	<p align="center">Fort Mill School District</p> <p align="center">Addendum #1</p>	Solicitation Number: #23-014 Date Issued: April 23, 2024 Procurement Specialist: Kelly Keniston Phone: (803) 548-8202 E-Mail Address: kenistonk@fortmillschools.org	
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DESCRIPTION: Fort Mill School District: Paving Projects

YOUR OFFER MUST BE SUBMITTED IN A SEALED PACKAGE WITH THE SOLICITATION NUMBER AND OPENING DATE CLEARLY MARKED ON THE OUTSIDE. SUBMIT YOUR SEALED OFFER TO THE FOLLOWING ADDRESS:

Mailing Address: FORT MILL SCHOOL DISTRICT 2233 DEERFIELD DR FORT MILL, SC 29715	PHYSICAL ADDRESS: FORT MILL SCHOOL DISTRICT 2233 DEERFIELD DRIVE FORT MILL, SC 29715
--	--

SUBMIT OFFER BY: **Thursday, May 2, 2024 at 2:00 pm**

SUBMIT QUESTIONS BY: **Tuesday, April 23, 2024 at 12:00 pm**

NUMBER OF COPIES TO BE SUBMITTED: **One (1) original**

CONFERENCE TYPE: Pre-Bid Meeting & Site Visit DATE & TIME: April 18, 2024 @ 2:00 pm	LOCATION: Fort Mill School District Office 2233 Deerfield Dr. Fort Mill, SC 29715
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AWARD & AMENDMENTS	Award will be posted on or around May 3, 2024 . The award, this solicitation, any amendments, and any related notices will be posted at the following web address: http://www.fortmillschools.org/departments/procurement/
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You must submit a signed copy of this form with Your Offer. By submitting a bid or proposal, You agree to be bound by the terms of the Solicitation. You agree to hold Your Offer open for a minimum of thirty (30) calendar days after the Opening Date.
(See "Signing Your Offer" and "Electronic Signature" provisions.)

NAME OF OFFEROR <small>(full legal name of business submitting the offer)</small>	Any award issued will be issued to, and the contract will be formed with, the entity identified as the Offeror. The entity named as the offeror must be a single and distinct legal entity. Do not use the name of a branch office or a division of a larger entity if the branch or division is not a separate legal entity, i.e., a separate corporation, partnership, sole proprietorship, etc.	
AUTHORIZED SIGNATURE <small>(Person must be authorized to submit binding offer to contract on behalf of Offeror.)</small>	TAXPAYER IDENTIFICATION NO. <small>(See "Taxpayer Identification Number" provision)</small>	
TITLE <small>(business title of person signing above)</small>		
PRINTED NAME <small>(printed name of person signing above)</small>	DATE SIGNED	STATE OF INCORPORATION <small>(If you are a corporation, identify the state of incorporation.)</small>

OFFEROR'S TYPE OF ENTITY: (Check one) (See "Signing Your Offer" provision.)

Sole Proprietorship
 Partnership
 Other _____

Corporate entity (not tax-exempt)
 Corporation (tax-exempt)
 Government entity (federal, state, or local)

Minority Participation:

Are you a SC Certified Minority Vendor Yes No If yes, SC Certification # _____

Are you a Non SC Certified Minority Vendor Yes No

PAGE TWO

(Return Page Two with Your Offer)

HOME OFFICE ADDRESS (Address for offeror's home office / principal place of business)	NOTICE ADDRESS (Address to which all procurement and contract related notices should be sent.) (See "Notice" clause)
	_____ Area Code - Number - Extension Facsimile _____ E- mail Address

PAYMENT ADDRESS (Address to which payments will be sent.) (See "Payment" clause)	ORDER ADDRESS (Address to which purchase orders will be sent) (See "Purchase Orders and "Contract Documents" clauses)
<input type="checkbox"/> Payment Address same as Home Office Address <input type="checkbox"/> Payment Address same as Notice Address (check only one)	<input type="checkbox"/> Order Address same as Home Office Address <input type="checkbox"/> Order Address same as Notice Address (check only one)

ACKNOWLEDGMENT OF AMENDMENTS
 Offerors acknowledges receipt of amendments by indicating amendment number and its date of issue. (See "Amendments to Solicitation" Provision)

Amendment No.	Amendment Issue Date	Amendment No.	Amendment Issue Date	Amendment No.	Amendment Issue Date	Amendment No.	Amendment Issue Date

DISCOUNT FOR PROMPT PAYMENT (See "Discount for Prompt Payment" clause)	10 Calendar Days (%)	20 Calendar Days (%)	30 Calendar Days (%)	_____ Calendar Days (%)
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PREFERENCES - A NOTICE TO VENDORS (SEP. 2009): On June 16, 2009, the South Carolina General Assembly rewrote the law governing preferences available to in-state vendors, vendors using in-state subcontractors, and vendors selling in-state or US end products. This law appears in Section 11-35-1524 of the South Carolina Code of Laws. A summary of the new preferences is available at www.procurement.sc.gov/preferences. **ALL THE PREFERENCES MUST BE CLAIMED AND ARE APPLIED BY LINE ITEM, REGARDLESS OF WHETHER AWARD IS MADE BY ITEM OR LOT. VENDORS ARE CAUTIONED TO CAREFULLY REVIEW THE STATUTE BEFORE CLAIMING ANY PREFERENCES. THE REQUIREMENTS TO QUALIFY HAVE CHANGED. IF YOU REQUEST A PREFERENCE, YOU ARE CERTIFYING THAT YOUR OFFER QUALIFIES FOR THE PREFERENCE YOU'VE CLAIMED. IMPROPERLY REQUESTING A PREFERENCE CAN HAVE SERIOUS CONSEQUENCES.** [11-35-1524(E)(4)&(6)]

PREFERENCES - ADDRESS AND PHONE OF IN-STATE OFFICE: Please provide the address and phone number for your in-state office in the space provided below. An in-state office is necessary to claim either the Resident Vendor Preference (11-35-1524(C)(1)(i)&(ii)) or the Resident Contractor Preference (11-35-1524(C)(1)(iii)). Accordingly, you must provide this information to qualify for the preference. An in-state office is not required, but can be beneficial, if you are claiming the Resident Subcontractor Preference (11-35-1524(D)).

In-State Office Address same as Home Office Address
 In-State Office Address same as Notice Address **(check only one)**

Addendum #1 is being issued to update specific bid schedule information, answer questions received from bidders, and issue minutes from the pre-bid meeting.

You must acknowledge this addendum on page #1 and the bid form.

Please note, unless otherwise stated, all stipulations from the original solicitation apply

ATTACHMENTS:

- 1.1 Pre-Bid Meeting Minutes
- 1.2 Bid Form – Addendum #1

GENERAL: (Changes indicated in **BOLD** font)

- 2.1 **PACKAGE A: FARMHOUSE ROAD IMPROVEMENTS – ATTACHMENT A**
 - a. **Replace the Scope of work in its Entirety.**
- 2.2 **PACKAGE B: TRANSPORTATION BUS PARKING OVERLAY – ATTACHMENT B**
 - a. **Replace the Scope of work in its Entirety.**
- 2.3 **PACKAGE C: ORCHARD PARK ELEMENTARY SCOPE OF WORK – ATTACHMENT C**
 - a. **Replace the Scope of work in its Entirety.**

RFI's:

- 3.1 **Q: PACKAGE A: Farmhouse Road Improvements - Please clarify either York County or SCDOT Spread Rates are to be used?**
 - A: Contractors are to follow SCDOT Requirements (600psi) – 7.7% by weight, 64lb/sy.**
- 3.2 **Q: PACKAGE A: Farmhouse Road Improvements – Please confirm the Curing Method to used within Section 13 of SCDOT SC-M-306?**
 - A: Contractors shall use Curing Method A: Surface (Single) Treatment.**



PRE-BID MEETING MINUTES
FMSD: ASPHALT PROJECTS
 April 18, 2024

ATTACHMENTS:

- | | | | |
|----|---------------|----|-----|
| A) | Sign-In Sheet | C) | N/A |
| B) | N/A | D) | N/A |

INTRODUCTIONS

RESPONSIBLE:

- | | | |
|------|--|-------------|
| 1.01 | Jay Gaither opened the meeting, with LMG, who will be the Construction Manager for this project and shall be considered the point of contact throughout the duration of the project. | Comment |
| 1.02 | Pre-Bid meeting attendance was not mandatory in order to bid on the project. | All Bidders |

BID DATE AND LOCATION

- | | | |
|------|---|---------|
| 1.03 | The deadline to receive bids is May 2, 2024 at 2:00pm. The Fort Mill School District must receive hard copies of bids, prior to the bid opening. Bids can be mailed or hand delivered at the District Office front reception desk located at 2233 Deerfield Dr. Fort Mill, SC 29715. The formal public bid opening will be within the same building. Room is TBD. | Comment |
|------|---|---------|

BIDDING REQUIREMENTS

- | | | |
|------|---|-------------|
| 1.04 | Potential bidders were notified the project will be awarded as a Single Prime Contract. | Comment |
| 1.05 | Bids are to be submitted in a sealed opaque envelope bearing "SEALED BID", the solicitation number, project title, and name and address of Bidder. | All Bidders |
| 1.06 | Contractors are required to acknowledge receipt of all addenda on the Bid Form (pg 5-7 of Advertisement). | All Bidders |
| 1.07 | Bidders are required to be properly licensed in South Carolina. Bid Form must be signed, and South Carolina contractor's license number and contract amounts noted. | All Bidders |
| 1.08 | All parties were informed of the (4) separate Packages (A/B/C/D) identified within this RFB. Bidders are to provide individual Base Bid amounts for each package they intend to bid. Should a bidder elect not to provide a cost for any individual package, this line item shall be marked as "N/A". | |
| 1.09 | Bidders were informed of specific Cash & Unit Price Allowances including the following items. All parties were informed to include the following amounts within each respective bid package. All remaining unused Allowance balances shall be credited back to the Owner upon Substantial Completion. | All Bidders |

Cash Allowances:

- General Contingency Allowance Schedule:
 - o Package A: \$15,000
 - o Package B: \$15,000
 - o Package C: \$15,000

Unit Price Allowances:

- Unsuitable Soils Allowance (To be included within Base Bid of Each Package)
 - o Unsuitable Soils (Offsite) – Removal / Replace with Imported Fill
 - 250cy to be included in Each Base Bid Package

- | | | |
|------|---|-------------|
| 1.10 | Submitted bid documents must include the following fully executed items to be considered responsive: | All Bidders |
| | <ol style="list-style-type: none"> 1. Bid Form – Pages 5-7 of Solicitation 2. Appendix A – Offeror Representations and Certification 3. Appendix B – Minority Participation 4. Appendix C – Drug Free Workplace Certification | |
| 1.11 | All bids must comply with the laws of South Carolina. | All Bidders |
| 1.12 | Each proposal must be accompanied by a Bid Bond made payable to the Owner in an amount not less than (5%) of the total amount of the Bid. | Comment |
| 1.13 | Payment and Performance Bonds (100%) will be required from the awarded contractor following the awarded contract. All Bidders were notified that costs associated with acquiring the bonds shall be included within the bid amount. | All Bidders |

SPECIAL CONDITIONS

- | | | |
|------|--|-------------|
| 1.14 | The Intent to Award will be issued on May 3, 2024. | Comment |
| 1.15 | Notice to Proceed will be issued May 13, 2024 following the required protest period. | Comment |
| 1.16 | Mobilization and commencement of field activities can begin no sooner than June 1, 2024 following the last day of the school year. | All Bidders |
| 1.17 | Substantial Completion for the project is July 26, 2024. The construction schedule will be 56 Calendar days following Commencement date. Contractors voiced no concerns regarding the schedule requirements during the meeting. | All Bidders |
| 1.18 | All required Special Inspections (Chapter 17) will be paid for by the Owner. However, in the event of a failed inspection, all re-inspections are the responsibility of the Contractor. Detailed records of inspections and associated costs will be provided to the contractor for reimbursement if deemed necessary. | All Bidders |
| 1.19 | Bid Package A: Farmhouse Road Reclamation will require additional inspection services performed by York County. The contractor is responsible for coordination of inspections with York County. | All Bidders |

ADDENDA / ALTERNATES

- | | | |
|------|---|-------------|
| 1.20 | Addendum #1 shall include the Pre-Bid Meeting minutes and will be issued no later than tomorrow. Subsequent addenda shall include responses to received RFI's & Substitutions, and any other miscellaneous project clarifications. | All Bidders |
| 1.21 | A site visit is scheduled with all interested parties following the Pre-Bid Meeting. The site visit is not mandatory to submit a bid for the project. Should firms not attending the Pre-Bid meeting wish to visit the site, please contact Jay Gaither, with LMG to schedule. | All Bidders |
| 1.22 | All Bidders requested to send all requests for information (RFI) to Jay Gaither, with LMG. | All Bidders |
| 1.23 | Bidders are to include all alternates and/or unit prices as indicated on the bid form. If no alternates nor unit prices are identified, Bidders shall note as "N/A" within the adjacent fields. It was noted that there are currently (1) Alternate and (1) Unit Prices included on the Bid Form and further described below. | All Bidders |

Alternate #1 – Bid Package B: Transportation Lot Overlay

- Gravel Parking Lot - Provide cost associated with the construction of 1,500sy gravel parking lot as indicated in Package B construction documents. Scope shall include the demo of the existing curb and replacement with valley curb at the indicated parking entrance. Provide necessary grading to cut 4" of existing material and compact subgrade

prior to placement and compaction of 4" of ABC stone. Cost shall include all necessary surveying, grading, and stone required to prepare the gravel parking lot.

Unit Price #1 – Unsuitable Soil (Offsite)

- Unsuitable Soil (Offsite): Remove and replace soil with suitable material imported from off-site. Unsuitable soil shall be removed from the site.
 - o **INCLUDE 250 CY in base bid of each package.**

PROJECT DESCRIPTION AND SCOPE

- | | | |
|------|---|-------------|
| 1.24 | The Contractor's scope of work shall include all surveying, demo, grading, and paving activities identified and all associated costs included within the submitted bid. | All Bidders |
| 1.25 | All Bidders were notified that the project documents are currently available for download on the Fort Mill School District website via the following link. All future project information including Addenda will also be available at this location.
https://vrapp.vendorregistry.com/Bids/View/BidsList?BuyerId=11355f9a-0f05-4070-812b-4788bd2db9d9 | All Bidders |
| 1.26 | It was noted that the awarded contractor(s) will be responsible for providing temporary facilities throughout the duration of the project. This includes, but is not limited to, exterior restroom facilities. It was noted that the existing interior restrooms are not to be used by contractors. | All Bidders |
| 1.27 | All Bidders were informed of Package D included on the Bid Form. Bidders can provide a lump sum cost to perform Packages A/B/C. The Owner reserves the right to award contracts per the individual Packages or by Package D for all paving projects. | All Bidders |

QUESTIONS

- | | | |
|------|--|-------------|
| 1.28 | All RFI's should be sent to Jay Gaither with LMG. Electronic mail is the preferred means of communication (jay@leitnergrp.com). The deadline for RFI's must be received prior to Noon on April 23, 2024 with responses issued by Addendum no later than April 24, 2024. All questions must be submitted to LMG to ensure the items are answered and included in the Addenda. | All Bidders |
| 1.29 | All responses and associated contract information will be distributed through addendum. | Comment |

CONTRACTOR OPEN SESSION QUESTIONS

- | | |
|-----------|--|
| Q: | Is the project Tax exempt or shall Taxes be included in the Base Bid? |
| A: | Bidders are to include all Taxes within the bid amount. |
| Q: | Concerns regarding the Tensar – Rapid Repair System were voiced during the meeting. Contractor inquired about the use of Chip Seal in lieu of the specified product? |
| A: | This alternative materials and application will be reviewed internally and further clarification provided via addendum if applicable. |
| Q: | Contractor requested performing the Crack Fill at OPES via a Unit Cost in lieu of lump sum. It was indicated a quantity would be required. |
| A: | Scope regarding this bid package is currently under review and further clarification will be provided via addendum if applicable. |

- Q:** A pavement cross section of the area shown to be cut and replaced at OPES was requested?
- A:** The cross section of the existing pavement is located on sheet C105 of Package C for reference. The cut and patch of this area should match the original cross section or approved full depth asphalt replacement.

The content of these meeting minutes are the writer's interpretation of the primary discussions held during the meeting. Should the information contained herein be misleading or inaccurate, please notify the writer within seven (7) days of receipt. It is requested that the Prime Contractor(s) forward a copy of these minutes to all appropriate subcontractors for review.



FMSD: PAVING PROJECTS
PRE-BID CONFERENCE MEETING

Fort Mill School District
April 18, 2024



Sign - In Sheet

Name:	Company:	Email Address:	Phone Number:
Joe Romenick	Fort Mill School District	romenickj@fortmillschools.org	(803) 984-8980
Jay Gaither	LMG	jay@leitnergrp.com	(803) 230-1650
Jack Smith	Eddie Smith & Sons	Jack.Smith@esandsonspaving.com	803-242-4788
Paul Atkins	Atkins Paving	AAPLLC1@comporium.net	403-242-3104
Len Moorefield	LCI-Lineberger	LMOOREFIELD@LCI-Lineberger.com	803-873-5700
Michael Collins	BEN Braden	michael@bngrading.com	704-242-5770
TELFORD WOOD	NOVA ENGINEERING	twood@usanova.com	704-492-3742
Kelly Keniston	FMSD	Kenistonk@fortmillschools.org	803-548-8202

II. Bid Form



SOLICITATION RFB #23-014
FMSD: Paving Projects

BIDDER NAME: _____

BIDDER PHONE: _____

BIDDER EMAIL: _____

FORT MILL SCHOOL DISTRICT
2233 DEERFIELD DR.
FORT MILL, SC 29715

SINGLE PRIME CONTRACT

All Parties:

Having carefully examined the Drawings and Specifications for the above noted project(s), as well as the premises and conditions affecting the work, the undersigned proposes to furnish all materials, labor, equipment, and services called for by them for a lump sum consideration of:

PACKAGE A: FARMHOUSE RD – RECLAMATION

BASE BID: \$ _____ (NUMERICAL AMOUNT HERE)

_____ (WRITTEN DOLLARS HERE)

PACKAGE B: TRANSPORTATION BUS PARKING OVERLAY

BASE BID: \$ _____ (NUMERICAL AMOUNT HERE)

_____ (WRITTEN DOLLARS HERE)

Alternate No. 1: Gravel Parking Lot – Approximately (50) Spaces

Base Bid: Provide cost associated with the repairs, overlay, and restriping as indicated in Package B contract documents.

Alternate: Provide cost associated with the construction of 1,500sy gravel parking lot as indicated in Package B construction documents. Scope shall include the demo of the existing curb and replacement with valley curb at the indicated parking entrance. Provide necessary grading to cut 4" of existing material and compact subgrade prior to placement and compaction of 4" of ABC stone. Cost shall include all necessary surveying, grading, and stone required to prepare the gravel parking lot.

ADD and/or DEDUCT \$ _____

PACKAGE C: ORCHARD PARK ELEMENTARY STAFF PARKING

BASE BID: \$ _____ (NUMERICAL AMOUNT HERE)
_____ (WRITTEN DOLLARS HERE)

PACKAGE D: COMBINATION OF ALL(3) PACKAGES A / B / C

BASE BID: \$ _____ (NUMERICAL AMOUNT HERE)
_____ (WRITTEN DOLLARS HERE)

The above stated bids are based on the above-mentioned Drawings, Specifications, Pre-Bid Schedule and any Addenda issued subsequent to the basic Drawings and Specifications. (List all Addenda with dates of any issued. If no additional Addenda are issued, write the word "NONE".)

<u>Addendum Number</u>	<u>Date</u>
_____	_____
_____	_____
_____	_____

If any of the following Alternates are accepted, the above stated sum (base bid amount) will be altered by the amount(s) indicated below.

- a. If no Alternates are indicated, enter the term "NOT APPLICABLE" after the dollar (\$) sign.
- b. If Alternates are indicated, strike through completely either "add" or "deduct" in order to leave exposed the proper change to the base bid amount and indicate the amount of the change in numbers after the dollar (\$) sign.
- c. If Alternates are indicated, but there is no change to the base bid amount, enter the term "NO CHARGE" after the dollar (\$) sign.

UNIT PRICES

Enter the requested unit prices below. The amount listed will be used for contract deductions in cases of credits and contract increases in cases of work scope additions. The amount listed should be fully inclusive of labor, material, equipment, taxes, insurance, overhead, profit, etc.

- 1. Unsuitable Soil (Offsite): Remove and replace soil with suitable material imported from off-site. Unsuitable soil shall be removed from the site. **INCLUDE 250 CY in base bid of each package.**

ADD and/or DEDUCT \$ _____

- 2. Package B: Concrete Replacement: Provide Unit Cost to Demo and Replace existing 6" thick RCC with 3,500psi concrete and finish level with adjacent substrate. Contractor responsible for the disposal of all waste materials. Unit cost will be utilized to ADD or OMIT identified areas requiring replacement. **Unit Cost applies only to Package B.**

ADD and/or DEDUCT \$ _____

If notified of the acceptance of this bid or any Alternate within one hundred twenty (120) days after the date fixed for the opening of the bid, the undersigned agrees to execute and deliver the specified Contract and Contractor's Bond within ten (10) days. The undersigned agrees, if awarded the Contract within one hundred twenty (120) days from the fixed date for opening of the bids, to faithfully and properly complete the whole work within the specified time, consistent with the best interest of the Owner, the safety of the public and in accordance with first-class workmanship.

The undersigned agrees that the Owner may retain the sum of money specified as "Liquidated Damaged" as indicated within the Contract Documents, from the amount of compensation to be paid the undersigned for each calendar day that work remains uncompleted and unaccepted after the maximum duration of time for the work to be completed. This amount is agreed upon as the proper measure of liquidated damages, which the Owner sustains per day by failure of the undersigned to complete the work in the stipulated time and is not to be construed in any sense as a penalty.

Attached hereto is a Bid Bond, which shall not be less than five percent (5%) of the principal's bid, made payable to the Owner.

The undersigned agrees, if awarded the Contract, to comply with all provisions regarding commencement, prosecution, completion and acceptance of the work as described in the above-mentioned Specifications, "Bid Form", Construction Contract and Performance Bond. If the undersigned fails to perform according to these documents, the Bid Bond shall be paid as liquidated damages for such failure; otherwise, the Bid Bond accompanying this proposal shall be returned to the undersigned.

A Performance and Payment Bond, executed on AIA Document A312, will be required in the amount of one hundred percent (100%) of the Contract amount. Cost of bonds shall be included in the bid.

Please indicate any applicable preferences being claimed in this solicitation, please note, preferences are not applicable for bids over \$500,000.

It is agreed that the undersigned has completed and/or will comply with all requirements concerning licensing and with all other local, state, and national laws and that no legal requirement has been or will be violated in making or accepting this proposal, in awarding the Contract to him and/or in the performance of the Work required there under.

By submission of this bid, the undersigned declares that the person or persons signing this proposal is/are authorized to sign the proposal on behalf of the firm listed and to fully bind the firm listed to all the conditions and provisions thereof. Furthermore, each person signing on behalf of any bidder certifies, under penalty of perjury that, to the best of its knowledge and belief, each bidder is not on the list created pursuant to Section 11-57-310 of the South Carolina Code of Laws.

Respectfully submitted this _____ day of _____, 2024.

(Name of Firm)

(S.C. Contractor's License)

(Address)

By _____
(Title)

Minority Owned/Operated Contractor/Business? Yes ___ No ___ Certificate Number _____

***** Be sure to include this page in your proposal *****
END OF ADDENDUM NO. 1

PACKAGE A: SCOPE OF WORK / SPECIFICATIONS – Attachment A

The Fort Mill School District (FMSD) is accepting Bids for **Single Prime** Contractor services to provide comprehensive services as described, but not limited to, the scope outlined within the Scope of Work listed below. The Contractor's scope of work shall include all surveying, demo, grading, , and paving identified below and all associated costs included within the submitted bid.

The proposed project will consist of the rehabilitation of Farm House Drive (entrance drive to Sugar Creek Elementary School) as shown on the attached sketch. FMSD is requesting bid estimates for full depth reclamation of the existing roadway as described below:

- The portion of the roadway proposed for full depth cement reclamation is approximately 1,000 feet in length, approximately 26,000 square feet or 3,000 square yards along Farm House Drive.
- Project limits will extend approximately 5Lft North of the intersection of Laurent Ave along Farm House Drive to the entrance monument to Sugar Creek Elementary School.
- The existing pavement section ranges in thickness from approximately 7 to 8.75 inches.
- The existing right-of-way is currently 66 feet in width.
- The existing roadway is currently approximately 24 feet in width and will need to be widened to 26 feet in width to meet York County Roadway Standards. This 2-foot widening will occur to the westside of Farm House Drive from Laurent Avenue along Farm House Drive to approximately 70 feet south of the intersection of Regal Manor Lane at which point the widening will shift to the eastside of Farm House Drive and continue to termination of the improved area.
- For the 2Lft widening, graded aggregate base course will need to be installed to match the existing pavement section. This will be incorporated in the overall full depth reclaimed section.
- Specified reclaimed depth is 12.5 inches.
- Proposed pavement section is 7.25 inches of reclaimed cement-treated base course, 5.25 inches of bituminous concrete surface course.
- Spread Rate:
 - **SCDOT Requirements (600 psi) – 7.7 % by weight, 64 lb./square yard**
- Full Depth Reclamation is to be performed in general accordance with the attached “Supplement Technical Specification for Cement Modified Recycled Base” SCDOT Designation: SC-M-306 (07/21)
- Contractor responsible for adhering to all York County Roadway Standards and SCDOT requirements.
- Including but not limited to testing procedures, required striping, traffic control, etc.
- Allowance: \$15,000 General Contingency Allowance to be included within Bid. This allowance shall be utilized for additional repairs as needed and approved by the Owner.
- Attachments:
 - “Report of Pavement Subsurface Exploration, Full Depth Reclamation, and Pavement Design Services” dated April 7, 2023 - ESP Project No. LM32.300.
 - Supplement Technical Specification for Cement Modified Recycled Base - SCDOT Designation: SC-M-306 (07/21)
 - **Section 13: Curing – Contractors shall use Curing Method A: Surface (Single) Treatment**
- Project Limits Sketch

FARMHOUSE ROAD - RECLAMATION Proposed Project Limits

Legend



Proposed Area
26,833.12 sf

Proposed area of Farmhouse Rd to be Demo'd / Replaced: 26,850sf



April 7, 2023

Mr. Joe Romenick
Assistant Superintendent, Operations
Fort Mill School District
2233 Deerfield Drive
Fort Mill, SC 29715

Reference: **REPORT OF PAVEMENT SUBSURFACE EXPLORATION,
FULL DEPTH RECLAMATION, AND PAVEMENT DESIGN SERVICES
Sugar Creek Elementary – Farm House Road**
Fort Mill, South Carolina
ESP Project No. E4-LM32.300

Dear Mr. Romenick:

ESP Associates, Inc. (ESP) has completed the pavement subsurface exploration, full-depth reclamation, and pavement design services for Farm House Drive, from the school sign to the intersection of Farm House Drive and Laurent Avenue in Fort Mill, South Carolina. These services were performed in general accordance with our Proposal No. E4-23046 – Revision No. 1, dated January 18, 2023. This report summarizes the results of our pavement subsurface exploration services and provides conclusions and recommendations regarding the existing pavement section as it relates to pavement replacement, pavement section design, and construction considerations.

PROJECT INFORMATION

It is our understanding that Fort Mill School District is planning to renovate the existing pavement section along Farm House Drive from the intersection with Laurent Avenue to the school entrance sign.

We understand that the planned renovation will include full-depth reclamation and resurfacing of the existing infrastructure.

In general, we understand that the full-depth reclamation (FDR) plan will consist of blending the in-situ materials along with Portland cement and water to a depth of 8 inches. Once the cement-treated materials have been blended, they will be compacted in-place and then fine graded in accordance with the roadway alignment profiles. After the cement-treated base has cured (typically 7 days), we understand that an asphalt wearing surface will be placed.

FIELD EXPLORATION AND FINDINGS

ESP obtained full-depth reclamation bulk samples to the planned FDR mixing depth of approximately 8 inches below the top of pavement utilizing a concrete drill and hand auger at two locations (S-2 and S-6).

Sampling was performed at six test locations along Farm House Drive. Refer to the attached Test Location Plan (Figure 1) for the approximate test locations. The sample locations were located in the field utilizing existing site features and landmarks, and minimum testing criteria outlined in “AASHTO Guide for Design of Pavement Structures”. After obtaining the full-depth reclamation samples, ESP measured and documented the thickness of the pavement and, if present, stone base.

Kessler Dynamic Cone Penetrometer (DCP) testing was performed at four sample locations (S-2, S-3, S-5 and S-6) using a 17.6-pound standard hammer to a depth of approximately three feet below the planned FDR mixing depth. The Kessler DCP tests were performed in general accordance with ASTM D 6951. The Kessler DCP is used to estimate in-situ California Bearing Ratio (CBR) values within the subgrade material.

FINDINGS

The existing asphaltic concrete pavement section at our test locations was comprised of approximately 2 to 3 inches of asphalt underlain by approximately 4 to 6 inches of aggregate base course. For more information about surficial material depths at each location, reference the Table 1 below.

TABLE 1: SUMMARY OF SURFICIAL MATERIALS

Sample Location	Asphalt Depth (inches)	Aggregate Base Course Depth (inches)
S-1	2 ¼	4 ½
S-2 (Kessler)	2 ½	5 ½
S-3 (Kessler)	3	5 ¼
S-4	2 ½	5 ½
S-5 (Kessler)	2 ¾	6
S-6 (Kessler)	3	5 ¾

The correlated CBR values on materials tested at Locations S-1 through S-4 within the upper approximate three feet of the subgrade soils ranged from 5.3 to more than 10 with an average correlated CBR value of approximately 8. The results of the Kessler DCP tests are presented on the attached “Kessler DCP Test Data” sheets.

LABORATORY TESTING

ESP obtained samples of the asphalt and stone base at two locations (S-2 and S-6) for laboratory testing associated with full-depth reclamation recommendations. The limited testing program was designed to determine select engineering properties of the on-site materials relative to their use for the project.

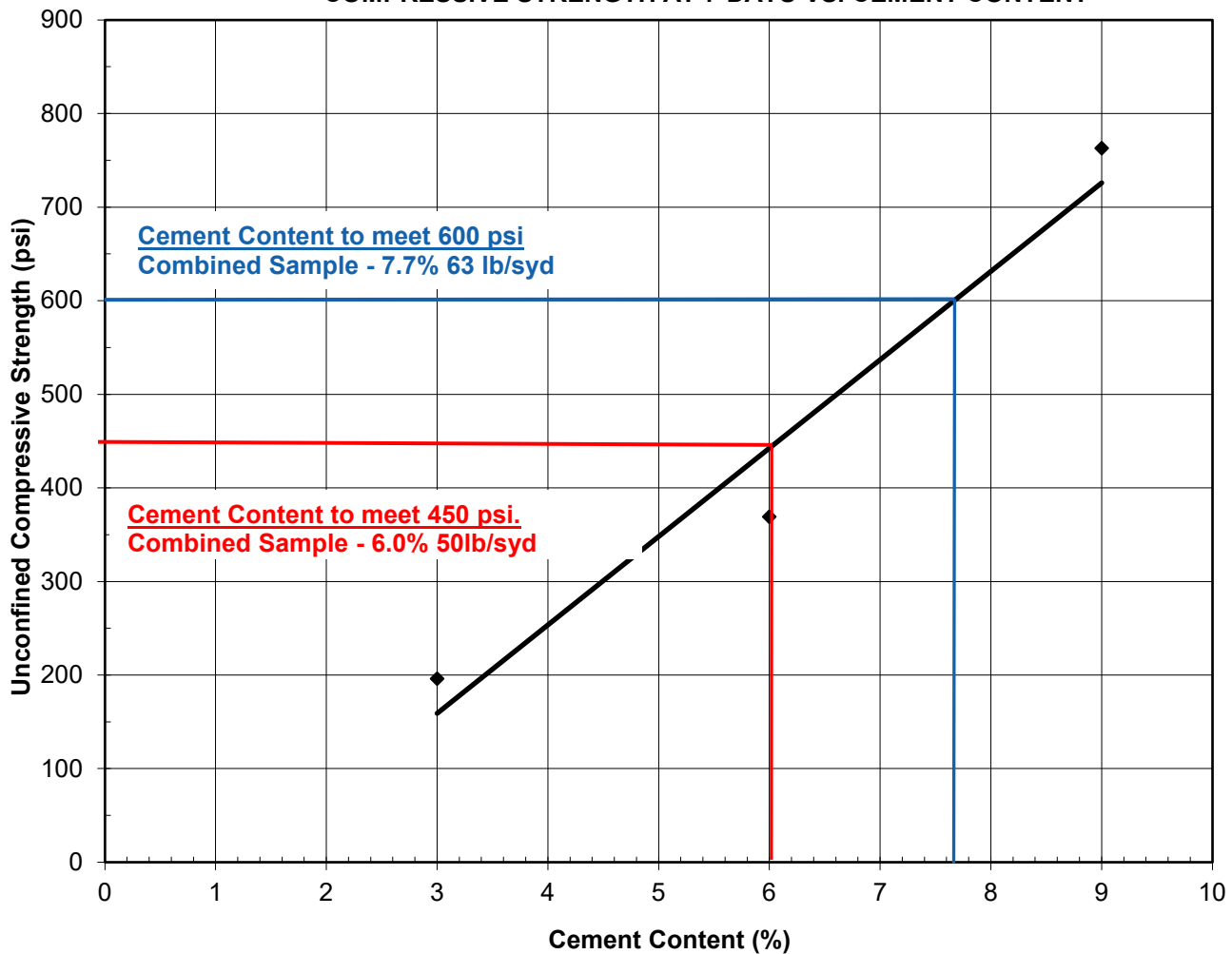
The materials obtained from each sample location were combined and then mixed with varying amounts of Type I/II Portland cement in order to estimate the percentage of cement necessary to yield the desired unconfined compressive strength of between 450 and 600 pounds per square inch (psi). South Carolina Department of Transportation (SCDOT) Standard Specifications for Highway Construction requires a minimum unconfined compressive strength of 600 psi for roadways. The Portland Cement Association (PCA) requires a minimum unconfined compressive strength of 450 psi for cement-treated base applications. The mix design procedures were performed in general accordance with SCDOT methods and the PCA Publication EB052-Soil-Cement Laboratory Handbook.

A summary of the soil laboratory test results are presented in Table 2 and in the Full Depth Reclamation Design chart shown below. Detailed results of the soil tests performed for this study are attached to this report.

TABLE 2 – SUMMARY OF LABORATORY TESTING

Test Location	Maximum Dry Density (pcf)	Optimum Moisture (%)	Compressive Strength (psi)		
			3% (by weight)	6% (by weight)	9% (by weight)
Combined Sample	136.9	7.7	196	369	763

**FULL DEPTH RECLAMATION DESIGN
 COMBINED SAMPLE
 COMPRESSIVE STRENGTH AT 7-DAYS VS. CEMENT CONTENT**



PAVEMENT DESIGN

General Design Basis. ESP utilized the “AASHTO Guide for Design of Pavement Structures”, dated 1993 for the analysis and design process with guidance from the “SCDOT Pavement Design Guidelines,” dated

July 2008, for selection of subgrade soil support values, structural coefficient for pavement layers, and selection of recommended pavement components. The recommendations presented herein assume that the production and placement of the bituminous and base course as well as the bituminous concrete meet the requirements of the current “SCDOT Standard Specifications for Highway Construction.”

ESP utilized the PCA Publication EB052-Soil-Cement Laboratory Handbook guidelines for the application rates of cement for the cement-treated base and the SCDOT specifications for the pavement design. As referenced above, the PCA guideline allows for a reduced compressive strength for cement-treated bases as compared to the SCDOT guidelines. If Fort Mill School District is not willing to accept the reduced compressive strength as determined by the PCA guidelines, ESP recommends that the roadway pavement design follow the SCDOT guidelines presented above.

Subgrade Soil Conditions. The pavement section subgrade will consist of cement-treated reclaimed asphalt and stone mixture underlain by existing sandy clays. A CBR value of 6 was utilized to determine the soil support value for the underlying subgrade soils. This value was determined through various Kessler DCP tests performed on the in-situ soils.

Serviceability Index and Regional Factor. A terminal serviceability index of $P_t=2.0$ and initial serviceability index of $P_o=4.2$ were used for the pavement design analysis in conjunction with a regional factor of 1.

Design Traffic Volumes. At this time, traffic volume report has not been made available to ESP. If traffic volume information becomes available, ESP requests the opportunity to review that information, and make any necessary changes to our conclusions and recommendations, if necessary. For the purposes of this report, ESP assumes that traffic conditions will consist primarily of passenger vehicles on the order of 1,000 vehicles per day. This volume was estimated by using the current enrollment of approximately 900 students, assuming approximately 60 percent of those students are car-riders, and will be both dropped off and picked up from school.

Design of Full-Depth Reclamation Pavement Sections. The full-depth reclamation pavement sections required to support the anticipated traffic were established based on the above stated design parameters and traffic loading information. The recommended section is presented below.

TABLE 3 – SUMMARY OF PAVEMENT SECTION OPTIONS

Section Type	Bituminous Concrete Surface Course – Asphalt (Inches)	Full-Depth Reclaimed Cement-Treated Base Course (Inches)	Graded Aggregate Base Course (Inches)
Full Depth Reclamation	3	8	N/A

PAVEMENT CONSTRUCTION

ESP recommends that following option be implemented for the rehabilitation of the areas that were included in our subsurface exploration of the existing pavements:

- **Full-Depth Reclamation** - this process includes the milling/pulverization of the existing pavement section in-place and then adding a specified amount of Portland cement to the reclaimed material to provide a stabilized base course for pavement support. Prior to compaction efforts, the full-depth reclaimed materials should be fine graded to the design grades. The cement-treated base materials should then be compacted to at least 95% of the standard Proctor maximum dry density and allowed to cure for a period of at least 7 days prior to placing the asphalt wearing course in general accordance with SCDOT guidelines. This process allows for the reuse of the existing materials with limited haul off of reclaimed material to be able to match existing grades. Full-depth reclamation may be difficult to implement due to equipment limitations in areas with tight turns and short runs.

CONSIDERATIONS

The owner should consider the cost of construction, the impact to traffic, the timing and cost of future maintenance, level of tolerable risk and future use of the repaired areas. In addition, testing and evaluation of the pavement construction, including the FDR process, should be performed by an ESP representative during the construction phase. As with typical pavement sections, routine maintenance is required to aid in achieving the desired pavement performance.

We recommend the following testing and inspection program be implemented during the pavement construction phase.

- Full-Depth Reclamation (FDR)
 - Measure the cement spread rate,
 - Density testing of the compacted cement-treated base,
 - Obtain a sample of the blended cement-treated base materials and mold field specimens for compressive strength testing,
 - Perform nuclear density testing of asphalt,
 - Coring of the asphalt pavement to confirm thickness and density.

LIMITATIONS OF REPORT

This report has been prepared in accordance with generally accepted geotechnical engineering practice with regard to the specific conditions and requirements of this site. The conclusions and recommendations contained in this report were based on the applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, expressed or implied, is made. The analysis and recommendations submitted herein are based, in part, upon the data obtained from the limited subsurface exploration. The nature and extent of variations between the borings will not be known until construction is underway. If variations appear evident, then we request the opportunity to re-evaluate the recommendations of this report.

CLOSING

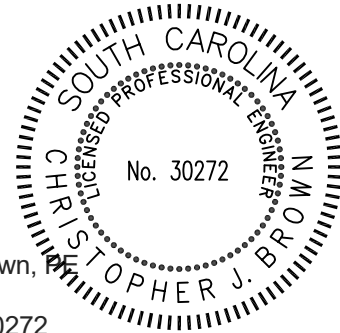
ESP appreciates the opportunity to assist you during this phase of the project by performing subsurface exploration, full-depth reclamation laboratory testing, and pavement design services for the referenced project. If you should have questions concerning this proposal, or if additional information is required, please contact us.

Sincerely,

ESP Associates, Inc.



Nathan McLaren, PG
Project Manager



Christopher J. Brown,
Senior Engineer
SC License No. 30272

NDM/

Enclosures: Test Location Plan
Standard Moisture-Density Relationship (1 sheet)
Kessler DCP Test Data (4 sheets)





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri

SITE VICINITY MAP
(Not to Scale)



This drawing is intended to show approximate boring locations only. No other information is expressed or implied.

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

Approximate Test Location

Boring Labels

Boring Name Designation
Depth of Stone Base Material (inches)
Asphalt Thickness (inches)
Kessler Location

SHEET TITLE:

Test Location Plan with Site Vicinity Map
Figure 1

Sugar Creek Elementary - Farm House Drive
Fort Mill, South Carolina

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DATE: April 03, 2023

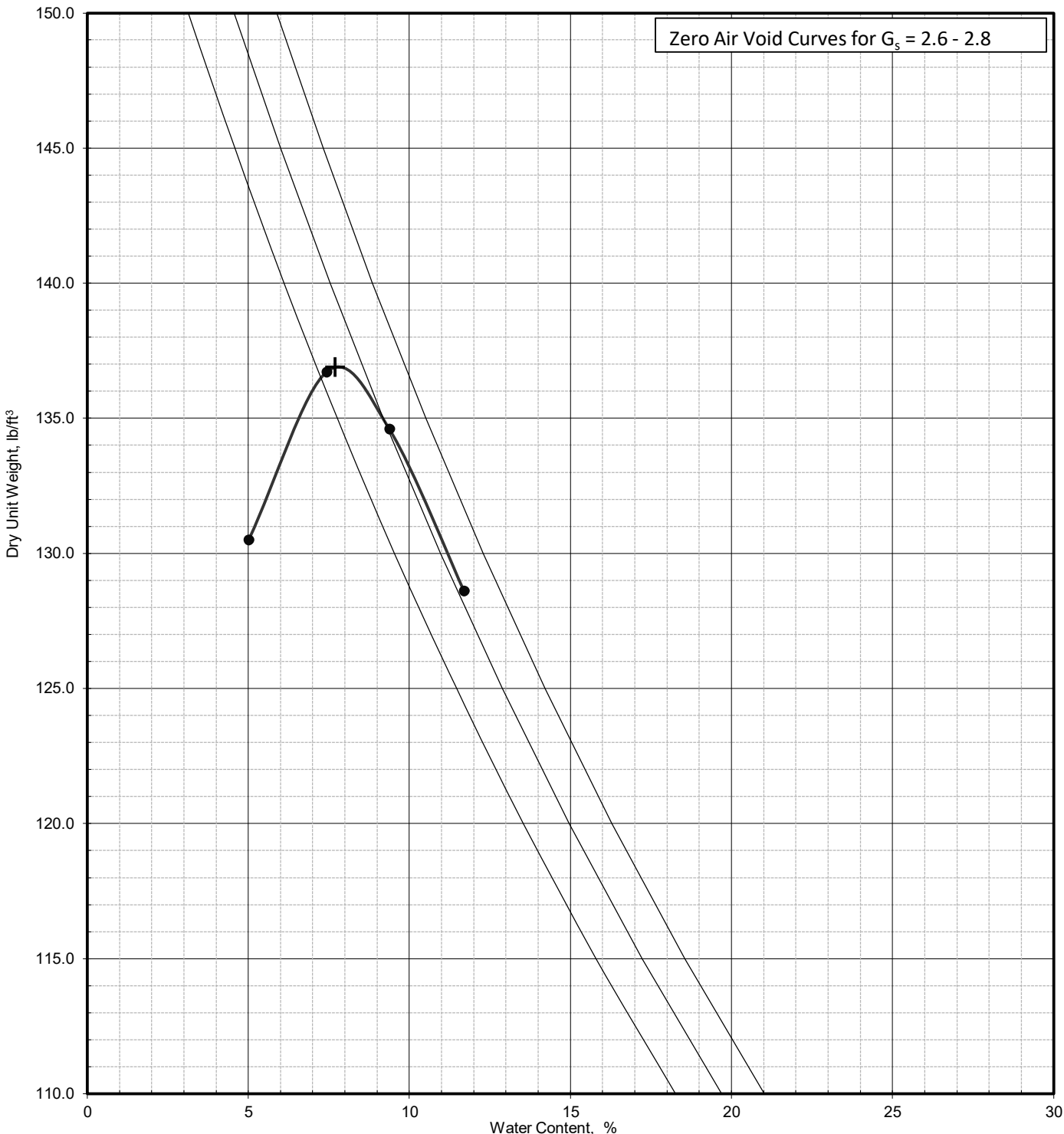



PROJECT NO.:	E4-LM32.300
SCALE:	NTS
DRAWN BY:	NDM
CHECKED BY:	CJB

3475 Lakemont Blvd.
Fort Mill, SC 29708

www.espassociates.com
Phone: 803-802-2440

Zero Air Void Curves for $G_s = 2.6 - 2.8$



Soil Description: FDR Pill Mix (soil/asphalt/base course)		Sample No. S-1	
Sample Type: BLK	Preparation: Moist	Rammer: Manual - 5.5lbf (24.5N)	Location: Farm House Road
Depth: 0 - 2 ft	Maximum Dry Unit Weight: 136.9 lb/ft³	PL: 17	PI: 3
Received water content: %	Optimum Water Content: 7.7 %	Fines: 17.2 %	LL: 20
Remarks:		STANDARD MOISTURE-DENSITY RELATIONSHIP	
		TEST METHOD: ASTM D698 method C	
	Address: 3475 Lakemont Boulevard Fort Mill, SC 29708	Project: Sugar Creek Elementary - Farm House Road	
	Telephone: 803-802-2440	Number: LM32.300.000	
Lab Technician:		Project Manager: nmclaren	

This report shall not be reproduced, except in full, without the prior written approval of ESP Associates, Inc.
 The test results shown are specific to the specimen/sample numbers tested, as noted above.

**Supplemental Technical Specification for
Cement Modified Recycled Base**

SCDOT Designation: SC-M-306 (07/21)

**APPROVED:
Division Administrator**

By: _____
FEDERAL HIGHWAY ADMINISTRATION

1.0 DESCRIPTION

- 1.1 This section contains specifications for the materials, equipment, construction, measurement, and payment for the modification of an existing paved roadway or shoulder by scarifying the existing pavement structure, mixing it with Portland cement, and constructing the base course in conformance with the lines, grades, dimensions, and cross-sections shown on the Plans or as directed by the **RCE**.

2.0 MATERIALS

- 2.1 Portland Cement - Use Portland cement that conforms to the requirements of **Subsection 301.2.1**.
- 2.2 Water - Use water conforming to the requirements of **Subsection 701.2.11**.
- 2.3 Asphalt Material – Use asphalt material conforming to the requirements of **Subsection 301.2.4**.

3.0 EQUIPMENT

- 3.1 Ensure that the equipment necessary for the proper construction of the work is on site and in acceptable working condition. Provide sufficient equipment to enable prosecution of the work in accordance with the project schedule and completion of the work in the specified time.
- 3.2 Construct the base with self-propelled rotary mixer(s)/reclaimer(s) capable of mixing in place to the required depth. The mixer(s)/reclaimer(s) shall have a mechanism for controlling the reclaimed material gradation via breaker bar and/or a door opening on the mixer(s)/reclaimer(s). Mixer(s)/reclaimer(s) shall be fitted with an integrated liquid injection system capable of introducing liquid into the cutting drum during the mixing process.
- 3.3 Provide a sufficient number of water trucks on the jobsite at all times of operation to maintain the moisture requirements listed in **Subsection 9**. Ensure that the water truck used in conjunction with the reclaimer uses a direct injection system, and additional trucks maintain surface moisture during grading and compaction work and until the curing treatment is applied in accordance with **Subsection 13**. Accomplish this using a controlled and uniform application of water without eroding or otherwise damaging the CMRB surface.
- 3.4 Provide a spreader/distributor capable of achieving consistent, accurate and uniform distribution across the entire length and width of the roadway while minimizing dust. Ensure that the spreader has adjustable openings or gate headers and is not solely dependent on vehicle speed to obtain the required spread rate.
- 3.5 Provide a combination of sheepsfoot rollers, smooth wheel tandem rollers, and/or pneumatic-tired rollers that have the ability to adequately compact reclaimed material throughout the entire specified CMRB thickness. Ensure the necessary weight, size and number of rollers to achieve the requirements of **Subsection 10**.

4.0 CONSTRUCTION

- 4.1 Regulate the sequence of work to process the necessary quantity of material to provide the full depth of modification as shown on the Plans:
 - 4.1.1 Ensure structural integrity of reclaimed material is consistent throughout the depth of the modification.
 - 4.1.2 Ensure surface quality is sufficient to provide durable temporary pavement structure surface and supports permanent pavement structure performance.
 - 4.1.3 Incorporate appropriate material as specified in the plans for drainage correction, cross slope correction or roadway strengthening.

5.0 QUALITY CONTROL PLAN, TEST STRIP & CORRECTIVE ACTION REQUIREMENTS

- 5.1 Prepare an annual Quality Control Plan that ensures that operational techniques and activities provide integral and finished material of acceptable quality for each Cement Modified Recycled Base project. Submit a Quality Control Plan for acceptance to the Chemical Stabilization Engineer (**CSE**) in writing a minimum of two weeks before work begins for the year.
- 5.2 The Quality Control Plan should include, but not be limited to addressing the following items;
 - 5.2.1 Contingency plans for pulverization, mixing and compaction when specifications criteria are not met. Consider the specific roadway conditions of various project sites.
 - 5.2.2 Plan for identifying in-situ moisture conditions, adjusting the moisture content to meet specifications, and maintaining moisture content through the time of curing. Include a description of the methods and minimum contractor testing for moisture. Consider specific environmental conditions of various project sites and schedules.
- 5.3 Test Strips
 - 5.3.1 The first load of cement on the roadway will be used as a test strip to determine if the contractor is capable of producing a mixture according to specifications. Particular attention will be paid to the moisture and compaction requirements set in **Subsection 10**, mixing and processing requirements set in **Subsection 9**, pulverization requirements set in **Subsection 7**, depth requirements in **Subsection 17**, and cement tolerances in **Subsection 8**. Cease production after the first load if any of the requirements of the specification are outside of the tolerances and change procedures to contingency plans approved in the QC Plan to continue work. Continue production as normal on the same day when the test strip meets the specification requirements.
 - 5.3.2 The first load applied with the contingency plans will be used as a test strip to evaluate the corrective action plan. Cease production after this initial load of cement if the requirements of this specification are still not being met and submit a revised corrective action plan to the **RCE** for acceptance prior to continuing work.
 - 5.3.3 If the requirements of this specification are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the **RCE** for acceptance prior to continuing work.

6.0 SHOULDERS & ROADWAY PREPARATION

- 6.1 Remove all excess vegetation generated from the clipping and cleaning of shoulders from the roadway and any other debris, including Reflective Pavement Markers, prior to performing the mixing operations. Remove material from the shoulders as necessary to ensure proper drainage at all times.

7.0 PULVERIZATION

- 7.1 Provide means, methods, and equipment necessary to obtain satisfactory pulverization of the pavement so that at the completion of pulverization and mixing (prior to compactive efforts), a uniform mixture is created in which 100% of the reclaimed material mixture (by weight) passes a 3 inch sieve and 95% of the reclaimed material mixture (by weight) passes a 2 inch sieve. When necessary, SC-T-1 Section 6.6 will be used for sampling to run gradation tests. Rework areas not meeting this gradation control measure as necessary, adhering to the time limitations in **Subsection 11**. The pulverization pass is defined as at least one pass of the mixer prior to the application of cement. Additional passes are allowed. Lightly compact following each pass of the mixer to produce a uniform layer. Carefully control the depth of pulverization and conduct operations in a manner to ensure that the surface of the roadbed below the pulverized material remains undisturbed and conforms to the required cross-section. Means, methods and equipment including but not limited to additional passes of the reclaimer, milling in place or the use of supplementary equipment to achieve pulverization is the responsibility of the contractor and incidental to the process.
- 7.2 If the requirements of pulverization are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the **RCE** for acceptance prior to continuing work.

8.0 APPLICATION OF CEMENT

- 8.1 The **CSE** will determine the rate of cement based on test results supplied in writing by the Contractor. Do not commence construction until an approved rate has been determined by the **CSE**. Allow two weeks from the date of submittal for the results and selection of appropriate cement rate. The test results will be conducted according to SC-T-26 by an AASHTO-accredited laboratory with material obtained from the roadway in which construction is to occur. Ensure that the roadway sampling and mix design testing is representative of the entire area and depth to be treated, several samples and/or designs may be necessary.
- 8.2 Spread Portland Cement uniformly on the pulverized material at the rate established by the **CSE**, taking care to minimize fugitive dust and minimize overlapping of the passes (maximum 6 inches). Apply cement only when the temperature is 40°F in the shade and rising, and no freezing temperatures are predicted for at least 48 hours. Do not perform work on frozen or excessively wet subgrade. A tolerance of 5% (of the rate) is allowed in the spread rate for individual sections (load of cement) of roadway; however, adjustments should be made in order to keep the actual spread rate as close to that established by the **CSE**. Only apply cement to such an area that all the operations (including final compaction) can be continuous and completed in daylight, unless adequate artificial light is provided. Ensure that all operations (including final compaction) can be completed within 3 hours of application of cement.

- 8.3 Do not allow the percentage of moisture in the reclaimed material mixture at the time of cement application to exceed the quantity that permits uniform and thorough mixture of reclaimed material or that creates instability of the roadway. Do not allow equipment, except that used in spreading and mixing, to pass over the freshly spread cement until it is mixed with the reclaimed material mixture.
- 8.4 If the requirements of cement application are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the **RCE** for acceptance prior to continuing work.

9.0 MIXING & PROCESSING

- 9.1 Pulverize material as necessary to meet the requirements given in **Subsection 7**. The pulverization pass is defined as at least one pass of the mixer prior to the application of cement. Lightly compact following each pass of the mixer to produce a uniform layer.
- 9.2 After the cement has been applied per **Subsection 8**, mix and uniformly add necessary moisture to the reclaimed material to ensure that the moisture content is above the optimum value as set in the approved mix design and within +/- 2% of the optimum moisture content when tested within 30 minutes of final compaction. Mix with at least one pass of the reclaimer after cement application at minimum. Additional passes are allowed, adhering to time limitations set forth within this specification. Ensure full width pulverizing and mixing by overlapping a minimum of 6 inches with each longitudinal pass, including at the longitudinal joint of each lane, and a minimum of 2 feet with each transverse joint. Additional mixing passes may be required in the contract documents. Lightly compact following each pass of the mixer to produce a uniform layer.
- 9.3 Immediately begin final compaction after the mixing process has been completed so that the requirements of **Subsection 10** are met.
- 9.4 Remove excess material generated from the mixing process after final grading operations have been completed.
- 9.5 If the requirements of mixing and processing are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the **RCE** for acceptance prior to continuing work.

10.0 COMPACTION

- 10.1 Before beginning compaction, ensure that the mixture is free from excessive fluff and overly compacted areas to allow for uniform compaction of the layer. Continue compaction until the entire depth of the base course mixture is uniformly compacted to not less than 95% of the maximum density. SC-T-23, SC-T-26, SC-T-27, or SC-T-29 will be used at the discretion of the **RCE** to determine the maximum density of the composite mix. If tests show that 95.0% requirement is not being met, adjust construction operations to obtain the required density. Complete the compaction work within 1 hour of the final mixing pass.
- 10.2 After the mixture is compacted, reshape the surface of the base course as necessary to conform to the required lines, grades, and cross-section. Perform light scarifying to a depth which removes the sheepsfoot imprints at minimum. Continue as required to obtain a uniform surface and to prevent scaling and delamination.

- 10.3** Perform compacting and finishing in a manner that produces a smooth, closely knit surface, free from equipment imprints, cracks, ridges, or loose material. Maintain the moisture content of the mixture within +/- 2% of the optimum moisture as determined by the pre-approved mix design and keep the surface continuously moist to the time of final curing coat being applied. The moisture content and density requirements for compaction will be tested for acceptance within 30 minutes of final compaction. Additional moisture contents tests will be randomly performed for acceptance through the curing application to ensure that the surface moisture is maintained above optimum moisture.
- 10.4** If the requirements of compaction are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the **RCE** for acceptance prior to continuing work.

11.0 CONSTRUCTION LIMITATIONS

- 11.1** Perform work in daylight hours unless adequate artificial light is provided. Limit the area over which the cement-pavement mixture is spread so that all operations specified in **Subsections 7, 8, 9, 10 and 13** are performed continuously until completion of a section (load of cement). Complete all grading and compaction work on a section (load of cement) within 2 hours after the initial mixing pass of the reclaimer unless the **RCE** approves a longer period.
- 11.2** If operations are interrupted for a continuous period of greater than 1 hour after the cement has been mixed with the reclaimed material, reconstruct the entire affected section (area of interruption) in accordance with these specifications. When the uncompacted reclaimed material mixture and cement is wetted so that the moisture content exceeds that specified, manipulate and aerate the mixture to reduce the moisture to the specified content provided the base course is completed within the time limits of these specifications.
- 11.3** Begin subsequent lifts of asphalt or chip seals which cover the Cement Modified Recycled Base curing methods and act as a final riding surface within 7 calendar days of completion of the CMRB section unless the **RCE** approves a longer period. Begin these subsequent lifts so that no more than 4 miles have temporary surface treatment on them at any time. A section is defined as the contract section of roadway receiving CMRB treatment. When using Curing Methods B or C, ensure that a milled surface is not left open to the public for more than 72 hours.

12.0 WEATHER LIMITATIONS

- 12.1** Apply cement only when the temperature is 40°F in the shade and rising, and no freezing temperatures are predicted for at least 48 hours. Do not perform work on frozen or excessively wet subgrade. The temperature restrictions for single treatment, when used as a curing option, shall meet the requirements of this reclamation specification. If the successive course is a final riding course, the seasonal restrictions of December, January and February apply unless otherwise approved by the DOC.

13.0 CURING

- 13.1** After the Cement Modified Recycled Base has been finished as specified, cure the surface using the specified method in the plans or contract. Dampen and sweep the CMRB immediately prior to the application of the surface treatment.

Curing Method A: Surface (Single) Treatment

~~Curing Method B: Surface (Single) Treatment with Milling~~
~~Curing Method C: Surface (Double) Treatment with Milling~~

- 13.2** After the Cement Modified Recycled Base has been finished as specified, protect the base from rapid drying and traffic by placing Asphalt Surface Treatment as specified in **Section 406 or 407**, with the exception that lightweight aggregate is not required and CRS-2 may be used in place of CRS-2P. Perform this operation daily to protect the newly constructed Cement Modified Recycled Base, unless otherwise directed by the **RCE**.
- 13.3** Prior to placement of the HMA course in Methods B & C, mill the Cement Modified Recycled Base course surface to obtain a true and level finish for the asphalt placement. Ensure that a diamond milling pattern with a double or triple strike is clearly visible in the finished surface. Consider the final thickness during construction, leaving the specified depth of treatment after the milling has occurred. Ensure that the surface is left in a condition ready for paving, free from scabbing, scaling and other defects. Ensure that any structure lost to additional, deeper milling to remove these defects is replaced with asphalt. Include this cost in the Cement Modified Recycled Base price.

14.0 CONSTRUCTION JOINTS

- 14.1** At the end of each day's construction, form a straight construction joint as specified in **Subsection 301.4.9**.

15.0 SURFACE SMOOTHNESS

- 15.1** Ensure that the finished surface of the recycled base meets the requirements of **Subsection 301.4.10**. The grade of the road will be based on existing conditions of the roadway. Grade the cross slope to obtain positive drainage as well as smooth transitions from crown to superelevated sections of the roadway, re-grade roads with a pre-existing cross slope of 2% or greater to the same cross slope. On roads with a pre-existing cross slope of less than 2%, the Contractor and **RCE** will determine the measures required to obtain positive drainage and the final cross slope.

16.0 RIDEABILITY

- 16.1** Ensure that the final asphalt surface placed on Cement Modified Recycled Base course meets the Rideability requirements of SC-M-403 for either New Construction or Resurfacing, whichever is applicable based on the specified pavement structure.

17.0 THICKNESS TOLERANCE

- 17.1** The thickness of the completed Cement Modified Recycled Base will be measured at random intervals not to exceed 1,000 feet in length. The average job thickness will be measured daily using the average value of all measurements taken by the inspector each day. Where the measured thickness is more than 1 inch greater than the specified thickness, the thickness of that location will be considered the specified thickness plus 1 inch. If the average job thickness varies from the specified job thickness by more than ½ inch, an adjusted unit price is used for calculating payment. The pay factor will be calculated as below and applied;

$$\text{Pay Factor} = 1 - \frac{|\text{Average Job Thickness} - \text{Specified Job Thickness}|}{\text{Specified Job Thickness}}$$

$$\text{Adjusted Contract Unit Price} = \text{Pay Factor} * \text{Contract Unit Price}$$

17.2 If the requirements of thickness (any single test value greater than 1 inch different from the specified depth) are not being met in a section not defined as a test strip (a section is defined as one load of cement) then one additional load of cement will be allowed. Cease production after this additional load of cement if the requirements are still not being met and submit a corrective action plan to the **RCE** for acceptance prior to continuing work.

18.0 OPENING TO TRAFFIC

18.1 Local traffic may use completed portions of the Cement Modified Recycled Base provided the base has hardened sufficiently to prevent marring, damaging or visible rutting of the surface by such usage. Ensure that no damage occurs to the curing coat. With approval of the District Office, temporary detours may be utilized during the reclamation process to reduce the traffic on the reclaimed roadway. Use the subgrade shoulders or completed pavement, when available, for transporting materials, workers, and equipment throughout the project. Do not place construction equipment on the base without the approval of the **RCE** unless it is being used in the subsequent construction operation.

19.0 MAINTENANCE

19.1 Maintain the Cement Modified Recycled Base in accordance with **Subsection 301.4.13**.

20.0 MEASUREMENT

20.1 The quantity for the pay item Cement Modified Recycled Base (of the uniform thickness required) is the surface area of a uniform base constructed by applying and mixing cement with the subgrade as specified and is measured by the square yard (SY) of the modified base in-place, complete and accepted. Cement Modified Recycled Base constructed outside the designated area is not measured for payment.

20.2 The quantity for the pay item Portland Cement for Cement Modified Recycled Base is the weight of cement incorporated into the base at the rate established by the **CSE** and is measured by the ton (TON), complete and accepted. Portland cement incorporated in excess of 5% of the amount established by the **CSE** is not included in the measurement. Furnish the **RCE** with invoices of all cement received to verify weight.

21.0 PAYMENT

21.1 Payment for the accepted quantity of Cement Modified Recycled Base (of the uniform required thickness) or Portland Cement for Cement Modified Recycled Base, measured in accordance with **Subsection 20** is determined using the contract unit bid price for the applicable item.

21.2 Payment for Cement Modified Recycled Base (of the uniform required thickness) is full compensation for constructing the Cement Modified Recycled Base course as specified or directed and includes pulverizing and scarifying the existing pavement, applying and spreading cement, processing and mixing base course material, watering

and maintaining proper moisture content, compacting, finishing, curing, hauling and disposing of excess shoulder material and curing base course, forming construction joints, and all other materials, labor, equipment, tools, transportation, and incidentals necessary to complete the work in accordance with the Plans, the Specifications, and other terms of the Contract.

- 21.3** Base course that is deficient in thickness is paid for at the adjusted unit price specified in **Subsection 20**.
- 21.4** Payment for Portland Cement for Cement Modified Recycled Base is full compensation for furnishing and weighing the cement as specified or directed and includes all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to complete the work in accordance with the Plans, the Specifications, and other terms of the Contract.
- 21.5** Payment for excess reclaimed material generated from the roadway (excluding shoulder material) is paid for as unclassified excavation.
- 21.6** Payment for each item includes all direct and indirect costs or expenses required to complete the work.
- 21.7** Pay items under this section include the following:

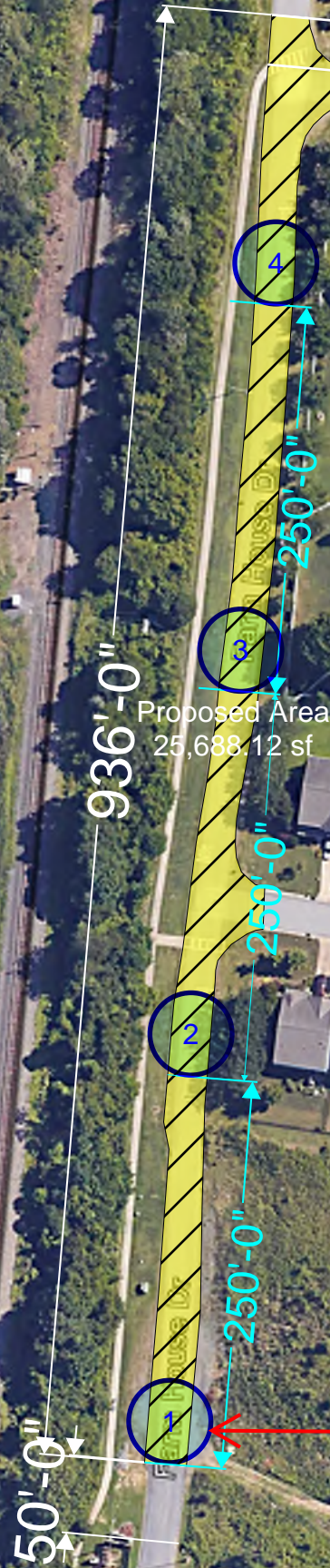
Item No.	Pay Item	Unit
3063306	Cement Modified Recycled Base (6" Uniform)	SY
3063308	Cement Modified Recycled Base (8" Uniform)	SY
3063310	Cement Modified Recycled Base (10" Uniform)	SY
3063312	Cement Modified Recycled Base (12" Uniform)	SY
3064000	Portland Cement for Cement Modified Recycled Base	TON

Farmhouse Rd Testing Limits

Proposed locations of Cores / Samples / Testing / etc.

Legend

Proposed area of Farmhouse Rd to be Demo'd / Replaced: 25,690sf OR 2,855syd



These are the locations where the (4) cores shall be performed. Per YC they requested a max of 250-300Lft between locations.



PACKAGE B: TRANSPORTATION BUS PARKING OVERLAY SCOPE OF WORK – Attachment B

The Fort Mill School District (FMSD) is accepting Bids for Single Prime Contractor to provide comprehensive services as described, but not limited to, the scope outlined within Attachment B of the Construction Documents. The Contractor's scope of work shall include all demo, paving, and striping identified below and all associated costs included within the submitted bid.

The proposed project will consist of overlaying the existing concrete pavement with asphalt.

- Please see Attachment B for the limits of the proposed project information.
- The project is located at 351 Gillig Rd. Fort Mill, SC 29715.
- Contractor responsible for necessary demo / replacement of identified existing 6" thick concrete areas indicated on page 3 of Attachment B.
 - **Base Bid shall include cost to replace 252sy of identified areas**
 - Contractor shall utilize 3,500psi concrete and finish level with the adjacent existing concrete for repairs.
- **Contractor to remove existing curb and install New ADA Ramp as indicated on page 10.**
- **Existing concrete pavement and control joints shall be thoroughly cleaned.**
- **Contractor to install Single Layer of Chip Seal over entire identified 28,870sy area prior to overlay.**
- Install necessary tack coat prior to paving activities.
- Proposed area to receive 2" Hot Mix Asphalt Surface Course, Type C (SCDOT STd. Spec. Section 403) overlay is highlighted on page 2 of Attachment B and totaling approximately 28,870sy.
- Perform all necessary striping as indicated per Sheet C4.0.
 - Striping scope shall include entire Car and Bus parking and drive areas as indicated.
 - Car Parking – 116 Spaces
 - Bus Parking – 140 Spaces
 - All indicated traffic directional marking and islands as indicated.
 - **Provide 3'-0" wide pedestrian walkway as indicated.**
 - Paint shall conform to the requirements of the SCDOT Standard Specifications for Highway Construction and Federal Specification TT-P-1952. Color shall be white unless otherwise indicated.
- All work shall adhere to the latest SCDOT Standards.
- General Contingency Allowance: \$15,000 – Allowance to be included within Bid. This allowance shall be utilized for additional repairs as needed and approved by the Owner.
- **Unit Price: Contractor to submit unit cost for 6" Concrete patchwork as described above. Unit cost will be utilized for Additional or Deductions to the quantities included within Base Bid.**

Alternate #1: Gravel Parking Lot – Scope of Work:

- Provide cost associated with the construction of 1,500sy gravel parking lot as indicated in Package B construction documents.
- Demo of the existing curb and replacement with valley curb as indicated on the Striping plan.
- Necessary grading to cut 4" of existing material and compaction of subgrade.
- Placement and compaction of 4" of ABC stone where indicated for a total area of 1,500sy.
- Striping of approximately (50) parking spaces on the gravel parking lot. Standard marking paint with 4" White lines.
- Cost shall include all necessary surveying, grading, and stone required for construction.

FMSD Transportation

Concrete Patch Locations

Legend

 Gillig Rd

- Include 252SY of 6" Concrete Patchwork Shown in Pictures 1-11 within Base Bid.

- Unit Price will be utilized to Add / Deduct patchwork identified during construction.



Gillig Rd

PIC 11

PIC 10

PICS 1 & 2

PIC 3

PIC 4

PIC 5

PIC 6 & 7

PIC 8

PIC 9

Google Earth

Image Landsat / Copernicus

500 ft



PICTURE #1 - 238SF or 26.5SY



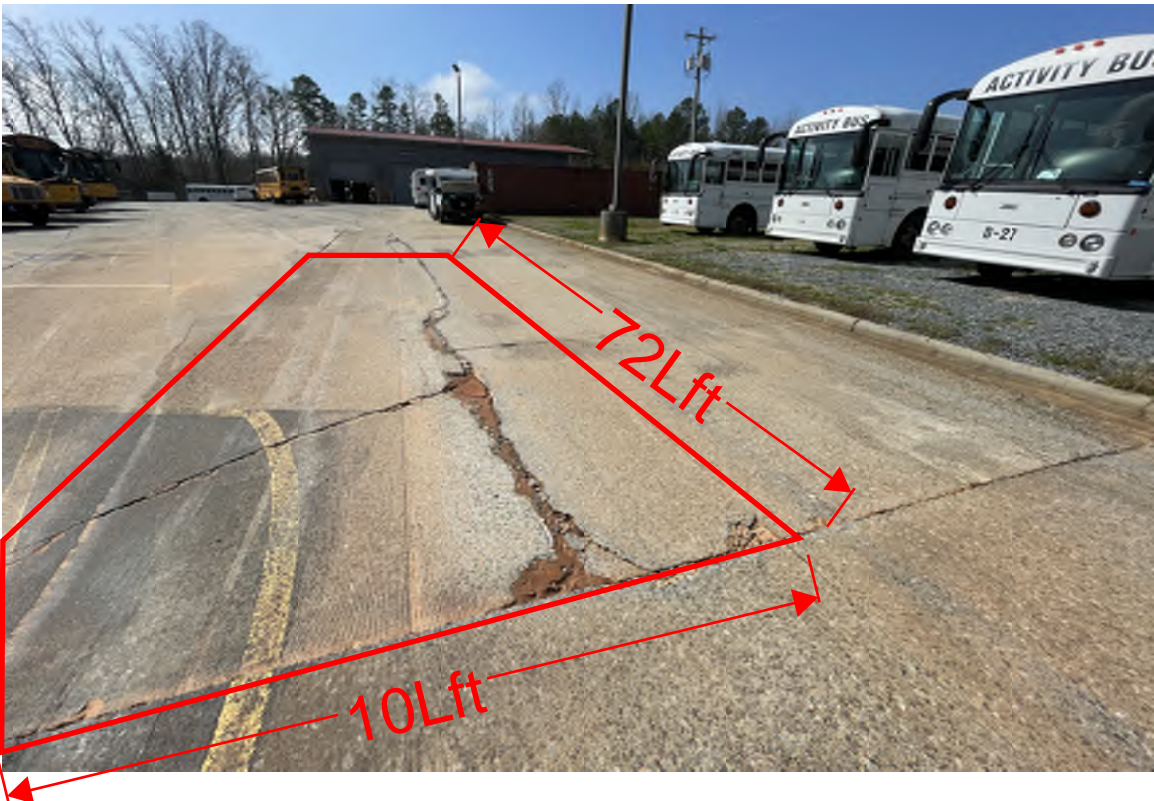
PICTURE #2 - Area Included in Calculation Above



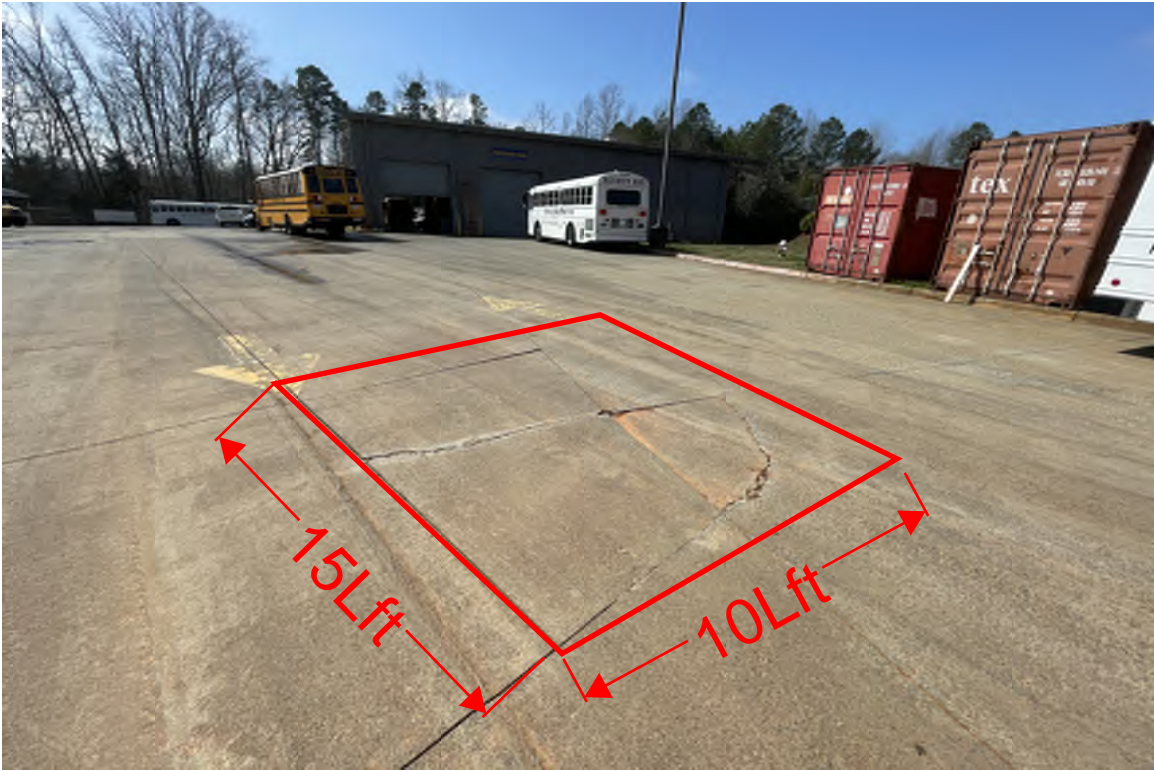
PICTURE #3 - 165SF or 18.33SY



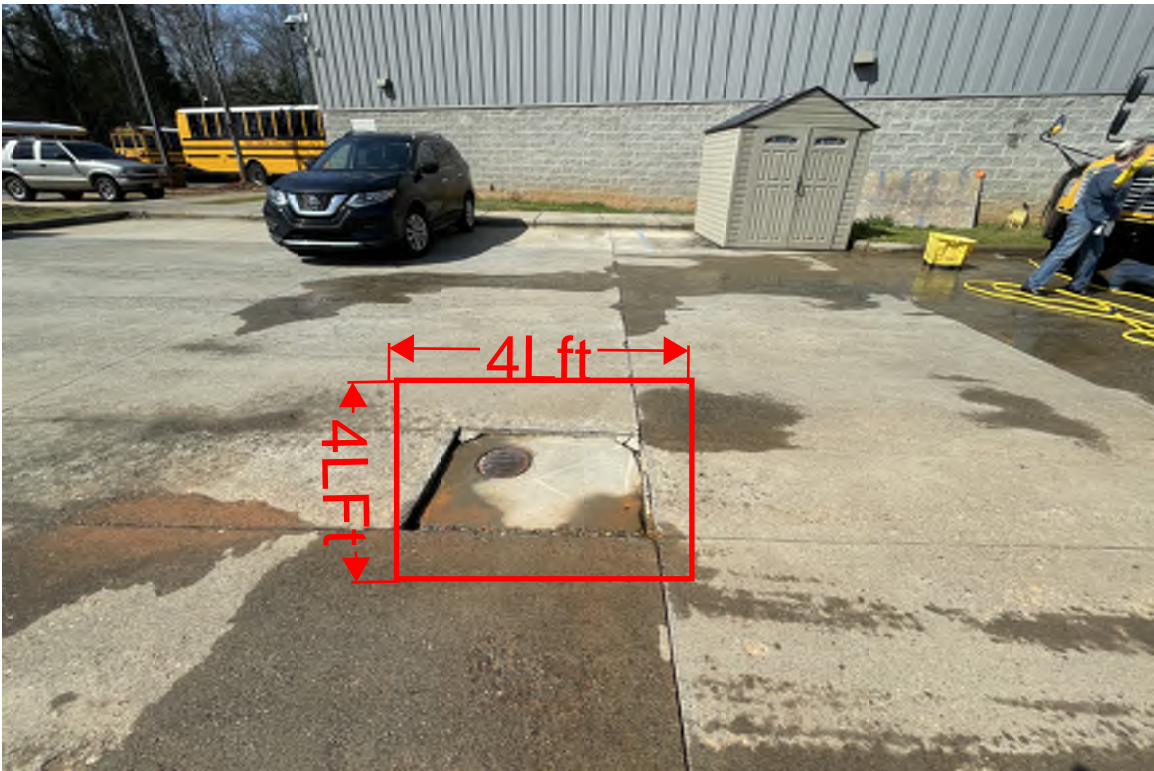
PICTURE #4 - 720SF or 80SY



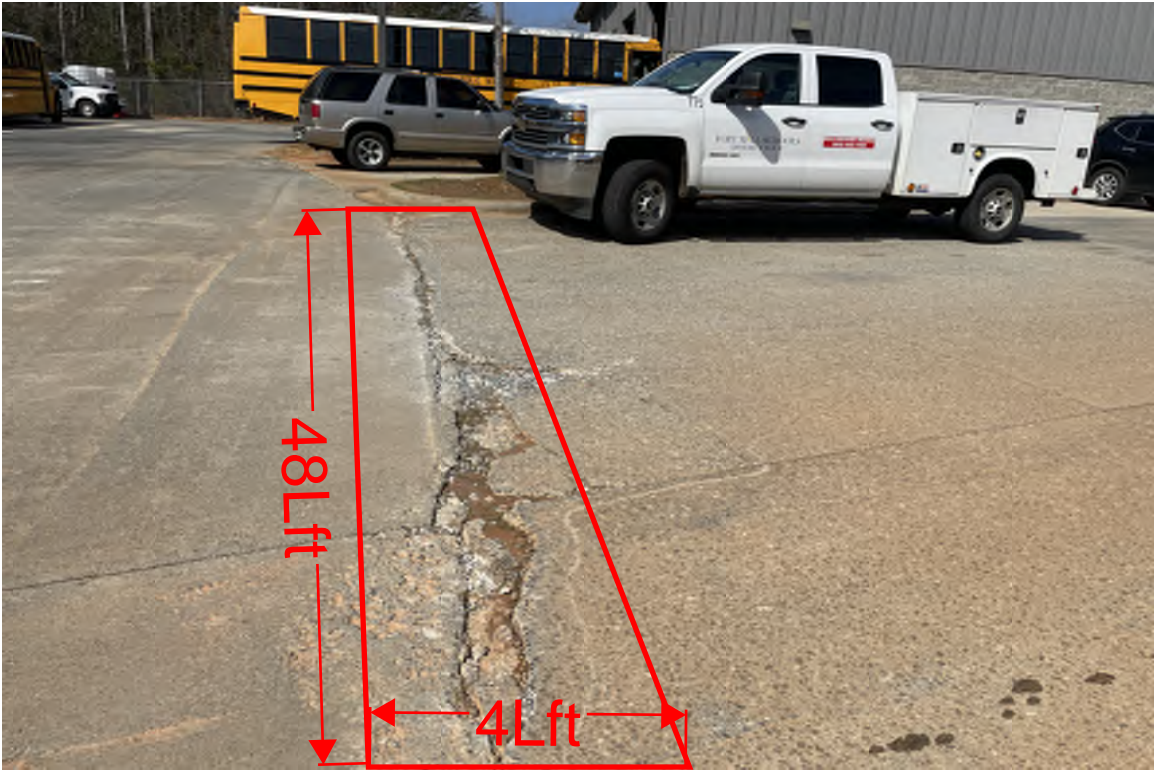
PICTURE #5 - 150SF or 16.67SY



PICTURE #6 - 16SF or 1.78SY



PICTURE #7 - 192SF or 21.33SY



PICTURE #8 - 180SF or 20SY



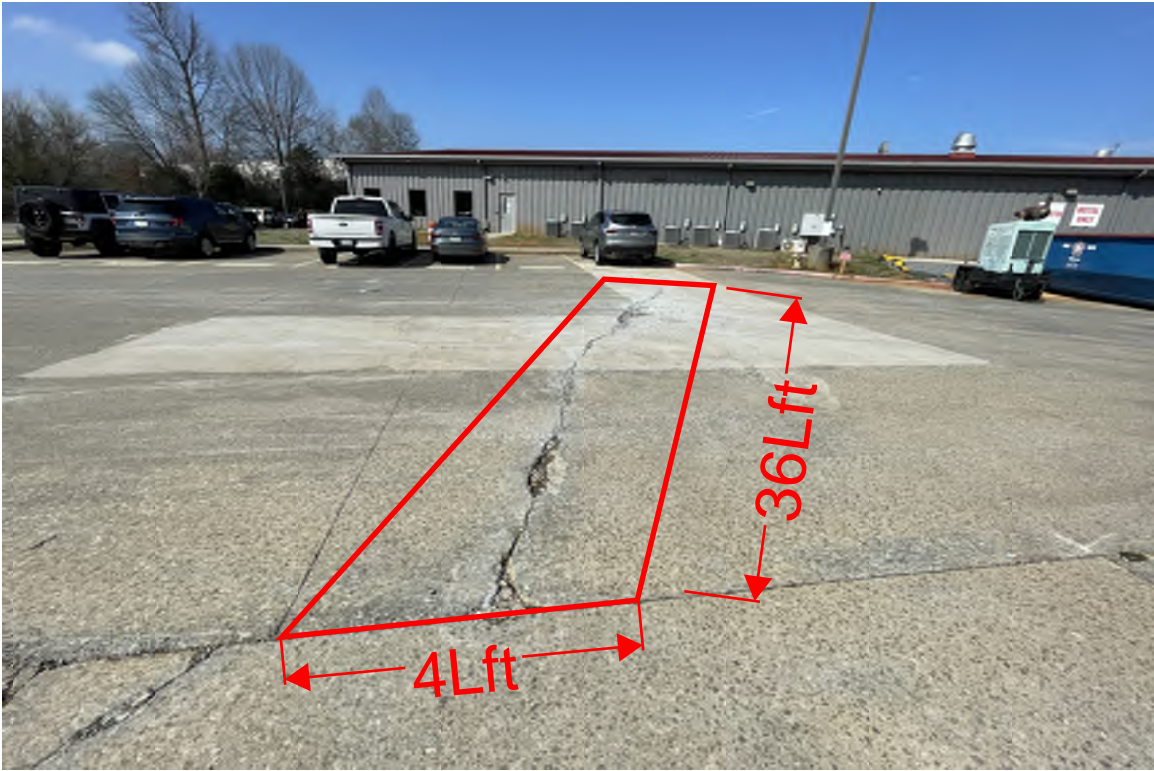
PICTURE #9 - 300SF or 33.33SY



PICTURE #10 - 162SF or 18SY



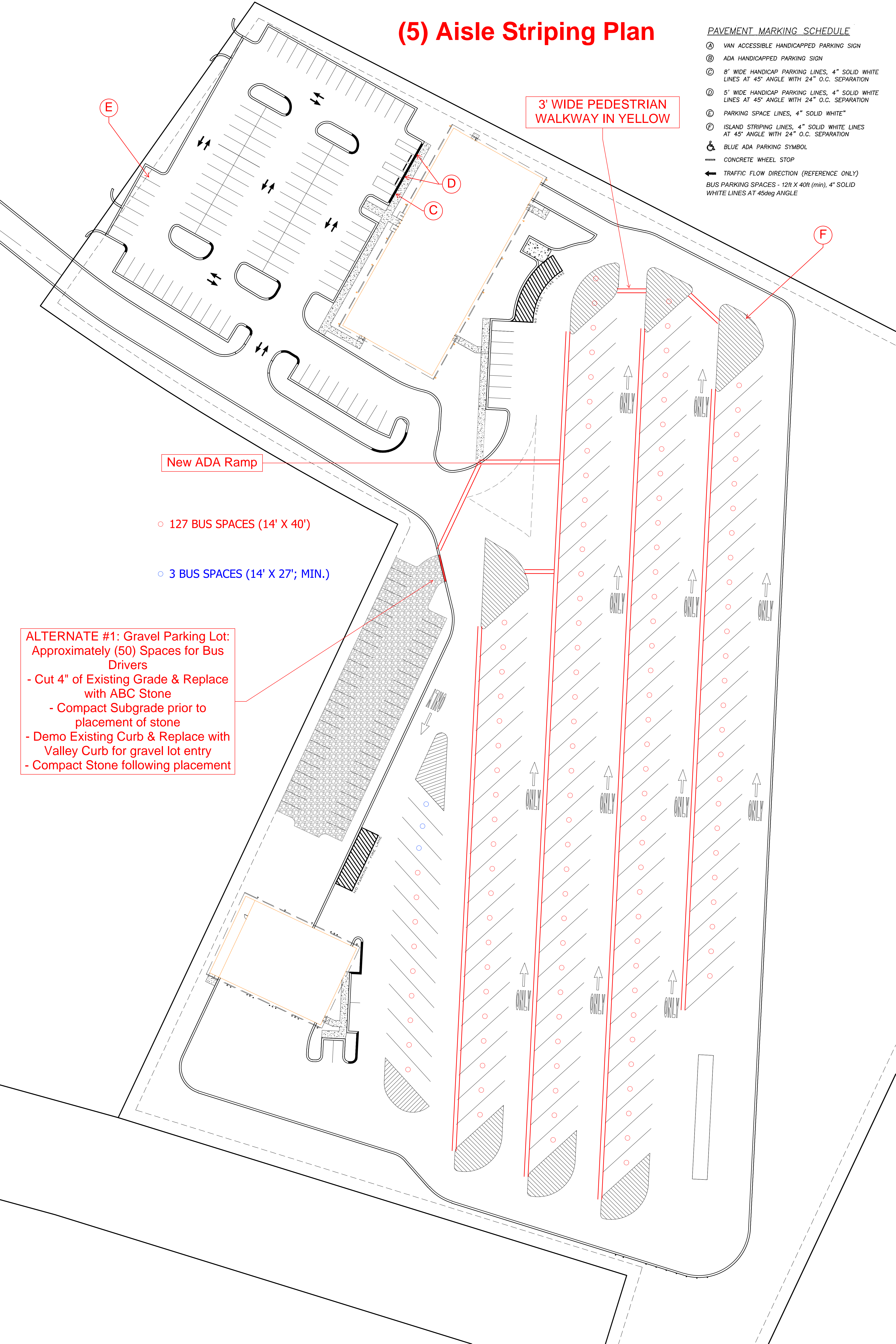
PICTURE #11 - 144SF or 16SY



(5) Aisle Striping Plan

PAVEMENT MARKING SCHEDULE

- (A) VAN ACCESSIBLE HANDICAPPED PARKING SIGN
- (B) ADA HANDICAPPED PARKING SIGN
- (C) 8' WIDE HANDICAP PARKING LINES, 4" SOLID WHITE LINES AT 45° ANGLE WITH 24" O.C. SEPARATION
- (D) 5' WIDE HANDICAP PARKING LINES, 4" SOLID WHITE LINES AT 45° ANGLE WITH 24" O.C. SEPARATION
- (E) PARKING SPACE LINES, 4" SOLID WHITE"
- (F) ISLAND STRIPING LINES, 4" SOLID WHITE LINES AT 45° ANGLE WITH 24" O.C. SEPARATION
- ♿ BLUE ADA PARKING SYMBOL
- CONCRETE WHEEL STOP
- ← TRAFFIC FLOW DIRECTION (REFERENCE ONLY)
- BUS PARKING SPACES - 12ft X 40ft (min), 4" SOLID WHITE LINES AT 45deg ANGLE



3' WIDE PEDESTRIAN WALKWAY IN YELLOW

New ADA Ramp

○ 127 BUS SPACES (14' X 40')

○ 3 BUS SPACES (14' X 27'; MIN.)

ALTERNATE #1: Gravel Parking Lot:
 Approximately (50) Spaces for Bus Drivers
 - Cut 4" of Existing Grade & Replace with ABC Stone
 - Compact Subgrade prior to placement of stone
 - Demo Existing Curb & Replace with Valley Curb for gravel lot entry
 - Compact Stone following placement

PACKAGE C: ORCHARD PARK ELEMENTARY SCOPE OF WORK

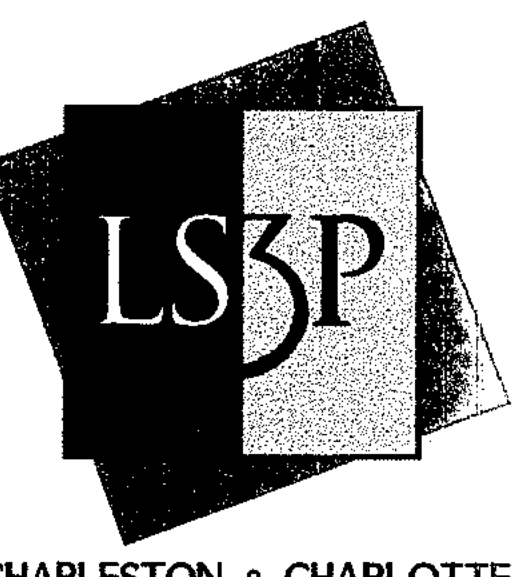
The Fort Mill School District (FMSD) is accepting Bids for **Single Prime** Contractor to provide comprehensive services as described, but not limited to, the scope outlined within Attachment C of the Construction Documents. The Contractor's scope of work shall include all surveying, demo, grading, and paving identified below and all associated costs included within the submitted bid.

The proposed project will consist of milling, repaving, and restriping of the existing Staff Parking Lot and Bus Loop at OPES.

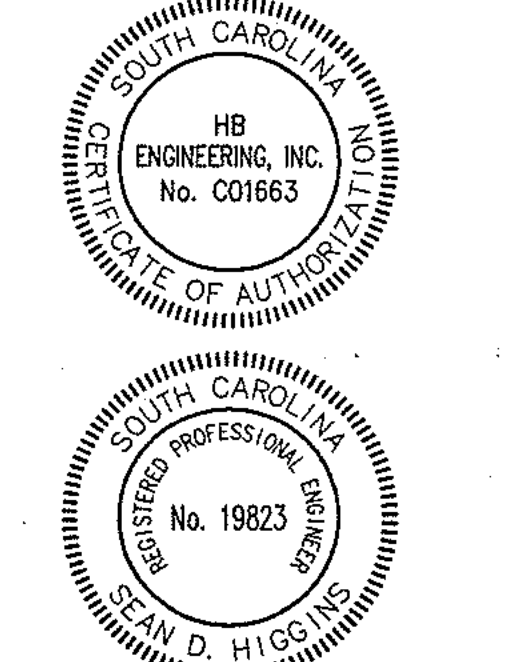
- Please see Attachment C for the limits of the proposed seal coat project.
- The project is located at 474 Third Baxter St, Fort Mill, SC 29708.
- Proposed area highlighted in Attachment C is approximately 5,350sy.
- Allowance: **\$15,000 General Contingency Allowance** to be included within Bid. This allowance shall be utilized for additional repairs as needed and approved by the Owner.
- Scope to include:
 - Cut and Replace approximately 20sy of asphalt as shown on Sheet C103A of Attachment C.
 - **Mill identified area of existing pavement 2" and replace with 2" Hot Mix Asphalt Surface Course, Type C (SCDOT Std. Spec Section 403)**
 - Re-Stripe parking lot per Sheet C103B including all existing directional arrows and (4) lane track around the existing bus loop as indicated on Attachment C.
 - Paint shall conform to the requirements of the SCDOT Standard Specifications for Highway Construction and Federal Specification TT-P-1952. Color shall be white unless otherwise indicated.

PACKAGE C: ORCHARD PARK ELEMENTARY - STAFF PARKING MILL & REPAVE PROJECT
474 THIRD BAXTER ST. FORT MILL, SC 29708

**FORT MILL
 ELEMENTARY
 SCHOOL
 BAXTER SITE**



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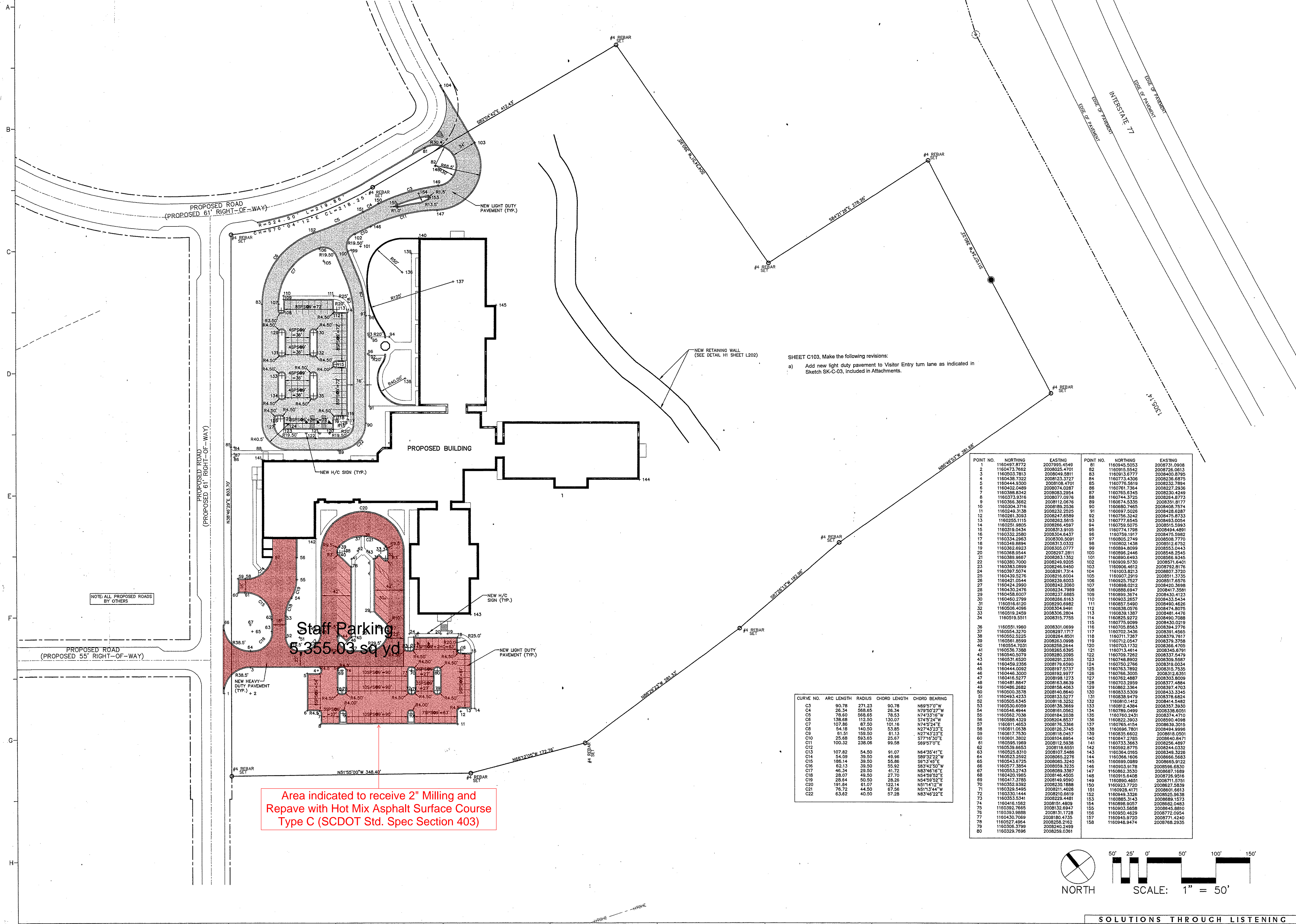
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REVISIONS:

PROJECT: I201-9810.18
 DATE: 10 March 2000
 DRAWN BY: PL
 CHECKED BY: SH

**STAKING
 PLAN**

C103A



Area indicated to receive 2" Milling and Repave with Hot Mix Asphalt Surface Course Type C (SCDOT Std. Spec Section 403)

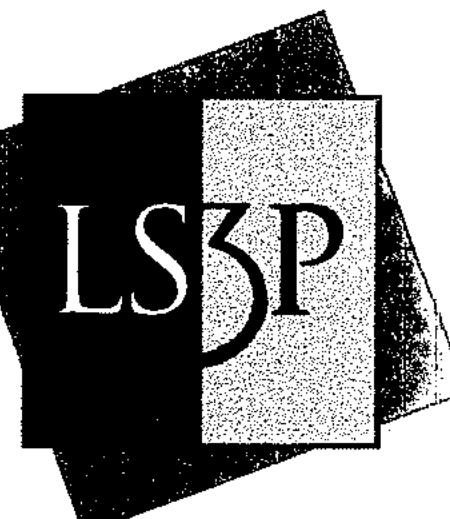


CUT OUT AND REPLACE APPROX. 20SY OF ASPHALT RUTTING. SEE PICTURE & HEAVY DUTY CROSS SECTION ON FOLLOWING PAGE

EXISTING BUS LOOP TRACK TO BE INSTALLED WITH STRIPING

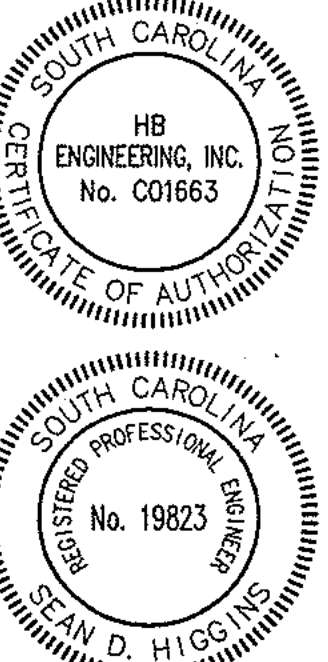


FORT MILL ELEMENTARY SCHOOL BAXTER SITE



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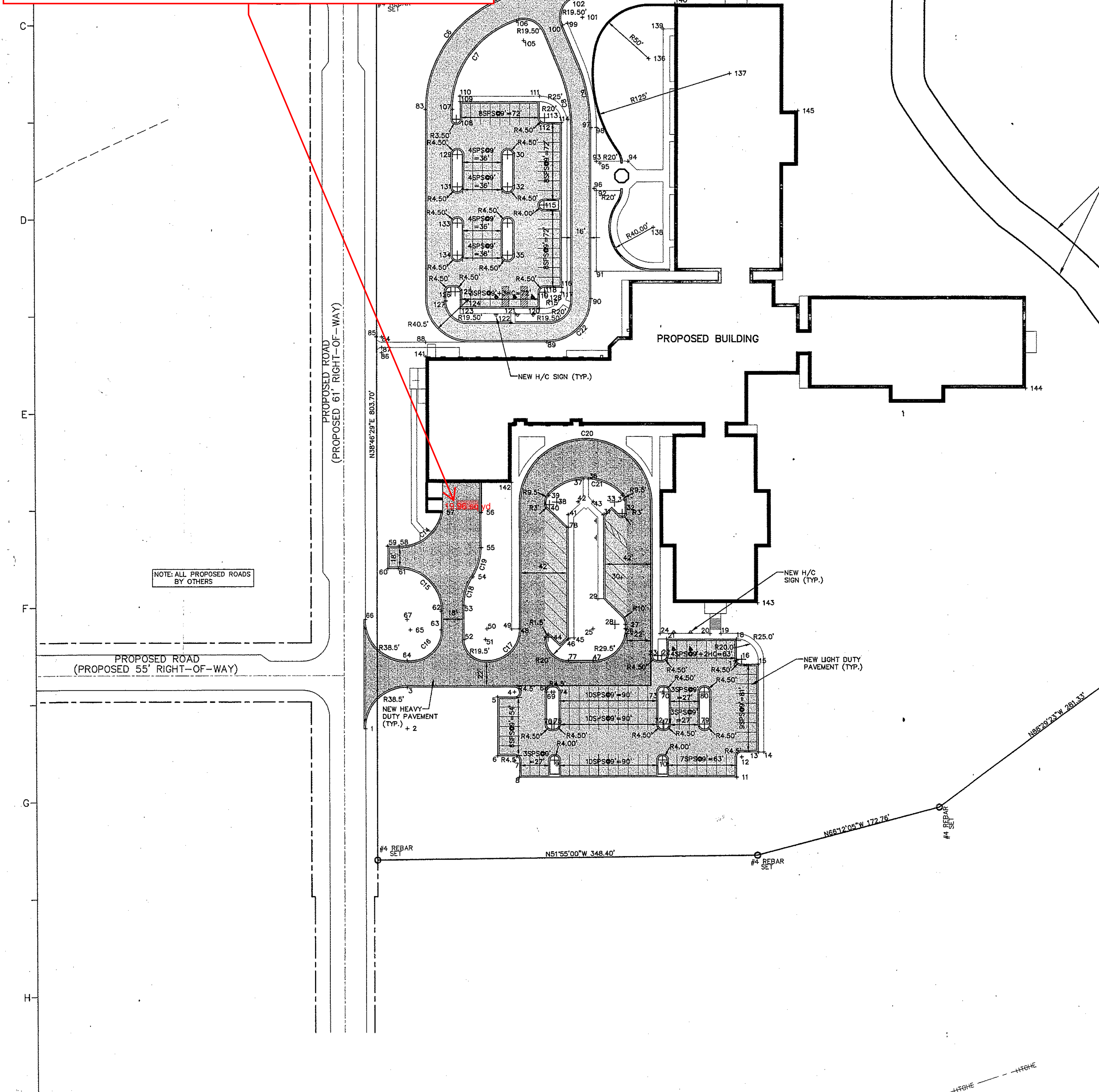
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REVISIONS:

PROJECT: I201-98120
DATE: 10 March 2000
DRAWN BY: PL
CHECKED BY: SH

STAKING PLAN

C103B

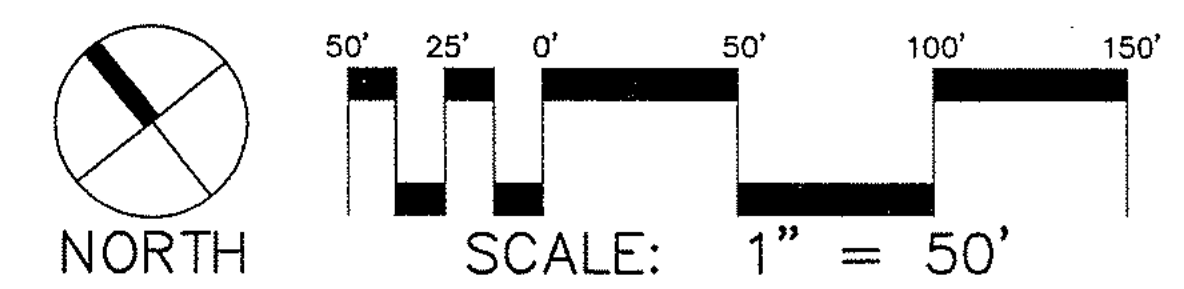


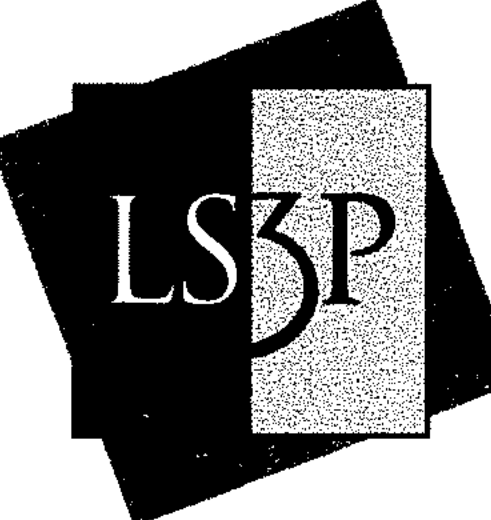
SHEET C103, Make the following revisions:
a) Add new light duty pavement to Visitor Entry turn lane as indicated in Sketch SK-C-03, included in Attachments.

STRIPING SCOPE:
- INCLUDE ALL PARKING AND ADA ACCESSIBLE SPOTS AS INDICATED
- INCLUDE (4) LANE TRACK AROUND THE EXISTING BUS LOOP. REFER TO EXISTING CONDITIONS FOR EXAMPLE
- REINSTALL ALL DIRECTIONAL ARROWS AS INDICATED IN EXISTING CONDITIONS EXAMPLE.

CURVE NO.	ARC LENGTH	RADIUS	CHORD LENGTH	CHORD BEARING
C3	90.78	271.23	90.78	N89°57'0" W
C4	26.34	568.65	26.34	N79°50'27" W
C5	78.60	568.65	78.53	N74°33'16" W
C6	138.69	112.50	130.07	S74°52'00" W
C7	107.86	87.50	101.16	N83°46'16" E
C8	54.18	140.50	53.85	N27°43'23" E
C9	61.51	159.50	61.13	N27°43'23" E
C10	25.68	593.65	25.87	S77°16'30" E
C11	100.32	238.06	98.98	S69°57'0" E
C12	107.82	54.50	91.07	N64°35'41" E
C13	54.09	39.50	49.96	S89°32'22" W
C14	54.09	39.50	49.96	S89°32'22" W
C15	186.14	39.50	55.86	S61°34'50" E
C16	62.13	39.50	55.92	S83°42'00" W
C17	46.34	29.50	41.72	N83°46'16" E
C18	28.07	49.50	27.70	N54°59'52" E
C19	28.84	50.50	28.26	N54°59'52" E
C20	191.84	61.07	122.14	N51°14'12" W
C21	78.72	44.50	87.56	N51°14'12" W
C22	63.62	40.50	57.28	N83°46'22" E

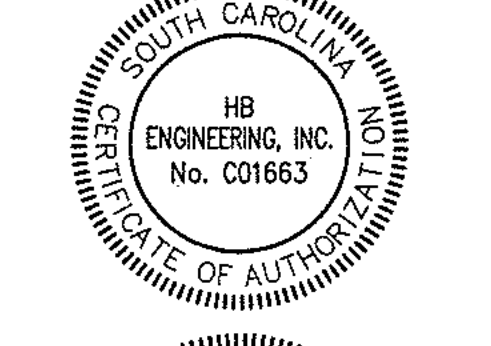
POINT NO.	NORTHING	EASTING	POINT NO.	NORTHING	EASTING
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3	1160503.7813	2008049.5811	83	1160931.8777	2008740.8793
4	1160438.7322	2008123.3727	84	1160773.4305	2008236.6875
5	1160444.0306	2008108.4701	85	1160776.5819	2008235.7889
6	1160402.0489	2008074.0287	86	1160761.7364	2008227.2936
7	1160388.8342	2008083.2954	87	1160765.8345	2008230.4249
8	1160373.9316	2008077.0976	88	1160744.3725	2008264.8773
9	1160366.3682	2008112.0676	89	1160674.5335	2008351.8177
10	1160354.3716	2008189.2536	90	1160686.7465	2008466.7574
11	1160249.3138	2008232.2255	91	1160697.5028	2008426.6287
12	1160281.3093	2008247.6559	92	1160756.3242	2008475.8733
13	1160255.1115	2008282.5615	93	1160771.8545	2008483.0054
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15	1160319.8434	2008313.9105	95	1160774.1769	2008494.4691
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78	1160329.7696	2008259.0361			





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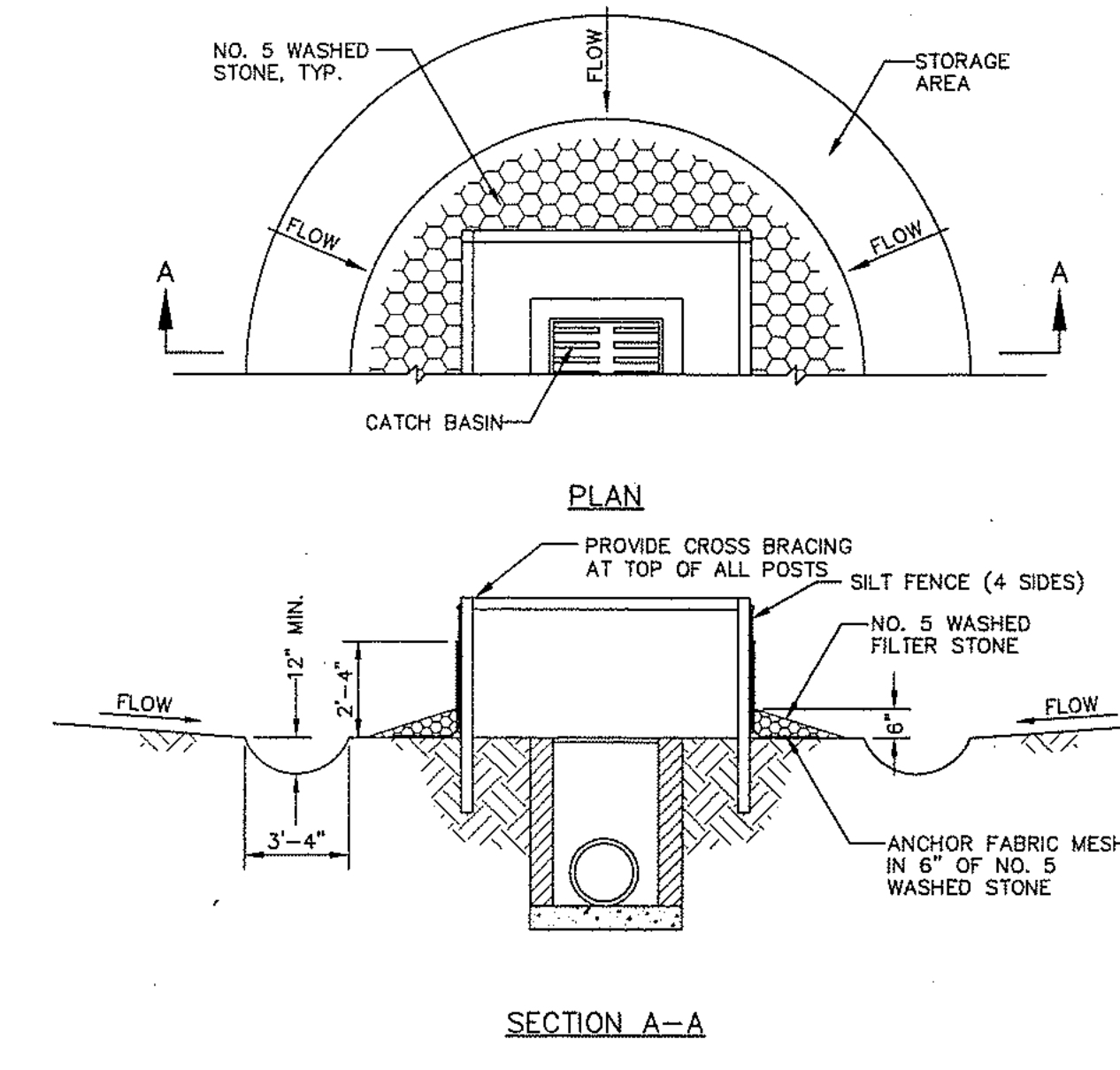
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REVISIONS:

PROJECT: 1201-98210.8
DATE: 10 March 2000
DRAWN BY: PL
CHECKED BY: SH

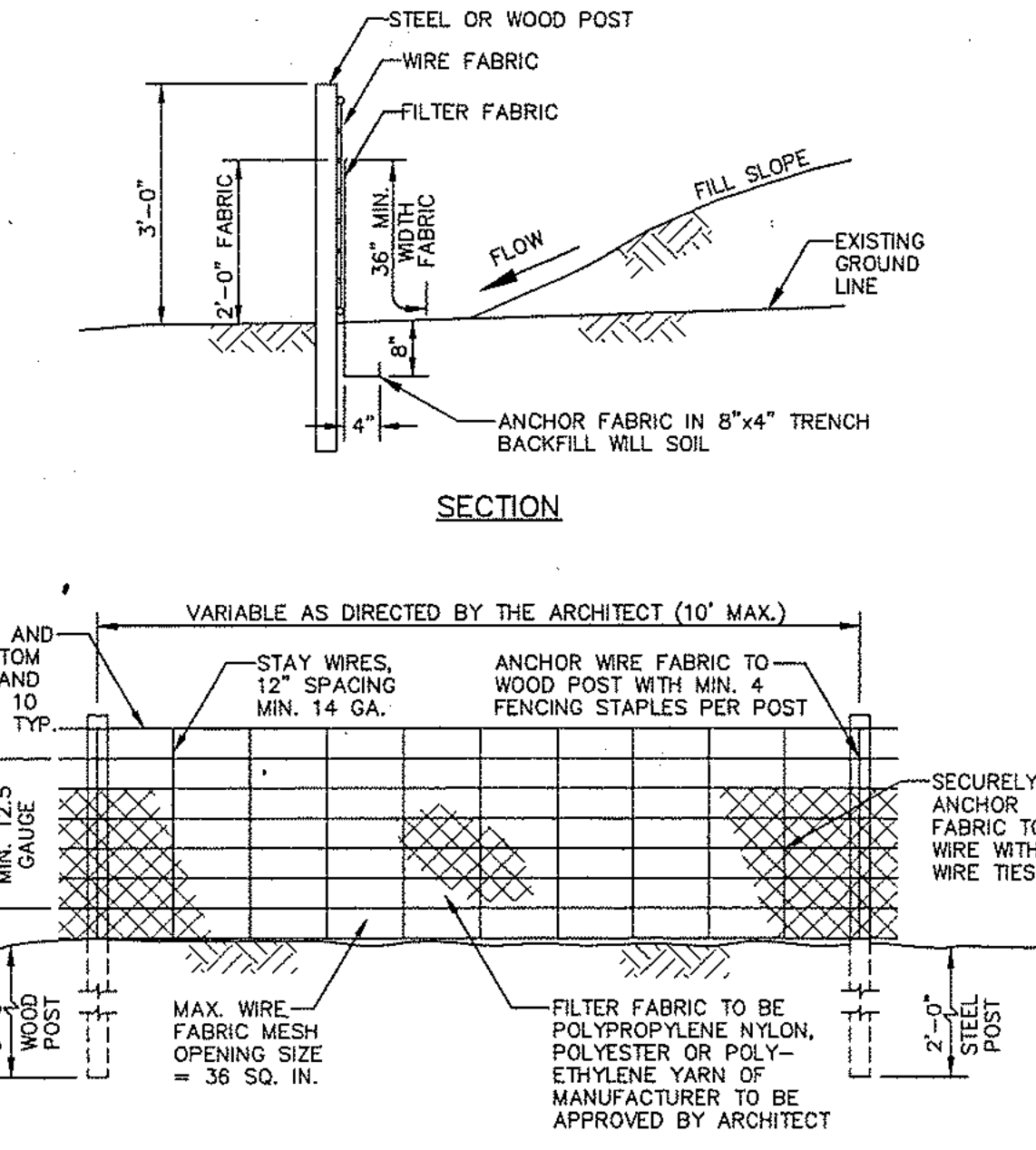
MISCELLANEOUS DETAILS

C105



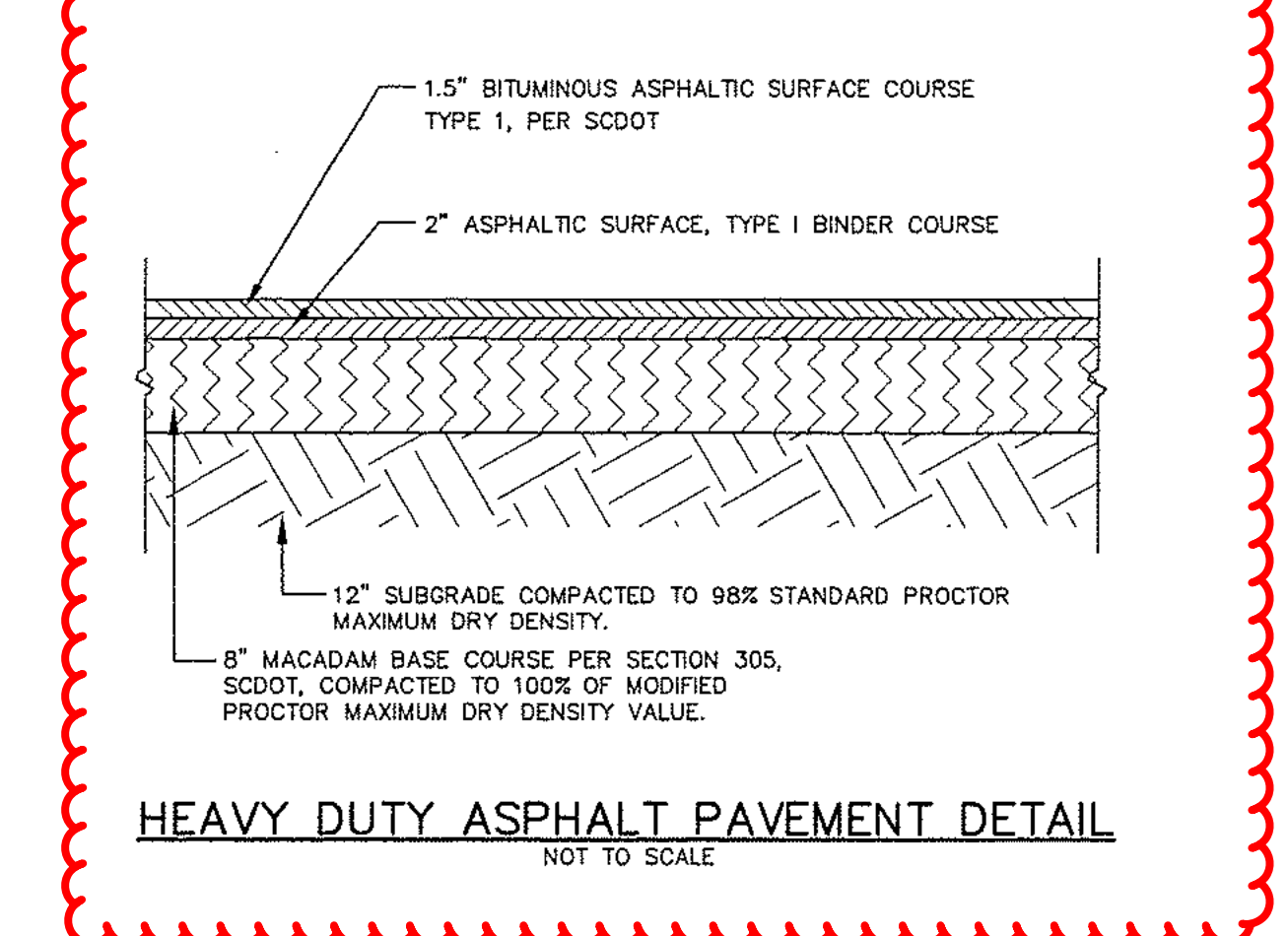
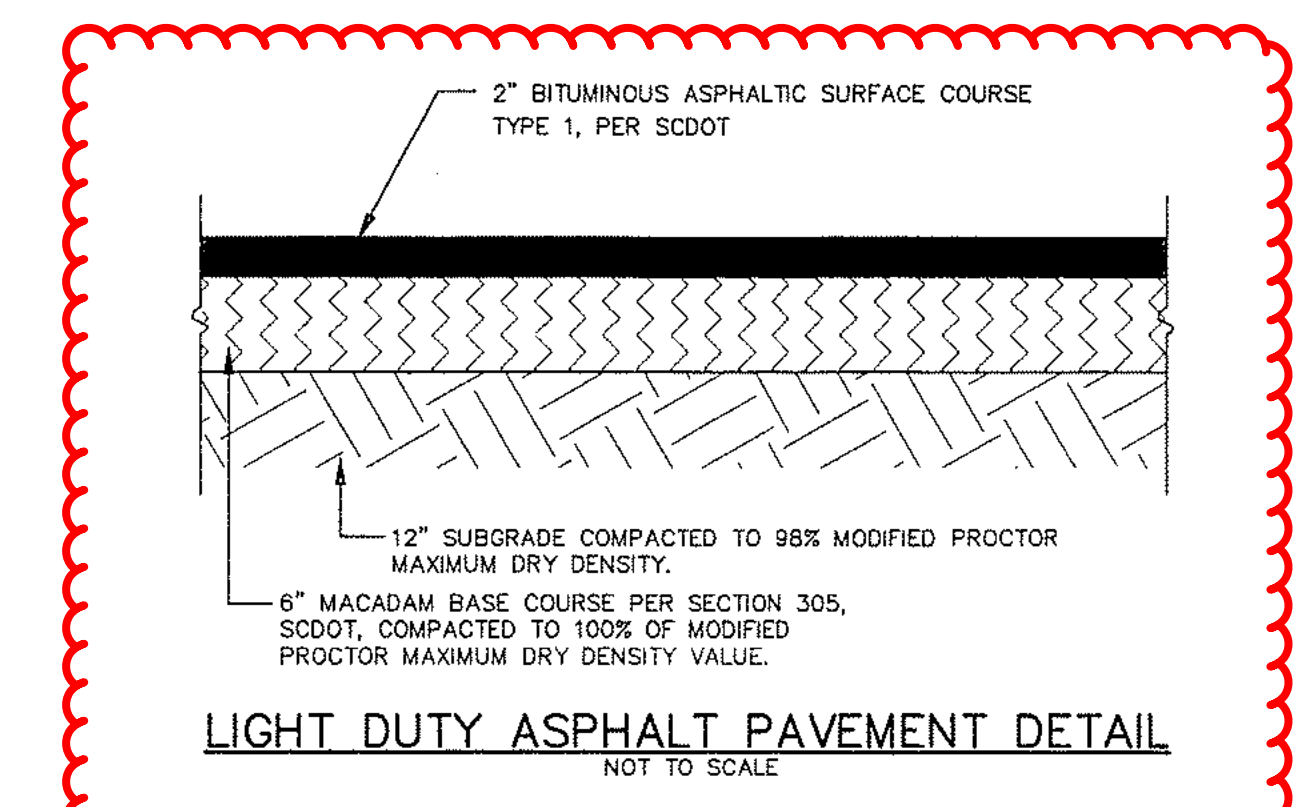
- NOTES:**
1. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
 2. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
 3. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION SHALL BE MINIMIZED.
 4. THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

TEMPORARY CATCH BASIN SEDIMENT TRAP
NOT TO SCALE



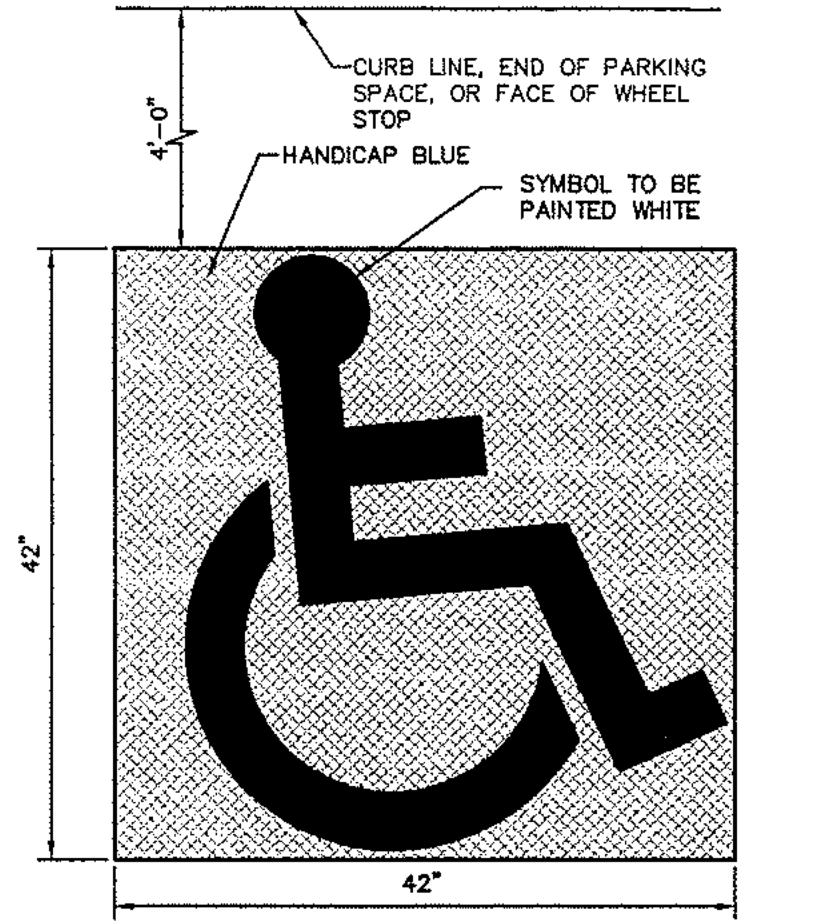
- NOTES:**
1. THE CONTRACTOR SHALL MAINTAIN ALL SILT FENCING BY REMOVING AND DISPOSING OF SILT ACCUMULATIONS AS DIRECTED BY THE ARCHITECT. FILTER FABRIC SHALL BE REPLACED WHEN IT HAS DEGRADED TO SUCH EXTENT THAT IT REDUCES THE EFFECTIVENESS OF THE SILT FENCE.
 2. FILTER FABRIC SHALL HAVE A MINIMUM TENSILE STRENGTH (20% MAX. ELONGATION) OF 300 LBS/LIN. IN. WIRE FABRIC REQUIRED.
 3. IF EXTRA STRENGTH FABRIC IS UTILIZED (MIN. TENSILE STRENGTH = 50 LBS/LIN. IN. @ MAX. 20% ELONGATION), WIRE FABRIC IS OPTIONAL, MAXIMUM POST SPACING = 6 FEET.
 4. POSTS SHALL BE 4" DIA. PINE, 2" DIA. OAK OR 1.33 LB/LF STEEL UNLESS OTHERWISE APPROVED BY ARCHITECT.

TEMPORARY SILT FENCE
NOT TO SCALE

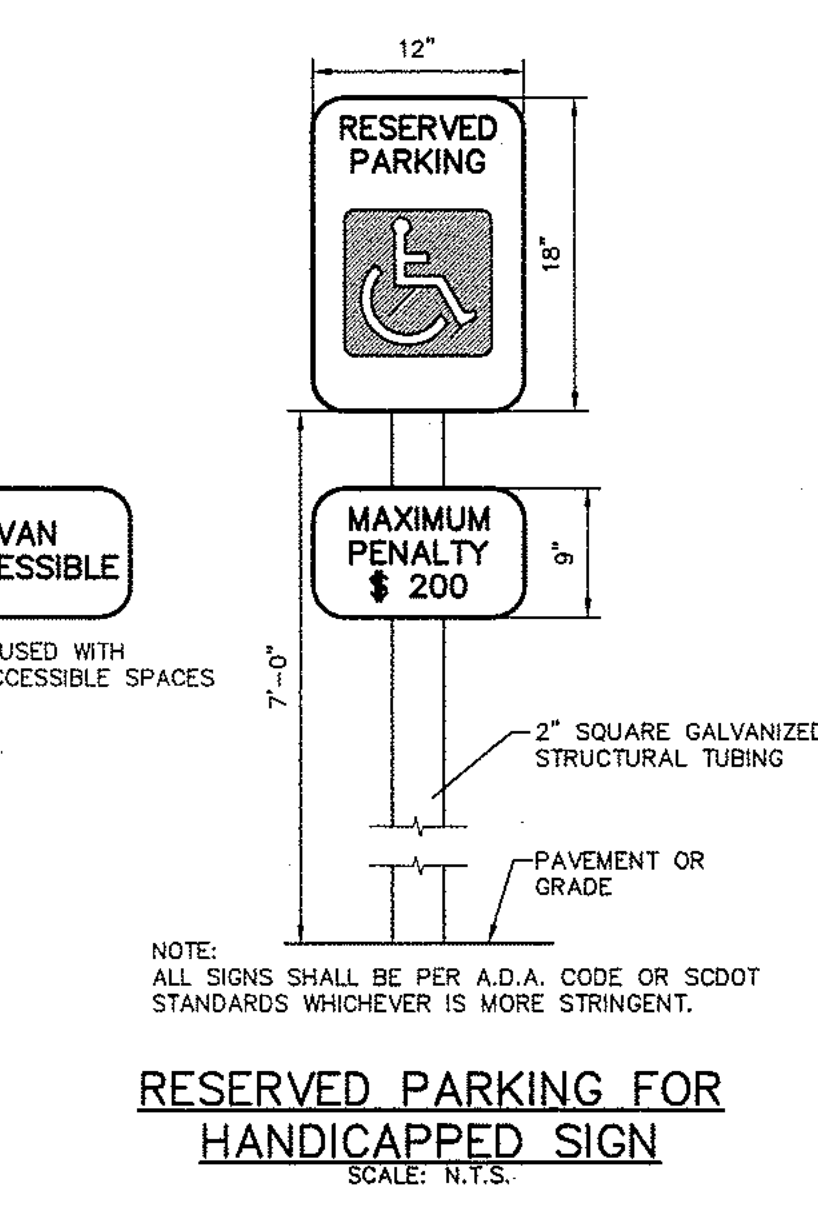


LIGHT DUTY ASPHALT PAVEMENT DETAIL
NOT TO SCALE

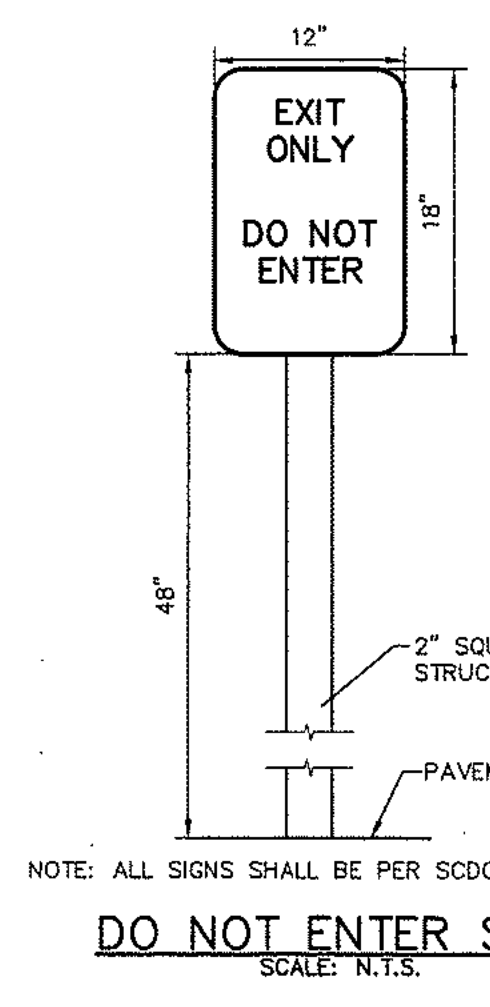
HEAVY DUTY ASPHALT PAVEMENT DETAIL
NOT TO SCALE



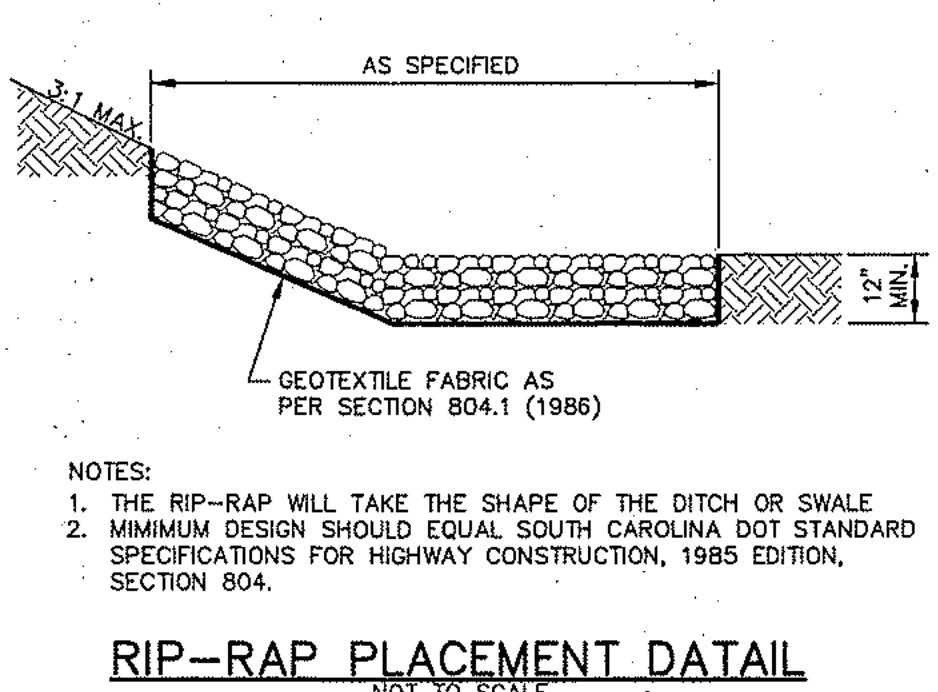
HANDICAP PARKING SYMBOL
SCALE: N.T.S.



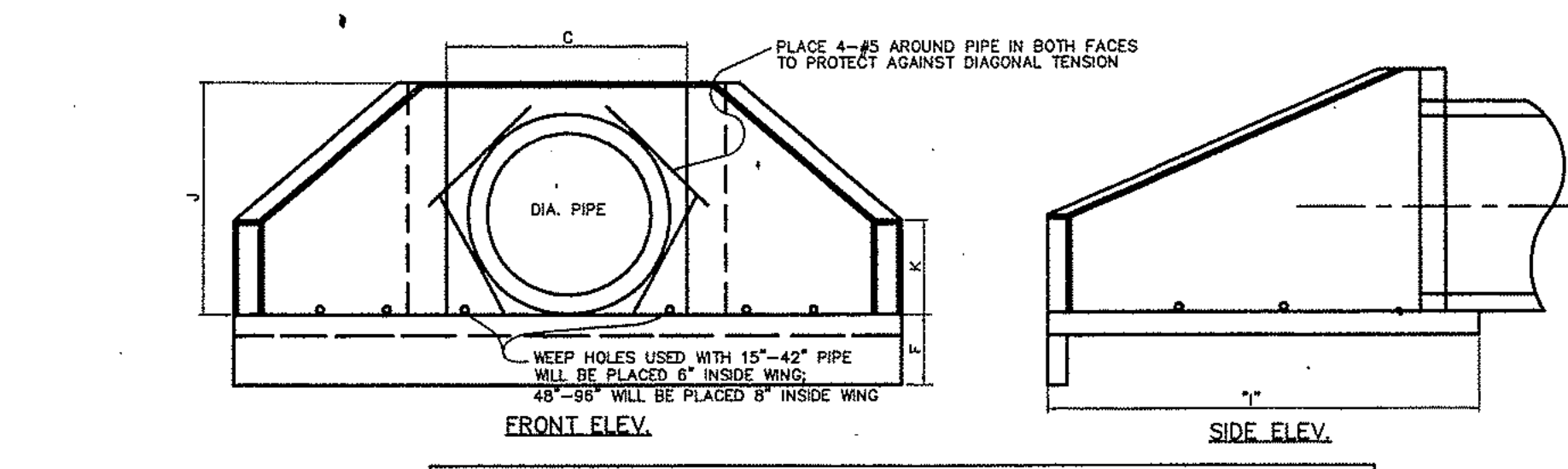
RESERVED PARKING FOR HANDICAPPED SIGN
SCALE: N.T.S.



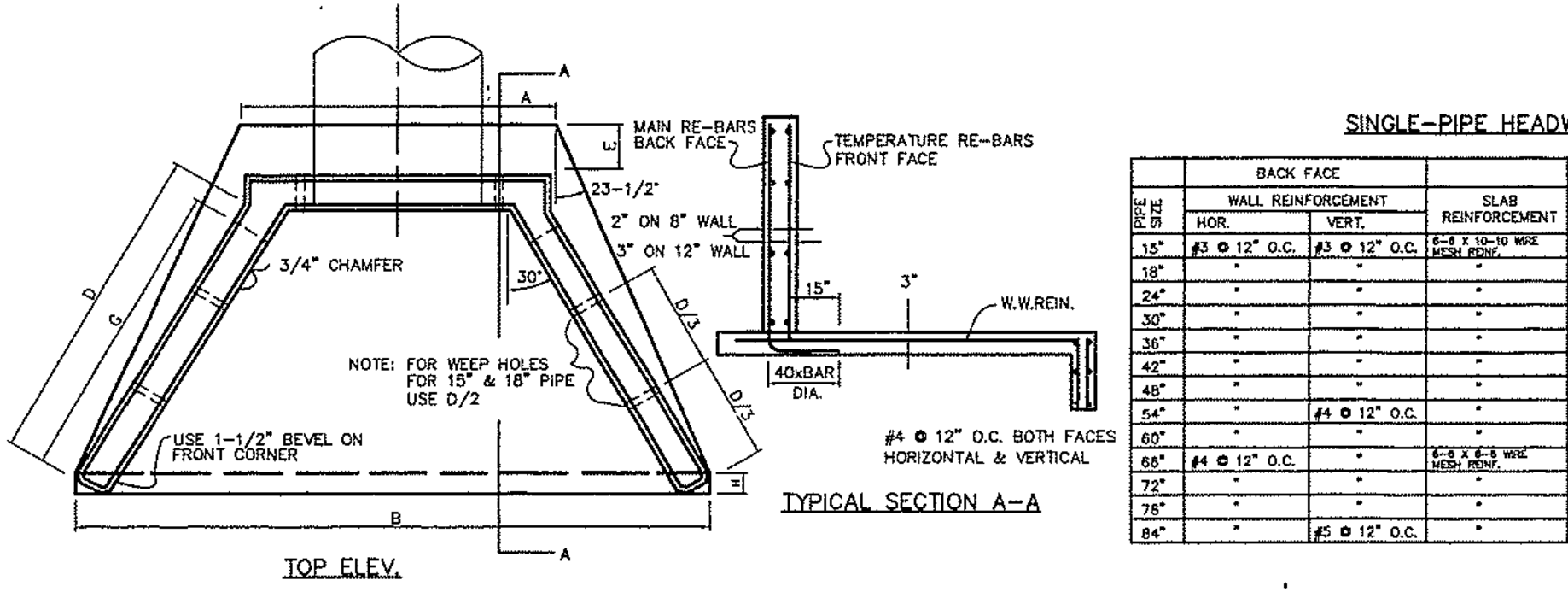
DO NOT ENTER SIGN
SCALE: N.T.S.



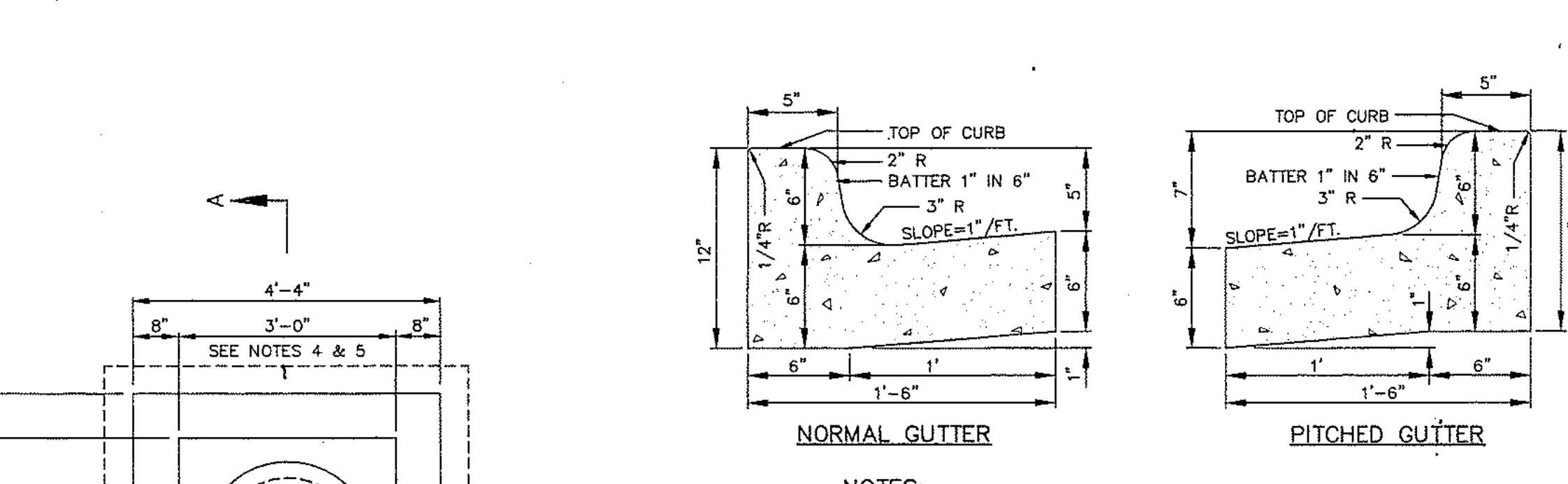
RIP-RAP PLACEMENT DETAIL
NOT TO SCALE



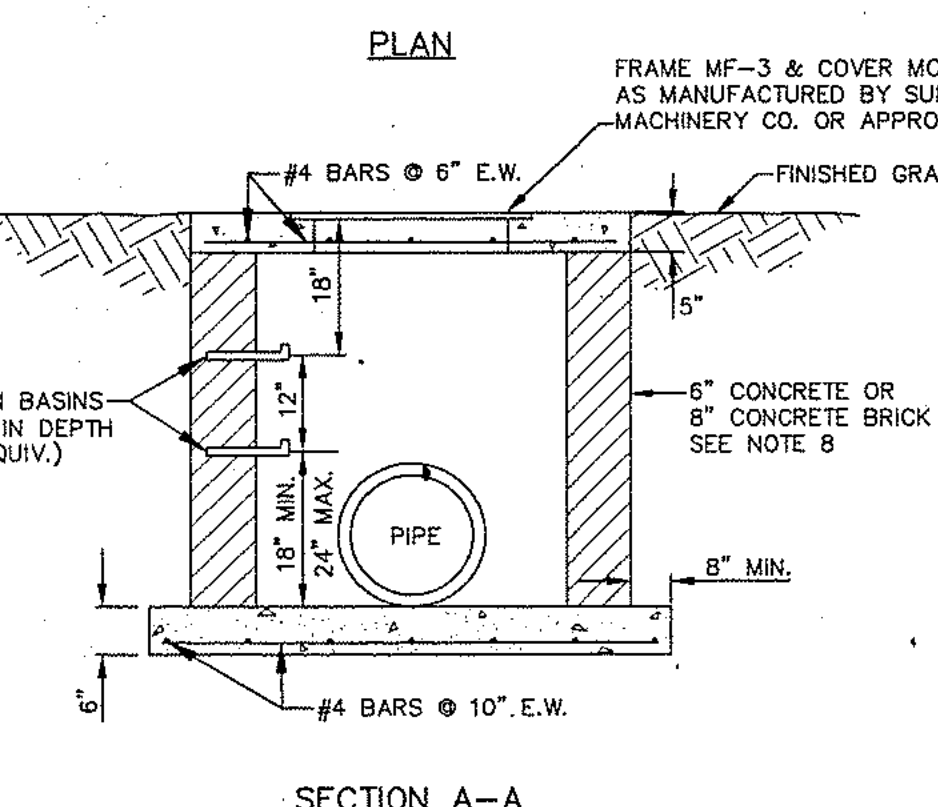
PIPE DIA. (IN.)	D50 (NO.)	12	15	18	24	30	36	42	48
12	20	15	18	24	30	36	42	48	54
15	25	18	22	28	34	40	46	52	58
18	30	22	27	33	39	45	51	57	63
24	40	28	34	40	46	52	58	64	70
30	50	34	40	46	52	58	64	70	76
36	60	40	46	52	58	64	70	76	82
42	70	46	52	58	64	70	76	82	88
48	80	52	58	64	70	76	82	88	94



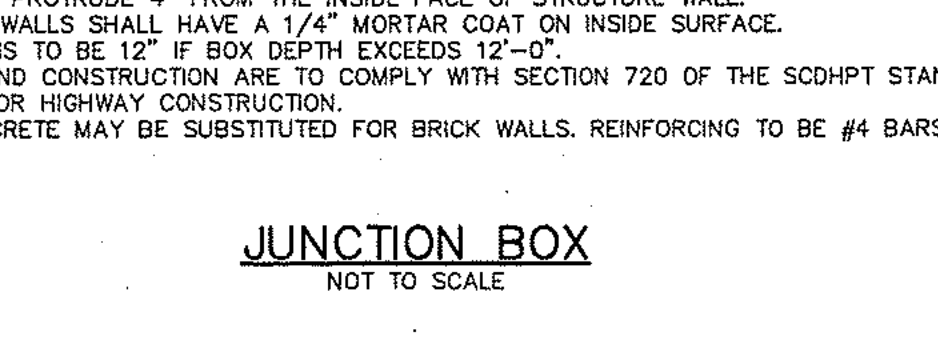
STANDARD REINFORCED CONCRETE HEADWALL WITH WINGWALLS
N.T.S.



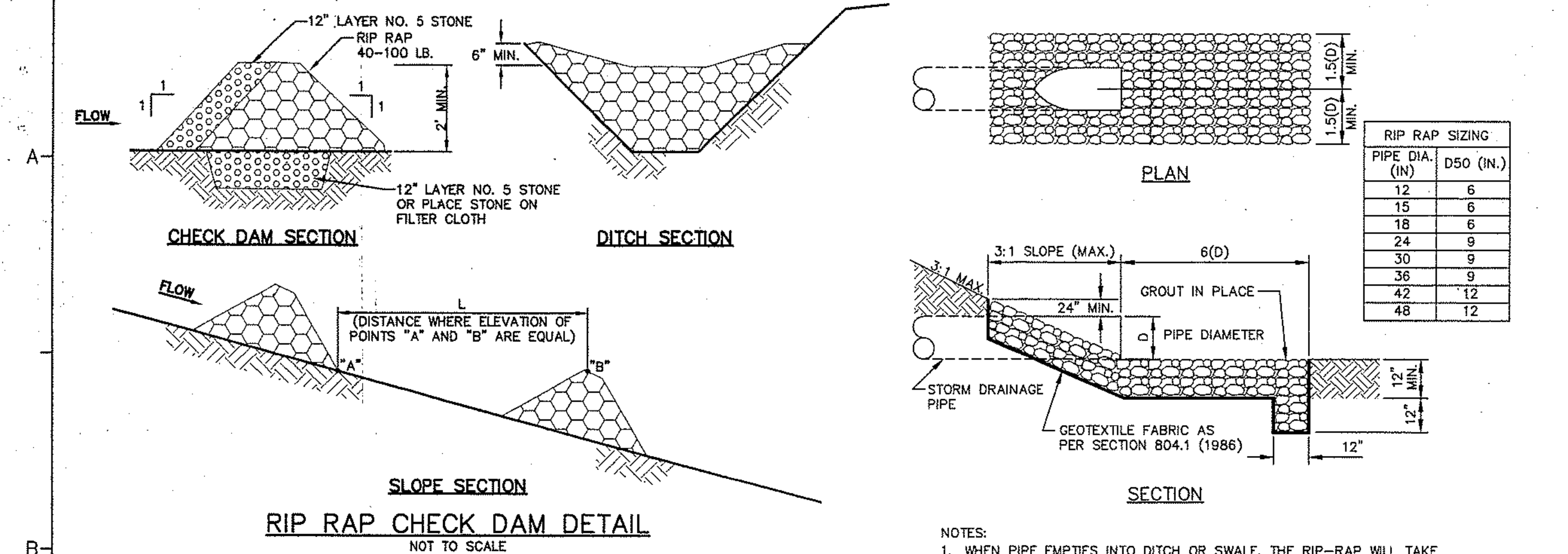
18" BARRIER TYPE CURB AND GUTTER
NOT TO SCALE



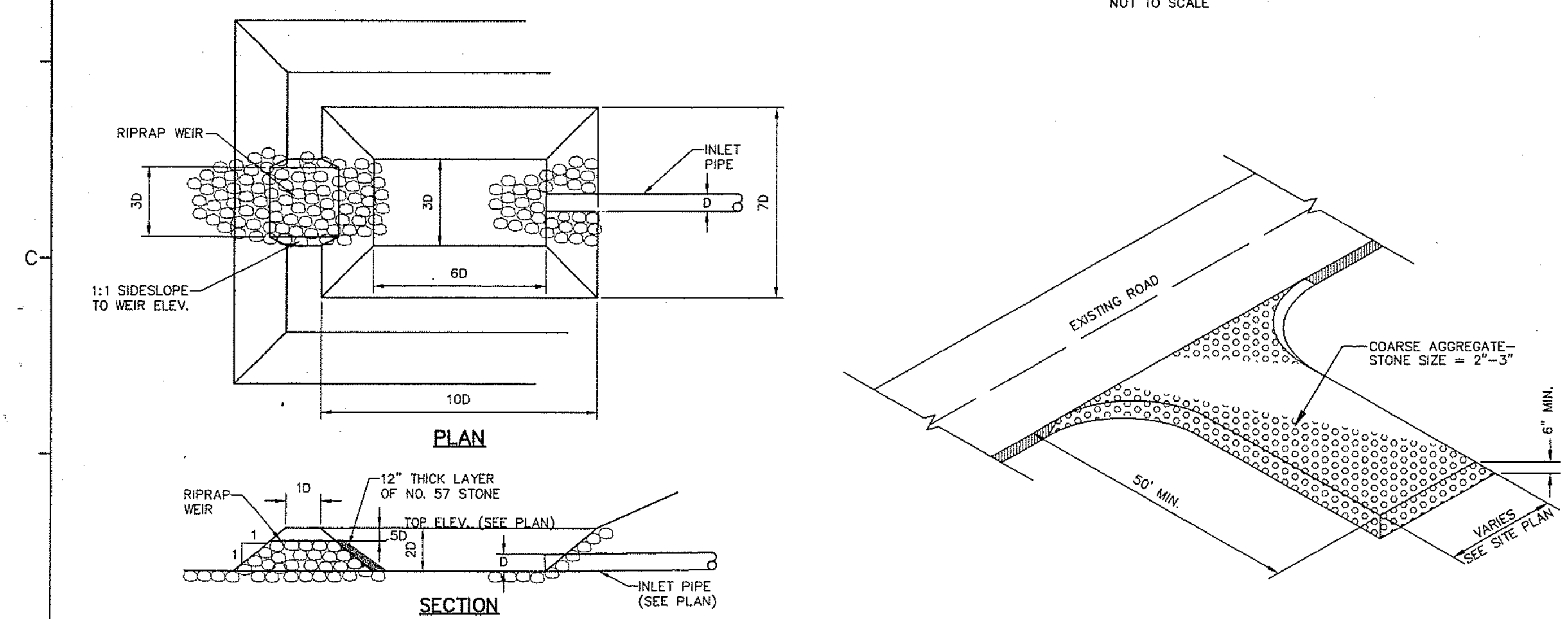
CATCH BASIN TYPE 9 (CB-9)
NOT TO SCALE



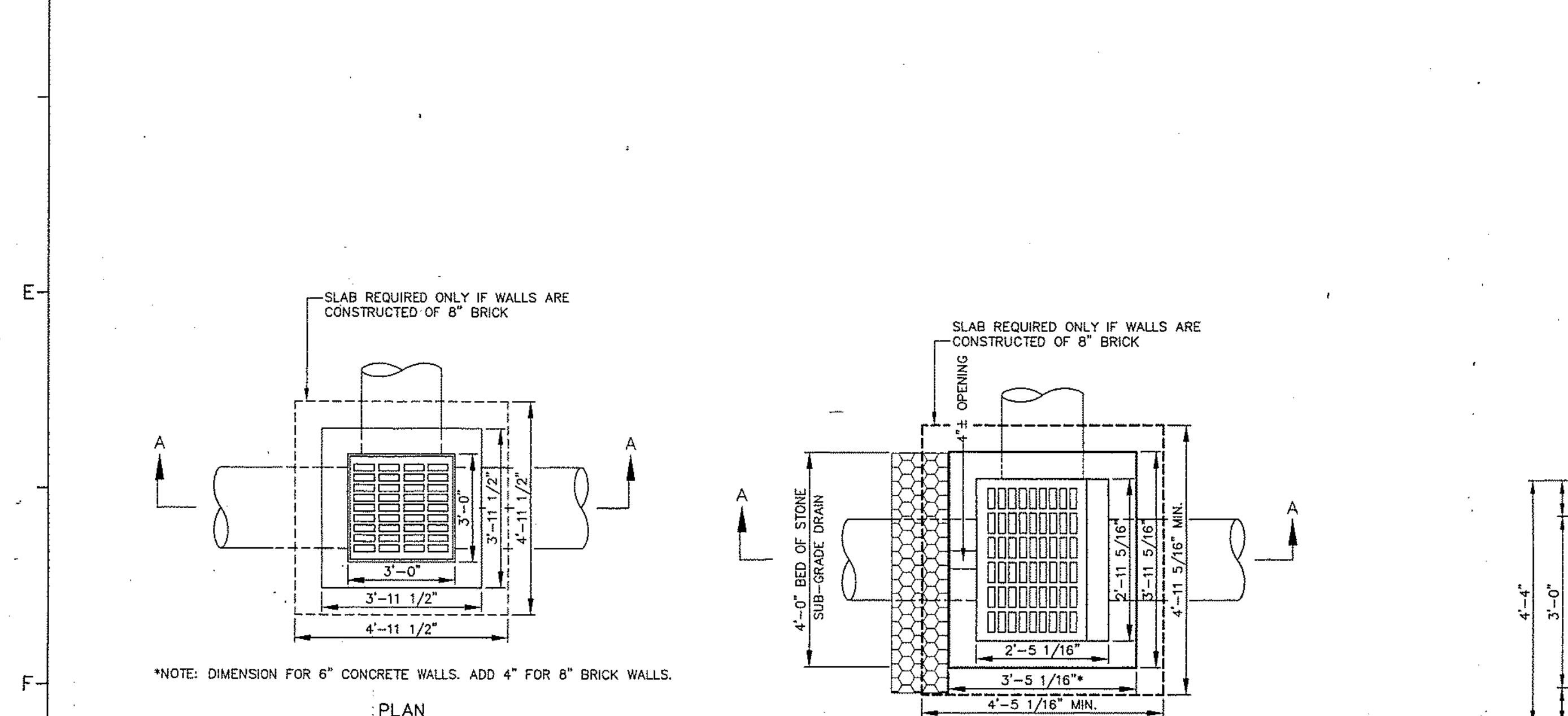
JUNCTION BOX
NOT TO SCALE



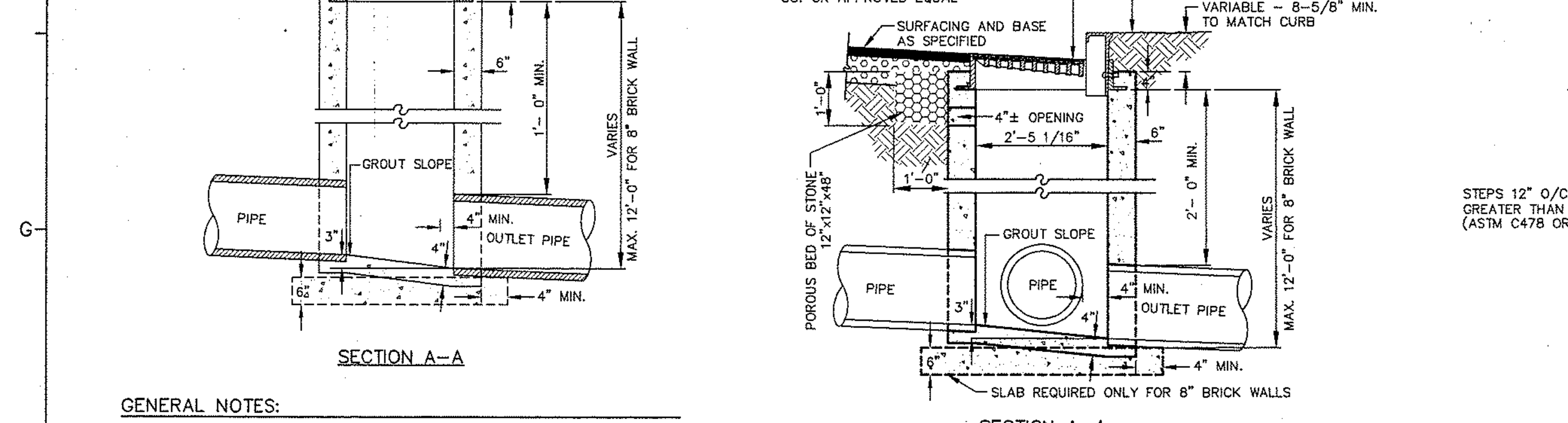
RIP-RAP CHECK DAM DETAIL
NOT TO SCALE



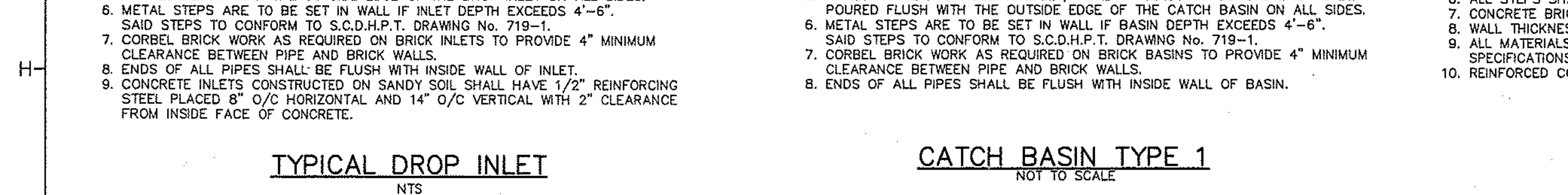
TEMPORARY GRAVEL CONSTRUCTION EXIT
NOT TO SCALE



TYPICAL DROP INLET
N.T.S.



CATCH BASIN TYPE 1
NOT TO SCALE



TYPICAL SPACE LAYOUT
NOT TO SCALE