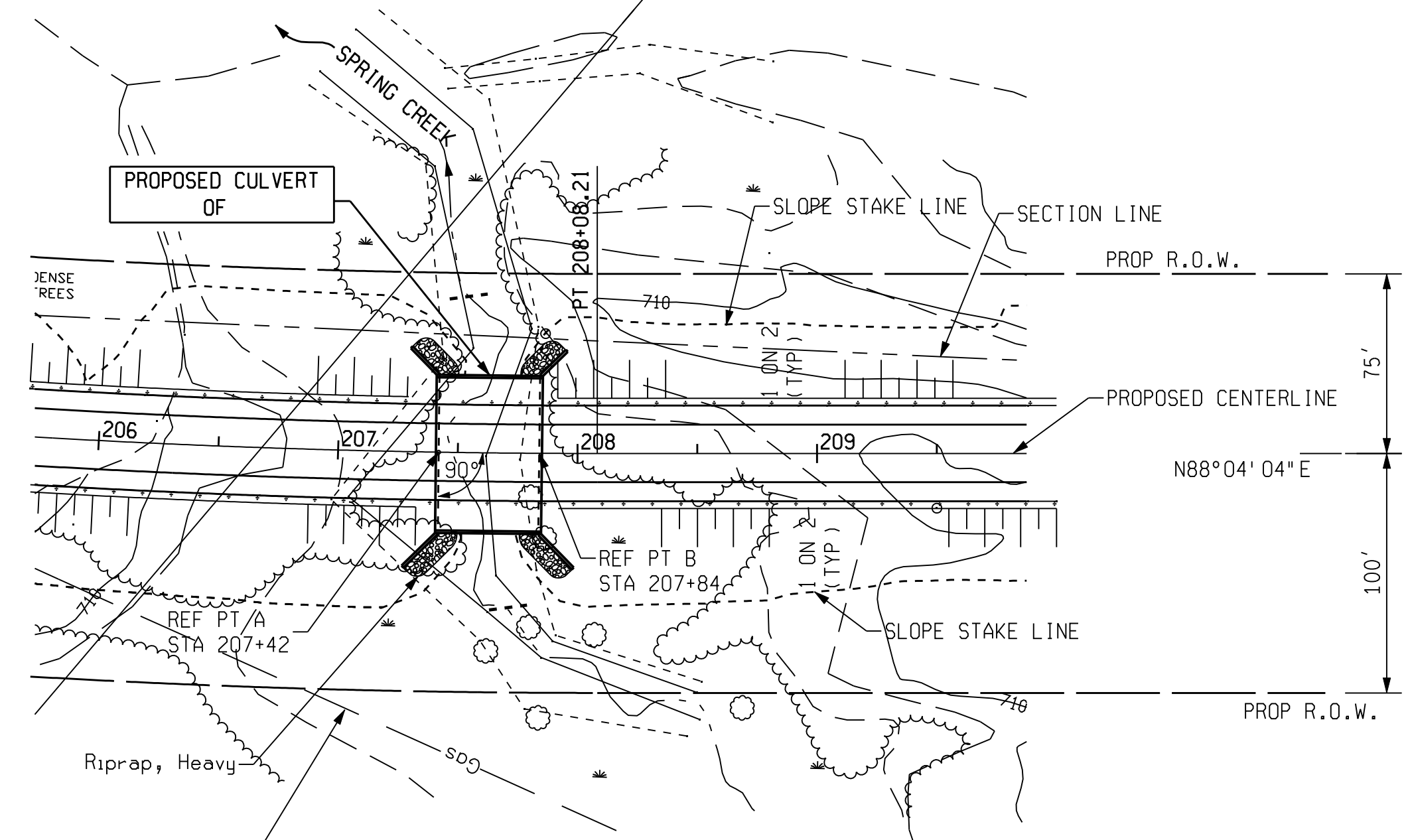




SECTION 15

CHAD E. & ANGELA M. RUGER DORIS M. SQUIER TRUST



CHAD E. & ANGELA M. RUGER

SECTION 22

SITUATION PLAN

RIGHT OF WAY FOR GAS MAINS TO CONSUMERS POWER CO. PER LIBER 258, PAGE 393

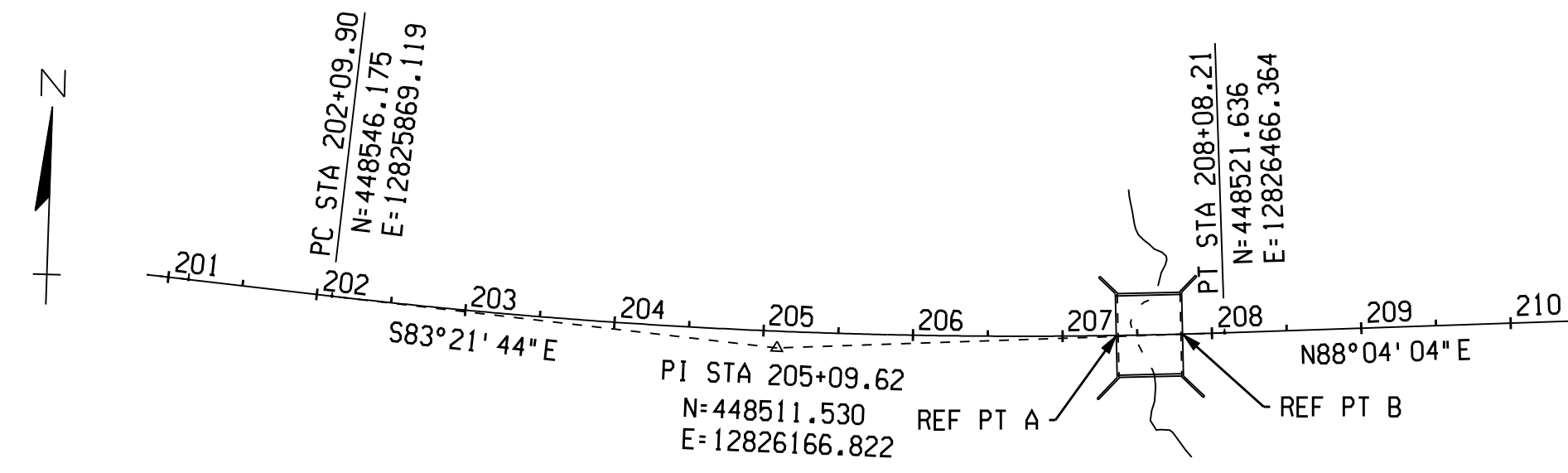
DORIS M. SQUIER TRUST

BENCH MARKS	
B.M. #24	ELEV=709.945 R.R. SPIKE IN NORTH SIDE OF A 9" MAPLE, ON S. EDGE OF GAS LINE CLEARING, HALF WAY BETWEEN TOE OF STEEP SLOPE TO WEST AND WEEDY POND TO EAST. STA 207+34±, 34' ± RT
B.M. #25	ELEV=712.778 LAG BOLT IN NORTH SIDE OF A 24" MAPLE, TOP OF WEST BANK OF THORNAPPLE RIVER AND AT SOUTH END OF TWO TRACK CONNECTING NORTH AND SOUTH HORSE PASTURES. STA 213+75±, 17' ± RT

ESTIMATED TRAFFIC DATA	
ADT (2008)	- 0
ADT (2028)	- 10,000
DESIGN	- 55 mph
POSTED SPEED	- NONE
DESIGN LOADING	- HL93

CURVE DATA	
CURVE DATA:	
Δ	08°34'12" LT.
D	01°25'57"
R	4000.00
T	299.71
L	597.75, S87°38'50"E
E	11.21
PC	202+09.90, N 448546.17, E 12825869.12
PI	205+09.62, N 448511.53, E 12826166.82
PT	208+08.21, N 448521.64, E 12826466.36
PROP E%	= 2.70%

CONTROL POINT WITNESSES	
CONTROL POINT #25	- STA 204+84.08, 61.79' RT 1/2" IRON W/WPS (RED) CONTROL CAP N. 448462.119 E. 12826139.404 EL = 732.33 TRAVERSE POINT CAP, SOUTH SIDE OF GAS LINE CLEARING ON SIDE OF STEEP HILL OVER LOOKING SWAMP
CONTROL POINT #27	- STA 213+37.27, 9.48' LT 1/2" IRON W/WPS (RED) CONTROL CAP N. 448549.021 E. 12826996.806 EL = 709.27 TRAVERSE POINT CAP 60' ± WEST BANK OF THORNAPPLE RIVER, SOUTH END OF TWO TRACK CONNECTING HORSE PASTURES



ALIGNMENT DIAGRAM

NOTES:

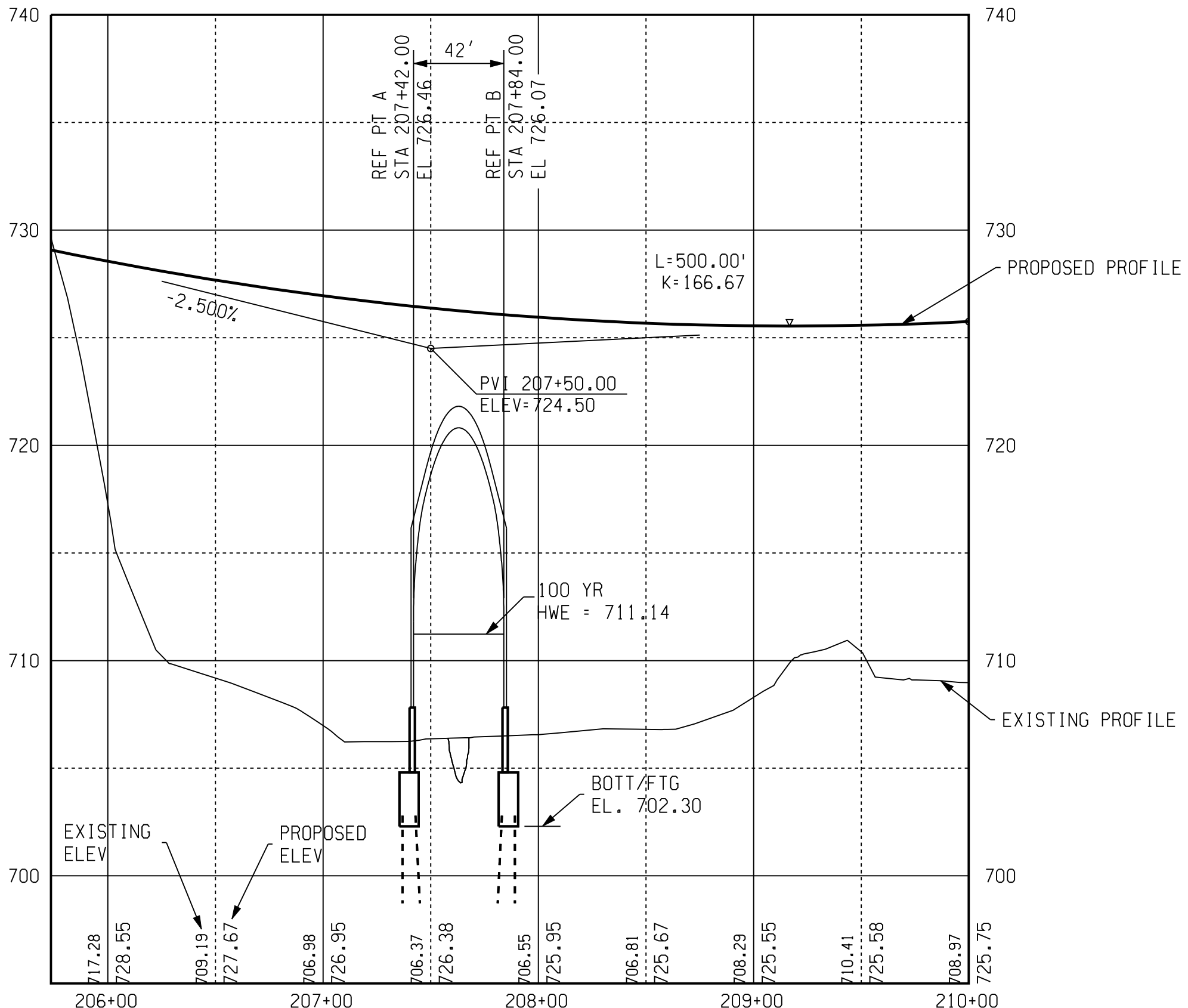
THE WORK COVERED BY THESE PLANS INCLUDES CONSTRUCTION OF THE PROPOSED BRIDGE AND PLACING GRANULAR MATERIAL, AND RIPRAP TO THE LIMITS SHOWN. ALL OTHER WORK IS COVERED ON THE ROAD PLANS.

THE CONTRACTOR SHALL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.

PLAN ELEVATIONS REFER TO USGS DATUM.

MEASURES SHALL BE TAKEN TO PREVENT DEBRIS FROM FALLING FROM THE STRUCTURE. IF DEBRIS FALLS INTO THE WATERWAY, IT SHALL BE REMOVED WITHIN 24 HOURS. SINCE DISTURBANCE OF THE WATERWAY BOTTOM MAY BE AS HARMFUL AS THE DEBRIS ITSELF, THE PREVENTIVE MEASURES MUST BE EFFECTIVE.

IMMEDIATELY AFTER THE CONSTRUCTION OF AN ABUTMENT IS COMPLETED, SLOPE PROTECTION AND SEEDING OR SODDING SHALL BE PLACED ON THE ADJACENT EMBANKMENT SLOPES.



PROFILE ALONG PROPOSED ALIGNMENT

GENERAL PLAN OF SITE						
FINKBEINER/CRANE RD OVER SPRING CREEK						
DATE	BRIDGE NO.	MDOT JOB NO.	WILCOX JOB NO.	DESIGN UNIT	SHEET NO.	
5/20/2008	B01 OF XXXXXX	89077A	12056.00002	DIEMER	48 OF	



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BRIDGE BORING NO.1

LOCATION STATION:

ELEV. | GROUND SURFACE ELEVATION:

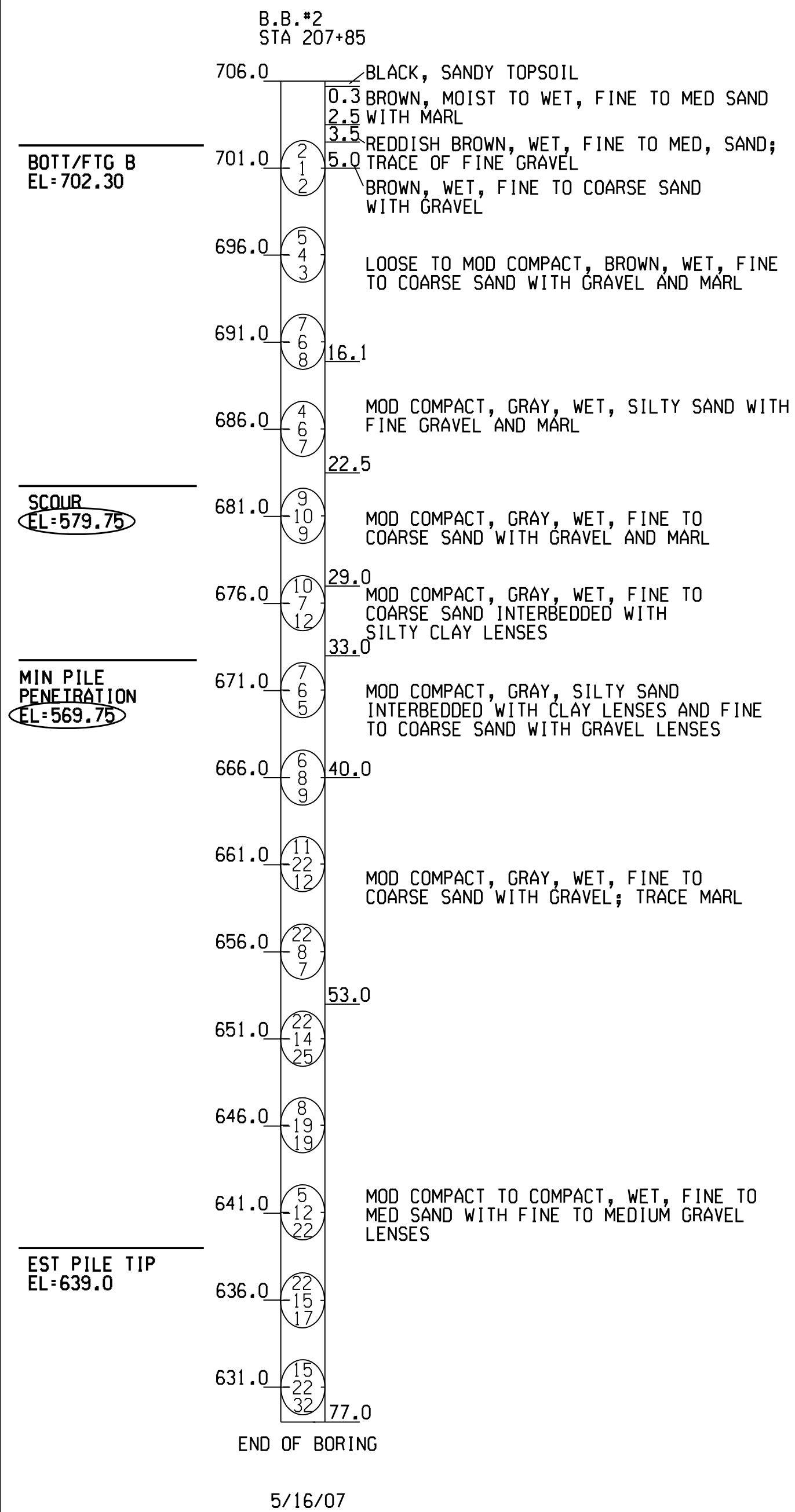
FOOTING A

BRIDGE BORING NO.2

LOCATION STATION: 207+85', 50' LT

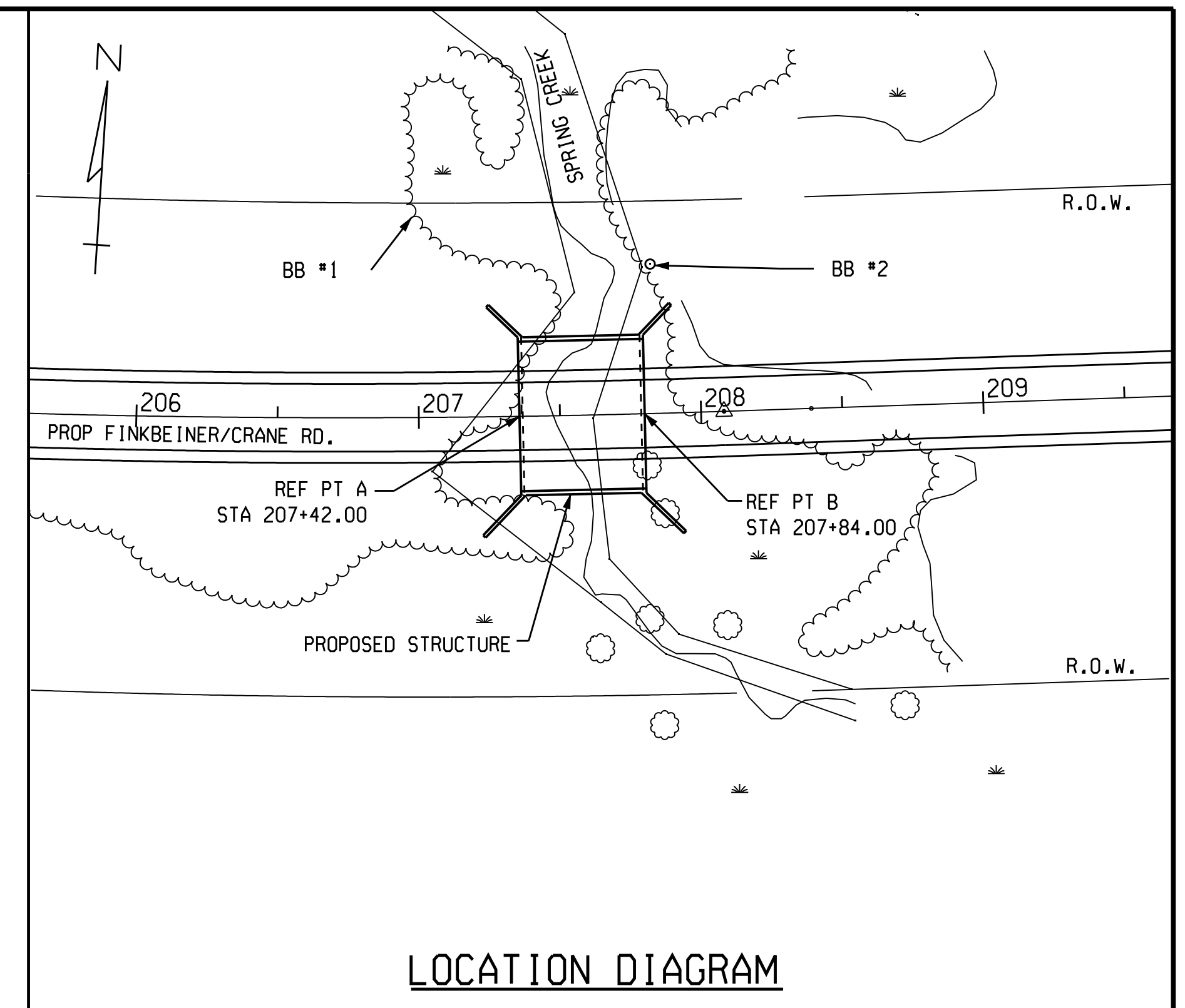
ELEV. | GROUND SURFACE ELEVATION: 706.0

FOOTING B



WATER LEVEL DURING DRILLING: 2'
WATER LEVEL AT COMPLETION: N/A

BORING CONDUCTED WITH THE DIEDRICH D-90 DRILL RIG WITH 3.25" HOLLOW STEM AUGERS ON 05/16/2007



NOTES:

10 10 10
1st 6 inches
2nd 6 inches
3rd 6 inches

NUMBERS IN CIRCLES DENOTE NUMBER OF BLOWS REQUIRED TO DRIVE A 2" SPLIT SPOON SAMPLER 3 SUCCESSIVE 6" INCREMENTS USING A 140# HAMMER FALLING 30" .

CONSISTENCY WAS DETERMINED BY INSPECTION OF SAMPLES AND SUBSTANTIATED BY SOILS RESISTANCE TO DRILLING TOOLS.

WATER LEVELS MAY BE INFLUENCED BY RESIDUAL BORING WATER.

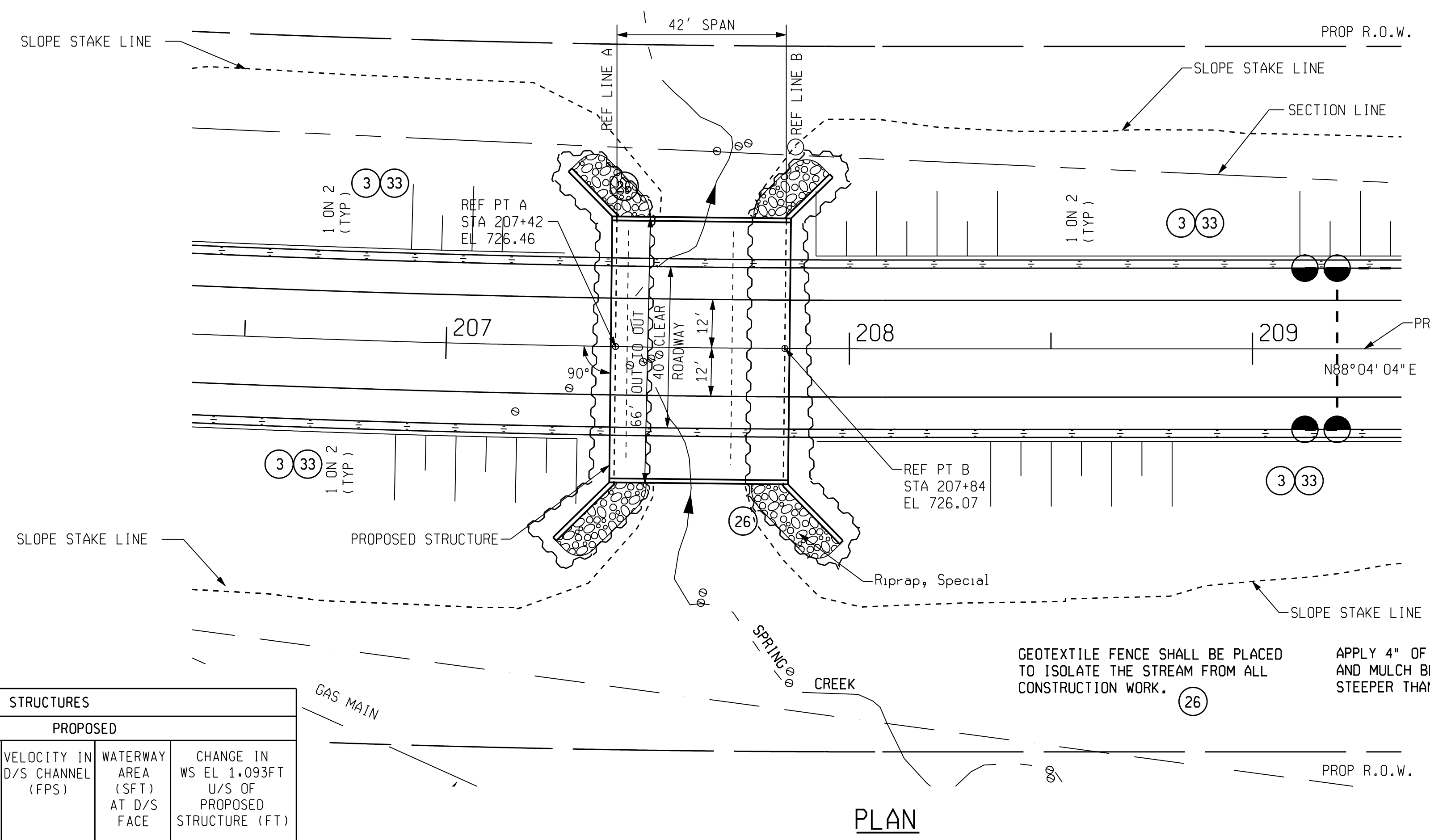
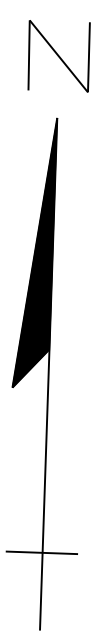
THE SOIL BORING LOGS REPRESENT POINT INFORMATION. PRESENTATION OF THIS INFORMATION IN NO WAY IMPLIES THAT SUBSURFACE CONDITIONS ARE THE SAME AT LOCATIONS OTHER THAN THE EXACT LOCATION OF THE BORING.

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SOIL BORINGS					
FINKBEINER/CRAVE RD OVER SPRING CREEK					
DATE	BRIDGE NO.	MDOT JOB NO.	WILCOX JOB NO.	DESIGN UNIT	SHEET NO.
5/20/2008	B01 OF XXXXXX	89077A	12056.00002	DIEMER	49 OF

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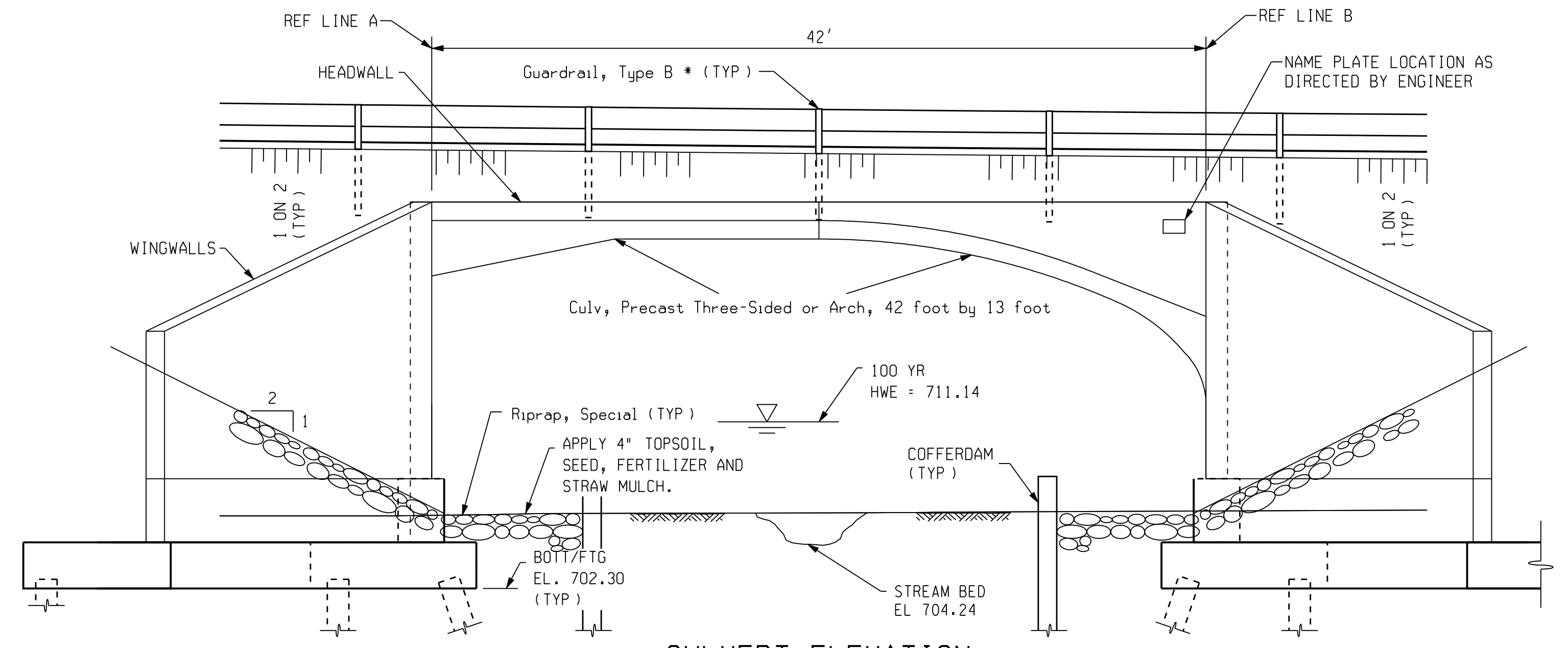


PLAN

SUMMARY OF HYDRAULIC ANALYSIS - FOR BOTH STRUCTURES							
FLOOD DATA	DIS-CHARGE (CFS)	EXISTING		PROPOSED			
		WATER SURFACE ELEV. AT LOCATION OF U/S FACE OF PROP STRUCTURE	VELOCITY IN D/S CHANNEL (FPS)	WATER SURFACE ELEV. AT U/S FACE OF STRUCTURE (FT)	VELOCITY IN D/S CHANNEL (FPS)	WATERWAY AREA (SFT) AT D/S FACE	CHANGE IN WS EL 1.093FT U/S OF PROPOSED STRUCTURE (FT)
50 YEAR	7200	710.69	5.57	710.65	6.02	1399	0.02
100 YEAR	8500	711.28	5.54	711.14	6.59	1507	0.11

MAXIMUM BRIDGE AREA BELOW LOW CHORD IS 3438 SQUARE FEET

THE WATER SURFACE AND/OR ENERGY GRADE ELEVATIONS SHOWN ON THE ABOVE HYDRAULIC TABLE ARE TO BE USED FOR COMPARISON PURPOSES ONLY AND ARE NOT TO BE USED FOR ESTABLISHING A REGULATORY FLOODPLAIN. THE ELEVATIONS MAY BE USED PROVIDED THEY ARE VERIFIED WITH THE LAND AND WATER MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY.



CULVERT ELEVATION

* SEE ROAD PLANS FOR DETAILS & QUANTITIES

GEOTEXTILE FENCE SHALL BE PLACED TO ISOLATE THE STREAM FROM ALL CONSTRUCTION WORK.

APPLY 4" OF TOPSOIL, SEED, FERTILIZER, AND MULCH BLANKETS TO ALL SLOPES STEEPER THAN 1:3.

NOTES:

THE DESIGN OF THIS STRUCTURE IS BASED ON CURRENT AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES HL-93 LOADING. LIVE LOAD PLUS IMPACT DEFLECTION DOES NOT EXCEED 1/1000 OF SPAN LENGTH. THE LOAD FACTOR METHOD OF DESIGN WAS USED FOR THIS STRUCTURE.

WITHOUT THE PREVENTIVE MEASURES SHOWN ON THESE PLANS, THERE IS A POSSIBILITY THAT STREAM BED SCOUR MAY OCCUR. THE ESTIMATED TOTAL SCOUR DEPTH IS CALCULATED TO BE 1 FEET AT FTG. A & B. THESE DEPTHS ARE BASED ON A 100 YEAR RUNOFF EVENT.

THE RIPRAP QUANTITY IS BASED ON THE LATERAL DIMENSIONS OF THE AREA TO BE PROTECTED, REGARDLESS OF THE NUMBER OF LAYERS REQUIRED.

PLACE RIPRAP FROM EL. XXX.XX TO EL. XXX.XX.

GEOTEXTILE LINER SHALL BE PLACED ON ALL SLOPES PRIOR TO PLACING RIPRAP. PAYMENT FOR GEOTEXTILE LINER SHALL BE INCLUDED IN, "Riprap, Special"

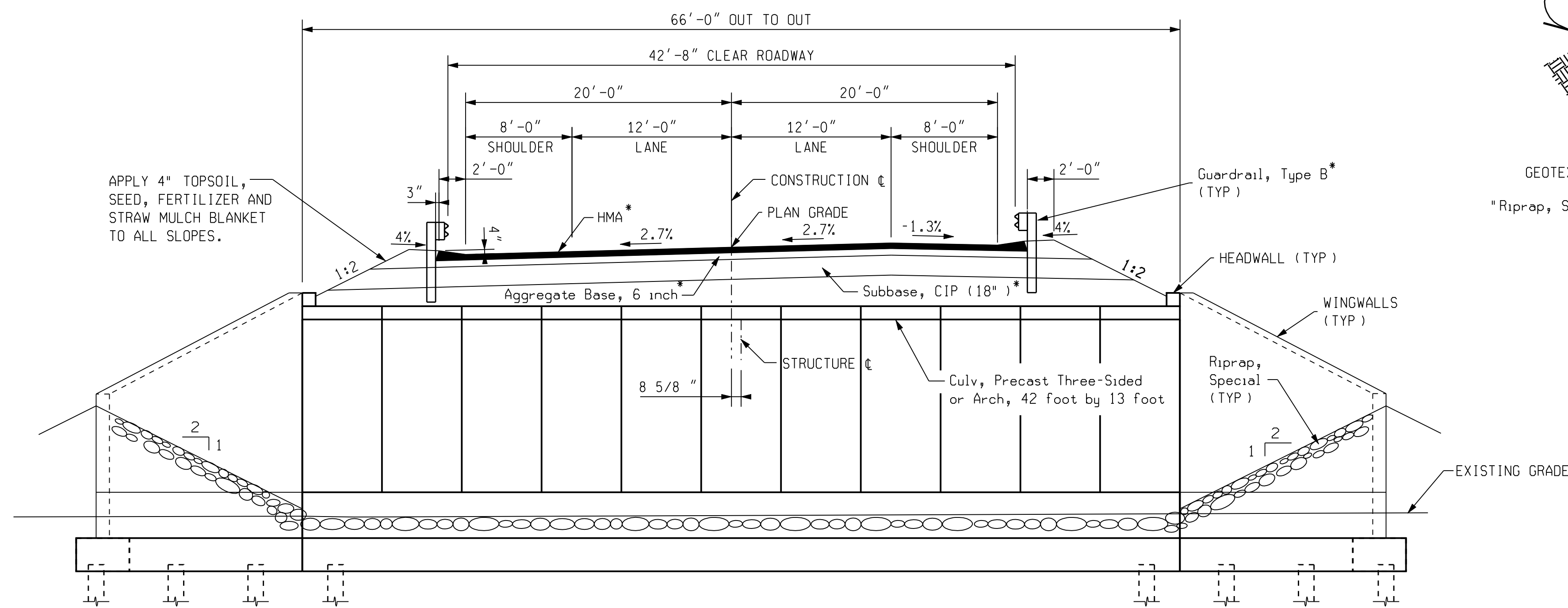
CIRCLED NUMBERS REFER TO ITEMS ON MDT STANDARD PLANS R-96-SERIES Soil Erosion & Sedimentation Control Measures

FOR DETAILS OF SLOPE PROTECTION, SEE STANDARD PLAN R-100-SERIES.

SLOPESTAKE LINES ARE APPROXIMATE AND SHOULD NOT BE USED AS CONTROL LAYOUT OF STRUCTURE.

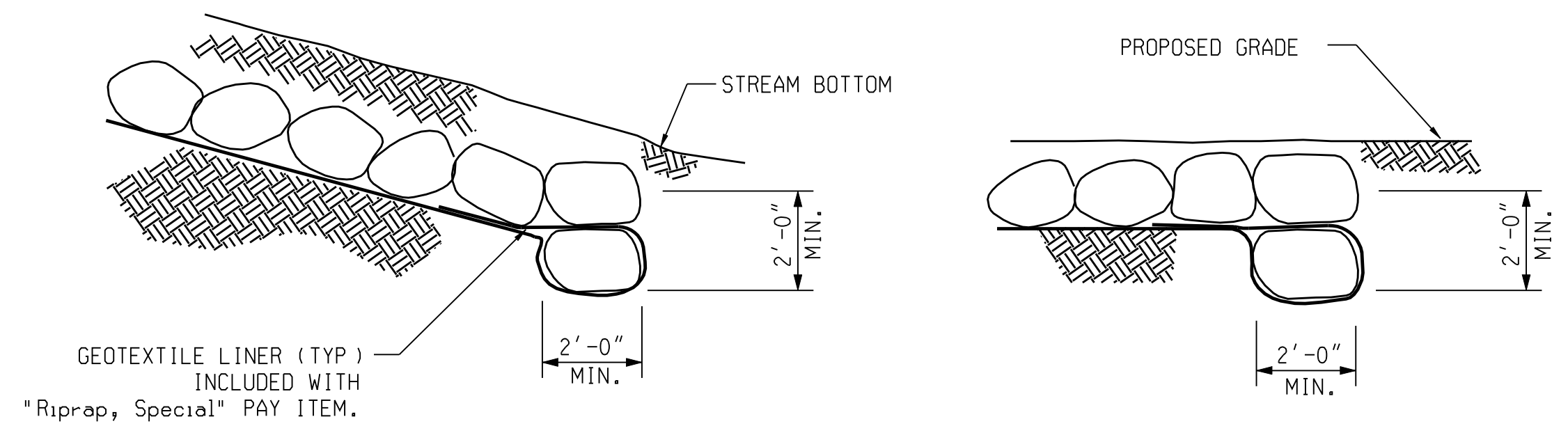


GENERAL PLAN OF STRUCTURE					
FINKBEINER/CRANE RD OVER SPRING CREEK					
DATE	BRIDGE NO.	MDOT JOB NO.	WILCOX JOB NO.	DESIGN UNIT	SHEET NO.
5/20/2008	B01 OF XXXXXX	89077A	12056.00002	DIEMER	50 OF



TYPICAL ROADWAY SECTION (AT CULVERT)

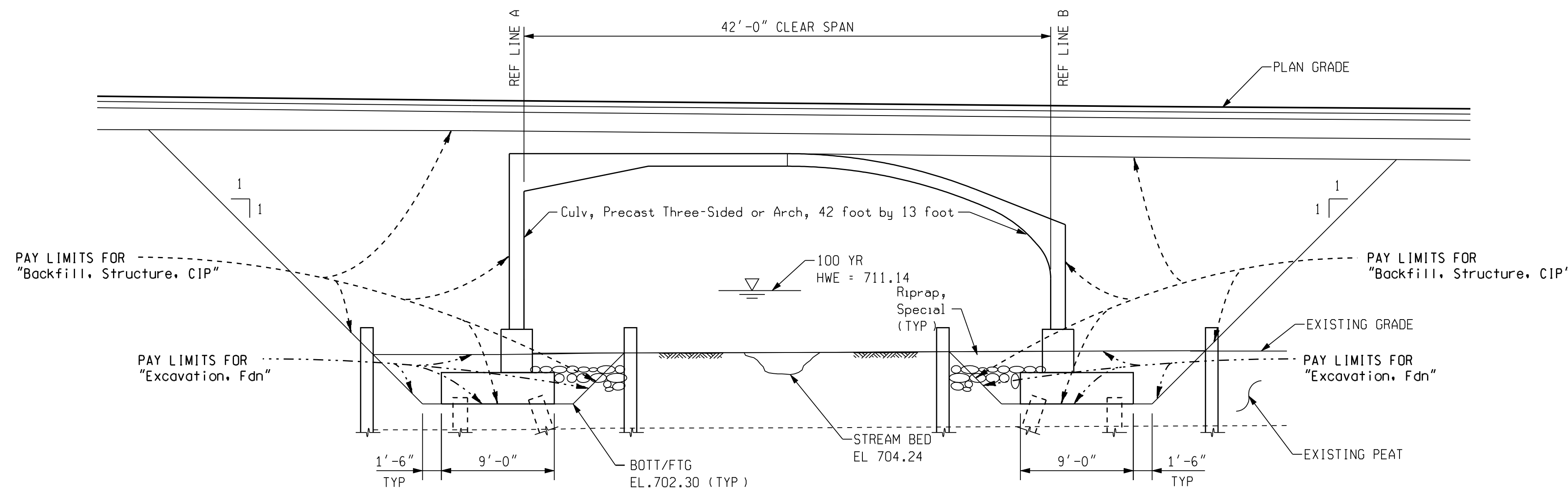
* SEE ROAD PLANS FOR DETAILS & QUANTITIES



TOE HEADER

EDGE HEADER

RIPRAP HEADER DETAILS



CULVERT ELEVATION

NOTE: REMOVE ALL PEAT WITHIN COFFERDAMS, TO BE PAID FOR AS "Excavation, Fdn." BACKFILL SHALL BE PAID FOR AS "Backfill, Structure, CIP." ALL AREAS WITHIN THE COFFERDAMS BENEATH THE STRUCTURE SHALL BE TOP DRESSED WITH 1 FT MIN. OF NATIVE PEAT (INCLUDED IN OTHER PAY ITEMS).

GENERAL PLAN OF STRUCTURE

FINKBEINER/CRANE RD OVER SPRING CREEK



DATE	BRIDGE NO.	MDOT JOB NO.	WILCOX JOB NO.	DESIGN UNIT	SHEET NO.
5/20/2008	B01 OF XXXXXX	89077A	12056.00002	DIEMER	51 OF



DORIS M. SQUIER TRUST

SECTION 15

AGREEMENTS & EASEMENTS FOR DREDGING RIGHTS IN THE THORNAPPLE RIVER TO MIDDLEVILLE POWER CO. PER LIBER 161; PAGE 525, 533, 619, 620 & 621 (DATED 1938 & 1939)

JOHN L. HERWEYER

BENCH MARKS

B.M. *25 ELEV=712.778
LAG BOLT IN NORTH SIDE OF A 24" MAPLE, TOP OF WEST BANK OF THORNAPPLE RIVER AND AT SOUTH END OF TWO TRACK CONNECTING NORTH AND SOUTH HORSE PASTURES.
STA 213+75±, 17' ± RT

B.M. *26 ELEV=715.031
RAILROAD SPIKE IN NE. SIDE OF A 12" OAK, TOP OF EAST BANK OF THORNAPPLE RIVER
STA 215+47±, 14' ± RT

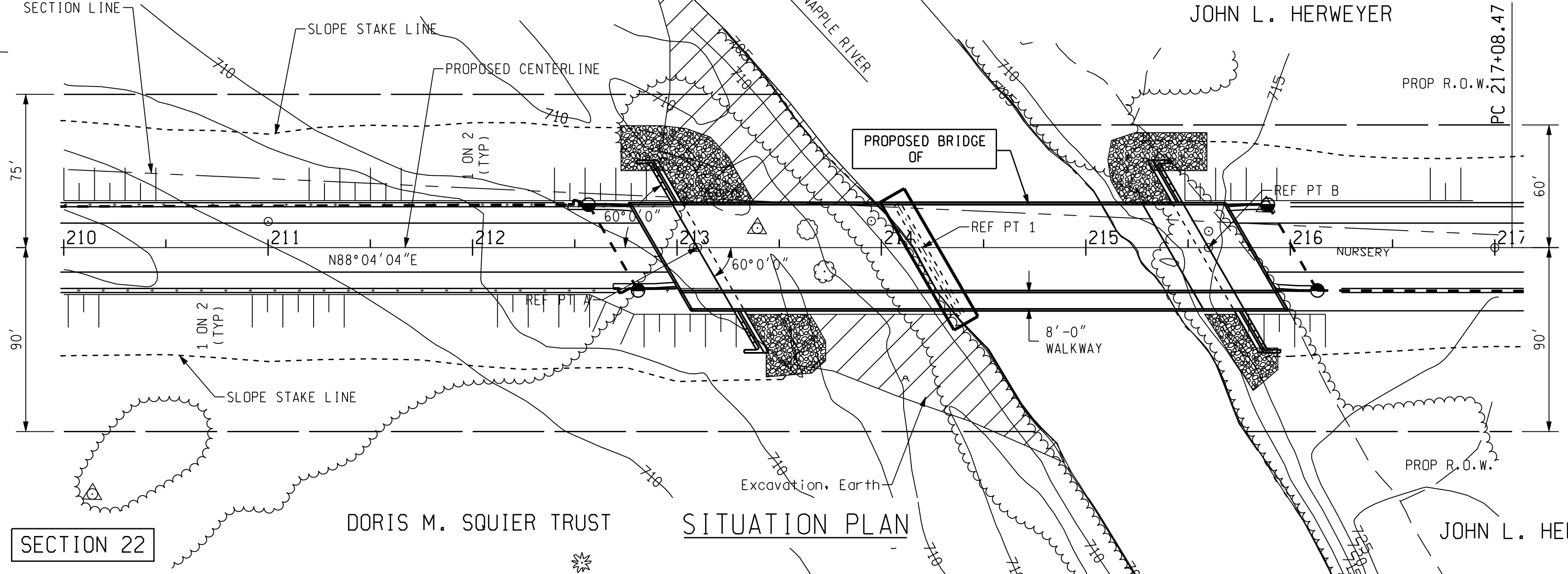
ESTIMATED TRAFFIC DATA

ADT (2008) - 0
ADT (2028) - 10,000
DESIGN - 55 mph
POSTED SPEED - NONE
DESIGN LOADING - HL93

CONTROL POINT WITNESSES

CONTROL POINT #27 - STA 213+37.27, 9.48' LT
1/2" IRON W/WPS (RED) CONTROL CAP
N. 448549.021
E. 12826996.806
EL = 709.27
TRAVERSE POINT CAP 60' ± WEST BANK OF THORNAPPLE RIVER, SOUTH END OF TWO TRACK CONNECTING HORSE PASTURES

CONTROL POINT #28 - STA 215+89, 20' RT
1/2" IRON W/WPS (RED) CONTROL CAP
N. 448567.989
E. 12827245.079
EL = 715.68
TRAVERSE POINT CAP EAST SIDE OF THORNAPPLE RIVER, SOUTH OF SECTION LINE AND 120' ± TAN METAL SHED

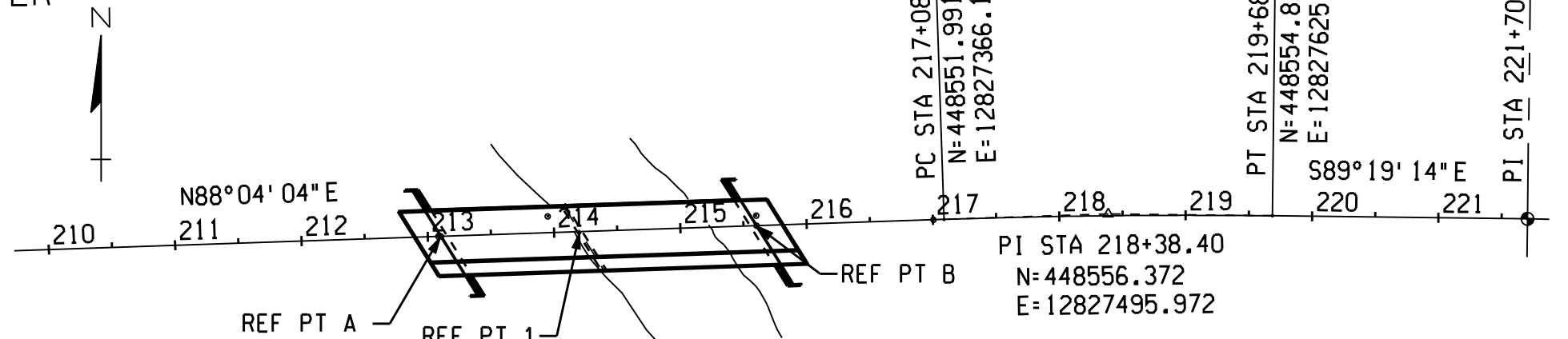


SECTION 22

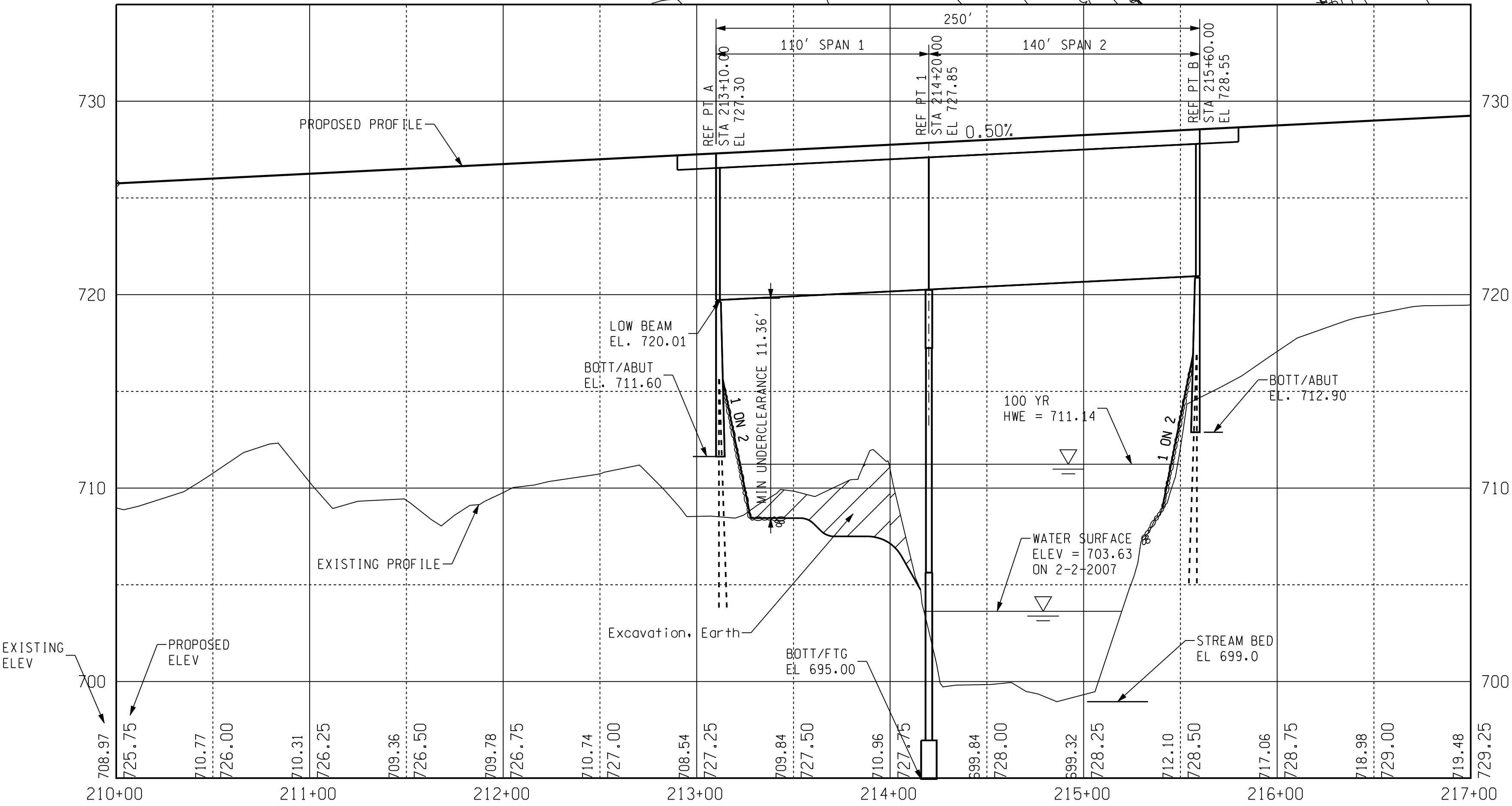
DORIS M. SQUIER TRUST

SITUATION PLAN

JOHN L. HERWEYER



ALIGNMENT DIAGRAM



PROFILE ALONG PROPOSED ALIGNMENT

- NOTES:
- THE WORK COVERED BY THESE PLANS INCLUDES CONSTRUCTION OF THE PROPOSED BRIDGE AND PLACING GRANULAR MATERIAL, AND RIPRAP TO THE LIMITS SHOWN. ALL OTHER WORK IS INCLUDED IN THE ROAD PLANS THAT ARE A PART OF THIS CONTRACT.
 - THE CONTRACTOR SHALL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.
 - PLAN ELEVATIONS REFER TO USGS DATUM.
 - MEASURES SHALL BE TAKEN TO PREVENT DEBRIS FROM FALLING FROM THE STRUCTURE. IF DEBRIS FALLS INTO THE WATERWAY, IT SHALL BE REMOVED WITHIN 24 HOURS. SINCE DISTURBANCE OF THE WATERWAY BOTTOM MAY BE AS HARMFUL AS THE DEBRIS ITSELF, THE PREVENTIVE MEASURES MUST BE EFFECTIVE.
 - IMMEDIATELY AFTER THE CONSTRUCTION OF AN ABUTMENT IS COMPLETED, SLOPE PROTECTION AND SEEDING OR SODDING SHALL BE PLACED ON THE ADJACENT EMBANKMENT SLOPES.

GENERAL PLAN OF SITE

FINKBEINER/CRANE RD OVER THORNAPPLE RIVER

DATE	BRIDGE NO.	MDOT JOB NO.	WILCOX JOB NO.	DESIGN UNIT	SHEET NO.
5/20/2008	B01 OF XXXXXX	89077A	12056.00002	DIEMER	52 OF



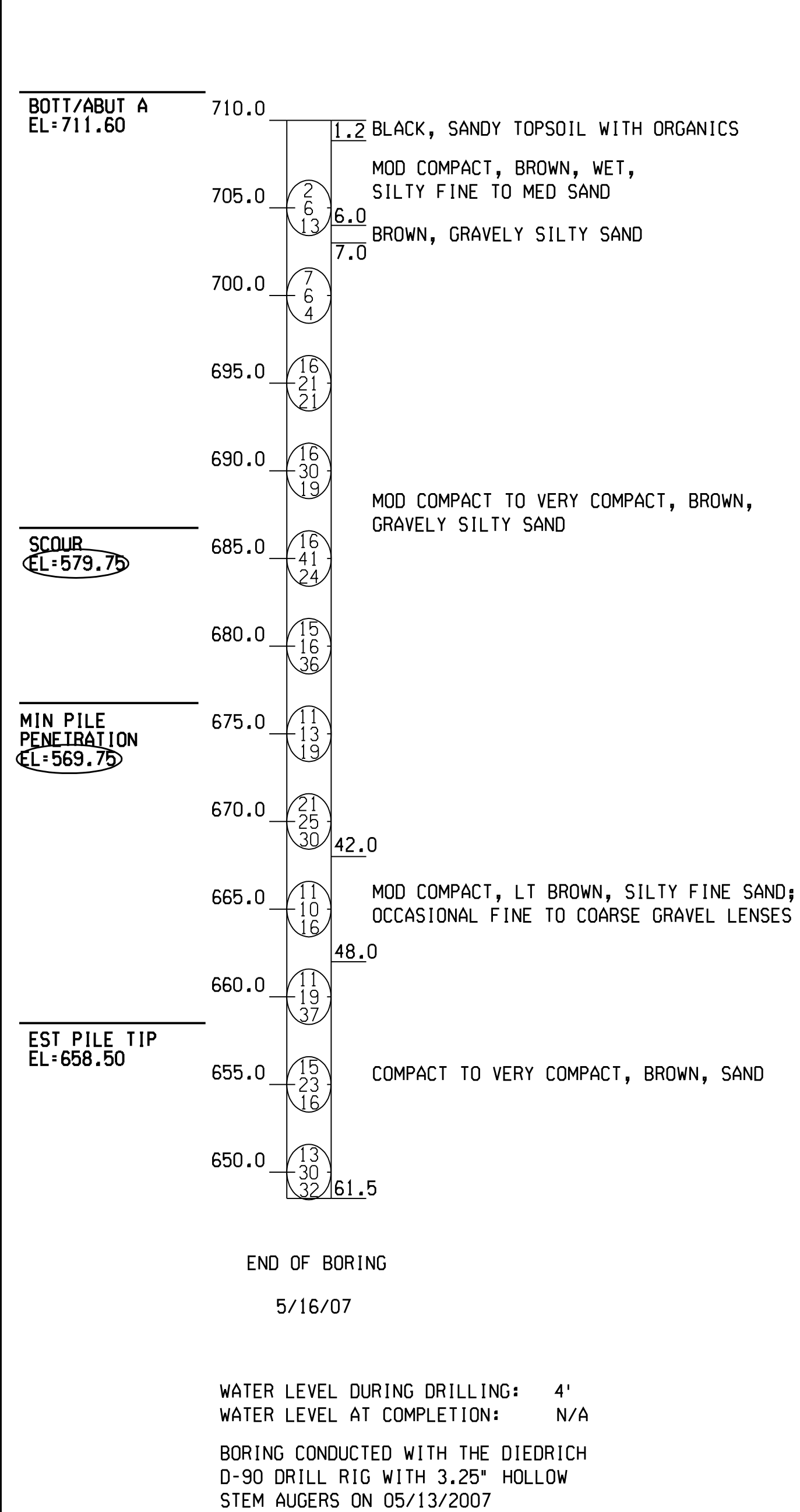
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BRIDGE BORING NO.3

LOCATION STATION: 213+08, 0.0' LT

ELEV. | GROUND SURFACE ELEVATION: 710.0

ABUTMENT A

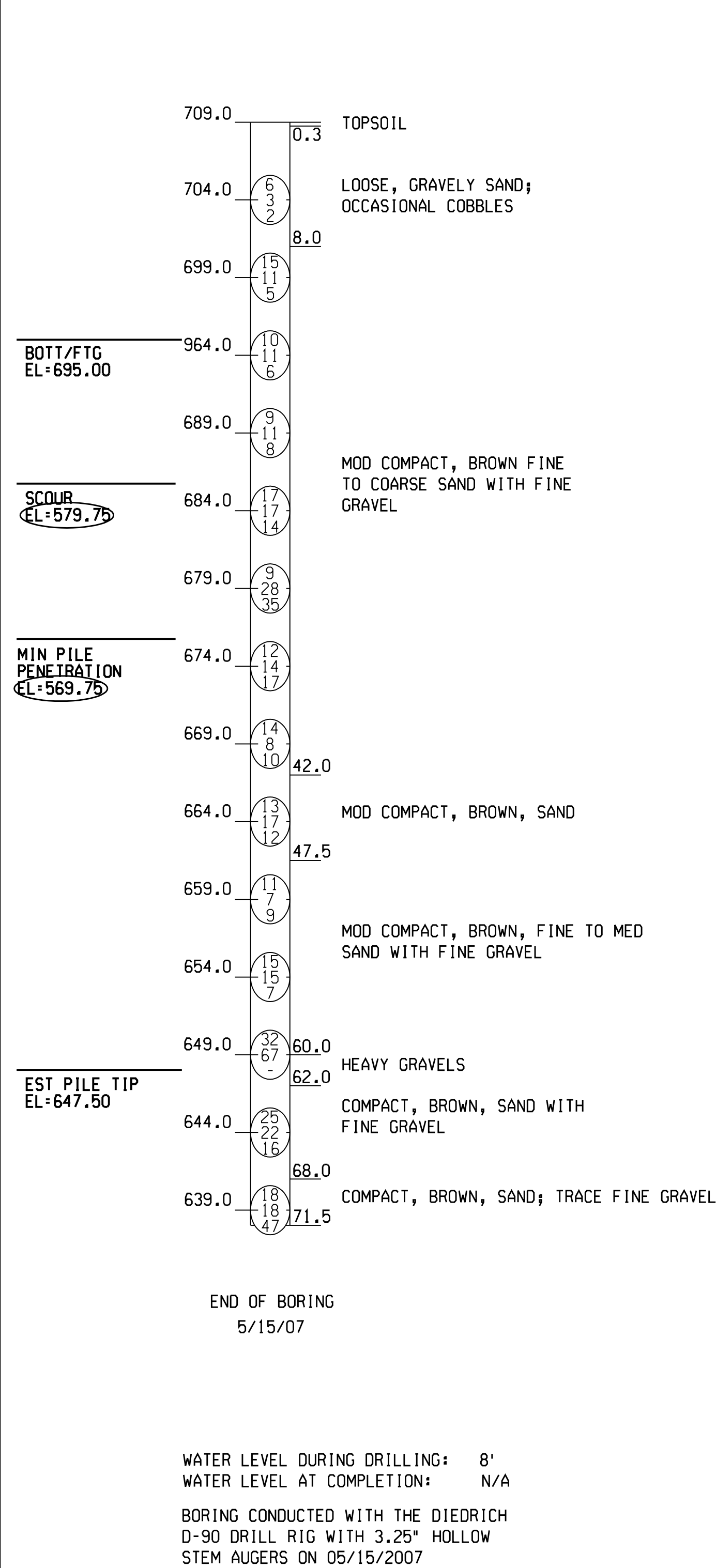


BRIDGE BORING NO.4

LOCATION STATION: 213+95', 13.0' LT

ELEV. | GROUND SURFACE ELEVATION: 709.0

PIER 1

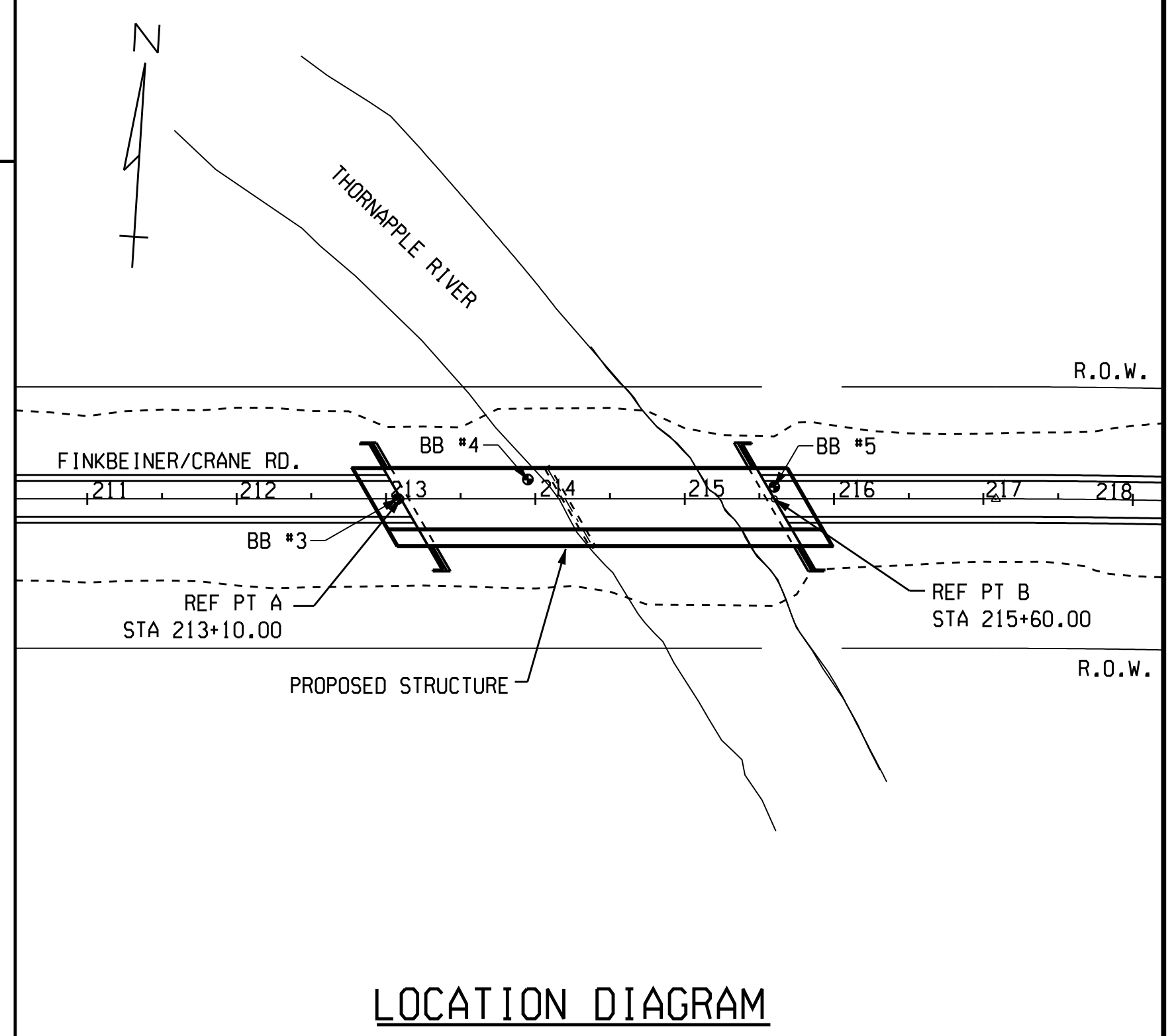
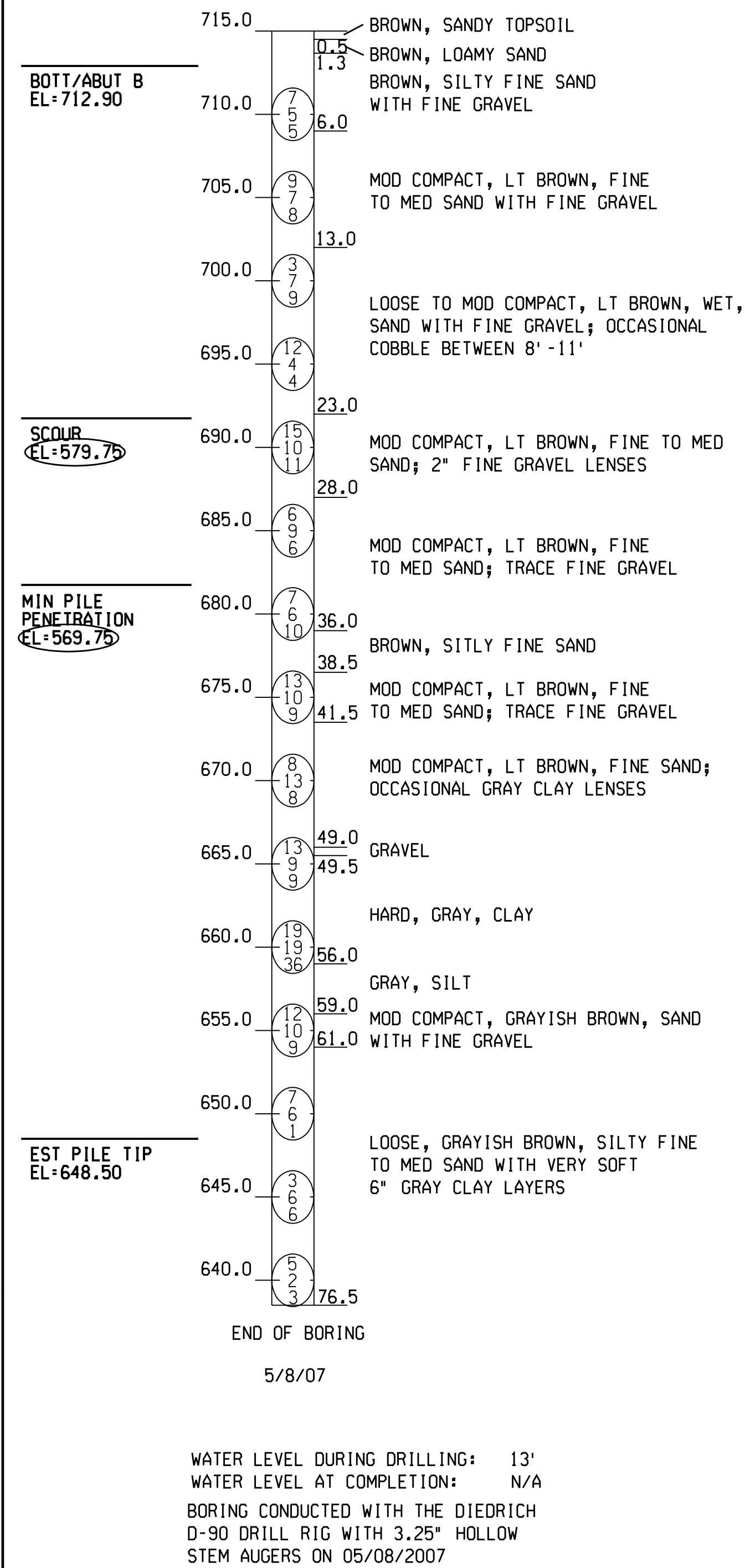


BRIDGE BORING NO.5

LOCATION STATION: 215+60', 8.0' LT

ELEV. | GROUND SURFACE ELEVATION: 715.0

ABUTMENT B



NOTES:

1st 6 inches
 2nd 6 inches
 3rd 6 inches

NUMBERS IN CIRCLES DENOTE NUMBER OF BLOWS REQUIRED TO DRIVE A 2" SPLIT SPOON SAMPLER 3 SUCCESSIVE 6" INCREMENTS USING A 140# HAMMER FALLING 30".

CONSISTENCY WAS DETERMINED BY INSPECTION OF SAMPLES AND SUBSTANTIATED BY SOILS RESISTANCE TO DRILLING TOOLS.

WATER LEVELS MAY BE INFLUENCED BY RESIDUAL BORING WATER.

THE SOIL BORING LOGS REPRESENT POINT INFORMATION. PRESENTATION OF THIS INFORMATION IN NO WAY IMPLIES THAT SUBSURFACE CONDITIONS ARE THE SAME AT LOCATIONS OTHER THAN THE EXACT LOCATION OF THE BORING.

SOIL BORINGS

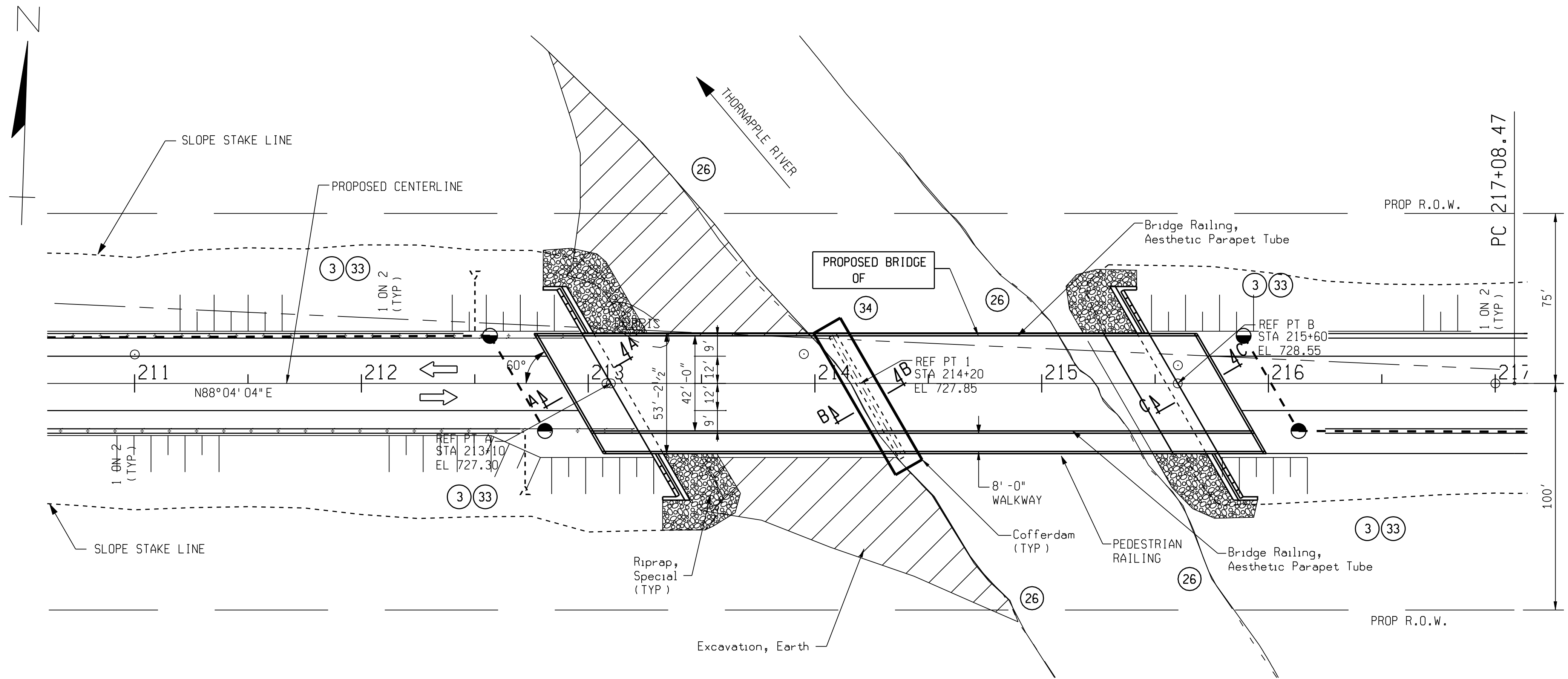
FINKBEINER/CRANE RD OVER THORNAPPLE RIVER

DATE	BRIDGE NO.	MDOT JOB NO.	WILCOX JOB NO.	DESIGN UNIT	SHEET NO.
5/20/2008	B01 OF XXXXXX	89077A	12056.00002	DIEMER	53 OF



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SUMMARY OF HYDRAULIC ANALYSIS							
FLOOD DATA	DIS-CHARGE (CFS)	EXISTING		PROPOSED			CHANGE IN WS EL 1.093FT U/S OF PROPOSED STRUCTURE (FT)
		WATER SURFACE ELEV. AT LOCATION OF U/S FACE OF PROP STRUCTURE	VELOCITY IN D/S CHANNEL (FPS)	WATER SURFACE ELEV. AT U/S FACE OF STRUCTURE (FT)	VELOCITY IN D/S CHANNEL (FPS)	WATERWAY AREA (SFT) AT D/S FACE	
50 YEAR	7200	710.69	5.57	710.65	6.02	1399	0.02
100 YEAR	8500	711.28	5.54	711.14	6.59	1507	0.11

MAXIMUM BRIDGE AREA BELOW LOW CHORD IS 3438 SQUARE FEET

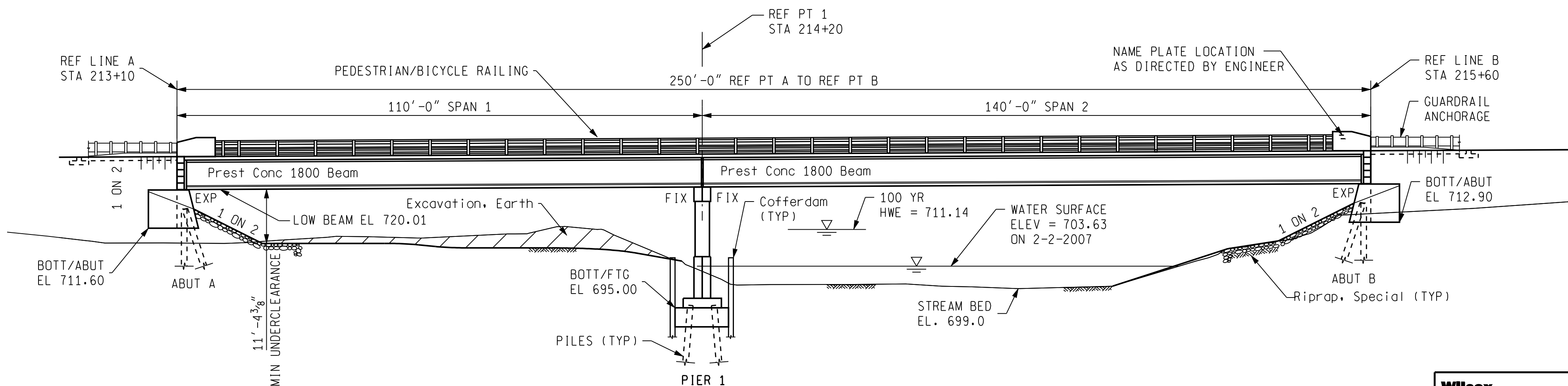
THE WATER SURFACE AND/OR ENERGY GRADE ELEVATIONS SHOWN ON THE ABOVE HYDRAULIC TABLE ARE TO BE USED FOR COMPARISON PURPOSES ONLY AND ARE NOT TO BE USED FOR ESTABLISHING A REGULATORY FLOODPLAIN. THE ELEVATIONS MAY BE USED PROVIDED THEY ARE VERIFIED WITH THE LAND AND WATER MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY.

PLAN

- GEOTEXTILE FENCE SHALL BE PLACED TO ISOLATE THE STREAM FROM ALL CONSTRUCTION WORK NOT PROTECTED BY COFFERDAMS. (33)
- COFFERDAM TO BE PLACED TO CONFINE PIER CONSTRUCTION, EXCAVATION, BACKFILL, AND RIPRAP. EXACT LOCATION TO BE APPROVED BY THE ENGINEER. (34)
- APPLY 4" OF TOPSOIL, SEED, FERTILIZER, AND MULCH BLANKETS TO ALL SLOPES STEEPER THAN 1:3. (33)

NOTES:

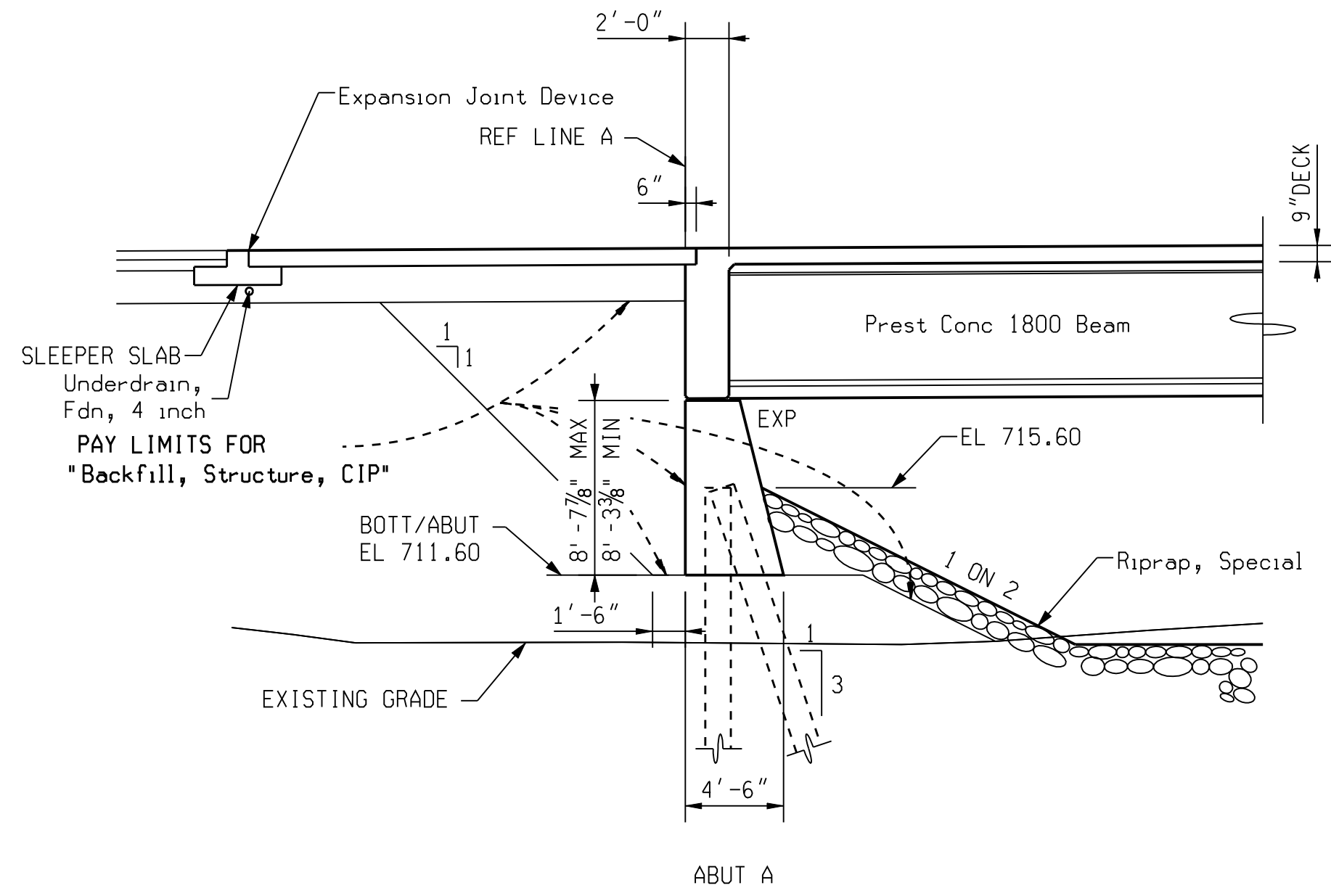
- THE DESIGN OF THIS STRUCTURE IS BASED ON CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATION HL-93 LOADING. LIVE LOAD PLUS IMPACT DEFLECTION DOES NOT EXCEED 1/800 OF SPAN LENGTH. THE LOAD AND RESISTANCE FACTOR METHOD OF DESIGN WAS USED FOR THIS STRUCTURE.
- WITHOUT THE PREVENTIVE MEASURES SHOWN ON THESE PLANS, THERE IS A POSSIBILITY THAT STREAM BED SCOUR MAY OCCUR. THE ESTIMATED TOTAL SCOUR DEPTH IS CALCULATED TO BE 1 FEET AT ABUT. A & B. THESE DEPTHS ARE BASED ON A 100 YEAR RUNOFF EVENT.
- THE RIPRAP QUANTITY IS BASED ON THE LATERAL DIMENSIONS OF THE AREA TO BE PROTECTED, REGARDLESS OF THE NUMBER OF LAYERS REQUIRED.
- GEOTEXTILE LINER SHALL BE PLACED ON ALL SLOPES PRIOR TO PLACING RIPRAP. PAYMENT FOR GEOTEXTILE LINER SHALL BE INCLUDED IN, "Riprap, Special"
- CIRCLED NUMBERS REFER TO ITEMS ON MDT STANDARD PLANS R-96-SERIES Soil Erosion & Sedimentation Control Measures
- FOR DETAILS OF SLOPE PROTECTION, SEE STANDARD PLAN R-100-SERIES.
- SLOPESTAKE LINES ARE APPROXIMATE AND SHOULD NOT BE USED AS CONTROL LAYOUT OF STRUCTURE.
- DEWATERING OF FOOTING AREA SHALL BE DONE IN A MANNER ACCEPTABLE TO THE ENGINEER (PUMPS, WELL POINTS, ETC), AND IS INCLUDED IN "Cofferdam" PAY ITEM. WATER PUMPED FROM COFFERDAMS SHALL BE DISCHARGED INTO A GEOTEXTILE FILTER BAG.
- THE TREMIE SEAL DESIGN WAS BASED ON A WATER SURFACE AT EL. 704.00.



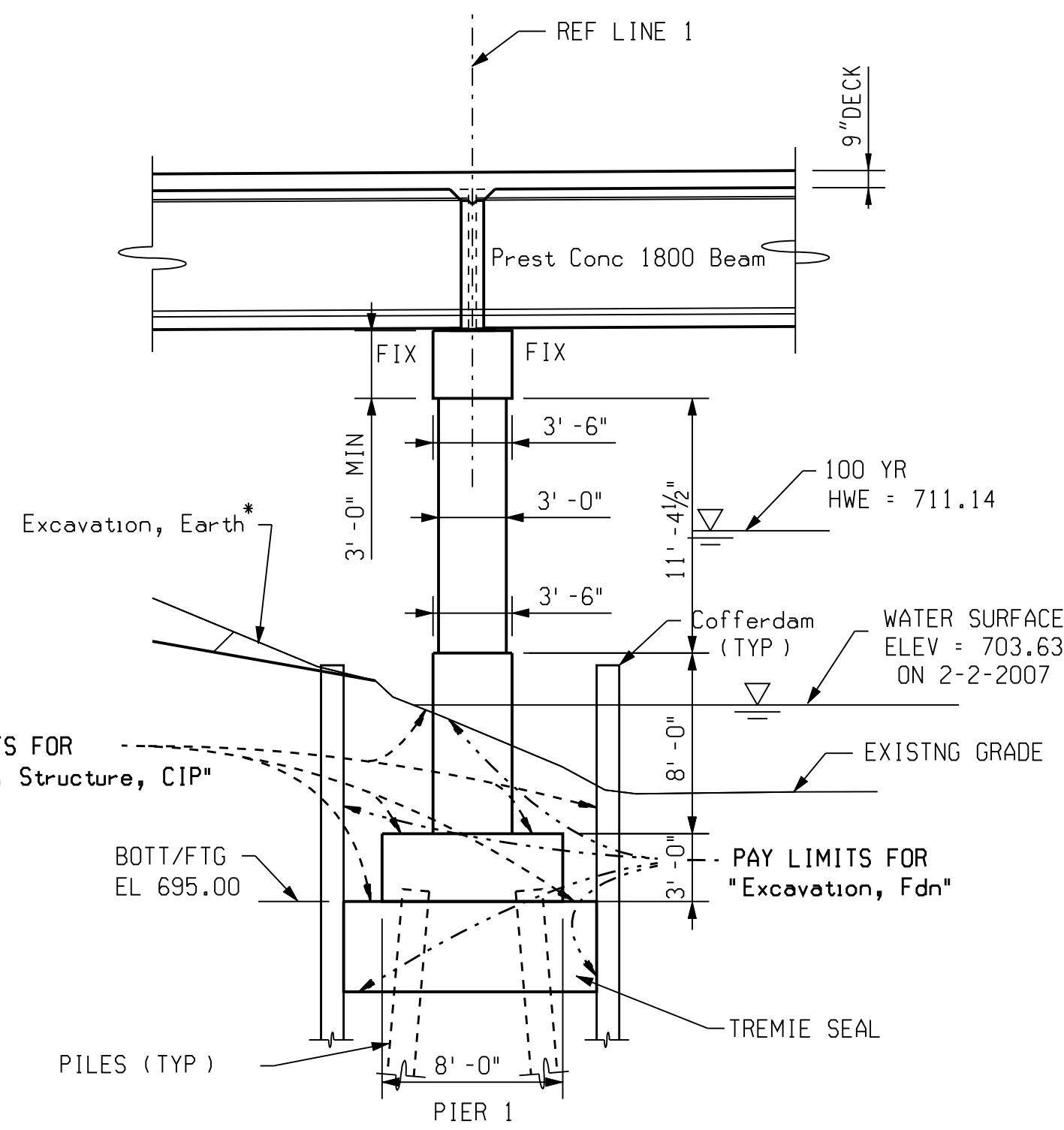
STRUCTURE ELEVATION



GENERAL PLAN OF STRUCTURE					
FINKBEINER/CRANE RD OVER THORNAPPLE RIVER					
DATE	BRIDGE NO.	MDOT JOB NO.	WILCOX JOB NO.	DESIGN UNIT	SHEET NO.
5/20/2008	B01 OF XXXXXX	89077A	12056.00002	DIEMER	54 OF

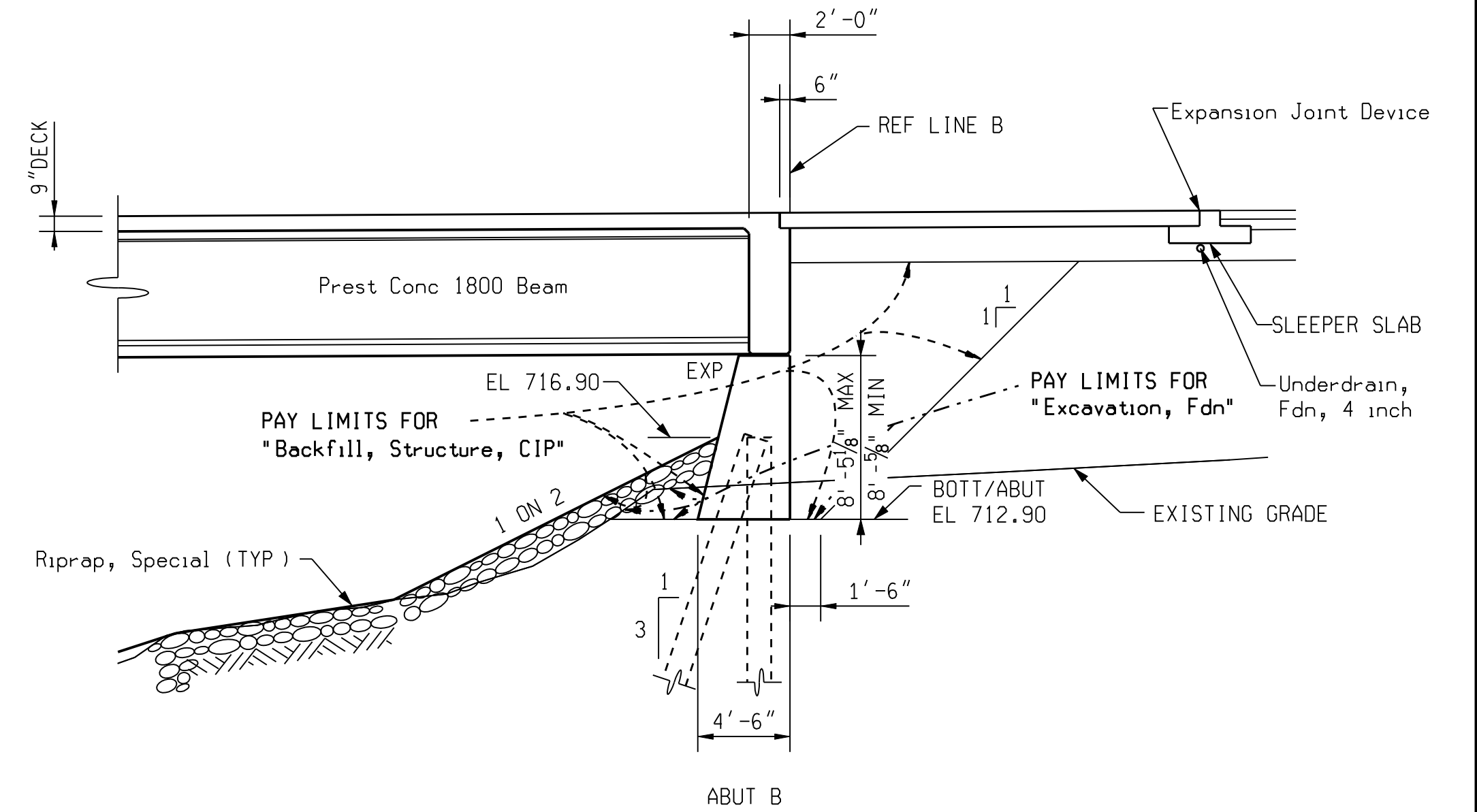


SECTION A-A

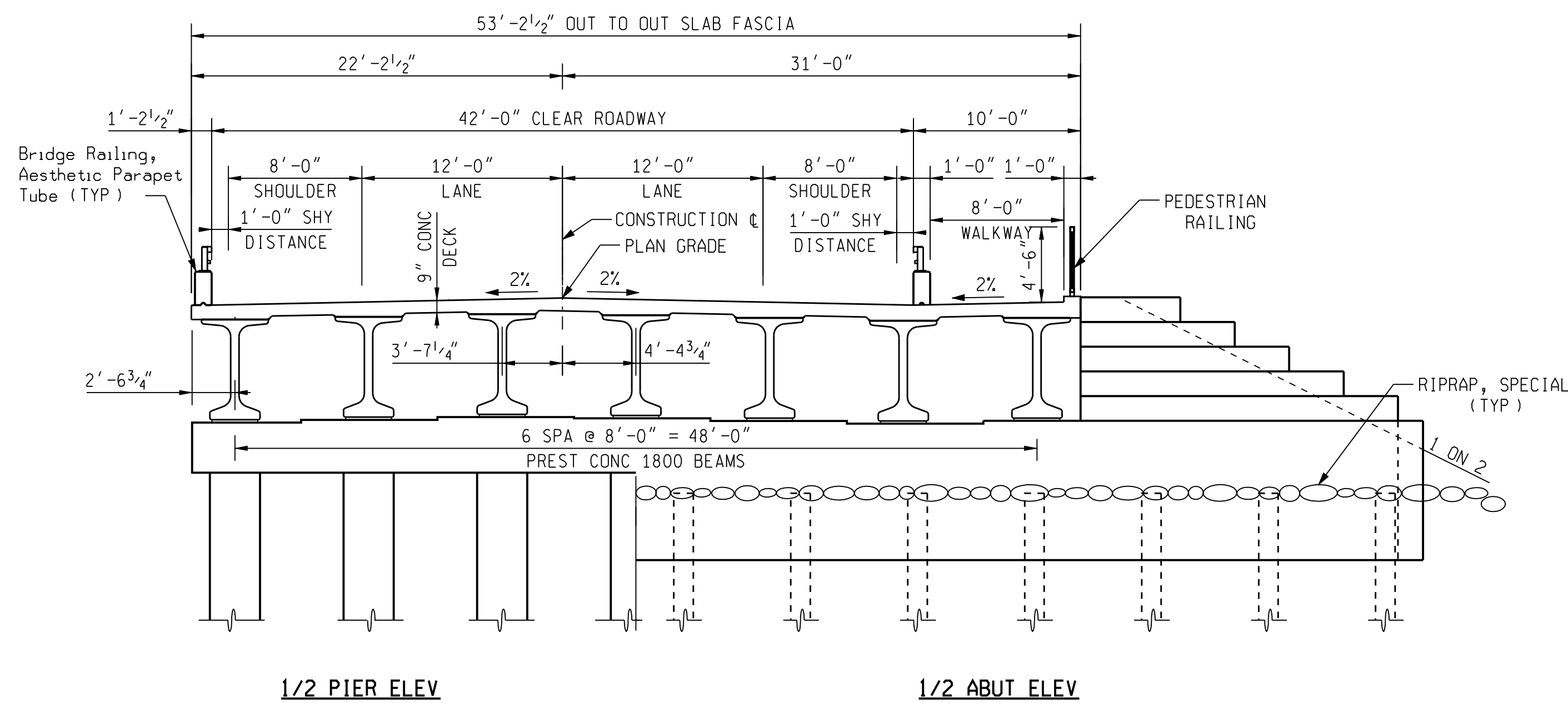


SECTION B-B

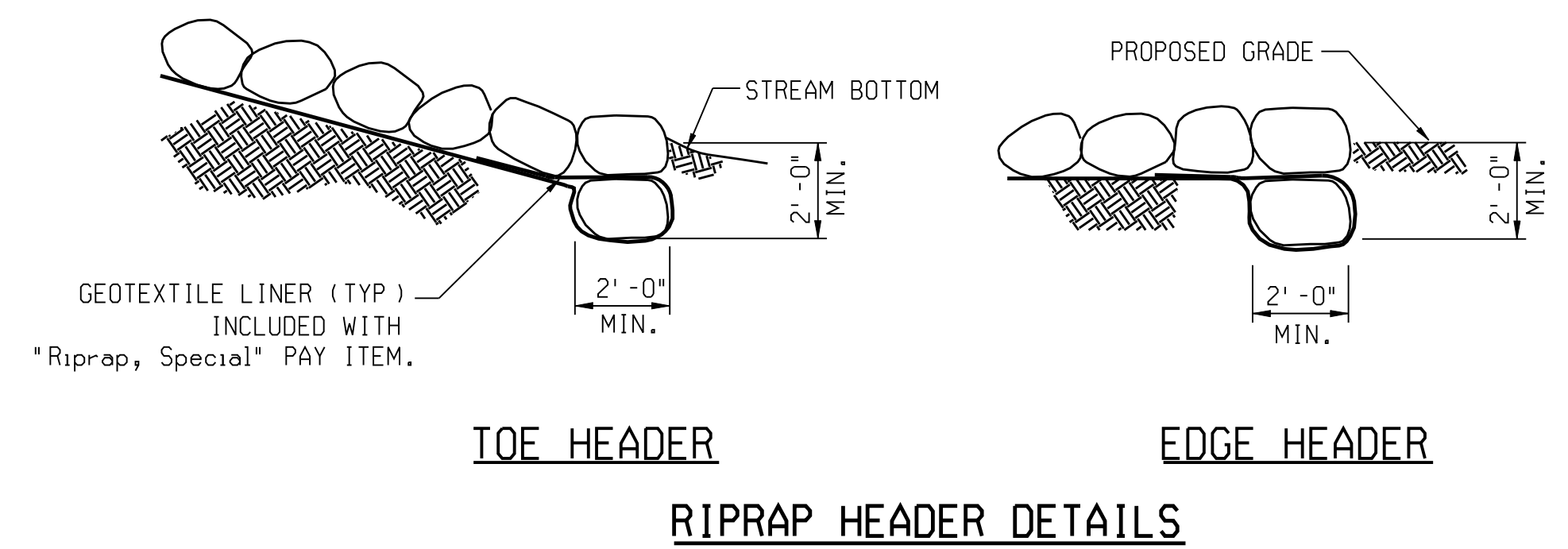
*SEE ROAD PLANS



SECTION C-C



TYPICAL DECK SECTION



TOE HEADER

EDGE HEADER

RIPRAP HEADER DETAILS

GENERAL PLAN OF STRUCTURE					
FINKBEINER/CRANE RD OVER THORNAPPLE RIVER					
DATE	BRIDGE NO.	MDOT JOB NO.	WILCOX JOB NO.	DESIGN UNIT	SHEET NO.
5/20/2008	B01 OF XXXXXX	89077A	12056.00002	DIEMER	55 OF

