

Benchmark #107: "x" in sidewalk south side of Arthur Avenue east of Willow Creek. Elev. 671.95

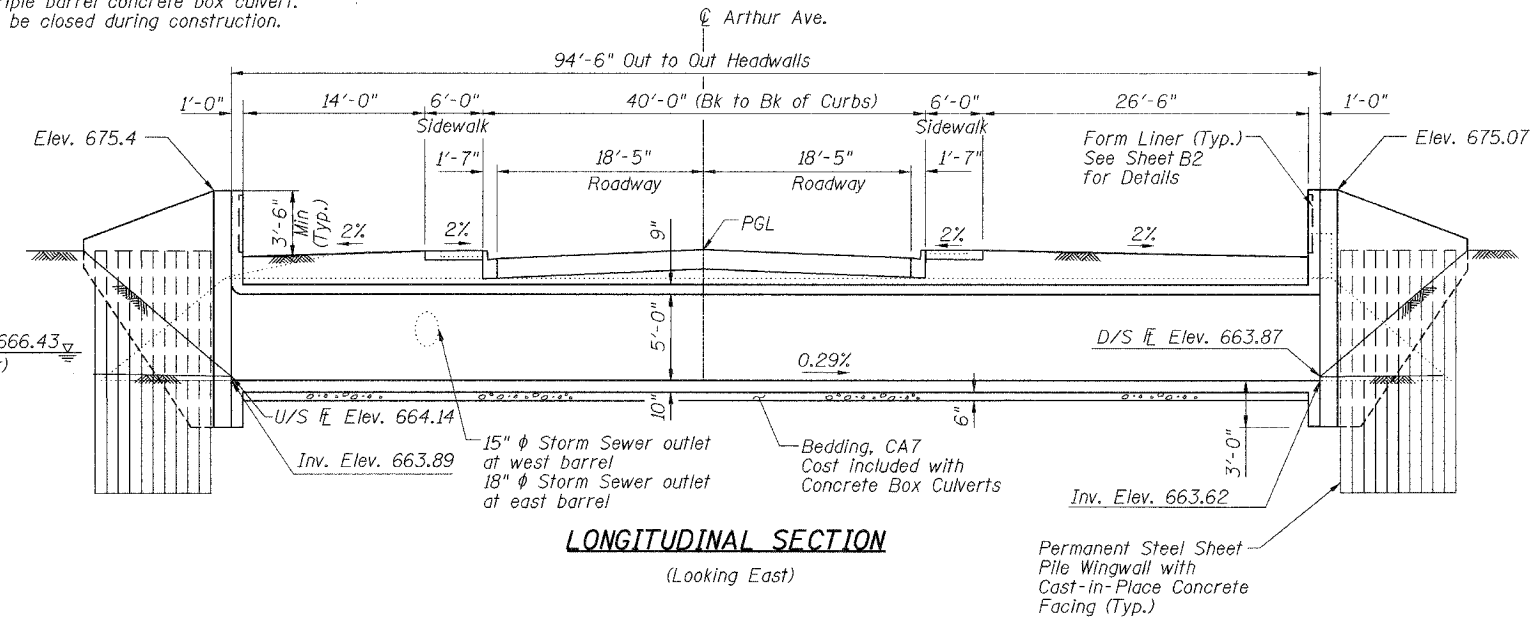
Existing Structure: S.N. 016-7851 built in 1962, is a triple 72"  $\phi$  cell corrugated metal pipe culvert with reinforced concrete sloped headwalls, approximate length is 117'-6". Structure to be removed and replaced by a reinforced triple barrel concrete box culvert. Roadway will be closed during construction.

No Salvage.

|                       |         |          |                    |                     |
|-----------------------|---------|----------|--------------------|---------------------|
| ROUTE NO.             | SECTION | COUNTY   | SHEET NO.          | SHEET NO. OF SHEETS |
| 02-00048-00-BR        |         | COOK     | 27                 | 16                  |
| FED. ROAD DIST. NO. 7 |         | ILLINOIS | FED. AID PROJECT - |                     |
|                       |         |          | * 83779            |                     |

**GENERAL NOTES**

- Reinforcement bars shall conform to the requirements of AASHTO M31, M42, or M53 Grade 60.
- Reinforcement bars designated (E) shall be epoxy coated.
- All construction joints shall be bonded.
- Exposed edges shall have a standard  $\frac{3}{4}$ " chamfer unless otherwise noted.
- Layout of slope protection system may be varied in the field to suit the ground conditions as directed by the Engineer.
- F.F. = Front Face  
B.F. = Back Face
- The cost of concrete and excavation for the wingwall facing is included in the cost of "Concrete Box Culverts".
- The sheet pile section chosen for use shall be selected by the contractor from the table provided in Special Provision "Permanent Steel Sheet Piling" and shall have an "Effective Section Modulus" larger than or equal to that shown on the plans.



**TOTAL BILL OF MATERIAL**

| ITEM                                  | UNIT  | TOTAL  |
|---------------------------------------|-------|--------|
| Stone Riprap, Class A4                | sq yd | 150    |
| Filter Fabric For Use With Riprap     | sq yd | 220    |
| Removal of Existing Structures No. 1  | each  | 1      |
| Reinforcement Bars, Epoxy Coated      | pound | 25,260 |
| Concrete Box Culverts                 | cu yd | 197.5  |
| Form Liner Textured Surface           | sq ft | 157    |
| Clear Protective Coating For Concrete | sq ft | 899    |
| Permanent Steel Sheet Piling          | sq ft | 1208   |

**LOADING HS20-44**

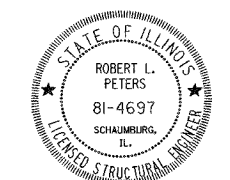
Allow 50#/sq. ft. for future wearing surface.

**DESIGN SPECIFICATIONS**

2002 AASHTO "Standard Specifications for Highway Bridges"

**DESIGN STRESSES**

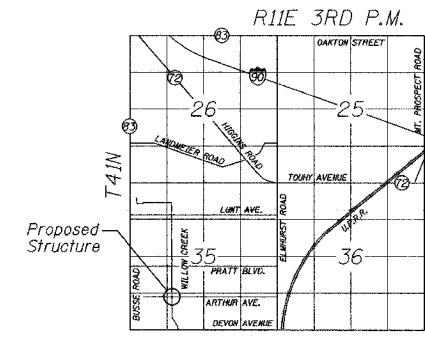
$f_c = 3,500$  psi  
 $f_y = 60,000$  psi (reinforcement)  
 $f_y = 38,500$  psi (sheet piling)  
 (AASHTO 202 Grade 38.5)



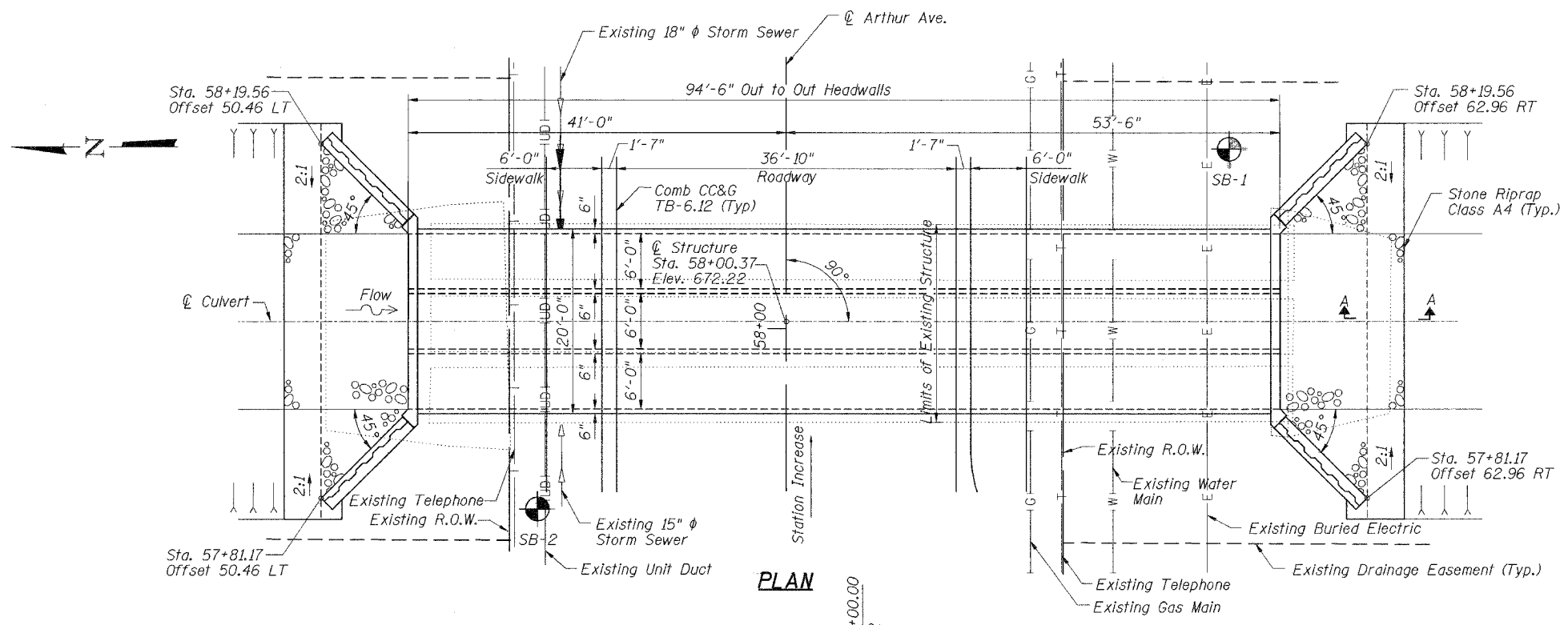
*Robert L. Peters*

ROBERT L. PETERS, P.E., S.E.  
 NO. 081-04697  
 EXP. DATE 11/30/06

I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THIS BOX CULVERT DESIGN IS STRUCTURALLY ADEQUATE FOR THE DESIGN LOADING SHOWN ON THE PLANS. THE DESIGN IS AN ECONOMICAL ONE FOR THE STYLE OF STRUCTURE AND COMPLIES WITH REQUIREMENTS OF THE CURRENT "AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES."



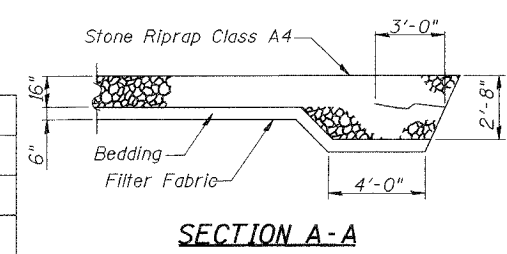
**LOCATION SKETCH**



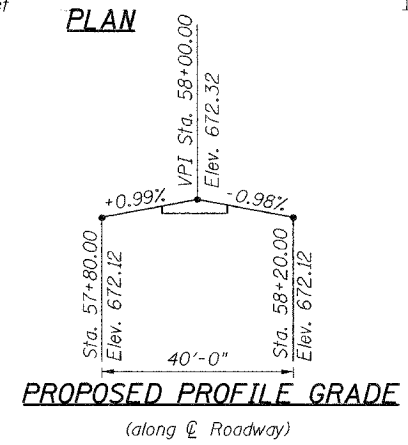
**WATERWAY INFORMATION**

Drainage Area = 345 Acres Low Grade Elev. 672.06 ft @ Sta. 58+27.00

| Flood       | Freq. Yr. | Q. C.F.S. | Opening Sq. Ft. |       | Natural Head - Ft. |       | Headwater El. |        |        |
|-------------|-----------|-----------|-----------------|-------|--------------------|-------|---------------|--------|--------|
|             |           |           | Exist.          | Prop. | Exist.             | Prop. | Exist.        | Prop.  |        |
| Design      | 30        | 129       | 40.2            | 49.8  | 666.43             | 0.55  | 0.13          | 666.98 | 666.56 |
| Base        | 100       | 163       | 47.1            | 56.4  | 666.80             | 0.58  | 0.16          | 667.38 | 666.96 |
| Overtopping | -         | -         | -               | -     | -                  | -     | -             | -      | -      |
| Max. calc.  | 500       | 260       | 62.7            | 70.8  | 667.57             | 0.76  | 0.26          | 668.33 | 667.83 |



**SECTION A-A**



**PROPOSED PROFILE GRADE**  
 (along  $\phi$  Roadway)

|          |     |
|----------|-----|
| DESIGNED | SLD |
| CHECKED  | JRS |
| DRAWN    | BAW |
| CHECKED  | SLD |

**GENERAL PLAN**

ARTHUR AVENUE OVER WILLOW CREEK  
 SECTION 02-00048-00-BR  
 COOK COUNTY  
 STATION 58+00.37



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