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PHONE: (908) 709-7217
CONTACT: ERIK HASTRUP

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1800 RAHWAY AVENUE, UNION, NJ 07083
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GAS SERVICE
ELIZABETHTOWN GAS COMPANY
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PHONE: (908) 662-8321 CONTACT: GREGORY J. BALINT

ELECTRIC SERVICE
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
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VERIZON COMMUNICATIONS
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BUILDING 4, LIVINGSTON, NJ 07039
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# TOWNSHIP OF CRANFORD

KATHLEEN MILLER PRUNTY, MAYOR
JASON GAREIS, DEPUTY MAYOR/COMMISSIONER

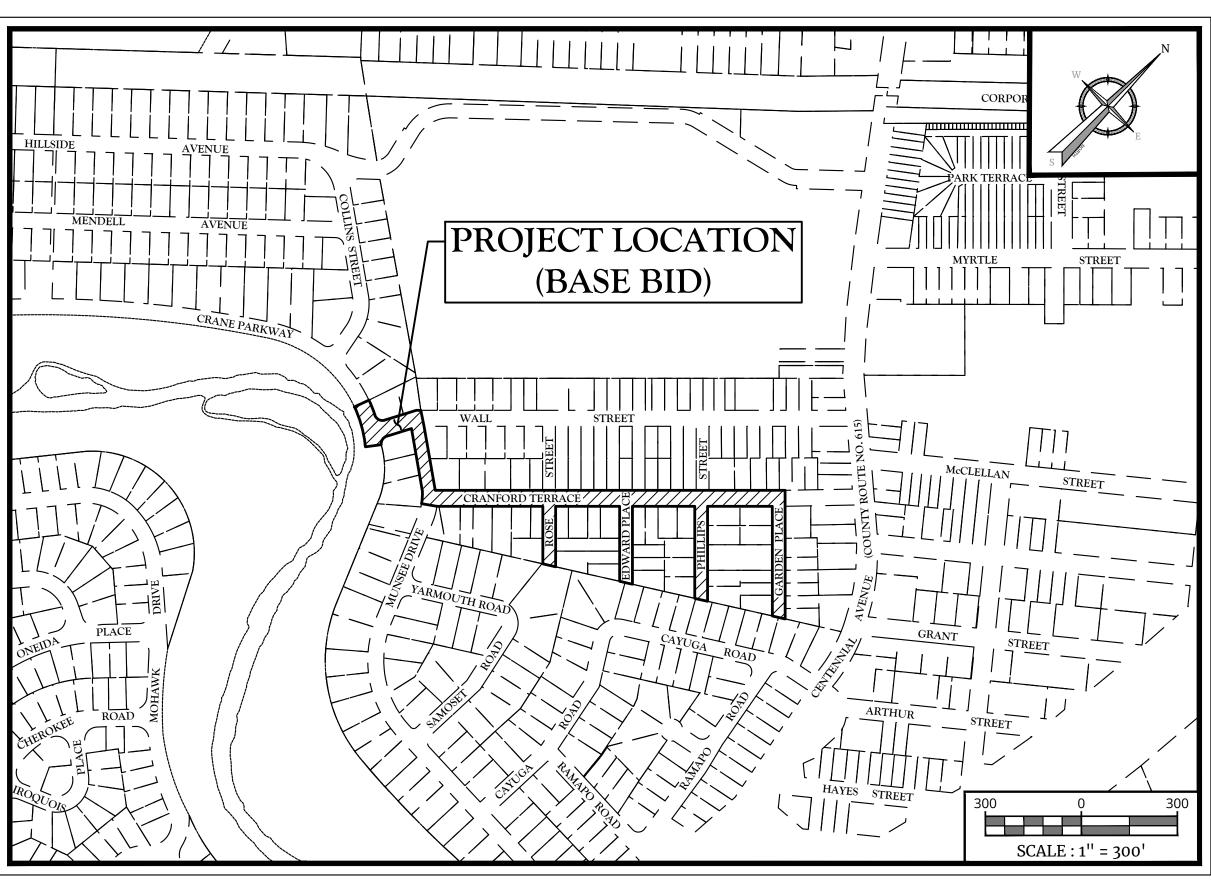
BRIAN ANDREWS, COMMISSIONER GINA BLACK, COMMISSIONER MARY O'CONNOR, COMMISSIONER

PATRICIA DONAHUE, TOWNSHIP CLERK JAMIE CRYAN, TOWNSHIP ADMINISTRATOR

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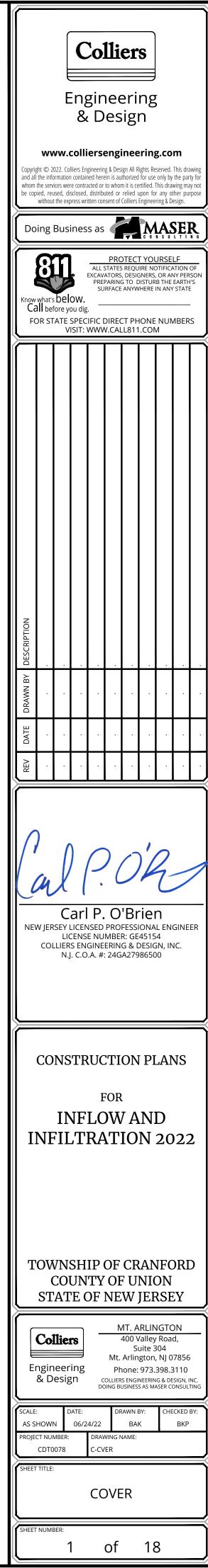
# CONSTRUCTION PLANS FOR INFLOW AND INFILTRATION 2022

TOWNSHIP OF CRANFORD UNION COUNTY, NEW JERSEY



**KEY MAP** 

NEW JERSEY DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS 2019
WITH AMENDMENTS THERETO SHALL GOVERN



NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION

### **SURVEY NOTES:**

- ALL EXISTING FEATURES DEPICTED ON THIS PLAN ARE BASED ON INFORMATION FROM THE SURVEY ENTITLED, "PARTIAL BOUNDARY AND TOPOGRAPHIC SURVEY FOR PORTION OF BLOCK 598, LOT 1, BLOCK 551, LOTS 10, 11 & 12, BLOCK 544, LOT I - CRANFORD TERRACE; MUNSEE DRIVE; EDWARD PLACE; PHILLIPS STREET; GARDEN PLACE" FOR THE TOWNSHIP OF CRANFORD, PREPARED BY COLLIERS ENGINEERING & DESIGN, DATED 04/25/22, LAST REVISED
- THE HORIZONTAL POSITION OF THIS SURVEY IS BASED ON GPS OBSERVATION AND IS RELATIVE TO NAD 1983 ADJUSTMENT.
- THE ELEVATIONS SHOWN HERON ARE RELATIVE TO N.A.V.D. 1988 ADJUSTMENT

### GENERAL NOTES:

- ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION RELATED TO THE PROPOSED IMPROVEMENTS SHOWN HEREIN SHALL BE IN ACCORDANCE WITH THE FOLLOWING, UNLESS SPECIFICALLY AMENDED OR SUPPLEMENTED BY CONTRACT DOCUMENTS:
  - A. N.I. DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2019", AS CURRENTLY AMENDED;
- B. N.J. DEPARTMENT OF TRANSPORTATION "STANDARD ROADWAY CONSTRUCTION TRAFFIC CONTROL BRIDGE CONSTRUCTION DETAILS, 2016", AS CURRENTLY AMENDED;
- C. "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED;
- D. CURRENT PREVAILING MUNICIPAL, COUNTY AND/OR STATE AGENCY SPECIFICATIONS, STANDARDS, CONDITIONS AND REQUIREMENTS
- E. CURRENT PREVAILING UTILITY COMPANY/AUTHORITY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS;
- F. CURRENT MANUFACTURER'S SPECIFICATIONS, STANDARDS AND REQUIREMENTS;
- THE CONTRACTOR IS RESPONSIBLE FOR PROJECT SAFETY INCLUDING PROVISION OF ALL SAFETY DEVICES AND TRAINING REQUIRED.
- THE CONTRACTOR IS RESPONSIBLE FOR EXAMINING THE PROJECT PLANS, SPECIFICATIONS, DETAILS, AND SITE. THE CONTRACTOR SHALL NOTIFY THE UNDERSIGNED PROFESSIONAL IMMEDIATELY IF ANY SITE CONDITIONS DIFFER MATERIALLY FROM THOSE REPRESENTED HEREIN.
- THE CONTRACTOR SHALL OBTAIN PERMITS REQUIRED FOR THE PROPOSED IMPROVEMENTS.
- ALL MATERIALS MUST BE AMERICAN MADE. THE CONTRACTOR MUST PROVIDE THE ENGINEER WITH SHIPPING AND DELIVERY TICKETS/RECEIPTS FOR ALL MATERIALS TO USED FOR CONSTRUCTION OF THE PROPOSED
- THE CONTRACTOR SHALL OBTAIN SHOP DRAWING APPROVAL PRIOR TO THE INSTALLATION OF EACH ITEM. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL AT LEAST TWO (2) WEEKS PRIOR TO ORDERING MATERIALS.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL STAKEOUT AND LAYOUT, AS NECESSARY, TO CONSTRUCT THE PROPOSED IMPROVEMENTS IN STRICT CONFORMANCE WITH THE PROJECT PLANS, SPECIFICATIONS AND DETAILS.
- 8. ACTUAL FIELD LIMITS OF MILLING, PAVING, CURB AND SIDEWALK WORK WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- NO "SIDE PROJECTS" FOR RESIDENTS, UTILITIES OR BUSINESS MAY BE CONSTRUCTED WITH MATERIAL PURCHASED FOR THE COMPLETION OF THE PROPOSED IMPROVEMENTS SHOWN HEREIN.
- THE CONTRACTOR MUST REVIEW AND AGREE TO AS-BUILT QUANTITIES WITH THE ENGINEER ON A WEEKLY BASIS.
- 11. THE ENGINEER MUST BE CONTACTED IMMEDIATELY UPON THE CONTRACTOR RECEIVING A COMPLAINT FROM ANY PERSON WITHIN THE PROJECT AREA OR MUNICIPAL OFFICIAL

### **UTILITY NOTES:**

- UNDERGROUND UTILITIES WITHIN OFF-SITE STREETS AND FEATURES WERE MAPPED USING RADIO FREQUENCY PIPE AND CABLE LOCATORS (RFL) AND GROUND PENETRATING RADAR (GPR). OTHER BURIED UTILITIES MAY BE PRESENT BUT WERE NOT DETECTED DUE TO LIMITATIONS OF THE RFL AND GPR SYSTEMS, UNFAVORABLE SOIL CONDITIONS, SITE ACCESS, AND/OR DENSE UTILITY INFRASTRUCTURE; THEREFORE, 100% DETECTION IS NOT GUARANTEED. CAUTION SHOULD BE USED WHEN EXCAVATING IN THE VICINITY OF MAPPED FEATURES.
- POSITION OF GEOPHYSICAL FEATURES CANNOT BE GUARANTEED WITHOUT EXPOSURE.
- TARGETS WITH LATERAL EXTENTS OF LESS THAN 3 FEET AS OBSERVED IN GEOPHYSICAL DATA WERE NOT MAPPED
- PLOTTED UTILITY POSITIONS AND DEPTHS REPRESENT LOCATION OF MOST APPROPRIATE INTERPRETED GEOPHYSICAL RESPONSE. THIS RESPONSE IS GENERALLY PRESENT OVER THE TOP CENTER OF THE TARGET BUT MAY BE LOCATED OFF-CENTER DEPENDING ON SIGNAL QUALITY AND THE EFFECTS OF LOCAL INTERFERENCE. FEATURE MAY BE WIDER THAN PLOTTED LINE (E.G. DUCT BANKS, LARGE CONDUIT).
- UTILITIES MAY BE INSTALLED WITHIN A DUCT BANK, DUE TO THE LIMITATIONS OF GEOPHYSICAL EQUIPMENT AND THE LOCATION OF FEATURES WITHIN THE DUCT BANK, THE ACTUAL HORIZONTAL AND VERTICAL DIMENSIONS OF THE DUCT BANK SYSTEM (AS OBSERVED IN GEOPHYSICAL DATA) MAY VARY.
- DUE TO LIMITATIONS OF GEOPHYSICAL METHODS, IT IS NOT ALWAYS POSSIBLE TO DISCRIMINATE BETWEEN UTILITIES AND OTHER BURIED FEATURES; THEREFORE IT IS POSSIBLE THAT SOME PLOTTED FEATURES MAY REPRESENT
- OBJECTS OTHER THAN UTILITIES.
- DUE TO VARYING SOIL CONDITIONS, POSSIBLE CHANGES IN UTILITY MATERIAL, AND OTHER FACTORS, SOME UNDERGROUND UTILITIES COULD NOT BE TRACED ENTIRELY WITHIN THE PROJECT LIMITS. THE UTILITY MAY CONTINUE, BUT SINCE IT WAS NOT OBSERVED IN THE GEOPHYSICAL DATA BEYOND THESE POINTS, IT COULD NOT BE MAPPED.
- DEPTHS SHOWN FOR UTILITIES ARE IN FEET BELOW EXISTING GROUND SURFACE AT TIME OF SURVEY. AS RFLS CANNOT PROVIDE RELIABLE DETPH INFORMATION, DEPTHS ARE NOT PROVIDED FOR UTILITIES LOCATED WITH RFLS,
- BUT NOT DETECTED IN THE GPR DATA. DUE TO THE SITE SPECIFIC CONDITIONS, GPR SIGNAL PENETRATION DEPTH IS APPROXIMATELY 4 FEET. UTILITIES BELOW THIS DEPTH WERE NOT CONSISTENTLY DETECTED WITH GPR. THERE MAY BE OTHER UTILITIES PRESENT AT
- THE SITE BELOW THIS DEPTH THAT WERE NOT DETECTED AND THEREFORE ARE NOT PLOTTED ON THESE MAPS. 10. ONLY THOSE AREAS DENOTED WITHIN THE PROJECT SITE LIMITS WERE INVESTIGATED WITH GEOPHYSICAL METHODS. NO CLAIMS TO UTILITY POSITION ARE MADE OUTSIDE OF THESE BOUNDARIES.
- 11. SURFACE OBSTRUCTIONS SUCH AS UTILITY POLES AND HEAVY VEGETATION MAY HAVE LIMITED THE DATA COLLECTION AREA.
- 12. CONTRACTOR IS RESPONSIBLE FOR CONTACTING ONE-CALL SERVICES AS REQUIRED BY STATE AND/OR LOCAL ORDINANCES PRIOR TO ANY EXCAVATION ACTIVITIES.
- 13. NOT ALL UTILITY POLES, UTILITY VALVES AND UTILITY LINES ARE SHOWN ON THE PLAN. THE CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
- 14. THE CONTRACTOR SHALL CALL FOR A UTILITY MARK-OUT PRIOR TO THE START OF CONSTRUCTION (CALL I-800-272-1000).
- 15. UTILITY RELOCATIONS SHOWN ON THE PLAN, IF ANY, ARE FOR INFORMATIONAL PURPOSES ONLY AND MAY NOT REPRESENT ALL REQUIRED WORK. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH ALL UTILITY COMPANIES/AUTHORITIES IMPACTED BY THE PROPOSED WORK AND PERFORMING UTILITY RELOCATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF THE PERTINENT UTILITY COMPANIES/AUTHORITIES. NO SEPARATE PAYMENT SHALL BE MADE FOR COORDINATING AND PERFORMING UTILITY RELOCATIONS.
- ALL UTILITY MANHOLES, VALVE BOXES, CLEANOUTS, METERS, ETC. SHALL BE RESET BY THE CONTRACTOR TO MEET PROPOSED ROAD, SIDEWALK AND DRIVEWAY GRADES. THE CONTRACTOR SHALL COORDINATE WITH
- IMPACTED UTILITY COMPANIES/AUTHORITIES AS NECESSARY. WATER VALVE BOXES GAS VALVE BOXES WITHIN THE ROADWAY SHALL BE RESET TO MEET PROPOSED GRADES.
- MISCELLANEOUS UTILITY EQUIPMENT WITHIN THE DRIVEWAYS SHALL BE RESET TO MEET PROPOSED GRADES DURING THE PROGRESS OF CURB, SIDEWALK AND DRIVEWAY CONSTRUCTION. NO SEPARATE PAYMENT SHALL BE
- MADE FOR THE RESETTING OF MISCELLANEOUS UTILITY EQUIPMENT, INCLUDING VALVE BOXES, CLEANOUTS, METERS, ETC. WITHIN SIDEWALK AND DRIVEWAY AREAS. 19. THE CONTRACTOR SHALL TAKE PRECAUTION WHEN WORKING ADJACENT TO UTILITIES AND TEMPORARILY SUPPORT UTILITY POLES, IF REQUIRED, DURING THE PROGRESS OF WORK.
- 20. THE CONTRACTOR SHALL CLEAN AND MAINTAIN ALL STORM SEWER STRUCTURES, AS NECESSARY, FOR THE DURATION OF THE PROJECT.

### **WORKING HOURS:**

- I. THE CONTRACTOR SHALL WORK ON WEEKDAYS ONLY. APPROVAL TO WORK ON WEEKENDS MUST BE GRANTED BY THE LOCAL POLICE DEPARTMENT AND OWNER.
- THE CONTRACTOR SHALL NOT COMMENCE ANY CONSTRUCTION RELATED ACTIVITIES BEFORE 7 AM ON WEEKDAYS. ALL CONSTRUCTION RELATED ACTIVITIES MUST BE FINISHED AND THE SITE SHALL BE CLEANED AND

### SIGNS, STRIPING AND MARKING NOTES:

- I. ALL SIGNAGE, TRAFFIC STRIPING AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.), AS CURRENTLY AMENDED.
- 2. ALL EXISTING SIGNS SHALL BE RESET/RELOCATED WITH NEW POSTS. SIGNS SHALL BE RESET USING EXISTING SIGN BLADES WITH NEW SIGN POSTS PLACED IN SLEEVES. SLEEVES FOR NEW SIGN POSTS SHALL BE FILLED.

### MILLING AND PAVING NOTES:

- THE CONTRACTOR MUST PROVIDE A SMOOTH SAWCUT EDGE WHERE PROPOSED PAVEMENT ABUTS EXISTING PAVEMENT.
- 2. AFTER MILLING OPERATIONS AND PRIOR TO PAVING, THE CONTRACTOR MUST ALLOW ADEQUATE TIME FOR THE ENGINEER TO INSPECT THE MILLED SURFACE TO EVALUATE THE NEED FOR REPAIRS IN THE PAVEMENT BASE.
- IF REPAIRS IN THE PAVEMENT BASE ARE NECESSARY AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL NOT SCHEDULE OR COMMENCING PAVING OPERATIONS UNTIL SUCH TIME THAT ALL REPAIRS IN THE PAVEMENT BASE ARE COMPLETE.
- 4. THE CONTRACTOR SHALL MARK ALL RAISED UTILITY MANHOLES, INLETS AND VALVE BOXES THAT ARE EXPOSED AS A RESULT OF MILLING. IN ADDITION, THE CONTRACTOR SHALL INSTALL TEMPORARY PAVEMENT RAMPS AROUND RAISED UTILITIES AS DIRECTED BY THE ENGINEER WHERE SUCH UTILITIES MAY BE IN CONFLICT WITH VEHICULAR AND PEDESTRIAN TRAFFIC.
- ALL JOINTS BETWEEN EXISTING AND PROPOSED ASPHALT SHALL BE SEALED WITHIN 48 HOURS OF PAVING.

### MAINTENANCE AND PROTECTION OF TRAFFIC NOTES:

- THE CONTRACTOR SHALL COORDINATE ALL TRAFFIC CONTROL MEASURES WITH THE LOCAL POLICE DEPARTMENT AND OWNER. TRAFFIC CONTROL DETAILS PROVIDED HEREIN ARE TYPICAL AND SUBJECT TO MODIFICATION BY THE LOCAL POLICE DEPARTMENT AND OWNER.
- THE CONTRACTOR SHALL MAKE PROVISIONS FOR MATERIAL AND EQUIPMENT STORAGE. NO EQUIPMENT OR MATERIALS SHALL BE STORED WITHIN THE R.O.W. WITHOUT EXPRESS WRITTEN CONSENT FROM THE LOCAL POLICE DEPARTMENT AND OWNER.
- THE CONTRACTOR SHALL PREPARE AND SUBMIT A TRAFFIC CONTROL SCHEDULE AND STAGING PLAN TO THE LOCAL POLICE DEPARTMENT AND OWNER FOR REVIEW AND APPROVAL. THE PLAN MUST BE APPROVED BY THE LOCAL POLICE DEPARTMENT AND OWNER PRIOR TO THE START OF CONSTRUCTION.
- THE CONTRACTOR SHALL NOTIFY THE OWNER AND LOCAL POLICE DEPARTMENT SEVENTY-TWO (72) HOURS PRIOR TO THE START OF ANY WORK.
- THE CONTRACTOR SHALL COORDINATE WITH THE LOCAL POLICE DEPARTMENT TO DETERMINE THE NEED FOR POLICE TRAFFIC DIRECTORS. THE CONTRACTOR SHALL PROVIDE THE LOCAL POLICE DEPARTMENT WITHIN AT LEAST ONE (I) WEEK NOTICE PRIOR TO REQUESTING POLICE TRAFFIC DIRECTORS.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PLACING TEMPORARY NO PARKING SIGNS. SIGNS MUST BE OBTAINED FROM THE LOCAL POLICE DEPARTMENT. TEMPORARY NO PARKING SIGNS MUST BE POSTED AT LEAST FORTY-EIGHT (48) HOURS IN ADVANCE CONSTRUCTION.

### SOIL EROSION AND TREE PROTECTION NOTES:

- THE CONTRACTOR SHALL INSTALL AND MAINTAIN SOIL EROSION AND SEDIMENT CONTROL MEASURES FOR THE DURATION OF THE PROJECT IN ACCORDANCE WITH THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL MEASURES IN NEW JERSEY
- INLET FILTERS ARE TO BE INSTALLED ON ALL EXISTING AND NEW INLETS WITHIN THE PROJECT LIMITS AND IMMEDIATELY ADJACENT TO PROJECT LIMITS.
- SILT FENCE SHALL BE INSTALLED AS DIRECTED IN THE FIELD BY THE ENGINEER, AS NECESSARY
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING DUST CONTROL MEASURES, AS NECESSARY. ALL VEHICLES SHALL BE CLEAN AND ALL ROADWAYS SHALL BE MAINTAINED TO AVOID DUST POLLUTION.
  - THE CONTRACTOR SHALL PROTECT ALL TREES SCHEDULED TO REMAIN DURING CONSTRUCTION. DAMAGE TO EXISTING TREES WILL BE EVALUATED BY THE OWNER AND ENGINEER. DAMAGED TREES WILL BE REPLACED AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
  - WHERE EXISTING TREES AND ROOT SYSTEMS MAY CONFLICT WITH THE PROPOSED IMPROVEMENTS, THE CONTRACTOR MUST RETAIN A CERTIFIED TREE EXPERT TO EVALUATE TREES IN QUESTION. ALL EVALUATIONS SHALL BE IN WRITING AND SHALL ACCURATELY IDENTIFY THE TREE IN QUESTION BY STATION AND OFFSET (LEFT OR RIGHT). ALL EVALUATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
- TREES THAT ARE TO REMAIN, WHERE IT IS DETERMINED THAT ROOT CUTTING MAY SEVERELY DAMAGE THE TREE, SHALL HAVE A CURB BREAK AND STEEL CURB FACE PLATE INSTALLED AS DIRECTED BY THE ENGINEER.
- 8. ALL EXCAVATED MATERIAL SHALL BE DISPOSED OF OFF-SITE. NO EXCAVATED MATERIAL SHALL BE STOCKPILED AND STORED WITHIN THE PROJECT LIMITS.

### **DEMOLITION AND CONSTRUCTION NOTES:**

- ALL EXCAVATED MATERIALS ARE TO BE DISPOSED OF IN ACCORDANCE WITH APPROVED NIDOT AND NIDEP MEANS AND METHODS. THE CONTRACTOR MUST NOT DEPOSIT EXCESS MATERIALS WITHIN THE MUNICIPAL LIMITS
- 2. ALL EXCAVATED AND DEMOLISHED MATERIALS, DEBRIS, AND EQUIPMENT, INCLUDING STONE, TOPSOIL, TREES, BLOCK AND CONCRETE FORMS, MUST BE REMOVED FROM THE PROJECT AREA AT THE CONCLUSION OF EACH DAY, UNLESS OTHERWISE APPROVED BY THE ENGINEER AND LOCAL POLICE DEPARTMENT.
- THE CONTRACTOR SHALL NOTE THAT ROADWAY BASE MATERIAL MAY CONSIST OF COBBLESTONES, CONCRETE AND/OR ASPHALT. NO ADDITIONAL PAYMENTS WILL BE MADE TO CONTRACTOR FOR DAMAGES TO EQUIPMENT OR ADDITIONAL LABOR REQUIRED TO MAKE IMPROVEMENTS AS DESCRIBED ON PLANS DUE TO VARIATIONS IN ROADWAY BASE MATERIALS.
- 4. ALL EXISTING GRATES AND CASTINGS ARE THE PROPERTY OF THE MUNICIPALITY OR RESPECTIVE UTILITY AUTHORITY. ALL EXISTING GRATES AND CASTINGS THAT ARE TO BE REPLACED AS A PART OF THE PROPOSED IMPROVEMENTS SHALL BE RETURNED TO THE MUNICIPALITY OR RESPECTIVE UTILITY AUTHORITY.
- THE CONTRACTOR MUST PROTECT CONCRETE UNTIL CONCRETE IS CURED. DAMAGED AND VANDALIZED CONCRETE SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- RECYCLED AGGREGATE (CONCRETE OR ASPHALT) MUST BE NJDOT APPROVED. CONTRACTOR MUST PROVIDE DOCUMENTATION FOR APPROVED MATERIAL PRIOR TO PLACEMENT.
- 7. THE CONTRACTOR SHALL RESET ALL RAILINGS, GATES AND FENCES AS REQUIRED TO COMPLETE THE PROPOSED IMPROVEMENTS
- 8. THE CONTRACTOR IS RESPONSIBLE TO REPLACE/RESET ANY SPRINKLERS DAMAGED/DISTURBED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.

### ACCESS TO RESIDENCES AND BUSINESSES:

- THE CONTRACTOR SHALL MAINTAIN SAFE PEDESTRIAN AND VEHICULAR ACCESS TO ALL RESIDENCES AND BUSINESSES FOR THE DURATION OF THE PROJECT
- DURING DEMOLITION AND IMMEDIATELY AFTER POURING CONCRETE, THE CONTRACTOR MUST PLACE WOOD PLANKS, AT LEAST TWO (2) FT. WIDE, AT EACH ADJACENT BUILDING ENTRANCE TO ALLOW FOR SAFE ACCESS. PEDESTRIANS CANNOT BE EXPECTED TO CROSS OVER STONE, DIRT OR OTHER DEMOLISHED MATERIAL WITHOUT PLANKS. THE CONTRACTOR WILL NOT BE PERMITTED TO LEAVE THE SITE WITHOUT PLACING WOODEN ACCESS PLANKS TO PROVIDE SAFE ACCESS TO RESIDENCES AND BUSINESSES
- THE CONTRACTOR SHALL MAINTAIN VEHICULAR ACCESS TO ALL DRIVEWAYS DURING CONSTRUCTION. THE CONTRACTOR SHALL TEMPORARILY INSTALL AND MAINTAIN DENSE GRADED AGGREGATE OR HOT MIX ASPHALT TO PROVIDE A RIDING SURFACE FOR VEHICLE ACCESS TO EACH PROPERTY DURING CONSTRUCTION.
- 4. THE CONTRACTOR MUST ASSURE ACCESS FOR EMERGENCY VEHICLES AND GARBAGE COLLECTION VENDORS FOR THE DURATION OF THE PROJECT
- 5. THE CONTRACTOR SHALL PROVIDE TEMPORARY ACCESSIBLE CURB RAMPS WITH HAND RAILS WHEN EXISTING ACCESSIBLE ACCESS IS REMOVED OR LIMITED DUE TO CONSTRUCTION.
- 6. NO SEPARATE PAYMENT SHALL BE MADE FOR THE PROVISION OF SAFE PEDESTRIAN AND VEHICULAR ACCESS AS DESCRIBED ABOVE AND AS DIRECTED IN THE FIELD BY THE ENGINEER

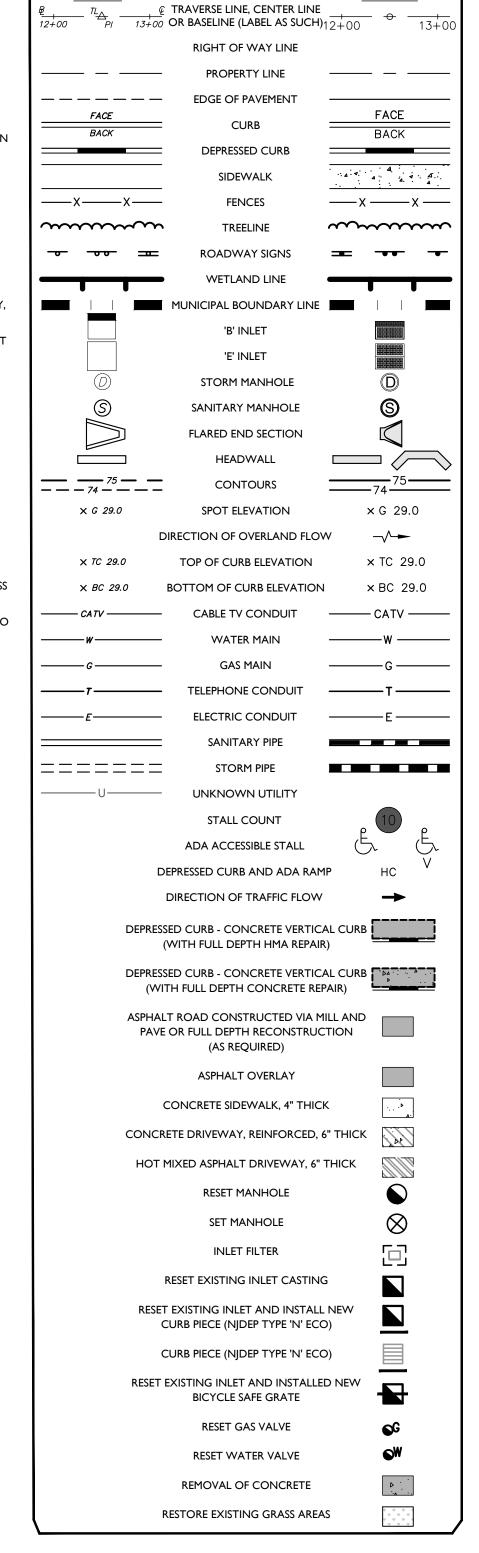
### FINAL CLEAN UP AND PROJECT ACCEPTANCE:

STRAW MULCHING

- PRIOR TO FINAL ACCEPTANCE, ALL PROPERTY CORNERS OR MONUMENTS REMOVED OR DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY A NEW JERSEY LICENSED LAND SURVEYOR AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR MUST REPLACE ANY DAMAGED CONCRETE CURB AND SIDEWALK BEFORE ACCEPTANCE OF THE PROJECT BY THE OWNER.
- 3. ALL AREAS OUTSIDE OF THE PROJECT LIMITS THAT ARE DISTURBED AS RESULT OF CONSTRUCTION ACTIVITIES SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER PRIOR TO PROJECT ACCEPTANCE.
- 4. ALL GRASSED AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED BY TOPSOILING, SEEDING, FERTILIZING AND MULCHING.

BASE BID - DRAINAGE IMPROVEMENTS	UNIT	TOTAL BASE BID QUANTITY	DIRECTED QUANTITY	PLAN SHEET QUANTITY
SOIL EROSION AND SEDIMENT CONTROL	LS	1	0	0
POLICE TRAFFIC DIRECTORS	MAN HOUR	480	480	0
TRAFFIC CONTROL MEASURES AND DEVICES	LS	1	0	0
ASPHALT PRICE ADJUSTMENT	DOLLAR	100	100	0
CLEARING SITE	LS	1	1	0
EXCAVATION, TEST PIT	CY	51	25	26
HOT MIX ASPHALT PAVEMENT REPAIR	SY	1,224	159	1,065
12" REINFORCED CONCRETE PIPE, CLASS V	LF	26	0	26
15" REINFORCED CONCRETE PIPE, CLASS V	LF	630	0	630
15" WATERTIGHT HIGH DENSITY POLYETHYLENE PIPE	LF	866	0	866
18" WATERTIGHT HIGH DENSITY POLYETHYLENE PIPE	LF	1,330	0	1,330
CONNECT EXISTING ROOF LEADER TO PROPOSED PIPE	UNIT	4	4	0
INLET, TYPE B	UNIT	3	0	3
INLET, TYPE E	UNIT	5	0	5
INLET, DOGHOUSE, TYPE DOUBLE E	UNIT	1	0	11
MANHOLE, 5' DIAMETER	UNIT	7	0	7
HOT MIX ASPHALT DRIVEWAY, 2" THICK	SY	42	42	0
9" X 18" CONCRETE VERTICAL CURB	LF	200	200	0
8" DUCTILE IRON PIPE, CLASS 52	LF	12	0	12
RECONNECT SANITARY SEWER LATERAL WITH NEW PIPE	UNIT	20	20	0
TOPSOIL SPREADING, 4" THICK	SY	70	50	20
FERTILIZING AND SEEDING, TYPE ERNMIX-106	SY	70	50	20
	SOIL EROSION AND SEDIMENT CONTROL  POLICE TRAFFIC DIRECTORS  TRAFFIC CONTROL MEASURES AND DEVICES  ASPHALT PRICE ADJUSTMENT  CLEARING SITE  EXCAVATION, TEST PIT  HOT MIX ASPHALT PAVEMENT REPAIR  12" REINFORCED CONCRETE PIPE, CLASS V  15" REINFORCED CONCRETE PIPE, CLASS V  15" WATERTIGHT HIGH DENSITY POLYETHYLENE PIPE  18" WATERTIGHT HIGH DENSITY POLYETHYLENE PIPE  CONNECT EXISTING ROOF LEADER TO PROPOSED PIPE  INLET, TYPE B  INLET, TYPE B  INLET, TYPE B  INLET, DOGHOUSE, TYPE DOUBLE E  MANHOLE, 5' DIAMETER  HOT MIX ASPHALT DRIVEWAY, 2" THICK  9" X 18" CONCRETE VERTICAL CURB  8" DUCTILE IRON PIPE, CLASS 52  RECONNECT SANITARY SEWER LATERAL WITH NEW PIPE  TOPSOIL SPREADING, 4" THICK	SOIL EROSION AND SEDIMENT CONTROL  POLICE TRAFFIC DIRECTORS  MAN HOUR  TRAFFIC CONTROL MEASURES AND DEVICES  ASPHALT PRICE ADJUSTMENT  CLEARING SITE  LS  EXCAVATION, TEST PIT  CY  HOT MIX ASPHALT PAVEMENT REPAIR  12" REINFORCED CONCRETE PIPE, CLASS V  LF  15" WATERTIGHT HIGH DENSITY POLYETHYLENE PIPE  LF  18" WATERTIGHT HIGH DENSITY POLYETHYLENE PIPE  CONNECT EXISTING ROOF LEADER TO PROPOSED PIPE  UNIT  INLET, TYPE B  UNIT  INLET, TYPE E  UNIT  MANHOLE, 5' DIAMETER  HOT MIX ASPHALT DRIVEWAY, 2" THICK  8" DUCTILE IRON PIPE, CLASS 52  RECONNECT SANITARY SEWER LATERAL WITH NEW PIPE  UNIT  TOPSOIL SPREADING, 4" THICK  SY	SOIL EROSION AND SEDIMENT CONTROL  POLICE TRAFFIC DIRECTORS  TRAFFIC CONTROL MEASURES AND DEVICES  ASPHALT PRICE ADJUSTMENT  CLEARING SITE  EXCAVATION, TEST PIT  HOT MIX ASPHALT PAVEMENT REPAIR  15" REINFORCED CONCRETE PIPE, CLASS V  15" REINFORCED CONCRETE PIPE, CLASS V  15" WATERTIGHT HIGH DENSITY POLYETHYLENE PIPE  18" WATERTIGHT HIGH DENSITY POLYETHYLENE PIPE  INLET, TYPE B  INLET, TYPE B  INLET, TYPE B  WANNIT  MANHOLE, 5' DIAMETER  BID QUANTITY  BID CONCRETE VERTICAL CURB  BID QUANTITY  BID CONCRETE VERTICAL CURB  BID CONC	SOIL EROSION AND SEDIMENT CONTROL   LS

IF/WHERE



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**PROPOSED** 

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CONSTRUCTION PLANS

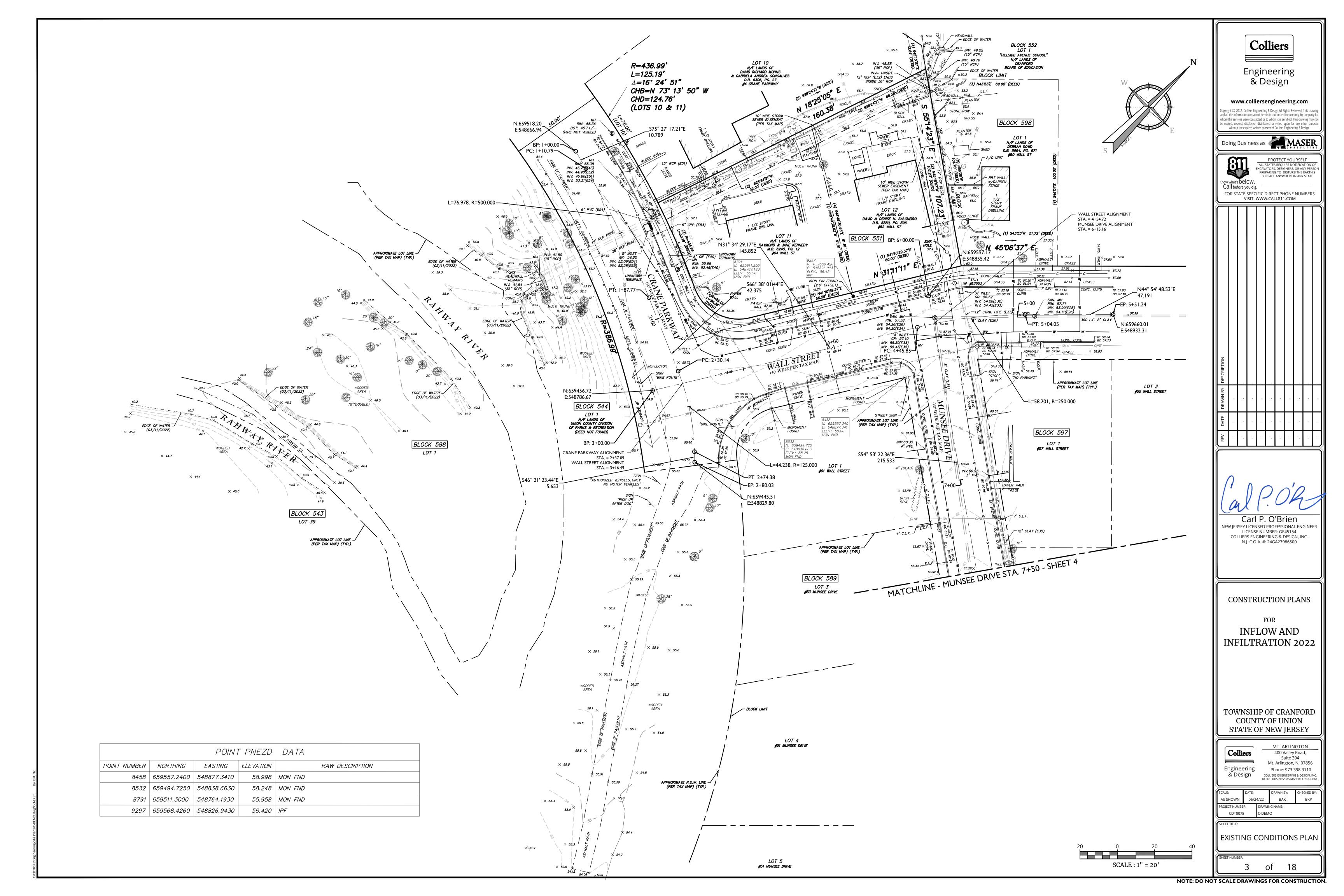
INFLOW AND **INFILTRATION 2022** 

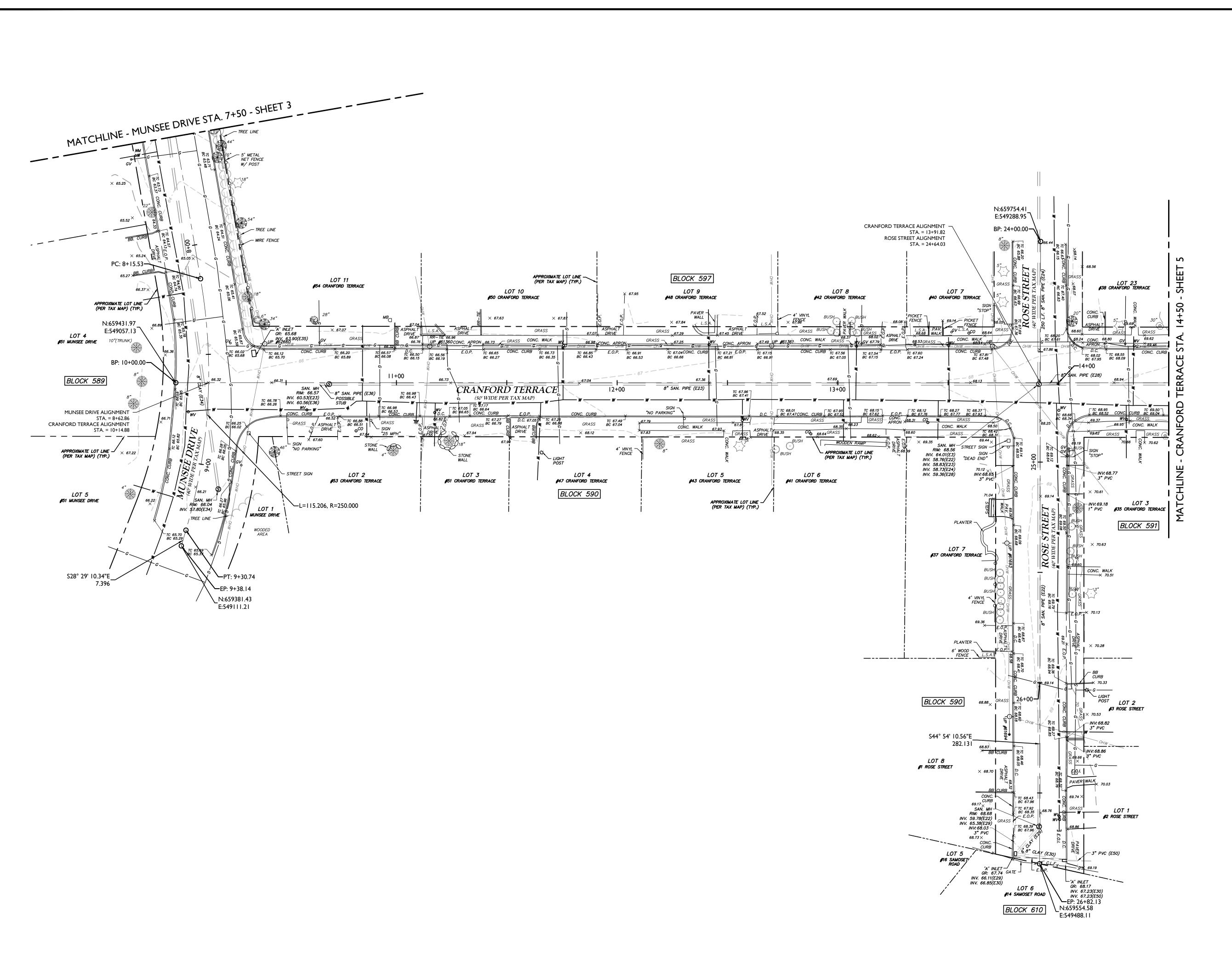
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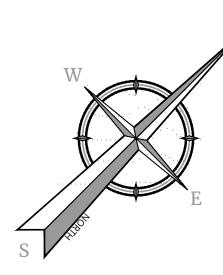
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**GENERAL NOTES &** QUANTITIES







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CONSTRUCTION PLANS

FOR **INFLOW AND INFILTRATION 2022** 

TOWNSHIP OF CRANFORD COUNTY OF UNION STATE OF NEW JERSEY

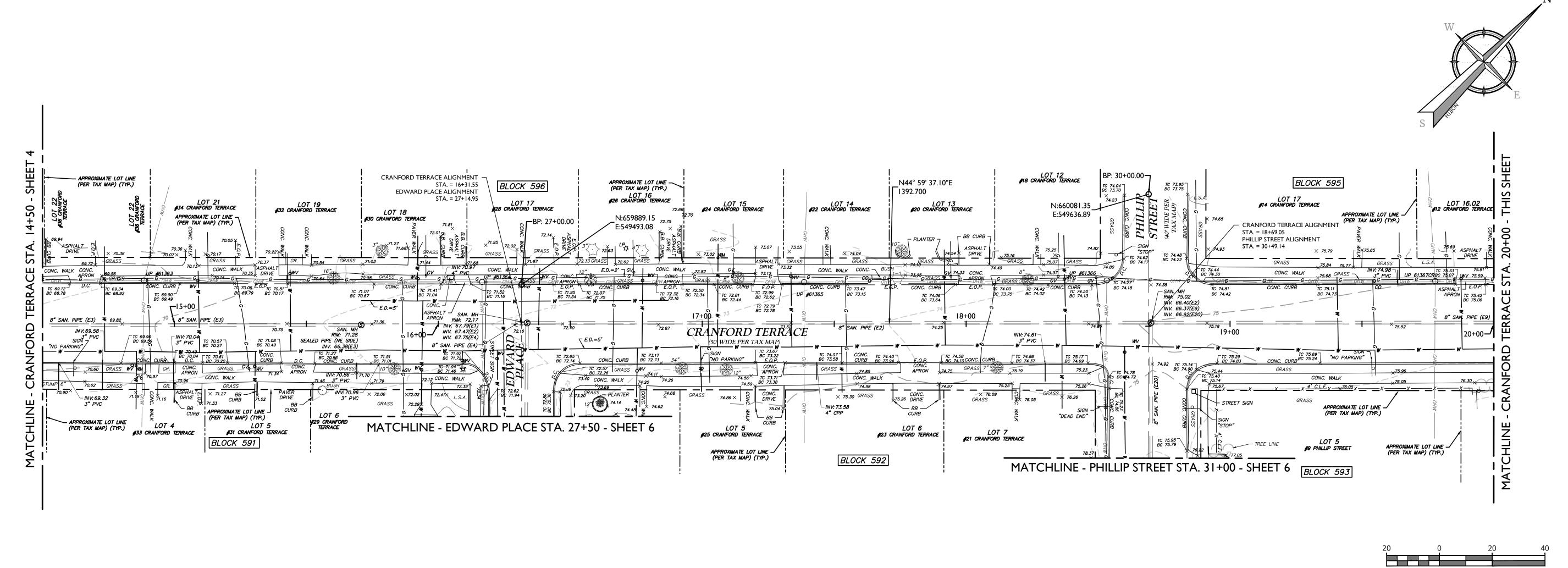
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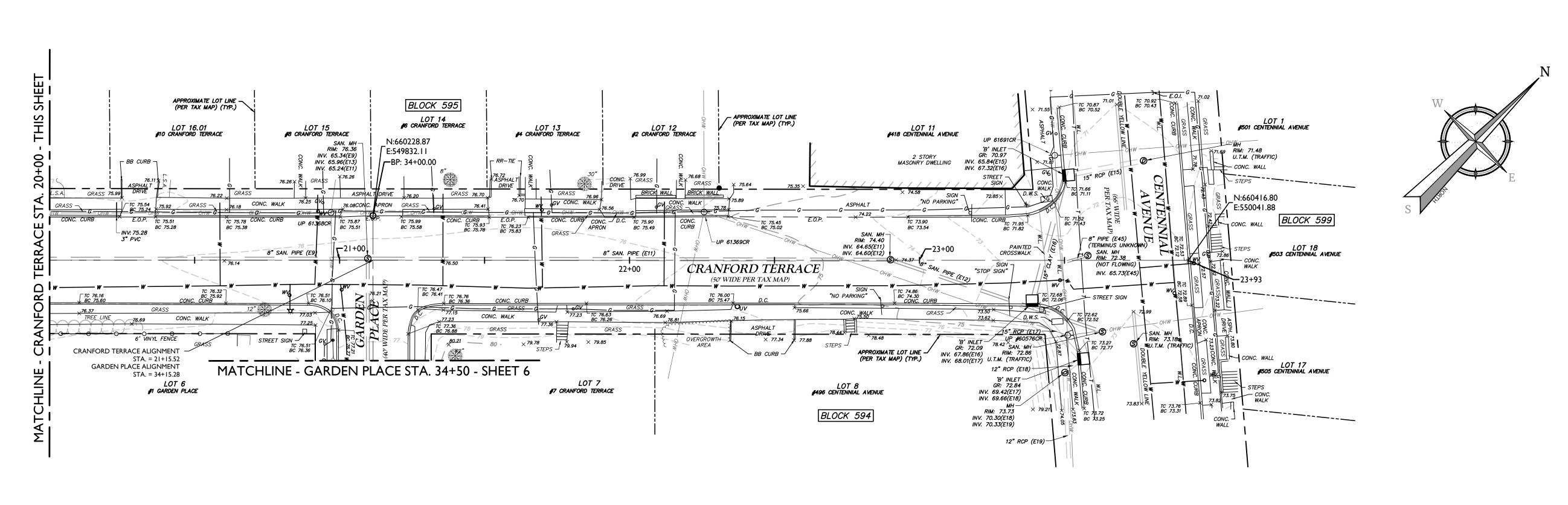
MT. ARLINGTON 400 Valley Road, Suite 304 Mt. Arlington, NJ 07856 Phone: 973.398.3110 COLLIERS ENGINEERING & DESIGN, INC DOING BUSINESS AS MASER CONSULTIN

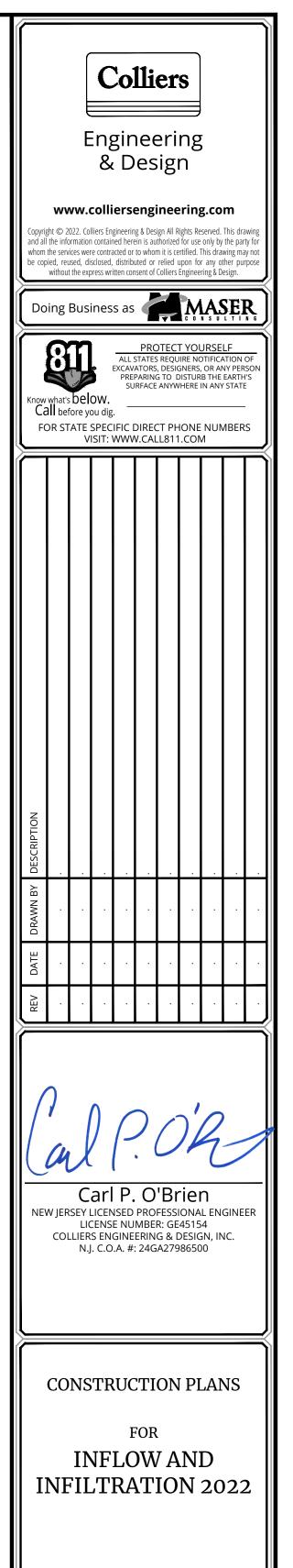
SCALE: 1" = 20'

**EXISTING CONDITIONS PLAN** 

18







SCALE: 1" = 20'

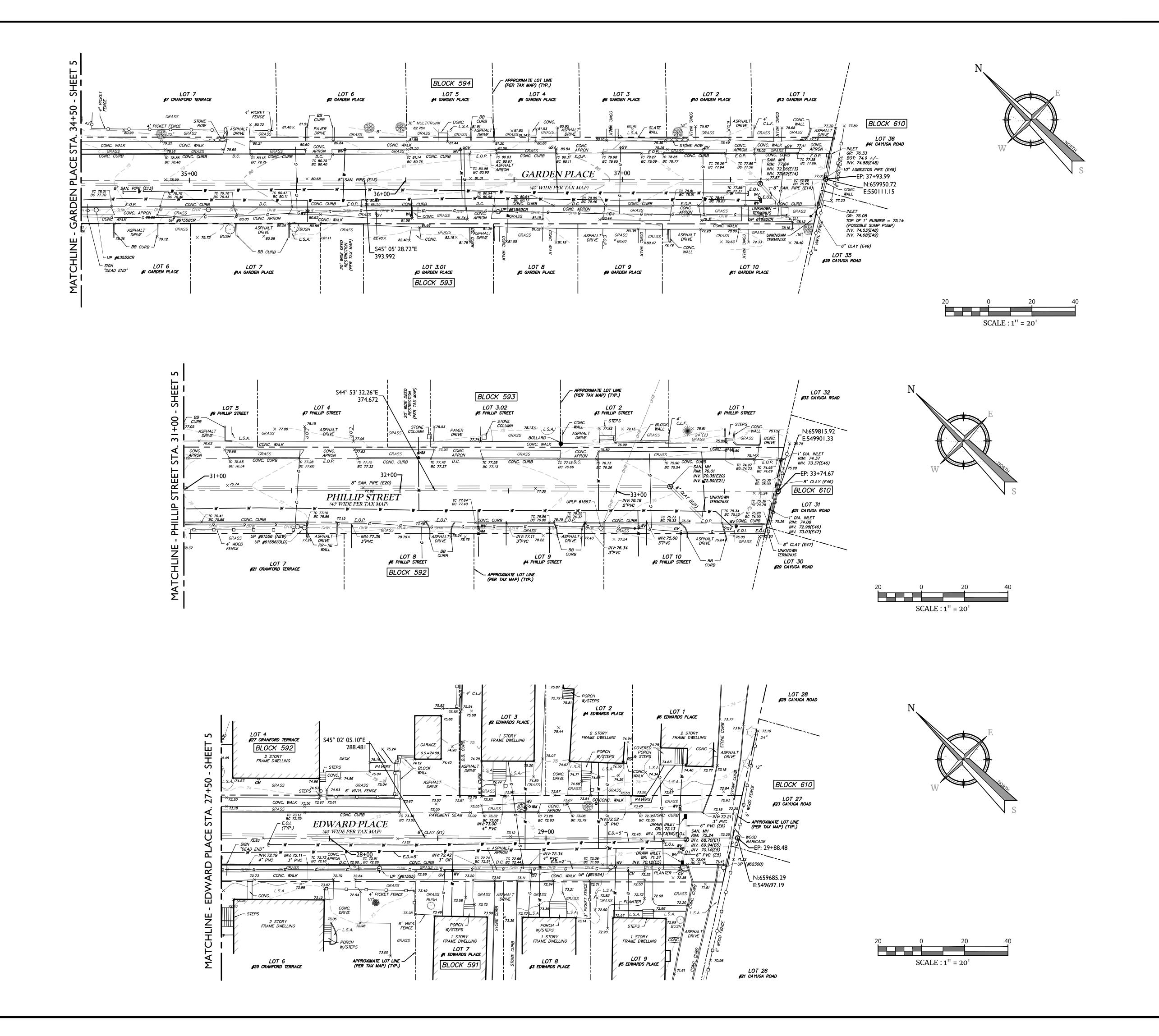
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TOWNSHIP OF CRANFORD COUNTY OF UNION STATE OF NEW JERSEY

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**EXISTING CONDITIONS PLAN** 

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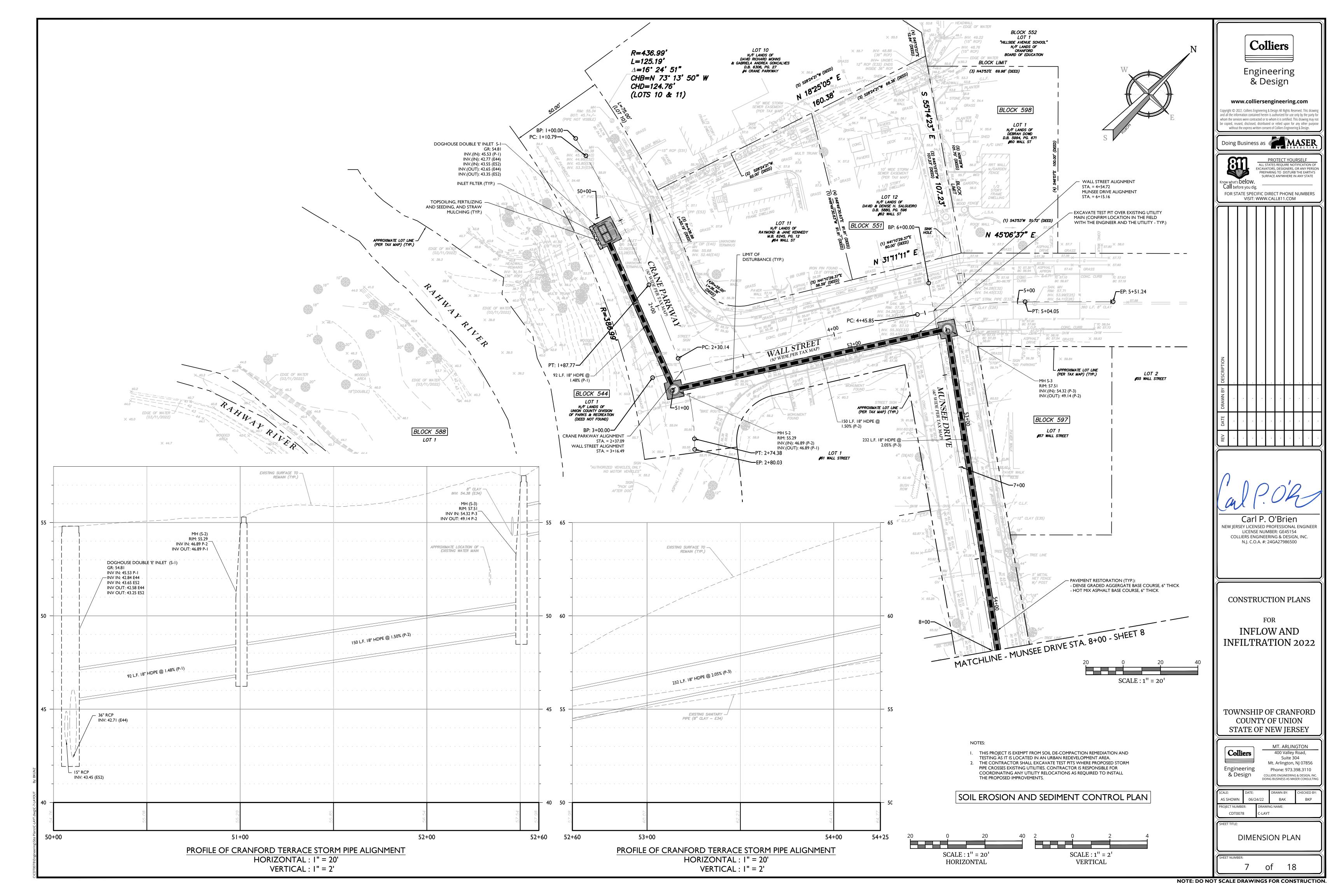
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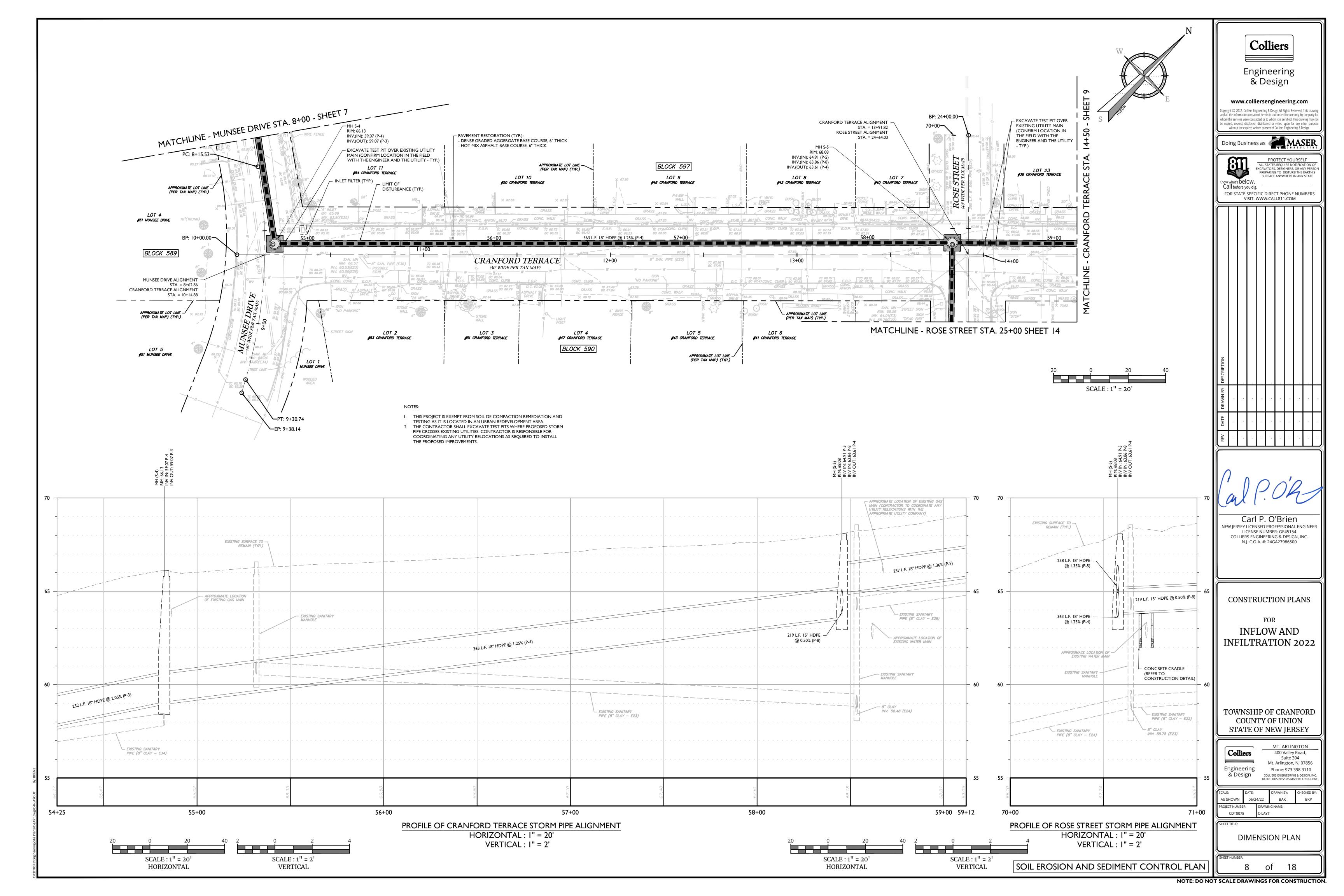
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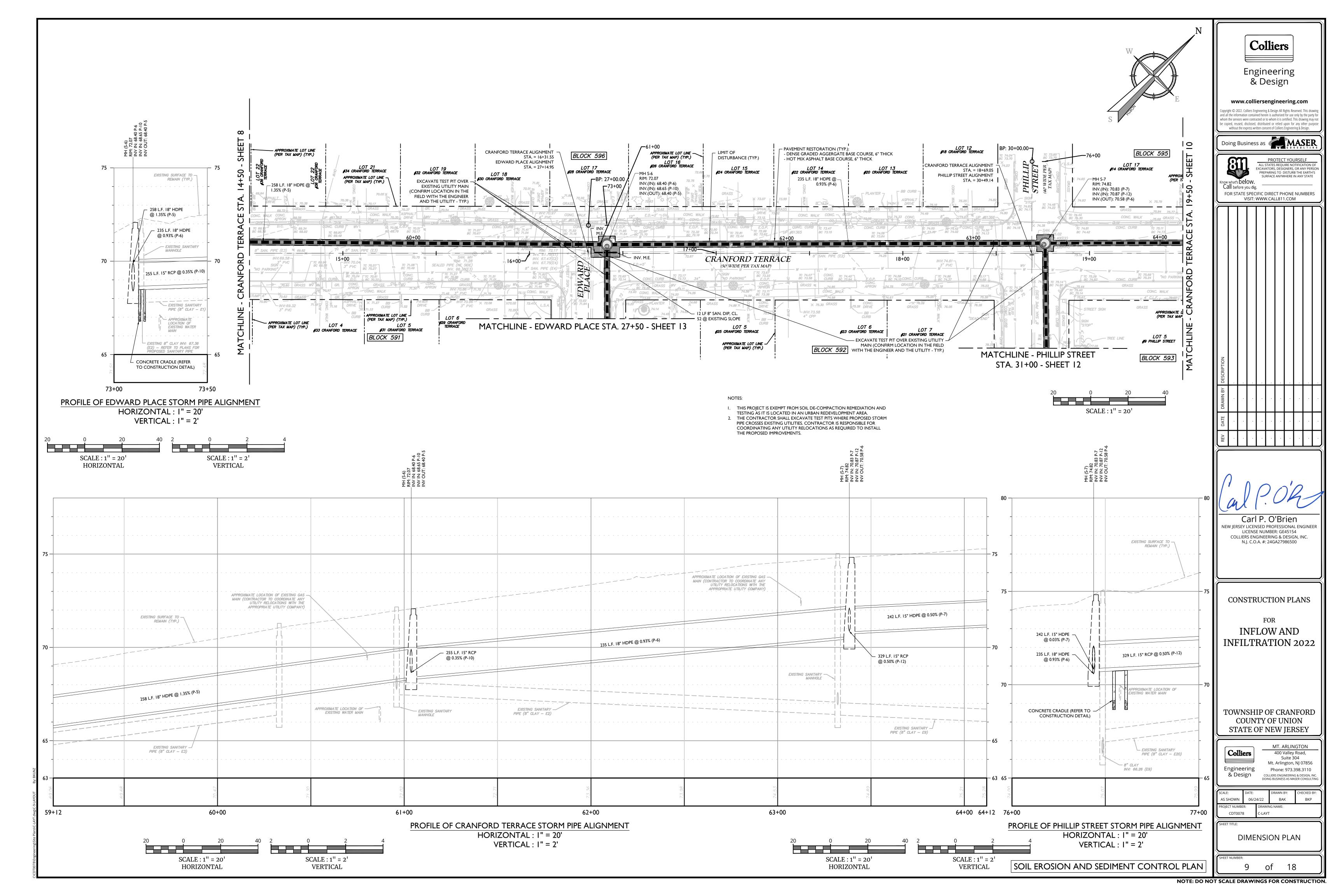
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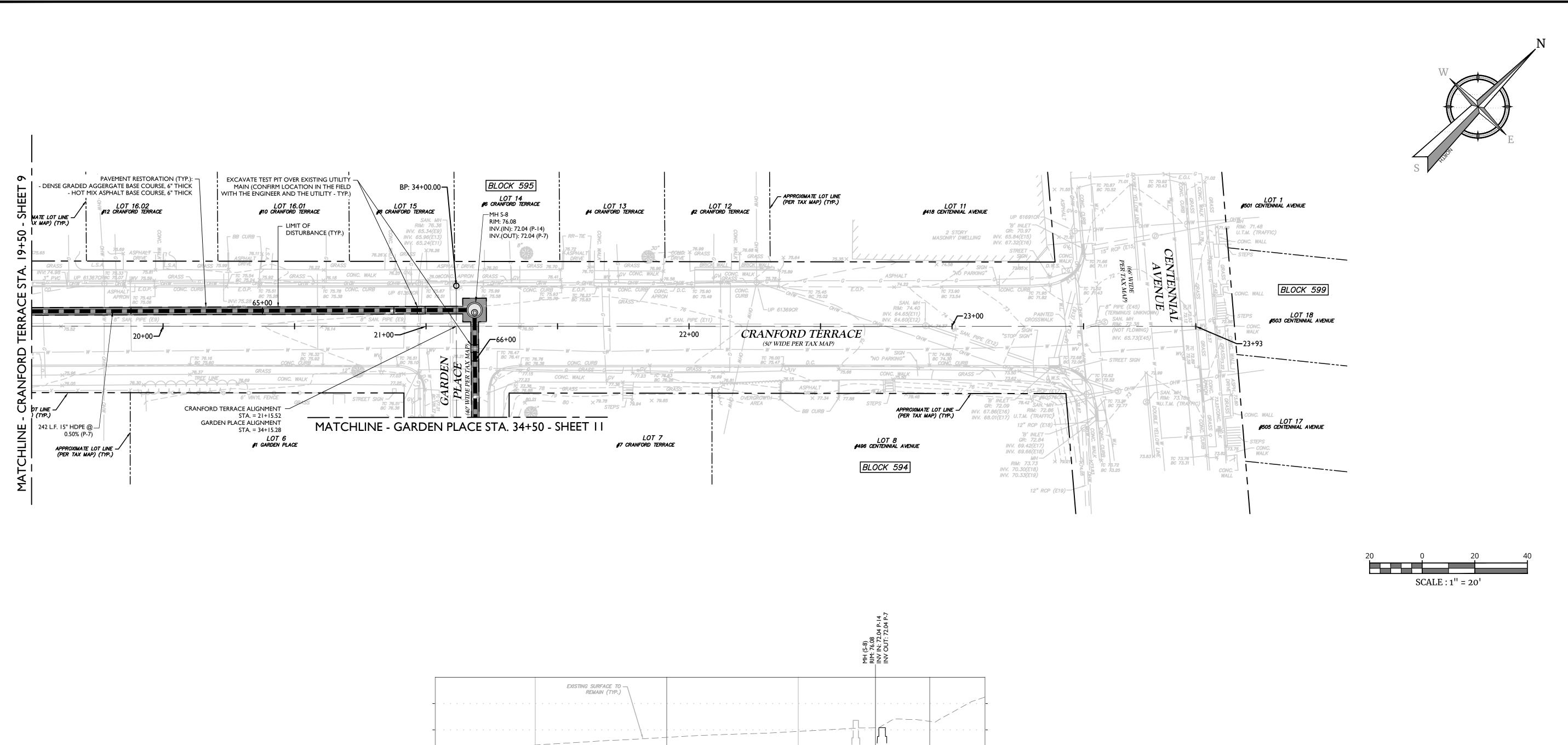
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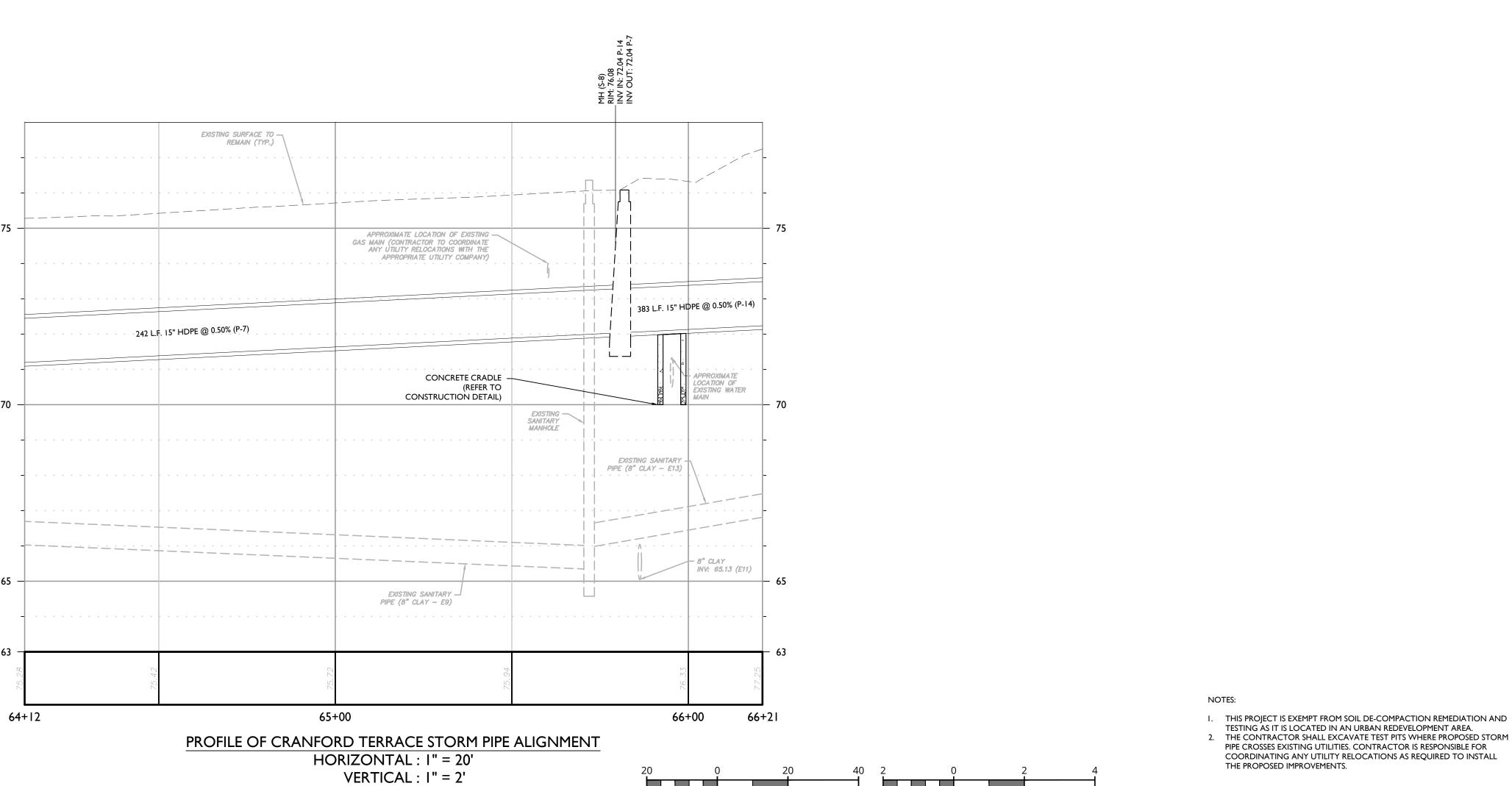
EXISTING CONDITIONS PLAN











SCALE: 1" = 20'

HORIZONTAL

SCALE : 1" = 2' VERTICAL Engineering & Design

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CONSTRUCTION PLANS

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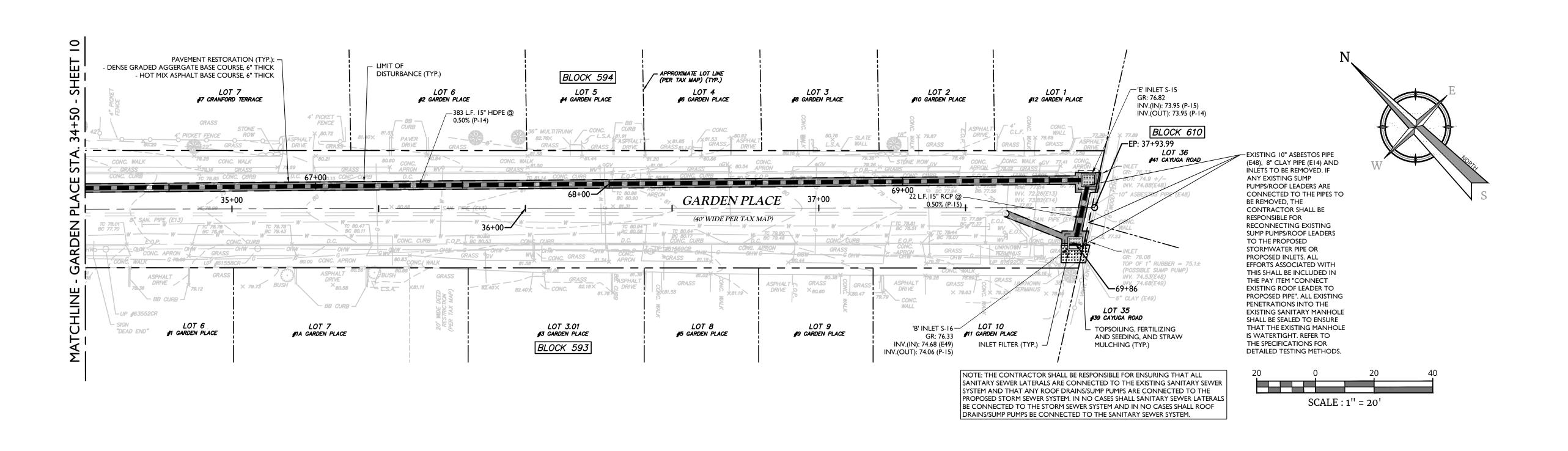
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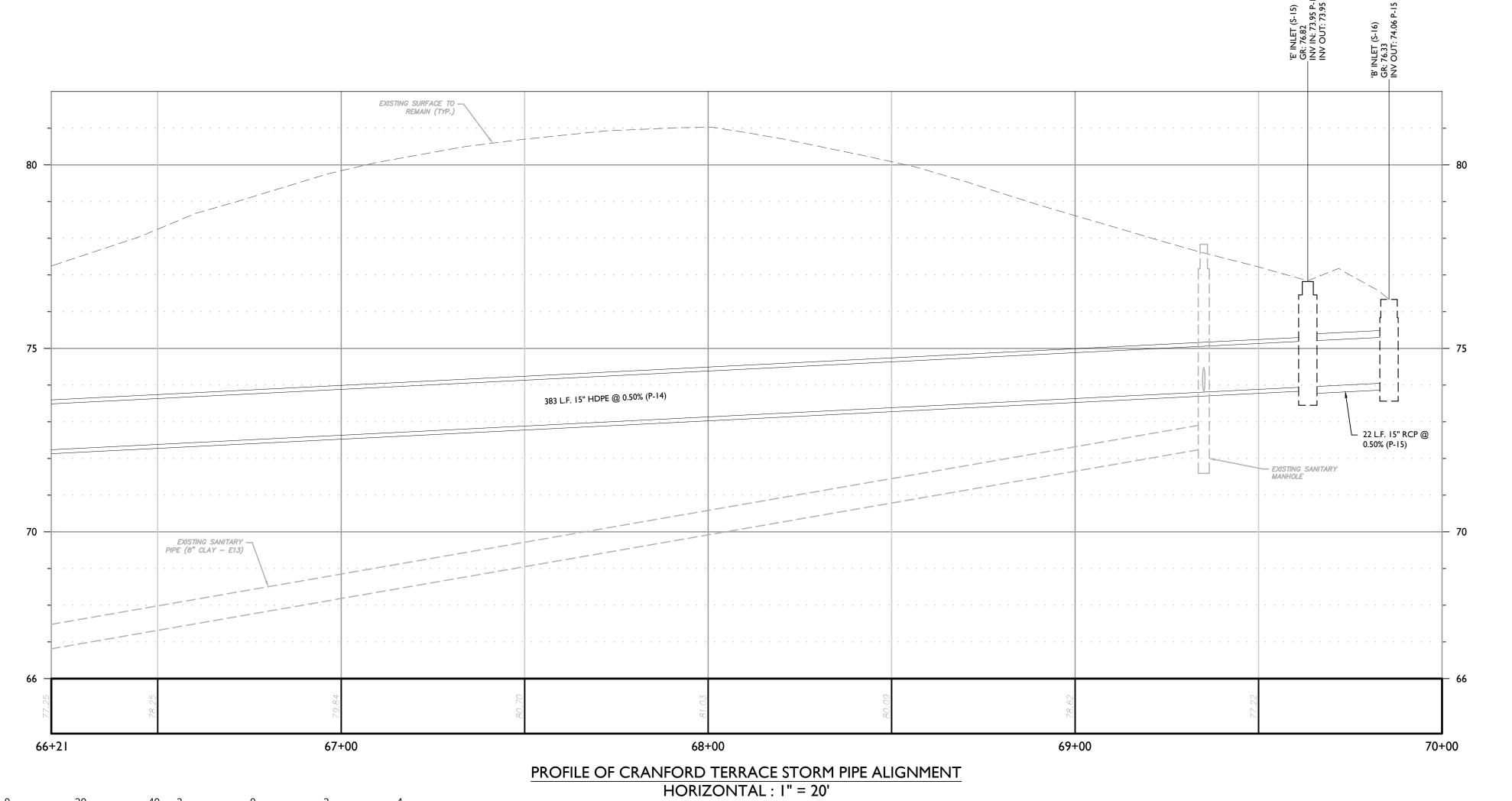
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DIMENSION PLAN

10 of 18

SOIL EROSION AND SEDIMENT CONTROL PLAN





VERTICAL : I" = 2'

SCALE: 1" = 2'

VERTICAL

SCALE: 1" = 20'

HORIZONTAL

- I. THIS PROJECT IS EXEMPT FROM SOIL DE-COMPACTION REMEDIATION AND TESTING AS IT IS LOCATED IN AN URBAN REDEVELOPMENT AREA. 2. THE CONTRACTOR SHALL EXCAVATE TEST PITS WHERE PROPOSED STORM PIPE CROSSES EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE FOR
- COORDINATING ANY UTILITY RELOCATIONS AS REQUIRED TO INSTALL THE PROPOSED IMPROVEMENTS.

SOIL EROSION AND SEDIMENT CONTROL PLAN

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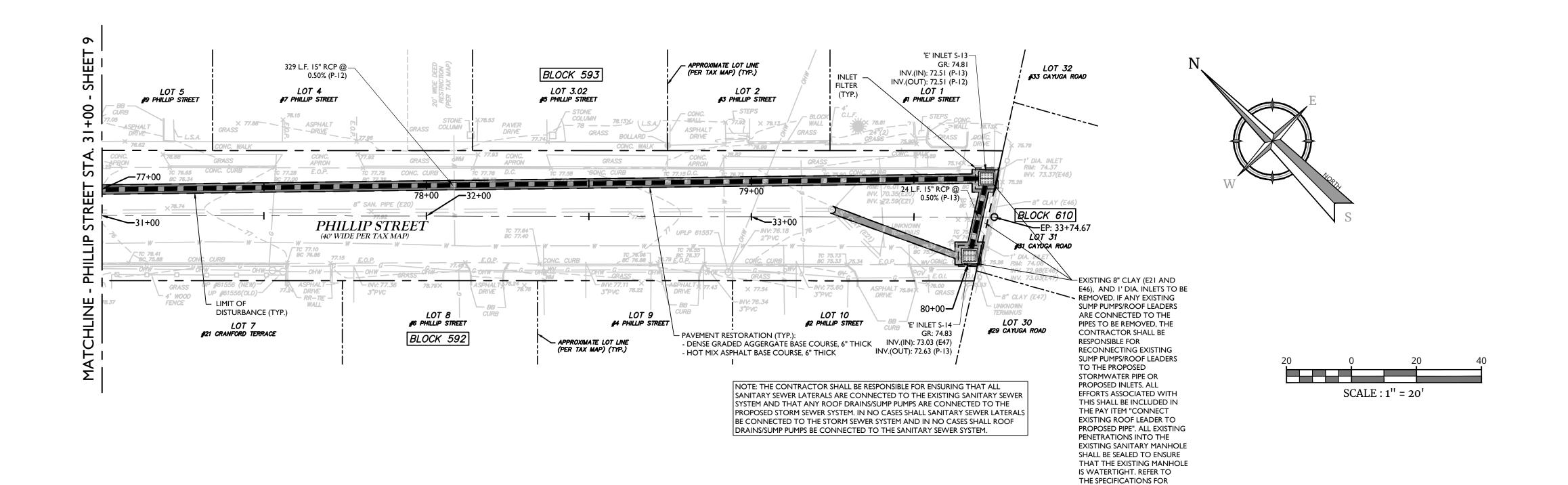
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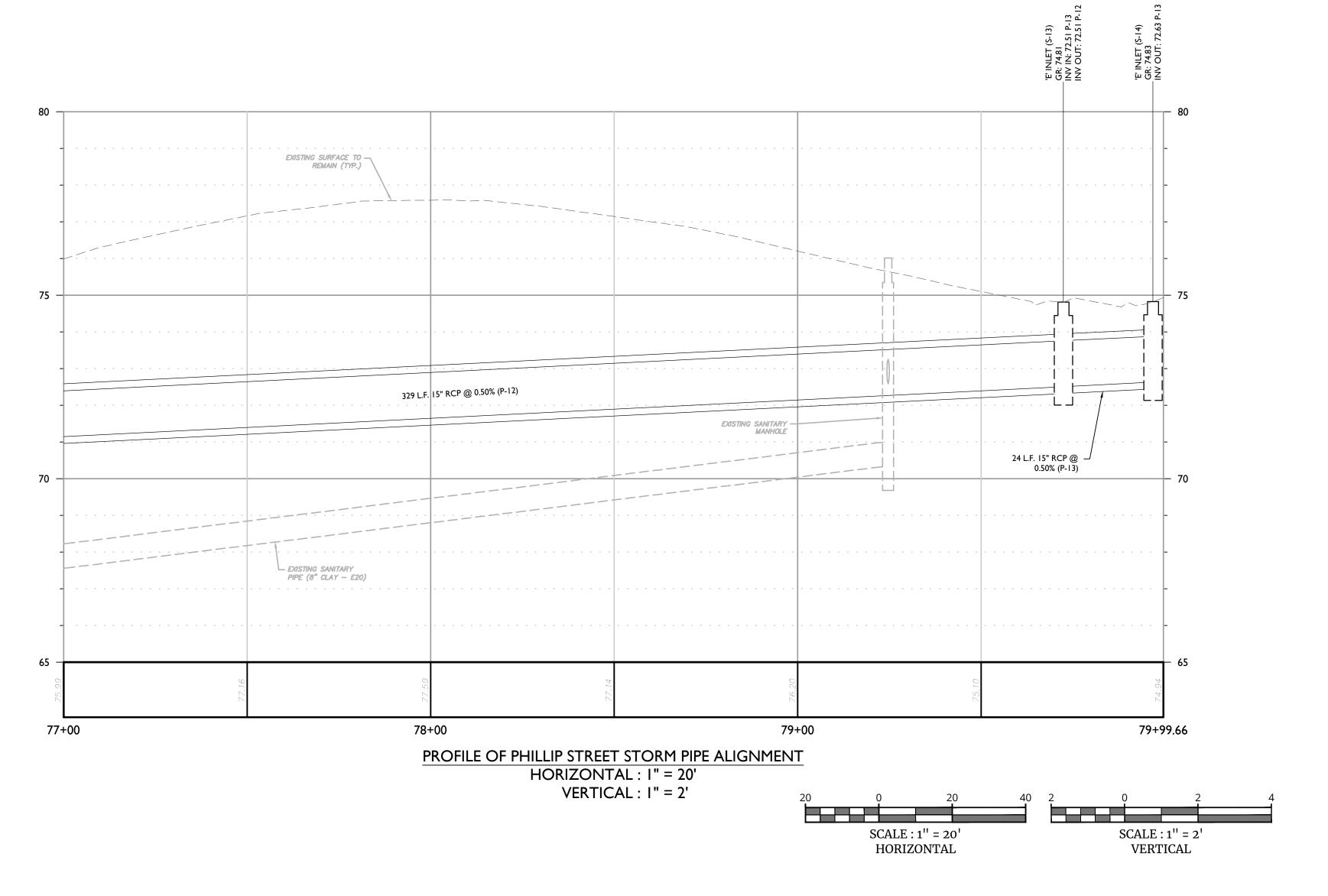
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DIMENSION PLAN

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DETAILED TESTING METHODS.



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DIMENSION PLAN

12 of 18

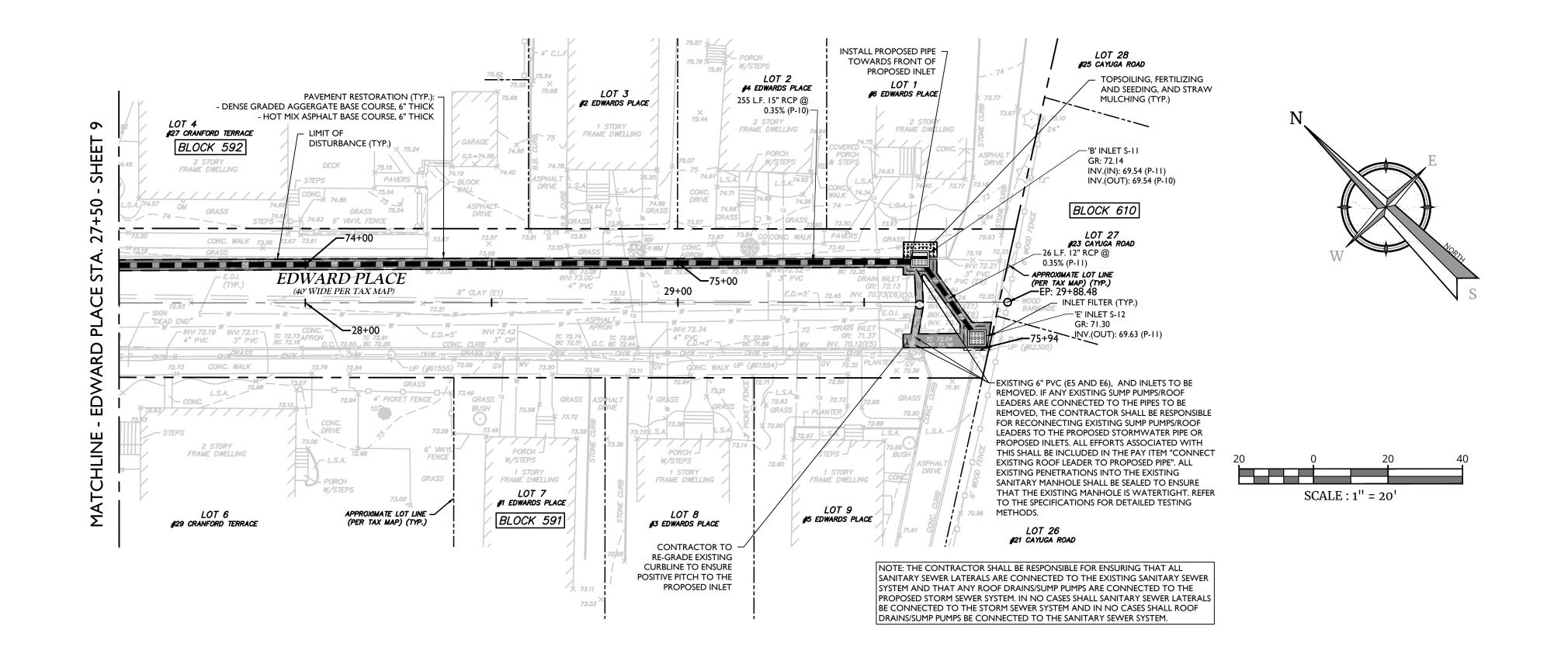
SOIL EROSION AND SEDIMENT CONTROL PLAN

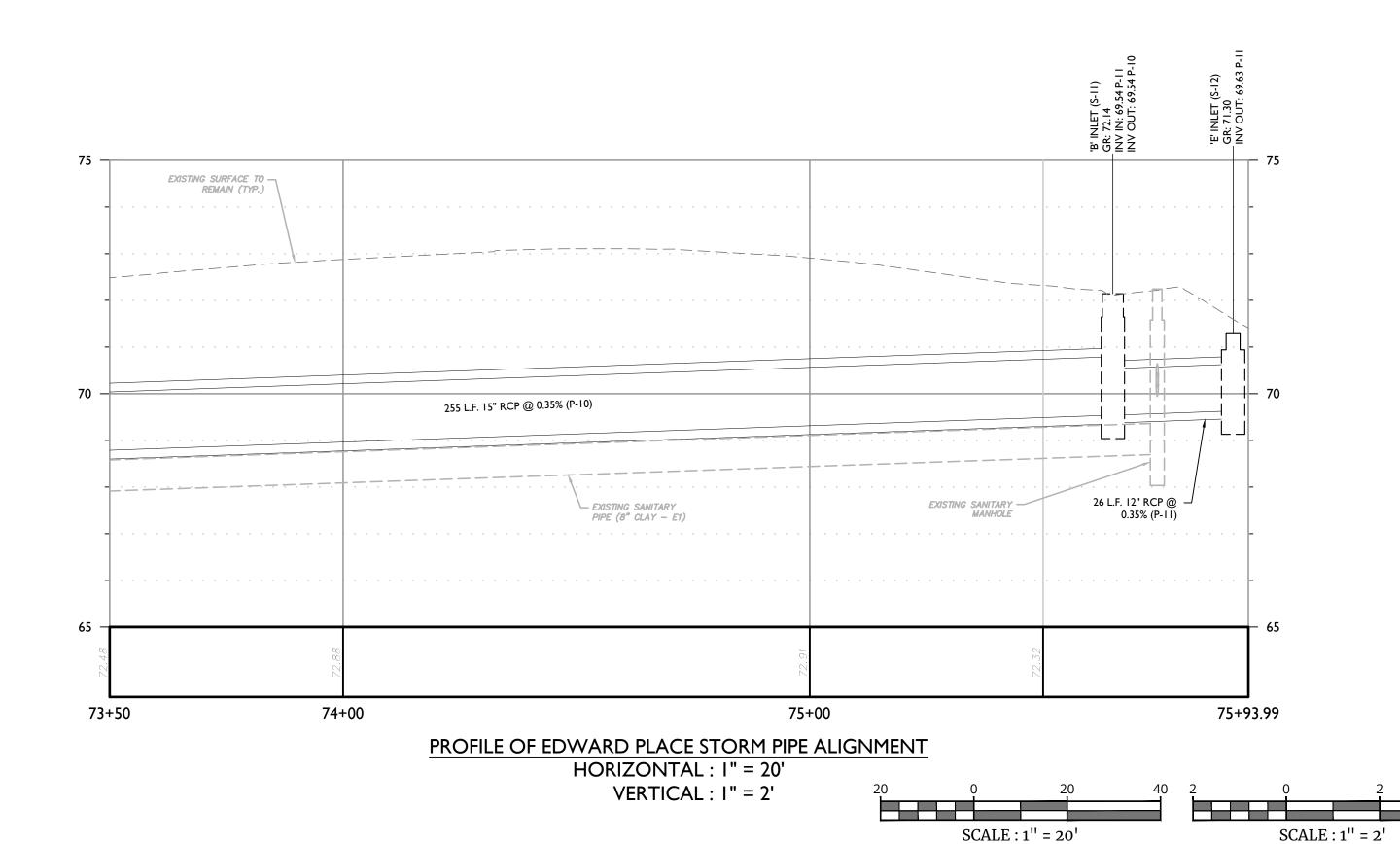
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PIPE CROSSES EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE FOR

COORDINATING ANY UTILITY RELOCATIONS AS REQUIRED TO INSTALL

THE PROPOSED IMPROVEMENTS.





HORIZONTAL

VERTICAL

- THIS PROJECT IS EXEMPT FROM SOIL DE-COMPACTION REMEDIATION AND TESTING AS IT IS LOCATED IN AN URBAN REDEVELOPMENT AREA.
- THE CONTRACTOR SHALL EXCAVATE TEST PITS WHERE PROPOSED STORM PIPE CROSSES EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ANY UTILITY RELOCATIONS AS REQUIRED TO INSTALL THE PROPOSED IMPROVEMENTS.

SOIL EROSION AND SEDIMENT CONTROL PLAN

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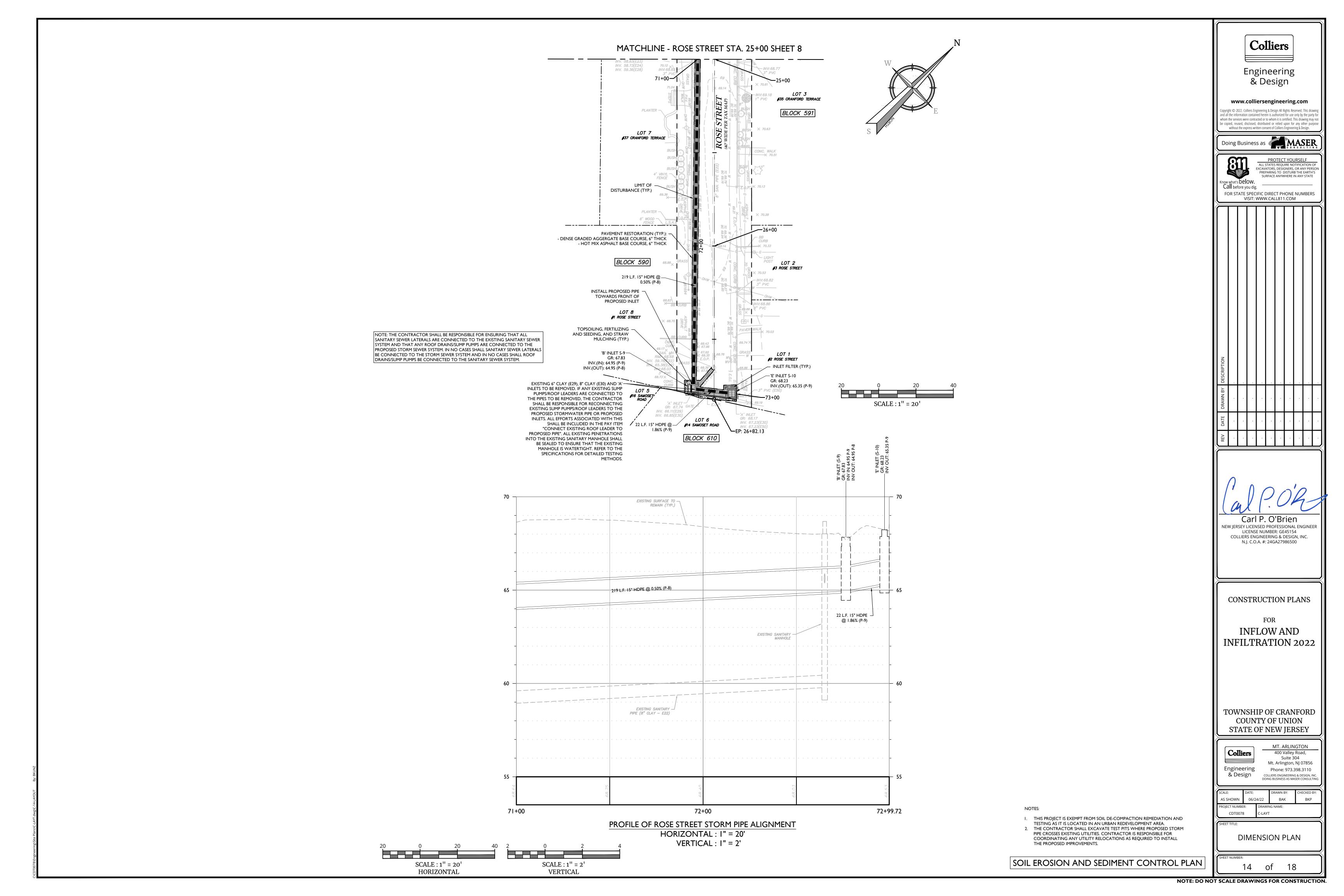
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DIMENSION PLAN

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### SOMERSET-UNION SOIL CONSERVATION DISTRICT NOTES

MCNJ-SOIL-NOTE-1013

- ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCES, OR IN THEIR PROPER SEQUENCE AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
- 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 TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO NJ STATE STANDARDS.
- PERMANENT VEGETATION SHALL BE SEEDED OR SODDED ON ALL EXPOSED AREAS WITHIN TEN (I0) DAYS AFTER FINAL GRADING. MULCH WILL BE USED FOR PROTETION UNTIL SEEDING IS ESTABLISHED.
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE NI STATE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION LAST REVISED IANUARY 2014.
- 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 OR PRELIMINARY GRADING.
- 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 NJ STATE
- ANY STEEP SLOPES RECEIVING PIPELINE INSTALLATION WILL BE BACKFILLED AND STABILIZED DAILY, AS THE INSTALLATION PROCEEDS (I.E.: SLOPES GREATER THAT 3:1)
- TRAFFIC CONTROL STANDARDS REQUIRE THE INSTALLATION OF A 50'X30'X6"PAD OF I 1/2" OR 2" STONE, AT ALL CONSTRUCTION DRIVEWAYS, IMMEDIATELY AFTER INITIAL SITE DISTURBANCE.
- THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED IN WRITING 48 HOURS IN ADVANCE OF NAY LAND DISTURBING ACTIVITY.
- ). AT THE TIME WHEN THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A 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 OF PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED. TOP SOIL SHOULD BE HANDLED ONLY WHEN IT IS DRY ENOUGH TO WORK WITHOUT DAMAGING THE SOIL STRUCTURE. A UNIFORM APPLICATION TO A DEPTH OF 5 INCHES (UNSETTLED) IS REQUIRED ON ALL SITES.
- 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
- CONDUIT OUTLET PROTECTION MUST BE INSTALLED AT ALL REQUIRED OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.

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 NJ STATE SOIL EROSION & SEDIMENT CONTROL STANDARDS.
- THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED OF ANY CHANGES IN OWNERSHIP.
- MULCHING TO THE NJ STANDARDS IS REQUIRED FOR OBTAINING A CONDITIONAL REPORT OF COMPLIANCE. CONDITIONALS ARE ONLY ISSUED WHEN THE SEASON
- CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL ADJACENT ROADS CLEAN DURING LIFE OF CONSTRUCTION PROJECT.
- THE DEVELOPER SHALL BE RESPONSIBLE FOR REMEDIATING ANY EROSION OR SEDIMENT PROBLEMS THAT ARISE AS A RESULT OF ONGOING CONSTRUCTION AT THE REQUES OF THE SOMERSET-UNION SOIL CONSERVATION DISTRICT.
- HYDRO SEEDING 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 SEEDING OPERATION. HYDRO-MULCH SHOULD BE APPLIED AT A RATE OF 1500 LBS. PER ACRE IN SECOND STEP. THE USE OF HYDRO-MULCH, AS OPPOSED TO STRAW, IS LIMITED TO OPTIMUM SEEDING DATES AS LISTED IN THE NJ STANDARDS.

### PERMANENT SEEDING SPECIFICATIONS

### I. SITE PREPARATION

A. INSTALL EROSION CONTROL MEASURES AND FACILITIES SUCH AS SILT FENCE, DIVERSIONS, SEDIMENT BASINS, CHANNEL STABILIZATION, ETC. SEE STANDARDS 11 THROUGH 42.

B. GRADE AS NEEDED AND FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, MULCH ANCHORING AND MAINTENANCE. ALL GRADING SHOULD BE DONE IN ACCORDANCE WITH THE STANDARD FOR LAND GRADING.

### 2. SEEDBED PREPARATION

A. APPLY A UNIFORM 5 INCHES (UNSETTLED) OF TOPSOIL IN ACCORDANCE WITH THE STANDARD FOR TOPSOILING OVER ALL DISTURBED AREAS, SOILS WITH A PH OF 4.0 OR LESS OR CONTAINING IRON SULFIDE SHALL BE COVERED WITH A MINIMUM DEPTH OF 12 INCHES OF SOIL HAVING PH OF 5.0 OR MORE IN ACCORDANCE WITH THE STANDARD FOR MANAGEMENT OF HIGH ACID PRODUCING SOIL

B. TOPSOIL SHOULD BE HANDLED ONLY WHEN DRY ENOUGH TO WORK WITHOUT DAMAGING SOIL

C. APPLY GROUND LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS SUCH AS OFFERED BY RUTGERS CO-OPERATIVE EXTENSION. SOIL SAMPLE MAILERS ARE AVAILABLE FROM THE LOCAL RUTGERS COOPERATIVE EXTENSION OFFICES. FERTILIZER SHALL BE APPLIED AT THE RATE OF 500 POUNDS PER ACRE OR 11 POUNDS PER 1,000 SQUARE FEET OF 10-20-10 OR EQUIVALENT WITH 50% WATER INSOLUBLE NITROGEN UNLESS A SOIL TEST INDICATES OTHERWISE. APPLY LIMESTONE IN ACCORDANCE WITH THE TABLE BELOW AND THE RESULTS OF SOIL TESTING. CALCIUM CARBONATE IS THE EQUIVALENT AND STANDARD FOR MEASURING THE ABILITY OF LIMING MATERIALS TO NEUTRALIZE SOIL ACIDITY AND SUPPLY CALCIUM AND MAGNESIUM TO GRASSES AND LEGUMES. THE TABLE BELOW IS A GENERAL GUIDELINE FOR LIMESTONE APPLICATION RATES.

### LIMESTONE APPLICATION RATE BY SOIL TEXTURE SOIL TEXTURE LBS/1,000 SQ. FT. CLAY, CLAY LOAM, AND HIGH ORGANIC SOIL SANDY LOAM, LOAM, SILT LOAM LOAMY SAND, SAND

D. IMMEDIATELY PRIOR TO SEEDING AND TOPSOIL APPLICATION, THE SURFACE SHOULD BE SCARIFIED 6" TO 12" WHERE THERE HAS BEEN SOIL COMPACTION. THIS PRACTICE IS PERMISSIBLE ONLY WHERE THERE IS NO DANGER TO UNDERGROUND UTILITIES (CABLES, IRRIGATION SYSTEMS, ETC.)

E. WORK LIME AND FERTILIZER INTO THE SOIL TO A DEPTH OF APPROXIMATELY 4 INCHES. THE FINAL HARROWING OR DISC OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM SEEDBED IS PREPARED.

F. REMOVE FROM THE SURFACE ALL STONES 2 INCHES OR LARGER IN ANY DIMENSION AND OTHER DEBRIS SUCH AS WIRE, TREE ROOTS, PIECES OF CONCRETE, CLODS LUMPS OR OTHER UNSUITABLE

A. SELECT THE SEED MIXTURE AS SPECIFIED ON THIS SHEET AND APPLY AS NOTED WITHIN THE DATES SPECIFIED IN THE STANDARD.

B. CONVENTIONAL SEEDING IS PERFORMED BY APPLYING SEED UNIFORMLY BY HAND, CYCLONE (CENTRIFUGAL) SEEDER, DROP SEEDER, DRILL OR CULTIPACKER SEEDER. EXCEPT FOR DRILLED, HYDROSEEDED OR CULTIPACKED 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. HYDROSEEDING IS A BROADCAST SEEDING METHOD USUALLY INVOLVING A TRUCK OR TRAILER MOUNTED TANK, WITH AN AGITATION SYSTEM AND 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 FIBERED MULCH MAY BE APPLIED WITH A HYDROSEEDER FOLLOWING SEEDING. (ALSO SEE SECTION 4 MULCHING BELOW) 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,

D. AFTER SEEDING, FIRMING THE SOIL WITH A CORRUGATED ROLLER WILL ASSURE GOOD SEED-TO-SOIL CONTACT, RESTORE CAPILLARITY AND IMPROVE SEEDLING EMERGENCE. THIS IS THE PREFERRED METHOD. WHEN PERFORMED ON THE CONTOUR, SHEET EROSION WILL BE MINIMIZED AND WATER CONSERVATION ON SITE WILL BE MAXIMIZED.

### 4. MULCHING

### A. MULCHING IS REQUIRED ON ALL SEEDING.

B. STRAW OR HAY - UNROTTED SMALL GRAIN STRAW, HAY FREE OF SEEDS, OR 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 ADHÉSIVE 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. STRAW OR HAY MULCH MUST BE ANCHORED IMMEDIATELY AFTER PLACEMENT USING PEG AND TWINE, MULCH NETTING, MECHANICAL CRIMPER OR LIQUID MULCH BINDERS IN ACCORDANCE WITH THE STANDARD.

C. 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 NOT BE MIXED IN THE TANK WITH SEED. USE IS LIMITED TO

FLATTER SLOPES AND DURING OPTIMUM SEEDING PERIODS IN SPRING AND FALL.

### **DUST CONTROL NOTES**

### THE FOLLOWING METHODS SHOULD BE CONSIDERED FOR CONTROLLING DUST:

SEE STANDARD FOR STABILIZATION WITH MULCHES ONLY. (PAGE 5-1 OF "STANDARDS FOR SOIL

EROSION AND SEDIMENT CONTROL IN NEW JERSEY", LATEST EDITION) SEE STANDARD FOR TEMPORARY VEGETATIVE COVER (PAGE 7-1 OF "STANDARDS FOR SOIL VEGETATIVE COVER

EROSIN AND SEDIMENT CONTROL IN NEW JERSEY", LATEST EDITION), PERMANENT VEGETATIVE COVER FOR SOIL STABILIZATION (PAGE 4-1 OF "STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY", LATEST EDITION), AND PERMANENT STABILIZATION WITH SOD (PAGE 6-I OF "STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY", LATEST EDITION).

ON MINERAL SOILS (NOT EFFECTIVE ON MUCK SOILS). KEEP TRAFFIC OFF THESE AREAS.

MATERIAL	WATER DILUTION	TYPE OF NOZZLE	APPLY GALLONS/ACRE		
ANIAONIC ASPHALT EMULSION	7:1	COARSE SPRAY	1200		
LATEX EMULSION	12.5:1	FINE SPRAY	235		
RESIN IN WATER	4:1	FINE SPRAY	300		
POLYACRYLAMIDE (PAM) - SPRAY ON POLYACRYLAMIDE (PAM) - DRY SPRAY	ALSO BE USED AS FLOCCULATE ANI SEDIMENT BASIN	APPLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS. MA' ALSO BE USED AS AN ADDITIVE TO SEDIMENT BASINS TO FLOCCULATE AND PRECIPITATE SUSPENDED COLLOIDS. (SEE SEDIMENT BASIN STANDARD (PAGE 26-I OF "STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY", LATEST EDITION)			
ACIDULATED SOY BEAN SOAP STICK	NONE	COARSE SPRAY	1200		

TO ROUGHEN SURFACE AND BRING CLODS TO THE SURFACE. THIS IS A TEMPORARY EMERGENCY TILLAGE 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.

<u>SPRINKLING</u> SOLID BOARD FENCES, SNOW FENCES, BURLAP FENCES, CRATE WALLS, BALES OF HAY, AND **BARRIERS** SIMULAR MATERIAL CAN BE USED TO CONTROL AIR CURRENTS AND SOIL BLOWING.

SITE IS SPRINKLED UNTIL THE SURFACE IS WET.

SHALL BE IN THE FORM OF LOOSE, DRY GRANULATES OF FLAKES FINE ENOUGH TO FEED THROUGH CALCIUM CHLORIDE 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.

### **CONSTRUCTION SEQUENCE**

IMPLEMENTATION OF SOIL EROSION & SEDIMENT CONTROL MEASURES INCLUDING: - INLET FILTERS LDAY

- SILT FENCE I DAY CONSTRUCT IMPROVEMENTS: 4 WFFKS - INSTALL DRAINAGE

INSTALL PAVEMENT WEEKS UNIFORMLY APPLY TOPSOIL TO AN AVERAGE DEPTH OF 5", MINIMUM OF 4", FIRMED IN PLACE FERTILIZING, SEEDING AND STRAW MULCHING 2 DAYS

NOTE: TOTAL ESTIMATED PROJECT DURATION: 6 WEEKS

- REMOVAL OF SOIL EROSION & SEDIMENT CONTROL

THIS SCHEDULE IS FOR SOIL EROSION AND SEDIMENT CONTROL PURPOSES ONLY

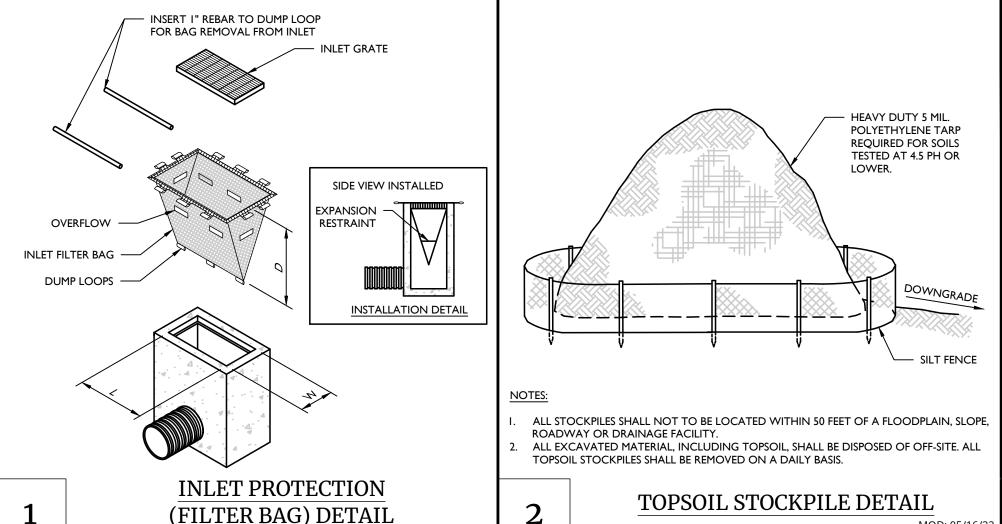
### STOCKPILE

MEASURES

ALL EXCAVATED MATERIAL, INCLUDING TOPSOIL, SHALL BE DISPOSED OF OFF-SITE. ALL TOPSOIL STOCKPILES SHALL BE REMOVED ON A DAILY BASIS.

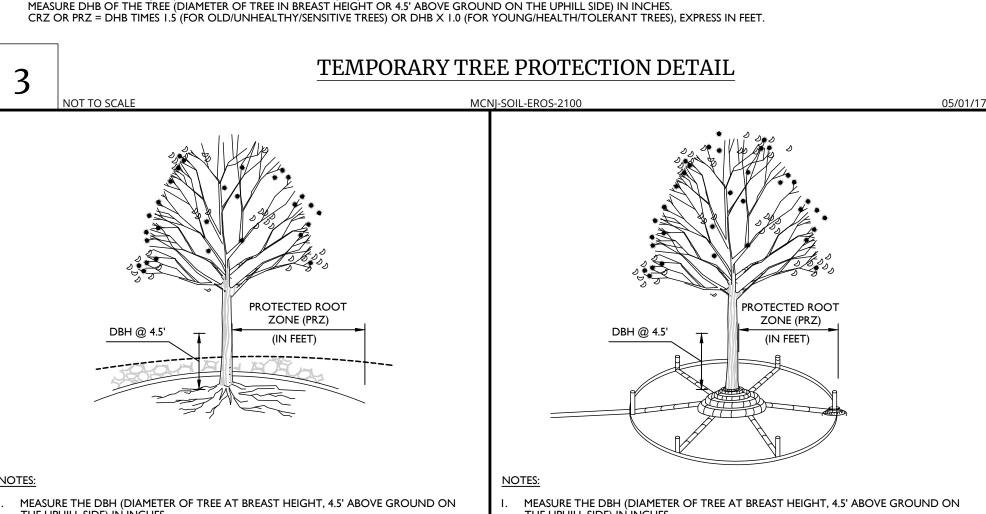
I DAY

TOTAL PROJECT AREA OF DISTURBANCE = 9,765 SF OR 0.22 ACRES



SECOND CUT BRANCH -BARK RIDGE 4' HIGH SNOW FENCE WITH POST DRIVEN 3' INTO **GROUND AT 5' INTERVALS** 

- PROTECTIVE FENCING IS TO BE ERECTED PRIOR TO CONSTRUCTION AND MAINTAINED DURING CONSTRUCTION AS DIRECTED BY THE LANDSCAPE ARCHITECT, SOIL CONSERVATION DISTRICT AND/OR MUNICIPAL ENGINEER.
- 2. NO CONSTRUCTION ACTIVITY IS PERMITTED WITHIN THE PROTECTIVE FENCING.
- 3. AS CONSTRUCTION NEARS COMPLETION THE FENCING WILL BE REMOVED AS DIRECTED.
- 4. AT THE COMPLETION OF CONSTRUCTION, ALL TREES WILL BE PRUNED AS NECESSARY TO CORRECT ANY DAMAGE RESULTING FROM CONSTRUCTION ACTIVITY.
- 5. GENERAL MECHANICAL DAMAGE SEE CRITICAL ROOT ZONE CALCULATION (CRZ) FOR CORRECT PLACEMENT OF TREE PROTECTION.
- 6. BOX TREES WITHIN 25 FEET OF A BUILDING SITE TO PREVENT MECHANICAL INJURY. FENCING OR OTHER BARRIER SHOULD BE INSTALLED BEYOND THE CRITICAL ROOT ZONE.
- 7. BOARDS WILL NOT BE NAILED TO TREES DURING BUILDING OPERATIONS.
- 8. FEEDER ROOTS SHOULD NOT BE CUT IN AN AREA INSIDE THE PROTECTED ROOT ZONE (PRZ) OR CRITICAL ROOT ZONE (CRZ). TREE ROOT SYSTEM COMMONLY EXTEND BEYOND THE
- DAMAGED TRUNKS OR EXPOSED ROOTS SHOULD HAVE DAMAGED BARK REMOVED IMMEDIATELY AND NO PAINT SHALL BE APPLIED. EXPOSED ROOTS SHOULD BE COVERED WITH TOPSOIL IMMEDIATELY AFTER EXCAVATION IS COMPLETE. ROOTS SHALL BE PRUNED TO GIVE A CLEAN, SHARP SURFACE AMENABLE TO HEALING. ROOTS EXPOSED DURING HOT
- WEATHER SHOULD BE IRRIGATED TO PREVENT PERMANENT TREE INJURY. CARE FOR SERIOUS INJURY SHOULD BE PRESCRIBED BY A PROFESSIONAL FORESTER OR CERTIFIED TREE EXPERT. 10. TREE LIMB REMOVAL WHERE NECESSARY, WILL BE DONE AS NATURAL TARGET PRUNING TO REMOVE THE DESIRED BRANCH COLLAR. THERE SHOULD BE NO FLUSH CUTS. FLUSH CUTS DESTROY A MAJOR DEFENSE SYSTEM OF THE TREE. NO TREE PAINT SHALL BE APPLIED. ALL CUTS SHALL BE MADE AT THE OUTSIDE EDGE OF THE BRANCH COLLAR. CUTS MADE TOO FAR BEYOND THE BRANCH COLLAR MAY LEAD TO EXCESS SPROUTING, CRACKS AND ROT. REMOVAL OF A "V" CROTCH SHOULD BE CONSIDERED FOR FREE STANDING SPECIMEN TREES TO AVOID FUTURE SPLITTING DAMAGE.
- II. CRITICAL ROOT ZONE (CRZ) OR PROTECTED ROOT ZONE (PRZ) CALCULATION: MEASURE DHB OF THE TREE (DIAMETER OF TREE IN BREAST HEIGHT OR 4.5' ABOVE GROUND ON THE UPHILL SIDE) IN INCHES.



THE UPHILL SIDE) IN INCHES.

PROTECTED ROOT ZONE (PRZ) = CRITICAL ROOT ZONE IN FEET = DBH (INCHES) X 1.5' (FOR OLD/SENSITIVE TREES) OR DBH X 1.0 (FOR YOUNG/TOLERANT TREES) TILE AND GRAVEL WILL ALLOW AIR CIRCULATION TO ROOT ZONE UNDER A FILL.

ROOT PROTECTION DURING CONSTRUCTION DETAIL

THE UPHILL SIDE) IN INCHES. PROTECTED ROOT ZONE (PRZ) = CRITICAL ROOT ZONE IN FEET = DBH (INCHES) X 1.5'

TREE PROTECTION IN CUT

AREAS DETAIL

TOWNSHIP OF CRANFORD COUNTY OF UNION (FOR OLD/SENSITIVE TREES) OR DBH X 1.0 (FOR YOUNG/TOLERANT TREES STATE OF NEW JERSEY MT. ARLINGTON

> Colliers Suite 304 Mt. Arlington, NJ 07856 Engineering Phone: 973.398.3110 & Design COLLIERS ENGINEERING & DESIGN, IN

400 Valley Road,

NEW IERSEY LICENSED PROFESSIONAL ENGINEER LICENSE NUMBER: GE45154

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CONSTRUCTION PLANS

**INFLOW AND** 

**INFILTRATION 2022** 

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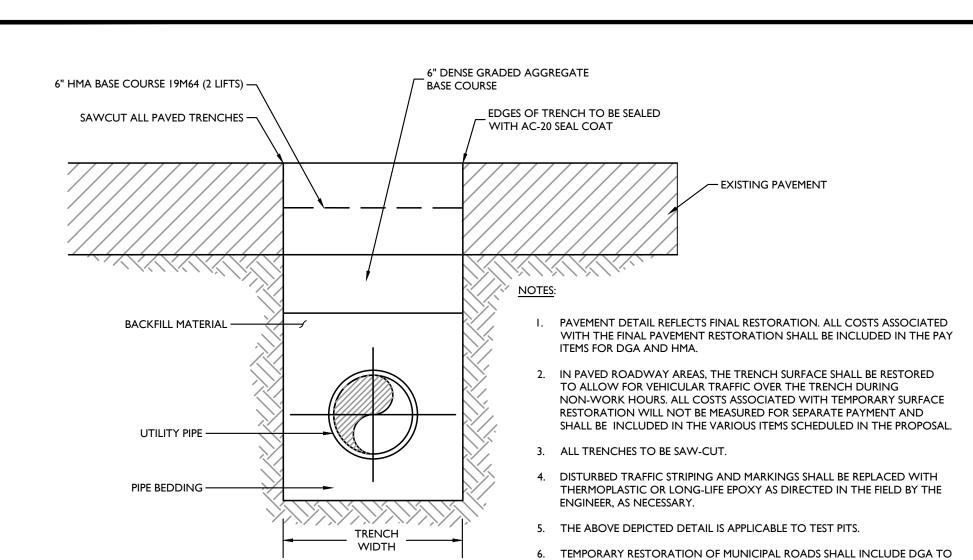
SURFACE ANYWHERE IN ANY STATE

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SOIL EROSION & SEDIMENT CONTROL DETAILS

of

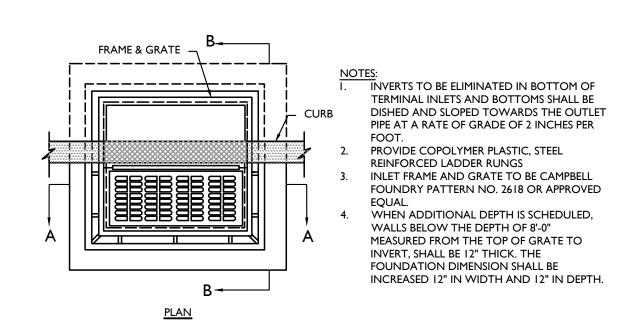
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION

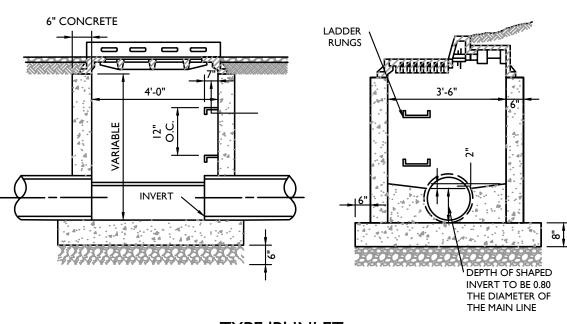


# PAVEMENT RESTORATION DETAIL

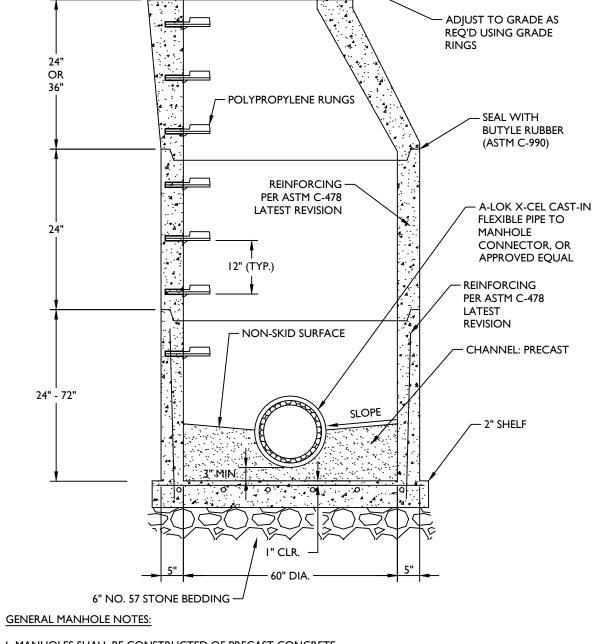
GRADE ON A DAILY BASIS AND FINAL PAVING ON A WEEKLY BASIS. THE CONTRACTOR MAY INSTALL FINAL PAVING ON A DAILY BASIS AT NO

ADDITIONAL COST TO THE OWNER. NO ADDITIONAL PAYMENT SHALL BE MADE FOR TEMPORARILY RESTORING TRENCHES WITH DGA AND SHALL BE INCLUDED IN THE SY COST FOR HOT MIX ASPHALT PAVEMENT REPAIR.





TYPE 'B' INLET



— RESTORATION —

R=I" (TYP.) ALL CURBS

PAVEMENT

HMA 9.5M64

HMA 19M64

DENSE GRADED

AGGREGATE

COMPACTED SUBGRADE

2' REPAIR

SAWCUT \

I. TRAVERSE JOINTS 1/2" WIDE SHALL BE INSTALLED IN THE CURB 20 FEET APART AND SHALL BE FILLED WITH

2. EXPANSION JOINTS THRU AND ADJACENT TO THE CURB SHALL BE INCLUDED IN THE UNIT PRICE FOR

9"X18" CONCRETE VERTICAL CURB

THE CURB. PROVIDE DUMMY JOINTS (FORMED) MIDWAY BETWEEN EXPANSION JOINTS.

3. CURB SHALL ONLY BE INSTALLED ON AN IF/WHERE BASIS AS DIRECTED BY THE ENGINEER.

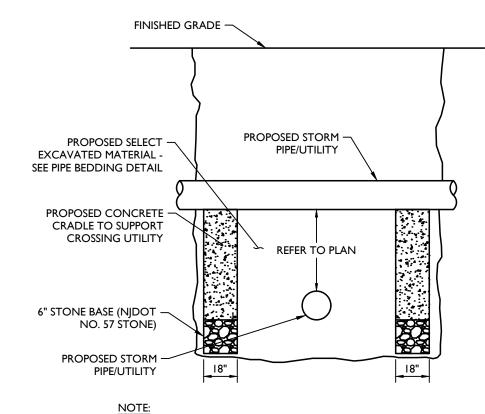
PREFORMED BITUMINOUS-IMPREGNATED FIBER JOINT FILLER RECESSED 1/4" IN FROM FONT FACE AND TOP

TOPSOIL, FERT., SEED AND STRAW

CONCRETE

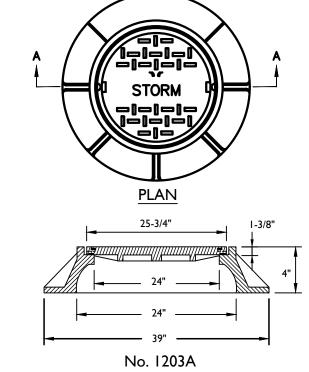
 MANHOLES SHALL BE CONSTRUCTED OF PRECAST CONCRETE.
 CASTINGS OF PRECAST MANHOLES SHALL BE ADJUSTED TO GRADE WITH PRECAST CONCRETE GRADE RINGS, AS REQUIRED, 3. WHERE EXISTING PIPE IS TO BE CONNECTED TO NEW MANHOLE, 5 FEET OF NEW PIPE AND COUPLINGS SHALL BE INCLUDED IN COST OF MANHOLE. 4. PRECAST MANHOLES SHALL MEET THE REQUIREMENTS OF ASTM C-478, "PRECAST REINFORCED CONCRETE MANHOLE 5. REINFORCED CONCRETE STRUCTURES SHALL WITHSTAND AASHTO HS-20 LIVE LOAD CONDITIONS.
6. PROVIDE PRECAST MANHOLE SLAB IN LIEU OF STANDARD PRECAST TOP SECTION FOR MANHOLES HAVING 6'-9" DEPTH OR

# STORM MANHOLE



I. CONTRACTOR SHALL USE A CONCRETE CRADLE IF THE VERTICAL CLEARANCE BETWEEN THE PROPOSED STORM PIPE AND EXISTING UTILITY IS LESS THAN 12".

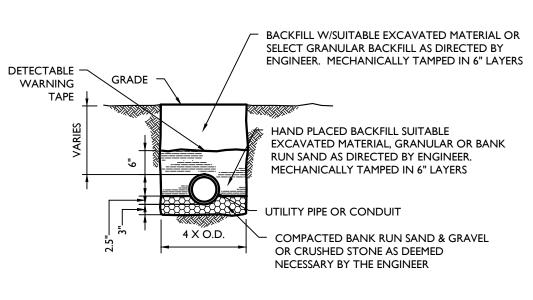
**CONCRETE CRADLE** 



NOTE: PRODUCT SHALL BE CAMPBELL FOUNDRY MODEL NO. 1203A, OR APPROVED EQUAL

### STANDARD MANHOLE COVER/FRAMES



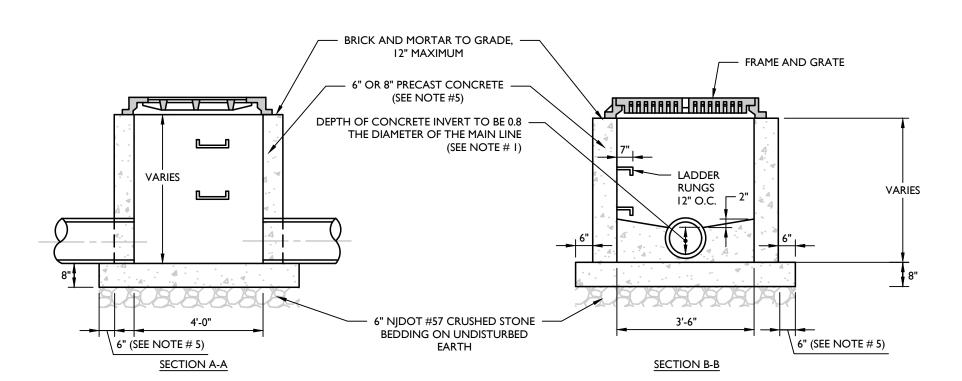


I. INSTALLATION SHALL BE AS PER THE UTILITY COMPANY, CRANFORD BUILDING DEPARTMENT, CRANFORD DEPARTMENT OF PUBLIC WORKS AND ENGINEER REQUIREMENTS.

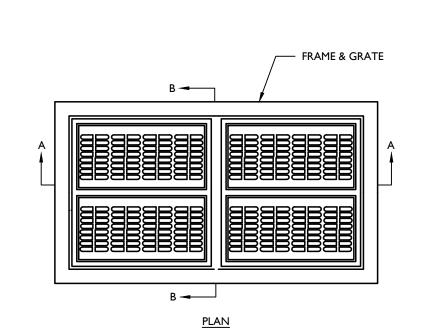
### **UTILITY SERVICE DETAILS**

FRAME AND GRATE

- INVERTS TO BE ELIMINATED IN BOTTOM OF TERMINAL INLETS, BOTTOMS SHALL BE DISHED AND SLOPED TOWARDS THE OUTLET PIPE AT A RATE OF GRADE OF 2 INCHES PER FOOT.
- 2. THIS INLET SHALL BE CONSTRUCTED OF PRECAST CONCRETE.
- 3. PROVIDE 7/8" DIA. X 7" X 12", 12" O.C. COPOLYMER POLYPROPYLENE PLASTIC STEPS WITH 1/2" DIA. GRADE 60 STEEL REINFORCEMENT, PS2-PF OR PS2-B WITH PRECAST PRESS FIT INSERTS, OR APPROVED EQUIVALENT.
- 4. INLET FRAME AND GRATES TO BE CAMPBELL FOUNDRY PATTERN # 2618 OR APPROVED EQUAL. 5. WHEN DEPTH IS GREATER THEN 12' THE WALLS SHOULD BE EITHER 8" THICK CONCRETE AND THE FOOTING
- SHALL BE EXTENDED TO 12" BEYOND THE OUTSIDE WALLS. 6. ALL CONCRETE TO BE NJDOT CLASS "B"
- 7. INLETS SHALL BE CONSTRUCTED IN ACCORDANCE WITH H-20 LOADING REQUIREMENTS.



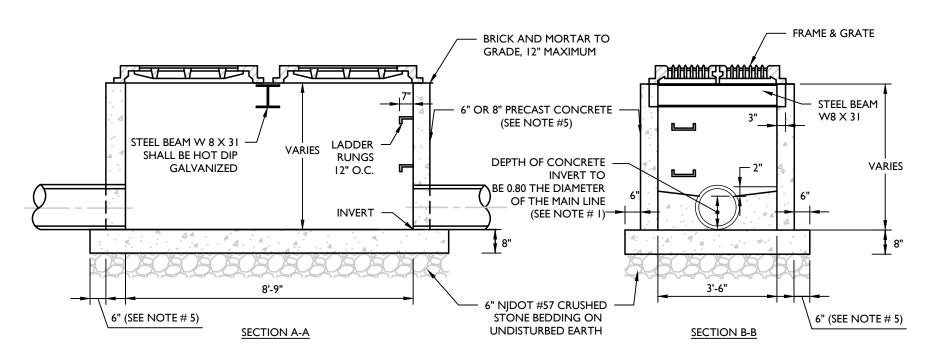
# TYPE 'E' INLET



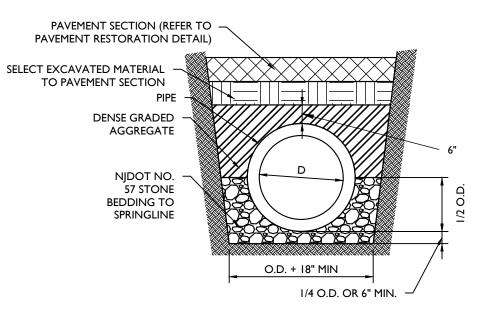
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<u>PLAN</u>

- I. INVERTS TO BE ELIMINATED IN BOTTOM OF TERMINAL INLETS. BOTTOMS SHALL BE DISHED AND SLOPED TOWARDS THE OUTLET PIPE AT A RATE OF GRADE OF 2 INCHES PER
- 2. THIS INLET SHALL BE CONSTRUCTED OF PRECAST CONCRETE.
- 3. PROVIDE 7/8" DIA. X 7" X 12", 12" O.C. COPOLYMER POLYPROPYLENE PLASTIC STEPS WITH 1/2" DIA. GRADE 60 STEEL REINFORCEMENT, PS2-PF OR PS2-B WITH PRECAST PRESS FIT INSERTS, OR APPROVED EQUIVALENT.
- 4. INLET FRAME AND GRATES TO BE CAMPBELL FOUNDRY PATTERN # 2618 OR APPROVED
- 5. WHEN DEPTH IS GREATER THAN 12' THE WALLS SHOULD BE EITHER 8" THICK CONCRETE AND THE FOOTING SHALL BE EXTENDED TO 12" BEYOND THE OUTSIDE WALLS.
- 6. ALL CONCRETE TO BE NJDOT CLASS "B".
- 7. INLETS SHALL BE CONSTRUCTED IN ACCORDANCE WITH H-20 LOADING REQUIREMENTS.



# TYPE DOUBLE 'E' INLET

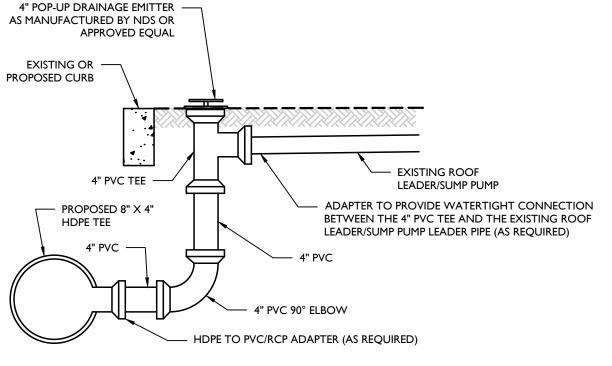


I. BACKFILL TO BE PLACED SO AS TO ENSURE SUFFICIENT COMPACTION

UNDER PIPE HAUNCHES. 2. THE PIPE OR UTILITY TRENCH TO BE BACKFILLED IN ACCORDANCE WITH THE SPECIFICATIONS FOR BACKFILLING. ENSURE THE WIDTH IS 36" MINIMUM OF THE OUTSIDE DIAMETER OF THE PIPE PLUS 18".

### HDPE & RCP PIPE BEDDING

N.T.S.



ROOF LEADER/SUMP PUMP CONNECTION DETAIL

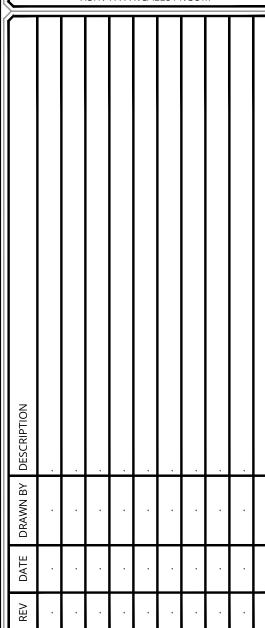
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CONSTRUCTION PLANS

**INFLOW AND INFILTRATION 2022** 

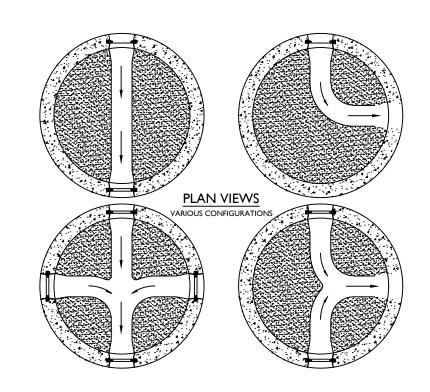
TOWNSHIP OF CRANFORD COUNTY OF UNION STATE OF NEW JERSEY

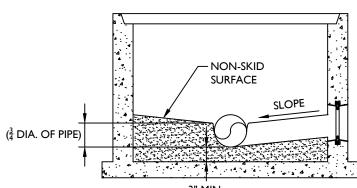
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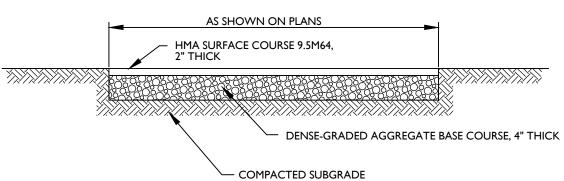


# NOTE:

I. THE INVERT SHALL BE PRECAST OR FORMED IN THE FIELD USING PRECISION FORMS TO CREATE A SMOOTH, ACCURATE CHANNEL THAT MINIMIZES TURBULENCE AND RESULTS IN OPTIMUM FLOW

### TYPICAL BENCHING CROSS SECTIONS

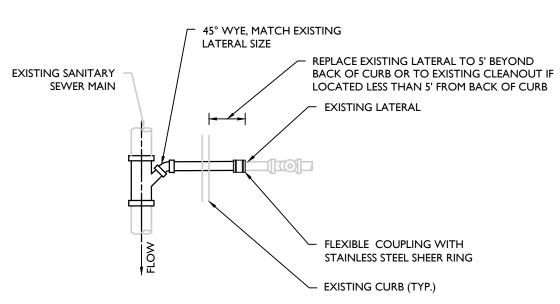
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NOTES:

I. THE CONTRACTOR SHALL REPAIR HOT MIX ASPHALT DRIVEWAYS AS DIRECTED BY THE ENGINEER. LIMITS OF DRIVEWAY REPAIR SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.

### HOT MIX ASPHALT DRIVEWAY, 2" THICK



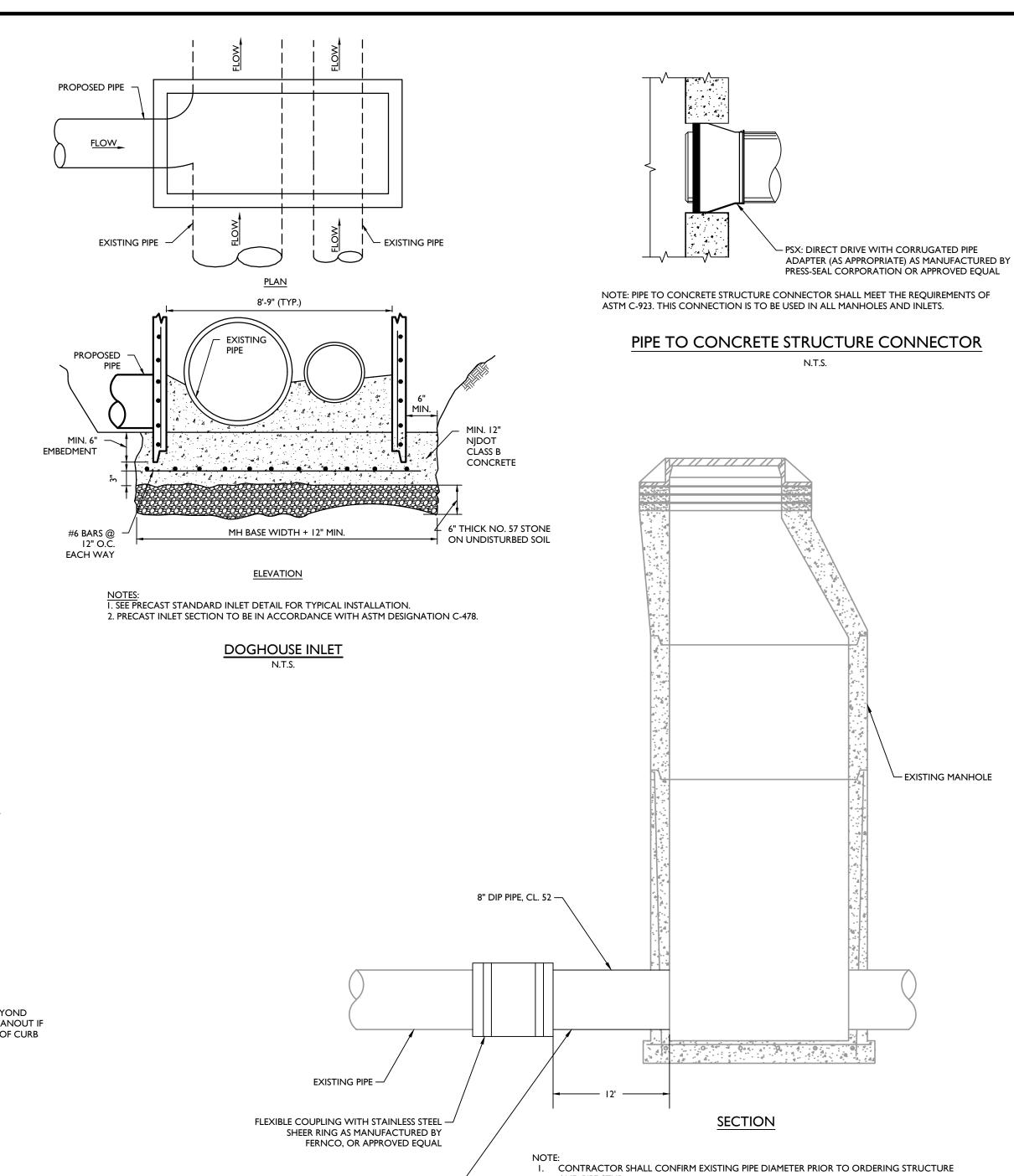
NOTES:

I. ALL COSTS ASSOCIATED WITH RECONNECTING EXISTING SANITARY SEWER LATERALS SHALL BE COVERED IN THE PAY ITEM "RECONNECT SANITARY SEWER LATERAL WITH NEW PIPE". THIS INCLUDES BUT IS NOT LIMITED TO TRENCHING, BEDDING, CUTTING OF PIPE, INSTALLING NEW PIPE, FLEXIBLE COUPLINGS, LANDSCAPE RESTORATION, INSTALLING PIPE

# RECONNECT SANITARY SEWER LATERAL WITH NEW PIPE DETAIL

BENDS / FITTINGS AS NECESSARY AND PAVEMENT RESTORATION.

EVV PIPE



PIPE BEDDING AS PER SANITARY SEWER —

TRENCH DETAIL

PROPOSED MANHOLE - CONNECTION TO EXISTING PIPE

### PAVEMENT - REFER TO PAVEMENT TRENCH WIDTH RESTORATION DETAIL OD + 36" IF THE CONTRACTOR **EXCAVATES TO OR** CAUSES THE TRENCH TO ASSUME A "V" SHAPE HE WILL DO SO AT HIS OWN EXPENSE 4" WIDE DETECTABLE WARNING TAPE IN COLOR GREEN OVER SEWER MAIN MARKED "BURIED SANITARY SEWER LINE BELOW" (DO NOT INCLUDE ON 16" STORM SEWER DIP) CONTROLLED LOW STRENGTH MATERIAL - NJDOT COARSE AGGREGATE NO. 57 PIPE (REFER TO PLAN)

### NOTES:

 PIPE SHALL BE CERAMIC EPOXY, PROTECTO 401, OR APPROVED EQUAL DUCTILE IRON PIPE (DIP), THICKNESS CLASS 52 WITH ASPHALTIC EXTERIOR COATING.
 ALL DIP PIPE SHALL BE POLYETHYLENE ENCASED, AS PER THE PROVISIONS OF ANSI/AWWA C105/A21.5

### DIP SANITARY SEWER TRENCH DETAIL

### GENERAL SANITARY SEWER MAIN TRENCH NOTES:

- I. ALL TRENCHES IN EXISTING PAVEMENT MUST BE SAWCUT.
- 2. WHERE NECESSARY, PARTICULARLY FOR SAFETY OR TO PREVENT DISTURBANCE, DAMAGE OR SETTLEMENT OF ADJACENT STRUCTURES, PIPELINES, UTILITIES, IMPROVEMENTS OR PAVING, EXCAVATION SHALL BE ADEQUATELY SHEETED AND
- 3. SHEETING AND BRACING OF ALL EXCAVATION SHALL COMPLY WITH NEW JERSEY CONSTRUCTION AND SAFETY CODES AND THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT.
- 4. WHERE SHEETING IS USED, IT MUST BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW JERSEY, SAID ENGINEER SHALL PROVIDE THE CONTRACTOR WITH A SIGNED AND SEALED CERTIFICATE STATING THAT THE DESIGN OF THE SHEETING AND BRACING CONFORMS TO ALL APPLICABLE REQUIREMENTS OF THE NEW JERSEY CONSTRUCTION SAFETY CODE AND THE OCCUPATIONAL HEALTH AND SAFETY ACT. COPIES OF THIS CERTIFICATE SHALL BE SUBMITTED TO THE ENGINEER.
- 5. THE CONTRACTOR SHALL COMPLY WITH OSHA STANDARDS FOR EXCAVATIONS (29 CFR PART 1926). AS SUCH, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A \*COMPETENT PERSON\* AS DEFINED IN THE OSHA STANDARDS AND AS REQUIRED BY THE STANDARDS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SELECTION, DESIGN, INSTALLATION, AND IMPLEMENTATION OF ALL "PROTECTIVE SYSTEMS" AS DEFINED IN THE OSHA STANDARDS. THE PIPELINE DESIGN BY THE OWNER OR THE ENGINEER DOES NOT INCLUDE THE DESIGN OF "PROTECTIVE SYSTEMS" SINCE THE DESIGN OF THE "PROTECTIVE SYSTEMS" IS THE RESPONSIBILITY OF THE CONTRACTOR.
- 6. THE CONTRACTOR MUST FOLLOW PROPOSED SHEETING PLANS SUBMITTED. NO DEVIATIONS MAY BE MADE FROM THE FILED PROCEDURE WITHOUT FIRST SUBMITTING A REVISED SHEETING AND BRACING PLAN, SIGNED AND CERTIFIED AS REQUIRED FOR THE ORIGINAL SUBMISSION, BY THE SAME LICENSED PROFESSIONAL ENGINEER WHO PREPARED THE ORIGINAL SUBMISSION.
- 7. ANY DAMAGE TO NEW OR EXISTING STRUCTURES OCCURRING THROUGH SETTLEMENT, WATER OR EARTH PRESSURE OR OTHER CAUSES DUE TO INADEQUATE BRACING OR THROUGH NEGLIGENCE OR FAULT OF THE CONTRACTOR IN ANY OTHER MANNER, SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
- 8. SEPARATE PAYMENT WILL NOT BE MADE FOR SAW CUTTING, EXCAVATION AND BACKFILL, REMOVAL OF EXISTING SANITARY SEWER ABANDONED UTILITIES, PIPE BEDDING, CONCRETE ENCASEMENT, DEWATERING, ABANDONMENT OF EXISTING SEWER UTILITIES OR REMOVAL IF REQUIRED, TRENCH PROTECTION, TEMPORARY SURFACE RESTORATION INCLUDING TEMPORARY PAVING, TRAFFIC STRIPES, CURB, DRIVEWAY, SIDEWALK, FENCE, LANDSCAPING, COUPLINGS, BYPASS PUMPING, SERVICE SADDLES, DETECTABLE WARNING TAPE OR TESTING. ALL COSTS TO BE INCLUDED IN THE VARIOUS ITEMS SCHEDULED IN THE PROPOSAL.

### SANITARY SEWER NOTES

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Carl P. O'Brien

NEW JERSEY LICENSED PROFESSIONAL ENGINEER LICENSE NUMBER: GE45154 COLLIERS ENGINEERING & DESIGN, INC. N.J. C.O.A. #: 24GA27986500

CONSTRUCTION PLANS

FOR
INFLOW AND
INFILTRATION 2022

TOWNSHIP OF CRANFORD COUNTY OF UNION STATE OF NEW JERSEY

**Colliers**Engineering & Design

Suite 304 Mt. Arlington, NJ 07856 Phone: 973.398.3110 COLLIERS ENGINEERING & DESIGN, IND DOING BUSINESS AS MASER CONSULTIN

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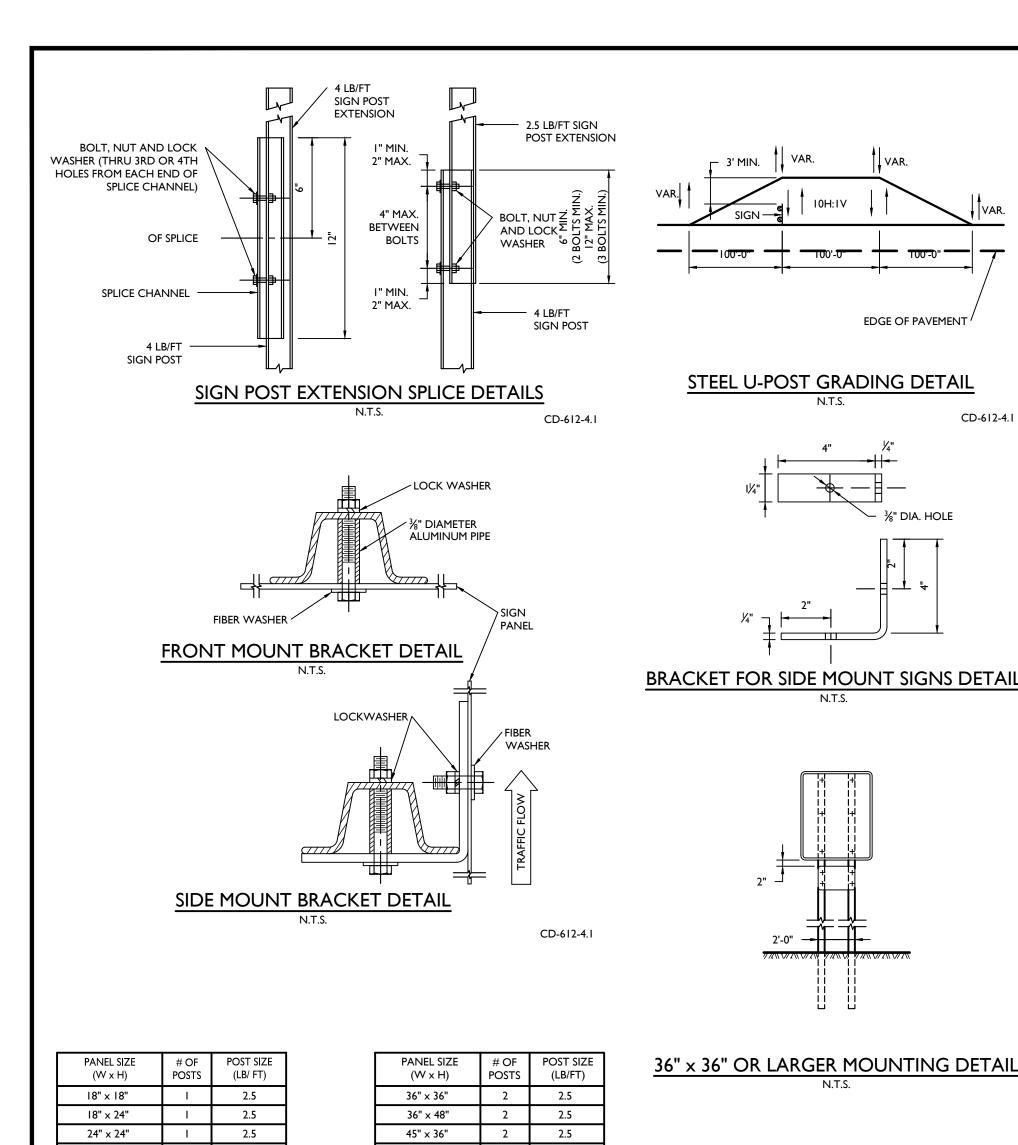
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TITLE:

CONSTRUCTION DETAILS

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NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



### $24" \times 30"$ 48" × 24" 2.5 2.5 48" x 36" 24" x 36" 2.5 2 2.5 48" × 48" $30" \times 24"$ 4.0 30" × 30" 2.5 48" x 64" x 64" 2 2.5 36" x 12" 60" x 36" 2 4.0 2.5 36" x 36" x 36" $48" \times 60"$ 4.0 30" x 36" 2 4.0 U-POST SELECTION TABLE

# SIGN POST NOTES:

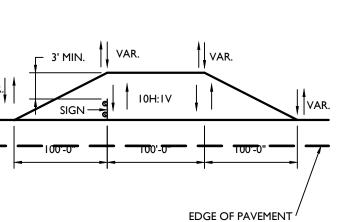
ALL POSTS SHALL BE OF ADEQUATE LENGTH TO MEET THE REQUIREMENTS FOR ERECTION AS STATED IN THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND AS INDICATED BELOW.

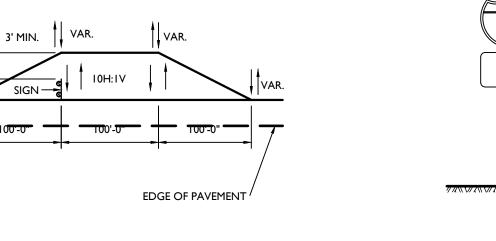
CD-612-4.1

- ALL SMALL SIGN SUPPORTS SHALL BE OF THE BREAKAWAY TYPE WITH EXCEPTION OF THOSE INSTALLED BEHIND GUIDE RAIL OR OTHER ROADSIDE BARRIER
- ALL STEEL POSTS AND BRACKETS SHALL BE CUT, BENT, AND HOLES PUNCHED AND DRILLED BEFORE GALVANIZING. GALVINIZING SHALL BE IN CONFORMANCE WITH ASTM A123.
- 4. ALL STEEL U-POST SIGN SUPPORTS MUST BE INSTALLED FACING THE PREDOMINANT TRAFFIC FLOW. A MOUNTING BRACKET SHOULD BE USED ON SIDE MOUNTED SIGNS SUCH AS "ONE WAY" SIGNS INSTALLED IN MEDIANS.
- SIGN PANEL SIZES SHALL DETERMINE POST TYPE AND NUMBER AS SHOWN ON THIS DETAIL.
- 6. BOLTS SHALL NOT PROTRUDE MORE THAN ¾" BEYOND THE NUT WHEN TIGHT, BUT SHALL ENGAGE ALL THREADS IN THE NUT.
- WHEN SIGNS ARE INSTALLED ON SLOPES 10H:1V OR FLATTER, THE MINIMUM VERTICAL CLEARANCE REQUIREMENTS FOR SIGNS ARE: FOR SINGLE POST INSTALLATIONS - THE MINIMUM DISTANCE BETWEEN THE EDGE OF THE PAVEMENT AND THE BOTTOM OF ANY PANEL MUST BE 7 FEET, AND THE MINIMUM DISTANCE FROM EDGE OF PAVEMENT TO THE TOP OF ANY SIGN PANEL MUST BE 9 FEET.
- FOR MULTI-POST INSTALLATIONS THE MINIMUM DISTANCE BETWEEN THE EDGE OF PAVEMENT AND THE BOTTOM OF A MAJOR

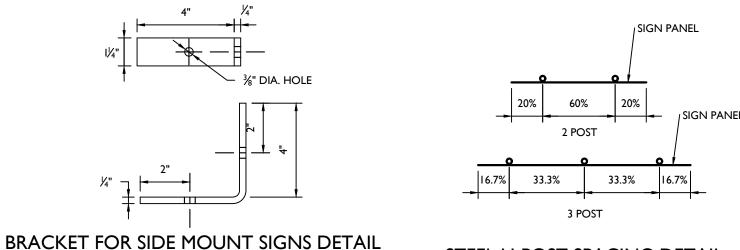
SECONDARY SIGN PANELS (LAND SERVICE HIGHWAYS) - THE MINIMUM DISTANCE BETWEEN THE EDGE OF PAVEMENT AND THE

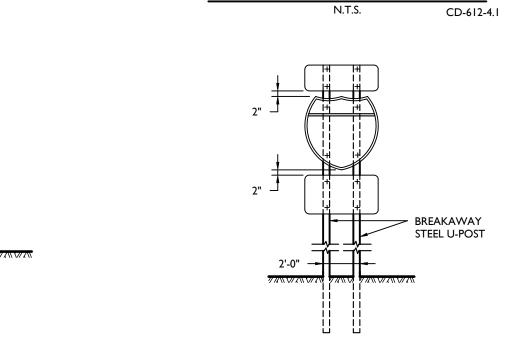
- BOTTOM OF A SECONDARY SIGN PANEL IS 6 FEET. SECONDARY SIGN PANELS (INTERSTATE AND FREEWAYS) - THE BOTTOM OF THE MAJOR SIGN SHALL BE A MINIMUM OF 8 FEET AND
- THE SECONDARY SIGN PANEL A MINIMUM OF 5 FEET ABOVE THE EDGE OF PAVEMENT.
- WHERE GRADING OF 10H: IV OR FLATTER CANNOT BE OBTAINED, OR WHERE CURB OR BERM IS GREATER THAN 4 INCHES, THE MINIMUM VERTICAL CLEARANCE WILL BE MEASURED FROM THE GROUND LINE TO THE BOTTOM OF THE SIGN.
- THE HORIZONTAL OFFSET FROM EDGE OF PAVEMENT TO EDGE OF SIGN IS DERIVED FROM SECTION 2A.19 OF THE MUTCD AS FOLLOWS:
- FOR URBAN INSTALLATION IN AREAS WHERE LATERAL OFFSETS ARE LIMITED, A MINIMUM LATERAL OFFSET OF 2 FEET IS DESIRABLE. A MINIMUM OFFSET OF I FOOT FROM THE FACE OF THE CURB MAY BE USED IN AREAS WHERE THE SIDEWALK WIDTH IS LIMITED OR
- FOR RURAL INSTALLATION 6 FEET MINIMUM DESIRABLE FROM EDGE OR SHOULDER, BUT 12 FEET MINIMUM DESIRABLE FROM EDGE OF TRAFFIC OR AUXILIARY LANE.
- FOR INTERSTATE AND FREEWAY INSTALLATION 6 FEET MINIMUM DESIRABLE FROM EDGE OF SHOULDER, BUT NOT LESS THAN 12
- FEET FROM THE EDGE OF TRAFFIC OR AUXILIARY LANE. FOR RAMP INSTALLATIONS - 6 FEET MINIMUM FROM EDGE OF ROAD.
- WHERE BEHIND GUIDE RAIL 4 FEET MINIMUM FROM BACK OF BEAM GUIDE RAIL ELEMENT TO SIGN POST.
- PERMANENT SIGN SUPPORTS SHOULD NOT BE INSTALLED ON SLOPES GREATER THAN 10H:1V, EXCEPT WHERE GRADING OF 10H:1V CANNOT BE OBTAINED OR THE SIGN SUPPORTS WILL BE BEHIND A TRAFFIC BARRIER.
- 10. EXTRUDED ALUMINUM SIGN PANELS ARE NOT PERMITTED FOR USE WITH STEEL U-POST SIGN SUPPORTS.
- 11. STEEL U-POST SIGN SUPPORTS SHALL NOT BE PLACED IN FRONT OF GUIDE RAIL AND THE POSTS MUST NOT STRADDLE GUIDE RAIL.
- 12. TO EXTEND THE HEIGHT OF A SIGN POST, A MAXIMUM OF ONE SPLICE MAY BE MADE AND MUST BE A MINIMUM OF 9 FEET FROM THE GROUND LINE TO CENTER LINE OF SPLICE.
- THE NEW JERSEY DEPARTMENT OF TRANSPORTATION "STANDARD ROADWAY CONSTRUCTION/TRAFFIC CONTROL/BRIDGE CONSTRUCTION DETAILS" BOOKLET DATED (2016) AND "ELECTRICAL BUREAU STANDARD DETAILS" (2007) TO GOVERN, EXCEPT FOR THOSE DETAILS CONTAINED HEREIN.





STEEL U-POST GRADING DETAIL 24" x 24" SHIELD MOUNTING DETAIL CD-612-4.1 CD-612-4.1





30" x 30" OR SMALLER MOUNTING DETAIL

36" x 36" OR LARGER MOUNTING DETAIL

 $30" \times 30"$  OR SMALLER MOUNTING DETAIL

CD-612-4.1

CD-612-4.1

CD-612-4.1

 BREAKAWAY STEEL U-POST

BREAKAWAY

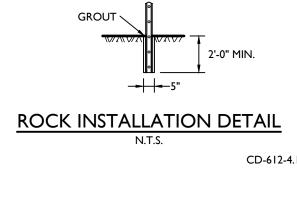
STEEL U-POST

STEEL U-POST SPACING DETAIL

36" x 36" SHIELD MOUNTING DETAIL

BREAKAWAY

STEEL U-POST



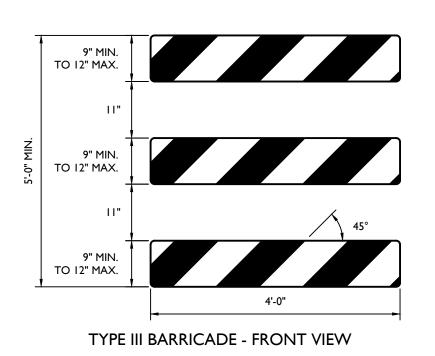
# 4" TOLERANCE -½"

CONCRETE INSTALLATION DETAIL

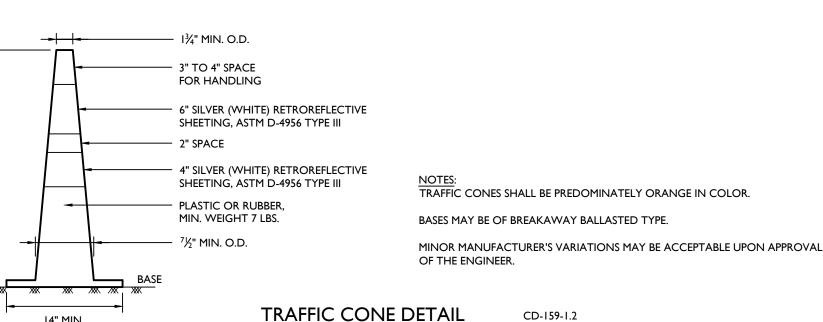
CD-612-4.1 SYSTEM BECOMING OPERATIONAL

### THE 9" MIN. X 48", OR 12" MAX. X 48" BARRICADE RAILS SHALL BE FABRICATED FROM 0.125" MAX. PLASTIC SHEETING AND SHALL BE ATTACHED, 4 PER RAIL, WITH I INCH NO. 14 PAN HEAD METAL SCREWS OR PLASTIC RIVETS. ALL CORNERS SHALL BE ROUNDED.

- ORANGE AND SILVER (WHITE) STRIPES SHALL BE RETROREFLECTIVE SHEETING, ASTM D 4956 TYPE III. AS SHOWN FOR CONSTRUCTION SIGNS, ALTERNATE ORANGE AND SILVER (WHITE) STRIPES 6" WIDE SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS
- 3. IF NECESSARY, THE SANDBAGS SHALL BE FABRICATED AND PLACED ACCORDING TO THE MANUFACTURE'S
- 4. THE FRAMING FOR BARRICADE PANELS SHALL BE NCHRP-350 CRASHED TESTED AND FHWA APPROVED.



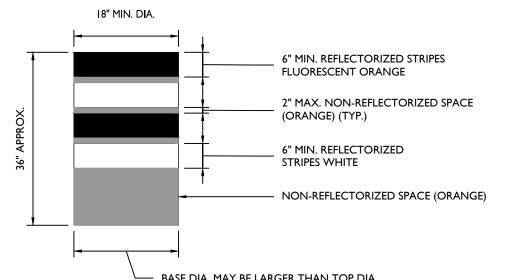
## BREAKAWAY BARRICADES



DRUMS SHALL BE MADE OF ORANGE PLASTIC WITH A MINIMUM OF FOUR ALTERNATE FLUORESCENT ORANGE AND WHITE RETROREFLECTIVE STRIPES. IF THERE ARE NON-REFLECTORIZED SPACES BETWEEN THE STRIPES, THEY SHALL BE NO MORE THAN 2" WIDE. RETROREFLECTIVE SHEETING FOR STRIPES SHALL CONFORM WITH ASTM D 4956 TYPE VII OR VIII WITH S2 REQUIREMENTS.

THE TOP OF THE DRUM SHALL NOT BE OPEN. DRUMS SHALL BE CONSTRUCTED TO INHIBIT ROLLING IF KNOCKED OVER.

THE REFLECTORIZED AREA OF DRUMS SHALL BE ROUND EXCEPT THAT OTHER SHAPES, WHICH PROVIDE THE SAME VISIBILITY AS AN 18 INCH DIAMETER ROUND DRUM REGARDLESS OF ORIENTATION, MAY BE USED.



BASE DIA. MAY BE LARGER THAN TOP DIA. WHEN BALLAST IS REQUIRED BY THE ENGINEER, SAND SHALL BE USED. THE MAXIMUM WEIGHT OF THE BALLAST SHALL BE 50 LBS. AND BE

LOCATED APPROXIMATELY AT GROUND LEVEL. ALTERNATE TYPES OF BALLAST SHALL BE APPROVED BY THE ENGINEER.

CD-159-1.1

### SOIL EROSION AND SEDIMENT CONTROL NOTES

- ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCES, 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 NI STATE STANDARDS
- 3. PERMANENT VEGETATION SHALL BE SEEDED 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 NJ 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 OR 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 NI STATE STANDARDS.
- 7. ANY STEEP SLOPES RECEIVING PIPELINE INSTALLATION WILL BE BACKFILLED AND STABILIZED DAILY, AS THE INSTALLATION PROCEEDS (I.E.: SLOPES GREATER THAT 3:1)

### NOT IN PROJECT.

- 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 A 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 OF PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED.
- II. IN THAT NISA 4:24-39 ET SEO., REOUIRES 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
- NOT IN PROJECT.
- 14. THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED OF ANY CHANGES IN OWNERSHIP.
- 15. MULCHING TO THE NJ STANDARDS IS REQUIRED FOR OBTAINING A CONDITIONAL REPORT OF COMPLIANCE. CONDITIONALS ARE ONLY ISSUED WHEN THE SEASON PROHIBITS SEEDING.
- 16. CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL ADJACENT ROADS CLEAN DURING LIFE OF CONSTRUCTION
- 17. THE CONTRACTOR 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. NOT IN PROJECT

# SIGN FACES:

CD-159-1.3

I. SIGN FACES SHALL BE ASTM D 4956 TYPE VII OR VIII FLUORESCENT ORANGE SHEETING.

6. WOOD POSTS TO BE USED ONLY ON TEMPORARY SIGN SUPPORT.

### **FASTENING:**

SIGN NOTES:

2. (S) REPRESENTS A SPECIAL SIZE SIGN.

**BACKING MATERIAL** 

BARRICADES.

DIMENSIONS FOR:

SINGLE POST =  $4" \times 6"$ 

TEMPORARY SIGN SUPPORTS:

TWO POSTS =  $3" \times 6"$  OR  $4" \times 5"$ 

THREE POSTS =  $3" \times 5"$  OR  $4" \times 4"$ 

BARRIER OR CRASH CUSHIONS.

ACCORDANCE WITH THE SPECIFICATIONS.

I. ALL SIGNS SHALL BE SECURELY FASTENED TO THEIR SUPPORTS WITH BOLTS, NUTS AND WASHERS IN

DIMENSIONS, COLORS AND DETAILS OF VARIOUS SIZE SIGNS, AND ACCESSORY PANELS TO FOLLOW

3. LETTERS AND NUMERALS SHALL CONFORM TO THE CURRENT MANUAL, "STANDARD ALPHABETS FOR

THE ADVANCE WARNING SIGNS, AND FOR THE SPEED LIMIT TO BE USED ON THE R2-I SIGN.

HIGHWAY SIGNS" U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

THE CONTRACTOR SHALL OBTAIN THE APPROVAL OF THE ENGINEER FOR THE DISTANCE TO BE USED ON

A. 0.10" THICK FOR ALL CONSTRUCTION SIGNS EXCEPT SIGNS SHOWN MOUNTED ON BREAKAWAY

B. 0.024" THICK FOR ALL CONSTRUCTION SIGNS SHOWN MOUNTED ON BREAKAWAY BARRICADES.

I. SIGN SUPPORTS SHALL BE OF WELL SEASONED LUMBER, S4S, FREE OF SPLITS, KNOTS AND WARPS, OR OF

NO BRACING IS PERMITTED. VERTICAL CLEARANCES FOR SIGNS MOUNTED ON WOOD SUPPORTS SHALL

BE 7 FOOT MINIMUM. EMBEDMENT DEPTH FOR THE WOOD POST SHALL NOT EXCEED 3.5 FEET

4. STEEL POSTS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAIL FOR U-POST SIGN SUPPORT.

TEMPORARY SIGN SUPPORTS NOT MEETING THIS CRITERIA SHALL BE SHIELDED BY A LONGITUDINAL

2. WOOD POSTS SHALL HAVE A UNIFORM CROSS-SECTION AND SHALL NOT EXCEED THE FOLLOWING

ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".

5. DISTANCE LEGEND: SIGN NUMBER FOLLOWED BY LETTER & DISTANCE

MILES AHEAD

ALUMINUM SHALL BE FLAT SHEET OF ALLOY AND TEMPER 5052-H38 OR 6061-T6:

1000'

STANDARDS IN THE CURRENT "STANDARD HIGHWAY SIGN PUBLICATION" AND THE CURRENT "MANUAL

CD-159-6.1

### MAINTENANCE AND PROTECTION OF TRAFFIC NOTES:

- ALL DEVICES AND PROCEDURES FOR THE MAINTENANCE AND PROTECTION OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" FOR STREETS AND HIGHWAYS. THE CONTRACTOR SHALL PLAN AND CARRY OUT HIS WORK TO PROVIDE FOR THE CONVENIENT AND SAFE PASSAGE OF ALL VEHICULAR AND PEDESTRIAN TRAFFIC.
- 2. CONTRACTOR TO DEVELOP DETAILED MAINTENANCE AND PROTECTION OF TRAFFIC PLAN FOR REVIEW BY THE ENGINEER PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL FOLLOW THE RECOMMENDED TRAFFIC CONTROL PROCEDURES. IF TH CONTRACTOR DESIRES TO CHANGE THE PROCEDURE, HE SHALL PRESENT HIS CHANGES IN WRITING TO THE ENGINEER FOR REVIEW AND APPROVAL. THERE MAY BE UTILITY RELOCATIONS, ADJUSTMENTS AND IMPROVEMENTS WHICH ARE NECESSITATED BY THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH EACH OF THE UTILITY COMPANIES LOCATED WITHIN THE
- 4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING MAINTENANCE AND PROTECTION OF TRAFFIC THROUGHOUT THE DURATION OF CONSTRUCTION. THE COSTS FOR THE INDIVIDUAL DEVICES USED TO MAINTAIN AND PROTECT TRAFFIC SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THE SPECIFIC TRAFFIC CONTROL DEVICES IN THE PROPOSAL. NO ADDITIONAL PAYMENT WILL BE MADE FOR RELOCATING THE DEVICES AS REQUIRED, OR AS DIRECTED BY THE ENGINEER, DURING THE COURSE OF
- THE CONTRACTOR WILL NOT BE PERMITTED TO CLOSE DOWN THE ENTIRE STREET. THE CONTRACTOR SHALL PROVIDE MEANS OF ACCESS AT ALL TIMES FOR PEDESTRIANS AND VEHICULAR TRAFFIC AT ALL PRIVATE DRIVEWAYS AND OCCUPIED BUILDINGS AFFECTED BY THE WORK OF THIS CONTRACT. DURING CONSTRUCTION, IN THE VICINITY OF A DRIVEWAY, THE ACCESS WIDTH AT THE DRIVEWAY ENTRANCE SHALL BE PLAINLY MARKED BY LIGHTS, BARRICADES OR OTHER SUCH DEVICES APPROVED BY THE
- 6. DURING CONSTRUCTION, ALL ROADS SHALL BE PROPERLY MAINTAINED TO ACCOMMODATE EMERGENCY VEHICLES AT ALL TIMES.
- 7. ALL BARRICADES SHALL BE TYPE III BREAKAWAY BARRICADES.
- FILL MATERIAL FOR ESCAPE RAMPS SHALL BE ON-SITE MATERIAL. ALL COSTS FOR STORING, PLACING, MOVING, AND REMOVING FILLET MATERIAL SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS

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CONSTRUCTION PLANS

INFLOW AND **INFILTRATION 2022** 

TOWNSHIP OF CRANFORD COUNTY OF UNION STATE OF NEW JERSEY

MT. ARLINGTON Colliers Suite 304 Mt. Arlington, NJ 07856 Engineering Phone: 973.398.3110 & Design COLLIERS ENGINEERING & DESIGN, IN DOING BUSINESS AS MASER CONSUL

CDT0078

**CONSTRUCTION DETAILS** 

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.