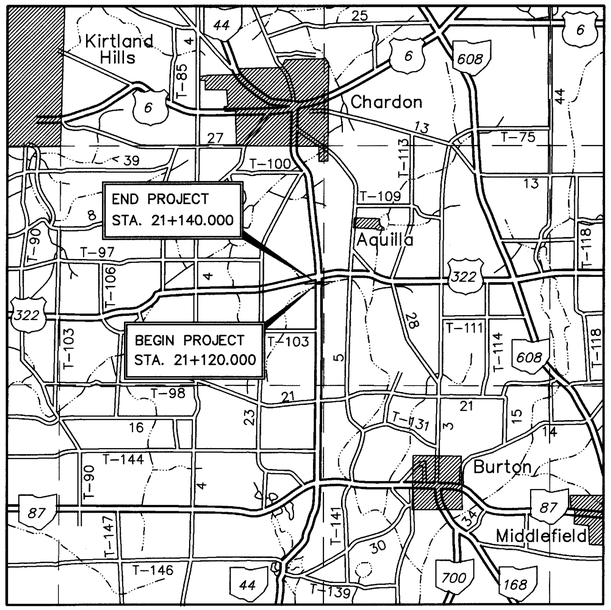
STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
GEA-44-21.120 (13.13)
MUNSON TOWNSHIP
GEAUGA COUNTY



LOCATION MAP

SCALE: 1:50000

LATITUDE: N41°31'58" LONGITUDE: W81°11'35"

LEGEND

PORTION TO BE IMPROVED
STATE HIGHWAYS
OTHER HIGHWAYS

DESIGN DESIGNATION

CURRENT A.D.T. (1999)	= 9700
DESIGN A.D.T. (2019)	= 14600
D.H.V. (2019)	= 1460
D.	= 55%
T.	= 7%
V. (Design Speed)	= 90 K.P.H.
U. (Legal Speed)	= 55 M.P.H.
FUNCTIONAL CLASSIFICATION	= MINOR ARTERIAL (RURAL)

DESIGN EXCEPTIONS
VERTICAL CURVE

INDEX OF SHEETS

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PROJECT DESCRIPTION

IMPROVEMENT OF 0.02 KILOMETERS OF S.R. 44 BY REPLACEMENT OF AN EXISTING CONCRETE SLAB STRUCTURE OVER BRANCH OF BUTTERNUT CREEK WITH A PRECAST BOX CULVERT INCLUDING APPROACH RECONSTRUCTION.

1997 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT DETOURS WILL BE PROVIDED AS SET FORTH ON THE PLANS AND ESTIMATES.

UNDERGROUND UTILITIES

2 WORK DAYS BEFORE YOU DIG

CALL 800-362-2764 (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE

NON MEMBERS
MUST BE CALLED DIRECTLY

Plans Prepared and Recommended By:

RESOURCE INTERNATIONAL INC.
9454 MIDWEST AVE., SUITE N
CLEVELAND, OHIO 44125
(216) 581-0777

STATE OF OHIO — JOSEPH S. BOLZENIUS E-55423 — REGISTERED PROFESSIONAL ENGINEER

STANDARD CONSTRUCTION DRAWINGS

BP-3.1M	10-28-94	MT-99.10M	1-30-95
BP-4.1M	10-28-94	MT-101.60M	4-25-94
		MT-105.10M	4-25-94
GR-1.1M	**10-21-97**	MT-105.11M	4-25-94
GR-1.3M	11-30-94		
GR-2.1M	**4-14-98**		
GR-2.2M	**10-21-97**		
GR-4.1M	11-30-94	TC-41.10	**3-31-94**
GR-4.2M	**10-21-97**	TC-41.20	**7-1-94**
		TC-52.10	**7-29-94**
RM-1.1M	**4-8-97**	TC-52.20	**7-29-94**
		TC-65.10	**7-29-94**
DM-4.3M	6-30-95		
DM-4.4M	6-30-95		
DM-1.1M	**10-21-97**		

SUPPLEMENTAL SPECIFICATIONS

802	3-23-95
806	9-9-97
842	1-6-99
877	4-13-99

SPECIAL PROVISIONS

WATERWAY PERMITS

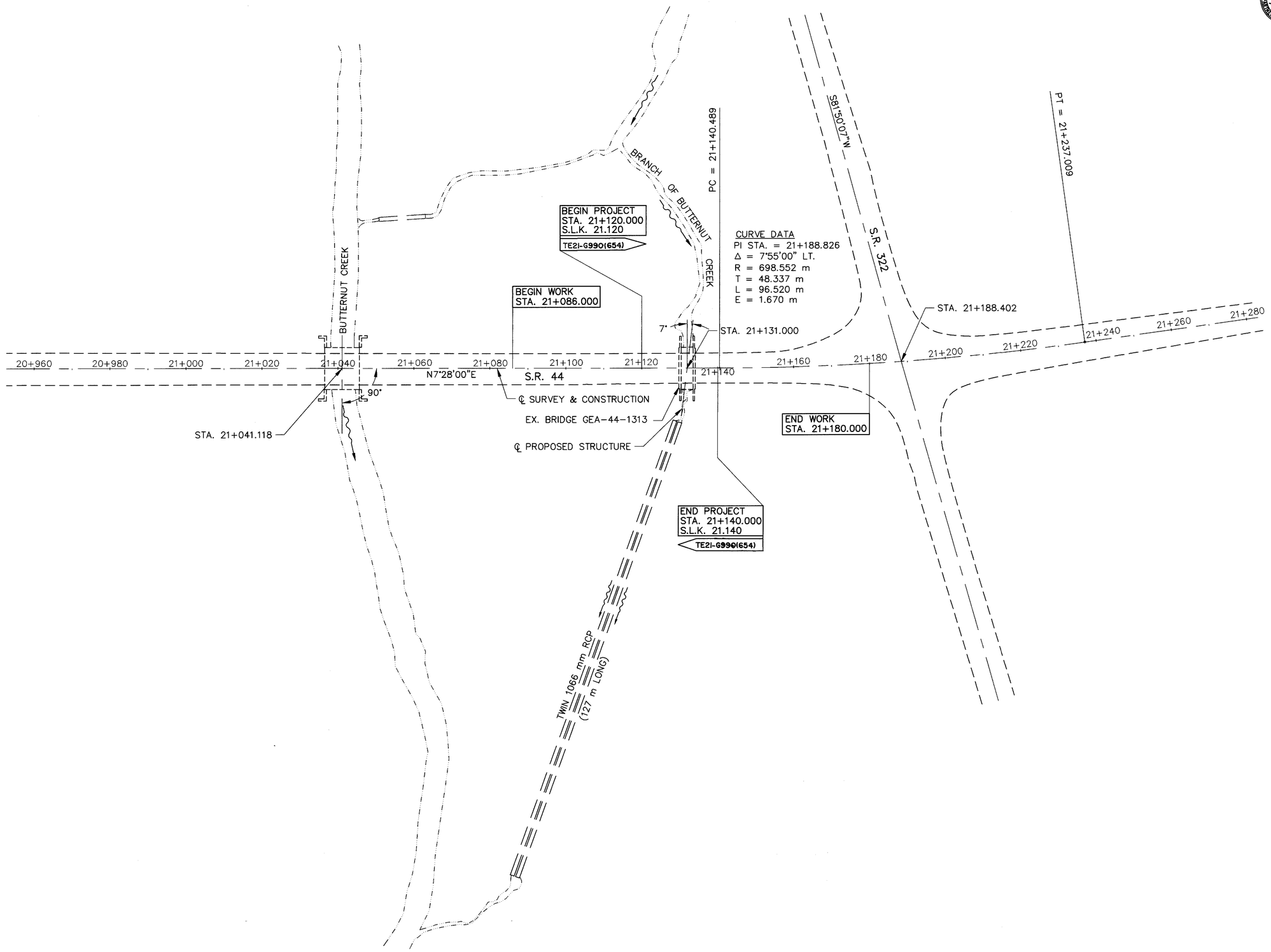
NWP #3 & #14	8-31-98

APPROVED [signature]
DATE 31 AUG 99 DISTRICT DEPUTY DIRECTOR OF TRANSPORTATION
APPROVED Gordon Proctor Jr.
DATE 9-9-99 DIRECTOR, DEPARTMENT OF TRANSPORTATION

metric units

FEDERAL PROJECT NO. TE 21-G990 (654).
PID NO. 12830
CONSTRUCTION PROJECT NO.
RAILROAD INVOLVEMENT NONE
GEA-44-21.120

GEA - SR 44 - 21.120
990758
PID#12830
12/15/99
DIST 12



metric units

HORIZONTAL SCALE IN METERS
0 12.5 25

CALCULATED SSK
CHECKED JSB

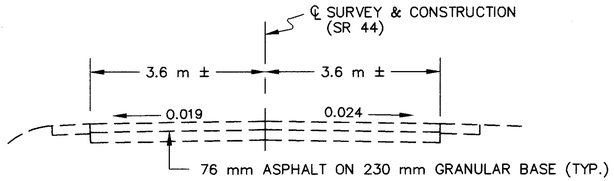
SCHEMATIC PLAN

GEA-44-21.120

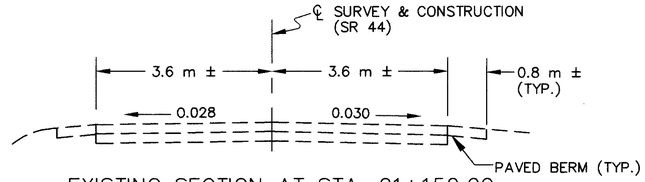
GEA3D1.DWG 8/30/06

TYPICAL SECTIONS

metric units



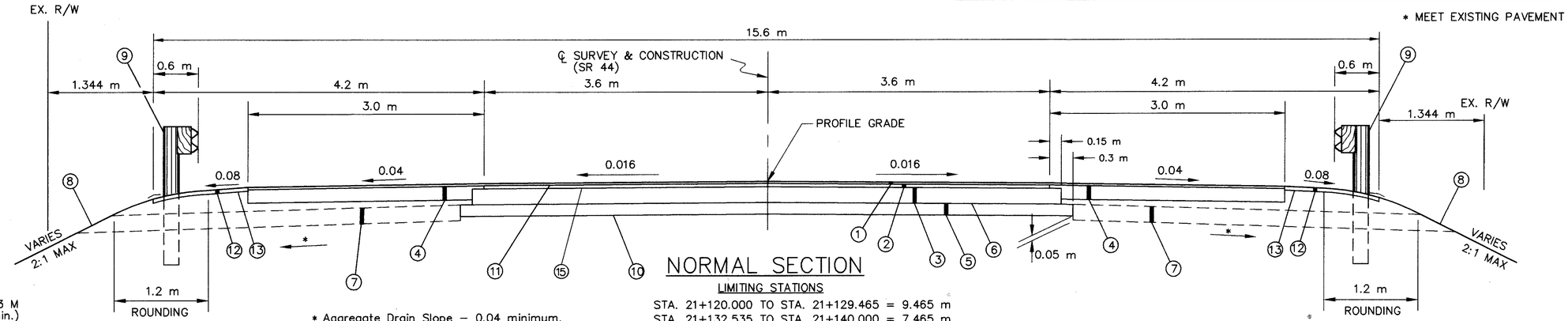
EXISTING SECTION AT STA. 21+110.00



EXISTING SECTION AT STA. 21+150.00

PAVEMENT ELEVATION TABLE								
STATION	LEFT			℄	RIGHT			REMARKS
	ELEV.	RATE	OFFSET	ELEV.	OFFSET	RATE	ELEV.	
21+110.00	351.88 *	−0.019	3.6 m	351.95 *	3.6 m	−0.024	351.86 *	BEGIN PAVING
21+120.00	351.920	−0.016	3.6 m	351.978	3.6 m	−0.016	351.920	BEGIN PROJECT
21+125.00	351.962	−0.016	3.6 m	352.020	3.6 m	−0.016	351.962	
21+130.00	352.021	−0.016	3.6 m	352.079	3.6 m	−0.016	352.021	
21+135.00	352.096	−0.016	3.6 m	352.154	3.6 m	−0.016	352.096	
21+140.00	352.188	−0.016	3.6 m	352.246	3.6 m	−0.016	352.188	END PROJECT
21+150.00	352.38 *	−0.028	3.6 m	352.48 *	3.6 m	−0.030	352.37 *	END PAVING

* MEET EXISTING PAVEMENT

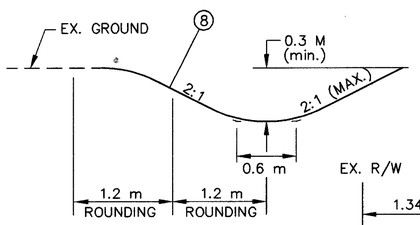


NORMAL SECTION

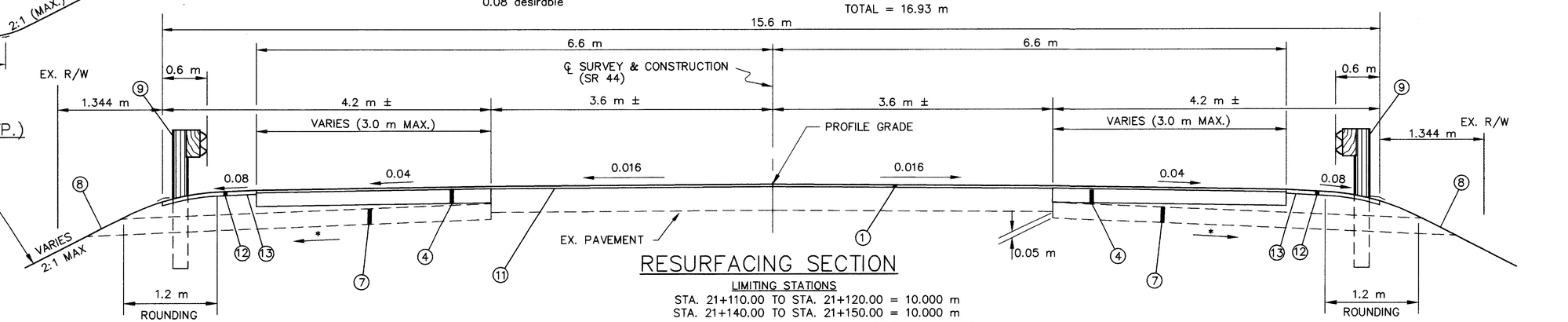
LIMITING STATIONS

STA. 21+120.000 TO STA. 21+129.465 = 9.465 m
STA. 21+132.535 TO STA. 21+140.000 = 7.465 m
TOTAL = 16.93 m

* Aggregate Drain Slope – 0.04 minimum, 0.08 desirable



PROPOSED DITCH (TYP.)



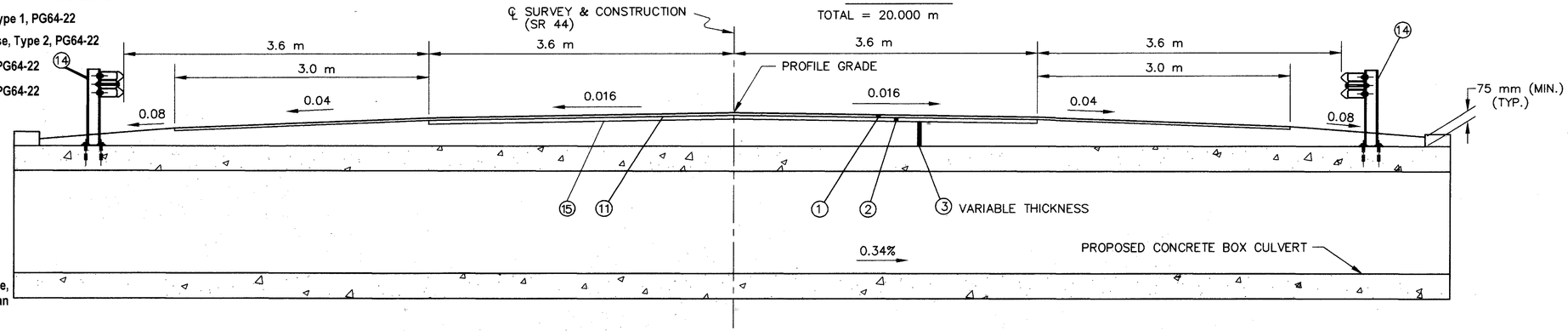
RESURFACING SECTION

LIMITING STATIONS

STA. 21+110.00 TO STA. 21+120.00 = 10.000 m
STA. 21+140.00 TO STA. 21+150.00 = 10.000 m
TOTAL = 20.000 m

LEGEND

①	ITEM 448	**32 mm Asphalt Concrete Surface Course, Type 1, PG64-22**
②	ITEM 448	**45 mm Asphalt Concrete Intermediate Course, Type 2, PG64-22**
③	ITEM 301	230 mm Bituminous Aggregate Base, **PG64-22**
④	ITEM 301	205 mm Bituminous Aggregate Base, **PG64-22**
⑤	ITEM 304	150 mm Aggregate Base,
⑥	ITEM 408	Bituminous Prime Coat @ 1.8 L/sm.
⑦	ITEM 605	Aggregate Drains
⑧	ITEM 659	Seeding and Mulching
⑨	ITEM 606	Guardrail, Type 5
⑩	ITEM 203	Subgrade Compaction
⑪	ITEM 407	Tack Coat
⑫	ITEM 448	**50 mm Asphalt Concrete Intermediate Course, Type 1, PG64-22, Under Guardrail, As Per Plan**
⑬	ITEM 203	Linear Grading
⑭	ITEM 606	Guardrail, Type 5, as per plan
⑮	ITEM 407	Tack Coat **for Intermediate Course**



CULVERT SECTION

LIMITING STATIONS

STA. 21+129.465 TO STA. 21+132.535 = 3.070 m

CALCULATED JSB
CHECKED SSK

TYPICAL SECTIONS

GEA-44-21.120

GEA1SP.DWG 11/20/25

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

ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS
THE ROUNDED CORNERS SHOWN ON THE TYPICAL SECTIONS APPLY TO ALL CROSS SECTIONS EVEN THOUGH OTHERWISE SHOWN ON THESE PLANS.

UTILITY OWNERSHIP
THE FOLLOWING UTILITIES AND OWNERS ARE LOCATED WITHIN THE WORK LIMITS OF THIS PROJECT:

POWER
THE ILLUMINATING COMPANY
7755 AUBURN ROAD
PAINESVILLE, OHIO 44077
ATTN: RICH KERNEY, PHILLIP MULLET
VOICE: (440) 953-7751, (440) 953-7741
FAX:: (440) 953-7750

GAS
EAST OHIO GAS COMPANY
1201 EAST 55TH STREET
CLEVELAND, OHIO 44103
ATTN: PAUL ARENDASH
VOICE: (216) 736-6675
FAX: (216) 736-6780

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

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

CONTINGENCY QUANTITIES
THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK LISTED IN THE GENERAL SUMMARY FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED AT THE ENGINEER'S DISCRETION SHALL BE MADE A MATTER OF RECORD BY INCORPORATION INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

ITEM 605 - AGGREGATE DRAINS
AGGREGATE DRAINS SHALL BE PLACE ON THE EDGES OF PAVEMENT AT THE LOCATIONS SPECIFIED ON SHEET 3 AND 5.

REMOVAL OF TREES
ALTHOUGH THERE ARE NO TREES AND/OR STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE LIMITS OF THIS PROJECT, A LUMP SUM QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR ITEM 201, CLEARING AND GRUBBING. ALL PROVISIONS AS SET FORTH IN THE SPECIFICATIONS UNDER THIS ITEM SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING.

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

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

659 SEEDING AND MULCHING ..... 200 SQUARE METER

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

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

659 WATER ..... 13 CUBIC METER

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL
THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE PLACED BY THE CONTRACTOR WITH THE ENGINEER'S CONCURRENCE FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES:

877 TEMPORARY SEEDING AND MULCHING ..... 50 SQUARE METER
877 TEMPORARY DITCH CHECK FILTER FABRIC FENCE ..... 10 METER
877 TEMPORARY PERIMETER FILTER FABRIC FENCE ..... 60 METER
877 SEDIMENT REMOVAL ..... 10 CUBIC METER
877 ROCK CHANNEL PROTECTION (WITH FILTER) ..... 200 CUBIC METER
659 COMMERCIAL FERTILIZER ..... 50 KILOGRAM
659 WATER ..... 10 CUBIC METER

EROSION CONTROL
ITEM 667 IS PROVIDED IN THE PLANS FOR EROSION CONTROL. ROCK OF A STABLE NATURE SHALL NOT BE REMOVED IN ORDER TO PLACE ANY OF THESE ITEMS AND TURF OF A STABLE NATURE SHALL NOT BE REMOVED IN ORDER TO PLACE 667. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES OF THIS ITEM WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION. IN ADDITION, THIS ITEM SHALL MEET THE REQUIREMENT OF 108.04.

667 SEEDING AND JUTE MATTING ..... 50 SQUARE METER

OVERNIGHT TRENCH CLOSING
THE BASE WIDENING SHALL BE COMPLETED TO A DEPTH OF NO MORE THAN 250mm BELOW THE EXISTING PAVEMENT BY THE END OF EACH WORK DAY. NO TRENCH SHALL BE LEFT OPEN OVERNIGHT EXCEPT FOR A SHORT LENGTH (10 m OR LESS) OF A WORK SECTION AT THE END OF THE TRENCH. IN CASE WORK BE SUSPENDED BECAUSE OF INCLEMENT WEATHER OR OTHER REASONS, THE TRENCH FOR THE UNCOMPLETED BASE WIDENING SHALL BE BACKFILLED AT THE DIRECTION OF THE ENGINEERS.

SEEDING AND MULCHING OF LAWNS
IN ADDITION TO "AREAS IN FRONT OF RESIDENCES" REFERRED TO IN 659.09, THE SPECIAL PREPARATION SHALL BE EXTENDED TO ENCOMPASS ALL LAWNS AND/OR LAWN-LIKE AREAS AS DETERMINED BY THE ENGINEER.

ITEM 407 - TACK COAT AND ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE
THE RATE OF APPLICATION OF THE 407 TACK COAT SHALL BE SUBJECT TO ADJUSTMENT AS DIRECTED BY THE ENGINEER. FOR ESTIMATING PURPOSES ONLY, THE PLAN QUANTITIES INDICATE AN AVERAGE APPLICATION RATE OF:

407 TACK COAT ..... 0.23 LITER PER SQUARE METER
407 TACK COAT FOR INTERMEDIATE COURSE ..... 0.45 LITER PER SQUARE METER

WATER FOR DUST CONTROL
MATERIALS FOR DUST CONTROL, TO BE USED AS DIRECTED BY THE ENGINEER, ARE PROVIDED AS FOLLOWS:

616 WATER ..... 40 CUBIC METER
616 CALCIUM CHLORIDE ..... 1 METRIC TON

PAVING UNDER GUARDRAIL
THIS OPERATION SHALL INCLUDE PREPARATION OF THE GRADED SHOULDER USING 203, LINEAR GRADING, AND PAVING UNDER GUARDRAIL USING 448, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, PG64-22, UNDER GUARDRAIL, AS PER PLAN.

ITEM 203, LINEAR GRADING, SHALL CONSIST OF EXCAVATING TOPSOIL, PLACING GRANULAR MATERIAL AND APPLYING HERBICIDE AS SPECIFIED IN THE PLANS AND IN ACCORDANCE WITH THE FOLLOWING:

ALL COLLECTED DEBRIS AND TOPSOIL, INCLUDING RHIZOMES, ROOTS AND OTHER VEGETATIVE PLANT MATERIAL SHALL BE REMOVED AND DISPOSED OF AS SPECIFIED IN 203.05.

THE REMOVED MATERIAL SHALL BE REPLACED WITH COMPACTABLE GRANULAR MATERIAL CONFORMING TO 203.02 PLACE TO GRADE AS DETAILED ON THE TYPICAL SECTION OR AS APPROVED BY THE ENGINEER.

HERBICIDE SHALL BE TREFLAN E.C. SPIKE OR AN APPROVED EQUAL AND SHALL BE APPLIED TO THE PREPARED AREA AFTER FINAL LEVELING AND GRADING HAS BEEN COMPLETED. THE APPLICATION SHALL BE JUST PRIOR TO PAVING AND SHALL DIRECTLY ADHERE TO THE MANUFACTURER'S INSTRUCTIONS.

ONLY PROPERLY LICENSED PERSONNEL SHALL APPLY HERBICIDES AS REQUIRED BY THE OHIO REVISED CODE.

ALL EQUIPMENT, MATERIALS, AND LABOR REQUIRED TO PERFORM THE WORK OUTLINE ABOVE SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 203, LINEAR GRADING.

PAVING UNDER GUARDRAIL SHALL CONSIST OF PLACING ITEM 404 TO THE DEPTH SPECIFIED USING THE FOLLOWING METHOD:

1) PLACE ITEM 448.
2) BORE ASPHALT AT PORT LOCATIONS (MAY BE OMITTED IF STEEL POSTS ARE USED).
3) SET GUARDRAIL POST.
4) PATCH AROUND POSTS. THE MATERIALS USED FOR PATCHING SHALL BE A BITUMINOUS CONCRETE APPROVED BY THE ENGINEER. PATCHED AREAS SHALL BE COMPACTED USING EITHER HAND OR MECHANICAL METHODS. FINISHED SURFACES SHALL BE SMOOTH AND SLOPED TO DRAIN AWAY FROM THE POSTS.

ALL EQUIPMENT, MATERIALS AND LABOR REQUIRED TO PERFORM THE WORK OUTLINED ABOVE WITH THE EXCEPTION OF SETTING GUARDRAIL POSTS, SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 448, ASPHALT CONCRETE INTERMEDIATE COURSE, UNDER GUARDRAIL, AS PER PLAN.

TRENCH FOR WIDENING
TRENCH EXCAVATION FOR BASE WIDENING SHALL BE ONLY ON ONE SIDE OF THE PAVEMENT AT A TIME. THE OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH DRUMS OR BARRICADES AT ALL TIMES. PLACEMENT OF PROPOSED SUBBASE AND BASE MATERIAL SHALL FOLLOW AS CLOSELY AS POSSIBLE BEHIND EXCAVATION OPERATIONS. THE LENGTH OF WIDENING TRENCH WHICH IS OPEN AT ANY ONE TIME SHALL BE HELD TO A MINIMUM AND SHALL AT TIMES BE SUBJECT TO APPROVAL OF THE ENGINEER.

CONSTRUCTION NOISE
ACTIVITIES AND LAND ADJACENT TO THIS PROJECT MAY BE AFFECTED BY CONSTRUCTION NOISE. IN ORDER TO MINIMIZE ANY ADVERSE CONSTRUCTION NOISE IMPACTS, ANY POWER-OPERATED CONSTRUCTION-TYPE DEVICE SHALL NOT BE OPERATED BETWEEN THE HOURS OF 8 PM AND 7 AM. IN ADDITION, ANY SUCH DEVICE SHALL NOT BE OPERATED AT ANY TIME IN SUCH A MANNER THAT THE NOISE CREATED SUBSTANTIALLY EXCEEDS THE NOISE CUSTOMARILY AND NECESSARY ATTENDANT TO THE REASONABLE AND EFFICIENT PERFORMANCE OF SUCH EQUIPMENT.

NOTIFICATION OF ROAD CLOSURE OR RESTRICTION
IN ORDER FOR ODOT TO PROPERLY PERMIT OVERSIZE LOADS, PREPARE PROPER SIGNING WHEN REQUIRED AND FURTHER TO NOTIFY THE GENERAL MOTORING PUBLIC, THE CONTRACTOR SHALL NOTIFY (IN WRITING) THE DISTRICT 12 CONSTRUCTION ENGINEER WITH COPIES FOR THE DISTRICT 12 TRAFFIC ENGINEER AND PROJECT ENGINEER NOT LESS THAN 21 DAYS BEFORE ACTIVATING SUCH CLOSURE OR LANE RESTRICTION.

SEND NOTIFICATION TO:
DISTRICT 12 CONSTRUCTION ENGINEER
TRANSPORTATION BLVD.
GARFIELD HEIGHTS, OHIO 44125
PHONE (216) 581-2100 EXT. 350

LOOP DETECTOR WIRE
EXISTING PLANS SHOW LOOP DETECTORS IN THE N.B. LANE OF S.R. 44 ALTHOUGH THERE WAS NO FIELD EVIDENCE OF THEM. THE CONTRACTOR SHALL REPAIR ANY DAMAGED LOOP DETECTORS UNDER ITEM 632, LOOP DETECTOR TIE-IN. THIS WORK SHALL BE APPROVED BY THE ENGINEER.

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

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

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

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

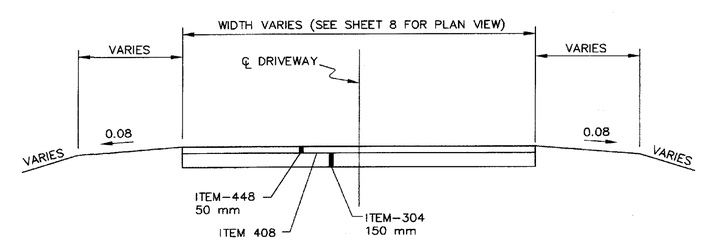
THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE.

603 - 300 mm CONDUIT, TYPE B ..... 10 METER
603 - 200 mm CONDUIT, TYPE E ..... 10 METER
603 - 150 mm CONDUIT, TYPE F ..... 10 METER

ADDITIONAL SOIL INFORMATION
THE SOIL PROFILE AND/OR STRUCTURE FOUNDATION INVESTIGATION SHEETS CONTAIN ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME ASPECT OF THE PROJECT. MORE INFORMATION, IF ANY, MAY BE OBTAINED IN DISTRICT 12, THE OFFICE OF MATERIALS MANAGEMENT AT 1600 WEST BROAD STREET, THE OFFICE OF PRODUCTION, OR THE OFFICE OF STRUCTURAL ENGINEERING AT 1980 WEST BROAD STREET IN COLUMBUS, OHIO.

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

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



DRIVEWAY TYPICAL SECTION

metric units

CALCULATED SSK
CHECKED JSB
REVISED NRE
CHECKED CKH

GENERAL NOTES

GEA-44-21.120

CALCULATIONS

metric units

QUANTITIES – ROADWAY PAVEMENT:

① **Item 448 - 32 mm Asphalt Concrete Surface Course, Type 1, PG64-22**

Mainline Pavement:
Station 21+120.00 to Station 21+140.00 = 20 m X 7.2 m = 144 Sq. m
144 Sq. m X (32 mm / 1000) = 4.6 Cu. m

Resurfacing Section:
Station 21+110.00 to Station 21+120.00 = 10 m X 7.2 m = 72 Sq. m
Station 21+140.00 to Station 21+150.00 = 10 m X 7.2 m = 72 Sq. m
144 Sq. m X (32 mm / 1000) = 4.6 Cu. m

Shoulders:
(Lt.) Station 21+090.00 to Station 21+167.00; Area = 172.2 Sq. m (from CAD)
(Rt.) Station 21+111.63 to Station 21+150.00; Area = 95.5 Sq. m (from CAD)
Total = 267.7 Sq. m
267.7 Sq. m X (32 mm / 1000) = 8.6 Cu. m

Total Item **448** = 18 Cu. m

② **Item 448 - 45 mm Asphalt Concrete Intermediate Course, Type 2, PG64-22**

Mainline Pavement:
Station 21+120.00 to Station 21+140.00 = 20 m X 7.2 m = 144 Sq. m
144 Sq. m X (45 mm / 1000) = 6.5 Cu. m

Total Item **448** = 7 Cu. m

③ **Item 301 - 230 mm Bituminous Aggregate Base, PG64-22**

Mainline Pavement:
Station 21+120.00 to Station 21+129.465 = 9.465 m
Station 21+132.535 to Station 21+140.00 = 7.465 m
Total = 16.93 m
Area = 16.93 X 7.5 = 127 Sq. m
127 Sq. m X (230 mm / 1000) = 29.2 Cu. m

Culvert Section:
Station 21+129.465 to Station 21+132.535 = 3.07 m
End Area = 4.3 Sq. m
4.3 Sq. m X 3.07 m = 13.2 Cu. m

④ **Item 301 - 205 mm Bituminous Aggregate Base, PG64-22**

Shoulders:
(Rt.) Station 21+111.60 to Station 21+128.90; Area = 45.2 Sq. m (from CAD)
(Rt.) Station 21+131.90 to Station 21+150.00; Area = 39.6 Sq. m (from CAD)
(Lt.) Station 21+090.00 to Station 21+130.10; Area = 82.9 Sq. m (from CAD)
(Rt.) Station 21+133.20 to Station 21+167.00; Area = 86.1 Sq. m (from CAD)
Total = 253.8 Sq. m

253.8 Sq. m X (205 mm / 1000) = 52.0 Cu. m

Total Item 301 = 29.2+13.2+52.0 = 95 Cu. m

⑤ Item 304 – 152 mm Aggregate Base

Mainline Pavement:
Station 21+120.00 to Station 21+129.465 = 9.465 m X 7.8 m = 73.8 Sq. m
Station 21+132.535 to Station 21+140.00 = 7.465 m X 7.8 m = 58.2 Sq. m
Total = 132 Sq. m
132 Sq. m X (150 mm / 1000) = 19.8 Cu. m

Driveway:
Area = 104.2 Sq. m (from CAD)
104.2 Sq. m x (150 mm / 1000) = 15.6 Cu. m

Total Item 304 = 19.8+15.6 = 36 Cu. m

⑥ Item 408 – Bituminous Prime Coat

Mainline Pavement:
Area (same as Item 304) = 132 Sq. m
Driveway:
Area = 104.2 Sq. m (from CAD)
Total = 236.2 Sq. m
Application Rate = 1.8 Liter/Sq. m
236.2 Sq. m X 1.8 (Liter / Sq. m) = 425.2 Liter

Total Item 408 = 425 Liter

⑪ **Item 407 - Tack Coat**

Mainline Pavement:
[STA 21+120.00 TO STA 21+140.00] 20 m × 7.2 m = 144 sq. m

Resurfacing Section:
[STA 21+110.00 TO STA 21+120.00] 10 m × 7.2 m = 72 sq. m
[STA 21+140.00 TO STA 21+150.00] 10 m × 7.2 m = 72 sq. m

Shoulders:
[Left: STA 21+090.00 TO STA 21+167.00] Area (from CAD) = 172.2 sq. m
[Right: STA 21+111.63 TO STA 21+150.00] Area (from CAD) = 95.5 sq. m

(Total Area = 555.7 sq. m) × (Application Rate = 0.23 Liter/sq. m) = 127.8 Liters
Total Item 407 - Tack Coat = 128 Liters

⑮ **Item 407 - Tack Coat For Intermediate Course**

Mainline Pavement:
[STA 21+120.00 TO STA 21+140.00] 20 m × 7.2 m = 144 sq. m

(Total Area = 144 sq. m) × (Application Rate = 0.45 Liter/sq. m) = 64.8 Liters
Total Item 407 - Tack Coat For Intermediate Course = 65 Liters

Item 448 - 50 mm Asphalt Concrete Intermediate Course, Type 2, PG64-22, (Driveways)

(Area from CAD = 104.2 sq. m) × (50 mm / 1000) = 5.2 cu. m
Total Item 448 (Driveways) = 6 cu. m

QUANTITIES – MISC. ITEMS:

⑦ Item 605 – Aggregate Drains

Aggregate Drain Location

Station	Side	Station	Side
21+091	Lt.	21+134	Rt.
21+096	Lt.	21+139	Lt.
21+101	Lt.	21+144	Rt.
21+111	Lt.	21+149	Lt.
21+116	Rt.	21+154	Lt.
21+121	Lt.	21+159	Lt.
21+126	Rt.	21+164	Lt.
21+129	Lt.		

Total number of drains = 15; Average length = 5.5 m

Total length = 15 X 5.5 m = 82.5 m

Total Item 605 = 83 m

Item 659 – Agricultural Liming

200 Sq. m X (225 Kg/1000 Sq. m) = 45 Kg

Total Item 659 – Agricultural Liming = 45 kg

Item 659 – Commercial Fertilizer

200 Sq. m X 0.1 (Kg/Sq. m) = 20 Kg

Total Item 659 – Commercial Fertilizer = 20 kg

⑩ Item 203 – Subgrade Compaction

Mainline Pavement:
Station 21+120.00 to Station 21+129.465 = 9.465 m X 7.2 m = 68.1 Sq. m
Station 21+132.535 to Station 21+140.00 = 7.465 m X 7.2 m = 53.7 Sq. m
Total = 121.8 Sq. m

Total Item 203 – Subgrade Compaction = 122 Sq. m

⑫ **Item 448 - 50 mm Asphalt Concrete Intermediate Course, Type 1, PG64-22, Under Guardrail, As Per Plan**

(Rt.) Station 21+114.00 to Station 21+128.50; Area = 35.5 Sq. m
(Rt.) Station 21+132.50 to Station 21+144.00; Area = 17.0 Sq. m
(Lt.) Station 21+088.00 to Station 21+130.50; Area = 93.4 Sq. m
(Lt.) Station 21+133.50 to Station 21+149.00; Area = 19.3 Sq. m
Total = 165.2 Sq. m
165.2 Sq. m X (50 mm / 1000) = 8.3 Cu. m

Total = 8 CU. m

⑬ Item 203 – Linear Grading

(Rt.) Station 21+114.00 to Station 21+128.50; Length = 17.1 m
(Rt.) Station 21+132.50 to Station 21+144.00; Length = 11.4 m
(Lt.) Station 21+088.00 to Station 21+130.50; Length = 41.9 m
(Lt.) Station 21+133.50 to Station 21+149.00; Length = 15.3 m
Total = 85.7 m
85.7 m / 1000 = 0.09 km

Total = 0.09 km

Note: Reference numbers on items are as listed on sheet 3 (Typical Sections).

CALCULATED SSK CHECKED JSB

CALCULATIONS

GEA-44-21.120

SHEET NUMBER 4	5	7	8	ITEM	ITEM EXTENSION	GRAND TOTAL	UNIT	DESCRIPTION (metric units)	SEE SHEET NO.
								ROADWAY	
LUMP				201	11000	LUMP		CLEARING AND GRUBBING	
			144	202	23500	144	SQ. METER	WEARING COURSE REMOVED	
			66	202	38000	66	METER	GUARDRAIL REMOVED	
			4	202	54100	4	EACH	RAISED PAVEMENT MARKERS REMOVED FOR STORAGE	
			12	202	98100	12	EACH	REMOVAL MISC.: BOLLARD	
			212	203	12000	212	CU.METER	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION	
			16	203	20000	16	CU.METER	EMBANKMENT	
	122			203	50000	122	SQ. METER	SUBGRADE COMPACTION	
	0.09			203	60000	0.09	KILOMETER	LINEAR GRADING	
			103	606	13000	103	METER	GUARDRAIL, TYPE 5	
			2	606	25000	2	EACH	ANCHOR ASSEMBLY, TYPE A	
			2	606	26500	2	EACH	ANCHOR ASSEMBLY, TYPE T	
								EROSION CONTROL	
200			19	601	32204	219	CU.METER	ROCK CHANNEL PROTECTION, TYPE C WITH FABRIC FILTER	
200				659	10000	200	SQ. METER	SEEDING AND MULCHING	
50	20			659	20000	70	KILOGRAM	COMMERCIAL FERTILIZER	
	45			659	30000	45	KILOGRAM	AGRICULTURAL LIMING	
23				659	35000	23	CU.METER	WATER	
50				667	10000	50	SQ. METER	SEEDING AND JUTE MATTING	
50				877	10000	50	SQ. METER	TEMPORARY SEEDING AND MULCHING	
60				877	30100	60	METER	TEMPORARY PERIMETER FILTER FABRIC FENCE	
10				877	30200	10	METER	TEMPORARY DITCH CHECK FILTER FABRIC FENCE	
10				877	60000	10	CU.METER	SEDIMENT REMOVAL	
								DRAINAGE	
10				603	01500	10	METER	150 mm CONDUIT, TYPE F	
10				603	02500	10	METER	200 mm CONDUIT, TYPE E	
10				603	04400	10	METER	300 mm CONDUIT, TYPE B	
			3	603	07900	3	METER	450 mm CONDUIT, TYPE D	
	83			605	31100	83	METER	AGGREGATE DRAIN	
								PAVEMENT	
	95			301	46000	95	CU.METER	BITUMINOUS AGGREGATE BASE, PG64-22	
	20		16	304	20000	36	CU.METER	AGGREGATE BASE	
	128			407	10000	128	LITER	TACK COAT	
	250			407	14000	250	LITER	TACK COAT FOR INTERMEDIATE COURSE	
	237		188	408	10000	425	LITER	BITUMINOUS PRIME COAT	
			6	448	46024	6	CU.METER	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-22 (DRIVEWAYS)	
	7			448	46050	7	CU.METER	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-22	
	8			448	46061	8	CU.METER	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, PG64-22, UNDER GUARDRAIL, AS PER PLAN	4
	18			448	47020	18	CU.METER	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22	
								STRUCTURE, 6 m SPAN AND UNDER	
								FOR ESTIMATED QUANTITIES SEE SHEET 13	
								TRAFFIC CONTROL	
			4	621	00200	4	EACH	RAISED PAVEMENT MARKER, INSTALLATION ONLY	
2				632	27200	2	EACH	LOOP DETECTOR TIE-IN	
			0.08	642	00102	0.08	KILOGRAM	EDGE LINE, TYPE 2	
			0.04	642	00302	0.04	KILOGRAM	CENTER LINE, TYPE 2	
								MAINTENANCE OF TRAFFIC	
40				616	10000	40	CU.METER	WATER	
1				616	20000	1	M. TON	CALCIUM CHLORIDE	
				642	00302	0.04	KILOGRAM	CENTER LINE, TYPE 2	
				614	11000	LUMP		MAINTAINING TRAFFIC	
		2		614	18601	2	SIGN MONTH	PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN	7
				806	16000	2	MONTH	FIELD OFFICE, TYPE A	
				623	10000	LUMP		CONSTRUCTION LAYOUT STAKES	
				624	10000	LUMP		MOBILIZATION	

CALCULATED NRE CHECKED CKH

GENERAL SUMMARY

GEA-44-21.120

① ROAD CLOSED TO THRU TRAFFIC — R-76C 60"x 30"

DETOUR — OC-14L 48"x 24"

② ROAD CLOSED TO THRU TRAFFIC — R-76C 60"x 30"

MILES — OW-145A 24"x 12"

③ ROAD CLOSED — R-75 48"x 30"

S.R. 44 — # SPECIAL BLACK LETTERS ON A 48"x 24" ORANGE SIGN

④ DETOUR — OC-29R 30"x 24"

S.R. 44 — # SPECIAL BLACK LETTERS ON A 48"x 24" ORANGE SIGN

⑤ DETOUR — OC-29L 30"x 24"

⑥ ROAD CLOSED AHEAD — OW-120-48 48" X 48"

MILES — OW-145A 24"x 12"

⑦ DETOUR AHEAD — OW-120-36 48" X 48"

⑧ S.R. 44 WILL BE CLOSED_____ FOR ___ DAYS — OC-60A 60"x 36"

CONTRACTOR TO INSERT SCHEDULED CLOSURE DATE

⑨ M-21 21"x 15"

DETOUR — OM-23 24"x 12"

⑩ M-19 21"x 15"

DETOUR — OM-23 24"x 12"

⑪ END DETOUR — ## SPECIAL BLACK LETTERS ON A 48"x 30" ORANGE SIGN

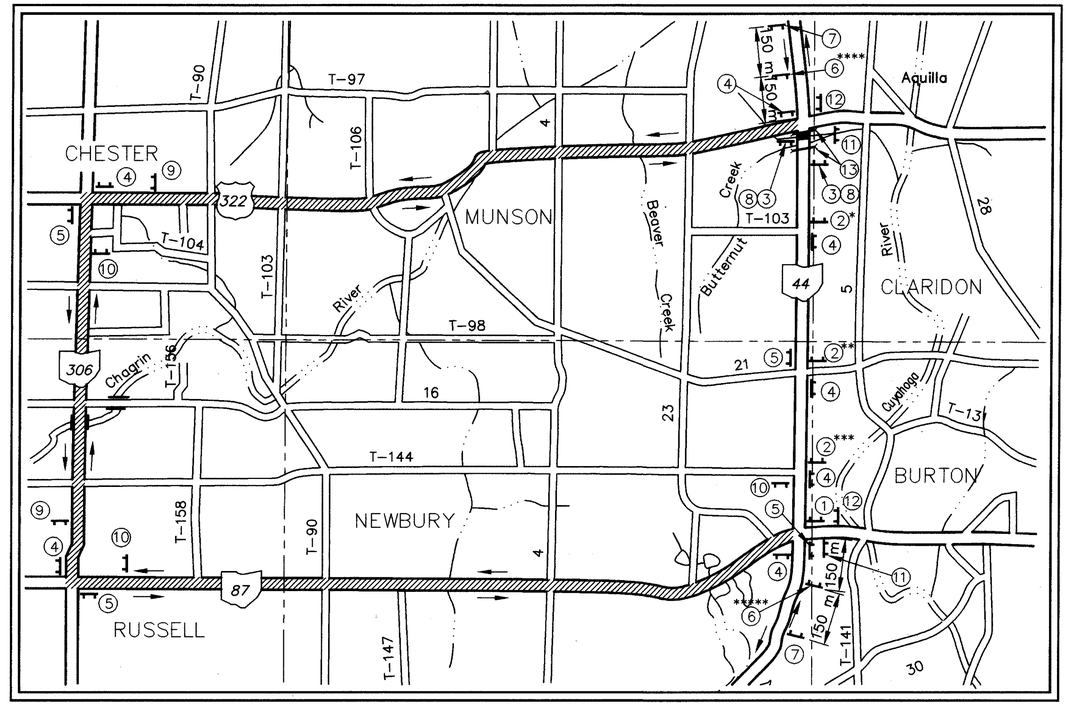
S.R. 44 — # SPECIAL BLACK LETTERS ON A 48"x 24" ORANGE SIGN

⑫ DETOUR — OC-29 30"x 24"

⑬ GATES AND BARRICADES PER STD. DWG. MT-101.60M

DETOUR

REF. NO.	DESIGNATION	QUANT.	SPECIAL LETTERING	LIGHTS
1	R-76C	1		
	OC-14L			
2	R-76C	3		
	OW-145A		*1, **2 1/2, ***3 1/2	
3	R-75	2		
4	# SPECIAL	7	S.R. 44	
	OC-29R			
5	# SPECIAL	4	S.R. 44	
	OC-29L			
6	OW-120-48	2		2 TYPE A YELLOW &
	OW-145A		****1/4, *****4 1/2	2 FLAGS
7	OW-120-36	2		
8	OC-60A	2		
9	M-21	2		
	OM-23			
10	M-19	3		
	OM-23			
11	## SPECIAL	2	END DETOUR	
12	# SPECIAL	2	S.R. 44	
	OC-29			



NOTICE OF CLOSURE SIGNS

THESE SIGNS SHALL BE ERECTED BY THE CONTRACTOR AT LEAST ONE WEEK IN ADVANCE OF THE SCHEDULED ROAD CLOSURE. THE SIGNS SHALL BE ERECTED ON THE RIGHT HAND SIDE OF THE ROAD FACING TRAFFIC. THEY SHALL BE LOCATED IN THE FIELD SO AS NOT TO INTERFERE WITH ANY PERMANENT SIGNS. ON ROADWAY THEY SHOULD BE ERECTED AT THE POINT OF CLOSURE.

PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614 MAINTAINING TRAFFIC AND SHALL INCLUDE FURNISHING, ERECTING, MAINTAINING AND REMOVING THE SIGNS INCLUDING SUPPORTS.

ADJUSTMENTS IN CONTRACT TIME

TIME EXTENSIONS WILL ONLY BE CONSIDERED WHEN CONTROLLING ITEMS OF WORK ON THE APPROVED CPM SCHEDULE ARE AFFECTED DUE TO NO FAULT OF THE CONTRACTOR.

WHEN ADDITIONAL WORK IS REQUIRED, TIME EXTENSIONS WILL ONLY BE GRANTED FOR CONTROLLING ITEMS ON THE CPM SCHEDULE.

PROGRESS SCHEDULE (CRITICAL PATH METHOD)

THE PRE-CONSTRUCTION MEETING SHALL BE HELD NO LATER THAN 30 CALENDAR DAYS AFTER THE CONTRACT IS SIGNED. THE CONTRACTOR SHALL SUBMIT THEIR PROPOSED CPM SCHEDULE AT THE PRE-CONSTRUCTION MEETING FOR REVIEW BY THE CONSTRUCTION ENGINEER. WRITTEN COMMENTS REGARDING THE CPM SCHEDULE WILL BE FORWARDED TO THE CONTRACTOR BY THE CONSTRUCTION ENGINEER WITHIN 14 CALENDAR DAYS AFTER THE PRE-CONSTRUCTION MEETING.

A FINAL CPM SCHEDULE SHALL BE SUBMITTED TO THE CONSTRUCTION ENGINEER WITHIN 30 CALENDAR DAYS FROM THE DATE OF THE PRE-CONSTRUCTION MEETING BUT AT LEAST SEVEN (7) CALENDAR DAYS PRIOR TO THE DATE DESIGNATED AS THE STARTING DATE IN THE CPM SCHEDULE. THE SCHEDULE SHALL BE SIGNED AND DATED BY THE PRIME CONTRACTOR AND NAMED SUBCONTRACTORS.

PORTABLE CHANGEABLE MESSAGE SIGNS

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN, AND REMOVE WHEN NO LONGER NEEDED A PORTABLE CHANGEABLE MESSAGE SIGN(S). THE PCMS SHALL BE OF THE TYPE SHOWN ON THE LIST OF APPROVED PCMS MAINTAINED BY THE DIRECTOR. THE PCMS SHALL BE A CLASS 1 OR 2 TYPE UNIT. NO FLIP DISK UNITS WILL BE ALLOWED EVEN IF ON THE DIRECTOR'S LIST.

THE PORTABLE CHANGEABLE MESSAGE SIGN SHALL BE MOUNTED ON A TRAILER. THE LOCATION OF THE PCMS SHALL BE AS DIRECTED BY THE ENGINEER. THE ENGINEER SHALL BE PROVIDED ACCESS TO EACH SIGN UNIT AND SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS .

THE PCMS SHALL CONTAIN A CELLULAR TELEPHONE LINK WHICH WILL ALLOW REMOTE SIGN ACTIVATION, DEACTIVATION, MESSAGE CHANGES, MESSAGE ADDITIONS AND REVISIONS TO TIME OF DAY PROGRAMS. THE SYSTEM SHALL ALSO PERMIT VERIFICATION OF CURRENT AND PROGRAMMED MESSAGES.

AT THE DIRECTION OF THE ENGINEER THE PCMS MAY BE REMOVED FOR PERIODS OF TIMES WHEN NOT IN USE. NO PAYMENT WILL BE MADE FOR THESE TIMES (EX. WINTER MONTHS).

PAYMENT:
THERE SHALL BE 2 CLASS 2 PCMS AT 1 MONTHS EACH.

ITEM 614 PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN 2 SIGN MONTHS.

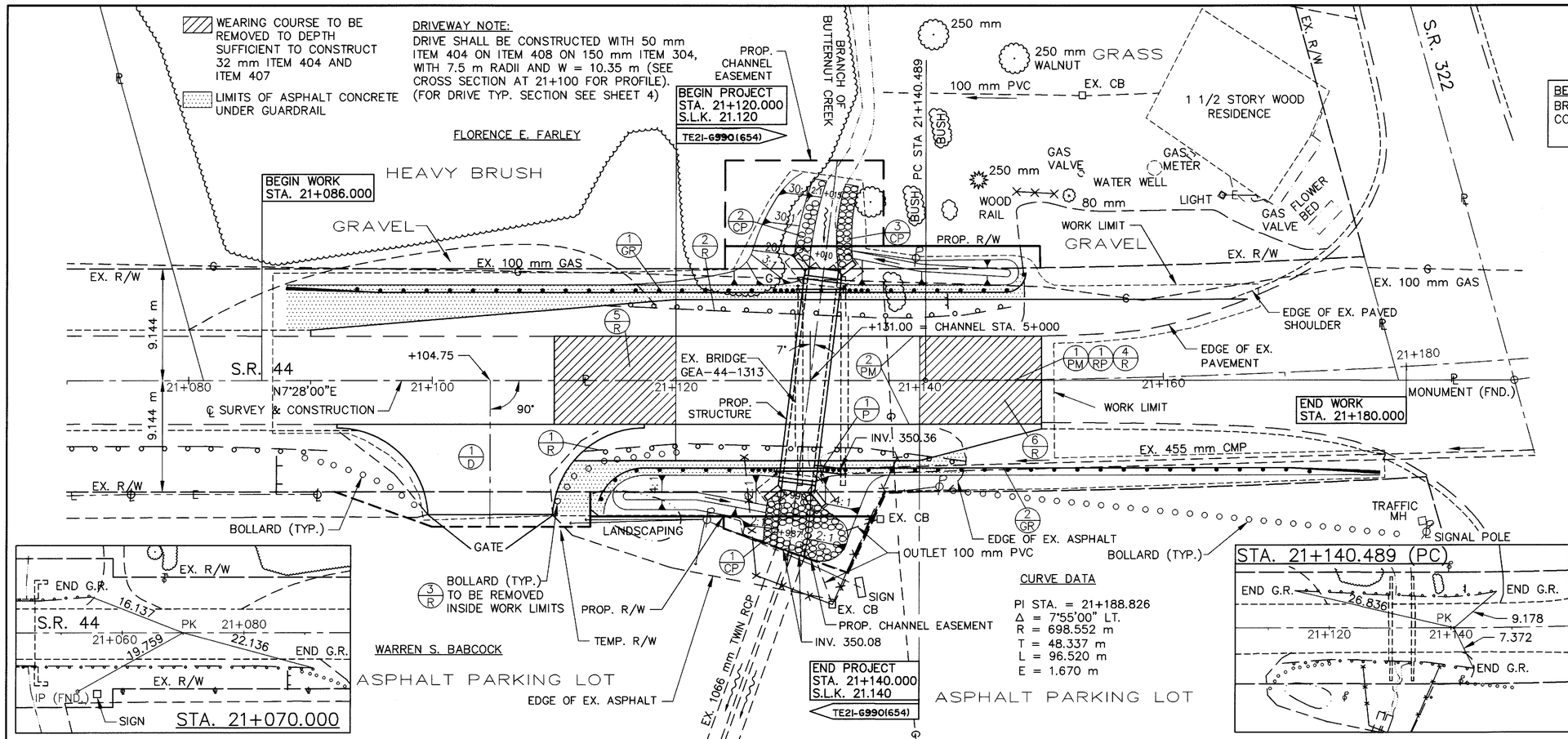
N

0 1000 2000 HORIZONTAL SCALE IN METERS

CALCULATED SSK CHECKED JSB

DETOUR PLAN & SCHEDULE NOTES

GEA-44-21.120



metric units

BENCHMARK :
BRASS DISK SET IN CONCRETE, NEAR THE N.E. CORNER OF S.R. 44 AND S.R. 322. ELEV. 354.602

HORIZONTAL SCALE IN METERS 0 5 10

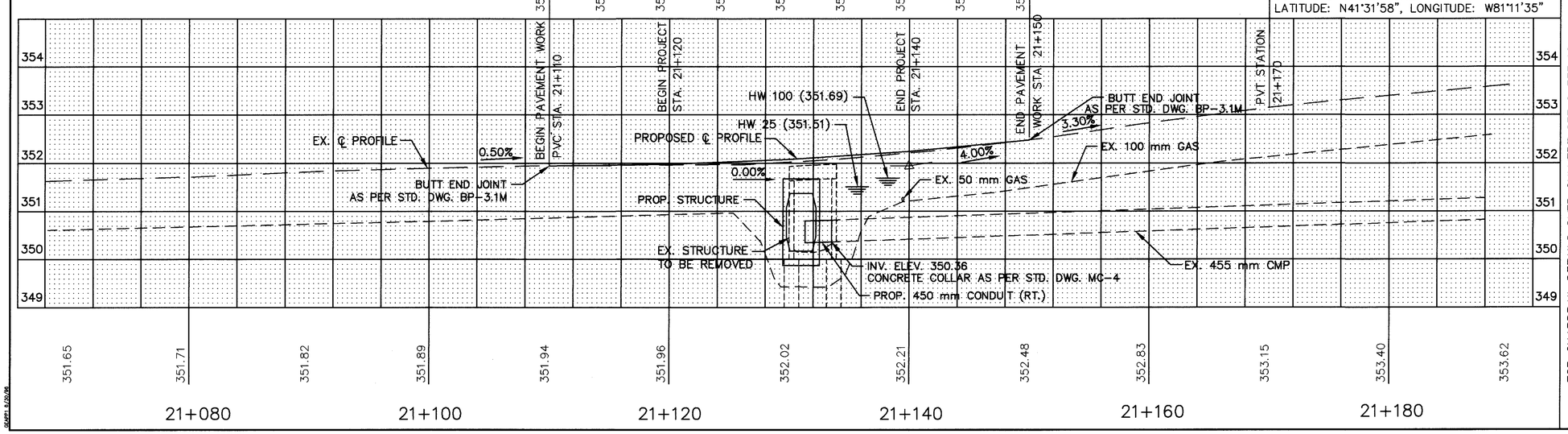
CALCULATED SSK
CHECKED DOR

EXISTING STRUCTURE DATA:

TYPE: SINGLE SPAN CONCRETE SLAB BRIDGE
CLEAR SPAN: 3.1 m
ROADWAY (F/F RAILS): 12.2 m
SKEW: 0°
WEARING SURFACE: ASPHALT CONCRETE
DATE BUILT: 1924
STRUCTURE FILE NO. 2800306

EXCAVATION = 212 m³
EMBANKMENT= 16 m³

60 m V.C. = PVI STA. 21+140.00, ELEV. 351.945, K=15
(ACTUAL SSD = 136 m, ACTUAL K = 35 FOR 90 kph DESIGN SPEED)



PROPOSED STRUCTURE DATA:

TYPE: 2400 mm x 1200 mm CONCRETE FOUR SIDED BOX CULVERT
SKEW: 7° R.F.
LOADING: MS18-44 (AND ALTERNATE MILITARY)
ROADWAY: 7.2 m
ALIGNMENT: TANGENT
WEARING SURFACE: ASPHALT CONCRETE
SUPERELEVATION: NONE
LATITUDE: N41°31'58", LONGITUDE: W81°11'35"

ESTIMATED QUANTITIES

* INCLUDES 1.905 m WITH 1.65 m RADIUS
** INCLUDES 3.810 m WITH 3.90 m RADIUS

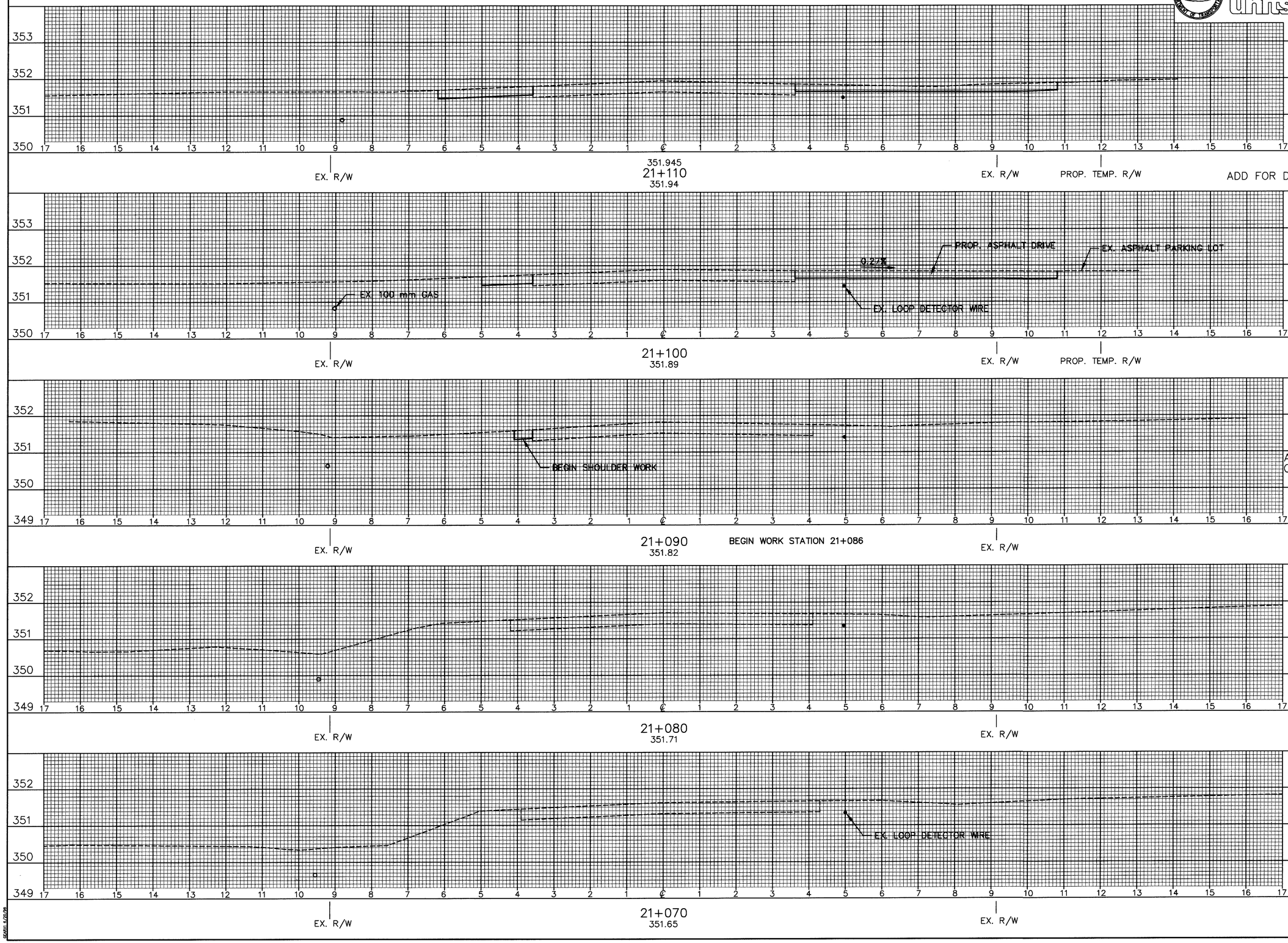
FOR GUARDRAIL DETAILS OVER CULVERT SEE SHEET 12

REF. NO.	STATION TO STATION	SIDE	202 WEARING COARSE REMOVED SQ. METER	202 GUARD-RAIL REMOVED METER	202 R.P.M. REMOVED FOR STORAGE EACH	202 REMOVAL MISC. BOLLARD EACH	304 AGG. BASE CU. METER	448 ASPHALT CONCRETE DRIVEWAY CU. METER	408 PRIME COAT LITER	601 R.C.P. TYPE C W/ FILTER CU. METER	603 450 mm CONDUIT TYPE D METER	606 GUARD-RAIL TYPE 5 METER	606 ANCHOR ASSEMBLY TYPE A EACH	606 ANCHOR ASSEMBLY TYPE T EACH	621 R.P.M. INSTALLATION ONLY EACH	642 CENTER LINE DOUBLE SOLID KILOMETER	642 EDGE LINE (WHITE) KILOMETER	SEE SHEET NO.
1-R	21+112.00 TO 21+144.00	LT.	32															
2-R	21+114.00 TO 21+148.00	RT.	34															
3-R	21+110.00 TO 21+120.00	RT.				12												
4-R	21+110.00 TO 21+150.00	–			4													
5-R	21+110.00 TO 21+120.00	–	72															
6-R	21+140.00 TO 21+150.00	–	72															
1-D	21+104.75	RT.					16	5	188									
1-CP	21+127.00 TO 21+134.00	RT.								9								
2-CP	21+130.00 TO 21+131.30	LT.								5								
3-CP	21+133.00 TO 21+134.30	LT.								5								
1-P	21+131.35 TO 21+133.54	RT.									3							
1-GR	21+088.00 TO 21+149.00	LT.										49.53	1	1*				
2-GR	21+113.50 TO 21+177.85	RT.										53.34	1	1**				
1-RP	21+110.00 TO 21+150.00	–													4			
1-PM	21+110.00 TO 21+150.00	–														0.04		
2-PM	21+110.00 TO 21+150.00	–															0.08	
	TOTAL:		144	66	4	12	16	5	188	19	3	103	2	2	4	0.04	0.08	

PLAN AND PROFILE

GEA-44-21.120

metric units



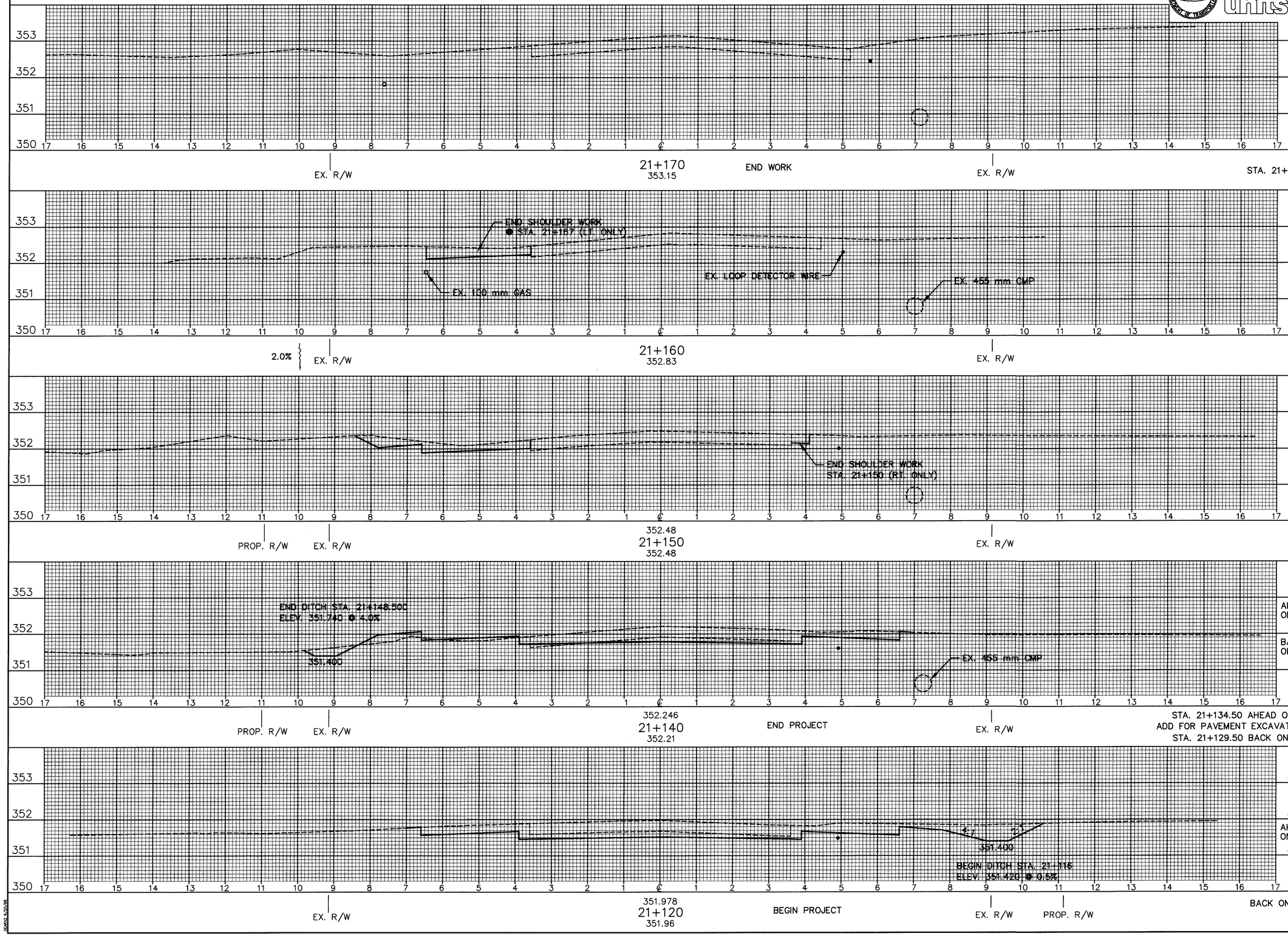
	END AREA m² CUT	END AREA m² FILL	VOLUME m³ CUT	VOLUME m³ FILL
	0.6	0.0		
			4.5 20.8	0.0
	0.3	0.0		
			2.0	0.0
	0.1	0.0		

CALCULATED SSK
CHECKED JSB

CROSS SECTIONS - STATION 21+070 TO STATION 21+110

GEA-44-21.120

metric units



	END AREA m² CUT	END AREA m² FILL	VOLUME m³ CUT	VOLUME m³ FILL
STA. 21+167	0.0	0.0		
	0.8	0.0	2.8	0.0
	1.1	0.0	9.5	0.0
	0.7	0.3	9.0	1.5
AHEAD ONLY	3.2	0.3	20.9	2.5
BACK ONLY	4.4	0.6	74.0	0.0
STA. 21+134.50 AHEAD ONLY	4.3	0.0	47.0	0.0
ADD FOR PAVEMENT EXCAVATION	5.6	0.0		
STA. 21+129.50 BACK ONLY	2.0	0.0	13.0	0.0
BACK ONLY	0.6	0.0		

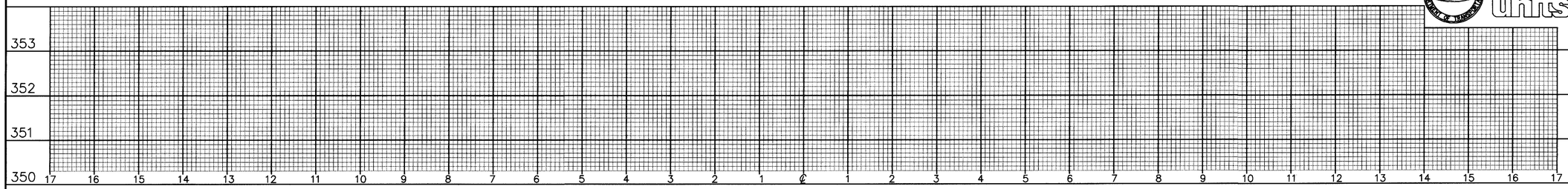
CALCULATED SSK
CHECKED JSB

CROSS SECTIONS - STATION 21+120 TO STATION 21+170

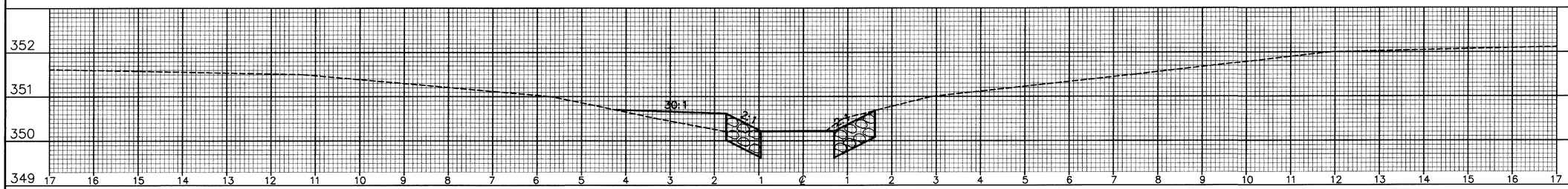
GEA-44-21.120

SCANCE 9/20/06

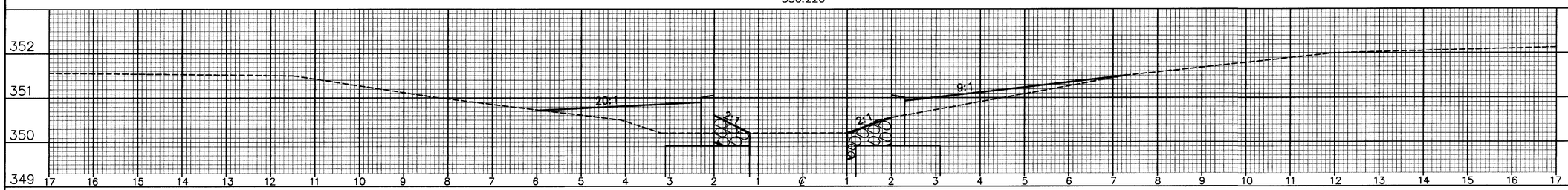
metric units



END CHANNEL WORK STA. 5+016.5

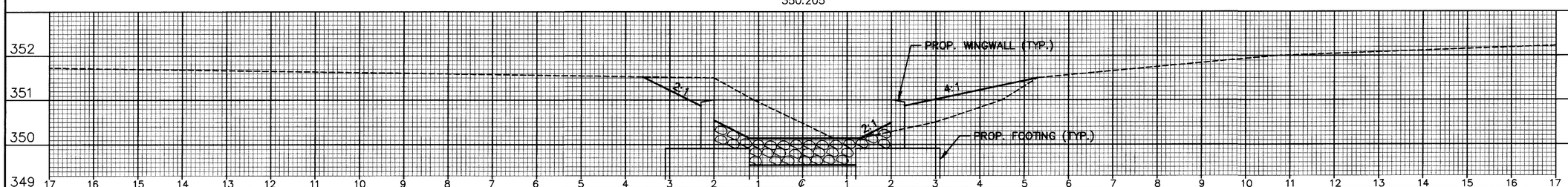


5+015
350.220

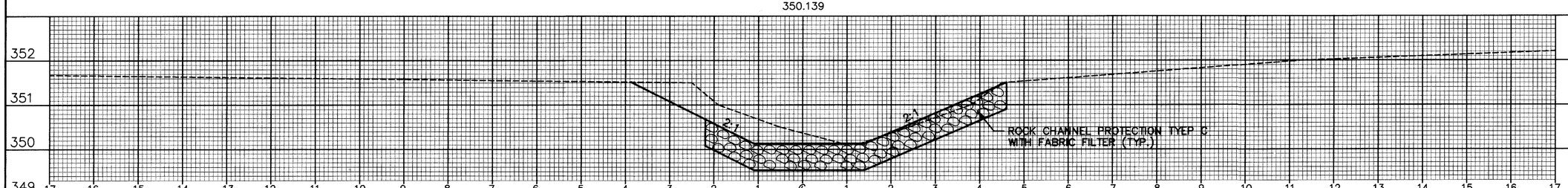


5+010
350.205

STA. 5+008.5 AHEAD ONLY
STA. 4+991.5 BACK ONLY



4+990
350.139



4+987
350.130

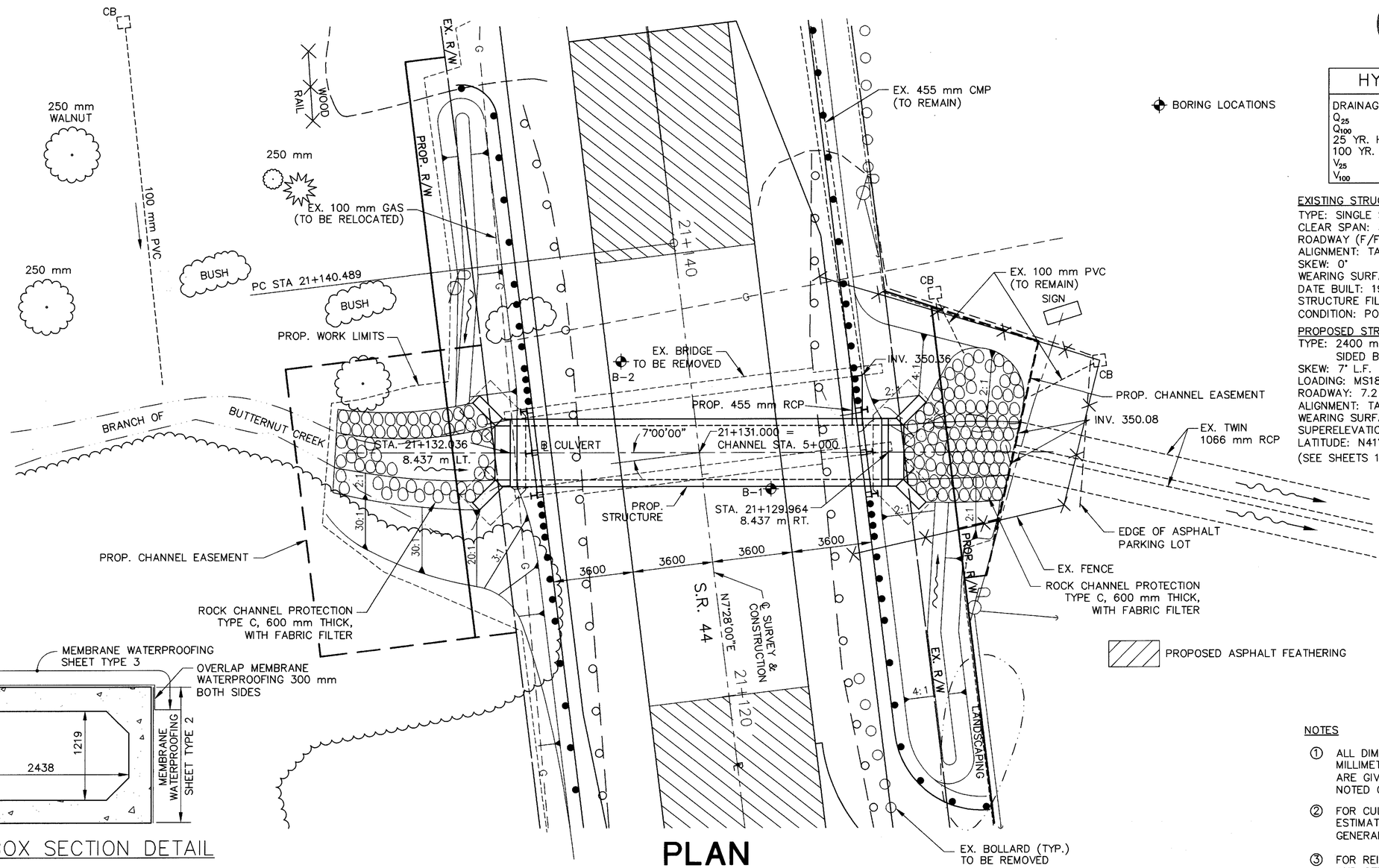
BEGIN CHANNEL WORK STA. 4+986

	END AREA m² CUT	END AREA m² FILL	VOLUME m³ CUT	VOLUME m³ FILL
END CHANNEL WORK STA. 5+016.5	0.0	0.0		
	0.1	0.5	0.1	0.4
			0.3	6.5
STA. 5+008.5 AHEAD ONLY	0.0	2.1		
STA. 4+991.5 BACK ONLY	0.0	0.0	0.0	1.6
	0.0	0.0		
	3.5	1.1	2.6	0.8
			8.0	1.7
BEGIN CHANNEL WORK STA. 4+986	1.8	0.0		
	0.0	0.0	0.0	0.9

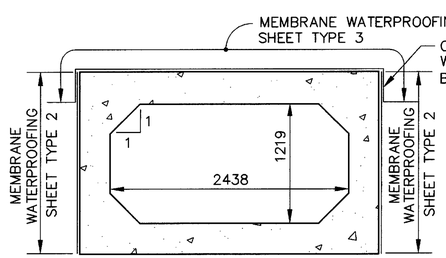
CALCULATED SSK
CHECKED JSB

CHANNEL CROSS SECTIONS - STATION 4+987 TO STATION 5+015

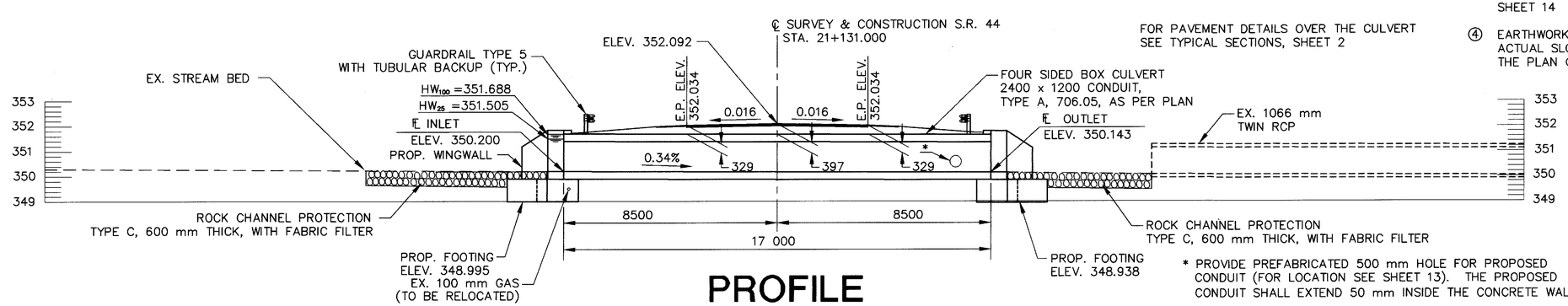
GEA-44-21.120



PLAN



PRECAST BOX SECTION DETAIL



PROFILE

FOR PAVEMENT DETAILS OVER THE CULVERT SEE TYPICAL SECTIONS, SHEET 2

* PROVIDE PREFABRICATED 500 mm HOLE FOR PROPOSED CONDUIT (FOR LOCATION SEE SHEET 13). THE PROPOSED CONDUIT SHALL EXTEND 50 mm INSIDE THE CONCRETE WALL.

metric units

HYDRAULIC DATA

DRAINAGE AREA	=1810000 m^2
Q_{25}	=4.25 m^3/s
Q_{100}	=5.95 m^3/s
25 YR. HW ELEV.	=351.505 m
100 YR. HW ELEV.	=351.688 m
V_{25}	=1.17 m/s
V_{100}	=1.09 m/s

EXISTING STRUCTURE:
TYPE: SINGLE SPAN CONCRETE SLAB BRIDGE
CLEAR SPAN: 3.1 m
ROADWAY (F/F RAILS): 12.2 m
ALIGNMENT: TANGENT
SKEW: 0°
WEARING SURFACE: ASPHALT CONCRETE
DATE BUILT: 1924
STRUCTURE FILE NO. 2800306
CONDITION: POOR

PROPOSED STRUCTURE:
TYPE: 2400 mm x 1200 mm CONCRETE FOUR SIDED BOX CULVERT
SKEW: 7° L.F.
LOADING: MS18 (AND ALTERNATE MILITARY)
ROADWAY: 7.2 m
ALIGNMENT: TANGENT
WEARING SURFACE: ASPHALT CONCRETE
SUPERELEVATION: NONE
LATITUDE: N41°31'58", LONGITUDE: W81°11'35"
(SEE SHEETS 12-14 FOR STRUCTURE DETAILS)

NOTES

1. ALL DIMENSIONS ARE GIVEN IN MILLIMETERS AND ELEVATIONS ARE GIVEN IN METERS UNLESS NOTED OTHERWISE.
2. FOR CULVERT LAYOUT DETAILS, ESTIMATED QUANTITIES AND GENERAL NOTES SEE SHEET 13
3. FOR REINFORCING STEEL LIST AND STRUCTURE DETAILS SEE SHEET 14
4. EARTHWORK LIMITS ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO THE PLAN CROSS-SECTIONS.

HORIZONTAL SCALE IN METERS 0 2.5 5

CALCULATED	DRAWN	REVIEWED	DATE
SSK	SSK	JSB	6/96
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DOR		2800314	

CULVERT PLAN AND PROFILE

STRUCTURE NO. GEA-44-21120
OVER BRANCH OF BUTTERNUT CREEK

GEA-44-21.120

1/3

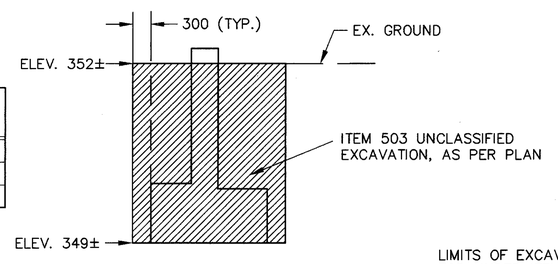
12/17

QUANTITIES BY: SSK 6/96
CHECKED BY: DOR 6/96

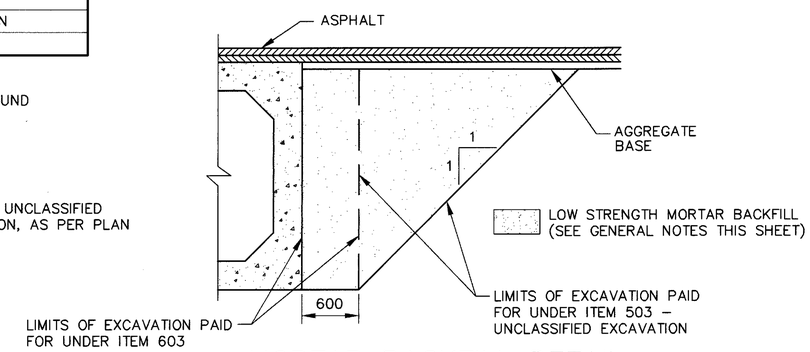
ESTIMATED QUANTITIES

ITEM	ITEM CODE	QUANTITY	UNIT	DESCRIPTION
202	11000	LUMP	LUMP	STRUCTURE REMOVED
503	11100	LUMP	LUMP	COFFERDAMS, CRIBS AND SHEETING
503	21100	86	CUBIC METER	UNCLASSIFIED EXCAVATION
503	21101	68	CUBIC METER	UNCLASSIFIED EXCAVATION, AS PER PLAN
613	41251	80	CUBIC METER	LOW STRENGTH MORTAR BACKFILL (TYPE I), AS PER PLAN
842	46000	6	CUBIC METER	CLASS C CONCRETE, RETAINING WALL/WINGWALL ABOVE FOOTING
842	46500	22	CUBIC METER	CLASS C CONCRETE, FOOTING
512	33000	64	SQUARE METER	TYPE 2 WATERPROOFING
512	33010	60	SQUARE METER	TYPE 3 WATERPROOFING
SPECIAL	51267510	23	SQUARE METER	SEALING OF CONCRETE SURFACES **(EPOXY-URETHANE) (SEE PROPOSAL NOTE)**
516	13600	3	SQUARE METER	25 mm PREFORMED EXPANSION JOINT FILLER
518	21200	2	CUBIC METER	POROUS BACKFILL WITH FILTER FABRIC
603	94801	17	METER	2400 mm x 1200 mm CONDUIT, TYPE A, 706.05, AS PER PLAN
606	13010	7.62	METER	GUARDRAIL, TYPE 5 WITH TUBULAR BACKUP, AS PER PLAN
606	35140	4	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 4

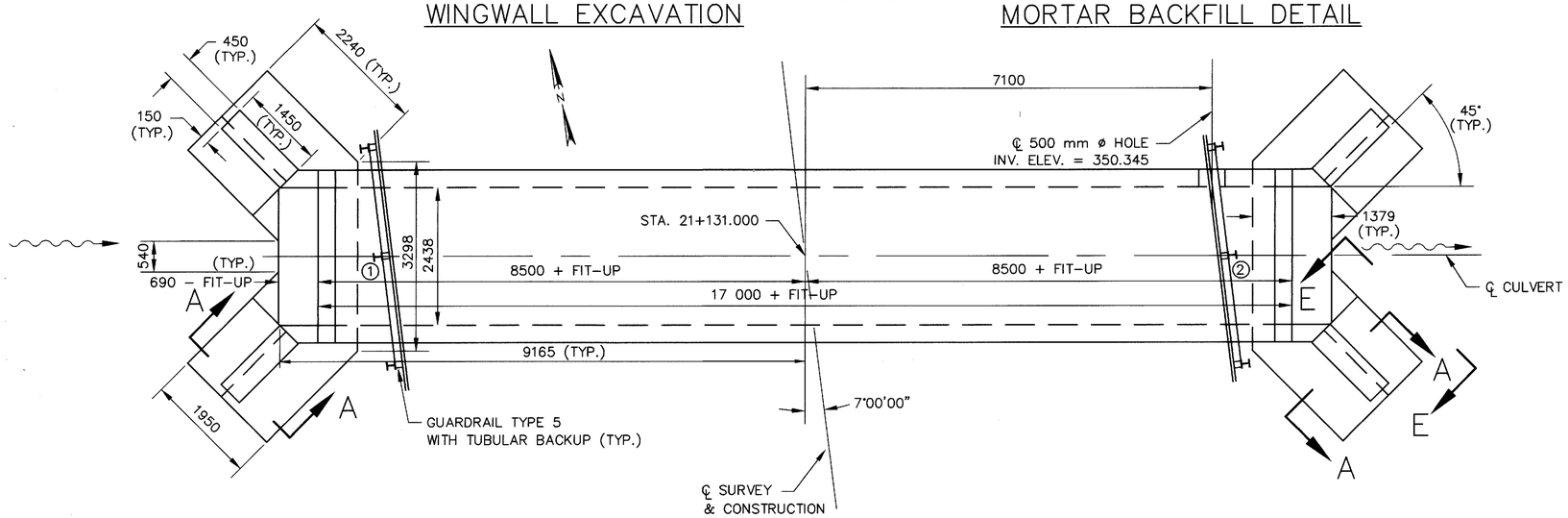
POST NO.	TOP OF POST ELEV.	POST HEIGHT (mm)	POST STATION
1	352.589	869	21+131.884
2	352.564	893	21+130.116



WINGWALL EXCAVATION



MORTAR BACKFILL DETAIL



CULVERT PLAN DETAIL

GENERAL NOTES

① ITEM 503, UNCLASSIFIED EXCAVATION, AS PER PLAN
THE FOUNDATION FOR THE CONDUIT BED AND WINGWALL FOOTER SHALL BE FIRM FOR THE ENTIRE STRUCTURE. UNSUITABLE MATERIAL ENCOUNTERED SHALL BE REMOVED TO ELEVATION 348.6± AND AS DIRECTED BY THE ENGINEER UNDER THE CONDUIT AND FOOTERS, AND TO THE WIDTH OF THE TRENCH, AND BE REPLACED WITH COMPACTED CLASS B BEDDING MATERIAL CONFORMING TO 603.02 AND 603.04, PLACED OVER GEOTEXTILE FABRIC. EXCAVATION OF UNSUITABLE MATERIAL, REPLACEMENT WITH COMPACTED BEDDING MATERIAL AND GEOTEXTILE FABRIC SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 503, UNCLASSIFIED EXCAVATION, AS PER PLAN.

PAYMENT FOR THE ABOVE WORK SHALL NOT INCLUDE THE EXCAVATION REQUIRED FOR THE 150 mm MINIMUM BEDDING (AS PER 603.04). THE DEPTH OF EXCAVATION ASSUMED FOR ESTABLISHING THE PAY QUANTITY IS 1300 mm UNDER THE CONDUIT AND 300 mm UNDER THE FOOTERS.

② LOW STRENGTH MORTAR BACKFILL (TYPE I), AS PER PLAN:
LOW STRENGTH MORTAR BACKFILL SHALL BE PLACED AS SHOWN AND LATERALLY TO THE EDGE OF SHOULDER.
PAYMENT FOR LOW STRENGTH MORTAR BACKFILL SHALL BE MADE ONLY FOR BACKFILL PLACED WITHIN THE LIMITS SPECIFIED.

③ DESIGN SPECIFICATIONS: THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1992, INCLUDING 1993, 1994 & 1995 INTERIM SPECIFICATIONS AND THE ODOT BRIDGE DESIGN MANUAL.

④ DESIGN DATA
DESIGN LOADING: MS 18 AND THE ALTERNATE MILITARY LOADING.
CONCRETE CLASS "C": COMPRESSIVE STRENGTH 28 MPa (WINGWALLS & FOOTINGS)
REINFORCING STEEL: ASTM A615M, A616M & A617M, GRADE 400
MINIMUM YIELD STRENGTH 400 MPa

⑤ ITEM 603 – 2400 mm X 1200 mm CONDUIT, TYPE A, 706.05, AS PER PLAN
JOINT WRAP AS SPECIFIED IN 603.06 AND CONCRETE SEALING AS SPECIFIED IN 603.08 ARE NOT REQUIRED UNDER THE LIMITS OF THE MEMBRANE WATERPROOFING. THE EXTERIOR JOINT GAP ON THE TOP AND SIDES BETWEEN THE PRECAST CULVERT SECTIONS SHALL BE FILLED WITH PORTLAND CEMENT MORTAR PRIOR TO INSTALLING THE MEMBRANE WATERPROOFING.

THE EARTHWORK AND PAVEMENT BUILDUP CALCULATIONS, AND ALL ELEVATIONS AND DIMENSIONS RELATIVE TO THE STRUCTURE SHALL BE BASED UPON ACTUAL CULVERT DIMENSIONS OF 2438 mm X 1219 mm X 305 mm WALL THICKNESS. DESIGN COVER SHALL BE 400 mm.

⑥ ITEM SPECIAL MEMBRANE WATERPROOFING
ITEM SPECIAL, MEMBRANE WATERPROOFING (SHEET TYPE 3), SHALL BE APPLIED TO THE TOP SURFACE OF THE PRECAST CULVERT SECTIONS AND SHALL EXTEND VERTICALLY 300 mm DOWN THE SIDES FOR ALL PORTIONS OF THE CULVERT WHICH SHALL BE IN CONTACT WITH THE BACKFILL. PAYMENT FOR THE MEMBRANE WATERPROOFING SHALL BE AT THE CONTRACT PRICE BID PER SQUARE METER FOR ITEM SPECIAL, MEMBRANE WATERPROOFING (SHEET TYPE 3). MEMBRANE WATERPROOFING (SHEET TYPE 2) SHALL BE APPLIED BEFORE (SHEET TYPE 3) AND SHALL BE PROVIDED ON THE ENTIRE FACE OF EACH VERTICAL SIDE OF THE CULVERT. PAYMENT FOR THE MEMBRANE WATERPROOFING SHALL BE AT THE CONTRACT BID PRICE PER SQUARE METER FOR ITEM SPECIAL, MEMBRANE WATERPROOFING, (SHEET TYPE 2).

⑦ FOUNDATION BEARING PRESSURE WINGWALL FOOTINGS, AS DESIGNED, PRODUCE A MAXIMUM BEARING PRESSURE OF 95 kpa. THE ALLOWABLE BEARING PRESSURE IS 120 kpa.

⑧ WINGWALLS ABOVE CONSTRUCTION JOINT SHALL NOT BE CAST UNTIL BOX CULVERT SECTIONS ARE IN PLACE

⑨ UTILITY LINES ALL EXPENSES INVOLVED IN RELOCATING THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE OWNERS. THE CONTRACTOR AND THE OWNERS ARE REQUESTED TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

⑩ POROUS BACKFILL
POROUS BACKFILL WITH FILTER FABRIC, 600 mm THICK SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE, TO 300 mm BELOW THE EMBANKMENT SURFACE, AND LATERALLY TO THE ENDS OF THE WINGWALLS. GEOTEXTILE FABRIC SHALL CONFORM WITH 712.09, TYPE A.

⑪ ITEM 606 – GUARDRAIL, TYPE 5 W/TUBULAR BACKUP, AS PER PLAN:
SHALL BE USED OVER THE STRUCTURE EXCEPT THAT STEEL POSTS AS SHOWN SHALL BE USED IN LIEU OF WOOD POSTS. THE STEEL POSTS AND BASE PLATE SHALL BE CONSTRUCTED AS PER STANDARD DWG. DR-2.2M. RAILING POST ANCHORAGE SHALL BE PARTIAL DEPTH OR PARTIAL DEPTH EPOXY BONDED ANCHORS, AS DESCRIBED ON STD. DWG. GR-2.2M. THROUGH BOLTING WILL NOT BE PERMITTED. COST OF CULVERT MOUNTED STEEL POSTS AND ANCHORAGES SHALL BE PAID FOR UNDER ITEM – 606, GUARDRAIL TYPE 5, WITH TUBULAR BACKUP.

⑫ REFERENCE SHALL BE MADE TO THE FOLLOWING STANDARD DRAWINGS:
GR-2.2M 1-3-96

FOR WINGWALL ELEVATION AND REINFORCING DETAILS SEE SHEET 14
FOR SECTION A-A & E-E SEE SHEET 14

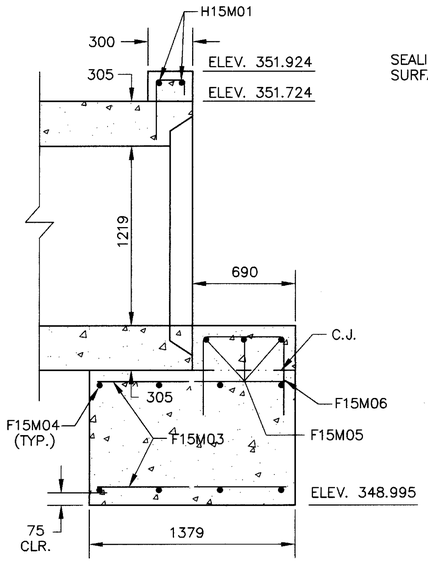
metric units

RESOURCE INTERNATIONAL INC.
28 ENTERPRISE DR.
WESTERVILLE, OHIO 43081
(614) 885-1959

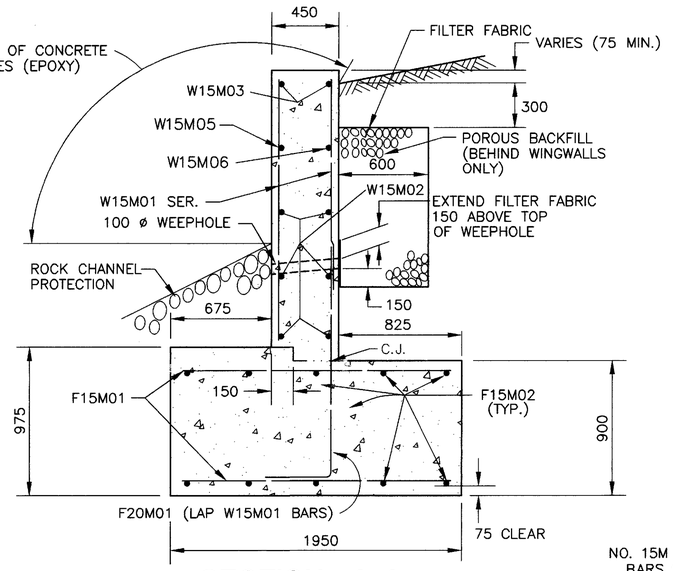
DESIGNED	DRAWN	REVIEWED	DATE
SSK	SSK	JSB	6/96
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DOR		2800314	

STRUCTURE PLAN AND GENERAL NOTES
STRUCTURE NO. GEA-44-21120
OVER BRANCH OF BUTTERNUT CREEK

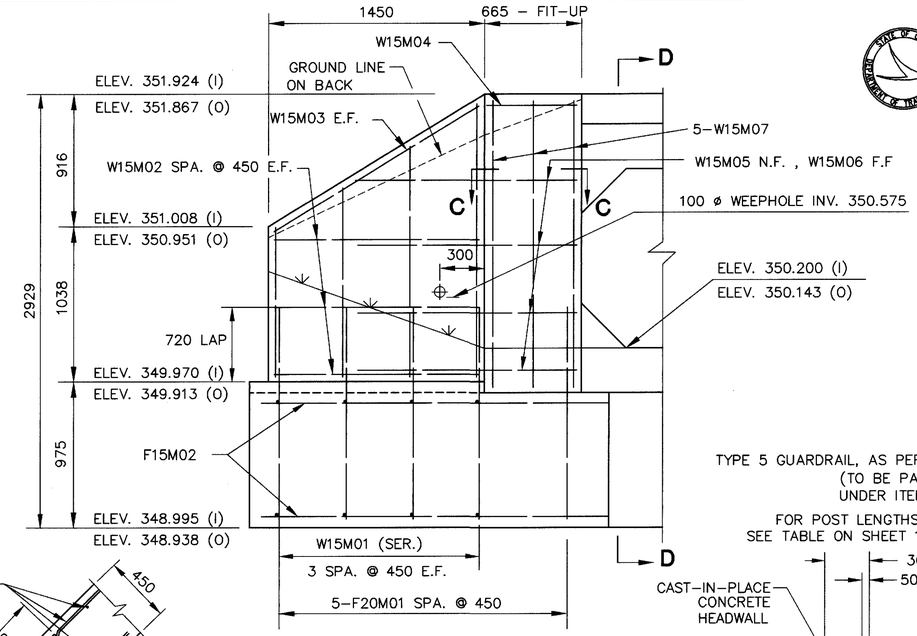
GEA-44-21.120



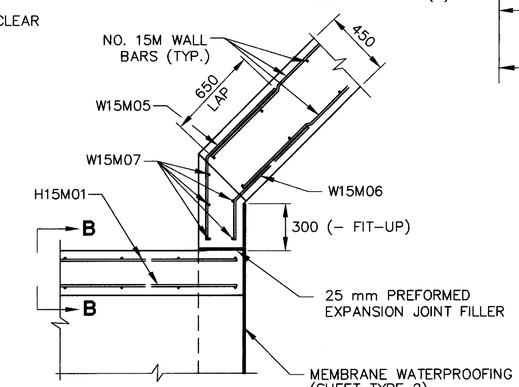
SECTION D-D
(INLET ELEVATION)



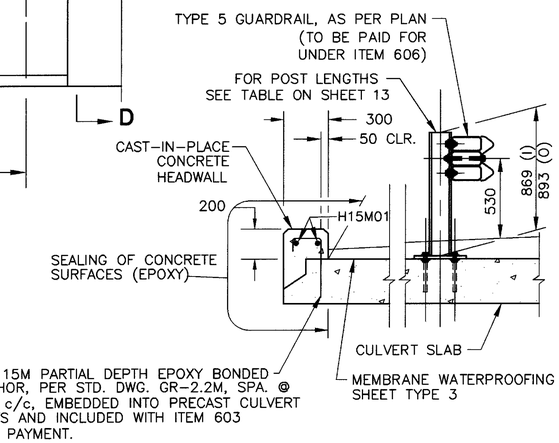
SECTION A-A



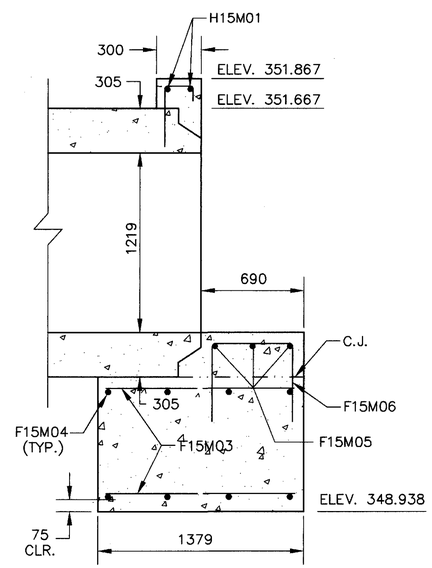
VIEW E-E



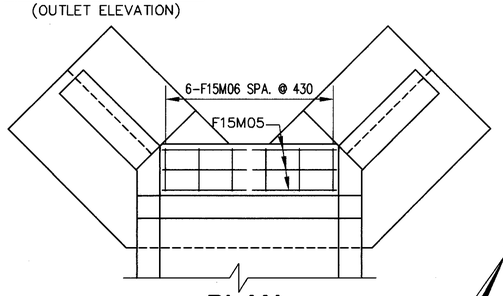
SECTION C-C



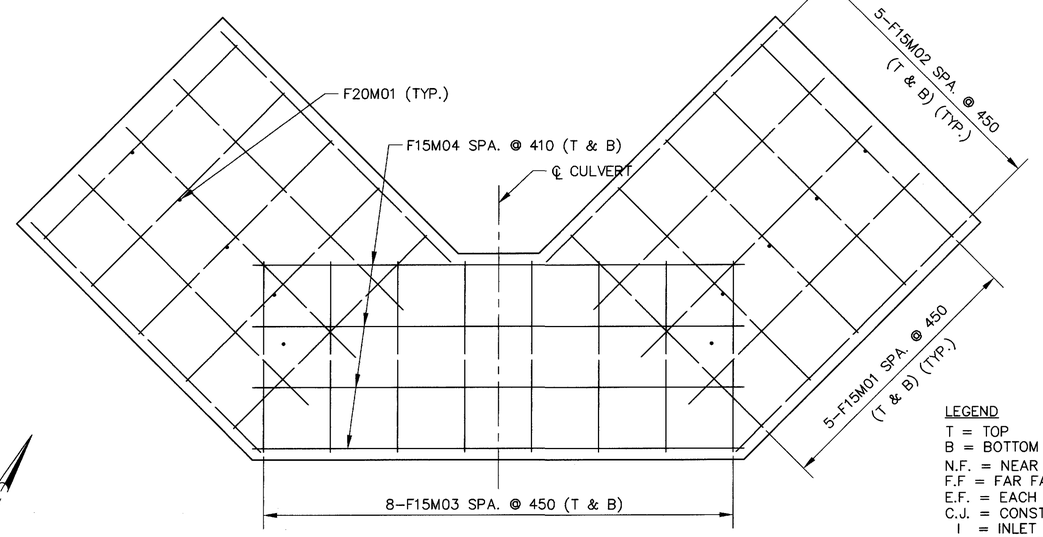
SECTION B-B
OUTLET SHOWN



SECTION D-D
(OUTLET ELEVATION)



PLAN
EDGE OF FOOTING REINFORCING DETAIL
INLET SHOWN, OUTLET SIMILAR



FOOTING REINFORCING DETAIL
INLET FOOTING SHOWN, OUTLET SIMILAR

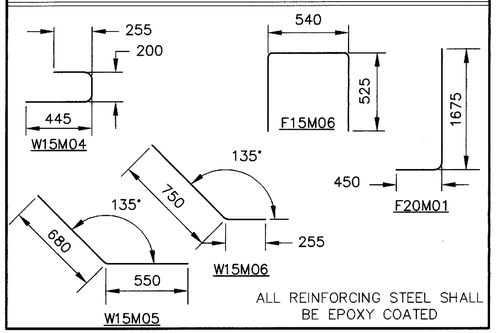
LEGEND
T = TOP
B = BOTTOM
N.F. = NEAR FACE
F.F = FAR FACE
E.F. = EACH FACE
C.J. = CONSTRUCTION JOINT
I = INLET
O = OUTLET

REINFORCING STEEL LIST

MARK	NO.	LENGTH (mm)	WEIGHT (kg)	TYPE
		WALLS		
W15M01	8 SERIES OF 4	950 TO 1850 *1	70	STR.
W15M02	24	1350	51	STR.
W15M03	8	1575	20	STR.
W15M04	4	825	5	BENT
W15M05	16	1220	31	BENT
W15M06	16	995	25	BENT
W15M07	20	1900	60	STR.
		TOTAL FOR WALLS = 262		
		FOOTINGS		
F15M01	40	1800	113	STR.
F15M02	40	2100	132	STR.
F15M03	32	1229	62	STR.
F15M04	16	3300	83	STR.
F15M05	6	2250	21	STR.
F15M06	12	1510	28	BENT
F20M01	20	2075	98	BENT
		TOTAL FOR FOOTINGS = 537		
		HEADWALLS		
H15M01	4	2900	18	STR.
		TOTAL FOR HEADWALLS = 18		
		TOTAL = 817 kg		

*1 INCREMENTS OF 300

BENDING DIAGRAMS



ALL REINFORCING STEEL SHALL BE EPOXY COATED

RESOURCE INTERNATIONAL INC.
281 ENTERPRISE DR.
WESTERVILLE, OHIO 43081
(614) 885-1959

metric units

DESIGNED	DRAWN	REVIEWED	DATE
SSK	SSK	JSB	6/93
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DOR		2800314	

STRUCTURE DETAILS AND REINFORCING STEEL LIST

STRUCTURE NO. GEA-44-21120
OVER BRANCH OF BUTTERNUT CREEK

GEA-44-21.120

3/3

14/17

CENTERLINE SURVEY PLAT

GEA–44–22.120 (13.13)
MUNSON TOWNSHIP
GEAUGA COUNTY
T–8, R–8
TRACT 2 & 3
LOTS 4 & 31

metric units

REFERENCE MONUMENTS TO BE SET BY THE CONTRACTOR

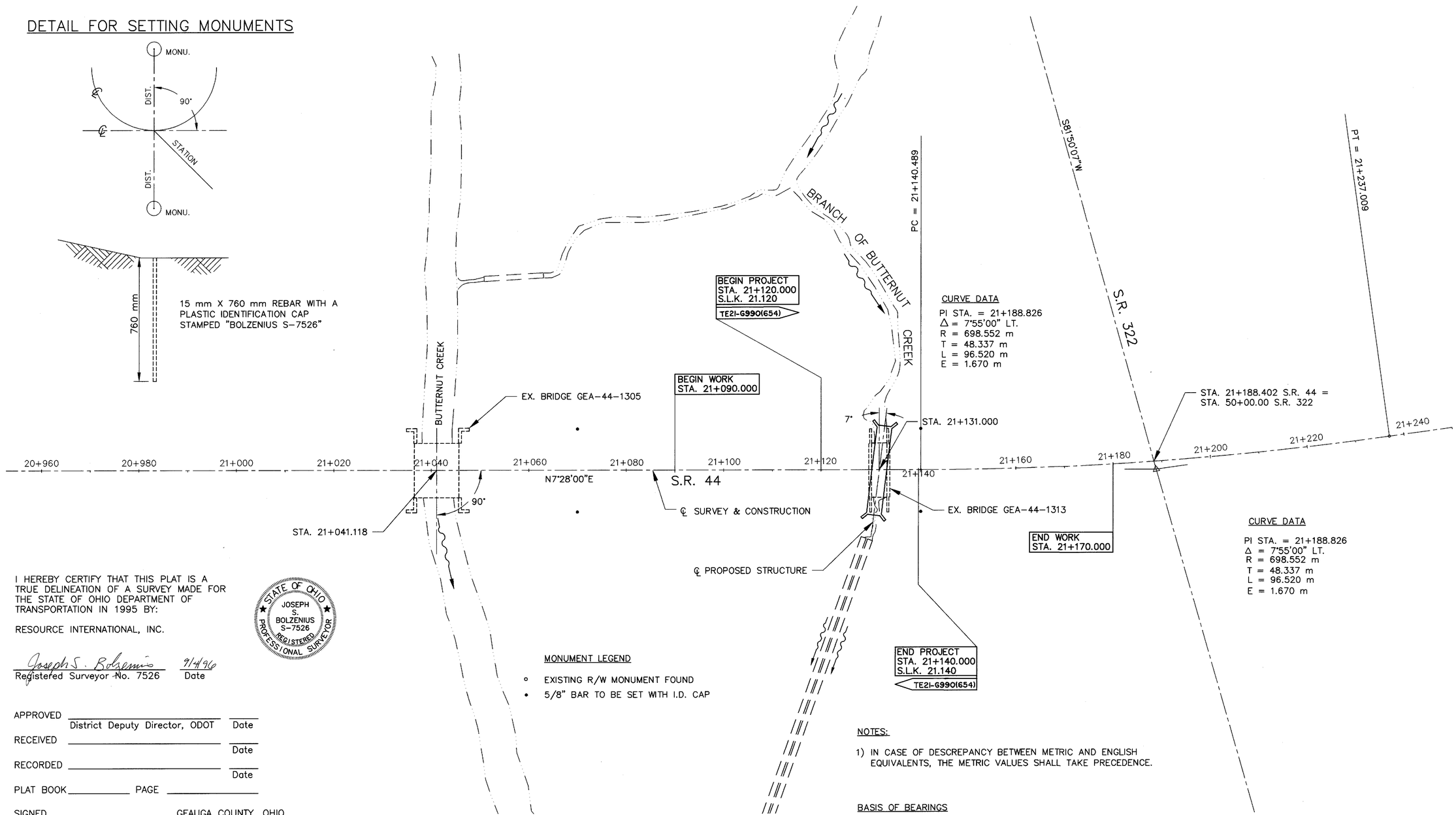
STATION	DIST. FROM ℄ LT.	DIST. FROM ℄ RT.	QUANT.
21+070.000	8.5 m	8.5 m	2
21+140.489 (PC)	8.5 m	8.5 m	2
TOTAL			4

QUANTITIES CARRIED TO GENERAL SUMMARY

CENTERLINE REFERENCE MONUMENTS SHALL BE CONSTRUCTED AS SHOWN ON THIS SHEET. THE PLACING OF THE MONUMENTS SHALL BE UNDER THE DIRECTION OF A PROFESSIONAL SURVEYOR AND ARE TO BE SET AS SHOWN BY THE HIGHWAY CONTRACTOR AT THE TIME OF CONSTRUCTION. ANY ALTERATIONS, WITH PRIOR APPROVAL OF THE DEPARTMENT OF TRANSPORTATION, SHALL BE NOTED AND ODOT SHALL BE NOTIFIED OF THE NEW LOCATIONS.

DETAIL FOR SETTING MONUMENTS

15 mm X 760 mm REBAR WITH A PLASTIC IDENTIFICATION CAP STAMPED "BOLZENIUS S–7526"



CURVE DATA

PI STA. = 21+188.826
Δ = 7°55'00" LT.
R = 698.552 m
T = 48.337 m
L = 96.520 m
E = 1.670 m

CURVE DATA

PI STA. = 21+188.826
Δ = 7°55'00" LT.
R = 698.552 m
T = 48.337 m
L = 96.520 m
E = 1.670 m

I HEREBY CERTIFY THAT THIS PLAT IS A TRUE DELINEATION OF A SURVEY MADE FOR THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION IN 1995 BY:

RESOURCE INTERNATIONAL, INC.

STATE OF OHIO — JOSEPH S. BOLZENIUS S–7526 — REGISTERED PROFESSIONAL SURVEYOR

Joseph S. Bolzenius — 9/4/96
Registered Surveyor No. 7526 — Date

APPROVED _____ District Deputy Director, ODOT — Date

RECEIVED _____ Date

RECORDED _____ Date

PLAT BOOK _____ PAGE _____

SIGNED _____ Recorder — GEAUGA COUNTY, OHIO

MONUMENT LEGEND

- ∘ EXISTING R/W MONUMENT FOUND
- • 5/8" BAR TO BE SET WITH I.D. CAP

NOTES:

1) IN CASE OF DESCREPANCY BETWEEN METRIC AND ENGLISH EQUIVALENTS, THE METRIC VALUES SHALL TAKE PRECEDENCE.

BASIS OF BEARINGS

CENTERLINE BEARING OF STATE ROUTE 44 ACCORDING TO ODOT PLAN 1CH 324 (SEC C) GEAUGA COUNTY, DATED 1924.

N

HORIZONTAL SCALE IN METERS 0 5 10 20

FEDERAL PROJ. NO. STP

STATE JOB NO

CENTERLINE SURVEY PLAT

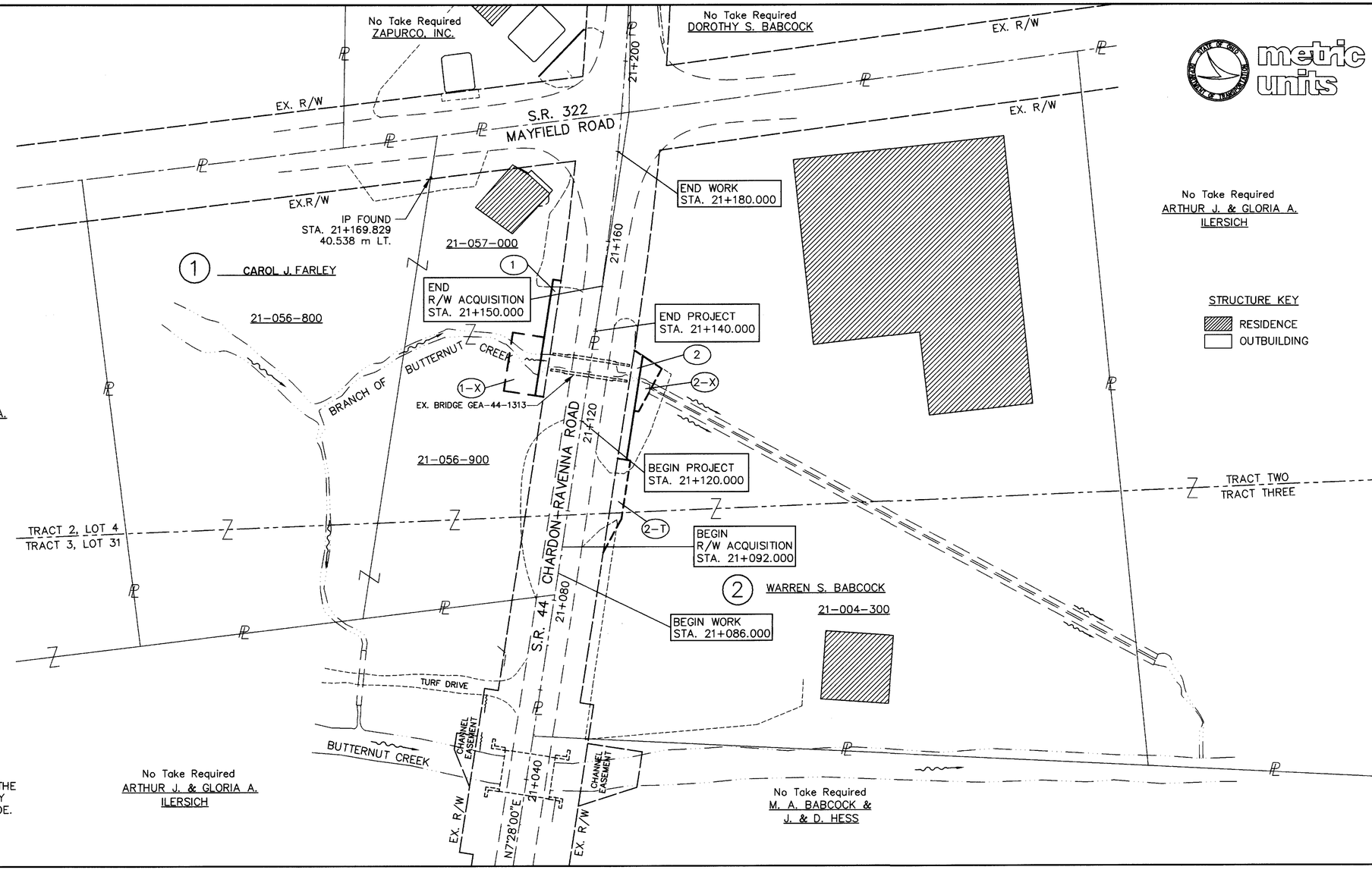
GEA-44-21.120

1/3

15/17

PROPERTY MAP

GEA-44-21.120 (13.13)
MUNSON TOWNSHIP
GEAUGA COUNTY
T-8, R-8
TRACTS 2 & 3
LOTS 4 & 31



UTILITIES:

GAS — EAST OHIO GAS
1717 EAST 9TH
CLEVELAND, OHIO 44114
(216) 736-6729

POWER — CLEVELAND ELECTRIC ILLUMINATING
696 EUCLID AVENUE
CLEVELAND, OHIO 44114
(216) 479-1234

UNDERGROUND UTILITY NOTE:
THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITY AS REQUIRED BY SECTION 153.64 OF THE OHIO REVISED CODE.

TOTAL NUMBER OF
2 OWNERSHIPS
0 TOTAL TAKES
0 OWNERSHIPS WITH STRUCTURES INVOLVED
0 OWNERSHIPS WITH "P" ITEMS

SUMMARY OF ADDITIONAL RIGHT OF WAY

GRANTEE:
ALL RIGHT OF WAY ACQUIRED IN THE NAME OF STATE OF OHIO UNLESS OTHERWISE SHOWN

PARCEL	OWNER	SHEET NO.	OWNER'S RECORD BOOK	OWNER'S RECORD PAGE	AUDITOR'S PARCEL NO.	RECORD AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. IN TAKE	NET TAKE	STRUCTURE	NET RESIDUE LEFT	NET RESIDUE RIGHT	TYPE FUND	REMARKS AND PERSONALTY	AS ACQUIRED BOOK	AS ACQUIRED PAGE
1	CAROL J. FARLEY	3	519	910	21-056-900	0.202 (0.500)	0.048 (0.118)	0.0048 (0.012)	0.000 (0.000)	0.0048 (0.012)	NONE			STATE	0.0015 FROM -056-900, 0.0033 FROM -057-000		
1-X		3	519	910	21-057-000	0.202 (0.500)	0.083 (0.206)	0.0091 (0.022)	0.000 (0.000)	0.0091 (0.022)					0.0062 FROM -056-900, 0.0029 FROM -057-000		
			519	910	21-056-800	0.664 (1.640)	0.071 (0.176)								- FOR DITCH CLEAN OUT AND CONSTRUCTION		
					TOTALS:	1.068 (2.640)	0.201 (0.500)	0.0139 (0.034)	0.000 (0.000)	0.0139 (0.034)		0.8531 (2.106)	-				
2	WARREN S. BABCOCK	3	954	1077	21-004-300	1.733 (4.283)	0.207 (0.511)	0.0047 (0.012)	0.000 (0.000)	0.0047 (0.012)	NONE			STATE			
2-X		3	725	1166				0.0033 (0.008)	0.000 (0.000)	0.0033 (0.008)					FOR DITCH CLEAN OUT AND CONSTRUCTION		
			657	1171													
					TOTALS:	1.733 (4.283)	0.207 (0.511)	0.0080 (0.020)	0.000 (0.000)	0.0080 (0.020)		-	1.5180 (3.751)				
2-T		3						0.0049 (0.012)							FOR DRIVE CONSTRUCTION		

NOTE: ALL TEMPORARY PARCELS TO BE OF 6 MONTHS DURATION

NOTE: ALL AREAS ARE GIVEN IN HECTARES WITH EQUIVALENT ACREAGE IN ( ).
1 HECTARE = 2.471 ACRES

REV.	DATE	DESCRIPTION
2	09/01/98	ADDED VOL. 725/657, PAGE 1166/1171
CKH	3/24/98	REVISED OWNERSHIP, PARCEL I

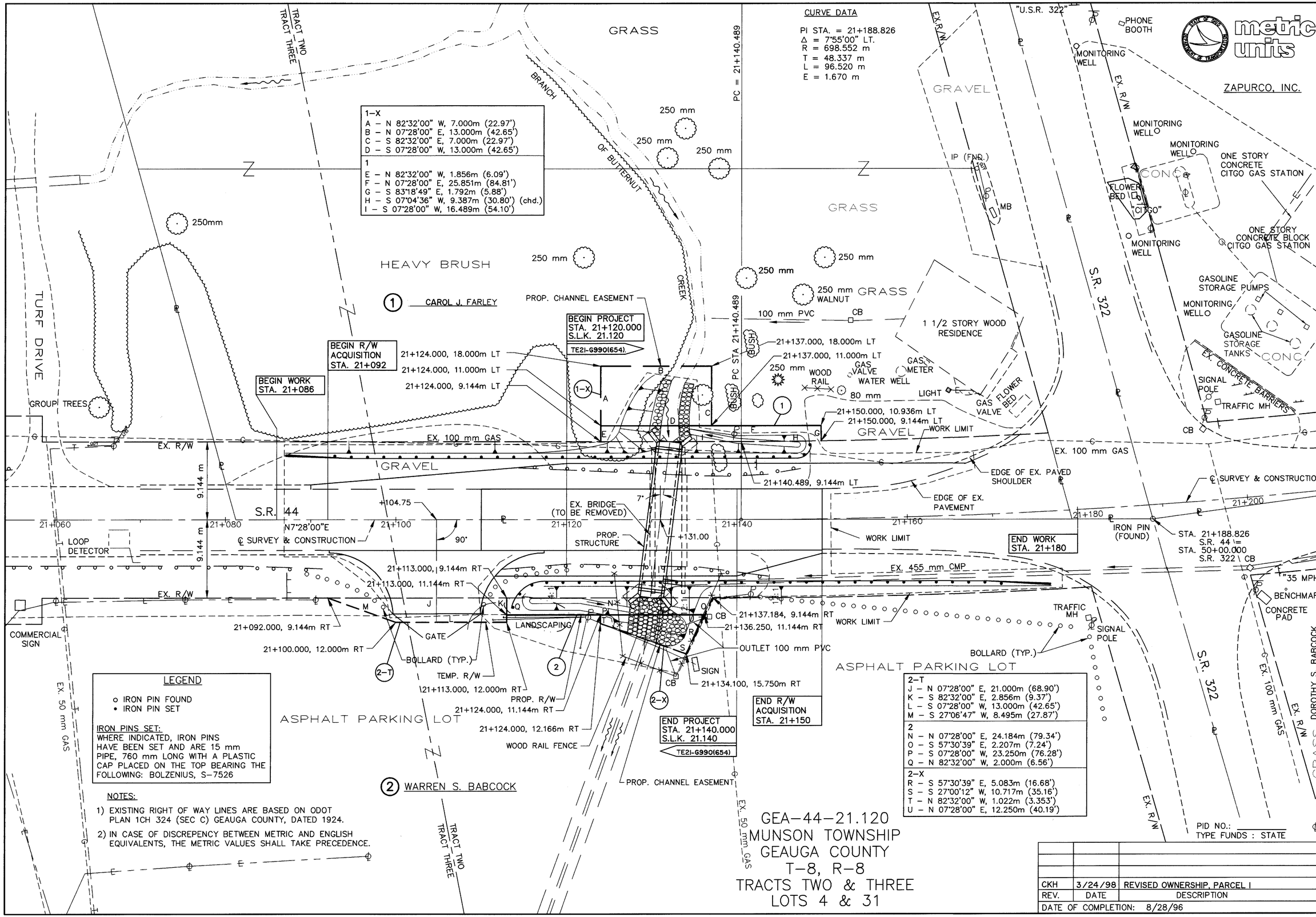
DATE OF COMPLETION: 8/27/96

FEDERAL PROJ. NO. STP

STATE JOB NO

PROPERTY MAP & SUMMARY OF ADDITIONAL R/W

GEA-44-21.120



FEDERAL PROJ. NO. STP

STATE JOB NO

RIGHT OF WAY PLAN

GEA-44-21.120

3/3

17/17

SPECIAL PROVISIONS

WATERWAY PERMITS
FOR
CRS: GEA - 44 - 21.120

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

OHIO EPA
PERMIT NUMBER: N/A

DATE: August 31, 1998

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

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

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

a. The width of the fill is limited to the minimum necessary for the actual crossing;

b. The fill placed in waters of the United States is limited to a filled area of no more than 1/3 acre. Furthermore, no more than a total of 200 linear feet of the fill for the roadway can occur in special aquatic sites, including wetlands;

c. The crossing is culverted, bridged or otherwise designed to prevent the restriction of, and to withstand, expected high flows and tidal flows, and to prevent the restriction of low flows and the movement of aquatic organisms;

d. The crossing, including all attendant features, both temporary and permanent, is part of a single and complete project for crossing of a water of the United States; and,

e. For fills in special aquatic sites, including wetlands, the permittee notifies the District Engineer in accordance with the "Notification" general condition. The notification must also include a delineation of affected special aquatic sites, including wetlands.

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

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

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

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

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

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

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

NATIONWIDE PERMIT CONDITIONS

GENERAL CONDITIONS:

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

1. Navigation. No activity may cause more than a minimal adverse effect on navigation.

2. Proper maintenance. Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.

3. Erosion and siltation controls. Appropriate erosion and siltation controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date.

4. Aquatic life movements. No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity @ s primary purpose is to impound water.

5. Equipment. Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.

6. Regional and case-by-case conditions. The activity must comply with any regional conditions which may have been added by the Division Engineer (see 33 CFR 330.4(e) and with any case specific conditions added by the Corps or by the State or tribe in its section 401 water quality certification.

7. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely effect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service.)

8. Tribal rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

9. Water quality certification. In certain states, an individual Section 401 water quality certification must be obtained or waived (see 33 CFR 330.4(c).

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

11. Endangered Species.

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

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

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

13. Notification.

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

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

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

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s) or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity; and

(4) For NWPs S 18, 21, 26, 29, 34, and 38, the PCN must also include a delineation of affected special aquatic sites, including wetlands (see paragraph 13(f);

(5) For NWP 21 - Surface Coal Mining Activities, the PCN must include an OSM or State approved mitigation plan.

(6) For NWP 29-Single-Family Housing, the PCN must also include:

(i) Any past use of this NWP by the individual permittee and/or the permittee's spouse;

(ii) A statement that the single-family housing activity is for a personal residence of the permittee;

(iii) A description cf the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring 0.5 acre or less will not require a formal on-site delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than 0.5 acre in size, a formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f);

(iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee t s spouse, within a one mile radius of the parcel, in any form of ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

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

(I) Sufficient baseline information so as to identify the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided that the approved flood control protection or drainage is not increased;

(ii) A delineation of any affected special aquatic sites, including wetlands; and,

(iii) Location of the dredged material disposal site.

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

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

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

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

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

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

(i) For NWP 14, 21, 26 (between l and 3 acres of impact), 29, 33, 37, and 38. The District Engineer will, upon receipt of a notification, provide immediately, e.g., facsimile transmission, overnight mail or other expeditious manner, a copy to the appropriate offices of the Fish and Wildlife Service, State natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the National Marine Fisheries Service. With the exception of NWP 37, these agencies will then have S calendar days from the date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 10 calendar days (16 calendar days for NWP 26 PCNs) before making a decision on ,the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.
(ii) Optional Agency Coordination For NWPs 5, 7, 12, 13, 17, 18, 27, 31, and 34, where a Regional Administrator of EPA, a Regional Director of USFWS, or Regional Director of NMFS has formally requested general notification from the District Engineer for the activities covered by any of these NWPs, the Corps will provide the requesting agency with notification on the particular NWPs. However, where the agencies have a record of not generally submitting substantive comments on activities covered by any of these NWPs, the Corps district may discontinue providing notification to those regional agency offices The District Engineer will coordinate with the resources agencies to identify which activities involving a PCN that the agencies will provide substantive comments to the Corps The District Engineer may also request comments from the agencies on a case by case basis when the District Engineer determines that such comments would assist the Corps in reaching a decision whether effects are more than minimal either individually or cumulatively.
(iii) Optional Agency Coordination, 401 Denial. For NWP 26 only, where the State has denied its 401 water quality certification for activities with less than I acre of wetland impact, the EPA regional administrator may request agency coordination of PCNs between 1/3 and I acre. The request may only include acreage limitations within the 1/3 to 1 acre range for which the state has denied water quality certification. In cases where the EPA has requested coordination of projects as described here, the Corps will forward the PCN to EPA only. The PCN will then be forwarded to the Fish and Wildlife Service and the National Marine Fisheries Service by EPA under agreements among those agencies. Any agency receiving the PCN will be bound by the time frames for providing comments to the Corps.

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

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

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

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

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

SECTION 404 ONLY CONDITIONS:

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

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

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

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

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

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

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

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

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

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

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
GEA-44-21.120 (13.13)
MUNSON TOWNSHIP
GEAUGA COUNTY

metric units

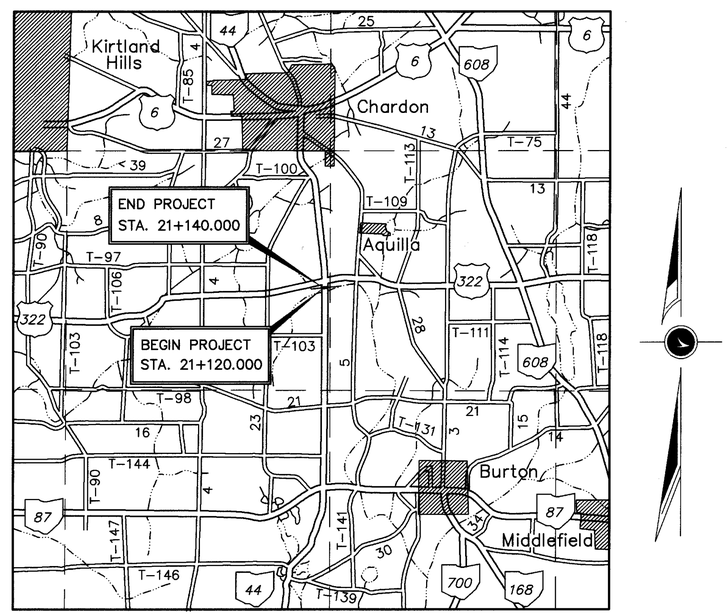
PROJECT DESCRIPTION

IMPROVEMENT OF 0.02 KILOMETERS OF S.R. 44 BY REPLACEMENT OF AN EXISTING CONCRETE EXISTING CONCRETE SLAB STRUCTURE OVER BRANCH OF BUTTERNUT CREEK WITH A PRECAST BOX CULVERT INCLUDING APPROACH RECONSTRUCTION.

CONVENTIONAL SIGNS

FENCE LINE
UTILITY POLES — POWER — TELEPH. — COMBINATION
MAIL BOX
TREES & STUMPS
TREES & STUMPS TO BE REMOVED
CENTER LINE OF ROAD
PROPERTY LINE
EXISTING RIGHT-OF-WAY — EX. R/W
PROPOSED RIGHT-OF-WAY — R/W
GAS VALVE — G.V., WATER VALVE — W.V., FIRE HYDRANT — F.H.
WATER LINE — w — SAN. SEWER — San — GAS LINE — G —
GUARDRAIL (EXISTING)
GUARDRAIL (PROPOSED)

RIGHT OF WAY ONLY



LOCATION MAP
0 50 km
SCALE: 1:50000

ACQUIRING AGENCY: STATE OF OHIO

INDEX OF SHEETS

TITLE SHEET
CENTERLINE SURVEY PLAT 1
PROPERTY MAP & SUMMARY OF ADDITIONAL RIGHT OF WAY 2
RIGHT OF WAY PLAN 3

1997 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

PORTION TO BE IMPROVED
STATE HIGHWAYS
OTHER HIGHWAYS

SCALES IN METERS

RIGHT OF WAY PLAN 0 5 m 10 m
SCALE: 1:200

UNDERGROUND UTILITIES

2 WORK DAYS
BEFORE YOU DIG
CALL 800-362-2764 (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON MEMBERS
MUST BE CALLED DIRECTLY

Plans Prepared and Recommended By:

RESOURCE INTERNATIONAL INC.
281 ENTERPRISE DR.
WESTERVILLE, OHIO 43081
(614) 885-1959

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____

DIVISION ADMINISTRATOR _____ DATE _____

APPROVED _____

DATE 25 JUN 98 DISTRICT DEPUTY DIRECTOR, DEPARTMENT OF TRANSPORTATION

FEDERAL PROJECT NO. **STP**

PID NO. **12830**

S.J.N.

RAILROAD INVOLVEMENT **NONE**

GEA-44-21.120

GEOLOGY OF THE SITE

GEOLOGICALLY, THE SITE IS LOCATED ON THE GLACIATED, MODERATELY HILLY ALLEGHENY PLATEAU. THE WISCONSIN GLACIER PASSED OVER THIS REGION, DEPOSITING A RELATIVELY THIN LAYER OF DRIFT, ON THE ORDER OF 5 TO 45 FEET IN DEPTH. THE UNDERLYING BEDROCK CONSISTS OF SHARON CONGLOMERATE AND SHALE.

EXPLORATION

A TOTAL OF FOUR (4) ENGINEERING TEST BORINGS WERE DRILLED AT THE APPROXIMATE SECTIONS AND OFFSETS SHOWN ON THE BORING LOGS. TWO TEST BORINGS, DESIGNATED SB-1 AND SB-2, WERE DRILLED IN REFERENCE TO THE CREEK, AND WERE COMPLETED TO THE DEPTHS OF 11.7 AND 12.2 METERS, RESPECTIVELY. BORINGS RB-1 AND RB-2 WERE EACH COMPLETED TO DEPTHS OF 3.1 METERS AND WERE DRILLED IN REFERENCE TO THE ROADWAY BOTH NORTH AND SOUTH OF THE CULVERT. THE LOCATIONS AND ELEVATIONS OF ALL FOUR BORINGS WERE DETERMINED AND MARKED BY REPRESENTATIVES OF RESOURCE INTERNATIONAL. THE DRILLING WAS PERFORMED BETWEEN DECEMBER 26, 1995 AND DECEMBER 28, 1995.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

BOTH STRUCTURAL BORINGS, DESIGNATED SB-1 AND SB-2, REVEALED APPROXIMATELY 7.6 CM OF ASPHALT OVERLYING NEARLY 22.9 CM OF GRANULAR BASE FILL. BORING SB-1 CONTAINED VERY STIFF SILTY CLAY BETWEEN 0.3 AND 1.2 METERS, FOLLOWED BY 1.1 METERS OF MEDIUM STIFF SANDY SILT. THE UNDERLYING 6.5 METERS OF BORING SB-1 DISPLAYED PREDOMINANTLY GRANULAR SOILS, DESCRIBED AS MEDIUM DENSE TO DENSE SAND OR SAND AND GRAVEL MIXES. BETWEEN 8.8 METERS AND 10.5 METERS, HARD SILTY CLAY WITH SOME SAND WAS NOTED, OVERLYING WEATHERED SHALE AT A DEPTH OF 10.5 METERS, AND MEDIUM STIFF SHALE AT 10.7 METERS.

BORING SB-2 CONTAINED NEARLY 1.8 METERS OF STIFF TO VERY STIFF SILTY CLAY UNDERNEATH THE GRANULAR ROADWAY BASE, TO A DEPTH OF 2.1 METERS. AS IN BORING SB-1, PREDOMINANTLY GRANULAR MATERIAL EXISTED BETWEEN 2.1 AND 8.8 METERS. THESE SOILS WERE GENERALLY DESCRIBED AS LOOSE TO MEDIUM DENSE SAND WITH LITTLE GRAVEL, LITTLE SILT, AND LITTLE CLAY. HARD SILTY CLAY WAS ENCOUNTERED BETWEEN 8.8 AND 10.2 METERS, FOLLOWED BY A THIN LENS OF CONGLOMERATE, AND MEDIUM-FIRM SHALE.

BOTH ROADWAY BORINGS DISPLAYED BETWEEN 5.1 AND 7.6 CM OF ASPHALT, OVERLYING 17.8 TO 25.4 CM OF SAND AND GRAVEL BASE. BORING RB-1 EXHIBITED VERY DENSE TO MEDIUM DENSE SAND JUST BELOW THE GRANULAR BASE, TO A DEPTH OF 3.0 METERS. A 60 CM LENS OF HARD SANDY SILT WITH SOME FINE GRAVEL WAS ENCOUNTERED AT A DEPTH OF 1.8 METERS.

MEDIUM STIFF CLAY WAS ENCOUNTERED IN BORING RB-2 BELOW THE GRANULAR BASE, TO A DEPTH OF 1.1 METERS. THE REMAINDER OF THE BORING'S 3.0 METER DEPTH CONSISTED OF GRANULAR SOILS, GENERALLY DESCRIBED AS MEDIUM DENSE TO LOOSE SAND AND GRAVEL MIXES.

A MORE COMPREHENSIVE DESCRIPTION OF THE SOIL STRATA ENCOUNTERED CAN BE FOUND IN THE BORING LOGS AT THE END OF THIS REPORT (APPENDIX B). LABORATORY TEST RESULTS AND VISUAL EXAMINATION OF REPRESENTATIVE SAMPLES TESTED INDICATE THAT THE SUBSURFACE SOILS ENCOUNTERED ARE PRIMARILY CLASSIFIED AS ODOT A-1a, A-2-6, A-3, A-4a, AND A-7-6.

MANY SOIL PROPERTIES, INCLUDING SOIL CONSISTENCY AND SHEAR STRENGTH (OF COHESIVE SAMPLES), ARE PRIMARILY DERIVED FROM STANDARD PENETRATION BLOW COUNTS. BLOW COUNTS FOR BOTH BORINGS WERE RECORDED AS RANGING FROM 6 BLOWS PER 15 CM TO REFUSAL. REFUSAL IS DEFINED AS OBTAINING IN EXCESS OF 50 BLOWS WITH LESS THAN 15 CM OF PENETRATION.

NATURAL MOISTURE CONTENTS OF ALL SOIL SAMPLES TESTED RANGED FROM 8 TO 25%. THE MOISTURE CONTENTS FOR COHESIVE SAMPLES TESTED WERE BETWEEN 2 AND 3% ABOVE THEIR CORRESPONDING PLASTIC LIMITS. IN GENERAL, MOISTURE CONTENTS IN SOILS ENCOUNTERED BELOW A DEPTH OF 1.0 METER IN BORINGS SB-1 AND SB-2 AND BELOW A DEPTH OF 2.0 METERS IN BORING RB-1 ARE CONSIDERED TO BE SIGNIFICANTLY ABOVE THEIR CORRESPONDING OPTIMUM MOISTURE CONTENTS. ALL OTHER SAMPLES TESTED ARE CONSIDERED TO BE SLIGHTLY ABOVE THEIR OPTIMUM MOISTURE LEVELS.

BECAUSE WASH-WATER WAS USED DURING THE CORING OF BEDROCK, THE ACCURATE DETERMINATION OF GROUNDWATER COULD NOT BE DETERMINED. GROUNDWATER IS EXPECTED TO BE AT OR NEAR THE CURRENT ELEVATION OF THE CREEK'S WATER LEVEL. THE ASSUMED APPROXIMATE ELEVATION AT WHICH GROUNDWATER EXISTED AT THE TIME OF THIS INVESTIGATION WAS 349.5 METERS.

BEDROCK WAS ENCOUNTERED IN BORINGS SB-1 AND SB-2 AT AN APPROXIMATE DEPTH OF 10.2 METERS (ELEVATION 341 METERS). THE BEDROCK WAS GENERALLY DESCRIBED AS MEDIUM-FIRM, SLIGHTLY WEATHERED, BROKEN SHALE, WITH INDURATED CLAY SEAMS. RQD VALUES FOR THE BEDROCK CORES SAMPLED WAS DETERMINED TO BE 22% (VERY POOR).

LEGEND

Press and/or Drive Sample and/or Core Boring Location-Plan View.

Horizontal Bar on Boring Log indicates the Depth the Sample was Taken.

X/Y/Z — Figures Beside the Boring Log in Profile indicate the Number of Blows for Standard Penetration Test.

X = Number of Blows for First 150 Millimeters

Y = Number of Blows for Second 150 Millimeters

Z = Number of Blows for Third 150 Millimeters

TR — Top of Rock

W — Indicates Free Water level

▽ — Indicates Static Water level

Particle Size Definitions

Boulders	Cobbles	Gravel	C.Sand	F.Sand	Silt	Clay
	30.48cm	7.62cm	20mm	0.42mm	0.074mm	0.005mm
			No. 10	No. 40	No. 200	

SYMBOL OF ROCK TYPE

SHALE

GENERAL INFORMATION

Borings are made by means of a truck mounted rotary drilling machine. Standard Penetration testing was performed at 0.75 to 1.5 meter intervals. The Standard Penetration Test (ASTM D 1586) is conducted by using a 63.5 kg hammer falling 760 millimeters to drive a 51 millimeter O.D. split-barrel sampler 450 millimeters. Driving resistance is recorded on the boring logs in terms of blows per 150 millimeter interval of the driving distance. The second and third intervals are added to obtain the number of blows per 300 millimeters.

The boring log sheet shows graphic plot of the information obtained, including depth and elevation of the sample, number of blows for the Standard Penetration Tests in three 150 millimeter increments, field sample number, and sample description based on laboratory tests and the Ohio Department of Transportation Classification System. Results of strength and consolidation testing, if performed, appear on separate enclosures.

At depths where materials are bouldery or gravelly to the extent that the sample cannot be driven, a wash sample is procured for visual classification to determine the general character of the material. These samples are not considered sufficiently representative to warrant laboratory testing.

Note--all available soil and bedrock information which can be conveniently shown on the structure foundation investigation sheets has been so reported. Additional subsurface investigations may have been made to study some special aspect of the project. Copies of the data, if any, may be inspected in the District Deputy Director's Office (District 12), the Pavement and Soils Section of the Office of Roadway Engineering or in the Office of Bridges at 25 South Front Street.

The purpose of this subsurface investigation is to develop soils information specifically for foundation design purposes and is not intended to be used for construction estimating or bidding. Information shown was obtained for use in establishing design criteria for the project. The accuracy of the data presented is not guaranteed by the State of Ohio or Consultant and is not to be construed as part of the plans governing construction of the project.

RESOURCE INTERNATIONAL INC.
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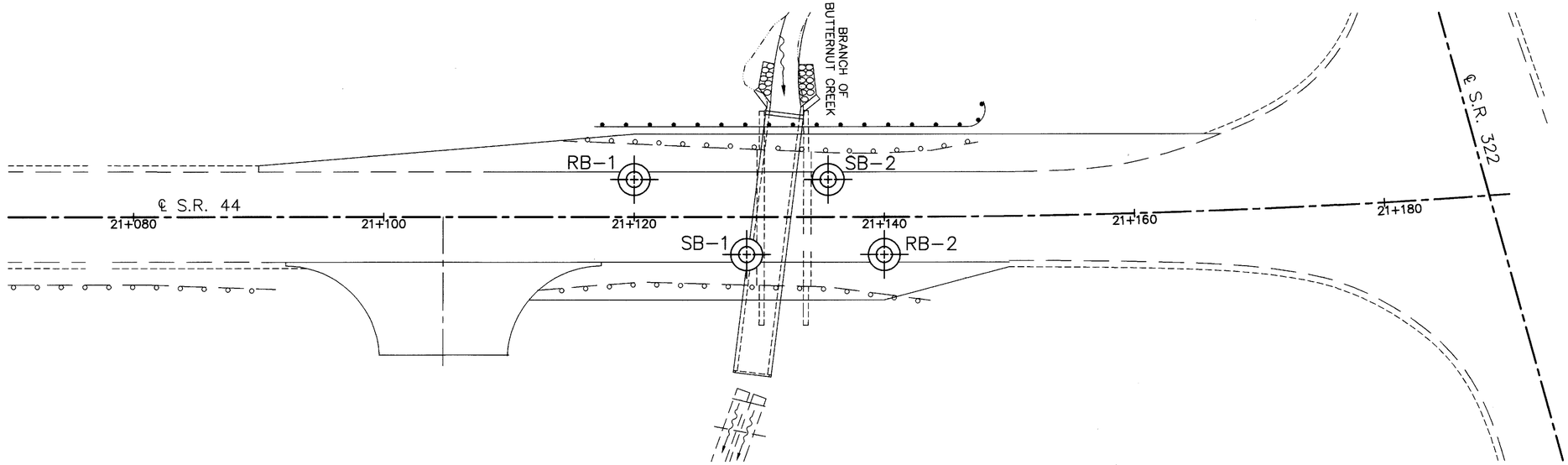
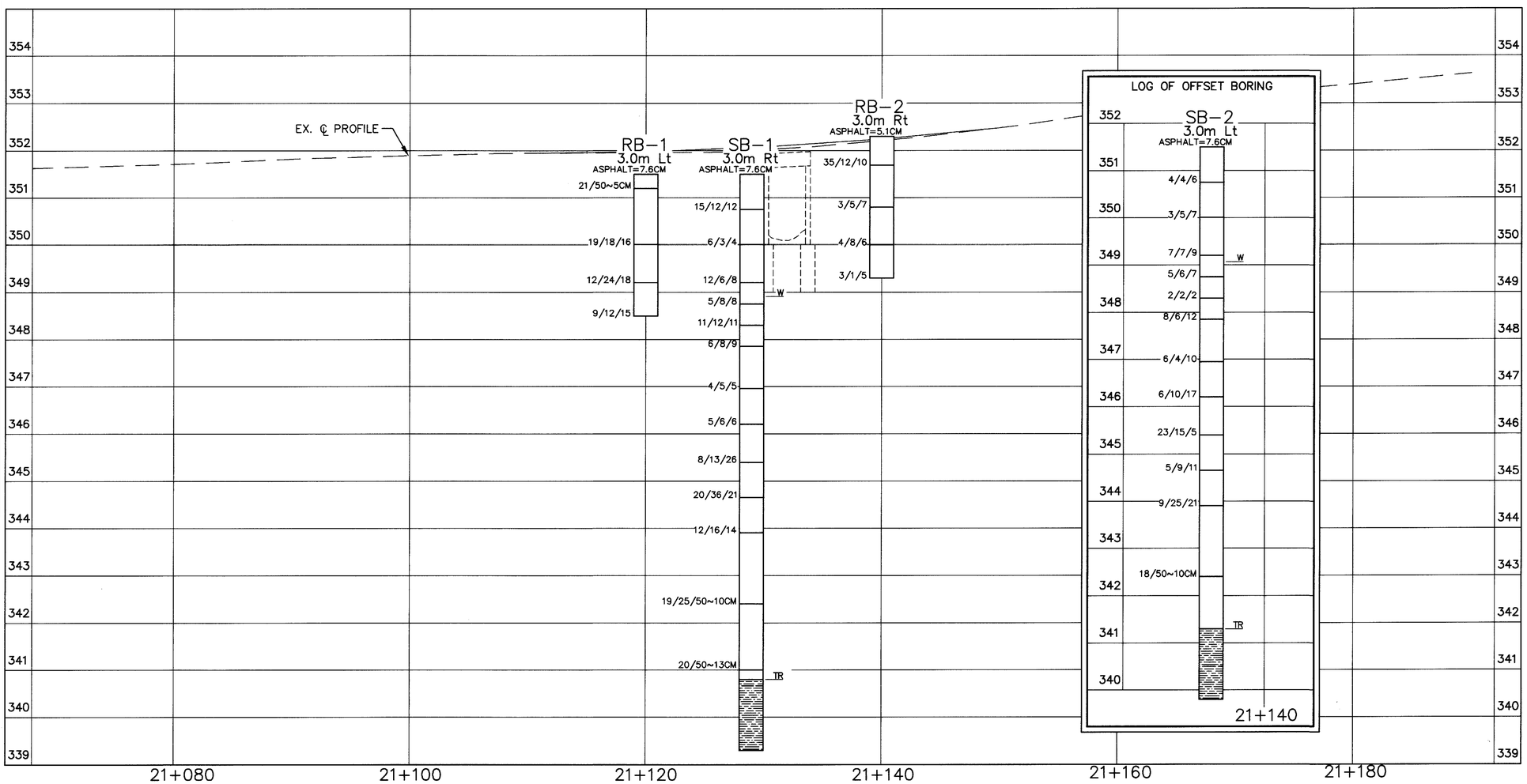
CLEVELAND, OHIO 44125
(216) 581-0777

STRUCTURE FOUNDATION INVESTIGATION

GEA-44-21.120
OVER BUTTERNUT CREEK

RESOURCE INTERNATIONAL INC. FILENAME: 5145S1-1.DWG
PROJECT NO. W-5145 DATE: 25-APR-1996





metric units

HORIZONTAL SCALE IN METERS 0 5 10

CALCULATED KEB
CHECKED GPH

STRUCTURE FOUNDATION INVESTIGATION

GEA-44-21.120
OVER BUTTERNUT CREEK

2/3

RESOURCE INTERNATIONAL INC.
PROJECT NO. W-5145
FILENAME: 5145S1-2.DWG
DATE: 25_APR_1996

BORING LOG: RB-1

STATION AND OFFSET: 21+120, 3.0M LT.
SURFACE ELEVATION: 351.5M
WATER ENCOUNTERED: DRY

DATE STARTED: 12/26/95
DATE FINISHED: 12/26/95
SAMPLER TYPE: HSA

ELEV.	SAMPLE NUMBER	BLOWS PER 15 cm	REC (%)	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	% AGG	% CS	% FS	% SI	% CL	ODOT CLASS
351.2	SS-1	21/50~5CM	60		ASPHALT 0.1M; SAND AND GRAVEL BASE 0.3M; LIGHT BROWN SAND, LITTLE GRAVEL, TRACE SILT AND CLAY (PROBABLE FILL). 1.0M	18								A-6a
350.0	SS-2	19/18/16	17	1	BROWN SAND, LITTLE SILT, TRACE CLAY, TRACE GRAVEL AND SANDSTONE FRAGMENTS. 1.8M	10								VISUAL
349.2	SS-3	12/24/18	6	2	MOTTLED BROWN AND GRAY SANDY SILT, SOME CLAY, SOME GRAVEL. 2.4M	23	24	3	26	6	19	24	25	A-4a
348.5	SS-4	9/12/15	78		BROWN SAND, LITTLE SILT, TRACE CLAY, TRACE GRAVEL. 3.0M	22			56	4	13	-27-		VISUAL

BOTTOM OF BORING=3.0M

BORING LOG: RB-2

STATION AND OFFSET: 21+140, 3.0M RT.
SURFACE ELEVATION: 352.3M
WATER ENCOUNTERED: DRY

DATE STARTED: 12/26/95
DATE FINISHED: 12/26/95
SAMPLER TYPE: HSA

ELEV.	SAMPLE NUMBER	BLOWS PER 15 cm	REC (%)	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	% AGG	% CS	% FS	% SI	% CL	ODOT CLASS
351.7	SS-1	35/12/10	67		ASPHALT 0.1M; SAND AND GRAVEL BASE 0.2M; BROWN SILTY CLAY, LITTLE SAND, TRACE GRAVEL (PROBABLE FILL) 1.1M									VISUAL
350.8	SS-2	3/5/7	6	1	BROWNISH-GRAY SAND, SOME GRAVEL, TRACE SILT, TRACE CLAY (POSSIBLE FILL). 1.4M	8								VISUAL
350.0	SS-3	4/8/6	100	2	GRAY SAND AND GRAVEL, TRACE SILT. 2.3M	14			66	10	18	-6-		VISUAL
349.3	SS-4	3/1/5	83		BROWN SAND, LITTLE GRAVEL, LITTLE SILT, TRACE CLAY. 3.0M	14								VISUAL

BOTTOM OF BORING=3.0M

BORING LOG: SB-1

STATION AND OFFSET: 21+129, 3M RT.
SURFACE ELEVATION: 351.5M
WATER ENCOUNTERED: SEEPAGE ⊙ 2.59M

DATE STARTED: 12/28/95
DATE FINISHED: 12/28/95
SAMPLER TYPE: HSA/RC

ELEV.	SAMPLE NUMBER	BLOWS PER 15 cm	REC (%)	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	% AGG	% CS	% FS	% SI	% CL	ODOT CLASS
350.8	SS-1	15/12/12	11		ASPHALT 0.1M; SAND AND GRAVEL BASE 0.3M; BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL. 1.2M	16								VISUAL
350.0	SS-2	6/3/4	33	1	GRAY SANDY SILT, LITTLE CLAY, LITTLE GRAVEL. 2.3M	18			11	5	27	-57-		VISUAL
349.3	SS-3	12/6/8	67	2	GRAY SAND, LITTLE SILT, TRACE GRAVEL. 4.3M									VISUAL
348.8	SS-4	5/8/8	28		BROWNISH-GRAY SAND, SOME GRAVEL, SOME CLAY, LITTLE SILT. 6.1M	24			3	38	49	-10-		A-3
348.3	SS-5	11/12/11	11	3	GRAY SAND AND GRAVEL, LITTLE CLAY, LITTLE SILT. 7.5M									VISUAL
347.9	SS-6	6/8/9	22		BROWN SAND, SOME GRAVEL, LITTLE SILT, LITTLE CLAY. 8.8M									VISUAL
347.0	SS-7	4/5/5	22	4	GRAY SILTY CLAY, SOME SAND, TRACE GRAVEL. 10.5									VISUAL
346.2	SS-8	5/6/6	44	5	GRAY WEATHERED SHALE. 10.7	12								VISUAL
345.4	SS-9	8/13/26	72	6	SHALE; GRAY, FISSILE, MEDIUM FIRM, SEVERELY TO SLIGHTLY FRACTURED AND BROKEN, MODERATELY TO SLIGHTLY WEATHERED WITH CLAY SEAMS. -NO CORE LOSS -RQD = 22%	18								VISUAL
344.7	SS-10	20/36/21	56	7										VISUAL
343.9	SS-11	12/16/14	28	8										VISUAL
342.4	SS-12	19/25/50~10CM	56	9										VISUAL
341.0	SS-13	20/50~13CM	44	10										VISUAL
	RC-1		100	11										
339.3				12										

BOTTOM OF BORING=12.2M

BORING LOG: SB-2

STATION AND OFFSET: 21+135.5, 3.0M LT.
SURFACE ELEVATION: 351.5M
WATER ENCOUNTERED: SEEPAGE ⊙ 2.43M

DATE STARTED: 12/26/95
DATE FINISHED: 12/26/95
SAMPLER TYPE: HSA/RC

ELEV.	SAMPLE NUMBER	BLOWS PER 15 cm	REC (%)	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	% AGG	% CS	% FS	% SI	% CL	ODOT CLASS
350.8	SS-1	4/4/6	44		ASPHALT 0.1M; SAND AND GRAVEL BASE 0.3M; BROWN SILTY CLAY, LITTLE GRAVEL, TRACE SAND. 1.7M									VISUAL
350.0	SS-2	3/5/7	50	1	MOTTLED BROWN AND GRAY SILTY CLAY, LITTLE SAND, TRACE GRAVEL. 2.1M	25	42	20	17	2	3	32	46	A-7-6
349.3	SS-3	7/7/9	22	2	GRAY GRAVEL, SOME SAND, LITTLE CLAY, LITTLE SILT. 2.9M									VISUAL
348.8	SS-4	5/6/7	100		LIGHT BROWN SAND, SOME GRAVEL, TRACE SILT. 4.1M	23			51	10	22	-17-		VISUAL
348.3	SS-5	2/2/2	22	3	LIGHT BROWN SAND, LITTLE GRAVEL, LITTLE SILT, LITTLE CLAY. 5.8M	21								VISUAL
347.9	SS-6	8/6/12	11	4	GRAY SAND, LITTLE SILT, TRACE GRAVEL. 6.5M									VISUAL
347.0	SS-7	6/4/10	11	5	BROWN SAND, LITTLE SILT, LITTLE CLAY, TRACE GRAVEL AND SANDSTONE FRAGMENTS. 8.8M									VISUAL
346.2	SS-8	6/10/17	56	6	GRAY SILTY CLAY, SOME SAND, TRACE GRAVEL. 10.2M									VISUAL
345.4	SS-9	23/15/5	33	7	CONGLOMERATE / SANDSTONE 10.3M	16								VISUAL
344.7	SS-10	5/9/11	33	8	SHALE; GRAY, FISSILE, MEDIUM FIRM, SEVERELY TO MODERATELY FRACTURED AND BROKEN, SEVERELY TO MODERATELY WEATHERED WITH CLAY SEAMS. -NO CORE LOSS									VISUAL
343.9	SS-11	9/25/21	56	9										VISUAL
342.4	SS-12	18/50~10CM	60	10										VISUAL
	RC-1		100	11										
339.8														

BOTTOM OF BORING=11.7M

DRAWN KEB
CHECKED GPH

STRUCTURE FOUNDATION INVESTIGATION

GEA-44-21.120
OVER BUTTERNUT CREEK

3/3

RESOURCE INTERNATIONAL INC. FILENAME: 5145S1-3.DWG
PROJECT NO. W-5145 DATE: 25 APR 1996