

APPENDIX A. EXISTING PLANS

MEDINA COUNTY COUNTY HIGHWAY NO. 50

REPLACEMENT OF EXISTING BRIDGE NO. 26 OVER McCABE'S CREEK

PROJECT No. LAF - 50; BRIDGE No. 26 - 10/89

INDEX OF DRAWINGS

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CONVENTIONAL SYMBOLS

| | | | |
|---------------------|-------|----------------|---|
| RIGHT-OF-WAY LIMITS | _____ | R/W | |
| CENTERLINE | _____ | CL | |
| EDGE OF PAVEMENT | _____ | E/P | |
| POWER POLE | ○ | TELEPHONE POLE | ○ |
| DECIDUOUS TREE | _____ | | |
| WATER LINE | —W— | —W— | |

UTILITY OWNERSHIP

POWER: OHIO EDISON CO.
76 S. MAIN ST.
AKRON, OHIO 44308
PHONE: (216) 384-5631

TELEPHONE: GENERAL TELEPHONE CO. OF OHIO
6223 NORWALK RD.
P.O. BOX 585
MEDINA, OHIO 44256
PHONE: (216) 722-9580

UNDERGROUND UTILITIES: CALL 800-362-2764
2 WORKING DAYS BEFORE
YOU DIG.

GAS: COLUMBIA GAS OF OHIO
7080 FRY ROAD
MIDDLEBURG HEIGHTS, OHIO 44130
PHONE: (216) 243-1000



SCALES

| | | |
|----------------------|-------|----------|
| PLAN | _____ | 1" = 20' |
| PROFILE - HORIZONTAL | _____ | 1" = 20' |
| PROFILE - VERTICAL | _____ | 1" = 5' |
| CROSS-SECTIONS | _____ | 1" = 5' |

RECORDED IN MEDINA COUNTY FIELD BOOK No. 487 p. 38 - 55

1990 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS, SHALL GOVERN THIS IMPROVEMENT UNLESS OTHERWISE ORDERED BY THE MEDINA COUNTY ENGINEER OR HIS AGENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE INSTALLATION OF THIS IMPROVEMENT WILL REQUIRE THE CLOSING OF THE HIGHWAY FOR THROUGH TRAFFIC.

APPROVED David L. Miller, M.S. PE, PS. DATE 4/2/90
DAVID L. MILLER - MEDINA COUNTY ENGINEER
REG. ENG. No. 37031 & REG. SURVEYOR No. 6921

MEDINA COUNTY
BOARD OF COUNTY COMMISSIONERS

APPROVED Charles E. Hawley DATE 4/3/90
CHARLES E. HAWLEY (CHAIRMAN)

APPROVED John H. Happ DATE _____
JOHN H. HAPP

APPROVED Ralph A. Berry, Jr. DATE 4/2/90
RALPH A. BERRY, JR.

Recommended For Approval... B. D. Smith
Date... 5-18-1990
APPROVED... Bernard B. Smith
Date... 5-18-1990

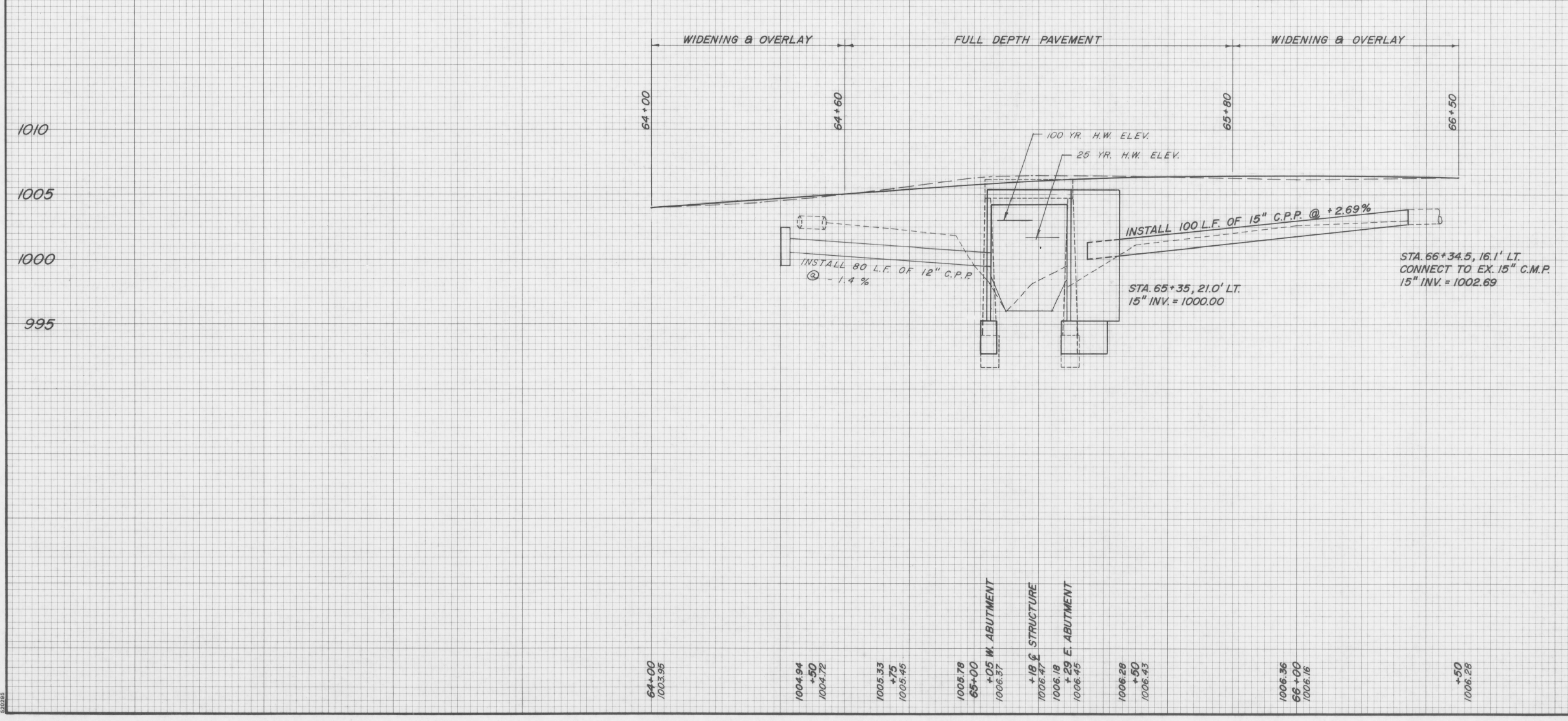
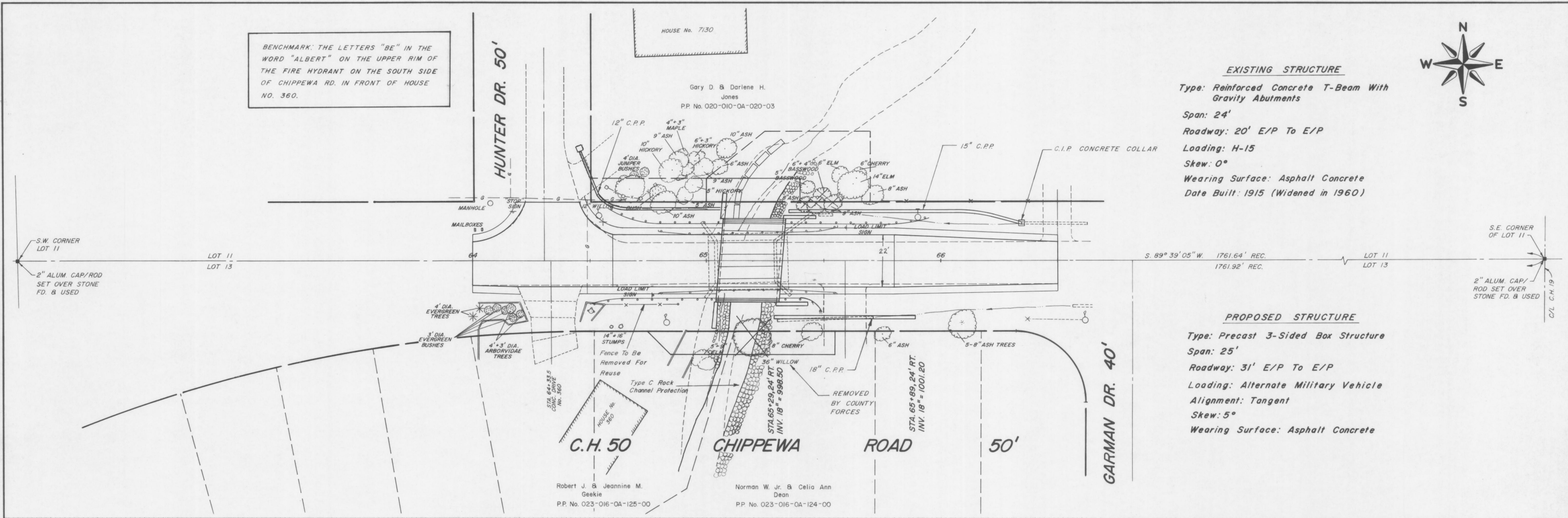
PLANS PREPARED BY
MEDINA COUNTY ENGINEERS OFFICE
MEDINA, OHIO



BENCHMARK: THE LETTERS "BE" IN THE WORD "ALBERT" ON THE UPPER RIM OF THE FIRE HYDRANT ON THE SOUTH SIDE OF CHIPPEWA RD. IN FRONT OF HOUSE NO. 360.

EXISTING STRUCTURE
 Type: Reinforced Concrete T-Beam With Gravity Abutments
 Span: 24'
 Roadway: 20' E/P To E/P
 Loading: H-15
 Skew: 0°
 Wearing Surface: Asphalt Concrete
 Date Built: 1915 (Widened in 1960)

PROPOSED STRUCTURE
 Type: Precast 3-Sided Box Structure
 Span: 25'
 Roadway: 31' E/P To E/P
 Loading: Alternate Military Vehicle
 Alignment: Tangent
 Skew: 5°
 Wearing Surface: Asphalt Concrete



| | | | |
|---|---|---|----------|
| OFFICE OF THE MEDINA COUNTY ENGINEER MEDINA COUNTY ENGINEERING CENTER 791 W. SMITH ROAD P.O. BOX 825 MEDINA, OHIO 44258-0825 PH. 723-9561 MEDINA COUNTY HIGHWAY GARAGE PH. 722-9356 | | SITE PLAN & PROFILE CO. RD. 50, BRIDGE No. 26 OVER McCABE'S CREEK LAFAYETTE TOWNSHIP, MEDINA COUNTY | |
| PROJECT NO. LAF-50-BR 26 DRAWN BY: S. CLUTTER, B. SAGANES CHECKED BY: BILL VIOVODE | FIELD BOOK NO. 497 SCALE: HOR. 1"=20', VERT. 1"=5' DATE: MARCH 15, 1990 | FILE NO. DATE | DRAWN BY |

| | | | |
|-------------|-------|---------|--|
| FHWA REGION | STATE | PROJECT | |
| 5 | OHIO | | |

11/3/88

ITEM 603-Precast Reinforced Concrete Flat Topped Three-sided Culverts

General

Where the plans call for "Item 603 Precast Reinforced Concrete Flat Topped Three-sided Culverts" the culverts shall be manufactured to comply with the following.

These Culverts shall be flat deck structures with a minimum span of 14 feet and a minimum rise of 4 feet; and a maximum span of 34 feet and maximum rise of 10 feet. Minimum wall and deck thicknesses shall be 10 inches and 12 inches respectively, measured under the haunch and at the centerline of the span.

These culverts are intended to be used for the conveyance of storm water, and will be subjected to earth and highway loadings. The culverts are designated by clear span, measured perpendicular to the structure walls, and opening rise. The requirements of the Construction and Material Specifications (CMS) Item 603 Type A conduit shall apply except as modified hereinafter.

Basis of Acceptance

Acceptability of the three-sided culvert produced in accordance with this note shall be determined by the results of the concrete compressive strength tests, by the material requirements described hereinafter and by inspection of the finished product. The manufacturer shall submit shop drawings for review and approval. Manufacture shall not begin until written approval of the submitted drawings has been received from the Bureau of Location and Design.

Materials

Cement - Portland cement shall conform to the requirements of AASHTO M 85.

Aggregates - Fine aggregates shall be a natural sand conforming to the CMS 703.02. Course aggregate shall have a standard size designation from a number 5 to a number 8 inclusive as specified in CMS 703.01. The quality requirements of CMS 703.02 shall apply.

Admixtures - Air entraining admixtures conforming to CMS 705.10 and Chemical admixtures conforming to CMS 705.12 Types A, B, D, or F may be used.

Steel Reinforcement - Reinforcement shall consist of welded wire fabric conforming to CMS 709.10 or 709.12, or deformed billet steel bars conforming to CMS 709.01, Grade 60. Both mats of top slab reinforcing and exterior wall mat reinforcing shall be epoxy coated as per CMS 709.00 or Supplemental Specification 941, unless the depth of fill on the culvert measured at the edge of roadway pavement exceeds 3 ft. In lieu of epoxy coated reinforcing, a calcium nitrite-based corrosion inhibiting concrete admixture may be used. The admixture shall conform to ASTM C 494 type C. The calcium nitrite shall be a minimum of 2% calcium nitrite solids by weight of cement. Payment will be included in the bid price for the three-sided culvert.

Design

The culvert design shall be in accordance with the AASHTO standard specifications for highway bridges. The culvert dimensions shall be as shown, subject to the permissible variations contained hereinafter. The minimum concrete compressive strength shall be 5000 p.s.i. Approved reinforcement designs for the structure sections shown are on record in the Bureau of Bridges and Structures, rating and inventory section and in the District Bridge office.

Modified and Special Designs - The manufacturer may request approval by the purchaser of modified designs which differ from the approved designs.

Placement of Reinforcement - The concrete cover dimension over reinforcement shall be a minimum of 1". When the earth cover over the culvert deck is less than 3 ft, measured at the edge of roadway pavement the minimum concrete cover dimension over the top line of reinforcement in the deck shall be 2". When calcium nitrite-based corrosion inhibiting admixture is used the minimum concrete cover over all exterior reinforcement shall be 2". The clear distance of the end circumferential wires shall not be less than 5/8 in. nor more than 2 in. from the ends of the culvert. Reinforcement shall be assembled utilizing any combination of single or multiple layers (3 maximum) of welded wire fabric or steel bars. The welded wire fabric shall be composed of circumferential and longitudinal wires meeting the spacing requirements hereinafter. The ends of the longitudinal reinforcement shall not be more than 2 in. from the ends of the culvert. The exposure of the ends of longitudinal reinforcement, and spacers used to position the reinforcement shall not be cause for rejection.

Reinforcing development, splices, and spacings
Exterior corner reinforcement shall be fully developed or extend 12 in. past the point of peak stress. For deformed steel bars (CMS 709.01) equal leg 90 degree bends with leg lengths as follows: *3-13", *4-17", *5-21", *6-34", *7-40", and *8-40" will satisfy this development criteria. The development length for welded wire fabric (CMS 709.10 or 709.12) shall conform to AASHTO standard specifications for highway bridges.

Splices in circumferential reinforcement shall be made by lapping and not by welding. Lap lengths shall be as per AASHTO standard specifications for highway bridges.
Spacing center to center of the circumferential wires in a fabric sheet shall not be less than 2 in. nor more than 4 in. The spacing center to center of the longitudinal wires or bars shall not be more than 8 in. Where circumferential reinforcement is composed of bars, crack control criteria shall be checked. Calculations performed by a registered professional engineer verifying that the proposed bar spacings meet the crack control criteria shall be submitted to the purchaser.

Joints

The precast reinforced concrete flat topped three-sided culvert sections shall be produced with a grout filled keyway. The keyway shall provide a void volume equivalent to that of 12" prestressed beam as per Std. Dwg. PSBD-1-B1. The keyway surfaces shall be given a medium sandblast, 2000 p.s.i. water blast, or a thorough wire brushing at the plant within four days prior to leaving the plant. The ends shall be of such design and the ends of the culvert sections so formed that when they are laid together they will make a continuous line of culverts with a smooth interior free of appreciable irregularities, all compatible with the permissible variations hereinafter.

Mortar for the keyway shall be a non-shrinking non-metallic mortar having a minimum compressive strength at 28 days of 5000 p.s.i. according to the Corps of Engineers Specification CRD-C621 when prepared to a moderate fluidity (124-145% @ 5 drops). The mortar or grout shall also meet all other requirements of Specification CRD-C621. A list of approved mortars will be maintained by the ODOT Testing Laboratory located at 1600 West Broad Street in Columbus, Ohio 43223. The mortar shall be prepared, placed and cured in accordance with the manufacturer's recommendations. Before mortaring the keyway shall be thoroughly clean of all dirt, dust and other foreign matter. The keyway surfaces shall be wetted, but no free water shall be allowed to remain in the keyway.

The joint exterior shall be covered with a minimum of a 9 inch wide wrap centered on the joint. The exterior wrap shall be as per ASTM C-877, or Parrotac as manufactured by Phillips Fiber Corp. Care shall be exercised to keep the joint wrap in its proper location during backfilling.

Manufacture and Construction

Mixture - Aggregates, cement, and water shall be proportioned and mixed in a batch mixer to produce a homogeneous concrete meeting the strength requirements as stated. In no case however, shall the proportion of portland cement be less than 564 lb./CY. of concrete. The concrete shall contain 4 ± 1 percent entrained air.

Forms - The forms used shall be sufficiently rigid and accurate to maintain the culvert dimensions within the permissible variations given hereinafter. All the casting surfaces shall be of a smooth material.

Curing - The culvert shall be cured for a sufficient length of time so that the concrete will develop the specified compressive strength in 28 days or less. Any one of the following methods of curing or combinations thereof shall be used for culvert sections

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

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

Forms Left in Place - An accelerated overnight cure accomplished through the use of an external heat source may be used provided moisture loss from exposed surfaces is minimized. The maximum temperature increase or decrease shall be 40 degrees Fahrenheit per hour. The initial application of the heat shall be two hours after the final placement of concrete to allow the initial set to take place.

Handling - Devices or holes shall be permitted in each culvert section for the purpose of handling. However, not more than four holes may be cast or drilled in each section. The holes shall be tapered unless drilled, and before backfilling the tapered holes shall be filled with portland cement mortar, or with precast concrete plugs which shall be secured with portland cement mortar or other approved adhesive. Drilled holes shall be filled with portland cement mortar. Holes shall be covered on the exterior with the joint wrap material. This wrap shall have a minimum length and width of 9".

Where the culvert is to be placed in a trench, a minimum trench width of 2 ft. on each side of the conduit shall be required. Where the culvert is above the existing ground, the CMS 603.03 requirement that the embankment be constructed to at least the spring-line before trenching is waived.

Physical Requirements

Test Specimen - Concrete compressive strength shall be determined from compression tests made on cores. For each continuous production run, each group of 15 culvert sections of a single size or fraction thereof shall be considered separately for the purpose of testing and acceptance. A production run shall be considered continuous if not interrupted for more than 3 consecutive days.

Compression Testing of Cores - Cores shall be obtained and tested for compressive strength in accordance with the provisions of ASTM C 497. One core shall be cut from a section selected at random from each group of 15 culvert sections or fraction thereof of a single size from each continuous production run.

Acceptability by core tests: The compressive strength of the concrete in each group of culvert sections defined above is acceptable when the core test strengths are equal to or greater than the design concrete strength.

When the compressive strength of the core tested is less than the design concrete strength, the culvert section from which that core was taken may be cored again. When the compressive strength of the new core is equal to or greater than the design concrete strength, the compressive strength of the concrete in that group of culvert sections is acceptable.

When the compressive strength of any new core is less than the design concrete strength, the culvert section from which that core was taken shall be rejected. Two culvert sections from the remainder of the group shall be selected at random and one core shall be taken from each. If the compressive strength of both cores is equal to or greater than the design concrete strength, the compressive strength of the remainder of that group of culvert sections is acceptable. If the compressive strength of either of the two cores tested is less than the design concrete strength, each culvert of the remainder of the group shall be cored and accepted individually, and any of these culvert sections that have cores with less than the design concrete strength shall be rejected.

Plugging Core Holes - The core holes shall be plugged and sealed by the manufacturer in a manner such that the culvert section will meet all of the test requirements of this proposal. Culvert sections so sealed shall be considered satisfactory for use.

Coring equipment - Every manufacturer furnishing culvert sections under this proposal shall furnish equipment and personnel necessary to obtain the cores.

Permissible Variations

Internal Dimensions - The internal dimension shall vary not more than 2 in. from the design dimensions. The haunch dimensions shall vary not more than 3/4 in. from the dimensions shown.
Deck and Wall Thickness - The deck and wall thickness shall not be less than that shown by more than 3/4 in. A thickness more than that required shall not be cause for rejection.
Length of Opposite Surfaces - Variations in laying lengths of two opposite surfaces of the culvert sections shall not be more than 1 in., except where beveled ends for laying of curves are specified.

PRECAST REINFORCED
CONCRETE FLAT TOPPED
THREE-SIDED CULVERTS.

Length of Section - The under run in length shall not be more than 1/2 in. in any culvert section.

Position of Reinforcement - The maximum variation in the position of the reinforcement shall be $\pm \frac{3}{8}$ inch, except the cover over the reinforcement for the external surface of the top slab shall not be less than 2 inches for earth covers less than 3 ft. The above tolerances or cover requirements do not apply to mating surfaces of the joint.

Area of Reinforcement - The areas of steel reinforcement shall be the design steel areas per linear ft. Steel areas greater than those required shall not be cause for rejection. The permissible variation in diameter of any reinforcement shall conform to the tolerances prescribed in the ASTM specification for that type of reinforcement.

Workmanship and Finish

The culverts shall be substantially free of fractures. All surfaces shall have a smooth finish. The ends shall be normal to the walls and center line within the limits of variations given above, except where beveled ends are specified.

Culverts may be repaired, if necessary, because of occasional imperfections in manufacture, handling damage, or construction. Repairs shall be made in accordance with CMS 519. No additional payment will be made for culvert repairs. Repairs will be acceptable if in the opinion of the purchaser the repairs are sound, properly finished and cured, and the repaired culvert conforms to the requirements contained hereinabove.

Culverts shall be subject to rejection for failure to conform to any of the requirements contained hereinabove or any of the following:

- Fractures or cracks passing through the slab or wall.
- Defects that indicate imperfect proportioning, mixing, and forming.
- Honeycombed or open texture.
- Precast Damaged ends, where such damage would prevent making a satisfactory joint.

Inspection

The quality of materials, the process of manufacture, and the finished culvert shall be subject to inspection by the purchaser.

Marking

The following information shall be clearly marked on the interior of the culvert by indentation, waterproof paint, or other approved means:

- Culvert span and rise
- Design earth cover
- Date of manufacture
- Name or trademark of the manufacturer

Sealing

One sealer shall be applied on the top surface of the culvert and shall extend 5' vertically down the sides, except in the keyway. The sealer shall be provided for the full length of the structure. Surface preparation and application procedures shall be as recommended by the sealer manufacturer.

Sealer Alternates:

Penseal 50 as manufactured by: American Metaseal Co.
509 Washington Avenue Carlstadt, New Jersey 07072

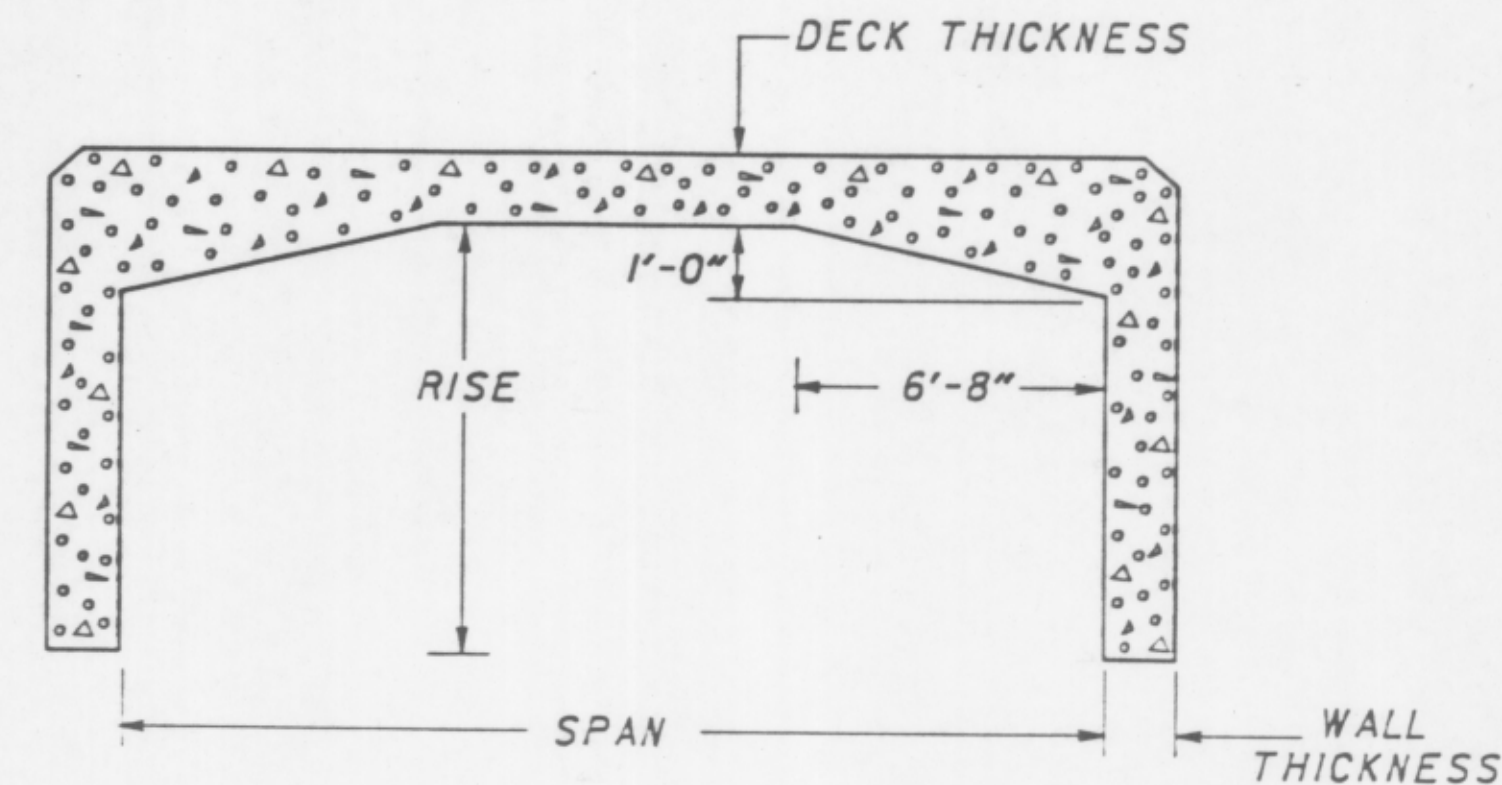
Two coats shall be applied at a rate of one gallon per 120 square feet for each coat. Prior to drying, the second coat shall be seeded with silica sand at 1 1/2 lb. per square yard.
Hydrozo Clear 56 as manufactured by: Hydrozo Coatings Co.
1001 Y Street P.O. Box 80879 Lincoln, Neb. 68501

One coat shall be applied at a rate of one gallon per 100 square feet.

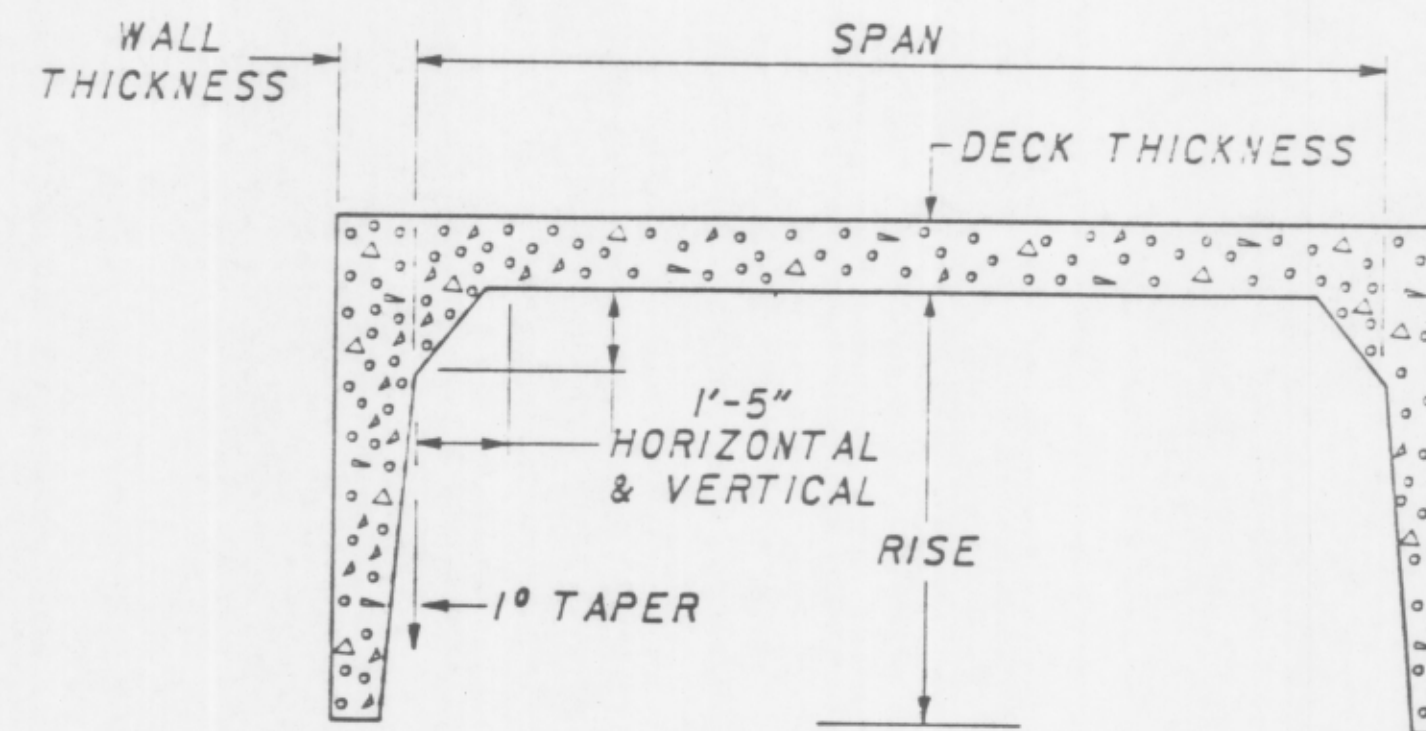
Basis of Payment

The accepted quantity of conduit of the size specified will be paid for at the contract unit price per linear foot, complete in place. Payment will be made under:

| Item | Unit | Description |
|------|-------------|--|
| 603 | Linear Foot | ○ 'span x ○ ' rise Conduit, Type A Precast Reinforced Concrete Flat Topped Three-sided Culvert As Per Plan. |

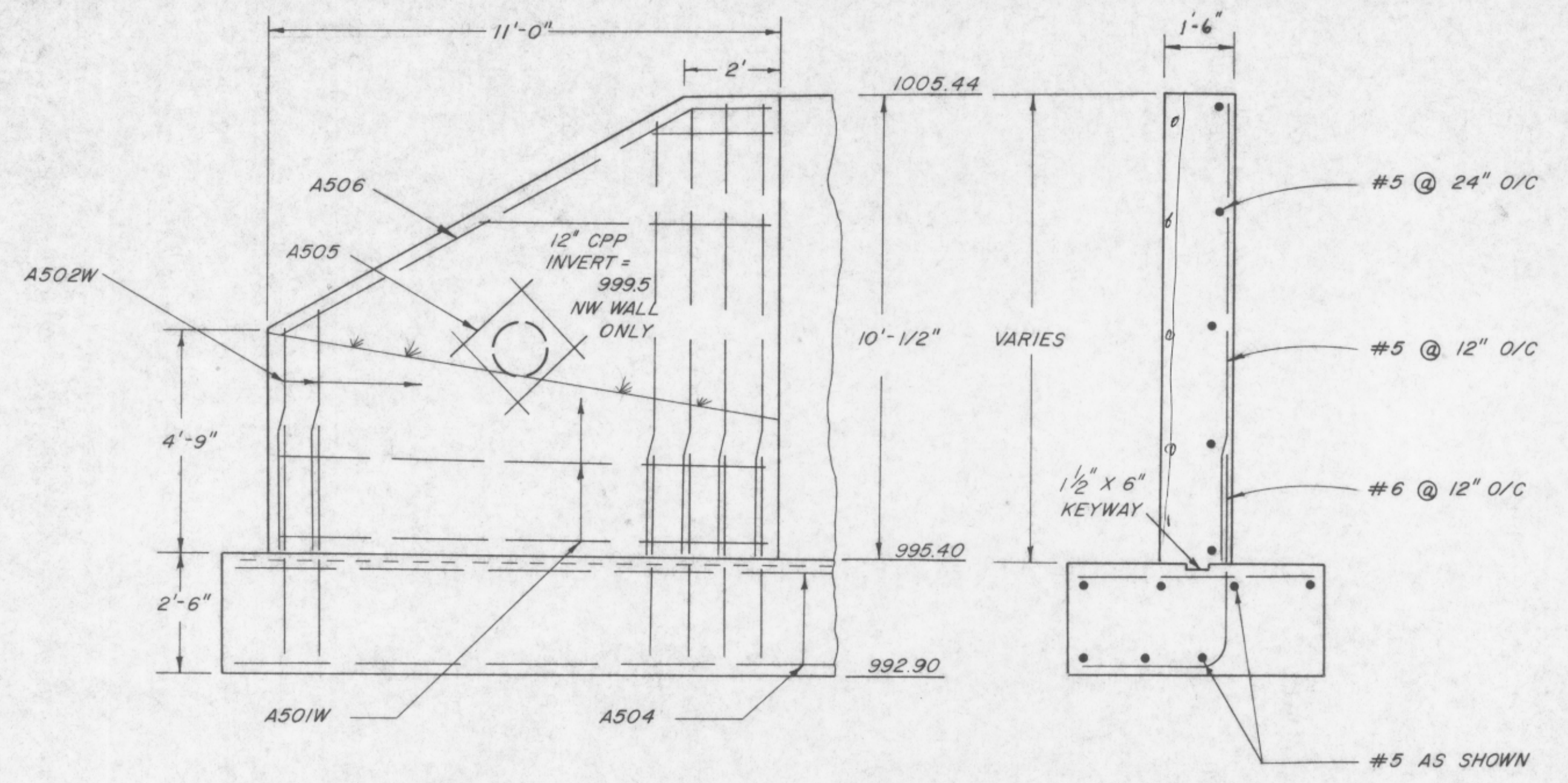
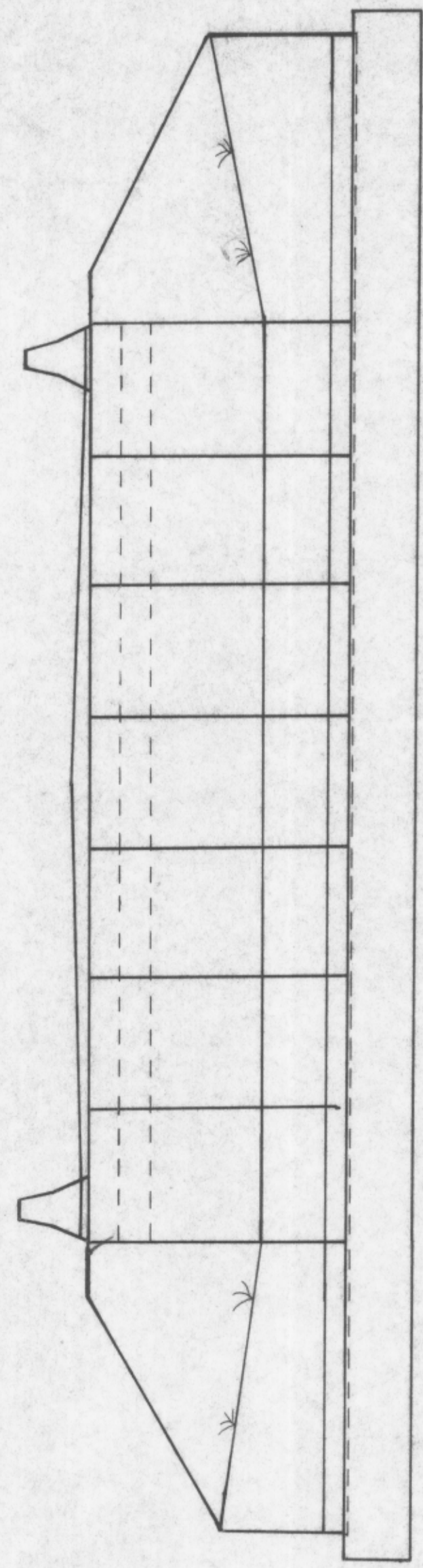
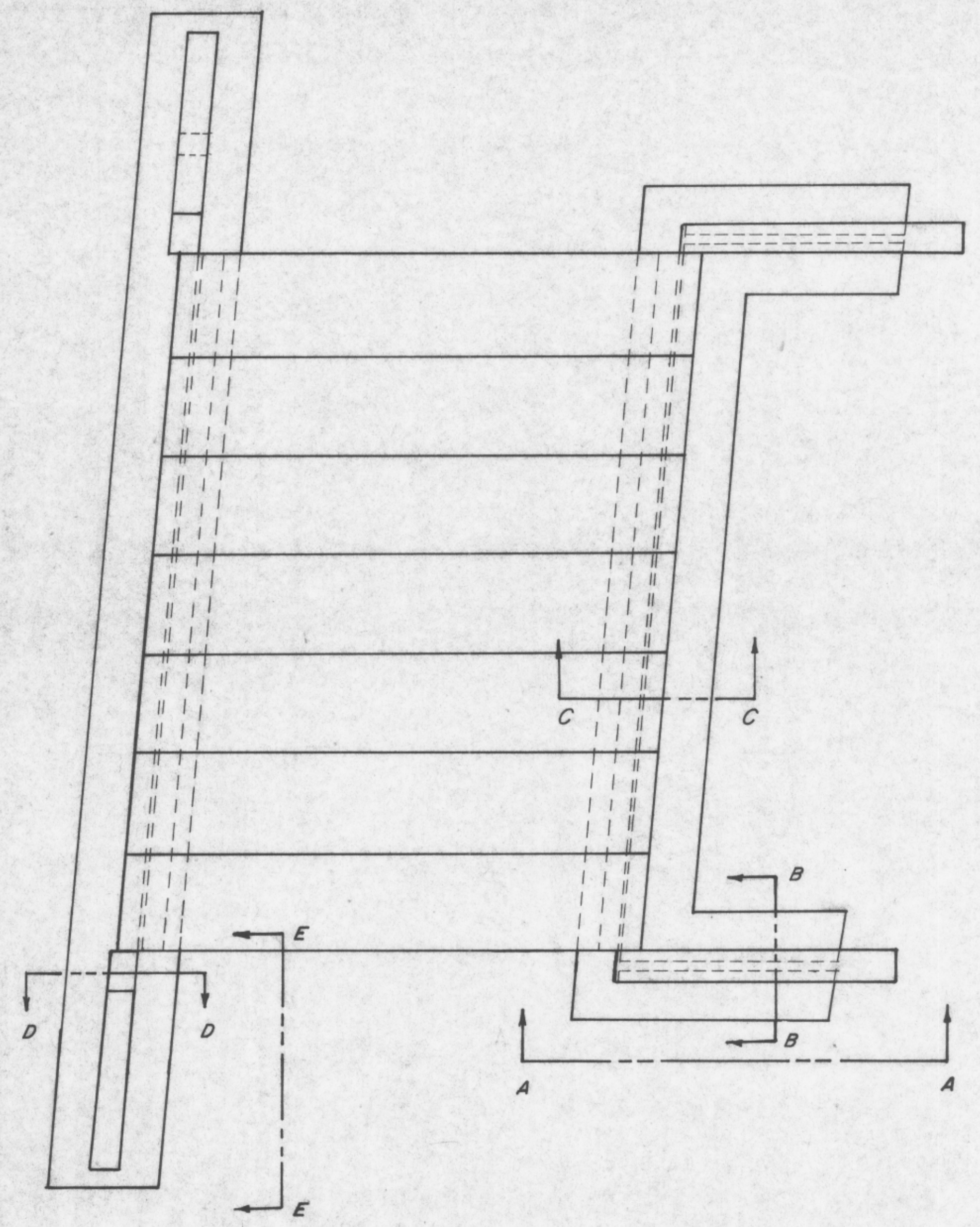


HY-SPAN
As manufactured by
HYWAY CONCRETE PIPE COMPANY
FINDLAY, OHIO



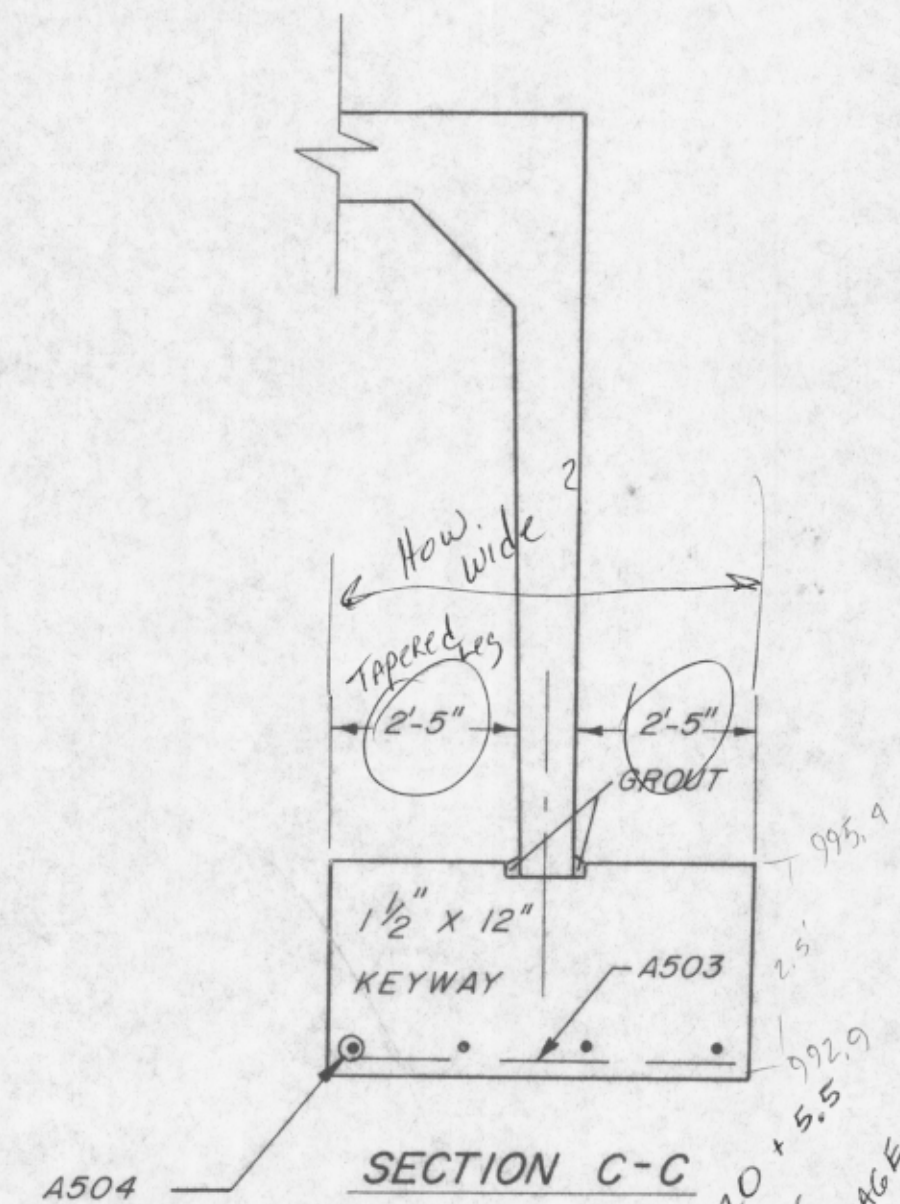
3/S BRIDGE
As manufactured by
PRICE BROTHERS COMPANY
DAYTON, OHIO

PRECAST REINFORCED
CONCRETE FLAT TOPPED
THREE-SIDED CULVERTS



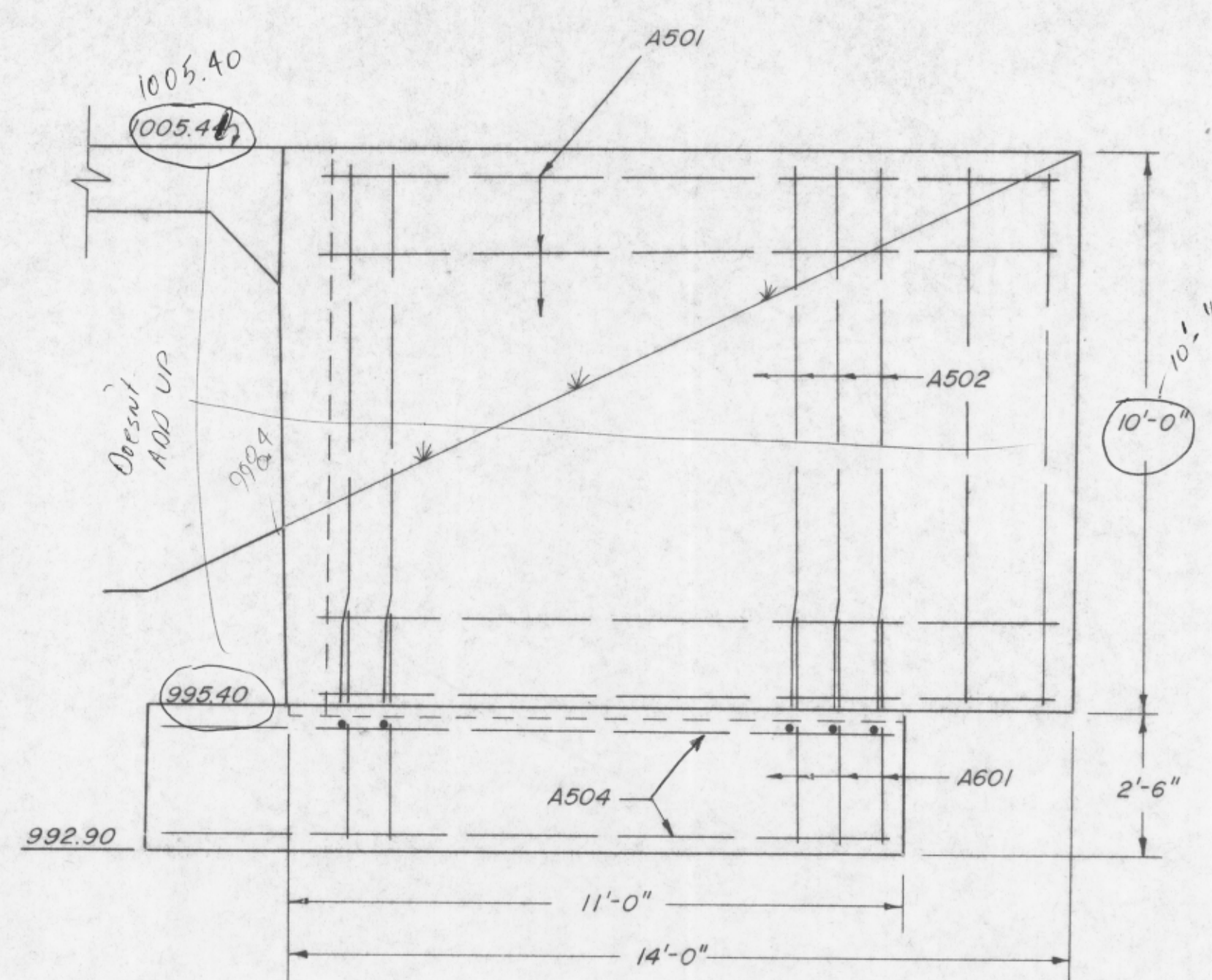
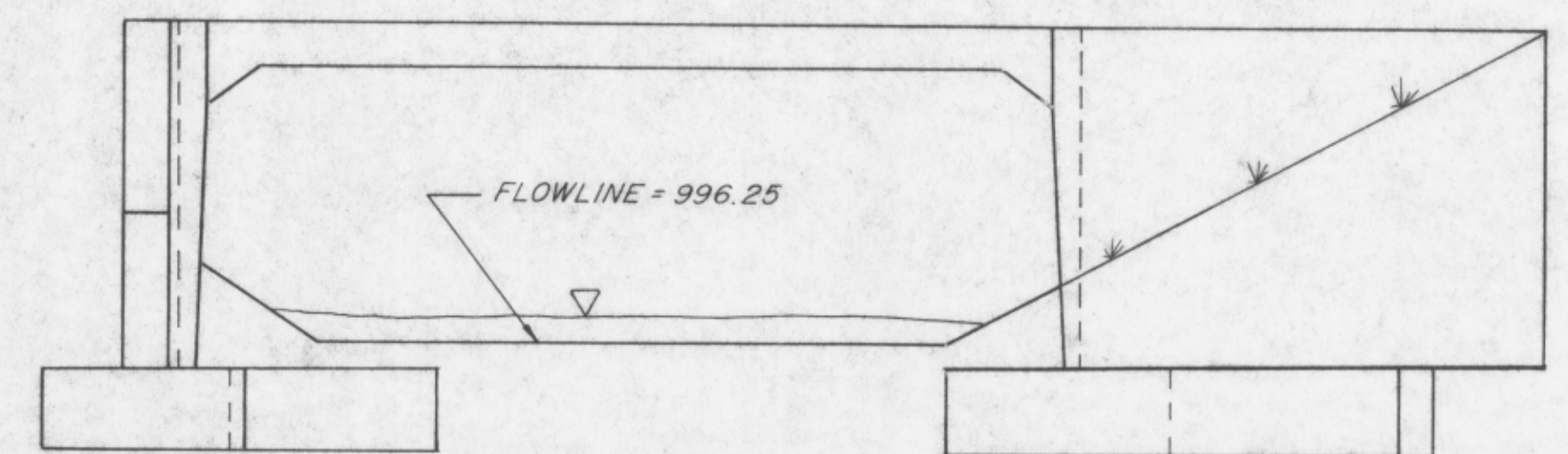
SECTION E-E

SECTION D-D

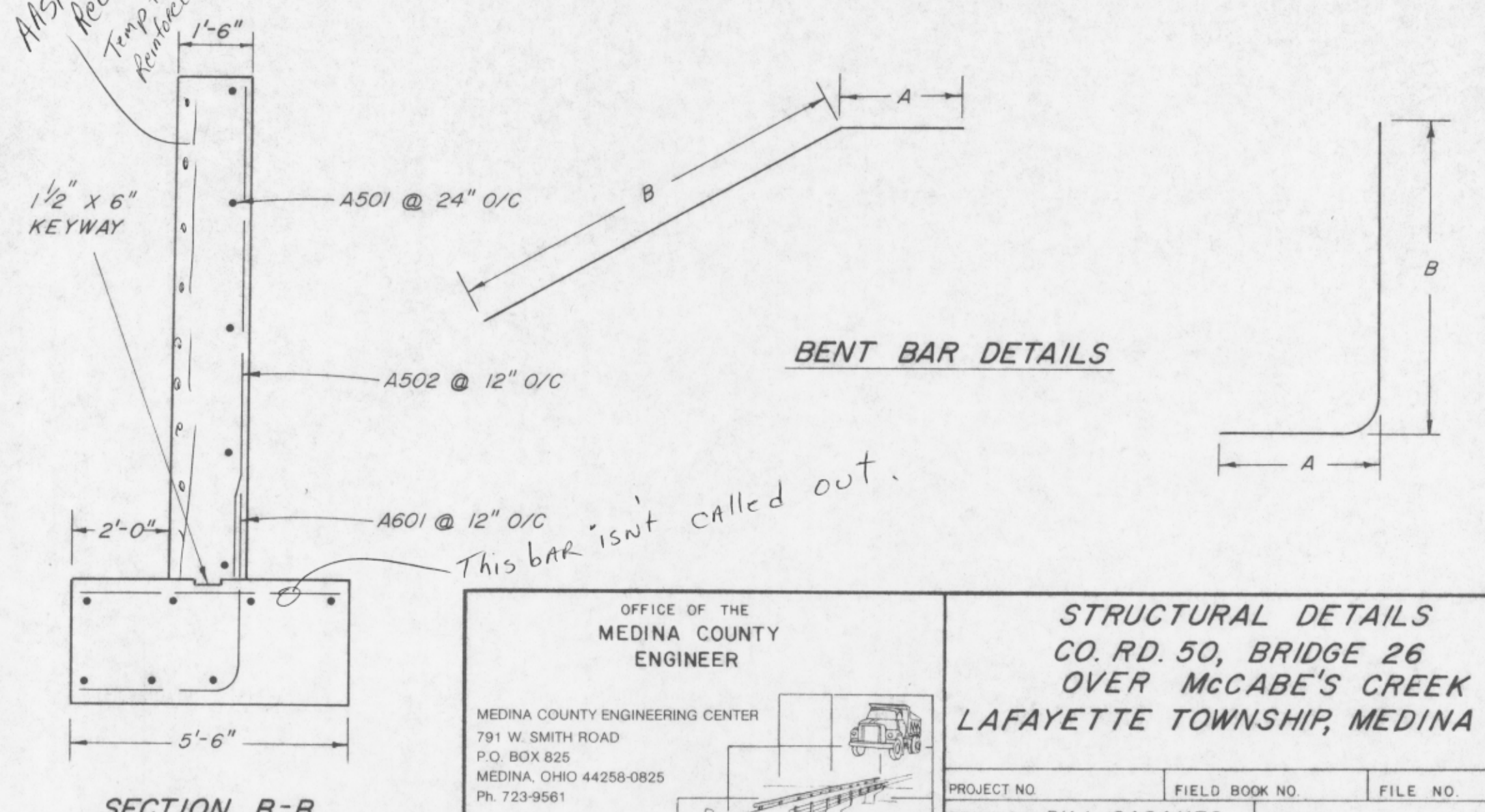


SECTION C-C

| MARK | NUMBER | | LENGTH | TYPE | A | B | WT. (lbs.) | |
|--|--------|------|--------|---------|------|--------|------------|-------|
| | WEST | EAST | | | | | | TOTAL |
| A501 | | 12 | 12 | 13'-6" | STR. | | 169 | |
| A501W | 12 | | 12 | VARIES | STR. | | 95 | |
| A502 | | 28 | 28 | 9'-9" | STR. | | 285 | |
| A502W | 24 | | 24 | VARIES | STR. | | 193 | |
| A503 | 60 | 60 | 120 | 5'-0" | STR. | | 626 | |
| A504 | 7 | 7 | 14 | VARIES | | | 635 | |
| A505 | 4 | | 4 | 2'-0" | STR. | | 9 | |
| A506 | 2 | | 2 | 11'-11" | BENT | 10'-2" | 1'-9" | 25 |
| A601 | 24 | 24 | 48 | 7'-3" | BENT | 3'-0" | 4'-3" | 522 |
| TOTAL REINFORCING STEEL WEIGHT = 2559 lbs. | | | | | | | | |



SECTION A-A

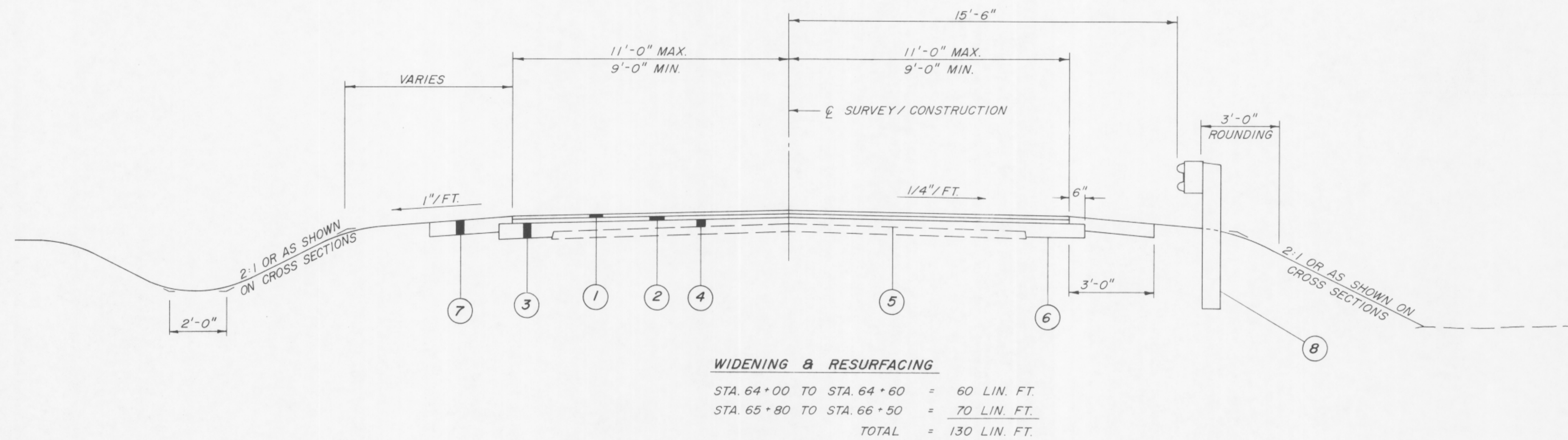
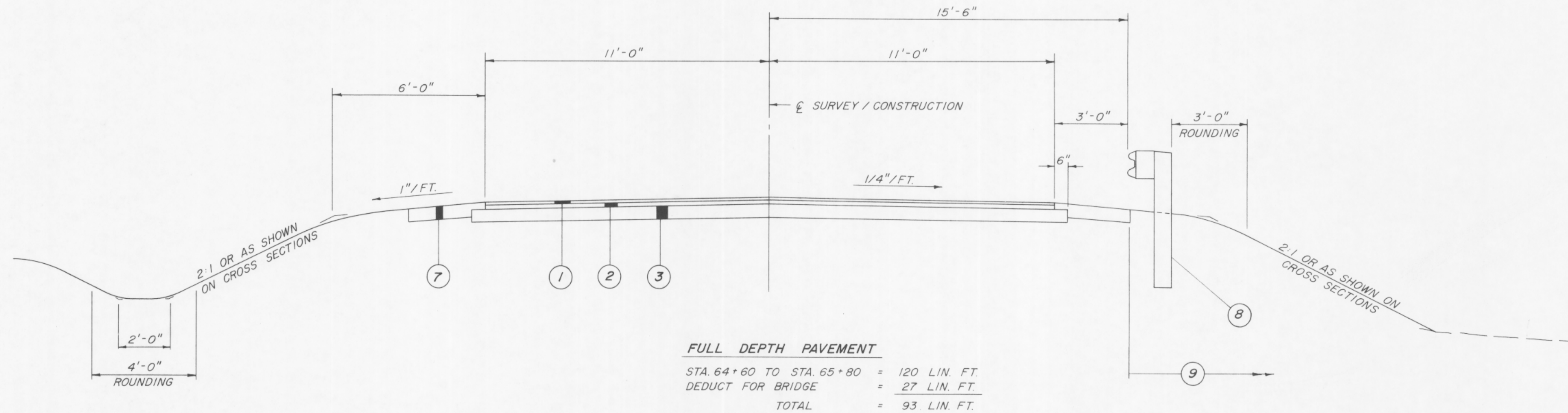


SECTION B-B

BENT BAR DETAILS

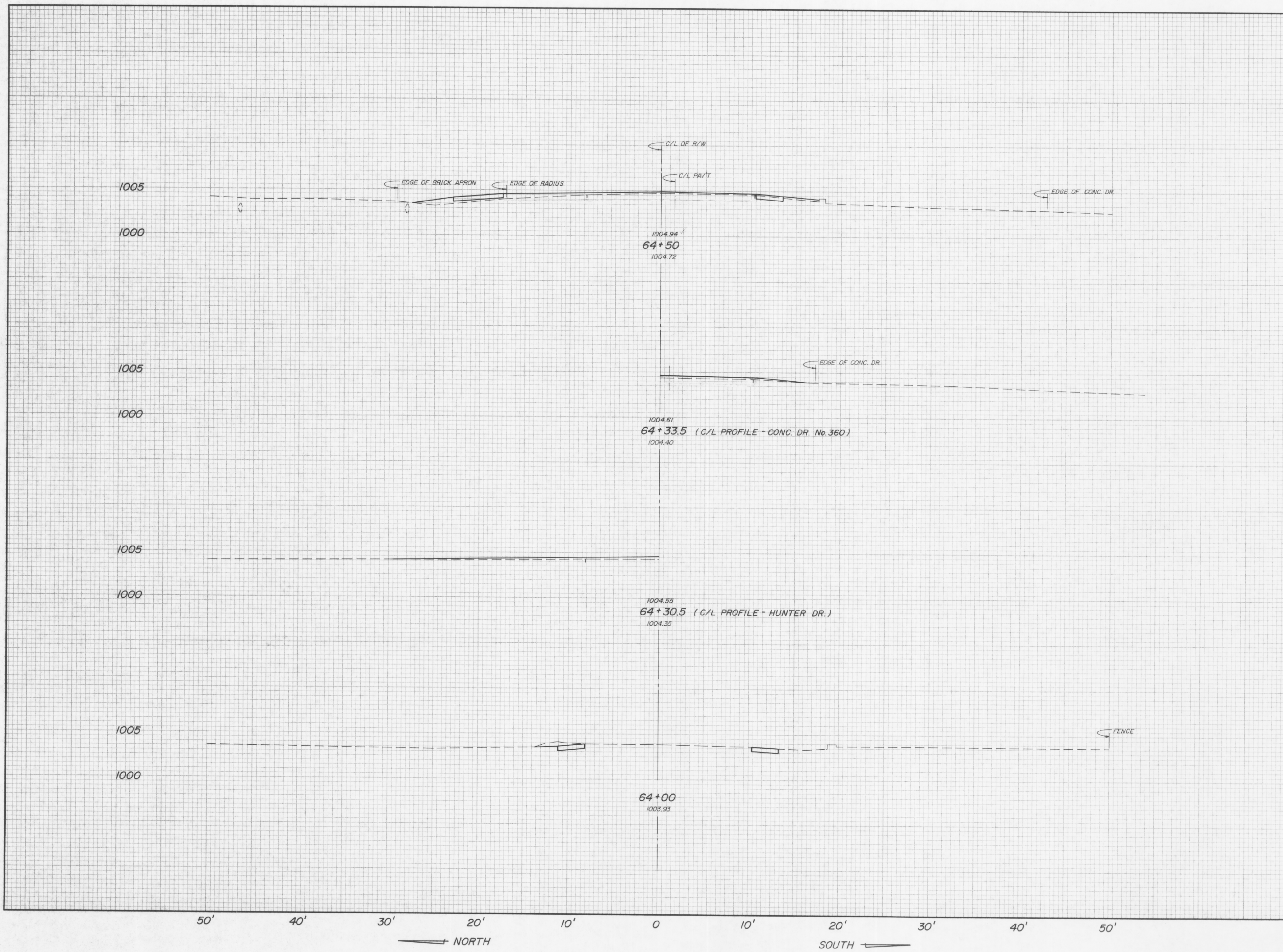
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| OFFICE OF THE MEDINA COUNTY ENGINEER | | STRUCTURAL DETAILS CO. RD. 50, BRIDGE 26 OVER McCABE'S CREEK LAFAYETTE TOWNSHIP, MEDINA CNTY | |
| MEDINA COUNTY ENGINEERING CENTER 791 W. SMITH ROAD P.O. BOX 825 MEDINA, OHIO 44258-0825 Ph. 723-9561 | PROJECT NO. _____ DRAWN BY: BILL SAGANES CHECKED BY: _____ | FIELD BOOK NO. _____ SCALE: _____ DATE: _____ | FILE NO. _____ DATE: _____ DESCRIPTION: _____ DRAWN BY: _____ |

TYPICAL SECTIONS
TYPE 404 ON 301

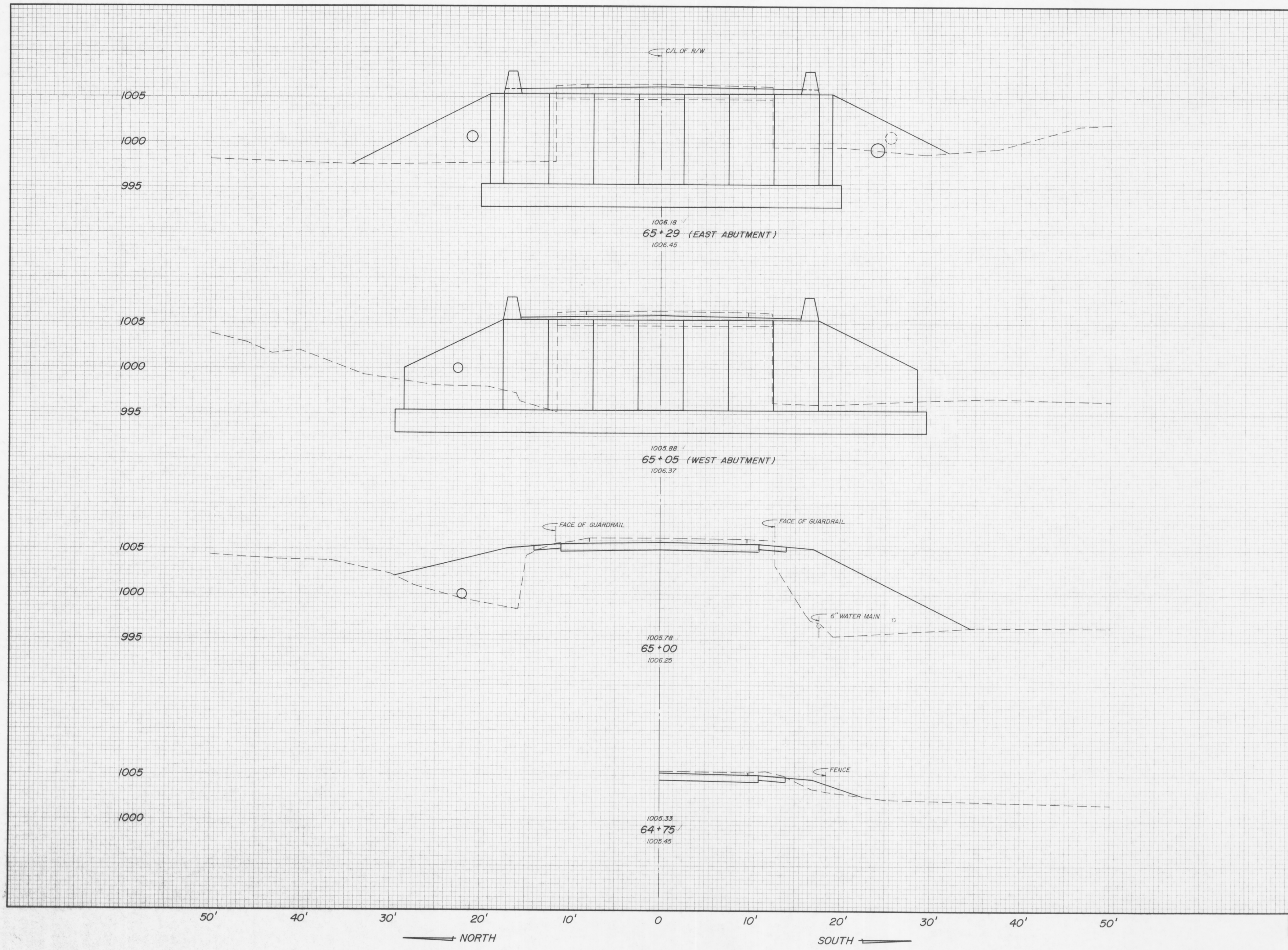


- | | |
|--|----------------------------------|
| ① ITEM 404 - 1 1/4" ASPHALT CONCRETE, AC-20 | ⑥ ITEM 203 - SUBGRADE COMPACTION |
| ② ITEM 402 - 1 3/4" ASPHALT CONCRETE, AC-20 | ⑦ ITEM 304 - 6" AGGREGATE BASE |
| ③ ITEM 301 - 6" BITUMINOUS AGGREGATE BASE, AC-20 | ⑧ ITEM 606 - GUARDRAIL TYPE 5 |
| ④ ITEM 301 - VARIABLE THICKNESS | ⑨ ITEM 659 - SEEDING & MULCHING |
| ⑤ ITEM 407 - TACK COAT | |

| | | | |
|--|------|--|---------------------|
| OFFICE OF THE MEDINA COUNTY ENGINEER | | TYPICAL SECTIONS BRIDGE No. 26, C.H. 50 OVER McCABE'S CREEK | |
| MEDINA COUNTY ENGINEERING CENTER 791 W. SMITH ROAD P.O. BOX 85 MEDINA, OHIO 44256 Ph. 723-3641 | | LAFAYETTE TWP. MEDINA COUNTY | |
| MEDINA COUNTY HIGHWAY GARAGE Ph. 725-0133 | | PROJECT NO. LAF-50-BR.26 | FIELD BOOK NO. 487 |
| MAINTAINING MEDINA COUNTY HIGHWAYS | | DRAWN BY: BILL SAGANES | SCALE: |
| | | CHECKED BY: BILL VIOVODE | DATE: MARCH 6, 1990 |
| REV NO. | DATE | DESCRIPTION | DRAWN BY |



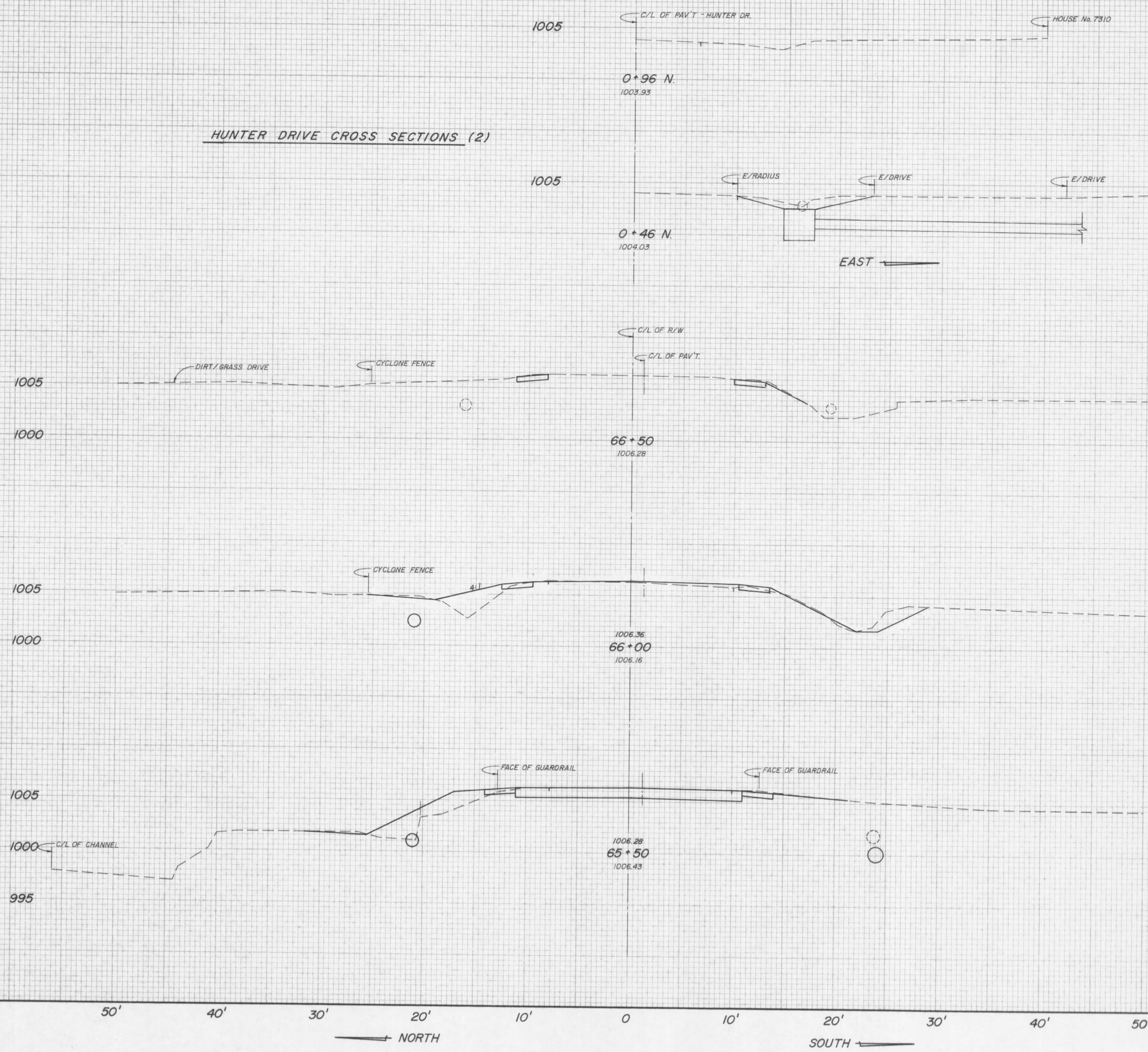
| END AREA (SQ. FEET) | | VOLUME (CU. YDS.) | |
|------------------------|------|----------------------|------|
| CUT | FILL | CUT | FILL |
| 0 | 2 | | |



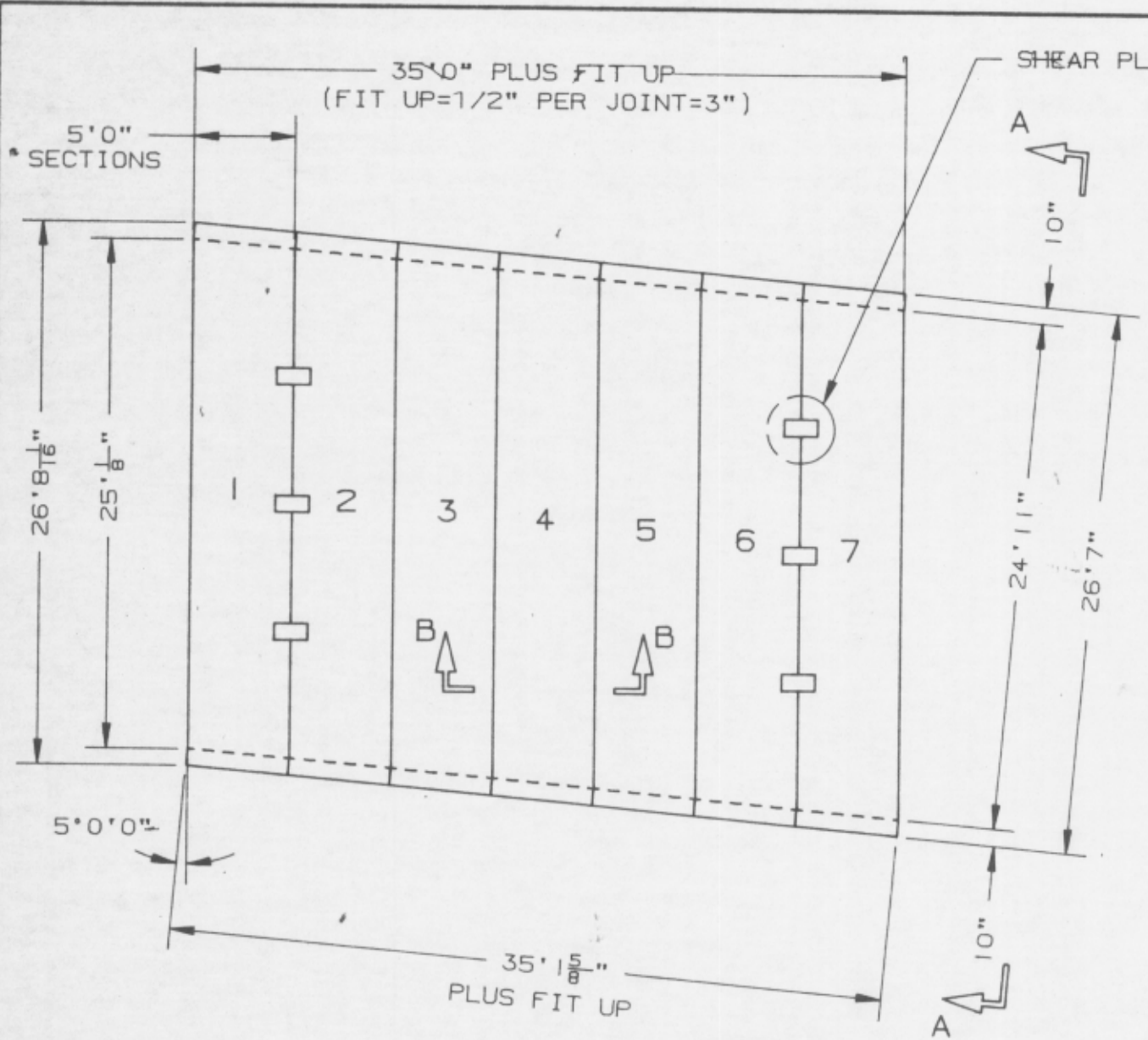
| END AREA (SQ. FEET) | | VOLUME (CU. YDS.) | |
|------------------------|-------|----------------------|------|
| CUT | FILL | CUT | FILL |
| 0 | 100.4 | | |
| 0 | 163.8 | | |
| | | 0 | 154 |

C.H. 50, CHIPPEWA RD - BRIDGE No. 26
CROSS SECTIONS STA. 64+75 - 65+29

HUNTER DRIVE CROSS SECTIONS (2)

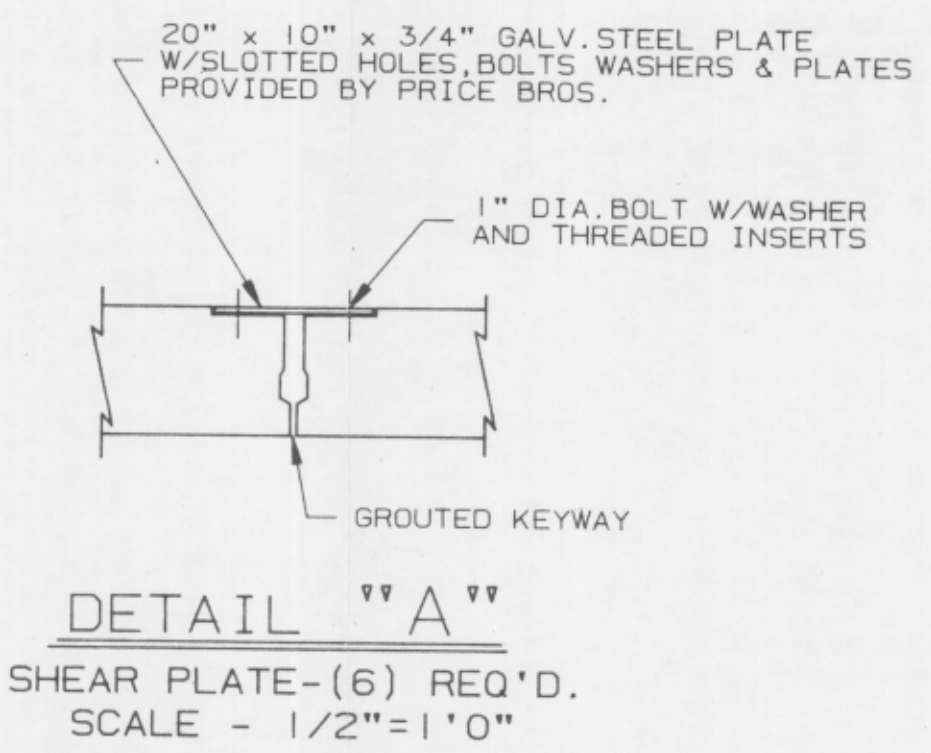


| END AREA (SQ. FEET) | | VOLUME (CU. YDS.) | |
|------------------------|------|----------------------|------|
| CUT | FILL | CUT | FILL |
| 0 | 0 | 8 | 0 |
| 8.5 | 0 | | |
| 0 | 0 | 7 | 11 |
| 7.8 | 11.7 | | |
| | | 7 | 29 |
| 0 | 19.8 | | |
| | | 0 | 34 |



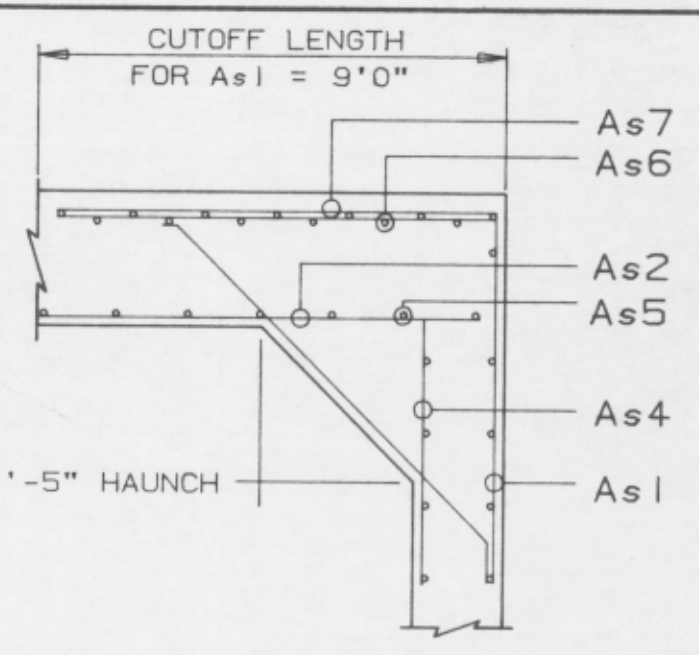
PLAN VIEW
SCALE - 1/8" = 1'0"

SHEAR PLATE - DETAIL "A"



DETAIL "A"
SHEAR PLATE - (6) REQ'D.
SCALE - 1/2" = 1'0"

| MARK | STEEL AREA |
|------|---------------------------|
| As1 | 1.046 IN ² /FT |
| As2 | 0.927 IN ² /FT |
| As4 | 0.240 IN ² /FT |
| As5 | 0.336 IN ² /FT |
| As6 | 0.336 IN ² /FT |
| As7 | 0.336 IN ² /FT |

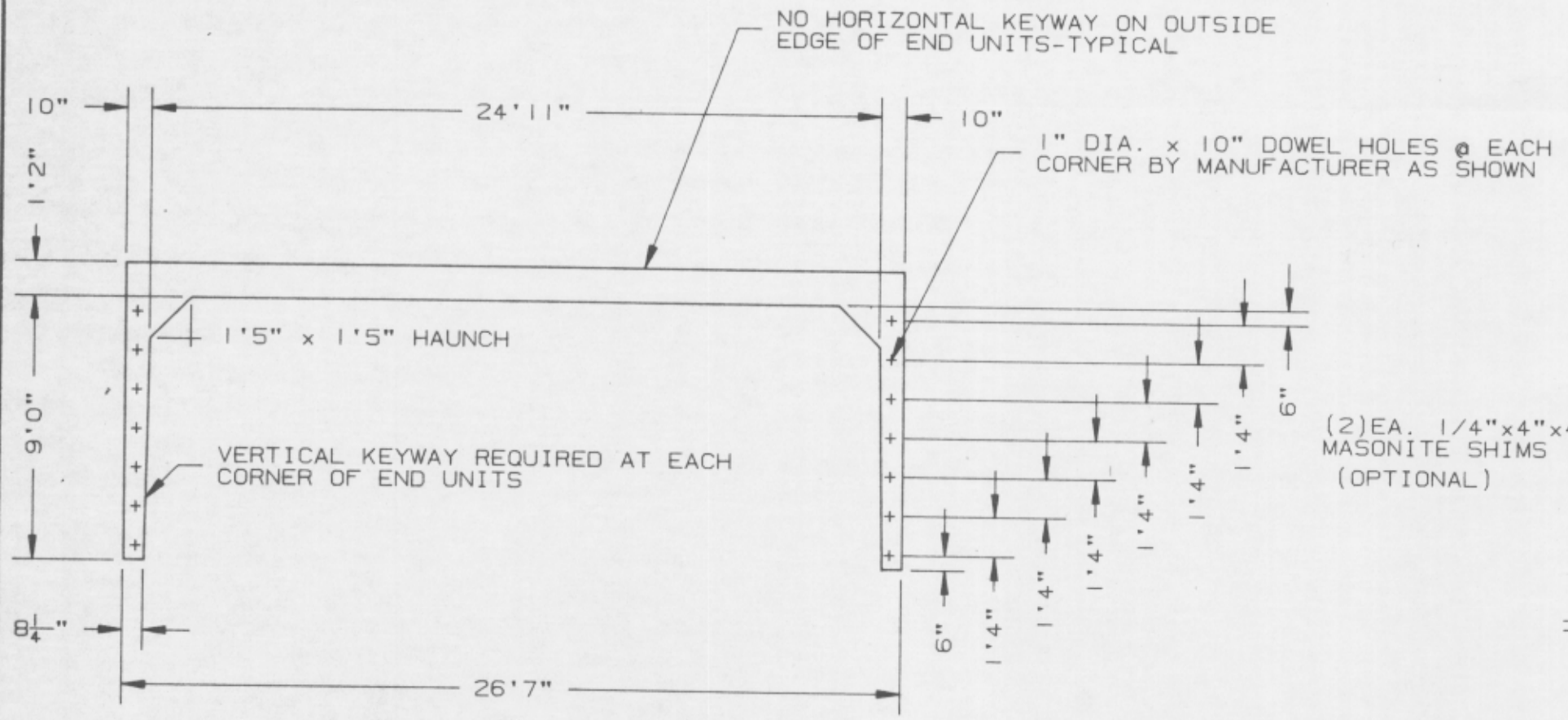


REINFORCING DETAIL
SCALE = NONE

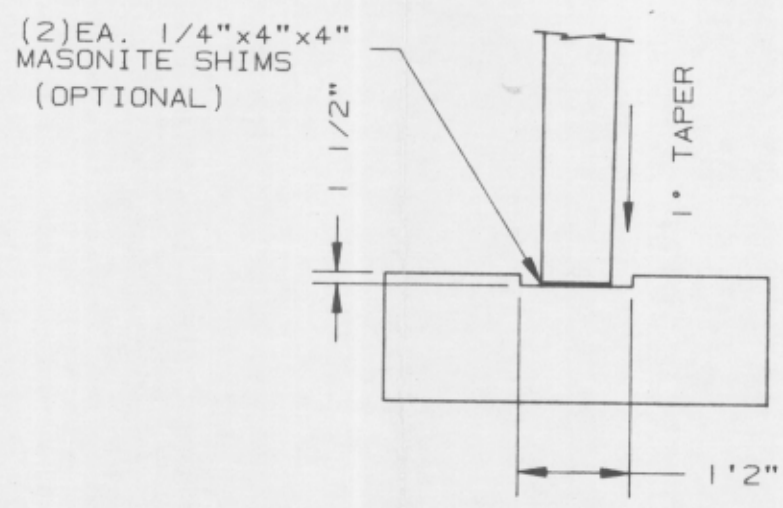
GENERAL NOTES :

- DESIGN LOADING: INTERSTATE PER AASHTO; PIN/PIN SUPPORT
- HEIGHT OF FILL OVER CULVERT IS 0'0" PLUS PAVEMENT T = 4 1/2"
- CONCRETE=5000 PSI STEEL= 65,000 PSI; WELDED WIRE FABRIC
- WEIGHT= 17.6 TONS PER PIECE
- SERVICE FORCES FOR FOOTING:

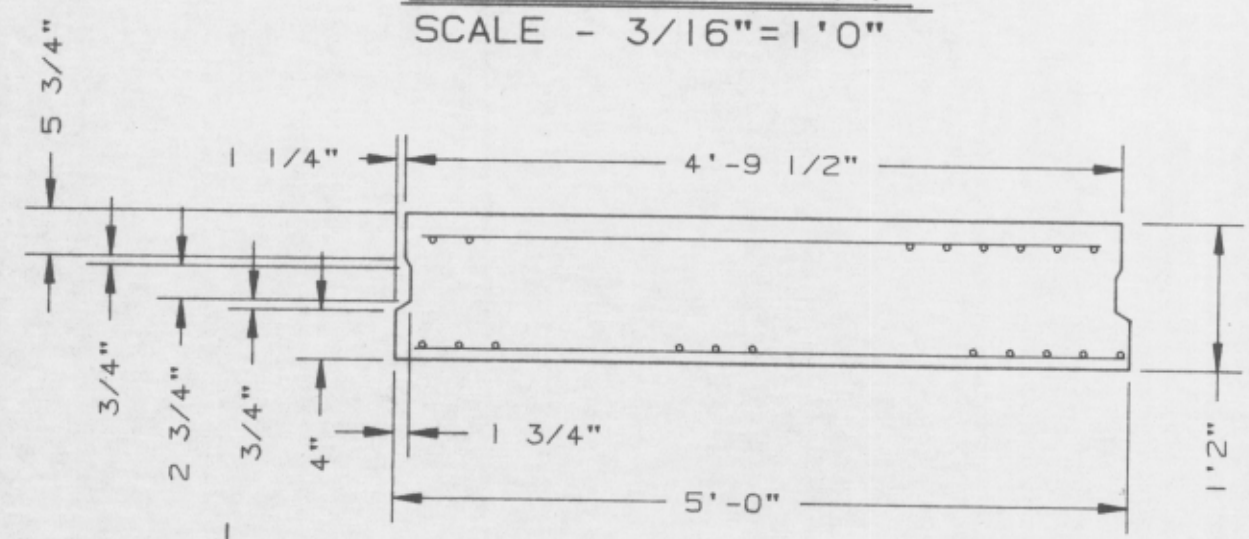
| | LIVE | DEAD |
|--------------------------|----------|----------|
| INWARD HORIZONTAL FORCE | 1.2 K/FT | 1.0 K/FT |
| OUTWARD HORIZONTAL FORCE | 1.5 K/FT | 1.6 K/FT |
| VERTICAL FORCE | 6.7 K/FT | 3.5 K/FT |
- CONCRETE COVER OVER TOP MAT REINFORCEMENT IN DECK= 2"
CONCRETE COVER OVER SIDE WALL, OUTSIDE FACE= 2"
ALL OTHER CONCRETE COVER TO BE 1"
- AIR ENTRAINMENT= 4% ± 1%
- IN LIEU OF EPOXY COATED STEEL REINFORCING, A CALCIUM NITRITE-BASED CORROSION INHIBITING CONCRETE ADMIXTURE MAY BE USED. THE ADMIXTURE SHALL CONFORM TO ASTM C 494 TYPE C. THE CALCIUM NITRITE SHALL BE A MINIMUM OF 2% CALCIUM NITRITE SOLIDS BY WEIGHT OF CEMENT.
- TOP EXTERIOR OF STRUCTURE TO BE SHOP COATED WITH HYDROZO 56 CLEAR AT A RATE OF 100 FT²/GAL. AND TO EXTEND 5'-0" DOWN OUTSIDE LEG.



VIEW A-A
SCALE - 3/16" = 1'0"



TYP. FOOTING SKETCH
SCALE = 3/8" = 1'-0"



SECTION B-B
SCALE = NONE

MEDINA CO. ENGR. APPR. _____ DATE _____
CONTRACTOR APPR. *[Signature]* DATE 5-9-90

CONTRACTOR ; *MAY 7 1990*
KEY CORP.
P.O. 383
CRESTON, OHIO 44217
216/435-6356

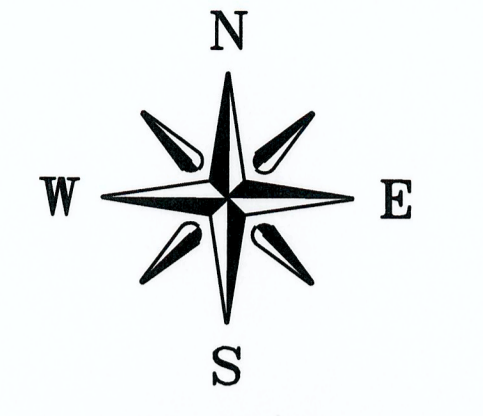
NOTICE OF CONFIDENTIAL INFORMATION
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL AND IS PROPRIETARY TO PRICE BROTHERS COMPANY. WHERE FURNISHED WITH A PROPOSAL THE RECIPIENT SHALL USE IT SOLELY TO EVALUATE THE PROPOSAL. WHERE FURNISHED TO A CUSTOMER, IT SHALL BE USED SOLELY FOR PURPOSES OF INSPECTION, INSTALLATION OR MAINTENANCE. WHERE THE PERFORMANCE OF WORK CONTRACTED FOR BY THIS COMPANY, THE INFORMATION SHALL NOT BE USED OR DISCLOSED BY THE RECIPIENT FOR ANY OTHER PURPOSE WHATSOEVER. PRICE BROTHERS COMPANY RESERVES THE RIGHT TO UTILIZE ALL REMEDIES UNDER STATE AND FEDERAL LAW IF THIS CONFIDENTIAL INFORMATION IS USED OR DISCLOSED BY THE RECIPIENT IN AN UNLAWFUL MANNER.

| | | | |
|---|--------------------------|--------------|------|
| B | | | |
| A | | | |
| SYM | CHANGE NO. | BY | DATE |
| PRICE BROTHERS CO. DAYTON, OHIO | | | |
| CHIPPAWA BRIDGE MEDINA CO., OHIO 35LF OF 25'x9' - 5' LEFT FORWARD | | | |
| MACHINING TOLERANCE UNLESS OTHERWISE SPECIFIED | SCALE NOTED | DATE 4/26/90 | |
| FRACTIONAL DECIMAL ANGLE | DRAWN G. HAGEDORN | DRAWING NO. | |
| ± 1/64 ± .010 ± 2° | CHKD. <i>[Signature]</i> | 47836-C | |
| | APPR. <i>[Signature]</i> | | |

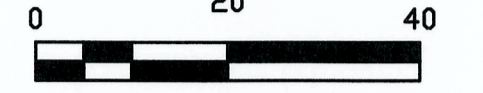
USED ON

APPENDIX B. PRELIMINARY SURVEY

C.H. 50 CHIPPEWA ROAD R/W VARIES



BASIS OF BEARINGS
GRID NORTH OF THE NORTH ZONE OF THE
OHIO STATE PLANE COORDINATE SYSTEM

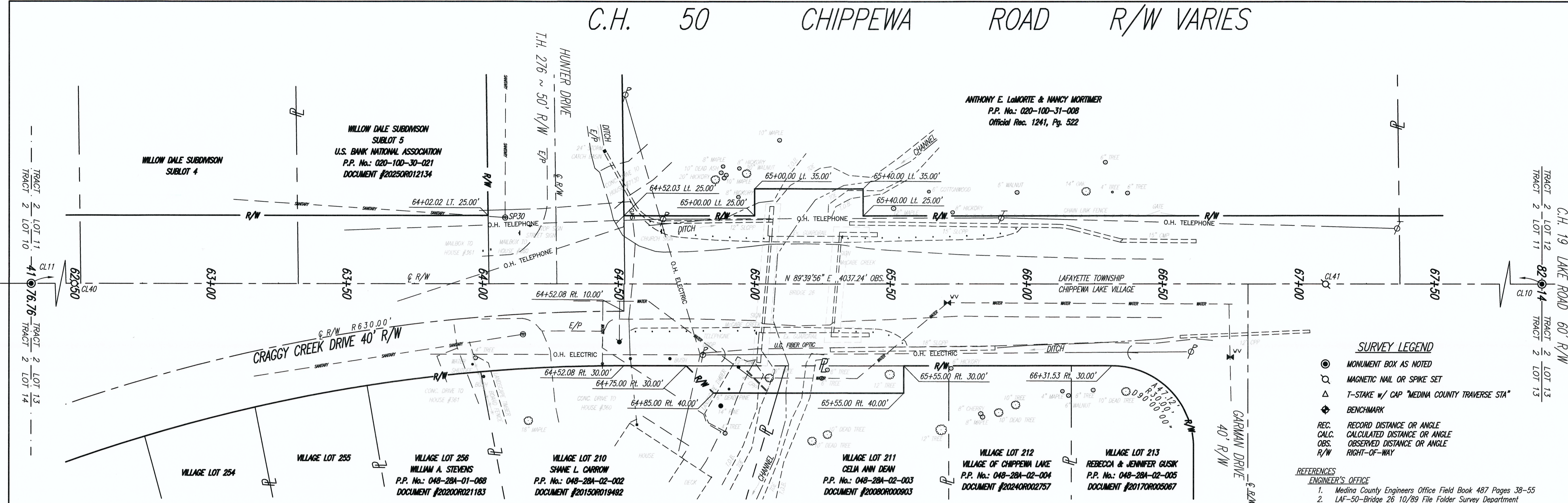


LEGEND—LINE WORK/SYMBOLS

| | | |
|-----------------------|-----|----------------|
| EXISTING FEATURES | --- | --- |
| PROPERTY LINE | --- | --- |
| LOT LINE | --- | --- |
| OVERHEAD ELECTRIC | --- | O.H. ELECTRIC |
| UNDERGROUND ELECTRIC | --- | U.G. ELECTRIC |
| OVERHEAD TELEPHONE | --- | O.H. TELEPHONE |
| UNDERGROUND TELEPHONE | --- | U.G. TELEPHONE |
| GAS LINE | --- | GAS |
| SEWER | --- | SEWER |
| WATERLINE | --- | WATER |
| UTILITY POLE | ⊕ | TELEPHONE POLE |
| GUY WIRE | ⌒ | WATER SHUT OFF |
| GAS VALVE | ⊕ | WATER VALVE |
| GAS LINE MARKER | ⊕ | FIRE HYDRANT |
| GAS METER | ⊕ | WATER METER |

SURVEY LEGEND

- ⊕ MONUMENT BOX AS NOTED
 - ⊕ MAGNETIC NAIL OR SPIKE SET
 - ⊕ T-STAKE w/ CAP "MEDINA COUNTY TRAVERSE STA"
 - ⊕ BENCHMARK
 - REC. RECORD DISTANCE OR ANGLE
 - CALC. CALCULATED DISTANCE OR ANGLE
 - OBS. OBSERVED DISTANCE OR ANGLE
 - R/W RIGHT-OF-WAY
- REFERENCES**
- ENGINEER'S OFFICE**
- Medina County Engineers Office Field Book 487 Pages 38-55
 - LAF-50-Bridge 26 10/89 File Folder Survey Department
 - Survey Book 7 Page 1176
- RECORDERS' OFFICE**
- All deeds and plats references shown hereon are recorded in the Medina County Recorder's Office.
- Plot Book 4 Page 5 ~ Briarwood Beach
 - Plot Book 4 Page 22 ~ Willow Dale
 - Plot Book 6 Page 16 ~ Willow Dale
 - Plot Book 8 Page 186 ~ Chippewa Lake Village HIGHWAY EASEMENTS
 - Official Record Book 542 Page 303
 - Official Record Book 542 Page 306
 - Official Record Book 556 Page 464
 - Official Record Book 557 Page 628



SURVEY AND UTILITY NOTES

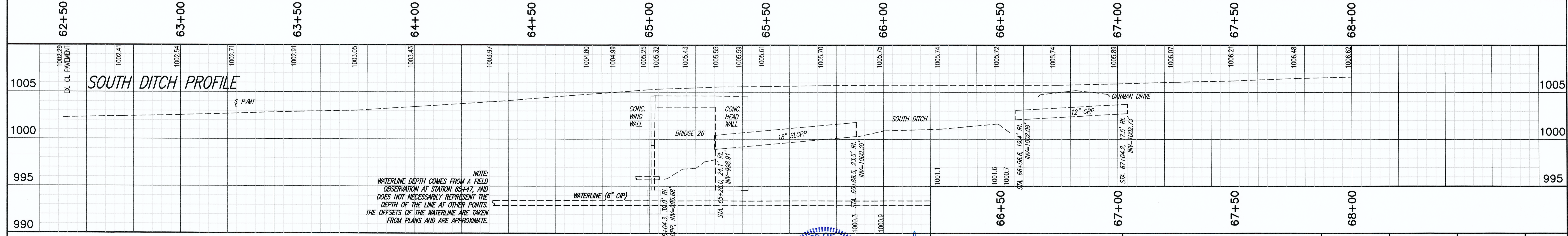
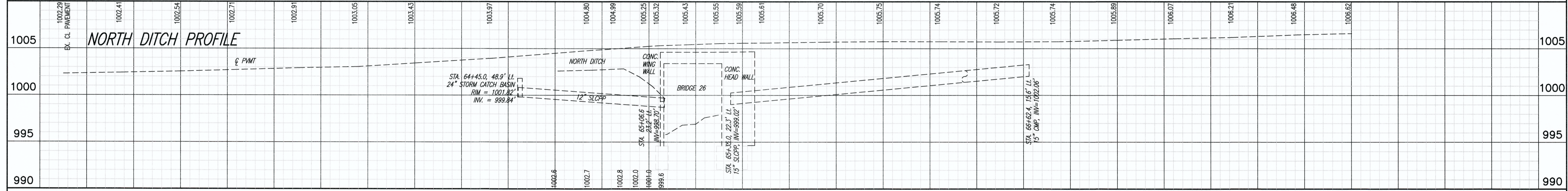
- Topographic and Right-of-Way Surveys were completed between August 18, 2021 and August 24, 2021.
- Utilities shown hereon are located from field observations, record plans, and markings from O.U.P.S field ticket number A123200961.
- Utility Poles shown hereon are owned by Ohio Edison Company (OEC). These poles carry aerial electric and communications lines.
- The gasoline shown hereon was located from field markings and is owned by Columbia Gas of Ohio.
- The waterline shown hereon was located from field markings, an atlas provided by Medina County Sanitary Engineers, and an observation taken July 25, 2023. The pipe appears to run south of the Bridge, but the extent of the offset was not confirmed.
- U.G. fiber optics line is owned by ACD.NET / ACD TELECOM per the positive response OUPS report.
- An excavation was made to locate the waterline, south of Bridge 26. The pipe is a 6" CIP. The elevation observed at the point of excavation was used for the entire pipe.

BENCHMARK DESCRIPTION

BM# 1
"BE" IN THE WORD "ALBERT"
SE SIDE OF HYDRANT
STATION 64+51.0, 21.8' R.
Elevation = 1005.45' (NAVD 88)

| Point | Northing | Easting | Elevation | Description | Station | Offset |
|-----------|------------|-------------|-----------|---|----------|------------|
| CL10 | 514320.016 | 2134390.716 | 1041.54 | MON. BOX w/ 3/4" REBAR w/ RED CAP, OVER STONE | 82+14.00 | 0.00 |
| CL11 | 514296.457 | 2130353.545 | 989.06 | MON. BOX w/ 3/4" REBAR w/ RED CAP, OVER STONE | 41+76.76 | 0.00 |
| CL40 | 514308.557 | 2132426.749 | 1002.26 | MAG SET ON CENTERLINE RIGHT OF WAY | 62+50 | 0.00 |
| CL41 | 514311.239 | 2132886.739 | 1005.95 | MAG SET ON CENTERLINE RIGHT OF WAY | 67+10 | 0.00 |
| SP30 | 514332.786 | 2132584.882 | 1002.67 | CROSS CUT SET SOUTH RIM SANITARY MANHOLE | 64+08.27 | 23.31' LI. |
| SP32 (BM) | 514287.916 | 2132627.881 | 1005.45 | "BE" IN ALBERT ON HYDRANT FLANGE ~ DATE 1981 | 64+51.0 | 21.8' R. |

SURVEY CONTROL WAS ESTABLISHED UTILIZING RTK GPS BASE ROVER WITH BASE STATION PLACED AT MEDINA COUNTY SURVEY MONUMENT LF19 (AKA POINT 19)
GRID COORDINATE VALUE NORTH:521506.828 EAST:2131323.532, HORIZONTAL DATUM: NAD83(2007) OHIO NORTH OF THE OHIO STATE PLANE COORDINATE SYSTEM.
THE POINTS IN THE ABOVE TABLE WERE SCALED TO GROUND AT POINT #10 A MONUMENT BOX WITH 3/4" REBAR WITH RED CAP INSERT OVER THE BAR.
THE GROUND TO GRID COMBINED SCALE FACTOR IS 0.9998947.



62+50 63+00 63+50 64+00 64+50 65+00 65+50 66+00 66+50 67+00 67+50 68+00

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791 W. SMITH ROAD
P.O. BOX 825
MEDINA, OHIO 44258-0825
PHONE (330) 723-9561

MEDINA COUNTY ENGINEERS

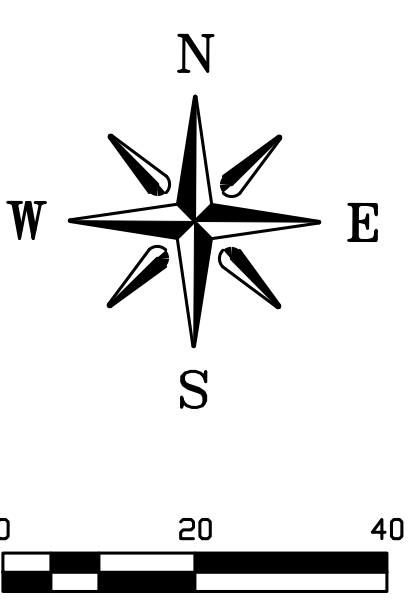
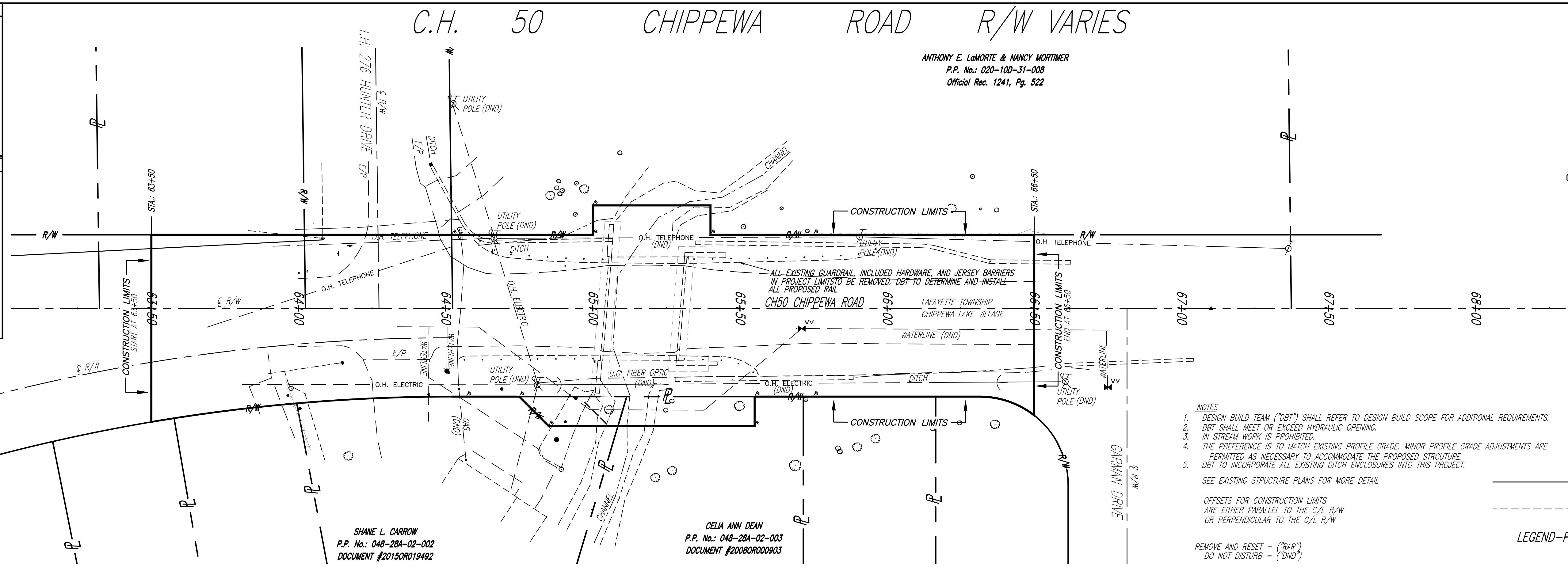
C.H. 50 CHIPPEWA ROAD
BRIDGE 26
PRELIMINARY SURVEY,
PLAN & PROFILE

| | | | |
|-------------------|----------------|------------------------|------|
| PROJECT NO. | FIELD BOOK NO. | DATE: 09/21 | PAGE |
| DRAWN BY | | HORIZ. SCALE: 1" = 20' | 1 |
| CHECKED BY | | VERT. SCALE: 1" = 5' | |
| COMPUTER FILE NO. | | | |
| REV. NO. | DRAWN BY | DESCRIPTION | OF |
| | | | 1 |

APPENDIX C. SITE PLAN

EXISTING STRUCTURE
 TYPE: 3-SIDED PRECAST CONCRETE BOX
 CLEAR SPAN: 25'-0"
 CULVERT LENGTH: 35'-0"
 ROADWAY: VARIES UP TO 20'-0"
 WEARING COURSE: ASPHALT
 APPROACH SLAB: NONE
 SKEW: 85° 18' LT.
 YEAR BUILT: 1990
 ALIGNMENT: -
 EXISTING STRUCTURAL FILE NUMBER: 5244307

PROPOSED STRUCTURE
 TYPE: TO BE DETERMINED BY THE DESIGN BUILD TEAM. REFER TO THE DESIGN BUILD SCOPE FOR ADDITIONAL REQUIREMENTS AND ACCEPTABLE BRIDGE TYPES.



NOTES

- DESIGN BUILD TEAM ("DBT") SHALL REFER TO DESIGN BUILD SCOPE FOR ADDITIONAL REQUIREMENTS.
- DBT SHALL MEET OR EXCEED HYDRAULIC OPENING.
- IN STREAM WORK IS PROHIBITED.
- THE PREFERENCE IS TO MATCH EXISTING PROFILE GRADE. MINOR PROFILE GRADE ADJUSTMENTS ARE PERMITTED AS NECESSARY TO ACCOMMODATE THE PROPOSED STRUCTURE. DBT TO INCORPORATE ALL EXISTING DITCH ENCLOSURES INTO THIS PROJECT.
- SEE EXISTING STRUCTURE PLANS FOR MORE DETAIL.

OFFSETS FOR CONSTRUCTION LIMITS ARE EITHER PARALLEL TO THE C/L R/W OR PERPENDICULAR TO THE C/L R/W

REMOVE AND RESET = ("RAR")
 DO NOT DISTURB = ("DND")

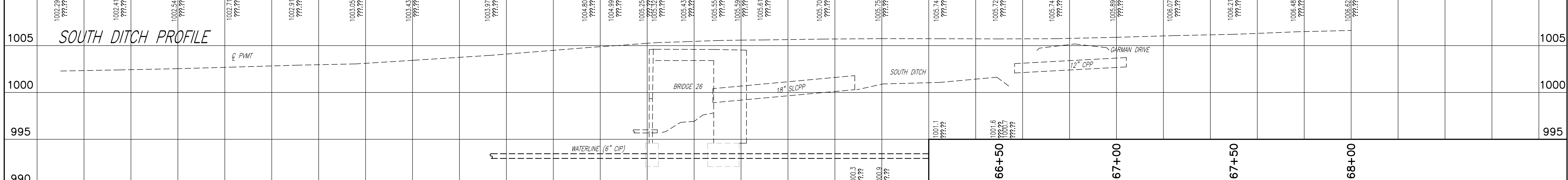
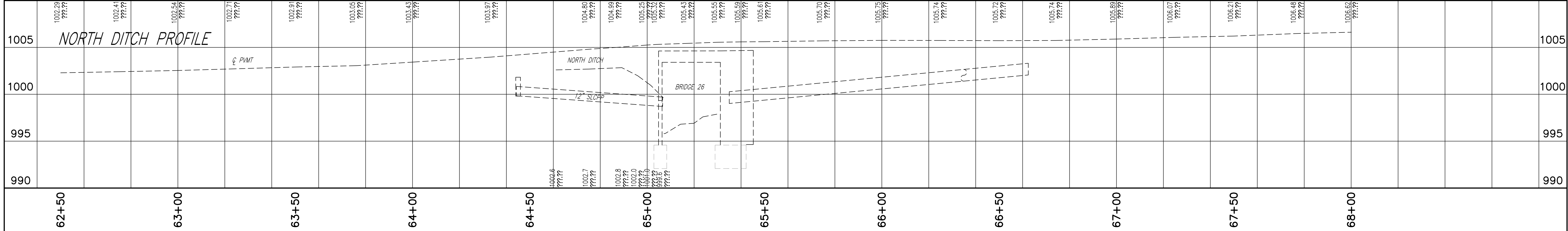
LEGEND—PROPOSED CONSTRUCTION WORK
 ——— NEW CONSTRUCTION
 - - - - - EXISTING FEATURES

SURVEY AND UTILITY NOTES

- Topographic and Right-of-Way Survey was completed between August 18, 2021 and August 24, 2021.
- Utilities shown hereon are located from field observations, record plans, and markings from D.U.P.S. field ticket number A123200961.
- Utility Poles shown hereon are owned by Ohio Edison Company (OEC). These poles carry aerial electric and communications lines.
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- U.G. fiber optics line is owned by ACD.NET / ACD TELECOM per the positive response OUPS report.
- An excavation was made to locate the waterline, south of Bridge 26. The pipe is a 6" CIP. The elevation observed at the point of excavation was used for the entire pipe.

BENCHMARK DESCRIPTION

BM# 1
 "BE" IN THE WORD "ALBERT"
 SE SIDE OF HYDRANT
 STATION 64+51.0, 21.8' Rt.
 Elevation = 1005.47' (NAVD 88)



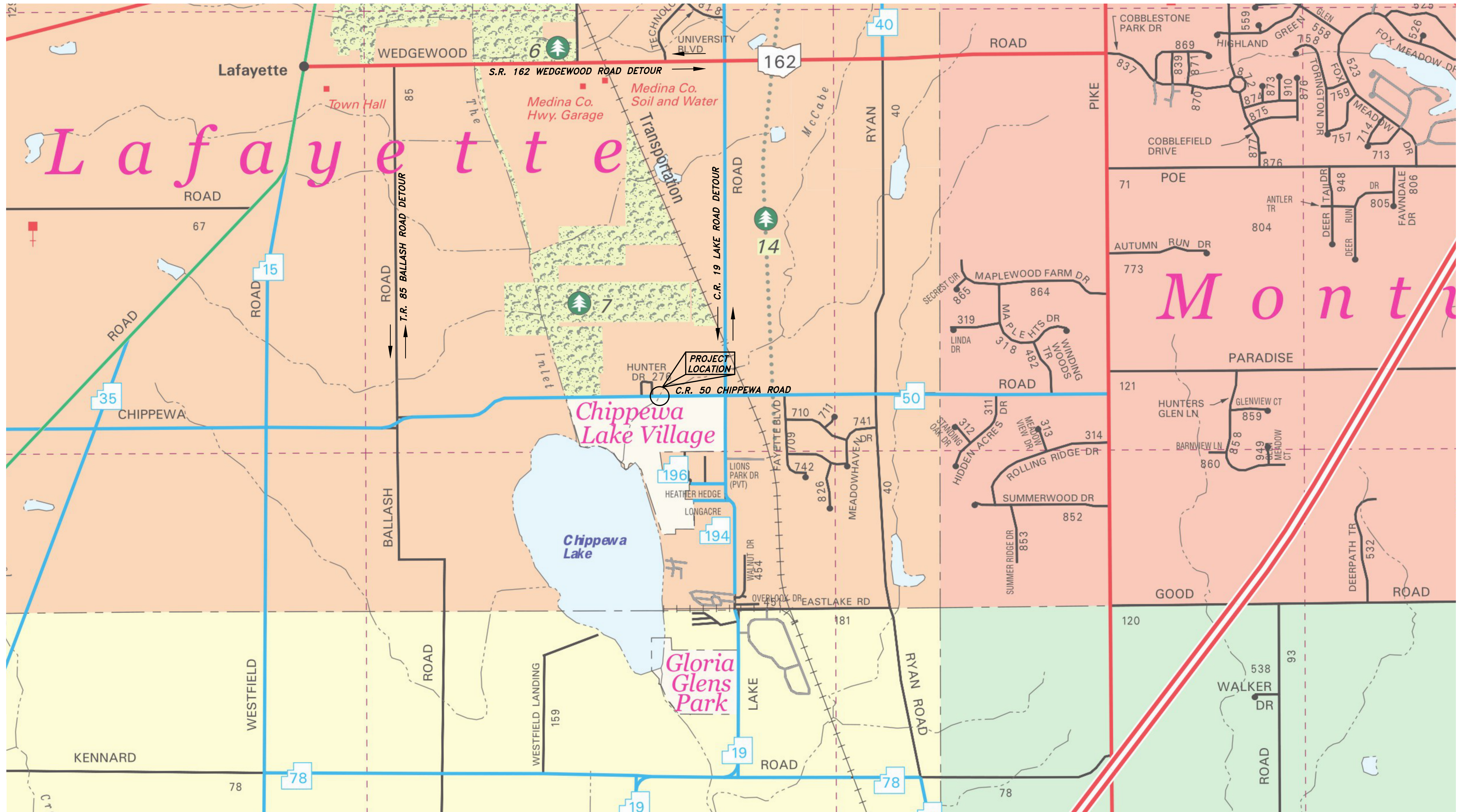
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MEDINA COUNTY ENGINEERING CENTER
 791 W. SMITH ROAD
 P.O. BOX 625
 MEDINA, OHIO 44258-0825
 PHONE (330) 723-9561

C.H. 50 CHIPPEWA ROAD
 BRIDGE 26
 PRELIMINARY SURVEY
 PLAN & PROFILE

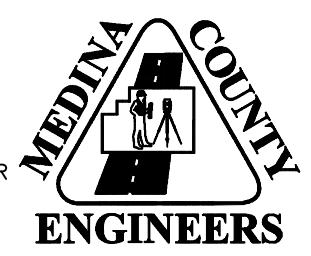
| | | | |
|-------------------|------------------------|-------------|-----------|
| PROJECT NO. | FIELD BOOK NO. | DATE: 05/25 | PAGE 1 |
| DRAWN BY | HORIZ. SCALE: 1" = 20' | | |
| CHECKED BY | VERT. SCALE: 1" = 5' | | OF 1 |
| COMPUTER FILE NO. | REV. NO. | DRAWN BY | |

APPENDIX D. DETOUR



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 P.O. BOX 825
 MEDINA, OHIO 44258-0825
 PHONE (330) 723-9561



C.H. 50 CHIPPEWA ROAD
 BRIDGE No. 26
 DETOUR

| | | | |
|--|----------------|--------------------|------|
| PROJECT NO. | FIELD BOOK NO. | DATE: 10-29-25 | PAGE |
| DRAWN BY: E.M.H. | | HORIZ. SCALE: NONE | 1 |
| CHECKED BY: J.E.W. | | VERT. SCALE: NONE | |
| COMPUTER FILE NO. MCHG-0050-BRIDGES-26 | | | |
| REV. NO. | DRAWN BY | DESCRIPTION | OF |
| | | | 1 |

APPENDIX E. ENVIRONMENTAL COMMITMENTS



APPENDIX E. ENVIRONMENTAL COMMITMENTS

Duplicate page

APPENDIX F. ASBESTOS REPORT

ASBESTOS SURVEY REPORT

Chippewa Road Bridge Over McCabes Creek
Lafayette Township, Medina County, Ohio

April 9, 2025

Prepared for:

Medina County Engineer's Office
791 West Smith Road
Medina, Ohio 44256

Prepared by:



6105 Heisley Road ♦ Mentor, Ohio 44060
440-357-1260 ♦ Fax 440-357-1510



HZW
Environmental
Consultants

April 9, 2025

Mr. Emry Hollopeter, E.I., S.I.
Medina County Engineer's Office
791 West Smith Road
Medina, Ohio 44256

Subject: *Report of Findings of an Asbestos Survey Conducted at the Chippewa Road Bridge Over McCabes Creek, Lafayette Township, Medina County, Ohio (Med-C0050-0639)(HZW Project No. H25155)*

Dear Mr. Hollopeter:

HZW Environmental Consultants, LLC (HZW) is pleased to submit this letter report that presents the findings of an asbestos survey conducted at the Chippewa Road bridge over McCabes Creek, Lafayette Township, Ohio, herein referred to as the "subject bridge". These services were provided to the Medina County Engineer's Office (the Client) in accordance with the terms of our letter agreement.

METHODS OF INVESTIGATION

General

During March 2025, a representative of HZW, certified as an Asbestos Hazard Evaluation Specialist (AHES), performed an asbestos survey of the subject bridge. This certification is required to be maintained by the inspector in accordance with the Asbestos School Hazard Abatement Reauthorization Act (ASHARA) and the Ohio Environmental Protection Agency (Ohio EPA) Asbestos regulation [Chapter 3745-22 of the Ohio Administrative Code (OAC)].

The asbestos survey was conducted in accordance with the United States Environmental Protection Agency (U.S. EPA) Asbestos National Emission Standards for Hazardous Air Pollutants (Asbestos NESHAP) survey protocol. The Asbestos NESHAP regulation requires no specific survey protocol be followed; however, the Asbestos Hazard Emergency Response Act (AHERA) protocol is recommended. Therefore, the asbestos survey at the subject bridge was conducted in accordance with AHERA protocol.

Bulk Sampling Protocol

In accordance with AHERA, HZW classified each homogeneous area/building material suspect for containing asbestos into one (1) of three (3) categories, based on the material's ability to be crumbled, pulverized, or reduced to powder by hand pressure (herein referred as "friable"), prior to performing the bulk sampling activities. These three (3) categories are as follows:

| Surfacing Materials | Thermal System Insulation (TSI) | Miscellaneous Friable and Nonfriable Materials |
|---|--|---|
| Examples include fireproofing and acoustical plaster. | Examples include, but are not limited to pipe lagging, pipe wrap, block insulation, batt insulation and mudded fitting insulation. | Examples of miscellaneous friable materials include, but are not limited to ceiling tile, drywall and joint compound. Examples of nonfriable materials include, but are not limited to, floor tile and mastic, roofing materials and transite. |

Once categorized, HZW subsequently determined the quantity of each homogeneous area/building material within each specific functional space. HZW based the bulk sampling protocol on the AHERA category assigned to a specific homogeneous area/building material and the quantity of that area/material identified. The bulk sampling protocol performed at the subject bridge consisted of the following:

- For **Surfacing Materials**, if the quantity of the homogeneous area/material was less than 1,000 square feet (ft²), then HZW collected a minimum of three (3) samples from this area/material. If the size of the homogeneous area/material was between 1,000 and 5,000 ft², then HZW collected a minimum of five (5) samples from this area/material. If the size of the homogeneous area/material was greater than 5,000 ft², then HZW collected a minimum of seven (7) samples from this area/material.
- For **TSI**, HZW either assumed the suspect material contained asbestos or collected at least three (3) bulk samples from each specific homogeneous area/material identified.
- For **Miscellaneous Friable Materials and Nonfriable Materials**, the number of bulk samples HZW collected from these materials was at the discretion of the inspector and in a "manner sufficient" to prove the asbestos content of the material.

Condition Categorization

In determining the condition of a material, HZW used the following guidelines:

| General Damage Category | Criteria |
|--------------------------------|--|
| Good | No Damage |
| Fair | Up to 10% overall damage Up to 25% localized damage |
| Poor | Over 10% overall damage Over 25% localized damage |

Analytical Laboratory

Any bulk samples collected were submitted to CA Labs, LLC of Baton Rouge, Louisiana, for analysis of asbestos content by polarized light microscopy (PLM) using the Environmental Protection Agency (EPA) Method 600/R-93/116.

ASBESTOS REGULATIONS

Federal Regulations

The Occupational Safety and Health Administration's (OSHA's) Asbestos Standard for the Construction Industry (29 CFR 1926.1101) regulates all renovation and demolition work involving buildings materials which contain any amount of asbestos. Building owners and/or contractors who perform renovation and/or demolition activities which disturb buildings materials identified as containing asbestos are required to conduct these activities in accordance with OSHA's Asbestos Standard. An asbestos-containing material (ACM), as defined by OSHA and the EPA, is any material containing more than one percent (1%) asbestos as determined by Polarized Light Microscopy (PLM).

The Asbestos NESHAP (40 C.F.R. Part 61, Subpart M) regulates which ACMs must be removed prior to renovation and demolition activities being performed. If the quantity of regulated ACMs (RACMs) to be disturbed as part of a renovation or demolition activity meets or exceeds 160 square feet on facility components, 260 linear feet on pipes or 35 cubic feet off facility components, then the activity would be regulated under the Asbestos NESHAP. RACMs are defined as 1) friable ACMs, 2) Category I Nonfriable ACMs that has become friable, 3) Category I Nonfriable ACMs that will be or have been subjected to sanding, grinding, cutting or abrading, or 4) Category II Nonfriable ACMs that have a high probability of becoming or have become crumbled, pulverized, or reduced to powder by the forces expected to act on the materials in the course of the demolition or renovation activities. A friable ACM is a material that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Examples of friable ACMs consist of asbestos-containing pipe insulation, fireproofing, and ceiling tile. Examples of Category I Nonfriable ACMs consist of asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products. Examples of Category II Nonfriable ACMs consist of any material, excluding Category I Nonfriable ACMs.

State Regulations

The Ohio EPA Asbestos regulations are under Chapter 3745-20 and 3745-22 of the Ohio Administrative Code (OAC) also referred to as the “Emission Control Rules”. Chapter 3745-20 is nearly identical to the Asbestos NESHAP, 40 CFR, Part 61, Subpart M, cited above. Chapter 3745-22 is the former Ohio Department of Health asbestos “Licensing Rules”, which on January 1, 2018, were adopted by the Ohio EPA. Chapter 3745-22 encompasses the rules governing asbestos hazard abatement contractors, specialists, project designers, workers, and training courses.

Under the Asbestos NESHAP and Ohio EPA Asbestos regulations the “Notification of Demolition and Renovation” form is required to be submitted ten (10) days prior to any of the following activities being performed:

- Demolition of a facility, regardless of whether asbestos is involved. This includes all structures that will be intentionally burned for fire training purposes.
- Renovation of a facility when the amount of RACM stripped, removed, dislodged, cut, drilled, or similarly disturbed exceeds 260 linear feet on pipes or 160 square feet on other facility components or 35 cubic feet off facility components.
- Abatement at a facility when the activity involves the removal, renovation, enclosure, repair or encapsulation of *friable* ACMs in an amount greater than 50 linear feet on pipes or 50 square feet on other facility components.

FINDINGS

Based on HZW’s findings from the physical inspection conducted at the subject bridge, six (6) building materials suspect for containing asbestos were identified. A total of two (2) bulk samples were collected from each suspect building material identified. Based on the laboratory analytical report, none of the bulk samples submitted for analysis were identified as containing asbestos.

HZW’s Asbestos Bulk Sampling Information form that documents the bulk sampling locations and each sample’s characterization (homogeneous area and functional space) and a site sketch of the subject bridge documenting where the bulk samples and photographs were taken are included as **Attachment 1**. A photographic log depicting the site conditions at the subject bridge at the time of the asbestos survey is included as **Attachment 2**. A copy of the laboratory analytical for the bulk samples collected at the subject bridge is included as **Attachment 3**. A partially completed Ohio EPA “Notification of Demolition and Renovation/Abatement” form is included as **Attachment 4**.

RECOMMENDATIONS

Based on the findings of the asbestos survey conducted at the subject bridge, the following recommendations are being presented for consideration:

1. Submit the Ohio EPA “Notification of Demolition and Renovation/Abatement” form to the Ohio EPA 10 days prior to demolition activities being conducted at the subject bridge.

Mr. Emry Hollopeter, E.I., S.I.

April 9, 2025

Page 5

2. Ensure demolition of the subject bridge is performed in accordance with Ohio EPA regulations. Ohio EPA requires that during demolition activities that no visible dust emissions be present. Therefore, ensure that the demolition work is performed using wet methods.

HZW appreciates the opportunity you have given us to provide professional services to the Medina County Engineer's Office. Should you have any questions regarding the information presented in this letter report, please do not hesitate to contact us.

Sincerely,

HZW ENVIRONMENTAL CONSULTANTS, LLC

Carmen Rocco

Carmen Rocco

Asbestos Hazard Evaluation Specialist

(OEPA License No. ES 33794)

Joan A. Sablar

Joan A. Sablar

Group Leader

Industrial Hygiene, IAQ, Asbestos and Lead

CR:cr\jas\H25155

Attachments

I:\2025\H25155\Chippewa Road Bridge over McCabes Creek\Chippewa Road Bridge over McCabes Creek, Lafayette Township, Medina County, Ohio Asbestos Survey Report.doc



ATTACHMENT 1

**HZW'S ASBESTOS BULK SAMPLING INFORMATION FORM AND SITE
SKETCH OF BRIDGE**



ASBESTOS BULK SAMPLING INFORMATION FORM

Client: Medina County Engineer's Office

Site: Chippewa Road Bridge Over McCabes Creek, Lafayette Township, Medina County, Ohio

| HOMOGENEOUS | | | | | AHERA CATEGORY | | | QUANTITY & CONDITION | | | RESULT |
|-------------|---------------------------------|---|-------------------------|-----------------|----------------|-----|------------|----------------------|------|------|------------|
| HA | MATERIAL | LOCATION | VALIDATION FOR SAMPLING | BULK SAMPLE NO. | SUR. | TSI | MISC. F/NF | GOOD | FAIR | POOR | ASBESTOS % |
| A | Tar Sealant - Black | Topside Located across Bridge Deck | Minimum 2 Samples | 01 | | | | | | | ND |
| | | | | 02 | | | | | | | ND |
| B | Rubber Vapor Barrier - Black | Underside Located on the Backside of the Abutment Walls | Minimum 2 Samples | 03 | | | | | | | ND |
| | | | | 04 | | | | | | | ND |
| C | Cloth Vapor Barrier - Black | Underside Located on the Front of the Abutment Walls | Minimum 2 Samples | 05 | | | | | | | ND |
| | | | | 06 | | | | | | | ND |
| D | Wood Pulp Vibration Pad - Brown | Underside Located Between Abutment Wall and Deck | Minimum 2 Samples | 07 | | | | | | | ND |
| | | | | 08 | | | | | | | ND |
| E | Rubber Vibration Pad - Black | Underside Located Between Abutment Wall and Deck | Minimum 2 Samples | 09 | | | | | | | ND |
| | | | | 10 | | | | | | | ND |
| F | Wood Pulp Gaskets | Underside Associated with Abutment Walls | Minimum 2 Samples | 11 | | | | | | | ND |
| | | | | 12 | | | | | | | ND |

ND = No Asbestos Detected

HZW Project No. H25155

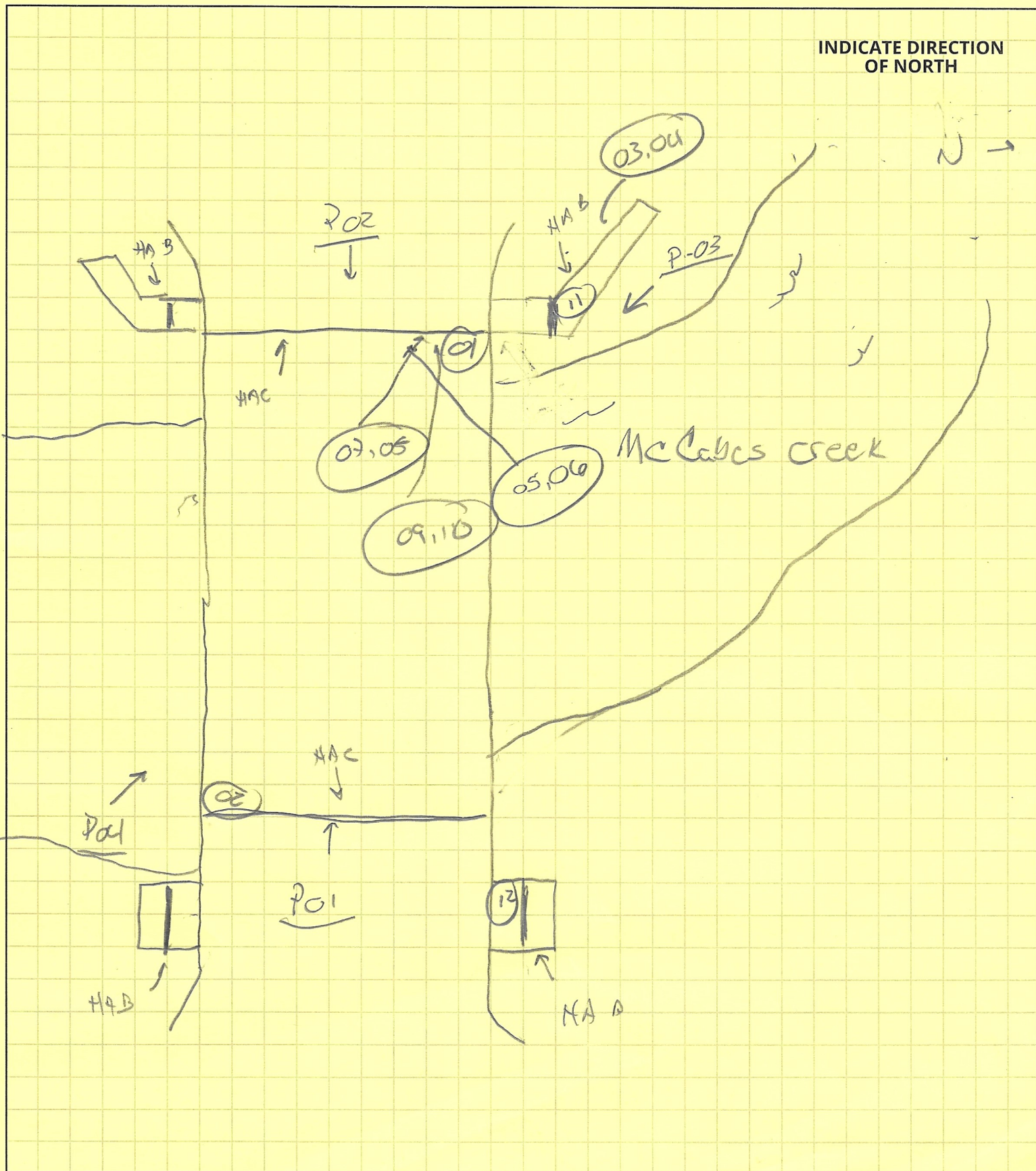
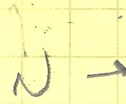


HZW ENVIRONMENTAL
CONSULTANTS, LLC

6105 Heisley Road • Mentor, Ohio 44060
Phone 440-357-1260 • 800-804-8484
Fax 440-357-1510
A Woman-Owned Business Enterprise

PROJECT Chippewa Road Bridge
PROJECT NO. H25 155
PAGE NO. 2 OF 2
FIELD REPRESENTATIVE CR DATE 03/07/25
SCALE (7)

INDICATE DIRECTION
OF NORTH



ATTACHMENT 2

PHOTOGRAPHIC LOG OF BRIDGE





Photograph 01

View Looking West at the Top of the Chippewa Road Bridge
Over McCabes Creek, Lafayette Township, Medina County, Ohio



Photograph 02

View Looking East at the Top of the Chippewa Road Bridge
Over McCabes Creek, Lafayette Township, Medina County, Ohio



Photograph 03

View Looking Southeast at the Underside of the Chippewa Road Bridge
Over McCabes Creek, Lafayette Township, Medina County, Ohio



Photograph 04

View Looking Northwest at the Underside of the Chippewa Road Bridge
Over McCabes Creek, Lafayette Township, Medina County, Ohio

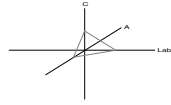
ATTACHMENT 3

LABORATORY ANALYTICAL REPORT



CA Labs
Dedicated to
Quality

CA Labs, L.L.C.
12232 Industriplex, Suite 32
Baton Rouge, LA 70809
Phone 225-751-5632
Fax 225-751-5634



NVLAP #200772-0
TDSHS #300370
CDPHE #AL-18111
LELAP #03069

Materials Characterization - Bulk Asbestos Analysis

Laboratory Analysis Report - Polarized Light

HZW Environmental Consultants

6105 Heisley Rd.
Mentor, OH 44060

Attn: Joan Sablar

Customer Project: Chippewa Road Bridge H25155

Reference #: CBR25032001

Date: 3/17/2025

Analysis and Method

Summary of polarizing light microscopy (PLM / Stereomicroscopy bulk asbestos analysis) using the methods described in 40CFR Part 763 Appendix E to Subpart E (Interim and EPA 600 / R-93 / 116 (Improved)). The sample is first viewed with the aid of stereomicroscopy. Numerous liquid slide preparations are created for analysis under the polarized microscope where identifications and quantifications are performed. Calibrated liquid refractive oils are used as liquid mounting medium. These oils are used for identification (dispersion staining). A calibrated visual estimation is reported, should any asbestiform mineral be present. Other techniques such as acid washing are used in conjunction with refractive oils for detection of smaller quantities of asbestos. All asbestos percentages are based on calibrated visual estimation traceable to NIST standards for regulated asbestos. Traceability to measurement and calibration is achieved by using known amounts and types of asbestos from standards where analyst and laboratory accuracy are measured. As little as 0.001% asbestos can be detected in favorable samples, while detection in unfavorable samples may approach the detection limit of 0.50% (well above the laboratory definition of trace).

Discussion

Vermiculite containing samples may have trace amounts of actinolite-tremolite, where not found by PLM should be analyzed using TEM methods and / or water separation techniques. Suspected actinolite/vermiculite presence will be indicated through the sample comment section of this report.

Fibrous talc containing samples may even contain a related asbestos fiber known as anthophyllite. Under certain conditions the same fiber may actually contain both talc and anthophyllite (a phenomenon called intergrowth). Again, TEM detection methods are recommended. CA Labs PLM report comments will denote suspected amounts of asbestiform anthophyllite with talc, where further analysis is recommended.

Some samples (floor tiles, surfacings, etc.) may contain fibers too small to be detectable by PLM analysis and should be analyzed by TEM bulk protocols.

A "trace asbestos" will be reported if the analyst observes far less than 1% asbestos. CA Labs defines "trace asbestos" as a few fibers detected by the analyst in several preparations and will indicate as such under these circumstances.

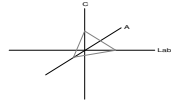
Quantification of <1% will actually be reported as <=1% (allowable variance close to 1% is high). Such results are ideal for point counting, and the technique is mandatory for friable samples (NESHAP, Nov. 1990 and clarification letter 8 May 1991) under 1% percent asbestos and the "trace asbestos". **In order to make all initial PLM reports issued from CA Labs NESHAP compliant, all <1% asbestos results (except floor tiles) will be point counted at no additional charge.**

Qualifications

CA Labs is accredited by the National Voluntary Accreditation Program (NVLAP) for selected test methods for airborne fiber analysis (TEM), and for bulk asbestos fiber analysis (PLM). All analysts have a college degree in a natural science (geology, biology, or environmental science) or are recognized by a state professional board in one of these disciplines. Extensive in-house training programs are used to augment education background of the analyst. The group leader of polarized light has received supplemental McCrone Research training for asbestos identification. This report is not covered by the scope of AIHA accreditation. Analysis performed at CA Labs, LLC 12232 Industriplex, Suite 32 Baton Rouge, LA 70809.

CA Labs
Dedicated to
Quality

CA Labs, L.L.C.
 12232 Industriplex, Suite 32
 Baton Rouge, LA 70809
 Phone 225-751-5632
 Fax 225-751-5634



NVLAP #200772-0
TDSHS #300370
CDPHE #AL-18111
LELAP #03069

Overview of Project Sample Material Containing Asbestos

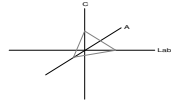
| | | | |
|--------------------------|-----------------------------|---|---|
| Customer Project: | Chippewa Road Bridge H25155 | CA Labs Project #: | CBR25032001 |
| Sample # | Layer # | Analysts Physical Description of Subsample | Asbestos type / calibrated visual estimate percent |
| | | | List of Affected Building Material Types |

No Asbestos Detected.

Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):

| | | | |
|------------------|--------------|--------------------|--------------------------|
| ca - carbonate | pe - perlite | fg - fiberglass | pa - palygorskite (clay) |
| gypsum - gypsum | qu - quartz | mw - mineral wool | |
| bi - binder | | wo - wollastinite | |
| or - organic | | ta - talc | |
| ma - matrix | | sy - synthetic | |
| mi - mica | | ce - cellulose | |
| ve - vermiculite | | br - brucite | |
| ot - other | | ka - kaolin (clay) | |

This report relates to the items tested. This report is not to be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, AIHA LAP, LLC, or any other agency of the federal government. This report may not be reproduced except in full without written permission from CA Labs. These results are submitted pursuant to CA Labs' current terms and sale, condition of sale, including the company's standard warranty and limitations of liability provisions and no responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, CA Labs will store the samples for a period of ninety (90) days before discarding. A shipping or handling fee may be assessed for the return of any samples.



Polarized Light Asbestiform Materials Characterization

Customer Info: Attn: Joan Sablar
HzW Environmental Consultants
6105 Heisley Rd.
Mentor, OH 44060

Customer Project:
Chippewa Road Bridge
H25155

CA Labs Project #:
CBR25032001

Turnaround Time: 5 day

Date: 3/17/2025
Samples Received: 3/11/2025
Date Of Sampling:
Purchase Order #: 2024-03

Phone # 440-357-1260
Fax # 440-357-1510

| Sample # | Com ment | Layer # | Analysts Physical Description of Subsample | Homo- geneo us (Y/N) | Asbestos type / calibrated visual estimate percent | Non-asbestos fiber type / percent | Non-fibrous type / percent |
|----------|-------------|------------|--|-------------------------------|--|--------------------------------------|-------------------------------|
| 01 | | 01-1 | Black Tar | Y | None Detected | | 100% qu, ma, bi |
| 02 | | 02-1 | Black Tar | Y | None Detected | | 100% qu, ma, bi |
| 03 | | 03-1 | Black Sealant | Y | None Detected | | 100% qu, ma |
| 04 | | 04-1 | Black Sealant | Y | None Detected | | 100% qu, ma |
| 05 | | 05-1 | Gray Insulation | Y | None Detected | 80% sy | 20% qu, ma |
| 06 | | 06-1 | Gray Insulation | Y | None Detected | 80% sy | 20% qu, ma |
| 07 | | 07-1 | Brown Paneling | Y | None Detected | 80% ce | 20% qu, ma, bi |

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

| | | | |
|-----------------|------------------|-------------------|--------------------------|
| ca - carbonate | mi - mica | fg - fiberglass | ce - cellulose |
| gypsum - gypsum | ve - vermiculite | mw - mineral wool | br - brucite |
| bi - binder | ot - other | wo - wollastinite | ka - kaolin (clay) |
| or - organic | pe - perlite | ta - talc | pa - palygorskite (clay) |
| ma - matrix | qu - quartz | sy - synthetic | |

Approved Signatories:

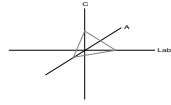
David Darby
Analyst

Senior Analyst
Alicia Stretz

Laboratory Director
Chris Williams

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages effecting fibrous percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze

6. Anthophyllite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested



Polarized Light Asbestiform Materials Characterization

Customer Info: Attn: Joan Sablar
HZW Environmental Consultants
6105 Heisley Rd.
Mentor, OH 44060

Customer Project:
Chippewa Road Bridge
H25155

CA Labs Project #:
CBR25032001

Phone # 440-357-1260
Fax # 440-357-1510

Turnaround Time: 5 day


Date: 3/17/2025
Samples Received: 3/11/2025
Date Of Sampling:
Purchase Order #: 2024-03

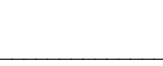
| Sample # | Com ment | Layer # | Analysts Physical Description of Subsample | Homo- geneo us (Y/N) | Asbestos type / calibrated visual estimate percent | Non-asbestos fiber type / percent | Non-fibrous type / percent |
|----------|-------------|------------|---|-------------------------------|--|--------------------------------------|-------------------------------|
| 08 | | 08-1 | Brown Paneling | Y | None Detected | 80% ce | 20% qu, ma, bi |
| 09 | | 09-1 | Black Sealant | Y | None Detected | | 100% qu, ma |
| 10 | | 10-1 | Black Sealant | Y | None Detected | | 100% qu, ma |
| 11 | | 11-1 | Black Gasket | Y | None Detected | 80% ce | 20% qu, ma, bi |
| 12 | | 12-1 | Black Gasket | Y | None Detected | 80% ce | 20% qu, ma, bi |

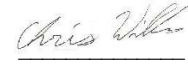
Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

| | | | |
|-----------------|------------------|-------------------|--------------------------|
| ca - carbonate | mi - mica | fg - fiberglass | ce - cellulose |
| gypsum - gypsum | ve - vermiculite | mw - mineral wool | br - brucite |
| bi - binder | ot - other | wo - wollastinite | ka - kaolin (clay) |
| or - organic | pe - perlite | ta - talc | pa - palygorskite (clay) |
| ma - matrix | qu - quartz | sy - synthetic | |

Approved Signatories:


David Darby
Analyst


Senior Analyst
Alicia Stretz


Laboratory Director
Chris Williams

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages effecting fibrous percentages
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6. Anthophyllite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested

ATTACHMENT 4

**PARTIALLY COMPLETED COPY OF OHIO EPA'S "NOTIFICATION OF
DEMOLITION AND RENOVATION/ABATEMENT FORM" FOR THE BRIDGE**





Notification of Demolition and Renovation/Abatement

Section 1: General Information

Division of Air Pollution Control

Work on projects cannot begin until 10 working days after a COMPLETE original notification form, **including payment**, is submitted to Ohio EPA. Instructions and a worksheet for fee calculation are available at epa.ohio.gov/asbestos. This form can be completed, and payment made, at ebiz.epa.ohio.gov. Questions? asbestos@epa.ohio.gov or (614) 466-0061.

| | | | | |
|-------------------|-----------------|-----------------|---------------|---|
| Ohio EPA Use Only | Notification #: | Postmarked: / / | Received: / / | <input type="checkbox"/> Hand-Delivered |
|-------------------|-----------------|-----------------|---------------|---|

1) Notification Information (Check all that apply)

| | | | | | | |
|---|--|---------------------------------------|------------------------------------|---------------------------------|---------------------------------------|------------------------|
| <input checked="" type="checkbox"/> Original | <input type="checkbox"/> Revision # (count): | <input type="checkbox"/> Installation | <input type="checkbox"/> Emergency | <input type="checkbox"/> Annual | <input type="checkbox"/> Cancellation | Project County: Medina |
| <input type="checkbox"/> NESHAP Residential Exemption | | | | | | |

2) Owner, Asbestos Abatement Contractor, Billing and Fire Department Information

Revised?

| | | |
|--|---------------|--|
| Owner | | |
| Name: Medina County Engineers | | Is this a company? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Address: 791 West Smith Road | | Contact Person: Mr. Emry Hollopeter, E.I., S.I. |
| City: Medina | State: Ohio | Zip: 44256 - |
| Email: ehollpeter@medinaco.org | Phone: () - | Fax: () - |
| Asbestos Abatement Contractor (if applicable) | | |
| Name: | License #: AC | Expiration Date: / / |
| Address: | | Contact Person: |
| City: | State: | Zip: - |
| Email: | Phone: () - | Fax: () - |
| Billing Contact (Entity paying for original notification) | | |
| Is this contact associated with the <input type="checkbox"/> Owner, <input type="checkbox"/> Asbestos Abatement Contractor, or <input type="checkbox"/> Demolition Contractor (if not installation)? | | |
| Address: | | Contact Person: |
| City: | State: | Zip: - |
| Email: | Phone: () - | Fax: () - |
| Fire Department (if applicable) | | |
| Name: | | Contact Person: |
| Address: | | Contact Person: |
| City: | State: | Zip: - |
| Email: | Phone: () - | Fax: () - |

3) Ohio Asbestos Hazard Evaluation Specialist and Evaluation Procedure

Revised?

| | | |
|---|---------------------------|---------------------------------|
| Evaluation Specialist: Carmen Rocco | Certification #: ES 33794 | Expiration Date: 10 / 31 / 2025 |
| Procedure, including analytical methods, employed to detect the presence of and to estimate the quantity of regulated asbestos-containing material (RACM) and Category I and Category II non-friable asbestos-containing material: <input checked="" type="checkbox"/> PLM <input type="checkbox"/> Point Count <input type="checkbox"/> TEM <input type="checkbox"/> Other Method (Explain Below): | | |
| NESHAP Asbestos Survey | | |

4) Procedures to be followed should unexpected RACM be discovered (check all that apply)

Revised?

| | | | |
|--|---|--|---|
| <input checked="" type="checkbox"/> Stop work and keep wet | <input checked="" type="checkbox"/> Evacuate area | <input checked="" type="checkbox"/> Demarcate area | <input checked="" type="checkbox"/> Contact licensed abatement contractor |
| <input type="checkbox"/> Contact district office/local air authority | | | |
| <input type="checkbox"/> Other (Explain): | | | |

5) Planned Demolition (check all that apply)

Revised?

| | |
|---|--|
| Describe demolition work to be performed and method(s) to be employed, including demolition techniques to be used: | |
| <input type="checkbox"/> Implosion <input type="checkbox"/> Fire Training <input checked="" type="checkbox"/> Wet Methods <input checked="" type="checkbox"/> Manual Demolition <input checked="" type="checkbox"/> Mechanical Demolition <input type="checkbox"/> Other (Explain): | |

Notification of Demolition and Renovation/Abatement

Section 1: General Information

Continued

Mail completed form and payment to:
Ohio EPA, DAPC – Asbestos
P.O. Box 1049, Columbus, OH 43216-1049

Description of affected facility components (include attachment if necessary):

(Revised 10/18)

Page 1 of 1

6) Asbestos Description and Engineering Controls (if asbestos is being abated)

Revised?

For the material listed in each project, describe the type(s) of ACM to be abated, engineering controls and work practices to be used to minimize emissions and ensure proper waste handling:

| | | | | | |
|---------------------------|---|-------------------------------------|-------------------------------------|---------------------------------|---------------------------------|
| Type of ACM to be abated: | <input type="checkbox"/> Surfacing | <input type="checkbox"/> Mechanical | <input type="checkbox"/> Other | | |
| Engineering Controls: | <input type="checkbox"/> Wet Methods | <input type="checkbox"/> Glove Bag | <input type="checkbox"/> NPE | <input type="checkbox"/> AFD | <input type="checkbox"/> Other: |
| Work Practices: | <input type="checkbox"/> Intact Removal | <input type="checkbox"/> Manual | <input type="checkbox"/> Mechanical | <input type="checkbox"/> Other: | |

7) Asbestos Waste Transporter (if applicable)

Revised?

| | | |
|--------------------------------------|--------------|-----------------|
| Transporter #1 Name: | | |
| Address: | | Contact Person: |
| City: | State: | Zip: - |
| Email: | Phone: () - | Fax: () - |
| Transporter #2 Name (if applicable): | | |
| Address: | | Contact Person: |
| City: | State: | Zip: - |
| Email: | Phone: () - | Fax: () - |

8) Asbestos Waste Disposal Site (if applicable)

Revised?

| | | |
|----------|--------------|-----------------|
| Name: | | |
| Address: | | Contact Person: |
| City: | State: | Zip: - |
| Email: | Phone: () - | Fax: () - |

9) Emergency Demolition (complete if you checked "Emergency" above and "Demolition" for any project)

Revised?

A copy of the issued order, including the following information, **must be attached** to this notification.

| | |
|------------------------------------|--|
| Government Official Issuing Order: | Title: |
| Agency: | Authority of Order (Citation of Code): |
| Date of Order: / / | Demolition Date: / / |

10) Emergency Renovation/Abatement (complete if you checked "Emergency" above and "Renovation/Abatement" for any project)

Revised?

| | |
|--|--|
| Date of Emergency: / / | Time of Emergency: : <input type="checkbox"/> a.m. <input type="checkbox"/> p.m. |
| Description of Sudden, Unexpected Event: | |
| Explanation of how the event caused unsafe conditions or equipment damage: | |

11) Attestation

Revised?

In accordance with Ohio Administrative Code rule 3745-20-03(A)(4)(p), I certify that at least one person trained as required by paragraph (B) of rule 3745-20-04 of the Administrative Code will supervise the stripping and removal described by this notification. I acknowledge that the submission of false or misleading statements is prohibited by law and I certify that facts contained in this notification are true, accurate, and complete.

| | |
|---------------|-----------|
| Signature: | Date: / / |
| Name: | Title: |
| Organization: | |



Notification of Demolition and Renovation/Abatement

Section 2: Project Address Specific Information

Division of Air Pollution Control

Please complete Section 2 for the address included with this notification. If the project is an "Installation" per OAC 3745-20, complete a separate Section 2 page for each address associated with this notification.

| | |
|-------------------|---------------------|
| Ohio EPA Use Only | Project ID #: _____ |
|-------------------|---------------------|

A. Facility Description Revised?

| | | | |
|---|-------------------|---|--|
| Building Name (if applicable): Chippewa Road Bridge | | Site Location (specific): Chippewa Road Bridge over McCabes Creek | |
| Address: Chippewa Road Bridge over McCabes Creek | | | |
| City: Lafayette Township | State: OH | Zip: - | |
| Building Size (square feet): NA | No. of Floors: NA | Age: Unknown | |
| Present Use: Bridge | | Prior Use: Bridge | |

B. Type of Operation (check all that apply) Revised?

| | |
|--|--|
| <input checked="" type="checkbox"/> Demolition | <input type="checkbox"/> Renovation/Abatement – Type: <input type="checkbox"/> Removal <input type="checkbox"/> Repair <input type="checkbox"/> Encapsulation <input type="checkbox"/> Enclosure |
|--|--|

C. Asbestos Present (check one) Revised?

| | | | |
|------------------------------|--|--|--------------------|
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> No, previously abated | Year Abated: _____ |
|------------------------------|--|--|--------------------|

D. Approximate Amount of Asbestos-Containing Materials (complete table below and Section 1 #6 if asbestos is present) Revised?

| | Material to be Removed | | | | Material NOT to be Removed | |
|--|------------------------|--|-------------|--|----------------------------|--|
| | RACM | Non-friable Asbestos-Containing Material | | Non-friable Asbestos-Containing Material | | |
| | | Category I | Category II | Category I | Category II | |
| Pipes (linear feet) | | | | | | |
| Surface area on other facility components (ft ²) | | | | | | |
| Volume if length or area cannot be measured (ft ³) | | | | | | |

E. Asbestos Abatement Schedule and Abatement Specialist (original notification is required 10 working days prior to the start of work) Revised?

| | | | | | | | |
|----------------------------------|--------|---------------------|---------------------|----------|--------------------|----------------------|--------|
| Setup Date: / / | | Abatement Date: / / | | | Complete Date: / / | | |
| (Shift 1) Time start/end on site | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| Abatement Specialist Name: | | | Certification #: AS | | | Expiration Date: / / | |
| (Shift 2) Time start/end on site | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| Abatement Specialist Name: | | | Certification #: AS | | | Expiration Date: / / | |

F. Demolition Contractor (if applicable) Revised?

| | | | |
|----------|--------------|-----------------|--|
| Name: | | | |
| Address: | | Contact Person: | |
| City: | State: | Zip: - | |
| Email: | Phone: () - | Fax: () - | |

G. Demolition Schedule (original notification is required 10 working days prior to the start of work) Revised?

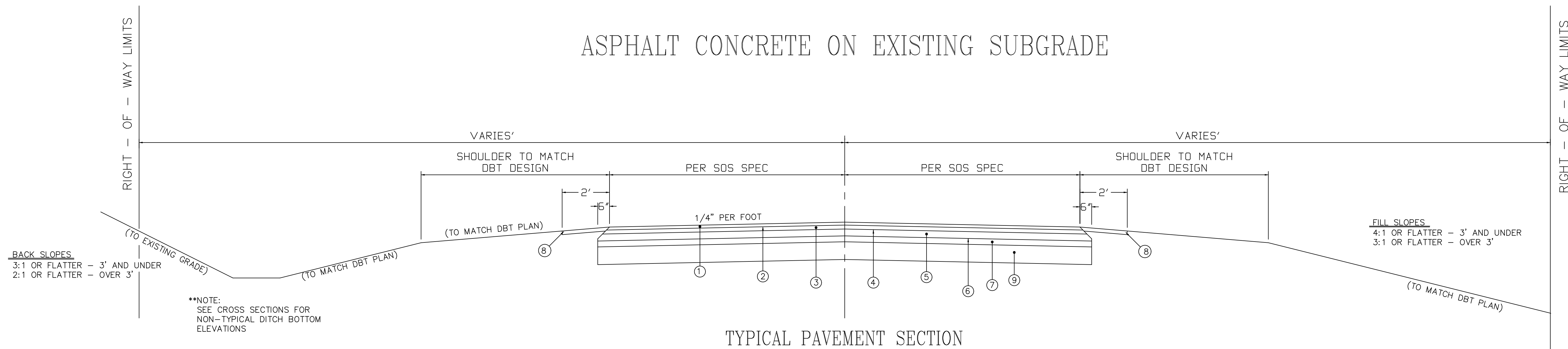
| | |
|-----------------|--------------------|
| Start Date: / / | Complete Date: / / |
|-----------------|--------------------|

H. Project Hold Revised?

| | |
|----------------------|-----------------------|
| Hold Begin Date: / / | Work Resume Date: / / |
|----------------------|-----------------------|

APPENDIX G. ROAD TYPICAL SECTION

ASPHALT CONCRETE ON EXISTING SUBGRADE



TYPICAL PAVEMENT SECTION

| No. | MATERIAL |
|-----|---|
| ① | 1.5" ITEM 449 ASPHALT CONCRETE SURFACE COURSE, TYPE 1, |
| ② | ITEM 407 TACK COAT APPLIED AT 0.1 GALLONS PER SQUARE YARD. |
| ③ | 1.5" ITEM 449 ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, |
| ④ | ITEM 407 TACK COAT APPLIED AT 0.1 GALLONS PER SQUARE YARD, OR AS DIRECTED BY THE MEDINA COUNTY ENGINEER. |
| ⑤ | 8" ITEM 301 BITUMINOUS AGGREGATE BASE MATERIAL. |
| ⑥ | ITEM 408 PRIME COAT APPLIED AT 0.5 GALLONS PER SQUARE YARD, OR AS DIRECTED BY THE MEDINA COUNTY ENGINEER. |
| ⑦ | 6" - No. 304 COMPACTED LIMESTONE AGGREGATE BASE |
| ⑧ | No. 411 LIMESTONE BERM ON COMPACTED EARTHEN MATERIAL, 2 FEET WIDE, THICKNESS VARIABLE. |
| ⑨ | EXISTING SUBGRADE IF NOT DISTURBED |

MEDIUM TRAFFIC ASPHALT CONCRETE

MATERIALS - PLANT MIXES:

A. AGGREGATES:

ALL AGGREGATES USED IN ITEM 449 SURFACE AND ITEM 448 INTERMEDIATE COURSE MIXES SHALL BE CRUSHED LIMESTONE. AGGREGATES SHALL CONFORM TO OHIO DEPARTMENT OF TRANSPORTATION (ODOT) ITEM 703 SPECIFICATIONS. THE USE OF RECLAIMED MATERIALS IS PROHIBITED IN ANY ITEM 449 OR ITEM 448 PLANT MIX. AGGREGATES FOR ITEM 301 BITUMINOUS BASE MIX CAN BE EITHER LIMESTONE OR GRAVEL MEETING SPECIFICATIONS OF ODOT ITEMS 301 AND 703. USE OF UP TO 20% RECLAIMED MATERIALS IN AN ITEM 301 MIX WILL BE ACCEPTABLE.

B. BITUMINOUS MATERIAL SHALL BE PG64-22 FOR ALL MIXES.

C. ASPHALT CONCRETE:

ALL REQUIREMENTS IN SECTION 400 OF THE "OHIO DOT CONSTRUCTION AND MATERIALS SPECIFICATIONS" SHALL APPLY TO MIXING, HAULING, SPREADING, COMPACTING AND TEMPERATURE RANGES OF ALL PLANT MIXES UNLESS OTHERWISE NOTED BY MEDINA COUNTY ENGINEER OR HIS AUTHORIZED REPRESENTATIVE.

D. MIX DESIGNS - TESTING:

AT LEAST TWO (2) WEEKS PRIOR TO MATERIAL PRODUCTION, THE CONTRACTOR SHALL SUBMIT A JOB MIX FORMULA (JMF) FOR EACH SPECIFIED MATERIAL. MIXES SHOULD BE ODOT MEDIUM TRAFFIC PROVEN AND ACCEPTED DESIGNS COMPLYING WITH M.C.E. CRITERIA NOTED ABOVE. NO PAVEMENTS SHALL BE PLACED WITHOUT A MIX DESIGN APPROVAL BY THE MEDINA COUNTY ENGINEERS. DURING PAVING OPERATIONS, TWO (2) MATERIAL SAMPLES (PER MIX TYPE) PER DAY WILL BE OBTAINED AND SENT TO AN AUTHORIZED LABORATORY FOR EXTRACTION/GRADATION TESTING. BITUMEN DEVIATION RANGE IS ±0.3% AS PER ODOT ITEM 441. PAVEMENT ACCEPTANCE WILL BE BASED ON TEST RESULTS COMPARED TO MIX DESIGN SPECIFICATIONS.

E. TACK COAT:

MATERIAL SHALL MEET APPLICABLE REQUIREMENTS OF ODOT ITEMS 407 AND 702 SPECIFICATIONS AND BE APPLIED AT 0.1 GALLONS PER SQUARE YARD IN BETWEEN PAVING LIFTS OR WHEN DIRECTED BY THE MEDINA COUNTY ENGINEER.

F. LIMESTONE AGGREGATE BASE:

CONTRACTOR SHALL INSTALL A SIX (6) INCH THICK COMPACTED NO. 304 LIMESTONE AGGREGATE BASE UNDER ALL PROPOSED PAVEMENT AREAS. BASE SHALL BE IN ACCORDANCE WITH ODOT ITEMS 304 AND 703.04 SPECIFICATIONS. YIELD SHOULD BE 4,000 LBS. PER CUBIC YARD.

G. AC BANDS:

AC BANDS SHALL BE INSTALLED AT THE TRANSVERSE JOINTS BETWEEN PHASE LINES.

| | | | | | | |
|--|--|----------|---|-------------------------|------------------------|------|
| OFFICE OF THE MEDINA COUNTY ENGINEER ANDREW J. CONRAD, P.E., P.S. | | | PROJECT: | DRAWN BY: <i>EH</i> | DATE: <i>10/29/25</i> | |
| MEDINA COUNTY ENGINEERING CENTER 791 W. SMITH ROAD P.O. BOX 825 MEDINA, OHIO 44258-0825 Ph. (330) 723-9561 | | | TYPICAL PAVEMENT SECTION CHIPPEWA ROAD BRIDGE 26 | CHECKED BY: <i>JWAC</i> | SCALE: <i>AS NOTED</i> | |
| COMPUTER FILE No. <i>MCHC-0050-BRIDGES-26</i> | | REV. No. | DATE | DESCRIPTION | DRAWN BY | PAGE |
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| | | 3 | | | | 1 |

APPENDIX H. EXISTING ROAD PAVEMENT THICKNESS BUILDUP

| Road # | Sec. | Township | From | To | Width Ft. | Length Ft. | Length Miles | Type | Description | Year |
|--------|------|-----------|---------------------------------|----|-----------|------------|--------------|--------|-------------------------|------|
| 50 | D | Lafayette | C.H.15 to C.H.19 | | | 11,440 | 2.17 | | Gravel | 1929 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 18' | 11,440 | 2.17 | 404 | 2.50" Asphalt | 1950 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 18' | 11,440 | 2.17 | 404 | 1" Asphalt | 1958 |
| 50 | D | Lafayette | C.H.15 to Inlet Bridge | | 18' | 7,537 | 1.43 | 404 | 1.25" Asphalt | 1966 |
| 50 | D | Lafayette | Bridge Approaches | | 18' | 637 | 0.12 | 404 | 1.50" Asphalt | 1972 |
| 50 | D | Lafayette | Bridge Approaches | | 18' | 637 | 0.12 | T-32 | 1.50" Asphalt | 1973 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 18' | 11,440 | 2.17 | 402 | 1.25" Asphalt | 1973 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 18' | 11,440 | 2.17 | 409 | Seal | 1973 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 18' | 11,440 | 2.17 | 409 | Seal | 1978 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 18' | 11,440 | 2.17 | 405 | 2" Motorpave | 1979 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 18' | 11,440 | 2.17 | 409 | Seal | 1979 |
| 50 | D | Lafayette | At Inlet | | 18' | 1,056 | 0.20 | 409 | Seal | 1982 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 6' | | | 404 | Blade Patch | 1984 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 18' | 11,440 | 2.17 | 409 | Seal w/ Slag | 1986 |
| 50 | D | Lafayette | 2 nd Curve to Bridge | | 18' | 3,940 | 0.75 | 409 | County Seal | 1988 |
| 50 | D | Lafayette | C.H.15 to 1 st Curve | | 18' | 3,548 | 0.67 | 409 | Latex Seal | 1990 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 18' | 11,440 | 2.17 | 409 | Seal | 1992 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 18' | 11,440 | 2.17 | 705 | Crack Seal | 1993 |
| 50 | D | Lafayette | T.H.85 to C.H.19 | | 6' | 3,750 | 0.71 | 404 | Patch Pave | 1997 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 20' | 11,440 | 2.17 | 403 | .50" Asphalt / leveling | 2001 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 20' | 11,440 | 2.17 | 404 | 1.50" Asphalt / ware | 2001 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 6' | 4,800 | 0.91 | 404 | Patch Pave | 2004 |
| 50 | D | Lafayette | Flood Area | | 20' | 600 | 0.11 | 404 | Patch Pave | 2008 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 6' | 1,440 | 0.27 | 404 | Patch Pave | 2009 |
| 50 | D | Lafayette | C.H.15 to C.H.19 | | 6' | 4,190 | 0.79 | 404 | Patch Pave | 2010 |
| 50 | D | Lafayette | C.H.15 to 2 nd Spur | | 20' | 3,548 | 0.67 | 405 | 2" Motorpave | 2011 |
| 50 | D | Lafayette | C.H.15 to 2 nd Spur | | 20' | 3,548 | 0.67 | 422 | CRS-2P w/ Slag | 2011 |
| 50 | D | Lafayette | 2 nd Spur to Bridge | | 18' | 3,940 | 0.75 | 409 | CRS-2P w/ limestone | 2011 |
| 50 | D | Lafayette | Bridge Approaches | | 18' | 100 | 0.09 | 448 T1 | 1.50" Asphalt | 2017 |
| 50 | D | Lafayette | C.H.15 to 2 nd Spur | | 20' | 3,548 | 0.67 | 422 | CRS-2P w/ Slag | 2018 |
| 50 | D | Lafayette | C.H.15 to Inlet Bridge | | 20' | 4,121 | 0.78 | 448 | 2" Mill Fill | 2021 |
| 50 | D | Lafayette | Inlet Bridge to T.H. 85 | | 20' | 3,918 | 0.74 | 405 | 2" Motorpave | 2021 |
| 50 | D | Lafayette | C.H.15 to Inlet Bridge | | 20' | | | 422 | CRS-2P w/ Slag | 2025 |

APPENDIX I. PN555 1-17-2025 SURFACE SMOOTHNESS FOR BRIDGES AND APPROACHES

PN 555 - 01/17/2025 – SURFACE SMOOTHNESS FOR BRIDGES AND APPROACHES

DESCRIPTION

For projects with new full depth cast-in-place concrete decks and slab superstructures, the surface smoothness requirements of C&MS 451.13 are modified as follows for bridge encounters defined as 25 feet of entry pavement, entry approach slab, bridge deck, exit approach slab and 25 feet of exit pavement including all joints.

MATERIALS AND EQUIPMENT

Provide smoothness measuring equipment conforming to Supplement 1058. Furnish the Department's approval letter of the profiler and the operator to the Engineer prior to commencing work. The Engineer will verify the smoothness measuring equipment conforms to Supplement 1058. The Engineer will verify the profile operator's certification against the operator list posted on the Office of Construction Administration webpage. Furnish equipment meeting the requirements of C&MS 257.02 for performing corrective diamond grinding. The Engineer will complete the Smoothness Profiler Verification Report in Supplement 1058.

SMOOTHNESS MEASUREMENT

Collect surface smoothness measurements for both wheel paths in each proposed travel lane during one continuous pass. The wheel paths are located parallel to the centerline or baseline of the roadway or ramp and approximately 3.0 feet from the centerline of the lane, measured transversely in both directions. Start the profile measurement approximately 250 feet before the approach slab/pavement interface at the entry end and continue to approximately 250 feet after the approach slab/pavement interface at the exit end.

Notify the engineer a minimum of 24 hours prior to surface smoothness measurements. Do not perform final measurements until all final wearing courses are in place within the bridge encounter lanes being measured and all concrete surfaces have reached specified curing and loading requirements. Place expansion joint material including polymer modified joint material, unarmored strip seals, unarmored expansion seals or similar material after completing corrective action. Place temporary material in lieu of the joint material for profile measurement until all corrective action is complete. Remove all dirt and debris from the surface of the travel lanes prior to performing the surface smoothness measurements. Provide permanent or temporary pavement markings for all travel lanes that are of sufficient size to be visible during surface smoothness measurements. Ensure the path of the profiler is parallel to the lane centerline at all times during data collection.

Develop an International Roughness Index (IRI) according to ASTM E 1926 for the bridge encounter using a continuous 25 feet base length analysis for each wheel path. Submit two copies of the summary report from ProVAL conforming to Supplement 1112 and two electronic copies of all bridge encounter profiles in ProVAL compatible format to the Engineer.

Provide necessary traffic control and survey stationing for all surface smoothness measurements.

MANDATORY CORRECTIVE ACTION

The Department will require corrective action where the Localized Roughness IRI (Refer to Supplement 1112 Appendix D for Definition) in any 25 feet segment of the bridge encounter exceeds 250 inches per mile, except on structures that include a steel armored expansion joint system where corrective action is required when the IRI exceeds 300 inches per mile. Perform corrective action to reduce the IRI for each corrected lane to 250 inches per mile or less for any 25 feet segment for a structure without a steel armor expansion joint system. For a structure that includes a steel armored expansion joint system, perform corrective action to reduce the IRI at the steel armor for each corrected lane to 300 inches per mile or less. Do not perform corrective diamond grinding within 1.5 feet of a steel armored expansion joint system installed prior to the corrective action. Do not exceed 0.5 inches of material removed by corrective diamond grinding without approval of the Engineer. If proposing diamond grinding exceeding 0.5 inches, use a pachometer or equivalent, capable of locating the nearest reinforcement, (i.e. size and location), accurate to within ± 0.1 inches. Provide cover readings within 6 inches of grinding locations exceeding 0.5 inches of removal depth.

Anytime PN 420 is used in conjunction with PN 555, the localized roughness criteria for the pavement beyond one foot of the approach slab will be governed by the criteria in PN 420.

If corrective action is required, develop a corrective action plan in accordance with Supplement 1112. Submit the corrective action plan to the Engineer at least 7 days before beginning corrective action. Do not begin corrective action until receiving the Engineer's acceptance of the corrective action plan. The corrective action plan may include but is not limited to grinding, pavement removal and replacement or a combination of the two. Corrective action required to meet the maximum allowable IRI values that are performed after the contract completion date, will be a Punch List item in accordance with C&MS 109.12.B. Corrective action will not be assessed liquidated damages in C&MS 108.07 or similar contract disincentives. If correction action on the Punch List is not completed within a reasonable time, it will be subject to an assessment of fifty percent of liquidated damages in accordance with C&MS 109.12.B. Upon completion of the corrective action, re-measure surface smoothness according to this specification. Feather areas adjacent to ground areas to provide a smooth surface. Re-groove diamond ground surfaces according to 511.17 if the existing grooves are less than 0.08 inches deep at no additional cost to the Department. Replace pavement markings and raised pavement markers according to the plans. All costs for corrective action will be the responsibility of the contractor.

PAY ADJUSTMENTS

A lump sum pay adjustment will be made according to Table 1 (without steel armored expansion joint system) or Table 2 (with steel armored expansion joint system) below based on the localized roughness histogram analysis within PROVAL per Supplement 1112. Positive Pay adjustments will only be made on histogram bins (refer to Supplement 1112 for definition.) on pre-corrected profile data that is below 200 IRI. The positive pay adjustment will only be made if the final structure does not have any locations exceeding a localized roughness of 250 IRI post correction without steel armored expansion joint systems or a localized roughness of 300 IRI with steel armored expansion joint systems, even for histogram bins on pre-corrected profile data below 200. The negative pay adjustments will be based on post corrective data.

The Department will not accept the Work for any part of the bridge with an IRI above 600 and consider the same as not in reasonably close conformance with the contract documents per C&MS 105.03. For surface smoothness above 600 IRI localized roughness, the Contactor must submit a corrective work plan per C&MS 501.05.C.

| Table 1 - Pay Adjustment – No Steel Armor Expansion Joint Systems | | | |
|---|---|--------------------------------|----------------------------|
| IRI | Approx. Area Under the Curve (AAUC) | Factored Bid Cost (FBC) | Pay Adjustment (PA) |
| IRI > 600 | Contractor submits corrective action plan. | | |
| 550 < IRI ≤ 600 | AAUC = -325 * L₅₅₀₋₆₀₀ | FBC = BC/1000 | PA = AAUC*FBC |
| 500 < IRI ≤ 550 | AAUC = -275 * L₅₀₀₋₅₅₀ | | |
| 450 < IRI ≤ 500 | AAUC = -225 * L₄₅₀₋₅₀₀ | | |
| 400 < IRI ≤ 450 | AAUC = -175 * L₄₀₀₋₄₅₀ | FBC = BC/2000 | |
| 350 < IRI ≤ 400 | AAUC = -125 * L₃₅₀₋₄₀₀ | | |
| 300 < IRI ≤ 350 | AAUC = -75 * L₃₀₀₋₃₅₀ | | |
| 250 < IRI ≤ 300 | AAUC = -25 * L₂₅₀₋₃₀₀ | | |
| 200 < IRI ≤ 250 | No Pay Adjustment | | |
| 150 < IRI ≤ 200 | AAUC = 25 * L₁₅₀₋₂₀₀ | FBC = BC/4000 | PA = AAUC*FBC |
| 100 < IRI ≤ 150 | AAUC = 75 * L₁₀₀₋₁₅₀ | | |
| 50 < IRI ≤ 100 | AAUC = 125 * L₅₀₋₁₀₀ | | |
| 0 < IRI ≤ 50 | AAUC = 175 * L₀₋₅₀ | | |
| Notes: L _{i-j} = Total length (ft) of encounter with i < IRI ≤ j (e.g. L ₂₀₀₋₂₅₀ for 200 < IRI ≤ 250) BC bridge decks = Unit Bid Cost (\$/yd ³) of superstructure concrete deck | | | |

| Table 2 – Pay Adjustment – with Steel Expansion Joint Systems | | | |
|--|---|--------------------------------|----------------------------|
| IRI | Approx. Area Under the Curve (AAUC) | Factored Bid Cost (FBC) | Pay Adjustment (PA) |
| IRI > 600 | Contractor submits corrective action plan. | | |
| 550 < IRI ≤ 600 | AAUC = -325 * L₅₅₀₋₆₀₀ | FBC = BC/1000 | PA = AAUC*FBC |
| 500 < IRI ≤ 550 | AAUC = -275 * L₅₀₀₋₅₅₀ | | |
| 450 < IRI ≤ 500 | AAUC = -225 * L₄₅₀₋₅₀₀ | | |
| 400 < IRI ≤ 450 | AAUC = -175 * L₄₀₀₋₄₅₀ | FBC = BC/2000 | |
| 350 < IRI ≤ 400 | AAUC = -125 * L₃₅₀₋₄₀₀ | | |

| | | | |
|--|---|----------------------|------------------------|
| 300 < IRI ≤ 350 | AAUC = -75 * L₃₀₀₋₃₅₀ | | |
| 250 < IRI ≤ 300 | No Pay Adjustment | | |
| 200 < IRI ≤ 250 | | | |
| 150 < IRI ≤ 200 | AAUC = 25 * L₁₅₀₋₂₀₀ | FBC = BC/4000 | PA = AAUC * FBC |
| 100 < IRI ≤ 150 | AAUC = 75 * L₁₀₀₋₁₅₀ | | |
| 50 < IRI ≤ 100 | AAUC = 125 * L₅₀₋₁₀₀ | | |
| 0 < IRI ≤ 50 | AAUC = 175 * L₀₋₅₀ | | |
| Notes: | | | |
| L _{i-j} = Total length (ft) of encounter with i < IRI ≤ j (e.g. L ₂₀₀₋₂₅₀ for 200 < IRI ≤ 250) | | | |
| BC bridge decks = Unit Bid Cost (\$/yd ³) of superstructure concrete deck | | | |

Basis of Payment:

Include the cost of all labor, equipment, materials, and all traffic control including LEO's necessary to meet this specification in the contract unit or lump sum price for applicable bridge or pavement items.

Designer Notes: This note should be included on all projects with new bridge decks and approach slabs and at least 100 feet of new approach pavement on each side of the approach slabs. The District has the option to include this note on projects with less approach pavement after review of the approach pavement profile and existing conditions. The District may also use discretion in areas with low ADT (Ex. Under 500) or with low speed limits (Ex. 25 mph).

Division of Planning, Office of Technical Services (614-752-5745)

Division of Construction Management, Office of Construction Administration, (614-752-57283)

APPENDIX J. SOIL BORING REPORT



GEOTECHNICAL ENGINEERING REPORT

PROPOSED BRIDGE STRUCTURE NO. 26
NEAR INTERSECTION OF CHIPPEWA RD. & HUNTER DR.
CHIPPEWA LAKE (MEDINA COUNTY), OHIO



Prepared For:

Medina County, OH

Attention:

Emry Hollopeter, E.I.

Delbert J. Channels
02/22/2022

GPD Project No. 2021821.70
February 22, 2022

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SECTION 1

1.0 Introduction

GPD Group is pleased to submit this Geotechnical Report for the aforementioned project. The purpose of this study was to obtain information on the subsurface conditions at the proposed project site and, based on this information, to provide geotechnical recommendations regarding the design and construction of foundations, and site development for the proposed bridge structure. A total of two (2) borings extending to auger refusal depths of approximately 44 to 45 feet below the existing ground surface were drilled at the site. Individual boring logs and a Boring Location Plan are attached.

1.1 Project Description

The site for the proposed structure is located along Chippewa Road between Hunter Drive and Garman Drive in Chippewa Lake, Ohio. We understand that the existing culvert/bridge, spanning McBabe Creek, will be replaced with a 24-ft single-span bridge with a concrete deck. GPD also understands the new single-span bridge and concrete bridge deck will be supported on concrete abutments per the provided standard details. Structural loading conditions were not available for this writing, however, we anticipate maximum foundation loads will be in accordance with ODOT HL-93 specifications for a "Simple Span Slab Bridge."

1.2 Purpose and Scope

The purposes of this report were to investigate subsurface conditions within the proposed bridge abutments and to provide geotechnical engineering recommendations for earthwork and foundation design. Specifically, the scope of work included the following:

- ❖ Conducting a field exploration program consisting of site reconnaissance and drilling sample borings at selected locations nearest the proposed bridge abutment locations to explore subsurface conditions and collect soil samples.
- ❖ Conducting geotechnical engineering laboratory test on sampled soils to assist with soil classifications and estimation of engineering properties.
- ❖ Develop geotechnical engineering recommendations for the design and construction of foundations, wingwalls and earthwork for site grading.

SECTION 2

2.0 Site Conditions

In general, the proposed bridge will be located along Chippewa Road and span McBabe Creek with ground surface elevations ranging from about 1,006 to 1,007 feet above sea level (Estimated from GoogleEarth Aerial Imagery). McBade Creek runs in a general north-to-southward direction with an estimated water surface elevation (WSEL) of approximately 1,000 feet above sea level.

2.1 Subsurface Exploration Program

The subsurface exploration consisted of drilling and sampling two (2) borings at the site to auger refusal depths ranging from about 44 to 45 feet below existing grade. The boring locations were laid out by GPD personnel using a hand held GPS device. The locations of the borings should be considered accurate only to the degree implied by the means and methods used to define them.

The borings were drilled with a truck-mounted CME-55 rotary drill rig using hollow-stem augers and an automatic SPT hammer to advance the boreholes. Representative soil samples were obtained by the split-barrel sampling procedure in general accordance with the appropriate ASTM standards. In the split-barrel sampling procedure, the number of blows required to advance a standard 2-inch O.D. split-barrel sampler the last 12 inches of the typical total 18-inch penetration by means of a 140-pound hammer with a free fall of 30 inches, is the standard penetration resistance value (N-Value). This value is used to estimate the in-situ relative density of cohesion-less soils and the consistency of cohesive soils. The sampling depths and penetration distance, plus the standard penetration resistance values, are shown on the boring logs. The samples were sealed and returned to the laboratory for testing and classification.

A CME automatic SPT hammer was used to advance the split-barrel sampler in the borings performed for this site. A significantly greater efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an appreciable effect on the standard penetration resistance blow count (N) values. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

Field logs of each boring were prepared by the drill crew. These logs included visual classifications of the materials encountered during drilling as well as the driller's interpretation of the subsurface conditions between samples. Final boring logs included with this report represent an interpretation of the field logs and include modifications based on observations made by a Geotechnical Engineer and the results of laboratory testing.

2.2 Laboratory Testing

The samples were classified in the laboratory based on visual observation, texture and plasticity. The descriptions of the soils indicated on the boring logs are in accordance with the enclosed General Notes and the Unified Soil Classification System. A brief description of this classification system is attached to this report.

The laboratory testing program consisted of performing natural water content tests in general accordance with ASTM D-2216. Information from these tests was used in conjunction with field penetration test data to evaluate soil strength in-situ, volume change potential, and soil classification. Results of these tests are attached and provided on the boring logs.

2.3 Subsurface Conditions

Asphalt - All Borings were drilled in asphalt covered areas with an asphalt layer thickness on the order of about 9.0 to 12.0 inches.

Stratum I – The asphalt surface is generally underlain by brown fine to coarse silt and sand with varying amounts of sand and gravel extending to depths ranging from about 12 to 17 feet below existing grade. N-values ranged from 7 to 13 blows per foot indicative of loose to medium dense consistency.

Stratum II – Stratum I was underlain by gray silty clay with varying amounts of sand and gravel extending to dept of about 32 to 37 feet below existing grade. N-values ranged from 9 to 21 blows per foot indicative of a medium stiff to very stiff consistency. The moisture content of the Stratum II soil, where measured, was on the order of about 12% to 17% indicative of moist to wet fine-grained soil.

Stratum III (B-1) – Stratum II, as encountered in Boring B-1, was underlain by gray fine to coarse sand and silt with little gravel. N-values ranged from 21 to 25 blows per foot indicative of a medium dense consistency.

Completely Weathered Sandstone – Borings B-1 and B-2 encountered gray, completely weathered sandstone at depths of about 32 and 37 feet below grade, respectively. Augers were able to be advanced in the completely weathered sandstone to refusal depths of 44.9 and 43.8 feet below grade, respectively. N-values within this stratum ranged from approximately 50 blows per 3 to 4 inches of penetration. Refer to the attached boring logs for additional soil information.

2.3.1 Groundwater Conditions

The borings were monitored while drilling and immediately after completion for the presence and level of groundwater. Water levels observed in the borings are noted on the boring logs. At these times, groundwater was observed in Borings B-1 and B-2 at depths ranging from approximately 9.0 to 8.5 feet below existing grade, respectively. These water level observations provide an approximate indication of the groundwater conditions existing on the site at the time the borings were drilled.

Fluctuations of the groundwater level can occur due to seasonal variations in the amount of rainfall, runoff, WSEL of McBabe Creek and other factors not evident at the time the borings were performed. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

SECTION 3

3.0 Engineering Recommendations

The following engineering recommendations are based on information provided to GPD Group regarding the design of the proposed single-span bridge, the field and laboratory testing performed on the soil/rock encountered at this site, and other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, GPD should be immediately notified so that further evaluation and supplemental recommendations can be provided.

3.1 Geotechnical Considerations

Based on the information obtained during the course of this study, the following geotechnical considerations should be taken into account during the planning, design and construction phases of the project. These geotechnical considerations are provided as a summary of the primary issues we believe are associated with this site. This report must be read in its entirety for a full description of our geotechnical recommendations:

- ❖ It should be noted that shallow groundwater was encountered at depths ranging from 8.5 to 9.0 feet below the existing grade at the time of our field operations. It should also be noted that the sand and silt stratum located slightly above and directly below these elevations will need to be supported during any excavation operations.
- ❖ Consideration was given to the use of a conventional shallow foundation to support the bridge. However, based on the loose sand/silt encountered, along with the erosion and scour characteristics, we do not recommend the use of a shallow foundation system. Contingent upon proper site preparation and evaluation of the foundation excavations, it is our opinion that the proposed concrete bridge abutments can be supported on drilled cast-in-place concrete piers.

The following report sections provide detailed recommendations regarding the geotechnical considerations presented above. In the event changes in the project design occur, GPD Group must review this report to determine if modifications to our recommendations are warranted.

3.2 Site Preparation

As part of this project, the existing bridge/culvert will be removed, including the roadway pavement and foundations. It is anticipated that the removal of the existing structure will cause disturbance to the underlying moisture sensitive silty soils, especially if construction is conducted in the wetter seasons. It should be added that the subsurface conditions directly beneath the existing structure could not be explored during our field study. With this said, in order to minimize the risk of unexpected construction issues and future settlement associated with the new facility, it is recommended that the removal of the existing structure, undercutting of unsuitable materials, selection of engineered fill and backfilling and compaction operations should be closely monitored by GPD Group on a full-time basis to verify that the disturbed areas are adequately repaired.

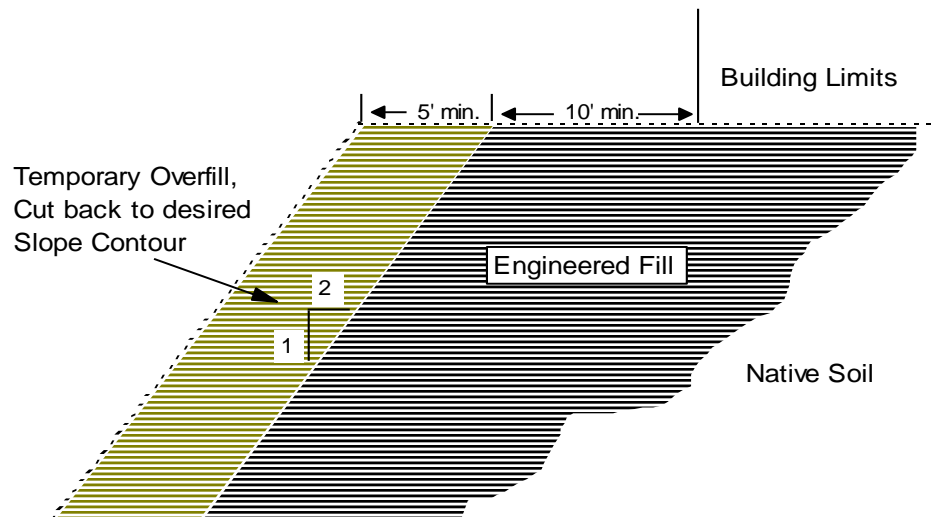
In addition to the removal of the bridge and pavements as discussed above, any vegetation, topsoil, tree roots, organic-containing soils, and any soft or otherwise unsuitable materials should be removed from the proposed building limits. We recommend the actual removal depths required be determined by a representative of GPD Group during construction.

3.3 Fill Material

Any fill or backfill required within building limits should be select material, as approved by a qualified geotechnical engineer. For all filling operations, the following should be observed:

- ❖ Prior to use, the approved fill material should be tested as outlined in ASTM D-698 to determine the maximum dry density and optimum moisture content for silty or cohesive soils, or ASTM D-4253 and D-4254 for clean granular soils. For each change in borrow material, additional tests will be required.
- ❖ For all fill or backfill used, the fill material should be placed on the approved subgrade in controlled lifts, with each lift compacted to a stable condition, and to a minimum of 98% maximum dry density per ASTM D-698 at a moisture content within 1.5% of optimum for cohesive or silty borrow. Controlled lifts of granular material should be compacted to 80% relative density per ASTM D-4254.
- ❖ All filling operations should be observed by a qualified soils technician with field density tests made, to assure compaction to specification.

Proper moisture control of fine grained silty soils is critical in attaining the required compaction. It should be noted that both in-situ soils and new fill composed of fine grained soils are susceptible to disturbance by construction equipment traffic when wet. Thus, construction operations should be planned to prevent such disturbance and the resulting weakening of the subgrade soils. Such precautions would include, but not be limited to grading the site to prevent ponding of water, sealing the subgrade soils at the end of operations each day, and allowing wet subgrades to dry before operating heavy equipment on the soil.



Proper benching of the structural fills will be critical for their long term stability. The depth and width of the benches can be determined by inspection during the excavation operations but should typically have a width of about 10 to 15 feet. The vertical cut of any bench should not exceed about 3 to 5 feet.

Compaction equipment and techniques will be dependent on the type of material being used as fill. A sheepsfoot roller should provide adequate compaction for cohesive (clayey) soils. A vibratory type compactor such as a drum roller will be required for non-cohesive (sandy) soils.

3.4 Drilled Concrete Pier Foundations

Based on the results of this study, it is our opinion that cast-in-place concrete piers would be appropriate for support of the proposed bridge abutments. The following net design parameters may be used to design the proposed foundation system. Factors of safety of 2 and 3 have been applied to the allowable skin friction and bearing pressure values provided below, respectively. The cohesion, internal angle of friction and unit weight parameters along with the vertical modulus of subgrade reaction, horizontal modulus of subgrade reaction, sliding friction coefficient, and strain values given in the following table are based on the results of the sample boring, lab testing, published values and our past experience with similar soil/rock types. These values should, therefore, be considered approximate.

Table 1: Drilled Pier – Allowable Design Parameters (B-1)

| Depth (feet) | USCS | Unit Weight (pcf) | Horizontal Modulus of Subgrade Reaction (pci) | ϵ_{50} | Allowable Skin Friction ³ (psf) | Allowable Bearing Pressure (psf) | Internal Angle of Friction (Degrees) | Cohesion (psf) |
|--------------------|------|---------------------|---|-----------------|--|----------------------------------|--------------------------------------|----------------|
| 0 – 3 ¹ | SP | 115 | Ignore ¹ | - | Ignore ¹ | Ignore | - | - |
| 3 – 7 | SP | 115 | 90 | - | 340 | Ignore | 32 | 0 |
| 7 – 17 | CL | 110/48 ² | 25 | - | 525 | 2,500 | 28 | 0 |
| 17 – 32 | SP | 58 | 120 | 0.007 | 400 | 3,000 | 0 | 1,500 |
| 32 – 43 | SP | 53 | 150 | - | 825 | 5,000 | 34 | 0 |
| 43 – 45 | HWR | 73 | 225 | - | 850 | 10,000 | 38 | 0 |

¹The upper 3-ft should be ignored due to potential frost effects and construction disturbance considerations.

²Boyant unit weight should be utilized below a depth of 8.5 feet

³Use 2/3 of allowable skin friction (psf) for uplift resistance

Table 2: Drilled Pier – Allowable Design Parameters (B-2)

| Depth (feet) | USCS | Unit Weight (pcf) | Horizontal Modulus of Subgrade Reaction (pci) | ϵ_{50} | Allowable Skin Friction ³ (psf) | Allowable Bearing Pressure (psf) | Internal Angle of Friction (Degrees) | Cohesion (psf) |
|--------------------|------|---------------------|---|-----------------|--|----------------------------------|--------------------------------------|----------------|
| 0 – 3 ¹ | SP | 115 | Ignore ¹ | - | Ignore ¹ | Ignore | - | - |
| 3 – 7 | SP | 115 | 90 | - | 340 | Ignore | 32 | 0 |
| 7 – 12 | SP | 110/48 ² | 25 | - | 500 | 2,500 | 28 | 0 |
| 12 – 37 | CL | 58 | 150 | 0.005 | 650 | 4,000 | 0 | 2,000 |
| 37 – 44 | HWR | 73 | 180 | - | 875 | 10,000 | 38 | 0 |

¹The upper 3-ft should be ignored due to potential frost effects and construction disturbance considerations.

²Boyant unit weight should be utilized below a depth of 8.5 feet

³Use 2/3 of allowable skin friction (psf) for uplift resistance

The above parameters are provided for the design of cast-in-place concrete piers. In the event that a different foundation or tower type is chosen, these parameters are not considered valid and GPD Group should be notified immediately to provide appropriate design parameters, as warranted.

The foundation settlement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of compacted fill, and the quality of the earthwork operations. Assuming that footing construction is performed in accordance with our recommendations, it is our opinion that total settlement will be about 1 inch or less. Differential settlement on the order of 2/3 to 3/4 of the total settlement should be anticipated.

Drilled pier foundations should be designed with a minimum shaft diameter of 36 inches to facilitate clean out of the pier excavation. Temporary casing will be required during the pier excavation in order to support the sides of the excavation in weak soil zones. Casing should not extend below the rock surface. Care should be taken so that the sides and bottom of the excavations are not disturbed during construction. The bottom of the shaft should be free of loose soil or debris prior to reinforcing steel and concrete placement. It is essential that piers designed using the provided properties are cast against native soil/rock. Overexcavation and forming of piers is not permitted. Additionally, any auger advancement below the encountered auger refusal depths may prove difficult.

A concrete slump of at least 6 inches is recommended to facilitate temporary casing removal. It should be possible to remove the casing from a pier excavation during concrete placement provided that the concrete inside the casing is maintained at a sufficient level to resist any earth and hydrostatic pressures outside the casing during the entire casing removal procedure.

3.5 Lateral Earth Pressures – Wing Walls

Wingwall foundations comprised of conventional spread footings bearing on suitable native soils or on properly compacted fill extending to suitable native soil may be sized using a maximum new allowable bearing pressure of 1,500 psf. It should be noted that the foundations should be founded below the local frost depth and extend below the scour depth.

Wingwalls with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to those indicated in the Table 3. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall rotation. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls.

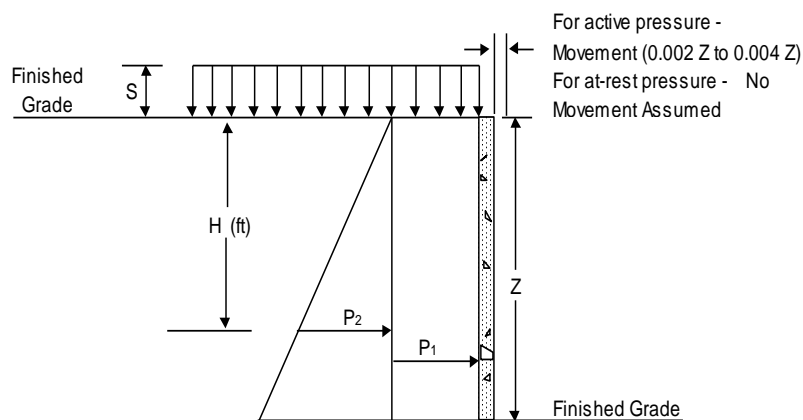


Figure 1: Lateral Earth Pressures

Table 1: Lateral Earth Pressure Coefficient

| EARTH PRESSURE CONDITIONS | COEFFICIENT FOR BACKFILL TYPE | EQUIVALENT FLUID PRESSURE (pcf) | SURCHARGE PRESSURE, P ₁ (psf) | EARTH PRESSURE, P ₂ (psf) |
|---------------------------|-------------------------------|---------------------------------|--|--------------------------------------|
| Active (K _a) | Granular - 0.29 | 35 | (0.29)S | (35)H |
| | Lean Clay - 0.42 | 50 | (0.42)S | (50)H |
| At-Rest (K _o) | Granular - 0.46 | 55 | (0.46)S | (55)H |
| | Lean Clay - 0.58 | 70 | (0.58)S | (70)H |
| Passive (K _p) | Granular - 3.0 | 360 | --- | --- |
| | Lean Clay - 2.4 | 288 | --- | --- |

Conditions applicable to the above coefficients include:

- ❖ For active earth pressure, wall must rotate about base, with top lateral movements 0.002 Z to 0.004 Z, where Z is wall height
- ❖ For passive earth pressure, wall must move horizontally to mobilize resistance.
- ❖ Uniform surcharge, where S is surcharge pressure
- ❖ In-situ soil backfill weight a maximum of 125 pcf
- ❖ Horizontal backfill, compacted to at least 98% of standard Proctor maximum dry density
- ❖ Loading from heavy compaction equipment not included
- ❖ No groundwater acting on wall
- ❖ No safety factor included
- ❖ Ignore passive pressure in frost zone

Backfill placed against structures should consist of granular soils. For the granular values to be valid, the granular backfill must extend out from the base of the wall at an angle of at least 45 and 60 degrees from vertical for the active and passive cases, respectively. A geotextile (i.e. filter fabric) should be placed between the granular backfill and cohesive soils to preclude the infiltration of fines. To calculate the resistance to sliding, a value of 0.35 should be used as the coefficient of friction between the footing and the underlying soil.

To control the water level behind the wall, we recommend a perimeter drain be installed at the foundation level and described in the following notes.

- ❖ Granular backfill in this case consist of free draining No. 57 stone or equivalent.
- ❖ Perforated pipe should be rigid PVC wrapped with a separator fabric (sock) and sized to transport the expected water.
- ❖ Exterior ground surface should consist of a 12 inch clay cap sloped to drain and underlain by filter fabric.
- ❖ The clay cap can be replaced by a pavement section
- ❖ Weep holes can be considered for retaining walls if the water seepage will not impact adjacent structures or slopes

3.6 Dewatering Recommendations

We expect shallow groundwater seepage to be encountered in any excavations extending below an estimated elevation of about 997 feet. The contractor should dewater any excavation (discharge either on or off the construction right-of-way) in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any body of water or other areas that could be negatively impacted. The Contractor shall submit an erosion and sediment control plan to the owner prior to construction in accordance with Federal, State and local codes.

The Contractor shall provide and maintain, at all times during construction, proper equipment necessary to promptly remove and dispose of all water entering excavations. Dewatering shall be performed by methods that will provide a dry excavation base and preserve the final lines and grades of the excavations. Dewatering methods may include the use of well points, sump pumps, or other means, all subject to the approval by GPD Group or Medina County. The cost of all dewatering activities shall be borne by the Contractor. GPD Group should be contacted immediately in the event excessive groundwater recharge rates are encountered which cannot be controlled using the conventional methods discussed above.

3.7 Excavations

All excavations shall be sloped or shored per the requirements of OSHA regulations. Based on the borings performed at this site, we recommend that the excavations be designed using an OSHA Type "C" soil classification. Where required, excavation bottoms shall be graded to provide a smooth, firm and stable foundation that is free from rocks and other obstructions. Although not anticipated, any excavations that extend greater than 20 feet shall be designed and approved by a professional engineer.

3.8 Cut and Fill Slopes

Based on our boring data and preliminary laboratory analysis, the following cut and fill design slope inclinations are recommended.

Table 4: Slope Inclinations

| Slope Height | Recommended Slope Inclination |
|---------------|-------------------------------|
| 0 to 10 feet | 3 (H) to 1 (V) |
| 10 to 25 feet | 4 (H) to 1 (V) |

It will be imperative that fill slopes be properly benched into the existing subgrade and be properly compacted, as outlined in the Section 3.3. A minimum bench of 3 feet vertical by 3 feet horizontal is recommended. Smaller benches may be required in smaller slopes. This benching will help provide a positive interaction between the fill and natural soils and reduce the possibility of failure along the fill/natural soil interface. Furthermore, we recommend that fill slopes be over filled and then cut back to develop an adequately compacted slope face.

Soil slopes should be covered for protection from rain, and surface runoff should be diverted away from the slopes. For erosion protection, a protective cover of grass or other vegetation should be established on permanent soil slopes as soon as possible. A minimum building setback from the top of slopes of 10 feet is recommended.

SECTION 4

4.0 Additional Design and Construction Considerations

4.1 Seismic Considerations

The International Building Code (IBC) requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The scope of services for this project required that borings be drilled to a maximum depth of about 45 feet. The noted site classification considers that weathered bedrock exists below the maximum depth of subsurface exploration. Based on the available field and laboratory test results and our knowledge and experience with the local site geology, a Seismic Site Classification "C" should be used for design of the structures according to the "International Building Code and Related Codes, Section 1613.5.2 Site Class Definitions.

4.2 Subsurface Drainage

At the time of this investigation, groundwater was encountered at elevations ranging from EL 997 to EL 998.5 feet. We expect that this water will be exposed during excavations but should be controllable with conventional dewatering methods, such as pumping from sumps, until foundations can be placed. It should be anticipated that the drilled concrete piers will require temporary casings during construction operations to preclude potential collapse or sluffing.

4.3 General Comments

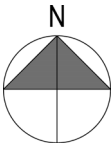
GPD Group should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Subsequent to the demolition of the existing structure, GPD should also be retained to provide testing and observation during site preparation and fill placement operations as well as during the foundation and earthwork phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, GPD should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken.

This report has been prepared for the exclusive use of **Medina County, Ohio** for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless GPD Group reviews the changes and either verifies or modifies the conclusions of this report in writing.

LOCATION PLAN



Legend

Soil Boring:

PROJECT: Medina County – Chippewa Rd Bridge #26
PROJECT NUMBER: 2021821.70 **DATE:** 2-2-2022
LOCATION: Chippewa Rd, Chippewa Lake, OH



520 S Main St, Suite 2531 Akron, Ohio 44311

Boring Number: B-1

CLIENT Medina County Engineer's Office
PROJECT NUMBER 2021821.70
DATE STARTED January 27, 2022 **COMPLETED** January 27, 2022
DRILLING CONTRACTOR GPD Geotechnical Services, INC.
DRILLING METHOD Hollow Stem Auger with Automatic SPT Hammer
LOGGED BY Dave Campana **CHECKED BY** Mitch Davis
NOTES CME 55, Truck

PROJECT NAME Medina County Bridge #26 Chippewa Rd.
PROJECT LOCATION Chippewa Rd, Chippewa Lake, OH
GROUND ELEVATION 1006 ft **HOLE SIZE** _____
GROUND WATER LEVELS:
 ▽ **AT TIME OF DRILLING** 9.00 ft / Elev 997.00 ft
 ▼ **AT END OF DRILLING** 9.00 ft / Elev 997.00 ft

| DEPTH (ft) | GRAPHIC LOG | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | DYNAMIC CONE PENETROMETER (BLOWS/1.75') | POCKET PEN. (tsf) | MOISTURE CONTENT (%) | ATTERBERG LIMITS | | | FINES CONTENT (%) |
|------------|-------------|--|--------------------|------------------|---|-------------------|----------------------|------------------|---------------|------------------|-------------------|
| | | | | | | | | LIQUID LIMIT | PLASTIC LIMIT | PLASTICITY INDEX | |
| 0 | | 12" Asphalt | | | | | | | | | |
| 5 | | Damp, medium dense, brown, fine to coarse SAND & SILT, little gravel. | SS 1 | 78 | 18-8-8 (16) | | | | | | |
| 10 | | Moist, loose, brown, fine to coarse SAND, SILT, & GRAVEL. | SS 2 | 61 | 7-6-5 (11) | | | | | | |
| 15 | | Wet, loose, gray, fine to coarse SAND & SILT, some gravel. | SS 3 | 50 | 4-3-2 (5) | | | | | | |
| 20 | | Damp, very stiff, gray, silty CLAY, little sand & gravel. | SS 4 | 75 | 4-3-4 (7) | | | | | | |
| 25 | | Moist to damp, stiff, gray, silty CLAY, little sand & gravel. | SS 5 | 81 | 7-8-10 (18) | | 12 | | | | |
| 30 | | Moist to wet, medium dense, gray, fine to coarse SAND & SILT, little gravel. | SS 6 | 64 | 3-4-5 (9) | | 14 | | | | |
| 35 | | Wet, medium dense, gray, fine to coarse SAND & SILT; weathered sandstone. | SS 7 | 83 | 4-6-8 (14) | | | | | | |
| 40 | | Wet, compact, gray, completely weathered SANDSTONE. | SS 8 | 78 | 6-11-14 (25) | | | | | | |
| | | | SS 9 | 50 | 12-9-12 (21) | | | | | | |
| | | | SS 10 | 65 | 17-13-50/5" | | | | | | |

Auger Refusal at 44.9 feet

GEOTECH WITH DCP VALUES - GINT STD US LAB.GDT - 2/22/22 12:56 - F:\GPD GILCHRIST\JOBS\2021\2021821.70 - MEDINA CO - MEDINA COUNTY BRIDGE #26, CHIPPEWA ROAD\B1 - B2 - COPY.GPJ

Boring Number: B-2

CLIENT Medina County Engineer's Office
PROJECT NUMBER 2021821.70
DATE STARTED January 27, 2022 **COMPLETED** January 27, 2022
DRILLING CONTRACTOR GPD Geotechnical Services, INC.
DRILLING METHOD Hollow Stem Auger with Automatic SPT Hammer
LOGGED BY Dave Campana **CHECKED BY** Mitch Davis
NOTES CME 55, Truck

PROJECT NAME Medina County Bridge #26 Chippewa Rd.
PROJECT LOCATION Chippewa Rd, Chippewa Lake, OH
GROUND ELEVATION 1007 ft **HOLE SIZE** _____
GROUND WATER LEVELS:
 ▽ **AT TIME OF DRILLING** 8.50 ft / Elev 998.50 ft
 ▼ **AT END OF DRILLING** 8.50 ft / Elev 998.50 ft

| DEPTH (ft) | GRAPHIC LOG | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | DYNAMIC CONE PENETROMETER (BLOWS/1.75') | POCKET PEN. (tsf) | MOISTURE CONTENT (%) | ATTERBERG LIMITS | | | FINES CONTENT (%) |
|------------|-------------|---|--------------------|------------------|---|-------------------|----------------------|------------------|---------------|------------------|-------------------|
| | | | | | | | | LIQUID LIMIT | PLASTIC LIMIT | PLASTICITY INDEX | |
| 0 | | 9" Asphalt | | | | | | | | | |
| 5 | | Damp, medium dense, brown, fine to coarse SAND, little gravel. | SS 1 | 72 | 22-14-10 (24) | | | | | | |
| 10 | | Moist to wet, loose, brown, fine to coarse SAND & SILT, some gravel. | SS 2 | 67 | 5-7-6 (13) | | | | | | |
| 15 | | Moist to wet, very stiff, gray, silty CLAY, some sand, trace of gravel. | SS 3 | 44 | 5-3-4 (7) | | | | | | |
| 20 | | Wet, stiff, gray, silty CLAY, trace of sand. | SS 4 | 50 | 5-13-8 (21) | | 13 | | | | |
| 25 | | Wet, stiff, gray, silty CLAY, some sand. | SS 5 | 50 | 3-5-6 (11) | | | | | | |
| 30 | | Wet, very stiff, gray, silty CLAY, trace of sand & gravel. | SS 6 | 78 | 4-6-9 (15) | | 15 | | | | |
| 35 | | Wet, stiff, gray, silty CLAY, little sand, trace of gravel. | SS 7 | 92 | 6-7-10 (17) | | | | | | |
| 40 | | Wet, to moist, compact, gray, completely weathered SANDSTONE. | SS 8 | 22 | 3-4-6 (10) | | 17 | | | | |
| 43.8 | | Wet, compact, gray, weathered SANDSTONE. | SS 9 | 55 | 26-50/4" | | | | | | |
| | | Auger Refusal at 43.8 feet | SS 10 | 100 | 50/4" | | | | | | |

GEOTECH WITH DCP VALUES - GINT STD US LAB.GDT - 2/22/22 12:56 - F:\GPD GILCHRIST\JOBS\2021\2021821.70 - MEDINA CO - MEDINA COUNTY BRIDGE #26, CHIPPEWA ROAD\B1 - B2 - COPY.GPJ

Unified Soil Classification System

| Major Divisions | | | Letter | Symbol | Description | |
|--|---|--------------------|--|------------|--|---|
| Coarse-grained Soils More than ½ retained on the No. 200 Sieve | Gravels More than ½ coarse fraction retained on the No. 4 sieve | Clean Gravels | GW | | Well-graded gravels and gravel-sand mixtures, little or no fines. | |
| | | Gravels With Fines | GP | | Poorly-graded gravels and gravel-sand mixtures, little or no fines. | |
| | | Gravels With Fines | GM | | Silty gravels, gravel-sand-silt mixtures. | |
| | | Gravels With Fines | GC | | Clayey gravels, gravel-sand-clay mixtures. | |
| | Sands More than ½ passing through the No. 200 sieve | Clean Sands | Clean Sands | SW | | Well-graded sands and gravelly sands, little or no fines. |
| | | | Clean Sands | SP | | Poorly-graded sands and gravelly sands, little or no fines. |
| | | Sands With Fines | Sands With Fines | SM | | Silty sands, sand-silt mixtures |
| | | | Sands With Fines | SC | | Clayey sands, sandy-clay mixtures. |
| Fine-grained Soils More than ½ passing through the No. 200 Sieve | Silts and Clays Liquid Limit less than 50% | | ML | | Inorganic silts, very fine sands, rock flour, silty or clayey fine sands. | |
| | | | CL | | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. | |
| | | | OL | | Organic clays of medium to high plasticity. | |
| | Silts and Clays Liquid Limit greater than 50% | | MH | | Inorganic silts, micaceous or diatomaceous fines sands or silts, elastic silts. | |
| | | | CH | | Inorganic clays of high plasticity, fat clays. | |
| | | | OH | | Organic clays of medium to high plasticity. | |
| Highly Organic Soils | | | PT | | Peat, muck, and other highly organic soils. | |
| Consistency Classification | | | | | | |
| <i>Granular Soils</i> | | | <i>Cohesive Soils</i> | | | |
| Description - Blows Per Foot (Corrected) | | | Description - Blows Per Foot (Corrected) | | | |
| | <u>MCS</u> | <u>SPT</u> | | <u>MCS</u> | <u>SPT</u> | |
| Very loose | <5 | <4 | Very soft | <3 | <2 | |
| Loose | 5 - 15 | 4 - 10 | Soft | 3 - 5 | 2 - 4 | |
| Medium dense | 16 - 40 | 11 - 30 | Firm | 6 - 10 | 5 - 8 | |
| Dense | 41 - 65 | 31 - 50 | Stiff | 11 - 20 | 9 - 15 | |
| Very dense | >65 | >50 | Very Stiff | 21 - 40 | 16 - 30 | |
| | | | Hard | >40 | >30 | |
| MCS = Modified California Sampler | | | SPT = Standard Penetration Test Sampler | | | |

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

| | |
|--|--|
| SFA: Solid Flight Auger - typically 4" diameter flights, except where noted. | SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted. |
| HSA: Hollow Stem Auger - typically 3 1/4" or 4 1/4" I.D. openings, except where noted. | ST: Shelby Tube - 3" O.D., except where noted. |
| M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry | BS: Bulk Sample |
| R.C.: Diamond Bit Core Sampler | PM: Pressuremeter |
| H.A.: Hand Auger | CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings |
| P.A.: Power Auger - Handheld motorized auger | |

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
 N₆₀: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
 Q_u: Unconfined compressive strength, TSF
 Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
 w%: Moisture/water content, %
 LL: Liquid Limit, %
 PL: Plastic Limit, %
 PI: Plasticity Index = (LL-PL), %
 DD: Dry unit weight, pcf
 ▼, ▼, ▼: Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

| <u>Relative Density</u> | <u>N - Blows/foot</u> |
|-------------------------|-----------------------|
| Very Loose | 0 - 4 |
| Loose | 4 - 10 |
| Medium Dense | 10 - 30 |
| Dense | 30 - 50 |
| Very Dense | 50 - 80 |
| Extremely Dense | 80+ |

ANGULARITY OF COARSE-GRAINED PARTICLES

| <u>Description</u> | <u>Criteria</u> |
|--------------------|--|
| Angular: | Particles have sharp edges and relatively plane sides with unpolished surfaces |
| Subangular: | Particles are similar to angular description, but have rounded edges |
| Subrounded: | Particles have nearly plane sides, but have well-rounded corners and edges |
| Rounded: | Particles have smoothly curved sides and no edges |

GRAIN-SIZE TERMINOLOGY

| <u>Component</u> | <u>Size Range</u> |
|------------------------|--|
| Boulders: | Over 300 mm (>12 in.) |
| Cobbles: | 75 mm to 300 mm (3 in. to 12 in.) |
| Coarse-Grained Gravel: | 19 mm to 75 mm (¾ in. to 3 in.) |
| Fine-Grained Gravel: | 4.75 mm to 19 mm (No.4 to ¾ in.) |
| Coarse-Grained Sand: | 2 mm to 4.75 mm (No.10 to No.4) |
| Medium-Grained Sand: | 0.42 mm to 2 mm (No.40 to No.10) |
| Fine-Grained Sand: | 0.075 mm to 0.42 mm (No. 200 to No.40) |
| Silt: | 0.005 mm to 0.075 mm |
| Clay: | <0.005 mm |

PARTICLE SHAPE

| <u>Description</u> | <u>Criteria</u> |
|--------------------|---|
| Flat: | Particles with width/thickness ratio > 3 |
| Elongated: | Particles with length/width ratio > 3 |
| Flat & Elongated: | Particles meet criteria for both flat and elongated |

RELATIVE PROPORTIONS OF FINES

| <u>Descriptive Term</u> | <u>% Dry Weight</u> |
|-------------------------|---------------------|
| Trace: | < 5% |
| With: | 5% to 12% |
| Modifier: | >12% |

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

| <u>Q_u - TSF</u> | <u>N - Blows/foot</u> | <u>Consistency</u> |
|----------------------------|-----------------------|---------------------|
| 0 - 0.25 | 0 - 2 | Very Soft |
| 0.25 - 0.50 | 2 - 4 | Soft |
| 0.50 - 1.00 | 4 - 8 | Firm (Medium Stiff) |
| 1.00 - 2.00 | 8 - 15 | Stiff |
| 2.00 - 4.00 | 15 - 30 | Very Stiff |
| 4.00 - 8.00 | 30 - 50 | Hard |
| 8.00+ | 50+ | Very Hard |

MOISTURE CONDITION DESCRIPTION

| <u>Description</u> | <u>Criteria</u> |
|--------------------|---|
| Dry: | Absence of moisture, dusty, dry to the touch |
| Moist: | Damp but no visible water |
| Wet: | Visible free water, usually soil is below water table |

RELATIVE PROPORTIONS OF SAND AND GRAVEL

| <u>Descriptive Term</u> | <u>% Dry Weight</u> |
|-------------------------|---------------------|
| Trace: | < 15% |
| With: | 15% to 30% |
| Modifier: | >30% |

STRUCTURE DESCRIPTION

| <u>Description</u> | <u>Criteria</u> | <u>Description</u> | <u>Criteria</u> |
|--------------------|---|--------------------|---|
| Stratified: | Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick | Blocky: | Cohesive soil that can be broken down into small angular lumps which resist further breakdown |
| Laminated: | Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick | Lensed: | Inclusion of small pockets of different soils |
| Fissured: | Breaks along definite planes of fracture with little resistance to fracturing | Layer: | Inclusion greater than 3 inches thick (75 mm) |
| Slickensided: | Fracture planes appear polished or glossy, sometimes striated | Seam: | Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample |
| | | Parting: | Inclusion less than 1/8-inch (3 mm) thick |

SCALE OF RELATIVE ROCK HARDNESS

| <u>Q_u - TSF</u> | <u>Consistency</u> |
|----------------------------|--------------------|
| 2.5 - 10 | Extremely Soft |
| 10 - 50 | Very Soft |
| 50 - 250 | Soft |
| 250 - 525 | Medium Hard |
| 525 - 1,050 | Moderately Hard |
| 1,050 - 2,600 | Hard |
| >2,600 | Very Hard |

ROCK BEDDING THICKNESSES

| <u>Description</u> | <u>Criteria</u> |
|--------------------|---------------------------------------|
| Very Thick Bedded | Greater than 3-foot (>1.0 m) |
| Thick Bedded | 1-foot to 3-foot (0.3 m to 1.0 m) |
| Medium Bedded | 4-inch to 1-foot (0.1 m to 0.3 m) |
| Thin Bedded | 1¼-inch to 4-inch (30 mm to 100 mm) |
| Very Thin Bedded | ½-inch to 1¼-inch (10 mm to 30 mm) |
| Thickly Laminated | 1/8-inch to ½-inch (3 mm to 10 mm) |
| Thinly Laminated | 1/8-inch or less "paper thin" (<3 mm) |

ROCK VOIDS

| <u>Voids</u> | <u>Void Diameter</u> |
|--------------|---------------------------------|
| Pit | <6 mm (<0.25 in) |
| Vug | 6 mm to 50 mm (0.25 in to 2 in) |
| Cavity | 50 mm to 600 mm (2 in to 24 in) |
| Cave | >600 mm (>24 in) |

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

| <u>Component</u> | <u>Size Range</u> |
|---------------------|--------------------|
| Very Coarse Grained | >4.76 mm |
| Coarse Grained | 2.0 mm - 4.76 mm |
| Medium Grained | 0.42 mm - 2.0 mm |
| Fine Grained | 0.075 mm - 0.42 mm |
| Very Fine Grained | <0.075 mm |

ROCK QUALITY DESCRIPTION

| <u>Rock Mass Description</u> | <u>RQD Value</u> |
|------------------------------|------------------|
| Excellent | 90 -100 |
| Good | 75 - 90 |
| Fair | 50 - 75 |
| Poor | 25 -50 |
| Very Poor | Less than 25 |

DEGREE OF WEATHERING

| | |
|---------------------|---|
| Slightly Weathered: | Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact. |
| Weathered: | Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife. |
| Highly Weathered: | Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife. |