

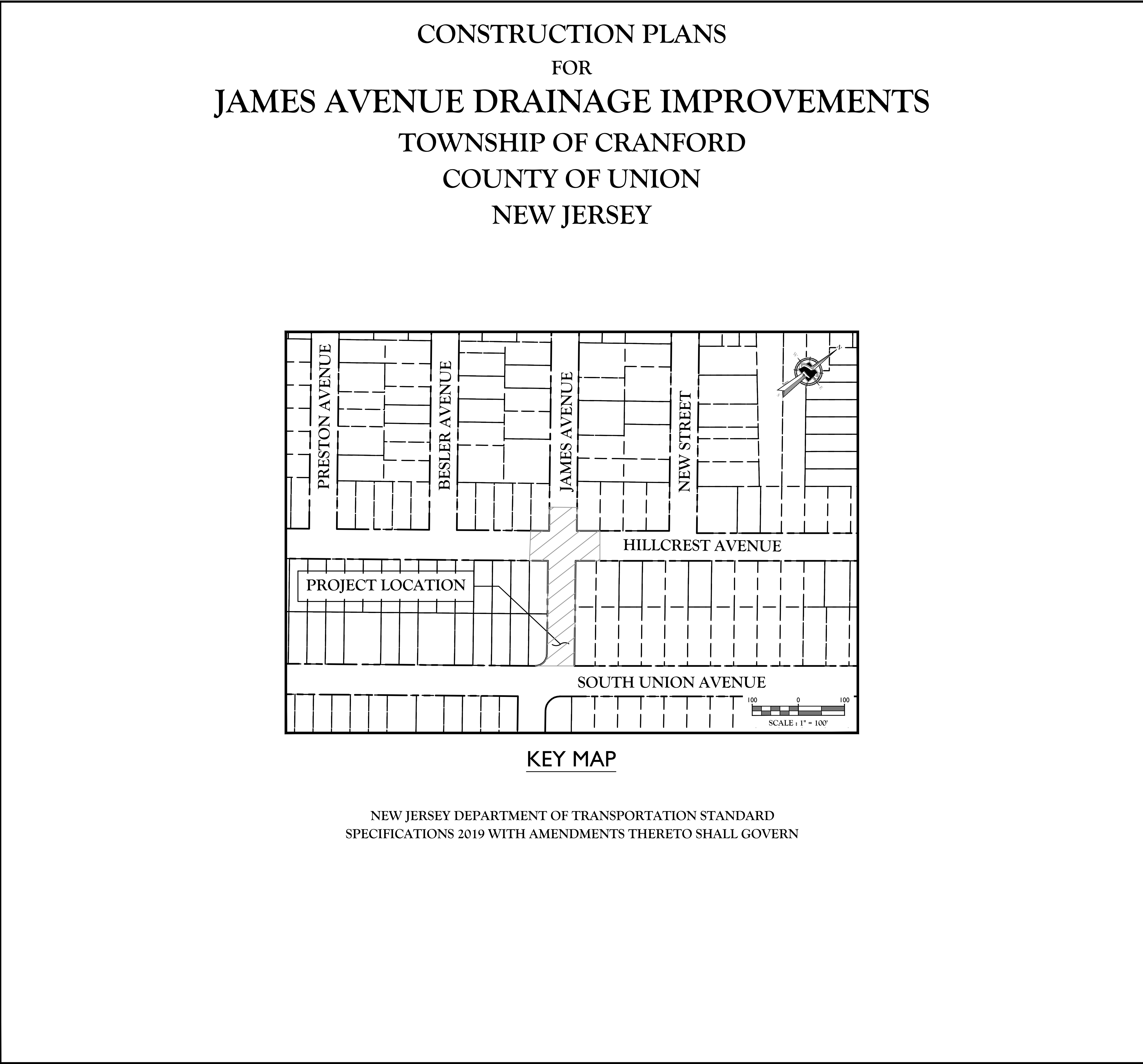
UTILITIES / AUTHORITIES	
<u>GAS SERVICE</u> ELIZABETHTOWN GAS COMPANY 520 GREEN LANE, UNION, NJ 7083 PHONE: (908) 662-8321 CONTACT: GREGORY J. BALINT	
<u>CABLE SERVICE</u> COMCAST CABLEVISION OF NJ 800 RAHWAY AVENUE, UNION, NJ 07083 PHONE: (908) 851-2258 CONTACT: GEORGE PALYCA	
<u>ELECTRIC SERVICE</u> PUBLIC SERVICE ELECTRIC AND GAS COMPANY 472 WESTON CANAL ROAD, SOMERSET, NJ 08873 PHONE: (732) 764-3067 CONTACT: JOHN GRABENSTEIN	
<u>WATER SERVICE</u> NEW JERSEY AMERICAN WATER COMPANY 1341 NORTH AVENUE, PLAINFIELD, NJ 07061 PHONE: (908) 791-3456 CONTACT: MICHAEL F. BANGE	
<u>TELEPHONE SERVICE</u> VERIZON COMMUNICATIONS 290 W. MT PLEASANT AVENUE, LIVINGSTON, NJ 07039 PHONE: (973) 422-5156 CONTACT: DARREN CRAY	
<u>SEWER SERVICES</u> TWP OF CRANFORD SEWER DEPARTMENT ROUND HOUSE, 364 NORTH AVENUE PHONE: (908) 709-7217 CONTACT: ERIK HASTRUP	
<u>RAHWAY VALLEY SEWERAGE AUTHORITY</u> 1050 EAST HAZELWOOD AVENUE, RAHWAY, NJ 07065 PHONE: (732) 388-0868 CONTACT: JOHN BUONOCORE	
TOWNSHIP OF CRANFORD	
PATRICK GIBLIN, MAYOR KATHLEEN MILLER PRUNTY, DEPUTY MAYOR/COMMISSIONER  THOMAS H. HANNEN, JR., COMMISSIONER JEAN-ALBERT MAISONNEUVE, COMMISSIONER MARY O'CONNOR, COMMISSIONER  PATRICIA DONAHUE, TOWNSHIP CLERK JAMIE CRYAN, TOWNSHIP ADMINISTRATOR	
INDEX OF SHEETS	
SHT. No.	DESCRIPTION
1	COVER
2	GENERAL NOTES & QUANTITIES
3 - 4	EXISTING CONDITIONS PLAN
5	DIMENSION PLAN
6	CROSS SECTIONS
7	SOIL EROSION & SEDIMENT CONTROL DETAILS
8 - 10	CONSTRUCTION DETAILS
11 - 14	NJDOT TRAFFIC CONTROL DETAILS
15 - 18	NJDOT CONSTRUCTION DETAILS

CONSTRUCTION PLANS  
FOR  
JAMES AVENUE DRAINAGE IMPROVEMENTS  
TOWNSHIP OF CRANFORD  
COUNTY OF UNION  
NEW JERSEY

A key map showing the project location on James Avenue. The map displays a grid of streets including Preston Avenue, Besler Avenue, James Avenue, New Street, Hillcrest Avenue, and South Union Avenue. A shaded area on James Avenue is labeled 'PROJECT LOCATION'. A north arrow is located in the upper right corner, and a scale bar indicating 1" = 100' is in the lower right corner.

KEY MAP

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



CONSTRUCTION PLANS  
FOR  
JAMES AVENUE DRAINAGE IMPROVEMENTS  
TOWNSHIP OF CRANFORD  
COUNTY OF UNION  
NEW JERSEY

A key map showing a street grid in Cranford, New Jersey. The map includes Preston Avenue, Besler Avenue, James Avenue, New Street, Hillcrest Avenue, and South Union Avenue. A shaded area on James Avenue between Hillcrest Avenue and South Union Avenue is labeled 'PROJECT LOCATION' with a leader line. A north arrow is located in the upper right corner, and a graphic scale bar (1" = 100') is in the lower right corner.

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KEY MAP

NEW JERSEY DEPARTMENT OF TRANSPORTATION STANDARD  
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1. EXISTING FEATURES SHOWN ON THIS PLAN WERE BASED ON INFORMATION FROM THE SURVEY ENTITLED, "TOPOGRAPHIC SURVEY FOR SOUTH UNION AVENUE" DATED 5/21/19, LAST REVISED 8/11/19, AND THE SURVEY ENTITLED, "TOPOGRAPHIC SURVEY FOR JAMES AVENUE & HILLCREST AVENUE" DATED 4/15/20, FOR THE TOWNSHIP OF CRANFORD, PREPARED BY MASER CONSULTING P.A..
2. THE HORIZONTAL POSITION OF THIS SURVEY IS BASED ON GPS OBSERVATIONS TIED TO THE KEYNET VIRTUAL REFERENCE STATION SYSTEM RELATIVE TO THE NEW JERSEY STATE PLANE COORDINATE SYSTEM, NAD 83. THE VERTICAL POSITION OF THE HEREON SURVEY IS BASED ON GPS OBSERVATIONS TIED TO THE KEYNET VIRTUAL REFERENCE STATION SYSTEM, ADJUSTED AND RELATIVE TO THE NORTH AMERICAN DATUM (NAVD 88).
3. ALL RIGHT-OF-WAY LINES, PROPERTY LINES, AND EASEMENTS ARE APPROXIMATE AND BASED UPON TAX MAPS.
4. THE LOCATION OF ALL UNDERGROUND UTILITIES AS SHOWN HEREON ARE APPROXIMATE AND ARE BASED ON VISIBLE ABOVE GROUND STRUCTURES AND UTILITY MARK OUTS. NO EXCAVATIONS WERE MADE DURING THE PROGRESS OF THIS SURVEY TO LOCATE BURIED UTILITIES/STRUCTURES. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED. THE CONTRACTOR SHALL HAVE ALL UNDERGROUND UTILITIES FIELD VERIFIED BY THE PROPER UTILITY COMPANIES BEFORE ANY CONSTRUCTION BEGINS.

1. ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION RELATED TO THE PROPOSED IMPROVEMENTS SHOWN HEREIN SHALL BE IN ACCORDANCE WITH THE FOLLOWING UNLESS SPECIFICALLY AMENDED OR SUPPLEMENTED BY CONTRACT DOCUMENTS:
  - A. N.J. DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2007", AS CURRENTLY AMENDED;
  - B. N.J. DEPARTMENT OF TRANSPORTATION "STANDARD ROADWAY CONSTRUCTION - TRAFFIC CONTROL - BRIDGE CONSTRUCTION DETAILS, 2007", AS CURRENTLY AMENDED;
  - C. "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED;
  - D. CURRENT PREVAILING MUNICIPAL, COUNTY AND/OR STATE AGENCY SPECIFICATIONS, STANDARDS, CONDITIONS AND REQUIREMENTS;
  - E. CURRENT PREVAILING UTILITY COMPANY/AUTHORITY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS;
  - F. CURRENT MANUFACTURER'S SPECIFICATIONS, STANDARDS AND REQUIREMENTS;
2. THE CONTRACTOR IS RESPONSIBLE FOR PROJECT SAFETY INCLUDING PROVISION OF ALL SAFETY DEVICES AND TRAINING REQUIRED.
3. THE CONTRACTOR IS RESPONSIBLE FOR THOROUGHLY EXAMINING THE PROJECT PLANS, SPECIFICATIONS, DETAILS, AND SITE. THE CONTRACTOR SHALL NOTIFY THE UNDERSIGNED PROFESSIONAL IMMEDIATELY IF ANY SITE CONDITIONS DIFFER MATERIALLY FROM THOSE REPRESENTED HEREIN.
4. THE CONTRACTOR SHALL OBTAIN PERMITS REQUIRED FOR THE PROPOSED IMPROVEMENTS.
5. ALL MATERIALS MUST BE AMERICAN MADE. THE CONTRACTOR MUST PROVIDE THE ENGINEER WITH SHIPPING AND DELIVERY TICKETS/RECEIPTS FOR ALL MATERIALS TO USED FOR CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
6. THE CONTRACTOR SHALL OBTAIN SHOP DRAWING APPROVAL PRIOR TO THE INSTALLATION OF EACH ITEM. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL AT LEAST TWO (2) WEEKS PRIOR TO ORDERING MATERIALS.
7. THE CONTRACTOR IS RESPONSIBLE FOR ALL STAKEOUT AND LAYOUT, AS NECESSARY, TO CONSTRUCT THE PROPOSED IMPROVEMENTS IN STRICT CONFORMANCE WITH THE PROJECT PLANS, SPECIFICATIONS AND DETAILS. THESE DESIGN DRAWINGS HAVE NOT BEEN DRAFTED OVER A SURVEY BASE MAP.
8. THE CONTRACTOR MUST REVIEW AND AGREE TO AS-BUILT QUANTITIES WITH THE ENGINEER ON A WEEKLY BASIS.
9. THE ENGINEER MUST BE CONTACTED IMMEDIATELY UPON THE INSPECTOR OR CONTRACTOR RECEIVING A COMPLAINT FROM ANY PERSON WITHIN THE PROJECT AREA OR MUNICIPAL OFFICIAL.

1. UNDERGROUND UTILITIES AND FEATURES WITHIN JAMES AVENUE, HILLCREST AVENUE & SOUTH UNION AVENUE WERE MAPPED USING RADIO FREQUENCY PIPE AND CABLE LOCATORS (RFL) AND GROUND PENETRATING RADAR(GPR), OTHER BURIED UTILITIES MAY BE PRESENT BUT WERE NOT DETECTED DUE TO LIMITATIONS OF THE RFL AND GPR SYSTEMS, UNFAVORABLE SOIL CONDITIONS, SITE ACCESS, AND/OR DENSE UTILITY INFRASTRUCTURE; THEREFORE, 100% DETECTION IS NOT GUARANTEED. CAUTION SHOULD BE USED WHEN EXCAVATING IN THE VICINITY OF MAPPED FEATURES.
2. POSITION OF GEOPHYSICAL FEATURES CANNOT BE GUARANTEED WITHOUT EXPOSURE.
3. TARGETS WITH LATERAL EXTENTS OF LESS THAN 3 FEET AS OBSERVED IN GEOPHYSICAL DATA WERE NOT MAPPED.
4. PLOTTED UTILITY POSITIONS AND DEPTHS REPRESENT LOCATION OF MOST APPROPRIATE INTERPRETED GEOPHYSICAL RESPONSE. THIS RESPONSE IS GENERALLY PRESENT OVER THE TOP CENTER OF THE TARGET BUT MAY BE LOCATED OFF-CENTER DEPENDING ON SIGNAL QUALITY AND THE EFFECTS OF LOCAL INTERFERENCE. FEATURE MAY BE WIDER THAN PLOTTED LINE (E.G. DUCT BANKS, LARGE CONDUIT).
5. UTILITIES MAY BE INSTALLED WITHIN A DUCT BANK. DUE TO THE LIMITATIONS OF GEOPHYSICAL EQUIPMENT AND THE LOCATION OF FEATURES WITHIN THE DUCT BANK, THE ACTUAL HORIZONTAL AND VERTICAL DIMENSIONS OF THE DUCT BANK SYSTEM (AS OBSERVED IN GEOPHYSICAL DATA) MAY VARY.
6. DUE TO LIMITATIONS OF GEOPHYSICAL METHODS, IT IS NOT ALWAYS POSSIBLE TO DISCRIMINATE BETWEEN UTILITIES AND OTHER BURIED FEATURES; THEREFORE IT IS POSSIBLE THAT SOME PLOTTED FEATURES MAY REPRESENT OBJECTS OTHER THAN UTILITIES.
7. DUE TO VARYING SOIL CONDITIONS, POSSIBLE CHANGES IN UTILITY MATERIAL, AND OTHER FACTORS, SOME UNDERGROUND UTILITIES COULD NOT BE TRACED ENTIRELY WITHIN THE PROJECT LIMITS. THE UTILITY MAY CONTINUE, BUT SINCE IT WAS NOT OBSERVED IN THE GEOPHYSICAL DATA BEYOND THESE POINTS, IT COULD NOT BE MAPPED.
8. DEPTHS SHOWN FOR UTILITIES ARE IN FEET BELOW EXISTING GROUND SURFACE AT TIME OF SURVEY. AS RFLS CANNOT PROVIDE RELIABLE DETPH INFORMATION, DEPTHS ARE NOT PROVIDED FOR UTILITIES LOCATED WITH RFLS, BUT NOT DETECTED IN THE GPR DATA.
9. DUE TO THE SITE SPECIFIC CONDITIONS, GPR SIGNAL PENETRATION DEPTH IS APPROXIMATELY 6 FEET. UTILITIES BELOW THIS DEPTH WERE NOT CONSISTENTLY DETECTED WITH GPR. THERE MAY BE OTHER UTILITIES PRESENT AT THE SITE BELOW THIS DEPTH THAT WERE NOT DETECTED AND THEREFORE ARE NOT PLOTTED ON THESE MAPS.
10. ONLY THOSE AREAS DENOTED WITHIN THE PROJECT SITE LIMITS WERE INVESTIGATED WITH GEOPHYSICAL METHODS. NO CLAIMS TO UTILITY POSITION ARE MADE OUTSIDE OF THESE BOUNDARIES.
11. SURFACE OBSTRUCTIONS SUCH AS UTILITY POLES AND HEAVY VEGETATION MAY HAVE LIMITED THE DATA COLLECTION AREA.
12. CONTRACTOR IS RESPONSIBLE FOR CONTACTING ONE-CALL SERVICES AS REQUIRED BY STATE AND/OR LOCAL ORDINANCES PRIOR TO ANY EXCAVATION ACTIVITIES.
13. NOT ALL UTILITY POLES, UTILITY VALVES AND UTILITY LINES ARE SHOWN ON THE PLAN. THE CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
14. THE CONTRACTOR SHALL CALL FOR A UTILITY MARK-OUT PRIOR TO THE START OF CONSTRUCTION (CALL 1-800-272-1000).
15. UTILITY RELOCATIONS SHOWN ON THE PLAN, IF ANY, ARE FOR INFORMATIONAL PURPOSES ONLY AND MAY NOT REPRESENT ALL REQUIRED WORK. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH ALL UTILITY COMPANIES/AUTHORITIES IMPACTED BY THE PROPOSED WORK AND PERFORMING UTILITY RELOCATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF THE PERTINENT UTILITY COMPANIES/AUTHORITIES. NO SEPARATE PAYMENT SHALL BE MADE FOR COORDINATING AND PERFORMING UTILITY RELOCATIONS.
16. ALL UTILITY MANHOLES, VALVE BOXES, CLEANOUTS, METERS, ETC. SHALL BE RESET BY THE CONTRACTOR TO MEET PROPOSED ROAD, SIDEWALK AND DRIVEWAY GRADES. THE CONTRACTOR SHALL COORDINATE WITH IMPACTED UTILITY COMPANIES/AUTHORITIES AS NECESSARY..
17. THE CONTRACTOR SHALL TAKE PRECAUTION WHEN WORKING ADJACENT TO UTILITIES AND TEMPORARILY SUPPORT UTILITY POLES, IF REQUIRED, DURING THE PROGRESS OF WORK.
18. THE CONTRACTOR SHALL CLEAN AND MAINTAIN ALL STORM SEWER STRUCTURES, AS NECESSARY, FOR THE DURATION OF THE PROJECT.

1. THE CONTRACTOR SHALL COORDINATE ALL TRAFFIC CONTROL MEASURES WITH THE LOCAL POLICE DEPARTMENT AND OWNER. TRAFFIC CONTROL DETAILS PROVIDED HEREIN ARE TYPICAL AND SUBJECT TO MODIFICATION BY THE LOCAL POLICE DEPARTMENT AND OWNER.
2. THE CONTRACTOR SHALL MAKE PROVISIONS FOR MATERIAL AND EQUIPMENT STORAGE. NO EQUIPMENT OR MATERIALS SHALL BE STORED WITHIN THE R.O.W. WITHOUT EXPRESS WRITTEN CONSENT FROM THE LOCAL POLICE DEPARTMENT AND OWNER.
3. THE CONTRACTOR SHALL PREPARE AND SUBMIT A TRAFFIC CONTROL SCHEDULE AND STAGING PLAN TO THE LOCAL POLICE DEPARTMENT AND OWNER FOR REVIEW AND APPROVAL. THE PLAN MUST BE APPROVED BY THE LOCAL POLICE DEPARTMENT AND OWNER PRIOR TO THE START OF CONSTRUCTION.
4. THE CONTRACTOR SHALL NOTIFY THE OWNER AND LOCAL POLICE DEPARTMENT SEVENTY-TWO (72) HOURS PRIOR TO THE START OF ANY WORK.
5. THE CONTRACTOR SHALL COORDINATE WITH THE LOCAL POLICE DEPARTMENT TO DETERMINE THE NEED FOR POLICE TRAFFIC DIRECTORS. THE CONTRACTOR SHALL PROVIDE THE LOCAL POLICE DEPARTMENT WITHIN AT LEAST ONE (1) WEEK NOTICE PRIOR TO REQUESTING POLICE TRAFFIC DIRECTORS.
6. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PLACING TEMPORARY NO PARKING SIGNS. SIGNS MUST BE OBTAINED FROM THE LOCAL POLICE DEPARTMENT, IF APPLICABLE. TEMPORARY NO PARKING SIGNS MUST BE POSTED AT LEAST FORTY- EIGHT (48) HOURS IN ADVANCE CONSTRUCTION.

1. THE CONTRACTOR SHALL INSTALL AND MAINTAIN SOIL EROSION AND SEDIMENT CONTROL MEASURES FOR THE DURATION OF THE PROJECT IN ACCORDANCE WITH THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL MEASURES IN NEW JERSEY.
2. INLET FILTERS ARE TO BE INSTALLED ON ALL EXISTING AND NEW INLETS WITHIN THE PROJECT LIMITS AND IMMEDIATELY ADJACENT TO PROJECT LIMITS.
3. SILT FENCE SHALL BE INSTALLED AS DIRECTED IN THE FIELD BY THE ENGINEER, AS NECESSARY.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING DUST CONTROL MEASURES, AS NECESSARY. ALL VEHICLES SHALL BE CLEAN AND ALL ROADWAYS SHALL BE MAINTAINED TO AVOID DUST POLLUTION.
5. THE CONTRACTOR SHALL PROTECT ALL TREES SCHEDULED TO REMAIN DURING CONSTRUCTION. DAMAGE TO EXISTING TREES WILL BE EVALUATED BY THE OWNER AND ENGINEER. DAMAGED TREES WILL BE REPLACED AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
6. WHERE EXISTING TREES AND ROOT SYSTEMS MAY CONFLICT WITH THE PROPOSED IMPROVEMENTS, THE CONTRACTOR MUST RETAIN A CERTIFIED TREE EXPERT TO EVALUATE TREES IN QUESTION. ALL EVALUATIONS SHALL BE IN WRITING AND SHALL ACCURATELY IDENTIFY THE TREE IN QUESTION BY STATION AND OFFSET (LEFT OR RIGHT). ALL EVALUATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

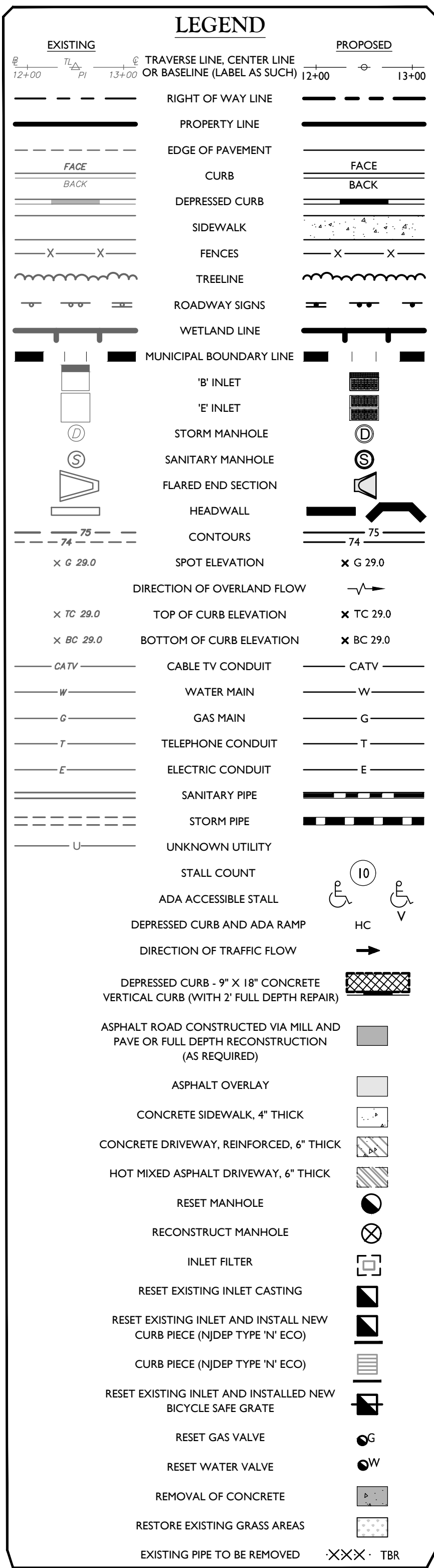
1. ALL EXCAVATED MATERIALS ARE TO BE DISPOSED OF IN ACCORDANCE WITH APPROVED NJDOT AND NJDEP METHODS AND MEANS. THE CONTRACTOR MUST NOT DEPOSIT EXCESS MATERIALS WITHIN THE MUNICIPAL LIMITS WITHOUT EXPRESS PERMISSION OF THE OWNER.
2. ALL EXCAVATED AND DEMOLISHED MATERIALS, DEBRIS, AND EQUIPMENT, INCLUDING STONE, TOPSOIL, TREES, BLOCK AND CONCRETE FORMS, MUST BE REMOVED FROM THE PROJECT AREA AT THE CONCLUSION OF EACH DAY, UNLESS OTHERWISE APPROVED BY THE ENGINEER AND LOCAL POLICE DEPARTMENT.
3. THE CONTRACTOR SHALL NOTE THAT ROADWAY BASE MATERIAL MAY CONSIST OF COBBLESTONES, CONCRETE AND/OR ASPHALT. NO ADDITIONAL PAYMENTS WILL BE MADE TO CONTRACTOR FOR DAMAGES TO EQUIPMENT OR ADDITIONAL LABOR REQUIRED TO MAKE IMPROVEMENTS AS DESCRIBED ON PLANS DUE TO VARIATIONS IN ROADWAY BASE MATERIALS.
4. ALL EXISTING GRATES AND CASTINGS ARE THE PROPERTY OF THE MUNICIPALITY OR RESPECTIVE UTILITY AUTHORITY. ALL EXISTING GRATES AND CASTINGS THAT ARE TO BE REPLACED AS A PART OF THE PROPOSED IMPROVEMENTS SHALL BE RETURNED TO THE MUNICIPALITY OR RESPECTIVE UTILITY AUTHORITY.
5. THE CONTRACTOR MUST PROTECT CONCRETE UNTIL CONCRETE IS CURED. DAMAGED AND VANDALIZED CONCRETE SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. THE CONTRACTOR SHALL RESET ALL RAILINGS, GATES AND FENCES AS REQUIRED TO COMPLETE THE PROPOSED IMPROVEMENTS.
7. THE CONTRACTOR IS RESPONSIBLE TO REPLACE/RESET ANY SPRINKLERS DAMAGED/DISTURBED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.

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

1. THE CONTRACTOR MUST PROVIDE A SMOOTH SAWCUT EDGE WHERE PROPOSED PAVEMENT ABUTS EXISTING PAVEMENT.
2. THE CONTRACTOR SHALL MARK ALL RAISED UTILITY MANHOLES, INLETS AND VALVE BOXES THAT ARE EXPOSED AS A RESULT OF MILLING. IN ADDITION, THE CONTRACTOR SHALL INSTALL TEMPORARY PAVEMENT RAMPS AROUND RAISED UTILITIES AS DIRECTED BY THE ENGINEER WHERE SUCH UTILITIES MAY BE IN CONFLICT WITH VEHICULAR AND PEDESTRIAN TRAFFIC.

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

PAY ITEM NO.	BASE BID - JAMES AVENUE DRAINAGE IMPROVEMENTS	UNIT	TOTAL BASE BID QUANTITY
1	CAUTION FENCE	LF	130
2	INLET FILTER, TYPE 2	SF	112
3	BREAKAWAY BARRICADE	UNIT	24
4	DRUM	UNIT	10
5	TRAFFIC CONE	UNIT	50
6	CONSTRUCTION SIGNS	SF	200
7	POLICE TRAFFIC DIRECTORS	HOURL	80
8	FUEL PRICE ADJUSTMENT	DOLLAR	200
9	CLEARING SITE	LS	1
10	EXCAVATION, BORROW EXCAVATION AND GRADING, UNCLASSIFIED	LS	1
11	HMA MILLING, 3" OR LESS	SY	449
12	HMA PROFILE MILLING	SY	1,032
13	SEALING OF CRACKS IN HOT MIX ASPHALT SURFACE COURSE	LF	2,700
14	HOT MIX ASPHALT 9.5 M 64 SURFACE COURSE	TON	296
15	HOT MIX ASPHALT 19 M 64 BASE COURSE	TON	179
16	FULL DEPTH CONCRETE PAVEMENT REPAIR, HMA	SY	546
17	24" REINFORCED CONCRETE PIPE, CLASS V	LF	524
18	14" DUCTILE IRON PIPE, CLASS 52	LF	11
19	16" DUCTILE IRON PIPE, CLASS 52	LF	143
20	18" DUCTILE IRON PIPE, CLASS 52	LF	39
21	20" DUCTILE IRON PIPE, CLASS 52	LF	23
22	INLET, TYPE B	UNIT	2
23	INLET, TYPE DOUBLE B	UNIT	2
24	INLET, TYPE E	UNIT	4
25	3' X 3' MANHOLE BOX	UNIT	4
26	RESET EXISTING CASTING (MANHOLE)	UNIT	4
27	HOT MIX ASPHALT DRIVEWAY, 6" THICK	SY	15
28	CONCRETE DRIVEWAY, REINFORCED, 6" THICK	SY	37
29	CONCRETE SIDEWALK, 4" THICK	SY	319
30	DETECTABLE WARNING SURFACE	SY	5
31	9" X 18" CONCRETE VERTICAL CURB	LF	722
32	TRAFFIC STRIPES, 6"	LF	285
33	8" DUCTILE IRON PIPE, CLASS 56	LF	80
34	10" DUCTILE IRON PIPE, CLASS 56	LF	40
35	TOPSOILING, 4" THICK	SY	142
36	FERTILIZING AND SEEDING, TYPE ERNMX-106	SY	142
37	STRAW MULCHING	SY	142



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*Carl P. O'Brien*

**CARL P. O'BRIEN**  
NEW JERSEY PROFESSIONAL  
ENGINEER - LICENSE NUMBER: GE45154

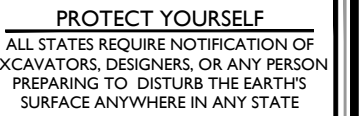
<h1 style="margin: 0;">CONSTRUCTION PLANS</h1>  <h2 style="margin: 0;">FOR</h2> <h1 style="margin: 0;">JAMES AVENUE DRAINAGE IMPROVEMENTS</h1>			
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 30%;">  </div> <div style="width: 65%;"> <p><b>MT. ARLINGTON OFFICE</b>  400 Valley Road  Suite 304  Mount Arlington, NJ 07856</p> <p>Phone: 973.398.3110  Fax: 973.398.3199</p> </div> </div>			
SCALE: AS SHOWN	DATE: 7/21/20	DRAWN BY: PPC	CHECKED BY: BKP
PROJECT NUMBER: CDT062		DRAWING NAME: C-COVER-JAME-HILL	
<div style="border: 1px solid black; padding: 5px;"> SHEET TITLE:  <h2 style="text-align: center; margin: 10px 0;">GENERAL NOTES &amp; QUANTITIES</h2> </div>			
SHEET NUMBER: <div style="display: flex; justify-content: space-around; align-items: center; font-size: 24px; font-weight: bold;"> <span>2</span> <span>of</span> <span>18</span> </div>			





State of N.J. C.O.A.: 24GA27986500

the express written consent of Fisher Consulting, P.A.




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REV	DATE	DRAWN BY	DESCRIPTION
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**CARL P. O'BRIEN**  
NEW JERSEY PROFESSIONAL  
ENGINEER - LICENSE NUMBER: GE45154

FOR  
JAMES AVENUE  
DRAINAGE  
IMPROVEMENTS

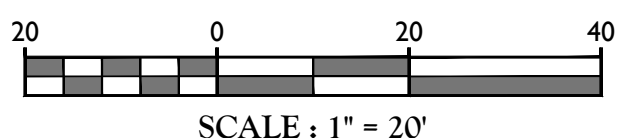
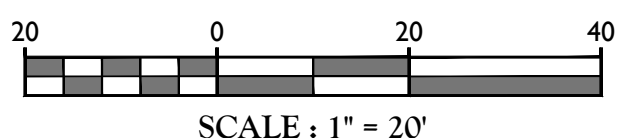


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AS SHOWN	7/21/20	PPC	BKP
PROJECT NUMBER:		DRAWING NAME:	
CDT062		C-DEMO-JAME-HILL	

SHEET NUMBER:  
3 of 18



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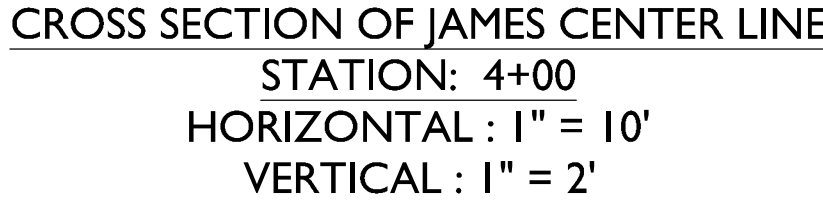
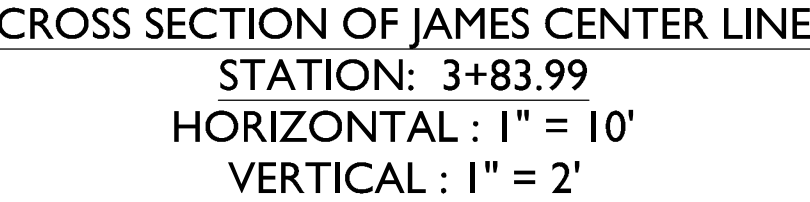
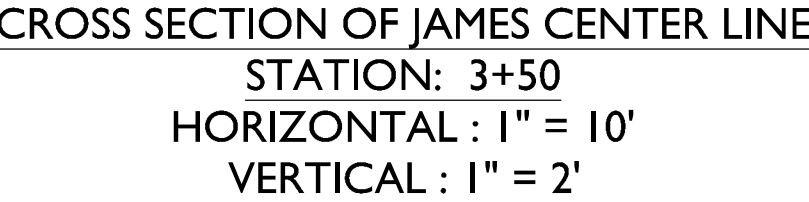
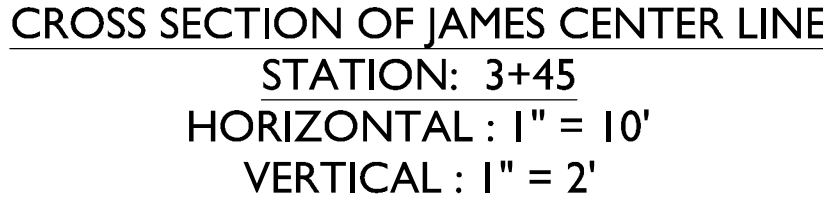
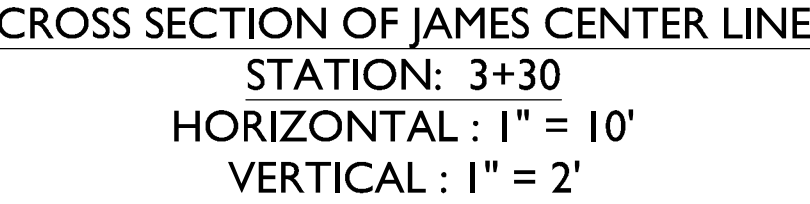
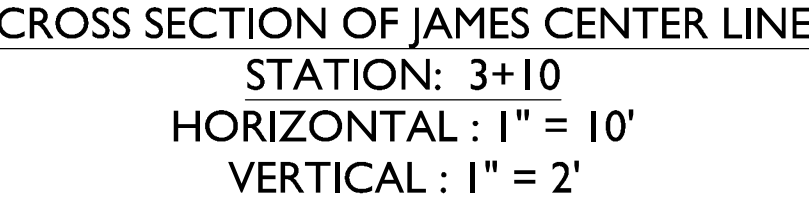
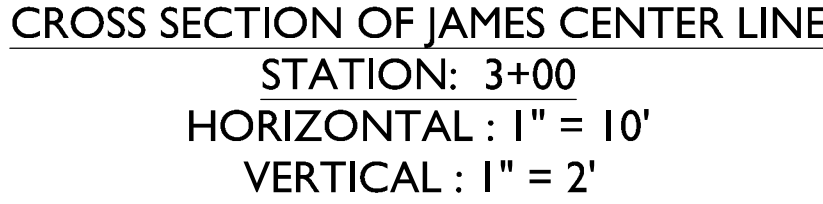
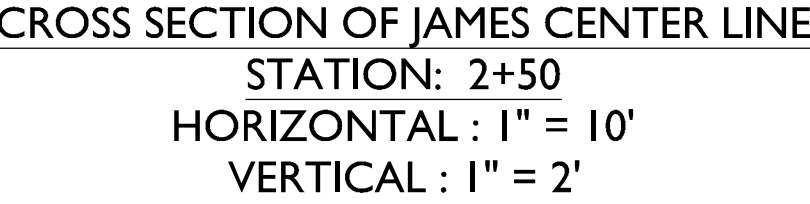
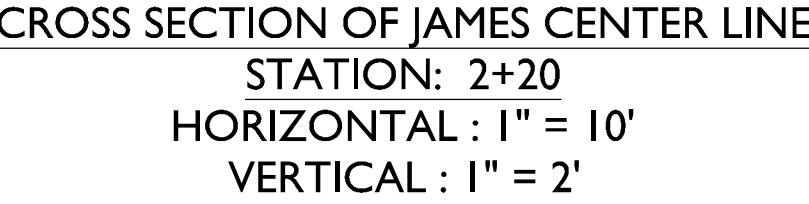






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CARL P. O'BRIEN  
NEW JERSEY PROFESSIONAL  
ENGINEER - LICENSE NUMBER: GE45154

CONSTRUCTION PLANS  
FOR  
JAMES AVENUE  
DRAINAGE  
IMPROVEMENTS

TOWNSHIP OF CRANFORD  
COUNTY OF UNION  
STATE OF NEW JERSEY



**MT. ARLINGTON OFFICE**  
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Suite 304  
Mount Arlington, NJ 07856

Phone: 973.398.3110  
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SCALE: AS SHOWN	DATE: 7/21/20	DRAWN BY: PPC	CHECKED BY: BKP
PROJECT NUMBER: CDT062		DRAWING NAME: C-LAYT-JAME-HILL	

SHEET TITLE:	CROSS SECTIONS
SHEET NUMBER:	6 of 18



MCJN-SOIL-NOTE-1013 05/01/17

THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED IN WRITING 48 HOURS IN ADVANCE OF ANY LAND DISTURBING ACTIVITY.

ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCES, OR IN THEIR PROPER SEQUENCE AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.

ANY STOCKPILE OR DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN 14 DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO NJ STATE STANDARDS.

PERMANENT VEGETATION SHALL BE SEED OR SODDED ON ALL EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADING. MULCH WILL BE USED FOR PROTECTION UNTIL SEEDING IS ESTABLISHED

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE NJ STATE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL, IN NEW JERSEY.

A SUB-BASE COURSE WILL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS IN ORDER TO STABILIZE STREETS, ROADS, WALKWAYS AND PARKING AREAS. IN AREAS WHERE NO UTILITIES ARE PRESENT, THE SUB-BASE SHALL BE INSTALLED WITHIN 15 DAYS OR PRELIMINARY GRADING.

IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING ALL CRITICAL AREAS SUBJECT TO EROSION (E.g. STEEP SLOPES, ROADWAY EMBANKMENTS) WILL RECEIVE A TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO THE NJ STATE STANDARDS.

ANY STEP SLOPES RECEIVING PIPELINE INSTALLATION WILL BE BACKFILLED AND STABILIZED DAILY, AS THE INSTALLATION PROCEEDS (E.G. SLOPES GREATER THAN 3:1)

TRAFFIC CONTROL STANDARDS REQUIRE THE INSTALLATION OF A 50'X30'X6" PAD OF 1 1/2" OR 2" STONE, AT ALL CONSTRUCTION DRIVEWAYS, IMMEDIATELY AFTER INITIAL SITE DISTURBANCE.

AT THE TIME WHEN THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER, SHALL BE REMOVED AND REPLACED WITH A SOIL WITH MORE PERMANENTLY ADJUST THE SOIL CONDITIONS AND TENDENCY TOWARD 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 THAT NJSA 424-39 ET SEQ., REQUIRES THAT NO CERTIFICATE OF OCCUPANCY BE ISSUED BEFORE THE PROVISIONS OF THE CERTIFIED PLAN FOR SOIL EROSION AND SEDIMENT CONTROL ARE COMPLETED. THE CERTIFIED PLAN FOR PERMANENT MEASURES, ALL SITE WORK FOR SITE PLANS AND ALL WORK AROUND INDIVIDUAL LOTS IN SUBDIVISIONS, WILL HAVE TO BE COMPLETED PRIOR TO THE DISTRICT ISSUING A REPORT OF COMPLIANCE FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE MUNICIPALITY.

CONDUIT OUTLET PROTECTION MUST BE INSTALLED AT ALL REQUIRED OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.

ANY CHANGES TO THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN WILL REQUIRE THE SUBMISSION OF REVISED SOIL EROSION AND SEDIMENT CONTROL PLANS TO THE DISTRICT FOR RECERTIFICATION. THE REVISED PLANS MUST MEET ALL CURRENT NJ STATE SOIL EROSION & SEDIMENT CONTROL STANDARDS.

THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED OF ANY CHANGES IN OWNERSHIP.

MULCHING TO THE NJ STANDARDS IS REQUIRED FOR OBTAINING A CONDITIONAL REPORT OF COMPLIANCE. CONDITIONALS ARE ONLY ISSUED WHEN THE SEASON PROHIBITS SEEDING.

CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL ADJACENT ROADS CLEAN DURING LIFE OF CONSTRUCTION PROJECT.

THE DEVELOPER SHALL BE RESPONSIBLE FOR REMEDIATING ANY EROSION OR SEDIMENT PROBLEMS THAT ARISE AS A RESULT OF ONGOING CONSTRUCTION AT THE REQUEST OF THE SOMERSET-UNION SOIL CONSERVATION DISTRICT.

HYDRO SEEDING IS A TWO- STEP PROCESS. THE FIRST STEP INCLUDES SEED, FERTILIZER, LIME, ETC., ALONG WITH MINIMAL AMOUNTS OF MULCH TO PROMOTE CONSISTENCY, GOOD SEED TO SOIL CONTACT, AND GIVE A VISUAL INDICATION OF COVERAGE. UPON COMPLETION OF SEEDING OPERATION, HYDROMULCH SHOULD BE APPLIED AT A RATE OF 1500 LBS. PER ACRE IN SECOND STEP. THE USE OF HYDROMULCH, AS OPPOSED TO STRAW, IS LIMITED TO OPTIMUM SEEDING DATES AS LISTED IN THE NJ STANDARDS.

UNLINEDREWATERING IS NOT PERMITTED. NECESSARY PRECAUTIONS MUST BE TAKEN DURING ALL Dewatering OPERATIONS TO MINIMIZE SOIL TRANSFER. ANY Dewatering METHODS USED MUST BE IN ACCORDANCE WITH THE STANDARD FOR Dewatering.

**TOPSOIL STOCKPILE PROTECTION**

0.1. APPLY GROUND LIMESTONE AT A RATE OF 90 LBS. PER 1000 SQ. FT.

0.2. APPLY FERTILIZER (10-20-10) AT A RATE 1 LBS. PER 1000 SQ. FT.

0.3. APPLY PERENNIAL RYEGRASS SEED AT 1 LB. PER 1000 SQ. FT. AND ANNUAL RYEGRASS SEED AT 1 LB. PER 1000 SQ. FT.

0.4. MULCH STOCKPILE WITH STRAW OR HAY AT A RATE OF 90 LBS. PER 1000 SQ. FT.

0.5. APPLY A LIQUID MULCH BINDER OR TACK TO STRAW OR HAY MULCH.

0.6. PROPERLY ENTRENCH A SILT FENCE AT THE BOTTOM OF THE STOCKPILE.

**TEMPORARY STABILIZATION SPECIFICATIONS**

1.1. APPLY GROUND LIMESTONE AT A RATE OF 90 LBS. PER 1000 SQ. FT.

1.2. APPLY FERTILIZER (10-20-10) AT A RATE 1 LBS. PER 1000 SQ. FT.

1.3. APPLY PERENNIAL RYEGRASS SEED AT 1 LB. PER 1000 SQ. FT. AND ANNUAL RYEGRASS SEED AT 1 LB. PER 1000 SQ. FT.

1.4. MULCH STOCKPILE WITH STRAW OR HAY AT A RATE OF 90 LBS. PER 1000 SQ. FT.

1.5. APPLY A LIQUID MULCH BINDER OR TACK TO STRAW OR HAY MULCH.

**PERMANENT STABILIZATION SPECIFICATIONS**

2.1. APPLY TOPSOIL TO A DEPTH OF 5 INCHES (UNSETTLED)

2.2. APPLY GROUND LIMESTONE AT A RATE OF 90 LBS. PER 1000 SQ. FT.

2.3. APPLY FERTILIZER (10-20-10) AT A RATE 1 LBS. PER 1000 SQ. FT.

2.4. APPLY PERENNIAL RYEGRASS SEED AT 1 LB. PER 1000 SQ. FT. AND ANNUAL RYEGRASS SEED AT 1 LB. PER 1000 SQ. FT.

2.5. MULCH STOCKPILE WITH STRAW OR HAY AT A RATE OF 90 LBS. PER 1000 SQ. FT.

2.6. APPLY A LIQUID MULCH BINDER OR TACK TO STRAW OR HAY MULCH.

NOTE: 72 HOURS PRIOR TO ANY SOIL DISTURBANCE, NOTICE IN WRITING, SHALL BE GIVEN TO THE SOMERSET UNION SOIL CONSERVATION DISTRICT AND A PRE-CONSTRUCTION MEETING HELD.

## SITE PREPARATION

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

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

### 2. SEEDBED PREPARATION

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

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

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

LIMESTONE APPLICATION RATE BY SOIL TEXTURE	TONS/ACRE	LB5/1,000 SQ. FT.
SOIL TEXTURE		
CLAY, CLAY LOAM, AND HIGH ORGANIC SOIL	3	135
SANDY LOAM, LOAM, SILTY LOAM	1	90
LOAMY SAND, SAND	1	45

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

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

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

### 3. SEEDING

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

B. CONVENTIONAL SEEDING IS PERFORMED BY APPLYING SEED UNIFORMLY BY HAND, CYCLONE (CENTRIFUGAL) SEEDER, DROP SEEDER, DRILL OR CULPTACKER SEEDER. EXCEPT FOR DRILLED, HYDROSEEDED OR CULPTACKED SEEDINGS, SEED SHALL BE INCORPORATED INTO THE SOIL WITHIN 24 HOURS OF SEEDBED PREPARATION TO A DEPTH OF 1/4 TO 1/2 INCH BY RAKING OR DRAGGING. DEPTH OF SEED PLACEMENT MAY BE 1/4 INCH DEEPER ON COARSE TEXTURED SOIL.

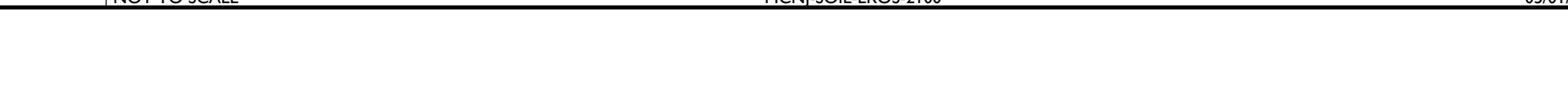
C. HYDROSEEDING IS A BROADCAST SEEDING METHOD USUALLY INVOLVING A TRUCK OR TRAILER MOUNTED TANK, WITH AN AGITATION SYSTEM AND MOUNTED TANK, WITH AN AGITATION SYSTEM AND HYDRAULIC PUMP FOR MIXING SEED, WATER AND FERTILIZER AND SPRAYING THE MIX ONTO THE PREPARED SEEDBED. MULCH SHALL NOT BE INCLUDED IN THE TANK WITH SEED. SHORT FIBERED MULCH PLANTED WITH A HYDROSEEDER FOLLOWING SEEDING. (ALSO SEE SECTION 4 MULCHING BELOW) HYDROSEEDING IS NOT A PREFERRED SEEDING METHOD BECAUSE SEED AND FERTILIZER ARE APPLIED TO THE SURFACE AND NOT INCORPORATED INTO THE SOIL. POOR SEED TO SOIL CONTACT RESULTS IN REDUCING GERMINATION AND GROWTH. HYDROSEEDING MAY BE USED FOR AREAS TOO STEEP FOR CONVENTIONAL EQUIPMENT TO TRAVERSE OR TOO OBSTRUCTED WITH ROCKS, STUMPS, ETC.

D. AFTER SEEDING, 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.

### 4. MULCHING

A. MULCHING IS REQUIRED ON ALL SEEDING.

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TOTAL PROJECT AREA OF DISTURBANCE = 8,856 SF OR 0.20 ACRES

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(FILTER BAG) DETAIL

MCNJ-SOIL-EROS-2100 05/01

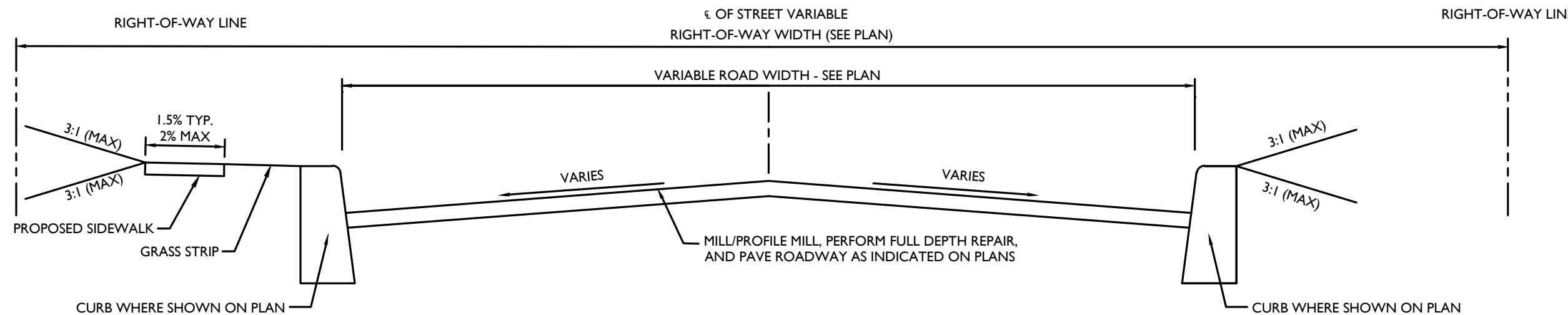
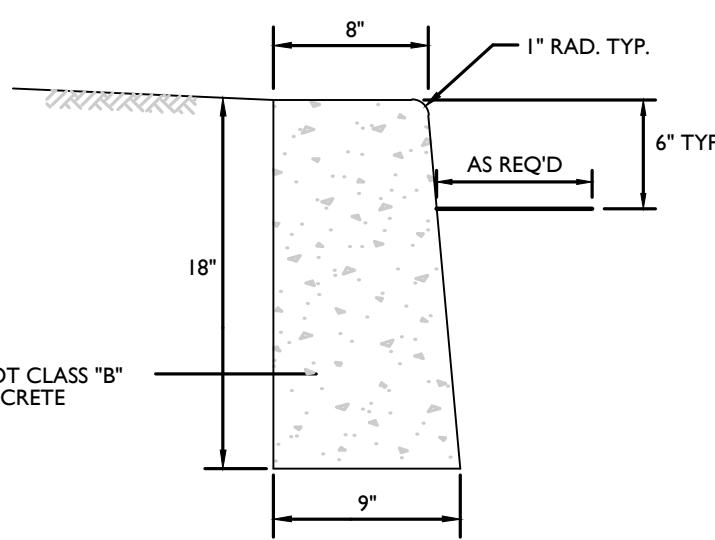
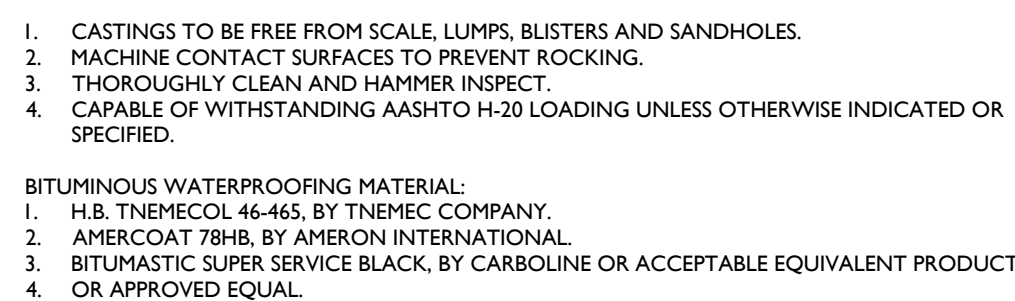
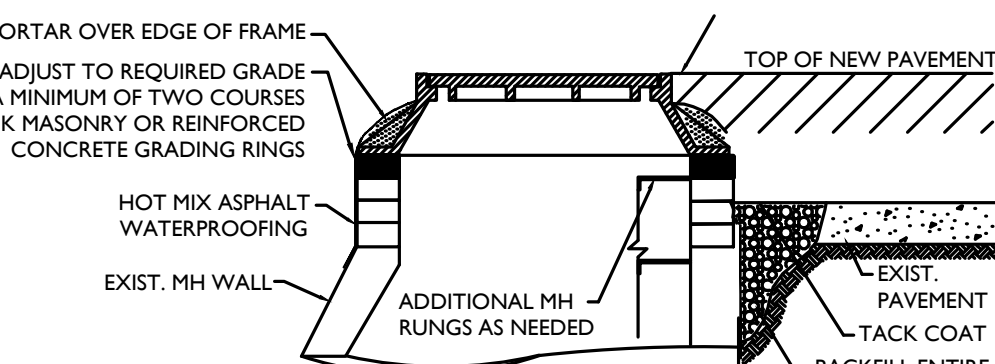
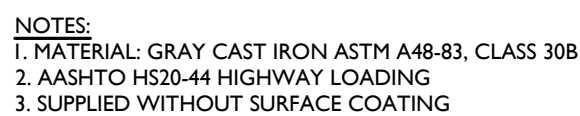
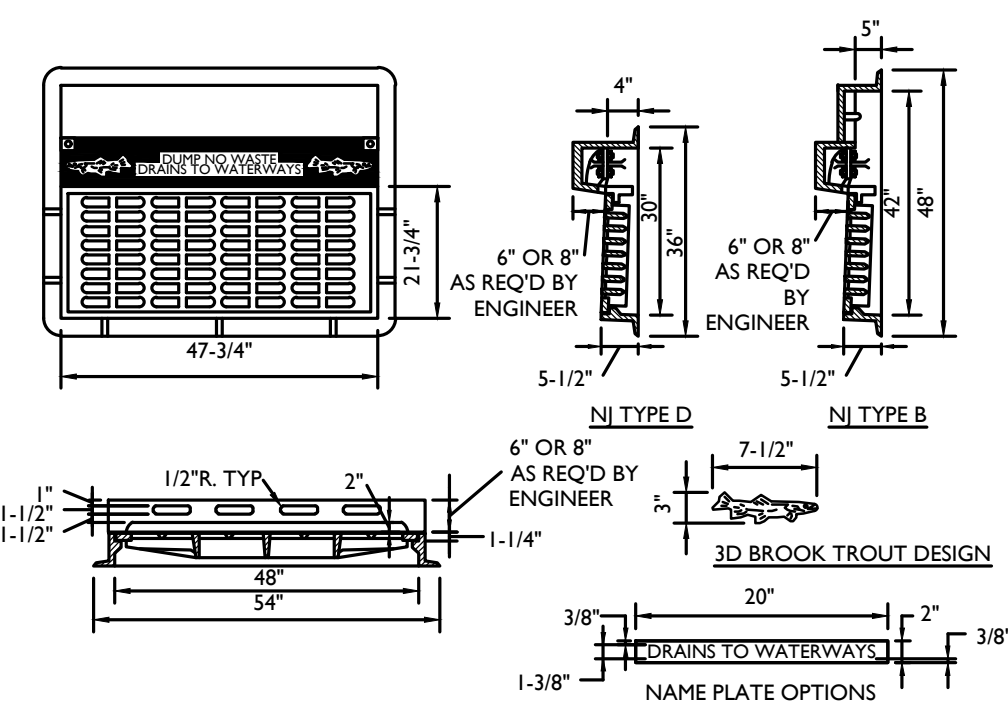
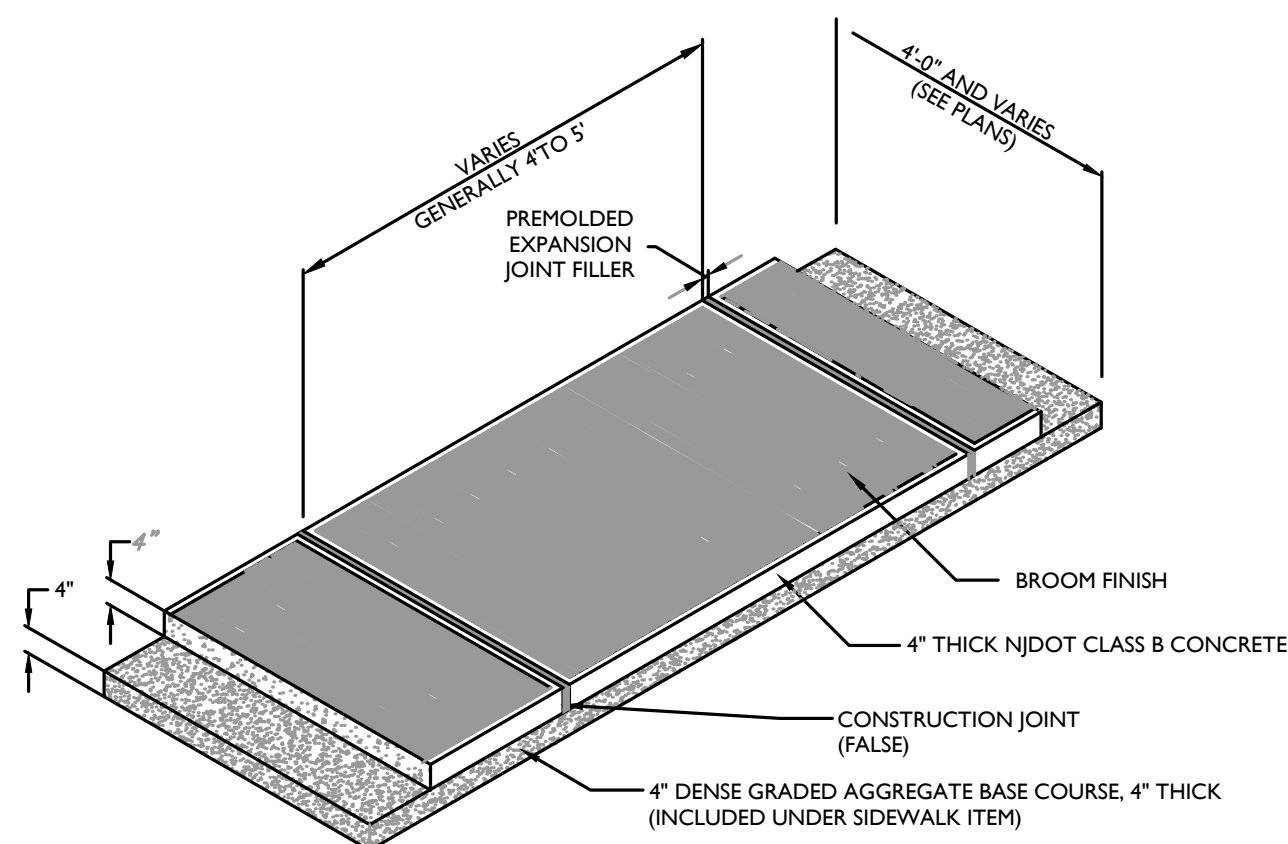
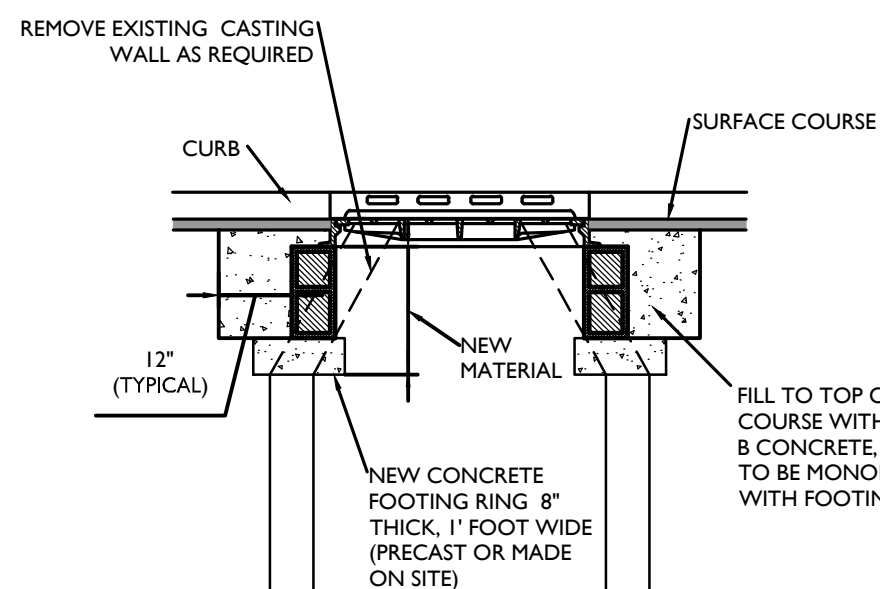
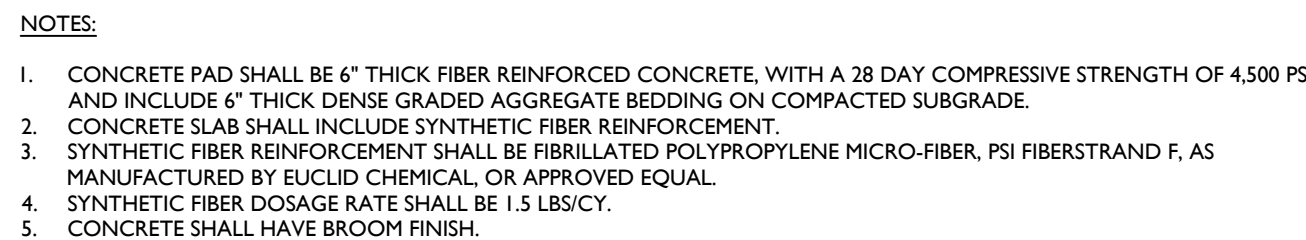
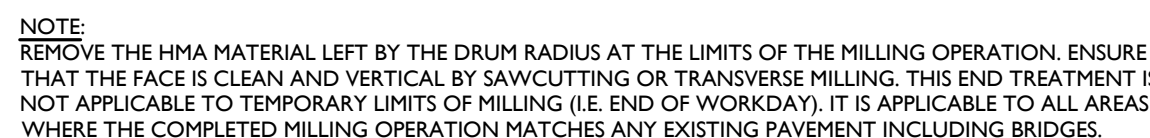
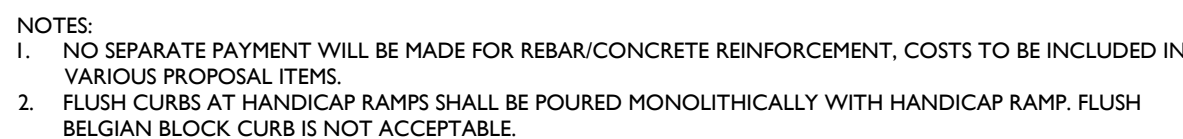
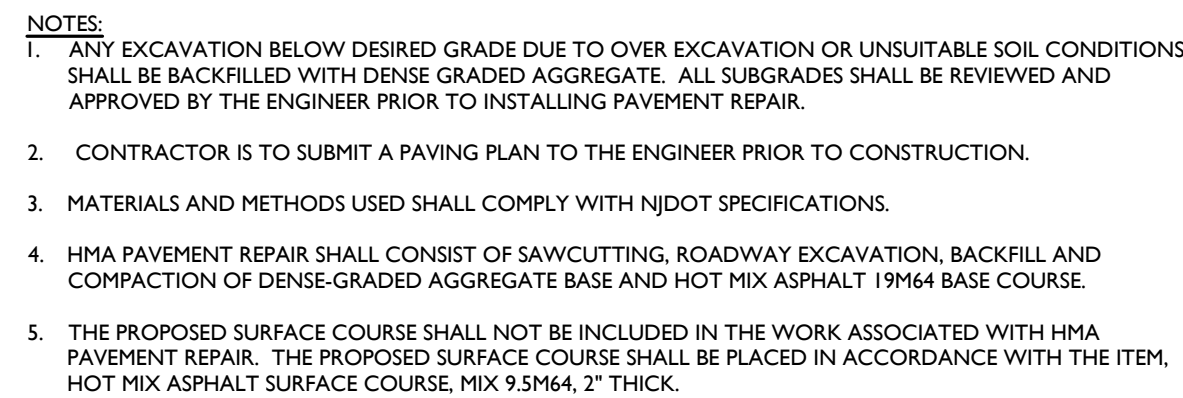
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FOR  
JAMES AVENUE  
DRAINAGE  
IMPROVEMENTS

TOWNSHIP OF CRANFORD  
COUNTY OF UNION  
STATE OF NEW JERSEY

		<b>MT. ARLEONE OFFICE</b> 400 Valley Road Suite 304 Mount Arlington, NJ 07856	
		Phone: 973.398.3110 Fax: 973.398.3199	
SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	7/21/02	PPC	BKP
PROJECT NUMBER:		DRAWING NAME:	
CDDT062		C-DTLS-JAME-HILL	
<b>SHEET TITLE:</b>  <b>SOIL EROSION &amp; SEDIMENT CONTROL DETAILS</b>			
<b>SHEET NUMBER:</b>  <div style="display: flex; justify-content: space-around; font-size: 2em; font-weight: bold;"> <span>7</span> <span>of</span> <span>18</span> </div>			

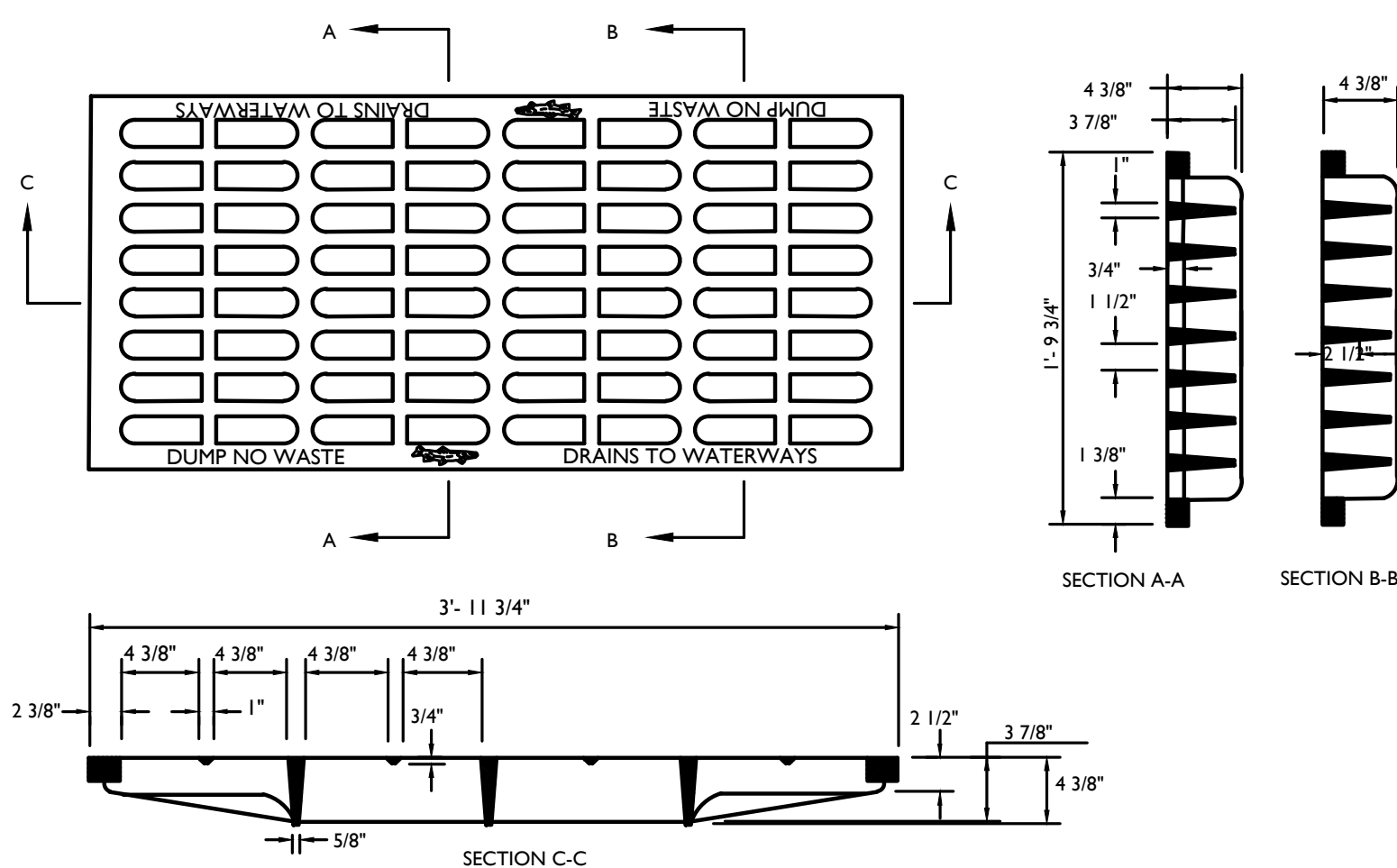
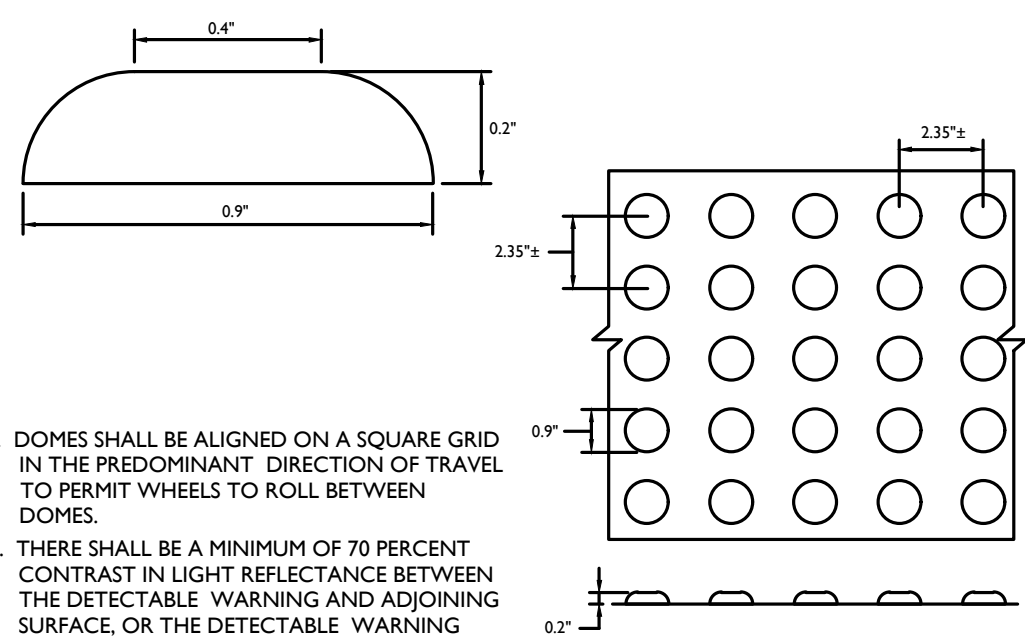




ASPHALT TYPE	MINIMUM COMPACTED THICKNESS	MAXIMUM COMPACTED THICKNESS PER LIFT
HOT MIX ASPHALT 9.5M64	1.5" - LEVELING COURSE, 2" SURFACE COURSE	4"
HOT MIX ASPHALT 19M64	3" - LEVELING COURSE, 4" BASE COURSE	6"



- AFTER MILLING/PROFILE MILLING, PERFORM BASE REPAIR AS DIRECTED IN THE FIELD BY THE ENGINEER, PRIOR TO OVERLAYING SURFACE.  
TO DETERMINE PROFILE MILLING, THE CONTRACTOR SHALL ROLL THE ROAD TO DETERMINE THE CONDITION OF THE BASE COURSE. SOFT SPOTS AND UNSUITABLE ROAD BASE SHOULD BE REPAIRED, SAVED CUTS OR PATCHES SHALL BE REPAIRED WITH NEW AGGREGATE AND BASE CONING DETAIL. SEE FULL DEPTH BASE REPAIR DETAIL.  
WHEN PROPOSED HMA SURFACE IS 0" - 2" ABOVE EXISTING HMA SURFACE COURSE, MILL EXISTING HMA SURFACE COURSE TO ACHIEVE 2" BETWEEN EXISTING HMA SURFACE COURSE AND PROPOSED HMA SURFACE COURSE.  
WHEN PROPOSED HMA SURFACE IS 2" - 4" ABOVE EXISTING HMA SURFACE COURSE, MILL EXISTING HMA SURFACE COURSE TO ACHIEVE 2" - 4" COMPACTED LIFT THICKNESS. LIFTS MAY BE SEPARATED INTO MULTIPLE THINNER LIFTS AS LONG AS MINIMUM COMPACTED THICKNESSES ARE ADHERED TO, PERFORM CRACK SEALING AND BASE REPAIR AS DIRECTED IN THE FIELD BY THE ENGINEER, PRIOR TO OVERLAYING SURFACE.  
WHEN PROPOSED HMA SURFACE IS 4" - 6" ABOVE EXISTING HMA SURFACE COURSE, MILL EXISTING HMA SURFACE COURSE TO ACHIEVE 4" - 6" COMPACTED LIFT THICKNESS. LIFTS MAY BE SEPARATED INTO MULTIPLE THINNER LIFTS AS LONG AS MINIMUM COMPACTED THICKNESSES ARE ADHERED TO, PERFORM CRACK SEALING AND BASE REPAIR AS DIRECTED IN THE FIELD BY THE ENGINEER, PRIOR TO OVERLAYING SURFACE.  
WHEN PROPOSED HMA SURFACE IS 5" - 10" ABOVE EXISTING HMA SURFACE COURSE, INSTALL A LIFT OF FM964A AND A LIFT OF FM964B, ADHERING TO MINIMUM AND MAXIMUM COMPACTED LIFT THICKNESSES DESCRIBED ABOVE.  
WHEN PROPOSED HMA SURFACE IS MORE THAN 10" ABOVE EXISTING HMA SURFACE COURSE, MILL EXISTING HMA SURFACE COURSE TO ACHIEVE 10" COMPACTED LIFT THICKNESS. LIFTS MAY BE SEPARATED INTO MULTIPLE THINNER LIFTS AS LONG AS MINIMUM COMPACTED THICKNESSES ARE ADHERED TO, PERFORM CRACK SEALING AND BASE REPAIR AS DIRECTED IN THE FIELD BY THE ENGINEER, PRIOR TO OVERLAYING SURFACE.  
INSTALLATION OF HMA SHALL BE REIMBURSED BY THE TON FOR THE HMA INSTALLED, NO SEPARATE PAYMENT SHALL BE MADE FOR INSTALLING MULTIPLE LIFTS OF HMA. INCLUDE COSTS IN HOT MIX ASPHALT PAY ITEMS.  
CONTRACTOR SHALL APPLY TACK COAT PRIOR TO PAVING AS REQUIRED.



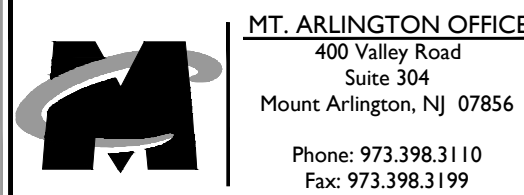
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CARL P. O'BRIEN  
NEW JERSEY PROFESSIONAL  
ENGINEER - LICENSE NUMBER: GE45154

## CONSTRUCTION PLANS

FOR  
JAMES AVENUE  
DRAINAGE  
IMPROVEMENTS

TOWNSHIP OF CRANFORD  
COUNTY OF UNION  
STATE OF NEW JERSEY



SCALE: AS SHOWN	DATE: 7/21/20	DRAWN BY: PPC	CHECKED BY: BKP
PROJECT NUMBER: CDT062		DRAWING NAME: C-DTLS-JAME-HILL	

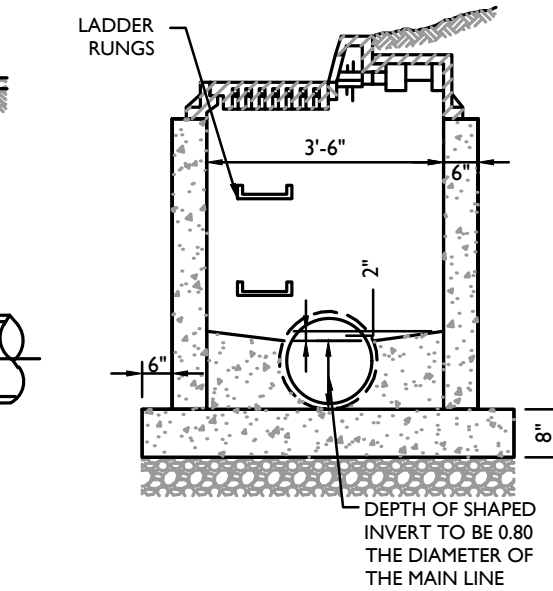
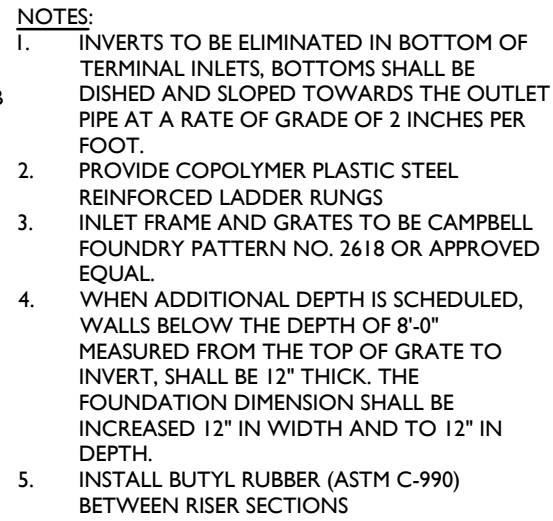
SHEET TITLE:

CONSTRUCTION DETAILS

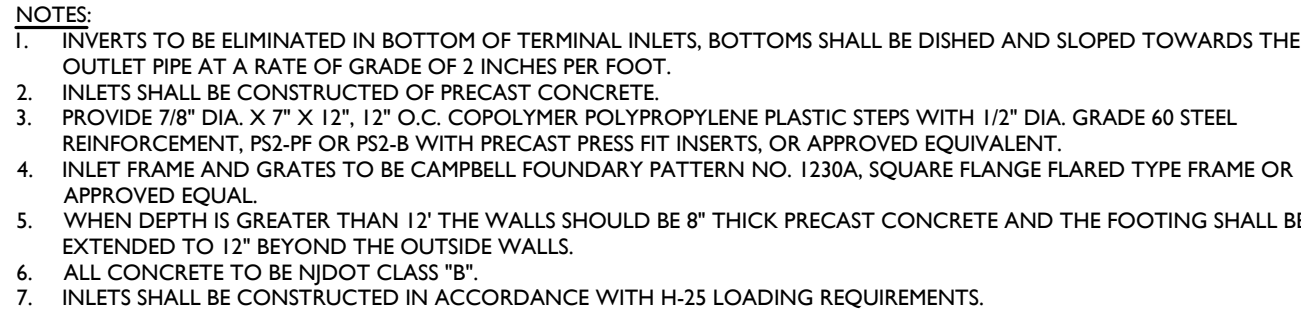
SHEET NUMBER: 8 of 18

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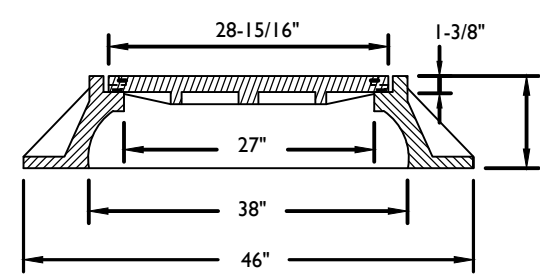




N.T.S.



N.T.S.



N.T.S.

THE CONCRETE STRUCTURE IS CAST WITH THE GASKET IN PLACE, SO THE GASKET BECOMES AN INTEGRAL PART OF THE WALL

15 DEGREES

A-LOK X-CEL GASKET, OR APPROVED EQUAL

N.T.S



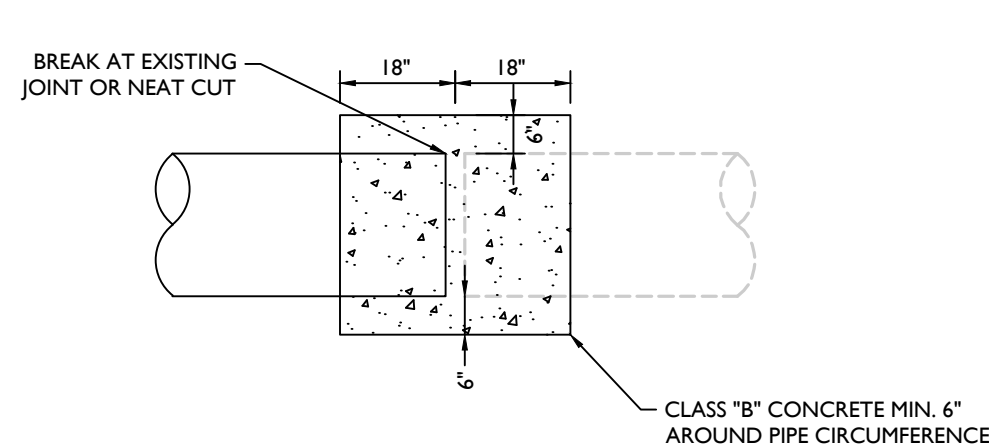
1. ALL REINFORCED CONCRETE PIPE AND BACKFILL SHALL BE INSTALLED IN ACCORDANCE WITH ASTM C1479.
2. REINFORCED CONCRETE PIPE (RCP) SHALL BE CLASS V CIRCULAR PIPE UNLESS OTHERWISE SPECIFIED, CONFORM TO ASTM C76 AND AASHTO M170.

N.T.S.



- NOTES:

- I. TO BE CONSTRUCTED WHERE SHOWN ON THE PLANS OR WHERE CLEARANCE BETWEEN SANITARY SEWER PIPE AND WATER MAIN IS LESS THAN 10' HORIZONTAL AND 18" VERTICALLY OR AS DIRECTED IN THE FIELD BY THE ENGINEER.



- NOTES:

1. COAT ALL SURFACES TO BE ENCASED IN CONCRETE COLLAR WITH APPROVED EPOXY BONDING COMPOUND. NO SEPARATE PAYMENT WILL BE MADE FOR THE CONCRETE COLLAR. INCLUDE COST IN THE VARIOUS PIPE ITEMS.
2. CONTRACTOR SHALL DISPLACE JOINT AS REQUIRED TO ACHIEVE HORIZONTAL ALIGNMENT AND VERTICAL ALIGNMENT AS REQUIRED TO ACHIEVE PROPOSED INVERTS.

N.T.S.



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

N.T.S.



N.T.S

- ## NOTES

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



N.T.S.



State of N.J. C.O.A.: 24GA27986500

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CARL P. O'BRIEN  
NEW JERSEY PROFESSIONAL  
ENGINEER - LICENSE NUMBER: GE45154

FOR  
JAMES AVENUE  
DRAINAGE  
IMPROVEMENTS

TOWNSHIP OF CRANFORD  
COUNTY OF UNION  
STATE OF NEW JERSEY



**MT. ARLINGTON OFFICE**  
 400 Valley Road  
 Suite 304  
 Mount Arlington, NJ 07856

Phone: 973.398.3110  
 Fax: 973.398.3199

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SHEET TITLE:

CONSTRUCTION DETAILS

SHEET NUMBER:  
9 of 18

**NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.**





- ### DIP SANITARY/STORM SEWER TRENCH DETAIL

N.T.S.

### GENERAL SANITARY SEWER MAIN TRENCH NOTES

- ## SANITARY SEWER NOTES

N.T.S.

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CARL P. O'BRIEN  
NEW JERSEY PROFESSIONAL  
ENGINEER - LICENSE NUMBER: GE45154

CONSTRUCTION PLANS  
FOR  
JAMES AVENUE  
DRAINAGE  
IMPROVEMENTS

TOWNSHIP OF CRANFORD  
COUNTY OF UNION  
STATE OF NEW JERSEY

	<b>MT. ARLINGTON OFFICE</b> 400 Valley Road Suite 304 Mount Arlington, NJ 07856 Phone: 973.398.3110 Fax: 973.398.3199		
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AS SHOWN	7/21/20	PPC	BKP
PROJECT NUMBER:		DRAWING NAME:	
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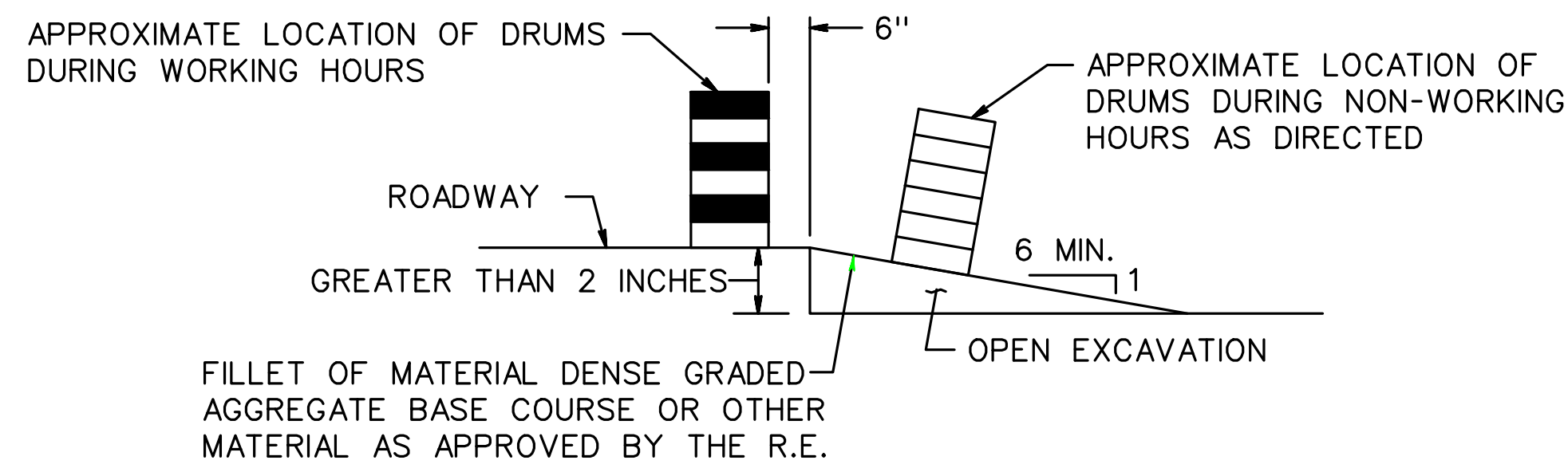
LEGEND	
	BREAKAWAY BARRICADES
	BREAKAWAY BARRICADES WITH SIGN
	CONSTRUCTION SIGNS
	DRUMS
	CONE
	PRECAST CONCRETE CURB CONSTRUCTION BARRIER (TYPE SPECIFIED)
	DIRECTION OF TRAFFIC FLOW
	TRAFFIC DIRECTOR, FLAGGER
	TRAILER MOUNTED MOUNTED ARROW BOARD SHOWING CAUTION MODE
 LEFT      RIGHT      BOTH	ILLUMINATED FLASHING ARROW MOUNTED ON TOWING VEHICLE SHOWING ARROW PATTERN (Left, Right, Both)
	TRAFFIC CONTROL TRUCK WITH MOUNTED CRASH CUSHION AND ARROW BOARD SHOWING CAUTION MODE
 LEFT      RIGHT      BOTH	TRAFFIC CONTROL TRUCK WITH MOUNTED CRASH CUSHION AND ARROW BOARD SHOWING ARROW PATTERN (Left, Right, Both)
	TEMPORARY CRASH CUSHION, INERTIAL BARRIER SYSTEM
	TEMPORARY CRASH CUSHION, (all other approved)
	BUFFER ZONE
	WORK AREA
	PAINT STRIPING TRUCK OR OTHER OPERATING VEHICLE

- ADVANCE WARNING SIGNS DISTANCES, AND TAPER LENGTHS MAY BE EXTENDED, AT DIRECTION OF THE DEPARTMENT, TO ADJUST FOR REDUCED VISIBILITY DUE TO HORIZONTAL AND VERTICAL CURVATURE OF THE ROADWAY.
2. THE APPROXIMATE LOCATIONS OF THE ILLUMINATED FLASHING ARROW BOARDS ARE SHOWN ON THE TRAFFIC CONTROL PLANS. THESE LOCATIONS MAY BE MODIFIED AS APPROVED BY RE. TO ADJUST FOR VISIBILITY DUE TO HORIZONTAL OR VERTICAL CURVATURE OF THE ROADWAY OR TO POSITION AT A SAFER LOCATION. ILLUMINATED FLASHING ARROW BOARDS ARE TO BE USED FOR TEMPORARY LANE CLOSINGS AND AT LOCATIONS SHOWN ON THE TRAFFIC CONTROL PLANS.
3. PRIOR TO ANY ROAD CONSTRUCTION, TRAFFIC CONTROL SIGNS AND DEVICES SHALL BE IN PLACE.
4. RAMPS AND/OR SIDE STREETS ENTERING THE ROADWAY AFTER THE FIRST ADVANCE WARNING SIGN SHALL BE PROVIDED WITH AT LEAST ONE W20-IF SIGN (ROAD WORK AHEAD) AS A MINIMUM.
5. ALL EXISTING ROAD SIGNS, PAVEMENT MARKINGS AND/OR PLOWABLE PAVEMENT REFLECTORS WHICH CONFLICT WITH THE PROPOSED TRAFFIC CONTROL PLAN SHALL BE COVERED, REMOVED OR RELOCATED AS DIRECTED BY THE RE.
6. CONFLICTING OR NON-OPERATING SIGNAL INDICATIONS ON EITHER THE EXISTING, TEMPORARY, OR PROPOSED TRAFFIC SIGNAL SYSTEMS SHALL BE BAGGED OR COVERED.
7. MAINTENANCE AND PROTECTION OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES - PART VI "STANDARDS AND GUIDES FOR TRAFFIC CONTROL FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY, AND INCIDENT MANAGEMENT OPERATIONS", UNLESS OTHERWISE NOTED IN THE PLANS AND SPECIFICATIONS.
8. CONSTRUCTION SIGN W99-2 (GIVE US A BRAKE) SHALL BE LOCATED 200 FEET IN ADVANCE OF PROJECT LIMITS.
9. A W1-6 (ARROW) SIGN MOUNTED ON A BREAKAWAY BARRICADE AND CENTERED ON THE CLOSED WIDTH SHALL BE LOCATED 100 FEET BEYOND EACH INTERSECTION OR MAIN ACCESS POINT WITHIN THE AREA OF A LANE OR SHOULDER CLOSURE.
10. CONSTRUCTION SIGNS R11-4 (ROAD CLOSED TO THRU TRAFFIC) SHALL BE PLACED AT THE INTERSECTING STREETS WHICH ARE CLOSED TO TRAFFIC BECAUSE OF CONSTRUCTION.
11. CONSTRUCTION SIGNS W8-9A (SYMBOL FOR UNEVEN PAVEMENT) AND W8-14A (GROOVED PAVEMENT) SHALL BE USED WHEN SUCH PAVEMENT CONDITIONS EXIST. THE PLACEMENT OF THESE SIGNS SHALL BE AS DIRECTED BY THE RE.
12. MOVING WORK AREAS IN A LANE CLOSURE REQUIRE A TRAILER MOUNTED ILLUMINATED FLASHING ARROW TO REMAIN AT THE END OF THE TAPER, THE TRAFFIC CONTROL TRUCK WITH MOUNTED CRASH CUSHION THAT SHALL MOVE WITH THE WORK AREAS TO KEEP A 70 FEET MIN. AND 150 FEET MAX. BUFFER IN ADVANCE OF EACH WORK AREA.
13. THE CONTRACTOR SHALL SUBMIT A PLAN FOR THE SAFE ACCESS OF CONSTRUCTION VEHICLES THROUGHOUT THE WORK SITE WHERE SPACE CONSTRAINTS PREVENT THE USE OF LANE CLOSURES. THE PLAN SHALL BE SUBMITTED TO THE RE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
14. TRAFFIC SAFETY SERVICES SHALL BE USED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR TRAFFIC CONTROL.
15. ALL EXCAVATED AREAS WITHIN OR ADJACENT TO THE ROADWAY SHALL BE BACKFILLED AND PLACED ON AT LEAST 6H : 1V SLOPE BEFORE THE END OF EACH WORK DAY. OTHER EXCAVATED AREA WITHIN THE CLEAR ZONE SHALL BE BACKFILLED.
16. WHERE REQUIRED, THE CONTRACTOR SHALL MAKE PROVISIONS FOR MAINTAINING PEDESTRIAN CROSSING LOCATIONS AND TYPE AS DIRECTED BY THE RE.
17. BITUMINOUS CONCRETE PLACED DURING THE VARIOUS CONSTRUCTION STAGES SHALL BE TRANSITIONED ON A MINIMUM 20H : 1V SLOPE TO MEET THE ADJACENT EXISTING GRADE AT THE LONGITUDINAL AND TRANSVERSE LIMITS OF THE STAGE CONSTRUCTION AREAS UNLESS OTHERWISE NOTED ON THE STAGE CONSTRUCTION PLANS.
18. THE PLACEMENT AND OR RELOCATION OF PRECAST CONCRETE CURB, CONSTRUCTION BARRIER SHALL BE DONE DURING APPROVED OFF-PEAK HOURS WHEN TRAFFIC MAY BE REDUCED TO ONE LANE IN EACH DIRECTION.
19. CONSTRUCTION ZONE SPEED LIMIT WILL BE DETERMINED BY THE TRAFFIC SIGNAL & SAFETY ENGINEERING, REGIONAL TRAFFIC ENGINEER - WORK ZONE, AT THE TIME OF OR DURING CONSTRUCTION, AS REQUESTED BY THE R.E..
20. THE SPEED LIMIT, R2-1 (BLACK ON WHITE) WITH ADDED WORK ZONE PLATE (BLACK ON ORANGE) SIGNS SHALL BE LOCATED THROUGH WORK AREAS AS DIRECTED BY THE TRAFFIC SIGNAL & SAFETY ENGINEERING REGIONAL TRAFFIC ENGINEER - WORK ZONE
21. THE REDUCED SPEED AHEAD SIGN, W3-5(S) (BLACK ON ORANGE) SHALL BE LOCATED IN ADVANCE OF SPEED LIMIT R2-1 SIGNS WHICH REDUCE THE NORMAL POSTED SPEED LIMIT THROUGH THE CONSTRUCTION ZONE.
22. TRAFFIC FINES DOUBLED IN WORK AREA R(NJ)5-17(S) , 4 FEET BY 2.5 FEET SIGN SHALL BE LOCATED 500 FEET AFTER THE FIRST ADVANCE WARNING SIGN, (W20 SERIES) AT EACH WORK AREA LOCATED WITHIN URBAN AREAS. THIS SIGN SHALL ALSO BE USED ON PROJECTS REQUIRING MOVING OPERATIONS IN WHICH CASE THE SIGN SHALL BE MOUNTED ON A SLOW MOVING CONSTRUCTION VEHICLE.
23. THE FINAL HMA SURFACE PAVEMENT SHALL NOT BE CONSTRUCTED UNTIL THE FINAL STAGE OF THE PROJECT UNLESS OTHERWISE DIRECTED BY THE RE OR INDICATED ON THE PLANS. MANHOLES AND INLETS SHALL BE SET TO FINISHED GRADE AND TEMPORARY PAVEMENT RAMPS ARE TO BE CONSTRUCTED AROUND THEM WITH A MINIMUM 20H : 1V SLOPE IN ALL DIRECTIONS USING HOT MIX ASPHALT PAVEMENT. THIS TEMPORARY MATERIAL WILL BE REMOVED IMMEDIATELY PRIOR TO PLACING THE SURFACE COURSE.

- FOR THE INITIAL START OF WORK THAT REQUIRES "IMPACTS TO NORMAL TRAFFIC FLOW", THE CONTRACTOR SHALL NOTIFY THE RE IN WRITING, ON THE ADVANCE FORM 10-103 PROVIDED BY THE DEPARTMENT, OF THE PROPOSED DATE. THE NOTICE SHALL BE SUBMITTED AT LEAST TWENTY-EIGHT CALENDAR DAYS, BUT NOT MORE THAN SIXTY CALENDAR DAYS, BEFORE THE PROPOSED DATE. START OF WORK THAT IMPACTS NORMAL TRAFFIC FLOW WILL NOT BE PERMITTED PRIOR TO THE DATE STATED IN THE NOTICE. THE CONTRACTOR SHALL CONFIRM, IN WRITING TO THE RE, THE PROPOSED DATE SEVEN (AND/OR FOURTEEN) CALENDAR DAYS BEFORE STARTING THE ESTABLISHMENT OF THE TRAFFIC CONTROL MEASURES FOR THE TRAFFIC IMPACT. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE RE IF THE PROPOSED ESTABLISHMENT CAN NOT BE COMPLETED ON THE PROPOSED DATE.
- FOR A "PERMANENT LANE CLOSURE", THE CONTRACTOR SHALL NOTIFY THE RE IN WRITING, ON ADVANCE FORM 10-103, OF THE PROPOSED DATE A NEW TRAFFIC PATTERN WILL BE ESTABLISHED. THE NOTICE SHALL BE SUBMITTED AT LEAST TWENTY-EIGHT CALENDAR DAYS, BUT NOT MORE THAN SIXTY CALENDAR DAYS, IN ADVANCE OF THE PROPOSED DATE. START OF A NEW TRAFFIC PATTERN WILL NOT BE PERMITTED PRIOR TO THE DATE STATED IN THE NOTICE. THE CONTRACTOR SHALL CONFIRM, IN WRITING TO THE RE, THE PROPOSED DATE OF THE NEW TRAFFIC PATTERN SEVEN (AND/OR FOURTEEN) DAYS BEFORE STARTING TRAFFIC CONTROL MEASURES FOR THE ESTABLISHMENT OF THE NEW PATTERN. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE RE IF THE PROPOSED ESTABLISHMENT CAN NOT BE COMPLETED ON THE PROPOSED DATE.
- STARTING THE ESTABLISHMENT OF A NEW PERMANENT TRAFFIC PATTERN SHALL BEGIN NO EARLIER THAN 11:00 PM FRIDAY AND SHALL BE COMPLETED AND READY FOR OPERATIONS BY 6:00 PM THE FOLLOWING SUNDAY. THE ESTABLISHMENT SHALL BE COMPLETED IN ACCORDANCE WITH THE LANE CLOSURE HOURS SPECIFIED IN THE CONTRACT.
- ADVANCE NOTICES SENT PRIOR TO THE PRE-CONSTRUCTION MEETING SHALL BE ADDRESSED TO THE CONTACT PERSON AS SPECIFIED IN SUBSECTION 101.04 OF THE SPECIAL PROVISIONS.

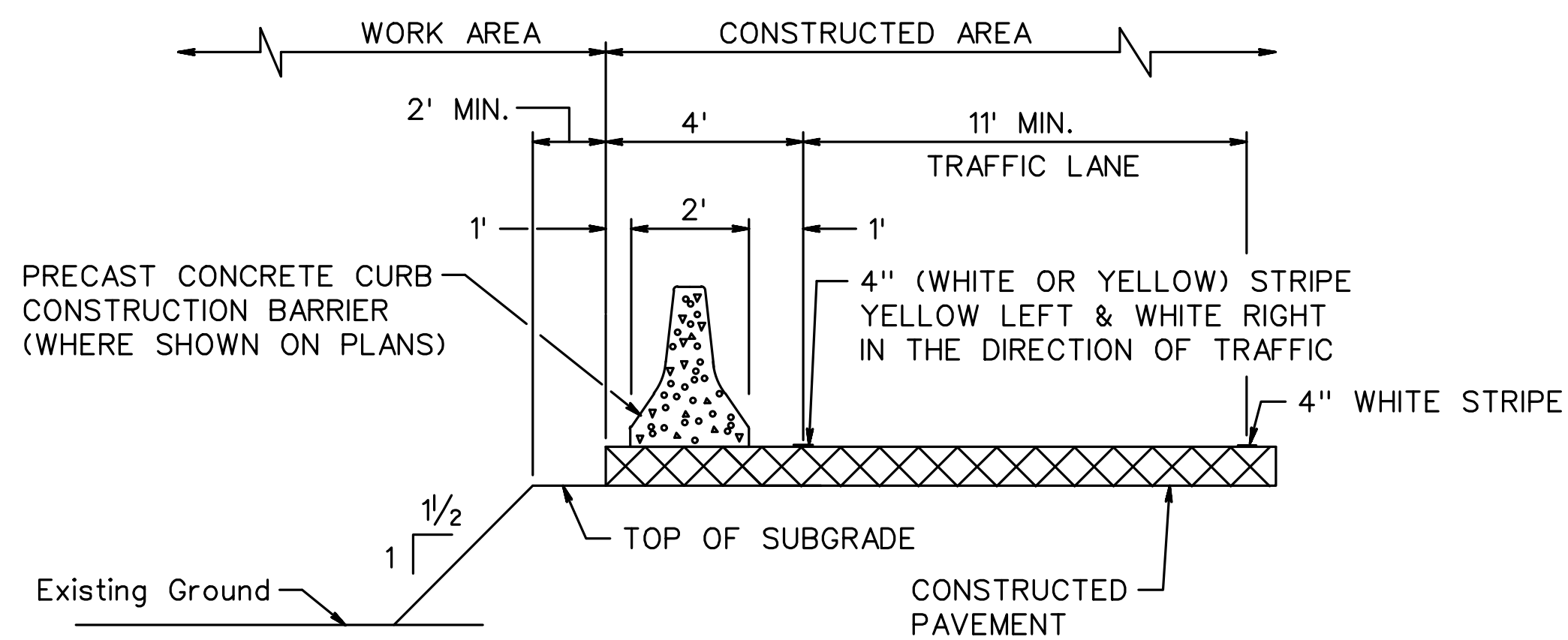
- REQUEST FOR A CHANGE TO THE TRAFFIC CONTROL REQUIREMENTS IN THE CONTRACT DOCUMENTS SHALL BE SUBMITTED IN WRITING TO THE RE AS FOLLOWS:
- CHANGES TO THE SCHEDULED HOURS FOR "TEMPORARY LANE CLOSURES" SHALL BE SUBMITTED TO THE R.E. AT LEAST EIGHT CALENDAR DAYS IN ADVANCE OF WHEN THE CHANGE IS PROPOSED TO START.
- OTHER PROPOSED CHANGES TO "TEMPORARY LANE CLOSURES" AND ALL CHANGES TO "PERMANENT LANE CLOSURES" SHALL BE SUBMITTED TO THE RE AS SPECIFIED IN THE SPECIFICATIONS.





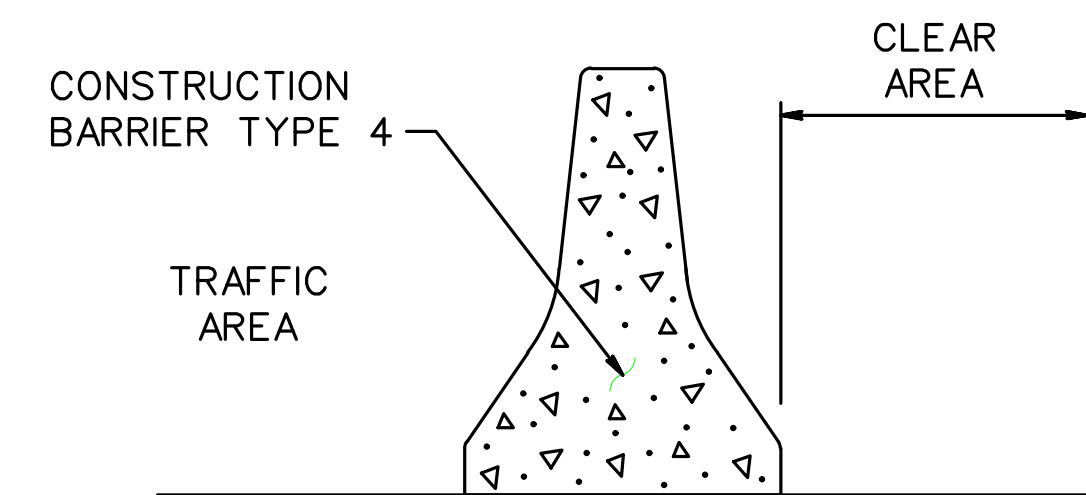
NOTE:  
ESCAPE RAMPS MUST BE CONSTRUCTED AND MAINTAINED DURING NON-WORKING HOURS WHERE A VERTICAL DROP GREATER THAN 2 INCHES EXISTS ADJACENT TO TRAVELED LANE.

ESCAPE RAMP DETAIL



TYPICAL SECTION

PLACEMENT OF PRECAST CONCRETE CONSTRUCTION BARRIER



- NOTES:
- CHANGES TO THE PROPOSED JOINT CLASS AT ANY LOCATION MUST BE APPROVED BY THE DEPT.
  - NO ROADWAY DROP OFFS, OBSTRUCTIONS, STORAGE OF MATERIALS OR WORK WILL BE PERMITTED IN THE CLEAR AREA UNLESS APPROVED BY THE R.E.

STAGE	LOCATION		JOINT CLASS
	RTE.	STA. TO	

JOINT CLASS	CLEAR AREA
A	20 INCHES
B	16 INCHES
C	11 INCHES

CONSTRUCTION BARRIER, TYPE 4  
JOINT CLASS AND CLEAR AREA

REGULATORY APPROACH SPEED OF TRAFFIC  MILES/HOUR	RECOMMENDED SIGHT DISTANCE TO BEGINNING OF CHANNELIZING TAPERS		
	DESIRABLE		MINIMUM
	RURAL FEET	URBAN FEET	RURAL AND URBAN FEET
25	375	525	150
30	450	625	200
35	525	725	250
40	600	825	325
45	675	925	400
50	750	1025	475
55	875	1150	550
60	1000	1275	650
65	1050		725

- NOTES:
- AVOIDANCE MANEUVER IS FOR A SPEED, PATH, AND/OR DIRECTION CHANGE PRIOR TO THE BEGINNING OF CHANNELIZING TAPERS.
  - RECOMMENDED DISTANCES BETWEEN TWO SEPARATE LANE CLOSURES SHALL BE DOUBLE THE VALUES SHOWN ABOVE.
  - RURAL AND URBAN ROAD DESIGNATIONS SHALL BE AS DEFINED IN THE NJDOT STATE HIGHWAY STRAIGHT LINE DIAGRAMS.
  - DESIRABLE VALUES SHALL BE PROVIDED WHEREVER POSSIBLE. IF IT IS NOT FEASIBLE OR PRACTICAL TO PROVIDE DESIRABLE VALUES BECAUSE OF HORIZONTAL OR VERTICAL CURVATURE OR IF RELOCATION OF THE TAPER IS NOT POSSIBLE, THEN MINIMUM VALUES CAN BE APPLIED. WHEN MINIMUM VALUES ARE USED, SPECIAL ATTENTION SHOULD BE GIVEN TO THE USE OF SUITABLE TRAFFIC CONTROL DEVICES FOR PROVIDING ADVANCED WARNING OF THE CONDITIONS THAT ARE LIKELY TO BE ENCOUNTERED.
  - TAPERS SHALL BE LOCATED TO MAXIMIZE THE VISIBILITY OF THEIR TOTAL LENGTH.

RECOMMENDED TAPER LENGTH AND SPACING FOR CHANNELIZING TAPERS					RECOMMENDED SPACING ALONG TANGENTS	
REGULATORY APPROACH SPEED OF TRAFFIC  MILES/HOUR	MINIMUM TAPER RATIO IN LENGTH PER FOOT OF WIDTH	MINIMUM TAPER LENGTH L - FOR LANE WIDTHS			MAXIMUM DEVICE (B) SPACING ALONG TAPERS IN FEET	MAXIMUM DEVICE (D) SPACING ALONG TANGENTS IN FEET
		10'	11'	12'		
25	10.5:1	105	115	125	25	50
30	15:1	150	165	180	30	60
35	20.5:1	205	225	245	35	70
40	27:1	270	300	325	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
60	60:1	600	660	720	60	120
65	65:1	650	715	780	65	130

NOTE:  
THE MAXIMUM DEVICE SPACING ALONG CURVES SHALL BE AS DEFINED FOR TAPERS (B) IN THE ABOVE TABLE.

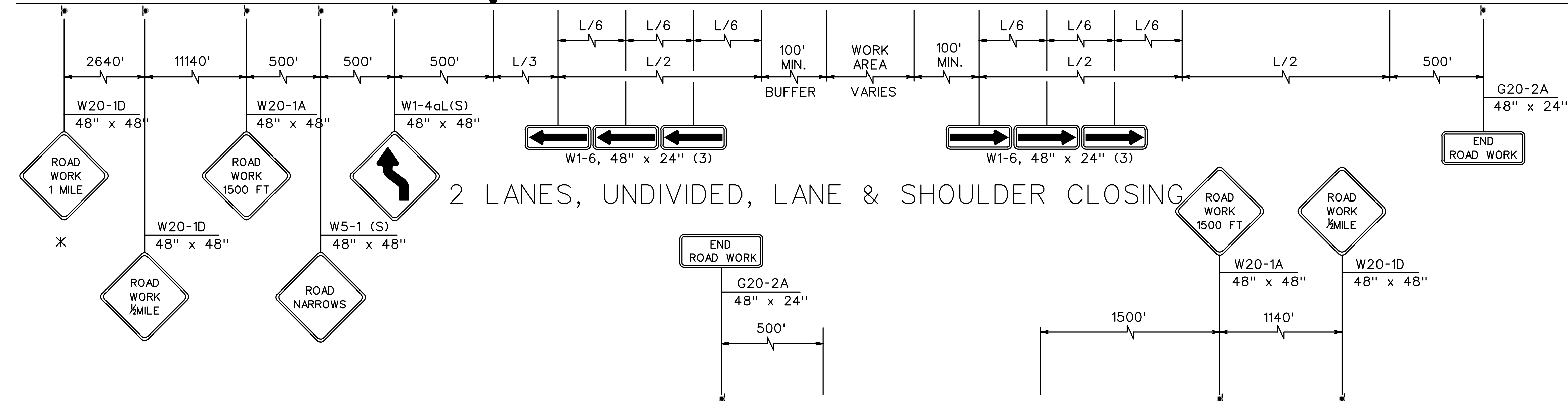
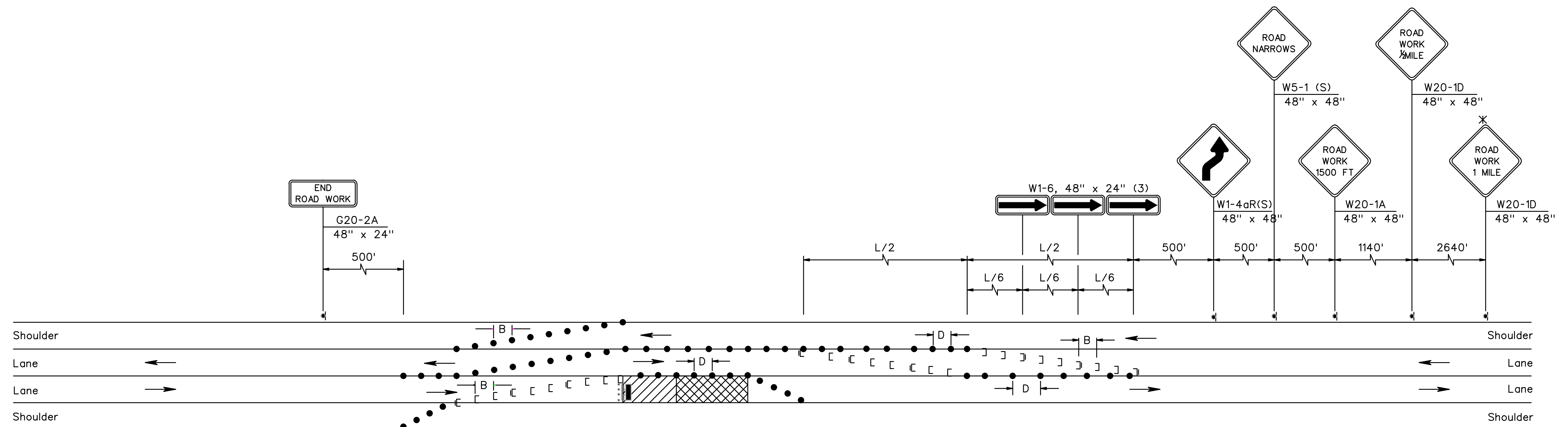
N.T.S.

TCD-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS





2 LANES, UNDIVIDED, LANE & SHOULDER CLOSING

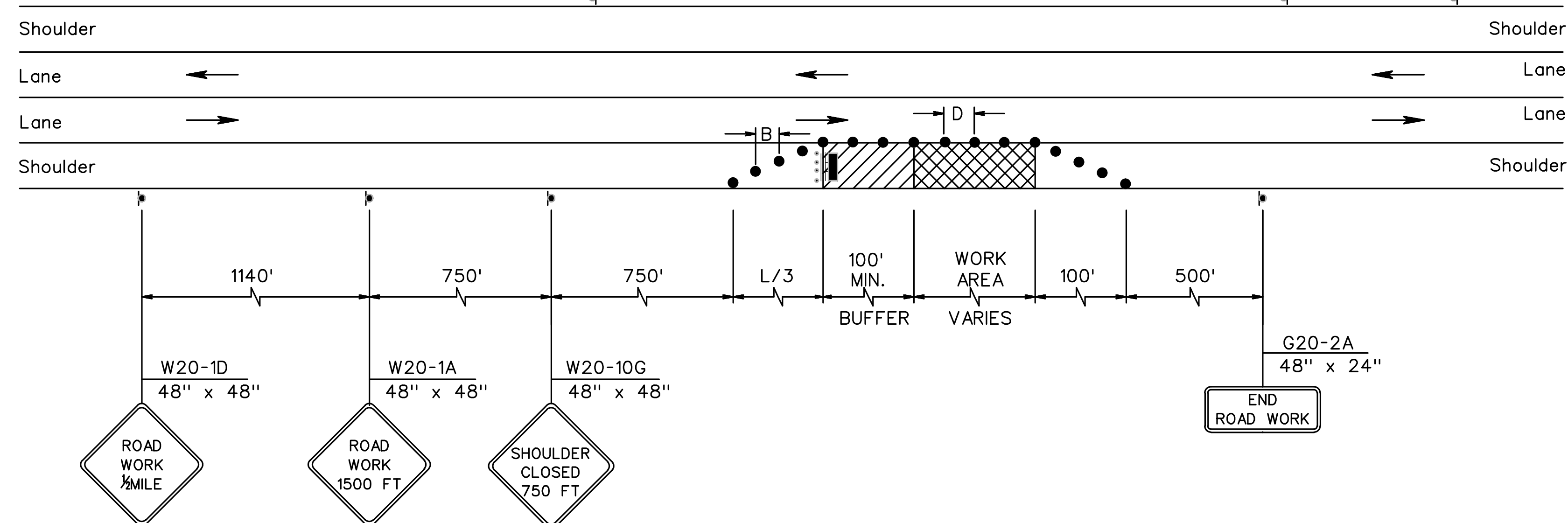
\* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:  
SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.



R8-8 SIGN DETAIL  
NOT TO SCALE



2 LANES, UNDIVIDED, SHOULDER CLOSING

TCD-3

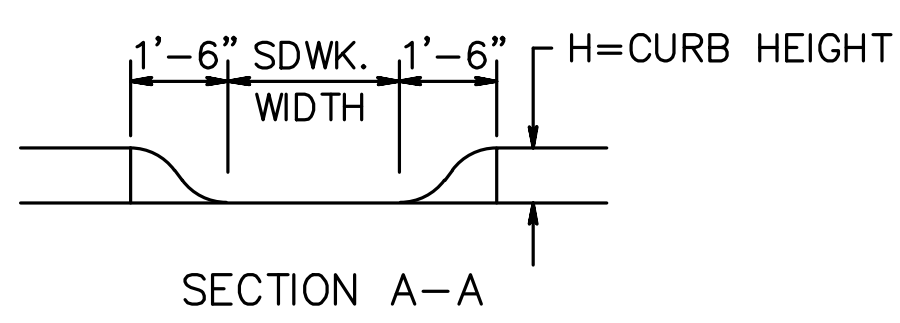
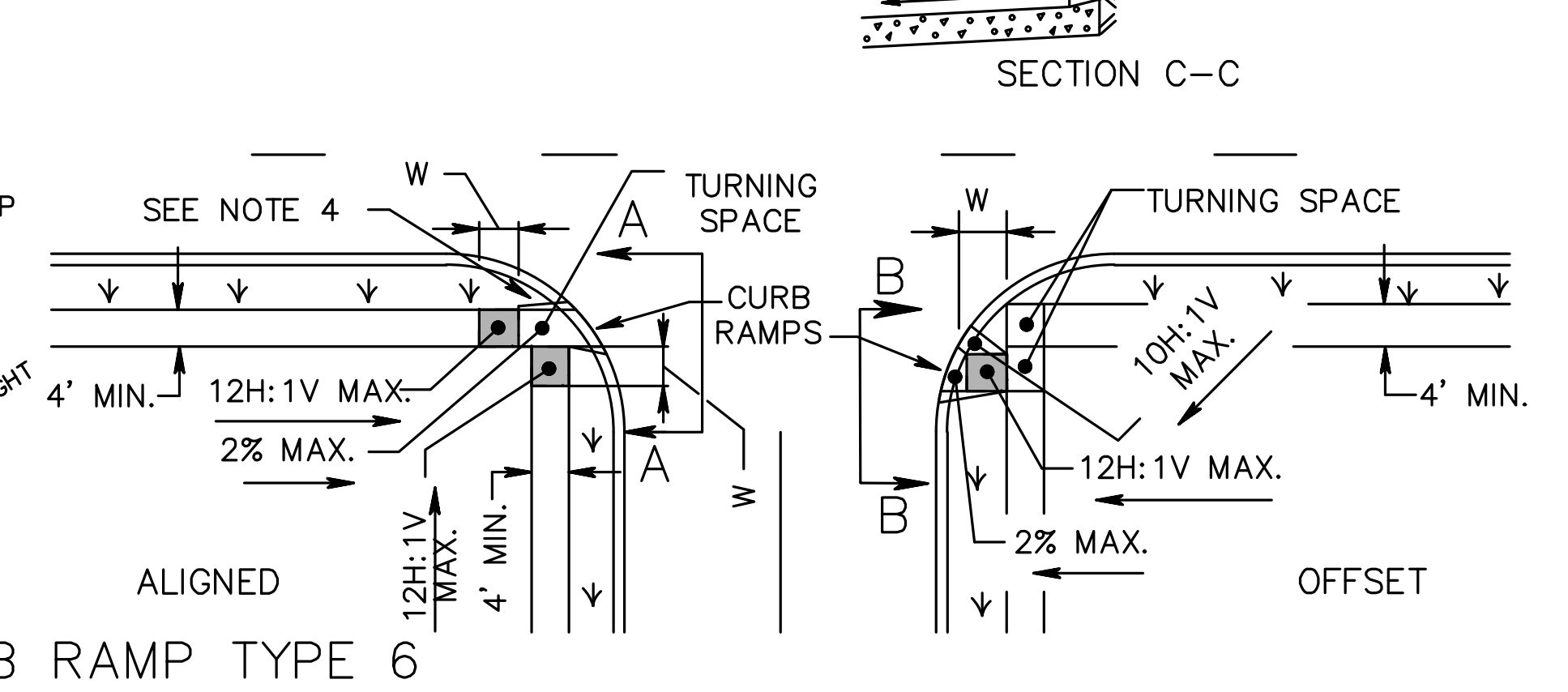
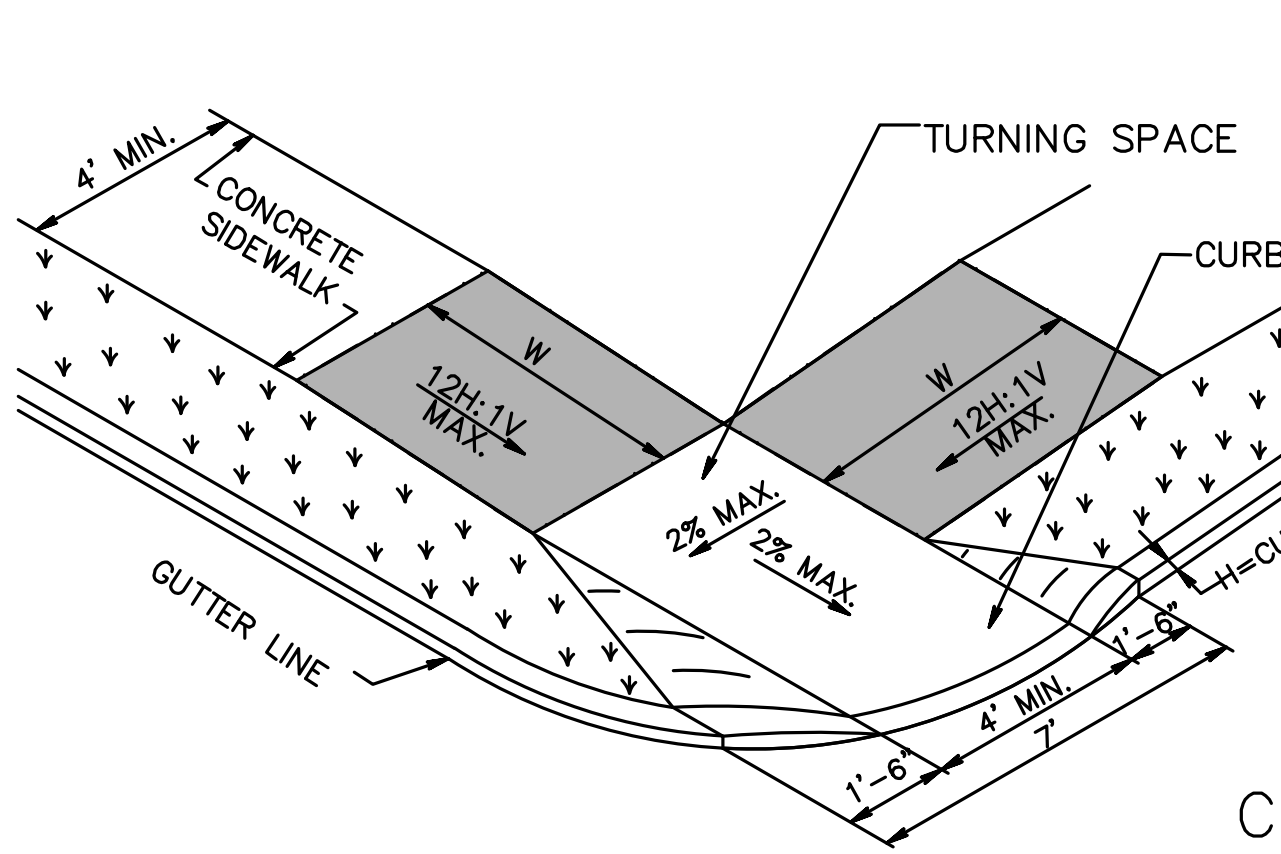
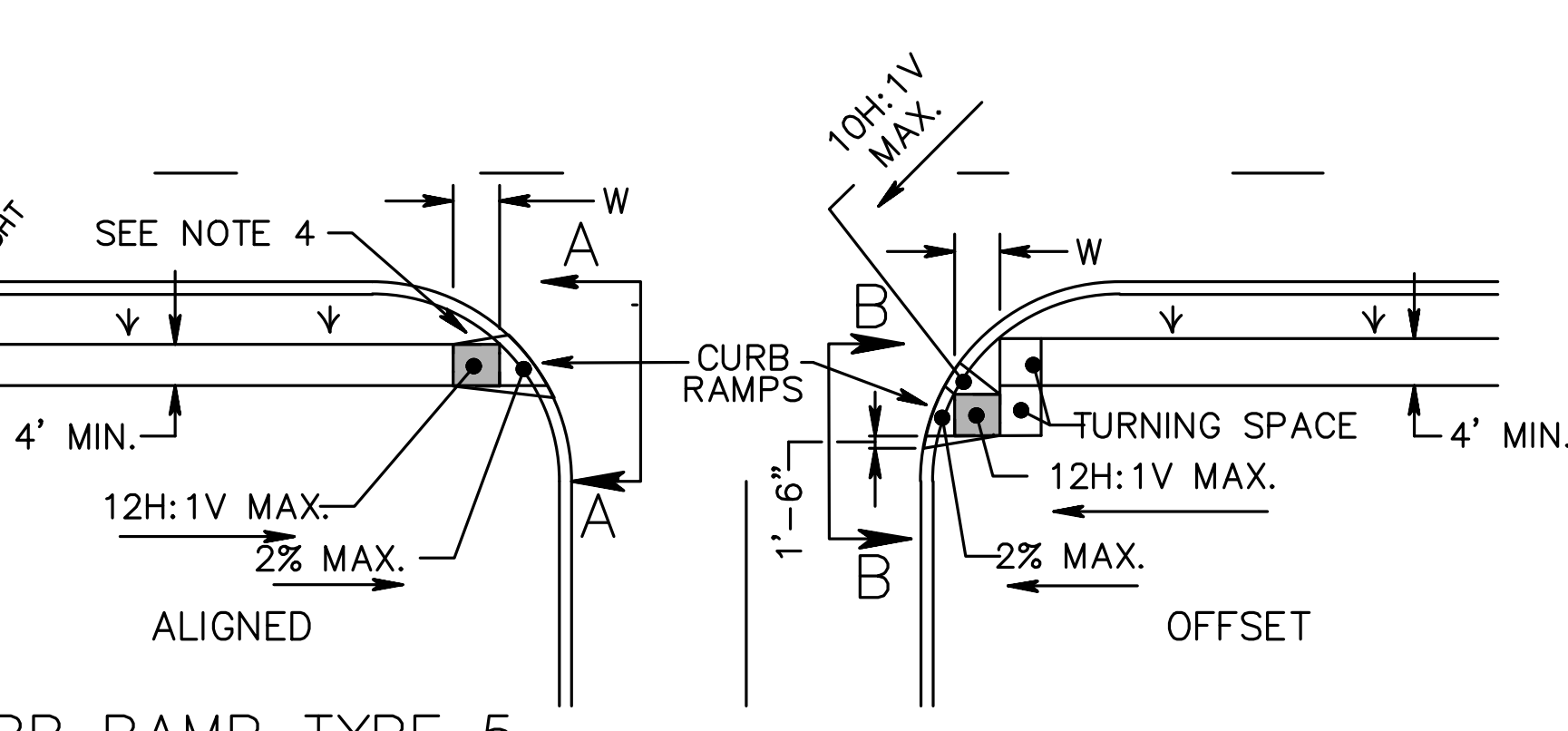
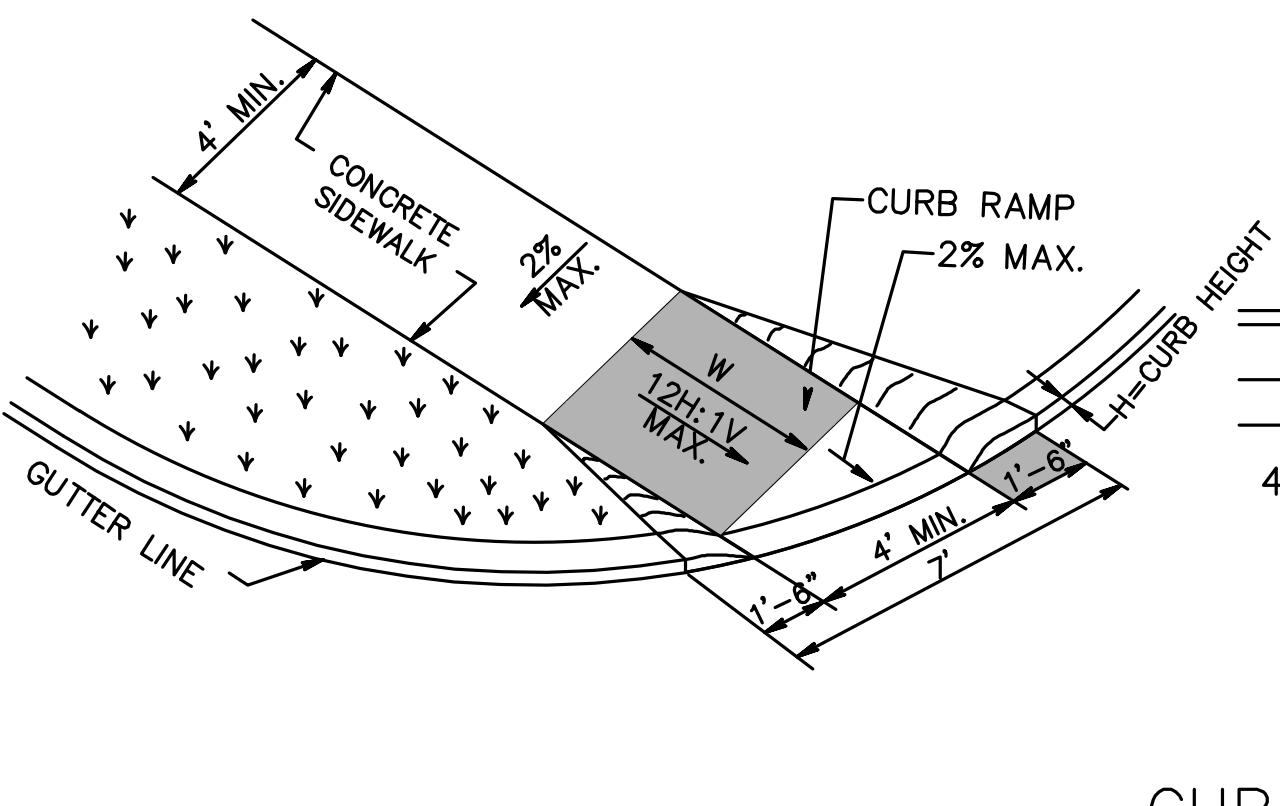
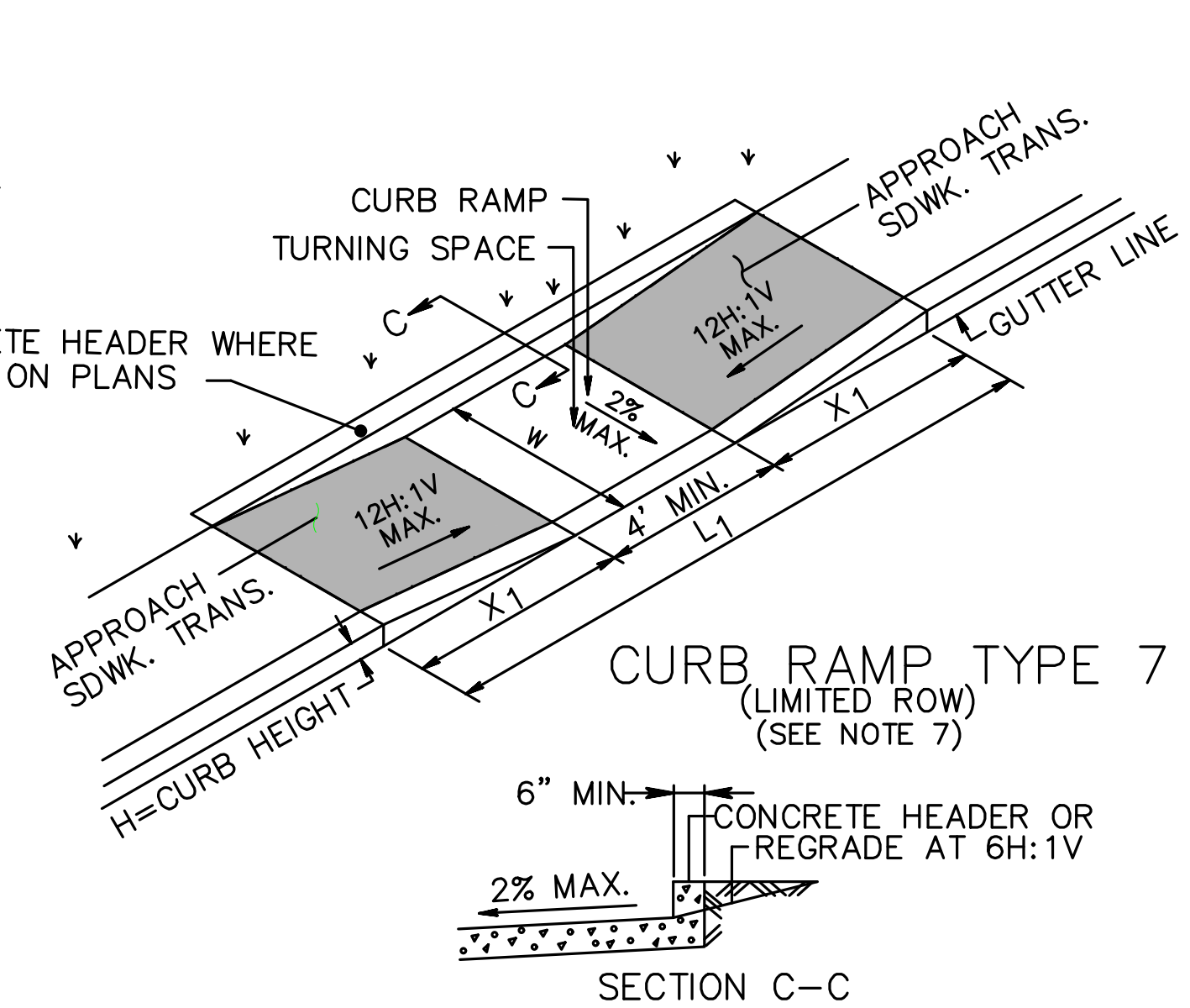
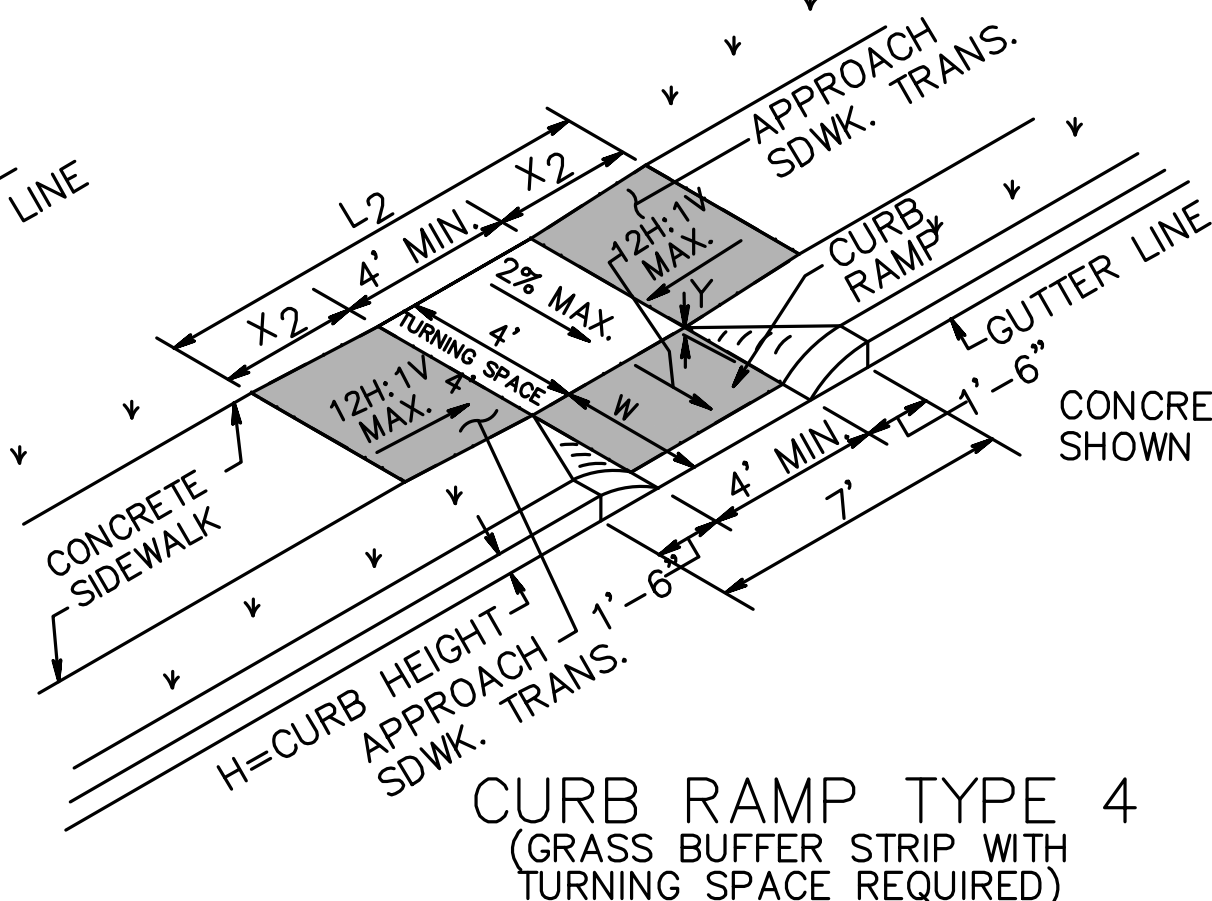
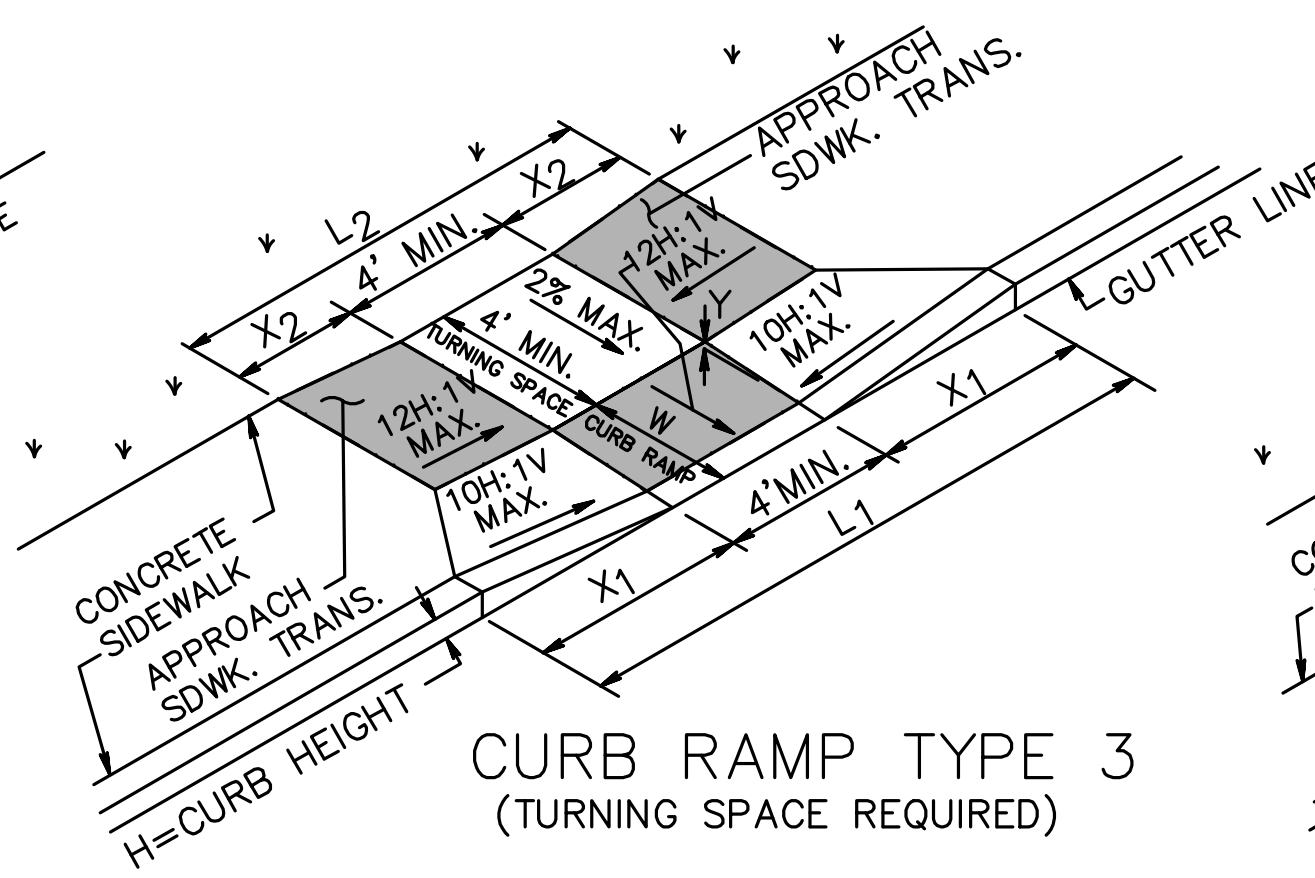
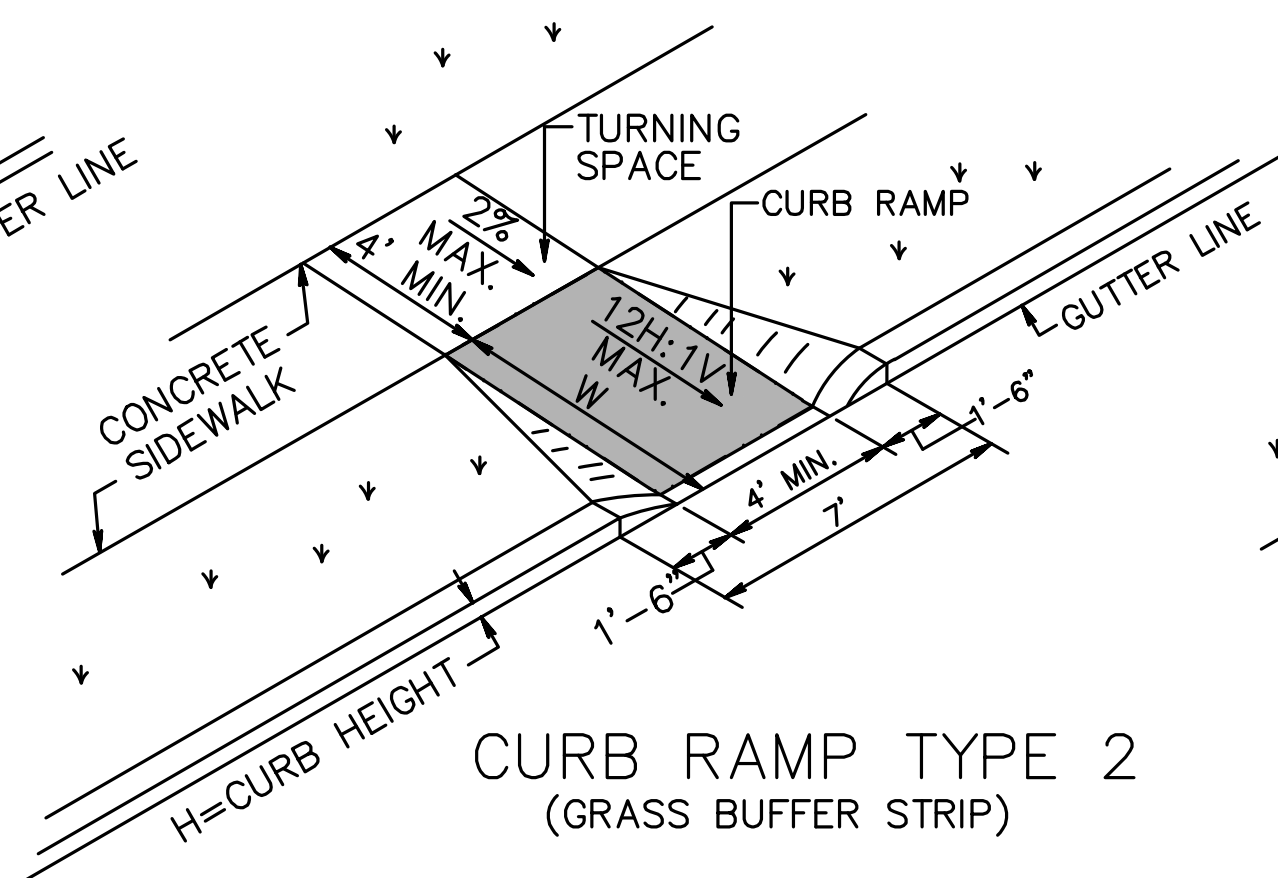
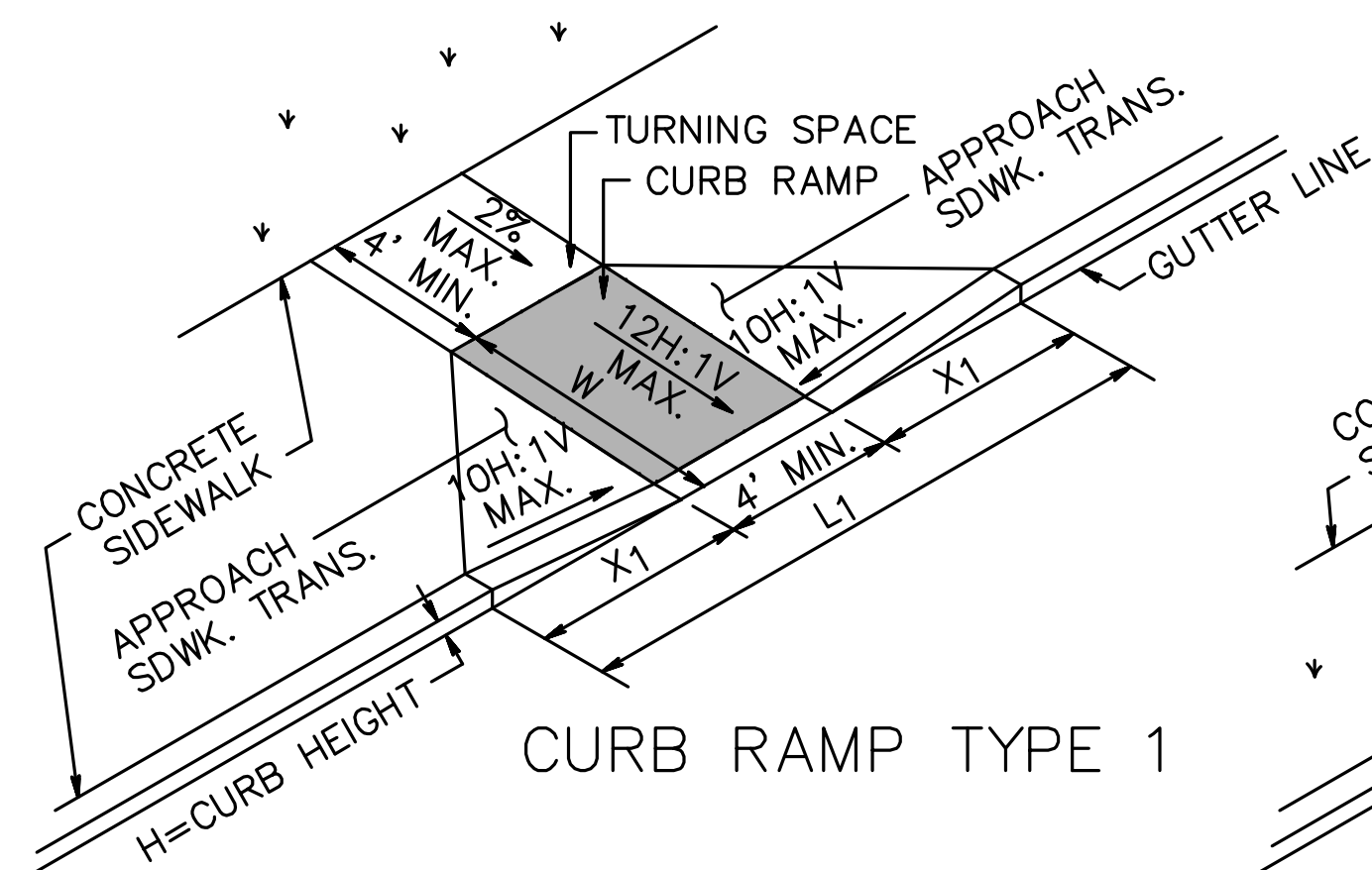
NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS

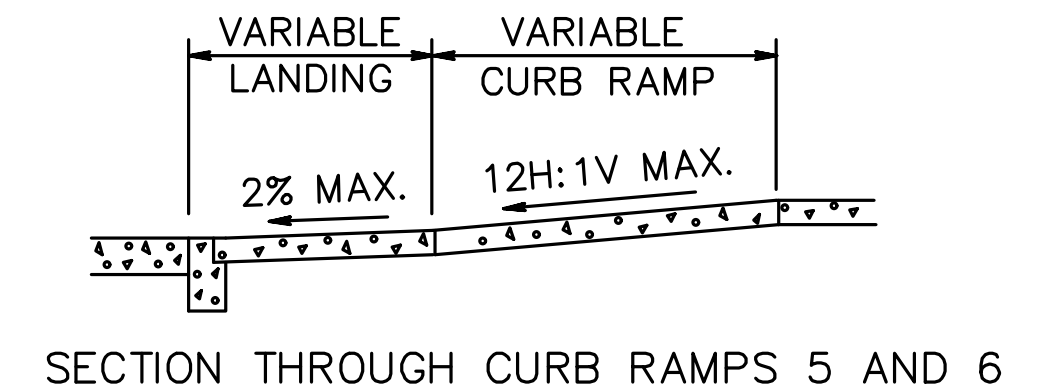
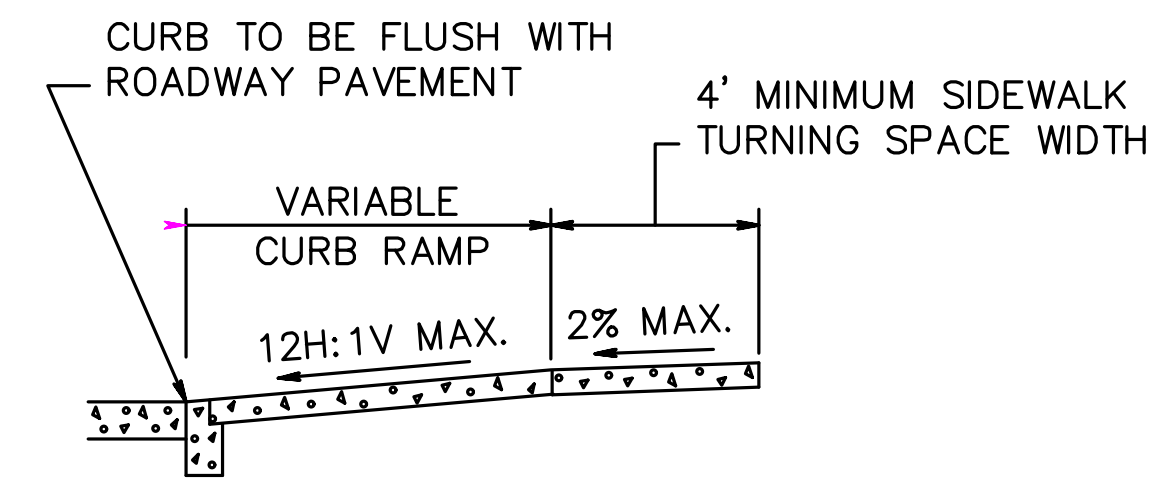
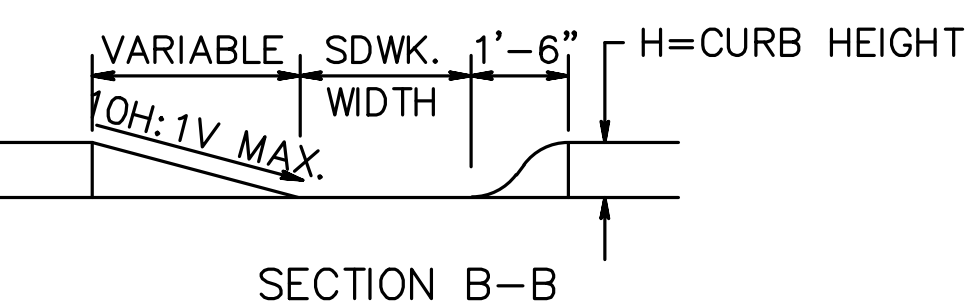








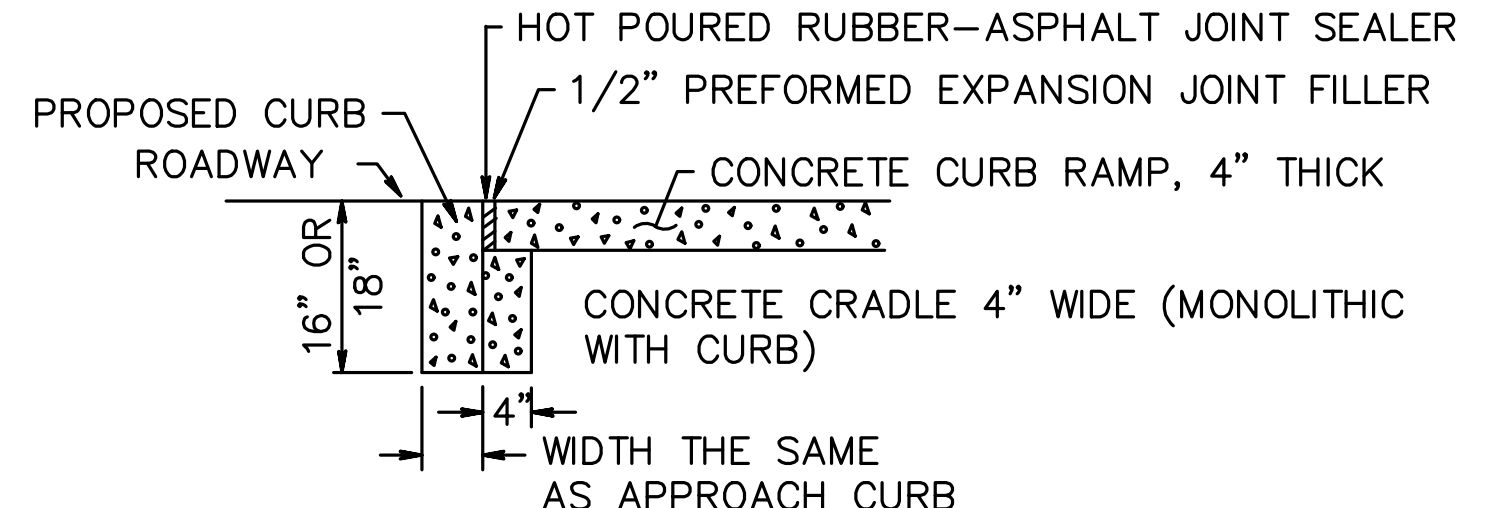
NOTE:  
CURB RAMP OPENING TO BE FLUSH WITH ROADWAY  
PAVEMENT (CURB RAMP TYPES 5 & 6).



- NOTES:
- KEEP TURNING SPACE, APPROACH SIDEWALK TRANSITIONS, AND CURB RAMP CLEAR OF OBSTRUCTIONS THAT PROTRUDE ABOVE THE SIDEWALK.
  - FOR DIMENSIONS SEE CD-606-1B AND CD-606-1C.
  - CURB (DROPPED CURB) GUTTERLINE TO BE FLUSH WITH ROADWAY PAVEMENT A MINIMUM OF 4 FEET AT ALL CURB RAMPS.
  - FOR CURB RAMP TYPES 5 AND 6, IF A GRASS BUFFER DOES NOT EXIST, SLOPE CURB TO EQUAL SLOPE OF ADJACENT CURB RAMP.
  - SIDEWALK AND CURB RAMP WITHIN AREA ENCLOSED BY HEAVY LINES INDICATES THE PAY LIMIT FOR CONCRETE SIDEWALK OF THE APPROPRIATE ADJACENT THICKNESS.
  - CURB AND HEADER WITHIN AREA ENCLOSED BY HEAVY LINES INDICATES THE PAY LIMIT FOR VERTICAL CURB OR SLOPING CURB OF THE APPROPRIATE ADJACENT SIZE AND KIND.
  - WHERE THE DISTANCE FROM THE GUTTER LINE TO THE OUTSIDE EDGE OF SIDEWALK IS 6 FEET OR LESS, USE CURB RAMP TYPE 7, INSTEAD OF CURB RAMP TYPE 1 THROUGH 4.
  - CROSSWALKS AND STOP LINES MAY BE MARKED OR UNMARKED. SEE PLANS.
  - DIMENSIONS SHOWN IN TABLES ARE FOR 3 INCH TO 9 INCH CURB HEIGHTS. WHERE THE CURB HEIGHTS ARE OTHER THAN WHAT IS PROVIDED IN THE TABLES, THE DIMENSIONS OF THE RAMPS WILL HAVE TO BE CALCULATED BASED ON CROSS SLOPES SHOWN.
  - THE 12H:1V MAX SLOPE IS THE RUNNING SLOPE FOR CURB RAMPS, BUT ONLY THE 12H:1V SLOPE MEASURED AS X2 IS THE RUNNING SLOPE FOR TYPE 3 AND TYPE 4 CURB RAMPS. ENSURE THE RUNNING SLOPE OF CURB RAMPS DOES NOT REQUIRE ITS LENGTH TO EXCEED 15 FEET. THE RUNNING SLOPE MAY EXCEED THE 12H:1V MAX SLOPE SO AS NOT TO EXCEED THE 15 FEET MAXIMUM LENGTH.

CURB RAMP NOTES:

- THE MAXIMUM CROSS SLOPE OF SIDEWALKS SHALL BE 2%.
- THE MAXIMUM LONGITUDINAL TRANSITION SLOPE OF SIDEWALKS SHALL BE 5%.
- THE MAXIMUM LONGITUDINAL SLOPE OF CURB RAMPS SHALL BE 8%.
- THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE ALONG ALL SIDEWALKS, CURB RAMPS AS WELL ADJACENT TO ALL SIDEWALKS. STORMWATER RUNOFF SHALL NOT BE BLOCKED BY SIDEWALKS OR CURBS.
- FOR TYPE 5 & TYPE 6 RAMPS, LEADING EDGE OF DETECTABLE WARNING SURFACE MUST BE LOCATED A MAXIMUM OF 5 FEET FROM EDGE OF TRAVELWAY - THIS REQUIREMENT MAY WARRANT MULTIPLE DETECTABLE WARNING SURFACES FOR A SINGLE RAMP.
- THERE MUST BE A MINIMUM OF 24 INCH OF DETECTABLE WARNING SURFACE IN THE DIRECTION OF PEDESTRIAN TRAVEL, THE FULL WIDTH OF THE SIDEWALK - THIS REQUIREMENT MAY WARRANT MULTIPLE DETECTABLE WARNING SURFACES FOR A SINGLE RAMP.
- A MINIMUM 4' X 4' LANDING AREA, GRADED AT A MAXIMUM SLOPE OF 2% IN ALL DIRECTIONS, MUST BE PROVIDED AT THE TOP OF EVERY RAMP.



CONCRETE SIDEWALK  
(PUBLIC SIDEWALK CURB RAMP)  
N.T.S.

CD-606-1

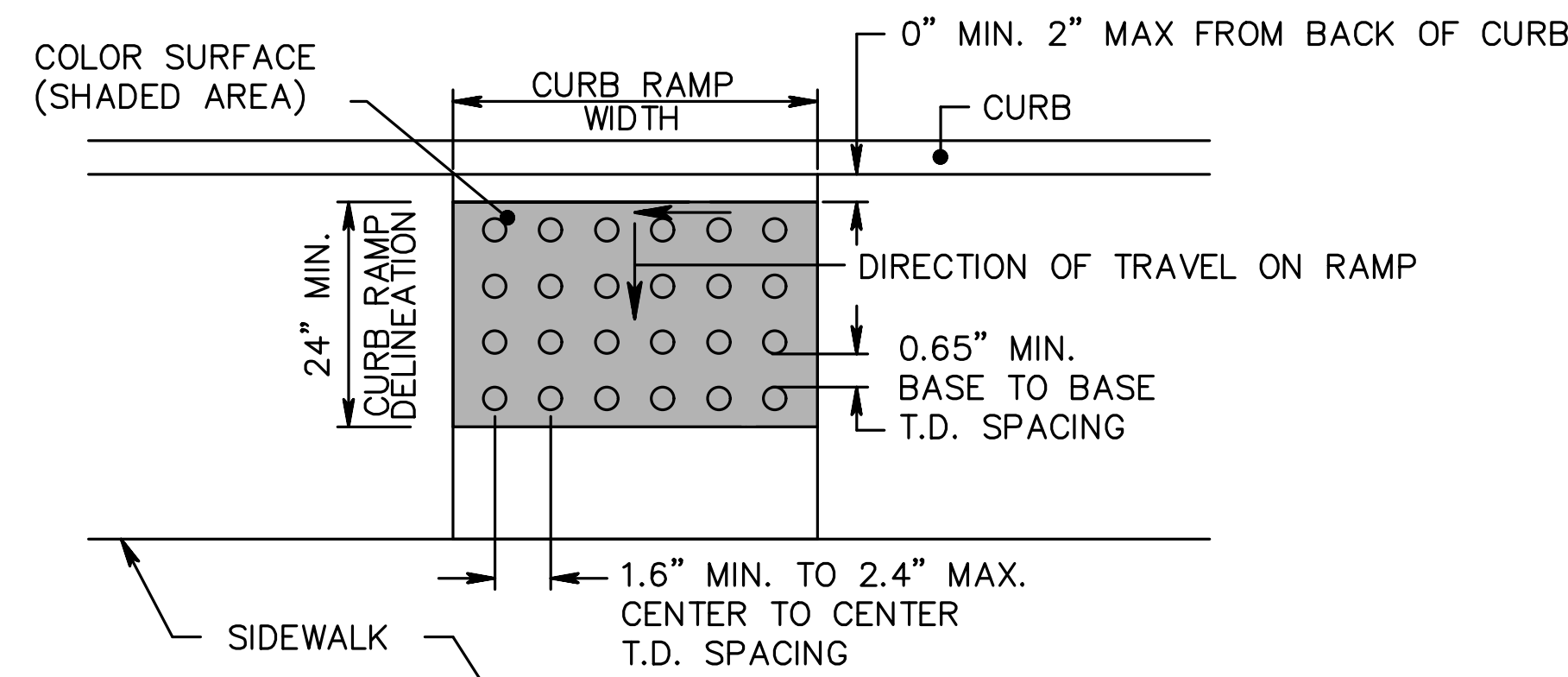
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

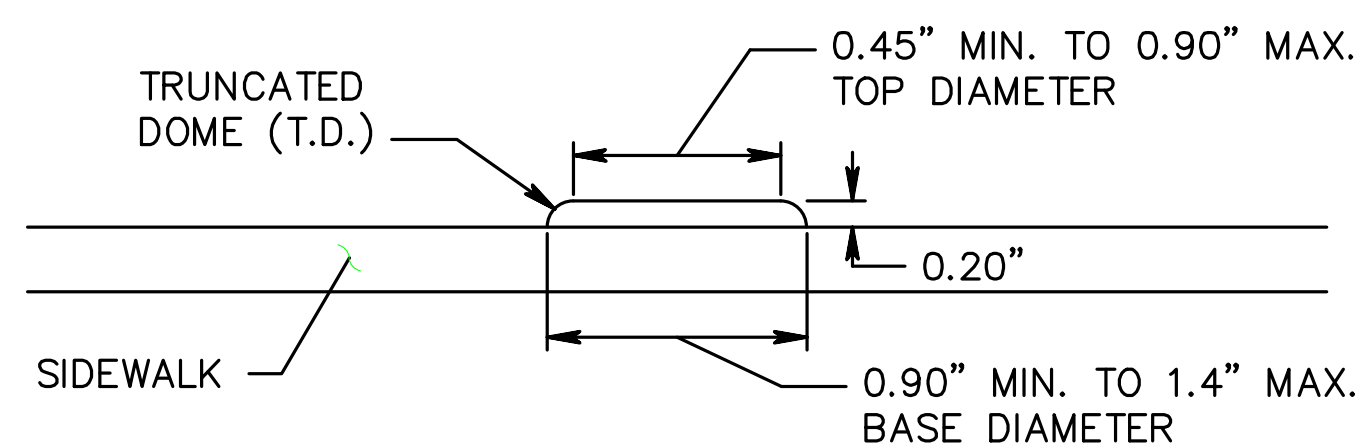
CURB RAMPS

CD-606-1.1





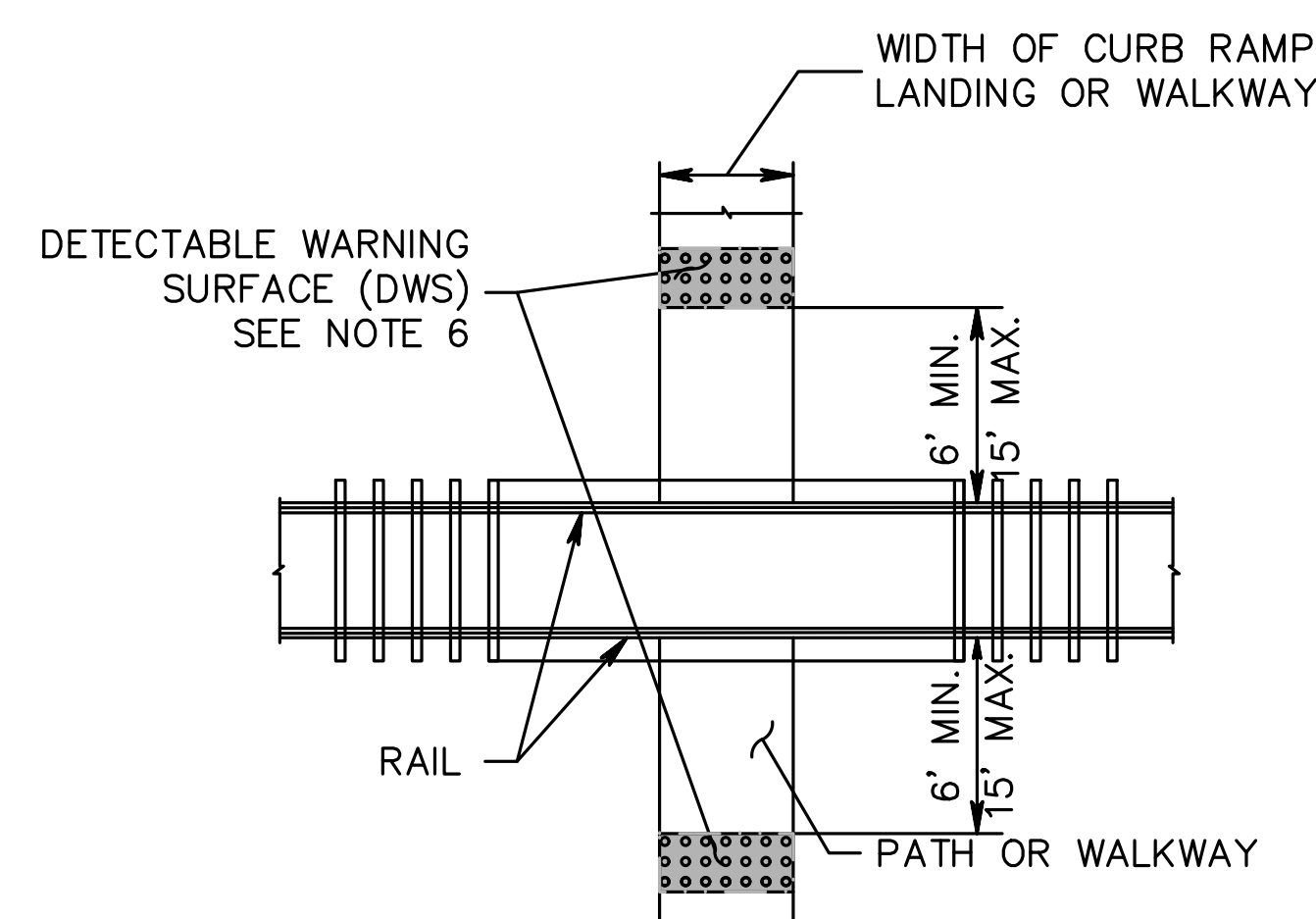
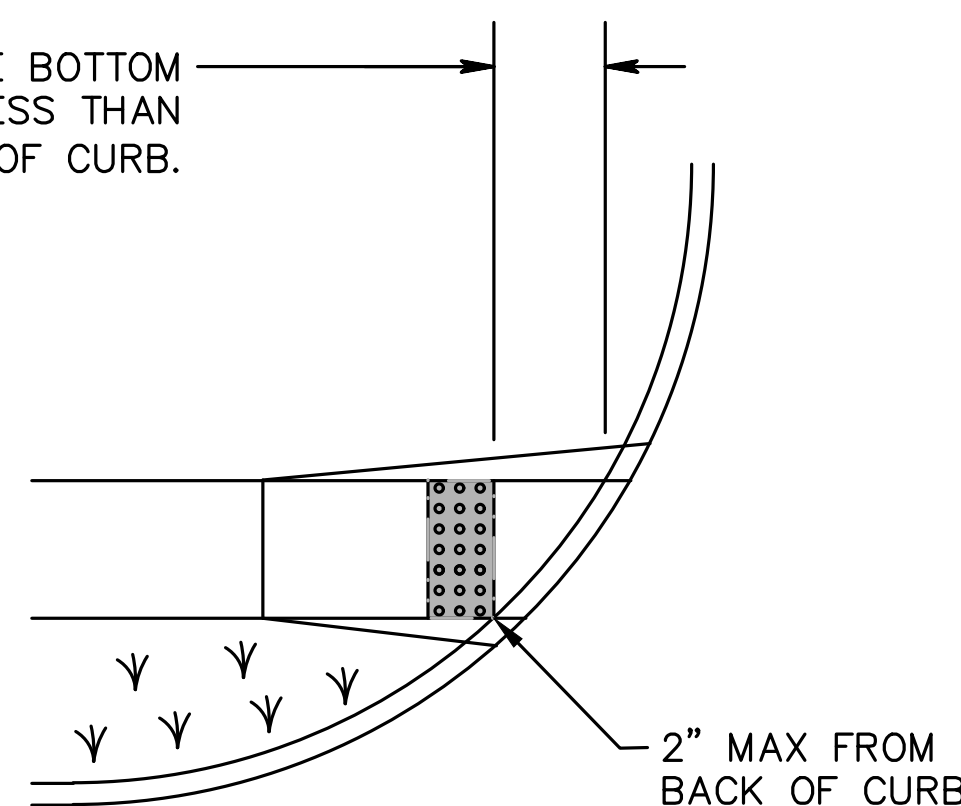
PLAN VIEW



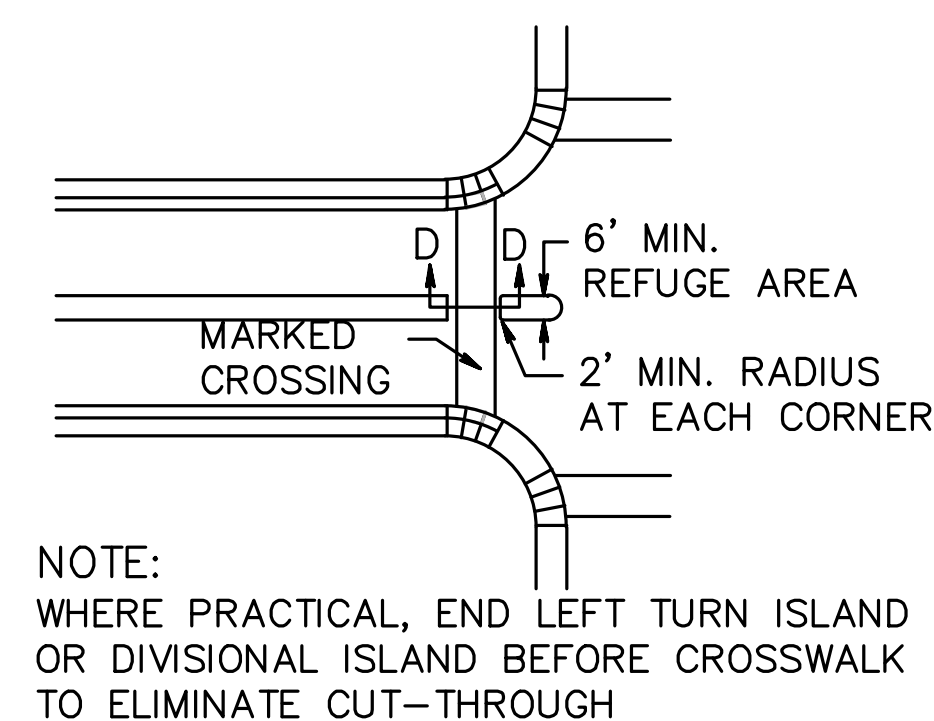
ELEVATION

## DETECTABLE WARNING SURFACE

BOTH ENDS OF THE BOTTOM GRADE BREAK ARE LESS THAN 5' FROM BACK OF CURB.

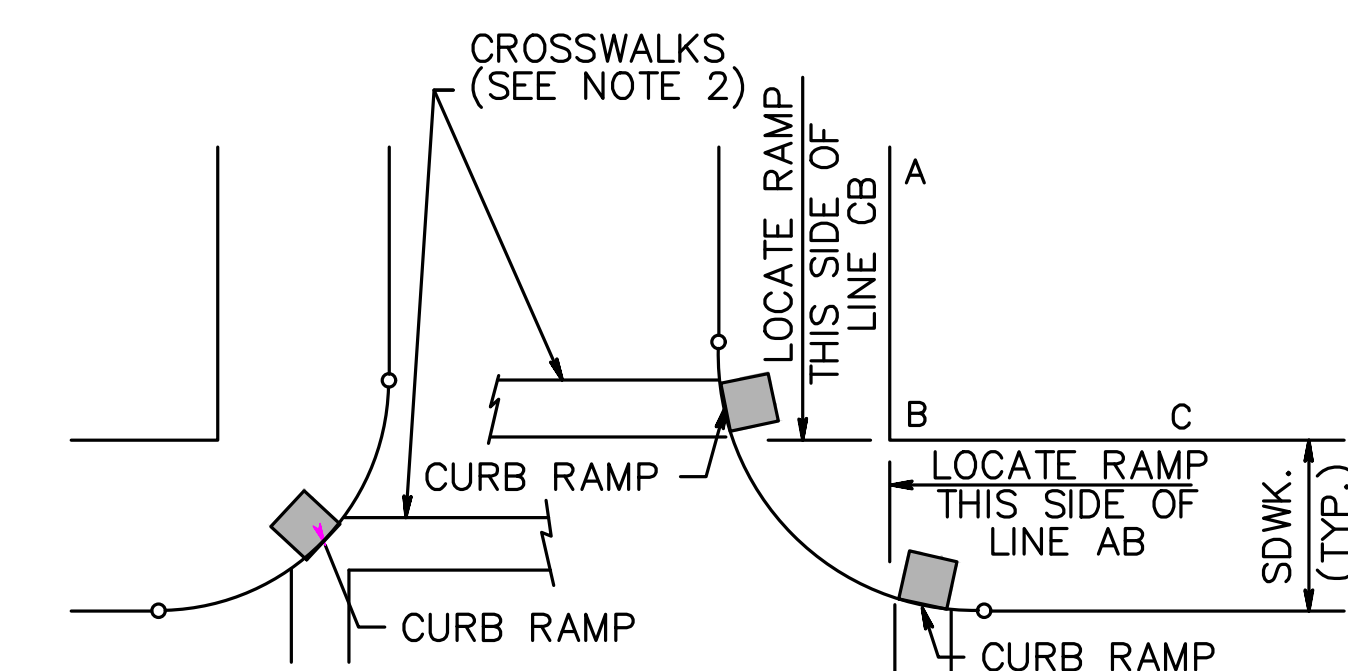


## PEDESTRIAN RAILROAD CROSSING



## PEDESTRIAN REFUGE ISLAND WALKWAY OPENING AT INTERSECTIONS

NOTE:  
5' MIN. WIDE OPENING TO BE FLUSH WITH ROADWAY PAVEMENT

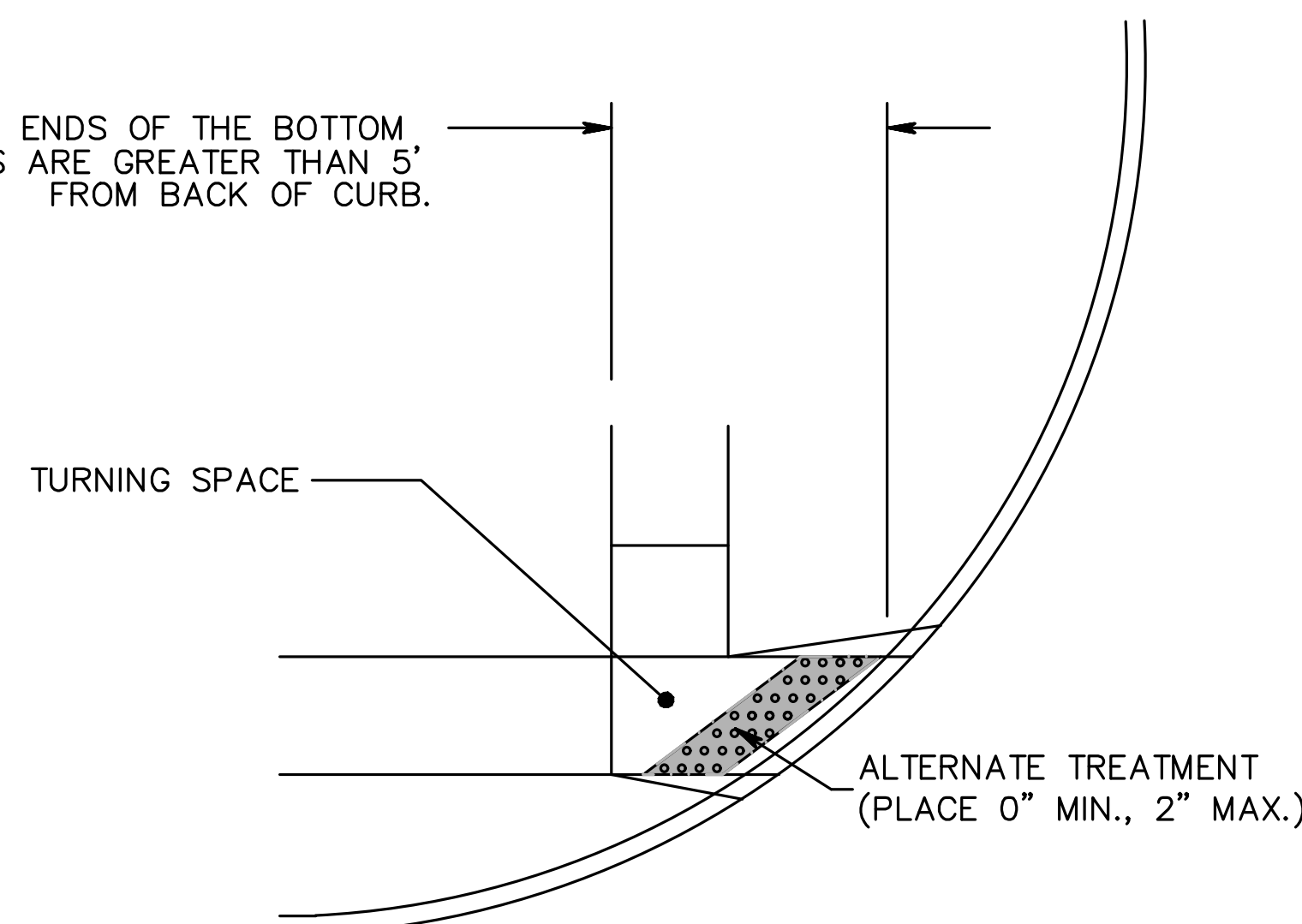


ALTERNATE TREATMENT (SEE NOTE 5)

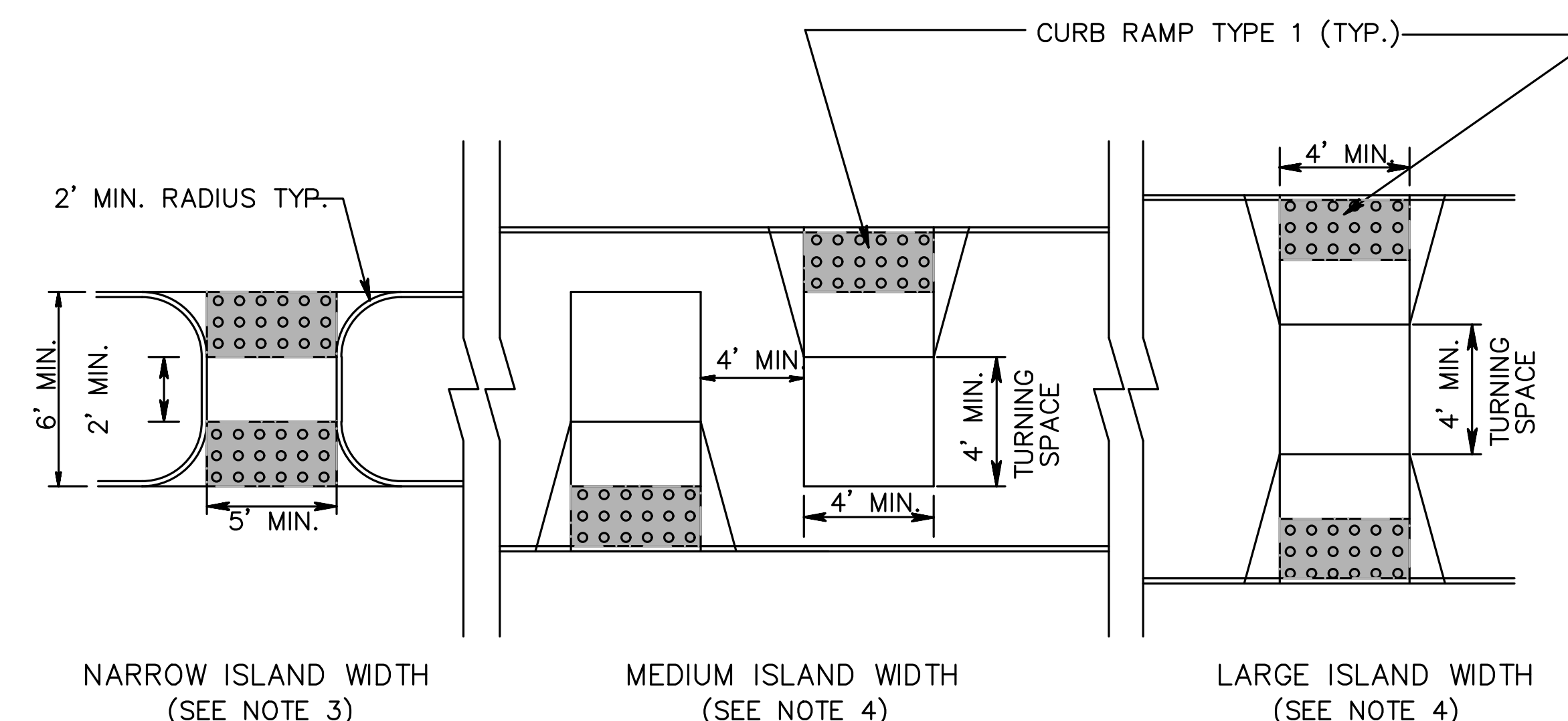
PREFERRED TREATMENT (SEE NOTE 5)

## LOCATION OF CURB RAMP TYPES 1, 2, 3, 4 & 7 FOR CROSSING PARALLEL AND PERPENDICULAR TO HIGHWAY

ONE OR BOTH ENDS OF THE BOTTOM GRADE BREAKS ARE GREATER THAN 5' FROM BACK OF CURB.



## PLACEMENT OF DETECTABLE WARNING SURFACE FOR CURB RAMP TYPE 5 AND 6



## PEDESTRIAN REFUGE ISLAND

## DETECTABLE WARNING SURFACE N.T.S.

- NOTES:
- KEEP TURNING SPACE, APPROACH SIDEWALK TRANSITIONS, AND CURB RAMP CLEAR OF OBSTRUCTIONS THAT PROTRUDE ABOVE THE SIDEWALK.
  - CROSSWALKS AND STOP LINES MAY BE MARKED OR UNMARKED, SEE PLANS.
  - FOR NARROW ISLAND WIDTH, SEE PEDESTRIAN REFUGE ISLAND WALKWAY OPENING AT INTERSECTIONS DETAIL.
  - FOR MEDIUM AND LARGE ISLAND WIDTH, SEE CURB RAMP TYPE 1 ON CD-606-1.
  - CONSTRUCT CURB RAMP TYPES 1, 2, 3, 4 & 7 PERPENDICULAR TO CURBLINE, AS SHOWN.
  - IF A CURB RAMP IS REQUIRED, THE LOCATION OF THE DETECTABLE WARNING SURFACE MUST BE AT THE BOTTOM OF THE RAMP AND WITHIN THE REQUIRED DISTANCE FROM THE RAIL.

NEW JERSEY DEPARTMENT OF TRANSPORTATION

## CONSTRUCTION DETAILS

CD-606-1.1A

16  
18



CURB RAMP TYPE 1

0.0% GUTTER LINE PROFILE				
H INCHES	W FEET	X1u FEET	X1L FEET	Lz FEET
3	3	2.50	2.50	9.00
4	4	3.33	3.33	10.67
5	5	4.17	4.17	12.33
6	6	5.00	5.00	14.00
7	7	5.83	5.83	15.67
8	8	6.67	6.67	17.33
9	9	7.50	7.50	19.00

1.0% GUTTER LINE PROFILE				
H INCHES	W FEET	X1u FEET	X1L FEET	Lz FEET
3	3	2.78	2.27	9.05
4	4	3.70	3.03	10.73
5	5	4.63	3.79	12.42
6	6	5.56	4.55	14.10
7	7	6.48	5.30	15.78
8	8	7.41	6.06	17.47
9	9	8.33	6.82	19.15

2.0% GUTTER LINE PROFILE				
H INCHES	W FEET	X1u FEET	X1L FEET	Lz FEET
3	3	3.13	2.08	9.21
4	4	4.17	2.78	10.94
5	5	5.21	3.47	12.68
6	6	6.25	4.17	14.42
7	7	7.29	4.86	16.15
8	8	8.33	5.56	17.89
9	9	9.38	6.25	19.63

3.0% GUTTER LINE PROFILE				
H INCHES	W FEET	X1u FEET	X1L FEET	Lz FEET
3	3	3.57	1.92	9.49
4	4	4.76	2.56	11.33
5	5	5.95	3.21	13.16
6	6	7.14	3.85	14.99
7	7	8.33	4.49	16.82
8	8	9.52	5.13	18.65
9	9	10.71	5.77	20.48

4.0% GUTTER LINE PROFILE				
H INCHES	W FEET	X1u FEET	X1L FEET	Lz FEET
3	3	4.17	1.79	9.95
4	4	5.56	2.38	11.94
5	5	6.94	2.98	13.92
6	6	8.33	3.57	15.90
7	7	9.72	4.17	17.89
8	8	11.11	4.76	19.87
9	9	12.50	5.36	21.86

5.0% GUTTER LINE PROFILE				
H INCHES	W FEET	X1u FEET	X1L FEET	Lz FEET
3	3	5.00	1.67	10.67
4	4	6.67	2.22	12.89
5	5	8.33	2.78	15.11
6	6	10.00	3.33	17.33
7	7	11.67	3.89	19.56
8	8	13.33	4.44	21.78
9	9	15.00	5.00	24.00

6.0% GUTTER LINE PROFILE				
H INCHES	W FEET	X1u FEET	X1L FEET	Lz FEET
3	3	6.25	1.56	11.81
4	4	8.33	2.08	14.42
5	5	10.42	2.60	17.02
6	6	12.50	3.13	19.63
7	7	14.58	3.65	22.23
8	8	15.00	4.17	23.17
9	9	15.00	4.69	23.69

0.0% GUTTER LINE PROFILE				
H INCHES	W FEET	X1u FEET	X1L FEET	Lz FEET
3	3	8.33	1.47	13.80
4	4	11.11	1.96	17.07
5	5	13.89	2.45	20.34
6	6	15.00	2.94	21.94
7	7	15.00	3.43	22.43
8	8	15.00	3.92	22.92
9	9	15.00	4.41	23.41

CURB RAMP TYPE 3

0.0% GUTTER LINE PROFILE								
H INCHES	W FEET	X1u FEET	X1L FEET	L1 FEET	Y INCHES	X2u FEET	X2L FEET	L2 FEET
3	2.5	2.50	2.50	9.00	2.5	1.10	1.10	6.20
4		3.33	3.33	10.67		2.10	2.10	8.20
5		4.17	4.17	12.33		3.10	3.10	10.20
6		5.00	5.00	14.00		4.10	4.10	12.20
7		5.83	5.83	15.67		5.10	5.10	14.21
8		6.67	6.67	17.33		6.10	6.10	16.21
9		7.50	7.50	19.00		7.10	7.10	18.21
3	3.0	*	*	*	3.0	*	*	*
4		3.33	3.33	10.67		1.72	1.72	7.44
5		4.17	4.17	12.33		2.72	2.72	9.44
6		5.00	5.00	14.00		3.72	3.72	11.45
7		5.83	5.83	15.67		4.72	4.72	13.45
8		6.67	6.67	17.33		5.72	5.72	15.45
9		7.50	7.50	19.00		6.72	6.72	17.45
3	3.5	*	*	*	3.5	*	*	*
4		3.33	3.33	10.67		1.34	1.34	6.68
5		4.17	4.17	12.33		2.34	2.34	8.68
6		5.00	5.00	14.00		3.34	3.34	10.69
7		5.83	5.83	15.67		4.34	4.34	12.69
8		6.67	6.67	17.33		5.34	5.34	14.69
9		7.50	7.50	19.00		6.34	6.34	16.69
3	4.0	*	*	*	4.0	*	*	*
4		*	*	*		*	*	*
5		4.17	4.17	12.33		1.96	1.96	7.92
6		5.00	5.00	14.00		2.96	2.96	9.93
7		5.83	5.83	15.67		3.96	3.96	11.93
8		6.67	6.67	17.33		4.96	4.96	13.93
9		7.50	7.50	19.00		5.96	5.96	15.93

4.0% GUTTER LINE PROFILE								
H INCHES	W FEET	X1u FEET	X1L FEET	L1 FEET	Y INCHES	X2u FEET	X2L FEET	L2 FEET
3	2.5	4.17	1.79	9.95	2.5	2.12	0.74	6.86
4		5.56	2.38	11.94		4.04	1.42	9.46
5		6.94	2.98	13.92		4.85	2.28	11.13
6		8.33	3.57	15.90		6.41	3.02	13.43
7		9.72	4.17	17.89		7.98	3.75	15.73
8	3.0	11.11	4.76	19.87	3.0	9.54	4.49	18.03
9		12.50	5.36	21.86		11.10	5.22	20.33
3		4.17	1.79	9.95		1.39	0.49	5.88
4		5.56	2.38	11.94		3.31	1.16	4.48
5		6.94	2.98	13.92		5.24	1.84	11.08
6	3.5	8.33	3.57	15.90	3.5	5.24	2.52	13.68
7		9.72	4.17	17.89		9.09	3.19	16.28
8		11.11	4.76	19.87		11.02	3.87	18.88
9		12.50	5.36	21.86		12.94	4.54	21.48
3		*	*	*		*	*	*
4	4.0	5.56	2.38	11.94	4.0	2.58	0.91	7.49
5		6.94	2.98	13.92		4.51	1.58	10.09
6		8.33	3.57	15.90		6.43	2.26	12.69
7		9.72	4.17	17.89		8.36	2.93	15.29
8		11.11	4.76	19.87		10.28	3.61	17.89
9	4.0	12.50	5.36	21.86	4.0	12.20	4.29	20.49
3		*	*	*		*	*	*
4		5.56	2.38	11.94		1.85	0.65	6.50
5		6.94	2.98	13.92		3.78	1.33	9.10
6		8.33	3.57	15.90		5.70	2.00	11.70
7	4.0	9.72	4.17	17.89	4.0	7.62	2.68	14.30
8		11.11	4.76	19.87		9.55	3.35	16.90
9		12.50	5.36	21.86		11.47	4.03	19.50
3		*	*	*		*	*	*
4		5.56	2.38	11.94		1.85	0.65	6.50

CURB RAMP TYPE 2

0.0% GUTTER LINE PROFILE				
H INCHES	W FEET	X1u FEET	X1L FEET	Lz FEET
3	3	1.50	1.50	7.00
4	4	1.50	1.50	7.00
5	5	1.50	1.50	7.00
6	6	1.50	1.50	7.00
7	7	1.50	1.50	7.00
8	8	1.50	1.50	7.00
9	9	1.50	1.50	7.00

1.0% GUTTER LINE PROFILE										
H INCHES	W FEET	X1u FEET	X1L FEET	L1 FEET	Y INCHES	X2u FEET	X2L FEET	L2 FEET		
3	2.5	2.78	2.27	9.05	2.5	1.25	0.98	6.24		
4		3.70	3.03	10.73		2.39	1.18	8.27		
5		4.63	3.79	12.42		3.53	2.77	10.30		
6		5.56	4.55	14.10		4.66	3.66	12.33		
7		6.48	6.06	15.78		5.80	4.56	14.36		
8		7.41	6.06	17.47		6.94	5.45	16.39		
9		8.33	6.82	19.15		8.07	6.34	18.42		
3		3.0	2.78	2.27		9.05	3.0	0.82	0.64	5.46
4			3.70	3.03		10.73		1.96	1.54	7.49
5	4.63		3.79	12.42	3.09	2.43		9.52		
6	5.56		4.55	14.10	4.23	3.32		11.55		
7	6.48		6.06	15.78	4.23	4.22		13.58		
8	7.41		6.06	17.47	5.37	5.11		15.61		
9	8.33		6.82	19.15	7.64	6.00		17.64		
33	*		*	*	*	*		*		
4	3.5		3.70	3.03	10.73	3.5		1.53	1.20	6.72
5		4.63	3.79	12.42	2.66		2.09	8.75		
6		5.56	4.55	14.10	3.80		2.98	10.78		
7		6.48	6.06	15.78	4.94		3.88	12.81		
8		7.41	6.06	17.47	6.07		4.77	14.84		
9		8.33	6.82	19.15	7.21		5.66	16.87		
33		*	*	*	*		*	*		
4		4.0	3.70	3.03	10.73		4.0	1.09	0.86	5.95
5			4.63	3.79	12.42			2.23	1.75	7.98
6	5.56		4.55	14.10	3.37	2.65		10.01		
7	6.48		6.06	15.78	4.50	3.54		12.04		
8	7.41		6.06	17.47	5.64	4.43		14.07		
9	8.33		6.82	19.15	6.78	5.32		16.01		
33	*		*	*	*	*		*		

5.0% GUTTER LINE PROFILE								
H INCHES	W FEET	X1u FEET	X1L FEET	L1 FEET	Y INCHES	X2u FEET	X2L FEET	L2 FEET
3	2.5	5.00	1.67	10.67	2.5	2.76	0.69	7.44
4		6.67	2.22	12.89		5.26	1.31	10.57
5		8.33	2.78	15.11		7.76	1.94	13.57
6		10.00	3.33	17.33		10.26	2.56	16.83
7		11.67	3.89	19.56		12.77	3.19	19.95
8		13.33	4.44	21.78		15.00	3.81	22.81
9	15.00	5.00	24.00	15.00	4.44	23.44		
3	3.0	5.00	1.67	10.67	3.0	1.80	0.45	6.26
4		6.67	2.22	12.89		4.31	1.08	9.38
5		8.33	2.78	15.11		6.81	1.70	12.51
6		10.00	3.33	17.33		9.31	2.33	15.64
7		11.67	3.89	19.56		11.81	2.95	18.77
8		13.33	4.44	21.78		14.32	3.58	21.89
9	15.00	5.00	24.00	15.00	4.20	23.20		
3	3.5	*	*	*	3.5	*	*	*
4		6.67	2.22	12.89		3.36	0.84	8.20
5		8.33	2.78	15.11		5.86	1.46	11.32
6		10.00	3.33	17.33		8.36	2.09	14.45
7		11.67	3.89	19.56		10.86	2.71	17.58
8		13.33	4.44	21.78		13.37	3.34	20.71
9	15.00	5.00	24.00	15.00	3.96	22.96		
3	4.0	*	*	*	4.0	*	*	*
4		6.67	2.22	12.89		2.41	0.60	7.01
5		8.33	2.78	15.11		4.91	1.23	10.14
6		10.00	3.33	17.33		7.41	1.85	13.26
7		11.67	3.89	19.56		9.91	2.48	16.39
8		13.33	4.44	21.78		12.42	3.10	19.52
9	15.00	5.00	24.00	11.92	3.73	22.65		



CURB RAMP TYPE 4

0.0% GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X2u FEET	X2L FEET	Lz FEET
3	2.5	2.5	1.10	1.10	6.20
4			2.10	2.10	8.20
5			3.10	3.10	10.20
6			4.10	4.10	12.20
7			5.10	5.10	14.21
8			6.10	6.10	16.21
9			7.10	7.10	18.21
3	3.0	3.0	**	**	**
4			1.72	1.72	7.44
5			2.72	2.72	9.44
6			3.72	3.72	11.45
7			4.72	4.72	13.45
8			5.72	5.72	15.45
9			6.72	6.72	17.45
3	3.5	3.5	**	**	**
4			1.34	1.34	6.68
5			2.34	2.34	8.68
6			3.34	3.34	10.69
7			4.34	4.34	12.69
8			5.34	5.34	14.69
9			6.34	6.34	16.69
3	4.0	4.0	**	**	**
4			**	**	**
5			1.96	1.96	7.92
6			2.96	2.96	9.93
7			3.96	3.96	11.93
8			4.96	4.96	13.93
9			5.96	5.96	15.93

4.0% GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X2u FEET	X2L FEET	Lz FEET
3	2.5	2.5	2.12	0.74	6.86
4			4.04	1.42	9.46
5			5.97	2.10	12.06
6			7.89	2.77	14.66
7			9.82	3.45	17.26
8			11.74	4.12	19.87
9			13.67	4.80	22.47
3	3.0	3.0	1.39	0.49	5.88
4			3.31	1.16	8.48
5			5.24	1.84	11.08
6			7.16	2.52	13.68
7			9.09	3.19	16.28
8			11.01	3.87	18.88
9			12.94	4.54	21.48
3	3.5	3.5	0.66	0.23	4.89
4			2.58	0.91	7.49
5			4.51	1.58	10.09
6			6.43	2.26	12.69
7			8.36	2.93	15.29
8			10.28	3.61	17.89
9			12.20	4.29	20.49
3	4.0	4.0	**	**	**
4			1.85	0.65	6.50
5			3.78	1.33	9.10
6			5.70	2.00	11.70
7			7.62	2.68	14.30
8			9.55	3.35	16.90
9			11.47	4.03	19.50

1.0% GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X2u FEET	X2L FEET	Lz FEET
3	2.5	2.5	1.25	0.98	6.24
4			2.39	1.88	8.27
5			3.53	2.77	10.30
6			4.66	3.66	12.33
7			5.80	4.56	14.36
8			6.94	5.45	16.39
9			8.07	6.34	18.42
3	3.0	3.0	0.82	0.64	5.46
4			1.96	1.54	7.49
5			3.09	2.43	9.52
6			4.23	3.32	11.55
7			5.37	4.22	13.58
8			6.50	5.11	15.61
9			7.64	6.00	17.64
3	3.5	3.5	0.39	0.30	4.69
4			1.53	1.20	6.72
5			2.66	2.09	8.75
6			3.80	2.98	10.78
7			4.94	3.88	12.81
8			6.07	4.77	14.84
9			7.21	5.66	16.87
3	4.0	4.0	**	**	**
4			1.09	0.86	5.95
5			2.23	1.75	7.98
6			3.37	2.65	10.01
7			4.50	3.54	12.04
8			5.64	4.43	14.07
9			6.78	5.32	16.10

5.0% GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X2u FEET	X2L FEET	Lz FEET
3	2.5	2.5	2.76	0.69	7.44
4			5.26	1.31	10.57
5			7.76	1.94	13.70
6			10.26	2.56	16.83
7			12.77	3.19	19.95
8			15.00	3.81	22.81
9			15.00	4.44	23.44
3	3.0	3.0	1.80	0.45	6.26
4			4.31	1.08	9.38
5			6.81	1.70	12.51
6			9.31	2.33	15.64
7			11.81	2.95	18.77
8			14.32	3.58	21.89
9			15.00	3.87	23.20
3	3.5	3.5	0.85	0.21	5.07
4			3.36	0.84	8.20
5			5.86	1.46	11.32
6			8.36	2.09	14.45
7			10.86	2.71	17.58
8			13.37	3.34	20.71
9			15.00	3.96	22.96
3	4.0	4.0	**	**	**
4			2.41	0.60	7.01
5			4.91	1.23	10.14
6			7.41	1.85	13.26
7			9.91	2.48	16.39
8			12.42	3.10	19.52
9			14.92	3.73	22.65

2.0% GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X2u FEET	X2L FEET	Lz FEET
3	2.5	2.5	1.45	0.89	6.34
4			2.77	1.69	8.46
5			4.08	2.50	10.58
6			5.40	3.31	12.71
7			6.72	4.12	14.83
8			8.03	4.92	16.95
9			9.35	5.73	19.08
3	3.0	3.0	0.95	0.58	5.53
4			2.27	1.39	7.65
5			3.58	2.20	9.78
6			4.90	3.00	11.90
7			6.22	3.81	14.02
8			7.53	4.62	16.15
9			8.85	5.42	18.27
3	3.5	3.5	0.45	0.28	4.72
4			1.77	1.08	6.85
5			3.08	1.89	8.97
6			4.40	2.70	11.09
7			5.72	3.50	13.22
8			7.03	4.31	15.34
9			8.35	5.12	17.46
3	4.0	4.0	**	**	**
4			1.27	0.78	6.04
5			2.58	1.58	8.16
6			3.90	2.39	10.29
7			5.22	3.20	12.41
8			6.53	4.00	14.53
9			7.85	4.81	16.66

6.0% GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X2u FEET	X2L FEET	Lz FEET
3	2.5	2.5	3.94	0.64	8.58
4			7.51	1.22	12.74
5			11.09	1.80	16.89
6			14.67	2.38	21.05
7			15.00	2.97	21.97
8			15.00	3.55	22.55
9			15.00	4.13	23.13
3	3.0	3.0	2.58	0.42	7.0
4			6.16	1.00	11.16
5			9.73	1.58	15.31
6			13.31	2.16	19.47
7			15.00	2.75	21.75
8			15.00	3.33	22.33
9			15.00	3.91	22.91
3	3.5	3.5	1.22	0.20	5.42
4			4.80	0.78	9.58
5			8.37	1.36	13.74
6			11.95	1.94	17.89
7			15.00	2.52	21.52
8			15.00	3.11	22.11
9			15.00	3.69	22.69
3	4.0	4.0	**	**	**
4			3.44	0.56	8.00
5			7.02	1.14	12.16
6			10.59	1.72	16.31
7			14.17	2.30	20.47
8			15.00	2.89	21.89
9			15.00	3.47	22.47

3.0% GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X2u FEET	X2L FEET	Lz FEET
3	2.5	2.5	1.72	0.81	6.53
4			3.28	1.55	8.83
5			4.85	2.28	11.13
6			6.41	3.02	13.43
7			7.98	3.75	15.73
8			9.54	4.49	18.03
9			11.10	5.22	20.33
3	3.0	3.0	1.13	0.53	5.66
4			2.69	1.27	7.96
5			4.25	2.00	10.26
6			5.82	2.74	12.55
7			7.38	3.47	14.85
8			8.94	4.21	17.15
9			10.51	4.94	19.45
3	3.5	3.5	0.53	0.25	4.78
4			2.10	0.99	7.08
5			3.66	1.72	9.38
6			5.22	2.46	11.68
7			6.79	3.19	13.98
8			8.35	3.93	16.28
9			9.91	4.66	18.58
3	4.0	4.0	**	**	**
4			1.50	0.71	6.21
5			3.07	1.44	8.51
6			4.63	2.18	10.81
7			6.19	2.91	13.11
8			7.76	3.65	15.41
9			9.32	4.38	17.71

7.0% GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X2u FEET	X2L FEET	Lz FEET
3	2.5	2.5	6.90	0.60	11.50
4			13.16	1.14	18.31
5			15.00	1.69	20.69
6			15.00	2.23	21.23
7			15.00	2.77	21.77
8			15.00	3.32	22.32
9			15.00	3.86	22.86
3	3.0	3.0	4.52	0.39	8.91
4			10.78	0.94	15.72
5			15.00	1.48	20.48
6			15.00	2.02	21.02
7			15.00	2.57	21.57
8			15.00	3.11	22.11
9			15.00	3.65	22.65
3	3.5	3.5	2.14	0.19	6.32
4			8.40	0.73	13.13
5			14.67	1.27	19.94
6			15.00	1.82	20.82
7			15.00	2.36	21.36
8			15.00	2.90	21.90
9			15.00	3.45	22.45
3	4.0	4.0	**	**	**
4			6.03	0.52	10.55
5			12.29	1.07	17.36
6			15.00	1.61	20.61
7			15.00	2.15	21.15
8			15.00	2.70	21.70
9			15.00	3.24	22.24