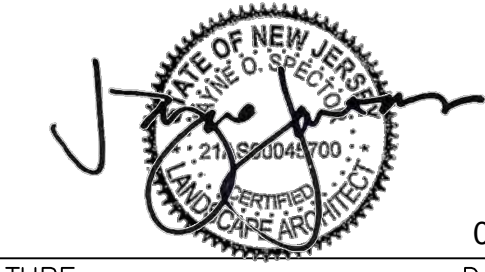
Drawing Title: **LIGHTING PLAN**

Project No. 100594413  
 Date: 7/8/2019  
 Scale: 1" = 60'  
 Drawn By: YW Checked By: JS  
 Drawing No. LL101  
 Sheet 14 of 22





Date	Description	No.
3/27/2020	REVISED FOR BOROUGH, COUNTY, AND NJDEP COMMENTS	2
1/30/2020	REVISED FOR BOROUGH ENGINEER AND NJDEP COMMENTS	1

  
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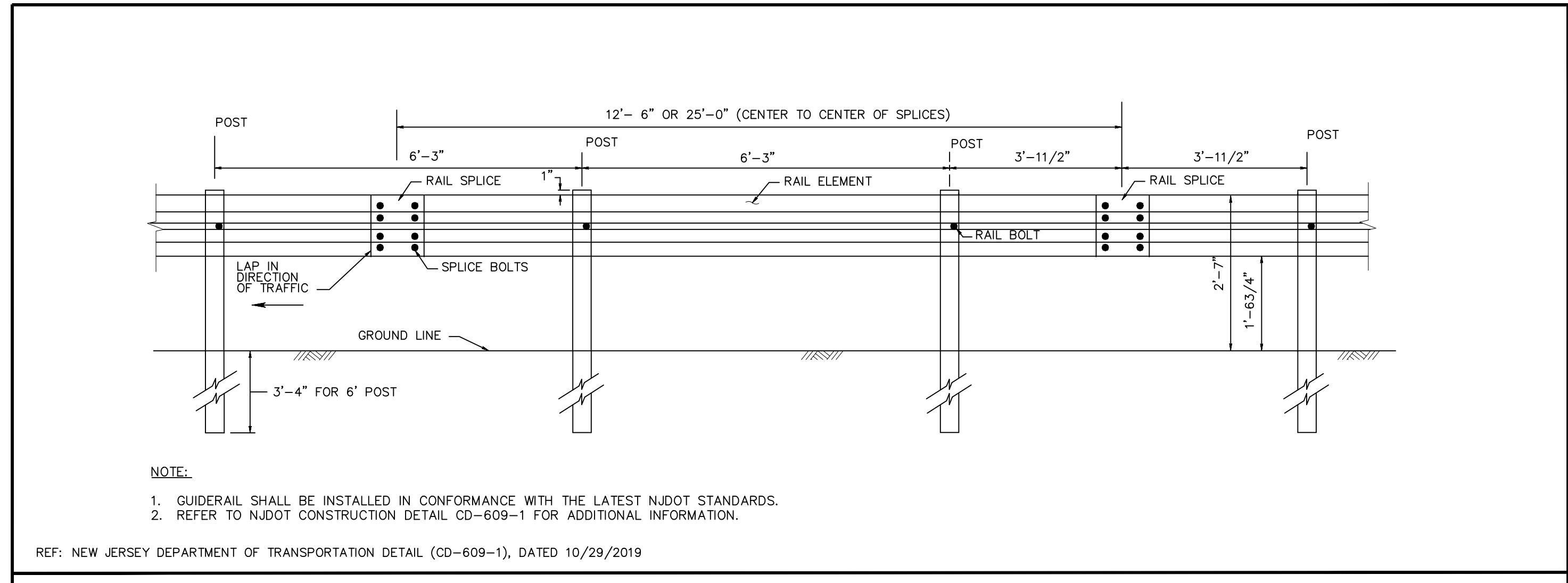
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 NJ CERTIFICATE OF AUTHORIZATION No. 246A27996400

Project  
**MIDDLESEX BOROUGH WAREHOUSE PROJECT**  
 BLOCK No. 353, LOTS No. 1.01 AND 1.02  
 BOROUGH OF MIDDLESEX  
 MIDDLESEX COUNTY NEW JERSEY

Drawing Title  
**LIGHTING CALCULATION EXHIBIT**

Project No. <b>100594413</b>	Drawing No. <b>LL102</b>
Date <b>7/8/2019</b>	
Scale <b>1" = 60'</b>	
Drawn By <b>YW</b>	Checked By <b>JS</b>
Sheet 15 of 22	



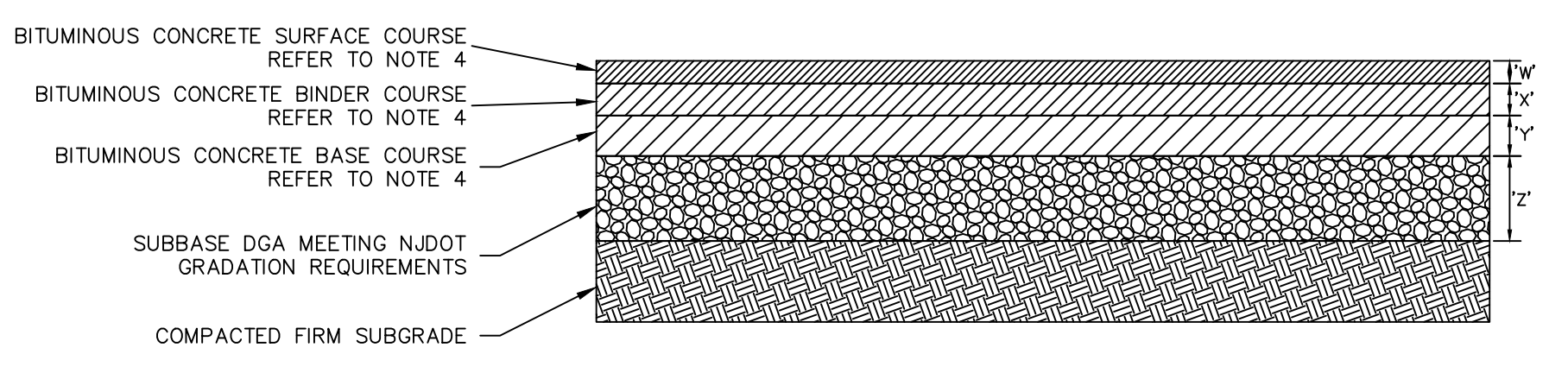


NOTE:  
 1. GUIDERAIL SHALL BE INSTALLED IN CONFORMANCE WITH THE LATEST NJDOT STANDARDS.  
 2. REFER TO NJDOT CONSTRUCTION DETAIL CD-609-1 FOR ADDITIONAL INFORMATION.

REF: NEW JERSEY DEPARTMENT OF TRANSPORTATION DETAIL (CD-609-1), DATED 10/29/2019

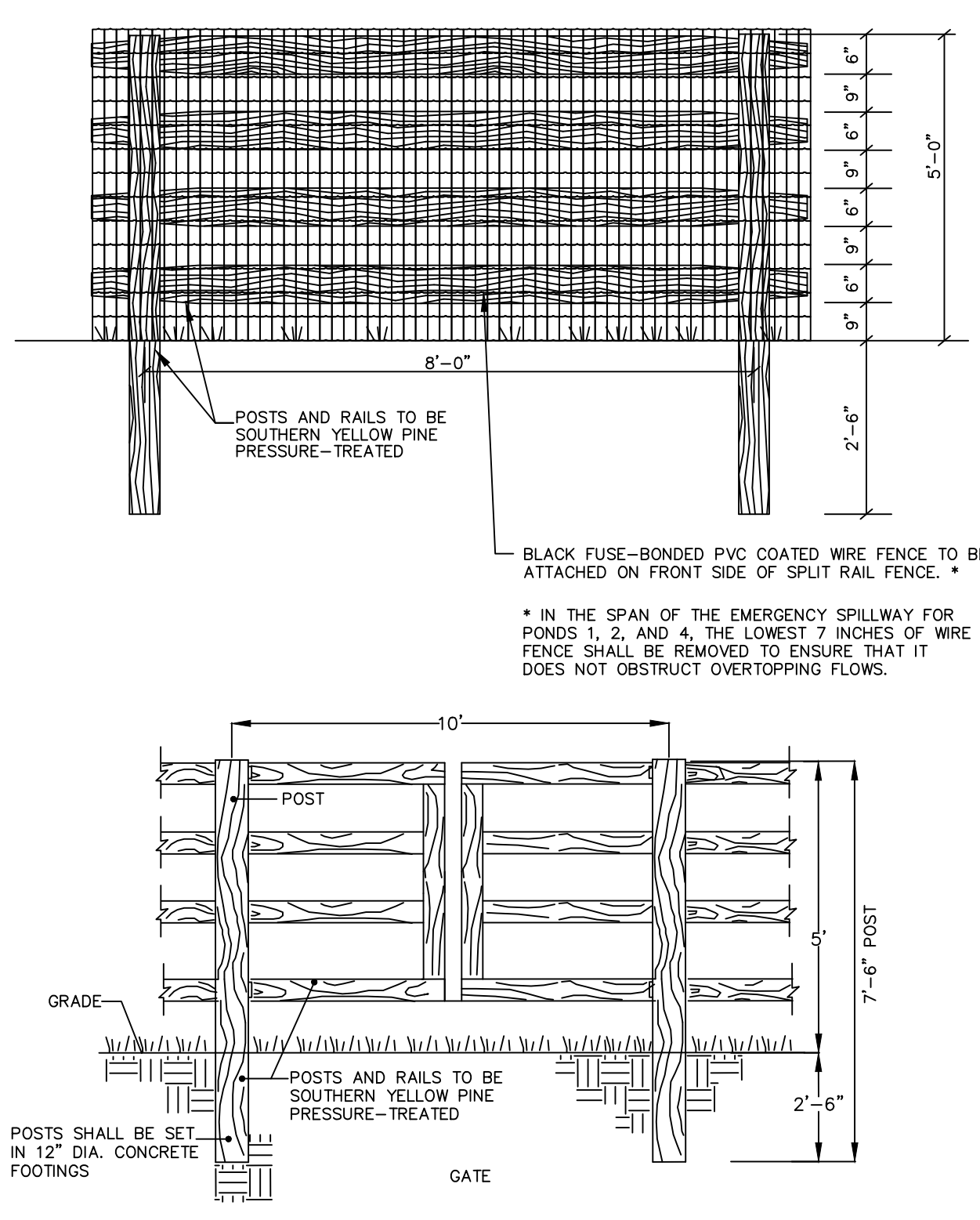
**GUIDERAIL (NJDOT DETAIL)**

ASPHALT SECTION	SURFACE COURSE - 'W'	BINDER COURSE - 'X'	BASE COURSE - 'Y'	SUBBASE - 'Z'
HEAVY DUTY	2 INCHES	0 INCHES	4 INCHES	10 INCHES
LIGHT DUTY	1.5 INCHES	2.5 INCHES	0 INCHES	6 INCHES



- NOTES:
- PAVEMENT DESIGN BASED ON ASSUMED TRAFFIC LOADING. THE PAVEMENT DESIGN SHALL BE RE-EVALUATED BASED ON A TRAFFIC STUDY OR SPECIFIC TENANT REQUIREMENTS.
  - ALL PAVEMENT SUBGRADE AREAS SHALL BE PROOFROLLED WITH AT LEAST 4 PASSES OF A SMOOTH DRUM ROLLER HAVING A MINIMUM STATIC DRUM WEIGHT OF 5-TONS IN THE PRESENCE OF A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF THE SUBBASE MATERIAL. ANY SOFT AREAS SHALL BE REMOVED AND REPLACED WITH APPROVED, COMPACTED FILL. FILL SHALL BE PLACED IN LOOSE LIFTS NOT TO EXCEED 8-INCHES AND SHALL BE COMPACTED TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557.
  - PRIOR TO ASPHALT PAVING, THE COMPACTED SUBBASE SHALL BE PROOFROLLED USING A FULLY-LOADED TRI-AXIAL DUMP TRUCK IN THE PRESENCE OF A QUALIFIED GEOTECHNICAL ENGINEER. ANY SOFT AREAS EXHIBITING EXCESSIVE PUMPING OR RUTTING SHALL BE REMOVED AND REPLACED WITH APPROVED, COMPACTED FILL.
  - SUPERPAVE MIXES (BASED ON 2007 NJDOT STANDARDS) SHALL BE THE FOLLOWING:
    - TRUCK COURTS / TRACTOR TRAILER PARKING PAVEMENT: 12.5M64 FOR SURFACE COURSE AND 25M64 FOR BASE COURSE
    - CAR PARKING LOTS: 9.5M64 FOR SURFACE COURSE AND 19M64 FOR BINDER COURSE
  - ASPHALT PLACEMENT SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS FOR THE PROJECT OR NJDOT GUIDELINES.
  - ASPHALT SHALL BE COMPACTED TO AT LEAST 92% OF THE MAXIMUM THEORETICAL DENSITY AS DETERMINED BY ASTM D-6925.

**SPLIT RAIL FENCE AND GATE**



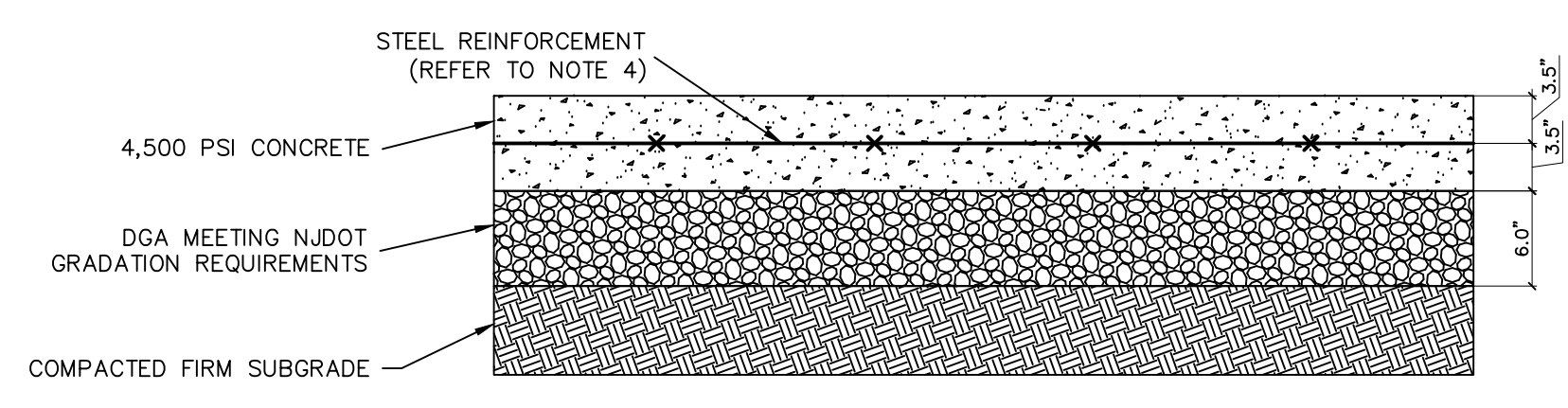
POSTS AND RAILS TO BE SOUTHERN YELLOW PINE PRESSURE-TREATED

BLACK FUSE-BONDED PVC COATED WIRE FENCE TO BE ATTACHED ON FRONT SIDE OF SPLIT RAIL FENCE.

\* IN THE SPAN OF THE EMERGENCY SPILLWAY FOR PONDS 1, 2, AND 4, THE LOWEST 7 INCHES OF WIRE FENCE SHALL BE REMOVED TO ENSURE THAT IT DOES NOT OBSTRUCT OVERTOPPING FLOWS.

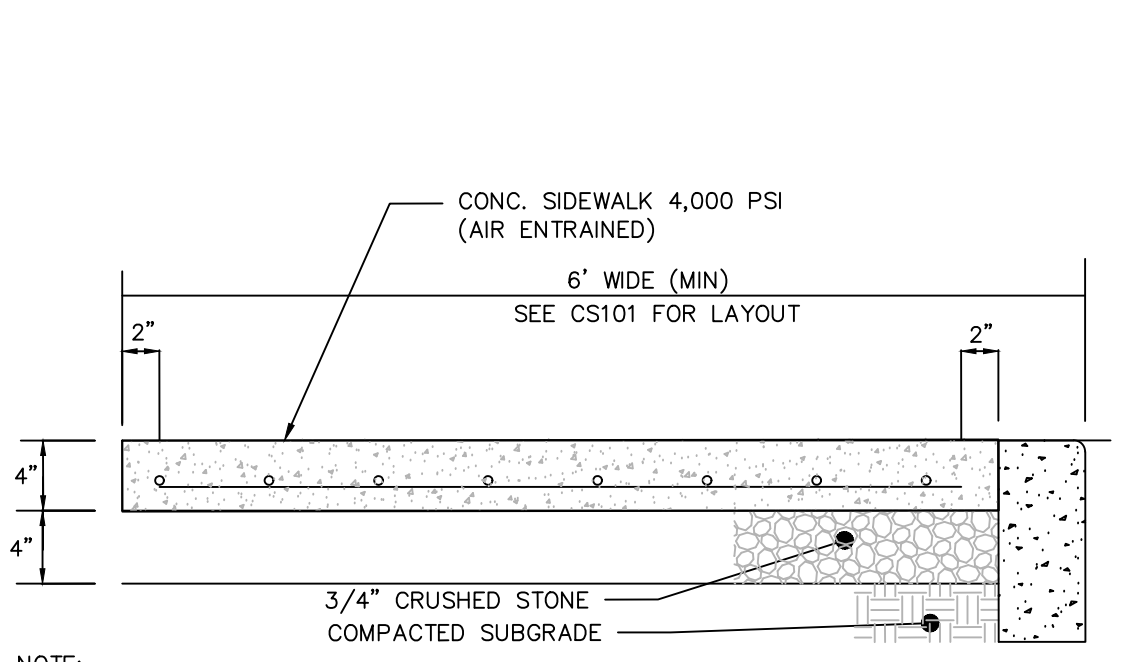
POSTS SHALL BE SET IN 12" DIA. CONCRETE FOOTINGS

**ASPHALT PAVEMENT SECTIONS**



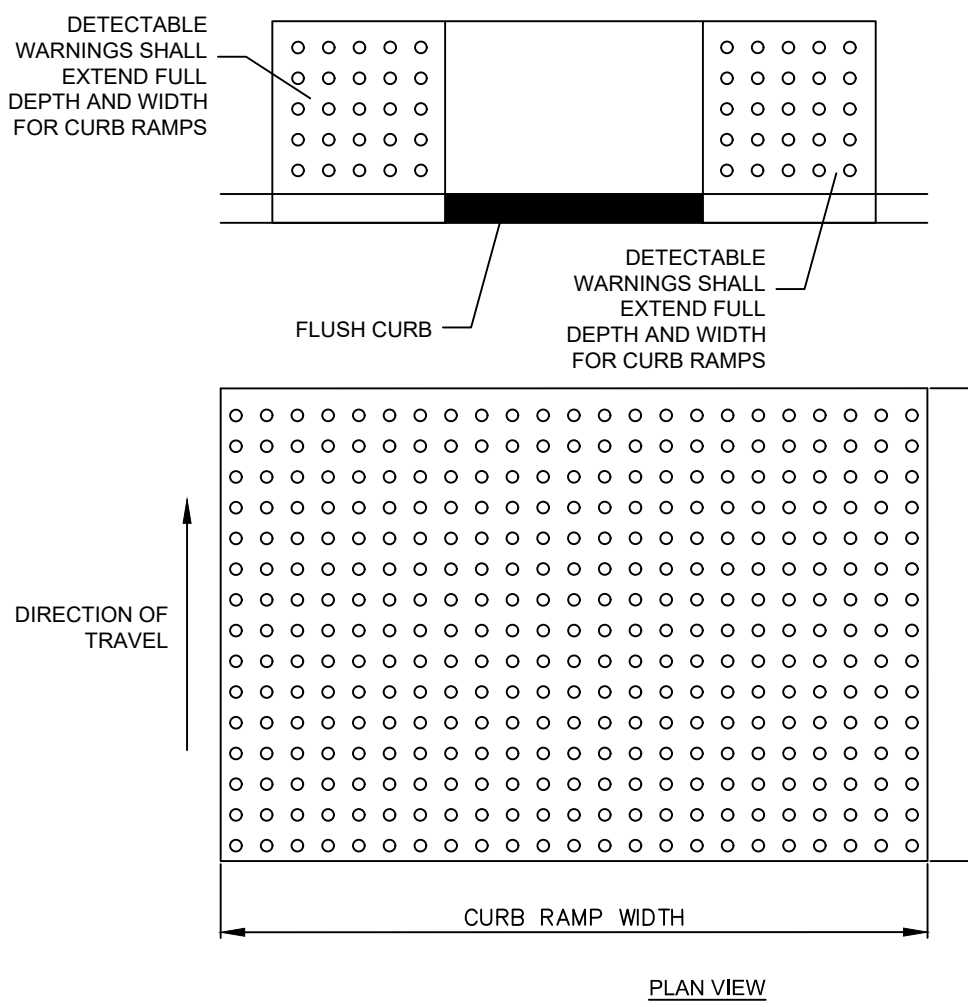
- NOTES:
- ALL PAVEMENT SUBGRADE AREAS SHALL BE PROOFROLLED WITH AT LEAST 4 PASSES OF A SMOOTH DRUM ROLLER HAVING A MINIMUM STATIC DRUM WEIGHT OF 5-TONS IN THE PRESENCE OF A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF THE SUBBASE MATERIAL. ANY SOFT AREAS SHALL BE REMOVED AND REPLACED WITH APPROVED, COMPACTED FILL. FILL SHALL BE PLACED IN LOOSE LIFTS NOT TO EXCEED 8-INCHES AND SHALL BE COMPACTED TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557.
  - PRIOR TO CONCRETE PAVING, THE COMPACTED SUBBASE SHALL BE PROOFROLLED USING A FULLY-LOADED TRI-AXIAL DUMP TRUCK IN THE PRESENCE OF A QUALIFIED GEOTECHNICAL ENGINEER. ANY SOFT AREAS EXHIBITING EXCESSIVE PUMPING OR RUTTING SHALL BE REMOVED AND REPLACED WITH APPROVED, COMPACTED FILL.
  - THE CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,500 PSI, A WATER CONTENT RATIO OF 0.45, AND 6% AIR ENTRAINMENT.
  - GRADE 60 NO. 4 DEFORMED BARS - SLAB REINFORCEMENT LONGITUDINAL AND TRANSVERSE SPACING SHOULD BE A MAXIMUM OF 12 INCHES ON CENTER. REINFORCEMENT SHOULD BE PROPERLY SUPPORTED DURING CONCRETE PLACEMENT.
  - TRANSVERSE AND LONGITUDINAL CONTROL JOINTS SHALL BE SAW CUT AND HAVE A MAXIMUM SPACING OF 15 FEET.
  - DOWEL BARS SHALL BE PLACED AT ALL CONSTRUCTION JOINTS.
  - ISOLATION JOINTS SHALL BE INSTALLED AGAINST ALL STRUCTURES.

**CONCRETE PAVEMENT SECTION (LOADING DOCK, DRIVE-IN RAMP, AND DRIVEWAY ENTRANCE APRONS)**

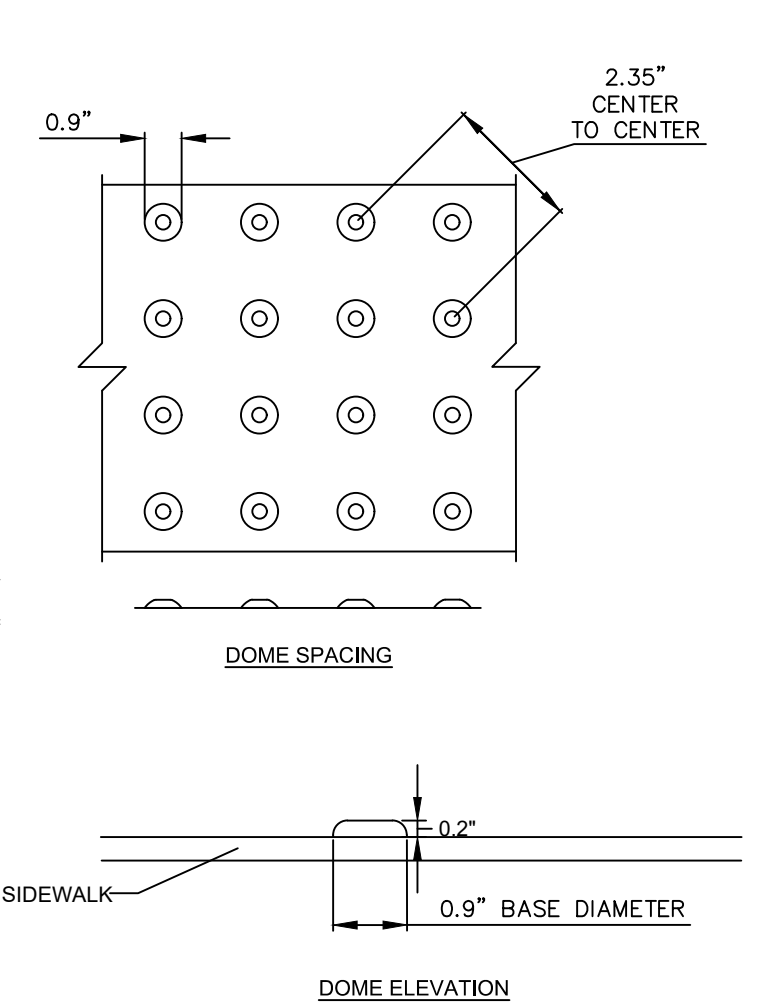


- NOTE:
- ONE LAYER OF 6" X 6" X 10/10 WELDED WIRE FABRIC SHALL BE PLACED MID-DEPTH IN CONCRETE SIDE WALKS. SPLICES SHALL BE OVERLAPPED 12" AND TIED.
  - TRANSVERSE SCORE JOINTS SHALL BE PROVIDED EVERY 4' O/C. EXPANSION JOINTS SHALL BE 3/4" WIDE AND SHALL BE PROVIDED EVERY 12' O/C.
  - ALL SIDEWALKS TO HAVE A BROOM FINISH TO ENSURE A SLIP RESISTANT SURFACE.

**CONCRETE SIDEWALK**

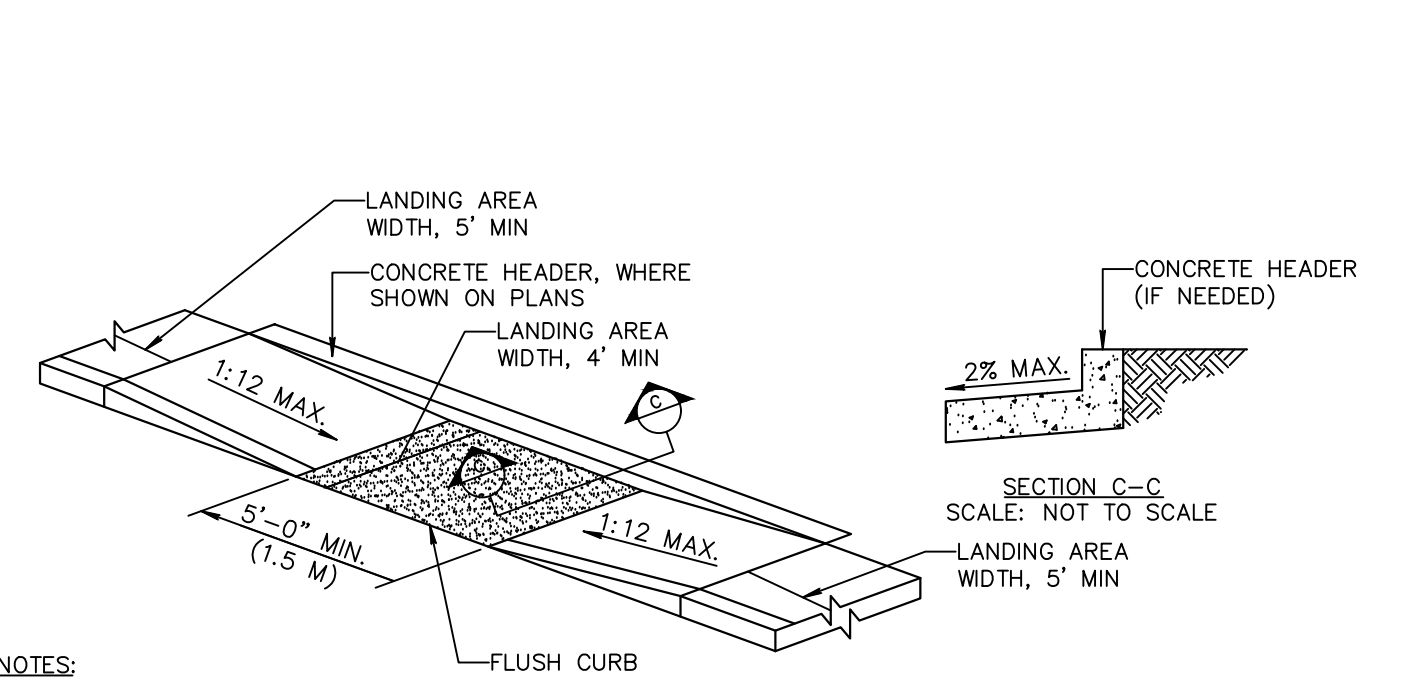


**ADA DETECTABLE WARNING SURFACE**



**12-INCH HIGH CONCRETE CURB**

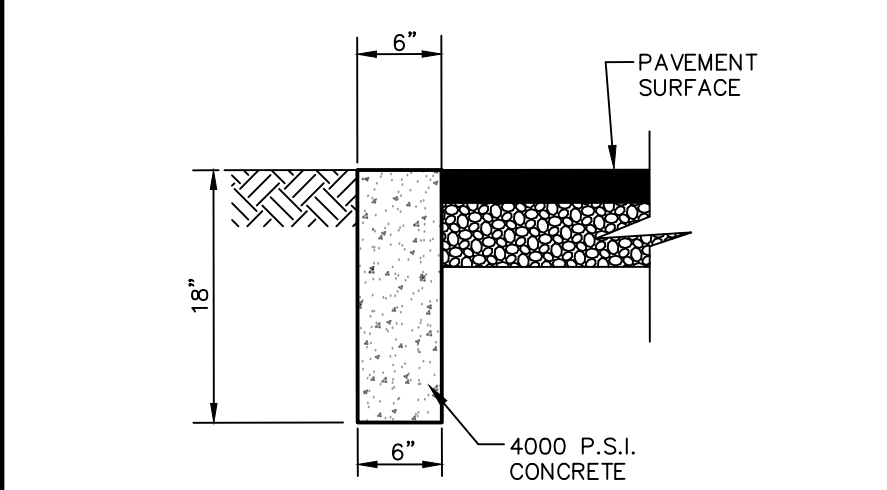
- NOTES:
- DETECTABLE WARNINGS SHALL BE CONSTRUCTED PER MANUFACTURER'S SPECIFICATIONS.
  - WIDTH OF DETECTABLE WARNING AREA SHALL BE FULL WIDTH OF RAMP.
  - LENGTH OF DETECTABLE WARNING AREA SHALL BE MINIMUM 2 FEET REGARDLESS OF SECTION WIDTH. FOR CURB RAMPS, THE DETECTABLE WARNING SHALL EXTEND THE FULL DEPTH OF THE RAMP AND COMPLY WITH ADAAG 4.29.2.
  - DETECTABLE WARNING AREA CAN BE SQUARE WHERE USED IN A CURB RADIUS.
  - DETECTABLE WARNING DOMES SHALL BE ALIGNED ON A SQUARE GRID PARALLEL ALIGNMENT IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO TRAVEL BETWEEN DOMES.
  - DETECTABLE WARNING DOMES SHALL BE PLACED SO THE EDGE NEAREST THE CURB IS 6 INCHES TO 8 INCHES FROM CURB LINE.
  - MAT EDGES SHALL BE BEVELED TO ELIMINATE TRIP HAZARD.
  - DETECTABLE WARNING COLOR SHALL CONTRAST WITH ADJOINING SURFACES. CONTRACTOR SHALL SUBMIT SHOP DRAWING FOR "SAFETY YELLOW" OR APPROVED EQUAL.
  - CONTRACTOR SHALL OBTAIN LOCAL AUTHORITY, OWNER'S ENGINEER, AND OWNER'S APPROVAL FOR COLOR AND MANUFACTURER PRIOR TO INSTALLATION.



- NOTES:
- LANDING AREA, APPROACH SIDEWALK TRANSITIONS, AND CURB RAMP SHALL BE KEPT CLEAR OF OBSTRUCTIONS.
  - CURB GUTTER LINE TO BE FLUSH WITH ROADWAY PAVEMENT A MINIMUM OF 5 FEET.
  - CROSS SLOPE ON RAMPS SHALL NOT EXCEED 2%. SLOPE IN LANDING AREAS SHALL NOT EXCEED 2% IN ANY DIRECTION.

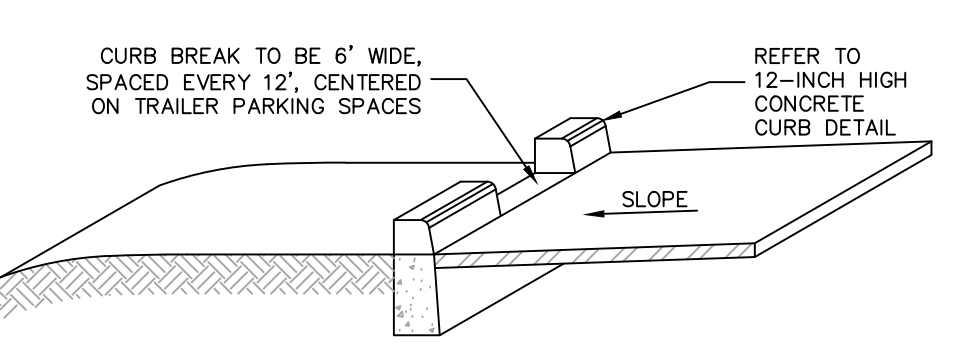
**PARALLEL CURB RAMP**

**ADA ACCESSIBLE PARKING STALL**

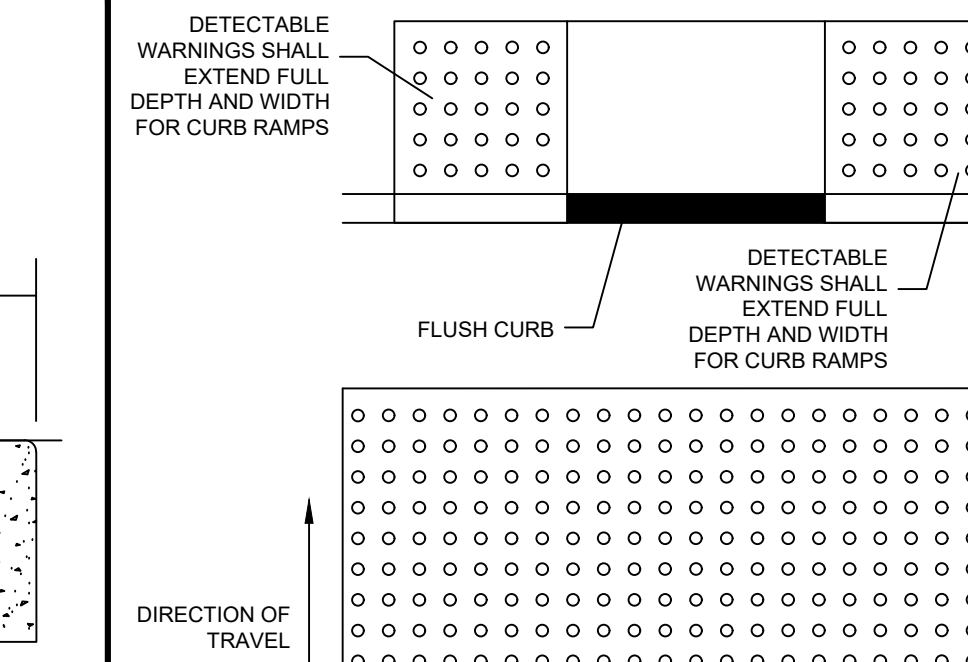


- NOTES:
- CONCRETE TO TEST 4,000 P.S.I. MINIMUM ON 28 DAY TEST. AIR ENTRAINMENT 4% TO 7% SLUMP TO BE 3" MAXIMUM.
  - TRANSVERSE JOINTS 1/2" WIDE SHALL BE INSTALLED IN THE CURB 20"-0" APART AND SHALL BE FILLED WITH PREFORMED BITUMINOUS JOINT FILLER.
  - EXPOSED CONCRETE SURFACE IS TO BE RUBBED TO PROVIDE SMOOTH FINISHED SURFACE.

**FLUSH CURB**

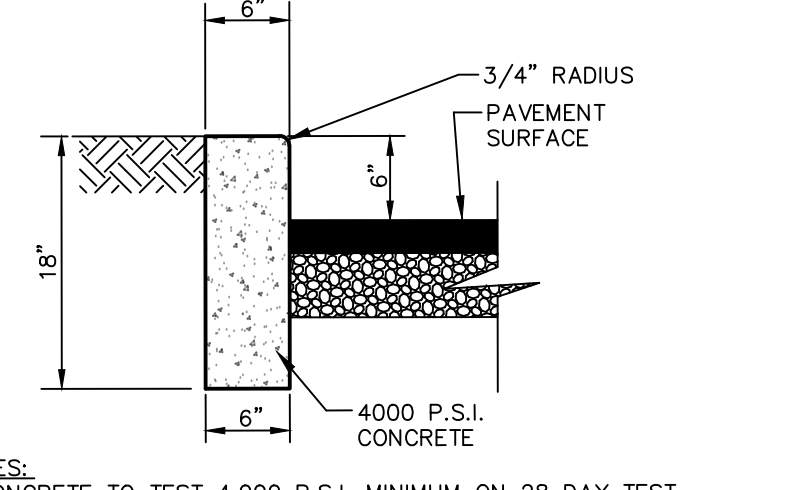


**SLOTTED CURB**



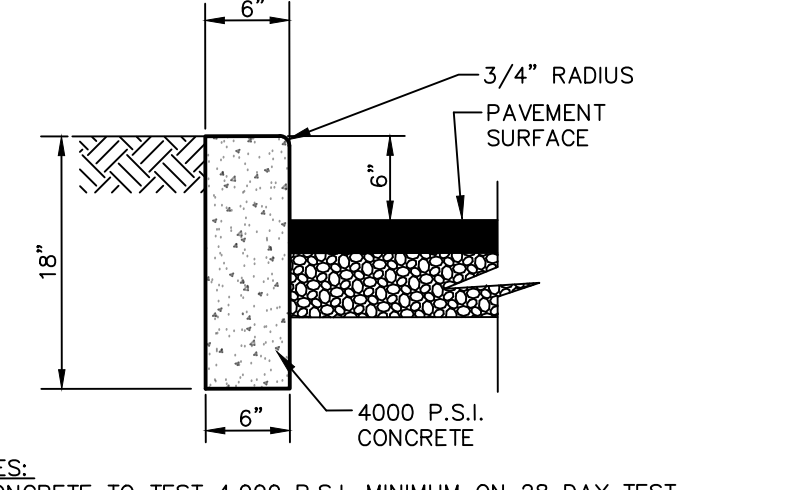
**FLUSH CURB**

**STOP BAR PAVEMENT MARKING**



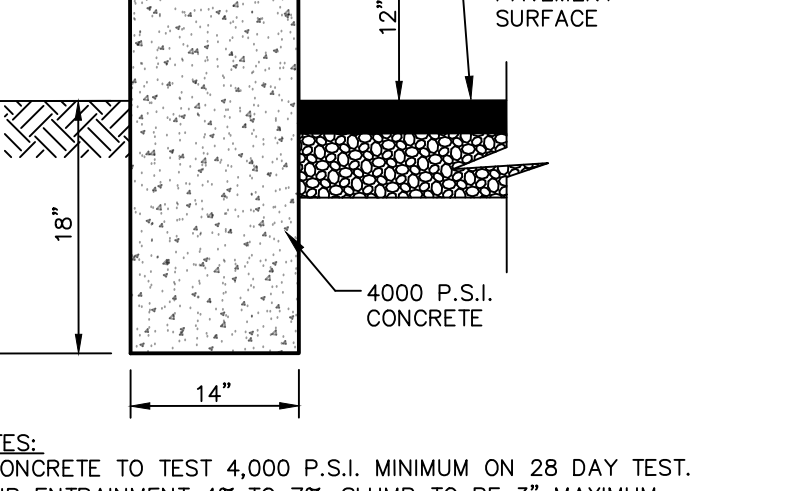
- NOTES:
- ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248 TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER.
  - SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN DISABILITIES ACT AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), LATEST EDITION.
  - THE MINIMUM DIMENSIONS ARE SHOWN. STATE REGULATORS MAY REQUIRE LARGER DIMENSIONS.
  - APPLY 2 COATS OF TRAFFIC PAINT. ALLOW FOR MINIMUM CURE TIME OF 24 HOURS BETWEEN APPLICATIONS.
  - SYMBOLS & PARKING STALLS TO BE PAINTED BLUE.

**STANDARD CAR PARKING STRIPING**



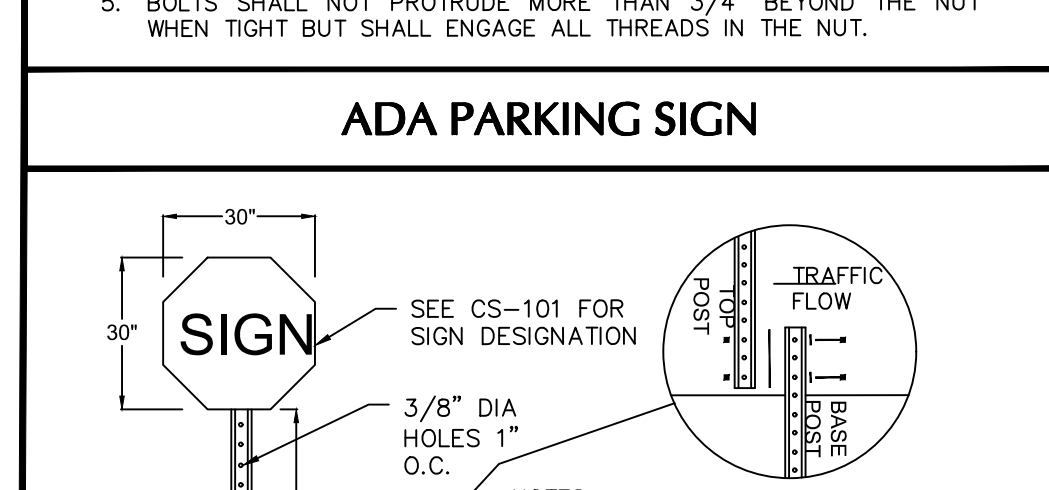
- NOTES:
- CONCRETE TO TEST 4,000 P.S.I. MINIMUM ON 28 DAY TEST. AIR ENTRAINMENT 4% TO 7% SLUMP TO BE 3" MAXIMUM.
  - TRANSVERSE JOINTS 1/2" WIDE SHALL BE INSTALLED IN THE CURB 20"-0" APART AND SHALL BE FILLED WITH PREFORMED BITUMINOUS JOINT FILLER.
  - EXPOSED CONCRETE SURFACE IS TO BE RUBBED TO PROVIDE SMOOTH FINISHED SURFACE.

**6-INCH HIGH CONCRETE CURB**



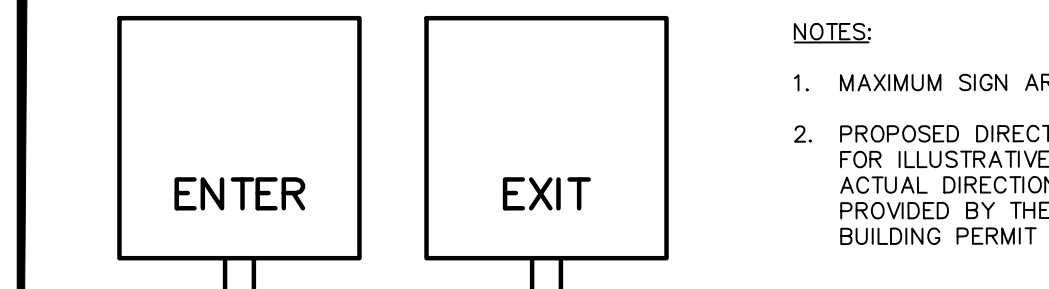
- NOTES:
- CONCRETE TO TEST 4,000 P.S.I. MINIMUM ON 28 DAY TEST. AIR ENTRAINMENT 4% TO 7% SLUMP TO BE 3" MAXIMUM.
  - TRANSVERSE JOINTS 1/2" WIDE SHALL BE INSTALLED IN THE CURB 20"-0" APART AND SHALL BE FILLED WITH PREFORMED BITUMINOUS JOINT FILLER.
  - EXPOSED CONCRETE SURFACE IS TO BE RUBBED TO PROVIDE SMOOTH FINISHED SURFACE.

**ADA PARKING SIGN**



- NOTES:
- ALL POSTS SHALL MEET THE REQUIREMENTS STATED IN THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".
  - ALL POSTS SHALL BE EMBEDDED 4'-2" MINIMUM BELOW GRADE.
  - ALL STEEL POSTS AND BRACKETS SHALL BE CUT, BENT, AND HOLES PUNCHED AND DRILLED BEFORE GALVANIZING. GALVANIZING SHALL BE IN CONFORMANCE WITH CURRENT A.S.T.M. SPECIFICATION A123-78 (OR LATEST REVISED).
  - ALL SIGN POSTS SHALL BE GALVANIZED BREAKAWAY STEEL "U"-POST (2 LBS./FT).
  - BOLTS SHALL NOT PROTRUDE MORE THAN 3/4" BEYOND THE NUT WHEN TIGHT BUT SHALL ENGAGE ALL THREADS IN THE NUT.
  - ALL TRAFFIC AND PEDESTRIAN SIGNAGE AND LOCATION SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND ALL CURRENT AMENDMENTS.

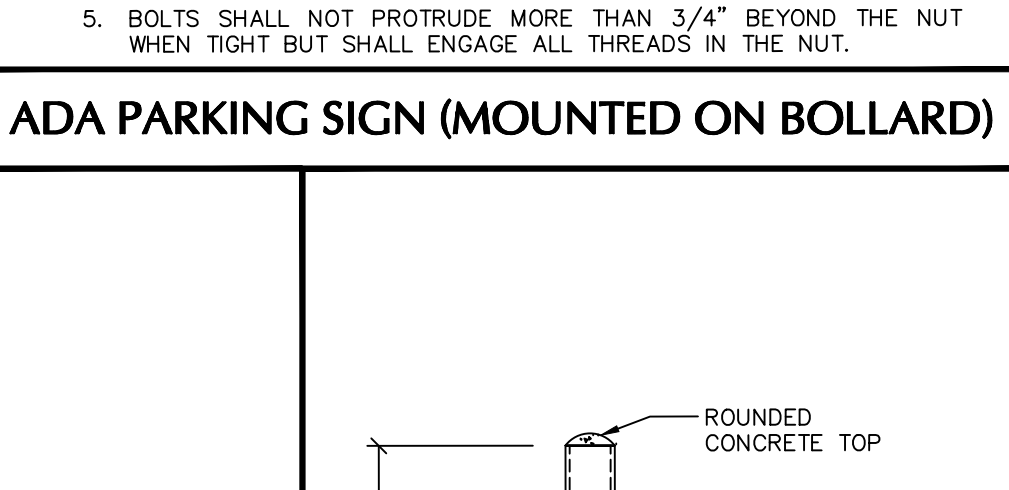
**SIGN POST**



- NOTES:
- MAXIMUM SIGN AREA = 2 SF.
  - PROPOSED DIRECTIONAL SIGNS ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL DIRECTIONAL SIGN DETAILS WILL BE PROVIDED BY THE TENANT AS PART OF BUILDING PERMIT SUBMISSION.

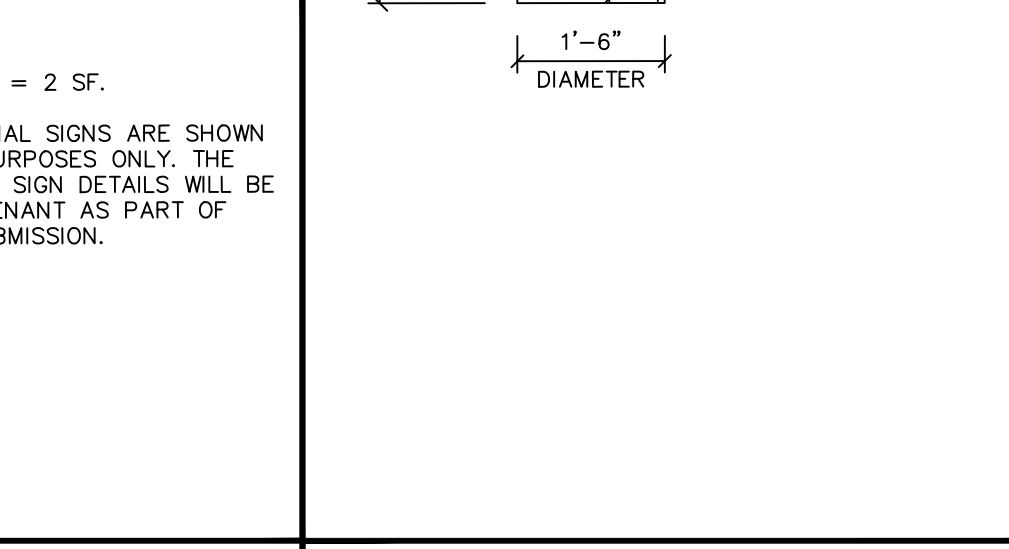
**DIRECTIONAL SIGN**

**ADA PARKING SIGN (MOUNTED ON BOLLARD)**



- NOTES:
- ALL POSTS SHALL MEET THE REQUIREMENTS STATED IN THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".
  - ALL POSTS SHALL BE EMBEDDED 4'-2" MINIMUM BELOW GRADE.
  - ALL STEEL POSTS AND BRACKETS SHALL BE CUT, BENT, AND HOLES PUNCHED AND DRILLED BEFORE GALVANIZING. GALVANIZING SHALL BE IN CONFORMANCE WITH CURRENT A.S.T.M. SPECIFICATION A123-78 (OR LATEST REVISED).
  - POSTS SHALL BE GALVANIZED BREAKAWAY STEEL "U"-POST (2 LBS./FT).
  - BOLTS SHALL NOT PROTRUDE MORE THAN 3/4" BEYOND THE NUT WHEN TIGHT BUT SHALL ENGAGE ALL THREADS IN THE NUT.

**8" DIAMETER BOLLARD**



Date	Description	No.
3/27/2020	REVISED FOR BOROUGH, COUNTY, AND NJDEP COMMENTS	2
1/30/2020	REVISED FOR BOROUGH ENGINEER AND NJDEP COMMENTS	1

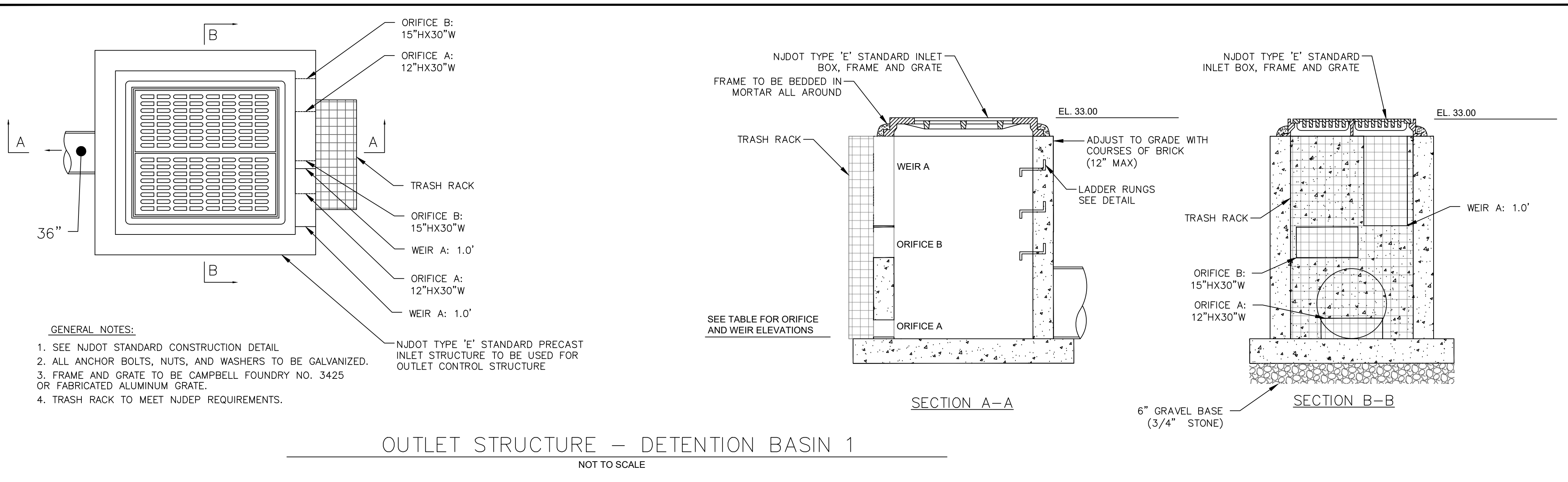
SIGNATURE: RICHARD BURROW DATE SIGNED: 04/08/2020  
 PROFESSIONAL ENGINEER NJ Lic. No. 24GE04459300

**LANGAN**  
 Langan Engineering and Environmental Services, Inc.  
 300 Kimball Drive  
 Parsippany, NJ 07054  
 T: 973.560.4900 F: 973.560.4901 www.langan.com  
 NJ CERTIFICATE OF AUTHORIZATION No. 24GA2796620

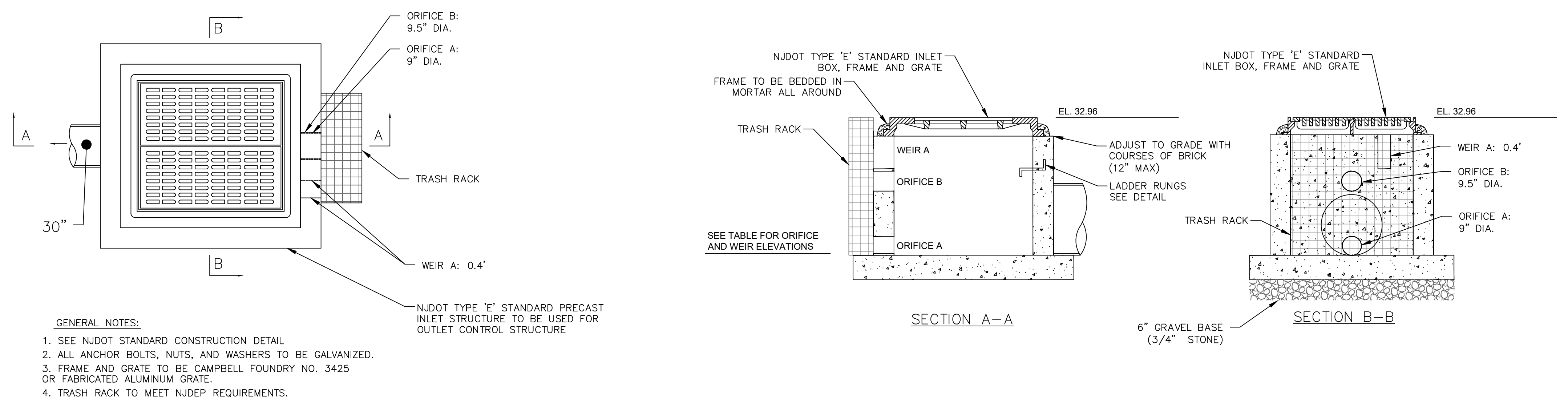
Project: **MIDDLESEX BOROUGH WAREHOUSE PROJECT**  
 BLOCK No. 353, LOTS No. 1.01 AND 1.02  
 BOROUGH OF MIDDLESEX  
 MIDDLESEX COUNTY NEW JERSEY

Drawing Title: **CONSTRUCTION DETAILS I**

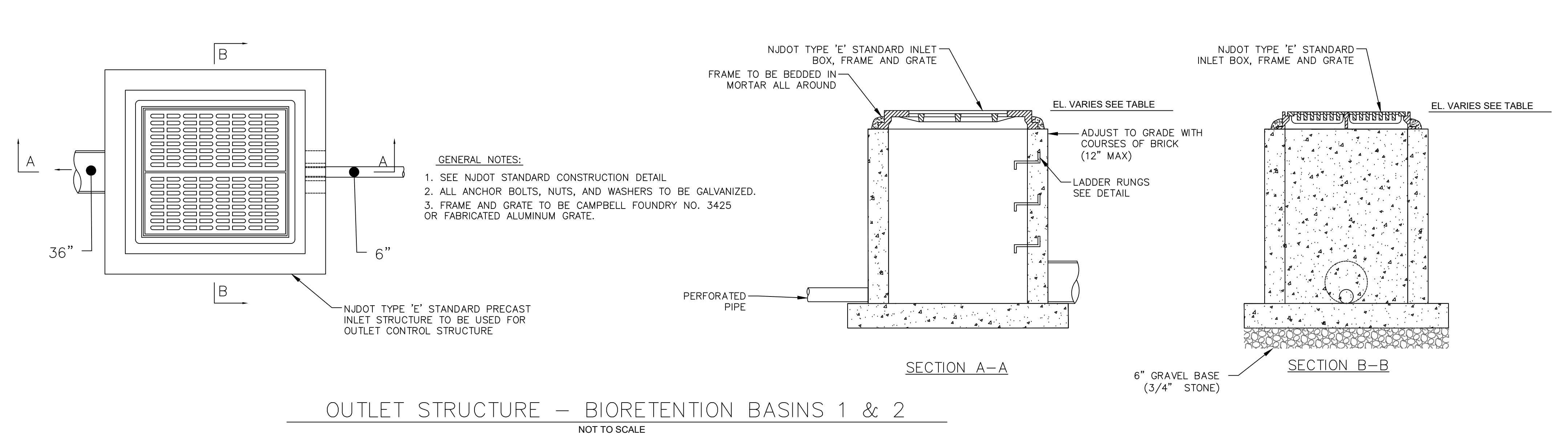
Project No. **100594413**  
 Date: **7/8/2019**  
 Scale: **N.T.S.**  
 Drawn By: **JEI** Checked By: **MRW**  
**CS501**  
 Sheet 17 of 22



OUTLET STRUCTURE - DETENTION BASIN 1  
NOT TO SCALE

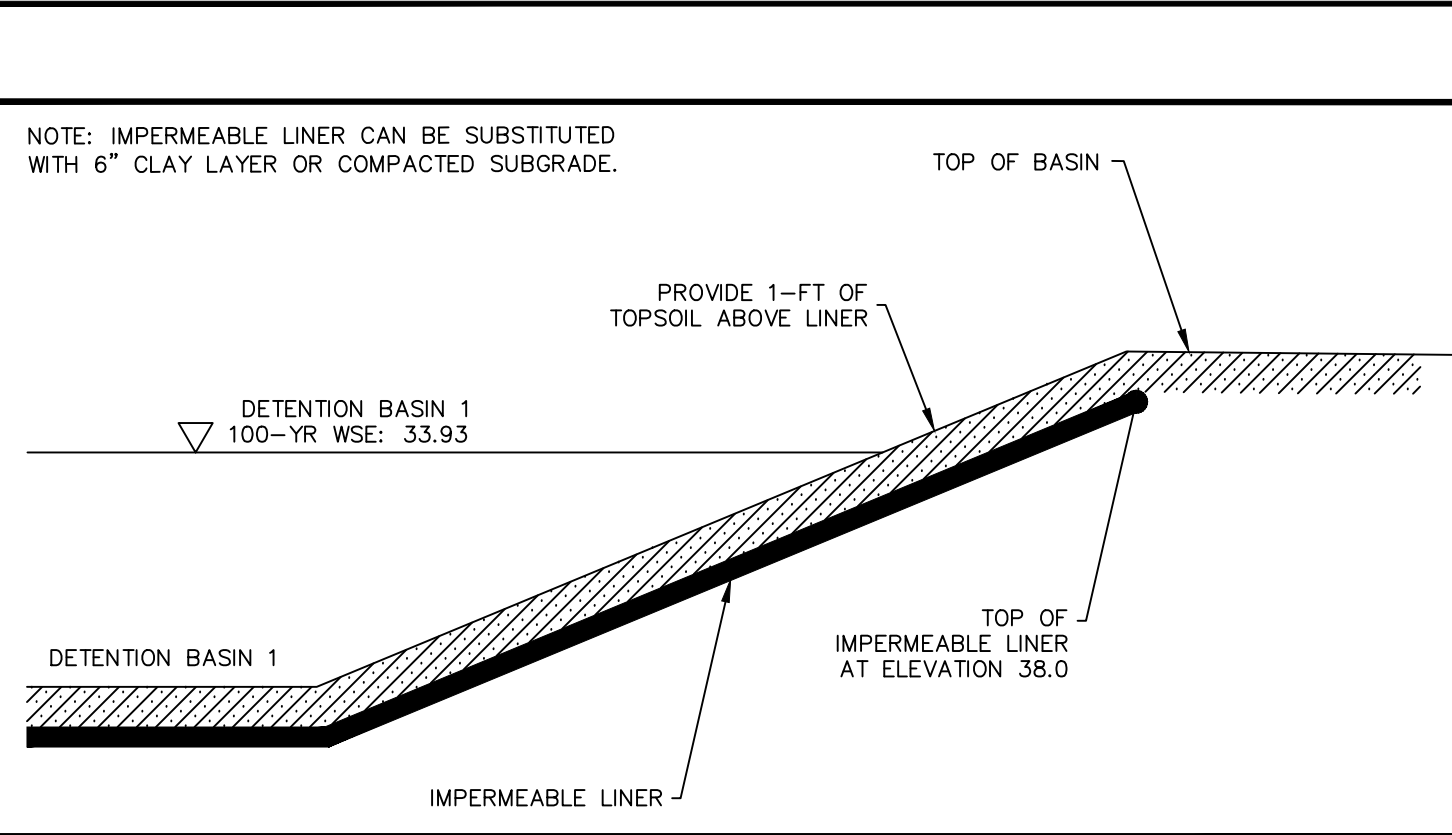


OUTLET STRUCTURE - DETENTION BASIN 2  
NOT TO SCALE

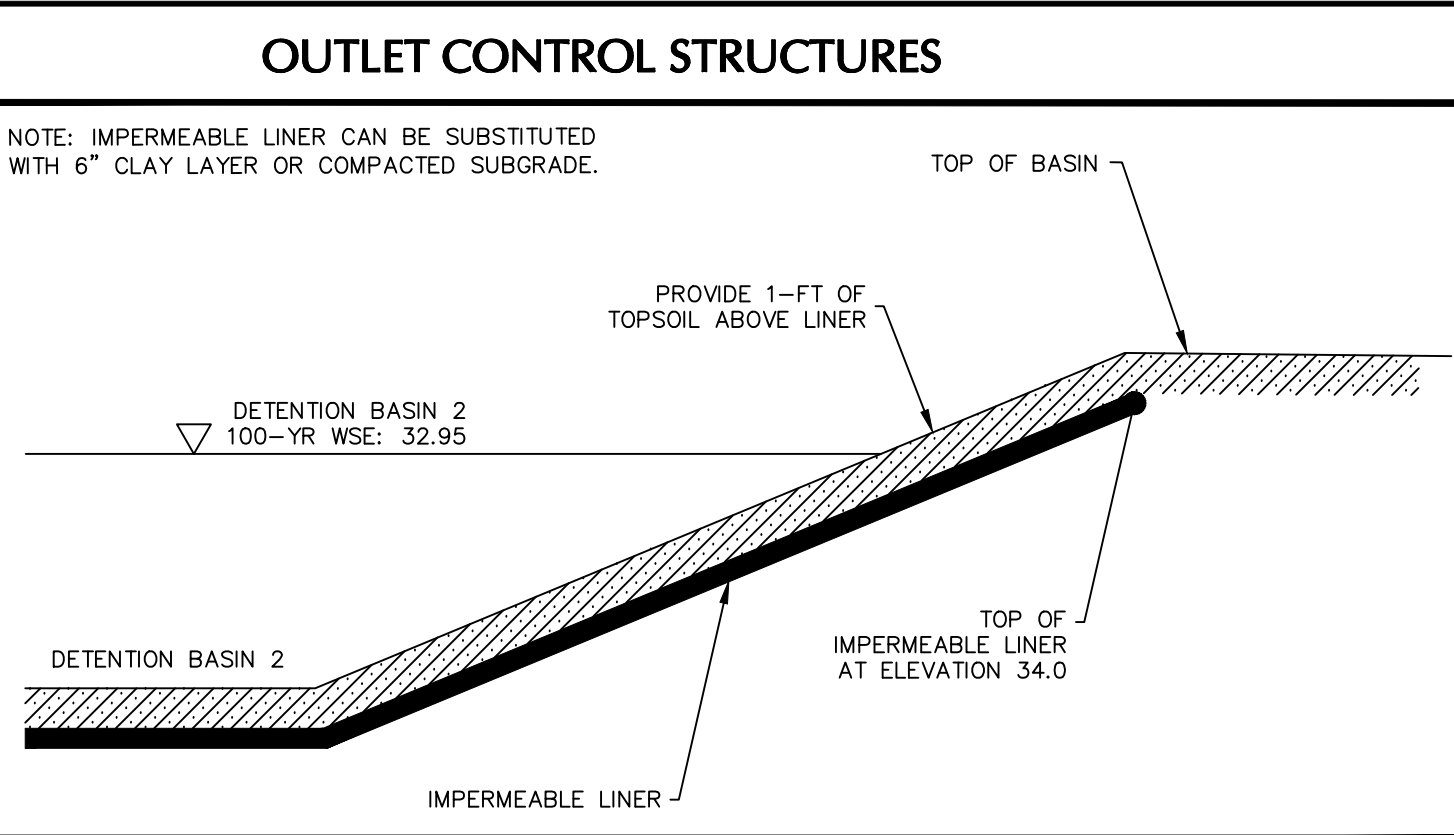


OUTLET STRUCTURE - BIORETENTION BASINS 1 & 2  
NOT TO SCALE

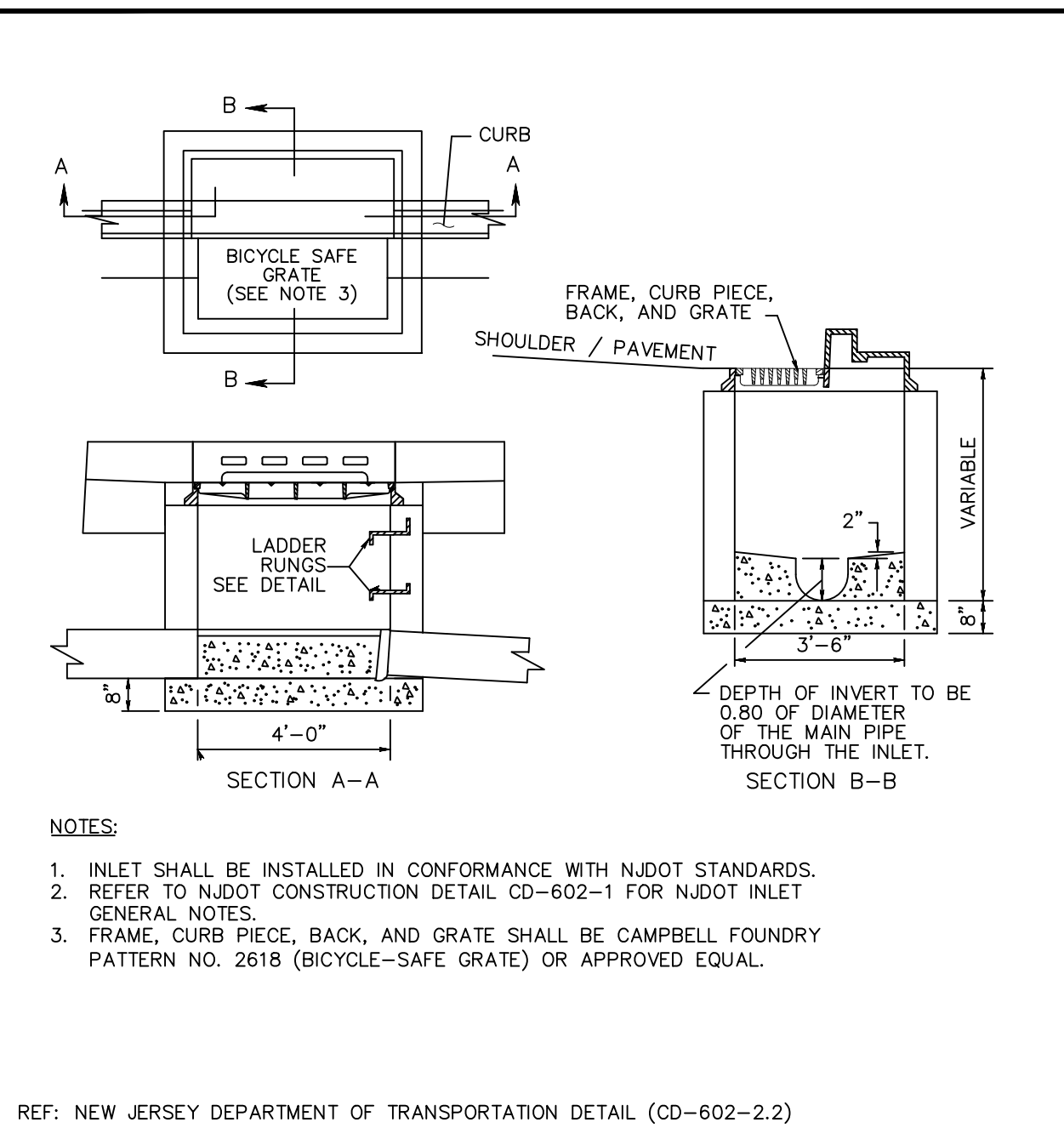
Basin	Orifice A Dims. (in)	Orifice A EL.	Orifice B Dims. (in)	Orifice B EL.	Weir A Length (ft)	Weir A EL.	Grate EL.
Detention Basin 1	12'Hx30'W	29.86	15'Hx30'W	32.04	1.00	32.75	33.00
Detention Basin 2	9\"/>						



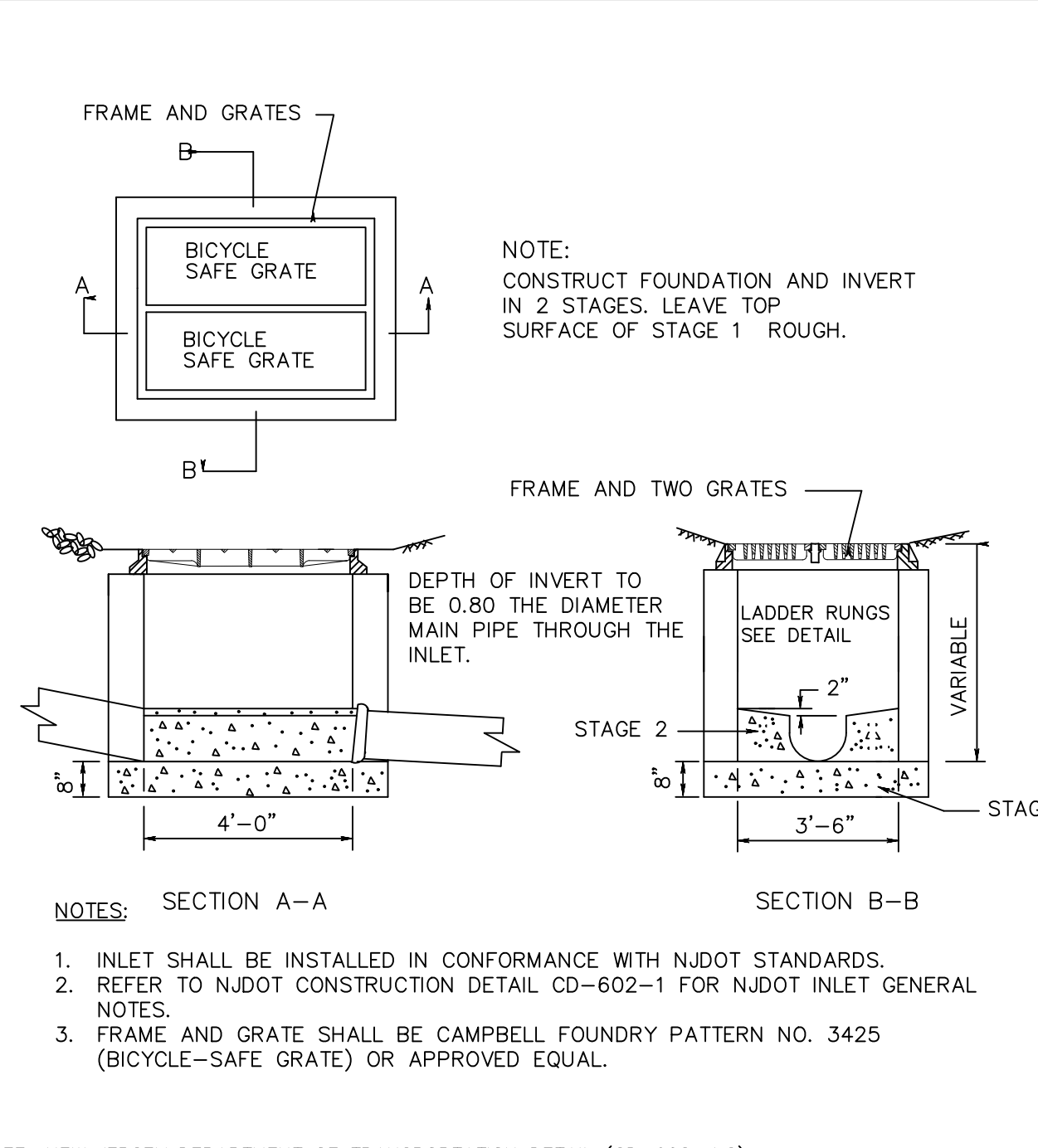
DETENTION BASIN 1 IMPERMEABLE LINER



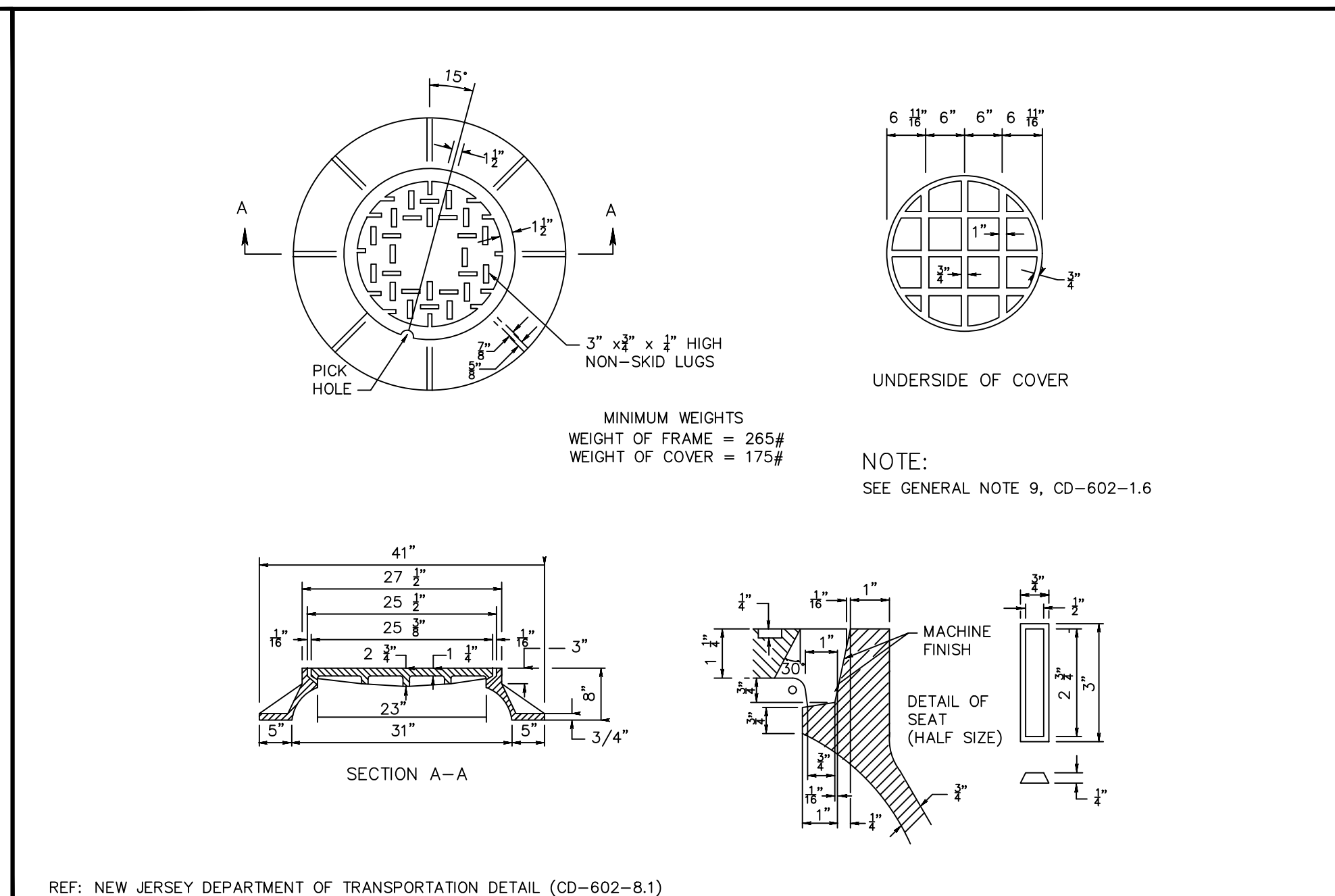
DETENTION BASIN 2 IMPERMEABLE LINER



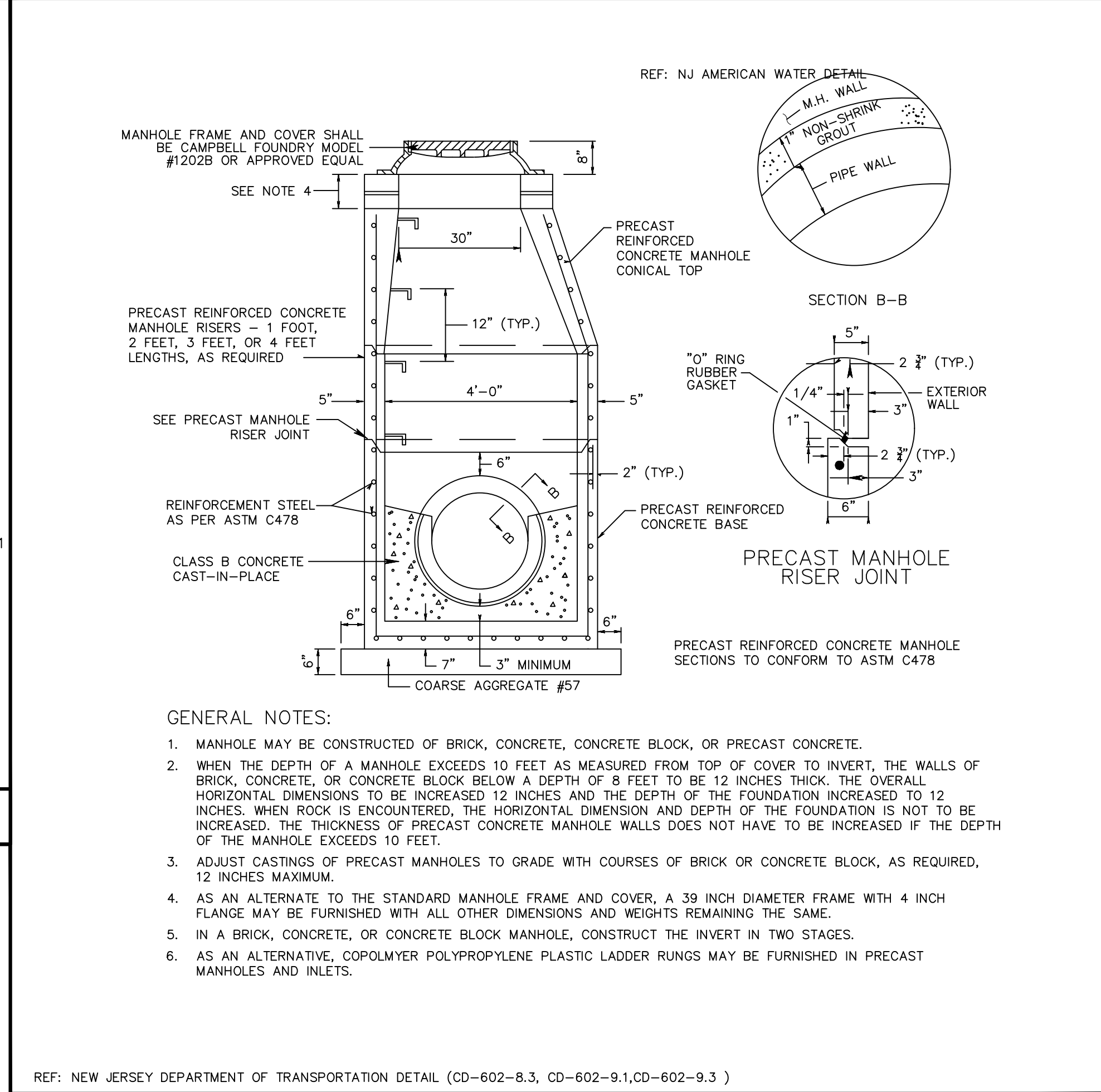
INLET TYPE B (NJDOT DETAIL)



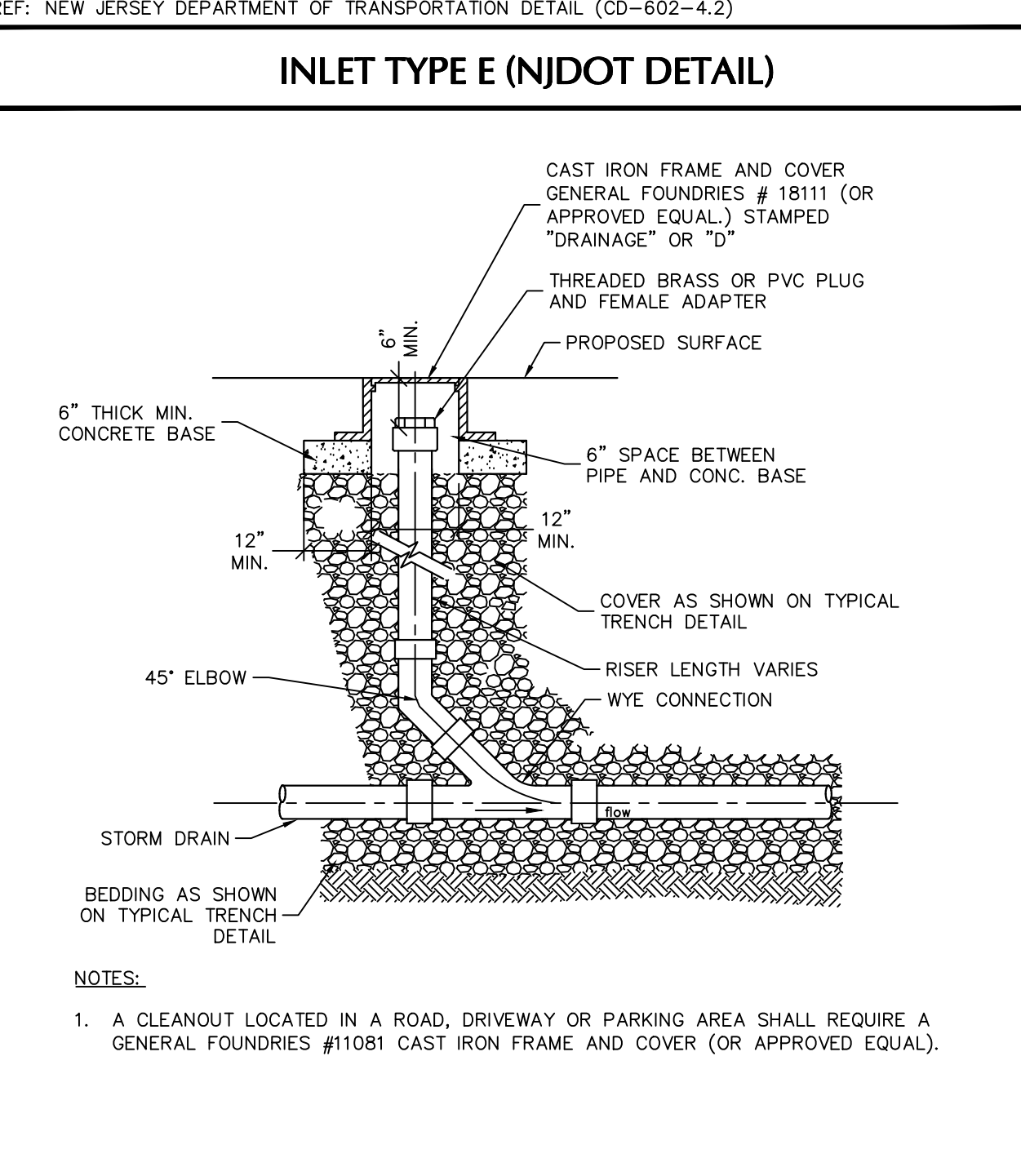
INLET TYPE E (NJDOT DETAIL)



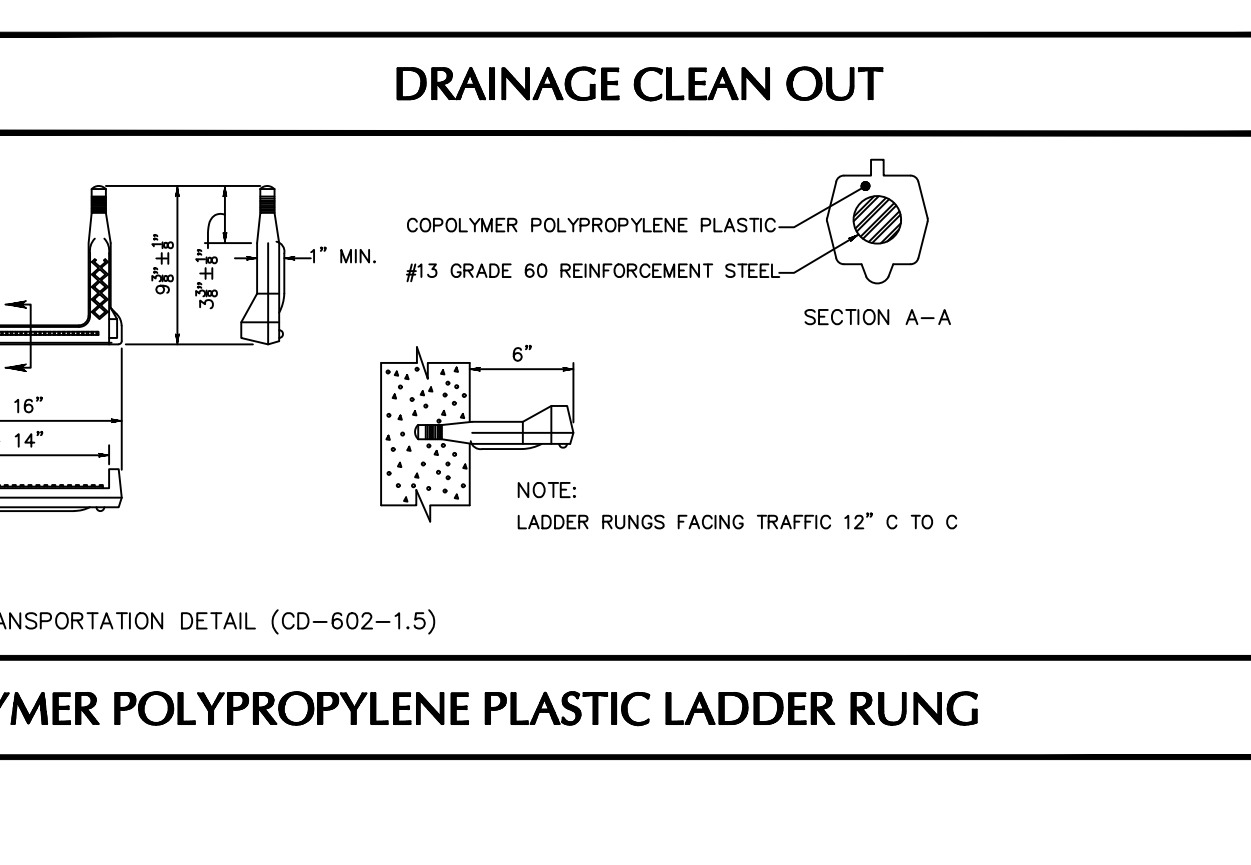
STORM MANHOLE FRAME AND COVER (NJDOT DETAIL)



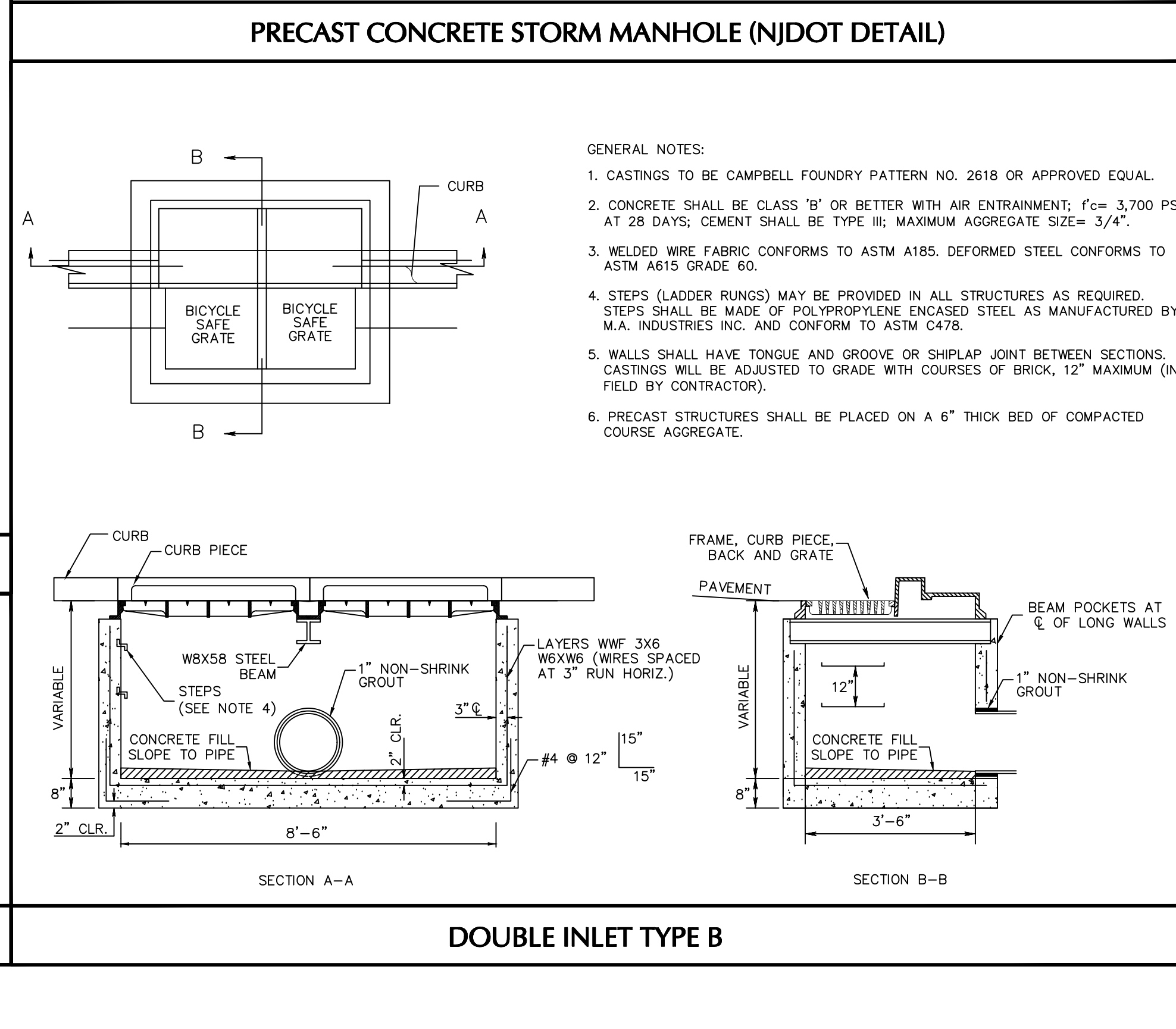
PRECAST CONCRETE STORM MANHOLE (NJDOT DETAIL)



DRAINAGE CLEAN OUT



COPOLYMER POLYPROPYLENE PLASTIC LADDER RUNG



DOUBLE INLET TYPE B

Date	Description	No.
3/27/2020	REVISED FOR BOROUGH, COUNTY, AND NJDEP COMMENTS	2
1/30/2020	REVISED FOR BOROUGH ENGINEER AND NJDEP COMMENTS	1

Date	Description	No.
04/08/2020	SIGNATURE RICHARD BURROW DATE SIGNED PROFESSIONAL ENGINEER NJ Lic. No. 24GE04459300	1

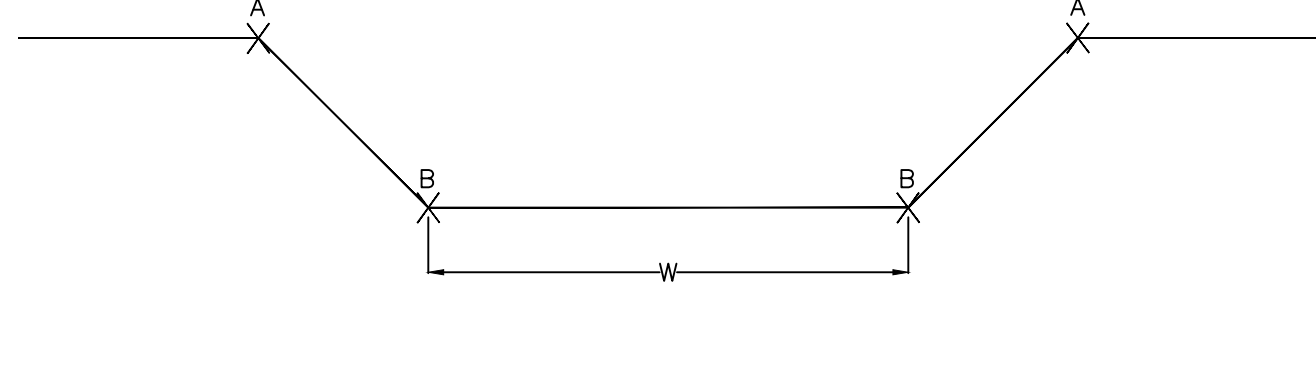
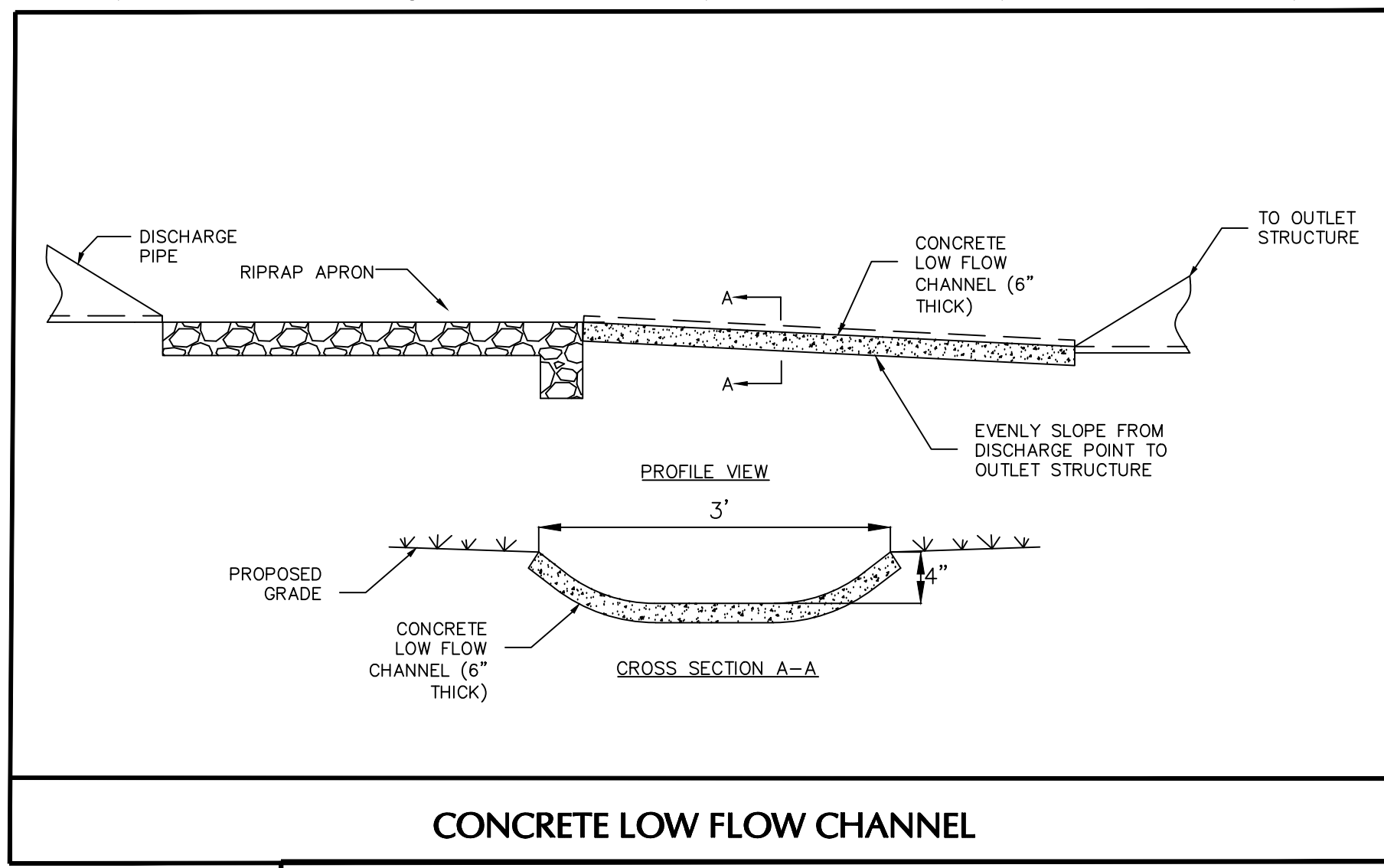
**LANGAN**  
Langan Engineering and Environmental Services, Inc.  
300 Kimball Drive  
Parsippany, NJ 07054  
T: 973.560.4900 F: 973.560.4901 www.langan.com  
NJ CERTIFICATE OF AUTHORIZATION NO. 24G042996400

Project  
**MIDDLESEX BOROUGH WAREHOUSE PROJECT**  
BLOCK No. 353, LOTS No. 1.01 AND 1.02  
BOROUGH OF MIDDLESEX  
MIDDLESEX COUNTY NEW JERSEY

Drawing Title  
**CONSTRUCTION DETAILS II**

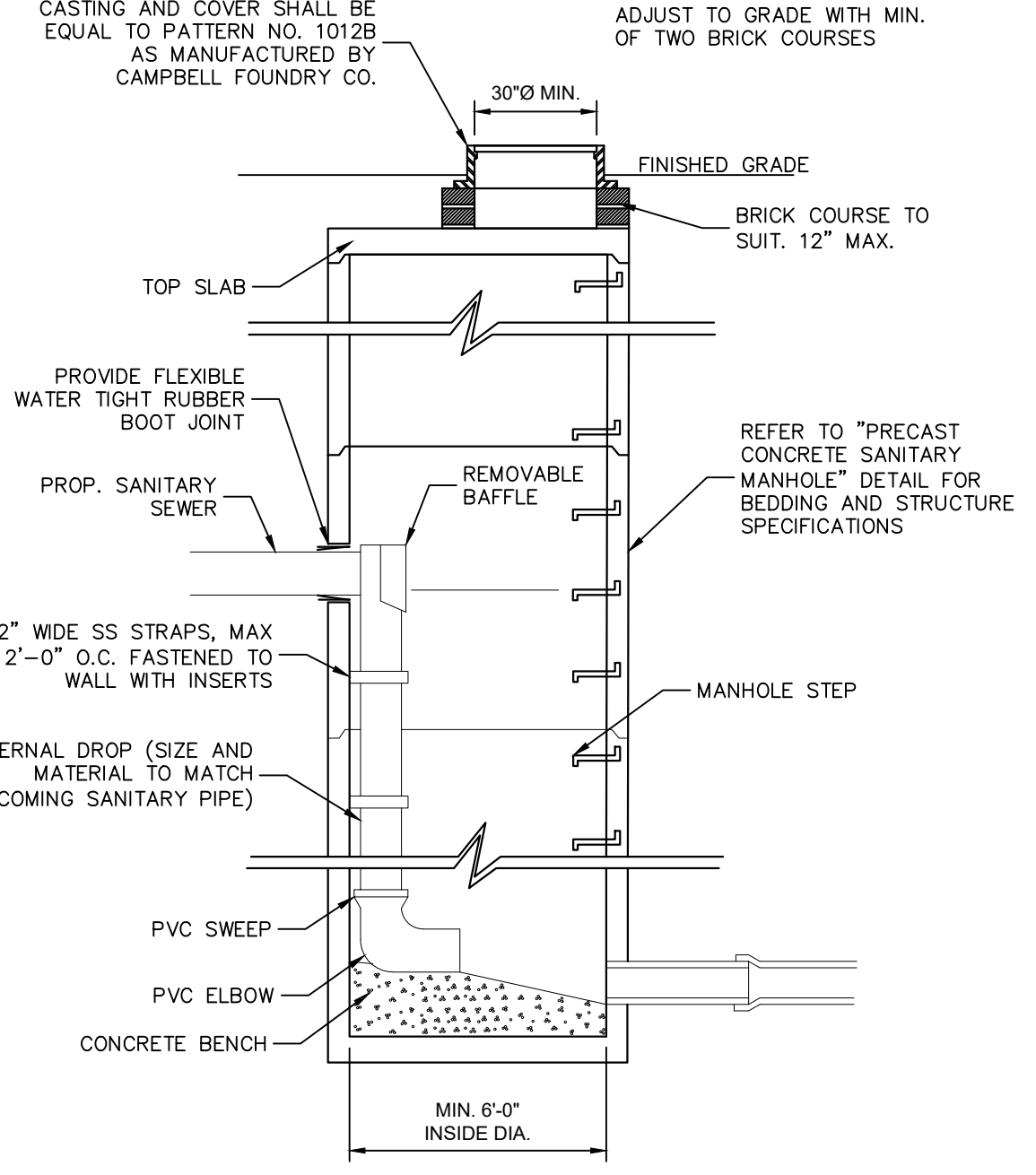
Project No. 100594413  
Date 7/8/2019  
Scale N.T.S.  
Drawn By JEI Checked By MRW

Project No. 100594413  
Drawing No. CS502  
Sheet 18 of 22

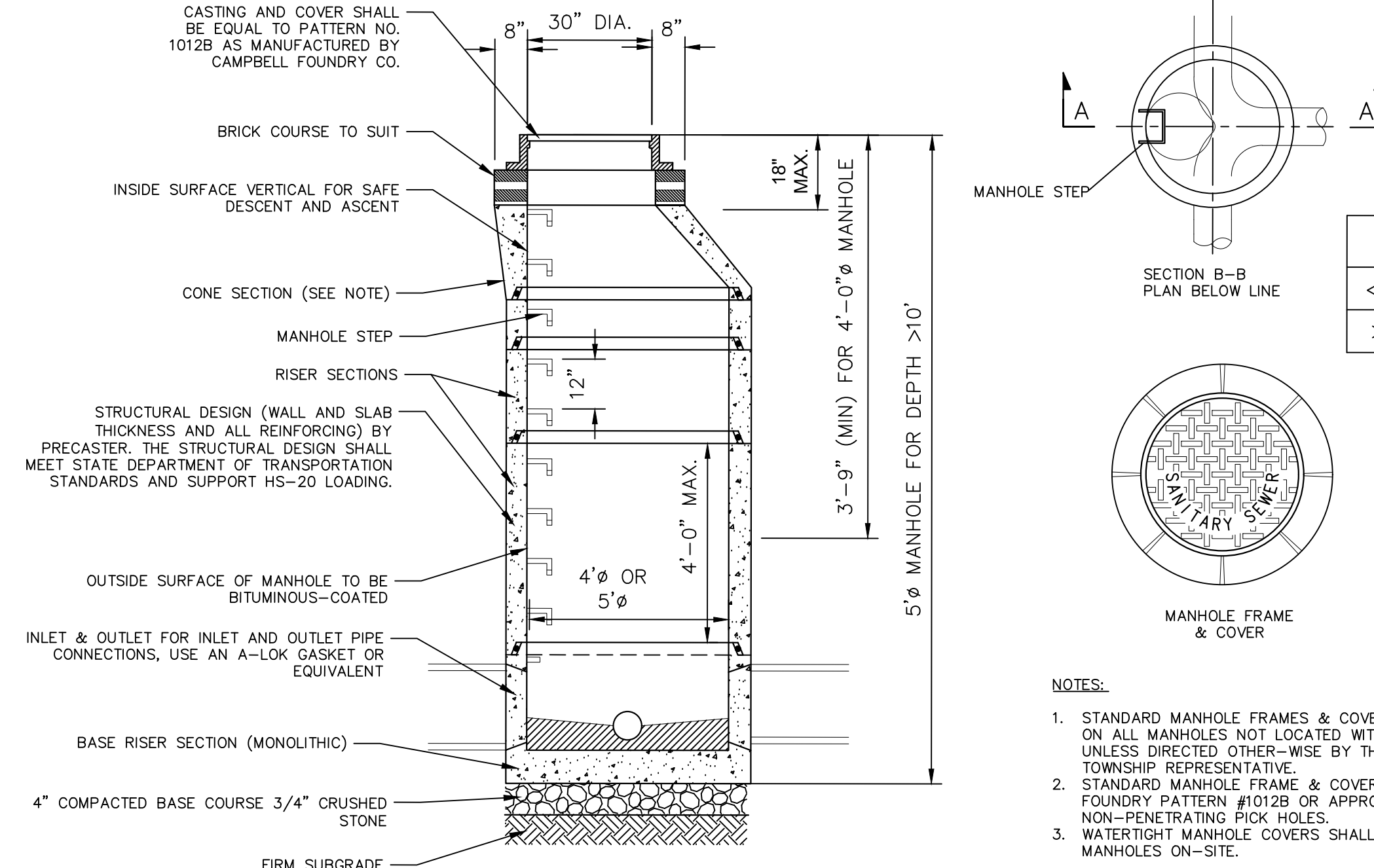


SPILLWAY	W(H)	Elevation	B(Elevation)
Bio 1	5	40.72	39.56
Bio 2	29	39.80	38.82
Det 1	30	38.53	37.58
Det 2	65	35.00	34.50

EMERGENCY SPILLWAY DETAIL

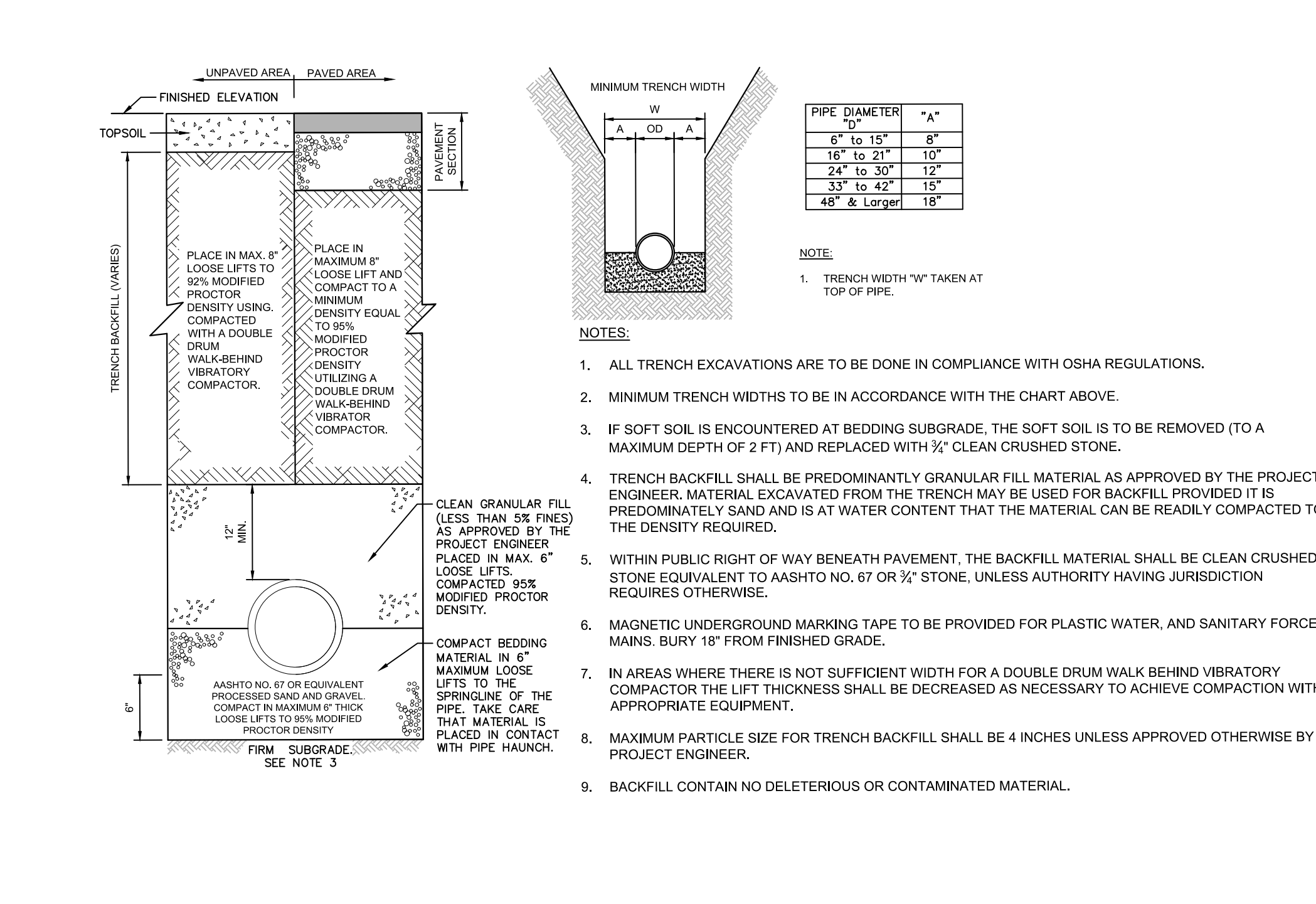


DROP SANITARY MANHOLE

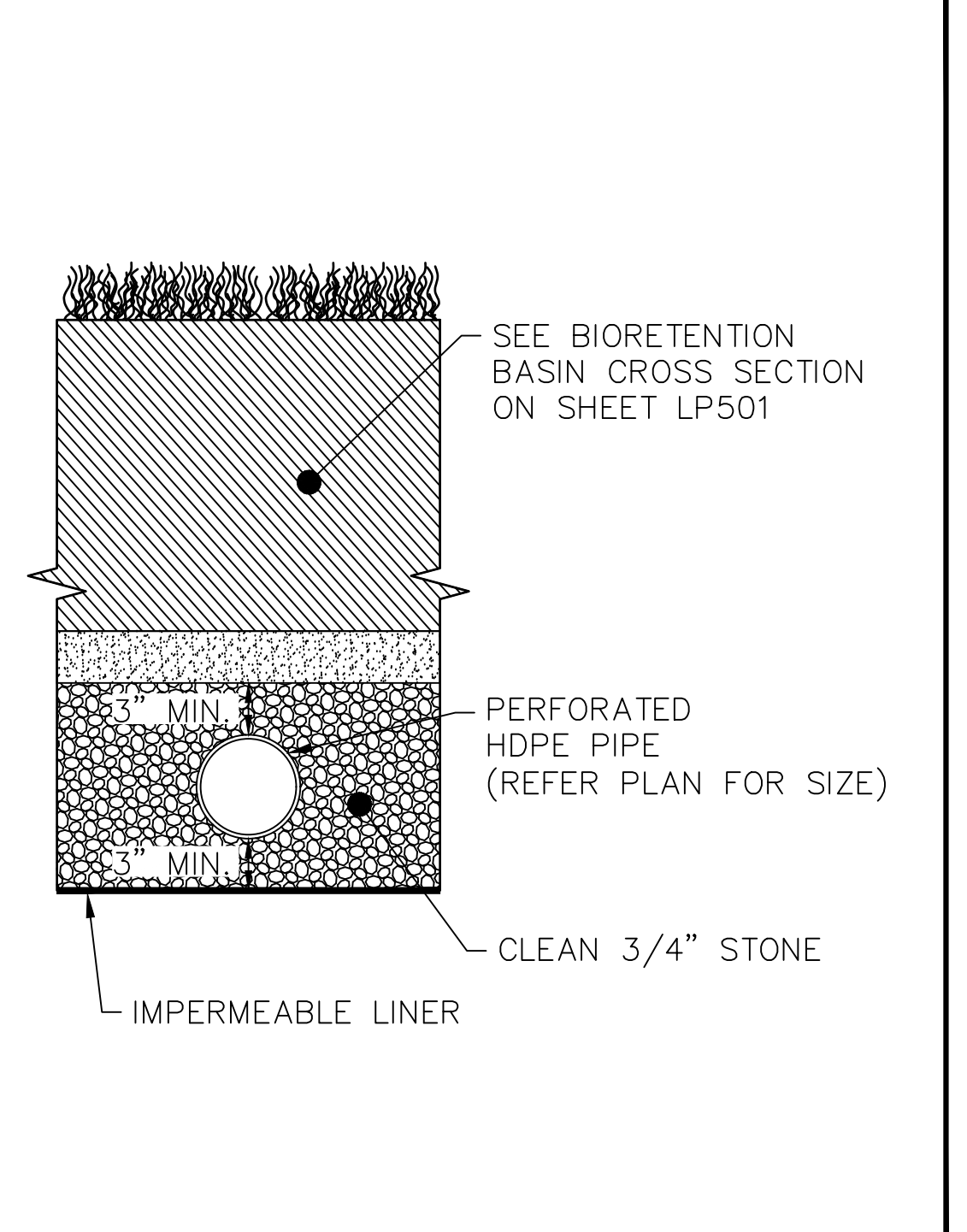


- SANITARY MANHOLE NOTES:**
1. THE DEPTH OF THE INVERT CHANNEL SHALL BE EQUAL TO 3/4 OF THE DIAMETER OF THE SEWER.
  2. THE SHELVE SHALL SLOPE TOWARD THE INVERT CHANNEL AT A RATE OF 1" PER FOOT.
  3. ALL CONCRETE SHALL BE 4000 PSI MINIMUM.
  4. ENTIRE OUTSIDE SURFACE OF MANHOLE SHALL RECEIVE TWO COATS OF BITUMINOUS COATING, COOPER'S CREEK SEALER SP WATERPROOFER, OR APPROVED EQUAL.
  5. INSTALL 2 LAYERS OF PLASTIC PREFORMED JOINT SEALANT BETWEEN ALL SECTIONS & UNDER FRAME.
  6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF MANHOLES FOR REVIEW BY ENGINEER.
  7. 4" DIA. MANHOLE - FROM 8" TO 30" PIPES
  8. UNLESS OTHERWISE SPECIFIED, SANITARY SEWER MANHOLES SHALL HAVE LETTERS "SEWER".
  9. THE PRECAST CONCRETE STRUCTURE SHALL COMPLY WITH ASTM SPECIFICATIONS C478.
  10. ALL SANITARY SEWER MANHOLES ARE TO BE CONSTRUCTED WITH THE COMPRESSION TYPE RESILIENT SEAL ASSEMBLY EQUAL TO "OMEGA CONCRETE PRODUCTS INC."
  11. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FURNISH AND CONSTRUCT THE PROPER SIZE STRUCTURE INCLUDING THE NECESSARY OPENINGS TO ACCOMMODATE THE WORK, AS SHOWN ON THE PLANS OR ORDERED BY THE ENGINEER, AT NO ADDITIONAL COST.
  12. ALL NECESSARY PATCHING SHALL BE ACCOMPLISHED WITH A NON-SHRINKING CEMENT MORTAR GROUT EQUAL TO "SIKA-SE" AS MANUFACTURED BY THE SIKHA CHEMICAL CORPORATION.
  13. FOR INTERNAL DROP OF 2 FT OR MORE, A DROP CONNECTION MUST BE USED. SEE SEPARATE DETAIL FOR SANITARY DROP MANHOLE.

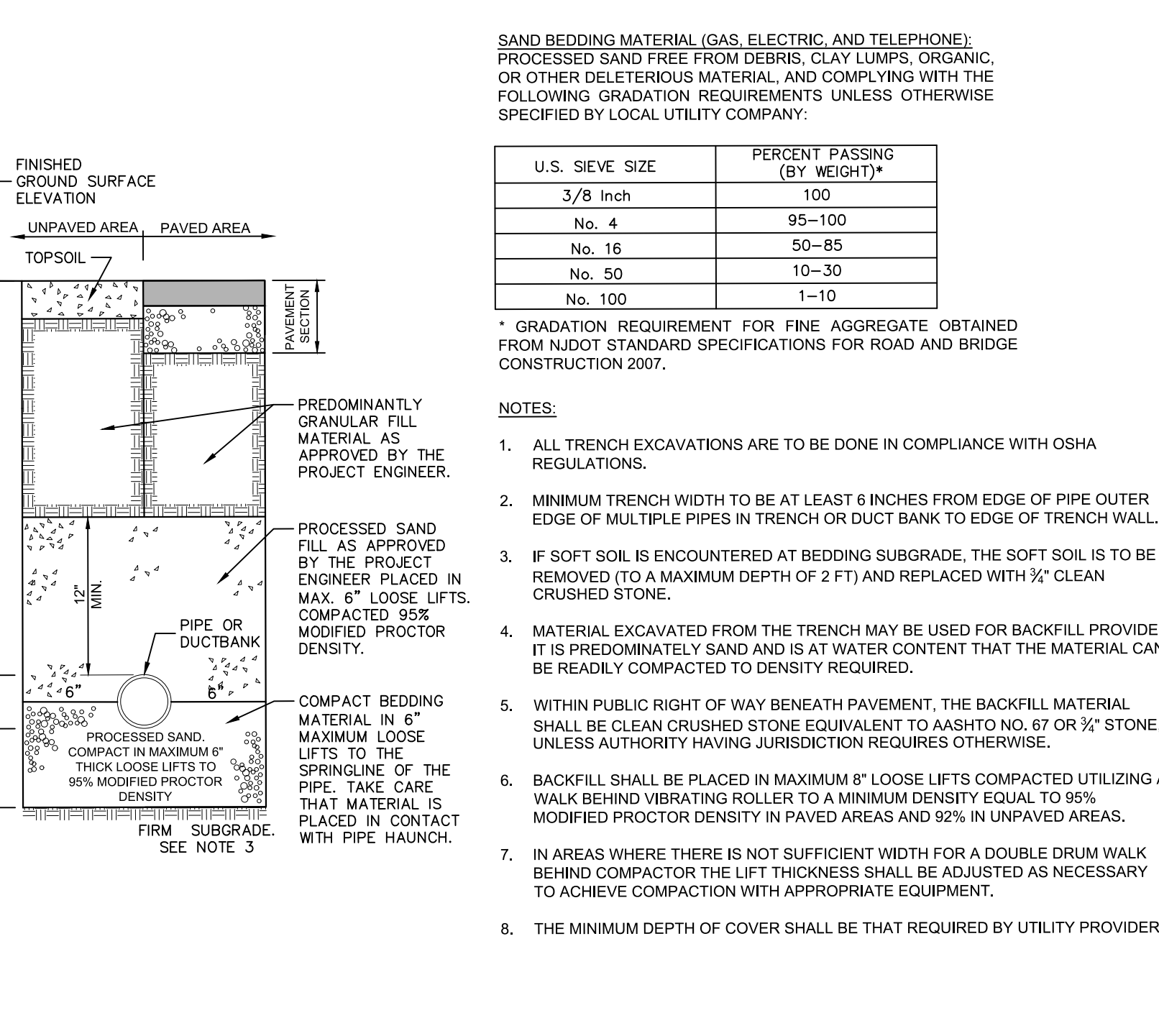
PRECAST CONCRETE SANITARY MANHOLE



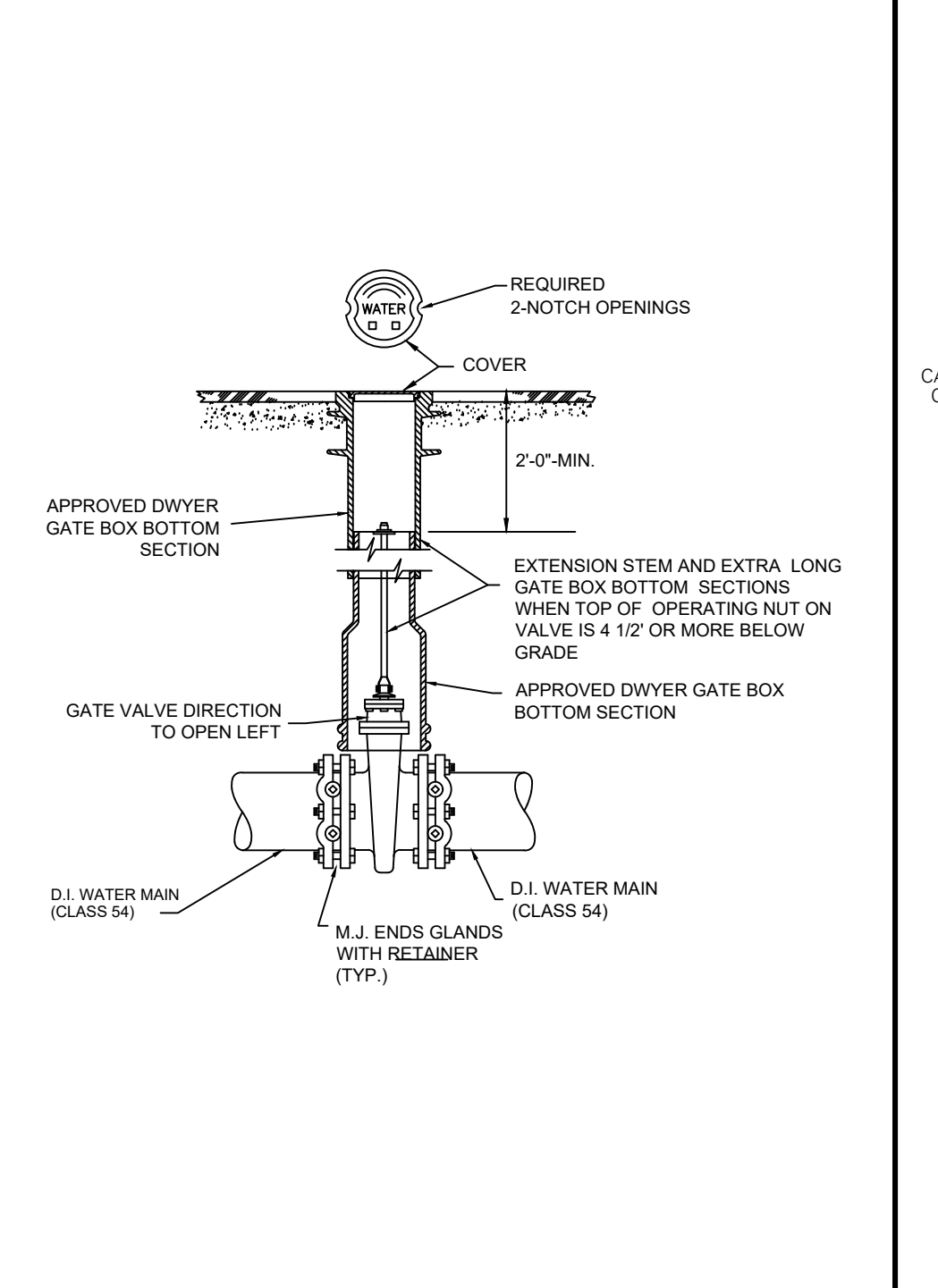
TRENCH DETAIL FOR SANITARY SEWER, WATER AND STORM SEWER PIPE



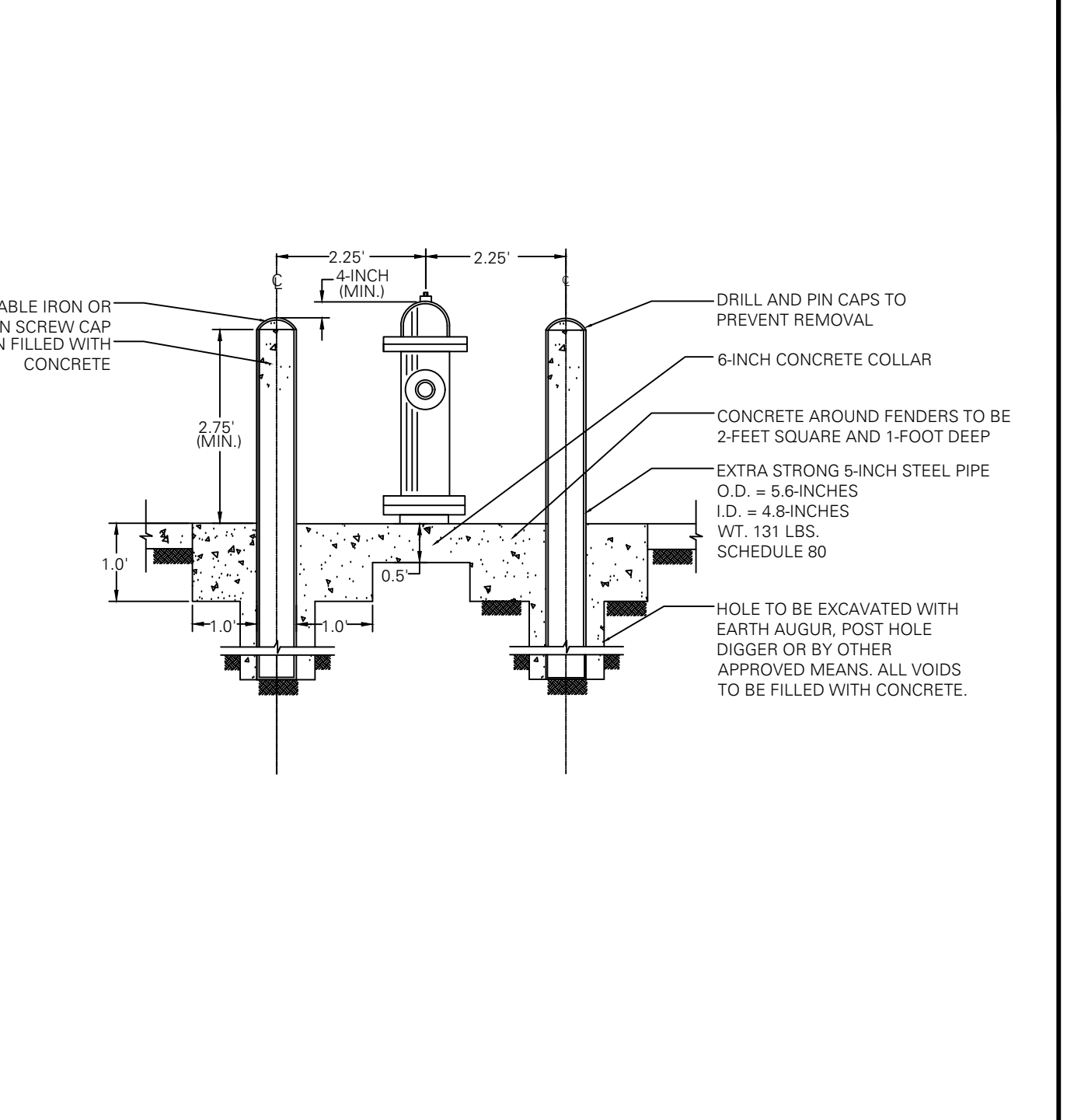
BIORETENTION BASIN UNDERDRAIN



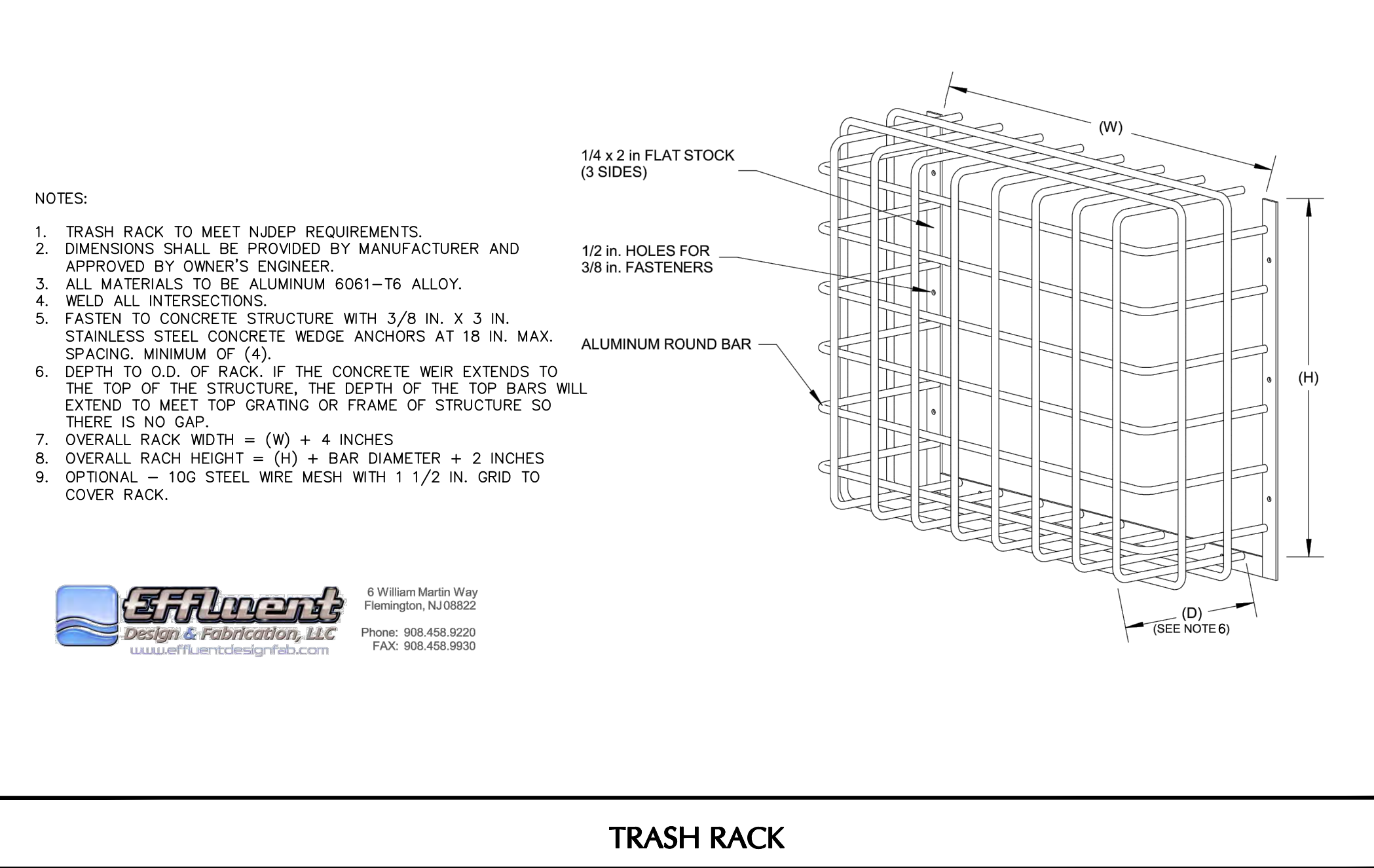
TRENCH DETAIL FOR GAS, ELECTRIC, CABLE AND TELEPHONE



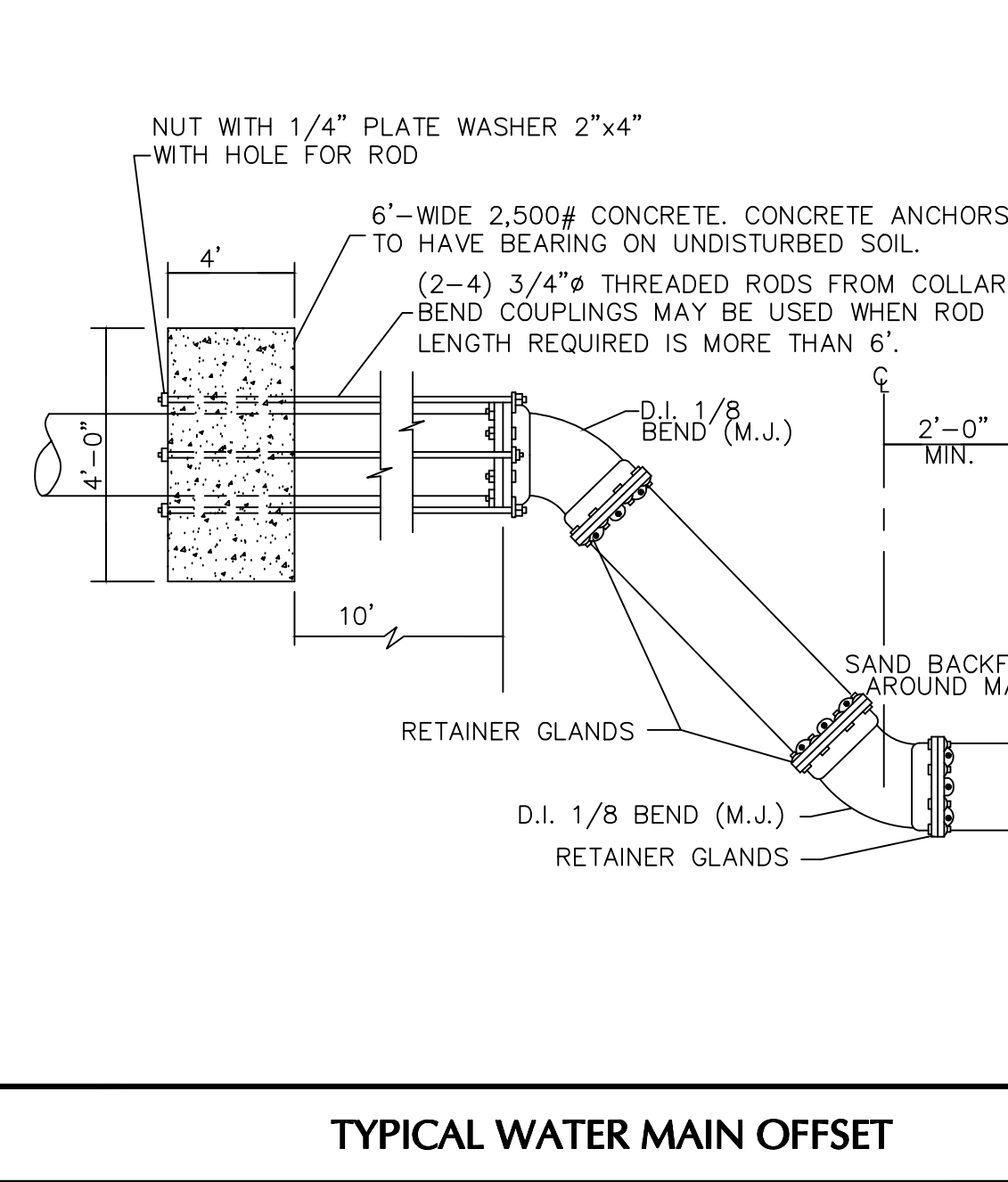
GATE VALVE INSTALLATION



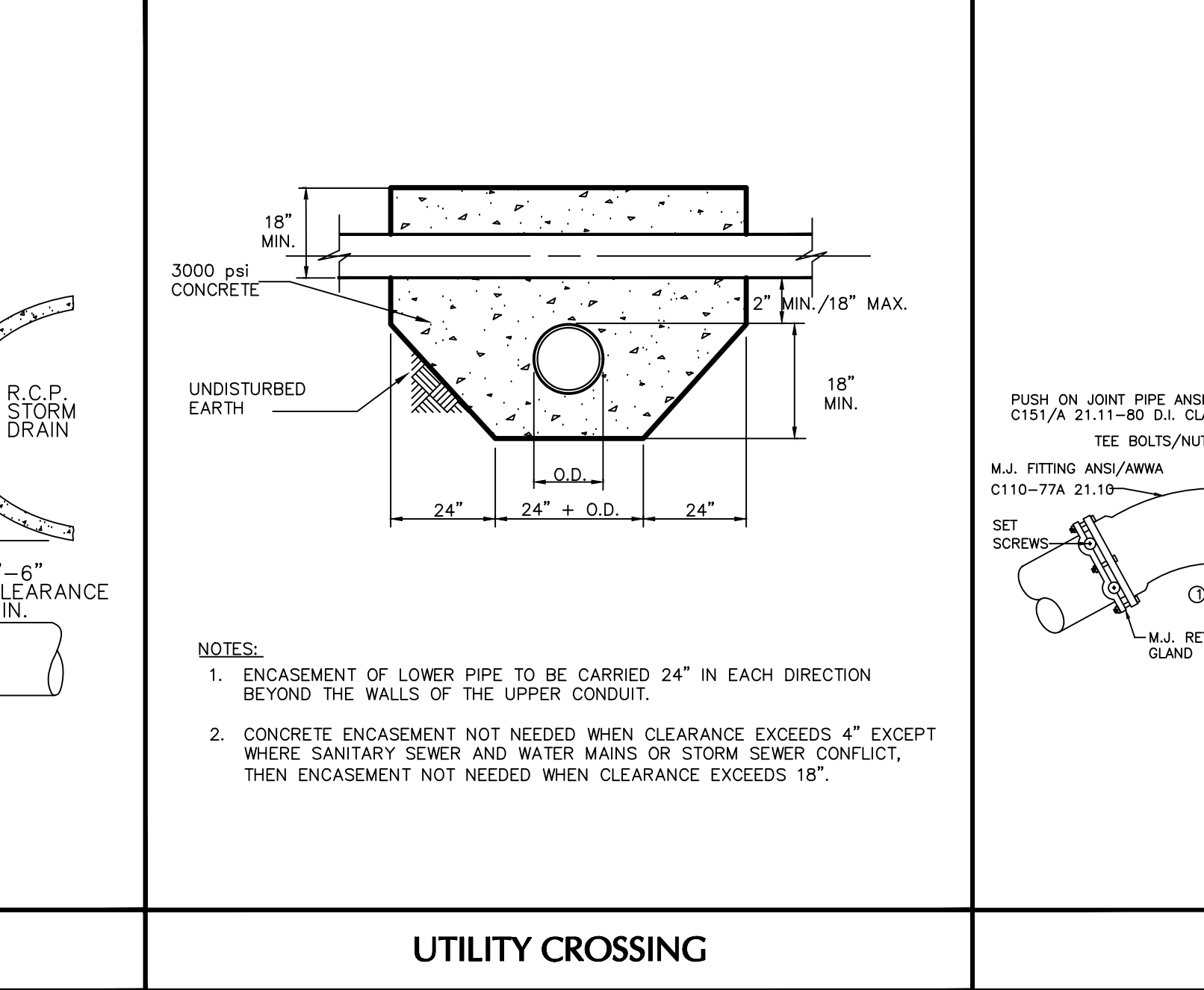
HYDRANT BOLLARDS



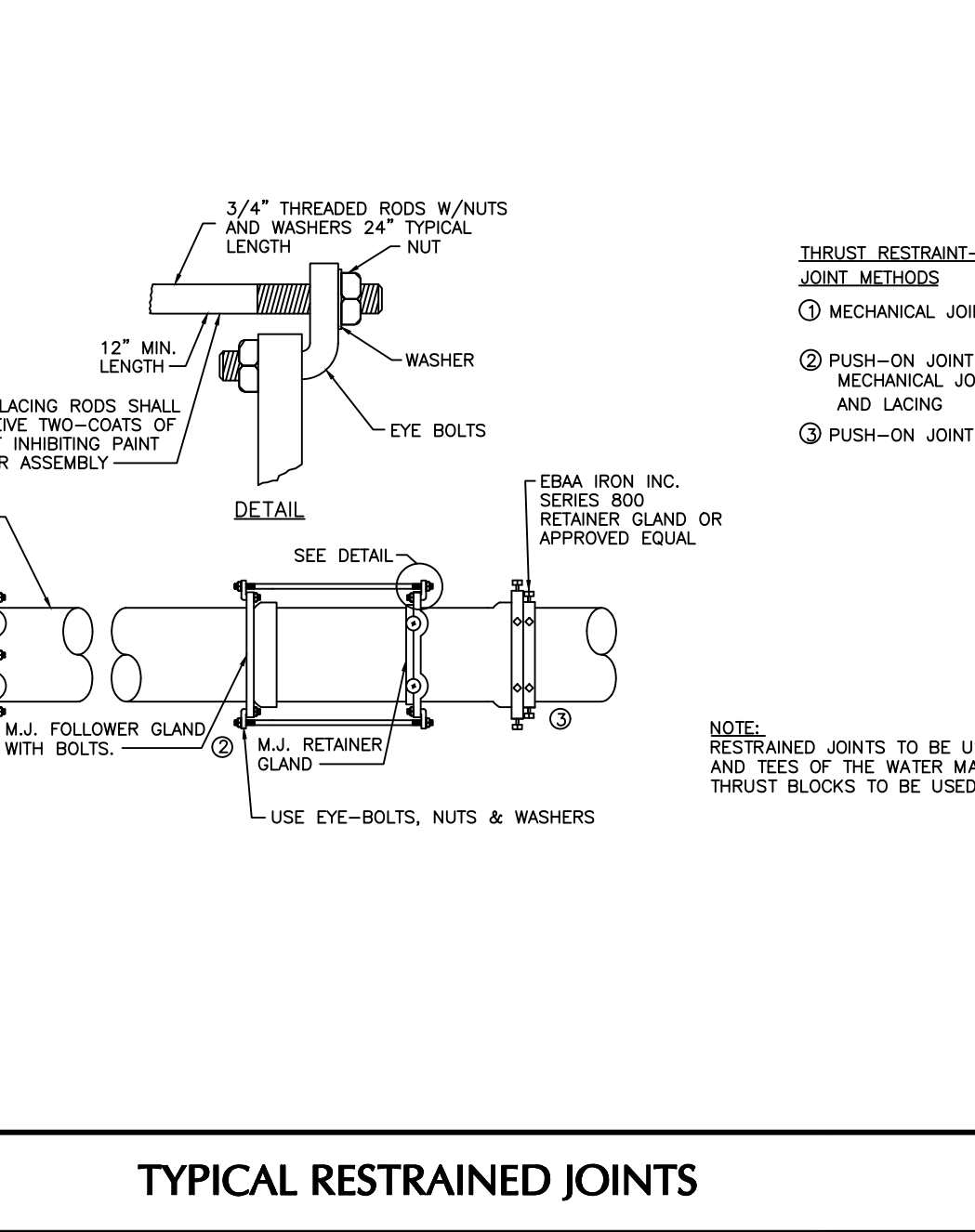
TRASH RACK



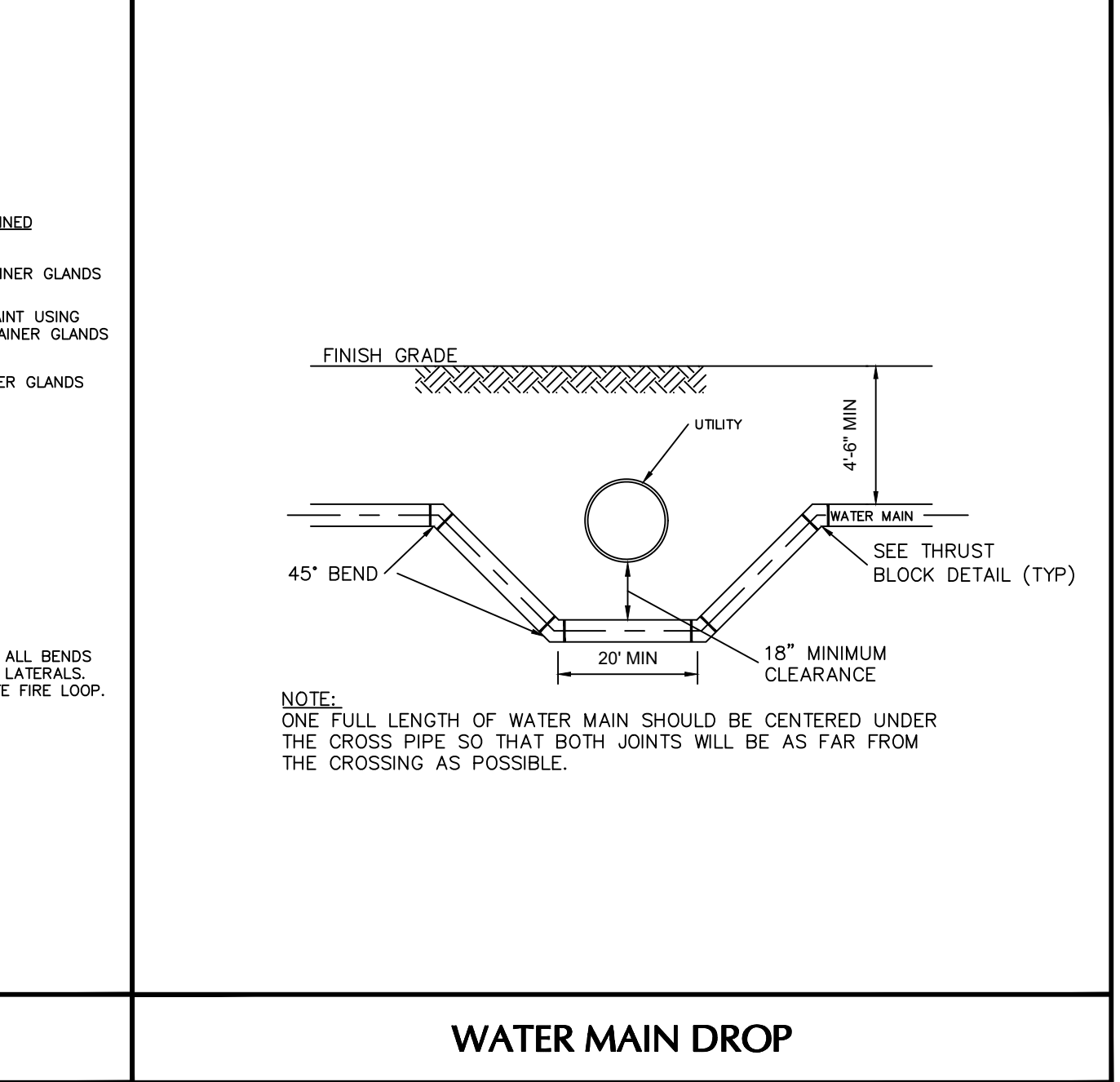
TYPICAL WATER MAIN OFFSET



UTILITY CROSSING



TYPICAL RESTRAINED JOINTS



WATER MAIN DROP

Date	Description	No.
3/27/2020	REVISED FOR BOROUGH, COUNTY, AND NJDEP COMMENTS	2
1/30/2020	REVISED FOR BOROUGH ENGINEER AND NJDEP COMMENTS	1

SIGNATURE: DATE SIGNED: 04/08/2020  
 PROFESSIONAL ENGINEER NJ Lic. No. 24GE04459300

**LANGAN**  
 Langan Engineering and Environmental Services, Inc.  
 300 Kimball Drive  
 Parsippany, NJ 07054

Project: **MIDDLESEX BOROUGH WAREHOUSE PROJECT**  
 BLOCK No. 353, LOTS No. 1.01 AND 1.02  
 BOROUGH OF MIDDLESEX  
 MIDDLESEX COUNTY NEW JERSEY

Drawing Title: **CONSTRUCTION DETAILS III**

Project No. **100594413**  
 Date: **7/8/2019**  
 Scale: **N.T.S.**  
 Drawing No. **CS503**  
 Sheet 19 of 22



**GENERAL NOTES:**

- COVER OVER TOP OF PIPE SHALL BE BELOW FROST LINE OR 30" MINIMUM IN NON-FROST AREAS OR ACCORDING TO REGULATORY REQUIREMENTS. IF GRADING PLANS RECEIVED BY THE ENGINEER/OWNER WITH THE REQUEST FOR WATER MAIN LAYOUT INDICATE ADJUSTMENTS TO EXISTING GRADE, THEN PIPE SHALL BE INSTALLED TO MEET MINIMUM AND MAXIMUM COVER FROM PROPOSED GRADES SHOWN ON SAID PLANS.
- THRUST BLOCKS SHALL BE BUILT AGAINST UNDISTURBED SOIL WITH ADEQUATE BACKING TO PREVENT MOVEMENT OF FITTING.
- NO THRUST BLOCKS TO BE PLACED IN SEWER LATERAL DITCHES.
- THRUST BLOCKING MUST FIT IN EASEMENT, IN SOME CASES ADDITIONAL RESTRAINT MAY BE REQUIRED.
- DIMENSION "C" BASED ON MINIMUM BEARING AREA, 18" MINIMUM.
- POLYETHYLENE ENCASUREMENT ON ALL D.I. PIPE AND FITTINGS.
- PIPE JOINTS AND BOLTS MUST BE ACCESSIBLE.
- ALL ANCHOR BOLTS SHALL BE COR-BLUE, MINIMUM 1/2" DIAMETER, COAT EXPOSED ROD WITH APPROVED MATERIAL AFTER CONCRETE HAS SET.
- ALLOW SUFFICIENT CLEARANCE BETWEEN CONCRETE AND BOLTS FOR FUTURE MAINTENANCE.
- ALL M.W. AND F.L.G. FITTINGS TO RECEIVE THRUST BLOCKS SHALL HAVE THE FASTENER AREAS FELT WRAPPED AND TAPPED PRIOR TO THE CONCRETE POUR TO ALLOW FUTURE ACCESS TO THE FASTENERS AT THE JOINTS.
- THRUST BLOCKING DETAILS ARE SHOWN HERE FOR TYPICAL INSTALLATIONS. IN SOME CASES, ADDITIONAL RESTRAINT MAY BE REQUIRED.
- PORTLAND CEMENT CONCRETE USED FOR THRUST BLOCKS SHALL BE 3000 PSI CONCRETE (MIN.).

**SECTION A-A**  
N.T.S.

\* BEARING AREAS ARE BASED ON SOIL HAVING AN ALLOWABLE SAFE LATERAL BEARING OF 2000 POUNDS PER SQUARE FOOT AND 200 PSI TEST PRESSURE. AREA MUST BE REVISED FOR SOILS WITH A LOWER BEARING CAPACITY OR HIGHER TEST PRESSURE.

REF: NJ AMERICAN WATER DETAIL

**THRUST BLOCK AT HORIZONTAL BENDS EXCEEDING 3-FT IN THICKNESS**

**GENERAL NOTES:**

- COVER OVER TOP OF PIPE SHALL BE BELOW FROST LINE OR 30" MINIMUM IN NON-FROST AREAS OR ACCORDING TO REGULATORY REQUIREMENTS. IF GRADING PLANS RECEIVED BY THE ENGINEER/OWNER WITH THE REQUEST FOR WATER MAIN LAYOUT INDICATE ADJUSTMENTS TO EXISTING GRADE, THEN PIPE SHALL BE INSTALLED TO MEET MINIMUM AND MAXIMUM COVER FROM PROPOSED GRADES SHOWN ON SAID PLANS.
- THRUST BLOCKS SHALL BE BUILT AGAINST UNDISTURBED SOIL WITH ADEQUATE BACKING TO PREVENT MOVEMENT OF FITTING.
- NO THRUST BLOCKS TO BE PLACED IN SEWER LATERAL DITCHES.
- THRUST BLOCKING MUST FIT IN EASEMENT, IN SOME CASES ADDITIONAL RESTRAINT MAY BE REQUIRED.
- DIMENSION "C" BASED ON MINIMUM BEARING AREA, 18" MINIMUM.
- POLYETHYLENE ENCASUREMENT ON ALL D.I. PIPE AND FITTINGS.
- PIPE JOINTS AND BOLTS MUST BE ACCESSIBLE.
- ALL ANCHOR BOLTS SHALL BE COR-BLUE, MINIMUM 1/2" DIAMETER, COAT EXPOSED ROD WITH APPROVED MATERIAL AFTER CONCRETE HAS SET.
- ALLOW SUFFICIENT CLEARANCE BETWEEN CONCRETE AND BOLTS FOR FUTURE MAINTENANCE.
- ALL M.W. AND F.L.G. FITTINGS TO RECEIVE THRUST BLOCKS SHALL HAVE THE FASTENER AREAS FELT WRAPPED AND TAPPED PRIOR TO THE CONCRETE POUR TO ALLOW FUTURE ACCESS TO THE FASTENERS AT THE JOINTS.
- THRUST BLOCKING DETAILS ARE SHOWN HERE FOR TYPICAL INSTALLATIONS. IN SOME CASES, ADDITIONAL RESTRAINT MAY BE REQUIRED.
- PORTLAND CEMENT CONCRETE USED FOR THRUST BLOCKS SHALL BE 3000 PSI CONCRETE (MIN.).

**SECTION A-A**  
N.T.S.

\* BEARING AREAS ARE BASED ON SOIL HAVING AN ALLOWABLE SAFE LATERAL BEARING OF 2000 POUNDS PER SQUARE FOOT AND 200 PSI TEST PRESSURE. AREA MUST BE REVISED FOR SOILS WITH A LOWER BEARING CAPACITY OR HIGHER TEST PRESSURE.

REF: NJ AMERICAN WATER DETAIL

**THRUST BLOCK AT HORIZONTAL BENDS LESS THAN 3-FT IN THICKNESS**

**GENERAL NOTES:**

- COVER OVER TOP OF PIPE SHALL BE BELOW FROST LINE OR 30" MINIMUM IN NON-FROST AREAS OR ACCORDING TO REGULATORY REQUIREMENTS. IF GRADING PLANS RECEIVED BY THE ENGINEER/OWNER WITH THE REQUEST FOR WATER MAIN LAYOUT INDICATE ADJUSTMENTS TO EXISTING GRADE, THEN PIPE SHALL BE INSTALLED TO MEET MINIMUM AND MAXIMUM COVER FROM PROPOSED GRADES SHOWN ON SAID PLANS.
- THRUST BLOCKS SHALL BE BUILT AGAINST UNDISTURBED SOIL WITH ADEQUATE BACKING TO PREVENT MOVEMENT OF FITTING.
- NO THRUST BLOCKS TO BE PLACED IN SEWER LATERAL DITCHES.
- THRUST BLOCKING MUST FIT IN EASEMENT, IN SOME CASES ADDITIONAL RESTRAINT MAY BE REQUIRED.
- BASED ON 200 PSI (150 PSI STATIC PRESSURE PLUS 50 PSI WATER HAMMER) AND 2000 PSF SOIL BEARING.
- POLYETHYLENE ENCASUREMENT ON ALL D.I. PIPE AND FITTINGS.
- PIPE JOINTS AND BOLTS MUST BE ACCESSIBLE.
- ALLOW SUFFICIENT CLEARANCE BETWEEN CONCRETE AND BOLTS FOR FUTURE MAINTENANCE.
- ALL ANCHOR BOLTS SHALL BE COR-BLUE, MINIMUM 1/2" DIAMETER, COAT EXPOSED ROD WITH APPROVED MATERIAL AFTER CONCRETE HAS SET.
- ALL M.W. AND F.L.G. FITTINGS TO RECEIVE THRUST BLOCKS SHALL HAVE THE FASTENER AREAS FELT WRAPPED AND TAPPED PRIOR TO THE CONCRETE POUR TO ALLOW FUTURE ACCESS TO THE FASTENERS AT THE JOINTS.
- THRUST BLOCKING DETAILS ARE SHOWN HERE FOR TYPICAL INSTALLATIONS. IN SOME CASES, ADDITIONAL RESTRAINT MAY BE REQUIRED.
- PORTLAND CEMENT CONCRETE USED FOR THRUST BLOCKS SHALL BE 3000 PSI CONCRETE.
- FOR UNSTABLE SOIL CONDITIONS, CHECK WITH ENGINEER FOR THRUST BLOCK DIMENSIONS.
- FOR MAIN SIZES GREATER THAN 16", SEE ENGINEER FOR THRUST BLOCK DIMENSIONS.

**SECTION A-A**  
N.T.S.

REF: NJ AMERICAN WATER DETAIL

**FIRE HYDRANT DETAIL**

**NOTE:**

- FINAL DESIGN OF HOTBOX TO BE COORDINATED WITH MEP AND NEW JERSEY AMERICAN WATER.

REF: HARRINGTON GROUP INC. DETAIL

**BACKFLOW PREVENTER IN ABOVE GROUND HOTBOX**

**TYPICAL SERVICE LINE INSTALLATION**  
NEW JERSEY AMERICAN WATER COMPANY, FIELD SERVICE DEPARTMENT

REF: NJ AMERICAN WATER DETAIL

**TYPICAL SERVICE LINE INSTALLATION DETAIL**

**FREESTANDING FDC WITH CHECK VALVE IN VAULT**

REF: HARRINGTON GROUP INC. DETAIL

**FREESTANDING FDC WITH CHECK VALVE IN VAULT**

**MINIMUM BEARING AREA ON UNDISTURBED SOIL AND TYPICAL DIMENSIONS**

PIPE SIZE (IN)	90 DEGREE BENDS			45 DEGREE BENDS			TEES/CROSSES		
	AREA (SQ FT)	MIN. THICKNESS (IN)	MIN. LENGTH (IN)	AREA (SQ FT)	MIN. THICKNESS (IN)	MIN. LENGTH (IN)	AREA (SQ FT)	MIN. THICKNESS (IN)	MIN. LENGTH (IN)
1/2"	0.12	1/2"	12"	0.12	1/2"	12"	0.12	1/2"	12"
3/4"	0.18	3/4"	18"	0.18	3/4"	18"	0.18	3/4"	18"
1"	0.24	1"	24"	0.24	1"	24"	0.24	1"	24"
1 1/2"	0.45	1 1/2"	36"	0.45	1 1/2"	36"	0.45	1 1/2"	36"
2"	0.72	2"	48"	0.72	2"	48"	0.72	2"	48"
3"	1.08	3"	72"	1.08	3"	72"	1.08	3"	72"
4"	1.44	4"	96"	1.44	4"	96"	1.44	4"	96"
6"	2.16	6"	144"	2.16	6"	144"	2.16	6"	144"
8"	2.88	8"	192"	2.88	8"	192"	2.88	8"	192"
10"	3.60	10"	240"	3.60	10"	240"	3.60	10"	240"
12"	4.32	12"	288"	4.32	12"	288"	4.32	12"	288"
14"	5.04	14"	336"	5.04	14"	336"	5.04	14"	336"
16"	5.76	16"	384"	5.76	16"	384"	5.76	16"	384"

REF: NJ AMERICAN WATER DETAIL

**THRUST BLOCK DETAIL**

REVISIONS	Date	Description	No.
3/27/2020	REVISED FOR BOROUGH COUNTY, AND NJDEP COMMENTS		2
1/30/2020	REVISED FOR BOROUGH ENGINEER AND NJDEP COMMENTS		1

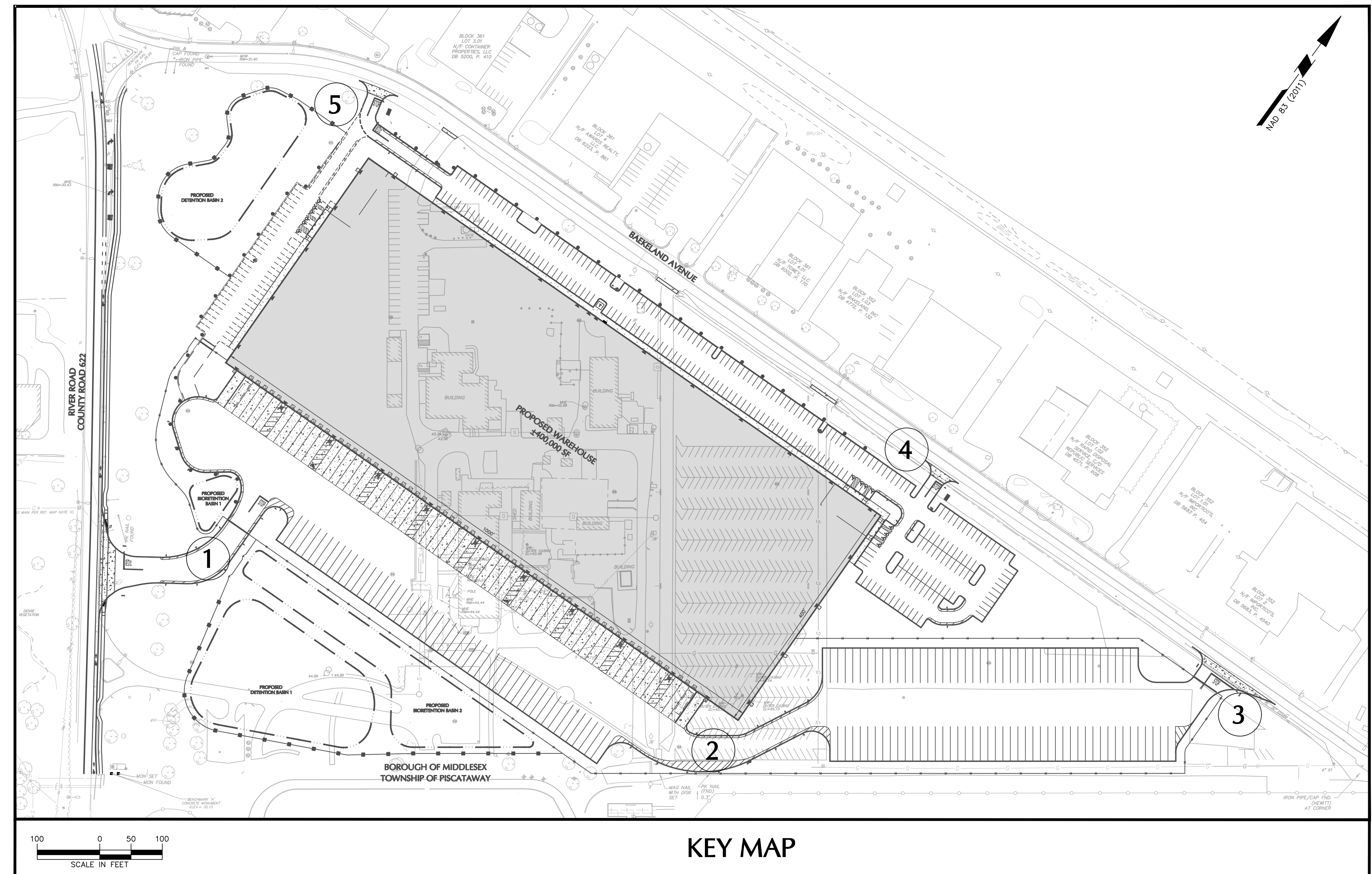
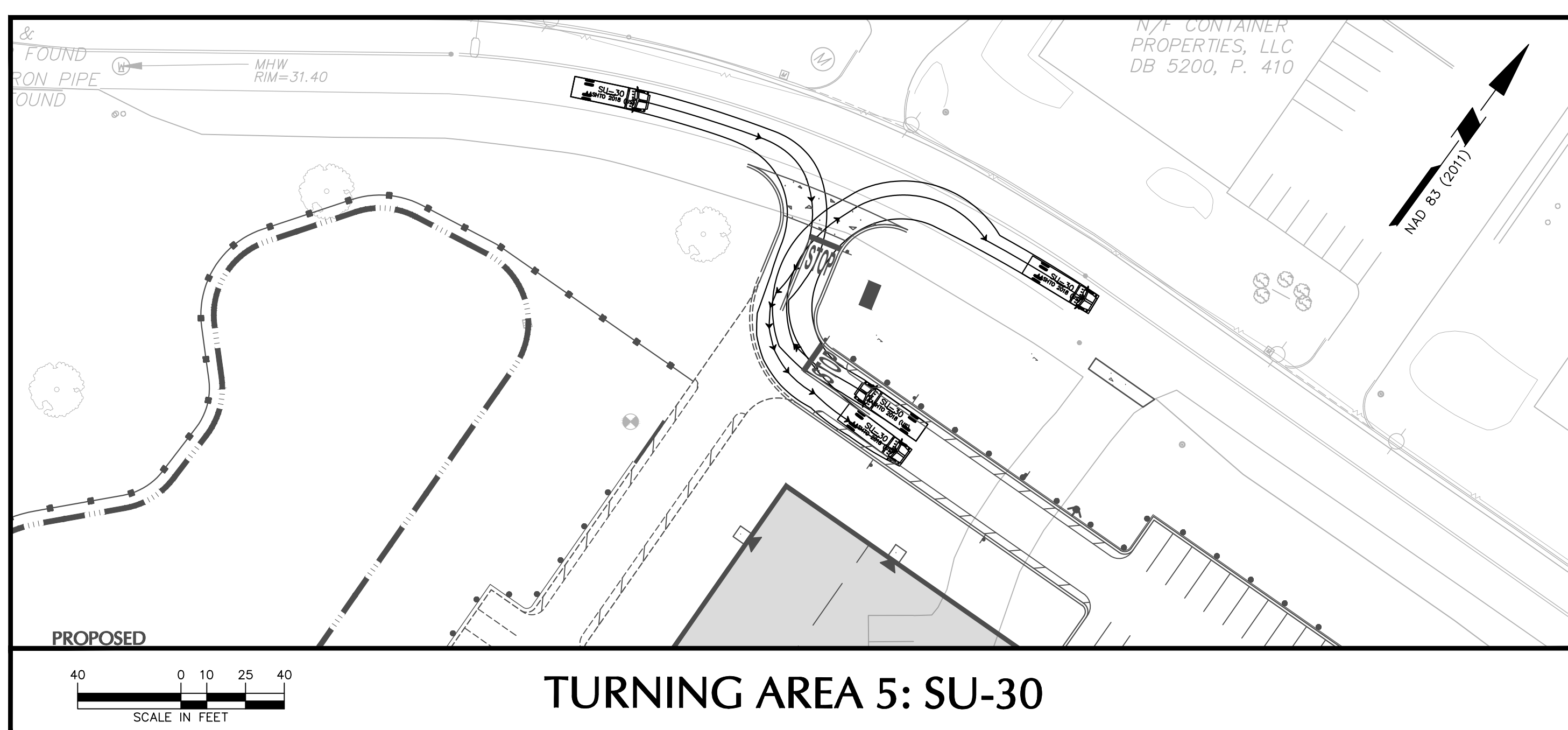
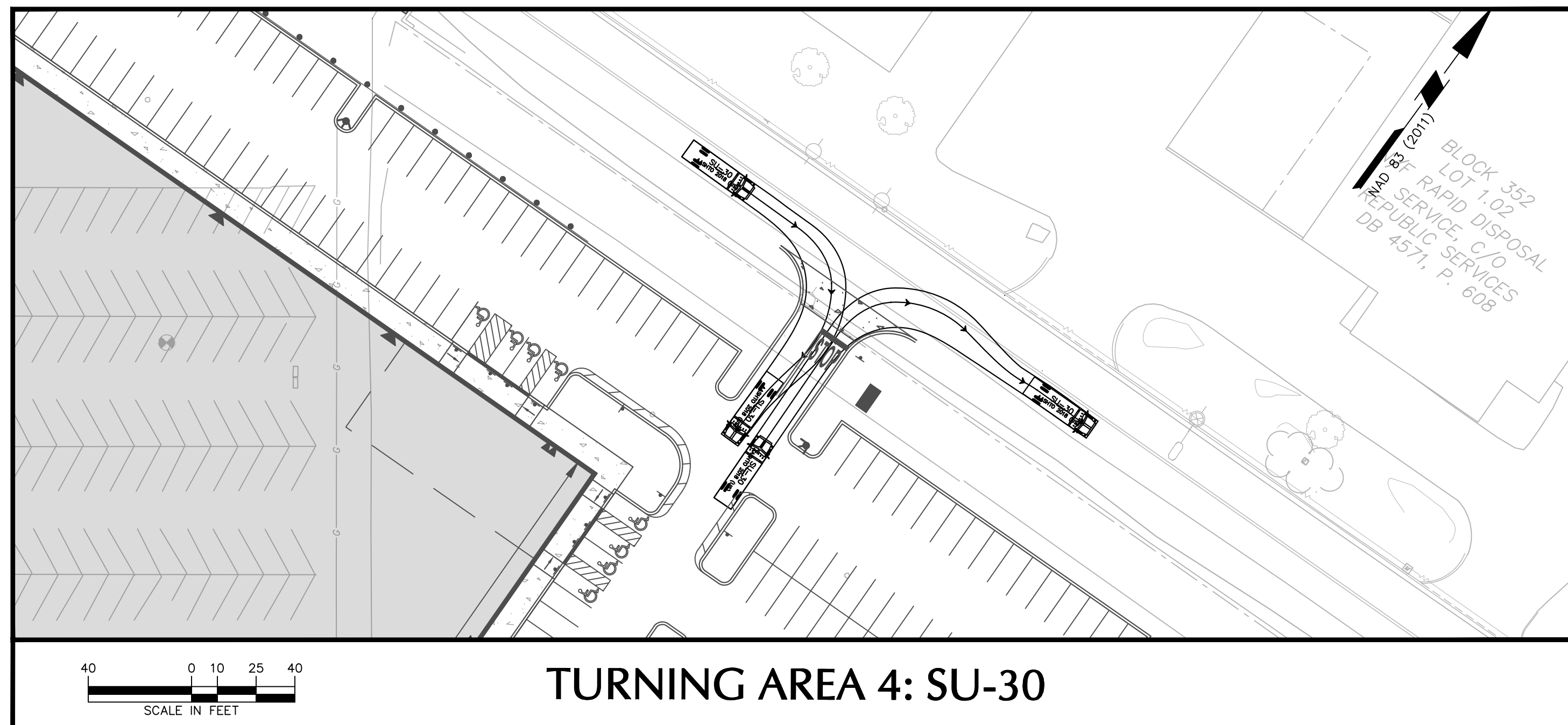
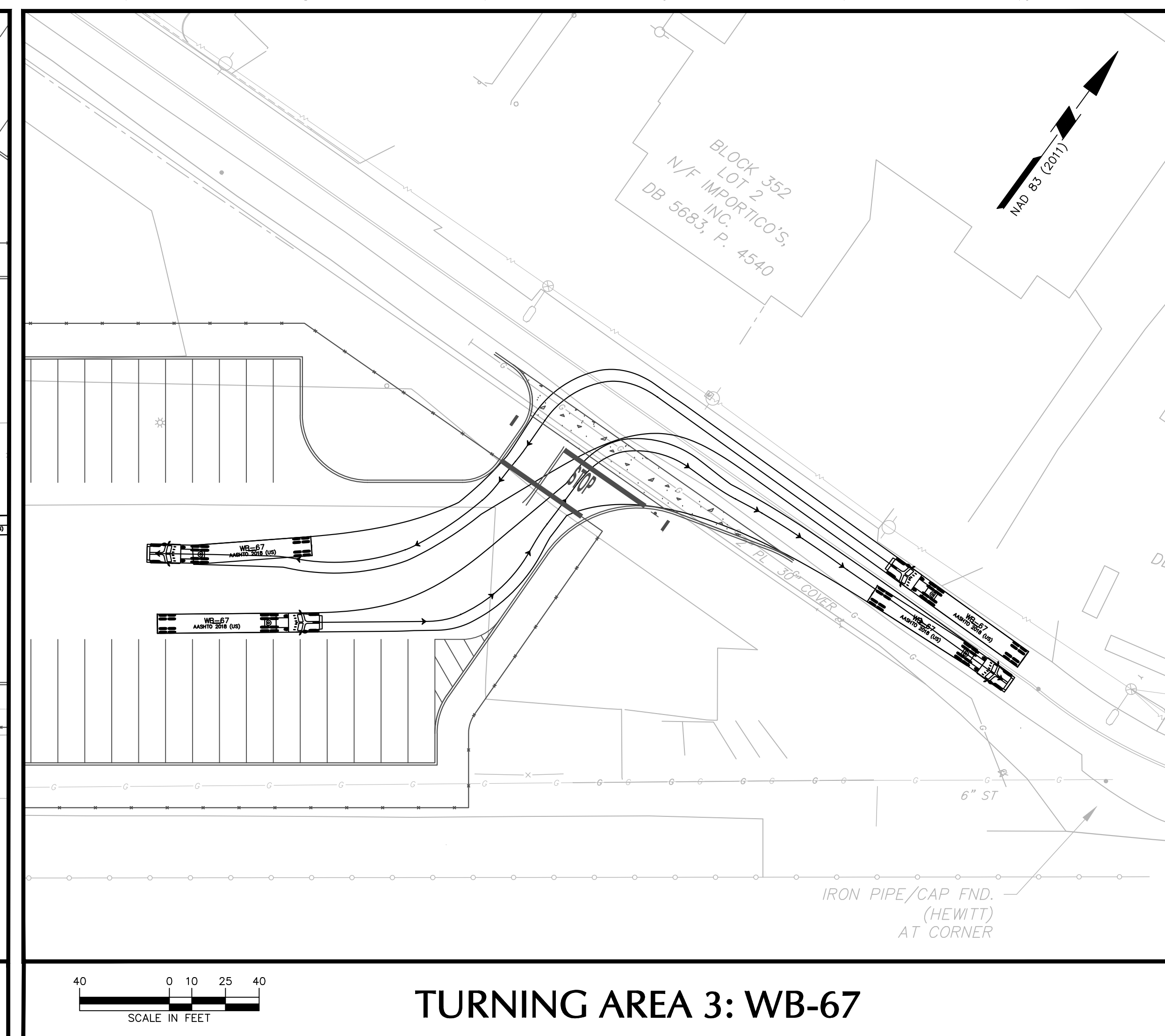
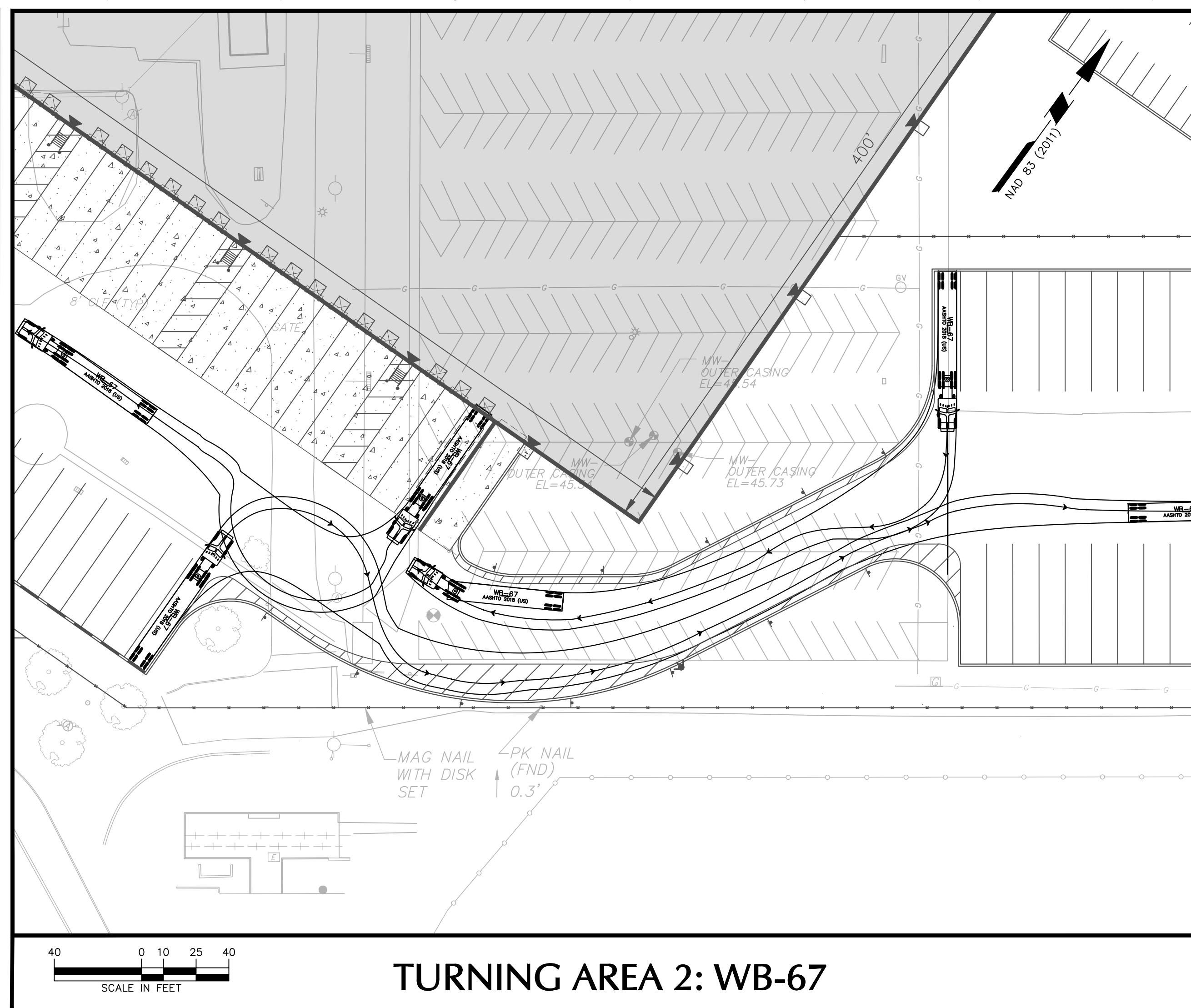
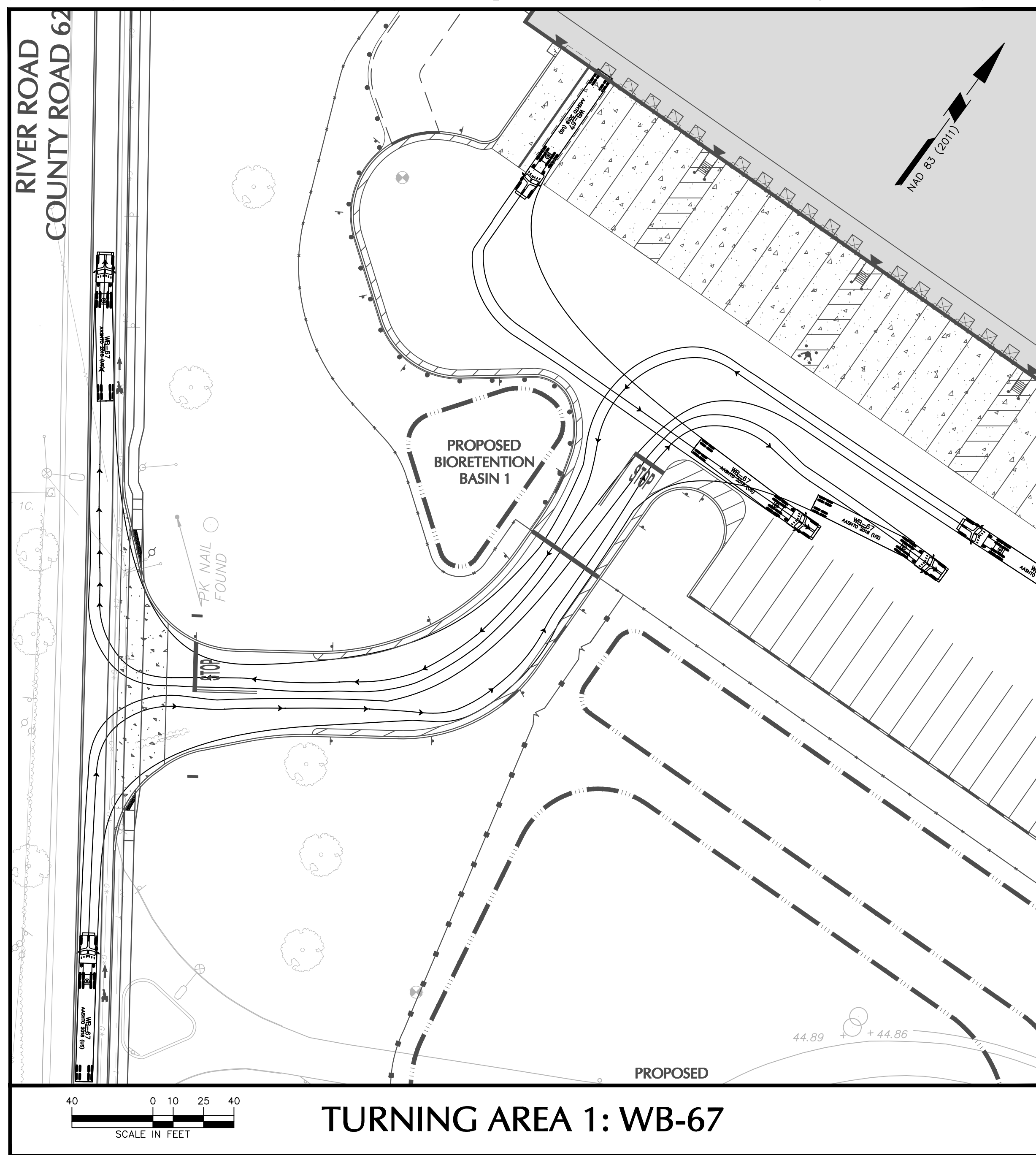
SIGNATURE: RICHARD BURROW DATE SIGNED: 04/08/2020  
PROFESSIONAL ENGINEER NJ Lic. No. 24GE04459300

**LANGAN**  
Langan Engineering and Environmental Services, Inc.  
300 Kimball Drive  
Parsippany, NJ 07054  
T: 973.560.4900 F: 973.560.4901 www.langan.com  
NJ CERTIFICATE OF AUTHORIZATION NO. 24G02796620


Project: **MIDDLESEX BOROUGH WAREHOUSE PROJECT**  
BLOCK No. 353, LOTS No. 1.01 AND 1.02  
BOROUGH OF MIDDLESEX  
MIDDLESEX COUNTY NEW JERSEY

Drawing Title: **CONSTRUCTION DETAILS IV**

Project No. 100594413  
Date: 7/8/2019  
Scale: N.T.S.  
Drawn By: JEI  
Checked By: MRW  
Drawing No. CS504  
Sheet 20 of 22



Date	Description	No.
3/27/2020	REVISED FOR BOROUGH, COUNTY, AND NJDEP COMMENTS	2
1/30/2020	REVISED FOR BOROUGH ENGINEER AND NJDEP COMMENTS	1

SIGNATURE:  RICHARD BURROW  
 PROFESSIONAL ENGINEER NJ Lic. No. 24GE04459300  
 DATE SIGNED: 04/08/2020

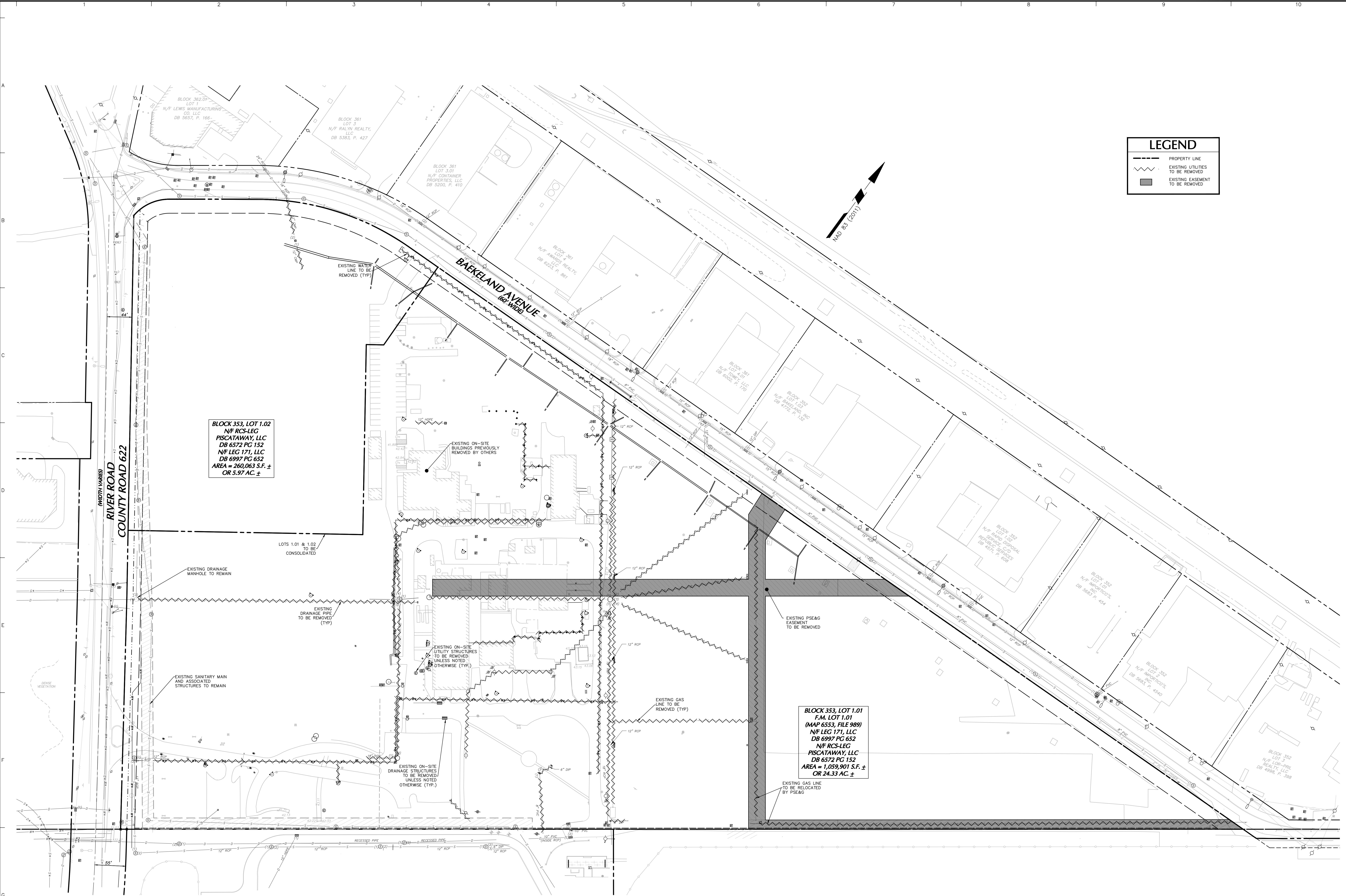
**LANGAN**  
 Langan Engineering and Environmental Services, Inc.  
 300 Kimball Drive  
 Parsippany, NJ 07054  
 T: 973.560.4900 F: 973.560.4901 www.langan.com  
 NJ CERTIFICATE OF AUTHORIZATION No. 24GA2796420

Project: **MIDDLESEX BOROUGH WAREHOUSE PROJECT**  
 BLOCK No. 353, LOTS No. 1.01 AND 1.02  
 BOROUGH OF MIDDLESEX  
 MIDDLESEX COUNTY NEW JERSEY

Drawing Title: **TRUCK CIRCULATION PLAN**

Project No. 100594413  
 Date 9/4/2019  
 Scale VARIES  
 Drawn By SLK Checked By MRW

Drawing No. **CS201**  
 Sheet 21 of 22



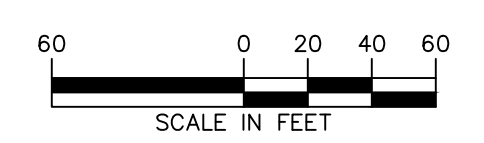
**LEGEND**

- PROPERTY LINE
- ~ EXISTING UTILITIES TO BE REMOVED
- EXISTING EASEMENT TO BE REMOVED

**BLOCK 353, LOT 1.02**  
 N/F RCS-LEG  
 PISCATAWAY, LLC  
 DB 6572 PG 152  
 N/F LEG 171, LLC  
 DB 6997 PG 652  
 AREA = 260,063 S.F. ±  
 OR 5.97 AC. ±


**BLOCK 353, LOT 1.01**  
 F.M. LOT 1.01  
 (MAP 6553, FILE 989)  
 N/F LEG 171, LLC  
 DB 6997 PG 652  
 N/F RCS-LEG  
 PISCATAWAY, LLC  
 DB 6572 PG 152  
 AREA = 1,059,901 S.F. ±  
 OR 24.33 AC. ±

REFER TO CS002 FOR GENERAL NOTES



Date	Description	No.
3/27/2020	REVISED FOR BOROUGH, COUNTY, AND NJDEP COMMENTS	2
1/30/2020	REVISED FOR BOROUGH ENGINEER AND NJDEP COMMENTS	1

REVISIONS

SIGNATURE:   
 RICHARD BURROW DATE SIGNED: 04/08/2020  
 PROFESSIONAL ENGINEER NJ Lic. No. 24GE04459300

**LANGAN**  
 Langan Engineering and Environmental Services, Inc.  
 300 Kimball Drive  
 Parsippany, NJ 07054  
 T: 973.560.4900 F: 973.560.4901 www.langan.com  
 NJ CERTIFICATE OF AUTHORIZATION No. 24GA2796420

Project: **MIDDLESEX BOROUGH WAREHOUSE PROJECT**  
 BLOCK No. 353, LOTS No. 1.01 AND 1.02  
 BOROUGH OF MIDDLESEX  
 MIDDLESEX COUNTY NEW JERSEY

Drawing Title: **UTILITY REMOVAL AND EASEMENT MODIFICATION EXHIBIT**

Project No. 100594413	Drawing No. CD101
Date 9/4/2019	Scale 1" = 60'
Drawn By SLK	Checked By MRW
Sheet 22 of 22	