

FINAL HYDRAULICS REPORT

HYDROLOGIC DATA

DRAINAGE AREA: 20.6 sq. mi.  
 CHARACTER OF TERRAIN: Hilly  
 CHARACTER & TYPE OF STREAM: Sinuous, perennial in alluvium  
 NATURE OF STREAMBED: Cobble layer over glacial fill  
 02.33= 830 cfs 050= 3100 cfs  
 010= 1800 cfs 0100= 3800 cfs  
 025= 2500 cfs 0500= 6500 cfs  
 DATE OF FLOOD OF RECORD: Unknown  
 WATER SURFACE ELEV.: Unknown ESTIMATED DISCHARGE: Unknown  
 NATURAL STREAM VELOCITY @ 050 = 10.7 fps  
 ICE CONDITIONS: Unknown DEBRIS: Unknown  
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEVATION RAPIDLY? Yes  
 IS ORDINARY RISE RAPID? Yes  
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No  
 IF YES, DESCRIBE.  
 WATERSHED STORAGE: HEADWATERS: UNIFORM THROUGHOUT WATERSHED IMMEDIATELY ABOVE SITE

EXISTING STRUCTURE

STRUCTURE TYPE: Continuous three span rolled beam bridge  
 YEAR BUILT: 1956  
 CLEAR SPAN (NORMAL TO STREAM): 252 ft.  
 VERTICAL CLEARANCE ABOVE STREAMBED: 71 ft.  
 WATERWAY OF FULL OPENING: 9,218 sq. ft.  
 DISPOSITION OF STRUCTURE: Rehabilitate and widen substructures. Replace superstructures.  
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: Glacial till  
 WATER SURFACE ELEV. @ 02.33= 347.7 ft VELOCITY= 5.8 fps  
 010= 349.7 ft " 8.2 fps  
 025= 350.8 ft " 9.6 fps  
 050= 351.7 ft " 10.7 fps  
 0100= 352.3 ft " 12.0 fps  
 LONG TERM STREAM BED CHANGES: None  
 IS THE ROADWAY OVERTOPPED BELOW THE 0100? No FREQUENCY: N/A  
 RELIEF ELEVATION: N/A DISCHARGE OVER ROAD @ 0100: None

UPSTREAM STRUCTURE: TOWN: Guilford DISTANCE: 0.4 mi.  
 HIGHWAY NO.: US 5 STRUCTURE NO.: Unknown  
 STRUCTURE TYPE: N/A  
 CLEAR SPAN: N/A CLEAR HEIGHT: N/A  
 YEAR BUILT: N/A FULL WATERWAY: N/A  
 DOWNSTREAM STRUCTURE: TOWN: Guilford DISTANCE: 0.2 mi.  
 HIGHWAY NO.: Broad Brook Road STRUCTURE NO.: Unknown  
 STRUCTURE TYPE: N/A  
 CLEAR SPAN: N/A CLEAR HEIGHT: N/A  
 YEAR BUILT: N/A FULL WATERWAY: N/A

DESIGN CRITERIA:

- DESIGN LIVE LOAD AASHTO HS25 - 44
- DESIGN SPAN 78.25 - 97.75 - 78.25
- ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL 12 KSF (PIERS 1 & 2 @ BR 3N) ON LEDGE N/A
- ALLOWABLE LOAD FOR PILING 70 Tons TYPE HPI2X53 ESTIMATED LENGTH 65 ft @ Abut. 1, 65 ft @ Abut. 2 (BR 3N)
- STRUCTURAL STEEL AASHTO GRADE M270 GR50W
- REINFORCING STEEL GRADE 60
- CONCRETE, HIGH PERFORMANCE CLASS A  $f_c = 4000$  PSI  
 CONCRETE, HIGH PERFORMANCE CLASS B  $f_c = 3500$  PSI  
 CLASS A OC/DA CONCRETE  $f_c = 4000$  PSI

TRAFFIC MAINTENANCE:

- IS TRAFFIC TO BE MAINTAINED? YES IF YES, ON EXISTING STRUCTURE YES (3N) OR ON TEMPORARY BRIDGE NO
- TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY N/A TRAFFIC CONTROL SIGNALS REQUIRED N/A  
 MINIMUM CLEAR SPAN (NORMAL TO STREAM): N/A VERTICAL CLEARANCE ABOVE STREAMBED: N/A  
 WATERWAY AT FULL OPENING: N/A  
 ARE SIDEWALKS REQUIRED? N/A IF SO, ON WHAT SIDE? N/A

LOAD RATING (3N/3S) (TONS)

LOADING LEVELS (LOAD FACTOR)	TRUCK				
	H	HS	3S2	6 AXLE	3A, STR. 4A, STR. 5A, SEMI
INVENTORY A=2.17; B=1.00	33*/32*	59*/57*			
POSTED A=1.55; B=1.40	46*/45*	83*/81*	125*/121*	104/103	106/105 120*/116*
OPERATING A=1.30; B=1.67		98*/96*	148*/144*	161*/156*	123/121 126/125

$$\text{STRENGTH RF} = \frac{\phi M_n - 1.3 M_{UH}}{A X M_{LH}}$$

$$*\text{SERVICEABILITY RF} = B \left[ \frac{0.95 F_y S_{LL+1} - M_{UH} S_{LL+1} - M_{SD} S_{SD}}{167 M_{LH+1}} \right]$$

STATE OF VERMONT AGENCY OF TRANSPORTATION

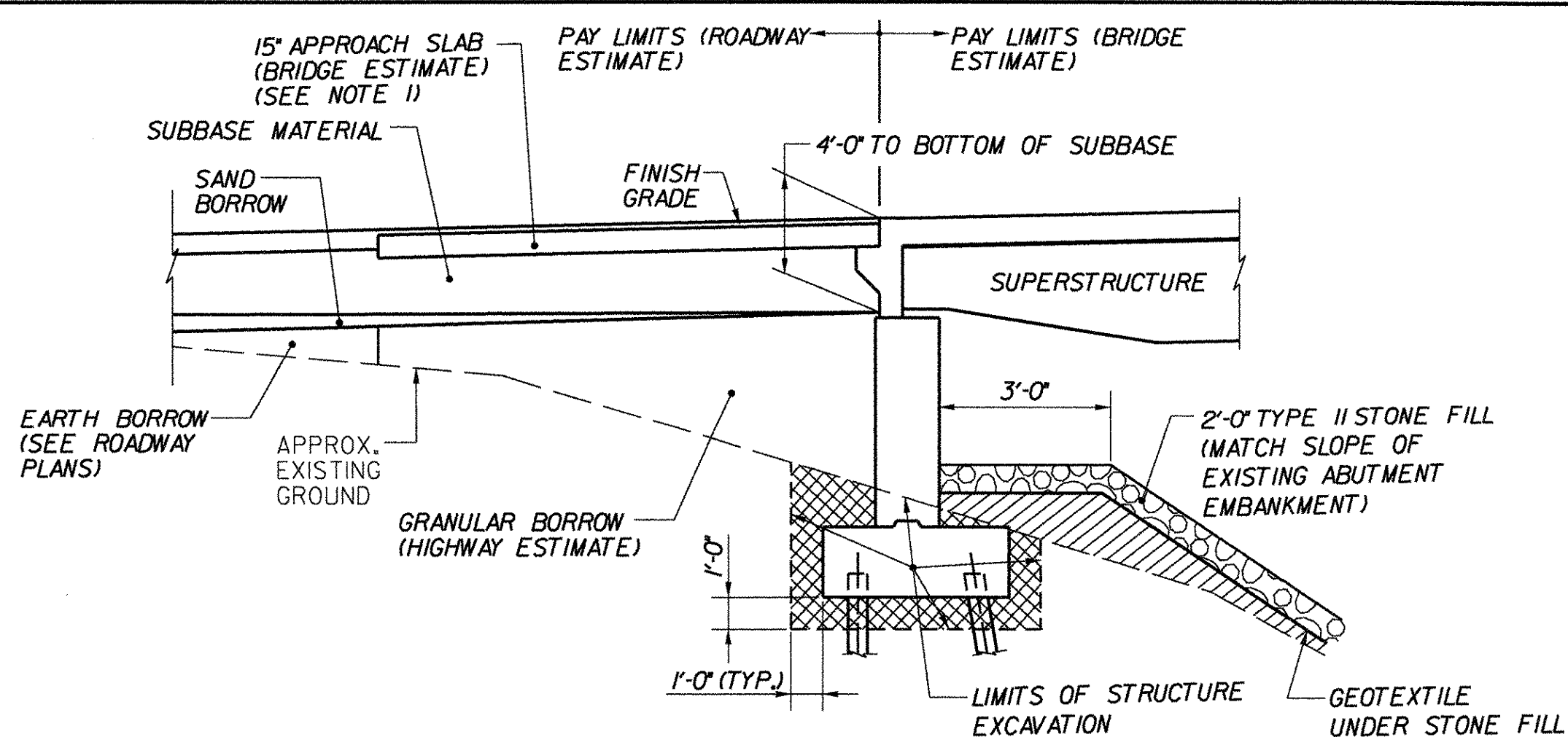
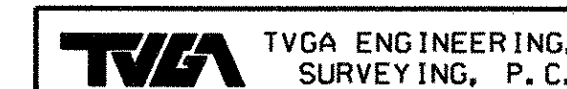
Town Of GUILFORD Bridge No. 3N&S  
 Highway No. I-91 Log Sta. Surv. Sta.

I-91 OVER BROAD BROOK & BROAD BROOK ROAD

PRELIMINARY INFORMATION SHEET

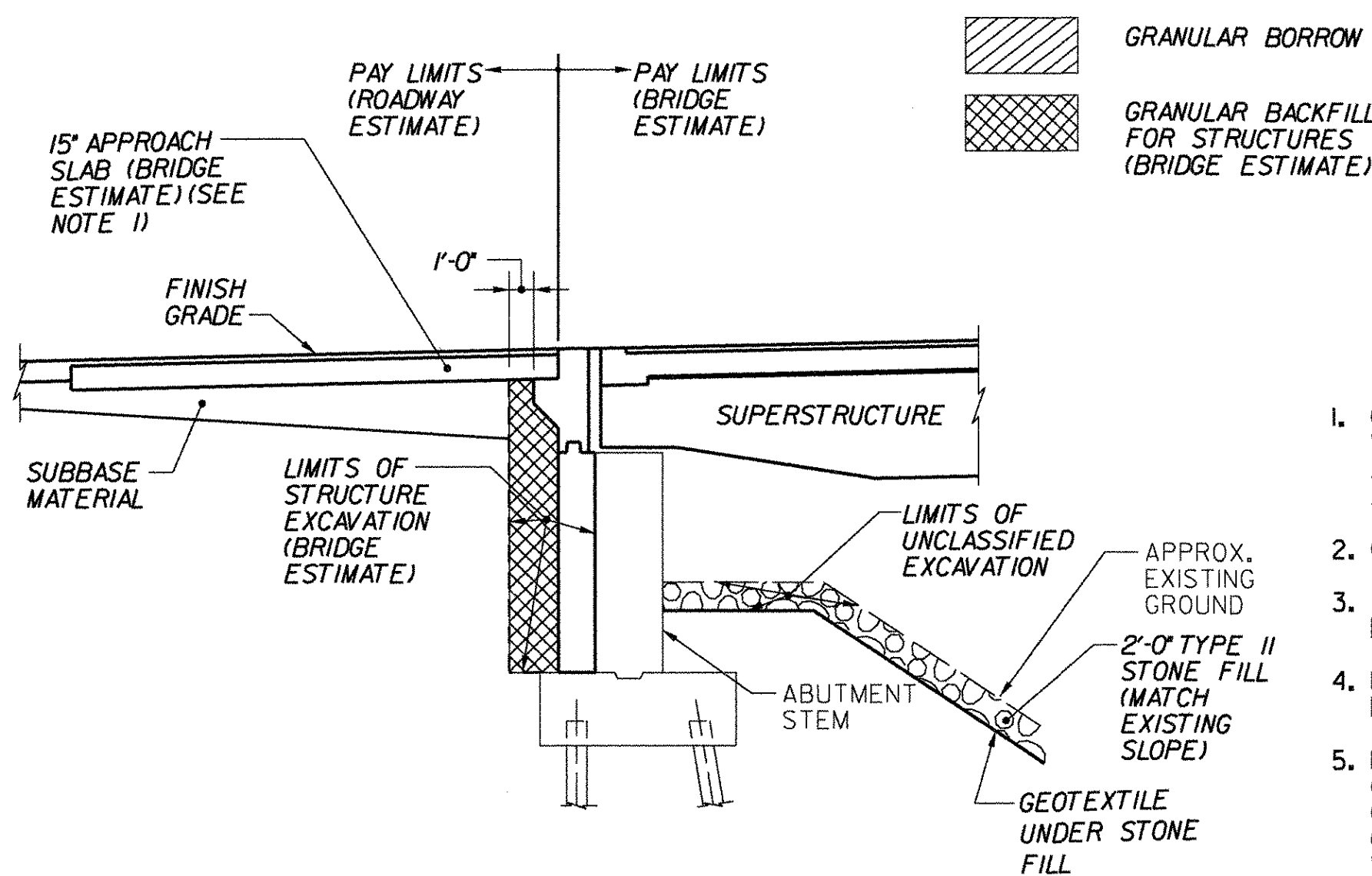
Designed By D.R. GOODISON Drawn By G.K. MORZE  
 Checked By Date Bridge Design Supervisor  
 P. BIJHOUWER 01/03 J.P. HALSTEAD Date 01/03

PROJECT GUILFORD PROJECT NO. IM 091-1(33)  
 TVGA CAD Drawing No. G-pl-sheet.dgn Date 06/06/08  
 Bridge Sheet No. BR100 Sheet 26 of 114



TYPICAL WIDENED ABUTMENT SECTION (3N)

NOT TO SCALE  
 (FIXED ABUTMENT SHOWN, EXPANSION ABUTMENT SIMILAR)

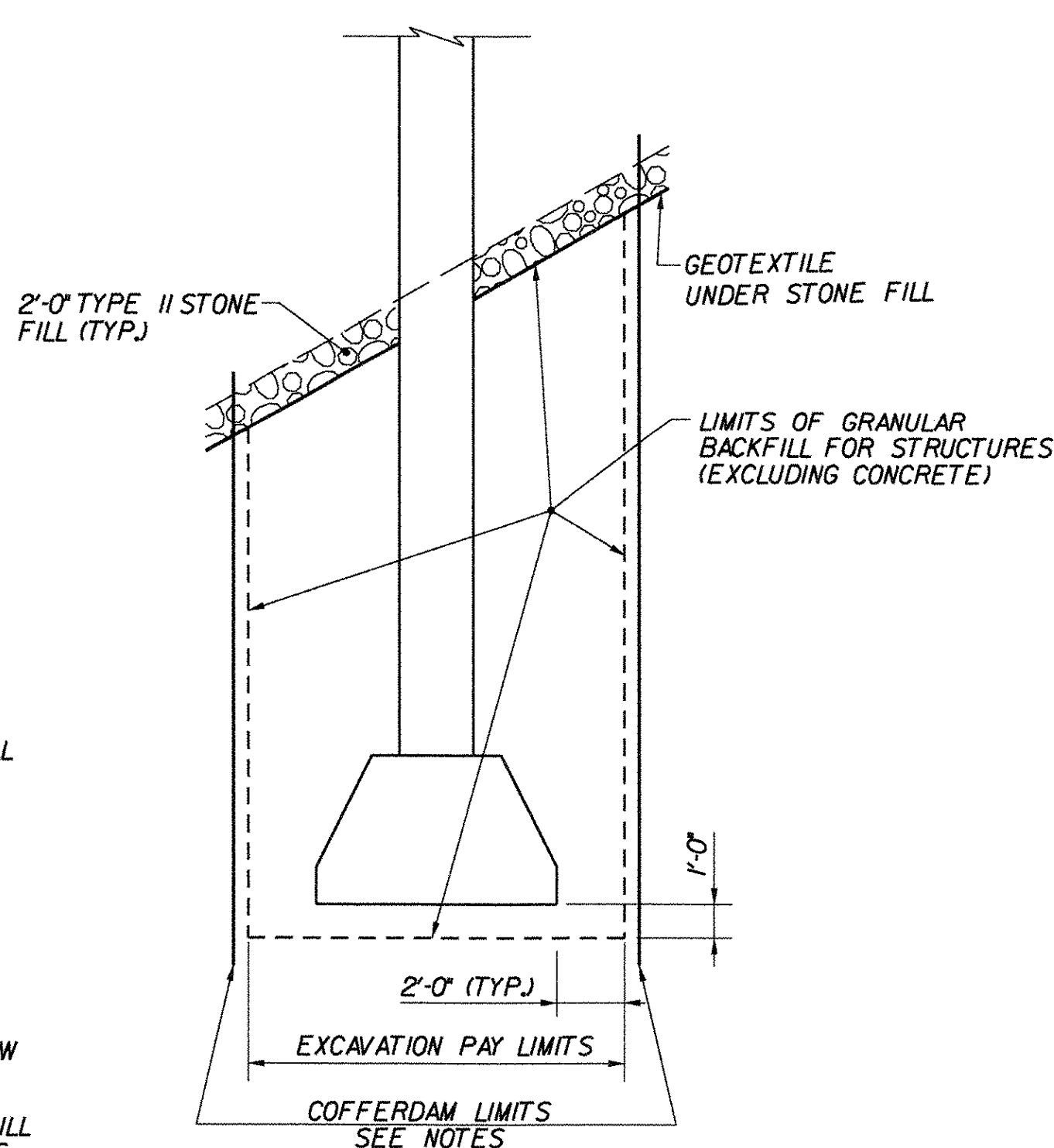


TYPICAL REHABILITATED ABUTMENT SECTION (3N&S)

NOT TO SCALE  
 (EXPANSION ABUTMENT SHOWN, FIXED ABUTMENT SIMILAR)

NOTES:

- PAYMENT FOR REMOVAL OF EXISTING APPROACH SLAB AND ANY EXCAVATION REQUIRED FOR CONSTRUCTION OF NEW APPROACH SLAB SHALL BE MADE UNDER ITEM 204.25, "STRUCTURAL EXCAVATION".
- STREAM BANK SLOPES UP TO ELEVATION 359.0 SHALL BE STABILIZED WITH TYPE IV STONE FILL. SLOPES ABOVE THIS ELEVATION SHALL BE STABILIZED WITH TYPE II STONE FILL.

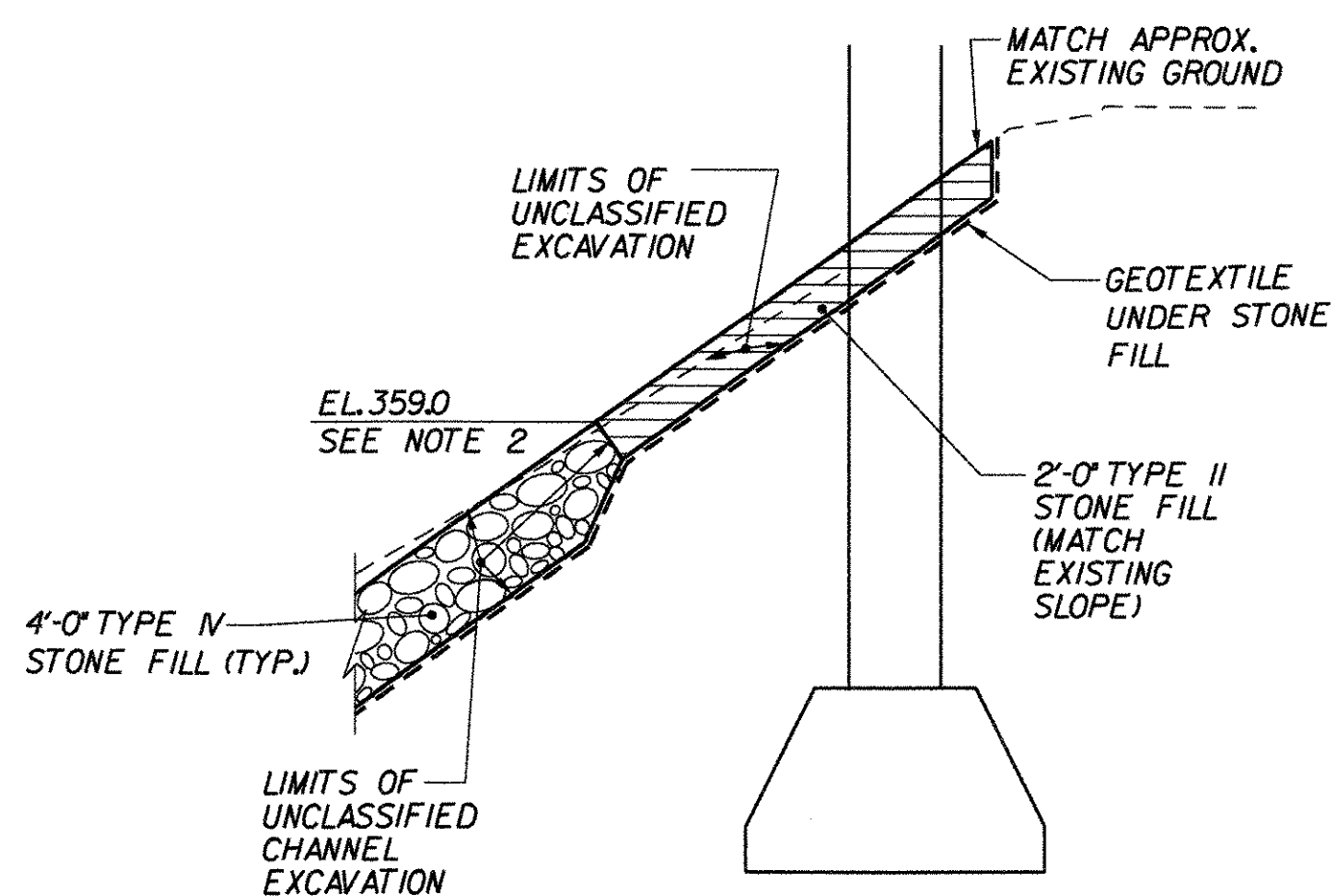


TYPICAL WIDENED PIER SECTION (3N)

NOT TO SCALE  
 (PIER 2 SHOWN, PIER 1 SIMILAR)

COFFERDAM NOTES:

- COFFERDAMS ARE REQUIRED FOR THE CONSTRUCTION OF THE PIER WIDENINGS. THE CONTRACTOR SHALL PREPARE DETAILED PLANS IN ACCORDANCE WITH SUBSECTION 208.07 OF THE SPECIFICATIONS FOR APPROVAL BY THE STRUCTURES ENGINEER.
- COFFERDAM SIZE TO BE DETERMINED BY THE CONTRACTOR.
- THE PAY LIMITS OF "COFFERDAM EXCAVATION, EARTH" AND "COFFERDAM EXCAVATION, ROCK" SHALL BE 2'-0" OUTSIDE THE PERIMETER OF FOOTING.
- 1'-0" UNDERCUT AS DETERMINED NECESSARY BY THE RESIDENT ENGINEER.
- IF A COFFERDAM IS CONSTRUCTED WHICH IS LARGER THAN THE COFFERDAM EXCAVATION PAY LIMITS, PAYMENT FOR ALL UNCLASSIFIED CHANNEL EXCAVATION, INCLUDING THAT PORTION WHICH IS INSIDE OF COFFERDAM BUT OUTSIDE THE COFFERDAM EXCAVATION PAY LIMITS, WILL BE MADE AT THE CONTRACT UNIT PRICE FOR UNCLASSIFIED CHANNEL EXCAVATION.



TYPICAL PIER SECTION (3S)

NOT TO SCALE