

# PLANS FOR 2017 CAPITAL ROAD IMPROVEMENTS

## HIGHLANDS BOROUGH MONMOUTH COUNTY, NEW JERSEY

### UTILITY OWNERS

**GAS**  
NJ NATURAL GAS  
1415 WYCKOFF ROAD  
WALL, NJ 07719  
ATTN: RODNEY AU, PROJECT ENGINEER  
(732) 938-1179

**ELECTRIC**  
JERSEY CENTRAL POWER & LIGHT  
331 NEWMAN SPRINGS ROAD-- BLDG 3  
RED BANK, NJ 07701  
ATTN: WILLIAM UELLNER  
(732) 212-4246

**WATER**  
NJ AMERICAN WATER  
661 SHREWSBURY AVENUE  
SHREWSBURY, NJ 07702  
ATTN: JOE PAVLEK  
(800) 987-5325

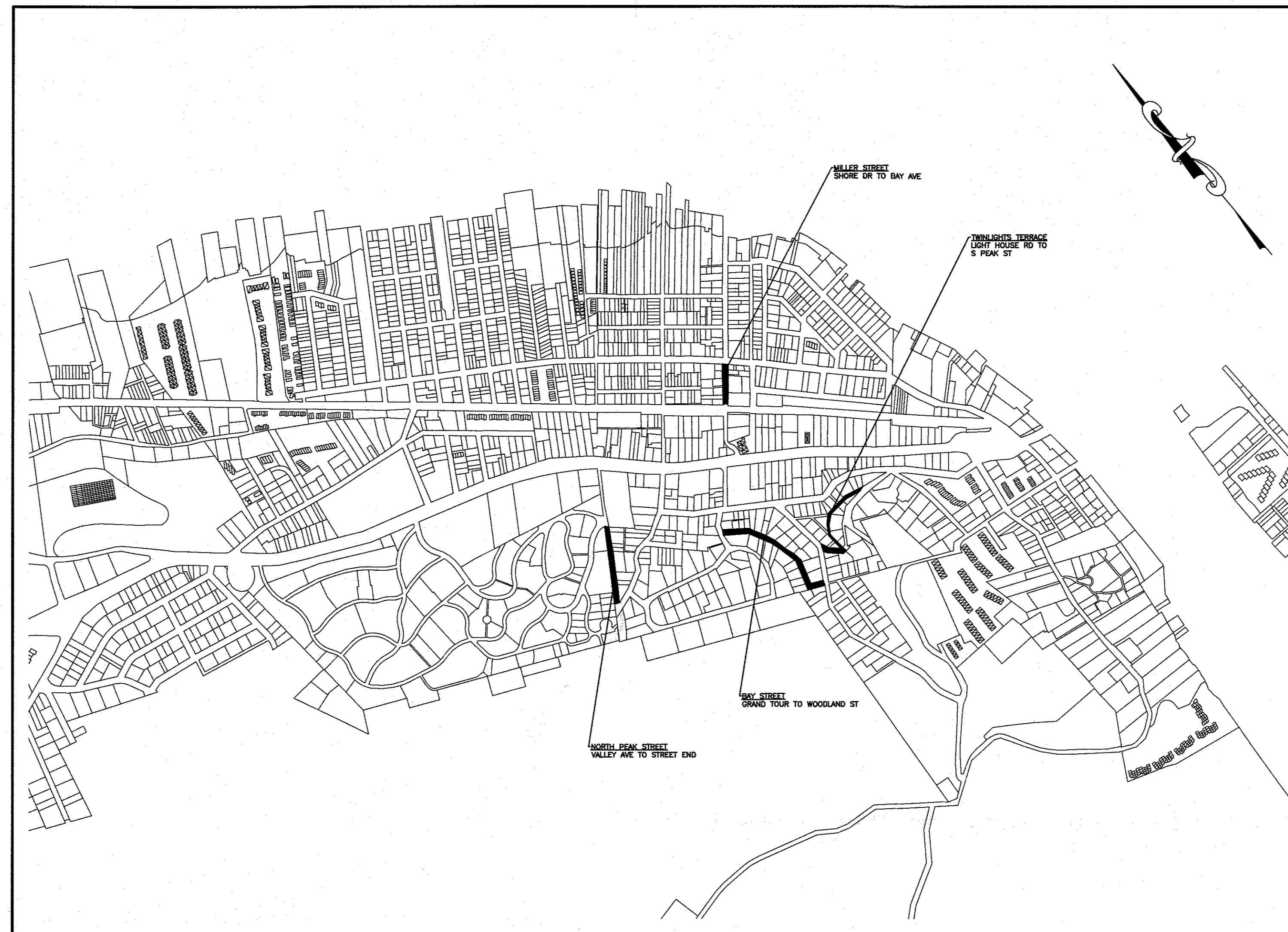
**TELEPHONE**  
VERIZON COMMUNICATIONS  
145 WEST MAIN STREET, FLR. 1  
FREEHOLD, NJ 07728  
ATTN: GREG WECKHERLEN  
(732) 751-8742

**CABLE**  
COMCAST CABLE CO.  
571 BRICK BLVD.  
BRICK, NJ 08723  
ATTN: LAWRENCE FARY  
(732) 380-7145

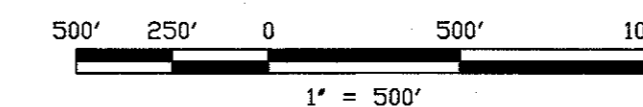
**SEWER**  
BOROUGH OF HIGHLANDS  
DEPARTMENT OF PUBLIC WORKS  
42 SHORE DRIVE  
HIGHLANDS, NJ 07732  
ATTN: MARK PHILPOT, CPWM

LOCATION OF UTILITIES SHOWN ON THESE PLANS ARE NOT WARRANTED AS TO EXACTNESS. CONTRACTOR SHALL DETERMINE EXACT LOCATION AND DEPTH OF UTILITIES PRIOR TO CONSTRUCTION IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND OTHER APPLICABLE LAWS.

PRIOR TO DIGGING CALL 1-800-272-1000



KEY MAP



### SHEET LIST TABLE

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3	CONSTRUCTION PLAN
TWIN LIGHTS TERRACE	
4	EXISTING CONDITIONS
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6	GRADING PLAN
7	PROFILE
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9	CONSTRUCTION PLAN
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14	GRADING PLAN STA. 10+00 - 15+75
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CONSTRUCTION DETAILS	
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**ROBERT R. KEADY, P.E., C.M.E.**  
HIGHLANDS BOROUGH ENGINEER



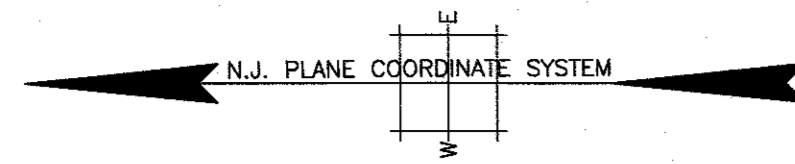
11 TINDALL ROAD  
MIDDLETOWN, NJ 07748  
TEL 732-671-8400  
FAX 732-671-7365

NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS  
AND LAND SURVEYORS  
CERTIFICATE OF AUTHORIZATION 2462/2987600

PROJECT INFORMATION:  
FILE PATH: G:\Projects\HIGHL\0703\Plans\  
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DATE PLOTTED: 10 Aug 2017, 3:25PM  
LAST SAVE BY: ADR001

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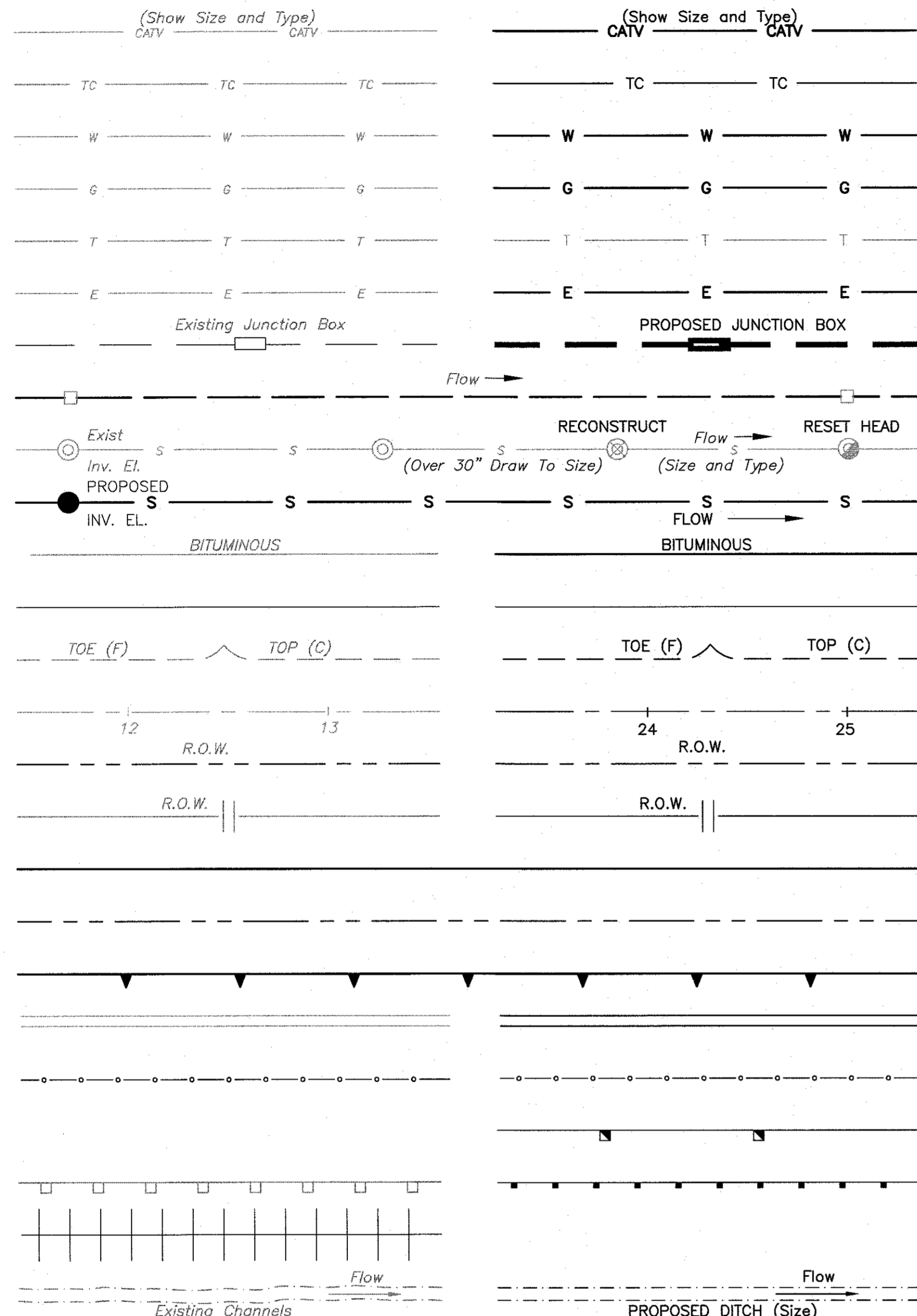
**STANDARD LEGEND**



NORTH ARROW

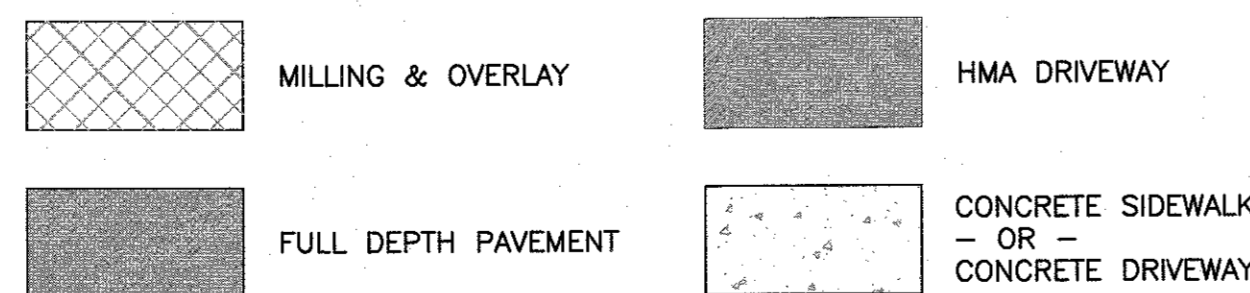
**EXISTING**

**PROPOSED**



- Exist
- Existing Monument
- Sign
- Exist. Light
- WV--Water Gate Valve
- Pole No. & Type (Guy, Light, Etc.)
- GV--Gas Gate Valve
- Hydrant
- Traffic Light
- Traffic Control Box
- Exist R.C. End Section Or C.M. Headwall
- Bush or Brush
- Deciduous Trees (size, kind)
- Wooded Area
- PROPOSED
- RESET EXISTING CASTING (TYPE AS SPECIFIED)
- NEW INLET CASTING (TYPE AS SPECIFIED)
- RECONSTRUCT
- INLETS CONVERTED TO MANHOLE
- NEW MONUMENT
- PROPOSED R.C. END SECT. OR C.M. HEADWALL
- PROPOSED HEADWALL & APRON
- PROPOSED HEADWALL
- TREE TO BE REMOVED (T.B.R.)
- PROPOSED UTILITY POLE
- BORING TEST LOCATION

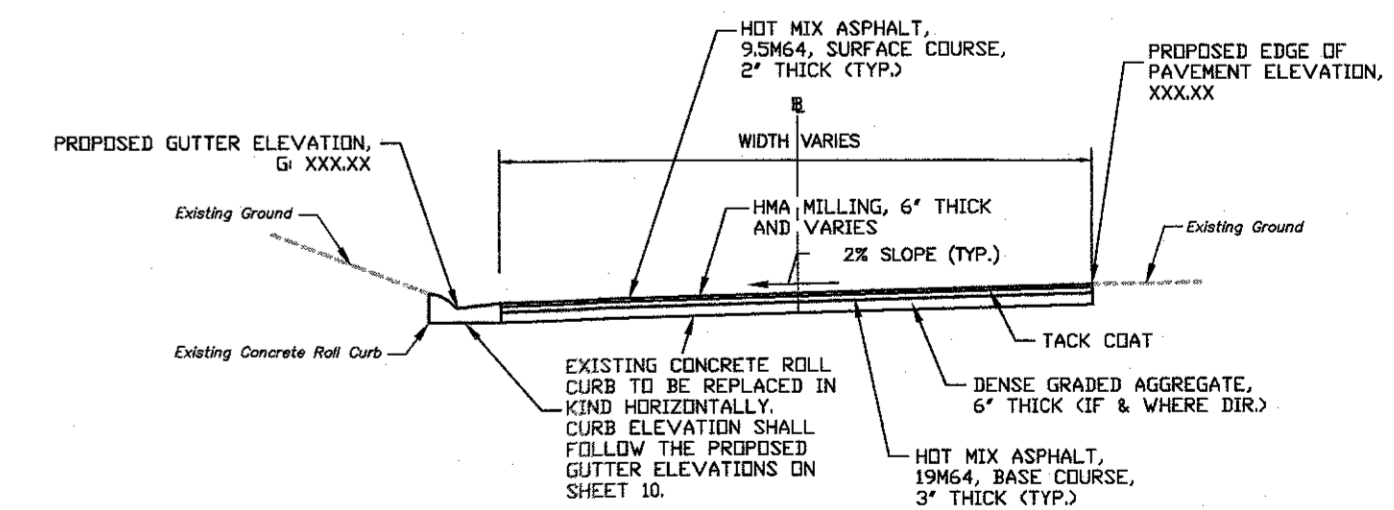
**HATCH PATTERNS**



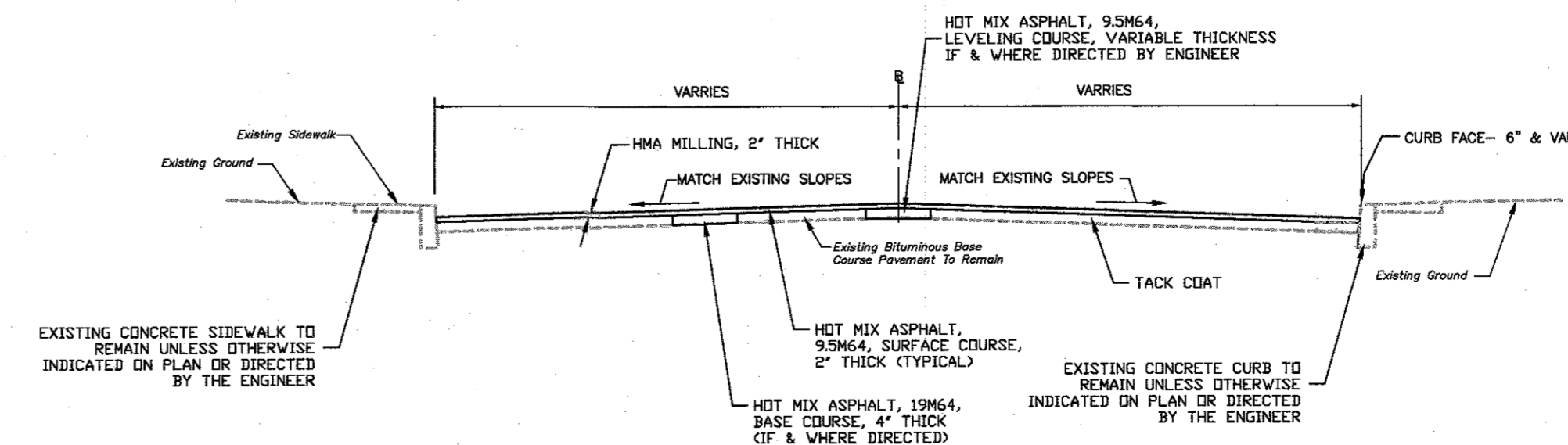
**GENERAL NOTES**

- HORIZONTAL DATUM IS IN THE NEW JERSEY PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM 1983.
- ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM, 1988. NGVD 1929 = NAVD 1988 + 1.08'
- ALL DIMENSIONS, UNITS, ETC. ARE IN THE U.S. CUSTOMARY SYSTEM.
- THE CONTRACTOR SHALL PROTECT ALL SURVEY CONTROL POINT MARKS FROM DAMAGE AND SHALL ESTABLISH OFFSET POINTS AS REQUIRED FOR ITS WORK.
- LOCATIONS OF EXISTING AND PROPOSED UTILITIES ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ALL UTILITY LOCATIONS IN THE FIELD PRIOR TO EXCAVATION.
- ALL SOIL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO GROUND DISTURBANCE.
- DEPRESSED CURBS AT HANDICAPPED RAMPS/CROSSWALKS SHALL BE FLUSH WITH THE PAVEMENT SURFACE. DEPRESSED CURBS AT DRIVEWAYS SHALL HAVE A 1 1/2" CURB FACE.
- ALL TRAFFIC CONTROL DEVICES SHALL CONFORM WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- ONLY PAY ITEMS LISTED IN THE PROPOSAL ARE APPLICABLE TO THIS PROJECT. PAY ITEMS NOT IN THE PROPOSAL WILL NOT BE USED.
- WHERE CONCRETE CURB IS BEING REPLACED, CONTRACTOR SHALL SURVEY EXISTING TOP OF CURB ELEVATIONS. CUT SHEETS FOR PROPOSED TOP OF CURB ELEVATIONS MAY BE REQUIRED AS DIRECTED BY THE ENGINEER FOR REVIEW AT LEAST 2 WEEKS PRIOR TO CONSTRUCTION. THE INTENT IS TO MAINTAIN EXISTING TOP OF CURB ELEVATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER. ALL COSTS SHALL BE INCLUDED IN THE COSTS OF THE VARIOUS ITEMS LISTED IN THE BID PROPOSAL.
- THE CONTRACTOR IS ADVISED THAT THE QUANTITIES SHOWN ON THE PLANS ARE ONLY APPROXIMATE AND THE OWNER RESERVES THE RIGHT TO OMIT, INCREASE OR DECREASE THE QUANTITIES. PAYMENT WILL BE MADE FOR THE ACTUAL AMOUNT OF WORK PERFORMED UNDER EACH ITEM AS MEASURED IN THE FIELD BY THE ENGINEER.
- NO CONSTRUCTION ACTIVITY IS TO TAKE PLACE OUTSIDE THE LIMIT OF DISTURBANCE UNLESS DIRECTED BY THE ENGINEER. THE LIMIT OF DISTURBANCE IS WITHIN 2' OF THE LIMIT OF CONSTRUCTION.
- AT THE END OF EACH WORKDAY, THE CONTRACTOR SHALL CLEAN AND REMOVE ALL CONSTRUCTION DEBRIS FROM ROADWAYS AND MAINTAIN SAFE ACCESS TO ALL HOMES AND BUSINESSES FOR PEDESTRIANS AND VEHICLES.
- EXISTING UTILITY INFORMATION SHOWN HEREON HAS BEEN COLLECTED FROM VARIOUS SOURCES AND IS NOT GUARANTEED AS TO ACCURACY OR COMPLETENESS. THE CONTRACTOR SHALL CONTACT THE SAFE DIG HOTLINE (1-800-272-1000) AND VERIFY ALL INFORMATION TO HIS SATISFACTION PRIOR TO ANY EXCAVATION. WHERE EXISTING UTILITIES ARE TO BE CROSSED BY PROPOSED CONSTRUCTION, TEST PITS SHALL BE DUG BY THE CONTRACTOR TO ASCERTAIN EXISTING INVERTS, MATERIALS AND SIZES. TEST PIT INFORMATION SHALL BE GIVEN TO THE ENGINEER PRIOR TO THE ORDERING OF DRAINAGE PIPE AND STRUCTURES TO PERMIT ADJUSTMENTS AS MAY BE REQUIRED TO AVOID UTILITY CONFLICTS.
- DENSE GRADED AGGREGATE BASE COURSE SHALL BE INSTALLED AS DIRECTED BY ENGINEER.
- IF APPLICABLE, CONTRACTOR SHALL, AT LIMIT OF PAVING, MILL 6" WIDE KEY 1 1/2" AVERAGE DEPTH OR SAWCUT EXISTING PAVEMENT FOR NEAT STRAIGHT LINE UNLESS OTHERWISE DIRECTED. CONTRACTOR SHALL PAY CLOSE ATTENTION TO DETAIL 'END TREATMENT FOR MILLING OPERATIONS' ON DRAWING CSD-1, IF APPLICABLE. ALL KEYWAYS SHALL HAVE A SAWCUT, VERTICAL EDGE. MEET EXISTING GRADE AT OUTER LIMIT OF MILLING.
- THE HMA MILLING, 2" DEPTH OPERATION SHOWN ON THE PLANS SHALL BE PAID FOR UNDER THE BID ITEM "MILLING, 2" VARIABLE DEPTH".
- TACK COAT SHALL BE IN ACCORDANCE WITH SECTION 401.03.02.
- CONTRACTOR SHALL CLEAN AND SWEEP AND TACK THE PAVEMENT IMMEDIATELY PRIOR TO OVERLAY.
- INSTALLATION OF HOT MIX ASPHALT SURFACE COURSE SHALL NOT BE PERMITTED UNTIL THE BASE COURSE IS APPROVED BY THE ENGINEER. THE ENGINEER MAY DIRECT THE CONTRACTOR TO MAKE CORRECTIVE MEASURES, INCLUDING LEVELING, TO THE BASE COURSE PRIOR TO THE INSTALLATION OF THE SURFACE COURSE. ALL COSTS TO BE PAID UNDER BID ITEMS "HOT MIX ASPHALT 19M64 BASE COURSE, 4" THICK," & "HOT MIX ASPHALT 9.5M64 LEVELING COURSE, VARIABLE THICKNESS (IF & WHERE DIRECTED)
- JOINTS RESULTING FROM THE PAVING OPERATIONS SHALL BE TREATED WITH AN APPLICATION OF POLYMERIZED JOINT ADHESIVE IN ACCORDANCE WITH THE NJDOT STANDARD SPECIFICATIONS.
- CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE PATTERNS WHEN RECONSTRUCTING OR OVERLAYING UNLESS OTHERWISE DIRECTED BY THE ENGINEER. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY QUESTIONABLE DRAINAGE AREAS SO THAT FIELD ADJUSTMENTS CAN BE MADE TO ELIMINATE PONDING.
- THE EDGES OF THE HOT MIX ASPHALT BASE COURSE SHALL BE PARALLEL TO THE ROADWAY CENTERLINE AND RECTANGULAR IN SHAPE. ALL EDGES SHALL BE VERTICAL.
- THE LIMIT OF EXCAVATION AND HOT MIX ASPHALT BASE COURSE AT PAVEMENT RECONSTRUCTION AREAS MAY VARY AS DIRECTED BY ENGINEER IN FIELD.
- CONTRACTOR IS RESPONSIBLE FOR SUPPORTING UTILITY POLES AS RECOMMENDED BY THE UTILITY COMPANY WHEN EXCAVATING FOR DRAINAGE PIPE OR STRUCTURES. NO ADDITIONAL PAYMENT SHALL BE MADE.
- THE CONTRACTOR SHALL VERIFY AND DOCUMENT THE LOCATION OF ALL EXISTING TRAFFIC LINES AND MARKINGS AND SHALL REPLACE ALL TRAFFIC STRIPING IN KIND UPON COMPLETION OF THE PAVING, OR AS DIRECTED BY THE ENGINEER.
- LOCATIONS OF GAS AND WATER VALVES SHOWN ARE APPROXIMATE. THERE MAY BE MORE THAN SHOWN ON CONSTRUCTION PLANS. CONTRACTOR IS RESPONSIBLE FOR RESETTING ALL VALVE CASTINGS, REGARDLESS OF WHAT IS SHOWN ON PLANS. INCLUDE COSTS IN VARIOUS ITEMS IN THE BID PROPOSAL.
- RESTORE TURF AREAS WITH 4" THICK BORROW TOPSOILING, FERTILIZING & SEEDING, TYPE 'G,' & STRAW MULCHING.
- THE TOPSOIL USED FOR THIS PROJECT SHALL BE IN STRICT CONFORMANCE TO THE PROJECT SPECIFICATIONS. ANY TOPSOIL NOT MEETING THE REQUIREMENTS OF THE SPECIFICATIONS SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL SUBMIT SEED BAG TICKETS TO THE ENGINEER FOR APPROVAL PRIOR TO PLACING SEED.
- CONTRACTOR SHALL ESTABLISH A FULL STAND OF GRASS WITH NO BARE PATCHES, CRABGRASS OR WEEDS.
- HOT MIX ASPHALT TO BE INSTALLED IN CURB TRENCHES WITHIN 72 HOURS OF CURB INSTALLATION.
- HOT MIX ASPHALT TO BE INSTALLED IN ALL OPEN TRENCHES, EXCEPT CURB, AT THE END OF EACH WORKING DAY. NO ADDITIONAL PAYMENT WILL BE MADE.
- THE CONTRACTOR WILL BE RESPONSIBLE TO APPLY FOR AND OBTAIN ANY AND ALL COUNTY AND STATE ROAD OPENING PERMITS.
- CONTRACTOR IS ADVISED THAT THERE IS GAS MAIN, WATER MAIN, AND UTILITY SERVICE REPLACEMENTS ANTICIPATED FOR BAY STREET AND TWINLIGHTS TERRACE. ALL WORK IS SCHEDULED TO BE COMPLETED PRIOR TO ROADWAY CONSTRUCTION. CONTRACTOR SHALL COORDINATE HIS WORK WITH NEW JERSEY AMERICAN WATER COMPANY AND NEW JERSEY NATURAL GAS COMPANY.

PROJECT INFORMATION: C:\Projects\10763\10763.dwg  
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 LAST MODIFIED: 7/10/2017 2:28PM  
 LAST SAVED DATE AND TIME: 7/10/2017 2:28PM  
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**NORTH PEAK STREET TYPICAL SECTION**



**MILLER STREET TYPICAL SECTION**

NO.	DATE	REVISIONS	BY	CHKD

08/16/2017  
 LICENSED PROFESSIONAL ENGINEER  
 STATE OF NJ LICENSE NO. 2468419100  
**ROBERT R. KEADY, P.E., C.M.E.**  
 HIGHLANDS BOROUGH ENGINEER

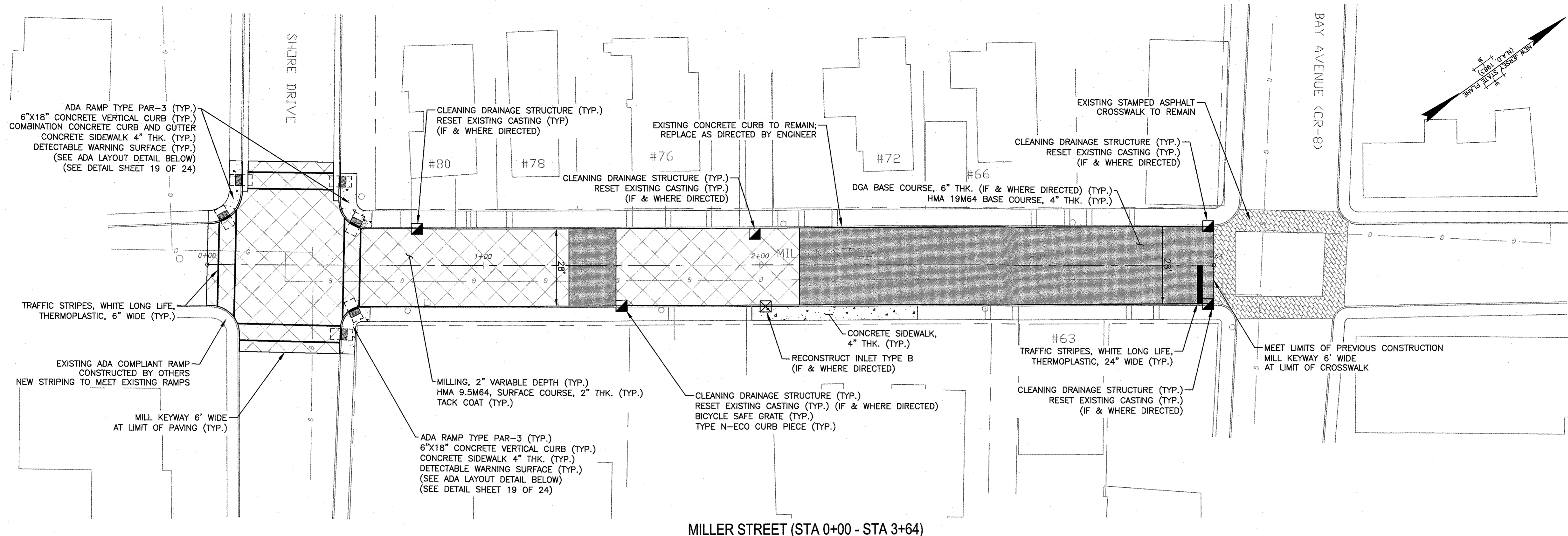
BOROUGH OF HIGHLANDS  
**2017 CAPITAL ROAD IMPROVEMENTS**  
 HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY  
**LEGEND AND GENERAL NOTES**

**AND**  
 YOUR GOALS. OUR MISSION.

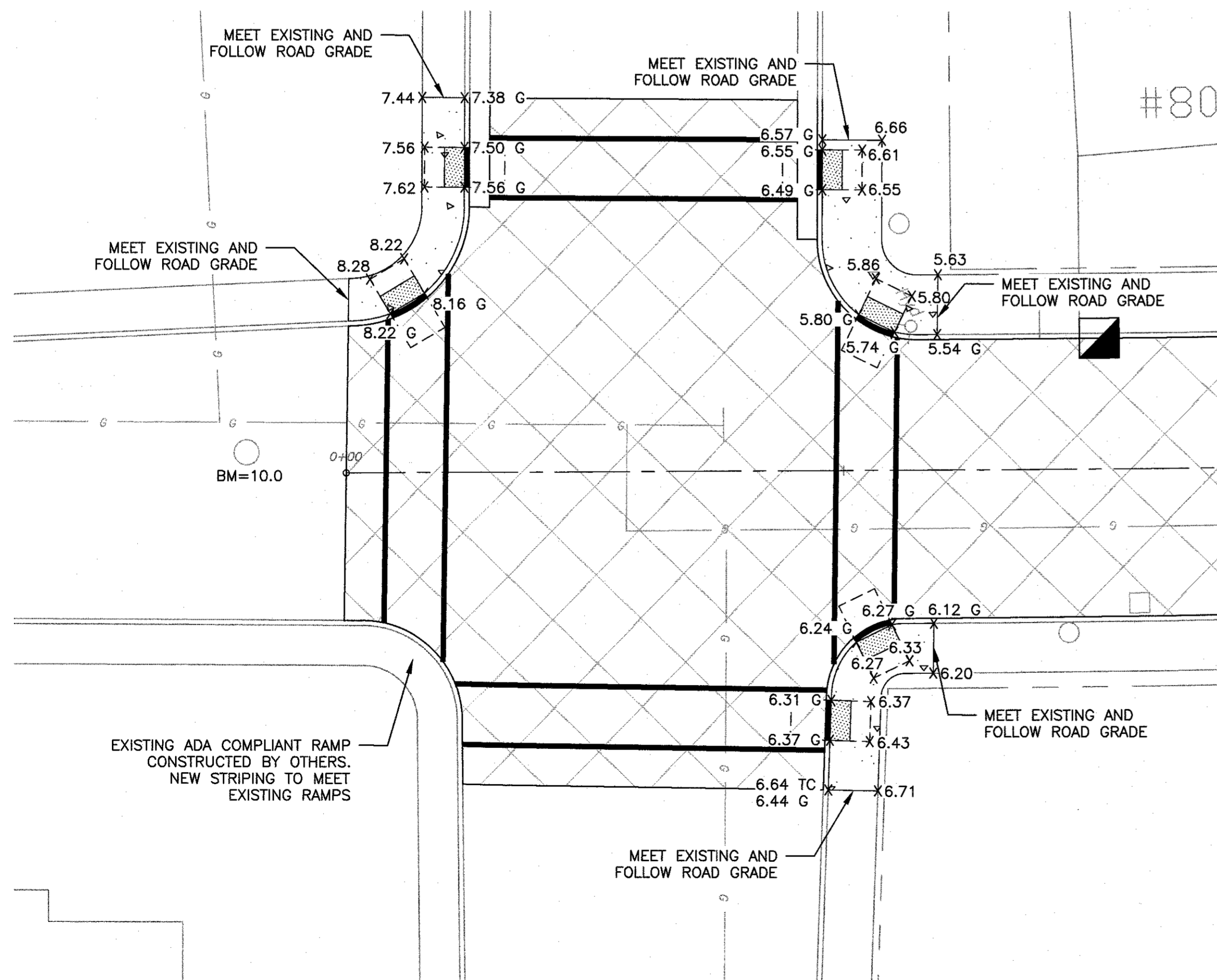
11 TINDALL ROAD  
 MIDDLETOWN, NJ 07748  
 TEL 732-671-6400  
 FAX 732-671-7365

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 AND LAND SURVEYORS  
 CERTIFICATE OF AUTHORIZATION 265A27897500  
 OFFICES LOCATED IN:  
 DELAWARE, INDIANA, KENTUCKY,  
 MASSACHUSETTS, MICHIGAN, NEW JERSEY,  
 OHIO AND PENNSYLVANIA

DESIGNED BY	DMD	DRAWING	LEG-1
CHECKED BY	RRK	SHEET	2
DRAWN BY	AWD	OF	24
DATE	7-10-2017		
SCALE	AS SHOWN		
PROJ. NO.	HGHL-10763		



MILLER STREET (STA 0+00 - STA 3+64)



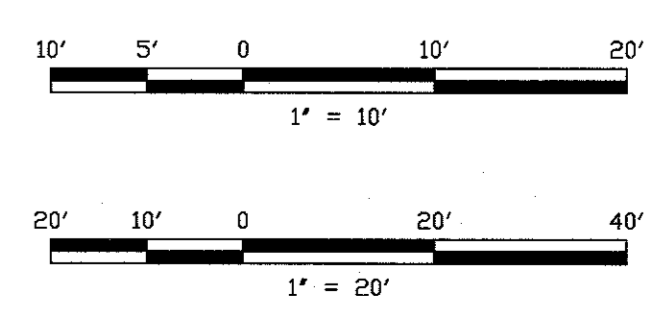
ADA LAYOUT: 1" = 10'

**CONSTRUCT ITEMS:**

865	SY	MILLING, 2" VARIABLE DEPTH
605	SY	MILLING, 6" VARIABLE DEPTH
305	SY	DGA BASE COURSE, 6" THK., (IF & WHERE DIRECTED)
265	TON	HOT MIX ASPHALT 19M64 BASE COURSE, 4" THK., (IF & WHERE DIRECTED)
50	TON	HOT MIX ASPHALT 9.5 M64, LEVELING COURSE, VARIABLE THICKNESS (IF & WHERE DIRECTED)
180	TON	HOT MIX ASPHALT 9.5M64 SURFACE COURSE, 2" THK.
165	GAL	TACK COAT
6	UN	CLEAN DRAINAGE STRUCTURE
1	UN	RECONSTRUCT INLET, TYPE B (IF & WHERE DIRECTED)
2	UN	BICYCLE SAFE GRATE
2	UN	TYPE N-ECO CURB PIECE
5	UN	RESET EXISTING CASTING (IF & WHERE DIRECTED)
190	LF	6"x18" CONCRETE CURB (IF & WHERE DIRECTED)
30	LF	COMBINATION CONCRETE CURB AND GUTTER
80	SY	CONCRETE SIDEWALK, 4" THK.
110	LF	TRAFFIC STRIPES, LONG LIFE EPOXY RESIN, 4" WIDE
305	LF	TRAFFIC STRIPES, WHITE LONG LIFE, THERMOPLASTIC, 6" WIDE
55	LF	TRAFFIC STRIPES, WHITE LONG LIFE, THERMOPLASTIC, 24" WIDE
6	SY	DETECTABLE WARNING SURFACE

**CONSTRUCTION NOTES:**

1. CONTRACTOR SHALL TAKE CARE TO ENSURE POSITIVE FLOW TOWARDS ALL INLETS
2. LIMITS OF CONCRETE CURB AND SIDEWALK REPLACEMENT TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
3. BASELINE INFORMATION PROVIDED IS FOR REFERENCE ONLY.
4. APPROXIMATE LIMIT OF MILLING/PAVING SHALL MEET THE EXISTING PAVEMENT USING A MILLING LINE ACROSS THE EXISTING PAVEMENT TO ALIGN WITH THE PREVIOUS CONSTRUCTION.
5. THESE PLANS ARE SCHEMATIC, DO NOT SCALE FROM DRAWING. THE CONTRACTOR IS ADVISED TO MEASURE ACTUAL ROADWAY DIMENSIONS IN FIELD.
6. CONTRACTOR SHALL BE RESPONSIBLE TO LOCATE AND RECORD ALL TRAFFIC STRIPING PRIOR TO CONSTRUCTION AND REPLACE ALL TRAFFIC STRIPING IN-KIND, UNLESS OTHERWISE SPECIFIED.
7. ACTUAL LIMITS OF HMA BASE REPAIRS TO BE DETERMINED IN THE FIELD BY THE ENGINEER AFTER MILLING.
8. ALL EXISTING UTILITIES SHALL BE VERIFIED IN THE FIELD.



PROJECT INFORMATION:  
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08/16/2017  
 LICENSED PROFESSIONAL ENGINEER  
 STATE OF NJ LICENSE NO. 24864185100

ROBERT R. KEADY, P.E., C.M.E.  
 HIGHLANDS BOROUGH ENGINEER

BOROUGH OF HIGHLANDS  
 2017 CAPITAL ROAD IMPROVEMENTS  
 HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY  
 MILLER STREET  
 CONSTRUCTION PLAN

11 TINDALL ROAD  
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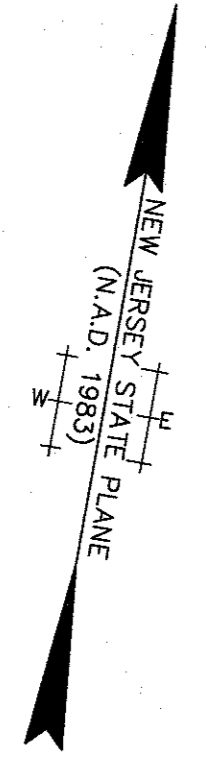
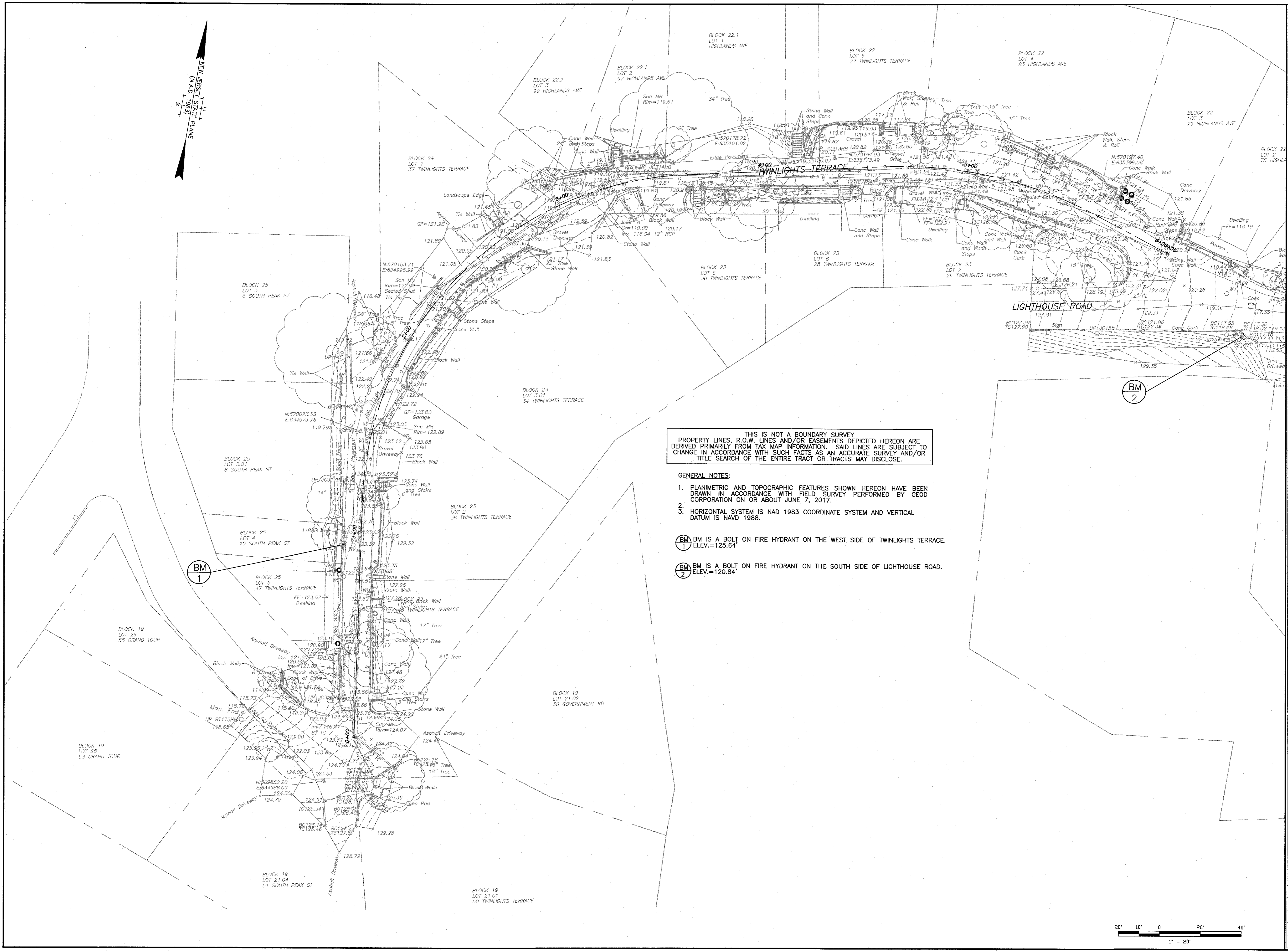
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 CERTIFICATE OF AUTHORIZATION #6427587500

OFFICES LOCATED IN:  
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 MASSACHUSETTS, MICHIGAN, NEW JERSEY,  
 OHIO AND PENNSYLVANIA

DESIGNED BY	DMD	DRAWING	CSP-1
CHECKED BY	RRK	SHEET	3
DRAWN BY	JLS	OF	24
DATE	06-21-2017	PROJ. NO.	HGL-10763
SCALE	AS SHOWN		

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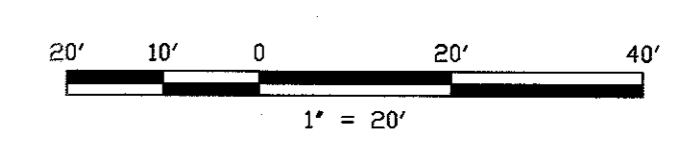


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 TITLE SEARCH OF THE ENTIRE TRACT OR TRACTS MAY DISCLOSE.

GENERAL NOTES:

1. PLANIMETRIC AND TOPOGRAPHIC FEATURES SHOWN HEREON HAVE BEEN DRAWN IN ACCORDANCE WITH FIELD SURVEY PERFORMED BY GEO D CORPORATION ON OR ABOUT JUNE 7, 2017.
2. HORIZONTAL SYSTEM IS NAD 1983 COORDINATE SYSTEM AND VERTICAL DATUM IS NAVD 1988.

- BM 1 BM IS A BOLT ON FIRE HYDRANT ON THE WEST SIDE OF TWINLIGHTS TERRACE. ELEV.=125.64'
- BM 2 BM IS A BOLT ON FIRE HYDRANT ON THE SOUTH SIDE OF LIGHTHOUSE ROAD. ELEV.=120.84'



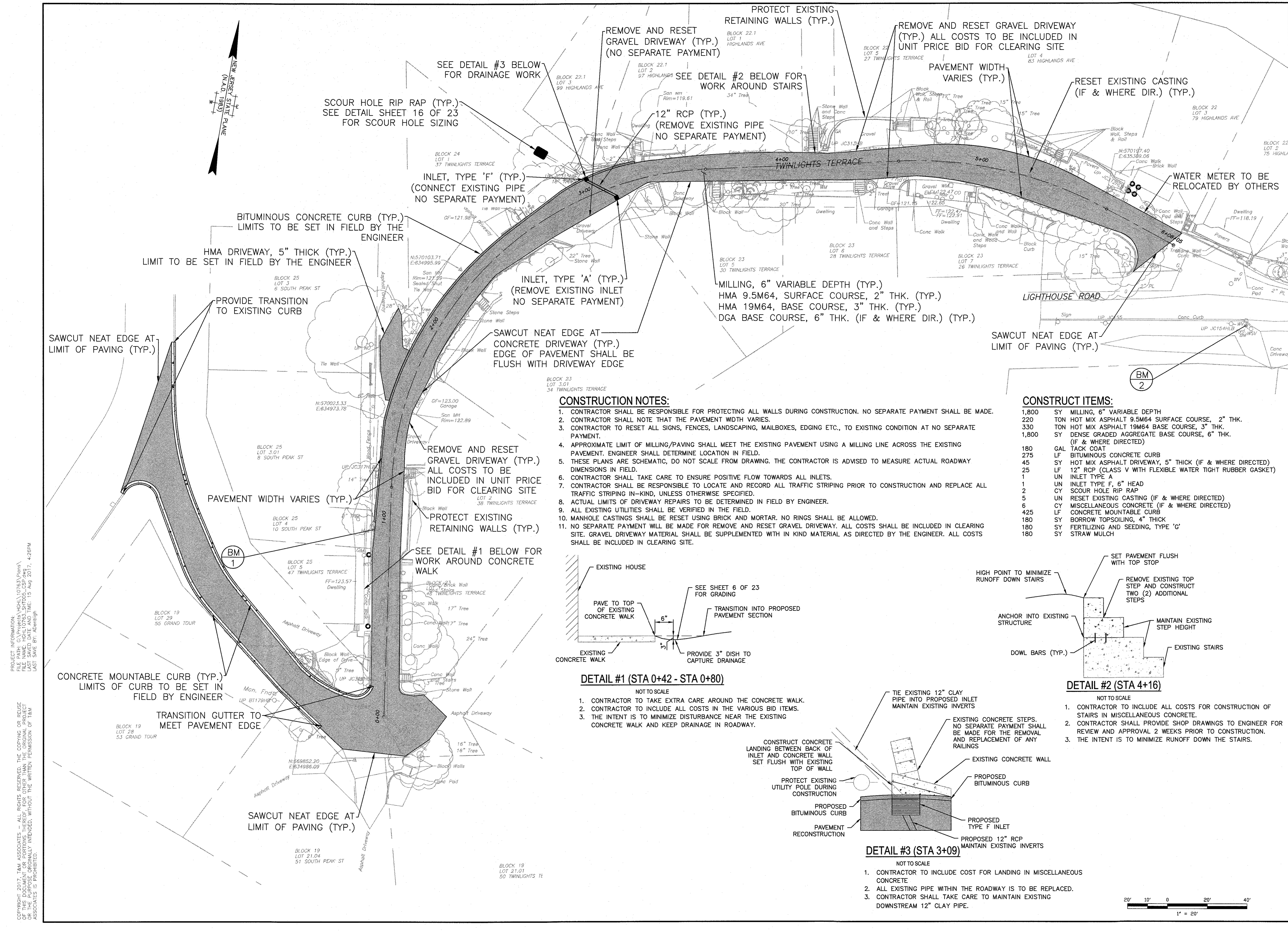
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08/16/2017  
 T&M ASSOCIATES  
 STATE OF NJ LICENSE NO. E-000145100  
**ROBERT R. KEADY, P.E., C.M.E.**  
 HIGHLANDS BOROUGH ENGINEER

BOROUGH OF HIGHLANDS  
**2017 CAPITAL ROAD IMPROVEMENTS**  
 HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY  
**TWIN LIGHTS TERRACE**  
**EXISTING CONDITIONS**

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 OHIO AND PENNSYLVANIA

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CHECKED BY	RRK	SHEET	4
DRAWN BY	AWD	DATE	7-10-2017
SCALE	AS SHOWN	PROJ. NO.	HGH-10763
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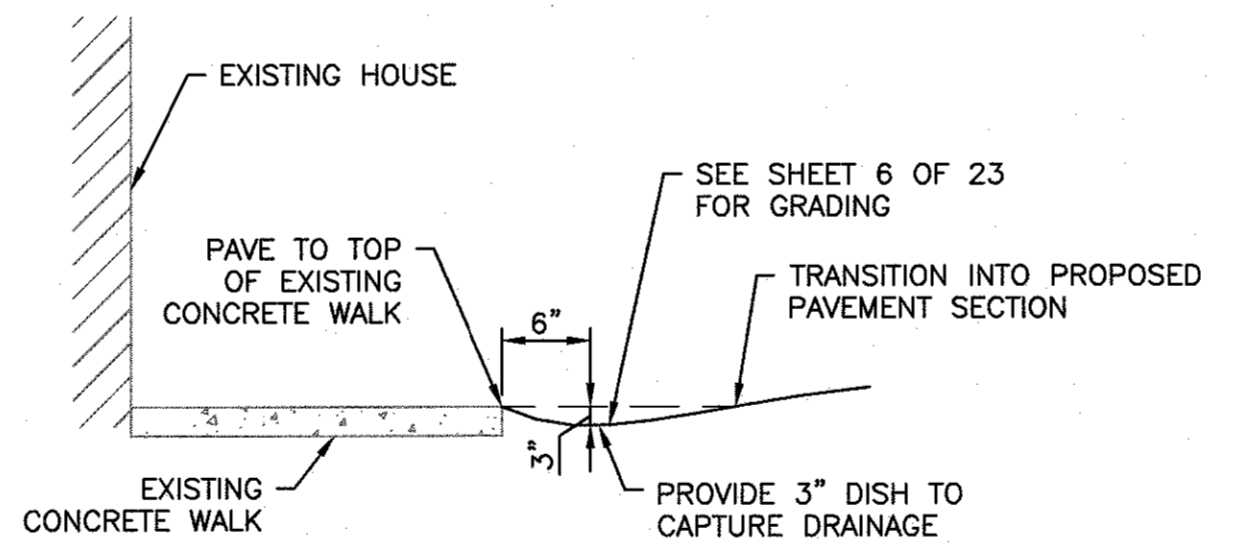
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**CONSTRUCTION NOTES:**

- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL WALLS DURING CONSTRUCTION. NO SEPARATE PAYMENT SHALL BE MADE.
- CONTRACTOR SHALL NOTE THAT THE PAVEMENT WIDTH VARIES.
- CONTRACTOR TO RESET ALL SIGNS, FENCES, LANDSCAPING, MAILBOXES, EDGING ETC., TO EXISTING CONDITION AT NO SEPARATE PAYMENT.
- APPROXIMATE LIMIT OF MILLING/PAVING SHALL MEET THE EXISTING PAVEMENT USING A MILLING LINE ACROSS THE EXISTING PAVEMENT. ENGINEER SHALL DETERMINE LOCATION IN FIELD.
- THESE PLANS ARE SCHEMATIC, DO NOT SCALE FROM DRAWING. THE CONTRACTOR IS ADVISED TO MEASURE ACTUAL ROADWAY DIMENSIONS IN FIELD.
- CONTRACTOR SHALL TAKE CARE TO ENSURE POSITIVE FLOW TOWARDS ALL INLETS.
- CONTRACTOR SHALL BE RESPONSIBLE TO LOCATE AND RECORD ALL TRAFFIC STRIPING PRIOR TO CONSTRUCTION AND REPLACE ALL TRAFFIC STRIPING IN-KIND, UNLESS OTHERWISE SPECIFIED.
- ACTUAL LIMITS OF DRIVEWAY REPAIRS TO BE DETERMINED IN FIELD BY ENGINEER.
- ALL EXISTING UTILITIES SHALL BE VERIFIED IN THE FIELD.
- MANHOLE CASTINGS SHALL BE RESET USING BRICK AND MORTAR. NO RINGS SHALL BE ALLOWED.
- NO SEPARATE PAYMENT WILL BE MADE FOR REMOVE AND RESET GRAVEL DRIVEWAY. ALL COSTS SHALL BE INCLUDED IN CLEARING SITE. GRAVEL DRIVEWAY MATERIAL SHALL BE SUPPLEMENTED WITH IN KIND MATERIAL AS DIRECTED BY THE ENGINEER. ALL COSTS SHALL BE INCLUDED IN CLEARING SITE.

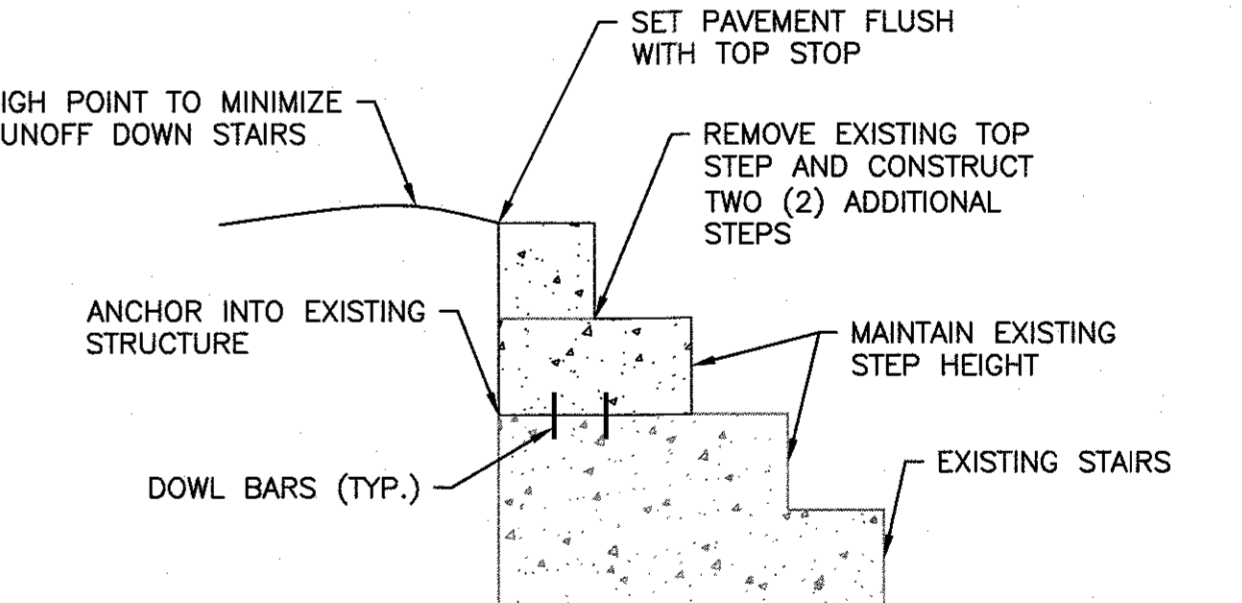
**CONSTRUCT ITEMS:**

1,800	SY	MILLING, 6" VARIABLE DEPTH
220	TON	HOT MIX ASPHALT 9.5M64 SURFACE COURSE, 2" THK.
330	TON	HOT MIX ASPHALT 19M64 BASE COURSE, 3" THK.
1,800	SY	DENSE GRADED AGGREGATE BASE COURSE, 6" THK. (IF & WHERE DIRECTED)
180	GAL	TACK COAT
275	LF	BITUMINOUS CONCRETE CURB
45	SY	HOT MIX ASPHALT DRIVEWAY, 5" THICK (IF & WHERE DIRECTED)
25	LF	12" RCP (CLASS V WITH FLEXIBLE WATER TIGHT RUBBER GASKET)
1	UN	INLET TYPE A
1	UN	INLET TYPE F, 6" HEAD
2	CY	SCOUR HOLE RIP RAP
5	UN	RESET EXISTING CASTING (IF & WHERE DIRECTED)
6	CY	MISCELLANEOUS CONCRETE (IF & WHERE DIRECTED)
425	LF	CONCRETE MOUNTABLE CURB
180	SY	BORROW TOPSOILING, 4" THICK
180	SY	FERTILIZING AND SEEDING, TYPE 'c'
180	SY	STRAW MULCH



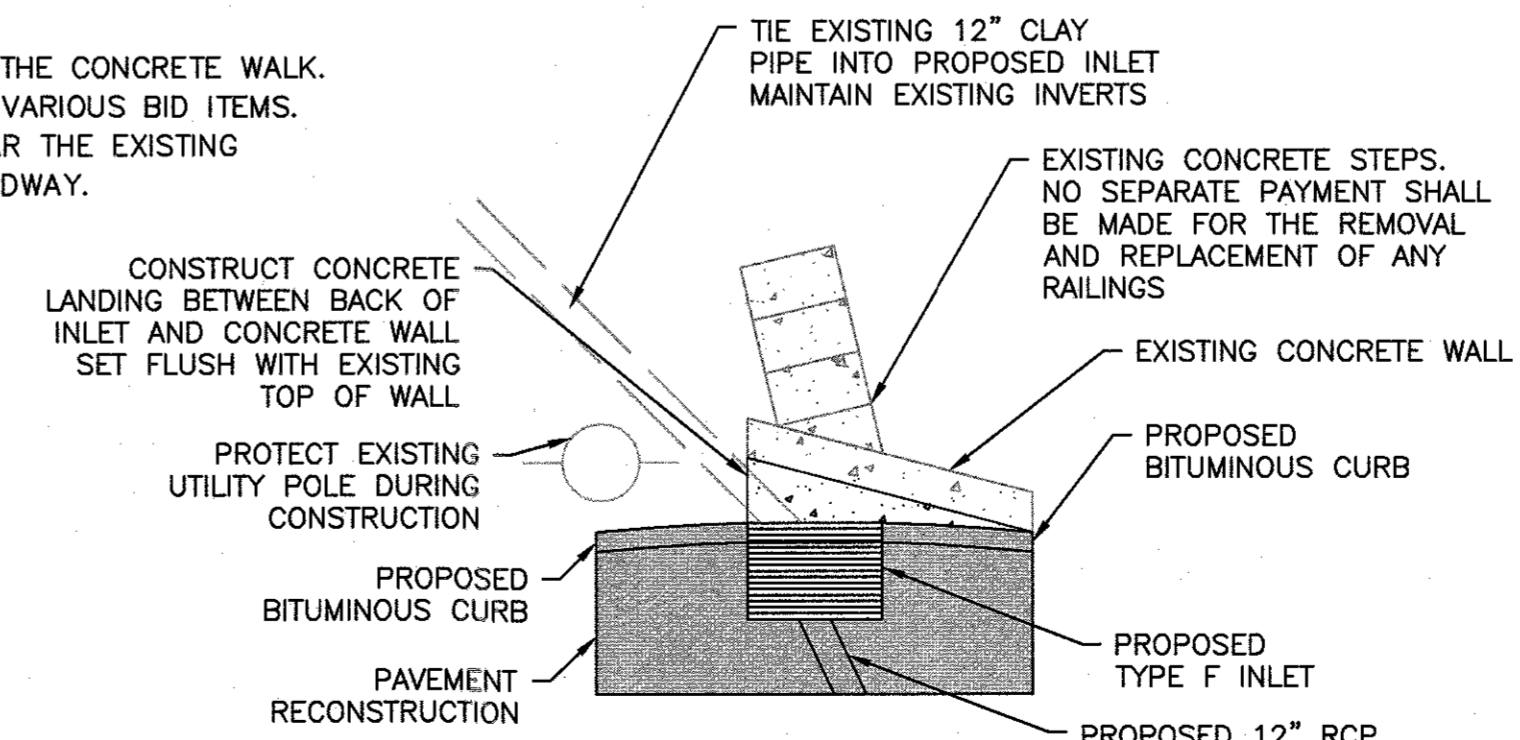
**DETAIL #1 (STA 0+42 - STA 0+80)**

- NOT TO SCALE
- CONTRACTOR TO TAKE EXTRA CARE AROUND THE CONCRETE WALK.
  - CONTRACTOR TO INCLUDE ALL COSTS IN THE VARIOUS BID ITEMS.
  - THE INTENT IS TO MINIMIZE DISTURBANCE NEAR THE EXISTING CONCRETE WALK AND KEEP DRAINAGE IN ROADWAY.



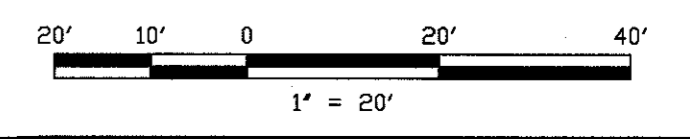
**DETAIL #2 (STA 4+16)**

- NOT TO SCALE
- CONTRACTOR TO INCLUDE ALL COSTS FOR CONSTRUCTION OF STAIRS IN MISCELLANEOUS CONCRETE.
  - CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO ENGINEER FOR REVIEW AND APPROVAL 2 WEEKS PRIOR TO CONSTRUCTION.
  - THE INTENT IS TO MINIMIZE RUNOFF DOWN THE STAIRS.



**DETAIL #3 (STA 3+09)**

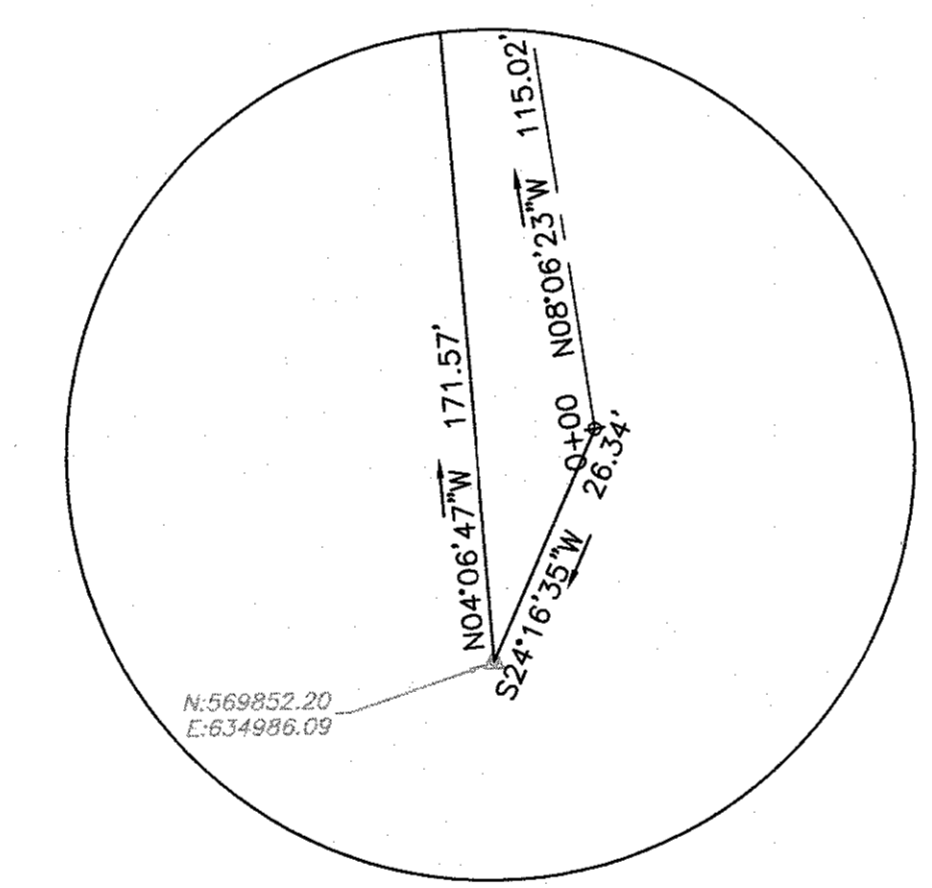
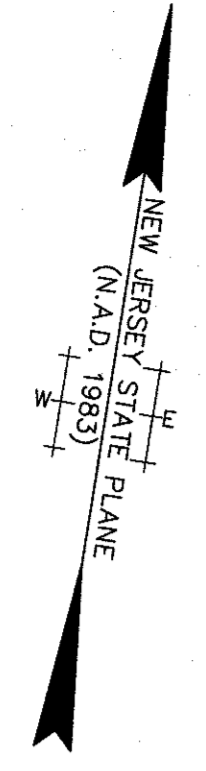
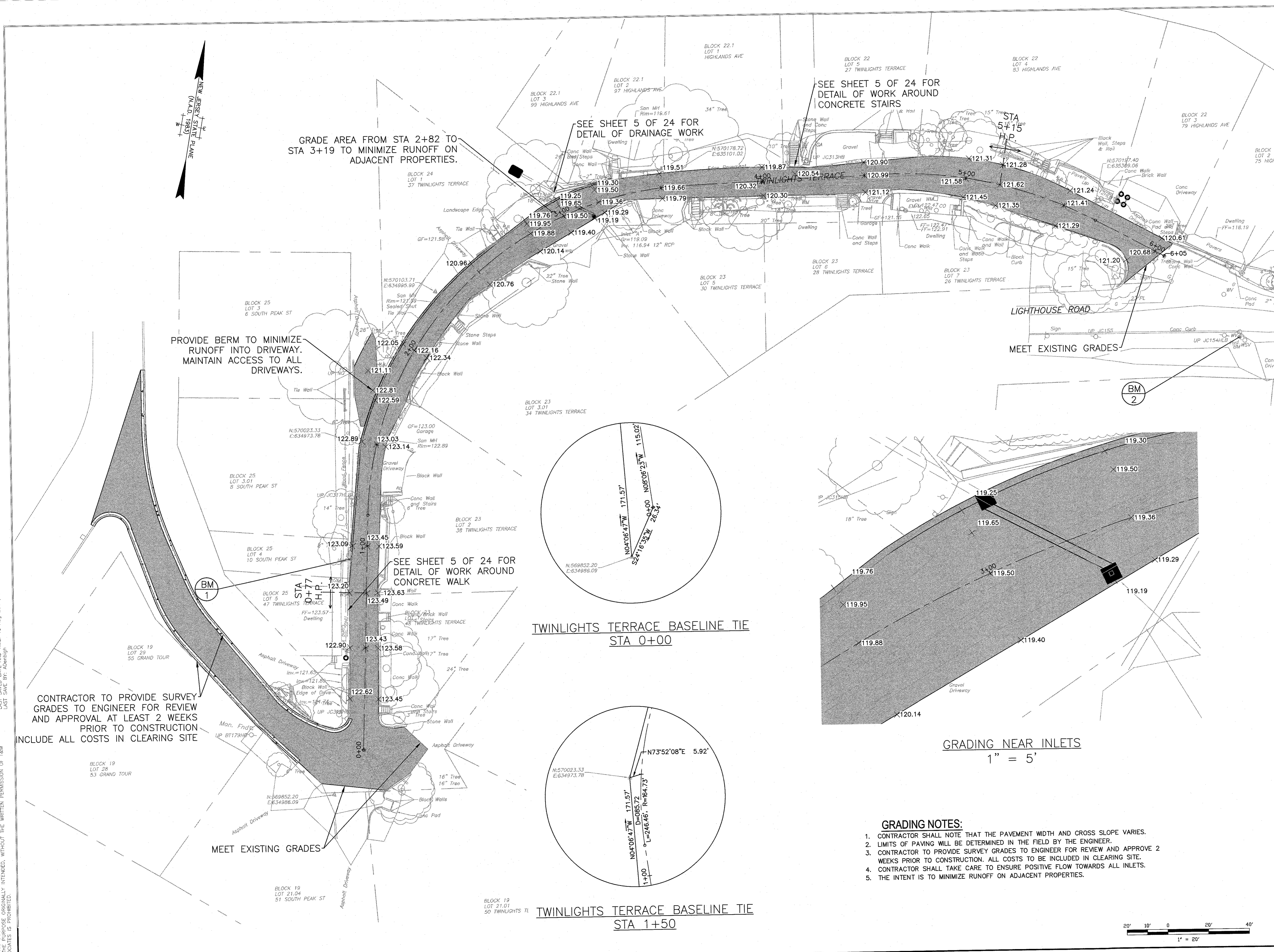
- NOT TO SCALE
- CONTRACTOR TO INCLUDE COST FOR LANDING IN MISCELLANEOUS CONCRETE
  - ALL EXISTING PIPE WITHIN THE ROADWAY IS TO BE REPLACED.
  - CONTRACTOR SHALL TAKE CARE TO MAINTAIN EXISTING DOWNSTREAM 12" CLAY PIPE.



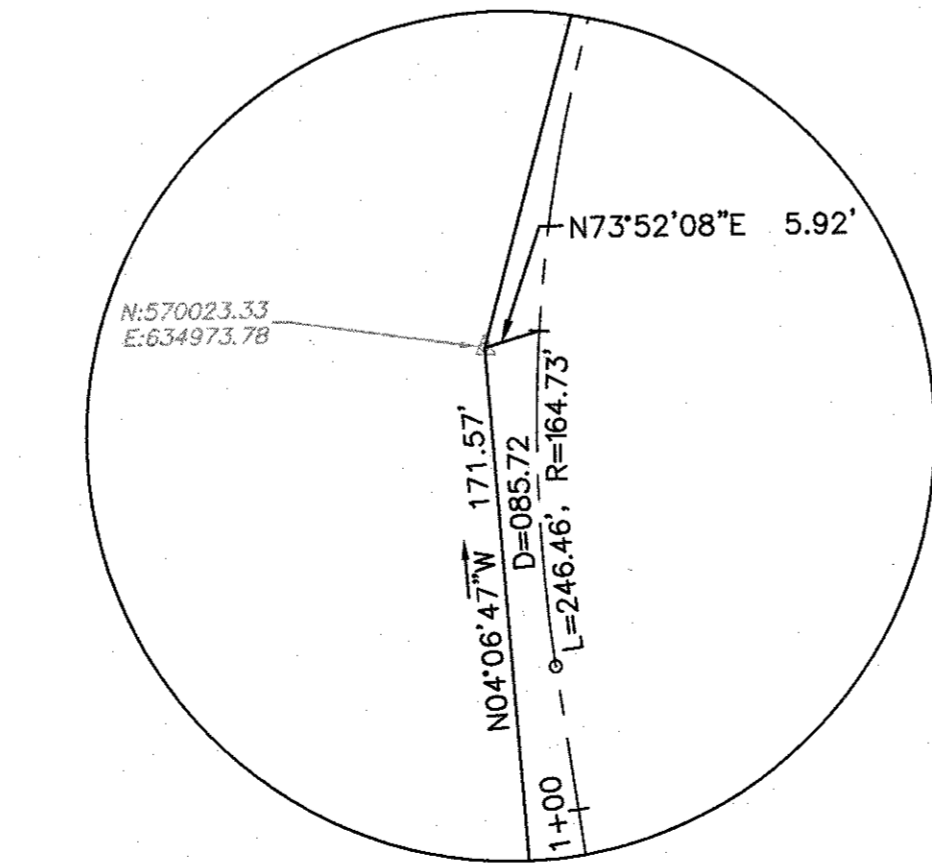
<p><b>2017 CAPITAL ROAD IMPROVEMENTS</b>          HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY</p>	<p><b>TWIN LIGHTS TERRACE</b>  <b>CONSTRUCTION PLAN</b></p>																								
<p><b>ROBERT R. KEADY, P.E., C.M.E.</b>          HIGHLANDS BOROUGH ENGINEER</p>	<p>08/16/2017          LICENSED PROFESSIONAL ENGINEER          STATE OF NJ LICENSE NO. 24604195100</p>																								
<p><b>YOUR GOALS. OUR MISSION.</b></p> <p>11 TINDALL ROAD          MIDDLETOWN, NJ 07748          TEL 732-671-6400          FAX 732-671-7365</p> <p>www.tandmassociates.com          NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS          AND LAND SURVEYORS          CERTIFICATE OF AUTHORIZATION 24027987900</p> <p>OFFICES LOCATED IN:          DELAWARE, INDIANA, KENTUCKY,          MASSACHUSETTS, MICHIGAN, NEW JERSEY,          OHIO AND PENNSYLVANIA</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DESIGNED BY</td> <td>DMD</td> <td>DRAWING</td> <td></td> </tr> <tr> <td>CHECKED BY</td> <td>RRK</td> <td><b>CSP-2</b></td> <td></td> </tr> <tr> <td>DRAWN BY</td> <td>AWD</td> <td>SHEET</td> <td><b>5</b></td> </tr> <tr> <td>DATE</td> <td>7-30-2017</td> <td>AS SHOWN</td> <td></td> </tr> <tr> <td>SCALE</td> <td>AS SHOWN</td> <td>PROJ. NO.</td> <td>HGL-10763</td> </tr> <tr> <td></td> <td></td> <td>OF</td> <td><b>24</b></td> </tr> </table>	DESIGNED BY	DMD	DRAWING		CHECKED BY	RRK	<b>CSP-2</b>		DRAWN BY	AWD	SHEET	<b>5</b>	DATE	7-30-2017	AS SHOWN		SCALE	AS SHOWN	PROJ. NO.	HGL-10763			OF	<b>24</b>
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DRAWN BY	AWD	SHEET	<b>5</b>																						
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SCALE	AS SHOWN	PROJ. NO.	HGL-10763																						
		OF	<b>24</b>																						

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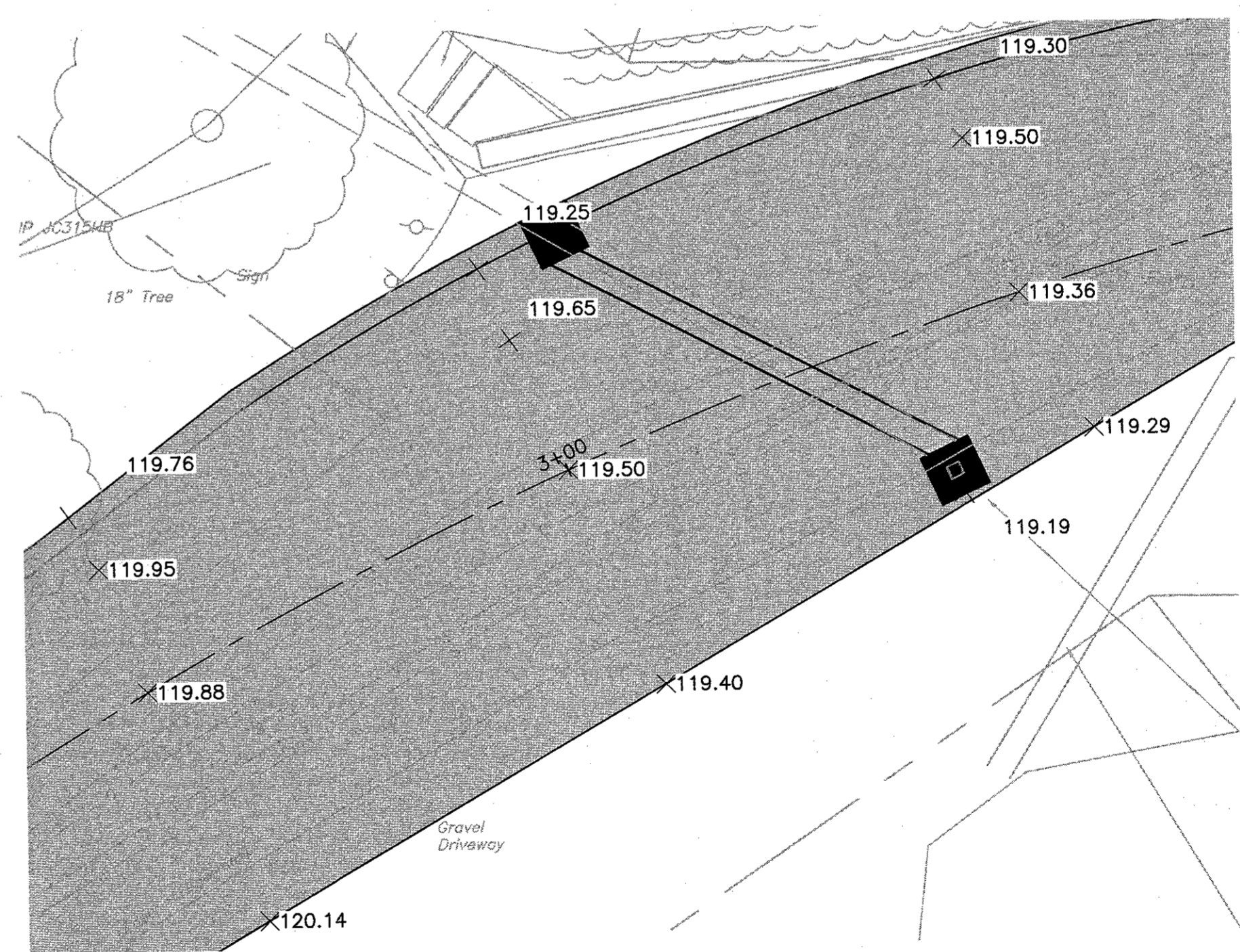
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TWINLIGHTS TERRACE BASELINE TIE  
 STA 0+00

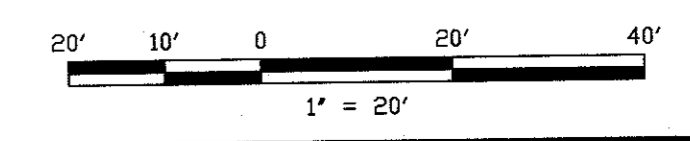


TWINLIGHTS TERRACE BASELINE TIE  
 STA 1+50



GRADING NEAR INLETS  
 1" = 5'

- GRADING NOTES:**
1. CONTRACTOR SHALL NOTE THAT THE PAVEMENT WIDTH AND CROSS SLOPE VARIES.
  2. LIMITS OF PAVING WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
  3. CONTRACTOR TO PROVIDE SURVEY GRADES TO ENGINEER FOR REVIEW AND APPROVE 2 WEEKS PRIOR TO CONSTRUCTION. ALL COSTS TO BE INCLUDED IN CLEARING SITE.
  4. CONTRACTOR SHALL TAKE CARE TO ENSURE POSITIVE FLOW TOWARDS ALL INLETS.
  5. THE INTENT IS TO MINIMIZE RUNOFF ON ADJACENT PROPERTIES.



NO.	DATE	REVISIONS	BY	CHKD

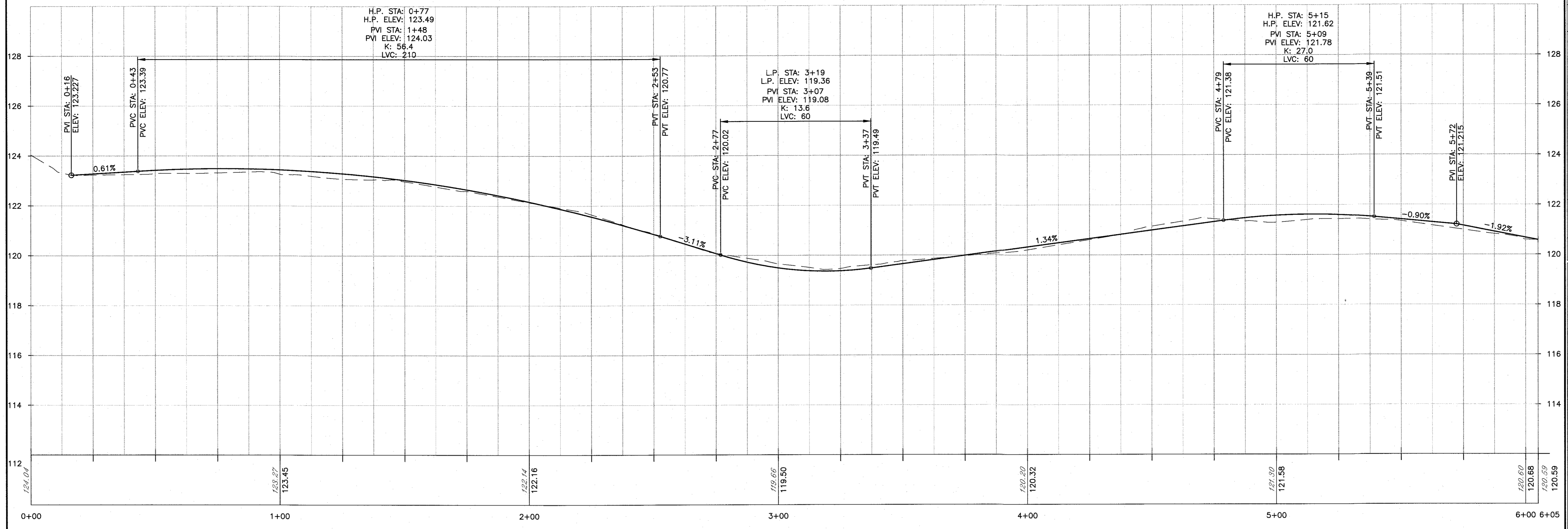
09/16/2017  
 LICENSED PROFESSIONAL ENGINEER  
 STATE OF NJ LICENSE NO. 246204195100

BOROUGH OF HIGHLANDS  
 2017 CAPITAL ROAD IMPROVEMENTS  
 HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY  
 TWIN LIGHTS TERRACE  
 GRADING PLAN

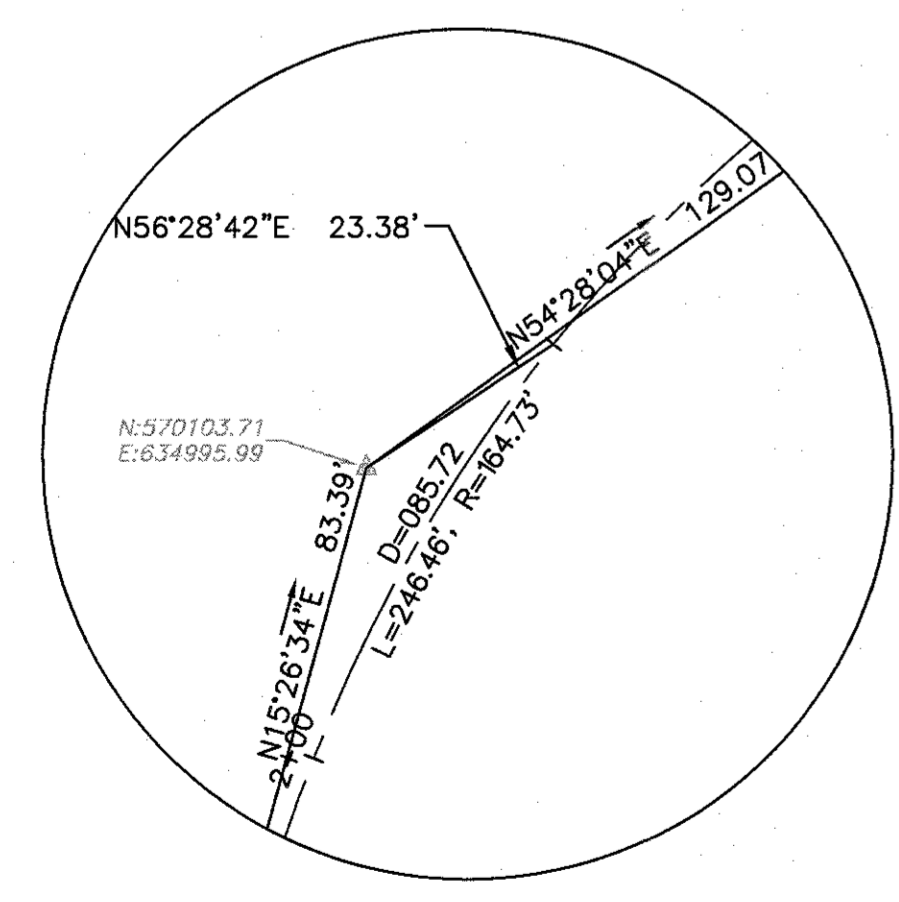
11 TINDALL ROAD  
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 FAX 732-671-7365  
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 NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS  
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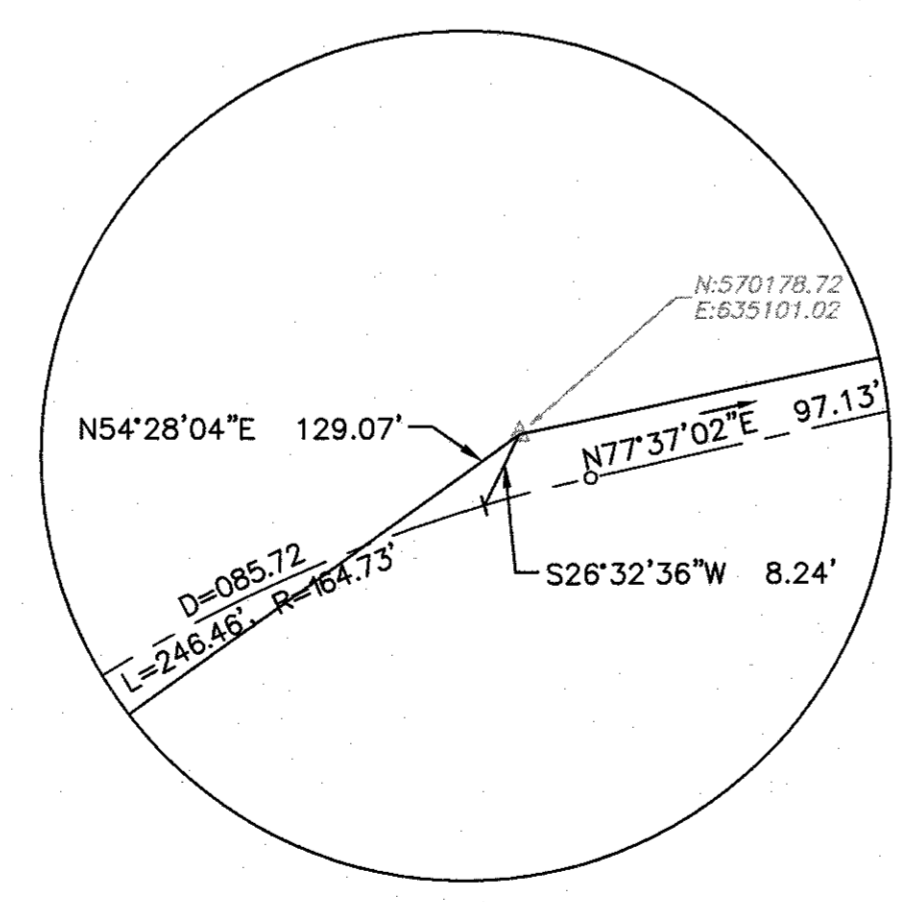
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DRAWN BY	AWD	DATE	7-10-2017
DATE	7-10-2017	SCALE	AS SHOWN
PROJ. NO.	HGH1-10763	OF	24



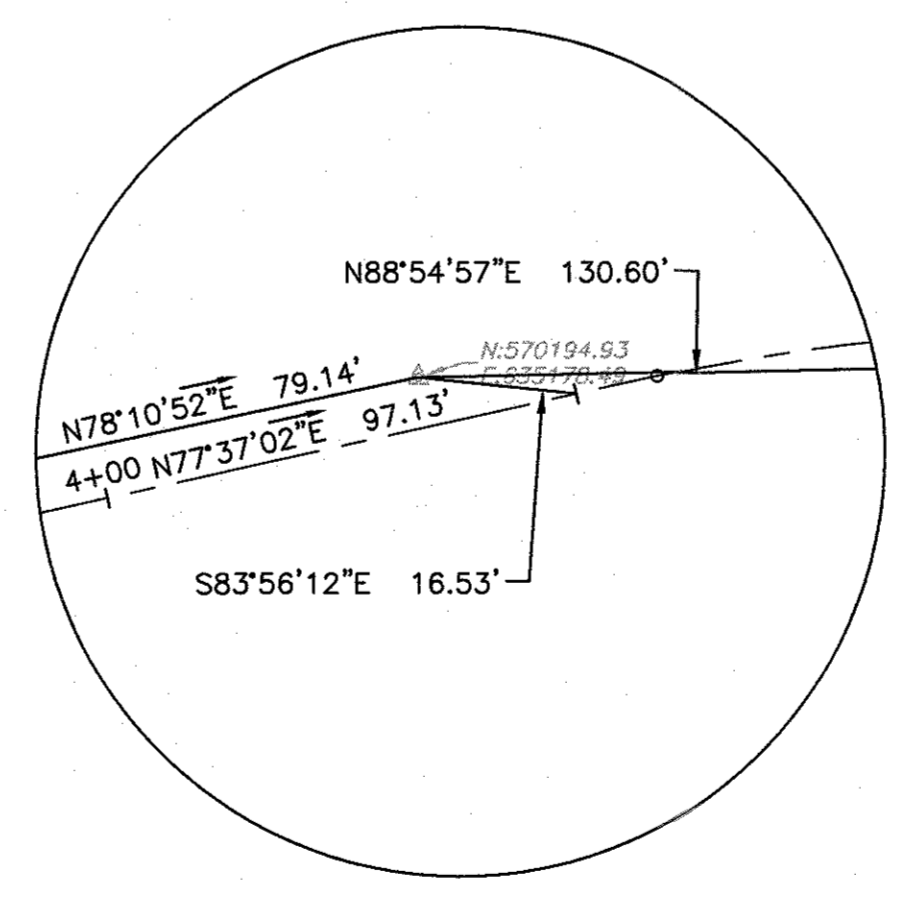
TWINLIGHTS TERRACE CENTERLINE  
 HORIZONTAL SCALE: 1" = 20'  
 VERTICAL SCALE: 1" = 2'



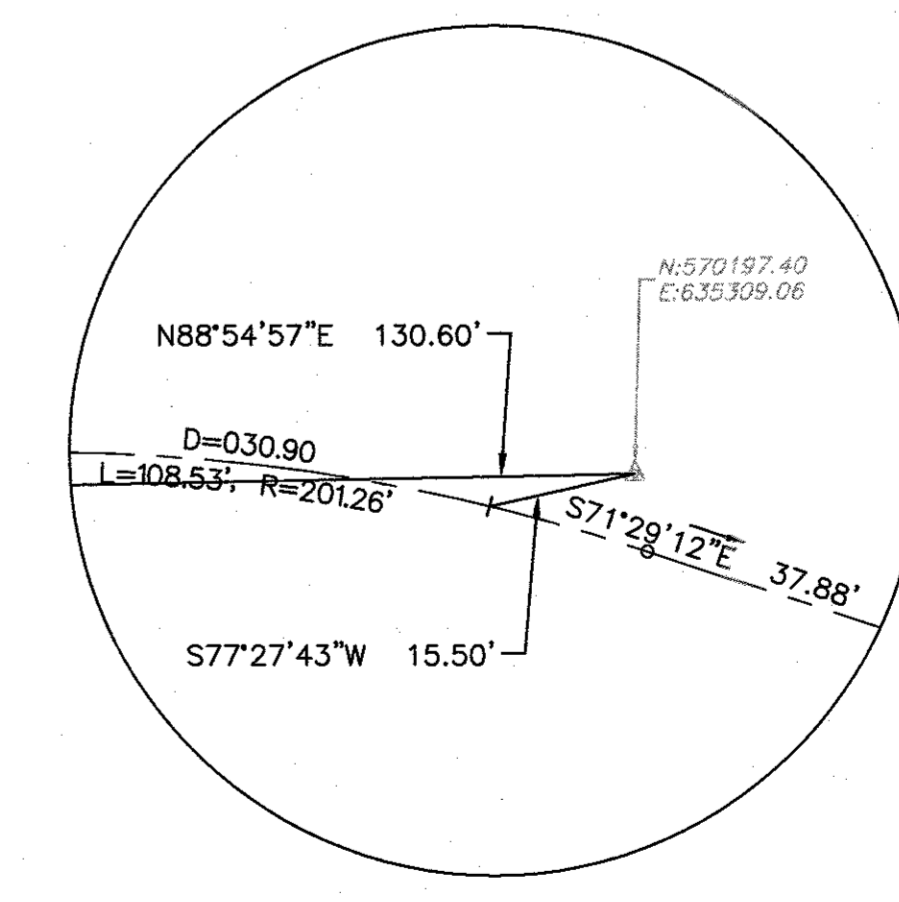
TWINLIGHTS TERRACE BASELINE TIE  
 STA 2+50



TWINLIGHTS TERRACE BASELINE TIE  
 STA 3+50



TWINLIGHTS TERRACE BASELINE TIE  
 STA 4+50

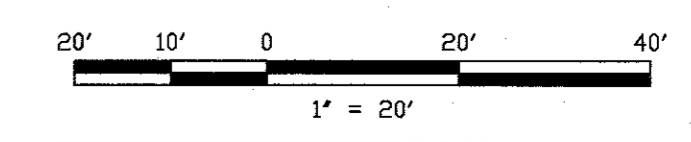


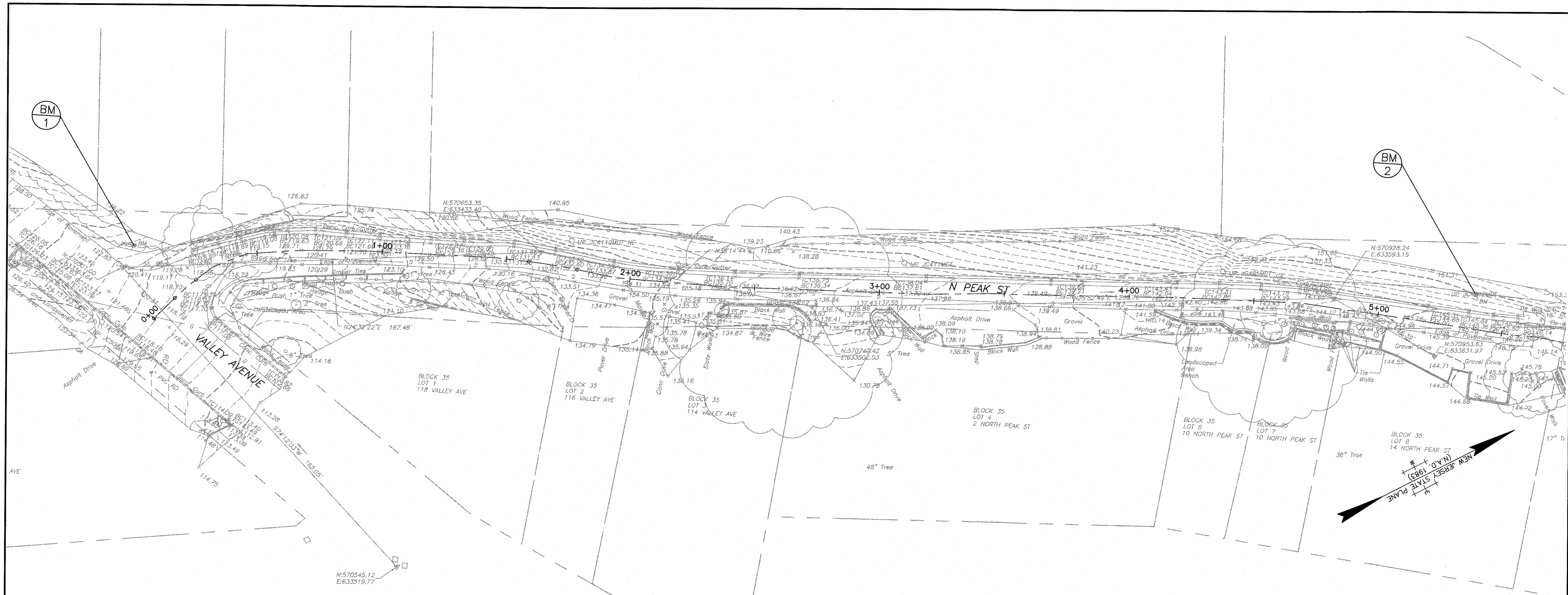
TWINLIGHTS TERRACE BASELINE TIE  
 STA 5+50

PROJECT INFORMATION:  
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 LAST SAVE BY: AdamBigh

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<b>ROBERT R. KEADY, P.E., C.M.E.</b> HIGHLANDS BOROUGH ENGINEER	08/16/2017 LICENSED PROFESSIONAL ENGINEER STATE OF NJ LICENSE NO. 24601495.100
BOROUGH OF HIGHLANDS <b>2017 CAPITAL ROAD IMPROVEMENTS</b> HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY	<b>TWIN LIGHTS TERRACE</b> PROFILE
<p>YOUR GOALS. OUR MISSION.</p> <p>11 TINDALL ROAD          MIDDLETOWN, NJ 07748          TEL 732-671-6400          FAX 732-671-7365</p> <p>www.tandmassociates.com          NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS          AND LAND SURVEYORS          CERTIFICATE OF AUTHORIZATION 246A27987500</p> <p>OFFICES LOCATED IN:          DELAWARE, INDIANA, KENTUCKY,          MASSACHUSETTS, MICHIGAN, NEW JERSEY,          OHIO AND PENNSYLVANIA</p>	
DESIGNED BY: DMD CHECKED BY: RRR DRAWN BY: AWD DATE: 7-10-2017 SCALE: AS SHOWN PROJ. NO.: HGHIL-10763	DRAWING: <b>LGP-2</b> SHEET: <b>7</b> OF <b>24</b>





THIS IS NOT A BOUNDARY SURVEY  
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 TITLE SEARCH OF THE ENTIRE TRACT OR TRACTS MAY DISCLOSE.

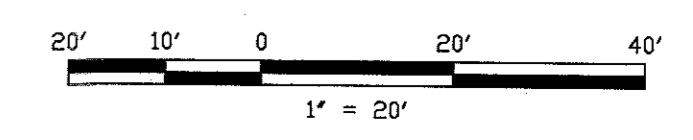
**GENERAL NOTES:**

1. PLANIMETRIC AND TOPOGRAPHIC FEATURES SHOWN HEREON HAVE BEEN DRAWN IN ACCORDANCE WITH FIELD SURVEY PERFORMED BY GEOD CORPORATION ON OR ABOUT MAY 17, 2017.
2. HORIZONTAL SYSTEM IS NAD 1983 COORDINATE SYSTEM AND VERTICAL DATUM IS NAVD 1988.

- BM 1 IS A BOLT ON FIRE HYDRANT AT THE INTERSECTION OF THE NORTH SIDE OF VALLEY AVENUE AND THE WEST SIDE OF N PEAK STREET. ELEV.=124.35'
- BM 2 IS A NAIL ON AN UTILITY POLE #JC4112M2T ON THE WEST SIDE OF N PEAK STREET. ELEV.=150.67'

PROJECT INFORMATION: Project: HGH-10763 (Plans)  
 FILE NAME: HGH-10763.dwg  
 LAST SAVED DATE AND TIME: 10 JUL 2017, 10:41AM  
 LAST SAVE BY: 99880

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NO.	DATE	REVISIONS	BY	CHKD

08/16/2017  
 LICENSED PROFESSIONAL ENGINEER  
 STATE OF NJ LICENSE NO. 24604195100

**ROBERT R. KEADY, P.E., C.M.I.E.**  
 HIGHLANDS BOROUGH ENGINEER

BOROUGH OF HIGHLANDS  
**2017 CAPITAL ROAD IMPROVEMENTS**  
 HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY  
**NORTH PEAK STREET**  
**EXISTING CONDITIONS**

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DESIGNED BY	DMD	DRAWING
CHECKED BY	RRK	<b>EXC-2</b>
DRAWN BY	GTG	SHEET
DATE	7-10-2017	<b>8</b>
SCALE	AS SHOWN	OF <b>24</b>
PROJ. NO.	HGH-10763	

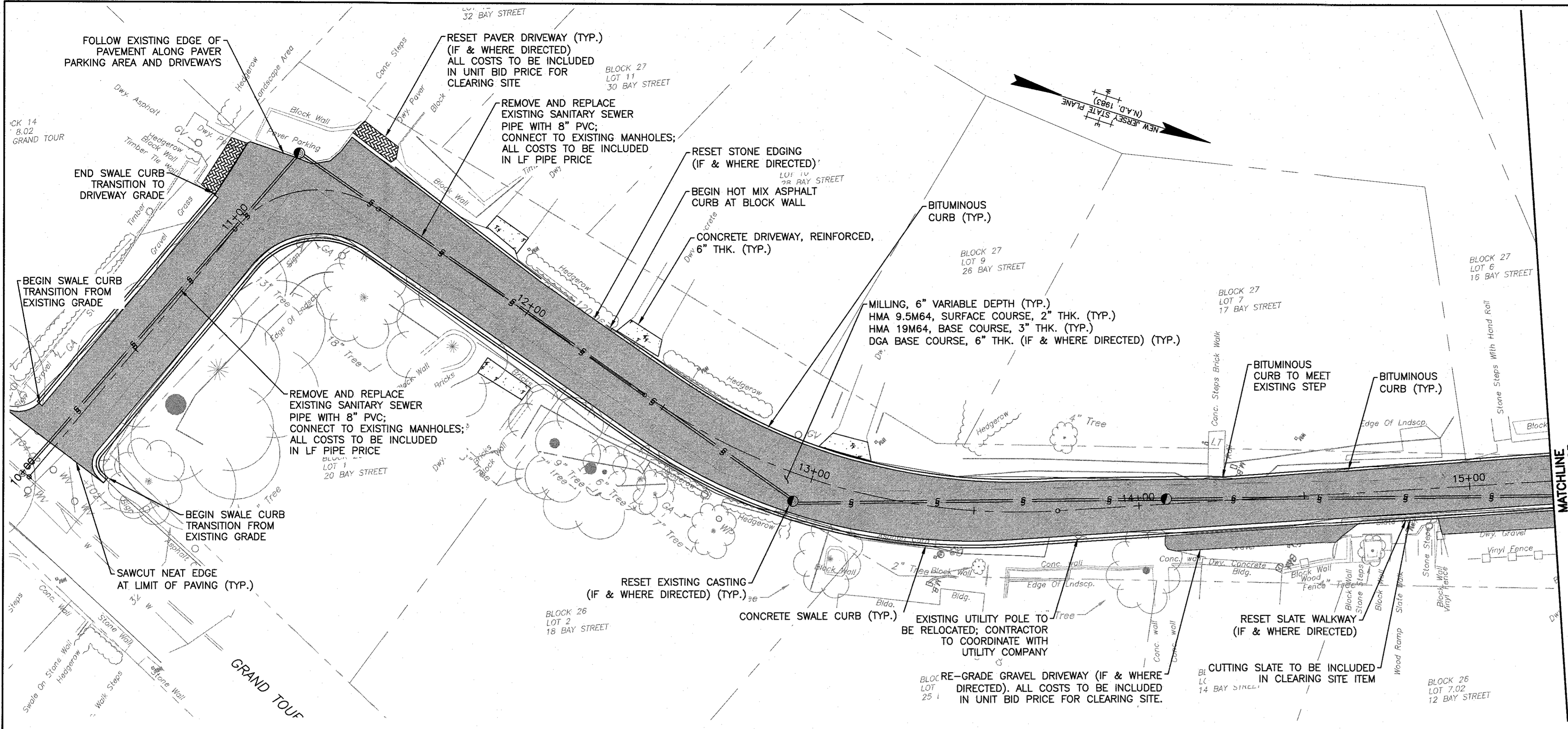










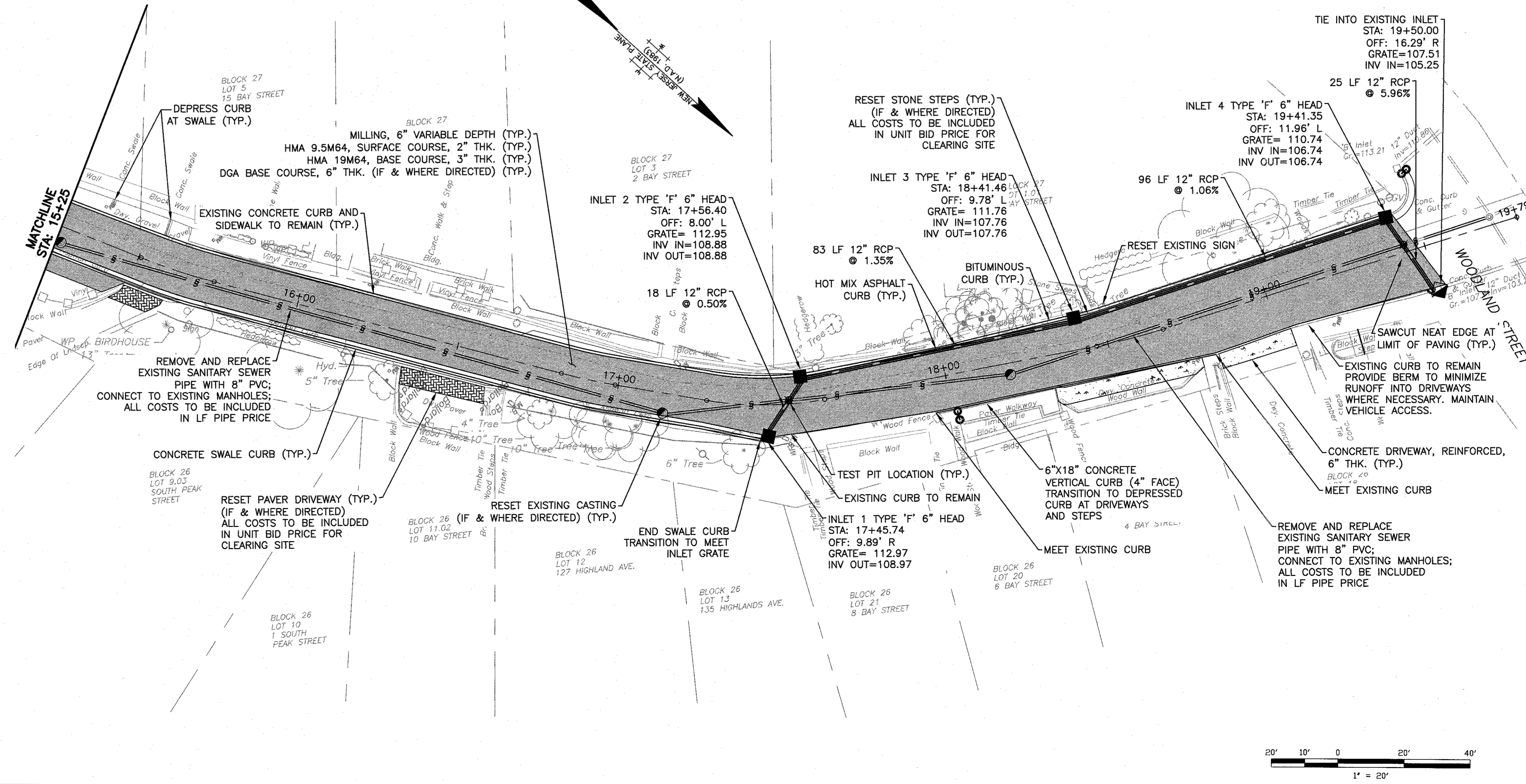


**CONSTRUCT ITEMS**

10	CY	EXCAVATION, TEST PITS (IF & WHERE DIRECTED)
2,125	SY	MILLING, 6" VARIABLE DEPTH
260	TON	HOT MIX ASPHALT 9.5M64, SURFACE COURSE, 2" THICK
385	TON	HOT MIX ASPHALT 19M64, BASE COURSE, 3" THICK
1,065	SY	DENSE GRADED AGGREGATE BASE COURSE, 6" THICK (IF & WHERE DIRECTED)
170	GAL	TACK COAT
1,070	LF	8" PVC SANITARY SEWER PIPE
250	LF	12" RCP PIPE (CLASS V WITH FLEXIBLE WATER TIGHT RUBBER GASKET)
4	UN	INLET TYPE F, 6" HEAD
5	UN	RESET EXISTING CASTING (IF & WHERE DIRECTED)
1	UN	RECONSTRUCTED INLET, TYPE 'B', USING EXISTING CASTING
890	LF	CONCRETE SWALE CURB
100	LF	6"x18" CONCRETE VERTICAL CURB
775	LF	BITUMINOUS CURB
80	SY	CONCRETE DRIVEWAY, REINFORCED, 6" THICK
275	SY	BORROW TOPSOILING, 4" THICK
275	SY	FERTILIZING AND SEEDING, TYPE 'G'
275	SY	STRAW MULCH

**CONSTRUCTION NOTES**

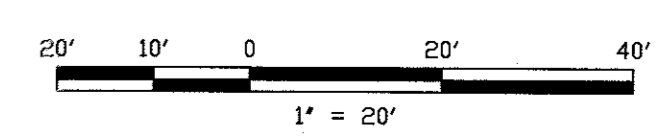
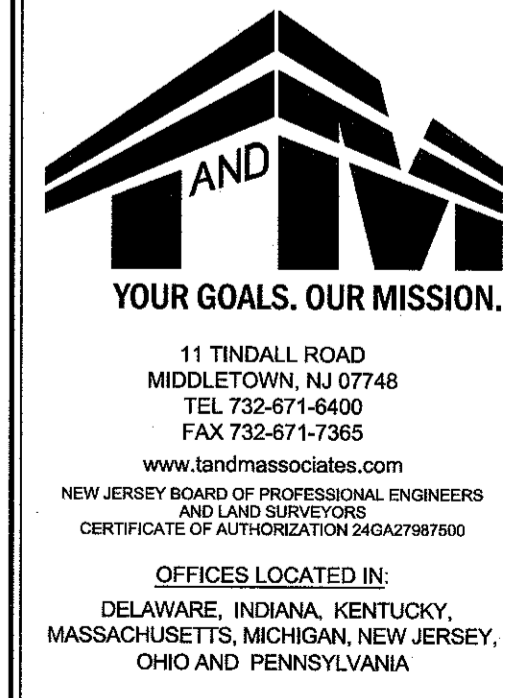
1. THE CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE AND RESET ANY EXISTING SIGNS. ANY SIGNS DAMAGED AS A RESULT OF THE CONTRACTOR'S ACTIVITY SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. ALL COSTS TO BE INCLUDED IN THE LUMP SUM BID PRICE FOR CLEARING SITE.
2. CONTRACTOR SHALL TAKE CARE TO ENSURE POSITIVE FLOW TOWARDS ALL INLETS.
3. FINAL LIMITS OF PAVING TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
4. CONTRACTOR TO RESET ALL SIGNS, FENCES, LANDSCAPING, MAILBOXES, EDGING, ETC. TO EXISTING CONDITION AT NO SEPARATE PAYMENT.
5. CONTRACTOR IS ADVISED THAT THERE ARE AREAS WHERE THERE ARE WALLS BEHIND THE EXISTING EDGE OF PAVEMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE WALLS DURING CONSTRUCTION. NO SEPARATE PAYMENT SHALL BE MADE. ALL COSTS FOR REMOVAL AND RESETTING OF EXISTING WALLS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CLEARING SITE.
6. ALL EXISTING UTILITIES SHALL BE VERIFIED IN THE FIELD.
7. MANHOLE CASTINGS SHALL BE RESET USING BRICK AND MORTAR. NO RINGS SHALL BE ALLOWED.
8. LIMITS OF HOT MIX ASPHALT CURB TO BE DETERMINED IN THE FIELD BY ENGINEER.
9. SANITARY SEWER MAIN IS TO BE REPLACED IN KIND WITH 8" PVC PIPE AND CONNECTED TO EXISTING MANHOLES. ALL DETAILS FOR INSTALLATION CAN BE FOUND ON THE DETAIL SHEET 17 OF 24. ALL COSTS ASSOCIATED WITH THE INSTALLATION OF THE NEW SANITARY SEWER MAIN INCLUDING EXCAVATION, INSTALLATION, CONNECTION TO EXISTING MANHOLES, PAVEMENT REPAIR, AND TIE IN OF EXISTING LATERALS SHALL BE INCLUDED IN THE LINEAR FOOT PRICE BID FOR 8" PVC PIPE.



PROJECT INFORMATION:  
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 LAST SAVE DATE AND TIME: 15 Aug 2017, 4:32PM  
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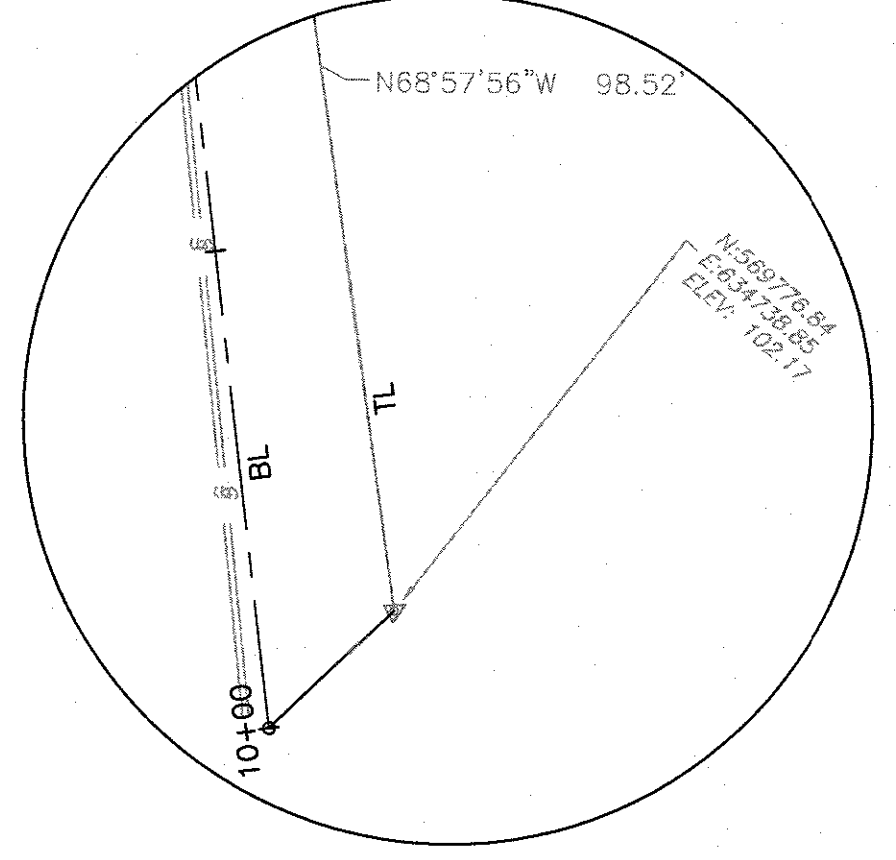
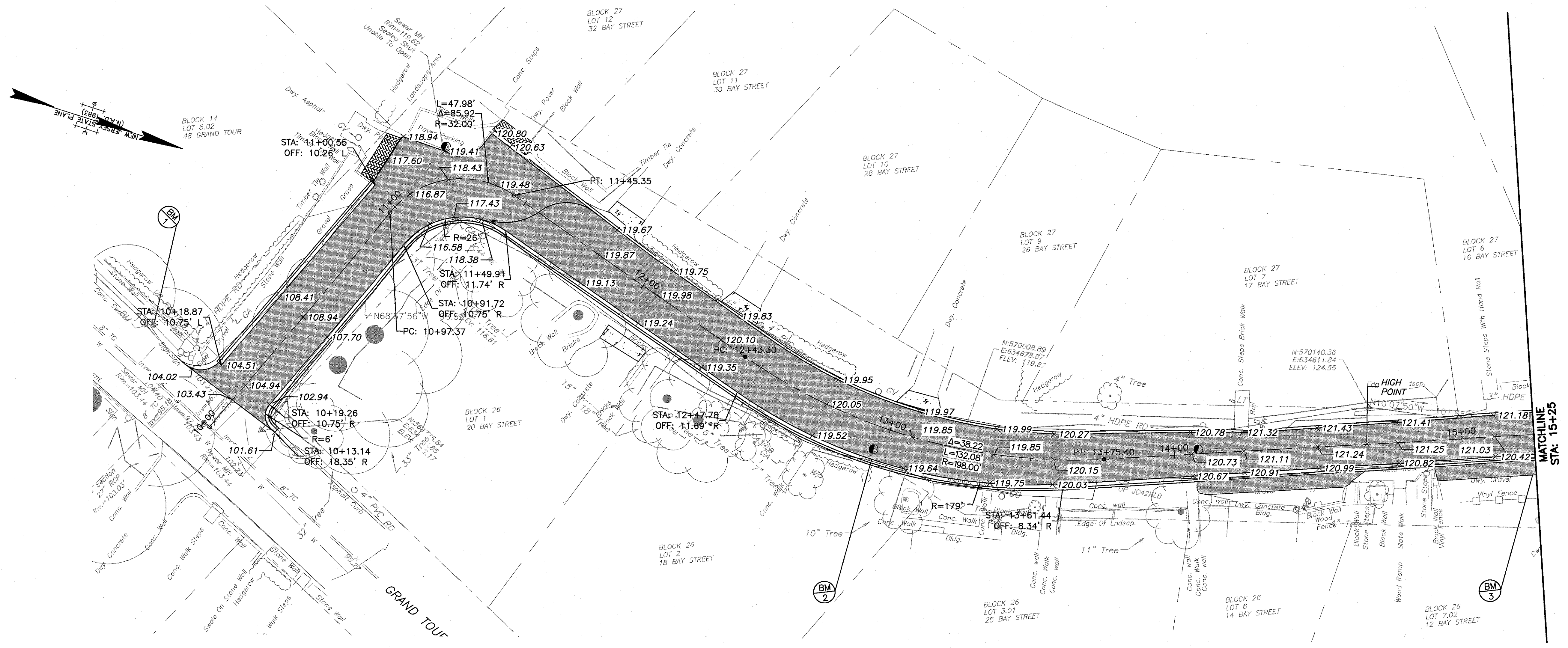
<p><b>ROBERT R. KEADY, P.E., C.M.E.</b> HIGHLANDS BOROUGH ENGINEER</p> <p>BOROUGH OF HIGHLANDS</p> <p>2017 CAPITAL ROAD IMPROVEMENTS HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY</p> <p>BAY STREET</p> <p>CONSTRUCTION PLAN</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">DESIGNED BY</td> <td style="width: 20%;">DMD</td> <td style="width: 20%;">DRAWING</td> <td style="width: 40%;">CSP-4</td> </tr> <tr> <td>CHECKED BY</td> <td>RRK</td> <td></td> <td></td> </tr> <tr> <td>DRAWN BY</td> <td>AWD</td> <td>SHEET</td> <td>13</td> </tr> <tr> <td>DATE</td> <td>7-10-2017</td> <td>SCALE</td> <td>AS SHOWN</td> </tr> <tr> <td>PROJ. NO.</td> <td>HGLH-10763</td> <td></td> <td>OF 24</td> </tr> </table>	DESIGNED BY	DMD	DRAWING	CSP-4	CHECKED BY	RRK			DRAWN BY	AWD	SHEET	13	DATE	7-10-2017	SCALE	AS SHOWN	PROJ. NO.	HGLH-10763		OF 24
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CHECKED BY	RRK																				
DRAWN BY	AWD	SHEET	13																		
DATE	7-10-2017	SCALE	AS SHOWN																		
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08/18/2017  
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 STATE OF NJ LICENSE NO. 24604195100

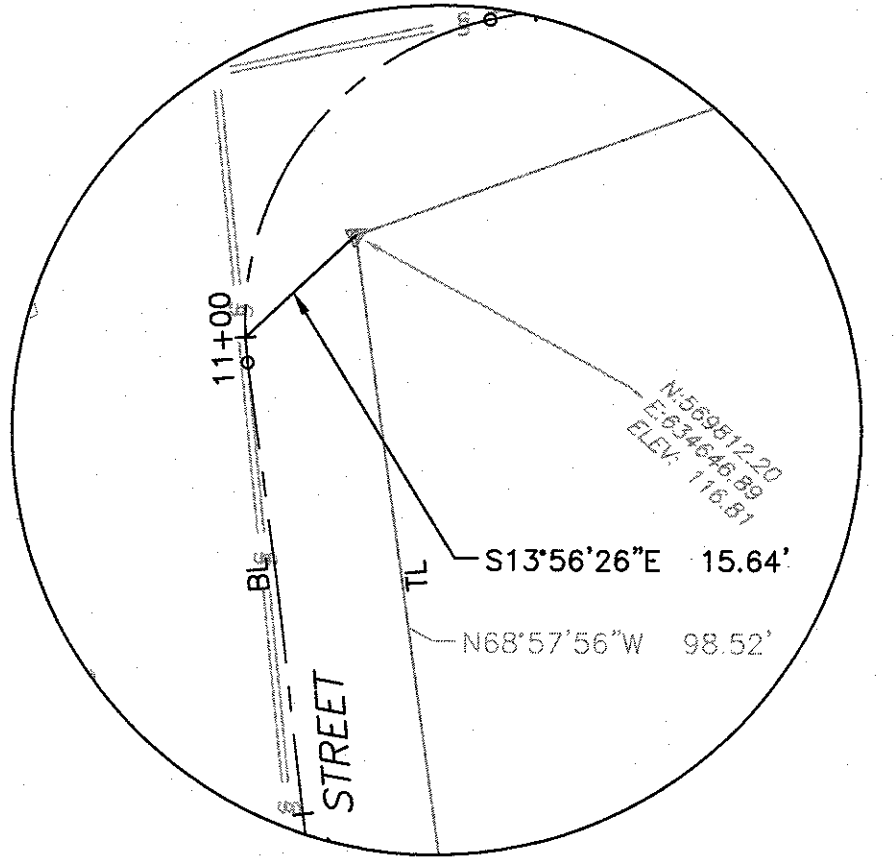


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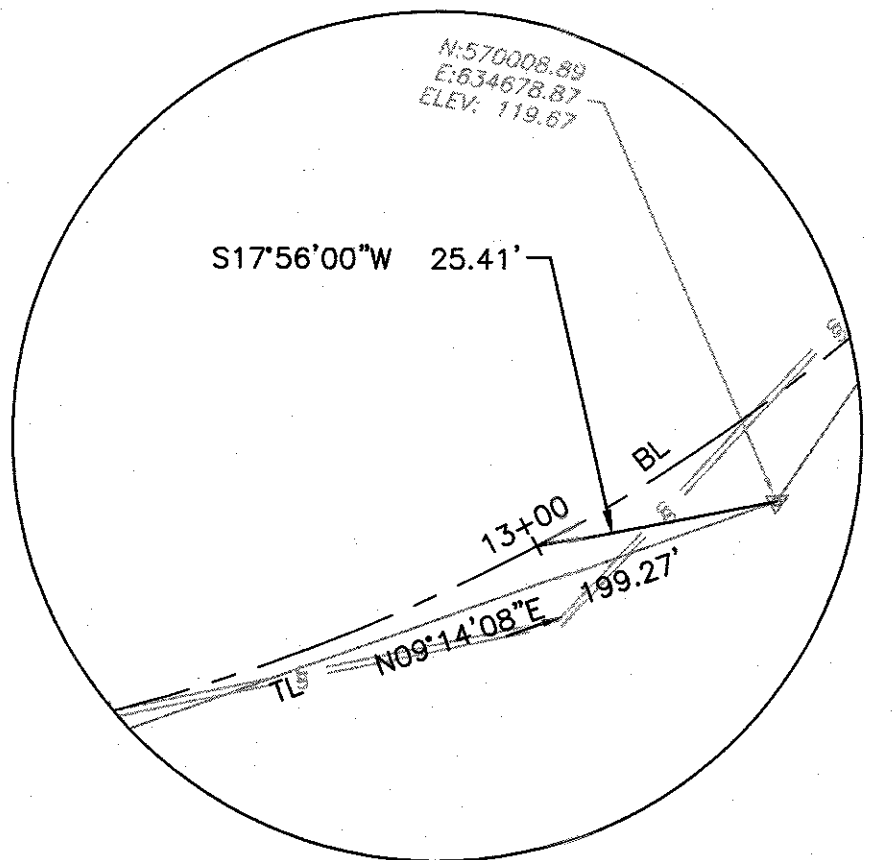
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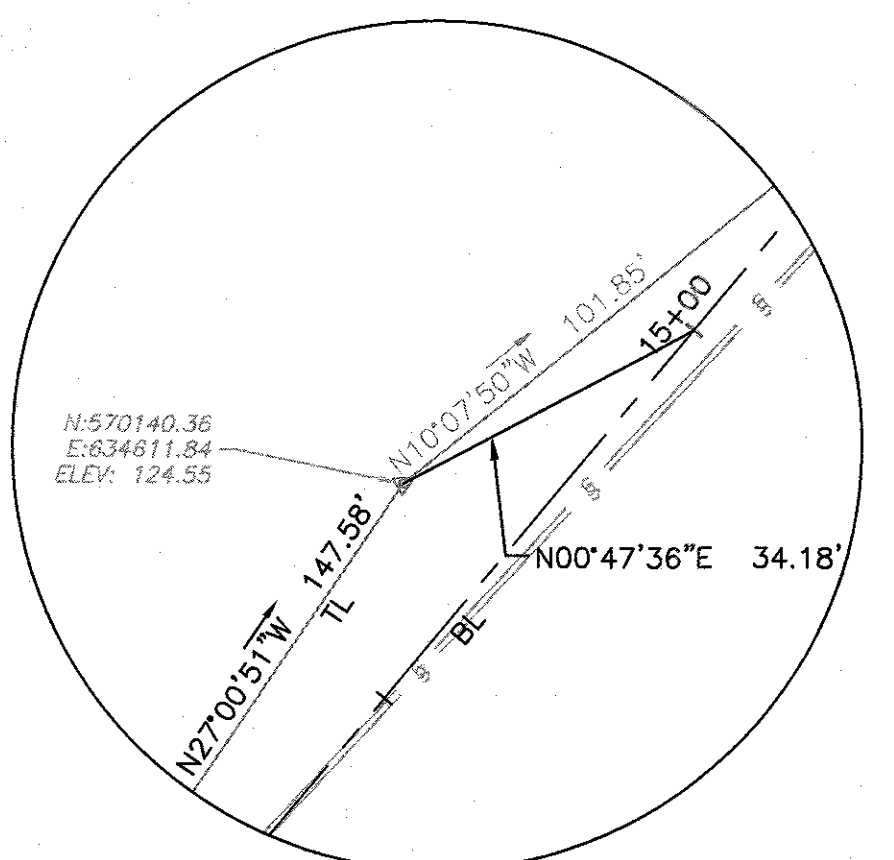
BAY AVE BASELINE TIE  
 STA 10+00



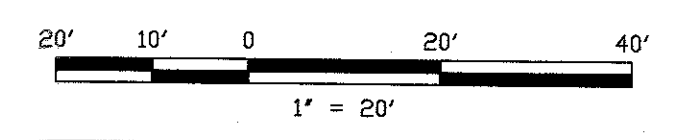
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 STA 11+00



BAY AVE BASELINE TIE  
 STA 13+00



BAY AVE BASELINE TIE  
 STA 15+00



NO.	DATE	REVISIONS	BY	CHKD

ROBERT R. KEADY, P.E., C.M.E.  
 HIGHLANDS BOROUGHINGENIER

09/16/2017

REGISTERED PROFESSIONAL ENGINEER  
 STATE OF NJ LICENSE NO. 24680485100

BOROUGH OF HIGHLANDS

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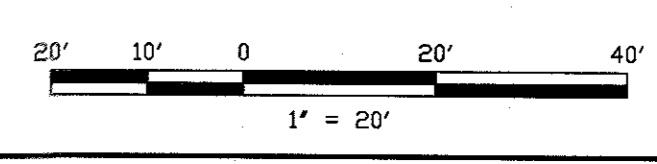
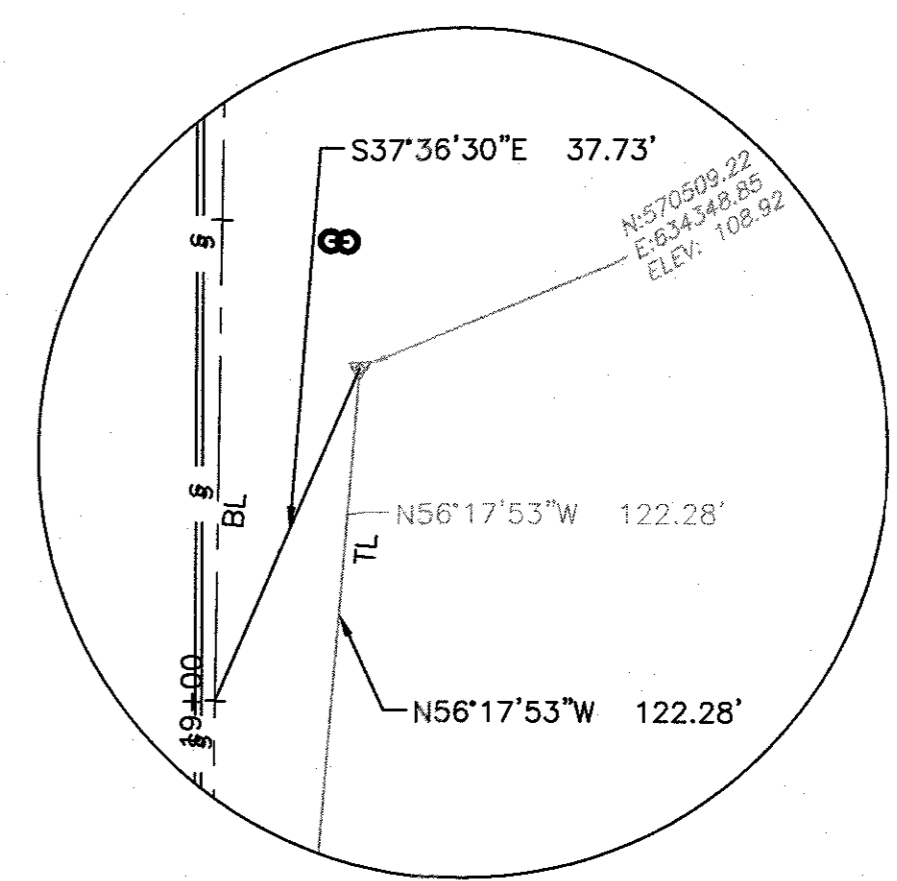
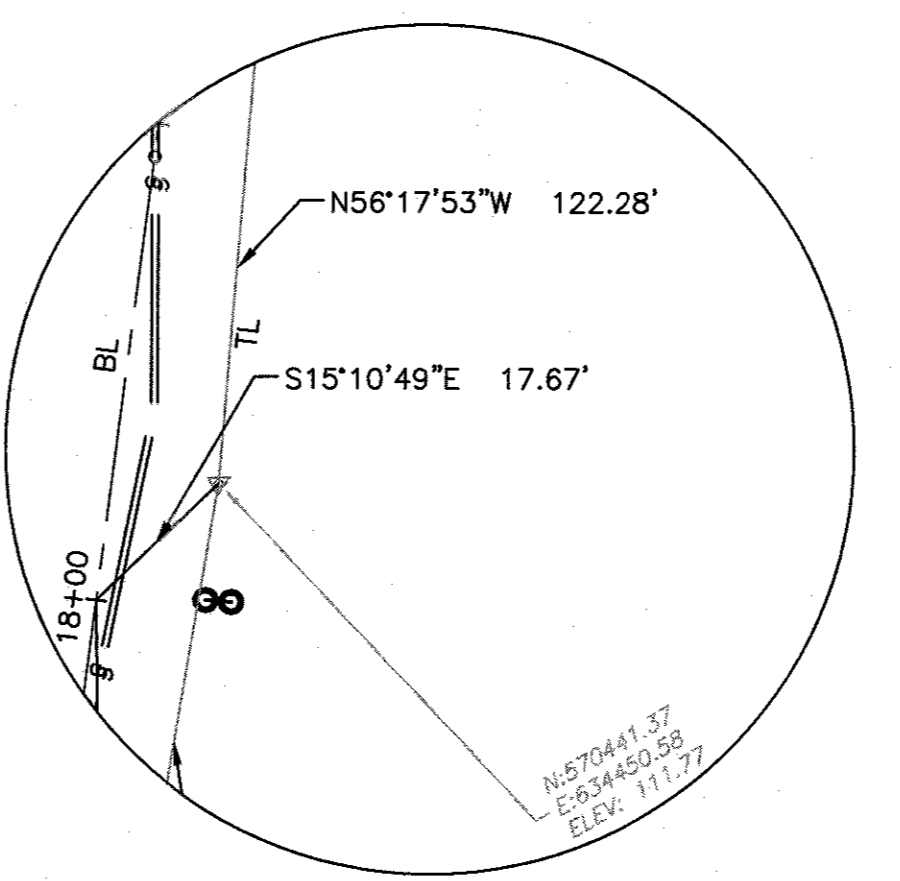
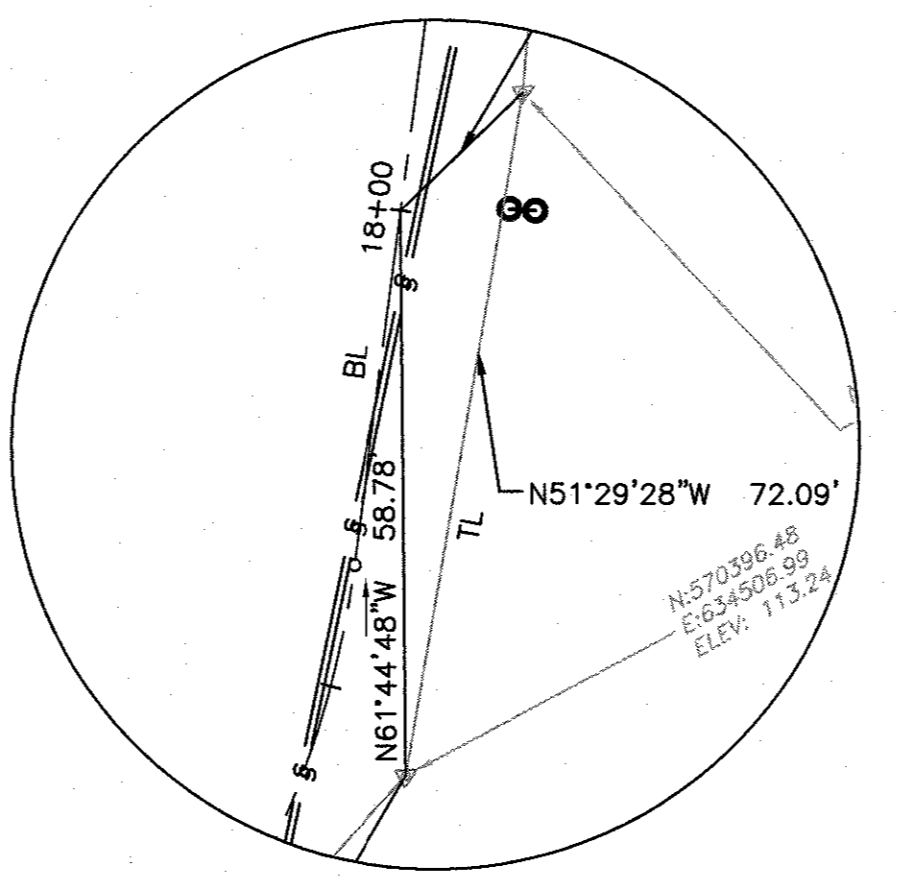
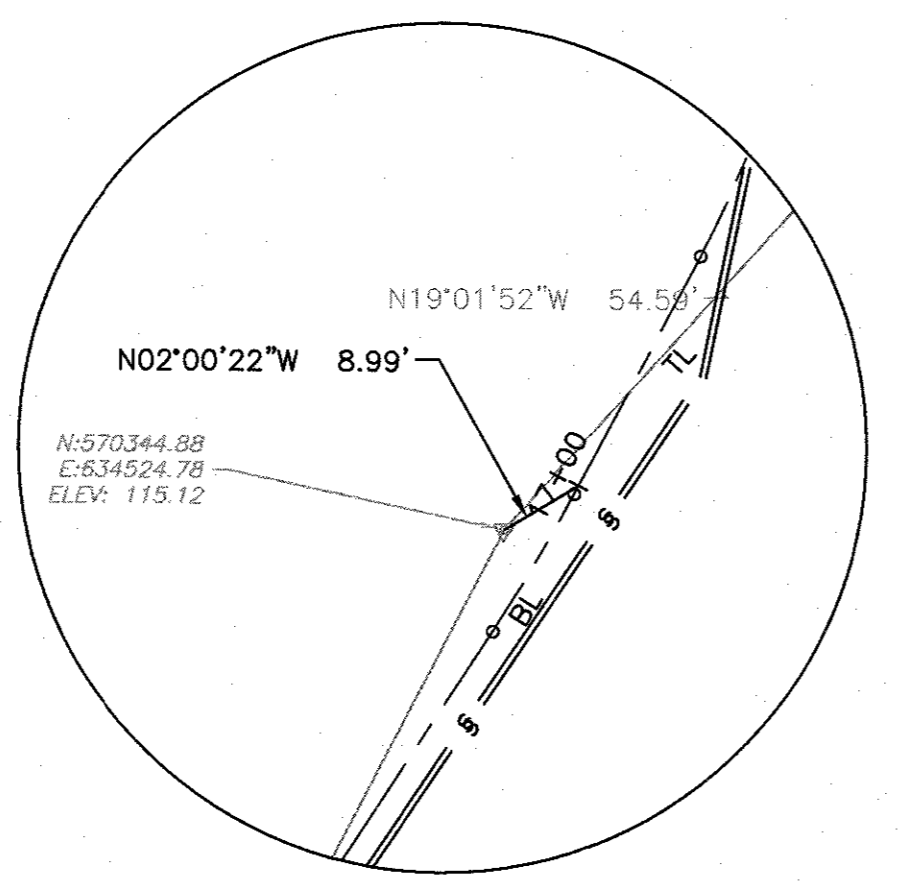
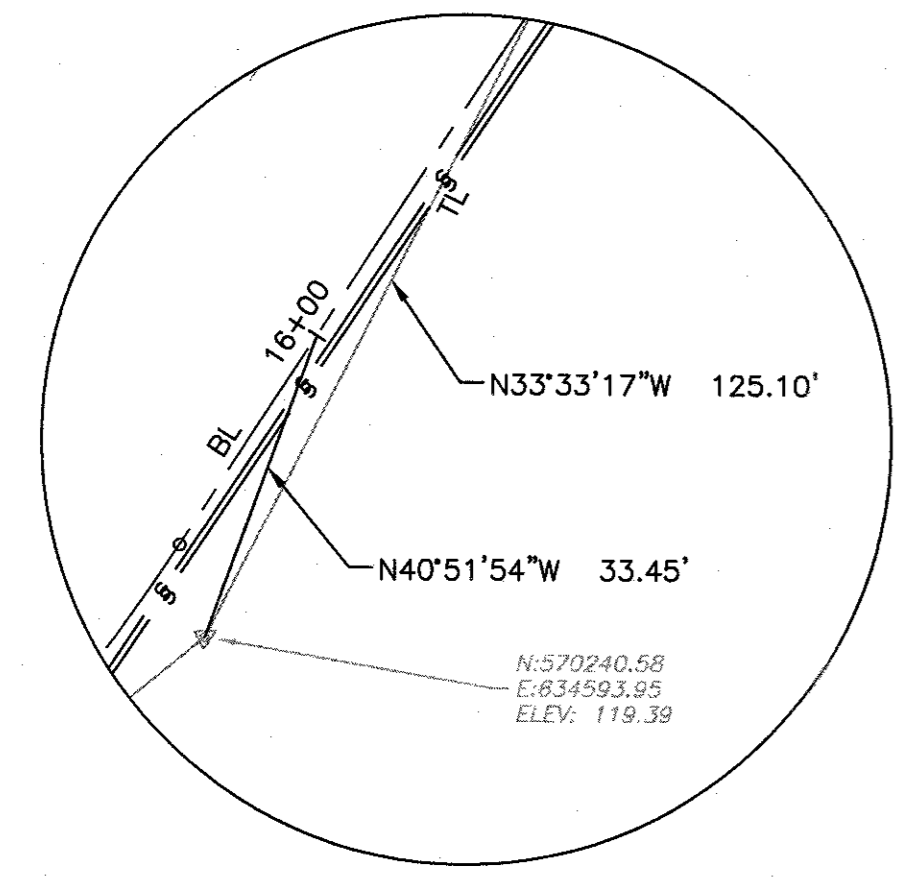
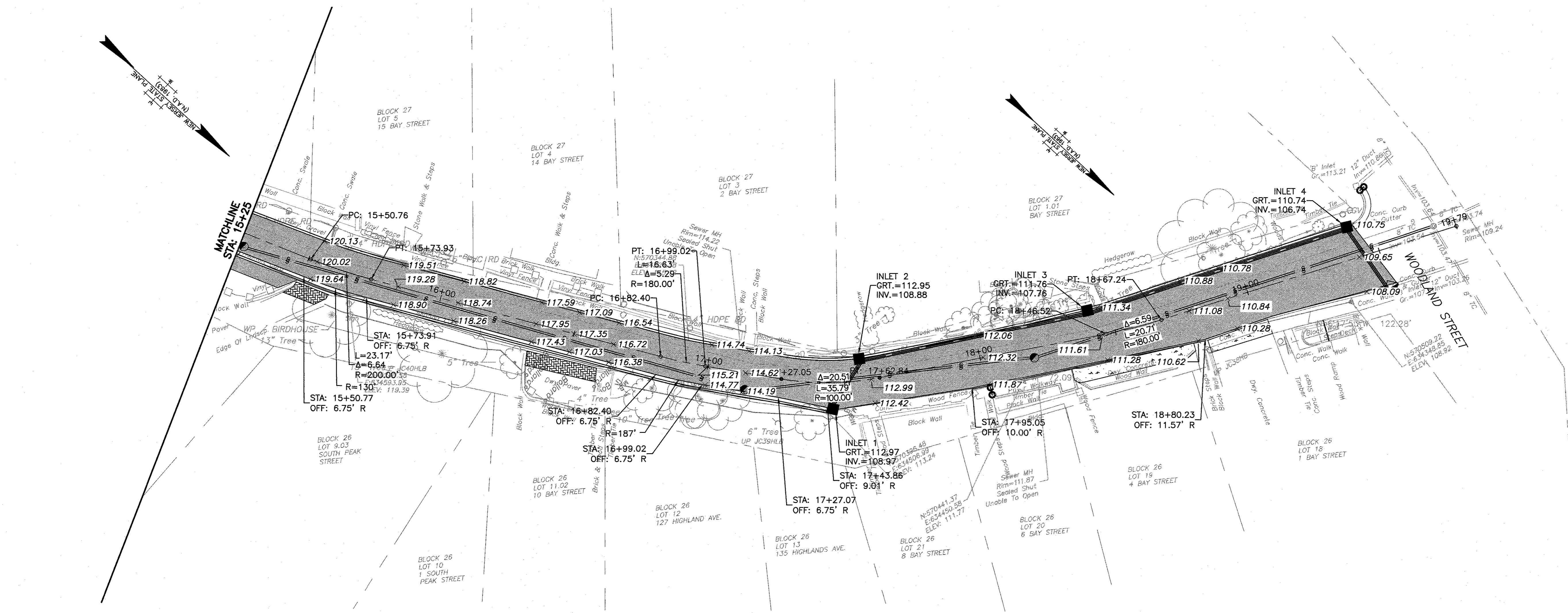
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DESIGNED BY	DMD	DRAWING	LGP-5
CHECKED BY	RRK	SHEET	14
DRAWN BY	AWD	DATE	7-10-2017
SCALE	AS SHOWN	PROJ. NO.	HGHL-10763
			OF 24

PROJECT INFORMATION:  
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 DATE PLOTTED: 15 Aug 2017, 1:44PM  
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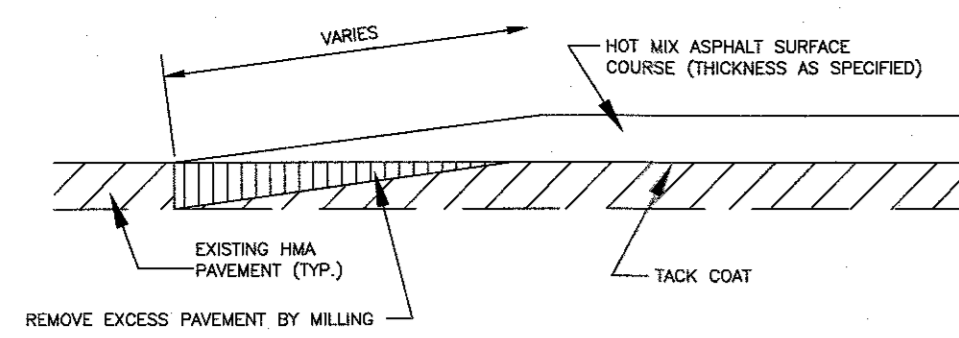
NO.	DATE	REVISIONS	BY	CHKD

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 STATE OF NJ LICENSE NO. 246041385.00  
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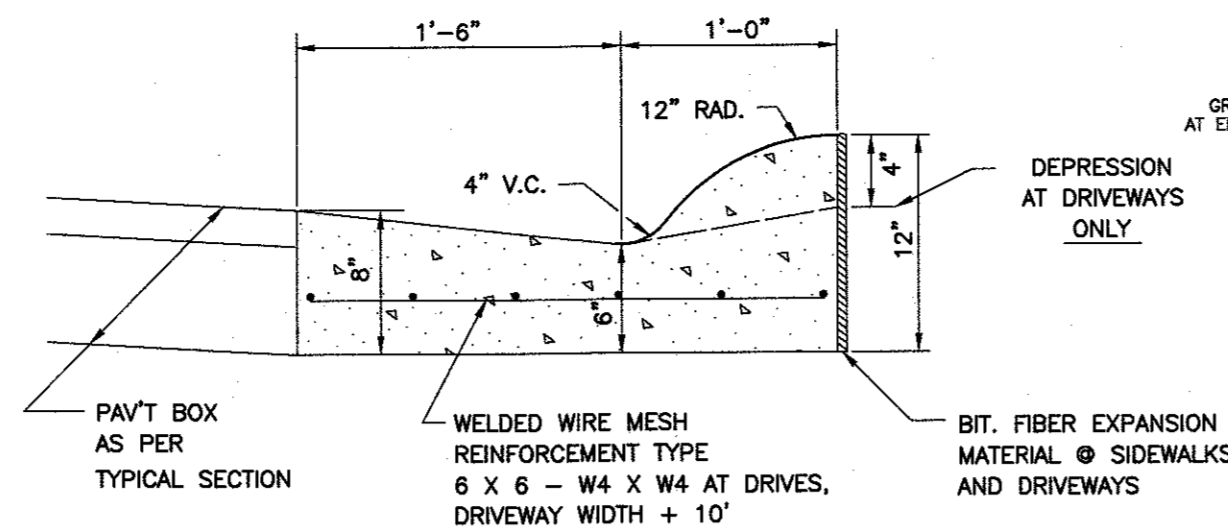
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**2017 CAPITAL ROAD IMPROVEMENTS**  
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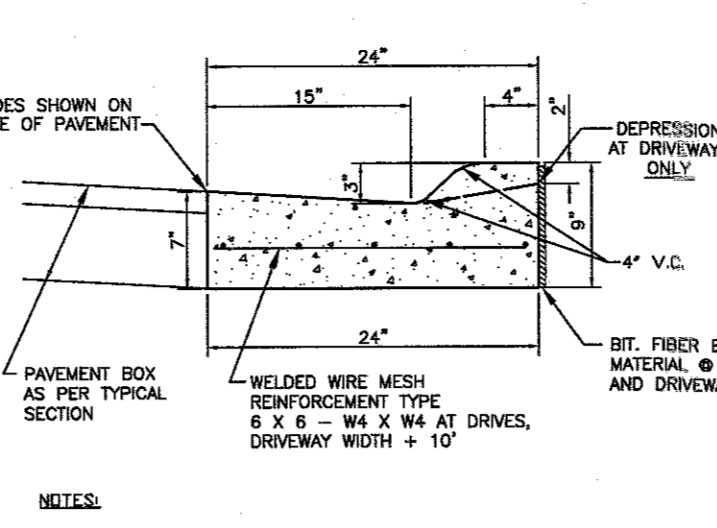
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DATE	7-10-2017		
SCALE	AS SHOWN		
PROJ. NO.	HCHL-10763		



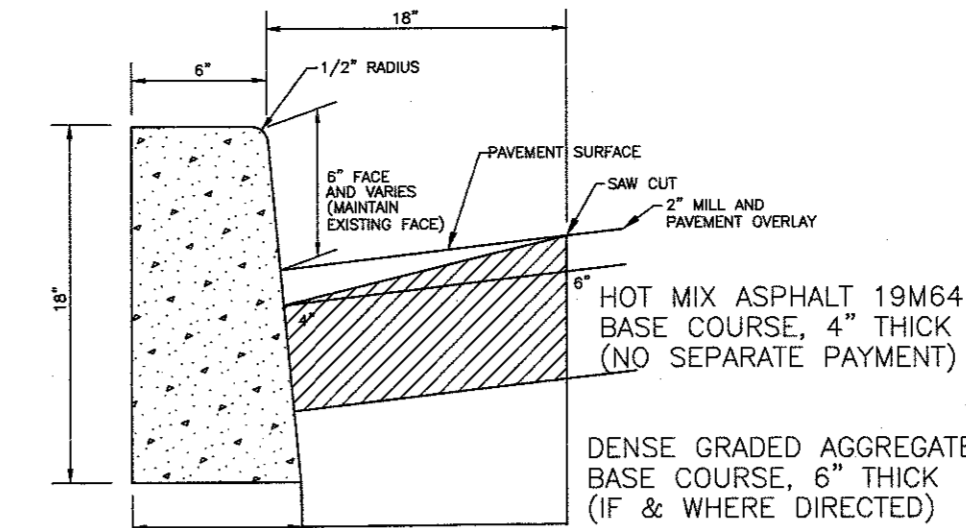
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NOT TO SCALE



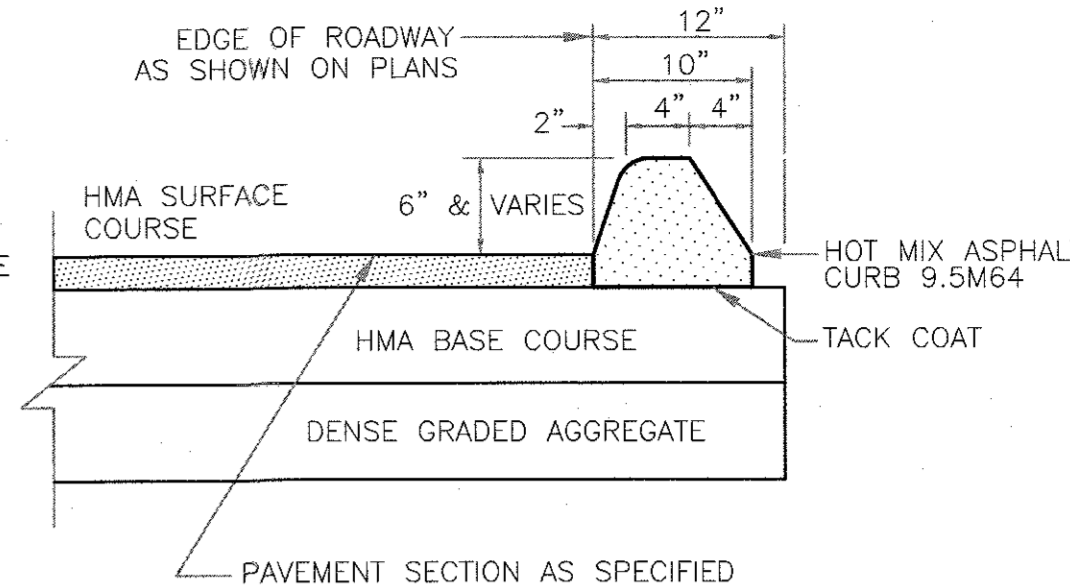
**CONCRETE ROLL CURB**  
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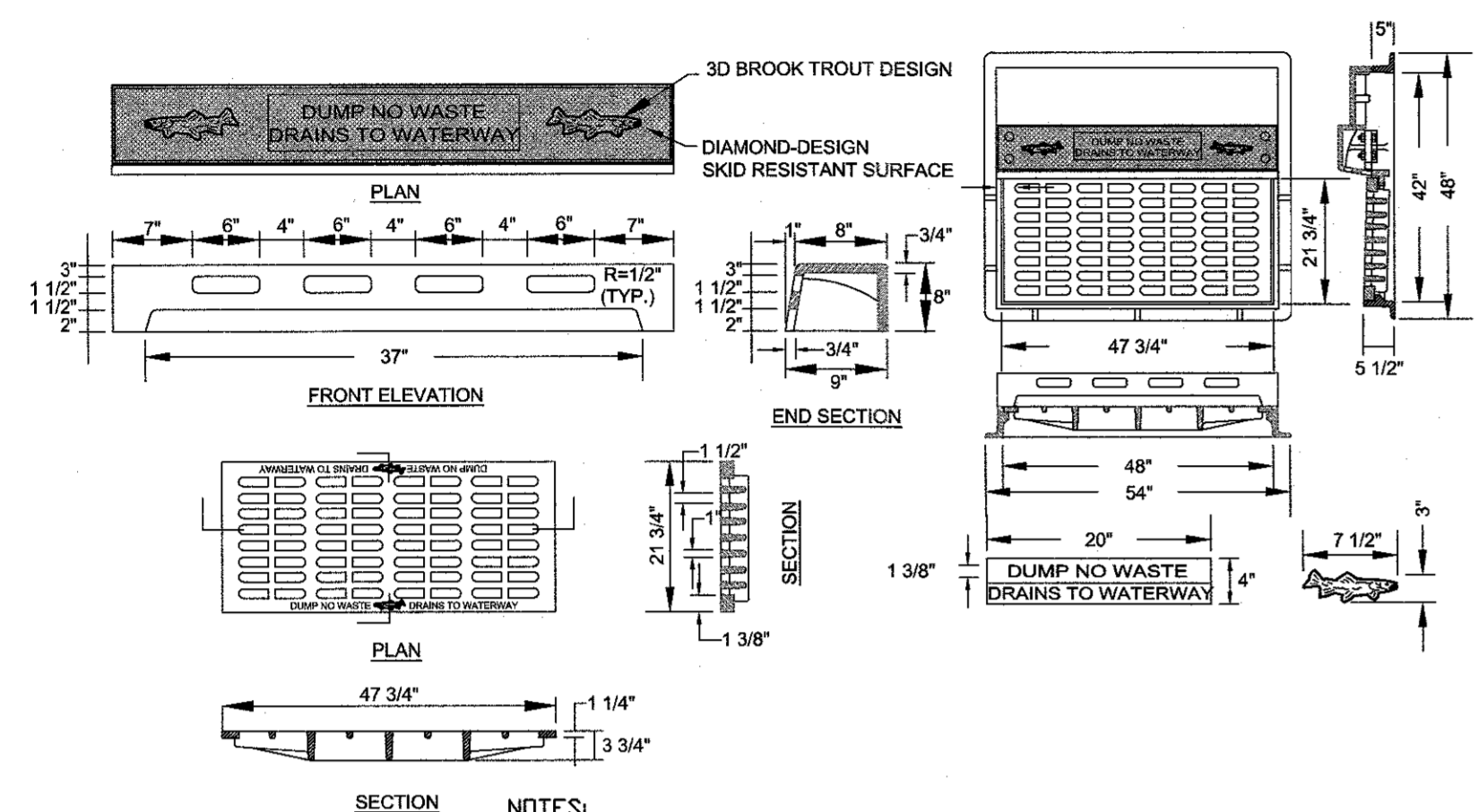
**CONCRETE SWALE CURB**  
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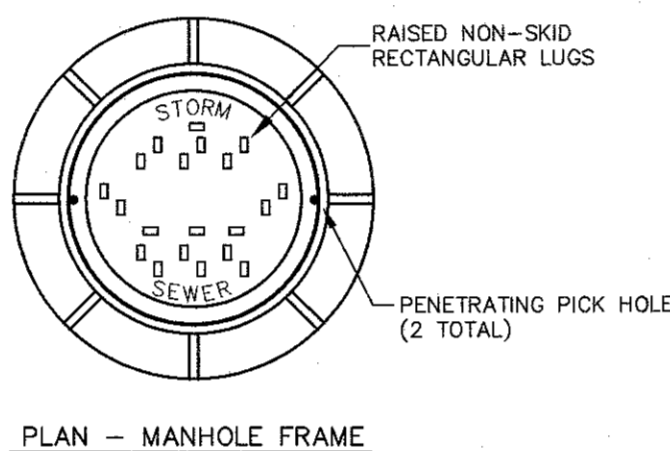
**6"x8"x18" CONCRETE CURB**  
NOT TO SCALE



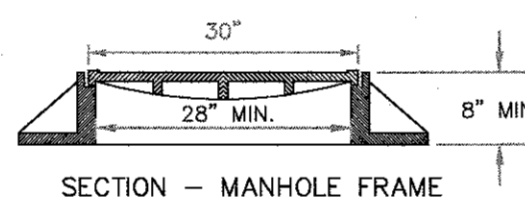
**HOT MIX ASPHALT CURB**  
NOT TO SCALE



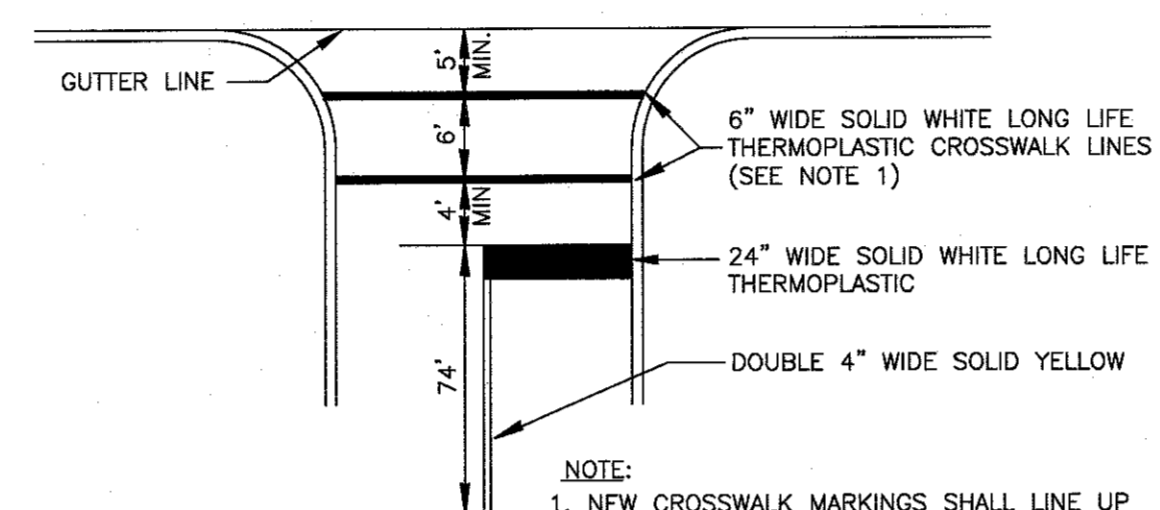
**NJDEP APPROVED INLET CASTINGS**  
NOT TO SCALE



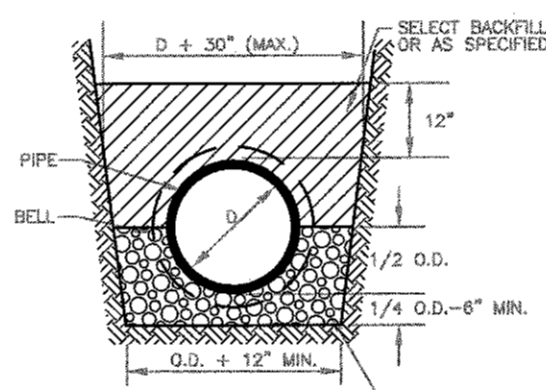
- GENERAL NOTES**
- MANHOLE FRAME AND COVER CASTINGS SHALL CONFORM TO THE LATEST ASTM A-48 CLASS 30 SPECIFICATION AND BE SUITABLE FOR HJ-20 LOADING CAPACITY.
  - FRAME AND COVERS SHALL BE COATED WITH TWO COATS OF ASPHALTUM VARNISH.
  - THE MANHOLE FRAME SHALL HAVE A MINIMUM OVERALL HEIGHT OF 8"
  - THE MANHOLE COVER THICKNESS SHALL BE A MINIMUM OF 2"



**STORM MANHOLE FRAME AND COVER**  
NOT TO SCALE

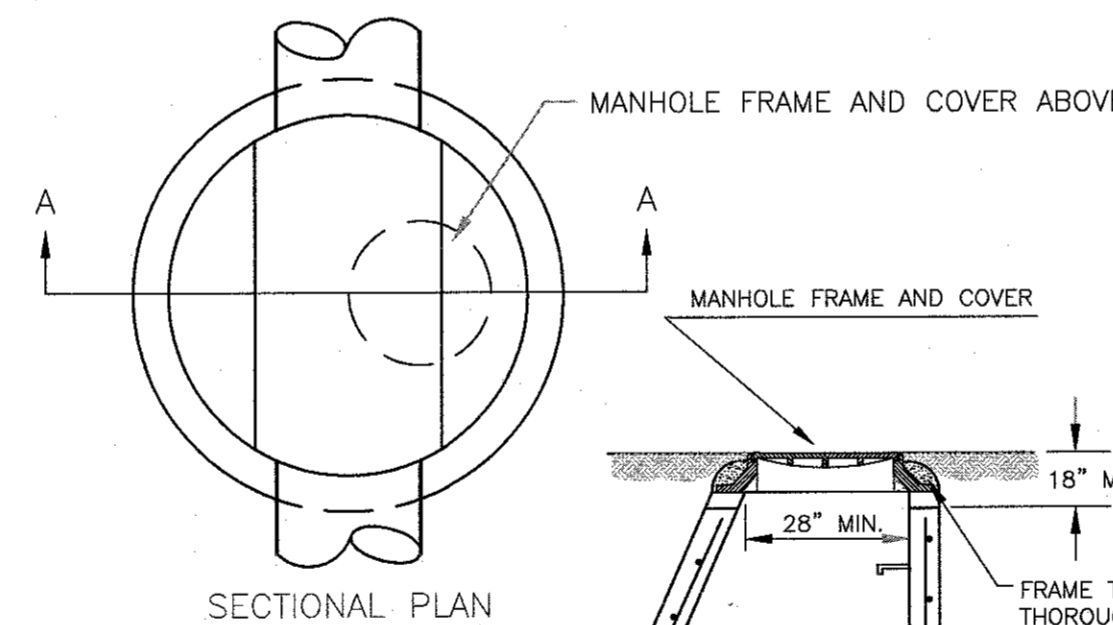


**CROSSWALK AND STOP LINE STRIPING DETAIL**  
NOT TO SCALE

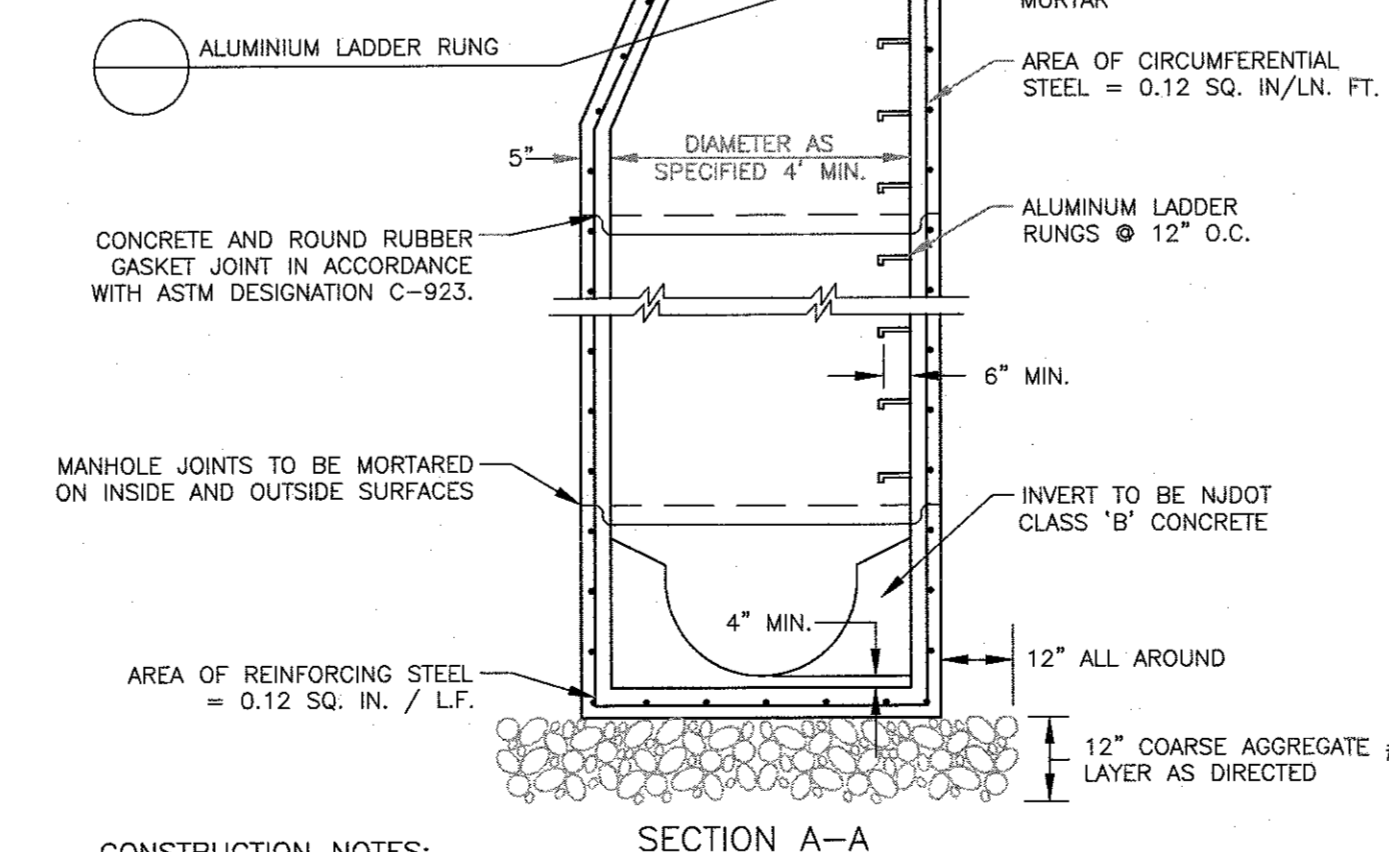


**CLASS 'C' BEDDING PIPE BEDDING**  
NOT TO SCALE

THERE WILL BE NO SEPARATE PAYMENT FOR STONE BEDDING. INCLUDE ALL COSTS IN THE VARIOUS PIPE BID ITEMS.



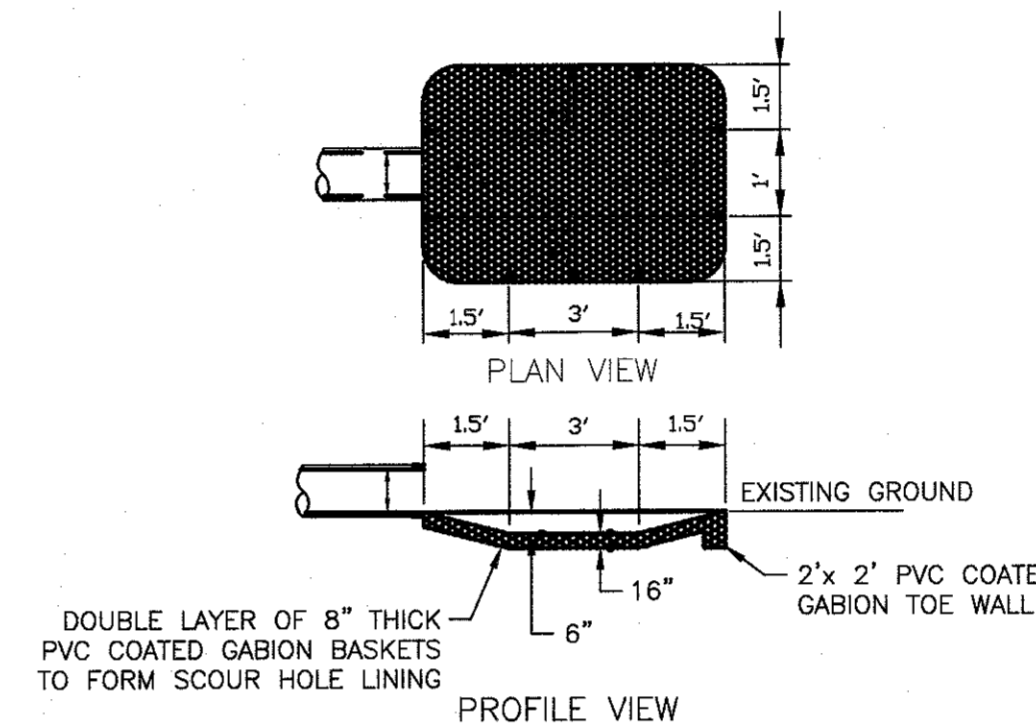
**SECTIONAL PLAN**



**SECTION A-A**

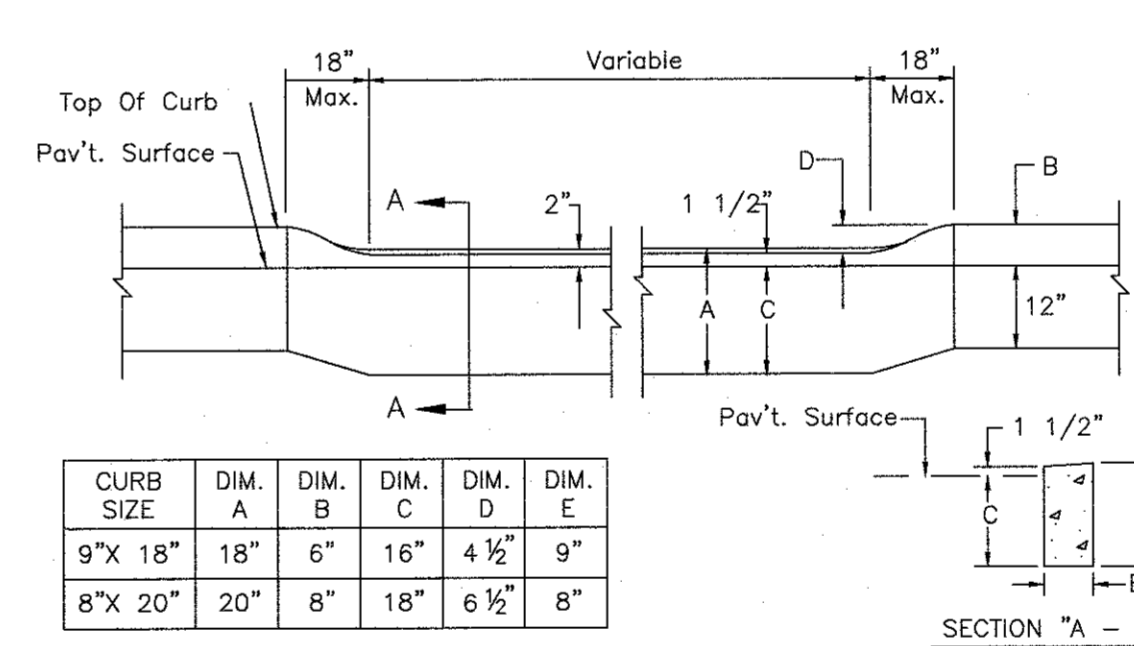
- CONSTRUCTION NOTES:**
- PRECAST MANHOLE SECTIONS TO BE ON ACCORDANCE WITH LATEST ASTM SPECIFICATION ASTM C-473 WITH RUBBER GASKET JOINTS, CONFORMING TO ASTM SPECIFICATION C-923. MAXIMUM ADSORPTION TO BE 8% IN ACCORDANCE WITH ASTM SPECIFICATION C-476.
  - MINIMUM COMPRESSION STRENGTH TO BE 4000 PSI.

**PRECAST DRAINAGE MANHOLE**  
NOT TO SCALE

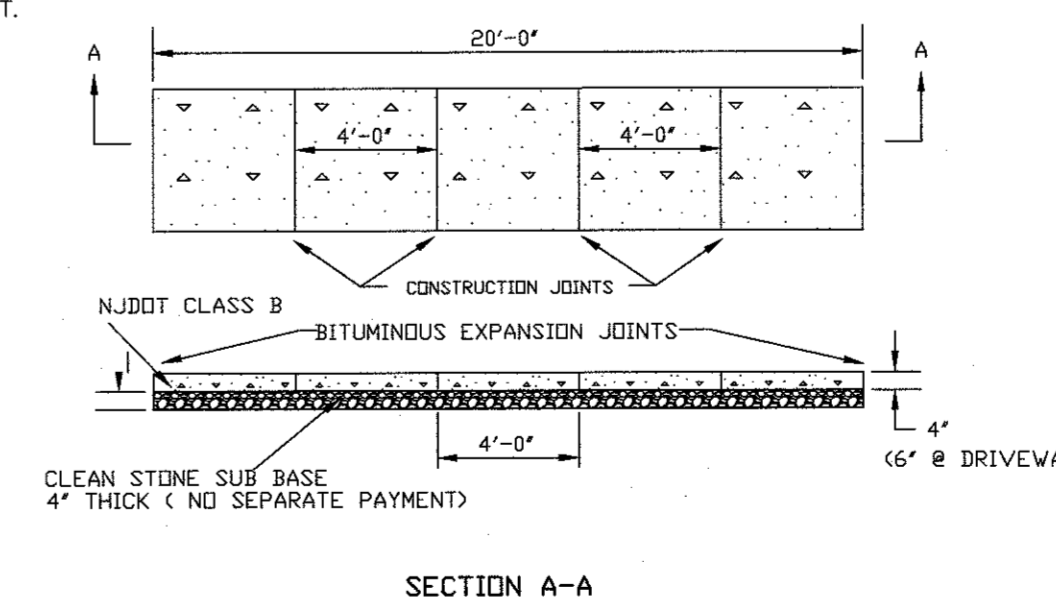


**SCOUR HOLE AT HEADWALL**  
N.T.S.

- NOTE:**
- GABIONS TO BE MANUFACTURED BY MACCAFERRI GABIONS, INC. OF RAMSEY, NJ (201)818-2661 OR EQUAL, AND THEY ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.



**METHOD OF DEPRESSING CURB AT DRIVEWAYS**  
NOT TO SCALE

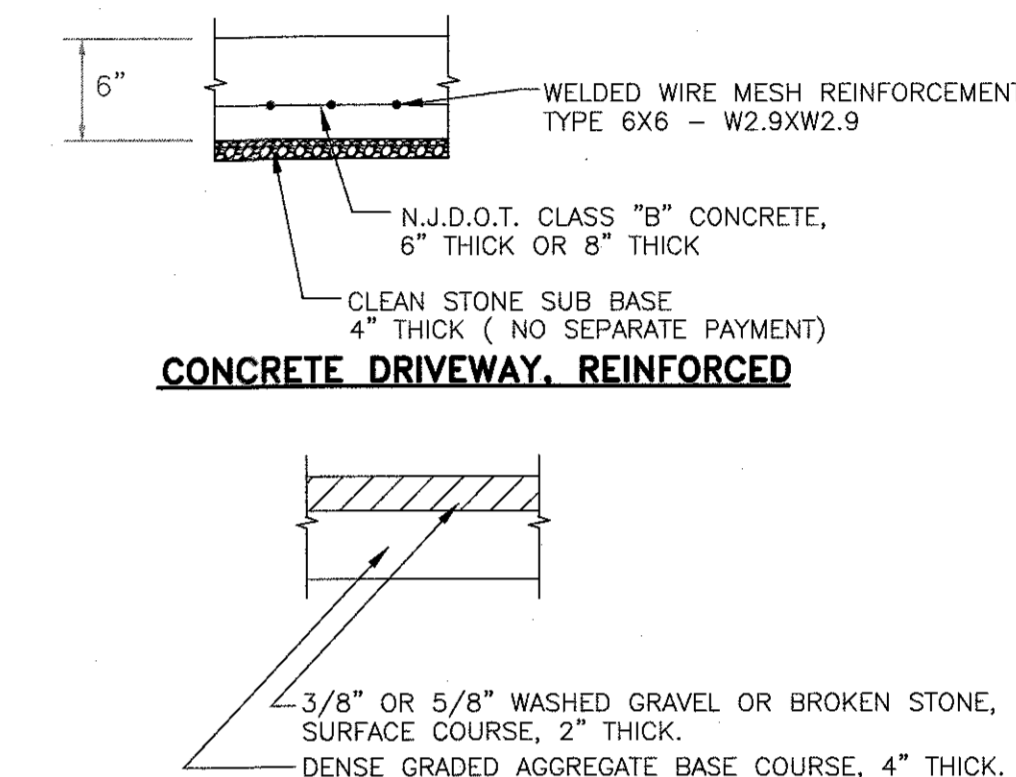


**SECTION A-A**

**CONSTRUCTION NOTES:**

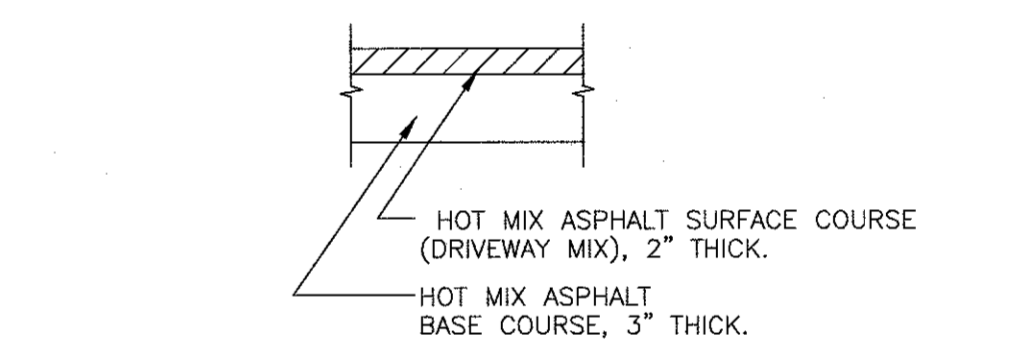
- A PREFORMED, BITUMINOUS EXPANSION JOINT 1/2" THICK, 4" WIDE, AND EXTENDING THE FULL WIDTH OF THE WALK, UNBROKEN, SHALL BE INSTALLED EVERY TWENTY (20) FEET.
- CONSTRUCTION JOINTS SHALL BE INSTALLED EVERY FOUR (4) FEET THE FULL WALK WIDTH.
- THERE SHALL BE A FLAT FINISH WITH THE EDGES FINISHED WITH A SUITABLE TOOL.
- SUB BASE SHALL BE 4" THICK CLEAN STONE. NO SEPARATE PAYMENT TO BE PROVIDED.

**CONCRETE SIDEWALK**  
NOT TO SCALE



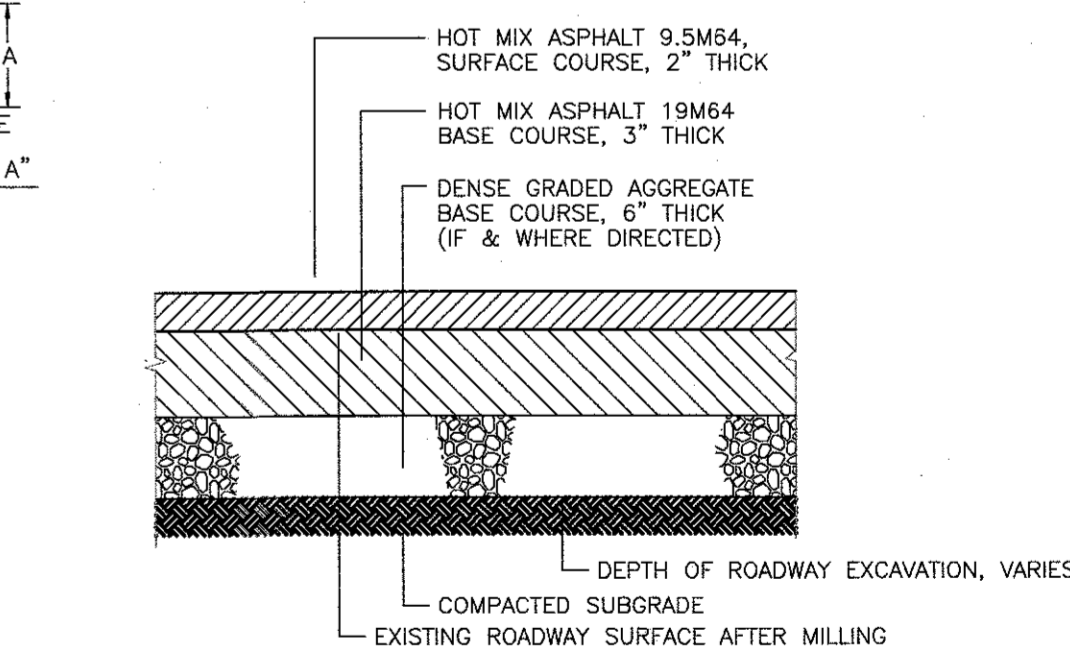
**CONCRETE DRIVEWAY, REINFORCED**

**DECORATIVE STONE DRIVEWAY**

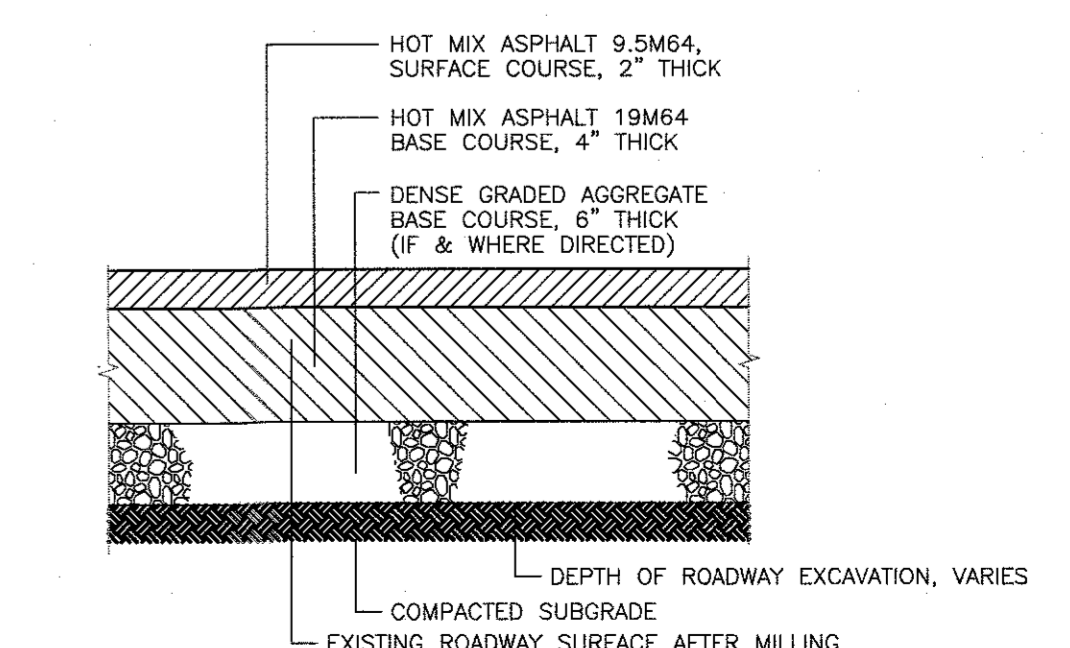


**HOT MIX ASPHALT DRIVEWAY**

**DRIVEWAYS**  
NOT TO SCALE



**TYPICAL PAVEMENT SECTION**  
NOT TO SCALE



**PAVEMENT SECTION- MILLER ST**  
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 STATE OF NJ LICENSE NO. 2462013100

**ROBERT R. KEADY, P.E., C.M.E.**  
 HIGHLANDS BOROUGH ENGINEER

**BOROUGH OF HIGHLANDS**  
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 HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY

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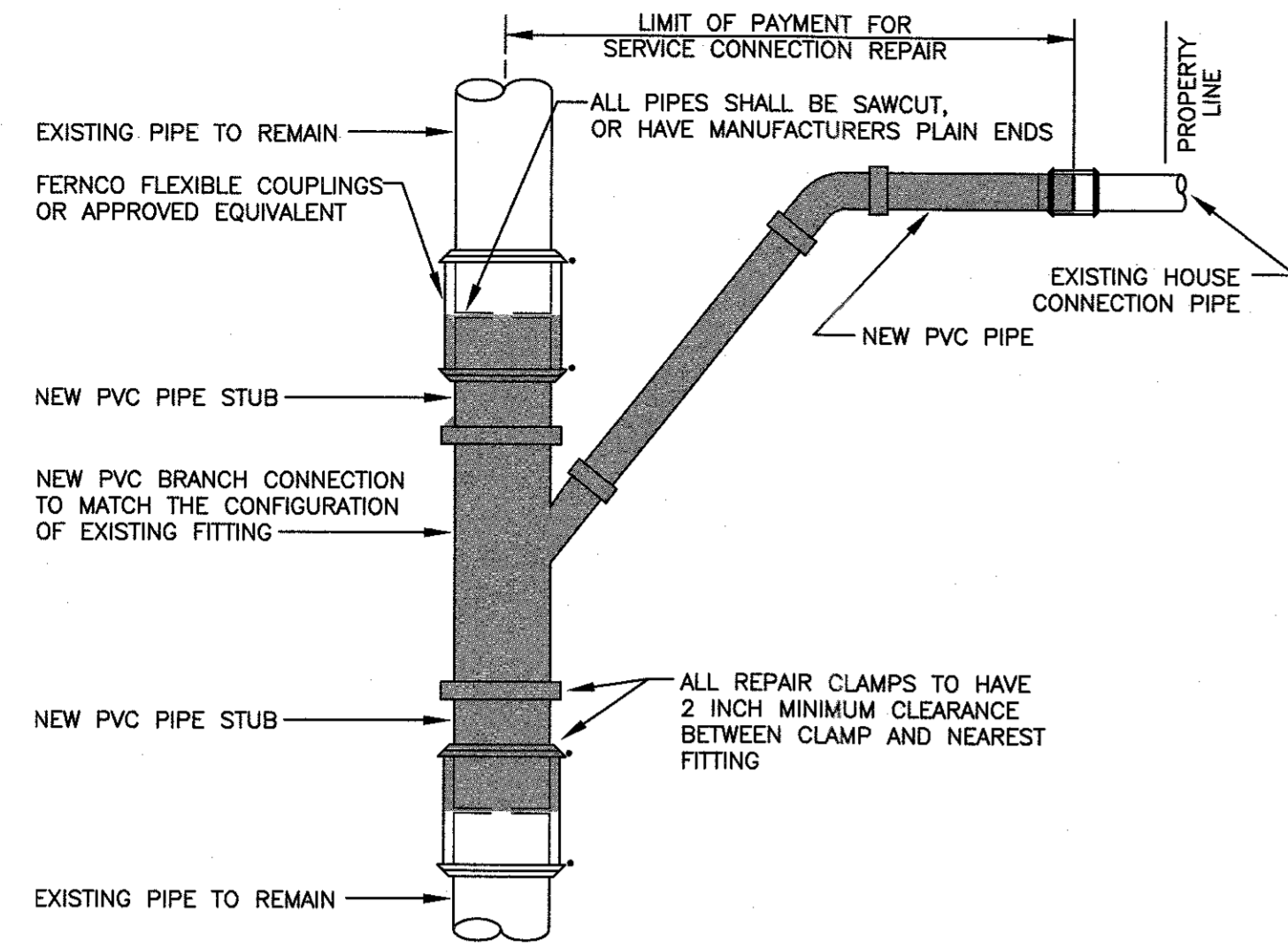
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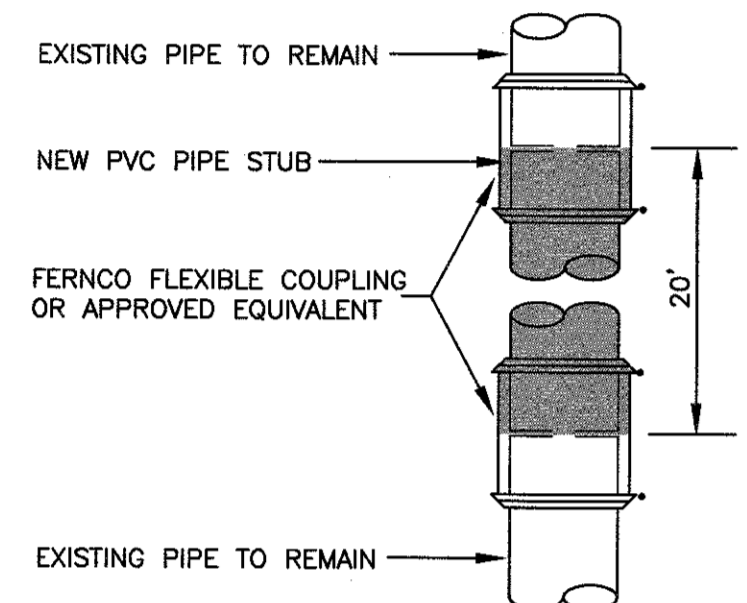
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CHECKED BY	RRK	SHEET	16
DRAWN BY	AWD	SCALE	AS SHOWN
DATE	7-10-2017	PROJ. NO.	HGHL-10763
SCALE	AS SHOWN	OF	24





SERVICE CONNECTION REPAIR

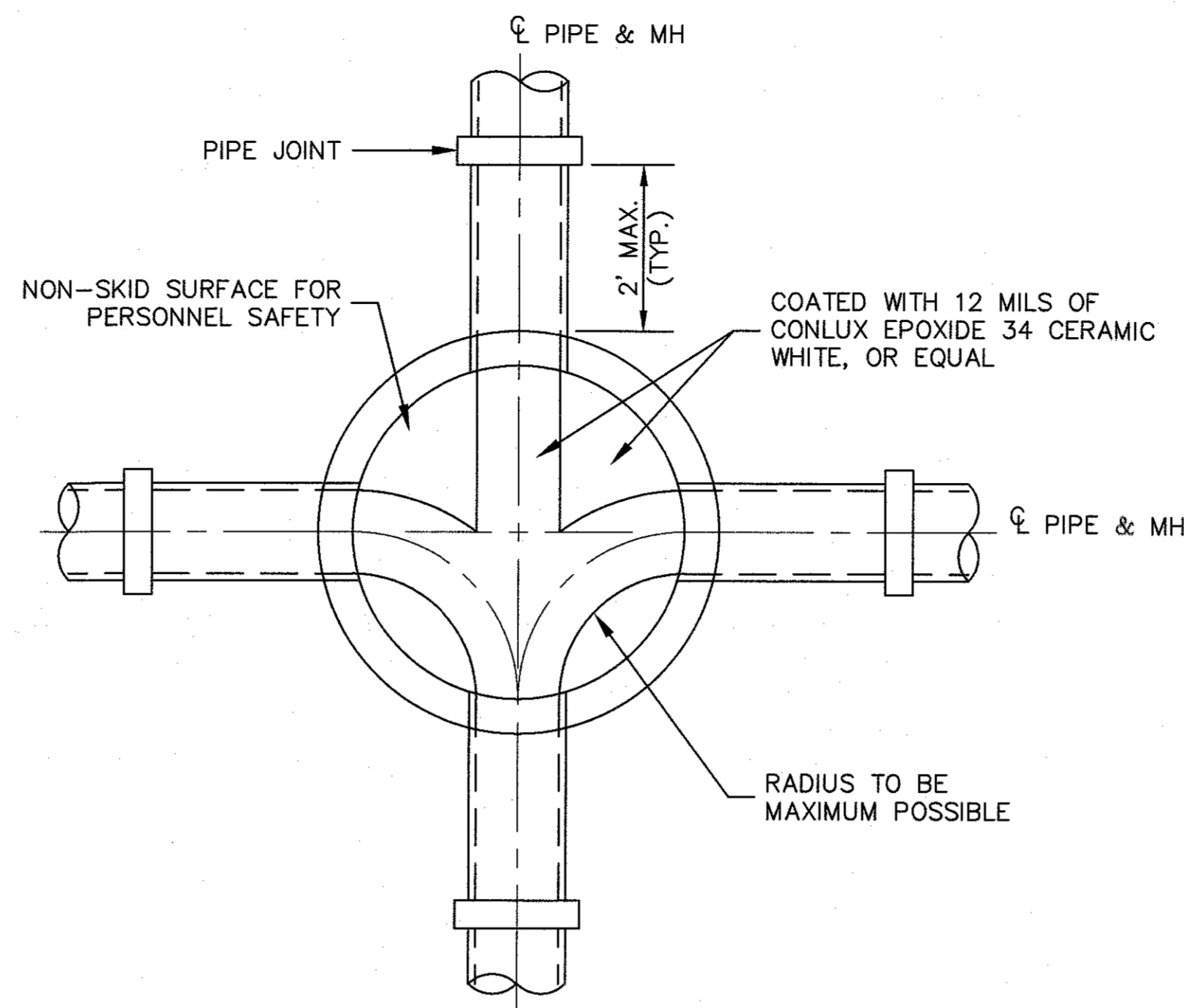


SEWER MAIN REPAIR

- CONSTRUCTION NOTES:**
- REPAIR CLAMPS SHALL BE OF THE PROPER SERIES TO MATCH THE OUTSIDE DIAMETERS OF THE PIPES BEING JOINED.
  - ALL REPLACEMENT PIPES AND FITTINGS SHALL BE OF THE SAME NOMINAL DIAMETERS AS THE EXISTING PIPE AND/OR FITTING.
  - ANY ADDITIONAL ADAPTERS OR FITTINGS REQUIRED TO CONNECT NEW PIPE TO EXISTING MANHOLES SHALL BE INSTALLED IN ACCORDANCE WITH SECTION "SANITARY SEWERS".

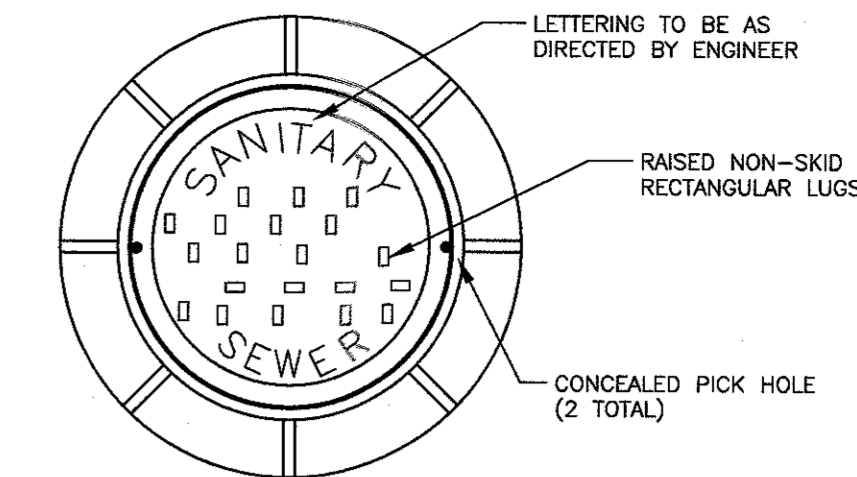
**TYPICAL SEWER AND SERVICE CONNECTION REPAIR**

NOT TO SCALE



**TYPICAL CHANNELING OF MANHOLE BOTTOM**

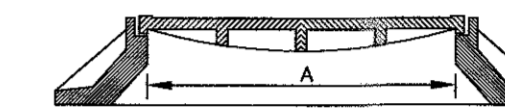
NOT TO SCALE



PLAN - MANHOLE FRAME

**CONSTRUCTION NOTES:**

- MANHOLE FRAME AND COVER CASTINGS SHALL CONFORM TO THE LATEST ASTM A-48 CLASS 30 SPECIFICATION.
- FRAME AND COVERS SHALL BE COATED WITH TWO COATS OF ASPHALTUM VARNISH.



SECTION - MANHOLE FRAME

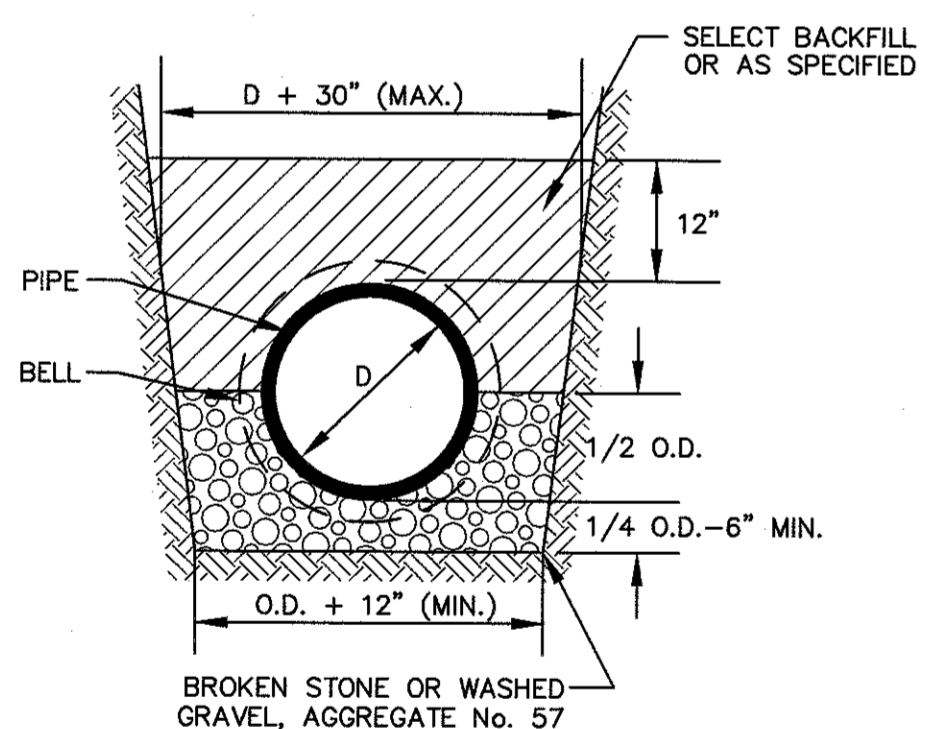
**MANHOLE COVERS AND FRAMES SHALL BE:**

STANDARD (HEAVY TRAFFIC TYPE)  
CAMPBELL FOUNDRY COMPANY - WATERTIGHT  
PATTERN NO. 1203

**DIMENSIONS:**  
NO. 1203  
A=24"

**WATERTIGHT MANHOLE FRAME AND COVER**

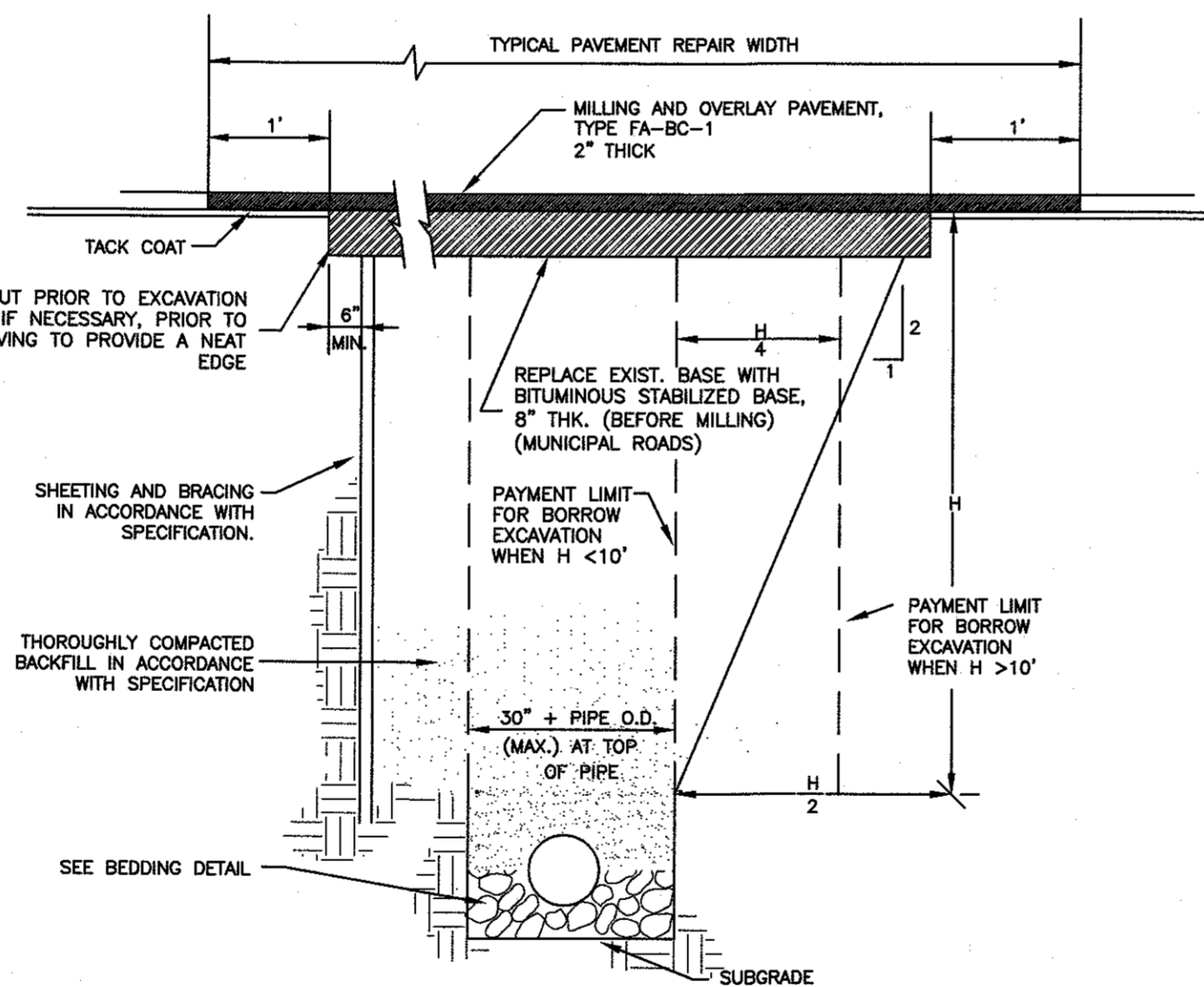
NOT TO SCALE



CLASS 'B' BEDDING

**TYPICAL PIPE BEDDING SEWER**

NOT TO SCALE

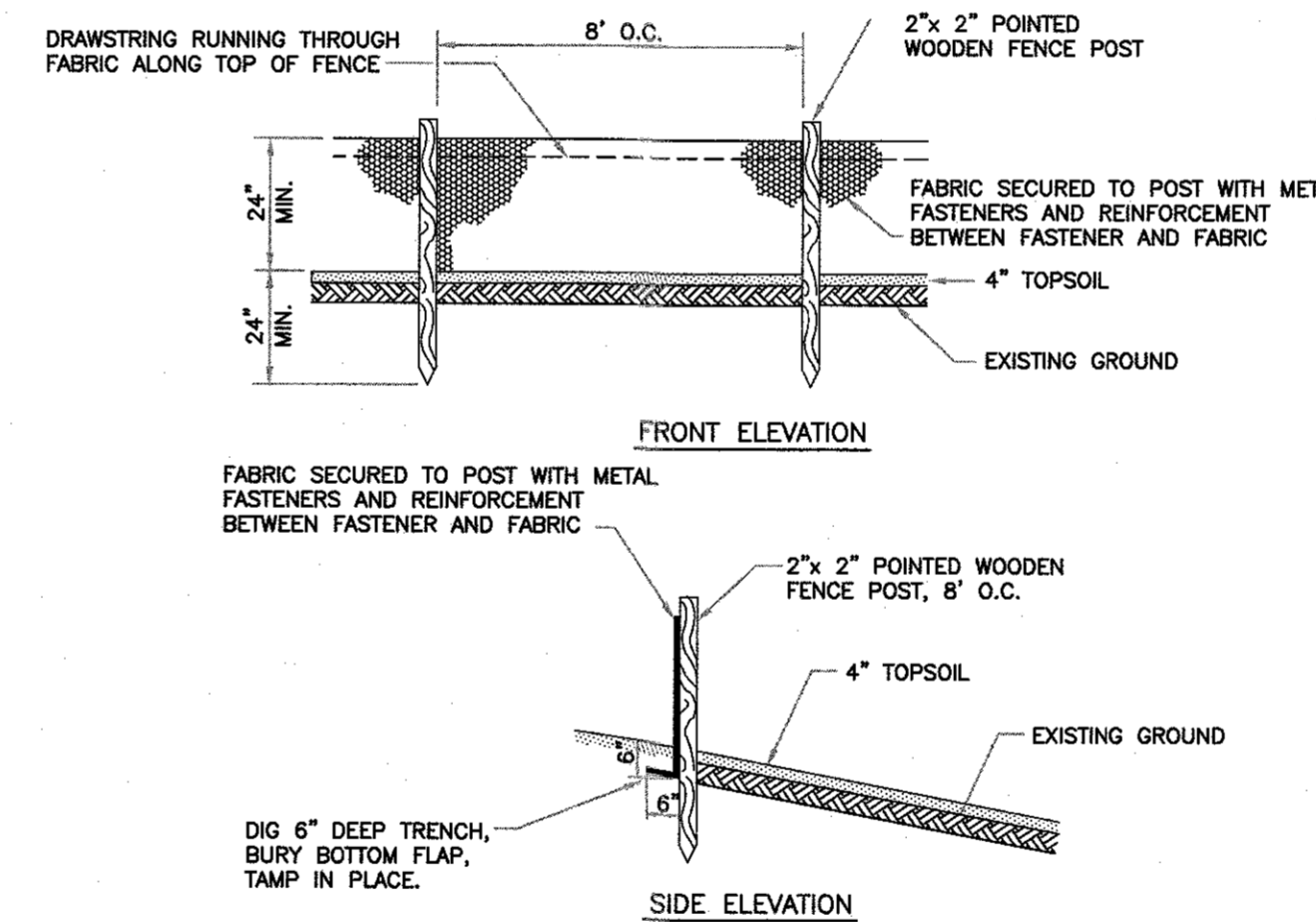


**CONSTRUCTION NOTES:**

- MAXIMUM PAYMENT WIDTH FOR BORROW EXCAVATION SHALL BE 30' + PIPE O.D., WHEN PLACED IN A TRENCH WITH DEPTH OF 10' OR LESS TO THE TOP OF THE PIPE. FOR TRENCHES OF GREATER DEPTH, THE MAXIMUM PAYMENT WIDTH FOR BORROW EXCAVATION SHALL BE 30' + PIPE O.D. + H/2.
- AT MANHOLES BITUMINOUS STABILIZED BASE IS TO BE PLACED 6" BEYOND THE TRENCH LIMIT OR 6" BEYOND DAMAGED PAVEMENT BASE COURSE WHICHEVER IS GREATER.
- SERVICE CONNECTION TRENCHES ARE TO BE REPAIRED AS ABOVE EXCEPT MAXIMUM OVERLAY PAY WIDTH SHALL BE 6'.
- ANY SUPERFICIAL SURFACE DAMAGE CAUSED BY THE CONTRACTOR OUTSIDE THE LIMIT SHOWN, SHALL BE PAVED WITH SURFACE COURSE. WHEN THE BASE COURSE OF THE EXISTING PAVEMENT IS DAMAGED BEYOND THE LIMIT SHOWN THE CONTRACTOR SHALL EXCAVATE 6" BEYOND THE DAMAGED AREA AND REPLACE IT WITH BITUMINOUS STABILIZED BASE COURSE. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS EXTRA PAVEMENT.

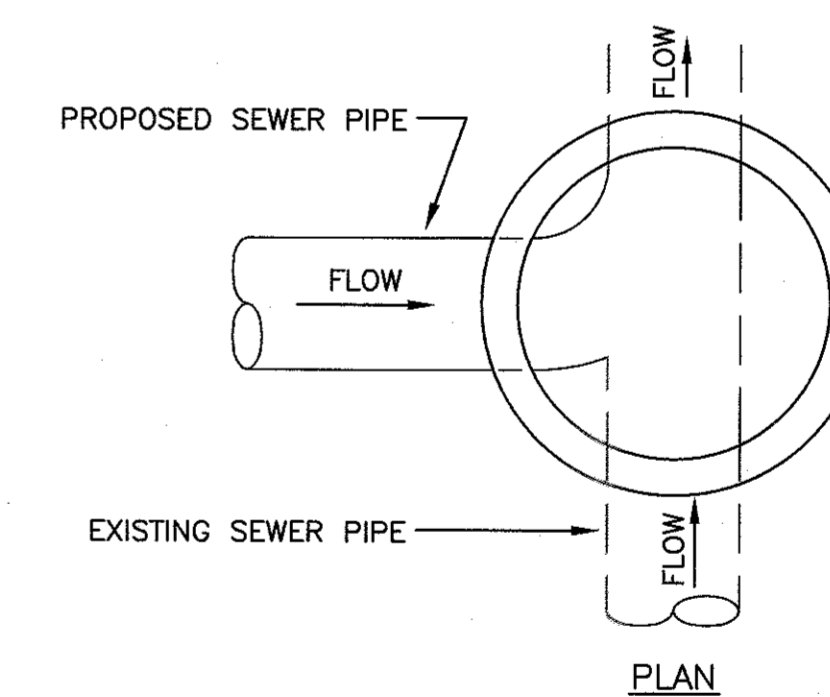
**TYPICAL TRENCH & PAVEMENT REPAIR DETAIL**

NOT TO SCALE

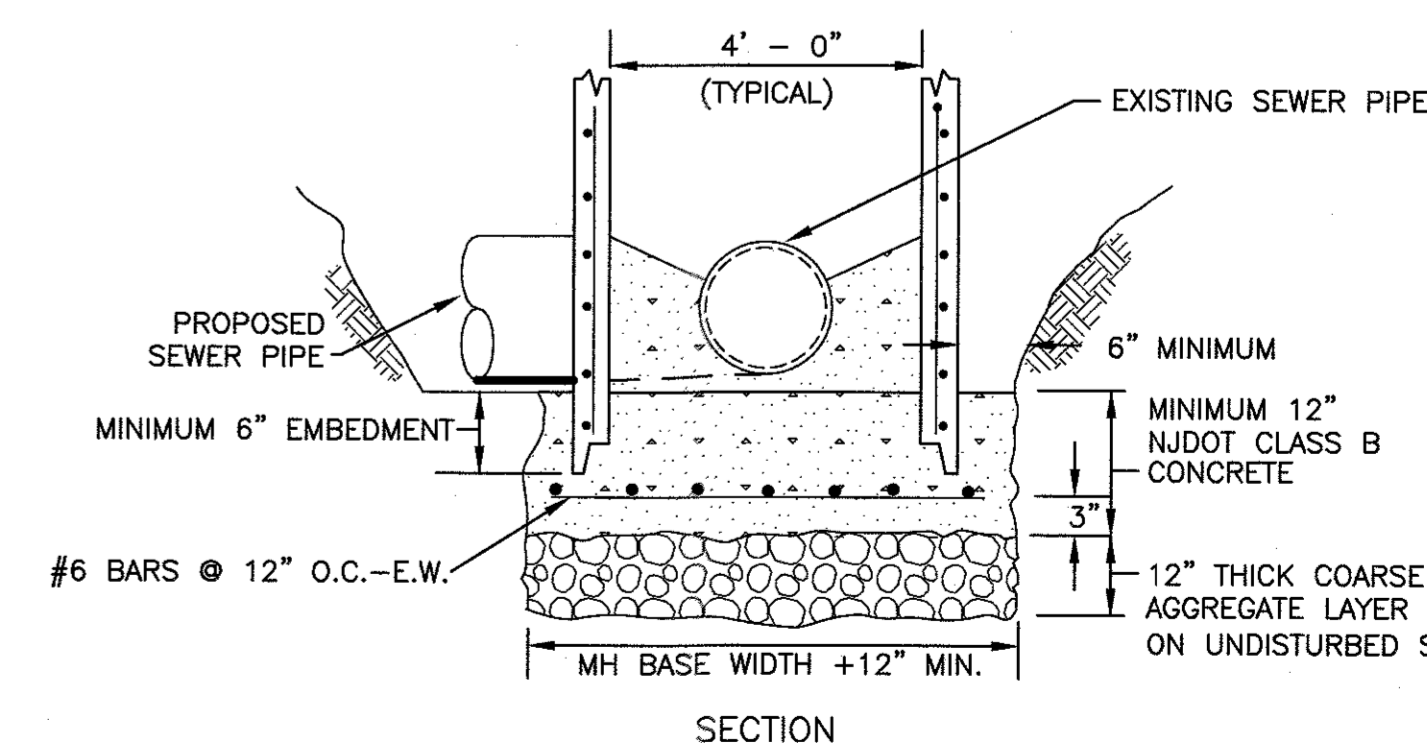


**SILT FENCE**

NOT TO SCALE



PLAN



SECTION

**CONSTRUCTION NOTES:**

- PRECAST MANHOLE SECTION TO BE IN ACCORDANCE WITH ASTM DESIGNATION C-478.

**DOGHOUSE MANHOLE**

N.T.S.

PROJECT INFORMATION:  
FILE PATH: C:\Projects\HIGHL-10763\Draws\...  
LAST SAVED DATE AND TIME: 15 Aug 2017, 3:22PM  
LAST SAVE BY: Avenagh

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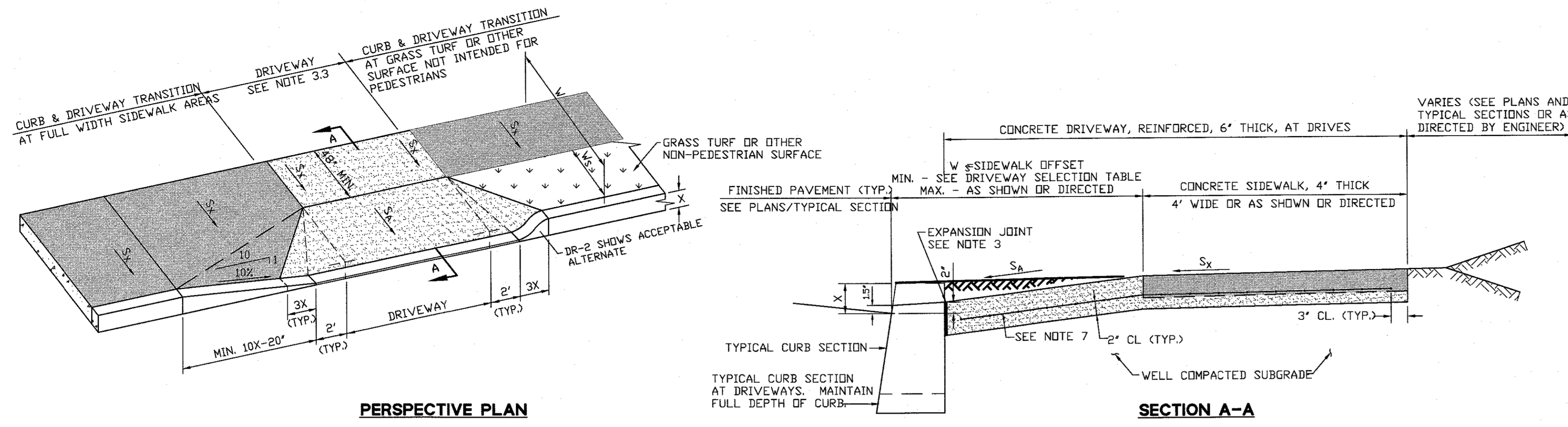
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 LICENSED PROFESSIONAL ENGINEER  
 STATE OF NJ LICENSE NO. 24GED0195100

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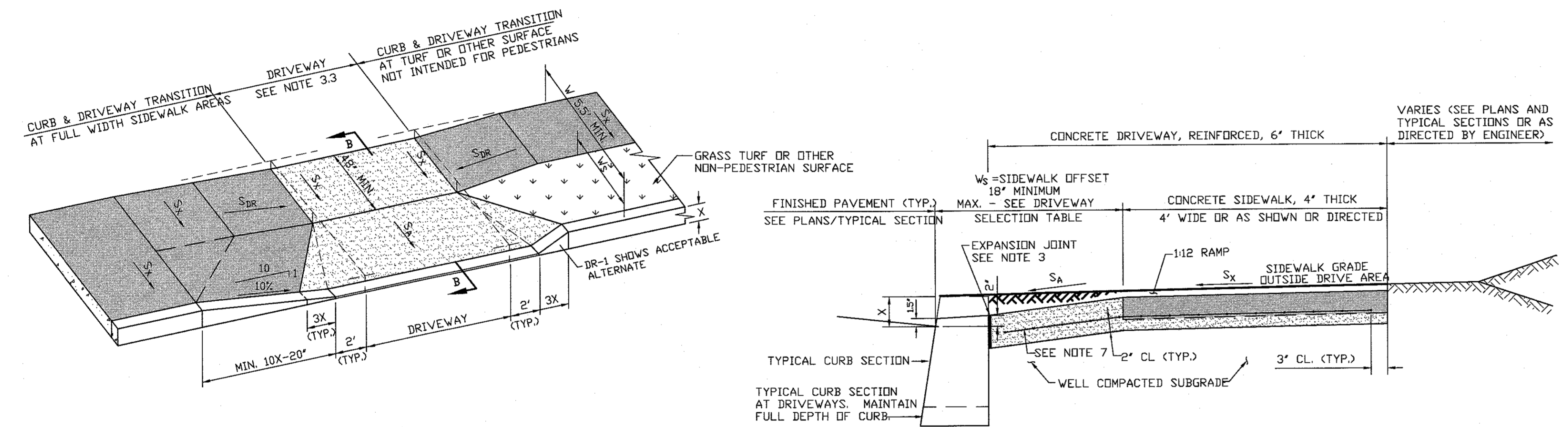
PERSPECTIVE PLAN

CONCRETE SIDEWALK, 4" THICK  
 CONCRETE DRIVEWAY, REINFORCED, 6" THICK

DETAIL DR-1

CONCRETE DRIVEWAY TYPE 1 - LARGE SIDEWALK OFFSET

NOT TO SCALE

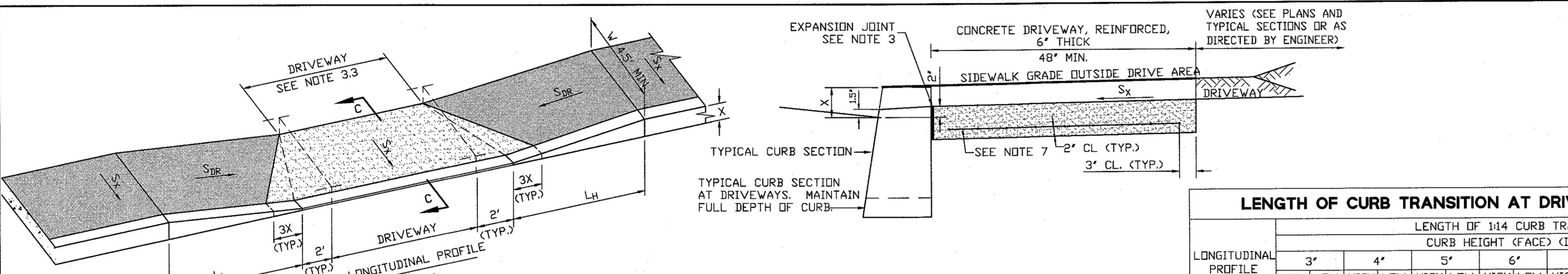


PERSPECTIVE PLAN

DETAIL DR-2

CONCRETE DRIVEWAY TYPE 2 - INTERMEDIATE SIDEWALK OFFSET

NOT TO SCALE



PERSPECTIVE PLAN

DETAIL DR-3

CONCRETE DRIVEWAY TYPE 3 - MINIMUM SIDEWALK OFFSET

NOT TO SCALE

LENGTH OF CURB TRANSITION AT DRIVEWAY TABLE (FOR DR-3)

LONGITUDINAL PROFILE (Sp %)	LENGTH OF 14\"/>															
	3'		4'		5'		6'		7'		8'		9'		10'	
	HIGH SIDE (L <sub>H</sub> )	LOW SIDE (L <sub>L</sub> )	HIGH SIDE (L <sub>H</sub> )	LOW SIDE (L <sub>L</sub> )	HIGH SIDE (L <sub>H</sub> )	LOW SIDE (L <sub>L</sub> )	HIGH SIDE (L <sub>H</sub> )	LOW SIDE (L <sub>L</sub> )	HIGH SIDE (L <sub>H</sub> )	LOW SIDE (L <sub>L</sub> )	HIGH SIDE (L <sub>H</sub> )	LOW SIDE (L <sub>L</sub> )	HIGH SIDE (L <sub>H</sub> )	LOW SIDE (L <sub>L</sub> )	HIGH SIDE (L <sub>H</sub> )	LOW SIDE (L <sub>L</sub> )
SEE NOTE 2	1'2"	1'2"	2'4"	2'4"	3'6"	3'6"	4'9"	4'9"	5'10"	5'10"	7'0"	7'0"	8'2"	8'2"	9'5"	9'5"
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0.3	1'2"	1'1"	2'5"	2'5"	3'8"	3'8"	3'4"	4'10"	4'6"	6'1"	4'7"	6'8"	7'10"	7'10"	8'11"	8'11"
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1.50	1'5"	1'1"	2'11"	1'11"	4'5"	2'11"	5'11"	3'10"	6'10"	4'10"	6'9"	6'9"	7'8"	7'8"	8'8"	8'8"
2.00	1'7"	1'2"	3'2"	1'10"	4'10"	2'9"	6'6"	3'7"	6'7"	4'7"	6'8"	6'8"	7'6"	7'6"	8'6"	8'6"
2.50	1'9"	1'3"	3'6"	1'8"	5'4"	2'7"	6'5"	3'5"	6'6"	4'4"	6'9"	6'9"	7'6"	7'6"	8'6"	8'6"
3.00	2'0"	1'4"	4'0"	1'7"	6'0"	2'5"	6'0"	3'3"	6'7"	4'4"	6'11"	6'11"	7'6"	7'6"	8'6"	8'6"
3.50	2'3"	1'6"	4'6"	1'6"	6'10"	2'4"	6'10"	3'1"	6'8"	4'4"	6'11"	6'11"	7'6"	7'6"	8'6"	8'6"
4.00	2'7"	1'8"	5'2"	1'6"	6'2"	2'3"	6'2"	3'0"	6'9"	4'6"	6'11"	6'11"	7'6"	7'6"	8'6"	8'6"
4.50	3'1"	1'9"	6'2"	1'5"	6'2"	2'2"	6'2"	2'10"	6'7"	4'7"	6'11"	6'11"	7'6"	7'6"	8'6"	8'6"
5.00	3'5"	2'0"	6'8"	1'4"	6'1"	2'0"	6'1"	2'9"	6'5"	4'1"	6'11"	6'11"	7'6"	7'6"	8'6"	8'6"
5.50	4'1"	2'1"	7'4"	1'4"	6'1"	1'11"	6'1"	2'7"	6'3"	4'1"	6'11"	6'11"	7'6"	7'6"	8'6"	8'6"

NOTES:  
 1. INTERPOLATE BETWEEN SLOPES SHOWN AS REQUIRED.  
 2. NO ADJUSTMENT FOR PROFILE SLOPES LESS THAN 0.2%.  
 3. CONSULT ENGINEER FOR PROFILE SLOPES GREATER THAN 5.5%.

GENERAL NOTES:

- CONCRETE FOR CURBS, DRIVEWAYS AND SIDEWALKS SHALL BE NJDOT CLASS B. DRIVEWAY CONCRETE SHALL ATTAIN A STRENGTH OF NOT LESS THAN 3000 PSI WITHIN 3 DAYS OF PLACEMENT.
- CURB, DRIVEWAYS AND SIDEWALKS SHALL BE CAST IN SEPARATE OPERATIONS UNLESS OTHERWISE PERMITTED BY THE ENGINEER.
- EXPANSION JOINTS WITH PREFORMED EXPANSION JOINT FILLER CONFORMING TO AASHTO M33, PREFORMED EXPANSION JOINT FILLER FOR CONCRETE (BITUMINOUS TYPE), SHALL BE PROVIDED AS FOLLOWS:
  - 1/2" THICK AT LONGITUDINAL INTERVALS OF APPROXIMATELY TWENTY FEET (20');
  - 1/4" THICK BETWEEN CURB AND SIDEWALK OR DRIVEWAYS, AROUND ALL STRUCTURES OR APPURTENANCES, SUCH AS MANHOLES, JUNCTION BOXES AND UTILITY POLES, AND ADJACENT TO ANY FIXED STRUCTURE;
  - AT LONGITUDINAL CENTERLINE OF ANY DRIVE WHICH EXCEEDS TWELVE FEET (12') IN WIDTH OR AS DIRECTED BY ENGINEER.
- EXPANSION JOINT MATERIAL SHALL BE TRIMMED AS TO BE SLIGHTLY BELOW THE SURFACE OF THE CONCRETE.
- TOOLED JOINTS SHALL BE PROVIDED WITH A GROOVING TOOL SO AS TO DIVIDE THE CONCRETE SURFACE INTO BLOCKS AS CLOSELY APPROACHING A SQUARE AS PRACTICABLE. GROOVES SHALL BE CUT TO A DEPTH OF AT LEAST 1/2 INCH AND SHALL BE FINISHED WITH AN EDGING TOOL HAVING A RADIUS OF 1/4 INCH.
- UNLESS OTHERWISE DIRECTED BY THE ENGINEER, EXPANSION AND TOOLED JOINTS IN CONCRETE SURFACES SHALL BE ALIGNED WITH JOINTS IN CURBS.
- WELDED WIRE FABRIC IN DRIVEWAYS SHALL BE 6X6-6X6 (OLD DESIGNATION), 6X6-W2.9XW2.9 (NEW DESIGNATION) IN ACCORDANCE WITH ASTM A-185.

DRIVEWAY DESIGN SLOPE AND TOLERANCES TABLE

SYMBOL	DESCRIPTION	SLOPES (NOTE 1)		
		DESIGN (NOMINAL)	MINIMUM	MAXIMUM
S <sub>x</sub>	CROSS SLOPE OF PUBLIC SIDEWALK	1/60 1.67% 3/4" PER 4' 3/16" PER 1'	1/72 1.4% 5/8" PER 4' 3/16" PER 1'	1/50 2% 2%
S <sub>DR</sub>	LONGITUDINAL (RUNNING) SLOPE OF DRIVEWAY TRANSITION RAMP	NORMAL RANGE MINIMUM 1/36 2.8% 1 1/4" PER 4' 5/16" PER 1' MAXIMUM 1/14 7.1% 3/4" PER 4' APPROX 7/8" PER 1' (NOTE 2)	1/50 2%	1/12 8.3% (NOTE 2)
S <sub>A</sub>	LONGITUDINAL (RUNNING) SLOPE OF DRIVEWAY APRON	1/10 10% 1 1/4" PER 1'	1/50 2%	1/8 12.5% 1 1/2" PER 1'

- NOTES:  
 1. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, CONSTRUCTION WHICH DOES NOT CONFORM TO THE TOLERANCES SPECIFIED (i.e. WHICH EXCEEDS THE MAXIMUM OR IS LESS THAN THE MINIMUM) WILL BE REMOVED AND REPLACED WITHOUT COST TO THE OWNER.  
 2. IF S<sub>DR</sub> EXCEEDS 1/20 (5%), THE MAXIMUM VERTICAL RISE PERMITTED IS 6'. WHEN THIS CANNOT BE ACHIEVED IN THE ALTERATION OF EXISTING FACILITIES, CONSULT THE ENGINEER.

DRIVEWAY SELECTION TABLE

CURB FACE (X) (INCHES)	W LESS THAN (INCHES)	W <sub>s</sub> (FEET)															
		1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0						
3	5.5'	1'8"															
4			2'8"														
5				3'8"													
6					4'8"												
7						5'8"											
8							6'8"										
9								7'8"									
10									8'8"								

AT DESIGN (NOMINAL) APRON SLOPE (S<sub>A</sub>)

PROJECT INFORMATION: (LOCAL) 10763A (08-16-17)  
 FILE NAME: 10763A-SHTD18.CSD.dwg  
 LAST SAVED DATE AND TIME: 15 Aug 2017, 1:53PM  
 LAST SAVE BY: mactortorena  
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**BOROUGH OF HIGHLANDS**  
**2017 CAPITAL ROAD IMPROVEMENTS**  
 HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY  
**CONSTRUCTION DETAILS**

**YOUR GOALS. OUR MISSION.**

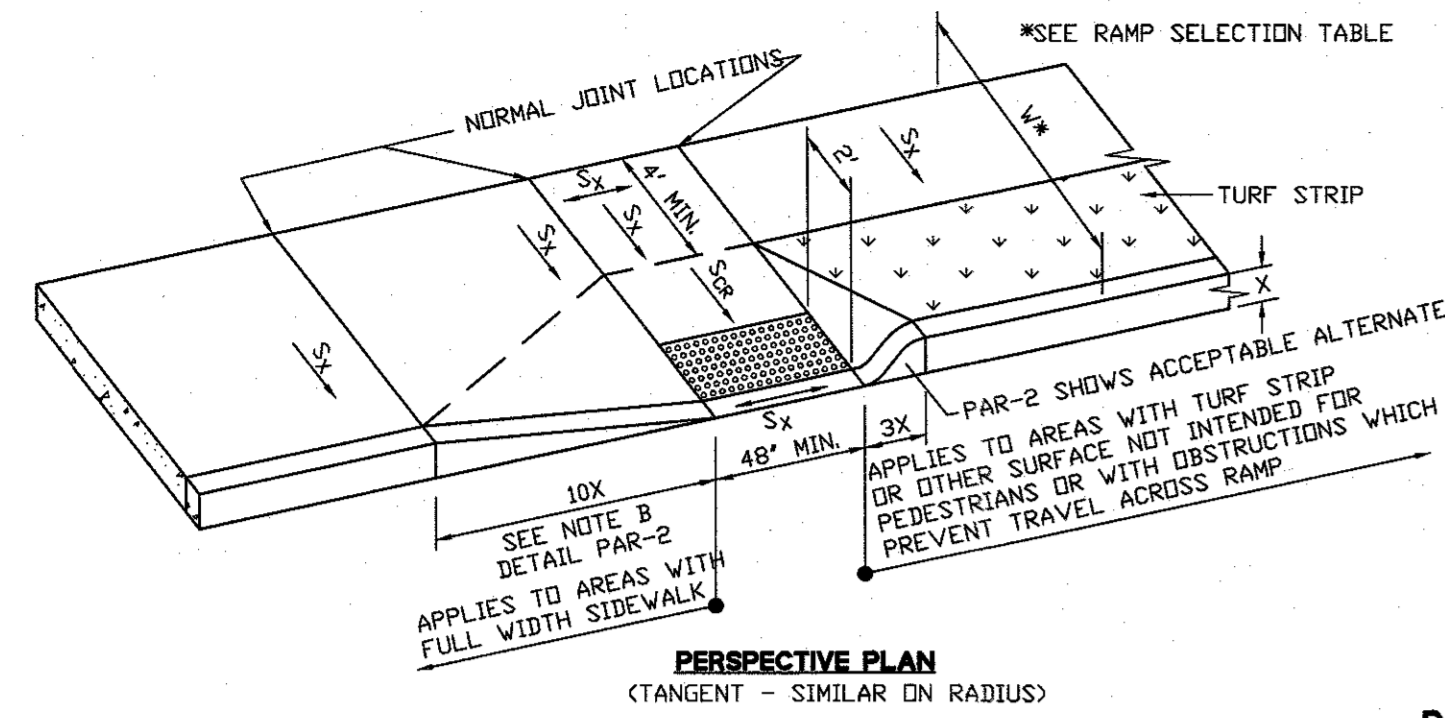
11 TINDALL ROAD  
 MIDDLETOWN, NJ 07748  
 TEL 732-671-8400  
 FAX 732-671-7365

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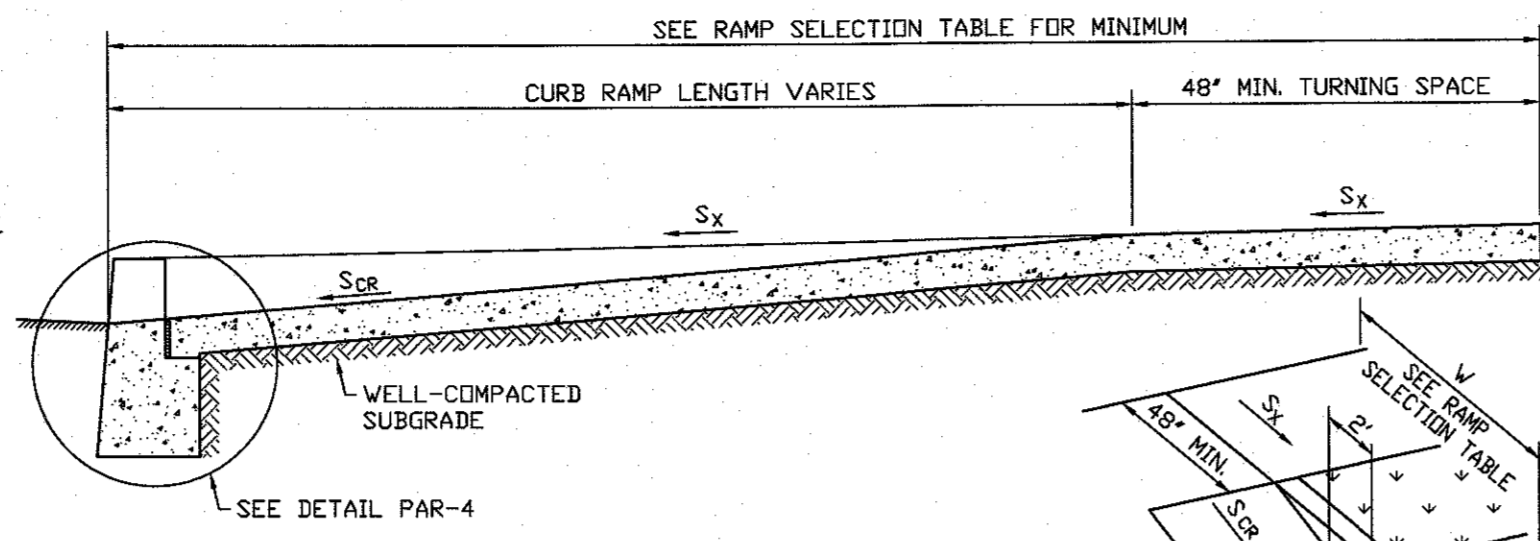
OFFICES LOCATED IN:  
 DELAWARE, INDIANA, KENTUCKY,  
 MASSACHUSETTS, MICHIGAN, NEW JERSEY,  
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DESIGNED BY	DMD	DRAWING	
CHECKED BY	RRK	CSD-3	
DRAWN BY	AWD	SHEET	
DATE	7-10-2017	18	
SCALE	AS SHOWN	OF	24
PROJ. NO.	HGHL-10763		

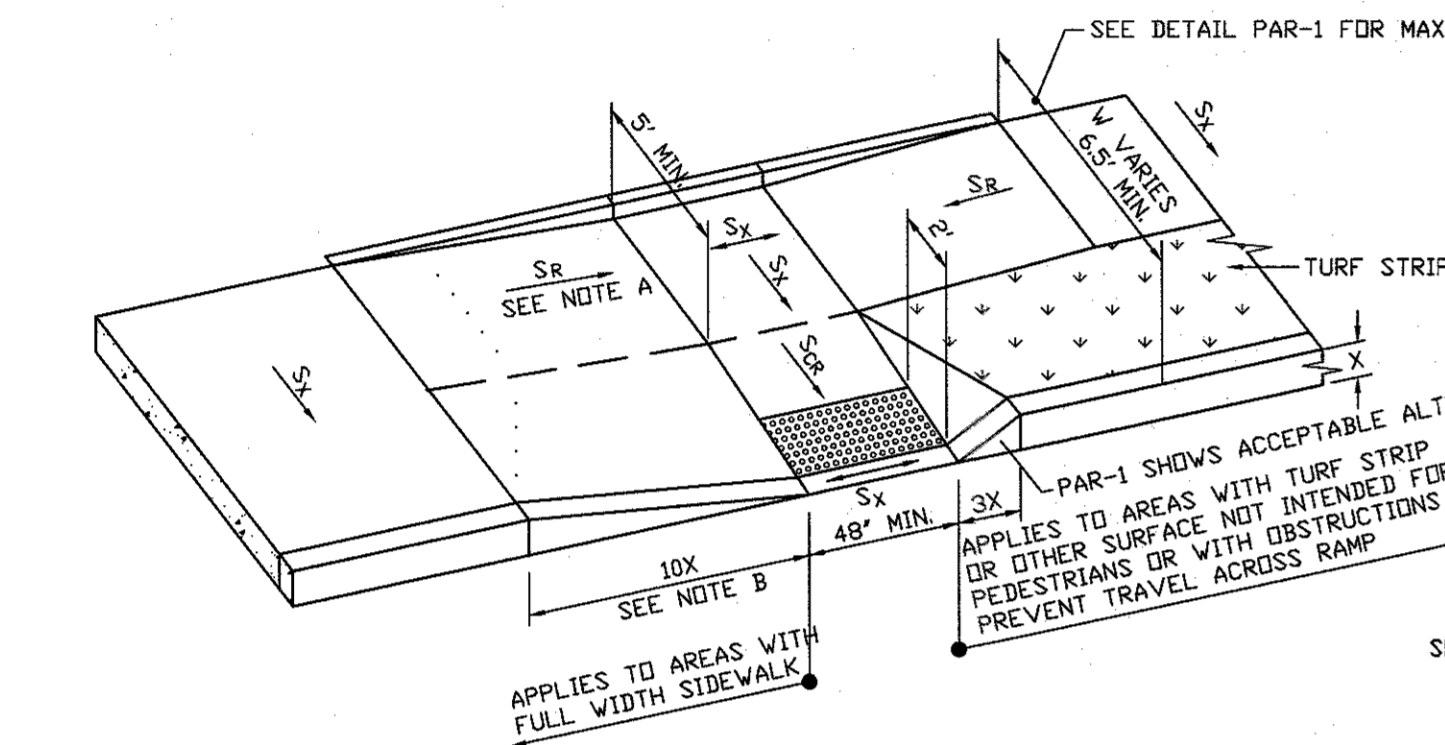
08/16/2017  
 LICENSED PROFESSIONAL ENGINEER  
 STATE OF NJ LICENSE NO. 24604195.100



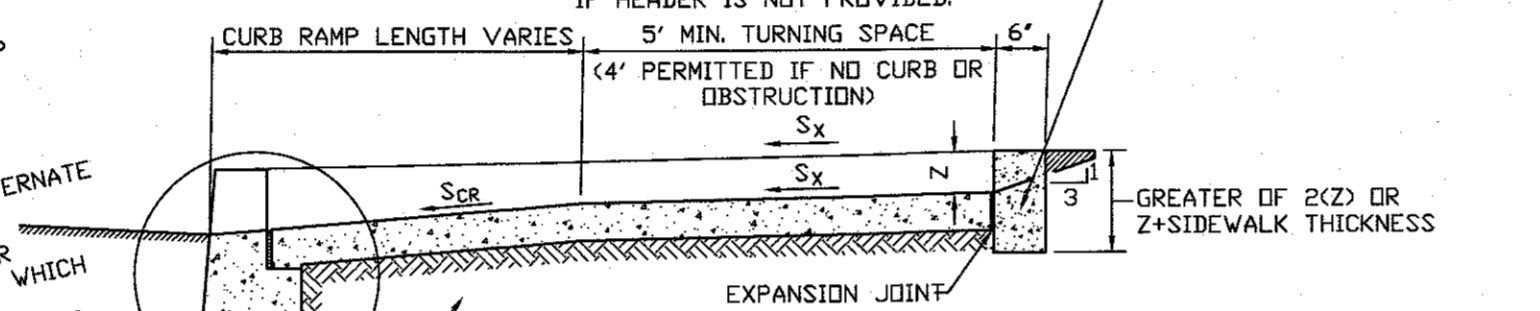
**DETAIL PAR-1**  
**PERPENDICULAR PUBLIC SIDEWALK CURB RAMP**  
NOT TO SCALE



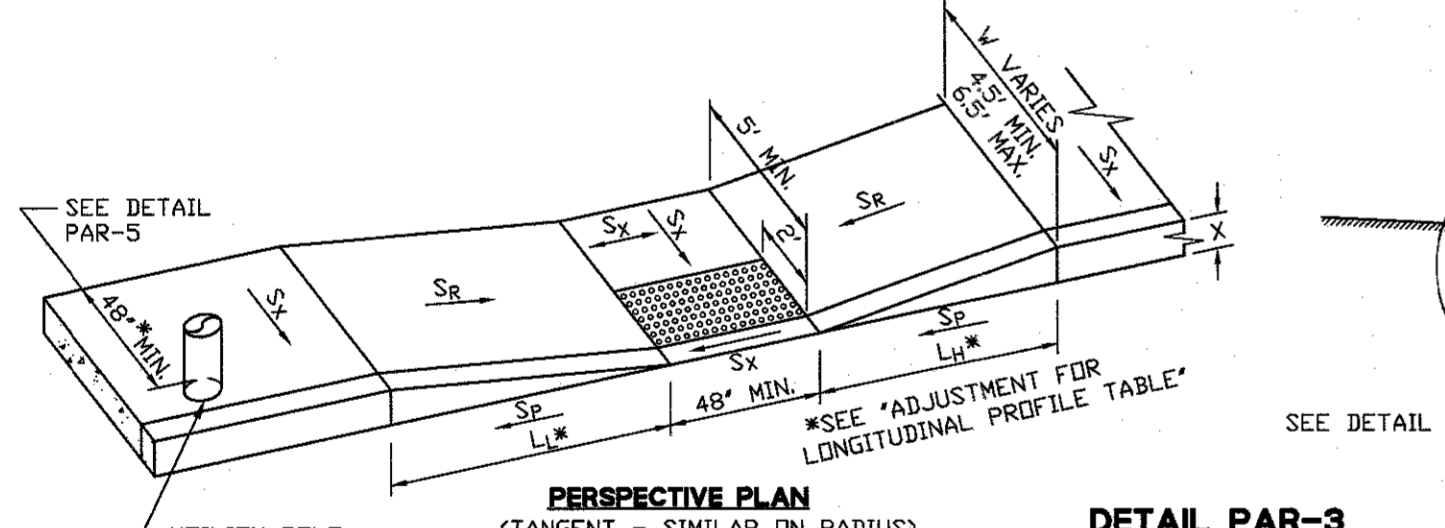
**DETAIL PAR-1A**  
**ALTERNATIVE CURB TRANSITION**  
WHERE SHOWN OR DIRECTED  
NOT TO SCALE



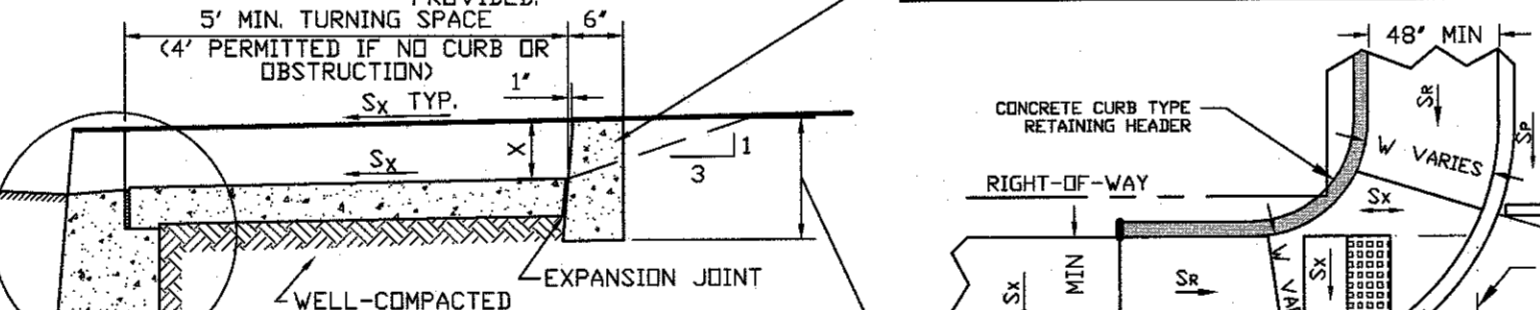
**DETAIL PAR-2**  
**COMBINATION (PERPENDICULAR AND PARALLEL) PUBLIC SIDEWALK CURB RAMP**  
(APPLIES TO RAMPS WHERE DETAILS  
PAR-1 AND PAR-3 DO NOT APPLY)  
NOT TO SCALE



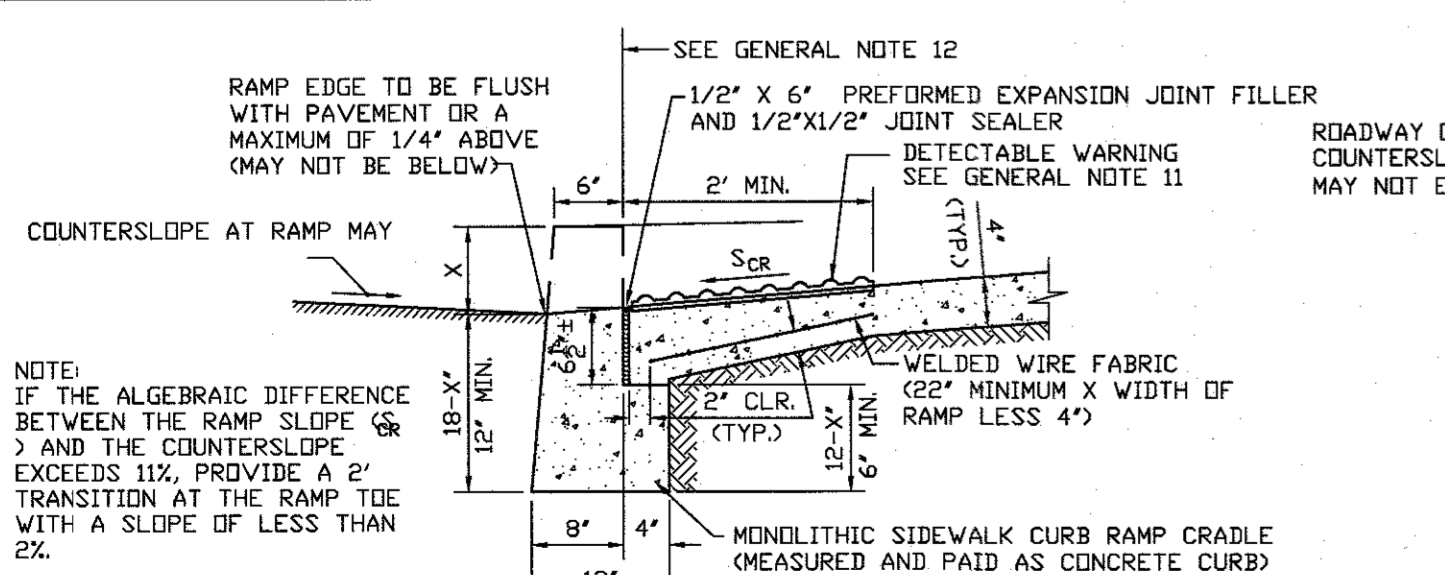
**DETAIL PAR-2A**  
**ALTERNATIVE CURB TRANSITION**  
WHERE SHOWN OR DIRECTED  
NOT TO SCALE



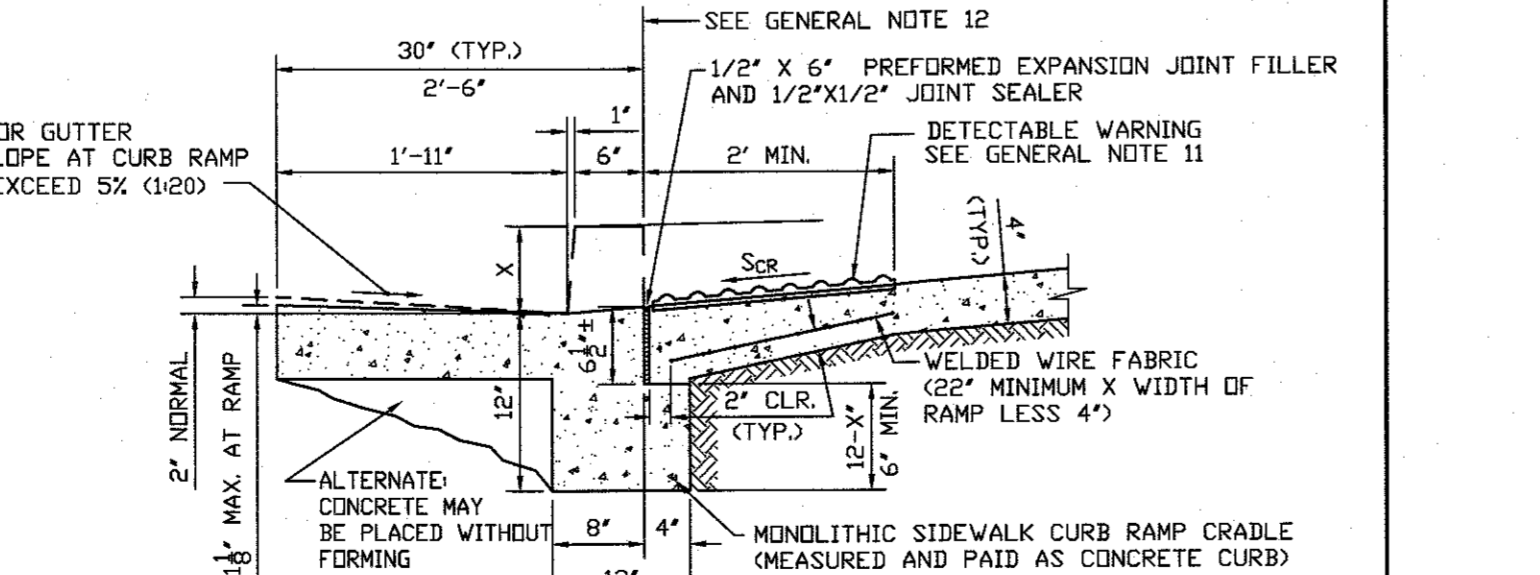
**DETAIL PAR-3**  
**PARALLEL PUBLIC SIDEWALK CURB RAMP**  
**(NO TURF SEPARATION STRIP)**  
NOT TO SCALE



**DETAIL PAR-3A**  
**ALTERNATIVE CURB TRANSITION**  
WHERE SHOWN OR DIRECTED  
NOT TO SCALE

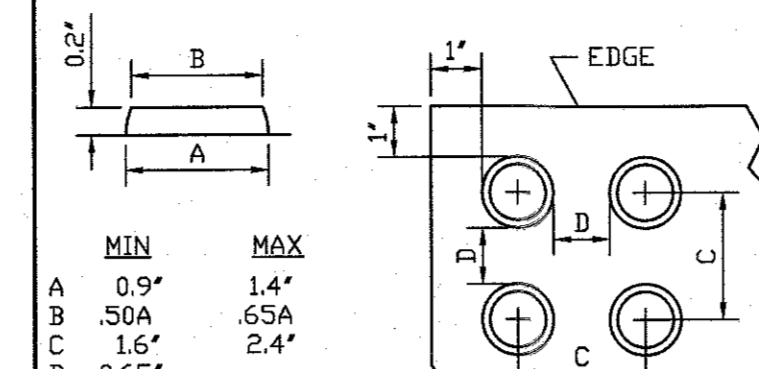


**(USED WITH CONCRETE VERTICAL CURB)**

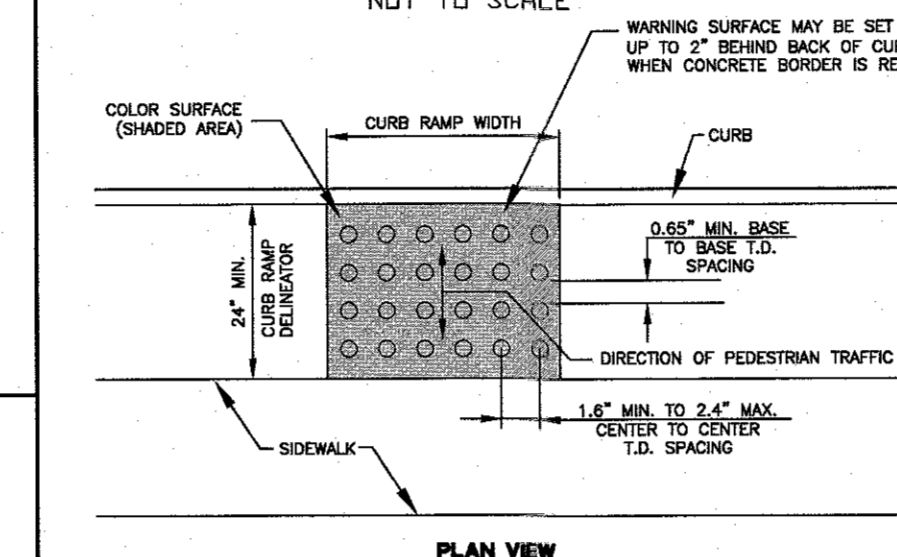


**(USED WITH CONCRETE COMBINATION CURB AND GUTTER)**

**DETAIL PAR-4**  
**MONOLITHIC SIDEWALK CURB RAMP CRADLE**



**DETAIL - DETECTABLE WARNING**  
(SEE GENERAL NOTE 11)  
NOT TO SCALE



**ELEVATION**  
**DETECTABLE WARNING SURFACE**

CURB FACE (INCHES)	V (FEET)	DETAIL PAR-1 APPLIES	DETAIL PAR-2 APPLIES
3	88	NO	NO
4	100	NO	NO
5	112	NO	NO
6	124	NO	NO
7	136	NO	NO
8	148	NO	NO
9	160	NO	NO
10	172	NO	NO

SYMBOL	DESCRIPTION	SLOPES (NOTE 1)	
		DESIGN (NOMINAL)	MINIMUM MAXIMUM
S <sub>x</sub>	CROSS SLOPE OF PUBLIC SIDEWALK OR CROSS SLOPE OF CURB RAMP	1/60 1.67% 3/4" PER 4' 3/16" PER 1' (NOTE 3)	1/72 1.4% 5/8" PER 4' 3/16" PER 1' (NOTE 3)
S <sub>cr</sub>	LONGITUDINAL (RUNNING) SLOPE OF PUBLIC SIDEWALK CURB RAMP	1/4 7.1% 3 1/2" PER 4' (APPROX 7/8" PER 1')	1/50 2% (NOTE 2)
S <sub>p</sub>	LONGITUDINAL (RUNNING) SLOPE OF PARALLEL SIDEWALK CURB RAMP	1/4 7.1% 3 1/2" PER 4' (APPROX 7/8" PER 1')	1/2.05 8.3% (NOTE 2)

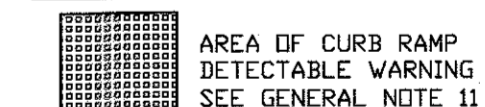
LONGITUDINAL PROFILE (S <sub>x</sub> )	MINIMUM LENGTH OF 14H + 1V CURB TRANSITION (FEET/INCHES)															
	3'		4'		5'		6'		7'		8'		9'		10'	
HIGH SIDE (L <sub>1</sub> )	LOW SIDE (L <sub>2</sub> )	HIGH SIDE (L <sub>1</sub> )	LOW SIDE (L <sub>2</sub> )	HIGH SIDE (L <sub>1</sub> )	LOW SIDE (L <sub>2</sub> )	HIGH SIDE (L <sub>1</sub> )	LOW SIDE (L <sub>2</sub> )	HIGH SIDE (L <sub>1</sub> )	LOW SIDE (L <sub>2</sub> )	HIGH SIDE (L <sub>1</sub> )	LOW SIDE (L <sub>2</sub> )	HIGH SIDE (L <sub>1</sub> )	LOW SIDE (L <sub>2</sub> )	HIGH SIDE (L <sub>1</sub> )	LOW SIDE (L <sub>2</sub> )	
SEE NOTE 2	3'6"	3'6"	4'0"	4'0"	5'10"	5'10"	7'0"	7'0"	8'2"	8'2"	9'5"	9'5"	10'6"	10'6"	11'8"	11'8"
0.2	3'7"	3'5"	4'10"	4'6"	6'0"	5'8"	7'2"	6'10"	8'4"	7'11"	9'7"	9'1"	10'10"	10'24"	12'0"	11'4"
0.3	3'8"	3'4"	4'10"	4'6"	6'1"	4'7"	7'4"	6'8"	8'6"	7'10"	9'9"	8'11"	10'11"	10'1"	12'2"	11'2"
0.4	3'8"	3'3"	4'11"	4'5"	6'2"	5'6"	7'5"	6'7"	8'8"	7'9"	9'11"	8'10"	11'2"	9'11"	12'4"	11'0"
0.5	3'9"	3'3"	5'0"	4'4"	6'3"	5'5"	7'6"	6'6"	8'9"	7'7"	10'0"	8'9"	11'3"	9'10"	12'6"	10'11"
0.75	3'11"	3'2"	5'2"	4'3"	6'5"	5'4"	7'10"	5'8"	9'2"	7'6"	10'3"	8'6"	11'5"	9'7"	13'0"	10'8"
1.00	4'1"	3'1"	5'5"	4'1"	6'9"	5'1"	8'2"	6'14"	9'6"	7'2"	10'10"	8'2"	12'2"	9'2"	13'7"	10'2"
1.50	4'5"	2'11"	5'11"	3'10"	7'4"	4'10"	8'10"	5'9"	10'4"	6'9"	11'10"	7'8"	13'4"	8'8"	14'9"	9'7"
2.00	4'10"	2'9"	6'6"	3'7"	8'11"	4'7"	9'8"	5'5"	11'4"	6'4"	12'11"	7'3"	14'7"	8'2"	15'8"	9'14"
2.50 (NOTE 3)	5'4"	2'5"	7'2"	3'5"	9'0"	4'4"	10'9"	5'2"	12'5"	6'8"	14'4"	6'11"	15'8"	7'9"	17'8"	8'7"
3.00	6'0"	2'5"	8'0"	3'3"	10'0"	4'4"	12'0"	4'11"	14'1"	5'9"	15'8"	6'7"	17'4"	7'4"	19'3"	8'3"
3.50	6'10"	2'4"	9'2"	3'1"	11'5"	3'11"	13'8"	4'8"	15'8"	5'6"	17'0"	6'3"	19'0"	7'0"	21'0"	7'10"
4.00	7'11"	2'3"	10'7"	3'0"	13'3"	3'9"	15'8"	4'6"	17'3"	5'3"	19'0"	6'0"	21'0"	6'9"	23'0"	7'6"
4.50	8'5"	2'2"	12'7"	2'10"	15'8"	3'7"	17'8"	4'3"	19'0"	5'0"	21'0"	5'8"	23'0"	6'5"	25'0"	7'2"
5.00	11'7"	2'0"	15'8"	2'9"	19'5"	3'5"	21'8"	4'1"	23'0"	4'10"	25'0"	5'6"	27'0"	6'2"	29'0"	7'10"
5.50	15'8"	1'11"	2'7"	2'7"	27'8"	3'11"	31'8"	3'11"	35'0"	3'3"	39'0"	3'3"	43'0"	3'3"	47'0"	4'7"

NOTES:  
1. INTERPOLATE BETWEEN SLOPES SHOWN AS REQUIRED.  
2. NO ADJUSTMENT FOR PROFILE SLOPES LESS THAN 0.2%.  
3. CROSS SLOPE OF PUBLIC SIDEWALK CURB RAMP AT GUTTER SHOULD NOT BE GREATER THAN 2% (1:50) OR AS DIRECTED BY ENGINEER.  
4. CONSULT ENGINEER FOR PROFILE SLOPES GREATER THAN 5.5%.

**GENERAL NOTES:**

- CONCRETE FOR CURBS, SIDEWALKS, CURB RAMPS AND MONOLITHIC CURB RAMP CRADLES SHALL BE NJDOT CLASS B.
- CURB AND MONOLITHIC CURB RAMP CRADLES SHALL BE POURED IN A SEPARATE OPERATION FROM SIDEWALKS AND CURB RAMPS UNLESS OTHERWISE PERMITTED BY THE ENGINEER.
- EXPANSION JOINTS WITH PREFORMED EXPANSION JOINT FILLER CONFORMING TO AASHTO M33, PREFORMED EXPANSION JOINT FILLER FOR CONCRETE (BITUMINOUS TYPE), SHALL BE PROVIDED AS FOLLOWS:
  - 1/2" THICK AT LONGITUDINAL INTERVALS OF APPROXIMATELY TWENTY FEET (20') AND BETWEEN ALL SIDEWALK CURB RAMPS AND MONOLITHIC CURB RAMP CRADLES.
  - 1/4" THICK BETWEEN CURB AND SIDEWALK, AROUND ALL STRUCTURES OR APPURTENANCES, SUCH AS MANHOLES, JUNCTION BOXES AND UTILITY POLES, AND ADJACENT TO ANY FIXED STRUCTURE.
- EXPANSION JOINT MATERIAL SHALL BE TRIMMED AS TO BE SLIGHTLY BELOW THE SURFACE OF THE CONCRETE.
- JOINT SEALER WHERE SHOWN OR REQUIRED SHALL CONFORM TO NJDOT SPECIFICATION 914. HOT-POURED JOINT SEALER SHALL CONFORM TO ASTM D 6690. CILD-APPLIED JOINT SEALER SHALL CONFORM TO ASTM D 5893, TYPE SL OR TYPE NS.
- TOOLED JOINTS SHALL BE PROVIDED WITH A GROOVING TOOL SO AS TO DIVIDE THE CONCRETE SURFACE INTO BLOCKS AS CLOSELY APPROACHING A SQUARE AS PRACTICABLE. GROOVES SHALL BE CUT TO A DEPTH OF AT LEAST 1/2 INCH AND SHALL BE FINISHED WITH AN EDGING TOOL HAVING A RADIUS OF 1/4 INCH.
- UNLESS OTHERWISE DIRECTED BY THE ENGINEER, EXPANSION AND TOOLED JOINTS IN CONCRETE SURFACES SHALL BE ALIGNED WITH JOINTS IN CURBS.
- WELDED WIRE FABRIC SHALL BE 6X6-6X6 (OLD DESIGNATION), 6X6-W29XW29 (NEW DESIGNATION) IN ACCORDANCE WITH ASTM A-185.
- PUBLIC SIDEWALK CURB RAMPS, TURNING SPACES, BLENDED TRANSITIONS AND CLEAR SPACES WITHIN THE PEDESTRIAN ACCESS ROUTE SHALL NOT CONTAIN GRATINGS, COVERS, UTILITY BOXES OR SIMILAR OBSTRUCTIONS. OUTSIDE OF THE ABOVE AREAS, GRATINGS IN PUBLIC SIDEWALKS MAY HAVE OPENINGS NO GREATER THAN 1/2 INCH WIDE MEASURED PARALLEL TO DIRECTION OF TRAVEL.
- ALL PUBLIC SIDEWALK CURB RAMPS SHALL BE PROVIDED WITH A SLIP-RESISTANT BROOM FINISH ORIENTED PERPENDICULAR TO THE TRAVEL DIRECTION.
- DETECTABLE WARNING SURFACES SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 606 OF THE SPECIFICATIONS AND THE SPECIAL PROVISIONS WHICH INCLUDE A LIST OF ACCEPTABLE SYSTEMS. UNLESS A SPECIFIC DETECTABLE WARNING SYSTEM IS REQUIRED BY THE SPECIAL PROVISIONS, THE CONTRACTOR MAY SELECT THE SYSTEM TO BE USED. ONLY ONE SYSTEM MAY BE USED IN ANY PROJECT. THE COLOR OF THE DETECTABLE WARNING SYSTEM SHALL BE AS REQUIRED BY THE SPECIAL PROVISIONS OR AS DIRECTED BY THE ENGINEER.
- IF NO CURB IS PROVIDED, THE EDGE OF THE DETECTABLE WARNING SURFACE SHALL BE AT LEAST 6" BUT NOT MORE THAN 8" FROM THE EDGE OF THE RAMP. THIS SHALL APPLY TO THE CORNERS OF THE DETECTABLE WARNING FOR RAMPS ON A RADIUS.
- DETECTABLE WARNING SIZE, GEOMETRY AND SPACING TO CONFORM TO SECTION 705 OF DEPARTMENT OF JUSTICE STANDARDS FOR ACCESSIBLE DESIGN (2010) OR SECTION R305 OF ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT OF WAY.

**LEGEND:**



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NO.	DATE	REVISIONS	BY	CHKD

ROBERT R. KEADY, P.E., C.M.E.  
HIGHLANDS BOROUGHS ENGINEER

BOROUGH OF HIGHLANDS  
2017 CAPITAL ROAD IMPROVEMENTS  
HIGHLANDS BOROUGHS, MONMOUTH COUNTY, NEW JERSEY

**AND**  
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DESIGNED BY DMD  
CHECKED BY RRR  
DRAWN BY AWD  
DATE 7-10-2017  
SCALE AS SHOWN  
PROJ. NO. HGHL-10763

DRAWING  
**CSD-4**  
SHEET  
**19**  
OF **24**



# STANDARD FOR PERMANENT VEGETATIVE COVER FOR SOIL STABILIZATION

## DEFINITION

ESTABLISHMENT OF PERMANENT VEGETATIVE COVER ON EXPOSED SOILS WHERE PERENNIAL VEGETATION IS NEEDED FOR LONG-TERM PROTECTION.

## PURPOSE

TO PERMANENTLY STABILIZE THE SOIL, ENSURING CONSERVATION OF SOIL AND WATER, AND TO ENHANCE THE ENVIRONMENT. WATER QUALITY ENHANCEMENT 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 A POTENTIAL FOR CAUSING OFF-SITE ENVIRONMENTAL DAMAGE.

## METHODS AND MATERIALS

### 1. SITE PREPARATION

- 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 STANDARD FOR LAND GRADING.
- IMMEDIATELY PRIOR TO SEEDING AND TOPSOIL APPLICATION, THE SUBSOIL SHALL BE EVALUATED FOR COMPACTION IN ACCORDANCE WITH THE STANDARD FOR LAND GRADING.
- TOPSOIL 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. TOPSOIL SHALL BE AMENDED WITH ORGANIC MATTER, AS NEEDED, IN ACCORDANCE WITH THE STANDARD FOR TOPSOILING.
- INSTALL NEEDED EROSION CONTROL PRACTICES OR FACILITIES SUCH AS DIVERSIONS, GRADE-STABILIZATION STRUCTURES, CHANNEL STABILIZATION MEASURES, SEDIMENT BASINS, AND WATERWAYS.

### 2. SEEDBED PREPARATION

- UNIFORMLY APPLY GROUND LIMESTONE AND FERTILIZER TO TOPSOIL WHICH HAS BEEN SPREAD AND FIRMED, ACCORDING TO SOIL TEST RECOMMENDATIONS SUCH AS OFFERED BY RUTGERS CO-OPERATIVE EXTENSION SERVICE (HTTP://NJ.RUTGERS.EDU/COUNTY/). FERTILIZER SHALL BE APPLIED AT THE RATE OF 500 POUNDS PER ACRE OR 11 POUNDS PER 1,000 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.
- WORK LIME AND FERTILIZER INTO THE TOPSOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING-TOOTH HARROW, OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISKING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLE UNIFORM SEEDBED IS PREPARED.
- HIGH ACID PRODUCING 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.

### 3. SEEDING

- SELECT A MIXTURE FROM TABLE 4-3 OR USE A 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.
  - 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 SEEDING AREA AND MOWED ONCE.
  - WARM-SEASON MIXTURES ARE GRASSES AND LEGUMES WHICH MAXIMIZE GROWTH AT HIGH TEMPERATURES, GENERALLY 85°F 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.
  - COOL-SEASON MIXTURES ARE GRASSES AND LEGUMES WHICH MAXIMIZE GROWTH AT TEMPERATURES BELOW 85°F. MANY GRASSES BECOME ACTIVE AT 65°F. SEE TABLE 4-3, MIXTURES 8-20. ADJUSTMENT OF PLANTING RATES TO COMPENSATE FOR THE AMOUNT OF PLS IS NOT REQUIRED FOR COOL SEASON GRASSES.
- CONVENTIONAL SEEDING IS PERFORMED BY APPLYING SEED UNIFORMLY BY HAND, CYCLONE (CENTRIFUGAL) SEEDER, DROP SEEDER, DRILL OR CULTIPACKER SEEDER. EXCEPT FOR DRILLED, HYDROSEEDER 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.
- AFTER SEEDING, FIRING 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.
- 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-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. WHEN POOR SEED TO SOIL CONTACT OCCURS, THERE IS A REDUCED SEED GERMINATION AND GROWTH.

### 4. MULCHING

MULCHING IS REQUIRED ON ALL SEEDING. MULCH WILL PROTECT 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, 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 AT LEAST 85% OF THE SOIL SURFACE IS COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000 SQUARE FEET 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 MULCH TO SOIL SURFACE BY STRETCHING TWINE BETWEEN PEGS IN A CRISS-CROSS AND A SQUARE PATTERN. 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 COULTER 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 TACKIFYING OR ADHESIVE AGENT IS REQUIRED.
- LIQUID MULCH-BINDERS - MAY BE USED TO ANCHOR SALT HAY, HAY OR STRAW MULCH.

- 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 WHEN MIXED WITH WATER FORMULATES A GEL AND WHEN APPLIED TO MULCH UNDER SATISFACTORY CURING CONDITIONS WILL FORM MEMBRANED NETWORKS OF INSOLUBLE POLYMERS. THE VEGETABLE GEL SHALL BE PHYSIOLOGICALLY HARMLESS AND NOT

RESULT IN A PHYTOXIC EFFECT OR IMPEDE GROWTH OF TURF GRASS. USE AT 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 OF MULCH, DRYING AND CURING, SHALL NO LONGER BE SOLUBLE OR DISPERSIBLE IN WATER. BINDER SHALL BE APPLIED AT RATES RECOMMENDED BY THE MANUFACTURER AND REMAIN TACKY UNTIL GERMINATION OF GRASS.

NOTE: ALL NAMES GIVEN ABOVE ARE REGISTERED TRADE NAMES. THIS DOES NOT CONSTITUTE A RECOMMENDATION OF THESE PRODUCTS TO THE EXCLUSION OF OTHER PRODUCTS.

- 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. 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.

- PELLETIZED MULCH - COMPRESSED AND EXTRUDED PAPER AND/OR WOOD FIBER PRODUCT, WHICH MAY CONTAIN CO-POLYMERS, TACKIFIERS, FERTILIZERS, AND COLORING AGENTS. THE DRY PELLETS, WHEN APPLIED TO A SEEDING AREA AND WATERED, FORM A MULCH MAT. PELLETIZED 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, SEEDING AREAS WHERE WEED-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.

### 5. IRRIGATION (WHERE FEASIBLE)

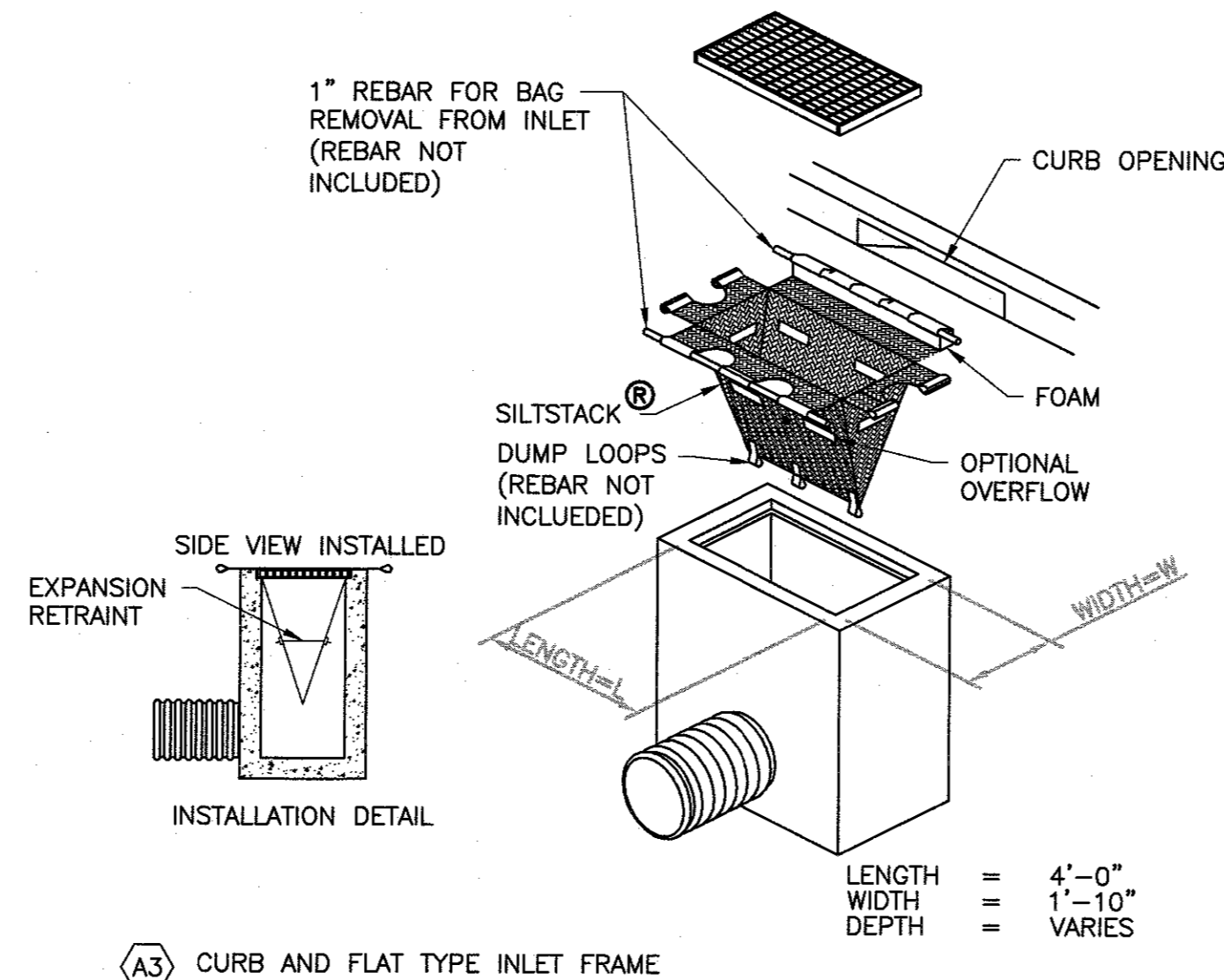
IF SOIL MOISTURE IS DEFICIENT SUPPLY NEW SEEDING WITH ADEQUATE WATER (A MINIMUM OF 1/4 INCH APPLIED UP TO TWICE A DAY UNTIL VEGETATION IS WELL ESTABLISHED). THIS IS ESPECIALLY TRUE WHEN SEEDINGS ARE MADE IN ABNORMALLY DRY OR HOT WEATHER OR ON DROUGHTY SITES.

### 6. TOPDRESSING

SINCE SOIL ORGANIC MATTER CONTENT AND SLOW RELEASE NITROGEN FERTILIZER (WATER INSOLUBLE) ARE PRESCRIBED IN SECTION 2A - SEEDBED PREPARATION IN THIS STANDARD, NO FOLLOW-UP OF TOPDRESSING IS MANDATORY. AN EXCEPTION MAY BE MADE WHERE GROSS NITROGEN DEFICIENCY EXISTS IN THE SOIL 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 GROSS NITROGEN DEFICIENCY IN THE TURF IS AMELIORATED.

### 7. ESTABLISHING PERMANENT VEGETATIVE STABILIZATION

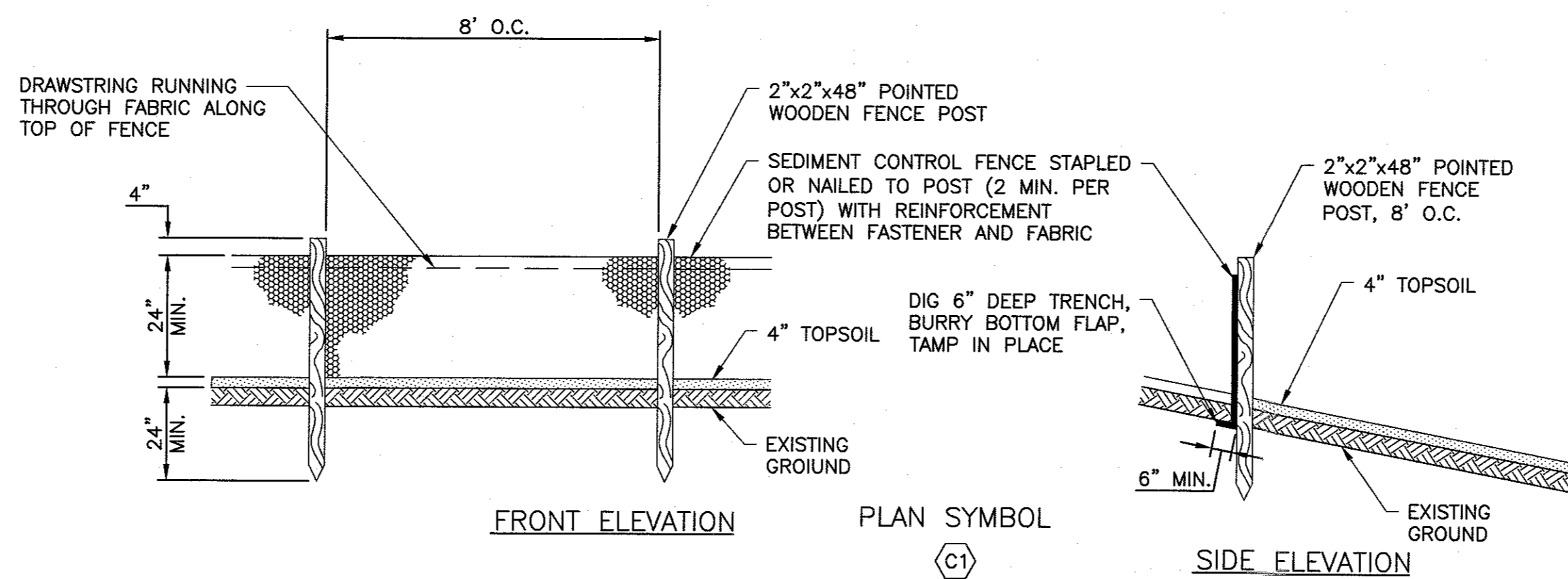
THE QUALITY OF PERMANENT VEGETATION RESTS WITH THE CONTRACTOR. THE TIMING OF SEEDING, PREPARING THE SEEDBED, APPLYING NUTRIENTS, MULCH AND OTHER MANAGEMENT ARE ESSENTIAL. THE SEED APPLICATION RATES IN TABLE 4-3 ARE REQUIRED WHEN A REPORT OF COMPLIANCE IS REQUESTED PRIOR TO ACTUAL ESTABLISHMENT OF PERMANENT 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 SEEDING SPECIES) AND MOWED ONCE. NOTE THIS DESIGNATION OF MOWED ONCE DOES NOT GUARANTEE THE PERMANENCY OF THE TURF SHOULD OTHER MAINTENANCE FACTORS BE NEGLECTED OR OTHERWISE MISMANAGED. SEEDING PERIODS IN SPRING AND FALL.



EXISTING INLET FILTER PROTECTION, TYPE 2

## EXISTING INLET FILTER PROTECTION, TYPE 2

N.T.S.



SEDIMENT CONTROL FENCE

N.T.S.

## SOIL EROSION AND SEDIMENT CONTROL NOTES

- THE FREEHOLD SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED FORTY-EIGHT (48) HOURS IN ADVANCE OF ANY SOIL DISTURBING ACTIVITY.
- ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE INSTALLED PRIOR TO SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
- ANY CHANGES TO THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLANS 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.
- N.J.S.A. 4:24-39 ET. SEQ. REQUIRES THAT NO CERTIFICATES OF OCCUPANCY BE ISSUED BEFORE THE DISTRICT DETERMINES THAT A PROJECT OR PORTION THEREOF IS IN FULL COMPLIANCE WITH THE CERTIFIED PLAN AND STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY AND A REPORT OF COMPLIANCE HAS BEEN ISSUED. UPON WRITTEN REQUEST FROM THE APPLICANT, THE DISTRICT MAY ISSUE A REPORT OF COMPLIANCE WITH CONDITIONS ON A LOT-BY-LOT OR SECTION-BY-SECTION BASIS, PROVIDED THAT THE PROJECT OR PORTION THEREOF IS IN SATISFACTORY COMPLIANCE WITH THE SEQUENCE OF DEVELOPMENT AND TEMPORARY MEASURES FOR SOIL EROSION AND SEDIMENT CONTROL HAVE BEEN IMPLEMENTED, INCLUDING PROVISIONS FOR STABILIZATION AND SITE WORK.
- ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN SIXTY (60) 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 2 TO 2 1/2 TONS PER ACRE, ACCORDING TO THE STANDARD FOR STABILIZATION WITH MULCH ONLY.
- IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E. SOIL STOCKPILES, STEEP SLOPES AND ROADWAY EMBANKMENTS) WILL RECEIVE TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AND A MULCH ANCHOR, IN ACCORDANCE WITH STATE STANDARDS.
- A SUB-BASE COURSE WILL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS TO STABILIZE STREETS, ROADS, DRIVEWAYS, AND PARKING AREAS. IN AREAS WHERE NO UTILITIES ARE PRESENT, THE SUB-BASE SHALL BE INSTALLED WITHIN FIFTEEN (15) DAYS OF THE PRELIMINARY GRADING.
- THE STANDARD FOR STABILIZED CONSTRUCTION ACCESS REQUIRES THE INSTALLATION OF A PAD OF CLEAN CRUSHED STONE AT POINTS WHERE TRAFFIC WILL BE ACCESSING THE CONSTRUCTION SITE. AFTER INTERIOR ROADWAYS ARE PAVED, INDIVIDUAL LOTS REQUIRE A STABILIZED CONSTRUCTION ACCESS CONSISTING OF ONE INCH TO TWO INCH (1" - 2") STONE FOR A MINIMUM LENGTH OF TEN FEET (10') EQUAL TO THE LOT ENTRANCE WIDTH. ALL OTHER ACCESS POINTS SHALL BE BLOCKED OFF.
- ALL SOIL WASHED, DROPPED, SPILLED, OR TRACKED OUTSIDE THE LIMIT OF DISTURBANCE OR ONTO PUBLIC RIGHT-OF-WAYS WILL BE REMOVED IMMEDIATELY.
- PERMANENT VEGETATION IS TO BE SEEDING OR SODDED ON ALL EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADING.
- AT THE TIME THAT 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 IT 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.
- IN ACCORDANCE WITH THE STANDARD FOR MANAGEMENT OF HIGH ACID PRODUCING SOILS, ANY SOIL HAVING A PH OF 4 OR LESS OR CONTAINING IRON SULFIDES SHALL BE ULTIMATELY PLACED OR BURIED WITH LIMESTONE APPLIED AT THE RATE OF 10 TONS/ACRE, (OR 450 LBS/1,000 SQ FT OF SURFACE AREA) AND COVERED WITH A MINIMUM OF 12" OF SETTLED SOIL WITH A PH OF 5 OR MORE, OR 24" WHERE TREES OR SHRUBS ARE TO BE PLANTED.
- CONDUIT OUTLET PROTECTION MUST BE INSTALLED AT ALL REQUIRED OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.
- UNFILTERED DEWATERING IS NOT PERMITTED. NECESSARY PRECAUTIONS MUST BE TAKEN DURING ALL DEWATERING OPERATIONS TO MINIMIZE SEDIMENT TRANSFER. ANY DEWATERING METHODS USED MUST BE IN ACCORDANCE WITH THE STANDARD FOR DEWATERING.
- SHOULD THE CONTROL OF DUST AT THE SITE BE NECESSARY, THE SITE WILL BE SPRINKLED UNTIL THE SURFACE IS WET, TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED OR MULCH SHALL BE APPLIED AS REQUIRED BY THE STANDARD FOR DUST CONTROL.
- STOCKPILE AND STAGING LOCATIONS ESTABLISHED IN THE FIELD SHALL BE PLACED WITHIN THE LIMIT OF DISTURBANCE ACCORDING TO THE CERTIFIED PLAN. STAGING AND STOCKPILES NOT LOCATED WITHIN THE LIMIT OF DISTURBANCE WILL REQUIRE CERTIFICATION OF A REVISED SOIL EROSION AND SEDIMENT CONTROL PLAN. CERTIFICATION OF A NEW SOIL EROSION AND SEDIMENT CONTROL PLAN MAY BE REQUIRED FOR THESE ACTIVITIES IF AN AREA GREATER THAN 5,000 SQUARE FEET IS DISTURBED.
- ALL SOIL STOCKPILES ARE TO BE TEMPORARILY STABILIZED IN ACCORDANCE WITH SOIL EROSION AND SEDIMENT CONTROL NOTE #6.
- THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR ANY EROSION OR SEDIMENTATION THAT MAY OCCUR BELOW STORMWATER OUTFALLS OR OFFSITE AS A RESULT OF CONSTRUCTION OF THE PROJECT.

FREEHOLD SOIL CONSERVATION DISTRICT  
4000 KOZLOSKI ROAD  
FREEHOLD NJ 07728-5033  
TEL: (732) 683-8500  
FAX: (732) 683-9140

THE TOTAL ESTIMATED TIME OF CONSTRUCTION IS ROUGHLY 145\* DAYS  
\*SCHEDULE TO BE CONFIRMED BY CONTRACTOR

### PROPOSED CONSTRUCTION SEQUENCE

NOTIFY FREEHOLD SOIL CONSERVATION DISTRICT 72 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY	DURATION
1. APPLICATION OF PROPER MEASURES FOR THE CONTROL OF SOIL EROSION AND SEDIMENTATION CONTROL.	5 DAYS
2. SITE PREPARATION.	10 DAYS
3. SITE GRADING. UPON COMPLETION OF ANY STEEP SLOPE GRADING THESE AREAS WILL BE PERMANENTLY STABILIZED WITH VEGETATION.	10 DAYS
4. MAINTENANCE OF SOIL EROSION MEASURES.	10 DAYS
5. TEMPORARY STABILIZATION OF DISTURBED AREAS IN A ROUGH GRADED CONDITION MAINTAINED BY SEEDING AND/OR MULCHING UNTIL PROPER WEATHER CONDITIONS EXIST FOR ESTABLISHMENT OF PERMANENT VEGETATIVE COVER.	10 DAYS
6. CONSTRUCTION OF PROPOSED SITE IMPROVEMENTS, APPURTENANCES AND LANDSCAPING.	95 DAYS
7. REMOVAL OF SOIL EROSION AND SEDIMENT CONTROL DEVICES AFTER ESTABLISHED VEGETATIVE GROWTH HAS OCCURRED.	5 DAYS
<b>CONSTRUCTION</b>	<b>145 DAYS</b>

THE DURATIONS LISTED ABOVE FOR EACH CONSTRUCTION ITEM IN THE PROPOSED SEQUENCE OF CONSTRUCTION ARE APPROXIMATE AND MAY VARY DUE TO UNFORESEEN DELAYS CAUSED BY WEATHER OR SCHEDULING CONFLICTS. ITEMS LISTED ABOVE MAY BE ACCOMPLISHED CONCURRENTLY.

NO.	DATE	REVISIONS	BY	CHKD

08/16/2017  
ROBERT R. KEADY, P.E., C.M.E.  
HIGHLANDS BOROUGH ENGINEER  
LICENSED PROFESSIONAL ENGINEER  
STATE OF NJ LICENSE No. 24604195-100

BOROUGH OF HIGHLANDS  
2017 CAPITAL ROAD IMPROVEMENTS  
HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY  
SOIL EROSION AND SEDIMENT CONTROL

**AND**  
YOUR GOALS. OUR MISSION.

11 TINDALL ROAD  
MIDDLETOWN NJ 07748  
TEL 732-671-6400  
FAX 732-671-7365

NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS  
AND LAND SURVEYORS  
CERTIFICATE OF AUTHORIZATION 26427987500

OFFICES LOCATED IN:  
DELAWARE, INDIANA, KENTUCKY,  
MASSACHUSETTS, MICHIGAN, NEW JERSEY,  
OHIO AND PENNSYLVANIA

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DRAWN BY	AWD	SHEET	21
SCALE	7-10-2017		
AS SHOWN			
PROJ. NO.	HGH-10763	OF	24

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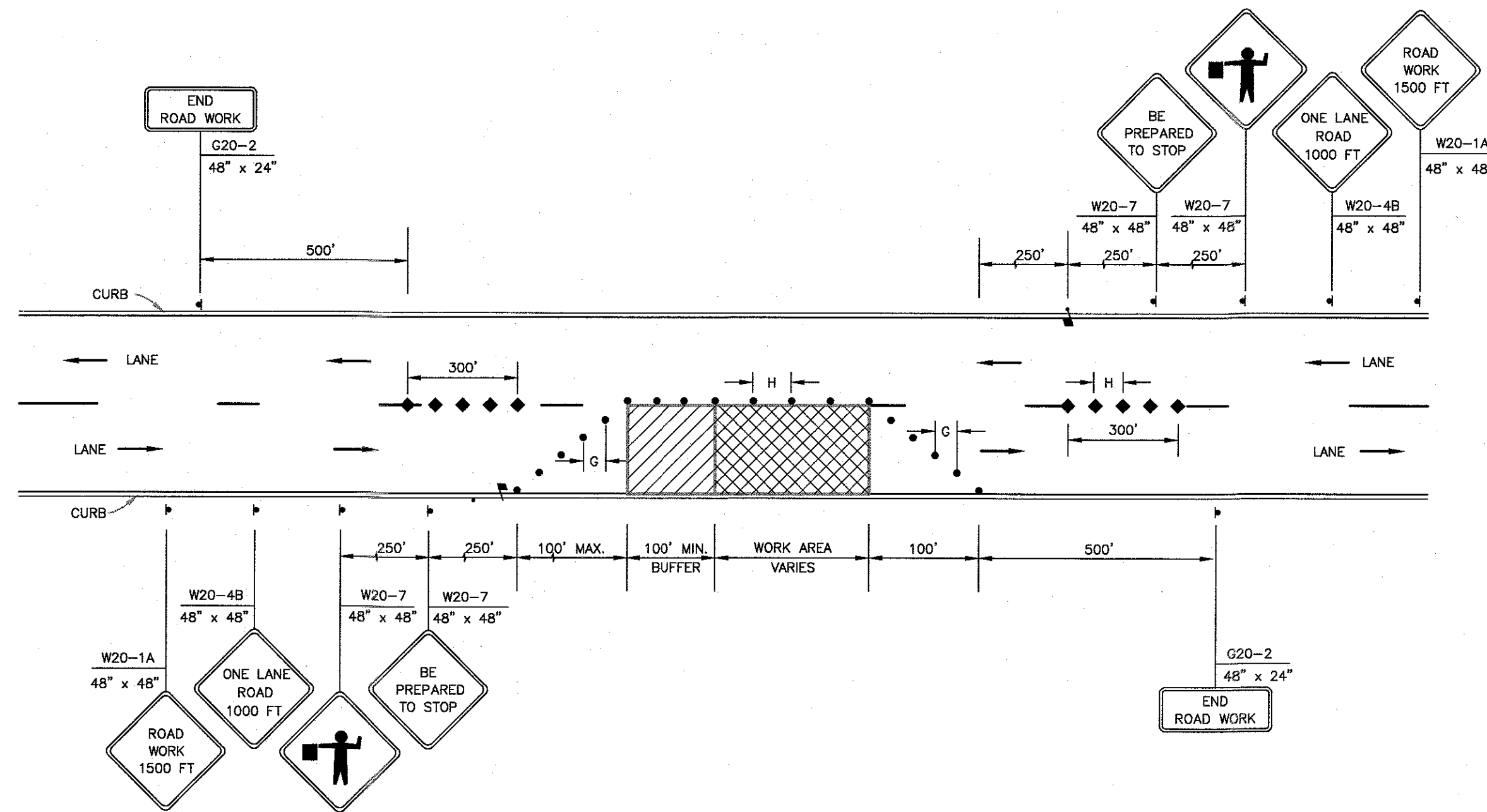


**NOTES:**

1. THE INFORMATION SHOWN ON THIS SHEET IS DESIGNED TO GUIDE AND ASSIST THE CONTRACTOR IN PREPARATION OF A PROJECT TRAFFIC CONTROL PLAN (TCP) CONSISTENT WITH SECTION 159 OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR IS FULLY RESPONSIBLE FOR THE FINAL TRAFFIC CONTROL PLAN. THE INFORMATION SHOWN IS NOT WARRANTED TO BE COMPLETE AND NEITHER THE SCOPE OR DETAILS SHOWN NOR THE FAILURE TO PROVIDE INFORMATION RELIEVES THE CONTRACTOR FROM RESPONSIBILITY FOR THE PROJECT TCP.
2. THE CONTRACTOR SHALL NOTIFY THE POLICE DEPARTMENT AND ENGINEER 72 HOURS IN ADVANCE OF CONSTRUCTION.
3. ALL CONSTRUCTION SIGNS SHALL BE BLACK ON ORANGE AS PER THE SPECIFICATIONS AND AS REQUIRED IN THE LATEST EDITION OF THE U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".
4. ALL CONSTRUCTION SIGNS AND SAFETY EQUIPMENT SHALL BE IN PLACE PRIOR TO ANY CONSTRUCTION ACTIVITY.
5. TEMPORARY TRAFFIC TAPE, DETOUR GRADE SHALL BE USED OUTSIDE OF THE LIMITS OF CONSTRUCTION AND ON FINAL PAVEMENT. OTHER TEMPORARY TRAFFIC STRIPES SHALL BE STANDARD PAINT.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION TO VEHICLE OPERATORS SHALL BE REMOVED BY GRINDING OR OBLITERATED AS SOON AS PRACTICABLE.
7. ACCESS TO DRIVEWAYS AND SIDE STREETS FROM BOTH APPROACHES SHALL BE MAINTAINED AT ALL TIMES.
8. TRENCHES ARE TO BE COVERED AT THE END OF EACH DAY OF WORK.
9. STREETS INTERSECTING THE ROADWAY AFTER THE FIRST ADVANCE WARNING SIGN SHALL BE PROVIDED WITH AT LEAST ONE "ROAD WORK AHEAD" SIGN AS A MINIMUM.
10. POLICE TRAFFIC DIRECTORS MAY BE USED TO ASSIST IN CONTROLLING TRAFFIC AT INTERSECTIONS.
11. 100' BEYOND EACH INTERSECTION OR MAIN ACCESS POINT WITHIN THE AREA OF A LANE OR SHOULDER CLOSURE THERE SHALL BE A W1-6 MOUNTED ON A BREAKAWAY BARRICADE CENTERED ON THE CLOSED WIDTH.
12. ADVANCE WARNING SIGNS AND TAPERS MAY BE EXTENDED AS SIGHT DISTANCES REQUIRE TO ADJUST FOR REDUCED VISIBILITY DUE TO THE HORIZONTAL AND VERTICAL CURVATURE OF THE ROADWAY.
13. ALL METHODS SHALL COMPLY WITH THE LATEST EDITION OF THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".

**DISTANCE LEGEND**

LETTER	DISTANCE
A	1500'
B	1000'
C	500'
D	1/2 MILE
E	1 MILES AHEAD
F	1/2 MILES AHEAD



**TYPICAL LANE CLOSURE WITH FLAGGING**  
(LESS THAN 45 MPH)  
NOT TO SCALE

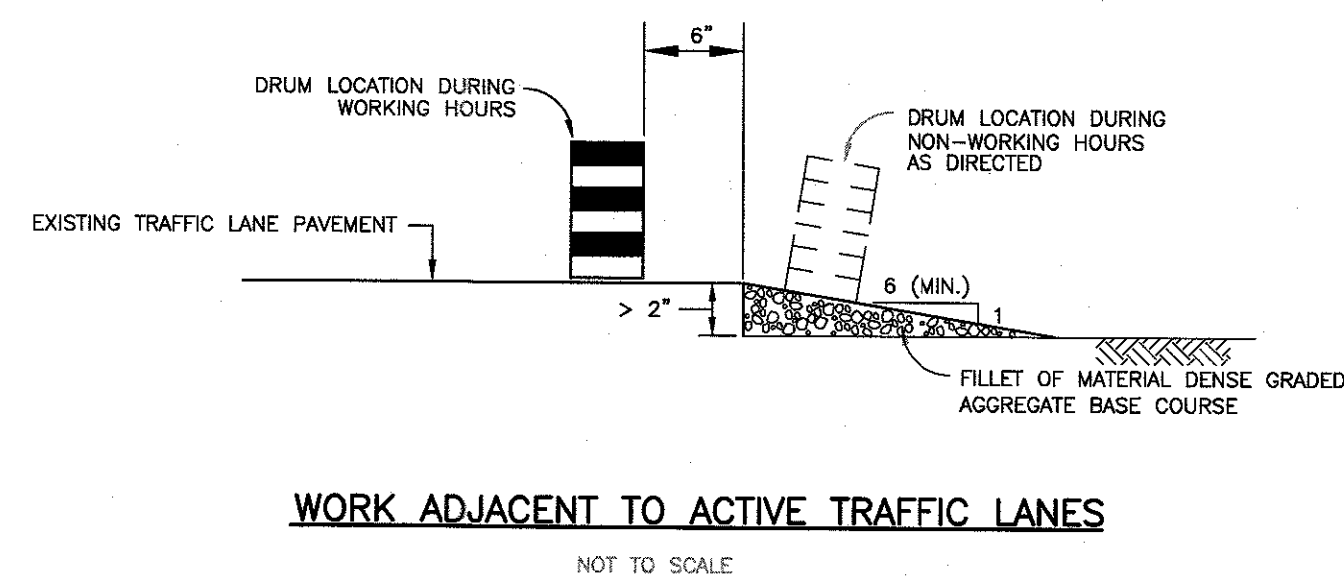
DURING CONSTRUCTION THE LENGTH OF LANE SHIFT AND SPACING OF TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE TABLE LISTED BELOW.

APPROACH SPEED OF TRAFFIC IN MILES/HOUR	*MINIMUM TAPER RATIO IN LENGTH PER FOOT OF WIDTH	*MINIMUM TAPER LENGTH FOR LATERAL SHIFT OF			MAXIMUM DEVICE SPACING ALONG TAPER IN FEET (G)	RECOMMENDED SPACING ALONG TANGENTS	
		10 FT	11 FT	12 FT		MAXIMUM DEVICE SPACING ALONG TANGENTS IN FEET (H)	MAXIMUM DEVICE SPACING ALONG TANGENTS IN FEET (I)
25	10 1/2:1	105	115	125	25	50	
30	15:1	150	165	180	30	60	
35	20 1/2:1	205	225	245	35	70	
40	27 1/2:1	275	300	330	40	80	
45	45:1	450	495	540	45	90	
50	50:1	500	550	600	50	100	
55	55:1	550	605	660	55	110	

**LANE SHIFT LENGTHS AND CONTROL DEVICE SPACING TABLE**  
NOTE: DEVICES AND LANE SHIFT LENGTH SHOWN ALSO APPLY TO LANE CLOSURE REQUIREMENTS  
\*NOT TO BE USED IN CONJUNCTION WITH FLAGGERS.

**NOTES:**

1. THE CONTRACTOR SHALL PREPARE AND SUBMIT A TRAFFIC CONTROL PLAN TO THE ENGINEER AND THE TOWNSHIP OF FREEHOLD POLICE DEPARTMENT FOR REVIEW AND APPROVAL BY THE TRAFFIC SAFETY OFFICER PRIOR TO THE START OF ANY CONSTRUCTION. NO SEPARATE PAYMENT SHALL BE MADE FOR COSTS ASSOCIATED WITH THE PREPARATION OF THE TRAFFIC CONTROL PLAN, ALL COSTS SHALL BE INCLUDED IN THE LUMP SUM ITEM BID FOR MAINTENANCE AND PROTECTION OF TRAFFIC.
2. NO SEPARATE PAYMENT SHALL BE MADE FOR ITEMS ASSOCIATED WITH THE MAINTENANCE AND PROTECTION OF TRAFFIC, UNLESS APPROPRIATE SEPARATE ITEMS ARE SCHEDULED IN THE PROPOSAL. IF NO SUCH ITEMS ARE SCHEDULED, THE COST SHALL BE INCLUDED IN THE VARIOUS ITEMS WHICH ARE SCHEDULED IN THE PROPOSAL.
3. BASED ON THE CONTRACTOR'S SCHEDULE AND MEANS OF COMPLETING THE WORK, THE FREEHOLD TOWNSHIP POLICE DEPARTMENT MAY REQUIRE A DETOUR PLAN WHICH WILL BE REVIEWED AND APPROVED BY THE FREEHOLD TOWNSHIP POLICE DEPARTMENT. NO SEPARATE PAYMENT WILL BE MADE FOR COSTS ASSOCIATED WITH DETOUR OPERATIONS INCLUDING ALL ASSOCIATED TRAFFIC CONTROL DEVICES.



**WORK ADJACENT TO ACTIVE TRAFFIC LANES**  
NOT TO SCALE

**LEGEND**

- WORK AREA
  - BUFFER AREA
  - BREAKAWAY BARRICADE
  - BREAKAWAY BARRICADE WITH SIGN
  - SIGN
  - DRUM
  - CONE
  - DIRECTION OF TRAFFIC
  - FLAGGER
  - ILLUMINATED FLASHING ARROW
  - ILLUMINATED FLASHING BAR
  - TRUCK MOUNTED IMPACT ATTENUATOR
- MAY BE MOUNTED ON THE TRAFFIC CONTROL TRUCK

PROJECT INFORMATION:  
FILE PATH: C:\Projects\HGH\10763\Plan\...  
FILE NAME: HGH10763\_SHT023.MPT.dwg  
LAST SAVE BY: Admin@t&M  
LAST SAVE TIME: 15 Aug 2017, 3:53PM

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NO.	DATE	REVISIONS	BY	CHKD

09/16/2017  
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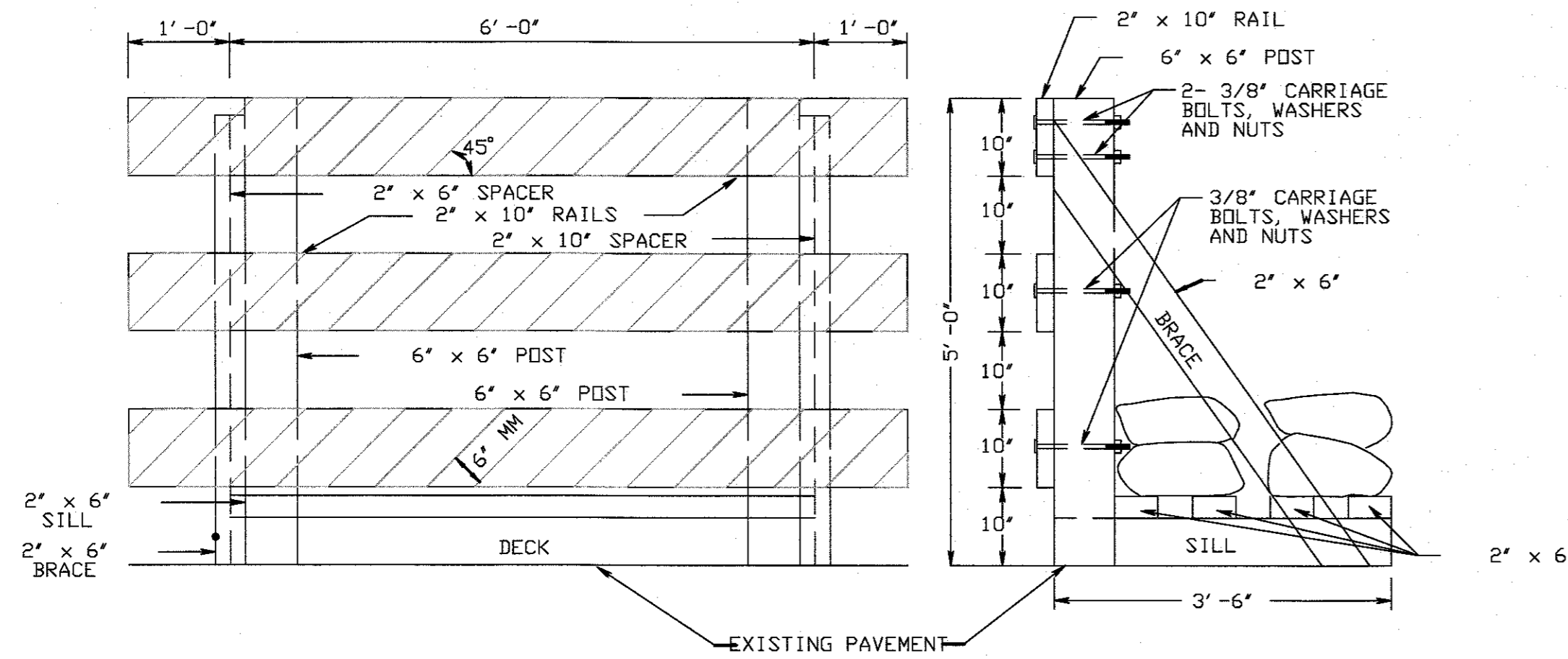
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2017 CAPITAL ROAD IMPROVEMENTS  
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DESIGNED BY	DMD	DRAWING	MPT-1
CHECKED BY	RRK	SHEET	23
DRAWN BY	AWD	SCALE	AS SHOWN
DATE	7-10-2017	PROJ. NO.	HGH-10763
SCALE	AS SHOWN	OF	24



BARRICADE, TYPE III A

NOTES:

1. LUMBER USED SHALL BE YELLOW PINE OR FIR NO. 1 COMMON S4S, EXCEPT 12" x 12" TIMBERS.
2. RAILS ARE TO BE PAINTED ALTERNATE ORANGE AND SILVER (WHITE) STRIPES 6" WIDE OR RETROREFLECTIVE SHEETING, TYPE II, OR III A MAY BE UTILIZED MEETING REQUIREMENTS SPECIFIED FOR CONSTRUCTION SIGNS. OTHER PARTS TO BE PAINTED WHITE, 3 COATS.
3. THE ORANGE AND WHITE STRIPES SHALL BE REFLECTORIZED SO AS TO BE VISIBLE UNDER NORMAL ATMOSPHERIC CONDITIONS FROM A MINIMUM DISTANCE OF 1000 FEET WHEN ILLUMINATED BY THE LOW BEAMS OF STANDARD AUTOMOBILE HEADLIGHTS.
4. THE 18" x 24" SANDBAGS SHALL BE FABRICATED FROM POLYPROPYLENE AND SHALL HAVE A CAPACITY OF 1 CU. FT. SANDBAG PLACEMENT MAY BE ADJUSTED AT THE DIRECTION OF THE ENGINEER.
5. BARRICADE, TYPE III A SHALL BE CONSTRUCTED OF WOOD OR METAL. RAILS MAY BE CONSTRUCTED OF WOOD, METAL OR PLASTIC. IF WOOD IS USED, SPACERS, BRACES, SILL AND DECK TO BE FASTENED WITH 40 SPIKES. HOLES TO BE BORED IN PLANKS FOR ALL SPIKES.

IMPORTANT

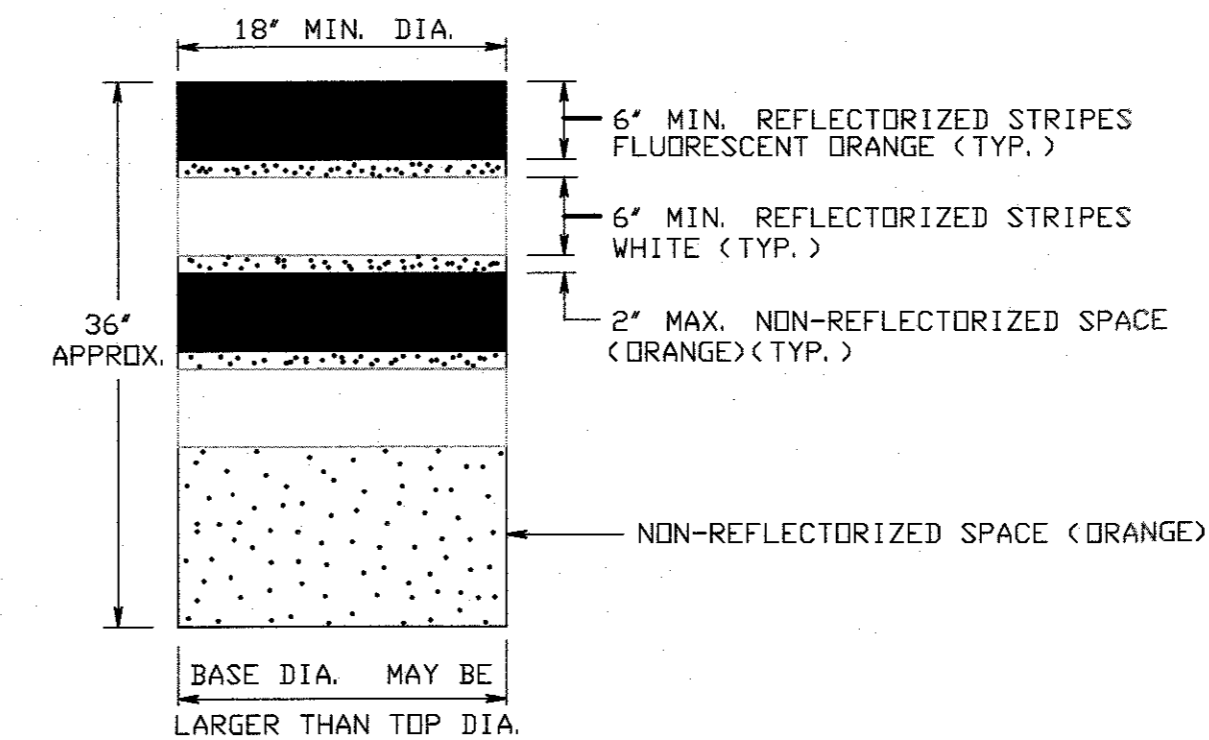
NOTE: BARRICADE TYPE III A SHALL NOT BE USED IN ANY AREA WHERE CONTACT WITH PUBLIC VEHICULAR TRAFFIC IS POSSIBLE. OPEN EXCAVATION AREAS AND OTHER SIMILAR SITUATIONS MAY REQUIRE BARRICADES TYPE III A AND THEIR USE SHALL BE ONLY UPON DIRECTION.

CD-617-1.1

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 A 18" DIAMETER ROUND DRUM REGARDLESS OF ORIENTATION, MAY BE USED IF APPROVED BY THE BUREAU OF MATERIALS.

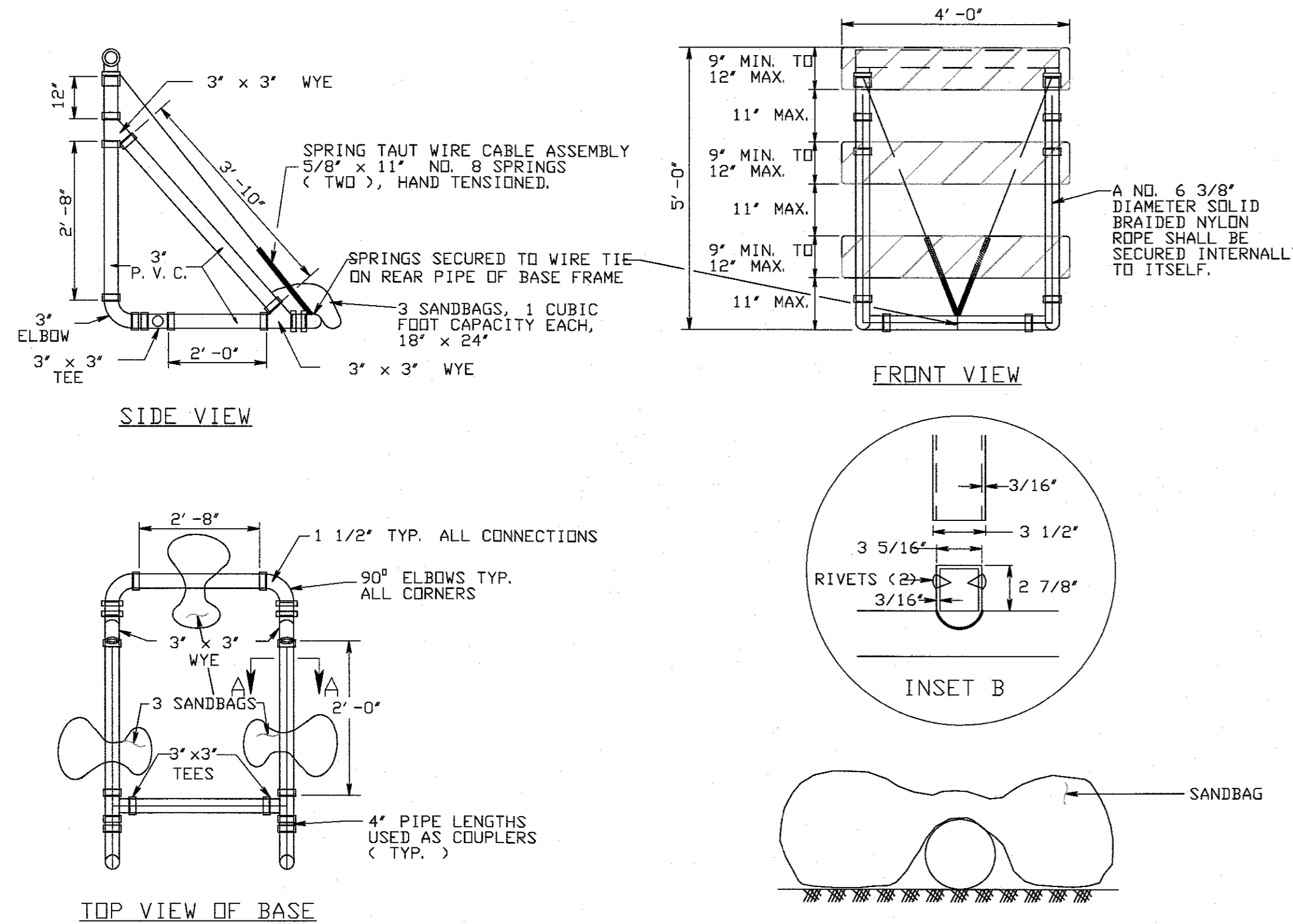


WHEN BALLAST IS REQUIRED BY THE R. E. SAND SHALL BE USED. THE MAXIMUM WEIGHT OF THE BALLAST SHALL BE 50 LBS. AND BE LOCATED APPROXIMATELY AT GROUND LEVEL. ALTERNATE TYPES OF BALLAST SHALL BE APPROVED BY THE R. E.

DRUMS

N. T. S.

CD-159-1.1



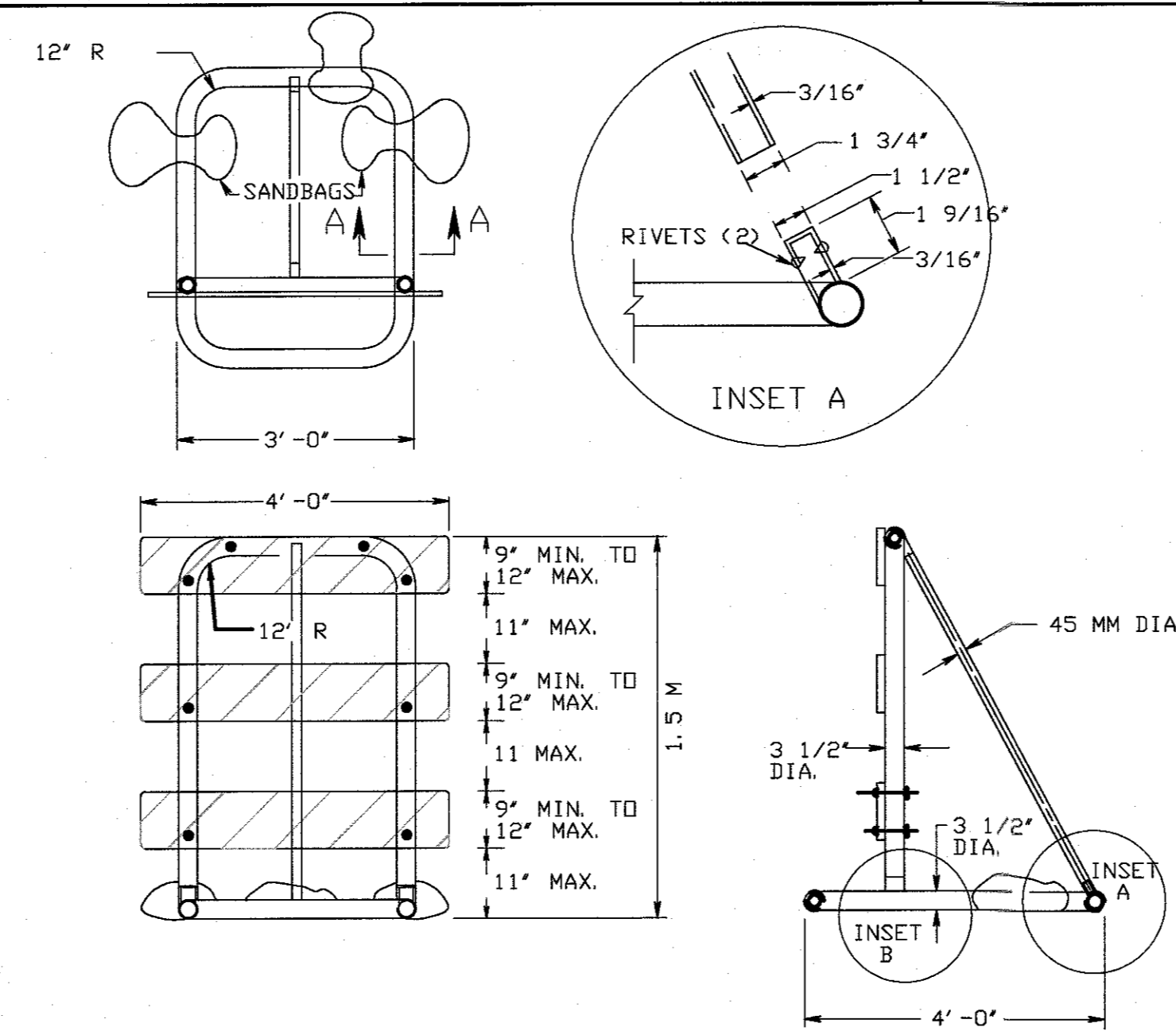
TYPE III, PVC

PIPE SHALL BE WHITE PVC SCHEDULE 40 ASTM D 1785 OR PVC, SDR-26 ASTM D 2241. FITTINGS SHALL BE WHITE PVC OR ABS OF MATCHING WALL THICKNESS AND INSIDE DIAMETER AND MEETING THE MATERIALS, REQUIREMENTS AND TESTING SECTIONS OF ASTM D 2466 FOR PVC AND ASTM D 2468 FOR ABS. ALL JOINTS SHALL BE SLIP FIT AND NOT THREADED OR CEMENTED. PVC FITTINGS MEETING ASTM D 2665 WILL ALSO BE ACCEPTABLE. PVC OR ABS MATERIAL SHALL BE ULTRAVIOLET LIGHT STABILIZED.

BREAKAWAY BARRICADES

N. T. S.

CD-617-1.3



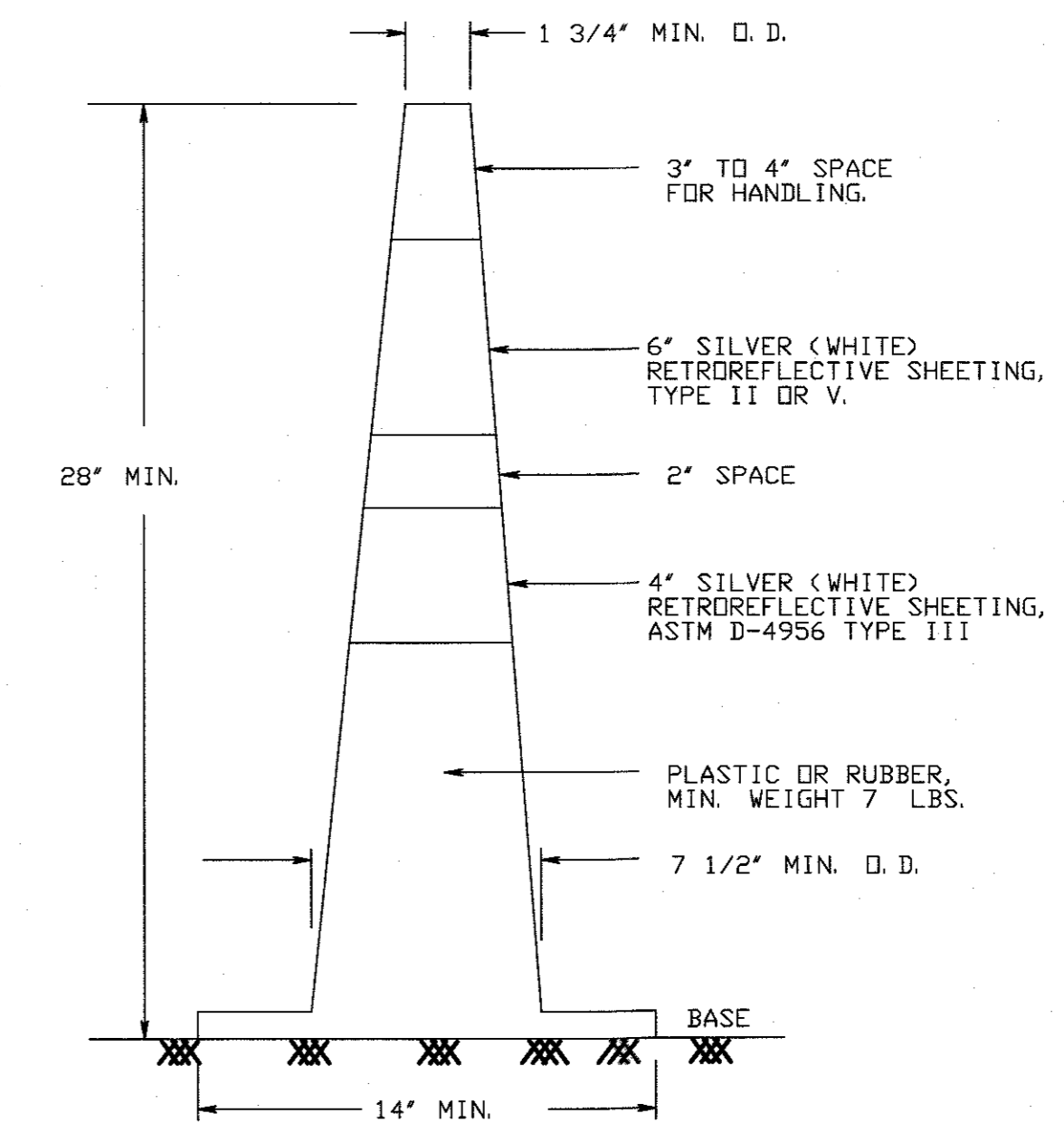
TYPE III, PE

THE BASE AND UPRIGHT SHALL BE 3 1/2" DIA. ROTATIONALLY MOLDED POLYETHYLENE PLASTIC CONFORMING TO ASTM D 1248-11 A3-E4. THE BRACE SHALL BE 1 3/4" DIA. EXTRUDED POLYETHYLENE PLASTIC CONFORMING TO ASTM D 1248-11 A4. POLYETHYLENE PLASTIC SHALL BE WHITE AND SHALL BE ULTRAVIOLET LIGHT STABILIZED.

NOTES:

1. THE 8" x 48", OR 9" MIN. x 48" BARRICADE RAILS SHALL BE FABRICATED FROM 0.024" ANODIZED ALUMINUM OR 0.125" MAX. PLASTIC SHEETING AND SHALL BE ATTACHED, 4 PER RAIL WITH 1" NO. 14 PAN HEAD METAL SCREWS OR PLASTIC RIVETS. ALL CORNERS SHALL BE ROUNDED.
2. ORANGE AND SILVER (WHITE) STRIPES SHALL BE RETROREFLECTIVE SHEETING, TYPE II OR III-A, AS SHOWN FOR CONSTRUCTION SIGNS. ALTERNATE ORANGE AND SILVER (WHITE) STRIPES 150 MM WIDE SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS.
3. THE 18" x 24" SANDBAGS SHALL BE FABRICATED FROM POLYPROPYLENE AND SHALL HAVE A CAPACITY OF 1 CUBIC FOOT. PLACEMENT OF SANDBAGS SHALL BE AS SHOWN ABOVE.
4. SANDBAG PLACEMENT MAY BE ADJUSTED AT THE DIRECTION OF THE ENGINEER. ALL DIMENSIONS ON FULL PIPE LENGTH.
5. EITHER TYPE III, PE OR TYPE III, PVC CAN BE USED AT THE OPTION OF THE CONTRACTOR.

TRAFFIC CONES SHALL BE PREDDMINATELY ORANGE IN COLOR.



BASES MAY BE OF BREAKAWAY BALLASTED TYPE. MINOR MANUFACTURER'S VARIATIONS MAY BE ACCEPTABLE UPON APPROVAL OF THE ENGINEER.

TRAFFIC CONES

N. T. S.

CD-159-1.2

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BOROUGH OF HIGHLANDS

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CHECKED BY	RRK	SHEET	24
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DATE	7-10-2017	PROJ. NO.	HGH-10763
NO.		OF	24

08/16/2017

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BY

CHD