

Benchmark : Cut Cross in top of wall at Sta 1+00, offset 7.2' RT.
Actual Elevation = 602.87'

Existing Structure: Exist. structure was built in late 1800's or early 1900's as a Stone Arch Culvert and carries IL Rt. 171 over Milne Creek. A few emergency repairs were done in 1997 and 2001. The structure is not historic. A portion of the existing structure will be retrofitted with a steel liner and the remainder will be removed and replaced with a 3-sided PCC Structure. Road to be closed during construction.

No Salvage

DESIGN SCOUR ELEVATION TABLE

Design Scour Elevation (Ft.)	Downstream	Upstream
	579.39	580.20

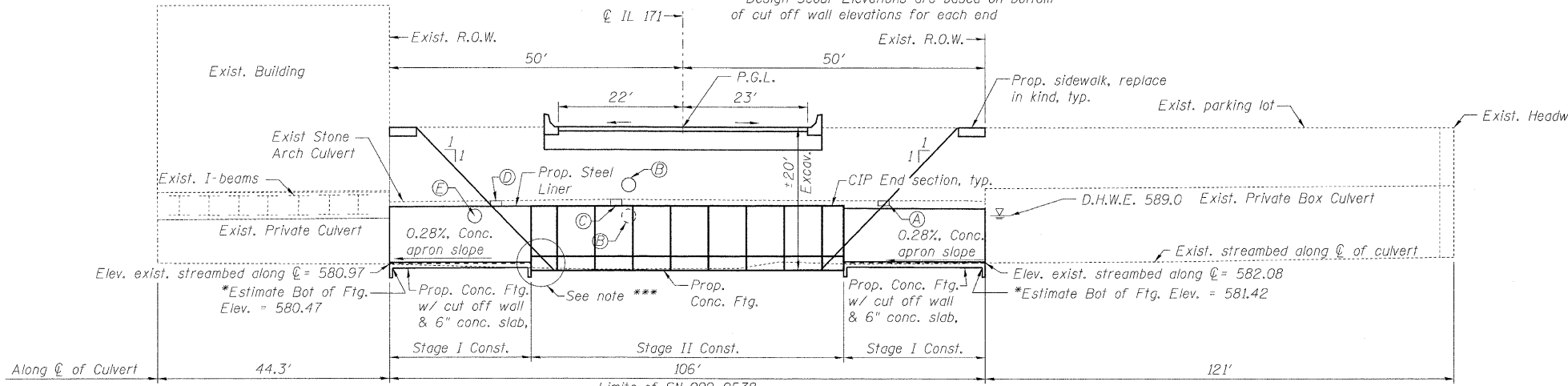
NOTE:
Design Scour Elevations are based on bottom of cut off wall elevations for each end

WATERWAY INFORMATION

Drainage Area = 2.0 mi² Exist. Low Grade Elev. = 600.56 ft. @ Sta. 62+00
Prop. Low Grade Elev. = 600.56 ft. @ Sta. 62+00

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft.		Nat. H.W.E.	Head - Ft.		Headwater E.I.	
			Exist.	Prop.		Exist.	Prop.	Exist.	Prop.
Design	10	409	93	88	585.6	1.6	1.6	587.2	587.2
Base	50	634	107	101	586.6	2.4	2.4	589.0	589.0
Overtopping	100	732	113	105	587.0	2.7	2.7	589.7	589.7
Max. Calc.	500	961	125	116	588.0	3.5	3.5	591.5	591.5

10 Yr. velocity through Exist. Culvert = 4.4 fps.
10 Yr. velocity through Prop. Culvert = 4.6 fps.
Max. Recorded H.W.E. = 591.0 July, 1957



WEST SECTION

***Temporary soil retention of approximately 4' will be required at the north footing for the west side steel liner and 6' at the south footing for the east side steel liner. Riprap to be placed to match top of 6" concrete slab apron at cut off wall, typ.

CENTRAL SECTION

LONGITUDINAL SECTION

(Looking North)

EAST SECTION

*Btm. fig. elev. varies based on min. allowable bearing capacity (Qmin = 5.6 ksf)

APPROVED
FOR STRUCTURAL ADEQUACY ONLY
William H. Epp, S.E.
ENGINEER OF BRIDGES AND STRUCTURES

SEISMIC DATA

Seismic Performance Category (SPC) = A
Horizontal Bedrock Acceleration = 0.04g
Site Coefficient = 1.0

LOADING HS20-44

Allow 50 psf for future wearing surface

DESIGN SPECIFICATIONS

2002 AASHTO

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 33,000 psi (AASHTO M167, Steel Plate Liner)
fy = 50,000 psi (AASHTO M270, Structural Steel)
fy = 60,000 psi (reinforcement)

PRECAST UNITS

f'c = 5,000 psi
fy = 65,000 psi (welded wire fabric)
fy = 60,000 psi (reinforcement)



William H. Epp
WILLIAM H. EPP, S.E.
IL. LIC. NO. 081-005150
EXP. 11/30/12
DATE 10/14/11

RECOMMENDED CONSTRUCTION SEQUENCE

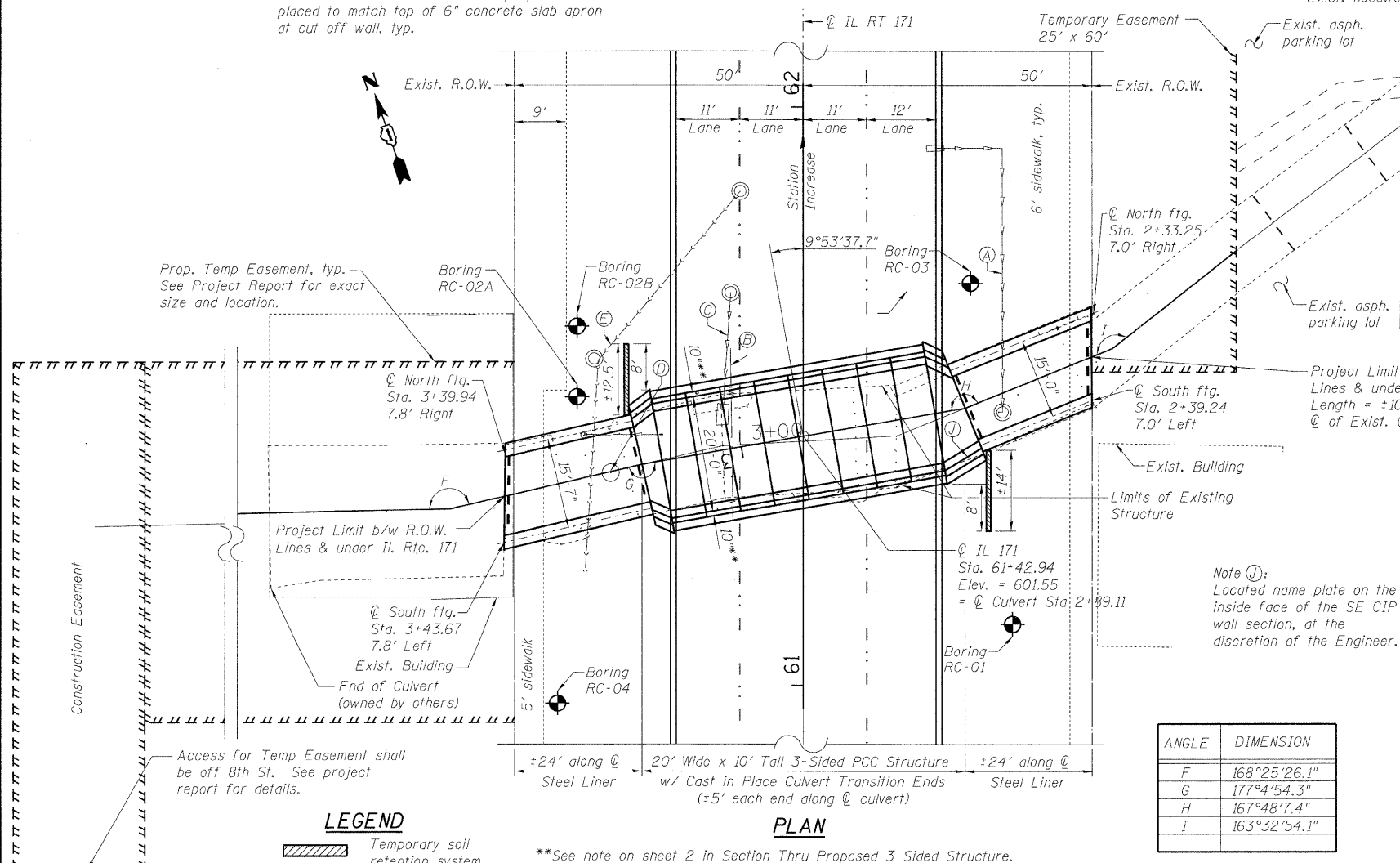
1. Remove debris from inside of culvert, including any silt or loose material from the streambed.
2. Repair scour within the culvert (see sheet S3).
3. Excavate and place footings for the proposed steel arch liners.
4. Install steel liner at downstream and upstream end of stone arch culvert and pump grout into void between liner and existing culvert wall.
5. Remove the existing stone arch culvert between the steel lined sections.
6. Place footings for the proposed 3-sided CIP and PCC structures.
7. Install riprap between steel lined sections.
8. Install a three-sided precast concrete structure in a straight chord between the steel lined sections with cast in place concrete culvert transition (both ends).
9. Compact fill above the three-sided precast concrete structure and reconstruct Illinois Route 171.

PIPE DESCRIPTION TABLE

LOCATION	DESCRIPTION	STATION	SKEW
A	12" φ Ceiling Penetration for Storm Drain	2+54.97	N.A.
B ①	12" φ water main, may not be in use	3+01.56	92°28'59"
C	24" φ storm sewer ceiling/wall penetration	3+03.00	N.A.
D	24" φ Ceiling Penetration for Storm Drain	3+23.00	N.A.
E ②	24" φ sanitary sewer, in use	3+26.45	102°51'18"

NOTE:
① Watermain to be relocated, by others, above proposed 3-sided PCC structure within a larger diameter sleeve, to allow for future increase in pipe size if ever needed.
② Sewermain to remain in place with larger diameter riveted corrugated steel pipe sleeve installed around sewermain to allow for future maintenance/repairs, or increased pipe size. Proposed steel liner shall be cut in field to fit around sewer main sleeve.

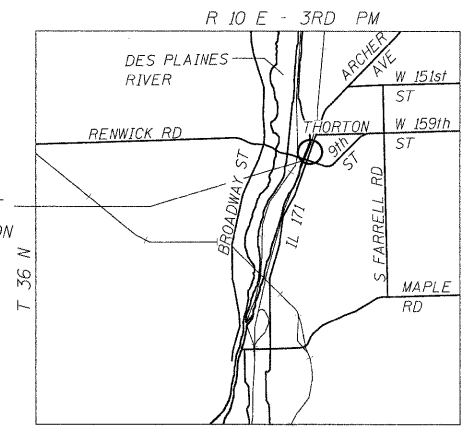
ANGLE	DIMENSION
F	168°25'26.1"
G	177°4'54.3"
H	167°48'7.4"
I	163°32'54.1"



LEGEND

Temporary soil retention system

**See note on sheet 2 in Section Thru Proposed 3-Sided Structure.



LOCATION SKETCH

GENERAL PLAN & ELEVATION
IL RT 171 OVER MILNE CREEK
F.A.P. RT. 577
SECTION D-T
WILL COUNTY
STA. 61+42.94
STRUCTURE NO. 099-0538

LONCO, INC.
CONSULTING ENGINEERS
1560 WALL ST., SUITE 222
NAPERVILLE, ILLINOIS 60563 PH: (630) 577-9100

DESIGNED - SLV	REVISED -
CHECKED - MJM	REVISED -
DRAWN - SLV	REVISED -
CHECKED - MJM	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURE NO. 099-0538
SHEET NO. S1 OF S11 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
577	D-T	WILL	44	20
D-91-265-06		CONTRACT NO. 60B10		
ILLINOIS FED. AID PROJECT				