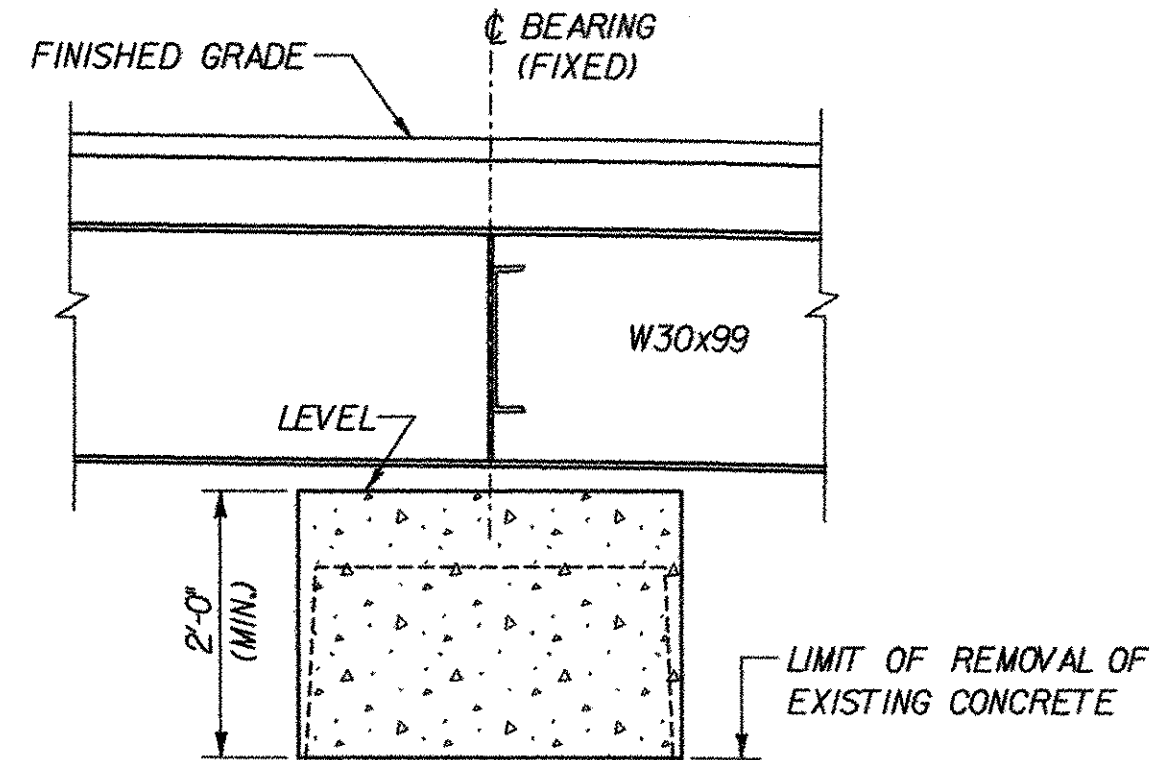
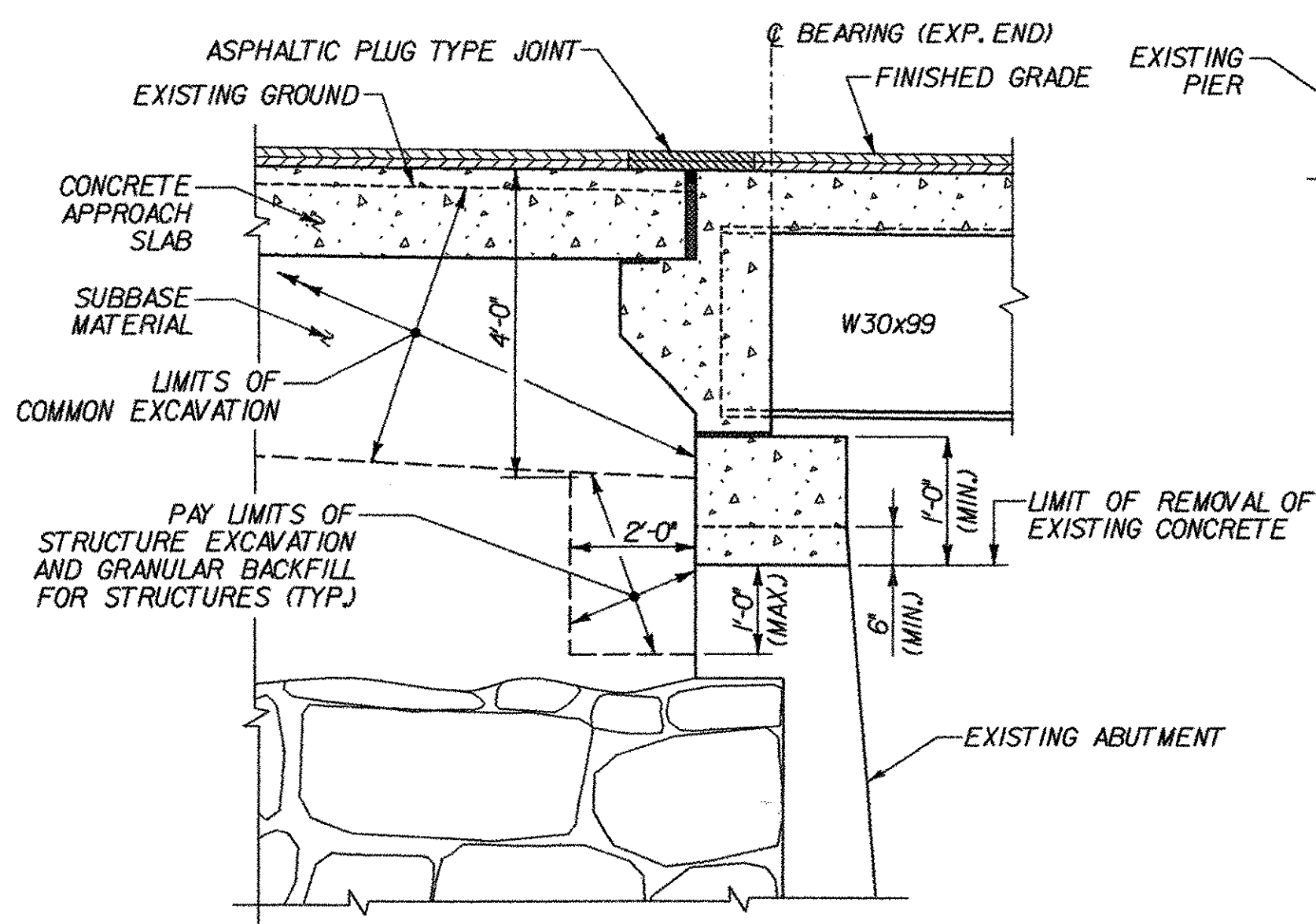


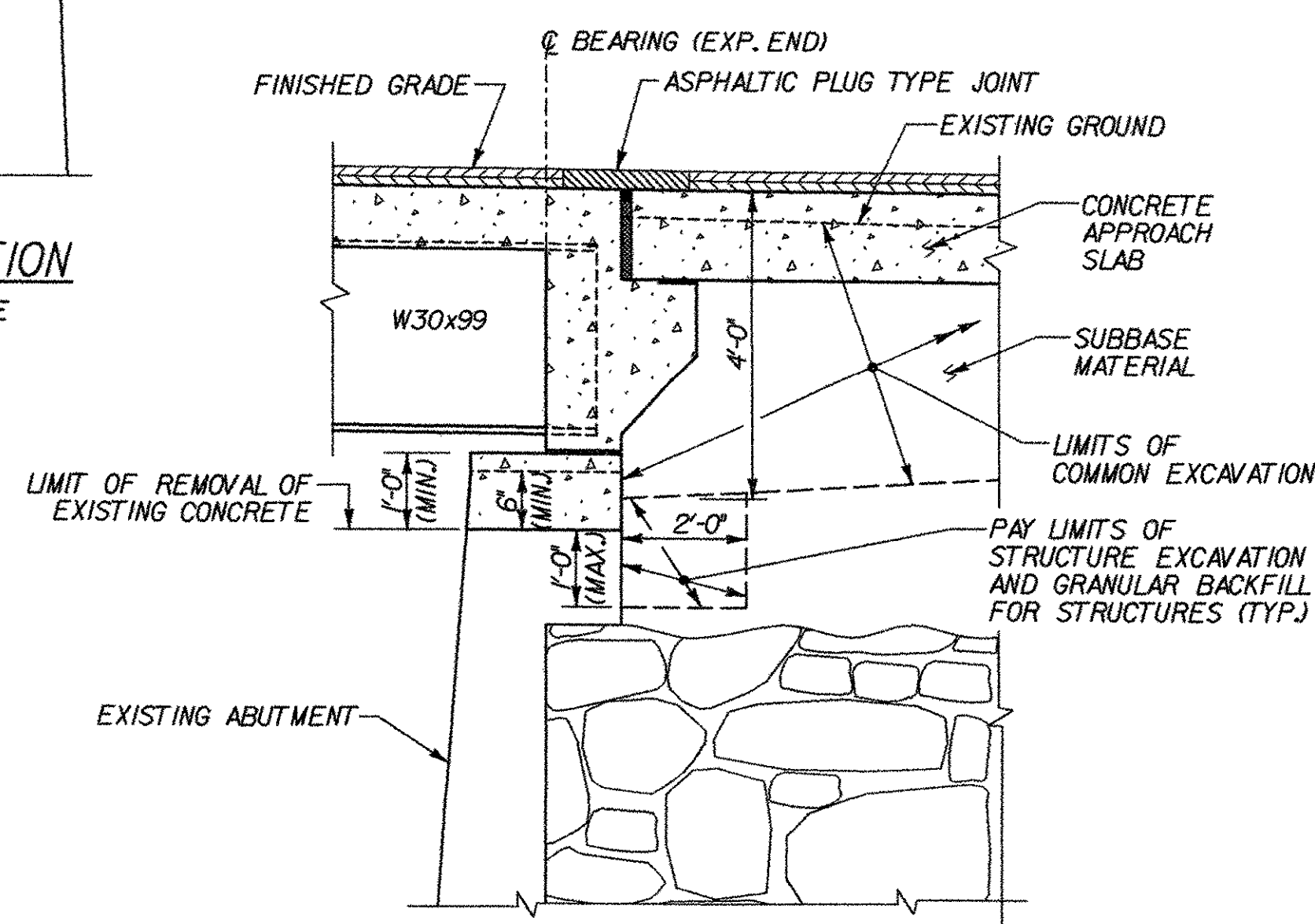
TYPICAL BRIDGE SECTION
SCALE 1/2" = 1'-0"
1 0 1 2



PIER SECTION
NOT TO SCALE



ABUTMENT #1
EARTHWORK SECTION
NOT TO SCALE



ABUTMENT #2
EARTHWORK SECTION
NOT TO SCALE

FINAL HYDRAULICS REPORT

HYDROLOGIC DATA
(NO CHANGE FROM EXISTING)

DRAINAGE AREA= 135.6 square miles
 CHARACTER OF TERRAIN: Rural basin, mostly forested and mountainous
 CHARACTER & TYPE OF STREAM: Perennial, narrow to wide flood plains, sinuous
 NATURE OF STREAMBED: Silt, sand and gravel
 Q2.33= 1680 cfs Q50= 2440 cfs
 Q10= 2050 cfs Q100= 2600 cfs
 Q25= 2270 cfs Q500= 4420 cfs
 DATE OF FLOOD OF RECORD: November 1927
 WATER SURFACE ELEV.: Unknown ESTIMATED DISCHARGE: Unknown
 NATURAL STREAM VELOCITY @ Q50 = 5.9 fps
 ICE CONDITIONS: Moderate DEBRIS: Light
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEVATION RAPIDLY? No
 IS ORDINARY RISE RAPID? No
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes
 IF YES, DESCRIBE: Upstream the Union Village Reservoir has a capacity of 1.66 billion cubic feet. Downstream stage is affected by the Connecticut River backwater.
 WATERSHED STORAGE: * HEADWATERS UNIFORM THROUGHOUT WATERSHED IMMEDIATELY ABOVE SITE X

EXISTING STRUCTURE

STRUCTURE TYPE: 2 span concrete deck with steel beams YEAR BUILT: 1950
 CLEAR SPAN (NORMAL TO STREAM): 85 ft
 VERTICAL CLEARANCE ABOVE STREAMBED: 18 ft
 WATERWAY OF FULL OPENING: 1370 sf
 DISPOSITION OF STRUCTURE: Rehabilitation
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: Refer to boring logs
 WATER SURFACE ELEV. @ Q2.33= 389.1 ft VELOCITY= 6.0 fpa**
 Q10= 391.5 ft " = 6.7 fpa**
 Q25= 393.6 ft " = 7.1 fpa**
 Q50= 395.3 ft " = 7.4 fpa**
 Q100= 397.1 ft " = 7.6 fpa**

LONG TERM STREAM BED CHANGES: Approximately 2 ft of degradation in the area of Bridge 46.
 IS THE ROADWAY OVERTOPPED BELOW THE Q100? Yes FREQUENCY: 80 Yr. Storm
 RELIEF ELEVATION: 396.4 ft DISCHARGE OVER ROAD @ Q100: 50 cfs

UPSTREAM STRUCTURE: TOWN: Thetford DISTANCE: 2.4 miles
 HIGHWAY NO.: TH-3 STRUCTURE NO.: CB 7
 STRUCTURE TYPE: Timber covered bridge
 CLEAR SPAN: 96 ft CLEAR HEIGHT: 20 ft
 YEAR BUILT: Rebuilt 2002 FULL WATERWAY: Unknown

DOWNSTREAM STRUCTURE: TOWN: Norwich DISTANCE: 0.4 miles
 HIGHWAY NO.: I-91 STRUCTURE NO.: 51 N & S
 STRUCTURE TYPE: 2 span concrete deck with steel beams
 CLEAR SPAN: 239 ft CLEAR HEIGHT: 15 ft
 YEAR BUILT: 1970 FULL WATERWAY: 3800 sf

DESIGN CRITERIA:

- DESIGN LIVE LOAD AASHTO HS-25
- DESIGN SPAN 48.30 ft + 49.59 ft = 97.89 ft AT PGL
- ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL ON LEDGE N/A ESTIMATED LENGTH N/A
- ALLOWABLE LOAD FOR PILING N/A TYPE N/A
- STRUCTURAL STEEL AASHTO GRADE 50W
- REINFORCING STEEL GRADE 60
- CONCRETE, HIGH PERFORMANCE CLASS A $f'_c = 4000$ PSI $f'_c = 1600$ PSI
 CONCRETE, HIGH PERFORMANCE CLASS B $f'_c = 3500$ PSI $f'_c = 1400$ PSI

TRAFFIC MAINTENANCE:

- IS TRAFFIC TO BE MAINTAINED? NO IF YES, ON EXISTING STRUCTURE N/A OR ON TEMPORARY BRIDGE N/A
- TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY N/A TRAFFIC CONTROL SIGNALS REQUIRED N/A
 MINIMUM CLEAR SPAN (NORMAL TO STREAM) N/A MINIMUM CLEAR HEIGHT N/A
 MINIMUM WATERWAY AREA N/A
 ARE SIDEWALKS REQUIRED? N/A IF SO, ON WHAT SIDE?
 STRUCTURE TYPE N/A

LOAD FACTOR LOAD RATING (TONS)

LOADING LEVELS (LOAD FACTOR)	TRUCK					
	H	HS	3S2	6 AXLE	3A. STR.	4A. STR. 5A. SEMI
INVENTORY A=2.17; B=1.00	26	47				
POSTED A=1.55; B=1.40	36	65	75		61	63 80
OPERATING A=1.30; B=1.67			78	90	87	73 75

STRENGTH $RF = \frac{\theta M_N - 1.3 M_{DL}}{A \times M_{LL+1}}$ SERVICEABILITY $RF = B \left[.95 F_y S_{LL+1} - M_{DL} \frac{S_{LL+1}}{S_{DL}} - M_{SOL} \frac{S_{LL+1}}{S_{DL}} \right] / 1.67 M_{LL+1}$

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2003	330	40	68	4	30
2023	430	60	68	3	30

18 kip ESAL for flexible pavement from 2003 to 2023 : 242,000
 18 kip ESAL for flexible pavement from 2003 to 2043 : 589,000
 Design speed: 35 mph

PROPOSED STRUCTURE

STRUCTURE TYPE: 2 span concrete deck with steel beams - Rehabilitation
 CLEAR SPAN (NORMAL TO STREAM): 85 ft
 VERTICAL CLEARANCE ABOVE STREAMBED: 18 ft
 WATERWAY OF FULL OPENING: 1340 sf
 WATER SURFACE ELEV. @ Q2.33= 389.1 ft VELOCITY= 6.8 fpa**
 Q10= 391.5 ft " = 7.5 fpa**
 Q25= 393.6 ft " = 7.9 fpa**
 Q50= 395.3 ft " = 8.2 fpa**
 Q100= 397.1 ft " = 8.5 fpa**
 IS THE ROADWAY OVERTOPPED BELOW THE Q100? Yes FREQUENCY: 80 Yr. Storm
 RELIEF ELEVATION: 396.4 ft DISCHARGE OVER ROAD @ Q100: 55 cfs
 AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 395.59 ft
 VERTICAL CLEARANCE @ Q50 = 0.29 ft
 SCOUR: Maximum scour @ Q500: contraction scour = 2 ft and pier scour = 7.2 ft or to ledge.
 REQUIRED CHANNEL PROTECTION: Grout Bags

PERMIT INFORMATION

AVERAGE DAILY FLOW: 280 cfs
 ORDINARY LOW WATER: 125 cfs DEPTH: 383 ft
 ORDINARY HIGH WATER: 720 cfs DEPTH: 385 ft
 IMPACTS BELOW ORDINARY HIGH WATER: Approx. 10 CY of excavation to allow for keying in the toe of the grout bags for scour protection. Approx. 31 CY of fill (volume of grout bags for scour protection). Except for keying in the toe, the grout bags will be placed on the existing stream bed and pumped full of grout.

ADDITIONAL INFORMATION

* Union Village Reservoir 2.8 miles upstream provides 1.66 billion cubic feet of storage capacity.
 ** Velocities listed are based on the worst case scenario i.e. no backwater from the Connecticut River.
 *** Water surface elevations based on 1988 FIS for the Town of Norwich with Connecticut River backwater.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of NORWICH Bridge No. 46
 Highway No. T.H. 3 Log Sta. Surv. Sta.

TOWN HIGHWAY NO. 3 OVER OMPOMPANOOSUC RIVER
PRELIMINARY INFORMATION SHEET

Designed By S. BURBANK Drawn By A. THIBAUT
 Checked By Date Bridge Design Supervisor
 M. CHENETTE 12/03 M. CHENETTE Date 12/03
 PROJECT NORWICH PROJECT NO. TH2-9625
 DH CAD Filename: ...Norw-Plsht.dgn Plot Date: 03/31/2004
 Bridge Sheet No. Sheet 2 of 40

