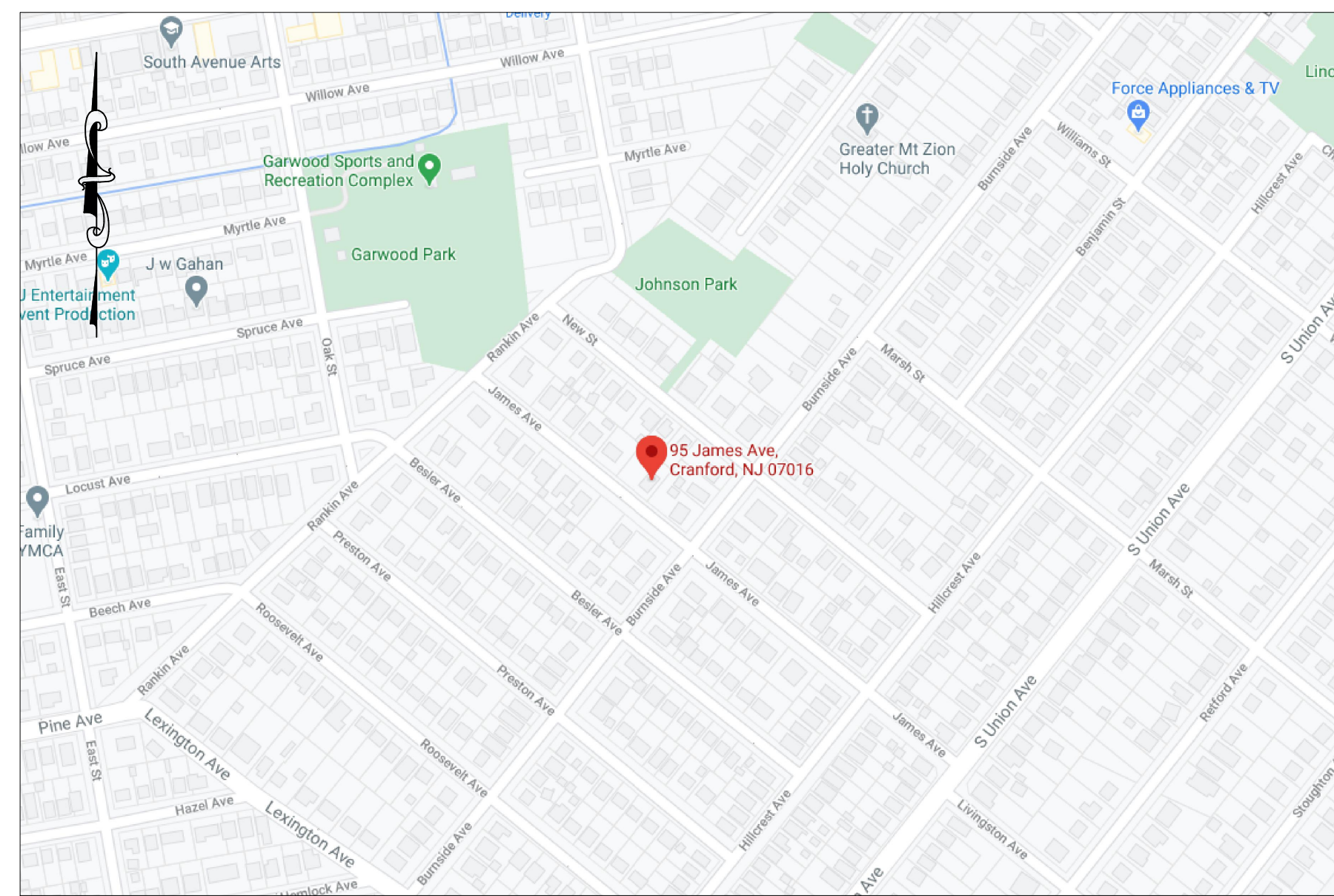


# PRELIMINARY AND FINAL MINOR SUBDIVISION PLAN

## 95 JAMES AVENUE TAX LOT 15, BLOCK 404 TOWNSHIP OF CRANFORD UNION COUNTY, NEW JERSEY

200 FEET OWNERS LIST			
BLOCK	LOT	PROPERTY LOCATION	PROPERTY OWNER & ADDRESS
405	13	106 BURNSIDE AVE	SZUKIS, JOANNA 2 COUNTY RD - 519 NEWTON, NJ 07860
405	5	86 JAMES AVE	CUCCOLO, JOHN T & MARIANNE 86 JAMES AVE CRANFORD, NJ 07016
405	4	84 JAMES AVE	WHEELER, ROBERT & CARLA 84 JAMES AVE CRANFORD, NJ 07016
413	3	3-5 NEW ST	KLIMEK, STANLEY 5 NEW ST CRANFORD, NJ 07016
413	1	95 BURNSIDE AVE	PELLINO, CARMINE & ANGELA 93 BURNSIDE AVE CRANFORD, NJ 07016
413	2	93 BURNSIDE AVE	PELLINO, CARMINE & ANGELA 93 BURNSIDE AVE CRANFORD, NJ 07016
405	11	100 BURNSIDE AVE	DR FABIO, PASQUALE & ANITA 414 HEMLOCK AVE GARWOOD, NJ 07027
405	16	114 BESLER AVE	LA BELLA, RONALD P SR & MARIA ELENA 114 BESLER AVE CRANFORD, NJ 07016
404	16	91 JAMES AVE	SZCZECZ-PATRICK & KIMBERLY A 91 JAMES AVE CRANFORD, NJ 07016
405	15	108 BESLER AVE	MARMAROU, GEORGE & SARAH 108 BESLER AVE CRANFORD, NJ 07016
405	9	94 JAMES AVE	DE GEORGE, MICHELINA 94 JAMES AVE CRANFORD, NJ 07016
403	7	112-114 NEW ST	SCHUBERT, WALTER 1064 PROSPECT AVE MOUNTAINSIDE, NJ 07092
404	10	115 NEW ST	JONES, MAXWELL & KAPLAN, EMMA 115 NEW ST CRANFORD, NJ 07016
405	14	104 BESLER AVE	WILSON, ANDREW & WEEN, LORI 104 BESLER AVE CRANFORD, NJ 07016
403	4	120 NEW ST	TAGLIA, D & MIALFANO, F/DEITZER, G 120 NEW ST CRANFORD, NJ 07016
403	5	118 NEW ST	BRYAN, RICHARD / SPENCER, LAUREN 118 NEW ST CRANFORD, NJ 07016
405	7	90 JAMES AVE	PINHEIRO, JANUARIO & FILDMEIA 90 JAMES AVE CRANFORD, NJ 07016
405	6	88 JAMES AVE	RICHARDSON, STEVEN & AGNES 88 JAMES AVE CRANFORD, NJ 07016
404	5	125 NEW ST	BUONTEMPO, RICHARD A & MARGARET M 4 CRESCENT PL CRANFORD, NJ 07016
405	8	92 JAMES AVE	DE GEORGE, MICHELINA 94 JAMES AVE CRANFORD, NJ 07016
405	12	102 BURNSIDE AVE	TICE, DANIELA 102 BURNSIDE AVE CRANFORD, NJ 07016
404	17	89 JAMES AVE	FLANAGAN, JOHN C & MARY ANN 89 JAMES AVE CRANFORD, NJ 07016
404	14	96 BURNSIDE AVE	VIGLIANTI, CHAD J 96 BURNSIDE AVE CRANFORD, NJ 07016
403	8	110 NEW ST	CARMEJO, HENRY & CAMEJO, ARMONDO 9 ALAN OKELL PL CRANFORD, NJ 07016
404	7	119 NEW ST	OKAY, TIMOTHY 119 NEW ST CRANFORD, NJ 07016
404	12	92 BURNSIDE AVE	BERGFELL, ANDRE & ANGELA B 92 BURNSIDE AVE CRANFORD, NJ 07016
403	9	88 BURNSIDE AVE	ACTON, JOHN J & CONSTANCE O 88 BURNSIDE AVE CRANFORD, NJ 07016
405	17	116 BESLER AVE	RIVERA, SANDY & BARBARA A 116 BESLER AVE CRANFORD, NJ 07016
404	11	111 NEW ST	ANTHONY JR & LISA K DEVRIES 111 NEW ST CRANFORD, NJ 07016
403	6	116 NEW ST	TOWNSHIP OF CRANFORD 8 SPRINGFIELD AVE CRANFORD, NJ 07016
404	13	94 BURNSIDE AVE	D'ANDREA NICHOLAS & NICOLE L 94 BURNSIDE AVE CRANFORD, NJ 07016
404	9	117 NEW ST	LOKI, ESTELLE FLYNN 117 NEW ST CRANFORD, NJ 07016
404	18	87 JAMES AVE	RENO, LAURENCE 87 JAMES AVE CRANFORD, NJ 07016
404	6	123 NEW ST	GRYBALSKI, JOHN P/BOFF, MC & JM 626 CHESTER AVE ROSELLE PARK, NJ 07204

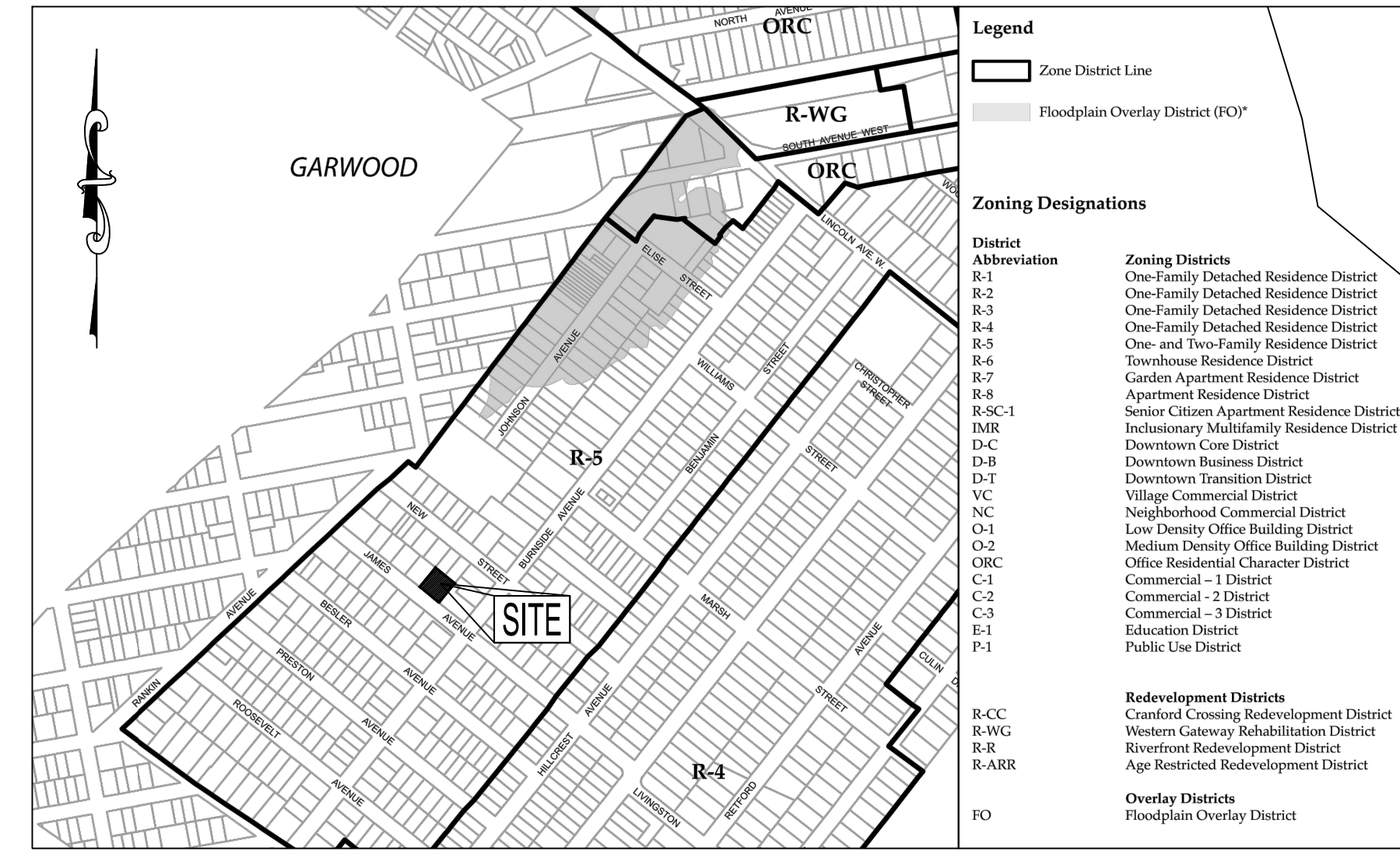


**SITE MAP**  
SCALE: 1" = ±150'

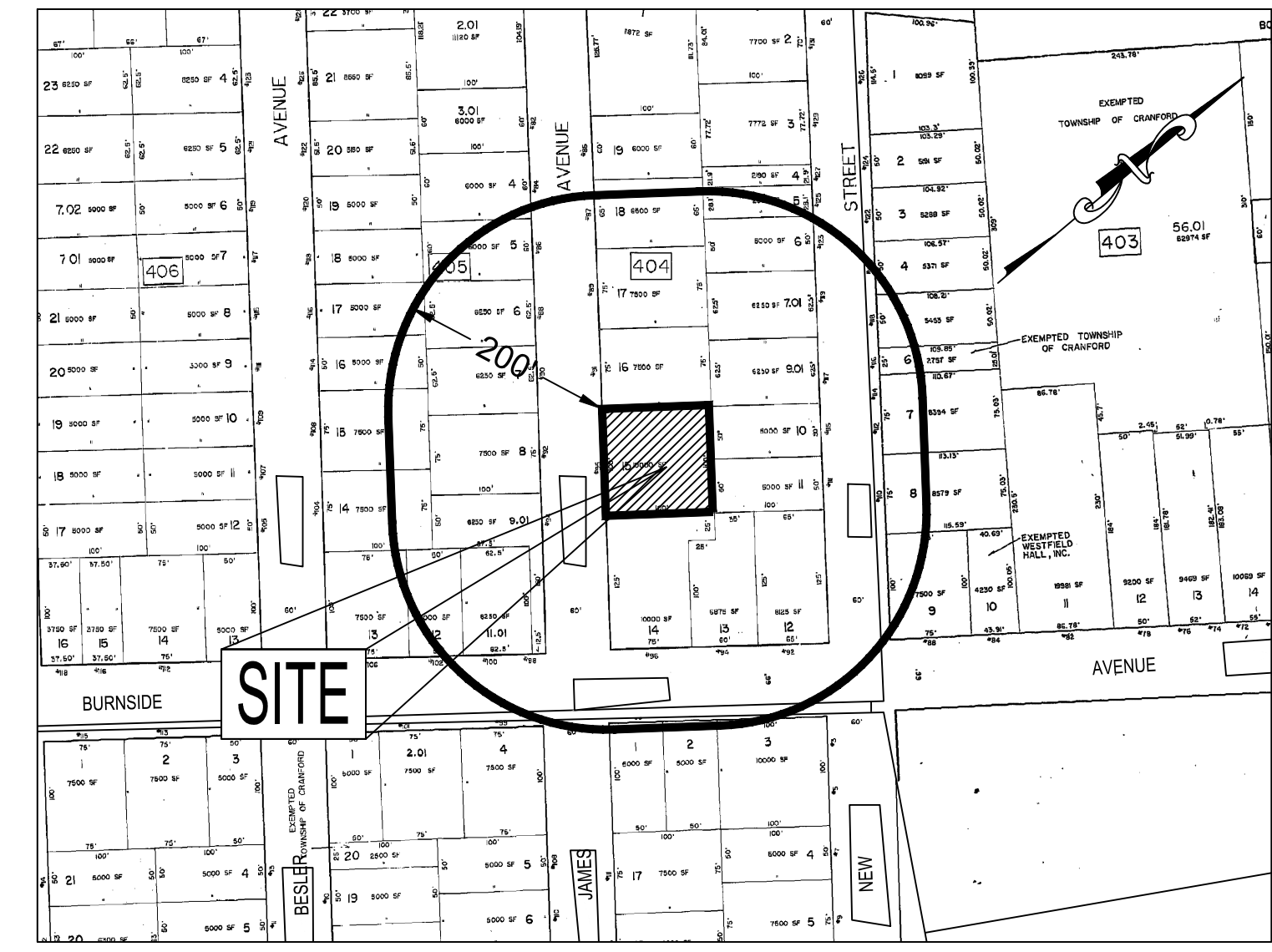
SCHEDULE OF GENERAL ZONING REQUIREMENTS (ZONE R-5, RESIDENTIAL DISTRICT)					
BLOCK 404 - 95 JAMES AVENUE - TOWNSHIP OF CRANFORD					
Regulation	General Requirements	Existing Lot 15	Proposed Lot 15.01	Proposed Lot 15.02	Comment
Principal Permitted Uses	One and Two-Family Residence District (Single-Family)	One-Family Residence	One-Family Residence	One-Family Residence	Conforming
Min. Lot Area (Interior Lot)	5,000 sq ft	10,000 sq ft	5,000 sq ft	5,000 sq ft	Conforming
Min. Lot Width (Interior Lot)	50 ft	100.00 ft	50.00 ft	50.00 ft	Conforming
Min. Front Yard*	25.25 ft.	24.35 ft. (e)	25.25 ft.	25.25 ft.	Conforming
Min. Rear Yard** (Lot Depth ≥ 100 ft.)	30 ft.	35.00 ft.	30 ft.	30.00 ft.	Conforming
Min. Side Yard (one) 10% Lot Width 7 ft. Min.	10 ft. (Excl. 7 ft. (Prop.))	11.68 ft.	7.50 ft.	7.50 ft.	Conforming
Min. Side Yard (both) 30% Lot Width	30 ft. (Excl. 15 ft. (Prop.))	73.00 ft.	15 ft.	15.00 ft.	Conforming
Min. Rear Yard (Accessory Structure)	3 ft.	2.06 ft. (e)	N/A	N/A	Not Applicable
Min. Side Yard (Accessory Structure)	5 ft.	4.33 ft. (e)	N/A	N/A	Not Applicable
Max. Floor Area Ratio	N/A	N/A	N/A	N/A	Not Applicable
Max. Lot Impervious Coverage***	45%	35.32%	42.20%	42.08%	Conforming
Max. Lot Impervious Coverage (Pavement, Front Yard)	35%	< 35%	33.33%	33.33%	Conforming
Max. Building Coverage	30%	18.00%	29.08%	29.08%	Conforming
Max. Building Height (story/ft.) Principal Structure****	2.5-Story / 32 ft.	2.5-Story / 32 ft.	2-Story / 21.90 ft.	2 Story / 32.00 ft.	Conforming
Max. Building Height (story/ft.) Accessory Structure	1-Story / 16 ft.	N/A	N/A	N/A	Not Applicable
Max. Distance from Front ROW that Minimum Lot Area May be Measured****	100 ft.	100 ft.	100 ft.	100 ft.	Conforming
Min. Distance from Principal Bldg. to a Railroad or Garden State Parkway	100 ft.	≥100 ft.	≥100 ft.	≥100 ft.	Conforming
Min. Distance from Principal Bldg. to 1 or 2-Family Residence Zone	N/A	N/A	N/A	N/A	Not Applicable

**Notes:**  
 (e) Pre-existing Nonconformity N/A - Denotes Not Applicable  
 (v) Variance is Required NA - Denotes Not Available  
 \*In the R-1 through R-5 Zones, the minimum front yard setback shall be maintained, except that, where a prevailing setback has been established on improved lots within 200 feet of the subject lot, the prevailing setback shall govern, but in no case shall the front yard be less than the minimum set forth below.  
 \*\*In the R-1 through R-5 Zones, the minimum rear yard setback shall be maintained, except that, where a prevailing setback has been established on improved lots within 200 feet of the subject lot, the prevailing setback shall govern, but in no case shall the rear yard be less than the minimum set forth below.  
 \*\*\*No more than 30% of the required front yard area in any residential zone shall be paved for use as a driveway or off-street parking.  
 \*\*\*\*Whichever is less.  
 \*\*\*\*\*Distance from the street right of way shall be measured parallel to the lot depth. The minimum depth of all lots in the R-1 Zone shall be 130 feet and in the R-2 through R-5 Zones 100 feet.

PARKING ANALYSIS					
	Required	Existing Lot 15	Proposed Lot 15.01	Proposed Lot 15.02	Comment
Single-family detached and two-family					
4 Bedrooms	2.5 Spaces	4 Spaces	3 Spaces	3 Spaces	Conforming
TOTAL (Car Parking)	2.5 Spaces	4 Spaces	3 Spaces	3 Spaces	Conforming



**ZONING MAP**  
SCALE: ±1"=600'



**200' TAX MAP**  
SCALE: ±1"=150'

DESIGN WAIVER SCHEDULE			
BLOCK 404 - 95 JAMES AVENUE - TOWNSHIP OF CRANFORD			
Code Regulation	Required	Proposed Lot 15.01	Proposed Lot 15.02
§ 255-26 Design standards, specific, c. Circulation, driveways, parking and loading and unloading requirements	(c) Minimum distances between driveways. Where two or more driveways connect a single site to any public or private road or individual driveways serve separate and adjoining sites, it is recommended that a minimum clear distance of 50 feet measured along the right-of-way line shall separate the closest of any two such driveways measured from the rights-of-way. A maximum of two driveways is recommended for any single site of a frontage of 300 feet or less.	N/A	11.24 ft. from driveway on lot 16.

**PROPERTY OWNER/APPLICANT:**  
**POMBAL BUILDERS, LLC**  
 887 COLONIAL AVENUE  
 UNION, NJ 07083

**APPROVED BY PLANNING BOARD - TOWNSHIP OF CRANFORD**

**BOARD SECRETARY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**BOARD CHAIRMAN:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**TOWNSHIP ENGINEER:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**PROTECT YOURSELF**  
 A PHONE CALL  
 CAN BE YOUR INSURANCE POLICY

WHAT YOU DON'T KNOW CAN HURT YOU.  
 THE STATE OF NEW JERSEY REQUIRES NOTIFICATION OF EXCAVATORS,  
 DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S  
 SURFACE ANYWHERE IN THE STATE.

**ADNAN A. KHAN, P.E., C.M.E.**  
 PROFESSIONAL ENGINEER  
 DATE: 12/14/20  
 DESIGNED BY: AK  
 DATE: 12/17/21  
 APPROVED BY: AK  
 DATE: 12/17/21

**AWZ ENGINEERING, INC.**  
 ENGINEERS • SCIENTISTS • CONSULTANTS  
 Main Office: 150 River Road, Suite B3, Montville, NJ 07045  
 Pennsylvania Office: Scranton, PA 18504  
 Tel: 973-588-7080 Fax: 973-588-7079  
 www.awzengineering.com e-mail: info@awzengineering.com  
 New Jersey Certificate of Authorization No.: 24GA28118400  
 Pennsylvania Certificate of Authority No.: 3771354

**TAX LOT 15**  
**95 JAMES AVENUE**  
**TOWNSHIP OF CRANFORD**  
**UNION COUNTY, NEW JERSEY**

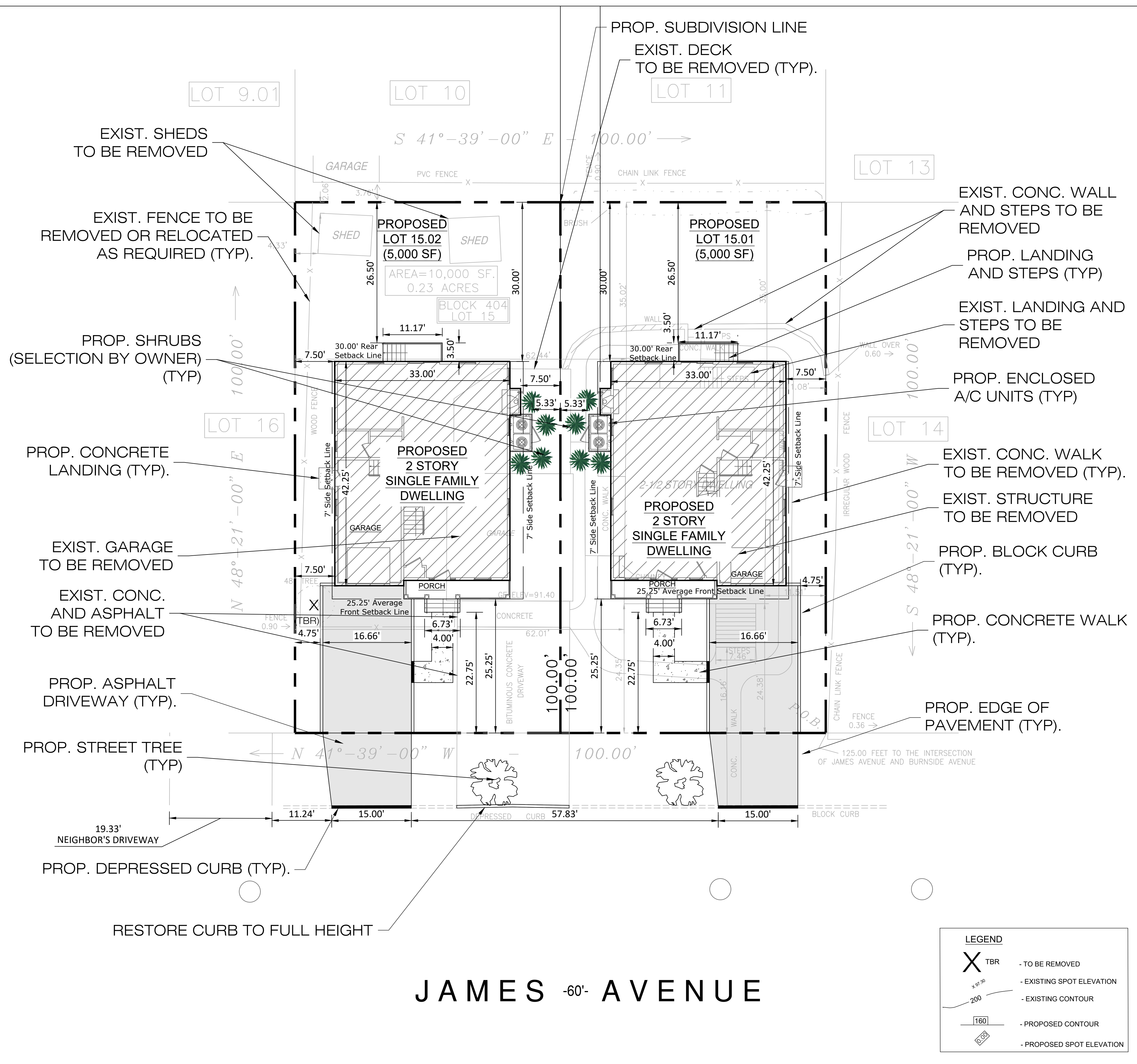
**JOB NUMBER:**  
 20-1206

**SCALE:** AS SHOWN

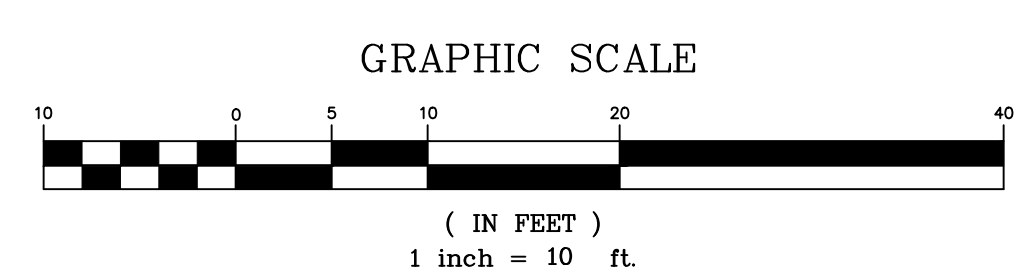
**C-01**  
 SHEET 1 OF 4

**COVER SHEET**

SHEET	TITLE	ISSUED	REVISED
1	COVER SHEET	02/18/21	10/07/21
2	SITE DEVELOPMENT PLAN	02/18/21	10/07/21
3	GRADINGS AND UTILITY PLAN	02/18/21	12/17/21
4	CONSTRUCTION DETAILS	02/18/21	12/17/21
5	SOIL EROSION AND SEDIMENT CONTROL PLAN	02/18/21	N/A
6	SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	02/18/21	N/A



# JAMES AVENUE



LEGEND

X TBR	- TO BE REMOVED
4.99 30	- EXISTING SPOT ELEVATION
200	- EXISTING CONTOUR
160	- PROPOSED CONTOUR
8.59	- PROPOSED SPOT ELEVATION

PROPOSED PLANTING SCHEDULE

KEY	QTY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREE(S)						
AROG	2		ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	3" RANGE	B+B

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

- GENERAL NOTES:**
- PARCEL IS KNOWN AS TAX LOT 15, IN BLOCK 404 AS SHOWN ON THE TAX MAPS OF THE TOWNSHIP OF CRANFORD.
  - AREA OF PARCEL = 10,000 S.F. OR 0.23 ACRES.
  - PARCEL IS LOCATED ENTIRELY IN THE R-5 (RESIDENTIAL) DISTRICT AS SHOWN ON THE ZONING MAP OF THE TOWNSHIP OF CRANFORD.
  - IF THIS DOCUMENT DOES NOT CONTAIN A RAISED IMPRESSION SEAL OF THE PROFESSIONAL, IT IS NOT AN AUTHORIZED ORIGINAL, AND MAY HAVE BEEN ALTERED.
  - THIS IS A SITE DEVELOPMENT PLAN AND NOT A SURVEY. DO NOT SCALE DRAWINGS FOR LOCATIONS OF ADJACENT STRUCTURES AND SURROUNDING PHYSICAL CONDITIONS. THESE ITEMS MAY BE SCHEMATIC ONLY EXCEPT WHERE DIMENSIONS ARE SHOWN THERETO.
  - THE CONTRACTOR SHALL NOTIFY THE UNDERSIGNED PROFESSIONAL IMMEDIATELY IF ANY FIELD CONDITIONS ENCOUNTERED DIFFER FROM THOSE SHOWN HEREON.
  - ELEVATIONS AND CONTOURS SHOWN ON THIS PLAN ARE BASED ON THE SURVEY PERFORMED AND PROVIDED BY MARTIN A. GRANT SURVEYING, INC. OF MONROE TOWNSHIP, NJ, DATED 11/16/20, AND ARE BASED ON NAVD-88 DATUM.
  - PROPOSED BUILDING FOOTPRINT AS PER THE ARCHITECTURAL PLANS PREPARED AND PROVIDED BY ZEN ARCHITECTURE & ENGINEERING OF ELIZABETH, NJ, DATED 08/05/21, RECEIVED AS DIGITAL FILE.
  - UTILITY INFORMATION SHOWN HEREON HAS BEEN COLLECTED FROM VARIOUS SOURCES AND IS NOT GUARANTEED AS TO ACCURACY AND COMPLETENESS. THE CONTRACTOR SHALL VERIFY ALL UTILITY INFORMATION TO HIS SATISFACTION PRIOR TO COMMENCEMENT OF ANY WORK. THE CONTRACTOR SHALL PERFORM TEST PITS WHERE EXISTING UTILITIES ARE TO BE CROSSED. TEST PIT INFORMATION SHALL BE GIVEN TO THE ENGINEER PRIOR TO CONSTRUCTION TO PERMIT ADJUSTMENTS AS MAY BE REQUIRED TO AVOID CONFLICTS.
  - ALL EXISTING UTILITIES THAT ARE TO BE RELOCATED OR ALTERED IN ANY MANNER ARE TO BE DONE IN ACCORDANCE WITH THE RESPECTIVE UTILITY COMPANIES STANDARDS. ALL THE EXISTING UTILITIES EXPOSED DURING CONSTRUCTION ARE TO BE SUPPORTED UNTIL BACKFILL IS IN PLACE. ANY CROSSING LESS THAN ONE FOOT CLEAR TO BE SUPPORTED WITH A SADDLE (CONCRETE OR SAND) AS NOTED.
  - ALL SEWER LINES SHALL BE LOCATED AT LEAST 10 FEET HORIZONTALLY FROM POTABLE WATER LINES AND/OR AT LEAST 18 INCHES BELOW POTABLE WATER LINES AND IN SEPARATE TRENCHES.
  - ALL UTILITIES SHALL BE INSTALLED UNDERGROUND. DESIGN AND INSTALLATION OF WATER, ELECTRIC, GAS, TELEPHONE AND CABLE TO BE PROVIDED BY RESPECTIVE UTILITY COMPANIES.
  - WATER AND GAS SERVICE MATERIALS, BURIAL DEPTH, AND COVER REQUIREMENTS SHALL BE SPECIFIED BY THE LOCAL UTILITY COMPANY. CONTRACTOR'S PRICE FOR WATER SERVICE SHALL INCLUDE ALL FEES AND APPURTENANCES REQUIRED BY THE UTILITY TO PROVIDE A COMPLETE WORKING SERVICE. UTILITY CONNECTIONS SHALL COMPLY WITH THE COUNTY/MUNICIPAL ROAD OPENING PERMIT REQUIREMENTS.
  - SITE GRADING AND UTILITY WORK ARE TO BE PERFORMED IN A MANNER TO MINIMIZE DAMAGE TO EXISTING VEGETATION AND TREES. ALL AREAS NOT AFFECTED BY CONSTRUCTION ARE TO REMAIN NATURAL AND UNDISTURBED.
  - LOCATION OF PROPOSED ROOF DRAINS SHALL BE COORDINATED WITH THE PROJECT ARCHITECT PRIOR TO CONSTRUCTION. ALL PROPOSED ROOF LEADERS SHALL HAVE CLEANOUTS AND SHOULD BE TIED INTO THE STORMWATER SYSTEM AS SHOWN.
  - ALL EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE. NO MATERIAL IS TO BE STORED ON TOWNSHIP PROPERTY.
  - COMPACTING IN FILL AREAS BENEATH ALL PROPOSED UTILITIES AND STRUCTURES SHOULD MEET ALL MANUFACTURERS AND MUNICIPAL REQUIREMENTS AND BE EQUAL TO THE MINIMUM 95% MODIFIED PROCTOR DENSITY.
  - THIS SET OF PLANS HAS BEEN PREPARED FOR PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND THE DRAWINGS MARKED "ISSUED FOR CONSTRUCTION".
  - ALL MATERIAL, WORKMANSHIP AND CONSTRUCTION FOR SITE IMPROVEMENTS SHOWN HEREON SHALL BE PERFORMED IN STRICT CONFORMANCE WITH:
    - NJDOT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", A CURRENTLY AMENDED.
    - CURRENT PREVAILING MUNICIPAL AND/OR COUNTY SPECIFICATIONS.
    - STANDARDS, AND REQUIREMENTS.
    - CURRENT PREVAILING UTILITY COMPANY/AUTHORITY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS.
    - "RESIDENTIAL SITE IMPROVEMENT STANDARDS", N.J. ADMINISTRATIVE CODE TITLE 5, CHAPTER 21, AS CURRENTLY AMENDED.
    - STANDARDS AND/OR CONDITIONS OF ANY OTHER GOVERNING BODIES HAVING JURISDICTION.
  - CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, WHO SHALL ALSO BE SOLELY RESPONSIBLE FOR THE MEANS, METHODS, AND SEQUENCING OF CONSTRUCTION OPERATIONS. UNDER NO CIRCUMSTANCES SHOULD THE INFORMATION PROVIDED HERE BE INTERPRETED TO MEAN THAT AWZ ENGINEERING, INC. IS ASSUMING RESPONSIBILITY FOR CONSTRUCTION SITE SAFETY OR THE CONTRACTOR'S ACTIVITIES; SUCH RESPONSIBILITY IS NOT BEING IMPLIED AND SHOULD NOT BE INFERRED.
  - THE EXISTING BUILDING, DRIVEWAY, AND OTHER STRUCTURES TO BE RAZED AND MATERIALS SHOULD BE REMOVED FROM SITE AND PROPERLY DISPOSED IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
  - ALL EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE. NO MATERIAL IS TO BE STORED ON TOWNSHIP PROPERTY, UNLESS PRIOR APPROVAL IS OBTAINED FROM THE TOWNSHIP ENGINEER. UNDER NO CIRCUMSTANCES CAN THE CONTRACTOR PLACE EXCAVATED MATERIAL WITHIN TOWNSHIP OWNED PROPERTY.
  - ALL REQUIRED SOIL EROSION AND SEDIMENT CONTROL DEVICES MUST BE INSTALLED PRIOR TO ANY SITE DISTURBANCE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SUPPLY ANY ADDITIONAL SOIL EROSION & SEDIMENT CONTROL MEASURES AS REQUESTED BY THE GOVERNING SOIL CONSERVATION DISTRICT.
  - ANY SITE SOIL DISTURBANCE SHALL BE PERFORMED IN ACCORDANCE WITH THE TOWNSHIP REQUIREMENTS.
  - THE APPLICANT SHALL REPAIR ANY DAMAGE TO IMPROVEMENTS WITHIN THE TOWNSHIP RIGHT-OF-WAY, INCLUDING BUT NOT LIMITED TO, SIDEWALK, DRIVEWAY APRON, CURB AND ASPHALT PAVEMENT AS PER THE TOWNSHIP REQUIREMENTS.
  - THE APPLICANT SHALL COORDINATE INSPECTIONS WITH THE TOWNSHIP ENGINEERING DEPARTMENT 24-HOURS PRIOR TO START OF ANY CONSTRUCTION RELATED TO SITE GRADING AND DRAINAGE IMPROVEMENTS.
  - THE CURB LOCATED ALONG JAMES AVENUE SHALL BE REPLACED IN-KIND WITH CONCRETE CURB.
  - ALL EXCAVATED MATERIAL SHALL BE REMOVED FROM SITE. NO MATERIAL IS TO BE STORED ON TOWNSHIP PROPERTY UNLESS PRIOR APPROVAL IS OBTAINED FROM THE TOWNSHIP ENGINEER. UNDER NO CIRCUMSTANCES CAN THE CONTRACTOR PLACE EXCAVATED MATERIAL WITHIN THE TOWNSHIP PROPERTY. ANY SOIL DISTURBANCE SHALL BE DONE AS SET FORTH BY SUBSECTION 351-1.
  - THE APPLICANT SHALL NOT DIRECT ANY STORMWATER TOWARDS ADJOINING PROPERTIES. THE SIE GRADING AND DRAINAGE SHOULD NOT ADVERSELY AFFECT OR BURDEN THE ADJACENT PROPERTY OWNERS OR POSE A NEGATIVE IMPACT AS SET FORTH BY SUBSECTION 364-5E. (3).

**TAX LOT 15**      **BLOCK 404**

**95 JAMES AVENUE**  
**TOWNSHIP OF CRANFORD**  
**UNION COUNTY, NEW JERSEY**

**SITE DEVELOPMENT PLAN**

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**JOB NUMBER:**  
20-1206

**SCALE:** AS SHOWN

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**C-02**  
SHEET 2 OF 4

ADNAN A. KHAN, P.E., C.M.E.  
 PROFESSIONAL ENGINEER

DESIGNED BY: [Signature]  
 DATE: 12/17/21

APPROVED BY: [Signature]  
 DATE: 12/16/20

PER TOWNSHIP REVIEW COMMENTS: 10/07/21 LF AAK  
 PER ARCHITECTURAL LAYOUT CHANGES: 08/02/21 LF AAK  
 PER PLANNING REVIEW COMMENTS: 07/23/21 LF AAK  
 REVISIONS: 1  
 DATE: BY: APE  
 NO. 10/07/21

N.J. LICENSE NO. 39812      P.A. LICENSE NO. 4965E  
 N.Y. LICENSE NO. 08645      M.D. LICENSE NO. 4180

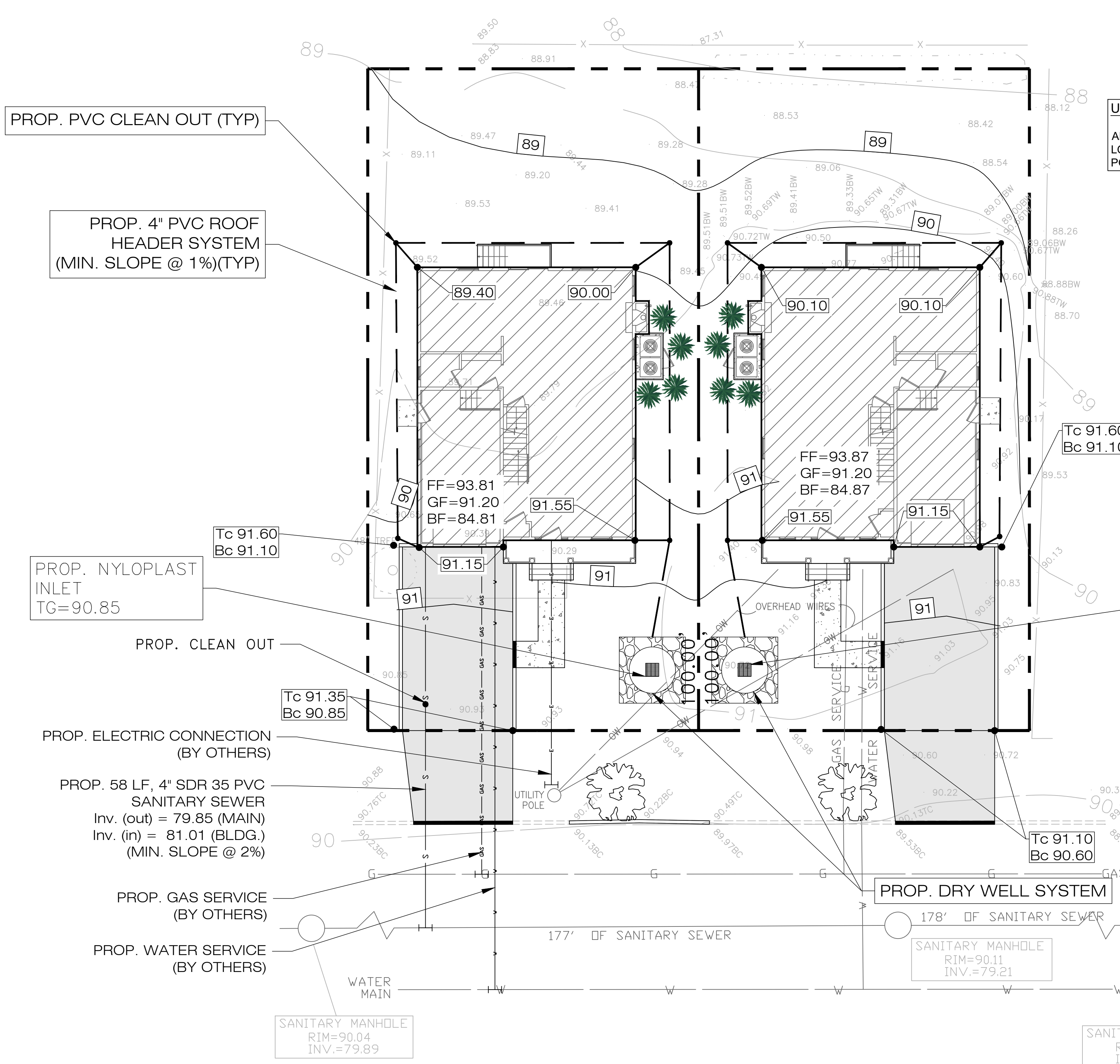
**AWZ ENGINEERING, INC.**  
 ENGINEERS • SCIENTISTS • CONSULTANTS

Main Office: 150 River Road, Suite B3, Montville, NJ 07045  
 Pennsylvania Office: Scranton, PA 18504

Tel: 973-588-7080      Fax: 973-588-7079  
 www.awzengineering.com      e-mail: info@awzengineering.com  
 New Jersey Certificate of Authorization No.: 24GA28118400  
 Pennsylvania Certificate of Authority No.: 3771354

**LEGEND**

	TBR	- TO BE REMOVED
		- EXISTING SPOT ELEVATION
		- EXISTING CONTOUR
		- PROPOSED CONTOUR
		- PROPOSED SPOT ELEVATION



**UTILITY NOTE:**  
ALL EXISTING UTILITY CONNECTIONS, OF LOT 15.01, TO BE REUSED WHERE POSSIBLE.

**MAINTENANCE OF UNDERGROUND STORM FACILITIES:**

UNDERGROUND STORM SYSTEM - The underground drainage system, including all pipes, manholes, catch basins, inlets and appurtenances must be inspected for clogging and excessive debris and sediment accumulation at least annually as well as after every storm exceeding 2 inches of rainfall. Sediment removal should take place when all runoff has drained from the conveyance network and the systems are reasonably dry. Disposal of debris, trash, sediment, and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state, and federal waste regulations.

All structural components must be inspected for cracking, subsidence, breaching, wearing, and deterioration at least annually. The condition of surrounding and above lying materials shall be inspected for evidence of potential failures or deterioration.

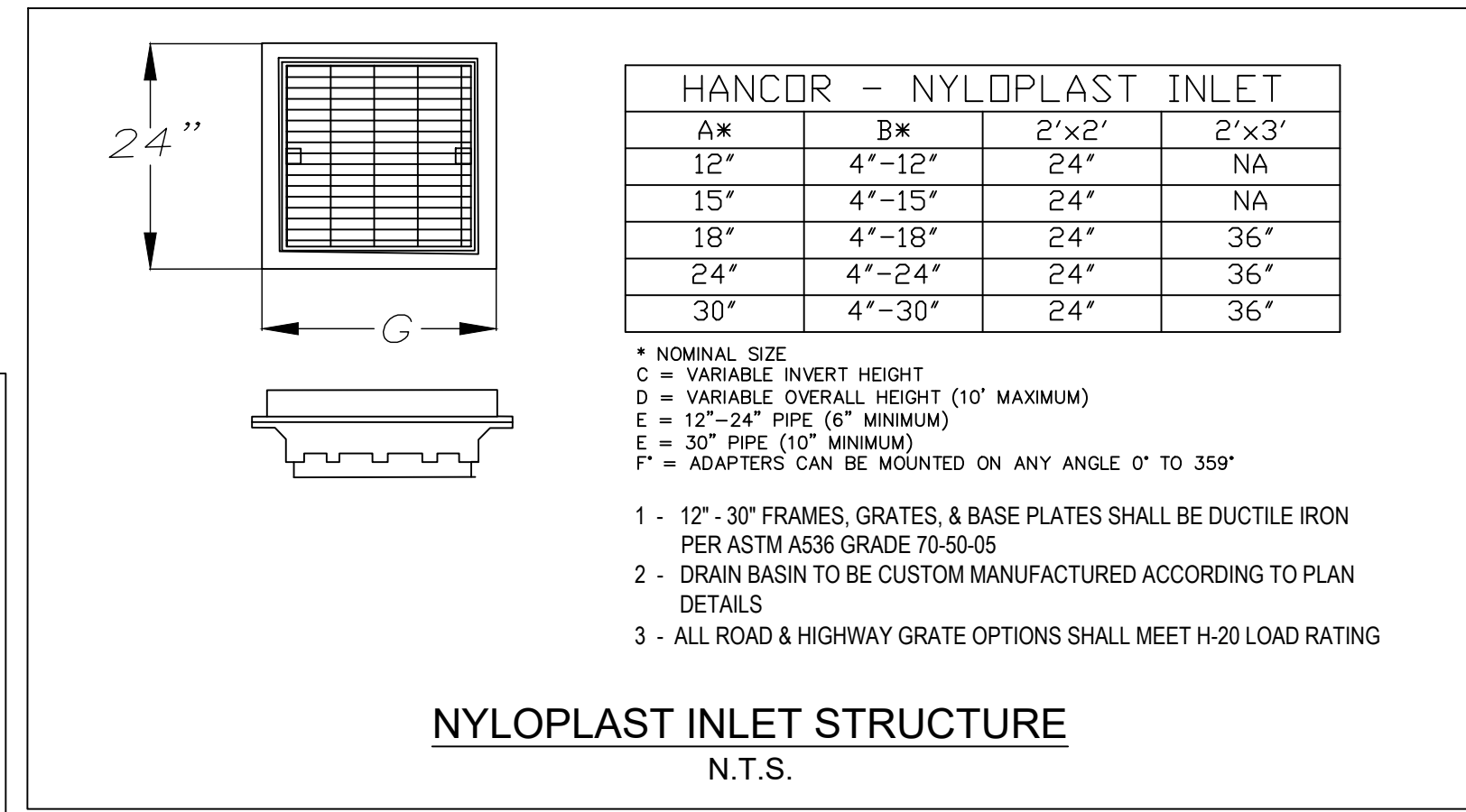
Two people will be needed to perform routine maintenance of the conveyance systems. The routine equipment to be utilized for the maintenance tasks include a jet vacuum vehicle, shovels, lighting equipment and a wheel barrel or truck for the hauling off of debris. No manufacturer's instructions or user manuals are available for maintenance of these components. Maintenance would only take place in the adjacent components of the system, i.e. the catch basins, pipes, and other units outside the seepage pit system. Water, mosquito control chemicals, and concrete repair materials may also be required depending on the condition of the structure.

PROPERTY OWNER SHALL BE RESPONSIBLE PARTY FOR ALL STORM STRUCTURE MAINTENANCE.

**LOT COVERAGE CALCULATIONS**  
**95 JAMES AVENUE - TOWNSHIP OF CRANFORD**

Block 404, Lot 15

DESCRIPTION	EXISTING LOT 15	EXISTING LOT 15.01	EXISTING LOT 15.02	PROPOSED LOT 15.01	PROPOSED LOT 15.02
Lot Area	10,000.00	5,000.00	5,000.00	5,000.00	5,000.00
Exist. 2 1/2 Story Dwelling	1,075.56	1,075.56	0.00	0.00	0.00
Garage	571.58	57.57	514.01	0.00	0.00
Shed	157.44	0.00	157.44	0.00	0.00
Proposed Porch	0.00	0.00	0.00	70.00	70.00
Proposed Building	0.00	0.00	0.00	1,384.24	1,384.24
Proposed Garage	0.00	0.00	0.00	0.00	0.00
<b>Total Building</b>	<b>1,804.58</b>	<b>1,133.13</b>	<b>671.45</b>	<b>1,454.24</b>	<b>1,454.24</b>
Conc. Walk	790.38	694.84	95.54	89.32	78.33
Conc. Landing and steps	101.81	101.81	0.00	55.75	55.75
Conc. Wall	57.52	57.52	0.00	0.00	0.00
Conc. Curb	0.00	0.00	0.00	27.87	27.87
Misc.	4.02	4.02	0.00	29.05	29.05
<b>Total Concrete</b>	<b>953.73</b>	<b>858.19</b>	<b>95.54</b>	<b>201.99</b>	<b>191.00</b>
Wood Deck	410.81	38.22	372.59	0.00	0.00
Pavement	422.64	34.31	388.33	458.89	458.89
Green Area/Dirt	6,408.24	2,936.15	3,472.09	2,884.88	2,895.87
<b>TOTAL</b>	<b>10,000.00</b>	<b>5,000.00</b>	<b>5,000.00</b>	<b>5,000.00</b>	<b>5,000.00</b>
<b>Pervious</b>	6,408.24	2,936.15	3,472.09	2,884.88	2,895.87
<b>Impervious</b>	3,591.76	2,063.85	1,527.91	2,115.12	2,104.13
<b>Lot Coverage</b>	35.92%	41.28%	30.56%	42.30%	42.08%
<b>Building Coverage</b>	18.05%	22.66%	13.43%	29.08%	29.08%
<b>Front Yard Coverage (Paved)</b>				33.33%	33.33%

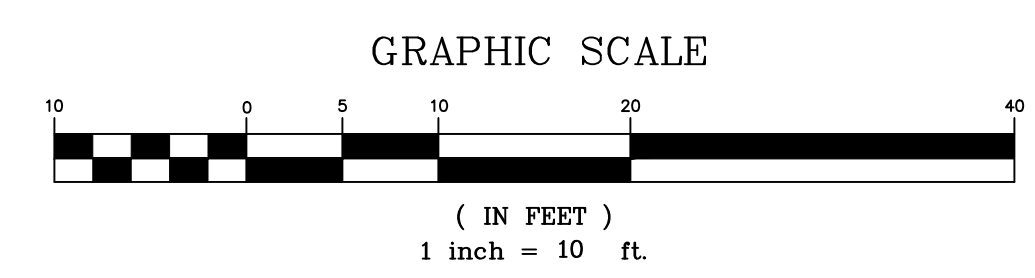


**BUILDING HEIGHT CALCULATION (LOT 15.01)**  
- AVERAGE FINISHED GRADE ELEVATION = 90.81'  
- BUILDING HEIGHT FROM FINISHED FLOOR = 28.84'  
- FINISHED FLOOR = 93.87'  
- DIFFERENCE BETWEEN FINISHED FLOOR AND AVERAGE FINISHED GRADE = 93.87'-90.81' = 3.06'  
- BUILDING HEIGHT = 3.06'+28.84' = 31.90'

**BUILDING HEIGHT CALCULATION (LOT 15.02)**  
- AVERAGE FINISHED GRADE ELEVATION = 90.65'  
- BUILDING HEIGHT FROM FINISHED FLOOR = 28.84'  
- FINISHED FLOOR = 93.81'  
- DIFFERENCE BETWEEN FINISHED FLOOR AND AVERAGE FINISHED GRADE = 93.81'-90.65' = 3.16'  
- BUILDING HEIGHT = 3.16'+28.84' = 32.00'

**NOTE:**  
ACCORDING TO FEMA MAP (NO. 34039C0031F, EFFECTIVE DATE 09/20/06), THE ENTIRE SITE IS LOCATED OUTSIDE THE FLOOD HAZARD AREA LIMITS.

**DRAINAGE AREA NOTE:**  
UNDER EXISTING CONDITIONS, 82.58% OF THE SITE RUNOFF GOES UNDETAINED TOWARDS THE REAR OF THE PROPERTY, AND 17.42% RUNS TOWARDS JAMES AVENUE.  
UNDER PROPOSED CONDITIONS, 43.90% OF THE SITE RUNOFF (EXCLUDING THE ROOF AREA) GOES UNDETAINED TOWARDS THE REAR OF THE PROPERTY, AND 28.41% RUNS TOWARDS JAMES AVENUE.



DESIGNED BY	DATE	12/14/20	PER ENGINEERING REVIEW COMMENTS	12/17/21	LF	AAK
DESIGNED BY	DATE	12/14/20	PER TOWNSHIP REVIEW COMMENTS	10/07/21	LF	AAK
APPROVED BY	DATE	12/17/21	PER ARCHITECTURAL LAYOUT CHANGES	08/05/21	LF	AAK
APPROVED BY	DATE	12/17/21	PER PLANNING REVIEW COMMENTS	07/23/21	LF	AAK
NO.	NO.	NO.	REVISIONS	DATE	BY:	APR

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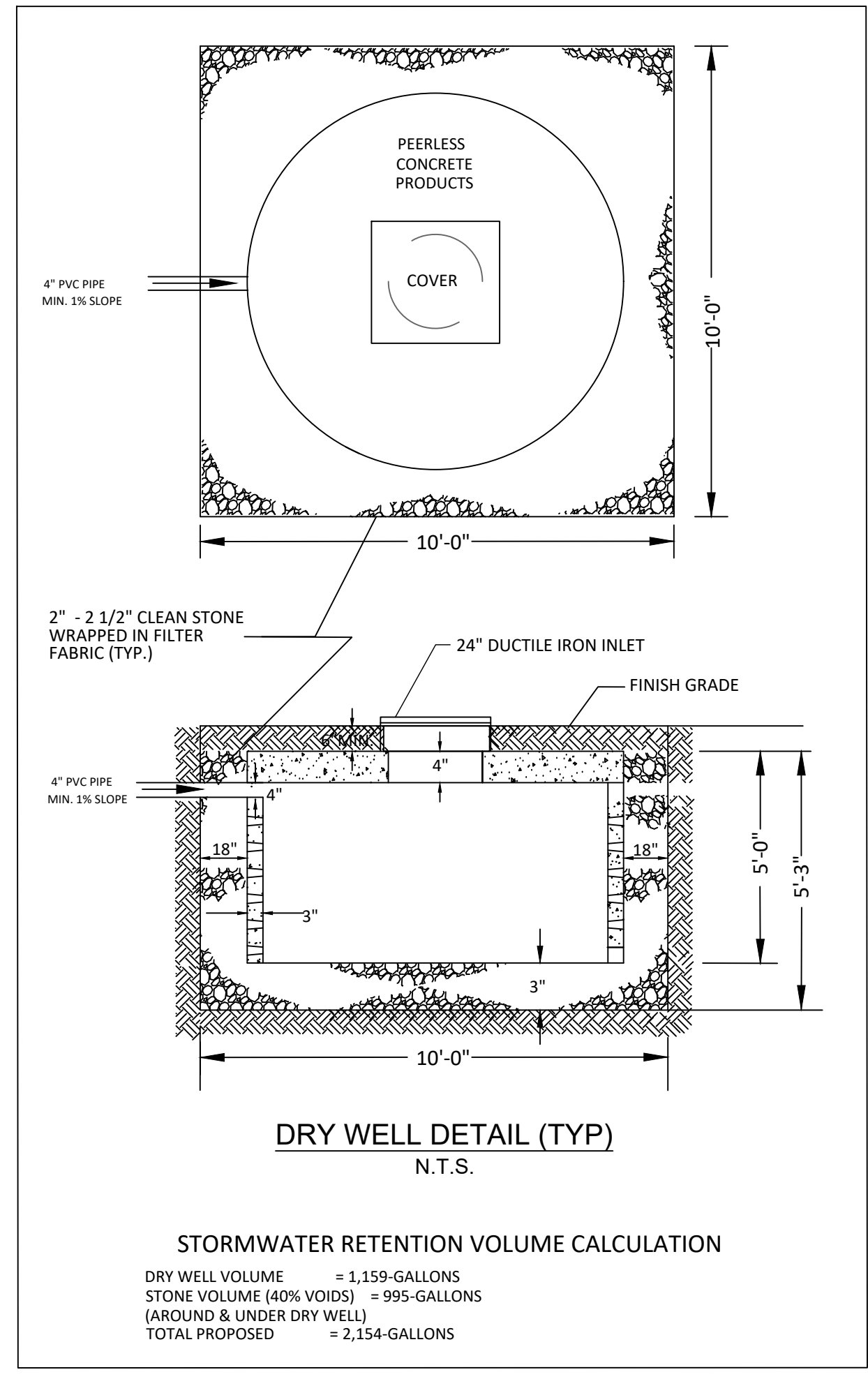
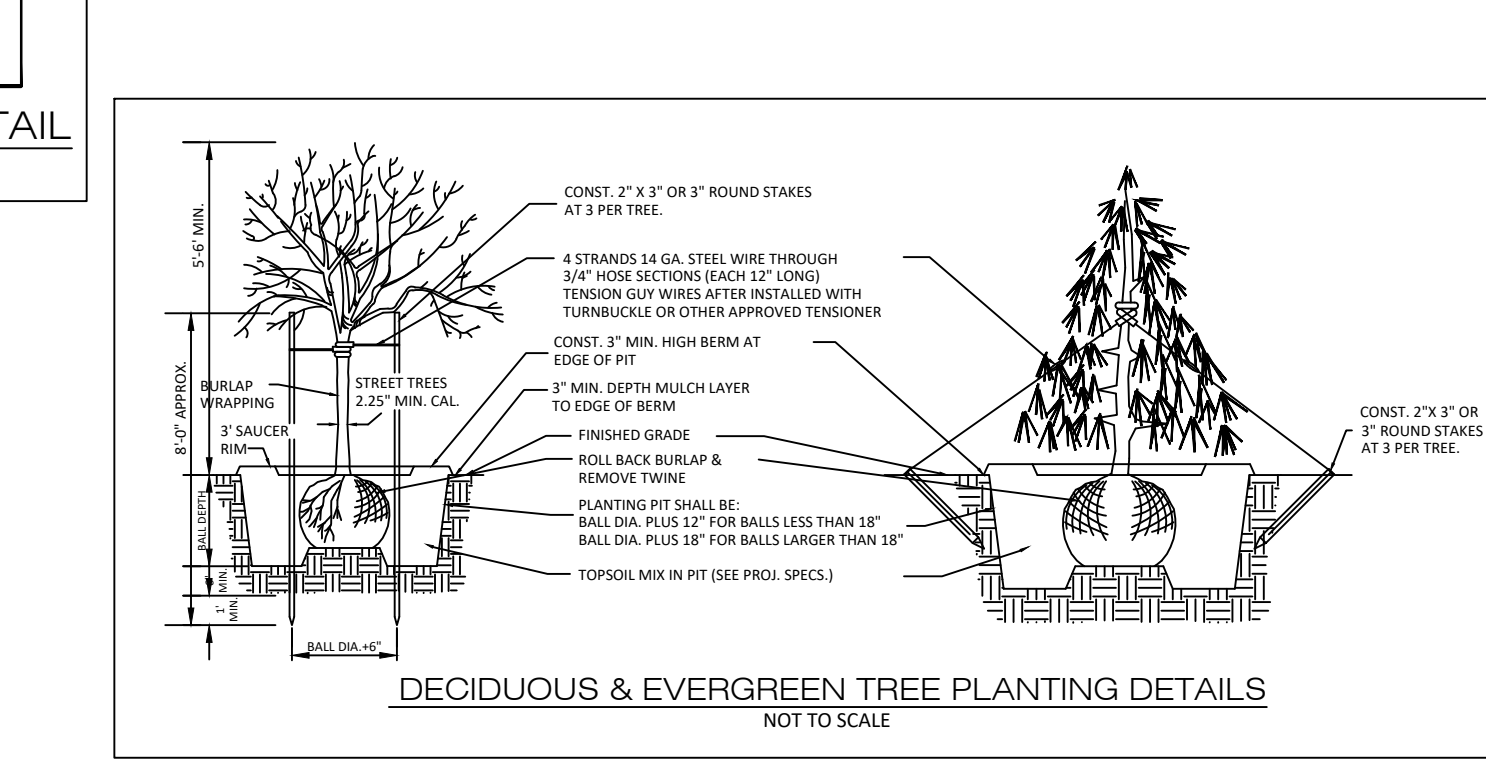
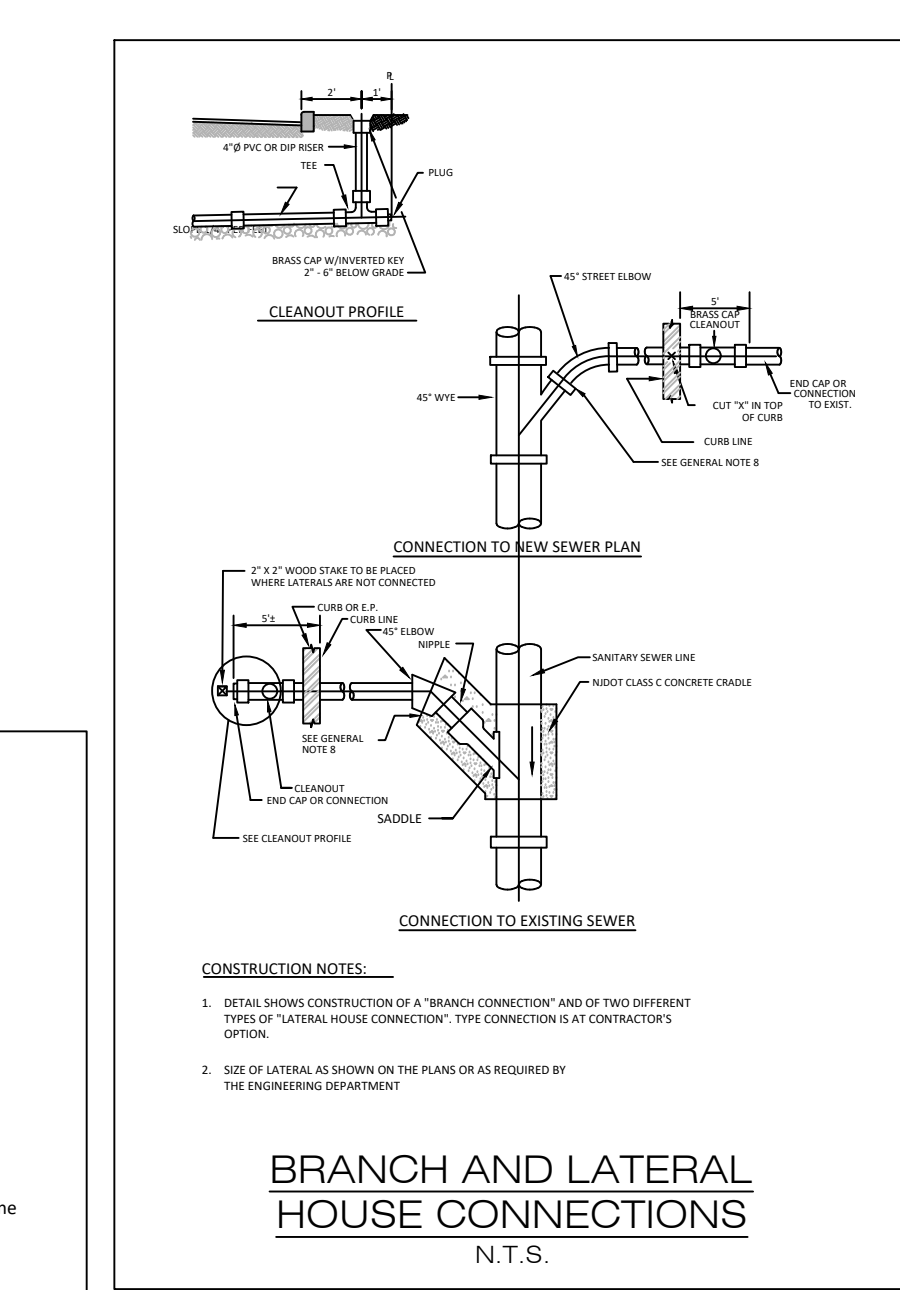
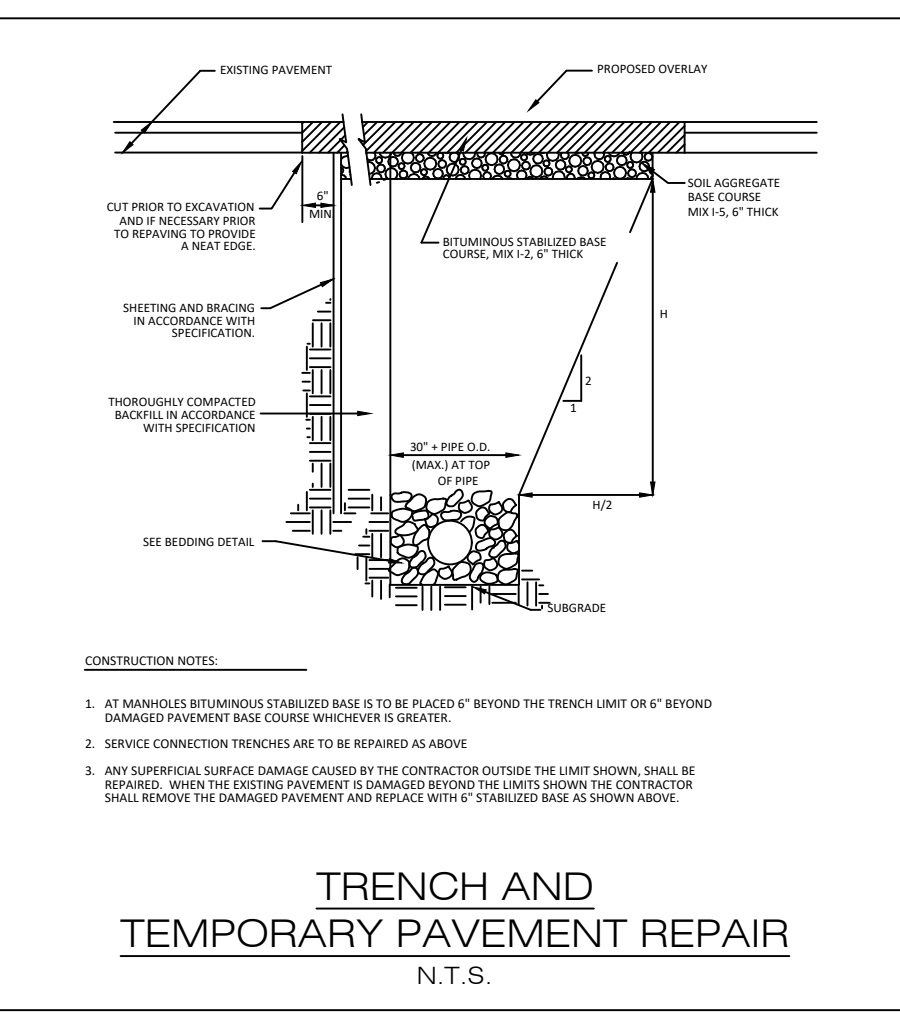
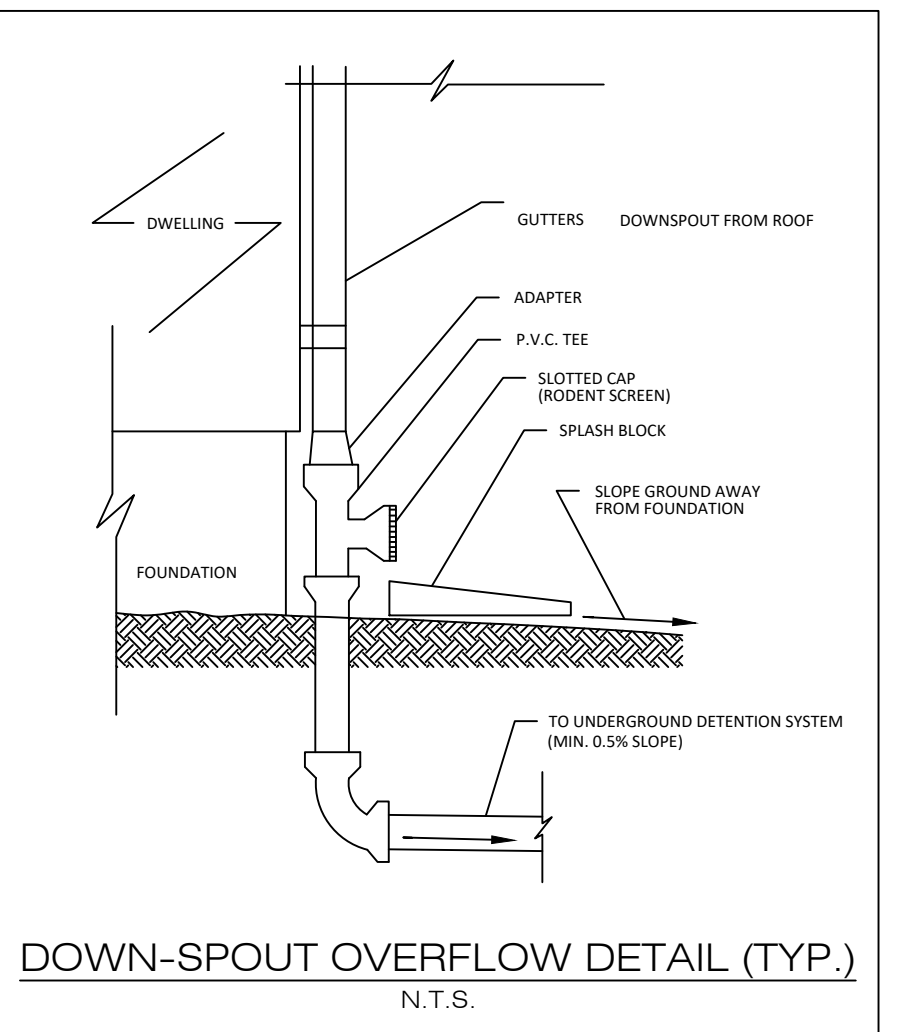
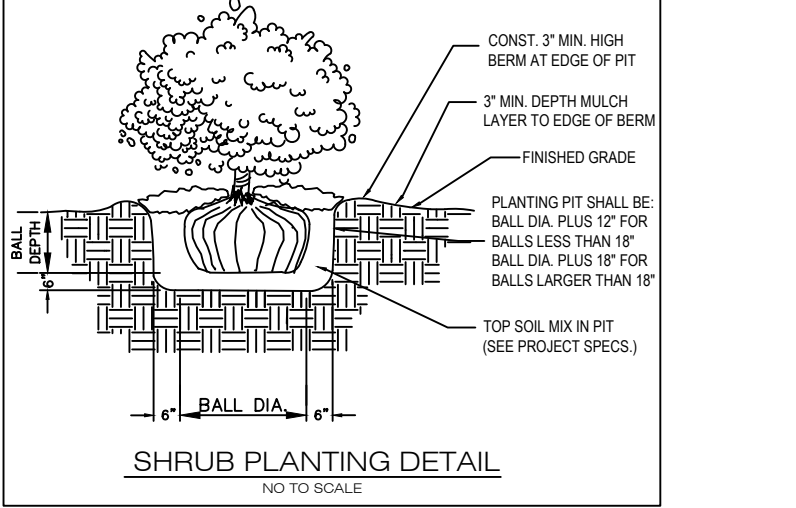
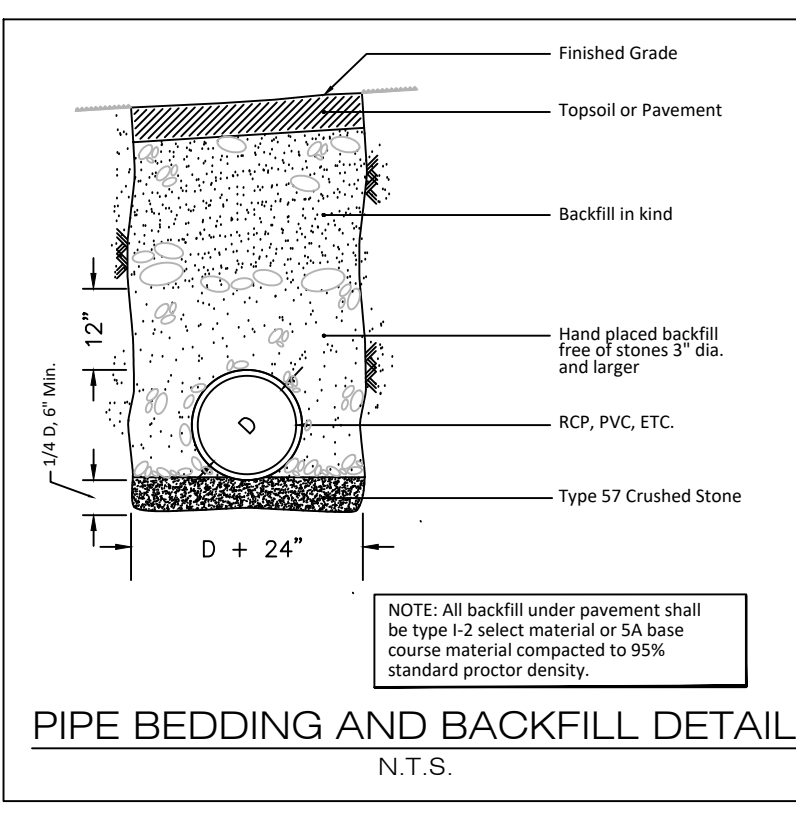
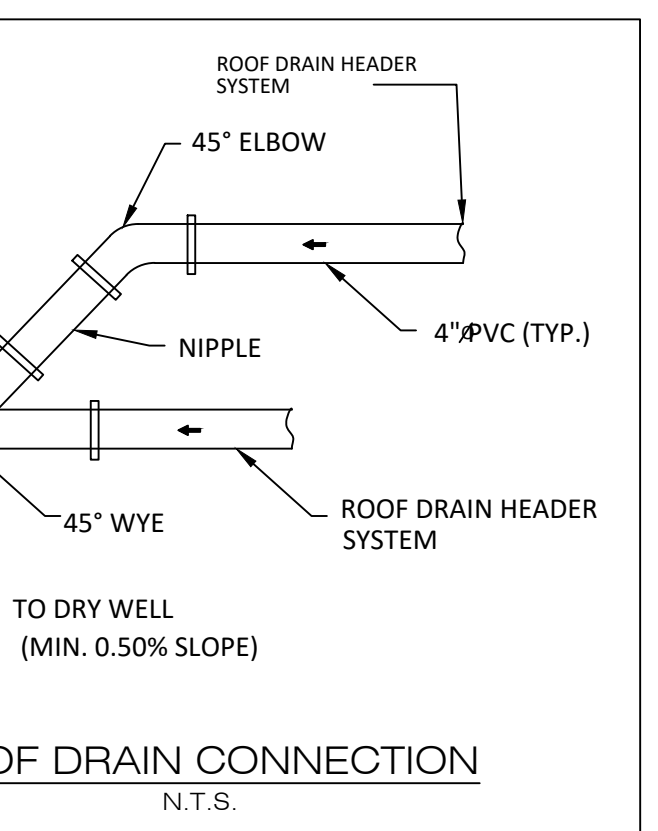
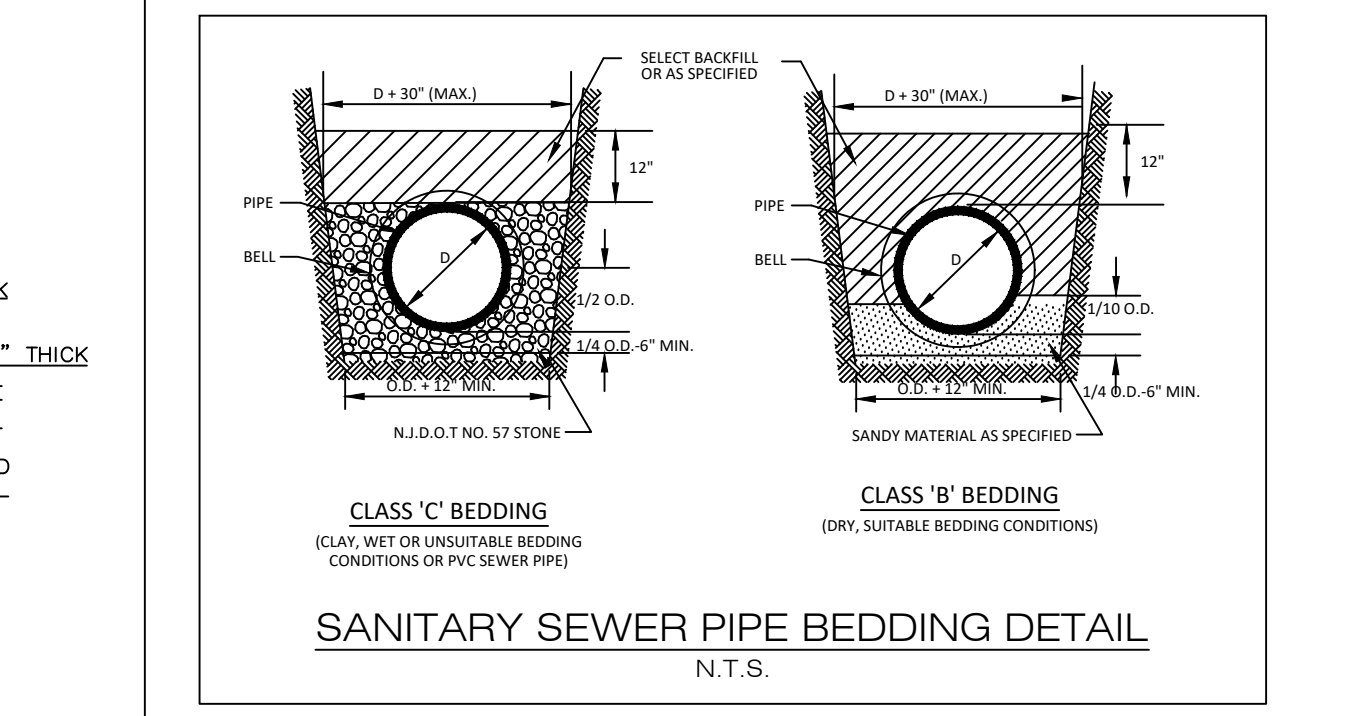
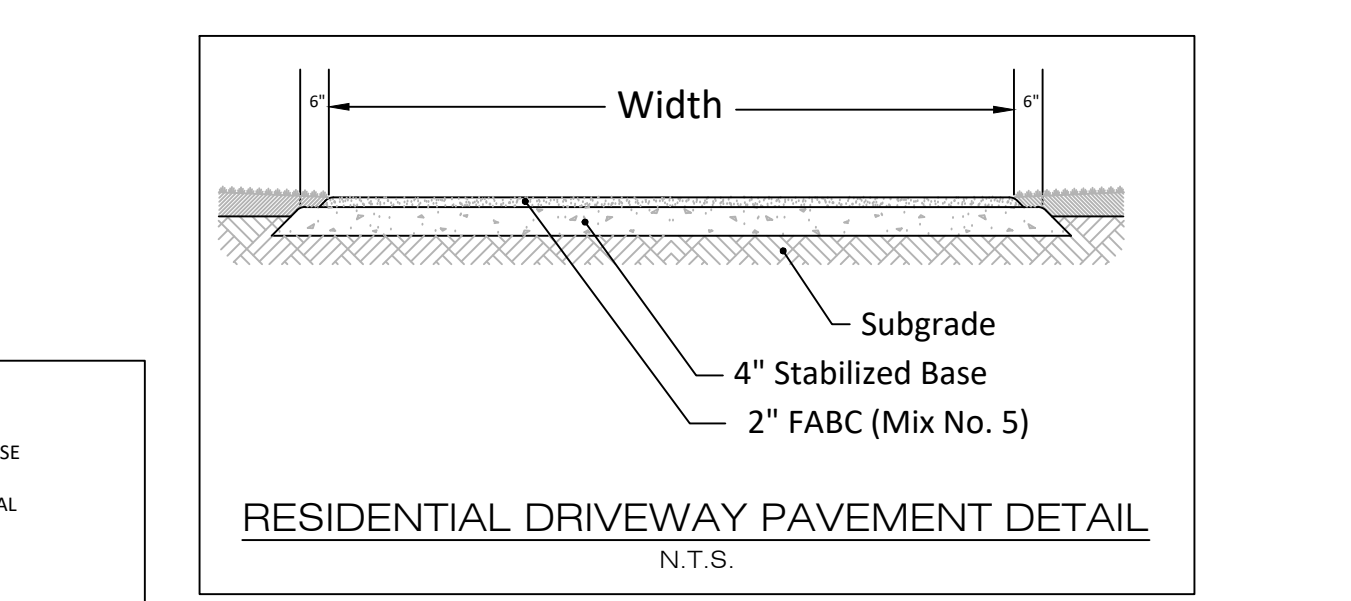
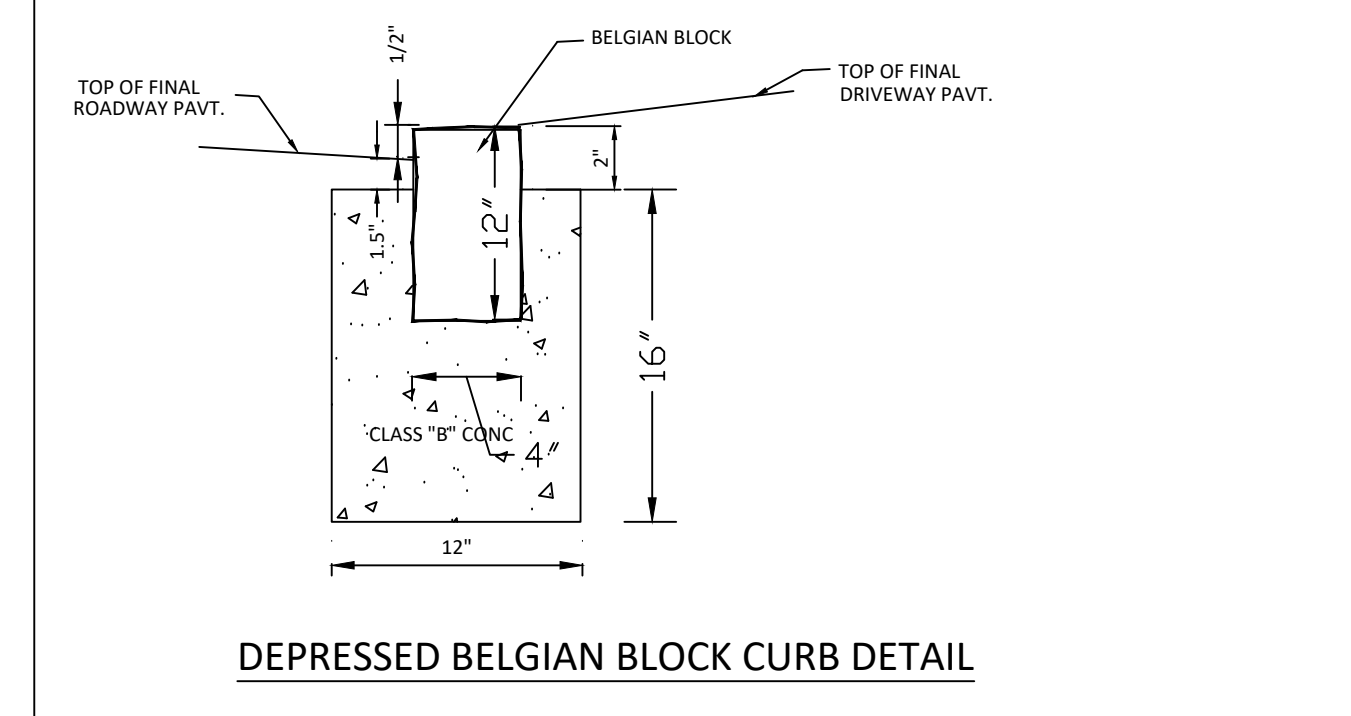
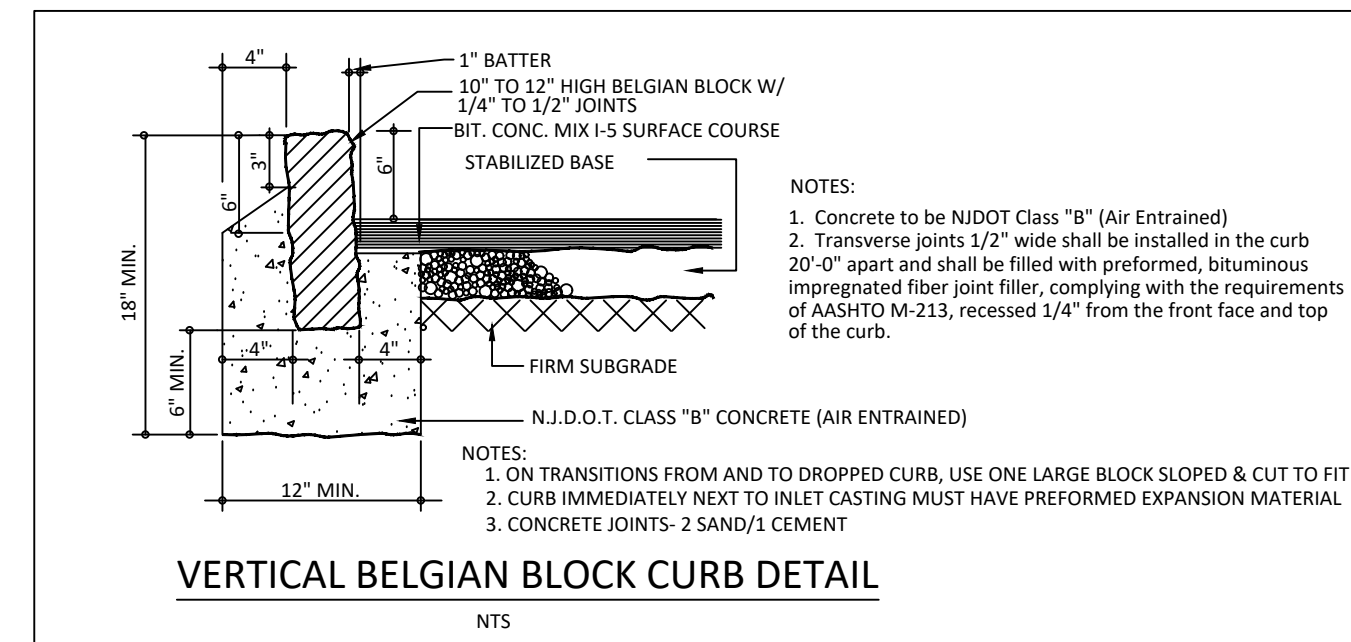
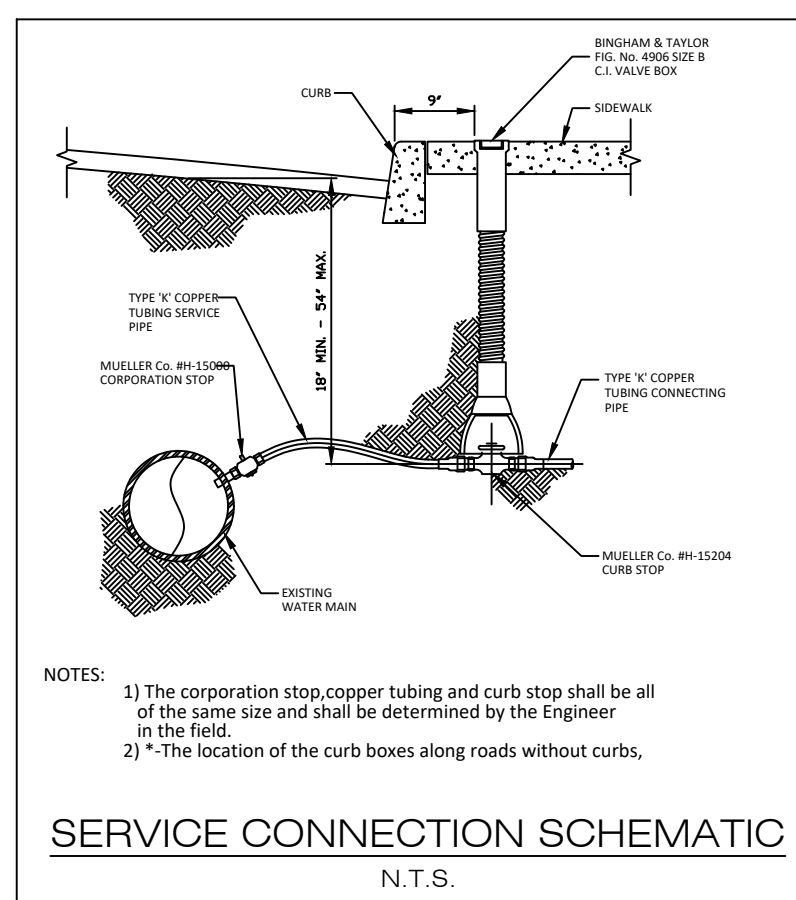
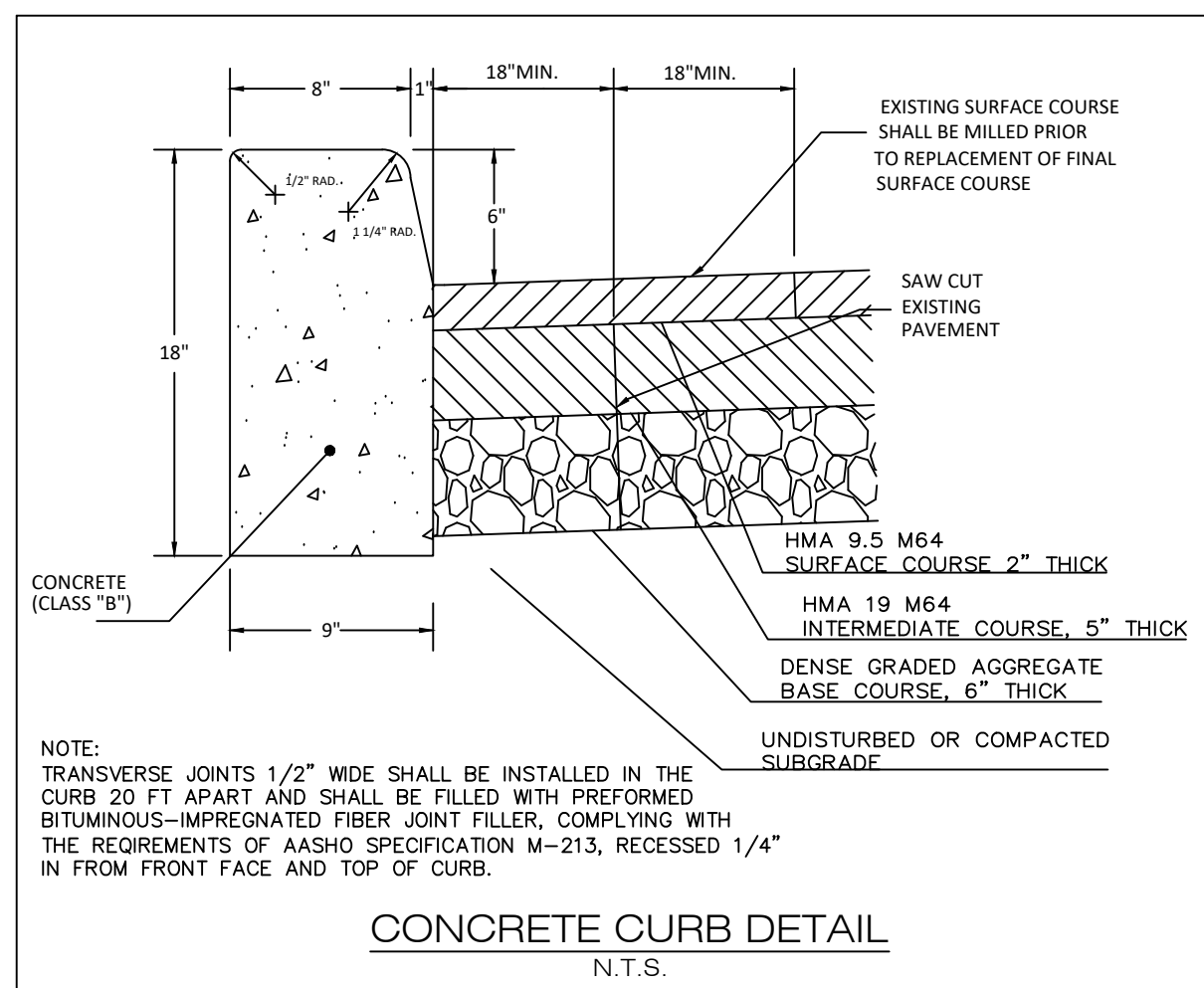
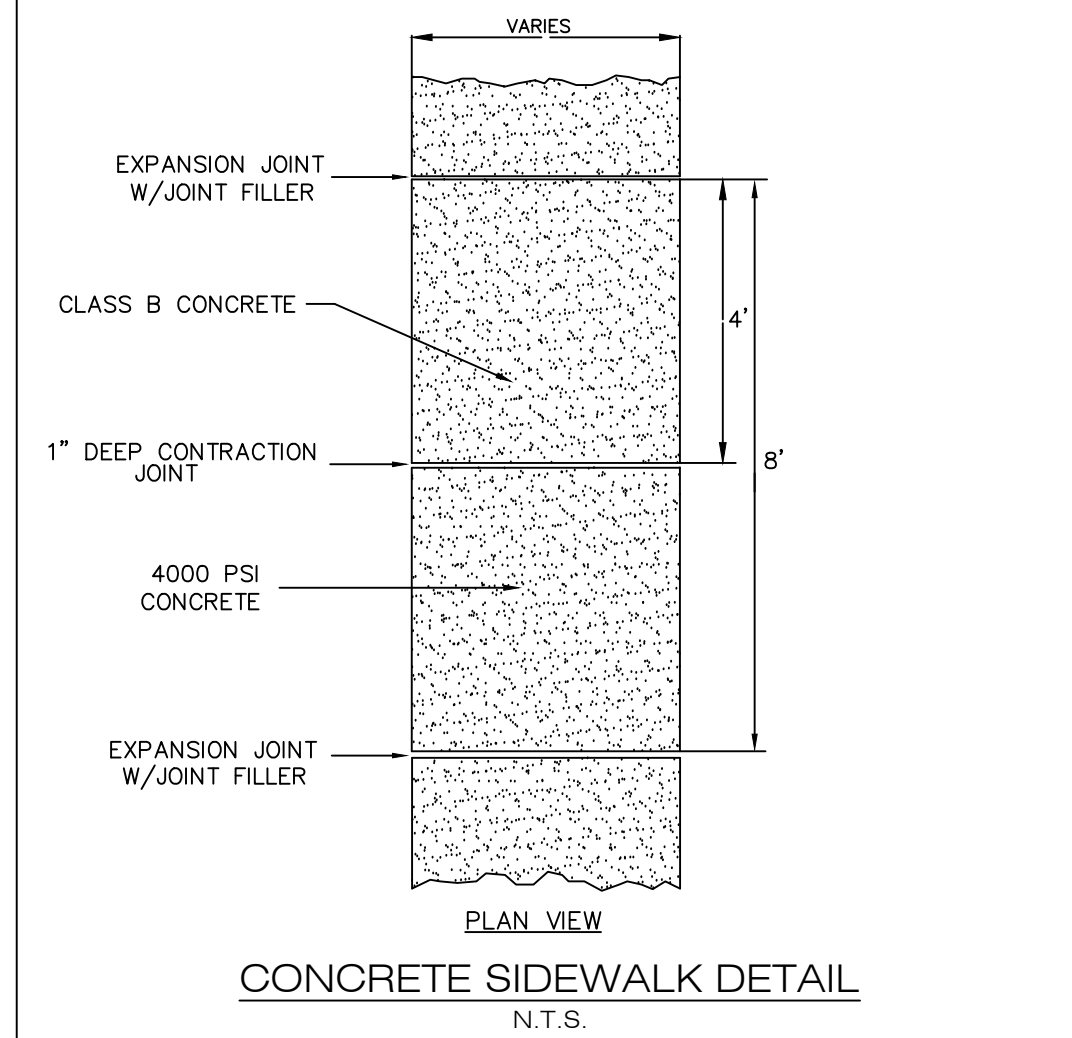
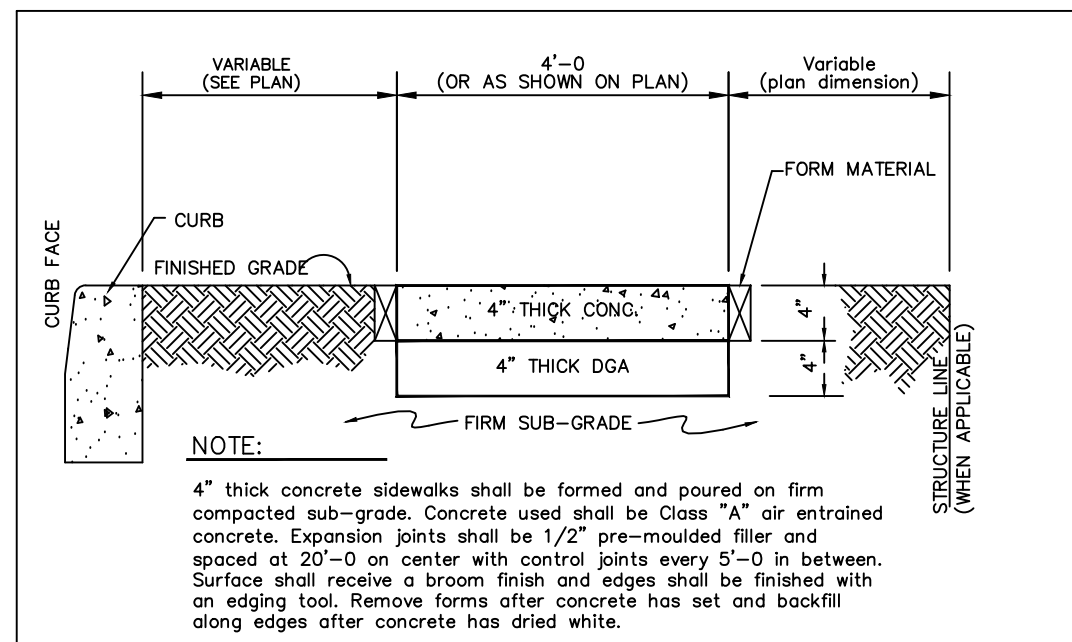
**TAX LOT 15**  
**95 JAMES AVENUE**  
**TOWNSHIP OF CRANFORD**  
**UNION COUNTY, NEW JERSEY**

**BLOCK 404**  
**GRADING AND UTILITY PLAN**

JOB NUMBER:  
20-1206

SCALE: AS SHOWN

**C-03**  
SHEET 3 OF 4

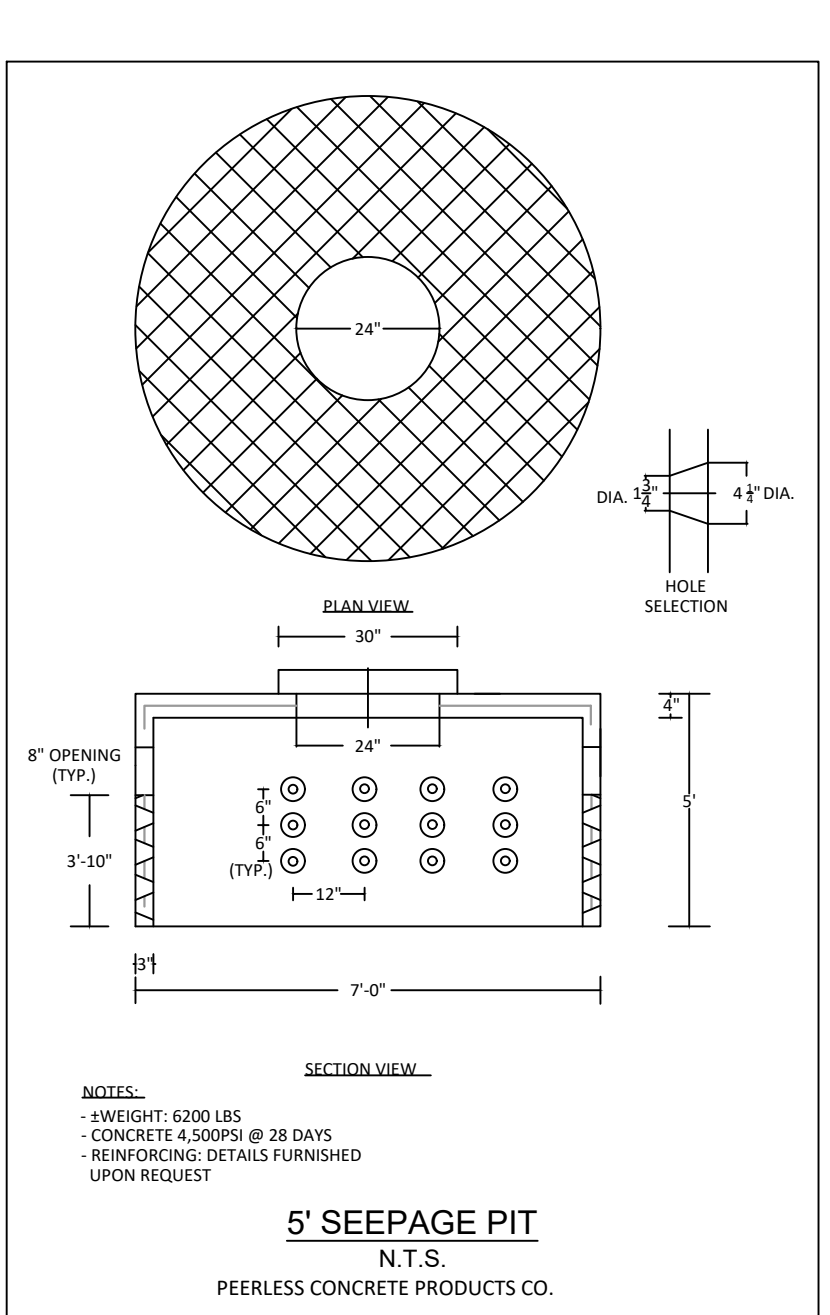
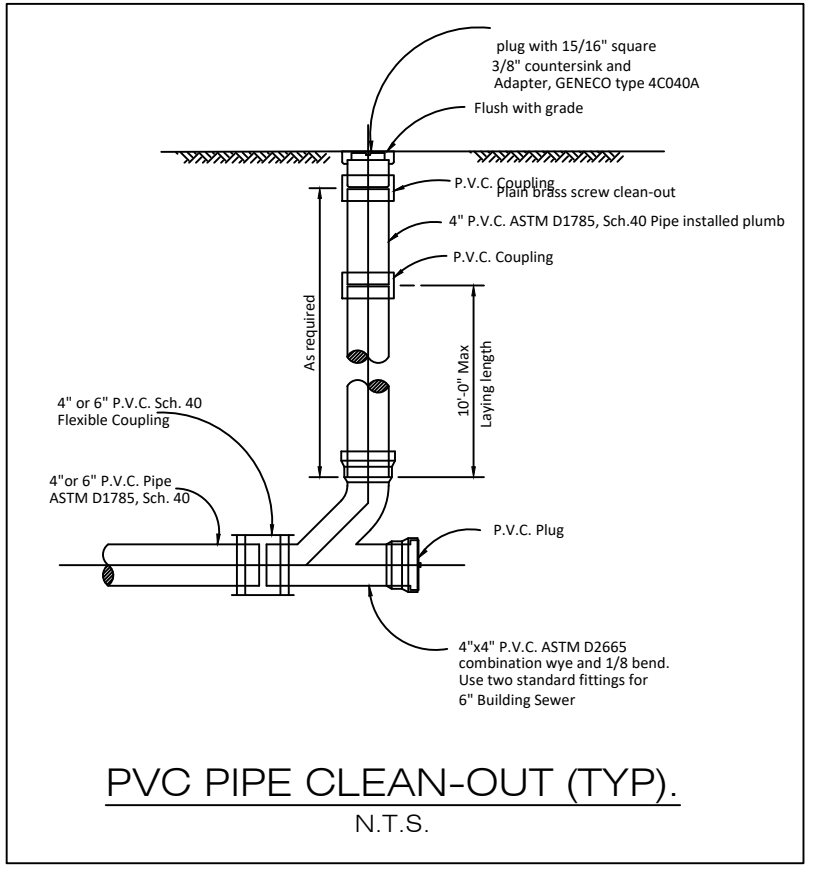
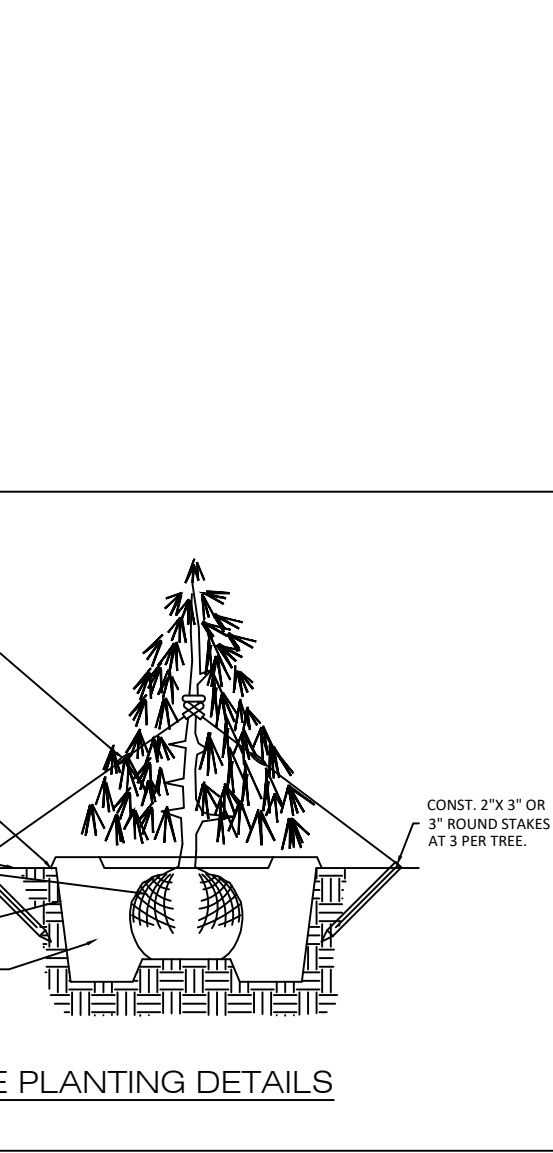


**STORMWATER MANAGEMENT NOTE:**

PER SECTION 364-8 C. (SOURCES FOR TECHNICAL GUIDANCE) OF THE TOWNSHIP ORDINANCES, THE "VOLUME OF REQUIRED STORAGE vs. DIFFERENCE IN IMPERVIOUS COVER" CHART HAS BEEN USED TO DETERMINE THE REQUIRED STORAGE VOLUME FOR THE PROPOSED DRY WELL ON LOT 15.02.

LOT 15.02  
IMPERVIOUS DIFFERENCE = 948.81 SF  
REQUIRED STORAGE VOLUME = 263 CF (1,967.24 GALLONS)  
STORAGE PROVIDED = 2,154 GALLONS

LOT 15.01  
IMPERVIOUS DIFFERENCE = 89.49 SF  
\*THE STORMWATER MANAGEMENT RULES DO NOT APPLY TO PROJECTS WITH LESS THAN 300 SF OF NET INCREASE OF IMPERVIOUS COVERAGE, HOWEVER A DRY WELL WITH A TOTAL VOLUME OF 2,154 GALLONS, IS PROVIDED.



**STORAGE VOLUME CALCULATIONS**

*Dry Well Volume: (Precast Concrete)*

Overall Diameter =	7.00 ft.
Overall Length =	5.00 ft.
Storage Diameter =	6.50 ft.
Storage Length =	4.67 ft.
Overall Area =	38.48 ft <sup>2</sup>
Overall Volume =	192.42 ft <sup>3</sup>
Overall Volume =	1439.324 Gallons
Storage Area =	33.18 ft <sup>2</sup>
Storage Volume =	154.97 ft <sup>3</sup>
Storage Volume =	1159.14 Gallons

*Stone Volume Around Dry Well (2" - 2 1/2")*

Excavation Length =	10.00 ft.
Excavation Width =	10.00 ft.
Excavation Depth =	5.25 ft. (to the top of the Dry Well)
Excavation Volume =	525.00 ft <sup>3</sup>
Total Stone Volume =	Excavation Volume - Overall Dry Well Volume
Total Stone Volume =	332.58 ft <sup>3</sup>
Total Stone Volume =	2487.68 Gallons
Water Storage Volume in Stone Voids (40%) =	133.03 ft <sup>3</sup>
Water Storage Volume in Stone Voids (40%) =	995.07 Gallons

*Proposed Water Retention Volume*

Total Water Retention Volume =	Dry Well Storage Volume + Storage Volume in Stone Voids
Total Water Retention Volume =	288.00 ft <sup>3</sup>
Total Water Retention Volume =	2154.21 Gallons

**Provide One (1) Dry Well System with Approximately 2,154-gallons Total Storage Volume**

**TAX LOT 15** **BLOCK 404**

**95 JAMES AVENUE**  
**TOWNSHIP OF CRANFORD**  
**UNION COUNTY, NEW JERSEY**

**CONSTRUCTION DETAILS**

**C-04**  
SHEET 4 OF 4

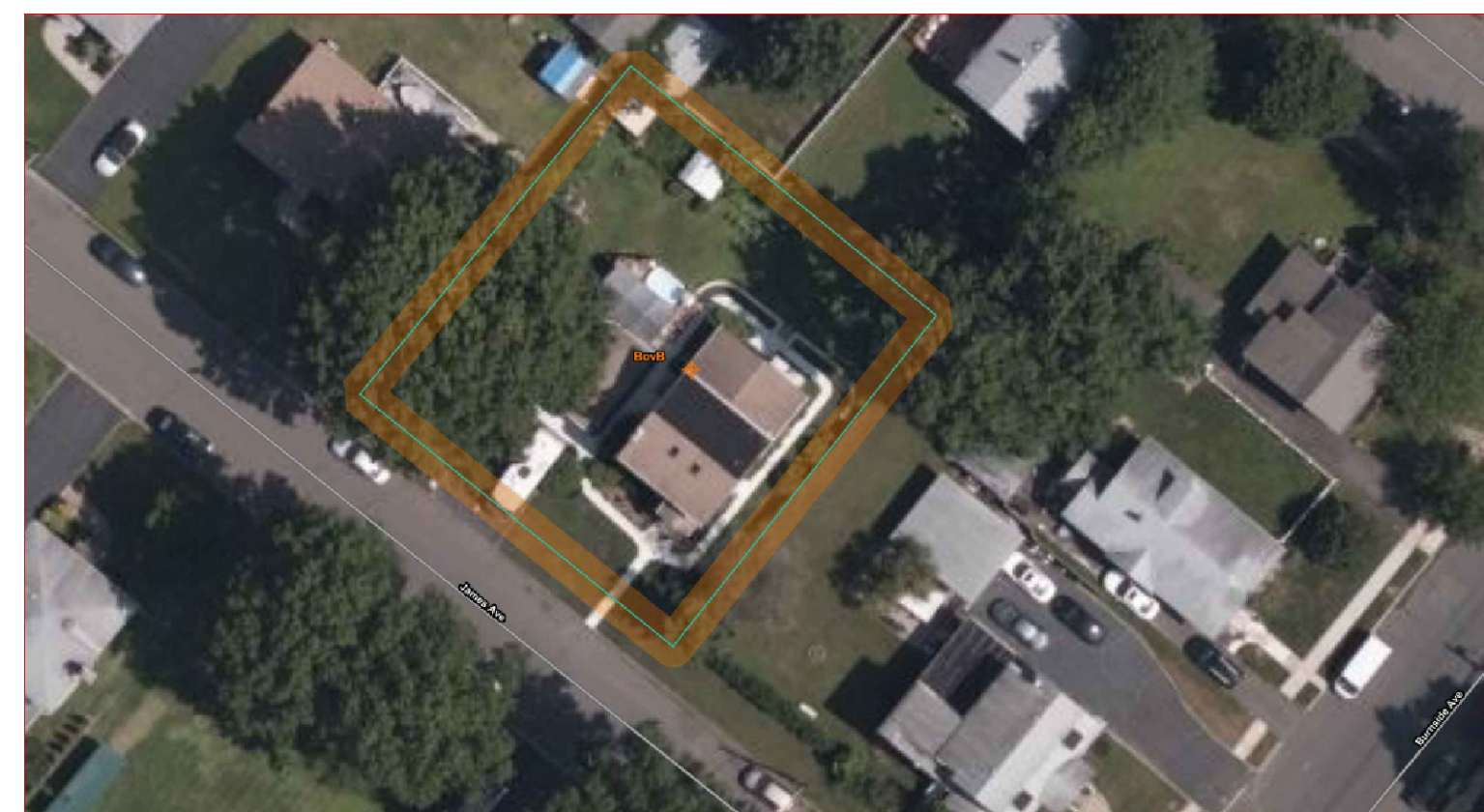
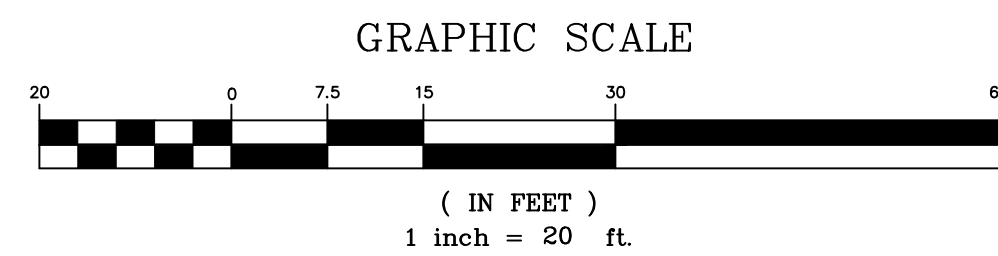
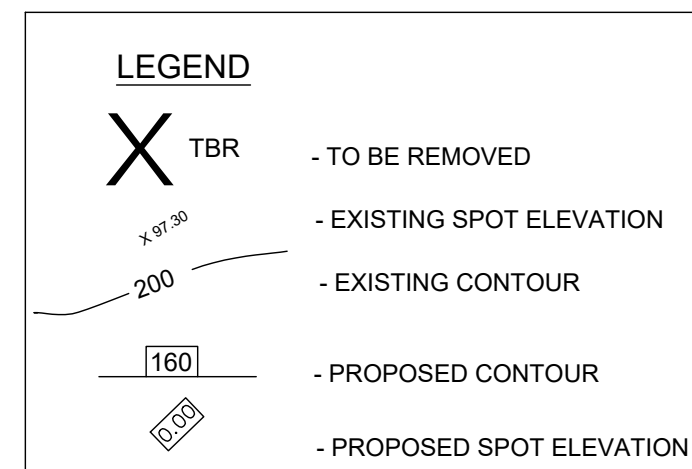
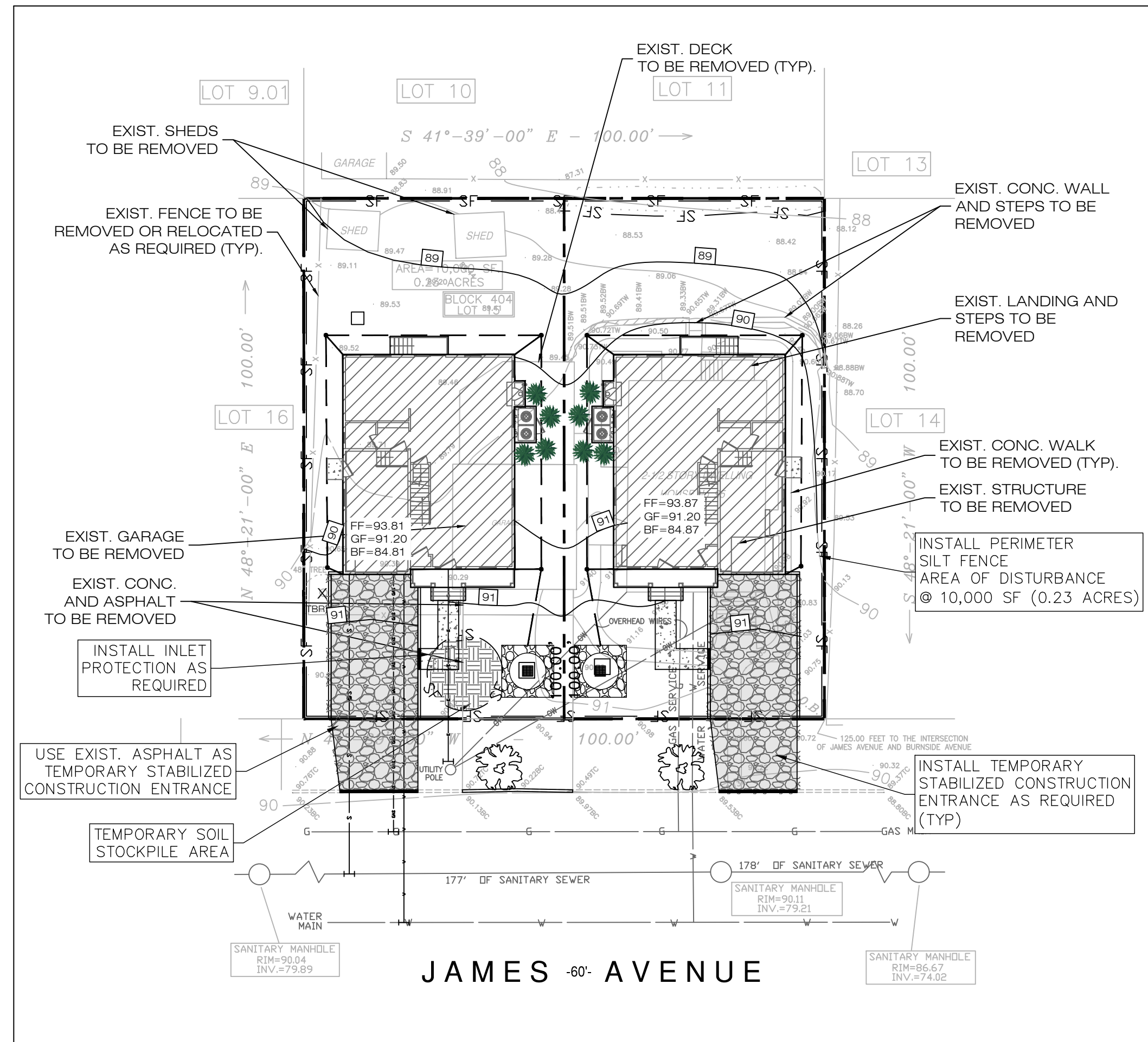
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DATE: 12/14/20  
DESIGNED BY: AAK  
DATE: 12/17/21  
APPROVED BY: AAK  
DATE: 12/17/21

PER ENGINEERING REVIEW COMMENTS: 12/17/21 LF AAK  
PER TOWNSHIP REVIEW COMMENTS: 10/07/21 LF AAK  
PER ARCHITECTURAL LAYOUT CHANGES: 08/02/21 LF AAK  
PER PLANNING REVIEW COMMENTS: 07/23/21 LF AAK  
REVISIONS: 07/23/21 LF AAK

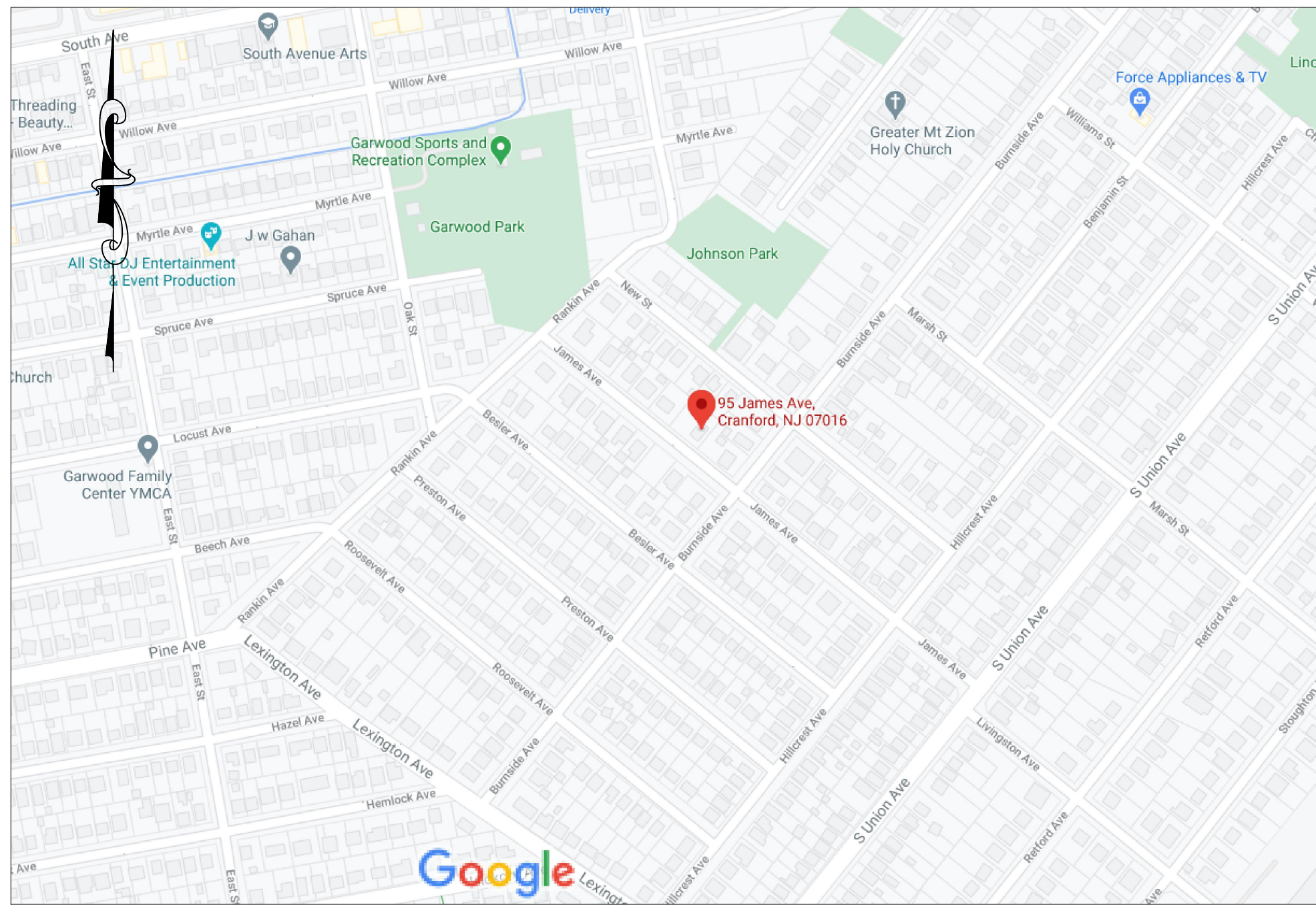
JOB NUMBER: 20-1206  
SCALE: AS SHOWN



USDA WEB SOIL SURVEY MAP  
N.T.S.

**NOTE:**  
ACCORDING TO USDA WEB SOIL SURVEY, THE MAP UNIT SYMBOL FOR THE ENTIRE SITE IS "BovB" (BOONTON-URBAN LAND-HALEDON COMPLEX, 0 TO 8 PERCENT SLOPES).

**SOIL MANAGEMENT NOTE:**  
ACCORDING TO STATE OF NEW JERSEY LAND USE CLASSIFICATION SYSTEM, THE SITE IS UNDER URBAN REDEVELOPMENT AREA, LAND USE CODE 1,110. THEREFORE, THE PROPOSED PROJECT DOES NOT REQUIRE COMPACTION REMEDIATION, AS PER EXEMPTION #6 UNDER SOIL MANAGEMENT AND PREPARATION STANDARDS FOR SOIL AND SEDIMENT CONTROL IN NEW JERSEY.



KEY MAP  
SCALE: 1"=150'

**DUST CONTROL NOTES**

THE FOLLOWING METHODS SHOULD BE CONSIDERED FOR CONTROLLING DUST: MULCHES - SEE STANDARD FOR STABILIZATION WITH MULCHES ONLY (PG. 5-1) OF STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY. NOTE: ALL PAGE REFERENCES ARE FOR ABOVE DOCUMENT DATED 7/99. VEGETATIVE COVER - SEE STANDARD FOR TEMPORARY VEGETATIVE COVER (PG. 7-1), PERMANENT VEGETATIVE COVER FOR SOIL STABILIZATION (PG. 4-1), AND PERMANENT STABILIZATION WITH SOD (PG. 6-1) SPRAY-ON ADHESIVES - ON MINERAL SOILS (NOT EFFECTIVE ON MUCK SOILS). KEEP TRAFFIC OFF THESE AREAS.

TABLE 16-1: DUST CONTROL MATERIALS

MATERIAL	WATER DILUTION	TYPE OF NOZZLE	APPLY GALLONS/ACRE
ANIONIC ASPHALT EMULSION	7:1	COARSE SPRAY	1200
LATEX EMULSION	12.5:1	FINE SPRAY	235
BASIN IN WATER	4:1	FINE SPRAY	300
POLYACRYLAMIDE (PAM)-SPRAY ON		APPLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS.	
POLYACRYLAMIDE (PAM)-DRY SPRAY		MAY ALSO BE USED AS AN ADDITIVE TO SEDIMENT BASINS TO FLOCCULATE AND PRECIPITATE SUSPENDED COLLOIDS.	
ACIDULATED SOY BEAN SOAP STICK	NONE	SEE SEDIMENT BASIN STANDARD (PG.26-1)	1200

**TILLAGE** - TO ROUGHEN SURFACE AND BRING CLODS TO THE SURFACE. THIS IS A TEMPORARY EMERGENCY MEASURE WHICH SHOULD BE USED BEFORE SOIL BLOWING STARTS. BEGIN PLOWING ON WINDWARD SIDE OF SITE.  
**CHISEL-TYPE PLOWS** SPACED ABOUT 12 INCHES APART, AND SPRING-TOOTHED HARROWS ARE EXAMPLES OF EQUIPMENT WHICH MAY PRODUCE THE DESIRED EFFECT.  
**SPRINKLING** - SITE IS SPRINKLED UNTIL THE SURFACE IS WET.  
**BARRIERS** - SOLID BOARD FENCES, SNOW FENCES, BURLAP FENCES, CRATE WALLS, BALES OF HAY, AND SIMILAR MATERIAL CAN BE USED TO CONTROL AIR CURRENTS AND SOIL BLOWING.  
**CALCIUM CHLORIDE** - SHALL BE IN THE FORM OF LOOSE, DRY GRANULATES OF FLAKES FINE ENOUGH TO FEED THROUGH COMMONLY USED SPREADERS AT A RATE THAT WILL KEEP SURFACE MOIST BUT NOT CAUSE POLLUTION OR PLANT DAMAGE. IF USED ON STEEPER SLOPES, THEN USE OTHER PRACTICES TO PREVENT WASHING INTO STREAMS, OR ACCUMULATION AROUND PLANTS.  
**STONE** - COVER SURFACE WITH CRUSHED STONE OR COARSE GRAVEL.

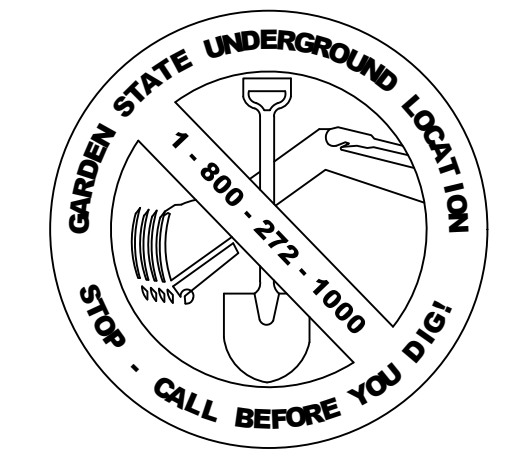
**NOTES FOR ROAD WORK:**

1. THE CONTRACTOR SHALL PREPARE A PLAN FOR THE PROPER DEWATERING OF EACH STREAM CROSSING PRIOR TO EXCAVATING THE STREAM BED. PLAN SHALL BE FORWARDED TO THE ENGINEER AND MORRIS COUNTY SOIL CONSERVATION DISTRICT FOR APPROVAL. THE DISTRICT SHALL BE NOTIFIED FOR INSPECTION PRIOR TO EACH STREAM CROSSING CONSTRUCTION.
2. ANY AREAS USED FOR CONTRACTOR'S STAGING, INCLUDING BUT NOT LIMITED TO, TEMPORARY STORAGE OF STOCKPILE MATERIALS (e.g. CRUSHED STONE, QUARRY PROCESS STONE, SELECT FILL, EXCAVATED MATERIALS, ETC.) SHALL BE ENTIRELY PROTECTED BY A SILT FENCE ALONG THE LOW ELEVATION SIDE TO CONTROL SEDIMENT RUNOFF.
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE MORRIS COUNTY SOIL CONSERVATION DISTRICT OF ANY STAGING AND/OR STOCKPILE LOCATION AREAS AND FOR OBTAINING A SOIL EROSION AND SEDIMENT CONTROL CERTIFICATION FOR THESE AREAS.
4. A CRUSHED STONE, VEHICLE WHEEL-CLEANING BLANKET SHALL BE INSTALLED AT THE CONTRACTOR'S STAGING YARD AND/OR STOCKPILE AREAS TO PREVENT OFF-SITE TRACING OF SEDIMENT BY CONSTRUCTION VEHICLE ONTO PUBLIC ROADS. BLANKET SHALL BE 15 FT. x 50 FT. x 6 IN. (MINIMUM), CRUSHED STONE 2-1/2 INCHES IN DIAMETER. SAID BLANKET SHALL BE UNDERLAIN WITH A SUITABLE SYNTHETIC SEDIMENT FILTER FABRIC AND MAINTAINED IN GOOD ORDER.

**SOMERSET-UNION COUNTY SOIL CONSERVATION DISTRICT SOIL EROSION AND SEDIMENT CONTROL NOTES:**

1. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
2. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN 30 DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW OR EQUIVALENT MATERIAL, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO STATE STANDARDS.
3. PERMANENT VEGETATION SHALL BE SEEDING OR SODDED ON ALL EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADING. MULCH WILL BE USED FOR PROTECTION UNTIL SEEDING IS ESTABLISHED.
4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STATE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.
5. A SUB-BASE COURSE WILL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS IN ORDER TO STABILIZE STREETS, ROADS, DRIVEWAYS AND PARKING AREAS. IN AREAS WHERE NO UTILITIES ARE PRESENT, THE SUB-BASE SHALL BE INSTALLED WITHIN 15 DAYS OF PRELIMINARY GRADING.
6. IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E. STEEP SLOPES, ROADWAY EMBANKMENTS) WILL RECEIVE A TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO THE STATE STANDARDS.
7. ANY STEEP SLOPES RECEIVING PIPELINE INSTALLATION WILL BE BACKFILLED AND STABILIZED DAILY, AS THE INSTALLATION PROCEEDS (I.E. SLOPES GREATER THAN 3:1).
8. TRAFFIC CONTROL STANDARDS REQUIRE THE INSTALLATION OF A 50'X30'X1" PAD OF 1 1/2" OR 2" STONE, AT ALL CONSTRUCTION DRIVEWAYS, IMMEDIATELY AFTER INITIAL SITE DISTURBANCE.
9. THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED IN WRITING 48 HOURS IN ADVANCE OF ANY LAND DISTURBING ACTIVITY.
10. AT THE TIME WHEN THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER, SHALL BE REMOVED OR TREATED IN SUCH A WAY THAT WILL PERMANENTLY ADJUST THE SOIL CONDITIONS AND RENDER IT SUITABLE FOR VEGETATIVE GROUND COVER. IF THE REMOVAL OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE CONDITIONS, NON-VEGETATIVE MEANS OR PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED.
11. IN THAT NJSA 4:24-39 ET SEQ., REQUIRES THAT NO CERTIFICATE OF OCCUPANCY BE ISSUED BEFORE THE PROVISIONS OF THE CERTIFIED PLAN FOR SOIL EROSION AND SEDIMENT CONTROL HAVE BEEN COMPLIED WITH FOR PERMANENT MEASURES, ALL SITE WORK FOR SITE PLANS AND ALL WORK AROUND INDIVIDUAL LOTS IN SUBDIVISIONS, WILL HAVE TO BE COMPLETED PRIOR TO THE DISTRICT ISSUING A REPORT OF COMPLIANCE FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE MUNICIPALITY.
12. CONDUIT OUTLET PROTECTION MUST BE INSTALLED AT ALL REQUIRED OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.
13. ANY CHANGES TO THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN WILL REQUIRE THE SUBMISSION OF REVISED SOIL EROSION AND SEDIMENT CONTROL PLANS TO THE DISTRICT FOR RE-CERTIFICATION. THE REVISED PLANS MUST MEET ALL CURRENT STATE SOIL EROSION AND SEDIMENT CONTROL STANDARDS.
14. THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED OF ANY CHANGES IN OWNERSHIP.
15. MULCHING IN THE STANDARDS IS REQUIRED FOR OBTAINING A CONDITIONAL REPORT OF COMPLIANCE. CONDITIONS ARE ONLY ISSUED WHEN THE SEASON PROHIBITS SEEDING.
16. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL ADJACENT ROADS CLEAN DURING THE LIFE OF THE CONSTRUCTION PROJECT.
17. THE DEVELOPER SHALL BE RESPONSIBLE FOR REMEDIATING ANY EROSION OR SEDIMENT PROBLEMS THAT ARISE AS A RESULT OF ONGOING CONSTRUCTION AT THE REQUEST OF THE SOMERSET-UNION SOIL CONSERVATION DISTRICT.
18. HYDROSEEDING IS A TWO-STEP PROCESS. THE FIRST STEP INCLUDES SEED, FERTILIZER, LIME, ETC., ALONG WITH MINIMAL AMOUNTS OF MULCH TO PROMOTE CONSISTENCY, GOOD SEED TO SOIL CONTACT, AND GIVE A VISUAL INDICATION OF COVERAGE. UPON COMPLETION OF THE SEEDING OPERATION, HYDRO-MULCH SHOULD BE APPLIED AT A RATE OF 1500 LBS. PER ACRE IN THE SECOND STEP. THE USE OF HYDRO-MULCH, AS OPPOSED TO STRAW, IS LIMITED TO OPTIMUM SEEDING DATES AS LISTED IN THE STANDARDS.

**PROTECT YOURSELF**  
A PHONE CALL  
CAN BE YOUR INSURANCE POLICY



WHAT YOU DON'T KNOW CAN HURT YOU.  
THE STATE OF NEW JERSEY REQUIRES NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE.

ADNAN A. KHAN, P.E., C.M.E.  
PROFESSIONAL ENGINEER  
DATE: 12/14/20  
DESIGNED BY: AK  
DATE: 12/14/20  
APPROVED BY: AK  
DATE: 12/14/20  
NO. 0210821

**AWZ ENGINEERING, INC.**  
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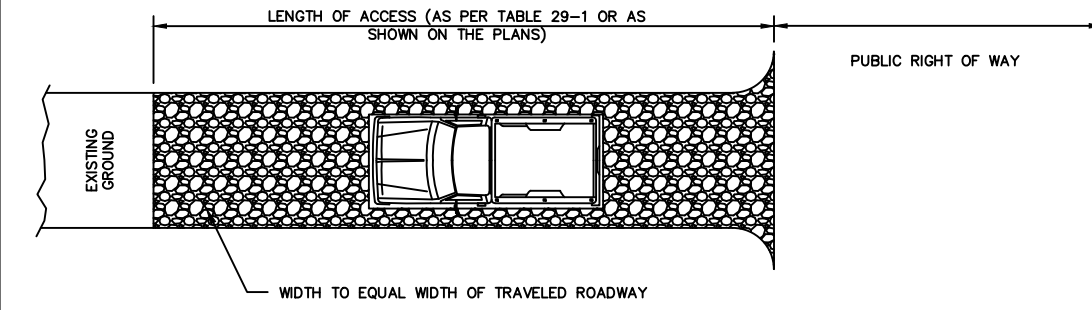
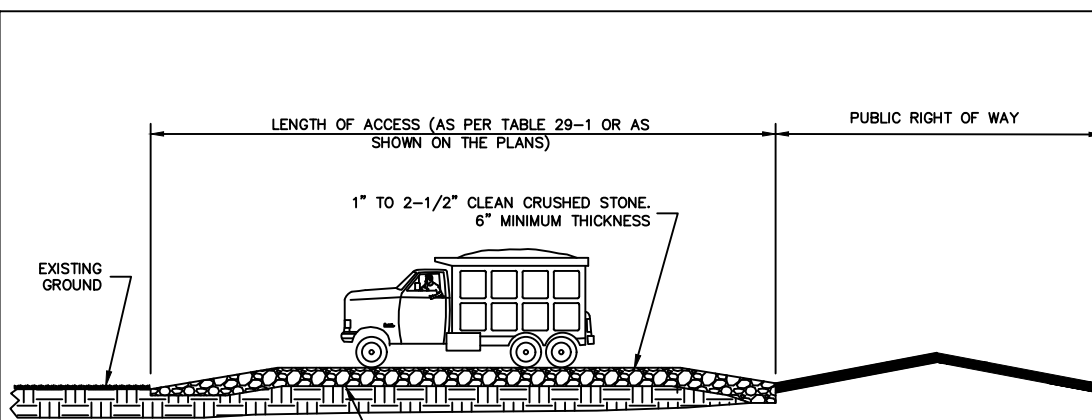
TAX LOT 15  
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UNION COUNTY, NEW JERSEY  
SOIL EROSION AND SEDIMENT CONTROL PLAN

JOB NUMBER:  
20-1206  
SCALE: AS SHOWN

S-01  
SHEET 1 OF 2

**THIS PLAN IS TO BE USED FOR SOIL EROSION CONTROL PURPOSES ONLY**

# THIS PLAN IS TO BE USED FOR SOIL EROSION CONTROL PURPOSES ONLY



**STABILIZED CONSTRUCTION ACCESS**

PERCENT SLOPE OF ROADWAY	LENGTH OF STONE REQUIRED
0 TO 2%	50 FT
2 TO 5%	100 FT
5%	200 FT

ENTIRE SURFACE STABILIZED WITH FABRIC base course per governing authority requirements

- NOTES:**
- ALL INDIVIDUAL LOT INGRESS/EGRESS POINTS SHALL REQUIRE STABILIZED CONSTRUCTION ENTRANCE ACCESS.
  - PLACE STABILIZED CONSTRUCTION ENTRANCE AT LOCATIONS AS SHOWN ON THE SOIL EROSION PREVENTION CONTROL PLAN.
  - STONE SIZE SHALL BE ASTM C-93, SIZE NO. 2 OR 3, CRUSHED STONE.
  - THE THICKNESS OF THE STABILIZED CONSTRUCTION ENTRANCE SHALL NOT BE LESS THAN 4".
  - THE WIDTH AT THE EXISTING PAVEMENT SHALL NOT BE LESS THAN THE FULL WIDTH OF POINTS OF INGRESS AND EGRESS.
  - THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE MAINTAINED BY A CONTRACTOR WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT INTO THE KEYWAY/PAVEMENT. THIS INCLUDES PERIODIC TOP DRESSING WITH ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY RESIDUE USED TO TOP DRESSMENT.
  - ALL SEDIMENT SPILLED, DRIPPED, WASHED OR TRACKED ONTO THE PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.
  - WHERE TRACKING OF SOIL ONTO ROADWAYS IS A CONTINUAL OCCURRENCE, ALL CONTRACTORS MUST SITE AND INSTALL CONSTRUCTION ACCESS AS REQUIRED TO BROAD SWEEP THE ROADWAY AT 2 HOUR INTERVALS PRIOR TO LEAVING THE CONSTRUCTION SITE AT THE END OF THE DAY.

## PROPOSED SEQUENCE OF DEVELOPMENT

- Installation of all sediment and erosion control devices (including silt fences and stabilized construction access) prior to any major soil disturbances or in their proper sequence and maintenance until permanent protection is established.
- Site demolition, clearing, clear and remove all debris as necessary. All remaining vegetation to be properly protected and to remain in its natural state.
- General and preliminary grading of all pavement areas and storm water management basins.
- Layout and location of all proposed utilities.
- Construction of all proposed improvements and drainage facilities.
- Installation of all erosion control measures affected by soil activities such as inlet sediment barriers.
- Pavement subbase course to be applied immediately following preliminary grading and construction of improvements in order to stabilize pavement areas.
- Installation of all pavement base material.
- Fine grading of all lot areas and basins including construction of all soil erosion control as necessary.
- Compaction test on mitigation areas.
- Stabilization of all off pavement areas.
- Uniformly apply topsoil to an average depth of 5", minimum of 4", firm in place. Provide permanent vegetative stabilization of all exposed areas.
- Complete all landscaping and vegetative cover.
- Removal of all temporary sediment and erosion control devices.

## STANDARD FOR TEMPORARY VEGETATIVE COVER FOR SOIL STABILIZATION

**DEFINITION**  
Establishment of temporary vegetative cover on soils exposed for periods of two to six months which are not being graded, not under active construction or not scheduled for permanent seeding within 60 days.

**PURPOSE**  
To temporarily stabilize the soil and reduce damage from wind and water erosion until permanent stabilization is accomplished.

**WATER QUALITY ENHANCEMENT**  
Provides temporary protection against the impacts of wind and rain, slows the over land movement of stormwater runoff, increases infiltration and retains soil and nutrients on site, protecting streams or other stormwater conveyances.

**WHERE APPLICABLE**  
On exposed soils that have the potential for causing off-site environmental damage.

## METHODS AND MATERIALS

**SITE PREPARATION**

A. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and mulch anchoring. All grading should be done in accordance with Standards for Land Grading, page 19-1.

B. Install needed erosion control practices or facilities such as diversions, grade stabilization structures, channel stabilization measures, sediment basins, and waterways. See Standards 11 through 42.

**SEEDING PREPARATION**

A. Apply limestone and fertilizer according to soil test recommendations such as offered by Rutgers Co-operative Extension. Soil sample mullers are available from the local Rutgers Cooperative Extension offices. Fertilizer shall be applied at the rate of 500 pounds per acre of 11 lbs. per 1000 square feet of 10-20-10 or equivalent with 50% water insoluble nitrogen unless a soil test indicates otherwise. Calcium carbonate is the equivalent and standard for measuring the ability of liming materials to neutralize soil acidity and supply calcium magnesium to grasses and legumes.

**SEEDING PREPARATION**

A. Uniformly apply ground limestone and fertilizer to topsoil which has been spread and firm, according to soil test recommendations such as offered by Rutgers Co-operative Extension. Soil sample mullers are available from the local Rutgers Cooperative Extension offices. Fertilizer shall be applied at the rate of 500 pounds per acre of 11 lbs. per 1000 square feet of 10-10-10 or equivalent with 50% water insoluble nitrogen unless a soil test indicates otherwise and incorporated into the surface 4 inches. If fertilizer is not incorporated, apply one-half the rate described above during seedbed preparation and repeat another one-half rate application of the same fertilizer within 3 to 5 weeks after seeding.

B. Work lime and fertilizer into the soil as nearly as practical to a depth of 4 inches with a disc, springtooth harrow, or other suitable equipment. The final harrowing or disking operation should be the general contour. Continue tillage until a reasonable uniform seedbed is prepared.

C. Insect seedbed just before seeding. If traffic has not soil compacted, the area must be retilled in accordance with the above.

D. Soils high in sulfides or having a pH of 4 or less refer to Standard for Management of High Acid Producing Soils, pp. 1-1.

**SEEDING**

A. Select seed from recommendations in Table 7-2.

**TABLE 7-2**  
**TEMPORARY VEGETATIVE STABILIZATION GRASSES, SEEDING RATES, DATES AND DEPTH.**

SEED SELECTIONS	SEEDING RATE <sup>1</sup>		OPTIMUM SEEDING DATE <sup>2</sup>		OPTIMUM SEEDING DEPTH <sup>3</sup> (inches)	
	Per Acre	Per 1000 Sq. Ft.	Zone 5a, 6a	Zone 7a, 8a		
<b>COLD SEASON GRASSES</b>						
1. Perennial ryegrass	100	1.0	3/15-6/1 8/1-9/15	3/1-5/15 8/15-10/1	2/15-5/1 8/15-10/15	0.5
2. Spring oats	86	2.0	3/15-6/1 8/1-9/15	3/1-5/15 8/15-10/1	2/15-5/1 8/15-10/15	1.0
3. Winter Barley	96	2.2	8/1-9/15	8/15-10/1	8/15-10/15	1.0
4. Annual ryegrass	110	1.0	3/15-6/1 8/1-9/15	3/1-5/15 8/15-10/1	2/15-5/1 8/15-10/15	0.5
5. Winter Cereal Rye	112	2.8	8/1-11/1	8/1-11/15	8/1-12/15	1.0
<b>WARM SEASON GRASSES</b>						
6. Pearl Millet	20	0.5	6/1-8/1	5/15-8/15	5/1-9/1	1.0
7. Millet (German or Hungarian)	30	0.7	6/1-8/1	5/15-8/15	5/1-9/1	0.25

1. Seeding rate for warm season grass, selections 5-7 shall be adjusted to reflect the amount of Pure Live Seed (PLS) as determined by a germination test result. No adjustment is required for cool season grasses.

2. May be planting following summer, if soil moisture is adequate or seeded area can be irrigated.

3. Plant Hardness Zone (see figure 7-7, pg. 7-4).

4. Twice the depth for sandy soils.

B. Conventional Seeding. Apply seed uniformly by hand, cyclone (centrifugal) seeder, drop seeder, drill or cutlapper seeder. Except for drilled, hydroseeded or cutlapped seedings, seed shall be incorporated into the soil, to a depth of 1/4 to 1/2 inch, by raking or dragging. Depth of seed placement may be 1/4 inch deeper on coarse textured soil.

C. Hydroseeding is a broadcast seeding method usually involving a truck or trailer mounted tank, with an agitation system and hydraulic pump for mixing seed, water and fertilizer and spraying the mix onto the prepared seedbed. Mulch shall not be included in the tank with seed. Short fibred mulch may be applied with a hydroseeder following seeding. (Also see Section IV Mulching) Hydroseeding is not a preferred seeding method because seed and fertilizer are applied to the surface and not incorporated into the soil. Poor seed to soil contact occurs reducing seed germination and growth. Hydroseeding may be used for areas too steep for conventional equipment to traverse or too obstructed with rocks, stumps, etc.

D. After seeding, firming the soil with a corrugated roller will assure good seed-to-soil contact, surface will be covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000 square foot sections and distribute 70 to 90 pounds within each section.

Anchoring shall be accomplished immediately after placement to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area, steepness of slopes, and costs.

Peg and Twine. Drive 8 to 10 inch wooden pegs to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may be driven before or after applying mulch. Secure twine around each peg with two or more round turns.

Mulch Nettings. Staple paper, jute, cotton, or plastic nettings to the soil surface. Use a degradable netting in areas to be mowed.

Crimper (mulch anchoring coupler tool). A tractor-drawn implement, somewhat like a disc-harrow, especially designed to push or cut some of the broadcast long fiber mulch 3 to 4 inches into the soil so as to anchor it and leave part standing upright. This technique is limited to areas traversable by a tractor, which must operate on the contour of slopes. Straw mulch rate must be 3 tons per acre. No tacking or adhesive agent is required.

Liquid Mulch-Binders. May be used to anchor salt hay, hay or straw mulch.

a. Applications should be heavier at edges where wind may catch the mulch, in valleys, and at crests of banks. The remainder of the area should be uniform in appearance.

Use one of the following:

- Organic and Vegetable Based Binders - Naturally occurring, powder based, hydrophilic materials which when water formulates a gel and when applied to mulch under satisfactory curing conditions will form a membrane network of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in a phytotoxic effect or impede growth of turf-grass. Use of rates and weather conditions as recommended by the manufacturer to anchor mulch materials. Many new products are available, some of which may need further evaluation for use in this state.
- Synthetic Binders - High polymer synthetic emulsion, miscible with water when diluted and following application to mulch, drying and curing shall no longer be soluble or dispersible in water. It shall be applied at rates recommended by the manufacturer and remain tacky until germination of grass.

**WOOD-FIBER OR PAPER-FIBER MULCH**. Shall be made from wood, plant fibers or paper containing no growth or germination inhibiting materials, used at the rate of 1,500 pounds per acre (or as recommended by the product manufacturer) and hydroseeded. This mulch shall be applied in accordance with the manufacturer's recommendations. Mulch may be applied by hand or mechanical spreader at the rate of 60-75 lbs./1,000 square feet and activated with 0.2 to 0.4 inches of water. This material has been found to be beneficial for use on small lawn or renovation areas, seeded areas where weed-seed free mulch is desired or on sites where straw mulch and tackifier agent are not practical or desirable.

Applying the full 0.2 to 0.4 inches of water after spreading pelletized mulch on the seed bed is extremely important for sufficient activation and expansion of the mulch to provide soil coverage.

**ESTABLISHING PERMANENT VEGETATIVE STABILIZATION**

The quality of permanent vegetation rests with the contractor. The timing of seeding, preparing the seedbed, applying nutrients, mulch and other management are essential. The seed application rates in Table 4-3 are required when a Report of Compliance is requested prior to actual establishment of permanent vegetation. Up to 50% reduction in application rates may be used when permanent vegetation is established prior to requesting a Report of Compliance from the district. These rates apply to all methods of seeding. Establishing permanent vegetation means 80% vegetative cover (of the seeded species) and mowed areas. Note this designation of mowed does not guarantee the permanency of the turf should other maintenance factors be neglected or otherwise mismanaged.

**TABLE 4-3**  
**PERMANENT VEGETATIVE MIXTURES, PLANTING RATES AND PLANTING DATES<sup>1</sup>**

SEED MIXTURE <sup>2</sup>	PLANTING RATE <sup>3</sup> (lb./1000 sq. ft.)	PLANTING DATES			REMARKS
		Zone 5a, 6a	Zone 6b	Zone 7a, 7b	
<b>WARM SEASON SEED MIXTURES</b>					
1. A. FOR PENNSYLVANIA NATIONAL FOREST SERVICE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY					
1. SWITCHGRASS AND/OR COASTAL PANICGRASS PLUS OR FLATFEST	15	3S			C-D
2. S. SWITCHGRASS	15	4S			C-D
3. S. SWITCHGRASS, BLUEGRASS, PERENNIAL RYEGRASS, PLUS WHITE CLOVER	20	4S			C-D
4. S. SWITCHGRASS AND/OR COASTAL PANICGRASS	10	2S			C-D
5. BERMUDA, FLORIDA BROOMS (SEED), ZOSTERAGRASS (SPERM)	15	3S			A-D
6. BERMUDA, FLORIDA BROOMS (SEED), ZOSTERAGRASS (SPERM)	30	7.0			A-D
<b>COOL SEASON SEED MIXTURES</b>					
7. FINE FESCUE (BLENDED) OR HYPERICUM (BLENDED) WITH STRONG CREEPING RED FESCUE OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	45	1.0			B-D
8. FINE FESCUE (BLENDED) OR HYPERICUM (BLENDED) WITH STRONG CREEPING RED FESCUE OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	10	5.0			B-D
9. STRONG CREEPING RED FESCUE OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	130	3			B-D
10. TALL FESCUE (BLENDED) OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	30	7.0			B-D
11. TALL FESCUE (BLENDED) OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	30	7.0			B-D
12. TALL FESCUE (BLENDED) OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	25	6.0			B-D
13. DEERTONGUE (REDTOP) OR WILD RYE (ELYSIUM) OR SWITCHGRASS	20	4.5			C-D
14. TALL FESCUE (BLENDED) OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	265	6			B-D
15. TALL FESCUE (BLENDED) OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	20	5.0			B-D
16. TALL FESCUE (BLENDED) OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	20	5.0			B-D
17. MONTOYIA BLUEGRASS OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	45	1			C-D
18. MONTOYIA BLUEGRASS OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	45	1			C-D
19. MONTOYIA BLUEGRASS OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	130	3			C-D
20. MONTOYIA BLUEGRASS OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	130	3			C-D
21. CREEPING BENTGRASS OR ALKALI BLEGRASS	45	1			B-D
22. CREEPING BENTGRASS OR ALKALI BLEGRASS	45	1			B-D
23. MAHOE DIVERSERS FESCUE OR WILD FLOWER MIXTURE	25	1.6			C-D
24. SANDHORN COORAGRASS OR SALMISODORON COORAGRASS	50		Before 7/1	Before 7/1	D
25. AMERICAN COASTAL PANICGRASS	20	4.5			D
26. PURPHELL GRASS	50		Before 5/10	Before 5/10	D
27. DANISH WILLOW OR SILENT DOGWOOD	50		Before 5/10	Before 5/10	D

1. Refer to Soil Surveys for drainage class descriptions.

2. Refer to Soil Bioengineering Standard for additional seed mixtures.

3. Spillways only.

4. See Appendix E for description of turf grasses and cultivars.

B. Work lime and fertilizer into the soil as nearly as practical to a depth of 4 inches with a disc, springtooth harrow, or other suitable equipment. The final harrowing or disking operation should be the general contour. Continue tillage until a reasonable uniform seedbed is prepared.

C. High acid producing soils. Soils having a pH of 4 or less or containing iron sulfide shall be covered with a minimum of 12 inches of soil having a pH of 5 or more before initiating seedbed preparation. See Standard for Management of High Acid Producing Soils for specific requirements.

**SEEDING**

A. Select a mixture from Table 4-3 or use mixture recommended by Rutgers Cooperative Extension or Natural Resources Conservation Service which is approved by the Soil Conservation District. Seed germination shall have been tested within 12 months of the planting date. No seed shall be accepted with a germination test date more than 12 months old unless retested.

(1) Seeding rates specified are required when a report of compliance is requested prior to actual establishment of permanent vegetation. Up to 50% reduction in rates may be used when permanent vegetation is established prior to a report of compliance inspection. These rates apply to all methods of seeding. Establishing permanent vegetation means 80% vegetative coverage with the specified seed mixture for the seeded area and mowed area.

(2) Warm season mixtures are grasses and legumes which maximize growth at high temperatures, generally 85F and above. See Table 4-3, mixtures 1 to 7. Planting rates for warm season grasses shall be the amount of Pure Live Seed (PLS) as determined by germination testing results.

(3) Cool Season Mixtures are grasses and legumes which maximize growth at temperatures below 85F. Many grasses become active at 65F. See Table 3, mixtures 8-20. Adjustment of planting rates to compensate for the amount of Pure Live Seed is not required for cool season grasses.

B. Conventional Seeding is performed by applying seed uniformly by hand, cyclone (centrifugal) seeder, drop seeder, drill or cutlapper seeder. Except for drilled, hydroseeded or cutlapped seedings, seed shall be incorporated into the soil within 24 hours of seedbed preparation to a depth of 1/4 to 1/2 inch, by raking or dragging. Depth of seed placement may be 1/4 inch deeper on coarse textured soil.

C. After seeding, firming the soil with a corrugated roller will assure good seed-to-soil contact restore capillary, and improve seed emergence. This is preferred method. When performed on the contour, sheet erosion will be minimized and water conservation on site will be maximized.

D. Hydroseeding is a broadcast seeding method usually involving a truck or trailer mounted tank, with an agitation system and hydraulic pump for mixing seed, water and fertilizer and spraying the mix onto the prepared seedbed. Mulch shall not be included in the tank with seed. Short fibred mulch may be applied with a hydroseeder following seeding. (Also see Section IV Mulching) Hydroseeding is not a preferred seeding method because seed and fertilizer are applied to the surface and not incorporated into the soil. Poor seed to soil contact occurs reducing seed germination and growth. Hydroseeding may be used for areas too steep for conventional equipment to traverse or too obstructed with rocks, stumps, etc.

**MULCHING**

Mulching is required on all seeding. Mulch will insure against erosion before grass is established and will promote faster and earlier establishment. The existence of vegetation sufficient to control soil erosion shall be deemed compliance with this mulching requirement.

Straw or Hay. Unrotted small grain straw, hay free of seeds, or salt hay to be applied at the rate of 1-1/2 to 2 tons per acre (70 to 90 pounds per 1,000 square feet), except that where a crimper is used instead of a liquid mulch-binder (tackifying or adhesive agent), the rate of application is 3 tons per acre. Mulch chopper-blowers must not grind the mulch. Hay mulch is not recommended for establishing fine turf or lawns due to the presence of weed seed.

Application. Spread mulch uniformly by hand or mechanically so that approximately 85% of the soil surface will be covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000 square foot sections and distribute 70 to 90 pounds within each section.

Anchoring shall be accomplished immediately after placement to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area, steepness of slopes, and costs.

Peg and Twine. Drive 8 to 10 inch wooden pegs to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may be driven before or after applying mulch. Secure twine around each peg with two or more round turns.

Mulch Nettings. Staple paper, jute, cotton, or plastic nettings to the soil surface. Use a degradable netting in areas to be mowed.

Crimper (mulch anchoring coupler tool). A tractor-drawn implement, somewhat like a disc-harrow, especially designed to push or cut some of the broadcast long fiber mulch 3 to 4 inches into the soil so as to anchor it and leave part standing upright. This technique is limited to areas traversable by a tractor, which must operate on the contour of slopes. Straw mulch rate must be 3 tons per acre. No tacking or adhesive agent is required.

Liquid Mulch-Binders. May be used to anchor salt hay, hay or straw mulch.

a. Applications should be heavier at edges where wind may catch the mulch, in valleys, and at crests of banks. The remainder of the area should be uniform in appearance.

b. Use one of the following:

- Organic and Vegetable Based Binders - Naturally occurring, powder based, hydrophilic materials which when water formulates a gel and when applied to mulch under satisfactory curing conditions will form a membrane network of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in a phytotoxic effect or impede growth of turf-grass. Use of rates and weather conditions as recommended by the manufacturer to anchor mulch materials. Many new products are available, some of which may need further evaluation for use in this state.
- Synthetic Binders - High polymer synthetic emulsion, miscible with water when diluted and following application to mulch, drying and curing shall no longer be soluble or dispersible in water. It shall be applied at rates recommended by the manufacturer and remain tacky until germination of grass.

**WOOD-FIBER OR PAPER-FIBER MULCH**. Shall be made from wood, plant fibers or paper containing no growth or germination inhibiting materials, used at the rate of 1,500 pounds per acre (or as recommended by the product manufacturer) and may be applied by a hydroseeder. This mulch shall be applied in accordance with the manufacturer's recommendations. Mulch may be applied by hand or mechanical spreader at the rate of 60-75 lbs./1,000 square feet and activated with 0.2 to 0.4 inches of water. This material has been found to be beneficial for use on small lawn or renovation areas, seeded areas where weed-seed free mulch is desired or on sites where straw mulch and tackifier agent are not practical or desirable.

Applying the full 0.2 to 0.4 inches of water after spreading pelletized mulch on the seed bed is extremely important for sufficient activation and expansion of the mulch to provide soil coverage.

**IRRIGATION (where feasible)**

If soil moisture is deficient, and mulch is not used, supply new seedings with adequate water (a minimum of 1/4 inch twice a day until vegetation is well established). This is especially true when seedlings are made in otherwise dry or hot weather or on droughty sites.

**TODRESSING**

Since soil organic matter content and slow fertilizer (water insoluble) are prescribed in Section 2A. Seeded preparation in this Standard, no follow-up of topdressing is mandatory.

An exception may be made where gross nitrogen deficiency exists to the extent that turf failure may develop. In that instance, topdress with 10-10-10 or equivalent at 300 pounds per acre or 7 pounds per 1,000 square feet every 3 to 5 weeks until the grass until the gross nitrogen deficiency in the turf is ameliorated.

**TABLE 4-2**  
**PERMANENT STABILIZATION MIXTURES FOR VARIOUS USES**

Application	PLANTING MIXTURES BY SOIL DRAINAGE CLASS/ <sup>1</sup> (See Table 4-3)		
	Excessively Drained	Moderately Well Drained	Somewhat Poorly to Poorly Drained
Residential/commercial lots	10, 12, 15	6, 10, 12, 13, 14, 15	16
Pond and channel banks, dikes, berms, and dams	2, 5, 6, 10	5, 6, 7, 8, 9, 15	2, 6, 16, 17
Drainage ditches, swales, detention basins	2, 9, 11	2, 7, 9, 11, 12	2, 9, 16, 17
Filter Strips	12	11, 12	11, 12
Drainage waterway, spillways	2, 3, 9, 10, 12	6, 7, 9, 10, 11, 12	2, 9, 11, 12
Recreation areas, athletic fields	5, 12, 15, 18	12, 13, 14, 15, 18	16
Steep slopes and banks, ditches, borrow areas	2, 3, 6, 8	2, 3, 5, 7, 8, 9, 10, 15	2, 9, 10, 11, 12
Sand and gravel pits, Sanitary landfills	1, 2, 3, 4, 6, 21	1, 2, 3, 4, 5, 6, 8	2, 8
Dredged material, spoilbanks, borrow areas	2, 3, 6, 20	2, 3, 6, 11	2, 8
Streambanks & shorelines <sup>2</sup>	2, 8, 20, 21a	2, 8, 19b, 20, 21a, 21b	2, 8, 19a, 21a,b,c,d
Utility rights-of-way	3, 7, 18a	3, 7	8, 9, 17

1. Refer to Soil Surveys for drainage class descriptions.

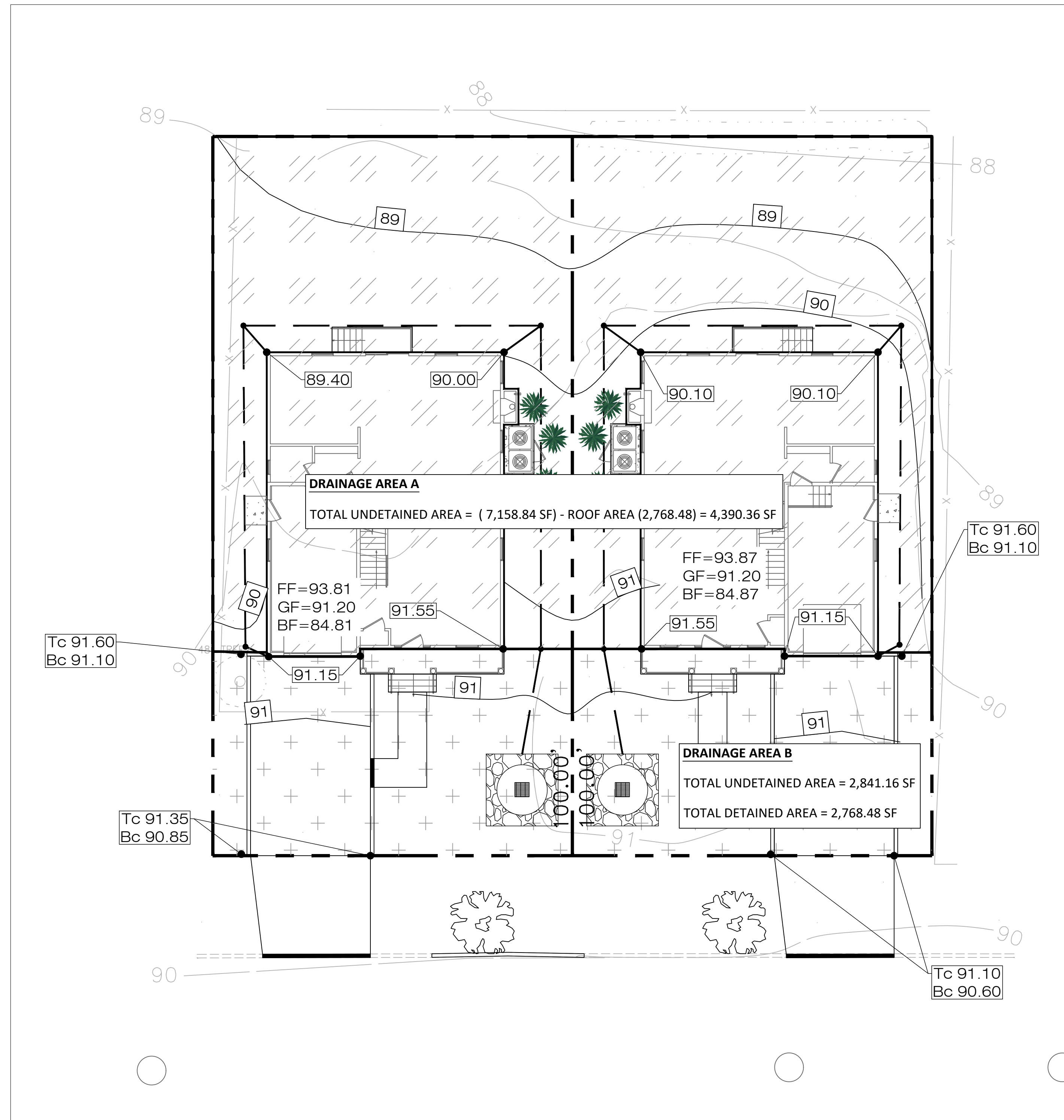
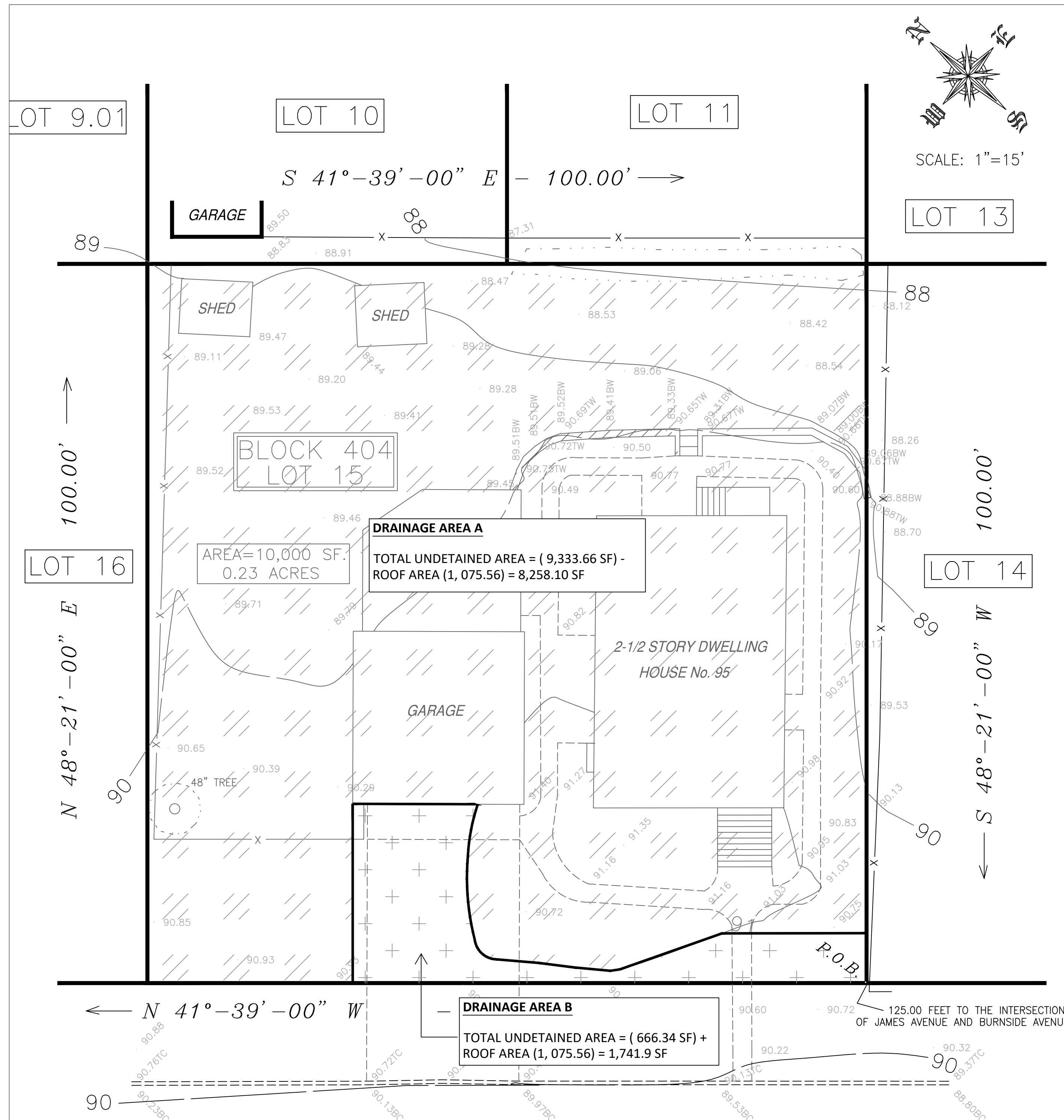
2. Refer to Soil Bioengineering Standard for additional seed mixtures.

3. Spillways only.

4. See Appendix E for description of turf grasses and cultivars.

**TABLE 4-3**  
**PERMANENT VEGETATIVE MIXTURES, PLANTING RATES AND PLANTING DATES<sup>1</sup>**

SEED MIXTURE <sup>2</sup>	PLANTING RATE <sup>3</sup> (lb./1000 sq. ft.)	PLANTING DATES			REMARKS
		Zone 5a, 6a	Zone 6b	Zone 7a, 7b	
<b>WARM SEASON SEED MIXTURES</b>					
1. A. FOR PENNSYLVANIA NATIONAL FOREST SERVICE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY					
1. SWITCHGRASS AND/OR COASTAL PANICGRASS PLUS OR FLATFEST	15	3S			C-D
2. S. SWITCHGRASS	15	4S			C-D
3. S. SWITCHGRASS, BLUEGRASS, PERENNIAL RYEGRASS, PLUS WHITE CLOVER	20	4S			C-D
4. S. SWITCHGRASS AND/OR COASTAL PANICGRASS	10	2S			C-D
5. BERMUDA, FLORIDA BROOMS (SEED), ZOSTERAGRASS (SPERM)	15	3S			A-D
6. BERMUDA, FLORIDA BROOMS (SEED), ZOSTERAGRASS (SPERM)	30	7.0			A-D
<b>COOL SEASON SEED MIXTURES</b>					
7. FINE FESCUE (BLENDED) OR HYPERICUM (BLENDED) WITH STRONG CREEPING RED FESCUE OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	45	1.0			B-D
8. FINE FESCUE (BLENDED) OR HYPERICUM (BLENDED) WITH STRONG CREEPING RED FESCUE OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	10	5.0			B-D
9. STRONG CREEPING RED FESCUE OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	130	3			B-D
10. TALL FESCUE (BLENDED) OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	30	7.0			B-D
11. TALL FESCUE (BLENDED) OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	30	7.0			B-D
12. TALL FESCUE (BLENDED) OR PERENNIAL RYEGRASS PLUS WHITE CLOVER	25	6.0			B-D
13. DEERTONGUE (REDTOP) OR WILD RYE (ELYSIUM) OR SWITCHGRASS	20	4.5			



NO.	REVISIONS	DATE	BY
100921			APR
100921			APR

ADNAN A. KHAN, P.E., C.M.E.  
PROFESSIONAL ENGINEER

DATE: 12/14/20  
DESIGNED BY: AK  
DATE: 12/14/20  
APPROVED BY: AK

100921

100921

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95 JAMES AVENUE  
BLOCK 404  
TOWNSHIP OF CRANFORD  
UNION COUNTY, NEW JERSEY

**DRAINAGE AREA MAPS**

JOB NUMBER:  
20-1206

SCALE: AS SHOWN

**D-01**  
SHEET 1 OF 1