

DM0499

March 5, 1999

# MEMORANDUM TO GROUP LEADERS & CONSULTANTS

SUBJECT: VALUE ENGINEERING PROPOSALS

The attached revised Bridge Design standard notes sheets should be used for bridge projects beginning with the May 1999 letting. The old "Alternates to Plan Details" note has been removed and a new "Value Engineering Proposals" note added in it's place.

This change is required to avoid conflict when road and bridge plans are let in the same contract. The attached new special provision entitled "Value Engineering Proposal" will be included in all bridge projects beginning with the May 1999 letting.

Plans that are complete and that will be let in May 1999 or later must be revised to include this revision. Your cooperation in this matter is appreciated.

Randy R. Cannon, P.E. Bridge Design Engineer

Attachments:

cc: Assistant Bridge Design Engineers

File: PC/REL



# (1) VALUE ENGINEERING PROPOSAL:

This value engineering specification is to provide an incentive to the Contractor to initiate, develop, and present to the Department of Transportation for consideration, any cost reduction proposals conceived by them involving changes in the drawings, designs, specifications, or other requirements of the contract. This specification does not apply unless the proposal submitted is specifically identified by the Contractor as being presented for consideration as a Value Engineering Proposal.

Value Engineering Proposals contemplated are those that would result in a net savings to the Department by providing a decrease in the total cost of construction or reduce the construction time without increasing the cost to construct the project. The affects the Proposal may have on the following items, but not limited to these items, will be considered by the Department when evaluating the proposal:

1) Service Life

5) Ease of Maintenance

2) Safety

6) Desired Aesthetics

3) Reliability

7) Design

4) Economy of Operation

8) Standardized Features

The Department reserves the right to reject the Proposal or deduct from the savings identified in the Proposal to compensate for any adverse effects to these items which may result form implementation of the Proposal.

The Department reserves the right to reject at its discretion any Value Engineering Proposal submitted which would require additional right-of-way. Substitution of another design alternate, which is detailed in the contract plans, for the one on which the Contractor bid, will not be allowed. Plan errors which are identified by the Contractor and which result in a cost reduction will not qualify for submittal as a Value Engineering Proposal. Pending execution of a formal supplemental agreement, implementing an approved Value Engineering Proposal, the Contractor shall remain obligated to perform in accordance with the terms of the existing contract. No time extension will be granted due to the time required to review a Value Engineering Proposal.

The Contractor is encouraged to include this specification in contracts with subcontractors. The Contractor shall encourage submissions of Value Engineering Proposals from subcontractors, however, it is not mandatory that the Contractor accept or transmit to the Department Value Engineering Proposals proposed by the subcontractors. The Contractor may choose any arrangement for the subcontractor value engineering payments, provided that these payments shall not reduce the Department's share of the savings resulting from the Value Engineering Proposal.

Should the Contractor desire a preliminary review of a possible Value Engineering Proposal, prior to expending considerable time and expense in full development, a copy of the preliminary proposal shall be submitted to the Resident Engineer. The submittal shall state, Preliminary Value Engineering Proposal Review Request and must contain sufficient drawings, cost estimates and written information that can be clearly understood and interpreted. Also, include the identity of any Private Engineering Firms proposed by the Contractor to prepare designs or revisions to designs. The Department will review the preliminary submittal only to the extent necessary to determine if it has a possible merit as a Value Engineering Proposal. This review does not obligate the Department to approve the final proposal should a preliminary review indicate the proposal has possible merit. The Department is under no obligation to consider any Value Engineering Proposal (Preliminary or Final) that is submitted.

A copy of the Final Value Engineering Proposal shall be submitted by the Contractor to the Resident Engineer. The proposal shall contain, as a minimum, the following:

- (1) A statement that the request for the modification is being made as a Value Engineering Proposal.
- (2) A description of the difference between the existing contract requirements and the proposed modifications, with the comparative advantages and disadvantages of each.
- (3) If applicable, a complete drawing of the details covering the proposed modifications and supporting design computations shall be included in the final submittal. The preparation of new

designs or revisions or modifications to the designs shown in the contract drawings shall be accomplished and sealed by a Professional Engineer registered in the State of South Carolina. Further, the Department may require a review, and possibly the redesign, be accomplished by the project's original designer, or an approved equal. The Department may contract with private engineering firms, when needed, for reviews requested by the Department. The Contractor shall contract with the original project designer, or an approved equal, when required by the Department, for any design work needed to completely and accurately prepare contract drawings. The Department may waive the requirements to have the preparation of contract drawings accomplished by a Professional Engineer or the project's original designer based on the extent, detail, and complexity of the design needed to implement the Value Engineering Proposal.

- (4) An itemized list of the contract requirements that would be modified and a recommendation of how to make each modification.
- (5) A detailed estimate of the cost of performing work under the proposed modification.
- (6) A statement of the time by which approval of the Value Engineering Proposal must be issued by the Department to obtain the total estimated cost reduction during the remainder of the contract, noting any effect on the contract completion or delivery schedule.

To facilitate the preparation of revisions to contract drawings, the Contractor may purchase reproducible copies of drawings for their use through the Department. The preparation of new design drawings by or for the Contractor shall be coordinated with the appropriate Department Branch. The Contractor shall provide, at no charge to the Department, one set of reproducible drawings of the approved design needed to implement the Value Engineering Proposal.

The Engineer will be the sole judge of the acceptability of a Value Engineering Proposal requested in accordance with these provisions and of the estimated net savings resulting from the approval of all or any part of the Proposal. The Contractor has the right to withdraw, in whole or in part, any Value Engineering Proposal not accepted by the Department within the period to be specified in the Proposal per Item (6) of the preceding paragraph.

If a Value Engineering Proposal is approved, the necessary changes will be effected by Supplemental Agreement. Included as a part of the Supplemental Agreement will be provisions for price adjustment giving the Contractor 50 percent of the net savings to the project resulting from the modifications.

The Department reserves the right to include in the Supplemental Agreement any conditions it deems appropriate for consideration, approval, and implementation of the proposal. Acceptance of the Supplemental Agreement by the Contractor shall constitute acceptance of such conditions.

The final net savings to be distributed will be the difference in cost between the existing contract cost for the involved bid items and the actual final cost occurring as a result of the modification. Only those unit bid items directly affected by the Supplemental Agreement will be considered in making the final determination of net savings. In determining the estimated net savings, the Department reserves the right to disregard the contract prices if, in the judgement of the Department, such prices do not represent a fair measure of the value of the work to be performed or to be deleted. Subsequent change documents affecting the modified unit bid items but not related to the Value Engineering Proposal will be excluded from such determination. The Department's review and administrative costs for Value Engineering Proposals will be borne by the Department. The Contractor's costs for designs and /or revisions to designs and the preparation of design drawings will be borne by the Contractor. The costs to either party will not be considered in determining the net saving obtained by implementing the Value Engineering Proposal. The Contractor's portion of the net savings shall constitute full compensation to them for effecting all changes pursuant to the agreement. The new savings will be prorated, 50 percent for the Contractor and 50 percent for the Department, for all accepted Value Engineering Proposals.

Upon execution of the Supplemental Agreement, the Department will thereafter have the right to use, duplicate or disclose in whole or in part any data necessary for utilization of the modification on other projects without obligation or compensation of any kind to the Contractor. Restrictions or conditions imposed by the Contractor for use of proposal on other projects shall not be valid.

Except as may otherwise precluded by this specification, the Contractor may submit a previously approved Value Engineering Proposal on another project.

Unless and until a Supplemental Agreement is executed and issued by the Department, the Contractor shall remain obligated to perform the work in accordance with the terms of the existing contract.

Acceptance of the modification and its implementation will not modify the completion date of the contract unless specifically provided for in the Supplemental Agreement.

The Contractor shall not be entitled to additional compensation for alterations in the plans or in the details of construction pursuant to the Value Engineering Proposal.

The Department will not be liable to the Contractor for failure to accept or act upon any Value Engineering Proposal submitted pursuant to this provision nor for any delays to the work attributable to any such proposal.

The Department reserves the right to negotiate desired changes with the Contractor under the provisions of the contract even though the changes are the result of a Value Engineering Proposal submitted on another contract. In this instance the savings will be prorated in accordance with the terms of the negotiated agreement.

STONOTES.STD

## WIDENING EXISTING CONCRETE STRUCTURE

WIDENING EXISTING CONCRETE STRUCTURE

WHERE NEW CONCRETE IS TO BE CAST AGAINST EXISTING CONCRETE, THE CONTACT SURFACE OF THE OLD CONCRETE SHALL BE CLEANED OF ALL LOOSE CONCRETE, DIRT. OIL, GREASE AND ANY OTHER DELETERIOUS SUBSTANCE. IN ADDITION, BEFORE PLACING NEW DECK SLAB CONCRETE, THE EDGE OF EXISTING DECK SLAB SHALL BE THOROUGHLY ROUGHENED TO AN AMPLITUDE OF APPROXIMATELY 1/4'. JUST PRIOR TO PLACING NEW CONCRETE. THE PORTION OF THE EXISTING SLAB FROM THE TOP SURFACE OF THE SLAB TO THE TOP LAYER OF REINFORCING SHALL BE COATED WITH A BONDING AGENT CONFORMING TO AASHTO SPECIFICATION M235 TYPE II APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE REMAINING PORTION OF THE VERTICAL FACE OF THE EXISTING SLAB SHALL BE FLUSHED WITH A 1:2 CEMENT MORTAR IMMEDIATELY PRIOR TO PLACENG THE NEW CONCRETE.

ALL REINFORCING STEEL PROTRUDING BEYOND THE SURFACE AFTER REMOVAL OF CONCRETE SHALL BE IMBEDDED IN THE NEW CONCRETE IF FEASIBLE. REINFORCING STEEL WHICH CANNOT BE IMBEDDED IN NEW CONCRETE SHALL BE CUT OFF FLUSH WITH THE SURFACE OF THE CONCRETE WHEN IT WILL BE COVERED WITH A DECK OVERLAY. OTHERWISE, CUT REINFORCING OFF 1' BELOW THE CONCRETE SURFACE AND PATCH THE RESULTING HOLE WITH AN EPOXY MORTAR APPROVED BY THE ENGINEER.

THE ENTIRE COST OF THE ABOVE WORK INCLUDING ALL DRILLING, CHIPPING, REMOVING AND DISPOSING OF PORTIONS OF OLD STRUCTURE NECESSARY TO CONSTRUCT NEW STRUCTURE SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR REMOVAL AND DISPOSAL OF DESIGNATED PORTIONS OF EXISTING BRIDGES.

THE CONTRACTOR SHALL REPAIR OR REPLACE AT HIS OWN EXPENSE. AND IN A MANNER SATISFACTORY TO THE ENGINEER, ANY PORTION OF THE EXISTING STRUCTURE DAMAGED AS A RESULT OF HIS CARELESSNESS OR NEGLIGENCE.

UNLESS OTHERWISE SPECIFIED IN THESE PLANS OR THE SPECIAL PROVISIONS, THE CONTRACTOR SHALL PROVIDE NECESSARY TEMPORARY SUPPORTS FOR UTILITIES ATTACHED TO THE BRIDGE TO MAINTAIN SERVICE DURING CONSTRUCTION. THE OWNER WILL MAKE ALL NECESSARY CHANGES IN ALICAMENT AND ELEVATION OF THE UTILITY AND FURNISH PERMANENT SUPPORTS WHICH SHALL BE PLACED IN THE CONCRETE BY THE CONTRACTOR. ALL COSTS OF THIS WORK TO BE PERFORMED BY THE CONTRACTOR SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CLASS 'D' CONCRETE.

ANY NECESSARY REPAIRS TO THE EXISTING STRUCTURE, IN THE OPINION OF THE ENGINEER. ARE TO BE PAID FOR AS EXTRA WORK. IF SUCH WORK IS NOT CALLED FOR IN THESE PLANS OR IN THE SPECIAL PROVISIONS FOR THIS PROJECT.

ALL DIMENSIONS OF NEW CONSTRUCTION ARE SUBJECT TO EXISTING CONDITIONS. IT IS RECOMMENDED THAT ALL DIMENSIONS WHICH MAY AFFECT MATERIALS AND QUANTITIES AS SHOWN ON THESE PLANS BE VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING THE MATERIALS.

## DRIVING PILES THROUGH FILL

WHERE PILES OCCUR IN FILL EXCEEDING 10 FEET IN HEIGHT.
THE FILL SHALL BE IN PLACE BEFORE PILES ARE DRIVEN.

TIMBER OR PRESTRESSED CONCRETE PILES WHICH ARE TO BE DRIVEN THROUGH FILL, SHALL BE INSTALLED IN PRE-BORED HOLES EXTENDING TO THE ORIGINAL GROUND.

HOLES FOR TIMBER PILES SHALL HAVE A 14' MINIMUM DIAMETER. HOLES FOR SQUARE PRESTRESSED CONCRETE PILES SHALL HAVE A MINIMUM DIAMETER OF 1.25 TIMES THE NOMINAL PILE SIZE. ALL COST OF PRE-BORING FILES FOR PILE INSTALLATION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PILES.

## REINFORCING STEEL

GRADE 420 REINFORCING STEEL CONFORMING TO ASTM A 615M-960 WILL BE USED ON THIS PROJECT. UNLESS SHOWN OTHERWISE, ALL TIES & STIRRUPS SHALL HAVE 135' HOOKS WITH EXTENSIONS NOT LESS THAN THE LARGER OF TEN BAR DIAMETERS OR 6 INCHES.

REINFORCING BAR FABRICATION SHALL CONFORM TO THE CURRENT C.R.S.I. MANUAL OF STANDARD PRACTICE EXCEPT AS NOTED

THE CONTRACTOR MAY ELECT TO SUBSTITUTE MECHANICAL REINFORCING COUPLERS FOR THE LAP SPLICES DETAILED IN THE PLANS. ALL MECHANICAL REINFORCING COUPLERS SHALL COMPLY WITH

ALL COSTS FOR FURNISHING AND INSTALLING COUPLERS SHALL BE CONSIDERED INCIDENTAL TO PLACING REINFORCING STEEL. PAYMENT FOR MECHANICAL REINFORCING COUPLERS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR REINFORCING STEEL.

WHEN APPROVED BY THE ENGINEER, WELDED LAP SPLICES SHALL BE MADE WITH LOW HYDROGEN TYPE ELECTRODES AND SHALL CONFORM WITH REQUIREMENTS OF AWS DI.4 STRUCTURAL WELDING CODE.

THE WELDING PROCEDURE AND TWO TEST SAMPLES SHALL BE SUBMITTED FOR APPROVAL BY THE DEPARTMENT PRIOR TO BEGINNING THE FABRICATION OF THE SPLICES.

LAP SPLICES IN COLUMN AND SHAFT REINFORCING STEEL SHALL NOT BE ALLOWED.

## MATERIAL AND WORKMANSHIP

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SOUTH CAROLINA DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 1986 EDITION.

## STRUCTURAL STEEL

BEAMS SHALL BE CAMBERED FOR VERTICAL CURVE AND DEAD LOAD DEFLECTION, EITHER IN MILL OR IN SHOP.

LAYOUT DIMENSIONS AND STANDARD LENGTHS OF BEAMS SHOWN ARE HORIZONTAL DIMENSIONS WHICH MUST BE INCREASED WHEN BRIDGE IS ON GRADE.

SHOP INSPECTION OF THE STRUCTURAL STEEL WILL BE PERFORMED BY THE DEPARTMENT OR LTS AUTHORIZED INSPECTION AGENCY AND THE CONTRACTOR SHALL SO STIPULATE IN HIS ORDER TO THE FABRICATOR. ALSO, THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF THE NAME AND ADDRESS OF THE FABRICATOR OF THE STRUCTURAL STEEL AS SOON AS THE FABRICATOR HAS BEEN GIVEN THE CONTRACT TO FABRICATE SO THAT THE INSPECTION PROCEDURE CAN BE SET UP.

WELDING TO THE BEAMS AND PLATE GIRDERS FOR THE PURPOSE ATTACHING ERECTION HARDWARE, EITHER FIELD OR SHOP, WILL NOT BE PERMITTED.

PAINTING OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH SPECIAL PROVISIONS.

## CHARPY V-NOTCH TOUGHNESS TEST

ALL STEEL FOR USE IN MAIN LOAD-CARRYING MEMBER COMPONENTS SUBJECT TO TENSILE STRESS SHALL CONFORM TO THE APPLICABLE CHARPY V-NOTCH IMPACT TEST REQUIREMENTS OF AASHTO M 270 (ASTM A 709) AS SPECIFIED FOR ZONE 2.

SPECIFICALLY, CHARPY TESTING SHALL BE REQUIRED AS FOLLOWS:

- SIMPLE SPAN ROLLED BEAM THE BEAM ITSELF AS WELL AS BOTTOM COVER PLATE, IF APPLICABLE.
- SIMPLE SPAN PLATE GIRDER THE WEB, BOTTOM FLANGE PLATE AND SPLICE PLATES FOR WEB AND BOTTOM FLANGE EXCLUDING ANY FILLER PLATES.
- CONTINUOUS SPAN ROLLED BEAM THE BEAM ITSELF AS WELL AS ANY TOP OR BOTTOM COVER PLATE LOCATED IN A TENSION REGION AS INDICATED IN THE PLANS. ALSO, ALL SPLICE PLATES FOR WEB AND TOP AND BOTTOM FLANGE PLATES EXCLUDING ANY FILLER PLATES.
- CONTINUOUS SPAN PLATE GIRDER ALL WEB PLATES, THE TOP FLANGE PLATES AND THE BOTTOM FLANGE PLATES LOCATED IN A TENSION REGION AS INDICATED IN THE PLANS. ALSO, ALL SPLICE PLATES FOR WEB AND TOP AND BOTTOM FLANGE PLATES EXCLUDING ANY FILLER PLATES.
- E) CURVED GIRDER STRUCTURES -IN ADDITION TO CHARPY TESTING OF WEB.FLANGE & SPLICE PLATES AS APPLICABLE AND AS SPECIFIED IN (A) THRU (D) ABOVE, ALL DIAPHRAGM MEMBERS, CONNECTION PLATES AND GUSSET PLATES SHALL

## HIGH STRENGTH BOLTED CONNECTIONS

ALL BOLTED CONNECTIONS SHALL HAVE 7/8' DIAM. ASTM A325
BOLTS. SEE SPECIAL PROVISIONS FOR STRUCTURAL STEEL FASTENERS.
ALL BOLTED CONNECTIONS ARE DESIGNED AS SLIP-CRITICAL CONNECTIONS HAVING CLASS 'B' CONTACT SURFACES.

GENERALLY, HOLES FOR 7/8' BOLTS SHALL BE 15/16' DIAM. HOWEVER, OVERSIZE HOLES, 3/16' LARGER THAN BOLT DIAM MAY BE USED IN DIAPHRAGMS AND/OR CROSSFRAMES AND THEIR CONNECTION PLATES PROVIDED HARDENED WASHERS ARE INSTALLED O PLATES PROVIDED HARDENED WASHERS ARE INSTALLED DVER UVERSIZE HOLES IN THE OUTER PLY OF THE MATERIAL GRIPPED. IN EVERY CASE A HARDENED WASHER SHALL BE INSTALLED UNDER THE ELEMENT TURNED FOR EACH BOLT OF A BOLTED CONNECTION. THE SHOP PLANS SHALL INDICATE WHICH HOLES ARE TO BE OVERSIZE AND WHERE HARDENED WASHERS ARE REQUIRED. ALL COSTS OF USING OVERSIZE HOLES, TO INCLUDE FURNISHING ADDITIONAL HARDENED WASHERS AS NECESSARY, SHALL BE AT NO EXPENSE TO THE DEPARTMENT.

THE MINIMUM DISTANCE BETWEEN CENTERS OF 7/8" DIAM. BOLTS FOR DIAPHRAGM CONNECTIONS SHALL BE 3" AND THE EDGE DISTANCE SHALL BE 1 1/2" FROM THE CENTERLINE OF BOLTS.

ALL COMPONENTS OF ANCHOR BOLT ASSEMBLIES SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO MITTOUR M232 AS APPLICABLE. THE WEIGHT OF ANCHOR BOLT ASSEMBLIES IS INCLUDED IN THE BENT QUANTITIES FOR REINFORCING STEEL. ALL COSTS OF FURNISHING AND INSTALLING ANCHOR BOLT ASSEMBLIES SHALL BE INCLUDED IN AND PAID FOR AT THE UNIT PRICE BID FOR

### BEARING ASSEMBLIES

ALL STEEL BEARING ASSEMBLY COMPONENTS SHALL MEET AASHTO M270 GR. 36 (ASTM A709 GR. 36) UNLESS OTHERWISE SPECIFIED IN THE PLANS AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO MILL OR M232 AS APPLICABLE.

AFTER THE REQUIRED FIELD WELDING OF HOT-DIP CALVANIZED BEARING ASSEMBLIES, THE WELD AREAS AND/OR ANY DAMAGED AREAS TO THE CALVANIZED COATING SHALL BE FIELD REPAIRED IN ACCORDANCE WITH ASTM A-780.

ALL COST OF FURNISHING AND INSTALLING STEEL BEARING ASSEMBLY COMPONENTS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR STRUCTURAL STEEL IF A BID ITEM FOR STRUCTURAL STEEL IS INCLUDED IN THE PROJECT. OTHERWISE, THE COST SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED BEAMS.

## ALLOWANCE FOR DEAD LOAD DEFLECTION AND SETTLEMENT

IN SETTING FORMS FOR STRUCTURAL STEEL OR PRESTRESSED CONCRETE BEAM SPANS, AN ALLOWANCE SHALL BE APPLIED TO DESIGN FINISH GRADE TO COMPENSATE FOR COMPUTED DEAD LOAD

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS. AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS. SETTLEMENT OF FALSEWORK AND LONG-TIME DEFLECTION SUCH THAT ON REMOVAL OF FALSEWORK THE TOP OF THE STRUCTURE SHALL CONFORM TO THEORETICAL FINISH GRADE PLUS THE ALLOWANCE FOR LONG-TIME DEFLECTION.

FOR CONCRETE FLAT SLAB SPANS TWENTY TO THERTY FEET IN LENGTH, SUB- SECTION 702.27 OF THE STANDARD SPECIFICATION IS AMENDED IN PART TO REQUIRE 1/8° OF CAMBER FOR DEAD LOAD AND LONG-TIME DEFLECTION UNLESS OTHERWISE DIRECTED BY THE

## CONTRACTOR'S OPTIONAL STAY-IN-PLACE FORMS

PERMANENT STEEL BRIDGE DECK FORMS MAY BE JSED ON THIS PROJECT AT THE CONTRACTOR'S OPTION. AN EXTRA DEAD LOAD OF 16 P.S.F. HAS BEEN INCORPORATED INTO THE DESIGN OF THIS STRUCTURE TO ACCOMMODATE THE USE OF SUCH FORMS. SEE SUBSECTION 702.11(d) OF THE STANDARD SPECIFICATIONS FOR REGULIREMENTS.

SECTION 702.11 (d) -3 (b) OF THE STANDARO SPECIFICATIONS IS AMENDED TO REQUIRE THAT DEFLECTIONS CALCULATED USING THE WEIGHT OF THE FORMS, THE PLASTIC CONCRETE AND REINFORCEMENT SHALL MEET THE FOLLOWING CRITERIA AND IN NO CASE SHALL THIS LOADING BE LESS THAN 120 P.S.F. TOTAL.

DEFLECTIONS FOR FORM SPANS LESS THAN OR EGUAL TO 10 FEET SHALL NOT EXCEED, 1/180 OF THE SPAN OR 1/2 INCH WHICHEVER IS LESS. DEFLECTIONS FOR FORM SPANS GREATER THAN 10 FEET SHALL NOT EXCEED 1/240 OF THE SPAN OR 3/4 INCH WHICHEVER IS LESS.

THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT AND THE FABRICATOR IF HE ELECTS TO USE THIS OPTION SO THAT SHOP PLANS CAN BE PROPERLY DETAILED.

## CONCRETE

THE CLASS OF CONCRETE SHALL BE AS NOTED ON OTHER SHEETS OF THESE PLANS.

BUILD-UPS ON BENT CAPS SHALL BE CAST MONOLITHIC WITH CAP UNLESS INDICATED OTHERWISE IN THESE PLANS. THE TOP OF EACH BUILD-UP SHALL BE LEVEL.

PAYMENT FOR CONCRETE IN SLAB WILL BE BASED ON THEORETICAL PLAN QUANTITY. ANY NECESSARY ADJUSTMENT IN QUANTITY DUE TO VARIATION IN CAMBER SHALL BE AT THE CONTRACTOR'S EXPENSE.

SIMPLE SPANS 80 FEET OR LESS SHALL BE POURED WITHOUT A TRANSVERSE CONSTRUCTION JOINT. FOR SIMPLE SPANS OVER 80 FEET IN LENGTH, A TRANSVERSE STRIP OF THE SLAB CENTERED AT MID-SPAN AND COMPRISING APPROXIMATELY 2/3 OF THE SLAB SHALL BE POURED FIRST AND ALLOWED TO CURE FOR NOT LESS THAN 4 DAYS BEFORE THE REMAINING END SECTIONS ARE POURED. HOWEVER, WHEN FAVORABLE WEATHER CONDITIONS EXIST THE ENGINEER MAY PERMIT THE ENTIRE SLAB TO BE POURED PROVICED A SULTABLE RETARDING AGENT IS USED IN SUCH AMOUNTS THAT NONE OF THE CONCRETE OF THE POUR SHALL REACH INITIAL SET PRIOR TO COMPLETION OF THE POUR

ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.

THE MINIMUM ACCEPTABLE CONCRETE COVER FOR REINFORCING STEEL MAY BE ONE HALF INCH LESS THAN THE PLAN DIMENSIONS WHEN REQUIRED BY REINFORCING BAR FABRICATION TOLERANCES.

THE TOP ONE FOURTH INCH OF ALL CONCRETE SLABS SHALL BE CONSIDERED AS A WEARING SURFACE AND SHALL NOT BE INCLUDED IN THE SLAB DEPTH USED FOR THE CALCULATION OF SECTION PROPERTIES

## REMOVAL OF FALSEWORK AND FORMS

SECTION 702.18 OF THE STANDARD SPECIFICATIONS IS AMENDED IN PART TO THE EXTENT THAT 'UNDER URGENT CONDITIONS AND WITH THE WRITTEN APPROVAL OF THE ENGINEER, ADDITIONAL STRENGTH CONTROL CYLINDERS MAY BE MADE AND THE FALSEWORK STRUCK WHEN THESE CYLINDERS, CURED UNDER THE SAME CONDITIONS AS THE CONCRETE IN THE STRUCTURE, DEVELOP A UNIT STRENGTH OF 3. 200 PSI. HOWEVER, SUCH CONCRETE SHALL NOT BE SUBJECTED TO A SUPERIMPOSED LOAD UNTIL THE COMPRESSIVE STRENGTH IS AT LEAST 4,000 PSI.

## WORKING DRAWINGS

WORKING DRAWINGS

WHEN REQUIRED BY THE PLANS, SPECIFICATIONS OR SPECIAL PROVISIONS, THE CONTRACTOR SHALL SUBMIT SHOP PLANS, ERECTION PLANS, FALSEWORK PLANS, COFFERDAM PLANS OR ANY OTHER SUPPLEMENTARY PLANS TO THE ENGINEER FOR REVIEW. THESE PLANS, ALONG WITH ANY ASSOCIATED DESIGN CALCULATIONS, SHALL BEAR THE SEAL AND SIGNATURE OF A SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER WITH THE FOLLOWING EXCEPTIONS:

A) SHOP PLANS FOR ARMOR PLATES LOCATED AT BRIDGE ENDS OR APPROACH SLAB ENDS

B) SHOP PLANS FOR PRESTRESSED CONCRETE PILING THAT ARE FABRICATED IN ACCORDANCE WITH THE DETAILS SHOWN IN THE PLANS.

PLANS.
ALL COSTS FOR THE PREPARATION AND FURNISHING OF THE WORKING DRAWINGS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE VARIOUS PAY ITEMS OF WORK.

### PRESTRESSED BEAMS

MEMBRANE CURING COMPOUND SHALL NOT BE USED ON TOPS OR

BEAM LENGTHS GIVEN ARE BASED ON HORIZONTAL SPAN ONLY. LENGTHS SHALL BE INCREASED TO CORRECT FOR CONCRETE SHRINKAGE, CONCRETE SHORTENING WHEN THE STRANDS ARE CUT, AND FOR BEAMS BEING ON A GRADE.

SECTION 704.15 AND 704.16 OF THE STANDARD SPECIFICATIONS ARE AMENDED IN PART TO REQUIRE THAT PRESTRESSED CONCRETE BEAMS BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER LINEAR FOOT.

## SPECIFICATIONS:

AASHTO 1996 STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES

ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE (LATEST EDITION) WITH ADDITIONS AND REVISIONS AS STATED IN THE SPECIAL PROVISIONS.

AASHTO HS25-44 LOADING OR AN ALTERNATE MILITARY LOADING OF 2 AXLES 4 FEET APART WITH EACH AXLE WEIGHING 24,000 POUNDS. WHICHEVER PRODUCES THE GREATEST STRESS.

#### DESIGN DATA:

STRENGTH DESIGN METHOD (LOAD FACTOR DESIGN)

CONCRETE: CLASS 'D' ,  $f'_{C}$  = 4,000 P.S.I.

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES ON THIS SHEET AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE STANDARD SPECIFICATIONS SEC. 105.04.

#### VALUE ENGINEERING PROPOSALS:

THE CONTRACTOR MAY INITIATE, DEVELOP, AND PRESENT TO THE DEPARTMENT OF TRANSPORTATION FOR CONSIDERATION, ANY COST REDUCTION PROPOSALS CONCEIVED BY THEM INVOLVING CHANGES IN THE DRAWINGS, DESIGNS, SPECIFICATIONS, OR OTHER REQUIREMENTS OF THE CONTRACT. ALL VALUE ENGINEERING PROPOSALS SHALL COMPLY WITH THE REQUIREMENTS OF THE SPECIAL PROVISIONS.

## EXCAVATION FOR END BENT

ALL COST OF EXCAVATION NECESSARY TO CONSTRUCT END BENTS AND TO REMOVE MATERIAL UNDER SUPERSTRUCTURE TO AN ELEVATION 1'-0" BELOW TOPS OF END BENT CAPS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CLASS 'D' CONCRETE.

IF A CONCRETE FOOTING IS USED FOR THE END BENT. THE EXCAVATION BELOW THAT INCLUDED FOR THE CAP AND BERM IN THE ABOVE PARAGRAPH WILL BE PAID FOR AT THE UNIT PRICE BID FOR EXCAVATION. EXCAVATION ABOVE THIS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CLASS 'D' CONCRETE.

## COMPLETION DATES

THE CONTRACTOR SHALL PLACE YEAR OF COMPLETION ON INSIDE FACE OF RIGHT SIDE BARRIER PARAPET/RAIL AT BEGINNING OF BRIDGE AND ON LEFT SIDE BARRIER PARAPET/RAIL AT END OF BRIDGE. NUMBERS ARE TO BE RECESSED IN THE CONCRETE USING NUMBERS THAT ARE FABRICATED FROM REUSABLE/DURABLE MATERIAL AND APPROVED BY THE ENGINEER. THE CONTRACTOR WILL BE RESPONSIBLE FOR SUPPLYING THE NUMBERS WITH DIMENSIONS SHOWN ON STANDARD DRAWING NUMBERS. STD FOUND ON SCOOT INTERNET FTP SITE AT FTP. DOT. STATE. SC. US LOGGN AS ANUNYMOUS. LOCATED IN DIR=PUB/BR CONSULTANT/ESTANDARD OR A COPY CAN BE OBTAINED FROM THE RESIDENT ENGINEER.

DES.		1		FILE	NO		ROUTE	COUNTY		DRAWING N	
DR.	GLP	BWB	9-89	1							
QUAN.		<u> </u>		]							
REVIE	VED			]		ST	'AND	ARD	NOT	`ES	
REV.	WC	RK D	wcs.	]							
REV.	REJ	JAR	11-98								
REV.	COMPL. DATE			<b>—</b>							
	REJ	JAR	1-99	]	BRIDGE DESIGN				COLUMBIA, S.C.		
REV.	VALUE ENG. PRO.			)	DEPARTMENT OF TRANSPORTATION						
	REJ	JAR	3-99	]		SOUTH CAROLINA					

## BAR SUPPORT DETAIL SECTION PARALLEL TO & ROADWAY

NOTE:

TERMS AND SYMBOLS USED BELOW REFER TO STANDARD TYPE BAR SUPPORTS AND CLASSES OF PROTECTION AS SPECIFIED IN C.R.S.I. MANUAL OF STANDARD PRACTICE, DATED 1997.

BAR SUPPORTS SHALL BE SPACED TO PROVIDE ADEQUATE SUPPORT FOR SLAB REINFORCING STEEL. THE LCWER LAYER OF SLAB STEEL SHALL BE SUPPORTED BY BEAM BOLSTERS (BB) BAR SUPPORTS WITH ONE ROW NEAR EACH END OF SPAN AND INTERIOR ROWS SPACED APPROXIMATELY 2'-0' ON CENTER. BB BAR SUPPORTS SHALL HAVE CLASS I MAXIMUM PROTECTION. TOP REINFORCING STEEL SHALL BE SUPPORTED BY CONTINUOUS HIGH CHAIRS UPPER (CHCU) AS SHOWN IN THE ABOVE DETAIL. SPACED 2'-6' ON CENTER MAXIMUM.

WEIGHT OF BAR SUPPORTS ARE NOT INCLUDED IN THE REINFORCING STEEL QUANTITIES. BAR SUPPORTS SHALL BE CONSIDERED INCIDENTAL TO THE REINFORCING STEEL AND ALL COSTS OF FURNISHING AND PLACING BAR SUPPORTS SHALL BE INCLUDED IN THE UNIT PRICE BID REPORTED STEEL STEEL PLACING BAR SUPPORTS S FOR REINFORCING STEEL.

## PLASTIC BAR SUPPORTS:

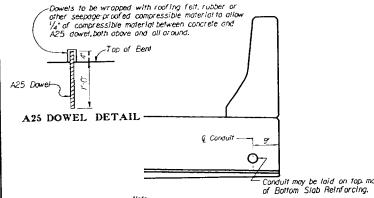
PLASTIC BAR SUPPORTS MAY BE USED IN LIEU OF BB WIRE SUPPORTS.

PLASTIC BAR SUPPORTS SHALL MEET THE FOLLOWING REQUIREMENTS:

- CHAIRS AND BOLSTERS MUST BE OF ADEQUATE STRENGTH TO RESIST A 300 POUND CONCENTRATED LOAD WITHOUT PERMANENT DEFORMATION OR BREAKAGE.
- THE MATERIAL FROM WHICH PLASTIC BAR SUPPORTS ARE MANUFACTURED SHALL BE EITHER VIRGIN RESIN OR FIRST GENERATION RECYCLED THERMOPLASTIC RESIN, BE COLORED WHITE, GRAY, OR BLACK, AND BE CHEMICALLY INERT IN CONCRETE.
- PLASTIC REBAR SUPPORTS SHALL BE MOLDED IN A CONFIGURATION WHICH DOES NOT RESTRICT CONCRETE FLOW AND CONSOLIDATION AROUND AND UNDER THE REBAR SUPPORT.

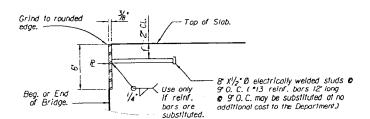
## INDEX PILES:

THE PILE LENGTHS GIVEN ARE FOR SID ESTIMATION PURPOSES ONLY.
ONE 18-IN, SQUARE PRESTRESSED INDEX PILE 41 FT. LONG SHALL BE
DRIVEN AT AN INTERIOR BENT AS DIRECTED BY THE ENGINEER. THE
DEPARTMENT RESERVES THE RIGHT 10 ADD. DELETE, OR SHIFT INDEX
PILINGS. ANY ADDITIONAL INDEX PILES WILL BE PAID FOR AS PRESTRESED INDEX PILE (18-IN, SQ.). THE REMAINDER OF THE PILES
SHALL NOT BE CAST UNTIL ALL INDEX PILES FOR THAT BRIDGE HAVE
BEEN DRIVEN AND PILE LENGTHS APPROVED BY THE ENGINEER. ALL
COSTS OF MATERIAL. EQUIPMENT, AND LABOR NECESSARY TO INSTALL
THE INDEX PILES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR
PRESTRESSED INDEX PILING (18-IN, SQ.). THE ENGINEERING MAY REROUTE THE CONTRACTOR TO PRE-DRILL OR SPUD IN ORDER TO OBTAIN
THE NECESSARY PENETRATION. ALL COST FOR PRE-DRILLING OF SPUDDING WILL BE INCLUDED IN THE PRICE BID FOR PRESTRESSED CONCRETE
PILING (18-IN, SQ.).



Conduits necessary for utilities to be furnished by the utility company and placed at no expense to the department. Use Slip Coupling on Conduits at Expansion Joints.

DETAIL SHOWING CONDUIT PLACEMENT



# ARMOR PLATE DETAIL

NOTE: THE 3/8 \* THICK PLATES WILL BE REQUIRED AT THE BEGINNING AND END OF THE BRIDGE.

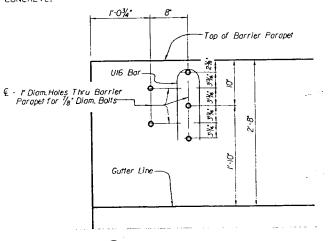
STEEL FOR THE ARMOR PLATES SHALL CONFORM TO THE LATEST AASHTO M270 GRADE 50W (ASTM A709 GR. 50W) STEEL AND NEITHER THE PLATES NOR THE ANCHOR STUDS NEED BE PAINTED.

THE FABRICATED PLATES SHALL CONFORM TO THE CROWN AND GRADE OF THE ROADWAY AND SHALL EXTEND FROM GUTTER LINE TO GUTTER LINE. THE PLATES MAY BE FABRICATED IN REASONABLE LENGTHS AND CONNECTED AT THE JOB SITE WITH FULL PENETRATION BUTT WELDS GROUND FLUSH ALONG THE TOP FACE OF CONNECTED PLATES.

IF NECESSARY, LONGITUDINAL REINFORCING BARS OF THE SLAB MAY BE SHIFTED LATERALLY TO CLEAR ANCHOR STUDS.

IF DESIRED BY THE CONTRACTOR, 9/16 0 HOLES SPACED APPROXI-MATELY 2'-0' O.C., MAY BE PROVIDED IN LOWER PORTION OF THE PLATES TO BOLT THE PLATES TO THE FORMS.

ALL COSTS OF MATERIAL AND WORKMANSHIP TO FABRICATE, FURNISH AND INSTALL THE ARMOR PLATES AND ANCHOR STUDS COMPLETE IN PLACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CLASS 'D'



O<sub>NOTE:</sub>

## THRIE BEAM GUARD RAIL ATTACHMENT TO PARAPET

THE 1 DIAM, HOLES MAY BE FORMED WITH PLASTIC OR PVC PIFE HAVING AN I.D. OF 1 (+ 1/8 ) OR 1 I.D. GALVANIZED STANDARD WEIGHT STEEL PIPE.

ALL COST OF PIPE AND INSTALLATION SHALL BE INCLUDED IN THE PRICE BID FOR REINFORCING STEEL.

ALL PIPE TO REMAIN IN PLACE WHEN FORMS ARE REMOVED.

THE RESIDENT ENGINEER SHALL CHECK THE LOCATION OF THE HOLES O INSURE THAT THE GUARDRAIL SHOE WILL FIT PROPERLY WHEN

ALL GUARDRAIL AND BOLTS TO BE FURNISHED AND INSTALLED BY CONTRACTOR.

## WORKING DRAWINGS

WHEN REQUIRED BY THE PLANS, SPECIFICATIONS OR SPECIAL PROVISIONS, THE CONTRACTOR SHALL SUBMIT SHOP PLANS, ERECTION PLANS, FALSEWORK PLANS, COFFERDAM PLANS OR ANY OTHER SUPPLEMENTARY PLANS TO THE ENGINEER FOR REVIEW. THESE PLANS, ALONG WITH ANY ASSOCIATED DESIGN CALCULATIONS, SHALL BEAR THE SEAL AND SIGNATURE OF A SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER WITH THE FOLLOWING EXCEPTIONS:

A) SHOP PLANS FOR ARMOR PLATES LOCATED AT BRIDGE ENDS OR APPROACH SLAB ENDS

B) SHOP PLANS FOR PRESTRESSED CONCRETE PILING THAT ARE EXPRICATED IN ACCORDANCE WITH THE DETAILS SHOWN IN THE

PLANS.

ALL COSTS FOR THE PREPARATION AND FURNISHING OF THE WORKING DRAWINGS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE VARIOUS PAY ITEMS OF WORK.

#### CONCRETE

THE CLASS OF CONCRETE SHALL BE AS NOTED ON OTHER SHEETS OF THESE PLANS.

BUILD-UPS ON BENT CAPS SHALL BE CAST MONOLITHIC WITH UNLESS INDICATED OTHERWISE IN THESE PLANS. THE TOP OF EACH BUILD-UP SHALL BE LEVEL.

PAYMENT FOR CONCRETE IN SLAB WILL BE BASED ON THEORETICAL PLAN QUANTITY. ANY NECESSARY ADJUSTMENT IN QUANTITY DUE TO VARIATION IN CAMBER SHALL BE AT THE CONTRACTOR'S EXPENSE.

EXPOSED EDGES SHALL BE CHAMFERED 3/4' UNLESS OTHERWISE NOTED.

THE MINIMUM ACCEPTABLE CONCRETE COVER FOR REINFORCING STEEL MAY BE ONE HALF INCH LESS THAN THE PLAN DIMENSIONS WHEN REQUIRED BY REINFORCING BAR FABRICATION TOLERANCES.

THE TOP ONE FOURTH INCH OF ALL CONCRETE SLABS SHALL BE CONSIDERED AS A WEARING SURFACE AND SHALL NOT BE INCLUDED IN THE SLAB DEPTH USED FOR THE CALCULATION OF SECTION PROPERTIES.

## VALUE ENGINEERING PROPOSALS:

THE CONTRACTOR MAY INITIATE, DEVELOP, AND PRESENT TO THE DEPARTMENT OF TRANSPORTATION FOR CONSIDERATION, ANY COST REDUCTION PROPOSALS CONCEIVED BY THEM INVOLVING CHANGES IN THE DRAWINGS, DESIGNS, SPECIFICATIONS, OR OTHER REQUIREMENTS OF THE CONTRACT. ALL VALUE ENGINEERING PROPOSALS SHALL COMPLY WITH THE REQUIREMENTS OF THE SPECIAL PROVISIONS.

#### REINFORCING STEEL

GRADE 420 REINFORCING STEEL CONFORMING TO ASTM A 615M-960 WILL BE USED ON THIS PROJECT. UNLESS SHOWN OTHERWISE, ALL TIES & STIRRUPS SHALL HAVE 135 HOOKS WITH EXTENSIONS NOT LESS THAN THE LARGER OF TEN BAR DIAMETERS OR 6 INCHES.

REINFORCING BAR FABRICATION SHALL CONFORM TO THE CURRENT C.R.S.I. MANUAL OF STANDARD PRACTICE EXCEPT AS NOTED ABOVE.

THE CONTRACTOR MAY ELECT TO SUBSTITUTE MECHANICAL REINFORCING COUPLERS FOR THE LAP SPLICES DETAILED IN THE PLANS. ALL MECHANICAL REINFORCING COUPLERS SHALL COMPLY WITH THE CRECIAL PROJECTION. THE SPECIAL PROVISIONS.

ALL COSTS FOR FURNISHING AND INSTALLING COUPLERS SHALL BE CONSIDERED INCIDENTAL TO PLACING REINFORCING STEEL. PAYMENT FOR MECHANICAL REINFORCING COUPLERS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR REINFORCING STEEL.

WHEN APPROVED BY THE ENGINEER, WELDED LAP SPLICES SHALL BE MADE WITH LOW HYDROGEN TYPE ELECTRODES AND SHALL CONFORM WITH REQUIREMENTS OF AWS D1.4 STRUCTURAL WELDING CODE.

THE WELDING PROCEDURE AND TWO TEST SAMPLES SHALL BE SUBMITTED FOR APPROVAL BY THE DEPARTMENT PRIOR TO BEGINNING THE FABRICATION OF THE SPLICES.

LAP SPLICES IN COLUMN AND SHAFT REINFORCING STEEL SHALL NOT BE ALLOWED.

## ALLOWANCE FOR DEAD LOAD DEFLECTION AND SETTLEMENT

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS. SETTLEMENT OF FALSEWORK AND LONG-TIME DEFLECTION SUCH THAT ON REMOVAL OF FALSEWORK THE TOP OF THE STRUCTURE SHALL CONFORM TO THEORETICAL FINISH GRADE PLUS THE ALLOWANCE FOR LONG-TIME DEFLECTION.

FOR CONCRETE FLAT SLAB SPANS TWENTY TO THIRTY FEET IN LENGTH, SUB- SECTION 702.27 OF THE STANDARD SPECIFICATION IS AMENDED IN PART TO REQUIRE 1/8 OF CAMBER FOR DEAD LOAD AND LONG-TIME DEFLECTION UNLESS OTHERWISE DIRECTED BY THE

## COMPLETION DATES

THE CONTRACTOR SHALL PLACE YEAR OF COMPLETION ON INSIDE FACE OF RIGHT SIDE BARRIER PARAPET/RAIL AT BEGINNING OF BRIDGE AND ON LEFT SIDE BARRIER PARAPET/RAIL AT END OF BRIDGE. NUMBERS ARE TO BE RECESSED IN THE CONCRETE USING NUMBERS THAT ARE FABRICATED FROM REUSABLE/DURABLE MATERIAL AND APPROVED BY THE ENGINEER. THE CONTRACTOR WILL BE RESPONSIBLE FOR SUPPLYING THE NUMBERS WITH THE DIMENSIONS SHOWN ON STANDARD DRAWING NUMBERS. STD FOUND ON SCOOT INTERNET FTP SITE AT FTP, DOT. STATE. SC. US LOCON AS ANONYMOUS. LOCATED IN DIR:PUB/BR CONSULTANT/ESTANDARD CR A COPY CAN BE OBTAINED FROM THE RESIDENT ENGINEER.

## EXCAVATION FOR END BENT

ALL COST OF EXCAVATION NECESSARY TO CONSTRUCT END BENTS AND TO REMOVE MATERIAL UNDER SUPERSTRUCTURE TO AN ELEVATION 1'-0' BELOW TOPS OF END BENT CAPS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CLASS 'D' CONCRETE.

IF A CONCRETE FOOTING IS USED FOR THE END BENT, THE EXCAVATION BELOW THAT INCLUDED FOR THE CAP AND BERM IN THE ABOVE FARAGRAPH WILL BE PAID FOR AT THE UNIT PRICE BID FOR EXCAVATION. EXCAVATION ABOVE THIS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CLASS 'D' CONCRETE.

FOR CONCRETE SLABS BEARING ON CONCRETE, THE TOP OF CAPS UNDER BEARING AREAS SHALL RECEIVE A SUITABLE TROWEL FINISH INSURE A SMOOTH AND LEVEL BEARING SURFACE. SEE STANDARD SPECIFICATIONS PARAGRAPH 702.26.

## DRIVING PILES THROUGH FILL

WHERE PILES OCCUR IN FILL EXCEEDING 10 FEET IN HEIGHT.
THE FILL SHALL BE IN PLACE BEFORE PILES ARE DRIVEN.

TIMBER OR PRESTRESSED CONCRETE PILES WHICH ARE TO BE DRIVEN THROUGH FILL, SHALL BE INSTALLED IN PRE-BORED HOLES EXTENDING TO THE ORIGINAL GROUND.

HOLES FOR TIMBER PILES SHALL HAVE A 14' MINIMUM DIAMETER. HOLES FOR SQUARE PRESTRESSED CONCRETE PILES SHALL HAVE A MINIMUM DIAMETER OF 1.25 TIMES THE NOMINAL PILE SIZE. ALL COST OF PRE-BORING FILLS FOR PILE INSTALLATION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PILES.

## REMOVAL OF FALSEWORK AND FORMS

SECTION 702.18 OF THE STANDARD SPECIFICATIONS IS AMENDED IN PART TO THE EXTENT THAT 'UNDER URGENT CONDITIONS AND WITH THE WRITTEN APPROVAL OF THE ENGINEER, ADDITIONAL STRENGTH CONTROL CYLINDERS MAY BE MADE AND THE FALSEWORK STRUCK WHEN THESE CYLINDERS, CURED UNDER THE SAME CONDITIONS AS THE CONCRETE IN THE STRUCTURE, DEVELOP A UNIT STRENGTH OF A SUPERIMPOSED LOAD UNTIL THE COMPRESSIVE STRENGTH IS AT LEAST 4 ROAD SLOAD UNTIL THE COMPRESSIVE STRENGTH IS AT LEAST 4,000 PSI.

#### SPECIFICATIONS:

AASHTO 1996 STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES. AND INTERIMS.

HND INTERIMS.
ANSI/AASHTO/AWS DI.5 BRIDGE WELDING CODE (LATEST EDITION)
HE TH ADDITIONS AND REVISIONS AS STATED IN THE SPECIAL PROVI-

### LIVE LOAD:

AASHTO HS25-44 LOADING OR AN ALTERNATE MILITARY LOADING OF 2 AXLES 4 FEET APART WITH EACH AXLE WEIGHING 24,000 POUNDS, WHICHEVER PRODUCES THE GREATEST STRESS.

# DESIGN DATA:

STRENGTH DESIGN METHOD (LOAD FACTOR DESIGN )

CONCRETE: CLASS 'D' .  $f'_{c}$  = 4.000 P.S.I.

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES ON THIS SHEET AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE STANDARD SPECIFICATIONS SEC. 105.04.

## MATERIAL AND WORKMANSHIP

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN
THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL
BE IN ACCORDANCE WITH THE SOUTH CAROLINA DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 1986 EDITION.

LEFT AND RIGHT SIDES, WHERE REFERRED TO IN THESE PLANS, ARE IN RELATION TO DIRECTION OF STATIONING.

REJ JAR 3-9 SOUTH CAROLINA DEV VALUE ENG. PRO. DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN REJ JAR 11-98 COMPL, DATE EJ JAR 11-9 REV STANDARD NOTES AND DETAILS WORK DWGS. REVIEWED FOR FLAT SLABS DR. REJ HDJ 7-90 7Ø2-2A