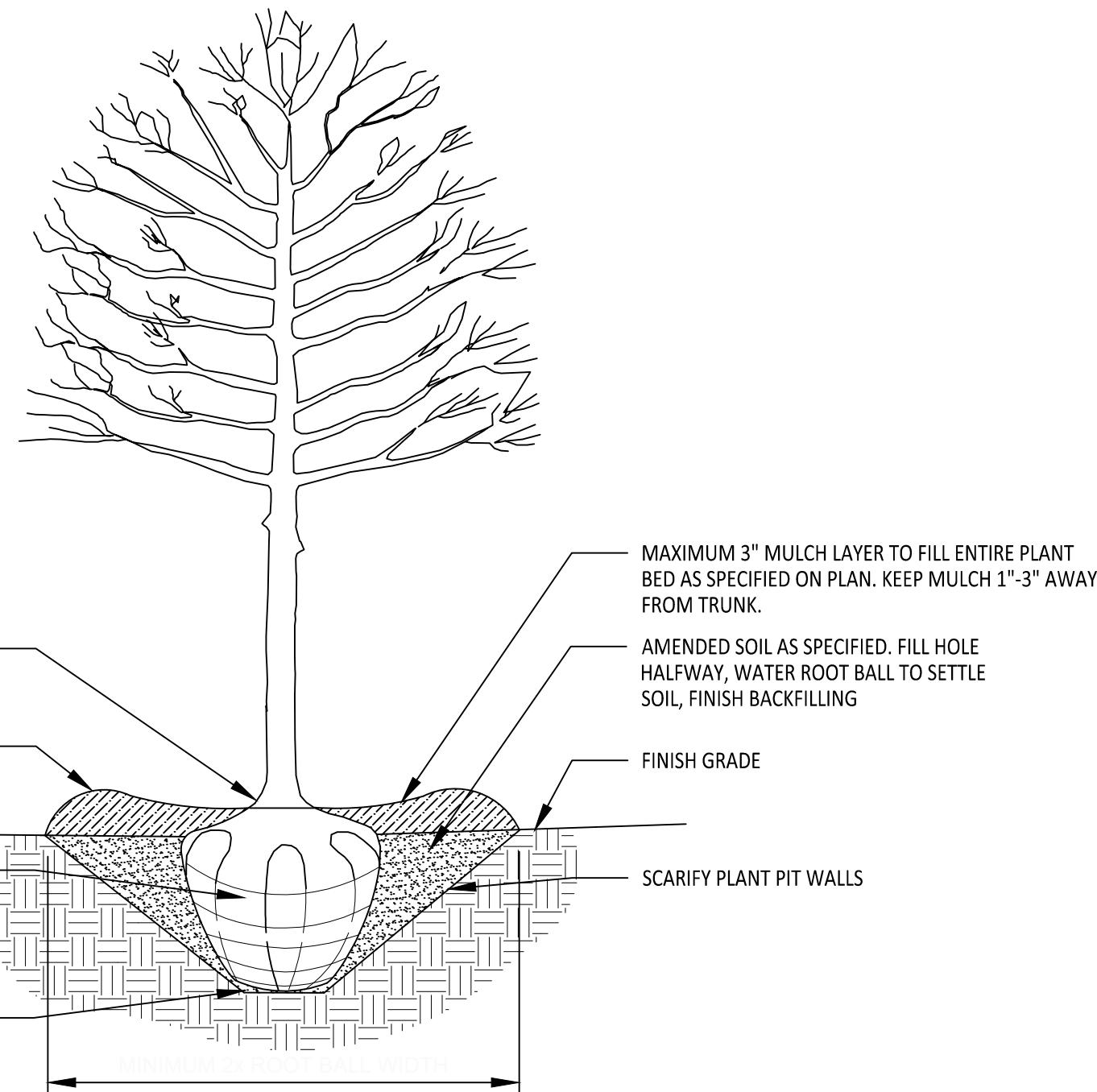


PLANT DETAILS

- NOTES**
- REMOVE WIRE AND NYLON TWINE FROM BALL AND CANOPY.
 - SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
 - DO NOT STAKE OR WRAP TRUNK UNLESS:
 - TREE HAS A LARGE CROWN
 - PLANTING SITE IS CONSISTENTLY WINDY OR IS A STEEP SLOPE
 - PLANTING SITE IS SUSCEPTIBLE TO VANDALISM.
 - REMOVE ALL TAGS AND LABELS FROM PLANT MATERIAL.
 - PRUNE DEAD, BROKEN, RUBBING OR CROSSING BRANCHES, AND ANY SUCKERS AFTER PLANTING. DO NOT TOP TREES.



ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004)

FOR EXAMPLE:

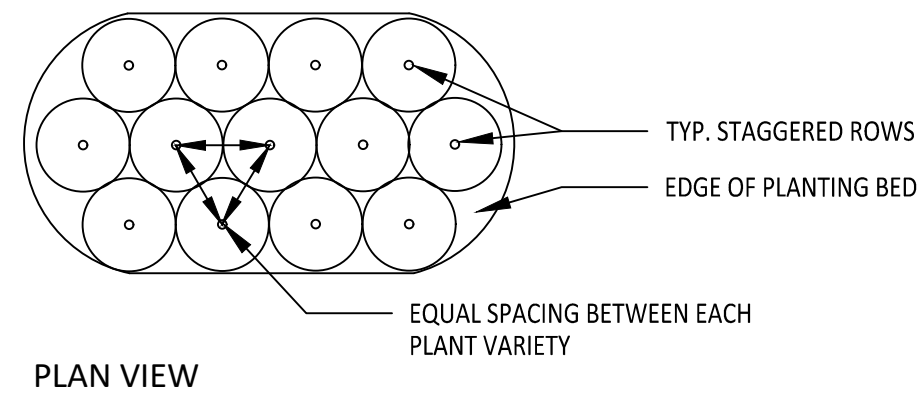
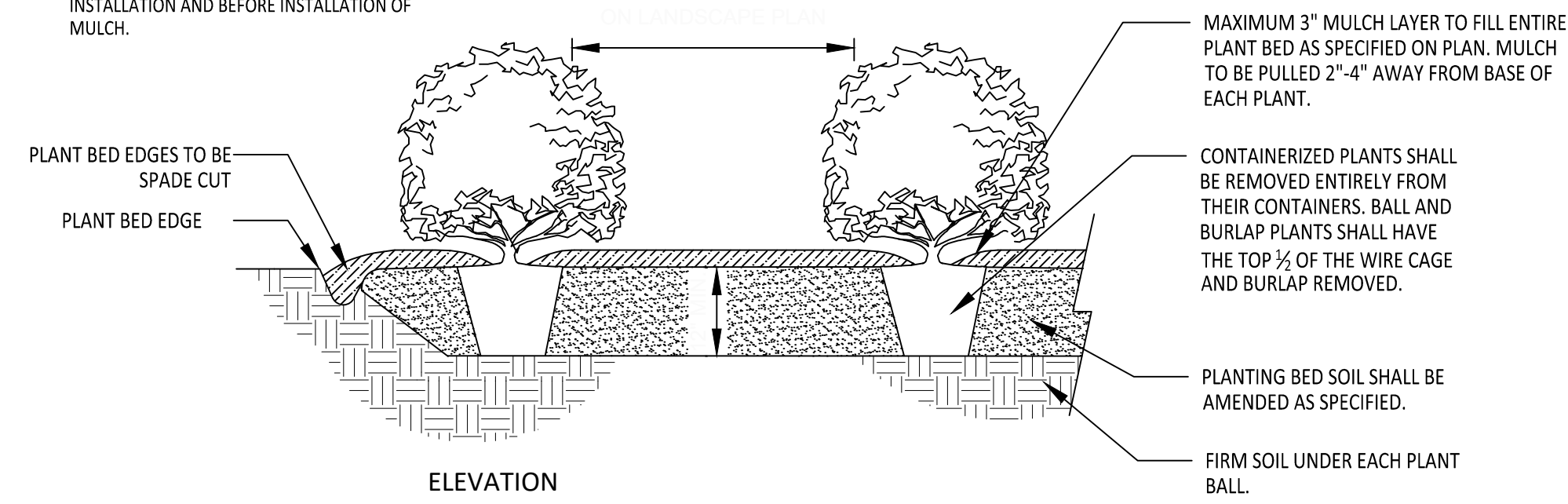
CALIPER	HEIGHT (RANGE)	MAX. HEIGHT	MIN. ROOT BALL DIA.	MIN. ROOT BALL DEPTH
2"	12'-14'	16'	24"	16"
3"	14'-16'	18'	32"	21"

TYPICAL TREE PLANTING

(FOR SINGLE AND MULTI-STEM TREES)

NOT TO SCALE

- NOTES**
- SCARIFY ROOT MASS OF CONTAINERIZED PLANTS.
 - PLANT ROOT BALL SHOULD BE INSTALLED 1"-3" MAXIMUM ABOVE FINISHED GRADE.
 - WATER EACH PLANT IMMEDIATELY AFTER INSTALLATION AND BEFORE INSTALLATION OF MULCH.



TYPICAL SHRUB PLANTING

NOT TO SCALE

PLANT NOTES

PLANT INSTALLATION & MAINTENANCE NOTES:

- ALL LANDSCAPING SHALL BE OF NURSERY STOCK QUALITY AND SHALL BE INSTALLED IN A SOUND, WORKMANLIKE MANNER AND ACCORDING TO ACCEPTED GOOD PLANTING PROCEDURES.
- ALL LANDSCAPING SHALL BE ADAPTABLE TO CLIMATIC CONDITIONS OF THE AREA.
- LARGE TREES SHOULD NOT BE PLANTED WITHIN EASEMENTS AND A MINIMUM OF 6' FROM UTILITY LINES, UNLESS OTHERWISE SPECIFIED BY REVIEWING AGENCY. SHRUBS MAY BE PLANTED IN EASEMENTS, BUT A MINIMUM OF 3' FROM UTILITY LINES, UNLESS OTHERWISE SPECIFIED BY REVIEWING AGENCY.
- ALL LANDSCAPING SHALL BE MAINTAINED IN GOOD CONDITION.
- ALL LANDSCAPING SHALL AT ALL TIMES PRESENT A HEALTHY, NEAT, CLEAN, ORDERLY, DISEASE-FREE AND PEST-FREE APPEARANCE.
- ALL LANDSCAPING SOIL AND FILL SHALL BE FREE FROM WEEDS, REFUSE, AND DEBRIS AT ALL TIMES.
- EXCESS SOIL SHALL BE DISPOSED OF IN A LEGAL MANNER.
- ANY DEAD PLANT MATERIAL OR MATERIAL THAT FAILS TO SHOW HEALTHY GROWTH MUST BE REMOVED WITHIN 30 DAYS.
- REPLACEMENT OF REMOVED PLANT MATERIAL MUST TAKE PLACE WITHIN 90 DAYS OF REMOVAL OR NOTIFICATION BY THE CITY, WHICHEVER OCCURS FIRST.
- ANY REPLACEMENT PLANT MATERIAL MUST MEET THE SIZE AND OTHER CHARACTERISTICS OF NEWLY PLANTED MATERIAL.
- IF USING STAKES AND GUYS SUCH SUPPORTS SHALL BE DESIGNED SO AS TO PROTECT TREES AND SHRUBS FROM INJURY. TREES AND SHRUBS SHALL BE FASTENED TO THE SUPPORT WITH AN ACCEPTABLE COMMERCIAL TREE TIE OF PLASTIC OR HOSE-COVERED WIRE. AFTER THE WARRANTY PERIOD HAS ENDED, STAKES AND GUYS SHALL BE REMOVED.
- CONTRACTOR IS RESPONSIBLE TO CONTACT MISS UTILITIES (811) 48 HOURS PRIOR TO COMMENCEMENT OF WORK. CONTACT LANDSCAPE ARCHITECT IF FIELD CONFLICTS/DISCREPANCIES ARISE.
- CONTRACTOR RESPONSIBLE TO VERIFY PLANT COUNTS. PLANTING PLAN SHALL GOVERN IN THE CASE OF A CONFLICT.
- ALL PLANTS SHALL MEET OR EXCEED STANDARDS AS DETERMINED BY THE AMERICAN STANDARD OF NURSERY STOCK.
- CONTRACTOR SHALL WARRANTY ALL PLANTS FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE.
- WHEN POSSIBLE, PLANTING SHALL BE INSTALLED BETWEEN SEPTEMBER 1 - JUNE 30TH AND IN FAVORABLE WEATHER CONDITIONS. WHEN PLANTING MUST BE PERFORMED OUTSIDE OF SPECIFIED DATES, PLANTS MUST BE WATERED ON A REGULAR BASIS TO ENSURE VIABILITY.
- PLANT VARIETIES, SIZES AND LAYOUT SHALL CONFORM ACCURATELY TO THE LANDSCAPE PLAN. CONTACT LANDSCAPE ARCHITECT FOR FIELD CONFLICTS.
- DISTURBED AREAS SHALL BE SEEDED ACCORDING TO THE NOTES FOUND ON THIS PAGE.
- PLANT SUBSTITUTIONS SHALL BE BROUGHT TO THE ATTENTION OF AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
- MULCH USED ON-SITE SHALL BE OF A NON-DYED, NATURAL HARDWOOD VARIETY TO BE INSTALLED AT A MAXIMUM DEPTH OF 3", MINIMUM DEPTH OF 2".

TOPSOIL / PLANTING MIX MINIMUM REQUIREMENTS:

- TOPSOIL/PLANTING MIX SHOULD BE NATURAL, FERTILE, AGRICULTURAL SOIL CAPABLE OF SUSTAINING VIGOROUS PLANT GROWTH. IT SHOULD BE UNIFORM COMPOSITION THROUGHOUT, WITH ADMIXTURE OF SUBSOIL. IT SHOULD BE FREE OF STONES, LUMPS, LIVE PLANTS AND THEIR ROOTS, STICKS AND OTHER EXTRANEIOUS MATTER. TOPSOIL SHOULD NOT BE USED WHILE IN A FROZEN OR MUDDY CONDITION.
- TOPSOIL/PLANTING MIX SHALL HAVE AN ACIDITY RANGE OF PH 5.5-7.0 AND THE FOLLOWING COMPOSITION:

CLAY (RED CLAY, WELL PULVERIZED)	MINIMUM 10%; MAXIMUM 35%
COMPOST*/ORGANIC	MINIMUM 5%; MAXIMUM 10%
SILT	MINIMUM 30%; MAXIMUM 50%
COARSE SAND (FREE OF ROCKS, 0.5 TO 1.0 MM F)	MINIMUM 30%; MAXIMUM 45%
- ORGANIC MATERIAL SUCH AS SAWDUST OR LEAF MOLD THAT HAS COMPLETED THE DECOMPOSITION PROCESS
- RECOMMENDATIONS:
- ALL PLANTING AREAS SHOULD BE TESTED FOR PROPER DRAINAGE. DRAINAGE SHOULD BE CORRECTED AS NECESSARY TO INSURE PROPER TREE GROWTH AND SURVIVAL. THE FOLLOWING LEVEL OF NUTRIENT ELEMENTS IS RECOMMENDED FOR PROPER GROWTH:

CALCIUM	55 - 80%
MAGNESIUM	10 - 30%
POTASSIUM	5 - 8%

SEEDING SCHEDULE FOR LAWNS & SLOPES (MAXIMUM 3:1):

DATE	TYPE	PLANTING RATE
AUG 15 - NOV 1	TALL FESCUE	300 LBS/ACRE
NOV 1 - MAR 1	TALL FESCUE AND ABRUZZI RYE	300 LBS/ACRE OR ANNUAL RYE
MAR 1 - APR 15	TALL FESCUE OR HARD FESCUE	300 LBS/ACRE
MAR 1 - JUL 15	HULLED COMMON BERMUDA GRASS OR HYBRID BERMUDA GRASS OR CENTIPEDE GRASS OR ZOYSIA GRASS OR ST. AUGUSTINE GRASS	200 LBS/ACRE
APR 15 - JUN 30	WEeping LOVE GRASS OR BAHIA GRASS	25 LBS/ACRE
JUL 1 - AUG 15	TALL FESCUE AND *** BROWNTOP MILLET *** OR SORGHUM-SUDAN HYBRIDS	120 LBS/ACRE 35 LBS/ACRE 30 LBS/ACRE



NO.	DATE	REVISION:

STIPULATION FOR REUSE

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**KALAS FALLS
PHASE 2
1832 ROLESVILLE ROAD
WAKE COUNTY, NC**

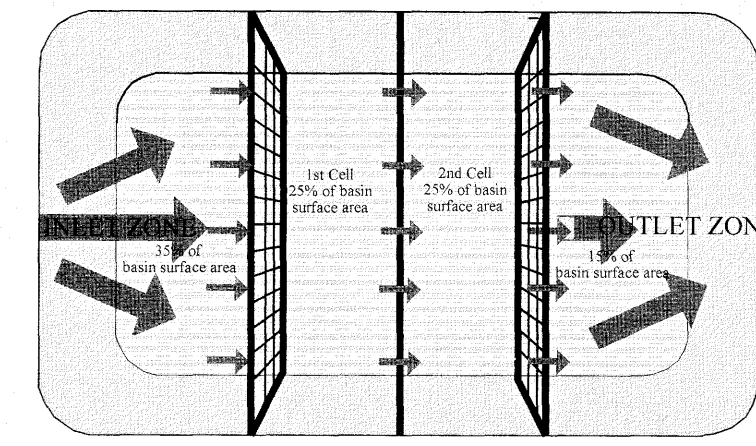
JOB NUMBER: 9900
CHECKED BY:
DRAWN BY:
DATE: DECEMBER 21, 2020

LANDSCAPE NOTES AND DETAIL

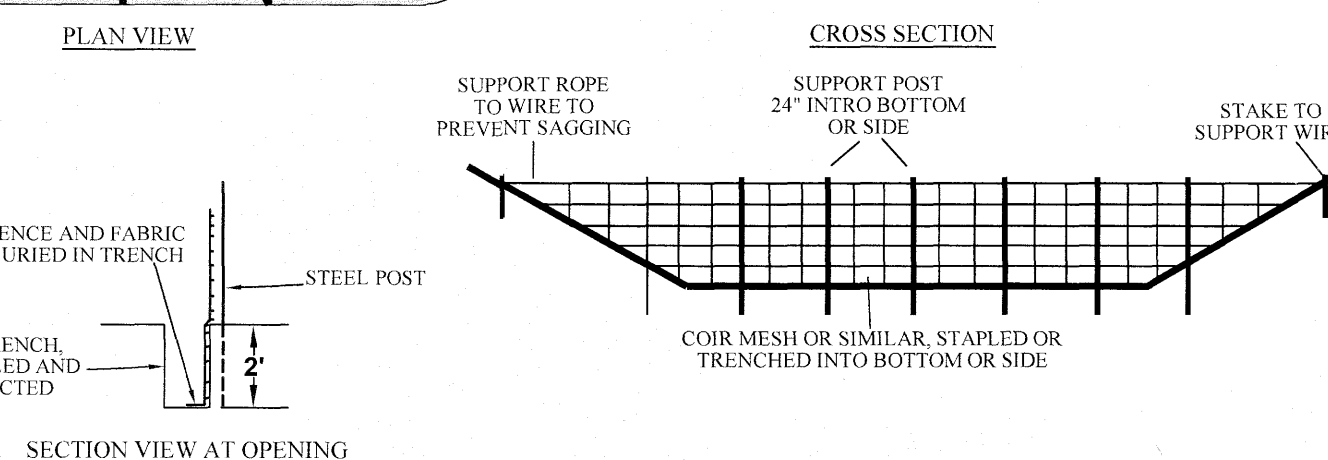
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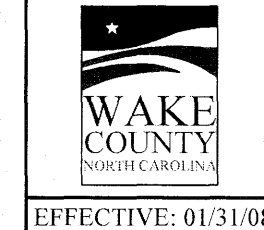
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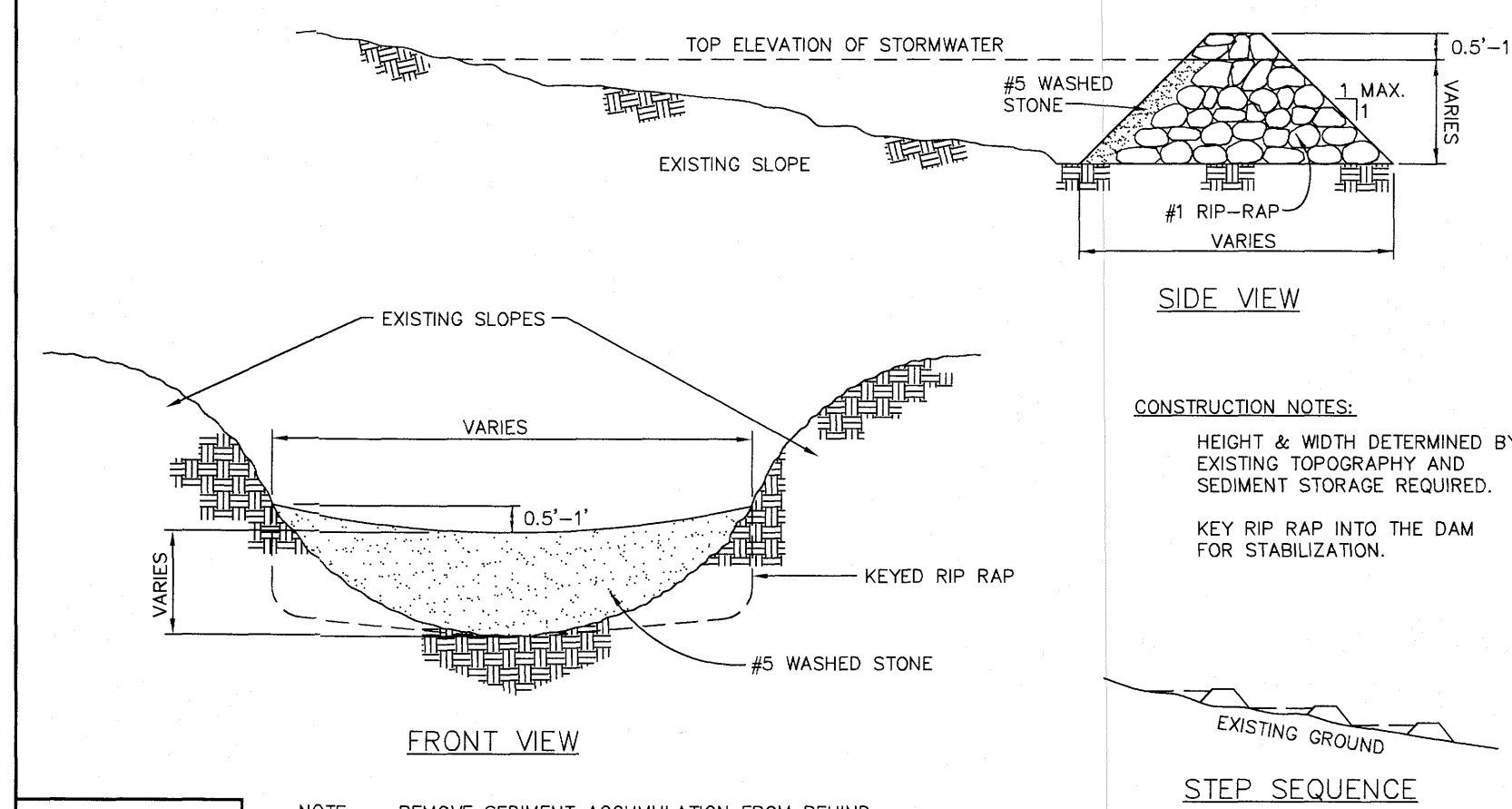
NOTES:
 1. BAFFLE MATERIAL SHOULD BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR SILT FENCE.
 2. MOST OF THE SEDIMENT WILL ACCUMULATE IN THE 1ST BAY, WHICH SHOULD BE READILY ACCESSIBLE FOR MAINTENANCE.
 3. PROVIDE 3 BAFFLES (USE TWO IF LESS THAN 20 FEET IN LENGTH), PROVIDE 4 BAFFLES FOR DRAINAGE AREAS GREATER THAN 10 ACRES.
 4. BAFFLES SHALL BE 70% COARSE CORROSION INERT.
 5. TIPS OF BAFFLES SHOULD BE 2 INCHES LOWER THAN THE TOP OF THE BERMS.
 6. INSPECT BAFFLES FOR REPAIR ONCE A WEEK AND AFTER EACH RAINFALL.



STANDARD BAFFLES DETAIL

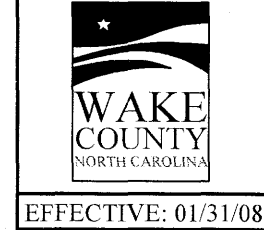


EFFECTIVE: 01/31/08

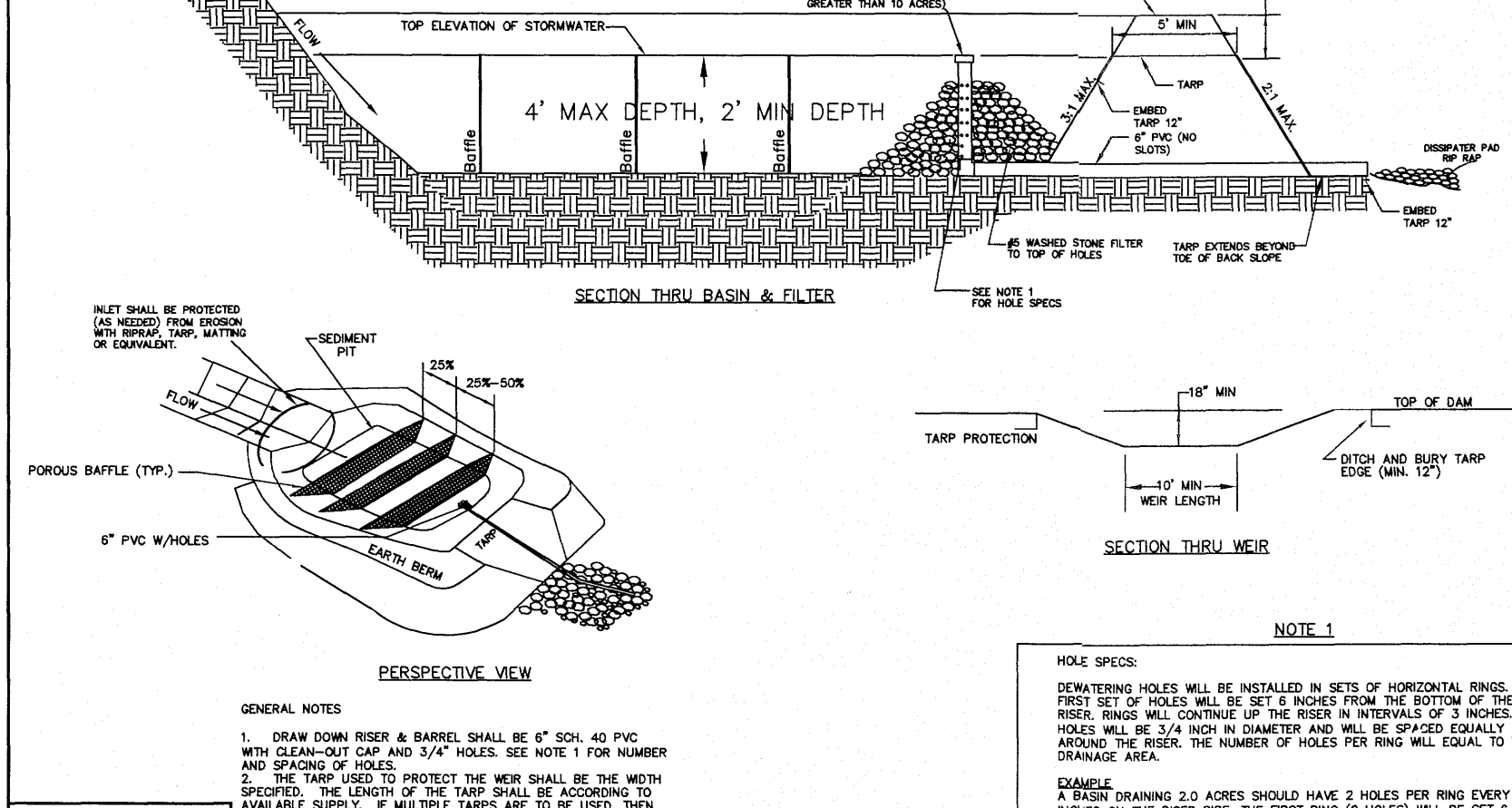


NOTE: REMOVE SEDIMENT ACCUMULATION FROM BEHIND CHECK DAMS TO PREVENT DAMAGE TO CHANNEL VEGETATION. FLOW SHOULD BE MAINTAINED THROUGH THE DAM.

STANDARD CHECK DAM

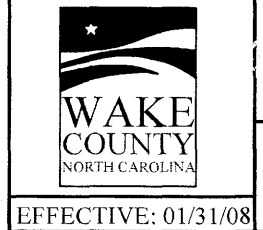


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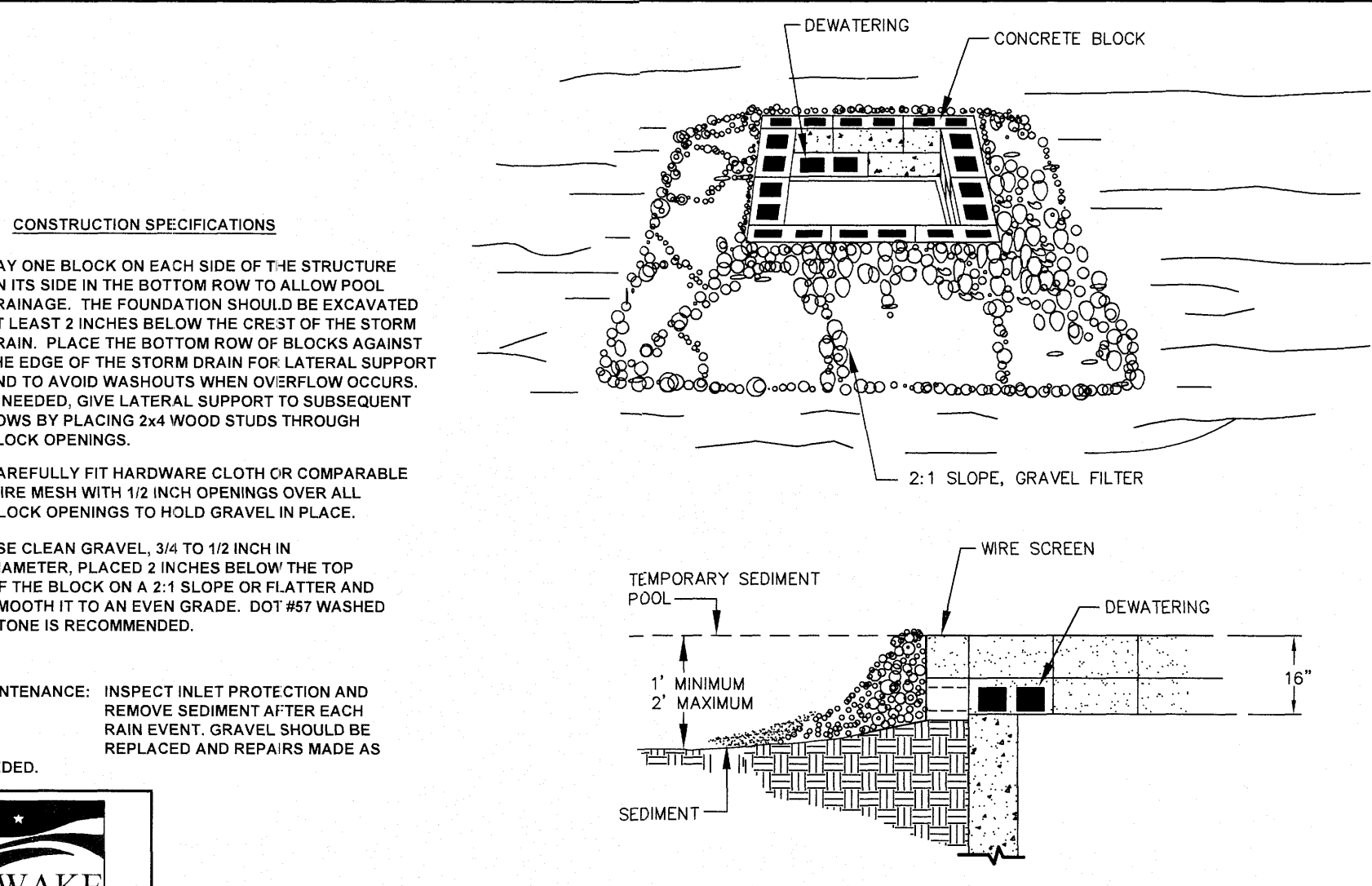


GENERAL NOTES:
 1. DRAW DOWN RISER & BARREL SHALL BE 4" SCH. 40 PVC WITH CLEAN-OUT CAP AND 5/8" HOLES. SEE NOTE 1 FOR NUMBER AND SPACING OF HOLES.
 2. THE TAMP USED TO PROTECT THE WEIR SHALL BE THE WIDTH AVAILABLE SUPPLY. IF MULTIPLE TAMPS ARE TO BE USED, THE TAMP SHALL BE OVERLAP AT LEAST 1". THE PERFORM 1" TAMP SHALL OVERLAP THE DOWNSTREAM TAMP. THE TAMP SHALL BE 2" TO 4" HEAVY DUTY GALVANIZED TAPPALE OR EQUIVALENT FOR P.V. RESISTANCE.
 3. MAINTENANCE: SEDIMENT TO BE REMOVED AND PROPERLY DISPOSED OF WHEN BASIN IS HALF FULL. GRAVEL TO BE ADJACENT RISER SHOULD BE REPLACED AS NEEDED TO ENSURE DEWATERING.

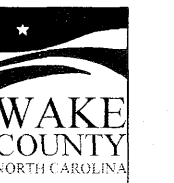
STANDARD CUSTOM BASIN



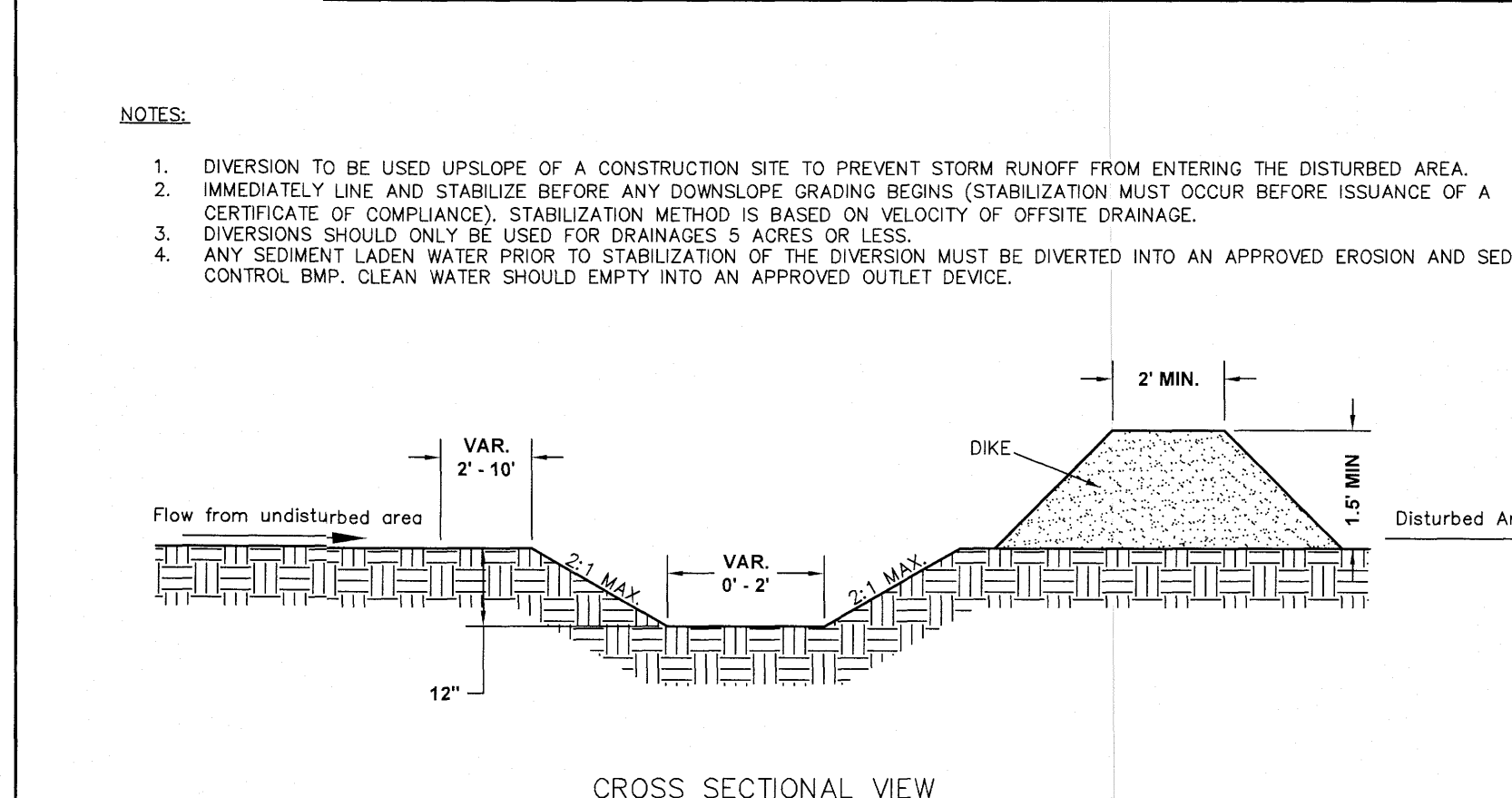
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STANDARD BLOCK & GRAVEL DROP INLET PROTECTION



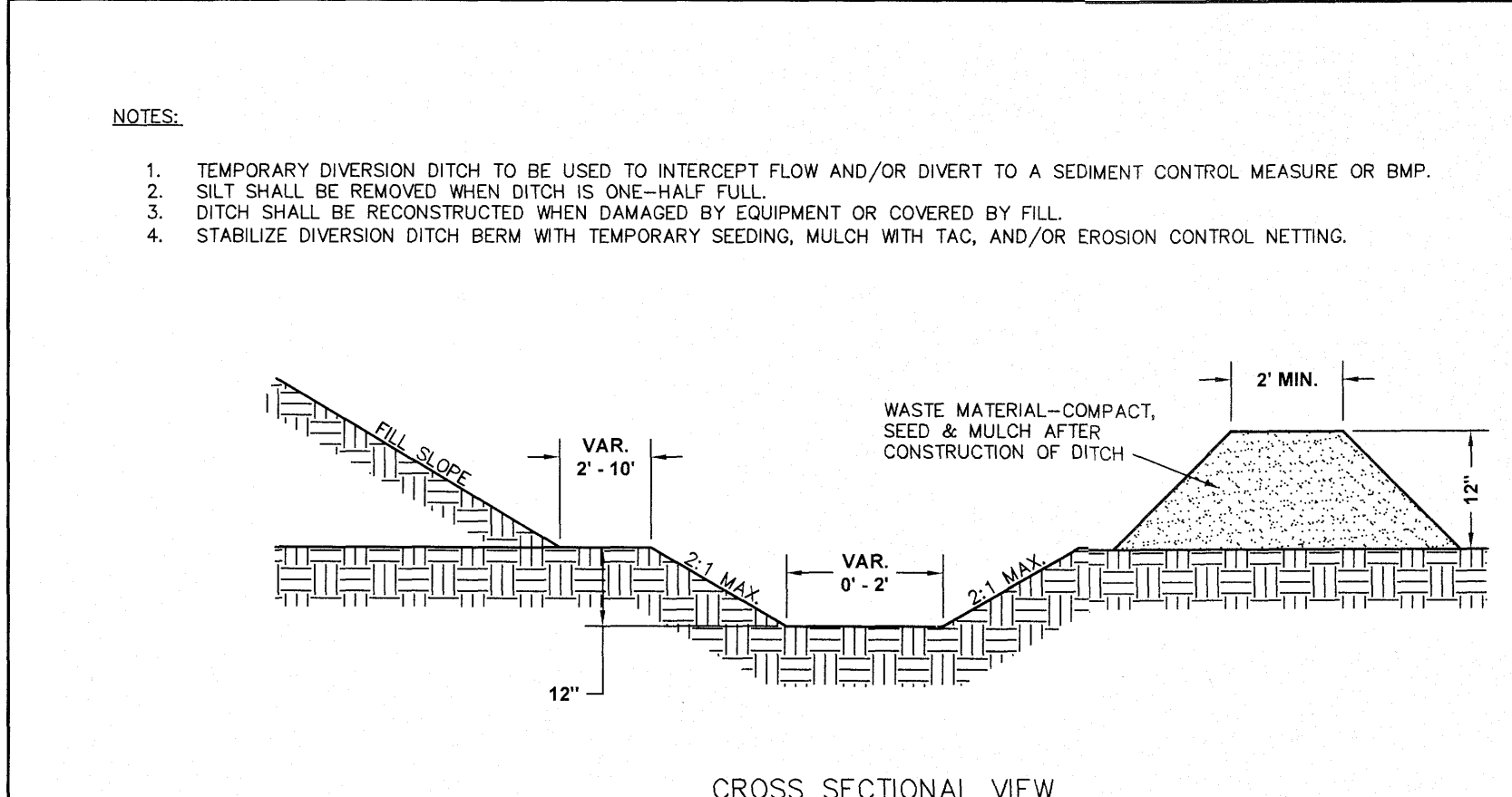
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STANDARD CLEAN WATER DIVERSION



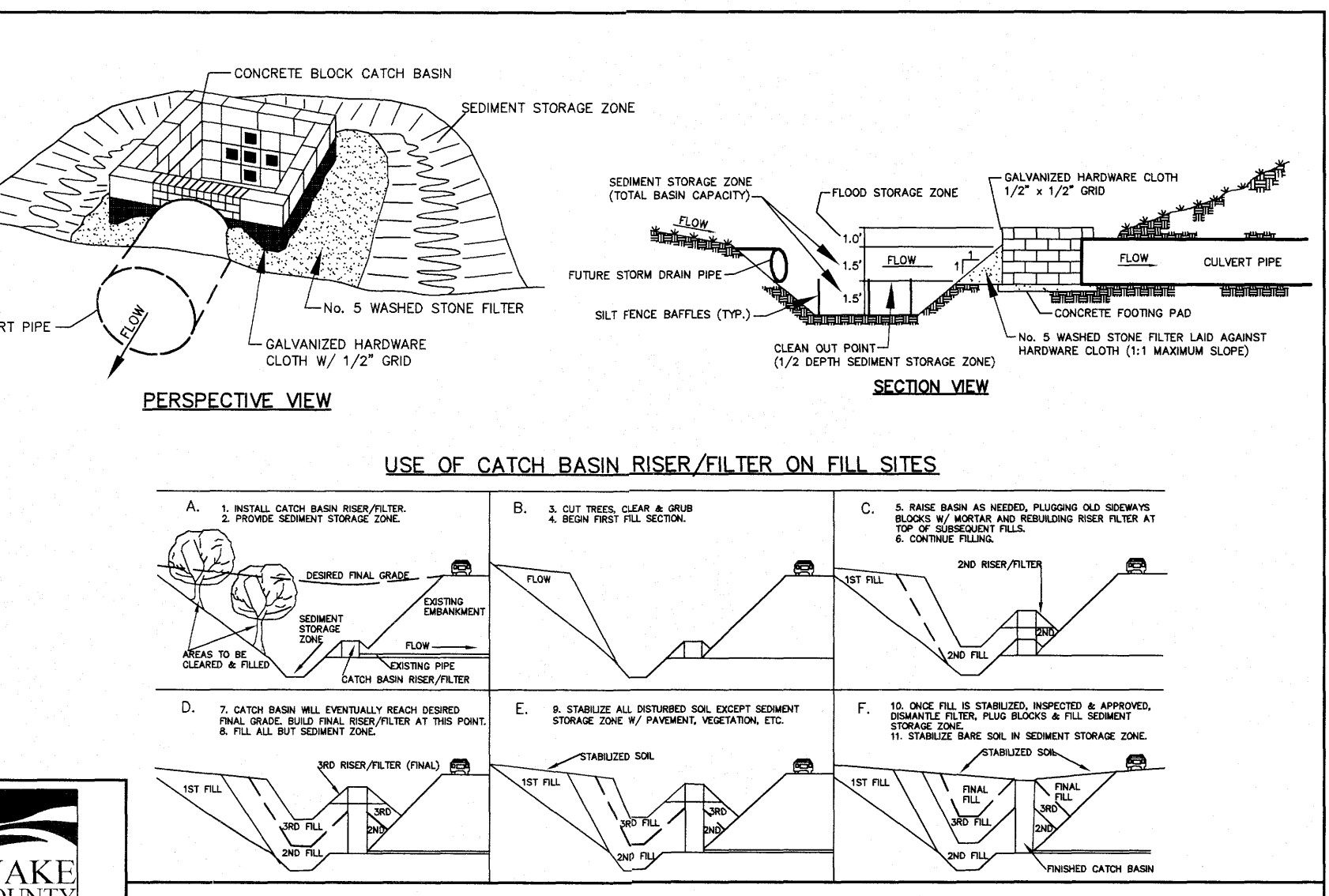
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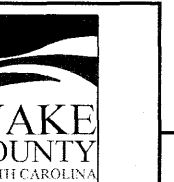
STANDARD TEMPORARY DIVERSION DITCH



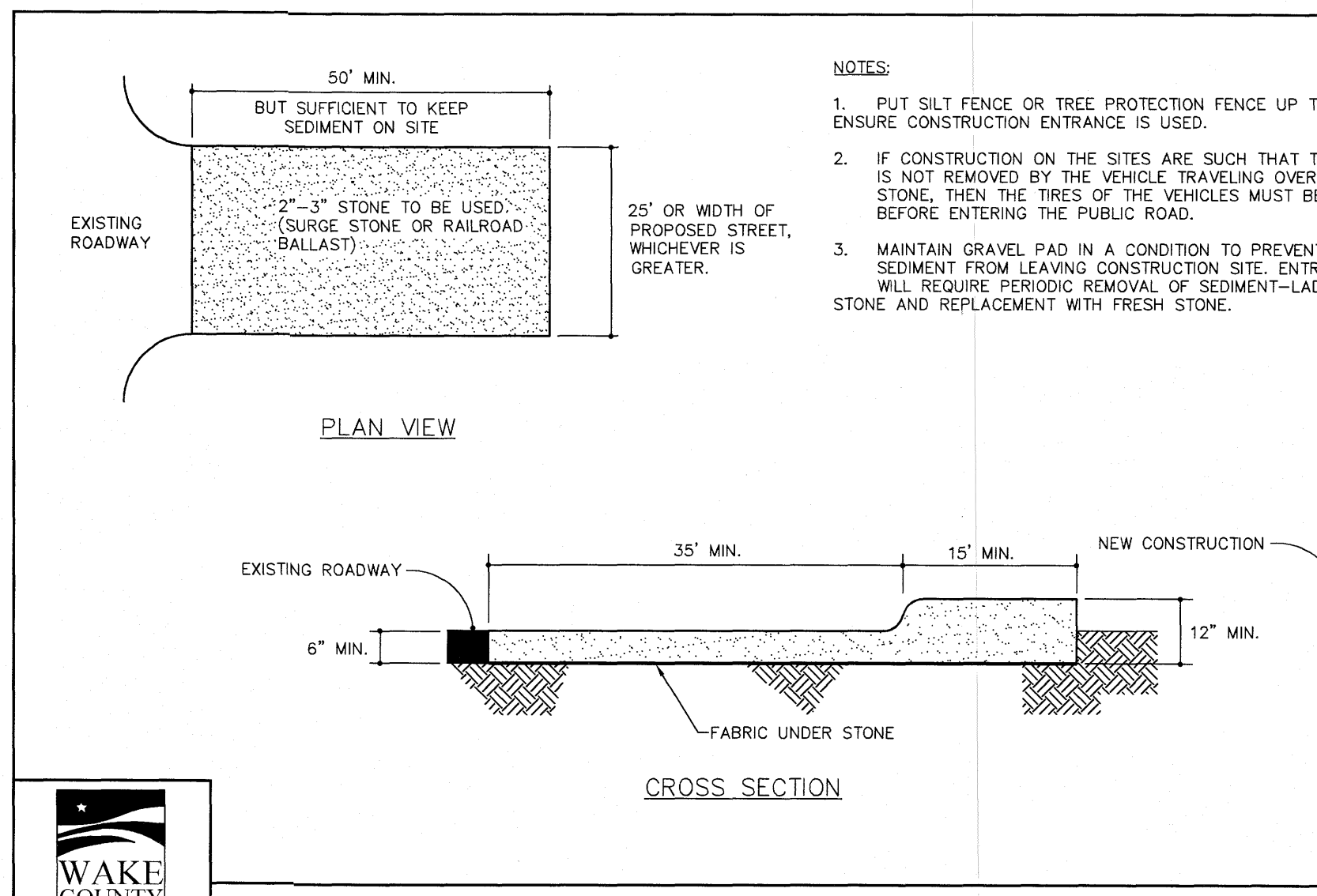
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STANDARD CATCH BASIN RISER/FILTER



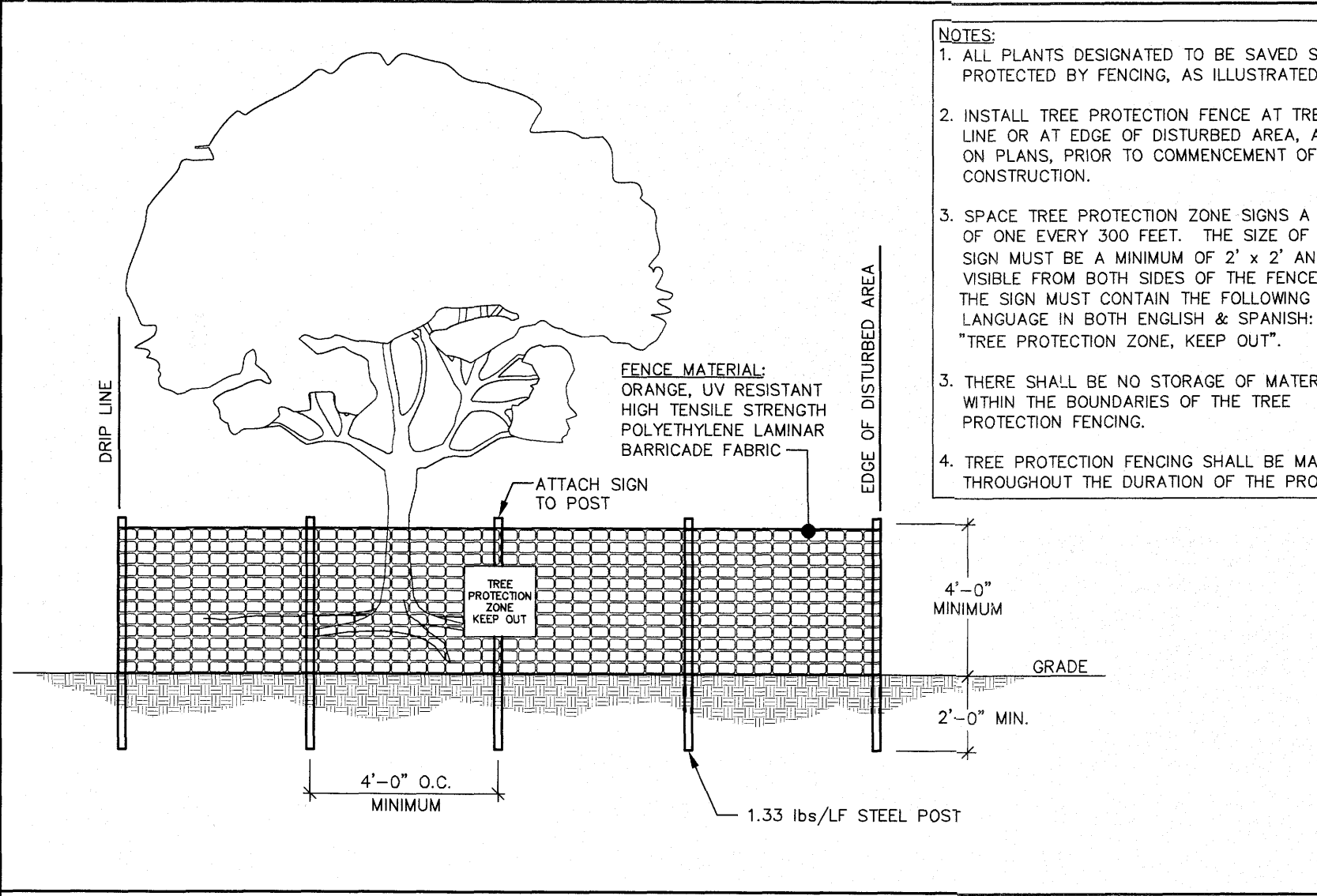
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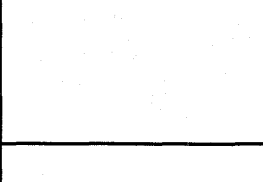
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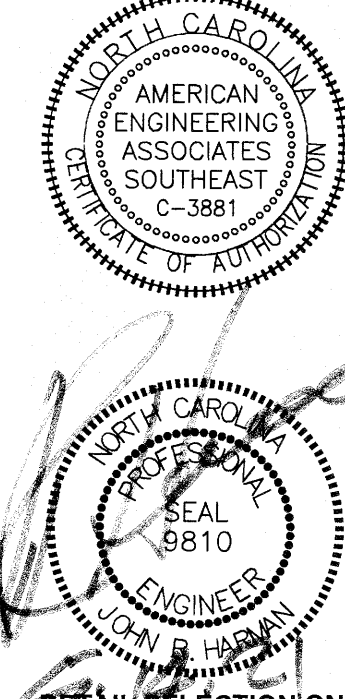
EFFECTIVE: 01/31/08



TREE PROTECTION FENCE



EFFECTIVE: 01/31/08



DETAIL SELECTION ONLY

NO.	DATE	REVISION:

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KALAS FALLS
PHASE 2
 1832 ROLESVILLE ROAD
 WAKE COUNTY, NC

JOB NUMBER: 9900
 CHECKED BY: _____
 DRAWN BY: _____
 DATE: DECEMBER 21, 2020
 SHEET TITLE: **KALAS FALLS CIVIL DETAILS**
 SHEET NO.: **CD1**

SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)
 The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit #** _____

City of Raleigh Permits
 The City of Raleigh consents to the connection and extension of the City's **Public Water System** as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit #** _____

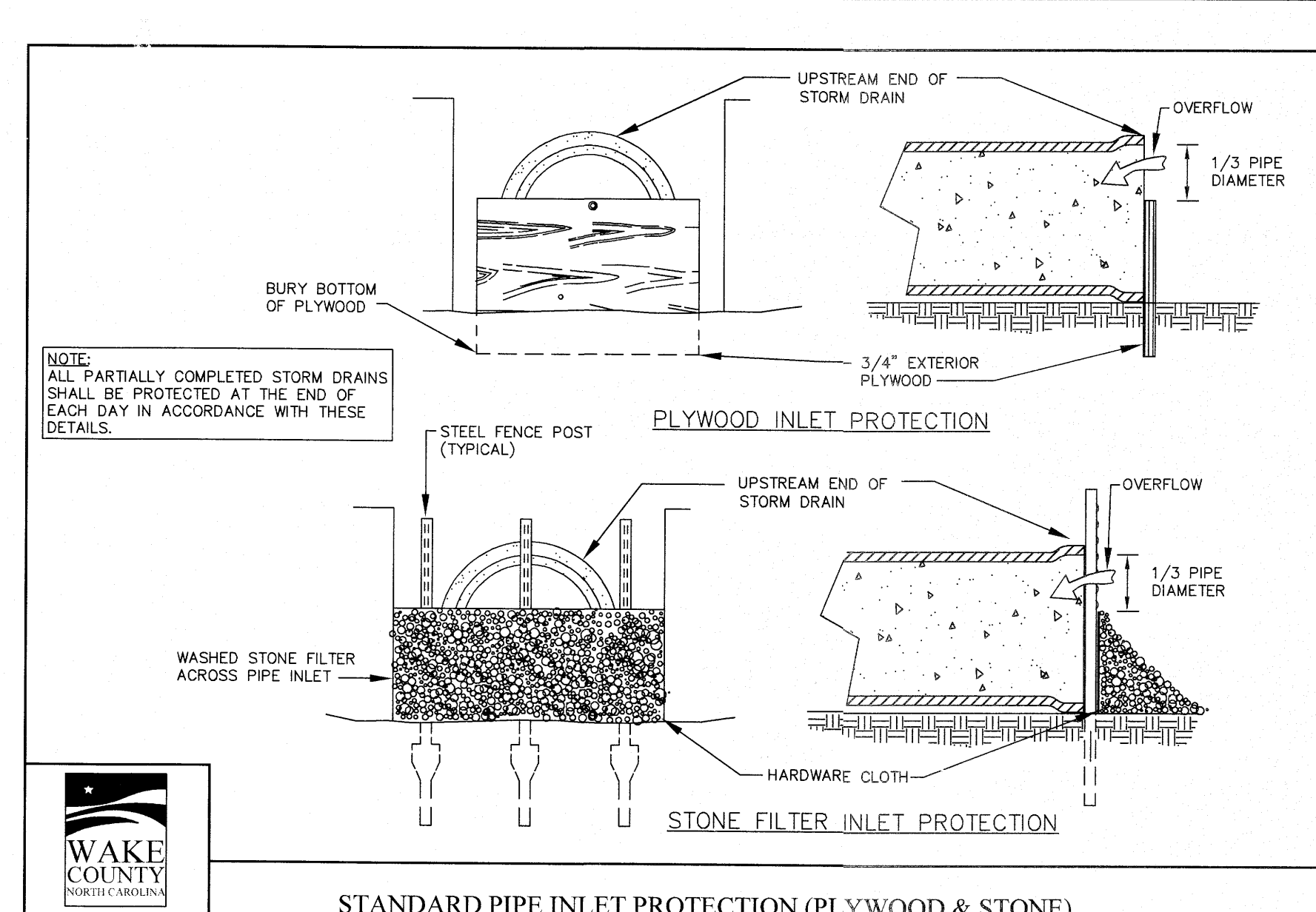
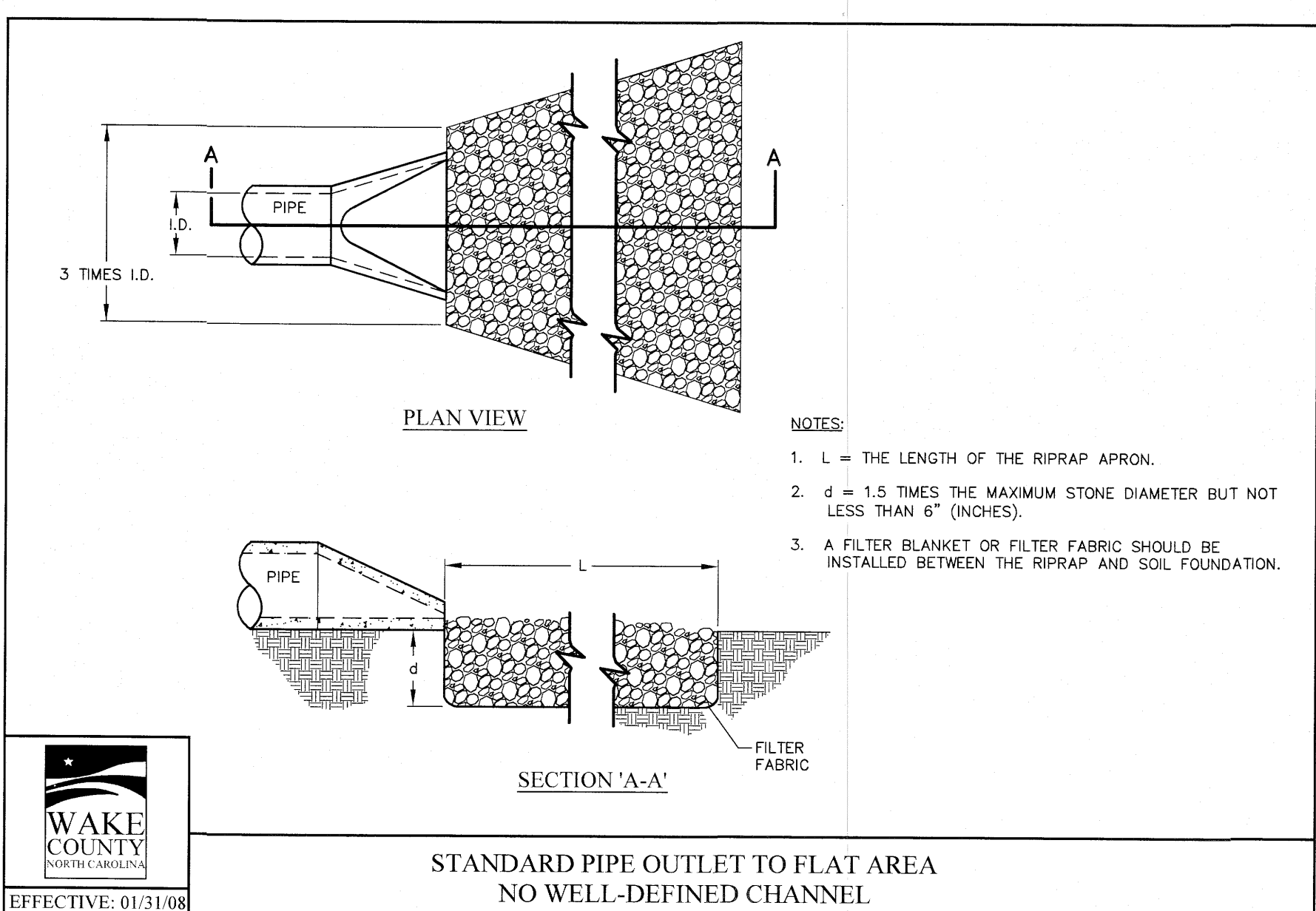
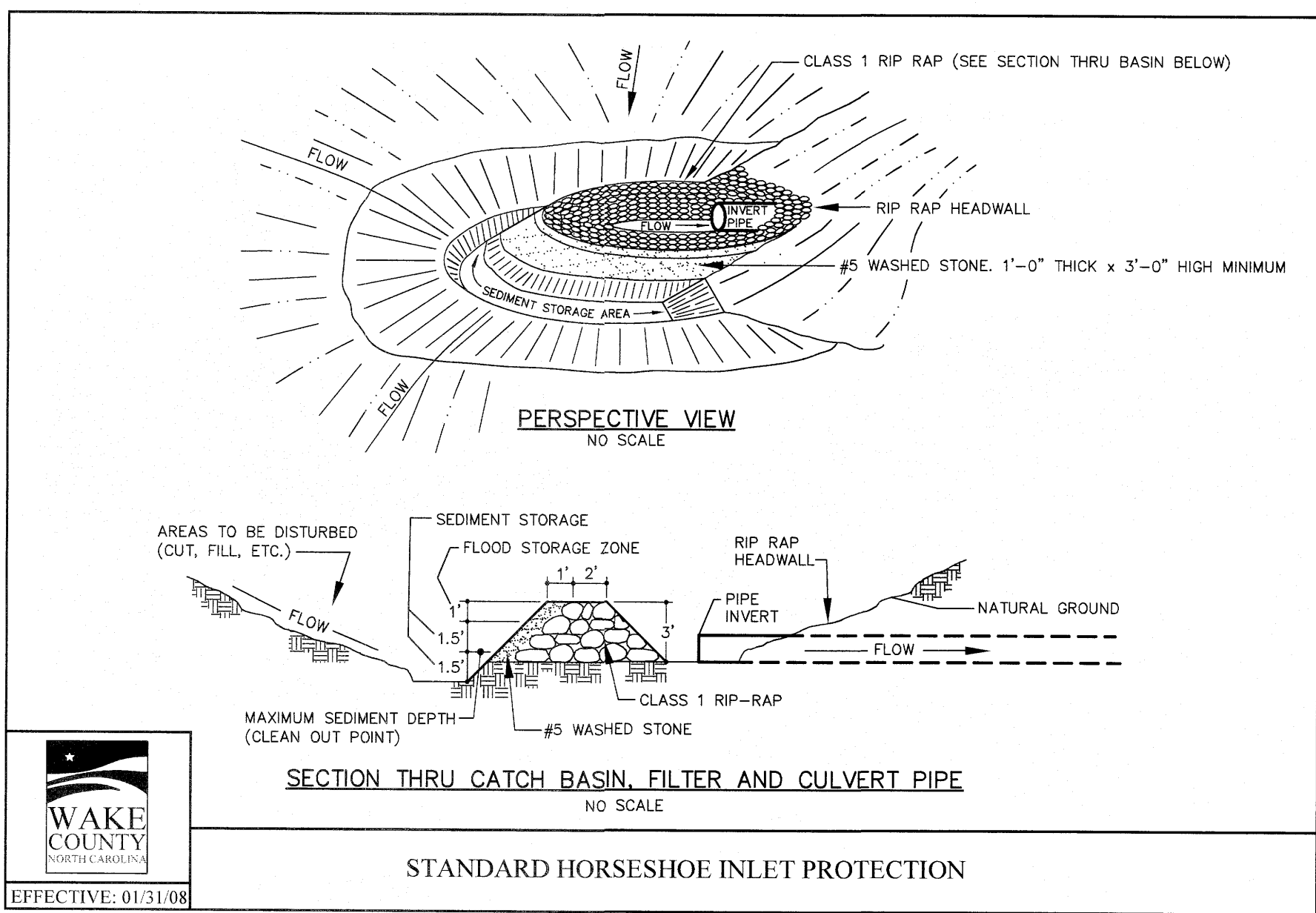
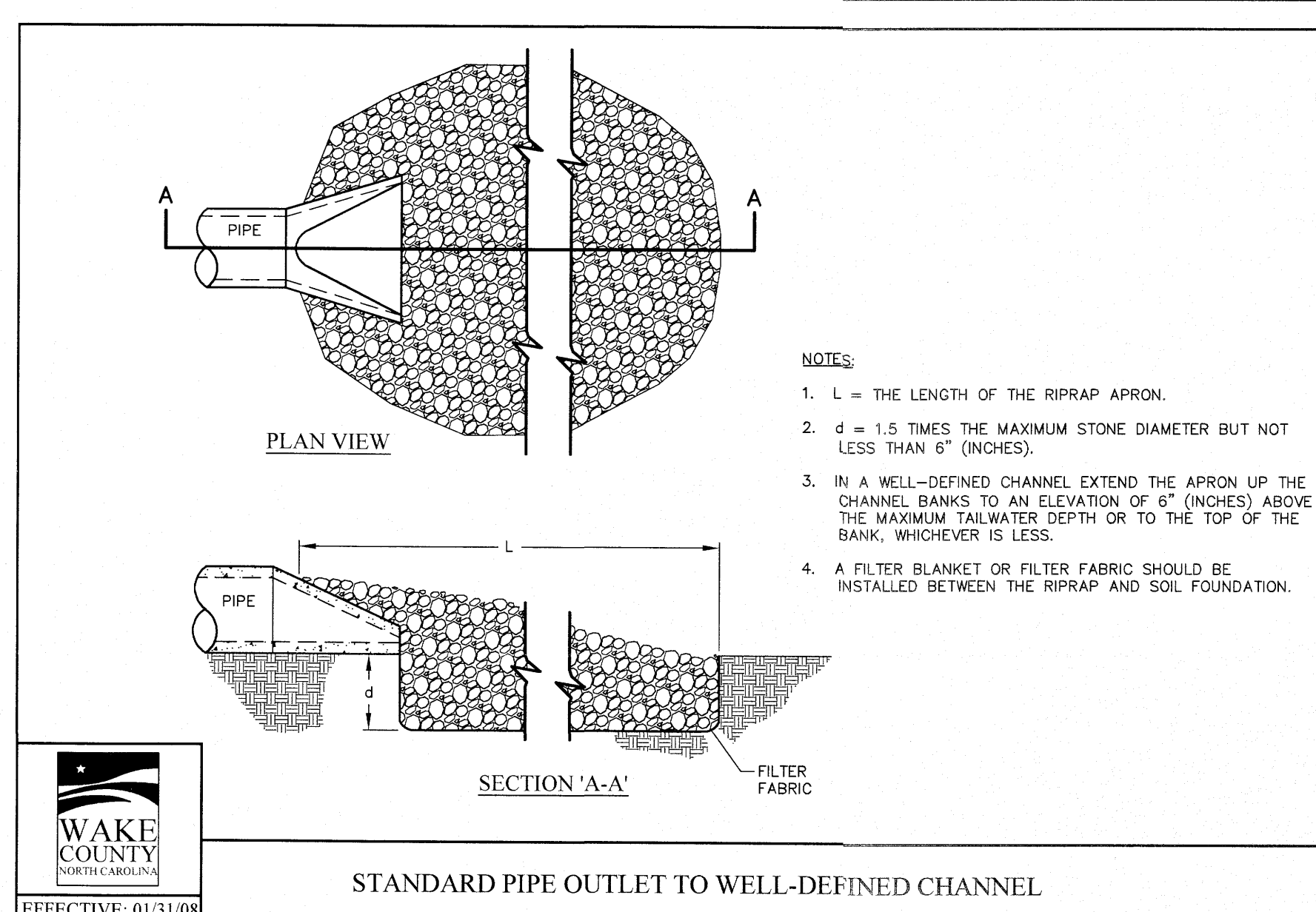
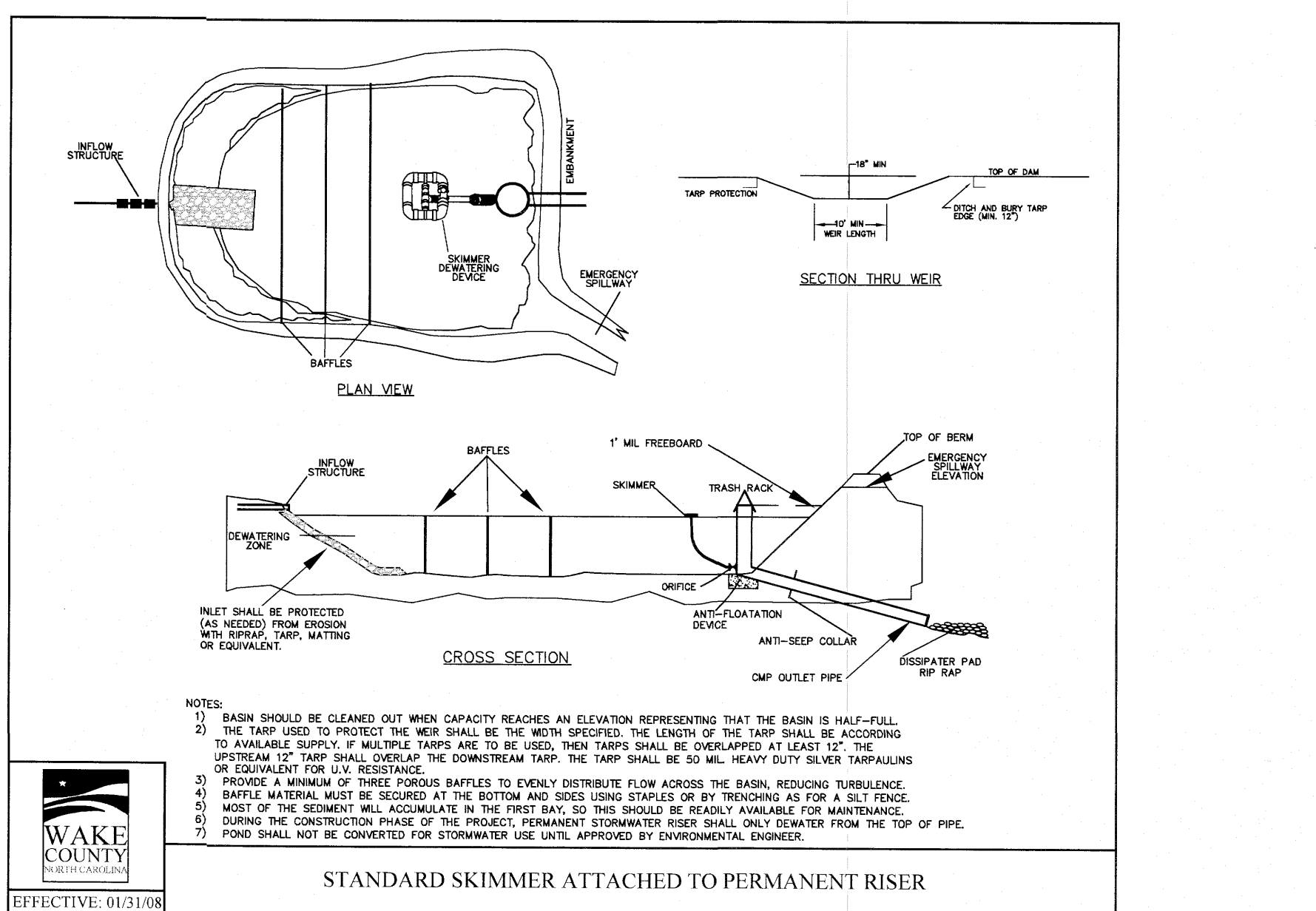
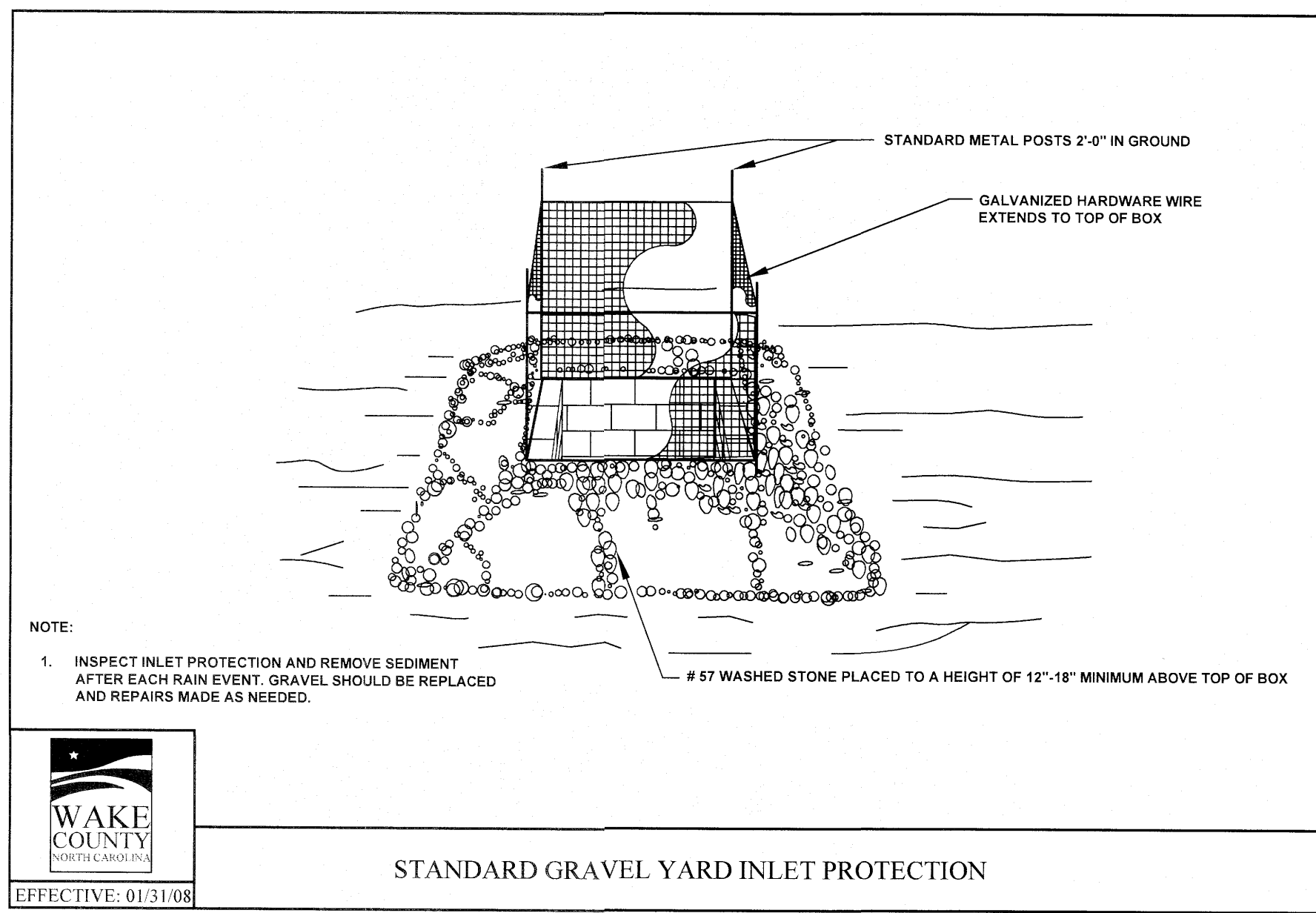
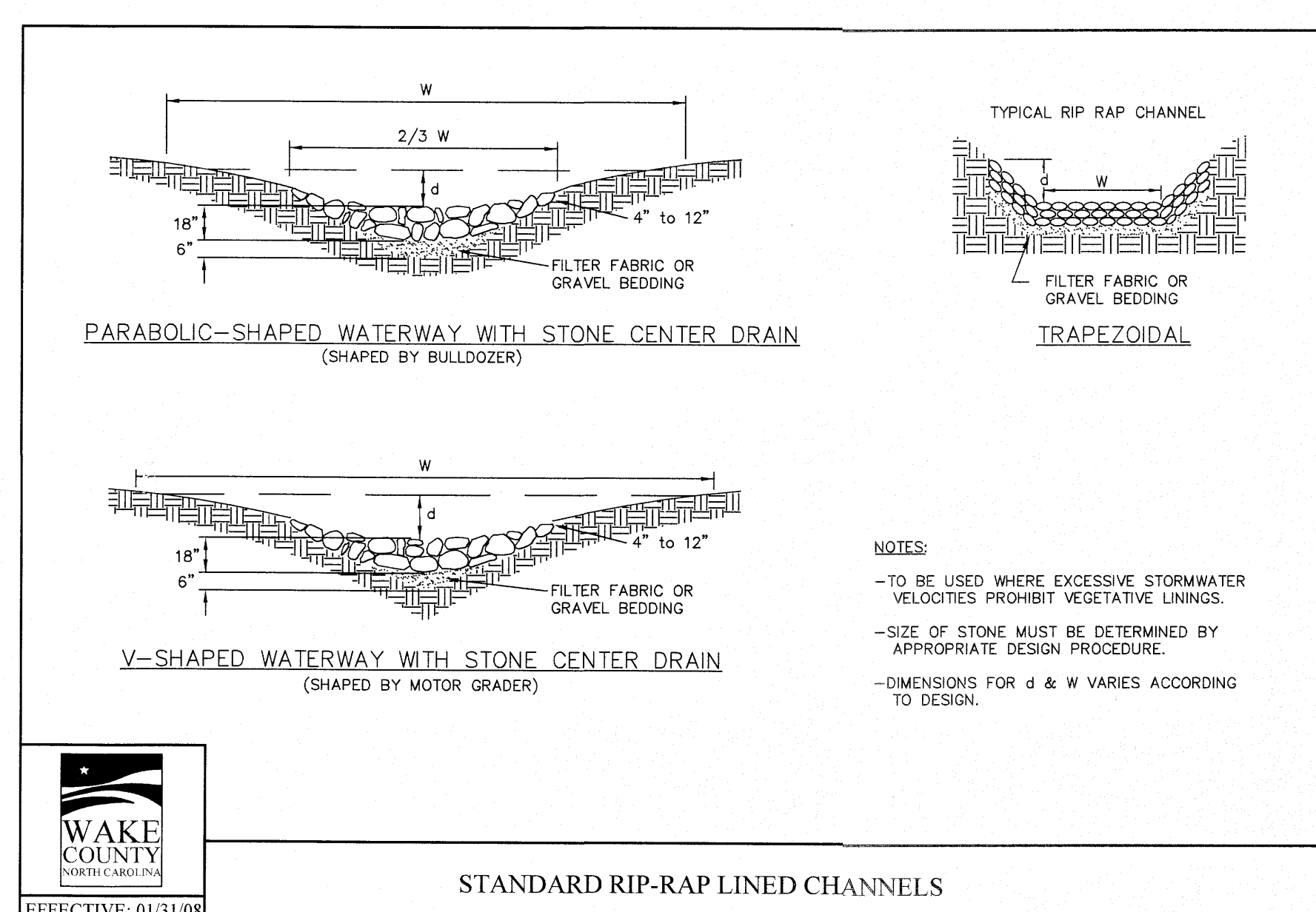
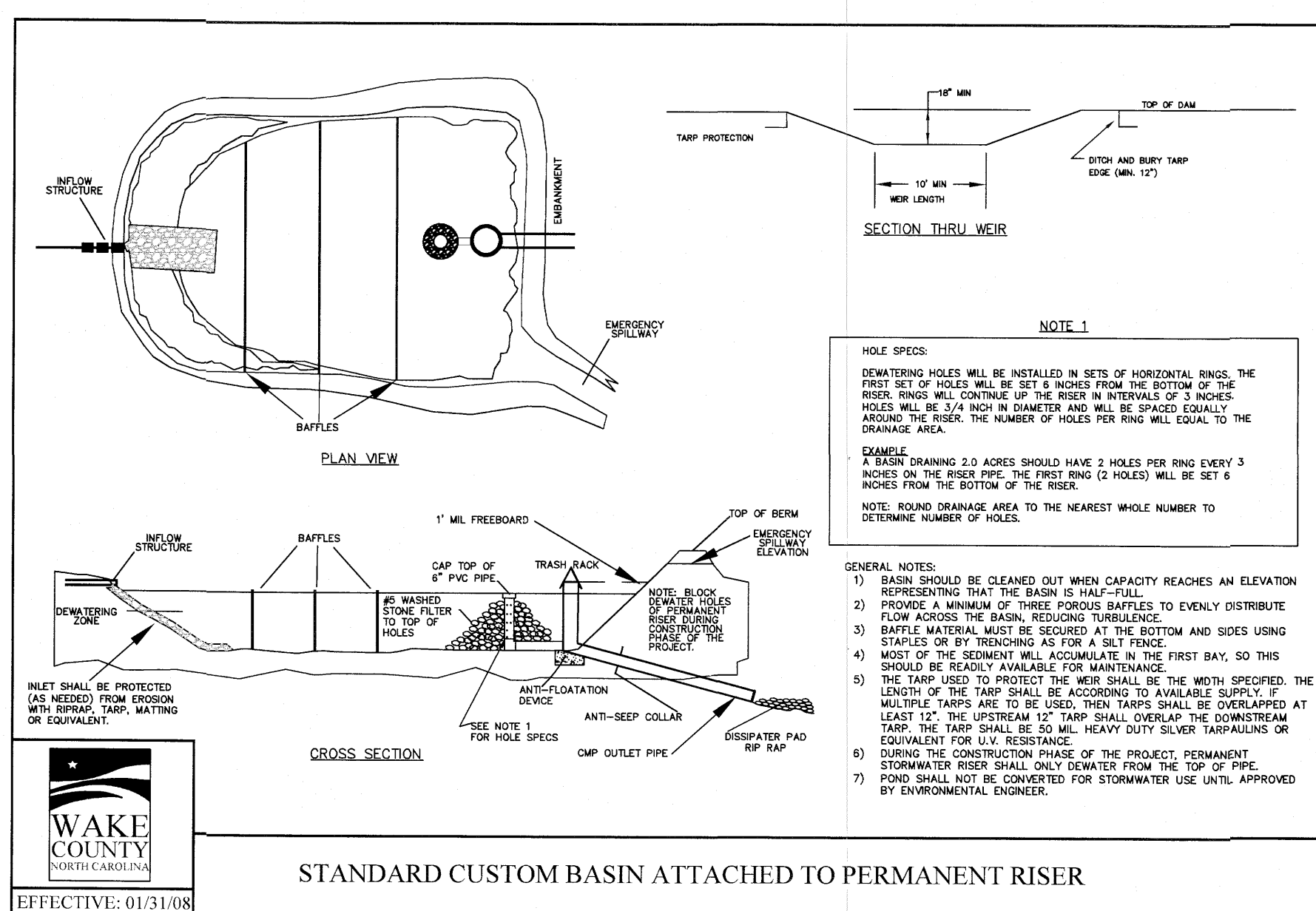
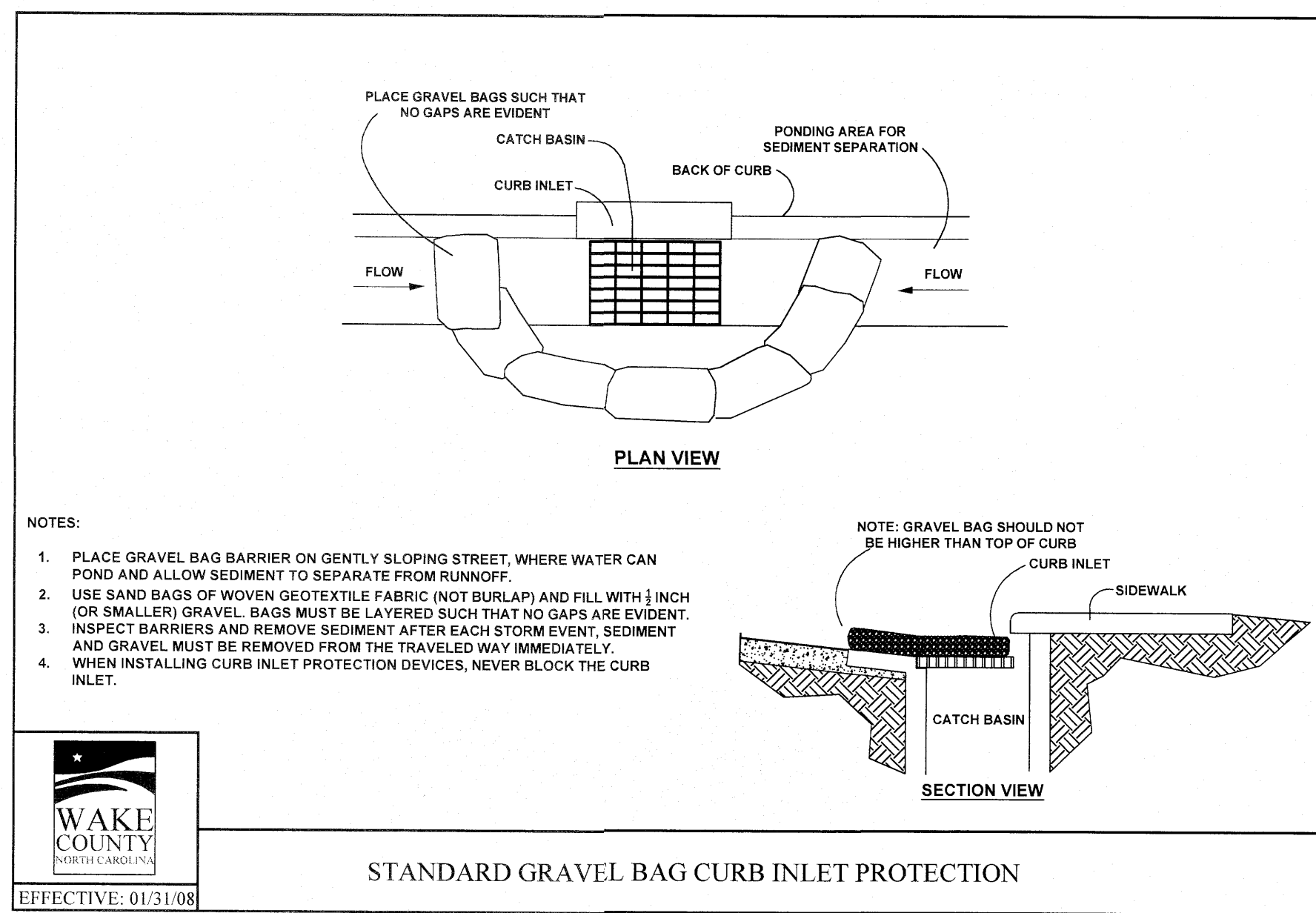
Private Sewer Permits
 The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit #** _____

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
 Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval: _____
 Raleigh Water Review Officer: _____

North Carolina 811
 *** 3 Days Before Digging ***
 North Carolina 811
 811 or 1-800-632-4949
 Remote Ticket Entry
<http://nc811.org/remoteticketentry.htm>

May 6, 2023
 Z:\Public\19200\19200\19200\Projects\Cal\Wake\Draw\Water\Kallas Falls\CD1\CD1.dwg



SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

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The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

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City of Raleigh Development Approval _____

Raleigh Water Review Officer _____

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City of Raleigh Development Approval _____

Raleigh Water Review Officer _____

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KALAS FALLS PHASE 2
1832 ROLESVILLE ROAD
WAKE COUNTY, NC

JOB NUMBER: 9900

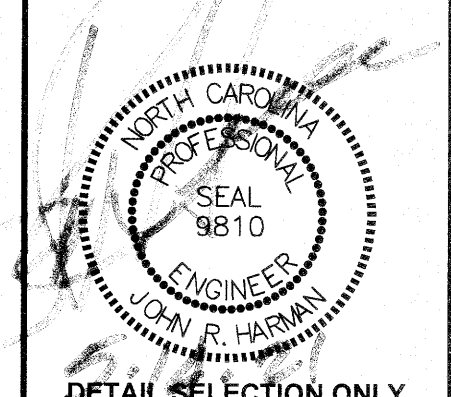
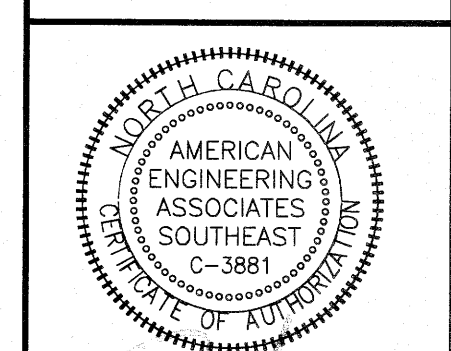
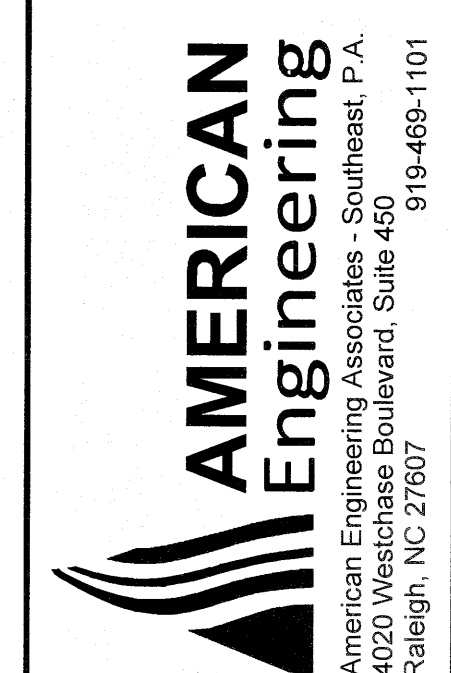
CHECKED BY: _____

DRAWN BY: _____

DATE: DECEMBER 21, 2020

SHEET TITLE: KALAS FALLS CIVIL DETAILS

SHEET NO.: CD2



NO.	DATE	REVISION

2: /s/ John R. Harman, Professional Engineer, License No. 9810, State of North Carolina
 1: /s/ John R. Harman, Professional Engineer, License No. 9810, State of North Carolina
 DATE: 12/21/2020

NO.	DATE	REVISION

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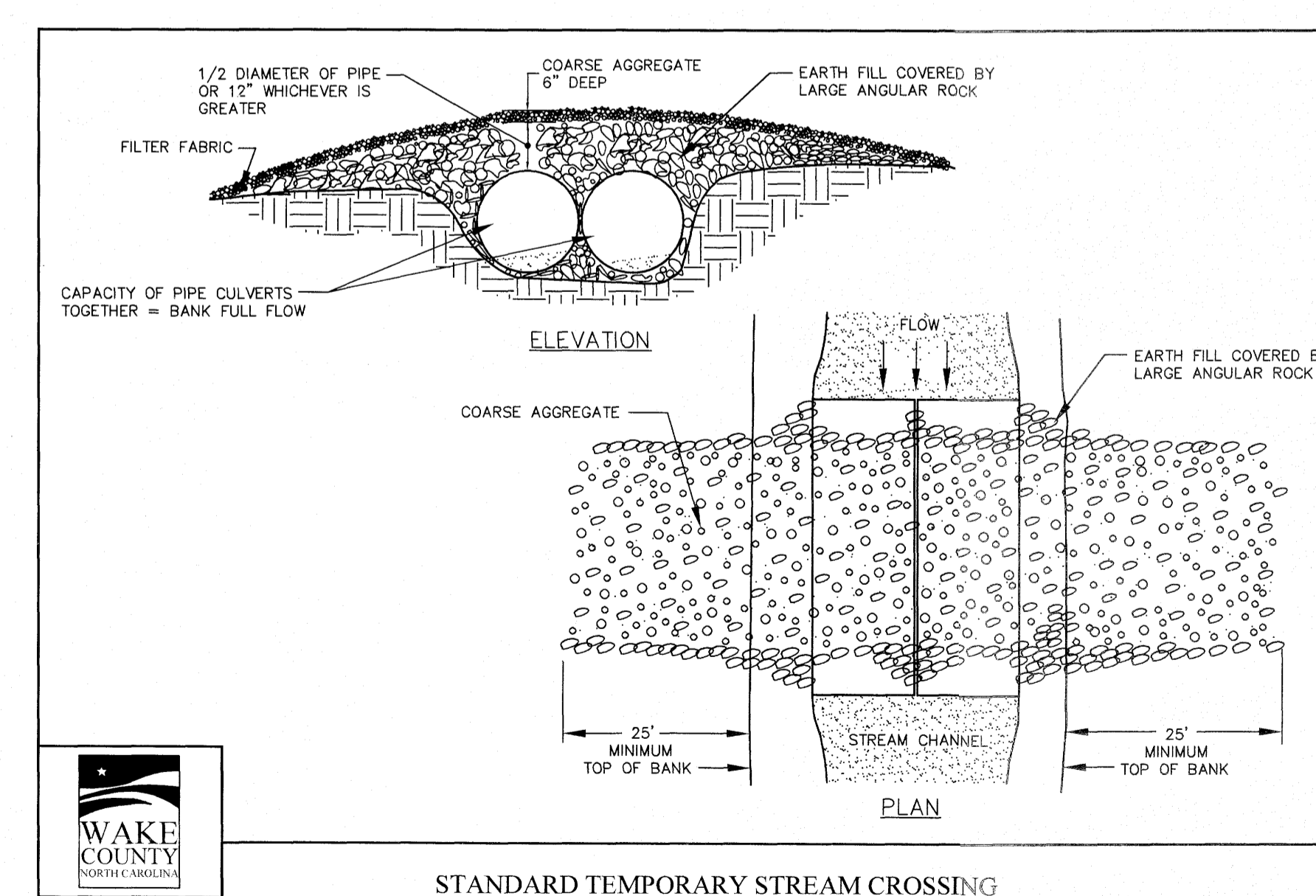
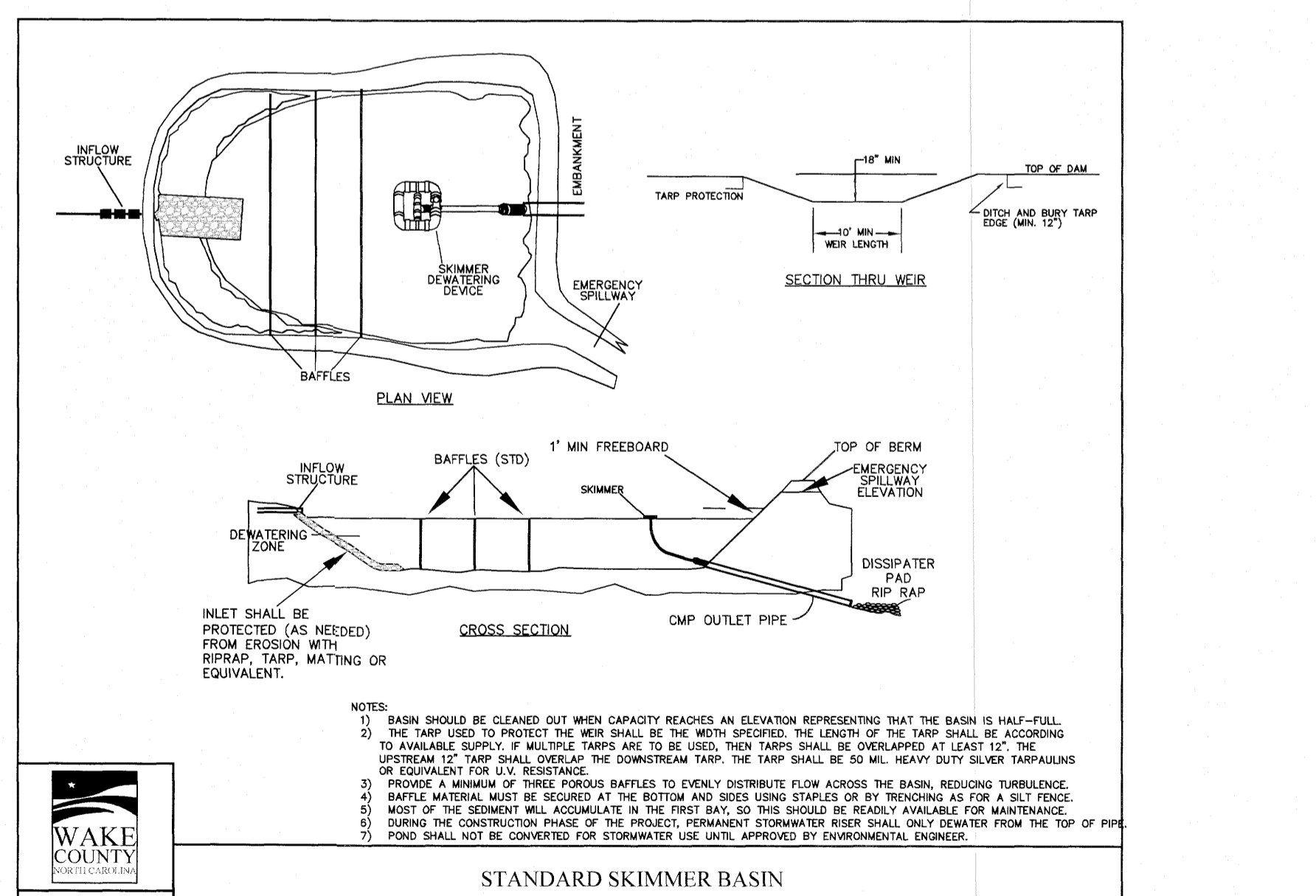
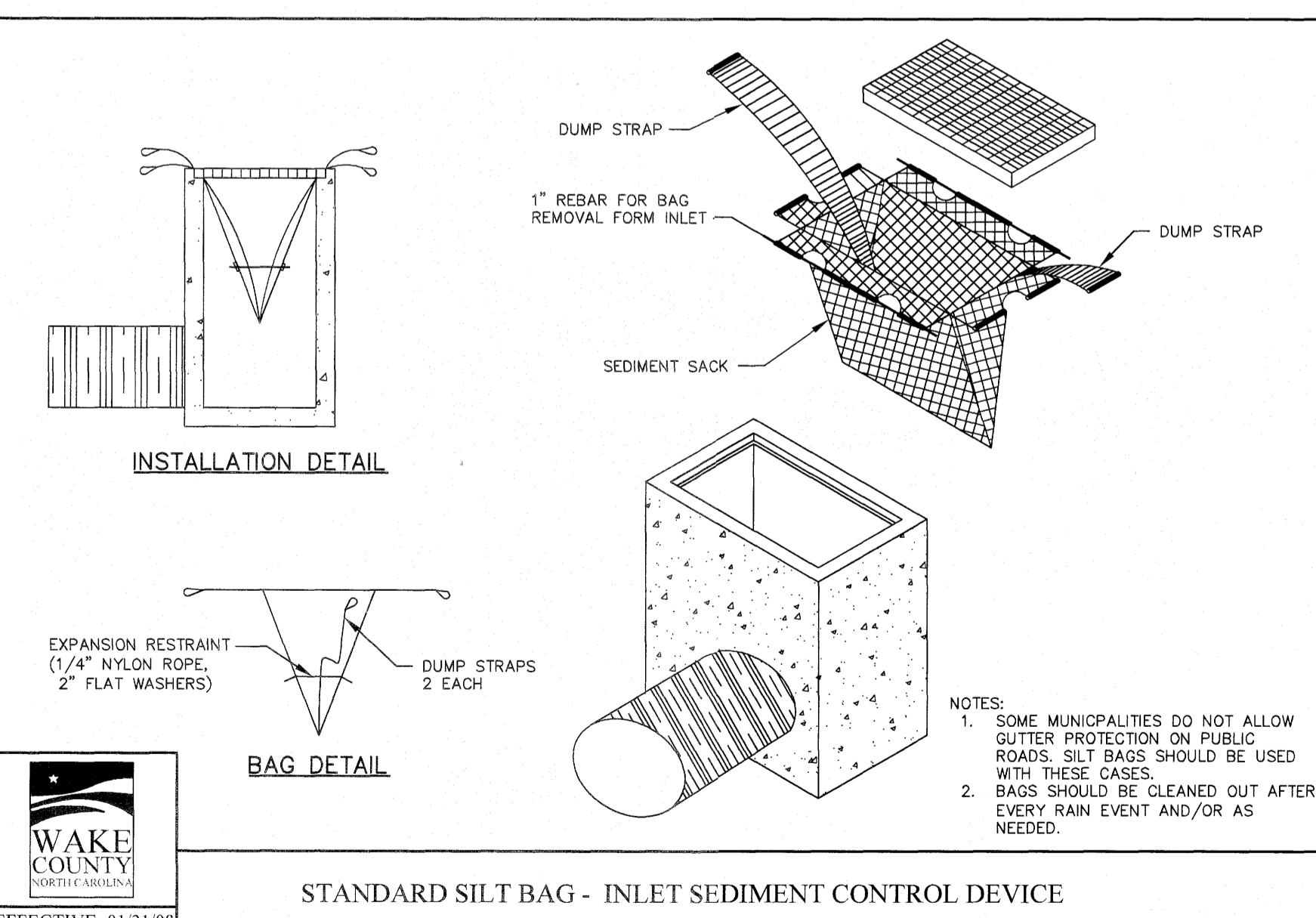
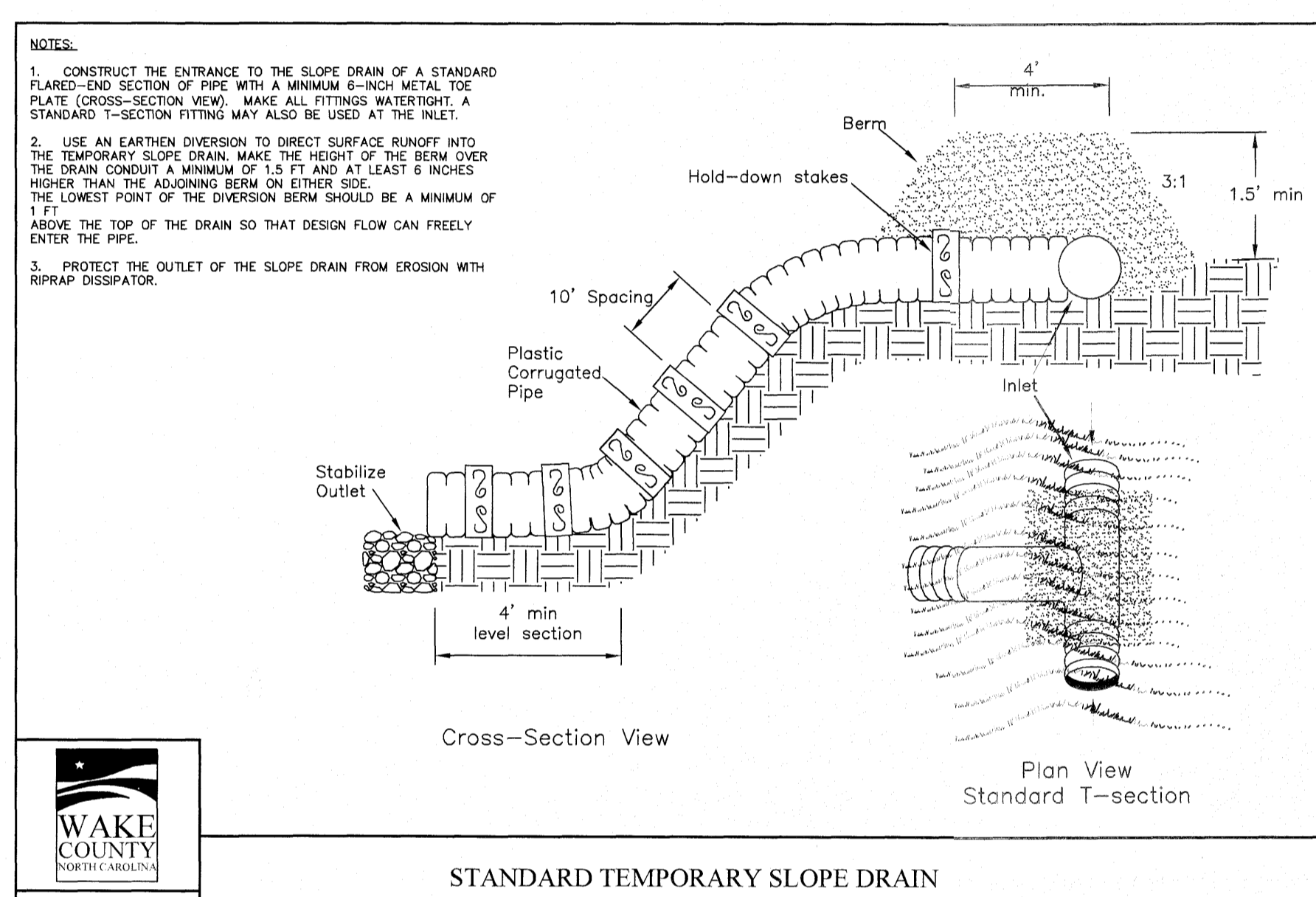
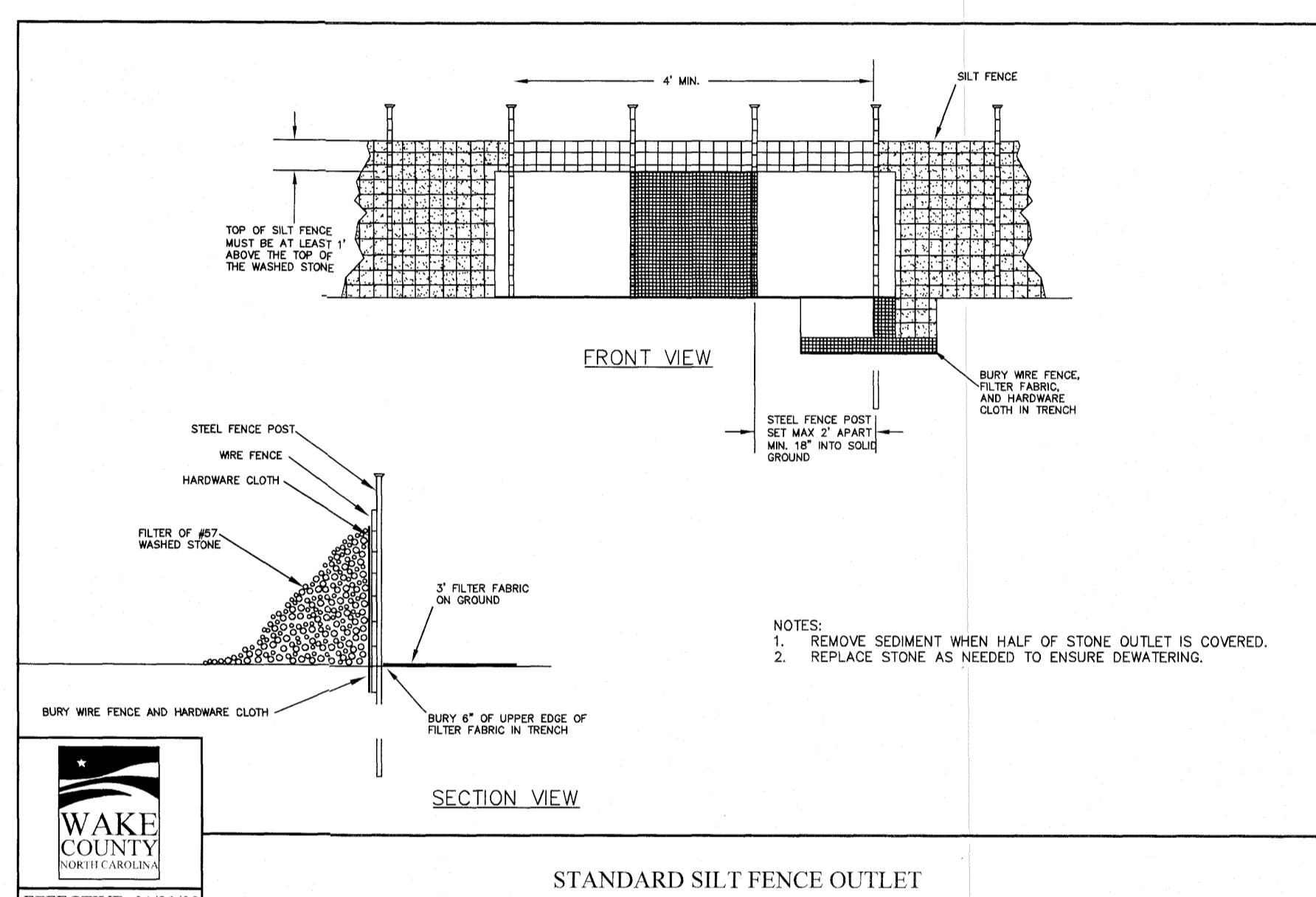
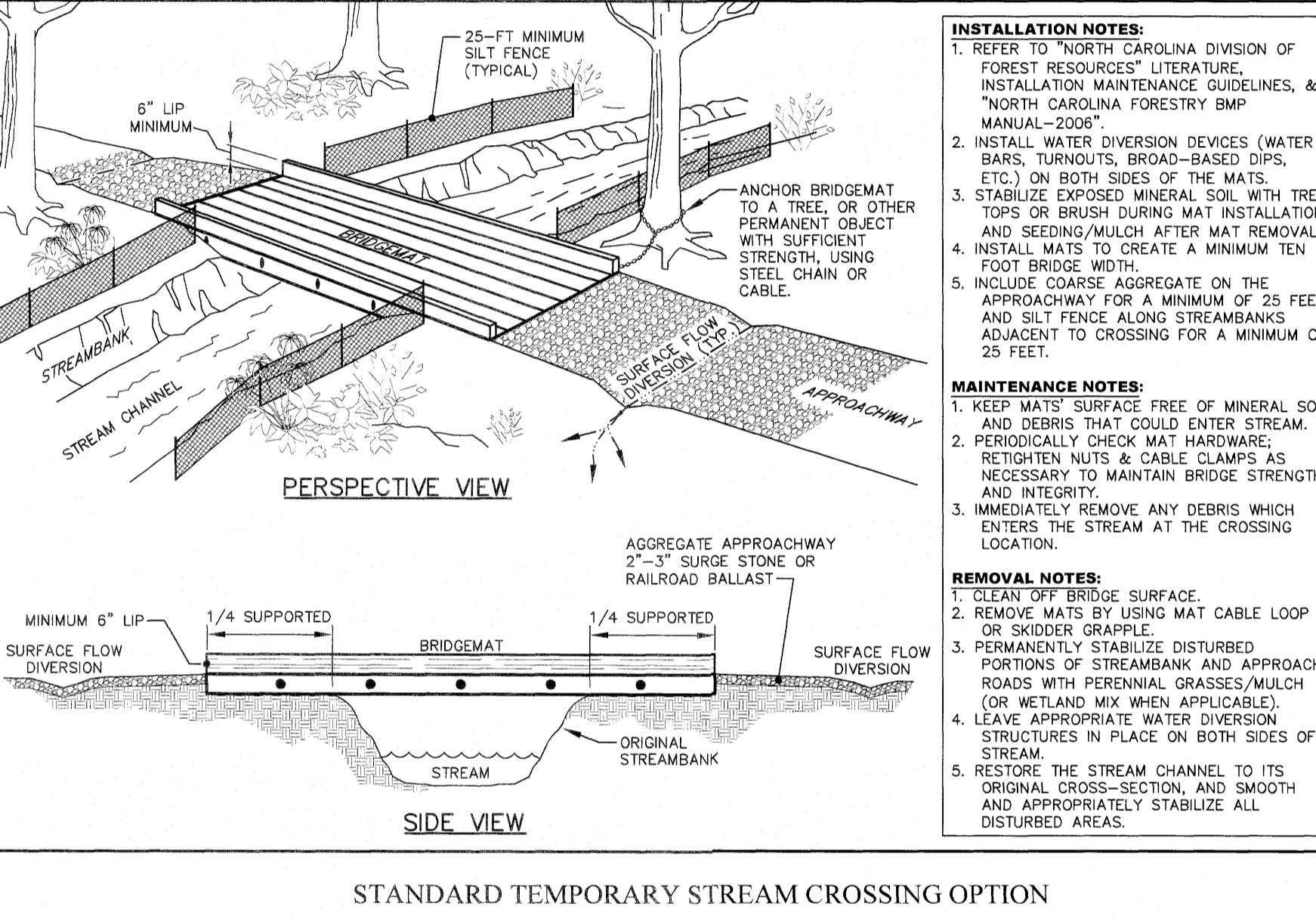
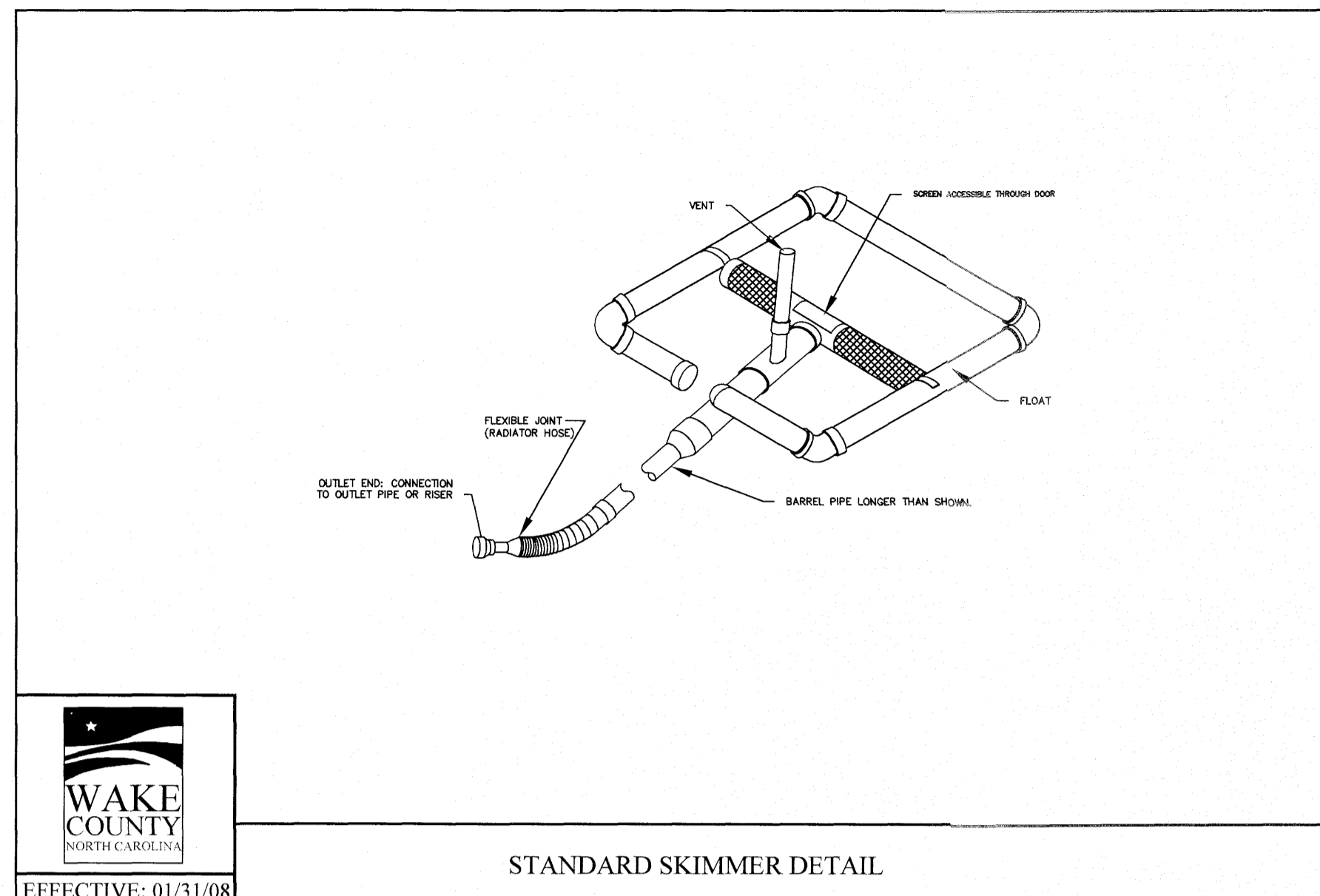
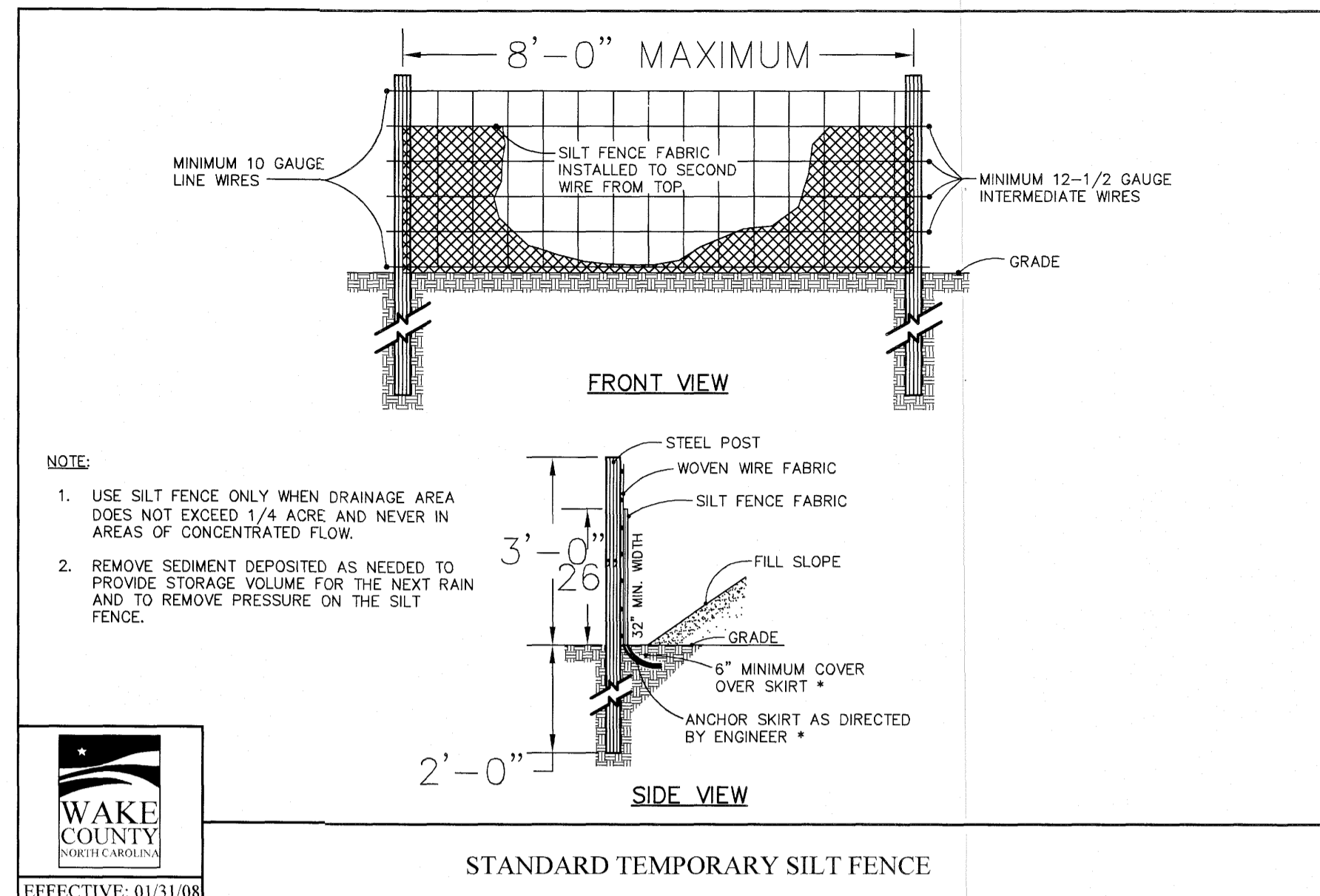
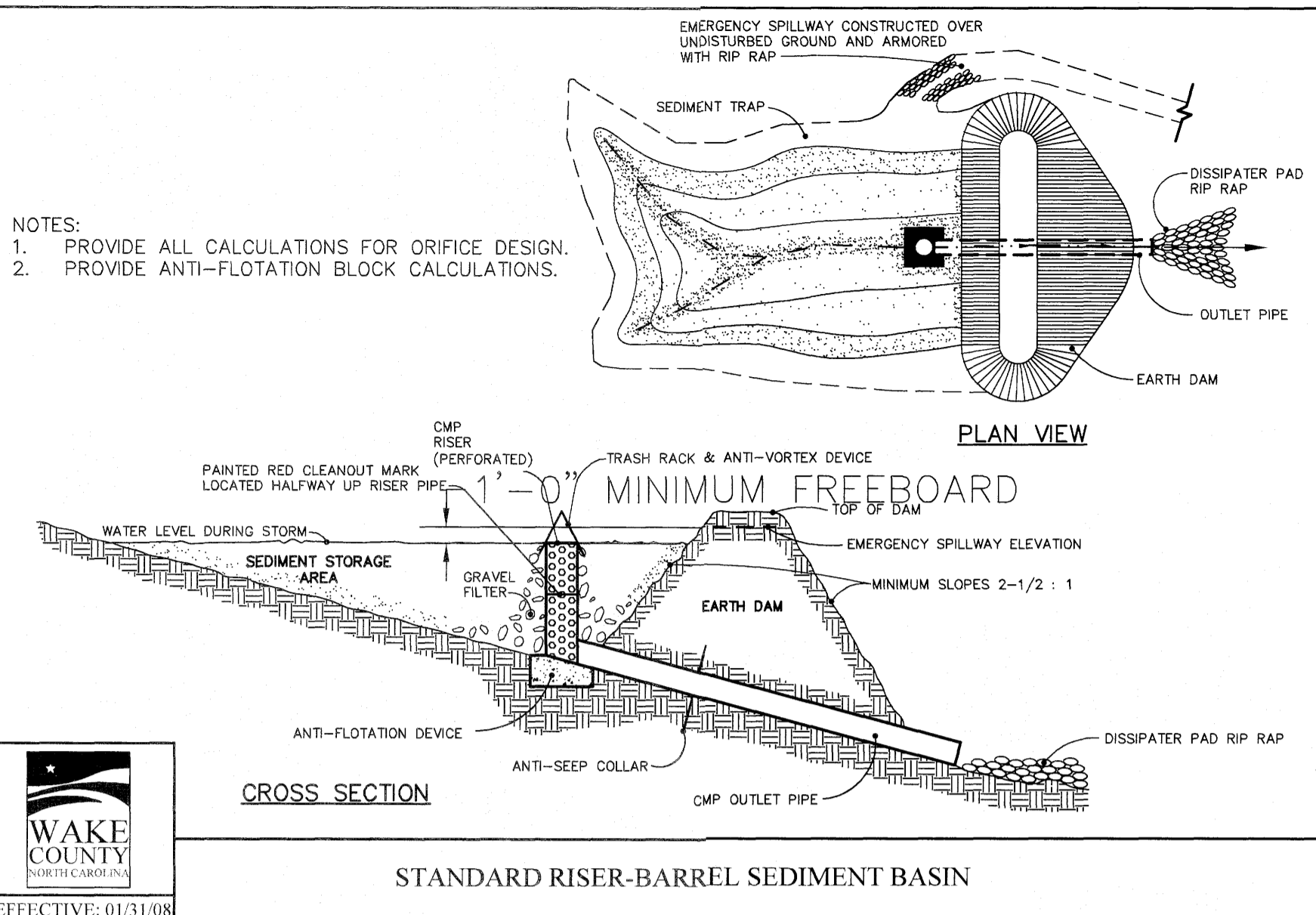
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**KALAS FALLS
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1832 ROLESVILLE ROAD
WAKE COUNTY, NC**

JOB NUMBER: 9900
CHECKED BY:
DRAWN BY:
DATE: DECEMBER 21, 2020
SHEET TITLE:

**KALAS FALLS
CIVIL DETAILS**

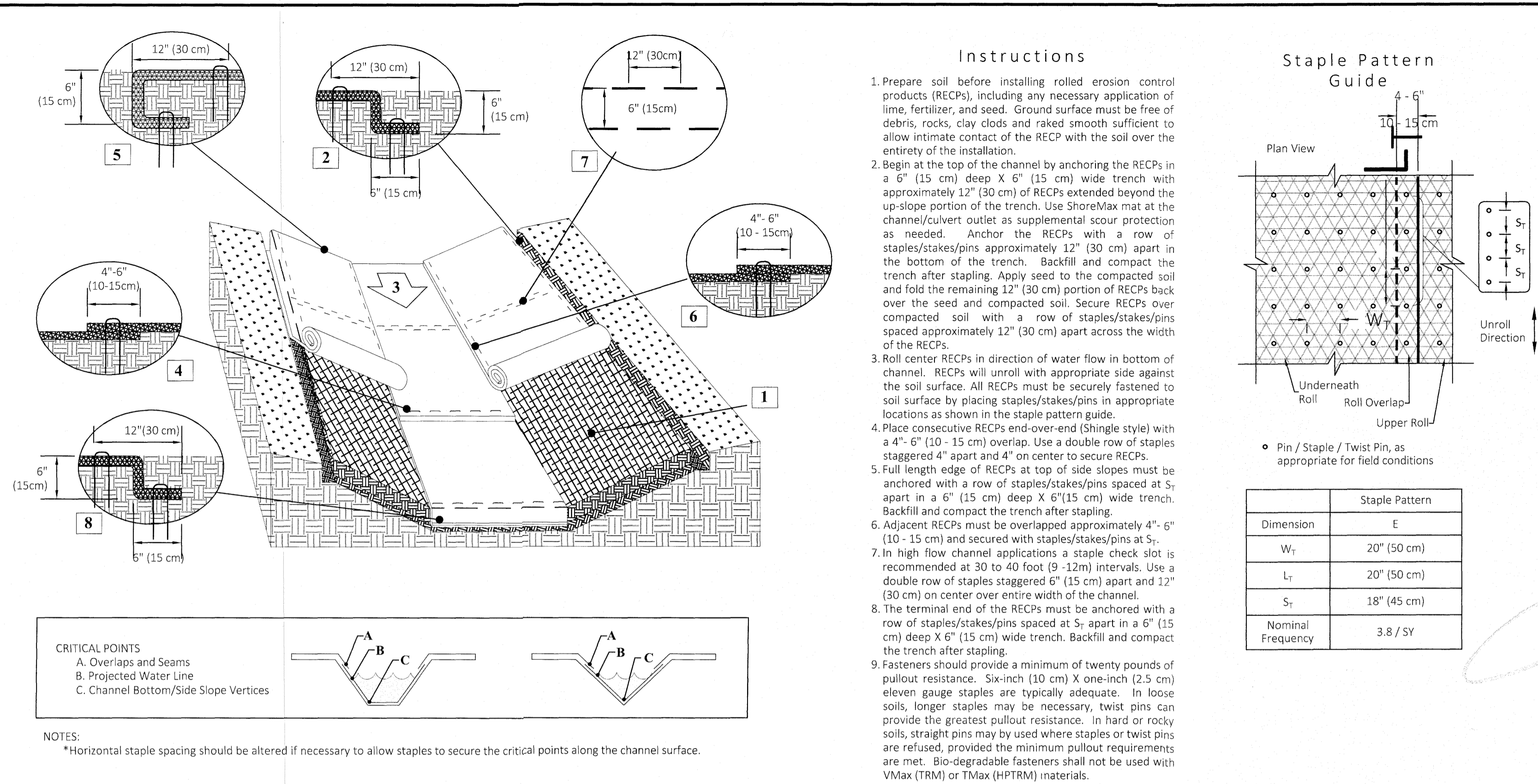
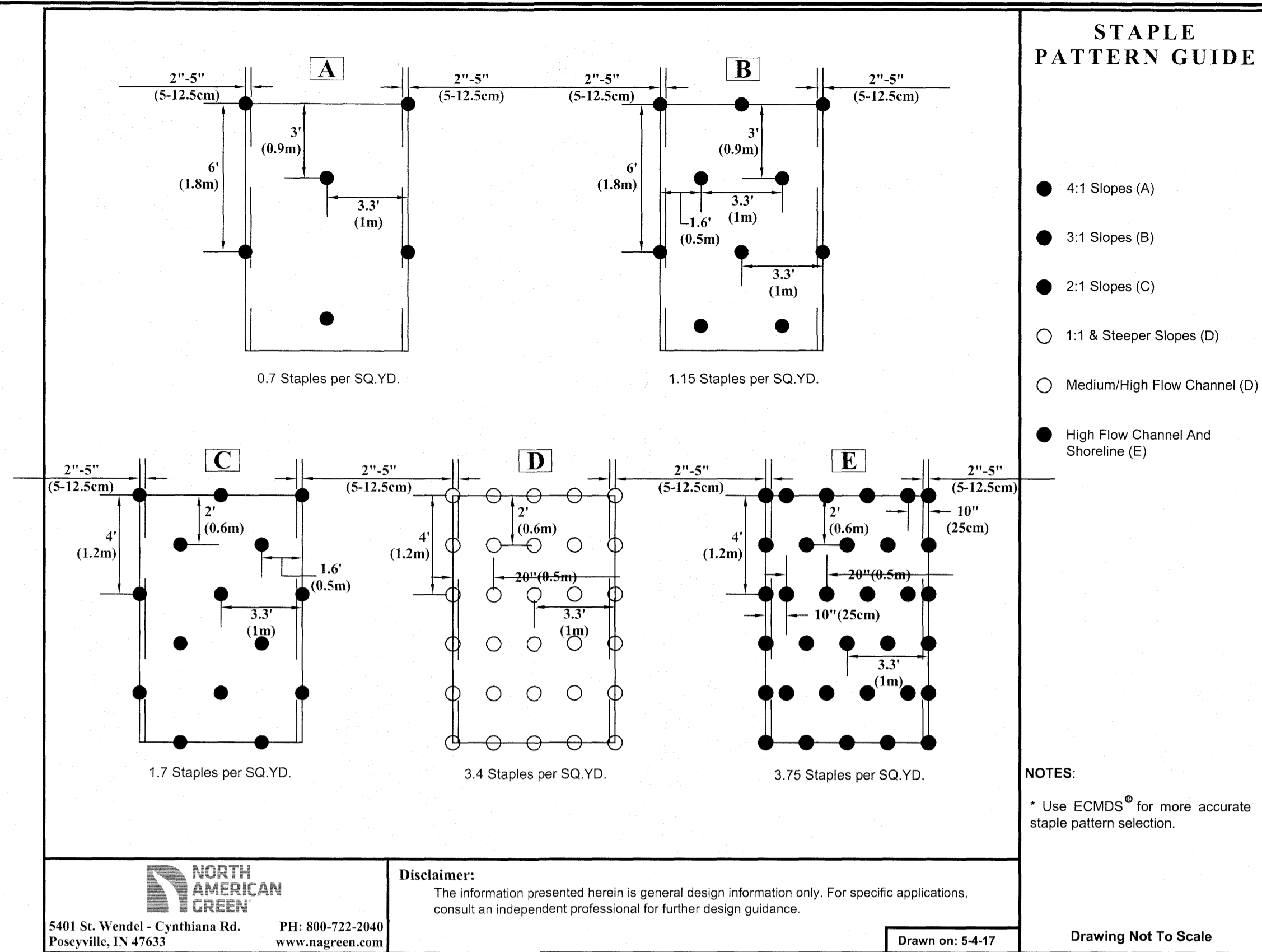
SHEET NO.:
CD3



SITE PERMITTING APPROVAL
Water and Sewer Permits (if applicable)
The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # S-4825
The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # W-3785
The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.
City of Raleigh Public Utilities Department Permit # _____

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.
City of Raleigh Development Approval
Raleigh Water Review Officer

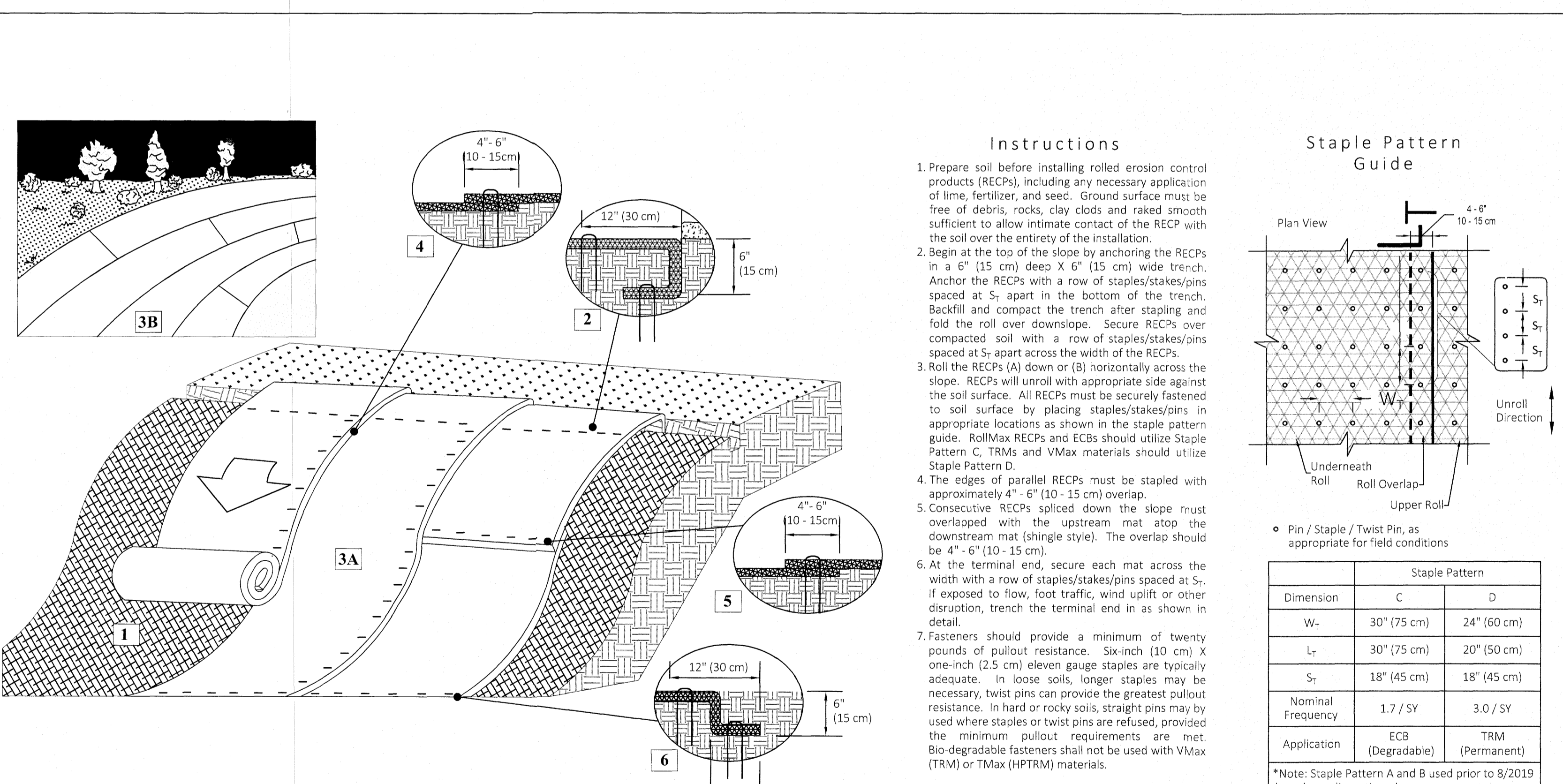
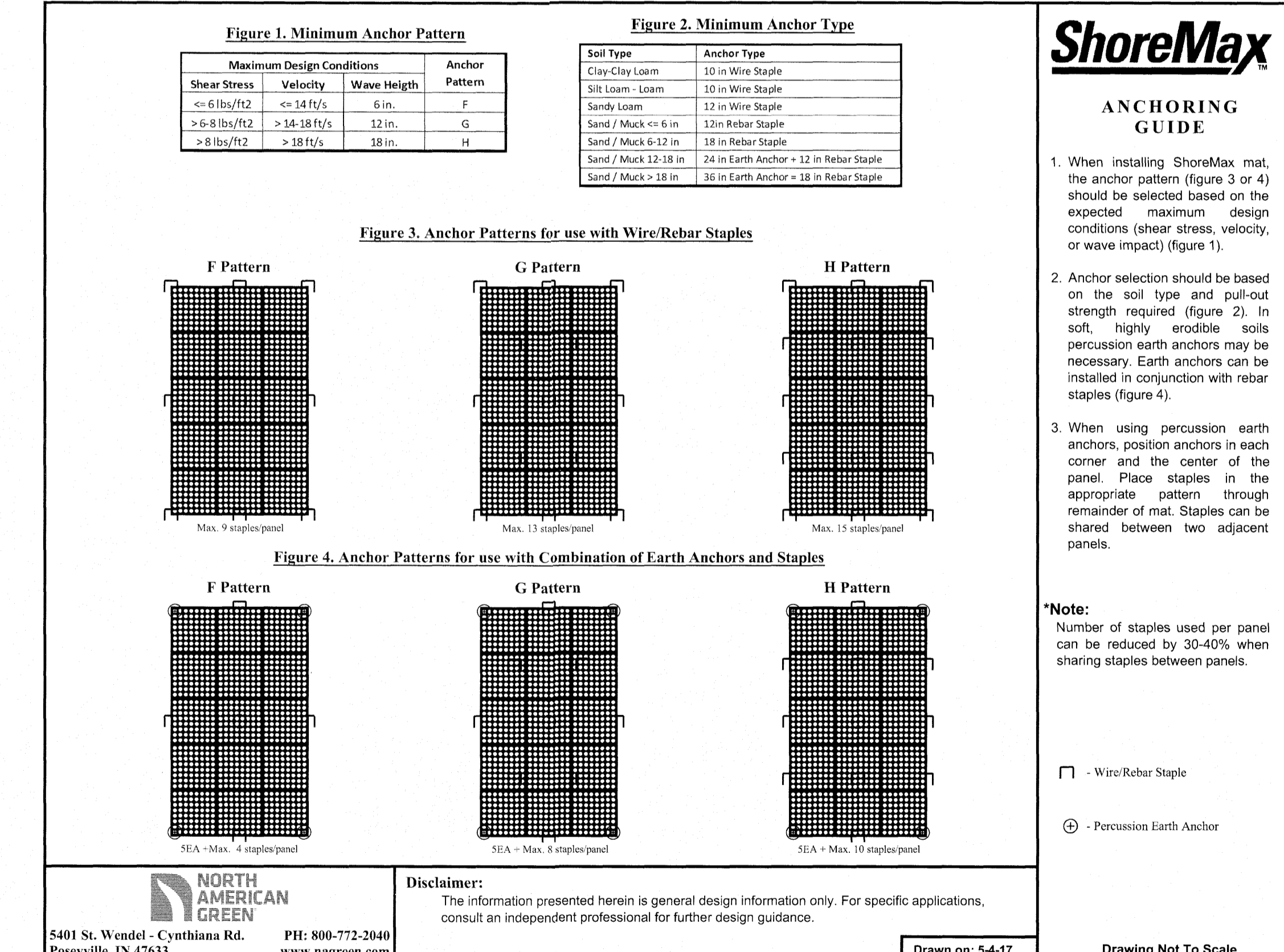
North Carolina 811
www.nc811.org
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm



AMERICAN ENGINEERING ASSOCIATES - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27667
919-469-1101

AMERICAN ENGINEERING ASSOCIATES - Southeast, P.A.
C-3881
STATE OF NORTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
EXPIRES 12/31/2024
9810
U.S. R. PARKER

DETAIL SELECTION ONLY



KALAS FALLS PHASE 2
1832 ROLESVILLE ROAD
WAKE COUNTY, NC

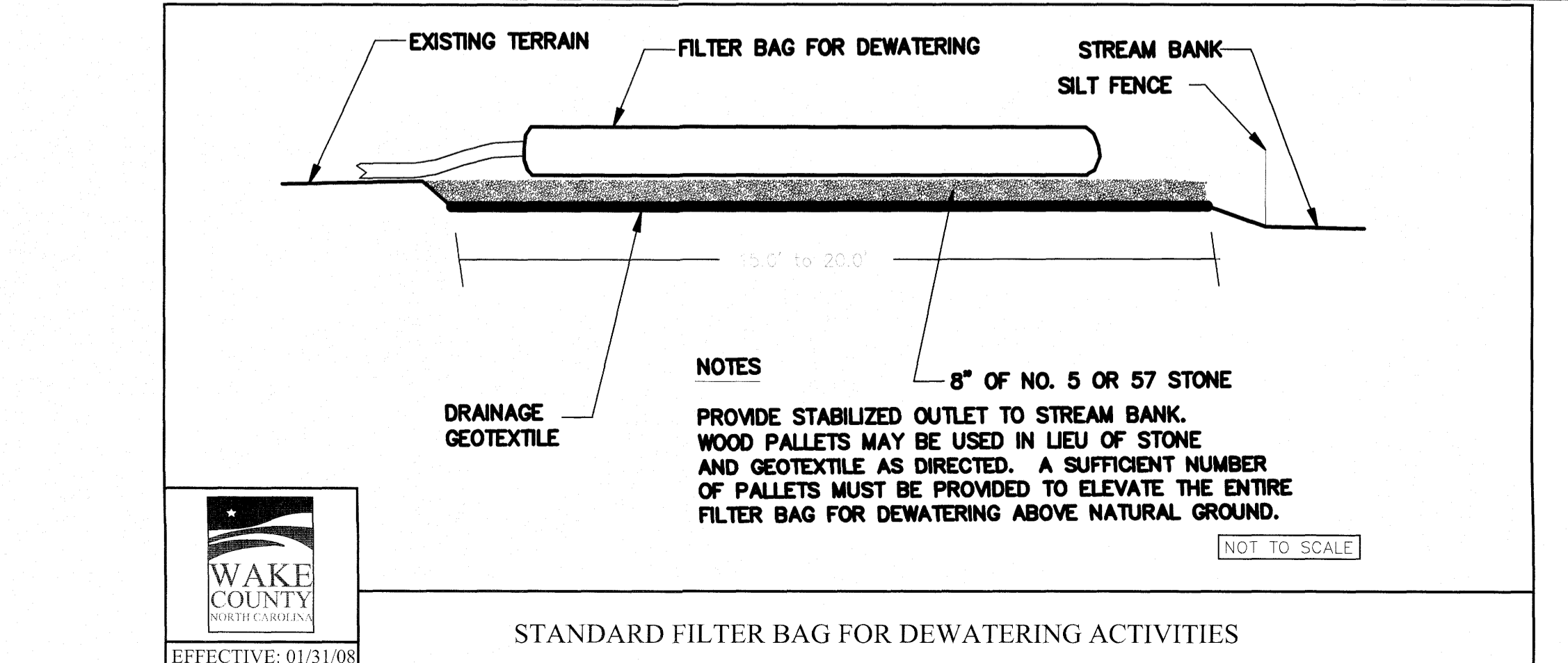
STIPULATION FOR REUSE
THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE, NAMED HEREON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED HEREON AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

REVISIONS:

NO.	DATE	DESCRIPTION

JOB NUMBER: 9900
CHECKED BY:
DRAWN BY:
DATE: DECEMBER 21, 2020
SHEET TITLE: KALAS FALLS CIVIL DETAILS
SHEET NO.: CD4

North Carolina 811
www.nc811.org
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-652-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm



SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # **S-4825**

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # **W-3785**

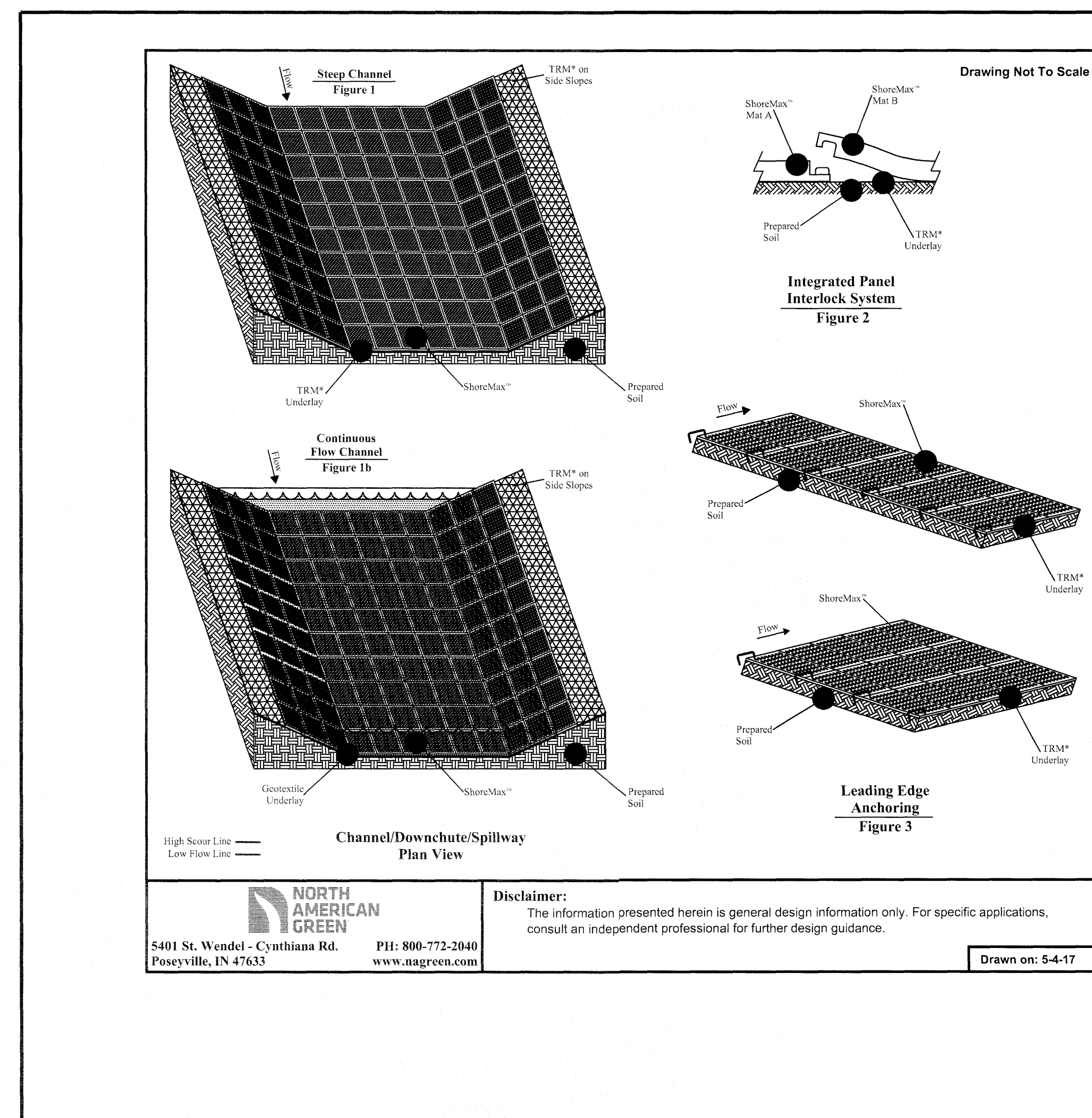
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City of Raleigh Public Utilities Department Permit # _____

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City of Raleigh Development Approval _____
Raleigh Water Review Officer



ShoreMax

STEEP CHANNEL/CHUTE/SPILLWAY DETAIL

* ShoreMax mats can be installed over a variety of underlayments including, soil, turf reinforcement mats (TRMs), geotextiles, and in some cases erosion control blankets (ECBs).

- Prepare soil before installing erosion control products, including any necessary application of lime, fertilizer, and seed (when installing TRM or ECB underlayment).
- Install turf reinforcement mat (TRM) over prepared soils according to manufacturer's recommendations.
- Place ShoreMax mat in the bottom of the channel over the installed TRM (figure 1). The ShoreMax mat should be installed up to the appropriate elevation on the side slope as determined by the engineer. When using multiple panels, connect the panels using the Integrated Panel Interlock System (figure 2). ShoreMax mat can be laid in either direction.
- For channels carrying continuous water flows, an appropriate geotextile should be placed under the ShoreMax mat for submerged applications (figure 1b).
- Place staples/anchors in the appropriate pattern. Perimeter staples can be shared between two adjacent panels. In soft or highly erodible soils, percussion earth anchors may be required. View ShoreMax Anchoring Guide, for additional details.
- At beginning of channel and areas where significant concentrated flows are directed onto the ShoreMax mat, place 1 staple/pin per linear foot along the leading edge of the ShoreMax system, resulting in 1 staple/pin on each corner and gridline (figure 3).

Channel/Downchute/Spillway Plan View

Disclaimers: The information presented herein is general design information only. For specific applications, consult an independent professional for further design guidance.

North American Green
5401 St. Wendel - Cynthia Rd. PO Box 800-772-2040
Poseyville, IN 47633 www.nagreen.com

Drawn on: 5-4-17

PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual day rainfall information is available, record the cumulative rain measurement for those unattended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-measuring device approved by the Division.
(2) E&S Measures	At least once per 7 calendar days and within 24 hours of a rain event > 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDOs)	At least once per 7 calendar days and within 24 hours of a rain event > 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event > 1.0 inch in 24 hours	1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event > 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office (see Part III, Section C, item 2)(a) of this permit.)
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&S measures, clearing and grubbing, installation of storm drainage facilities, completion of all land disturbing activity, construction or redevelopment, permanent ground cover), 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&S Plan Documentation

The approved E&S plan as well as any approved deviation shall be kept on the site. The approved E&S plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&S plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Documentation Requirements
(a) Each E&S measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&S plan.	Initial and date a copy of each E&S measure on a copy of the approved E&S plan or complete, date and sign an inspection report that lists each E&S measure shown on the approved E&S plan. This documentation is required upon the initial installation of the E&S measures or if the E&S measures are modified after installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&S plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&S plan.	Initial and date a copy of the approved E&S plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&S measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&S measures.	Initial and date a copy of the approved E&S plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation to be Kept on Site

In addition to the E&S plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical.

- This General Permit as well as the Certificate of Coverage, after it is received.
- Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

- Visible sediment deposition in a stream or wetland.
- Oil spills if:
 - They are 25 gallons or more,
 - They are less than 25 gallons but cannot be cleaned up within 24 hours,
 - They cause sheen on surface waters (regardless of volume), or
 - They are within 100 feet of surface waters (regardless of volume).
- Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.
- Anticipated bypasses and unanticipated bypasses.
- Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	<ul style="list-style-type: none"> Within 24 hours, an oral or electronic notification. Within 7 calendar days, a report that contains a description of the sediment and actions taken to address the cause of the deposition. If the stream is named on the NC 303(b) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per item 1(b)-(c) above	<ul style="list-style-type: none"> Within 24 hours, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses (40 CFR 122.41(d)(7))	<ul style="list-style-type: none"> A report at least ten days before the date of the bypass, if possible. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses (40 CFR 122.41(d)(8))	<ul style="list-style-type: none"> Within 24 hours, an oral or electronic notification. Within 7 calendar days, a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment (40 CFR 122.41(j)(7))	<ul style="list-style-type: none"> Within 24 hours, an oral or electronic notification. Within 7 calendar days, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. (40 CFR 122.41(j)(6)). Division staff may waive the requirement for a written report on a case-by-case basis.

AMERICAN ENGINEERING ASSOCIATES - SOUTHEAST, P.A.

American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-468-1101

DETAIL SELECTION ONLY

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

Site Area Description	Required Ground Stabilization Timeframes	
	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed. - 7 days for slopes greater than 50' in length and with slopes steeper than 4:1 - 7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones - 10 days for Falls Lake Watershed
(d) Slopes 3:1 to 4:1	14	- 7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones - 10 days for Falls Lake Watershed unless there is zero slope
(e) Areas with slopes flatter than 4:1	14	- 7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones - 10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

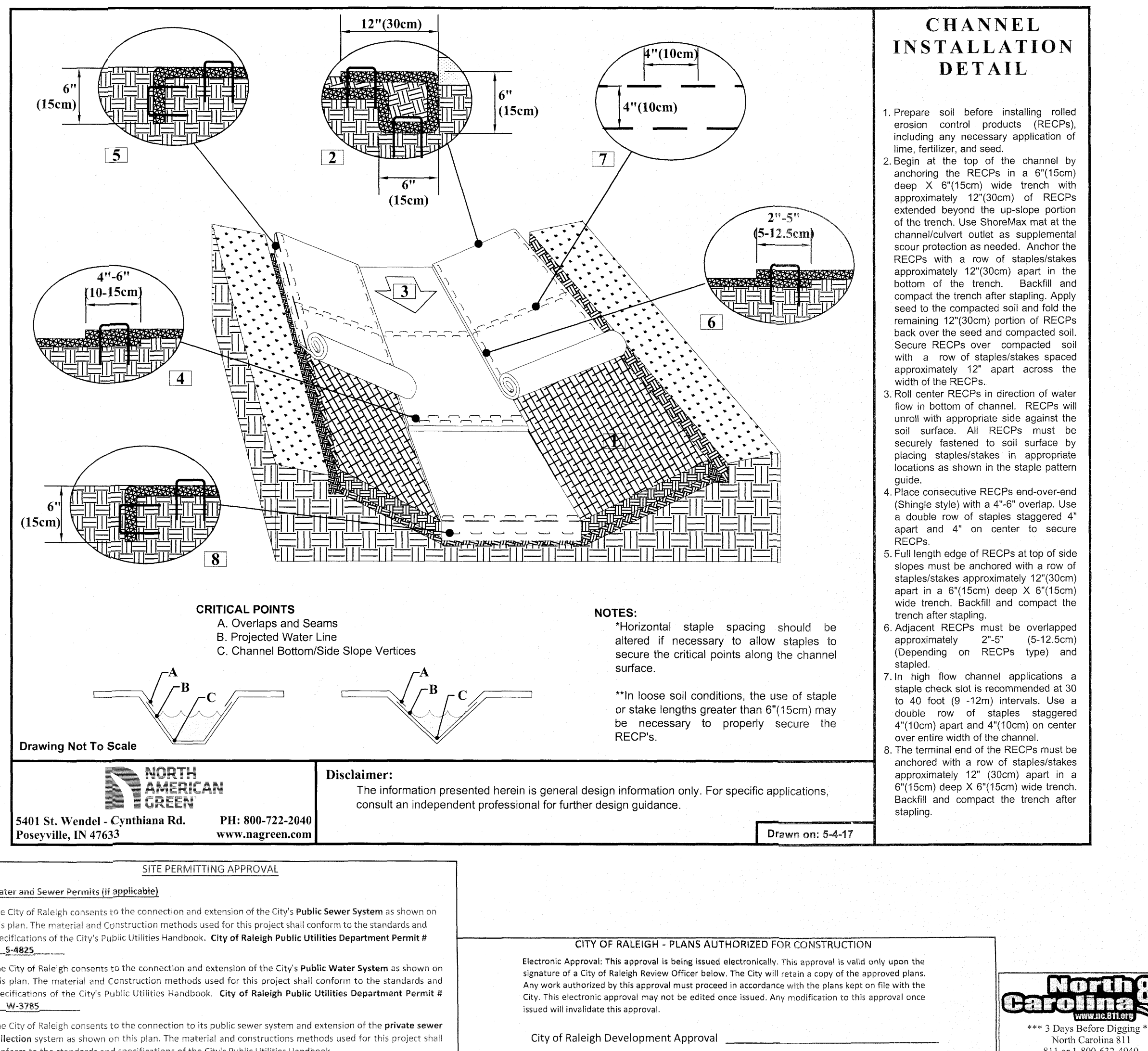
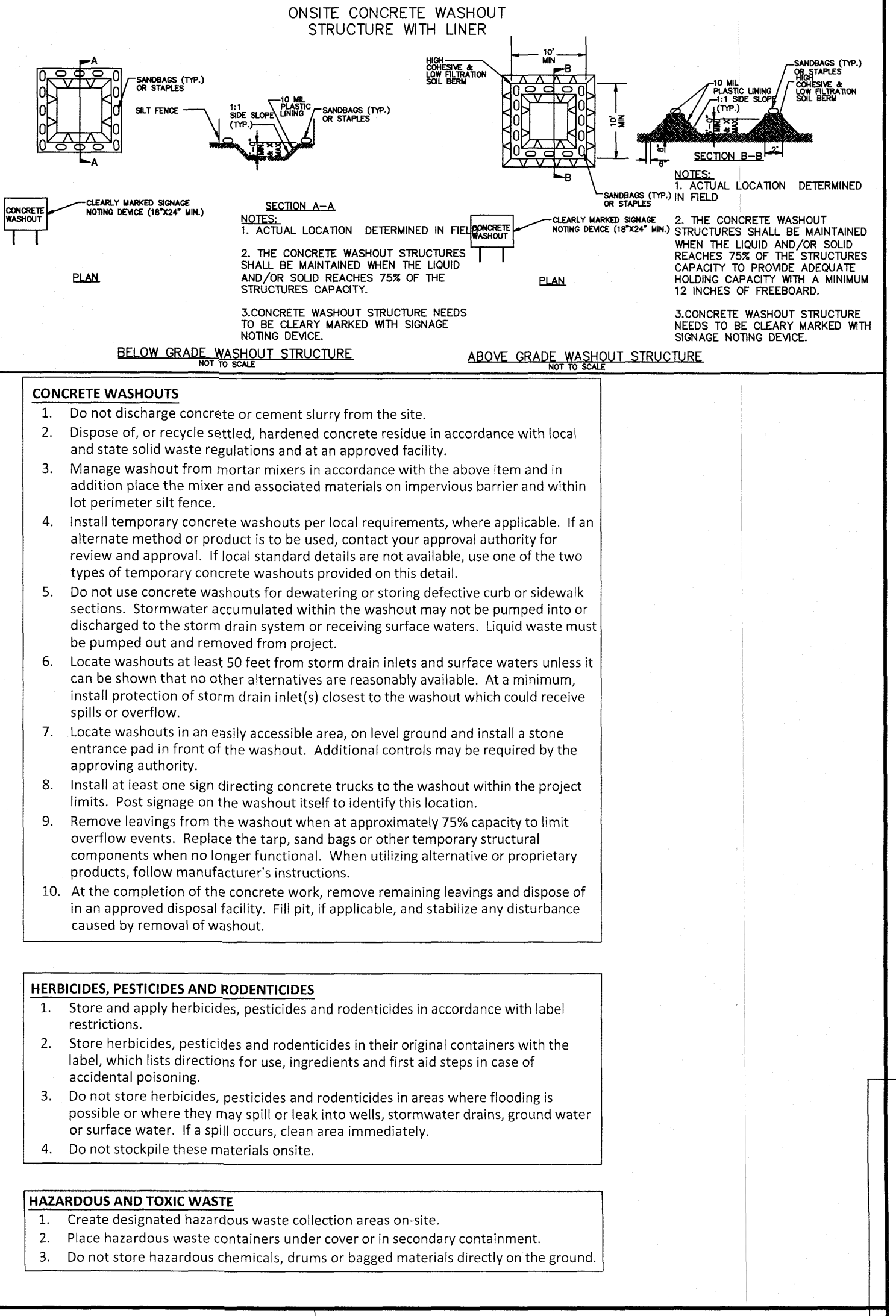
GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
<ul style="list-style-type: none"> Temporary grass seed covered with straw or other mulches and tackifiers Hydroseeding Roller erosion control products with or without temporary grass seed Appropriately applied straw or other mulch Plastic sheeting 	<ul style="list-style-type: none"> Permanent grass seed covered with straw or other mulches and tackifiers Geotextile fabrics such as permanent soil reinforcement matting Hydroseeding Shrubs or other permanent plantings covered with mulch Uniform and evenly distributed ground cover sufficient to restrain erosion Structural methods such as concrete, asphalt or retaining walls Roller erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

- Select flocculants that are appropriate for the soils being exposed during construction, selecting from the NC DWR List of Approved PAMS/Flocculants.
- Apply flocculants at or before the inlets and Sediment Control Measures.
- Apply flocculants at the concentrations specified in the NC DWR List of Approved PAMS/Flocculants and in accordance with the manufacturer's instructions.
- Provide ponding area for containment of treated Stormwater before discharging offsite.
- Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.



KALAS FALLS PHASE 2

1832 ROLESVILLE ROAD
WAKE COUNTY, NC

NO. DATE

REVISION:

NO.	DATE

STIPULATION FOR REUSE

THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE, NAMED HEREON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HEREON, AND IT IS NOT SUITABLE FOR OR AT A LATER TIME USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

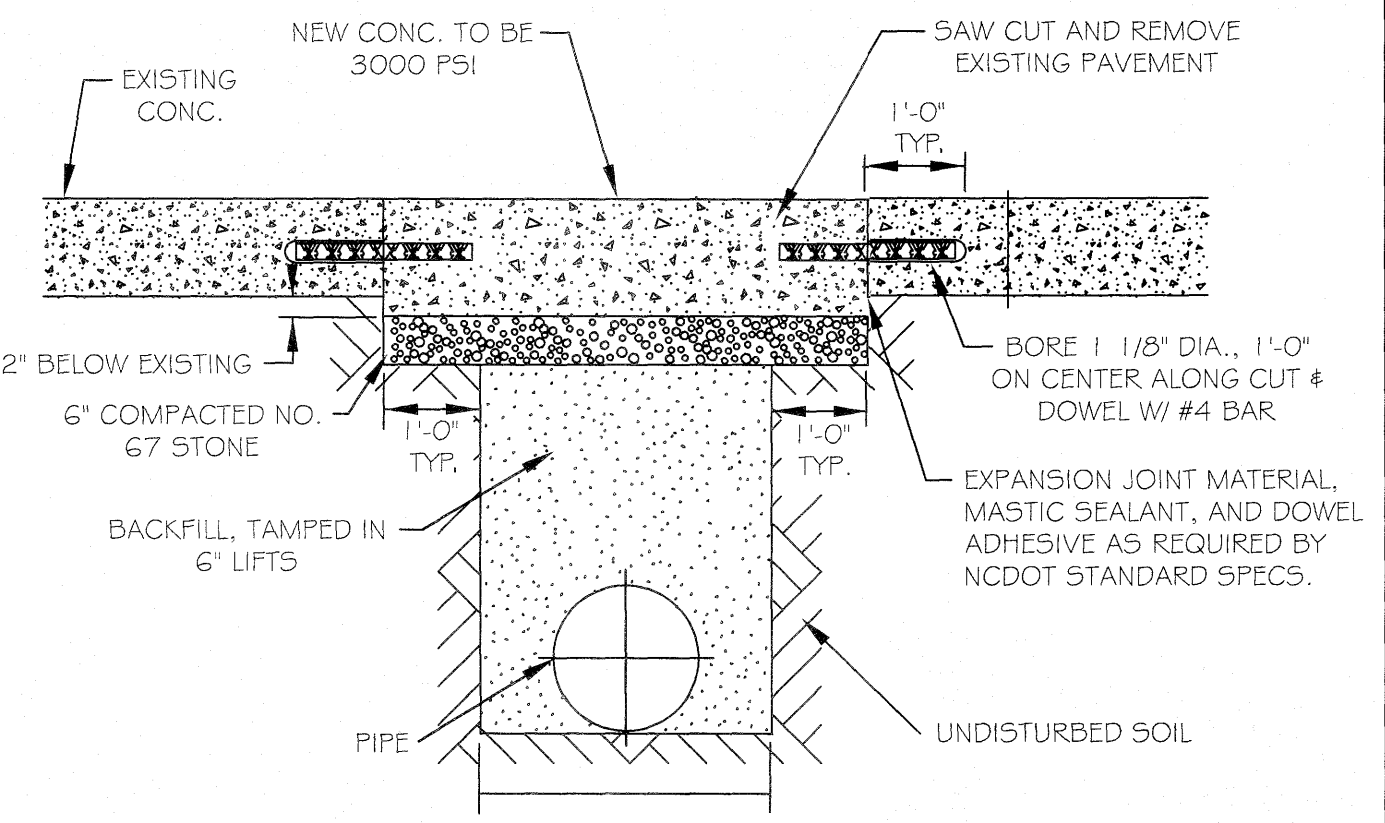
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KALAS FALLS CIVIL DETAILS

SHEET NO.: CD5

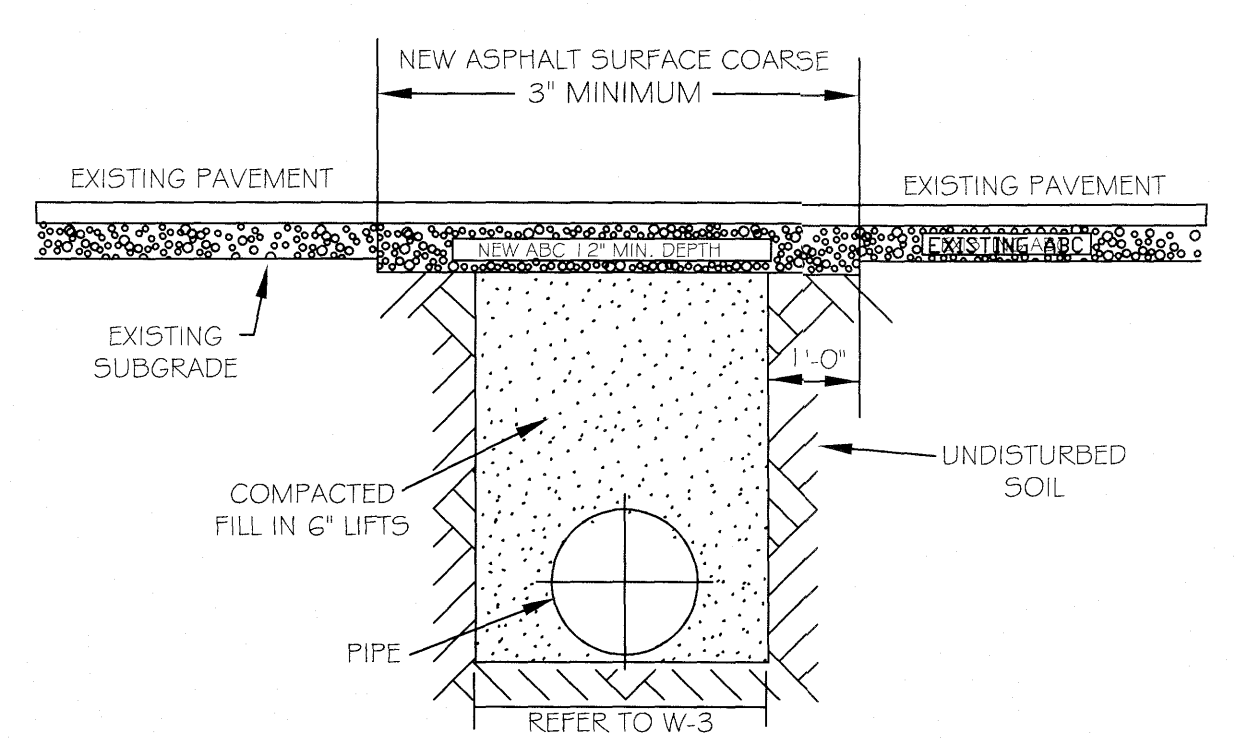
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City of Raleigh Development Approval
Raleigh Water Review Officer



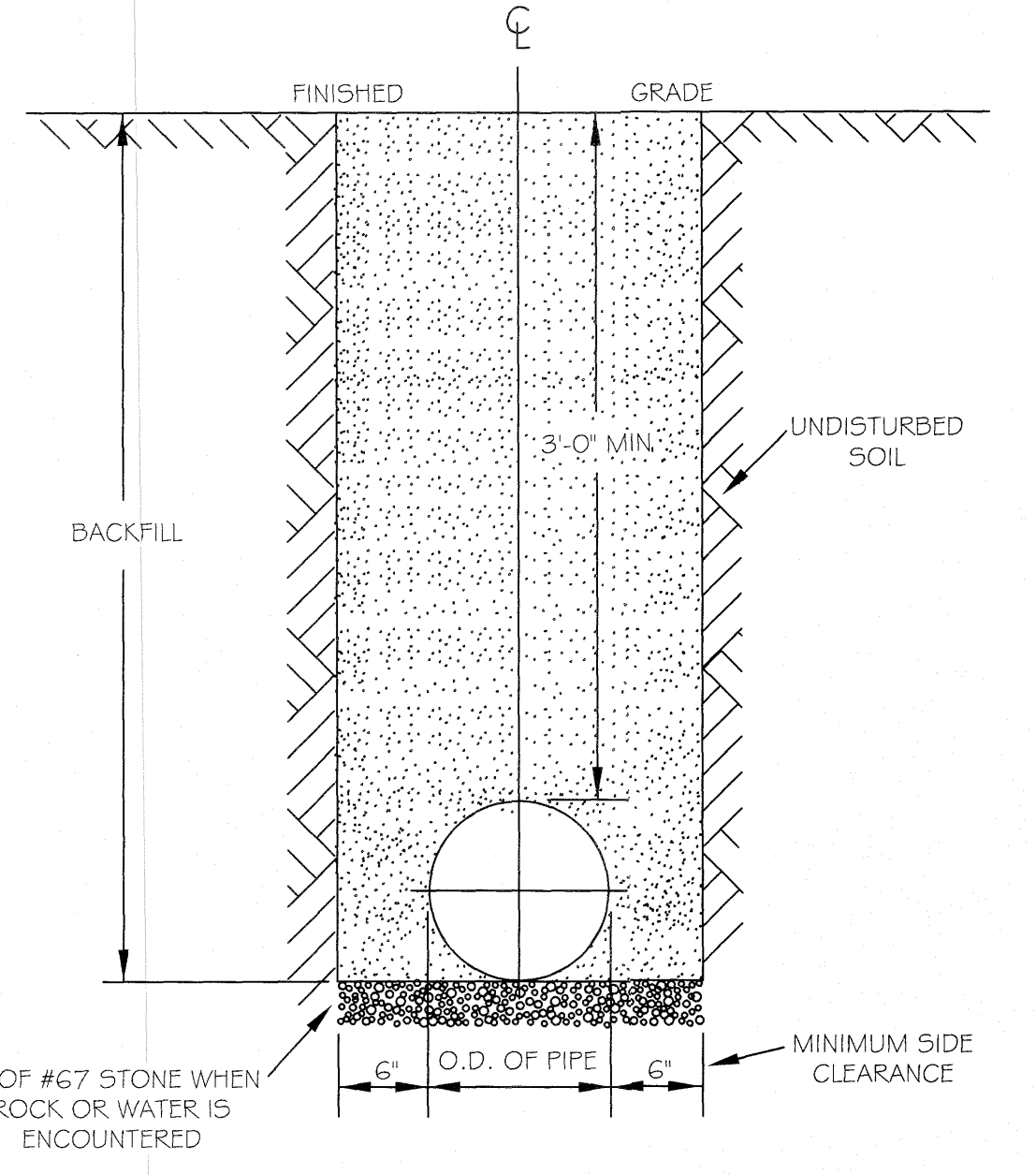
NOTES:
 1. SEE CITY OF RALEIGH STANDARDS FOR TRENCHES AND PIPE BEDDING W-3 FOR ADDITIONAL DETAILS.
 2. PAVEMENT CUTS WITHIN NCDOT ROW SHALL CONFORM TO THE APPROVED ON SITE ENCROACHMENT PERMIT.
 3. THE PAVEMENT CUT SHALL BE DEFINED BY A STRAIGHT EDGE AND CUT WITH AN APPROVED SAW CUT MACHINE.
 4. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT. 5. THE FINAL 1" OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY NCDOT.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
STANDARD CONCRETE PAVEMENT PATCH DETAIL					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-1	RRH	3-31-00	A.B.B.	10-29-10	
	A.B.B.	2-8-05	MAB	10-31-13	



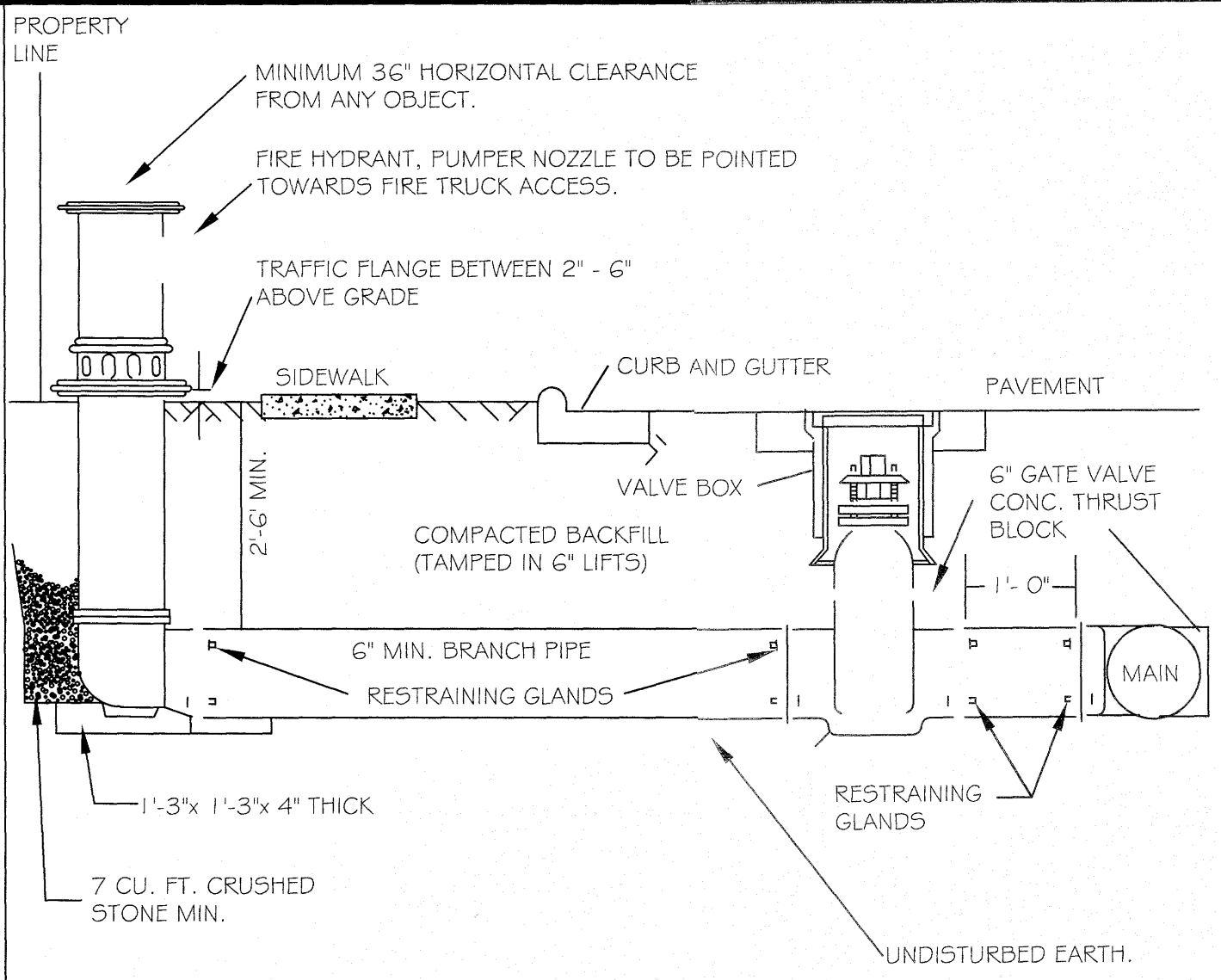
NOTES:
 1. THE PAVEMENT CUT SHALL BE DEFINED BY A STRAIGHT EDGE AND CUT WITH AN APPROPRIATE SAW CUT MACHINE.
 2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
 3. THE FINAL 1" OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY NCDOT.
 4. THE ENTIRE THICKNESS/ VERTICAL EDGE OF CUT SHALL BE TACKED.
 5. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 3" THICK.
 6. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH LEVEL PATCH.
 7. REFER TO CITY OF RALEIGH STANDARDS FOR TRENCHES AND PIPE BEDDING, W-3, FOR ADDITIONAL DETAILS.
 8. NO HAND PATCHING ALLOWED.
 9. PAVEMENT CUTS WITHIN NCDOT ROW SHALL CONFORM TO THE APPROVED ON SITE ENCROACHMENT PERMIT.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
STANDARD ASPHALT PAVEMENT PATCH DETAIL					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-2	RRH	3-31-00	A.B.B.	4-16-04	
	D.W.C.	11-1-99	J.P.S.	10-29-10	



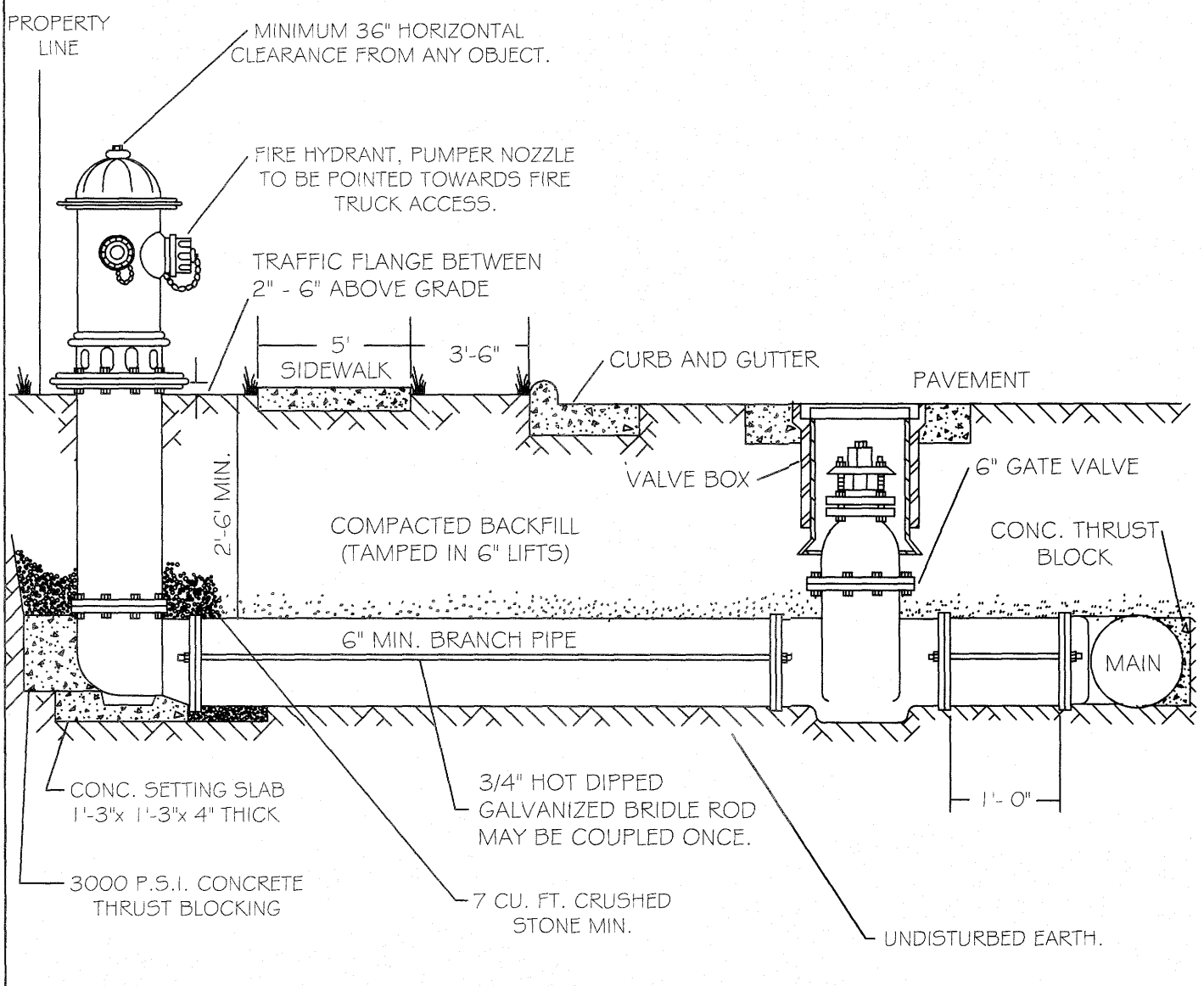
NOTES:
 1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
 2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN BACKFILL.
 3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
 4. BACKFILL SHALL BE TAMPED IN 6" LIFTS.
 5. ACHIEVE 95% COMPACTION IN BACKFILL.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-3	D.W.C.	9-3-99	ABB	2-15-05	
	RRH	3-31-00	J.P.S.	10-29-10	



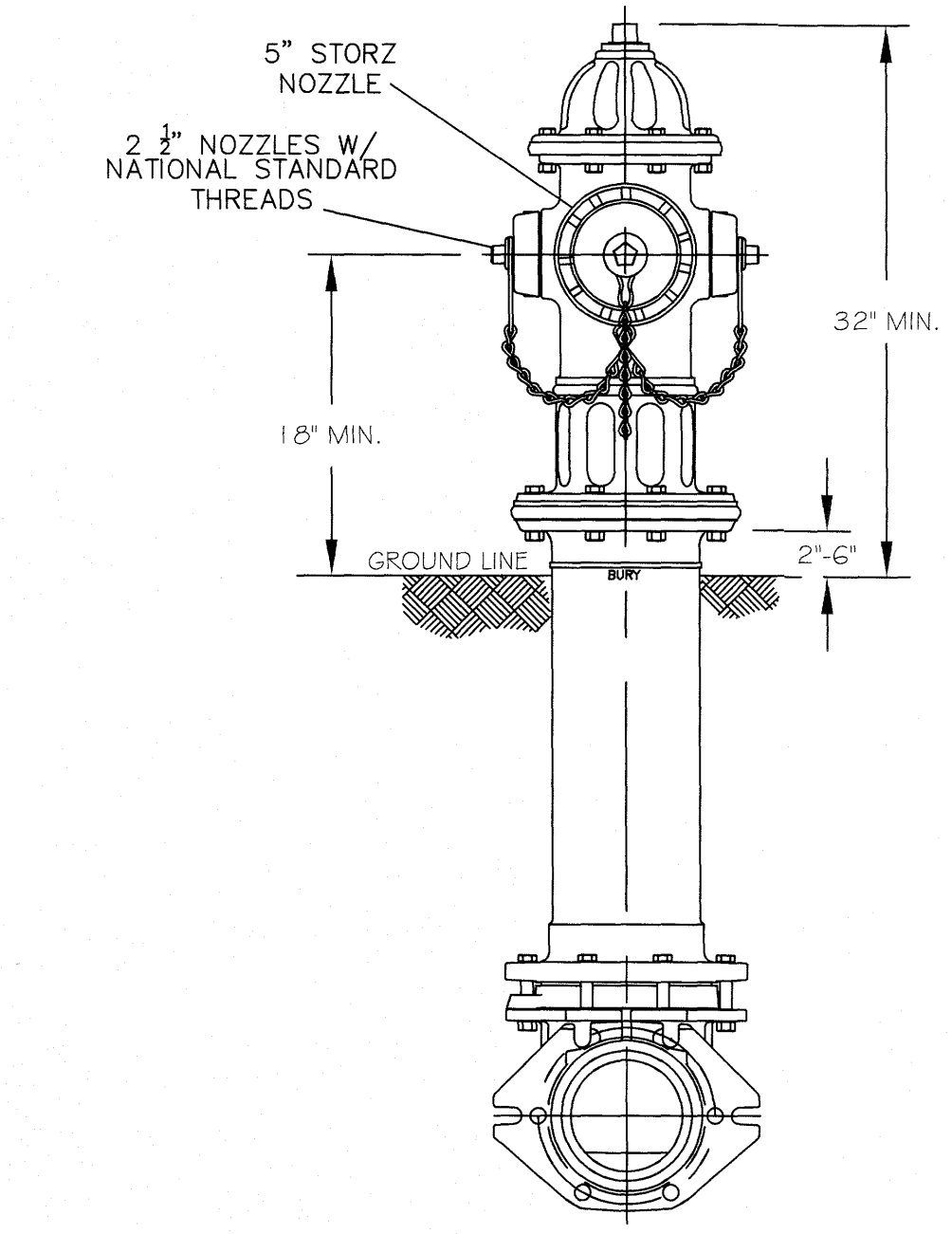
NOTES:
 1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M&H, WATERLOUS, GLOW, EAST JORDAN IRON WORKS, OR US PIPE.
 2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96.
 3. 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT.
 4. STEEL RODS AND BOLTS SHALL BE 3" HOT DIPPED GALVANIZED.
 5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION. RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
 FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
STANDARD FIRE HYDRANT INSTALLATION DETAIL					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-4	ABB	4-6-04	PAP	2/17/09	
	DHL	2/14/08			



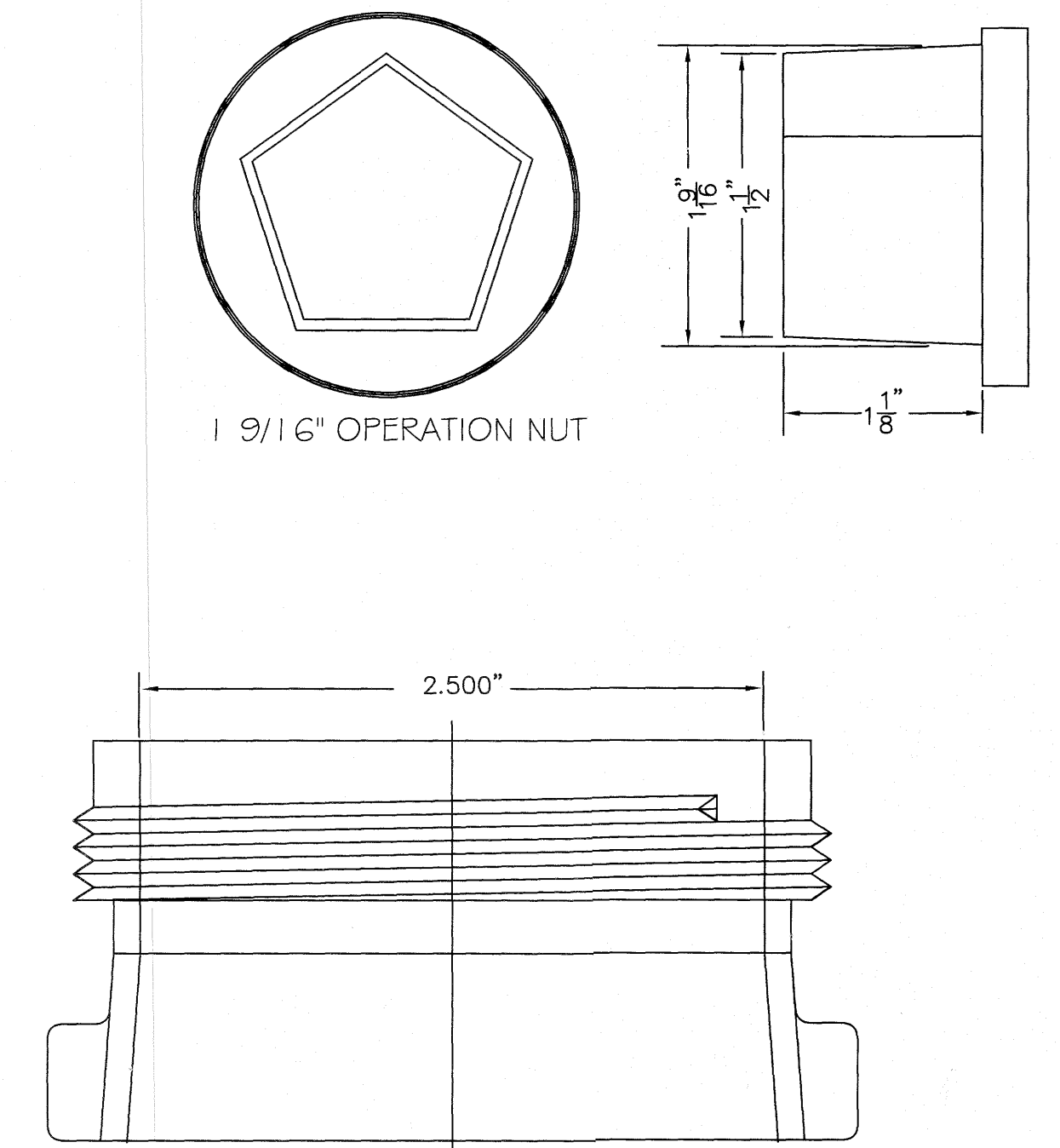
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 3. 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT.
 4. STEEL RODS AND BOLTS SHALL BE 3" HOT DIPPED GALVANIZED.
 5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION. RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
 FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
STANDARD FIRE HYDRANT INSTALLATION DETAIL					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-4	ABB	4-6-04			

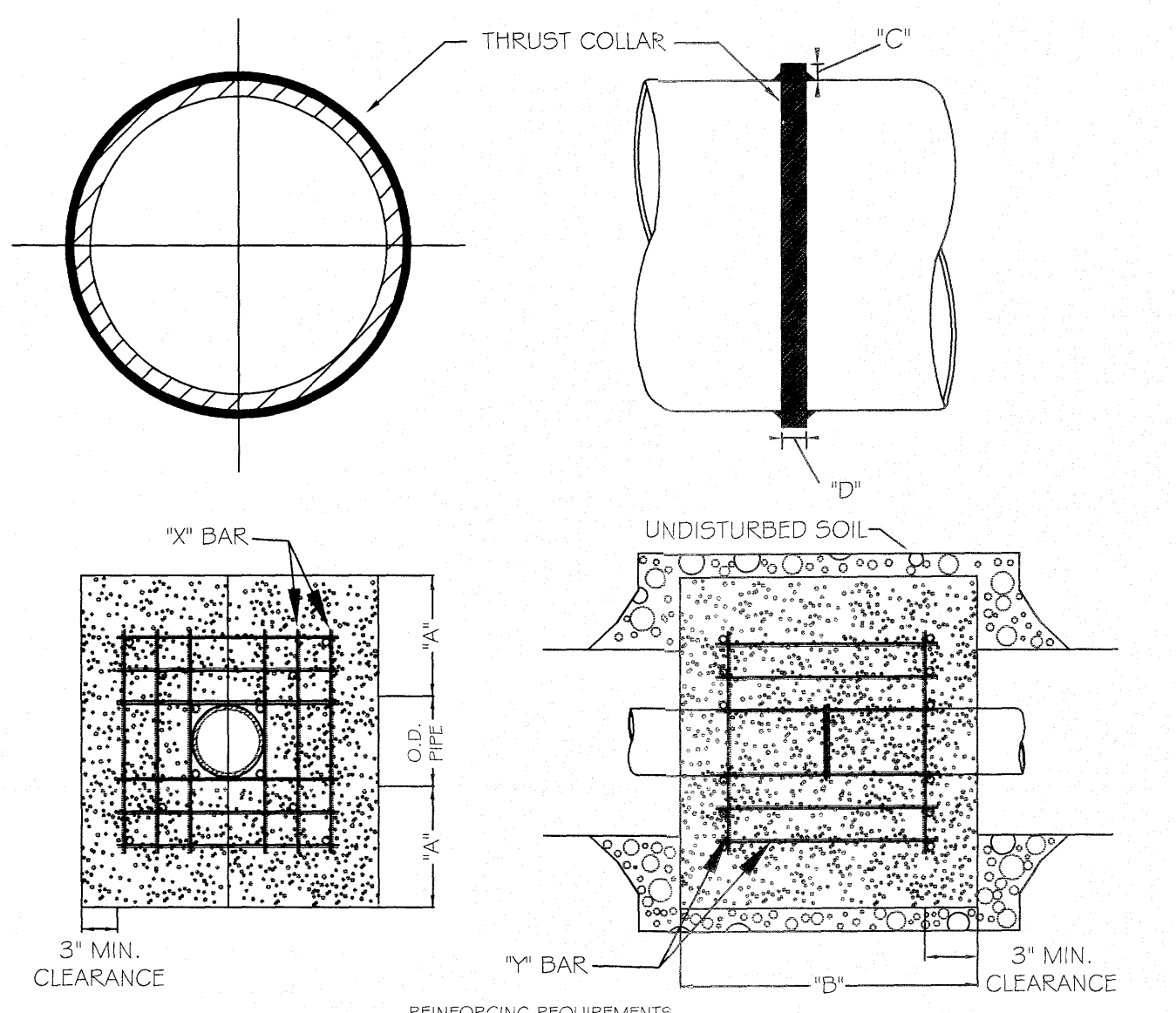


NOTES:
 1. ALL PUBLIC FIRE HYDRANTS IN THE CITY OF RALEIGH AND THE MERGER TOWNS OF GARNER, ROLESVILLE, WAKE FOREST, KNIGHTDALE, WENDELL AND ZEBULON SHALL BE PAINTED CHROME YELLOW WITH HIGH REFLECTIVE ALUMINUM SILVER CAPS, BONNETS AND OPERATING NUTS.
 2. ALL PRIVATE FIRE HYDRANTS SHALL BE RED.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
STANDARD FIRE HYDRANT WITH 5\"/>					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-5	MAB	6-30-16			
	KAT	9-15-17			



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
HYDRANT OPERATING NUT AND 2 1/2\"/>					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-6	RRH	5-31-00	DHL	2-18-08	
	A.B.B.	4-13-04	J.P.S.	11-1-10	



REINFORCING REQUIREMENTS						
I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"Y" BAR HEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
12" - 30"	#5	2'-0" O.D. PIPE	1043 LBS/FT	1'-1"	11 LBS. EACH	X-24, Y-12
48" & greater	#6	3'-0" O.D. PIPE	1,502 LBS/FT	1'-3"	19 LBS. EACH	X-24, Y-12

THRUST COLLAR AND THRUST SCHEDULE					
I.D. PIPE	"A"	"B"	"C"	"D"	
6" - 16"	1'-4"	1'-7"	2"	3/8"	
20" - 24"	1'-4"	1'-7"	3"	1/2"	
30" - 36"	1'-4"	1'-7"	4"	5/8"	
48" & greater	1'-8"	1'-9"	6"	7/8"	

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
THRUST BLOCKING DESIGN DATA FOR WATER MAINS					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-7	RRH	1-21-00	J.P.S.	11-1-10	
	D.H.L.	6-18-08			

SITE PERMITTING APPROVAL
 The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # **W-3785**
 The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # **W-3785**
 The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.
 City of Raleigh Public Utilities Department Permit # _____

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
 Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.
 City of Raleigh Development Approval _____
 Raleigh Water Review Officer _____

North Carolina 811
 www.nc811.org
 *** 3 Days Before Digging ***
 North Carolina 811
 811 or 1-800-632-0949
 Remote Ticket Entry
 http://nc811.org/remoteticketentry.htm

AMERICAN Engineering
 American Engineering Associates - Southeast, P.A.
 4020 Westchase Boulevard, Suite 450
 Raleigh, NC 27607
 919-469-1101

AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
 PROFESSIONAL ENGINEERS
 STATE OF NORTH CAROLINA
 LICENSE NO. 6-388

SEAL 9810
 NORTH CAROLINA PROFESSIONAL ENGINEERS
 JOHN R. HERRMAN

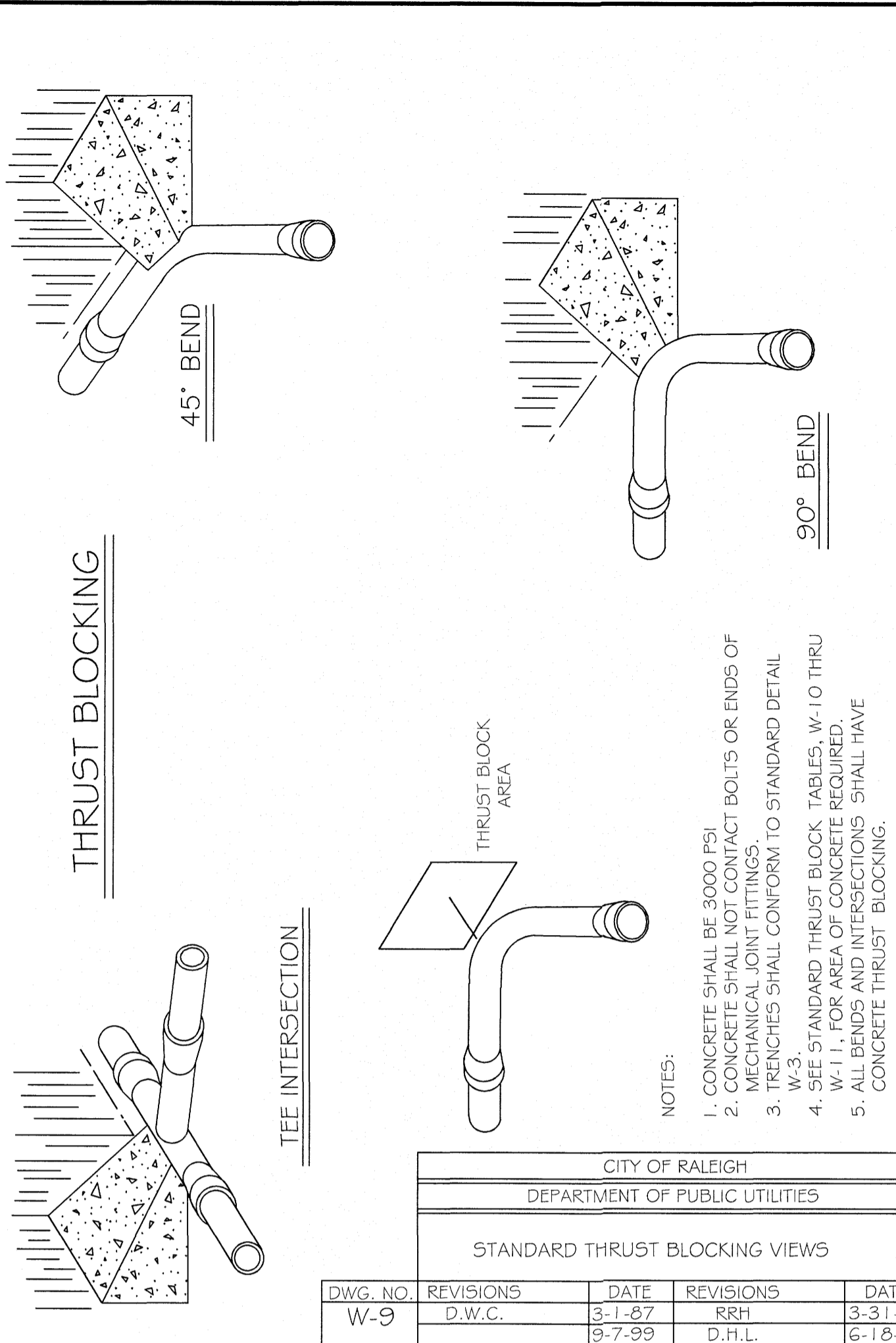
DETAIL SECTION ONLY

NO.	DATE	REVISION

STIPULATION FOR REUSE
 THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE, NAMED HEREON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HEREON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

**KALAS FALLS
 PHASE 2
 1832 ROLESVILLE ROAD
 WAKE COUNTY, NC**

JOB NUMBER: 9900
 CHECKED BY:
 DRAWN BY:
 DATE: DECEMBER 21, 2020
 SHEET TITLE:
KALAS FALLS CIVIL DETAILS
 SHEET NO.:
CD6



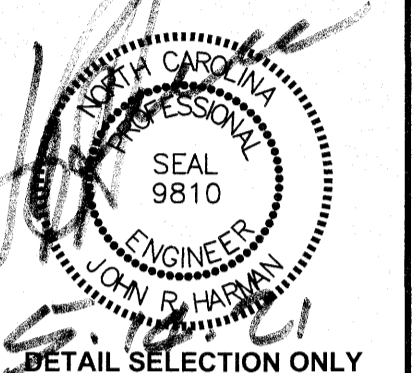
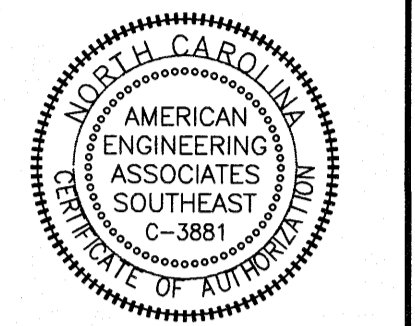
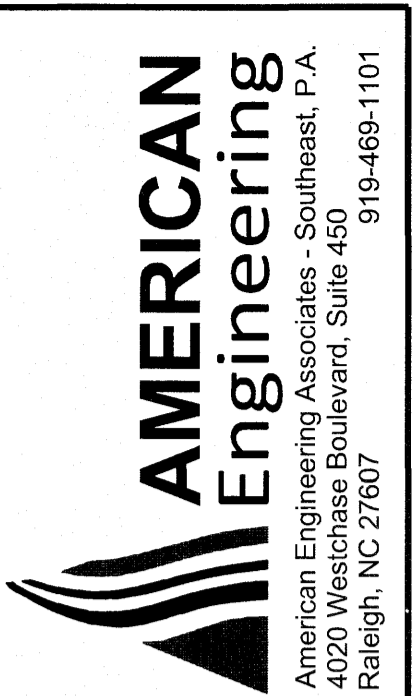
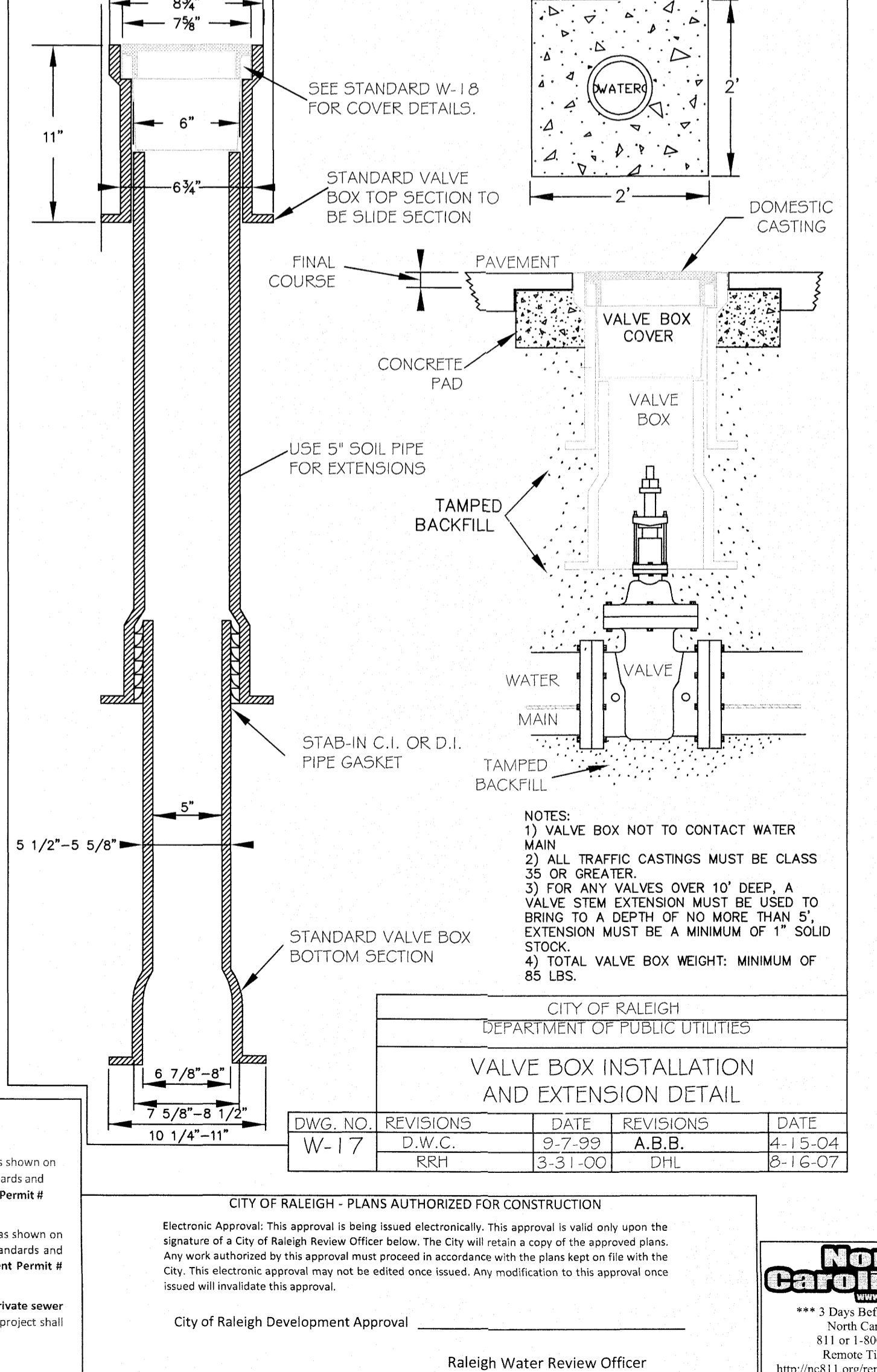
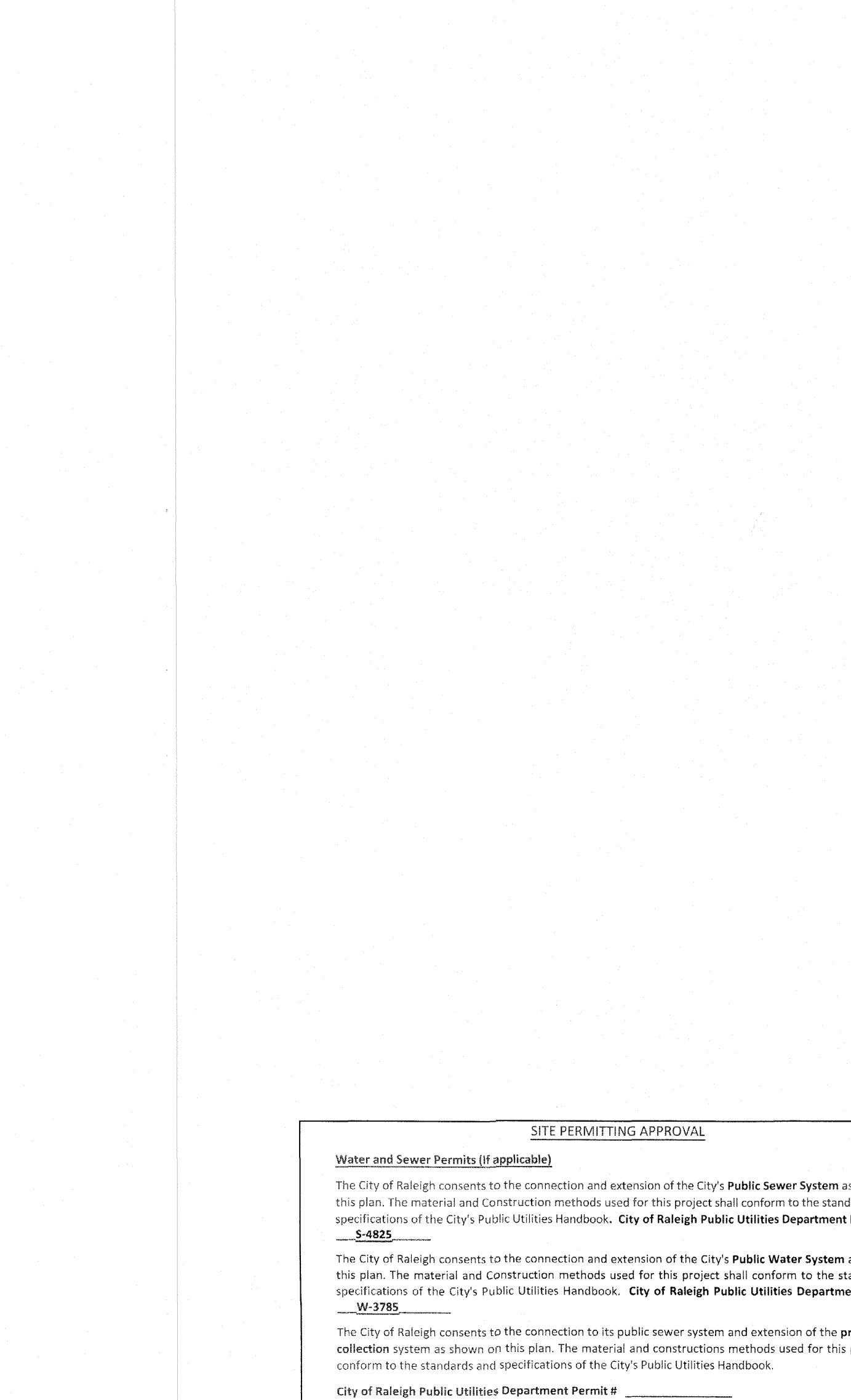
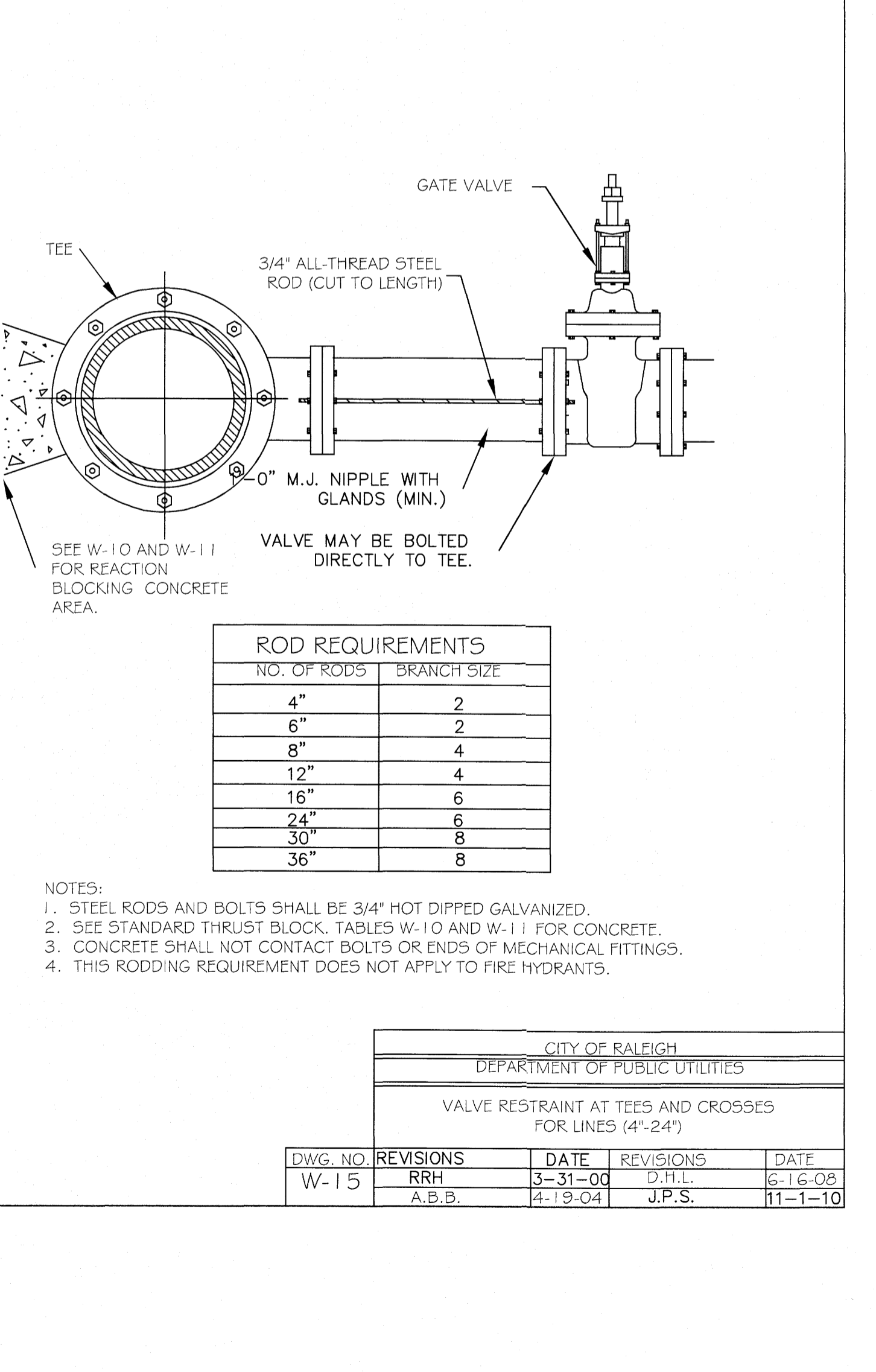
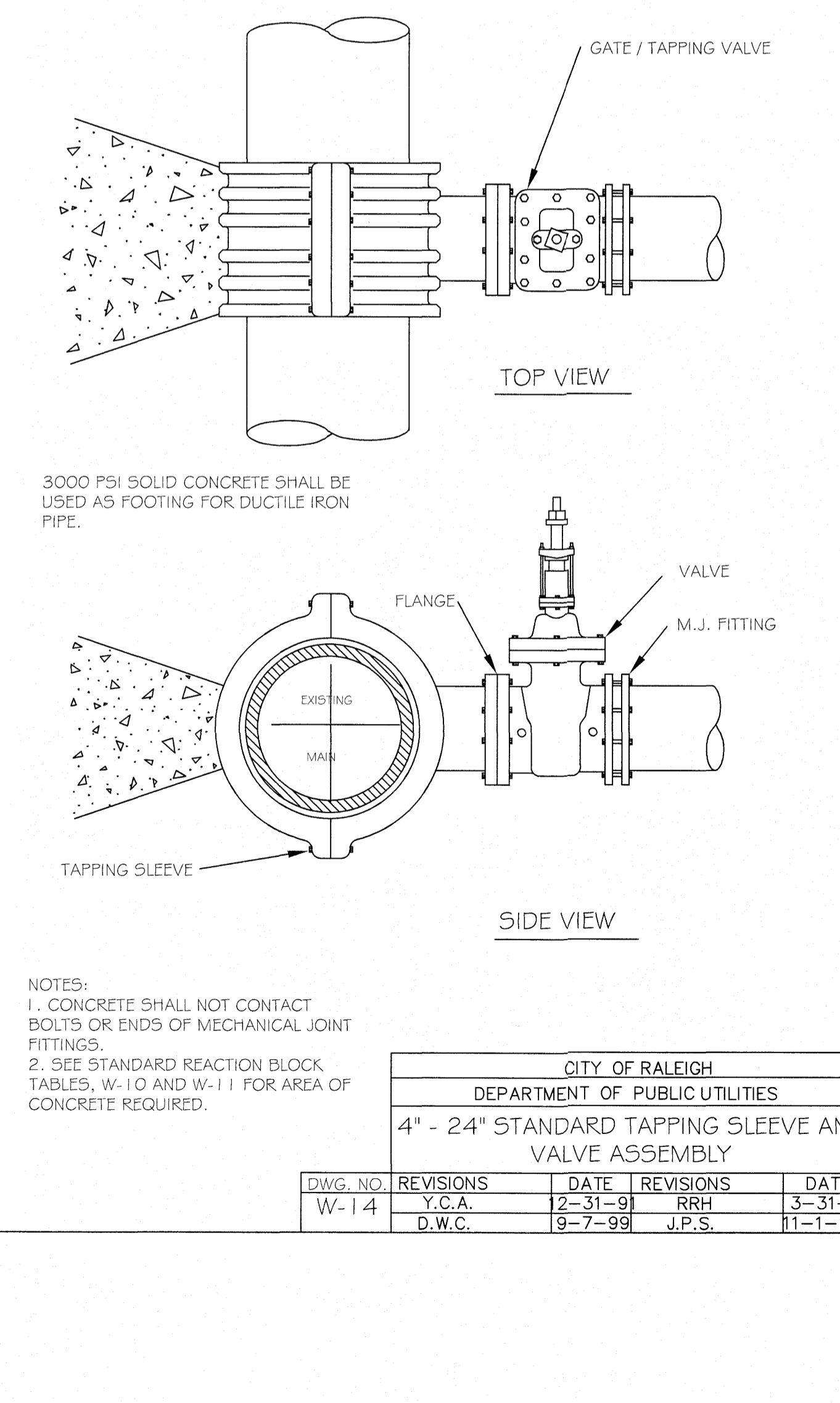
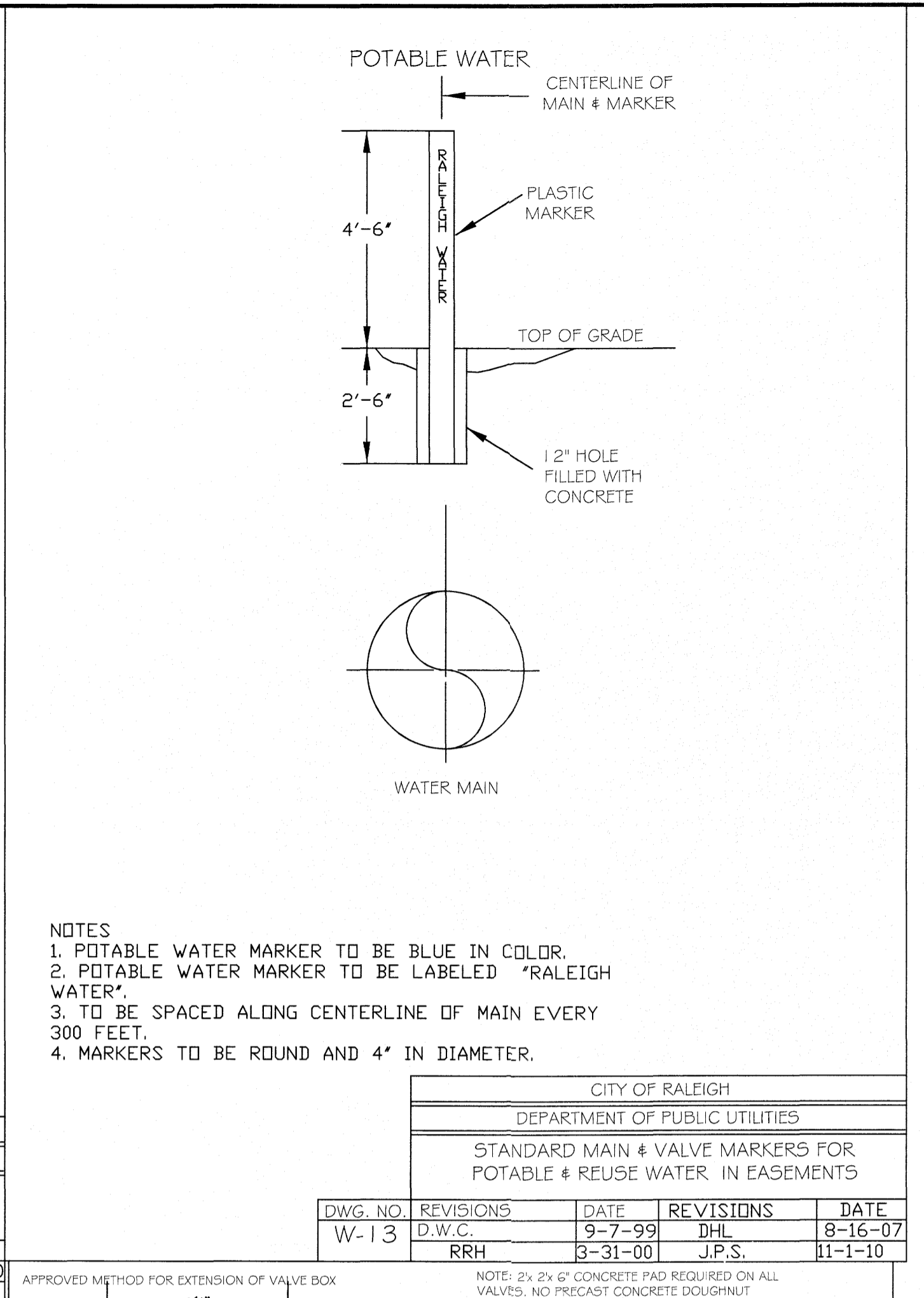
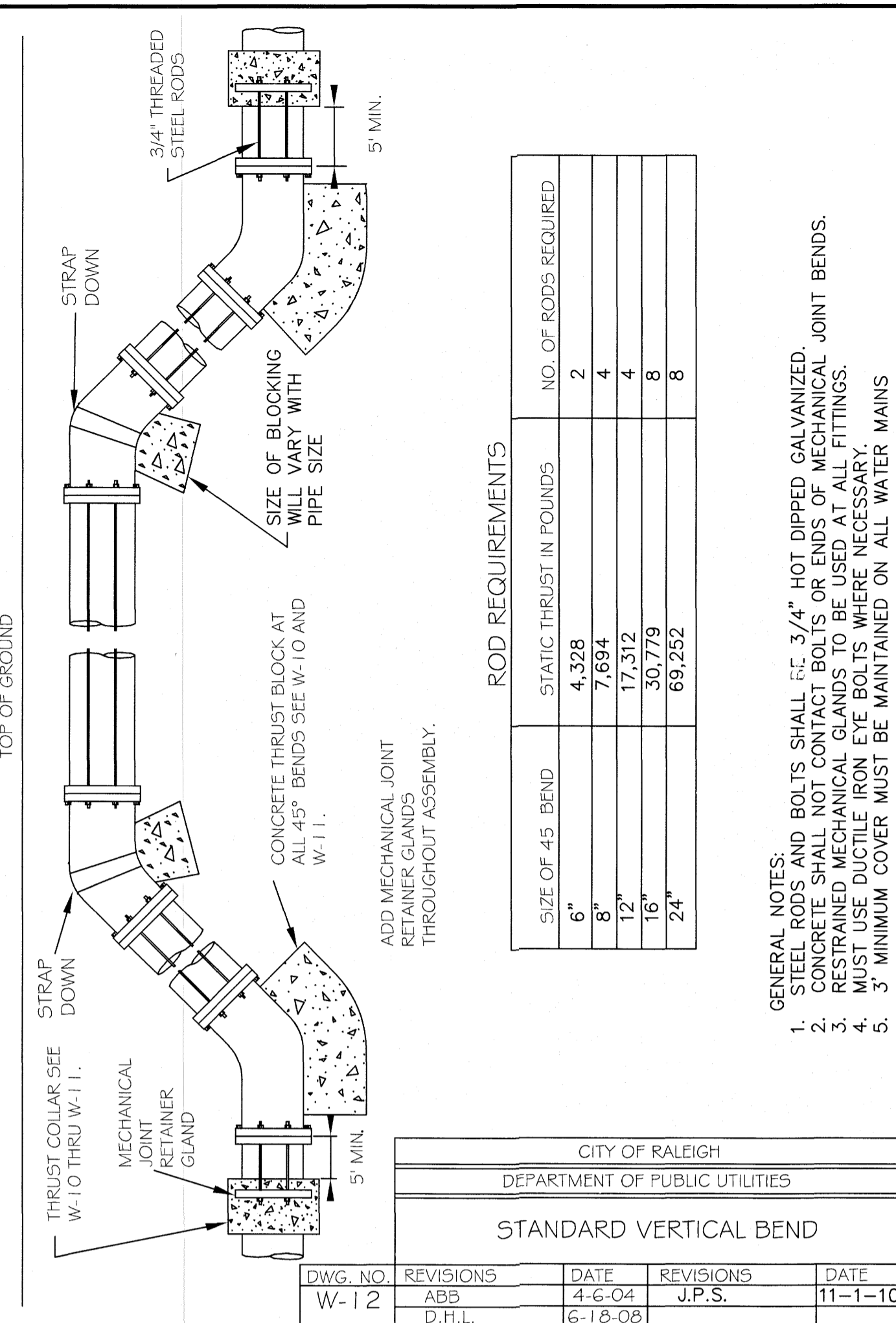
REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS
BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/FT ³	SOFT CLAY 2000 LBS/FT ³	1800 LBS/FT ³ COARSE SAND ALWAYS DRY	ROCKY LESTER DRY CLAY 8000 LBS/FT ³	SAND, COMPACT FIRM 8000 LBS/FT ³	SAND - CLEAN DRY 1000 LBS/FT ³	SOIL - LOOSE LBS/FT ³ QUICKSAND - VERY POOR 10,000 LBS/FT ³
0"								
11 1/4'	1,108	1	1	1	1	1	2	1
22 1/2'	2,207	1	2	2	1	1	3	1
45°	4,328	2	3	3	1	1	5	1
90°	7,996	2	4	5	1	1	8	1
PLUG	5,655	2	3	4	1	1	6	1
8"								
11 1/4'	1,970	1	1	2	1	1	2	1
22 1/2'	3,922	1	2	3	1	1	4	1
45°	7,694	2	4	5	1	1	8	1
90°	14,215	4	8	9	2	2	15	2
PLUG	10,053	3	5	6	2	2	10	1
12"								
11 1/4'	4,433	2	3	3	1	1	5	1
22 1/2'	8,826	3	5	6	2	2	9	1
45°	17,312	5	9	11	3	3	18	2
90°	31,983	8	16	19	4	4	32	4
PLUG	22,619	6	12	14	3	3	23	3
16"								
11 1/4'	7,881	2	4	5	1	1	8	1
22 1/2'	15,891	4	8	10	2	2	16	2
45°	30,779	8	16	19	4	4	31	4
90°	56,861	15	29	35	8	8	57	6
PLUG	40,213	10	21	25	5	5	41	5

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.



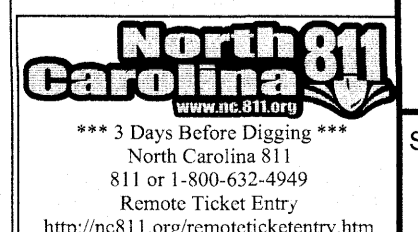
STIPULATION FOR REUSE

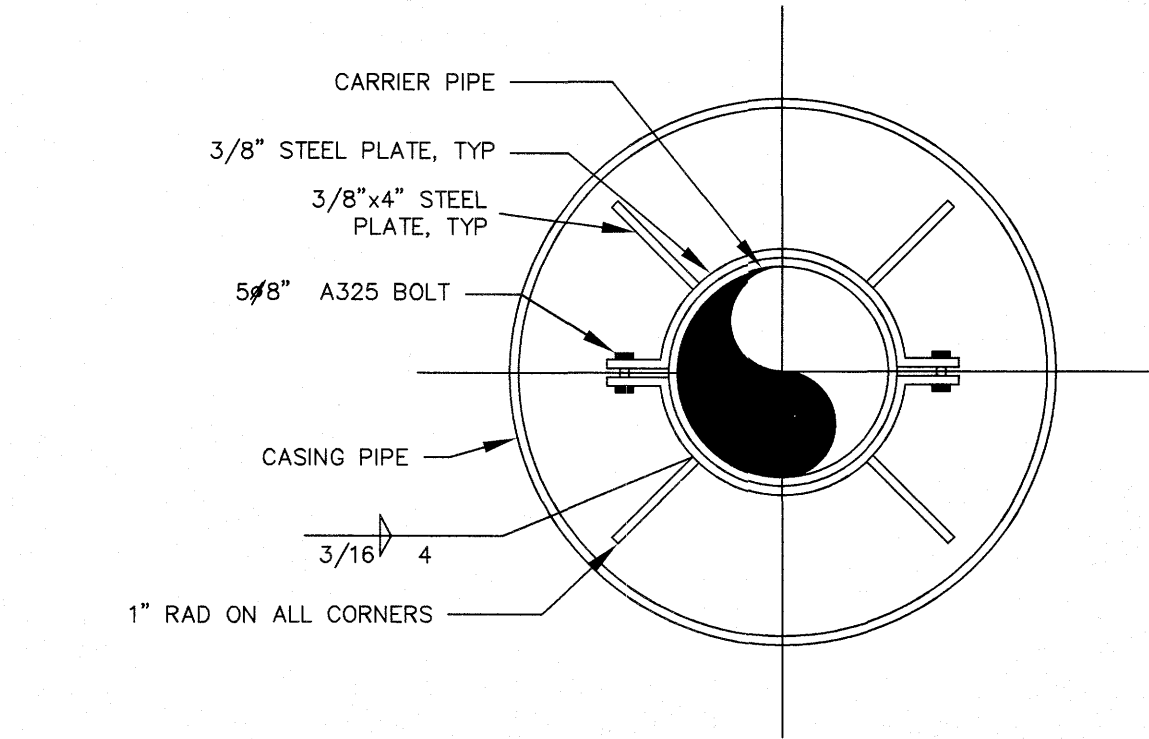
THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE, NAMED HEREON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HEREON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

KALAS FALLS PHASE 2
1832 ROLESVILLE ROAD
WAKE COUNTY, NC

JOB NUMBER: 9900
CHECKED BY:
DRAWN BY:
DATE: DECEMBER 21, 2020
SHEET TITLE: KALAS FALLS CIVIL DETAILS
SHEET NO.: CD7

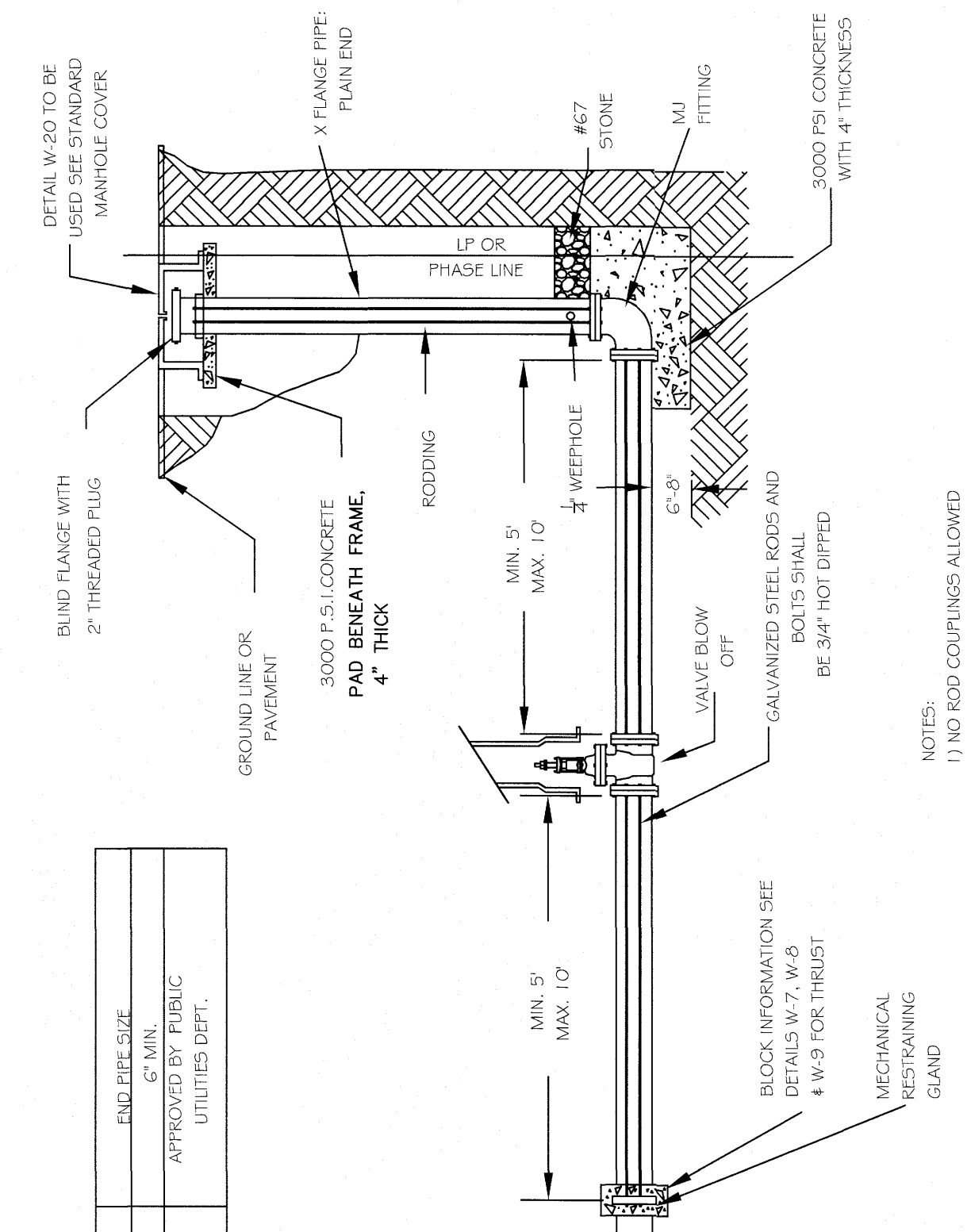
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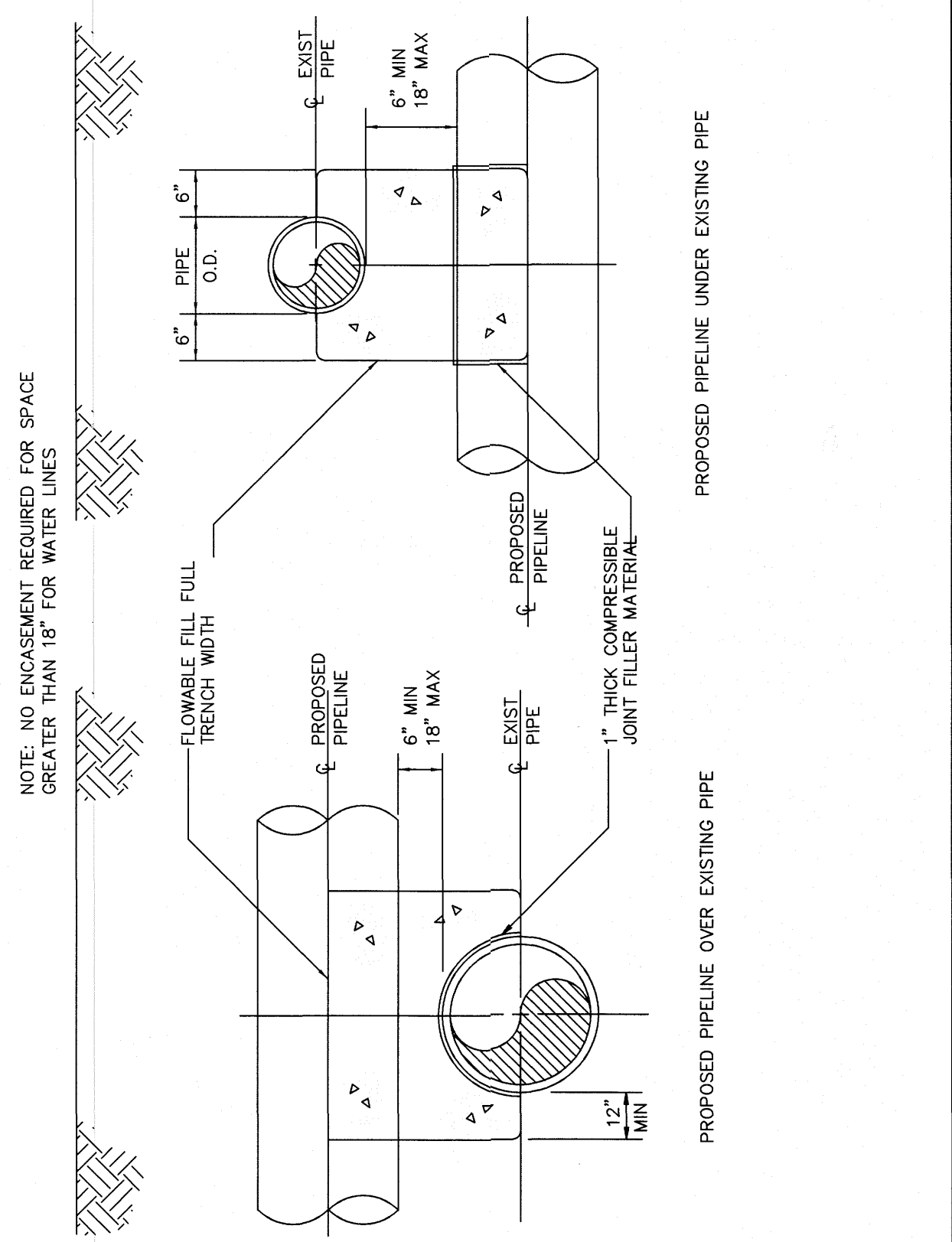
NOTE:
1) USE A MINIMUM OF TWO SPIDERS PER PIPE JOINT ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT ENDS.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
PIPE ALIGNMENT GUIDE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-40	RRH	3-31-00		
	A.B.B.	4-16-04		



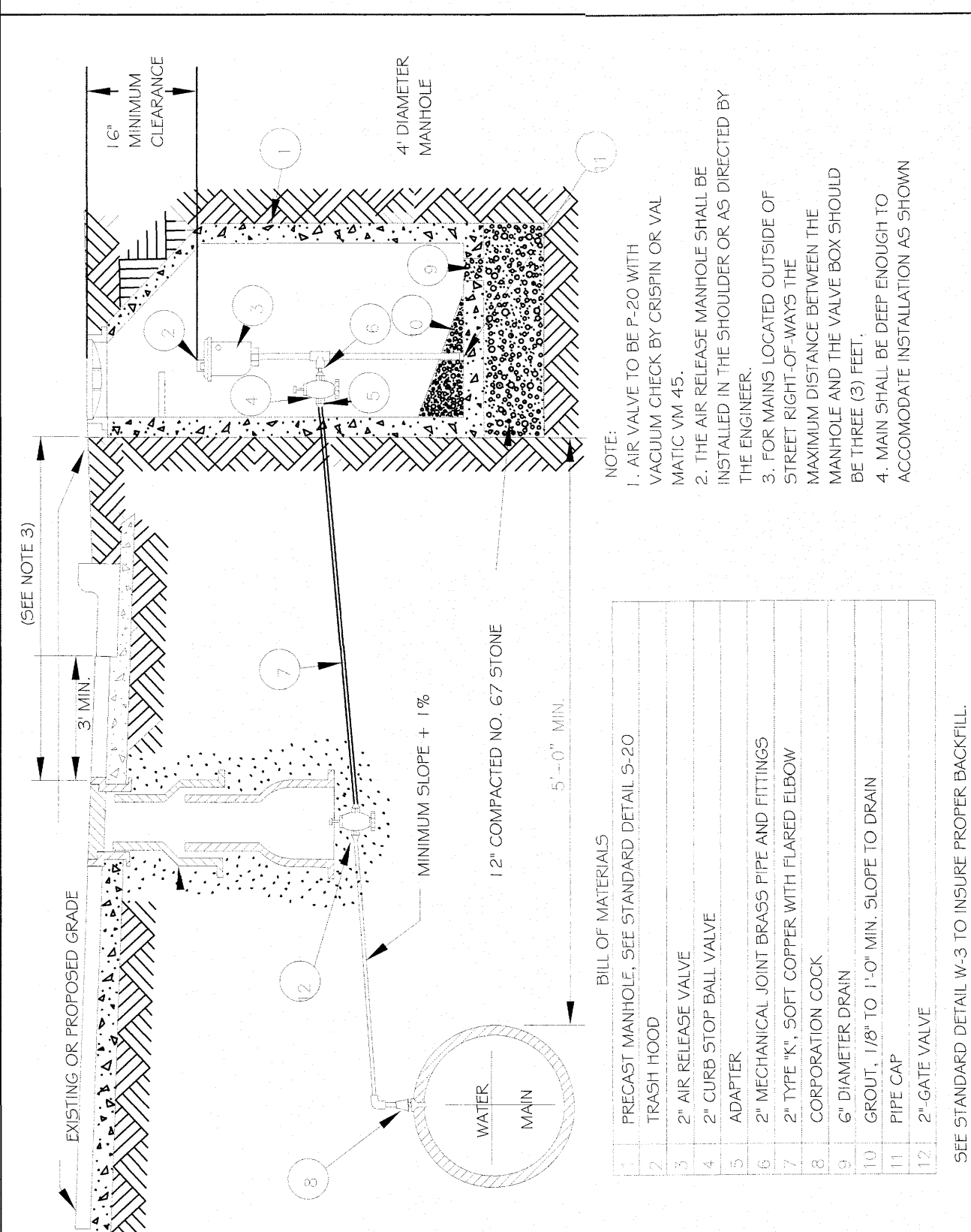
ENGINEER'S SEAL	
NAME	DATE
A.B.B.	4-16-04

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
TEMPORARY WATER MAIN BLOW OFF ASSEMBLY				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-21	D.W.C.	12-28-99	A.B.B.	4-12-04
	RRH	3-31-00	DHL	8-16-07



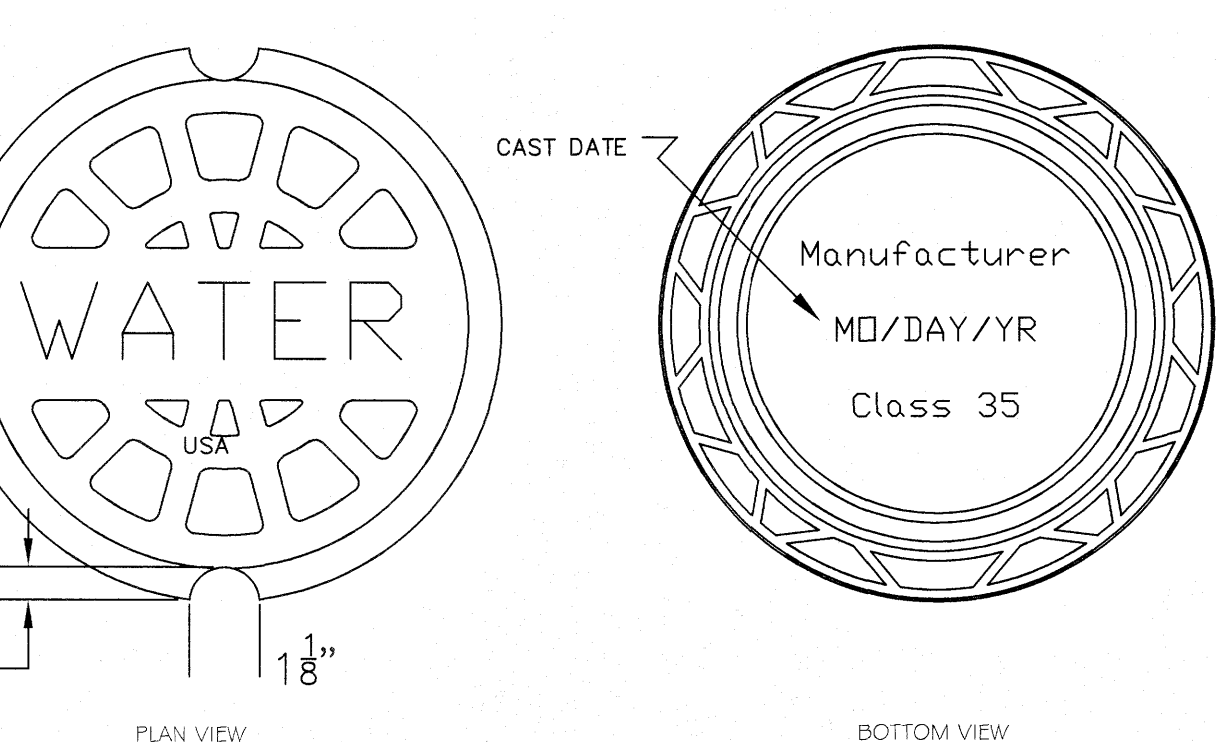
NOTE: NO ENCASMENT REQUIRED FOR SPACE GREATER THAN 18\"/>

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
CONCRETE CRADLE PROTECTION FOR WATER LINE CROSSINGS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-41	DHL	2-20-08		



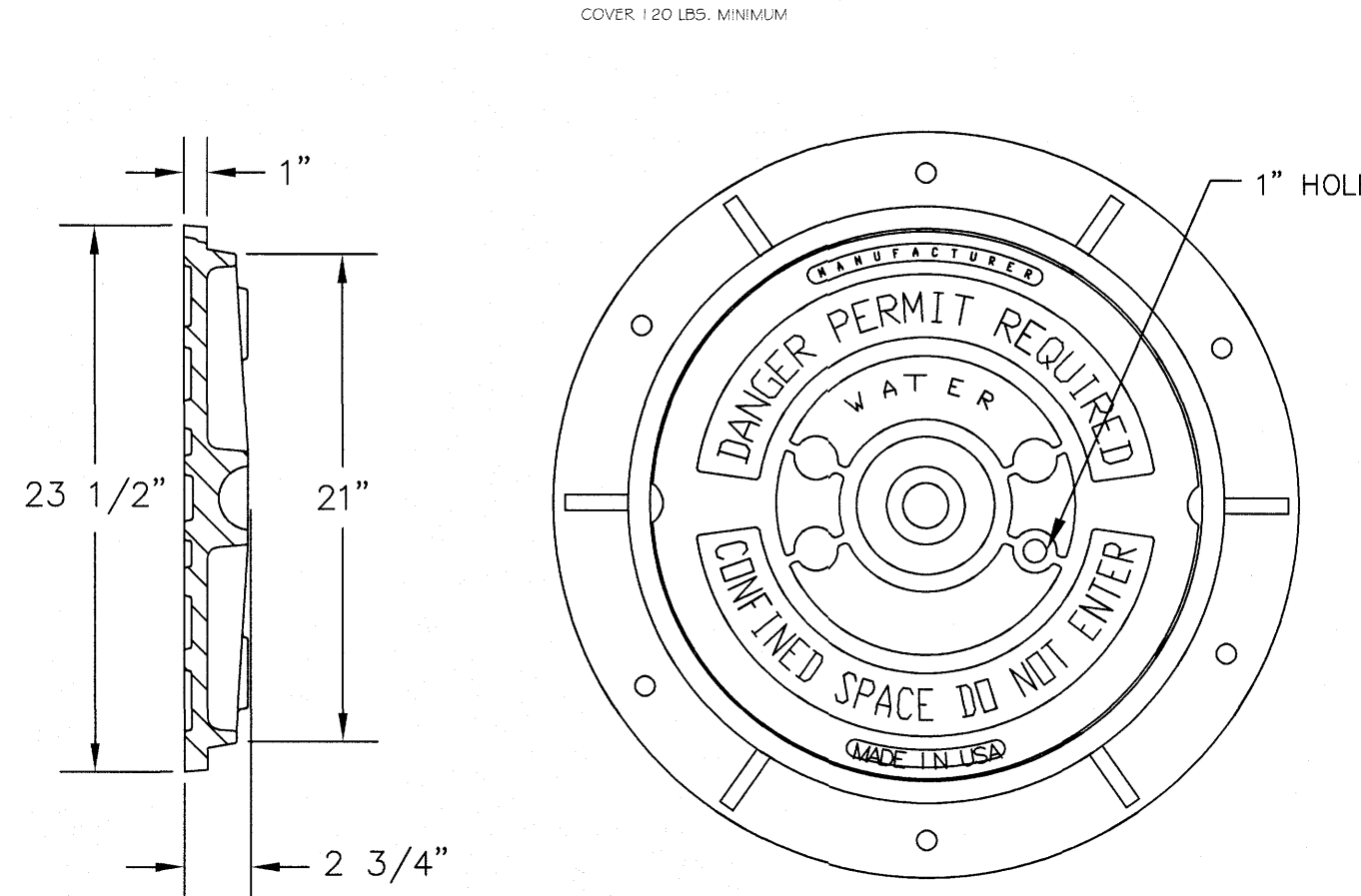
NOTE:
1. AIR VALVE TO BE P-20 WITH VACUUM CHECK BY CRISPIN OR VAL MATE VM 45.
2. THE AIR RELEASE MANHOLE SHALL BE INSTALLED IN THE SHOULDER OR AS DIRECTED BY THE STREET RIGHT-OF-WAYS DEPARTMENT.
3. FOR MANHOLE LOCATED OUTSIDE OF THE SHOULDER THE MAXIMUM DISTANCE BETWEEN THE MANHOLE AND THE VALVE BOX SHOULD BE AS SHOWN.
4. THE VALVE BOX SHALL BE DEEP ENOUGH TO ACCOMMODATE INSTALLATION AS SHOWN.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
STANDARD WATER AIR RELEASE VALVE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-19	ABB	10-4-04	RRH	2-31-91
	J.P.S.	11-1-10		6-7-00

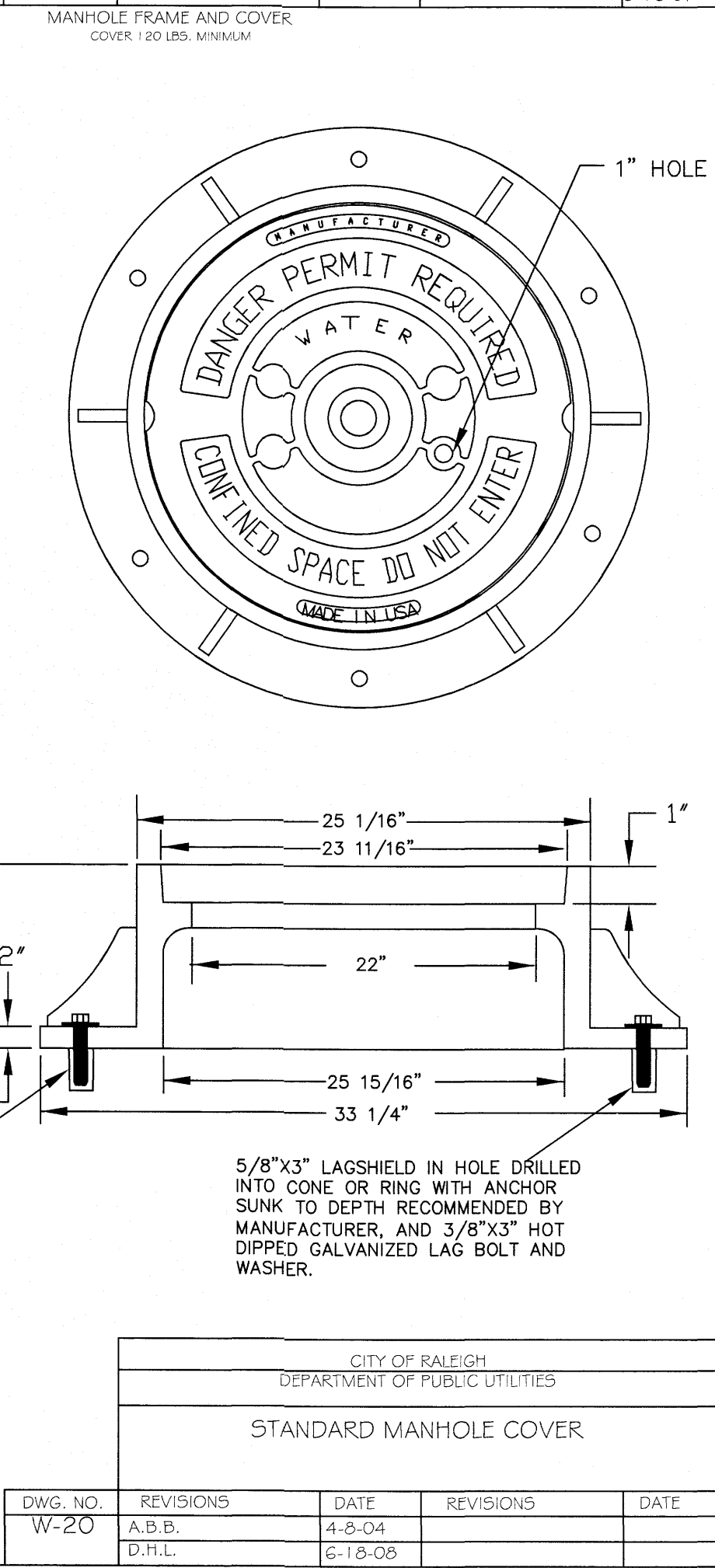


NOTE 1 - "WATER" LETTERING MUST BE 1\"/>

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
5 1/4\"/>				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-18				



NOTE:
1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2) FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS.
3) COVER SHALL WEIGH A MIN. OF 120 LBS.
4) MANHOLES WITHIN PAVED SURFACES SHALL BE CONSTRUCTED IN ACCORDANCE WITH S-29.

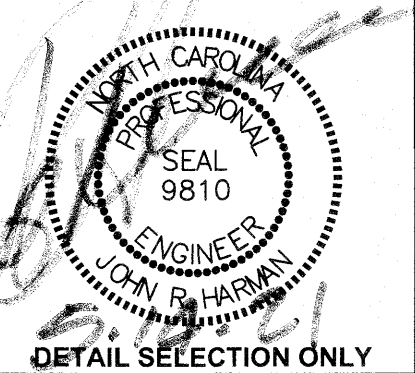


5/8\"/>

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
STANDARD MANHOLE COVER				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-20	A.B.B.	4-8-04		
	D.H.L.	6-18-08		



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
WATER METER BOX DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-25	D.W.C.	11-3-99	ABB	1-20-05
	RRH	3-31-00	J.P.S.	11-4-10



DETAIL SELECTION ONLY

NO.	REVISION	DATE

STIPULATION FOR REUSE
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KALAS FALLS
PHASE 2
1832 ROLESVILLE ROAD
WAKE COUNTY, NC

JOB NUMBER: 9900
CHECKED BY:
DRAWN BY:
DATE: DECEMBER 21, 2020
SHEET TITLE:
KALAS FALLS
CIVIL DETAILS

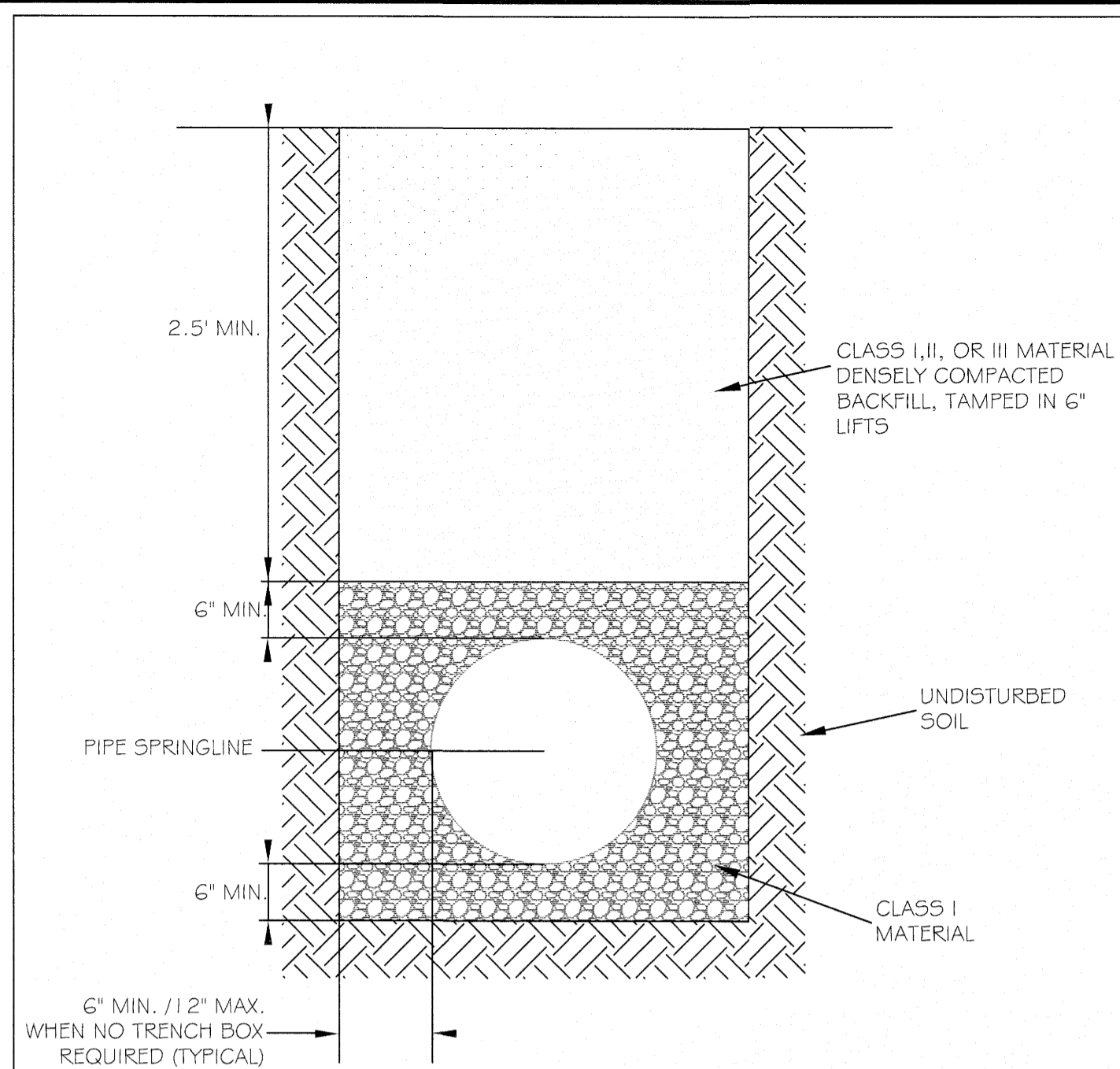
SHEET NO.:
CD8



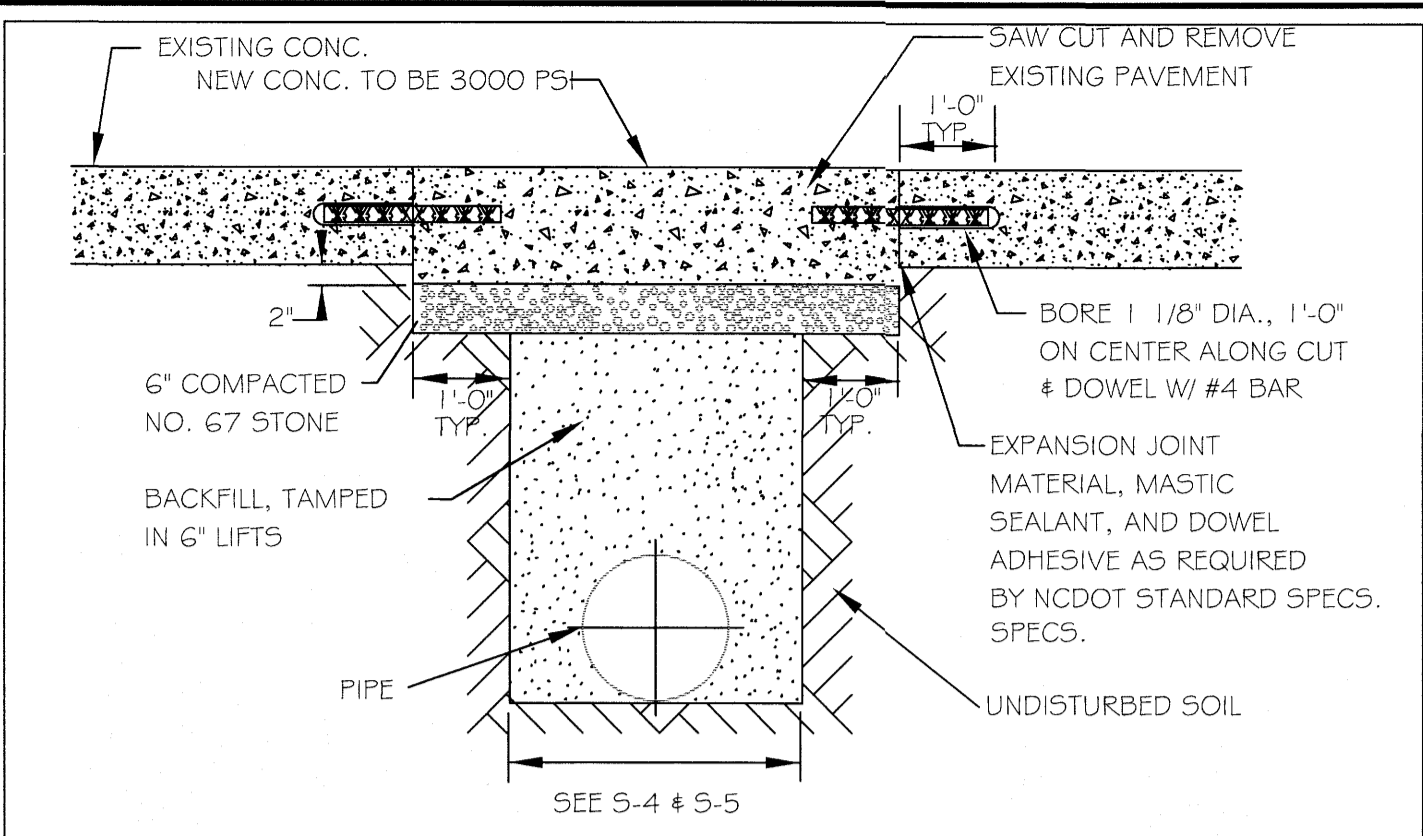
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-432-4949
Remote Ticket Entry
<http://nc811.org/remoteticketentry.htm>

City of Raleigh Development Approval
Raleigh Water Review Officer

May 6, 2021

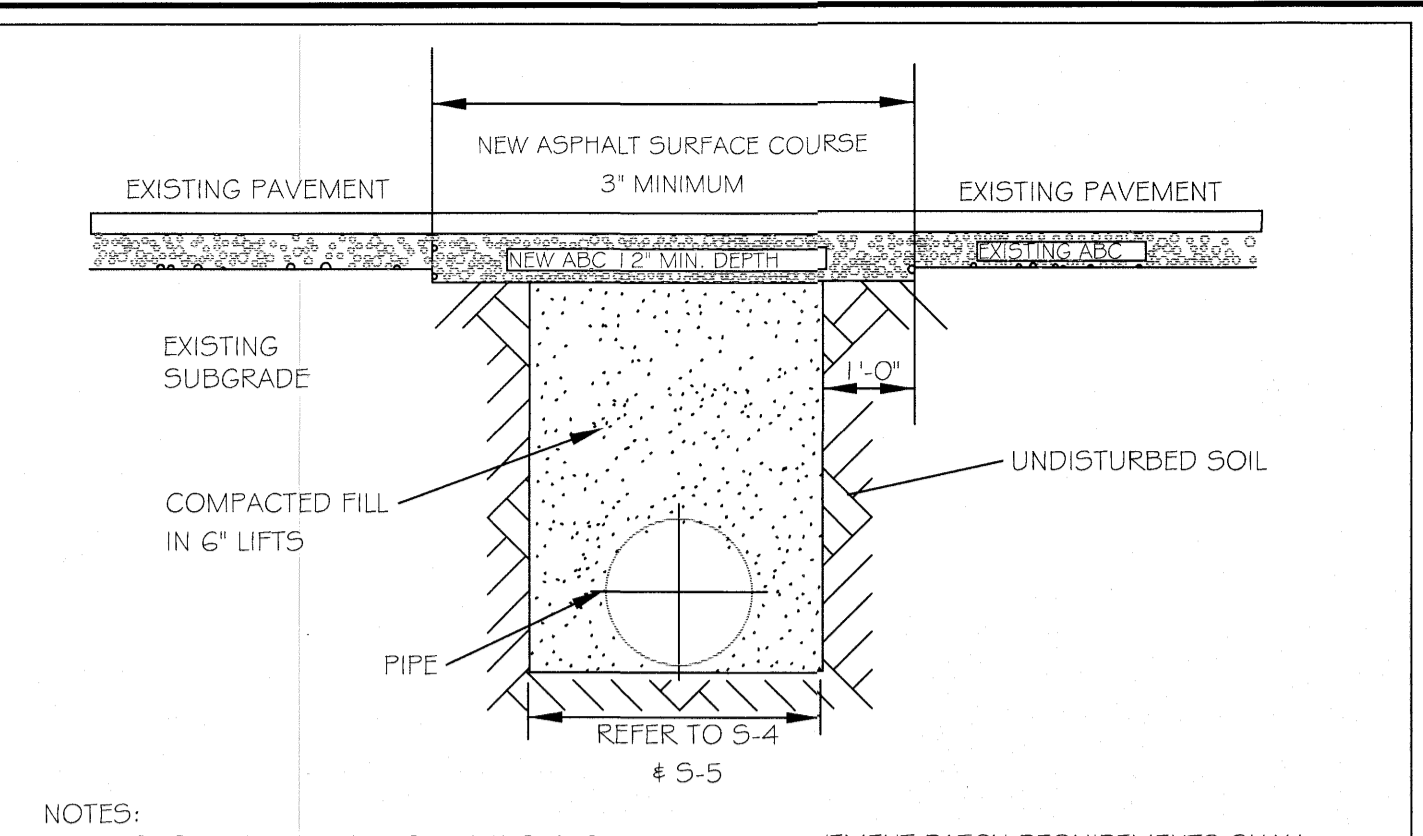


CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD BEDDING DETAILS FOR CCFRPM PIPES				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-1	J.P.S.	10-8-10		



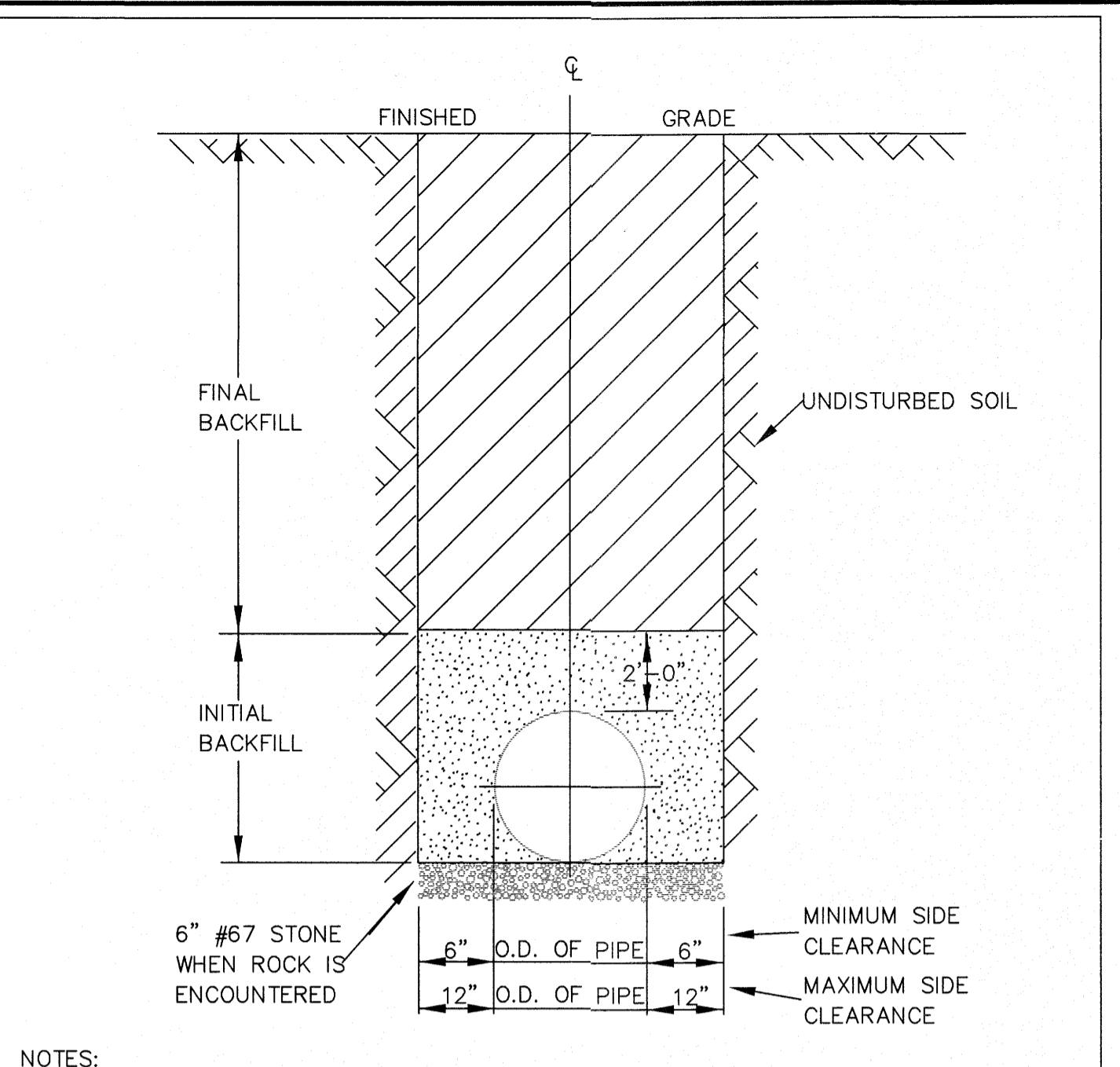
NOTES:
 1. See City of Raleigh standards for trenches and pipe bedding (S-4 & S-5) for additional details.
 2. Pavement cuts over 5'-0" in width shall be reinforced to N.C.D.O.T. standards.
 3. Pavement cuts shall be made with an appropriate saw cut machine.
 4. Pavement cuts within NCDOT ROW shall conform to the approved on site encroachment permit.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD CONCRETE PAVEMENT PATCH DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-2	D.W.C. RRH	6-23-99 3-30-00	A.B.B. J.P.S.	4-19-04 0-8-10



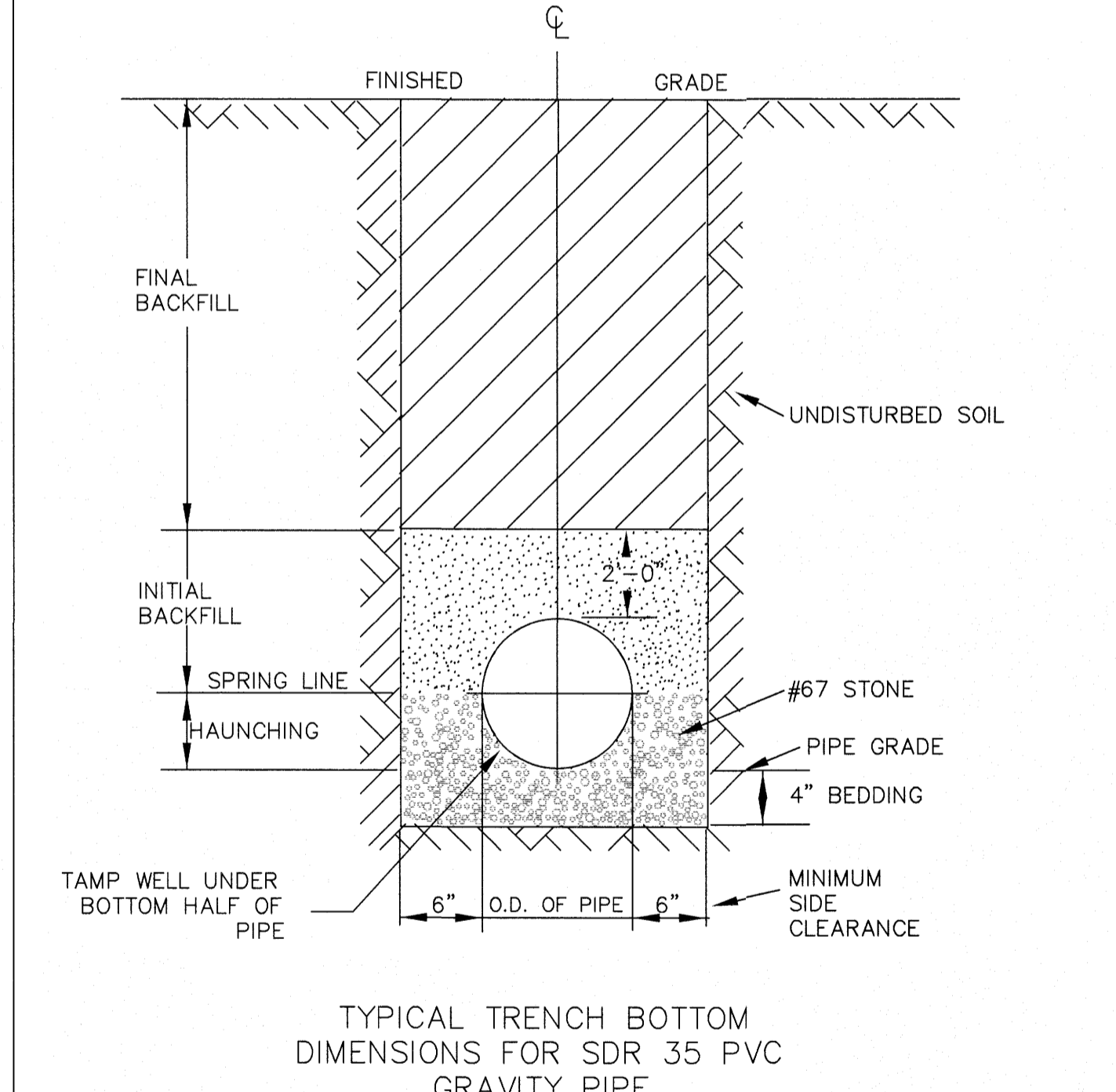
NOTES:
 1. IN NCDOT MAINTAINED ROADWAYS ENCROACHMENT PAVEMENT PATCH REQUIREMENTS SHALL TAKE PRECEDENCE.
 2. THE PAVEMENT CUT SHALL BE DEFINED BY A STRAIGHT EDGE AND CUT WITH AN APPROPRIATE SAWCUT MACHINE.
 3. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
 4. THE FINAL 1" OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY NCDOT.
 5. THE ENTIRE THICKNESS AND VERTICAL EDGE OF CUT SHALL BE TACKED.
 6. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 3" THICK.
 7. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH LEVEL PATCH.
 8. REFER TO CITY OF RALEIGH STANDARDS FOR TRENCHES AND PIPE BEDDING (S-4 & S-5) FOR ADDITIONAL DETAILS.
 9. NO HAND PATCHING ALLOWED.
 10. PAVEMENT CUTS WITHIN NCDOT ROW SHALL CONFORM TO THE APPROVED ON SITE ENCROACHMENT PERMIT.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD ASPHALT PAVEMENT PATCH DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-3	D.W.C. RRH	11-1-99 3-30-00	A.B.B. J.P.S.	4-19-04 0-8-10



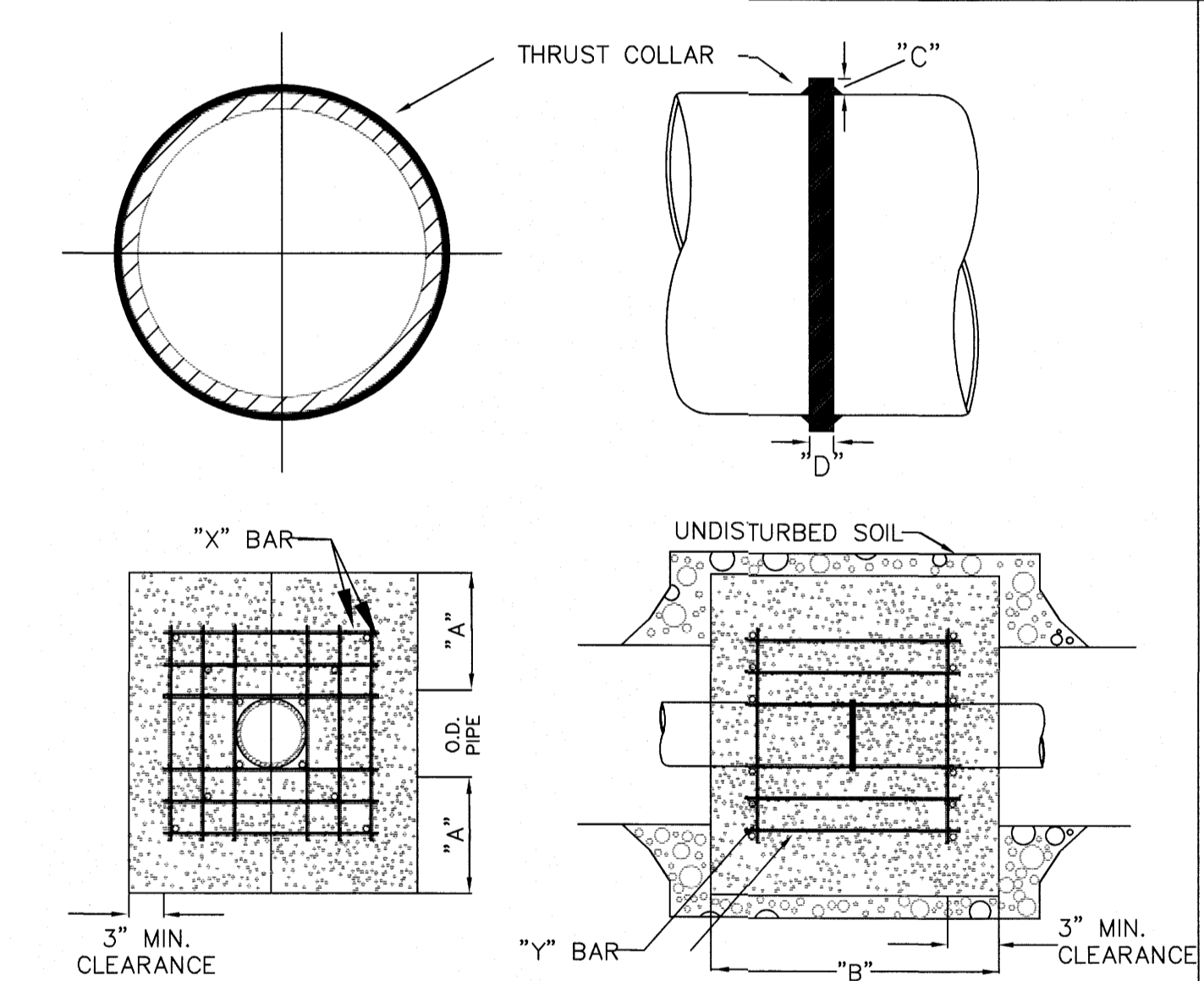
NOTES:
 1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
 2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
 3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
 4. BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.
 5. ACHIEVE 80% COMPACTION IN NON-TRAFFIC AREAS, AND 95% COMPACTION IN TRAFFIC AREAS.
 6. IF IN EASEMENT 4" TOPSOIL, AND 12" CLEAN SELECT FILL MAY BE REQUIRED.
 7. NO BOULDERS 8" IN DIAMETER OR GREATER ALLOWED IN FINAL BACKFILL.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-4	D.W.C. RRH	9-3-99 3-30-00		



NOTES:
 1. FOR TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
 2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
 3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
 4. BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.

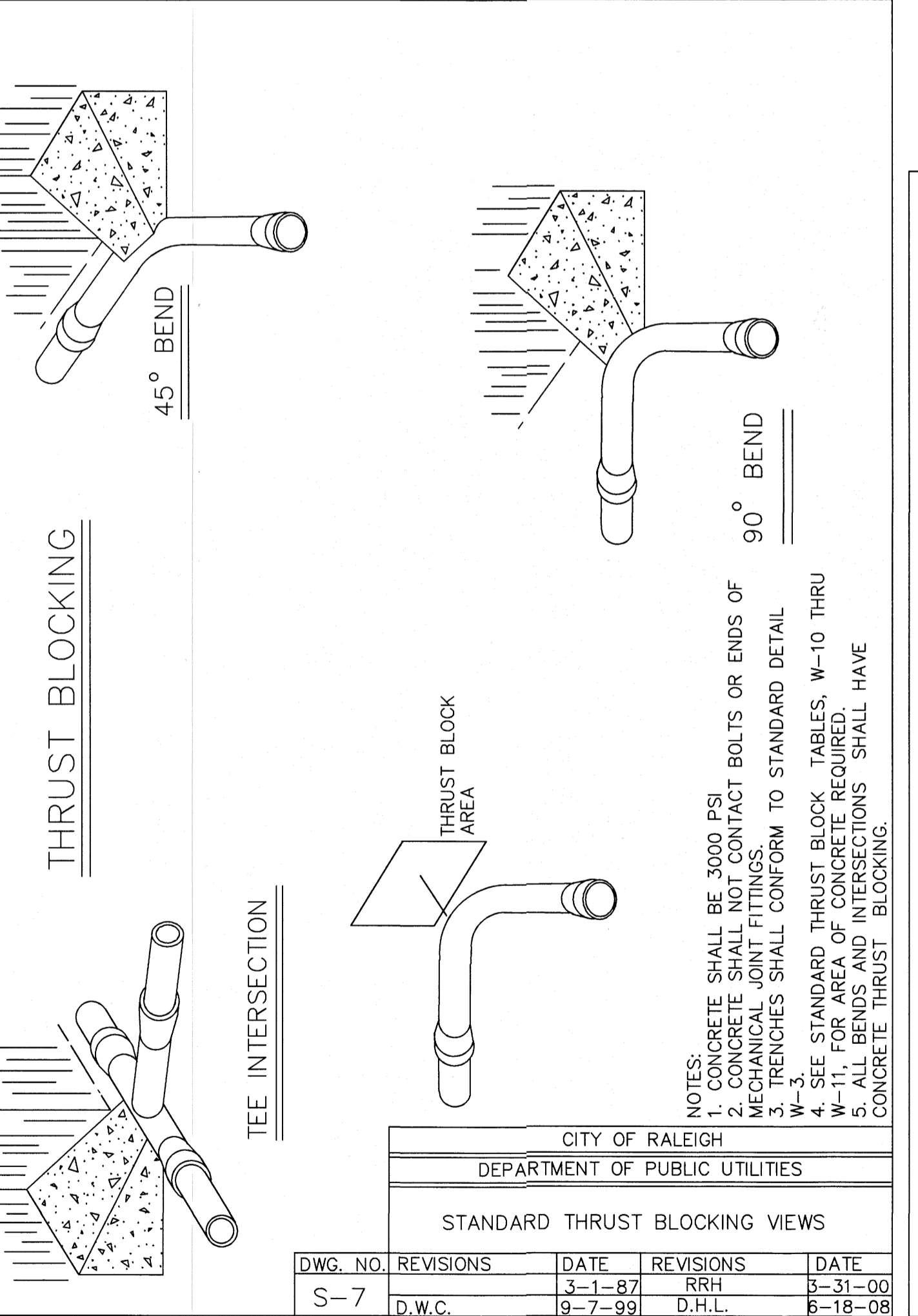
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TRENCH BOTTOM DIMENSIONS AND BACKFILLING REQUIREMENTS FOR PVC GRAVITY SEWER MAIN				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-5	TO NOTES	3-1-87 7-2-82	D.W.C. RRH	9-3-99 3-30-00



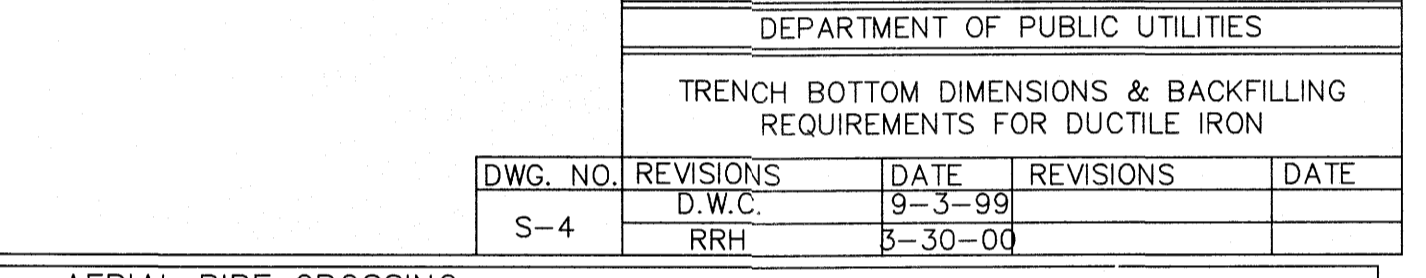
REINFORCING REQUIREMENTS					
I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT
6" - 16"	#5	2'-2" + O.D.	1.043 LBS/FT	1'-1"	1.1 LBS. EACH
20" - 24"	#5	3'-0" + O.D.	1.502 LBS/FT	1'-3"	1.9 LBS. EACH

NOTES:
 1. CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
 2. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
 3. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
 4. BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
 5. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
RESTRAINING COLLAR DESIGN DATA FOR SEWER FORCE MAIN				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-6	RRH D.H.L.	1-21-00 6-18-08		



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD THRUST BLOCKING VIEWS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-7	D.W.C.	3-1-87 9-7-99	RRH D.H.L.	5-31-00 6-18-08



GENERAL NOTES:
 ALL MATERIALS UTILIZED ON THESE DETAIL SHEETS SHALL CONFORM TO THE APPROPRIATE SECTIONS OF THE CITY OF RALEIGH PUBLIC UTILITIES HANDBOOK UNLESS NOTED OTHERWISE HEREIN.
 2. RESTRAINED JOINT PIPE AND FITTINGS SHALL CONSIST OF BOLTED RETAINER RINGS AND WELDED RETAINER BARS OR BOLTLESS TYPE WHICH INCLUDE DUCTILE IRON LOCKING SEGMENTS AND RUBBER RETAINERS. BOLTS FOR RESTRAINED JOINTS (IF APPLICABLE) SHALL CONFORM TO ANSI B18.2. RESTRAINED PIPE AND FITTINGS SHALL BE FLEX-RING OR LOK-RING TYPE JOINTS AS MANUFACTURED BY AMERICAN CAST IRON PIPE CO.; TR FLEX AS MANUFACTURED BY US PIPE, SUPER-LOCK AS MANUFACTURED BY CLOW, BOLT-LOK OR SNAP-LOK AS MANUFACTURED BY GRIFFIN PIPE PRODUCTS, OR EQUAL.

CONCRETE PROPERTIES SHALL BE AS FOLLOWS:
 CONCRETE COMPRESSIVE STRENGTH = 4000 PSI
 NOMINAL SLUMP = 4 INCHES
 WATER/CEMENTITIOUS MATERIALS RATIO = 0.45 (MAX)
 AIR CONTENT = 6% ± 1.5%
 CONCRETE SHALL BE COMPOSED OF CEMENT, WATER, COARSE AGGREGATES, FINE AGGREGATES AND AIR. CEMENT SHALL BE TYPE I/II OR II IN ACCORDANCE WITH ASTM C-150. MATERIAL REQUIREMENTS FOR ALL FINE AND COARSE AGGREGATES SHALL CONFORM TO ASTM C-33. COARSE AGGREGATE SHALL BE SIZE No. 57
 4. OR 67. AN APPROVED CLASS 'F' FLYASH MAY BE SUBSTITUTED FOR AN EQUAL AMOUNT OF CEMENT BY WEIGHT UP TO 25%.

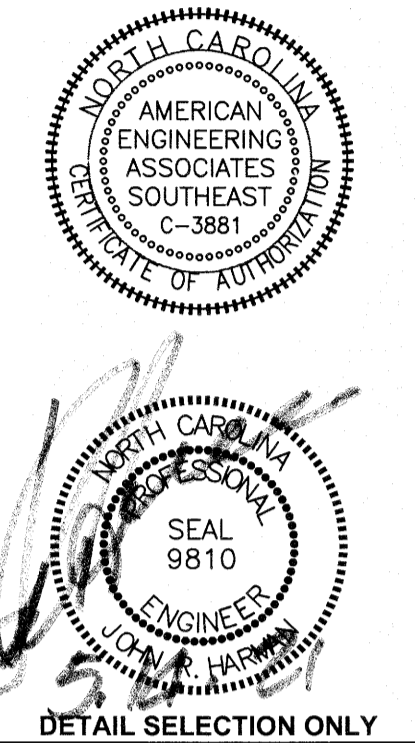
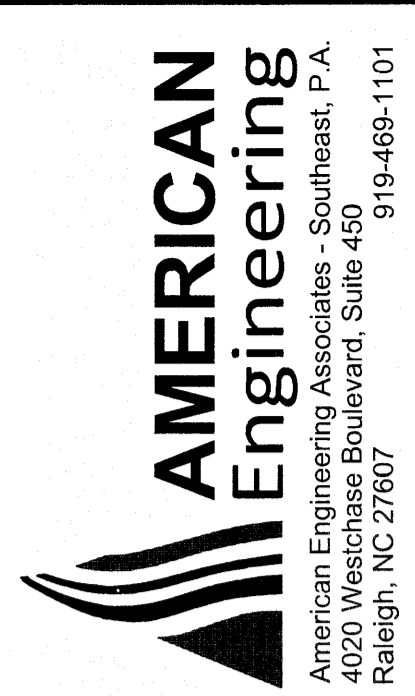
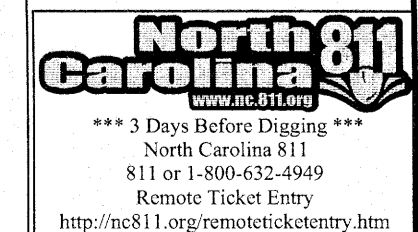
ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4".
 CONVENTIONAL REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60 AND SHALL BE PLACED IN ACCORDANCE WITH "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS" (LATEST EDITION) AS PUBLISHED BY THE CONCRETE REINFORCING INSTITUTE. SPLICES SHALL BE CLASS 'B' CONFORMING TO THE PROVISIONS OF ACI 318 - "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".

NEOPRENE BEARING PADS SHALL BE FORMED FROM PREVIOUSLY UNVULCANIZED, 100% VIRGIN NEOPRENE, WITH DUROMETER HARDNESS = 50.
 PILES SHALL BE STRUCTURAL STEEL HP12x53 PILES AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36. PILES SHALL BE DRIVEN TO DEPTHS REQUIRED TO OBTAIN AN ULTIMATE BEARING CAPACITY OF NOT LESS THAN TWO TIMES THE DESIGN LOADING OF 30 TONS. PILES SHALL PENETRATE A MINIMUM OF FIFTEEN FEET INTO UNDISTURBED SOIL. IN DRIVING PILES, A METHOD APPROVED BY THE ENGINEER SHALL BE USED WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED. IF REQUESTED BY THE ENGINEER, PILES SHALL BE TESTED TO DETERMINE THE ULTIMATE CAPACITY OF THE PILES. THE METHOD OF LOAD TESTING SHALL CONFORM TO ASTM D1143 AND THE NORTH CAROLINA STATE BUILDING CODE. WHERE PILES ARE EXPOSED, PILES SHALL BE PAINTED AND/OR COATED IN ACCORDANCE WITH THE CITY SPECIFICATIONS.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
AERIAL PIPE CROSSING GENERAL NOTES				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-10	D.H.L.	6/16/08		

SITE PERMITTING APPROVAL
 Water and Sewer Permits (if applicable)
 The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # S-4925
 The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # W-3785
 The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.
 City of Raleigh Public Utilities Department Permit # _____

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
 Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.
 City of Raleigh Development Approval _____
 Raleigh Water Review Officer _____



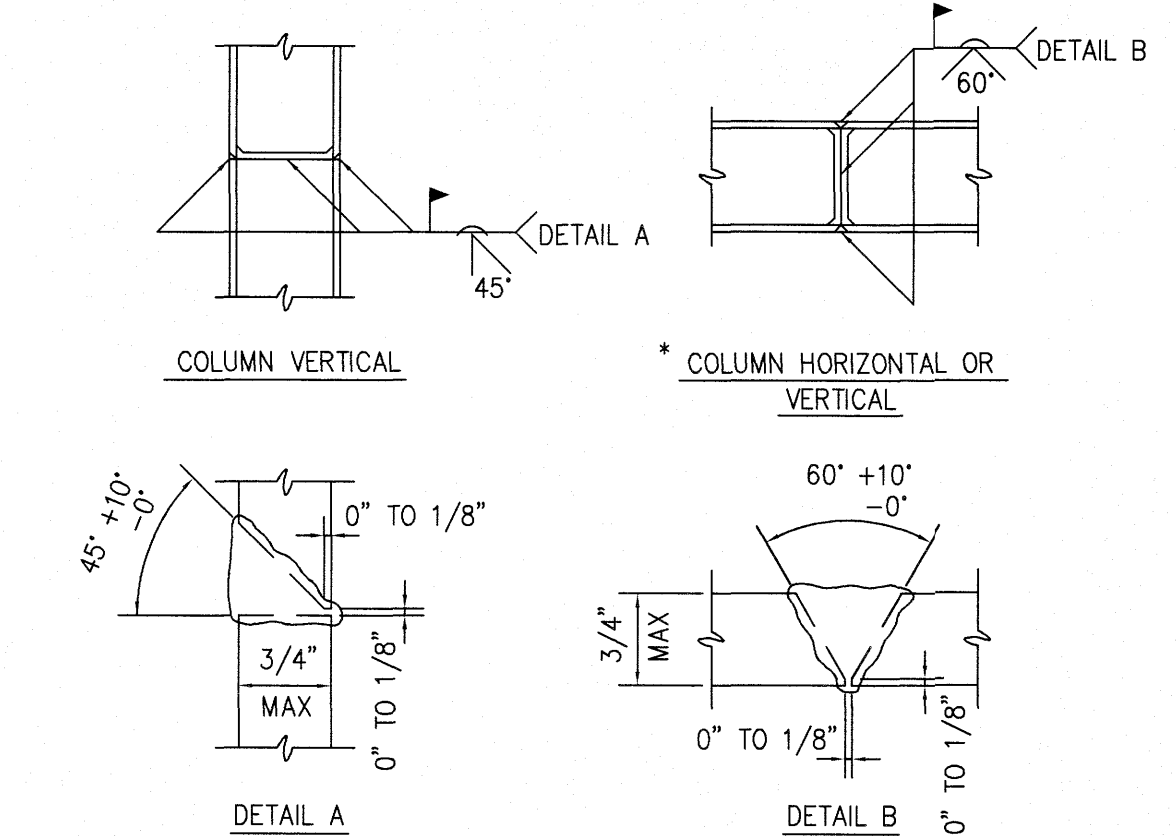
NO.	DATE	REVISION

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STIPULATION FOR REUSE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-4	D.W.C. RRH	9-3-99 3-30-00		

THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE, NAMED HEREON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HEREON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

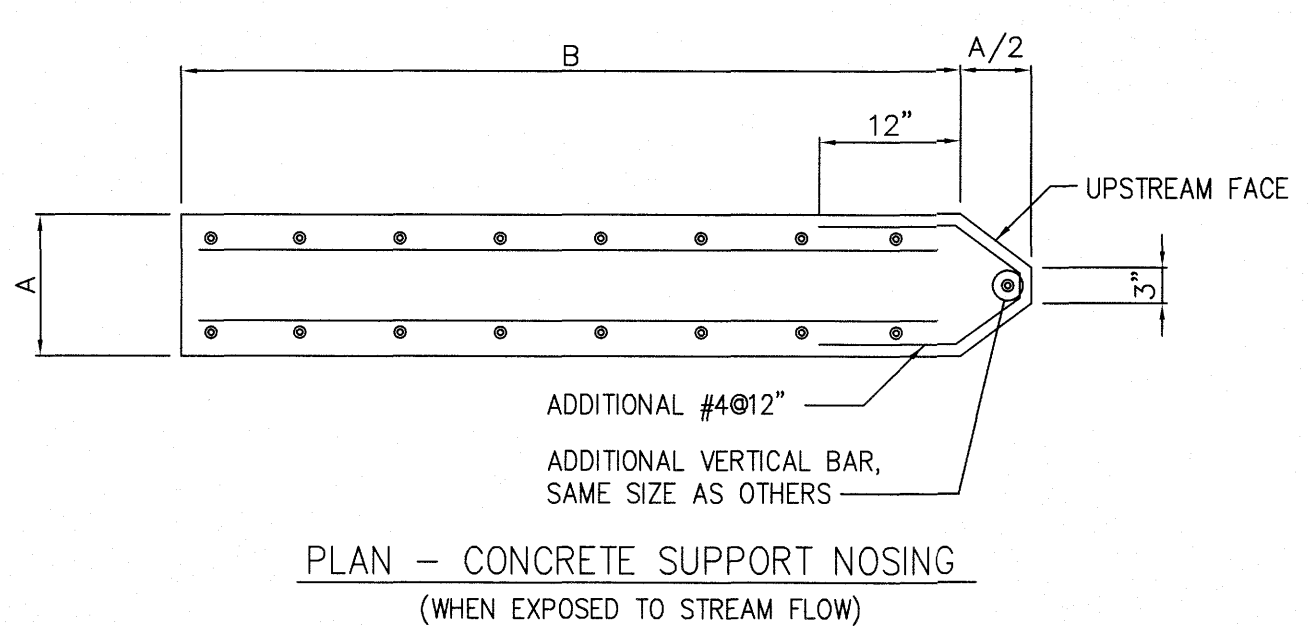
KALAS FALLS
 PHASE 2
 1832 ROLESVILLE ROAD
 WAKE COUNTY, NC

JOB NUMBER: 9900
 CHECKED BY:
 DRAWN BY:
 DATE: DECEMBER 21, 2020
 SHEET TITLE:
 KALAS FALLS CIVIL DETAILS
 SHEET NO.: CD9

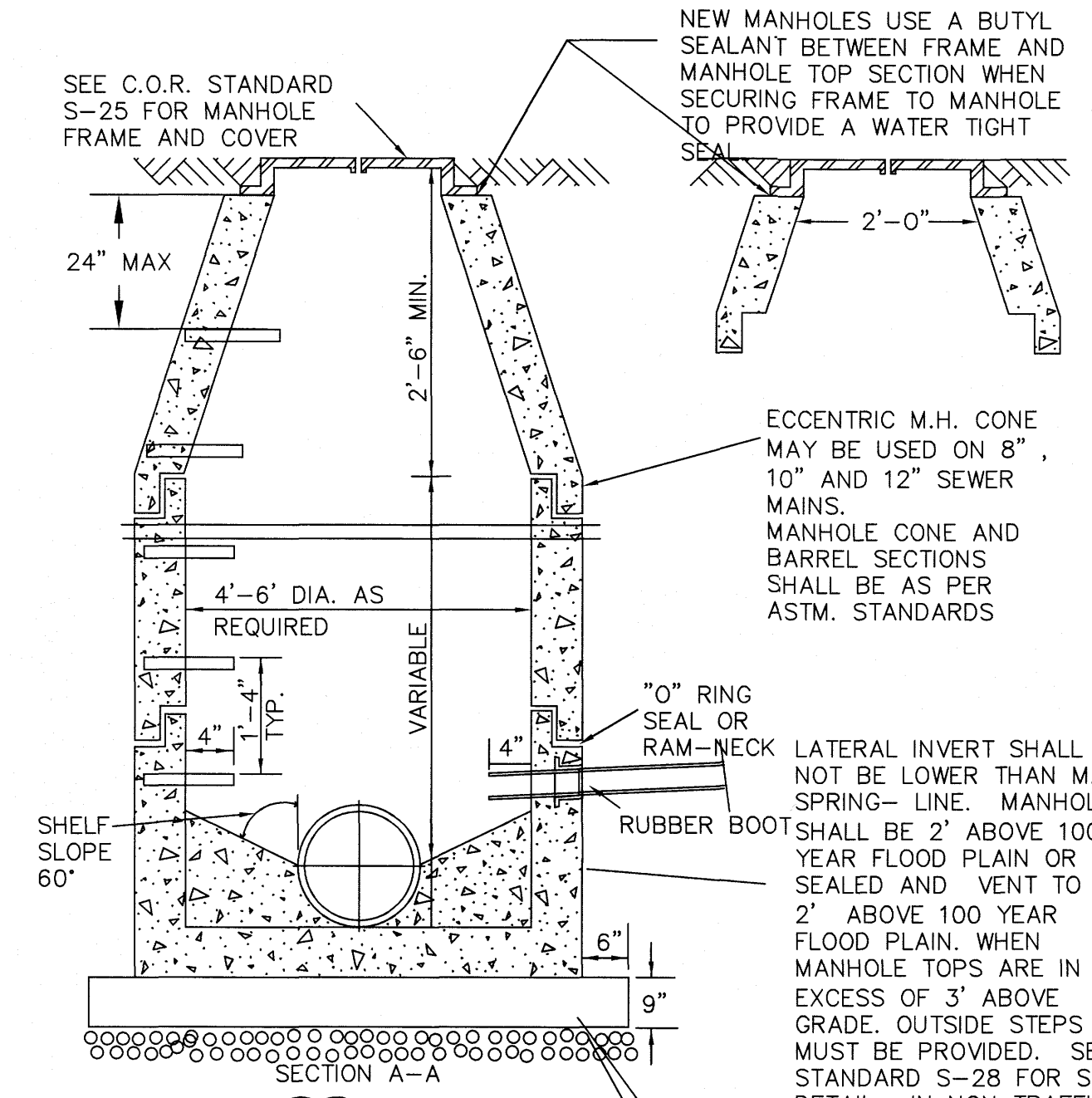


* POSITION OF COLUMN DURING WELDING

STEEL PILE SPlice



CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
AERIAL PIPE CROSSING CONCRETE SUPPORT DETAILS			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-19	D.H.L.	6/7/08	



NEW MANHOLES USE A BUTYL SEALANT BETWEEN FRAME AND MANHOLE TOP SECTION WHEN SECURING FRAME TO MANHOLE TO PROVIDE A WATER TIGHT SEAL

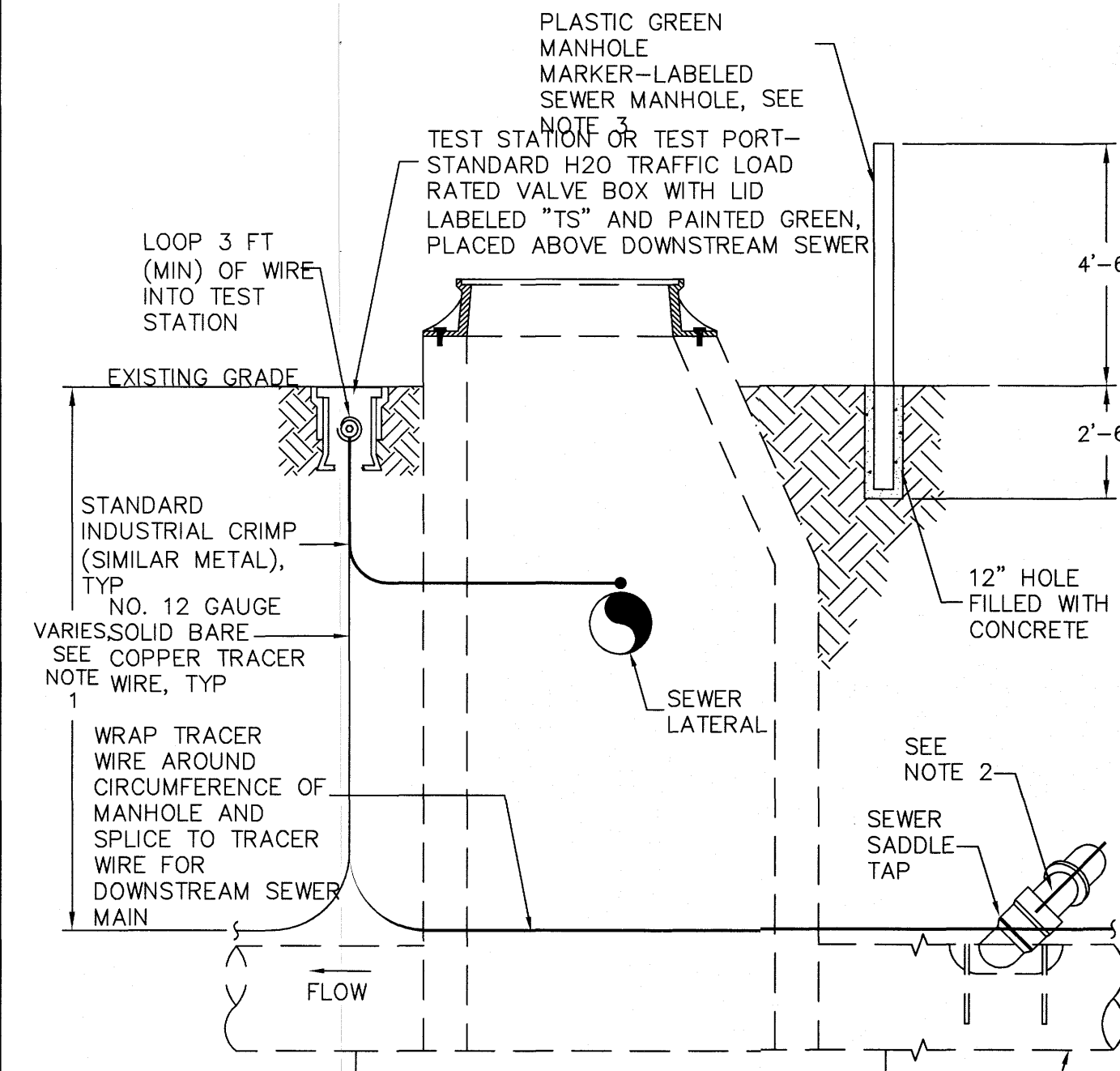
ECCENTRIC M.H. CONE MAY BE USED ON 8", 10" AND 12" SEWER MAINS. MANHOLE CONE AND BARREL SECTIONS SHALL BE AS PER ASTM STANDARDS

LATERAL INVERT SHALL NOT BE LOWER THAN MAIN SPRING-LINE. MANHOLE SHALL BE 2' ABOVE 100 YEAR FLOOD PLAIN OR SEALED AND VENT TO BE 2' ABOVE 100 YEAR FLOOD PLAIN. WHEN MANHOLE TOPS ARE IN EXCESS OF 3' ABOVE GRADE, OUTSIDE STEPS MUST BE PROVIDED. SEE STANDARD S-28 FOR STEP DETAIL. IN NON TRAFFIC AREAS, TOP OF FRAME AND COVER SHALL BE INSTALLED A MIN. OF 1' ABOVE FINISHED GROUND SURFACE.

SEE SEWER DESIGN SECTION

MIN. 9" COMPACTED #67 STONE BASE TO BE INSTALLED UNDER NEW MANHOLE.

CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
STANDARD PRECAST SANITARY SEWER MANHOLE			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-20	Y.C.A.	12-31-92	ABB
	RRH	3-30-00	D.H.L.
			6-18-08



PLASTIC GREEN MANHOLE MARKER-LABELED SEWER MANHOLE, SEE TEST STATION OR TEST PORT-STANDARD H2O TRAFFIC LOAD RATED VALVE BOX WITH LID LABELED "TS" AND PAINTED GREEN, PLACED ABOVE DOWNSTREAM SEWER

LOOP 3 FT (MIN) OF WIRE INTO TEST STATION

EXISTING GRADE

STANDARD INDUSTRIAL CRIMP (SIMILAR METAL), TYP. NO. 12 GAUGE VARISSOLID BARE SEE COPPER TRACER NOTE WIRE, TYP

WRAP TRACER WIRE AROUND CIRCUMFERENCE OF MANHOLE AND SPLICE TO TRACER WIRE FOR DOWNSTREAM SEWER MAIN

SEWER LATERAL

SEE NOTE 2

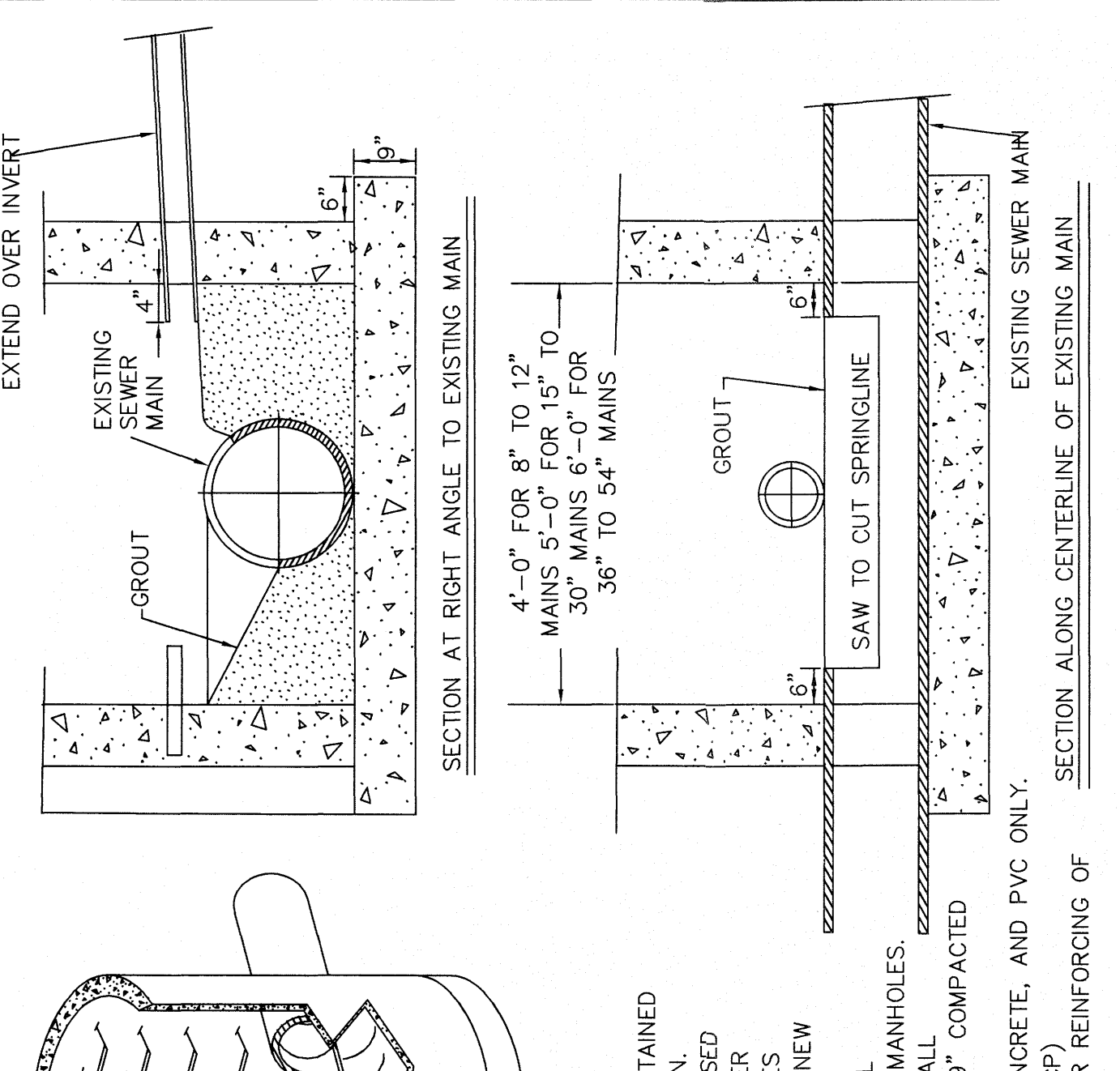
SEWER SADDLE TAP

12" HOLE FILLED WITH CONCRETE

FLOW

SEWER MAIN

CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-20A	WKD	09-14	



SECTION AT RIGHT ANGLE TO EXISTING MAIN

SECTION ALONG CENTERLINE OF EXISTING MAIN

EXTEND OVER INVERT

EXISTING SEWER MAIN

GROUT

EXISTING SEWER MAIN

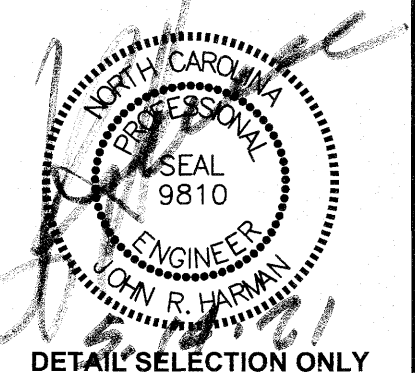
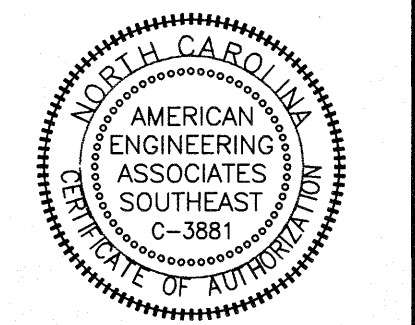
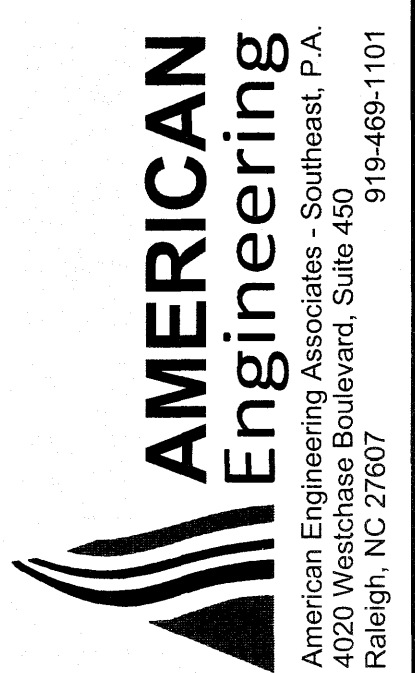
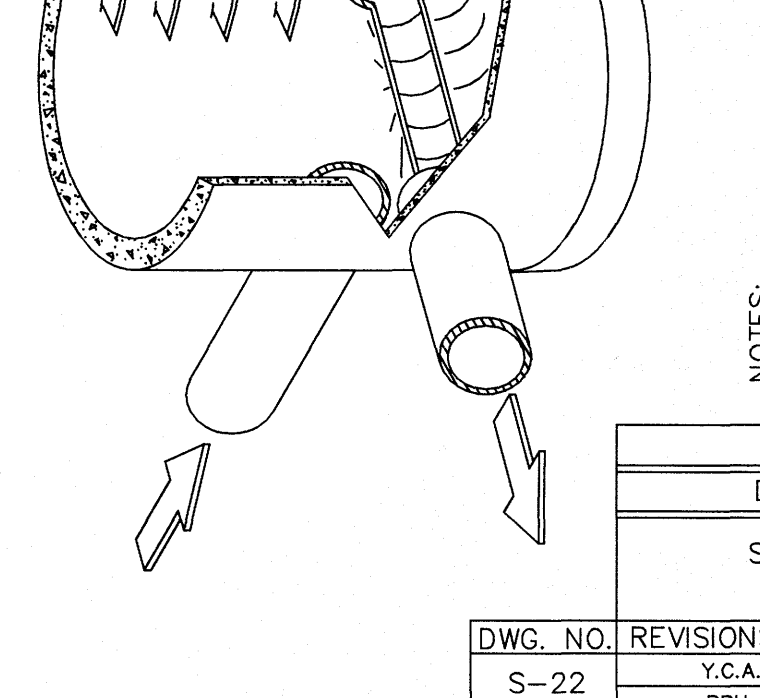
SAW TO OUT SPRINGLINE

EXISTING SEWER MAIN

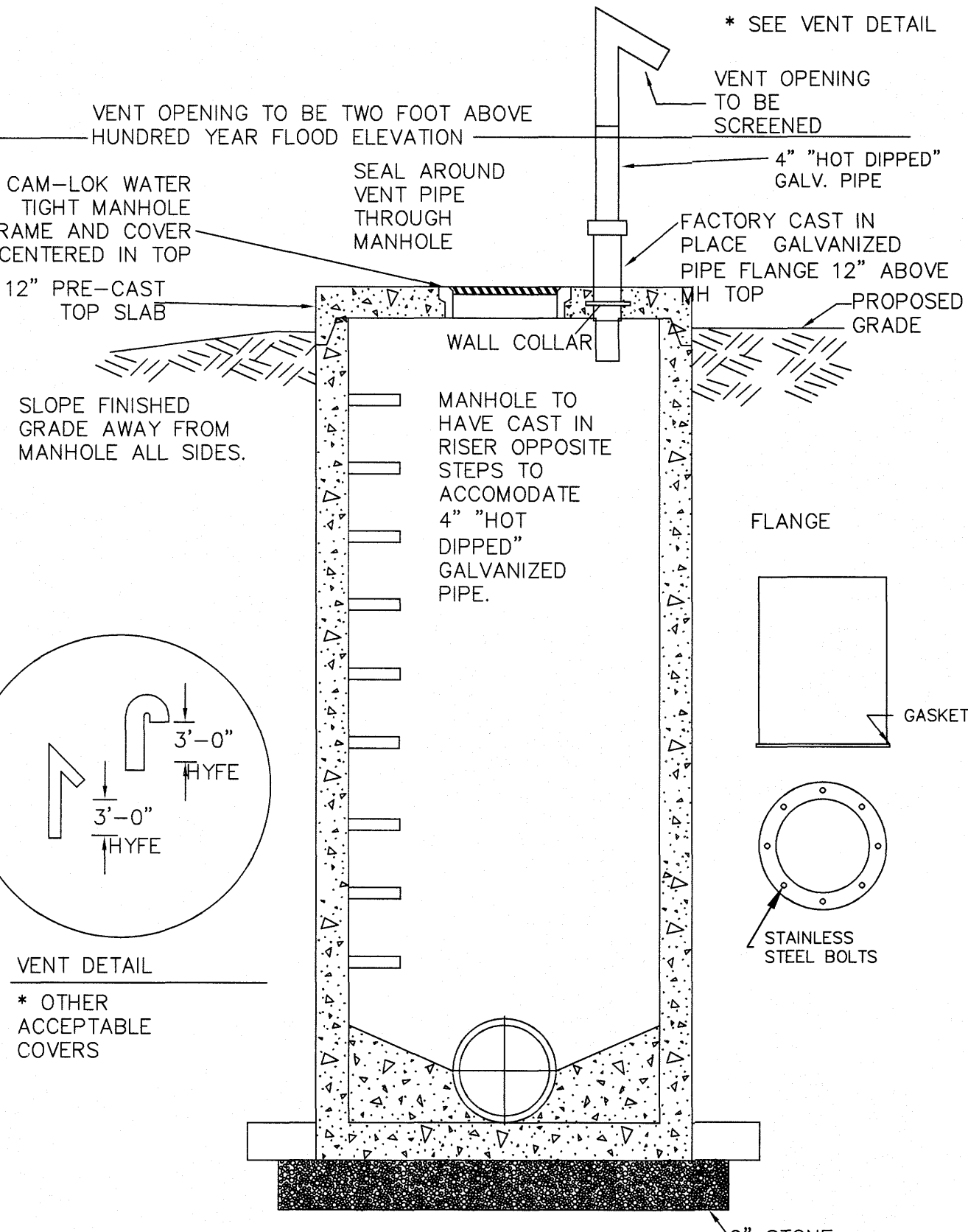
SECTION ALONG CENTERLINE OF EXISTING MAIN

POURED IN-PLACE BASE

CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
STANDARD MANHOLE INSTALLATION OVER EXISTING SEWER MAIN			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-22	Y.C.A.	12-31-91	A.B.B.
	RRH	3-30-00	D.H.L.
			6/16/08



DETAIL SELECTION ONLY



* SEE VENT DETAIL

VENT OPENING TO BE TWO FOOT ABOVE HUNDRED YEAR FLOOD ELEVATION

VENT OPENING TO BE SCREENED

CAM-LOK WATER TIGHT MANHOLE FRAME AND COVER CENTERED IN TOP

MIN. 12" PRE-CAST TOP SLAB

SEAL AROUND VENT PIPE THROUGH MANHOLE

4" "HOT DIPPED" GALV. PIPE

FACTORY CAST IN PLACE GALVANIZED PIPE FLANGE 12" ABOVE PROPOSED GRADE

WALL COLLAR

MANHOLE TO HAVE CAST IN RISER OPPOSITE STEPS TO ACCOMMODATE 4" "HOT DIPPED" GALVANIZED PIPE.

FLANGE

GASKET

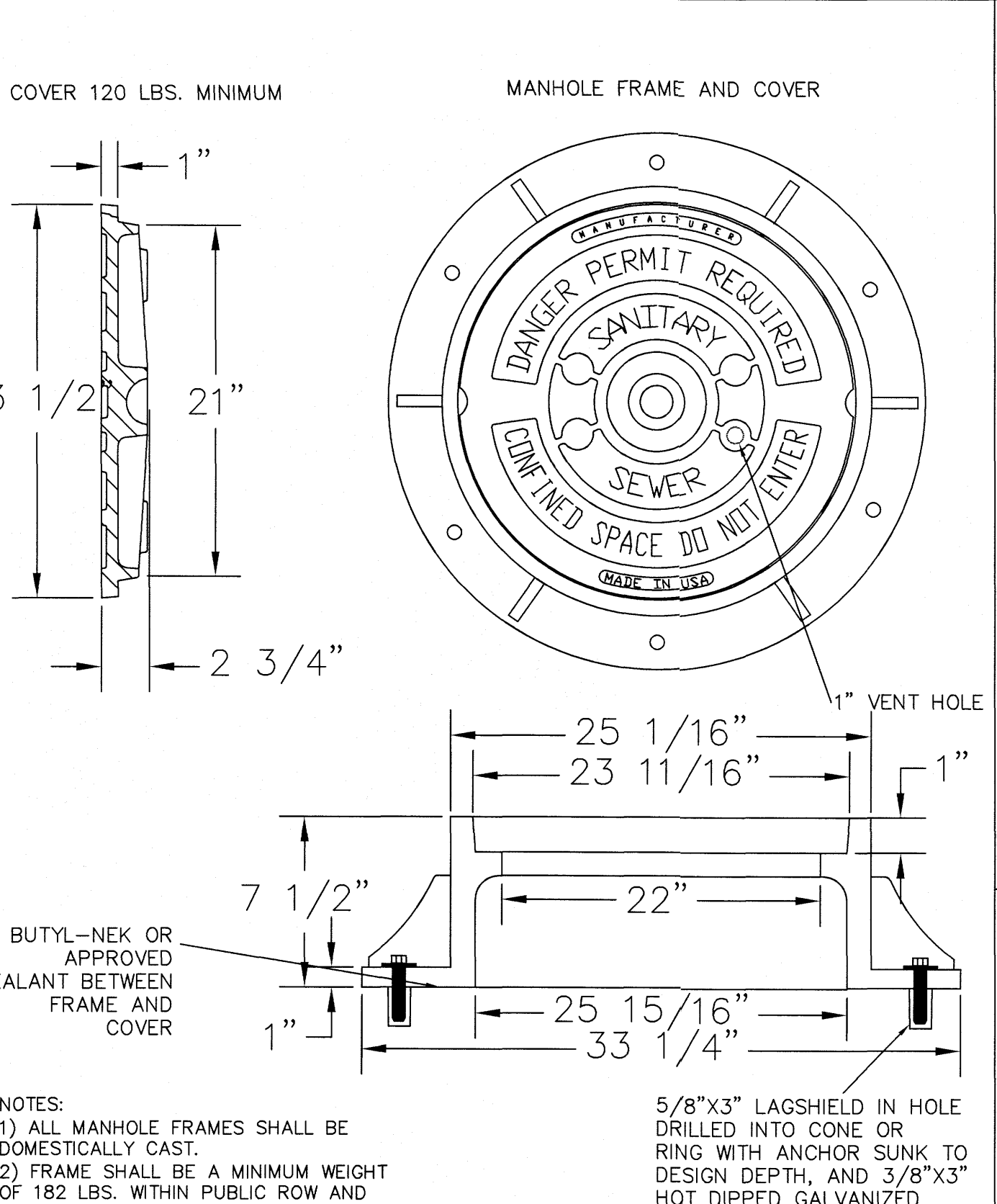
STAINLESS STEEL BOLTS

9" STONE

VENT DETAIL

* OTHER ACCEPTABLE COVERS

CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
STANDARD SEAL TIGHT MANHOLE WITH VENTED STACK			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-24	D.W.C.	6-7-99	A.B.B.
	RRH	3-30-00	D.H.L.
			6/16/08



COVER 120 LBS. MINIMUM

MANHOLE FRAME AND COVER

23 1/2"

21"

2 3/4"

1" VENT HOLE

25 1/16"

23 11/16"

1"

7 1/2"

22"

25 15/16"

33 1/4"

1"

5/8"x3" LAGSHIELD IN HOLE DRILLED INTO CONE OR RING WITH ANCHOR SUNK TO DESIGN DEPTH, AND 3/8"x3" HOT DIPPED GALVANIZED LAG BOLT AND WASHER.

NOTES:

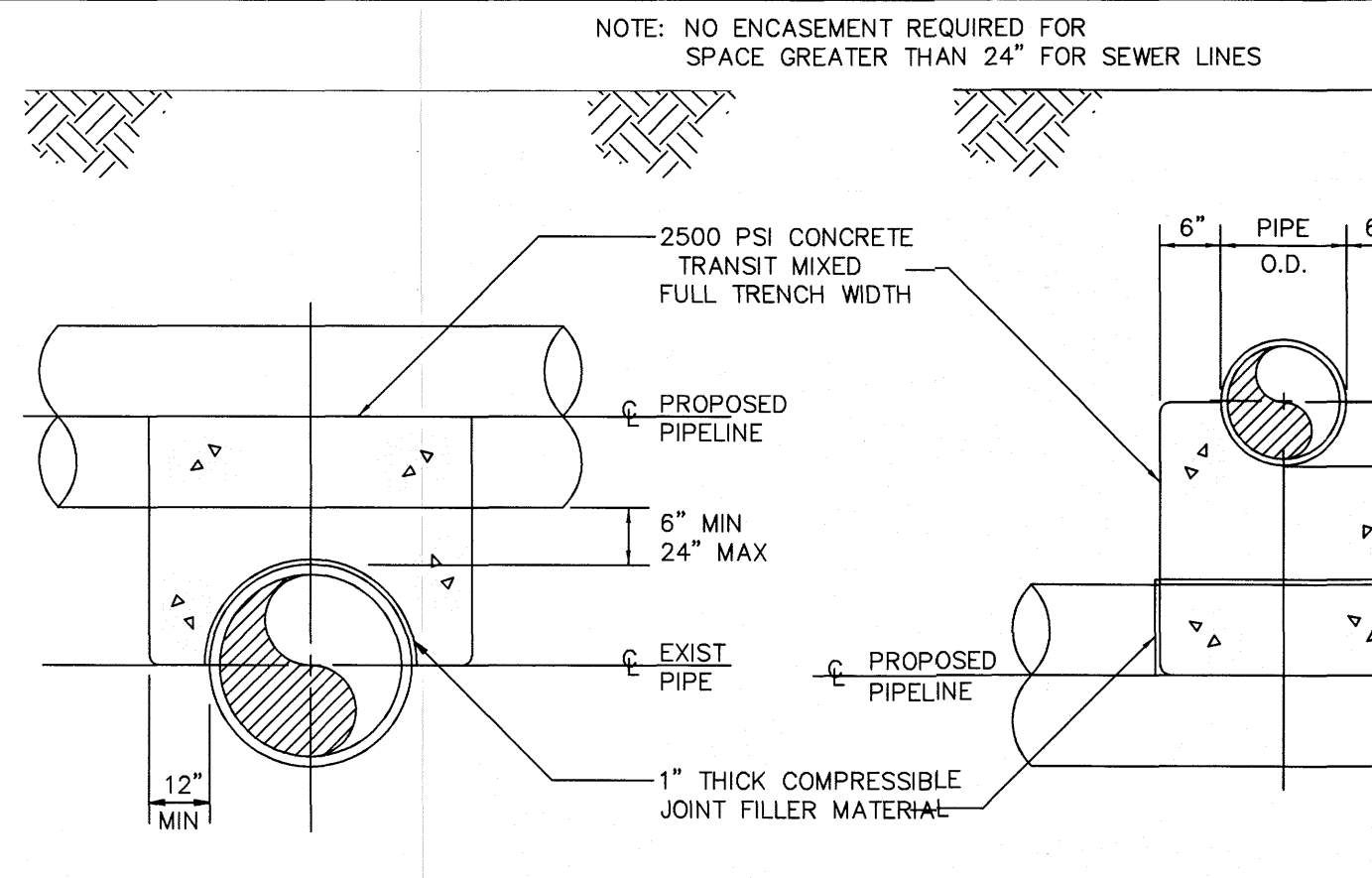
1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.

2) FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.

3) COVER SHALL WEIGH A MIN. OF 120 LBS.

4) ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
STANDARD MANHOLE COVER			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-25	3-1-87	3-1-87	A.B.B.
	RRH	3-30-00	D.H.L.
			6-18-08



NOTE: NO ENCASEMENT REQUIRED FOR SPACE GREATER THAN 24" FOR SEWER LINES

2500 PSI CONCRETE TRANSIT MIXED FULL TRENCH WIDTH

6" PIPE O.D.

EXIST PIPE

PROPOSED PIPELINE

6" MIN 24" MAX

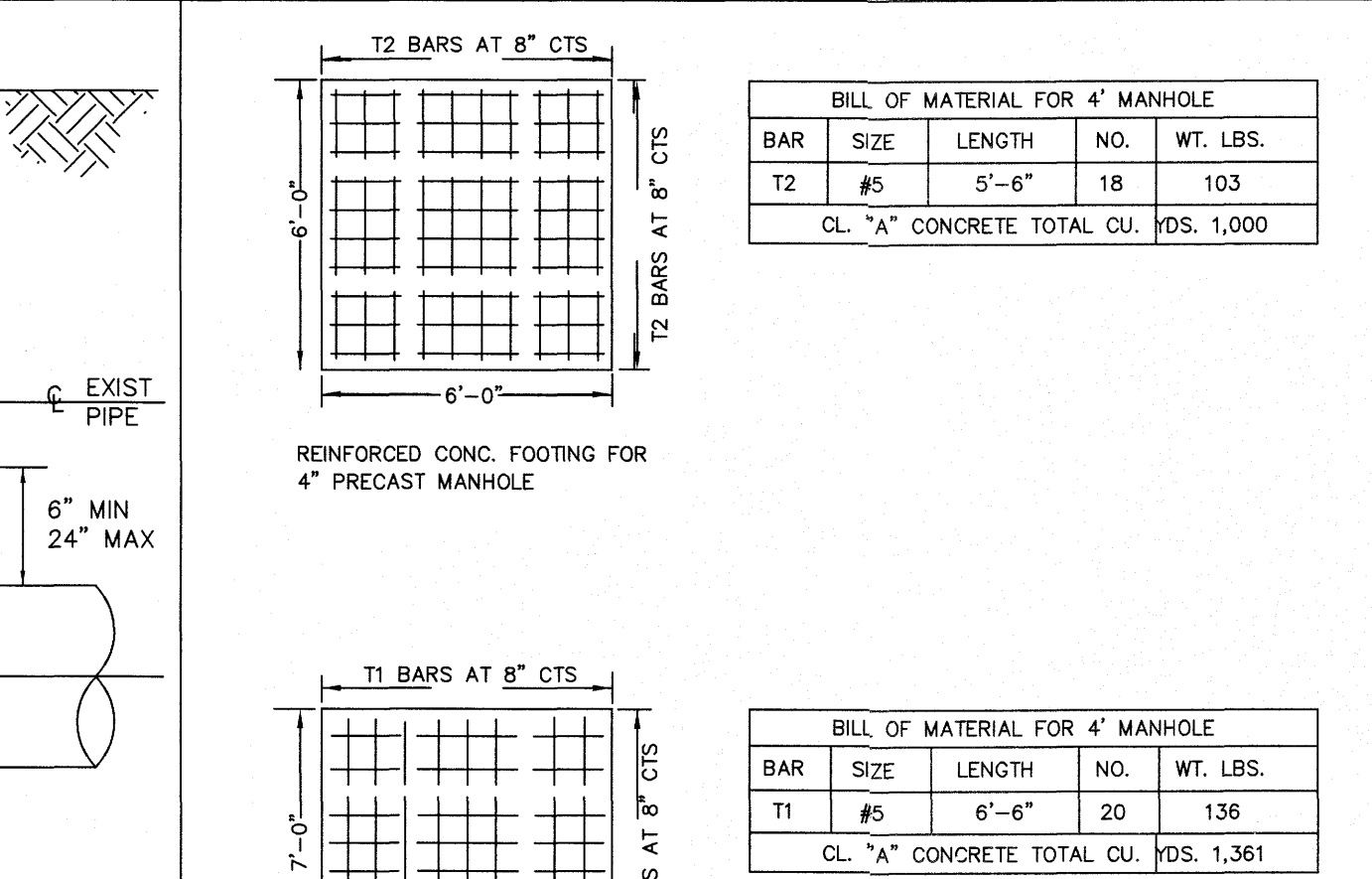
6" MIN 24" MAX

1" THICK COMPRESSIBLE JOINT FILLER MATERIAL

PROPOSED PIPELINE OVER EXISTING PIPE

PROPOSED PIPELINE UNDER EXISTING PIPE

CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
CONCRETE CRADLE PROTECTION FOR SEWER LINE CROSSINGS			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-49	DHL	2-20-08	



CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
EXTENDED BASE OR CAST-IN-PLACE REINFORCED CONCRETE BASE			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-21	RRH	3-1-87	ABB
		3-30-00	
			2-9-05

CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
STANDARD MANHOLE INSTALLATION OVER EXISTING SEWER MAIN			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-22	Y.C.A.	12-31-91	A.B.B.
	RRH	3-30-00	D.H.L.
			6/16/08

BILL OF MATERIAL FOR 4" MANHOLE			
BAR	SIZE	LENGTH	NO.
T2	#5	5'-6"	18
CL. "A" CONCRETE TOTAL CU. VOLS. 1,000			

BILL OF MATERIAL FOR 4" MANHOLE			
BAR	SIZE	LENGTH	NO.
T1	#5	6'-6"	20
CL. "A" CONCRETE TOTAL CU. VOLS. 1,361			

BILL OF MATERIAL FOR 4" MANHOLE			
BAR	SIZE	LENGTH	NO.
T2	#5	7'-6"	24
CL. "A" CONCRETE TOTAL CU. VOLS. 1,778			

SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook, City of Raleigh Public Utilities Department Permit # S-4925.

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook, City of Raleigh Public Utilities Department Permit # W-3785.

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit #

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. The electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval

Raleigh Water Review Officer



STIPULATION FOR REUSE

THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE NAMED HEREON. CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HEREON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

KALAS FALLS
PHASE 2
1832 ROLESVILLE ROAD
WAKE COUNTY, NC

JOB NUMBER: 9900

CHECKED BY:

DRAWN BY:

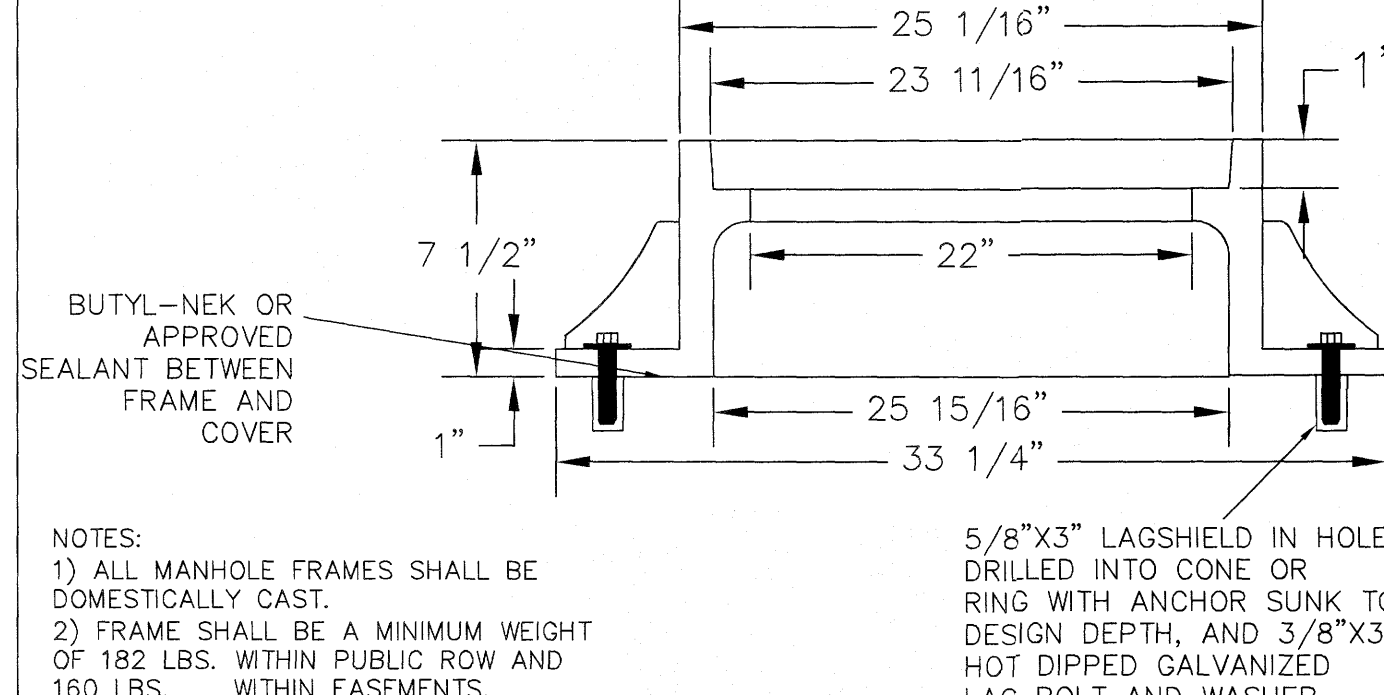
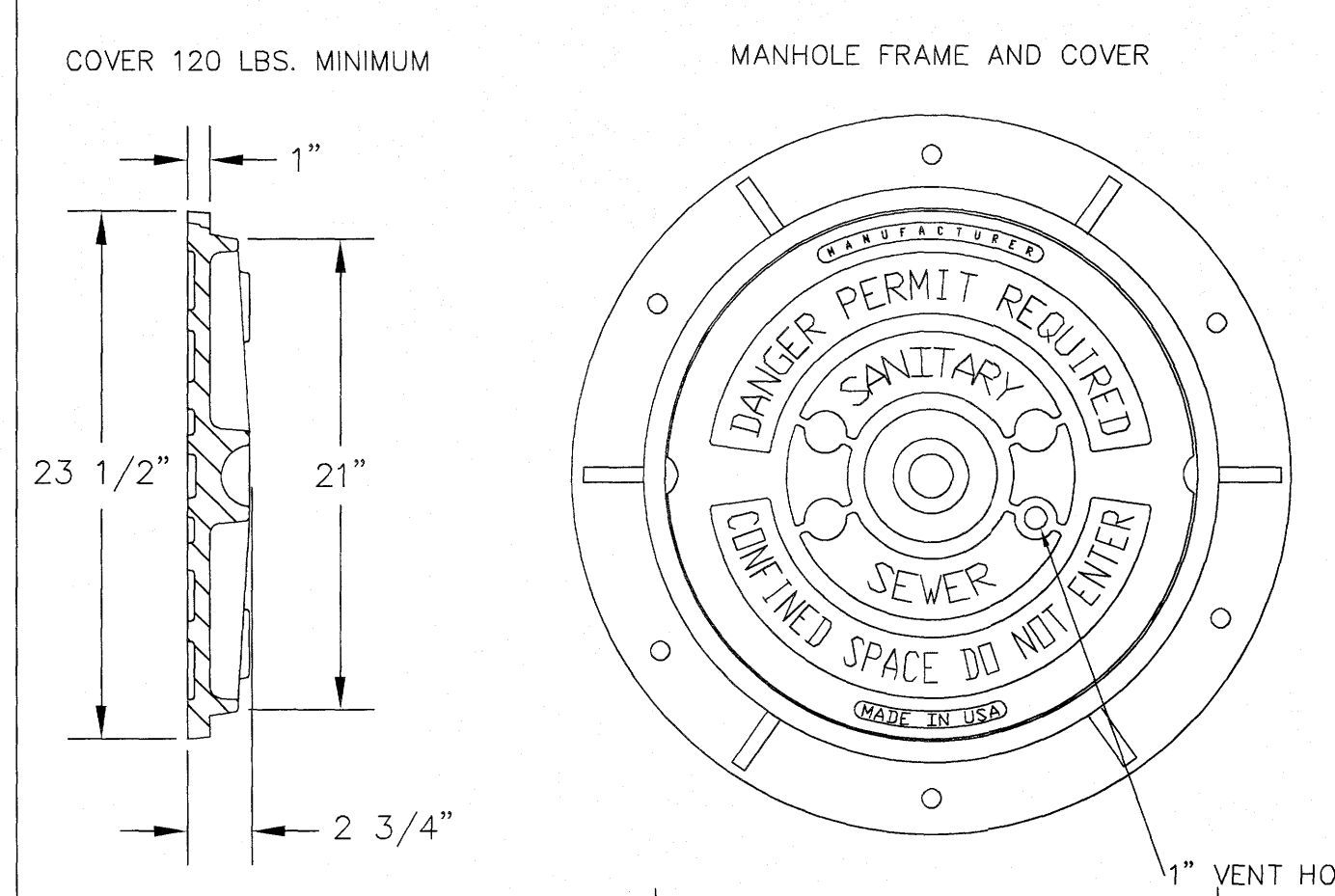
DATE: DECEMBER 21, 2020

SHEET TITLE:

KALAS FALLS CIVIL DETAILS

SHEET NO.:

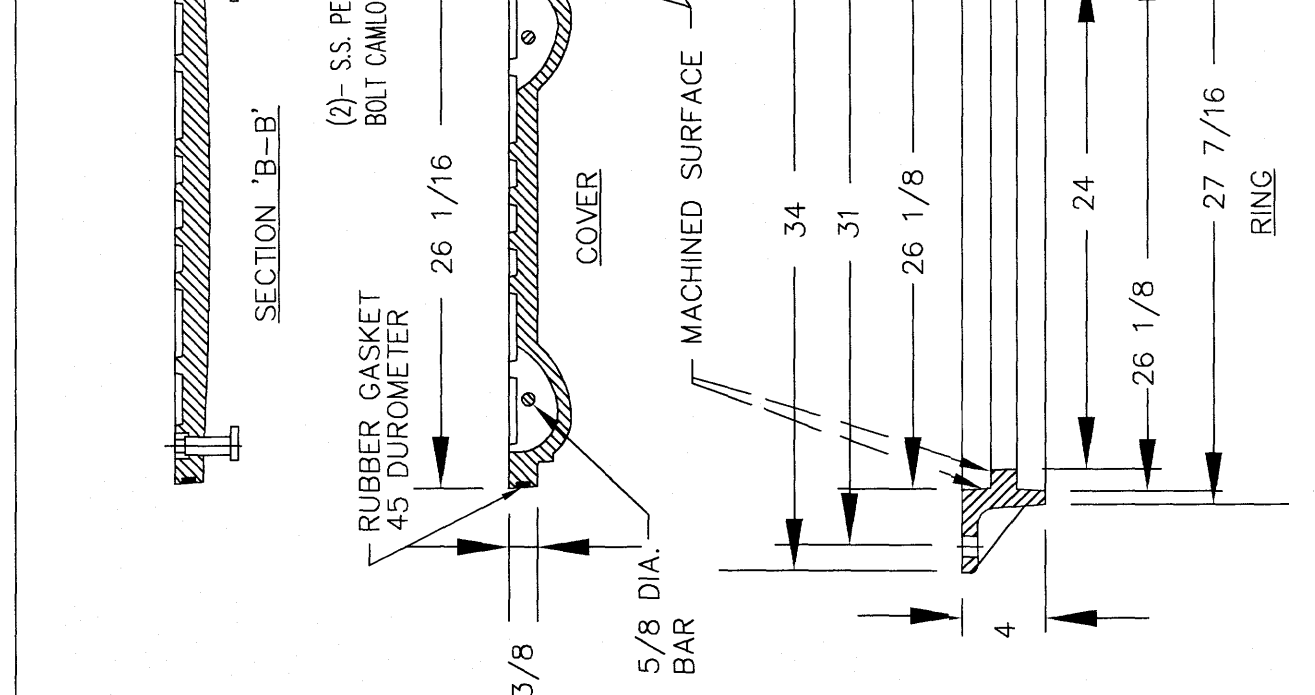
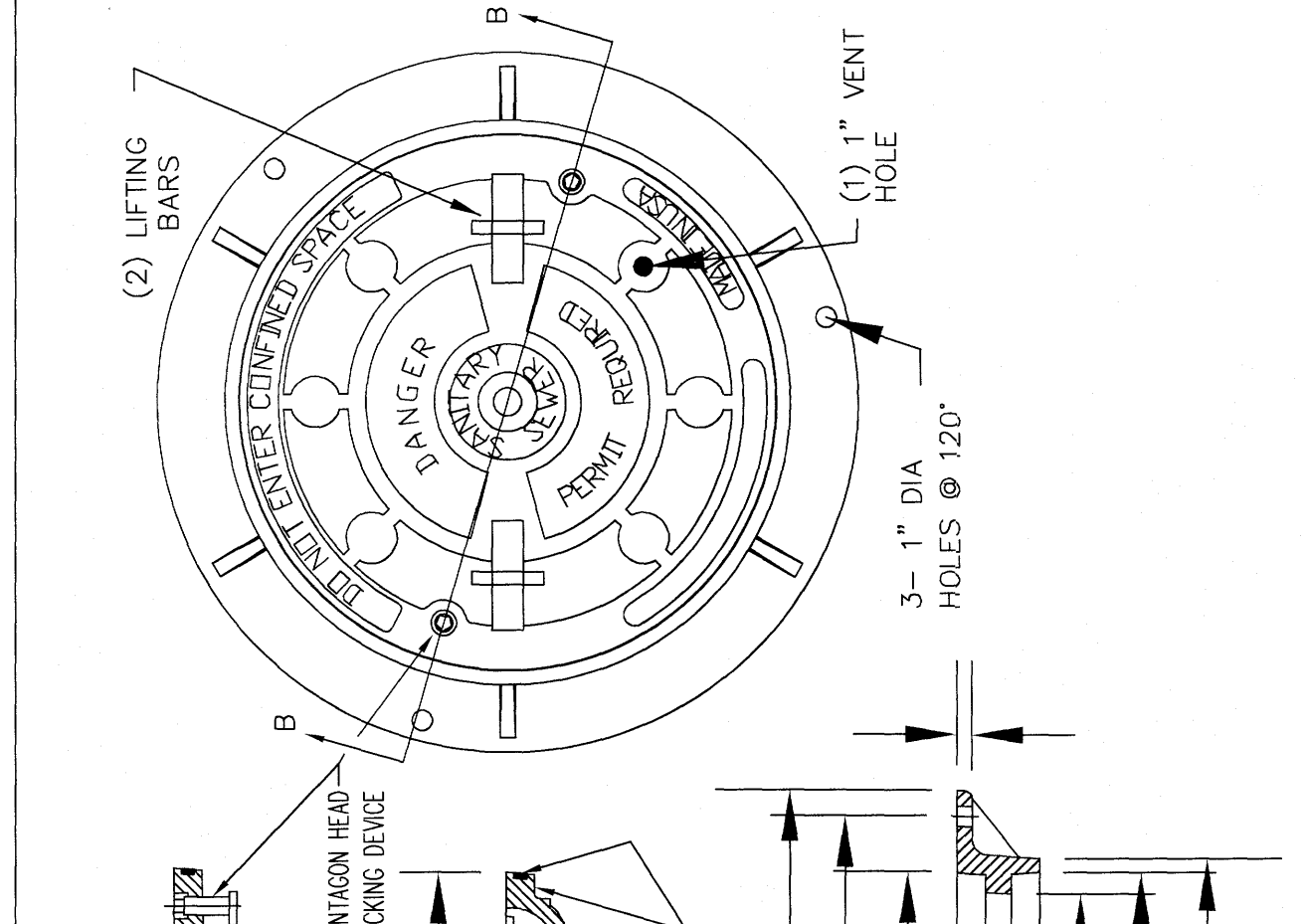
CD10



NOTES:

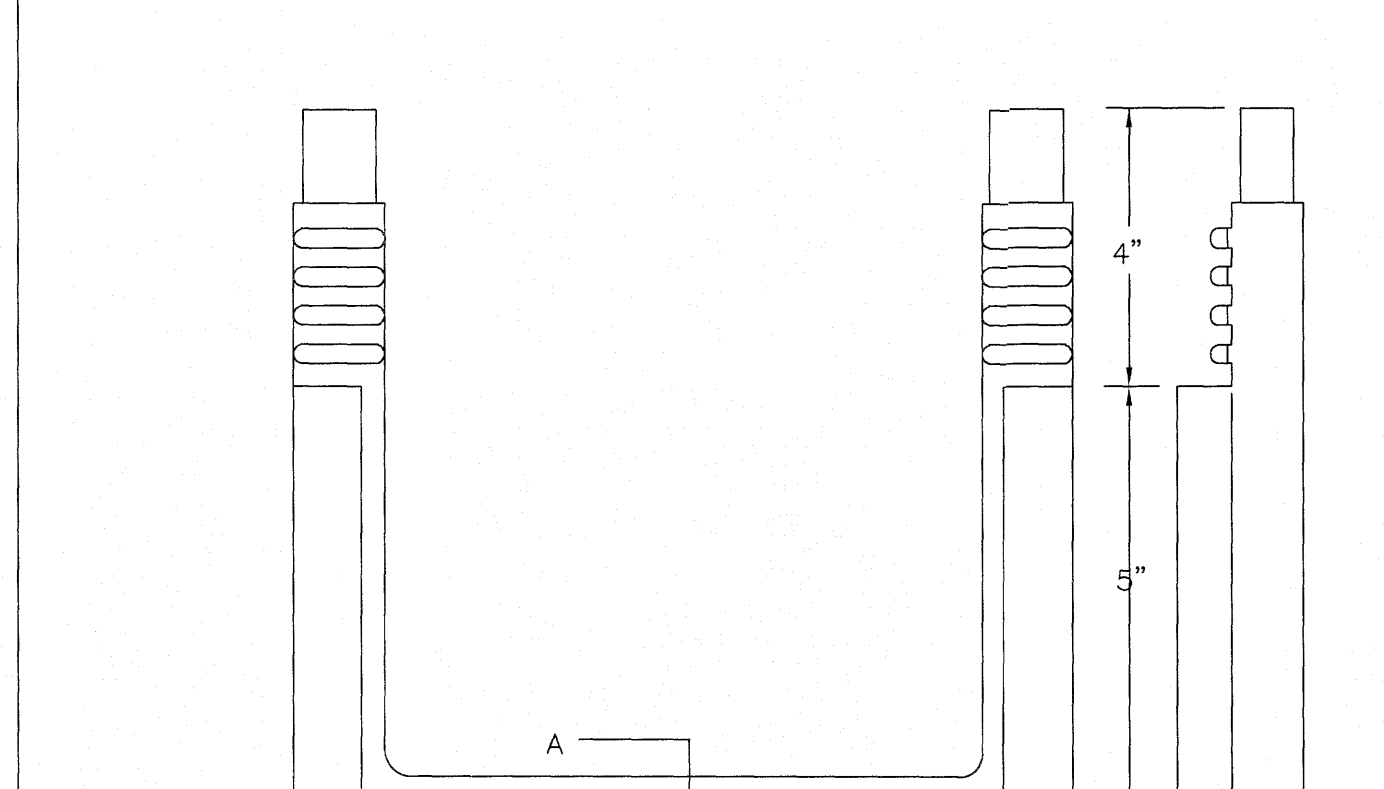
- 1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
- 2) FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS. WITHIN PUBLIC ROW AND 150 LBS. WITHIN EASEMENTS.
- 3) COVER SHALL WEIGH A MIN. OF 120 LBS.
- 4) ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
STANDARD MANHOLE COVER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-25	3-1-87	3-1-87	A.B.B.	2-9-05	
	RRH	3-30-00	D.H.L.	6-18-08	

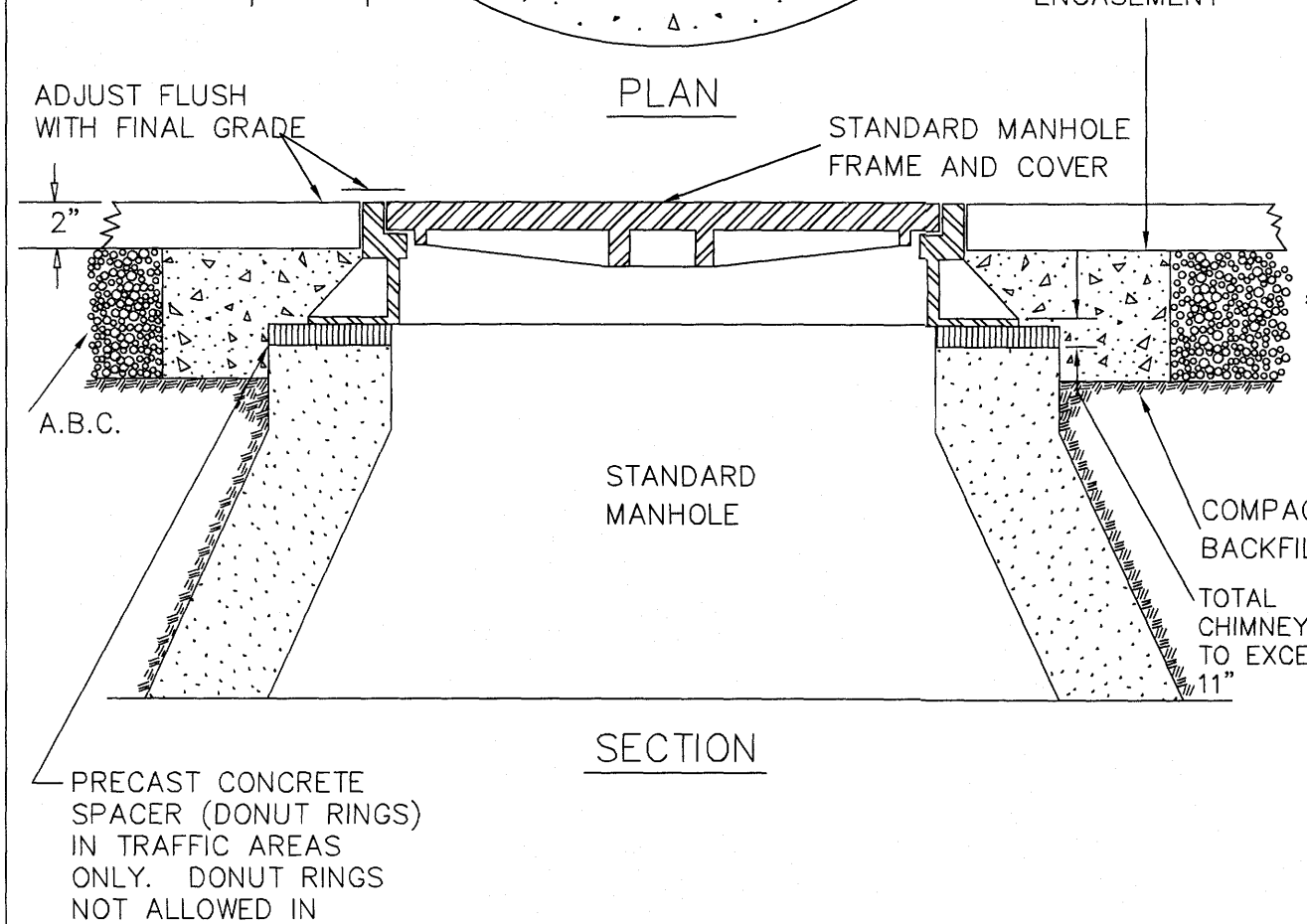
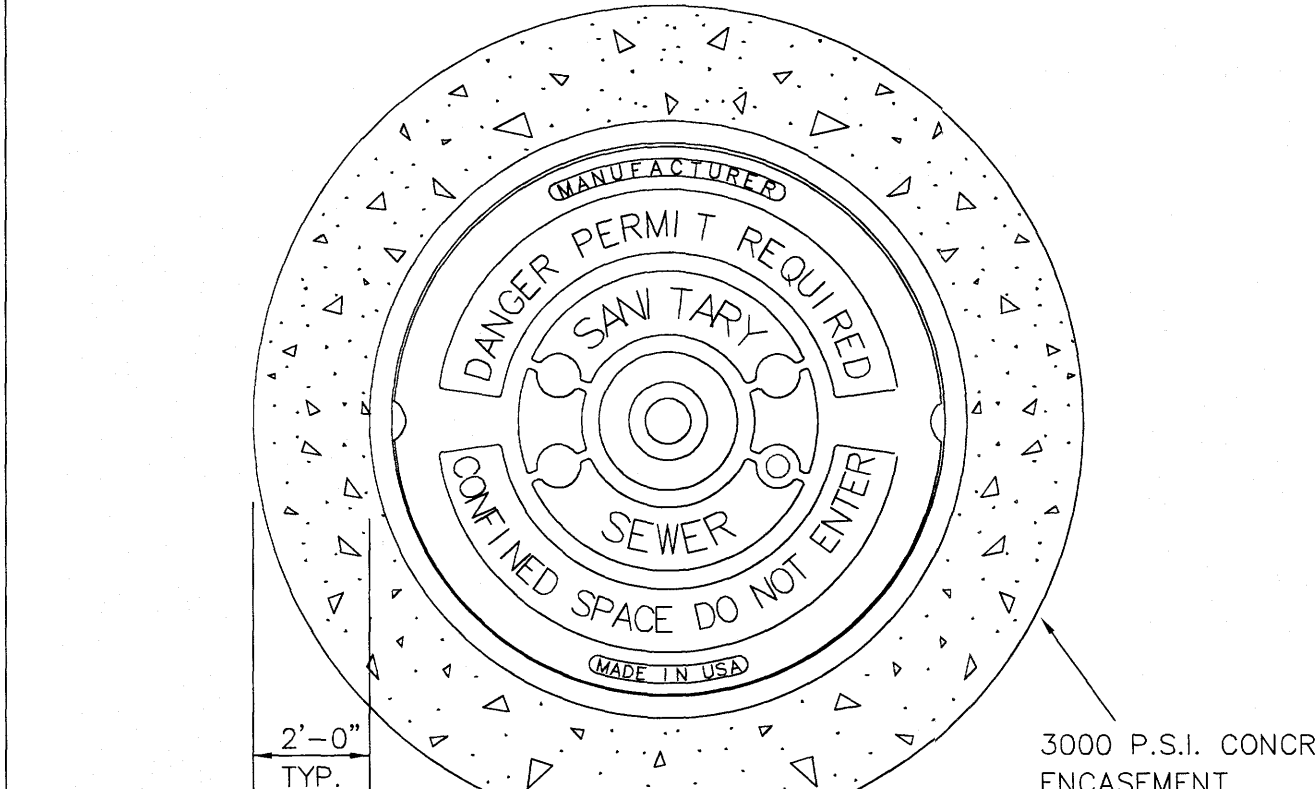


Note: solid cover required when water tight manhole specified.

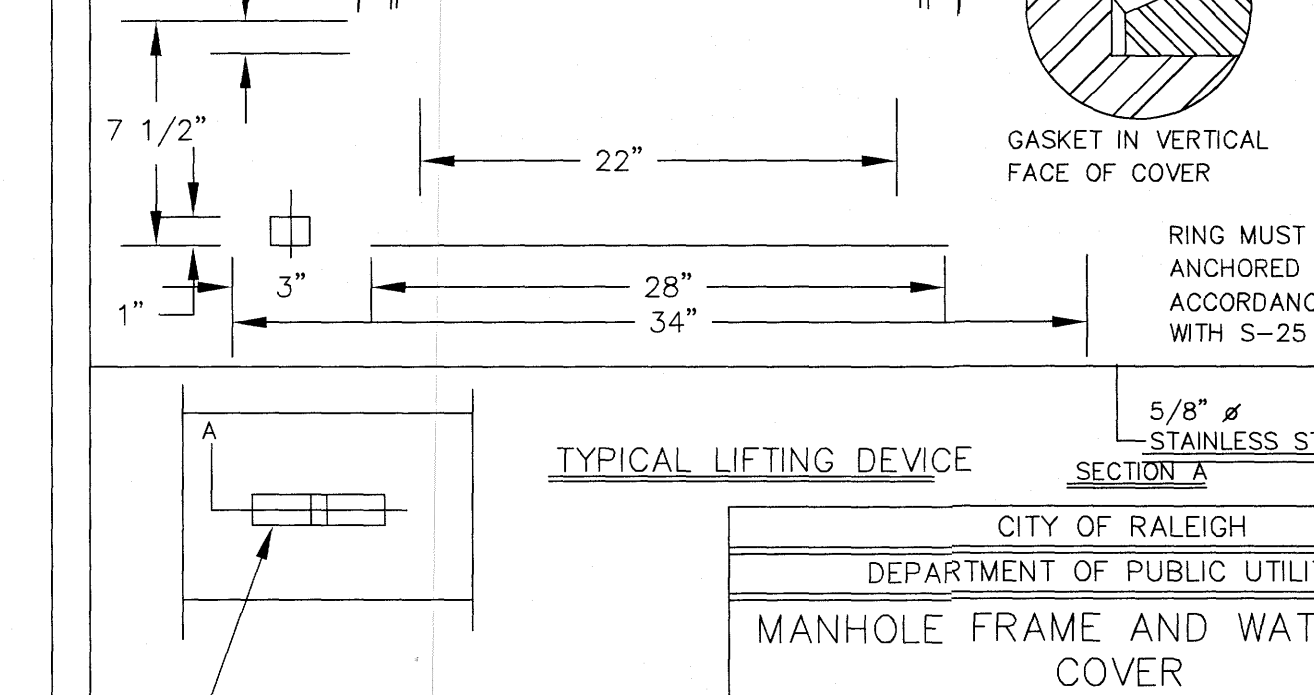
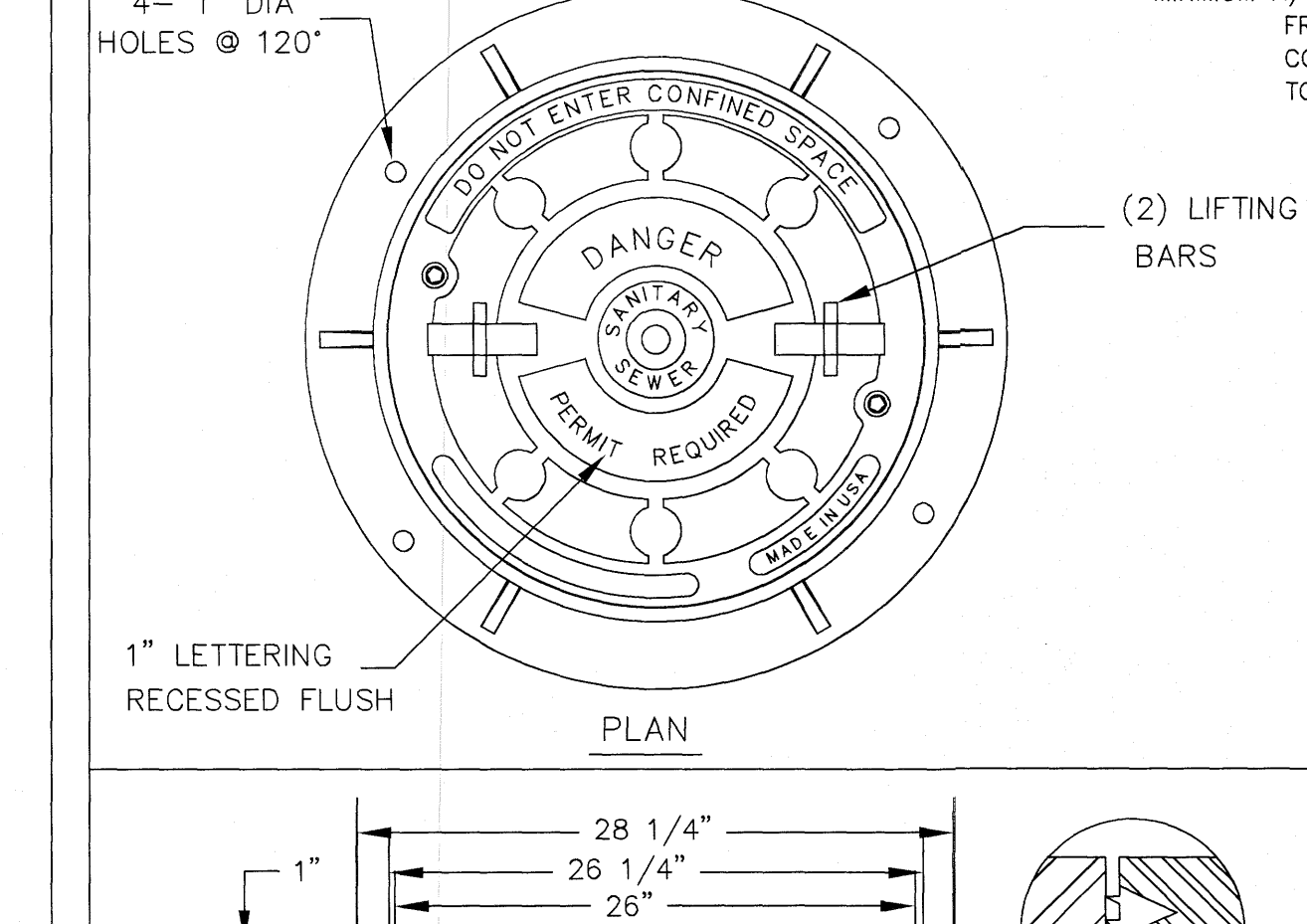
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
FLAT TOP MANHOLE COVER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-25a	3-1-87	3-1-87	A.B.B.	2-9-05	
	RRH	3-30-00	D.H.L.	6-18-08	



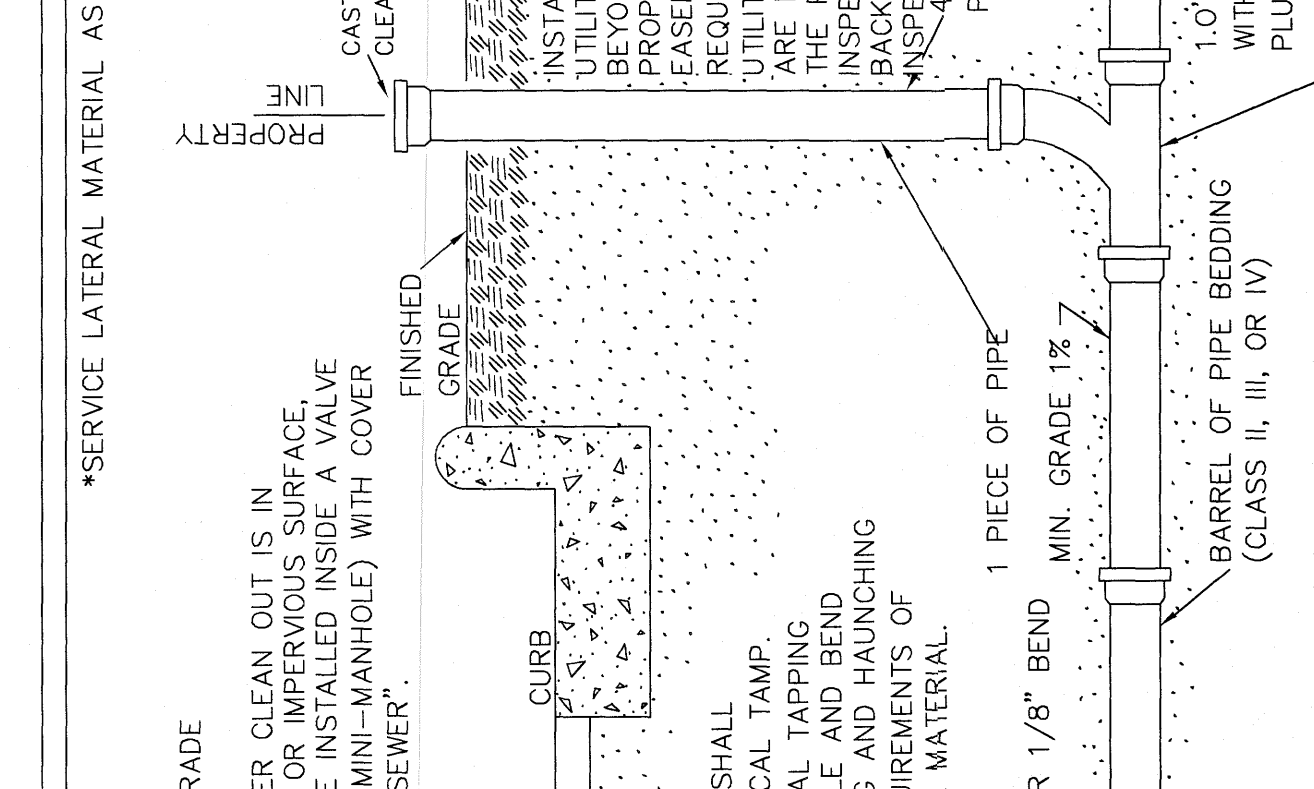
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
STANDARD SLIP RESISTANT MANHOLE STEP DETAIL					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-28	RRH	3-30-00			



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
STANDARD MANHOLE FRAME AND COVER DETAIL WITHIN PAVED SURFACES					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-29	Y.C.A.	12-31-91	ABB	9-20-04	
	RRH	3-30-00	DHL	11-29-07	



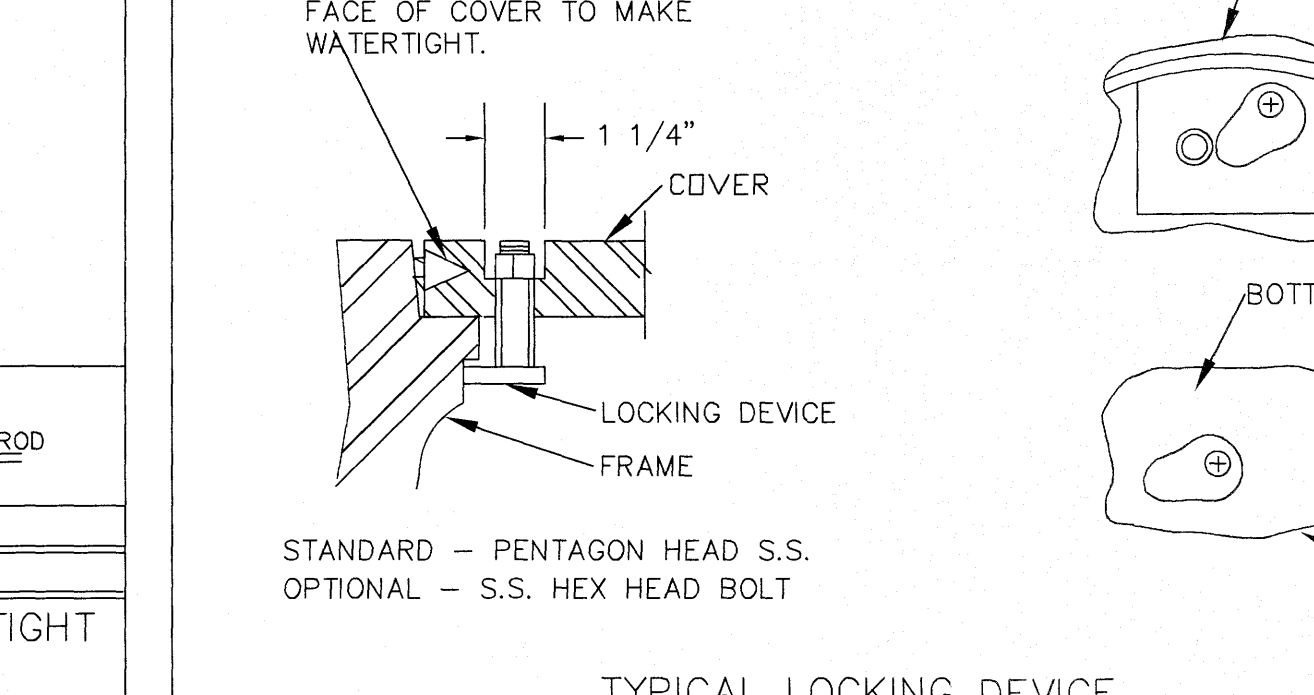
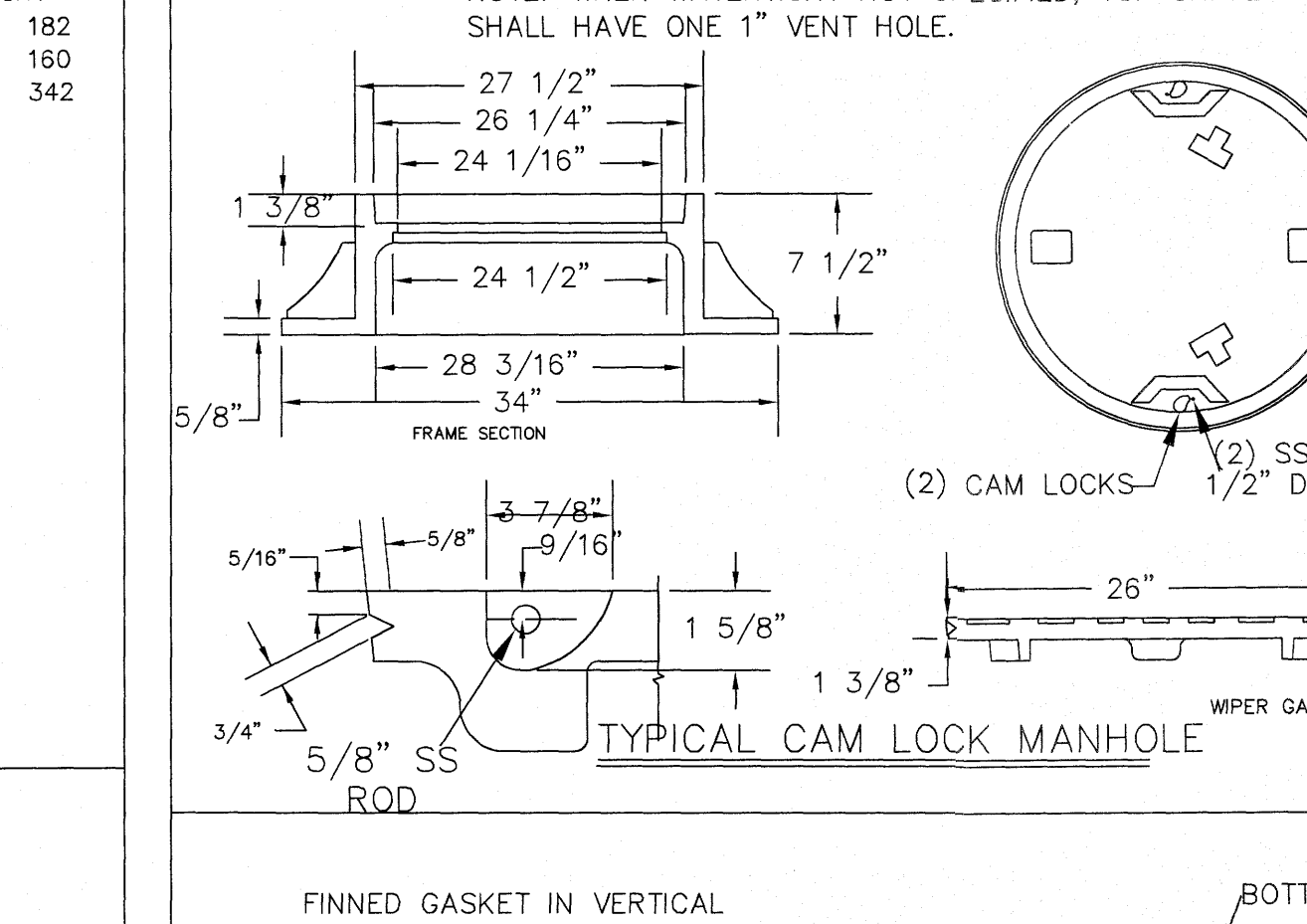
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
MANHOLE FRAME AND WATERTIGHT COVER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-26	3-1-87	3-1-87	ABB	8-29-05	
	RRH	3-30-00	D.H.L.	6/18/08	



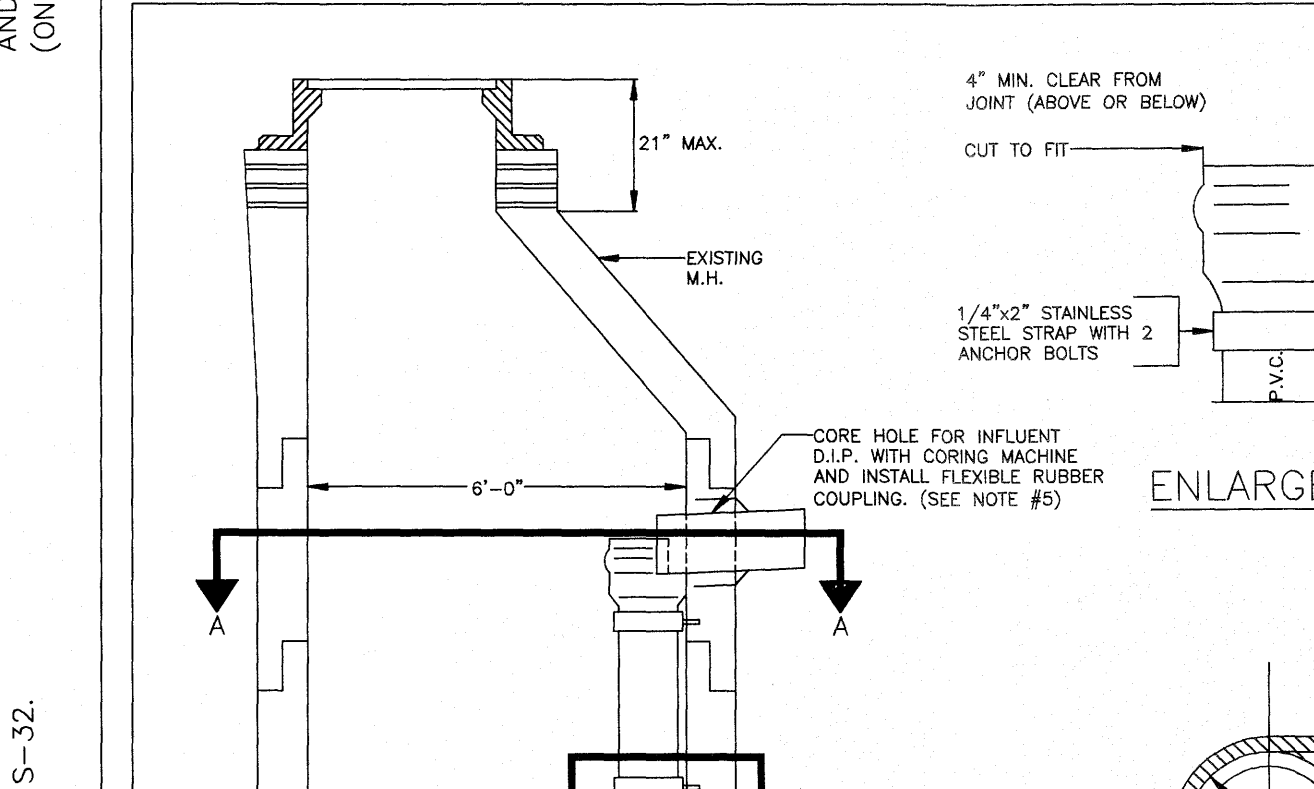
NOTE: THE FULL LENGTH OF THE SERVICE DITCH SHALL BE COMPACTED IN 6' LIFTS WITH MECHANICAL TAMP. ALL TAPS WILL BE MADE USING MECHANICAL TAPPING MACHINE. FOR PVC INSTALLATIONS, SADDLE AND BEND MUST BE BEDDED IN #7 STONE. BEDDING AND HAUNCHING OF PIPE BARREL MUST COMPLY WITH REQUIREMENTS OF DETAILS S-4 OR S-5 ACCORDING TO PIPE MATERIAL.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
TYPICAL SANITARY SEWER LATERAL CONNECTION					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-30	Y.C.A.	6-92	A.B.B.	4-8-04	
	RRH	3-30-00	D.H.L.	6-18-08	

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
INSIDE DROP MANHOLE					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-53	MAB	11-6-13			



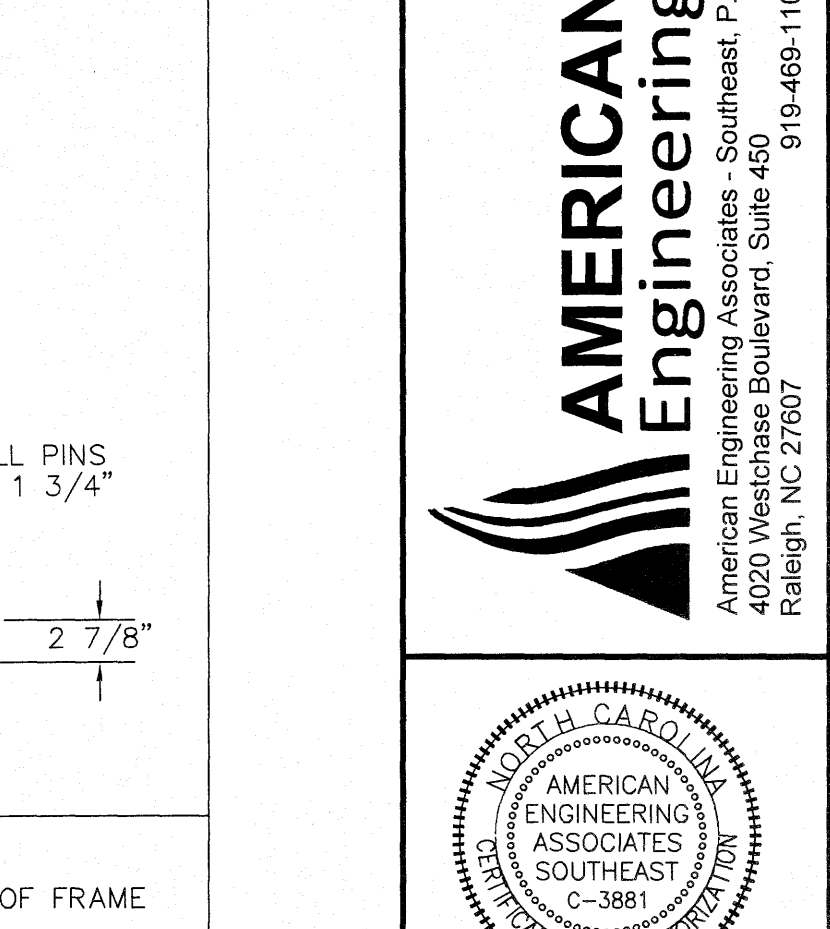
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
WATER-TIGHT MANHOLE FRAME WITH CAM LOCK COVER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-27	RRH	3-30-00			
	DHL	6-18-08			



NOTES:

- 1) PIPE FOR INSIDE DROP SHALL BE SDR 35 PVC CONFORMING TO ASTM SPECIFICATION 03034.
- 2) BOTTOM BEND TO BE 90° SHORT BEND, BELL SPIGOT, OF SDR 35 PVC. SPIGOT OF BEND TO REST DIRECTLY ON EXISTING SHELF. CONSTRUCT MASONRY TROUGH FROM DROP EFFLUENT TO MAIN CHANNEL.
- 3) NOTCH BELL OF PVC DROP TO ACCEPT D.I.P. SPIGOT AS SHOWN.
- 4) LOCATE STRAPS AT PIPE BELL AND ABOVE BELL OF 90° BEND AS SHOWN. ADD EXTRA STRAPS AS NECESSARY TO MAINTAIN MAXIMUM SPACING OF TEN FEET.
- 5) HOLE IN MANHOLE WALL TO BE MADE WITH A CORING MACHINE. INSTALL FLEXIBLE RUBBER COUPLING.
- 6) CORE HOLE SHALL NOT ENTER CONE SECTION.
- 7) STRAPS SHALL BE RELOCATED IF THEY CONFLICT WITH INSIDE DROP.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
INSIDE DROP MANHOLE					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-53	MAB	11-6-13			



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
STANDARD MANHOLE COVER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-25	3-1-87	3-1-87	A.B.B.	2-9-05	
	RRH	3-30-00	D.H.L.	6-18-08	

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
FLAT TOP MANHOLE COVER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-25a	3-1-87	3-1-87	A.B.B.	2-9-05	
	RRH	3-30-00	D.H.L.	6-18-08	

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
TYPICAL SANITARY SEWER LATERAL CONNECTION					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-30	Y.C.A.	6-92	A.B.B.	4-8-04	
	RRH	3-30-00	D.H.L.	6-18-08	

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
INSIDE DROP MANHOLE					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-53	MAB	11-6-13			

STIPULATION FOR REUSE

THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE NAMED HEREON, CONTEMPORANEOUSLY WITH ITS ISSUANCE DATE AS LISTED, HEREON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. THE USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

KALAS FALLS
PHASE 2
1832 ROLLESVILLE ROAD
WAKE COUNTY, NC

JOB NUMBER: 9900
CHECKED BY:
DRAWN BY:
DATE: DECEMBER 21, 2020
SHEET TITLE:
KALAS FALLS CIVIL DETAILS
SHEET NO.: CD11

North Carolina
Professional Seal
9810
North Carolina 811
811 or 1-800-632-9949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

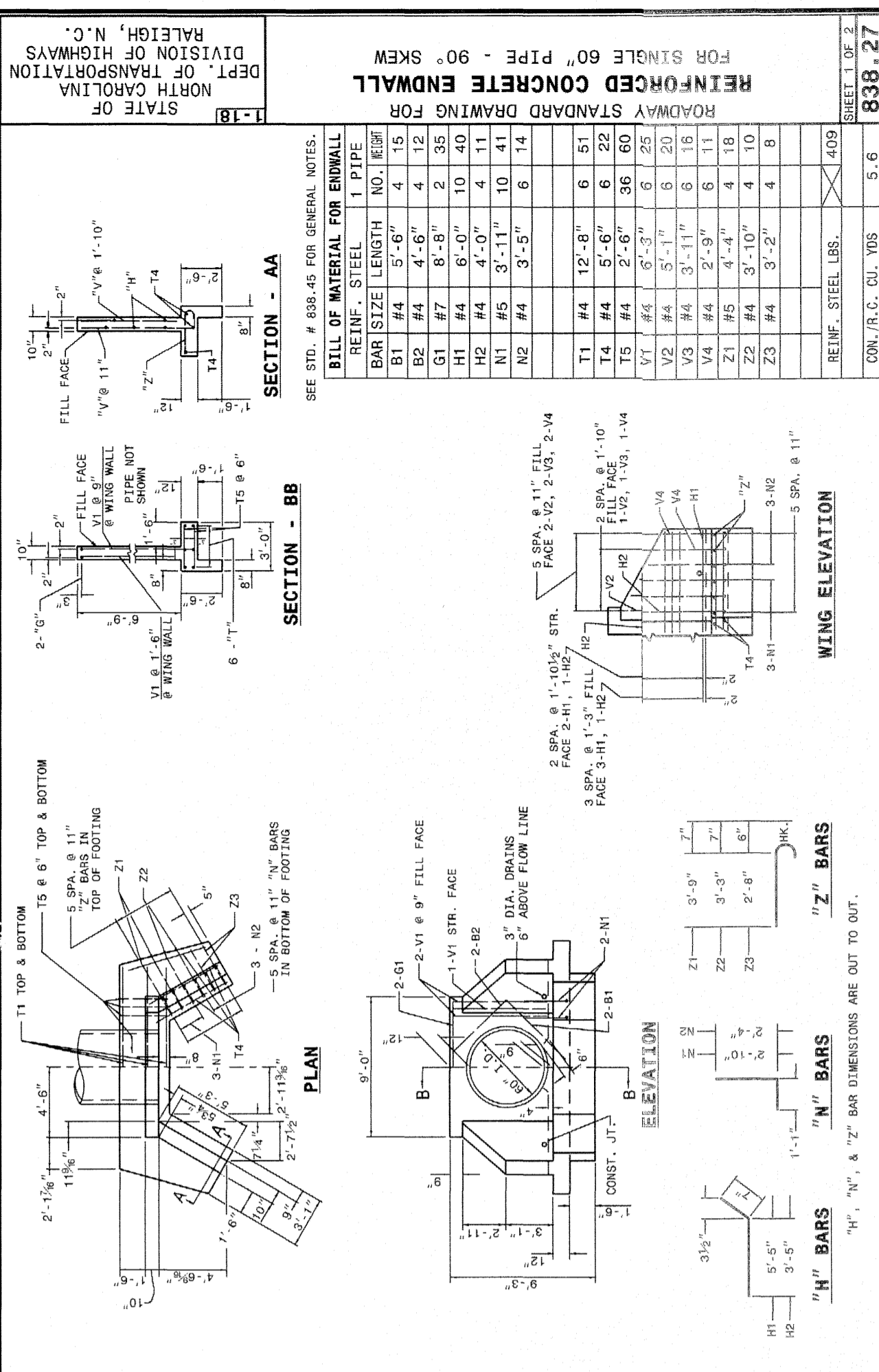
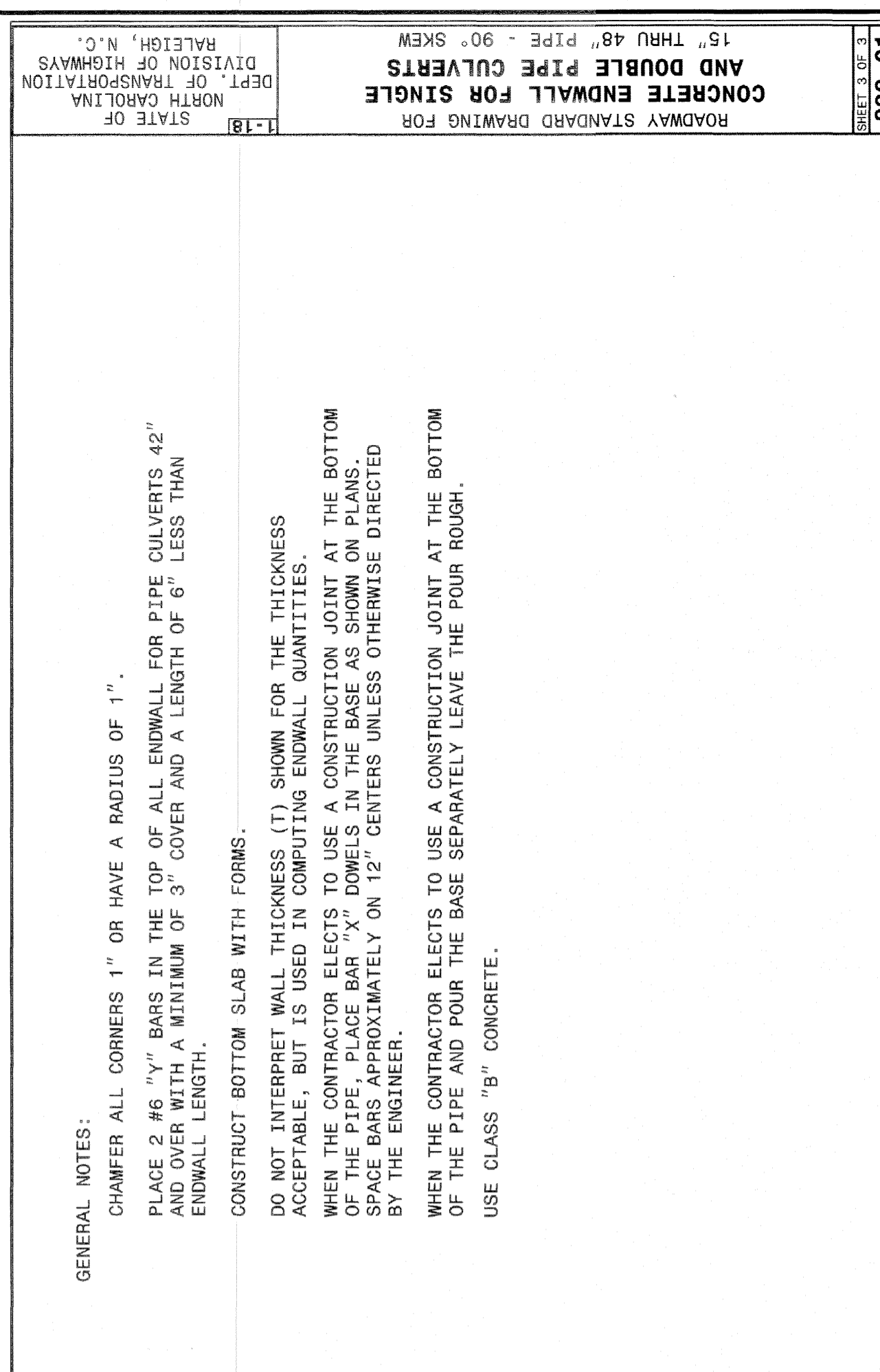
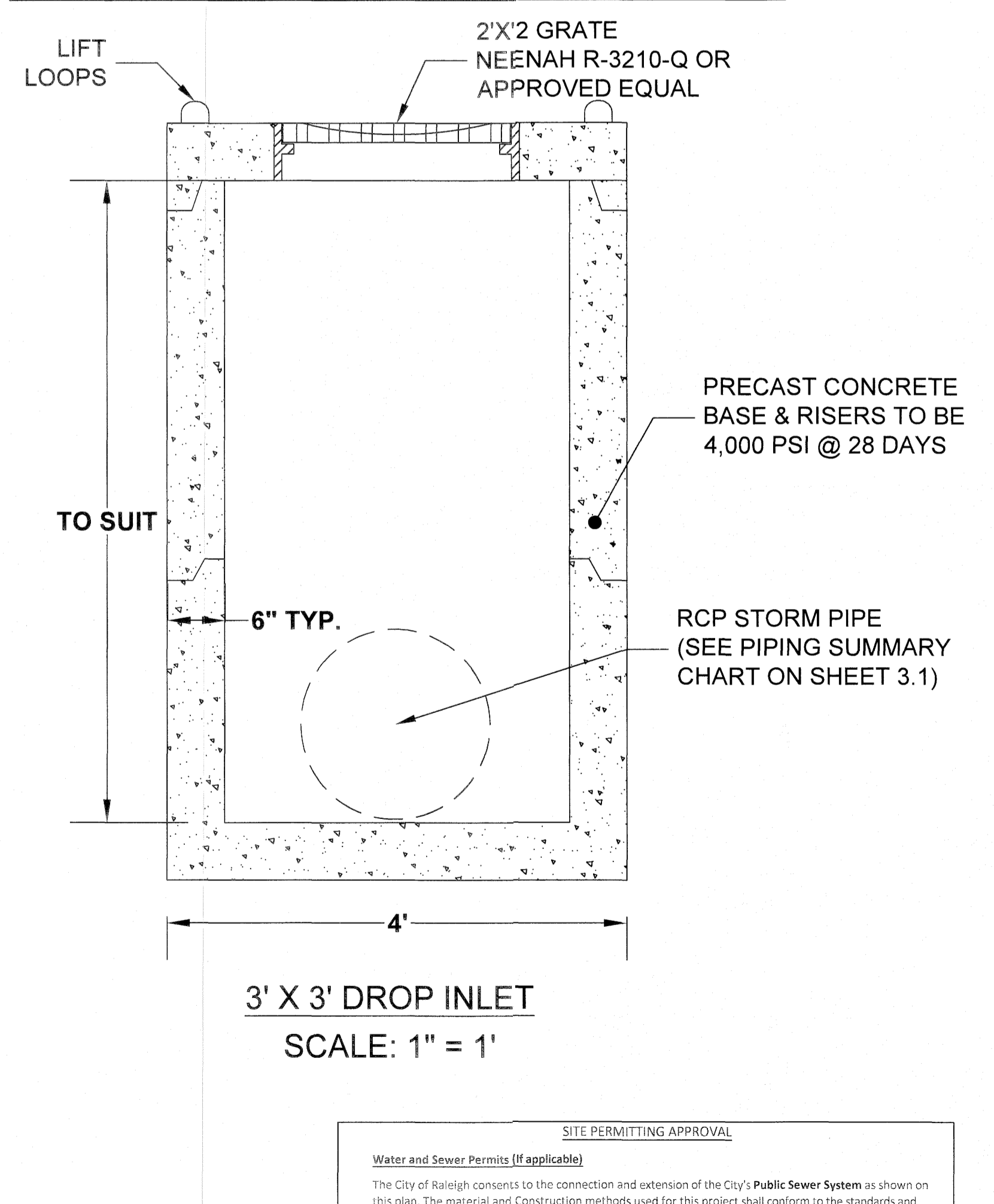
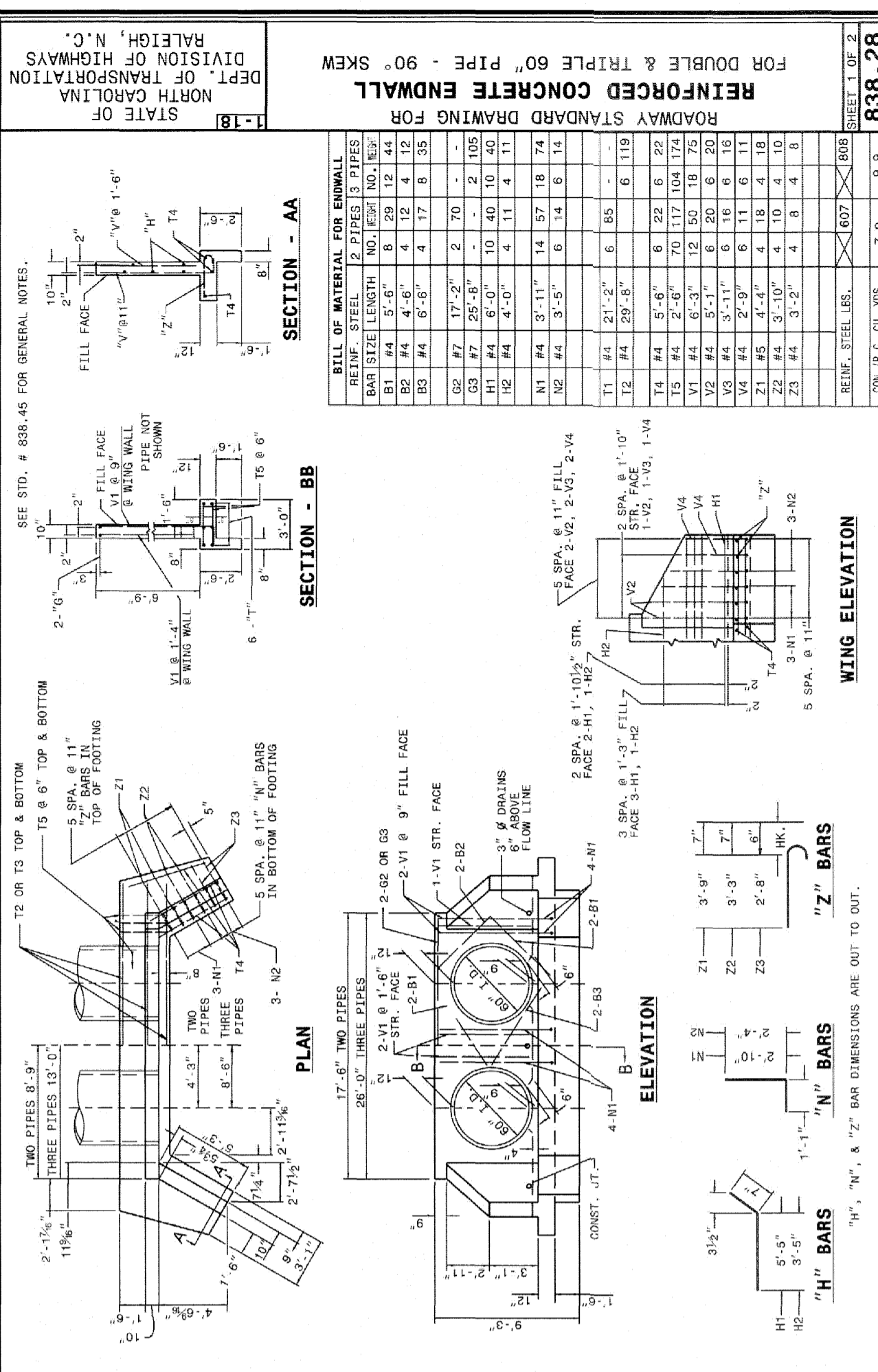
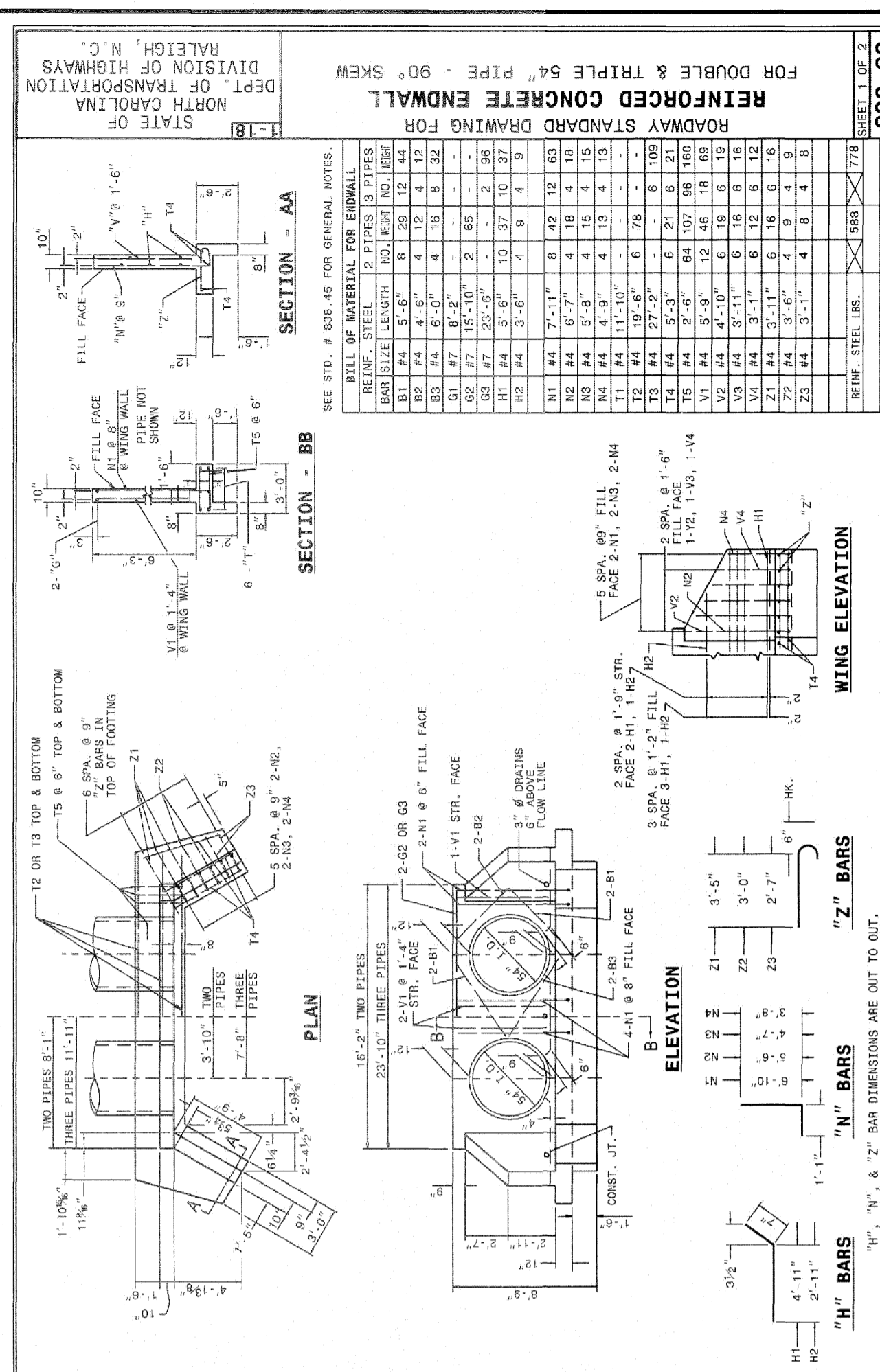
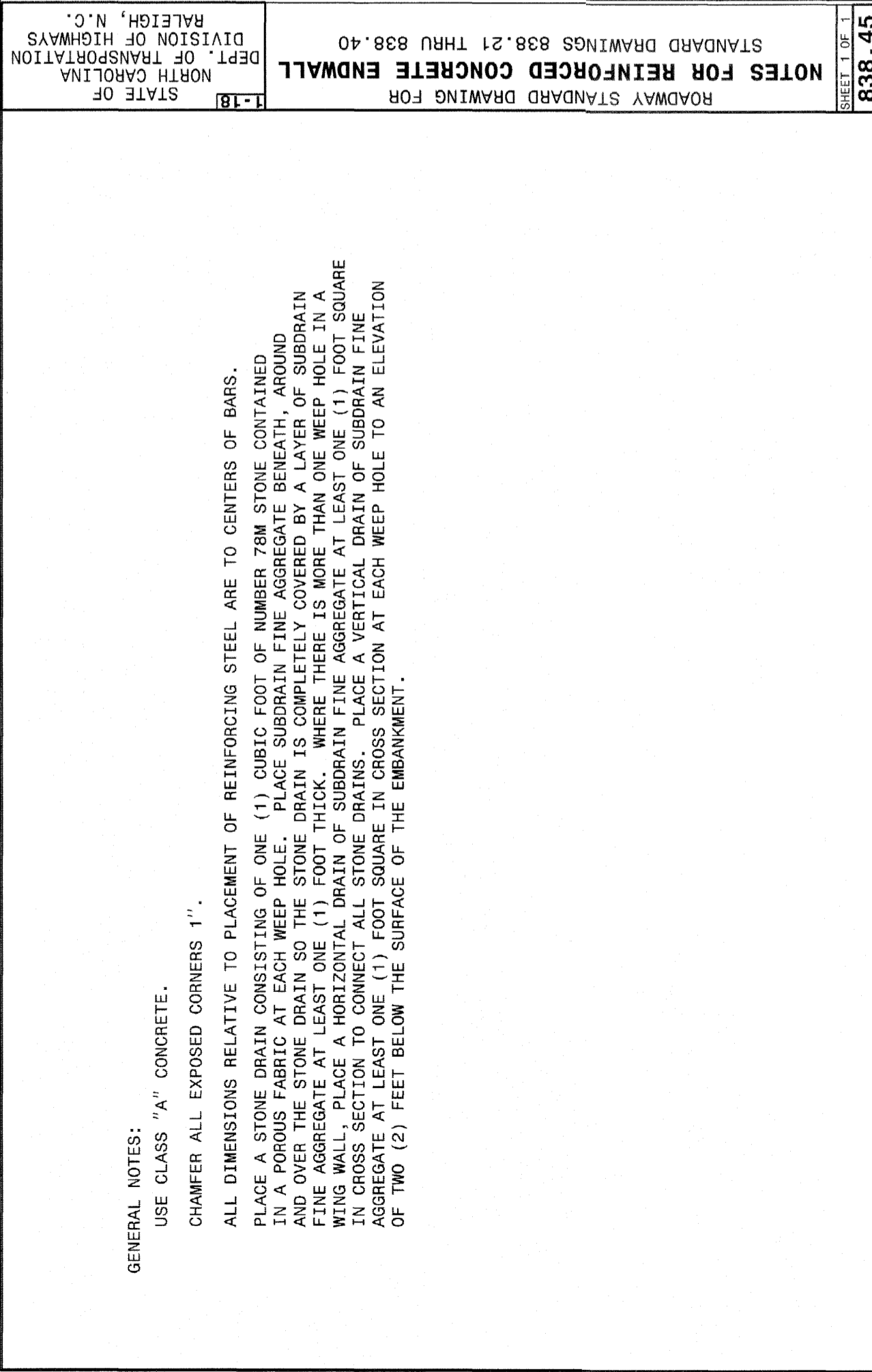
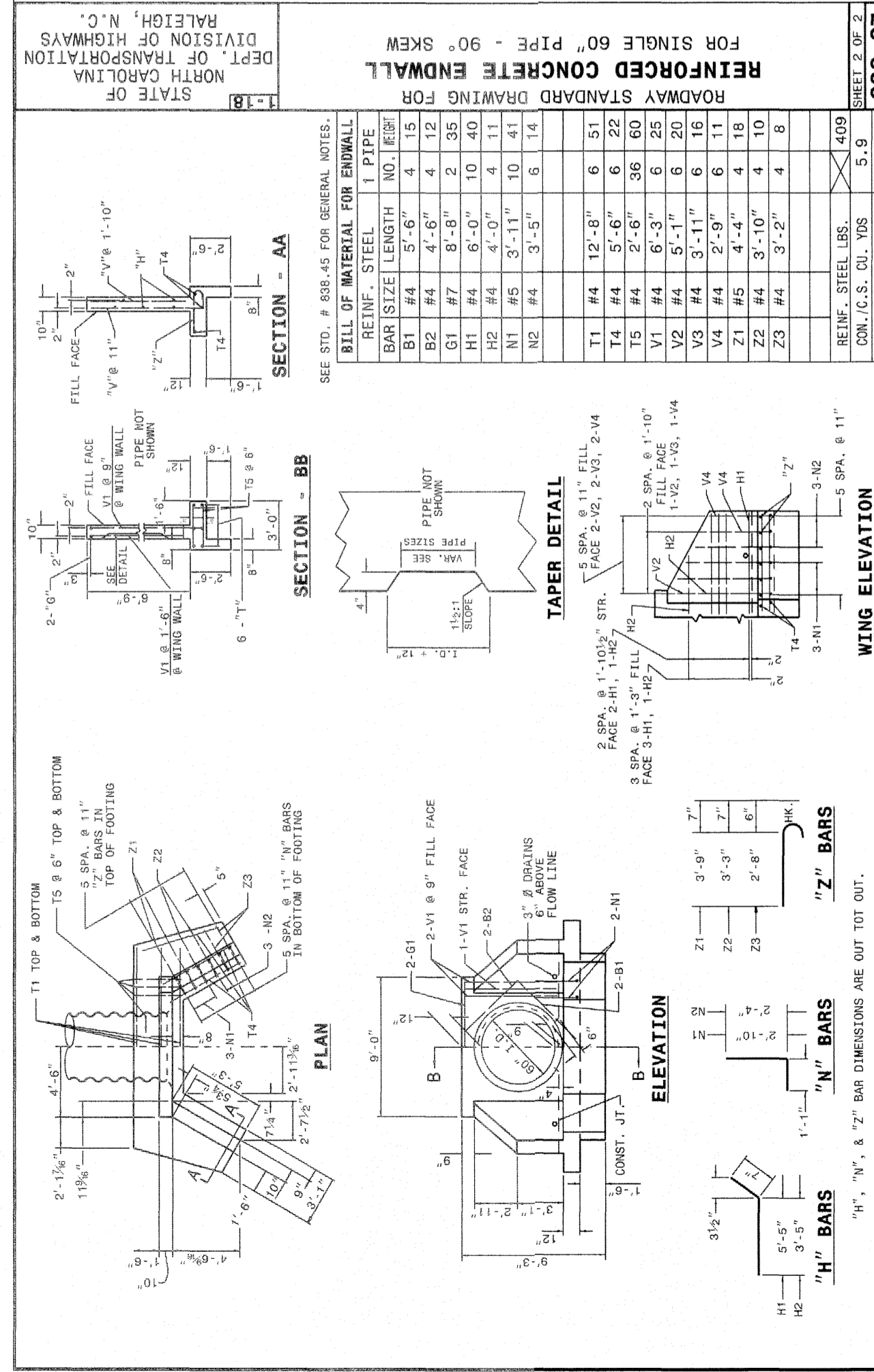
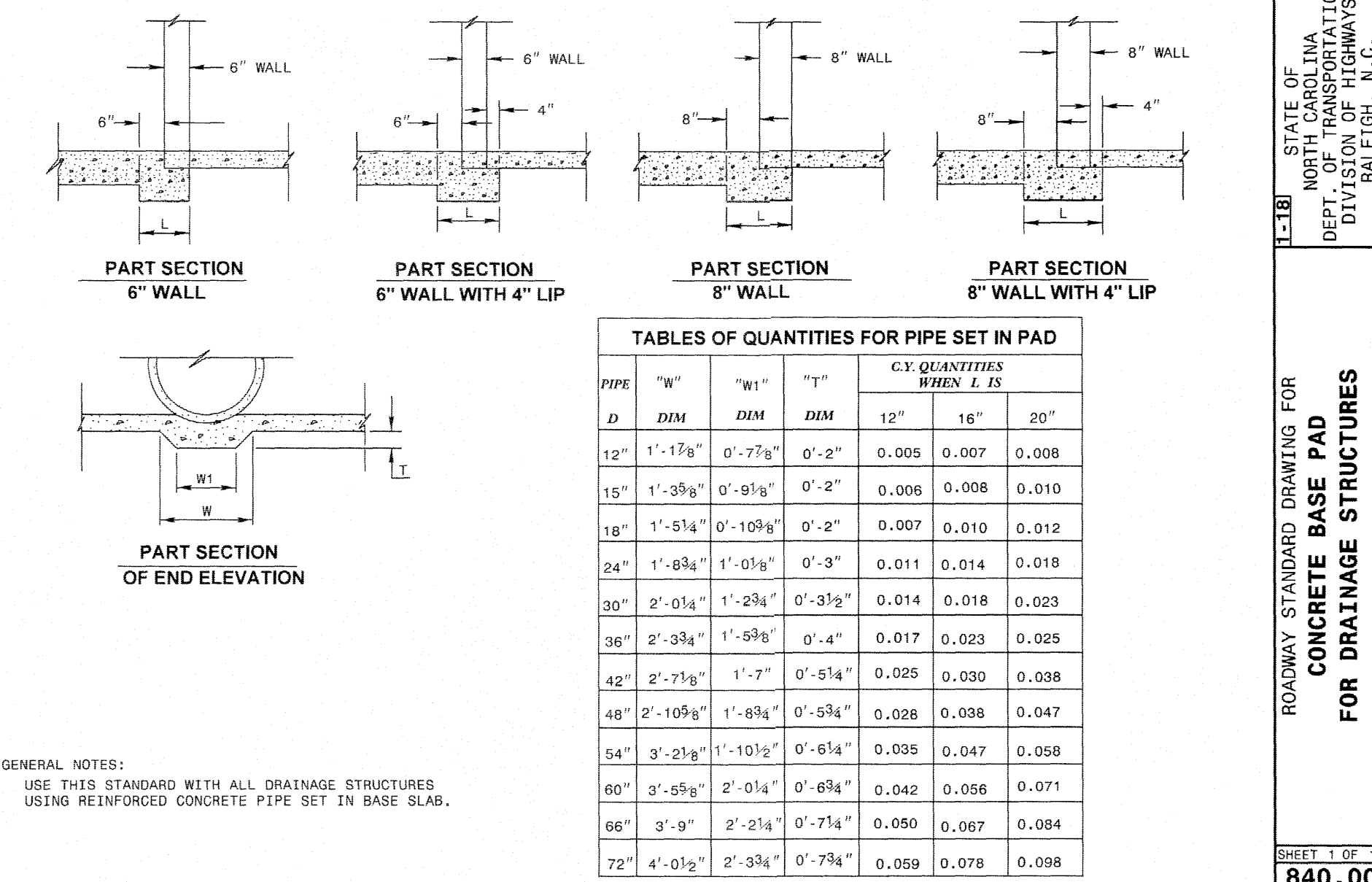


Table with columns: FT., MINIMUM BAR SIZE, MIN./MAX. HI (FT.), MIN./MAX. DI (FT.), MIN./MAX. WT, MIN./MAX. MP. Lists dimensions for various pipe sizes and materials.

STIPULATION FOR REUSE: THIS DRAWING WAS PREPARED FOR THE FOLLOWING STANDARDS: 838.01, 838.11, 838.21, 838.27, 838.33, 838.39, 838.51, 838.67, 838.69 AND 838.6A...

KALAS FALLS PHASE 2 1832 ROLESVILLE ROAD WAKE COUNTY, NC. Includes job number, date, and sheet title information. SHEET TITLE: KALAS FALLS CIVIL DETAILS.

AMERICAN Engineering logo and professional seal for Joan R. Harman, State of North Carolina Professional Engineer 9810.

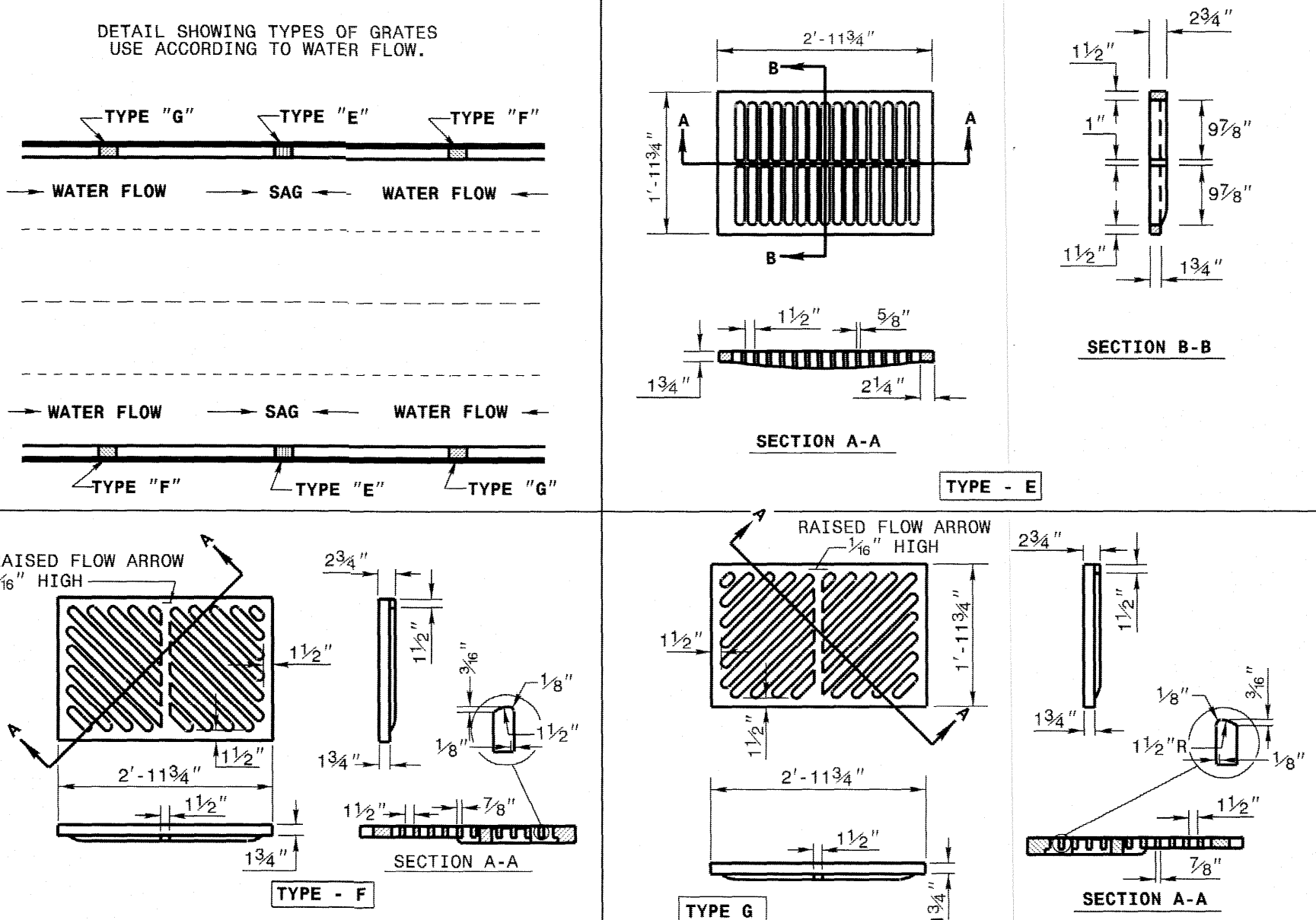


TABLES OF QUANTITIES FOR PIPE SET IN PAD

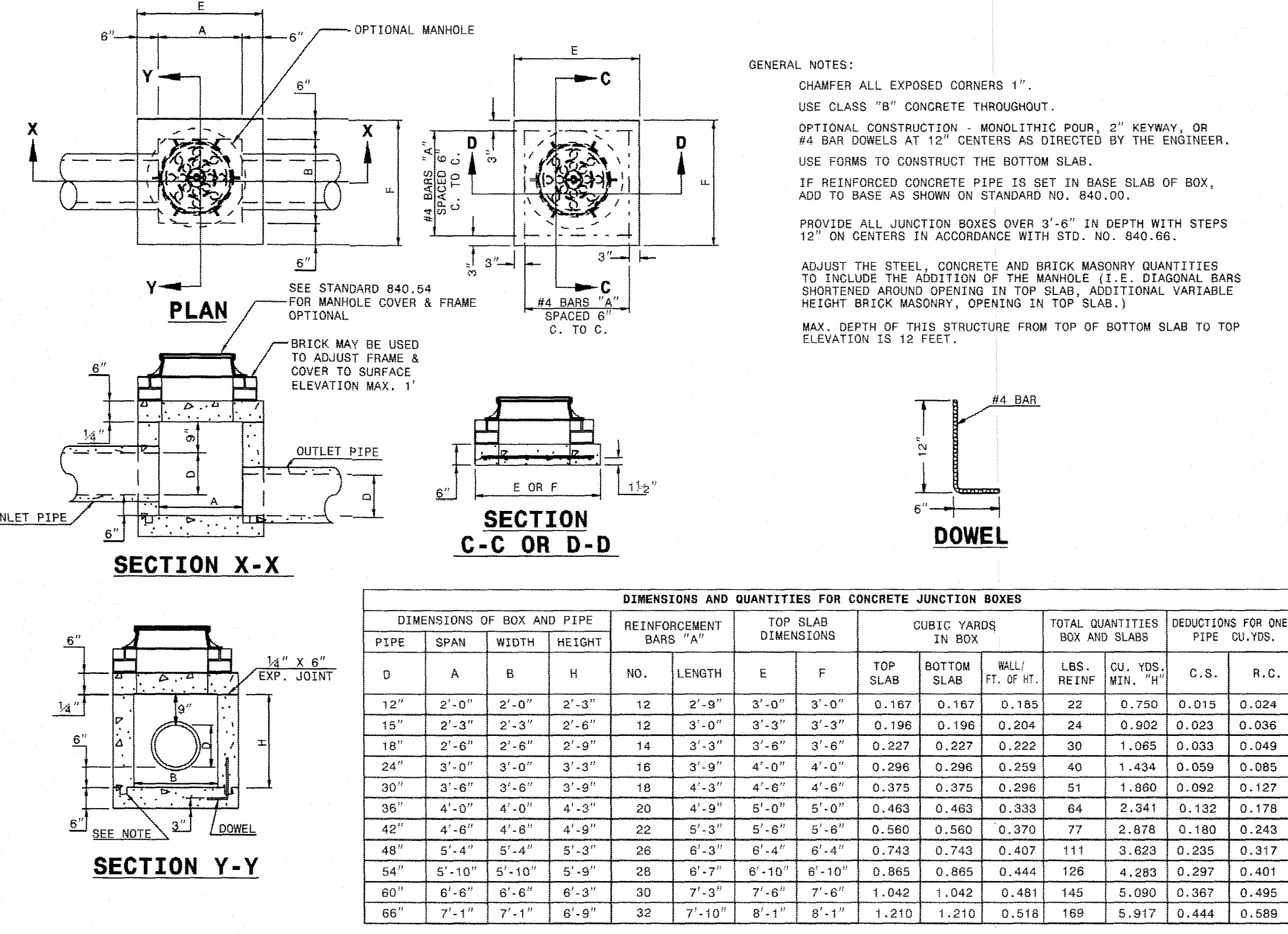
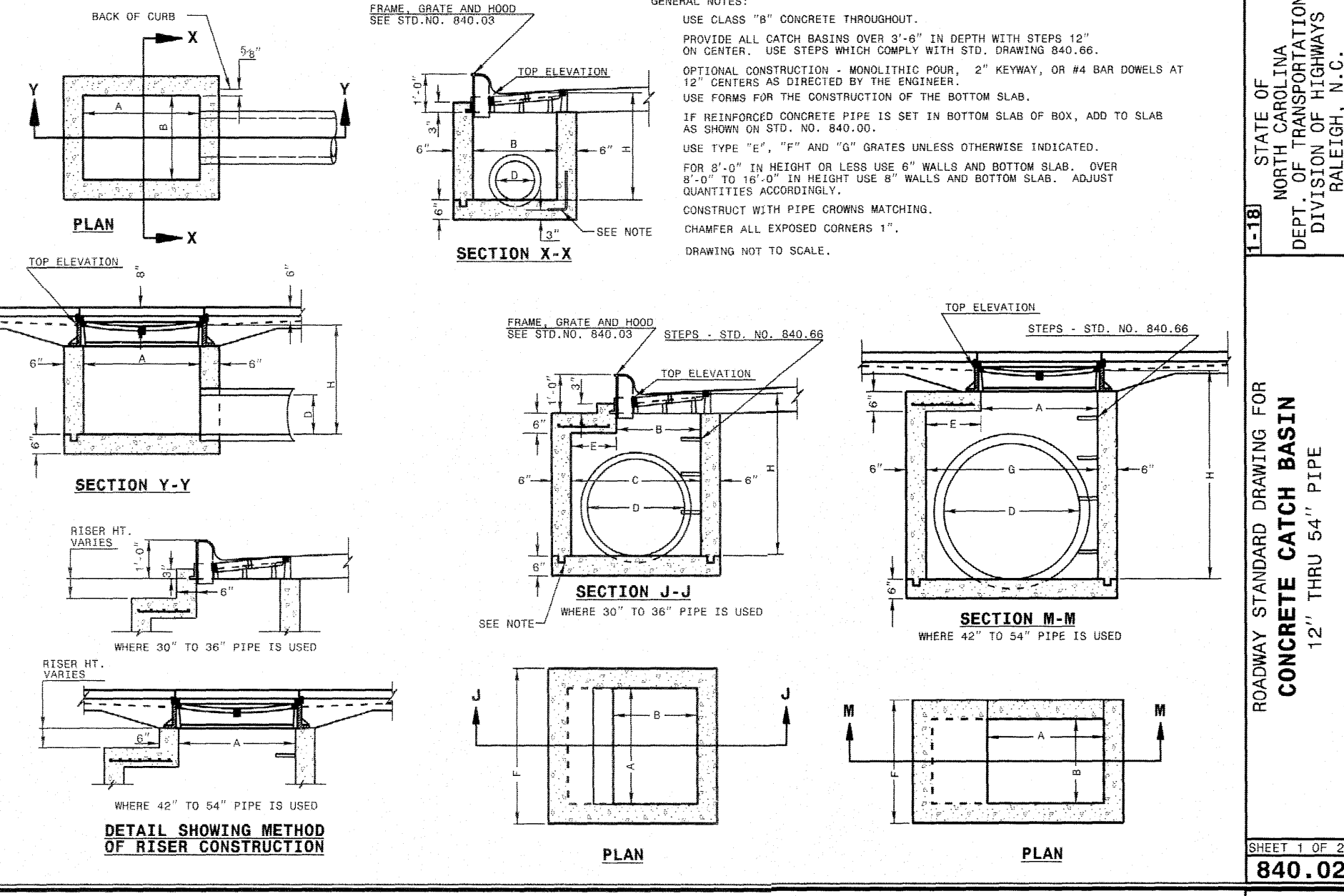
PIPE D	"W" DIM	"W" DIM	"T" DIM	C.Y. QUANTITIES WHEN L IS		
				12"	16"	20"
12"	1'-1 7/8"	0'-7 1/8"	0'-2"	0.005	0.007	0.008
15"	1'-3 3/8"	0'-9 1/8"	0'-2"	0.006	0.008	0.010
18"	1'-5 1/4"	0'-10 3/4"	0'-2"	0.007	0.010	0.012
24"	1'-6 3/4"	1'-0 1/8"	0'-3"	0.011	0.014	0.018
30"	2'-0 1/4"	1'-2 3/4"	0'-3 1/2"	0.014	0.018	0.023
36"	2'-3 3/4"	1'-5 3/8"	0'-4"	0.017	0.023	0.029
42"	2'-7 1/8"	1'-7 1/2"	0'-5 1/4"	0.025	0.030	0.038
48"	2'-10 5/8"	1'-8 3/4"	0'-5 3/4"	0.028	0.038	0.047
54"	3'-2 1/8"	1'-10 1/2"	0'-6 1/4"	0.035	0.047	0.058
60"	3'-5 5/8"	2'-0 1/4"	0'-6 3/4"	0.042	0.056	0.071
66"	3'-9"	2'-2 1/4"	0'-7 1/4"	0.050	0.067	0.084
72"	4'-0 1/2"	2'-3 3/4"	0'-7 3/4"	0.059	0.078	0.098

GENERAL NOTES:
USE THIS STANDARD WITH ALL DRAINAGE STRUCTURES
USING REINFORCED CONCRETE PIPE SET IN BASE SLAB.

L-1-B1 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N. C.
ROADWAY STANDARD DRAWING FOR CONCRETE BASE PAD FOR DRAINAGE STRUCTURES
SHEET 1 OF 1
840.00



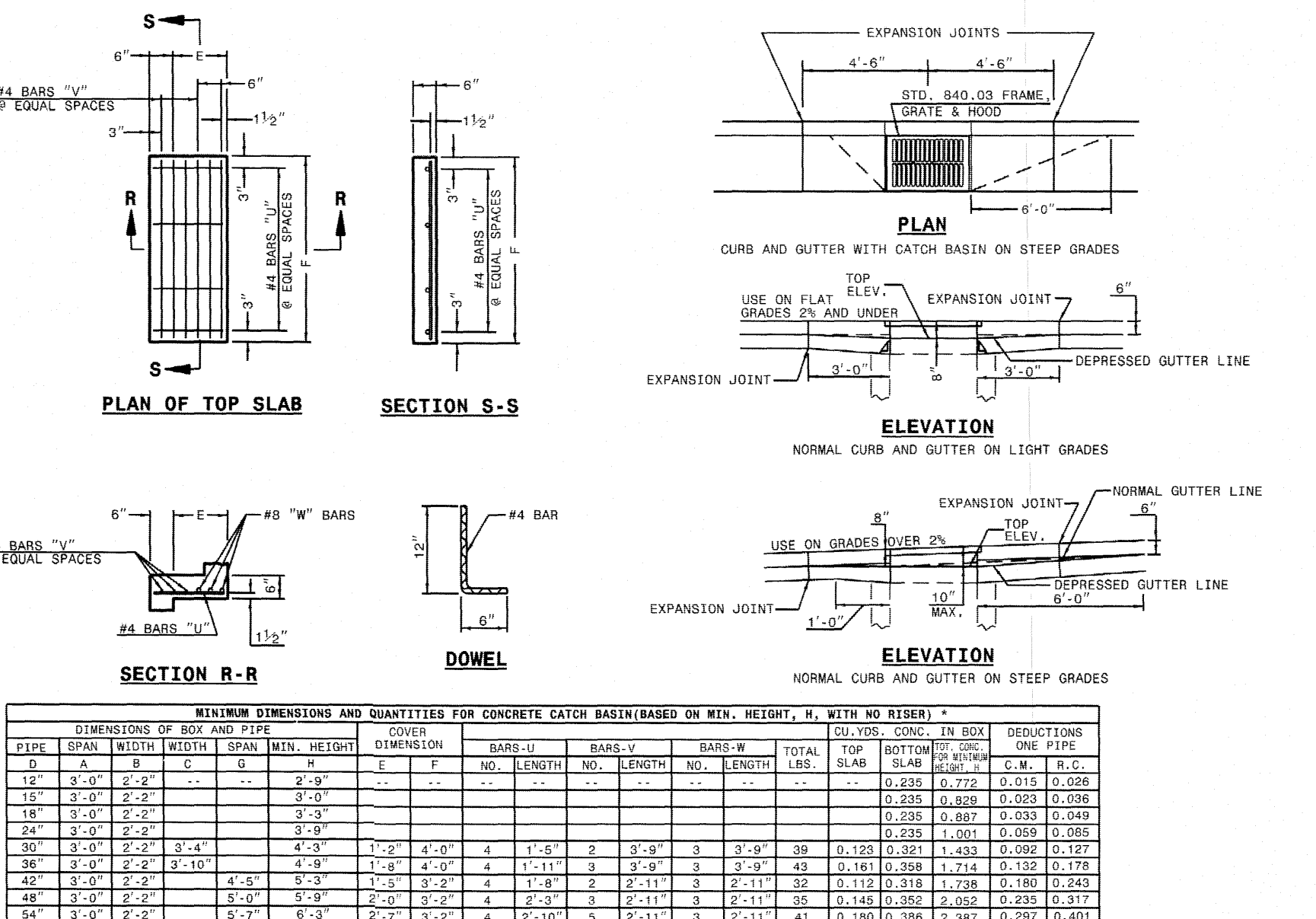
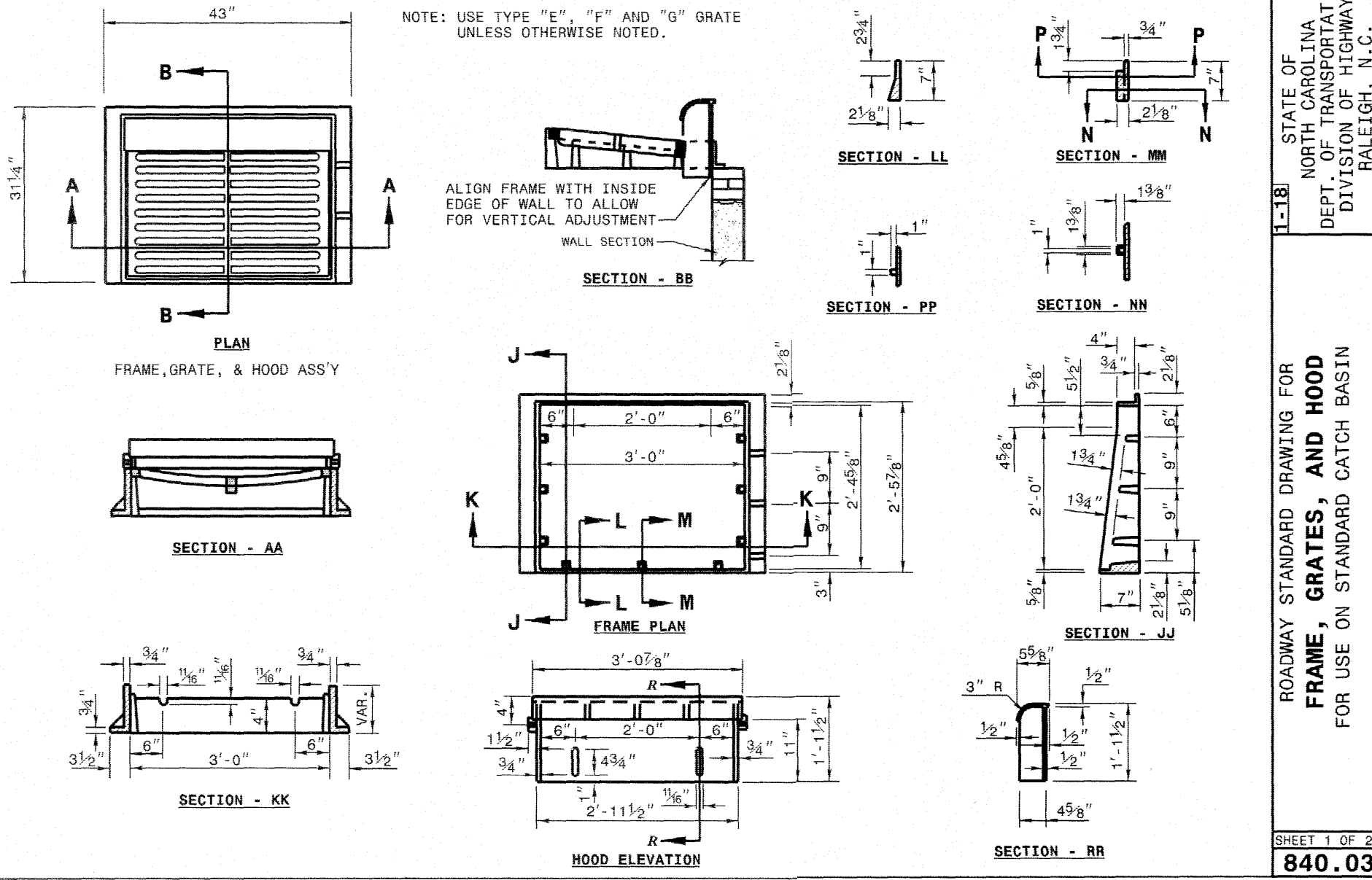
L-1-B2 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N. C.
ROADWAY STANDARD DRAWING FOR FRAME, GRATES, AND HOOD FOR USE ON STANDARD CATCH BASIN
SHEET 2 OF 2
840.03



MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE JUNCTION BOXES

PIPE D	SPAN	WIDTH	HEIGHT	REINFORCEMENT BARS "A"		TOP SLAB DIMENSIONS		CUBIC YARDS IN BOX		TOTAL QUANTITIES BOX AND SLABS				
				NO.	LENGTH	E	F	TOP SLAB	BOTTOM SLAB	WALL THICK.	NO. YRS.	CONC.	REBAR	
12"	2'-0"	2'-0"	2'-3"	12	2'-9"	3'-0"	3'-0"	0.167	0.167	0.185	22	0.750	0.015	0.024
15"	2'-3"	2'-3"	2'-6"	12	3'-0"	3'-3"	3'-3"	0.196	0.196	0.204	24	0.902	0.023	0.036
18"	2'-6"	2'-6"	2'-9"	14	3'-3"	3'-6"	3'-6"	0.227	0.227	0.233	30	1.063	0.033	0.049
24"	3'-0"	3'-0"	3'-3"	16	3'-9"	4'-0"	4'-0"	0.266	0.266	0.259	40	1.434	0.059	0.085
30"	3'-6"	3'-6"	3'-9"	18	4'-3"	4'-6"	4'-6"	0.375	0.375	0.298	51	1.850	0.092	0.127
36"	4'-0"	4'-0"	4'-3"	20	4'-9"	5'-0"	5'-0"	0.463	0.463	0.333	64	2.341	0.132	0.178
42"	4'-6"	4'-6"	4'-9"	22	5'-3"	5'-6"	5'-6"	0.550	0.550	0.370	77	2.878	0.160	0.243
48"	5'-0"	5'-0"	5'-3"	26	6'-3"	6'-4"	6'-4"	0.743	0.743	0.407	111	3.623	0.235	0.317
54"	5'-6"	5'-6"	5'-9"	28	6'-9"	6'-10"	6'-10"	0.865	0.865	0.444	126	4.283	0.297	0.401
60"	6'-0"	6'-0"	6'-3"	30	7'-3"	7'-6"	7'-6"	1.042	1.042	0.481	145	5.090	0.367	0.495
66"	6'-6"	6'-6"	6'-9"	32	7'-9"	8'-1"	8'-1"	1.210	1.210	0.518	169	5.917	0.444	0.589

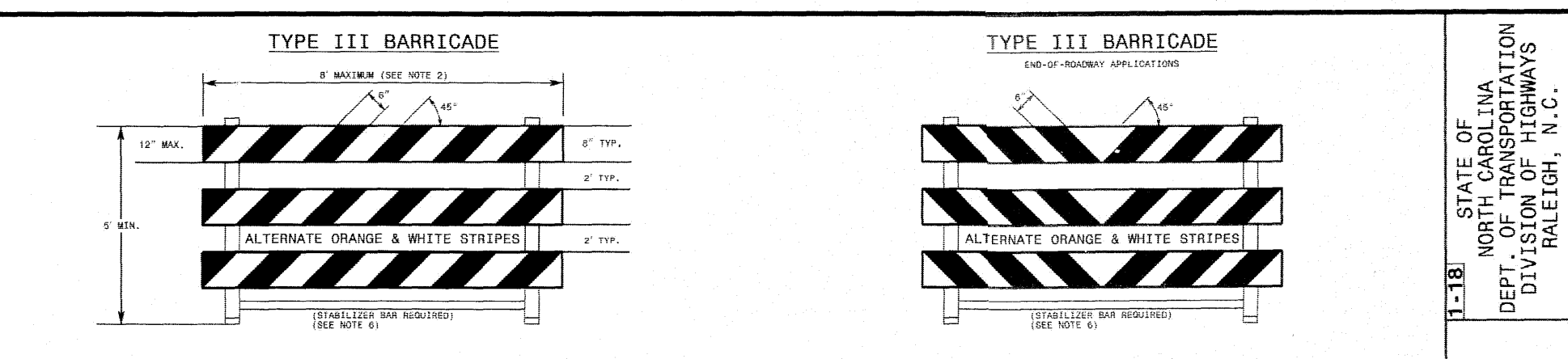
L-1-B3 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N. C.
ROADWAY STANDARD DRAWING FOR CONCRETE JUNCTION BOX WITH OPTIONAL MANHOLE 12" THRU 66" PIPE
SHEET 1 OF 1
840.31



MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN (BASED ON MIN. HEIGHT, N. WITH NO RISERS)

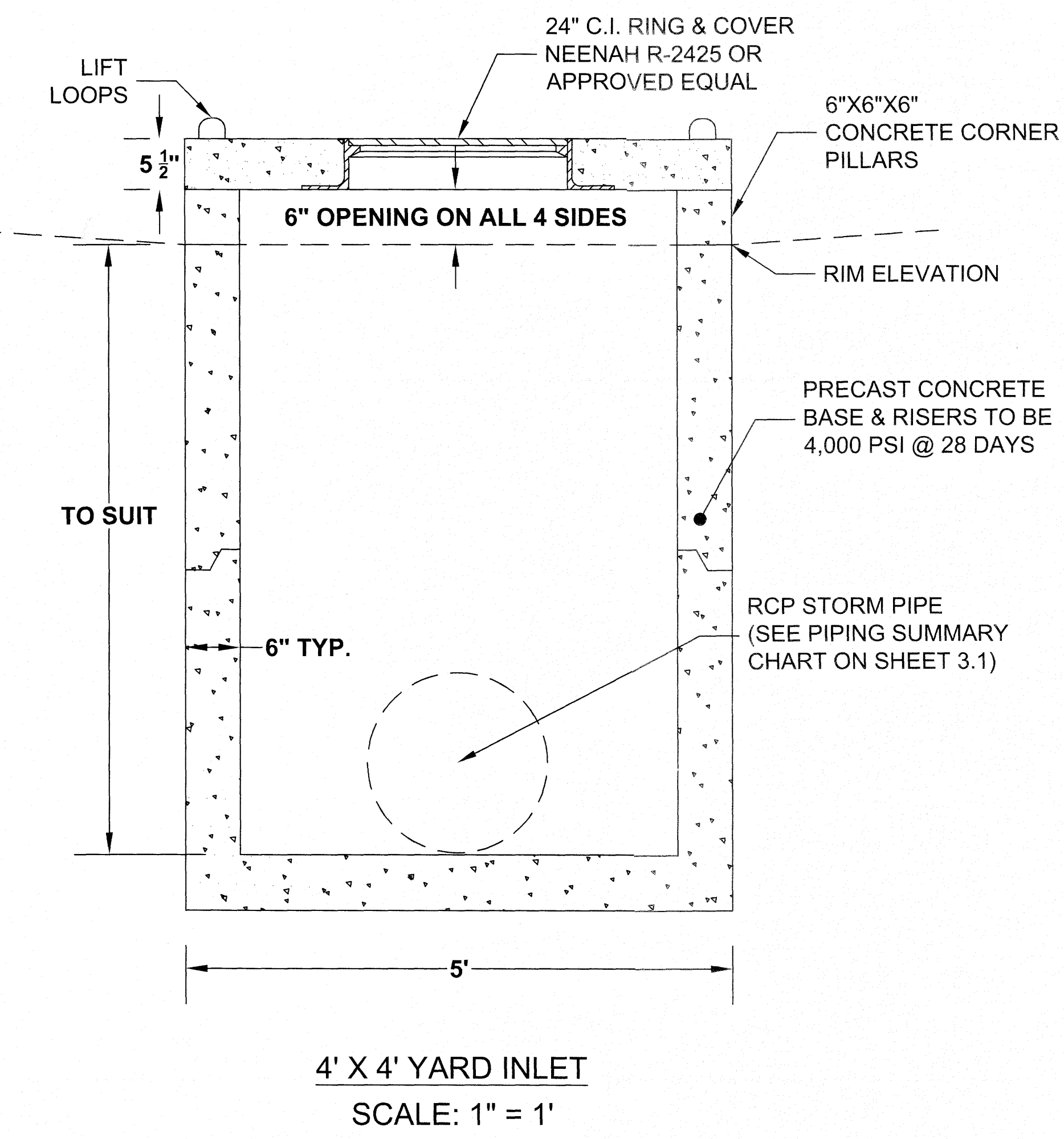
PIPE D	SPAN	WIDTH	HEIGHT	DIMENSION	COVER		TOTAL		CUBIC YARDS		CONC. IN BOX			
					NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
12"	3'-0"	3'-0"	3'-0"	3'-0"	3	3'-0"	3	3'-0"	0.235	0.235	0.235	0.235	0.019	0.028
15"	3'-6"	3'-6"	3'-6"	3'-6"	3	3'-6"	3	3'-6"	0.285	0.285	0.285	0.285	0.023	0.036
18"	4'-0"	4'-0"	4'-0"	4'-0"	3	4'-0"	3	4'-0"	0.335	0.335	0.335	0.335	0.028	0.043
24"	4'-6"	4'-6"	4'-6"	4'-6"	3	4'-6"	3	4'-6"	0.435	0.435	0.435	0.435	0.034	0.053
30"	5'-0"	5'-0"	5'-0"	5'-0"	3	5'-0"	3	5'-0"	0.535	0.535	0.535	0.535	0.041	0.062
36"	5'-6"	5'-6"	5'-6"	5'-6"	3	5'-6"	3	5'-6"	0.635	0.635	0.635	0.635	0.049	0.074
42"	6'-0"	6'-0"	6'-0"	6'-0"	3	6'-0"	3	6'-0"	0.735	0.735	0.735	0.735	0.058	0.090
48"	6'-6"	6'-6"	6'-6"	6'-6"	3	6'-6"	3	6'-6"	0.835	0.835	0.835	0.835	0.068	0.104
54"	7'-0"	7'-0"	7'-0"	7'-0"	3	7'-0"	3	7'-0"	0.935	0.935	0.935	0.935	0.079	0.120

L-1-B4 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N. C.
ROADWAY STANDARD DRAWING FOR CONCRETE CATCH BASIN 12" THRU 54" PIPE
SHEET 2 OF 2
840.02



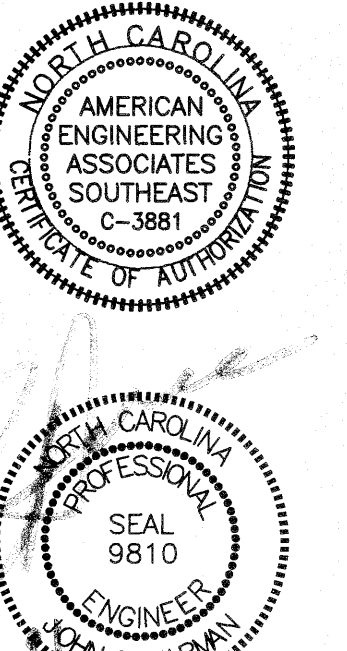
- GENERAL NOTES
- HORIZONTAL RAILS FOR MAY BE CONSTRUCTED OF APPROVED COMPOSITE, HOLLOW/CORRUGATED EXTRUDED RIGID POLYOLEFIN, HIGH DENSITY POLYETHYLENE, OR OTHER NGDP APPROVED MATERIAL.
 - BARRICADE SHALL BE LIMITED TO A MAXIMUM LENGTH OF 8 FT UNLESS NGDPR 350 CRASH TESTED FOR CATEGORY II DEVICES AND NGDPT APPROVED.
 - ONLY NGDPT APPROVED COMPOSITE AND ROLL-UP SIGNS MAY BE MOUNTED ON THE BARRICADE RAILS. MOUNT SIGNS TO BARRICADE RAILS TO ENSURE SIGN WILL NOT BECOME DETACHED UNDER NORMAL WIND AND TRAFFIC CONDITIONS.
 - SIGNS SHALL BE MOUNTED A MINIMUM OF 1 FOOT FROM THE GROUND TO THE BOTTOM OF THE SIGN UNLESS SIGNS R11-3 OR R11-4 ARE REQUIRED BY THE PLANS OR DIRECTED BY THE ENGINEER.
 - BARRICADE MUST BE NGDPR 350 FOR CATEGORY II DEVICES AND NGDPT APPROVED WITH STABILIZER BAR OR ADEQUATE LATERAL BRACING.
 - ASSEMBLY OF THE GENERIC BARRICADES MUST BE SELF CERTIFIED BY THE ASSEMBLER.
 - BARRICADES USED TO CLOSE A ROADWAY SHALL EXTEND ACROSS THE ENTIRE ROADWAY. WHERE LOCAL TRAFFIC MUST BE MAINTAINED, THEY MAY BE PLACED IN A STAGGERED PATTERN.
 - STRIPES ON WORK ZONE BARRICADE RAILS SHALL BE ALTERNATE ORANGE AND WHITE RETROREFLECTIVE STRIPES. SLOPED DOWNWARD TOWARD THE SIDE WHICH TRAFFIC IS TO PASS OR TURN IN DETOURING. WHERE NO TURNS ARE INTENDED, THE STRIPES SHOULD SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE OR BARRICADES.
 - USE RED AND WHITE STRIPES FOR PERMANENT BARRICADES.
 - ALL BARRICADES MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST.
 - PLACE MANUFACTURER'S NAME AND FEDERAL HIGHWAY ADMINISTRATION'S NGDPR 350 APPROVAL LETTER NUMBER ON BARRICADE FRAME.
 - PLACE SANDBAGS ON TOP OF A STRIPED RAIL OR STABILIZER BAR. DO NOT BALLAST BARRICADES BY HEAVY OBJECTS SUCH AS ROCKS, CHAINS OF CONCRETE OR OTHER ITEMS THAT WOULD CAUSE DAMAGE IF THE BARRICADE IS STRUCK BY A VEHICLE.

L-1-B5 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N. C.
ROADWAY STANDARD DRAWING FOR BARRICADES TYPE-III
SHEET 1 OF 1
1145.01



4' X 4' YARD INLET
SCALE: 1" = 1'

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101



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KALAS FALLS PHASE I
1822 ROLESVILLE ROAD
WAKE COUNTY, NC

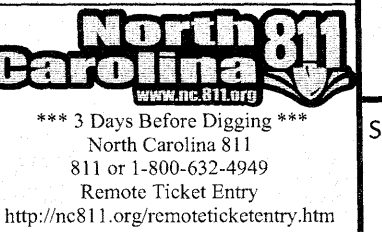
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CHECKED BY:
DRAWN BY:
DATE: 02-23-2021
SHEET TITLE:

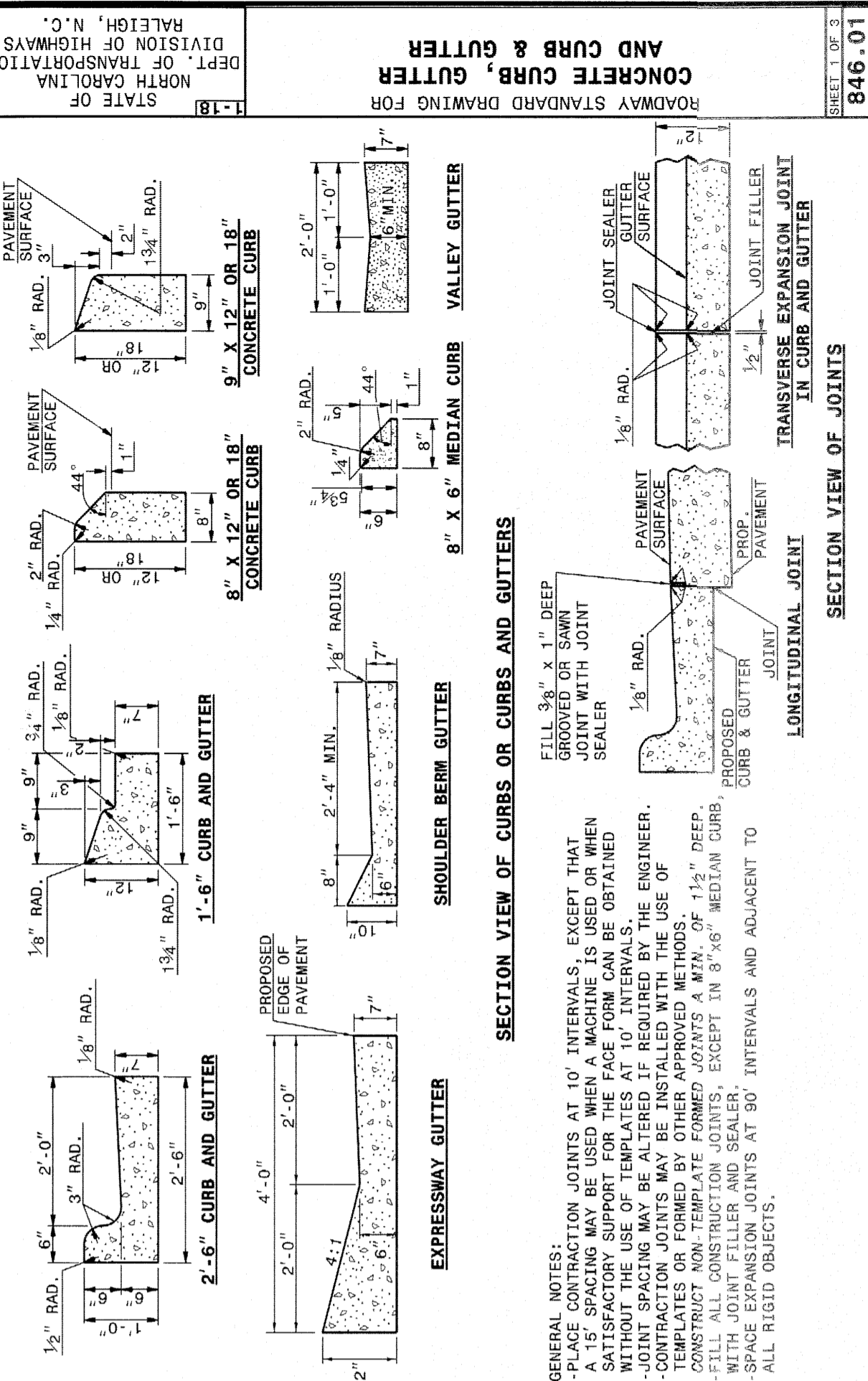
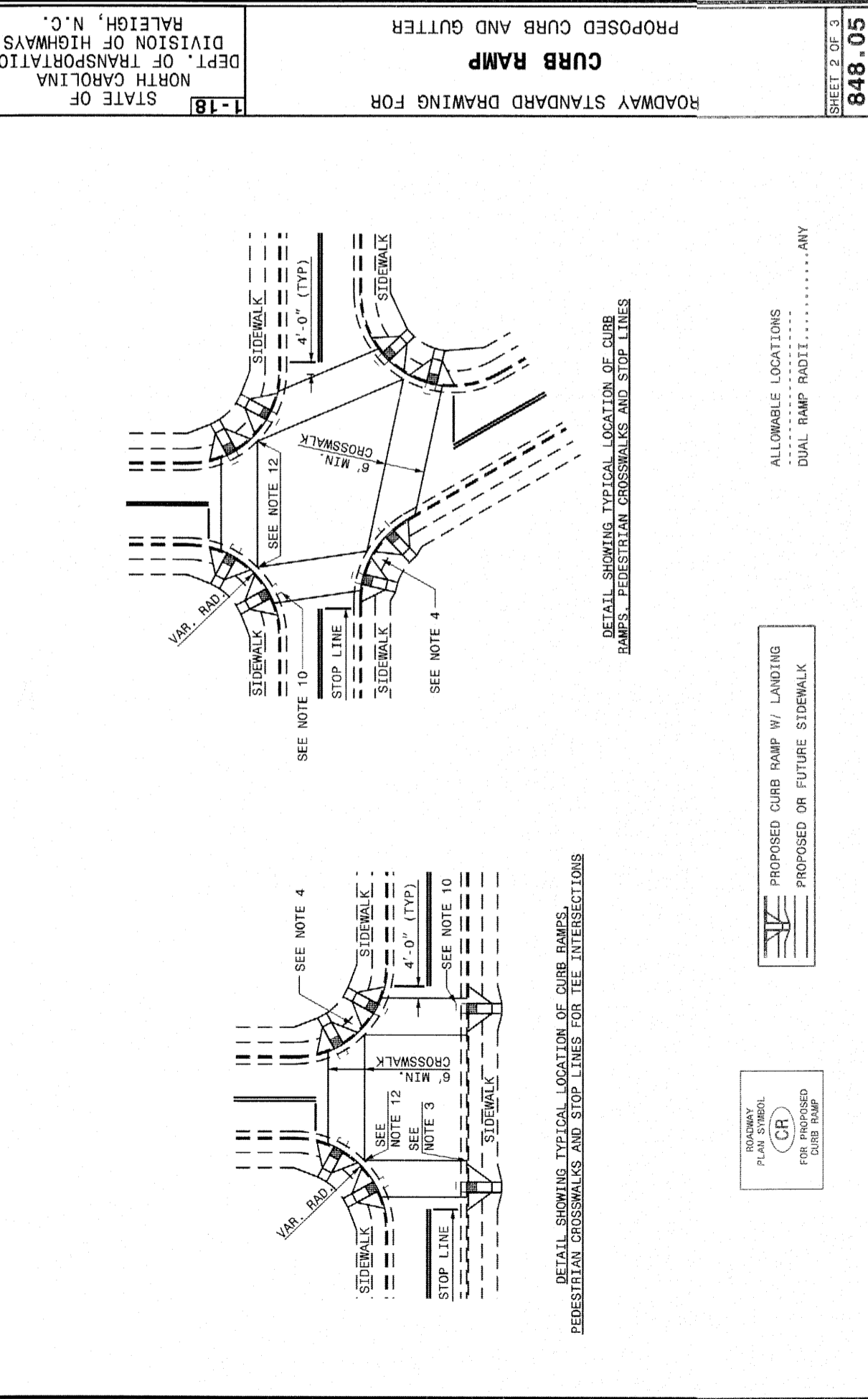
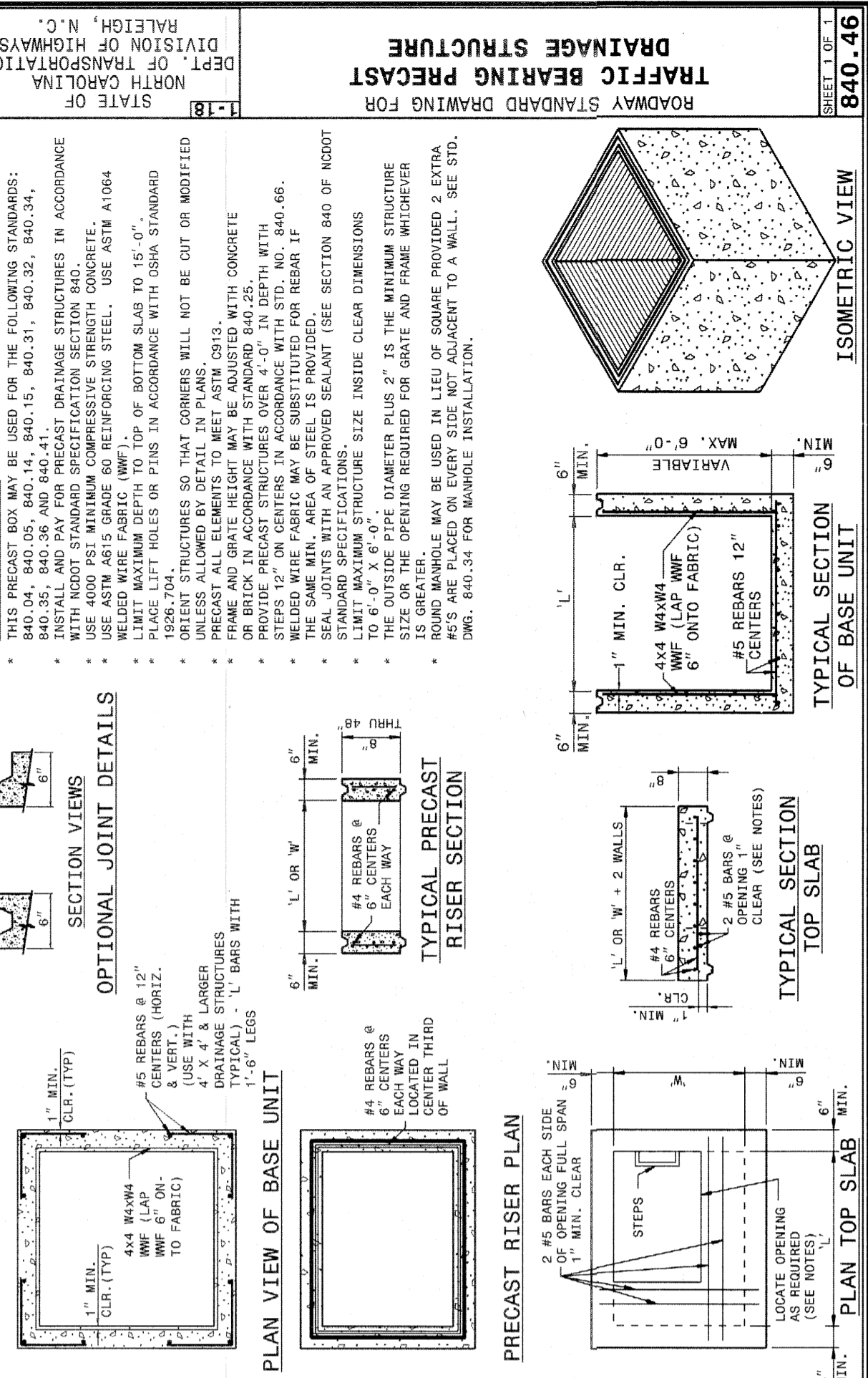
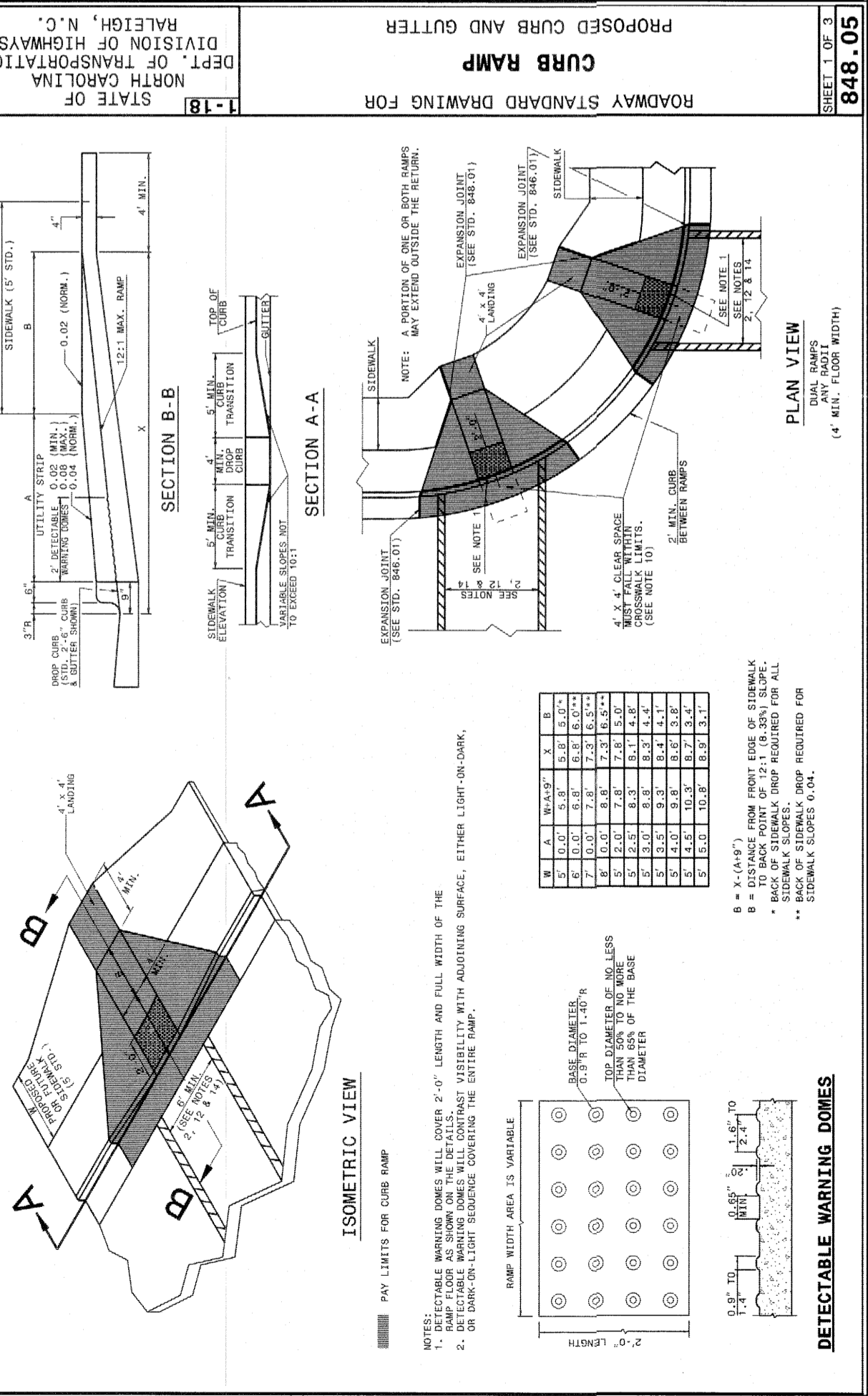
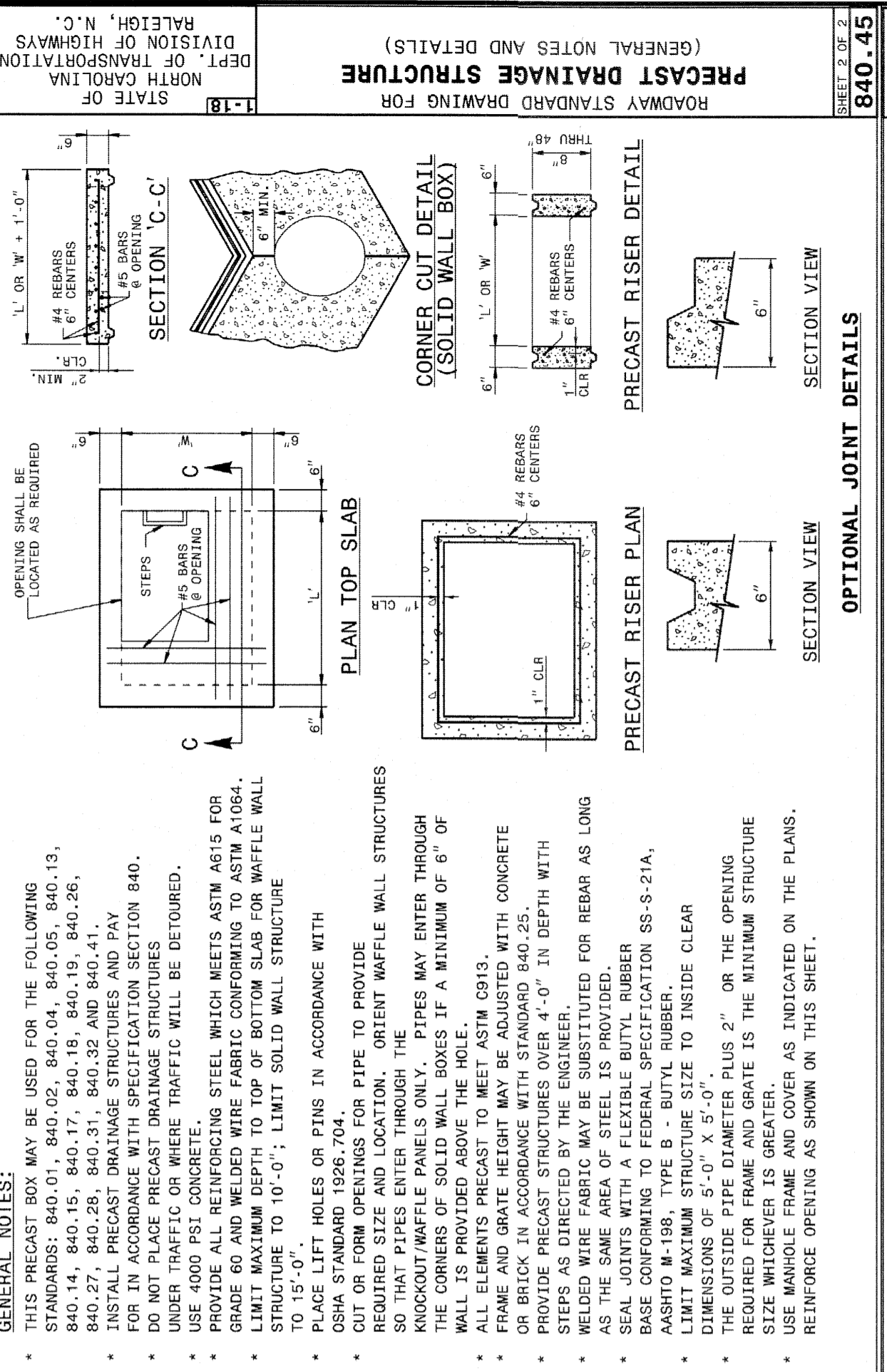
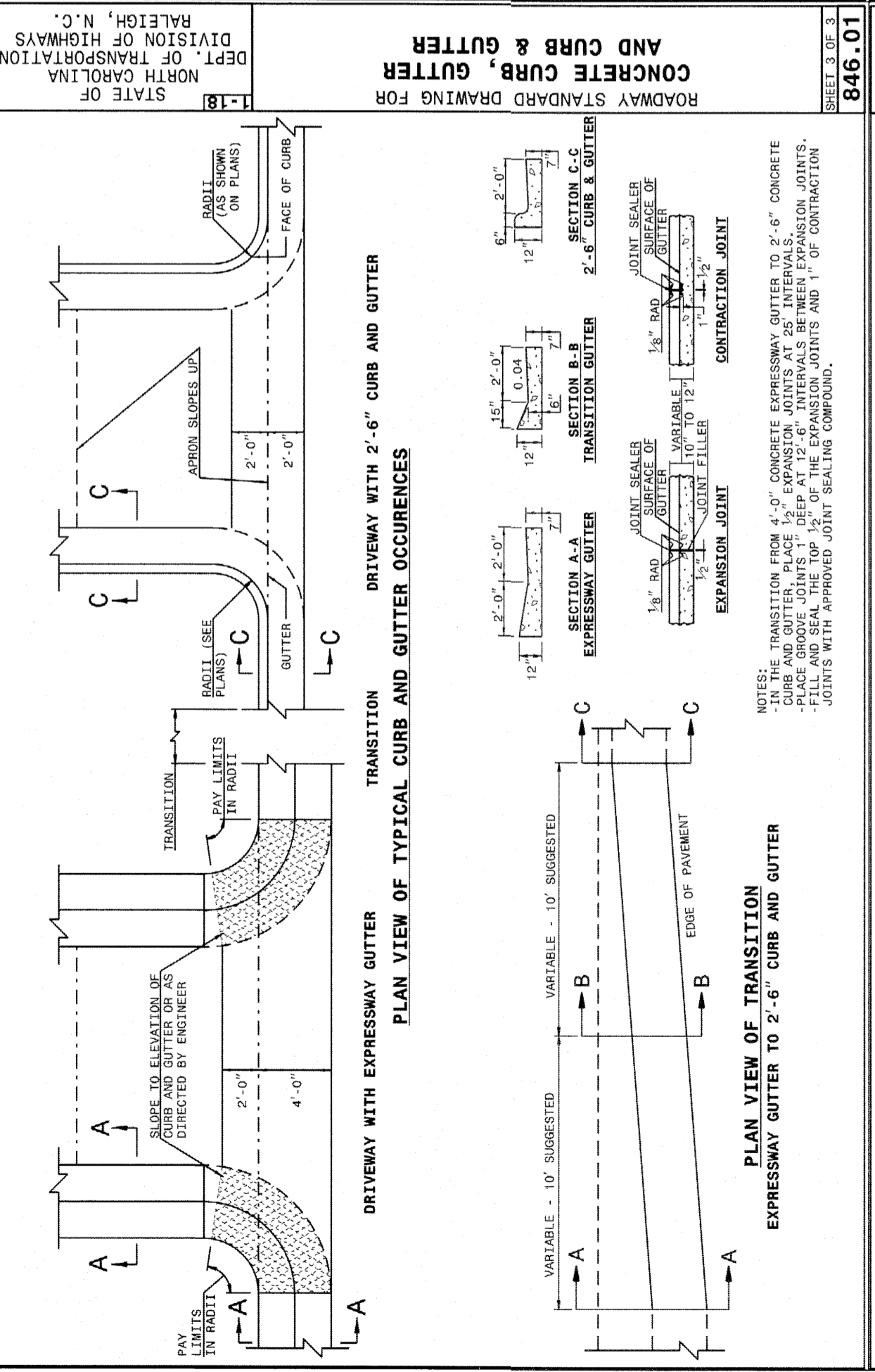
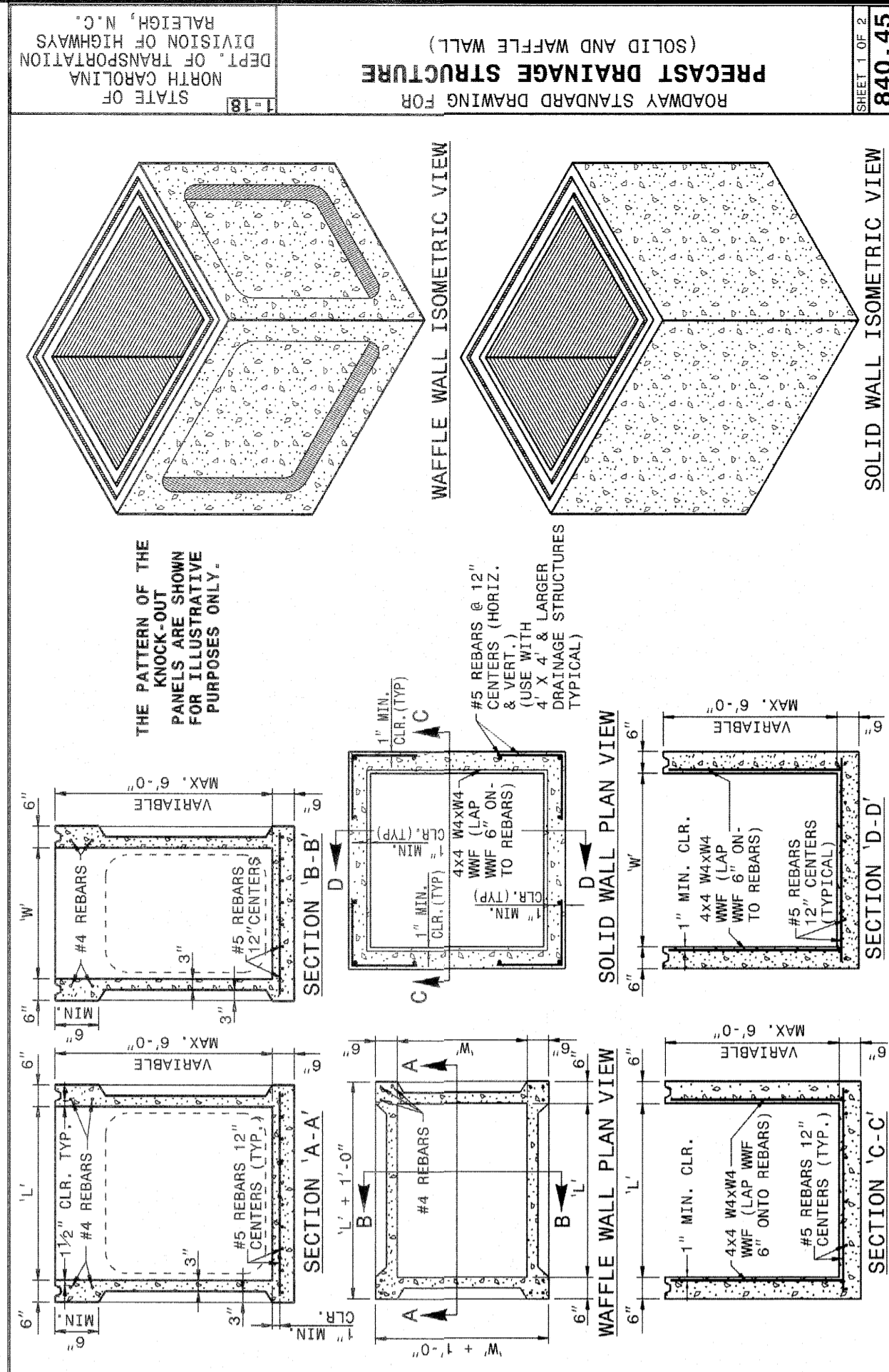
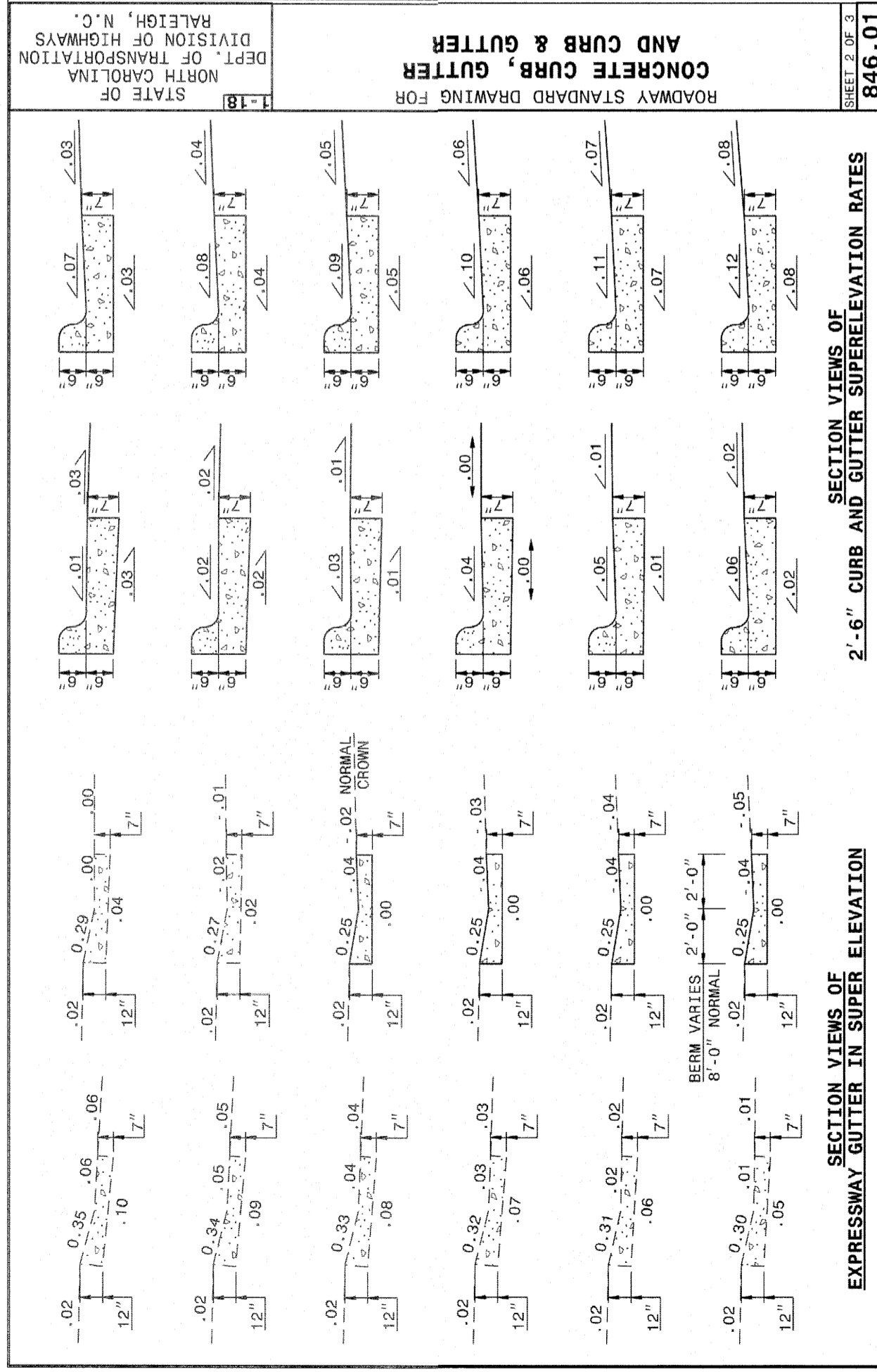
KALAS FALLS CIVIL DETAILS

SHEET NO.:
CD13

SITE PERMITTING APPROVAL
Water and Sewer Permits (if applicable)
The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # 4-824
The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # W-3788
The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # _____
City of Raleigh Public Utilities Department Permit # _____

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.
City of Raleigh Development Approval _____
Raleigh Water Review Officer _____





SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # 5-4925

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # W-3785

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit # _____

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approval plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval _____

Raleigh Water Review Officer _____

KALAS FALLS PHASE 2
1832 ROLESVILLE ROAD
WAKE COUNTY, NC

JOB NUMBER: 9900
CHECKED BY:
DRAWN BY:
DATE: DECEMBER 21, 2020
SHEET TITLE:
KALAS FALLS CIVIL DETAILS
SHEET NO.:
CD14

STIPULATION FOR REUSE

THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE NAMED HEREON. CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HEREON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-468-1101

AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
REGISTERED PROFESSIONAL ENGINEERS
STATE OF NORTH CAROLINA
LICENSE NO. 9810
JOHN E. BERMAN

DETAIL SELECTION ONLY

CURB RAMPS AND EXISTING SIDEWALK

RESURFACING PROJECTS
 PROPOSED CURB RAMP W/ LANDINGS FOR IMPROVING PROJECTS
 EXISTING SIDEWALK

ALLOWABLE LOCATIONS
 DUAL RAMP RADIUS.....ANY

RESURFACING PROJECTS
 PROPOSED CURB RAMP W/ LANDINGS FOR IMPROVING PROJECTS
 EXISTING SIDEWALK

DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSINGS AND STOP LINES FOR LEE INTERSECTIONS

CURB RAMP
 ROADWAY STANDARD DRAWING FOR EXISTING CURB AND GUTTER

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 1-18

NOTES:
 1. CONSTRUCT THE RAMP SURFACE TO BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.
 2. LOCATE CURB RAMPS AND PLACE PEDESTRIAN CROSSWALK MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS. WHEN FIELD ADJUSTMENTS REQUIRE MOVING CURB RAMPS OR MARKINGS AS SHOWN, CONTACT THE SIGNALING AND DELINEATION UNIT OR LOCATE AS DIRECTED BY THE ENGINEER.
 3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4'x4' CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.
 4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4' MINIMUM.
 5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATE AS DIRECTED BY THE ENGINEER.
 6. TERMINATE PARKING A MINIMUM OF 20' BACK OF A PEDESTRIAN CROSSWALK.
 7. CONSTRUCT CURB RAMPS A MINIMUM OF 4' WIDE.
 8. CONSTRUCT THE FINISHING SLOPE OF THE RAMP 0.33% MAXIMUM.
 9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
 10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.
 11. CONSTRUCT THE DOWNER SLOPE OF THE GUTTER ON STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
 12. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6' WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
 13. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5'x5' LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.
 14. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
 15. PLACE A 12" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01
 16. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE NOTED. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.
 17. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

CURB RAMP AND EXISTING SIDEWALK

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 1-18

NOTES:
 1. CONSTRUCT THE RAMP SURFACE TO BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.
 2. LOCATE CURB RAMPS AND PLACE PEDESTRIAN CROSSWALK MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS. WHEN FIELD ADJUSTMENTS REQUIRE MOVING CURB RAMPS OR MARKINGS AS SHOWN, CONTACT THE SIGNALING AND DELINEATION UNIT OR LOCATE AS DIRECTED BY THE ENGINEER.
 3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4'x4' CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.
 4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4' MINIMUM.
 5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATE AS DIRECTED BY THE ENGINEER.
 6. TERMINATE PARKING A MINIMUM OF 20' BACK OF A PEDESTRIAN CROSSWALK.
 7. CONSTRUCT CURB RAMPS A MINIMUM OF 4' WIDE.
 8. CONSTRUCT THE FINISHING SLOPE OF THE RAMP 0.33% MAXIMUM.
 9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
 10. CONSTRUCT THE SIZE FLARE SLOPE OF THE GUTTER ON STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
 11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4'x4' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
 12. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6' WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
 13. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5'x5' LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.
 14. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
 15. PLACE A 12" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01
 16. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE NOTED. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.
 17. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

CURB RAMP AND EXISTING SIDEWALK WITH GRASS STRIP

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 1-18

NOTES:
 1. PLACE THE CURB RAMP ON ONE OR BOTH SIDES OF THE ROADWAY WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
 2. CONSTRUCT THE FINISHING SLOPE OF THE RAMP 0.33% MAXIMUM.
 3. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
 4. CONSTRUCT THE SIZE FLARE SLOPE OF THE GUTTER ON STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
 5. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4'x4' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
 6. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6' WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
 7. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5'x5' LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.
 8. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
 9. PLACE A 12" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01
 10. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE NOTED. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.
 11. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

TWO-WAY UNDIVIDED (L-LINES)

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 1-18

NOTES:
 1. DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
 2. CONTRACTORS ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT LONGER THAN 3 DAYS.
 3. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS NECESSARY OR AS DIRECTED.
 4. ERECT SIGNS PER STD 1101.01. PARKING FOR WOOD POSTS, SUB-STEEL, CHAINS, AND CHAINS. STEEL TUBING POSTS WITH SLEWS WILL BE MADE ACCORDING TO STANDARD SPECIFICATIONS FOR WOOD WORK.
 5. WHEN NECESSARY, USE SIGNALS IN ACCORDANCE WITH STD. 1101.01.
 6. DO NOT BACK BRACK SIGN SUPPORTS.
 7. ADVANCE WARNING SIGNS SHALL BE PLACED WITHIN 1/2 MILE OF THE BEGINNING OF THE WORK ZONE.
 8. ADVANCE WARNING SIGNS SHALL BE PLACED WITHIN 1/2 MILE OF THE END OF THE WORK ZONE.
 9. ADVANCE WARNING SIGNS SHALL BE PLACED WITHIN 1/2 MILE OF THE BEGINNING OF THE WORK ZONE.
 10. ADVANCE WARNING SIGNS SHALL BE PLACED WITHIN 1/2 MILE OF THE END OF THE WORK ZONE.

CURB RAMPS AND EXISTING SIDEWALK ADJACENT TO CURB

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 1-18

NOTES:
 1. PLACE THE CURB RAMP ON ONE OR BOTH SIDES OF THE ROADWAY WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
 2. CONSTRUCT THE FINISHING SLOPE OF THE RAMP 0.33% MAXIMUM.
 3. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
 4. CONSTRUCT THE SIZE FLARE SLOPE OF THE GUTTER ON STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
 5. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4'x4' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
 6. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6' WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
 7. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5'x5' LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.
 8. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
 9. PLACE A 12" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01
 10. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE NOTED. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.
 11. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

TEMPORARY LAINE CLOSURES

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 1-18

GENERAL NOTES FOR FLAGGING OPERATIONS
 1. REFER TO STD. 1101.11, SHEET 1-10, FOR THE MINIMUM DISTANCE AND SPACING.
 2. CONTRACTORS SHALL MAINTAIN THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF THE WORK ZONE.
 3. CONTRACTORS SHALL MAINTAIN THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF THE WORK ZONE.
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 9. CONTRACTORS SHALL MAINTAIN THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF THE WORK ZONE.
 10. CONTRACTORS SHALL MAINTAIN THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF THE WORK ZONE.

RETROFITTING DETECTABLE WARNING DOMES ONTO EXISTING CURB RAMP

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 1-18

GENERAL NOTES FOR FLAGGING OPERATIONS
 1. REFER TO STD. 1101.11, SHEET 1-10, FOR THE MINIMUM DISTANCE AND SPACING.
 2. CONTRACTORS SHALL MAINTAIN THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF THE WORK ZONE.
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 10. CONTRACTORS SHALL MAINTAIN THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF THE WORK ZONE.

SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit # 5-4825**

The City of Raleigh consents to the connection and extension of the City's **Public Water System** as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit # W-3785**

The City of Raleigh consents to the connection to its public sewer system and extension of the **private sewer collection system** as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit #

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval _____

Raleigh Water Review Officer _____

North Carolina 811
 *** 3 Days Before Digging ***
 North Carolina 811
 811 or 1-800-432-4949
 Remote Ticket Entry
 http://nc811.org/remoteticketentry.htm

DETECTABLE WARNING DOMES

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 1-18

DETECTABLE WARNING DOMES
 DETECTABLE WARNING DOMES SHALL BE PLACED WITHIN 1/2 MILE OF THE BEGINNING OF THE WORK ZONE AND WITHIN 1/2 MILE OF THE END OF THE WORK ZONE.

TWO-WAY UNDIVIDED WORK ZONE (Y-LINES)

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 1-18

GENERAL NOTES FOR FLAGGING OPERATIONS
 1. REFER TO STD. 1101.11, SHEET 1-10, FOR THE MINIMUM DISTANCE AND SPACING.
 2. CONTRACTORS SHALL MAINTAIN THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF THE WORK ZONE.
 3. CONTRACTORS SHALL MAINTAIN THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF THE WORK ZONE.
 4. CONTRACTORS SHALL MAINTAIN THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF THE WORK ZONE.
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 10. CONTRACTORS SHALL MAINTAIN THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF THE WORK ZONE.

KALAS FALLS PHASE 2
 1832 ROLESVILLE ROAD
 WAKE COUNTY, NC

JOB NUMBER: 9900
 CHECKED BY:
 DRAWN BY:
 DATE: DECEMBER 21, 2020
 SHEET TITLE:
KALAS FALLS CIVIL DETAILS
 SHEET NO.: **CD15**

AMERICAN Engineering
 American Engineering Associates - Southeast, P.A.
 4020 Westchase Boulevard, Suite 450
 Raleigh, NC 27607

AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
 3888
 STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 9810
 STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 9810

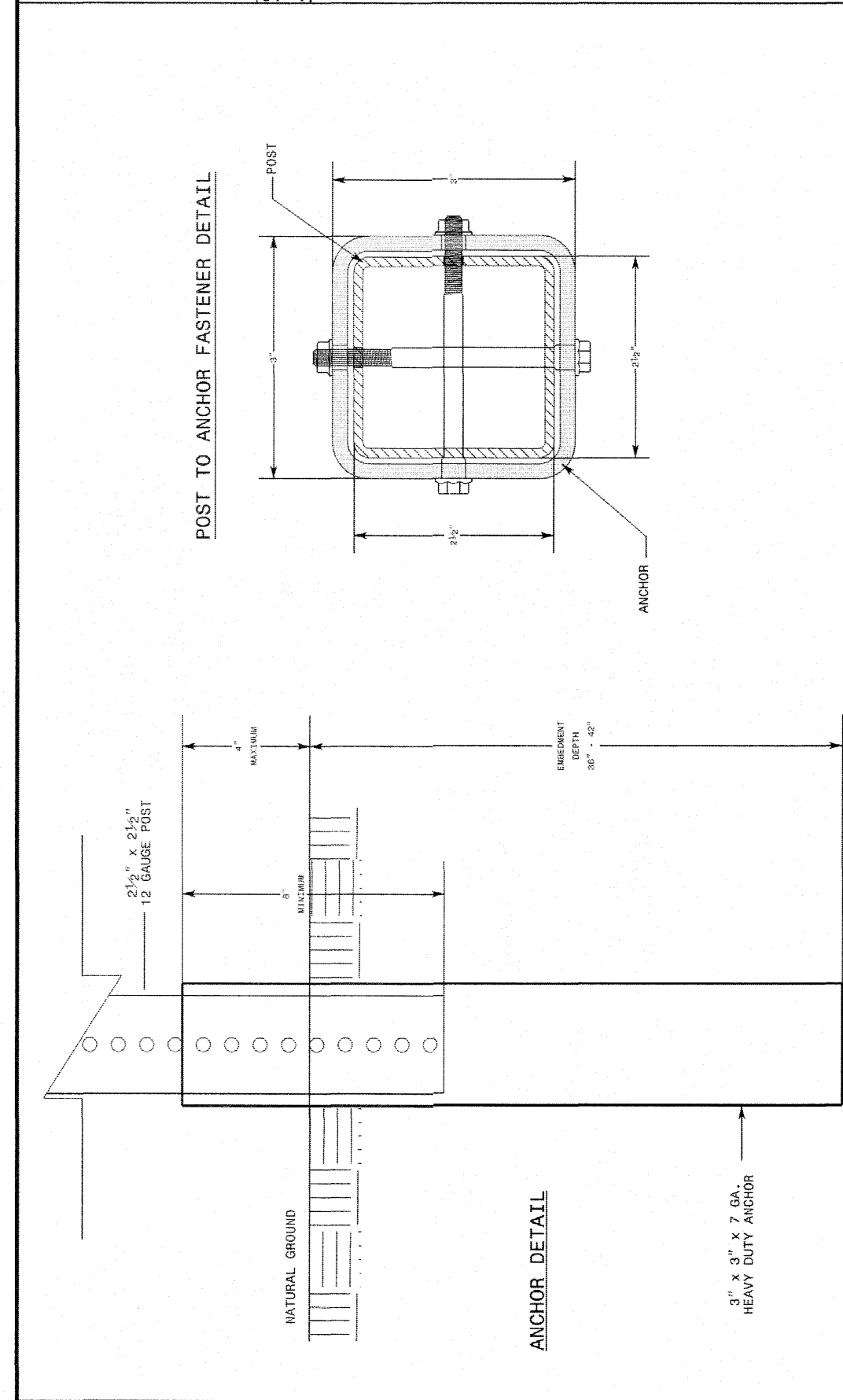
DETAIL SELECTION ONLY

NO.	DATE	REVISION:

STIPULATION FOR REUSE

THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE, NAMED HEREON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HEREON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

May 7, 2021



GENERAL NOTES

1. POSTS SHALL BE 2"x4" 30"x30" X 6 GAUGE STEEL.
2. ANCHORS SHALL BE 3" x 3" x 7 GAL. STEEL.
3. CONNECTIONS SHALL BE AS RECOMMENDED BY THE MANUFACTURER.

TRAFFIC CONTROL DESIGN TABLES FOR SPACING OF TEMPORARY SIGNS IN SERIES

ROADWAY STANDARD DRAWING FOR

TRAFFIC CONTROL DESIGN TABLES FOR SPACING OF TEMPORARY SIGNS IN SERIES

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

TRAFFIC CONTROL DESIGN TABLES
ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

TRAFFIC CONTROL DESIGN TABLES
ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

TRAFFIC CONTROL DESIGN TABLES FOR SPACING OF TEMPORARY SIGNS IN SERIES

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

GENERAL NOTES

1. TABLE FOR "L" DISTANCE IS BASED ON CHANNELIZATION TAPER FORMULA FROM THE WATO.

WHERE:

FORMULA: $L_{min} = M \cdot W \cdot S^2$

40 MPH OR LESS $L_{min} = M \cdot W \cdot S^2$

45 MPH OR GREATER

2. "L" & "W" DESIGNATIONS

DO NOT INTRODUCE A REDUCE OR SHIFTS THAT EFFECTS A PART OF THE ROADWAY

TRAFFIC CONTROL DESIGN TABLES FOR SPACING OF TEMPORARY SIGNS IN SERIES

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

TRAFFIC CONTROL DESIGN TABLES
ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

TRAFFIC CONTROL DESIGN TABLES
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RALEIGH, N.C.

TRAFFIC CONTROL DESIGN TABLES
ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

GENERAL NOTES

1. TABLE FOR "L" DISTANCE IS BASED ON CHANNELIZATION TAPER FORMULA FROM THE WATO.

WHERE:

FORMULA: $L_{min} = M \cdot W \cdot S^2$

40 MPH OR LESS $L_{min} = M \cdot W \cdot S^2$

45 MPH OR GREATER

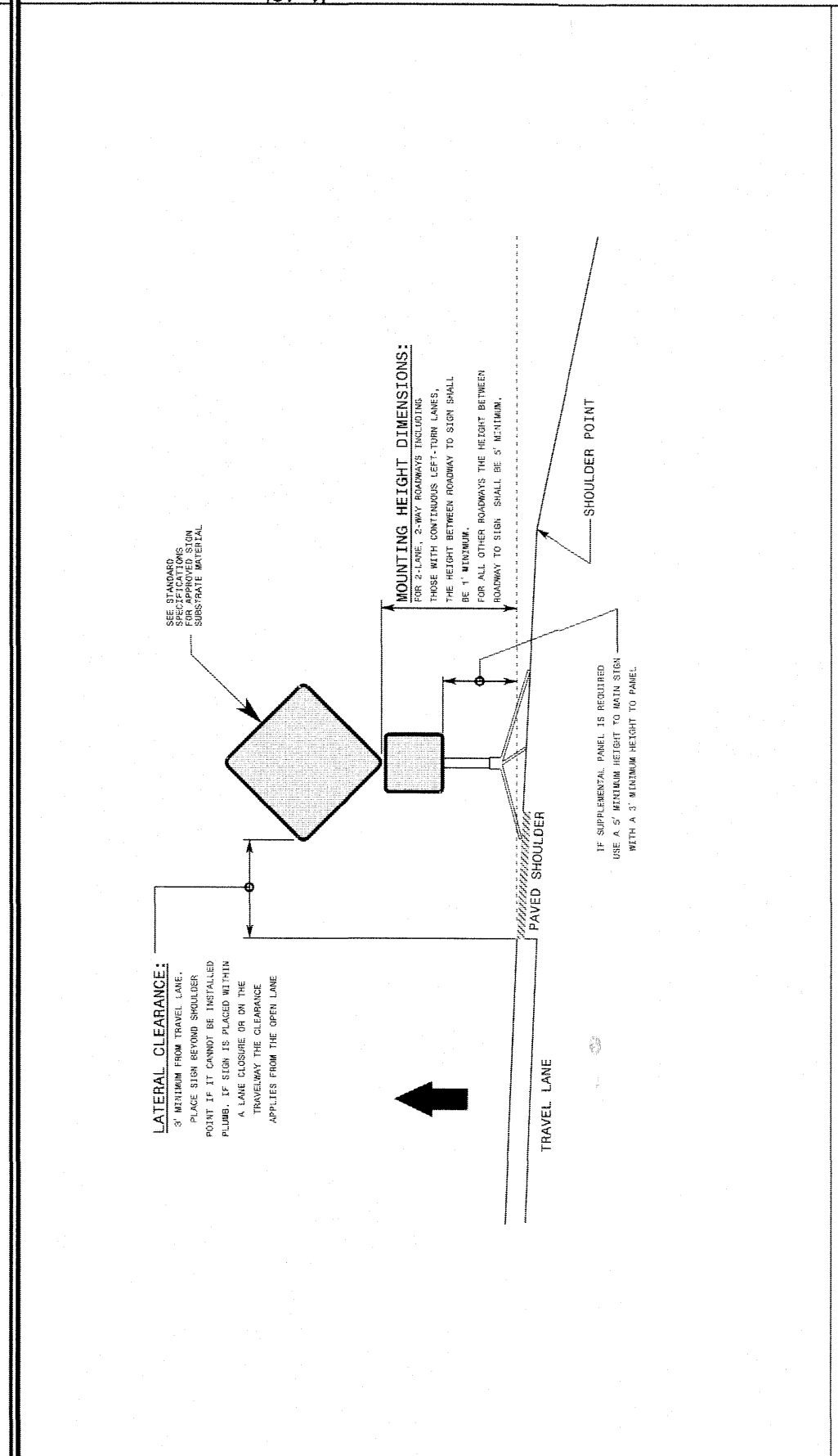
2. "L" & "W" DESIGNATIONS

DO NOT INTRODUCE A REDUCE OR SHIFTS THAT EFFECTS A PART OF THE ROADWAY

TRAFFIC CONTROL DESIGN TABLES FOR SPACING OF TEMPORARY SIGNS IN SERIES

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.



GENERAL NOTES

1. DIMENSIONS SHOWN ARE MINIMUM VALUES. WORK SIGNS SHOULD BE CLEARLY VISIBLE TO APPROXIMATELY 100 FEET BEHIND THE WORK ZONE. CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HERON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER DATE.
2. ALL PORTABLE SIGNS AND STANDBY SIGNS MUST MEET OR EXCEED THE REQUIREMENTS OF ANSI Z39 FOR CATEGORY II DEVICES. USE PORTABLE WORK ZONE SIGNS AND STANDBY SIGNS SPECIFICALLY DESIGNED FOR THE PURPOSES OF THIS DRAWING.
3. ALL PORTABLE WORK ZONE SIGNS AND STANDBY SIGNS MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST.

TRAFFIC CONTROL DESIGN TABLES FOR SPACING OF TEMPORARY SIGNS IN SERIES

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

GENERAL NOTES

1. TABLES ARE BASED ON THE ASPHALT GREEN BOOK. A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND A POLICY ON CONSTRUCTION METHODS FOR THE ASPHALT GREEN BOOK IS REQUIRED TO CORRECTLY APPLY THESE VALUES FOR PASSENGER CAR VEHICLES ON HET AND LEVEL ROADWAYS. CONSULT THE ASPHALT GREEN BOOK TO MAKE FINAL DETERMINATION OF STOPPING SIGHT DISTANCE REQUIREMENTS.

2. STOPPING SIGHT DISTANCE REQUIREMENTS BASED ON THE BRIMING POSITION OF STOPPING SIGHT DISTANCE REQUIREMENTS.

3. USE OF STOPPING SIGHT DISTANCE IN TRAFFIC CONTROL PLAN APPLICATIONS INCLUDES PRODUCING SIGN DISTANCE FOR TRAFFIC APPROXIMATING A LANE CLOSURE, PORTABLE 2-LANE, 2-WAY ROADWAY STOPPING SIGHT DISTANCE TO THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER), OR FLASHING LIGHTS IN A LANE CLOSURE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER). FLASHING LIGHTS ARE PROVIDED. STOPPING SIGHT DISTANCE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER) IS PROVIDED. STOPPING SIGHT DISTANCE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER) IS PROVIDED.

4. USE OF MINIMUM PASSING SIGHT DISTANCE TABLE IN TRAFFIC CONTROL PLAN APPLICATIONS INCLUDES PRODUCING SIGN DISTANCE FOR TRAFFIC APPROXIMATING A LANE CLOSURE, PORTABLE 2-LANE, 2-WAY ROADWAY STOPPING SIGHT DISTANCE TO THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER), OR FLASHING LIGHTS IN A LANE CLOSURE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER). FLASHING LIGHTS ARE PROVIDED. STOPPING SIGHT DISTANCE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER) IS PROVIDED. STOPPING SIGHT DISTANCE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER) IS PROVIDED.

TRAFFIC CONTROL DESIGN TABLES FOR SPACING OF TEMPORARY SIGNS IN SERIES

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

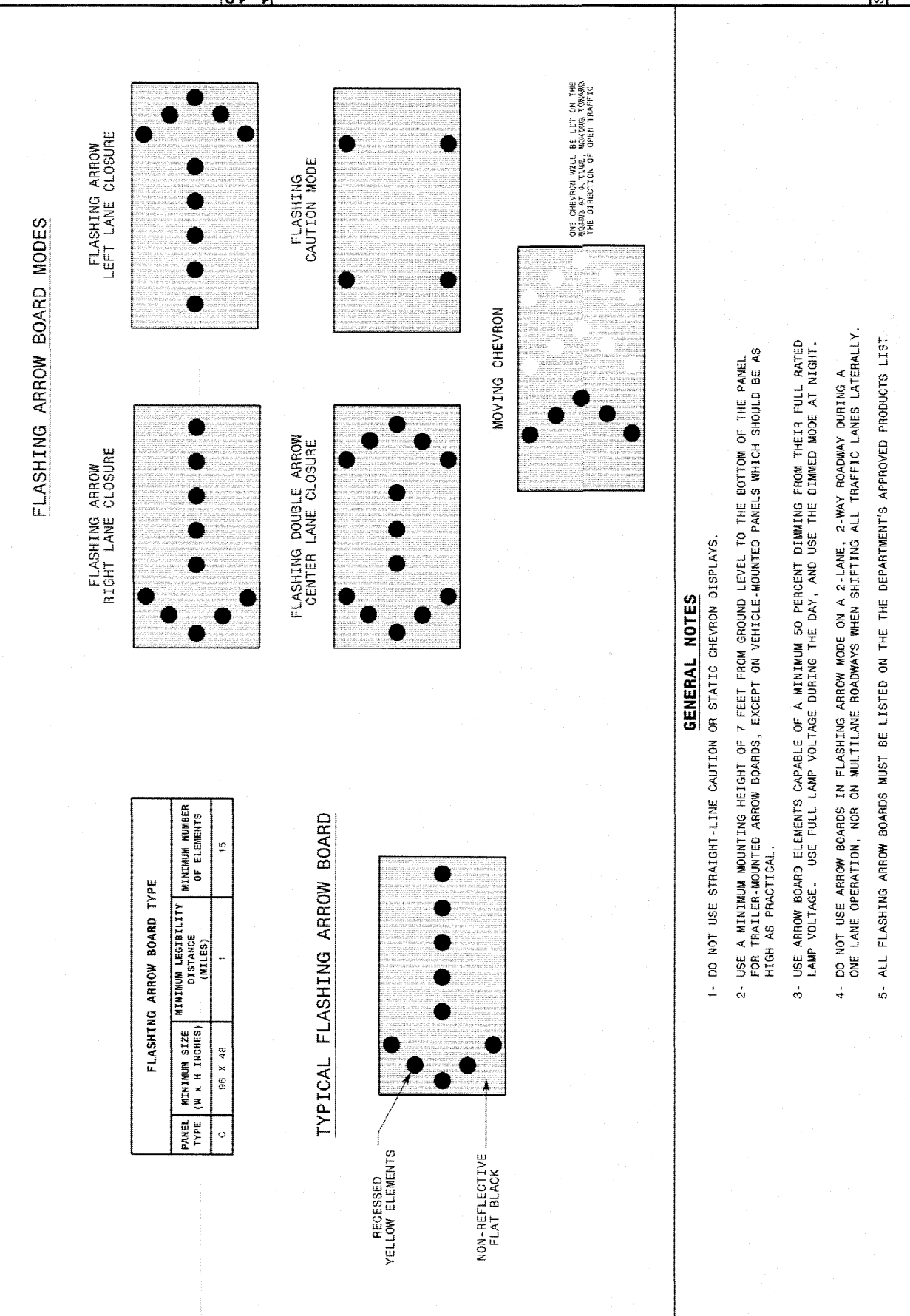
GENERAL NOTES

1. TABLES ARE BASED ON THE ASPHALT GREEN BOOK. A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND A POLICY ON CONSTRUCTION METHODS FOR THE ASPHALT GREEN BOOK IS REQUIRED TO CORRECTLY APPLY THESE VALUES FOR PASSENGER CAR VEHICLES ON HET AND LEVEL ROADWAYS. CONSULT THE ASPHALT GREEN BOOK TO MAKE FINAL DETERMINATION OF STOPPING SIGHT DISTANCE REQUIREMENTS.

2. STOPPING SIGHT DISTANCE REQUIREMENTS BASED ON THE BRIMING POSITION OF STOPPING SIGHT DISTANCE REQUIREMENTS.

3. USE OF STOPPING SIGHT DISTANCE IN TRAFFIC CONTROL PLAN APPLICATIONS INCLUDES PRODUCING SIGN DISTANCE FOR TRAFFIC APPROXIMATING A LANE CLOSURE, PORTABLE 2-LANE, 2-WAY ROADWAY STOPPING SIGHT DISTANCE TO THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER), OR FLASHING LIGHTS IN A LANE CLOSURE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER). FLASHING LIGHTS ARE PROVIDED. STOPPING SIGHT DISTANCE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER) IS PROVIDED. STOPPING SIGHT DISTANCE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER) IS PROVIDED.

4. USE OF MINIMUM PASSING SIGHT DISTANCE TABLE IN TRAFFIC CONTROL PLAN APPLICATIONS INCLUDES PRODUCING SIGN DISTANCE FOR TRAFFIC APPROXIMATING A LANE CLOSURE, PORTABLE 2-LANE, 2-WAY ROADWAY STOPPING SIGHT DISTANCE TO THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER), OR FLASHING LIGHTS IN A LANE CLOSURE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER). FLASHING LIGHTS ARE PROVIDED. STOPPING SIGHT DISTANCE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER) IS PROVIDED. STOPPING SIGHT DISTANCE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER) IS PROVIDED.



GENERAL NOTES

1. DO NOT USE STRAIGHT LINE CLOSURES ON STATE CONTROLLED HIGHWAYS.
2. USE THE HIGHEST AVAILABLE FLASHING ARROW BOARD FOR THE BOTTOM OF THE PANEL.
3. USE THE HIGHEST AVAILABLE FLASHING ARROW BOARD, FACE OR VEHICLE MOUNTED PANELS WHICH SHOULD BE AS HIGH AS PRACTICAL.
4. FLASHING ARROW BOARDS MUST BE USED IN TRAFFIC CONTROL PLAN APPLICATIONS. FOR TRAFFIC APPROXIMATING A LANE CLOSURE, PORTABLE 2-LANE, 2-WAY ROADWAY STOPPING SIGHT DISTANCE TO THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER), OR FLASHING LIGHTS IN A LANE CLOSURE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER). FLASHING LIGHTS ARE PROVIDED. STOPPING SIGHT DISTANCE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER) IS PROVIDED. STOPPING SIGHT DISTANCE AT THE BEGINNING OF THE LANE CLOSURE (WEDGE TAPER) IS PROVIDED.
5. ALL FLASHING ARROW BOARDS MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST.

TRAFFIC CONTROL DESIGN TABLES FOR SPACING OF TEMPORARY SIGNS IN SERIES

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

GENERAL NOTES

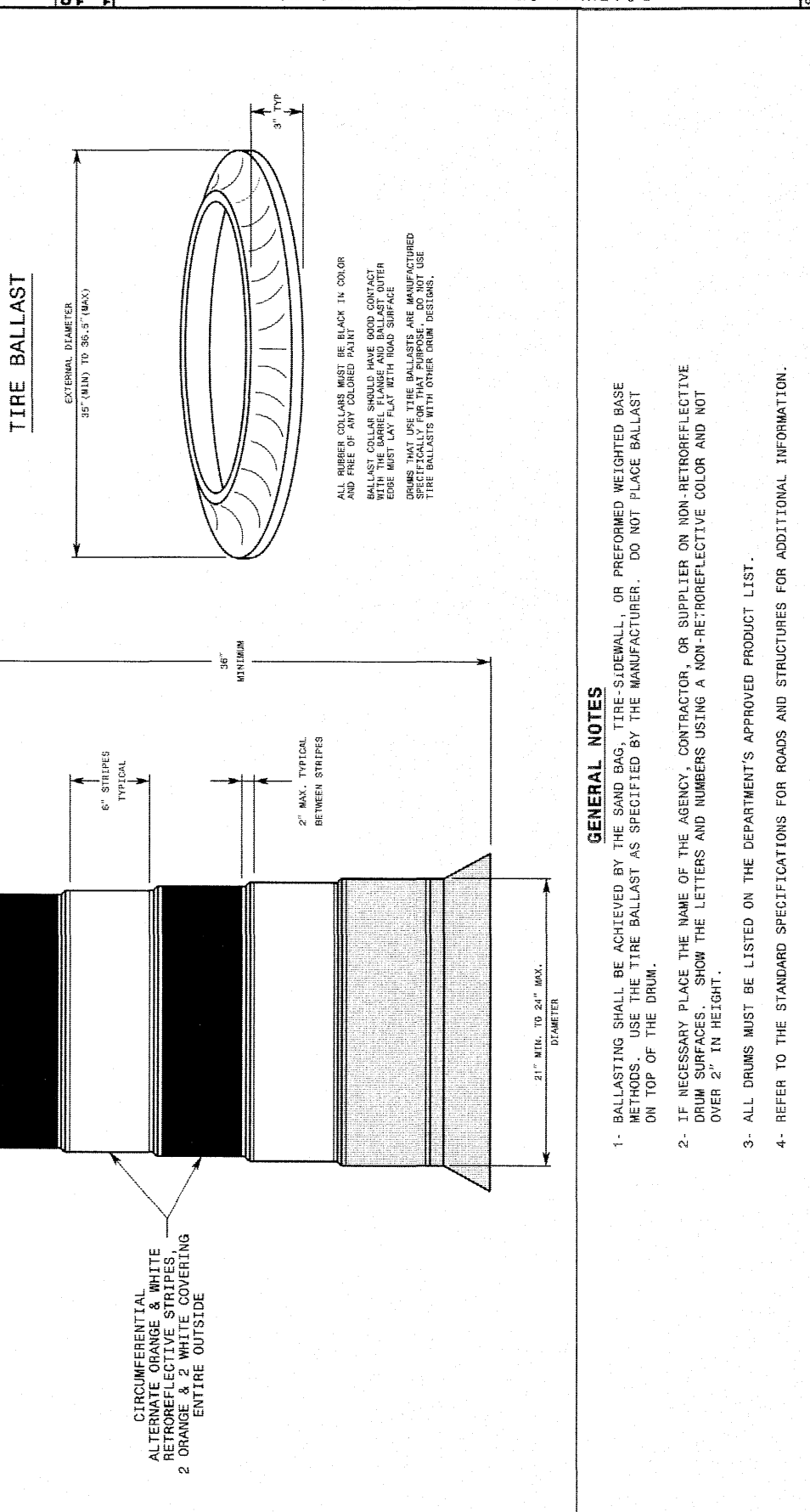
1. REFER TO THE 2011 ROADSIDE DESIGN GUIDE OR THE LATEST EDITION.

2. A BARRIER IS CONSIDERED PLACED WHEN IT IS NOT PARALLEL TO THE EDGE OF THE TRAVELWAY.

TRAFFIC CONTROL DESIGN TABLES FOR SPACING OF TEMPORARY SIGNS IN SERIES

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.



GENERAL NOTES

1. BALLASTING SHALL BE ACCOMPLISHED BY THE DRUM MANUFACTURER. THE SUBGRADE OR PREPARED REINFORCED BASE ON THE SPECIFIC SITE, NAMED HERON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HERON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER DATE.
2. IF NECESSARY PLACE THE NAME OF THE AGENCY, CONTRACTOR, OR SUPPLIER ON NON-REFLECTIVE OVERLAY OF THE SIGN. THE LETTERS AND NUMBERS MUST BE A NON-REFLECTIVE COLOR AND NOT GREY.
3. ALL SIGNS MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST.
4. REFER TO THE STANDARD SPECIFICATIONS FOR SIGNS AND STRUCTURES FOR ADDITIONAL INFORMATION.

TRAFFIC CONTROL DESIGN TABLES FOR SPACING OF TEMPORARY SIGNS IN SERIES

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

GENERAL NOTES

1. REFER TO 2009 WATO OR THE LATEST EDITION.

2. USE THIS STANDARD DRAWING IN CONJUNCTION WITH OTHER TRAFFIC CONTROL ROADWAY STANDARD DRAWINGS WHERE STOP SPACING DISTANCES A, B, C, ARE SPECIFIED.

3. USE THE HIGHEST AVAILABLE FLASHING ARROW BOARD, FACE OR VEHICLE MOUNTED PANELS WHICH SHOULD BE AS HIGH AS PRACTICAL.

PAVEMENT MARKINGS

ROADWAY STANDARD DRAWING FOR INTERSECTIONS

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS

SHEET 2 OF 2 1205.04

GENERAL NOTES:

- 1- PLACEMENT OF STOP BARS AT NON-SIGNALIZED INTERSECTIONS IS OPTIONAL AND USED WHERE IT IS DETERMINED THAT STOP BARS ARE MORE APPROPRIATE THAN STOP SIGNS. STOP BARS SHALL BE PLACED AT THE END OF THE STOP BAY AND NOT MORE THAN 30 FEET FROM THE NEAREST EDGE OF THE PAVEMENT.
- 2- MINI-SKIP LANE LINE EXTENSIONS SHOULD BE USED AT INTERSECTIONS THAT HAVE REDUCED VISIBILITY CONDITIONS SUCH AS OFFSET, SKewed, OR CURVED ROADWAYS.
- 3- MINI-SKIP EDGE LINE EXTENSIONS MAY BE PLACED THROUGH INTERSECTIONS AND MAJOR DRIVEWAYS.
- 4- REFER TO ROADWAY STANDARD DRAWINGS 1205.01, 1205.02, 1205.05, 1205.06 AND 1205.09 FOR ADDITIONAL STANDARD MARKING GUIDANCE.

LEGEND:

- STOP SIGN
- STATIONARY SIGN
- DIRECTION OF TRAVEL
- TRAFFIC FLOW
- OPTIONAL

CONES

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS

SHEET 1 OF 1 1135.01

GENERAL NOTES:

- 1- ACTIVE BALLASTING BY LITER SPECIES SHALL BE USED AS SAND BAG STOPS. DURING THE CONE, OR BARS THAT CAN BE FILLED WITH BALLAST. SECURITY PERMIT OF THE WEIGHT OF THE CONE MUST BE IN THE BASE. USE BALLAST THAT DO NOT PRESENT A HAZARD WHEN STRUCK.
- 2- ALL CONES MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST.

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS

SHEET 1 OF 1 1150.01

SECTION A-A

NOTES:

1. ACTUAL LOCATION DETERMINED IN FIELD
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY.
3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

SECTION B-B

NOTES:

1. ACTUAL LOCATION DETERMINED IN FIELD
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

FLAGGERS

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS

SHEET 1 OF 1 1150.01

GENERAL NOTES:

- 1- USE HAND SIGNALING DEVICES SUCH AS STOP SIGNS, FLAGGERS, FLASHING LIGHTS TO CONTROL TRAFFIC.
- 2- FABRICATE STOP-SLOW PADDLES FROM SHEET METAL OR OTHER LIGHT RIGID RIGID MATERIAL.
- 3- PROVIDE STOPPING SIGHT DISTANCE TO EACH FLAGGER STATION. REFER TO RD. 1101.11.
- 4- ILLUMINATE FLAGGER STATIONS DURING NIGHT OPERATIONS.
- 5- FOLLOW FLAGGER QUALIFICATIONS AND METHODS OF HAND-SIGNALING PROCEDURES IN ACCORDANCE WITH PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- 6- ALL FLAGGERS MUST BE CERTIFIED BY AN ADOPT APPROVED TRAINING RESOURCE.

PAVEMENT MARKINGS

ROADWAY STANDARD DRAWING FOR LINE TYPES AND OFFSETS

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS

SHEET 1 OF 2 1205.01

GENERAL NOTES:

- 1- USE THESE LINES ON ALL FULL CONTROL OF ACCESS FACILITIES AND OTHER NOTES UNLESS OTHERWISE SHOWN. USE 3/4" OR MINI-SKIP FOR MINI-SKIP LANE LINE AND LINE EXTENSIONS THROUGH TURNERS.
- 2- LANE LINES INDICATED AS "REVERSE" ON THE ROADWAY STANDARD DRAWINGS SHALL BE AT LEAST TWICE THE WIDTH OF THE NORMAL LINE.
- 3- GORE LINES SHALL BE TWICE THE WIDTH OF THE NORMAL LINE.

TABLE 1

EDGE LINE OFFSET FOR 2-LANE, 2-WAY ROADWAYS	EDGE LINE OFFSET FOR 2-LANE, 2-WAY ROADWAYS	EDGE LINE OFFSET FOR 2-LANE, 2-WAY ROADWAYS	EDGE LINE OFFSET FOR 2-LANE, 2-WAY ROADWAYS
TRAVERSE PAVEMENT FROM E.O.T.	TRAVERSE PAVEMENT FROM E.O.T.	TRAVERSE PAVEMENT FROM E.O.T.	TRAVERSE PAVEMENT FROM E.O.T.
10'	10'	10'	10'
12'	12'	12'	12'
14'	14'	14'	14'
16'	16'	16'	16'
18'	18'	18'	18'
20'	20'	20'	20'
22'	22'	22'	22'
24'	24'	24'	24'
26'	26'	26'	26'
28'	28'	28'	28'
30'	30'	30'	30'

LEGEND:

- W" WIDTH OF TRAVEL LANE
- C" WIDTH OF TRAVEL LANE
- DIRECTION OF TRAVEL
- TRAFFIC FLOW

WATTLE DETAIL

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS

SHEET 1 OF 2 1205.01

NOTES:

- 1- USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.
- 2- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- 3- ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
- 4- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
- 5- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
- 6- INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
- 7- INSTALL MATTING IN ACCORDANCE WITH SECTION 1651 OF THE STANDARD SPECIFICATIONS.

PAVEMENT MARKINGS

ROADWAY STANDARD DRAWING FOR LINE TYPES AND OFFSETS

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS

SHEET 2 OF 2 1205.01

GENERAL NOTES:

- 1- USE THESE LINES ON ALL FULL CONTROL OF ACCESS FACILITIES AND OTHER NOTES UNLESS OTHERWISE SHOWN. USE 3/4" OR MINI-SKIP FOR MINI-SKIP LANE LINE AND LINE EXTENSIONS THROUGH TURNERS.
- 2- LANE LINES INDICATED AS "REVERSE" ON THE ROADWAY STANDARD DRAWINGS SHALL BE AT LEAST TWICE THE WIDTH OF THE NORMAL LINE.
- 3- GORE LINES SHALL BE TWICE THE WIDTH OF THE NORMAL LINE.

TABLE 1

EDGE LINE OFFSET FOR 2-LANE, 2-WAY ROADWAYS	EDGE LINE OFFSET FOR 2-LANE, 2-WAY ROADWAYS	EDGE LINE OFFSET FOR 2-LANE, 2-WAY ROADWAYS	EDGE LINE OFFSET FOR 2-LANE, 2-WAY ROADWAYS
TRAVERSE PAVEMENT FROM E.O.T.	TRAVERSE PAVEMENT FROM E.O.T.	TRAVERSE PAVEMENT FROM E.O.T.	TRAVERSE PAVEMENT FROM E.O.T.
10'	10'	10'	10'
12'	12'	12'	12'
14'	14'	14'	14'
16'	16'	16'	16'
18'	18'	18'	18'
20'	20'	20'	20'
22'	22'	22'	22'
24'	24'	24'	24'
26'	26'	26'	26'
28'	28'	28'	28'
30'	30'	30'	30'

LEGEND:

- W" WIDTH OF TRAVEL LANE
- C" WIDTH OF TRAVEL LANE
- DIRECTION OF TRAVEL
- TRAFFIC FLOW

WATTLE DETAIL

ROADWAY STANDARD DRAWING FOR

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS

SHEET 2 OF 2 1205.01

NOTES:

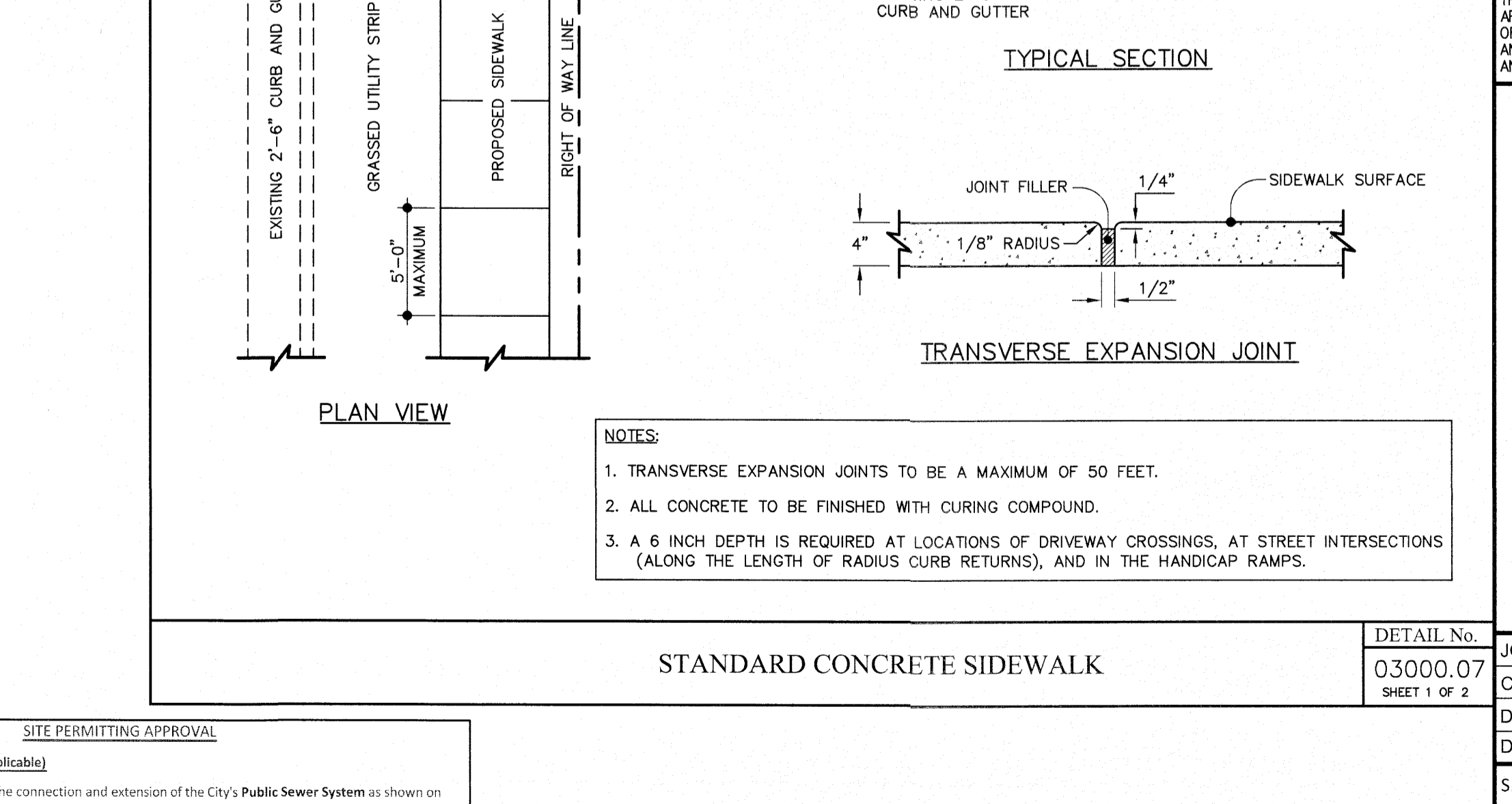
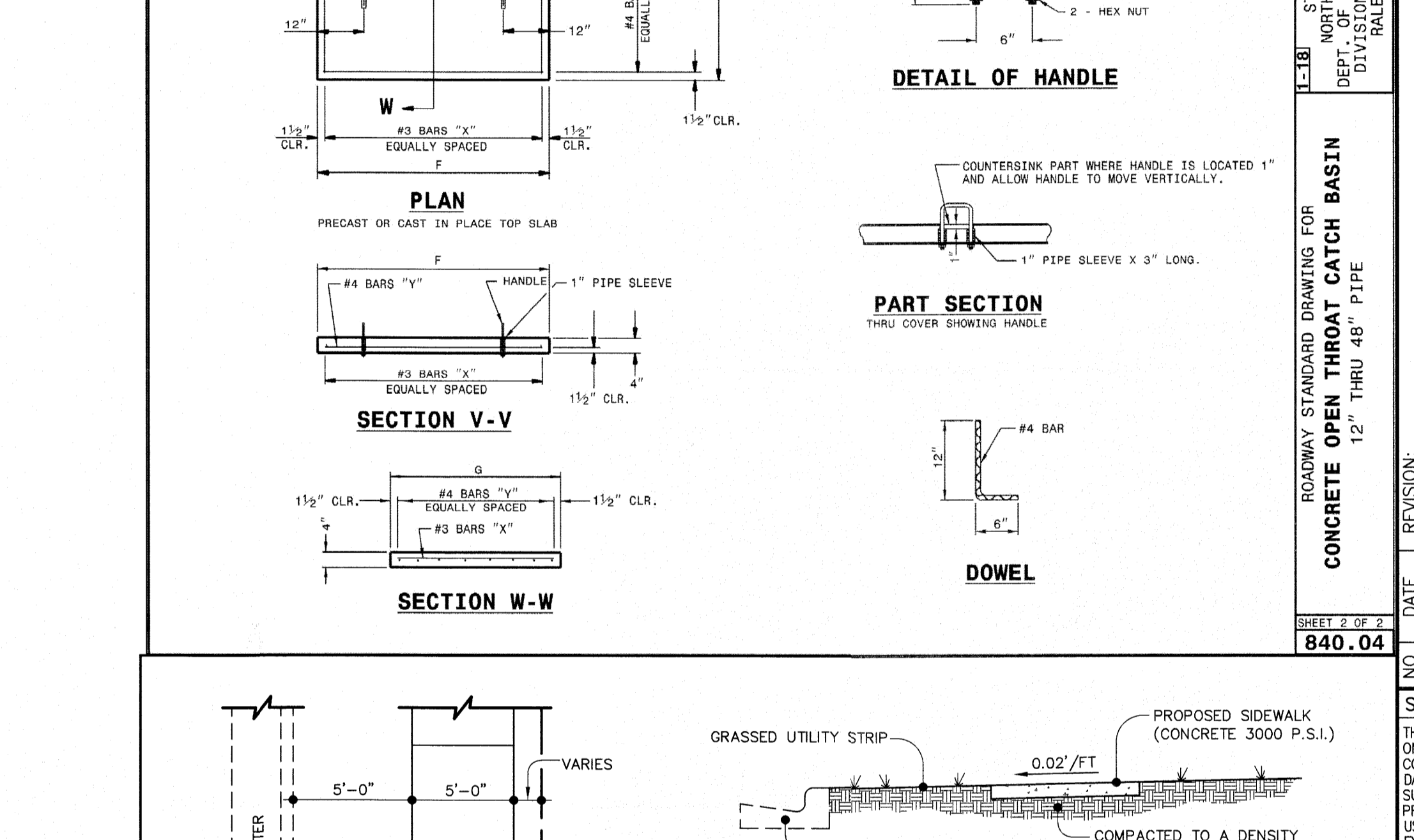
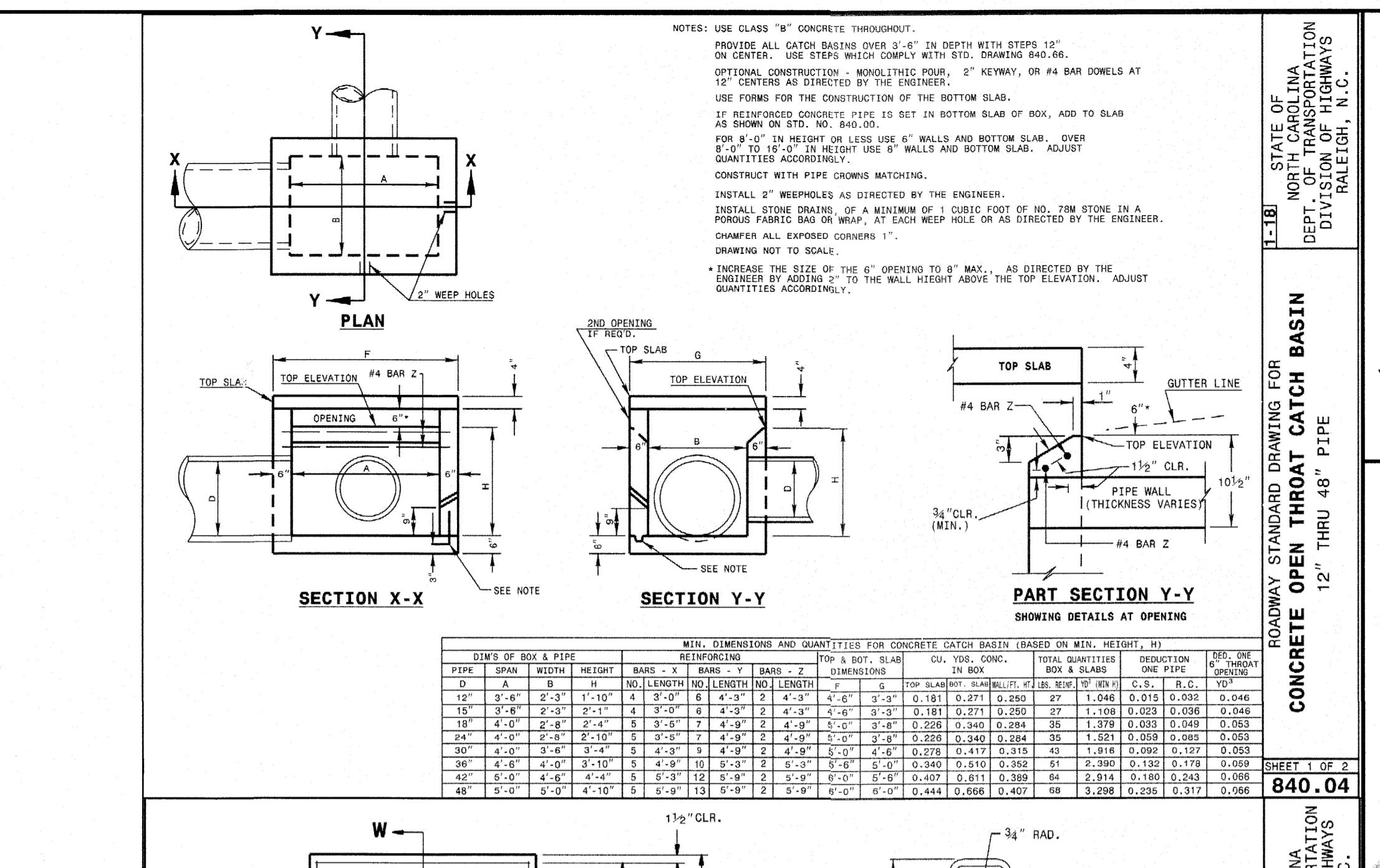
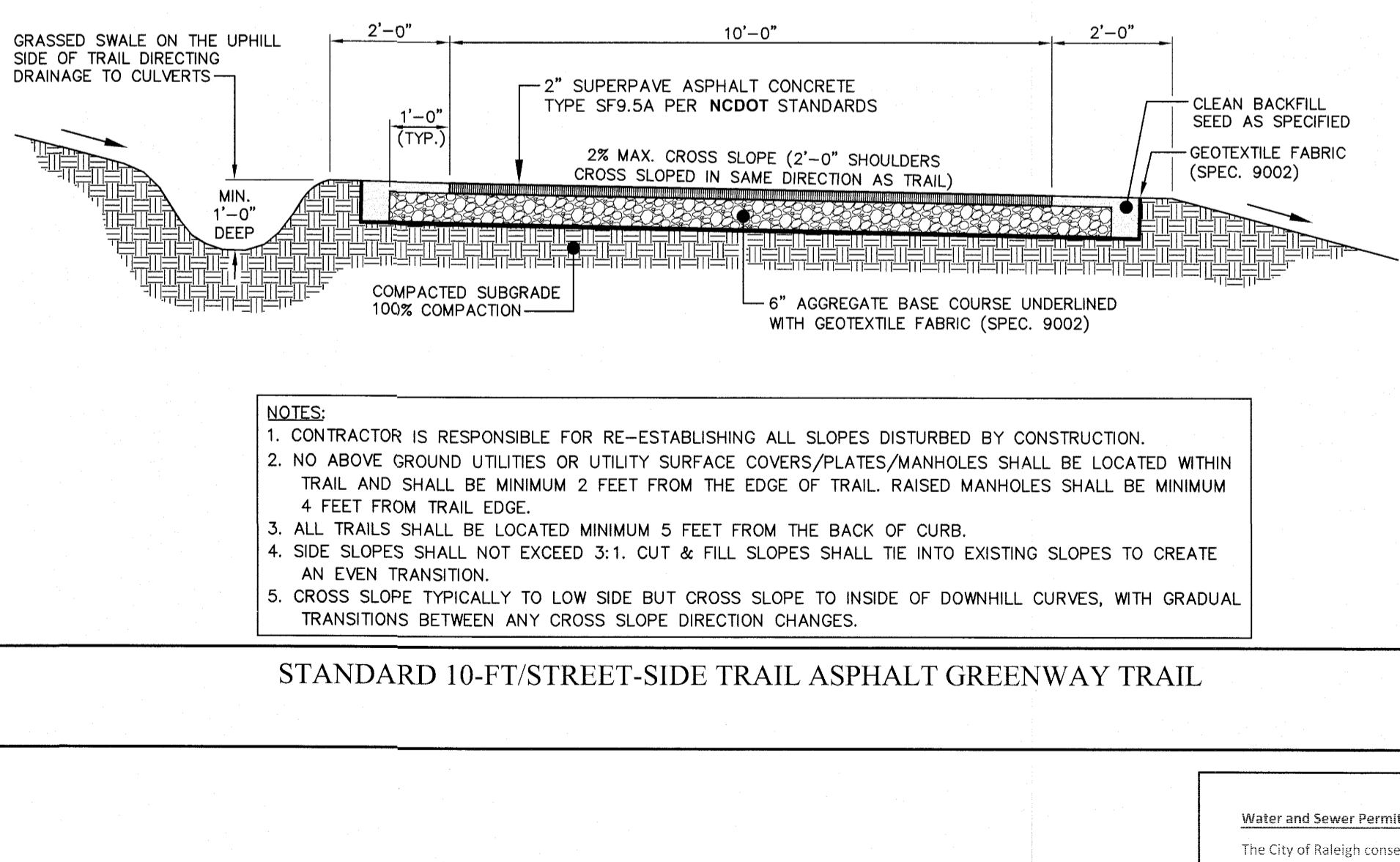
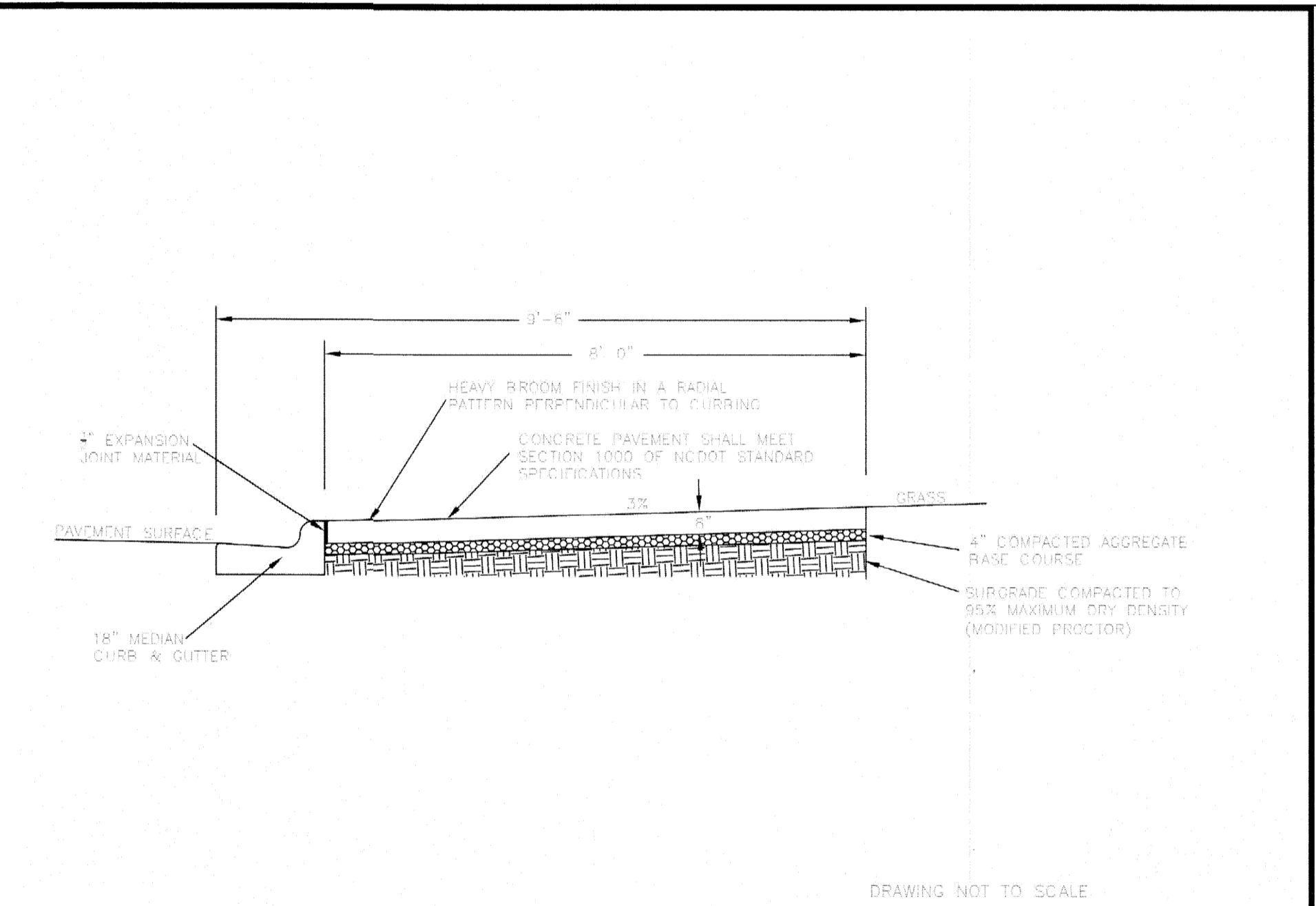
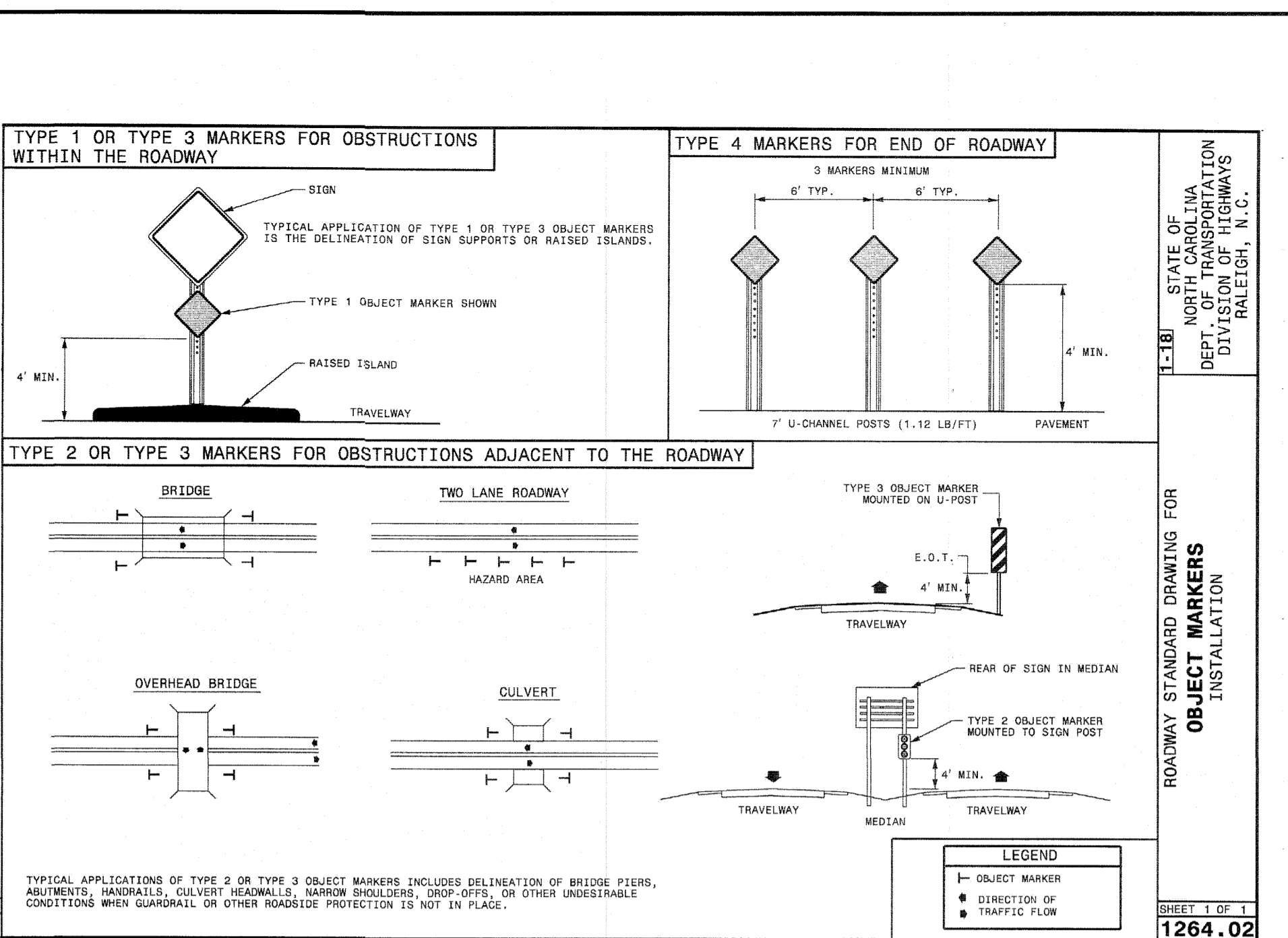
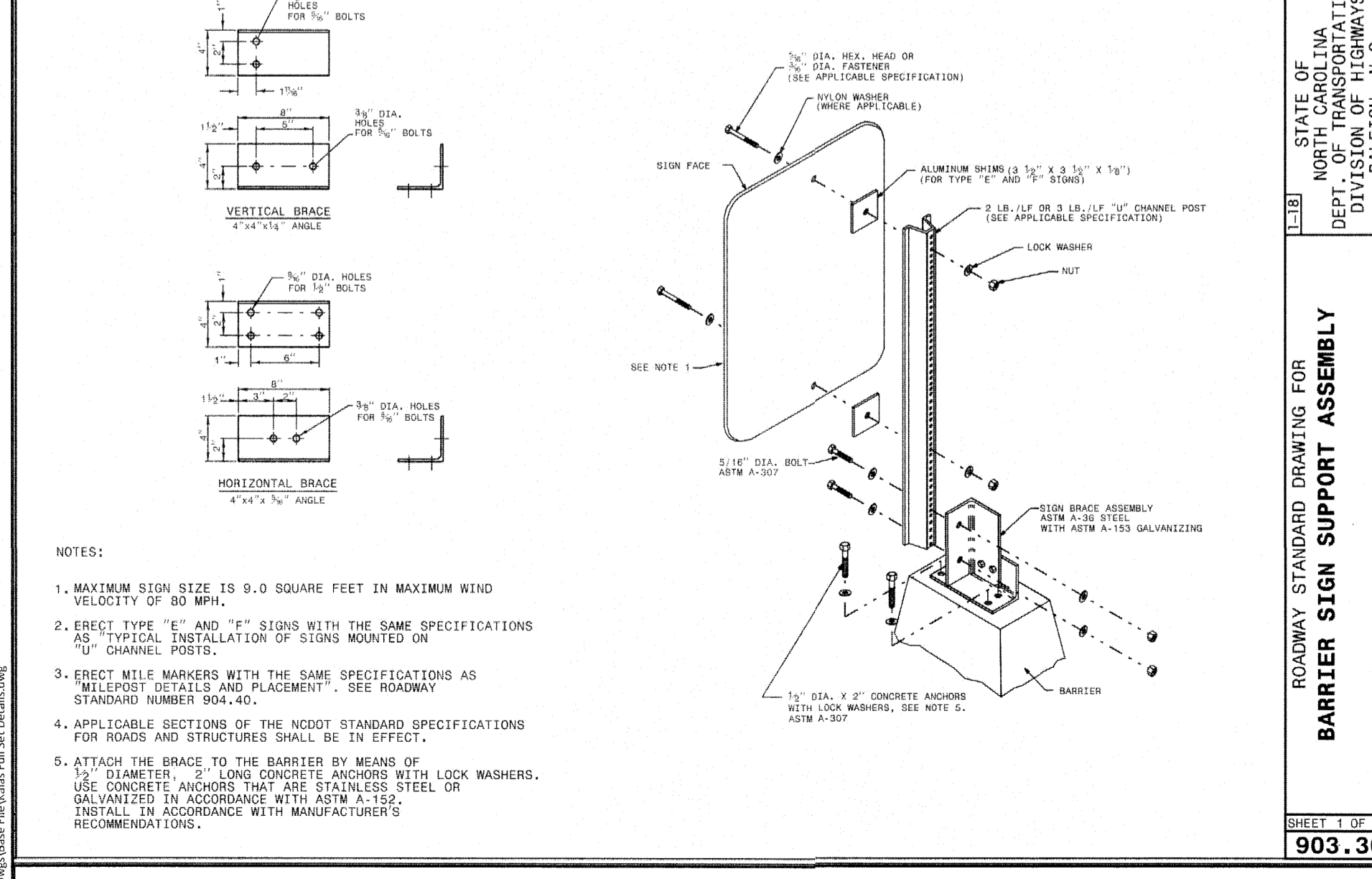
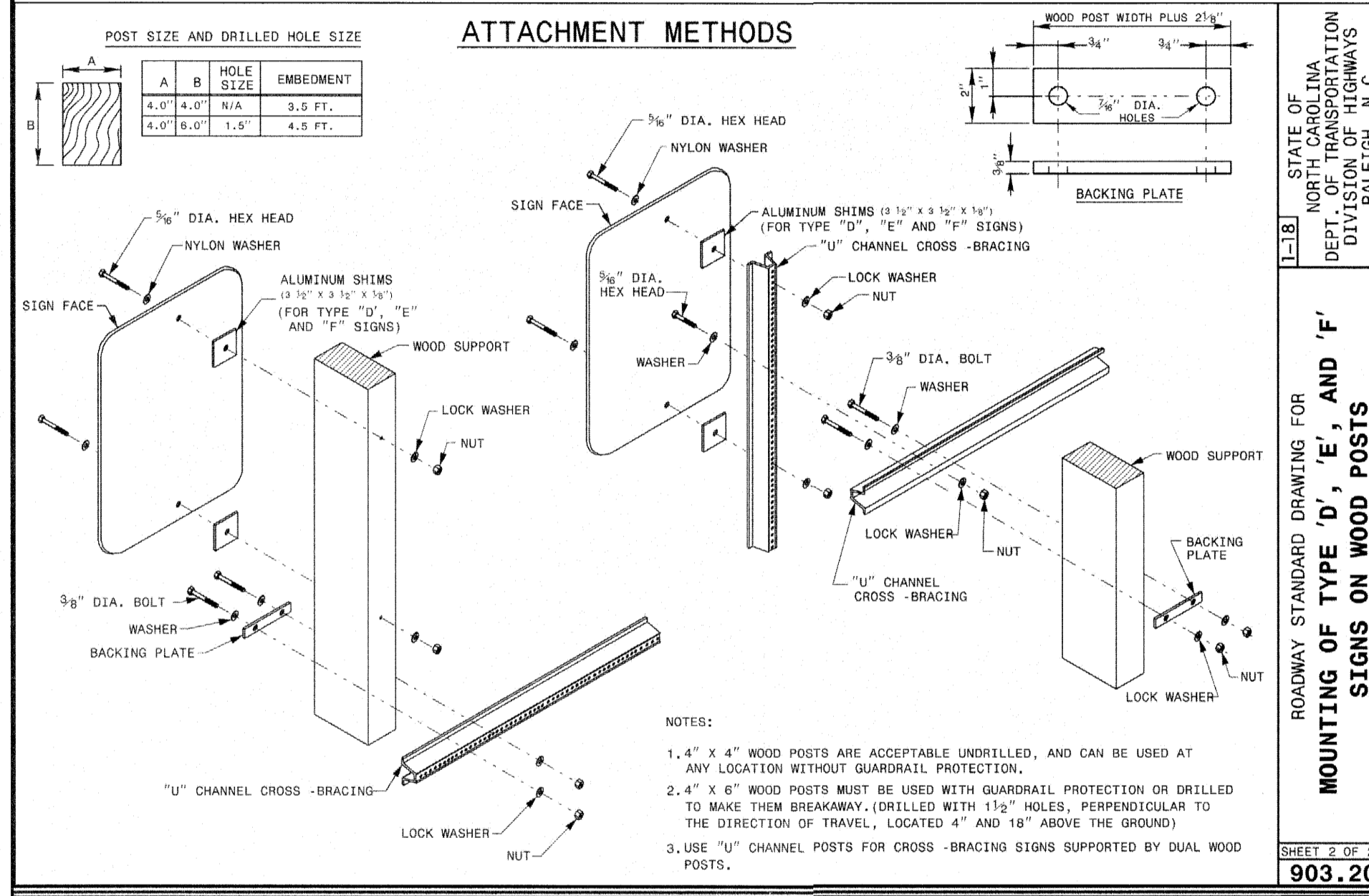
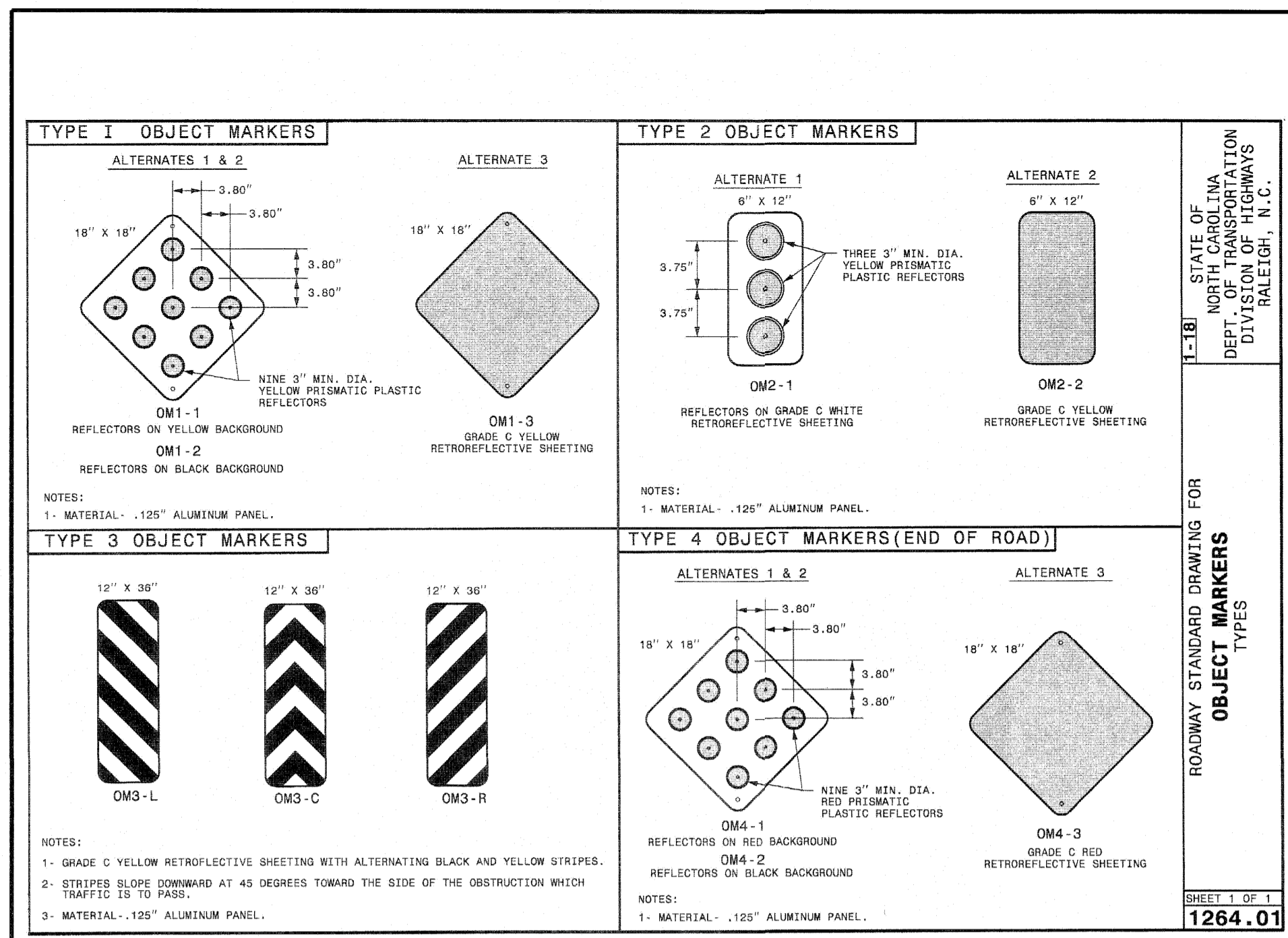
- 1- USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.
- 2- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
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- 4- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
- 5- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
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- 7- INSTALL MATTING IN ACCORDANCE WITH SECTION 1651 OF THE STANDARD SPECIFICATIONS.

KALAS FALLS PHASE 2
1832 ROLESVILLE ROAD
WAKE COUNTY, NC

JOB NUMBER: 9900
CHECKED BY:
DRAWN BY:
DATE: DECEMBER 21, 2020
SHEET TITLE:
KALAS FALLS CIVIL DETAILS
SHEET NO.: CD17

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607

Professional Engineer Seal for North Carolina, License No. 9810, Seal No. 0-3589.



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607

919-469-1101

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

REVISIONS:

NO.	DATE	REVISION

STIPULATION FOR REUSE: THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE, NAMED HERON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HERON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

KALAS FALLS
PHASE I
1832 ROLESVILLE ROAD
WAKE COUNTY, NC

DETAIL No. 03000.07
SHEET 1 OF 2

JOB NUMBER:
CHECKED BY:
DRAWN BY:
DATE:
SHEET TITLE:
KALAS FALLS CIVIL DETAILS
SHEET NO.: CD18

SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # 54884

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # W-3784

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit # _____

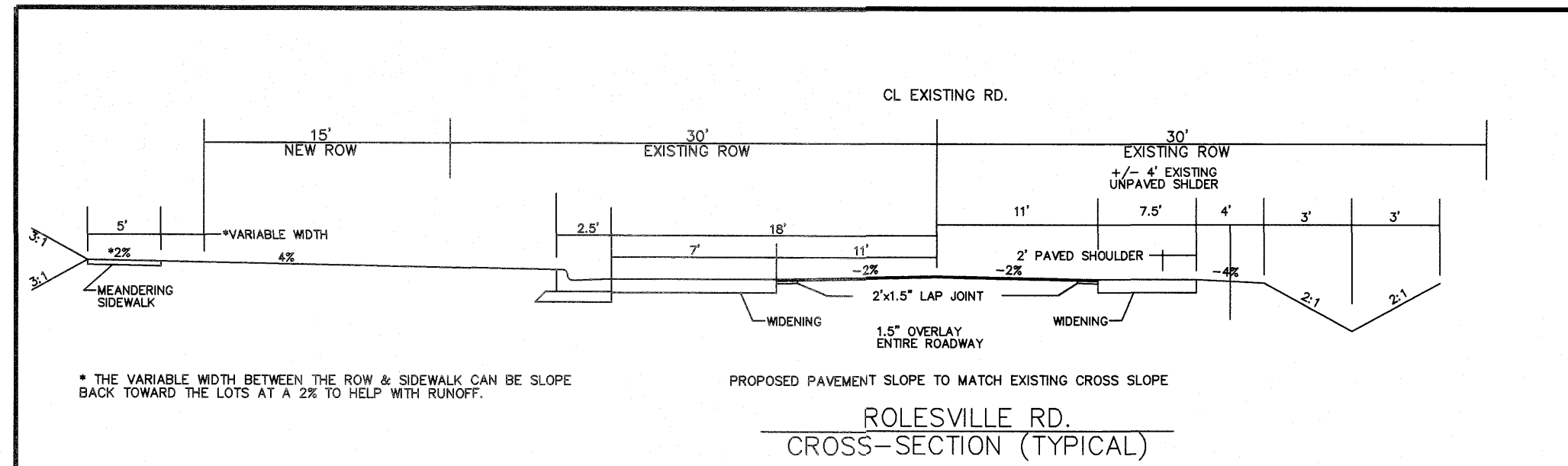
CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be relied upon if issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval _____

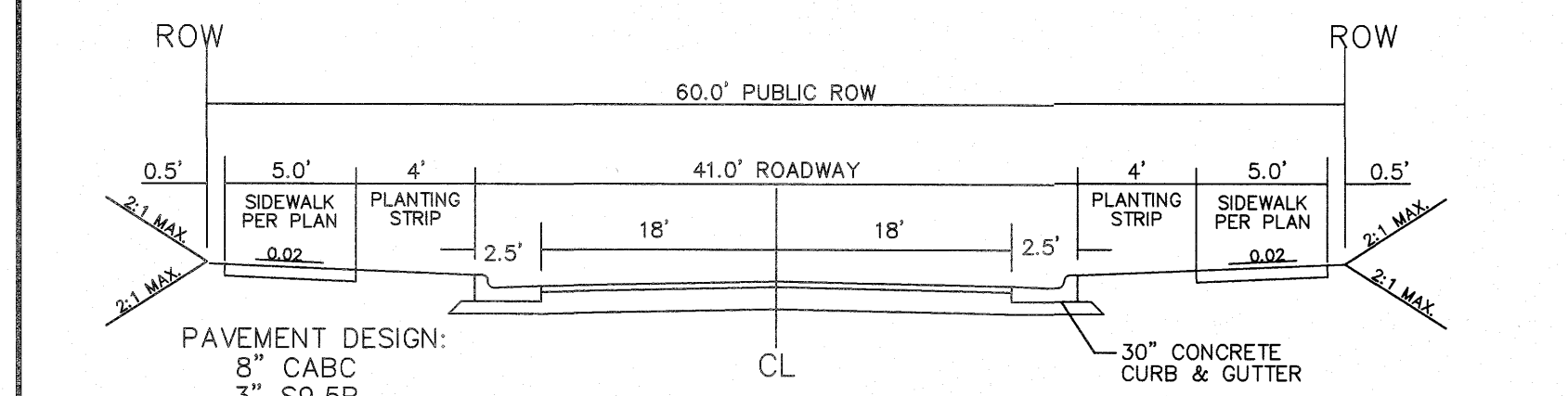
Raleigh Water Review Officer

North Carolina 811
3 Days Before Digging
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm



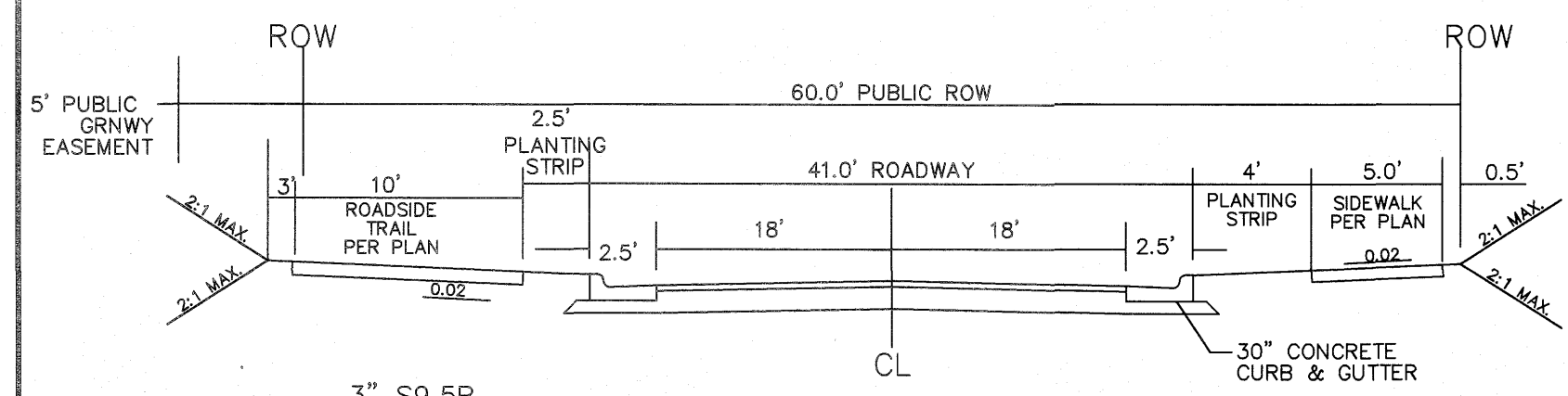
NOTE: PAVEMENT DESIGN TO BE DESIGNATED BY NCDOT ENCROACHMENT AGREEMENT OVERLAY OR LAP JOINT TO BE DETERMINED BY NCDOT ENCROACHMENT AGREEMENT

PAVEMENT DESIGN 6" OR LESS:	PAVEMENT DESIGN GREATER THAN 6":
3" S9.5C	3" S9.5C
4" S19C	4" S19C
5" B25.0C	10" ABC



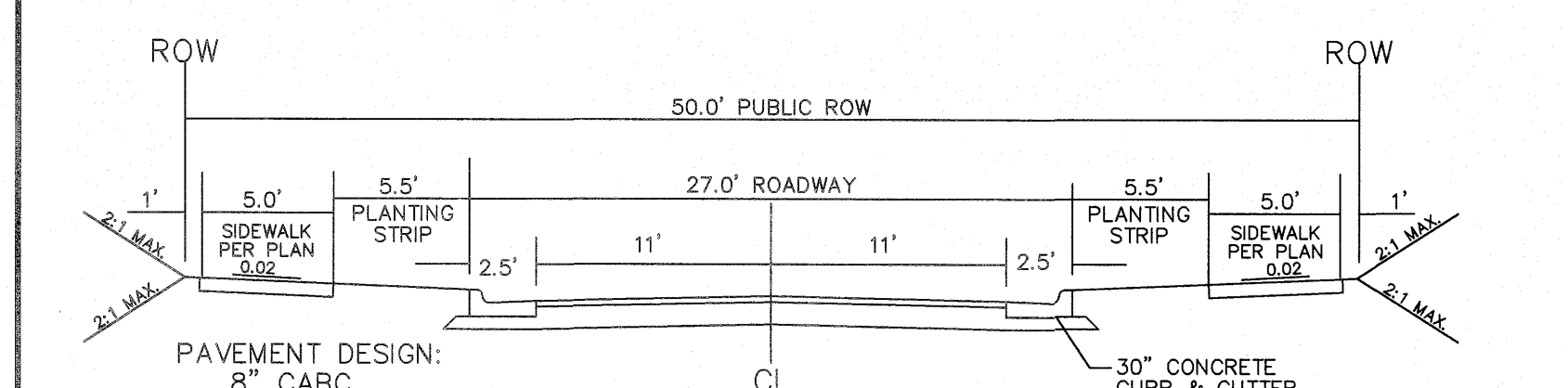
NOTE:
1. NORMAL CROWN OF 0.02 UNLESS OTHERWISE DIRECTED BY TOWN ENGINEER.
2. ASPHALT WILL BE INSTALLED AT A MIN. 1.5" LIFTS.

41' B-B ON A 60' R/W
TYPICAL SECTION



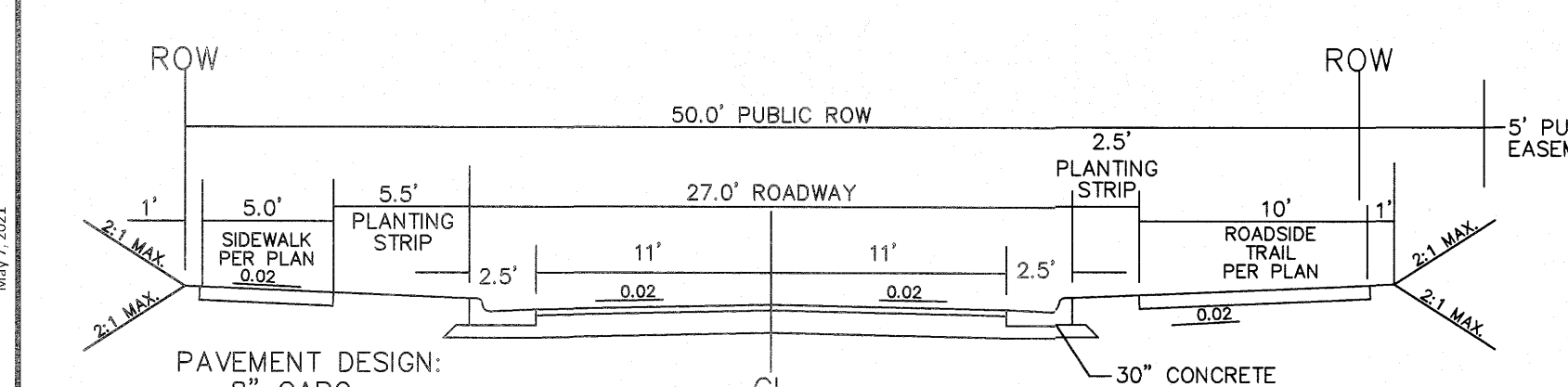
NOTE:
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2. ASPHALT WILL BE INSTALLED AT A MIN. 1.5" LIFTS.

41' B-B ON A 60' R/W
TYPICAL SECTION



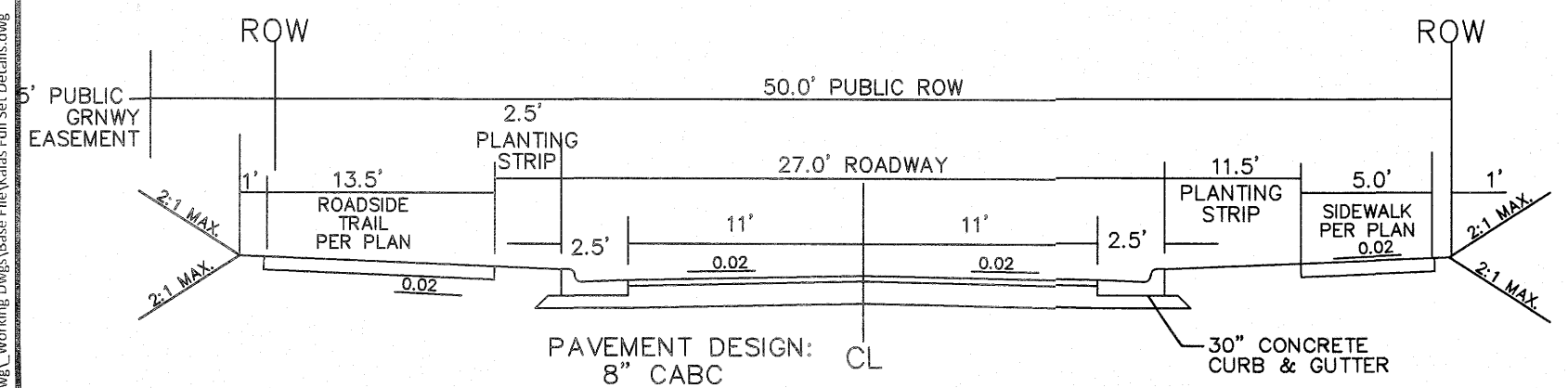
NOTE:
1. NORMAL CROWN OF 0.02 UNLESS OTHERWISE DIRECTED BY TOWN ENGINEER.
2. ASPHALT WILL BE INSTALLED AT A MIN. 1.5" LIFTS.

27' B-B ON A 50' R/W
TYPICAL SECTION



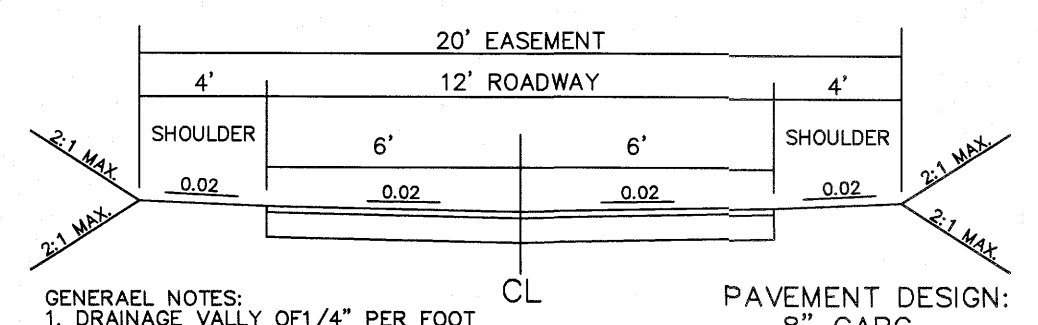
NOTE:
1. NORMAL CROWN OF 0.02 UNLESS OTHERWISE DIRECTED BY TOWN ENGINEER.
2. ASPHALT WILL BE INSTALLED AT A MIN. 1.5" LIFTS.

27' B-B ON A 50' R/W
TYPICAL SECTION



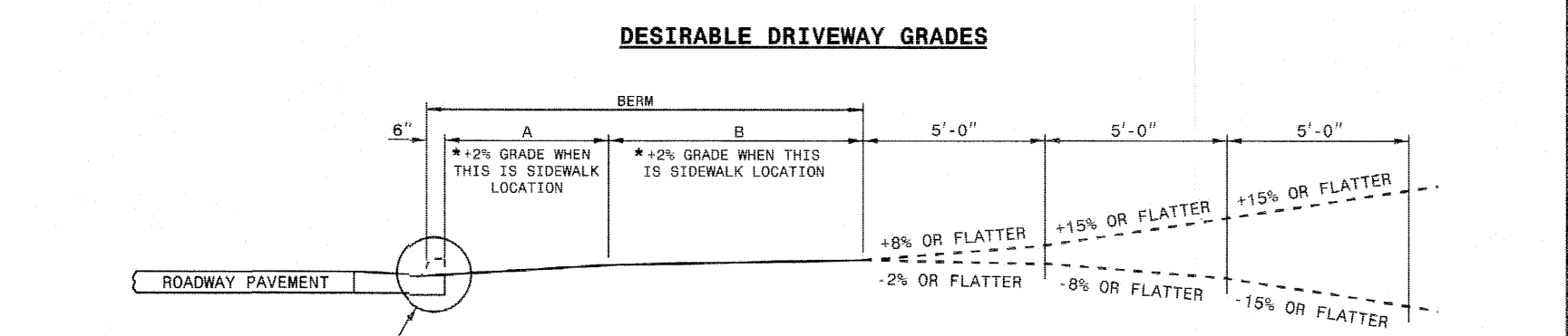
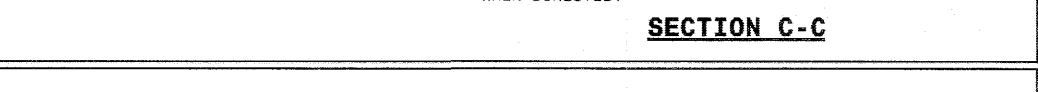
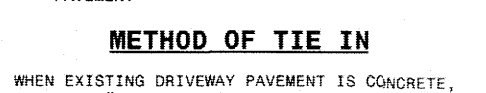
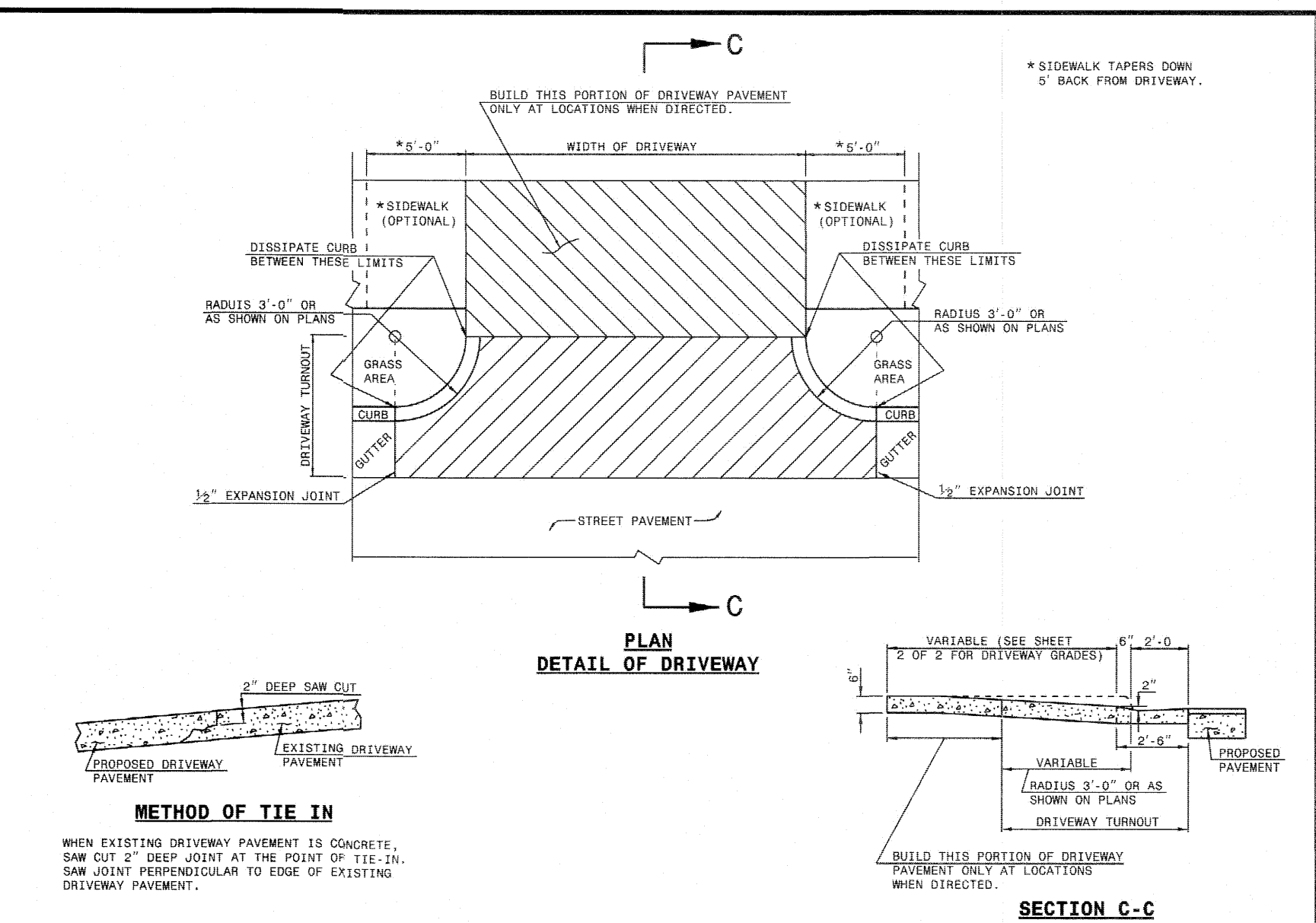
NOTE:
1. NORMAL CROWN OF 0.02 UNLESS OTHERWISE DIRECTED BY TOWN ENGINEER.
2. ASPHALT WILL BE INSTALLED AT A MIN. 1.5" LIFTS.

27' B-B ON A 50' R/W
TYPICAL SECTION

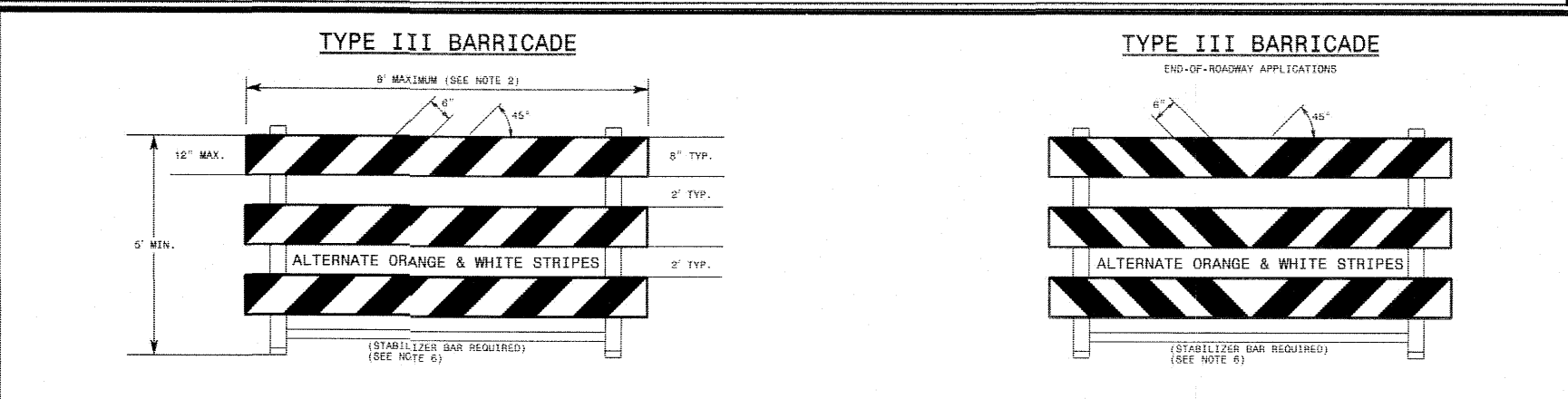
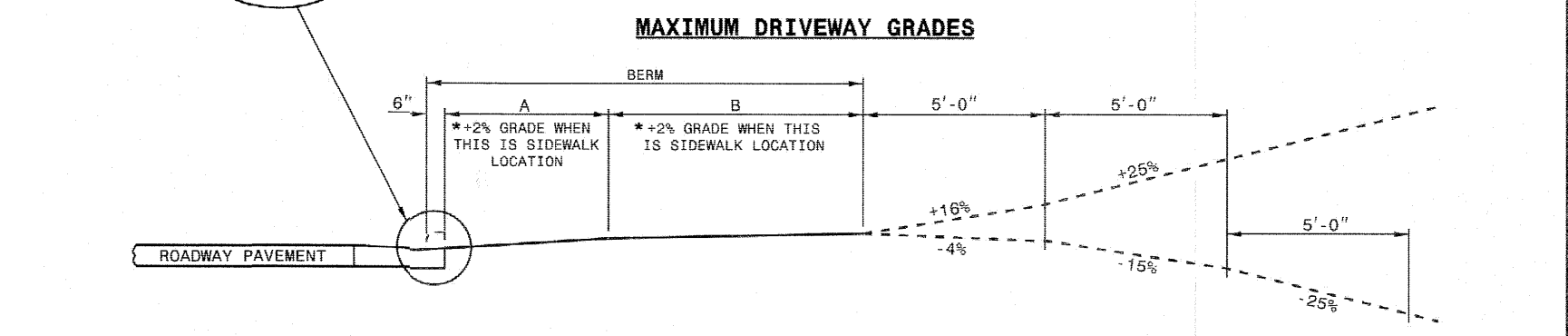


GENERAL NOTES:
1. DRAINAGE VALLEY OF 1/4" PER FOOT UNLESS OTHERWISE DIRECTED.
2. PAVEMENT DESIGN AS NOTED.
3. SEE DRIVEWAY DETAIL FOR ROAD INTERSECTIONS.

12' E-E IN A 20' EASEMENT
TYPICAL SECTION



BEAM WIDTH	A	GRADE	B	GRADE
8' OR LESS	5'-0"	+2%	2'-6"	+5%
8' OR LESS	2'-0"	+4%	3'-6"	+2%
10'	4'-0"	+4%	6'-6"	+2%
12' & OVER	4'-6"	+4%	7'-0"	+2%



GENERAL NOTES

- HORIZONTAL RAILS FOR MAY BE CONSTRUCTED OF APPROVED COMPOSITE, HOLLOW-CORRUGATED EXTRUDED RIGID POLYOLEFIN, HIGH DENSITY POLYETHYLENE, OR OTHER NCDOT APPROVED MATERIAL.
- BARRICADE SHALL BE LIMITED TO A MAXIMUM LENGTH OF 8 FT UNLESS NCHRP 350 CRASH TESTED FOR CATEGORY II DEVICES AND NCDOT APPROVED.
- ONLY NCDOT APPROVED COMPOSITE AND ROLL-UP SIGNS MAY BE MOUNTED ON THE BARRICADE RAILS. MOUNT SIGNS TO BARRICADE RAILS TO ENSURE SIGN WILL NOT BECOME DETACHED UNDER NORMAL WIND AND TRAFFIC CONDITIONS.
- SIGNS SHALL BE MOUNTED A MINIMUM OF 1 FOOT FROM THE GROUND TO THE BOTTOM OF THE SIGN UNLESS SIGNS 811-3 OR 811-4 ARE REQUIRED BY THE PLANS OR DIRECTED BY THE ENGINEER.
- BARRICADE MUST BE NCHRP 350 FOR CATEGORY II DEVICES AND NCDOT APPROVED WITH STABILIZER BAR OR ADEQUATE LATERAL BRACING.
- ASSEMBLY OF THE GENERIC BARRICADES MUST BE SELF CERTIFIED BY THE ASSEMBLER.
- BARRICADES USED TO CLOSE A ROADWAY SHALL EXTEND ACROSS THE ENTIRE ROADWAY. WHERE LOCAL TRAFFIC MUST BE MAINTAINED, THEY MAY BE PLACED IN A STAGGERED PATTERN.
- STRIPES ON WORK ZONE BARRICADE RAILS SHALL BE ALTERNATE ORANGE AND WHITE RETROREFLECTIVE STRIPES, SLOPED DOWNWARD TOWARDS THE SIDE WHICH TRAFFIC IS TO PASS OR TURN IN DETOURING. WHERE NO TURNS ARE INTENDED, THE STRIPES SHOULD SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE OR BARRICADES.
- USE RED AND WHITE STRIPES FOR PERMANENT BARRICADES.
- ALL BARRICADES MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST.
- PLACE MANUFACTURER'S NAME AND FEDERAL HIGHWAY ADMINISTRATION'S NCHRP 350 APPROVAL LETTER NUMBER ON BARRICADE FRAME.
- PLACE SANDBAGS OR OTHER APPROVED BALLASTING METHODS ON THE FEET OF THE FRAME. DO NOT PLACE SANDBAGS ON TOP OF A STRIPED RAIL OR STABILIZER BAR. DO NOT BALLAST BARRICADES BY HEAVY OBJECTS SUCH AS ROCKS, CRANKS OR CONCRETE OR OTHER ITEMS THAT WOULD CAUSE DAMAGE IF THE BARRICADE IS STRUCK BY A VEHICLE.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
DRIVEWAY TURNOUT
RADIUS TYPE

SHEET 1 OF 2
848.02

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

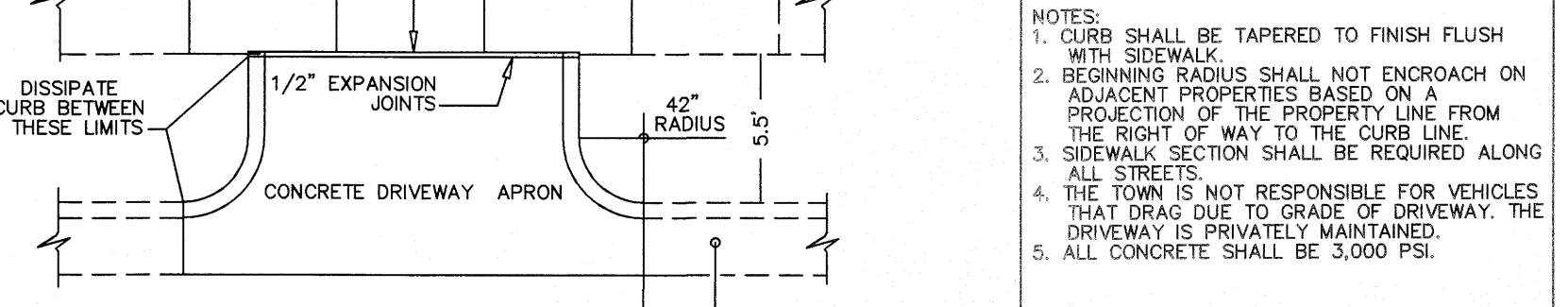
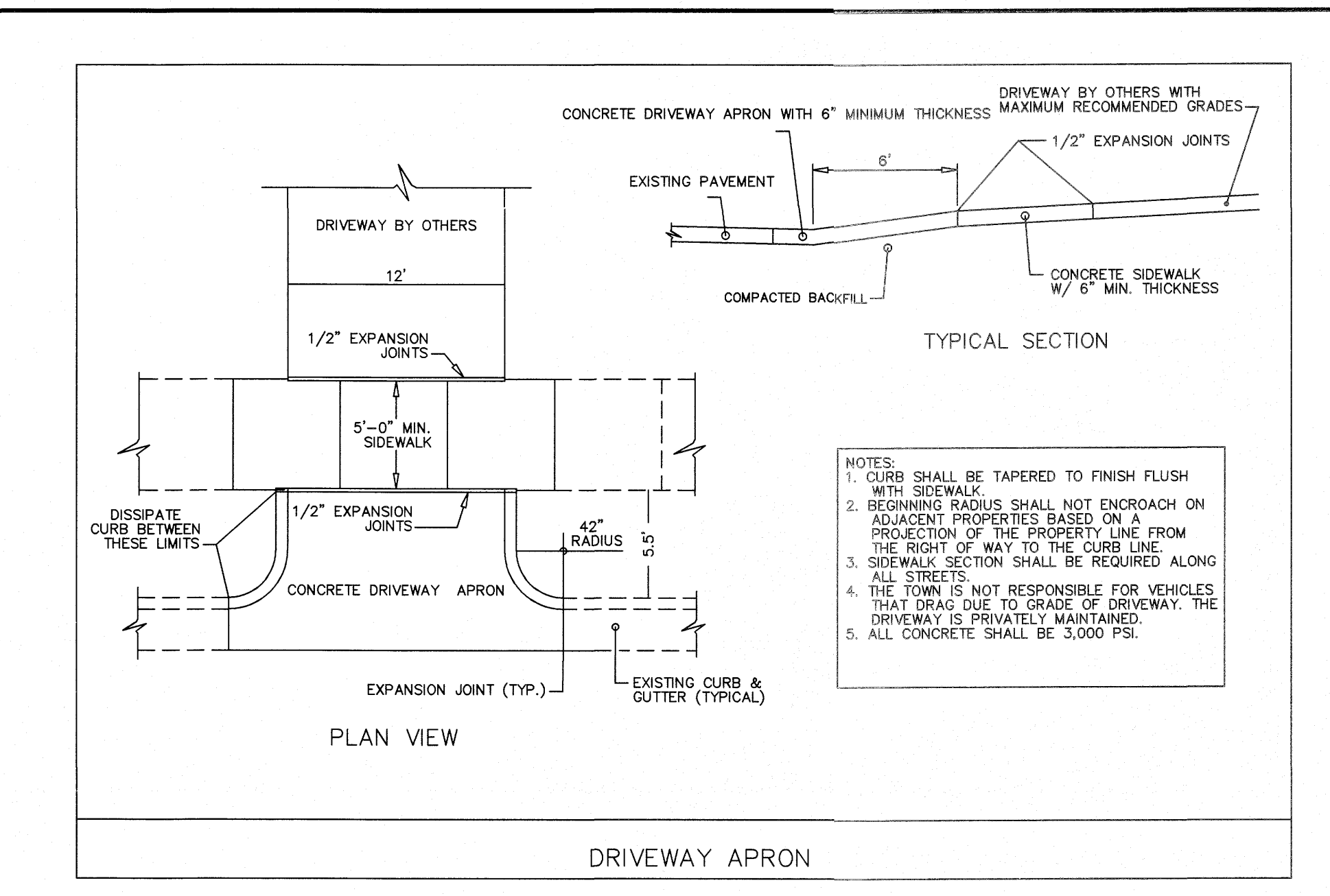
ROADWAY STANDARD DRAWING FOR
DRIVEWAY TURNOUT
GRADE TYPE

SHEET 2 OF 2
848.02

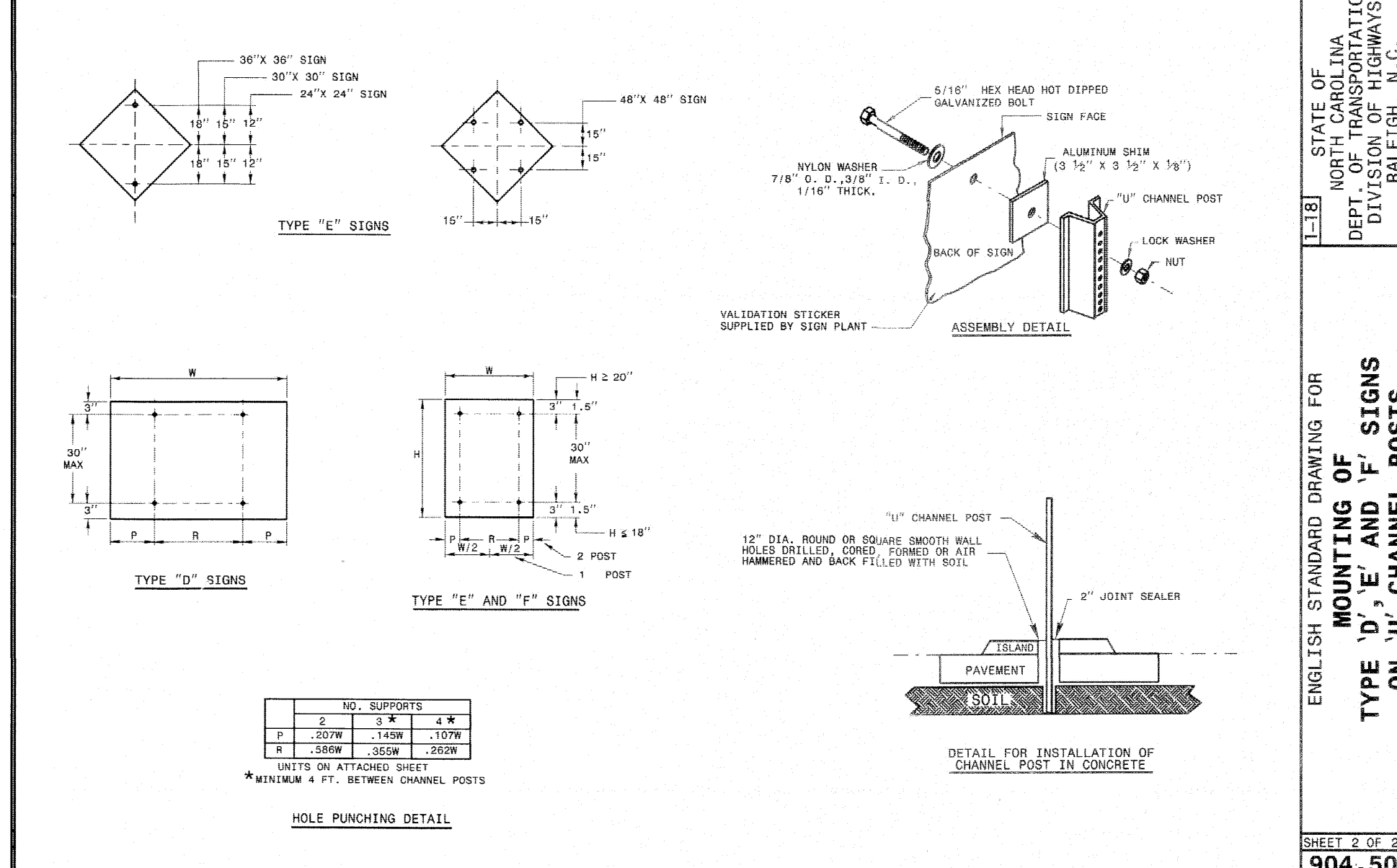
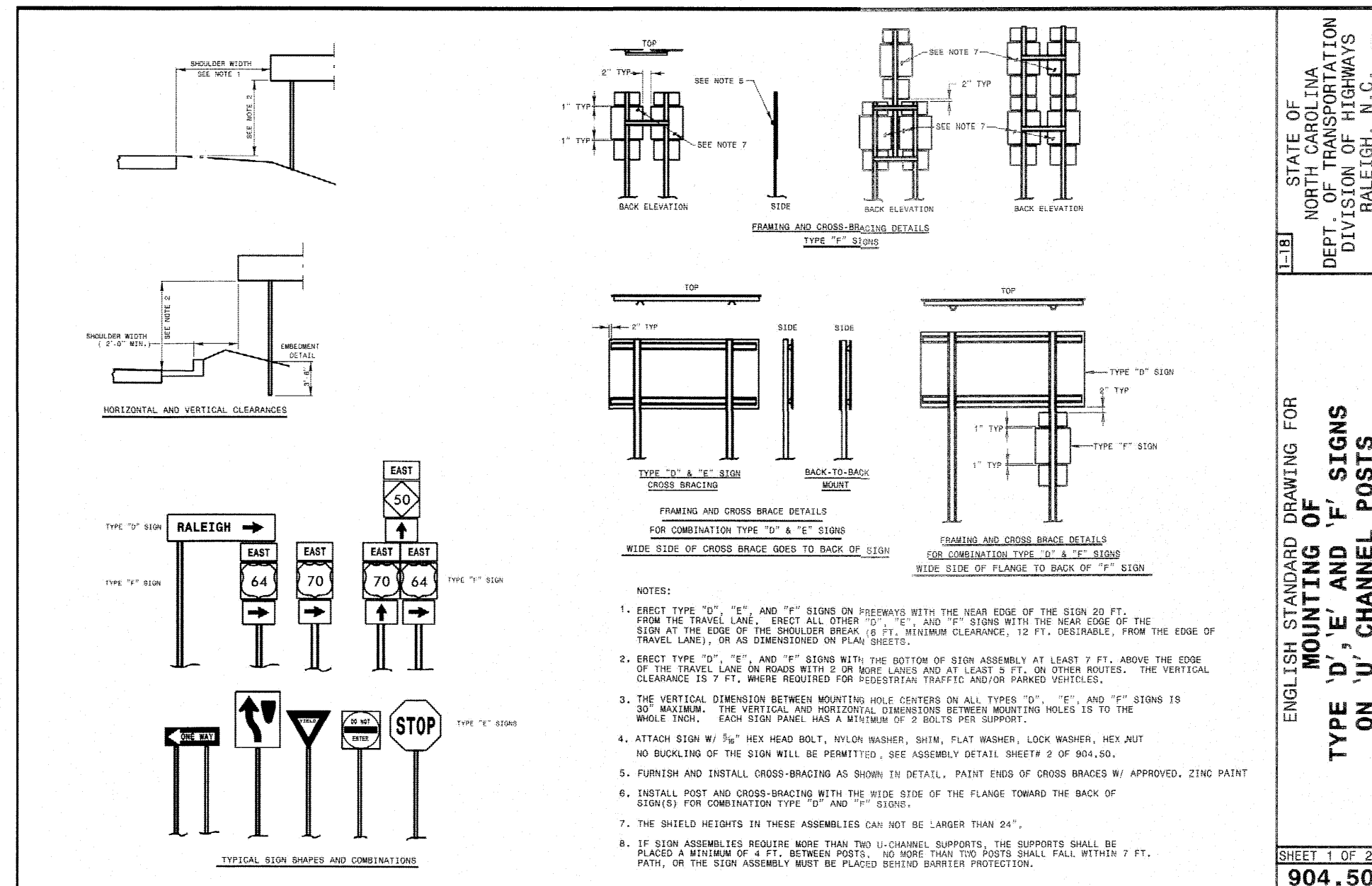
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
BARRICADES
TYPE-III

SHEET 1 OF 1
1145.01



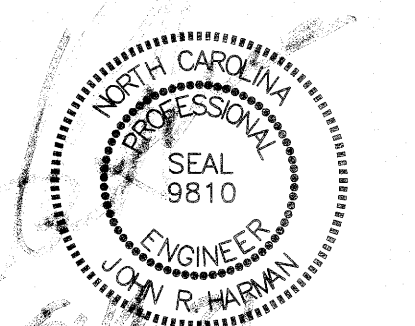
NOTES:
1. CURB SHALL BE TAPERED TO FINISH FLUSH WITH SIDEWALK.
2. BEGINNING RADIUS SHALL NOT ENDOACH ON ADJACENT PROPERTIES BASED ON A PROJECTION OF THE PROPERTY LINE FROM THE FRONT OF WAY TO THE CURB LINE.
3. SIDEWALK SECTION SHALL BE REQUIRED ALONG ALL STREETS.
4. THE TOWN IS NOT RESPONSIBLE FOR VEHICLES THAT DRAG DUE TO GRADE OF DRIVEWAY. THE DRIVEWAY IS PRIVATELY MAINTAINED.
5. ALL CONCRETE SHALL BE 3,000 PSI.



SITE PERMITTING APPROVAL
Water and Sewer Permits (If applicable)
The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # S-4825

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.
City of Raleigh Development Approval
Raleigh Water Review Officer

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607



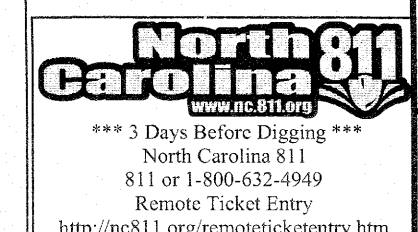
STIPULATION FOR REUSE

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NO.	DATE	REVISION:

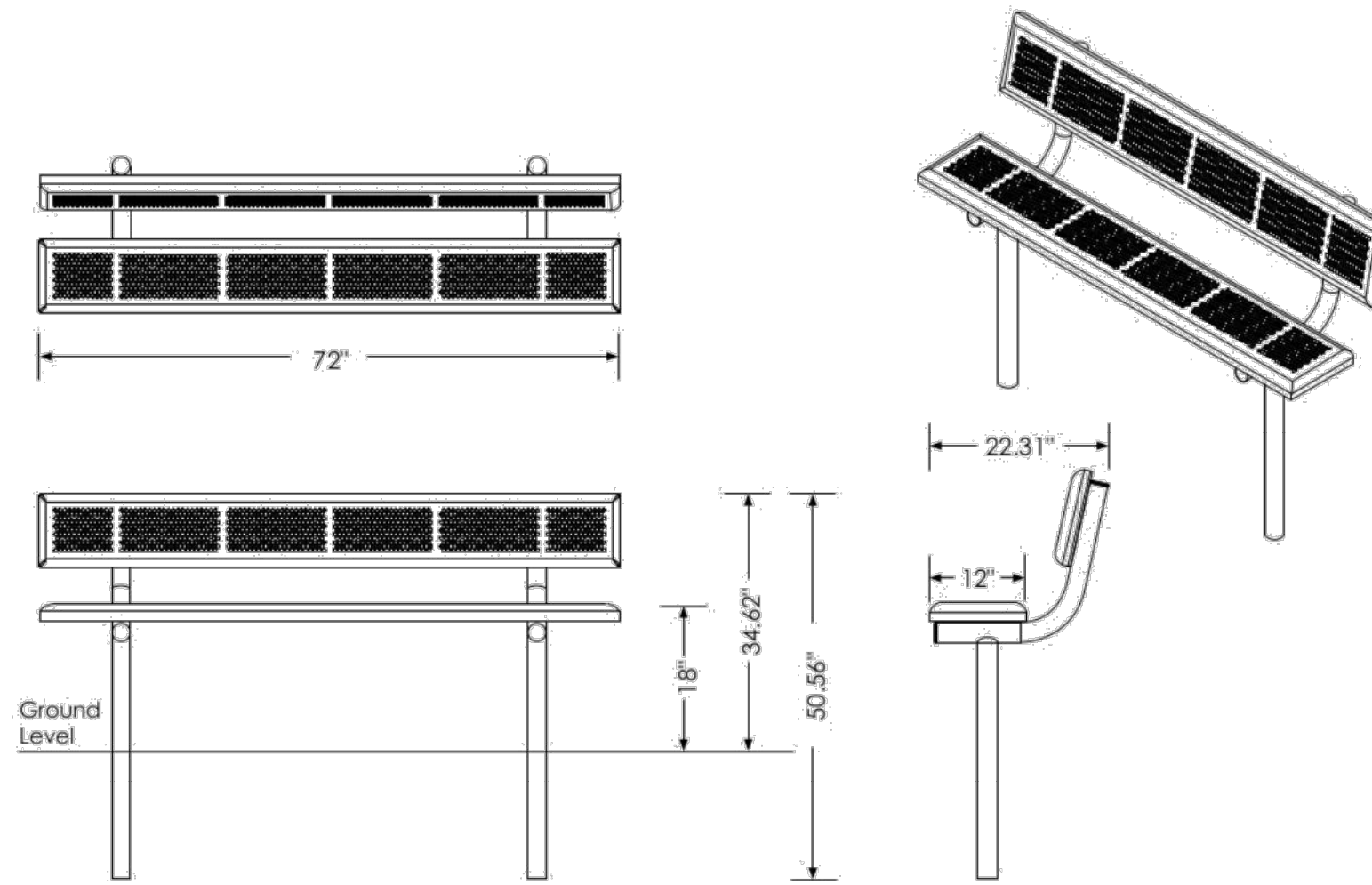
KALAS FALLS
PHASE 2
1832 ROLESVILLE ROAD
WAKE COUNTY, NC

JOB NUMBER: 9900
CHECKED BY:
DRAWN BY:
DATE: DECEMBER 21, 2020
SHEET TITLE:
KALAS FALLS CIVIL DETAILS
SHEET NO.:
CD19





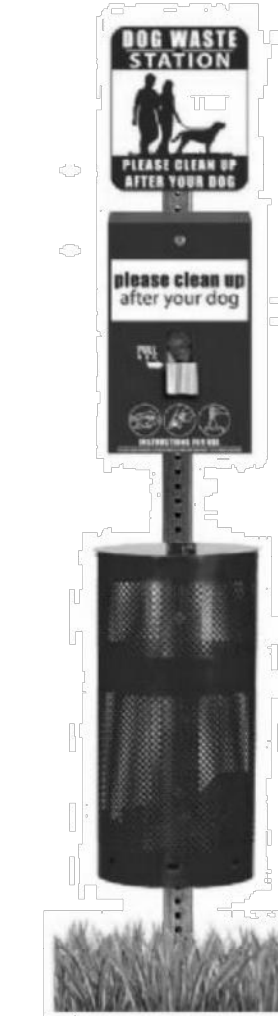
PLAYGROUND EQUIPMENT



BENCH



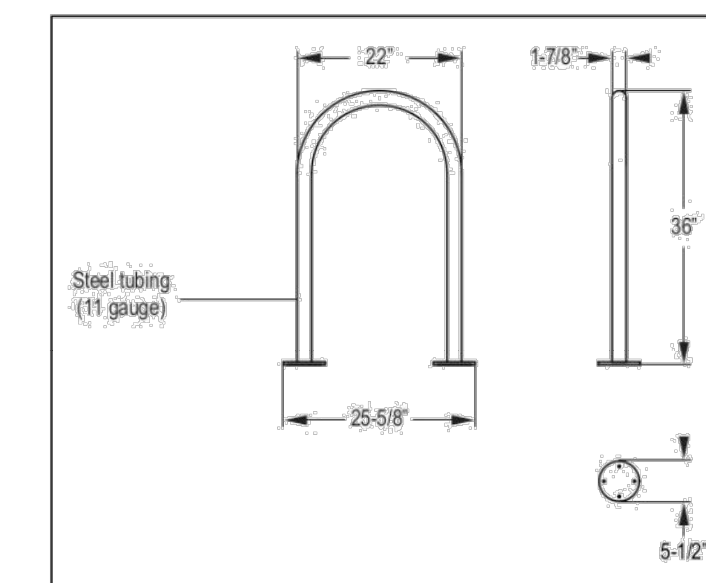
PICNIC TABLE



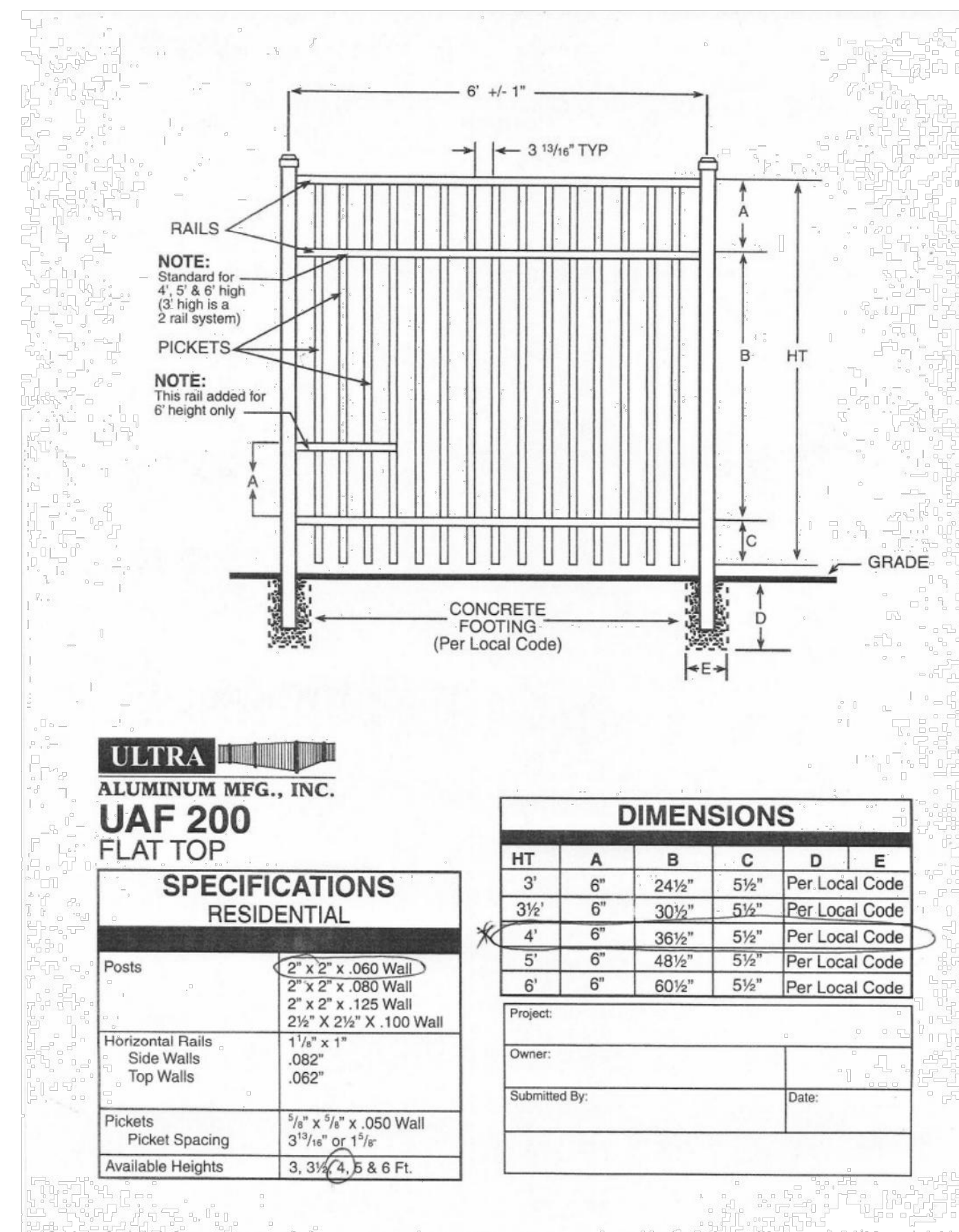
DOG WASTE STATION



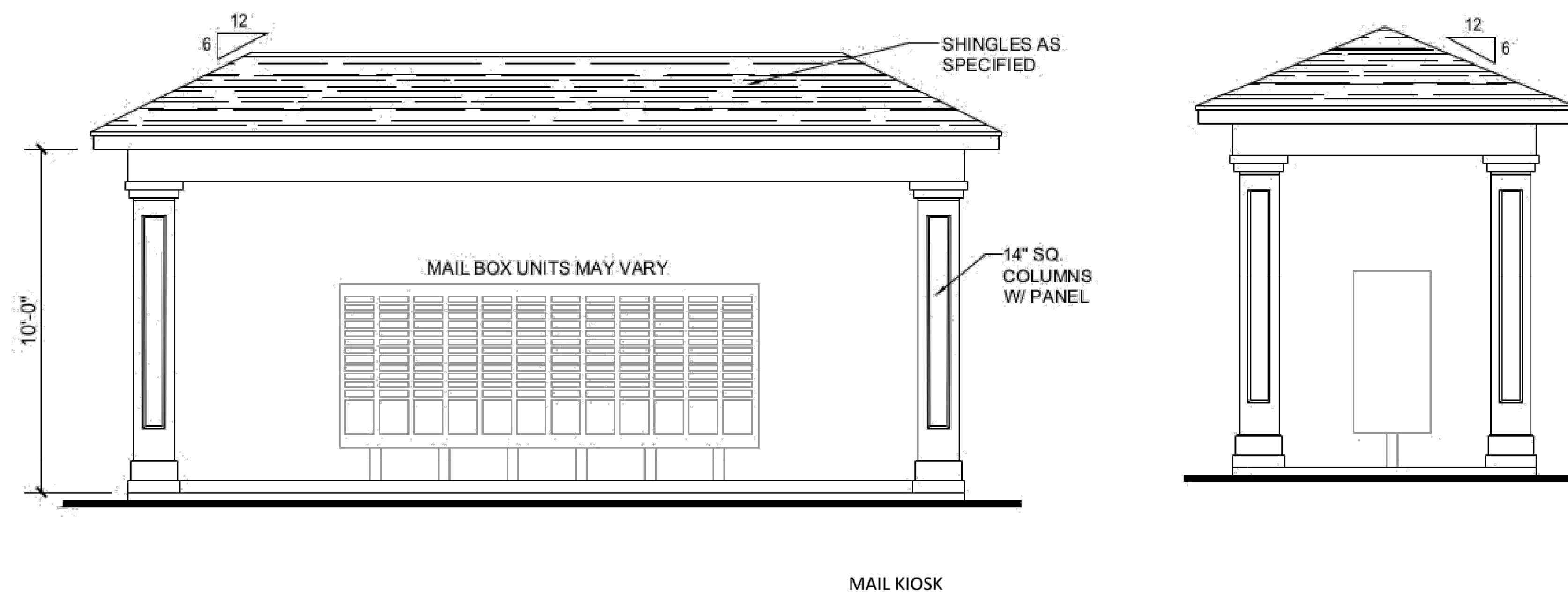
TRASH CAN



BICYCLE PARKING



SITE FENCE



MAIL KIOSK

DETAILS SHOWN ARE REPRESENTATIVE OF ANTICIPATED AMENITY FEATURES. EXACT MODELS MAY VARY.

NO.	DATE	REVISION

STIPULATION FOR REUSE

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**KALAS FALLS
PHASE 2
1832 ROLESVILLE ROAD
WAKE COUNTY, NC**

JOB NUMBER:
CHECKED BY:
DRAWN BY:
DATE:

SHEET TITLE:
**KALAS FALLS
RECREATIONAL
DETAILS**

SHEET NO.: