

Benchmark (B.M. 350): Chiseled square on NE corner of a 8' x 12' box culvert North of IL 121 and Montrose Blacktop. (Structure No. 018-8604): Elev. 602.9705.

Benchmark (B.M. 350A): Railroad spike in a power pole 70' South of 6' x 6' box culvert and 41' East of centerline of IL 121: Elev. 597.3058.

Benchmark (B.M. 324): Chiseled square on the Southwest corner of a box culvert 16' South of the centerline of CR700N, 300' East of the Montrose Blacktop: Elev. 622.528.

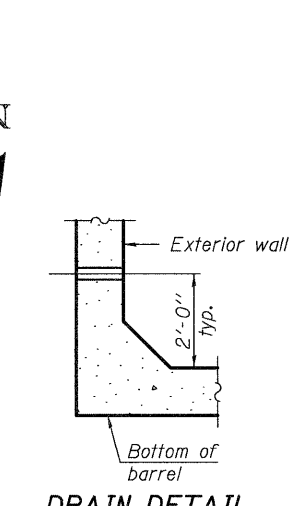
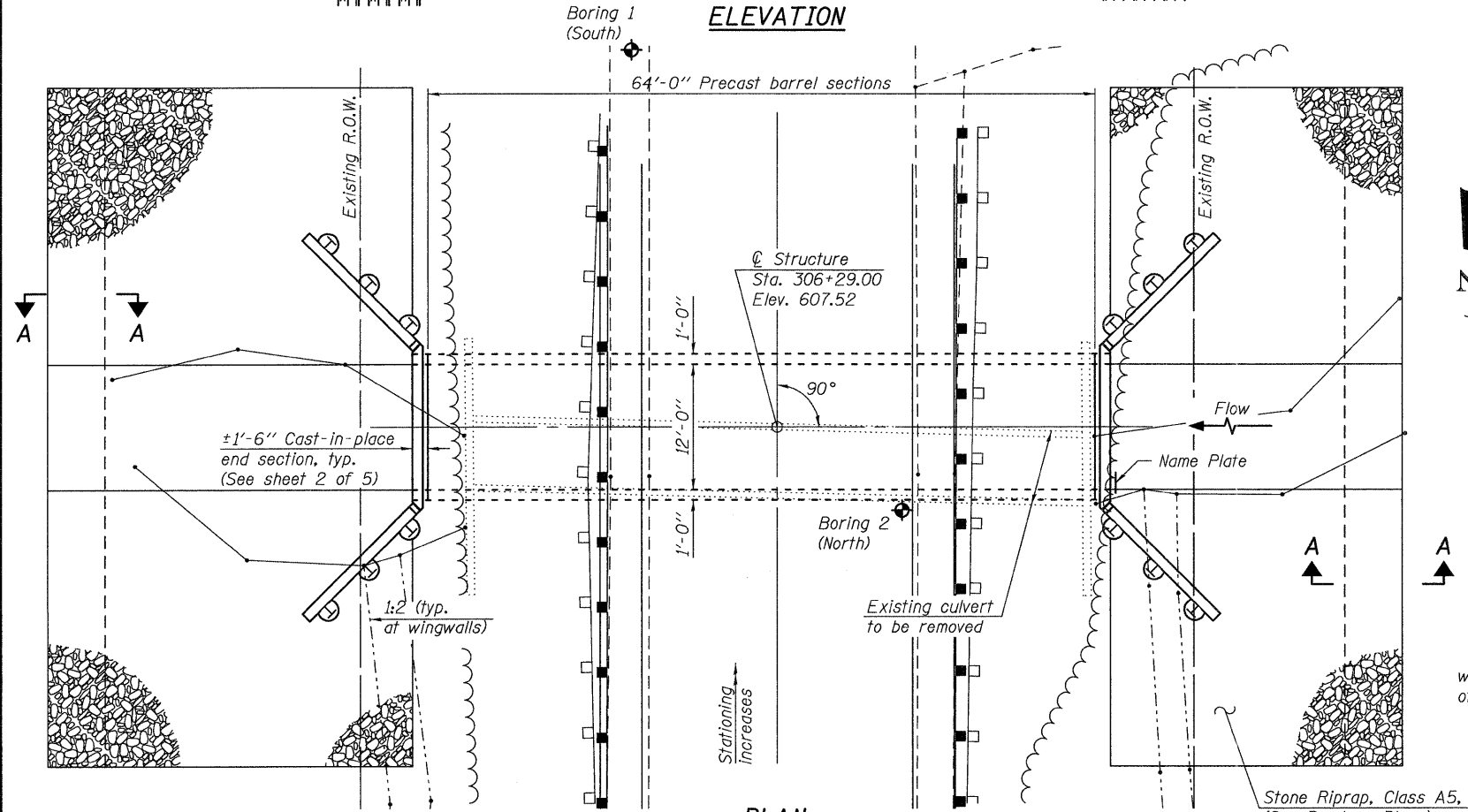
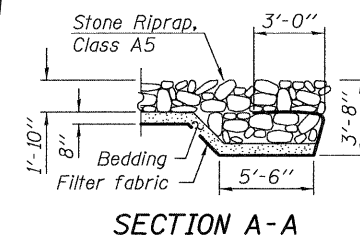
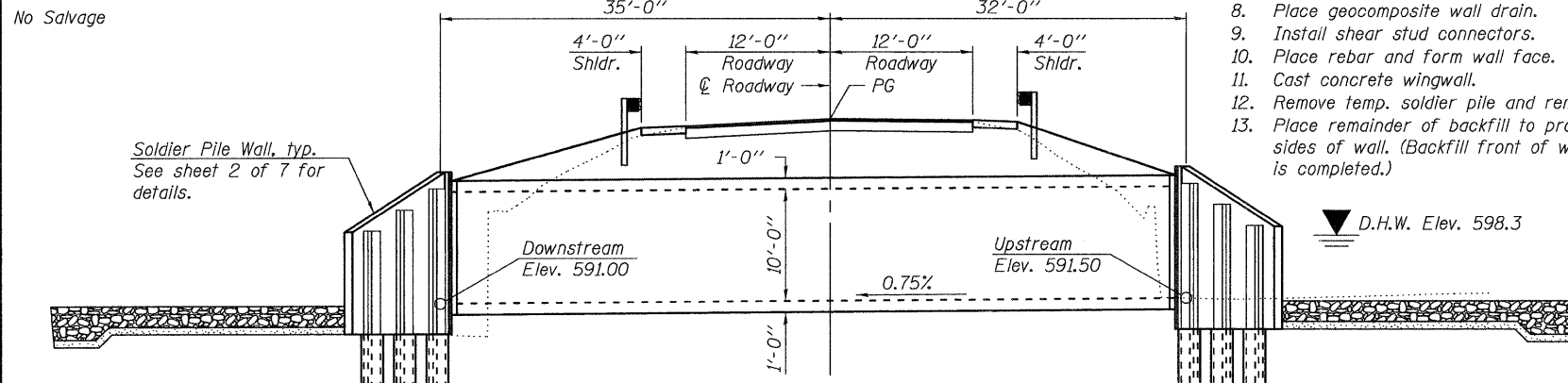
Existing Structure: S.N. 018-8605 is a 6' x 6' x 60' single barrel reinforced concrete box culvert. The culvert headwall is parallel to the roadway without wingwalls. The structure will be completely removed and replaced. The road will be temporarily closed during construction.

CULVERT CONSTRUCTION SEQUENCE

1. Remove existing structure.
2. Build cutoff wall.
3. Place precast box culvert sections.
4. Form and place concrete for portion of end sections to be cast onto precast box sections.
5. Drill soldier piles (May be completed prior to box placement).
6. Install timber lagging.
7. Place and compact backfill behind wall to top of timber lagging.
8. Place geocomposite wall drain.
9. Install shear stud connectors.
10. Place rebar and form wall face.
11. Cast concrete wingwall.
12. Remove temp. soldier pile and remaining timber outside wall limits.
13. Place remainder of backfill to proposed ground surface elevations on both sides of wall. (Backfill front of wall as much as possible before backfilling is completed.)

GENERAL NOTES

Reinforcement bars shall conform to the requirements of ASTM A 706, Gr. 60..
 Layout of slope protection system may be varied to suit ground conditions in the field as directed by the Engineer.
 The design fill height for this structure is 6 feet. The precast concrete box culvert sections shall conform to the requirements of AASHTO M259.
 Areas of the precast box culvert in contact with cast-in-place concrete shall be sand blasted, cleaned, and wetted prior to placing concrete in the field according to Article 503.09(b) of the Standard Specifications.
 In order to minimize excessive deflection and/or stresses in the soldier piles, compaction equipment used within 4 feet of the back face of the timber lagging shall be limited to lightweight mechanical tampers, rollers, or vibratory systems.
 Build top of headwalls parallel to the grade lines.
 All construction joints shall be bonded according to Article 503.09 of the Standard Specifications.
 End Sections will be paid for at the contract unit price each for BOX CULVERT END SECTIONS as outlined in Section 540 of the Standard Specifications.
 Class SI concrete shall be used for the concrete cast in the field for the cutoff walls, portions of the end sections being cast onto the end of the precast box sections, and the concrete facing for the walls.
 Concrete, rebar, and welded wire fabric quantities and lengths calculated for the end sections may vary based upon the precast box culverts supplied.
 Portions of the box culvert end sections may be built in the field or furnished as precast pieces as detailed in the plans. Portions of the end sections that will be precast shall be detailed in the shop drawings and submitted to the Engineer for review and approval.
 The ends of the precast box sections adjacent to the end sections shall be formed without the tongue and groove shapes specified in Article 8.1 of AASHTO M259 when the Contractor elects to cast the barrel portion of the end sections in the field.
 The longitudinal reinforcement of the welded wire fabric extending from the precast boxes into the end sections shall have a minimum area of 0.20 in²/ft. Substitution of reinforcement bars for welded wire fabric is not allowed.
 The joints between precast box sections shall be sealed and all voids filled with a mastic joint sealer. In addition, the joints shall be externally sealed on all four sides with a 13 inch wide external sealing band. The seal shall be centered over the joint, secured in place, and protected during the backfilling process.



INDEX OF SHEETS

1. General Plan and Elevation
- 2.-4. Box Culvert End Section Details
5. Bar Splicer Assembly Details
- 6.-7. Soil Boring Logs

TOTAL BILL OF MATERIAL

ITEM	UNIT	TOTAL
Stone Riprap, Class A5	Sq. yd.	455
Filter Fabric	Sq. yd.	455
Removal of Existing Structures No. 1	Each	1
Structure Excavation	Cu. yd.	586
Name Plates	Each	1
Box Culvert End Sections, Culvert No. 1	Each	2
Precast Concrete Box Culvert 12' x 10'	Foot	64.0

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
 fy = 60,000 psi (Reinforcement)
 fy = 36,000 psi (AASHTO M270, Grade 36) (Soldier Piles)

PRECAST UNITS

f'c = 5,000 psi
 fy = 65,000 psi (welded wire fabric)

LOADING HS 20-44

Allow 50#/sq. ft. for future wearing surface.

DESIGN SPECIFICATIONS

2002 AASHTO - Standard Specifications

GENERAL PLAN & ELEVATION

IL ROUTE 121 OVER TRIBUTARY

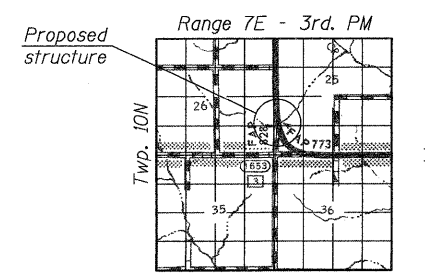
TO LONG POINT CREEK

F.A.P. RTE. 773 - SEC. (108,109,110)RS-3

CUMBERLAND COUNTY

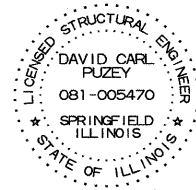
STATION 306+29.00

STRUCTURE NO. 018-8650



DESIGN SCOUR ELEVATION TABLE

Design Scour Elevation (ft.)	Downstream	Upstream
	588.0	588.5



WATERWAY INFORMATION

Proposed Low Grade Elev. 605.22 @ Sta. 309+00
 Existing Low Grade Elev. 605.55 @ Sta. 309+00
 Drainage Area = 0.47 mi.²

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft.		Nat. H.W.E.	Head - Ft.		Headwater El.	
			Exist.	Prop.		Exist.	Prop.	Exist.	Prop.
Design	10	344	27	64	596.8	3.8	0.3	600.6	597.1
Design	50	581	35	82	598.3	9.0	0	607.3	598.3
Base	100	690	36	86	598.7	13.4	0.1	612.1	598.8
Max. Calc.	500	964	36	95	599.4	26.1	1.3	625.6	600.7

10 year velocity through existing bridge = 14.3 ft./sec.
 10 year velocity through proposed culvert = 9.7 ft./sec.