

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION 806**

**FIELD OFFICE
September 9, 1997**

806.01 Description

806.02 General

806.03 Computer Equipment for Field Office

806.04 Basis of Payment

806.01 Description. This item shall consist of providing, maintaining and subsequently removing a field office for the exclusive use of the Department for the duration of the contract at a location approved by the Engineer. The field office will be designated as Type A, B or C.

806.02 General. The field office shall be available and completely functional at a time directed by the Engineer. The office shall have a minimum ceiling height of 2.1 m (7 feet) and have provisions for maintaining room temperature between 20 and 27 C (68 and 80 F). The Type C field office shall have a separate enclosed room for the Engineer. The Contractor shall provide and maintain telephone and electric service. One phone shall be connected to a recorded answering device. One speaker phone shall be required for Type B or Type C facilities. All field office types shall have one copying machine ;the copier shall be provided with all necessary maintenance and paper supplies, and be capable of producing multiple copies of documents up to 216 by 356 mm (8 1/2 by 14-inch) in size. The Type B and Type C field offices shall have a facsimile machine.

The office shall be provided with potable hot and cold water. The office shall also have neat, sanitary, enclosed toilet accommodations; associated lavatory and sanitary supplies shall be furnished. Portable facilities may be provided with the approval of the Engineer.

On all projects requiring moisture and density control of construction materials, the field office shall contain a storage box for a nuclear density gauge in accordance with drawings on file with the Director.

Additional requirements for field office and office equipment are as specified in the following table:

FIELD OFFICE

Item	Type A	Type B	Type C
Floor Space, m ² (sq. ft.).....	14 (150)	46 (500)	93 (1000)
Telephone	2	4	4
Base Radio & 4-Hand Held Units ¹	--	--	1
10 Column Electronic Calculator with Tape	1	2	3
Desk and Chair Set	1	3	5
Work Tables, 750 by 1800 mm (30 by 72-inch)	1	2	3
4 Drawer, Legal Size, Lockable Metal File Cabinet	--	1	2
2 Drawer, Metal File Cabinet ...	1	2	2
Portable Fire Extinguishers - Type 2A10BC-5#	1	1	2
All Weather Parking Spaces ...	4	8	10
Plan Rack ²	1	1	2

1. Units shall be capable of transmitting and receiving voice communication between office and any area on the project site.

2. Capable of handling the breakdown of 559x864 mm (22x34 inch) sized plans in to 10 sections.

The preceding requirements for the field office may be modified only upon written approval of the Engineer.

806.03 Computer Equipment for Field Office. Where required, the Contractor shall furnish, install, and maintain the following computer hardware and software in the field office required by this item for the life of the contract. All computer hardware and software furnished shall be for the exclusive use of the Engineer and staff and shall be operable at the same time as the field office.

This system shall not experience down time exceeding 48 hours from notification by the Engineer. The Contractor shall replace stolen, vandalized, or units otherwise inoperable within 48 hours after notification by the Engineer. Upon completion of the contract, the hardware and software furnished by the Contractor shall remain the property of the Contractor.

Computer Hardware

- (1) One IBM PC compatible computer with an Intel Pentium processor (or equal) operating at a minimum 200 MHz. The computer shall be provided with the following **minimum** requirements:
 - a. 2.1 Gigabyte hard disk
 - b. 32 Megabytes RAM

- c. one 3.5 inch., 1.44 MB floppy drive
- d. one 8x CD-ROM drive
- e. 101 key keyboard
- f. 15 inch Hi-Res Super VGA Color Monitor 1024 X 768 resolution with .28 dot pitch and Hi-Res Super VGA Card with 2 Megabytes of Video RAM.
- g. 2 Button Microsoft compatible mouse with appropriate software, compatible with required software.
- h. At least 1 parallel port and 1 serial interface port and 1 mouse port.
- i. one 56K firmware upgradeable 3Com compatible modem

(2) Hewlett Packard LaserJet compatible (PCL3 emulation) 6 page per minute printer or approved equal and parallel printer cable.

(3) Surge Protector. 15 amp six outlet with circuit breaker control, phone line circuit surge protection and a surge indicator light.

Computer Software

The Contractor shall furnish, load, and maintain the following software on the computers provided in the field offices: Microsoft Windows 95 (with games removed) and the Corel Professional Edition Office Suite Version 8.

All computer hardware and software shall be maintained by the Contractor during the life of the contract. Information for proposed "equal" equipment shall be submitted to the Engineer and be approved prior to use.

Along with the furniture under 806.02, the Contractor shall also provide the necessary stands, tables, etc. to accommodate the computer system.

806.04 Basis of Payment. The field office will be paid for at the contract price bid, which price shall be full compensation for furnishing, maintaining and subsequently removing the field office and all incidentals necessary to complete this item. The field office and any required computer equipment shall be paid on a monthly basis. The contract bid price shall be full compensation for furnishing, setting up, maintaining, and subsequently removing the specified computer hardware and software from the field office.

Item	Unit	Description
806	Month	Field office, Type _____
806	Month	Computer equipment for field office

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION 865**

PRESTRESSED CONCRETE BRIDGE MEMBERS

January 6, 1998

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865.01 Description and Definitions. This item shall consist of the manufacture, transportation, storage and erection, fabricator performed quality control (QC) and documentation of prestressed concrete bridge members produced in accordance with the plans, proposal and this specification.

ASTM	American Society of Testing and Materials
OMM	Office of Materials Management.
OSE	Office of Structural Engineering.
PCI	Precast/Prestressed Concrete Institute.
PFQCS	Prestressed fabrication quality control specialist.
QA	Quality assurance.
QC	Quality control.

865.02 Fabricator Approval. Fabricators shall be pre-qualified by the Office of Materials Management (OMM). Requests for pre-qualification shall be made by the Fabricator in writing to the Office of Materials Management, Cement and Concrete Engineer. The pre-qualification process and its requirements are listed in this specification. The Contractor shall select a fabricator from the pre-qualified prestressed fabricator list in effect at the date of contract letting. The list will be on file in the Office of Materials Management. The Contractor shall inform the District Construction Engineer and the Office of Materials Management of the selected Fabricator.

865.03 Fabricator Pre-qualification. OMM shall perform a facilities inspection for pre-qualification evaluation of a fabricator. Fabricators that meet all requirements will be assigned a fabrication level and will be included on the pre-qualified prestressed fabricator list. The pre-qualified prestressed fabricator list will be updated as necessary by OMM.

A pre-qualified Fabricator does not guarantee the work performed will meet quality and conformance requirements of the contract. Final conformance is the responsibility of the Contractor.

865.04 Levels of Fabrication Qualification. There are three levels of Fabricator qualification. Each Fabricator shall be listed at the highest level of fabrication they are qualified to perform.

Level	Description of Capabilities
One	Straight strand prestressed box beam members
Two	Straight strand prestressed I-beam members
Three	Draped strand prestressed I-beam members

865.05 Fabricator Evaluation and Required Qualifications. Fabricators requesting pre-qualification shall have a fabrication facilities inspection performed by OMM. A facilities inspection check list is part of this specification (see Appendix I). During the inspection the Fabricator will furnish OMM's representative with documentation to validate the Fabricator meets the criteria listed below:

Precast/Prestressed Concrete Institute (PCI) Certification

Level 1 - PCI Group B3

Level 2 - PCI Group B3

Level 3 - PCI Group B4

Fabricator inspection personnel shall meet the requirements of 865.051.

Welders shall meet the requirements of 865.11.

865.051 Quality Control Personnel Qualifications. The Fabricator shall designate one individual as their Prestressed Fabrication Quality Control Specialist (PFQCS). The PFQCS shall be a PCI Certified Level II Technician. The Fabricator shall furnish the PFQCS with all tools and equipment necessary to provide quality control (QC) on all facets of the prestressed fabrication. The PFQCS shall have a thorough understanding of the plans, supplements, proposal and specifications pertaining to the project. The PFQCS shall be responsible for inspecting all equipment at the specified intervals and the fabricated work at all quality control points. The PFQCS shall have the direct authority to stop work and report non-conforming work to the Contractor and OMM. The person assigned as a PFQCS shall be designated the duties full time with no other assigned duties.

The qualifications of the PFQCS shall be approved prior to the Fabricator being qualified. The Fabricator shall provide a resume listing qualifications, work experience and date of PCI certification. The PFQCS shall not be changed without the approval of OMM.

The PFQCS shall be responsible for documenting all inspection hold points (Appendix II) for each fabricated component to show conformance with the specification and contract documents. The Fabricator is responsible for providing supervisory and/or any additional QC inspection personnel to control the work properly and to assure satisfactory materials and workmanship. The use of production staff or additional QC staff for specific quality control functions does not eliminate the PFQCS's responsibility for documentation, QC and final acceptance of fabricated components at all required hold points.

QA inspection forms in Appendix II are for OMM quality assurance (QA) inspectors. While they define areas of rating by QA inspectors, these forms are not intended as forms for the Fabricator's PFQCS to use. QC inspection forms are the responsibility of the Fabricator to develop to assure that all facets of fabrication are documented for each member and to assure their QA rating by OMM inspectors.

865.06 Fabricator Rating System. OMM shall evaluate the Fabricator's level of quality throughout the fabrication process. This evaluation will include quality assurance reviews of shop drawings, material test reports and control, QC documentation, and shop Quality Assurance (QA) inspection.

OMM shall perform random and/or specific hold point QA inspections (see Appendix II). OMM may choose to waive any or all parts of the QA inspection. The Office of Structural Engineering, under OMM oversight, will perform QA reviews of Contractor approved shop drawings. The QA rating forms associated with each process are in the Appendix II of this specification.

The Fabricator shall perform QC and provide documentation for each main material member at specified QA hold points (Appendix II). QA hold point inspections are points in the fabrication process that require both QC inspection by the Fabricator and QA inspection by OMM before the recommencement of the fabrication process.

The results of OMM and field construction QA evaluations shall be the Fabricator's rating. This rating shall be reported to the fabricator and shall affect the future qualification of the fabricator as follows:

A-Rated Fabricators: Fabricators that perform fabrication resulting in ratings of 90 percent and above, based upon the average of five consecutive bridge, structural file, numbers, within the last 36 months and with no individual rating less than 80 percent will be defined as an A-rated Fabricator. These Fabricators shall have the A-rating QA hold points and random QA inspection performed. The A-rating QA hold point is: Final before shipment (hold point 10, Appendix II). A single rating below 80 percent, or the average of five consecutive ratings dropping below 90 percent, will result in the Fabricator's qualification being lowered to a B-rating.

B-Rated Fabricators: Fabricators that perform fabrication with ratings 89 to 80 percent, based upon the average of five consecutive bridge, structural file, numbers, within the last 36 months and with no individual rating less than 70 percent will be defined as a B-rated Fabricator. These Fabricators shall have all B-rating QA hold points and random QA inspection performed. The B-rating QA hold points are: Testing and De-tensioning (hold point 8, Appendix II), and Final before shipment (hold point 10, Appendix II). A single rating below 70 percent, or the average of five consecutive ratings dropping below 80 percent, will result in the Fabricator's pre-qualification being lowered to a C-rating.

C-Rated Fabricators: The C-rating is an interim level for Fabricators, newly approved, to validate their QC performance and upgrade to the Department's B and/or A-rating level. These Fabricators shall have all C-rating QA hold points and random QA inspection performed. The C-rating QA hold points are: Strand tensioning and pre-pour inspection (hold point 5, Appendix II); Testing and De-tensioning (hold point 8, Appendix II); Post inspection (hold point 9, Appendix II); and, Final before shipment (hold point 10, Appendix II).

The C-rating is not a permanent qualification level for Fabricators. Fabricators who fail to achieve an average rating above 80 percent but average between 70 to 79 percent

based on five consecutive bridge, structural file, numbers within the last 36 months, with no individual rating less than 60 percent, will be reduced one level on the pre-qualification list. The reduced level Fabricator shall then have three additional consecutive bridge, structural file, numbers to be averaged with the previous five to achieve a B-rating. Fabricators that still do not achieve a B-rating will result in removal from the pre-qualified Fabricator list. Any time the average of three consecutive ratings drops below 70 percent, the Fabricator shall be removed from the pre-qualified Fabricator list. The Fabricator can request re-qualification, 863.03, 36 months after removal.

Any rated Fabricator that receives a single rating below 60 percent shall be removed from the pre-qualified Fabricator list. The Fabricator can request pre-qualification, 863.03, 36 months after removal.

865.061 Fabricator Rating Review Process A Fabricator may request, in writing, a reconsideration of the performance rating by a board created by the Department. The board shall be comprised of the Deputy Director, Division of Engineering Policy, or his representative, the Administrator of the Office of Materials Management, or his representative, and the Administrator of the Office of Structural Engineering, or his representative. The board shall hear appeals concerning the Fabricator's performance rating on a specific bridge, structural file, number. The board has no authority to hear appeals for revocation or suspension of a Fabricator from the pre-qualification list.

Within ten days from receipt of the Department's performance rating, the Fabricator may write to the Office of Materials Management requesting the board evaluate a rating. The Fabricator shall also submit additional documentation or evidence bearing on the performance of the work.

The Office of Materials Management shall schedule an informal hearing where the Fabricator shall have an opportunity to present its case. The Department may have representatives at the hearing offering evidence in rebuttal. The board shall consider the evidence and issue its decision within fifteen days of the hearing.

865.07 General. All members shall be produced in accordance with 511, except as herein provided in this specification.

Shop inspection or acceptance of shop drawings by the Department shall not relieve the Contractor of responsibility for erroneous or inconsistent dimensions, notations, omissions or other errors. All parts forming a structure shall be built in accordance with the contract. The Contractor will not be responsible for any contract plan errors.

865.071 Fabricator Documentation Responsibility. The Fabricator shall keep and maintain documentation records for each project bridge, structural file, number concerning:

1. Fabricator approval
2. Shop drawing approval
3. Material test reports
4. Welding qualifications
5. Quality control inspection

This documentation shall be made available for auditing, inspection and copying upon the Department's request. The documentation shall be archived for at least a five-year period from the date of final shipment from the fabrication shop.

Documentation systems are the Fabricator's responsibility to establish. Quality control documentation shall include all material quality checks, dimensional checks, weld quality inspection, strand tensioning procedures, release procedures, concrete release and final strengths etc. to document both to the Fabricator and to the Department that all fabrication has been thoroughly inspected and meets the specification requirements. Evaluation of the Fabricator's performance by Departmental personnel, using forms defined in Appendix II, will include validation of the Fabricator's actual records of inspection. This validation is intended to assure that rating of an individual component will reflect the overall quality of all components.

865.08 Fabrication Shop Drawings. Prestressed fabricated items sold under this specification or other similar items requiring fabrication shall be detailed on shop drawings by the Contractor or Fabricator in accordance with AASHTO "Standard Specifications for Highway Bridges", the Bridge Design Manual.

The Contractor shall submit to OMM, Cement & Concrete Engineer, 14 days before the pre-fabrication meeting (see 865.081), written acceptance and four copies of the shop drawings, unless additional copies are requested. The written acceptance from the Contractor shall document review and acceptance of the shop drawings. All shop drawings shall be stamped and dated as reviewed by a registered professional engineer representing the Contractor. All drawings shall incorporate the Contractor's engineer's stamp and acceptance date. All drawings shall show detailer's initials. The Contractor shall furnish the fabricator's PFQCS with one record set of the checked and Contractor accepted shop drawings. This set will be furnished the PFQCS on or before the pre-fabrication meeting.

By submission of shop drawings, the Contractor represents to the Department that all materials, field measurements, construction requirements, contract requirements, performance criteria and similar data have been verified. By submission, the Contractor further certifies the shop drawings have been coordinated and verified with the details of the work to be performed by other Fabricators and entities on the project. No allowance for additional cost or delays will be made to the Contractor for incorrect fabrication as a result of failure to coordinate or perform these verifications.

The prints shall be made from tracings, neatly and accurately drawn on sheets 559 mm x 864 mm (22 x 34 inches).

Shop drawings shall show details, dimensions, size of materials, match mark diagrams for field connection and erection, and any other information necessary for the complete fabrication and erection of the prestressed members.

When changes on submitted drawings are requested by the Department, or the Contractor makes changes in addition to those expressly requested, the shop drawings shall be submitted to identify the changes with revision marks and include written acceptance by the Contractor, and be stamped and dated by the Contractor's Professional Engineer.

Deviation from the contract plans or accepted shop drawings will not be permitted without the order of the OMM. Requests for such deviation or change shall be submitted in writing to OMM. After acceptance by the Engineer, such plans shall be taken as supplemental to, but in no sense a substitute for, the contract. The Contractor shall be responsible for supplying documentation and any revised drawings or changes listed above.

After all fabrication is completed, the Contractor shall have the Fabricator furnish a 35-millimeter microfilm copy of each shop drawing mounted on an aperture card in accordance with Supplement 1002, on file in the Department. These microfilm copies shall be submitted to the OSE, Attention Structural Steel Engineer. If the details shown on a drawing apply to more than one bridge, an aperture card for that drawing shall be furnished for each bridge to which it applies, each card bearing the applicable bridge number. For structures carrying railroad traffic, an additional set of aperture card-mounted films or, at the option of the railroad, a set of full-size drawings on mylar shall be furnished for each railway company involved.

865.081 Pre-Fabrication Meeting. A pre-fabrication meeting shall be held at the Fabricator's facilities, or another location agreeable to all parties, for review of any fabrication issues, including information on shop drawings, inspection, hold points, unique fabrication items, special processes, etc. for the project. Attendance at the meeting shall include the Fabricator, the PFQCS, the Contractor, or designated representative, and OMM's QA inspector. The meeting will be conducted by the PFQCS. If all parties feel documentation is required, minutes can be taken and distributed. The issue of minutes shall be the first item during the meeting..

The time of the meeting shall be agreeable to all parties, but no earlier than 14 days after submittal of Contractor approved shop drawings, 865.08. OMM may waive the pre-fabrication meeting if accepted by the Fabricator and the Contractor.

865.09 Materials. Materials shall conform to the following:

Concrete	865.12
Aggregate*	703.02
Portland cement	701.01 thru 701.06
Air-entraining admixture	705.10
Chemical admixtures for concrete	705.12
Prestressing steel	711.27
Reinforcing steel	509
Transverse tie rods	711.01
*Fine aggregate shall be natural sand for members that will not have a separate wearing course. Coarse aggregate shall be modified as follows:	
Deleterious materials, max.	0.4%
Gradation shall be No. 57, 6, 67, 68, 7, 78 or 8 standard size coarse aggregate.	

Materials Approval. All materials either incorporated into the prestressed fabricated item or supplied under 865 as component parts of the fabricated items shall be the responsibility of the Fabricator to control, have tested, validate materials requirements and provide supporting documentation at the time of final inspection by the QA inspector. The Fabricator's PFQCS is responsible for the documentation, test results, or certification required by ODOT needed to validate that the materials meet the specification.

Department specified materials have either specific ASTM requirements, ODOT specification requirements or specific project requirements. The Department reserves the right to perform random check sampling of materials. Approval sampling of materials at the Fabricator's plant will not be performed.

865.091 Fabricator Materials Control. The Fabricator's PFQCS shall be responsible for materials approval. The PFQCS shall be responsible for delivered materials meeting specification requirements. This includes inspection of material; checking test reports for conformance to applicable specifications; requiring test reports, certifications and other required documentation at time of delivery; rejecting un-acceptable and/or un-documented materials; completing documentation forms for each bridge number and assembling complete and correct documentation packages for each project.

The forms in Appendix III are to be completely filled out for each project before presentation to the QA inspector. The QA inspector will verify from documented results the materials incorporated into the fabricated products to be shipped meet requirements. As verification will be done after the product is completed, any incomplete documentation will cause all products to be rejected. The QA inspector either at time of shipment, or at a time designated by the QA inspector, may require review of the complete materials package to support the completed forms or for required fabrication information.

If a coating is required, such as epoxy or galvanizing, coating records shall also be required showing date, type, and quality control records from the coater and actual thickness measurements of the coating. The PFQCS is responsible for making actual coating measurements on the delivered materials to assure the product meets specification and recording those measurements.

865.101 Casting Beds. Casting beds shall be constructed of steel or concrete. The beds shall be above grade to assure that they will not be submerged due to accumulation of water as a result of curing operations. Beds and abutments shall be so designed that they are capable of safely resisting all forces applied to them without appreciable movement or deflection. These forces consist of compression and eccentric forces due to end-jacking operations, forces at hold down points when draped strands are used, and downward forces due to the dead weight of the members.

865.102 Cold Weather Operations. The following procedures will be employed when the ambient air temperature is below 10 °C (50 °F). Mixing water, aggregates or both shall be heated as necessary to result in concrete temperatures not less than 10 °C (50 °F) nor more than 21 °C (70 °F) when placed. Water heated above 66 °C (150 °F) shall not be permitted to come in direct contact with the cement. Concrete shall not be placed in contact with forms, reinforcing steel, prestressing strand or other hardware materials having a temperature less than 0 °C (32 °F). When casting bed temperatures are less than -1 °C (30 °F), prestressing strand shall be tensioned to provide the design tension at 10 °C (50 °F).

865.103 Equipment. Hydraulic jacks of sufficient capacity and stroke shall be used for tensioning strands. Either single or multiple strand tensioning may be used. Tensioning jacks shall be equipped with automatic cutoff valves and gages with a minimum diameter of 150 mm (6 inches) and 2 kN (500 pound) increments. Gages shall be calibrated for the jacks with which they are to be used and a graph or table showing the calibration shall be available to the QA inspector. Two calibrated gages shall be provided for jacks, one of which shall be used during routine stressing, while the other is locked out and used only by the QA inspector to verify the accuracy of the working gage. Calibration of jacks shall be done by a method acceptable to the Office of Materials Management, at least once every six months or as ordered by the Director. Calibration documentation shall be part of project's QC documentation.

The jacking system shall be of such design as to assure uniform stress in all strands. When multiple strands are tensioned simultaneously, plants shall be equipped with approved types of dynamometers for equalizing the initial stress on all strands prior to application of the full tensioning load with the master jack. The capacity of the dynamometers shall be such that the desired readings are in the middle to upper range.

865.104 Inspection Facilities. The plant shall provide minimum floor area of 11 m² (120 square feet) for the use of QA Inspectors. This area shall be adequately heated

and ventilated and equipped with necessary desks, chairs, tables, and electrical outlets.

865.11 Construction Methods. Forms shall be adequate to produce members within the tolerances set forth on the plans. Only metal forms shall be used, with the exception of bulkheads and voids. The surface of the forms in contact with the concrete shall be smooth, and the joints between panels shall be tight. The soffit form shall have a plane surface at right angles to the vertical axis of the members and the two bottom edges shall be beveled 19 mm (3/4 inch) with a triangular strip built into the forms. The length of the members shall be increased for elastic shortening and normal concrete shrinkage, and the forms shall be so designed that they will not resist this movement.

Forms for voids in box beams shall be water-resistant and shall be constructed of a material that will resist breakage and deformation during the placing of the concrete, and they shall not excessively increase the dead load of the beams.

When forms are coated with an approved release agent, care shall be taken to prevent the oil from coming in contact with the prestressing strands or reinforcing steel.

Reinforcing steel shall be installed and assembled as per approved shop drawings. If authorized, welding of reinforcing cages shall be performed by welders qualified to AWS D1.4. Epoxy coated or galvanized reinforcing steel shall not be welded, except as approved by OMM. All coating areas damaged by welding shall be repaired as per coating manufacturer's instructions. Loss of cross-section of reinforcing due to welding shall be automatic cause for rejection of the reinforcing steel. Strands shall be accurately placed in the positions shown on the plans. Strands with kinks, bends, nicks, broken wires, or other defects, including scale or loose rust will not be permitted. Slight rusting, provided it is not sufficient to cause visible pits, shall not be cause for rejection. Before placing of the concrete, the strands shall be carefully cleaned of all dirt, grease, oil or other foreign matters. Splicing of the strands within a member will not be permitted.

Each strand shall be tensioned to the stress indicated on the plans. When two or more strands are stressed by one jack, each strand shall be individually stressed to about 4.5 kN (1000 pounds), or other approved initial pre-load, by means of a dynamometer before being attached to the jacking system. The required stress in the strands shall be measured by the jacking equipment and checked by the elongation of the strands. The PFQCS shall keep a record of all jacking forces and elongations.

The strands shall be secured by suitable anchorage devices capable of developing at least 85 percent of the ultimate strength of the strands. The anchorage shall be such that no slippage of the strand will occur after the tensioning operation.

When draped strands are used, the loss of stress due to friction shall not exceed 5 percent. The PFQCS shall be responsible for validating loss due to friction by a

procedure approved by the Office of Materials Management. In order not to exceed 5 percent, the strands shall be tensioned at both ends. Hold-down points shall be placed within 90 mm (3 inches) of the locations shown on shop drawings and within 0.3m (12 inches) of the locations on the plans.

865.12 Concrete. The concrete shall be machine mixed according to 499, except that 499.03 does not apply. The concrete shall contain 6 ± 2 percent entrained air, and slump shall be maintained with the range of 25 to 100 mm (1 to 4 inches). The slump may be increased to 180 mm (7 inches) provided the increase is achieved by the addition of a chemical admixture meeting the requirements of 705.12, Type F or G. An approved corrosion inhibiting admixture shall be used in all prestressed concrete. The admixture and dosage rate shall be approved by the Laboratory.

The concrete shall be proportioned of materials specified in 865.09 to provide a minimum cylinder strength of 38.0 MPa (5500 psi), or plan specified strength, in 28 days, as determined from the testing by the Laboratory of at least 2 cylinders. Each pair of cylinders shall have an average strength of not less than 38.0 MPa (5500 psi), or plan specified strength, and no cylinder shall have less than 95 percent of the specified strength. A minimum of 2 cylinders shall be made from the first and last loads in each casting bed used per day, and an additional 2 cylinders made for each 200 feet of beam produced per bed.

Fabricator concrete mix designs shall be submitted to OMM with test data validating the mix's capability to achieve the required 28 day strength under the curing method used.

Calcium chloride or admixtures containing calcium chloride are prohibited.

Concrete may be placed in the bottom flange of a box beam before the interior forms and reinforcement for the upper portion of the member is placed, providing continuous placement is not interrupted for more than 45 minutes.

The top surfaces of non-composite members shall be screeded and finished with a burlap drag, or other means to provide a uniform surface with a gritty texture suitable for waterproofing. The top surface of composite members shall be screeded and given a wire broom finish, in a transverse direction, penetrating the finished surface approximately 6 mm (1/4 inch).

The concrete shall be given an accelerated cure by low pressure steam or radiant heat within a suitable enclosure to contain the live steam or heat. The initial application of the steam or heat shall be from two to four hours after the final placement of concrete to allow the initial set to take place. If retarders are used, the waiting period shall be increased to four to six hours. The time of initial set may be determined by ASTM C 403, and the time limits described above may then be waived.

During the waiting period the temperature within the curing enclosure shall be not less

than 10 C (50 F).

During the initial application of live steam or radiant heat, the ambient temperature within the curing enclosure shall increase at an average rate not exceeding 44 C (80 F) per hour until the curing temperature is reached. The maximum curing temperature shall not exceed 87 C (190 F). The maximum temperature shall be held until the concrete has reached the desired strength. Detensioning shall be accomplished immediately after the steam or radiant heat curing has been discontinued. Additional curing is not required after detensioning.

(1) Curing with low pressure steam. Application of live steam shall not be directed on the concrete forms so as to cause localized high temperature.

(2) Curing with radiant heat. Radiant heat may be applied by means of pipes circulating steam, not oil or hot water, or by electric heating elements. Moisture loss shall be minimized by covering all exposed concrete surfaces with plastic sheeting or by applying an approved liquid membrane curing compound to all exposed concrete surfaces. Shear faces of composite members and other surfaces to which field-cast concrete or other materials will be bonded in the finished structure shall have the curing compound removed.

Cavities in the exposed surface of beams shall be neatly filled with grout. Grout used shall be non-shrink, conforming to ASTM C 1107. Cleaning, application and curing of the grout shall be as per manufacturer's published recommendations. Honeycomb that is considered to impair the member's performance shall be cause for rejection.

865.13 Release of Prestressing Strands. Prestressed strands shall not be released until the concrete has reached a strength of at least 28.0 MPa (4000 psi), or plan defined release strength, as determined by the testing of pairs of concrete cylinders made according to AASHTO T 23, cured by the exact method used to cure the beam, and tested according to AASHTO T 22. These cylinders shall be tested in the Fabricator's laboratory. Both tested cylinders shall meet or exceed the required strength of 28.0 MPa (4000 psi), or plan defined release strength. The QA Inspector shall be notified in advance and shall have the right to observe the testing of the cylinders. A-rated Fabricators are not required to provide notification.

The strands shall be released immediately after accelerated curing by steam has been discontinued. Prior to release of prestressed strands, forms and hold-downs which restrict either horizontal or vertical movement of prestressed members shall be loosened or removed. Each strand shall be burned or heat released simultaneously at selected exposed points between anchorages and the sequence should follow a predetermined pattern, approved by the Director, to equalize the forces being transferred to the various areas of the cross section of the member. For heat release, a low-oxygen flame shall be used and at least a 100 mm (4 inch) length of strand be uniformly heated.

865.14 Transportation, Storage and Erection. Prestressed members shall not be shipped until the 28-day design strength of the concrete is reached and approval by the QA inspector has been received.

The members shall be stored, transported and erected in an upright position, and points of support and direction of reactions shall be approximately the same during storage and transportation as when the members are in their final position. Whenever members are to be stored, care shall be taken to provide unyielding horizontal supports capable of maintaining the members in a vertical position. If it is found necessary to transport the members in any position other than vertical, it shall be done only with the written approval of the Director. The members shall be lifted and erected through the use of lifting devices capable of withstanding any required loads. Members damaged by improper handling, storing, transportation or erection shall be repaired or replaced, at the discretion of the Director, at no expense to the Department. In no instance shall any vehicular load be allowed on an individual prestressed concrete box beam in a prestressed concrete box beam deck after the tie rods have been tightened and prior to grouting of the keyway and the grout obtaining the specified design strength.

Prestressed box beams shall be accurately placed during erection to assure uniform load on all bearings. Box beams shall be placed to assure correct fit of the keyways and to assure that the keyways can be properly grouted. Keyway grouts approved by the Laboratory shall be mixed, installed and cured as per grout manufacturer's published recommendations to obtain a design compressive strength of 34.5 MPa (5000 psi). Any proposed deviations to the manufacturer's published recommendations shall not be acceptable without approval of the Office of Materials Management.

Where erection of prestressed members will require placement of cranes or launching devices on previously erected spans, erection procedures shall be submitted for approval as per 501.06.

865.15 Method of Measurement. The quantity shall be the number of members, or the length of the members in meters (linear feet).

This item includes all inserts, sleeves, fittings, reinforcing steel fully or partially encased in the members, and all transverse tie rods necessary to complete this item.

Concrete diaphragms, 511, and bearing plates or pads or other expansion materials, 516, will be paid for as separate items.

865.16 Basis of Payment. Payment will be made at contract price for:

Item	Unit	Description
865	Each, meter (linear foot)	Prestressed concrete non-composite box beam bridge members, Level 1
865	Each, meter (linear foot)	Prestressed concrete composite box beam bridge members, Level 1
865	Each, meter (linear foot)	Straight strand prestressed concrete bridge I-beam members, Level 2
865	Each, meter (linear foot)	Draped strand prestressed concrete bridge I-beam members, Level 3

APPENDIX I



OHIO DEPARTMENT OF TRANSPORTATION

1600 W Broad Street

Columbus, OH 43223

614-275-1325 / fax 614-275-1543 / bstruble@ODOT.DOT.Ohio.Gov

Facilities inspection has been performed by _____ From the Office of Materials Management (OMM) ____ / ____ / ____ Based upon this report your facility will be evaluated for acceptance into the Prequalified Prestressed Fabricator List as specified by Supplemental Specification 865.

Facilities Evaluation Check List

1. Company Name: _____

2. Address: _____

3. Phone: _____ Fax: _____ E Mail _____

4. PCI Certification, enclose copy of certification: _____

a. Level 1 fabricator: _____

b. Level 2 fabricator: _____

c. Level 3 fabricator: _____

5. Company Representative

a. President: _____

b. Chief Engineer: _____

c. Prestressed fabrication superintendent: _____

d. PFQCS, enclose certifications: _____

6. Prestressed Beds

Length (ft) _____

Length (ft) _____

Length (ft) _____

Length (ft) _____

Length (ft) _____

Length (ft) _____

7. Building facilities:

Reinforcing steel fabrication Area (dimensions)

_____ Adequate bending equipment

_____ Projection method for epoxy coating reinforcement

_____ Method of cage construction

_____ Reinforcing steel welders AWS qualified

APPENDIX I

Prestressed Concrete Cylinder Testing facilities

Capacity of cylinder testing equipment

Calibration documentation

Capping method equipment

ODOT QA inspection office (dimensions)

Adequate heating _____

Adequate lighting _____

Phone line _____

8. Lifting methods for beams

Crane capacity _____

9. Concrete Quality

Source of concrete _____

Mix design _____

QC procedure established for concrete _____

Moisture control methods for aggregate _____

Admixture batching method and QC _____

10. Fabrication Quality

Written prestressed strand tension method

straight

draped

Written prestressed strand release method

Method of debonding

11. Materials controls

Control and method of tracking

cement

aggregate

admixtures

reinforcing

prestressed strand

inserts and fabricated items

APPENDIX II

FABRICATOR RATING FOR SHOP DRAWINGS : PRESTRESSED CONCRETE

County: _____ Project: _____ SFN: _____ Date: _____
 Bridge: _____ Fabricator: _____

Contractor Coordination (10%) (1 point each)

1. The Contractor's P.E. provided a certification cover letter.
2. The shop drawings are approved and stamped by the Contractor.
3. Shop drawings were received fourteen (14) working days before prefabrication meeting.
4. Contractor's field verification of the existing structure is reflected on the shop drawings.
5. Contractual changes due to field conditions, plan errors, fabrication substitutions or other conditions been addressed by the fabricator.

Title Block (1%) (1 point each)

1. The project number is shown.
2. The reference number(s) is/are shown.
3. The county, route and section of the structure is shown.
4. The checker/reviewer initials are shown
5. The shop drawings are numbered sequentially
6. The Fabricator's name and address are shown.

General Notes (15%) (1 point each unless noted)

1. The release and 28 day concrete strengths are defined and conform to the Contract (5 points)
2. Corrosion inhibitor type and dosage as per Contract (2 points)
3. The keyways are sand-blasted four (4) days prior to shipment.
4. The beam ends are waterproofed as per Contract
5. The top of the beams are textured per 865.12.
6. Correct ODOT standard construction drawing is referenced
7. Release pattern for detensioning strands is symmetrical and defined (3 points)
8. The strand type, grade, diameter and initial stressing force as per Contract (5 points)
9. Reinforcing steel grade is meets Contract requirements. (4 points)
10. Final camber, prior to erection, detailed in conformance to Contract.
11. Keyways omitted on the exterior side of the fascia beam as per Contract.
12. Procedure defined for bending extended strands without heat.

Framing Plan (10%) (1 point each)

1. Member size(s) shown.
2. The skew is shown from the vertical to center line of bearing.
3. For each span, the center to center bearings are dimensioned.

Y	N	NA

Y	N	N/A

APPENDIX II

4. The end of beam to centerline of bearing is dimensioned.
5. The beams are dimensioned out to out.
6. The diaphragm/tierod plan are per the Contract.
7. The guardrail inserts are per Contract.
8. The beams piece marked for erection.
9. The phased construction width meets the Contract dimensions

Beam Details (34%) (1 point each unless noted)

1. End & intermediate diaphragm connections are dimensionally located per the framing plan (2 points)
2. Continuity connection details of beam end supported at piers meets the Contract (3 points)
3. Expansion device supports and dimensional details meets Contract requirements (2 points)
4. The beams are piece marked according to the framing plan.
5. Beam voids are dimensionally correct, spaced correctly and do not interfere with beam lifting devices (2 points)
6. Beams detailed to theoretically fit tight at crown or change in roadway cross-slope (2 points)
7. Members meet plan skew and are dimensioned correctly. (5 points)
8. Location of draped points as per plans or approved location (5 points)
9. Longitudinal reinforcing steel is detailed and lapped per the Contract requirements (4 points)
10. Epoxy coated reinforcing steel located as per Contract requirements. (2 points)
11. Transverse reinforcing steel detailed and located as per Contract requirements. (4 points)
12. Concrete cover meets the Contract requirements (3 points)
13. End block reinforcing steel detailed as per Contract (3 points)
14. Railing, diaphragm other plan or Contractor required inserts are completely detailed, properly dimensioned, located, and any interference with reinforcing steel or strand does not occur with inserts. (3 points)
15. Holes in members, not limited to anchor dowels and diaphragms, meet Contract requirements. (3 points)

16. Connections for, utilities, metal diaphragm, scuppers, etc. are as per Contract requirements. (2 points)
17. All hardware cast in the beam has protective coating meets Contract requirements.
18. Dimensions, location and fabrication of embedded bearing load plates meet Contract requirements. (2 points)

Cross Section Details (30%) (1 point each unless noted)

1. The strand pattern and spacing are per the Contract requirements (5 points)
2. The strands are debonded as per Contract requirements. (3 points)
3. Extended strands are not debonded strands. (3 points)
4. Concrete cross-section dimensions meet Contract requirements. (4 points)
5. Longitudinal reinforcing steel is spaced and sized as per Contract requirements. (3 point)

[illegible]

APPENDIX II

Y = yes, N = no, NA = not applicable
No partial points are used for Y, N or NA selection

Sum of {Y/(Y+N)} x Selection Factor = Fabricator Rating			
Contractor Coordination	(Y)/	(Y+N)* x 10 =	
Title Block	(Y)/	(Y+N) x 1 =	
General Notes	(Y)/	(Y+N) x 15 =	
Framing Plan	(Y)/	(Y+N) x 10 =	
Beam Details	(Y)/	(Y+N)* x 34 =	
Cross Section	(Y)/	(Y+N)* x 30 =	

Summation fabricator rating for performance of shop drawings (%) =

* Y / (Y+N) x 1.0 for Contractor Coordination, Beam Details or Cross Section sections. If an individual rating is lower than the summation fabricator rating, the fabricator rating shall be based upon the lowest individual section rating.

FABRICATOR RATING FOR SHOP FABRICATION

County: Project: SFN: Shop ID:

Office of Materials Management QA Inspector:				
Hold Point Descriptions for Prestressed Fabricators - Levels 1 thru 3	Points	Y	N	N/A
Strand and Reinforcing validation	QA Hold point 1			
Certified test data's Heat number matches tagging identification on rebar and strand	5			
Yield Strength of reinforcing meets plan requirements, Fy (psi)	3			
Tensile Strength of reinforcing steel meets plan specifications, Fu (psi)	1			
Tensile Strength of prestressing strand meets plans and specifications, Fu (psi)	5			
Strand and reinforcing inspected for acceptable surface conditions rust, etc.	1			
Hold Point 1 Sub Total	15			
Concrete Mix Inspection	QA Hold Point 2			
Mix design documented to OMM	5			
Batching weights controlled- equipment calibrated	3			
Corrosion inhibitor Admixture batched correctly	3			
Aggregates checked for segregation, contaminants, and proper handling	2			
Hold Point 2 Sub Total	13			

APPENDIX II

Reinforcing inspection - pre-form:	QA Hold Point 3			
Pre-fabrication cages meet dimensional requirements	5			
Individual bars checked dimensionally, size and grade before installation	1			
Tack welded assemblies, welds acceptable	3			
Welders qualified D1.5	2			
Welder following qualified procedure for reinforcing	2			
Lap lengths built into longitudinal bar assemblies meet requirements when stirrups properly spaced	2			
Hold Point 3 Sub Total	15			
Hold Point Descriptions for Prestressed Fabricators - Levels 1 thru 3	Points	Y	N	N/A
Form Inspection	QA Hold Point 4			
Cross-section dimensionally correct	3			
Skew ends meet dimensions and angle	2			
Hold down points located as per shop drawings (+/- 3 inches)	3			
Holes plugged and flush, welds ground flush	1			
Form joints sealed	1			
Forms string lined for straightness	2			
Length of members conforms with specifications with bulkheads correctly installed	4			
Hold Point 4 Sub Total	16			
Strand tensioning and pre-pour inspection:	QA Hold Point 5			
Strand diameter correct	5			
Strands inspected in bed for nicks, gouges	2			
Correct strands debonded and for correct length	3			
Check Elongation established using Strand reel Modulus of Elasticity (E), measured area of strand and corrections for temperature, bed shortening, additional strand length due to draping, slippage at ends and seating losses	5			
Jacking equipment calibrated as per specification	2			
Written strand stressing procedure at jacking location	1			
Pre-load applied	2			
Strands loaded symmetrically, Final load applied, elongation checked	6			
Draped strand force at bed ends shall be validated to be within 5%	4			

APPENDIX II

Hold Point 5 Sub Total	30			
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Hold Point Descriptions for Prestressed Fabricators - Levels 1 thru 3	Points	Y	N	N/A
reinforcing placement pre-pour:	QA Hold Point 6			
Reinforcing steel sizes correct	5			
Clearance of reinforcing and strand from forms meets concrete cover	3			
Lapsplce reinforcing installed and meet specifications	3			
Reinforcing adequately tied against movement	2			
Guardrail and inserts installed correctly	3			
Reinforcing located as per shop drawings	2			
Tierod holes and anchor holes dimensionally correct	2			
Release agent applied on forms	1			
Lifting devices installed	3			
Hold Point 6 Sub Total	24			
Member Fabrication Concrete QC	QA Hold Point 7			
Unit weight, slump and air tested and meet requirements	3			
Verification cylinders made	5			
Vibration performed as per specifications and plant approved procedure	2			
slump and air tested per load	2			
Dimensional				
Concrete cover checked during placement	3			
Concrete depth checks performed for top and bottom flange	4			
Composite reinforcing checked for extension out of member	2			
Voids inspected for location after concrete placed (box beam)	2			
Top of member surface finish meets specifications	1			
Lifting devices final location meets specifications	4			
Hold Point Descriptions for Prestressed Fabricators - Levels 1 thru 3	Points	Y	N	N/A

APPENDIX II

Cure application				
Protection of concrete before initial set performed	2			
Set time of mix exceeded before accelerated cure applied	3			
Temperature measurement during accelerated cure	5			
Cylinders cured as per member	3			
Hold Point 7 Sub Total	43			
Testing and De-tensioning:	QA Hold Point 8			
Cylinders tested for release strength	5			
Cylinder testing equipment calibrated	1			
Cure removed	2			
De-tensioning procedure performed and meets specifications	4			
Initial camber checked and recorded	2			
Hold Point 8 Sub Total	14			
Post inspection	QA Hold Point 9			
Beam length dimensionally correct	3			
Cavities in concrete surfaces repaired	1			
Honeycombing inspected and documented QA inspector notified	2			
Validate dimensional locations of tierods, guardrails and other inserts	3			
Sweep meets required tolerances	2			
Composite reinforcing meets required clearance	1			
reinforcing steel coating inspected and repaired as per requirements	1			
Hold Point 9 Sub Total	14			
Final before shipment	QA Hold Point 10			
Cylinders tested for 28 day strength to meet specifications	5			
Final camber measured and evaluated against adjacent members and tolerances	2			
Final sealing applied Documentation of cleaning and rate of application	3			
Inspection for cracks, lifting damage, etc.	3			
Hold Point 10 Sub Total	13			

Y = Yes, N = No, NA = Not Applicable, No partial points are available for a Y, N or NA answer

APPENDIX II

Hold Point	Yes/(Yes + No)	Weight Factor	RatingTotal
1		12	
2		10	
3		5	
4		5	
5		16	
6		7	
7		12	
8		13	
9		8	
10		12	
		Total Rating	

Summation Fabricator rating for performance of QA Inspection = _____

* $Y / (Y + N) \times 100$ for Hold Points 1, 5 and 8. If any of these individual ratings are lower than the summation fabricator rating, then the Fabricator rating shall be based upon the lowest individual section rating.

Required Hold points

A Rating hold points = 10

B Rating hold points = 8 and 10

C Rating hold points = 5, 8, 9 and 10

Final Total Fabricator Rating .20 x Shop Drawing Rating _____
.80 x Fabrication Rating _____

If no shop QA rating is performed, the Fabrication QA rating will be the fabricator's QA rating for the project.

APPENDIX III

ODOT MATERIALS CERTIFICATION FORM PRESTRESSED/PRECAST CONCRETE

Precast Producer _____
ODOT Project Number _____ Bridge Number _____

Cement

Manufacturer	Plant	Type	Insp. App.

Cementitious Materials (fly Ash, GGBF, Micro-silica)

Manufacturer	Source	Type	Insp. App.

Aggregate FINE

Producer	Type	Soundness %	Insp. App.

Aggregate COARSE

Producer	Type & Size	Deleterious Materials	Soundness %	Abrasion %	Insp. App.

ADMIXTURES (corrosion inhibitor, retarders, air entrainers, superplasticizers)

Manufacturer	Brand name	Admixture Type	Dosage rate	Insp. App.

APPENDIX III

REINFORCING STEEL

Rebar Size (Epoxy/Black)						
Manufacturer						
Heat Number						
Yield Strength						
Tensile Strength						
Elongation %						
Coating Thickness						
Bar Mark						
Use of Rebar						
TE-24						
Insp. App.						

WIRE MESH REINFORCING

Mesh Size						
Heat Number						
Manufacturer						
Tensile Strength (LW)						
Dia. (LW)						
Area (LW)						
Tensile Strength (CW)						
Dia. (CW)						
Area (CW)						
Weld Shear						
Coating Thickness						
TE-24						
Insp. App.						

PRESTRESSING STRAND

Heat Number						
Coil No.						
Nominal Diameter						
Area						
Ultimate Strength						
Yield Strength						
Elongation						

APPENDIX III

Modulus of Elasticity					
Coating Thickness					
Insp. App.					

TRANSVERSE TIE RODS

Heat Number					
Nominal Diameter					
Area					
Yield Strength					
Ultimate Strength					
Elongation					
Coating Thickness					
TE-24					
Insp. App.					

INSERTS INCLUDING EMBEDDED INSERTS, BOLTS, NUTS, WASHERS, COUPLING NUTS

Insert Description				
Certification or TE-24				
Mill Certs				
Coating Thickness				
Insp. App.				

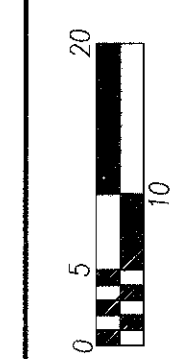
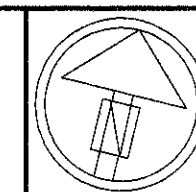
FABRICATED PLATE (BEARING INSERT PLATES, WELDING CONNECTION PLATES, ETC.)

Description			
Diameter			
Length			
Width			
Thickness			
Depth			
Coating Thickness			

APPENDIX III

Insp. App.			

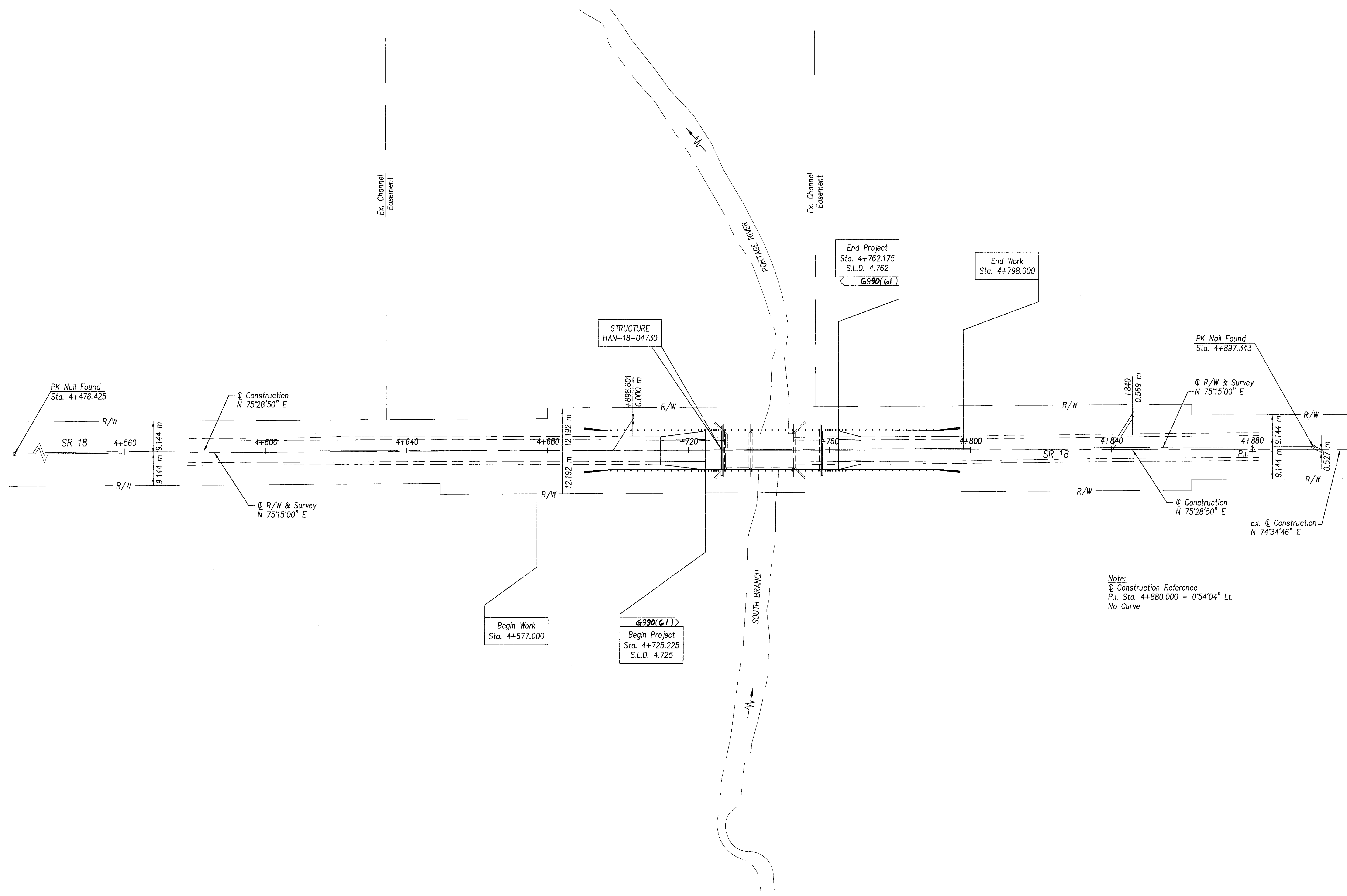




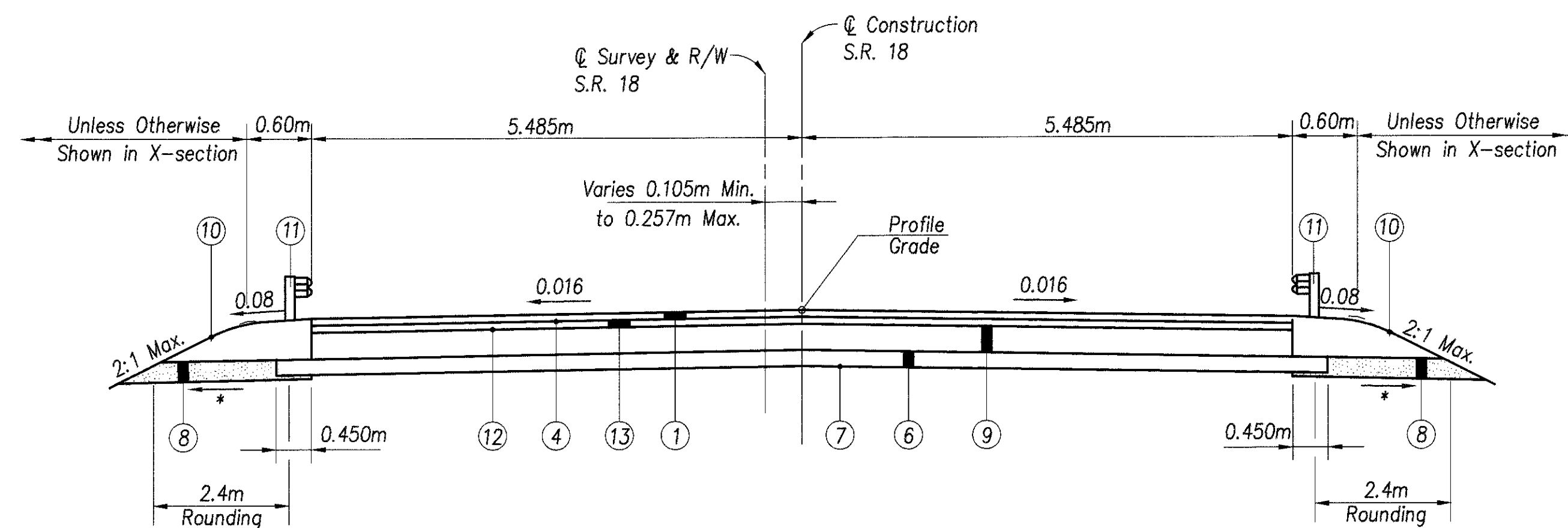
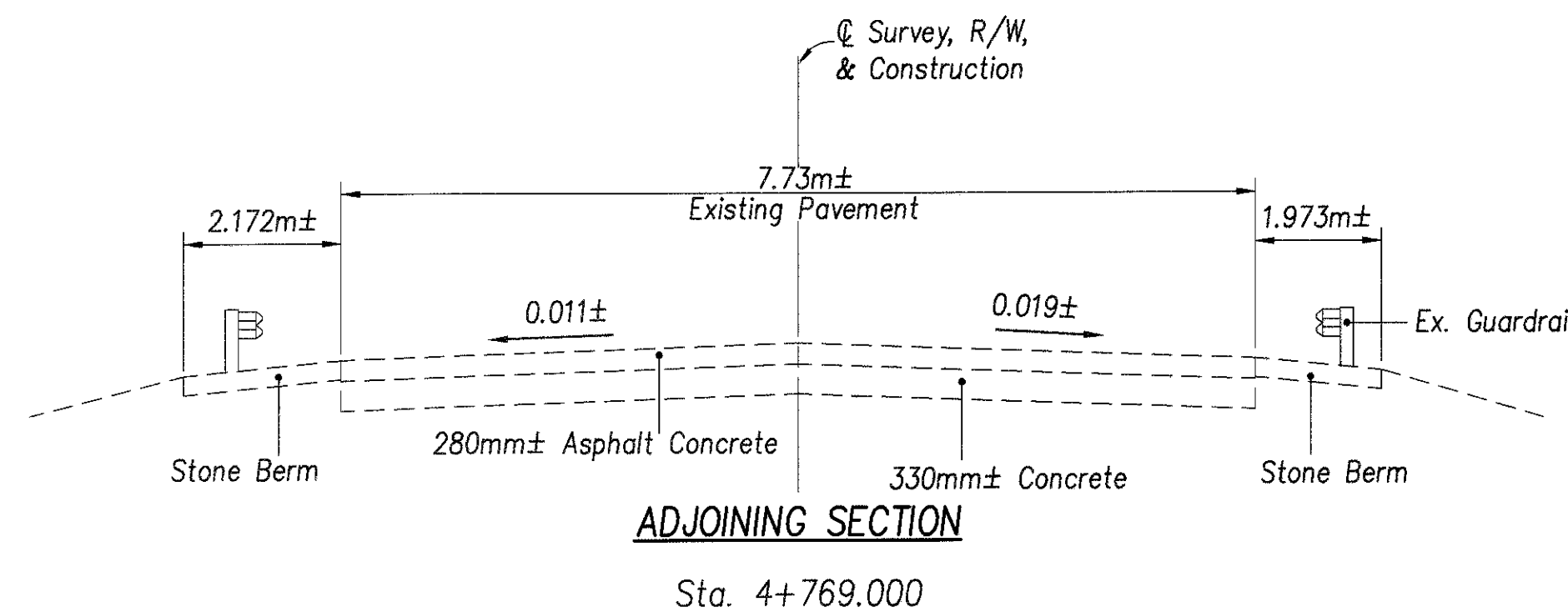
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SCHEMATIC PLAN

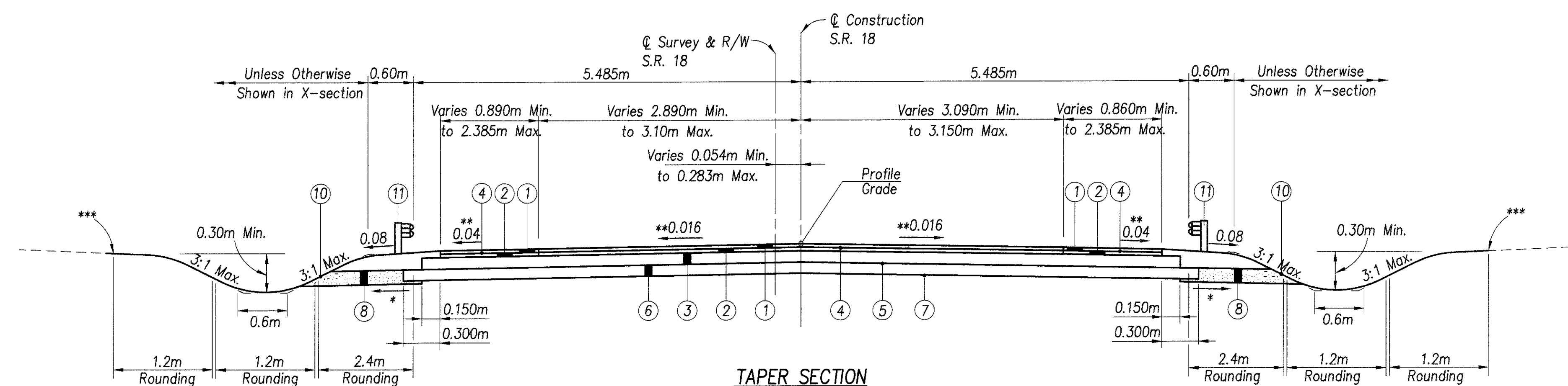
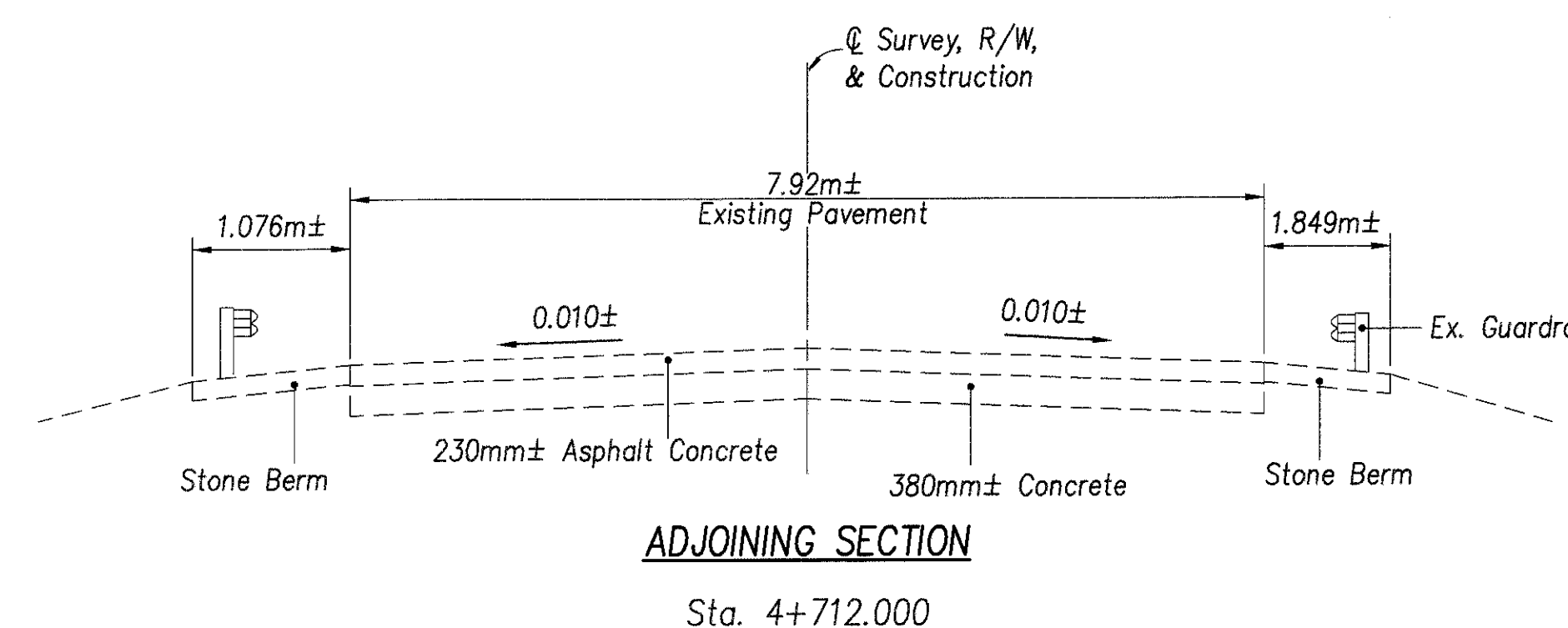
HAN-18-4.725



Note:
@ Construction Reference
P.I. Sta. 4+880.000 = 0°54'04" Lt.
No Curve



Sta. 4+725.225 to Sta. 4+729.825 = 4.600m
Sta. 4+757.575 to Sta. 4+762.175 = 4.600m
9.200m



Sta. 4+712.000 to Sta. 4+725.225 = 13.225m
Sta. 4+762.175 to Sta. 4+769.000 = 6.825m
20.050m

LEGEND

- ① ITEM 448 - 32mm Asphalt Concrete Surface Course, Type 1, PG64-22, As Per Plan (See General Note)
- ② ITEM 448 - 45mm Asphalt Concrete Intermediate Course, Type 2, PG64-22
- ③ ITEM 301 - 180mm Bituminous Aggregate Base, PG64-22
- ④ ITEM 407 - Tack Coat For Intermediate Course (See General Note)
- ⑤ ITEM 408 - Bituminous Prime Coat (1.82 Lit./m²)
- ⑥ ITEM 304 - 150mm Aggregate Base
- ⑦ ITEM 203 - Subgrade Compaction
- ⑧ ITEM 605 - Aggregate Drain
- ⑨ ITEM 611 - Reinforced Concrete Approach Slab (T=305mm)
- ⑩ ITEM 659 - Seeding and Mulching
- ⑪ ITEM 606 - Guardrail, Type 5
- ⑫ ITEM 407 - Tack Coat (See General Note)
- ⑬ ITEM 448 - Variable Thickness, 51mm Max. Asphalt Concrete Intermediate Course, Type 1, PG64-22

* 0.04 Minimum
0.08 Desirable

** Match Slope At Begin And End
Of Pavement Work

*** Match Existing

ROUNDING:

THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON THE TYPICAL SECTIONS APPLY TO ALL CROSS-SECTIONS EVEN THOUGH OTHERWISE SHOWN.

UTILITIES:

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS:

ARCADIA TELEPHONE	HANCOCK-WOOD ELECTRIC COOP.
102 W. FREMONT	2451 GRANT RD.
ARCADIA, OH 44804	NORTH BALTIMORE, OH 45872-0188
(419)894-6411	(419)426-3072

THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE OBTAINED FROM THE OWNERS OF THE UTILITY AS REQUIRED BY SEC. 153.64 ORC.

CONTINGENCY QUANTITIES:

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED FOR SUCH ITEMS SHALL BE INCORPORATED INTO FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

TEMPORARY STREAM CROSSING FORDS:

WHERE STREAM CROSSING FORDS ARE REQUIRED FOR EQUIPMENT CROSSING, THE CROSSING SHALL CONSIST OF CLEAN NON-TOXIC GRANULAR OR ROCK MATERIAL, PROPERLY MAINTAINED TO PREVENT EROSION, WITH PROVISIONS FOR CONVEYANCE OF ANTICIPATED HIGH FLOWS, AND SHALL NOT IMPEDE THE MOVEMENT OF AQUATIC LIFE. CONSTRUCTION SHALL BE IN ACCORDANCE WITH PART 330, APPENDIX A, SPECIFIC CATEGORIES OF DISCHARGES-NATIONALLY PERMITTED, PARAGRAPH (A14), MINOR ROAD CROSSING FILLS - THE FEDERAL REGISTER - CORPS OF ENGINEERS FINAL REGULATIONS, CURRENT EDITION.

ELEVATION DATUM:

ALL ELEVATIONS ARE BASED ON U.S.G.S. DATUM.

WORK LIMITS:

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATION OF ALL TEMPORARY TRAFFIC CONTROL AND TEMPORARY TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS SHALL BE PROVIDED BY THE CONTRACTOR WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

REMOVAL OF TREES OR STUMPS:

ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS SHALL BE REMOVED UNDER THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING.

SIZES	NO. TREES	NO. STUMPS	TOTAL
450mm	NONE	NONE	NONE
750mm	NONE	NONE	NONE
1200mm	NONE	NONE	NONE
1500mm	NONE	NONE	NONE

ITEM 659. SEEDING AND MULCHING:

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR ITEM 659, SEEDING AND MULCHING, ARE BASED ON THESE LIMITS.

WATERING PERMANENT SEEDED AREAS:

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER TO PROMOTE GROWTH AND TO CARE FOR THE PERMANENT SEEDED AREAS, PER 659.09:

659, WATER	8 CU METER
------------	------------

TEMPORARY SOIL EROSION & SEDIMENT CONTROL:

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES:

207, FILTER FABRIC FENCE	60 METER
207, STRAW OR HAY BALES	50 EACH

EROSION CONTROL:

ITEM 601 IS PROVIDED IN THE PLANS FOR EROSION CONTROL. ROCK OF STABLE NATURE SHALL NOT BE REMOVED IN ORDER TO PLACE THIS ITEM. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITY OF THIS ITEM WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION. IN ADDITION, THIS ITEM SHALL MEET THE REQUIREMENT OF 108.04.

BENCHING OF FOUNDATION SLOPES:

ALL SLOPED EMBANKMENT AREAS SHALL BE BENCHED AS SET FORTH IN 203.09.

ITEM 606. ANCHOR ASSEMBLY, TYPE E:

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING AN ET-2000, OPTION "B" GUARDRAIL END AS MANUFACTURED BY SYRO STEEL COMPANY, 1170 N. STATE STREET, GIRARD, OHIO 44420 (TELEPHONE: 330-545-4373).

THE LENGTH OF THE ET-2000 SYSTEM IS CONSIDERED TO BE 15.24 m, INCLUSIVE OF TWO 7.62 m LONG RAIL ELEMENTS. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND AT THE LOCATIONS SHOWN IN THE PLANS.

PAYMENT FOR THE ABOVE WORK SHALL BE MADE AT THE UNIT BID PRICE FOR ITEM 606, EACH, ANCHOR ASSEMBLY, TYPE E AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO CONSTRUCT A COMPLETE AND FUNCTIONAL ANCHOR ASSEMBLY SYSTEM, INCLUDING ALL RELATED HARDWARE, NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

STREAM CHANNEL EXCAVATION:

THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT ANY INCIDENTAL ASSOCIATED WITH THE EXCAVATION AND HAULING OF MATERIAL FROM THE STREAM CHANNEL. THIS PERTAINS TO ANY EXCAVATION OPERATIONS SUCH AS, FOUNDATION PIER OR ABUTMENT EXCAVATION, CHANNEL CLEAN OUT, EXCAVATION FOR ROCK CHANNEL PROTECTION AND REMOVAL OF ANY TEMPORARY FILL ASSOCIATED WITH CONSTRUCTION OPERATIONS.

DEMOLITION DEBRIS:

THE CONTRACTOR SHALL TAKE PRECAUTIONS TO AVOID AND/OR LIMIT DEMOLITION DEBRIS FROM ENTERING THESTREAM. ANY MATERIAL THAT DOES FALL INTO THE STREAM SHALL BE REMOVED AS SOON AS POSSIBLE.

FARM DRAINS:

ALL FARM DRAINS, WHICH ARE ENCOUNTERED DURING CONSTRUCTION, SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS. EXISTING COLLECTORS WHICH ARE LOCATED BELOW THE ROADWAY DITCH ELEVATIONS, AND WHICH CROSS THE ROADWAY, SHALL BE REPLACED WITHIN THE RIGHT-OF-WAY LIMITS BY ITEM 603 CONDUIT, TYPE B, ONE COMMERCIAL SIZE LARGER THAN THE EXISTING CONDUIT.

EXISTING COLLECTORS AND ISOLATED FARM DRAINS, WHICH ARE ENCOUNTERED ABOVE THE ELEVATION OF ROADWAY DITCHES, SHALL BE OUTLETTED INTO THE ROADWAY DITCH BY 603 TYPE F CONDUIT. THE OPTIMUM OUTLET ELEVATION SHALL BE 300 MM ABOVE THE FLOW-LINE ELEVATION OF THE DITCH. LATERAL FIELD TILES WHICH CROSS THE ROADWAY SHALL BE INTERCEPTED BY 603, TYPE E CONDUIT, AND CARRIED IN A LONGITUDINAL DIRECTION TO AN ADEQUATE OUTLET OR ROADWAY CROSSING.

THE LOCATION, TYPE, SIZE AND GRADE OF REPLACEMENTS SHALL BE DETERMINED BY THE ENGINEER AND PAYMENT SHALL BE MADE ON FINAL MEASUREMENTS.

EROSION CONTROL PADS AND ANIMAL GUARDS SHALL BE PROVIDED AT THE OUTLET END OF ALL FARM DRAINS AS PER STANDARD CONSTRUCTION DRAWING DM-1.1M, EXCEPT WHEN THEY OUTLET INTO A DRAINAGE STRUCTURE. PAYMENT FOR THE EROSION CONTROL PADS AND ANIMAL GUARDS AND ANY NECESSARY BENDS OR BRANCHES SHALL BE INCLUDED FOR PAYMENT IN THE PERTINENT CONDUIT ITEM.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE.

603 200 MM CONDUIT, TYPE E	5 METER
603 300 MM CONDUIT, TYPE B	5 METER
603 300 MM CONDUIT, TYPE F	5 METER

ITEM 605. AGGREGATE DRAINS:

AGGREGATE DRAINS SHALL BE PLACED AT 10 METER INTERVALS ON EACH SIDE OF NORMAL CROWNED SECTIONS, STAGGERED SO THAT EACH DRAIN IS 5 METERS FROM THE ADJACENT DRAIN ON THE OPPOSITE SIDE, AND AT 5 METER INTERVALS ON THE LOW SIDE ONLY OF SUPERELEVATED SECTIONS. AN AGGREGATE DRAIN SHALL BE PLACED AT THE LOW POINT OF EACH SAG VERTICAL CURVE.

ITEM 407 TACK COAT:

THE RATE OF APPLICATION OF THE 407 TACK COAT SHALL BE SUBJECT TO ADJUSTMENT AS DIRECTED BY THE ENGINEER. PLAN QUANTITIES INDICATE AN AVERAGE APPLICATION RATE OF 0.34 LITERS PER SQUARE METER OF TACK COAT FOR ESTIMATING PURPOSES ONLY. IN ADDITION, TACK COAT SHALL BE APPLIED AT AN AVERAGE APPLICATION RATE OF 0.34 LITER PER SQUARE METER BETWEEN THE ASPHALT CONCRETE SURFACE COURSE AND THE INTERMEDIATE COURSE.

ITEM 614. MAINTENANCE OF TRAFFIC:

A MINIMUM OF ONE LANE OF TRAFFIC IN EACH DIRECTION SHALL BE MAINTAINED AT ALL TIMES, EXCEPT FOR A PERIOD NOT TO EXCEED 90 CONSECUTIVE CALENDAR DAYS, WHEN THROUGH TRAFFIC MAY BE DETOURED AS SHOWN ON SHEET 4. LIQUIDATED DAMAGES SHALL BE ASSESSED (IN ACCORDANCE WITH 108.07) FOR EACH CALENDAR DAY THE ROADWAY REMAINS CLOSED TO TRAFFIC BEYOND THE SPECIFIED LIMIT.

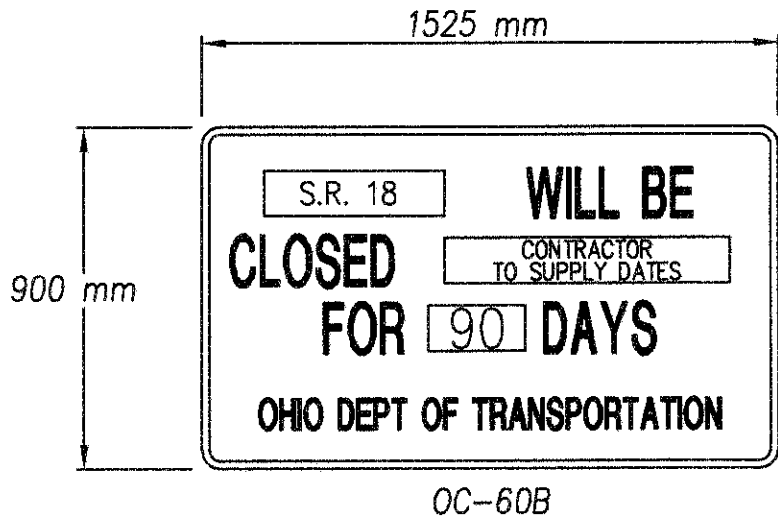
THE CONTRACTOR SHALL NOTIFY THE DISTRICT ONE ROADWAY SERVICES ENGINEER A MINIMUM OF FOURTEEN (14) CALENDAR DAYS IN ADVANCE OF THE DATE THE DETOUR IS NEEDED. THE STATE OF OHIO WILL INSTALL, MAINTAIN AND SUBSEQUENTLY REMOVE THE DETOUR SIGNING.

NOTICE OF CLOSURE SIGNS, AS DETAILED IN THESE PLANS, SHALL BE ERECTED BY THE CONTRACTOR AT LEAST FOURTEEN (14) DAYS IN ADVANCE OF THE SCHEDULED ROAD OR RAMP CLOSURE. THE SIGNS SHALL BE ERECTED ON THE RIGHT HAND SIDE OF THE ROAD/RAMP FACING TRAFFIC. THEY SHALL BE PLACED SO AS NOT TO INTERFERE WITH THE VISIBILITY OF ANY OTHER TRAFFIC CONTROL SIGNS. ON ROADWAYS, THEY SHOULD BE ERECTED AT THE POINT OF CLOSURE. THE SIGNS MAY BE ERECTED ANYWHERE ON RAMPS AS LONG AS THEY ARE VISIBLE TO THE MOTORISTS USING THE RAMP. ON ENTRANCE RAMPS, THE SIGN SHALL BE ERECTED WELL IN ADVANCE OF THE MERGE AREA TO AVOID DISTRACTING MOTORISTS.

THE CONTRACTOR SHALL PROVIDE, ERECT, AND MAINTAIN STANDARD 1200 MM X 750 MM "ROAD CLOSED" SIGNS SIGN SUPPORTS, BARRICADES, GATES AND LIGHTS, AS DETAILED IN STANDARD CONSTRUCTION DRAWING MT-101.60M AT THE FOLLOWING LOCATIONS DURING PERIODS IN WHICH THE THE AFFECTED ROADS ARE CLOSED TO TRAFFIC:

STATE ROUTE 18 JUST EAST OF TOWNSHIP ROUTE 250
STATE ROUTE 18 JUST WEST OF TOWNSHIP ROUTE 243

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR 614, MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.



DUST CONTROL:

THE CONTRACTOR SHALL FURNISH AND APPLY WATER AND CALCIUM CHLORIDE FOR DUST CONTROL PURPOSES AS DIRECTED BY THE ENGINEER. THE FOLLOWING QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR DUST CONTROL PURPOSES:

616, WATER	8 CU. METER
616, CALCIUM CHLORIDE	0.2 METRIC TON

DESIGNATED LOCAL DETOUR ROUTE:

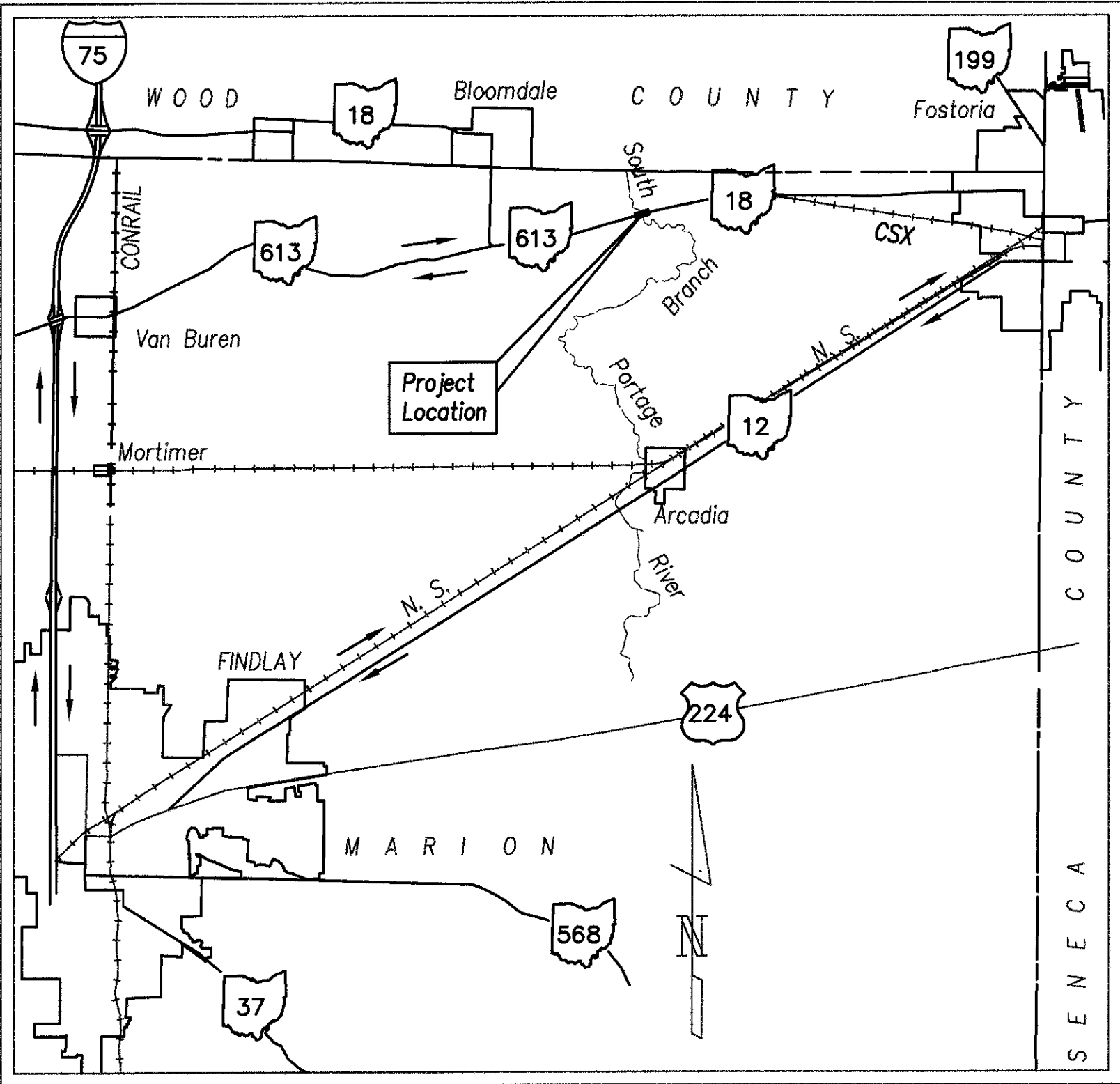
IN ADDITION TO THE OFFICIAL, SIGNED DETOUR ROUTE, A LOCAL ROUTE HAS BEEN DETERMINED TO BE THE SECONDARY, UNSIGNED DETOUR ROUTE OR "DESIGNATED LOCAL DETOUR ROUTE". THIS ROUTE IS SHOWN ON SHEET NO. 4. DURING THE TIME THAT TRAFFIC IS DETOURED, THE CONTRACTOR SHALL MAINTAIN THIS ROUTE IN A CONDITION WHICH IS REASONABLY SMOOTH AND FREE FROM HOLES, RUTS, RIDGES, BUMPS, DUST AND STANDING WATER. ONCE THE DETOUR IS REMOVED AND TRAFFIC RETURNED TO ITS NORMAL PATTERN, THE DESIGNATED LOCAL DETOUR ROUTE SHALL BE RESTORED TO A CONDITION THAT IS EQUIVALENT TO THAT WHICH EXISTED PRIOR TO ITS USE FOR THIS PURPOSE. ALL SUCH WORK SHALL BE PERFORMED WHEN AND AS DIRECTED BY THE ENGINEER.

THE FOLLOWING ESTIMATED QUANTITIES ARE PROVIDED FOR USE AS DIRECTED BY THE ENGINEER TO MAINTAIN AND SUBSEQUENTLY RESTORE THE DESIGNATED LOCAL DETOUR ROUTE.

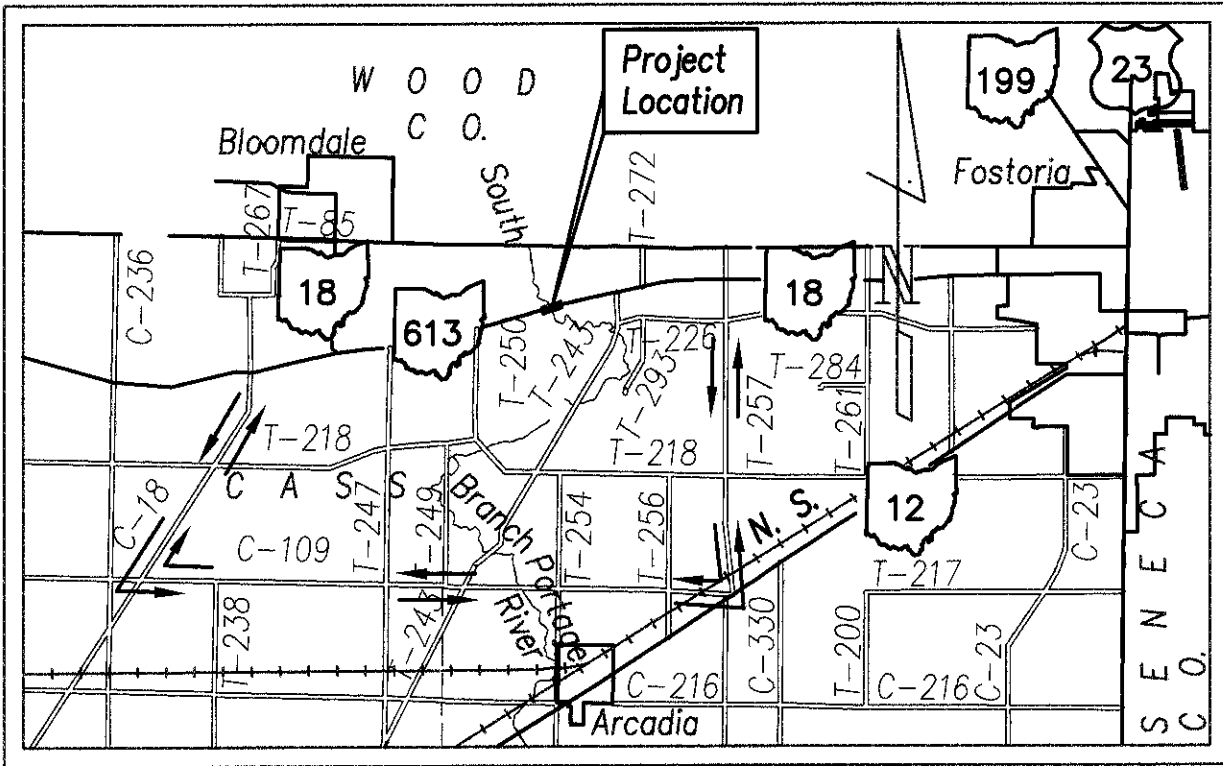
301 BITUMINOUS AGGREGATE BASE	20 CU. METER
304 AGGREGATE BASE	10 CU. METER
407 TACK COAT	180 LITER
448 ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22 AS PER PLAN	80 CU. METER
408 BITUMINOUS PRIME COAT	180 LITER

ITEM 448. ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22, AS PER PLAN:

THIS ITEM SHALL MEET ALL REQUIREMENTS OF SPECIFICATIONS 401, 441, AND 448 WITH THE FOLLOWING EXCEPTION: NO RECYCLED ASPHALT PAVEMENT SHALL BE USED IN THE SURFACE COURSE. ALL COSTS ASSOCIATED WITH EQUIPMENT, LABOR AND MATERIALS NECESSARY FOR SUPPLYING AND PLACING TIS ITEM SHALL BE INCLUDED IN THE PRICE PER BID FOR ITEM 448 ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22, AS PER PLAN.



STATE DETOUR ROUTE

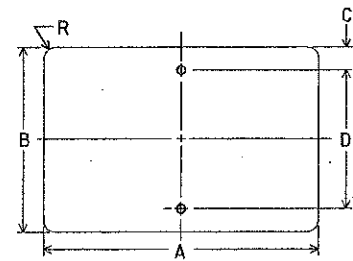


DESIGNATED LOCAL DETOUR ROUTE

CALCULATED
EAN
CHECKED
EKL

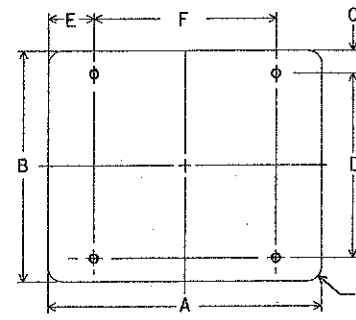
GENERAL NOTES

HAN-18-4.725



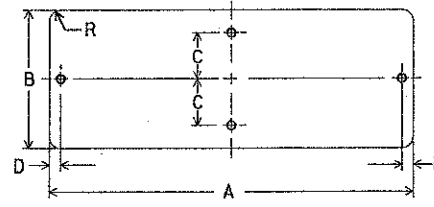
H-REC-1-2

A	B	C	D	R	THICKNESS	m ²
300	150	37.5	75	38	1.6	0.05
450	150	37.5	75	38	1.6	0.07
450	300	37.5	225	38	1.6	0.14
525	375	37.5	300	38	1.6	0.20
525	450	75	300	38	1.6	0.24
600	150	37.5	75	38	1.6	0.09
600	200	37.5	125	38	1.6	0.12
600	250	37.5	175	38	1.6	0.15
600	300	37.5	225	38	1.6	0.18
600	450	75	300	38	1.6	0.27
750	200	37.5	125	38	1.6	0.15
750	250	37.5	175	38	1.6	0.19
750	300	37.5	225	38	2.0	0.23
750	375	37.5	300	38	2.0	0.28
750	400	37.5	325	38	2.0	0.30
750	450	75	300	38	2.0	0.34
750	600	75	450	38	2.0	0.45
900	150	37.5	75	38	2.0	0.14
900	300	37.5	225	38	2.0	0.27
900	375	37.5	300	38	2.0	0.34
900	450	75	300	38	2.0	0.41
900	600	75	450	38	2.0	0.54
937	750	75	600	38	2.0	0.70
1050	375	37.5	300	38	2.0	0.39
1200	500	75	350	38	2.0	0.60



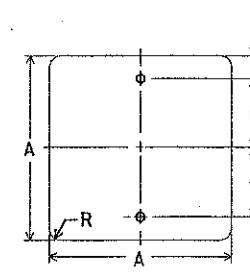
H-REC-2-4

A	B	C	D	E	F	R	THICKNESS	m ²
900	600	75	450	150	600	38	2.0	0.54
900	750	75	600	150	600	48	2.0	0.68
1000	500	75	350	150	700	38	2.0	0.50
1050	900	150	600	225	600	57	2.5	0.95
1125	900	150	600	225	675	57	2.5	1.01
1200	200	37.5	125	225	750	38	2.0	0.24
1200	212	37.5	137	225	750	38	2.0	0.25
1200	350	37.5	275	225	750	38	2.0	0.42
1200	400	37.5	325	225	750	38	2.0	0.48
1200	450	75	300	225	750	38	2.0	0.54
1200	600	75	450	225	750	48	2.5	0.72
1200	750	75	600	225	750	48	2.5	0.90
1200	900	150	600	225	750	57	2.5	1.08
1200	1050	150	750	225	750	57	2.5	1.26
1400	200	37.5	125	300	800	38	2.5	0.28
1500	300	37.5	225	300	900	38	2.0	0.45
1500	600	75	450	300	900	38	2.5	0.90
1500	750	75	600	300	900	48	2.5	1.13
1500	900	150	600	300	900	57	2.5	1.35
1500	1000	150	700	300	900	57	2.5	1.50
1600	200	37.5	125	300	1000	38	2.5	0.32
1650	600	75	450	300	1050	38	2.5	0.99
1650	900	150	600	300	1050	57	2.5	1.49
1800	300	37.5	225	300	1200	38	2.5	0.54
1800	450	75	300	300	1200	38	2.5	0.81
1800	600	75	450	300	1200	38	2.5	1.08
1800	900	75	600	300	1200	38	2.5	1.62



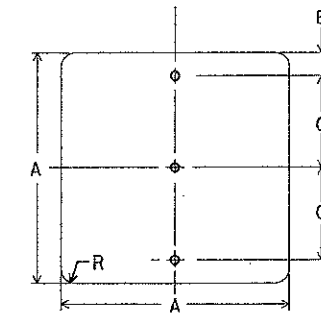
H-REC-1-4 (ONE WAY)

A	B	C	D	R	THICKNESS	m ²
900	300	100	25	38	2.0	0.27
1200	450	150	38	38	2.5	0.54



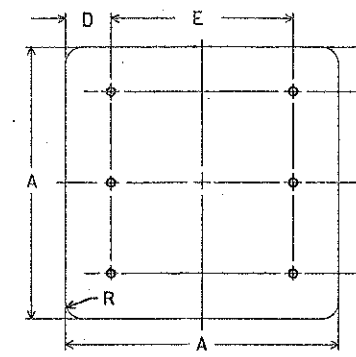
SQ-1-2

A	B	C	R	THICKNESS	m ²
375	75	112.5	38	1.6	0.14
450	75	150	38	1.6	0.20
600	75	225	38	1.6	0.36



SQ-1-3

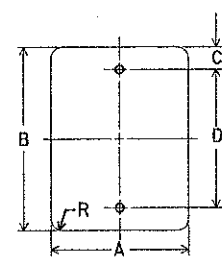
A	B	C	R	THICKNESS	m ²
750	75	300	48	2.0	0.56
900	150	300	57	2.0	0.81



SQ-2-6

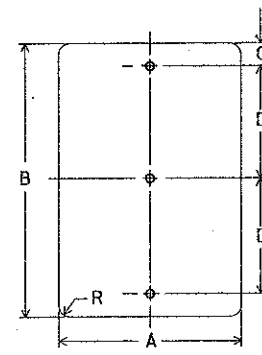
A	B	C	D	E	R	THICKNESS	m ²
* 900	150	300	150	600	57	2.0	0.81
1200	150	450	225	750	75	2.5	1.44

* "DO NOT ENTER" SIGN.



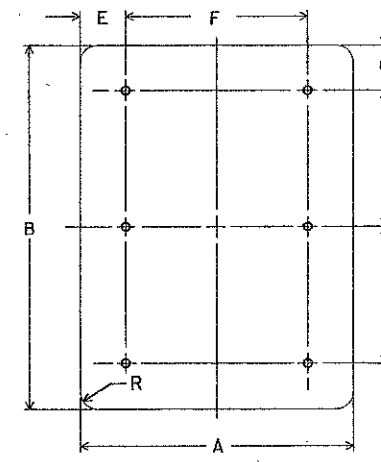
V-REC-1-2

A	B	C	D	R	THICKNESS	m ²
200	650	125	400	38	1.6	0.13
225	300	37.5	225	38	1.6	0.07
300	450	37.5	375	38	1.6	0.14
300	600	75	450	38	1.6	0.18
450	600	75	450	38	1.6	0.27



V-REC-1-3

A	B	C	D	R	THICKNESS	m ²
150	1350	225	450	38	2.0	0.20
300	900	75	375	38	1.6	0.27
300	1200	150	450	38	2.0	0.36
600	750	75	300	38	2.0	0.45
600	900	75	375	38	2.0	0.54
600	1200	225	375	38	2.5	0.72
750	900	75	375	48	2.0	0.68
750	950	75	400	38	2.0	0.68
750	1050	225	300	38	2.0	0.79
900	1050	225	300	57	2.5	0.95



V-REC-2-6

A	B	C	D	E	F	R	THICKNESS	m ²
900	1200	150	450	150	600	57	2.0	1.08
900	1350	150	525	150	600	57	2.5	1.22
900	1500	150	600	150	600	57	2.5	1.35
900	1800	225	675	150	600	57	2.5	1.62
1200	1350	150	525	225	750	75	2.5	1.62
1200	1500	150	600	225	750	75	2.5	1.80
1200	2400	300	900	225	750	75	2.5	2.88

SHAPE **H-REC-2-4** NO. BOLTS REQUIRED
NO. SUPPORTS REQUIRED

NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
- ALL BOLT HOLES SHALL BE 10 MILLIMETERS IN DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
- DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF ± 0.8 MILLIMETER.
- FOR ADDITIONAL BLANK DETAILS SEE SIGN LAYOUT DRAWINGS.

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

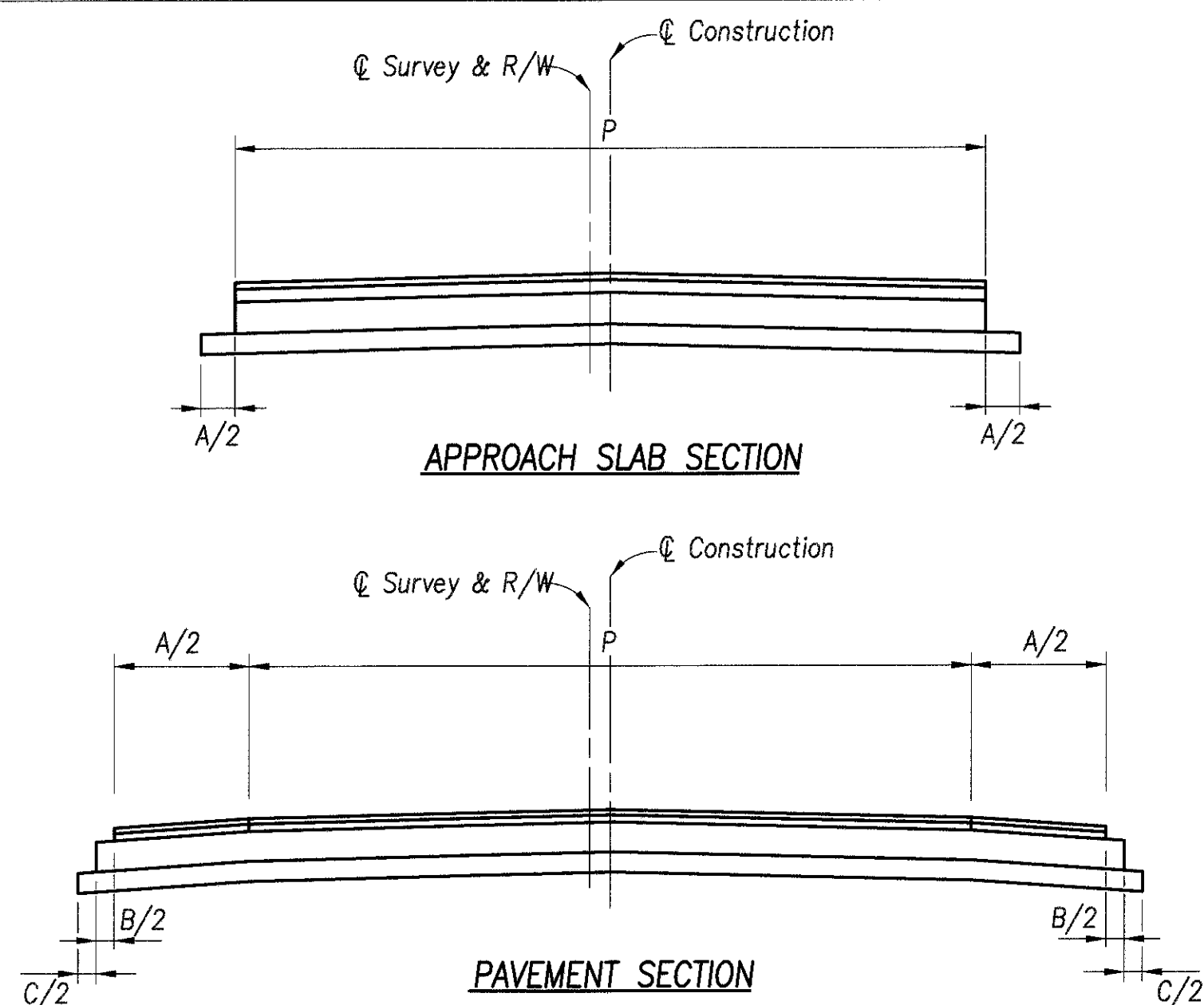
DATE
07/29/94

SIGN BLANK DETAILS II

STANDARD
CONSTRUCTION
DRAWING
APPROVED *[Signature]* ENGR. OF DESIGN SERVICES
TC-52.20M

PAVEMENT QUANTITIES TABLE																							
REFERENCE NO.	CARRIED FROM SHT.	STATION		SIDE	LENGTH	P	A	B	C	ITEM 202	ITEM 203	ITEM 203	ITEM 255	ITEM 301	ITEM 304	ITEM 407	ITEM 407	ITEM 408	ITEM 448	ITEM 448	ITEM 448	ITEM 611	
										APPROACH SLAB REMOVED	PAVEMENT REMOVED	SUBGRADE COMPACTION	FULL DEPTH PAVEMENT SAWING	180 mm BITUMINOUS AGGREGATE BASE PF64-22	150 mm AGGREGATE BASE	TACK COAT 0.34 L/S.M.	TACK COAT FOR INTERMEDIATE COARSE 0.34 L/S.M.	BITUMINOUS PRIME COAT 1.8 L/S.M.	51 mm Max. ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, PG64-22	45 mm ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-22	32 mm ASPHALT CONCRETE SURFACE COURSE TYPE 1, PG64-22 AS PER PLAN	REINFORCED CONCRETE APPROACH SLAB (T=305mm)	
		SQ METER	SQ METER							SQ METER	METER	CU METER	CU METER	LITER	LITER	LITER	CU METER	CU METER	CU METER	SQ METER			
		FROM/AT	TO		METER	METER	METER	METER	METER														
	7	4+712	4+725.225	LT&RT	13.225	6.120	3.325	0.30	0.30			124.910	7.92	23.198	19.927		42.469	231.980		5.621	3.997		
AS1	7	4+725.225	4+729.825	LT&RT	4.60	10.970	0.90					50.462			8.190	17.157	17.157		1.287		1.615	50.462	
AS2	7	4+757.575	4+762.175	LT&RT	4.60	10.970	0.90					50.462			8.190	17.157	17.157		1.287		1.615	50.462	
	7	4+762.175	4+769	LT&RT	6.825	6.090	3.260	0.30	0.30			63.814	7.73	11.855	10.186		21.697	118.550		2.872	2.042		
R3	7	4+725.309	4+730.491	LT&RT	5.182	6.096				31.589													
R4	7	4+749.944	4+755.126	LT&RT	5.182	6.096				31.589													
R6	7	4+712	4+725.309	LT&RT	13.309	6.096					81.131												
R7	7	4+755.126	4+769	LT&RT	13.874	6.096					84.576												
TOTALS										63.178	165.707	289.648	15.65	35.053	46.493	34.314	98.480	350.530	2.574	8.493	9.269	100.924	
TOTALS CARRIED TO GENERAL SUMMARY										63	166	290	16	35	46	34	98	351	3	8	9	101	

DRAINAGE AND EROSION CONTROL TABLE						
REFERENCE NO.	CARRIED FROM SHT.	STATION		ITEM 202	ITEM 601	ITEM 603
				PIPE REMOVED 600 MM AND UNDER	ROCK CHANNEL PROTECTION, TYPE C WITH FABRIC FILTER	300mm CONDUIT TYPE F
		FROM/AT	TO	CU METER	CU METER	METER
D1	7	4+729.842	4+743.302		150.478	
D2	7	4+744.730	4+754.001		128.807	
D3	7	4+752.063	4+753.061			1.0
D4	7	4+752.364	4+755.364			3.0
R5	7	4+739.148	4+740.648	1.5		
TOTALS CARRIED TO GENERAL SUMMARY				1.5	279	4.0



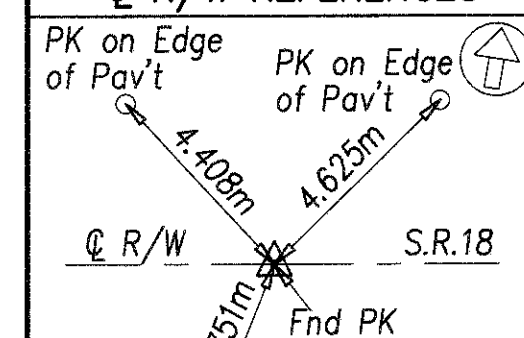
AGGREGATE DRAIN TABLE		
ITEM 605		ITEM 605
LEFT	STATION	RIGHT
METER		METER
	4+712	3.109
3.339	4+717	
	4+722	3.246
1.169	4+727	
	4+759	1.160
3.433	4+764	
	4+769	4.009
7.941		11.524
	19	
TOTALS CARRIED TO GENERAL SUMMARY		

EARTHWORK AND SEEDING TABLE								
REFERENCE NO.	CARRIED FROM SHT.	STATION		ITEM 203	ITEM 203	ITEM 659	ITEM 659	ITEM 659
				EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION	EMBANKMENT	SEEDING AND MULCHING	WATER @ 10 C.M./1000S.M.	COMMERCIAL FERTILIZER @ 0.1 KG/S.M.
		FROM/AT	TO	CU METER	CU METER	SQ METER	CU METER	KILOGRAM
		ROADWAY						
	8	4+767	4+798	112	188	675	6.75	67.5
		CHANNEL						
	9	0+980	1+020	294	10	89	0.89	8.9
TOTALS CARRIED TO GENERAL SUMMARY				406	198	764	*8	76
* CARRIED TO GENERAL NOTES								

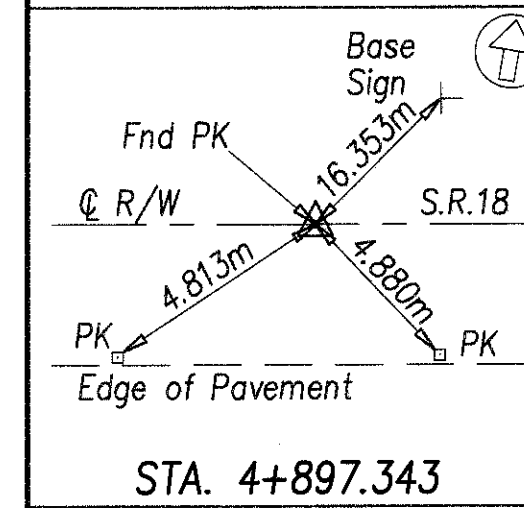
TEMPORARY PAVEMENT MARKING				
REFERENCE NO.	CARRIED FROM SHT.	STATION	ITEM 614	
			TEMPORARY CENTER LINE, CLASS 1 (DOUBLE YELLOW)	
		FROM/AT	TO	KILOMETER
		ROADWAY		
7		4+712	4+769	0.057
TOTALS CARRIED TO GENERAL SUMMARY				0.06

REFERENCE NO.	CARRIED FROM SHT.	STATION		SIDE	ITEM 202	ITEM 606	ITEM 606	ITEM 606	ITEM 626
					GUARDRAIL REMOVED	GUARDRAIL TYPE 5	ANCHOR ASSEMBLY, TYPE E	BRIDGE TERMINAL ASSEMBLY, TYPE 4	BARRIER REFLECTOR, TYPE A2
					METER	METER	EACH	EACH	EACH
G1	7	4+690.185	4+728.285	LT		34.290	1	1	2
G2	7	4+690.535	4+728.635	RT		34.290	1	1	2
G3	7	4+758.765	4+796.865	LT		34.290	1	1	2
G4	7	4+759.115	4+797.215	RT		34.290	1	1	2
R1	7	4+677.885	4+781.291	LT	103.406				
R2	7	4+678.131	4+781.737	RT	103.606				
TOTALS CARRIED TO GENERAL SUMMARY					207	137.160	4	4	8

Q R/W REFERENCES



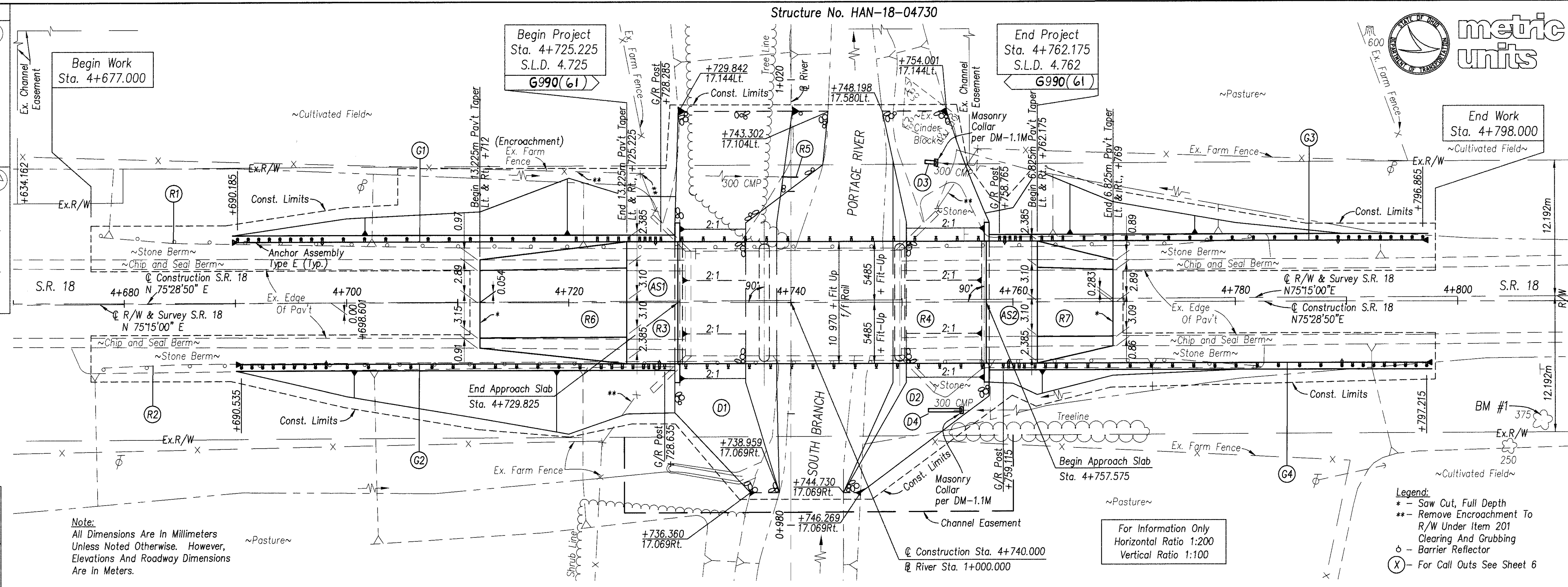
STA. 4+476.425



STA. 4+897.343

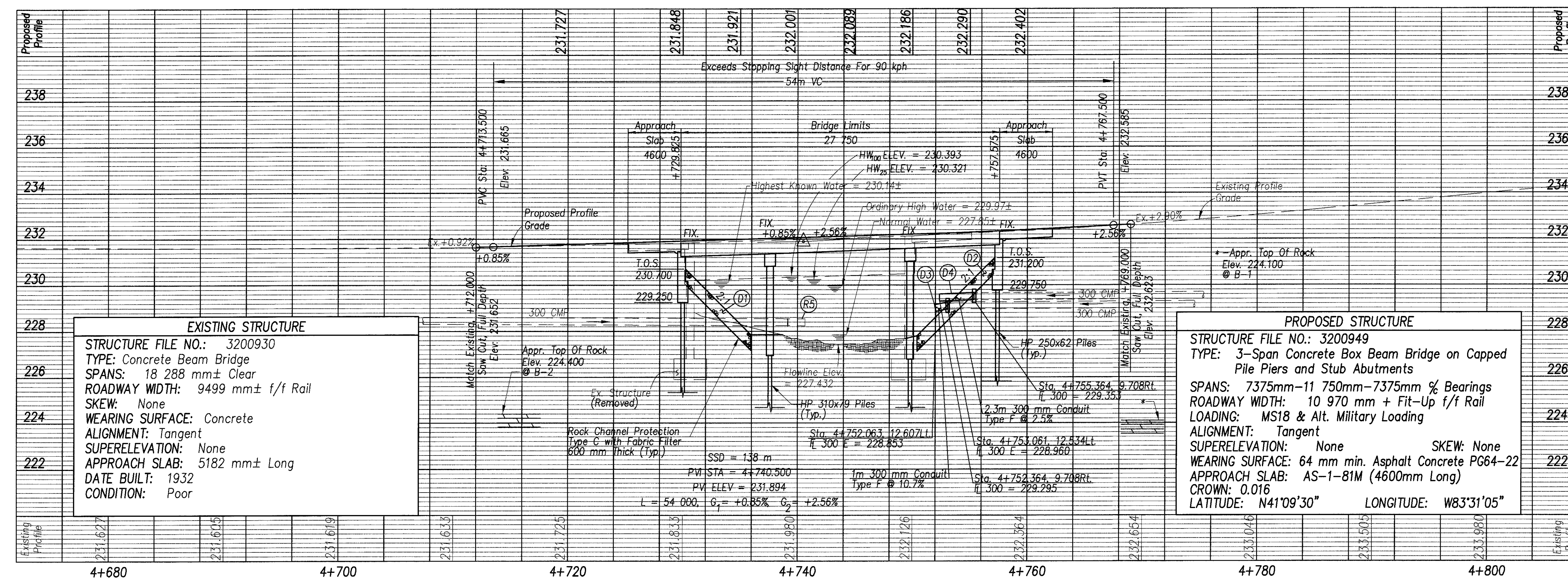
B.M.#1 - Elev: 236.789m
RR Spike Set in 375mm Tree
SE Corner Bridge
Sta: 4+807.507, 10.280m Rt.

B.M.#2 - Elev: 235.043m
Rebar with UCA Cap
Sta: 4+595.023, 11.835m Lt.



Note:
All Dimensions Are In Millimeters
Unless Noted Otherwise. However,
Elevations And Roadway Dimensions
Are In Meters.

Legend:
* - Saw Cut, Full Depth
** - Remove Encroachment To
R/W Under Item 201
Clearing And Grubbing
o - Barrier Reflector
(X) - For Call Outs See Sheet 6

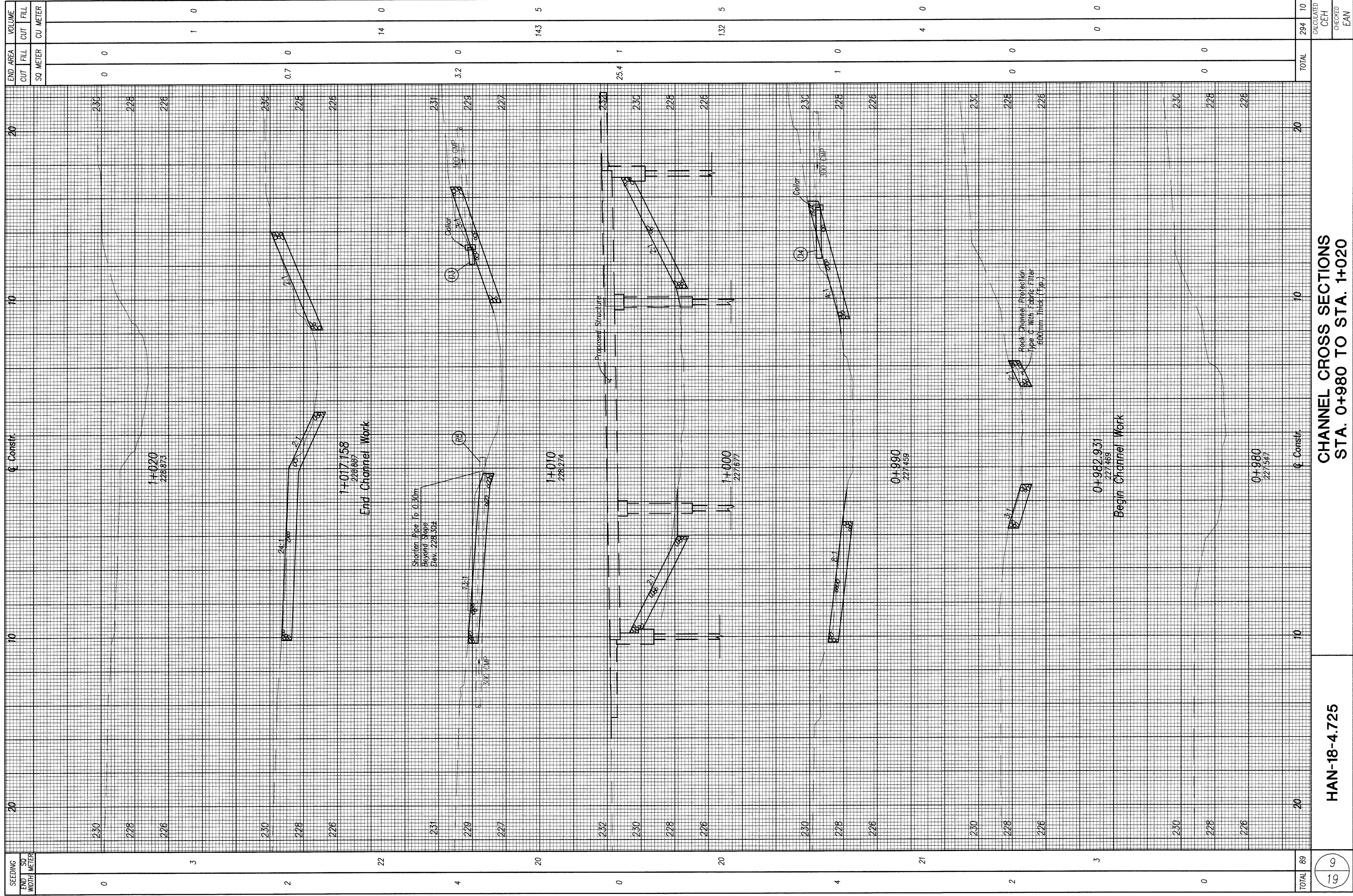


EXISTING STRUCTURE
STRUCTURE FILE NO.: 3200930
TYPE: Concrete Beam Bridge
SPANS: 18 288 mm± Clear
ROADWAY WIDTH: 9499 mm± f/f Rail
SKEW: None
WEARING SURFACE: Concrete
ALIGNMENT: Tangent
SUPERELEVATION: None
APPROACH SLAB: 5182 mm± Long
DATE BUILT: 1932
CONDITION: Poor

PROPOSED STRUCTURE
STRUCTURE FILE NO.: 3200949
TYPE: 3-Span Concrete Box Beam Bridge on Capped
Pile Piers and Stub Abutments
SPANS: 7375mm-11 750mm-7375mm % Bearings
ROADWAY WIDTH: 10 970 mm + Fit-Up f/f Rail
LOADING: MS18 & Alt. Military Loading
ALIGNMENT: Tangent
SUPERELEVATION: None
WEARING SURFACE: 64 mm min. Asphalt Concrete PG64-22
APPROACH SLAB: AS-1-81M (4600mm Long)
CROWN: 0.016
LATITUDE: N41°09'30" LONGITUDE: W83°31'05"

PLAN AND PROFILE
STA. 4+670 TO STA. 4+810

HAN-18-4.725



Begin Project
Sta. 4+725.225
S.L.D. = 4.725
G990(61)

End Project
Sta. 4+762.175
S.L.D. = 4.762
G990(61)

STRUCTURE NO.: HAN-18-04730

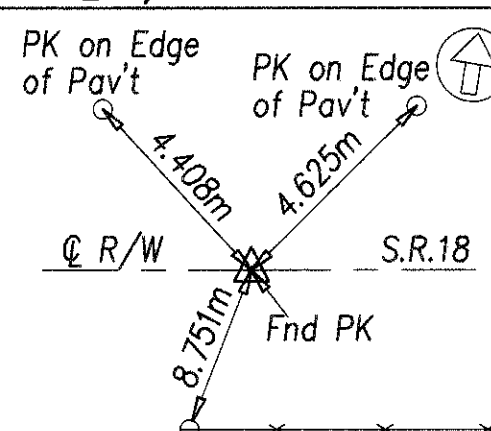


SOIL BORING INFORMATION

Boring No.	Station	Offset	Elev.
B-1	4+765.0	0.9m Lt	232.500
B-2	4+718.0	0.9m Lt	231.800

B.M.#1 - Elev. 236.789m
RR Spike Set in 375mm Tree
SE Corner Bridge
Sta: 4+807.507, 10.280m Rt.
B.M.#2 - Elev. 235.043m
Rebar with UCA Cap
Sta: 4+595.023, 11.835m Lt.

R/W REFERENCES



STA. 4+476.425

STA. 4+897.343

TRAFFIC DATA

CURRENT ADT (1999): 2530
DESIGN ADT (2019): 3850
DESIGN ADTT: 193

HYDRAULIC DATA

DRAINAGE AREA: 62.419 sq.km
Q₂₅: 45.300 m³/s Q₁₀₀: 56.625 m³/s
VELOCITY: 0.942 m/s VELOCITY: 1.096 m/s
DEPTH OF FLOW: 2.813 m DEPTH OF FLOW: 2.977 m
HEADWATER ELEV.: 230.245 HEADWATER ELEV.: 230.409
Design Year Flow Clears Low Point Of Superstructure
By 0.916 m.

EXISTING STRUCTURE

STRUCTURE FILE NO.: 3200930
TYPE: Concrete Beam Bridge
SPANS: 18 288 mm±
ROADWAY WIDTH: 9499 mm± f/f Rail
SKEW: None
WEARING SURFACE: Concrete
ALIGNMENT: Tangent
SUPERELEVATION: None
APPROACH SLAB: 5182 mm± Long
DATE BUILT: 1932
CONDITION: Poor

PROPOSED STRUCTURE

TYPE: 3-Span Concrete Box Beam Bridge on
Capped Pile Piers and Stub Abutments
SPANS: 7375 mm-11 750 mm-7375 mm % Bearings
ROADWAY WIDTH: 10 970 mm + Fit-up f/f Rail
LOADING: MS18 & Alt. Military Loading
ALIGNMENT: Tangent
SUPERELEVATION: None SKEW: None
WEARING SURFACE: 64 Min. Asphalt Concrete
APPROACH SLAB: AS-1-81M (4600mm Long)
CROWN: 0.016
LATITUDE: N41°09'30" LONGITUDE: W 83°31'05"

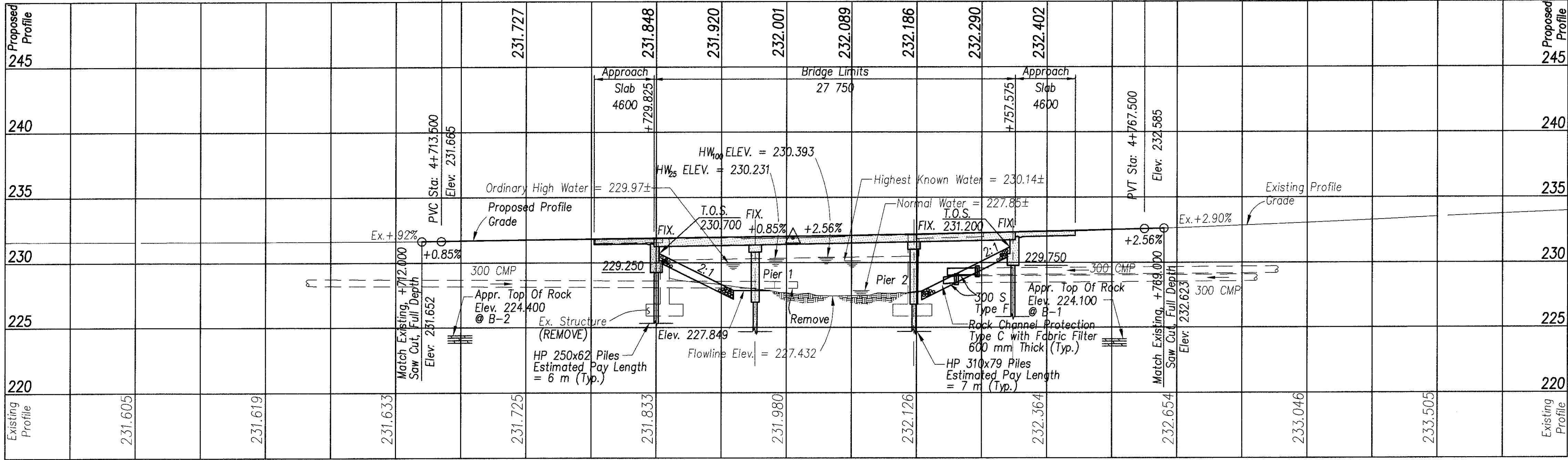
- Notes:
- Earthwork Limits Are Approximate. Actual Slopes Shall Conform To The Plan Cross-Sections.
 - All Dimensions Are In Millimeters Unless Noted Otherwise. However, Roadway Width, Elevations And Stations Are In Meters.

Legend:
* - Saw Cut, Full Depth
Boring Locations

PLAN

Existing Bridge Structure To Be Removed With Item 202

54m VC
PVI STA = 4+740.500
PVI ELEV = 231.894
L = 54m, G1 = +0.85% G2 = +2.56%



Profile At Q Construction S.R.18

DESIGN AGENCY
ULRICH-CHANG AND
ASSOCIATES, INC.
3220 CENTRAL PARK WEST
TOLEDO, OHIO 43617

DATE
12/3/97
REVIEWED
EKL
DRAWN
MEG
DESIGNED
MEG
CHECKED
EEC

HANCOCK COUNTY
Sta. 4+729.825
Sta. 4+757.575

SITE PLAN
BRIDGE NO. HAN-18-04730
OVER SOUTH BRANCH PORTAGE RIVER

HAN-18-4.725

1 / 8
10
19

Estimated Quantities									
Item	Item Ext.	Total	Unit	Description	Abut.	Pier	Super.	Gen.	Ref. Sheet No.
202	11003	Lump		Structure Removed, Over 6 m Span, As Per Plan				Lump	2/8
448	46020	21	Cu. Meter	Asphalt Concrete Intermediate Course, Type 1, PG64-22			21		
448	47021	10	Cu. Meter	Asphalt Concrete Surface Course, Type 1, PG64-22, As Per Plan			10		
503	11100	Lump		Cofferdams, Cribs And Sheeting				Lump	
503	21300	Lump		Unclassified Excavation	Lump				
505	11100	Lump		Pile Driving Equipment Mobilization				Lump	
507	00100	72	Meter	Steel Piles HP 250 X 62, Furnished	72				
507	00150	72	Meter	Steel Piles HP 250 X 62, Driven	72				
507	00200	84	Meter	Steel Piles HP 310 X 79, Furnished		84			
507	00250	84	Meter	Steel Piles HP 310 X 79, Driven		84			
507	50500	12	Each	Steel Pile Splices	6	6			
Special	50771200	50	Meter	Pile Encasement		50			2/8
507	93301	24	Each	Steel Point (Or Shoe), As Per Plan	12	12			2/8
511	34000	3.5	Cu. Meter	Class S Concrete, Superstructure			3.5		
511	42500	21.8	Cu. Meter	Class C Concrete, Pier Cap		21.8			
511	43500	45.7	Cu. Meter	Class C Concrete, Abutment Including Footing	45.7				
512	55910	Lump		Type 3 Waterproofing				Lump	
Special	51267500	32	Sq. Meter	Sealing Of Concrete Surfaces *			32		
Special	51267502	39	Sq. Meter	Sealing Of Concrete Surfaces (Epoxy) *	39				
515	53500	18	Each	Prestressed Concrete Box Beam(4.87-9.15 Meter) (B430-1220) *			18		
515	53700	9	Each	Prestressed Concrete Box Beam(9.15-12.20 Meter) (B430-1220) *			9		
Special	51631300	22	Meter	Polymer Modified Asphalt Expansion Joint System			22		7/8
516	41100	54	Each	3 mm Preformed Bearing Pad, 711.21	18	36			
516	43100	108	Each	Elastomeric Bearing With Internal Laminates Only (Neoprene) (200x150x28mm) (50 Durometer)	36	72			
517	72300	60.96	Meter	Railing(Deep Beam Rail With Steel Tubular Backup And Type 2 Steel Posts			60.96		
				And Anchor Bolts) *					
518	21230	Lump		Porous Backfill With Filter Fabric	Lump				
Special	51822300	65	Meter	Steel Drip Strip			65		6/8
518	40000	29	Meter	150 mm Perforated Corrugated Plastic Pipe	29				
518	40010	12	Meter	150 mm Non-Perforated Corrugated Plastic Pipe, Including Specials	12				

*: Denotes See Proposal Note

GENERAL NOTES

Reference Shall Be Made To Standard Drawings:

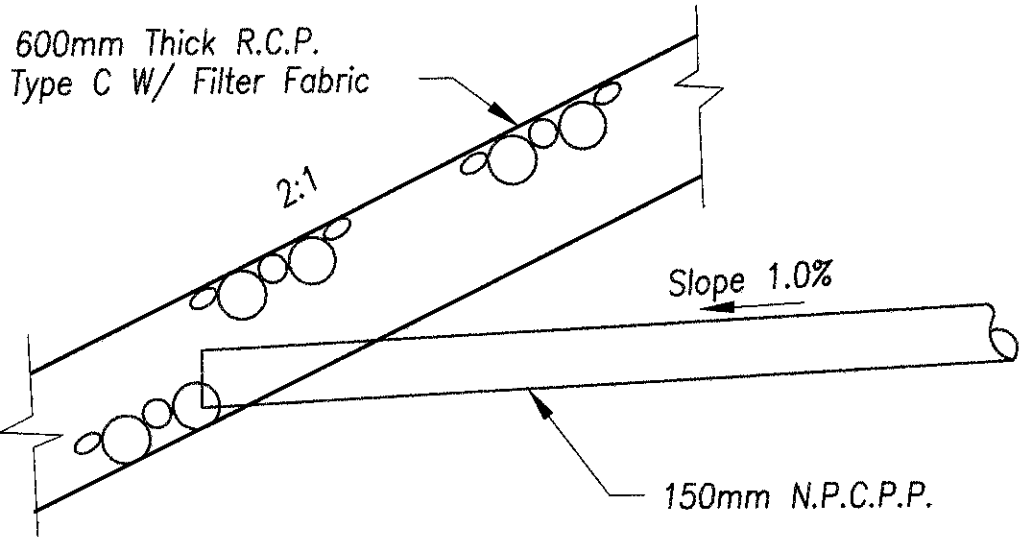
AS-1-81M	Dated 10-25-94
DBR-2-73M	Dated 8-18-95
DS-1-94M	Dated 12-15-94
PSBD-1-93M (4 Shts.)	Dated 12-19-94

Design Specifications

This Structure Conforms To "Standard Specifications For Highway Bridges" Adopted By The American Association For State Highway And Transportation Officials 1996 And The ODOT Bridge Design Manual.

Design Data

Design Loading	—	MS18 And The Alternate Military Loading.
Design Stresses:		
Concrete Class S	—	Compressive Strength, F'c= 31 Mpa For Superstructure.
Concrete Class C	—	Compressive Strength, F'c= 27.5 Mpa For Substructure.
Reinforcing Steel For Abutment	—	ASTM A615M, A616M Or A617M Grade 400: Minimum Yield Strength = 400 Mpa
Concrete For Prestressed Concrete Beams	—	Min. Compressive Strength At 28 Days f'c= 38 Mpa Min. Compressive Strength At Time Of Initial Prestress: f'c= 27.5 Mpa Unit Stress = 15.2 Mpa Compression Unit Stress = 3.1 Mpa Tension
Prestressing Steel	—	ASTM A416M, Grade 270, 12.7 mm Ø Seven Wires, Uncoated, Low Relaxation Strands, As= 99 mm Sq., f's = 1861 Mpa, Initial Stress = 0.75f's = 1400 MPa Stress At Release = 0.69f's = 1280 MPa
Deck Protection Method	—	Type 3 Waterproofing , Asphalt Concrete Overlay, Sealing Of Concrete Surfaces And Steel Drip Strips.
Wearing Surface	—	Asphalt Concrete



METHOD OF TERMINATING 150 mm N.P.C.P.P.



Piles To Bedrock:

Piles Shall Be Driven To Refusal On Bedrock. Refusal Shall Be Considered As Obtained By Penetrating Soft Bedrock For Several Millimeters With A Minimum Resistance Of 20 Blows Per 25 mm Or Refusal Shall Be Considered As Obtained After The Pile Has Contacted Hard Bedrock And The Pile Has Then Received At Least 20 Blows.

The Ultimate Bearing Value Is 710 kN Per Pile For The 12 Abutment Piles. The Ultimate Bearing Value is 805 kN Per Pile For The 12 Pier Piles.

The Order Lengths For The HP 250x62 Abutment Piles Is:

12 Piles 6 Meters Long, Estimated Length
12 Piles Of Order Length 6 Meters Long
6 Splices

The Order Lengths For The HP 310x79 Pier Piles Is:

12 Piles 7 Meters Long, Estimated Length
12 Piles Of Order Length 7 Meters Long
6 Splices

Utility Lines:

All Expense Involved In Relocating Any Affected Utility Lines Shall Be Borne By The Utility(ies). The Contractor & Utility(ies) Are Requested To Cooperate By Arranging Their Work In Such A Manner That Inconvenience To Either Will Be Held To A Minimum.

Item 601, Rock Channel Protection, Type C With Filter Fabric Will Be Included In The Roadway Quantities.

Stream Channel Excavation

The Contractor Shall Take All Precautions Necessary To Prevent Any Incidental Discharges Associated With The Excavation And Hauling Of Material From The Stream Channel. This Pertains To Any Excavation Operations Such As, Foundation Pier Or Abutment Excavation, Channel Clean Out, Excavation For Rock Channel Protection And Removal Of Any Temporary Fill Associated With Construction Operations.

Demolition Debris

The Contractor Shall Take Precautions To Avoid And/Or Limit Demolition Debris From Entering The Stream. Any Material That Does Fall Into The Stream Shall Be Removed As Soon As Possible.

Structure Removed, Over 6 m Span, As Per Plan: When No Longer Needed To Maintain Traffic The Existing Structure Shall Be Removed. Abutments Shall Be Removed To Elev. 225.882.

In Stream Work Will Be Limited Where Practical And Only Clean Non-erodible Material Will Be Used For Fords And Cofferdams. This Temporarily Placed Material Will Be Removed And The Stream Bottom Restored To Near Natural Coditions When The Work Is Completed.

The Specifications Set Forth In The Most Current Version Of ODOT's Construction And Material Specifications, Location And Design Manual And Standard Drawings Will Be Used To Ensure Adequate Erosion And Sediment Control During Construction.

Item Special – Pile Encasement

All Piles For The Capped Piers Shall Be Encased In Class S Concrete (409.03) And Shall Be In Accordance With 511, Except As Modified And Supplemented Herein. The Required Slump Is 150 mm, Plus Or Minus 12 mm. The Maximum Water To Cement Ratio Shall Be 0.50. If Concrete Is Placed Under Water, The Requirements Of Adding 10 Percent More Cement To The Concrete Shall Be Waived. The Concrete Shall Be Placed Within A Form That Consists Of Polyethylene Pipe (707.33), Or PVC Pipe (707.42). The Encasement Shall Extend From 1 Meter Below The Finished Ground Surface Up To The Concrete Pier Cap And Shall Be Positioned So That At Least 75 mm Concrete Cover Is Provided Around The Exterior Of The Pile.

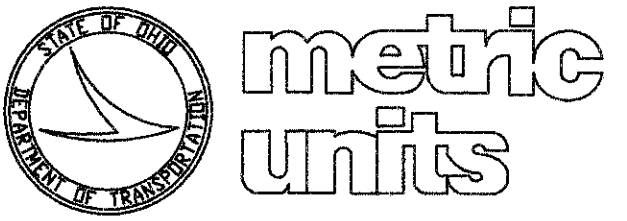
The Length Of The Pile Encasement Shall Be Measured In Meters Along The Length Of The Pile. This Item Includes All Work And Materials Necessary To Furnish The Required Encasement. Payment Will Be Made Under The Contract Unit Price Per Meter Of Pile Encasement Approved In Place.

In Lieu Of Encasing The Pile In Concrete, At The Option Of Contractor, The Pile May Be Galvanized As Per 711.02. The Galvanizing Shall Be Continuous From A Minimum Of 1 Meter Below The Finish Ground Surface Up To The Concrete Pier Cap. The Galvanized Coating Thickness Shall Be A Minimum Of 10 Micrometer. All Gouges, Scrapes, Scratches, Or Other Surface Imperfections Caused By The Handling And Driving Of The Pile Shall Be Repaired To The Satisfaction Of Engineer. Payment For The Galvanizing Will Be Made At The Contract Unit Price For Item Special, Pile Encasement. Payment Will Only Be Made For The Galvanized Length Of Pile As Required By The Plan And/Or Approved By The Engineer. All Galvanizing Provided Beyond The Project Requirements Is At The Contractor's Expense.

Item 507, Steel Points, As Per Plan: Steel Pile Points Shall Be Used To Protect The Tips Of The Proposed Steel "H" Piling. The Steel Points Shall Be Furnished By Associated Pile And Fitting Corporation, 262 Rutherford Blvd., Clifton, New Jersey 07014; Dougherty Foundation Products, Inc., P.O. Box 688, Franklin Lakes, New Jersey 07417; Versa Steel Inc., 3601 N.W. Yeon Ave., P.O. Box 10559, Portland, Oregon 97210; Piling Accessories, Inc., 3467 Gribble Road, Matthews, North Carolina 28105 Or By A Manufacturer That Can Furnish A Steel Point That Is Acceptable To The Director. The Material Used For Manufacturing Of Pile Points Shall Conform To ASTM A27 65/35 – Class 2 – Heat Treated or AASHTO M103 65/35 – Heat Treated. A Notorized Copy Of The Mill Test Report Shall Be Submitted To The Engineer.

Pile Driving Constraints: Prior To Driving Piles, The Spill Through Slopes And The Bridge Approach Embankment Behind The Abutments Shall Be Constructed Up To The Level Of The Subgrade Elevation For A Minimum Distance Of 60 Meters Behind Each Abutment. The Excavation For The Abutment Footings And The Installation Of The Abutment And Pier Piles, For Pier(S) 1 & 2, Shall Not Begin Until After The Required Embankment Has Been Constructed.

Estimated Pay-length & Top Elevation			
Abutment Location	Pile Nos.	Pile Type HP	Cut Off Elevation
Rear	RA-1 to RA-6	250X62	229.850
Forward	FA-7 to FA-12	250X62	230.350



DESIGN AGENCY
ULRICH-CHANG AND
ASSOCIATES, INC.
3220 CENTRAL PARK WEST
TOLEDO, OHIO 43617

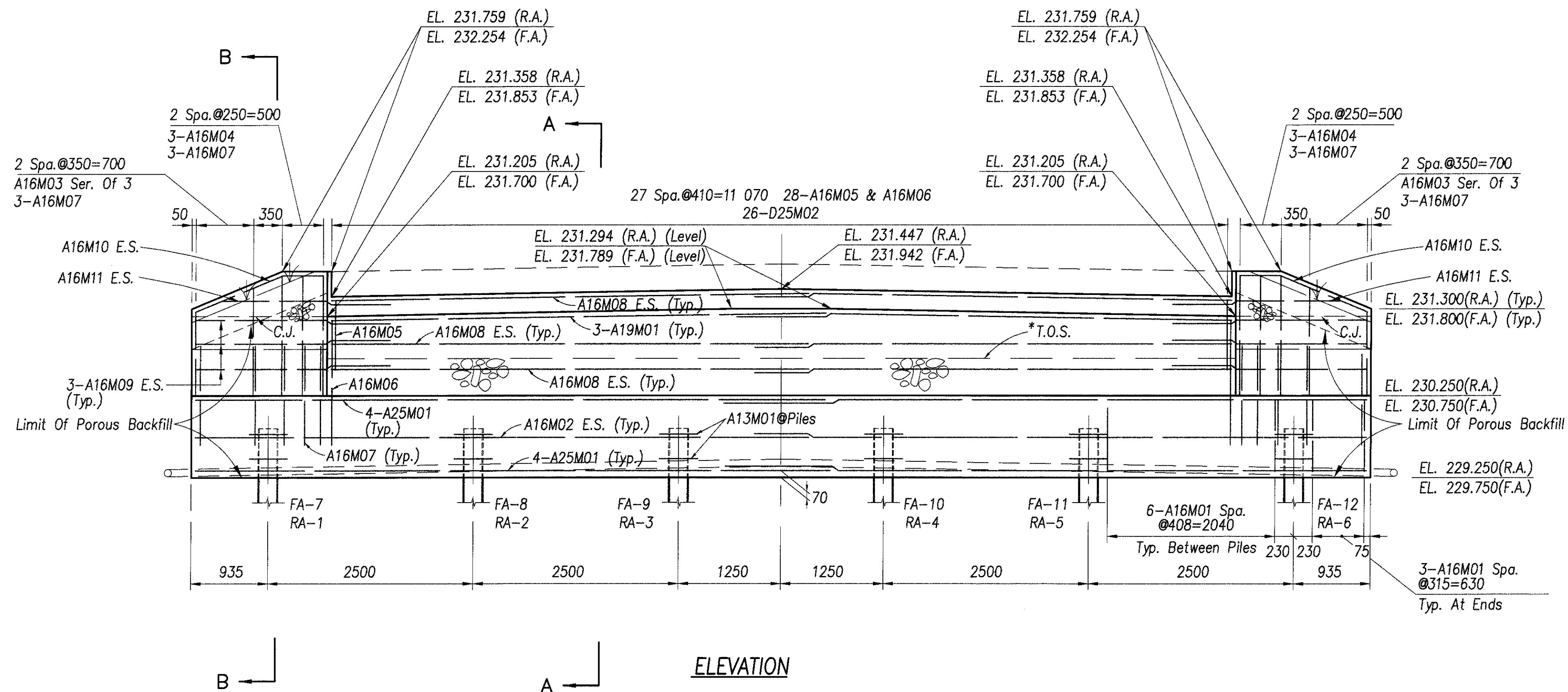
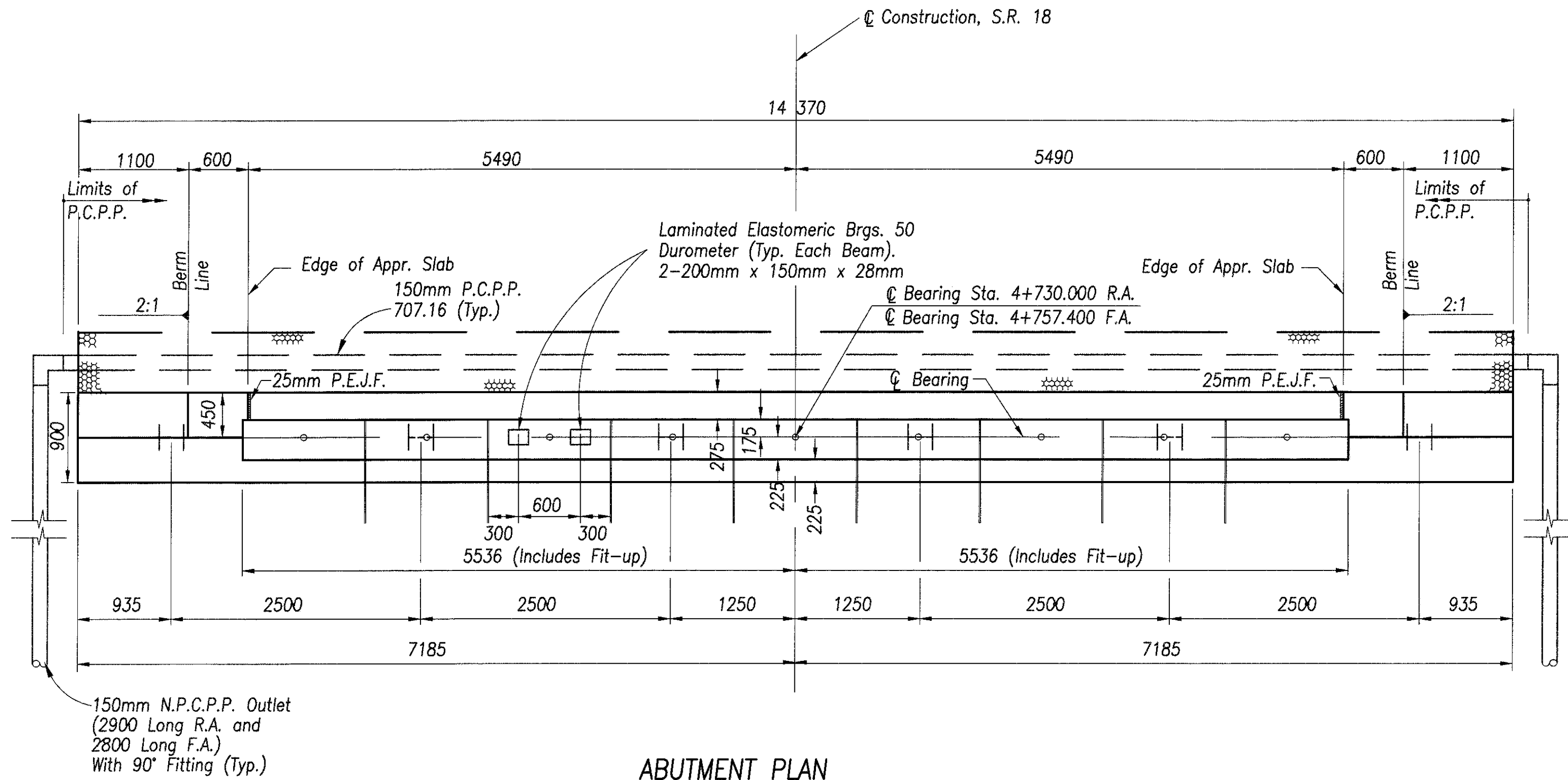
DATE
12/8/97
REVIEWED
EKL
STRUCTURE FILE NUMBER
3200949

DRAWN
AYZ
CHECKED
EEC
REVISED
MEG

ABUTMENT DETAILS
BRIDGE NO. HAN-18-04730
OVER SOUTH BRANCH PORTAGE RIVER

HAN-18-4.725

3/8
12
19



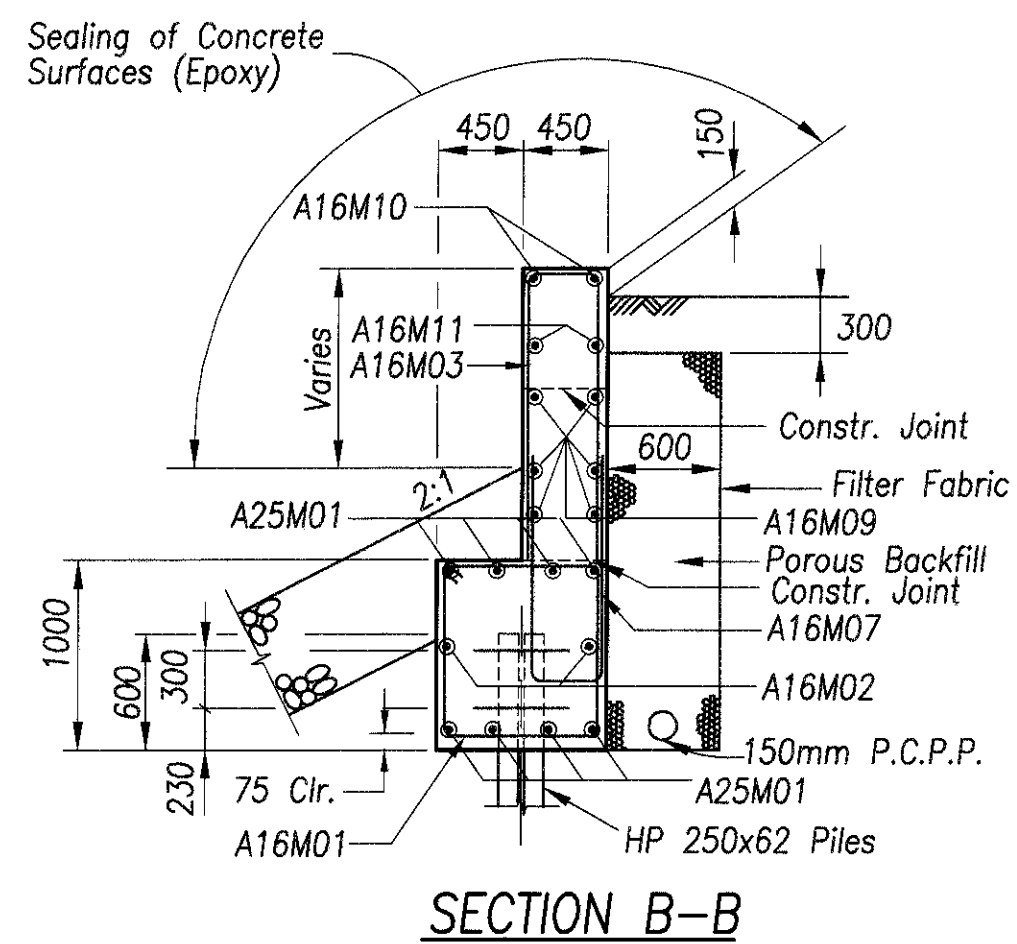
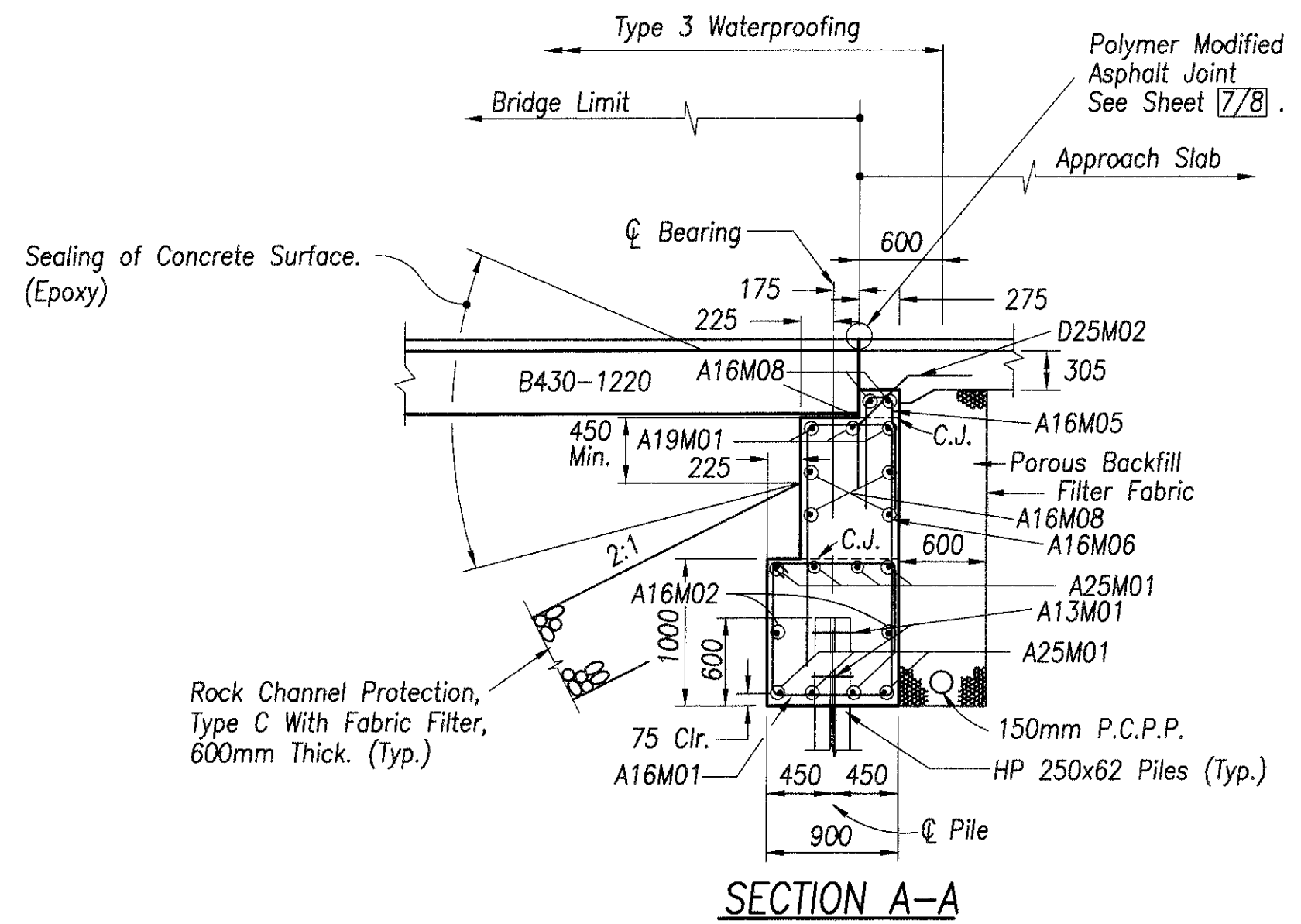
* T.O.S. 230.700 (R.A.)
T.O.S. 231.200 (F.A.)

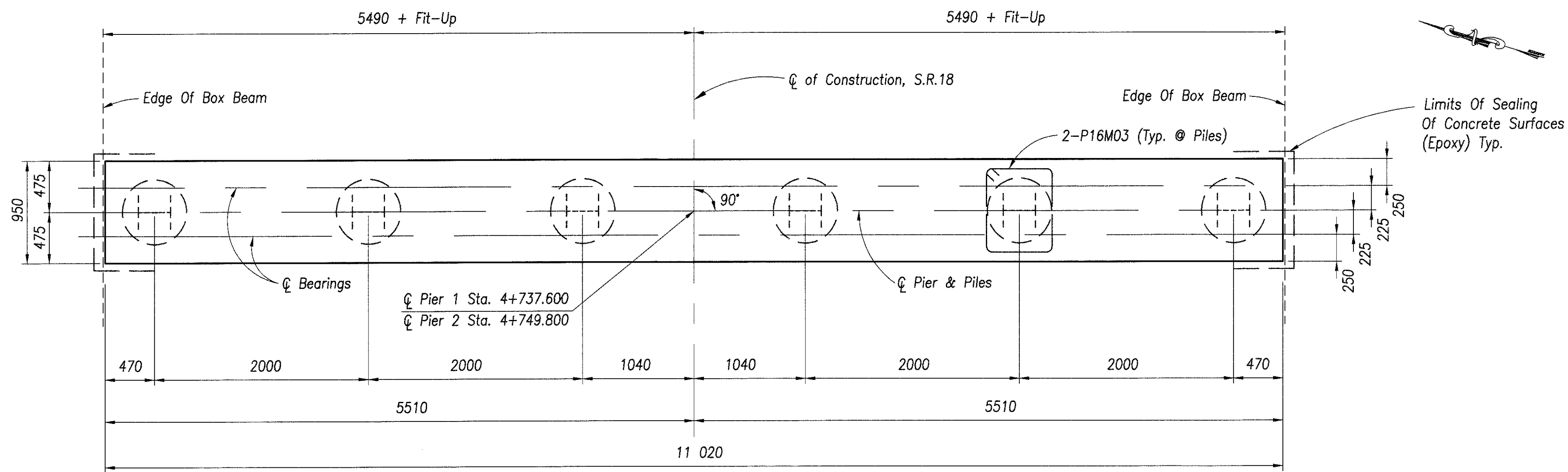
NOTES:

- Porous Backfill Shall Extend Upward To The Plane Of The Subgrade, To 300mm Below Proposed Ground Surface & Laterally To The Ends Of The Wingwalls. Filter Fabric Shall Conform With 712.09, Type A. Filter Fabric Is Included With Porous Backfill For Payment.
- Beam Seat Reinforcing: Special Care Shall Be Taken In Placing Reinforcing Steel In The Vicinity Of The Beam Seats Of The Abutments So As To Avoid Interference With The Drilling Of Anchor Dowel Holes.
- Lap Lengths Are As Follows.

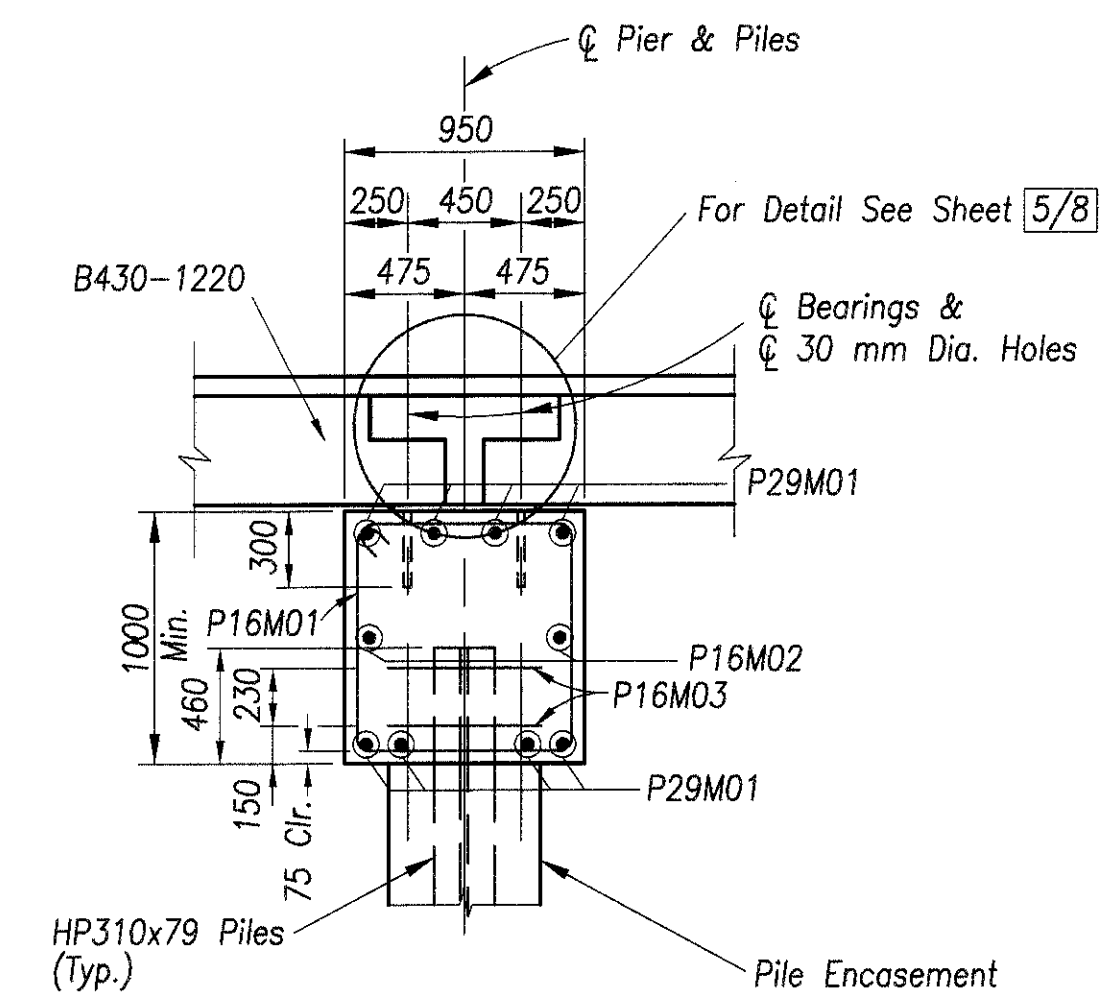
16M - 720 mm
19M - 1150 mm
25M - 1830 mm
- All Dimensions Are In Millimeters Unless Otherwise Noted except for Stations And Elevations Which Are In Meters.
- Abutment Concrete Above The Beam Seat Construction Joint Shall Not Be Placed Until The Prestressed Concrete Box Beams Have Been Erected.
- Legend

R.A. = Rear Abutment
F.A. = Forward Abutment
E.S. = Each Side
N.P.C.P.P. = Non-perforated Corrugated Plastic Pipe
P.C.P.P. = Perforated Corrugated Plastic Pipe
T.O.S. = Top of Slope
P.E.J.F. = Preformed Expansion Joint Filler
C.J. = Construction Joint

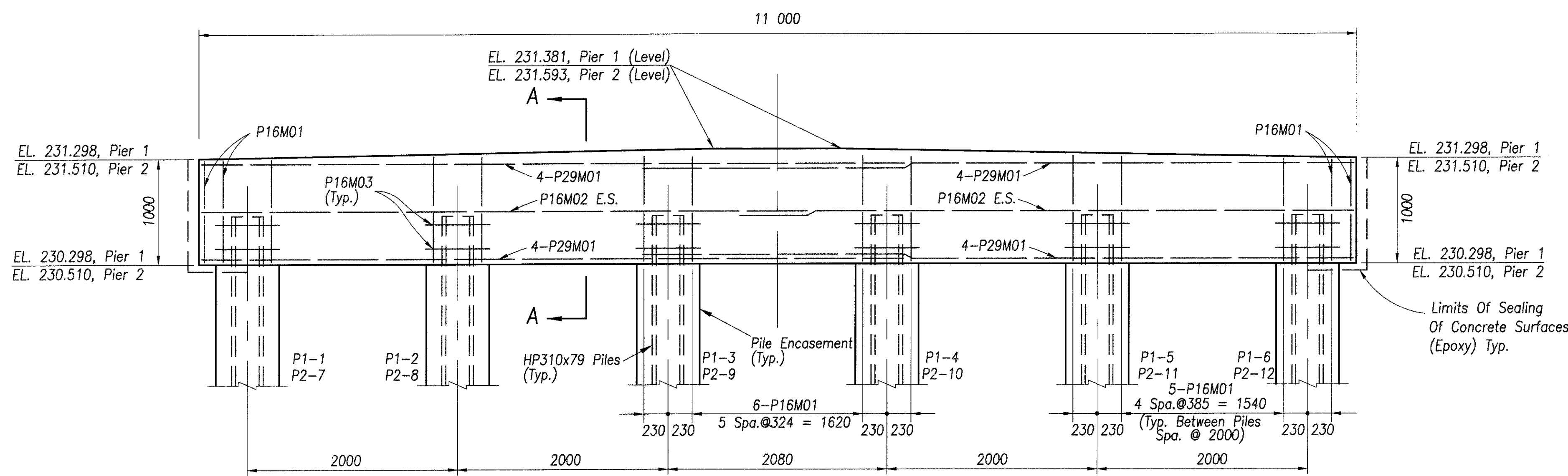




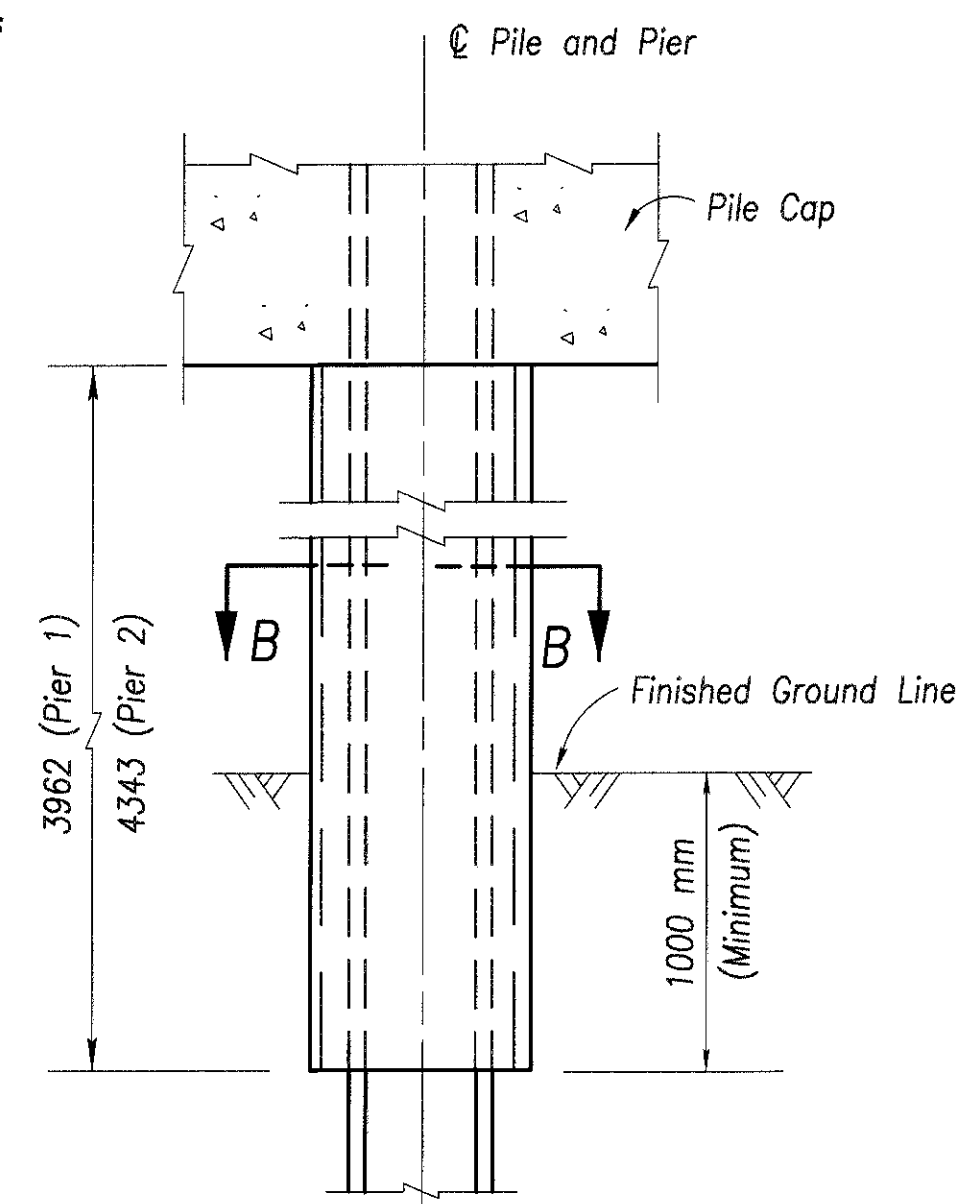
PIER PLAN



SECTION A-A

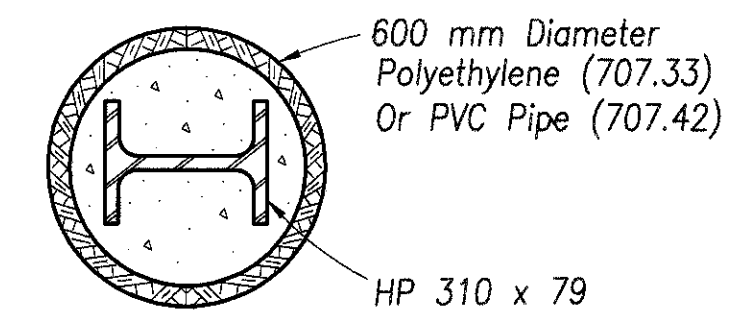


ELEVATION



PILE ENCASEMENT

See Sheet 2/8 For Additional Notes.



SECTION B-B

NOTES:

1. Beam Seat Reinforcing: Special Care Shall Be Taken In Placing Reinforcing Steel In The Vicinity Of The Beam Seats Of The Piers So As To Avoid Interference With The Drilling Of Anchor Dowel Holes.
2. Lap Lengths Are As Follows: 16M - 720 mm
29M - 2560 mm
3. All Dimensions Are In Millimeters Unless Otherwise Noted except for Stations And Elevations Which Are In Meters.
4. Legend

E.S. = Each Side

Note:
All Dimensions Are In Millimeters Unless Otherwise Noted Except
For Stations And Elevations Which Are In Meters.

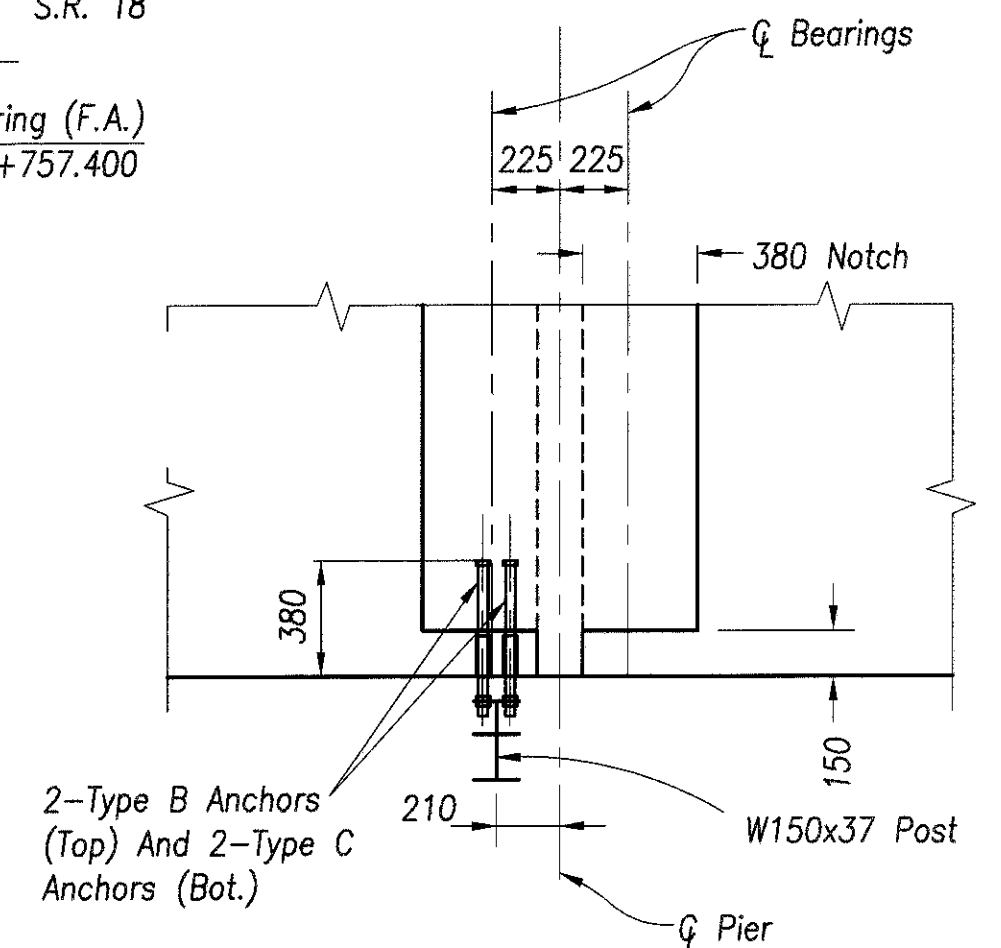
50 mm Dia. Hole For Anchor
Dowel In Superstructure. (Typ.)

Laminated Elastomeric Brgs. 50
Durometer (Typ.). Provide 2 Brgs.
Per End Of Beam. Each Brg. Shall
Be 200mm x 150mm x 28 mm
As Placed As Shown. For Laminated
Brg. Details, See Sheet 6/8

150mm x 150mm x 28mm
Polystyrene Around Dowels (Typ.).

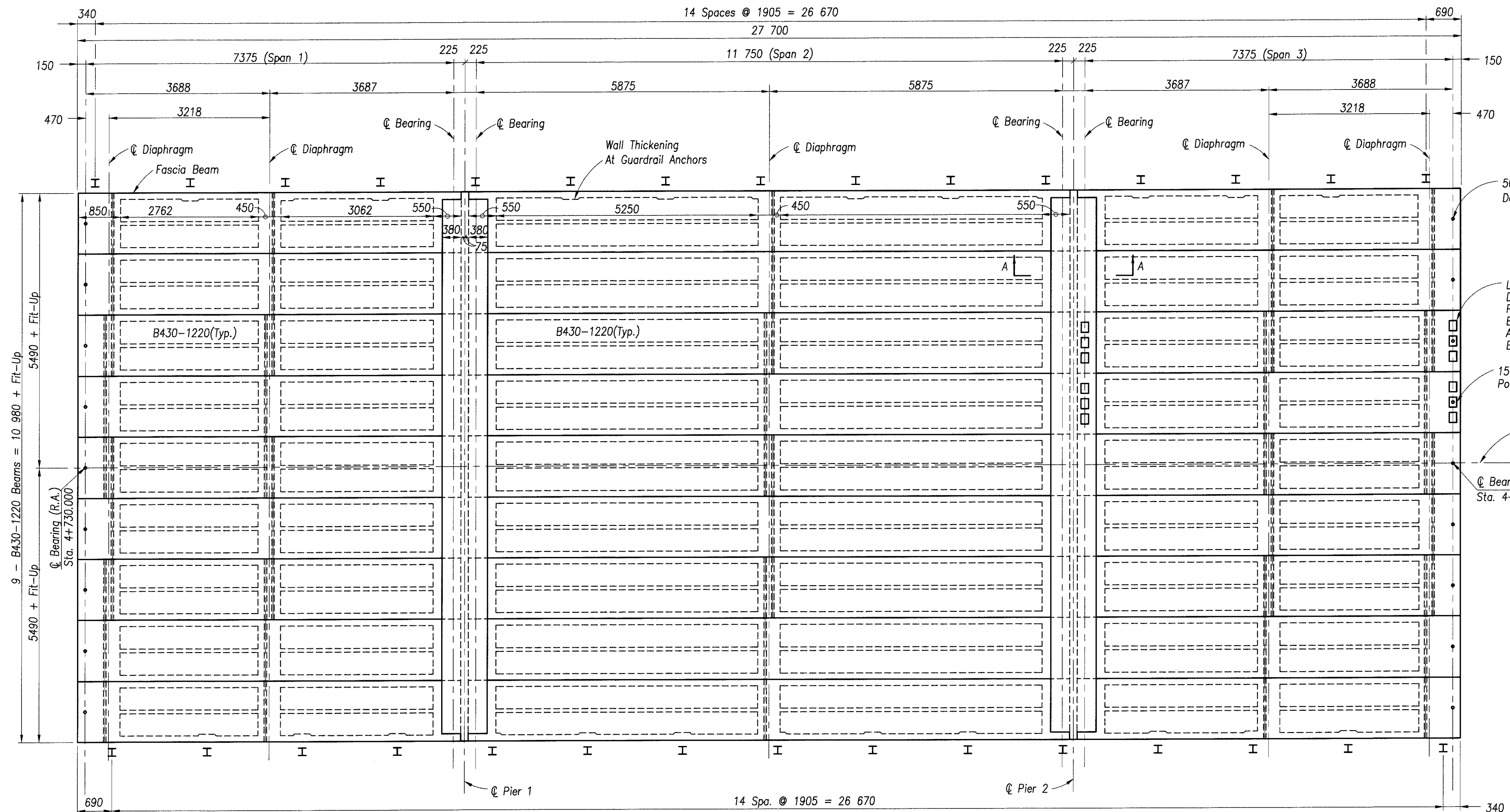
Construction
S.R. 18

Bearing (F.A.)
Sta. 4+757.400



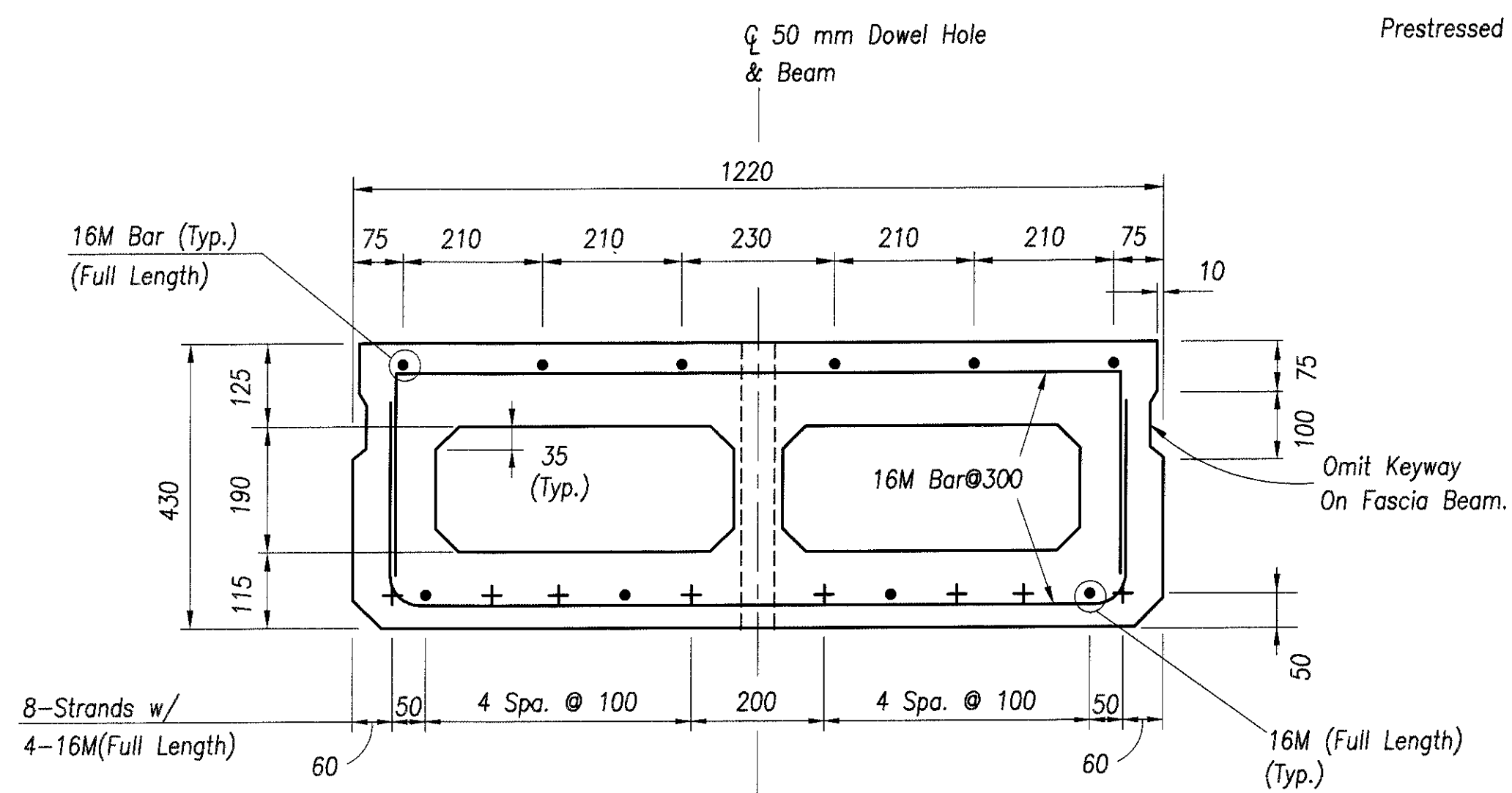
RAILING POST ANCHOR DETAIL AT PIERS

Pier 2 (Right Side) Shown
Pier 1 (Left Side) Similar



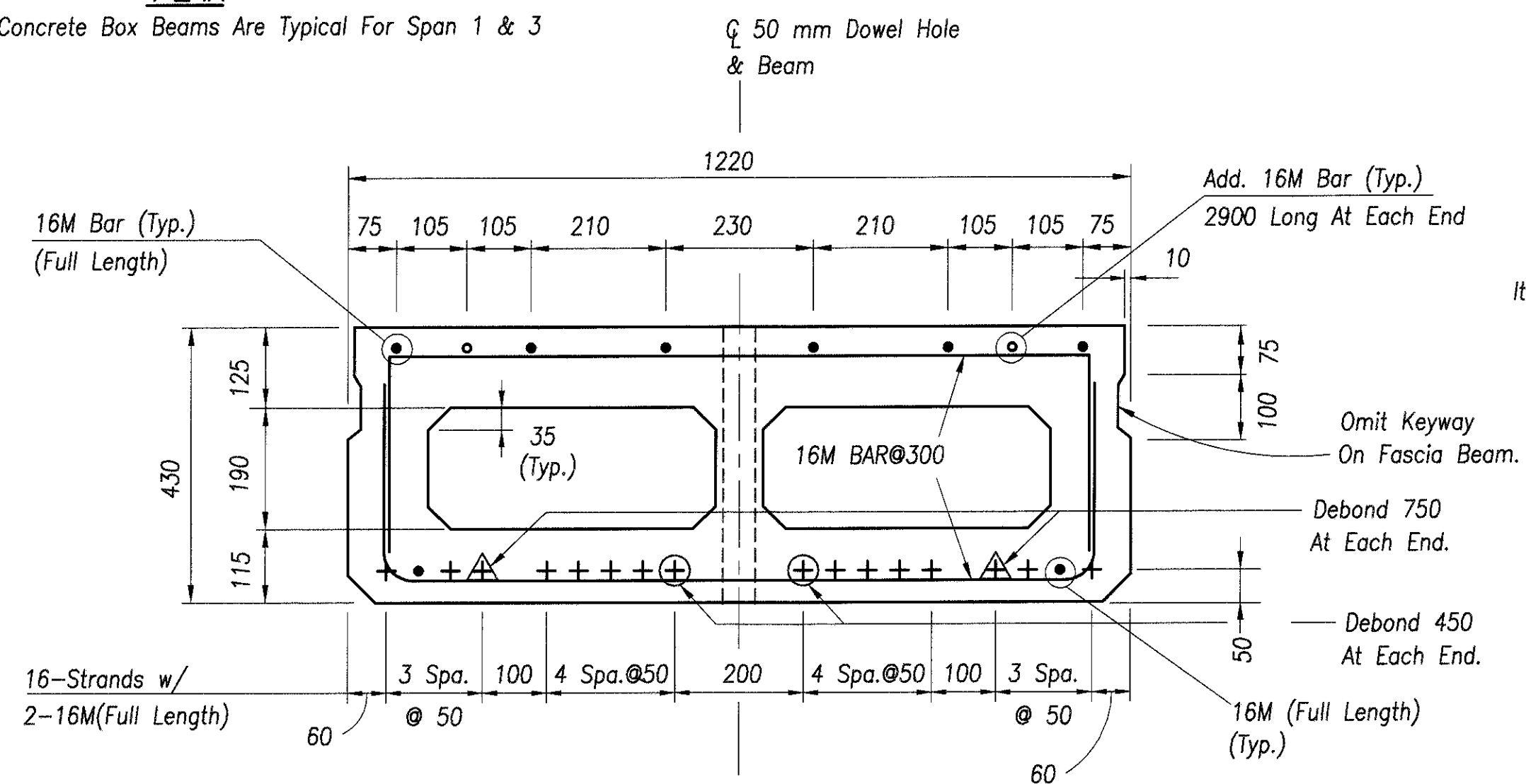
PLAN

Prestressed Concrete Box Beams Are Typical For Span 1 & 3

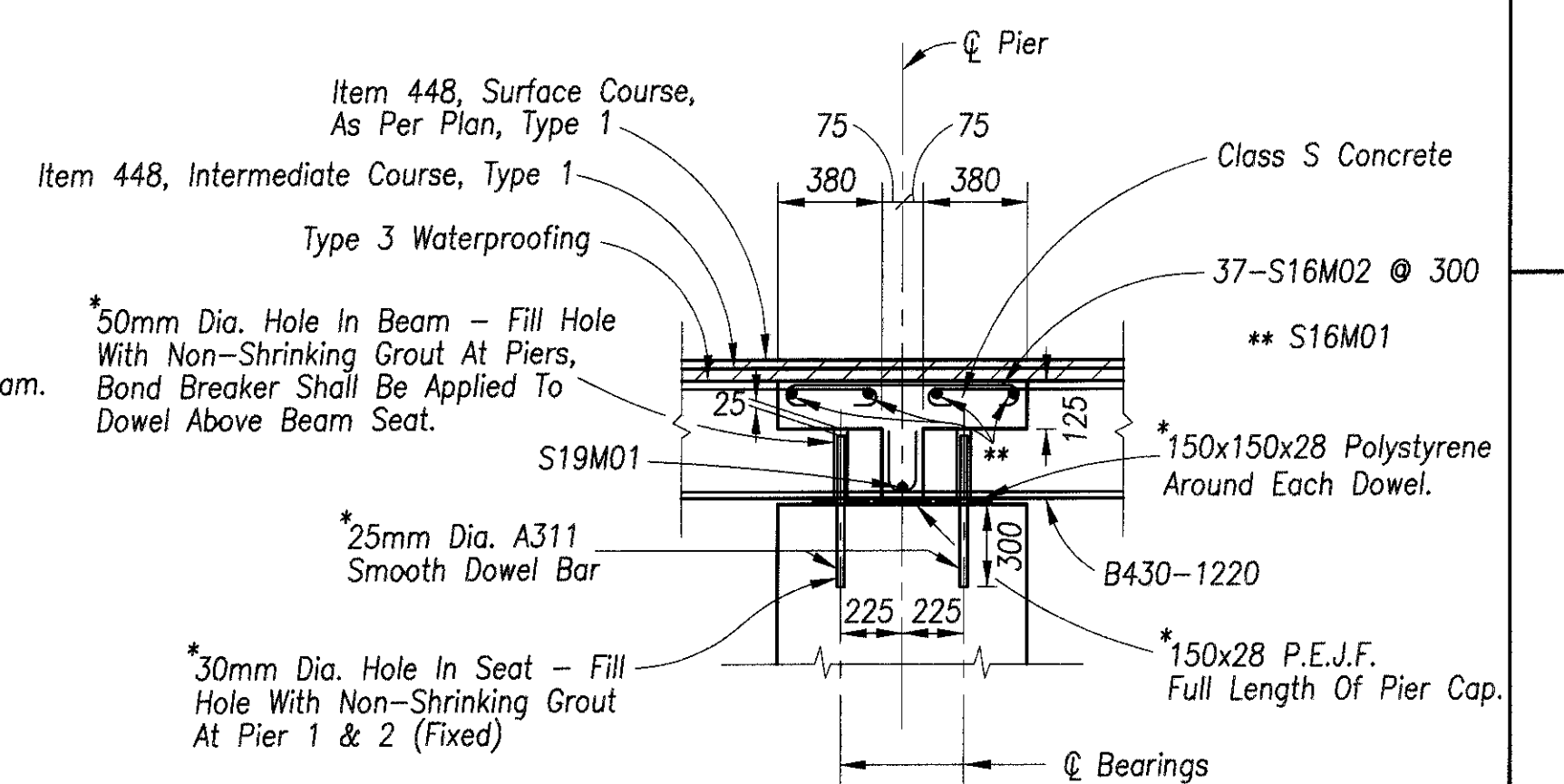


**B430-1220
SPAN 1 & 3**

+ = Prestress Strand

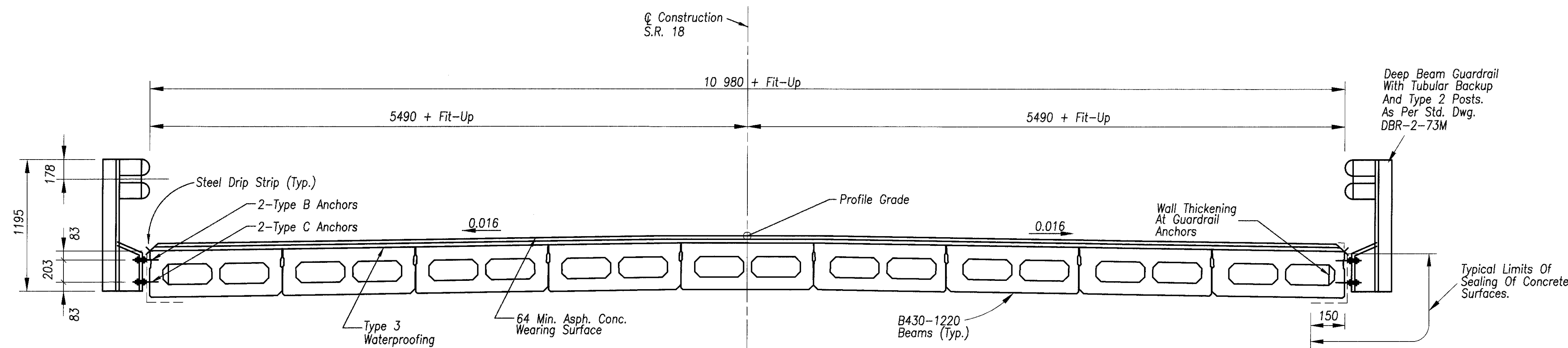


**B430-1220
SPAN 2**

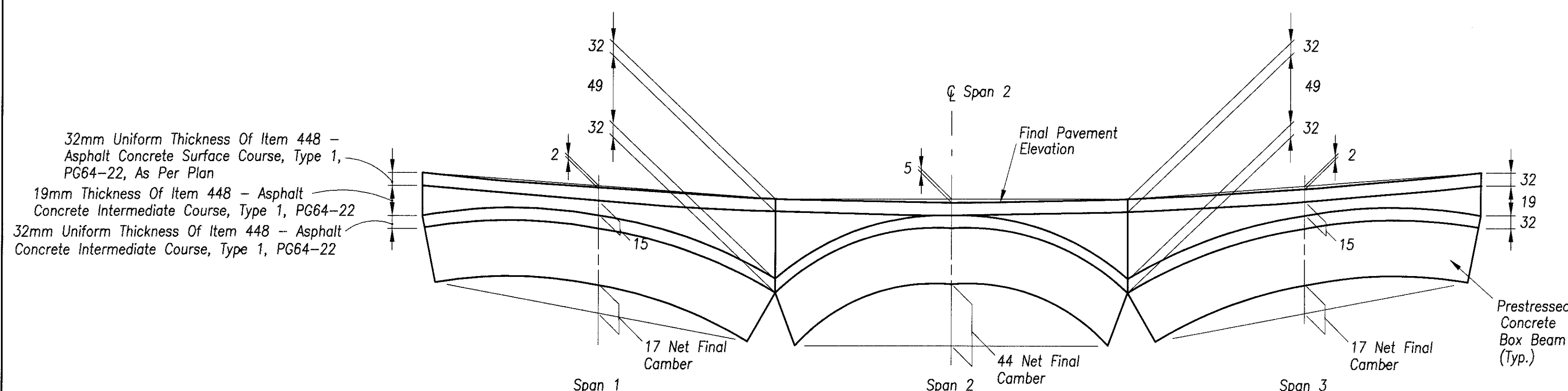


SECTION A-A

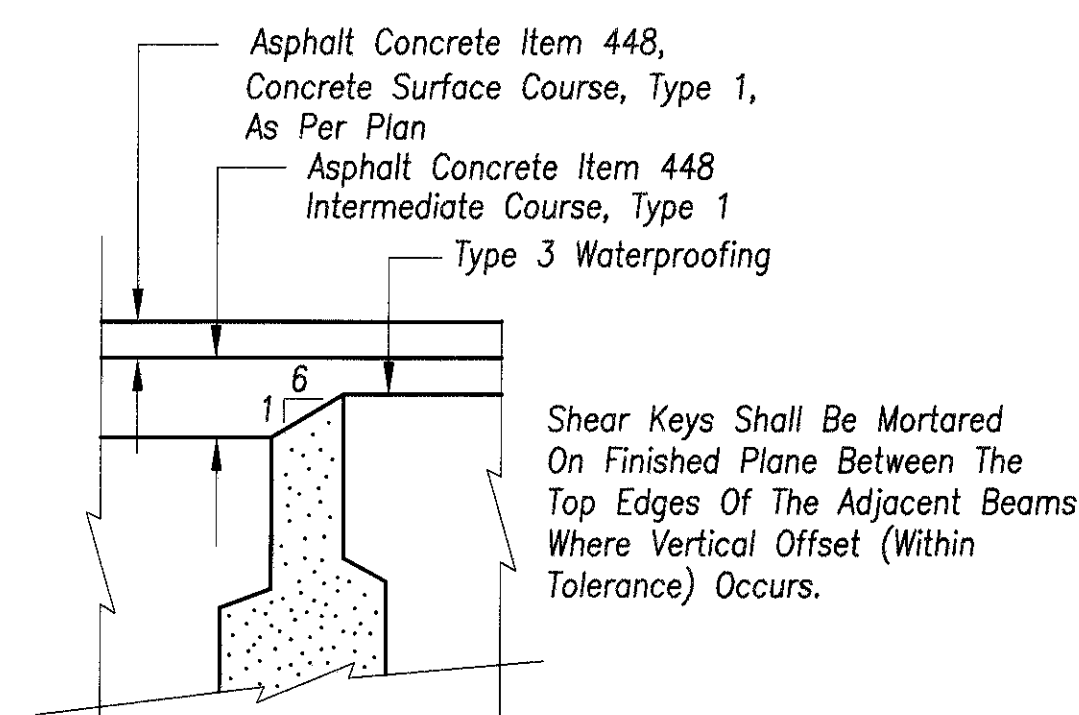
* Include With Item 515-Prestressed Concrete Beam



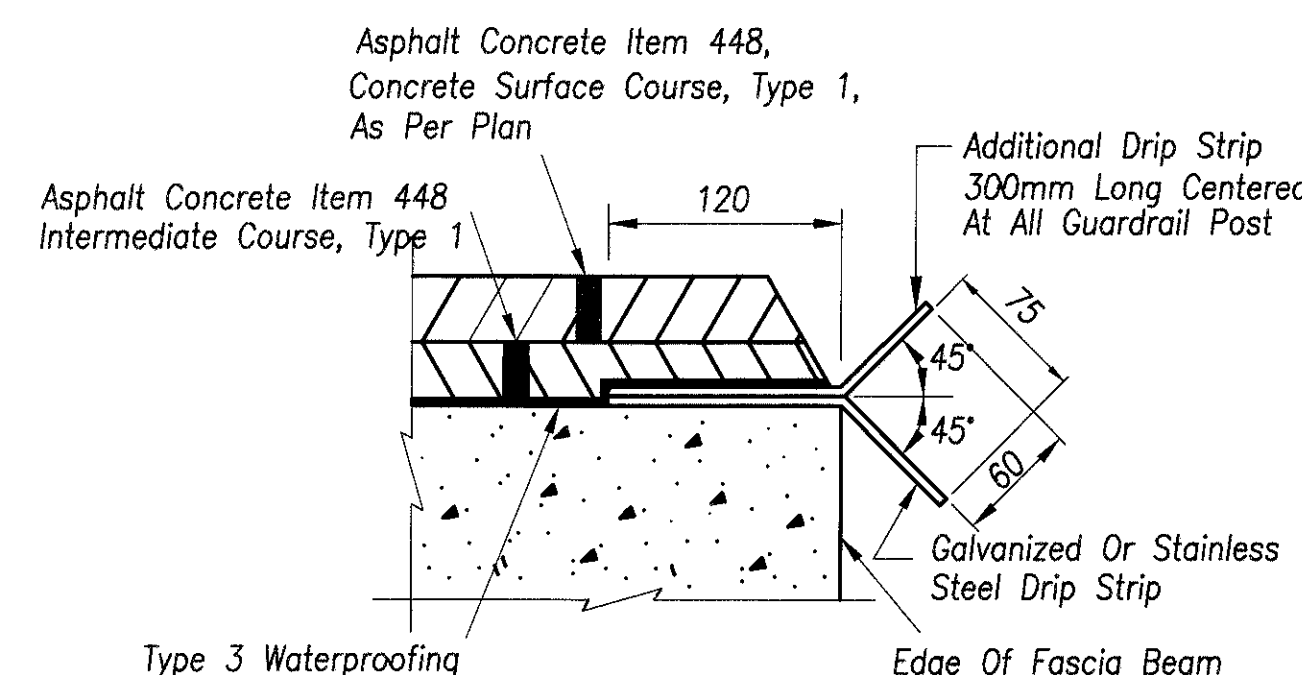
TRANSVERSE SECTION



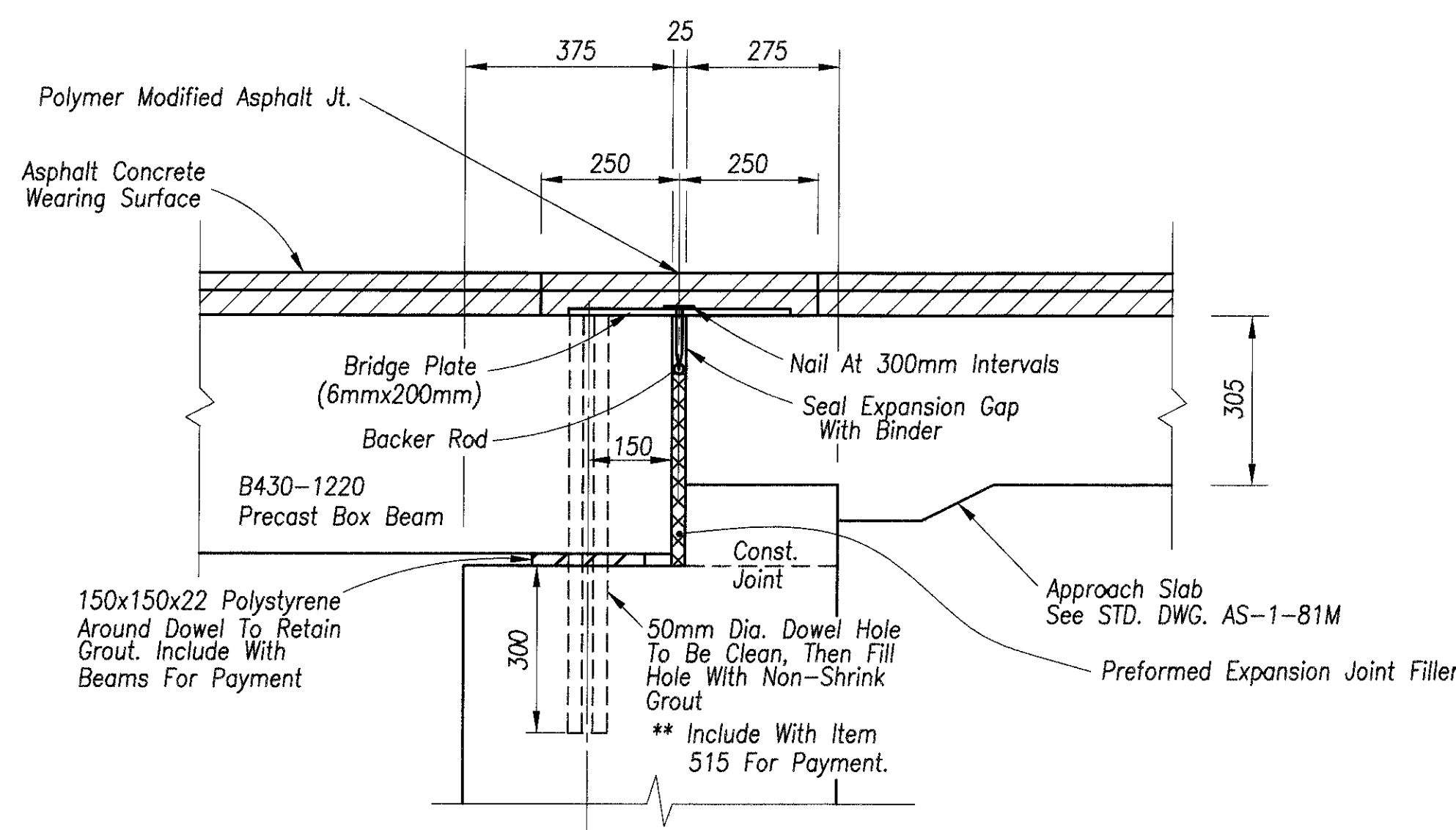
ASPHALT THICKNESS DIAGRAM



SHEAR KEY DETAIL

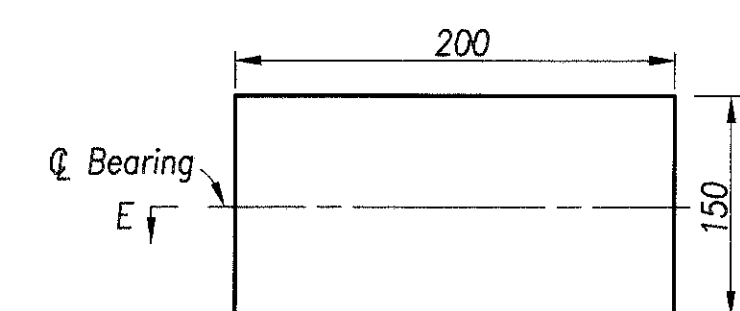


DRIP STRIP DETAIL

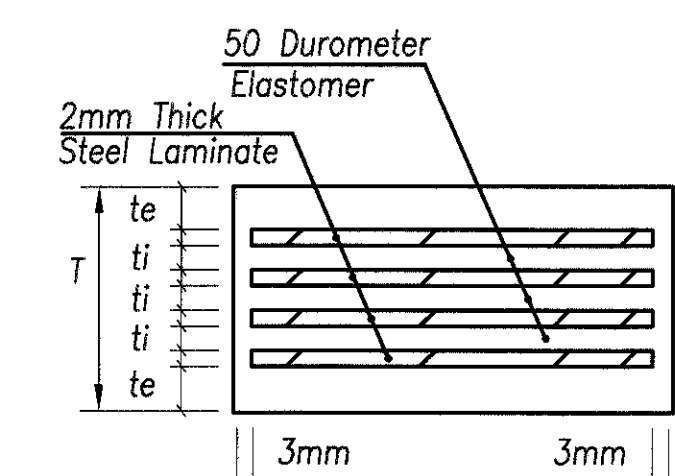


STRUCTURE EXPANSION JOINT DETAIL

Additional Details And Notes Are Shown On Sheet 7/8

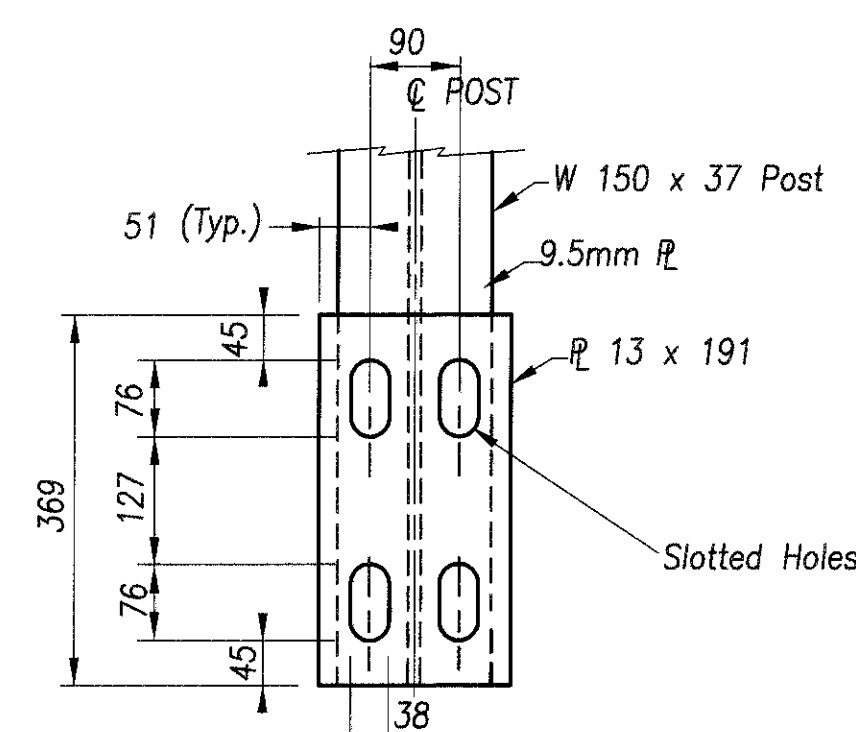


PLAN



SECTION E-E

ti = Thickness of Internal Elastomer Layers = 4.5mm
te = Thickness of External Elastomer Layers = 3.25mm
n = Number of Internal Elastomer Laminates = 3
T = Total Thickness = 28mm



G/R POST
ANCHORAGE DETAIL

Notes:

- Laminated Elastomeric Expansion Bearing (50 Durometer):
Dead Load Reaction = 33.00 KN
Live Load Reaction = 48.17 KN
Max. Design Load = 81.17 KN
- Calculated Camber (Span 2) For Sections B430-1220 At Time Of Paving, Including Allowance For Camber Growth Due To Creep Is 4.7mm. Calculated Deflection Due To Weight Of Surface Course And Railing Is 3mm. Net Final Camber Of Beams Is 44mm. This Is 44mm In Excess Of The Amount Required To Place The Top Of The Beam Parallel To Profile Grade. This Excess Amount Along With The 5mm Vertical Elevation Shall Be Compensated For By Thickening The 448 Intermediate Course, Type 1 From 0mm At The Center Of The Span To 49mm At The Piers.
- Calculated Camber (Spans 1 & 3) For Sections B430-1220 At Time Of Paving, Including Allowance For Camber Growth Due To Creep Is 18mm. Calculated Deflection Due To Weight Of Surface Course And Railing Is 1mm. Net Final Camber Of Beams Is 17mm. With 44mm Net Camber At Span 2, 27mm Extra Camber Along With The 2mm Vertical Elevation Are Required. This Shall Be Provided By Thickening The 448 Intermediate Course, Type 1 From 15mm At The Center Of The Span To 19mm At The Abutments.
- Asphalt Concrete:
Asphalt Concrete Surface Course Shall Consist Of A Variable Thickness Item 448 Asphalt Concrete, Intermediate Course, Type 1 And 32mm Uniform Thickness Item 448 Asphalt Concrete, Surface Course, Type 1, As Per Plan. The Item 448 Asphalt Concrete, Intermediate Course, Type 1 Shall Be Placed In Two Operations. The First Course Shall Be 32mm Uniform Thickness. The Second Course Shall Be Feathered To Place The Surface Parallel To And 32mm Below Final Pavement Surface Elevation.
- Elastomeric Bearings Shall Comply With Item 516 and Articles 18.2.5 Through 18.2.8 Of Section 18, Bearing Devices, Division II, Construction Of The AASHTO Standard Specification For Highway Bridges. Bearings Shall Be Grade 3, 50mm Durometer Elastomer, And Shall Be Subjected To Load Testing Requirements Corresponding To Design Method A. Testing Shall Be Included In The Unit Price Bid For The Bearings, Each.
- All Dimensions Are In Millimeters Unless Otherwise Noted Except For Stations And Elevations Which Are In Meters.
- Bearing Pad Shims: 3 mm Thick Preformed Bearing Pad Shims, Plan Area 200 mm By 150 mm (The Same Size Of The Elastomeric Bearing Pad Should Be Used) Shall Be Placed Under The Elastomeric Bearing Pads Where Required For Proper Bearing. The Amount Supplied Is Sufficient For 2 Shims Per Beam. Payment Will Be Made At The Contract Price For Item 516 - 3mm Preformed Bearing Pads. Any Unused Shims Shall Become The Property Of The State.

GENERAL NOTES AND DETAILS FOR POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM

Item Special – Polymer-Modified Asphalt Expansion Joint System

This Item Will Be Used To Seal The Expansion/Contraction Joints As Per These Details And The Manufacturer's Requirements Using A Polymer-Modified Asphalt System. The Prime Contractor Will Obtain The Services Of One Of The Following Licensed Applicators Who Will Furnish And Install The New Bridge Expansion Joint System After All Paving On The Affected Bridge(S) Has Been Completed.

Pavetech Engineered Systems, Inc. 2575 Us. Rt. 22 & 3, Office 1
Maineville, OH 45.039
Tel: 1-800-258-0162

Linear Dynamics, Inc. 400 Lawidex Plaza
Parsippany, NJ 07054
Tel: (201) 884-0300

Materials:

Bridging Plate:

Mild Steel Or Aluminum 3.2 mm Or 6.4 mm Thick Plate, 299 mm Wide

Binder:

Type: Polymer Modified Asphalt
Softening Point: 82 Degrees C. Min.
Flow: 3 mm. Max. At 60 C
Penetration: 9 mm. Max. At 25 C
1 mm. Max. At -17.7 C
ASTM D 3407
Ductility: 40 cm. Min. ASTM D 113
Resilience: 60% Min. At 25 C
Tensile Adhesion: 700% Min.
Specific Gravity: 1.10 ± 0.05
Pouring Temp: 180 – 200 Degrees C.

Aggregate:

Type: Crushed, Double Washed, And Dried Granite Or Basalt

Gradation: The Gradation Of The Aggregate Varies By Manufacturer And Will Be As Per The Manufacturer's Recommendations For The System Being Used On This Project.

Backer Rod:

Property:	Nominal Value	Test Method
Density	320 Kg/Cu Meter	Astm D 1622
Tensile Strength	170 KPa	Astm D 1623
Water Absorption By Volume	0.5%	Astm C 509
Compression Deflection At 6 KPa	25%	Astm D 1621
Temperature Resistance	-45 To +230 Degrees C	

Installation Procedures:

Sawing And Surface Preparation:

After All Paving Operations Are Complete, The Overlay Is To Be Transversely Saw Cut Full Depth No Less Than Two Inches Deep (500 mm Centered Over Joint Opening, Unless Otherwise Noted). Remove All Material, Including Water-Proofing Material, Between Saw Cuts. Thoroughly Clean And Dry Exposed Concrete, Steel, And Cut Surfaces Using Compressed Air And A Hot Compressed Air (Hca) Lance. The Lance Must Produce A Flame Retarded Air Stream Temperature Of 1650 Degrees C. At A Velocity Of 915 Meter Per Second With 105 KPaG Chamber Pressure. If There Is An Interruption Due To Weather Or Other Causes, The Operation Will Be Repeated Wit The Hcca Lance Immediately Befoe The Tanking Operation. Also, 150 mm Of The Road Surface On Either Side Of The Joint Will Be Dried So That A Suitable Surface For Bitumen Adhesion Is Obtained.

Sealing Of Expansion Joint: (Pre-Stressed Box Or Concrete Slab)

The Expansion Joint Gap Is To Be Sealed And A Bridging Plate Centered Along It. A Very Narrow Gap Will Be Sealed By Pouring Hot Binder Into The Gap. Caps Of 3 mm Or More Will First Be Filled With An Appropriately Sized Backer Rod. The Backer Rod Will Be Installed So That It Is Between 3 And 28 Below The Top Of The Existing Gap. The Gap Will Then Be Filled With Binder. Additional Binder Will Be Spread Over The Surface Area Where The Metal Plate Will Be Placed.

Bond Breaker:

Center The Bridging Plate Over The Existing Joint And Bed Into The Hot Binder. Butt Joint The Bridging Plates To Accomodate The Entire Joint Length. Spike Holes Will Be Drilled At 1 Foot Intervals Along The Longitudinal Centerline Of The Plates. Secure Bridging Plate With Nails Or Spikes. Seal Butt Joints With Hot Binder And Allow To Cool Before Tanking The Joint.

Tanking:

Seal All Pepared, Exposed Surfaces Of The Joint With Binder. Pour The Hot Binder Over The Floor Area Of The Joint And Spread To Coat All Exposed Surfaces. The Binder Will Be A Nimum Of 1 mm Thick On The Bottom Of The Joint Cavity, With Pools Of Greater Thickness Where Surface Irregularities Exist. The Binder Application Temperature Will Be Between 180 And 200 Degrees C. The Binder Will Not Be Allowed To Be Heated Above 210 Degrees F. Nor Allowed To Exceed 200 Degrees C. For More Than 1 Hour.

Build-Up Of Joint Layers:

Aggregate Preparation:

Heat The Aggregate To A Temperature Of 135 To 160 Degrees C., With A Suitable Rotating Drrum With Attached Heat Source Or A Hot Compressed Air Lance, To Remove All Dust And Moisture.

Aggregate Proportion And Layer Thickness:

Mix The Aggregate With The Binder Such That The Minimum Aggregate Content By Weight Will Be 68%. The Heated Aggregate And Binder Will Be Combined In Layers Not Less Than 20 mm Nor Exceeding 50 mm. The Thickness Of Each Layer Can Be Varied, Within These Limits, To Achieve The Required Joint Thickness. The Objective Is To Coat Each Stone And Fill The Voids While Avoiding An Excess Of Binder. This Will Achieve The Maximum Content Of Stone Consistent With All Stones Being Coated With Binder And A Maximum Void Content Of 2%. Rake The Mixture To Mix And Level.

Aggregate Preparation:

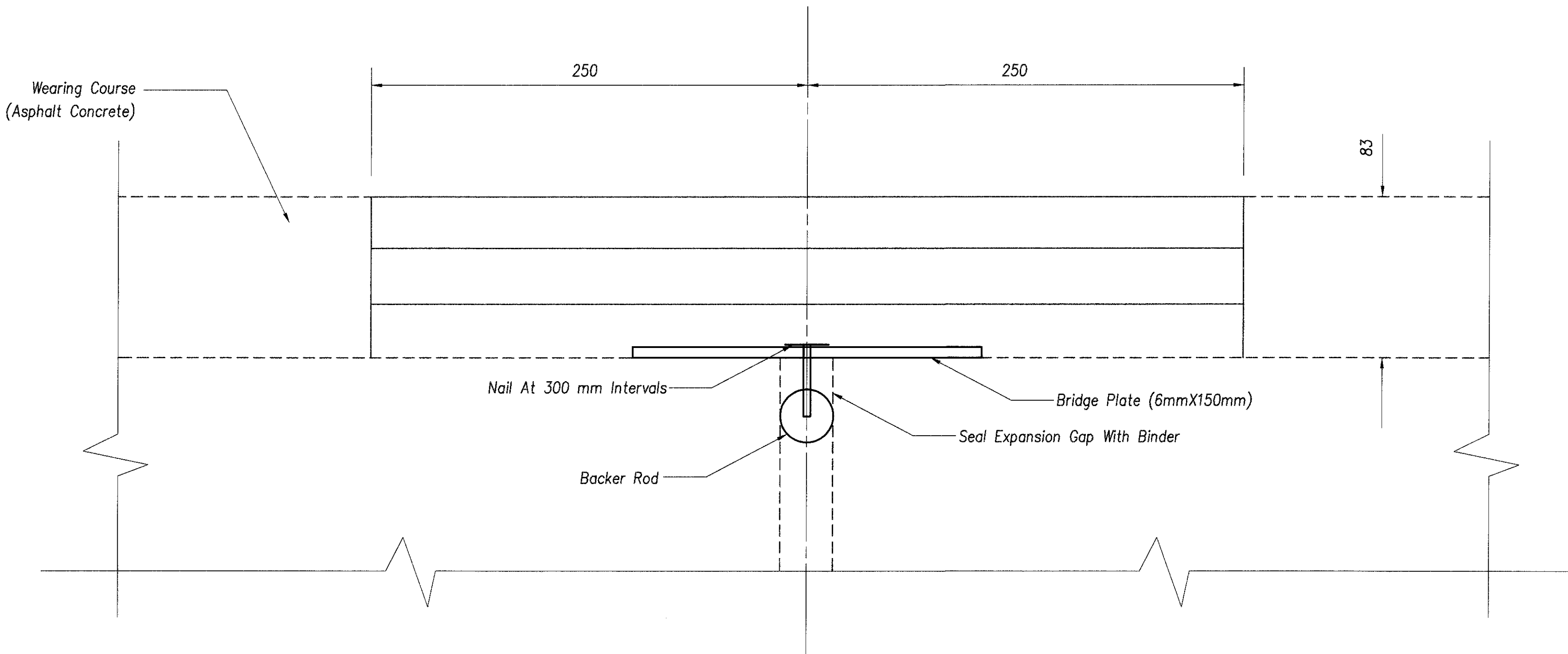
The Top Layer Thickness Wil Vary Between 13 mm And 25 mm. In Preparing The Top Layer, The Ratio Of Aggregate To Binder Will Be Approximately 6:1 By Weight. This Ratio Is Not Absolutely Vital Since Additional Binder Will Infiltrate The Top Layer From Both Below And Above. Overfill The Top Layer And Compact To The Level Of The Adjacent Surfaces Using A Roller Or Vibratory Plate Compactor. Immediately After Completion Of The Compaction, Pour Sufficient Binder Over The Joint To Fill The Surface Voids And Coat The Surface Stone. Dust The Finished Joint With A Fine, Dry Aggregate To Prevent Tackiness.

Maintenance Of Traffic:

If Necessary To Facilitate Maintenance, The Joint Will Be Installed In Two (2) Half-Width Phases. During Phase 1 Approximately Half Of The Total Joint Will Be Installed. During Phase 2, A Minimum Of 50 mm Of The Phase 1 Joint Will Be Removed, At Or Near The Centerline, With The Remainder Of The Joint Installed. Inall Ccases, Operations Will Be Scheduled So That All Lanes Can Be Open To Traffic During All Non-Working Hours.

Payment:

Payment For All The Above Will Be At The Unit Price Bid Per Meter Of Sealed Joint In Place For Item Special 516 31300, Polymer Modified Asphalt Expansion Joint System (83 mm Thick). This Will Include All Labor, Equipment, Materials, And Incidentals Necessary To Complete The Above Work.



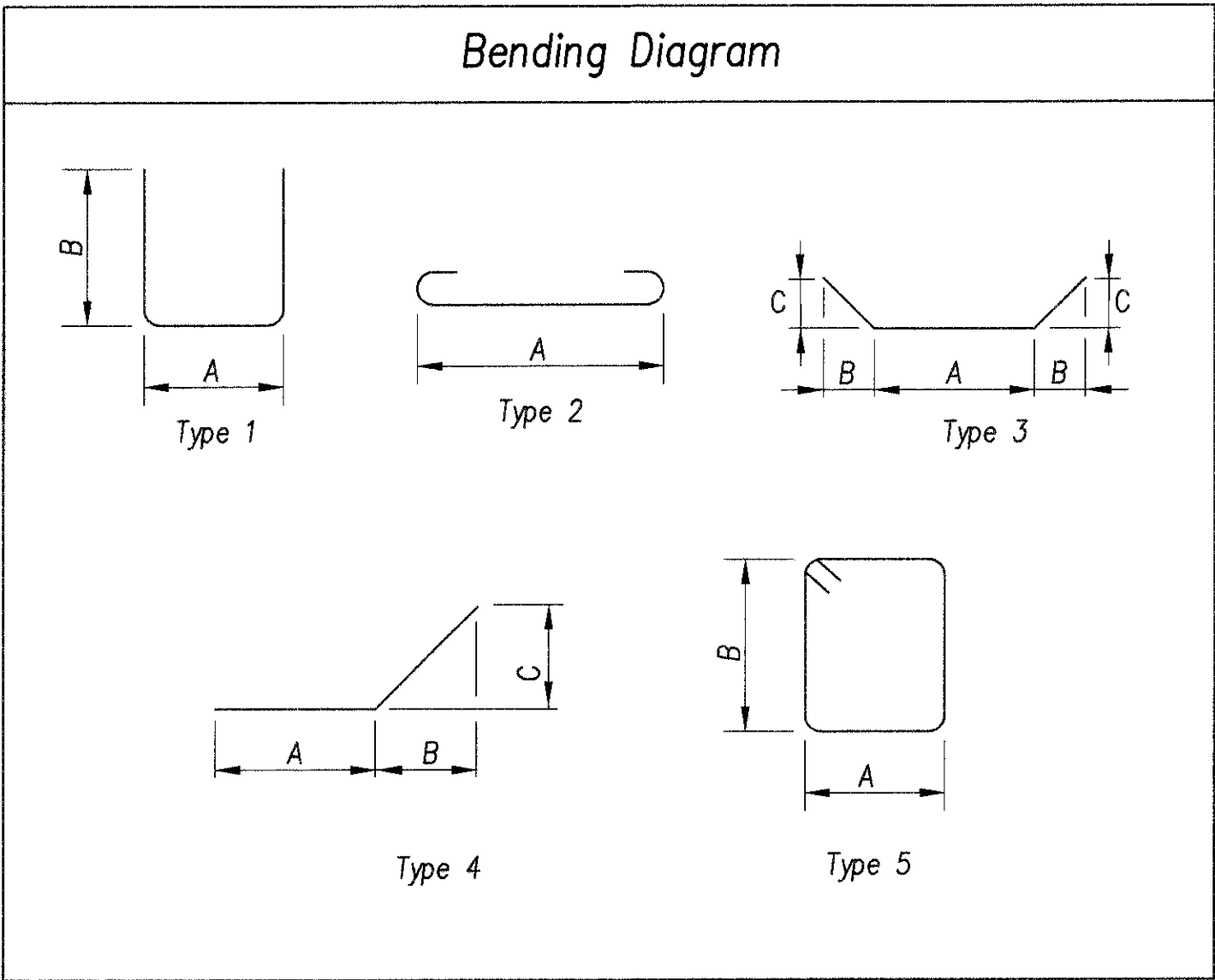
TYPICAL PRESTRESSED BOX BEAM JOINT

REINFORCING STEEL LIST										
Mark	Number			Length	Type	Dimensions				
	Rear	Fwd	Total			"A"	"B"	"C"	"D"	Incr.
Abutment										
A13M01	12	12	24	1945	5	450	450			
A16M01	36	36	72	3510	5	800	875			
A16M02	4	4	8	7495	Str.					
A16M03	2 Ser. Of 3	2 Ser. Of 3	4 Ser. Of 3	2300 To 2890	1	350	1015 To 1310			295
A16M04	6	6	12	3175	1	350	1455			
A16M05	28	28	56	1585	1	175	750			
A16M06	28	28	56	3795	1	575	1650			
A16M07	12	12	24	3250	1	350	1490			
A16M08	12	12	24	5895	Str.					
A16M09	12	12	24	2370	Str.					
A16M010	4	4	8	1630	4	1150	450	190		
A16M011	4	4	8	2055	Str.					
A19M01	6	6	12	6110	Str.					
A25M01	16	16	32	8050	Str.					
D25M02	26	26	52	1335	3	495	305	305		

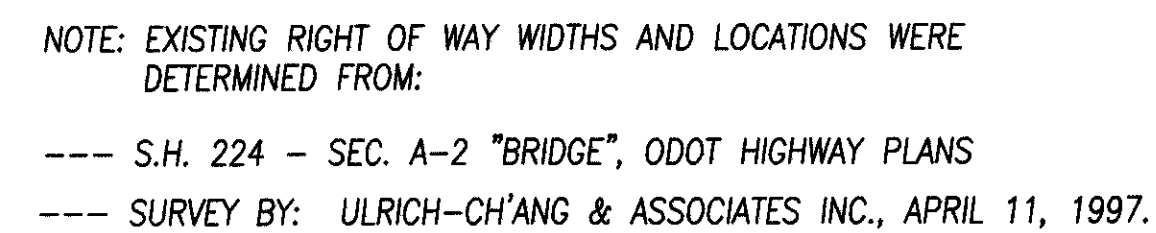
Mark		Number			Length	Type	Dimensions				
	Pier 1	Pier 2	Total	"A"			"B"	"C"	"D"	Incr.	
Pier											
P16M01	30	30	60		3560	5	850	850			
P16M02	4	4	8		5810	Str.					
P16M03	12	12	24		1960	5	450	450			
P29M01	16	16	32		6730	Str.					

Mark	Number	Length	Type	Dimensions				
				"A"	"B"	"C"	"D"	Incr.
Superstructure								
S16M01	8	10920	Str.					
S16M02	74	1170	2	810				
S19M01	2	10920	Str.					

- NOTE:
1. All Reinforcing Steel Are Epoxy. All Dimensions Are In Millimeters.
 2. The Bar Size Number Is Specified On The Plans In The Bar Mark Column.
The First Two Digits Indicates The Bar Size Number. Bar Dimensions Shown
Are Out To Out Unless Otherwise Indicated.

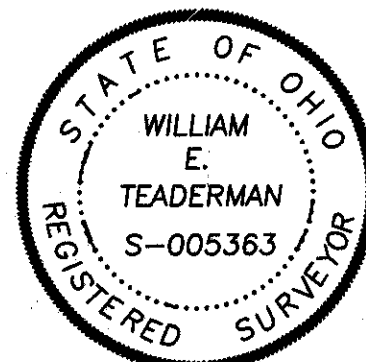


**T2N R12E, SECTION 6
WASHINGTON TOWNSHIP
HANCOCK COUNTY, OHIO**



THE ESTABLISHMENT OF THE PROPERTY LINES AND EXISTING
RIGHT OF WAY LINES SHOWN ON THIS PLAN AS OF THE DATE
WAS PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION.

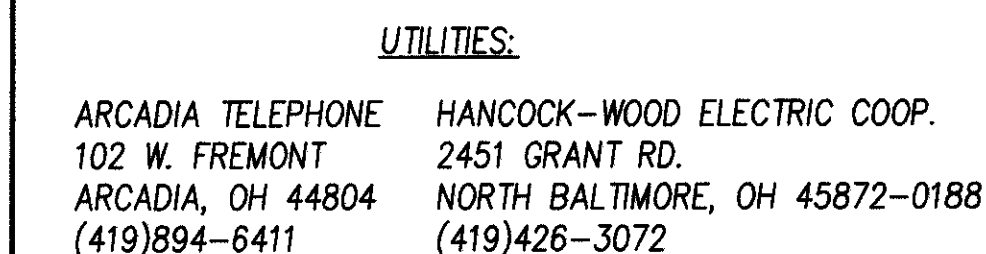
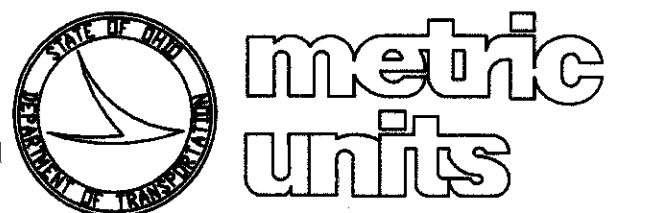
SURVEYOR NO. S-005363 DATE 5-8-98



RECEIVED 6-5, 19 98
RECORDED 6-5, 19 98
BOOK 20 PAGE 69~~70~~/~~71~~

COUNTY RECORDER

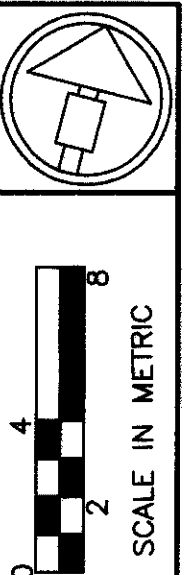
**T2N R12E, SECTION 6
WASHINGTON TOWNSHIP
HANCOCK COUNTY, OHIO**



THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN
ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF
THE UTILITY AS REQUIRED BY SECTION 153.64 O.R.C.

DOUGLAS D. & LOIS J.
McCRACKEN
31.6673 ha.
(78.250 Ac)

[illegible]



PK NAIL FOUND
STA. 4+897.333
0.000 m @ R/W

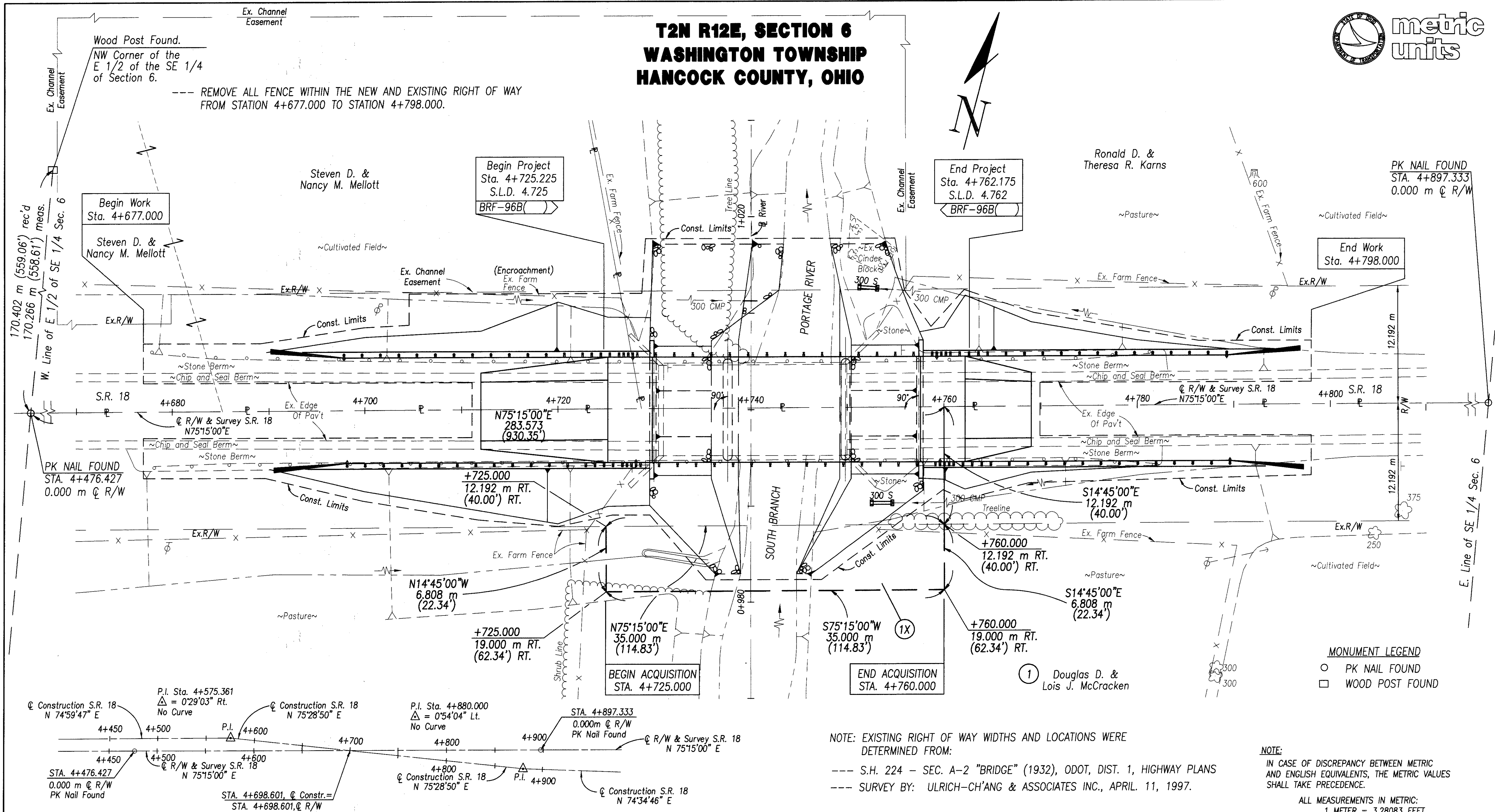
PID NO.
15985

RIGHT OF WAY PLAN AND SUMMARY OF ADDITIONAL RIGHT OF WAY

HAN-18-4.725 (2.94)

$$\frac{2}{2}$$
$$\frac{19}{19}$$

REV.	DATE	DESCRIPTION
DATE OF COMPLETION		5/8/98



PID NO. 15985

[illegible]

NOTE:
IN CASE OF DISCREPANCY BETWEEN METRIC
AND ENGLISH EQUIVALENTS, THE METRIC VALUES
SHALL TAKE PRECEDENCE.

ALL MEASUREMENTS IN METRIC:
1 METER = 3.28083 FEET.

AREAS ARE SHOWN IN HECTARES "ha":
1 HECTARE = 10,000 SQ. METER
OR 2.471 ACRES.

SPECIAL PROVISIONS

WATERWAY PERMITS FOR CRS: HAN-18-4.725

U.S. ARMY CORPS OF ENGINEERS
PERMIT NUMBER: NWP #3 and # 14

OHIO EPA
PERMIT NUMBER: _____

DATE: 2-6-98

NATIONWIDE PERMIT

3. Maintenance. The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area including those due to changes in materials, construction techniques, or current construction codes or safety standards which are necessary to make repair, rehabilitation, or replacement, are permitted provided the environmental effects resulting from such repair, rehabilitation, or replacement are minimal. Currently serviceable means useable as is or with some maintenance but not so degraded as to essentially require reconstruction. This NWP authorizes the repair, rehabilitation, or replacement of those structures destroyed by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced or under contract to commence within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the District Engineer, provided the permittee can demonstrate funding, contract, or other similar delays. Maintenance dredging and beach restoration are not authorized by this NWP. (Sections 10 and 404)

For activities involving a discharge, the Ohio State Certification General Conditions apply to this nationwide permit.

NATIONWIDE PERMIT

14. Road Crossings. Fills for roads crossing waters of the United States (including wetlands and other special aquatic sites) provided the activity meets all of the following criteria:

- a. The width of the fill is limited to the minimum necessary for the actual crossing;
- b. The fill placed in waters of the United States is limited to a filled area of no more than 1/3 acre. Furthermore, no more than a total of 200 linear feet of the fill for the roadway can occur in special aquatic sites, including wetlands;
- c. The crossing is culverted, bridged or otherwise designed to prevent the restriction of, and to withstand, expected high flows and tidal flows, and to prevent the restriction of low flows and the movement of aquatic organisms;
- d. The crossing, including all attendant features, both temporary and permanent, is part of a single and complete project for crossing of a water of the United States; and,
- e. For fills in special aquatic sites, including wetlands, the permittee notifies the District Engineer in accordance with the "Notification" general condition. The notification must also include a delineation of affected special aquatic sites, including wetlands.

This NWP may not be combined with NWP 18 or NWP 26 for the purpose of increasing the footprint of the road crossing. Some road fills may be eligible for an exemption from the need for a Section 404 permit altogether (see 33 CFR 323.4). Also, where local circumstances indicate the need, District Engineers will define the term "expected high flows" for the purpose of establishing applicability of this NWP. (Sections 10 and 404)

The Ohio State Certification General Conditions apply to this nationwide permit.

OHIO STATE CERTIFICATION GENERAL CONDITIONS FOR NATIONWIDE PERMITS.

The following general conditions apply to Nationwide Permits 3, 4, 5, 6, 7, 12, 13, 14, 15, 16, 18, 19, 20, 22, 23, 25, 26, 27, 29, 30, 31, 32, 33, 34, 36, 37, 38, and 40.

Steps shall be taken, upon completion of the projects, to ensure bank stability. This may include, but is not limited to, the placement of riprap or bank seeding.

Any damages to the immediate environment of the project by equipment needed for construction or hauling will be repaired immediately.

Care must be employed throughout the course of this project to avoid the creation of unnecessary turbidity which may degrade water quality or adversely affect aquatic life outside the project areas.

For Nationwide Permits 14, 21, 26 (1-3 acres), 29, 33, 37, and 38, that require Agency coordination, in accordance with the Nationwide Permit General Condition entitled "Notification", Number 13(e)(i), the Corps shall submit a pre-construction notification to Ohio EPA for review and comment.

NATIONWIDE PERMIT CONDITIONS

GENERAL CONDITIONS:

The following general conditions must be followed in order for any authorization by a NWP to be valid:

- 1. Navigation.** No activity may cause more than a minimal adverse effect on navigation.
- 2. Proper maintenance.** Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
- 3. Erosion and siltation controls.** Appropriate erosion and siltation controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date.
- 4. Aquatic life movements.** No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity @ s primary purpose is to impound water.
- 5. Equipment.** Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
- 6. Regional and case-by-case conditions.** The activity must comply with any regional conditions which may have been added by the Division Engineer (see 33 CFR 330.4(e) and with any case specific conditions added by the Corps or by the State or tribe in its section 401 water quality certification.
- 7. Wild and Scenic Rivers.** No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely effect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service.)
- 8. Tribal rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
- 9. Water quality certification.** In certain states, an individual Section 401 water quality certification must be obtained or waived (see 33 CFR 330.4(c)).

10. Coastal zone management. In certain states, an individual State coastal zone management consistency concurrence must be obtained or waived (see Section 330.4(d))

11. Endangered Species.

(a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or critical habitat might be affected or is in the vicinity of the project, and shall not begin work on the activity until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized.

(b) Authorization of an activity by a nationwide permit does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. Fish and Wildlife Service and National Marine Fisheries Service or their world wide web pages at <http://www.fws.gov/~r9endspp/endspp.html> and http://kingfish.spp.mnfs.gov/tmcintyr/prot_res.html#ES and Recovery, respectively.

12. Historic properties. No activity which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places is authorized, until the DE has complied with the provisions of 33 CFR Part 325, Appendix C. The prospective permittee must notify the District Engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)).

13. Notification.

(a) **Timing:** Where required by the terms of the NWP, the prospective permittee must notify the District Engineer with a Pre-Construction Notification (PCN) as early as possible and shall not begin the activity: (1) Until notified by the District Engineer that the activity may proceed under the NWP with any special conditions imposed by the District or Division

Engineer; or (2) If notified by the District or Division Engineer that an individual permit is required; or (3) Unless 30 days (or 45 days for NWP 26 only) have passed from the District Engineer's receipt of the notification and the prospective permittee has not received notice from the District or Division Engineer Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Notification: The notification must be in writing and include the following information:

- (1) Name, address and telephone numbers of the prospective permittee;
- (2) Location of the proposed project;
- (3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s) or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity; and
- (4) For NWPs S 18, 21, 26, 29, 34, and 38, the PCN must also include a delineation of affected special aquatic sites, including wetlands (see paragraph 13(f);
- (5) For NWP 21 - Surface Coal Mining Activities, the PCN must include an OSM or State approved mitigation plan.
- (6) For NWP 29-Single-Family Housing, the PCN must also include:
 - (i) Any past use of this NWP by the individual permittee and/or the permittee's spouse;
 - (ii) A statement that the single-family housing activity is for a personal residence of the permittee;
 - (iii) A description of the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring 0.5 acre or less will not require a formal on-site delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than 0.5 acre in size, a formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f);
 - (iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

(7) For NWP 31 Maintenance of Existing Flood Control Projects, the prospective permittee must either notify the District Engineer with a Pre-Construction Notification (PCN) prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the following:

- (i) Sufficient baseline information so as to identify the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided that the approved flood control protection or drainage is not increased;
- (ii) A delineation of any affected special aquatic sites, including wetlands; and,
- (iii) Location of the dredged material disposal site.

(8) For NWP 33-Temporary Construction, Access, and Deterring, the PCN must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic sources.

(c) Form of Notification: The standard individual permit application form (Form ENG 4345) may be used as the notification but must clearly indicate that it is a PCN and must include all of the information required in (b) (1)-(7) of General Condition 13. A letter may also be used.

(d) District Engineer's Decision: In reviewing the pre-construction notification for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative-adverse environmental effects or may be contrary to the public interest. The prospective permittee may, optionally, submit a proposed mitigation plan with the pre-construction notification to expedite the process and the District Engineer will consider any optional mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects are minimal, the District Engineer will notify the permittee and include any conditions the DE deems necessary.

Any mitigation proposal must be approved by the District Engineer prior to commencing work. If the prospective permittee elects to submit a mitigation plan, the District Engineer will expeditiously review the proposed mitigation plan, but will not commence a second 30-day (or 45-day for NWP 26) notification procedure. If the net adverse effects of the project (with the mitigation proposal) are determined by the District Engineer to be minimal, the District Engineer will provide a timely written response to the applicant stating that the project can proceed under the terms and conditions of the nationwide permit

If the District Engineer determines that the adverse effects of the proposed work are more than minimal, then he will notify the applicant either: (1) that the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submitting a mitigation proposal that would reduce the adverse effects to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions.

(e) Agency Coordination: The District Engineer will consider any comments from Federal and State agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(i) For NWP 14, 21, 26 (between 1 and 3 acres of impact), 29, 33, 37, and 38. The District Engineer will, upon receipt of a notification, provide immediately, e.g., facsimile transmission, overnight mail or other expeditious manner, a copy to the appropriate offices of the Fish and Wildlife Service, State natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the National Marine Fisheries Service. With the exception of NWP 37, these agencies will then have 5 calendar days from the date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 10 calendar days (16 calendar days for NWP 26 PCNs) before making a decision on the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.

(ii) Optional Agency Coordination For NWPs 5, 7, 12, 13, 17, 18, 27, 31, and 34, where a Regional Administrator of EPA, a Regional Director of USFWS, or Regional Director of NMFS has formally requested general notification from the District Engineer for the activities covered by any of these NWPs, the Corps will provide the requesting agency with notification on the particular NWPs. However, where the agencies have a record of not generally submitting substantive comments on activities covered by any of these NWPs, the Corps district may discontinue providing notification to those regional agency offices. The District Engineer will coordinate with the resource agencies to identify which activities involving a PCN that the agencies will provide substantive comments to the Corps. The District Engineer may also request comments from the agencies on a case by case basis when the District Engineer determines that such comments would assist the Corps in reaching a decision whether effects are more than minimal either individually or cumulatively.

(iii) Optional Agency Coordination, 401 Denial. For NWP 26 only, where the State has denied its 401 water quality certification for activities with less than 1 acre of wetland impact, the EPA regional administrator may request agency coordination of PCNs between 1/3 and 1 acre. The request may only include acreage limitations within the 1/3 to 1 acre range for which the state has denied water quality certification. In cases where the EPA has requested coordination of projects as described here, the Corps will forward the PCN to EPA only. The PCN will then be forwarded to the Fish and Wildlife Service and the National Marine Fisheries Service by EPA under agreements among those agencies. Any agency receiving the PCN will be bound by the time frames for providing comments to the Corps.

(f) Wetlands Delineations: Wetland delineations must be prepared in accordance with the current method required by the Corps. For NWP 29 see paragraph (b)(6)(iii) for parcels less than 0.5 acres in size. The permittee may ask the Corps to delineate the special aquatic site. There may be some delay if the Corps does the delineation. Furthermore, the 30-day period (45 days for NWP 26) will not start until the wetland delineation has been completed and submitted to the Corps, where appropriate.

(g) Mitigation: Factors that the District Engineer will consider when determining the acceptability of appropriate and practicable mitigation include, but are not limited to:

(i) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes;

(ii) To the extent appropriate, permittees should consider mitigation banking and other forms of mitigation including contributions to wetland trust funds, "in lieu fees" to organizations such as The Nature Conservancy, state or county natural resource management agencies, where such fees contribute to the restoration, creation, replacement, enhancement, or preservation of wetlands. Furthermore, examples of mitigation that may be appropriate and practicable include but are not limited to: reducing the size of the project; establishing wetland or upland buffer zones to protect aquatic resource values; and replacing the loss of aquatic resource values by creating, restoring, and enhancing similar functions and values. In addition, mitigation must address wetland impacts, such as functions and values, and cannot be simply used to offset the acreage of wetland losses that would occur in order to meet the acreage limits of some of the NWPs (e.g., for NWP 26, 5 acres of wetlands cannot be created to change a 6-acre loss of wetlands to a 1-acre loss; however, 2 created acres can be used to reduce the impacts of a 3-acre loss.).

14. Compliance certification. Every permittee who has received a Nationwide permit verification from the Corps will submit a signed certification regarding the completed work and any required mitigation. The certification will be forwarded by the Corps with the authorization letter and will include:

- a. A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions;
- b. A statement that any required mitigation was completed in accordance with the permit conditions;
- c. The signature of the permittee certifying the completion of the work and mitigation.

15. Multiple use of Nationwide permits. In any case where any NWP number 12 through 40 is combined with any other NWP number 12 through 40, as part of a single and complete project, the permittee must notify the District Engineer in accordance with paragraphs a, b, and c on the "Notification General Condition number 13. Any NWP number 1 through 11 may be combined with any other NWP without notification to the Corps, unless notification is otherwise required by the terms of the NWPs. As provided at 33 CFR 330.6(c) two or more different NWPs can be combined to authorize a single and complete project. However, the same NWP cannot be used more than once for a single and complete project.

SECTION 404 ONLY CONDITIONS:

In addition to the General Conditions, the following conditions apply only to activities that involve the discharge of dredged or fill material into waters of the U.S., and must be followed in order for authorization by the NWP's to be valid:

1. Water supply intakes. No discharge of dredged or fill material may occur in the proximity of a public water supply intake except where the discharge is for repair of the public water supply intake structures or adjacent bank stabilization.

2. Shellfish production. No discharge of dredged or fill material may occur in areas of concentrated shellfish production, unless the discharge is directly related to a shellfish harvesting activity authorized by NWP 4.

3. Suitable material. No discharge of dredged or fill material may consist of unsuitable material (e.g. trash, debris, car bodies, asphalt, etc.) and material discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

4. Mitigation. Discharges of dredged or fill material into waters of the United States must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site), unless the District Engineer approves a compensation plan that the District Engineer determines is more beneficial to the environment than on-site minimization or avoidance measures.

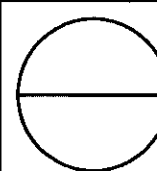
5. Spawning areas. Discharges in spawning areas during spawning seasons must be avoided to the maximum extent practicable.

6. Obstruction of high flows. To the maximum extent practicable, discharges must not permanently restrict or impede the passage of normal or expected high flows or cause the relocation of the water (unless the primary purpose of the fill is to impound waters).

7. Adverse effects from impoundments. If the discharge creates an impoundment of water, adverse effects on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow shall be minimized to the maximum extent practicable.

8. Waterfowl breeding areas. Discharges into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

9. Removal of temporary Fills. Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.



HAN-18-4.725

S.R.18 & 613 OVER SOUTH BRANCH PORTAGE RIVER
WASHINGTON TOWNSHIP, HANCOCK COUNTY, OHIO

GEOLOGY OF THE SITE:

THE PROJECT CONSISTS OF THE REPLACEMENT OF THE EXISTING BRIDGE CARRYING STATE ROUTE 18 OVER SOUTH BRANCH OF THE PORTAGE RIVER IN WASHINGTON TOWNSHIP, HANCOCK COUNTY, OHIO. THE SOIL PROFILE BENEATH THIS SITE CONSISTS FILL MATERIALS OVERLYING LACUSTRINE DEPOSITS. BENEATH THE LACUSTRINE DEPOSITS IS GLACIAL TILL WHICH IS AN UNSORTED, UNSTRATIFIED MIXTURE OF CLAY, SILT, SAND AND COARSER FRAGMENTS THAT WERE DEPOSITED DISCONTINUOUSLY AS GLACIERS RETREATED ACROSS NORTHERN OHIO.

AUGER REFUSAL (APPARENT BEDROCK) WAS ENCOUNTERED DURING THIS INVESTIGATION AT AN ELEVATION RANGING FROM 224.1 TO 224.4 METERS (735.2 TO 736.2 FEET). THE REFUSAL MATERIALS WERE FOUND TO CONSIST OF MODERATELY TO SEVERELY WEATHERED DOLOMITE WITH ROCK QUALITY DESIGNATIONS VARYING FROM 84 TO 88 PERCENT.

EXPLORATION:

THE SOIL EXPLORATION CONSISTED OF THREE DRIVE SAMPLE BORINGS MADE BY MEANS OF A MECHANICALLY POWERED HOLLOW-STEM ROTARY AUGER MOUNTED ON A MOBILE DRILL RIG. THE BORINGS WERE PERFORMED ON JUNE 11, 1997. BORING 1 WAS LOCATED BEHIND THE EXISTING EASTERN ABUTMENT, BORING 2 WAS LOCTED BEHIND THE EXISTING WESTERN ABUTMENT.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS:

SURFACE ELEVATIONS AT THE BORING LOCATIONS RANGED FROM 231.8 M TO 232.5 M (760.5 TO 762.8 FEET). THE UPPER PORTION OF THE SITE CONSISTS OF FILL DEPOSITS COMPOSED OF CLAYEY MATERIALS. BELOW THE FILL MATERILS IN THE ABUTMENT AREAS WAS CLAYEY GLACIAL TILL. THE GLACIAL TILL EXTENDS TO AN ELEVATION RANGING FROM 224.1 TO 224.4 m (735.2 TO 736.2 FEET). AUGER REFUSAL (APPARENT BEDROCK) WAS ENCOUNTERED DURING THIS INVESTIGATION AT AN ELEVATION RANGING FROM 224.1 TO 224.4 METERS (735.2 TO 736.2 FEET). THE REFUSAL MATERIALS WERE FOUND TO CONSIST OF MODERATELY TO SEVERELY WEATHERED DOLOMITE WITH ROCK QUALITY DESIGNATIONS VARYING FROM 84 TO 88 PERCENT.

GROUNDWATER WAS ENCOUNTERED IN THE BORINGS AT ELEVATIONS RANGING FROM 225.4 TO 230.2 METERS. THE NORMAL RIVER ELEVATION IS REPORTED TO BE AT ABOUT 227.8 METERS. THE 100-YEAR FLOOD ELEVATION IS REPORTED TO BE AT ELEVATION 229.9 METERS.

FOR DETAILED INFORMATION ABOUT THE SOIL CONDITIONS AT A PARTICULAR LOCATION, REFER TO THE BORING LOGS. D50 VALUES CALCULATED FOR THE SCOUR ANALYSES CAN BE FOUND ON PAGE 3 WITH THE BORING LOG INFORMATION.

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 50.80 mm O.D., 34.93 mm I.D., SPLIT SPOON SAMPLER, AT CONTINUOUS, 0.75 m, AND/OR 1.5 m DEPTH INTERVALS, DRIVEN BY MEANS OF A 63.5 kg HAMMER WITH A FREE FALL OF 0.76 m. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER THREE 0.15 m INCREMENTS IS CONSIDERED THE STANDARD PENETRATION RESISTANCE.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG, EMPLOYING A 76 mm O.D. THIN-WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS UNIFORM PRESSING APPLIED BY THE DRILLING RIG. (NOTE: NO PRESS SAMPLES WERE OBTAINED DURING THIS INVESTIGATION.)

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG, EMPLOYING AN NW-PAM CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

SAMPLING AND TESTING

THE BORING LOG SHEETS SHOW A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TEST IN THREE 0.15 m INCREMENTS, AND A SAMPLE DESCRIPTION BASED ON LABORATORY TEST RESULTS, UTILIZING THE ODOT CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS, INCLUDING THE DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY, AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION, AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED IN ORDER TO DETERMINE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

LEGEND

- Exploratory Boring Location - Plan View
- Top of Rock
- Horizontal Bars on Boring Logs Indicate Approximate Soil Transition Depths.
- Existing Fill Materials
- X/Y/Z Figures Beside the Boring Log in Profile Indicates the Number of Blows for Standard Penetration Test.
 - X=Number of Blows for First 150mm
 - Y=Number of Blows for Second 150mm
 - Z=Number of Blows for Third 150mm
- Initial Groundwater Depth in Borings
- Creek Water Level

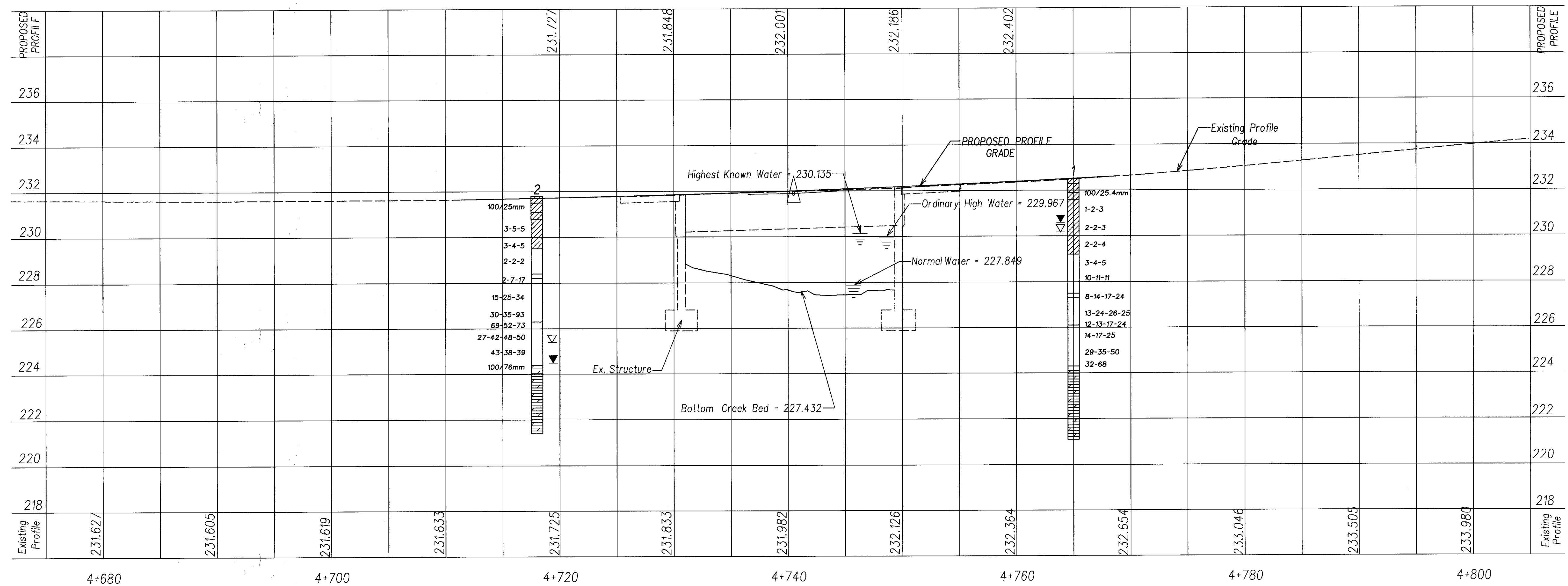
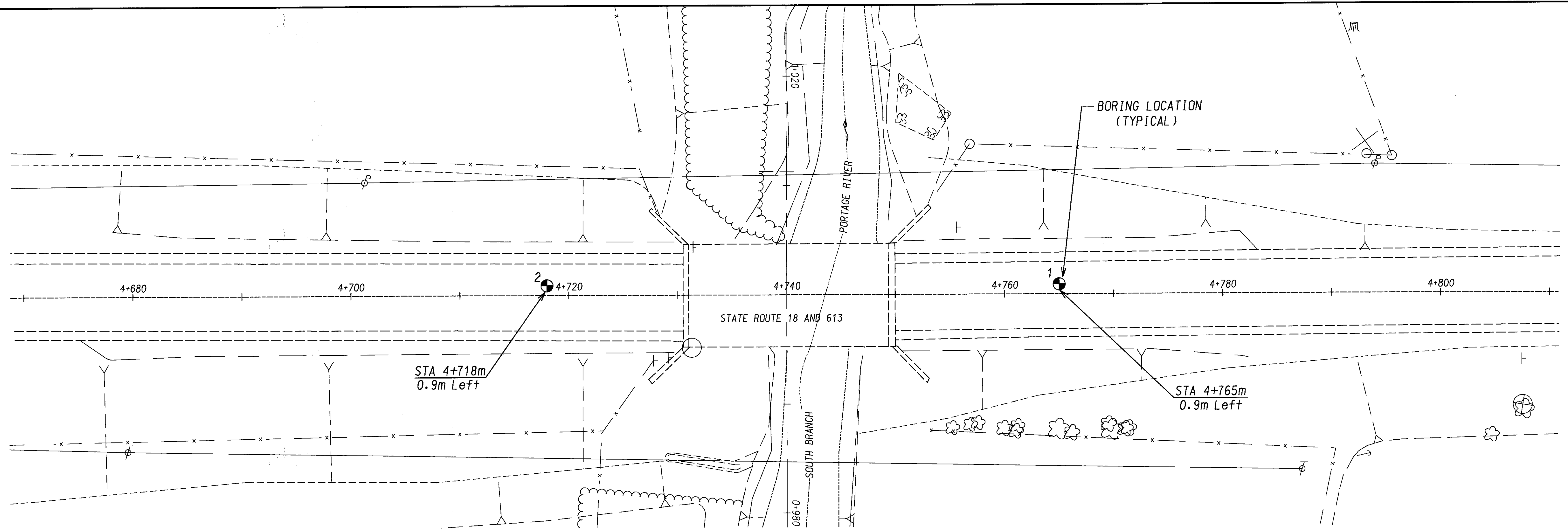
PARTICLE SIZE DEFINITIONS

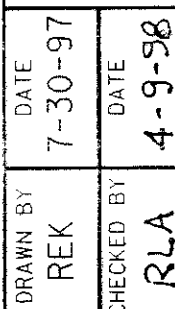
300mm	75mm	2.0mm	0.42mm	0.074mm	0.005mm	
Boulders	Cobbles	Gravel	Coarse Sand	Fine Sand	Silt	Clay
		No. 20 sieve	No. 40 sieve	No. 200 seive		

NOTES

ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE OFFICE OF MATERIALS MANAGEMENT AT 1600 WEST BROAD STREET, THE OFFICE OF ROADWAY ENGINEERING OR THE OFFICE OF STRUCTURAL ENGINEERING AT 25 SOUTH FRONT STREET, COLUMBUS, OHIO 43215.

DETAILED INFORMATION CONCERNING THE EXPLORATION FINDINGS MAY BE FOUND IN THE SUBSURFACE INVESTIGATION REPORT FOR THIS PROJECT PREPARED BY BOWSER-MORNER ASSOCIATES, INC. THE GEOTECHNICAL REPORT DISCUSSES THE SUBSURFACE SOIL AND GROUNDWATER CONDITIONS ENCOUNTERED, PRESENTS THE SOIL AND LABORATORY DATA, AND MAKES RECOMMENDATIONS CONCERNING FOUNDATION SUPPORT SYSTEMS. PLEASE REFER TO BOWSER-MORNER REPORT NO. 111225-0797-444, DATED JULY 23, 1997, FOR FURTHER INFORMATION.

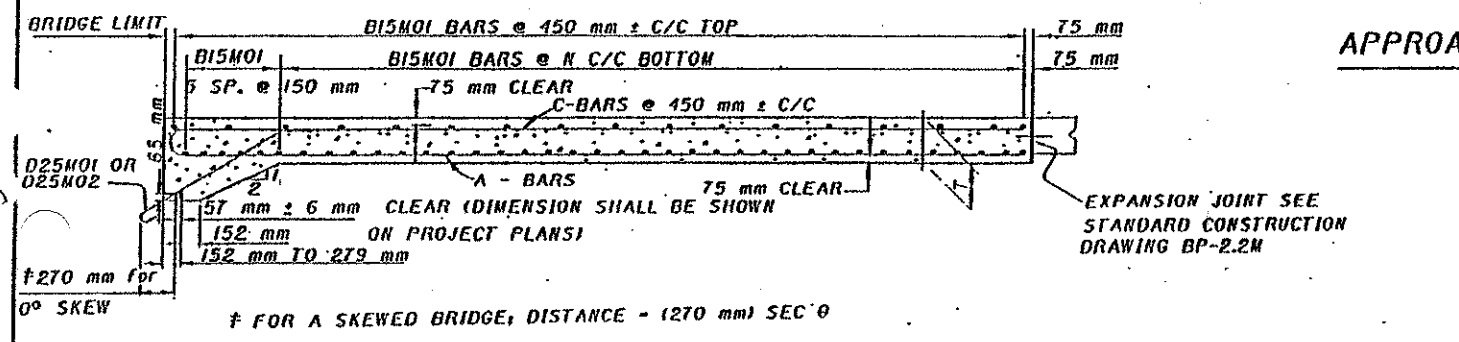
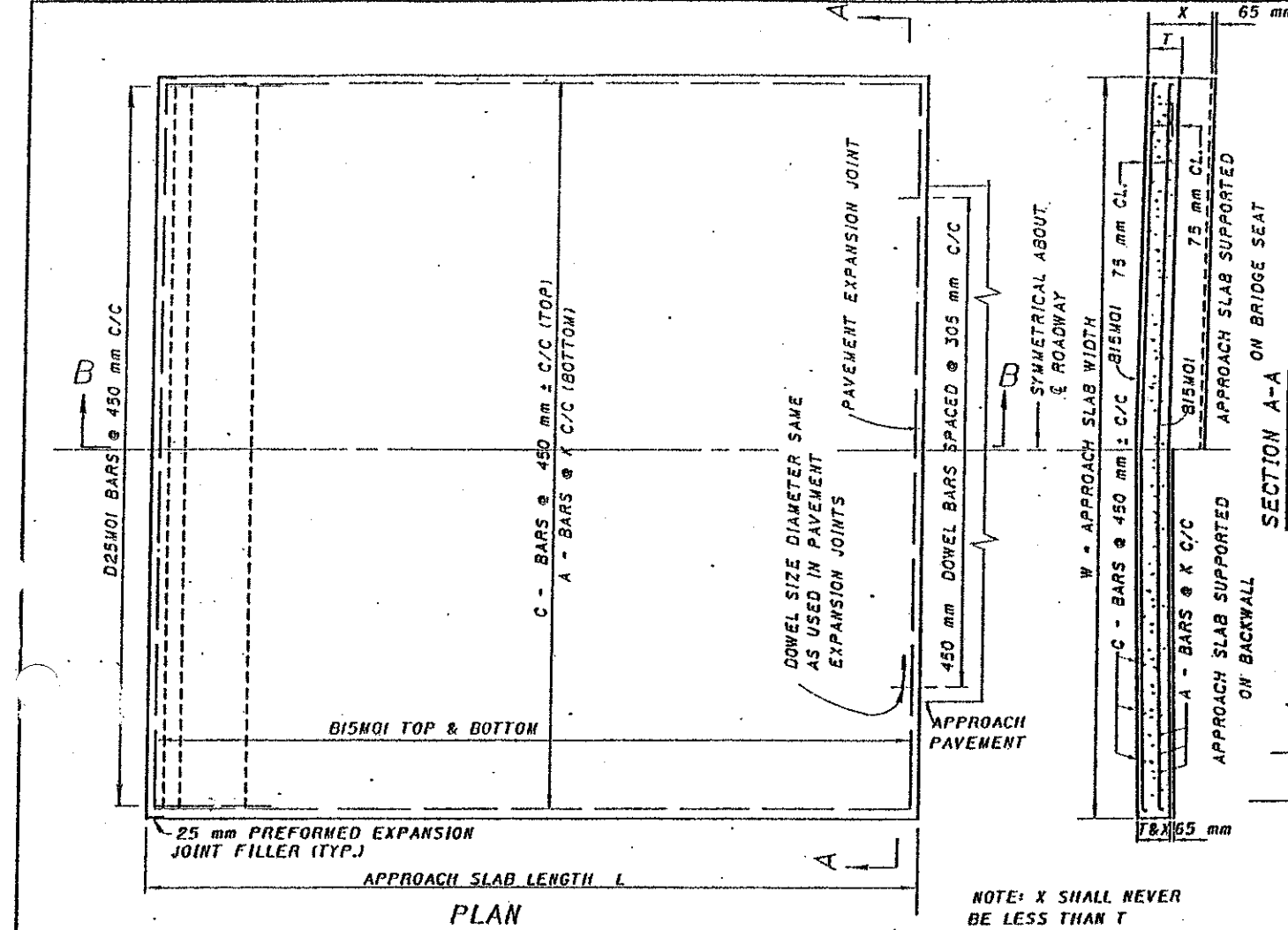




HAN-18-4.725
HANCOCK COUNTY

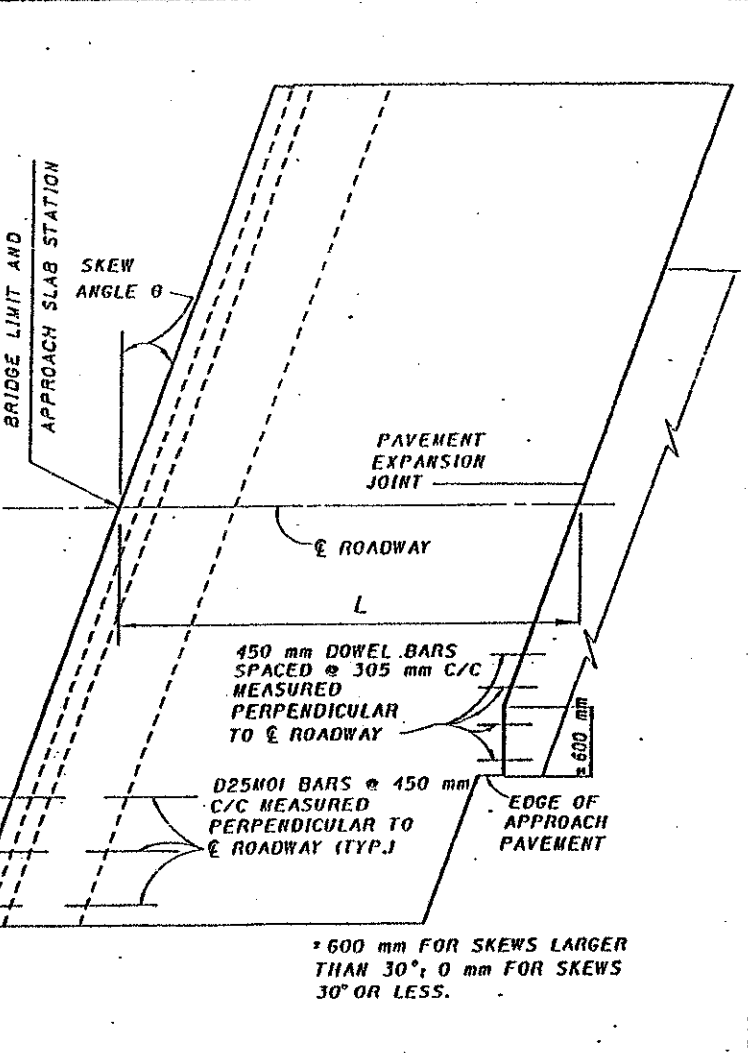
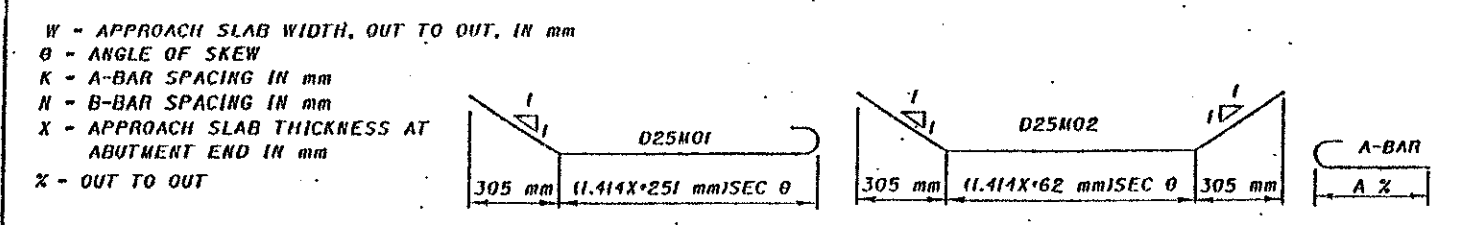
$$\frac{3}{3}$$

D50 VALUES			
TEST BORING 1		TEST BORING 2	
SAMPLE 1-5A	= 0.0138 mm	SAMPLE 2-6A	= 0.0068 mm
SAMPLE 1-6A	= 0.0153 mm	SAMPLE 2-8A	= 0.0203 mm



SECTION B-B

REINFORCING STEEL (FOR ONE APPROACH SLAB)															
LENGTH L mm	THICK- NESS T mm	A-BARS				B15M01 (BOTTOM)			B15M01 (TOP)		C-BARS			D25M01 OR D25M02 NO. REQ'D.	
		SP'C'G K	MARK	LENGTH mm	DIMENSION A mm	NO. REQ'D.	LENGTH mm	SP'C'G K	NO. REQ'D.	LENGTH mm	NO. REQ'D.	MARK	LENGTH mm		NO. REQ'D.
4600	305	255	A35M01	4880	4450	$\left[\begin{array}{c} W-150 \\ K \end{array} \right] \cdot 1$	$(W-150) \sec \theta$	230	22	$(W-150) \sec \theta$	11	C15M01	4125	$\left[\begin{array}{c} W-150 \\ 450 \end{array} \right] \cdot 1$	$\left[\begin{array}{c} W-150 \\ 450 \end{array} \right] \cdot 1$
6100	330	190	A35M02	6380	5950			200	31		14	C15M02	5950		
7600	380	180	A35M03	7880	7450			200	39		18	C15M03	7450		
9150	430	165	A35M04	9430	9000			215	44		21	C15M04	9000		



APPROACH SLAB FOR SKEWED STRUCTURE

GENERAL: THIS DRAWING PROVIDES DESIGN AND GENERAL CONSTRUCTION DETAILS. THE PROJECT PLANS WILL SHOW LENGTH, SKEW, CURBS (IF ANY), ESTIMATED QUANTITY (SQUARE METER), AND SPECIAL NOTES AND DETAILS WHERE NECESSARY. FOR CONDITIONS OTHER THAN THOSE INDICATED HEREON, THE APPROACH SLAB SHALL BE ADAPTED TO FIT THE ENDS OF THE BRIDGE AND THE APPROACH PAVEMENT.

ANCHOR BARS D25M01 OR D25M02 SHALL BE DETAILED FOR A SPECIFIC BRIDGE AND SHALL BE INCLUDED WITH ITEM 509 UNDER ABUTMENTS OR SUPERSTRUCTURE FOR PAYMENT. D25M01 BARS CANNOT BE USED AS SHOWN WHERE APPROACH SLABS ARE SUPPORTED ON BACKWALLS LESS THAN 350 mm THICK. D25M02 BARS SHALL BE USED ON PRESTRESSED CONCRETE BOX BEAM BRIDGES WHERE THE APPROACH SLAB IS SUPPORTED ON AN 280 mm THICK BACKWALL.

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST LETTER IDENTIFIES THE BAR LOCATION, NEXT TWO DIGITS AND LETTER INDICATES THE METRIC BAR SIZE DESIGNATION, AND THE REMAINING DIGITS ITS SEQUENCE NUMBER.

EXAMPLE: A35M01
 11 A - LOCATION OF THE BAR IN THE STRUCTURE
 21 35M - METRIC BAR SIZE DESIGNATION
 31 01 - SEQUENCE NUMBER

AT THE OPTION OF THE CONTRACTOR, B15M01 BARS MAY BE LAPPED 500 mm MINIMUM AT THE CENTERLINE OF ROADWAY, OR WHERE REQUIRED FOR LONGITUDINAL CONSTRUCTION JOINTS.

DESIGN SPECIFICATIONS: THIS STANDARD DRAWING CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1977, INCLUDING THE 1978, 1979, 1980 AND 1981 INTERIM SPECIFICATIONS AND THE OHIO "SUPPLEMENT" TO THESE SPECIFICATIONS.

DESIGN DATA
 DESIGN LOADING: MS18 AND THE ALTERNATE MILITARY LOADING.
 CONCRETE CLASS C: COMPRESSIVE STRENGTH 28 MPa

REINFORCING STEEL: ASTM A615H, A616M OR A617H-GRADE 400; MINIMUM YIELD STRENGTH OF 400 MPa AND SHALL BE EPOXY COATED.

REINFORCING STEEL: FOR SKEWED BRIDGES THE A AND C BARS SHALL BE PLACED PARALLEL TO THE CENTER LINE OF ROADWAY AND THE B BARS SHALL BE PLACED PARALLEL TO THE ABUTMENTS.

PREFORMED EXPANSION JOINT FILLER, TYPE "A" WATER PROOFING, AND SEALER AT THE CORNERS AND SIDES OF THE APPROACH SLAB SHALL BE INCLUDED IN THE PRICE BID PER SQUARE METER FOR THE APPROACH SLAB.

PREFORMED ELASTOMERIC JOINT SEALER SHOWN AT THE BRIDGE LIMIT END OF THE APPROACH SLAB SHALL BE INCLUDED IN THE PRICE BID PER SQUARE METER FOR THE APPROACH SLAB.

LONGITUDINAL CONSTRUCTION JOINTS REQUIRED FOR STAGE CONSTRUCTION SHALL BE AS PER S11.09.

CURBS, BRIDGES WITH SIDEWALKS: FOR BRIDGES CONSTRUCTED WITH RAISED SIDEWALKS, DEFLECTOR PARAPETS OR OTHER TYPES OF CONSTRUCTION WHICH RETAIN ROADWAY SURFACE DRAINAGE, THE APPROACH SLABS SHALL EITHER INCLUDE INTEGRAL CURBS OR BE CONSTRUCTED IN CONJUNCTION WITH BRIDGE CURBS. CURB HEIGHT SHALL BE TRANSITIONED UNIFORMLY BETWEEN BRIDGE CURB HEIGHT AND APPROACH CURB HEIGHT IN A LENGTH AS FOLLOWS: WHERE WINGWALL EXTENDS BEYOND END OF APPROACH SLAB, USE A MINIMUM LENGTH OF 3000 mm BEYOND END OF WINGWALL. WHERE THE APPROACH SLAB EXTENDS BEYOND THE END OF WINGWALL, TRANSITION IN THIS LENGTH, HOWEVER, THE TRANSITION LENGTH SHALL NOT BE LESS THAN 3000 mm AND THE TRANSITION SHALL EXTEND BEYOND THE END OF APPROACH SLAB IF NECESSARY.

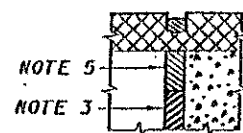
APPROACH SLAB WIDTH (W): APPROACH SLABS SHALL BE THE SAME WIDTH AS THE BRIDGE ROADWAY.

THE LENGTH OF APPROACH SLABS SHOULD BE BASED ON FACTORS SUCH AS THE SIZE AND AMOUNT OF EXCAVATION BEHIND THE ABUTMENTS, NEW OR EXISTING EMBANKMENTS AND SKEW OF THE BRIDGE.

CROWN SHALL CONFORM TO THAT OF THE APPROACH PAVEMENT AND BRIDGE DECK. IF THE RATE OF CROWN OF THE BRIDGE DECK DIFFERS FROM THAT OF THE APPROACH PAVEMENT, A SMOOTH TRANSITION SHALL BE PROVIDED WITHIN THE LIMITS OF THE APPROACH SLAB.

WEARING SURFACE: GENERALLY APPROACH SLABS SHALL HAVE AN ASPHALT CONCRETE WEARING SURFACE ONLY WHEN BOTH THE APPROACH PAVEMENT SURFACE AND THE BRIDGE WEARING SURFACE ARE ASPHALT CONCRETE.

EXPANSION JOINT DETAILS AT THE APPROACH PAVEMENT END OF THE APPROACH SLAB ARE USED ONLY IN CONJUNCTION WITH CONCRETE PAVEMENT OR CONCRETE BASE COURSE. PAYMENT FOR THE EXPANSION JOINT, INCLUDING DOWEL BARS, PREFORMED EXPANSION JOINT FILLER AND JOINT SEALER, IS INCLUDED IN THE PRICE BID PER SQ. METER FOR THE APPROACH SLAB.



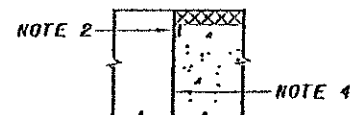
DETAIL A

CONCRETE WEARING
SURFACE ON BRIDGE DECK
AND APPROACH SLAB

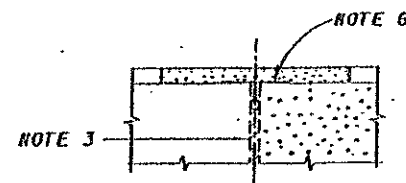


DETAIL B

CONCRETE WEARING
SURFACE ON BRIDGE DECK
AND APPROACH SLAB

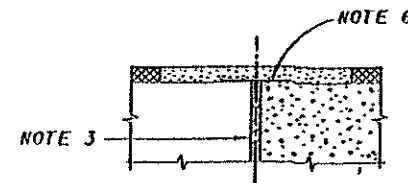


DETAIL C

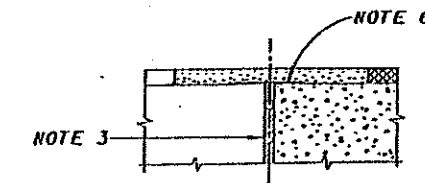


DETAIL D

CONCRETE WEARING
SURFACE ON BRIDGE
DECK ONLY



DETAIL E



DETAIL F

NOTE 1 : PREFORMED ELASTOMERIC JOINT SEALER
705.11 (32 mm FOR 13 mm JOINT) DEPRESSED 3 mm
BELOW ROADWAY, PLACED IN 13 mm x 55 mm
GROOVE.

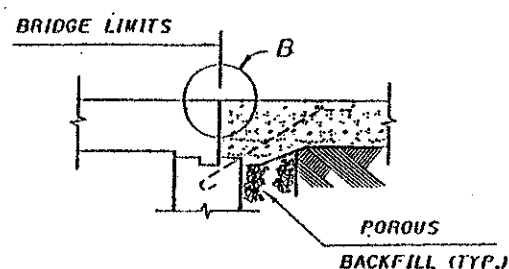
NOTE 2 : PREFORMED ELASTOMERIC JOINT SEALER
705.11 (32 mm FOR 13 mm JOINT) PLACED IN
13 mm x 55 mm GROOVE.

NOTE 3 : 25 mm PREFORMED EXPANSION JOINT FILLER
705.03

NOTE 4 : TYPE "A" WATERPROOFING.

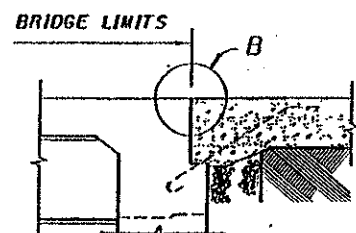
NOTE 5 : SEE PLAN INSERT SHEET, ABUTMENT JOINTS IN
BITUMINOUS CONCRETE BOX BEAM BRIDGES.

NOTE 6 : SEE PLAN INSERT SHEET, POLYMER MODIFIED
ASPHALT EXPANSION JOINT SYSTEM.

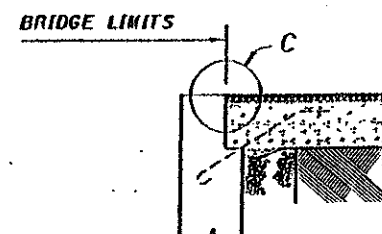


ON SLAB BRIDGES

ASPHALT CONCRETE WEARING
SURFACE ON BRIDGE DECK
AND APPROACH SLAB



ON BRIDGES WITH INTEGRAL CONSTRUCTION

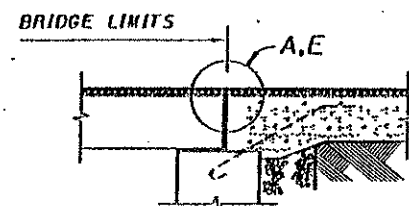


APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL

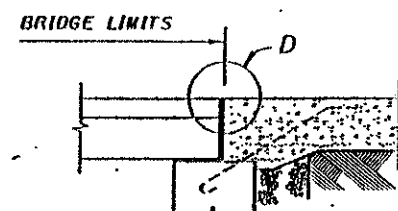
TYPE "A" WATERPROOFING SHALL NOT EXTEND ABOVE
THE BOTTOM OF THE GROOVE INTO WHICH THE PREFORMED
ELASTOMERIC JOINT SEALER IS TO BE PLACED. IT SHALL
BE APPLIED TO THE ENTIRE AREA OF THE ABUTMENT
OR SUPERSTRUCTURE WHICH COMES INTO CONTACT WITH
THE APPROACH SLAB.

FOR PRESTRESSED CONCRETE BOX BEAM BRIDGES WITH
ASPHALT CONCRETE ON BOTH BRIDGE DECK AND APPROACH
SLAB, THE TOP OF APPROACH SLAB AT THE BRIDGE END
SHALL BE CONSTRUCTED TO THE LEVEL OF THE TOP OF THE
BEAMS TO FACILITATE WATERPROOFING OF THE JOINT. THE
THICKNESS OF ASPHALT CONCRETE AT THE APPROACH END
SHALL BE THE THICKNESS OF ASPHALT CONCRETE USED ON
THE ROADWAY PAVEMENT. THE THICKNESS OF ASPHALT
CONCRETE SHALL VARY UNIFORMLY, IF NECESSARY, IN THE
LENGTH OF THE APPROACH SLAB. THE BASE SHALL BE
GRADED TO PERMIT THE BOTTOM OF THE APPROACH SLAB
TO BE PARALLEL TO THE TOP.

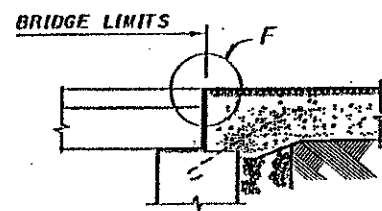
FOR STRUCTURES HAVING ASPHALT CONCRETE WEARING SURFACE
ON BOTH BRIDGE DECK AND APPROACH SLABS AND WHERE NO
DECK EXPANSION DEVICES ARE PROVIDED, THE DECK MEMBRANE
WATERPROOFING SHALL EXTEND BEYOND THE BRIDGE LIMITS
A DISTANCE OF 600 mm.



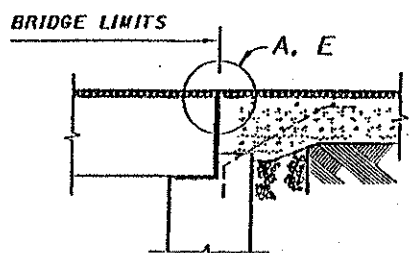
ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



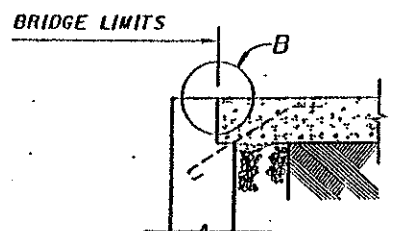
ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL



APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL

NOTE : APPROACH SLAB SEAT ON PRESTRESSED
CONCRETE BOX BEAM BRIDGES IS SHOWN
AT SAME ELEVATION AS BEAM SEAT.
HOWEVER, IT MAY ACTUALLY BE HIGHER
OR LOWER THAN THE BEAM SEAT DEPENDING
ON BOX BEAM DEPTH.

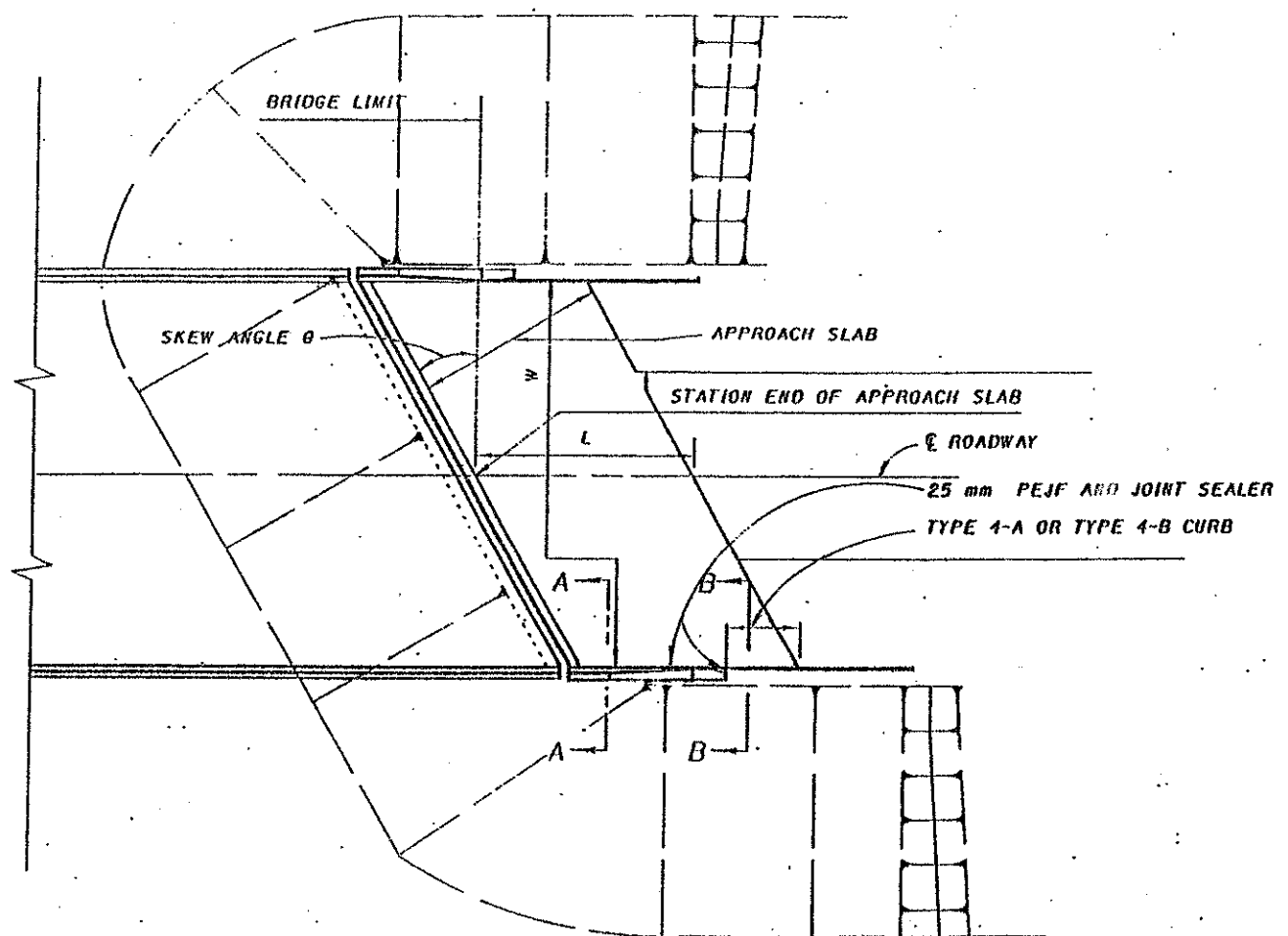
DESIGN AGENCY
BUREAU OF BRIDGES
AND
STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
11-25-94
DATE
ENGINEER OF BRIDGES

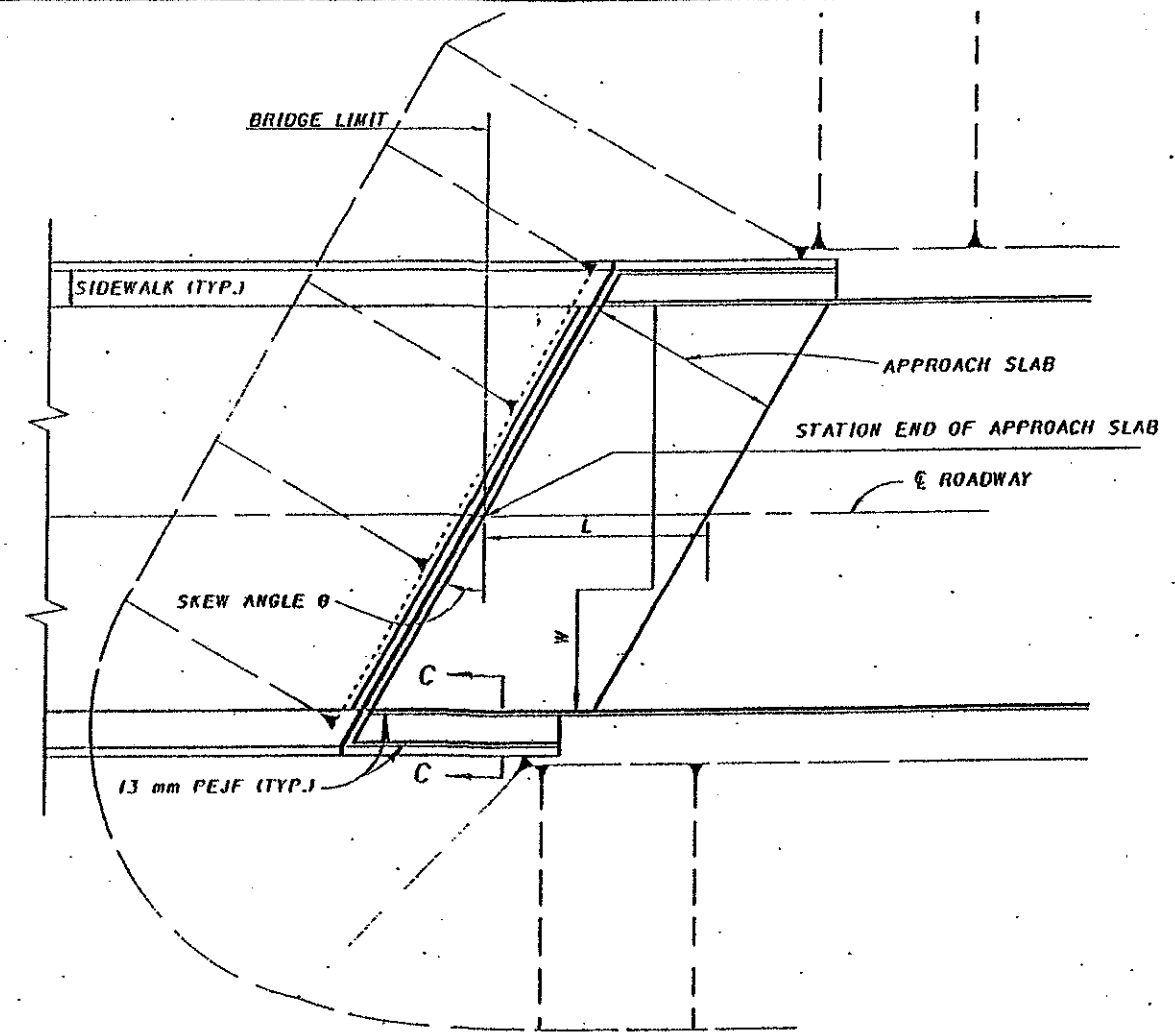
REVIEWED
JAN
JFF
JFF
AS-1-81H

STANDARD
REINFORCED CONCRETE
APPROACH SLAB - METRIC

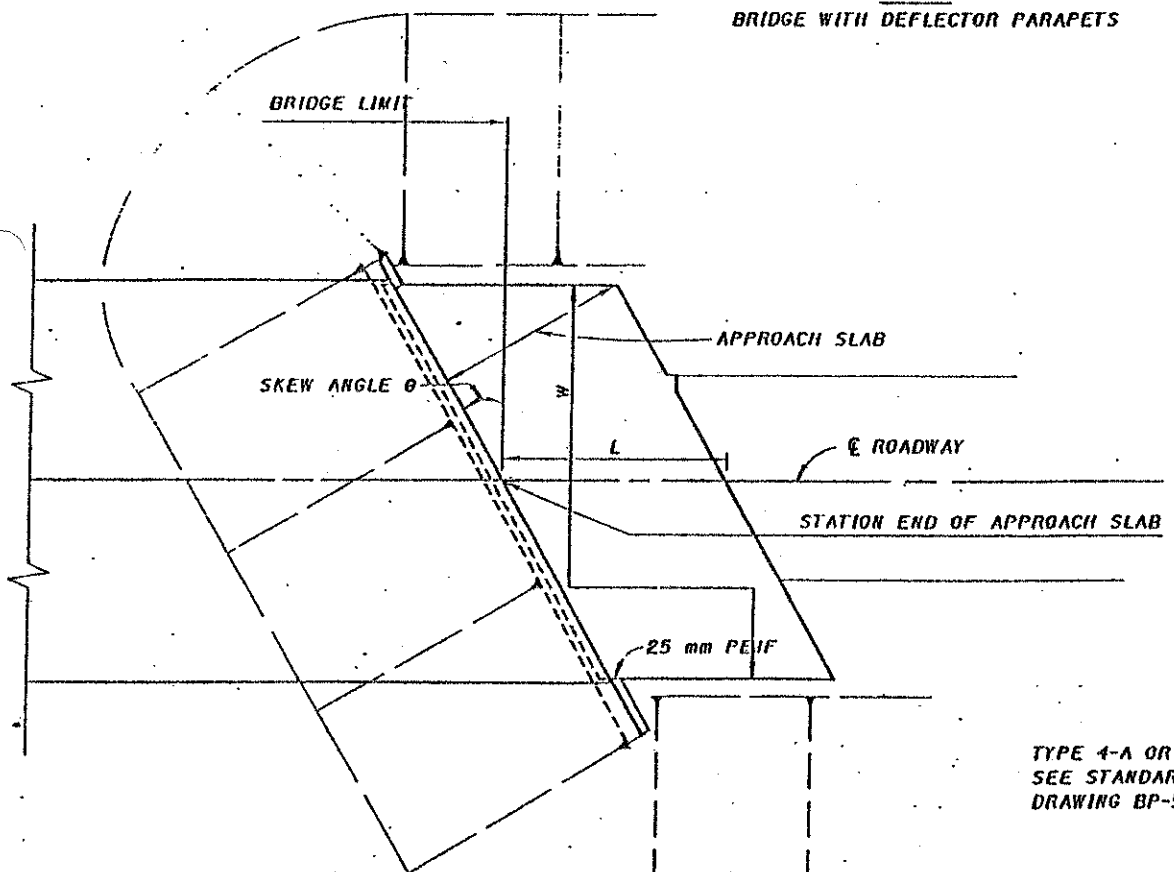
2/3



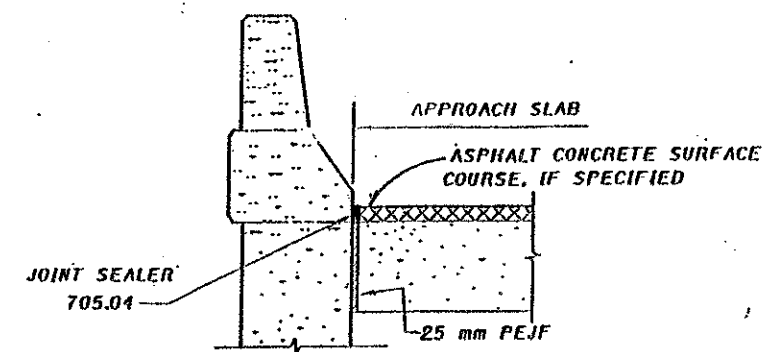
PLAN
BRIDGE WITH DEFLECTOR PARAPETS



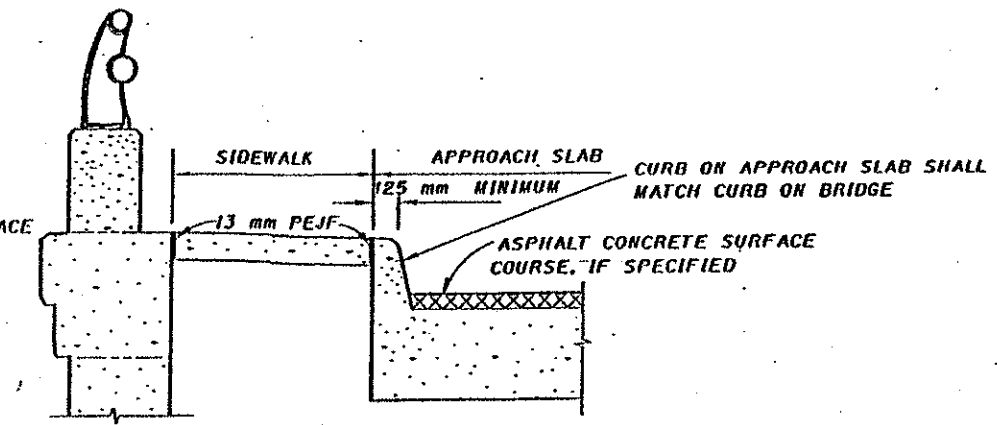
PLAN
BRIDGE WITH SIDEWALKS



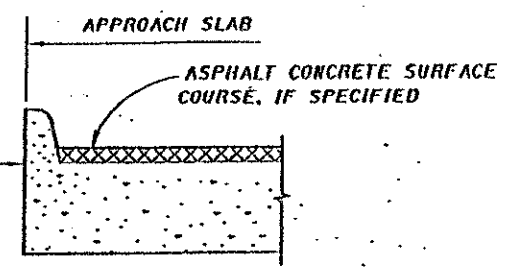
PLAN
BRIDGE WITHOUT CURBS



SECTION A-A



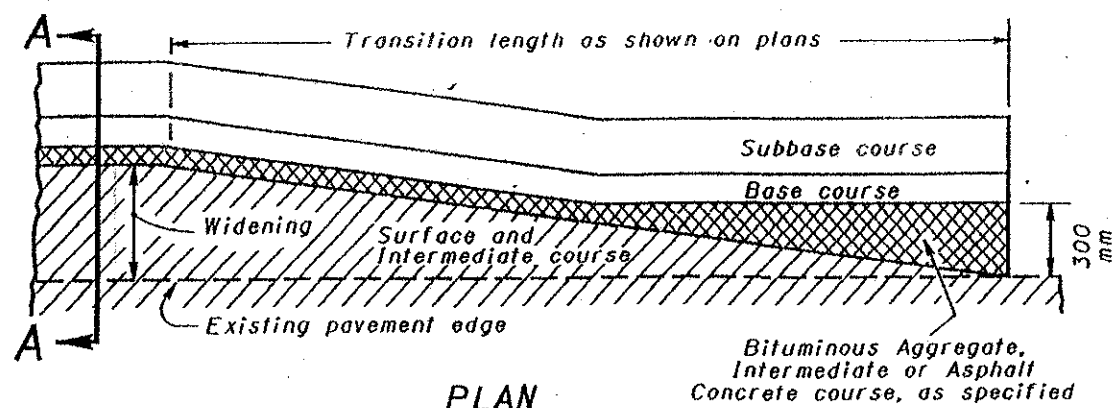
SECTION C-C



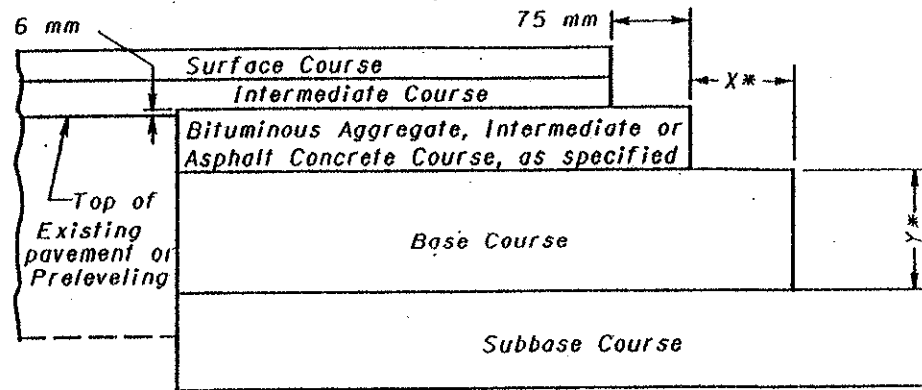
SECTION B-B

TYPE 4-A OR TYPE 4-B CURB
SEE STANDARD CONSTRUCTION
DRAWING BP-5.1 M

STANDARD REINFORCED CONCRETE APPROACH SLAB - METRIC	REVISIONS		DESIGNED JFF	CHECKED JAM	REVIEWED LW	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES ENGINEER OF BRIDGES DATE 10-25-94	DESIGN AGENT BUREAU OF BRIDGES STRUCTURAL DESIGN
			Drawn JFF				
			AS-1-81M				
	3		3				



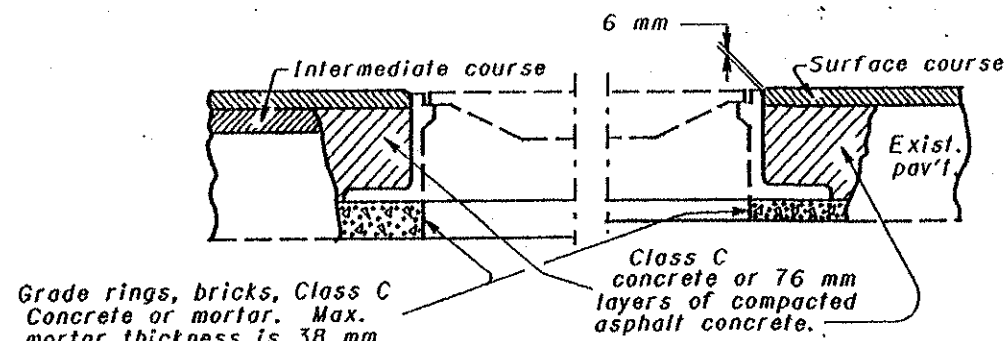
MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT



The Bituminous Aggregate in the upper part of the base widening shall finish approximately 6 mm above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 6 mm above the preleveling.

*The extended width (X) of a base or subbase course shall be equal to the depth (Y) of that particular course, unless otherwise specified in the plans.

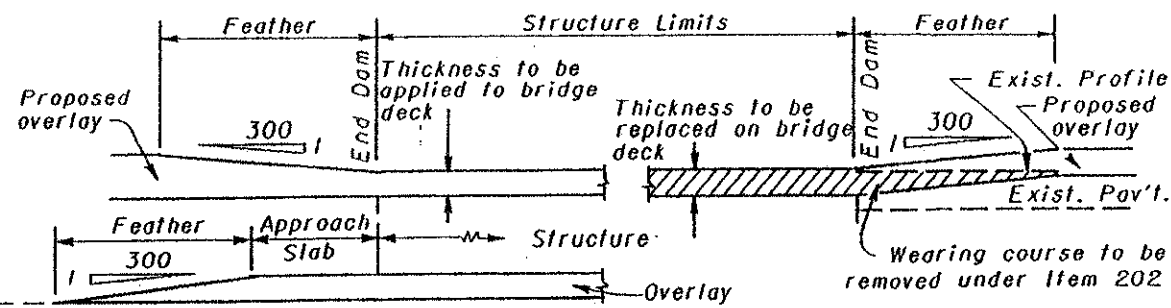
SECTION A-A COURSE DETAIL FOR WIDENING



USING CONCRETE OR MORTAR

Metal adjusting rings shall: (a) attach securely to the existing frame by welding or mechanical devices; (b) consist either of cast metal having an integral rim and seat, or be fabricated metal with a sturdy connection between the seat and rim; and (c) provide an even seat for the manhole cover. In addition, the adjusting ring type shall be a design acceptable to the local governmental agency responsible for street and sewer maintenance. Any installation unacceptable to the Engineer shall be replaced by the Contractor at his expense.

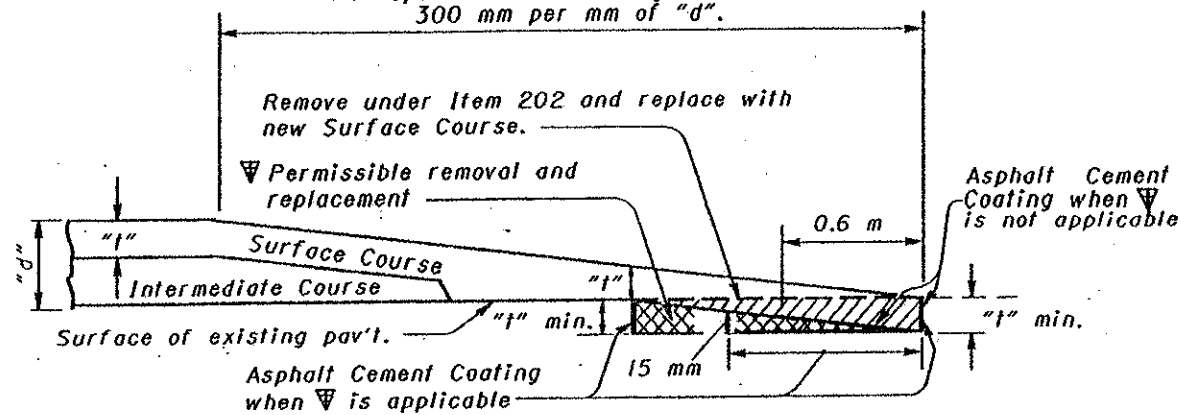
MANHOLES ADJUSTED TO GRADE



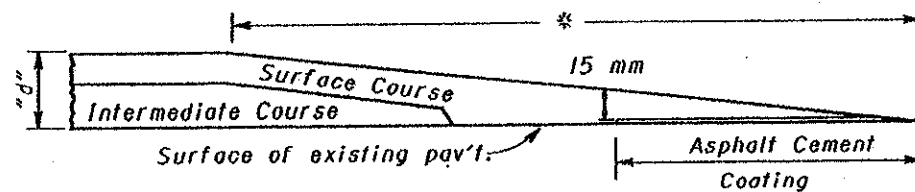
Details assume non-settled approach slabs. Smoothing of the profile for settlement is required per plan grades or as directed by the Engineer.

FEATHERING AT STRUCTURES

* Min length - 120 mm per mm of "d".
For speeds 80 km/h or greater, use 300 mm per mm of "d".



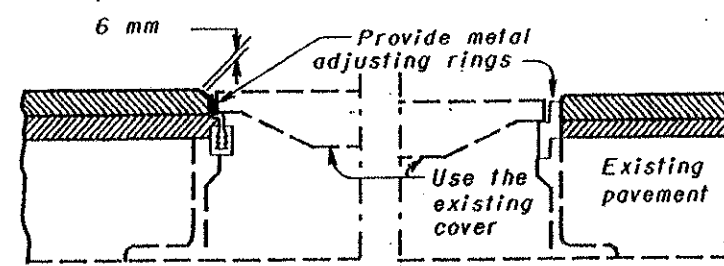
BUTT JOINT TYPE



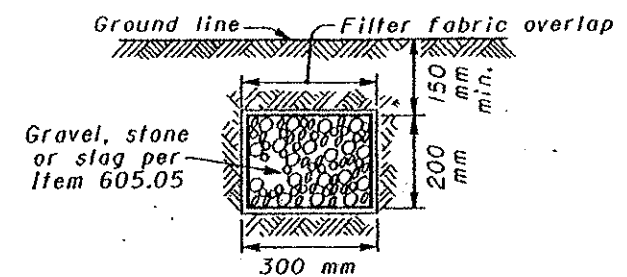
TAPER EDGE TYPE

NOTE: Either butt or taper type may be used unless type is specified by the plan.

PLACING FEATHERED AREAS

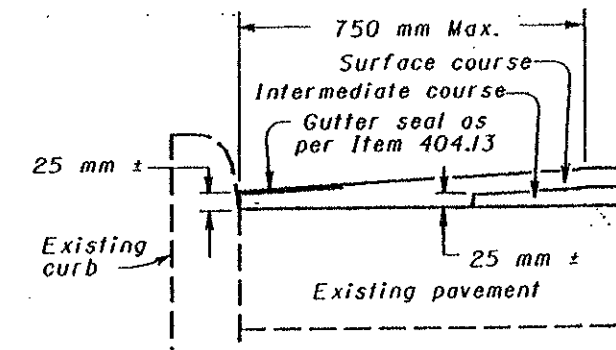


USING METAL ADJUSTING RINGS



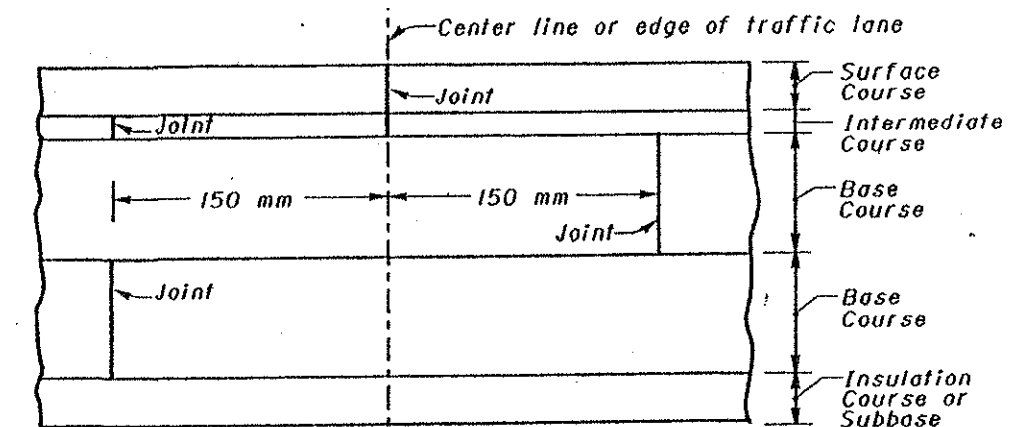
Aggregate drains to be placed where and as directed by Engineer. Provide filter fabric when specified as a separate pay item.

AGGREGATE DRAIN



Special care shall be taken during construction to obtain maximum compaction of bituminous concrete in gutters.

GUTTER FINISH



LAPPING LONGITUDINAL JOINTS

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

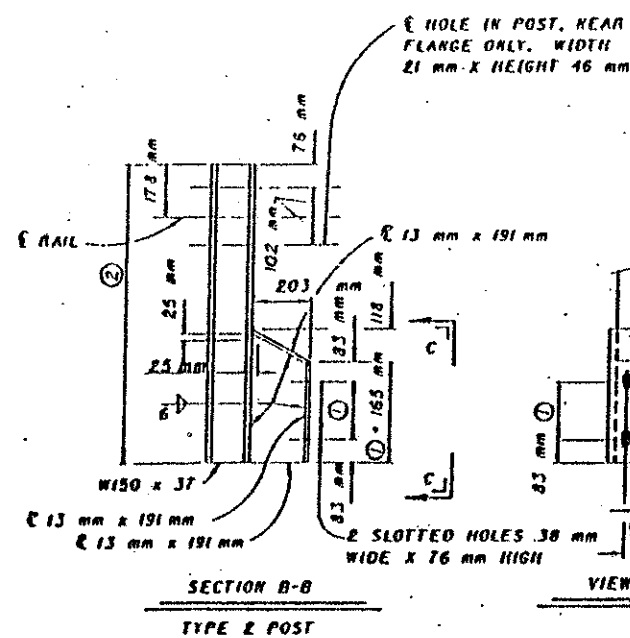
RESURFACING

STANDARD CONSTRUCTION DRAWING
BP-3.1M

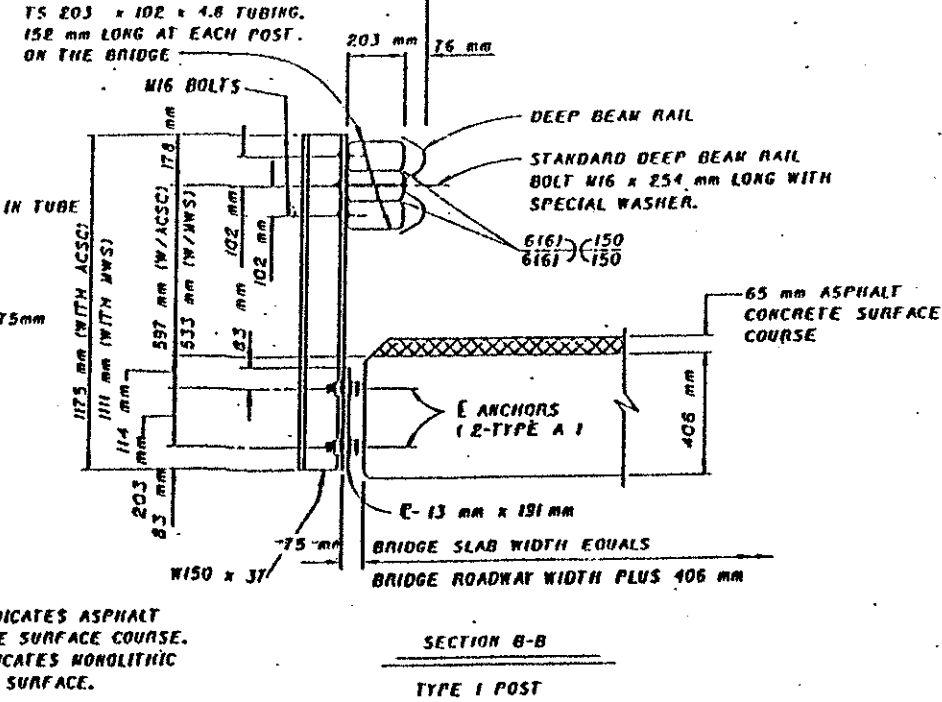
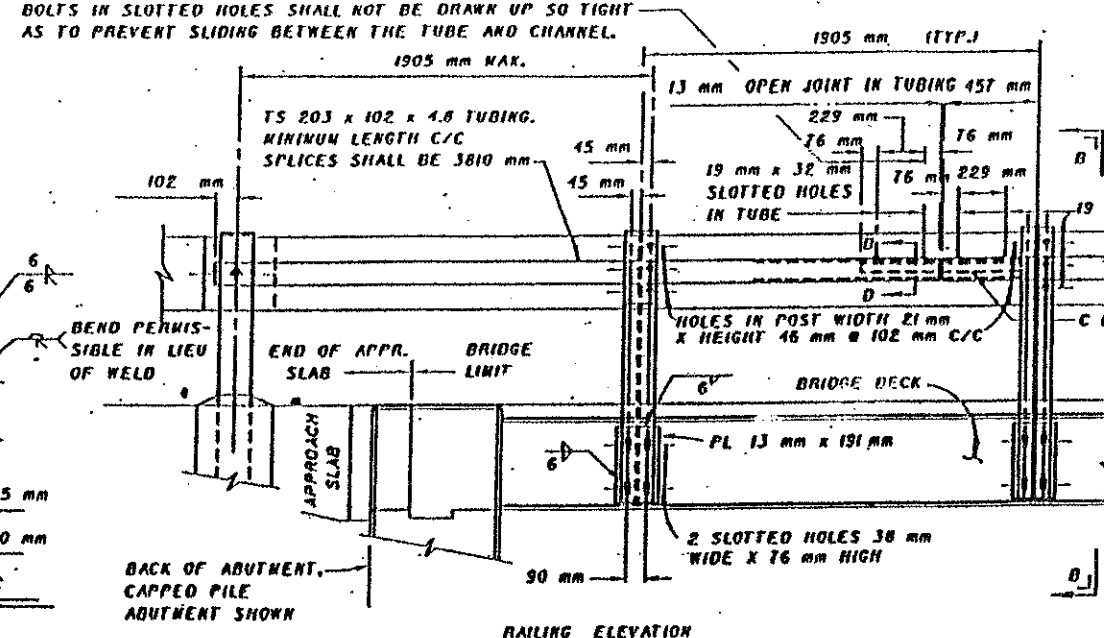
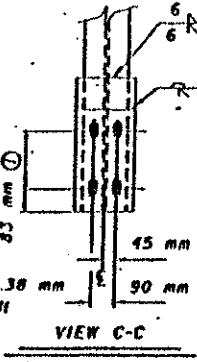
APPROVED W.K. Hulman
ENGR., L & D

DATE
10-28-94

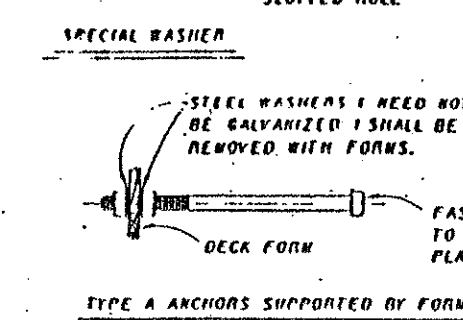
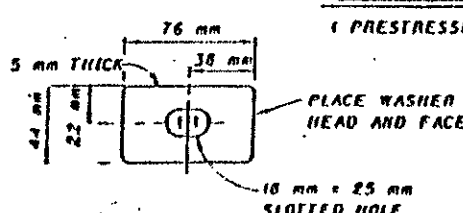
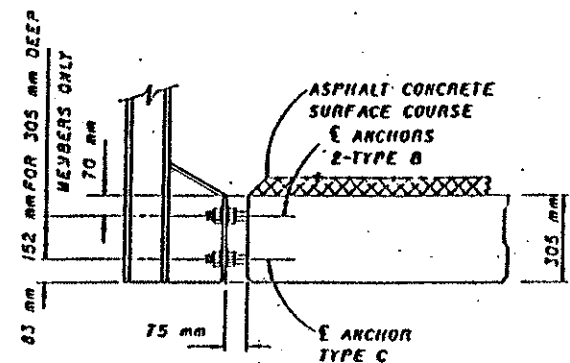
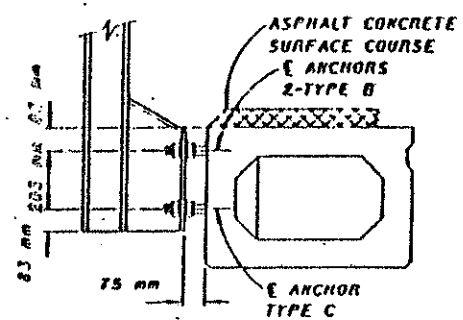




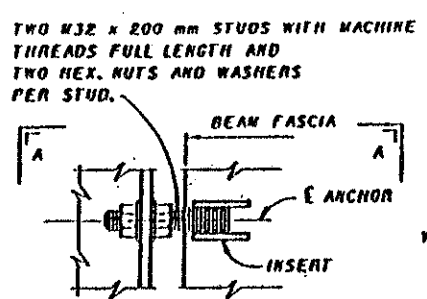
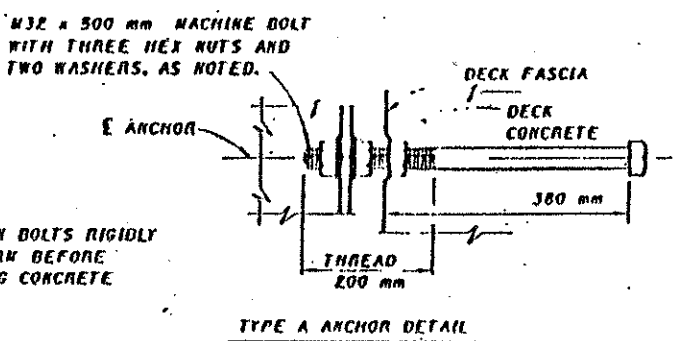
DIMENSION ① IS 152 mm ON 203 mm DEPENDING ON BOX BEAM DEPTH. SEE PROJECT PLANS AND POST ANCHORAGE DETAILS. PRESTRESSED CONCRETE BOX BEAMS. FOR DIMENSION ② SEE PROJECT PLANS. (FOR USE WITH PRESTRESSED CONCRETE BOX BEAMS)



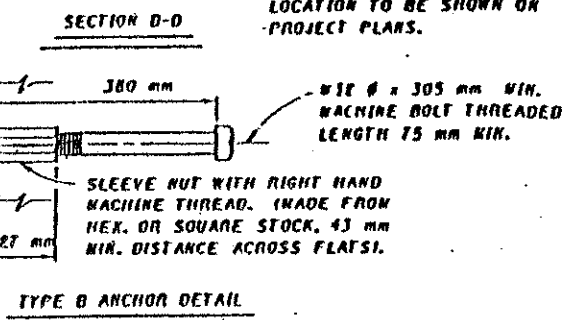
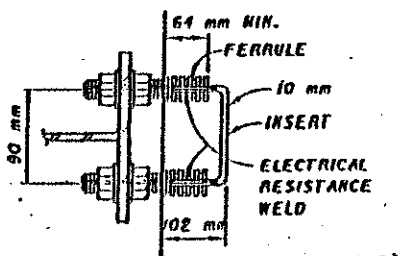
ACSC INDICATES ASPHALT CONCRETE SURFACE COURSE. MWS INDICATES MONOLITHIC WEARING SURFACE.



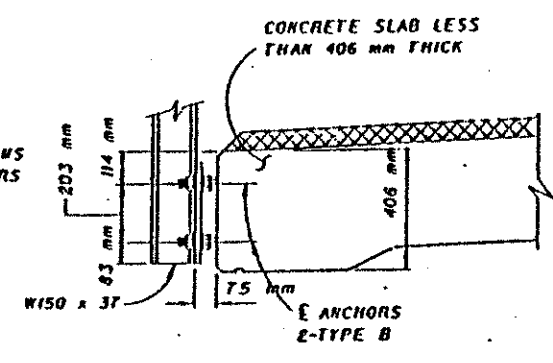
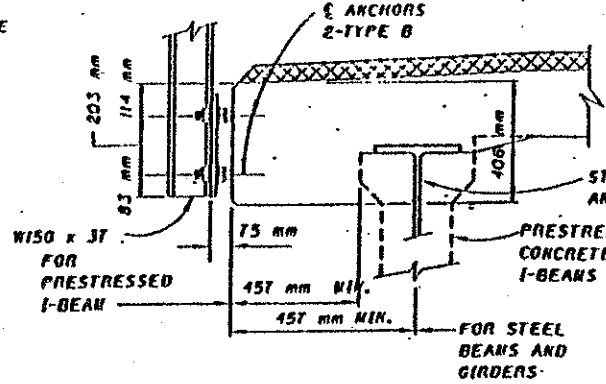
TYPE A ANCHORS SHOULD ONLY BE USED ON PROJECTS WHERE THE ORIGINAL ANCHORS WERE TYPE A AND ALL ANCHORS ON ANY SINGLE STRUCTURE ARE NOT BEING REMOVED OR REPLACED



SECTION A-A TYPE C ANCHOR DETAIL



TYPE B ANCHOR DETAIL



POST ANCHORAGE DETAILS (NOT FOR USE WITH PRESTRESSED BOX BEAMS)

MATERIAL: ALL NUTS SHALL CONFORM TO THE PHYSICAL PROPERTIES OF ASTM-A325. THE CHEMICAL PROPERTIES ARE WAIVED FOR ALL BOLTS, ANCHOR BOLTS, NUTS AND STUDS.

M16 BOLTS SHALL BE ASTM-A325.

M32 ANCHOR BOLTS AND STUDS SHALL CONFORM TO THE FOLLOWING PHYSICAL PROPERTIES:

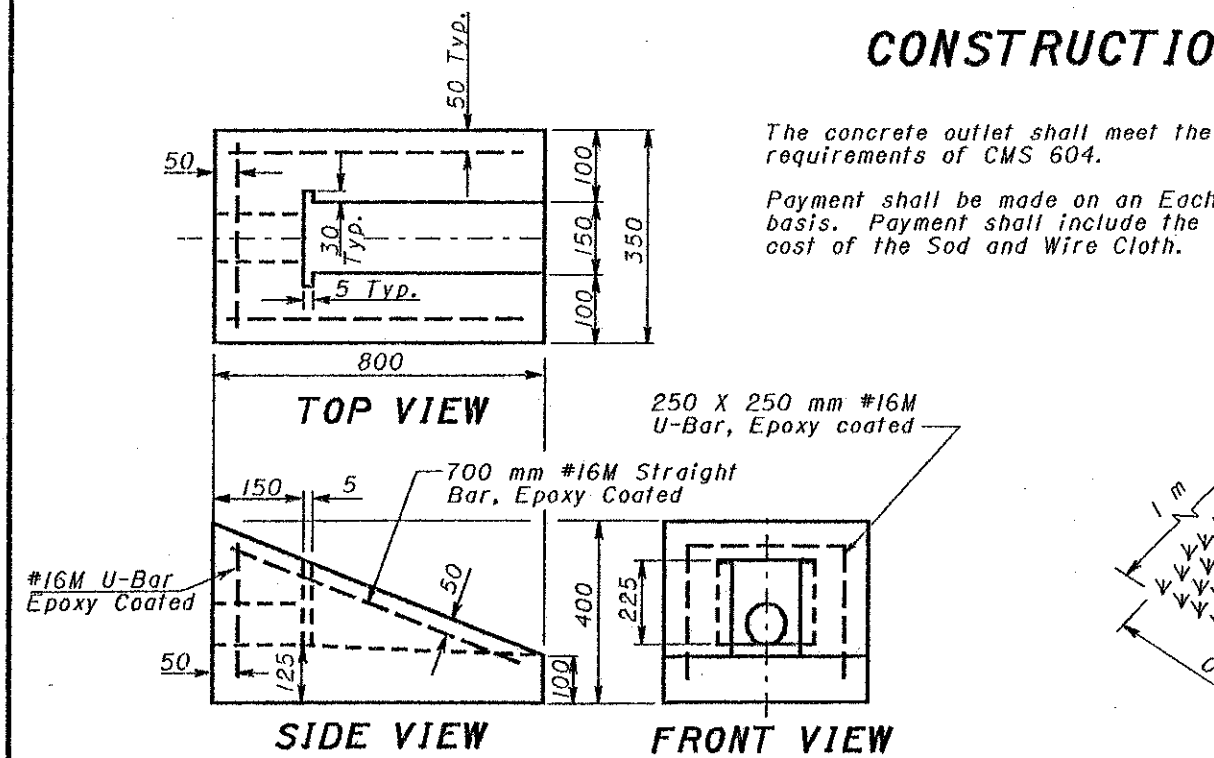
- A) ELONGATION SHALL BE 10X
- B) THREAD PITCH IS 3.6mm
- C) STRESS AREA IS 643mm²
- D) PROOF LOAD LENGTH MEASUREMENT METHOD IS 386A
- E) PROOF LOAD YIELD STRENGTH METHOD IS 424K
- F) MINIMUM TENSILE STRENGTH IS 534K
- G) PRODUCT HARDNESS IS ROCKWELL C23 MINIMUM AND C34 MAXIMUM.

STEEL TUBING SHALL BE AS PER ITEM 707.10. ALL GUARDRAIL POSTS SHALL BE ASTM A36.

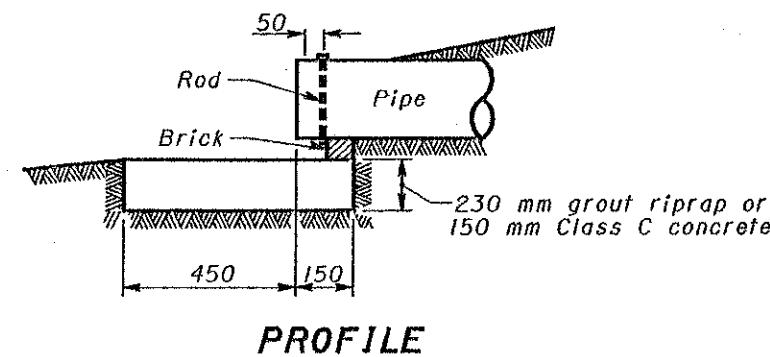
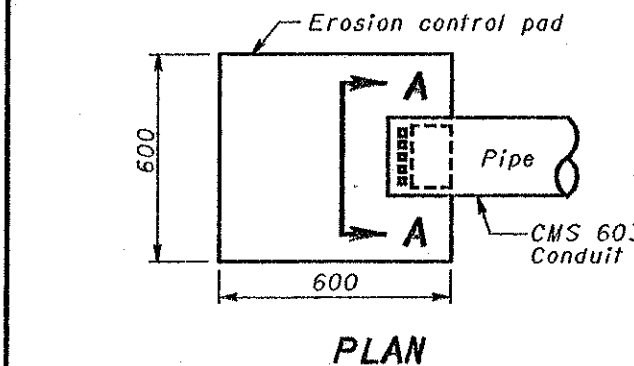
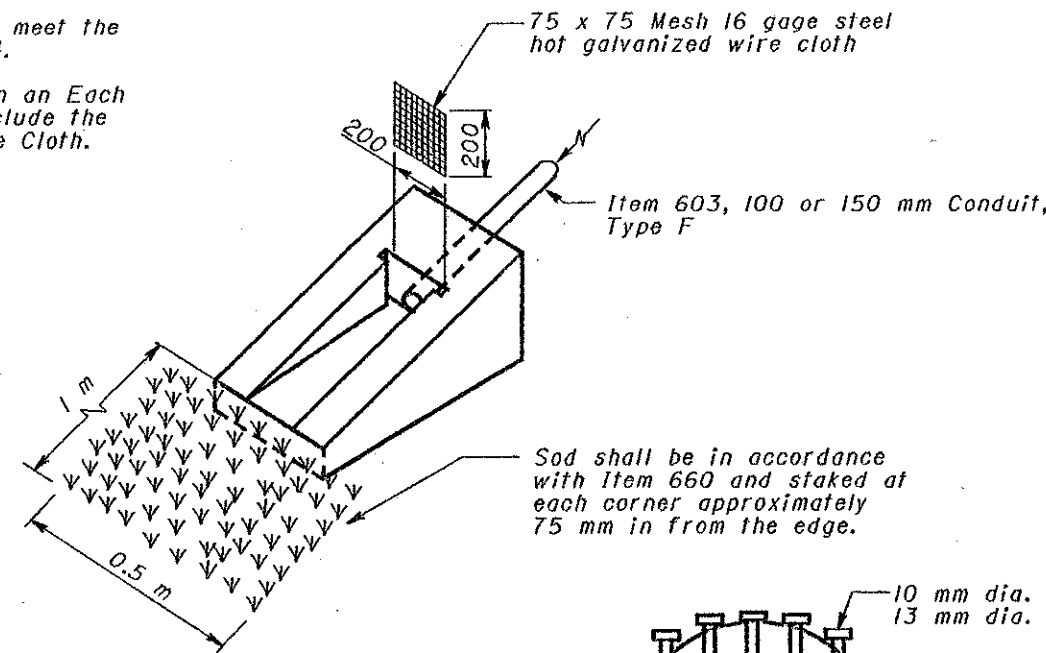
GALVANIZING: ALL GUARDRAIL POSTS, TUBES, HARDWARE AND ACCESSORIES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 OR ASTM A153, EXCEPT AS OTHERWISE NOTED.

TYPE C ANCHOR INSERTS OF A DIFFERENT TYPE MAY BE PROVIDED IF APPROVED BY THE DIRECTOR.

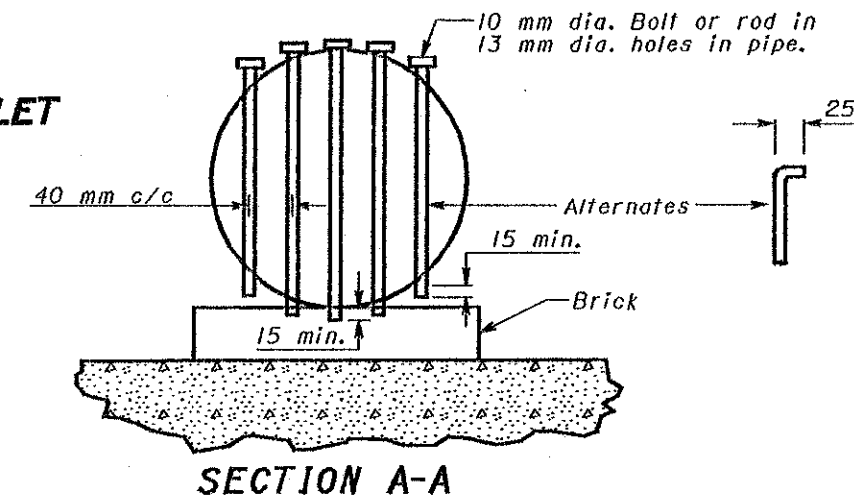
CONSTRUCTION METHODS



PRECAST REINFORCED CONCRETE OUTLET

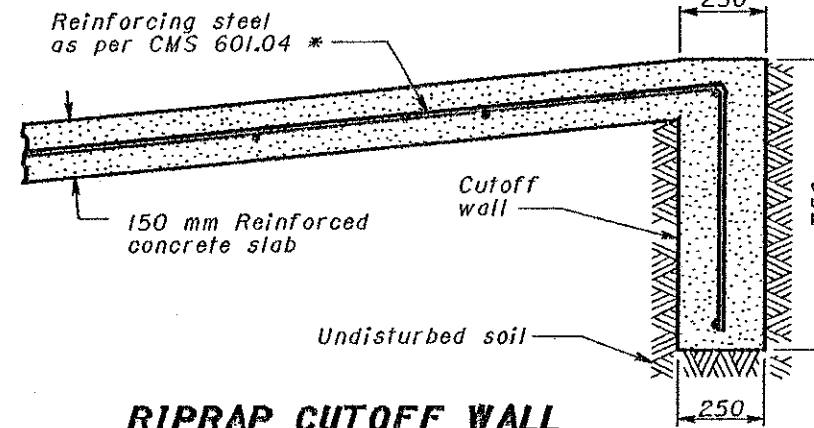


EROSION CONTROL PAD AND ANIMAL GUARD FOR OUTLET PIPE



Conduit Size (mm)	100	150	200	250	300	375	450
No. of Bolts	2	3	5	6	7	9	11

* If wire fabric is used in the slab, #10M bars at 600 mm overlapping the fabric. 300 mm, or wire fabric in accordance with SCD BP-1.1M may be used.

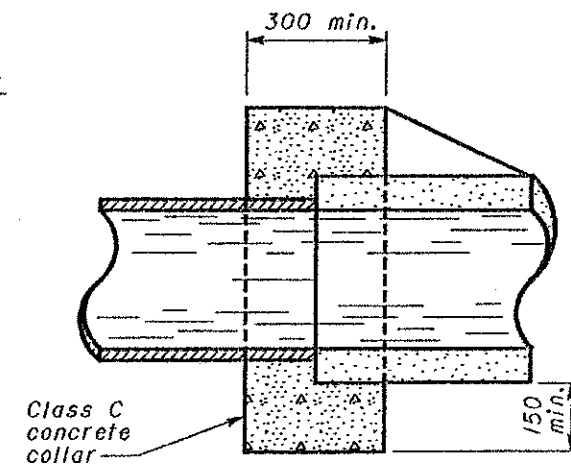


The cost of the cutoff wall shall be included in the unit price bid for Item 601 Riprap using 150 mm reinforced concrete slab

NOTES

MASONRY COLLARS: A masonry collar shall be provide where plans require that a pipe extension be joined to the end of an existing pipe with a butt joint. The cost shall be included in the unit price bid for the new conduit.

EROSION CONTROL PAD AND ANIMAL GUARDS: These items shall be provided at the outlet end of all farm drains except where they outlet into a drainage structure. The steel bolts or rods for the animal guard shall be galvanized per CMS 710.06. In lieu of drilling or punching the 13 mm diameter holes into the pipe, a metal collar meeting all of the above requirements may be clamped onto the pipe if approved by the Engineer. Payment for the erosion control pads and animal guards shall be included in the unit price bid for Item 603 — mm Conduit, Type —.



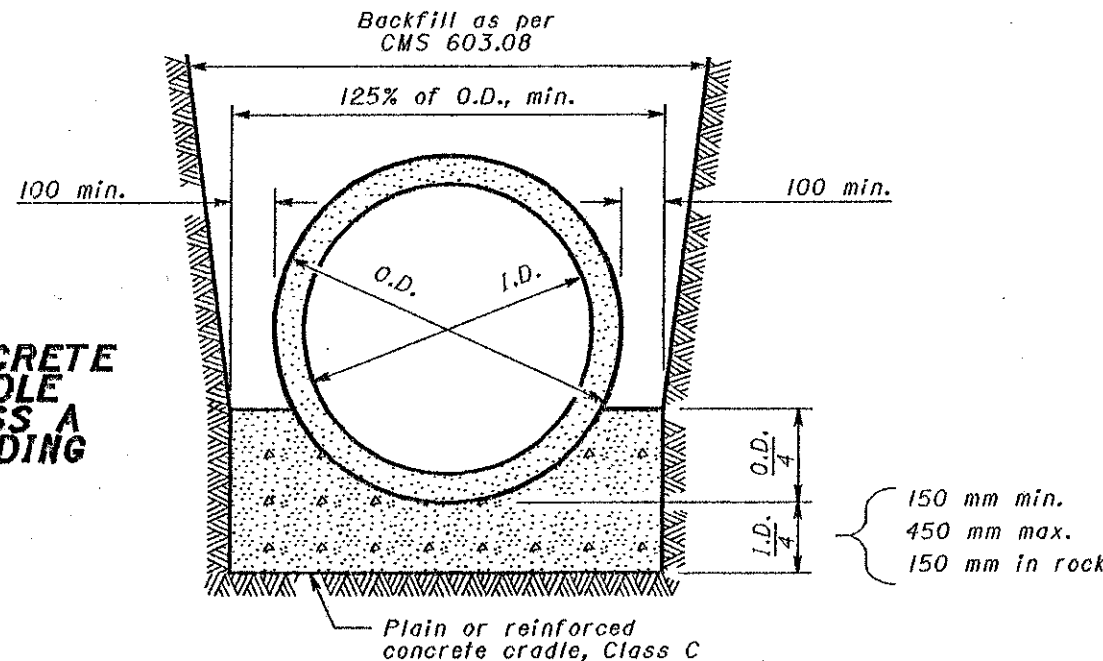
All dimensions are in millimeters unless otherwise noted.



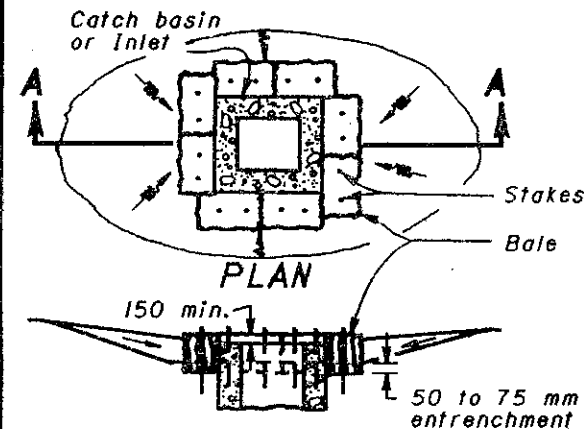
This Drawing Replaces MC-4.

OHIO DEPARTMENT OF TRANSPORTATION	
OUTLETS, DRAINS AND SEWERS	DATE 6-30-95 10-21-97
STANDARD CONSTRUCTION DM-1.1M DRAWING APPROVED <i>[Signature]</i>	

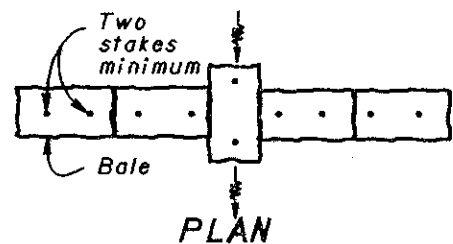
CONCRETE CRADLE CLASS A BEDDING



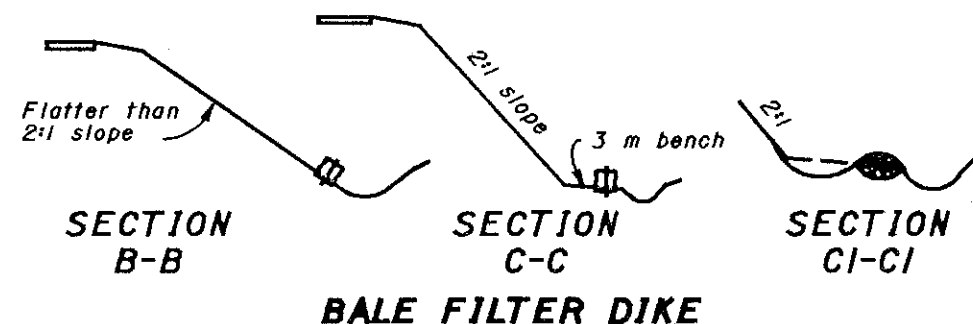
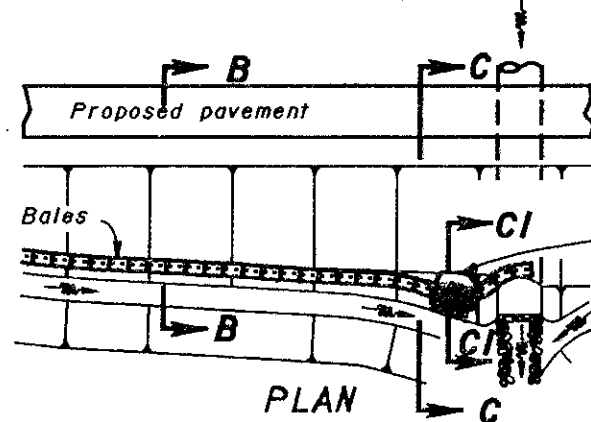
STRAW OR HAY BALES



SECTION A-A
BALE INLET FILTER



PLAN
ELEVATION
BALE DITCH CHECK



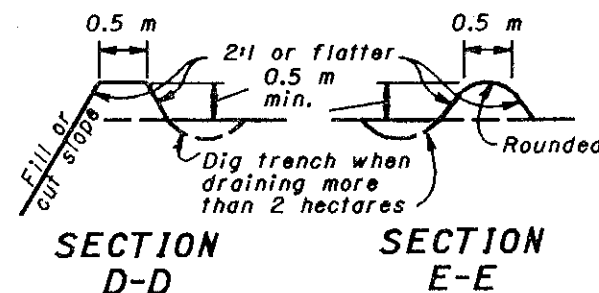
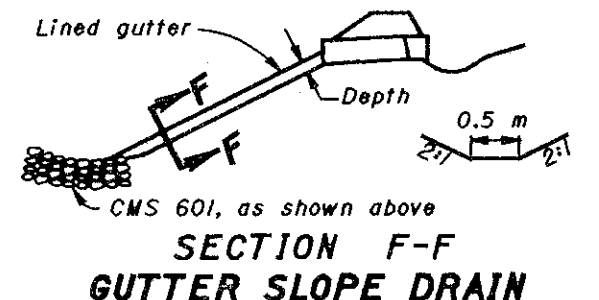
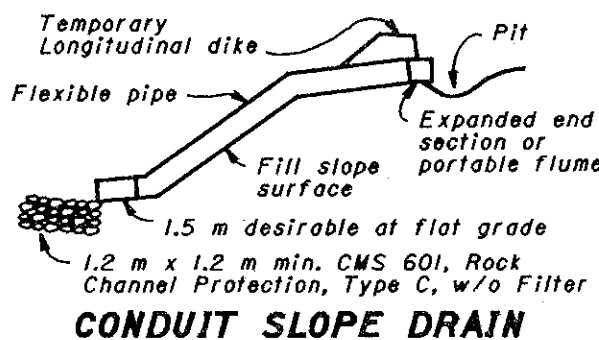
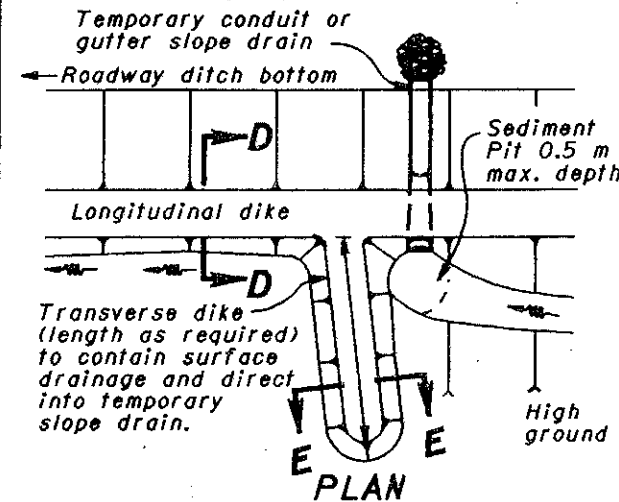
BALE PLACEMENT: Bales shall be tightly placed adjacently and entrenched 50 mm to 75 mm before staking; or a small amount of loose soil shall be lightly compacted along the upstream edge of the bales. Each bale shall be firmly staked with a minimum of two stakes at least 1 m in length. Stakes shall be wooden 50 x 50 mm, reinforcing bars or fence posts, as approved by the Engineer. Loose straw or hay shall be scattered for a distance of 3 m on the upstream side of each ditch check, and shall be wedged between and under staked bales.

PITS: Sediment pits shall be provided where directed by the Engineer, and their cost included in the unit price bid for the adjacent CMS 207 items.

MAINTENANCE: Sediment shall be removed when its depth reaches half the height of the exposed portion of the lowest bale.

BASIS OF PAYMENT: Straw or hay bale installation shall be paid for under Item 207, Straw or Hay Bales. Cost will include placing, staking, maintaining and removing.

DIKES AND SLOPE PROTECTION



GENERAL: Dikes & drains shown shall be used when earthwork operations on slopes higher than 2.5 m are suspended for three weeks or more and/or as directed by the Engineer. Smaller dikes used at the end of a day's operation shall be considered as part of the earthwork. Temporary slope drains shall be suitably positioned and anchored to prevent movement or undermining, as directed by the Engineer.

LONGITUDINAL DIKES: shall be constructed of suitable material as per CMS 203 and compacted to 85% maximum density.

CONDUITS: Conduits for slope drains shall be corrugated steel pipe, corrugated or smooth plastic pipe, rubber conduit, or an approved equal.

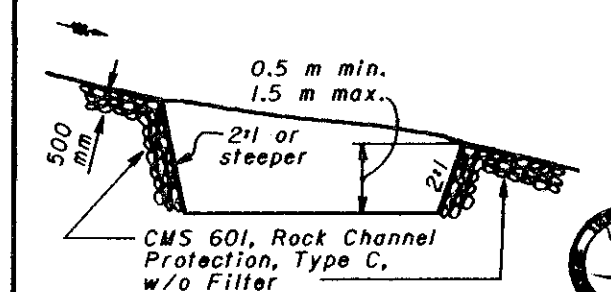
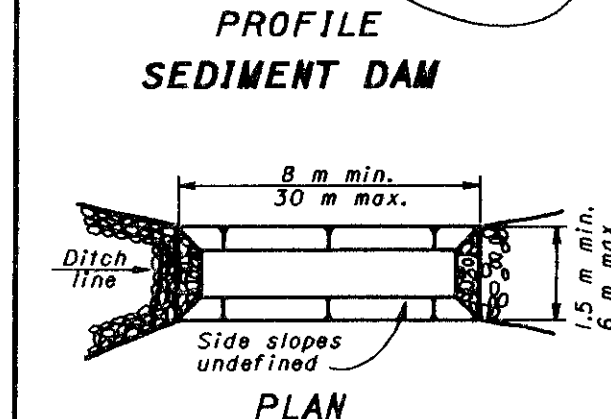
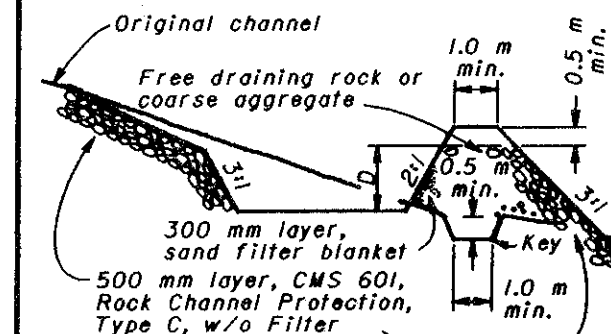
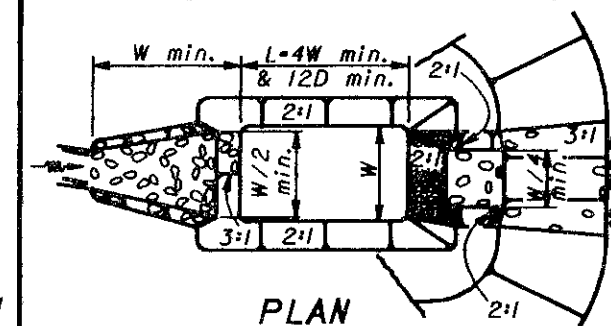
GUTTERS: Gutters for slope drains shall be lined with Type C rock channel protection, crushed aggregate slope protection, Portland cement concrete, bituminous concrete, plastic sheeting (on slopes 4:1 max.), partial pipe sections or approved equal.

PITS: Sediment pits shall be provided where directed by the Engineer and their cost included in the price bid for adjacent CMS 207 items.

BASIS OF PAYMENT: Temporary dikes shall be paid for under Item 207, Temporary Dikes. Temporary slope drains shall be paid for under Item 207, Temporary Slope Drains. Rock required shall be paid for under Item 60I, Rock Channel Protection, Type C, w/o Filter.

TEMPORARY SLOPE DRAINS RECOMMENDED SIZES				
Area (hectares)	Pipe Sizes (mm)			Gutter depth (mm)
	Smooth	Corru- gated	Half- round	
0-1.6	150	150	450	200
1.6-3.2	200	300	450	200
3.2-4.9	250	375	525	300

SEDIMENT BASINS & DAMS



EMBANKMENT: Sediment basin embankment construction shall be as per CMS 203 compacted as directed by the Engineer.

MAINTENANCE: Sediment pits, dams and basins shall be acceptably maintained. Deposited sediment shall be removed when the initial volume has been reduced one-half. The sand filter blanket on sediment basins shall be replaced when deposited sediment is removed. The cost of maintenance shall be included in the unit price bid for the appropriate CMS 207 item.

FILTERS: Plastic filter fabric, as approved by the Engineer, may be substituted for the sand filter blanket on sediment dams. Such fabrics may be cleaned in lieu of replacement, when approved by the Engineer.

SIZE: The volume shown on the plans is the total storage volume required for the sediment basin or dam. A series of smaller basins or dams may be substituted for a larger basin or dam when approved by the Engineer.

BASIS OF PAYMENT: Sediment Dams and Basins shall be paid for under Item 207, Temporary Benches, Dams and Sediment Basins. The pay quantity shall be the actual number of cubic cubic meters of excavation and embankment required to construct the basin or dam. Rock required shall be paid for under Item 60I, Rock Channel Protection, Type C, w/o Filter.



PROFILE
SEDIMENT BASIN

This Drawing Replaces MC-II.

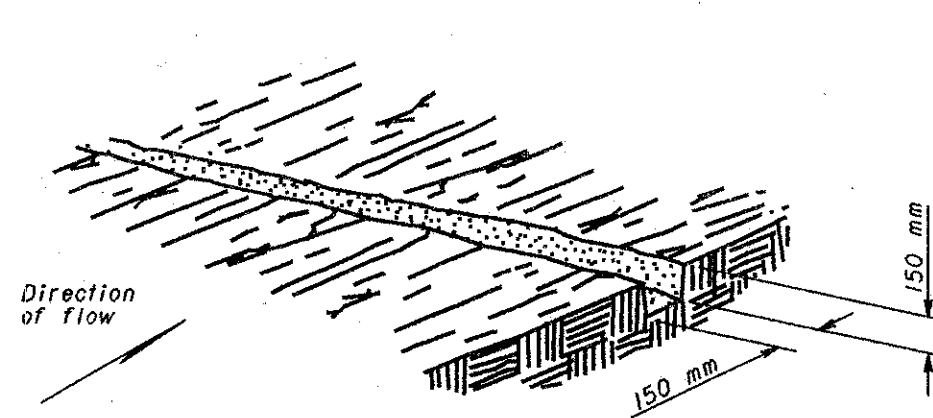
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

**TEMPORARY
EROSION
CONTROL**

DATE
6-30-95

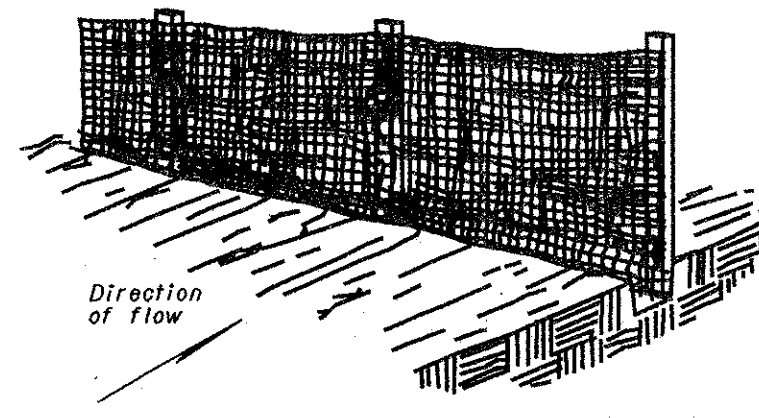
STANDARD
CONSTRUCTION
DRAWING
DM-4.3M

APPROVED
W.K. Huhman
ENGR. L & D



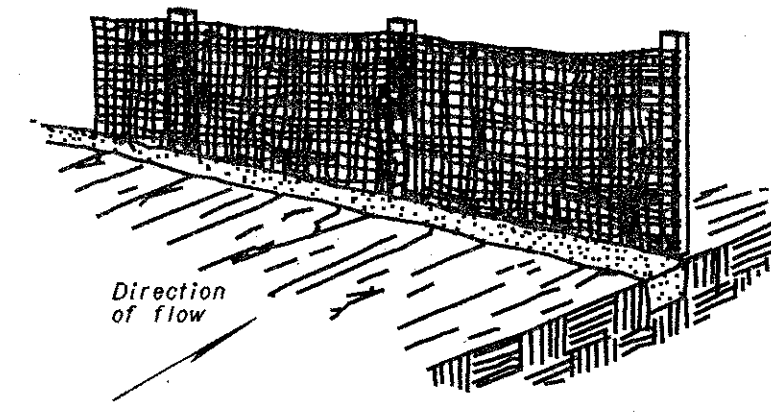
Excavate a 150 mm by 150 mm trench along the proposed fence line.

STEP 1



Place fabric and support stakes and extend fabric into the trench.

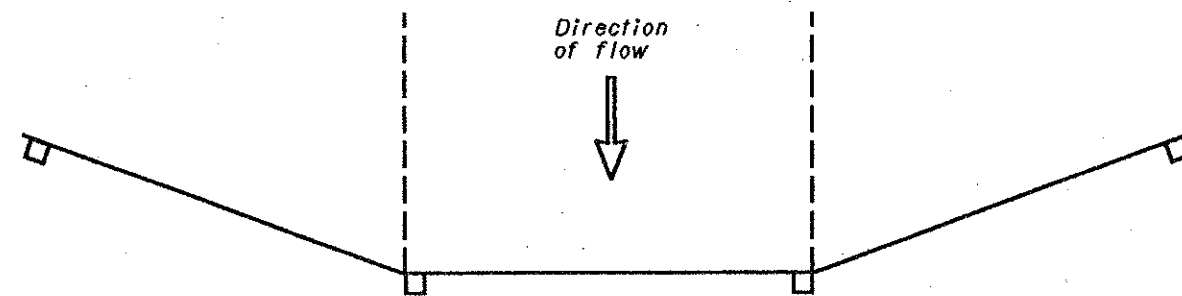
STEP 2



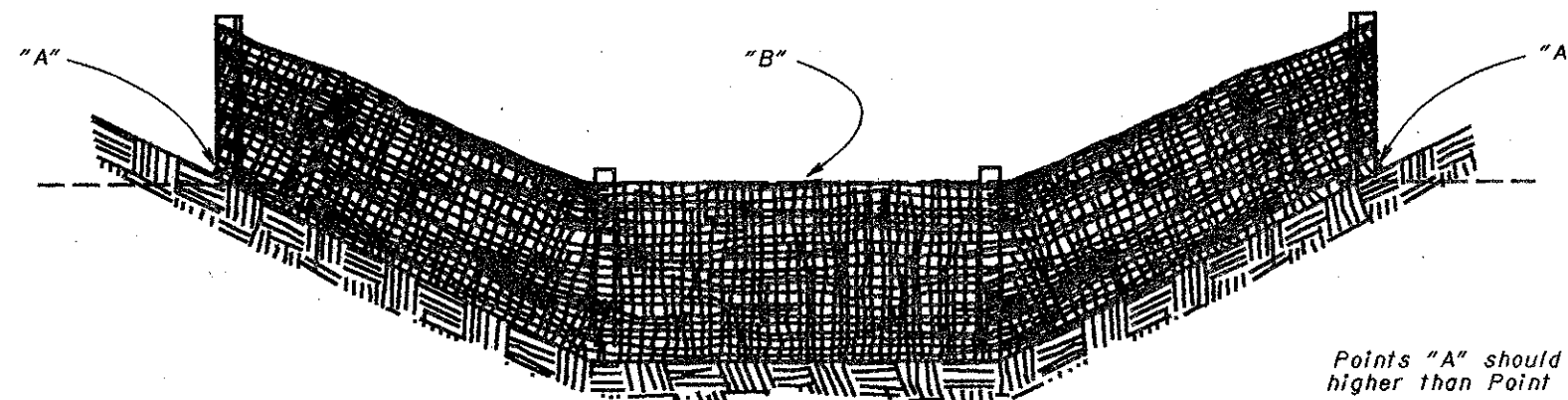
Backfill and compact the excavated soil.

STEP 3

CONSTRUCTION OF A FILTER BARRIER



PLAN VIEW



Points "A" should be higher than Point "B"

ELEVATION VIEW

PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

NOTES

MATERIALS: Filter fabric shall meet the requirements of CMS 207.02.

CONSTRUCTION: The bottom of the fabric shall be buried 150 mm below the ground. The fabric shall be high enough to retain sediment-laden water and adequately supported to prevent collapse or bursting. The ground elevation of the fence shall be held constant except that the end elevations shall be raised to prevent flow around the end of the fence.

MAINTENANCE: The filter fabric fence shall be maintained to be functional, at the direction of the Engineer. This shall include removal of trapped sediment and required cleaning, repair, and/or replacement of the filter fabric. Sediment shall be removed when its depth reaches half the height of the lowest section of fence.

PAYMENT: The cost of all materials, construction, maintenance and removal shall be paid for under Item 207, Meter, Filter Fabric Fence.



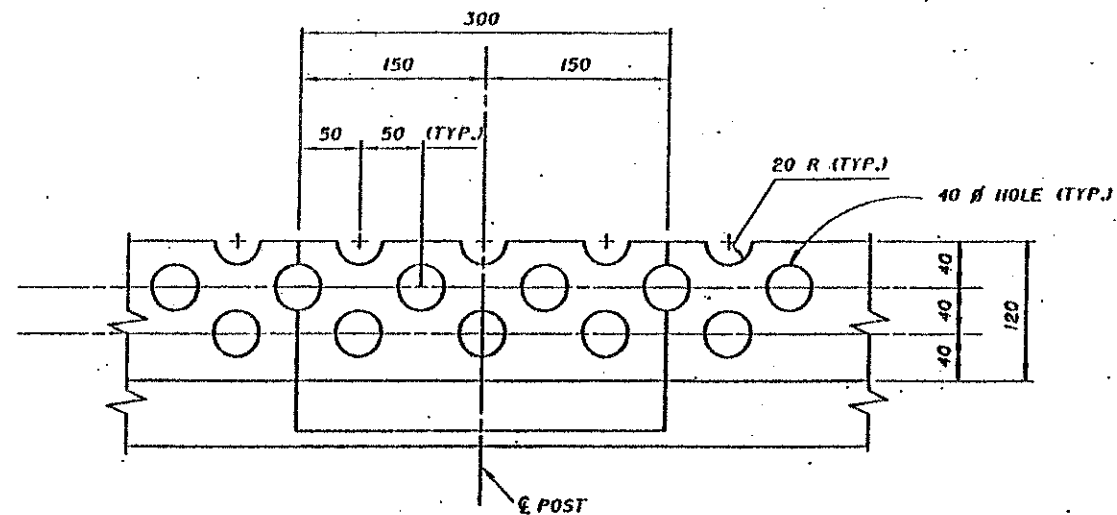
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

**TEMPORARY
EROSION
CONTROL**

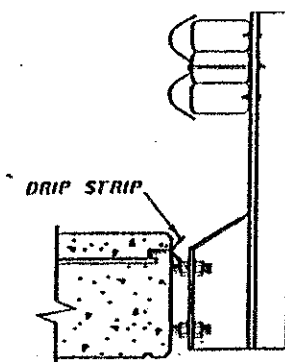
DATE
6-30-95

STANDARD
CONSTRUCTION
DRAWING **DM-4.4M**

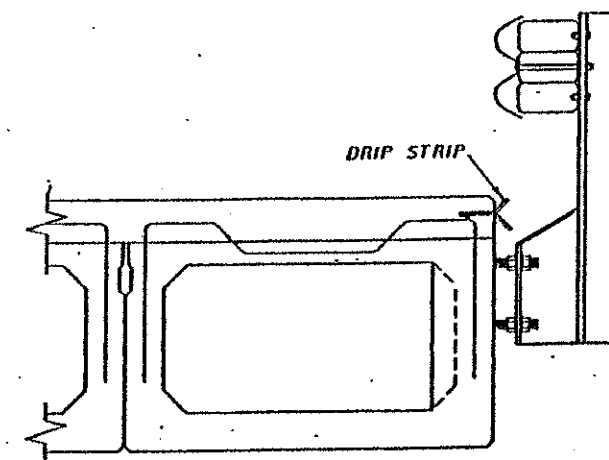
APPROVED *D. K. Hulman*
ENGR., L & D



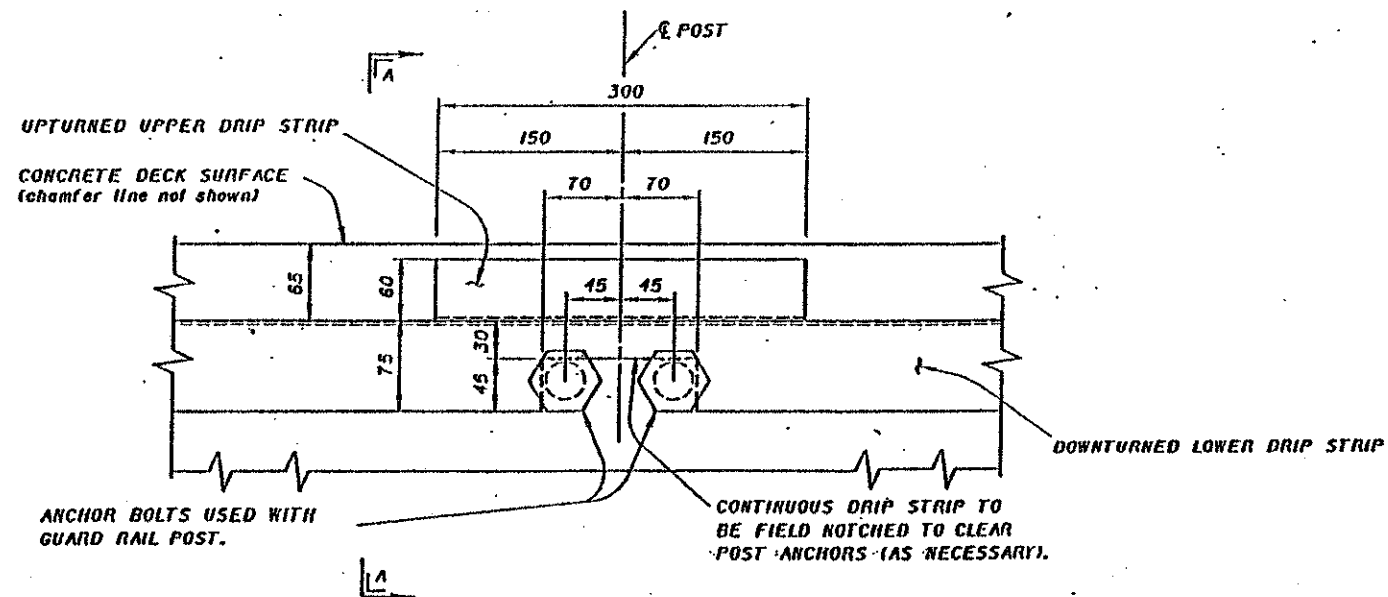
PARTIAL PLAN



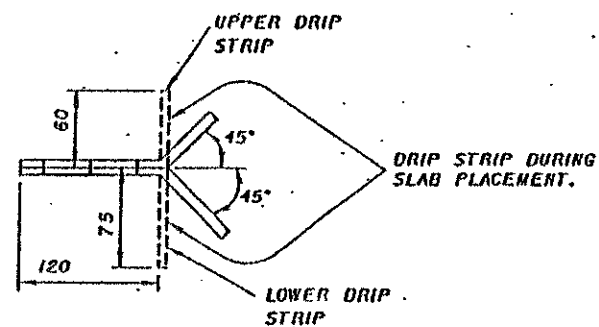
SECTION AT EDGE OF CONCRETE DECK SLAB



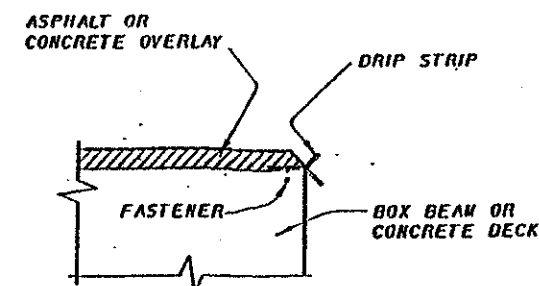
SECTION AT EDGE OF COMPOSITE PRESTRESSED BOX BEAM DECK



ELEVATION



SECTION A-A



*** SECTION AT EDGE OF ASPHALT OR CONCRETE OVERLAY**

D RIP STRIP NOTES:

LOWER STAINLESS STEEL D RIP STRIP, AS DETAILED, SHALL BE INSTALLED ALONG THE FULL LENGTH OF EACH SIDE OF THE BRIDGE. IF SPLICES ARE REQUIRED IN THE LOWER D RIP STRIP, THE INDIVIDUAL PIECES SHALL BE BUTTED TIGHTLY TOGETHER, NOT LAPPED. A 300 mm LONG UPPER D RIP STRIP SHALL BE INSTALLED AT EACH RAILING POST. STRIPS SHALL BE BENT UP AT 90° AGAINST THE INSIDE FACE OF THE FORMS BEFORE CONCRETE IS PLACED. AFTER THE FORMS ARE REMOVED, THE D RIP STRIPS SHALL BE BENT TO A FINAL POSITION OF 45° AS SHOWN IN SECTION A-A.

STAINLESS STEEL SHALL BE A MINIMUM OF 0.8 mm ASTM A167, TYPE 304, MILL FINISH.

CARE SHALL BE USED WHEN STRIPPING FORMWORK SO AS NOT TO DAMAGE OR WRINKLE THE STAINLESS STEEL D RIP STRIP. TO FURTHER ENSURE THAT WRINKLING OF THE STRIPS DOES NOT OCCUR, AN ADEQUATE LENGTH BACKUP BAR SHALL BE USED DURING THE BENDING OUT OPERATION.

TOTAL QUANTITY FOR BID ITEM SHALL INCLUDE LINEAR FOOTAGE OF BOTH LOWER AND UPPER D RIP STRIPS.

PAYMENT SHALL BE AT THE CONTRACT PRICE BID FOR ITEM SPECIAL, LIN. FT. STEEL D RIP STRIP AND SHALL INCLUDE ALL MATERIALS, LABOR, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM.

* PRIOR TO PLACING AN ASPHALT OR CONCRETE OVERLAY, THE BENT D RIP STRIPS SHALL BE INSTALLED ALONG THE EDGE OF THE SLAB OR PRESTRESSED BOX BEAM AS SHOWN. THE D RIP STRIPS SHALL BE FASTENED WITH (32 mm length, 3 mm shank diameter) BUTTON HEAD SPIKES WITH DEFORMED SHANKS OR EXPANSION ANCHORS AT 450 mm C/C MAX. ALL INSTALLATION DEVICES SHALL EITHER BE GALVANIZED OR STAINLESS STEEL.

OTHER SIMILAR DEVICES WHICH WILL NOT DAMAGE THE CONCRETE MAY BE USED SUBJECT TO THE APPROVAL OF THE ENGINEER.

DESIGN AGENT
BUREAU OF BRIDGES
AND
STRUCTURAL DESIGN

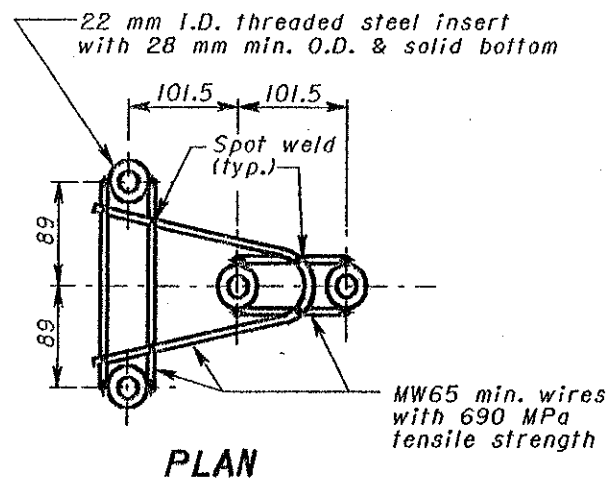
STATE OF OHIO DEPARTMENT OF TRANSPORTATION
12-15-94
DATE
ENGINEER OF BRIDGES

DESIGNED
REZA
CHECKED
JS
APPROVED
LWH
DS-1-94W

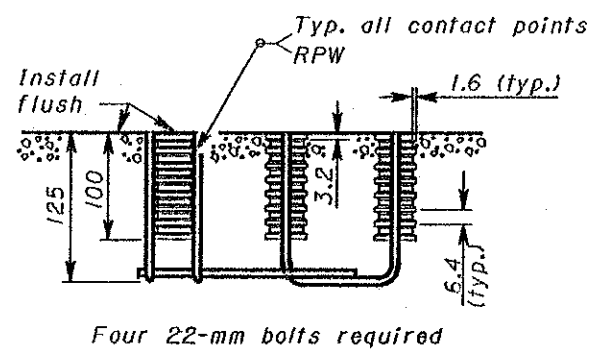
REVISIONS

STANDARD
D RIP STRIP DETAIL
FOR STRUCTURES WITH
OVER THE SIDE DRAINAGE

1/1

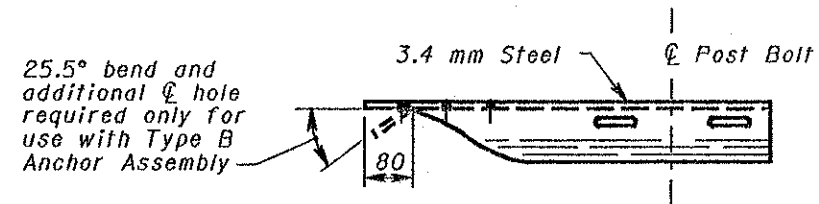


PLAN

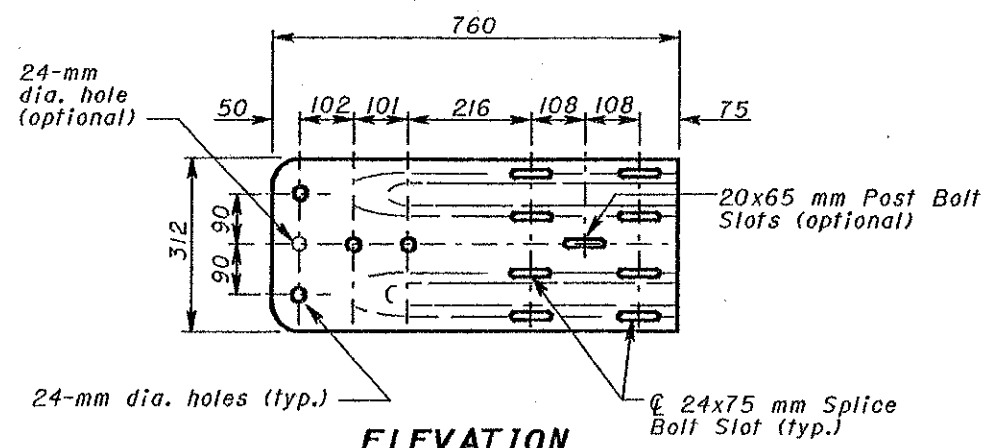


ELEVATION

CONCRETE INSERT ANCHOR ASSEMBLY
(W-BEAM ONLY)

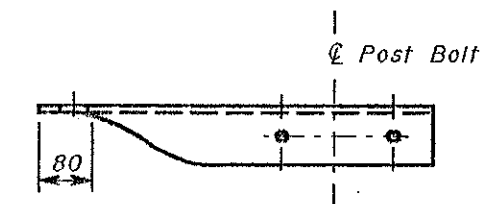


PLAN

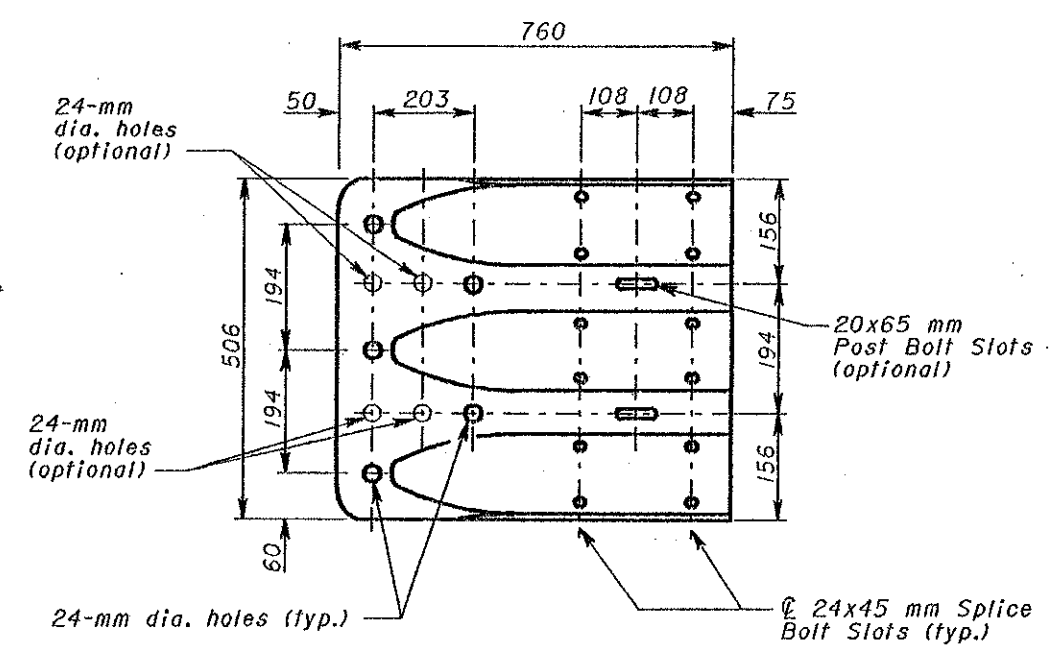


ELEVATION

W-BEAM TERMINAL CONNECTOR



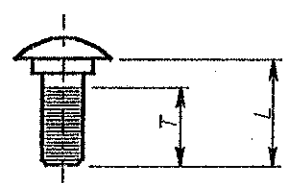
PLAN



ELEVATION

THRIE-BEAM TERMINAL CONNECTOR

All dimensions are in millimeters unless otherwise noted.



L (mm)	T min. (mm)	Bolt Use
455 (Standard Rail)	85	Type 5: WP/WB, PB
660 (Barrier Rail)	85	Type 5: WP/WB, PB
255	60	Type 4: WP Type 5: SP/WB, PB
50	35	Type 4: SP
32	Full	Splice Bolt

WP= wood post WB= wood blackout
SP= steel post PB= plastic blackout
Longer bolt may be needed for round WP larger than 200 mm dia.

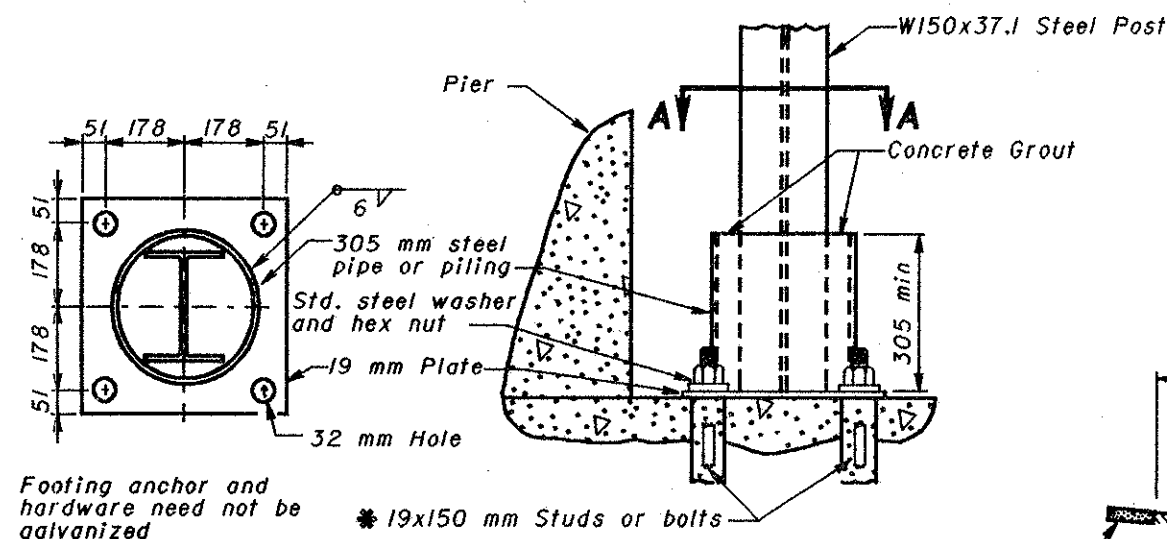
BUTTON HEAD BOLT
(For post and splice bolts)

NOTE

Refer to AASHTO M 180 for dimensional details of W-Beam and Thrie-Beam rail elements, related buffer and end sections, beam splices, post and splice bolts and nuts, and Type I W-Beam to Thrie-Beam Transition section.



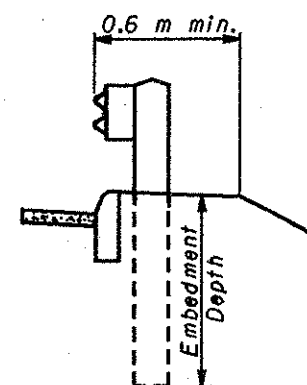
OHIO DEPARTMENT OF TRANSPORTATION	
GUARDRAIL DETAILS	DATE 11-30-94 10-21-97
	STANDARD CONSTRUCTION DRAWING GR-1.1M APPROVED <i>[Signature]</i>



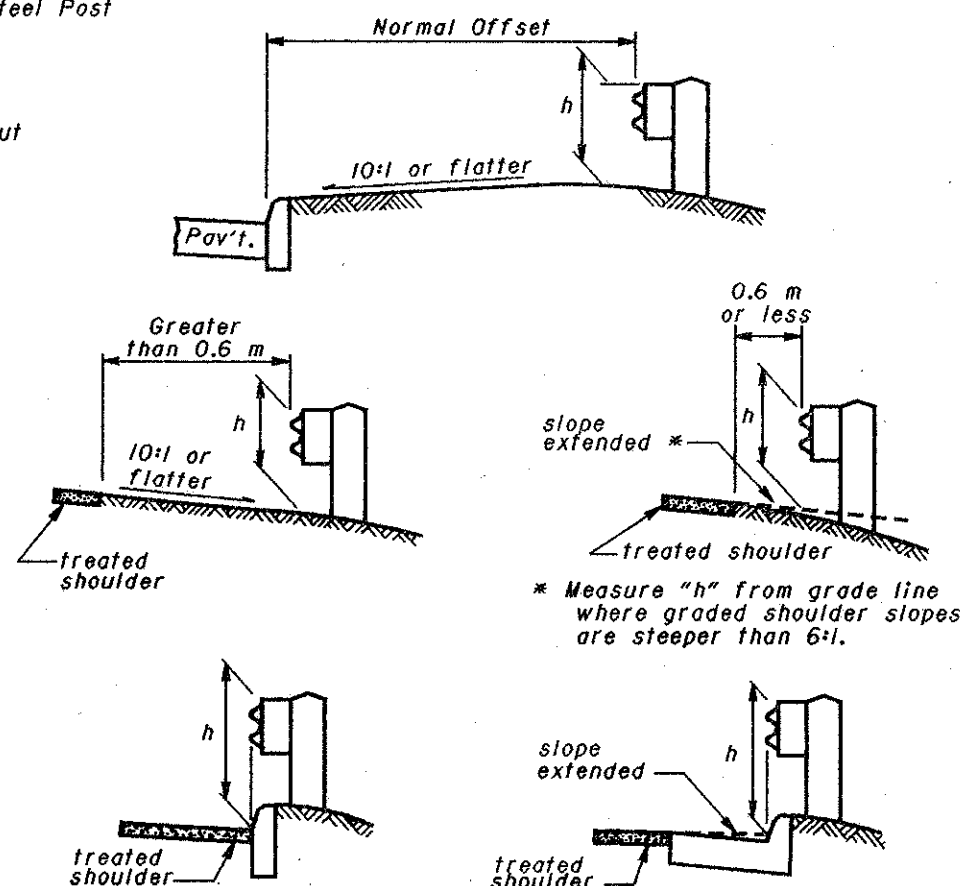
SECTION A-A

ELEVATION

FOOTING ANCHOR

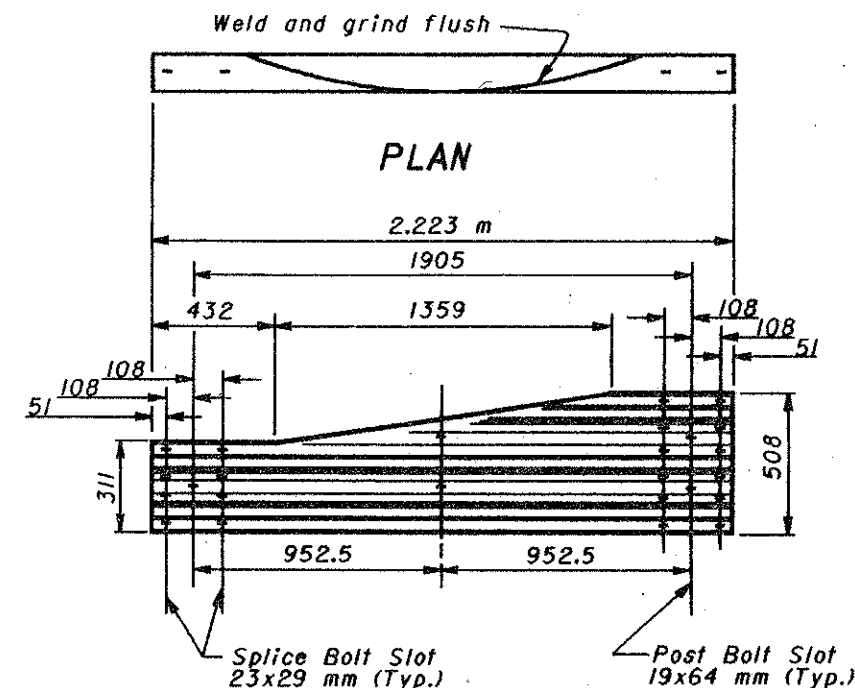


DETAIL A



h = Standard height (Tolerance ± 25 mm)

MEASURING GUARDRAIL HEIGHT



ELEVATION

TYPE 2
TRANSITION SECTION *
(W-Beam to Thrie-Beam)

* For details of Type 1
Transition Section, refer
to AASHTO M 180, Figure 4.

BEAM RAIL ELEMENTS: Elements shall be 3.81 m effective length, unless otherwise specified, with 19x64 mm post bolt slots on 1.905 m centers regardless of post spacing. Field punching or drilling of bolt holes or slots for irregularly spaced posts shall be according to CMS 606.05.

BEAM RAIL SPLICE between two rail elements or between a rail and terminal connector shall be lapped in the direction of traffic. The buffer or flared end sections shall lap on the traffic face. A 305 mm length of beam rail (Back-up Plate), with a 19 mm diameter bolt hole or a 19x64 mm slot, shall be provided at steel posts not having a rail splice.

EMBEDMENT DEPTH: Where less than 0.6 m of graded shoulder width (10:1 or flatter) exists, measured from the face of the guardrail (see Detail "A"), longer posts shall be used so that a minimum of 1.65 m embedment depth is provided. Payment for the longer posts will be made at the unit price bid per Each, Item 606 - Guardrail Post, 2.75 m.

PROTECTIVE COATING: In lieu of the requirements of CMS 710.06, expansion shields, anchors and insert anchor assemblies installed (embedded) in concrete shall be coated in accordance with ASTM A 153 or be of stainless steel. Any bolts screwed into these embedded devices shall meet CMS 710.06.

SPECIAL POST MOUNTINGS:

Posts located over a drainage inlet or structure shall be encased or anchored per the details shown on Standard Construction Drawing GR-2.2M.

Posts located over a footing with a cover of less than 0.75 m shall be installed with a footing anchor as detailed hereon. (A plate, as detailed on Section B-B of Standard Construction Drawing GR-2.2M, may be used as an alternate attachment method.) Where the cover is between 0.75 m and 1.04 m, the footing anchor may be omitted and the post encased instead with 100 mm (min.) of concrete.

Posts located over a culvert with less than 1.3 m of cover shall not be driven, but shall be set in drilled or dug holes. Where the available post embedment depth is less than 1.04 m, the post shall be encased with 100 mm (min.) of concrete.

All costs associated with special post mountings shall be included in the unit price bid for 606 Guardrail of the type specified in the plans.

*** ANCHORS:** Holes and grouting shall comply with CMS 510. Either cement or nonshrink, nonmetallic grout may be used.

Expansion shield anchors conforming to CMS 712.01 may be substituted except where concrete deterioration has occurred, as determined by the Engineer. The same bolt diameter specified shall be required. Where self-drilling anchors are used, the holes shall be drilled with the expansion shield (not by a drill bit) and the shield installed flush with the concrete surface.

All dimensions are in millimeters
unless otherwise noted.



This Drawing Replaces GR-1.2.

OFFICE OF ROADWAY ENGINEERING
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL
DETAILS

DATE
1-3-96

STANDARD
CONSTRUCTION DRAWING
GR-1.2M

APPROVED D.K. Hulman, P.E.
ADMINISTRATOR

NOTES

POSTS: Posts may be round (standard single rail only) or 150x200 mm square-sawn pressure-treated wood or W150x13.5 galvanized steel. The same type post shall be used throughout the length of the project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 200 mm ± 25 mm in diameter at the top and not more than 75 mm larger at the butt with a uniform taper. Post may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and blockouts shall be pressure-treated per CMS 710.14. Bolt holes shall be bored and the tops of posts shall be trimmed as shown, if required, after posts are set.

ALTERNATE BLOCKOUTS: Approved plastic blockouts may be used in lieu of the wood blockouts shown. The approved list is maintained by the Office of Materials Management.

WASHERS: Standard galvanized steel washers of the appropriate size shall be installed on the nut side of bolts through wood posts.

WELDED BEAMS: Welded beam guardrail posts and blockouts may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A 769M, Class 1 using Grade 36 steel (250 MPa yield point) with the following exceptions:

Sec. 7.2 Test reports of tensile properties for each lot shall accompany each shipment.

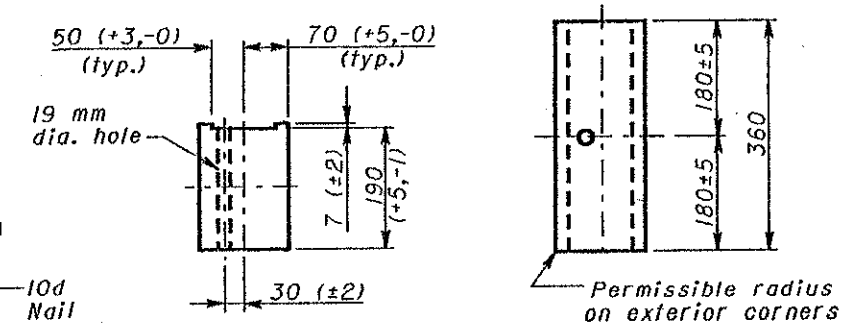
Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.

Sec. 13 Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

POST EMBEDMENT DEPTH: For specific depth requirements, see SCD GR-1.2M.

STEEL BEAM POSTS & BLOCKS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W150x13.5	150 mm	100 mm	5.5 mm	4.3 mm
Welded 150x13.5	152 mm	100 mm	5.5 mm	4.3 mm

MISCELLANEOUS: For details not shown see SCD's GR-1.1M and GR-1.2M.



PLAN NOTCHED BLOCKOUTS FOR STEEL POSTS

OHIO DEPARTMENT OF TRANSPORTATION

**GUARDRAIL
TYPE 5 & 5A**

DATE
11-30-94
10-21-97

**STANDARD
CONSTRUCTION
DRAWING**
APPROVED *[Signature]*

GR-2.1M



All dimensions are in millimeters unless otherwise noted.

METHOD 1

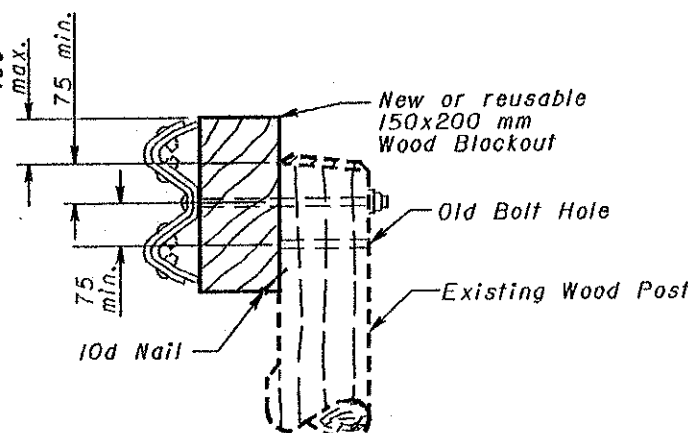
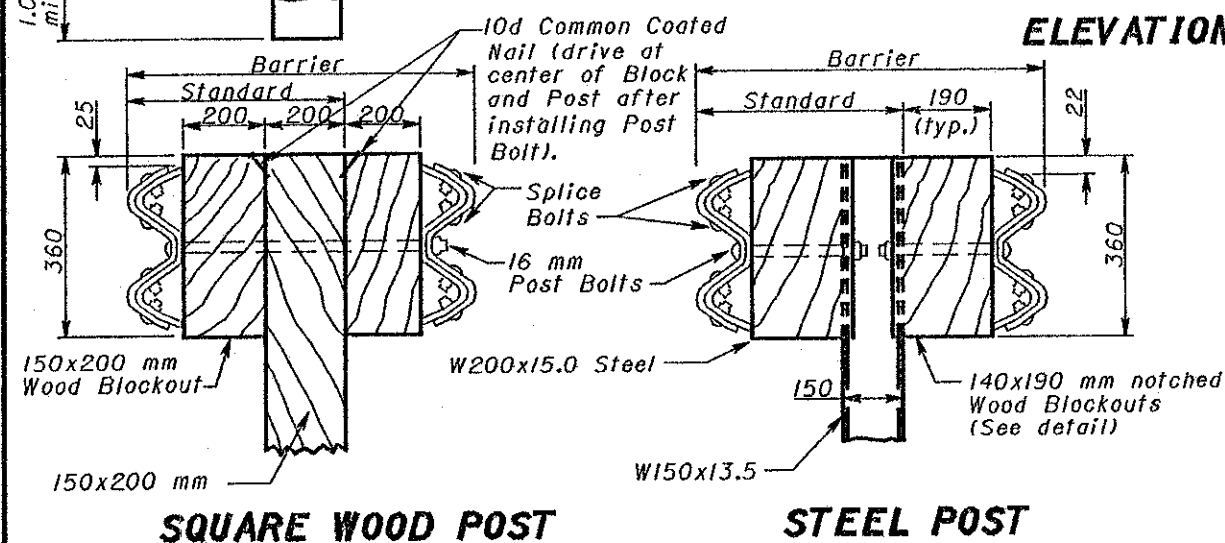
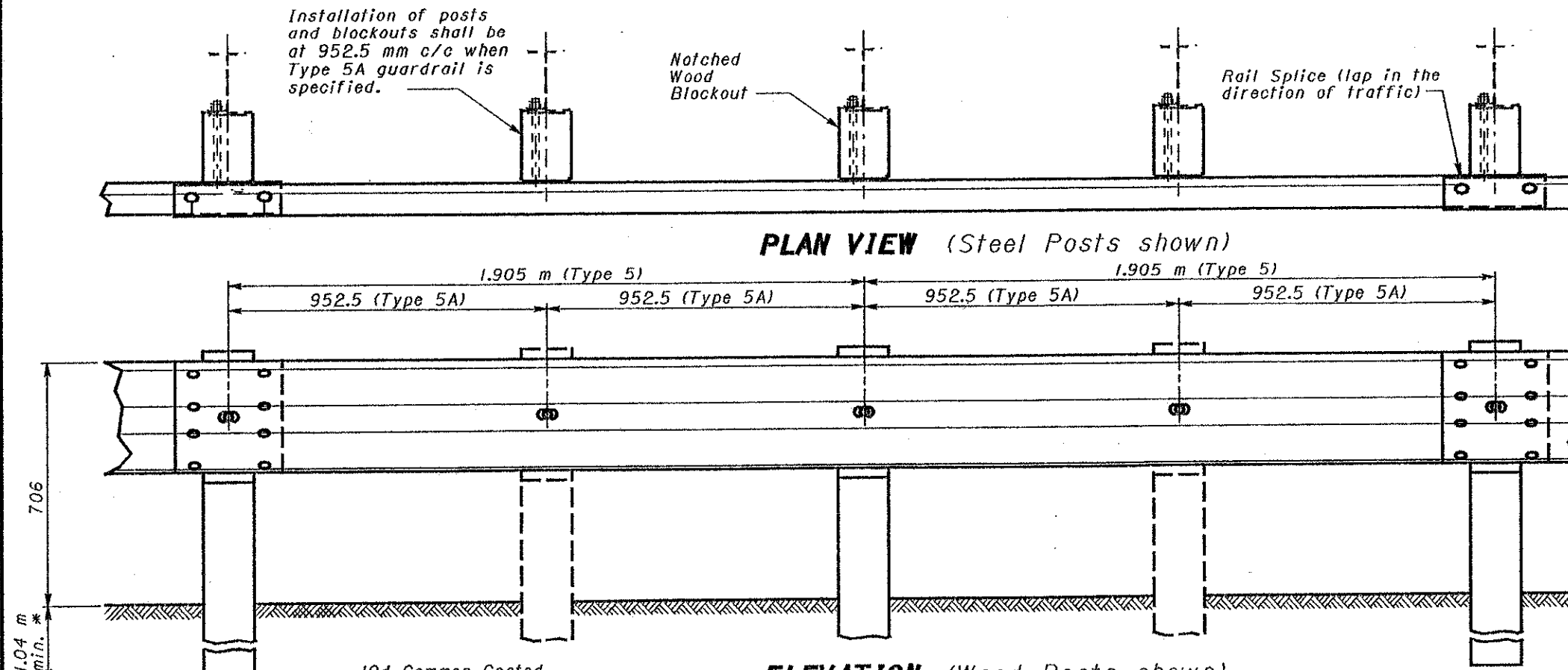
METHOD 2

Alternate methods of placing the blockouts on round posts may be submitted for consideration and approved by the Engineer.

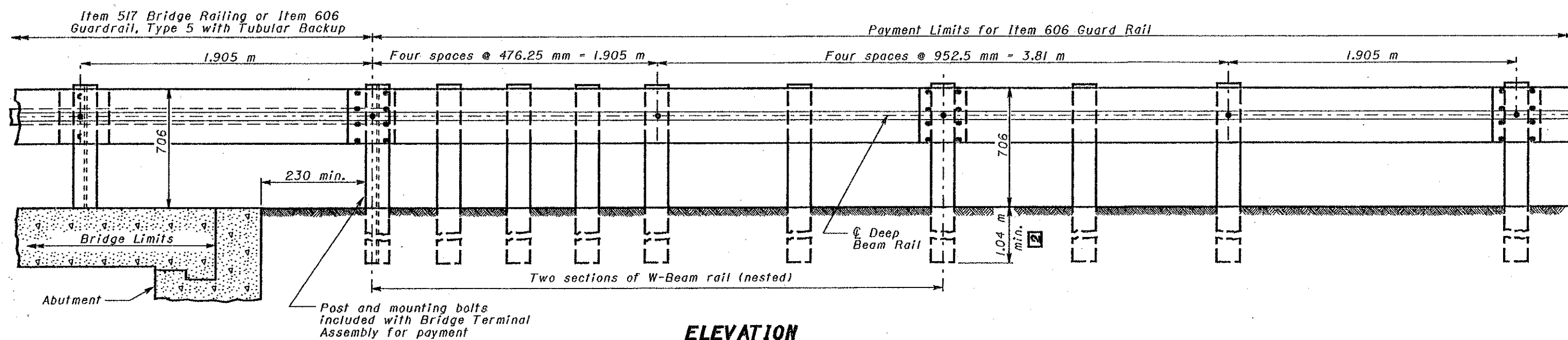
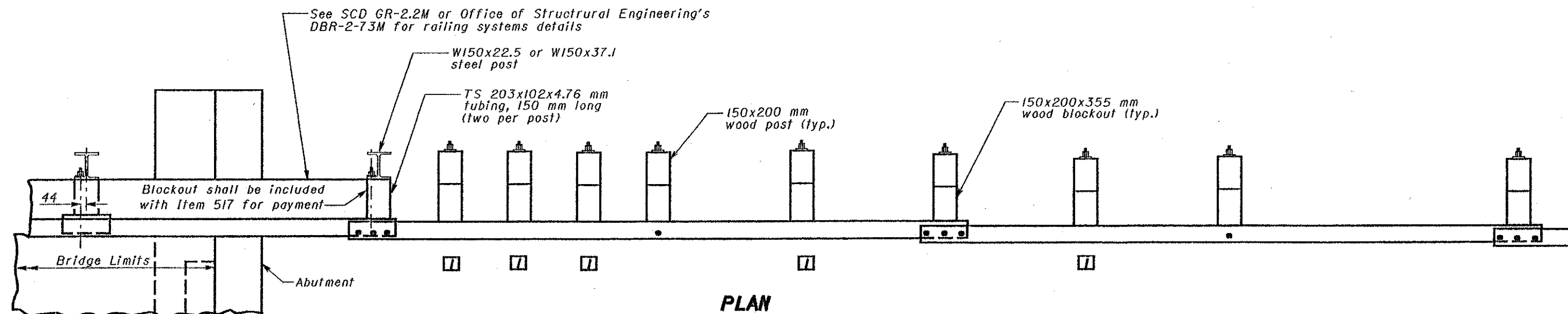
ROUND WOOD POSTS

PLAN VIEW (Steel Posts shown)

ELEVATION (Wood Posts shown)



**WOOD POSTS WITH WOOD BLOCK
RAISING EXISTING GUARDRAIL HEIGHT**



All dimensions are in millimeters unless otherwise noted.

1 Guardrail not attached to posts. Blockout fastened to post with standard post bolt.

2 See SCD GR-1.2M for additional post embedment details.

NOTES

GENERAL: For additional details, see SCD's GR-1.1M, GR-1.2M and other Drawings pertaining to the design of specific guardrail types.

APPLICATION: The Type 4 Bridge Terminal Assembly shall be used to connect guardrail runs to bridges having W-Beam railing with Tubular Backup.

DETAIL INFORMATION: The first post off the bridge shall be steel (W150x22.5 or W150x37.1). All holes in the off-structure end of the approach panel W-Beam rail section that spans the abutment shall be slotted 19x64 mm and the bolts shall be tightened as specified for expansion joints in Item 606.05.

POSTS: General - Posts may be set in drilled holes or driven to grade.

Wood Posts shall be square-sawn pressure treated wood, as per CMS 710.14, and fabricated with square ends. Bolt holes shall be bored and tops of posts trimmed, if required, after posts are set.

Steel Posts and Blockouts for Type 4 Bridge Terminal Assemblies may be furnished as an alternate. The steel alternate for the 150 mm by 200 mm wood posts and blockouts shall be W150x13.5.

PAYMENT: Payment for Item 606 - Each, Bridge Terminal Assembly, Type 4, shall include the extra cost, in excess of normal guardrail costs, for additional posts and other hardware. The TS 203x102 mm spacers and tubular backup rail extending to the first post off the bridge shall be included with Item 517 - Railing, or Item 606 - Guardrail, Type 5, with Tubular Backup, for payment.



This Drawing Replaces GR-3.4.

OHIO DEPARTMENT OF TRANSPORTATION

BRIDGE TERMINAL
ASSEMBLY, TYPE 4

DATE
1-3-96
10-21-97

STANDARD
CONSTRUCTION
DRAWING
GR-3.4M
APPROVED *[Signature]*

614 WORK ZONE
PAVEMENT MARKINGS

GENERAL

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND WHEN NECESSARY, REMOVE WORK ZONE RETROREFLECTIVE PAVEMENT MARKINGS ON EXISTING, RECONSTRUCTED, RESURFACED OR TEMPORARY ROADS WITHIN THE WORK LIMITS, IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE MARKINGS SHALL BE EVALUATED BY THE ENGINEER IN ACCORDANCE WITH THE THREE PERFORMANCE PARAMETERS CONTAINED IN SUPPLEMENT 1047. THE MARKINGS SHALL BE REPAIRED OR REPLACED WHEN THE NUMERICAL RATING OF A PARAMETER IS (a) SIX OR LOWER FOR DURABILITY, (b) FOUR OR LOWER FOR VISUAL EFFECTIVENESS AND (c) FOUR OR LOWER FOR NIGHT VISIBILITY. THE CONTRACTOR SHALL REPAIR OR REPLACE UNSATISFACTORY MARKINGS IMMEDIATELY AND AT NO ADDITIONAL COST TO THE STATE.

TEMPORARY PAVEMENT MARKING MATERIALS

UNLESS OTHERWISE INDICATED ON THE PLANS, TEMPORARY PAVEMENT MARKINGS MAY BE EITHER 64L02 PAINT OR 740.05 TYPE B OR TYPE C PREFORMED MATERIAL.

PAINT

PAINTED MARKINGS SHALL BE IN ACCORDANCE WITH 642 EXCEPT THAT (a) PARAGRAPH 64L18 SHALL NOT APPLY, (b) WHERE THE MARKINGS ARE NOT LIABLE TO BE TRACKED, EITHER CONVENTIONAL OR FAST DRY PAINT MAY BE USED FOR 64L02 AND (c) WHEN APPLIED TO NEW ASPHALT PAVEMENT SURFACES PLACED BY THIS PROJECT, THE SPECIFIED APPLICATION RATE SHALL BE AS FOLLOWS:

LITERS PER KILOMETER OF LINE	WIDTH OF LINE (MILLIMETERS)				
	100	200	300		
SOLID LINE	56.6	113.3	169.9	-	-
3.0 m DASHED LINE	14.2	-	-	-	-
1.2 m DASHED LINE	5.7	-	-	-	-
DOTTED LINE	19.0	-	-	-	-

(d) WHEN APPLIED TO PLANED ASPHALT PAVEMENT SURFACES, THE SPECIFIED APPLICATION RATE SHALL BE AS FOLLOWS:

LITERS PER KILOMETER OF LINE	WIDTH OF LINE (MILLIMETERS)				
	100	200	300		
SOLID LINE	67.9	135.9	203.8	-	-
3.0 m DASHED LINE	17.0	-	-	-	-
1.2 m DASHED LINE	6.8	-	-	-	-
DOTTED LINE	22.7	-	-	-	-

TYPE B AND TYPE C PREFORMED MATERIAL

PREFORMED MATERIAL SHALL COMPLY WITH 740.05 EXCEPT THAT NO PREFORMED MATERIAL CONTAINING METAL SHALL BE PLACED ON ANY SURFACE UNLESS IT WILL BE REMOVED LATER BY THE CONTRACTOR. TEMPORARY PAVEMENT MARKINGS OF 740.05 PREFORMED MATERIAL SHALL BE REMOVED PRIOR TO PLACEMENT OF 642 OR 644 SURFACE COURSE MARKINGS AT THAT LOCATION. PREFORMED MATERIAL SHALL BE IN ACCORDANCE WITH 644 EXCEPT AS MODIFIED HEREIN.

PLACEMENT

TEMPORARY MARKINGS SHALL BE COMPLETE AND IN PLACE ON ALL PAVEMENT, INCLUDING RAMPS, PRIOR TO EXPOSING IT TO TRAFFIC. WHEN TEMPORARY MARKINGS CONFLICT WITH THE TRAFFIC PATTERN, THEY SHALL BE REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH 64L10.

LINE PLACEMENT TOLERANCE FOR FINAL SURFACES SHALL BE IN ACCORDANCE WITH 64L07. ON SURFACES OTHER THAN THE FINAL, THE TOLERANCE PERMITTED SHALL BE TWICE THAT IN 64L07. LAYOUT AND PREMARKING SHALL BE IN ACCORDANCE WITH 64L06.

TEMPORARY MARKING CLASSES

CLASS I MARKINGS

CLASS I MARKINGS SHALL BE APPLIED TO THE STANDARD DIMENSIONS AS DEFINED IN 642 WITH THE FOLLOWING EXCEPTION:

1. TRANSVERSE LINES SHALL BE 200 mm IN WIDTH.
2. STOP LINES SHALL BE 300 mm IN WIDTH.
3. CROSSWALK LINES SHALL BE 200 mm IN WIDTH.

CLASS II MARKINGS

CLASS II MARKINGS (ABBREVIATED) SHALL BE DEFINED AS FOLLOWS:

CENTER LINES SHALL CONSIST OF SINGLE, YELLOW 100 mm WIDE BY A MINIMUM OF 1.2 m LONG DASHES SPACED AT A MAXIMUM OF 12.0 m INTERVALS.

LANE LINES SHALL CONSIST OF WHITE 100 mm WIDE BY A MINIMUM OF 1.2 m LONG DASHES SPACED AT A MAXIMUM OF 12.0 m INTERVALS.

GORE MARKINGS SHALL BE CONTINUOUS, WHITE 100 mm LINES PLACED AT THE THEORETICAL GORE OF AN EXIT RAMP OR DIVERGING ROADWAYS.

CONFLICTING EXISTING MARKINGS

THE CONTRACTOR SHALL, PRIOR TO PLACING TEMPORARY MARKINGS, REMOVE ALL CONFLICTING EXISTING MARKINGS VISIBLE TO THE TRAVELING PUBLIC DURING DAYLIGHT OR NIGHTTIME HOURS IN ACCORDANCE WITH 64L10. THE COST FOR REMOVAL OF CONFLICTING MARKINGS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC UNLESS SPECIFICALLY ITEMIZED.

THE CONTRACTOR SHALL ALSO REMOVE THE PRISMATIC RETRO-REFLECTOR WITHIN ANY RAISED PAVEMENT MARKER (RPM) WHICH IS IN CONFLICT WITH THE TEMPORARY PAVEMENT MARKINGS. WHEN THE TEMPORARY PAVEMENT MARKINGS ARE REMOVED AND THE RPM IS NO LONGER IN CONFLICT, THE CONTRACTOR SHALL THOROUGHLY CLEAN THE RECESSED REFLECTOR ATTACHMENT AREA OF THE CASTING AND INSTALL A NEW PRISMATIC RETRO-REFLECTOR OF THE SAME KIND AND COLOR. THE COST FOR THIS WORK SHALL BE INCIDENTAL TO THE VARIOUS PAY ITEMS.

ALLOWABLE DURATION OF CLASS II CENTER LINES

EXCEPT AS NOTED BELOW, ANYTIME EXISTING PERMANENT NO PASSING ZONE MARKINGS HAVE BEEN REMOVED OR OBLITERATED AS THE RESULT OF A CONSTRUCTION OPERATION (PAVEMENT GRINDING, ASPHALT PAVEMENT OVERLAYS, ETC.) AND THE SECTION OF PAVEMENT CONTINUES TO BE USED BY THE TRAVELING PUBLIC, THE CONTRACTOR MUST WITHIN 3 CALENDAR DAYS PLACE FINAL CENTER LINE MARKINGS AS SPECIFIED BY THE PLAN. EQUIVALENT 614 CLASS I CENTER LINE MARKINGS MAY BE USED IN LIEU OF FINAL MARKINGS. IN THIS EVENT, THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO PLACE AND MAINTAIN 614 CLASS I MARKINGS AS PART OF THE LUMP SUM BID FOR MAINTAINING TRAFFIC.

IF AFTER THE ORIGINAL MARKINGS ARE REMOVED OR OBLITERATED, THE CONTRACTOR RETURNS TO THE SUBJECT NO PASSING ZONE AND PLACES A PLAN SPECIFIED PAVEMENT COURSE WITHIN THE 3 CALENDAR DAY LIMIT, OR PERFORMS WORK IN PREPARATION FOR A SUBSEQUENT PAVEMENT COURSE, THE CONTRACTOR WILL HAVE TEMPORARILY SATISFIED THE CONDITIONS OF THE PREVIOUS PARAGRAPH. IN THIS EVENT THE 3 CALENDAR DAY LIMIT WILL BEGIN AGAIN.

SECTIONS OF PAVEMENT WHERE PASSING IS PERMITTED IN BOTH DIRECTIONS SHALL BE GOVERNED BY THE 21 DAY LIMIT DESCRIBED BELOW IN THE PARAGRAPH ENTITLED 'ALLOWABLE DURATION OF CLASS II LANE LINES, GORE MARKINGS AND ABSENCE OF EDGE LINES.'

FOR EACH CALENDAR DAY BEYOND 3 DAYS THAT THIS WORK SHALL REMAIN UNCOMPLETED, THE SUM OF \$200 PER CALENDAR DAY WILL BE DEDUCTED FROM ANY MONEY DUE THE CONTRACTOR, NOT AS A PENALTY BUT AS LIQUIDATED DAMAGES.

ALLOWABLE DURATION OF CLASS II LANE LINES
AND GORE MARKINGS AND ABSENCE OF EDGE LINES

ANYTIME EXISTING PERMANENT LANE LINES, GORE MARKINGS OR EDGE LINES HAVE BEEN REMOVED OR OBLITERATED AS THE RESULT OF A CONSTRUCTION OPERATION (PAVEMENT GRINDING, ASPHALT PAVEMENT OVERLAYS, PAVEMENT WIDENING, ETC.) AND THE SECTION OF PAVEMENT CONTINUES TO BE USED BY THE TRAVELING PUBLIC, THE CONTRACTOR MUST WITHIN 21 CALENDAR DAYS PLACE FINAL PAVEMENT MARKINGS AS SPECIFIED BY THE PLAN. EQUIVALENT 614 CLASS I MARKINGS MAY BE USED IN LIEU OF FINAL MARKINGS. IN THIS EVENT, THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO PLACE AND MAINTAIN 614 CLASS I MARKINGS AS PART OF THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC.

IF, AFTER THE ORIGINAL MARKINGS ARE REMOVED OR OBLITERATED, THE CONTRACTOR RETURNS TO THE SUBJECT SECTION OF PAVEMENT AND PLACES A PLAN SPECIFIED PAVEMENT COURSE WITHIN THE 21 CALENDAR DAY LIMIT, OR PERFORMS SPECIFIED WORK WHICH REQUIRES A LANE CLOSURE, EXCEPT ROUTINE MAINTENANCE REQUIRED BY 614.02, THE CONTRACTOR WILL HAVE TEMPORARILY SATISFIED THE CONDITIONS OF THE PREVIOUS PARAGRAPH. IN THIS EVENT, THE 21 CALENDAR DAY LIMIT WILL BEGIN AGAIN.

FOR EACH CALENDAR DAY BEYOND 21 DAYS THAT THIS WORK SHALL REMAIN UNCOMPLETED, THE SUM OF \$200 PER CALENDAR DAY WILL BE DEDUCTED FROM ANY MONEY DUE THE CONTRACTOR, NOT AS A PENALTY BUT AS LIQUIDATED DAMAGES.

IF A SECTION OF PAVEMENT IS IN A CONTINUOUS PART OF THE PROJECT THEN A NEW 21 DAY LIMIT FOR RENEWED WORK ON A SECTION SHALL APPLY TO ALL SECTIONS IN THAT PART. IF THE PROJECT IS IN PARTS AND THE TRAVELING PUBLIC WOULD NOT DISCERN THE PARTS AS ONE CONTINUOUS PROJECT, THEN A NEW 21 DAY LIMIT IN ONE PART WILL NOT APPLY TO THE OTHER PARTS. THE TWO DIRECTIONAL SIDES OF A FREEWAY SHALL BE TREATED AS SEPARATE PARTS. WORK ON ONE SIDE OF A FREEWAY SHALL NOT CREATE A NEW 21 DAY LIMIT FOR THE OTHER SIDE.

METHOD OF MEASUREMENT

TEMPORARY PAVEMENT MARKINGS WILL BE MEASURED COMPLETE IN PLACE, BY CLASS AND MATERIAL, IN THE UNITS DESIGNATED. LINE QUANTITIES WILL BE THE LENGTH OF THE COMPLETED STRIPE, INCLUDING GAPS, INTERSECTIONS, AND OTHER SECTIONS OF PAVEMENT NOT NORMALLY MARKED.

TEMPORARY PAVEMENT MARKINGS WILL INCLUDE THE LAYOUT, APPLICATION AND REMOVAL OF THE MARKINGS, WHEN REQUIRED.

BASIS OF PAYMENT

PAYMENT FOR ACCEPTED QUANTITIES COMPLETE IN PLACE WILL BE MADE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, INCIDENTALS AND EQUIPMENT FOR PLACEMENT, MAINTENANCE AND NECESSARY REMOVAL OF MARKINGS.

ITEM	UNIT	DESCRIPTION
614	KILOMETER	TEMPORARY LANE LINES, CLASS _____, ____.
614	KILOMETER	TEMPORARY CENTER LINES, CLASS _____, ____.
614	METER	TEMPORARY CHANNELIZING LINES, CLASS I, ____.
614	KILOMETER	TEMPORARY EDGE LINES, CLASS I, ____.
614	METER	TEMPORARY GORE MARKINGS, CLASS II, ____.
614	METER	TEMPORARY STOP LINES, CLASS I, ____.
614	METER	TEMPORARY CROSSWALK LINES, CLASS I, ____.
614	METER	TEMPORARY DOTTED LINES, CLASS I, ____.

* TYPE MATERIAL (642 PAINT, 740.05 TYPE B OR 740.05 TYPE C OR LEFT BLANK TO PERMIT ANY OF THE THREE)

614 WORK ZONE
MARKING SIGNS

GENERAL

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND SUBSEQUENTLY REMOVE WORK ZONE MARKING SIGNS (OW-167, R-33 AND R-34) AND THEIR SUPPORTS WITHIN THE WORK LIMITS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE CONTRACTOR SHALL, IN ADVANCE OF ANY SECTION OF ROADWAY LACKING OMUTCD STANDARD EDGE LINE MARKINGS, ERECT A 'NO EDGE LINES' (OW-167-36) SIGN. ON FREEWAYS AND EXPRESSWAYS AN OW-167-48 SIGN SHALL BE USED. THESE SIGNS SHALL BE IN PLACE PRIOR TO EXPOSING THE ROADWAY TO TRAFFIC. THESE SIGNS SHALL ALSO BE ERECTED ON EACH ENTRANCE RAMP, AT INTERSECTIONS OF THROUGH ROADS TO WARN ENTERING OR TURNING TRAFFIC OF THE CONDITIONS AND AT LEAST ONCE EVERY 3.2 km ALONG THE ROADWAY. THESE SIGNS SHALL BE REMOVED WHEN THEY DO NOT APPLY.

THE CONTRACTOR SHALL AT THE BEGINNING OF EACH NO-PASSING ZONE LACKING OMUTCD STANDARD CENTER LINE MARKINGS, ERECT A 'DO NOT PASS' (R-33-30) SIGN AND AT THE END OF EACH NO-PASSING ZONE, ERECT A 'PASS WITH CARE' (R-34-30) SIGN.

MATERIALS

THE CONTRACTOR MAY USE SIGNS AND SUPPORTS IN USED BUT GOOD CONDITION. SIGN FACES SHALL BE REFLECTORIZED WITH TYPE G SHEETING COMPLYING WITH THE REQUIREMENTS OF 730.19. WORK ZONE MARKING SIGNS SHALL BE PROVIDED WITH SUITABLE YIELDING SUPPORTS OF SUFFICIENT STRENGTH AND STABILITY.

METHOD OF MEASUREMENT

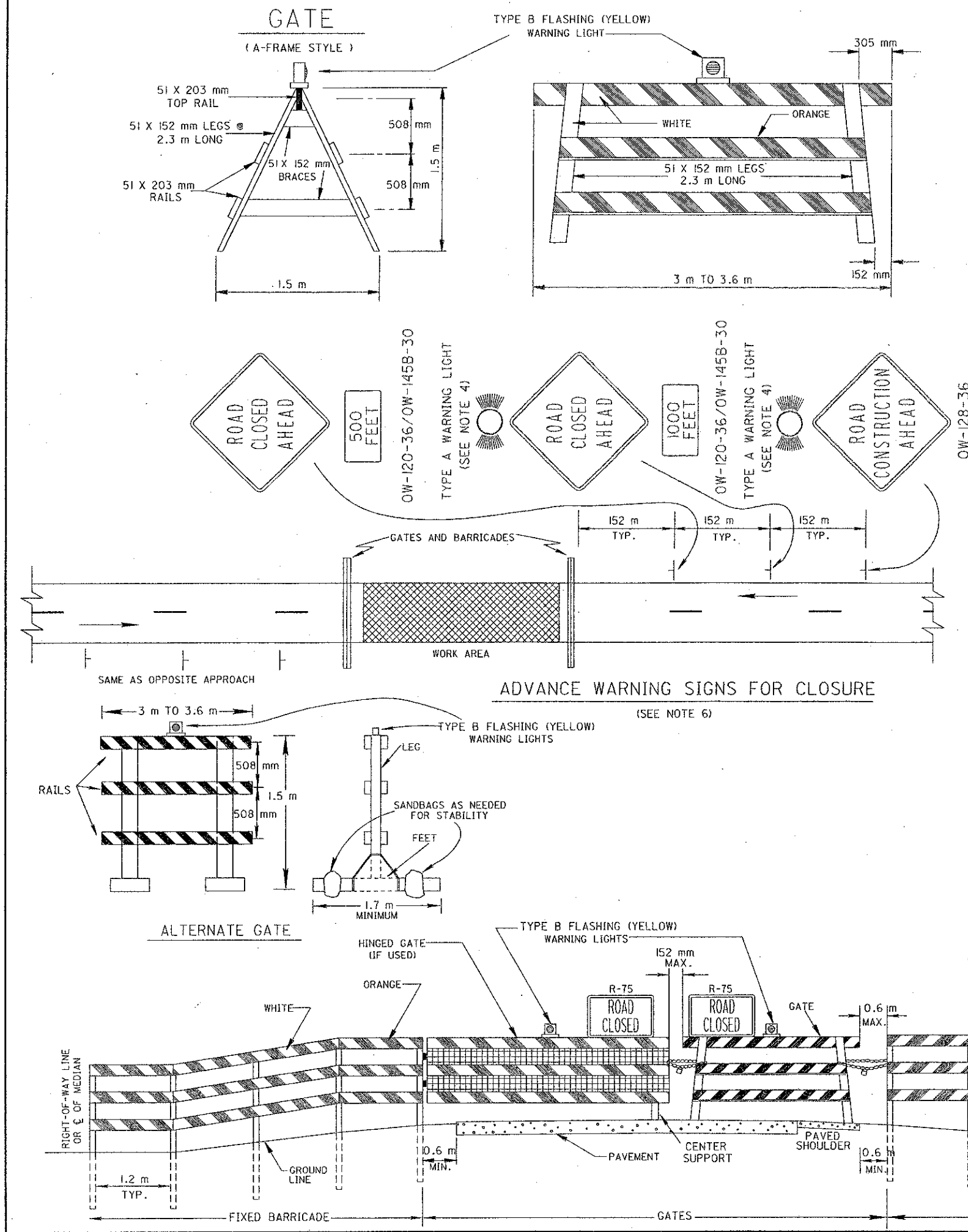
WORK ZONE MARKING SIGNS WILL BE MEASURED AS THE NUMBER OF SIGN INSTALLATIONS, INCLUDING THE SIGN, NECESSARY SUPPORTS AND ALL ATTACHMENT HARDWARE. ALL OTHER WORK ZONE SIGNS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC UNLESS SEPARATELY ITEMIZED.

BASIS OF PAYMENT

PAYMENT FOR ACCEPTED QUANTITIES, COMPLETE, IN PLACE WILL BE MADE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, INCIDENTALS AND EQUIPMENT FOR PLACEMENT, MAINTENANCE AND REMOVAL OF THE SIGNS.

ITEM	UNIT	DESCRIPTION
614	EACH	WORK ZONE MARKING SIGNS

METRIC	
BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 01/30/95
WORK ZONE PAVEMENT MARKINGS AND SIGNS	
STANDARD CONSTRUCTION DRAWING	MT-99.10M
APPROVED <i>[Signature]</i> ENGR. OF DESIGN SERVICES	



GENERAL NOTES

- BARRICADES:** BARRICADES SHALL BE CONSTRUCTED ACCORDING TO DETAILS SHOWN. WHEN THE ROAD IS CLOSED TO TRAFFIC, BARRICADES AND GATES SHALL BE USED TO EFFECTIVELY CLOSE THE ENTIRE ROADWAY INCLUDING THE MEDIAN OF DIVIDED HIGHWAYS. IN URBAN AREAS AND AT LOCATIONS WHERE IT IS IMPRACTICAL TO EXTEND THE BARRICADE TO THE RIGHT-OF-WAY LINE BECAUSE OF A SIDEWALK WHICH IS TO REMAIN OPEN OR OTHER OBSTRUCTION, THE ENDS OF THE BARRICADE SHALL BE LOCATED AS DIRECTED BY THE ENGINEER TO EFFECT THE DESIRED CLOSING OF THE HIGHWAY.
- PAINTING AND REFLECTORIZATION:** IN CONSTRUCTION OR MAINTENANCE AREAS ALL RAILS OF THE BARRICADES AND GATES SHALL BE REFLECTORIZED WITH ORANGE AND WHITE REFLECTORIZED TYPE G SHEETING IN 152 mm WIDE ALTERNATE STRIPES WHICH SLOPE DOWNWARD TOWARD THE CENTER LINE OF THE ROAD AT AN ANGLE OF 45°. THE TOP RAIL OF THE A-FRAME AND ALL THREE RAILS OF THE HINGED GATE SHALL BE STRIPED ON BOTH SIDES. ALL POST, BRACES, GATE LEGS, AND ANY UNSTRIPED RAILS SHALL BE PAINTED WHITE. (GATES AND BARRICADES USED IN PERMANENT OR SEMIPERMANENT APPLICATION SHALL DIFFER ONLY IN THAT THEY SHALL USE RED AND WHITE STRIPES).
- GATES:** ONE GATE SHALL BE ERECTED FOR EACH TRAFFIC LANE. GATES SHALL BE CHAINED AND PADLOCKED TO ONE ANOTHER AND TO ADJACENT POST OF THE BARRICADES. CHAINS SHALL BE 6.4 mm STOCK OR LARGER WITH WELDED LINKS. A HINGED GATE MAY BE USED AND SHALL BE SUPPORTED AT THE CENTER IN AN APPROVED MANNER.
- TYPE A FLASHING WARNING LIGHTS:** TYPE A FLASHING WARNING LIGHTS ARE REQUIRED ON THE OW-128 AND THE FIRST OW-120 SIGNS.
- TYPE B FLASHING WARNING LIGHTS:** EACH GATE SHALL BE EQUIPPED WITH A TYPE B FLASHING WARNING LIGHT, CONSPICUOUSLY VISIBLE AT ALL DISTANCES UP TO 305 m UNDER NORMAL ATMOSPHERIC CONDITIONS. THE LIGHT SHALL BE IN OPERATION AT ALL TIMES DURING THE PERIOD THE HIGHWAY IS CLOSED.
- SIGNS:** WHERE THE ROAD IS CLOSED TO TRAFFIC BY THE ERECTION OF GATES AND BARRICADES, R-75 SIGNS SHALL BE MOUNTED ON THE GATES AS SHOWN. THE ADVANCE WARNING SIGNS SHOWN ON THIS DRAWING WILL NOT BE REQUIRED WHEN ALL TRAFFIC HAS BEEN DIRECTED FROM THE ROADWAY AT OR JUST IN ADVANCE OF THE GATES AND BARRICADES SUCH AS ON A LIMITED ACCESS HIGHWAY OR WHEN A TEMPORARY RUNAROUND SIMILAR TO FIGURE C-24 OF THE OHIO MANUAL IS USED. ADVANCE WARNING SIGNS SHALL BE REQUIRED IN ALL OTHER SITUATIONS AND WHEN REQUIRED IN THE PLANS. ADVANCE WARNING SIGNS ON AN APPROACH SHALL CONSIST OF TWO OW-120 SIGNS WITH DISTANCE PLAQUES PLACED ABOUT 152 m AND 305 m FROM THE CLOSURE AND A OW-128 PLACED ABOUT 457 m FROM CLOSURE, THE SIGNS SHALL BE PLACED ON BOTH SIDES OF THE ROAD (DUALLED) FOR 4-LANE DIVIDED HIGHWAYS OR WHEN REQUIRED BY THE PLANS.

OPERATION: ON A 2-LANE 2-WAY ROADWAY THE CONTRACTOR WILL NORMALLY OPEN ONLY THE LEFT HAND GATE AS NECESSARY TO ALLOW VEHICLES TO ENTER AND IMMEDIATELY CLOSE IT. BOTH GATES WILL NOT NORMALLY BE OPENED AT THE SAME TIME. THE CONTRACTOR SHALL ASSIGN AN EMPLOYEE TO ASSURE THAT GATES ARE CLOSED AND CHAINED SHUT AT THE END OF EACH WORKDAY.

MATERIALS: GATES OR BARRICADES SHALL BE FABRICATED OF THE FOLLOWING MATERIALS:

- FIXED BARRICADE:**
- POST: - 102 X 102 mm SQUARE OR 127 mm DIA. (MAXIMUM) WOOD (MAY BE TREATED)
 - NO. 3, DRIVE POST (712.20)
 - UP TO 51 mm SQUARE, 14 GAUGE PUNCHED STEEL TUBING
 - RAILS: - 25 X 203 mm OR 51 X 203 mm COMMON LUMBER
 - 203 X (16 TO 25 mm) THICK EXTERIOR PLYWOOD
 - EXTRUDED PLASTIC OR FORMED SHEET METAL WITH A 203 mm WIDE SURFACE AND OF SUFFICIENT STIFFNESS TO RESIST TYPICAL WIND LOADS OF UP TO 1436 pascals, BUT HAVING A WEIGHT OF NOT MORE THAN 7.5 kg/m.

- FASTENERS:** - SPIKES (OF SUFFICIENT LENGTH TO CLINCH)
 - SCREWS/BOLTS (8 mm MIN. DIA.) METAL GUSSET PLATES AND FORMED OR WELDED METAL JOINTS OF SUFFICIENT SIZE AND QUANTITY TO RESIST THE WIND LOAD SPECIFIED ABOVE. ALL SLIPFIT CONNECTIONS SHALL ALSO BE BOLTED TO PREVENT UNAUTHORIZED DISASSEMBLY

- GATES:**
- LEGS: - 51 X 152 mm COMMON LUMBER ("A FRAME" ONLY)
 - 102 X 102 mm WOOD
 - UP TO 51 mm SQUARE, 14 GAUGE PUNCHED STEEL TUBING
 - NO. 3 DRIVE POST (712.20)
 - RAILS: - 51 X 203 mm COMMON LUMBER
 - FASTENERS: (SAME AS BARRICADES ABOVE)
 - FEET: - 152 X 152 mm WOOD
 - NO. 3 DRIVE POST (712.20)
 - UP TO 57 mm SQUARE, 12 GAUGE PUNCHED STEEL TUBING
 - BRACES: - 51 X 152 mm (MAXIMUM) COMMON LUMBER
 - 102 mm WIDE X 19 mm THICK PLYWOOD STRIPS
 - NO. 2 DRIVE POST (712.20)
 - HINGED GATE:
 - GATE: - 3.6 m X 1.2 m STEEL FRAME, FARM GATE
 - RAILS: (SAME AS FIXED BARRICADES ABOVE)
 - HARDWARE: - HINGED SCREWHOOKS FOR HANGING GATE TO POST

LUMBER: LUMBER USED IN THE CONSTRUCTION OF GATES AND BARRICADES SHALL BE COMMON YELLOW PINE OR COMMON DOUGLAS FIR, SURFACED ON FOUR SIDES STANDARD, ALL SIZES ARE NOMINAL.

METRIC

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 04/25/94
GATES AND BARRICADES IN POSITION	
STANDARD CONSTRUCTION DRAWING	MT-101.60M
APPROVED <i>[Signature]</i> ENGR. OF DESIGN SERVICES	

TEMPORARY SIGN SUPPORT REQUIREMENTS

A. PLACEMENT OF SIGNS WHICH WILL REMAIN MORE THAN ONE DAY:

- LATERAL PLACEMENT TO NEAREST EDGE OF SIGNS SHALL BE AS FOLLOWS:
 - ON THE RIGHT SIDE OF THE ROAD FOR APPROACHING TRAFFIC (EXCEPT FOR DUAL MOUNTED SIGNS AND SIGNS DESIGNATED IN THE PLANS FOR LEFT SIDE MOUNTING).
 - CURBED ROADWAY - MINIMUM 0.6 m BEHIND FACE OF CURB.
 - UNCURBED ROADWAY- 3.7 m FROM EDGE OF TRAFFIC LANE OR 1.8 m FROM EDGE OF PAVED OR USEABLE SHOULDER, WHICHEVER IS GREATER.
 - BEHIND GUARDRAIL OR BARRIER - PREFERABLY 0.6 m BEHIND FACE OF GUARDRAIL (MINIMUM 0.3 m) FOR SIGNS ON CLASS A SUPPORTS; 1.2 m FOR CLASS B OR C SUPPORTS; 0.3 m BEHIND FACE OF CONCRETE BARRIER UNLESS BARRIER TOP MOUNTING IS REQUIRED BY THE PLAN.
- VERTICAL CLEARANCE OF SIGNS, MEASURED ABOVE ROADWAY ELEVATION; SHALL BE AS FOLLOWS:
 - RURAL - 1.5 m WHEN PARKED CARS, CONSTRUCTION EQUIPMENT, ETC WILL NOT OBSCURE SIGN VISIBILITY.
 - RURAL AREAS WITH PARKED CARS OR CONSTRUCTION EQUIPMENT - 2.1 m
 - URBAN - 2.1 m
 - CARE SHALL BE TAKEN TO ASSURE THAT SIGNS WILL NOT BE OBSCURED BY CONSTRUCTION EQUIPMENT, TREES, WEEDS OR OTHER OBSTACLES. BRUSH, WEEDS OR GRASS WITHIN THE RIGHT OF WAY SHALL BE TRIMMED AS NECESSARY. SIGNS SHALL NORMALLY BE VISIBLE TO TRAFFIC 122 m TO 183 m IN ADVANCE OF THE SIGN.
- SUPPORTS FOR SIGNS WHICH WILL REMAIN IN PLACE MORE THAN ONE DAY SHALL BE FIXED RATHER THAN PORTABLE EXCEPT IN SITUATIONS WHERE THE SIGN MUST REST ON PERMANENT PAVEMENT OR OTHER SURFACE WHICH WOULD BE DAMAGED BY INSERTION OF POST TYPE SUPPORTS.

B. PLACEMENT OF SIGNS WHICH WILL REMAIN FOR ONE DAY OR LESS:

- SAME AS A-1 ABOVE EXCEPT THAT SIGNS MAY BE PLACED ON THE ROADWAY ONLY IF THEY DO NOT INTRUDE INTO A TRAFFIC LANE IN USE.
- MINIMUM OF 0.3 m ABOVE ROADWAY

C. CLASSES OF SUPPORTS:

ALL TEMPORARY SIGN SUPPORTS SHALL BE OF THE FOLLOWING TYPES:

1) CLASS A:

SUPPORTS SHALL BE USED FOR EXPOSED LOCATIONS ON HIGHWAYS WHERE TRAFFIC APPROACH SPEEDS OF 40 MPH AND HIGHER ARE ENCOUNTERED. THEY ARE ALSO SUITABLE FOR USE IN ALL OTHER LOCATIONS.

2) CLASS B:

SUPPORTS SHALL BE USED FOR EXPOSED LOCATIONS ON HIGHWAYS WHERE TRAFFIC APPROACH SPEEDS OF LESS THAN 40 MPH ARE ENCOUNTERED. THEY ARE ALSO SUITABLE FOR USE IN ALL APPLICATIONS DEFINED FOR CLASS C SUPPORTS.

3) CLASS C:

SUPPORTS MAY ONLY BE USED WHERE FULLY PROTECTED BY GUARDRAIL, CONCRETE BARRIER AND IN LOCATIONS POSITIVELY PROTECTED FROM TRAFFIC SUCH AS ON RETAINING WALLS OR WHERE TRAFFIC APPROACH SPEEDS ARE LESS THAN 25 MPH.

D. TRAFFIC APPROACH SPEEDS:

TRAFFIC APPROACH SPEEDS SHALL BE THE LOCALLY POSTED SPEED (NOT ADVISORY SPEED SIGNS) OR THE MEASURED ACTUAL (85TH PERCENTILE) SPEED (IF AVAILABLE) OF APPROACHING TRAFFIC, WHICHEVER IS HIGHER, ADJACENT TO THE SIGN LOCATION.

TABLE

APPROACH SPEED (MPH)	COMPLETELY PROTECTED BY GUARDRAIL OR BARRIER	PARTLY PROTECTED BY GUARDRAIL OR BARRIER *	GREATER THAN 9 m FROM EDGE OF PAVEMENT	WITHIN 9 m FROM EDGE OF PAVEMENT
40 AND HIGHER	A, B OR C	A OR B	A OR B **	A ONLY
26 TO 39	A, B OR C	A OR B	A OR B	A OR B
0 TO 25	A, B OR C	A, B OR C	A, B OR C	A, B OR C

* IF SUPPORTS ARE BEHIND GUARDRAIL BUT NOT FULLY 1.7 m BEHIND FACE OF RAIL OR IF SIGN IS NOT 0.3 m BEHIND FACE OF CONCRETE BARRIER.

** 9 m CRITERION IS BASED UPON STRAIGHT ROADWAY AND A SLOPE OF 6 to 1 OR FLATTER. SUPPORTS ON THE OUTSIDE OF CURVES OR LOCATED DOWN A SLOPE (STEEPER THAN 6 : 1) WILL REQUIRE USE OF CLASS A SUPPORTS.

E. BALLASTING

BALLASTING OF PORTABLE SUPPORTS SHALL BE WITH SANDBAGS PLACED WITHIN 0.3 m OF THE GROUND. IN NO CASE SHALL HARD OBJECTS BE USED FOR BALLAST.

F. STRENGTH OF SIGN SUPPORTS

THE CONTRACTOR SHALL CHOOSE SIGN SUPPORTS OF ADEQUATE STRENGTH AND WITH ADEQUATE FOUNDATIONS AND ANCHORAGE TO SUPPORT THE SIGN SIZES ERECTED. PROPRIETARY DEVICES SHALL NOT BE LOADED BEYOND THE LIMITS RECOMMENDED BY THE MANUFACTURER. SLIP BASE TYPE BREAKAWAY BEAM CONNECTIONS SHALL BE AT LEAST PARTIALLY EMBEDDED IN CONCRETE CONSISTING OF A 0.3 m DEEP BY 0.3 m DIAMETER COLLAR. SIGN SUPPORTS WHICH FAIL UNDER TYPICAL WIND LOAD CONDITIONS SHALL BE IMMEDIATELY MODIFIED OR REPLACED WITH A SUPPORT OF ADEQUATE STRENGTH.

G. PROHIBITED SUPPORTS

THE FOLLOWING SUPPORT TYPES SHALL NOT BE PERMITTED ON PROJECTS:

- SUPPORTS FABRICATED FROM AUTOMOTIVE AXLE DIFFERENTIAL ASSEMBLIES AND SIMILARLY HEAVY ASSEMBLIES WHICH CANNOT BE CONSIDERED BREAKAWAY TYPE.
- SUPPORTS CONSISTING OF VERTICAL POSTS WITH ANGLED BRACES MADE FROM DRIVEPOST OR OTHER RIGID ELEMENTS.

CLASS A SUPPORTS

FIXED SUPPORTS

- ALL #2 AND #3 POST WHEN INSTALLED SINGLY OR IN PAIRS (SIDE BY SIDE) ACCORDING TO THE DETAILS OF TC-41.20M. THE NUMBER OF SUPPORTS SHALL BE AS SHOWN ON TC-52.10M AND TC-52.20M.
- THE FOLLOWING POST TYPES, WHEN INSTALLED SINGLY, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 1.1 m.
 - UP TO 102 X 102 mm WOOD.
 - UP TO 51 mm DIAMETER SCHEDULE 40 STEEL PIPE.
 - UP TO 76 mm DIAMETER SCHEDULE 40 ALUMINUM PIPE.
 - UP TO 56.4 mm SQUARE, 12 GAUGE WALL, PUNCHED STEEL POST.
 - UP TO 152 X 203 mm WOOD WITH BREAKAWAY HOLES SHOWN BELOW.
- THE FOLLOWING POST TYPES WHEN INSTALLED IN PAIRS (SIDE BY SIDE) WITH LESS THAN 2 m BETWEEN POSTS, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 1.1 m:
 - UP TO 102 X 102 mm WOOD.
 - UP TO 51 mm DIAMETER SCHEDULE 40 STEEL PIPE.
 - UP TO 76 mm DIAMETER SCHEDULE 40 ALUMINUM PIPE.
 - UP TO 51 mm SQUARE, 14 GAUGE WALL, PUNCHED STEEL POST.
- FIXED TYPE III BARRICADES:
- ALL BREAKAWAY CONNECTION BEAM SUPPORTS, WHEN INSTALLED ACCORDING TO THE PROPER DETAILS SHOWN ON TC-41.10M WITH A MINIMUM CLEAR DISTANCE BETWEEN SUPPORTS OF 2.1 m FOR SUPPORTS LARGER THAN W6 X 9.
- ANY BREAKAWAY POST OR POST AND CONNECTION WHICH HAS BEEN CRASH TESTED AND APPROVED BY THE FHWA AS SATISFYING THE BREAKAWAY CRITERIA DESCRIBED IN 630.06.

(CONTINUED ON MT-105.11M)

M E T R I C

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

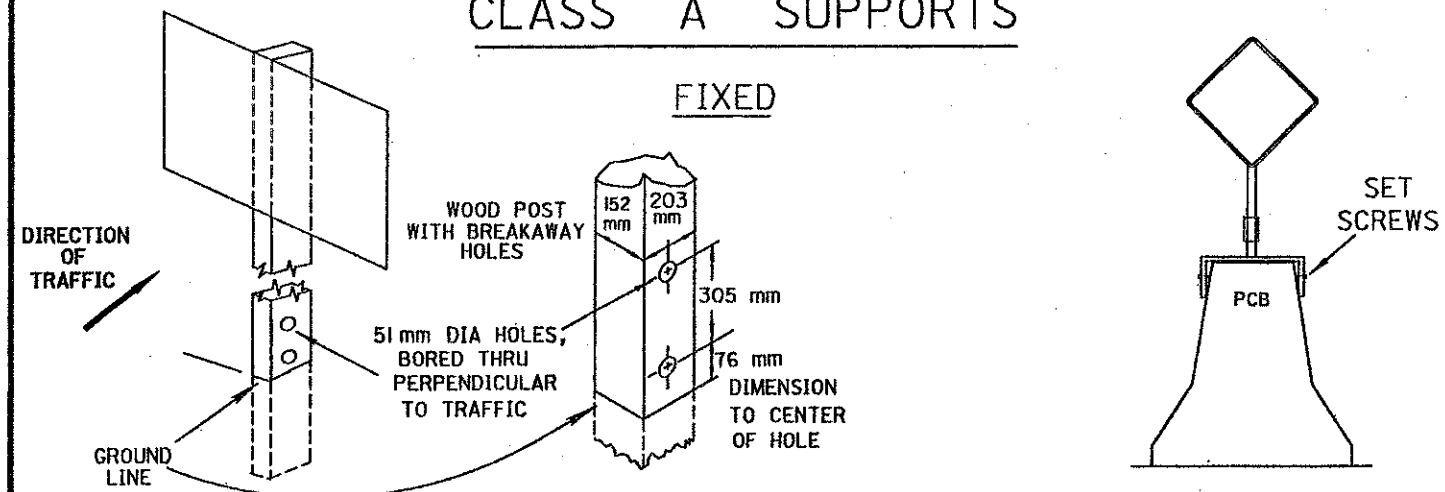
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TEMPORARY SIGN SUPPORT

STANDARD
CONSTRUCTION
DRAWING
APPROVED *[Signature]* ENGR. OF DESIGN SERVICES

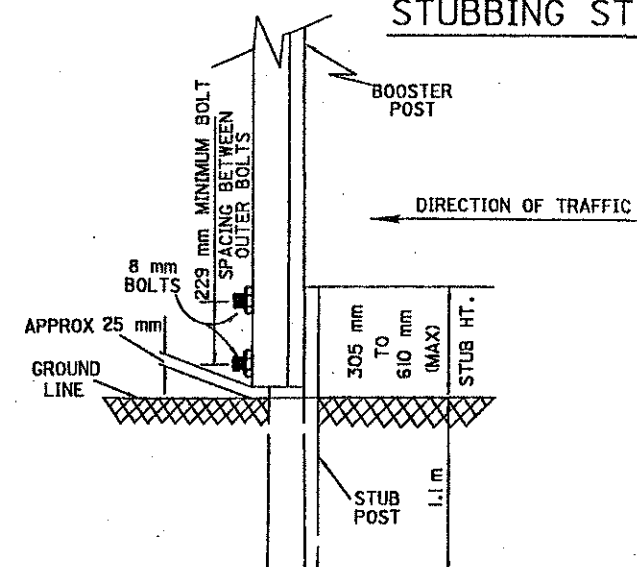
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CLASS A SUPPORTS



CLASS A SUPPORTS

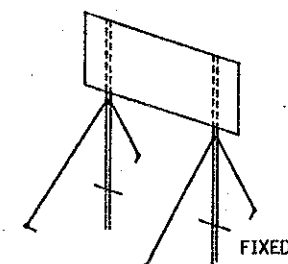
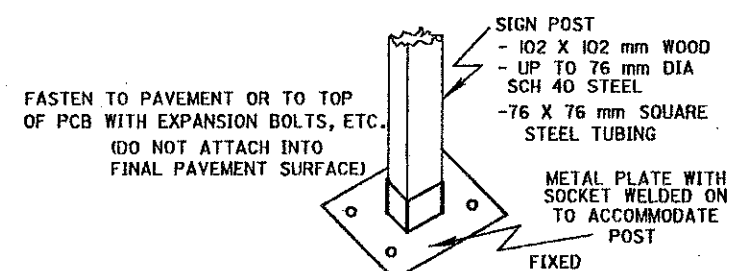
STUBBING STANDARD



NOTES

1. FOR USE WITH #3 POST OR SMALLER ONLY
2. BOLTS SHALL BE STEEL OR ALUMINUM
3. A MINIMUM OF TWO FASTENERS SHALL BE USED PER ASSEMBLY
4. BOOSTER POST SHALL BE MOUNTED BEHIND STUB POST
5. BOOSTER POST SHALL BE THE SAME OR 1.5 kg/m LESS THAN STUB POST

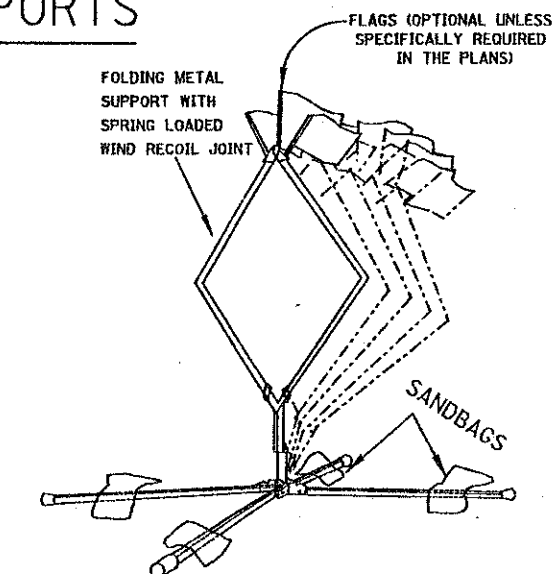
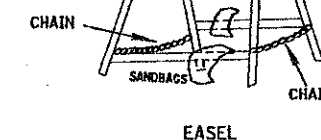
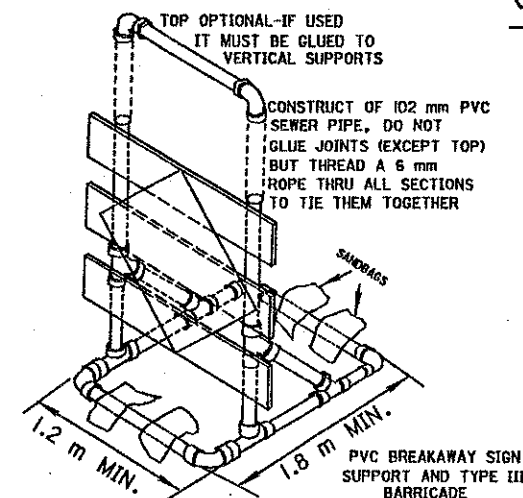
CLASS B SUPPORTS



ANY CLASS A SIGN POST WITH GUY WIRES ADDED TO INCREASE SIGN CARRYING ABILITY. (GUY WIRES SHALL NOT BE HEAVIER THAN 3.2 mm DIA. BRAIDED CABLE. GUY ANCHORS SHALL NOT EXTEND MORE THAN 152 mm ABOVE GROUND SURFACE).

CLASS A SUPPORTS

PORTABLE

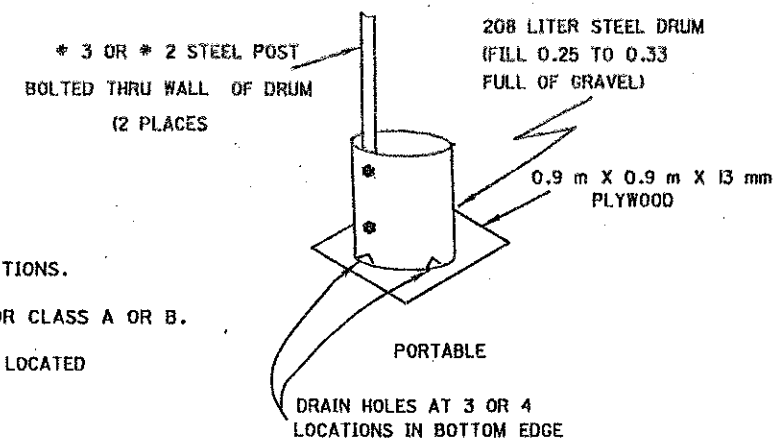


NOTES

RAIL MATERIALS:

25 X 203 mm OR 51 X 203 mm COMMON LUMBER
203 mm X (16 mm TO 25 mm) THICK EXTERIOR PLYWOOD
EXTRUDED PLASTIC OR FORMED SHEET METAL WITH A 203 mm WIDE SURFACE AND OF SUFFICIENT STIFFNESS TO RESIST TYPICAL WIND LOADS OF UP TO 147 kg/m², BUT HAVING A WEIGHT OF NOT MORE THAN 7.5 kg/m.

CLASS C SUPPORTS



1. ALL BEAM TYPE SUPPORTS WITHOUT BREAKAWAY CONNECTIONS.
2. SUPPORTS SIMILAR TO BUT LARGER THAN PERMITTED FOR CLASS A OR B.
3. THE STEEL DRUM(S) SHOWN BELOW MAY BE USED ONLY WHEN LOCATED BEHIND GUARDRAIL OR BARRIER.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF THE OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

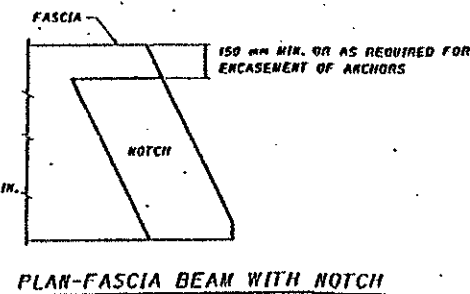
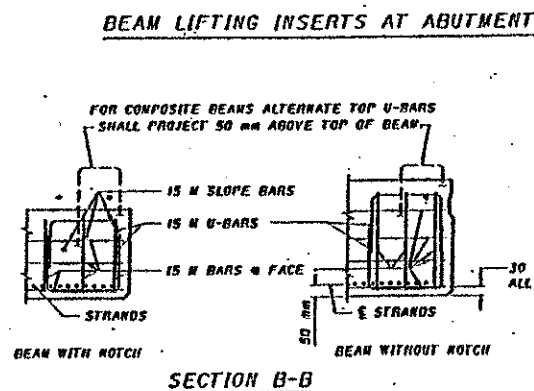
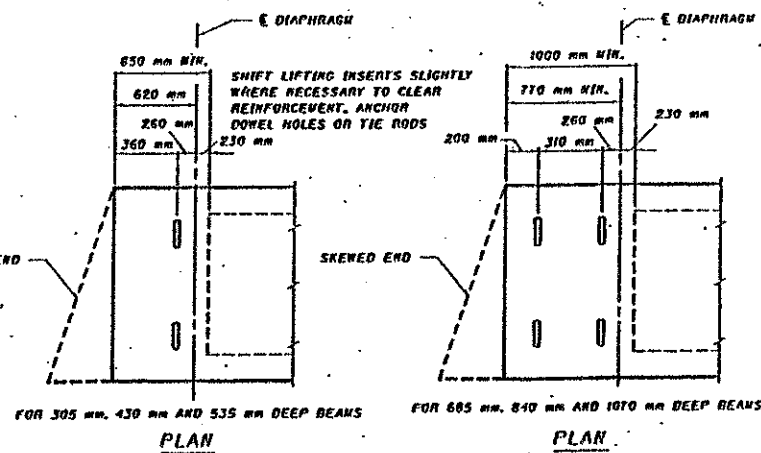
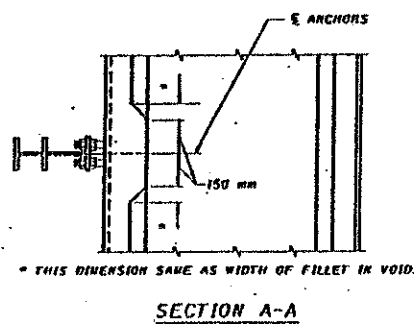
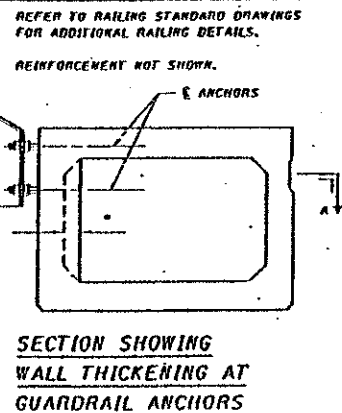
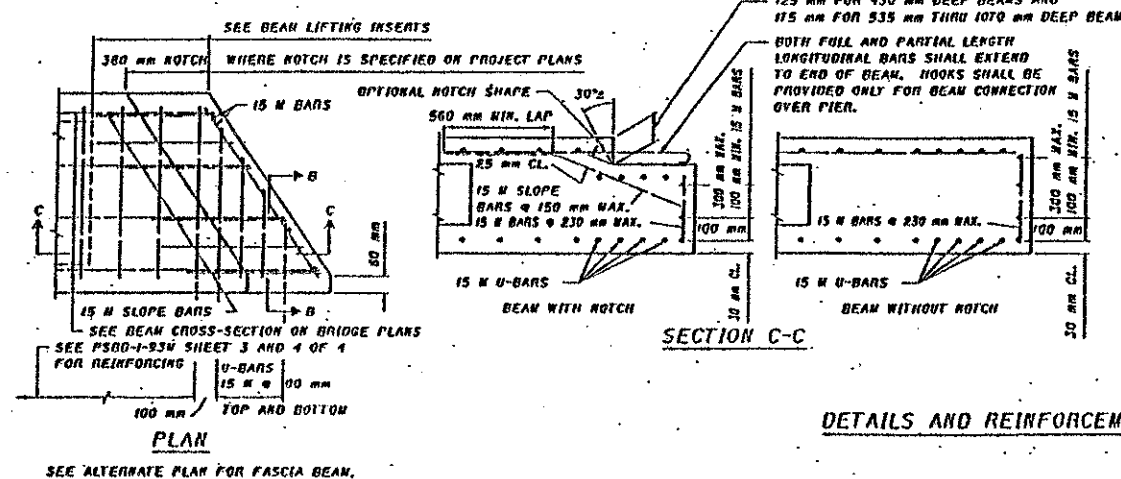
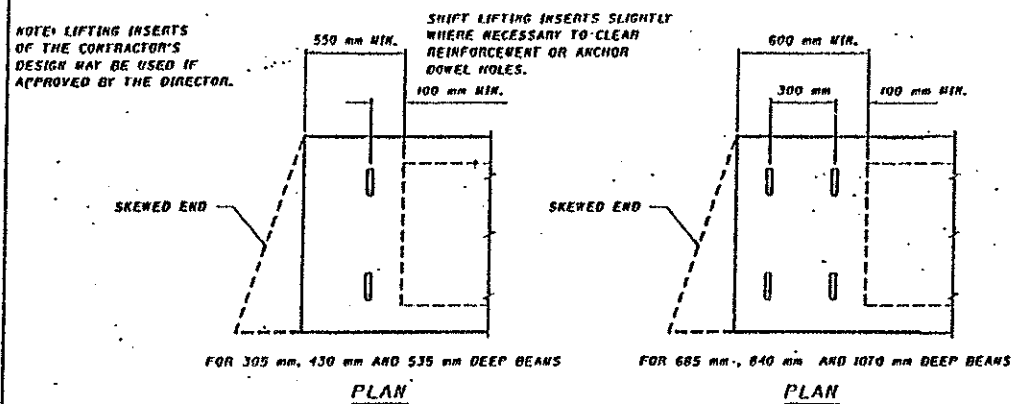
DATE
04/25/94

TEMPORARY SIGN SUPPORT

STANDARD
CONSTRUCTION
DRAWING
APPROVED *David L. Cragg* ENGR. OF DESIGN SERVICES

MT-105.IIM

METRIC



NOTES:
TRANSVERSE TIE RODS SHALL BE 25 mm DIAMETER STEEL RODS OF GRADE A518 GRAIN STEEL, THREADED BOTH ENDS, AND WITH WUT BAR AT EACH END. THREADS MAY BE HOT OR ROLLED. IF ROLLED THREADS ARE USED, MINIMUM DIAMETER ROD AND ROOT OF THREADS SHALL BE 21 mm. TENSION SHALL BE APPLIED BY A TORQUE OF APPROXIMATELY 340 N-M AT THE TIE RODS ARE TIGHTENED THE RECESSES IN THE FASCIA BEAMS SHALL BE FILLED WITH NON-SHRINKING MORTAR OF SAME GRADE AS CONCRETE. TIE RODS OF TRANSVERSE TIE ROD WILL BE PERMITTED TO TIE A MAXIMUM OF THREE BEAMS TOGETHER.

PRESTRESSING STRANDS: SHALL BE ASTM A16 GRADE 270, 12.7 mm DIAMETER SEVEN-WIRE, UNCOATED, LOW-RELAXATION STRANDS

GALVANIZING: ALL ANCHOR BOLTS, STUDS, INSERTS, TIE RODS, NUTS AND WASHERS SHALL BE GALVANIZED PER 711.02.

ANCHOR DOWELS: THE BEAM ENDS TO BE ANCHORED SHALL BE INDICATED ON THE PROJECT PLANS. ANCHOR DOWEL HOLES AND PRESTRESSING STRANDS SHALL BE LOCATED TO AVOID MUTUAL INTERFERENCE. THE LATERAL SPACING OF THE HOLES IN THE BEAM SHALL BE SUCH THAT THE ANCHOR DOWELS CLEAR THE ELASTOMERIC BEARING, AND ARE AS CLOSE TO THE $\frac{1}{2}$ OF BEAM AS POSSIBLE.

AFTER TENSIONING OF THE TRANSVERSE TIE RODS THE DOWEL HOLES SHALL BE DRILLED INTO THE ABUTMENT OR PIER SEAT AND DOWELS INSTALLED.

ELASTOMERIC BEARINGS: FOUR ELASTOMERIC BEARINGS ARE REQUIRED PER BEAM, POSITIONED AS SHOWN ON SHEET 4 OF 4.

PREFORMED BEARING PADS ON SKEWED BRIDGES. PREFORMED BEARING PADS PER TILZL, 3 MM THICK AND OF THE SAME PLAN DIMENSIONS AS THE ELASTOMERIC BEARING PADS SHOULD BE PROVIDED AS SHIMS.

NOTCHES SHALL BE PROVIDED IN BEAM ENDS WHERE SHOWN ON THE PROJECT PLANS TO ELIMINATE AN OPEN JOINT OVER PIERS (SEE SHEET 4 OF 4) OR TO ACCOMMODATE ANCHORAGE FOR END DAMS OR EXPANSION JOINTS.

ENDS OF BEAMS, AGAINST WHICH CONCRETE IS NOT TO BE PLACED, SHALL BE PROTECTED BY TYPE B WATER PROOFING AS PER S12.06 AND APPLIED IN THE FIELD.

SEALING OF CONCRETE SURFACES WITH EPOXY SHALL BE PROVIDED FOR THE FASCIA AND THE BOTTOM OF THE EXTERIOR BEAMS.

Drip Grooves: ON THE UNDERSIDE OF THE FASCIA BEAM SHALL NOT BE PERMITTED.

PREPARATION OF CONCRETE SURFACES IN CONTACT WITH MORTAR:
THE KEYWAY SURFACES SHALL BE GIVEN A MEDIUM SANDBLAST AT THE PLANT WITHIN FOUR DAYS BEFORE THE BEAMS LEAVE THE PLANT. BEFORE MORTARING, THE KEYWAYS SHALL BE THOROUGHLY CLEANED OF ALL DIRT, DUST AND OTHER FOREIGN MATTER BY MEANS OF HIGH PRESSURE WASHING OF AT LEAST 7 MPa AND A DELIVERY RATE OF NOT LESS THAN 16 L/MIN.

WORTAR: WORTAR OR GROUT FOR KEYWAYS BETWEEN PRESTRESSED CONCRETE BOX BEAMS, FOR THE ROD NECESSITIES AND FOR ANCHOR DOWEL HOLES SHALL BE A NON-SHRINKING WORTAR. THE WORTAR SELECTED AS DEFINED IN THE BELOW ALTERNATIVES SHALL BE PREPARED, PLACED AND CURED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

WORTAR SHALL BE TEST CYLINDERS OF 131.75" MM DIAMETER BY 130 MM HIGH BE TAKEN DURING THE ACTUAL GROUTING OPERATION AND SUBMITTED TO THE TESTING LABORATORY FOR COMPRESSION TESTING OF MINIMUM STRENGTH OF GROUT.

ALTERNATE 1
IF EITHER CONSTRUCTION OR NORMAL VEHICLE TRAFFIC WILL NOT
BE ON THE BOX BEAMS WITHIN 7 DAYS OF PLACEMENT OF THE MORTAR
OR GROUT, THE MORTAR MATERIAL SHALL CONFORM WITH CORPS OF
ENGINEER'S SPECIFICATION CRD-C621-89A OR SHEAR KEY MORTAR
AS PER PROPOSAL NOTE. MINIMUM STRENGTH OF THE MORTAR
SHALL BE 35 MPa BEFORE ANY TRAFFIC IS ALLOWED ON THE STRUCTURE.

ALTERNATE 2.
IF PART-WIDTH CONSTRUCTION IS BEING USED, OR ANY CONSTRUCTION
OR NORMAL VEHICLE TRAFFIC WILL BE ON THE BOX BEAMS WITHIN 7
DAYS OF PLACEMENT OF THE MORTAR OR GROUT, THE MORTAR MATERIAL
SHALL BE SHEAR KEY MORTAR AS PER PROPOSAL NOTE. MINIMUM
STRENGTH OF THE MORTAR SHALL BE 35 MPa BEFORE ANY TRAFFIC
IS ALLOWED ON THE STRUCTURE.

WORTARING OF SHEAR KEYS: AFTER THE TRANSVERSE TIE ROOS HAVE BEEN PLACED, SHEAR KEYS SHALL BE FILLED WITH NON-SHRINKING WORTAR. BEFORE WORTARING WITH CCR-C821-89A, THE KEYWAY SURFACES SHALL BE WETTED, BUT NO FREE WATER SHALL BE ALLOWED TO REMAIN IN THE KEYWAYS. SURFACES WHEN OTHER WORTAR IS USED SHALL BE AS PER MANUFACTURES RECOMMENDATION. WORTAR SHALL BE PLACED INTO THE KEYWAYS IN A MANNER THAT INSURES COMPLETE AND SOLID FILLING

COMPOSITE BRIDGES: THE FOLLOWING NOTES APPLY TO COMPOSITE BRIDGES ONLY:

1.1 CLEANING PRIOR TO PLACEMENT OF COMPOSITE SLAB:
BEFORE PLACEMENT OF THE SLAB CONCRETE, THE TOPS
OF ALL BEAMS SHALL BE THOROUGHLY CLEANED OF ALL DIRT,
DUST AND OTHER FOREIGN MATTER. THE SURFACE SHALL BE
FLUSHED WITH CLEAR WATER AND SHALL BE WET, WITHOUT FREE
WATER, WHEN THE CONCRETE IS PLACED.

2.2 SLAB PLACEMENT ON MULTI-SPAN BRIDGES WITH SLAB CONTINUOUS OVER SPAN CONSTRUCTION JOINTS PERPENDICULAR TO THE CENTERLINE OF ROADWAY MAY BE PLACED NEAR THE CENTER OF SPAN. HOWEVER, COMPOSITE SLAB POURS SHALL BE AS LONG AS PRACTICABLE. ON MULTI-SPAN BRIDGES WITH JOINTS AT PIERS, COMPOSITE SLABS SHALL BE PLACED BETWEEN JOINTS WITHOUT ADDITIONAL CONSTRUCTION JOINTS, BUT SHALL COMPLY WITH THE REQUIREMENTS OF ITEM 511.

PROJECT PLANS: SHALL SPECIFY THE DETAILS OF THE STANDARD DRAWING WHICH ARE TO APPLY AND WILL INCLUDE THE FOLLOWING:

- A BEAM LAYOUT PLAN SHOWING SPAN LENGTH, BEAM LENGTH, SKEW ANGLE, FIXED AND EXPANSION ENDS OF BEAMS, LOCATION OF ANCHOR DONUTS, SIZE, LOCATION AND HARDNESS OF ELASTOMERIC BEARING PADS, LOCATION OF DIAPHRAM CENTERLINES AND LOCATIONS

A TRANSVERSE CROSS-SECTION THRU THE DECK,
A CROSS-SECTION OF THE BEAM SHOWING BEAM TYPE, SIZE,
NUMBER, STRENGTH AND LOCATION OF STRANDS, DEBONDED
STRANDS, ALL REINFORCING STEEL DETAILS AND THE DESIGN
DATA.

DETAILS AT ABUTMENTS AND PIERS.
ALL OTHER NECESSARY DETAILS AND INFORMATION.
IT IS NOT INTENDED THAT DETAILS SHOWN ON THIS STANDARD
DRAWING BE REPEATED ON THE PROJECT PLANS EXCEPT AS
MAY BE REQUIRED FOR CLARITY.

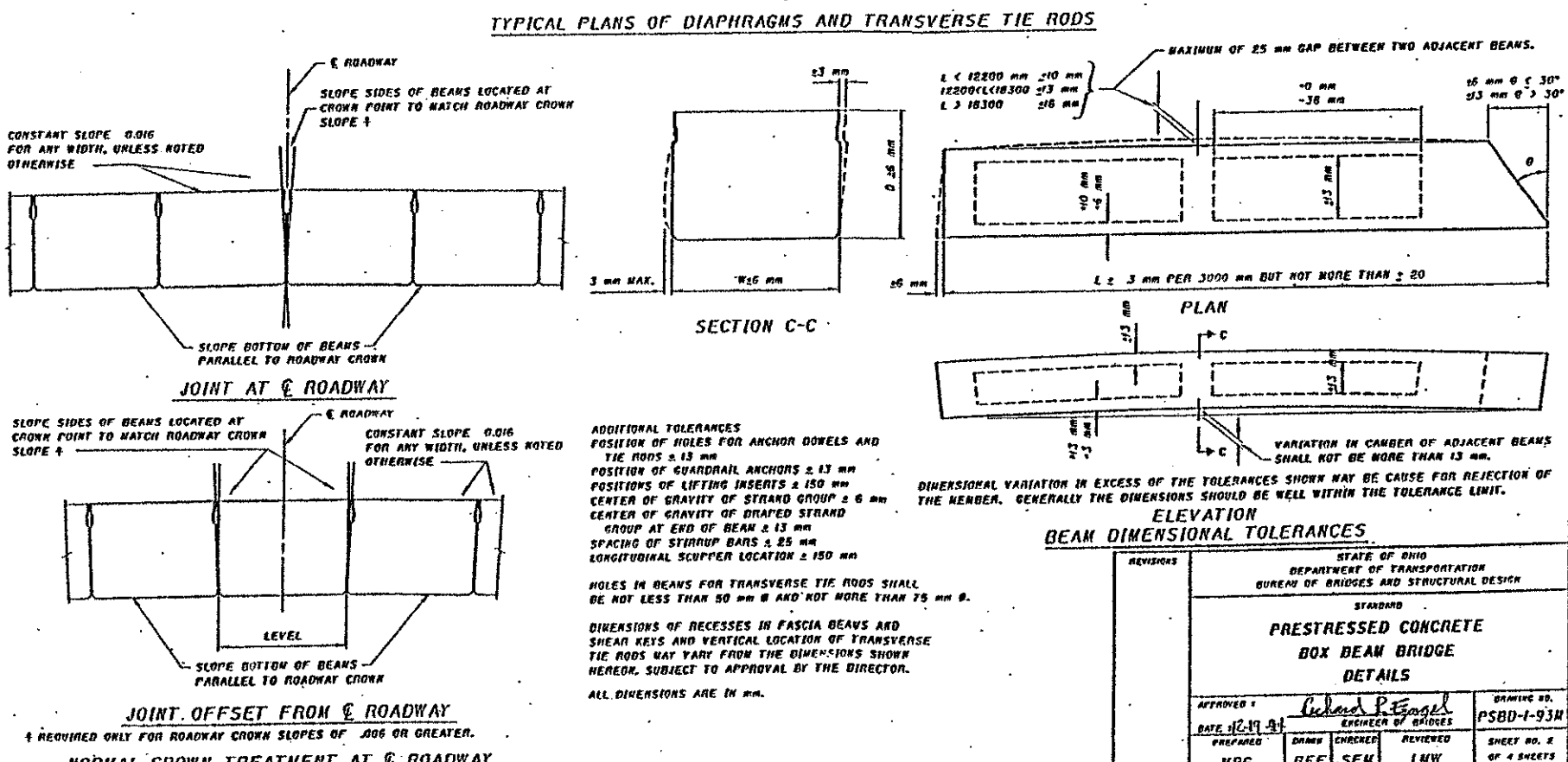
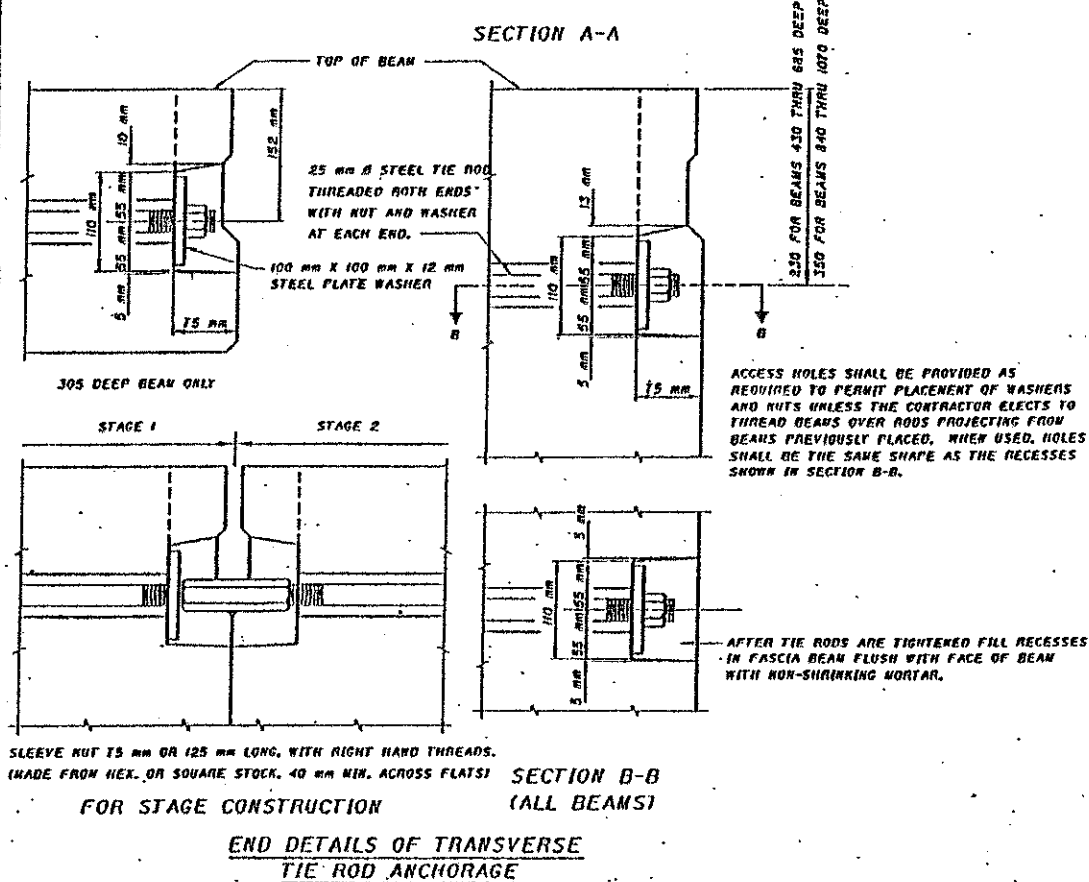
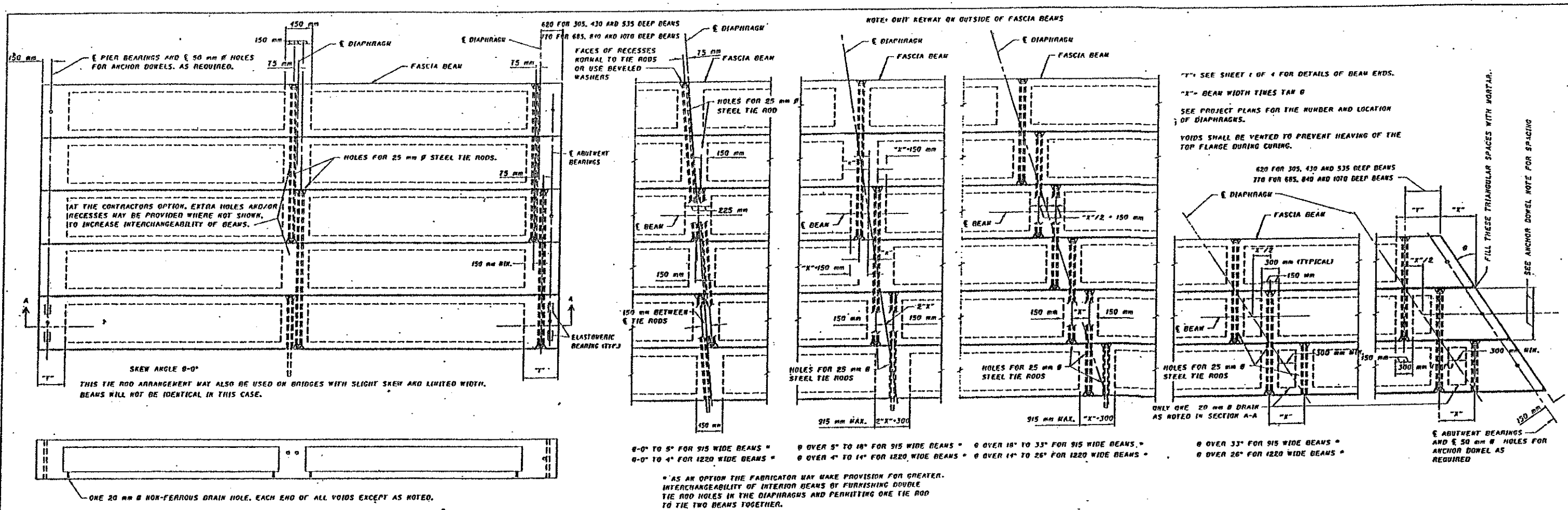
ITEMS INCLUDED WITH ITEM 515 FOR PAYMENT:

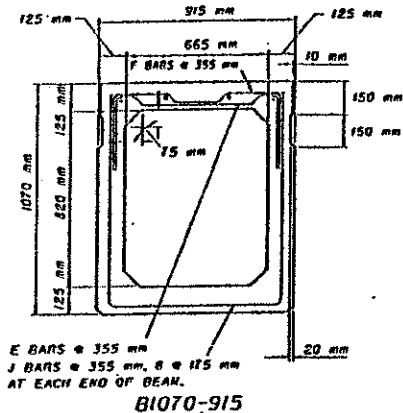
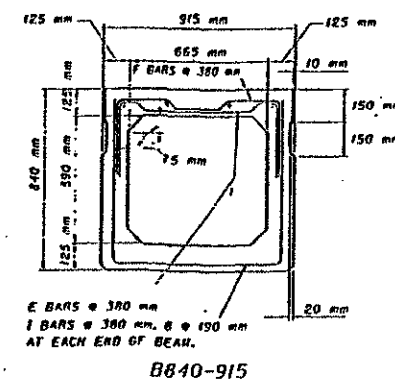
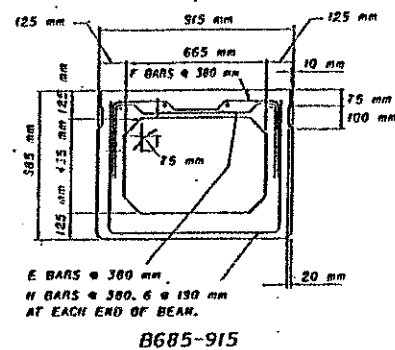
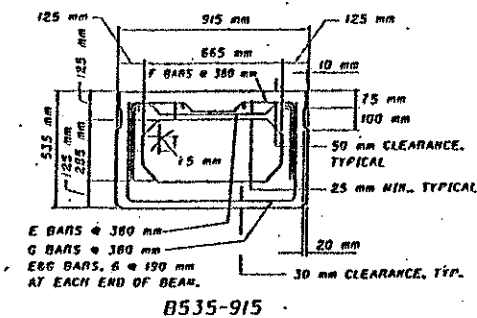
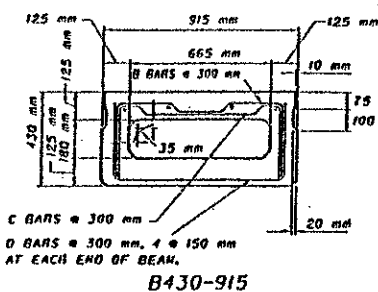
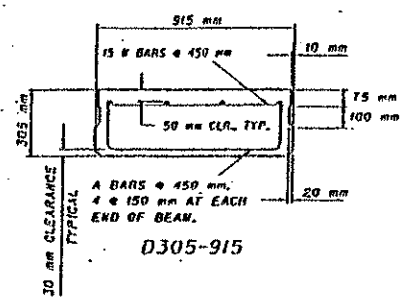
1. ANCHOR BOWELS AND INSTALLATION
2. ALL PREFORMED EXPANSION JOINT FILLER REQUIRED.
3. TYPE B WATER PROOFING AT ENDS OF BEAMS.
4. MORTAR AND LABOR REQUIRED.
5. ALL OTHER MATERIAL & LABOR REQUIRED FOR FABRICATION AND ERECTION.

ALL DIMENSIONS ARE IN mm

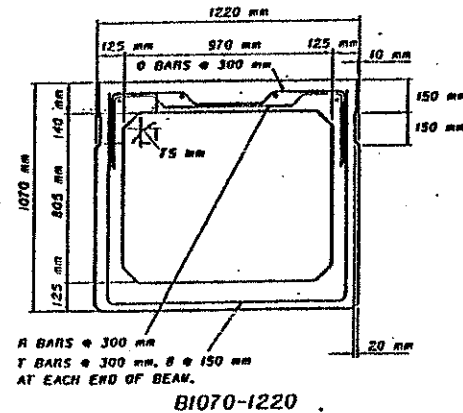
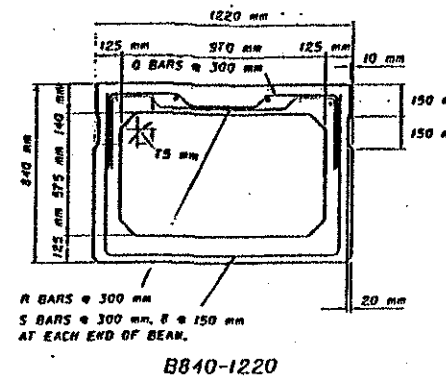
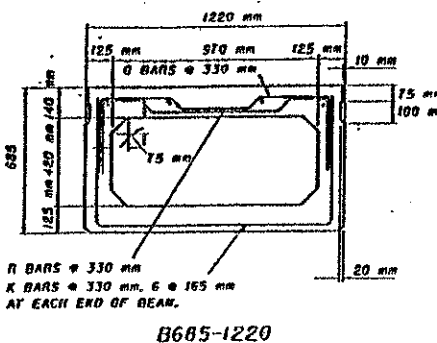
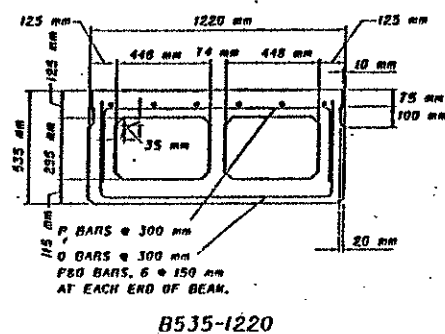
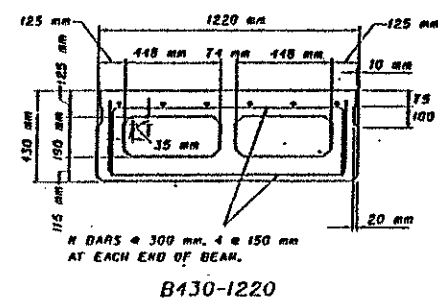
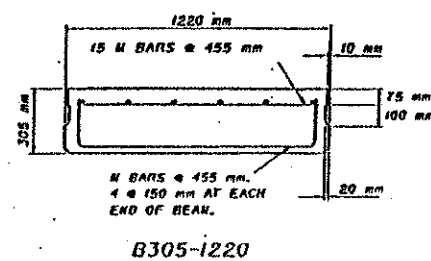
REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN			
	STANDARD			
	PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS			
	APPROVED :	<i>Richard F. Engel</i> ENGINEER OF BRIDGES		DRAWING NO. PSBD-93A
DATE: 11-11-41	PREPARED	DRAWN	CHECKED	REVIEWED
	HRG	REF	SEN	LHW
				SHEET NO. 1 OF 4 SHEETS

NOTE: THE FABRICATOR'S SHOP DRAWINGS SHALL SHOW COMPLETE DETAILS OF THE BEAM REINFORCING.

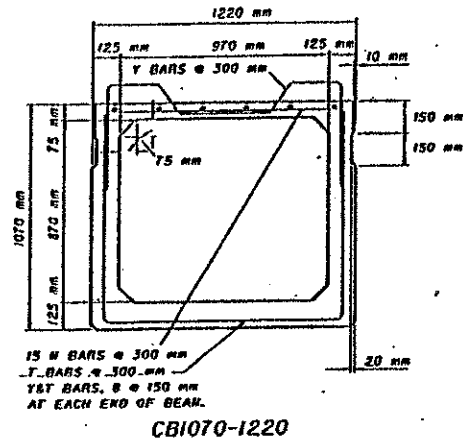
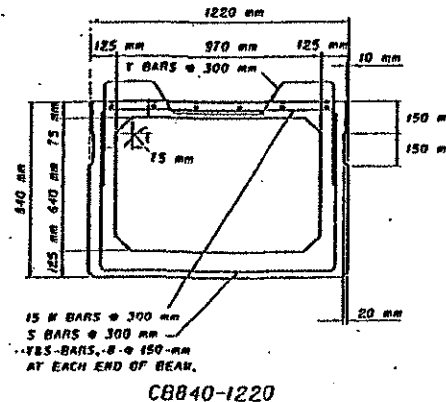
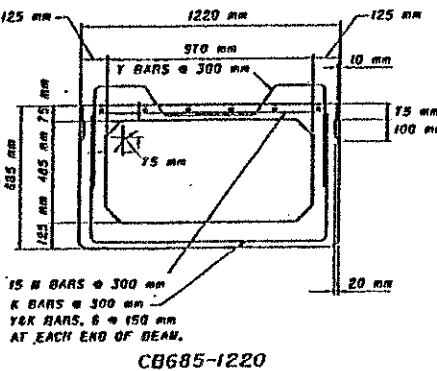
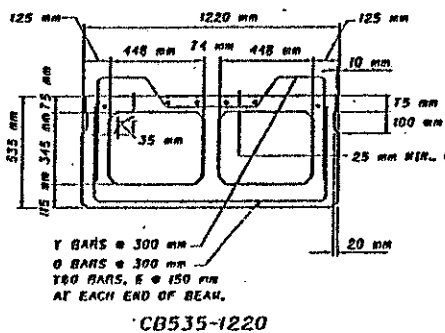
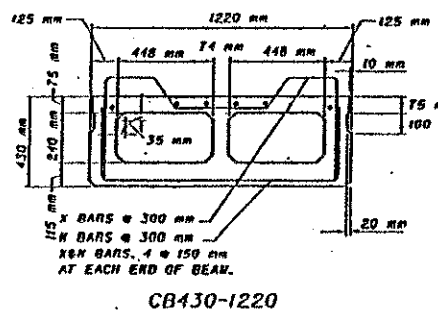
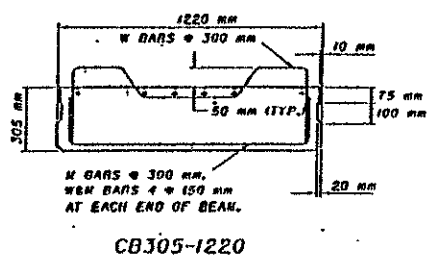




915 mm WIDE NON-COMPOSITE BEAMS

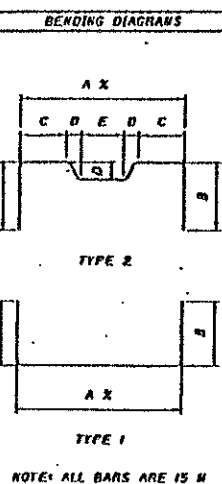


1220 mm WIDE NON-COMPOSITE BEAMS



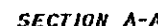
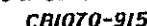
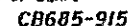
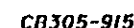
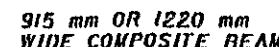
1220 mm WIDE COMPOSITE BEAMS

MARK	TYPE	A	B	C	D	E
A	1	785 mm	200 mm			
B	2	785 mm	330 mm	250 mm	40 mm	205 mm
C	2	785 mm	330 mm	100 mm	40 mm	505 mm
D	1	785 mm	330 mm			
E	2	785 mm	430 mm	100 mm	40 mm	505 mm
F	2	785 mm	430 mm	250 mm	40 mm	205 mm
G	1	785 mm	430 mm			
H	1	785 mm	585 mm			
I	1	785 mm	735 mm			
J	1	785 mm	985 mm			
K	1	1030 mm	585 mm			
L	1	1030 mm	200 mm			
M	1	1030 mm	330 mm			
N	1	1030 mm	430 mm			
O	1	1030 mm	430 mm			
P	1	1030 mm	430 mm			
Q	2	1030 mm	430 mm	330 mm	50 mm	330 mm
R	2	1030 mm	430 mm	178 mm	50 mm	635 mm
S	1	1030 mm	735 mm			
T	1	1030 mm	985 mm			
W	2	1030 mm	255 mm	230 mm	100 mm	430 mm
X	2	1030 mm	430 mm	230 mm	100 mm	430 mm
Y	2	1030 mm	530 mm	230 mm	100 mm	430 mm
XX	2	785 mm	300 mm	150 mm	100 mm	280 mm
YY	2	785 mm	430 mm	150 mm	100 mm	280 mm
YY	2	785 mm	530 mm	150 mm	100 mm	280 mm



NOTE:
ALTERNATE TOP STIRRUPS TO LAP BOTTOM STIRRUPS AT EACH
END OF BEAM WHERE TWO TYPES OF TOP STIRRUPS ARE PROVIDED.
915 mm WIDE COMPOSITE BEAMS ARE SHOWN ON SHEET 4 OF 4.
MINIMUM TOP LONGITUDINAL REINFORCING STEEL
915 mm WIDE NON-COMPOSITE & COMPOSITE BEAMS: 4-15 #4 BARS.
1220 mm WIDE NON-COMPOSITE BEAMS: B305 THRU B535, 6-15 #4 BARS
B685 THRU B1070, 4-15 #4 BARS
1220 mm WIDE COMPOSITE BEAMS: 6-15 #4 BARS
SEE PROJECT PLANS FOR ANY ADDITIONAL LONGITUDINAL
REINFORCING STEEL BARS REQUIRED.
ALL REINFORCING STEEL ARE GRADE 400 BARS
FABRICATOR'S SHOP DRAWINGS SHALL SHOW COMPLETE DETAILS OF
BEAM REINFORCING.

REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN	STANDARD PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS
APPROVED: <i>Richard L. Engel</i> DATE: 1/24/94 PREPARED: MRC	ENGINEER OF BRIDGES CHECKED: REF REVIEWED: SEN LWV	DRAWING NO. PSBD-1-93W SHEET NO. 3 OF 4 SHEETS

915 mm WIDE COMPOSITE BEAMS

NOTE:
REINFORCING BAR DATA AND NOTES ARE SHOWN ON SHEET J OF 4.

SECTION PROPERTIES FOR COMPOSITE SECTIONS ARE COMPUTED WITH A SLAB THICKNESS OF 125 mm. TOTAL THICKNESS OF SLAB IS 150 mm WHICH INCLUDES 25 mm MONOLITHIC WEARING SURFACE.

SLAB CONCRETE IS CLASS S CONCRETE : $f'_c = 31.0$ MPa
RIBBON BEAM CONCRETE STRENGTH AT 28 DAYS : $f'_c = 38.0$ MPa

ALL REINFORCING STEEL IN THE COMPOSITE DECK SLAB AND BARS PROJECTING FROM THE PRESTRESSED BOX BEAMS SHALL BE GRADE 408 EPOXY COATED BARS.

Egled

$\frac{1}{2} - 0.90$

ALL DIMENSIONS ARE IN mm

* LAP BARS SAME SIZE AND NUMBER AS BEAM BARS. HOOKS MAY BE ROTATED FROM THE VERTICAL POSITION TO PROVIDE THE REQUIRED CLEARANCE.

PROVIDE 6-20 # BARS EACH BEAM END IN 1220 MM WIDE BEAMS AND 4-20 # BARS EACH BEAM END IN 915 MM WIDE BEAMS. 20 # BARS SHALL BE LOCATED ON TOP OF STIRRUPS AND SHALL BE UNIFORMLY SPACED ACROSS THE BEAM.

↑ AT THE FABRICATOR'S OPTION, STRANDS MAY BE EXTENDED AND BENT UP IN LIEU OF 20 W BARS. 1220 MM WIDE BEAMS WITH A TOTAL OF 12 OR MORE STRANDS SHALL HAVE A MINIMUM OF 6 STRANDS BENT UP. 1220 MM WIDE BEAMS WITH LESS THAN 12 STRANDS TOTAL SHALL HAVE APPROXIMATELY ONE HALF OF THE TOTAL NUMBER OF STRANDS BENT UP. 915 MM WIDE BEAMS WITH A TOTAL OF 8 OR MORE STRANDS SHALL HAVE A MINIMUM OF 4 STRANDS BENT UP. 915 MM WIDE BEAMS WITH LESS THAN 8 STRANDS TOTAL SHALL HAVE APPROXIMATELY ONE HALF OF THE TOTAL NUMBER OF STRANDS BENT UP

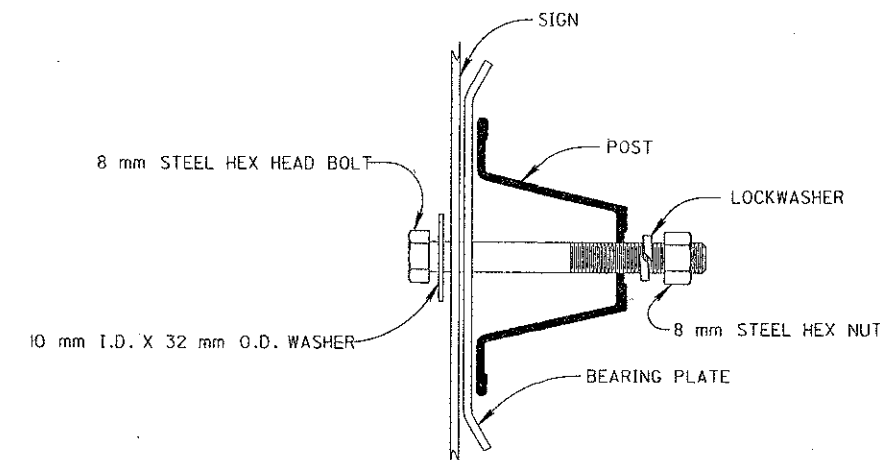
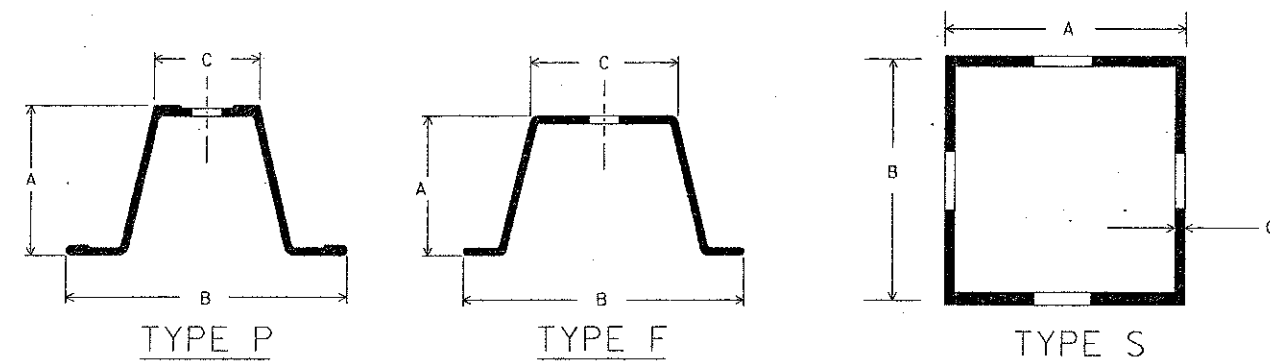
*** IN LIEU OF CLASS 5 CONCRETE, THE CONTRACTOR AT HIS OPTION MAY USE OTHER CONCRETE MIXTURES IN ACCORDANCE WITH CMS 499.03 FOR ACHIEVING THE REQUIRED STRENGTH EARLIER

NOTE: THE PRESTRESSING STRANDS WHICH ARE BENT UP SHALL BE STAGGERED IN ABUTTING BEAM ENDS TO AVOID INTERFERENCE.

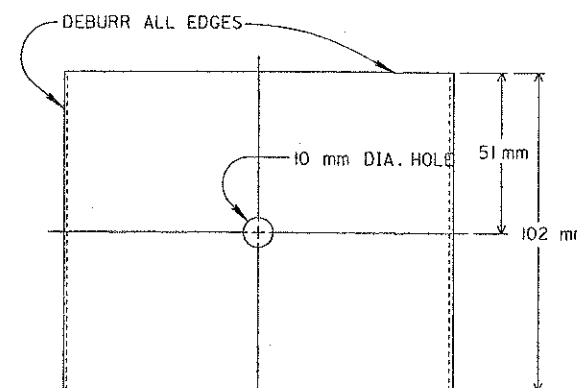
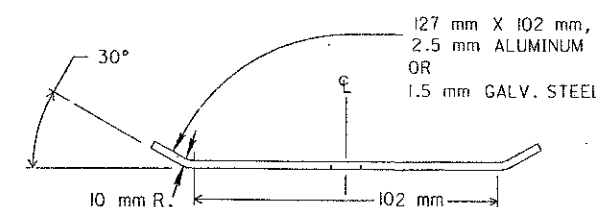
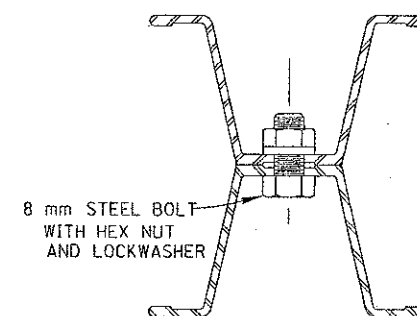
REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN					
	STANDARD					
	PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS					
	APPROVED : <i>Richard P. Engel</i> ENGINEER OF BRIDGES					DRAWING NO. PSBD-1-93
	DATE 12-19-91	PREPARED	DRAWN	CHECKED	REVISED	SHEET NO. 4 OF 4 SHEETS
	KRG	REF	WLF	SEN	LNW	

NOTES

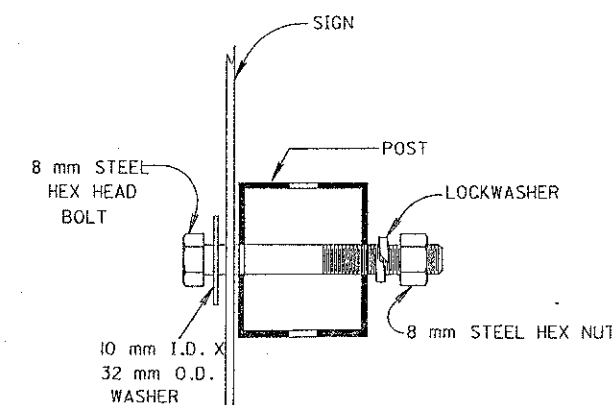
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2. USE OF ANCHOR BASE WITH SQUARE POST IS OPTIONAL.
3. SQUARE POST MAY HAVE DIE-CUT KNOCKOUTS OR OPEN HOLES.



U - CHANNEL SIGN ATTACHMENT DETAIL



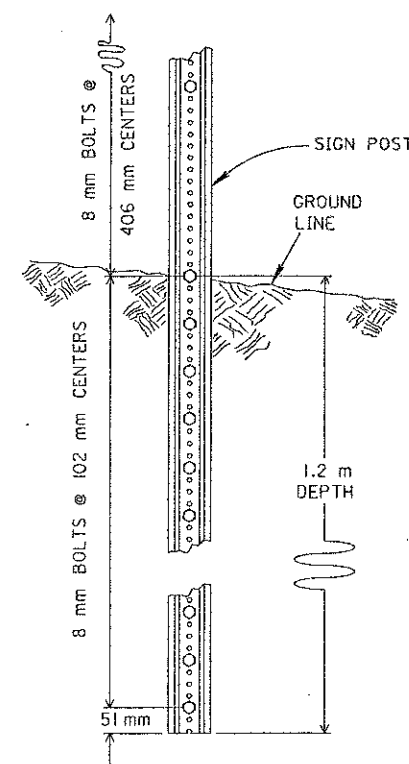
BEARING PLATE



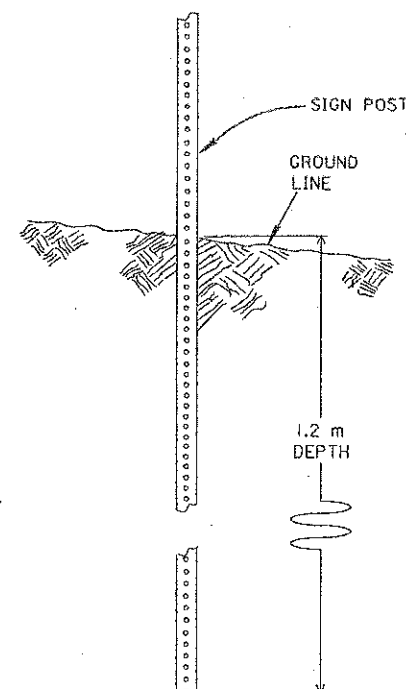
SQUARE POST

SIGN ATTACHMENT DETAIL

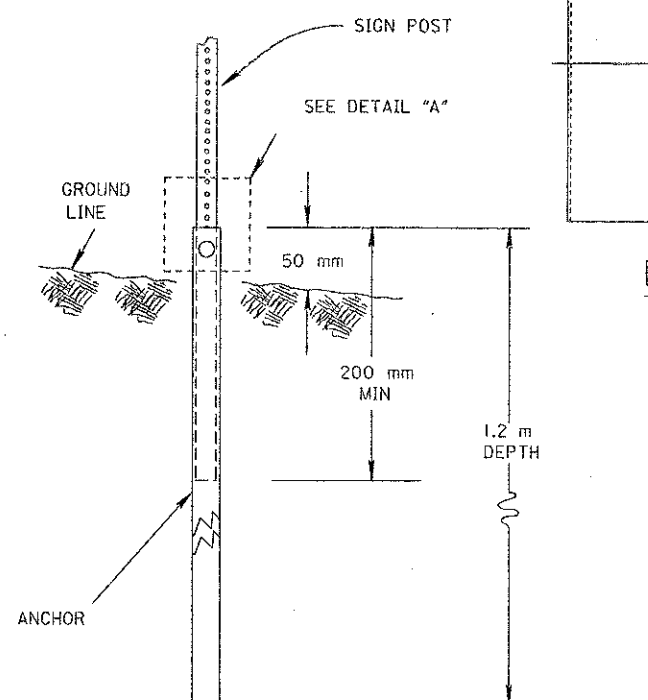
POST NO.	TYPE	Kg/m	POST DIMENSIONS MILLIMETERS			ANCHOR DIMENSIONS			NUMBER OF POSTS PERMITTED IN SEVEN FOOT PATH IN EXPOSED LOCATIONS
			A	B	C	A	B	C	
1	F	1.7	22	52	21				
	P	3.0	37	78	33				2
2	F	3.0	39	79	32				2
	S		51	51	2.1	57	57	2.7	2
3	P	4.5	48	89	33				2
	F	4.5	44	89	41				2
4	S		51	51	2.1	57	57	2.7	2
	P	6.0	TWO NO.2 POST						0
5	F	6.0	TWO NO.2 POST						0
	S		63	63	2.7	76	76	4.8	1
6	P	9.0	TWO NO.3 POST						0
	F	9.0	TWO NO.3 POST						0



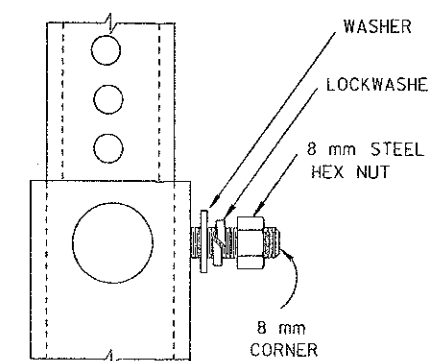
TYPICAL U - CHANNEL
DRIVEN INSTALLATION



TYPICAL SQUARE POST
DRIVEN INSTALLATION



TYPICAL SQUARE POST ANCHOR
BASE INSTALLATION



DETAIL "A"

M E T R I C

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

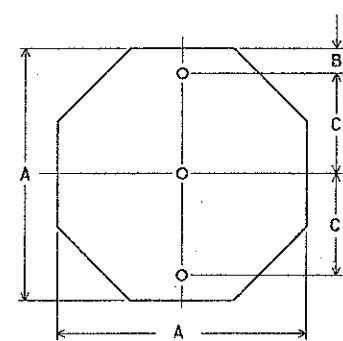
YIELDING POST

STANDARD
CONSTRUCTION
DRAWING

TC-41.20M

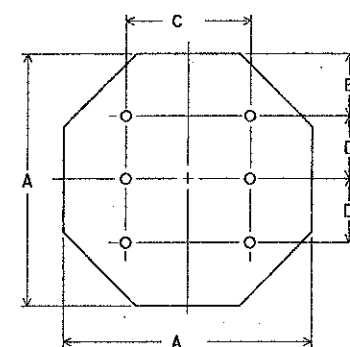
APPROVED: *[Signature]* ENGR. OF DESIGN SERVICES

DATE
07/01/94



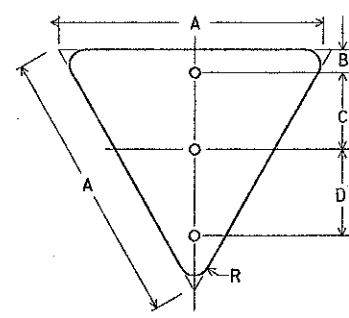
OCTA-1-3

A	B	C	THICKNESS	m ²
750	75	300	2.0	0.56
900	150	300	2.0	0.81



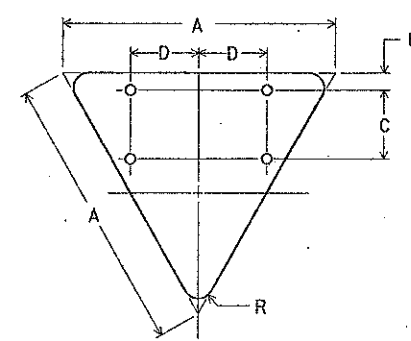
OCTA-2-6

A	B	C	D	THICKNESS	m ²
1200	300	1600	300	2.5	1.44



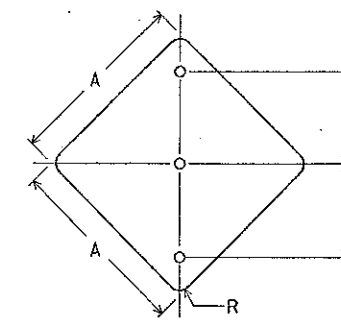
TRI-1-3

A	B	C	D	R	THICKNESS	m ²
900	75	250	275	50	2.5	0.35



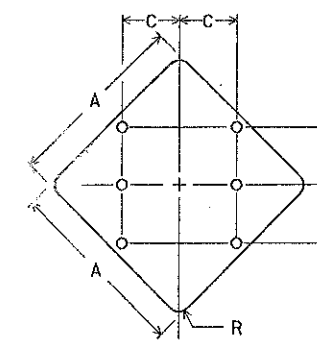
TRI-2-4

A	B	C	D	R	THICKNESS	m ²
1200	75	300	300	75	2.5	0.62
1500	75	450	375	100	2.5	0.97



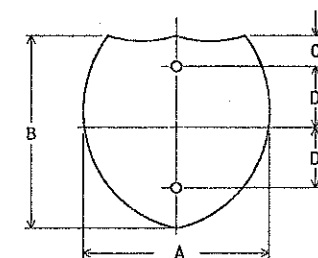
DIA-1-3

A	B	R	THICKNESS	m ²
600	300	38	1.6	0.36
750	375	48	2.0	0.56
900	450	57	2.0	0.81



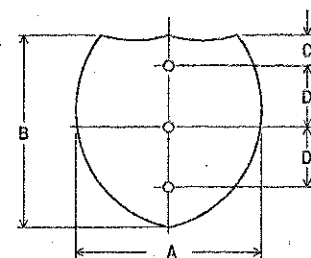
DIA-2-6

A	B	C	R	THICKNESS	m ²
1200	375	375	75	2.5	1.44
1500	450	450	95	2.5	2.25



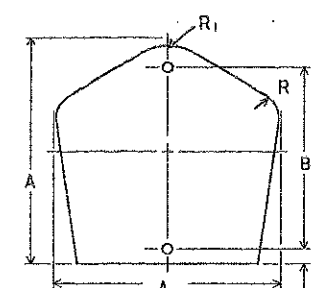
I.S.-1-2

A	B	C	D	THICKNESS	m ²
600	600	75	225	1.6	0.36
750	600	75	225	2.0	0.45
750	750	75	300	2.0	0.56
1000	750	75	300	2.0	0.75



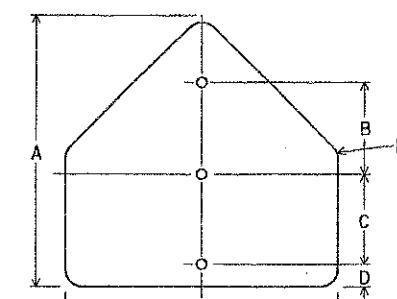
I.S.-1-3

A	B	C	D	THICKNESS	m ²
900	900	150	300	2.0	0.81
1200	900	150	300	2.5	1.08



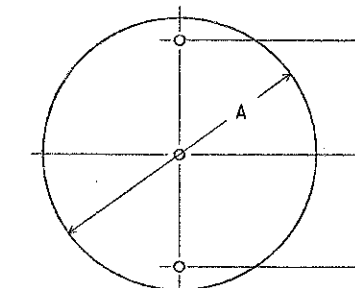
CO-1-2

A	B	C	R1	R	THICKNESS	m ²
450	375	25	125	50	1.6	0.20
600	450	50	135	68	1.6	0.36
750	600	50	168	86	2.0	0.56



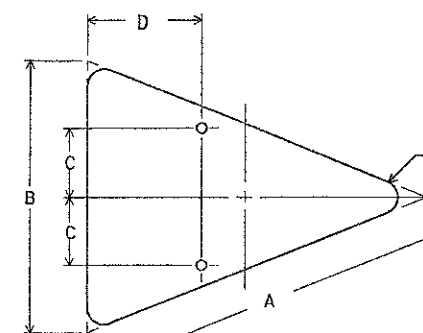
PENT-1-3

A	B	C	D	R	THICKNESS	m ²
750	250	275	75	48	2.0	0.56
900	300	300	75	57	2.0	0.81
1050	350	325	100	64	2.5	1.10



CIR-1-3

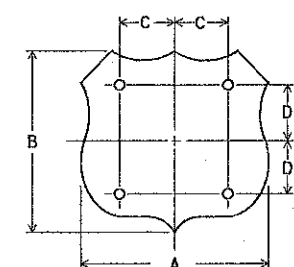
A	B	THICKNESS	m ²
750	300	1.6	0.56
900	375	2.0	0.81



ISOS-1-2

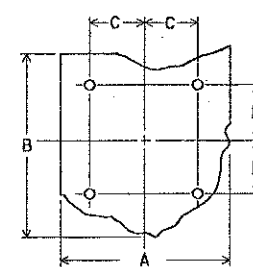
A	B	C	D	R	THICKNESS	m ²
1000	750	187	300	48	2.0	0.35
1200	900	225	375	57	2.5	0.50

ROUTE SHIELDS (FOR GUIDE SIGNS ONLY)



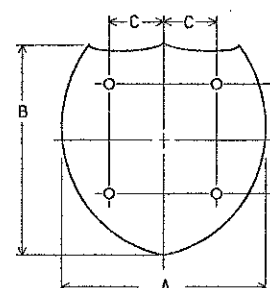
M-1C-

A	B	C	D
610	600	175	175
750	600	200	200
750	750	225	225
937	750	225	225
900	900	250	250
1125	900	375	250



M-2C-

A	B	C	D
600	600	175	175
750	600	200	200
750	750	225	225
937	750	225	225
900	900	250	250
1125	900	375	250



M-5C-

A	B	C	D
600	600	175	175
750	600	200	200
750	750	225	225
1000	750	225	225
900	900	250	250
1200	900	375	250

ALL SHIELDS SHALL BE 1.6 mm THICK

SHAPE **OCTA-2-6** NO. BOLTS REQUIRED
NO. SUPPORTS REQUIRED

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
2. ALL BOLT HOLES SHALL BE 10 MILLIMETERS IN DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
3. DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF ± 0.8 MILLIMETER.
4. FOR ADDITIONAL BLANK DETAILS, SEE SIGN LAYOUT DRAWING.

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

SIGN BLANK DETAILS I

STANDARD
CONSTRUCTION
DRAWING

TC-52.10M

APPROVED *[Signature]* ENGR. OF DESIGN SERVICES

DATE
07/29/94

WCC