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VERMONT AGENCY OF TRANSPORTATION
National Life Building - Drawer 33
MONTPELIER, VERMONT 05633-6001
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TO: STEVE W. JOHNSON, P.E.
Senior Project Engineer
Vanasse Hangen Brustlin, Inc.
Six Bedford Farms, Kilton Road
BEDFORD, NH 03110

LETTER OF TRANSMITTAL

DATE: 2-13-2002
CONTRACT No.
PROJECT Name: SR BURLINGTON
PROJECT NO: IM 0209(36)

WE ARE SENDING TO YOU THE FOLLOWING:

☒ ATTACHED	☐ UNDER SEPARATE COVER VIA	☐ BY FAX
☐ DRAWINGS	☒ PRINTS ☐ SAMPLE ☐ PLANS	Fax Number
☐ COPY OF LETTER	☐ CHANGE ORDER ☐ OTHER	Total number of sheets being Faxed

COPIES	DATE	NO.	DESCRIPTION
1	2/12/02	1	ROW PLANS FOR CONDUIT ACCESS GATES. Sheet 1 to 6 of 6 1- Full size 1- Half size

THESE ARE TRANSMITTED	AS CHECKED BELOW	
☐ FOR APPROVAL	☐ APPROVAL AS SUBMITTED	☐ RESUBMIT ☐ COPIES FOR
☒ FOR YOUR USE	☐ APPROVED AS NOTED	☐ SUBMIT ☐ COPIES FOR
☒ AS REQUESTED	☐ RETURNED FOR CORRECTIONS	☐ RETURN ☐ CORRECTED
☐ FOR REVIEW AND COMMENT	☐ OTHER	☐ PRINTS RETURNED AFTER
☐ FOR BIDS DUE		

REMARKS:

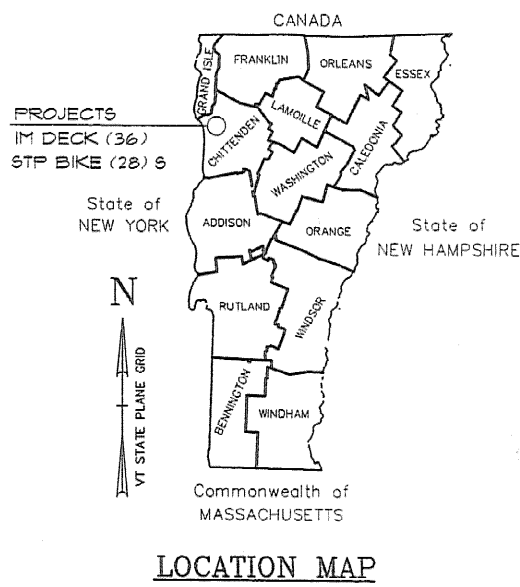
COPY TO: BOB SUTHER - SIGNED: Sherward Farnsworth
ATT: DAVE HOSHINS
PRG, FILE
SHERWARD.FARNSWORTH@state.vt.us

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT

CITY OF SOUTH BURLINGTON
COUNTY OF CHITTENDEN



R.O.W. PLANS

IM DECK (36)

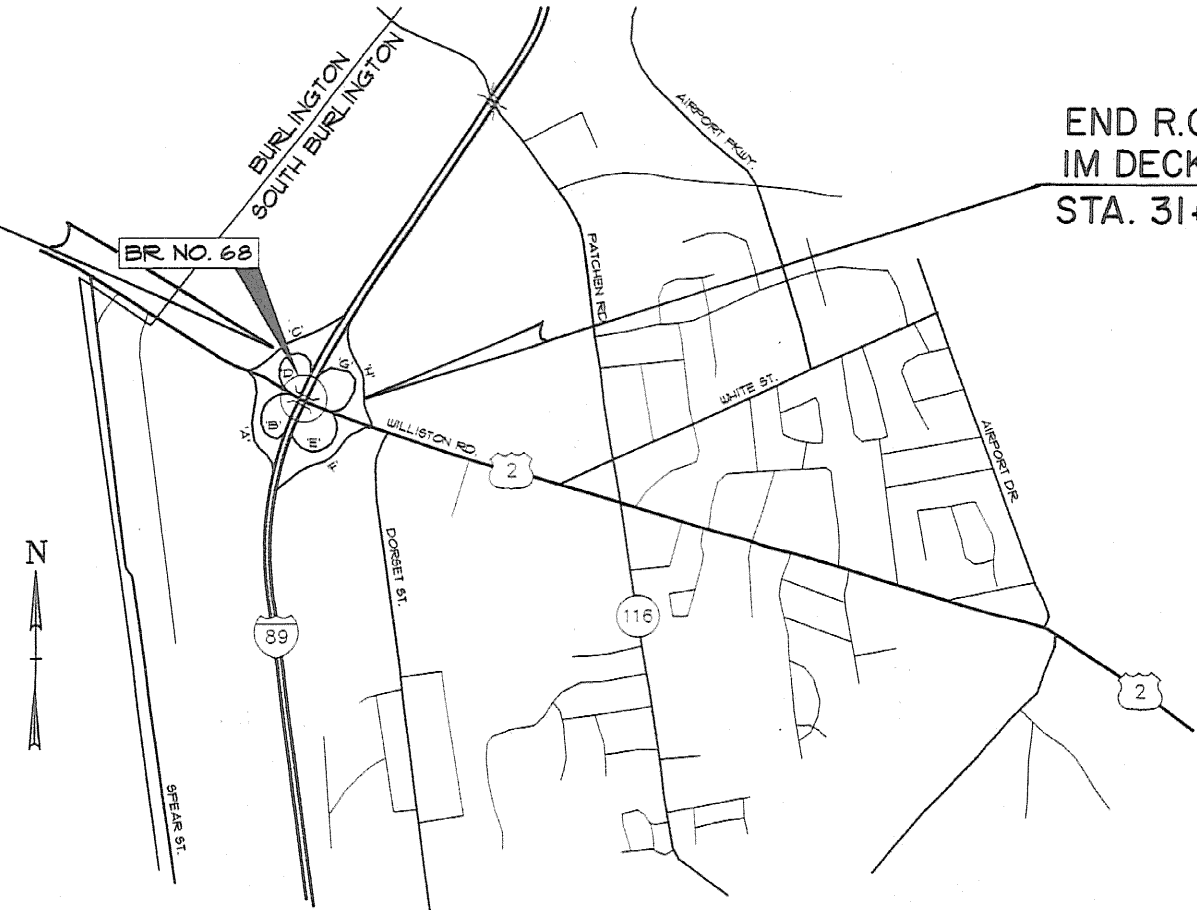
ROUTE NO. : 1-89
PROJECT LOCATION: U.S. 2 (WILLISTON RD.) OVER I-89
PROJECT DESCRIPTION: INSTALL TRAFFIC CONTROL, REHABILITATE
STRUCTURE, REMOVE TRAFFIC CONTROL
LENGTH OF STRUCTURE: 281.00'
LENGTH OF PROJECT: 1723.00'
LENGTH OF R.O.W. PROJECT: 1141'11"

STP BIKE (28) S

PROJECT LOCATION: U.S. 2 (WILLISTON RD.) OVER I-89
PROJECT DESCRIPTION: CONSTRUCT SIDEWALK AND BIKEWAY ALONG
U.S. 2 BETWEEN STA. 21+00 AND 36+61
LENGTH OF PROJECT: 1561.00'

BEGIN R.O.W. PROJECT
IM DECK (36)
STA. 20+13 11' LT.

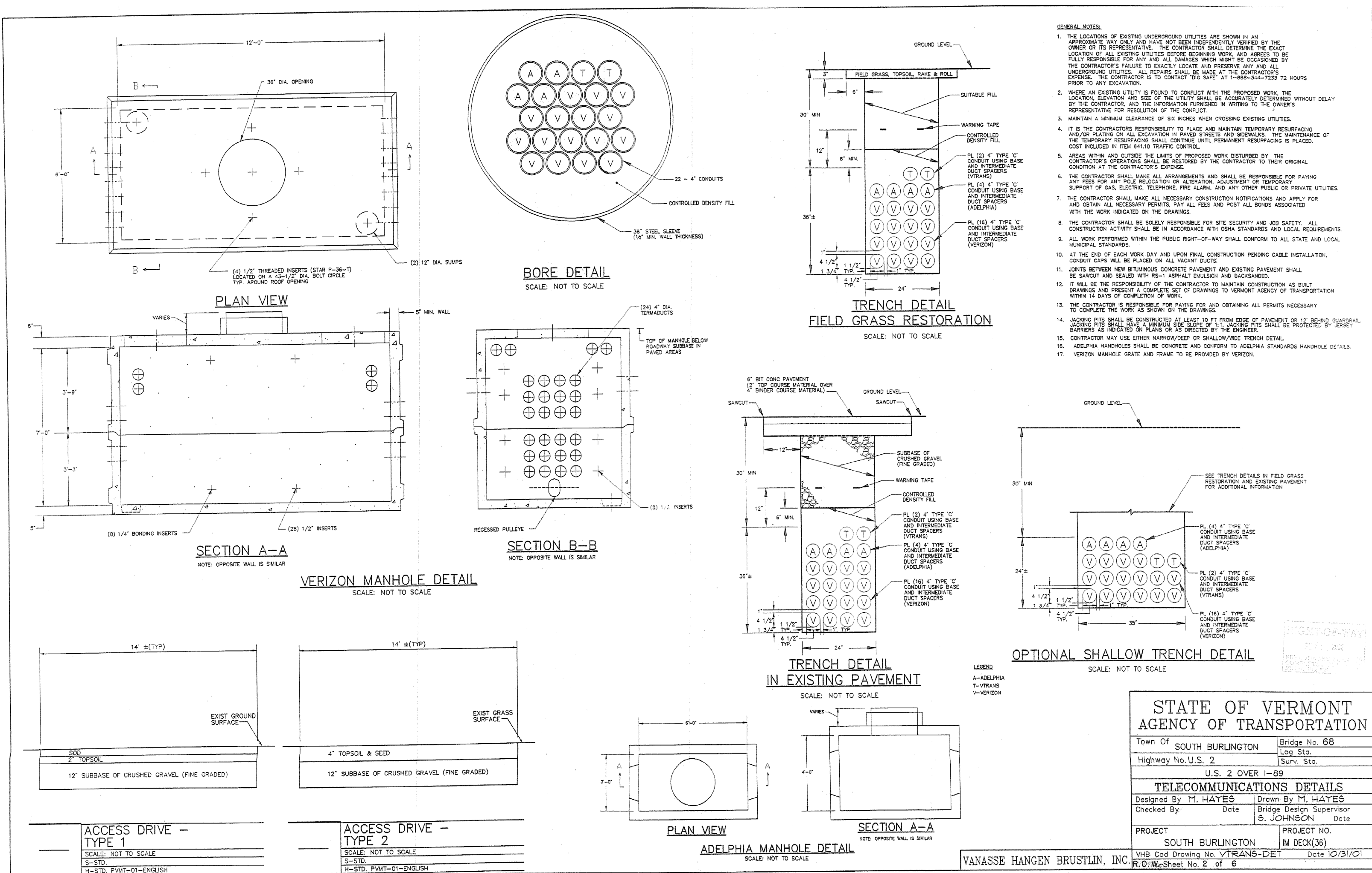
END R.O.W. PROJECT
IM DECK (36)
STA. 31+67 60' LT.



THESE PLANS ARE SUBJECT TO SUCH ENGINEERING
CHANGES AS MAY BE REQUIRED BY THE FEDERAL
HIGHWAY ADMINISTRATION OR THE CHIEF ENGINEER.
CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE
WITH THESE PLANS AND THE STANDARD SPECIFICATIONS
FOR CONSTRUCTION DATED 1990, AS APPROVED BY THE
FEDERAL HIGHWAY ADMINISTRATION ON MARCH 15, 1990.
FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT
REVISIONS AND SUCH REVISED SPECIFICATIONS AND
SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE
PLANS.

APPROVED: *[Signature]* DATE: 12/6/04
DIRECTOR OF PROJECT DEVELOPMENT
APPROVED: *[Signature]* DATE: 1/6/05
Chief, Right of Way
PROJECT: SOUTH BURLINGTON IM DECK(36)
SOUTH BURLINGTON STP BIKE (28) S
R.O.W. SHEET 1 OF 6 SHEETS

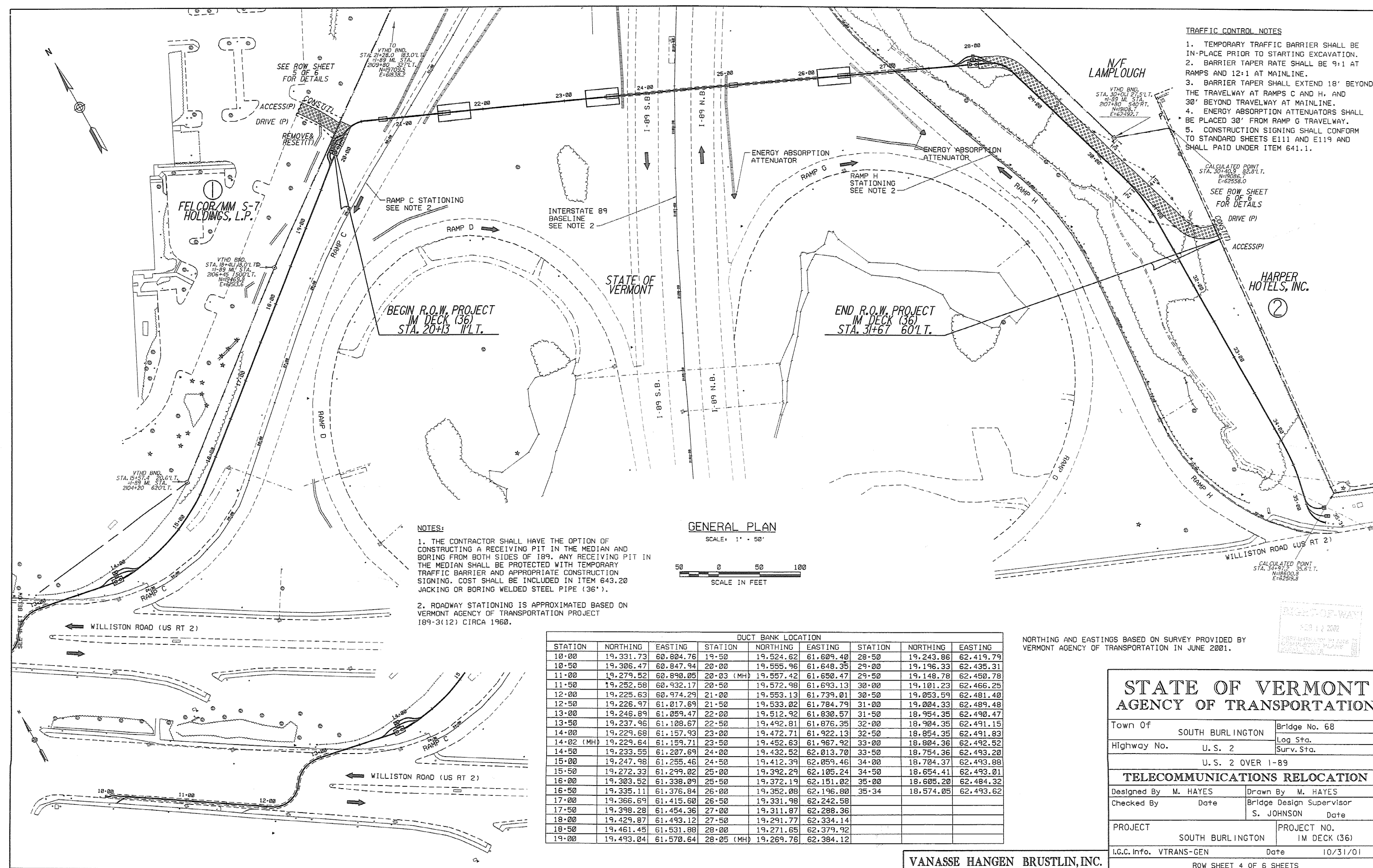
VANASSE HANGEN BRUSTLIN, INC.

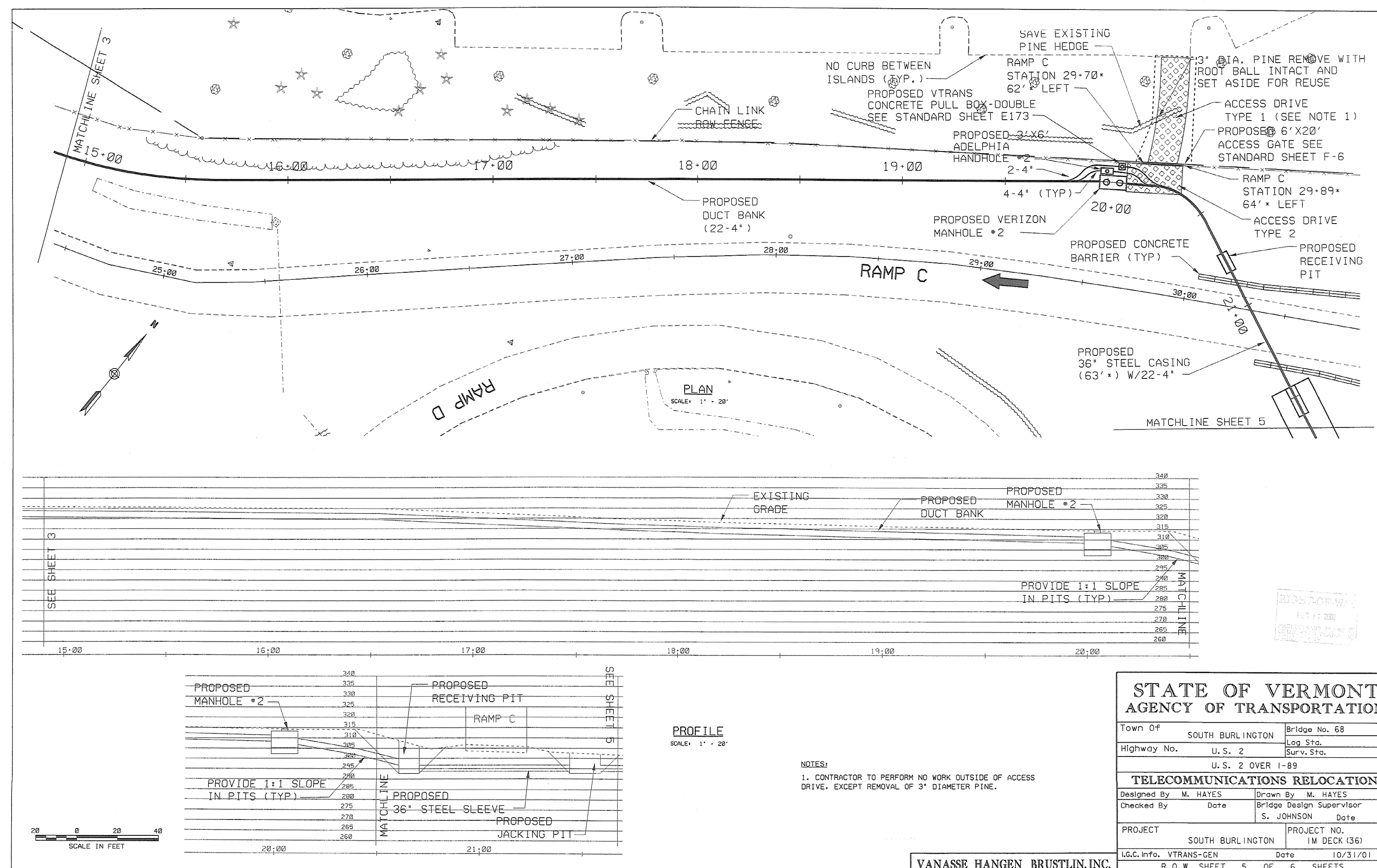


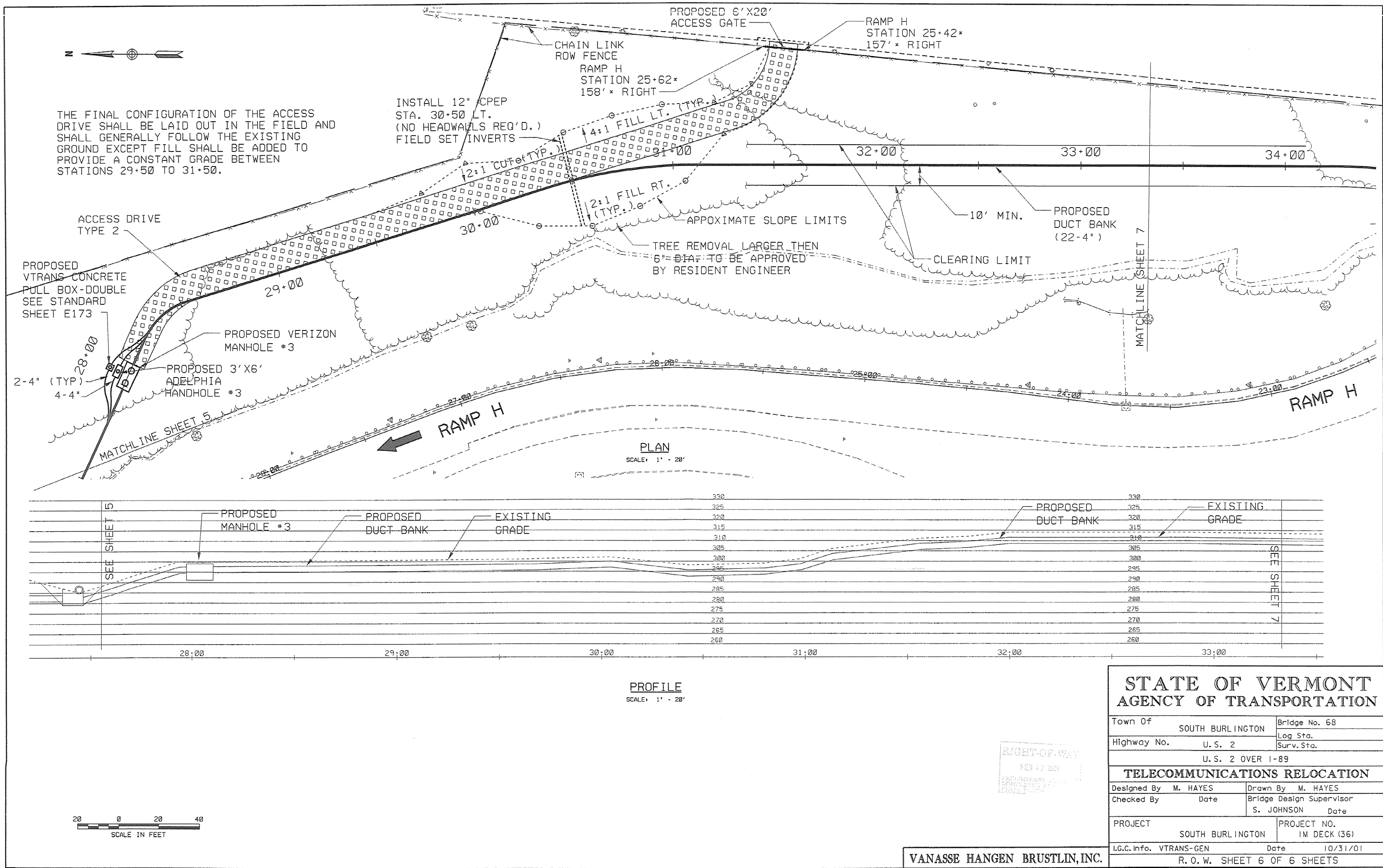
**STATE OF VERMONT
AGENCY OF TRANSPORTATION
RIGHT OF WAY PLANS
DETAIL SHEET**

R. O. W. PLANS

SOUTH BURLINGTON
IM DECK (36)
SHEET 3 OF 6









PROJECT DEVELOPMENT DIVISION – Structures Section

TO: DISTRIBUTION LIST

FROM: Sherward G. Farnsworth, P.E., Project Manager *Sof*

DATE: October 1, 2001

SUBJECT: Semi-Final Plans - South Burlington IM DECK(36) I-89, Exit 14
Relocation of Verizon conduit's and future relocation of Aldelphia's conduits from Williston Road bridge over I-89 >>>> Duct Bank Relocation <<<<

Final line and grade have been established for the relocation of Verizon conduits and future relocation of Aldelphia's conduits from Williston Road Bridge over I-89.

Attached are Semi-Final Plans showing relocated duct bank relocations. Also attached is the scope of work, estimated quantities, and specifications for duct bank conduit, manholes, and sleeves under roadway.

- Details that are missing from plans but will be added to final set are:
1. Stationing to Ramps C & H and main line to tie in ROW fence 12 foot openings and conduit crossings.
 2. Optional trench details for 6 wide by 4 high conduits under road or grass areas so that a trench box is not needed to install conduits.
 3. Vermont State plain grid coordinates for conduit locations.
 4. Details for Alelphia and State of Vermont pull boxes.
 5. Adding note giving the contractor the option of boring receiving pit in I-89 median and boring from NB side.
 6. Adding stationing to conduit profile views, estimated/final quantities, and minimum steel sleeve gauge.

DISTRIBUTION LIST:

- _X_ DTA Richard Hosking, District # 5. One set of plans is attached for your review and comment.
- _X_ Environmental Services Engineer, John Narowski. One set of plans is attached for your review and comment.
- _X_ Chief of Utilities & Permits, Al Wright – ATT: Pete Dye Two sets of plans are attached for your review and comment.
- _X_ Chief of Right-of-Way Section, Allen Blake - One set of plans is attached for your review and comment.
- _X_ Regional Construction Engineer, Alan Campo - One set of plans is attached for your review and comment.
- _X_ Resident Engineer, Bob Suckert - Two sets of plans are attached for your review and comment. Please share one with contractor.
- _X_ FHWA Bridge Engineer, Mike Canavan – One set of plans and estimate are attached for your review and comment.
- X_ VERIZON – Gary Sundbery and Mary Groom – One set of plans for each of you are attached for your review and comment.
- X_ ALDELPHIA Green Mt. System – Wayne Deslaurier – One set of plans are attached for your review and comment.

We are on a fast track to install these conduits this fall. Therefore we would like your review comments no later then Tuesday, Oct 9, 2001, noontime. These comments should be faxed to me at 802-828-3566 or email at Sherward.Farnsworth@state.vt.us. If you have any questions I can be reached at 802-828-3874. I will not be in on 10/8/01.

Attachment: VHB Plans, specs, and quantities

Cc JB McCarthy w/Est. & plans, Steve Johnson-VHB, Central files, Project file, Chrono

CONSTRUCTION QUANTITY ESTIMATE - DUCT BANK RELOCATION			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
201.11	CLEARING & GRUBBING	ACRE	1
220.10	SAWING BITUMINOUS CONCRETE PAVEMENT	LF	650
301.26	SUBBASE OF CRUSHED GRAVEL (FINE GRADED)	CY	115
406.25	BITUMINOUS CONCRETE PAVEMENT (PG64-28)	TON	55
541.21	CONCRETE VAULT (MOD. - TELEPHONE)	EA	3
541.21	CONCRETE VAULT (MOD. - CATV)	EA	4
616.40	REMOVING AND RESETTNG CURB	LF	10
618.10	PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH	SY	6
620.16	GATE FOR CHAIN LINK FENCE, 6 FEET (MOD.)	LF	24
621.90	TEMPORARY TRAFFIC BARRIER	LF	1,600
624.20	DUCTS, CONCRETE ENCASED (MOD. - DUCT BANK)	LF	1,860
624.20	DUCTS, CONCRETE ENCASED (MOD. - DUCT BANK, ROADWAY)	LF	330
624.20	DUCTS, CONCRETE ENCASED (MOD. - DUCT BANK, THROUGH SLEEVE)	LF	370
625.10	SLEEVES FOR UTILITIES (MOD. - JACK AND BORE)	LF	370
630.10	UNIFORMED TRAFFIC OFFICER	HR	150
641.10	TRAFFIC CONTROL	LS	1
651.15	SEED	LB	6
651.30	SODDING	SY	130
651.35	TOPSOIL	CY	140
678.25	PULL BOX	EA	4

SCOPE OF WORK

The work under this Contract consists of the construction of approximately 2600 feet of 4" PVC Duct Bank in the City of South Burlington, Vermont. The work includes the installation of Manholes and Handholes along the proposed Duct Bank. The proposed route will be located within the Highway Right Of Way and the City Roadway Layout. Installation of a Steel Sleeve, by Auger Boring, will be required beneath the Interstate roadways.

All work done under this Contract shall be in conformance with the Vermont Agency of Transportation Standard Specifications for Construction, 1990 Edition, the Supplemental Specifications, Construction Standards, the 2000 Manual on Uniform Traffic Control, and the American Standards for Nursery Stock (ANSI-Z60.1-1990), as amended, the Plans, and these Special Provisions.

The General Conditions, Supplementary Conditions and Special Provisions shall take precedence over the General Requirements of Division 100 of the Standard Specifications.

WORK SCHEDULE

No work shall be done on Saturdays, Sundays or holidays or on the day before or the day after a long weekend which involves a holiday without prior approval by the Engineer.

Work on Williston Road with lane closure will be permitted from 7 PM to 6 AM. One lane closures for work on the Interstate will be permitted between 7 PM and 6 AM, in accordance with the traffic control procedures.

PROVISIONS FOR TRAVEL AND PROSECUTION OF THE WORK
(Supplementing Subsection 104.04)

Before starting any work under this Contract, the Contractor shall prepare, and submit to the Engineer for approval, a plan (based on the Contract traffic management plans) that indicates the traffic routing proposed by the Contractor during the various stages and time periods of the work and the temporary barricades, signs, drums and other traffic control devices to be employed during each stage and time period of the work to maintain traffic and access to abutting properties.

Particular care shall be taken to establish and maintain methods and procedures that will not create unnecessary or unusual hazards to public safety. Traffic control devices required only during working hour operations shall be removed at the end of each working day.

Signs having messages that are irrelevant to normal traffic conditions shall be removed or properly covered at the end of each work period. Signs shall be kept clean at all times and legends shall be distinctive and unmarred.

PUBLIC SAFETY AND CONVENIENCE (Supplementing Subsection 107.07)

The Contractor shall provide necessary access for fire apparatus and other emergency vehicles through the work zones to abutting properties at all times.

At the end of each working day where trenches in areas of public travel are covered with steel plates, each edge of the plates shall be either beveled or protected by a bituminous concrete ramp at a slope of 2 feet horizontally to 1 inch vertically. Any temporary patching material may be used to construct the ramps. The cost of necessary patching materials, and their maintenance and removal, will be considered incidental to the item involved with no separate payment.

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Sweeping and cleaning of surfaces beyond the limits of the project required to clean up material caused by spillage or vehicular tracking during the various phases of the work shall be considered as incidental to the work being performed under the Contract and there will be no additional compensation.

PROTECTION OF UTILITIES AND PROPERTY (Supplementing Subsection 107.13)

The Contractor, in constructing or installing facilities alongside or near sanitary sewers, storm drains, water or gas pipes, electric or telephone conduits, poles, sidewalks, walls, vaults or other structures shall sustain them securely in place, cooperating with the officers and agents of the various utility companies and municipal departments which control them, so that the services of these structures shall be maintained. The Contractor shall also be responsible for the repair or replacement of any damage to such structures caused by construction, and shall leave them in the same condition as they existed prior to commencement of the work. In case of damage to utilities, the Contractor shall promptly notify the utility owner and shall, if requested by the Engineer, furnish labor and equipment to work temporarily under the utility owner's direction in providing access to the utility. Pipes or other structures damaged by the operation of the Contractor may be repaired by the Department or by the utility owner which suffers the loss. The cost of such repairs shall be paid by the Contractor, without compensation therefor.

If, as the work progresses, it is found that any of the utility structures are so placed as to render it impracticable, in the judgment of the Engineer, to do the work called for under this Contract, the Contractor shall protect and maintain the services in such utilities and structures and the Engineer will, as soon thereafter as reasonable, cause the position of the utilities to be changed or take such other actions deemed suitable and proper.

If live service connections are to be interrupted by excavations of any kind, the Contractor shall not break the service until new services are provided. Abandoned services shall be plugged off or otherwise made secure.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in protecting or repairing property as specified in this section, shall be considered included in the prices paid for the various Contract items of work and no additional compensation will be allowed therefore.

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SECTION 541- PRECAST CONCRETE MANHOLES AND HANDHOLES

SECTION 541- PRECAST CONCRETE MANHOLES AND HANDHOLES, is hereby made a new section of the specifications, superceding all previous editions and their modifications.

541.01. DESCRIPTION. This work shall consist of manufacturing, transporting, and placing precast concrete utility manholes and handholes as specified in the contract. The type, size, details and locations of the vaults shall be as shown on the plan or established by the Engineer.

541.02. MATERIALS. Materials shall meet the requirements of the following subsections of Division 700- Materials:

Portland Cement	701.02
Air-Entraining Portland Cement	701.03
High Early Strength Portland Cement	701.04
Fine Aggregate for Concrete	704.01
Coarse Aggregate for Concrete	704.02
Mortar, Type IV	707.03
Bar Reinforcement	713.01
Air-Entraining Admixtures	725.02(b)
Retarding Admixtures	725.02(c)
Water Reducing Admixtures	725.02(f)
Water Reducing and Retarding Admixtures	725.02(g)
Water	745.01

Unless otherwise specified in the contract all bar reinforcements shall conform to the requirements of AASHTO M31-94 Grade 60, and all mesh shall conform to AASHTO M53M/M55-94.

Concrete shall meet the requirements of Concrete Class A, Section 501.

Concrete for precast utility vaults shall have a compressive strength at 28 days, as determined in accordance with AASHTO T22, of not less than 5000 psi. Where a 28 day test results as defined herein or in the contract is below specified strength, all concrete represented by that test shall be unacceptable for the requirements of this specification, and the Engineer reserves the right to reject all members containing that substrength concrete. The cement factor in mix design shall be not less than 611 lb. per cubic yard of concrete. The percent of air entrainment shall be 6.0 with a tolerance of plus or minus one percent and the slump shall be between one and three inches.

The proposed concrete mix design, including performance history and all requests for variance from the material requirements of these specifications, shall be submitted for approval in accordance with these specifications. Six weeks may be required for testing and approval of the mix design.

To check the Fabricator's mix design, test specimens of concrete may be required to be made from the aggregate, cement and admixtures which he/she proposes to use. The Fabricator shall furnish, at their own expense, whatever quantities of these materials may be required for the tests.

Any admixture containing calcium chloride shall not be used. Type II or Type III Portland Cement may be used. Only one type of cement and only one source of that type shall be used for anyone structure.

VERIZON MANHOLES. Utility Manholes shall be precast units meeting the requirements for H-20 wheel loads, 30% impact and soil pressure of 130 lbs/ft3. The vaults shall be fabricated to the sizes detailed on the plans.

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They shall be designed for tongue-and-groove placement between upper and lower sections with a mastic sealant between sections (Rotondo Model #998-547-509, or equal). Other references that apply to the utility holes but not limited to the following: ASTM A153, A48, A123, ACI301, 318, 347 and CRSI. The complete utility manhole shall include a 36" diameter cast iron reversible frames and covers (Neenah 5900-J or equal) .The top of the cover shall have a logo in stand-up letters to read "TELEPHONE"

The Contractor shall install the frame to accommodate the distance from the top of manhole to the finish surface, including throats and extensions. The precast throats shall be 36" inside diameter opening to match utility hole with 8" thick wall. Wherever utility holes are located in streets, the throat shall be concrete from the top of the utility hole up to 10" below finish grade. Adjustments for finish grade from the top of the concrete to cover ring shall be accomplished with mortared brick. A sealant shall be applied to all joint locations (throat-utility hole, throat-brick, brick-covering) .Elsewhere the throat from the top of utility hole to the ring shall be concrete with a sealant provided between the throat, ring and top of utility hole. The concrete throat shall be installed so that the cover ring is flush with the finish surface. The actual height of the throat shall be determined on location prior to construction of forms. Further, each vault shall have one (1), 12" diameter sump hole directly under a 36" diameter hole in the roof. The floor of the utility hole shall slope towards the sump hole at the rate of 1/8" per 1' -0".

All vaults shall be equipped with 1-1/4" galvanized shank pulling eyes with 2" eye and 4" square washer on each side of the walls each wall opposite conduit penetrations. The pulling eye shall be suitable for a minimum 15,200 lbs @ 180 degree pull, and 3800 lbs @ 90 degree pull. Also, the vaults shall be manufactured with conduit penetration knockouts, (Condux Formex Duct Terminators or equal) and waterproof duct plugs for all ducts. A break membrane shall be on all terminators connected to ducts.

CATV HANDHOLES. Utility Handholes shall be precast units meeting the requirements for H-20 wheel loads, 30% impact and soil pressure of 130 lbs/ft3. The Handholes shall be heavy duty adjust to grade type composite concrete box with collar and cover 3'X6'X4' deep (CDR Systems Corporation, Menlo Park, California - CDR Model or equal)

The complete utility hole shall include a 36" diameter cast iron reversible frame and cover (Neenah 5900-J or equal) .The top of the cover shall have a logo in stand-up letters to read "CATV"

The Contractor shall install the frame to accommodate the distance from the top of manhole to the finish surface, including throats and extensions. The handhole shall be equipped with 1-1/4" galvanized shank pulling eyes with 2" eye and 4" square washer on each side of the walls.

541.03. DESIGN AND DRAWINGS. The Fabricator shall submit concrete mix design, design calculations, and working drawings in accordance with subsection 105.03. The precast concrete utility manholes and handholes shall be designed for 0' to 5' of earth cover, high water table at finish grade, and H-20 wheel loads in accordance with the current AASHTO Standard Specifications for Highway Bridges and shall be designed to protect against buoyancy.

541.04. QUALITY CONTROL. The Fabricator shall demonstrate a level of quality control testing that satisfies the Agency as to his/her ability and commitment to produce concrete to the requirements of this specification. A satisfactory program of quality control shall include gradation and moisture determinations of the aggregates, as well as slump, air content, and strength determinations of the concrete. These tests shall be performed at regular and suitable

intervals and actively used to maintain the quality of the concrete within the specified requirements.

541.05. INSPECTION. Materials furnished and the work performed under this Section shall be inspected by the Agency or their approved representative. The Engineer shall have the authority to reject any material or work which does not meet the requirements of these specifications. Advance notification of at least three weeks must be provided by the Fabricator to the Agency concerning his/her intention to commence work.

541.06. CONCRETE TESTING.

General. Precast manholes and handholes shall be manufactured in a plant which maintains a quality control laboratory complete with equipment for measuring the properties of fresh and hardened concrete. As a minimum, the laboratory shall be equipped with a compression testing machine, curing room or chamber, apparatus for measuring slump and air entrainment, and a complete sets of aggregate sieves and sieve shakers. The compression testing machine shall be calibrated yearly by an independent laboratory using equipment which is certified by the National Bureau of Standards.

Testing of Compressive Strength. Specimens shall be six inch by twelve inch standard cylinders, made by the Fabricator in accordance with AASHTO T23. Fabrication of test specimens shall conform to AASHTO M20S and shall be supplied by the Fabricator. For each member the Fabricator shall make for the Agency the following minimum number of specimens:

Four specimens to determine compliance with the 28-day strength requirement. The specimens shall be cured under the same conditions as the member from the time of casting until member is removed from the form. At that time, the specimens shall be moved to storage where curing shall continue under standard conditions in accordance with AASHTO T23. These specimens shall be retained by the Fabricator for testing by the Agency.

The average of the compressive strength of each of two specimens shall constitute a test result. Specimens shall be tested either at the Materials and Research Division Central Laboratory, or at the manufacturer's plant laboratory. An Agency representative shall witness all tests.

541.07. CURING. The precast vaults shall be cured for sufficient length of time so that the concrete will develop 5000psi strength in 28 days or less. Anyone of the following methods of curing or combinations thereof may be used;

Steam Curing. The vaults may be low pressure, steam-cured by a system that will maintain a moist atmosphere.

Water Curing. The vaults may be water-cured by any method that will keep the sections moist.

Membrane Curing. A sealing membrane conforming to the requirements of AASHTO M48 may be applied and shall be left intact until the required concrete compressive strength is attained. The concrete temperature at the time of application shall be within 10°F of the atmospheric temperature. All surfaces shall be kept moist prior to the application of the compounds and shall be damp when the compound is applied.

541.08. HANDLING AND INSTALLATION. Care shall be taken during storage, hoisting, and handling of the precast units to prevent cracking or damage. No units shall be shipped until a

compressive strength of 5000psi has been attained. Units damaged by improper storing or handling shall be replaced by the Contractor at his/her expense.

Vaults shall be placed on approved level foundations as detailed on the plans or these specifications. The Contractor shall install the frame and cover. The conduit shall be brought into the vault as shown on the plans and as directed by the Engineer with concurrence of the utility company inspector.

Excavation for vaults shall be to the required depth and shall include 6" beneath the floor, and twelve (12) inches beyond the perimeter of the floor, for a level, compacted base of material specified on the plans.

All excavation shall be confined to as little surface area as possible, keeping within all applicable safety requirements.

All frame and covers shall be constructed to final grade unless otherwise directed by the Engineer.

At manhole and handhole locations, conduits shall maintain a minimum separation of at least 3 inches of clearance from the outside surfaces of the vault walls, floor or roof and power or other foreign conduits. A minimum of 12 inches of clearance shall separate gas, water, oil mains,, etc. from the outside surfaces of vault walls, floor or roof.

541.09. METHODS OF MEASUREMENT. The quantity to be measured for payment will be the number of the type and size of precast concrete utility vaults specified, complete and accepted in place.

541.10. BASIS OF PAYMENT. Precast concrete utility vaults will be paid for at the contract unit price each for the type specified, which price shall be full compensation for detailing, fabricating, quality control testing, furnishing, transporting, handling and installing the material specified, including the concrete, reinforcement, manhole necks, manhole frames and covers, and any other material contained within, or attached to the unit(s), and the furnishing of all labor, tools, equipment, and incidentals necessary to complete the installation of the work specified including but not limited to, excavation and backfill.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
541.21	Concrete Vault (Mod. - Telephone)	Each
541.21	Concrete Vault (Mod. - CATV)	Each

SECTION 620 - FENCES

620.10 BASIS OF PAYMENT, is hereby modified by deleting paragraph three and replacing it with the following:

Payment at the unit price for installation of new gates in existing fence lines shall include removal of existing fencing, and posts, adding new posts, brace rods, truss rods, gate frames, fabric ties, and all incidentals and appurtenances necessary to complete the work as detailed in the plans and standards.

Payment will be made under:

Pay Item		Pay Unit
620.16	Gate for Chain - Link Fence, 6 Feet (Mod.)	Linear Foot

SECTION 624 – UNDERGROUND UTILITY SYSTEMS

SECTION 624 – UNDERGROUND UTILITY SYSTEMS, is hereby made a new section of the specifications, superceding all previous editions and their modifications.

624.01, DESCRIPTION This work shall consist of the construction of cable telephone underground conduit systems, an underground television conduit system and a VTans underground conduit system. This work shall also include conduit termination in this specification.

All work described above shall be in accordance with these specifications and in conformity with the lines, grades, dimensions, locations and details shown on the plans or established by the Engineer. The terms "Duct" and "Conduit" are used interchangeably in this specification.

Verizon shall provide a full time inspector when necessary during excavation, installation and backfill operation. Prior to backfilling trenches the Contractor shall notify the Engineer and Verizon (tel. 802-263-0702). Inspections will be scheduled for the construction of the new conduit system location and depth. All work must be accepted by Verizon and the engineer. Non-complying construction will be brought into compliance as directed at the expense of the Contractor. It is the responsibility of the installer to notify the Engineer and Verizon prior to backfilling. If notice is not given, Verizon (though approval of the Engineer) shall have the right to require any or all work to be exposed for visual inspection at the expense of the Contract.

624.02, MATERIALS:

CATV Conduit: (size noted on the plans)
PVC Schedule 40 Heavy Wall Rigid Conduit, conforming to subsection 710.06 of Division 700 - Materials, and to NEMA Standard TC-2.

Verizon Conduit: (size noted on the plans)
PVC Schedule 40 Heavy Wall Rigid Conduit, conforming to subsection 710.06 of Division 700 - Materials, and to NEMA Standard TC-2.

Vermont Agency of Transportation Conduit: (size noted on the plans)
PVC Schedule 40 Heavy Wall Rigid Conduit, conforming to subsection 710.06 of Division 700 - Materials ,and to NEMA Standard TC-2.

Conduit Spacers: Interlocking high-density polyethylene module spacers for direct burial including base pad, base spacer, intermediate modules and module cap as required. Spacer systems to be used as noted on the plans. Other systems may be used subject to approval by the Engineer.

Controlled Density Fill - Excavatable: The Contractor shall be responsible for producing a mix design meeting the requirements of this section. Controlled density fill is to be batched at a ready mix plant and is to be used at a slump of approximately 10 to 12 inches. It shall be flowable, require no vibration and after it has been placed can be excavated by hand tools and/or small machines. Compressive strength at 28 days shall be a minimum of 30 psi and a maximum of 80 psi; compressive strength at 90 days shall be less than 200 psi. Materials shall meet the requirements of the following Sections of Division 700 - Materials.

Portland Cement	701.02
Portland-Pozzolan Cement	701.05
Fine Aggregate for Concrete	704.01
Air-Entraining Admixtures	725.02(b)
Water	745.01

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The mix design shall be submitted for approval and shall be accompanied by compression test data at 90 days for at least five cylinders cast with the proposed mix design. Cylinders shall be prepared in accordance with ASTM D 4832. At the Engineer's discretion, evidence of successful past performance for a proposed mix design may be accepted in lieu of compression tests.

624.03. GENERAL. Verizon representative shall inform the Engineer of any improper construction techniques and/or inferior materials observed during their inspections. The engineer shall have the authority to reject any material or work which does not meet the requirements of these specifications. The Contractor shall request the services of DIG SAFE and where needed UVM "DIG SAFE" for the purposes of utility location.

The conduit system shall be constructed in a continuous manner, from cable vault to cable vault, rather than in segments.

624.04. EXCAVATION. The conduit trench shall be excavated to the required depth and to a width sufficient to install the conduit. Method of installation shall be in accordance with conduit manufacturer's specifications and recommendations.

Where an existing utility is found to conflict with the proposed work, the location, elevation and size of the utility shall be accurately determined without delay by the Contractor and the information shall be furnished, in writing, to the Engineer for resolution of the conflict. Excavation for handholes shall be to the required depth and shall include 6-inch depth beneath the bottom for a level compacted sand base.

All excavation shall be confined to as little surface area as possible, keeping within all applicable safety requirements.

624.05. INSTALLATION OF CONDUIT. Conduit shall not be placed until the trench has been approved by the Engineer. Also, prior to backfilling conduits, the Contractor shall contact (through the Engineer) Verizon for inspection and approval.

The conduits shall be placed in accordance with the configuration(s) shown on the plans, with spacers placed as indicated. Joints for conduit shall be made with the type of joint cement supplied and recommended by the conduit manufacturer.

Where conduit is stubbed, caps shall be provided. After backfilling, the end of the stub shall be prominently marked.

No preformed bends are required. No heat source or additional tools shall be used. The CATV conduit shall be installed with minimum bends in such a manner as to insure that during the coaxial cable installation no cable is subjected to pulling tensions greater than the following maximums:

For .500" cable 200 lbs.
For .750" cable 420 lbs.

Verizon conduit bends shall be as noted on the plans.

Random conduits shall be mandreled, at the direction of the Engineer, with a 4-inch diameter solid mandrel.

Mandrel the four corners plus one conduit in each intermediate tier of the conduit structure.

Conduit spacers, as approved, must be used to insure 1-inch separation between conduits. Spacers to be placed at 6-foot intervals or as recommended by the conduit manufacturer, and not more than 2 feet from manhole walls.

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Rubber type conduit plugs or PVC plastic caps, as approved by the engineer, shall be placed in all conduits which are terminated in vaults, closures, etc.

The Contractor shall furnish and install a nylon pull cord, which is rated at 500 lbs. Minimum tension, in all conduits. The pull cords shall be installed and the completed ducts shall be capped and plugged as directed by the Engineer with concurrence of the utility company inspector. The installed conduit shall be inspected and approved by the Engineer before backfilling.

The Contractor shall install plastic warning tape, describing buried lines and cables, along entire length of duct bank. The warning tape shall be placed 12" above the top of conduit.

Plastic duct joints shall be made watertight by the use of a brush applied comment as recommended by the manufacturer.

Duct bends required for passing duct under existing line of duct banks shall be made up by the use of 22 degree or 30 degree elbows. Field bends shall be avoided whenever possible.

Ducts entering manhole or vault walls shall terminate with bell ends grouted into manhole or vault wall. Entry into existing manholes shall be accomplished by use of core drill.

Ducts entering existing manhole shall be grouted in place with minimum 2500 psi concrete. All existing cables and equipment in a manhole shall be protected from possible damage. All work in existing manholes shall be coordinated and approved by Verizon.

Prior to pouring controlled density fill (CDF), the duct shall be securely anchored to prevent movement during the pour. Anchors shall be within 2 ft and on each side of a joint, at each end of a bend, and at a maximum distance of 10 ft between anchors.

The Contractor shall confirm, before placing duct lines, that the surface on which CDF is to be poured is undisturbed original ground or firmly compacted earth free from voids, rock or rubble.

Where a new entry for conduit must be made into the wall of an existing vault, the Contractor shall core drill or otherwise remove the concrete to provide a neat opening of the size shown on the plans. Conduit entry shall be done as provided in the previous paragraph. Conduit shall be grouted in place. No entry into existing vaults shall be allowed without the presence or permission of the utility company inspector.

All frame and covers shall be constructed to final grade unless otherwise directed by the Engineer.

624.06. BACKFILL. All Duct Banks shall be backfilled with CDF to the elevations shown on the plans. After the CDF has cured for a minimum of 24 hours and has obtained sufficient strength to support the weight of foot traffic without deformation for earthen backfill or vehicle traffic for paving operations, approved material shall be placed over the encased ducts. The material shall be brought to subgrade beneath roadway, grass belt, sidewalk, bike path, and any other paved or gravel areas. For grassed areas the material shall be brought to within three inches of the finished grade, a three inch layer of topsoil placed and the area seeded and mulched in accordance with the applicable requirements of Section 651. Paved, concrete or gravel areas shall be replaced in kind as directed by the Engineer.

Controlled Density Fill shall be pumped into the sleeved duct bank to fill the spaces between the ducts and sleeve.

624.07. ADJACENT UTILITIES. In excavating for conduits, the Contractor shall be attentive to the adjacent utilities with respect to type of materials, size, age, condition, type of construction, couplings and joints and pressure within. These factors shall determine the allowable separation. Damage to other utilities shall be repaired by the Contractor at his expense.

0 OF 10

When crossing foreign structures, the conduit shall be located either above or below the foreign structure depending on grade. The minimum separation between utility conduit systems and other conduit systems or foreign pipes such as water, gas mains, etc., shall be at least 6 inches of clearance when crossing and 12 inches when paralleling.

At vault and other locations, conduit shall maintain a minimum separation of at least 3 inches of clearance from the outside surfaces of the vault walls, floor or roof and power or other foreign conduits.

When crossing water laterals to hydrants, if lateral valve is located between the main and hydrant, the conduit shall be located so as to provide a minimum of 12 inches clearance from the valve.

When a condition is encountered other than above, such as the requirement for rerouting or relocation of another utility, bypasses, etc., the Engineer shall be notified immediately of consultation and agreement with both utility companies involved.

624.08. METHOD OF MEASUREMENT: The quantity of Ducts Concrete Encased- Duct Bank, Ducts Concrete Encased -Duct Bank Roadway, and Ducts Concrete Encased -Duct Bank Through Sleeve will be paid for at the contract unit price per linear foot. Measurement for Duct Banks will be made along the centerline of the main duct bank from the face of Verizon Manhole #116B to the face of Verizon Manhole #119A. No deduction shall be made for the length through intermediate manholes and no additional measurement shall be made for the two and four duct runs to handholes off the centerline of the main duct bank.

624.09. BASIS OF PAYMENT: The accepted quantities of each type duct bank will be paid at the contract unit price per unit for the item specified in the contract, which price shall be full compensation for furnishing, transporting, handling and installing the conduit material (including conduit, conduit spacers, transition couplings, elbows and other fittings, caps, plugs, pulling wire, marking tape, and all other material needed for a complete direct burial duct system), controlled density fill, and concrete grout, including but not limited to excavation and backfill, loading and transporting to the job site all materials required, disposal of unused materials off-site, making new entries into existing vaults and the furnishing of labor, tools, equipment and incidentals necessary to complete the work. Any additional depth of excavation required to construct conduit under other utilities, and the cost thereof, shall be included.

Backfill above the level of the controlled density fill will be paid at the unit prices of the following items as applicable: Topsoil, Subbase of Crushed Gravel (Fine Graded), Bituminous Concrete Pavement (PG 64-28), and Portland Cement Concrete Sidewalk, 5 inch.

Payment will be made under:

Pay Item		Pay Unit
624.20	Ducts, Concrete Encased (Mod. - Duct Bank)	Linear Foot
624.20	Ducts, Concrete Encased (Mod. - Duct Bank, Roadway)	Linear Foot
624.20	Ducts, Concrete Encased (Mod. - Duct Bank, Through Sleeve)	Linear Foot

SECTION 625 - SLEEVES FOR UTILITIES

625.03. INSTALLATION, is hereby modified by deleting paragraph one and two and replacing them with the following:

Sleeves shall be installed by boring or drilling, jetting or jacking without boring will not be permitted. Before any work has begun within the limits of operation, the CONTRACTOR shall have assembled all tools, materials, and equipment which will be required. When the CONTRACTOR has started the boring and jacking operations, he will proceed in a continuous operation without stopping.

During boring and jacking, the pavement shall not be disturbed. sleeve pipe shall be positively joined in accordance with standard procedures.

After the sleeve has been installed, the boring operation trenches or pits shall be backfilled in layers not exceeding 8" compacted depth, with each layer thoroughly compacted. Any surplus material shall be disposed off-site.

Submittals: The Contractor shall submit a detailed work plan to the Engineer for approval a minimum of 2 weeks prior to commencing construction. The work plan shall describe the proposed means and methods including; equipment design, equipment dimensions, methods of operation, methods of dealing with obstructions, proposed materials, equipment layout, procedures and manpower schedule for use in the pipe casing installation.

625.05. BASIS OF PAYMENT, is hereby modified by deleting paragraph two and three and replacing them with the following:

Excavation and backfill of trenches and boring or jacking pits for the placement of sleeves shall not be paid separately, but shall be included in the unit price for this item.

Payment will be made under:

Pay Item	Pay Unit
625.10 Sleeves for Utilities (Mod. – Jack and Bore)	Linear Foot

ADDITIONAL SPEC TO FOLLOW TO RESIDENT ENGINEER/CONTRACTOR
A. DTA,
SFT
10/1/2001

**B PLASTIC POLYVINYL CHLORIDE (PVC)
AND B POLYPROPYLENE CONDUIT
CONCRETE ENCASED
MAIN CONDUIT**

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1. GENERAL

1.01 This section covers the methods of laying concrete encased 4-inch diameter B plastic and B polypropylene conduit encased.

1.02 This section is being reissued to add reference to the B polypropylene conduit. Since this issue is a general revision, no revision arrows have been used to denote significant changes.

1.03 The B plastic PVC and B polypropylene conduit are 4-inch (id), single-bore conduit intended for use in single- or multiple-duct construction with concrete encasement. They can be used in structures such as bridges, viaducts, etc., where they can be cast in the concrete of the structure.

**Reprinted to comply with modified final judgement.

1.04 The B plastic conduit (thin wall) is made of virgin PVC with expanded bell on one end. It is fully compatible with B or C polypropylene conduit.

1.05 The B polypropylene conduit (rust colored) has an expanded bell on one end to fit the barrel of the mating conduit. The polypropylene conduit is fully compatible with B or C plastic conduit.

1.06 Section 622-100-010 outlines the various permits that may be required before start of construction.

1.07 When laying conduit, labor-saving equipment such as excavators, concrete cutting machines, etc., should be utilized to reduce trench opening time, minimize physical effort, and provide overall economy.

1.08 To ascertain that conduit has been properly laid, the conduit work should be inspected throughout the construction period by a thoroughly trained inspector who is completely familiar with job and construction specifications. The inspector should confirm that the conduit run is in the correct location, proper conduit depth is maintained, the trench bottom is level, no cracked or broken duct sections are used, all joints are properly made, horizontal and vertical alignment is maintained, the conduit is properly encased in concrete, selected backfill is used, and all specifications are met. In the event that underground obstructions or special field conditions require minor deviations from work plans, the inspector should note such changes with appropriate measurements on his copy of the work print for future posting to permanent records.

1.09 To facilitate subsequent cable placing operations, particular care should be taken concern-

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ing direction changes and the construction of joints. Curves, sweeps, and grade changes should be detailed on the work print. The ideal conduit structure is one that is essentially straight and level between manholes but allows grading for drainage into manholes. Direction changes should be as gradual as possible.

1.10 The types and uses of plastic conduit, couplings, and bends are covered in Section 622-020-100.

2. PRECAUTIONS

2.01 Both the cement used to join plastic PVC conduit and the adhesive used to join polypropylene conduit contains materials that are toxic and highly flammable. Concentrated vapors can be harmful and explosive. The following precautions must be observed when using or storing each of these materials.

- (a) Do not use near heat, sparks, or flames.
- (b) Use with adequate ventilation. Forced ventilation shall always be used to ventilate manholes whenever anyone is working in the manhole. See Section 620-140-501.
- (c) Standard manhole testing procedures shall be used for testing the manhole atmosphere.
- (d) Avoid breathing vapors and prolonged contact of these materials with the skin. After use, wash hands thoroughly. Do not take internally. In case of contact with eyes, flush immediately with water and get medical attention.
- (e) Do not leave the cement containers where they can be exposed to contact by the public.
- (f) When not in use, close containers tightly.
- (g) Dispose of used containers as outlined in local practices. Do not pour the contents of these containers into manholes, manhole excavations, or conduit excavations. Do not discard these containers in incinerators, refuse piles, etc.
- (h) A natural bristle brush must be used to apply the cement. Synthetic bristles will dissolve in these materials.

2.02 The requirements for shoring excavations as specified in Section 622-020-020 shall be observed.

2.03 Safety headgear and eye protection should be worn at all times when trenching and when handling or laying conduit.

2.04 Where blasting is necessary, it shall be done only by a licensed contractor.

2.05 At the excavation site, particularly near natural gas areas, landfills, and similar areas, the excavation should be tested for gas by following the procedures for testing manholes, as covered in Section 620-140-501.

2.06 The applicable precautions covered in Sections 620-102-010 and 622-100-010 shall be considered a part of this section and shall be observed.

3. HANDLING

3.01 If practical, distribute the conduit along the route of the trench, as shown in Fig. 1. Where conduit cannot be distributed along the trench, route delivery and storage procedures should be determined locally.

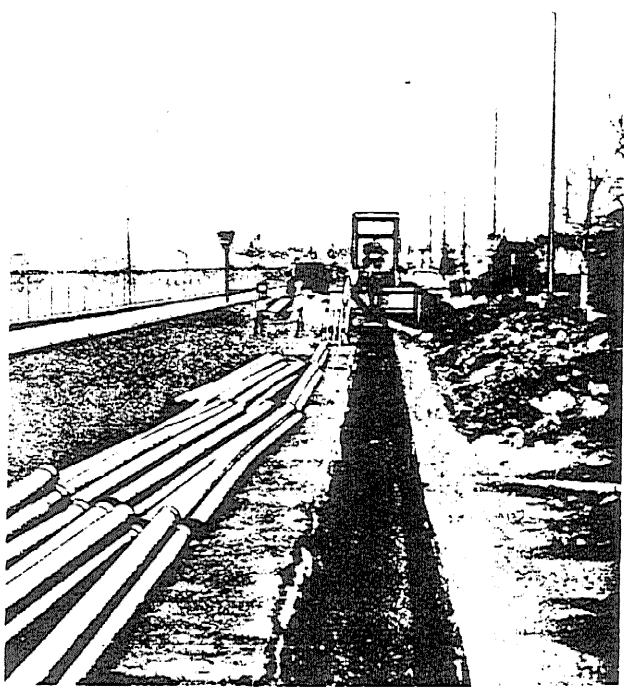


Fig. 1 —Conduit Along Trench Site

3.02 Do not let banded or single units of conduit drop in a free fall.

3.03 When moving or carrying conduit, be careful not to strike the ends against a hard surface. Damage to the ends can cause defective joints.

3.04 Both PVC and polypropylene have a tendency to assume the shape of whatever they are resting on, particularly when the storage area is warm. Store both types of conduit in accordance with the following:

(a) Conduit should be stored in the shipping pallet. Individual pallets should be stacked frame on top of frame to transfer the weight of the conduit to the pallet frame.

(b) When stacking loose conduit, place the conduit in a tightly packed orderly arrangement with all pieces oriented in the same direction.

(1) **Outside:** Place on a smooth surface of soil or sand.

(2) **Inside:** Place on a smooth level floor.

(c) Do not stack higher than 5 feet.

(d) Do not place wood strips under stacks of conduit.

(e) Conduit to be stored for more than 30 days should be protected from direct sunlight.

(f) If possible, store conduit in a cool location.

4. TRENCHING

4.01 In most cases, the trench sidewalls will act as a form for the concrete encasement of the conduit. The trench width should be no wider than is necessary to provide a minimum of 1-1/2 inches of concrete along each side of the duct structure. An excess width of even a few inches can greatly increase the amount of concrete required to complete the encasement.

4.02 Pavement should be carefully cut mechanically to prevent unnecessary widths at the top of the trench and thus reduce the amount of surface that must be repaved.

4.03 The total width of the trench will depend upon the number of ducts placed plus horizontal separation between ducts. The total depth of the trench will depend upon the number of ducts, vertical separation (if required) between ducts, and the depth of cover (Section 919-240-100).

4.04 Table A indicates the trench width, concrete depth, and volume of concrete required for various duct formations where there is no vertical separation and 1-inch horizontal separation between ducts. Figure 2 illustrates a nine-duct formation of this type in a straight conduit section.

TABLE A
8 PLASTIC PVC AND 8
POLYPROPYLENE CONDUIT
NO VERTICAL SEPARATION
TRENCH DIMENSIONS

DUCT FORMATION		TRENCH WIDTH	CONCRETE DEPTH	APPROX CU
NO.	NO.	(NOTE 1)	(NOTE 2)	YDS CONCRETE
WIDE	HIGH	(INCHES)	(INCHES)	PER 100 TRENCH FEET
3	2	18-1/2	12-1/2	3-1/2
3	3	18-1/2	17	4-1/2
3	4	18-1/2	21-1/2	5-1/2
4	2	23-1/2	12-1/2	4-1/2
4	3	23-1/2	17	6
4	4	23-1/2	21-1/2	7

Note 1: Includes 1-1/2 inches from each side of duct formation to trench wall and 1 inch between ducts.

Note 2: Includes 1-1/2 inches below bottom tier and 2 inches above top tier.

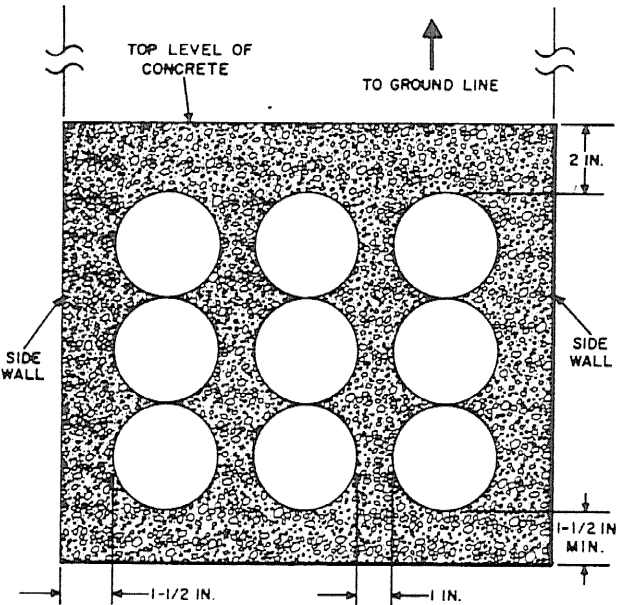


Fig. 2—Trench Dimensions—No Vertical Separation

 For formations not listed in Table A, the approximate cubic yards of concrete required per 100 trench feet can be obtained with the following formula:

Formula: $V = [9.2WH + 9H + 18.7W + 7]0.026$
V = volume of concrete (cubic yards/100 trench feet)
W = number of ducts wide
H = number of ducts high
Example: Duct formation 5 wide by 10 high
 $[(9.2 \times 5 \times 10) + (9 \times 10) + (18.7 \times 5) + 7]0.026$
 $[460 + 90 + 93.5 + 7]0.026$
 $[650.5 \times 0.026] = 16.9$ cubic yards.

4.05 Table B indicates the trench width, concrete depth, and volume of concrete required for various duct formations where there is 1-inch vertical and horizontal separation between ducts. Figure 3 illustrates a nine-duct formation of this type in a straight conduit section or at curves and grade changes.

TABLE B 8 PLASTIC PVC AND 8 POLYPROPYLENE CONDUIT 1-INCH VERTICAL SEPARATION TRENCH DIMENSIONS				
DUCT FORMATION		TRENCH WIDTH	CONCRETE DEPTH	APPROX CU
NO. WIDE	NO. HIGH	(NOTE 1) (INCHES)	(NOTE 2) (INCHES)	YDS CONCRETE PER 100 TRENCH FEET
3	2	18-1/2	12-1/2	4
3	3	18-1/2	19	5
3	4	18-1/2	24-1/2	6-1/2
4	2	23-1/2	12-1/2	5
4	3	23-1/2	19	6-1/2
4	4	23-1/2	24-1/2	8-1/2

Note 1: Includes 1-1/2 inches from each side of duct formation to trench wall and 1 inch between ducts.

Note 2: Includes 1-1/2 inches below bottom tier, 2 inches above top tier, and 1 inch between top ducts.

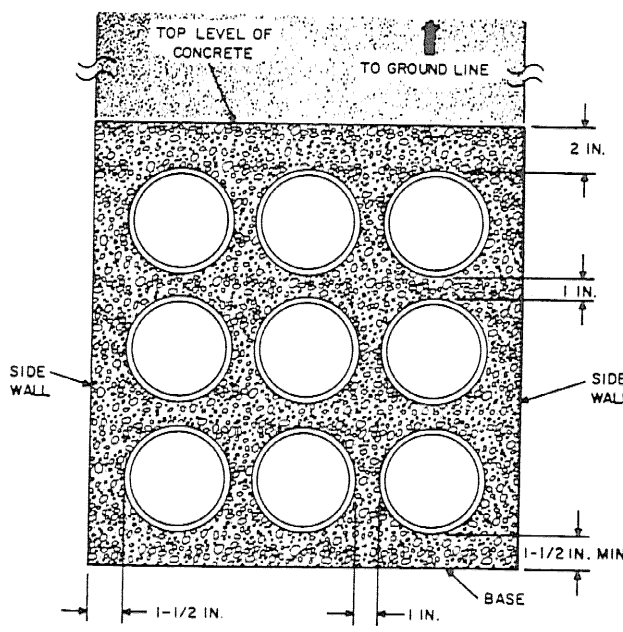


Fig. 3—Trench Dimensions—1-Inch Vertical and Horizontal Separation



For formations not listed in Table B, the approximate cubic yards of concrete required per 100 trench feet can be obtained with the following formula:

Formula: $V = [13.8WH + 10.7H + 13.4W + 4]0.026$

V = volume of concrete (cubic yards/100 trench feet)

W = number of ducts wide

H = number of ducts high

Example: Duct formation 5 wide by 10 high

$[(13.8 \times 5 \times 10) + (10.7 \times 10) + (13.4 \times 5) + 4]0.026$

$[690 + 107 + 67 + 4]0.026$

$[868 \times 0.026] = 22.6$ cubic yards.

5. LAYING CONDUIT



At the trench site, examine each conduit length and remove all mud and other debris such as lath, paper, stones, etc, from the ducts before placing them in the trench.

5.01 Place and join the duct sections in the trench. Lengths shorter than 5 feet should not be used at manholes or the cable entrance facility. Do not run polypropylene conduit into buildings.



Use only cement suitable for the kind of duct material being used; cement containers for use with ABS are marked for use with ABS; similarly marked are the containers to

be used with PVC. Use only the adhesive supplied with B polypropylene conduit on polypropylene conduit. Solvent cement which is shipped with ABS and PVC conduit must not be used with polypropylene conduit.

5.02 Join the conduit as follows (Fig. 4):

(1) Wipe any mud or dirt from the end of the duct and from the inside of the coupling or bell.

(2) Apply cement to the **spigot end** of the duct with a natural bristle brush up to the insertion depth line.

(3) Polypropylene conduit has been designed with an interference fit bell and spigot joint. If the spigot does not seat in the bell to the insertion line drive the conduit home using a mallet and a wooden block as a buffer.

Note: If PVC cement seizes before the spigot end is fully seated, use a handsaw to cut out the defective joint. If polypropylene adhesive dries on the spigot end before the joint is made, recoat the spigot end and insert into bell to complete joint.

5.03 The PVC cement and polypropylene adhesive should each have about the same consistency as oil base house paint. If it becomes too thick, discard and open a new can. When using polypropylene conduit and if immediate joint strength is required (eg, at field bends and manhole terminators), apply a thin coating of adhesive to the inside of the mating bell (or terminator). Allow a minimum of 5 minutes for adhesive to dry before completing the joint following Steps (2) and (3) of paragraph 5.02.

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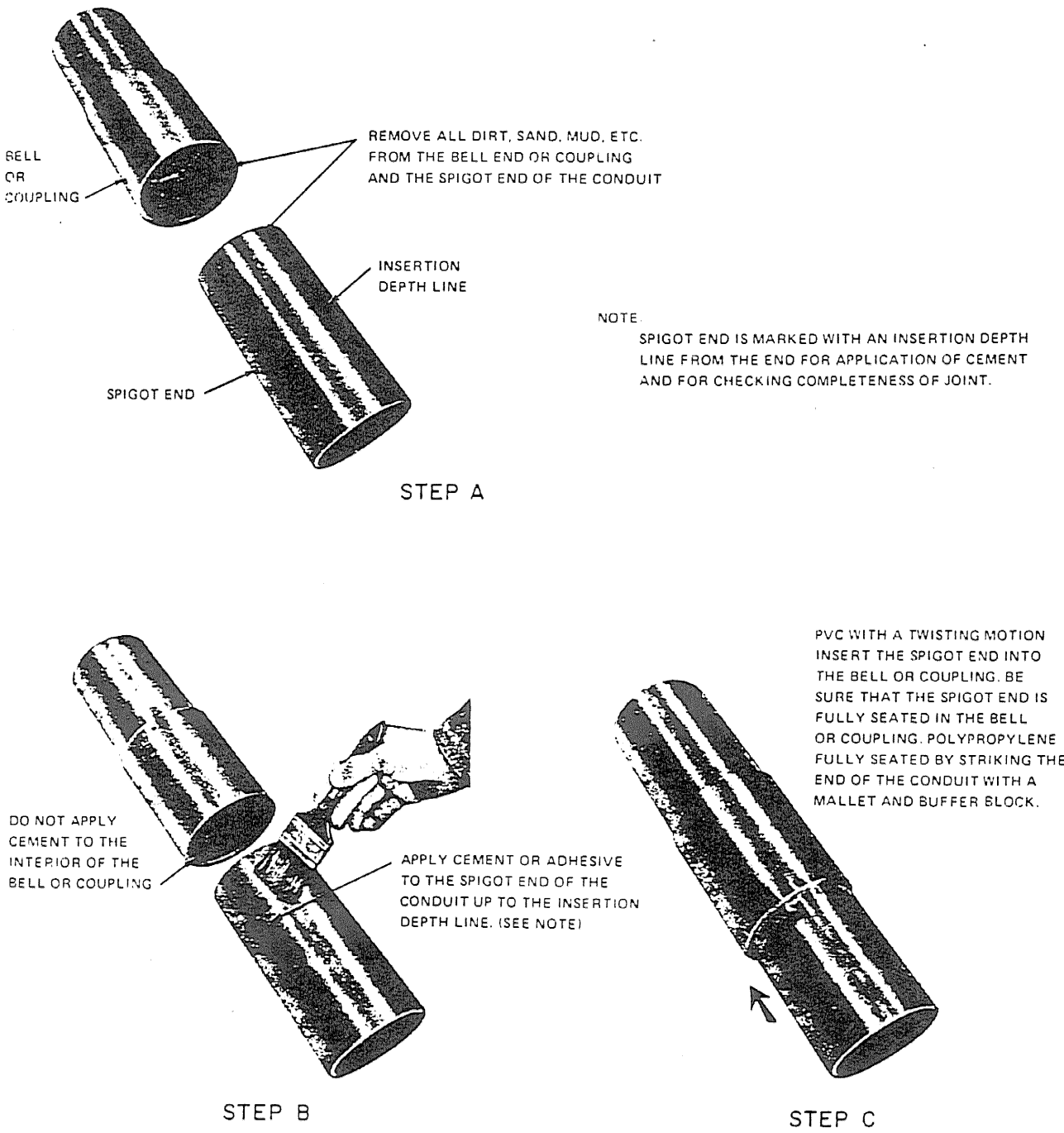


Fig. 4—Joining Conduit

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5.05 In straight sections up to and including three tiers high, stack the ducts one upon the other with no vertical separation. A minimum separation of 1 inch between vertical columns is obtained by use of temporary fork-type separators (Fig. 6). A monolithic (single pour) concrete encasement may be made with this duct formation.

(1) Place a wood or plastic strip approximately every 4 feet along the trench bottom so as to provide a minimum of 1-1/2 inches of clearance between the first tier of ducts and the trench bottom.

(2) Build up the duct structure in full formation; ie, when each tier of full lengths is laid 20 to 60 feet in the trench, place the second tier, and then the third tier. As the ducts are laid, do not follow deviations in trench alignment to maintain side clearance. Lay the duct as straight as possible, even though it may reduce side clearance for short distances. This is important to ensure against excessive pulling loads when placing cable.

(3) To provide the required horizontal separation between vertical columns of ducts, and from the trench sidewalls during construction, place locally fabricated separators. These should be on not more than 8-foot centers (Fig. 6).

5.06 In straight sections over three tiers high, either of two arrangements can be used, depending on the concrete encasing procedure:

(a) A monolithic (single pour) concrete encasement can be made in duct formations up to and including ten tiers high, provided that a minimum horizontal and vertical separation of 1 inch is obtained between adjacent ducts. These separations can be obtained by using permanent, commercially available plastic spacers. A minimum of 1-1/2 inches clearance is required between the first tier of ducts and the trench bottom.

(1) The base spacers should be placed along the trench bottom at intervals of not more than 8 feet. Set the first tier of ducts into the spacer grooves. Then place a tier of intermediate spacers, then the second tier of ducts, etc, and finally the spacer over the top tier, making cer-

tain that each tier of spacers is securely locked to the next lower tier. If the formation will exceed ten tiers, place approximately one-half the total number of tiers but not more than ten so that the concrete can be poured in successive stages.

(2) Where the formation will be wider than the maximum width of spacer available, slightly offset groups of four unit spacers in the same tier.

(b) The ducts can be stacked one upon the other up to four tiers high, with a minimum clearance of 1 inch between vertical columns obtained by the use of temporary fork-type separators. Place a wood or plastic strip approximately every 4 feet along the trench bottom so as to provide a minimum of 1-1/2 inches of clearance between the first tier of ducts and the trench bottom. The concrete is then poured to encase to the top of the third tier; then up to three additional tiers can be added. Where the duct structure is wider than the maximum width of spacer available, slightly offset groups of four unit spacers in the same tier. Always provide a cap spacer tier over the top tier of conduit to help prevent duct flotation.

5.07 At Bends, Sweeps, or Grade Changes: At bends having radii of 80 feet or less, or at grade changes of 20 percent (11.3 degrees) or more, permanent spacers are required to provide a minimum horizontal and vertical separation of 1 inch between adjacent ducts and a minimum clearance of 1-1/2 inches between the first tier of ducts and the trench bottom. The spacers should be located on not more than 8-foot centers and should be held in place with reinforcing rods driven 6 to 12 inches into the ground. A monolithic (single pour) concrete encasement can be made, provided the formation does not exceed ten tiers high. If the formation will exceed ten tiers, place approximately one-half the total number of tiers, but not more than ten, so the concrete can be poured in successive stages.

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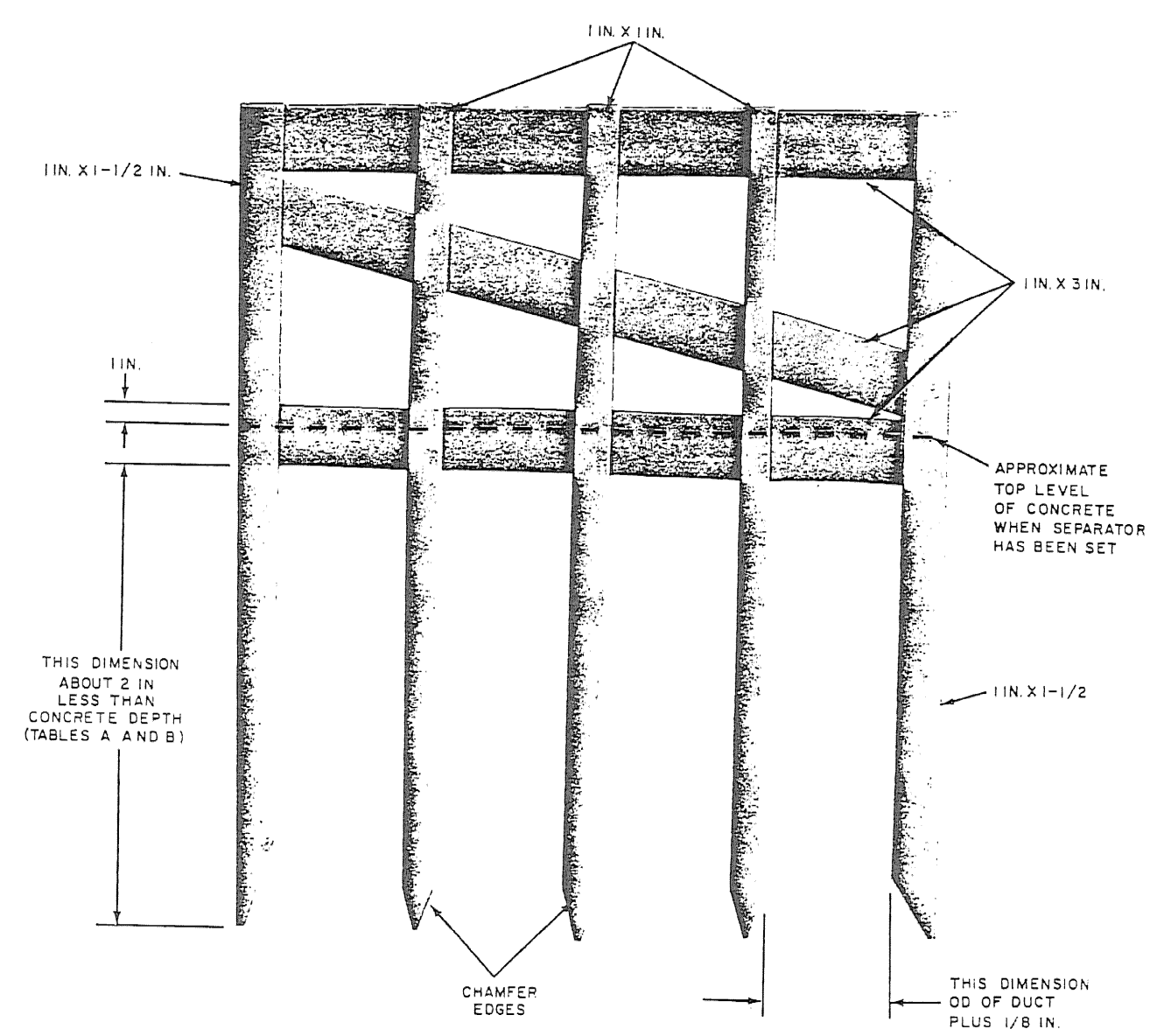


Fig. 6—Fork-Type Separator

5.08 Straight lengths of conduit can be used to construct horizontal or vertical bends or sweeps with a radius of 40 feet or more. Duct joints for the entire bend section should be made outside the trench at least 2 hours before placing to help ensure an effective joint. An example of a partially completed bend constructed with straight lengths of conduit is shown in Fig. 7.

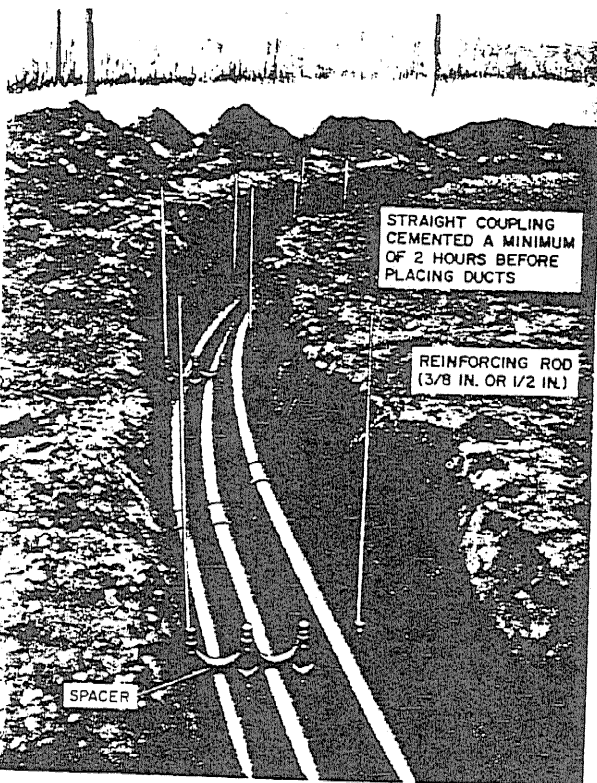


Fig. 7—Partially Completed Bend

When constructing bends with the bend segments, assemble the components on a flat surface alongside the trench to be sure the completed bend lies in a single plane.

5.09 The preformed 7-degree and 30-degree, 15-foot radius bend segments should be used to construct bends where a direction change with a radius of less than 40 feet is needed. The bend segments may be used singly or in combination to achieve the required direction change.

5.10 For mainline conduit, never use less than a 15-foot radius bend.

5.11 When it is necessary to stop construction in a section, 4-inch universal plugs can be used to temporarily seal the ducts against mud, dirt, etc (Fig. 8). Such plugs also can be used to advantage during manhole construction to keep duct entrances at manholes free of debris.

6. ENCASING

6.01 The concrete used to encase conduit is described in Section 622-020-020. It has a nominal compression strength of 2500 pounds per square inch. The slump should be 9 inches. It is important to use concrete of this type in order to permit adequate distribution and ensure proper support of the conduit. When the mix is too dry, flow to the bottom and between the layers of the duct formation will be difficult. When it is too wet, the ducts will float.

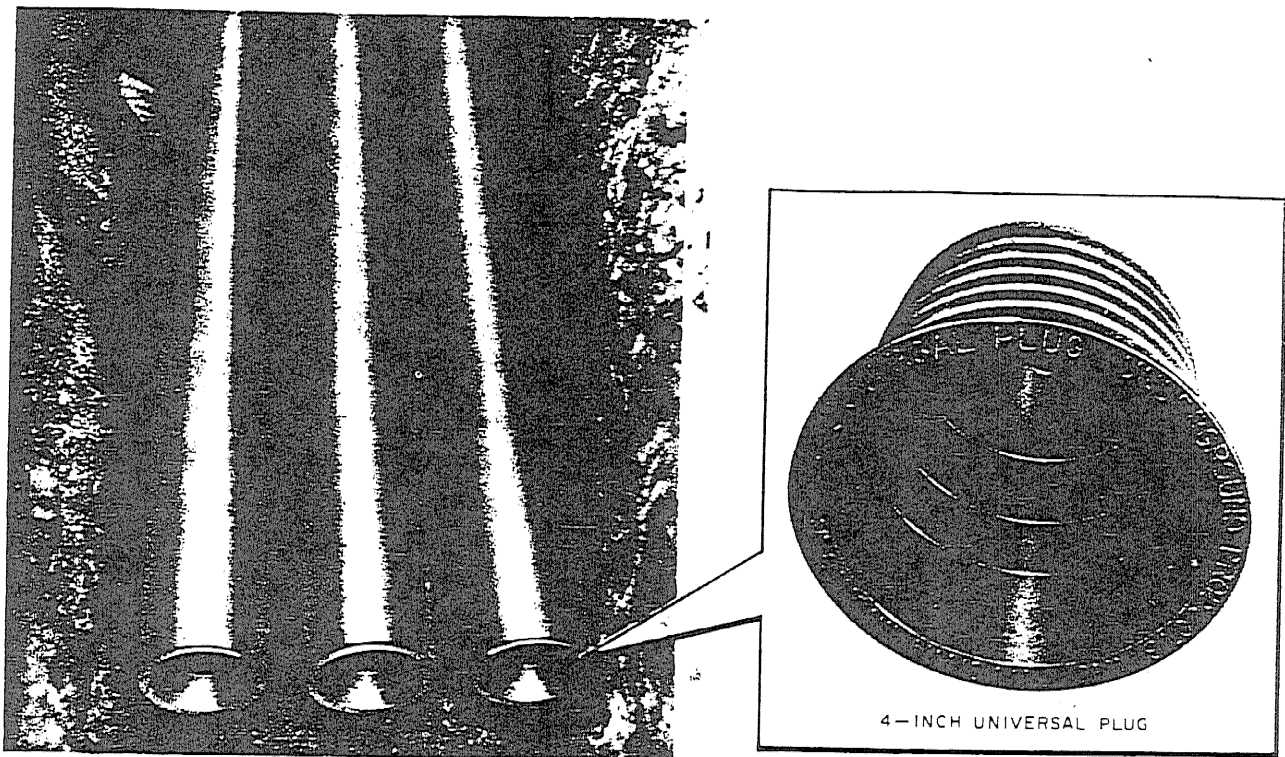


Fig. 8—Ducts Temporarily Plugged

6.02 When pouring concrete, adjust the delivery chute so the fall of concrete into the trench is as short as practicable. Use a splash board to divert the flow of concrete away from the trench sides to avoid dislodging soil and stones.

6.03 Encasement can begin as soon as enough of the duct structure has been completed so that pouring the concrete will not interfere with placing the conduit. Encase the conduit structure by pouring the concrete toward the free ends of the ducts. As the concrete is poured, use slicing bars or other similar tools to work the concrete down the sides of the formation and between ducts. It should be possible to see the concrete flowing along the bed of the trench just ahead of the point where it falls from the chute. This will assure the required minimum of 1-1/2 inches of concrete between the first tier of ducts and the bottom of the trench.

6.04 If separators are used, leave the separators in place until the concreting has been completed for at least 10 feet beyond the separator. When removing the separator, rock it slightly from side to side to ensure a good flow of concrete. Fill any remaining voids. Weights or ties should not be necessary to keep the ducts from floating if the separators are constructed so the lower crosspieces bear on the top duct. The lower crosspiece of the separator can be used as an approximate measure for the 2-inch cover required over the ducts.

6.05 To ensure complete encasement, use the methods described in the following paragraphs.

Formations With No Vertical Separation (Stacked With Separation Between Vertical Columns)

(a) **Three Ducts High:** Pour the concrete in a single pour to provide a 2-inch top cover. Work concrete down the sides of the formation and between the vertical columns.

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(b) **Four or More Ducts High:** Stack ducts four tiers high. Pour the concrete to encase to the top of the third tier. Raise the separators and add up to three additional tiers. Pour concrete to encase three tiers. Continue adding tiers until structure is complete, encasing three tiers at a time. On final pour, provide a 2-inch top cover.

Formations With Vertical and Horizontal Separation Between Ducts

(a) **Ten or Fewer Ducts High:** Where there is vertical and horizontal separation of 1 inch or more between the ducts and the duct structure is ten or fewer ducts high, a monolithic (single pour) encasement can be made. Work the concrete sufficiently to be assured of a good flow of concrete around the individual ducts. Pour sufficient concrete to provide a 2-inch top cover.

(b) **Eleven or More Ducts High:** Where there is vertical and horizontal separation of 1 inch or more between the ducts and the duct structure is more than ten ducts high, place half the total number of tiers and pour concrete to the bottom of the top tier. Place the remaining tiers and pour sufficient concrete to provide a 2-inch top cover. If the duct structure is more than 20 tiers high, place any number of tiers that is convenient but does not exceed ten. Encase to the bottom of the top tier. Place and encase successive portions of the duct structure. In all cases, work the concrete sufficiently to be assured of a good flow of concrete around the individual ducts.

7. BACKFILLING

7.01 Before backfilling, allow the concrete to cure for 1 to 2 hours. Because of the limited stiffness of the plastic conduit, it is important to allow sufficient time for the encasing concrete to develop some strength before backfill is placed. If the 1- to 2-hour waiting period will cause problems in some sections of the conduit run because of traffic, place temporary load-bearing plates over the trench or use C plastic conduit so backfill can be placed as soon as the concrete has been poured. Protect the concrete from weather—from drying too rapidly as well as from freezing (Section 622-020-020).

7.02 The first 12 inches of fill should be sand or other granular material. This fill should be thoroughly tamped using lightweight equipment, such as pneumatic or vibrating tampers. Complete the backfill with selected materials free of large stones, frozen material, etc.

8. MANDERELING

8.01 After backfilling, but before any required repaving begins, pull a D conduit mandrel (Fig. 9) through selected ducts. The mandrel will pass a curve of 15-foot radius. The conduit structure should be mandreled as follows:

(a) **Ten Ducts or Less:** Mandrel two diametrically opposite ducts.

(b) **Eleven Through Twenty Ducts:** Mandrel the four corners and a center duct.

(c) **Twenty-one or More Ducts:** Mandrel the four corner ducts plus one duct in each intermediate tier.

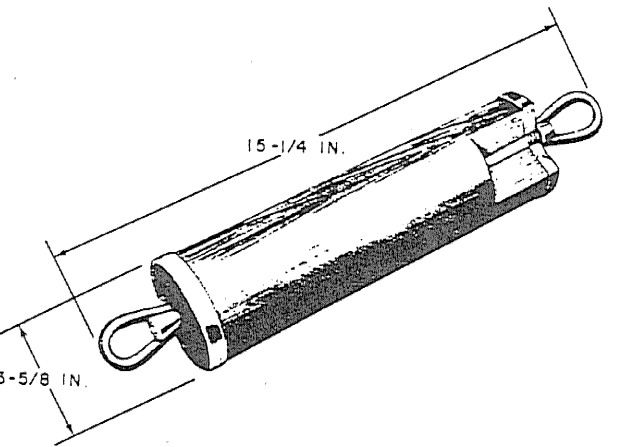


Fig. 9—D Conduit Mandrel

8.02 If the mandrel fails to pass through the duct being tested, either the duct is obstructed or misaligned, or the curve has too small a radius. The conduit must be exposed and the defect corrected. Encase the duct with concrete, backfill, and repeat the mandrel test in that unit of conduit.

9. PLUGGING DUCTS

9.01 At the completion of a manhole section, ducts are to be sealed, where required, in accordance with Section 628-220-200. Where duct sealing is not mandatory, it may be desirable, at local option, to

close each duct entrance with a 4-inch universal plug to keep the duct clean.

9.02 If ducts are dead-ended short of a terminating point with the intention of extending the run at a later date, they are to be sealed with solid rubber conduit plugs.

9.03 At the close of each work day, install temporary plugs, such as 4-inch universal plugs, in the ducts to keep out foreign materials.

AS-BUILT/RECORD DRAWINGS

QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FINAL
201.11	CLEARING & GRUBBING (INCLUDING INDIVIDUAL TREES AND STUMPS)	ACRE	1	
203.15	COMMON EXCAVATION	CY	250	
301.25	SUBBASE OF CRUSHED GRAVEL (FINE GRADED)	CY	350	
406.25	BITUMINOUS CONCRETE PAVEMENT (PS&A-25)	TON	60	
541.21	CONCRETE VAULT (MOD - TELEPHONE)	EA	3	
541.21	CONCRETE VAULT (MOD - CATV)	EA	4	
601.0415	18" DIOSP. D284 (2 - 7/8 x 1/2)	LF	48	
616.40	REMOVING AND RESETTING CURB	LF	10	
618.10	PORTLAND CEMENT CONCRETE SIDEWALK, 3" THK	SY	8	
620.15	GATE FOR CHAIN LINK FENCE, 8 FEET (MOD.)	LF	40	
621.57	ENERGY ABSORPTION ATTENUATOR	EA	2	
621.60	TEMPORARY TRAFFIC BARRIER	LF	843	
624.20	DUCTS, CONCRETE ENCASED (MOD - DUCT BANK - 18 TO 22)	LF	1,860	
624.20	DUCTS, CONCRETE ENCASED (MOD - DUCT BANK, ROADWAY - 18 TO 22)	LF	350	
624.20	DUCTS, CONCRETE ENCASED (MOD - DUCT BANK, THROUGH SLEEVES - 18 TO 22)	LF	315	
630.10	UNIFORMED TRAFFIC OFFICER	HR	150	
635.10	MOBILIZATION - MOD 1	LS	1	
641.10	TRAFFIC CONTROL - MOD 2	LS	1	
643.20	JACKING OR BORING WELDED STEEL PIPE (36")	LF	370	
651.15	SEED	LB	10	
651.15	FERTILIZER	LB	70	
651.20	AGRICULTURAL LIMESTONE	TON	0.3	
651.30	SODDING	SY	90	
651.35	TRIPOL	CY	75	
676.27	PULL BOX - DOUBLE	EA	4	

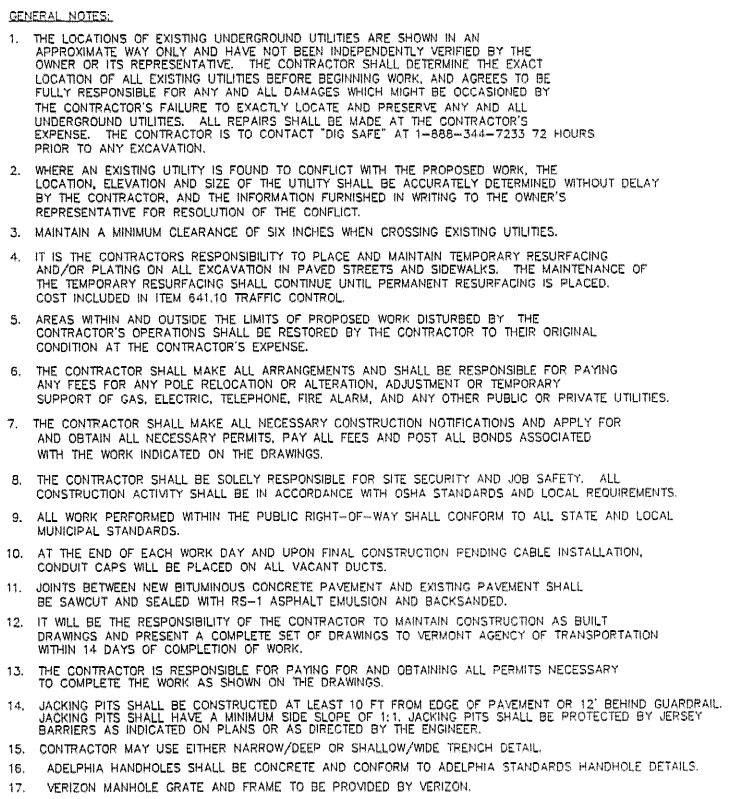
STANDARD SHEETS

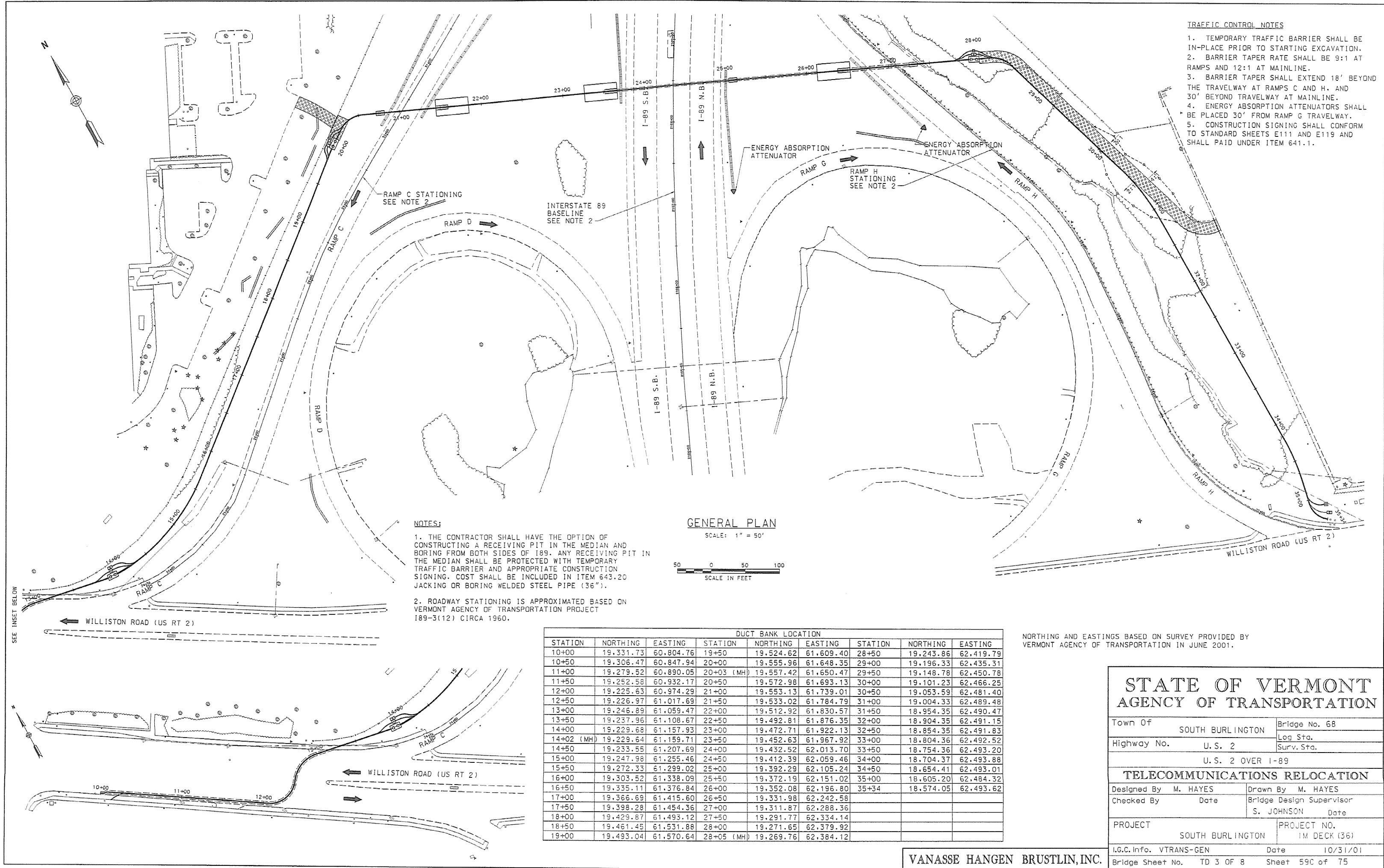
E-III
E-IVB
E-IVB
F6

03-11-97
08-08-95
08-08-95
08-01-94

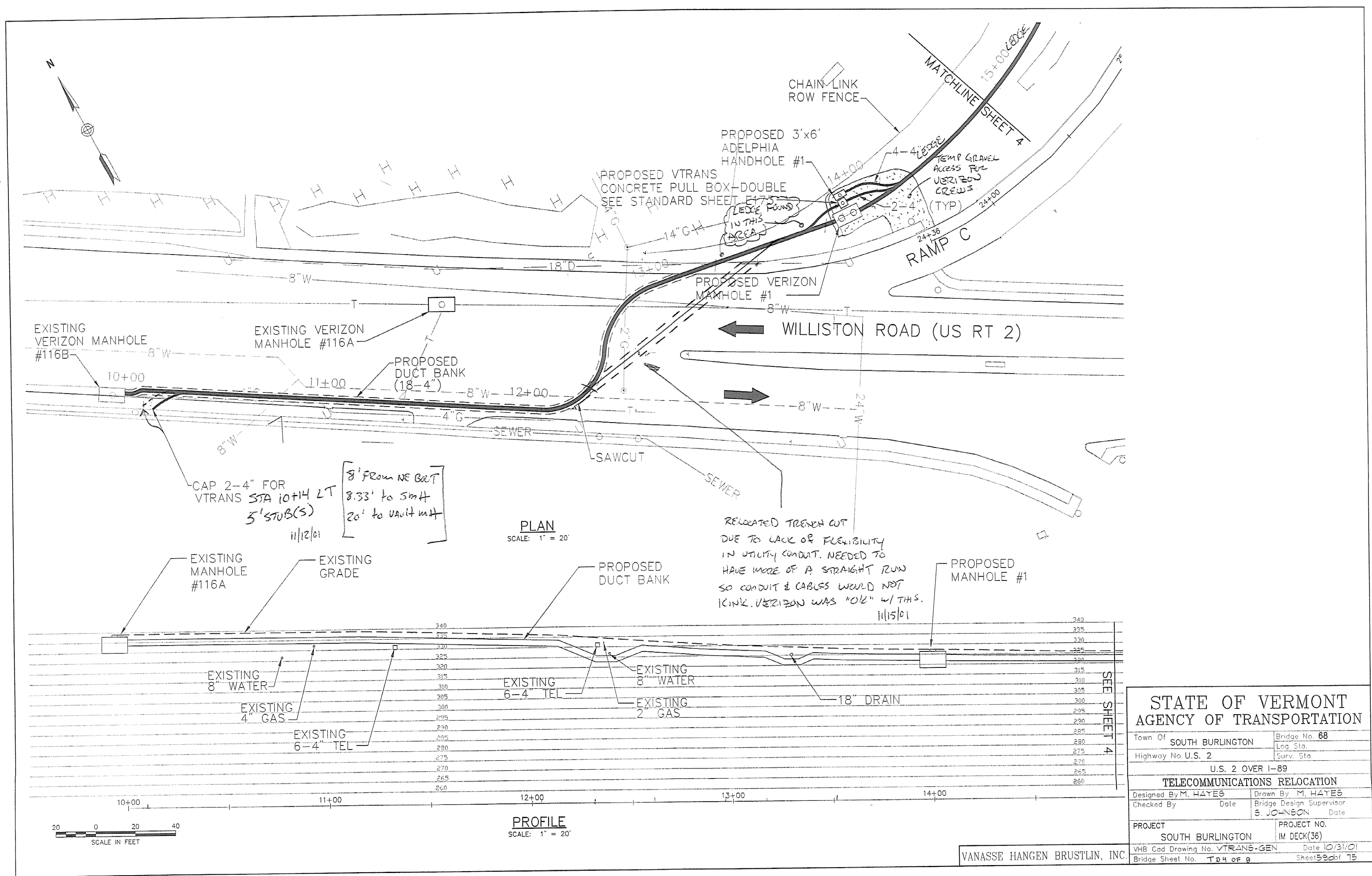
FINAL CONTRACT
PLANS 10/31/01

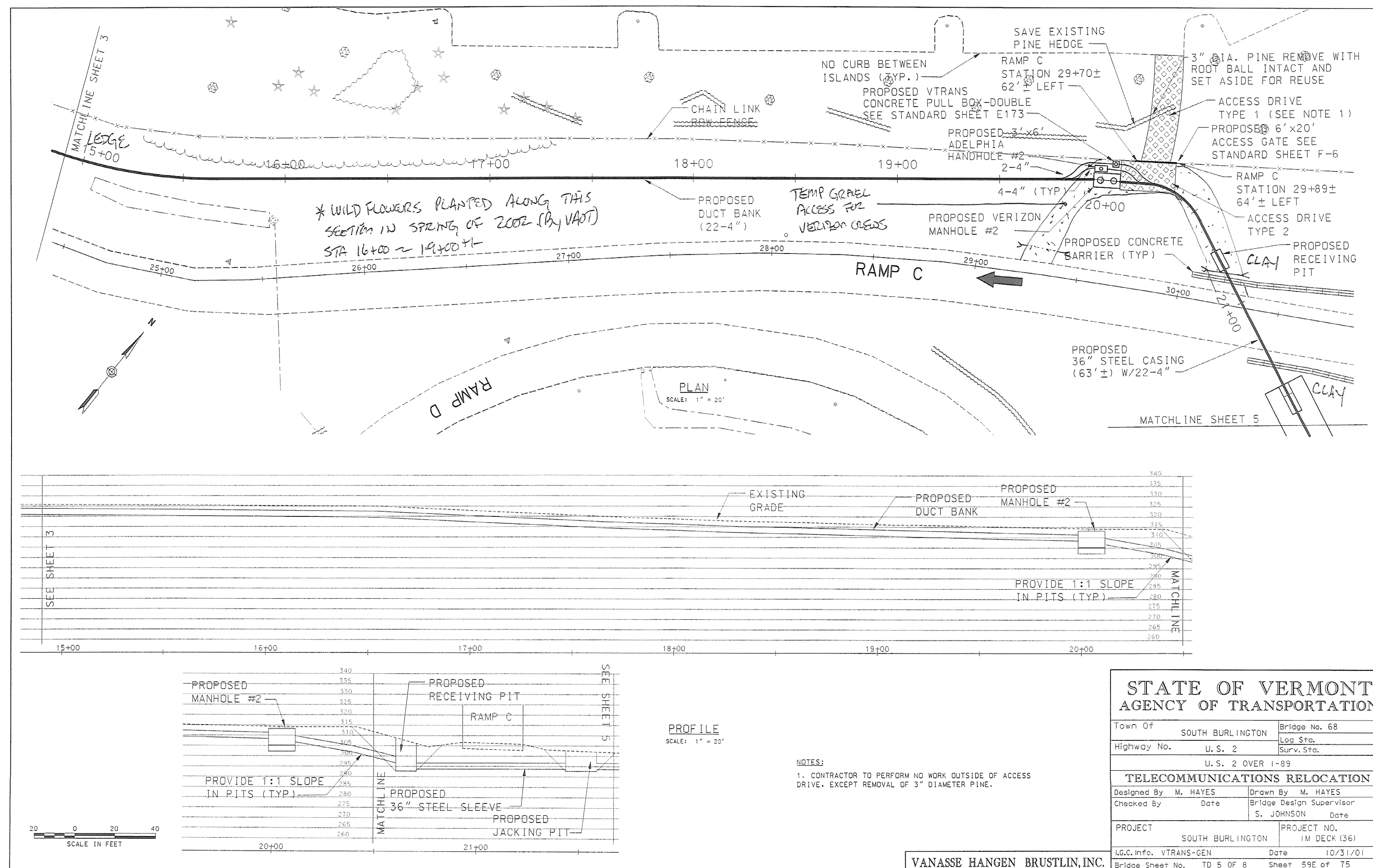
STATE OF VERMONT AGENCY OF TRANSPORTATION	
Town Of SOUTH BURLINGTON	Bridge No. 68
Highway No. U.S. 2	Loop Sta.
U.S. 2 OVER I-89	
TELECOMMUNICATIONS DETAILS	
Designed By M. HAYES	Drawn By M. HAYES
Checked By	Date Bridge Design Supervisor
S. JOHNSON	
PROJECT	PROJECT NO.
SOUTH BURLINGTON	MI DECK(36)
VHB Cod Drawing No. VTrans-Telecomant	Date 10/31/01
Bridge Sheet No. TD 1 OF 8	Sheet B58 of 75

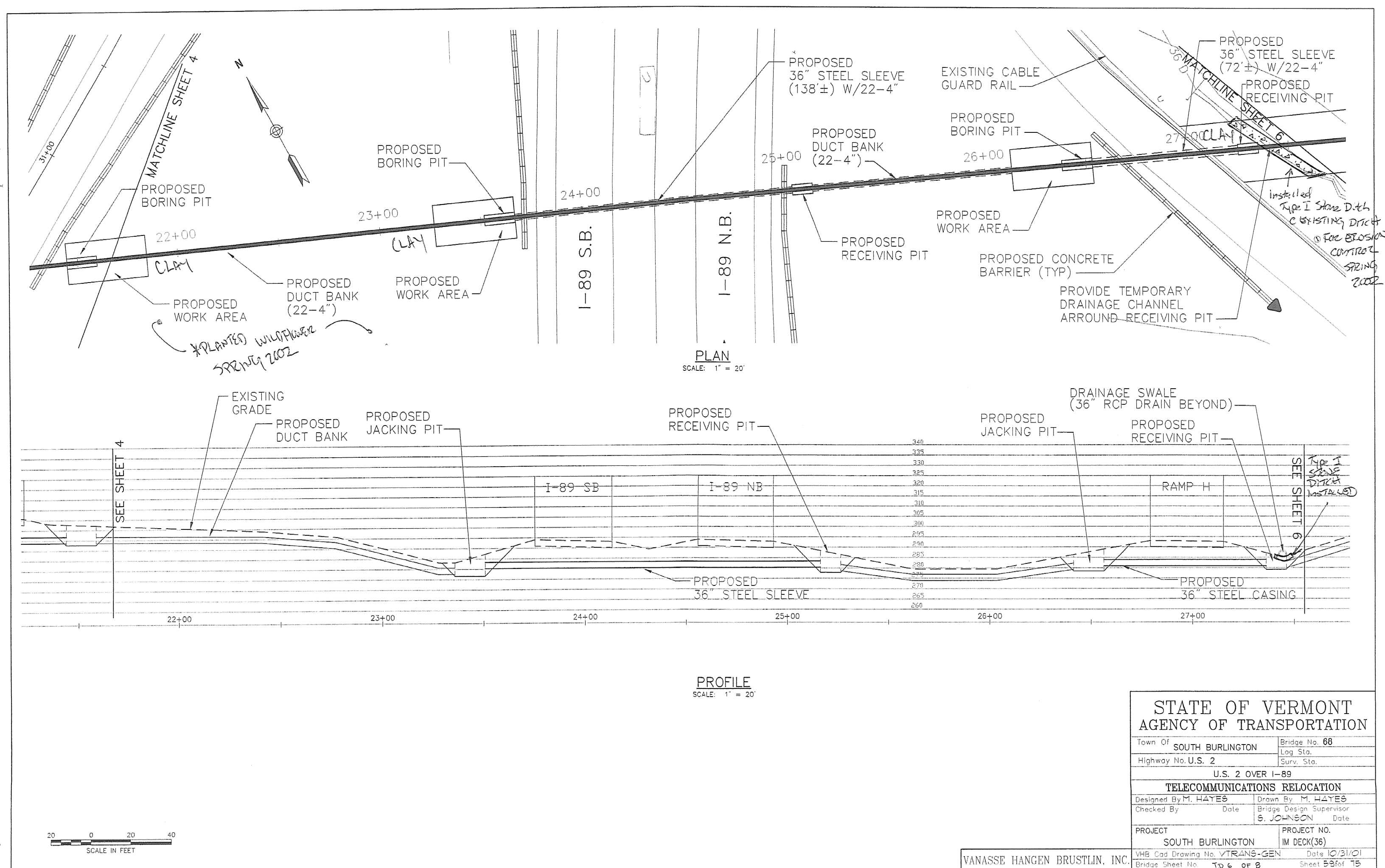


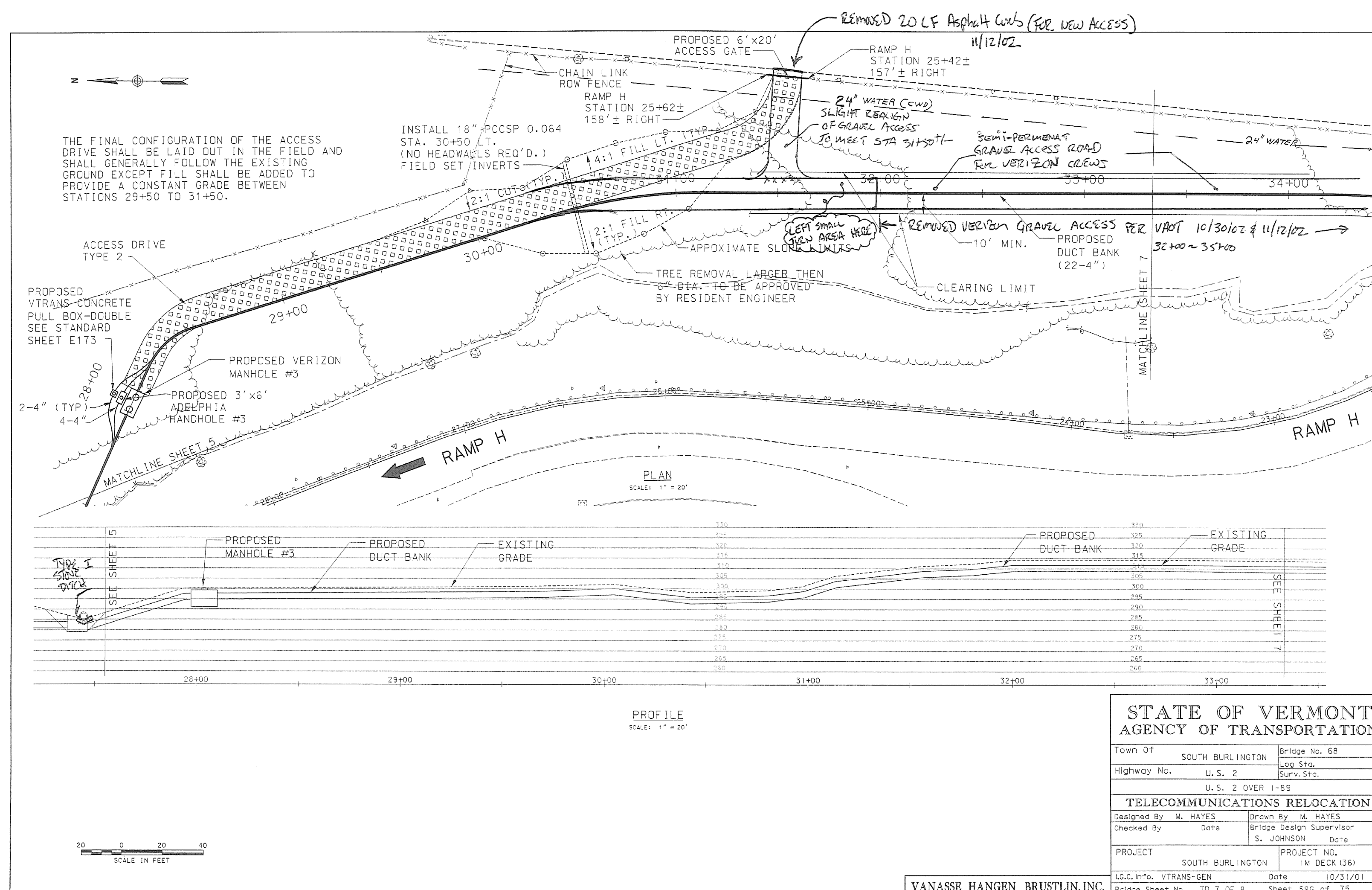


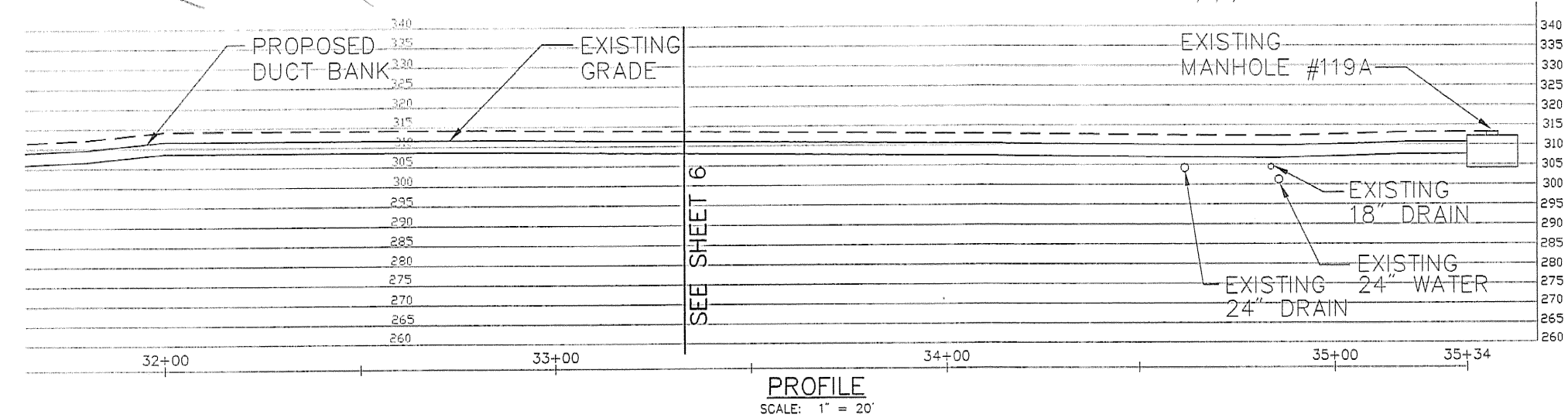
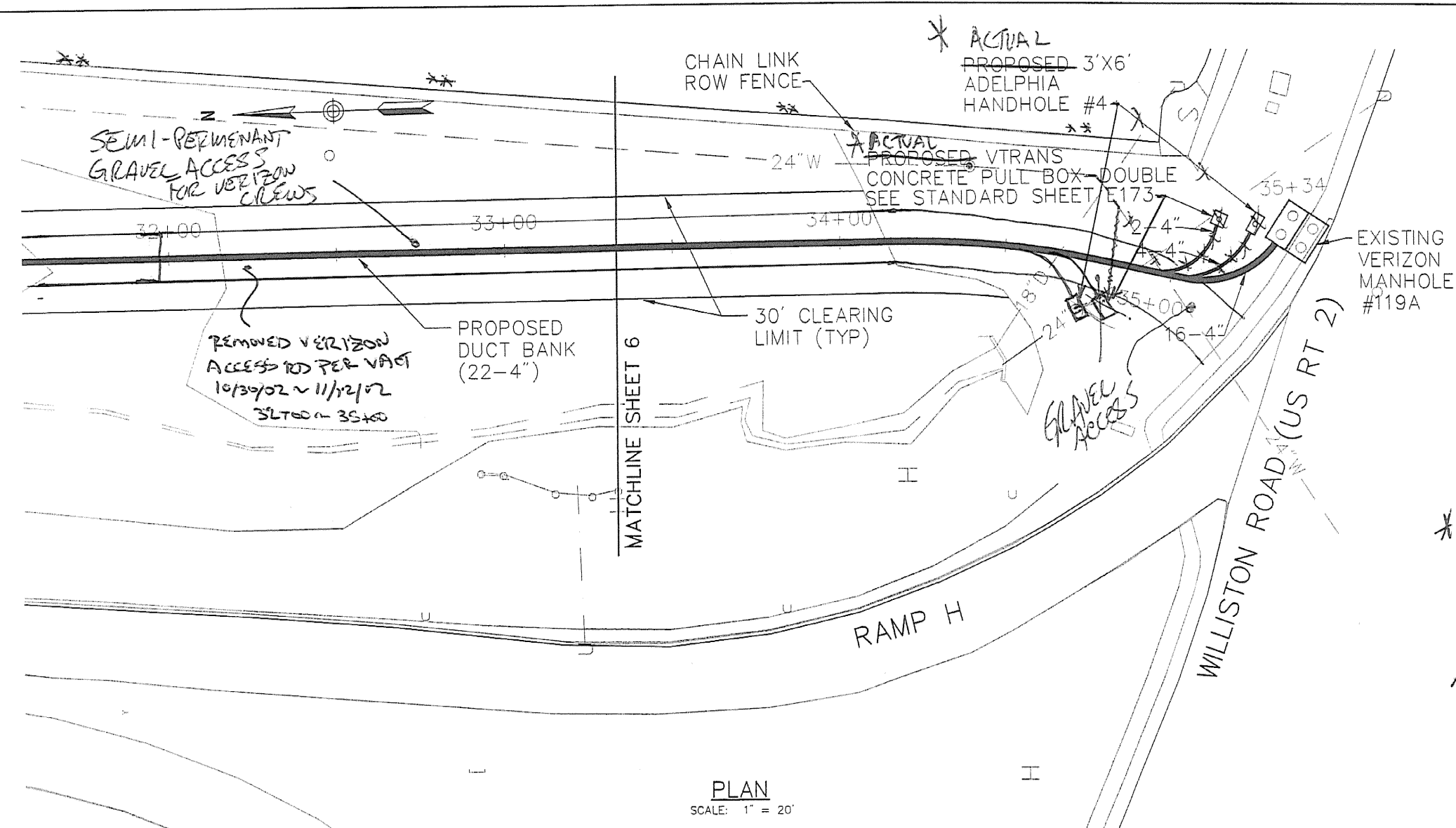
VANASSE HANGEN BRUSTLIN, INC.











* FIELD CONDITIONS GAVE THE
NEED TO RELOCATE THE CATV &
VADT HANDHOLDS TO CLEAR
EXISTING 8\"/>

** Holiday Inn Maintenance Cleared brush along
Row Fence 10/02. Saw Left Remainder
of Maple logs from clearing operations for
Holiday Inn @ their Request (11/12/02)

STATE OF VERMONT AGENCY OF TRANSPORTATION	
Town Of SOUTH BURLINGTON	Bridge No. 68
Highway No. U.S. 2	Loc. Sta.
U.S. 2 OVER I-89	
TELECOMMUNICATIONS RELOCATION	
Designed By M. HAYES	Drawn By M. HAYES
Checked By	Bridge Design Supervisor
	S. JOHNSON
PROJECT	PROJECT NO.
SOUTH BURLINGTON	IN DECK(35)
MBL (as Drawing No. VTRANS-GEN	Date 02/01/01
Bridge Sheet No. 1 of 3	Sheet 5 of 15

SOUTH BURLINGTON
IM DECK (36)
UTILITY STAKEOUT

DAVE HOSKING
10/23/01

FOR UTILITY DUST BANK
CONSTRUCTION

#	NORTHINGS	EASTINGS	ELEV.	DESC.
1	19709.8499	61835.1770	312.890	'HVCTRL
2	18832.3418	61630.1310	332.200	'HVCTRL
3	19043.2313	61168.3588	337.500	'HVCTRL
4	18829.3407	61624.5572	330.770	'HVCTRL
5	18709.8905	61894.4721	326.120	'HVCTRL
20	18866.4915	61179.6047	328.829	'HVCTRL
30	19275.0775	61039.0093	341.186	'HVCTRL
31	19409.4257	61347.0395	331.660	'HVCTRL
32	19588.1616	61519.6638	319.115	'HVCTRL
33	19760.7107	61688.5056	316.187	'HVCTRL
34	19709.7579	61835.1641	312.893	'HVCTRL
40	19254.6226	61342.0664	329.660	'HVCTRL
41	19310.8805	61472.0105	323.220	'HVCTRL
42	19375.2736	61754.0091	306.921	'HVCTRL
43	19171.5994	61848.5160	301.790	'HVCTRL
44	19234.0415	62039.9038	296.325	'HVCTRL
45	19341.4913	62290.3197	291.027	'HVCTRL
46	19140.9569	62364.7358	299.638	'HVCTRL
47	19039.1263	62394.3923	303.627	'HVCTRL
48	18828.6901	62385.5657	307.990	'HVCTRL
49	18720.8346	62387.1219	309.443	'HVCTRL
50	18652.8806	62420.4555	309.476	'HVCTRL
51	18557.1726	62554.2279	313.088	'HVCTRL
52	19091.2935	62574.8767	312.757	'HVCTRL
53	18850.0191	62513.8078	312.795	'HVCTRL
100	19331.7316	60804.7525	338.707	'CL 10+00 NAILPVT
101	19306.4533	60847.9600	338.626	'CL 10+50 NAILPVT
102	19279.5233	60890.0349	338.417	'CL 11+00 NAILPVT
103	19252.5853	60932.1898	338.306	'CL 11+50 NAILPVT
104	19225.6146	60974.2713	338.286	'CL 12+00 NAILPVT
105	19226.9373	61017.6761	338.572	'CL 12+50 NAILPVT
106	19246.8968	61059.4645	337.951	'CL 13+00 NAILPVT
107	19237.9922	61108.6071	341.538	'CL 13+50 T.WIT
108	19229.7233	61157.8190	340.140	'CL 14+00 T.WIT
109	19229.7291	61159.4749	340.233	'CL 14+02 MH TWIT
110	19233.5804	61207.8977	336.912	'CL 14+50 T.WIT
111	19247.9937	61255.6471	333.102	'CL 15+00 T.WIT
112	19272.2417	61293.2345	331.394	'CL 15+50 T.WIT
113	19303.4846	61338.0926	331.215	'CL 16+00 T.WIT
114	19335.1406	61376.8522	330.335	'CL 16+50 T.WIT
115	19366.7580	61415.6448	328.677	'CL 17+00 T.WIT
116	19398.2356	61454.3456	325.641	'CL 17+50 T.WIT
117	19429.8817	61493.1283	323.574	'CL 18+00 T.WIT
118	19461.4987	61531.9234	321.733	'CL 18+50 T.WIT
119	19493.0494	61570.6497	320.366	'CL 19+00 T.WIT
120	19524.5807	61609.3601	319.437	'CL 19+50 T.WIT
121	19555.8880	61648.2741	318.525	'CL 20+00 T.WIT
122	19587.3849	61650.4348	318.642	'CL 20+03 MH TWIT
123	19572.9651	61693.1120	316.552	'CL 20+50 T.WIT
124	19553.1440	61739.0343	307.132	'CL 21+00 NAILPVT
125	19532.8667	61784.7778	305.347	'CL 21+50 T.WIT
126	19512.9119	61830.5635	304.015	'CL 22+00 T.WIT
127	19492.5698	61876.0981	301.815	'CL 22+50 T.WIT
128	19472.5761	61921.8931	294.701	'CL 23+00 T.WIT
129	19452.5067	61967.5834	289.580	'CL 23+50 T.WIT

130	19412.3921	62059.4868	296.011	!CL 24+50 T.WIT
131	19392.2194	62105.4821	295.276	!CL 25+00 T.WIT
132	19372.1526	62151.1744	284.143	!CL 25+50 T.WIT
133	19352.0530	62197.0353	282.235	!CL 26+00 T.WIT
134	19332.0170	62242.7501	290.930	!CL 26+50 T.WIT
135	19311.9330	62288.3639	292.429	!CL 27+00 NAILPVT
136	19311.9363	62288.3645	292.513	!CL 27+50 NAILPVT
137	19291.9122	62334.0187	292.037	!CL 27+50 T.WIT
138	19271.7355	62379.9300	304.041	!CL 28+00 T.WIT
139	19269.6810	62384.1074	304.018	!CL 28+05 MH TWIT
140	19243.8600	62419.7889	304.215	!CL 28+50 T.WIT
141	19196.2503	62435.2079	304.622	!CL 29+00 T.WIT
142	19149.7674	62450.6527	305.859	!CL 29+50 T.WIT
143	19101.3106	62466.0453	306.385	!CL 30+00 T.WIT
144	19053.6890	62481.2686	300.290	!CL 30+50 T.WIT
145	19004.6214	62489.2146	304.040	!CL 31+00 T.WIT
146	18954.2674	62490.4882	315.276	!CL 31+50 T.WIT
147	18904.3960	62491.1266	316.018	!CL 32+00 T.WIT
148	18854.4011	62491.8089	316.406	!CL 32+50 T.WIT
149	18804.5775	62492.6219	315.963	!CL 33+00 T.WIT
150	18754.4978	62493.2308	314.132	!CL 33+50 T.WIT
151	18704.3056	62493.8710	314.641	!CL 34+00 T.WIT
152	18654.5726	62493.0294	315.431	!CL 34+50 T.WIT
153	18605.2839	62484.3295	315.229	!CL 35+00 T.WIT

STANDARD SHEETS

E-III 03-11-97
E-119 08-08-95
E-173 08-09-95
F6 06-01-94

QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FINAL
201.11	CLEARING & GRUBBING (INCLUDING INDIVIDUAL TREES AND STUMPS)	ACRE	1	
203.15	COMMON EXCAVATION	CY	260	
301.26	SUBBASE OF CRUSHED GRAVEL (FINE GRADED)	CY	330	
406.25	BITUMINOUS CONCRETE PAVEMENT (PG64-28)	TON	60	
541.21	CONCRETE VAULT (MOD.-TELEPHONE)	EA	3	
541.21	CONCRETE VAULT (MOD.-CATV)	EA	4	
601.0415	18" PCCSP 0.064 (2 - 2/3 x 1/2)	LF	46	
616.40	REMOVING AND RESETTING CURB	LF	10	
618.10	PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH	SY	6	
620.16	GATE FOR CHAIN LINK FENCE, 6 FEET (MOD.)	LF	40	
621.57	ENERGY ABSORPTION ATTENUATOR	EA	2	
621.90	TEMPORARY TRAFFIC BARRIER	LF	840	
624.20	DUCTS, CONCRETE ENCASED (MOD.-DUCT BANK-18 TO 22)	LF	1,860	
624.20	DUCTS, CONCRETE ENCASED (MOD.-DUCT BANK, ROADWAY-18 TO 22)	LF	330	
624.20	DUCTS, CONCRETE ENCASED (MOD.-DUCT BANK, THROUGH SLEEVE-18 TO 22)	LF	370	
630.10	UNIFORMED TRAFFIC OFFICER	HR	150	
635.10	MOBLIZATION - MOD.2	LS	1	
641.10	TRAFFIC CONTROL-MOD 2	LS	1	
643.20	JACKING OR BORING WELDED STEEL PIPE (36")	LF	370	
651.15	SEED	LB	10	
651.18	FERTILIZER	LB	70	
651.20	AGRICULTURAL LIMESTONE	TON	0.3	
651.30	SODDING	SY	90	
651.35	TOPSOIL	CY	75	
678.27	PULL BOX-DOUBLE	EA	4	

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of SOUTH BURLINGTON	Bridge No. 68
Highway No. U.S. 2	Log Sta.
	Surv. Sta.

U.S. 2 OVER I-89

TELECOMMUNICATIONS DETAILS

Designed By M. HAYES	Drawn By M. HAYES
Checked By Date	Bridge Design Supervisor S. JOHNSON Date

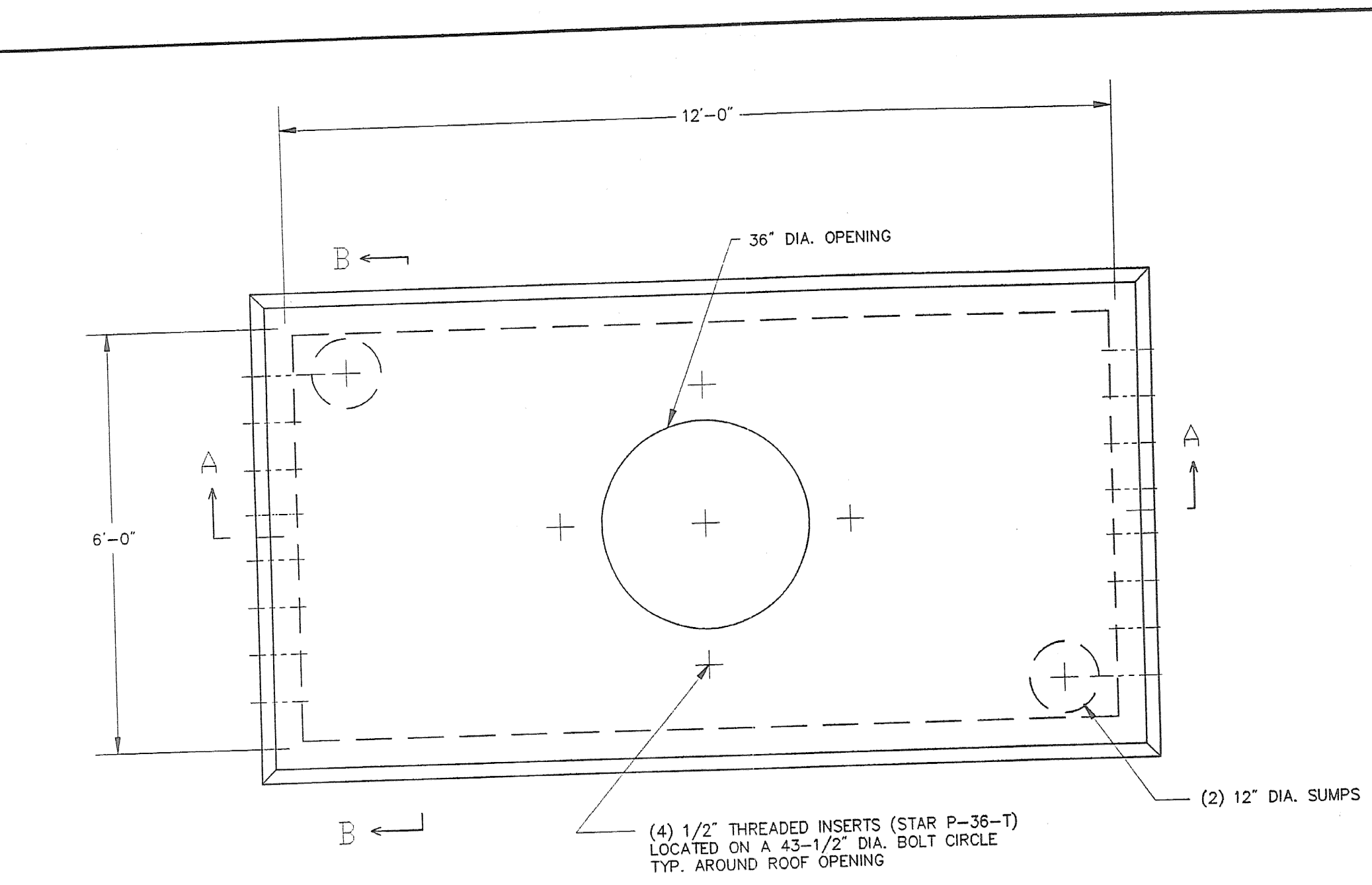
PROJECT SOUTH BURLINGTON	PROJECT NO. IM DECK(36)
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VANASSE HANGEN BRUSTLIN, INC.

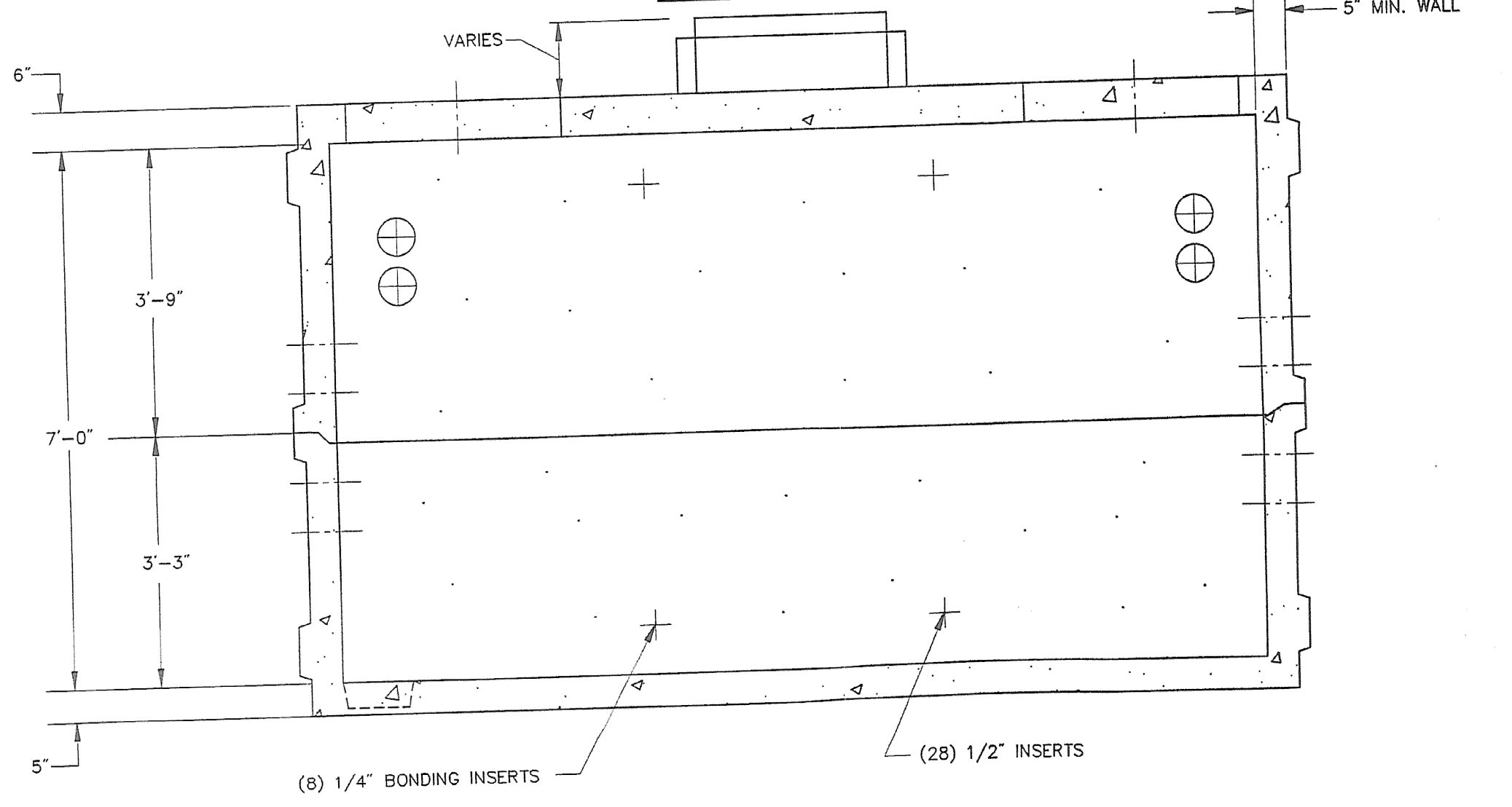
VHB Cad Drawing No. VTrans-Telecomant	Date 10/31/01
Bridge Sheet No. TD 1 OF 8	Sheet 59 of 75

GENERAL NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE BEGINNING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. ALL REPAIRS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR IS TO CONTACT "DIG SAFE" AT 1-888-344-7233 72 HOURS PRIOR TO ANY EXCAVATION.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
3. MAINTAIN A MINIMUM CLEARANCE OF SIX INCHES WHEN CROSSING EXISTING UTILITIES.
4. IT IS THE CONTRACTORS RESPONSIBILITY TO PLACE AND MAINTAIN TEMPORARY RESURFACING AND/OR PLATING ON ALL EXCAVATION IN PAVED STREETS AND SIDEWALKS. THE MAINTENANCE OF THE TEMPORARY RESURFACING SHALL CONTINUE UNTIL PERMANENT RESURFACING IS PLACED. COST INCLUDED IN ITEM 641.10 TRAFFIC CONTROL.
5. AREAS WITHIN AND OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
6. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS AND SHALL BE RESPONSIBLE FOR PAYING ANY FEES FOR ANY POLE RELOCATION OR ALTERATION, ADJUSTMENT OR TEMPORARY SUPPORT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM, AND ANY OTHER PUBLIC OR PRIVATE UTILITIES.
7. THE CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY PERMITS, PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. ALL CONSTRUCTION ACTIVITY SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
9. ALL WORK PERFORMED WITHIN THE PUBLIC RIGHT-OF-WAY SHALL CONFORM TO ALL STATE AND LOCAL MUNICIPAL STANDARDS.
10. AT THE END OF EACH WORK DAY AND UPON FINAL CONSTRUCTION PENDING CABLE INSTALLATION, CONDUIT CAPS WILL BE PLACED ON ALL VACANT DUCTS.
11. JOINTS BETWEEN NEW BITUMINOUS CONCRETE PAVEMENT AND EXISTING PAVEMENT SHALL BE SAWCUT AND SEALED WITH RS-1 ASPHALT EMULSION AND BACKSANDS.
12. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN CONSTRUCTION AS BUILT DRAWINGS AND PRESENT A COMPLETE SET OF DRAWINGS TO VERMONT AGENCY OF TRANSPORTATION WITHIN 14 DAYS OF COMPLETION OF WORK.
13. THE CONTRACTOR IS RESPONSIBLE FOR PAYING FOR AND OBTAINING ALL PERMITS NECESSARY TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS.
14. JACKING PITS SHALL BE CONSTRUCTED AT LEAST 10 FT FROM EDGE OF PAVEMENT OR 12' BEHIND GUARDRAIL. JACKING PITS SHALL HAVE A MINIMUM SIDE SLOPE OF 1:1. JACKING PITS SHALL BE PROTECTED BY JERSEY BARRIERS AS INDICATED ON PLANS OR AS DIRECTED BY THE ENGINEER.
15. CONTRACTOR MAY USE EITHER NARROW/DEEP OR SHALLOW/WIDE TRENCH DETAIL.
16. ADELPHIA HANDHOLES SHALL BE CONCRETE AND CONFORM TO ADELPHIA STANDARDS HANDHOLE DETAILS.
17. VERIZON MANHOLE GRATE AND FRAME TO BE PROVIDED BY VERIZON.



PLAN VIEW

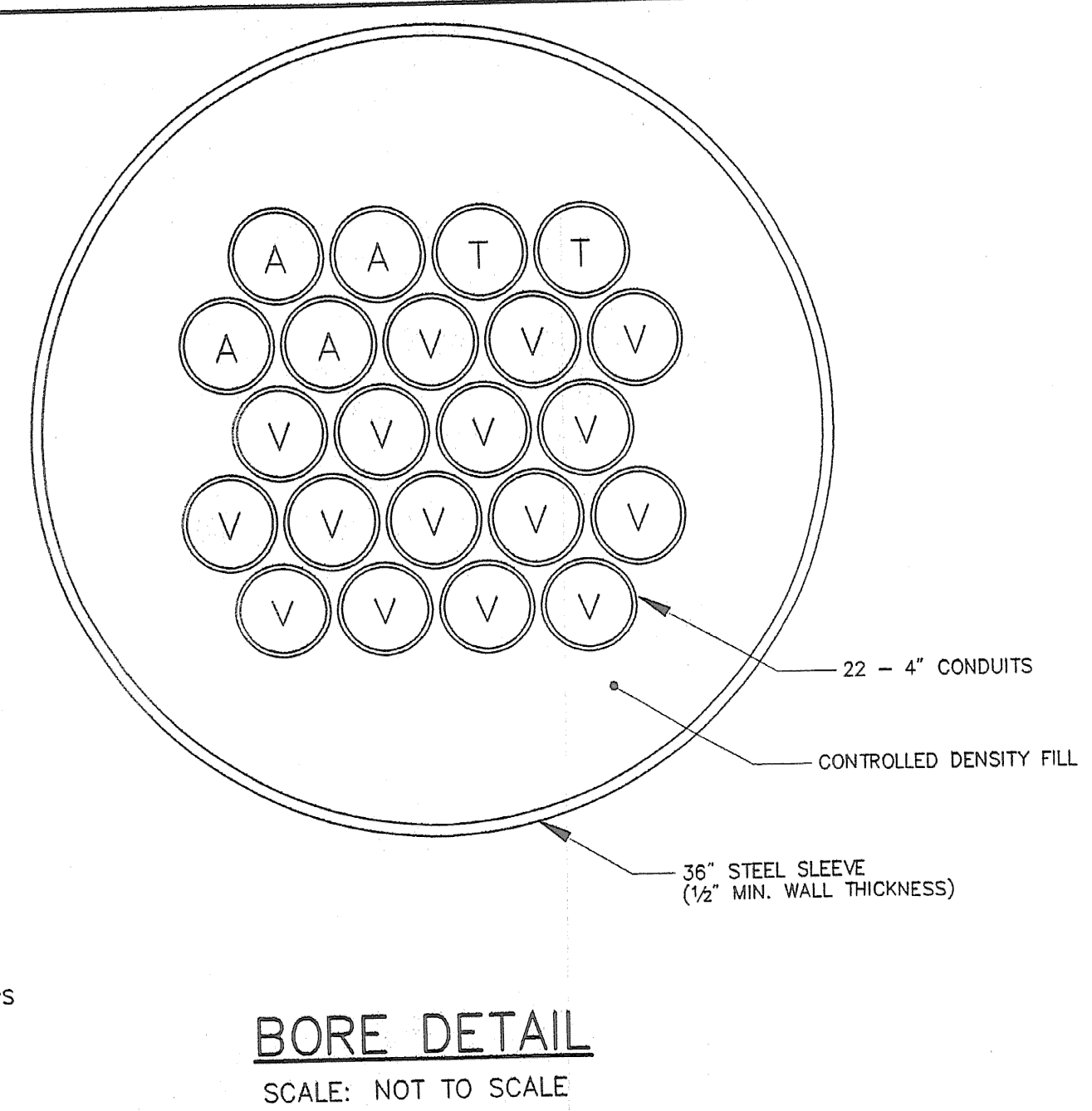


SECTION A-A

NOTE: OPPOSITE WALL IS SIMILAR

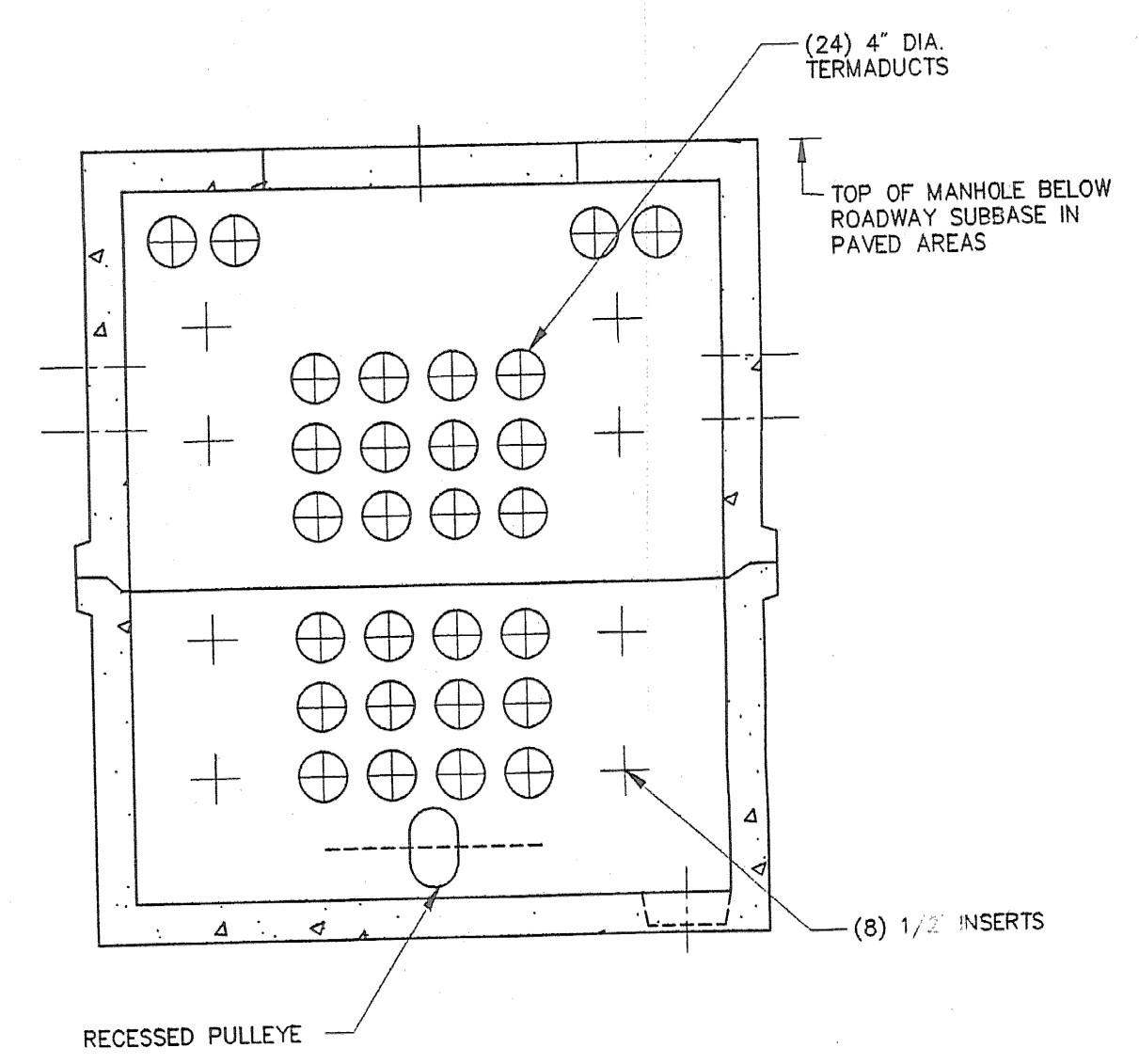
VERIZON MANHOLE DETAIL

SCALE: NOT TO SCALE



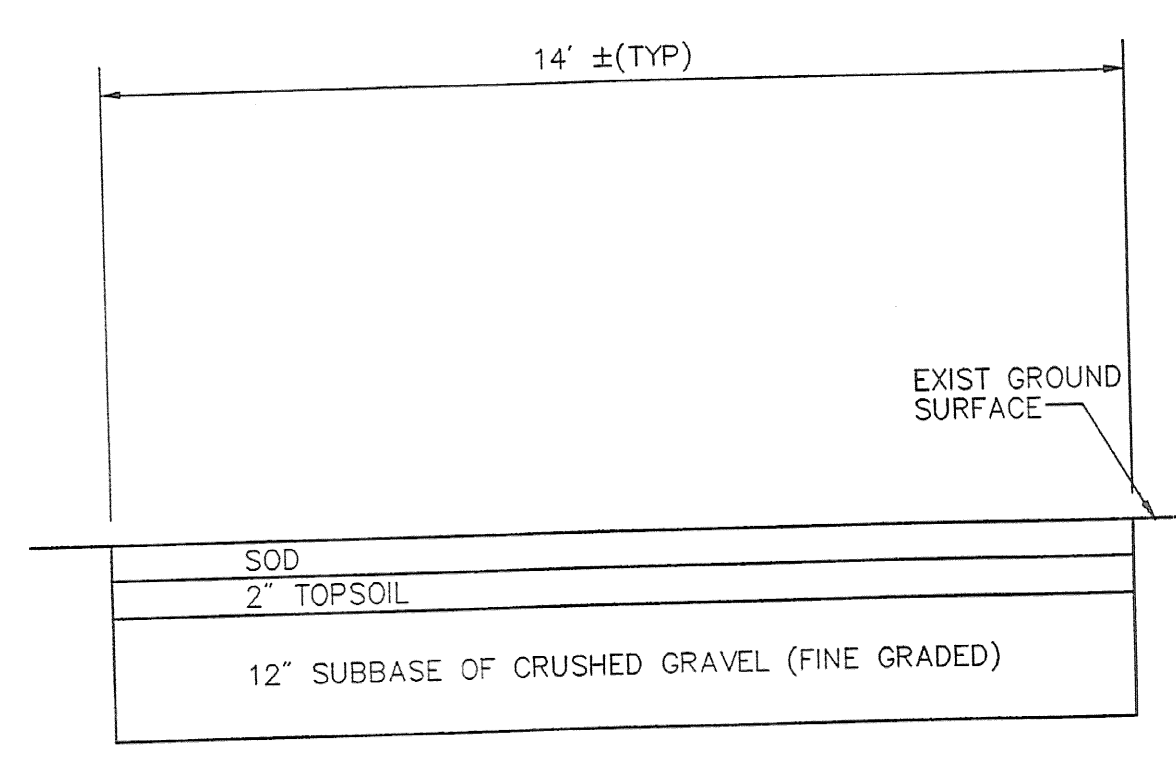
BORE DETAIL

SCALE: NOT TO SCALE



SECTION B-B

NOTE: OPPOSITE WALL IS SIMILAR

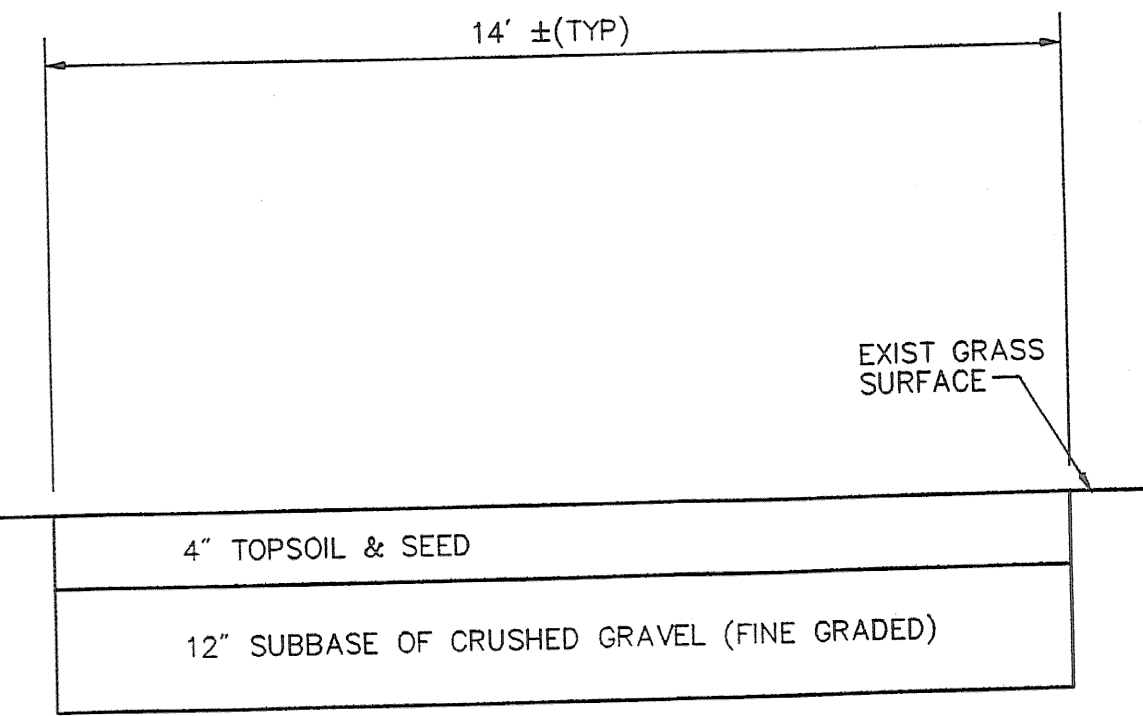


ACCESS DRIVE -- TYPE 1

SCALE: NOT TO SCALE

S-STD.

H-STD. PVMT-01-ENGLISH

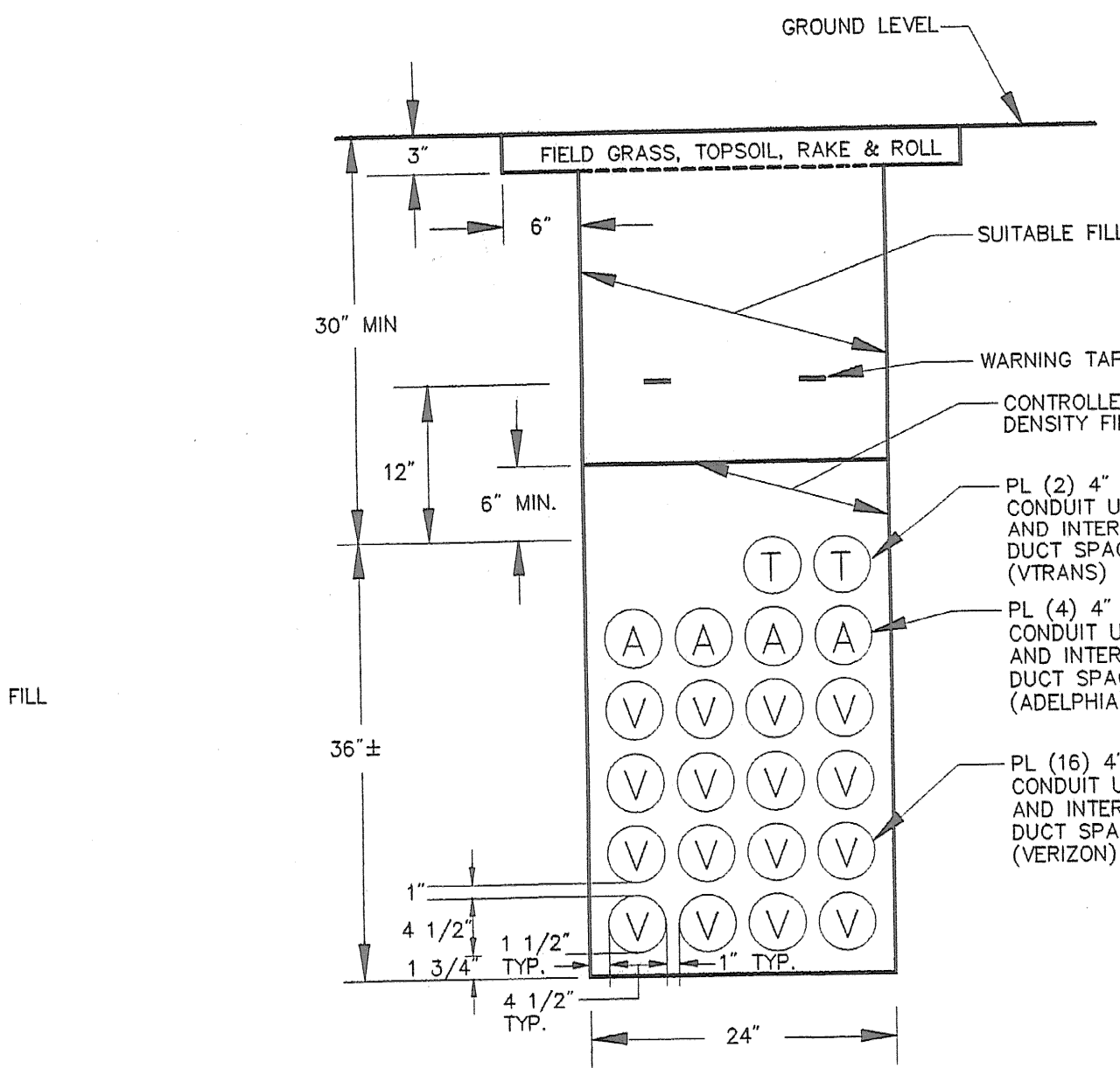


ACCESS DRIVE -- TYPE 2

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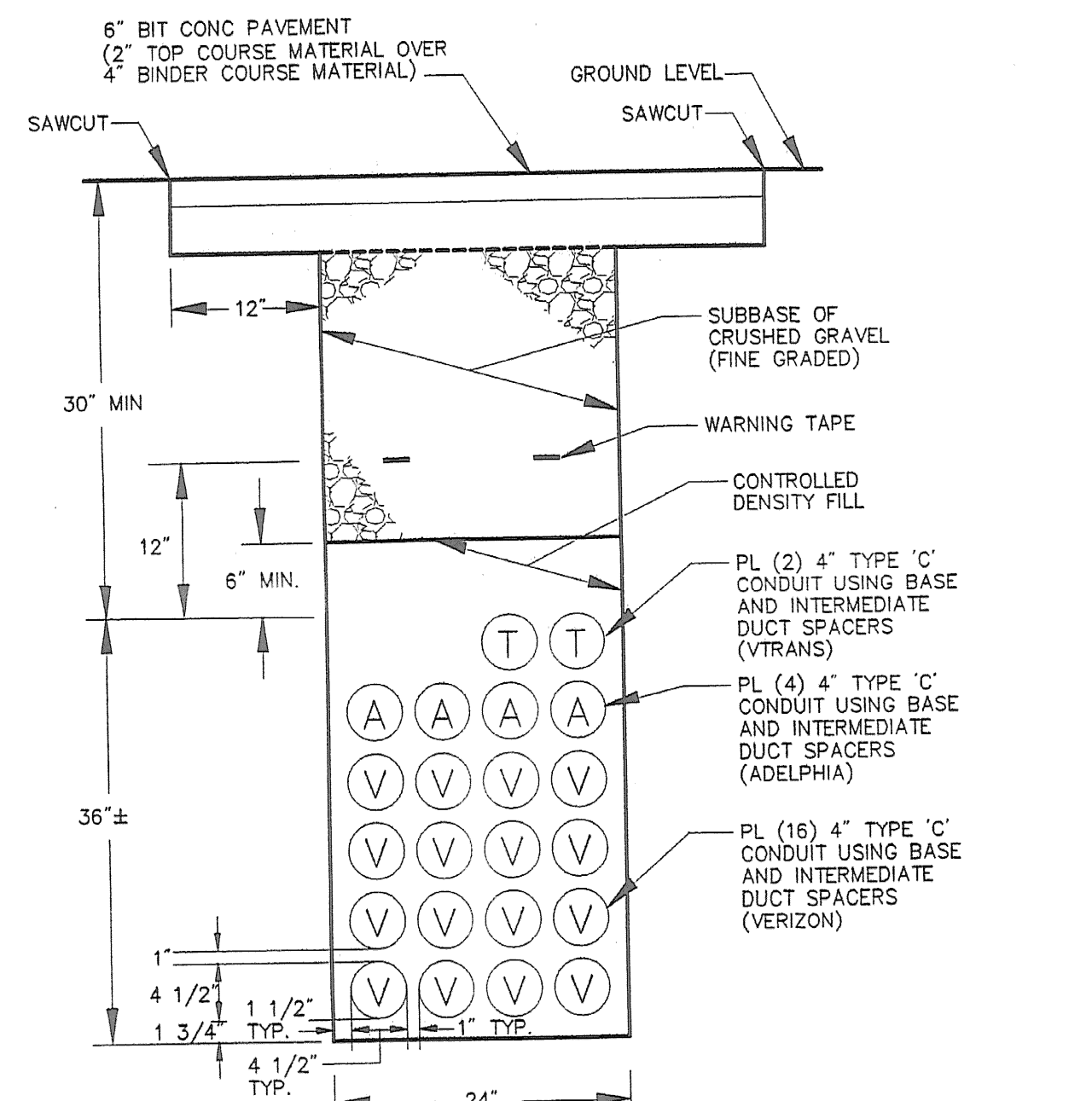
S-STD.

H-STD. PVMT-01-ENGLISH



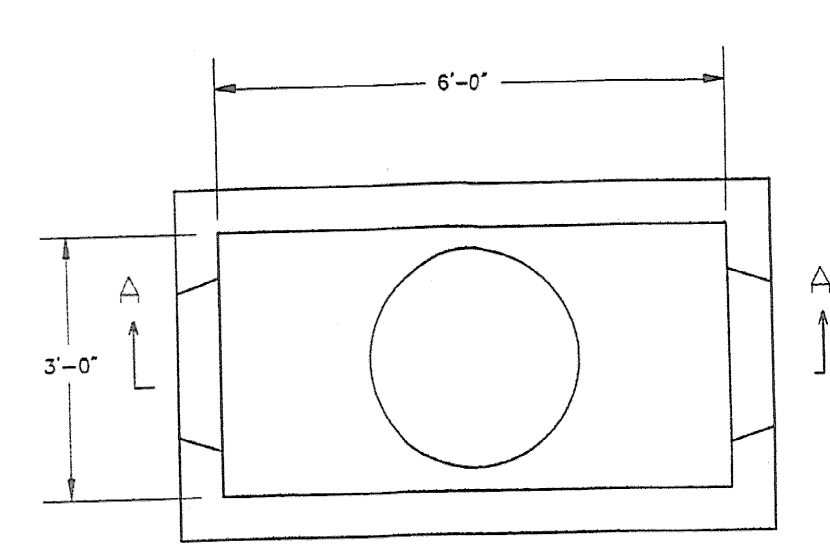
TRENCH DETAIL
FIELD GRASS RESTORATION

SCALE: NOT TO SCALE



TRENCH DETAIL
IN EXISTING PAVEMENT

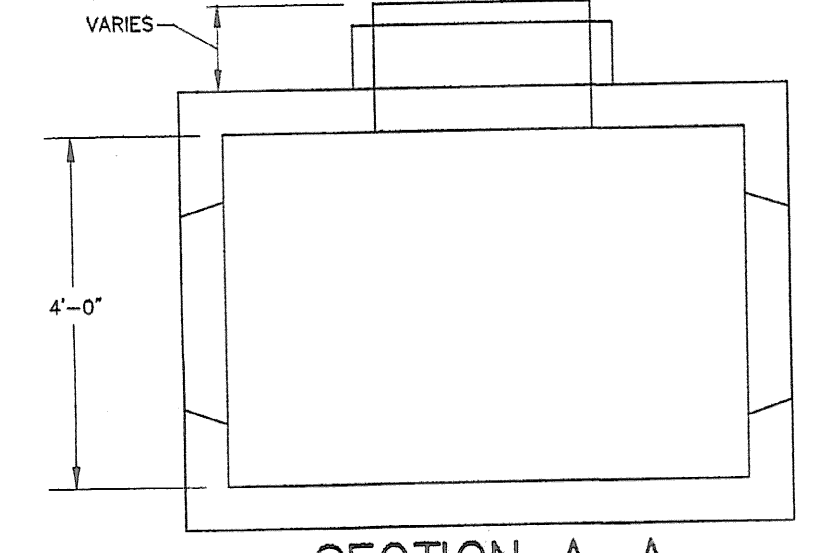
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PLAN VIEW

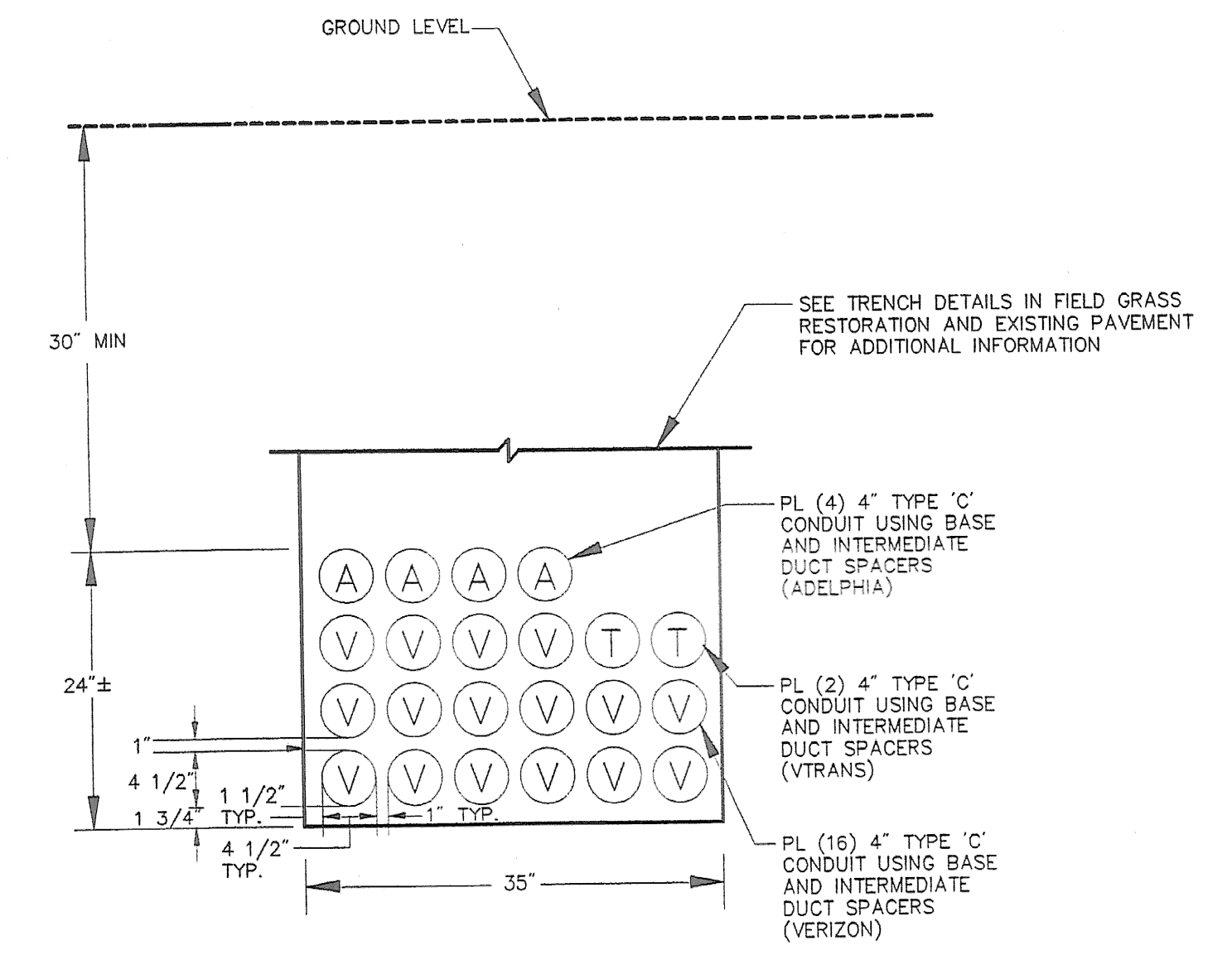
ADELPHIA MANHOLE DETAIL

SCALE: NOT TO SCALE



SECTION A-A

NOTE: OPPOSITE WALL IS SIMILAR



OPTIONAL SHALLOW TRENCH DETAIL

SCALE: NOT TO SCALE

LEGEND
A-ADELPHIA
T-TTRANS
V-VERIZON

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	SOUTH BURLINGTON	Bridge No.	68
Highway No.	U.S. 2	Log Sta.	
		Surv. Sta.	

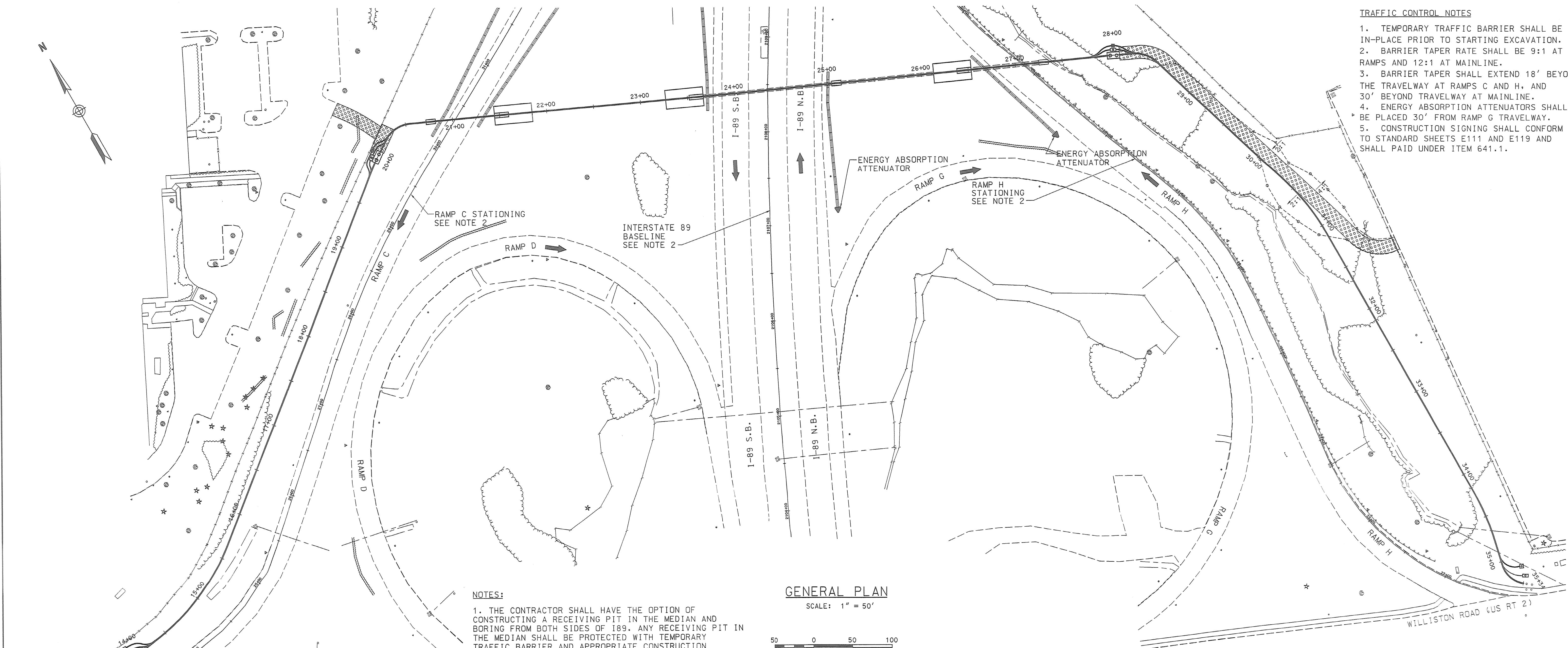
U.S. 2 OVER I-89

TELECOMMUNICATIONS DETAILS

Designed By	M. HAYES	Drawn By	M. HAYES
Checked By		Date	
		Bridge Design Supervisor	S. JOHNSON
		Date	

PROJECT	SOUTH BURLINGTON	PROJECT NO.	IM DECK(36)
VHB Cad Drawing No.	VTRANS-DET	Date	10/31/01
Bridge Sheet No.	TD 2 OF 8	Sheet	59 of 75

VANASSE HANGEN BRUSTLIN, INC.



- TRAFFIC CONTROL NOTES**
1. TEMPORARY TRAFFIC BARRIER SHALL BE IN-PLACE PRIOR TO STARTING EXCAVATION.
 2. BARRIER TAPER RATE SHALL BE 9:1 AT RAMP AND 12:1 AT MAINLINE.
 3. BARRIER TAPER SHALL EXTEND 18' BEYOND THE TRAVELWAY AT RAMP C AND H, AND 30' BEYOND TRAVELWAY AT MAINLINE.
 4. ENERGY ABSORPTION ATTENUATORS SHALL BE PLACED 30' FROM RAMP G TRAVELWAY.
 5. CONSTRUCTION SIGNING SHALL CONFORM TO STANDARD SHEETS E111 AND E119 AND SHALL PAID UNDER ITEM 641.1.

NOTES:

1. THE CONTRACTOR SHALL HAVE THE OPTION OF CONSTRUCTING A RECEIVING PIT IN THE MEDIAN AND BORING FROM BOTH SIDES OF I-89. ANY RECEIVING PIT IN THE MEDIAN SHALL BE PROTECTED WITH TEMPORARY TRAFFIC BARRIER AND APPROPRIATE CONSTRUCTION SIGNING. COST SHALL BE INCLUDED IN ITEM 643.20 JACKING OR BORING WELDED STEEL PIPE (36").

2. ROADWAY STATIONING IS APPROXIMATED BASED ON VERMONT AGENCY OF TRANSPORTATION PROJECT I89-3(12) CIRCA 1960.

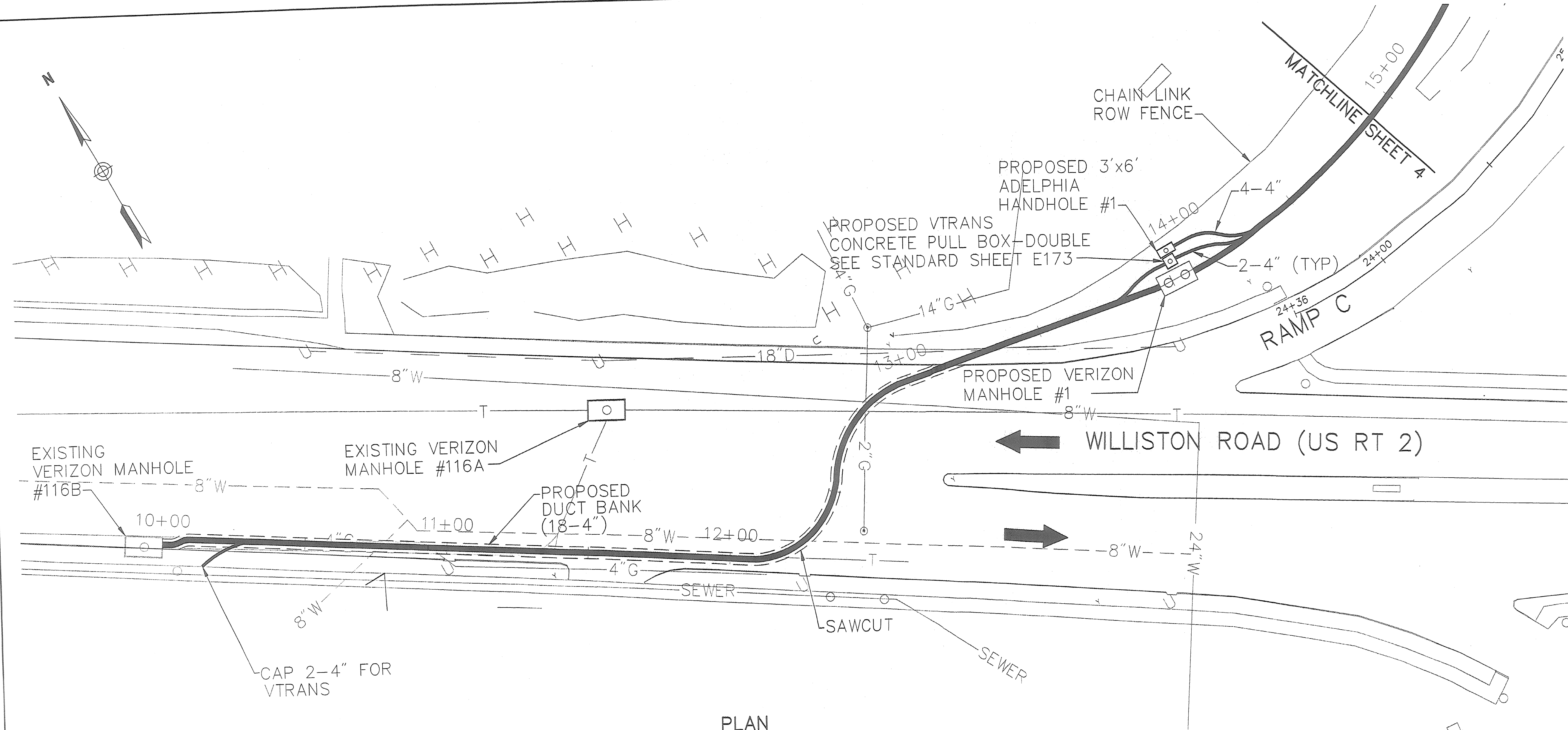
GENERAL PLAN
SCALE: 1" = 50'
50 0 50 100
SCALE IN FEET

DUCT BANK LOCATION								
STATION	NORTHING	EASTING	STATION	NORTHING	EASTING	STATION	NORTHING	EASTING
10+00	19,331.73	60,804.76	19+50	19,524.62	61,609.40	28+50	19,243.86	62,419.79
10+50	19,306.47	60,847.94	20+00	19,555.96	61,648.35	29+00	19,196.33	62,435.31
11+00	19,279.52	60,890.05	20+03 (MH)	19,557.42	61,650.47	29+50	19,148.78	62,450.78
11+50	19,252.58	60,932.17	20+50	19,572.98	61,693.13	30+00	19,101.23	62,466.25
12+00	19,225.63	60,974.29	21+00	19,553.13	61,739.01	30+50	19,053.59	62,481.40
12+50	19,226.97	61,017.69	21+50	19,533.02	61,784.79	31+00	19,004.33	62,489.48
13+00	19,246.89	61,059.47	22+00	19,512.92	61,830.57	31+50	18,954.35	62,490.47
13+50	19,237.96	61,108.67	22+50	19,492.81	61,876.35	32+00	18,904.35	62,491.15
14+00	19,229.68	61,157.93	23+00	19,472.71	61,922.13	32+50	18,854.35	62,491.83
14+02 (MH)	19,229.64	61,159.71	23+50	19,452.63	61,967.92	33+00	18,804.36	62,492.52
14+50	19,233.55	61,207.69	24+00	19,432.52	62,013.70	33+50	18,754.36	62,493.20
15+00	19,247.98	61,255.46	24+50	19,412.39	62,059.46	34+00	18,704.37	62,493.88
15+50	19,272.33	61,299.02	25+00	19,392.29	62,105.24	34+50	18,654.41	62,493.01
16+00	19,303.52	61,338.09	25+50	19,372.19	62,151.02	35+00	18,605.20	62,484.32
16+50	19,335.11	61,376.84	26+00	19,352.08	62,196.80	35+34	18,574.05	62,493.62
17+00	19,366.69	61,415.60	26+50	19,331.98	62,242.58			
17+50	19,398.28	61,454.36	27+00	19,311.87	62,288.36			
18+00	19,429.87	61,493.12	27+50	19,291.77	62,334.14			
18+50	19,461.45	61,531.88	28+00	19,271.65	62,379.92			
19+00	19,493.04	61,570.64	28+05 (MH)	19,269.76	62,384.12			

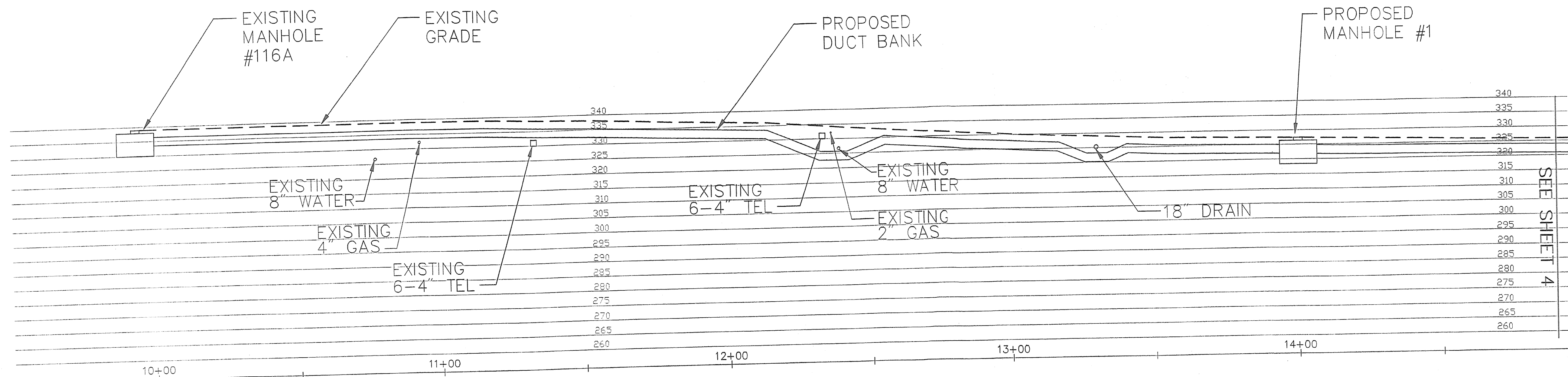
NORTHING AND EASTINGS BASED ON SURVEY PROVIDED BY VERMONT AGENCY OF TRANSPORTATION IN JUNE 2001.

STATE OF VERMONT			
AGENCY OF TRANSPORTATION			
Town Of	SOUTH BURLINGTON	Bridge No. 68	
Highway No.	U. S. 2	Log Sta.	
		Surv. Sta.	
U. S. 2 OVER I-89			
TELECOMMUNICATIONS RELOCATION			
Designed By	M. HAYES	Drawn By	M. HAYES
Checked By	Date	Bridge Design Supervisor	S. JOHNSON
		Date	
PROJECT	SOUTH BURLINGTON		PROJECT NO.
			IM DECK (36)
I.G.C. Info.	VTRANS-GEN	Date	10/31/01
Bridge Sheet No.	TD 3 OF 8	Sheet	59C of 75

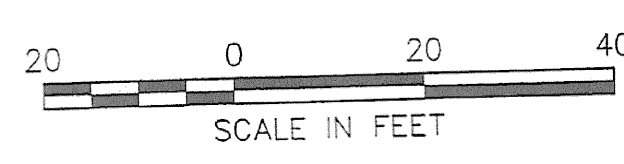
VANASSE HANGEN BRUSTLIN, INC.



PLAN
SCALE: 1" = 20'

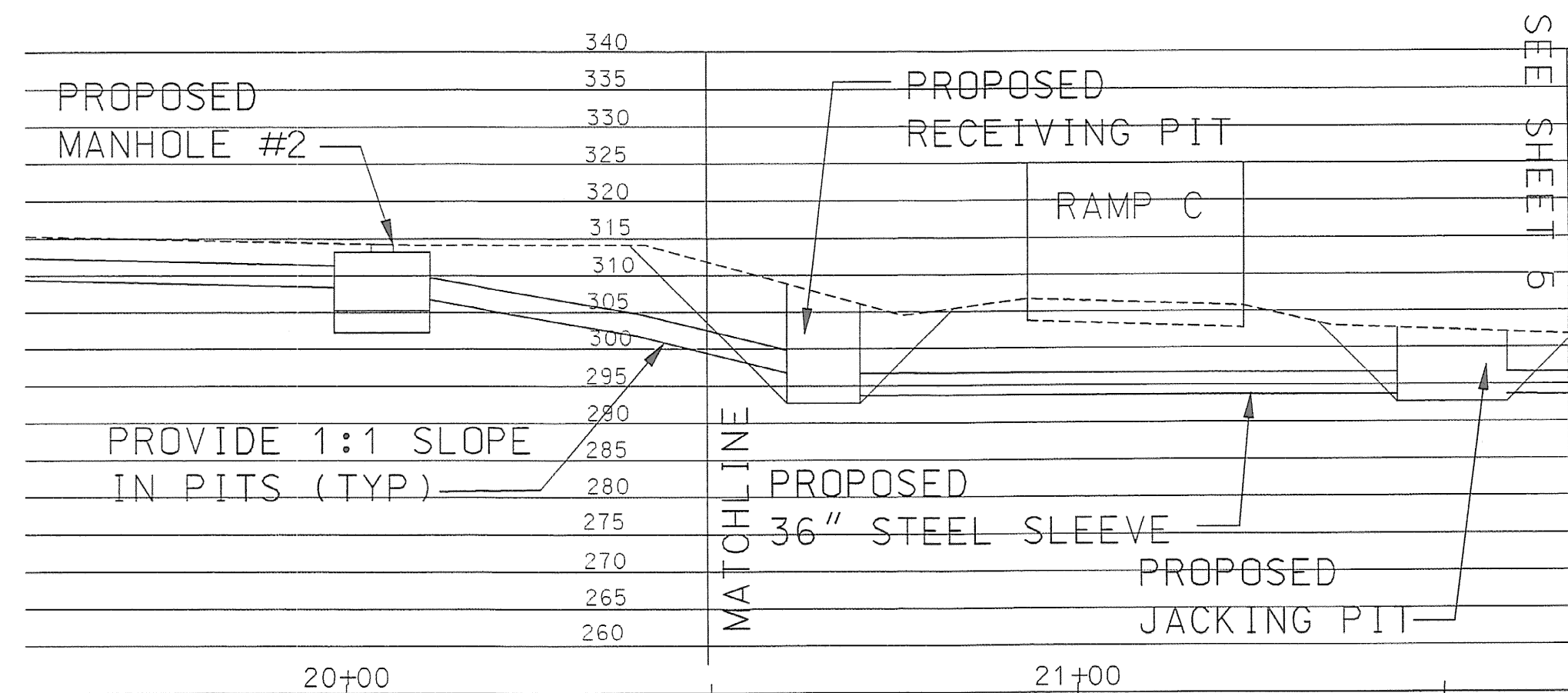
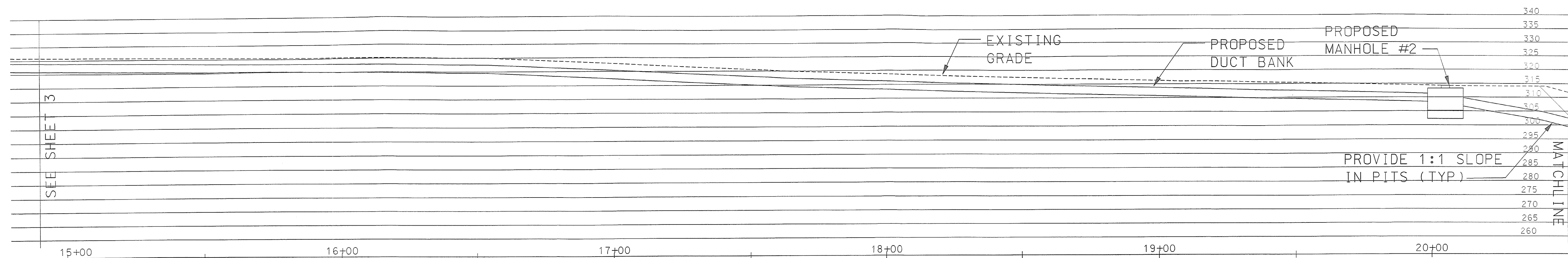
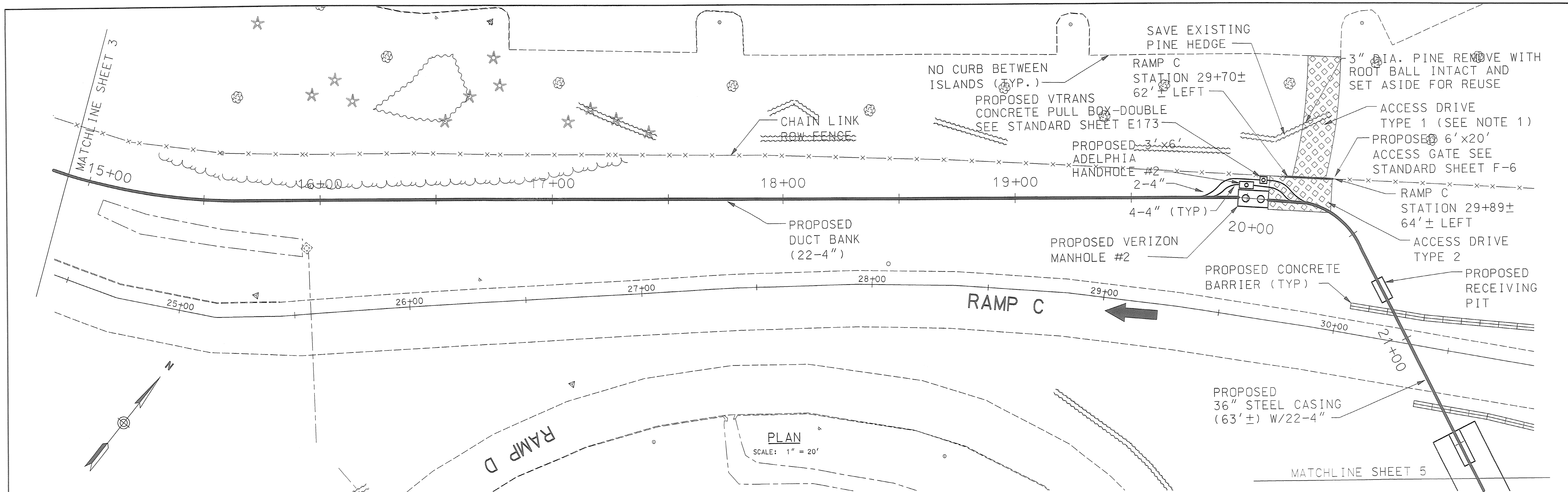


PROFILE
SCALE: 1" = 20'



STATE OF VERMONT AGENCY OF TRANSPORTATION			
Town Of SOUTH BURLINGTON		Bridge No. 68	
Highway No. U.S. 2		Log Sta.	
U.S. 2 OVER I-89		Surv. Sta.	
TELECOMMUNICATIONS RELOCATION			
Designed By M. HAYES	Drawn By M. HAYES		
Checked By	Date	Bridge Design Supervisor	Date
PROJECT SOUTH BURLINGTON		PROJECT NO. IM DECK(36)	
VHB Cad Drawing No. VTRANS-GEN		Date 10/31/01	
Bridge Sheet No. 1 of 2		Sheet 59 of 75	

VANASSE HANGEN BRUSTLIN, INC.



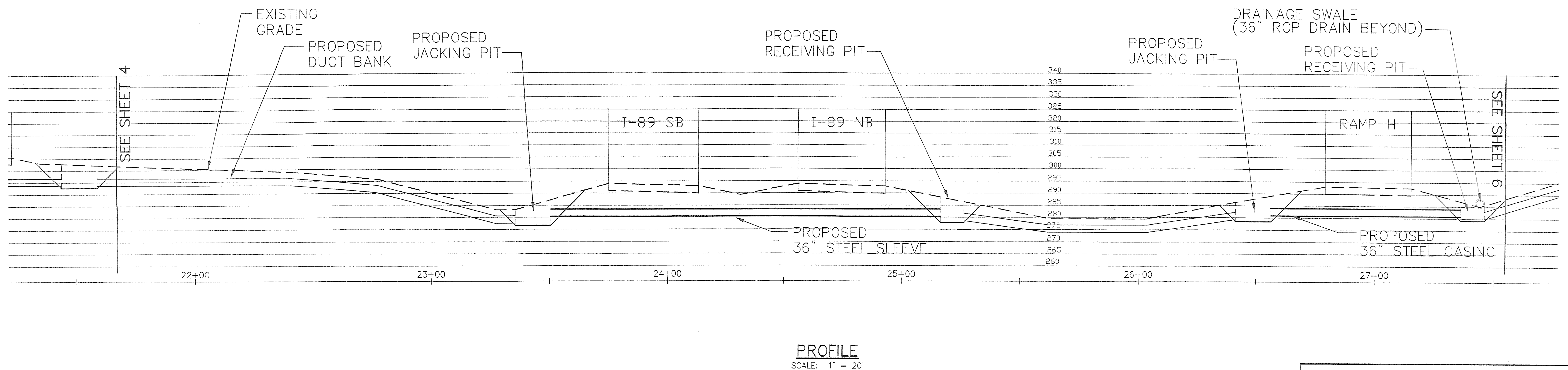
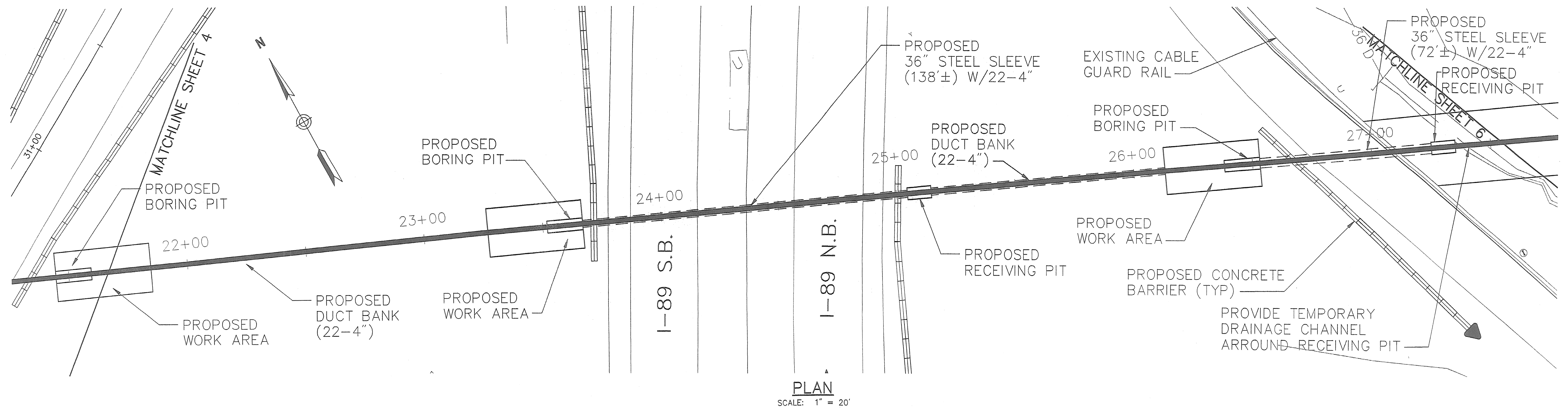
PROFILE
SCALE: 1" = 20'

NOTES:
1. CONTRACTOR TO PERFORM NO WORK OUTSIDE OF ACCESS DRIVE, EXCEPT REMOVAL OF 3" DIAMETER PINE.

STATE OF VERMONT AGENCY OF TRANSPORTATION

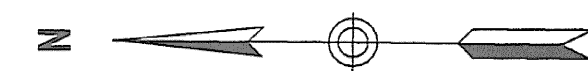
Town Of	SOUTH BURLINGTON	Bridge No. 68
Highway No.	U.S. 2	Log Sta.
	U.S. 2 OVER I-89	Surv. Sta.
TELECOMMUNICATIONS RELOCATION		
Designed By	M. HAYES	Drawn By M. HAYES
Checked By	Date	Bridge Design Supervisor S. JOHNSON Date
PROJECT	SOUTH BURLINGTON	PROJECT NO. IM DECK (36)
I.G.C. Info.	VTRANS-GEN	Date 10/31/01
Bridge Sheet No.	TD 5 OF 8	Sheet 59E of 75

VANASSE HANGEN BRUSTLIN, INC.

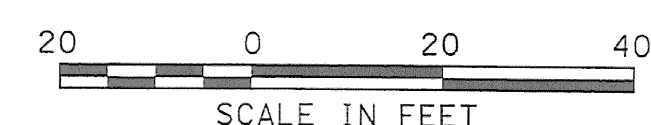
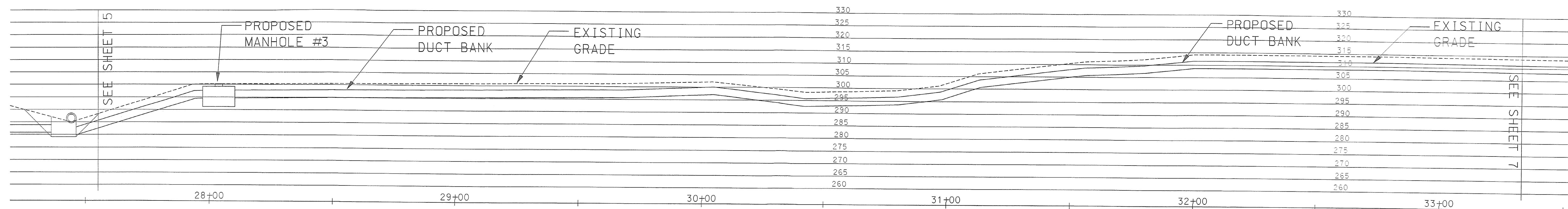
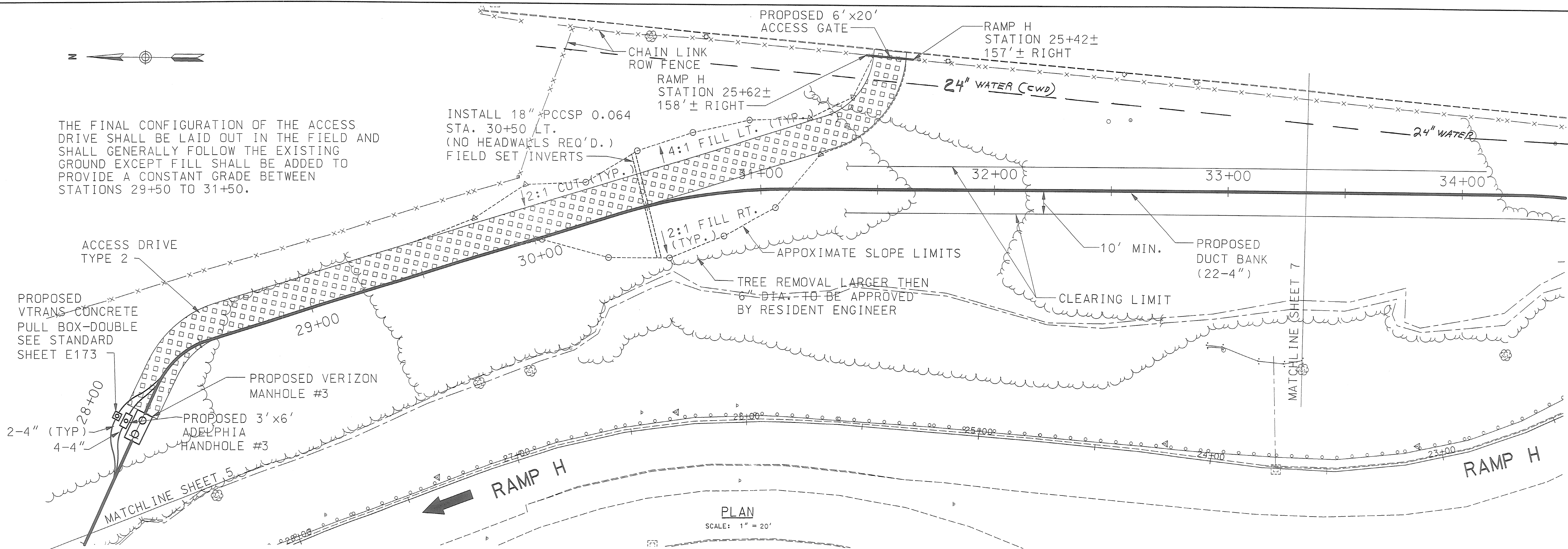


STATE OF VERMONT AGENCY OF TRANSPORTATION	
Town Of SOUTH BURLINGTON	Bridge No. 68
Highway No. U.S. 2	Log. Sta.
	Survey Sta.
U.S. 2 OVER 1-89	
TELECOMMUNICATIONS RELOCATION	
Designed By M. HAYES	Drawn By M. HAYES
Checked By Date	Bridge Design Supervisor S. JOHNSON Date
PROJECT	PROJECT NO.
SOUTH BURLINGTON	IM DECK(36)
VHB Cad Drawing No. VTRANS-GEN Date 10/31/01 Bridge Sheet No. TD 6 OF 8 Sheet 53 of 75	

VANASSE HANGEN BRUSTLIN, INC.



THE FINAL CONFIGURATION OF THE ACCESS DRIVE SHALL BE LAID OUT IN THE FIELD AND SHALL GENERALLY FOLLOW THE EXISTING GROUND EXCEPT FILL SHALL BE ADDED TO PROVIDE A CONSTANT GRADE BETWEEN STATIONS 29+50 TO 31+50.

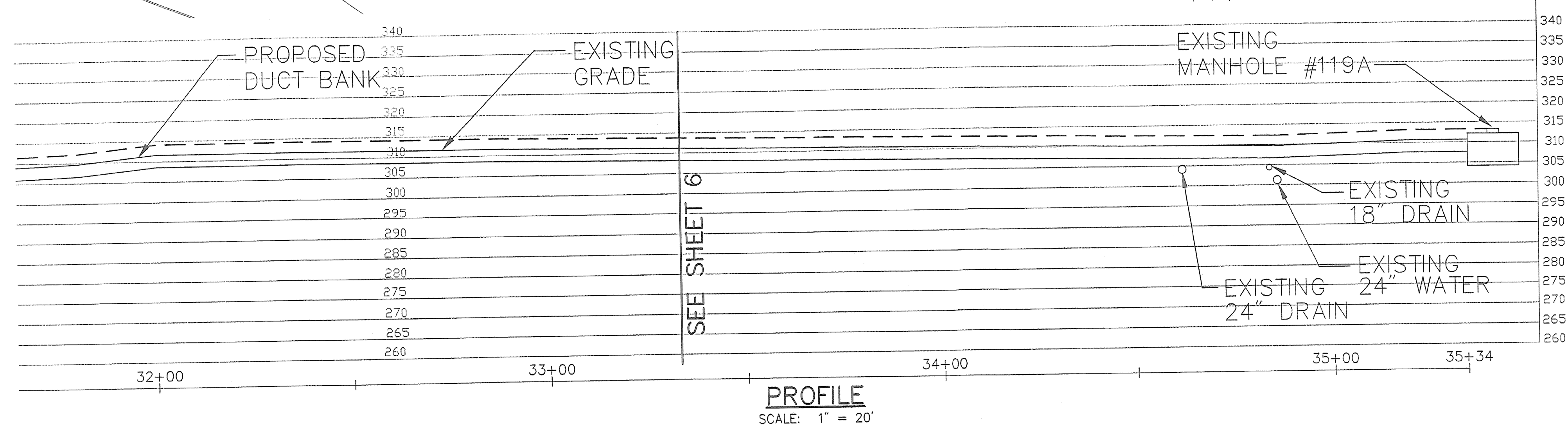
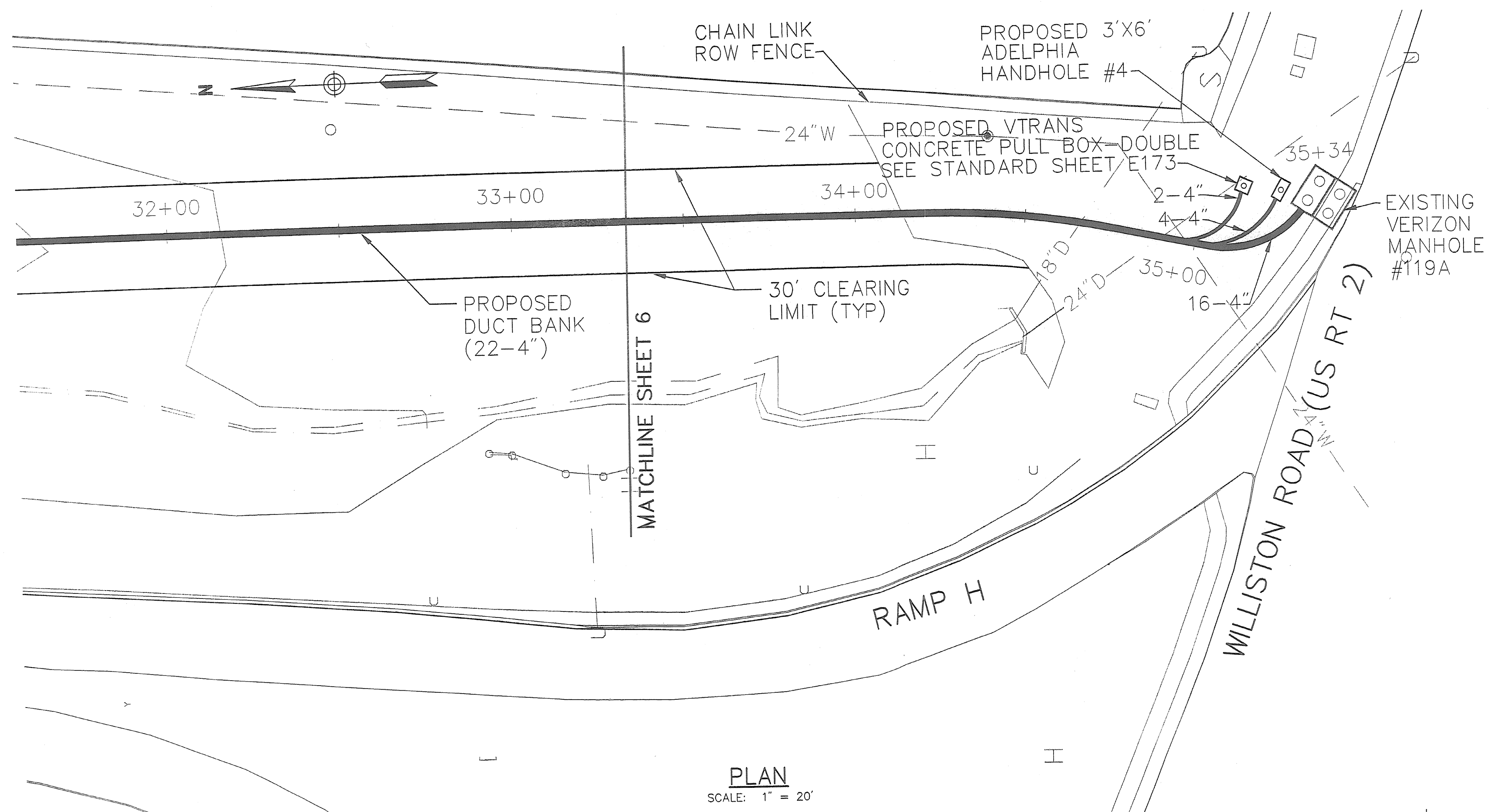


PROFILE
SCALE: 1" = 20'

STATE OF VERMONT AGENCY OF TRANSPORTATION

Town Of	SOUTH BURLINGTON	Bridge No.	68
Highway No.	U. S. 2	Log Sta.	
	U. S. 2 OVER I-89	Surv. Sta.	
TELECOMMUNICATIONS RELOCATION			
Designed By	M. HAYES	Drawn By	M. HAYES
Checked By	Date	Bridge Design Supervisor	S. JOHNSON Date
PROJECT	SOUTH BURLINGTON	PROJECT NO.	IM DECK (36)
I.G.C. Info.	VTRANS-GEN	Date	10/31/01
Bridge Sheet No.	TD 7 OF 8	Sheet	596 of 75

VANASSE HANGEN BRUSTLIN, INC.



VANASSE HANGEN BRUSTLIN, INC.

STATE OF VERMONT AGENCY OF TRANSPORTATION			
Town Of SOUTH BURLINGTON		Bridge No. 68	
Highway No. U.S. 2		Log Sta.	
		Surv. Sta.	
U.S. 2 OVER I-89			
TELECOMMUNICATIONS RELOCATION			
Designed By M. HAYES		Drawn By M. HAYES	
Checked By Date		Bridge Design Supervisor S. JOHNSON Date	
PROJECT SOUTH BURLINGTON		PROJECT NO. IM DECK(36)	
VHB Cad Drawing No. VTRANS-GEN		Date 10/31/01	
Bridge Sheet No. TD 8 OF 8		Sheet 53 of 75	

5.04 At the manhole or cable entrance facility, separate the ducts vertically and horizontally by a minimum of 2 inches (Fig. 5). Separation between ducts can be obtained with preformed, plastic spacers. Do not use wood for spacers. Join the conduit to duct terminators in the wall using the cement (or adhesive) supplied with the conduit. If the conduit is to be cast into the manhole (CEF) wall, attach the duct terminators to the termination end of the conduit prior to encasement in the wall. Place wooden bulkheads in front of the ducts inside the manhole to prevent the flow of concrete into the manhole, and pour concrete (2500 psi, 3/8-inch aggregate, 9-inch slump) around the ducts outside the manhole. To prevent the concrete from flowing along the trench, ei-

ther backfill or place a wooden form 12 to 18 inches from the manhole end wall. Pour the concrete to a minimum depth of 2 inches above the duct entrance.



Before pouring concrete at the duct entrance, remove all dirt, mud, etc., from the area of the end wall where the concrete will contact the wall. To prevent concrete from entering the ducts, seal each duct with a conduit plug.

Note: Section 622-512-200 outlines the special methods recommended for sealing conduit entrances into manholes.

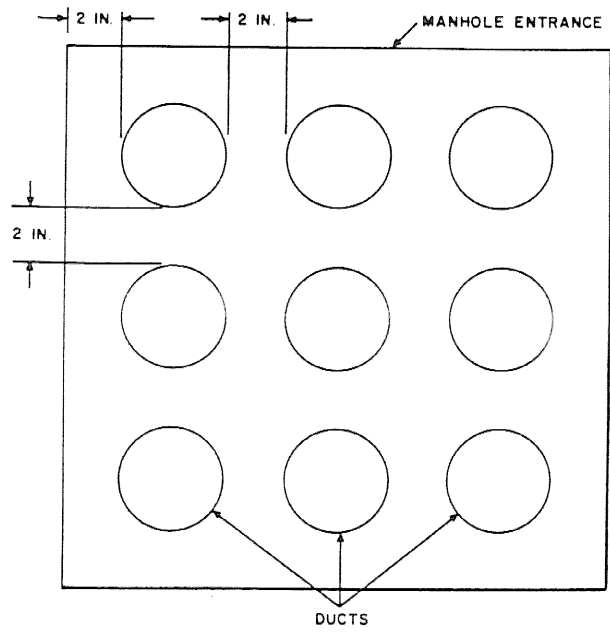
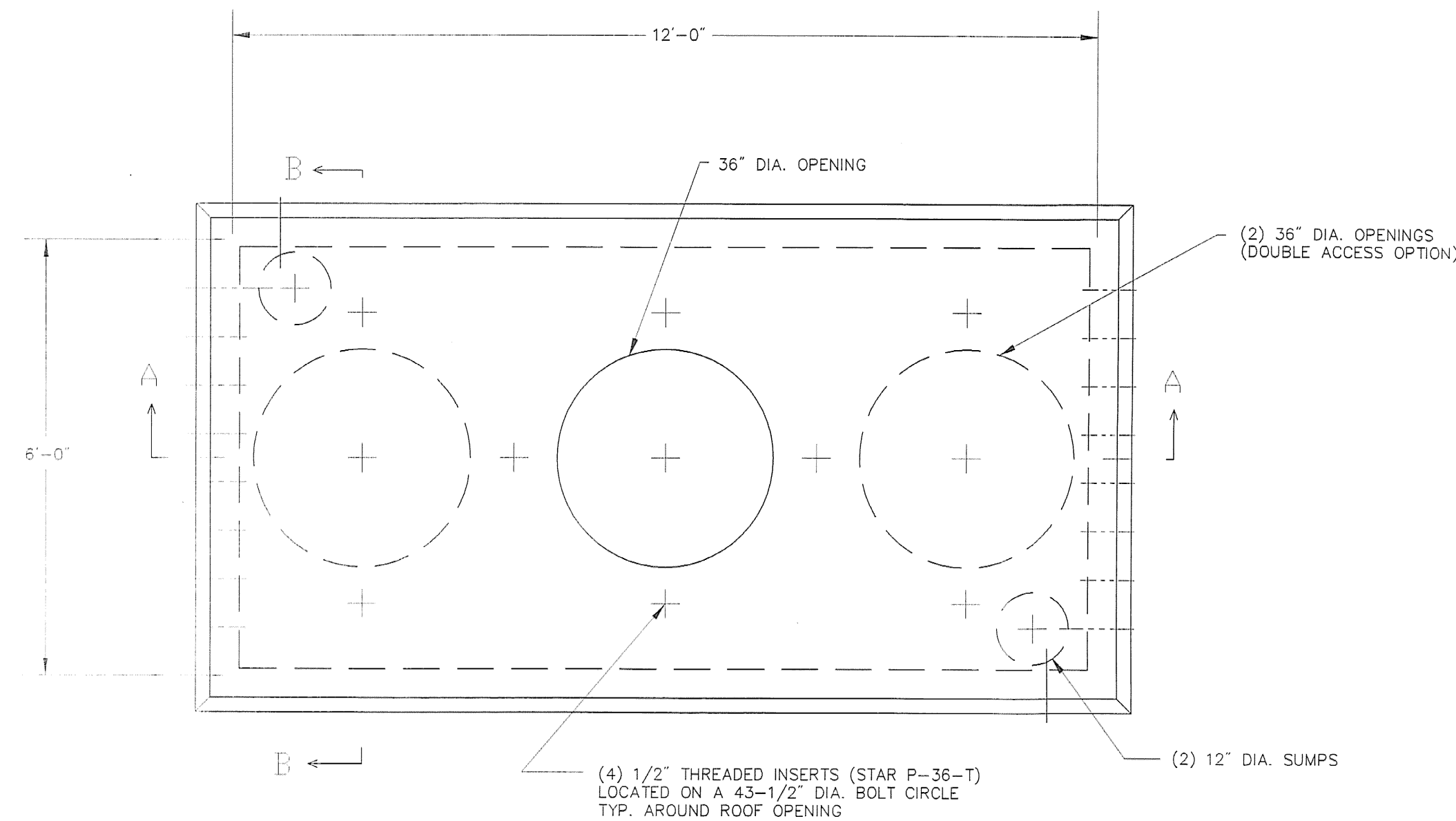
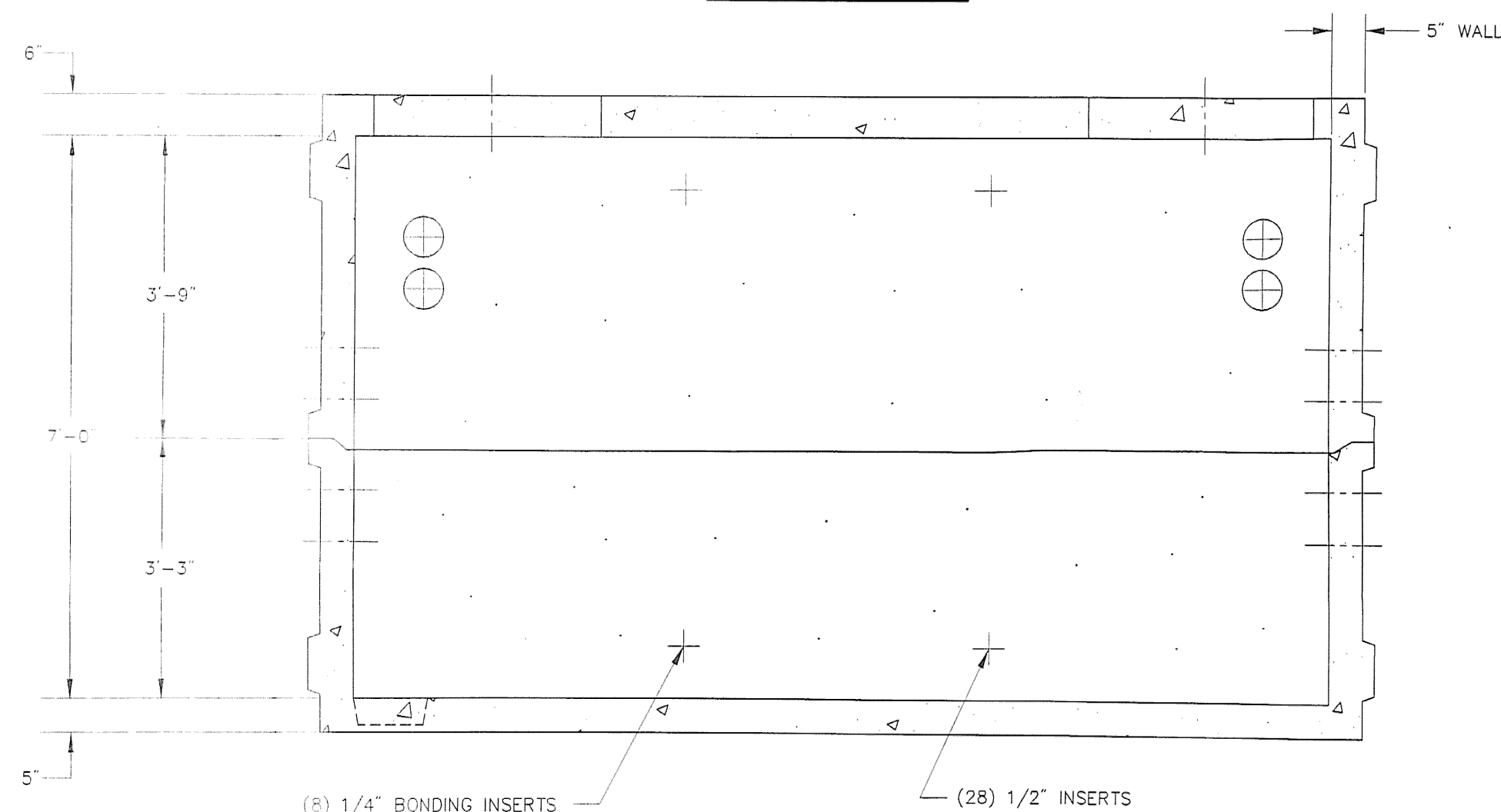


Fig. 5—Separation of Ducts of Manhole and Cable Vault Entrances

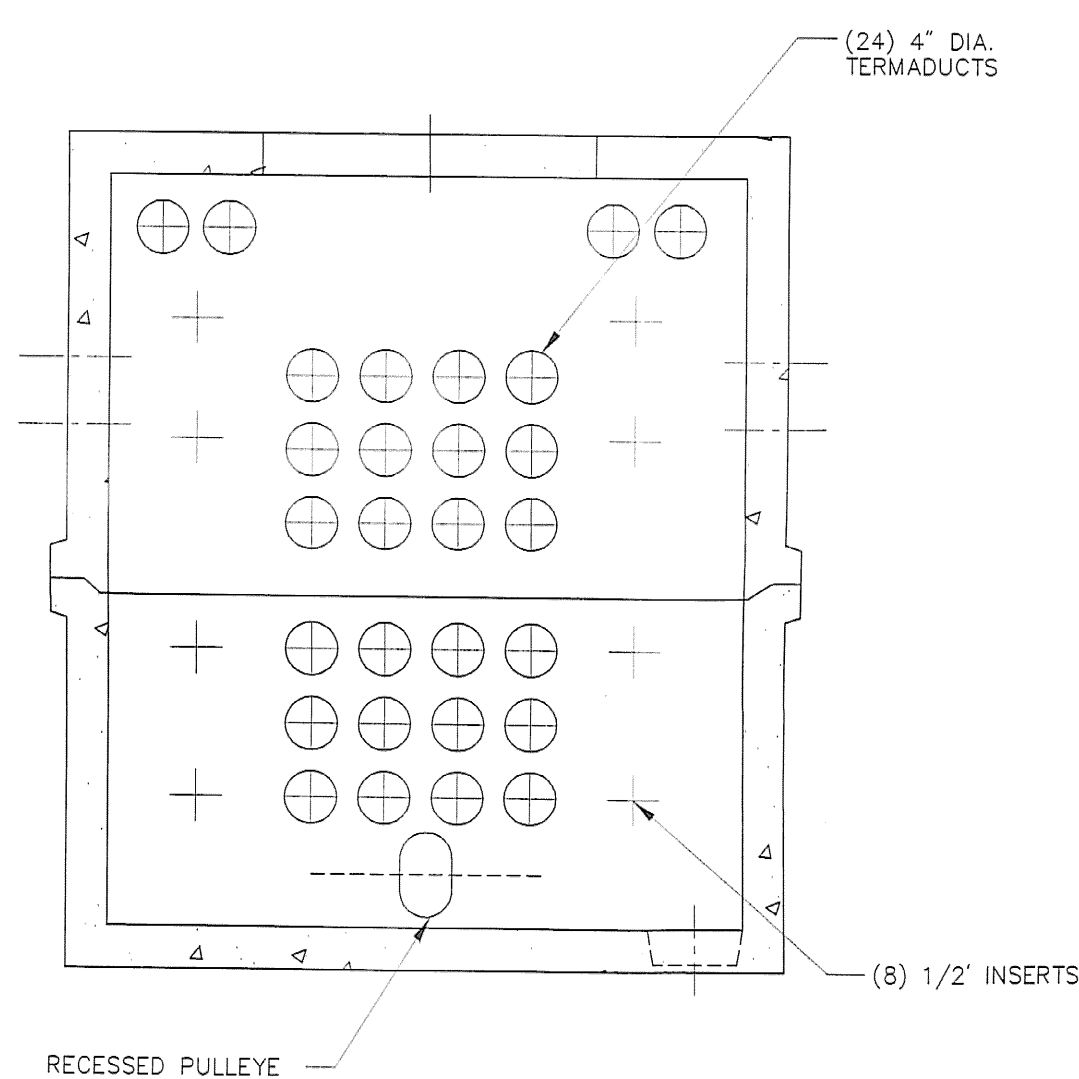


PLAN VIEW



SECTION A-A

NOTE: OPPOSITE WALL IS SIMILAR

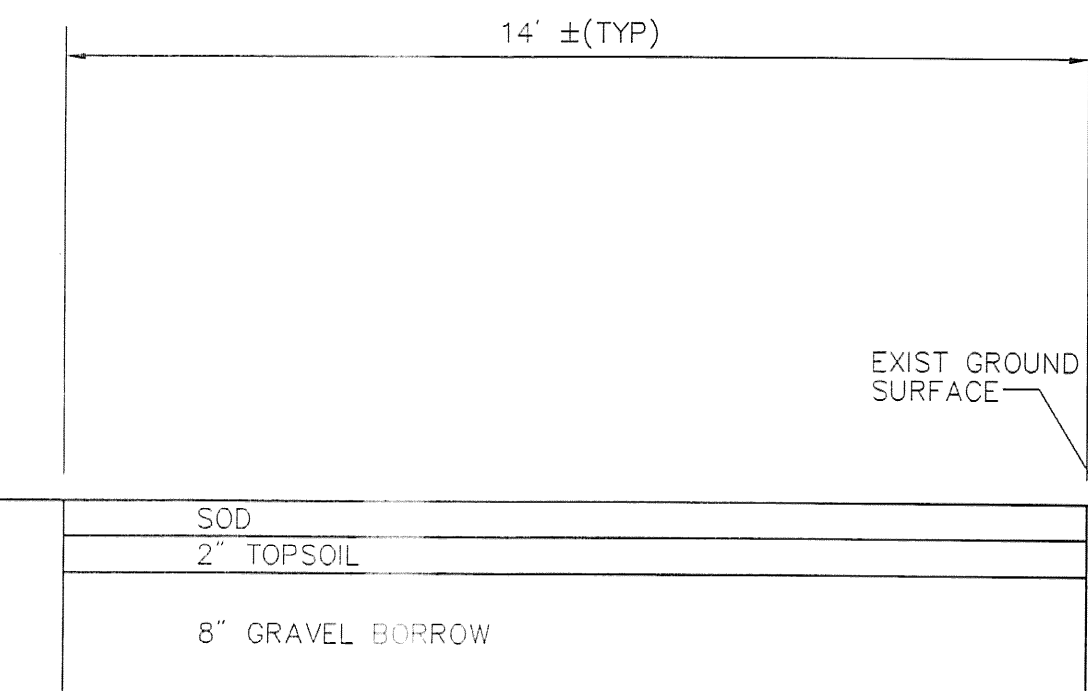


SECTION B-B

NOTE: OPPOSITE WALL IS SIMILAR

VERIZON MANHOLE DETAIL

SCALE: NOT TO SCALE

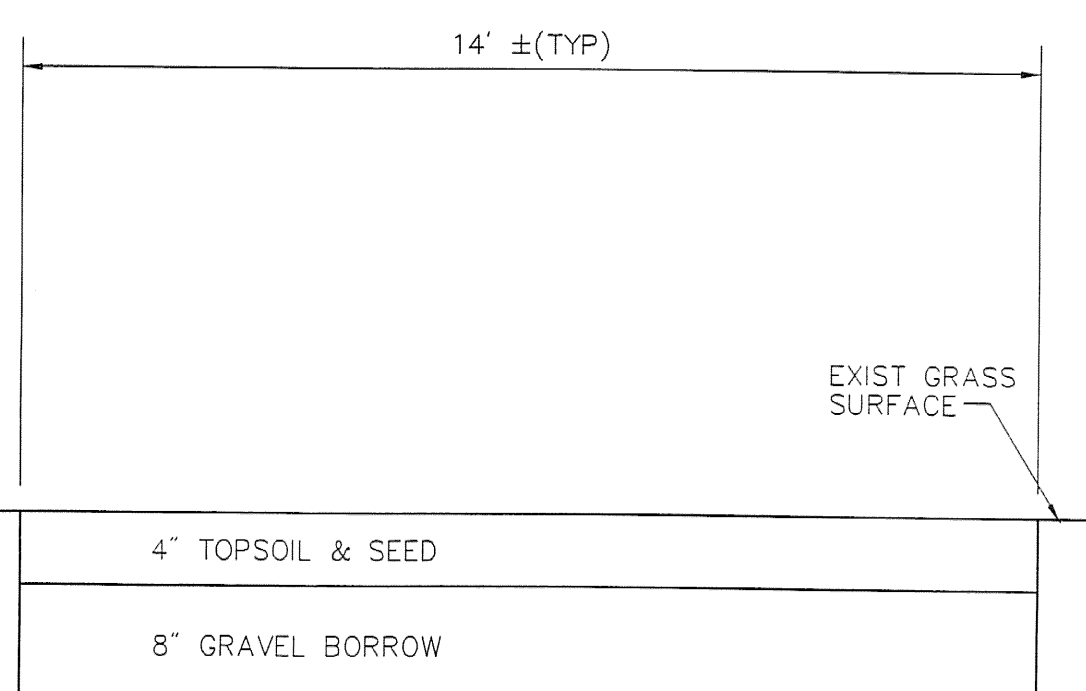


ACCESS DRIVE -
TYPE 1

SCALE: NOT TO SCALE

S-STD.

H-STD. PVMT-01-ENGLISH

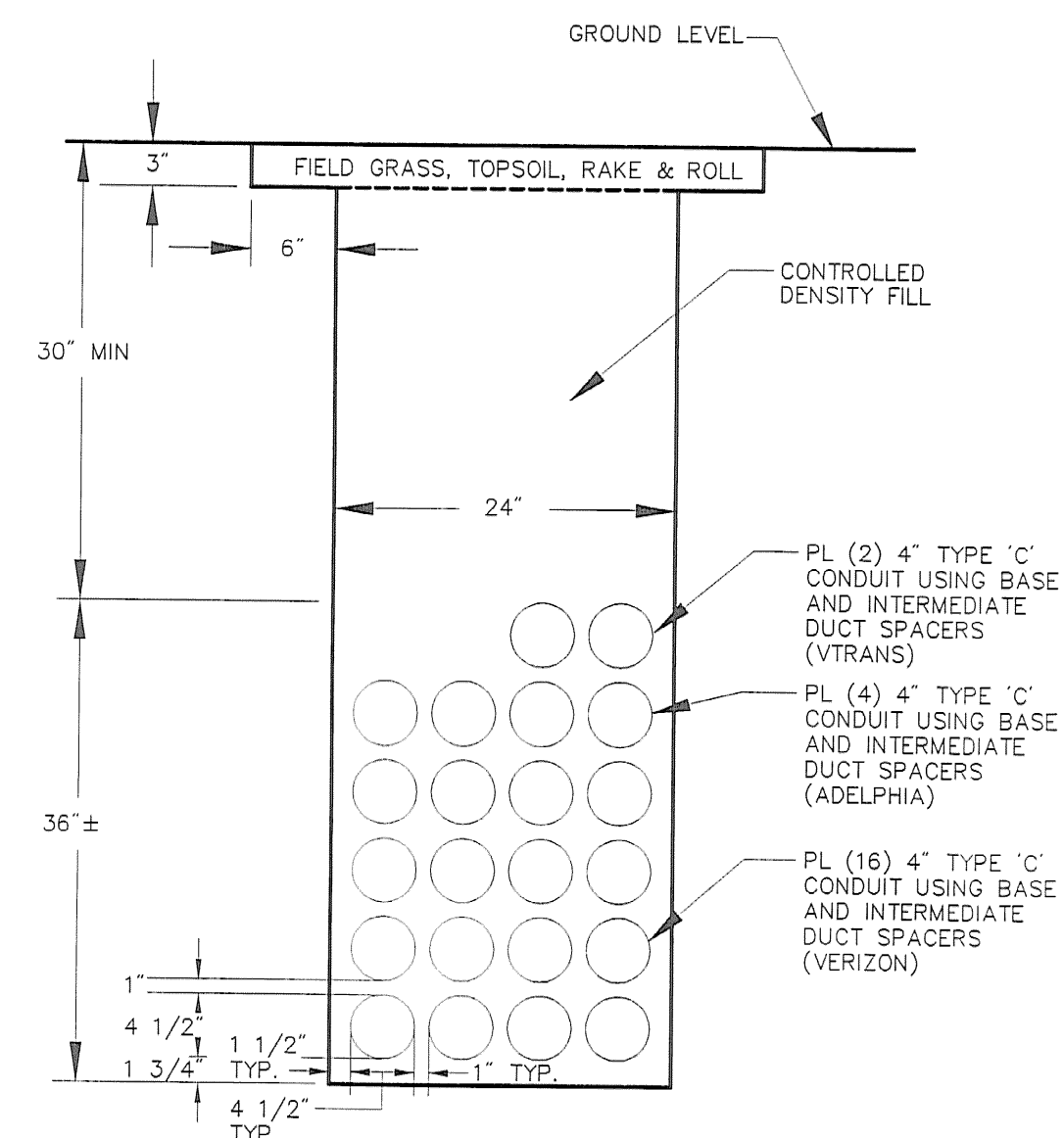


ACCESS DRIVE -
TYPE 2

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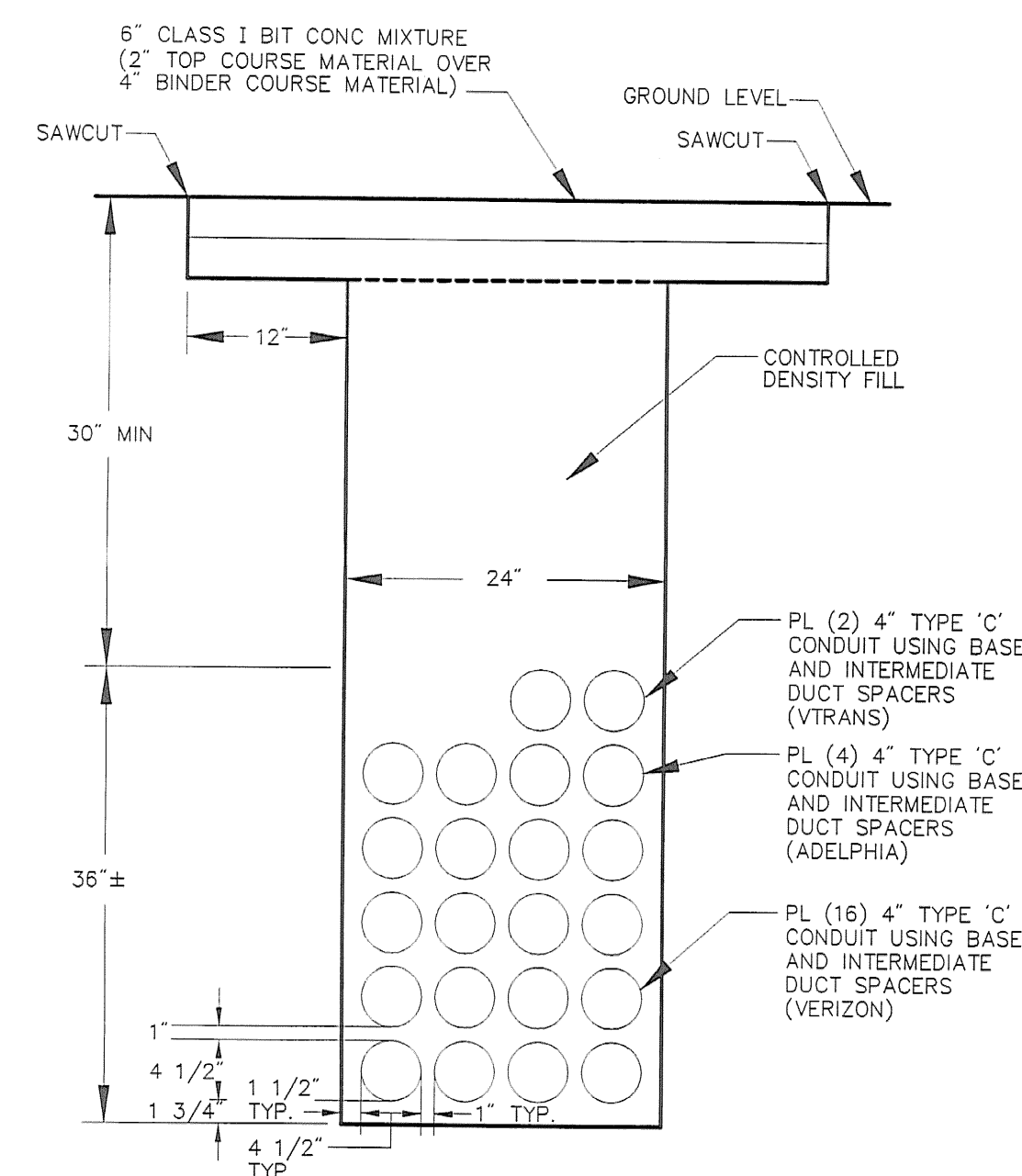
S-STD.

H-STD. PVMT-01-ENGLISH



TRENCH DETAIL
FIELD GRASS RESTORATION

SCALE: NOT TO SCALE

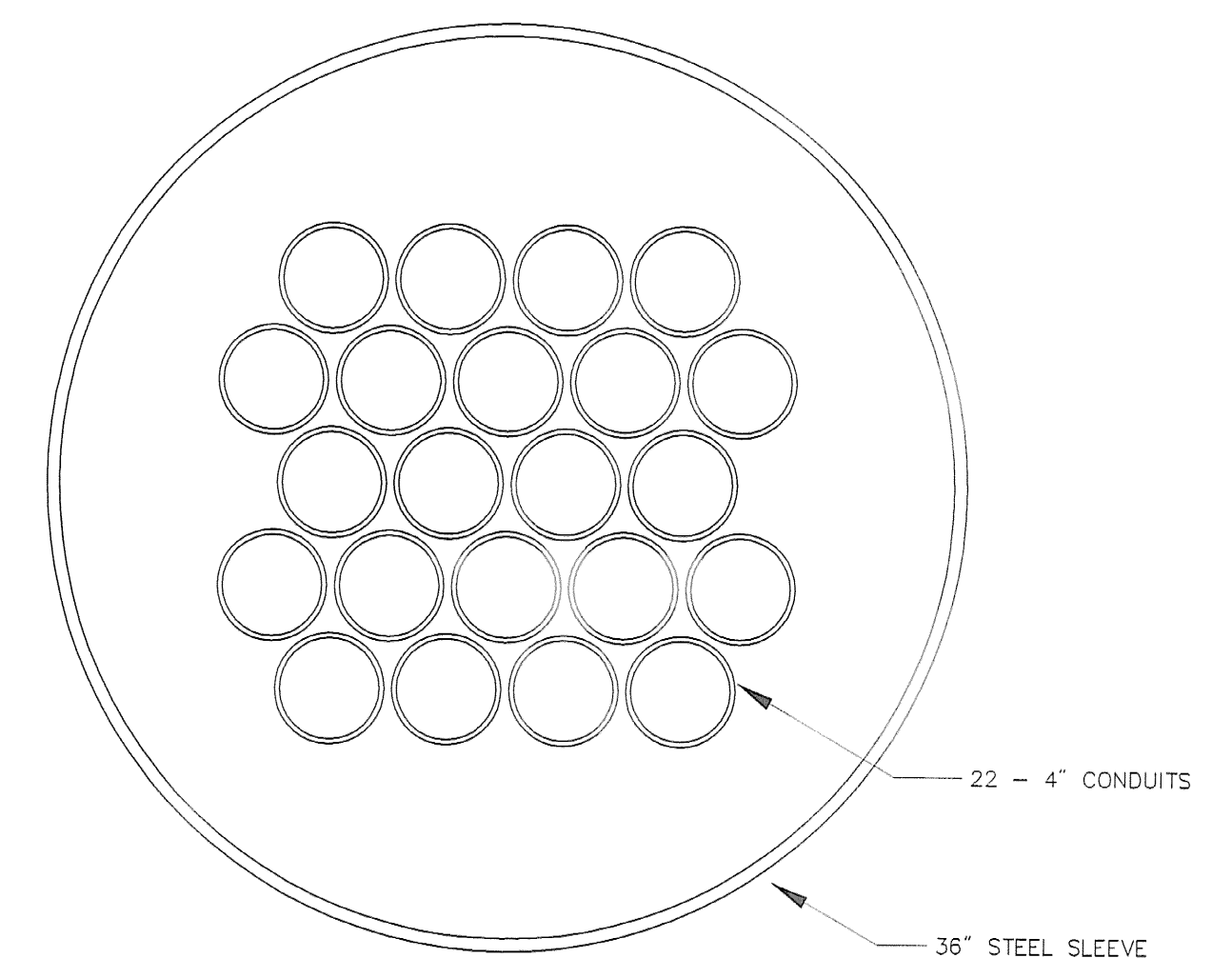


TRENCH DETAIL
IN EXISTING PAVEMENT

SCALE: NOT TO SCALE

GENERAL NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE BEGINNING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. ALL REPAIRS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR IS TO CONTACT "DIG SAFE" AT 1-888-344-7233 72 HOURS PRIOR TO ANY EXCAVATION.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
3. MAINTAIN A MINIMUM CLEARANCE OF SIX INCHES WHEN CROSSING EXISTING UTILITIES.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PLACE AND MAINTAIN TEMPORARY RESURFACING AND/OR PLATING ON ALL EXCAVATION IN PAVED STREETS AND SIDEWALKS. THE MAINTENANCE OF THE TEMPORARY RESURFACING SHALL CONTINUE UNTIL PERMANENT RESURFACING IS PLACED.
5. AREAS WITHIN AND OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
6. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS AND SHALL BE RESPONSIBLE FOR PAYING ANY FEES FOR ANY POLE RELOCATION OR ALTERATION, ADJUSTMENT OR TEMPORARY SUPPORT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM, AND ANY OTHER PUBLIC OR PRIVATE UTILITIES.
7. THE CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY PERMITS, PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. ALL CONSTRUCTION ACTIVITY SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
9. ALL WORK PERFORMED WITHIN THE PUBLIC RIGHT-OF-WAY SHALL CONFORM TO ALL LOCAL MUNICIPAL STANDARDS.
10. AT THE END OF EACH WORK DAY AND UPON FINAL CONSTRUCTION PENDING CABLE INSTALLATION, CONDUIT CAPS WILL BE PLACED ON ALL VACANT DUCTS.
11. JOINTS BETWEEN NEW BITUMINOUS CONCRETE PAVEMENT AND EXISTING PAVEMENT SHALL BE SAWCUT AND SEALED WITH RS-1 ASPHALT EMULSION AND BACKSANDS.
12. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN CONSTRUCTION AS BUILT DRAWINGS AND PRESENT A COMPLETE SET OF DRAWINGS TO LEVEL 3 COMMUNICATIONS, LLC, WITHIN 14 DAYS OF COMPLETION OF WORK.
13. THE CONTRACTOR IS RESPONSIBLE FOR PAYING FOR AND OBTAINING ALL PERMITS NECESSARY TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS.
14. JACKING PITS SHALL BE CONSTRUCTED AT LEAST 10 FT FROM EDGE OF PAVEMENT. JACKING PITS SHALL HAVE A MINIMUM SIDE SLOPE OF 1:1. JACKING PITS SHALL BE PROTECTED BY JERSEY BARRIERS AS INDICATED ON PLANS OR AS DIRECTED BY THE ENGINEER.



BORE DETAIL

SCALE: NOT TO SCALE

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of SOUTH BURLINGTON Bridge No. 68
Highway No. U.S. 2 Log Sta.
Surv. Sta.

U.S. 2 OVER I-89

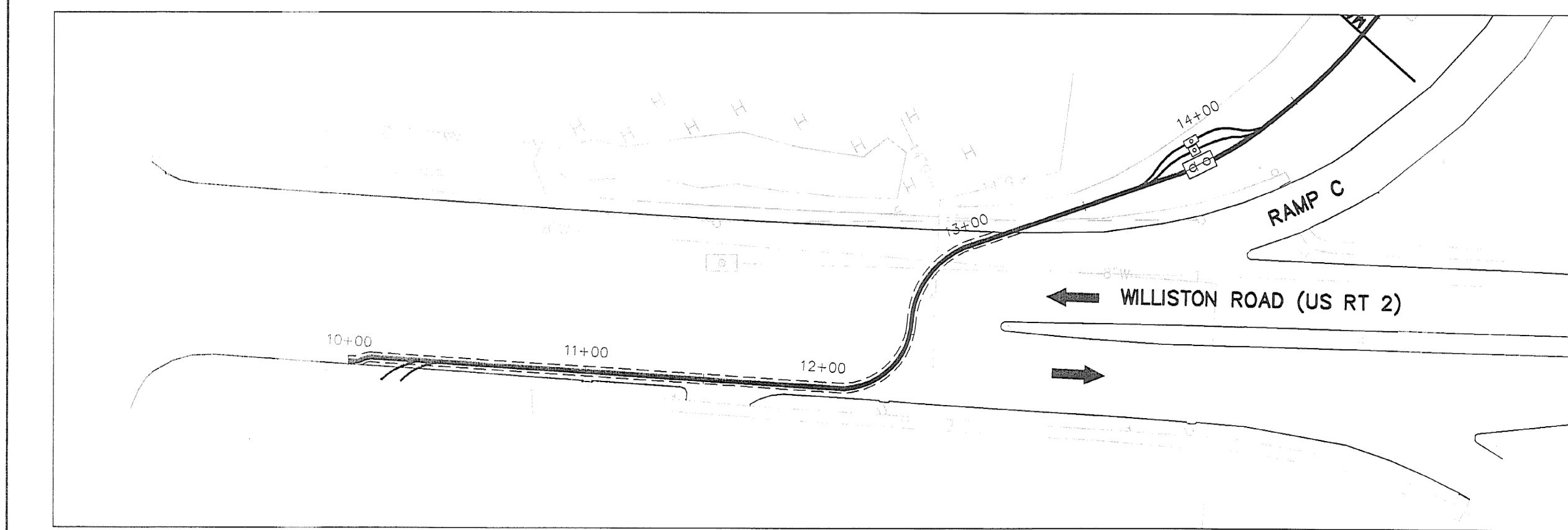
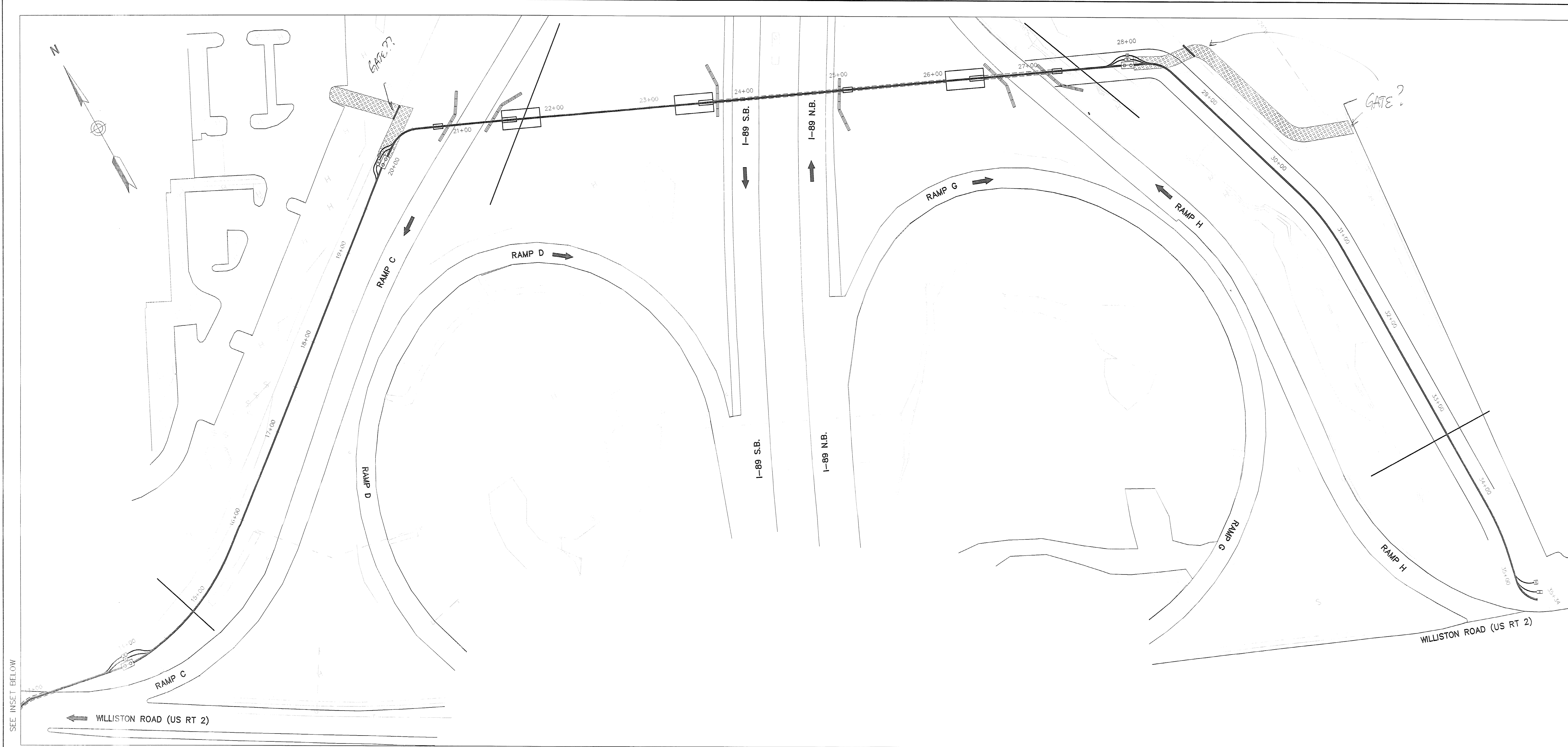
TELECOMMUNICATIONS DETAILS

Designed By M. HAYES Drawn By M. HAYES
Checked By Date Bridge Design Supervisor
S. JOHNSON Date

PROJECT SOUTH BURLINGTON PROJECT NO.
IM DECK(36)

VHB Cod Drawing No. VTRANS-DET Date 9/24/01
Bridge Sheet No. Sheet 1 of 7

VANASSE HANGEN BRUSTLIN, INC.



GENERAL PLAN

SCALE: 1" = 50'

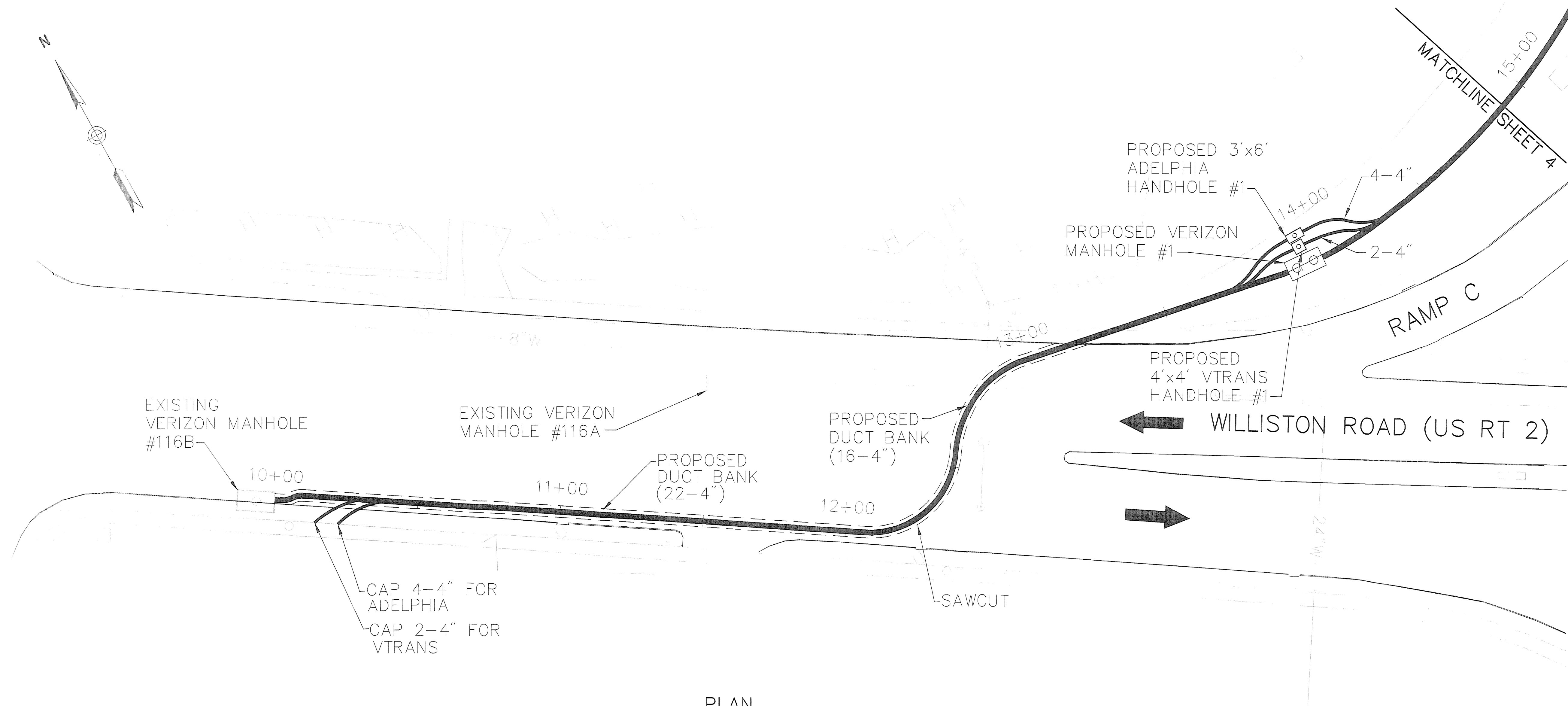
GENERAL NOTES:

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2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
3. MAINTAIN A MINIMUM CLEARANCE OF TWELVE INCHES WHEN CROSSING EXISTING UTILITIES.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PLACE AND MAINTAIN TEMPORARY RESURFACING AND/OR PLATING ON ALL EXCAVATION IN PAVED STREETS AND SIDEWALKS. THE MAINTENANCE OF THE TEMPORARY RESURFACING SHALL CONTINUE UNTIL PERMANENT RESURFACING IS PLACED.
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6. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS AND SHALL BE RESPONSIBLE FOR PAYING ANY FEES FOR ANY POLE RELOCATION OR ALTERATION, ADJUSTMENT OR TEMPORARY SUPPORT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM, AND ANY OTHER PUBLIC OR PRIVATE UTILITIES.
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12. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN CONSTRUCTION AS BUILT DRAWINGS AND PRESENT A COMPLETE SET OF DRAWINGS TO VERMONT AGENCY OF TRANSPORTATION WITHIN 14 DAYS OF COMPLETION OF WORK.
13. THE CONTRACTOR IS RESPONSIBLE FOR PAYING FOR AND OBTAINING ALL PERMITS NECESSARY TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS.
14. JACKING PITS SHALL BE CONSTRUCTED AT LEAST 10 FT FROM EDGE OF PAVEMENT. JACKING PITS SHALL HAVE A MINIMUM SIDE SLOPE OF 1:1. JACKING PITS SHALL BE PROTECTED BY JERSEY BARRIERS AS INDICATED ON PLANS OR AS DIRECTED BY THE ENGINEER.

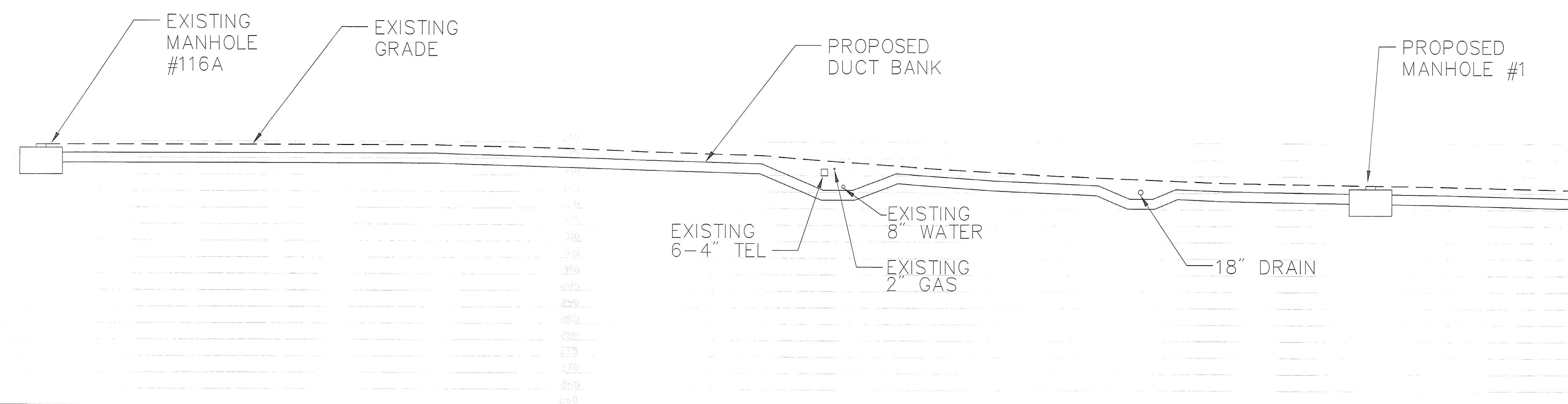


VANASSE HANGEN BRUSTLIN, INC.

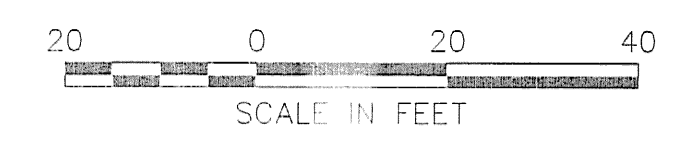
STATE OF VERMONT AGENCY OF TRANSPORTATION	
Town Of SOUTH BURLINGTON	Bridge No. 68
Highway No. U.S. 2	Log Sta.
	Surv. Sta.
U.S. 2 OVER I-89	
TELECOMMUNICATIONS RELOCATION	
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Checked By	Bridge Design Supervisor S. JOHNSON
Date	Date
PROJECT SOUTH BURLINGTON	PROJECT NO. IM DECK(36)
VHB Cad Drawing No. VTRAN6-GEN	Date 9/24/01
Bridge Sheet No.	Sheet 2 of 7



PLAN
SCALE: 1" = 20'

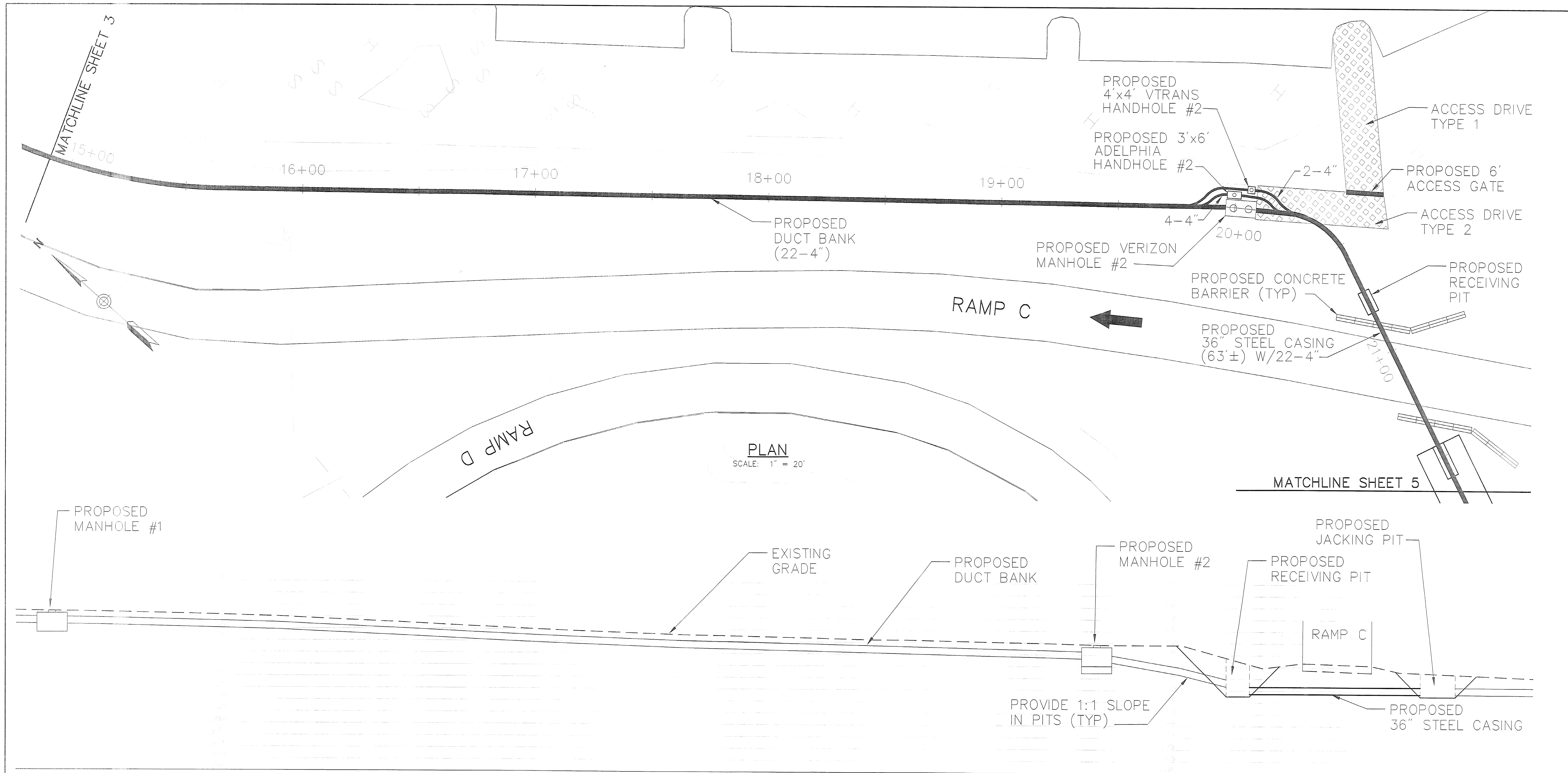


PROFILE
SCALE: 1" = 20'

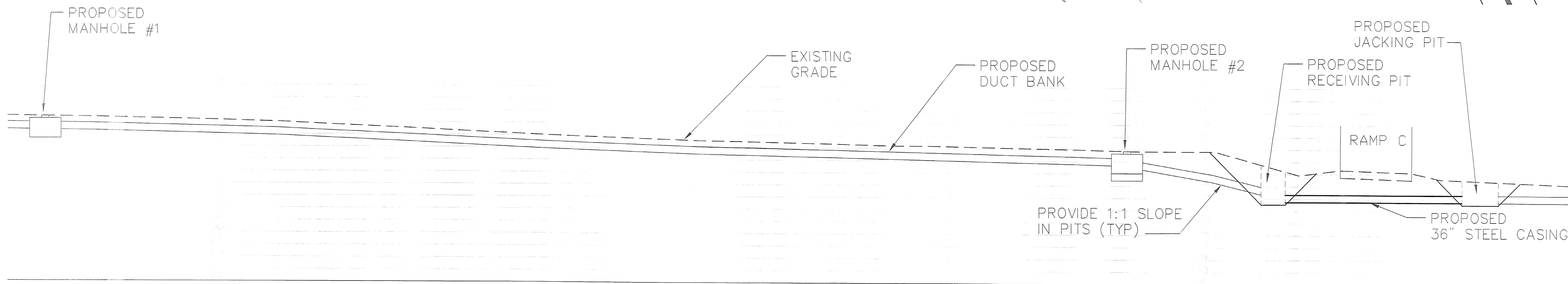


STATE OF VERMONT AGENCY OF TRANSPORTATION			
Town Of SOUTH BURLINGTON		Bridge No. 68	
Highway No. U.S. 2		Log. Sta.	
		Surv. Sta.	
U.S. 2 OVER I-89			
TELECOMMUNICATIONS RELOCATION			
Designed By M. HAYES		Drawn By M. HAYES	
Checked By		Bridge Design Supervisor	
Date		S. JOHNSON Date	
PROJECT		PROJECT NO.	
SOUTH BURLINGTON		IM DECK(36)	
VHB Cad Drawing No. VTRANS-GEN		Date 9/24/01	
Bridge Sheet No.		Sheet 3 of 7	

VANASSE HANGEN BRUSTLIN, INC.



PLAN
SCALE: 1" = 20'



PROFILE
SCALE: 1" = 20'



**STATE OF VERMONT
AGENCY OF TRANSPORTATION**

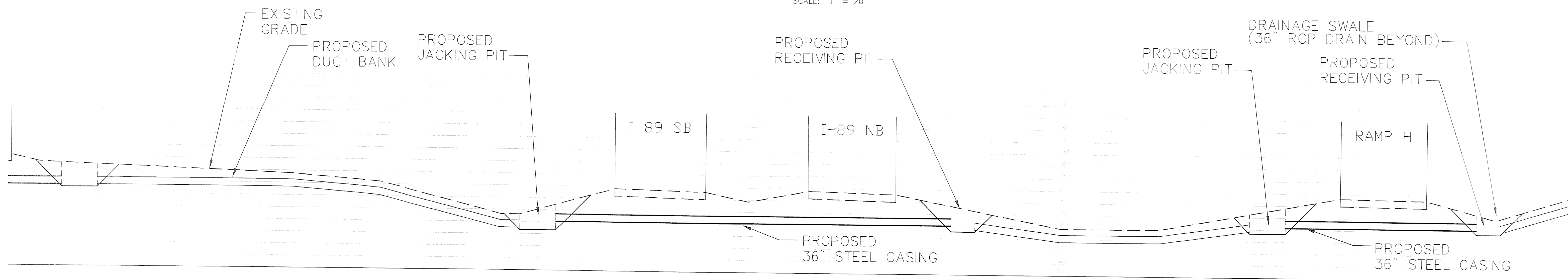
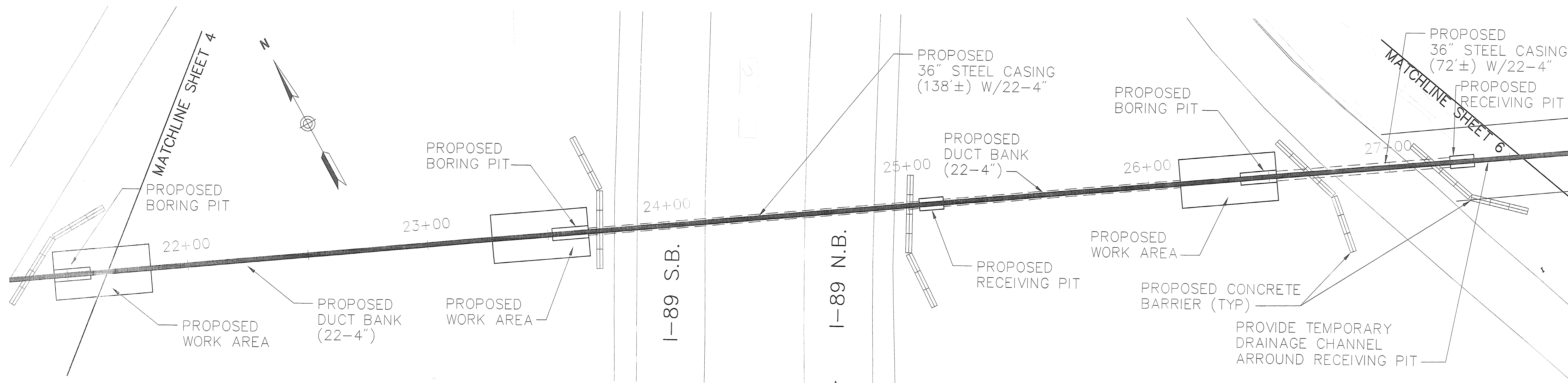
Town Of **SOUTH BURLINGTON** Bridge No. **68**
Highway No. **U.S. 2** Log Sta.
Surv. Sta.
U.S. 2 OVER I-89

TELECOMMUNICATIONS RELOCATION

Designed By **M. HAYES** Drawn By **M. HAYES**
Checked By **S. JOHNSON** Date **9/24/01**
Bridge Design Supervisor

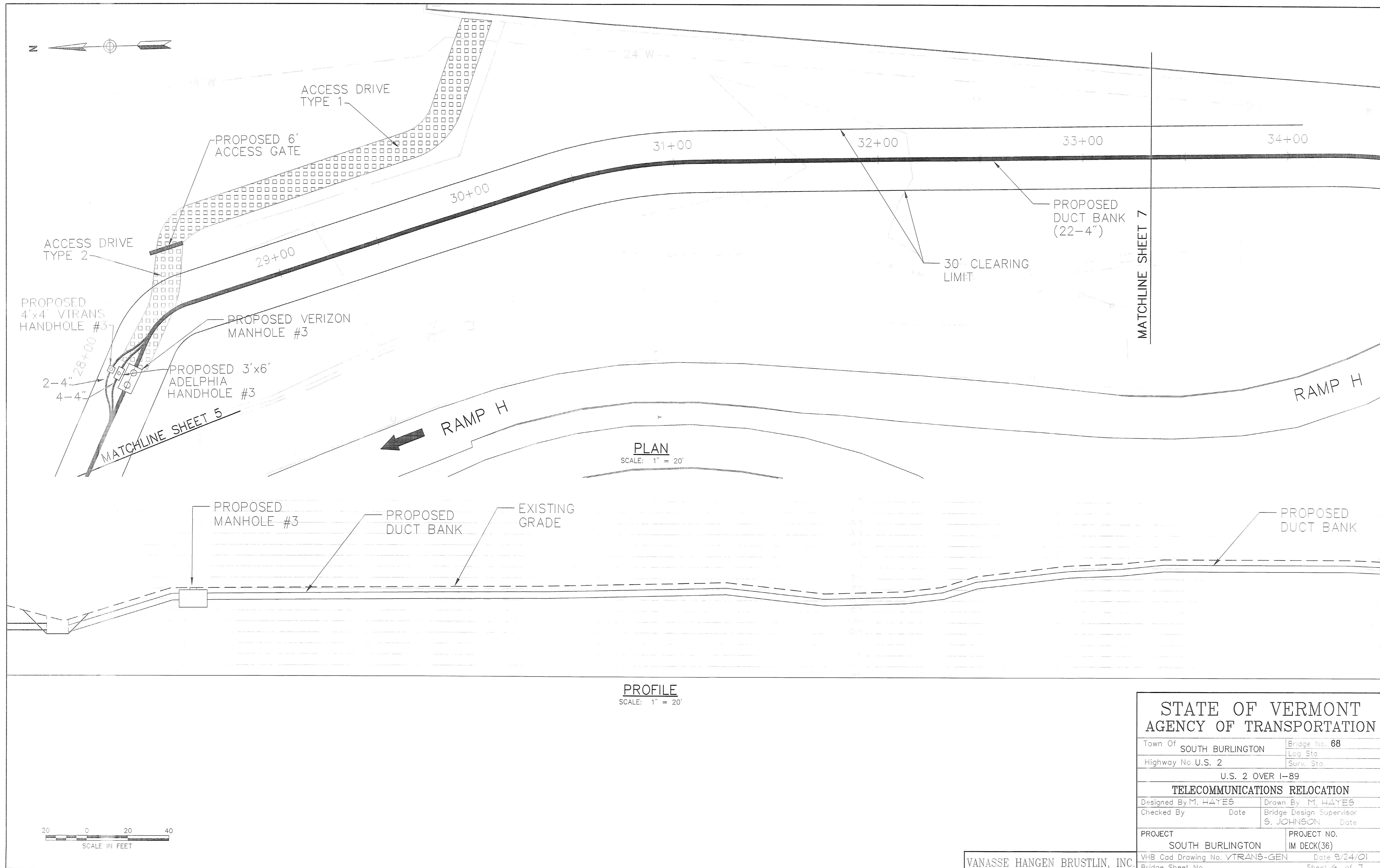
PROJECT **SOUTH BURLINGTON** PROJECT NO. **IM DECK(36)**
VHB Cod. Drawing No. **VTRANS-GEN** Date **9/24/01**
Bridge Sheet No. **Sheet 4 of 7**

VANASSE HANGEN BRUSTLIN, INC.



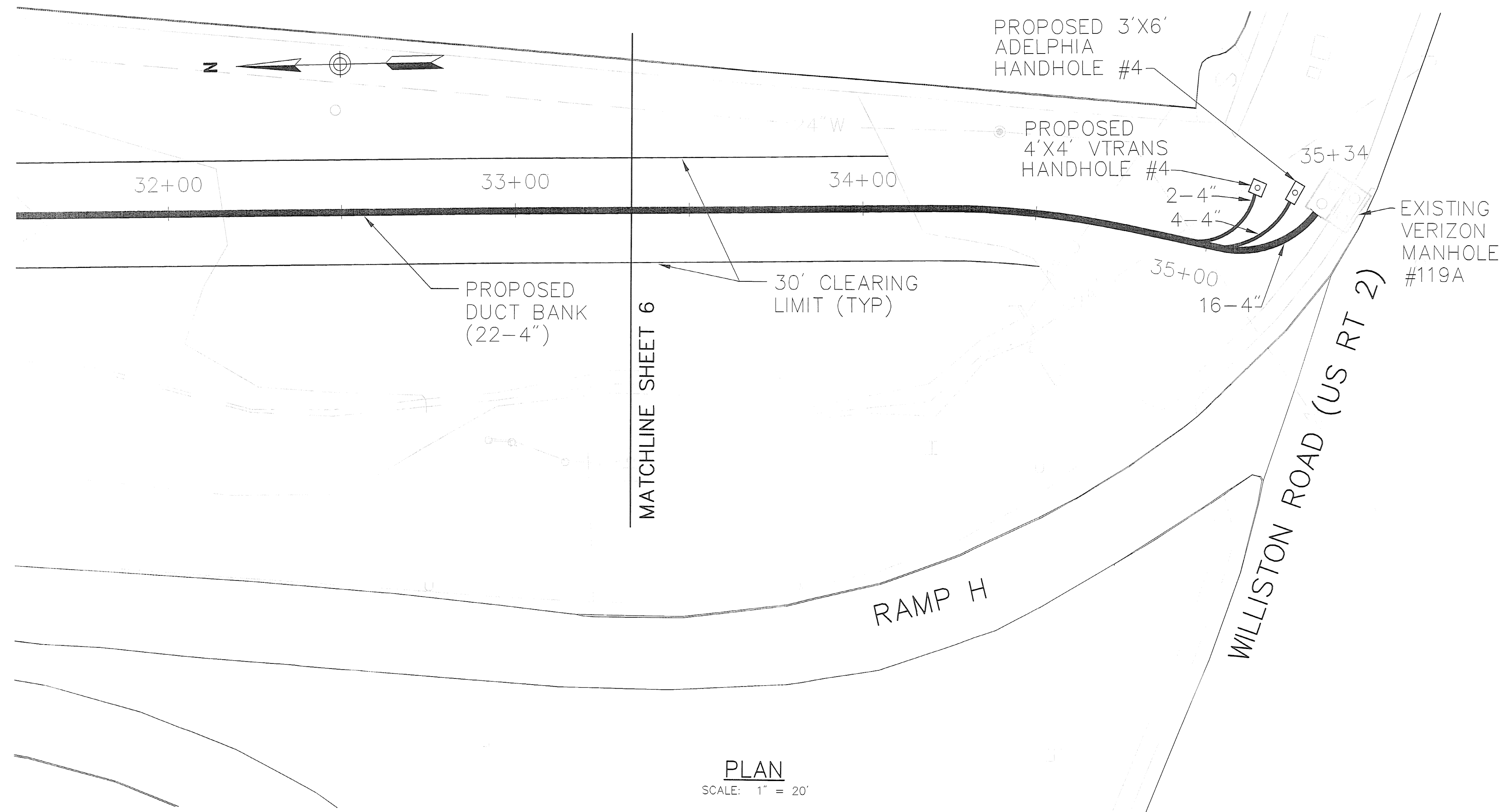
VANASSE HANGEN BRUSTLIN, INC.

STATE OF VERMONT			
AGENCY OF TRANSPORTATION			
Town Of		Bridge No. 68	
SOUTH BURLINGTON		Log Sta.	
Highway No. U.S. 2		Surv. Sta.	
U.S. 2 OVER I-89			
TELECOMMUNICATIONS RELOCATION			
Designed By M. HAYES		Drawn By M. HAYES	
Checked By		Bridge Design Supervisor	
Date		S. JOHNSON Date	
PROJECT		PROJECT NO.	
SOUTH BURLINGTON		IM DECK(36)	
VHB Cad Drawing No. VTRANS-GEN		Date 9/24/01	
Bridge Sheet No.		Sheet 5 of 7	

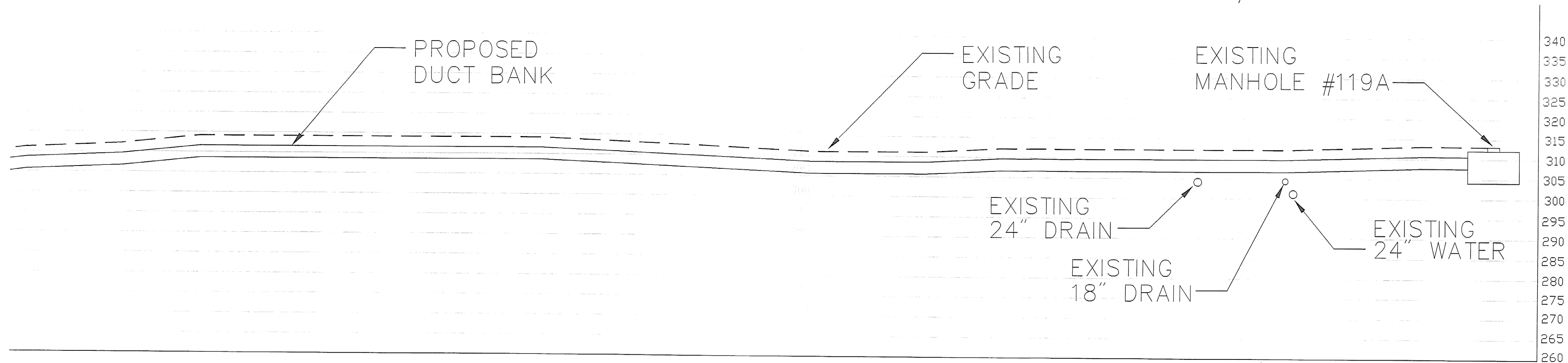


STATE OF VERMONT AGENCY OF TRANSPORTATION			
Town Of SOUTH BURLINGTON		Bridge No. 68	
Highway No. U.S. 2		Log. Sta.	
		Surv. Sta.	
U.S. 2 OVER I-89			
TELECOMMUNICATIONS RELOCATION			
Designed By M. HAYES		Drawn By M. HAYES	
Checked By		Bridge Design Supervisor	
Date		S. JOHNSON Date	
PROJECT		PROJECT NO.	
SOUTH BURLINGTON		IM DECK(36)	
VHB Cad Drawing No. VTRANS-GEN		Date 9/24/01	
Bridge Sheet No.		Sheet 6 of 7	

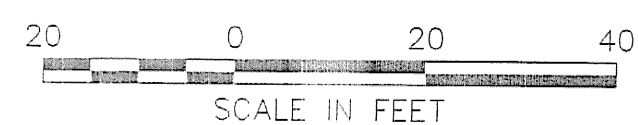
VANASSE HANGEN BRUSTLIN, INC.



PLAN
SCALE: 1" = 20'



PROFILE
SCALE: 1" = 20'



VANASSE HANGEN BRUSTLIN, INC.

STATE OF VERMONT AGENCY OF TRANSPORTATION			
Town Of	SOUTH BURLINGTON	Bridge No.	68
Highway No.	U.S. 2	Log Sta.	
		Surv. Sta.	
U.S. 2 OVER I-89			
TELECOMMUNICATIONS RELOCATION			
Designed By	M. HAYES	Drawn By	M. HAYES
Checked By		Bridge Design Supervisor	S. JOHNSON
		Date	
PROJECT	SOUTH BURLINGTON	PROJECT NO.	IM DECK(36)
VHB Cad Drawing No.	VTRANS-GEN	Date	9/24/01
Bridge Sheet No.		Sheet	7 of 7

Transportation
Land Development
Environmental Services

Kilton Road
Six Bedford Farms, Suite 607
Bedford, NH 03110-6532
603 644 0888
FAX 603 644 2385

TRANSMITTAL

To: Robert Suckert, PE, Resident Engineer
Vermont Agency of Transportation
209 South Pinnacle Ridge Road
Waterbury, VT 05676

Date: July 5, 2000

VHB
Project No.: 50929

Re: South Burlington IM DECK 36 Bridge No. 68
and STP BIKE (28) S

We are sending you:

☒ Attached

☐ Under Separate cover via Regular Mail the following items:

☐ Shop drawings

☐ Prints

☐ Plans

☐ Diskettes

☐ Specifications

☐ Copy of Letter

☐ Change Order

☐ Other

Copies	Date	No.	Description
1	6-27-00		Structural Drawings for Bridge Shoring Sheet S1 -Sections and Details

These are transmitted as checked below:

☐ Reviewed as required by the construction contract documents and approved, but only for conformance to the design concept of the work, and subject to further limitations and requirements contained in the construction contract documents.

☐ Rejected

☐ Revise and Resubmit

☒ Furnish as Corrected

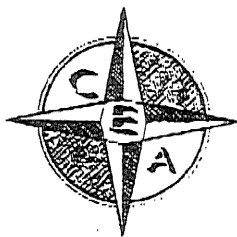
Copy to: VTrans Resident Engineer, Robert E. Suckert, P.E. w/prints
Contractor, J.A. McDonald, Inc. w/prints
Civil Engineering Associates w/prints
VTrans Consultant Project Manager , Sherward Farnsworth, PE w/prints
VHB Project Manager, Steve Johnson, PE ,VHB Project File

By: Athanasia S. Robinson, VHB Inc.

Athanasia S. Robinson

7-1 -2000 10:32PM FROM

P. 1



CIVIL ENGINEERING ASSOCIATES, INC.

928 Falls Road
P.O. Box 485
Shelburne, VT 05482

Phone: 802-985-2323
Fax: 802-985-2271
E-Mail: cca@together.net

July 5, 2000

Mr. Steve Johnson
Vanasse, Hangen, Brustlin, Inc.
Six Bedford Farms, Kilton Road
Bedford, New Hampshire 03110

**Subject: South Burlington IM Deck
End Support for Existing Stringers**

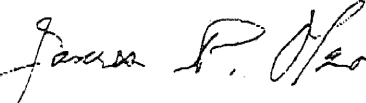
Dear Steve:

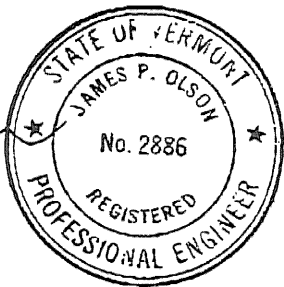
As a follow-up to your conversation with Lyn Wheatley, we are submitting the following description for securing the bridge stringers on the top of the temporary support frames.

1. One end of each set of stringers will be "fixed" to the beam seat (stub columns) with two heavy duty C-clamps (Proto model 6-HDL shown on attached sheet). Lateral restraint at this "fixed" end will be a 6-inch length of minimum 1/2 inch thick steel welded to the top of the stub column bearing plate adjacent to stringer bottom flange.
2. The "free" end will be restrained against vertical and lateral movement by the detail shown as "E" on our drawing S1 revised June 27, 2000.

Please call either Lyn Wheatley or me if you have any questions or if you require additional information.

Very truly yours,


James P. Olson, P.E.



JPO:pao
Enclosure

PROTO

C-CLAMPS—EXTRA HEAVY SERVICE
STANDARD SCREW

- Standard C-clamp design
- Heavy-duty threaded hub provides maximum screw support
- Forcing screws have a square head to be turned with a wrench
- Forcing screws have a hardened tip

No.	C	T	D	Min. Test Load Pounds	$\frac{1}{2}$ "
0-HD	0"-1/4"	1/4"	1/4"	2,800	0.4
1-HD	0"-1/4"	1/4"	1/4"	5,600	0.7
1 1/2-HD	0"-1/4"	1/4"	1/4"	8,750	1.0
4-HD	1"-5/8"	2 1/2"	1"	20,000	10.1

CID A-A-429C

C-CLAMPS—HEAVY SERVICE STANDARD SCREW

- Designed for heavy service applications where the strength of the extra heavy duty C-clamp is not required
- Clamps have a high strength steel frame with a hardened forcing screw
- Forcing screws are lined with impact resistant pins

No.	C	T	D	Min. Test Load Pounds	$\frac{1}{2}$ "
102SS	0"-2"	1 1/4"	1/4"	7,300	1.3
103SS	0"-3"	1 1/4"	1/4"	8,750	2.6
104SS	0"-4 1/4"	2"	1/4"	10,000	4.1
106SS	2"-6"	2 1/4"	1/4"	11,250	5.9
108SS	4"-8"	2 1/4"	1/4"	12,500	8.0
110SS	6"-10"	2 1/4"	1/4"	13,750	11.6
112SS	8"-12"	2 1/4"	1/4"	15,000	15.8
115SS	10"-15"	2 1/4"	1/4"	16,250	18.2
118SS	12"-18"	2 1/4"	1/4"	17,500	

CID A-A-429C

C-CLAMPS—EXTRA HEAVY SERVICE
FULL LENGTH SCREW

- Full length forcing screws provide greater capacity with the maximum capacity always being "T"
- Deep throat T-clamp design
- Heavy-duty threaded hub provides maximum screw support
- Forcing screws have a square head to be turned with a wrench
- Forcing screws have a hardened tip

No.	C	T	D	Min. Test Load Pounds	$\frac{1}{2}$ "
2-HDL	0"-2 1/4"	1 1/4"	1/4"	12,500	3.4
3-HDL	0"-3 1/4"	2"	1/4"	16,250	6.1
4-HDL	0"-4 1/4"	2 1/4"	1"	20,000	10.3
5-HDL	0"-5 1/4"	2 1/4"	1"	23,800	14.2
6-HDL	0"-6 1/4"	3 1/4"	1 1/4"	27,500	20.2
8-HDL	0"-8 1/4"	5"	1 1/2"	31,250	28.1
10-HDL	0"-10 1/4"	6 1/2"	1 1/2"	35,000	32.3
				40,000	40.8

C-CLAMPS—STANDARD SERVICE DEEP THROAT
FULL LENGTH SCREW

- Standard service deep throat style to the minimum depth required
- Max. forged for strength and hard wear
- Forcing screw has heavy rolled flange should allow the screw to turn easily under pressure and is for easy removal
- Forcing screw has a sliding T handle and an impact resistant pad
- Full length forcing screws provide greater capacity with the maximum capacity always being "T"

No.	C	T	D	Min. Test Load Pounds	$\frac{1}{2}$ "
402	0"-2"	2"	1/4"	3,500	1.3
403	0"-3"	2 1/4"	1/4"	3,500	2.0
404	0"-4"	2 1/4"	1/4"	5,500	3.5
406	0"-6"	3 1/4"	1/4"	6,500	5.0
408	0"-8"	4 1/4"	1/4"	6,500	7.0
410	1"-10"	5 1/4"	1/4"	8,000	10.5
412	1"-12"	5 1/4"	1/4"	9,500	15.5

TABLE NO.1 - PRO-POXY 300 FAST TENSION VALUES (lbs) FOR
THREADED ROD INSTALLED IN NORMAL WEIGHT CONCRETE ^{1,2,3,4,5,6}

Anchor Diameter (Inches)	Bit Diameter (Inches)	Embedment (Inches)	Ultimate Bond Strength (lbs)				Allowable Steel Strength (lbs)		
			Concrete Strength, f'c				A36	A307	300 Series
			2000 psi	2500 psi	4000 psi	5500 psi			
3/8	7/16	3-3/8	6530	7300	8250	9200	2110	4550	3100
3/8	9/16	3-3/8	8550	9560			2110	4550	3100
3/8	7/16	5-5/8	9820	10980	11360	11740	2110	4550	3100
1/2	9/16	4-1/2	9430	10540	11730	12920	3750	8100	5680
1/2	11/16	4-1/2	13090	14640			3750	8100	5680
1/2	9/16	7-1/2	13110	14660	17010	19360	3750	8100	5680
5/8	3/4	5-5/8	13240	14800	18870	22940	5880	12660	9040
5/8	7/8	5-5/8	20880	23340			5880	12660	9040
5/8	3/4	9-3/8	19280	21560	26260	30960	5880	12660	9040
3/4	7/8	6-3/4	20020	22380	25870	29360	8460	18220	11290
3/4	1	6-3/4	26700	29850			8460	18220	11290
3/4	7/8	11-1/4	27120	30320	34340	38360	8460	18220	11290
7/8	1	7-7/8	20420	22830	29235	35640	11500	24800	15580
7/8	1-1/8	7-7/8	32520	36360			11500	24800	15580
7/8	1	13-1/8	26670	29820			11500	24800	15580
1	1-1/8	9	20840	23300	28780	34260	15020	32400	20440
1	1-1/4	9	36440	40740			15020	32400	20440
1	1-1/8	15	34650	38340			15020	32400	20440
1-1/4	1-3/8	11-1/4	33240	37160	46760	56360	23480	50610	32700
1-1/4	1-3/8	18	44880	50180			23480	50610	32700

¹ The tabulated shear and tension values are for anchors installed in normal weight concrete having reached the designated ultimate compressive strength at the time of installation. Linear interpolation may be used for concrete strengths between those listed.

² Spacing and edge distance shall be in accordance with Table No. 5.

³ For other steel grades compare allowable tension values with table bond values and us the lesser. Stainless steel values are based on ASTM F 593, cold worked condition strength.

⁴ Allowable loads may be increased by 33-1/3% for short term loading due to earthquakes or wind.

⁵ 2000 psi ultimate loads were determined in accordance with Section 7.5 of ICBO-ES AC-508, by multiplying 2500 psi test results by a reduction factor of (2000/2500) ^ 1/2= 0.894.

⁶ Pro-Poxy 300 Fast is recognized for installation in water-filled or moist holes, for use in locations subject to severe exterior weathering conditions and for resisting tension and shear loads due to earthquake and wind.

TABLE NO.2 - PRO-POXY 300 FAST ALLOWABLE SHEAR VALUES FOR
THREADED ROD INSTALLED IN MINIMUM 2000 PSI CONCRETE ^{1,2,3,4,5}

Anchor Diameter (Inches)	Ba Diameter (Inches)	Embedment (Inches)	Allowable Steel Strength (lbs)		
			A36 A307	A193 B7	300 Series Stainless
3/8	7/16	3-3/8	1080	2350	1565
1/2	9/16	4-1/2	1930	4170	2900
5/8	3/4	5-5/8	3030	6520	4660
3/4	7/8	6-3/4	4360	9390	5880
7/8	1	7-7/8	5930	12780	8170
1	1-1/8	9	7740	16690	10730
1-1/4	1-3/8	11-1/4	12100	26070	17340

¹ The tabulated shear and tension values are for anchors installed in normal weight concrete having reached a minimum ultimate compressive strength f_c of 2000 psi at the time of installation.

² Spacing and edge distance shall be in accordance with Table No. 5.

³ Stainless steel values are based on ASTM F-353, cold worked condition strength.

⁴ Allowable loads may be increased by 33-1/3% for short term loading due to earthquakes or wind. A 36 & A 307 values must be used instead of listed values for higher strength steels for these loading conditions.

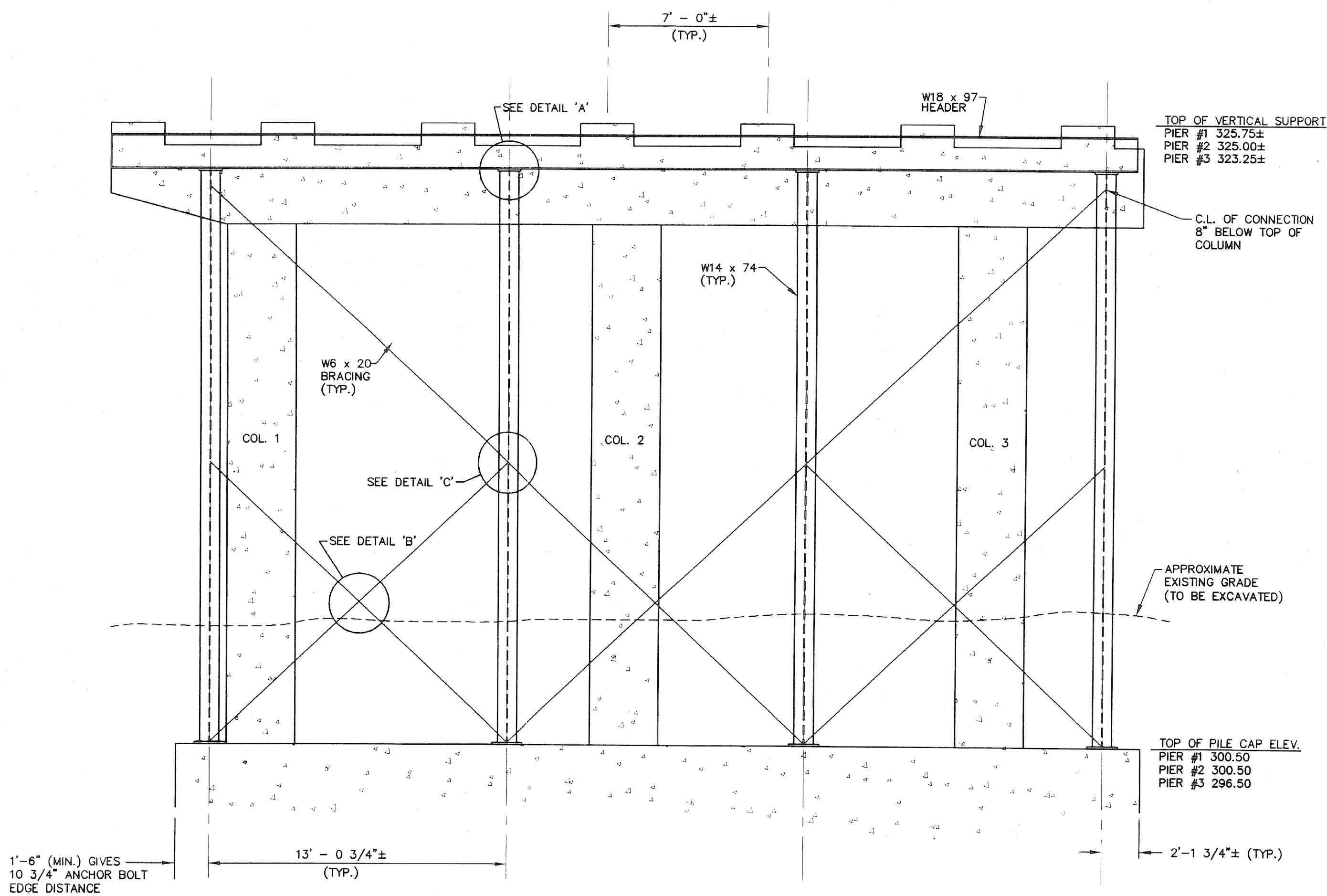
⁵ Pro-Poxy 300 Fast is recognized for installation in water-filled or moist holes, for use in locations subject to severe exterior weathering conditions and for resisting tension and shear loads due to earthquake and wind.

TABLE NO.5 - PRO-POXY 300 FAST
ALLOWABLE SPACING AND EDGE DISTANCE
(D = Anchor Diameter)

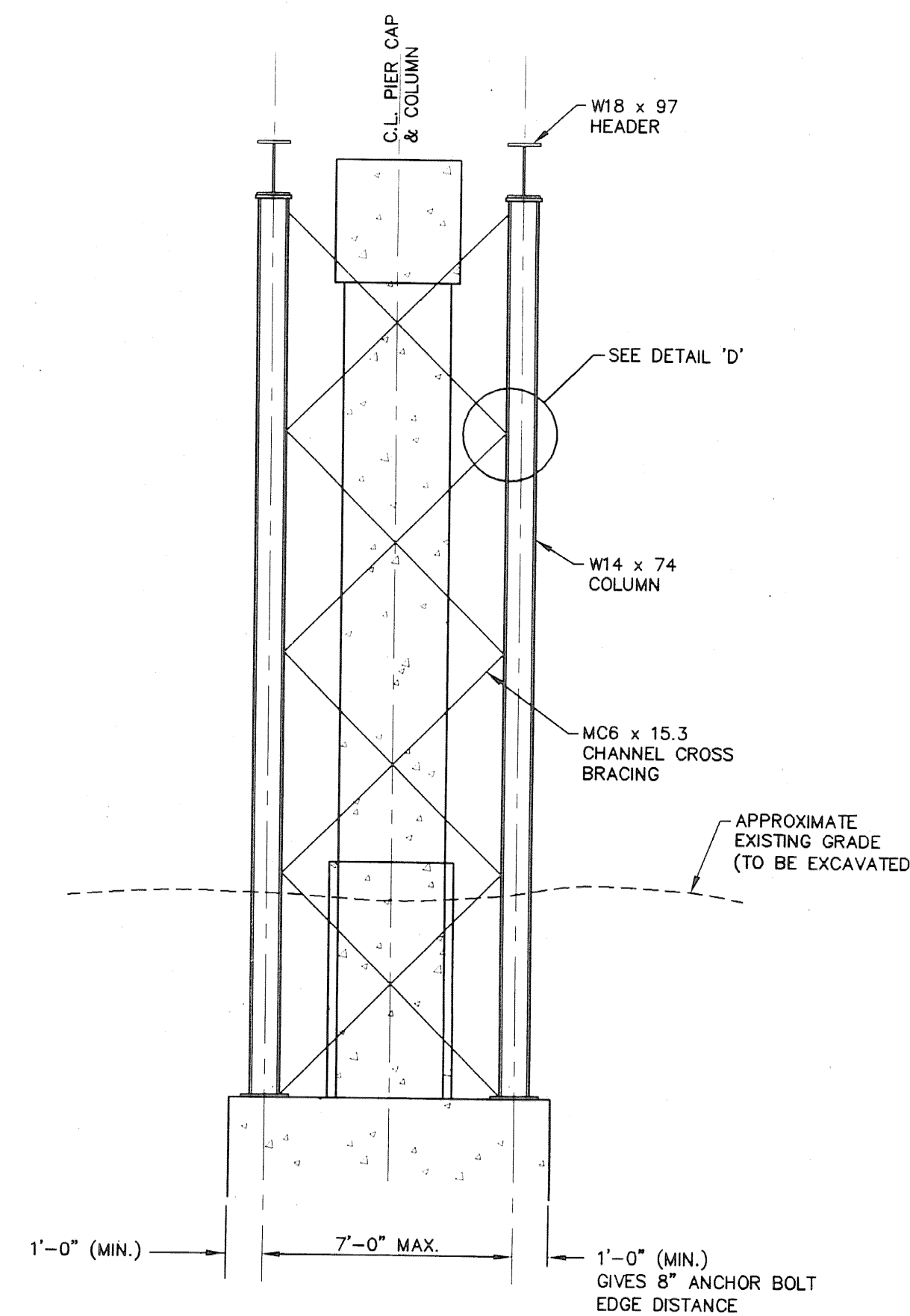
	DISTANCE FOR FULL ANCHOR CAPACITY (Critical Distance) ¹	DISTANCE FOR REDUCED ANCHOR CAPACITY	REDUCTION FACTOR ²
Edge Distance - Tension Loads	12D	4D	.70
Spacing Between Anchors	24D	8D	.90
Edge Distance - Shear Loads	12D	4D	.26

¹ The listed values are the minimum distances required to obtain the load values in Table Nos. 1, 2 & 3.
² Load values in the tables are multiplied by the reduction factor when anchors are installed at the reduced distances. Use linear interpolation for spacing and edge distances between listed values.

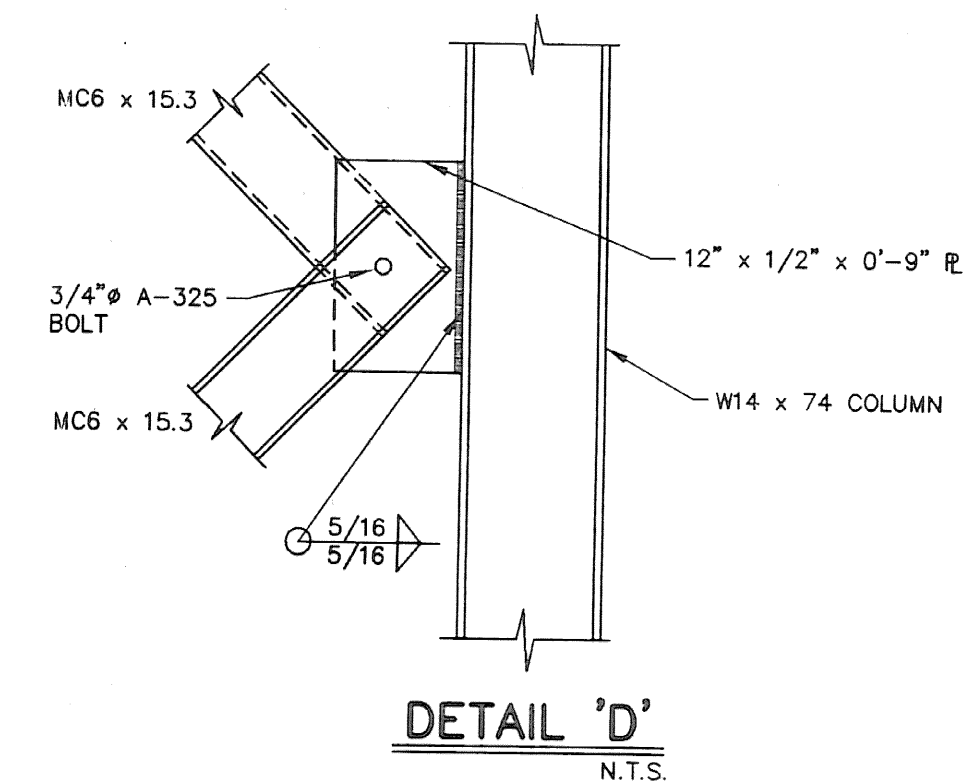
Example (2500 psi concrete 7/8" diameter hole)			
Anchor Diameter	Embedment Depth	Edge Distance	Ultimate Load
5/8"	5-5/8"	12D (7-1/2")	23,340 lbs (from Table #1)
5/8"	5-5/8"	4D (2-1/2")	16,340 lbs (23,340 ^{from Table 1} X .70 ^{reduction factor from Table 5}) (Value from Table 1 X Reduction factor from Table 5)



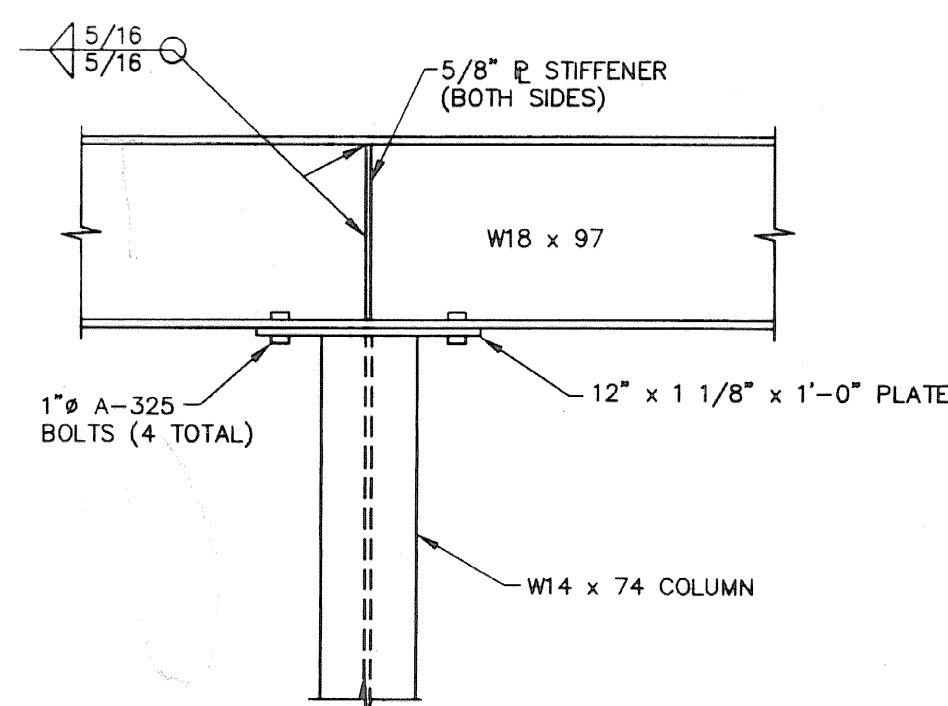
TYPICAL FRAME LAYOUT FOR SUPPORT
1/4" = 1'-0"



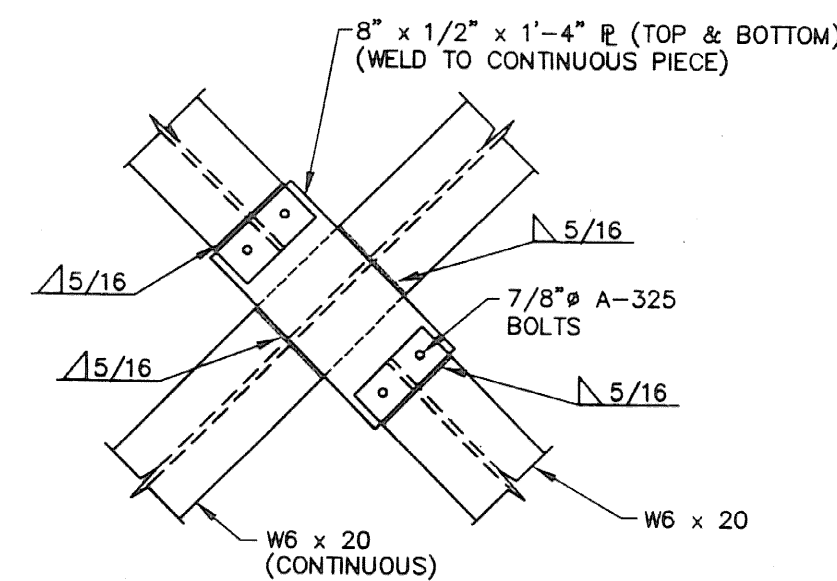
BRACING SCHEME E-W DIRECTION
1/4" = 1'-0"



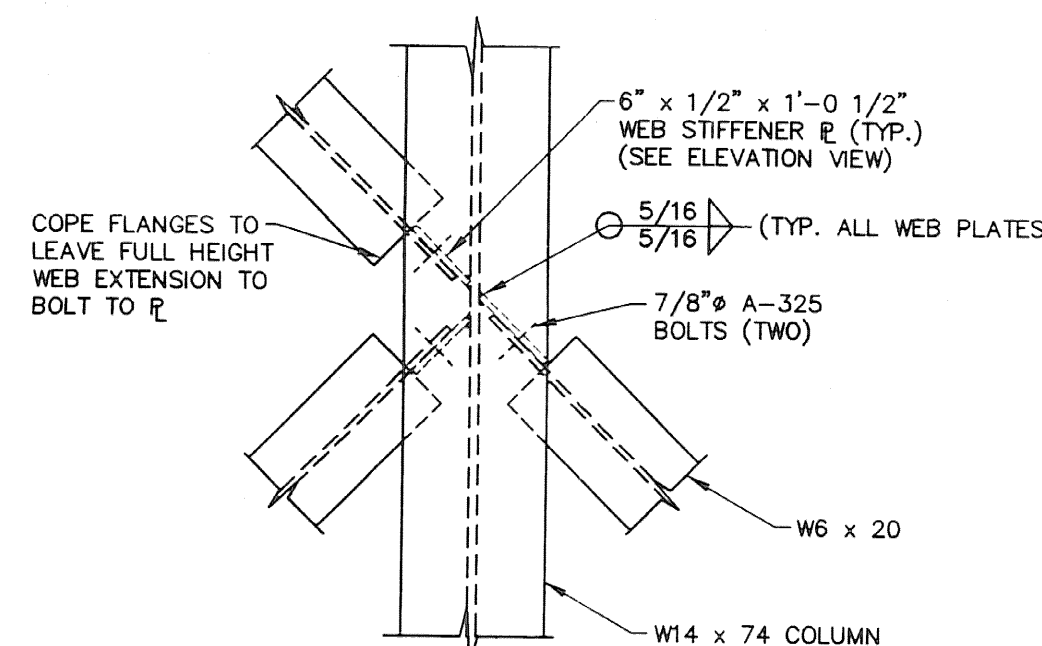
DETAIL 'D'
N.T.S.



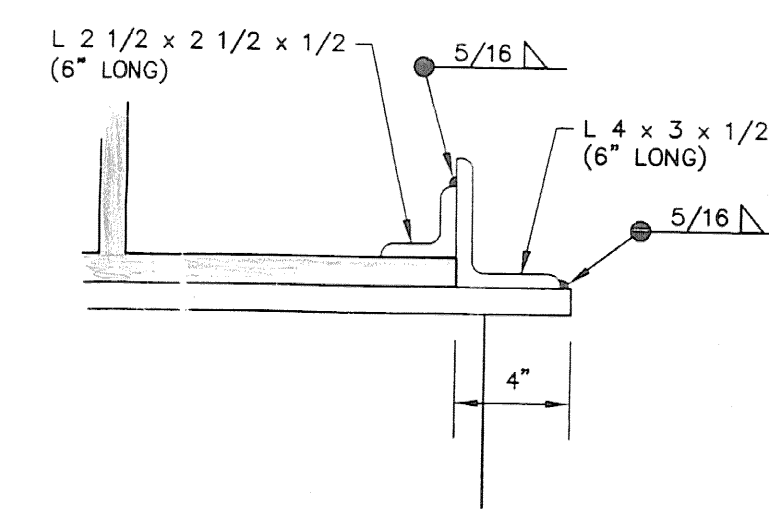
DETAIL 'A'
N.T.S.



DETAIL 'B'
N.T.S.



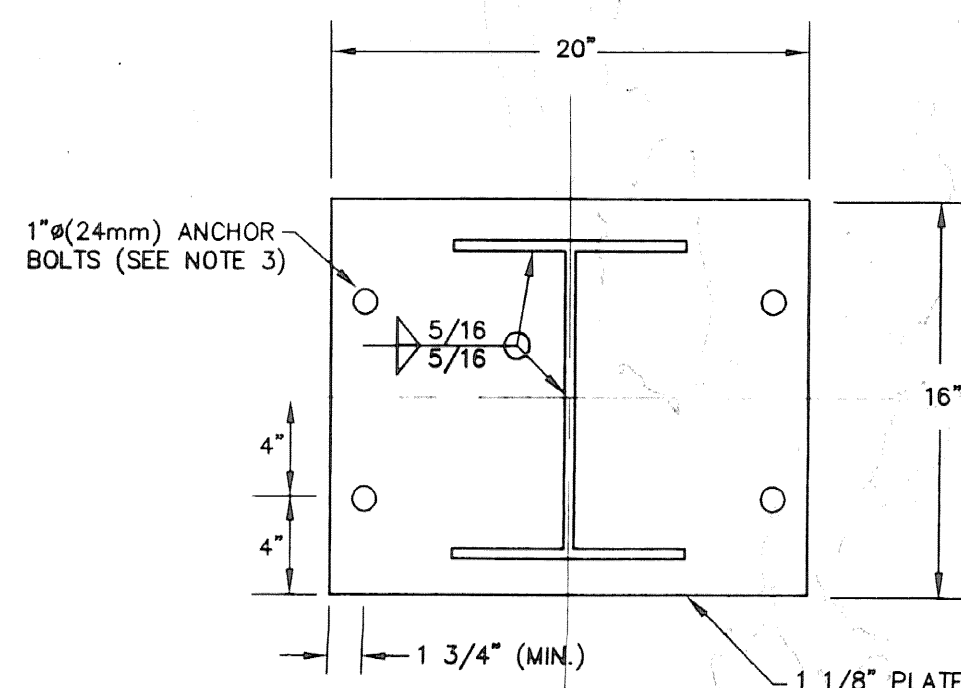
DETAIL 'C'
N.T.S.



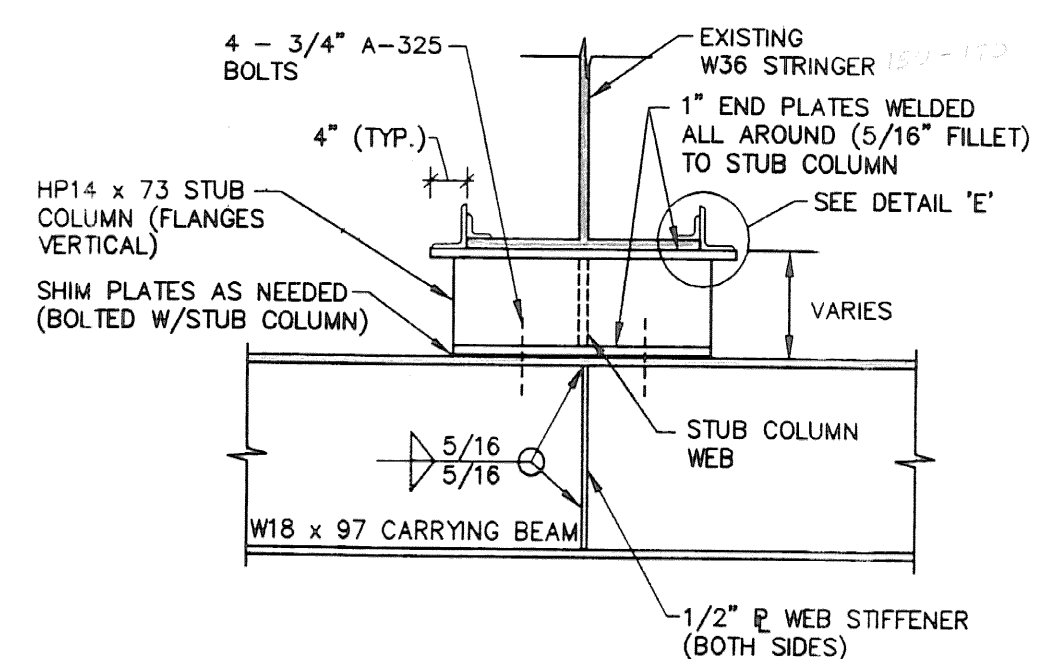
DETAIL 'E'
N.T.S.

NOTES:

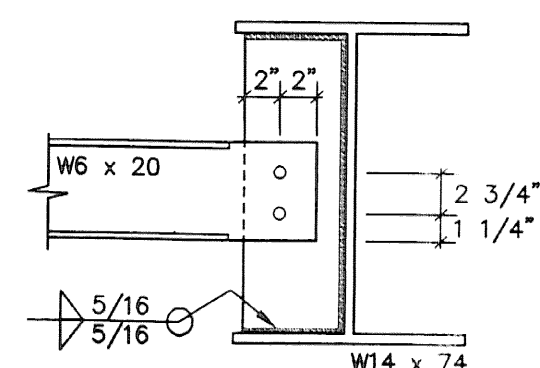
- ALL STEEL SECTIONS TO BE A-36 GRADE.
- ALL MEASUREMENTS TO BE FIELD VERIFIED.
- COLUMN BASEPLATES FOR TEMPORARY SUPPORTS TO BE ATTACHED TO EXISTING PILE CAP WITH 1" DIA. A193-B7 THREADED ROD (4 @ EACH COLUMN) INSTALLED TO A MINIMUM EMBEDMENT OF 9 INCHES USING PRO-POXY 300 FAST ADHESIVE. MINIMUM RECOMMENDED EDGE DISTANCE BY SUPPLIER IS 4 DIAMETERS AND FULL CAPACITY ACHIEVED AT 12 DIAMETERS. PRO-RATED FOR 8 DIAMETERS, AS SHOWN ON THE PLANS, THE ALLOWABLE PULL-OUT CAPACITY IS 6100 LBS. PER ROD AND ALLOWABLE SHEAR CAPACITY IS 8620 LBS. PER ROD. THESE ALLOWABLE LOADS MEET VERTICAL AND HORIZONTAL LOAD REQUIREMENTS.
- EXISTING STRINGERS TO BE SECURED TO SUPPORTING BEAM OR STUB COLUMN BY HOLD-DOWN ANGLES OVER BOTTOM FLANGE OF STRINGER.
- JACKING MAY BE ACCOMPLISHED BY TEMPORARILY REPLACING END MC18 x 42.7 DIAPHRAGM BEAM WITH A W18 x 97 JACKING BEAM BOLTED TO DIAPHRAGM PLATES WELDED TO STRINGERS.
- ONE UPPER BRACE (SEE TYPICAL FRAME LAYOUT DETAIL) MAY BE TEMPORARILY REMOVED TO PERMIT ACCESS TO WORK SPACE AT PIER VERTICAL COLUMNS.
- NO MORE THAN TWO OF FOUR LINES OF E-W BRACING (SEE BRACING SCHEME E-W DIRECTION) MAY BE TEMPORARILY REMOVED FOR ACCESS TO WORK SPACE.
- ALL WELDS ARE 5/16" FILLET WELDS USING E70XX ELECTRODES.



BASE PLATE DETAIL
N.T.S.



DETAIL @ GIRDER (STRINGER) SUPPORT
N.T.S.



ELEVATION VIEW @ DETAIL 'C'
N.T.S.

SITE ENGINEER:



CIVIL ENGINEERING ASSOCIATES, INC.
P.O. BOX 485 SHELburnE, VT 05482
802-985-2323 FAX: 802-985-2271 e-mail: cea@together.net

DRAWN

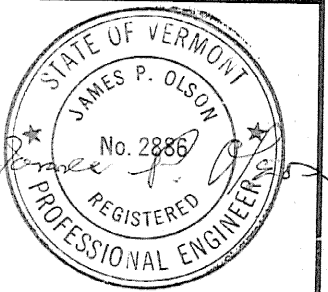
PJM

CHECKED

JPO

APPROVED

JPO



PROJECT:

J.A. McDONALD

**WILLISTON ROAD
BRIDGE SHORING
AT I-89**

SO. BURLINGTON, VERMONT

SUBMITTAL REVIEW

☐ REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE CONSTRUCTION CONTRACT DOCUMENTS AS SET FORTH IN DIVISION _____, DIVISION _____, SECTION _____, AND SHEET _____ OF THE PLANS, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS IN THE CONSTRUCTION CONTRACT DOCUMENTS.

☐ REJECTED ☐ REVISE AND RESUBMIT ☒ FURNISH AS CORRECTED

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY FOR CONFORMANCE WITH THE SPECIFICATIONS AND REQUIREMENTS OF THE DRAWINGS AND THE CONSTRUCTION CONTRACT DOCUMENTS AS SET FORTH IN DIVISION _____, DIVISION _____, SECTION _____, AND SHEET _____ OF THE PLANS, AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CORRECTING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING WORK WITH THAT OF OTHER TRADES, AND PERFORMING WORK IN A SAFE AND SATISFACTORY MANNER.

VHB Vansasse-Hangen Brustin, Inc.
Engineers, Planners, and Scientists
66 Spaulding Parkway, Milton Rd.
Bedford, NH 03110 603-644-0888

Job Number: **50929**
Reviewed By: **ASR**
Date: **7-5-00**

DATE	CHECKED	REVISION
6/27/00	JPO	GENERAL REVISIONS, ADDED DETAIL 'E', ADDED DIMENSIONS.

**SECTIONS
and DETAILS**

DATE
6/7/2000

SCALE
AS SHOWN

PROJ. NO.
00195

DRAWING NUMBER

S1

VHB

Transportation
Land Development
Environmental Services

Kilton Road
Six Bedford Farms, Suite 607
Bedford, NH 03110-6532
603.644.0825
FAX 603.644.2385

Vanasse Hangen Brustlin, Inc.

TRANSMITTAL

Date: 6-19-00

VHB

Project No.: 50929

Re: South Burlington IM DECK 36 Bridge No. 68
and STP BIKE (28) S

To: Robert Suckert, PE, Resident Engineer
Vermont Agency of Transportation
209 South Pinnacle Ridge Road
Waterbury, VT 05676

The Following details as outlined below, Item No. 531.10 Description Bearing Device Assembly for the above project transmitted with your letter dated 6-5-00 have been reviewed and are being returned herewith:

We are sending you:

☒ Attached

☐ Under Separate cover via Regular Mail the following items:

☒ Shop drawings

☐ Prints

☐ Plans

☐ Diskettes

☒ Specifications

☐ Copy of Letter

☐ Change Order

☐ Other

Copies	Date	No.	Description
as noted below	6/5/00	3342	Item 531.10 Cosmec Preformed Fabric Pad Bearings
as noted below	6/5/00	3343	Item 531.10 Cosmec Rocker Bearings
as noted below			Item 531.10 Welding and Bonding Procedures

These are transmitted as checked below:

☐ Reviewed as required by the construction contract documents and approved, but only for conformance to the design concept of the work, and subject to further limitations and requirements contained in the construction contract documents.

☐ Rejected

☐ Revise and Resubmit

☒ Furnish as Corrected

REMARKS:

There shall be no fabrication done until all drawings and welding procedures are approved or approved as noted. You must provide written notice to the Vermont Agency of Transportation (VTrans) Structures Section office as to the date fabrication represented by these drawings will begin. That notice must be received at least seven days prior to that date, as per Specifications 506.03. Any material fabricated prior to the notification date is subject to rejection without further cause.

Copy to:

VTrans Resident Engineer, Robert E. Suckert, P.E. w/prints **

Contractor, J.A. McDonald, Inc. w/prints **

Subcontractor, Cosmec - letter only

VTrans Construction Section - letter only

VTrans Consultant Project Manager, Sherward Farnsworth, PE w/prints **

VTrans Materials & Research Section (C&IA Unit) – letter only

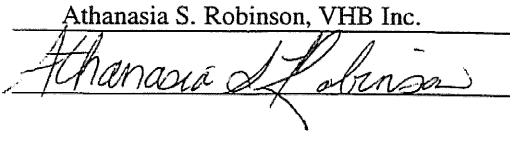
VTrans Structures Section – Shop Inspector – Jeff Clark w/ prints **

VHB Project Manager, Steve Johnson, PE, VHB Project File

** Attachments: One set of prints (and welding and/or bonding procedures).

By:

Athanasia S. Robinson, VHB Inc.



V.T. A.O.T.
IM Deck (36)

COSMEC, INC.
70 SOUTH STREET
WALPOLE, MA 02081
PH# 508-668-6600
FAX# 508-660-1022

EMS-QC-110
V.A.O.T.
RECEIVED
CK'D BY _____ CK'D BY JWC
JUN 13 2000
RESUBMIT _____ APPROVED ✓
BY _____ DATE 6-14-00

ENGINEERING AND MANUFACTURING STANDARD
PTFE FACING AND STEEL
OR PREFORMED FABRIC SUBSTRATE
SURFACE PREPARATION AND ADHESIVE PROCEDURE

RECEIVED
JUN 19 2000
VHB, Inc.

The PTFE facing shall be prepared for bonding to a substrate material by chemically etching the face to be bonded using the sodium ammonia process.

The mating surface of the substrate shall be prepared for bonding using a three-step process as follows:

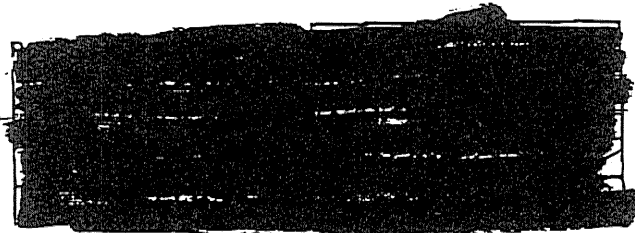
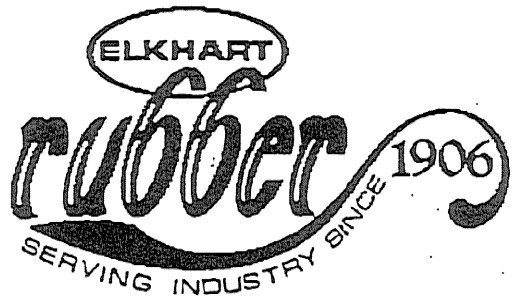
1. preliminary degrease using methyl ethyl ketone.
2. mechanically roughen to approx. 125 RMS and thoroughly brush and clean for final degreasing.
3. final degrease using methyl ethyl ketone

The PTFE and substrate mating surfaces shall be clean and dry with final degreasing performed within 30 minutes of bonding. Adhesive shall consist of a two-part epoxy adhesive system conforming to Military Specification MMM-A-134

The adhesive shall be applied to the full area of the contact surface in an even manner so as to establish a glue line not less than .002 inch nor more than .010 inch thick. Surfaces being bonded are to be assembled immediately with open assembly time not to exceed 20 minutes.

The PTFE material shall be greater in width and length than the substrate material by at least ½ inch when bonded. The PTFE shall be applied with contact starting at one edge and with contact progressing across entire bonded surface to eliminate air entrapment. The PTFE is to be in full contact with the steel or preformed fabric substrate. Curing of the bond shall be done under pressure of approx. 2-100 psi for 10-12 hours at approx. 70°F or other schedules as established by the manufacturer of the adhesive.

The PTFE shall be carefully trimmed to the same size as the substrate after bond curing and all bonds shall be visually inspected for bond retention.



VT. A.O.T.
PROJECT # 1M DECK 36
ITEM # 531.10

5/13/99

To: Naji @ Cosmec, Inc., Walpole, MA
From: Darren Spurgeon @ Elkhart Industries, High Point, NC
Re: Neoprene/Fabric Bearing Pads

RECEIVED
JUN 08 2000
VHB, Inc.

Dear Naji,

In regards to the process of making our bearing pads, I hope this information will be of service.

Elkhart Industries' "Yellow" Preformed fabric pads are constructed of alternating layers of AASHTO-spec Neoprene and heavy weight cotton duck fabric. They are built up from pre-forms of both materials. The pads are inserted into a steam press once the correct number of layers are added. Once inserted into our steam press, using a combination of 2,100 PSI and varying combinations of steam and time, these pads are cured into the final product. We are able to maintain exacting tolerances on the thickness by using different sizes and thicknesses of metal forms to stop the press from squeezing the material too tightly together. Once the material air-cools, the pieces are trimmed to the desired size and shipped.

Elkhart Industries' bearing pads meet both AASHTO 18.10.2, and 18.4.10.1, Div. II and Mil-C-882-B specifications, and certificates of conformance and test results are provided with each shipment if needed.

The total number of fabric ply will vary with the thickness of the finished pads. The number of ply will determine the final stiffness and hardness of the product. The relative stiffness of the finished pad is exponentially proportional to the number of plies. Thus a hypothetical 1/2" thick pad with 35 plies cannot be converted to a 1" thick pad with 70 plies. This would make the pad much too stiff. In other words, the thicker the pad, the fewer number of plies per inch.

05/13/1999 11:09 ELKHART RUBBER + 15025601022 NO.039 002



VT. A.O.T.
PROJECT # 1M DELK 36
ITEM # 531.10

In regards to your specific request, the 1-1/2" thick pads requested will contain 96 plies of cotton duck.

I hope this helps you and provides the necessary information. Unfortunately, the temperature and time needed to cure the sheets is proprietary information, and I am not free to disclose this information. If you require any further information on this subject, please contact me at (800)222-5678. I look forward to your call.

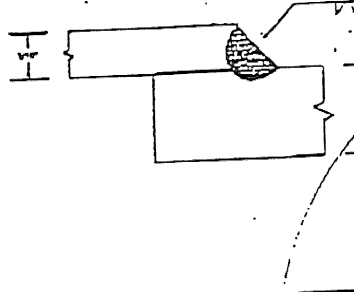
Best regards,

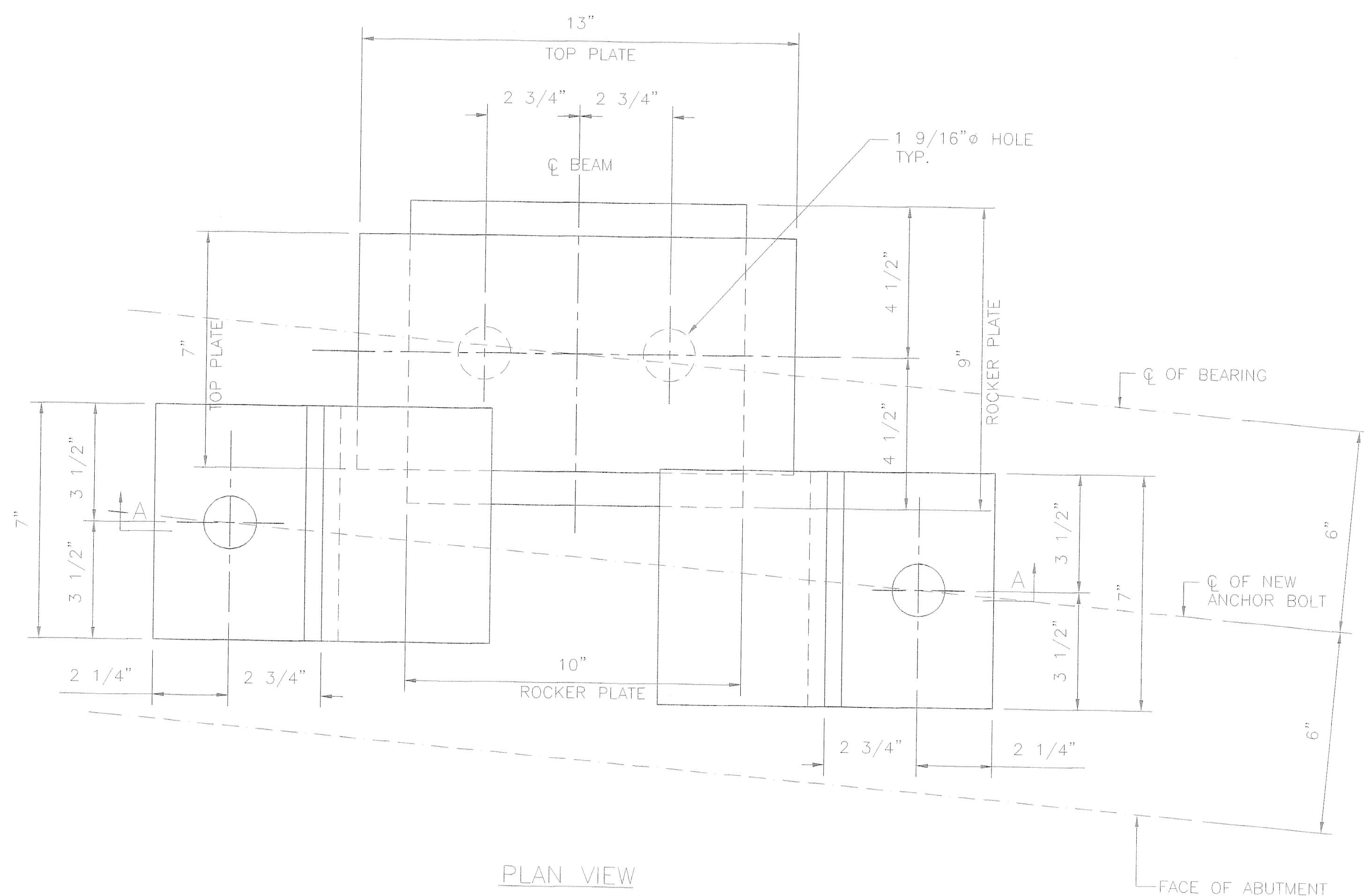
Darren Spurgeon
Darren Spurgeon
Sales Coordinator

cc: Jim Gregory

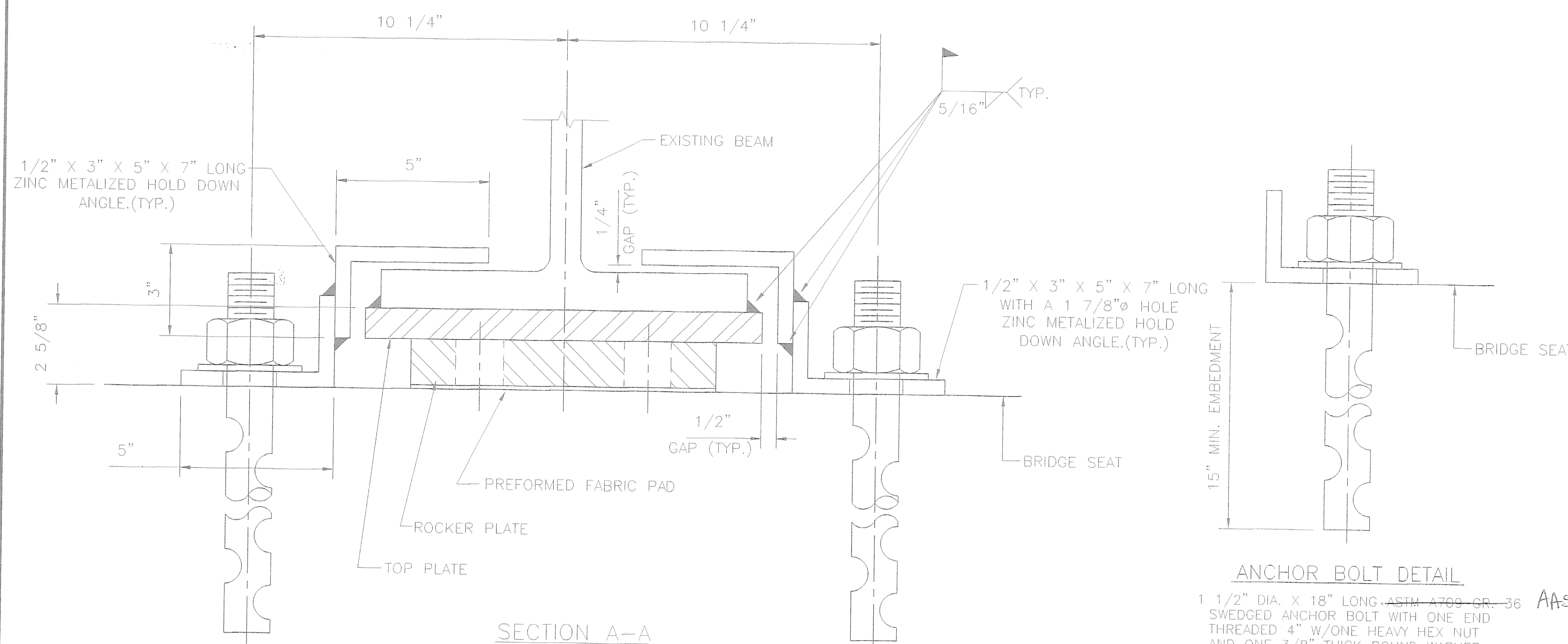
V.A.O.T.
RECEIVED
CND BY _____ OK'D BY *JWC*
JUN 13 2000
RESUBMIT _____ APPROVED *✓*
BY _____ DATE *6-14-00*

Page 1 of 1

WPS No. GTAW F1-REV. 6 Authorized By William Burthe Supporting PQR(s) 9S-101WB-F		Date 11/1/98 By Peter Crosby Date 11/1/98 Revised 6 Prequalified ☐		Type Manual ☐ Machine ☐ Semi-Auto ☐ Auto ☐																	
Welding Process(es) GTAW Supporting PQR(s) 9S-101WB-F		Joint Detail 																			
JOINT Type Lap Joint Basking Yes ☐ No ☐ Single Weld ☐ Double Weld ☐ Basking Material N/A Root Opening N/A Root Face Dimension N/A Groove Angle N/A Radius (A-J) N/A Back Gauge Yes ☐ No ☒ Method N/A		POSITION Position of Groove _____ Filler _____ Flat _____ Vertical Progression: ☐ Up ☐ Down																			
EASE METALS Material Spec. ASTM A240 to ASTM A338 Type or Grade 304 to 307 Thickness: Groove (in) _____ Filler (in) 1/32 Diameter (Pipe, in) _____		ELECTRICAL CHARACTERISTICS Transfer Mode (GMAW): Short-Circuiting ☐ Globular ☐ Spray ☐ Current: AC ☐ DCEP ☐ DCEN ☐ Pulsed ☐ Other _____ Tungsten Electrode (GTAW): Size 3/32 Type EWTh2																			
FILLER METALS AWS Specification A5.8 Harris-Welco AWS Classification ER209L Harris-Welco		TECHNIQUE Stringer or Weave Bead Stringer _____ Multi-pass or Single Pass (per side) Single _____ Number of Electrodes 1 _____ Electrode Spacing: Longitudinal _____ Lateral _____ Angle _____ Contact Tube to Work Distance 3/8 _____ Penetration NOT ALLOWED _____ Interpass Cleaning N/A _____ POSTWELD HEAT TREATMENT PWHT Required ☐ Temp. N/A _____ Time N/A _____																			
SHIELDING Gas Argon N/A Composition 100% Electrode-Flux (Class) _____ Flow Rate 45 CFH N/A Gas Cup Size 3/8" (6)		PREHEAT Preheat Temp., Min. 80 F Thickness Up to 3/4" Temperature _____ Over 3/4" to 1-1/2" _____ Over 1-1/2" to 2-1/2" _____ Over 2-1/2" _____ Interpass Temp., Min. N/A Max. N/A																			
WELDING PROCEDURE																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1</td> <td>GTAW</td> <td>ER209L</td> <td>3/32</td> <td>DCEN</td> <td>150</td> <td>23</td> <td>611/18</td> </tr> <tr> <td colspan="8" style="text-align: center;"> RECEIVED FOR PA TOLUPE APPROVED APRIL 23 2000 6-11-00 </td> </tr> </table>						1	GTAW	ER209L	3/32	DCEN	150	23	611/18	RECEIVED FOR PA TOLUPE APPROVED APRIL 23 2000 6-11-00							
1	GTAW	ER209L	3/32	DCEN	150	23	611/18														
RECEIVED FOR PA TOLUPE APPROVED APRIL 23 2000 6-11-00																					



PLAN VIEW
EXPANSION BEARING
LOCATION: ABUTMENT 1, BEAM LINE 14
QUANTITY: 1

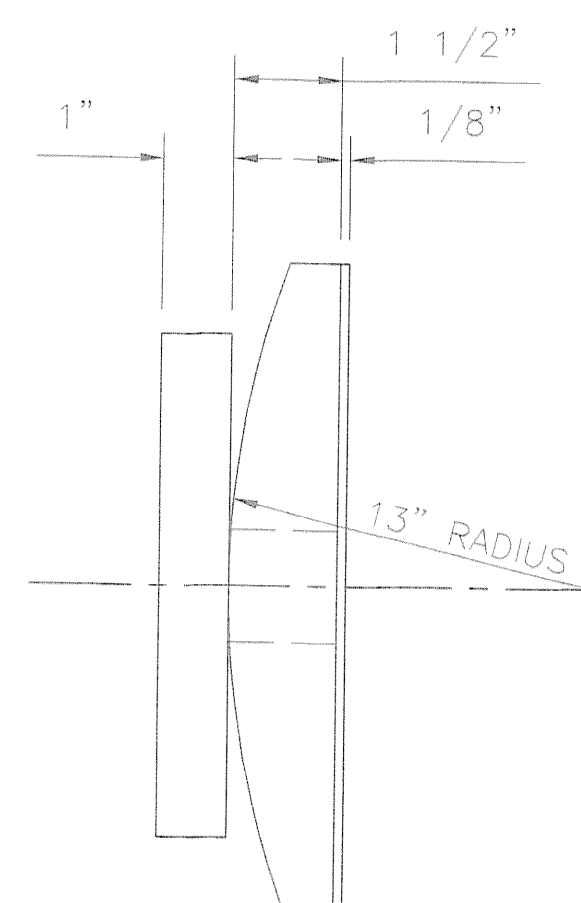


SECTION A-A

ANCHOR BOLT DETAIL

1 1/2" DIA. X 18" LONG - ASTM A709 GR. 36
SWEDGED ANCHOR BOLT WITH ONE END
THREADED 4" W/ ONE HEAVY HEX NUT
AND ONE 3/8" THICK ROUND WASHER
W/ 1 5/8" Ø HOLE - ALL GALVANIZED

NUTS SHALL BE PLACED
FINGER TIGHT AND ANCHOR BOLT
THREADS BURRED TO PREVENT
REMOVAL OF NUT (TYP.)



ELEVATION

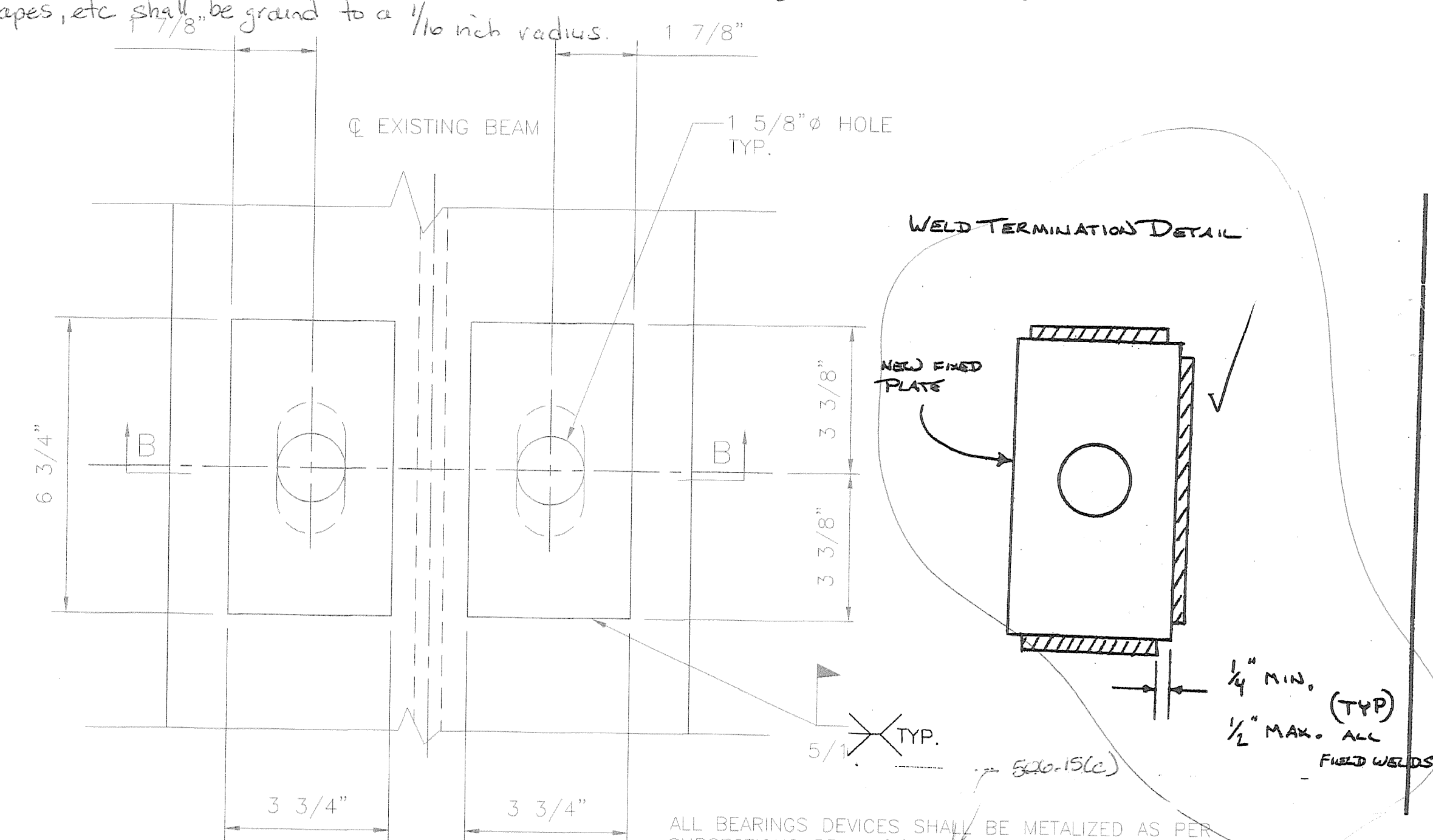
- Contractor responsible to verify dimensions of existing plates before ordering new plates.
- Shim Plates, if required shall be galvanized or metalized.

BEARING NOTES

1. ALL MATERIALS USED IN THE FABRICATION OF THESE BEARINGS SHALL BE MADE IN THE U.S.A.
2. BEARINGS ARE TO BE SHIPPED AS COMPLETE UNITS, STEEL BANDED, AND SHALL BE WRAPPED TO PROTECT FROM MOISTURE AND DIRT DURING TRANSIT AND STORAGE.
3. LOCATION OF FABRICATION PLANT - 70 SOUTH STREET, WALPOLE, MA 02081
4. COSMEC, INC. REPRESENTATIVE - MR. WILLIAM BURHOE (508) 668-6600
5. AT NO TIME MAY ANY BEARINGS BE DISASSEMBLED WITHOUT AUTHORIZATION FROM COSMEC, INC.
6. BEARINGS SHALL BE STORED IN A CLEAN, DRY, LEVEL UPRIGHT POSITION.
7. Prior to galvanizing or metalizing, all corners and edges of steel plates, shapes, etc. shall be ground to a 1/16 inch radius.

MATERIALS

STEEL - AASHTO M-183 GRADE 36 (ASTM A709 GR. 36) ZINC METALIZED AND SEALED WITH AN APPROVED SEALANT.
STAINLESS STEEL - ASTM A240 TYPE 304, (20 RMS) FINISH
PREFORMED FABRIC PAD - AASHTO DIV. II SPEC. 18.4.10.1
PTFE - ASTM D1457 (UNFILLED) and requirements 731.04 of Vermont Standard Spec.
ANCHOR BOLTS, NUTS & WASHERS - SEE DETAIL
Nuts - Heavy Hex Nut ASTM A307
Washers - AASHTO M183



ALL BEARINGS DEVICES SHALL BE METALIZED AS PER SUBSECTIONS 531.04(b) OR 516.16(a) & (b). BEARINGS SHALL BE SEALED WITH AN APPROVED SEALER AS SPECIFIED IN STANDARD SPEC. SUBSECTION 506.15(b). AREAS OF METALIZING DAMAGED BY FIELD WELDING OR HANDLING SHALL BE PAINTED WITH AN APPROVED SEALANT IN ACCORDANCE WITH STANDARD SPEC. SUBSECTION 708.02(d).

PLAN VIEW

MODIFY EXISTING EXPANSION BEARING TO FIXED BEARING
LOCATION: ABUTMENT 1, BEAM LINE 1 THRU 13
QUANTITY: 13

NEW NUTS SHALL BE PLACED
FINGER TIGHT AND ANCHOR BOLT
THREADS BURRED TO PREVENT
REMOVAL OF NUT (TYP.)

NEW NUT AND 3/8" THICK ROUND
WASHER W/ 1 5/8" Ø HOLE
(GALV.) ON EXISTING BOLT

NEW FIXED PLATE (GALV.)
1 1/2" X 3 3/4" X 6 3/4"

EXISTING BEAM
TO REMAIN

EXISTING BEARING
TO REMAIN

EXISTING 1 1/4" Ø
ANCHOR BOLTS TO REMAIN

SECTION B-B

SHOP DRAWING REVIEW

- ☐ REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.
- ☐ REJECTED ☐ REVISE AND RESUBMIT ☒ FURNISH AS CORRECTED

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWING DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING HIS WORK WITH THAT OF ALL OTHER TRADES, AND PERFORMING HIS WORK IN A SAFE AND SATISFACTORY MANNER.

VHB Vanessa Hanger Brustlin, Inc.
Engineers, Planners, and Scientists
Six Bedford Farms, 4000 Rd.
Bedford, NH 02822 603 844 0808

Job Number: 50929
Reviewed By: ASP
Date: 6-19-00

STATE OF VERMONT AGENCY OF TRANSPORTATION

U.S. 2 OVER I-89
TOWN OF SOUTH BURLINGTON
PROJECT NO. IM DECK (36)

ITEM NO. 531.10
BRIDGE NO.68

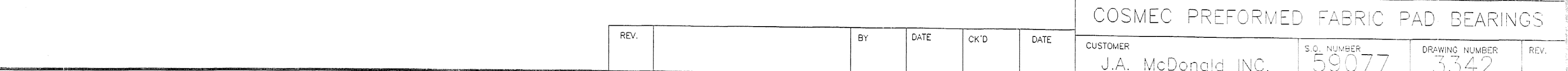
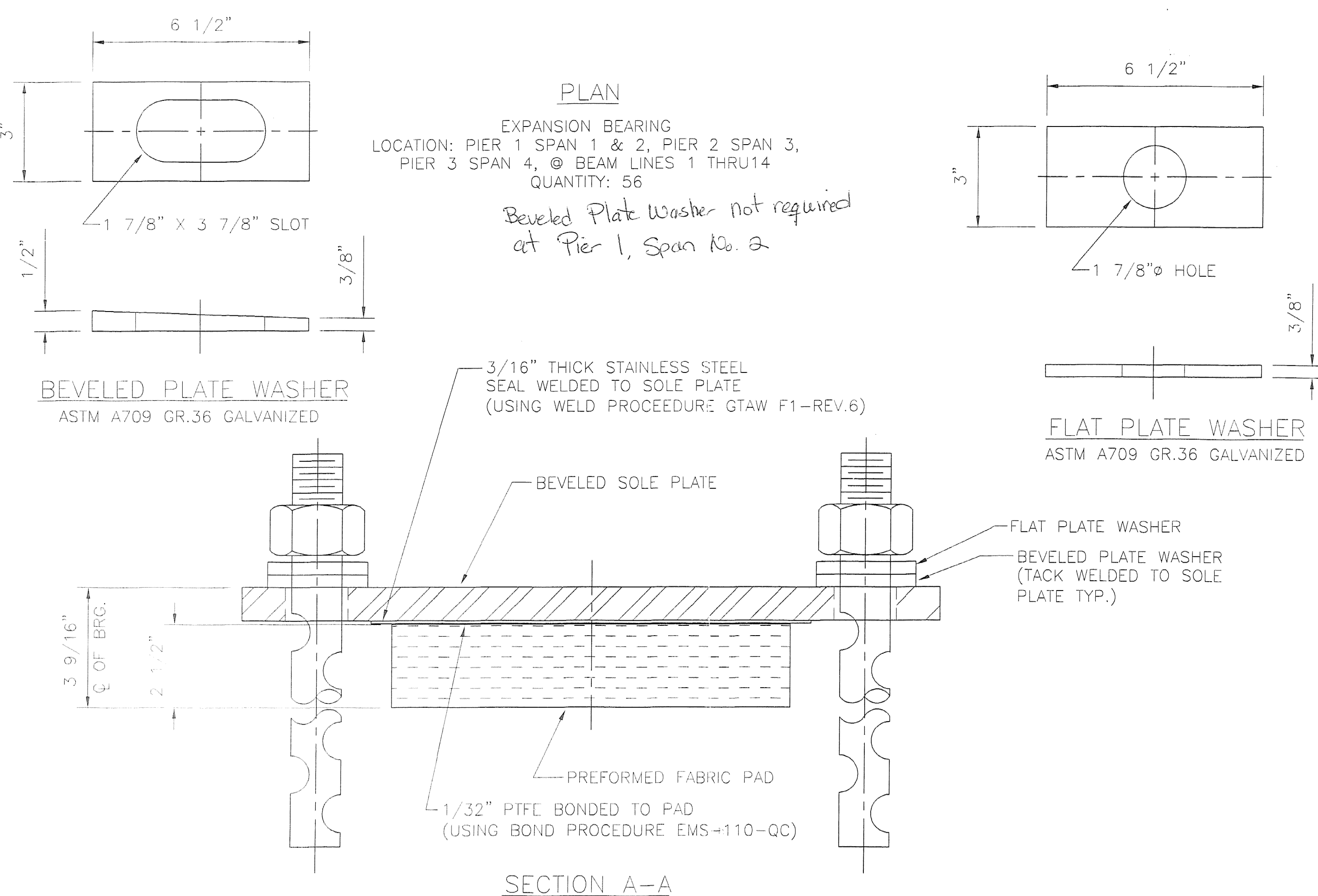
COSMEC, INC.

70 SOUTH STREET
WALPOLE, MA 02081

SCALE: 3/8" = 1" DRAWN BY: R.F.C. CHECKED BY: M.C.M.
DATE: 5/30/00 DATE: 6/5/00

COSMEC ROCKER BEARINGS

CUSTOMER: J.A. McDonald INC. S.O. NUMBER: 59077 DRAWING NUMBER: 3343 REV.





Vanasse Hangen Brustlin, Inc.

TRANSMITTAL

Transportation
Land Development
Environmental Services

Kilton Road
Six Bedford Farms, Suite 607
Bedford, NH 03110-6532
603.644.0888
FAX: 603.644.2385

To: Robert Suckert, PE, Resident Engineer
Vermont Agency of Transportation
209 South Pinnacle Ridge Road
Waterbury, VT 05676

Date: March 27, 2001

VHB
Project No.: 50929

Re: South Burlington IM DECK 36 Bridge No. 68
and STP BIKE (28) S

The Following details as outlined below, Item No. 506.60 Description Structural Steel for the above project transmitted with your letter dated 1/25/01 have been reviewed and are being returned herewith:

We are sending you: ☒ Attached ☐ Under Separate cover via Regular Mail the following items:

☒ Shop drawings ☐ Prints ☐ Plans ☐ Diskettes ☐ Specifications ☐ Copy of Letter ☐ Change Order

Copies	Date	No.	Description
as noted below	1/25/01		Revised Shop Drawings for New Diaphragms

These are transmitted as checked below:

☐ Reviewed as required by the construction contract documents and approved, but only for conformance to the design concept of the work, and subject to further limitations and requirements contained in the construction contract documents. ☐ Rejected ☐ Revise and Resubmit ☒ Furnish as Corrected

REMARKS: Shop drawing review completed after field confirmation of the final diaphragm location
from Bob Suckert on March 19, 2001

Copy to: Contractor, J.A. McDonald, Inc. - w/attach.
Subcontractor - Casco Bay- Letter Only
VTrans Resident Engineer, Robert E. Suckert, -w/ attach.
VTrans Consultant Project Manager, Sherward Farnsworth, PE -
letter w/attach.
VTrans-Shop Inspector-Jeff Clark - Letter only
VTrans - Materials & Research- Letter only
VTrans- Construction Section- Letter only

Athanasia S. Robinson
Athanasia S. Robinson

LETTER OF TRANSMITTAL

TO WAMPASS HANCOCK DISTRICT, INC.
SIX BEDFORD FARMS, KUTEN ROAD
BEDFORD, NH 05110-6532

DATE: JANUARY 25 1968	JOB NO. 50929
ATTENTION: STATE TOWN	
RE: SOUTH RIVERVIEW TOWNSHIP, N. BRIDGE No. 68 & ST. BRIDGE (CB) S	

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☒ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION	RECEIVED BY
220	1/25/61		NEW DIAPHRAGMS	1581 X 6 1000
				VHS, INC.

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

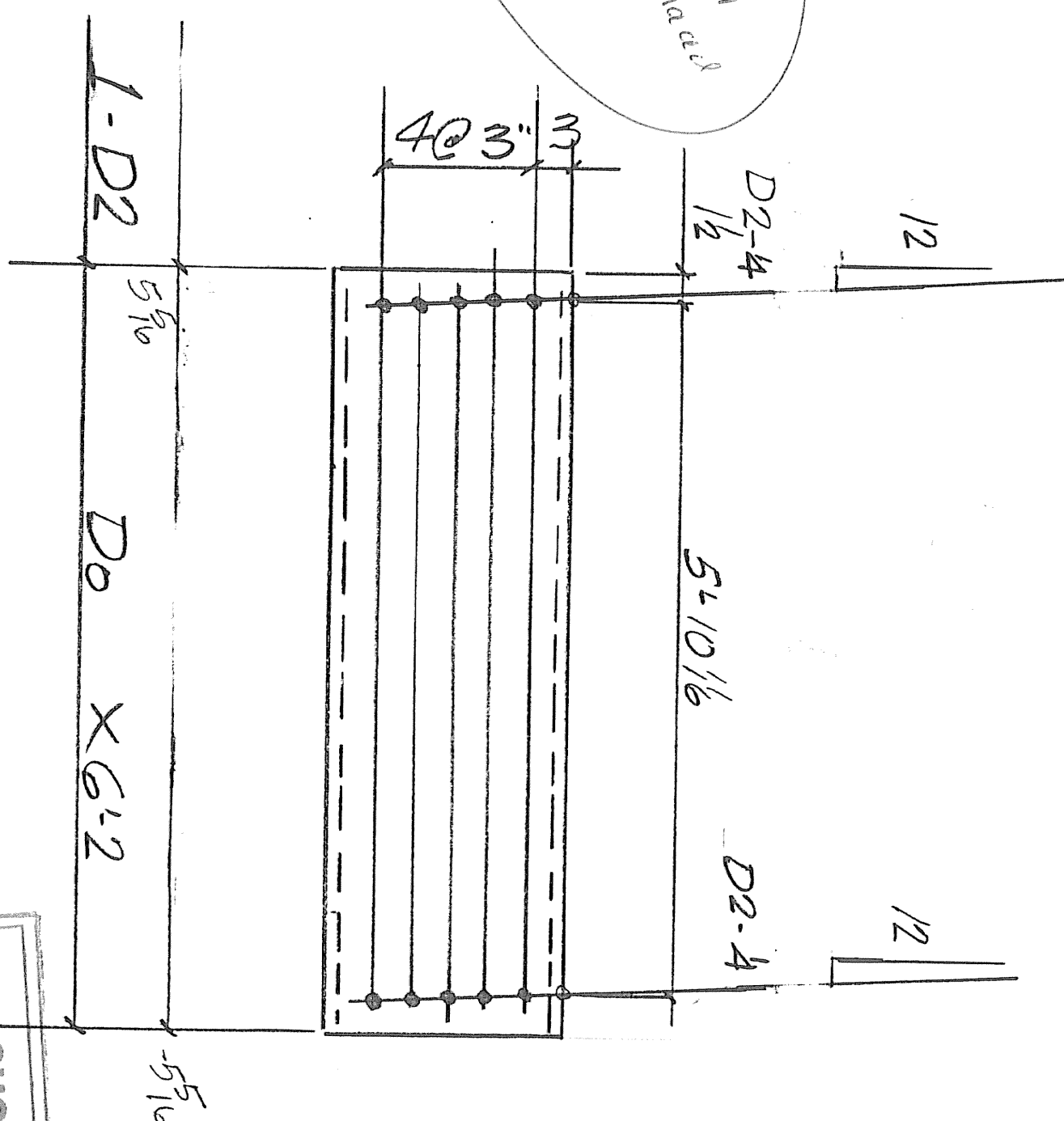
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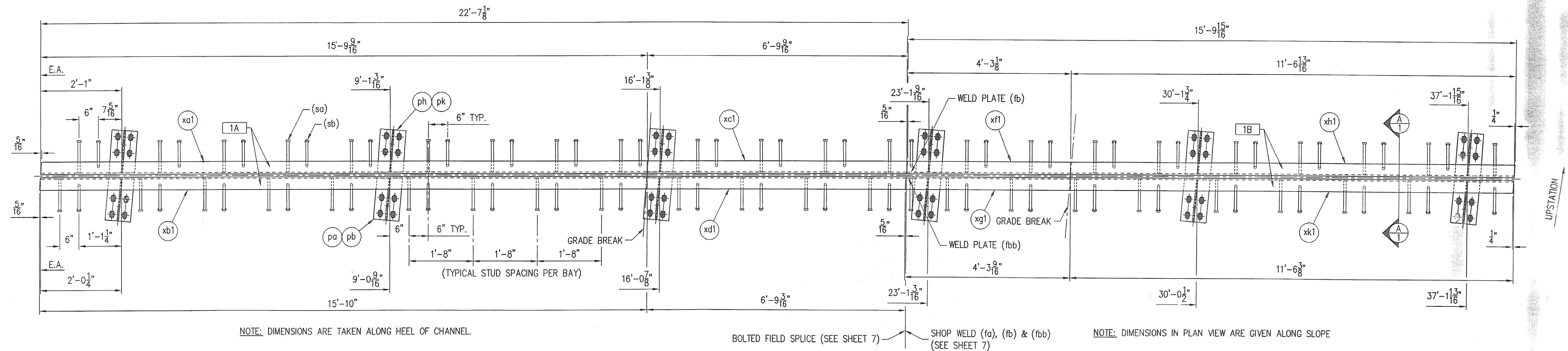
COPY TO _____

SIGNED: M. Brubaker

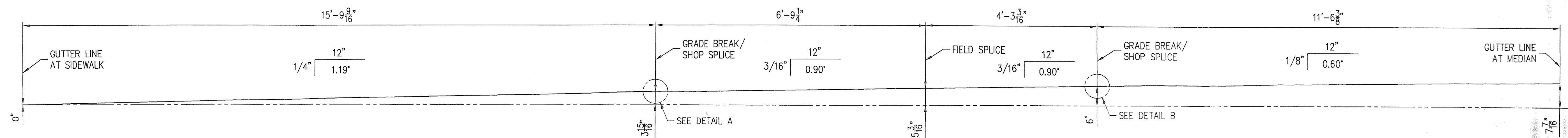
If enclosures are not as noted, kindly notify us at once.

only one disapproval is to be recorded

[illegible][illegible][illegible]



PLAN VIEW - EXPANSION JOINT
(PIER 1 - WESTBOUND)



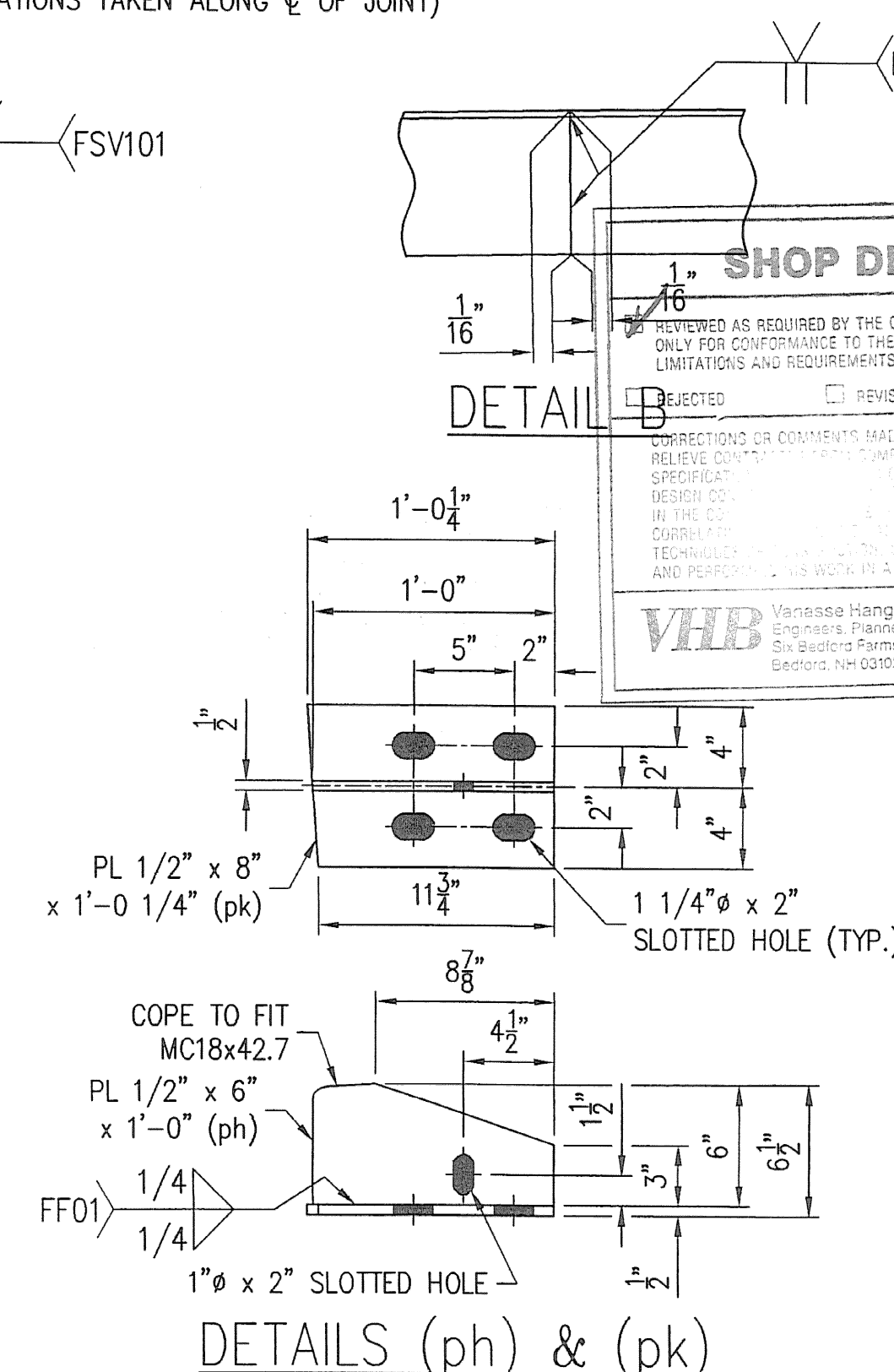
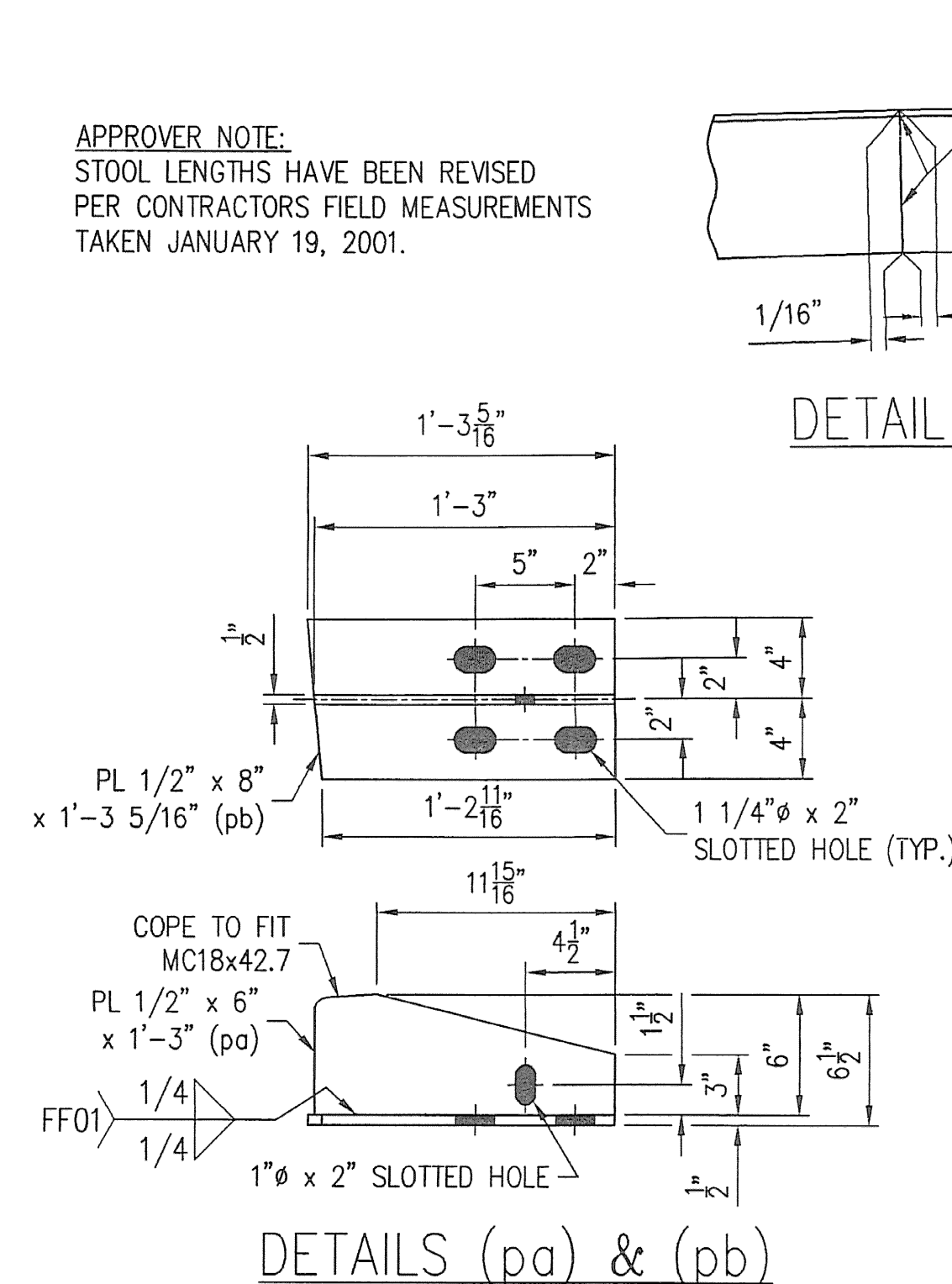
ELEVATION VIEW
(ELEVATIONS TAKEN ALONG C OF JOINT)

SEE SHEET 7 FOR GENERAL NOTES

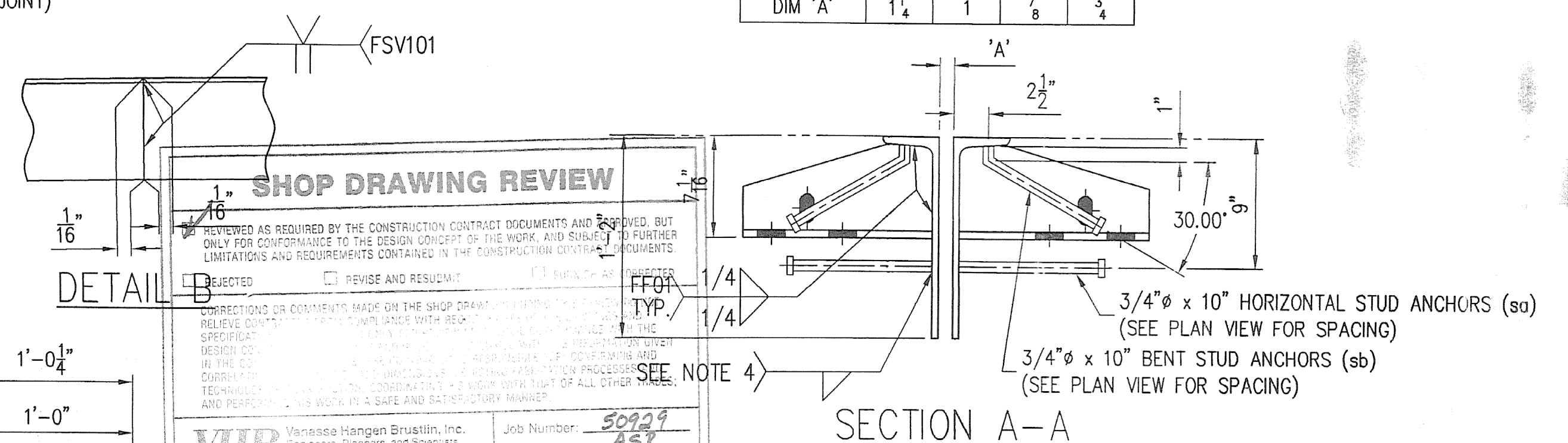
LINE NO.	DESCRIPTION	LENGTH	MK	REMARKS	WGHT.
1	EXPANSION JOINT ASS'Y		1A	HDC	
2	MC18x42.7	15'-9 9/16"	xa1	REMOVE FLANGE	11-8
3	MC18x42.7	15'-10"	xb1	REMOVE FLANGE	11-8
4	MC18x42.7	6'-9 9/16"	xc1	REMOVE FLANGE	11-8
5	MC18x42.7	6'-9 9/16"	xd1	REMOVE FLANGE	11-8
6	PL 1/2" x 6"	1'-3"	pa	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
7	PL 1/2" x 8"	1'-3 5/16"	pb	SHAPE CUT	19-16
8	PL 1/2" x 6"	1'-0"	ph	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
9	PL 1/2" x 8"	1'-0 1/4"	pk	SHAPE CUT	19-16
10	WS 3/4" x 10"		sa		29-19
11	WS 3/4" x 10"		sb	25 / BEND	29-19
12					
13					
14					
15	EXPANSION JOINT ASS'Y		1B	HDC	
16	MC18x42.7	4'-3 1/8"	xf1	REMOVE FLANGE	11-8
17	MC18x42.7	4'-3 1/8"	xg1	REMOVE FLANGE	11-8
18	MC18x42.7	11'-6 13/16"	xh1	REMOVE FLANGE	11-8
19	MC18x42.7	11'-6 3/8"	xk1	REMOVE FLANGE	11-8
20	PL 1/2" x 6"	1'-3"	pa	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
21	PL 1/2" x 8"	1'-3 5/16"	pb	SHAPE CUT	19-16
22	PL 1/2" x 6"	1'-0"	ph	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
23	PL 1/2" x 8"	1'-0 1/4"	pk	SHAPE CUT	19-16
24	WS 3/4" x 10"		sa		29-19
25	WS 3/4" x 10"		sb	18 / BEND	29-19
26	FB 1/4" x 2"	0'-2"	fa		16-29
27	FB 1/4" x 4"	1'-0"	fb		16-36
28	FB 1/4" x 4"	1'-0"	fb		16-36
29					
30					
31					
32					
33					

CONTRACTOR NOTE:
ALL SURFACES OF STEEL DECK JOINTS WHICH ARE TO HAVE CONCRETE PLACED AGAINST THEM, SHALL BE COATED WITH EPOXY BONDING COMPOUND. EPOXY BONDING COMPOUND TO BE PROVIDED BY THE CONTRACTOR.

APPROVER NOTE:
STOOL LENGTHS HAVE BEEN REVISED PER CONTRACTORS FIELD MEASUREMENTS TAKEN JANUARY 19, 2001.



TEMPERATURE ADJUSTING CHART - PIER 1				
TEMPERATURE	45°	60°	75°	90°
DIM 'A'	1 1/4"	1"	7/8"	3/4"



SHOP DRAWING REVIEW

REVIEWED BY: [Signature]

DATE: 8/26/01

Job Number: 50929

Reviewed By: ASK

Date: 8/26/01

GENERAL REVISION PER APPROVAL.

REV.	DESCRIPTION	DATE	INT.
1	GENERAL REVISION PER APPROVAL.	1/22/01	SLB

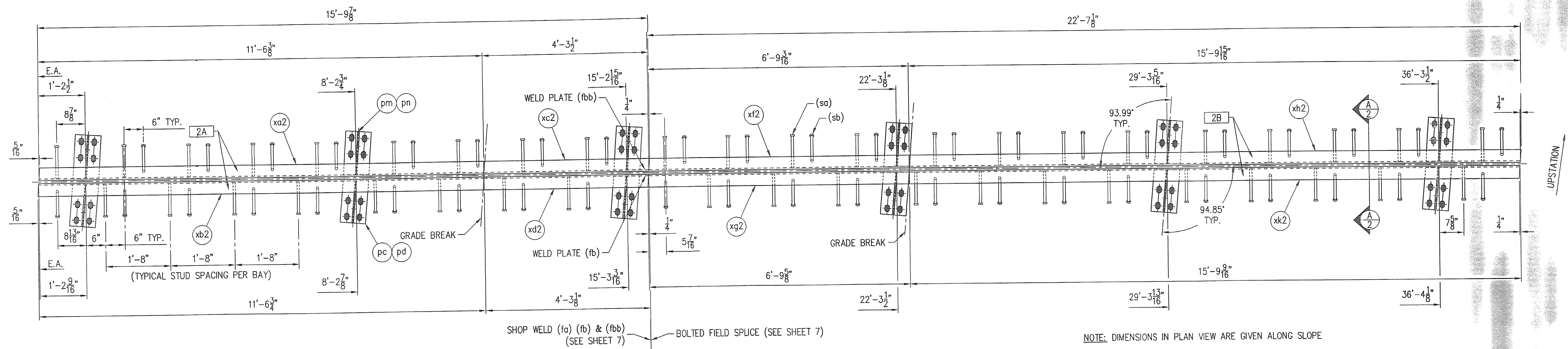
ANY AND ALL BACKCHARGES WILL BE REJECTED UNLESS WRITTEN CONSENT IS GIVEN BY LEWIS ENGINEERING COMPANY PRIOR TO ANY WORK PERFORMED FOR OUR ACCOUNT. SUCH REJECTION MEANS THAT INVOICES WILL NOT BE HONORED OR DEDUCTIONS FROM PAYMENT WILL BE CHARGED BACK.

LEWIS ENGINEERING COMPANY
4201 NOREX DRIVE - CHASKA, MINNESOTA 55318 - (612) 368-3000

PROJECT: BRIDGE NO. 68 SOUTH BURLINGTON U.S. 2 OVER I-93
STATE PROJECT: IM DECK (36)
FEDERAL PROJECT: -
CUSTOMER: J A McDONALD
LOCATION: CHITTENDEN COUNTY, VERMONT
DESCRIPTION: EXPANSION JOINT DETAILS WESTBOUND AT PIER 1

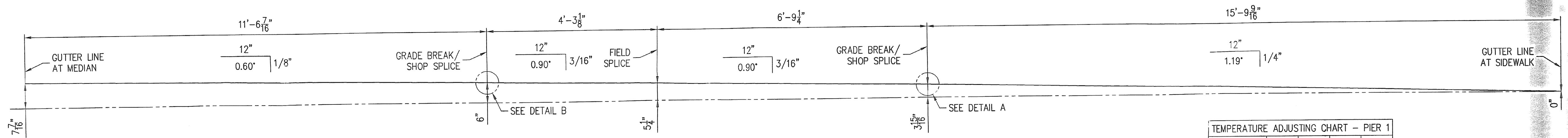
W.P. chkd JDC
Drawn By: SLB
Chkd By: AJC
Date: 11/21/01

SHEET NO. 1 OF 8 Job No.: 978.1049.1



NOTE: DIMENSIONS ARE TAKEN ALONG HEEL OF CHANNEL.

PLAN VIEW - EXPANSION JOINT
(PIER 1 - EASTBOUND)



TEMPERATURE ADJUSTING CHART - PIER 1				
TEMPERATURE	45°	60°	75°	90°
DIM 'A'	1 1/4	1	7/8	3/4

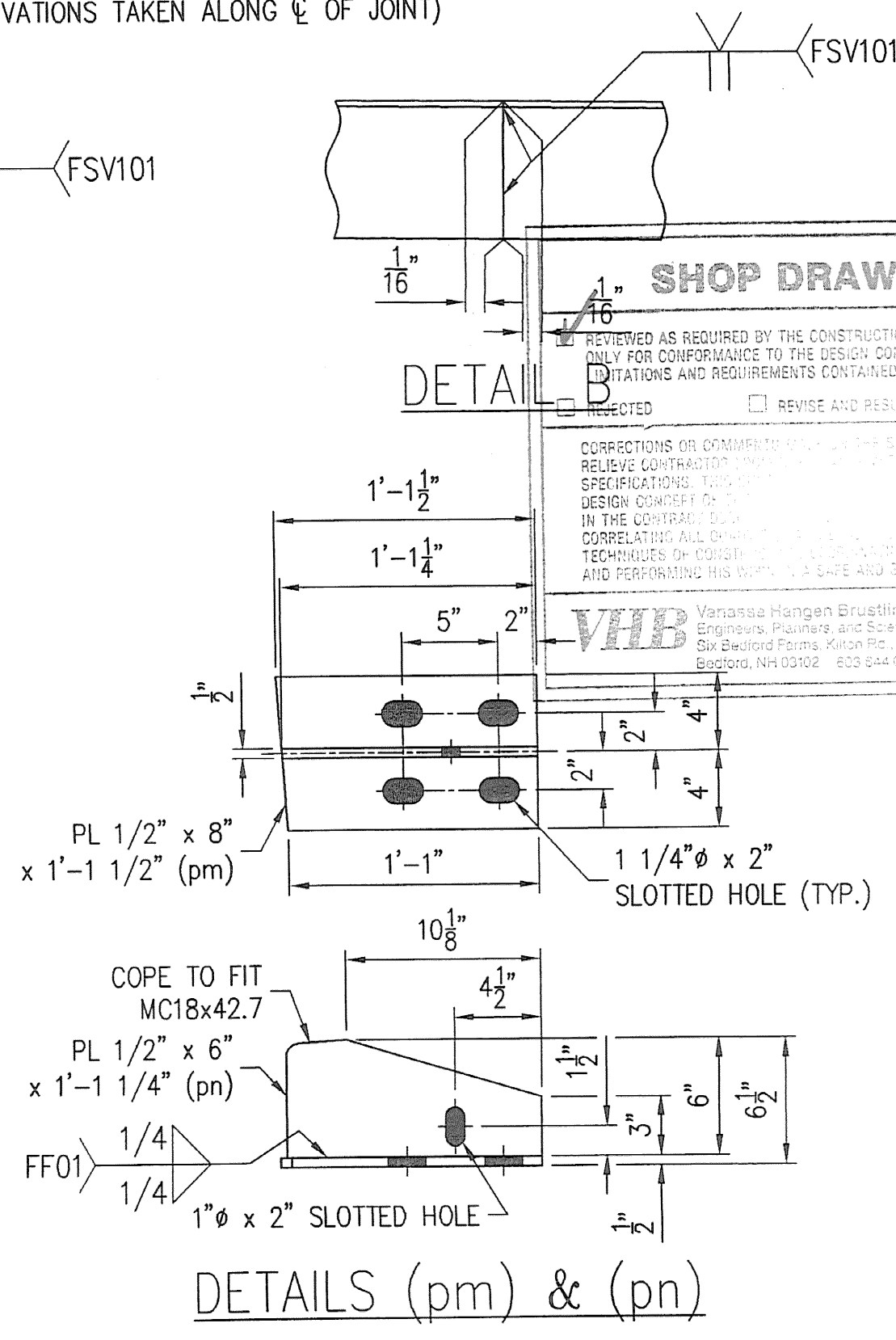
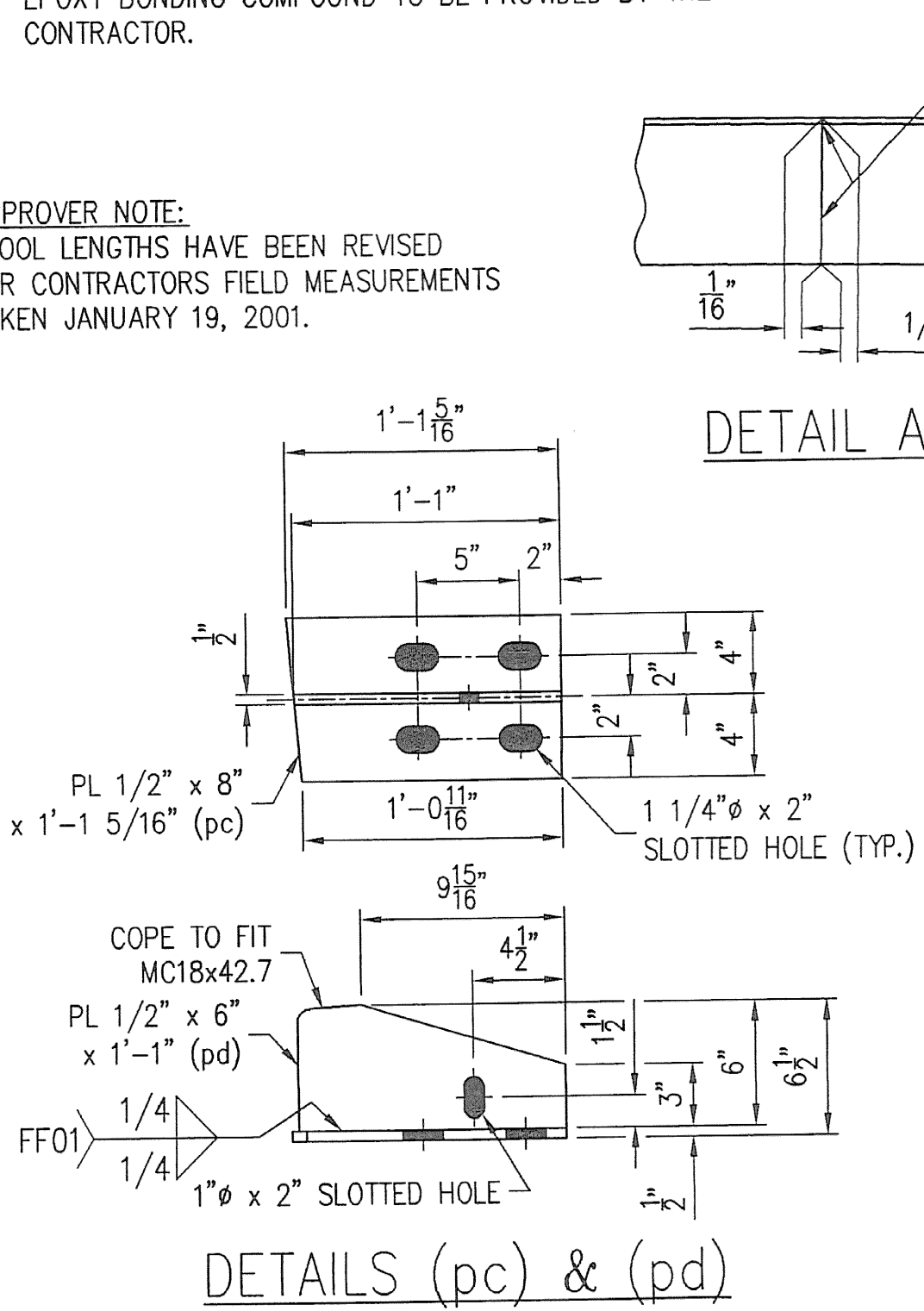
SEE SHEET 7 FOR GENERAL NOTES

LINE	NO.	DESCRIPTION	LENGTH	MK	REMARKS	WGHT.
1	1	EXPANSION JOINT ASS'Y		2A	HDG	
2	1	MC18x42.7	11'-6 3/8"	xa2	REMOVE FLANGE	11-8
3	1	MC18x42.7	11'-6 3/8"	xb2	REMOVE FLANGE	11-8
4	1	MC18x42.7	4'-3 1/2"	xc2	REMOVE FLANGE	11-8
5	1	MC18x42.7	4'-3 1/2"	xd2	REMOVE FLANGE	11-8
6	3	PL 1/2 x 8	1'-1 1/8"	pc	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
7	3	PL 1/2 x 6	1'-1 1/8"	pd	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
8	3	PL 1/2 x 8	1'-1 1/8"	pm	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
9	3	PL 1/2 x 6	1'-1 1/8"	pn	SHAPE CUT	19-16
10	18	WS 3/4 x 10		sa	17 / BEND	29-19
11	18	WS 3/4 x 10		sb	17 / BEND	29-19
12	2	FB 1/4 x 2	0'-2	fa		16-29
13	1	FB 1/4 x 4	1'-0	fb		16-36
14	1	FB 1/4 x 4	1'-0	fbb		16-36
15						
16						
17	1	EXPANSION JOINT ASS'Y		2B	HDG	
18	1	MC18x42.7	6'-9 3/8"	xf2	REMOVE FLANGE	11-8
19	1	MC18x42.7	6'-9 3/8"	xg2	REMOVE FLANGE	11-8
20	1	MC18x42.7	15'-9 15/16"	xh2	REMOVE FLANGE	11-8
21	1	MC18x42.7	15'-9 15/16"	xk2	REMOVE FLANGE	11-8
22	3	PL 1/2 x 8	1'-1 1/8"	pc	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
23	3	PL 1/2 x 6	1'-1 1/8"	pd	SHAPE CUT	19-16
24	3	PL 1/2 x 8	1'-1 1/8"	pm	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
25	3	PL 1/2 x 6	1'-1 1/8"	pn	SHAPE CUT	19-16
26	26	WS 3/4 x 10		sa	25	29-19
27	27	WS 3/4 x 10		sb	26 / BEND	29-19
28						
29						
30						
31						
32						
33						

CONTRACTOR NOTE:
ALL SURFACES OF STEEL DECK JOINTS WHICH ARE TO HAVE CONCRETE PLACED AGAINST THEM, SHALL BE COATED WITH EPOXY BONDING COMPOUND. EPOXY BONDING COMPOUND TO BE PROVIDED BY THE CONTRACTOR.

APPROVER NOTE:
STOOL LENGTHS HAVE BEEN REVISED PER CONTRACTORS FIELD MEASUREMENTS TAKEN JANUARY 19, 2001.

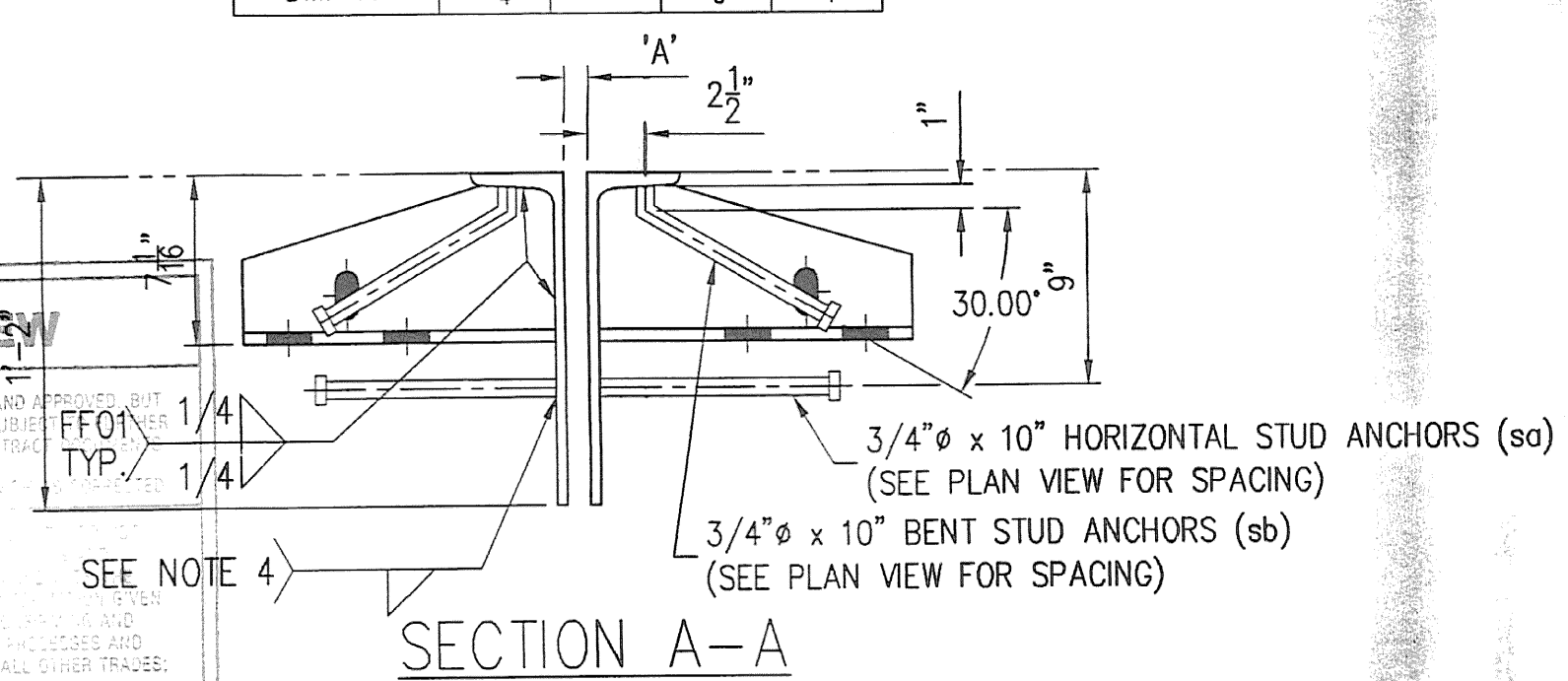
ELEVATION VIEW
(ELEVATIONS TAKEN ALONG C OF JOINT)



SHOP DRAWING REVIEW

REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED FOR THE PROJECT BY THE DESIGN ENGINEER. THIS REVIEW IS LIMITED TO THE DESIGN CONCEPT OF THE WORK AND DOES NOT CONSTITUTE A GUARANTEE OF THE ACCURACY OF THE INFORMATION PROVIDED OR THE QUALITY OF THE WORKMANSHIP. THE REVIEWER ASSUMES NO LIABILITY FOR THE WORKMANSHIP OF THE CONTRACTOR OR THE QUALITY OF THE MATERIALS USED IN THE WORK.

DESIGNED BY: [Signature]
CHECKED BY: [Signature]
DATE: 2/24/01



GENERAL REVISION PER APPROVAL.

REV.	DESCRIPTION	DATE	BY
1	GENERAL REVISION PER APPROVAL.	1/22/01	SLJ

ANY AND ALL BACKCHARGES WILL BE REJECTED UNLESS WRITTEN CONSENT IS GIVEN BY LEWIS ENGINEERING COMPANY PRIOR TO ANY WORK PERFORMED FOR OUR ACCOUNT. SUCH REJECTION MEANS THAT INVOICES WILL NOT BE HONORED OR DEDUCTIONS FROM PAYMENT WILL BE CHARGED BACK.

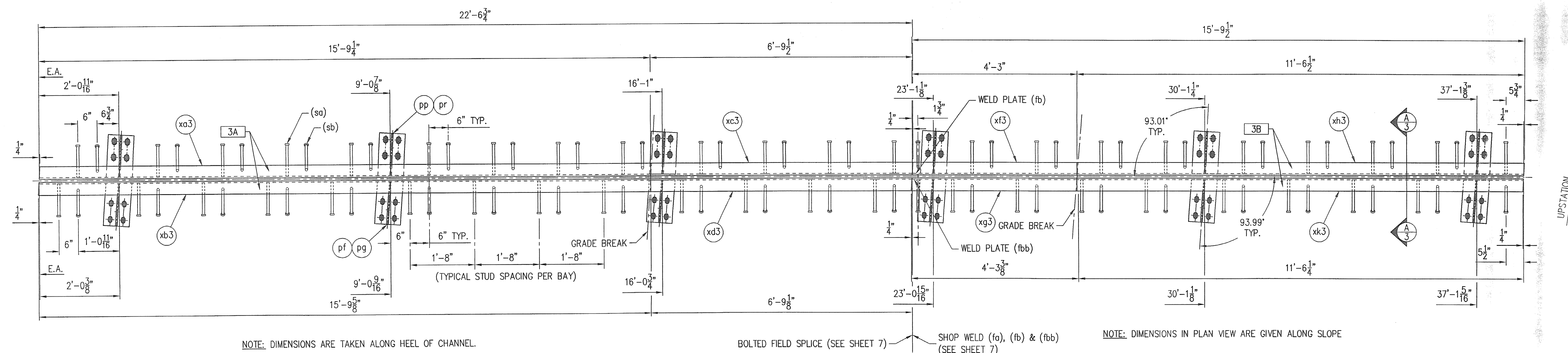
LEWIS ENGINEERING COMPANY
4201 NOREX DRIVE - CHASKA, MINNESOTA 55318 - (612) 368-3000

PROJECT - BRIDGE NO. 68 SOUTH BURLINGTON U.S. 2 OVER I-89
STATE PROJECT - IM DECK (36)
FEDERAL PROJECT -
CUSTOMER - J A McDONALD
LOCATION - CHITTENDEN COUNTY, VERMONT
DESCRIPTION - EXPANSION JOINT DETAILS EASTBOUND AT PIER 1

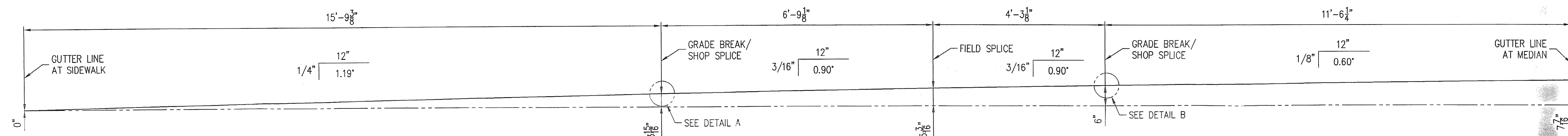
W.P. chkd By SLJ
Date: 11/21/00

FOR DATE
PRINTS ISSUED

SHEET NO. 2 OF 8 Job. No. : 978.1049.1



PLAN VIEW - EXPANSION JOINT
(PIER 2 - WESTBOUND)



ELEVATION VIEW
(ELEVATIONS TAKEN ALONG C OF JOINT)

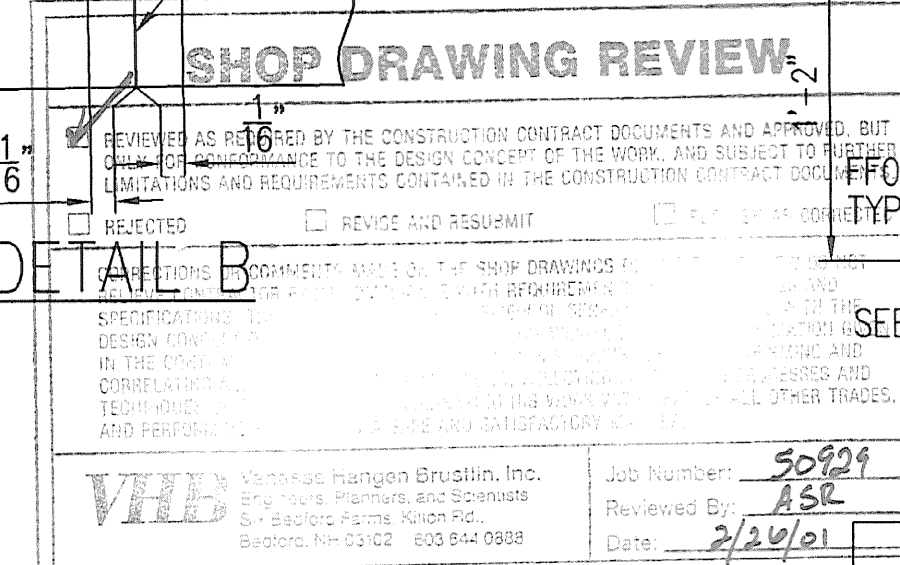
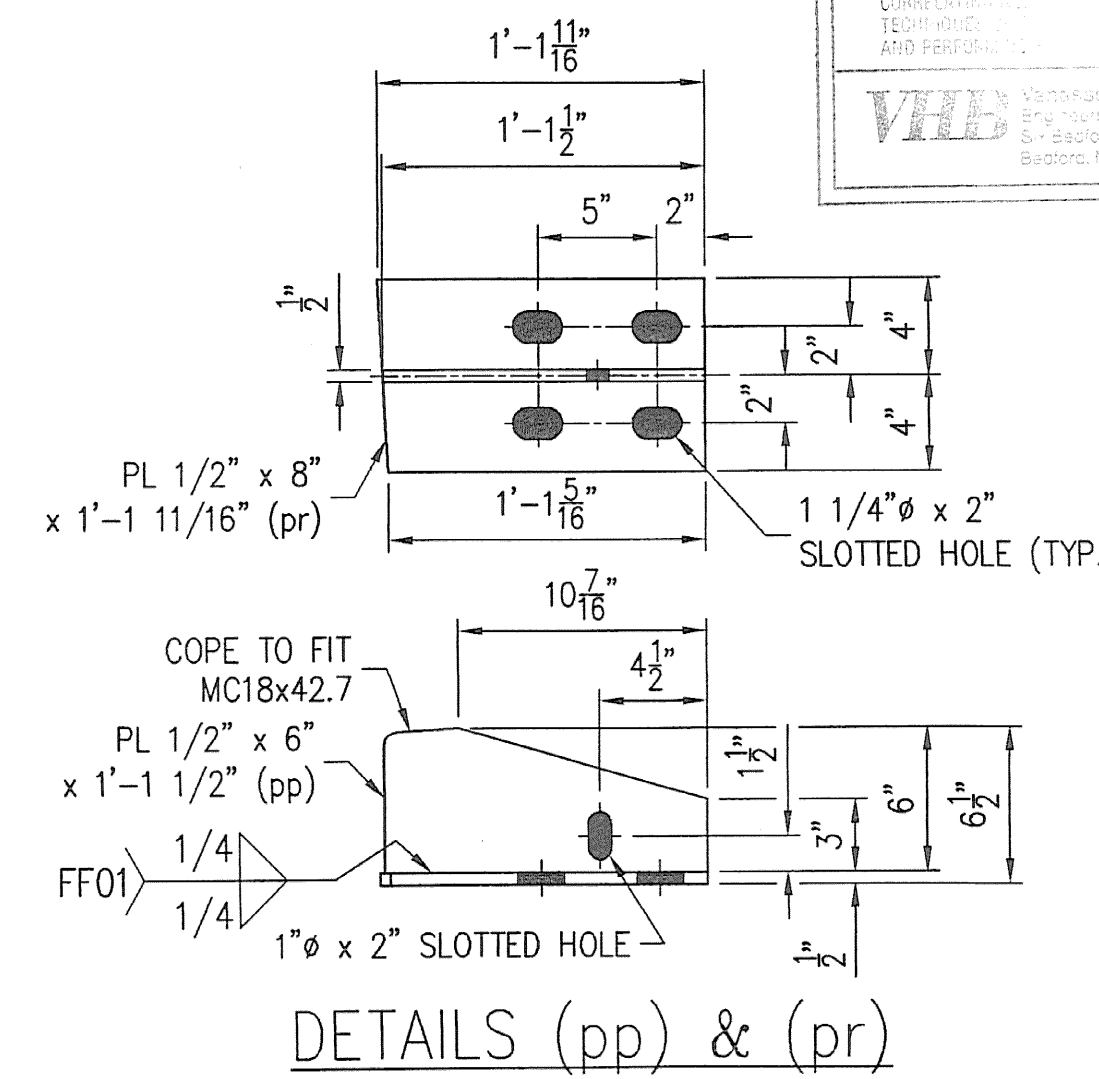
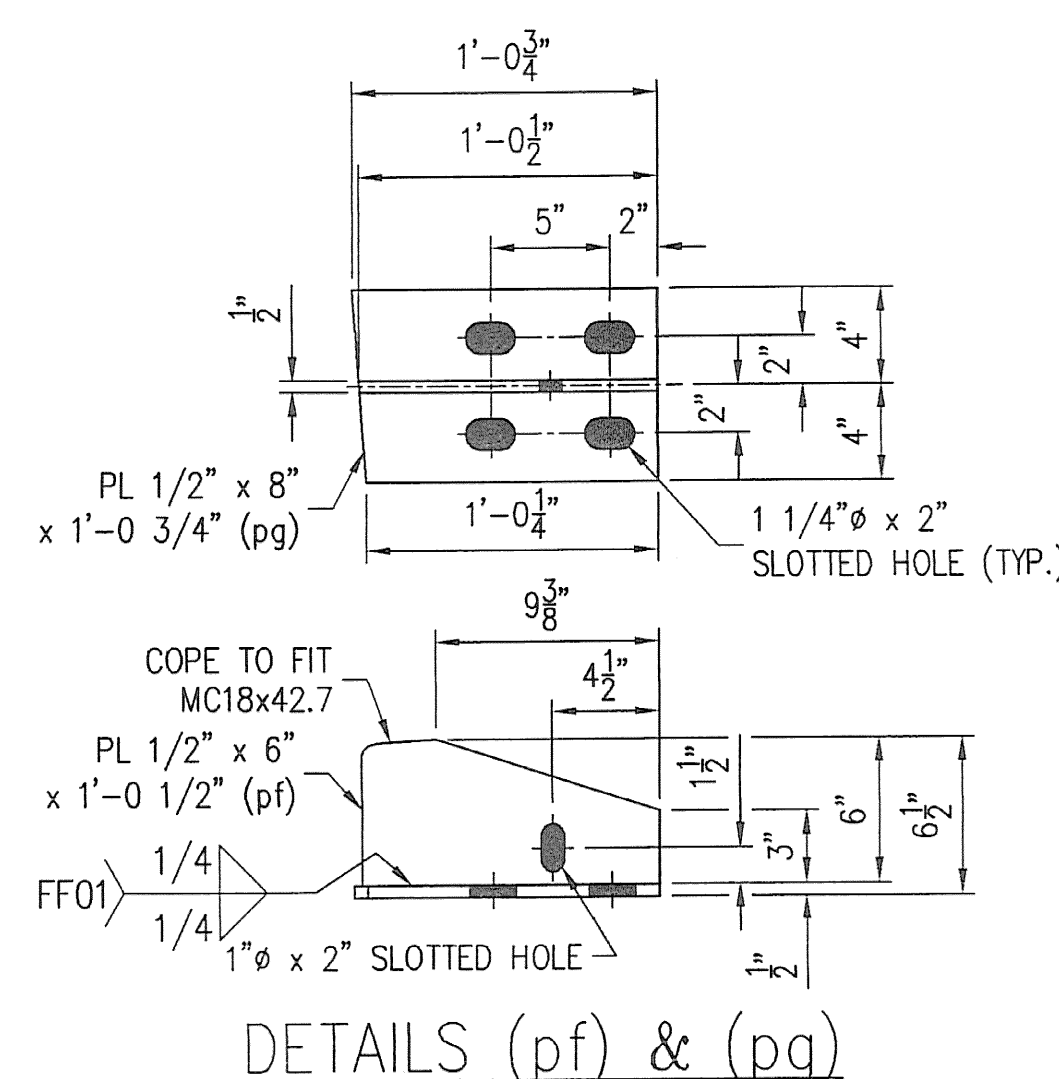
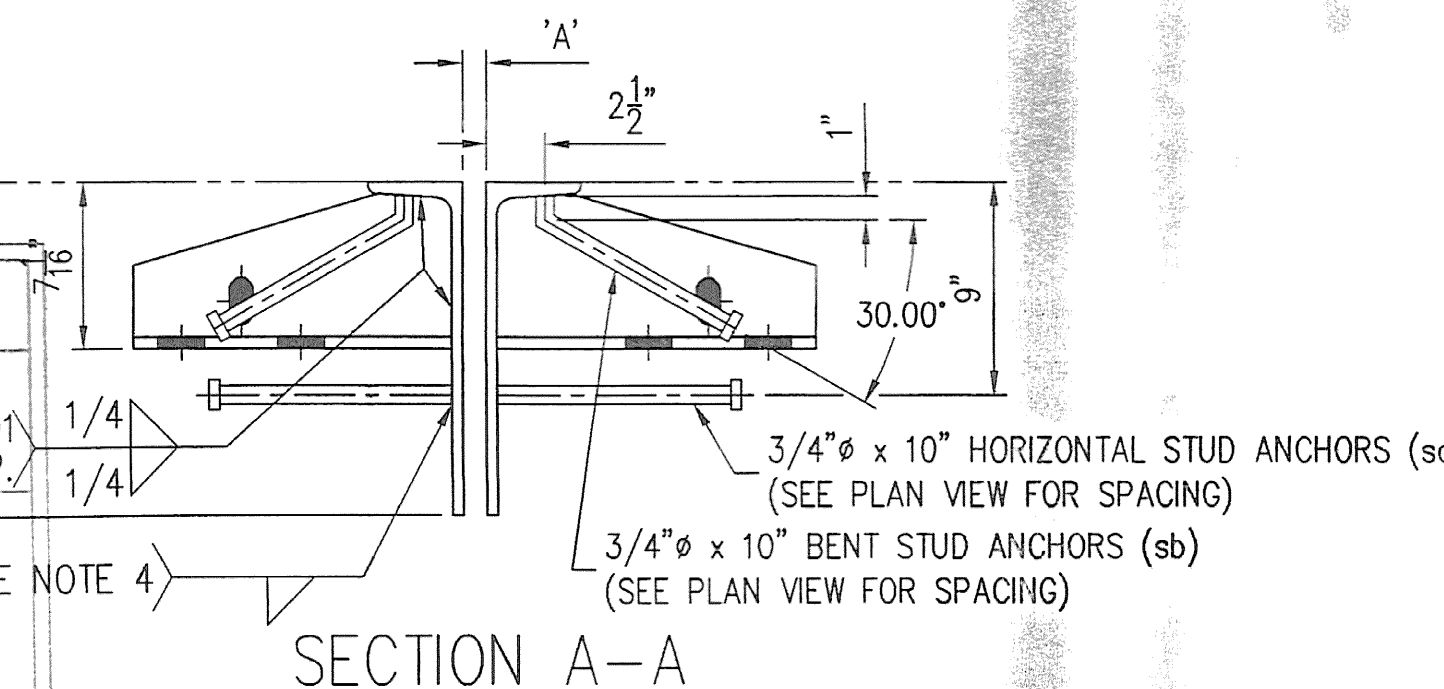
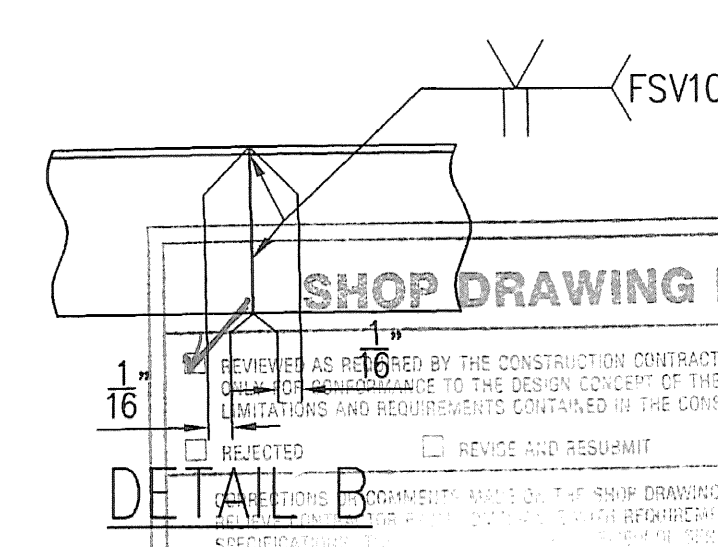
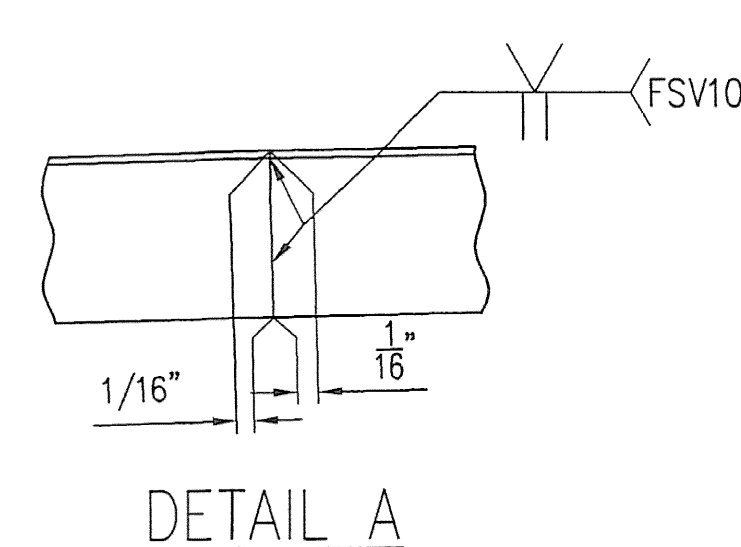
CONTRACTOR NOTE:
ALL SURFACES OF STEEL DECK JOINTS WHICH ARE TO HAVE CONCRETE PLACED AGAINST THEM, SHALL BE COATED WITH EPOXY BONDING COMPOUND. EPOXY BONDING COMPOUND TO BE PROVIDED BY THE CONTRACTOR.

APPROVER NOTE:
STOOL LENGTHS HAVE BEEN REVISED PER CONTRACTOR'S FIELD MEASUREMENTS TAKEN JANUARY 19, 2001.

TEMPERATURE ADJUSTING CHART - PIER 2				
TEMPERATURE	45°	60°	75°	90°
DIM 'A'	1	7/8	7/8	3/4

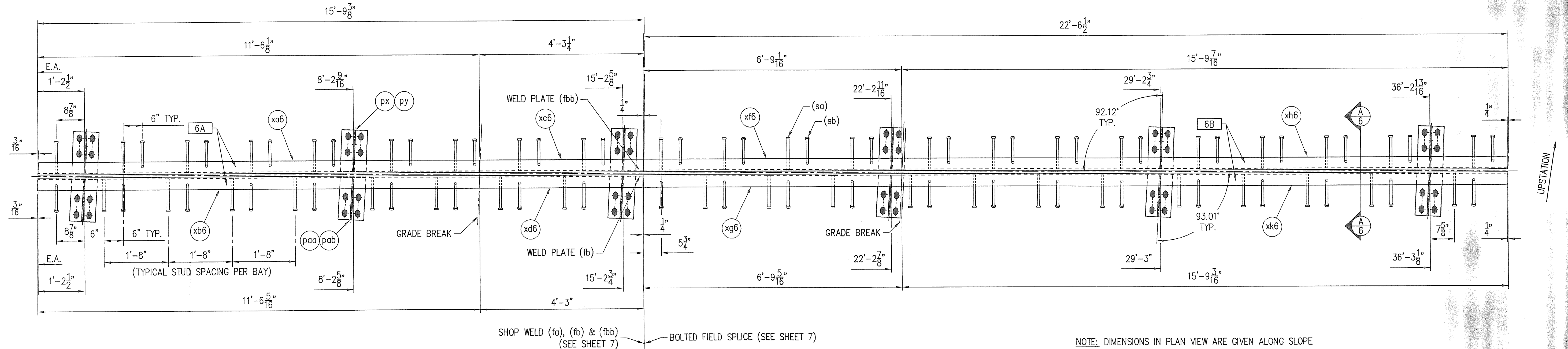
SEE SHEET 7 FOR GENERAL NOTES

LINE	NO. REQ'D	DESCRIPTION	LENGTH	MK	REMARKS	WGHT.
1	1	EXPANSION JOINT ASS'Y		3A	HDG	
2	1	MC18x42.7	15'-9 1/4"	xc3	REMOVE FLANGE	11-8
3	1	MC18x42.7	15'-9 1/8"	xb3	REMOVE FLANGE	11-8
4	1	MC18x42.7	6'-9 1/2"	xc3	REMOVE FLANGE	11-8
5	1	MC18x42.7	6'-9 1/8"	xd3	REMOVE FLANGE	11-8
6	3	PL 1/2 x 6	1'-0 1/2"	pf	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
7	3	PL 1/2 x 8	1'-0 1/4"	pg	SHAPE CUT	19-16
8	3	PL 1/2 x 6	1'-1 1/2"	pp	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
9	3	PL 1/2 x 8	1'-1 1/8"	pr	SHAPE CUT	19-16
10	27	WS 3/4 x 10		sa	26	29-19
11	26	WS 3/4 x 10		sb	25 / BEND	29-19
12						
13						
14						
15						
16						
17	1	EXPANSION JOINT ASS'Y		3B	HDG	
18	1	MC18x42.7	4'-3"	xf3	REMOVE FLANGE	11-8
19	1	MC18x42.7	4'-3 3/8"	xg3	REMOVE FLANGE	11-8
20	1	MC18x42.7	11'-6 1/2"	yh3	REMOVE FLANGE	11-8
21	1	MC18x42.7	11'-6 1/4"	xk3	REMOVE FLANGE	11-8
22	3	PL 1/2 x 6	1'-0 1/2"	pf	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
23	3	PL 1/2 x 8	1'-0 1/4"	pg	SHAPE CUT	19-16
24	3	PL 1/2 x 6	1'-1 1/2"	pp	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
25	3	PL 1/2 x 8	1'-1 1/8"	pr	SHAPE CUT	19-16
26	19	WS 3/4 x 10		sa	18	29-19
27	19	WS 3/4 x 10		sb	18 / BEND	29-19
28	2	FB 1/4 x 2	0'-2"	fa		16-29
29	1	FB 1/4 x 4	1'-0"	fb		16-36
30	1	FB 1/4 x 4	1'-0"	fbb		16-36
31						
32						
33						

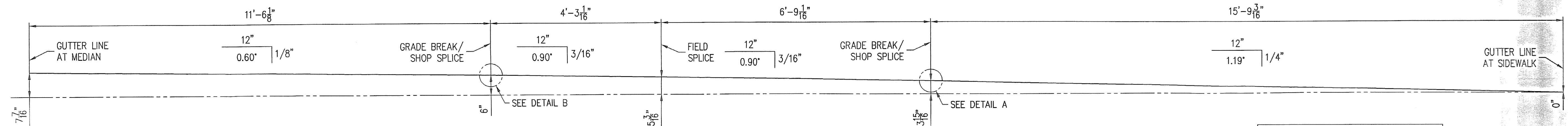


REV.	DESCRIPTION	DATE	BY
1	GENERAL REVISION PER APPROVAL.	1/22/01	SLB
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LEWIS ENGINEERING COMPANY			
4201 NOREX DRIVE - CHASKA, MINNESOTA 55318 - (612) 368-3000			
PROJECT	BRIDGE NO. 68 SOUTH BURLINGTON U.S. 2 OVER I-89		
STATE PROJECT	IM DECK (36)		
FEDERAL PROJECT			
CUSTOMER	J A McDONALD		
LOCATION	CHITTENDEN COUNTY, VERMONT		
DESCRIPTION	EXPANSION JOINT DETAILS WESTBOUND AT PIER 2		
W.P. chkd	JDK		
Drawn By	SLB		
Chkd. By	AJC		
Date:	11/21/00		
SHEET NO.	3	OF	8
Job. No. :	978.1049.1		



PLAN VIEW - EXPANSION JOINT
(PIER 3 - EASTBOUND)



ELEVATION VIEW
(ELEVATIONS TAKEN ALONG C/L OF JOINT)

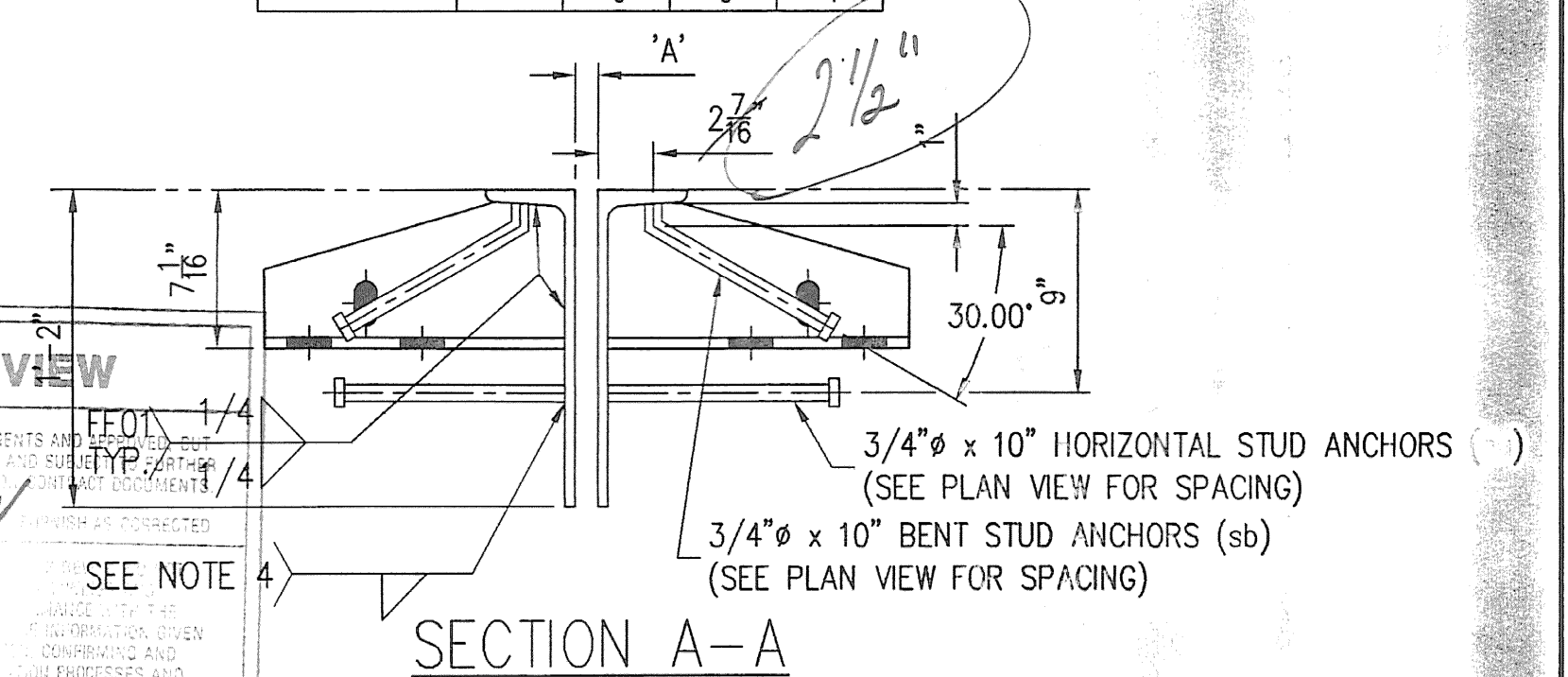
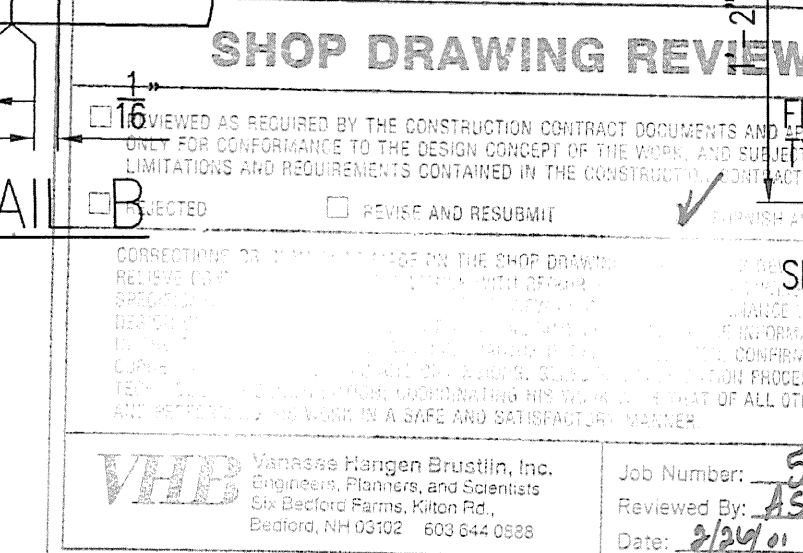
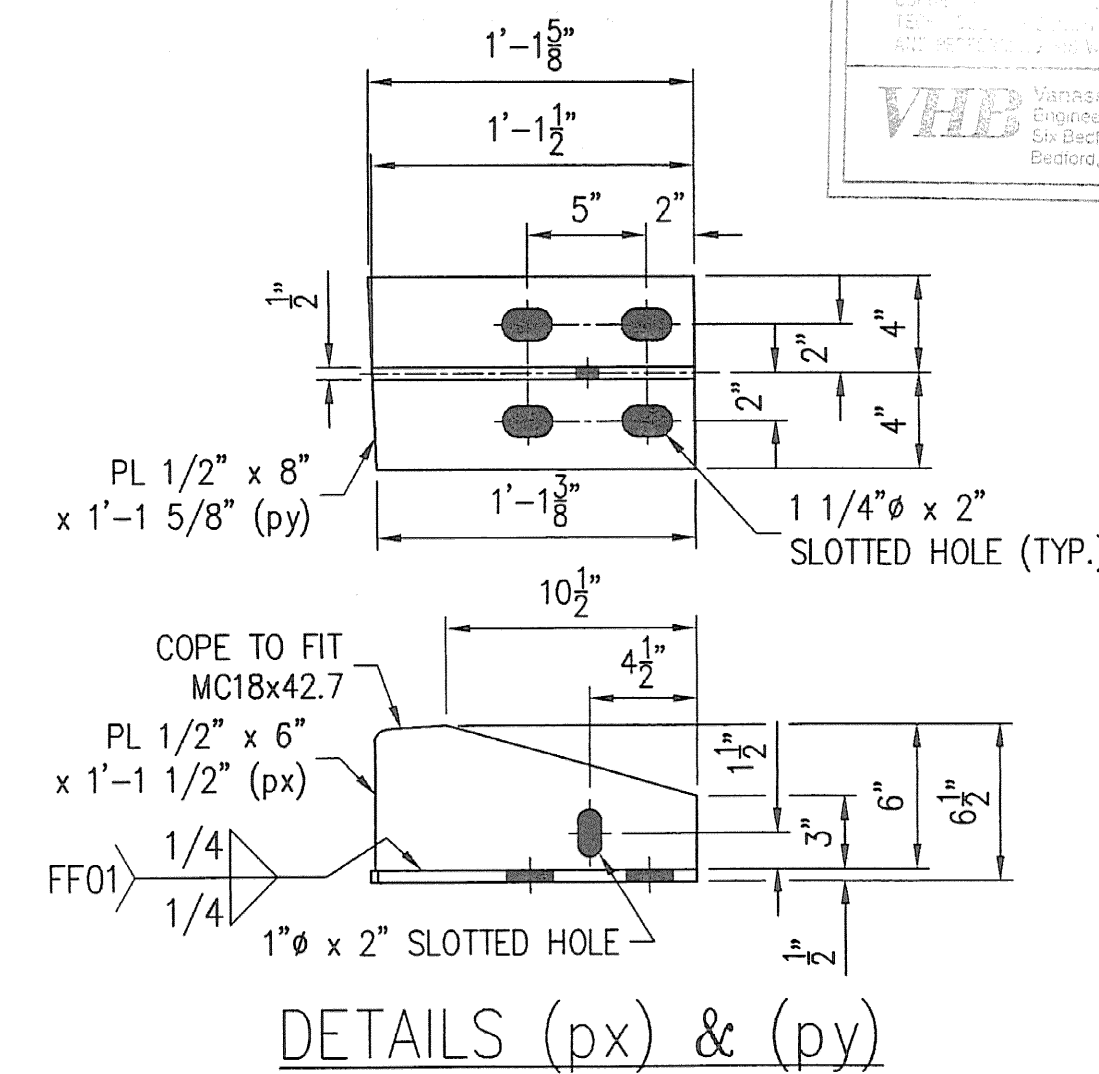
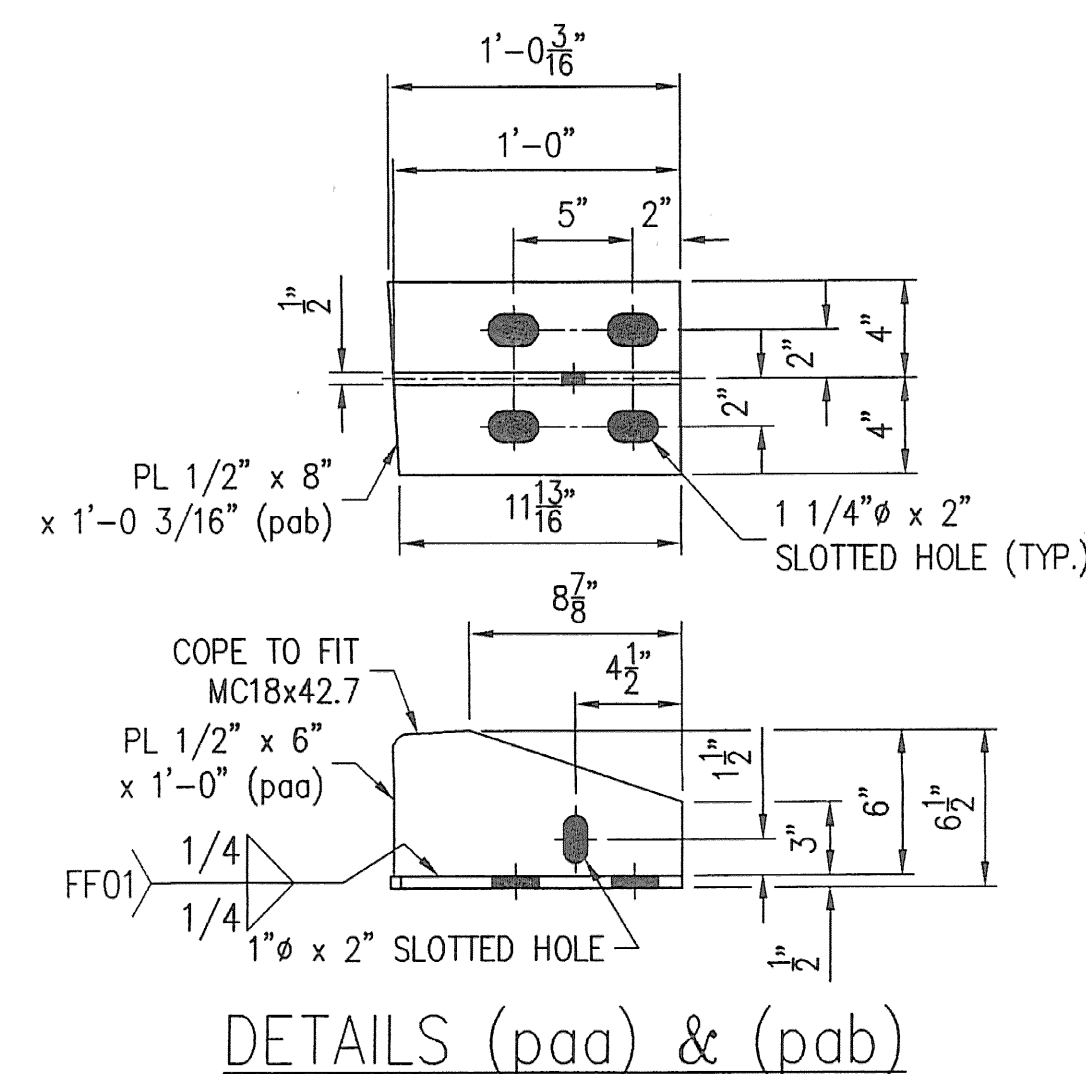
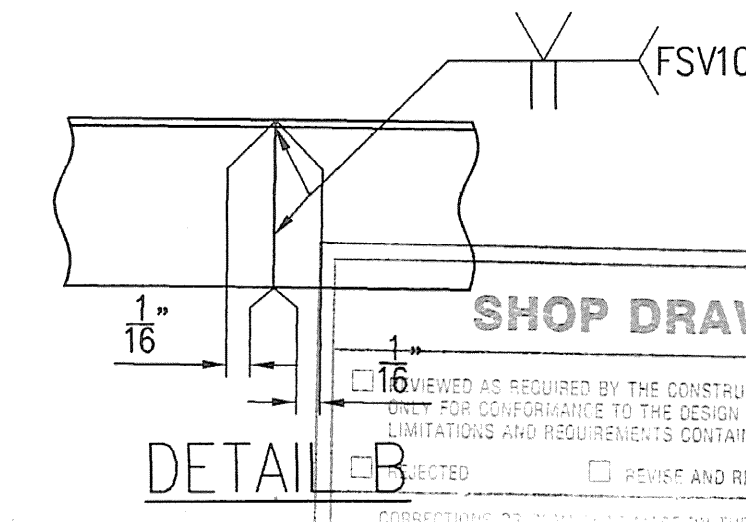
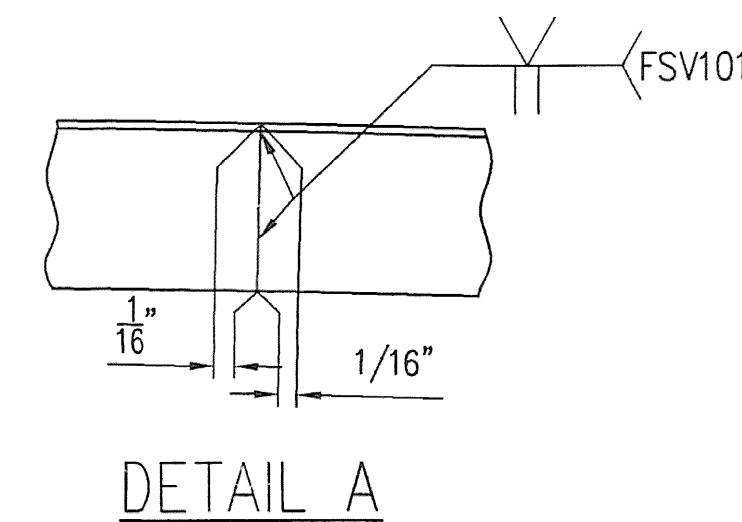
TEMPERATURE ADJUSTING CHART - PIER 3				
TEMPERATURE	45°	60°	75°	90°
DIM 'A'	1	7/8	7/8	3/4

SEE SHEET 7 FOR GENERAL NOTES

LINE	NO. REQ'D.	DESCRIPTION	LENGTH	MK	REMARKS	WGHT.
1	1	EXPANSION JOINT ASS'Y		6A	HDG	
2	1	MC18x42.7	11'-6 1/8"	xa6	REMOVE FLANGE	11-8
3	1	MC18x42.7	11'-6 1/8"	xb6	REMOVE FLANGE	11-8
4	1	MC18x42.7	4'-3 1/4"	xc6	REMOVE FLANGE	11-8
5	1	MC18x42.7	4'-3"	xd6	REMOVE FLANGE	11-8
6	3	PL 1/2 x 6	1'-1 1/2"	px	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
7	3	PL 1/2 x 6	1'-1 1/2"	py	SHAPE CUT	19-16
8	3	PL 1/2 x 6	1'-0"	paa	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
9	3	PL 1/2 x 8	1'-0 3/16"	pab	SHAPE CUT	19-16
10	18	WS 3/4 x 10		sa	17	29-19
11	18	WS 3/4 x 10		sb	17 / BEND	29-19
12	2	FB 1/4 x 2	0'-2"	fa		16-29
13	1	FB 1/4 x 4	1'-0"	fb		16-36
14	1	FB 1/4 x 4	1'-0"	fbb		16-36
15						
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18						
19	1	EXPANSION JOINT ASS'Y		6B	HDG	
20	1	MC18x42.7	6'-9 1/16"	xf6	REMOVE FLANGE	11-8
21	1	MC18x42.7	6'-9 1/16"	xg6	REMOVE FLANGE	11-8
22	1	MC18x42.7	15'-9 7/16"	xh6	REMOVE FLANGE	11-8
23	1	MC18x42.7	15'-9 7/16"	xk6	REMOVE FLANGE	11-8
24	3	PL 1/2 x 6	1'-1 1/2"	px	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
25	3	PL 1/2 x 8	1'-1 1/2"	py	SHAPE CUT	19-16
26	3	PL 1/2 x 6	1'-0"	paa	SHAPE CUT / COPE TO FIT MC18x42.7	19-16
27	3	PL 1/2 x 8	1'-0 3/16"	pab	SHAPE CUT	19-16
28	26	WS 3/4 x 10		sa	25	29-19
29	27	WS 3/4 x 10		sb	26 / BEND	29-19
30						
31						
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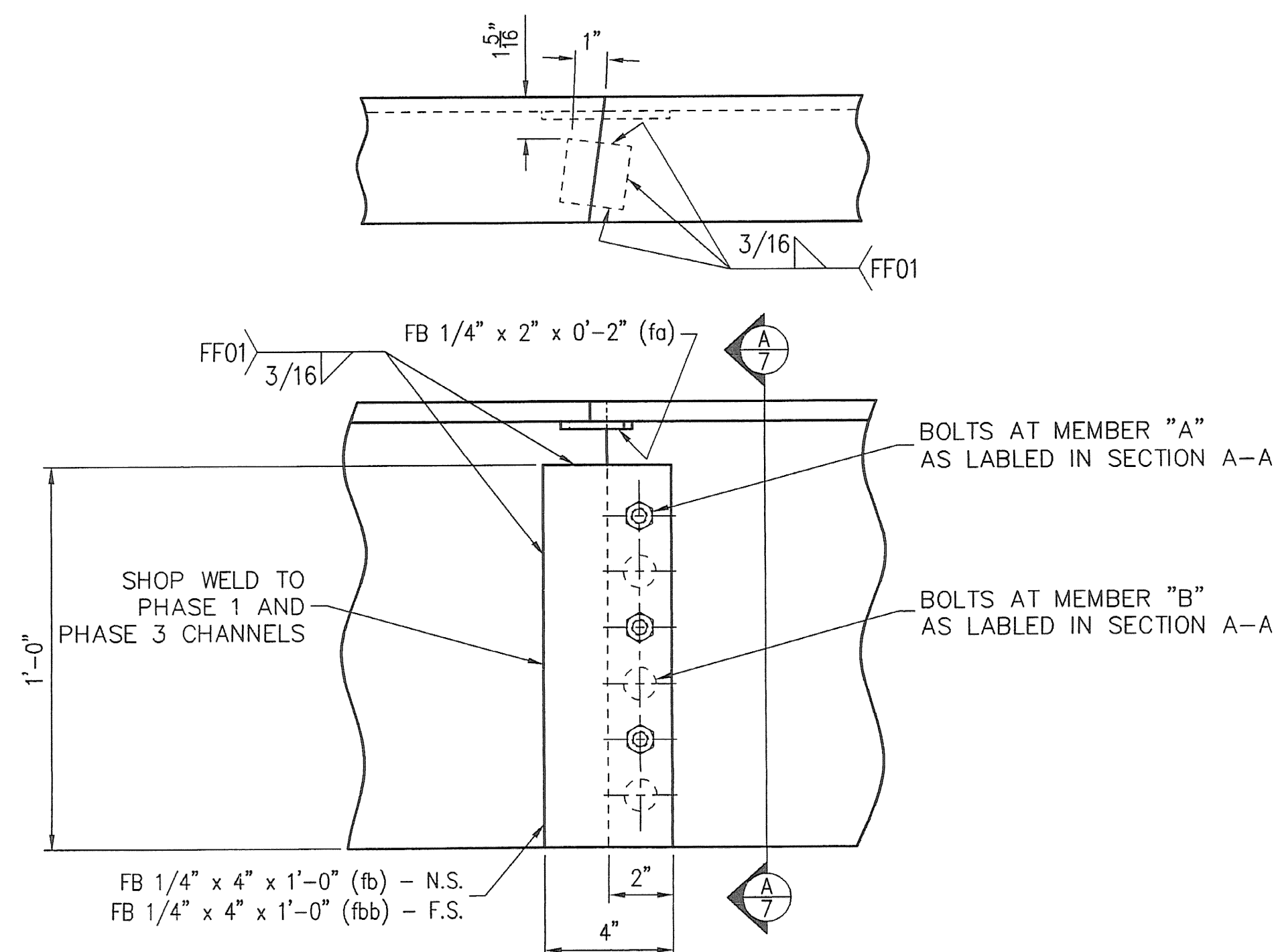
CONTRACTOR NOTE:
ALL SURFACES OF STEEL DECK JOINTS WHICH ARE TO HAVE CONCRETE PLACED AGAINST THEM, SHALL BE COATED WITH EPOXY BONDING COMPOUND. EPOXY BONDING COMPOUND TO BE PROVIDED BY THE CONTRACTOR.

APPROVER NOTE:
STOOL LENGTHS HAVE BEEN REVISED PER CONTRACTOR'S FIELD MEASUREMENTS TAKEN JANUARY 19, 2001.



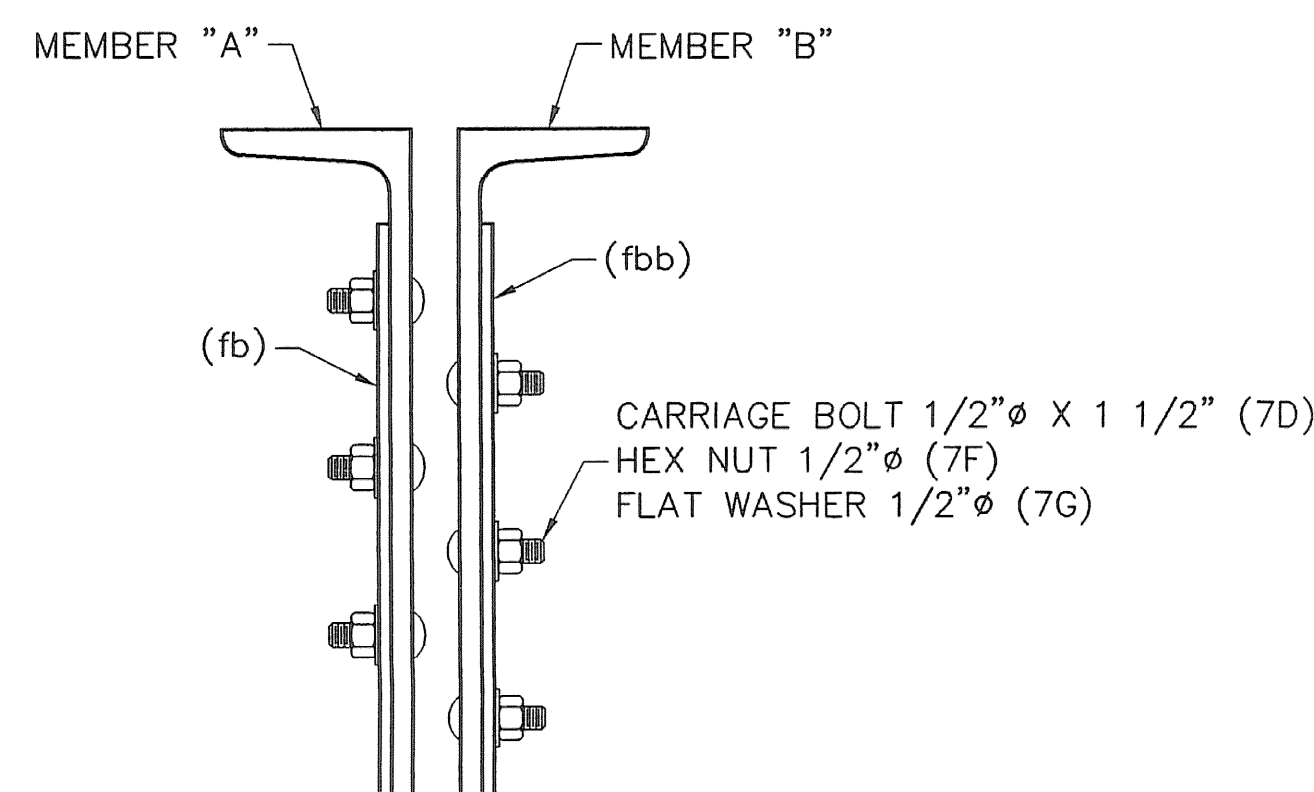
REV.	DESCRIPTION	DATE	BY
1	GENERAL REVISION PER APPROVAL.	1/22/01	SLB
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LEWIS ENGINEERING COMPANY			
4201 NOREX DRIVE - CHASKA, MINNESOTA 55318 - (612) 368-3000			
PROJECT	BRIDGE NO. 68 SOUTH BURLINGTON U.S. 2 OVER I-8		
STATE PROJECT	IM DECK (36)		
FEDERAL PROJECT			
CUSTOMER	J A McDONALD		
LOCATION	CHITTENDEN COUNTY, VERMONT		
DESCRIPTION	EXPANSION JOINT DETAILS EASTBOUND AT PIER 3		
W.P. chk'd	JDK		
Drawn By	SLB		
Chk'd. By	AJC		
Date:	11/21/00		
SHEET NO.	6	OF	8
Job. No. :	978.104.1		

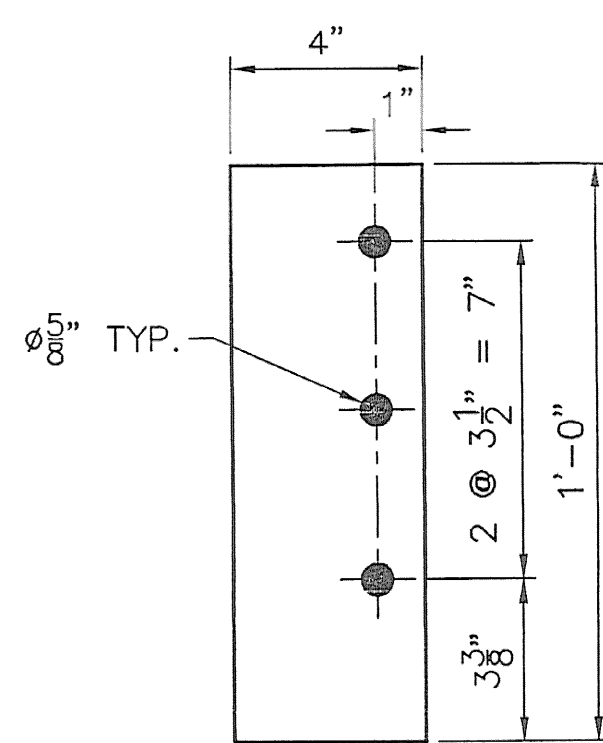


BOLTED FIELD SPLICE DETAIL

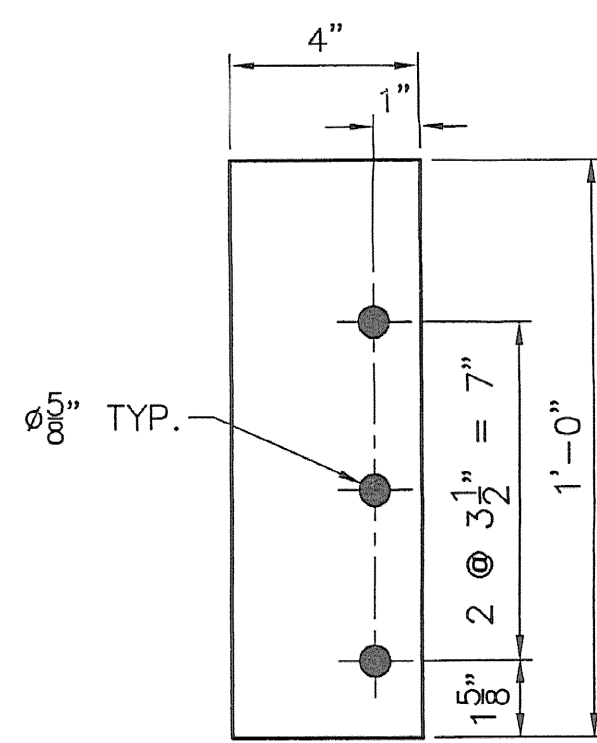
SHOP WELD (fo) & (fb) TO
6A, 5B, 4A, 3B, 2A & 1B



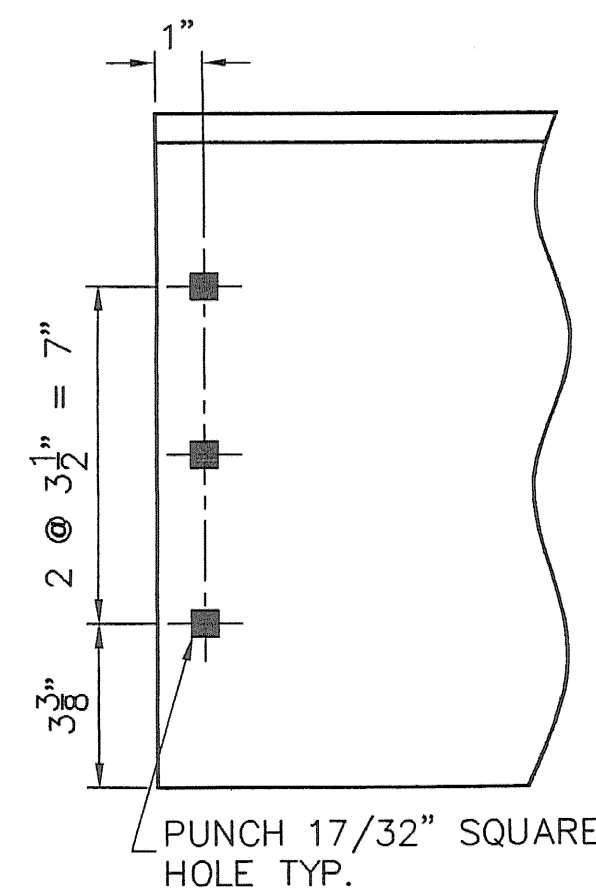
SECTION A-A



DETAIL (fb)

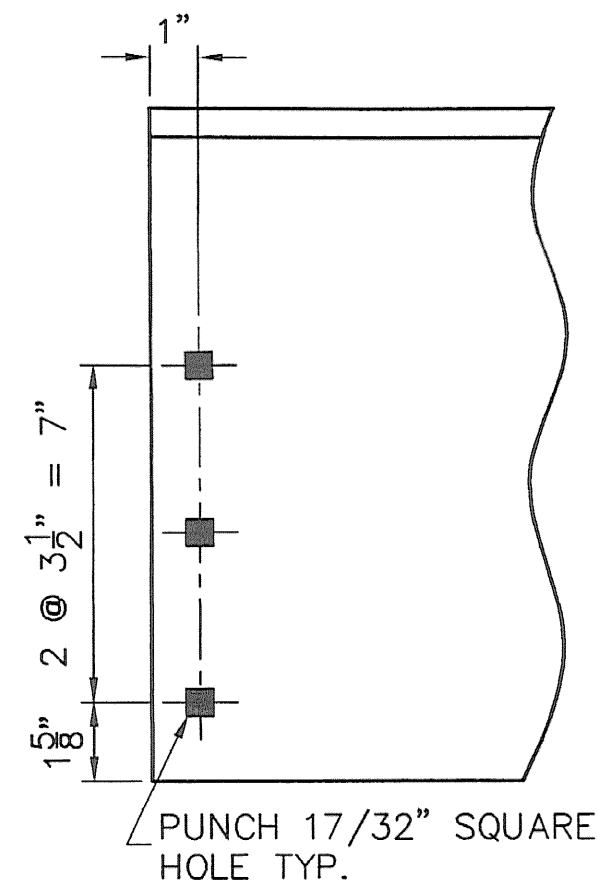


DETAIL (fbb)



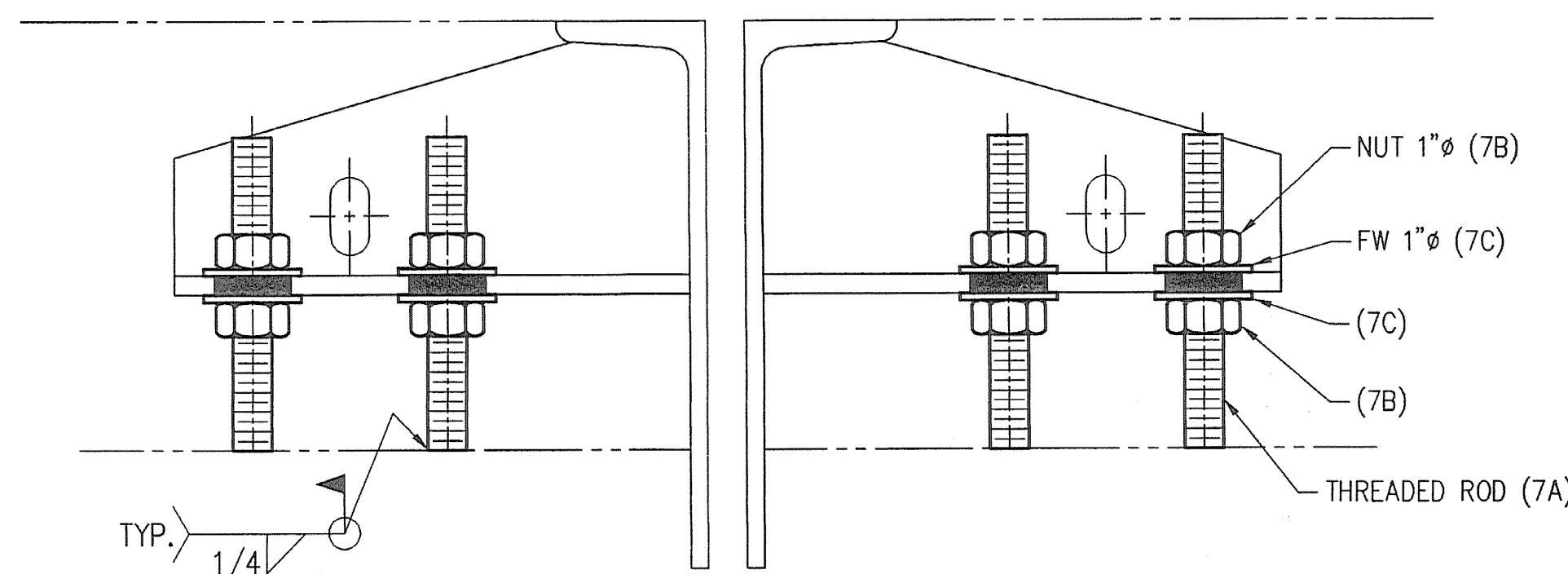
END PREP FOR BOLTED FIELD SPLICE DETAIL

PREP THE ENDS OF (xc1), (xc2), (xc3), (xc4), (xc5) & (xc6)



END PREP FOR BOLTED FIELD SPLICE DETAIL

PREP THE ENDS OF (xd1), (xd2), (xd3), (xd4), (xd5) & (xd6)



TYPICAL SECTION OF JOINT @ GIRDER

GENERAL NOTES:

- 1) ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO "STATE OF VERMONT, AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION" DATED 1990, ITS LATEST REVISIONS AND THE SPECIAL PROVISIONS.
- 2) STEEL SHALL CONFORM TO AASHTO M270 GRADE 36, U.N.O. STEEL SHALL BE GALVANIZED PER SECTION 506.15(c) OF THE GENERAL SPECIAL PROVISIONS AND ASTM A123.
- 3) WELDING SHALL MEET THE REQUIREMENTS OF THE ANSI/AASHTO/AWS D 1.5 BRIDGE WELDING CODE AS MODIFIED BY STANDARD SPECIFICATIONS.
- 4) ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 (ASTM-A108 GRADES 1010 TO 1020) STEEL. ALL STUD ANCHORS TO BE ELECTRIC ARC END-WELDED WITH COMPLETE FUSION. STUDS AND STUD WELDING SHALL CONFORM TO SECTION 7 OF THE ANSI/AASHTO/AWS D1.5-95 BRIDGE WELDING CODE. REPAIR WELD STUDS USING FF-STUD-REP-01 OR SM-STUD-REP-01.
- 5) ALL HARDWARE TO BE GALVANIZED PER ASTM A153.
- 6) PRIOR TO GALVANIZING, ALL CORNERS AND EDGES OF STEEL PLATES, SHAPES, ETC., SHALL BE GROUNDED TO A 1/16" RADIUS PER SECTION 506.14(c).
- 7) ANY GALVANIZED COATING DAMAGED DURING FIELD WELDING OR FROM OTHER CAUSES MUST BE REPAIRED IN ACCORDANCE WITH ASTM-A780.
- 8) DS BROWN IS TO SUPPLY ONLY THE PARTS SHOWN ON THESE DRAWINGS. ALL OTHER MATERIALS TO BE PROVIDED BY OTHERS.
- 9) JOINTS SHALL BE SHOP ASSEMBLED AND Banded PRIOR TO SHIPPING. JOINTS SHALL BE SHIPPED IN PAIRS.
- 10) SHOP INSPECTION BY VAOT.

LINE NO.	REQD.	DESCRIPTION	LENGTH	MK	REMARKS	WGHT.
1	288	THREADED ROD		7A	HDG	
2	288	RB 1 CONT THRD	0'-8"	7A		1.27
3						
4		FIELD BOLTS :				
5	588	HN 1 HVY A563DH HDG		7B	576	25-66
6	588	FW 1 F436 HDG		7C	576	27-15
7	37	MB 1/2 x 1 1/2 CARRIAGE		7D	36	
8	37	HN 1/2 HVY A563DH HDG		7F	36	25-3
9	37	FW 1/2 F436 HDG		7G	36	27-3
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SHOP DRAWING REVIEW

REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE REVIEW CONCEPT OF THE WORK, AND NOT FOR THE DESIGN LIMITATIONS AND REQUIREMENTS CAPTAINED IN THE GENERAL CONTRACT DOCUMENTS.

☐ REJECTED ☐ REVISED AND RESUBMITTED ☐ APPROVED

CONTRACT NO. 50929
PROJECT NO. 50929
DESIGNED BY: [Signature]
CHECKED BY: [Signature]
DATE: 2/20/01

VHB
VERMONT HIGHWAY BUILDING, INC.
200 N. BURLINGTON ST., SUITE 200
BURLINGTON, VT 05401
PHONE: 802-261-1000 FAX: 802-261-1001

REV.	DESCRIPTION	DATE	BY
1	GENERAL REVISION PER APPROVAL.	1/22/01	SLB

ANY AND ALL BACKCHARGES WILL BE REJECTED UNLESS WRITTEN CONSENT IS GIVEN BY LEWIS ENGINEERING COMPANY PRIOR TO ANY WORK PERFORMED FOR OUR ACCOUNT. SUCH REJECTION MEANS THAT INVOICES WILL NOT BE HONORED OR DEDUCTIONS FROM PAYMENT WILL BE CHARGED BACK.

PRELIM	11/28/00
SHOP	
APPROVAL	11/28/00
DIST.	
CUST.	
FOR	DATE
PRINTS	ISSUED

LEWIS ENGINEERING COMPANY
4201 NOREX DRIVE - CHASKA, MINNESOTA 55318 - (612) 368-3000

PROJECT — BRIDGE NO. 68 SOUTH BURLINGTON U.S. 2 OVER I-8

STATE PROJECT — IM DECK (36)

FEDERAL PROJECT —

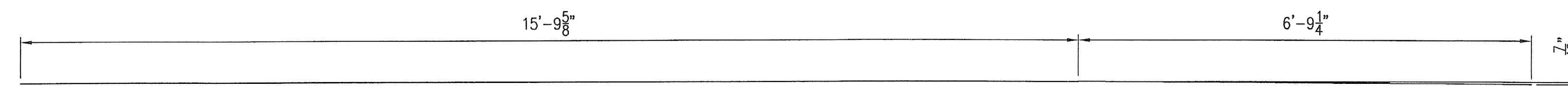
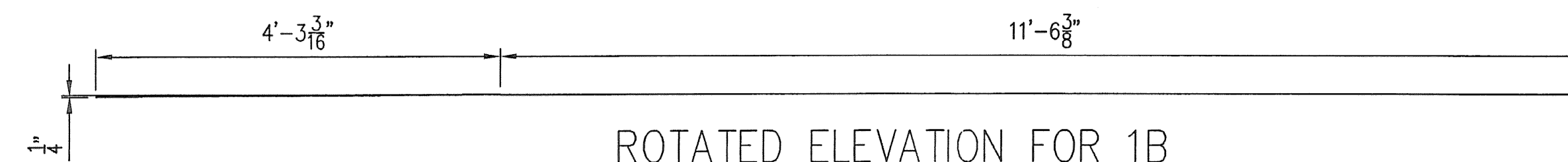
CUSTOMER — J A McDONALD

LOCATION — CHITTENDEN COUNTY, VERMONT

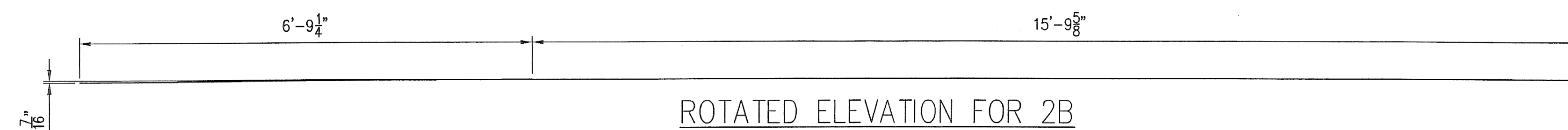
DESCRIPTION — EXPANSION JOINT DETAILS

W.P. chkd JUN
Drawn By SLB
Chkd By ASD
Date: 11/21/00

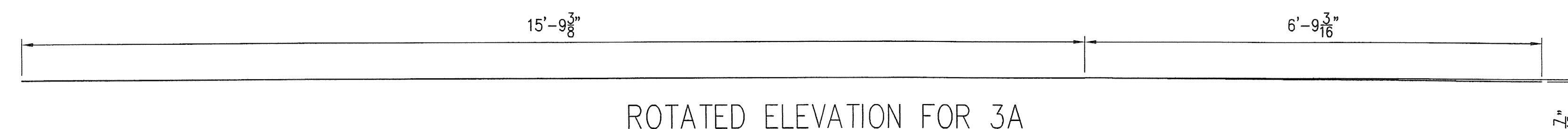
SHEET NO. 7 OF 8 Job. No. : 978.1040.1

ROTATED ELEVATION FOR 1AROTATED ELEVATION FOR 1B

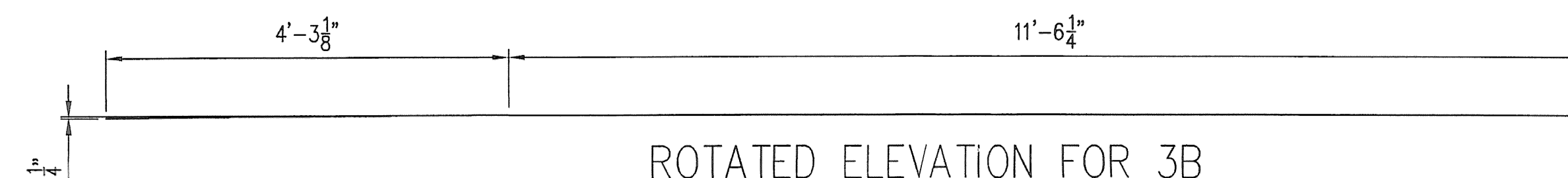
ROTATED ELEVATION FOR 2A



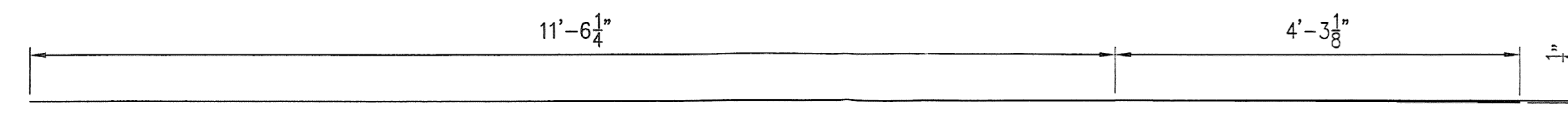
ROTATED ELEVATION FOR 2B



ROTATED ELEVATION FOR 3A



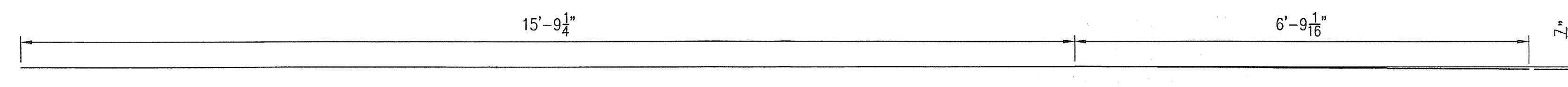
ROTATED ELEVATION FOR 3B



ROTATED ELEVATION FOR 4A



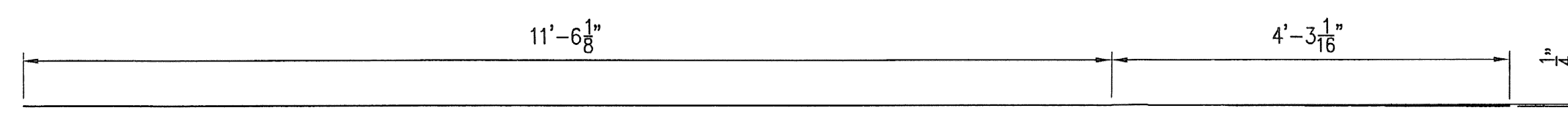
ROTATED ELEVATION FOR 4B



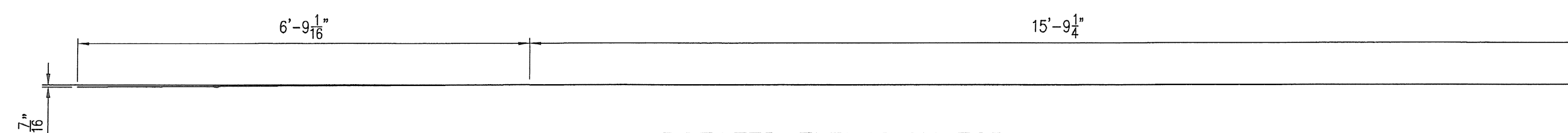
ROTATED ELEVATION FOR 5A



ROTATED ELEVATION FOR 5B



ROTATED ELEVATION FOR 6A



ROTATED ELEVATION FOR 6B

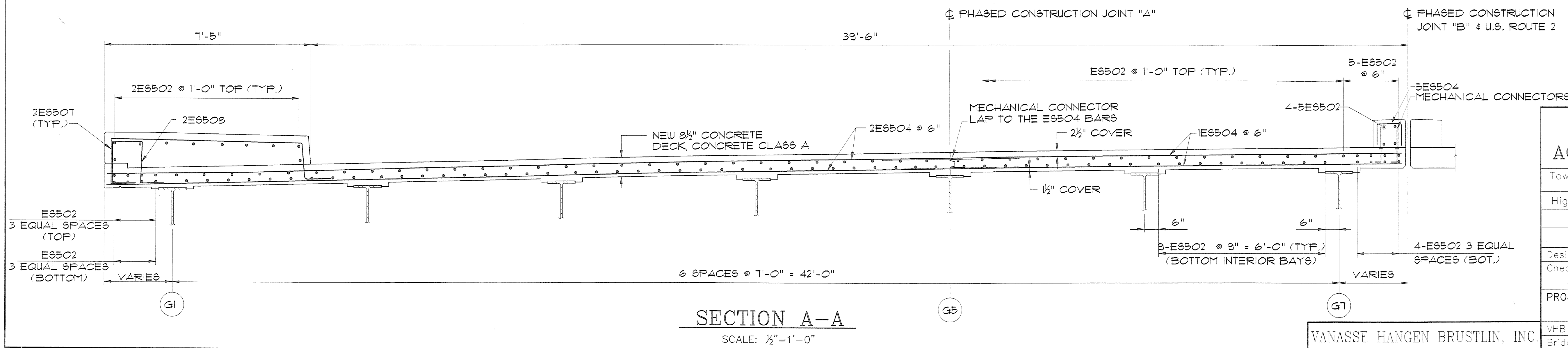
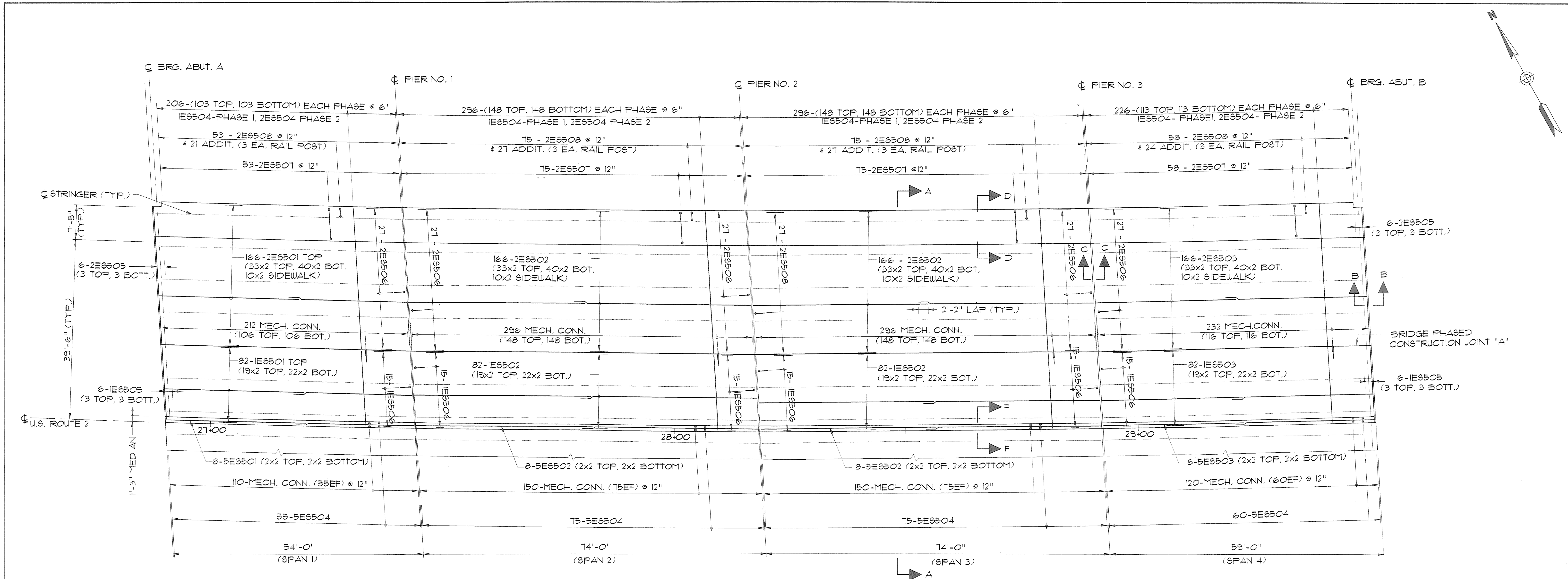
THIS SHEET IS FOR SHOP USE ONLY

SHOP NOTE:

ALL DIMENSIONS ARE GIVEN ALONG ϕ OF JOINT.

[illegible]

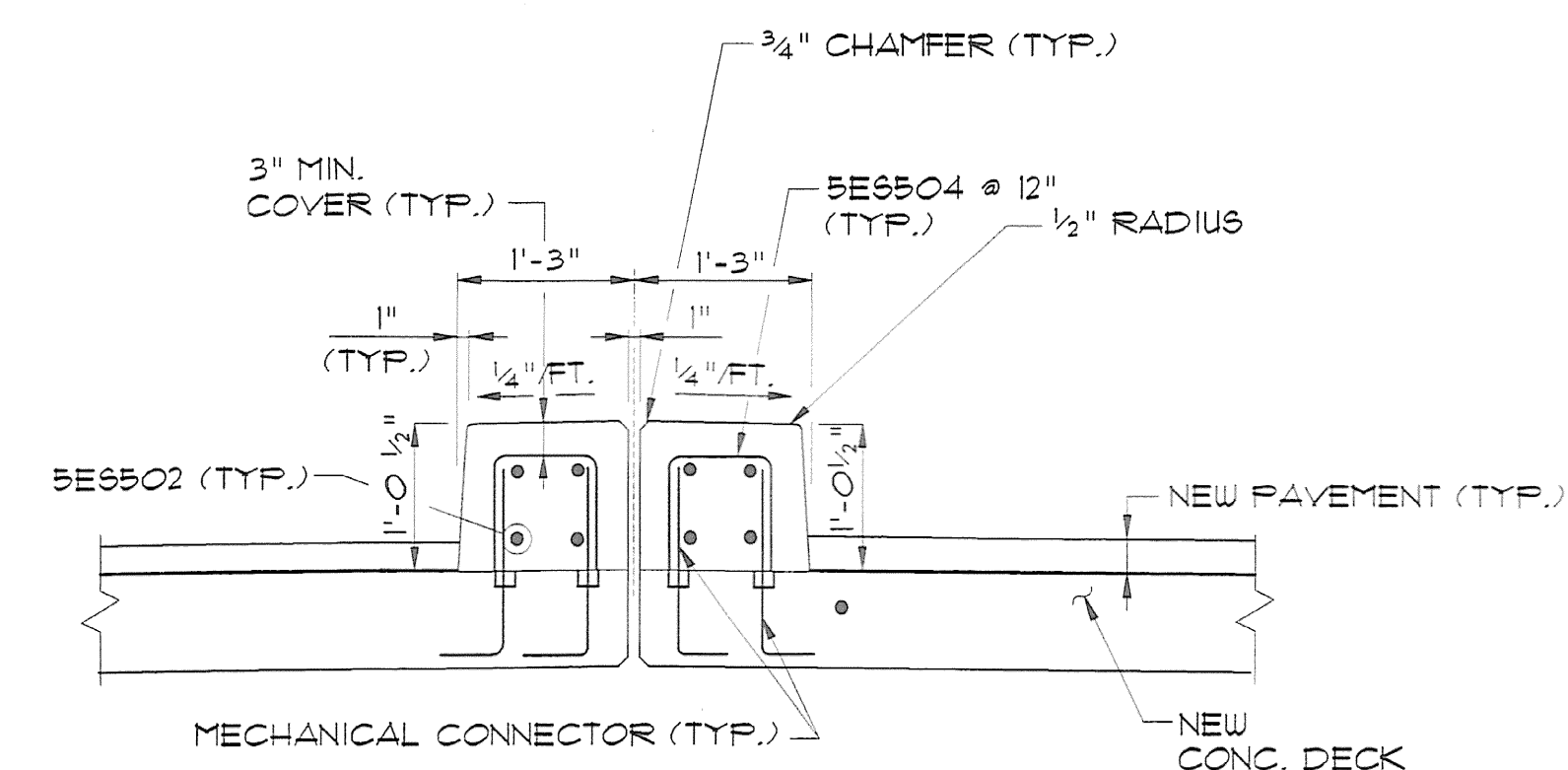
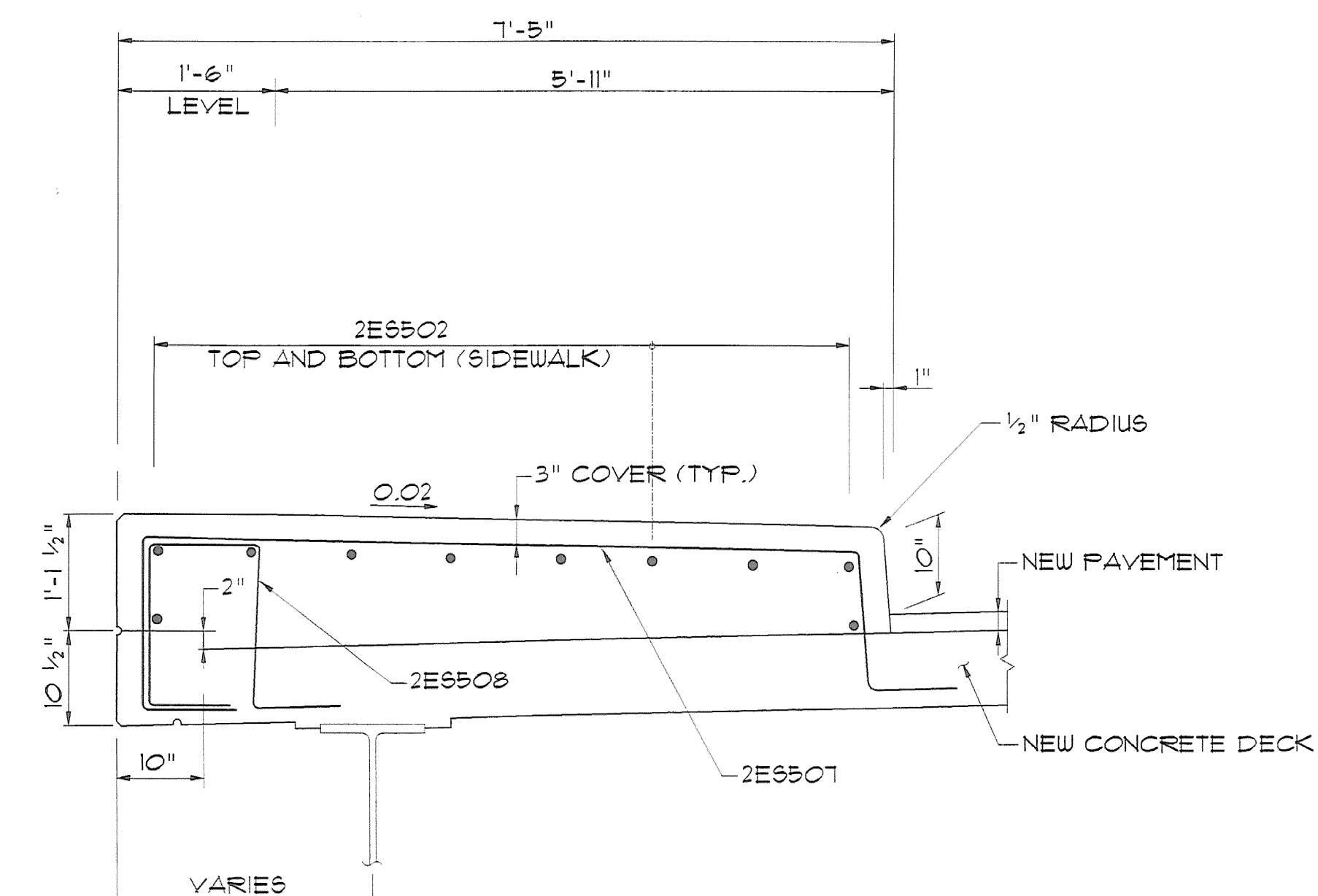
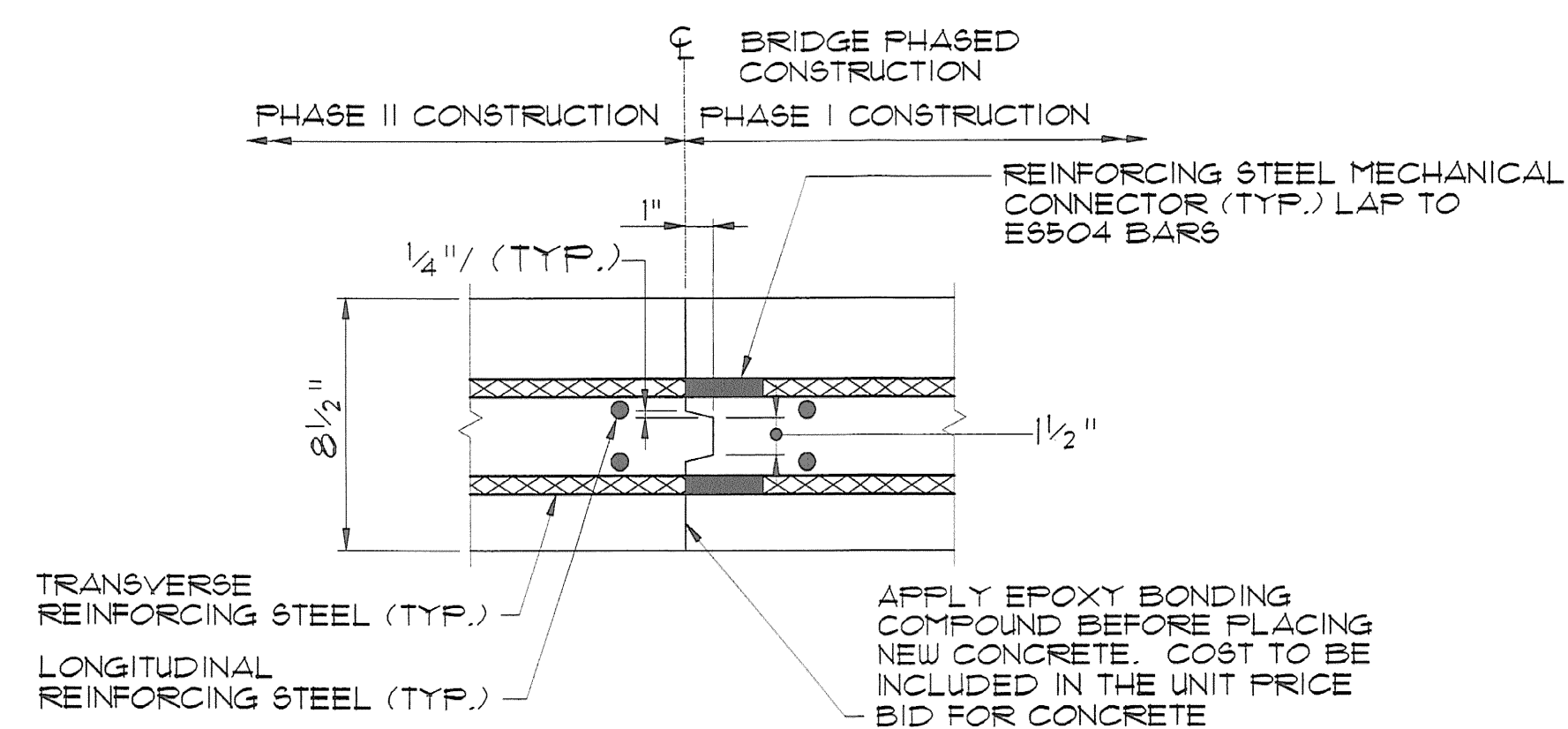
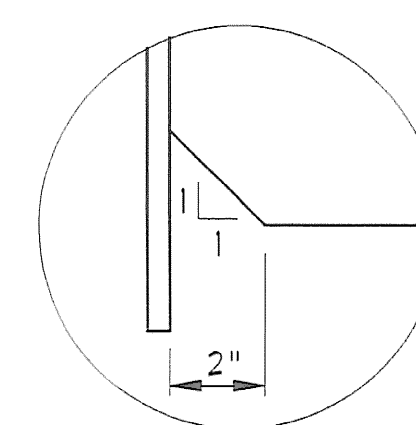
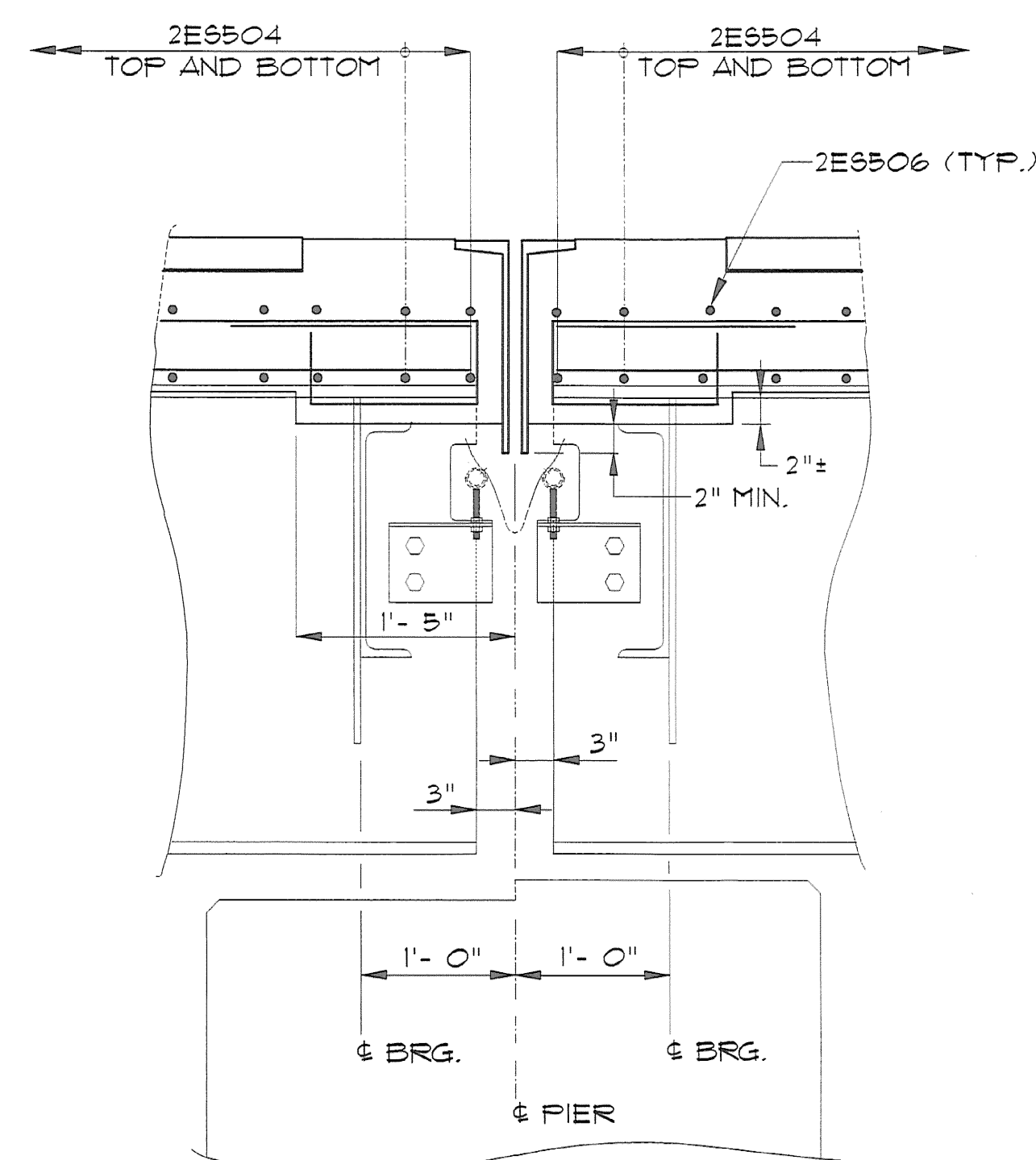
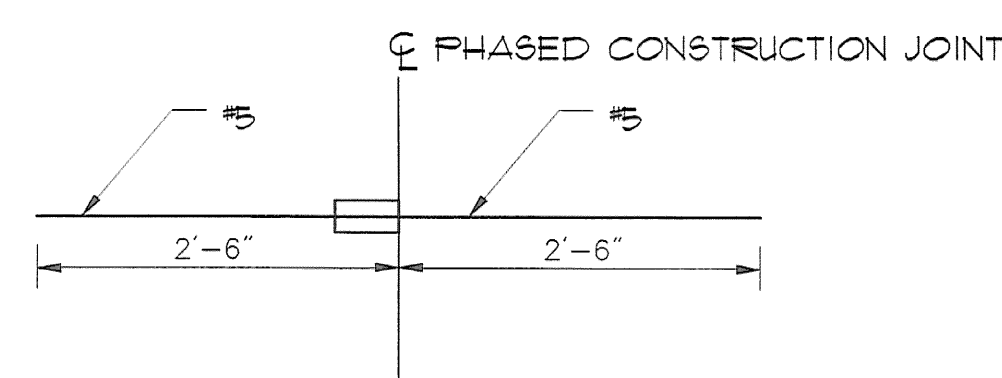
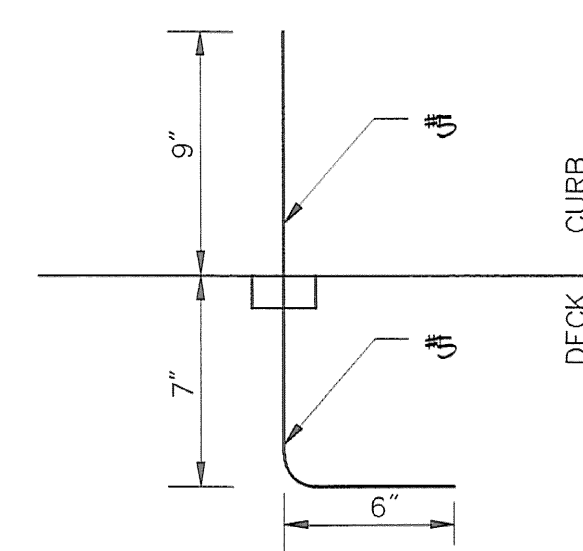
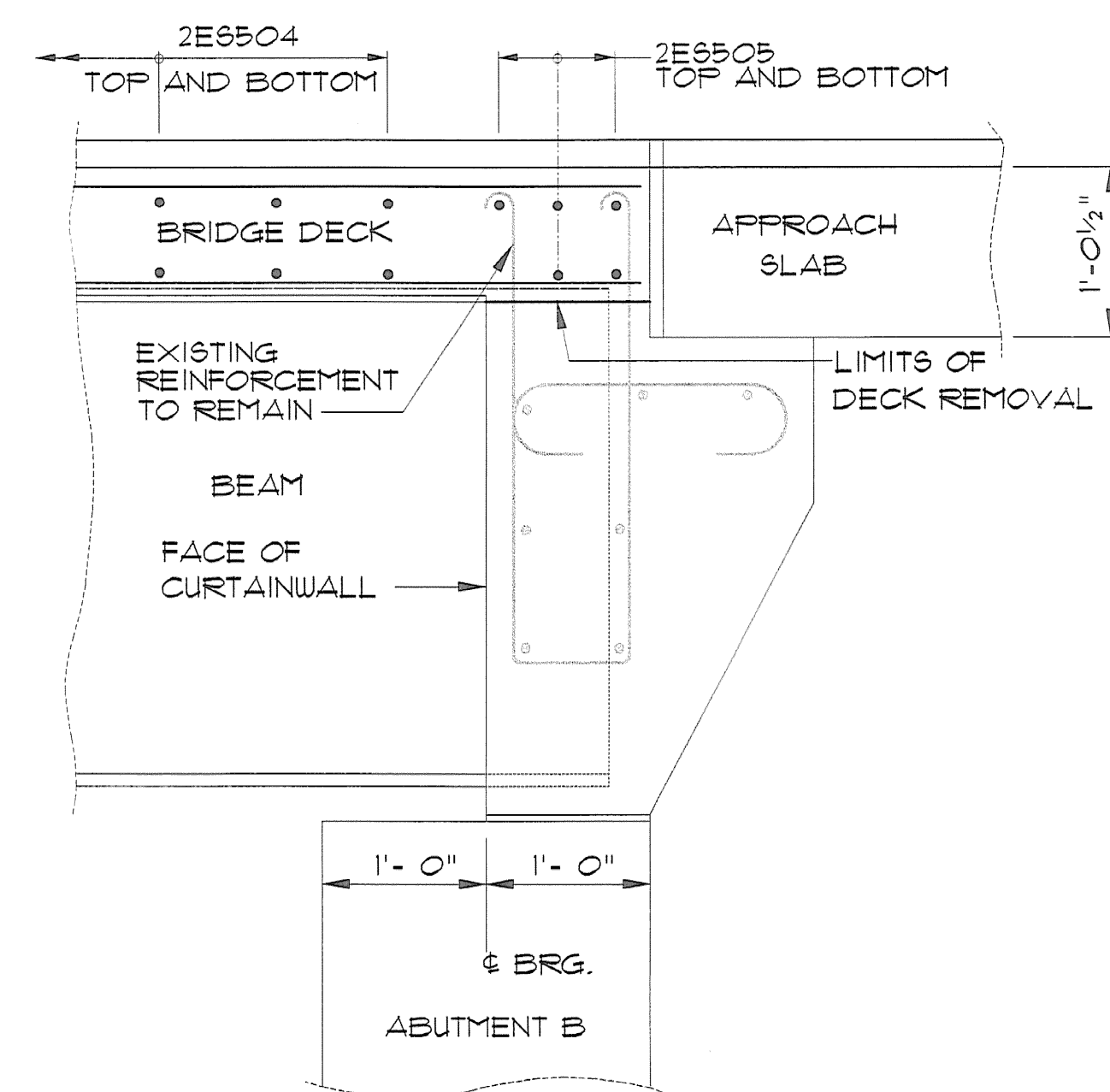
					REV.	DESCRIPTION				Date	TITLE
					ANY AND ALL BACKCHARGES WILL BE REJECTED UNLESS WRITTEN CONSENT IS GIVEN BY LEWIS ENGINEERING COMPANY PRIOR TO ANY WORK PERFORMED FOR OUR ACCOUNT. SUCH REJECTION MEANS THAT INVOICES WILL NOT BE HONORED OR DEDUCTIONS FROM PAYMENT WILL BE CHARGED AGAINST YOU.						
						LEWIS ENGINEERING COMPANY					
					4201 NOREX DRIVE - CHASKA, MINNESOTA 55318 - (612) 368-3000						
				SHOP	PROJECT	— BRIDGE NO. 68	SOUTH BURLINGTON	U.S. 2 OVER I-8			
					STATE PROJECT	— IM DECK (36)					
					FEDERAL PROJECT	—					
				APPROVAL	CUSTOMER	— J A McDONALD	W.P. Chk'd NFR Drawn By SPT Chk'd By ALB Date: 11/21/00				
				DIST.	LOCATION	— CHITTENDEN COUNTY, VERMONT					
				CUST.	DESCRIPTION	— EXPANSION JOINT DETAILS					
				FOR DATE PRINTS ISSUED	SHEET NO. 8 OF 8				Job. No. : 978.104.01		



SHEETS 11A, 11B AND 11C SHOW DECK REPLACEMENT REINFORCING. REFER TO OTHER CONTRACT SHEETS FOR ADDITIONAL INFORMATION. CONFLICTS BETWEEN THESE DRAWINGS AND OTHER CONTRACT DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE RESIDENT ENGINEER.

STATE OF VERMONT AGENCY OF TRANSPORTATION			
Town Of	SOUTH BURLINGTON	Bridge No.	68
Highway No.	U.S. 2	Log Sta.	
		Surv. Sta.	
U.S. 2 OVER I-89			
DECK REINFORCEMENT PLAN			
Designed By	A. ROBINSON	Drawn By	M. LANDREY
Checked By	S. JOHNSON	Bridge Design Supervisor	S. JOHNSON
PROJECT	SOUTH BURLINGTON	PROJECT NO.	IM DECK (36)
VHB Cod. Drawing No.	50929FRM	Date	5/9/01
Bridge Sheet No.		Sheet	11A of 15

VANASSE HANGEN BRUSTLIN, INC.



SHEETS 11A, 11B AND 11C SHOW
DECK REPLACEMENT REINFORCING.
REFER TO OTHER CONTRACT SHEETS
FOR ADDITIONAL INFORMATION.
CONFLICTS BETWEEN THESE DRAWINGS
AND OTHER CONTRACT DRAWINGS
SHALL BE BROUGHT TO THE ATTENTION
OF THE RESIDENT ENGINEER.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of SOUTH BURLINGTON	Bridge No. 68
	Log Sta.
Highway No. U.S. 2	Surv. Sta.

U.S. 2 OVER 1-89

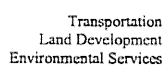
REINFORCEMENT DETAILS

Designed By	A. ROBINSON	Drawn By	M. LANDREY
Checked By	Date	Bridge Design Supervisor	
S. JOHNSON	5/9/01	S. JOHNSON	Date 5/9/01

PROJECT SOUTH BURLINGTON	PROJECT NO. IM DECK (36)
-----------------------------	-----------------------------

VHB Cad Drawing No. 50929DET2	Date 5/9/01
Bridge Sheet No.	Sheet 113 of 75

VANASSE HANGEN BRUSTLIN, INC.



Kilton Road
Six Bedford Farms, Suite 607
Bedford, NH 03110-6532
603 644 0888
FAX 603 644 2385

Date: 1-19-01	VHB Project No.: 50929
---------------	---------------------------

Date: 1-19-01	VHB Project No.: 50929
Re: South Burlington IM DECK 36 Bridge No. 68 and STP BIKE (28) S	

☒ Shop drawings ☐ Prints ☐ Plans ☐ Diskettes ☐ Specifications ☐ Copy of Letter ☐ Change Order

☐ Other _____

☒	Reviewed as required by the construction contract documents and approved, but only for conformance to the design concept of the work, and subject to further limitations and requirements contained in the construction contract documents.	☐ Rejected	☐ Revise and Resubmit	☐ Furnish as Corrected
-------------------------------------	---	-----------------------------------	--	---

Contractor, J.A. McDonald, Inc w/prints
Subcontractor: F.R. Lafayette w/prints
VTrans Consultant Project Manager , Sherward Farnsworth, PE w/prints
VTrans Structures Section – Shop Inspector – Jeff Clark – w/prints
VTrans Construction Section - letter only
VTrans Materials & Research Section (C&IA Unit) – letter only

Athanasia S. Robinson, VHB

Athanasia S. Robinson, VHB
Athanasia S. Robinson

VHB Project Manager, Steve Johnson, PE ,VHB Project File

F. R. Lafayette,
Inc.

F. R. LAFAYETTE, INC.
12 KELLOGG RD
ESSEX JCT.
VERMONT 05452

Phone: 802-878-5341
Fax: 802-878-2041

Thursday, January 11, 2001

RECEIVED

Vanasse Hangen Brustlin, Inc.
Attn.: Athanasia Robinson
Six Bedford Farms, Kilton Road
Bedford, NH 03110

JAN 1 6 2001
VHB, Inc.

Re: So. Burlington IM DECK(36)

Athanasia,

This letter is in response to the letter dated October 30, 2000, in which you asked for field verification of rail layout.

Robert Suckert, resident engineer on above mentioned project, and myself field verified the items listed below on January 10, 2001.

- The proposed bridge rail layout and approach rail layout has been field verified as shown on sheet 26 of the contract plans.
- The post locations on the wingwalls meet the minimum requirements as shown on Detail A, Sheet 26.

If you have any questions please feel free to contact me at the above noted number. Thank you.

Brent Tewksbury

Brent L. Tewksbury
Project Manager

Transportation
Land Development
Environmental
Services

VHB

Vanasse Hangen Brustlin, Inc.

Kilton Road
Six Bedford Farms, Suite 607
Bedford, New Hampshire 03110-6532
603 644-0888
FAX 603 644-2385

FAX
Transmittal

Deliver To:

Robert Suckert,
Resident Engineer

From:

Athanasia Robinson

Company:

Vermont Agency of
Transportation

VHB Project No.:

50929
IM DECK (36)
So. Burlington VT Br. 68
US 2 over I-89

Telephone No.:

1-(802)-658-6870

FAX No.:

1-(802) 658-6874

Original of Telecopy:

Will not be sent

Date and Time:

October 30, 2000

Total Number of Pages (Including Transmittal Form):

2

Bob,
I received a letter from the rail subcontractor at Lafayette Co.(attached) in response to VHB's previous request for field verification of the rail layout.

In order to clarify the information needed to complete our review, I have outlined them below.
Please forward a copy of this fax transmittal to the contractor for his response.
The contractor should respond by fax/letter that the following has been performed so we can finalize our review of the rail shop drawings.

- The proposed bridge rail layout and approach rail layout has been field verified as shown on sheet 26 of the contract plans.
- The configuration of the offset block has been determined from contractor's field measurements. (OK – noted on plans)
- The post locations on the wingwalls meet the minimum requirements as shown on Detail A-Sheet 26 of 75.

Once we have received this information, we will complete our review.

Athanasia Robinson

Athanasia Robinson

Structural Engineer

VHB, Inc.
Cc: Sherward Farnsworth, PE., VTrans (Fax. No. 1-802-828-3566)
Steve Johnson, PE., VHB, Proj. Folder, Proj. File

\\50929\docs\Transmittals\103000\ax88\Suckert.doc

F. R. LAFAYETTE
INC.

F. R. LAFAYETTE, INC.
32 KELLOGG RD
ESSEX JCT.
VERMONT 05432

Phone: 802 878-5341
Fax: 802 878-2041

RECEIVED

OCT 30 2000

VHB, Inc.

October 26, 2000

Vanasse Hangen Brustlin, Inc
Attn: Steve Johnson
Six Bedford Farms, Kilton Road
Bedford, NH 03110

Re: So Burlington IM DECK(36)

Gentlemen:

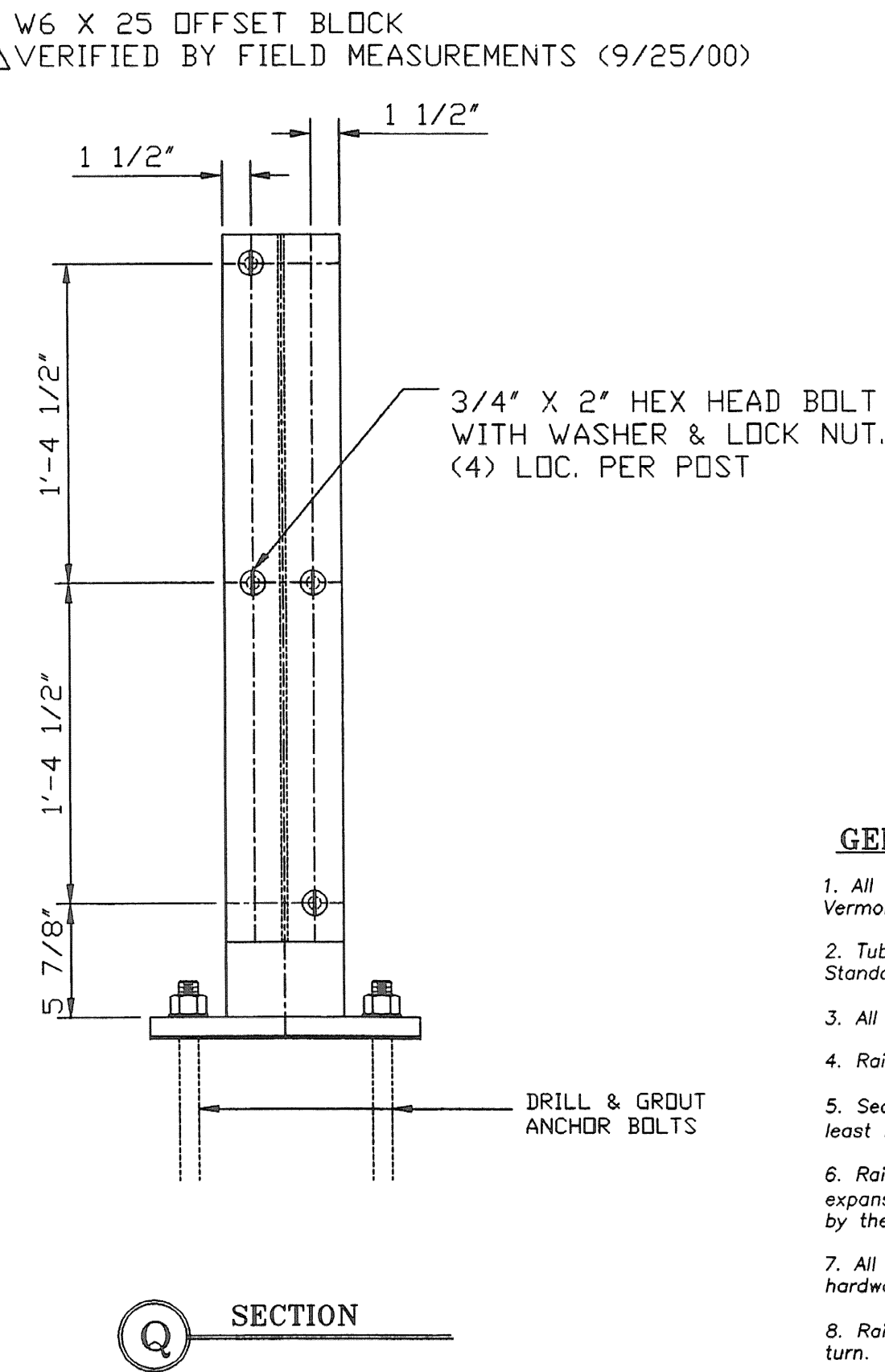
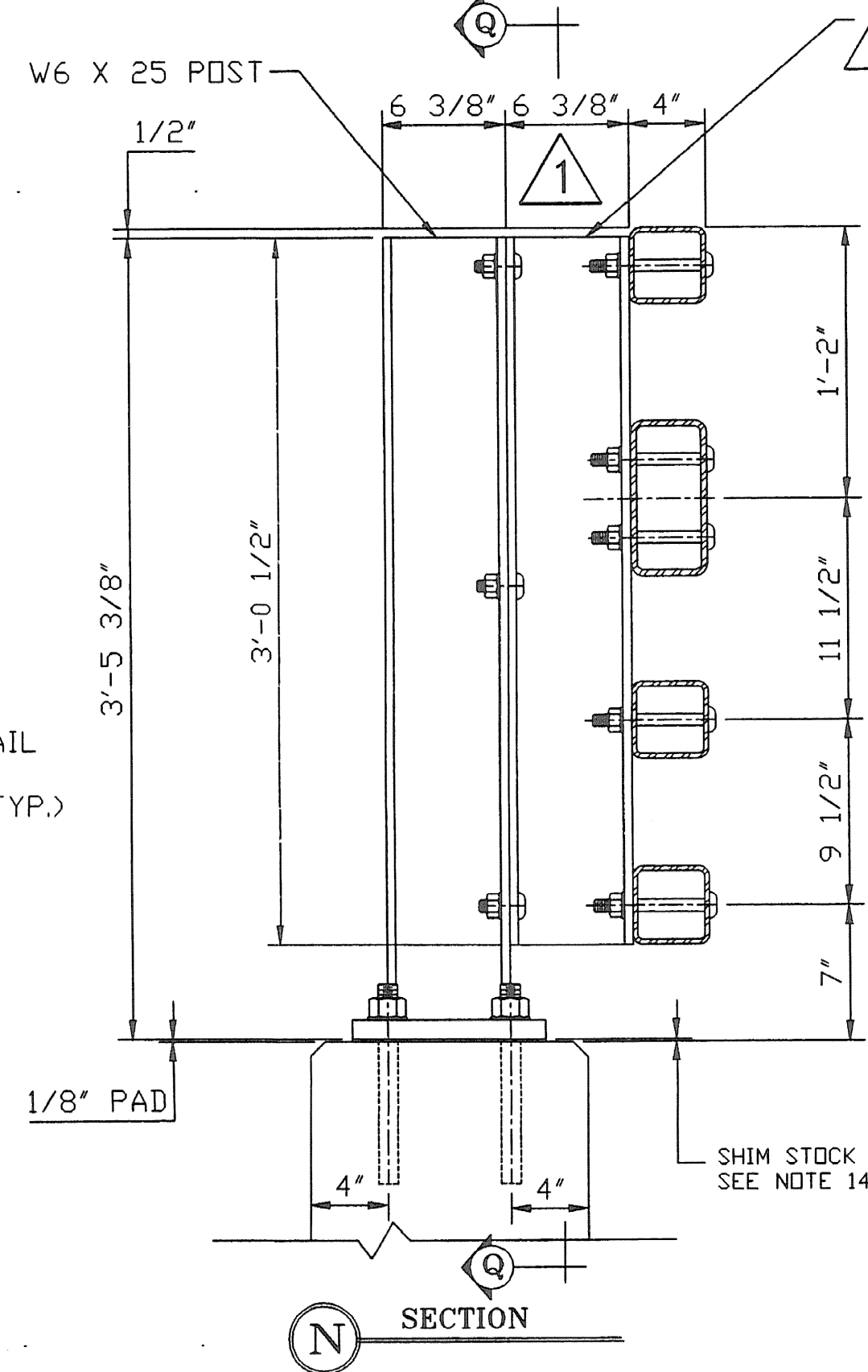
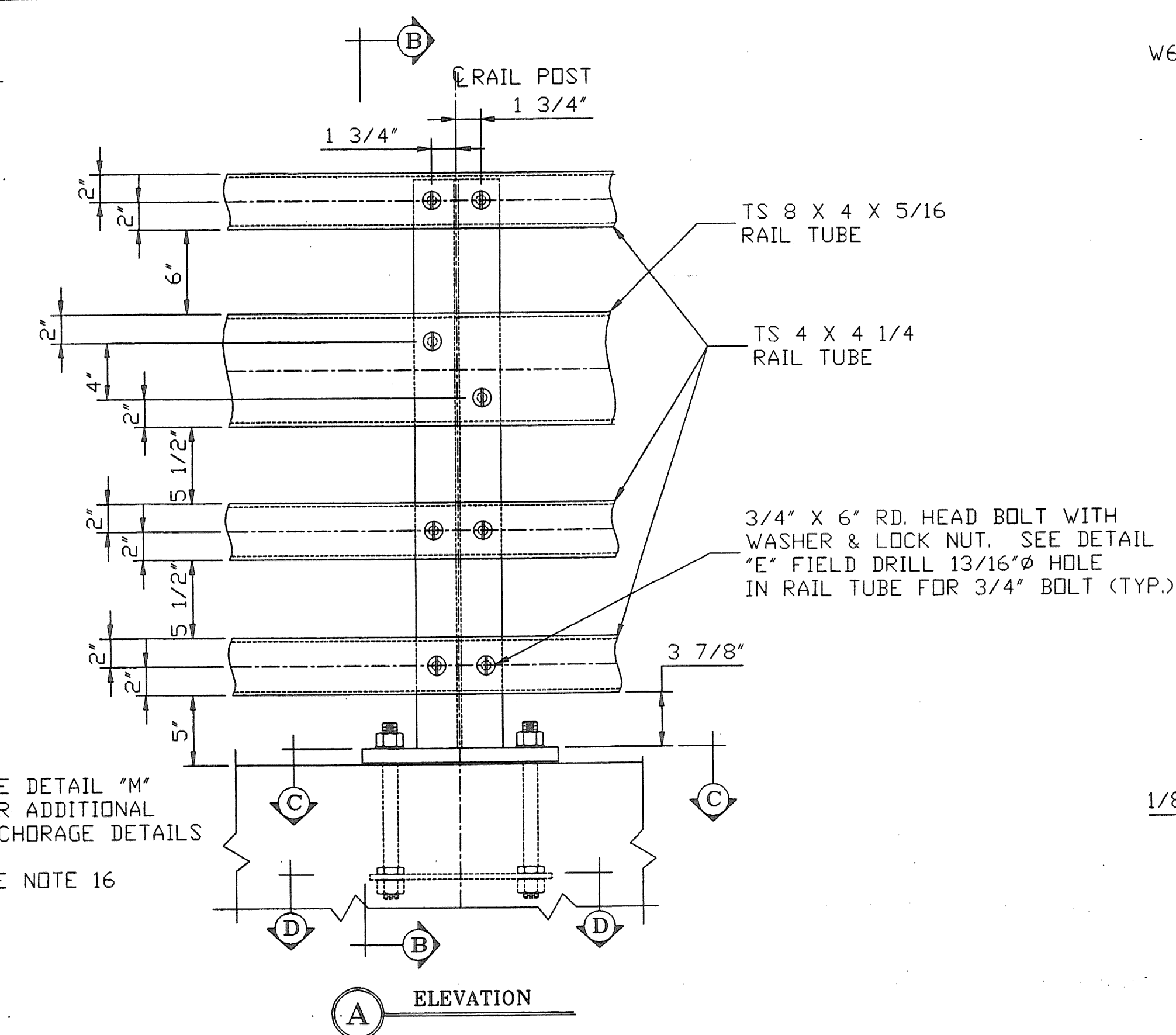
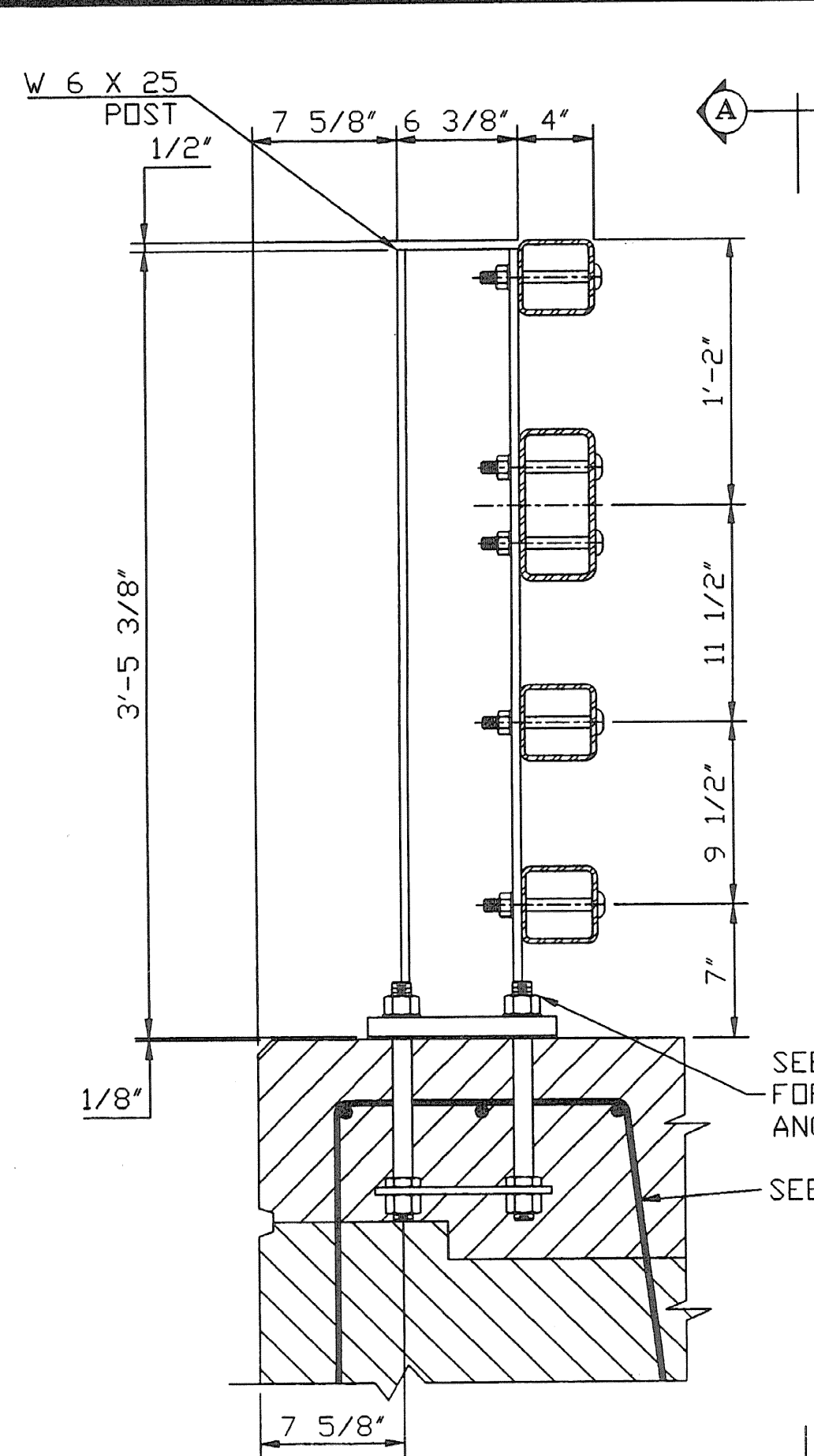
Please be advised that we field verified dimensions that were in question on the original shop drawings

If you have any questions please feel free to contact me at the above noted number.

Thank you.

Very truly yours,


President



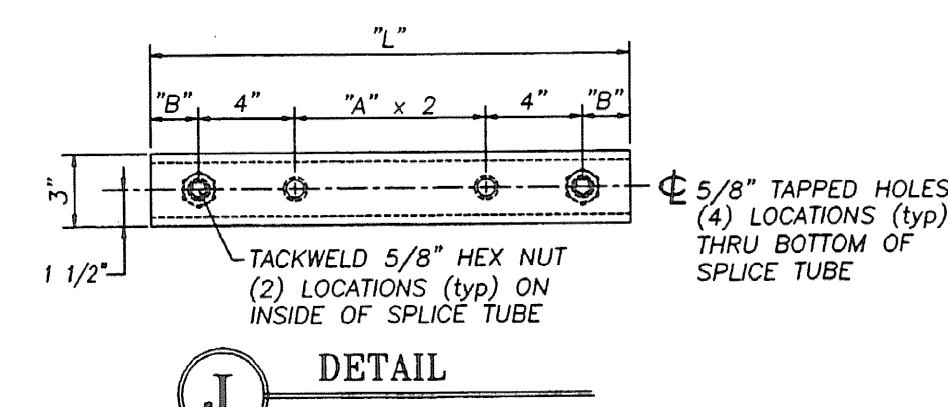
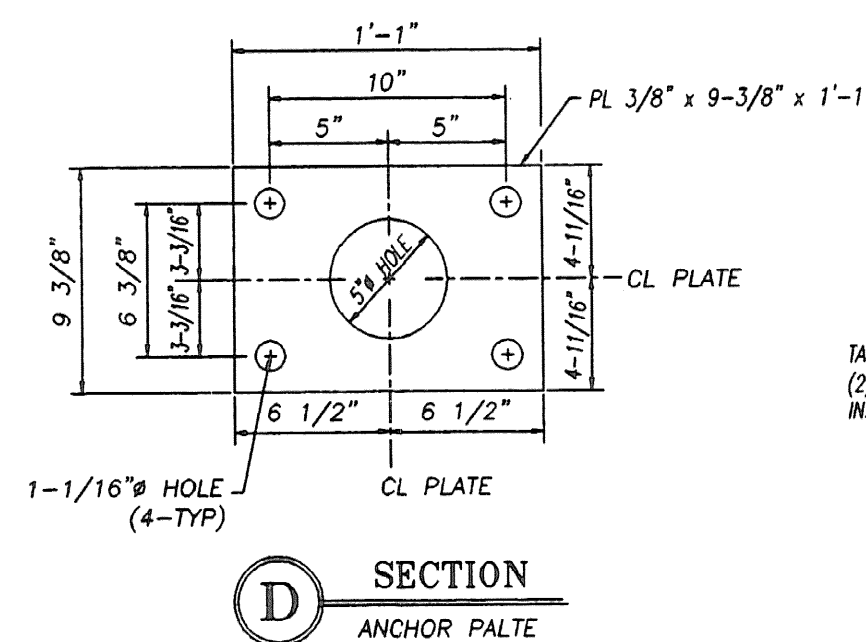
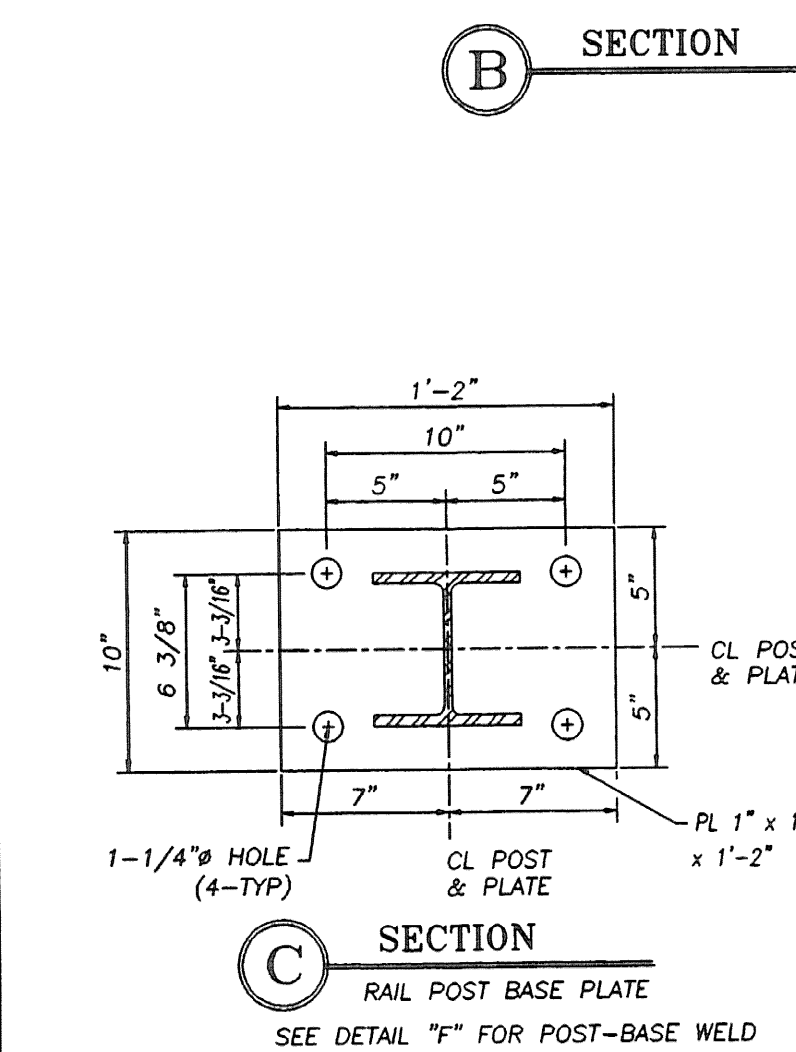
BILL OF MATERIAL			
Mk.	Qty.	Description	Total wgt.
66	1	RAIL POST W 6 x 25 WITH BASE PLATE	
8	1	SPEC. END POST W 6 x 25 W/BASE PLATE & OFFSET BLOCK	
66	1	ANCHORAGE ASSEMBLY WITH PLATE, (4) ANCH STUDS & HARDWARE	
8	1	DRILL & GROUT ANCHOR W/(4) STUDS & HARDWARE	
2	1	RAIL TUBE (TS 8 x 4 x 5/16) x 16'-7 1/2" OAL	
6	1	RAIL TUBE (TS 8 x 4 x 5/16) x 23'-11" OAL	
12	1	RAIL TUBE (TS 8 x 4 x 5/16) x 23'-11" OAL (EXP. END)	
4	1	RAIL TUBE (TS 8 x 4 x 5/16) x 21'-0" OAL	
6	1	RAIL TUBE (TS 4 x 4 x 1/4) x 16'-7 1/2" OAL	
18	1	RAIL TUBE (TS 4 x 4 x 1/4) x 23'-11" OAL	
36	1	RAIL TUBE (TS 4 x 4 x 1/4) x 23'-11" OAL (EXP. END)	
12	1	RAIL TUBE (TS 4 x 4 x 1/4) x 21'-0" OAL	
16	1	8" RAIL SPLICE TUBE (FIXED)	
48	1	4" RAIL SPLICE TUBE (FIXED)	
6	1	8" RAIL SPLICE TUBE (EXPANSION JOINT)	
18	1	4" RAIL SPLICE TUBE (EXPANSION JOINT)	
74	1	1/8" THICK BEARING PAD	
592	1	3/4 x 6" RD. HEAD BOLT WITH WASHER & LOCKNUT	
352	1	5/8 x 2" HEX HEAD BOLT WITH HARDENED WASHER	
96	1	3/4 SCH 40 SPACER PIPE 1/2" LONG	
32	1	3/4 x 2" HEX HEAD BOLT WITH WASHER & LOCKNUT	

GENERAL ERECTION NOTES

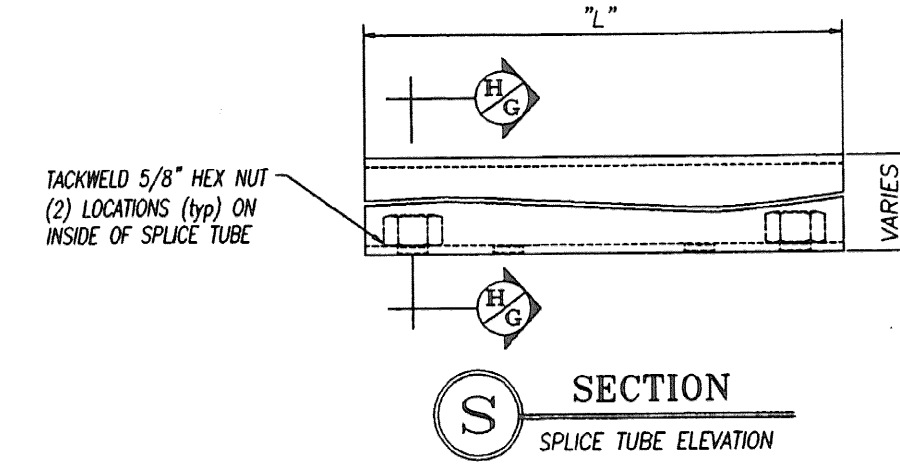
- All work and materials shall conform to the provisions of Section 525 - Railings of the Vermont Standard Specifications for Construction.
- Tubing & posts shall meet the requirements of Section 732 - Railing materials of the Standard Specifications for Construction.
- All exposed cut or sheared edges shall be ground to a 1/16" radius & be free of burrs.
- Rail posts shall be set normal to grade.
- Sections of rail bar shall be attached to a minimum of two (2) posts and preferably to at least four (4) posts.
- Rail bar expansion joints shall be provided in any rail bay spanning a superstructure expansion joint. Expansion joint width shall be "x" at 45° F and will be adjusted in the field by the engineer.
- All parts shall be galvanized after fabrication in accordance with AASHTO M111, except that hardware shall meet the requirements of AASHTO M232.
- Rail posts anchoring nuts shall be tightened to a snug-tight fit and given an additional 1/8 turn.
- Rail bars shall be attached using 3/4" full diameter body head bolts AASHTO M164 (Type-I) inserted through the face of the bar. Holes in post shall be 1/16" larger than the bolt size.
- Holes in rails for attachment to posts will be field-drilled. Holes shall be coated with an approved zinc-rich paint prior to erection.
- Radiused rails (if required) will be shop-curved. No field-bending of rail tubes.
- The drop-weight tear test in section 732 shall not apply to the structure tubing on this standard.
- New bridge rail posts on existing wingwalls shall include offset blocks to accommodate the proposed face of rail. The configuration of the offset block(s) shall be determined from field measurements. New rail posts shall be positioned on existing wingwalls so that the rail post anchor bolts are at least 4 inches away from the front face and back face of the existing wingwall masonry as shown on this sheet.
- New bridge rail post on existing wingwalls require a single shim plate between the 1/8" bearing pad and the railpost base plate. The shim plate thickness shall be determined from field measurements based on the increase in finished grade of the sidewalk and the existing elevation of the wingwall. Anchor bolt lengths for posts on wingwalls shall be adjusted to compensate for shim plate thickness.

MATERIALS

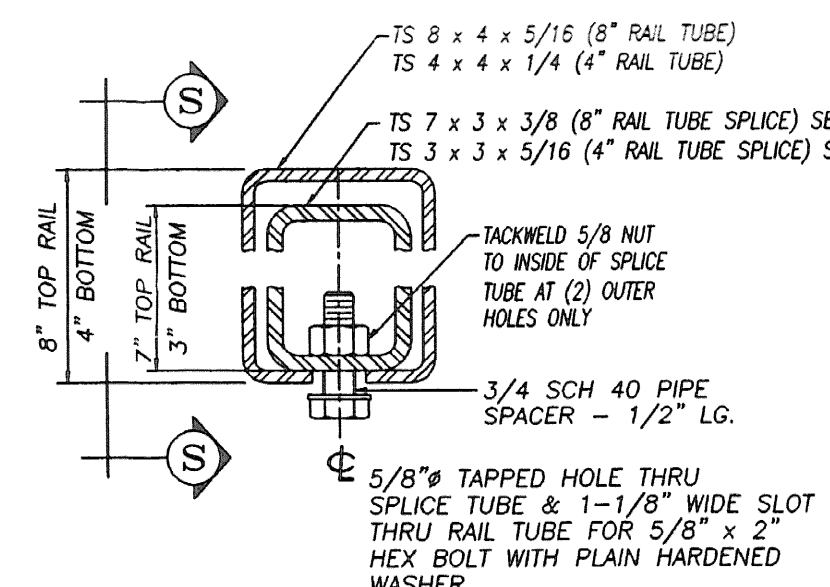
Rail bars.....ASTM A500 GR B or ASTM A501
 Rail posts.....ASTM A709 GR 50
 All other shapes & plates.....ASTM A709 GR 50
 Anchor studs.....ASTM A449
 All other bolts [unless noted].....AASHTO M164, TYPE I
 Nuts for ASTM A307 bolts & AASHTO M164 bolts shall comply with AASHTO M291. Nuts for anchor studs shall comply with ASTM A563.
 Washers shall comply with ASTM F436
 1/8" pad shall comply with standard specification subsection 731.01 or 731.02 of Vermont Standard Specifications.



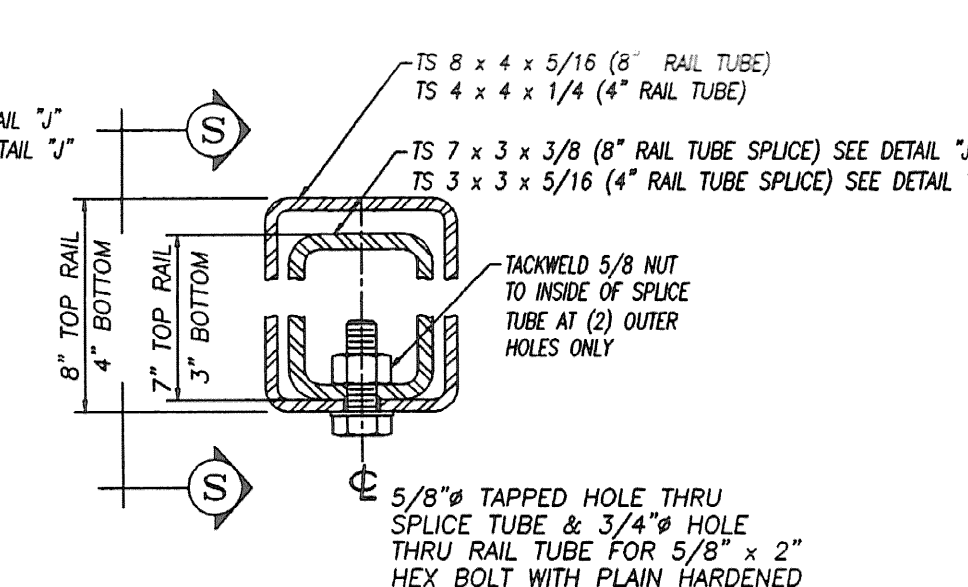
DETAIL
 SPLICE TUBE - BOTTOM VIEW
 (SEE CHART FOR DIMENSIONS)



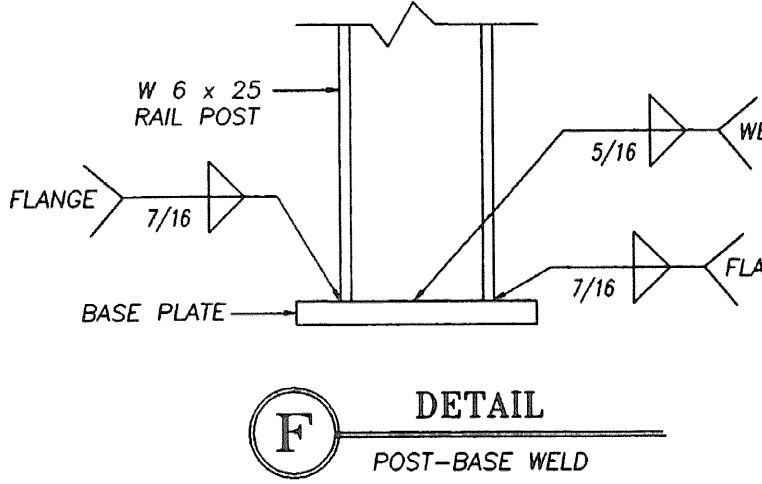
SECTION
 SPLICE TUBE ELEVATION



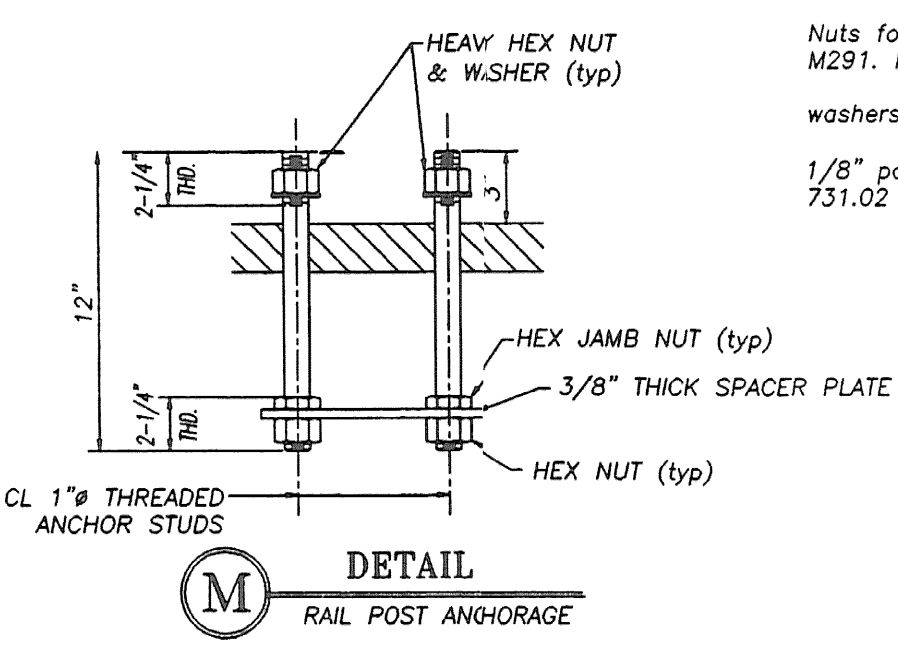
SECTION
 THRU EXPANSION SPLICE JOINT



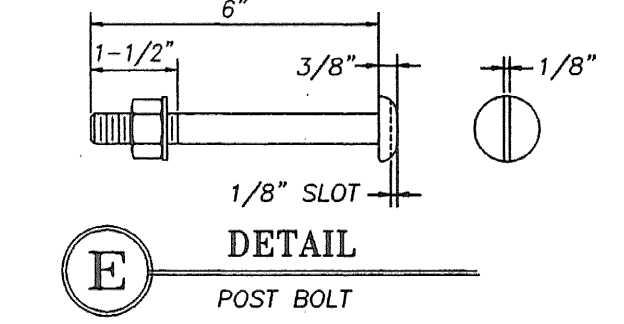
SECTION
 THRU FIXED SPLICE JOINT



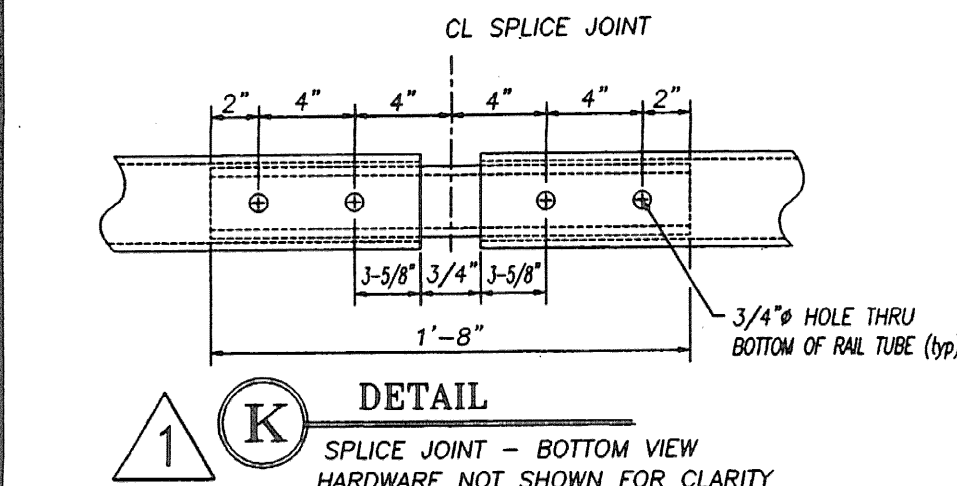
DETAIL
 POST-BASE WELD



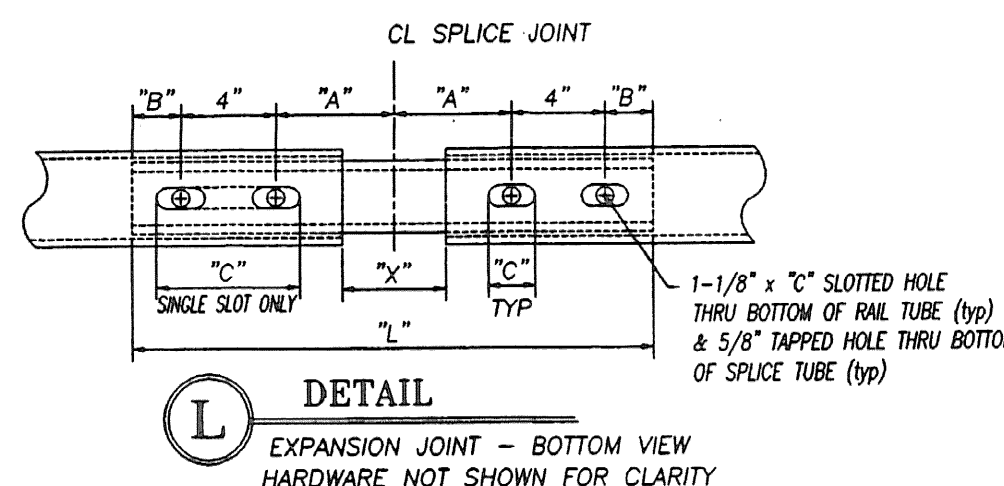
DETAIL
 RAIL POST ANCHORAGE



DETAIL
 POST BOLT



DETAIL
 SPLICE JOINT - BOTTOM VIEW
 HARDWARE NOT SHOWN FOR CLARITY



DETAIL
 EXPANSION JOINT - BOTTOM VIEW
 HARDWARE NOT SHOWN FOR CLARITY

SPLICE & EXPANSION JOINT TABLE					
"T"	"A"	"B"	"C"	"L"	"X"
SPLICE	4"	2"	20"	3/4"	
<4"	4"	2"	20"	2-1/2"	
>4" < 6-1/2"	5-1/2"	2-3/8"	3-1/2"	23-3/4"	4"
>6-1/2" < 9"	6-1/2"	3-3/8"	9"	27-3/4"	5"
>9" < 13"	8-1/2"	4-3/8"	11"	33-3/4"	7"

"T" = TOTAL REQUIRED MOVEMENT
 "X" = SINGLE SLOT

REVISIONS		
No.	Remarks	Date
0	Initial submittal	8/1/00
1	MISC CORRECTIONS, FIELD VERIFICATION	10/6/00

SHOP DRAWING REVIEW

REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWING, AND SPECIFICATIONS. THIS CHECK IS ONLY FOR REVIEW OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL CONFORMANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING HIS WORK WITH THAT OF ALL OTHER TRADES, AND PERFORMING HIS WORK IN A SAFE AND SATISFACTORY MANNER.

VHB Vanessa Hansen Brustin, Inc.
 Engineers, Planners, and Scientists
 Six Bedford Pkwy., Kilton Rd.,
 Bedford, NH 03110 603 844 0888

Job Number: 509339
 Reviewed By: A.S.B.
 Date: 1-19-01

HIGHWAY SAFETY CORP.
 GLASTONBURY, CT

ITEM 525.34 - BRIDGE RAILING - NETC 4 RAIL

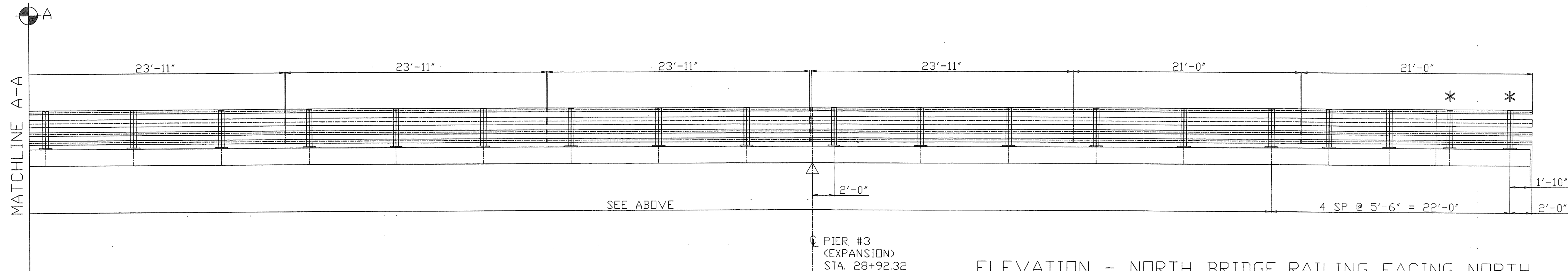
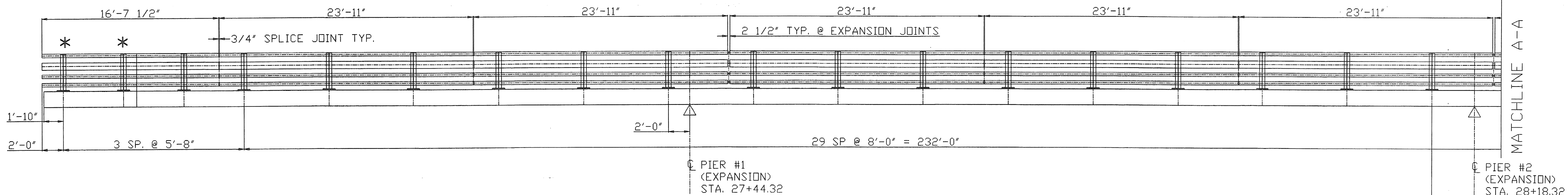
CITY OF SOUTH BURLINGTON
 US ROUTE 20VER I-89 @ EXIT 14
 IM DECK(36) BRIDGE #68

GENERAL CONTRACTOR
 SUB CONTRACTOR F.R. LAFAYETTE, INC.

DRAWN P. VUKAS
 CHECKED Paul R.
 DATE 07-31-00
 SCALE NONE
 HSC REFERENCE NO. 1213
 SIZE D REVISION 1
 SHEET NO. 2 of 2

BILL OF MATERIAL			
Mk.	Qty.	Description	Total wgt.

△ * - DENOTES SPECIAL WING WALL POST SEE SECTION "N" PAGE 2/2
VERIFIED BY FIELD MEASUREMENTS 9/25/00



ELEVATION - NORTH BRIDGE RAILING FACING NORTH
SOUTH BRIDGE RAILING SIMILAR
TOTAL PAY LIMIT ITEM 525.34(BRIDGE RAILING - 4 RAIL) = 550 LF

THE BRIDGE RAIL LAYOUT SHOWN IS BASED ON INFORMATION FROM EXISTING PLANS.
THE CONTRACTOR SHALL VERIFY THE PROPOSED BRIDGE RAIL LAYOUT PRIOR TO THE
FABRICATION OF BRIDGE RAIL.

REVISIONS		
No.	Remarks	Date
0	Initial submittal	8/7/00
1	misc corrections. field verification	10/6/00

SHOP DRAWING REVIEW	
☒ REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.	
☐ REJECTED	☐ REVISE AND RESUBMIT
CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWING SHALL BE MADE IN THE MARGIN OF THIS SHEET. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY APPROVALS FROM THE DESIGNER AND THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY APPROVALS FROM THE DESIGNER AND THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY APPROVALS FROM THE DESIGNER AND THE OWNER.	
VHIB Vannoy-Hughes Inc. Engineers, Planners and Surveyors 2000 N. Main St., Suite 100 Burlington, NH 05401	Job Number: 50929 Reviewed By: ASB Date: 1-19-01

HIGHWAY SAFETY CORP.	
GLASTONBURY, CT	
ITEM 525.34 - BRIDGE RAILING - NETC 4 RAIL	
CITY OF SOUTH BURLINGTON US ROUTE 20 VER I-89 @ EXIT 14 IM DECK(36) BRIDGE #68	DRAWN P. VUKAS CHECKED <i>[Signature]</i> DATE 07-23-00 SCALE NONE HSC REFERENCE NO. 1213 GENERAL CONTRACTOR SUB CONTRACTOR F.R. LAFAYETTE, INC.
SHEET NO. 1 of 2	



Transportation
Land Development
Environmental Services

Kilton Road
Six Bedford Farms, Suite 607
Bedford, NH 03110-4532
603 644 1885
FAX: 603 644 2385

Yvanasse Hangen Brustlin, Inc.

TRANSMITTAL

To: Robert Suckert, PE, Resident Engineer
Vermont Agency of Transportation
209 South Pinnacle Ridge Road
Waterbury, VT 05676

Date: 1-19-01	VHB Project No.: 50929
Re: South Burlington IM DECK 36 Bridge No. 68 and STP BIKE (28) S	

The Following details as outlined below, Item No.621.73 ,Description Guardrail Approach Section NETC 4 Rail for the above project transmitted with your letter dated September 8, 2000 have been reviewed and are being returned herewith:

We are sending you: ☒ Attached ☐ Under Separate cover via Regular Mail the following items:

☒ Shop drawings ☐ Prints ☐ Plans ☐ Diskettes ☐ Specifications ☐ Copy of Letter ☐ Change Order

☐ Other _____

Copies	Date	No.	Description
as noted below	9/8/00		Bridge Approach Rail Shop Drawings

These are transmitted as checked below:

☐ Reviewed as required by the construction contract documents and approved, but only for conformance to the design concept of the work, and subject to further limitations and requirements contained in the construction contract documents. ☐ Rejected ☐ Revise and Resubmit ☒ Furnish as Corrected

REMARKS: There shall be no fabrication done until all drawings and welding procedures are approved or approved as noted. You must provide written notice to the Vermont Agency of Transportation (VTrans) Structures Section office as to the date fabrication represented by these drawings will begin. **That notice must be received at least seven days prior to that date, as per Specifications 506.03. Any material fabricated prior to the notification date is subject to rejection without further cause.**

Copy to: VTrans Resident Engineer, Robert E. Suckert, P.E. w/prints
Contractor, J.A. McDonald, Inc w/prints
Subcontractor: F.R. Lafayette w/prints By:
VTrans Consultant Project Manager , Sherward Farnsworth, PE
w/prints
VTrans Structures Section – Shop Inspector – Jeff Clark – w/prints
VTrans Construction Section - letter only
VTrans Materials & Research Section (C&IA Unit) – letter only

VHB Project Manager, Steve Johnson, PE ,VHB Project File

Ashangia S. Robinson, VHB
Ashangia Robinson

F. R. LAFAYETTE,
INC.

F. R. LAFAYETTE, INC.
31 KELLOGG RD.
ESSEX JCT.
VERMONT 05452

Phone: 802 878-5341
Fax: 802 878-2041

RECEIVED

SEP 11 2000

VHB, Inc.

September 8, 2000

Vanasse Hangen Brustlin, Inc
Attn: Steve Johnson
Six Bedford Farms, Kilton Road
Bedford, NH 03110

Re: So Burlington IM DECK(36)

Gentlemen:

The enclosed shop drawings are being submitted for approval. Please return approved shop drawings to F. R. Lafayette, Inc. as soon as possible. .

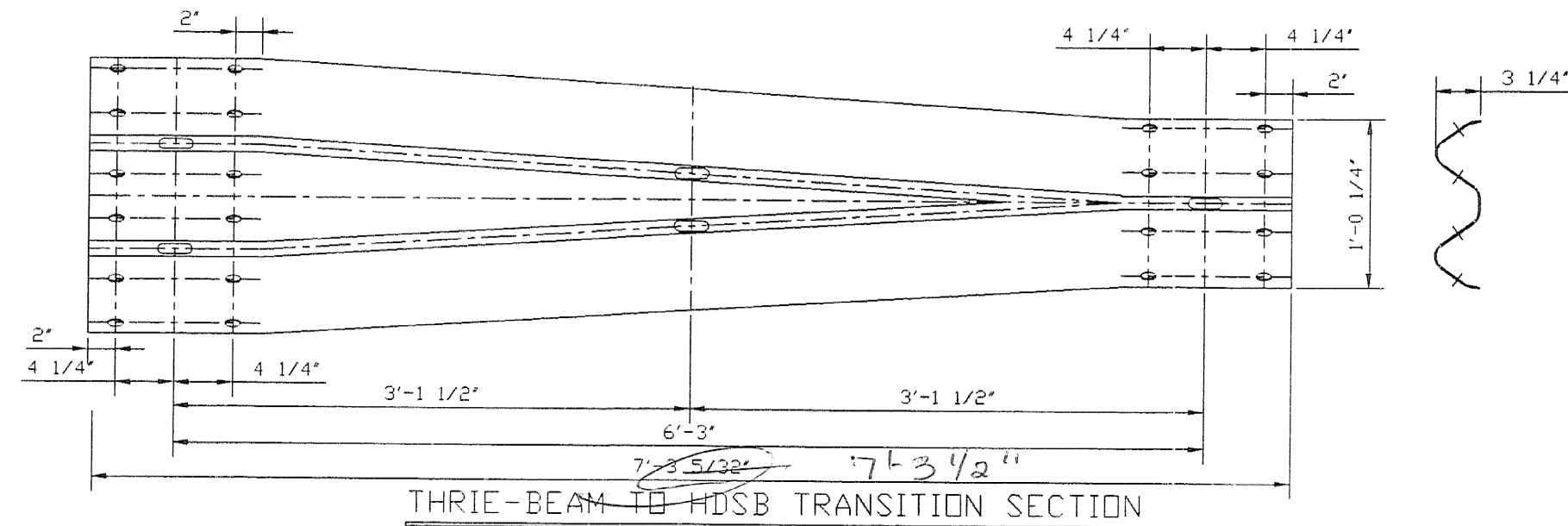
If you have any questions please feel free to contact me at the above noted number.

Thank you.

Very truly yours,

F. R. Lafayette

President



BILL OF MATERIAL				
Mk.	Qty.	Description	Material	Total wgt.
1/4"	12	TUBE 4" x 4" x 24'-11"	A500 GR B	
	4	TUBE 8" x 4" 5/16" x 24'-11"	A500 GR B	
	4	12GA THREE TRANSITION PANEL 7'-3 1/2"	M180 A2	
	4	THREE TERMINAL CONNECTOR 2'-6"	M180 A2	
	4	CONNECTOR PLATE	A36	
	12	END CAP FOR 4" x 4" RAIL	A36	
	4	END CAP FOR 8" x 4" RAIL	A36	
	12	ANGLE SPICE TUBE FOR 4" x 4" RAIL	A500 GR B	
	4	ANGLE SPICE TUBE FOR 8" x 4" RAIL	A500 GR B	
	32	POST W6X25 X 8'-8"	A572 GR 50	
	12	WOOD POST 6" X8" X 7'-0"		
	12	WOOD BLOCK 6" x 8" x 1'-10 1/2"		
	80	5/8" PANEL SPICE BOLT WITH NUT	A307	
	36	3/4" x 8" CARRIAGE BOLT WITH NUT & FW	A307	
24	3/4" x 18 HEX BOLT WITH NUT & FW	A307		
256	3/4" x 6 SLOTTED HD BOLT WITH FW & LN	A325		
64	5/8" x 1.75 TUBE SPICE BOLT WITH FW	A325		

GENERAL ERECTION NOTES

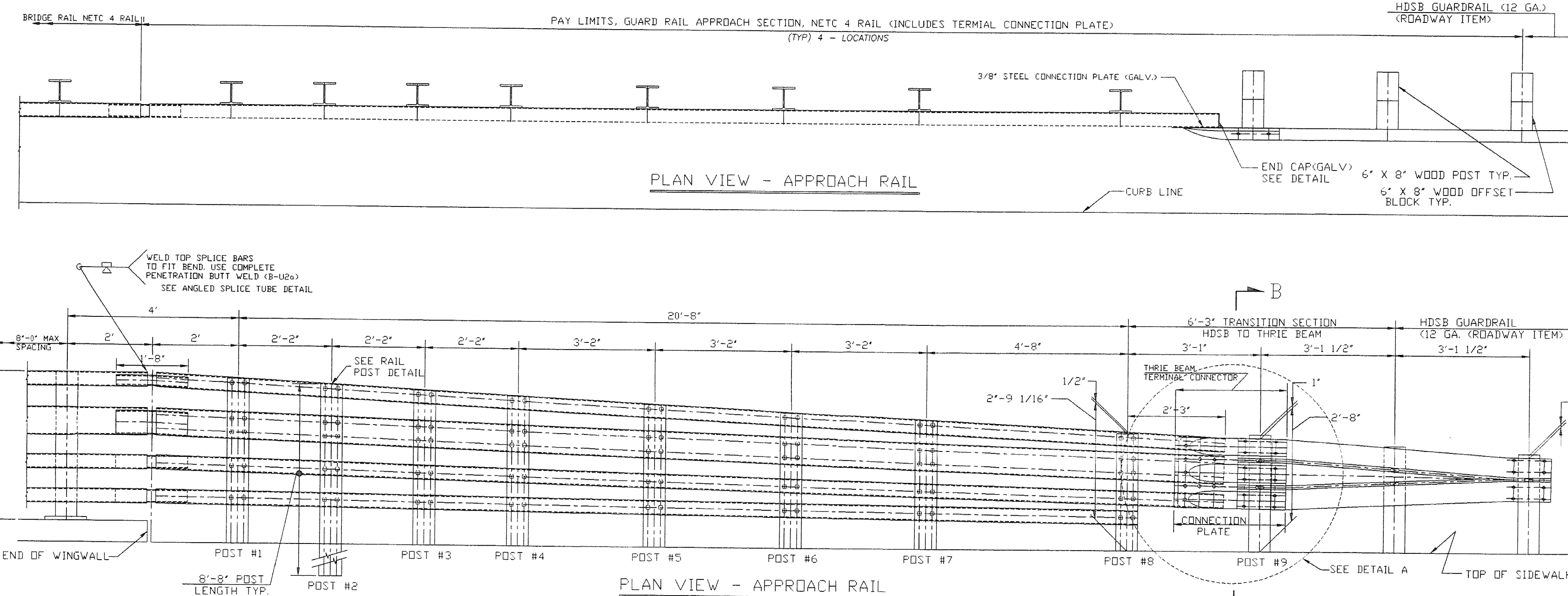
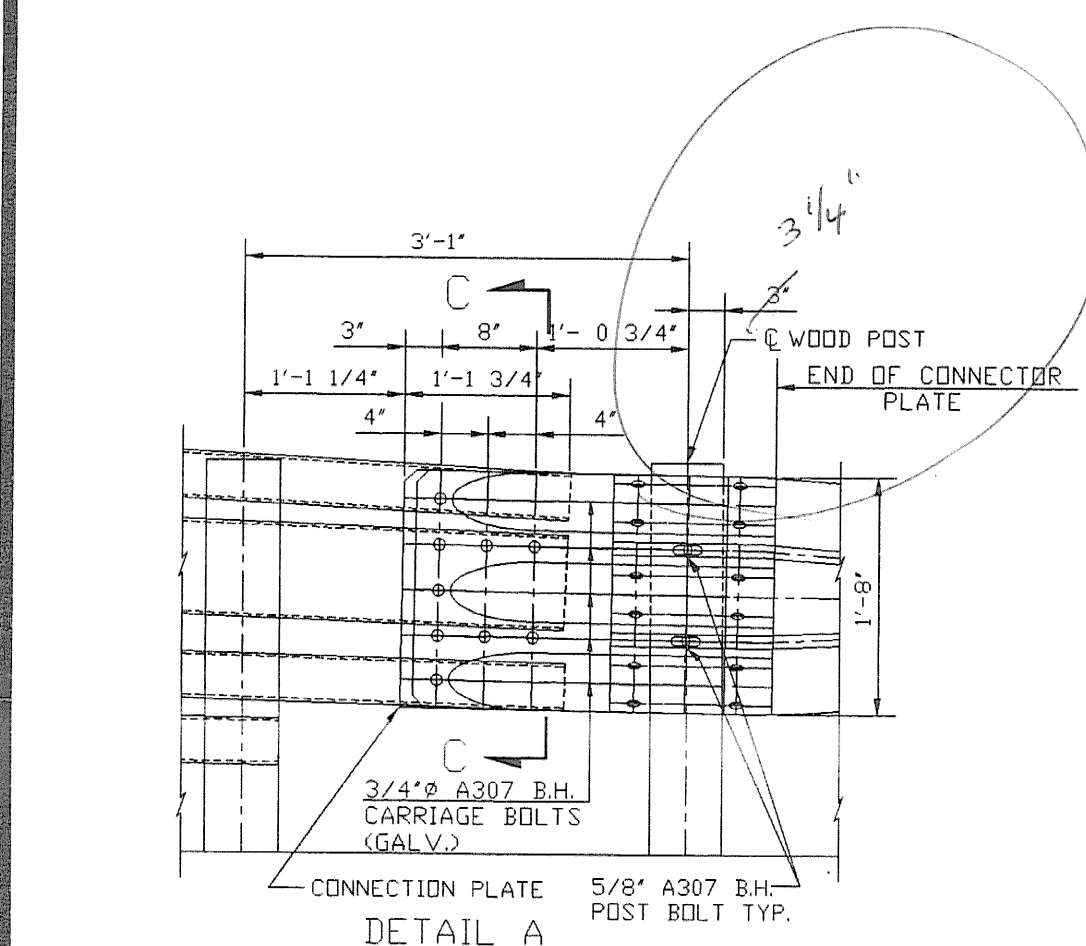
1. All work and materials shall conform to the provisions of Section 525 – Rollings of the Vermont Standard Specifications for Construction.
2. Tubing & posts shall meet the requirements of Section 732 – Railing materials of the Standard Specifications for Construction.
3. All exposed cut or sheared edges shall be ground to a $1/16"$ radius & be free of burrs.
4. Rail posts shall be set normal to grade.
5. Sections of rail bar shall be attached to a minimum of two (2) posts and preferably to at least four (4) posts.
6. Rail bar expansion joints shall be provided in any rail bay spanning a superstructure expansion joint. Expansion joint width shall be "X" at 45° F and will be adjusted in the field by the engineer.
7. All ports shall be galvanized after fabrication in accordance with AASHTO M111, except that hardware shall meet the requirements of AASHTO M232.
8. Rail posts anchoring nuts shall be tightened to a snug-tight fit and given an additional 1/8 turn.
9. Rail bars shall be attached using $3/4"$ # full diameter body head bolts AASHTO M164 (Type-I) inserted through the face of the bar. Holes in post shall be $1/16"$ larger than the bolt size.
10. Holes in bars for attachment to posts will be drill-flamed. Holes shall be coated with an approved zinc-rich paint prior to erection.
11. Radiused rails (if required) will be shop-curved. No field-bending of rail tubes
12. The drop-weight tear test in section 732 shall not apply to the structure tubing on this standard.

MATERIALS

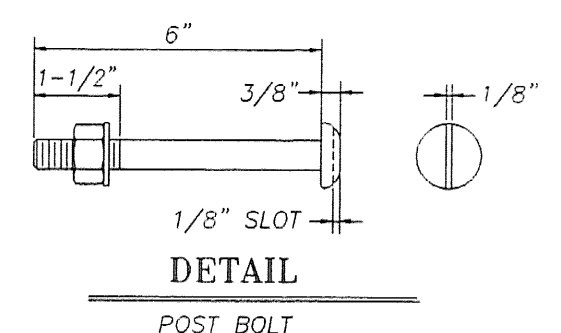
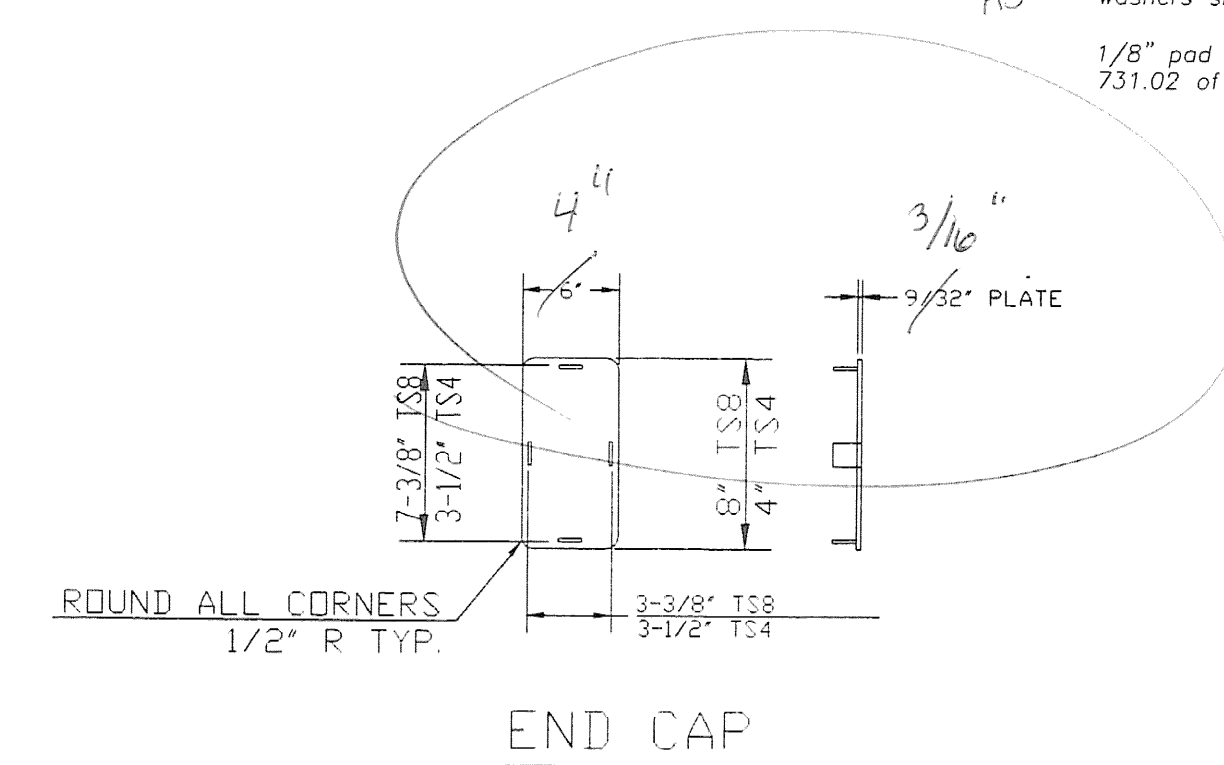
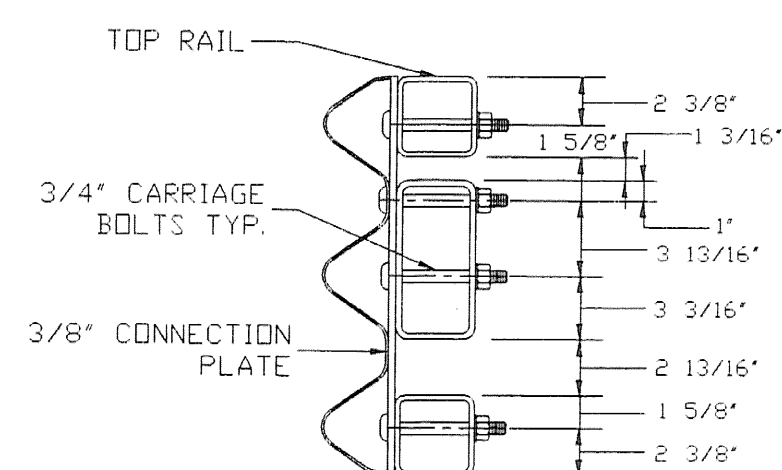
Rail bars.....	ASTM A500 GR B or ASTM A501
Rail posts.....	ASTM A709 GR 50
All other shapes & plates.....	ASTM A709 GR 36
Anchor studs.....	ASTM A449
All other bolts [unless noted].....	AASHTO M164, TYPE I

Nuts for ASTM A307 bolts & AASHTO M164 bolts shall comply with AASHTO M291. Nuts for anchor studs shall comply with ASTM A563.

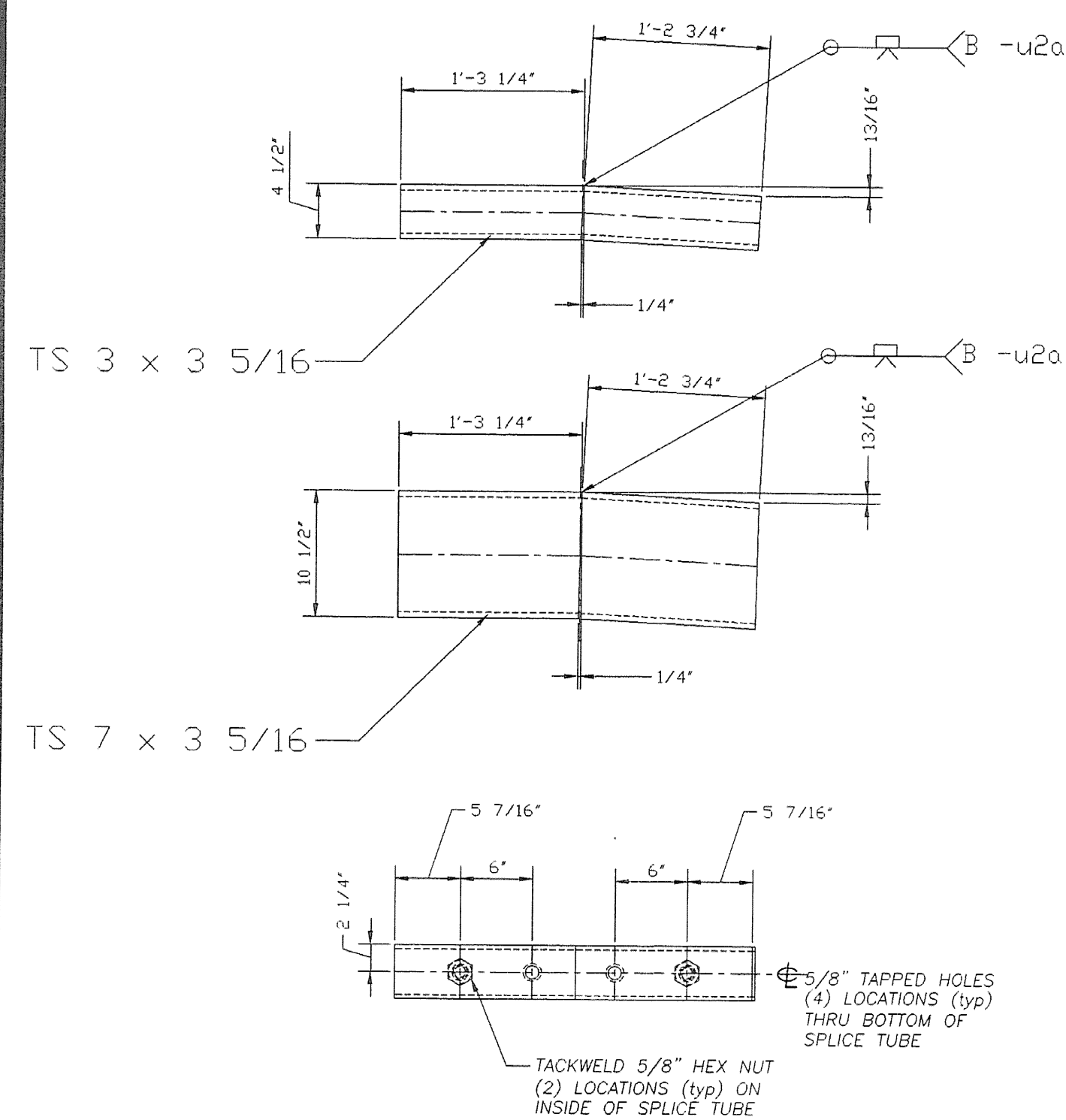
1/8" pad shall comply with standard specification subsection 731.01 or 731.02 of Vermont Standard Specifications.



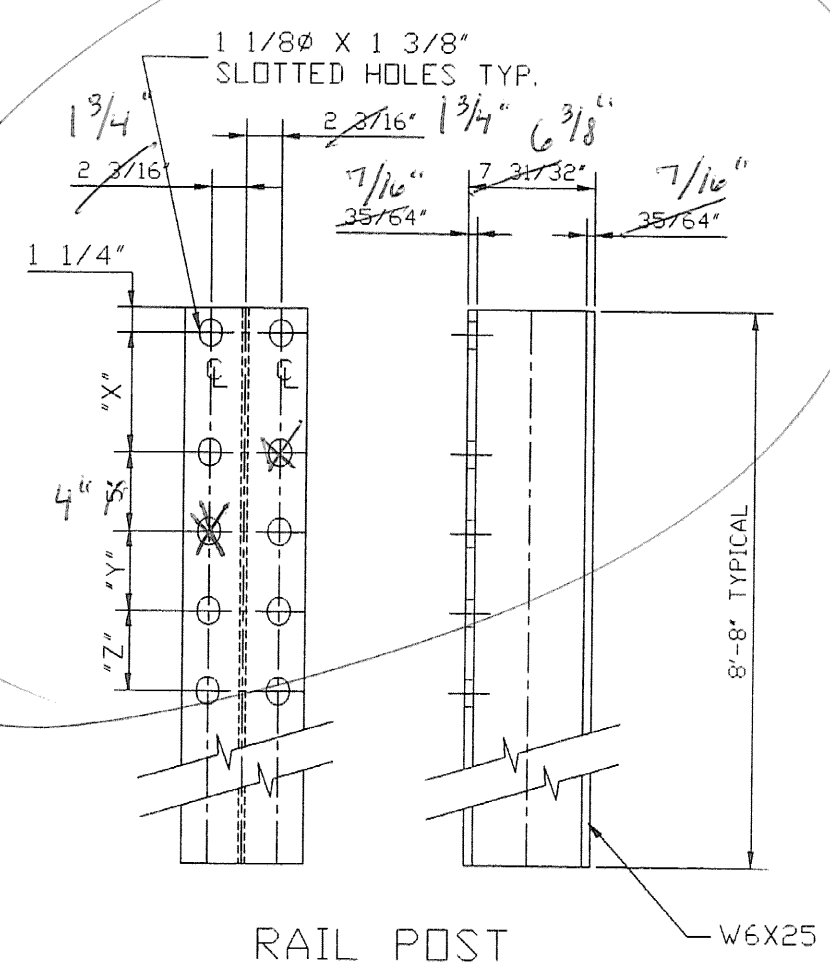
SECTION C-C (CONNECTION PLATE)



3/4"Ø M164 (TYPE I) ROUND HEAD BOLT WITH
WASHER & LOCKNUT (typ) FOR ALL RAIL TO POST
CONNECTIONS, THRU "FIELD-DRILLED" 13/16"Ø HOLES IN RAIL TUBE



SPLICE TUBES



HOLE PATTERN DIMENSIONS IN RAIL POSTS			
POST #	"X"	"Y"	"Z"
POST # 1	10 1/8"	9 9/16"	8 15/16"
POST # 2	9 3/4"	9 5/16"	8 9/16"
POST # 3	9 5/16"	9 1/8"	8 3/16"
POST # 4	8 15/16"	8 7/8"	7 13/16"
POST # 5	8 5/16"	8 1/2"	7 1/4"
POST # 6	7 11/16"	8 3/16"	6 11/16"
POST # 7	7 1/16"	7 13/16"	6 3/16"
POST # 8	6 3/16"	7 5/16"	5 5/16"

Verify ~~these~~ these dimensions with the Rail post Detail

REVISIONS		
No.	Remarks	Date
0	Initial submittal	9/1/00

SHOP DRAWING REVIEW

- ☐ REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.
- ☐ REJECTED ☐ REVISE AND RESUBMIT ☒ FURNISH AS CORRECTED

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS PERIOD, DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THIS CHECK IS ONLY FOR AID OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR: CONFIRMING AND CORRECTING ALL QUANTITIES AND DIMENSIONS; SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION; COORDINATING HIS WORK WITH THAT OF ALL OTHER TRADES; AND PREPARING HIS WORK IN A SAFE AND SATISFACTORY MANNER.

Job Number: 50929
Reviewed By: ASR
Date: 9-21-00



HIGHWAY SAFETY CORP.
GLASTONBURY, CT

ITEM 621.73 - BRIDGE RAILING - NETC 4 RAIL	URA
	CHE

CITY OF SOUTH BURLINGTON
US ROUTE 2 OVER I-89 @ EXIT 14
IM DECK(36) BRIDGE #68

GENERAL CONTRACTOR	
SUB CONTRACTOR	F. R. LAFAYETTE, INC.

DRAWN	P. VUKAS	
CHECKED	<i>P.R.</i>	
DATE	09-05-00	
SCALE	NONE	
HSC REFERENCE NO.		
1225		
SIZE	D	REVISION 0
SHEET NO.		
1 of 1		