

# Recommended Standard Details Manual



**TOWN OF NAGS HEAD  
DEPARTMENT OF ADMINISTRATION  
P.O. BOX 99  
NAGS HEAD, NC 27959  
252-441-6221  
[www.nagsheadnc.gov](http://www.nagsheadnc.gov)**

**Effective Date: August 5, 2015  
Revised Date: May 5, 2021**

**Introduction**

This manual was created and organized to assist planning, design, engineering, contractor and construction professionals for development activities in the Town of Nags Head. The Town of Nags Head “Recommended Standard Details Manual”, latest revision, is established to serve as a reference manual and guide to design professionals and contractors to ensure compliance with the Town Code of Ordinances. The information contained herein are minimum requirements for design and construction within the Town and referenced from adopted policies, standards, details and established practices.

This document will be amended periodically to include supplemental development details and/or changes in materials, methods and procedures.

Copies of this manual may be downloaded from the Town of Nags Head web site, ([www.nagsheadnc.gov](http://www.nagsheadnc.gov)). Hard copies of the information can be supplied upon request.

**Manual Provision**

The authors of this manual, to the best of their ability, have insured that the information presented here is correct and reliable. The execution of design and construction, however, involves professional judgment and only the design professional/contractor can ascertain whether a technique, method or material can be applied to a given situation. It is the sole responsibility of the design professional/contractor to ensure the standards, methods and practices utilized are accurate and correct.

**Variance or Modification**

Any variances, alternate design, construction methods and materials, not specifically prescribed herein, shall be subject to the approval of the Public Works Director, Town Engineer or his/her designee.

**Applicability**

On or after August 5, 2015 this “Recommended Standard Detail Manual,” latest revision, shall be applicable to all new improvements, alterations and additions located within the jurisdiction of the Town of Nags Head.

**Engineers Seal**



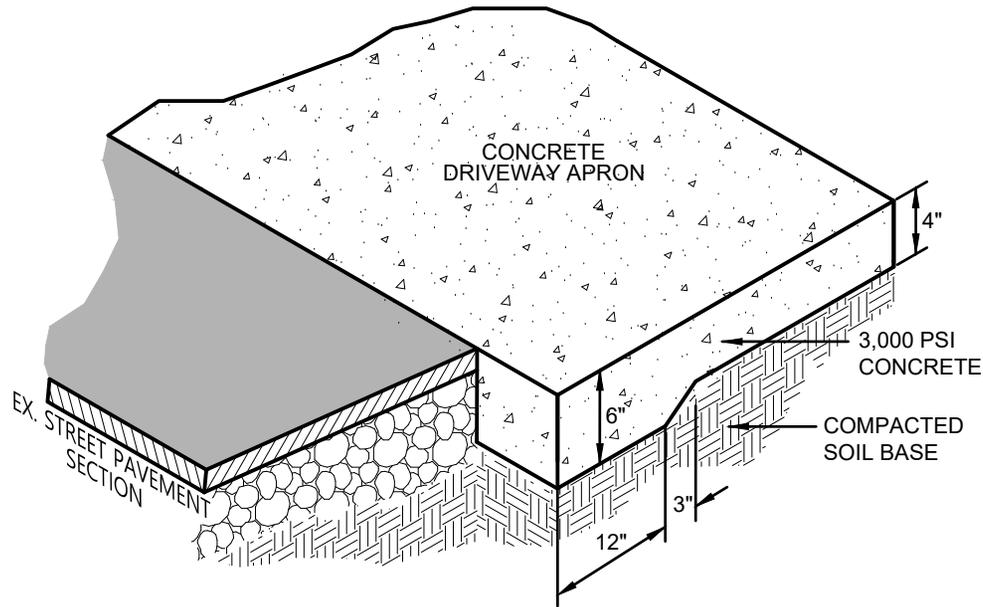
April 23, 2021

A handwritten signature in black ink, appearing to read "David M. Ryan", written over a horizontal line.

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## NOTES:

1. Contractor shall sawcut existing pavement straight and true prior to concrete apron installation.
2. Contractor shall contact the Department of Public Works prior to concrete installation to confirm compliance.
3. Special conditions may warrant exceptions to this detail. Subject to approval by Town Engineering or Public Works Director.
4. If the street pavement section is damaged during construction activity, the contractor shall patch the pavement section to the same pavement cross section that existed prior to the commencement of construction.
5. Driveway aprons shall be constructed of a min. 4" thick, 3000 psi concrete or 6" ABC base course with a 2" asphalt surface course.



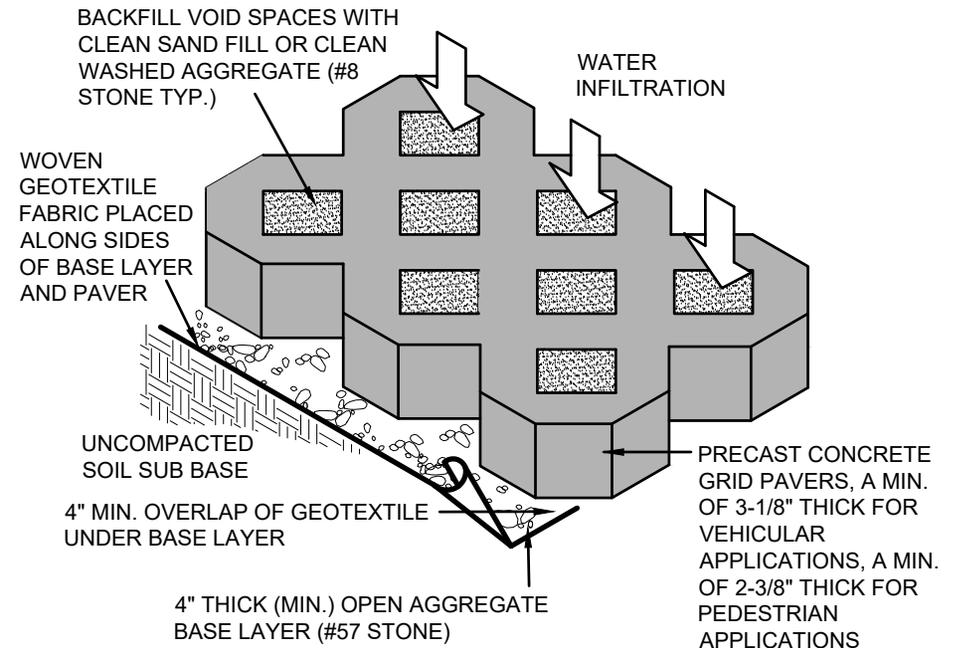
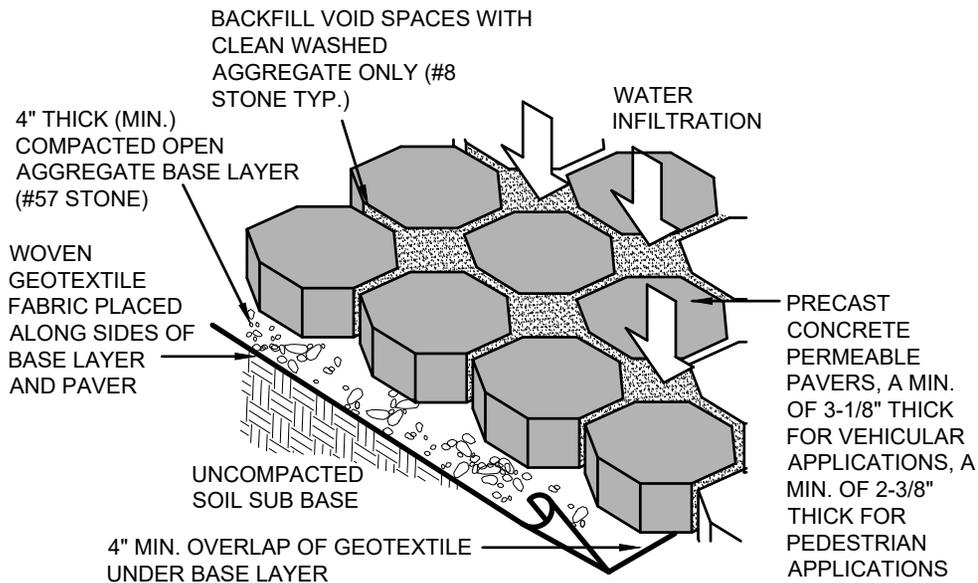
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## TYPICAL RESIDENTIAL DRIVEWAY CONCRETE THICKENED EDGE DETAIL

(THIS SECTION APPLIES TO CONCRETE DRIVEWAY INSTALLATIONS ONLY)

SCALE: NONE  
ISSUE DATE: 7-9-2015  
REVISION DATE: 1-3-2019  
SHEET NO: 1 OF 1  
DRAWN BY: DMR

DETAIL NO.:  
101

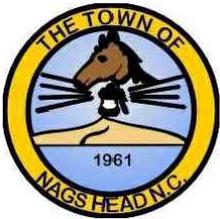


## PRECAST CONCRETE PERMEABLE PAVER

## PRECAST CONCRETE GRID PAVER

### NOTES:

1. Contractor shall submit specific product technical specifications to the Town for review and approval prior to installation.
2. Other permeable pavement systems may be considered, other than those noted hereon, as approved by Town Engineering
3. Pavement section substitutions may be considered in accordance with manufacturers recommended specifications OR as designed by a North Carolina Licensed Professional Engineer.
4. The pavement surface course installation shall be continuous and level .
5. Town Engineering shall be contacted for review and approval of the base layer and nonwoven geotextile fabric layer in advance of the paver installation.
6. A final inspection shall be conducted by the Town Engineering .
7. Edge restraints shall be constructed along the perimeter of the paver installation, (see detail 104) and between paver and asphalt pavement sections.
8. Aggregate fill material shall be installed flush with the finished pavement surface.
9. For paver installations that utilize clean sand fill as the media type to backfill paver void spaces, a nonwoven geotextile layer shall be installed above the aggregate base layer.



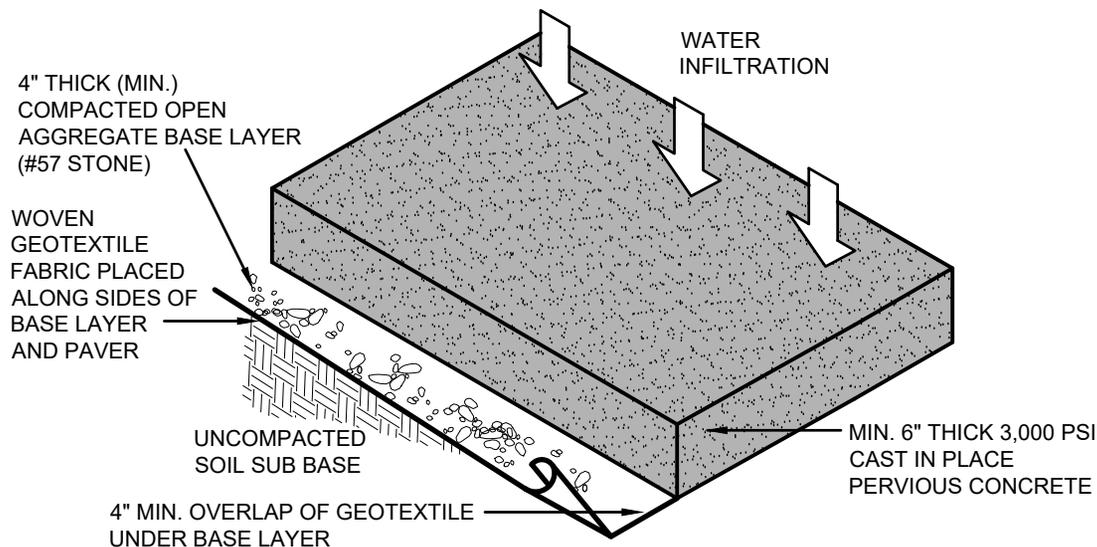
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## TYPICAL RESIDENTIAL PERMEABLE PAVER INSTALLATION DETAIL

(REFER TO DETAIL 104 FOR EDGE RESTRAINT OPTIONS)

SCALE: NONE  
ISSUE DATE: 7-9-2015  
REVISION DATE: 1-3-2019  
SHEET NO: 1 OF 1  
DRAWN BY: DMR

DETAIL NO.:  
**102**



## PERVIOUS CONCRETE PAVEMENT SECTION

### NOTES:

1. Contractor shall submit an appropriate certification indicating adequate training and experience for pervious concrete installations.
2. The pavement system shall be designed and installed in accordance with ACI specifications, or equivalent standard.
3. Operation and Maintenance requirements shall be a condition of approval.
4. NO porous concrete installation are permitted east of S. Virginia Dare Trail (NC 12) and east of S. Old Oregon Inlet Rd. (SR 1243).
5. The pavement section may be substituted when designed by a North Carolina Licensed Professional Engineer.
6. The pavement surface course installation shall be continuous and level .
7. Town Engineering shall be contacted for review and approval of the base layer and nonwoven geotextile fabric layer in advance of the surface course installation.
8. A final inspection shall be conducted by Town Engineering to review for compliance post-installation.
9. Edge restraints shall be constructed along the perimeter of the pavement installation, (see detail 104)

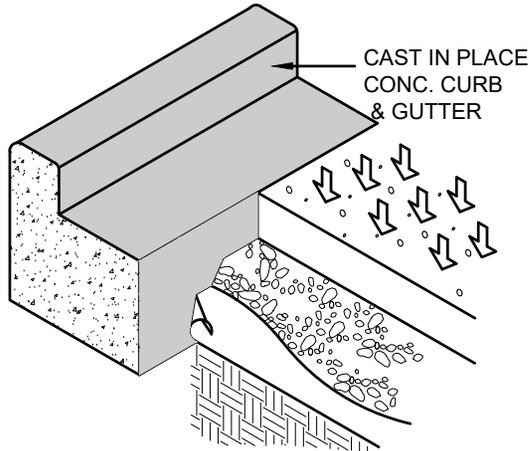


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**TYPICAL RESIDENTIAL POROUS  
 CONCRETE INSTALLATION DETAIL**  
(REFER TO DETAIL 104 FOR EDGE RESTRAINT OPTIONS)

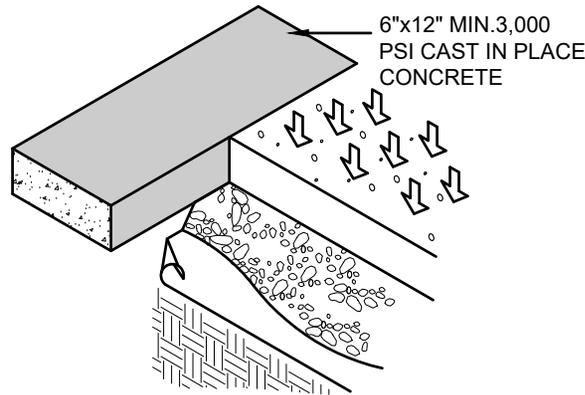
SCALE: NONE  
 ISSUE DATE: 7-9-2015  
 REVISION DATE: 1-3-2019  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

DETAIL NO.:  
**103**



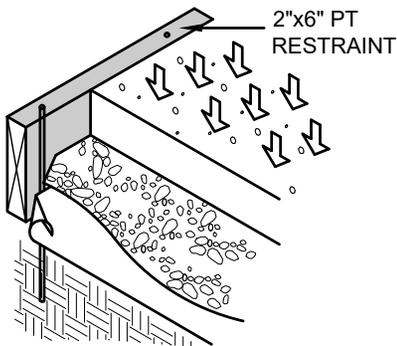
CAST IN PLACE  
CONC. CURB  
& GUTTER

**CONCRETE CURB & GUTTER**



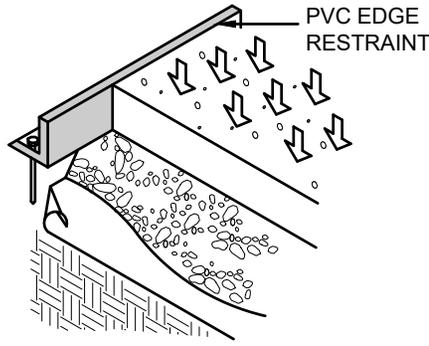
6"x12" MIN. 3,000  
PSI CAST IN PLACE  
CONCRETE

**CONCRETE CURB & GUTTER**



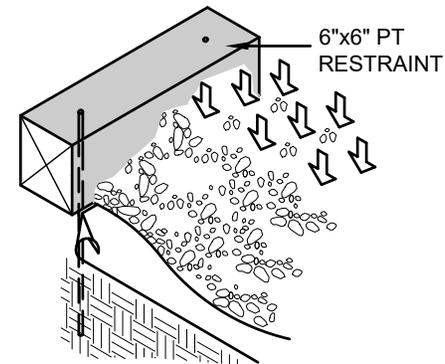
2"x6" PT  
RESTRAINT

**WOOD EDGE RESTRAINT**



PVC EDGE  
RESTRAINT

**PVC EDGE RESTRAINT**



6"x6" PT  
RESTRAINT

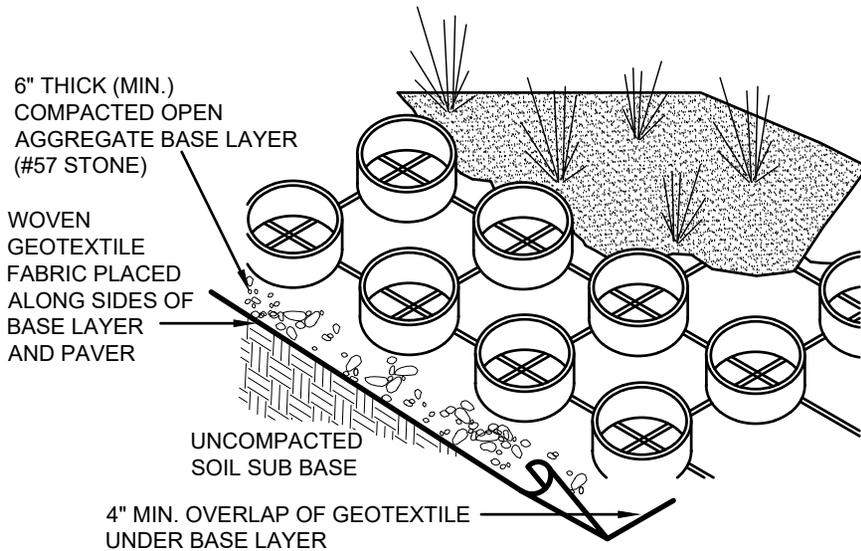
**TIMBER EDGE RESTRAINT**

(THIS APPLIES TO GRAVEL INSTALLATIONS ONLY)

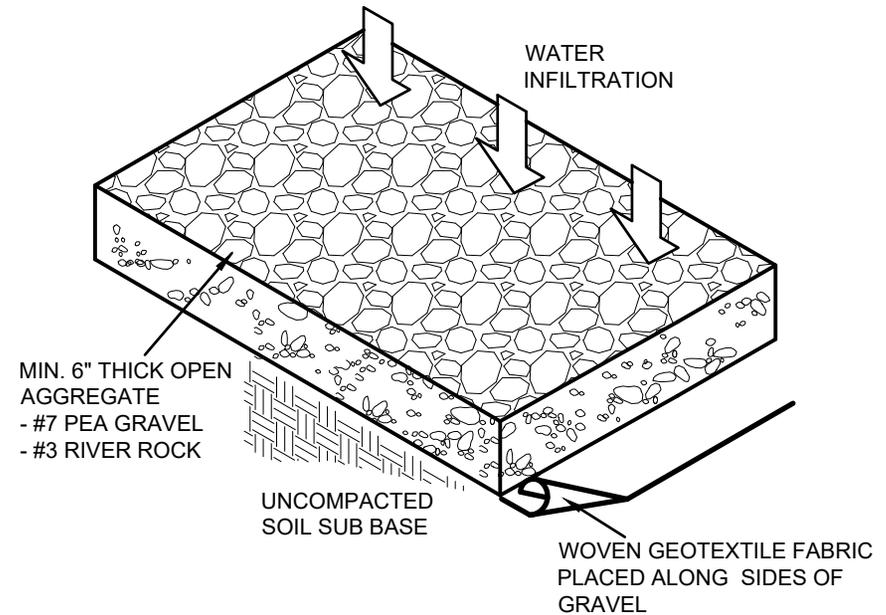
**NOTES:**

1. PVC Edge restraint and attachments shall be installed in accordance with manufacturer recommendations. PVC Edge restraints shall be used on paver installations ONLY.
2. Cast in place concrete compressive strength shall be a minimum of 3,000 psi. Wood edge restraint shall be pressure treated and drilled with 3/8 dia holes spaced at 3'-0" on center. 48" lengths of #3 rebar stakes shall be placed through the drilled holes and embedded in the soil below and cut flush to the top of restraint.
3. The edge restraint shall be continuous along the pavement length.
4. Refer to Detail 103 and Detail 105 for pavement section material type and thickness.





**TURF REINFORCEMENT SECTION**



**GRAVEL PAVEMENT SECTION**

**NOTES:**

1. Contractor shall submit specific product technical specifications to the Town for review and approval prior to installation.
2. Pavement section substitutions may be considered in accordance with manufacturers recommended specifications OR as design by a North Carolina Licensed Professional Engineer.
3. The pavement surface course installation shall be continuous and level.
4. Town Engineering shall be contacted for review and approval of the base layer and nonwoven geotextile fabric layer in advance of the grid or gravel installation.
5. A final inspection shall be conducted by the Town Engineering to review for compliance post-installation.
6. Edge restraints shall be constructed along the perimeter of the paver installation, (see detail 104).
7. Turf reinforcement shall only be utilized on up to 20% of the required parking spaces and is required to be delineated with curb stops.

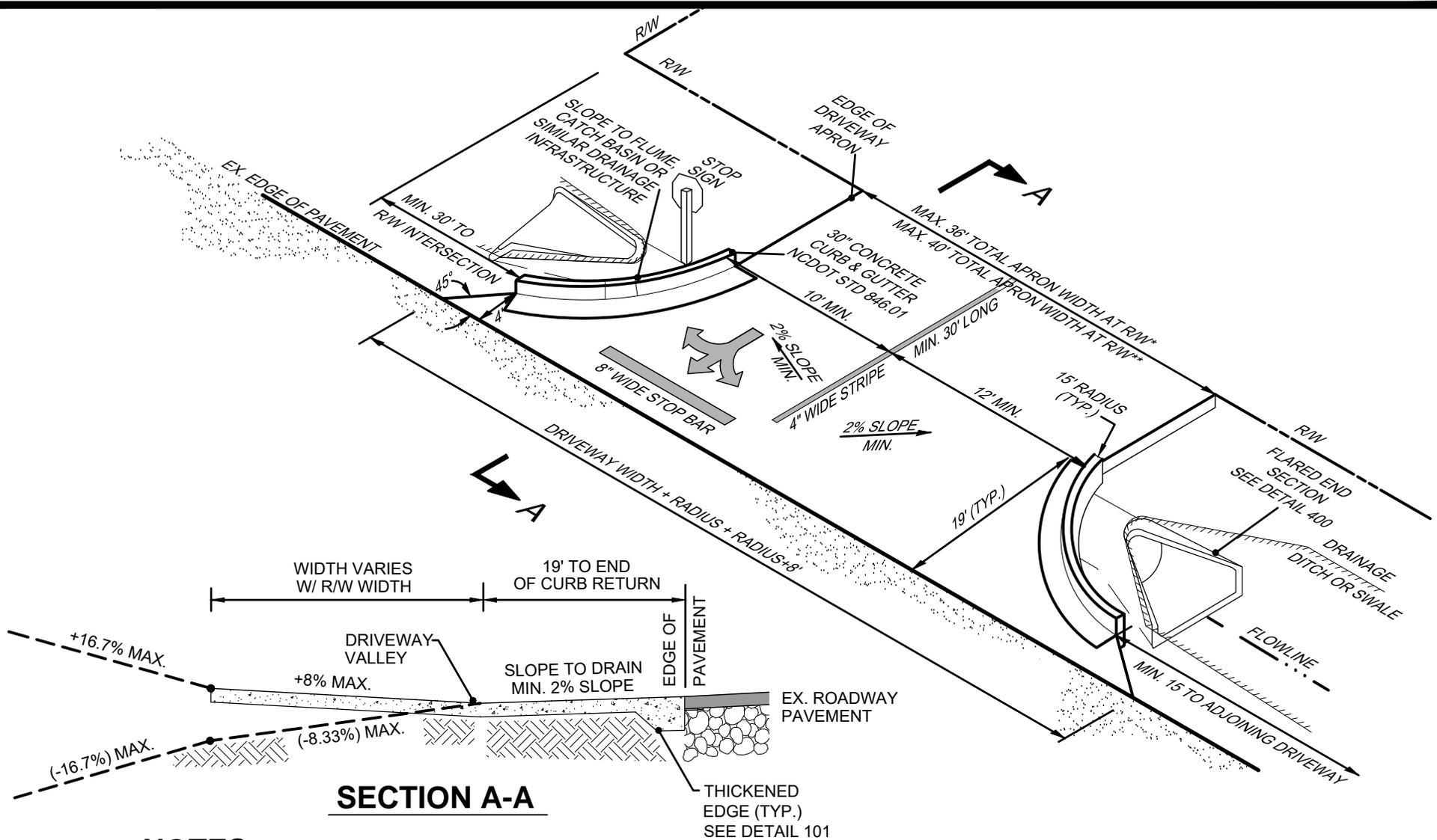


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**TYPICAL RESIDENTIAL ALTERNATIVE  
PAVEMENT SURFACE DETAILS**

SCALE: NONE  
ISSUE DATE: 7-9-2015  
REVISION DATE: 1-3-2019  
SHEET NO: 1 OF 1  
DRAWN BY: DMR

DETAIL NO.:  
**105**



**NOTES:**

1. All driveways must meet the current Town driveway requirements and NCDOT requirements for spacing, sight distance, and offsets from property lines and intersections.
2. Special conditions may warrant exceptions to this detail. Subject to approval by Town Engineering or Public Works Director.
3. Driveway width shall not exceed 36' when not served by tractor/trailer traffic (AASHTO WB-40)\*.
4. Driveway width shall not exceed 40' when served by tractor/trailer traffic (AASHTO WB-40)\*\*.
5. Driveway aprons shall be constructed of a min. 4" thick, 3000 psi concrete or 6" ABC base course with a 2" asphalt surface course.

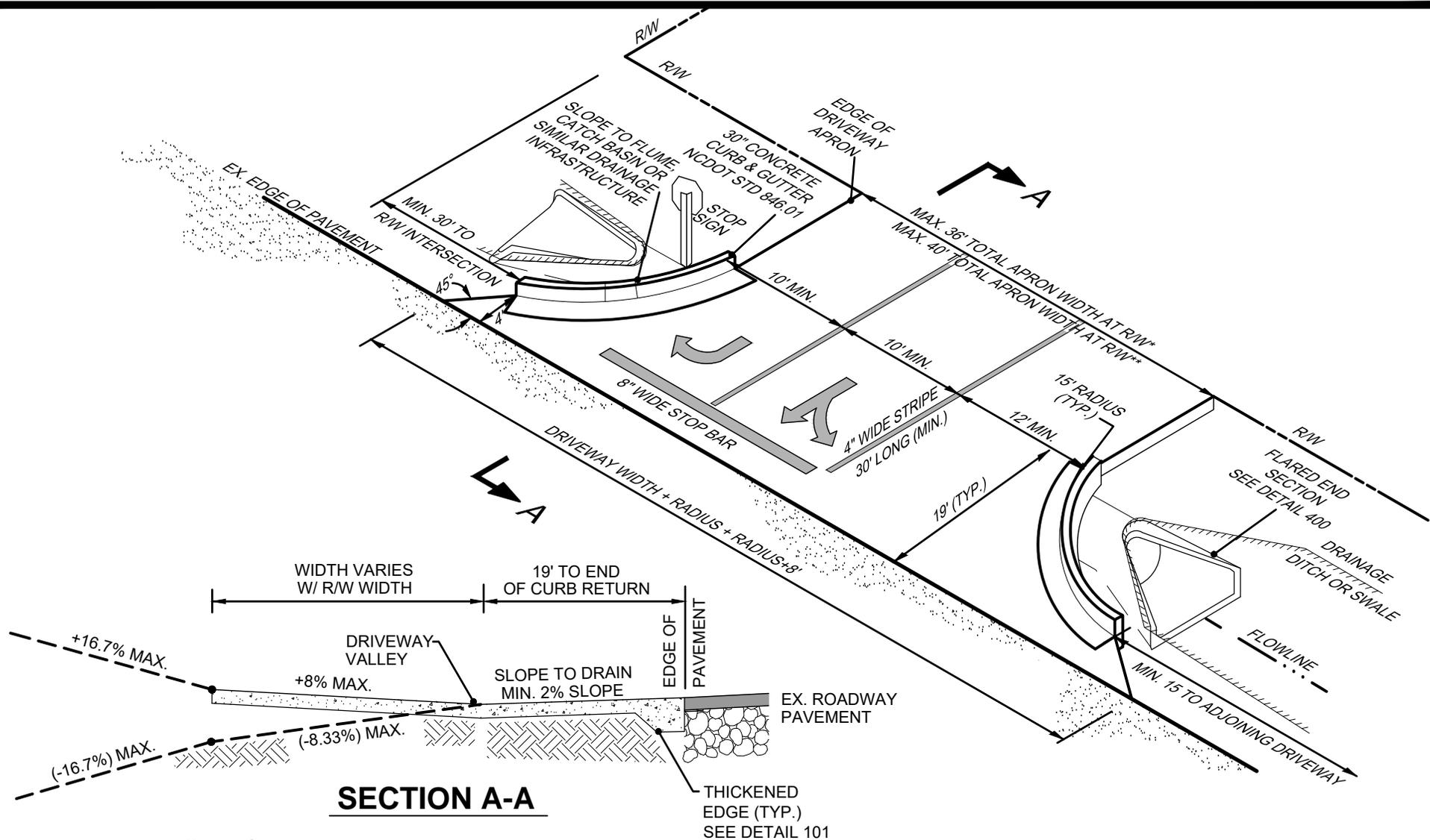


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**TYPICAL COMMERCIAL DRIVEWAY DETAIL**  
**SMALL PARKING LOT LAYOUT**  
 (FOR SMALL PARKING LOTS WITH LESS THAN 36 PARKING STALLS)

SCALE: NONE  
 ISSUE DATE: 7-9-2015  
 REVISION DATE: 1-3-2019  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

DETAIL NO.:  
**200**



**SECTION A-A**

**NOTES:**

1. All driveways must meet the current Town driveway requirements and NCDOT requirements for spacing, sight distance, and offsets from property lines and intersections.
2. Special conditions may warrant exceptions to this detail. Subject to approval by Town Engineering or Public Works Director.
3. Driveway width shall not exceed 36' when not served by tractor/trailer traffic (AASHTO WB-40)\*.
4. Driveway width shall not exceed 40' when served by tractor/trailer traffic (AASHTO WB-40)\*\*.
5. Driveway aprons shall be constructed of a min. 4" thick, 3000 psi concrete or 6" ABC base course with a 2" asphalt surface course.

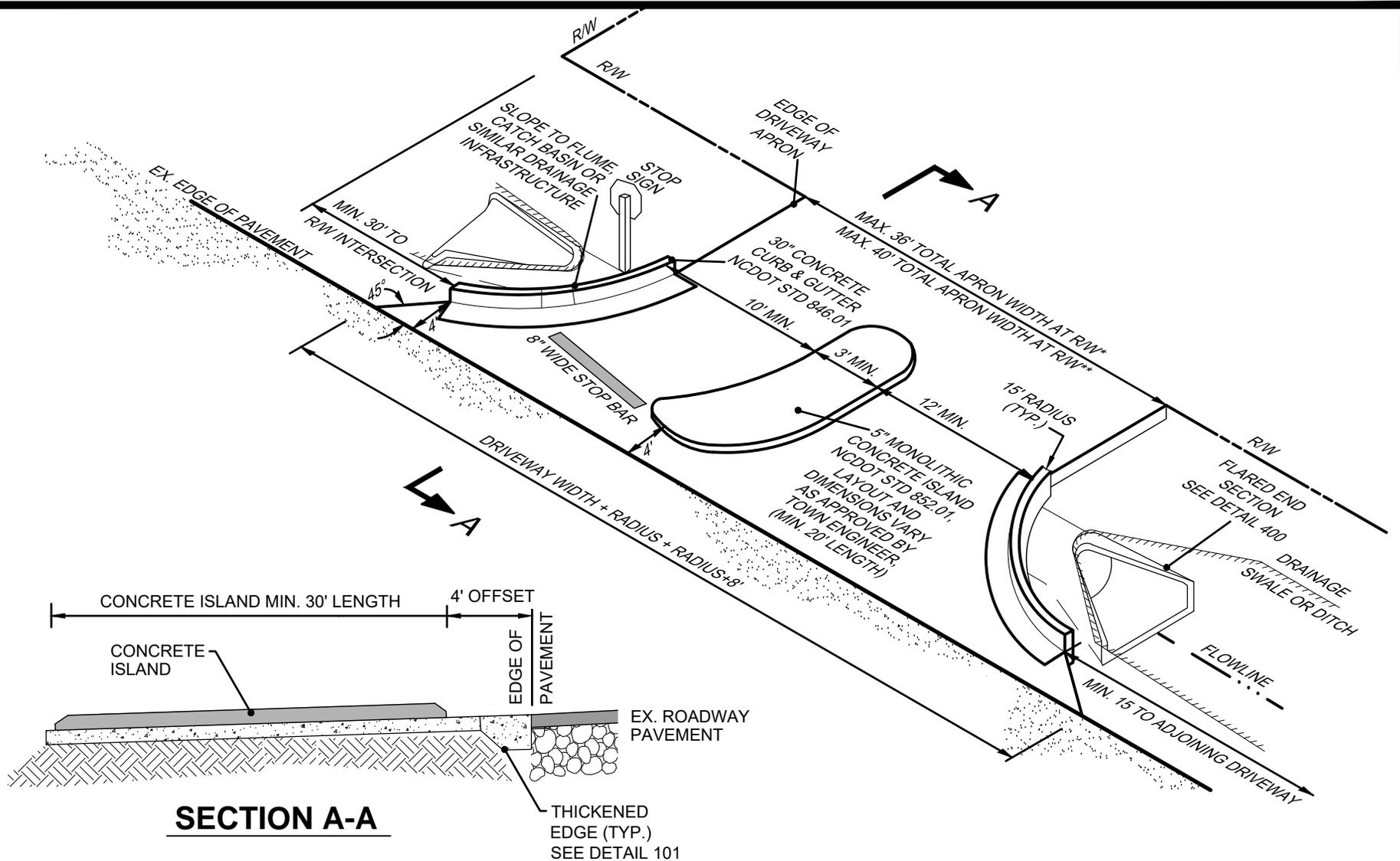


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**TYPICAL COMMERCIAL DRIVEWAY DETAIL**  
**LARGE PARKING LOT LAYOUT**  
 (FOR LARGE PARKING LOTS WITH GREATER THAN 36 PARKING STALLS)

SCALE: NONE  
 ISSUE DATE: 7-9-2015  
 REVISION DATE: 1-3-2019  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

DETAIL NO.:  
**201**



**NOTES:**

1. All driveways must meet the current Town driveway requirements and NCDOT requirements for spacing, sight distance, and offsets from property lines and intersections.
2. Special conditions may warrant exceptions to this detail. Subject to approval by Town Engineering, Public Works Director or NCDOT.
3. Concrete mountable island shall be installed in accordance with NCDOT Standard Detail 852.01.
4. Driveway aprons shall be constructed of a min. 4" thick, 3000 psi concrete or 6" ABC base course with a 2" asphalt surface course.



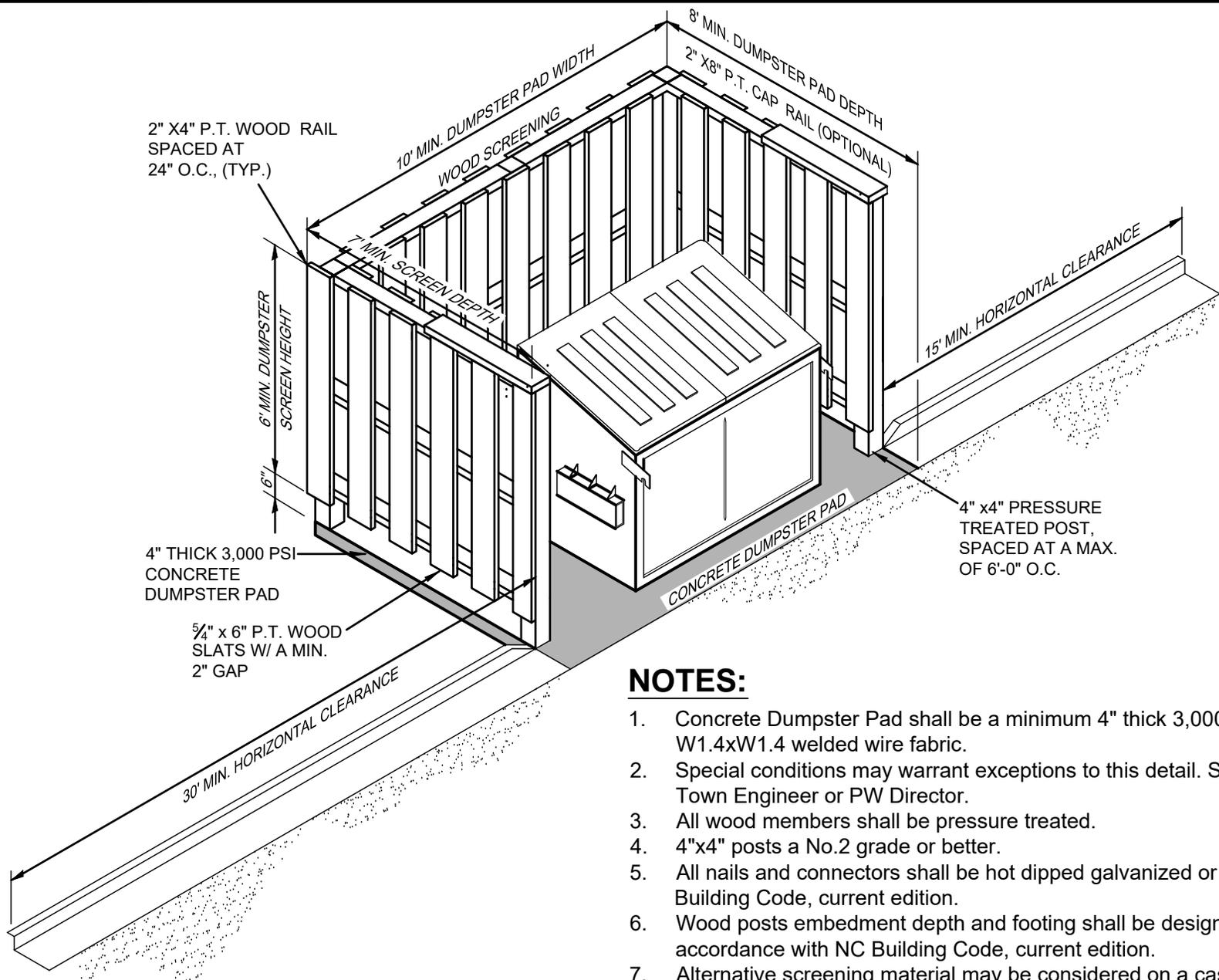
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**TYPICAL COMMERCIAL DRIVEWAY DETAIL  
WITH MOUNTABLE ISLAND DETAIL**

(FOR DRIVEWAY CONNECTIONS TO S. CROATAN HWY.)

SCALE: NONE  
ISSUE DATE: 7-9-2015  
REVISION DATE: 1-3-2019  
SHEET NO: 1 OF 1  
DRAWN BY: DMR

DETAIL NO.:  
**202**



**NOTES:**

1. Concrete Dumpster Pad shall be a minimum 4" thick 3,000 psi concrete with W1.4xW1.4 welded wire fabric.
2. Special conditions may warrant exceptions to this detail. Subject to approval by Town Engineer or PW Director.
3. All wood members shall be pressure treated.
4. 4"x4" posts a No.2 grade or better.
5. All nails and connectors shall be hot dipped galvanized or in accordance with NC Building Code, current edition.
6. Wood posts embedment depth and footing shall be designed and constructed in accordance with NC Building Code, current edition.
7. Alternative screening material may be considered on a case by case basis.
8. A minimum 16' vertical clearance shall be provided at the dumpster pad.
9. Multiple bulk container layouts shall be reviewed & approved by the PW Director.

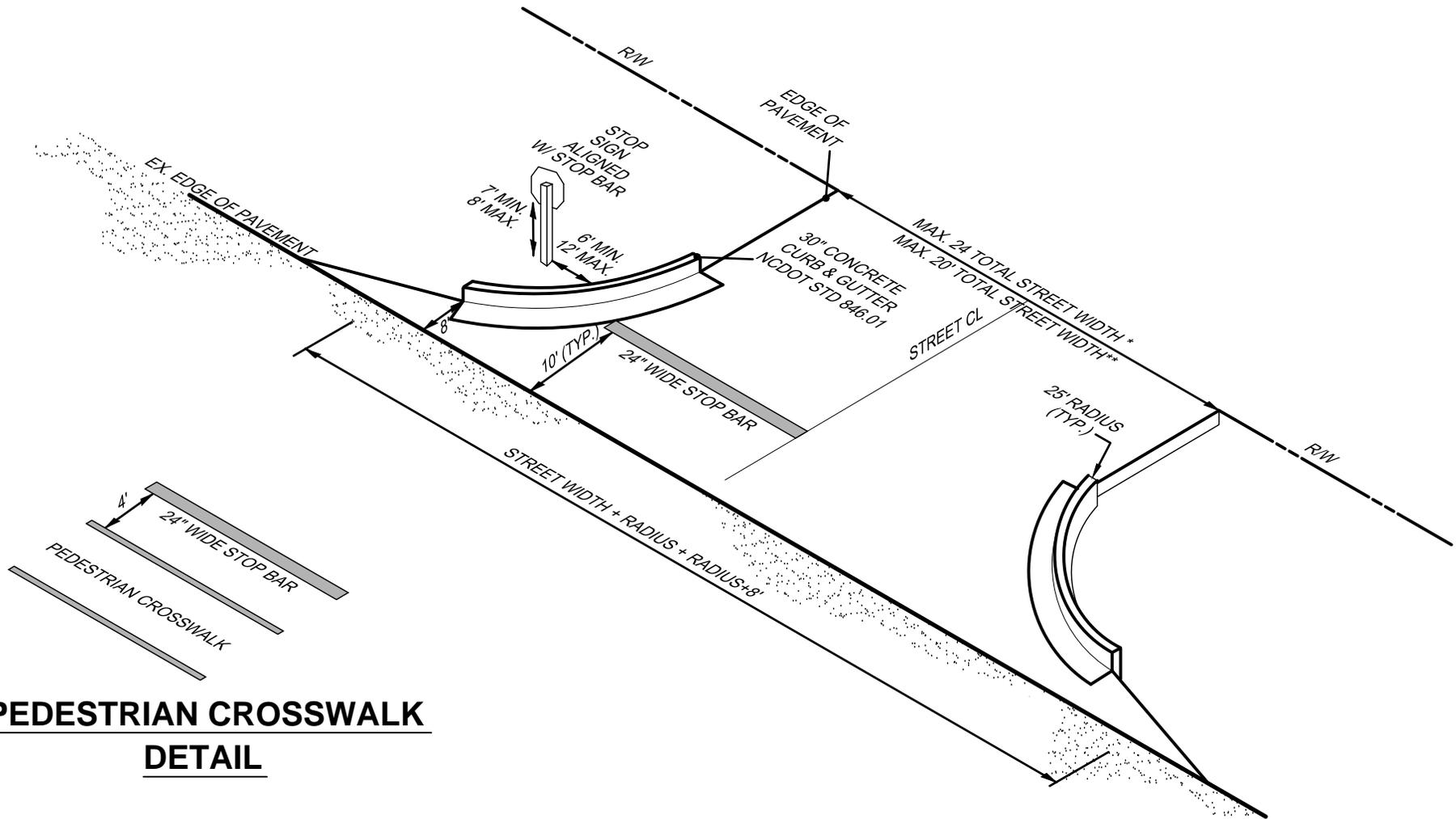


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**TYPICAL COMMERCIAL DUMPSTER PAD  
 WITH WOOD SCREEN DETAIL**  
 (FOR SIDE LOADING DUMPSTER CONFIGURATIONS)

SCALE: NONE  
 ISSUE DATE: 7-9-2015  
 REVISION DATE:  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

DETAIL NO.:  
**203**



**PEDESTRIAN CROSSWALK  
DETAIL**

**NOTES:**

1. Stop Bar shall span across the approach lane and shall installed parallel to the intersecting roadway.
2. Special conditions may warrant exceptions to this detail. The stop bar shall not be placed less than 4 ft. or greater than 30' from the nearest edge of the intersecting roadway.
3. The placement of the stop bar shall be placed so that vehicles have the optimum sight distance along intersecting roadways.
4. The stop sign shall not be blocked by other signs or vegetation and shall be positioned so to face approaching vehicular traffic.
5. The stop bar shall be installed a minimum of 4' offset from a pedestrian crosswalk if one exists.



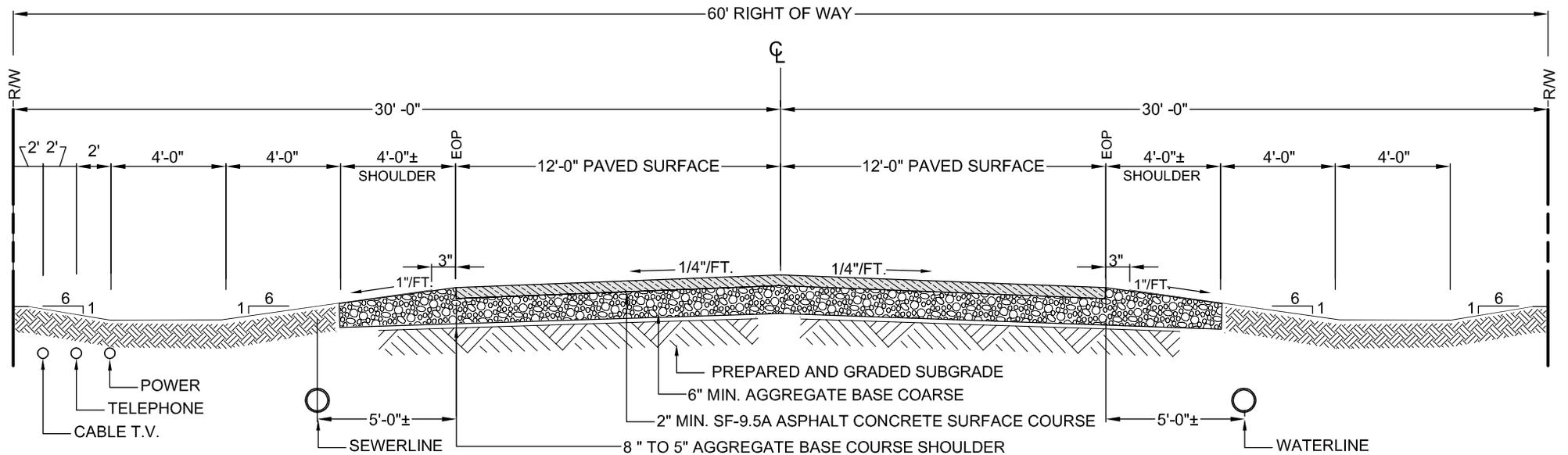
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**TYPICAL STREET STOP SIGN AND  
AND STOP BAR PLACEMENT**

\* WIDTH FOR COLLECTOR AND LOCAL ACCESS STREETS  
\*\* WIDTH FOR SUBCOLLECTOR AND ENVIRONMENTAL STREETS

SCALE: NONE  
ISSUE DATE: 8-13-2015  
REVISION DATE: 1-3-2019  
SHEET NO: 1 OF 1  
DRAWN BY: DMR

DETAIL NO.:  
**300**



NOTE:  
 A 0.18 TO 0.45 GAL/SYD PRIME COAT IS REQUIRED ON AGGREGATE BASE COURSE. THE PAVEMENT DESIGN SHOWN ARE MINIMUM THICKNESSES AND SHOULD BE DESIGNED BASED UPON SUBGRADE SOIL CONDITIONS AND PLANNED TRAFFIC LOADING IMPACTS. NO BASE COURSE SHALL BE PLACED ON MUCK, CLAY, ORGANIC MATTER OR OTHER UNSUITABLE MATERIAL. OTHER BASE COURSES MAY BE USED IN LIEU OF THOSE SHOWN ABOVE. ALTERNATE MATERIALS SHALL BE OF SUFFICIENT THICKNESS TO PROVIDE EQUIVALENT STRENGTH AND SHALL BE APPROVED BY THE TOWN ENGINEER.

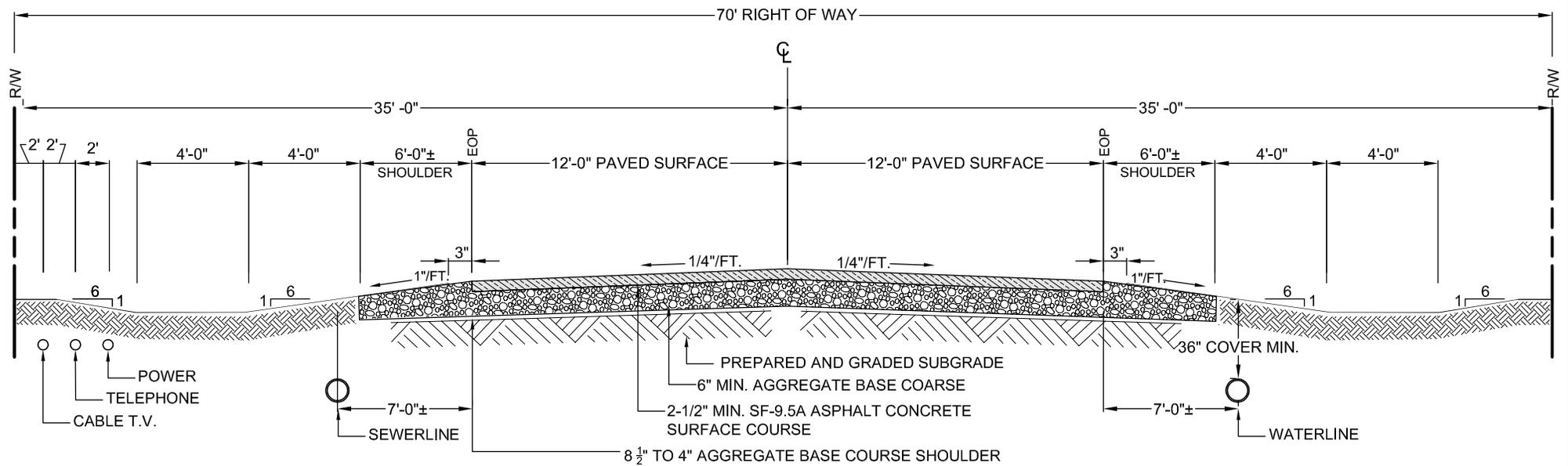


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## LOCAL ACCESS STREET TYPICAL CROSS SECTION

SCALE: NONE  
 ISSUE DATE: 1-29-2019  
 REVISION DATE: 1-29-2019  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

DETAIL NO.:  
 301



NOTE:  
 A 0.18 TO 0.45 GAL/SYD PRIME COAT IS REQUIRED ON AGGREGATE BASE COURSE. THE PAVEMENT DESIGN SHOWN ARE MINIMUM THICKNESSES AND SHOULD BE DESIGNED BASED UPON SUBGRADE SOIL CONDITIONS AND PLANNED TRAFFIC LOADING IMPACTS. NO BASE COURSE SHALL BE PLACED ON MUCK, CLAY, ORGANIC MATTER OR OTHER UNSUITABLE MATERIAL. OTHER BASE COURSES MAY BE USED IN LIEU OF THOSE SHOWN ABOVE. ALTERNATE MATERIALS SHALL BE OF SUFFICIENT THICKNESS TO PROVIDE EQUIVALENT STRENGTH AND SHALL BE APPROVED BY THE TOWN ENGINEER.

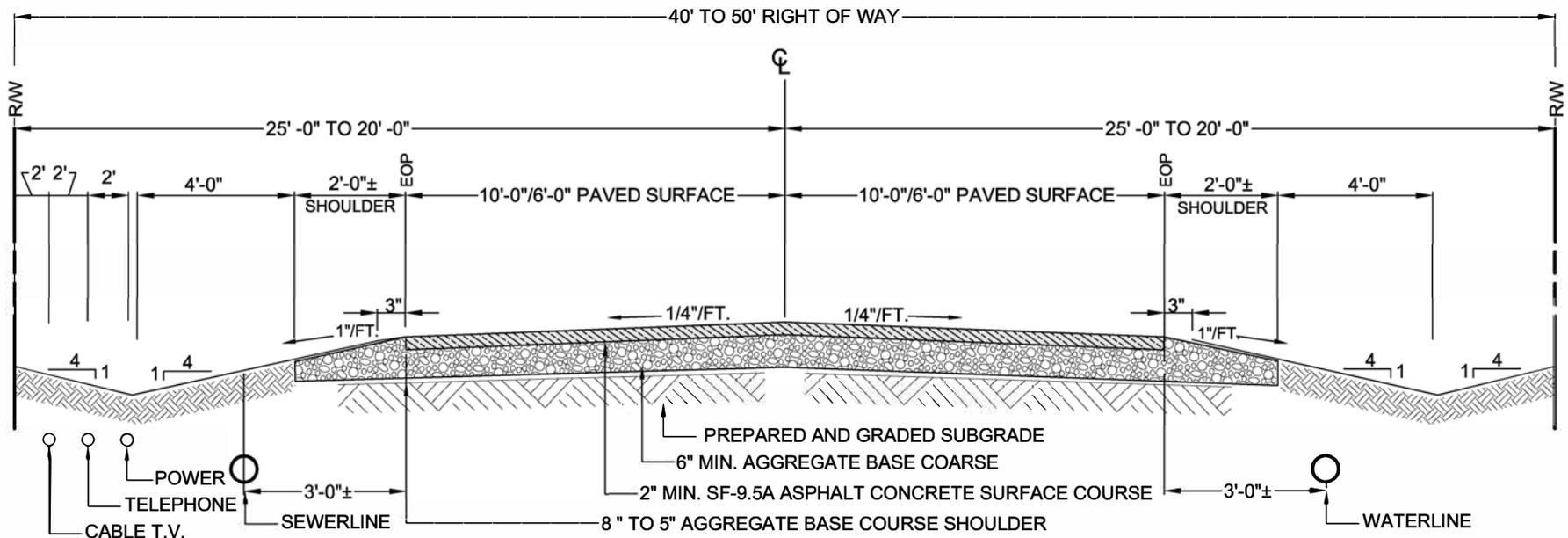


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## COLLECTOR STREET TYPICAL CROSS SECTION

SCALE: NONE  
 ISSUE DATE: 1-29-2019  
 REVISION DATE: 1-29-2019  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

DETAIL NO.:  
 302



**NOTE:**

A 0.18 TO 0.45 GAL/SYD PRIME COAT IS REQUIRED ON AGGREGATE BASE COURSE. THE PAVEMENT DESIGN SHOWN ARE MINIMUM THICKNESSES AND SHOULD BE DESIGNED BASED UPON SUBGRADE SOIL CONDITIONS AND PLANNED TRAFFIC LOADING IMPACTS. NO BASE COURSE SHALL BE PLACED ON MUCK, CLAY, ORGANIC MATTER OR OTHER UNSUITABLE MATERIAL. OTHER BASE COURSES MAY BE USED IN LIEU OF THOSE SHOWN ABOVE. ALTERNATE MATERIALS SHALL BE OF SUFFICIENT THICKNESS TO PROVIDE EQUIVALENT STRENGTH AND SHALL BE APPROVED BY THE TOWN ENGINEER.

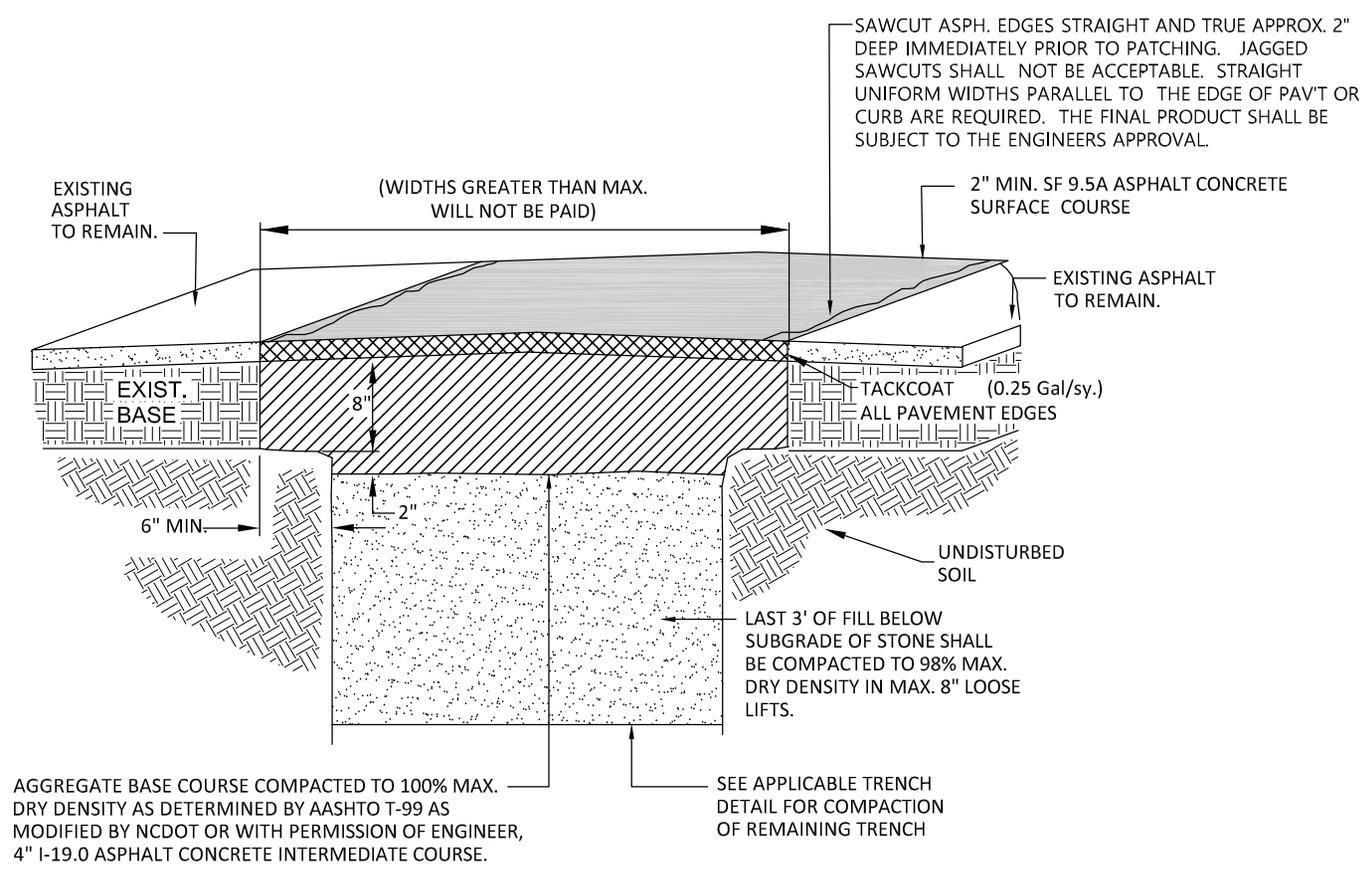


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**ENVIRONMENTAL & SUBCOLLECTOR STREETS  
 TYPICAL CROSS SECTION**

SCALE: NONE  
 ISSUE DATE: 1-29-2019  
 REVISION DATE: 1-29-2019  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

DETAIL NO.:  
**303**

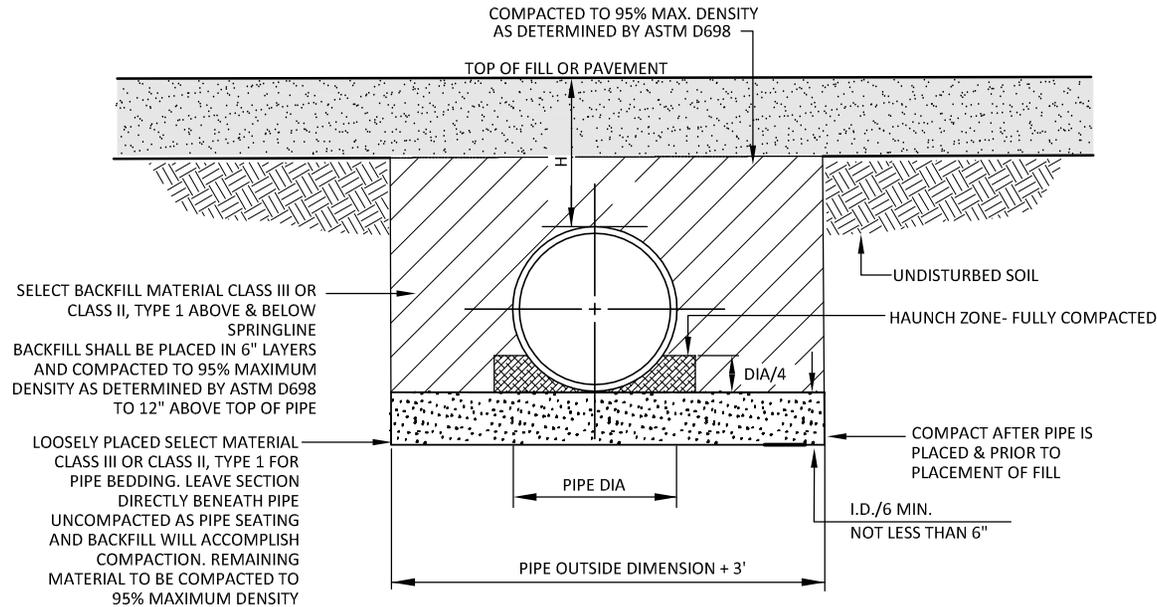


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## PERMANENT ASPHALT PAVEMENT PATCH DETAIL

SCALE: NONE  
 ISSUE DATE: 1-29-2019  
 REVISION DATE: 1-29-2019  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

DETAIL NO.:  
 304



**NOTES:**

1. ALL EXCAVATIONS SHALL COMPLY WITH THE TERMS AND CONDITIONS OF THE CONSTRUCTION STANDARDS FOR EXCAVATIONS IN OSHA "SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION", CHAPTER XV11 OF TITLE 29, CFR, PART 1926. THE CONTRACTOR SHALL HAVE A COMPETENT PERSON ON THE JOB AT ALL TIMES AND SHALL EMPLOY A PROFESSIONAL ENGINEER TO ACT UPON ALL PERTINENT MATTERS OF THE WORK.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

THE PIPE CULVERT INSTALLATION SHALL BE INSTALLED IN ACCORDANCE WITH NCDOT TYPICAL STANDARD DETAIL 300.01, METHOD OF PIPE INSTALLATION.

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE FLEXIBLE PAVEMENT STRUCTURE

RCP PIPE - AASHTO M170

MINIMUM FILL HEIGHT 1' FOR CLASS IV & CLASS V OR 2' HEIGHT FOR CLASS II AND CLASS III MAXIMUM FILL HEIGHT CLASS II PIPE IS 10 FT., CLASS III IS 20 FT., CLASS IV IS 30', CLASS V IS 40 FT.

A FLEXIBLE JOINT SEAL SHALL BE USED AT ALL PIPE JOINTS

12" - 18" DIA PIPE MIN. 1" WIDE JOINT SEALS

24"- 60" DIA. PIPE MIN. 1-1/4" WIDE JOINT SEAL

DOUBLE WALL POLYPROPYLENE PIPE - AASHTO M330

MINIMUM FILL HEIGHT FOR PIPE Ø >12" AND ≤48" IS 1 FT. AND FOR Ø ≥60" IS 2 FT.

MAXIMUM FILL HEIGHT FOR PIPE Ø ≤18" IS 20 FT.

MAXIMUM FILL HEIGHT FOR PIPE Ø ≥24" AND ≤60 IS 20 FT. FOR CLASS 2 BACKFILL 95%SPD

MAXIMUM FILL HEIGHT FOR PIPE Ø ≥24" AND ≤60 IS 14 FT. FOR CLASS 3 BACKFILL 95%SPD

1. ALL POLYPROPYLENE PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION, WITH THE EXCEPTION THAT THE INITIAL BACKFILL MAY EXTEND BEYOND THE CROWN OF THE PIPE. SOIL CLASSIFICATIONS AS PER THE LATEST VERSION OF ASTM D2321.

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL.

3. THE TRENCH BOTTOM SHALL BE STABLE AND OF A SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER.

4. ALL PIPE SUPPLIED SHALL BE DOUBLE GASKETED WATERTIGHT JOINTS, BELL AND SPIGOT MEETING THE REQUIREMENTS OF ASTM F2881. MARMAC REPAIR COUPLERS SHALL BE UTILIZED TO CONNECT FIELD CUT PIPE.

5. SHOULD FIELD CONDITIONS DEVIATE FROM WHAT HAS BEEN NOTED HEREON, CONSULT WITH ENGINEER



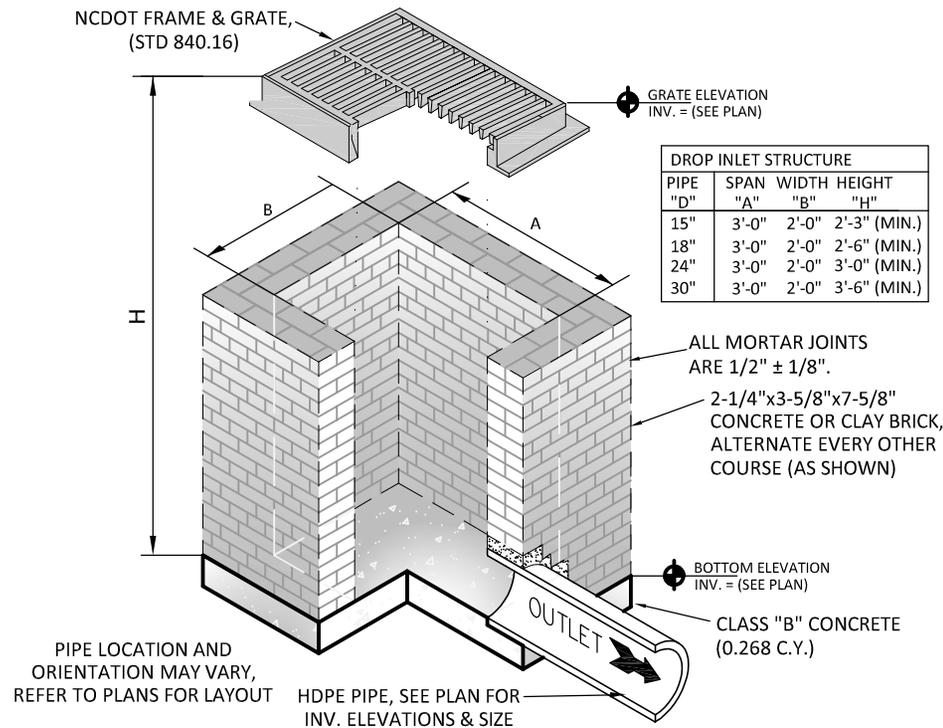
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## STANDARD CROSS-STREET DRAINAGE PIPE INSTALLATION DETAIL

SCALE: NONE  
ISSUE DATE: 1-29-2019  
REVISION DATE: 1-29-2019  
SHEET NO: 1 OF 1  
DRAWN BY: DMR

DETAIL NO.:  
**305**





#### DROP INLET NOTES

1. SPECIFICATIONS ATTACHED HEREON REFLECT THOSE AS OUTLINE IN NCDOT STANDARD 840.15, BRICK DROP INLET. AN ALTERNATE PRECAST DROP INLET MAY BE UTILIZED BASED UPON PRIOR APPROVAL BY THE ENGINEER.
2. DROP INLET DESIGN SPECIFICATIONS SHALL CONFORM TO LATEST ASTM C913 SPECIFICATIONS FOR "PRECAST CONCRETE WATER & WASTEWATER STRUCTURES.
3. CONCRETE COMPRESSIVE STRENGTH SHALL BE A MINIMUM OF 4,000PSI.
4. STEEL REINFORCING DESIGN TO CONFORM TO THE REQUIREMENTS OF ASTM C890 SPECIFICATIONS FOR "STRUCTURAL DESIGN LOADING FOR WATER & WASTEWATER STRUCTURES" AND SHALL UTILIZE GRADE 60 RE-BARS CONFORMING TO THE REQUIREMENTS OF ASTM A615 OR WWF CONFORMING TO THE REQUIREMENTS OF ASTM A185 OR BOTH.
5. PROVIDE ADDITIONAL REINFORCING AT OPENINGS AS REQUIRED PER NCDOT REQUIREMENTS.
6. MINIMUM DESIGN SHALL BE H-20-44 LOADING.
7. STEPS SHALL BE REQUIRED ON DROP INLETS OVER 3'-6" IN DEPTH. STEPS SHALL BE STEEL REINFORCED COPOLYMER POLYPROPYLENE PLASTIC AND MEET THE REQUIREMENTS OF ASTM C478. (OR APPROVED EQUAL).
8. TOTAL HEIGHT OF STRUCTURE AS SPECIFIED HEREIN.
9. PIPE PENETRATION TO BE AS SPECIFIED. PIPE TO BE INSTALLED AS PER NCDOT STANDARDS FOR MORTAR JOINT CONNECTIONS.
10. JOINTS TO BE SEALED WITH BUTYL RUBBER JOINT SEALANT CONFORMING TO THE REQUIREMENTS OF ASTM C990, OR MORTAR AS PER NCDOT REQUIREMENTS OR BOTH.
11. IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD BASE THICKNESS AS PRESCRIBED IN NCDOT STANDARD 840.00
12. ANY DEVIATIONS FROM THE APPROVED PLAN & SPECIFICATIONS SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.

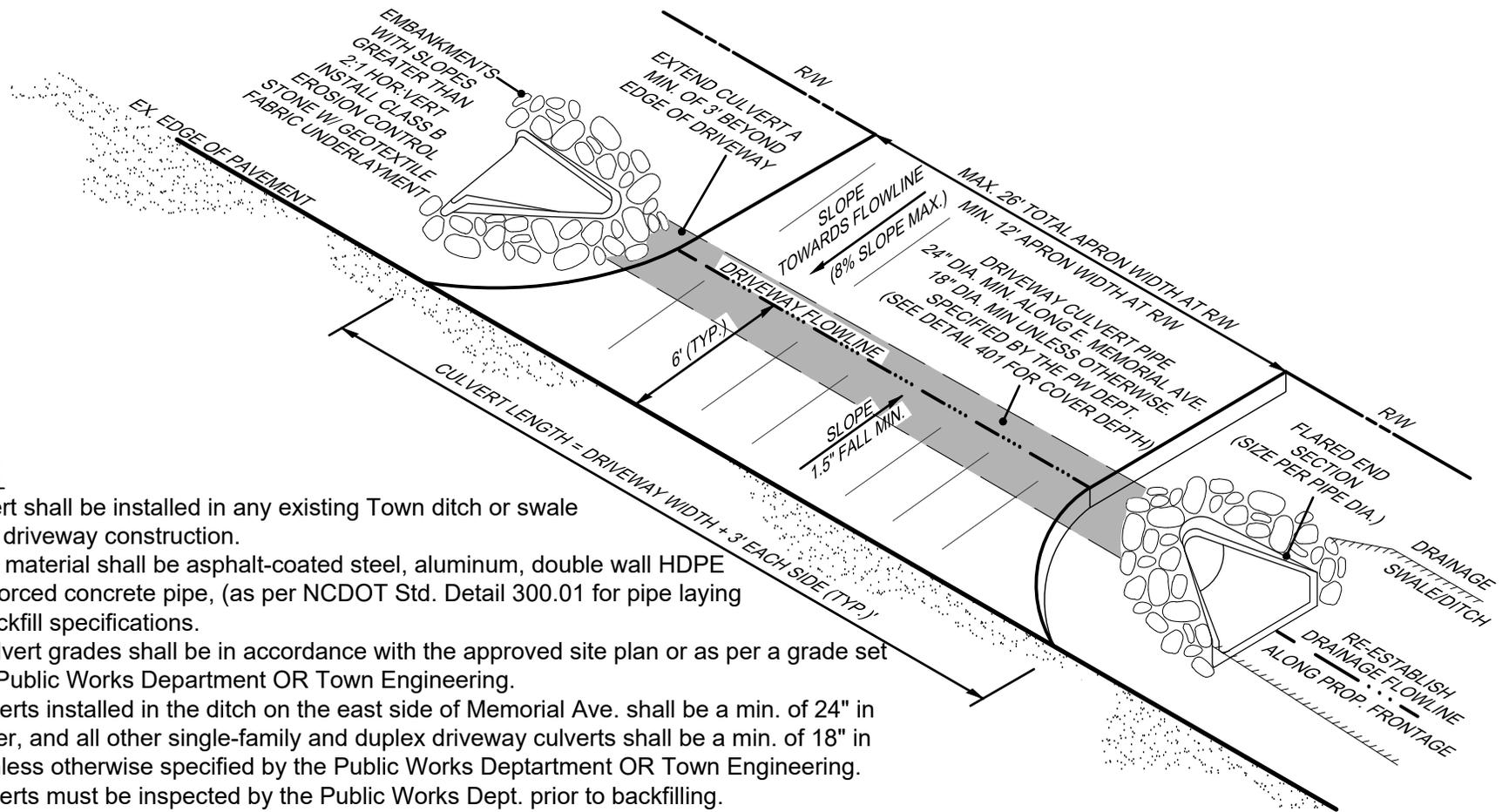


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## STANDARD DROP INLET STRUCTURE DETAIL

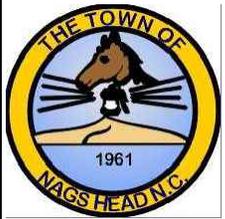
SCALE: NONE  
ISSUE DATE: 1-29-2019  
REVISION DATE: 1-29-2019  
SHEET NO: 1 OF 1  
DRAWN BY: DMR

DETAIL NO.:  
307



## NOTES:

1. A culvert shall be installed in any existing Town ditch or swale prior to driveway construction.
2. Culvert material shall be asphalt-coated steel, aluminum, double wall HDPE or reinforced concrete pipe, (as per NCDOT Std. Detail 300.01 for pipe laying and backfill specifications).
3. The culvert grades shall be in accordance with the approved site plan or as per a grade set by the Public Works Department OR Town Engineering.
4. All culverts installed in the ditch on the east side of Memorial Ave. shall be a min. of 24" in diameter, and all other single-family and duplex driveway culverts shall be a min. of 18" in dia., unless otherwise specified by the Public Works Department OR Town Engineering.
5. All culverts must be inspected by the Public Works Dept. prior to backfilling.
6. Endwalls are required on each end of all culverts installed in the ditch on the east side of Memorial Ave. and at the ends of other culverts as determined by the Public Works Director OR Town Engineering. Endwalls shall be constructed in accordance with NCDOT Std Detail 838.01.
7. Special conditions may warrant exceptions to this detail. Subject to approval by Town Engineering or Public Works Director.
8. The flared end material type shall match the pipe material type.
9. Culvert pipe inlet/outlet embankments resulting in a slope greater than 3:1 hor./vert. shall provide Class B erosion control stone, or approved equivalent, with a woven geotextile fabric underlayment installed on compacted a compacted soil base.

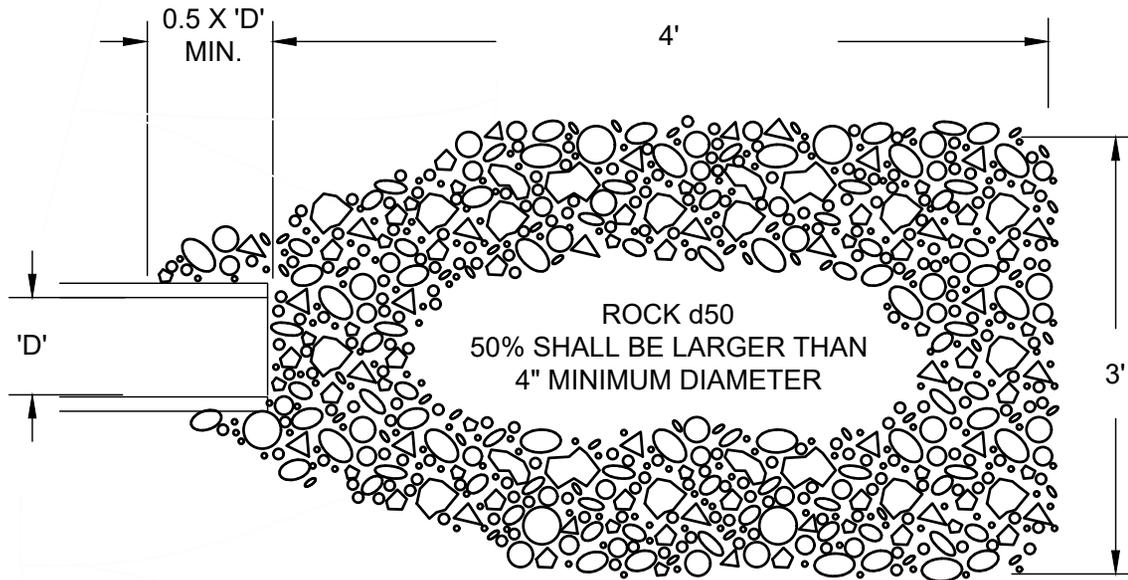


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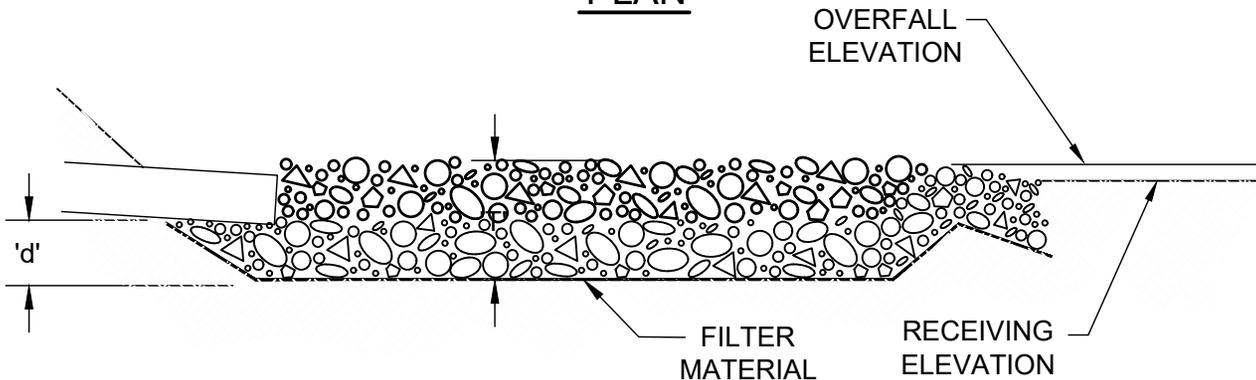
## TYPICAL RESIDENTIAL DRIVEWAY CULVERT PIPE DETAIL

SCALE: NONE  
ISSUE DATE: 7-9-2015  
REVISION DATE: 1-3-2019  
SHEET NO: 1 OF 1  
DRAWN BY: DMR

DETAIL NO.:  
**400**



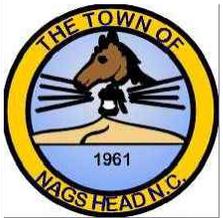
PLAN



SECTION

**NOTES:**

1. 'La' = length of apron. Distance 'La' shall be sufficient length to dissipate velocity
2. Filter material shall be a woven geotextile filter fabric underlayment or 6" thick minimum washed aggregate layers, installed on a compacted soil base, per a grade set by the Public Works Department OR Town Engineering.
3. Special conditions may warrant exceptions to this detail. Subject to approval by Town Engineering or Public Works Director.
4. Average apron thickness shall be 12 inches.
5. The typical apron geometry shall be 3' wide by 4' long.

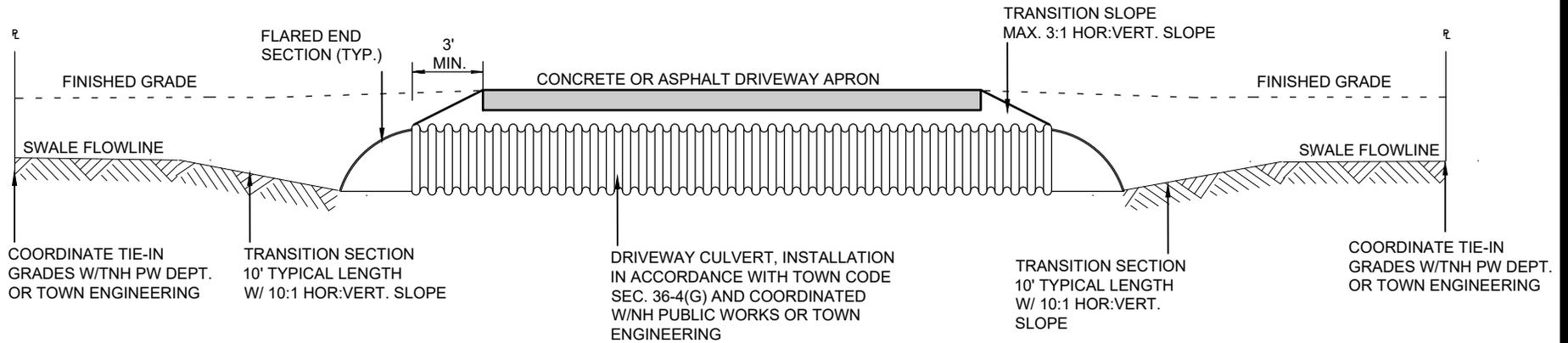


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**TYPICAL OUTLET PROTECTION/  
 ENERGY DISSIPATION DETAIL**

SCALE: NONE  
 ISSUE DATE: 3-9-2016  
 REVISION DATE: 1-3-2019  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

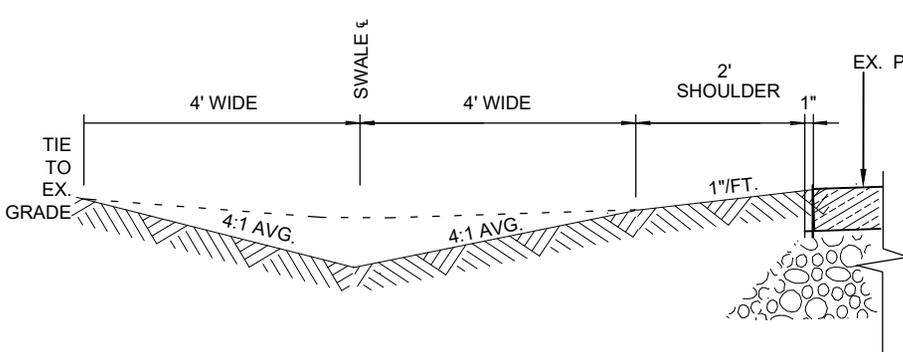
DETAIL NO.:  
**401**



## DRIVEWAY APRON W/CULVERT AND SWALE RESTORATION DETAIL

NOT TO SCALE (PROFILE VIEW)

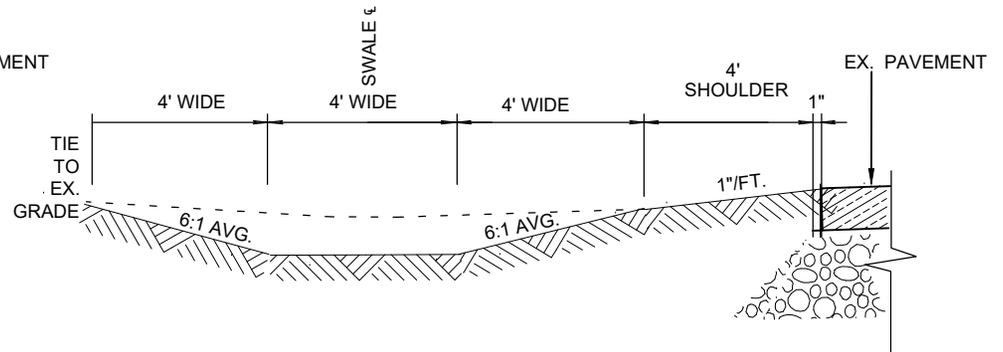
SWALE SECTION SHALL BE INSTALLED PER THE APPLICABLE RIGHT-OF-WAY DRAINAGE SWALE DETAIL SHOWN HEREON  
 DRIVEWAY CULVERT AND SWALE RESTORATION ARE IN ACCORDANCE WITH TOWN CODE SEC. 36-4



### 40'-50' RIGHT-OF-WAY DRAINAGE SWALE

NOT TO SCALE (SECTION VIEW)

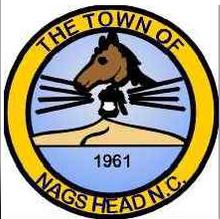
SWALE SECTION IS IN ACCORDANCE WITH STREET SPECIFICATIONS IN TOWN CODE SEC. 36-4



### 60' AND 70' RIGHT-OF-WAY DRAINAGE SWALE

NOT TO SCALE (SECTION VIEW)

SWALE SECTION IS IN ACCORDANCE WITH STREET SPECIFICATIONS IN TOWN CODE SEC. 36-4

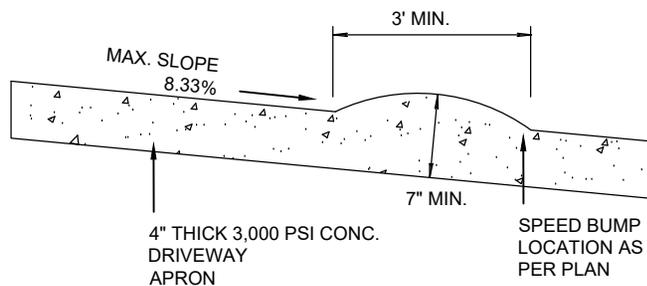


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## TYPICAL DRIVEWAY CULVERT PIPE INSTALLATION AND SWALE RESTORATION DETAILS

SCALE: NONE  
 ISSUE DATE: 3-9-2016  
 REVISION DATE: 1-3-2019  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

DETAIL NO.:  
**402**



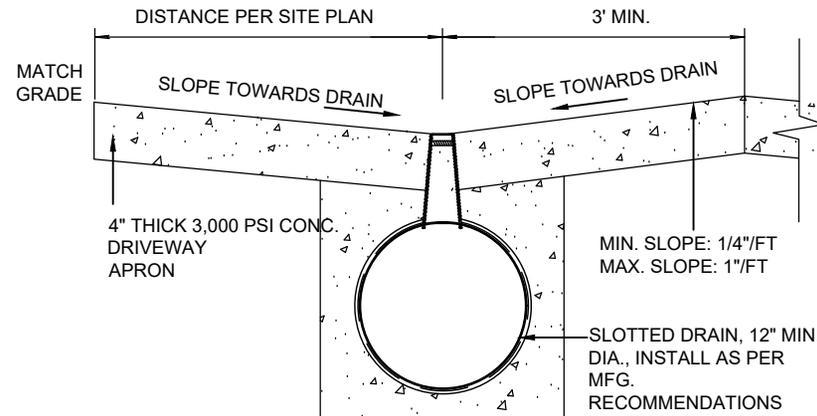
## "SPEED BUMP" INSTALLATION DETAIL

NOT TO SCALE PERMANENT MEASURE (AS DENOTED ON PLANS)

DETAIL IS IN ACCORDANCE WITH PROVISIONS OF TOWN CODE SEC. 36-4, 34-5 & 34-6  
 THIS DETAIL IS INTENDED TO PROVIDE MIN. DIMENSIONS FOR THE INSTALLATION OF  
 A "SPEED BUMP" TO MEET THE CODE REQUIREMENTS AS NOTED ABOVE

### PERMANENT DRAINAGE MEASURES NOTES:

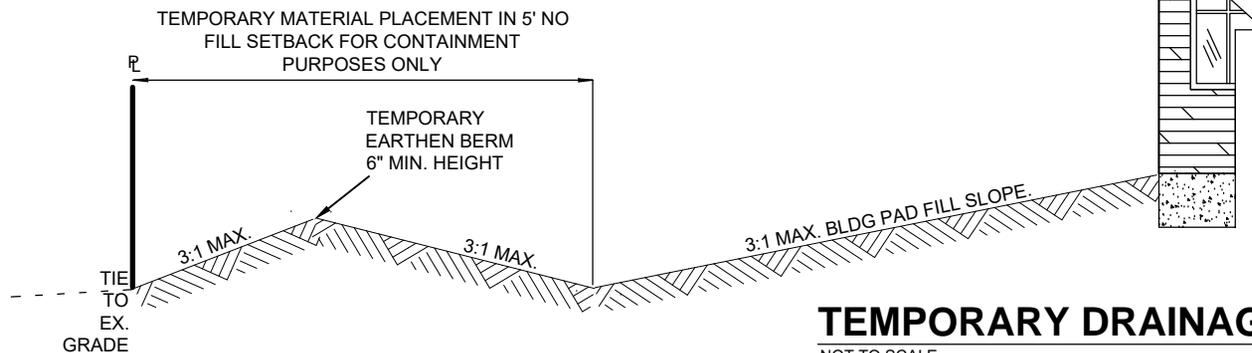
SHALL BE REQUIRED FOR DRIVEWAY APPLICATIONS SLOPED TOWARDS OR ARE ELEVATED ABOVE  
 THE NEAREST EDGE OF STREET PAVEMENT. THIS REQUIREMENT SHALL NOT BE APPLIED FOR  
 LEVEL DRIVEWAYS OR DRIVEWAYS SLOPED AWAY FROM OR ARE BELOW THE EDGE OF STREET  
 PAVEMENT ELEVATION. ALTERNATIVE MEASURES THAT DEVIATE FROM THE PERMANENT DETAILS  
 NOTED ABOVE SHALL BE CONSIDERED ON A CASE BY CASE BASIS.



## SLOTTED DRAIN INSTALLATION DETAIL

NOT TO SCALE PERMANENT MEASURE (AS DENOTED ON PLANS)

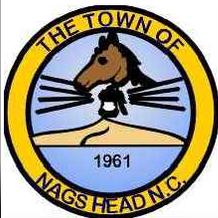
DETAIL IS IN ACCORDANCE WITH PROVISIONS OF TOWN CODE SEC. 36-4, 34-5 & 34-6



## TEMPORARY DRAINAGE MEASURES DETAIL

NOT TO SCALE

DETAIL IS IN ACCORDANCE WITH PROVISIONS OF TOWN CODE SEC. 34-5 & 34-6  
 TEMPORARY BERM CONSTRUCTION SHALL OCCUR IN CONJUNCTION WITH BUILDING PAD FILL PLACEMENT  
 AN ALTERNATE TO THIS INSTALLATION IS TO CONSTRUCT PERMANENT STORMWATER MEASURES IN  
 CONJUNCTION WITH BUILDING PAD FILL PLACEMENT

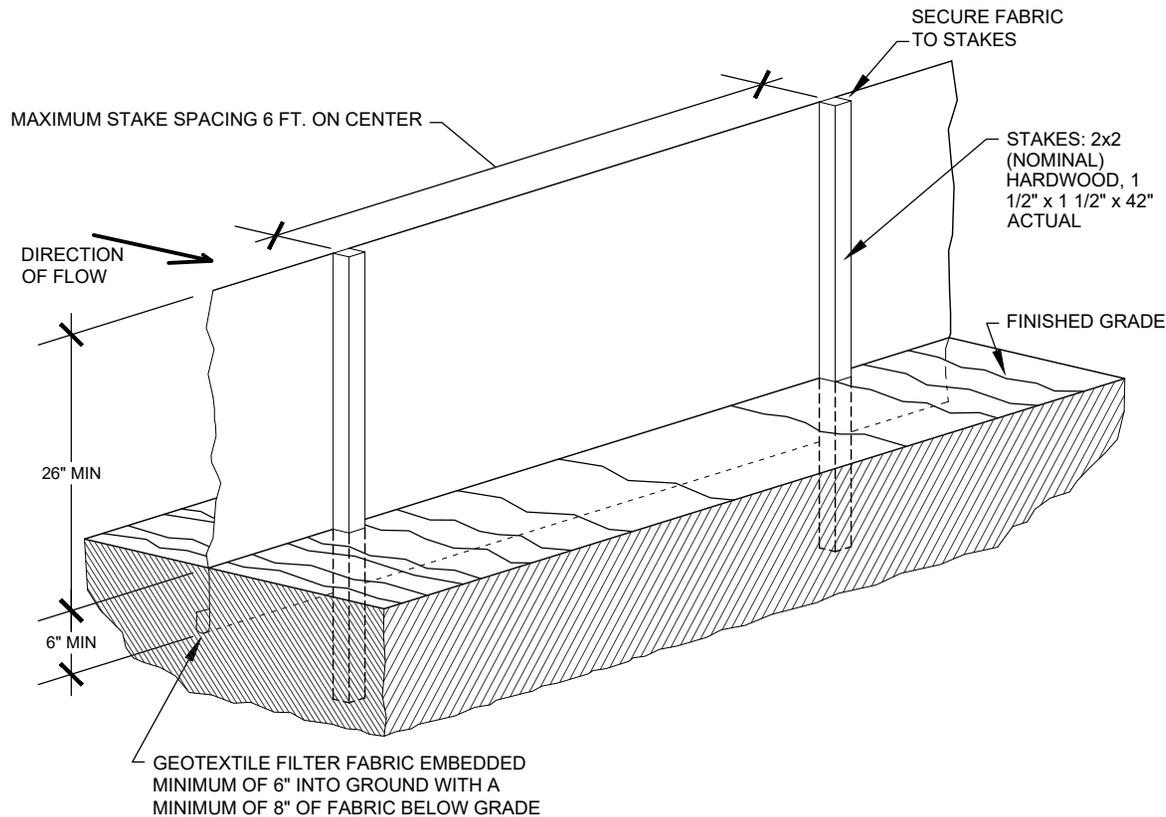
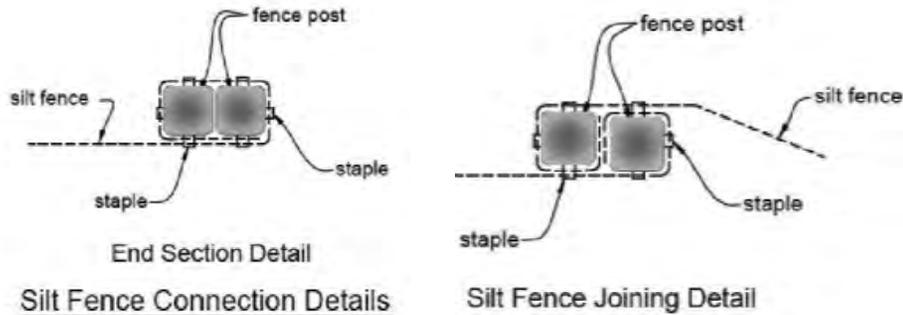


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## TYPICAL PERMANENT AND TEMPORARY STORMWATER CONTROL MEASURE DETAILS

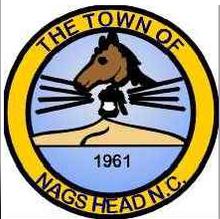
SCALE: NONE  
 ISSUE DATE: 12-12-2017  
 REVISION DATE: 1-3-2019  
 SHEET NO: 1 OF 1  
 DRAWN BY: DMR

DETAIL NO.:  
**403**



NOTES:

1. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE GROUND COVER IS REMOVED. CLEARING, GRUBBING, AND STUMPING CAN OCCUR BEFORE SILT FENCE INSTALLATION IF GROUND COVER IS NOT REMOVED.
2. WHERE POSSIBLE, SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
3. THE GEOTEXTILE FABRIC SHALL BE PLACED IN THE EXCAVATED TRENCH, BACKFILLED, AND COMPACTED TO THE EXISTING GROUND SURFACE.
4. THE SILT FENCE SHOULD BE BURIED AT LEAST 6" DEEP AND HAVE A TOTAL OF 8" OF FABRIC BELOW THE GROUND. THIS CAN BE ACCOMPLISHED WITH A TRENCHER, CABLE LAYING MACHINE, SLICING MACHINE OR OTHER SUITABLE DEVICE WHICH WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
5. THE STAKES SHALL BE PLACED ON THE DOWN SLOPE SIDE OF THE GEOTEXTILE. THE STAKES SHALL BE A MINIMUM OF 2X2 NOMINAL (1-1/2" X 1-1/2" ACTUAL) HARDWOOD STAKE OF SOUND QUALITY. EMBEDMENT DEPTHS SHALL BE A MIN. OF 24".
6. THE GEOTEXTILE FABRIC SHALL BE ATTACHED DIRECTLY TO THE UPSLOPE SIDE OF THE WOODEN POST WITH (3) 1/2" STAPLES, EQUALLY SPACED, OR WITH WOODEN LATH AND NAILS, WITH THE TOP FASTENER A MAX. OF 8" FROM TOP OF FABRIC.
7. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS AROUND THE ENDS, OR IN ANY OTHER WAY BECOMES A CONCENTRATED FLOW, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE: 1) AN ADDITIONAL RUN OF SILT FENCE SHALL BE PLACED UPSTREAM, 2) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED, 3) ACCUMULATED SEDIMENT SHALL BE REMOVED, OR 4) OTHER PRACTICES SHALL BE IMPLEMENTED.
8. THE MANUFACTURER SPECIFICATION REQUIREMENTS: MINIMUM TENSILE STRENGTH - 120 LBS.; MAXIMUM ELONGATION AT 60 LBS - 50%; MINIMUM PUNCTURE STRENGTH - 50 LBS.; MINIMUM TEAR STRENGTH - 40 LBS.; MINIMUM BURST STRENGTH - 200 PSI., APPARENT OPENING SIZE <= 84MM.; MINIMUM PERMITTIVITY 1X10-2SEC-1; ULTRAVIOLET EXPOSURE STRENGTH RETENTION - 70%.



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TYPICAL RESIDENTIAL  
SILT FENCE INSTALLATION DETAIL

SCALE: NONE  
ISSUE DATE: 3-18-2018  
REVISION DATE: 1-3-2019  
SHEET NO: 1 OF 1  
DRAWN BY: DMR

DETAIL NO.:  
404