

SUMMARY OF QUANTITIES

CODE NO.	ITEM	UNIT	TOTAL QUANTITY	0004	0011
20100210	TREE REMOVAL (OVER 15 UNITS DIAMETER)	UNIT	22	22	
20201200	REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	23	23	
20300100	CHANNEL EXCAVATION	CU YD	667		667
20400800	FURNISHED EXCAVATION	CU YD	292	292	
20800150	TRENCH BACKFILL	CU YD	2	2	
25100630	EROSION CONTROL BLANKET	SQ YD	3,209	3,209	
28000250	TEMPORARY EROSION CONTROL SEEDING	POUND	663	663	
28000305	TEMPORARY DITCH CHECKS	FOOT	84	84	
28000400	PERIMETER EROSION BARRIER	FOOT	1,403	1,403	
28000500	INLET AND PIPE PROTECTION	EACH	1	1	
*30300112	AGGREGATE SUBGRADE IMPROVEMENT 12"	SQ YD	1,253	1,253	
31101000	SUBBASE GRANULAR MATERIAL, TYPE B	TON	47	47	
35101400	AGGREGATE BASE COURSE, TYPE B	TON	179	179	
40600275	BITUMINOUS MATERIALS (PRIME COAT)	POUND	3,129	3,129	
40600290	BITUMINOUS MATERIALS (TACK COAT)	POUND	275	275	
40603080	HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50	TON	210	210	
40603310	HOT-MIX ASPHALT SURFACE COURSE, MIX "C", N50	TON	140	140	
40800050	INCIDENTAL HOT-MIX ASPHALT SURFACING	TON	8	8	
42000070	PAVEMENT CONNECTOR (HMA) FOR BRIDGE APPROACH SLAB	SQ YD	62	62	
42400200	PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	SQ FT	58	58	
44000200	DRIVEWAY PAVEMENT REMOVAL	SQ YD	5	5	
44000500	COMBINATION CURB AND GUTTER REMOVAL	FOOT	280	280	
48101500	AGGREGATE SHOULDERS, TYPE B 6"	SQ YD	200	200	
*50100100	REMOVAL OF EXISTING STRUCTURES	EACH	1		1
50102400	CONCRETE REMOVAL	CU YD	2.4	2.4	
50200100	STRUCTURE EXCAVATION	CU YD	268		268
*50300100	FLOOR DRAINS	EACH	6		6
*50300225	CONCRETE STRUCTURES	CU YD	173.2		173.2
50300255	CONCRETE SUPERSTRUCTURE	CU YD	124.6		124.6
50300260	BRIDGE DECK GROOVING	SQ YD	487		487
50300280	CONCRETE ENCASEMENT	CU YD	6.5		6.5
50300300	PROTECTIVE COAT	SQ YD	628		628
50301350	CONCRETE SUPERSTRUCTURE (APPROACH SLAB)	CU YD	90.8		90.8
50500105	FURNISHING AND ERECTING STRUCTURAL STEEL	LSUM	1		1
50500505	STUD SHEAR CONNECTORS	EACH	1,240		1,240
50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	90,490		90,490

CODE NO.	ITEM	UNIT	TOTAL QUANTITY	0004	0011
51200957	FURNISHING METAL SHELL PILES 12" X 0.250"	FOOT	690		690
51202305	DRIVING PILES	FOOT	690		690
51203200	TEST PILE METAL SHELLS	EACH	4		4
51500100	NAME PLATES	EACH	1		1
52100505	ANCHOR BOLTS, 5/8"	EACH	20		20
52100520	ANCHOR BOLTS, 1"	EACH	20		20
550A0050	STORM SEWERS, CLASS A, TYPE 1 12"	FOOT	9	9	
56400800	FIRE HYDRANT AND VALVE TO BE MOVED	EACH	1	1	
59100100	GEOCOMPOSITE WALL DRAIN	SQ YD	45		45
60223800	MANHOLES, TYPE A, 6'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	1	1	
60236800	INLETS, TYPE A, TYPE 11 FRAME AND GRATE	EACH	1	1	
60257900	MANHOLES TO BE RECONSTRUCTED	EACH	5	5	
60603800	COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.12	FOOT	385	385	
△ 63000001	STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS	FOOT	25	25	
△ 63100085	TRAFFIC BARRIER TERMINAL, TYPE 6	EACH	2	2	
△ 63100167	TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT	EACH	2	2	
67100100	MOBILIZATION	LSUM	1	1	
△ 72501000	TERMINAL MARKER - DIRECT APPLIED	EACH	2	2	
△ 78000200	THERMOPLASTIC PAVEMENT MARKING - LINE 4"	FOOT	435	435	
△ 78008210	POLYUREA PAVEMENT MARKING TYPE 1 - LINE 4"	FOOT	352	352	
△ 78200005	GUARDRAIL REFLECTORS, TYPE A	EACH	6	6	
*Z0013798	CONSTRUCTION LAYOUT	LSUM	1		
*Z0046304	PIPE UNDERDRAINS FOR STRUCTURES 4"	FOOT	156		156
*Z0051400	REMOVING AND RESETTING POSTS	EACH	7	7	
*X2020410	EARTH EXCAVATION (SPECIAL)	CU YD	230	230	
*X2500900	SEEDING, CLASS 1 (SPECIAL)	ACRE	0.57	0.57	
*X2501100	SEEDING, CLASS 3 (SPECIAL)	ACRE	0.10	0.10	
*X2810210	STONE RIPRAP, CLASS A5 (SPECIAL)	TON	1,215		1,215
*X5860110	GRANULAR BACKFILL FOR STRUCTURES	CU YD	106		106
*X6340205	GUARD POSTS REMOVAL	EACH	12	12	
*X7010216	TRAFFIC CONTROL AND PROTECTION, (SPECIAL)	LSUM	1	1	

*SEE SPECIAL PROVISIONS
 △ SPECIALTY ITEMS

FILE: S:\PROJECTS\2015\1160015 - Walnut DESIGN STRUCT 20 - Drawings\1160015 - Summary of Quantities.dwg



DESIGNED - TBS	REVISED △ 10/26/2017 PLP
CHECKED - LGN	REVISED
DRAWN - TBS	REVISED
CHECKED - LGN	REVISED

**VILLAGE OF WALNUT
 MAIN STREET OVER WALNUT DITCH
 STATION 20 + 00**

**SUMMARY OF QUANTITIES
 STRUCTURE NO. 006-8100**

SHEET NO. 1 OF 1 SHEETS

M.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
6050A	13-00019-00-BR	BUREAU	45	03
WHA* 1160015		CONTRACT NO. 87680		
ILLINOIS FED. AID PROJECT 48CY4459				

EXISTING STRUCTURE: S.N. 006-8109 built in 1953 under Walnut Twp. of Sta. 1+50.00 as a two span (2 @ 32'-0") skewed 30° Lt. Ahead reinforced concrete deck bridge on steel IWF beams on concrete pile coas. The structure is supported on creosoted timber piles with closed timber abutments, 58'-7 1/2" back-to-back of abutments and 25'-0" out to out of deck. The existing structure is to be removed and replaced.

BENCH MARK: Chiseled "□" in Northeast Corner Hubguard, Elev. 693.69

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Channel Excavation	Cu. Yd.		667	667
Removal of Existing Structures	Each			1
Structure Excavation	Cu. Yd.		268	268
Floor Drains	Each	6		6
Concrete Structures	Cu. Yd.		173.2	173.2
Concrete Superstructure	Cu. Yd.	124.6		124.6
Bridge Deck Grooving	Sq. Yd.	487		487
Concrete Encasement	Cu. Yd.		6.5	6.5
Protective Coat	Sq. Yd.	628		628
Concrete Superstructure (Approach Slab)	Cu. Yd.	90.8		90.8
Furnishing and Erecting Structural Steel	L. Sym			1
Stud Shear Connectors	Each	1,240		1,240
Reinforcement Bars, Epoxy Coated	Pound	65,510	24,980	90,490
Furnishing Metal Shell Piles 12"x0.250"	Foot		690	690
Driving Piles	Foot		690	690
Test Pile - Metal Shells	Each		4	4
Name Plates	Each	1		1
Anchor Bolts, 5/8"	Each	20		20
Anchor Bolts, 1"	Each	20		20
Geocomposite Wall Drain	Sq. Yd.		45	45
Pipe Underdrains for Structures 4"	Foot		156	156
Stone Riprap, Class A5 (Special)	Ton		1,215	1,215
Granular Backfill for Structures	Cu. Yd.		106	106

*See Special Provisions

INDEX OF SHEETS

1. General Plan and Elevation
2. Riprap and Pile Layout
3. Top of Slab Elevations
4. Top of South Approach Slab Elevations
5. Top of North Approach Slab Elevations
6. Superstructure
7. Superstructure Details
8. Diaphragm Details
- 9-10. Bridge Approach Slab Details
- 11-12. Structural Steel Details
13. Bearing Details
14. Abutment Details
15. Pier Details
16. Metal Shell Pile Details
17. Cantilever Forming Brackets
- 18-21. Boring Logs

GENERAL NOTES:

Fasteners shall be ASTM A325 Type 3, mechanically galvanized bolts. Bolts 7/8" dia. holes 1 1/8" dia. unless otherwise noted.

Calculated weight of Structural Steel = 45,600 lbs.

All structural steel shall be AASHTO M 270 Grade 50.

All structural steel shall be galvanized per ASTM A123/A123M-13 and AASHTO M111. See Special Provisions for Hot-Dip Galvanizing for Structural Steel.

Painting of galvanized structural steel is **NOT** specified for this project.

No field welding is permitted except as specified in the contract documents.

Reinforcement bars designated (E) shall be epoxy coated.

If the Contractor elects to use cantilever forming brackets on the exterior beams or girders, the brackets shall be placed at the same locations as required for the hardwood blocks in Article 503.06(b) of the Standard Specifications. If additional cantilever forming brackets are required, hardwood blocking shall be wedged between the exterior and first interior beam at each of these additional bracket locations.

Bearing seat surfaces shall be constructed or adjusted to the designated elevations within a tolerance of 1/8" (0.01"). Adjustment shall be made either by grinding the surface or by shimming the bearings.

Layout of the slope protection system may be varied to suit ground conditions in the field as directed by the Engineer.

The embankment configuration shown shall be the minimum that must be placed and compacted prior to construction of the abutments.

WATERWAY INFORMATION

Drain. Area = 14.5 sq. mi. Low Grade El. 680.90 @ Sta. 23+42.23

Flood	Freq. Yr.	Opnng. Sq. Ft.	Nat. Head - Ft.	Headwater El.
Overlapping (EX)	20	1,792	442.2	633.3
Overlapping (PR)	20	1,792	442.2	633.3
Design	30	4,400	442.2	661.9
Base	100	6,229	442.2	734.0
Scour Check	200	7,450	442.2	766.6
Max. Cois.	500	8,300	442.2	788.2

WALNUT DITCH
BUILT 2018 BY
VILLAGE OF WALNUT
SEC. 13-00019-00-BR
U.S. RTE. 6050A STA. 20+00
STR. NO. 006-8100 LOADING HL93

NAME PLATE

See Std. 515001

DESIGN SPECIFICATIONS

2014 AASHTO LRFD Bridge Design Specifications, 7th Edition with 2016 Interims

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
f'c = 4,000 psi (Superstructure Concrete)
fy = 50,000 psi (Structural Steel)
fy = 60,000 psi (Reinforcement)

LOADING HL-93

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

SEISMIC DATA

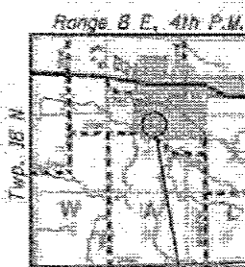
Seismic Performance Zone (SPZ) = 1
Design Spectral Acceleration at 1.0 sec. (S₁) = 0.092
Design Spectral Acceleration at 0.2 sec. (S_s) = 0.15
Soil Site Class = D

BRIDGE DESIGN SCOUR ELEVATION TABLE

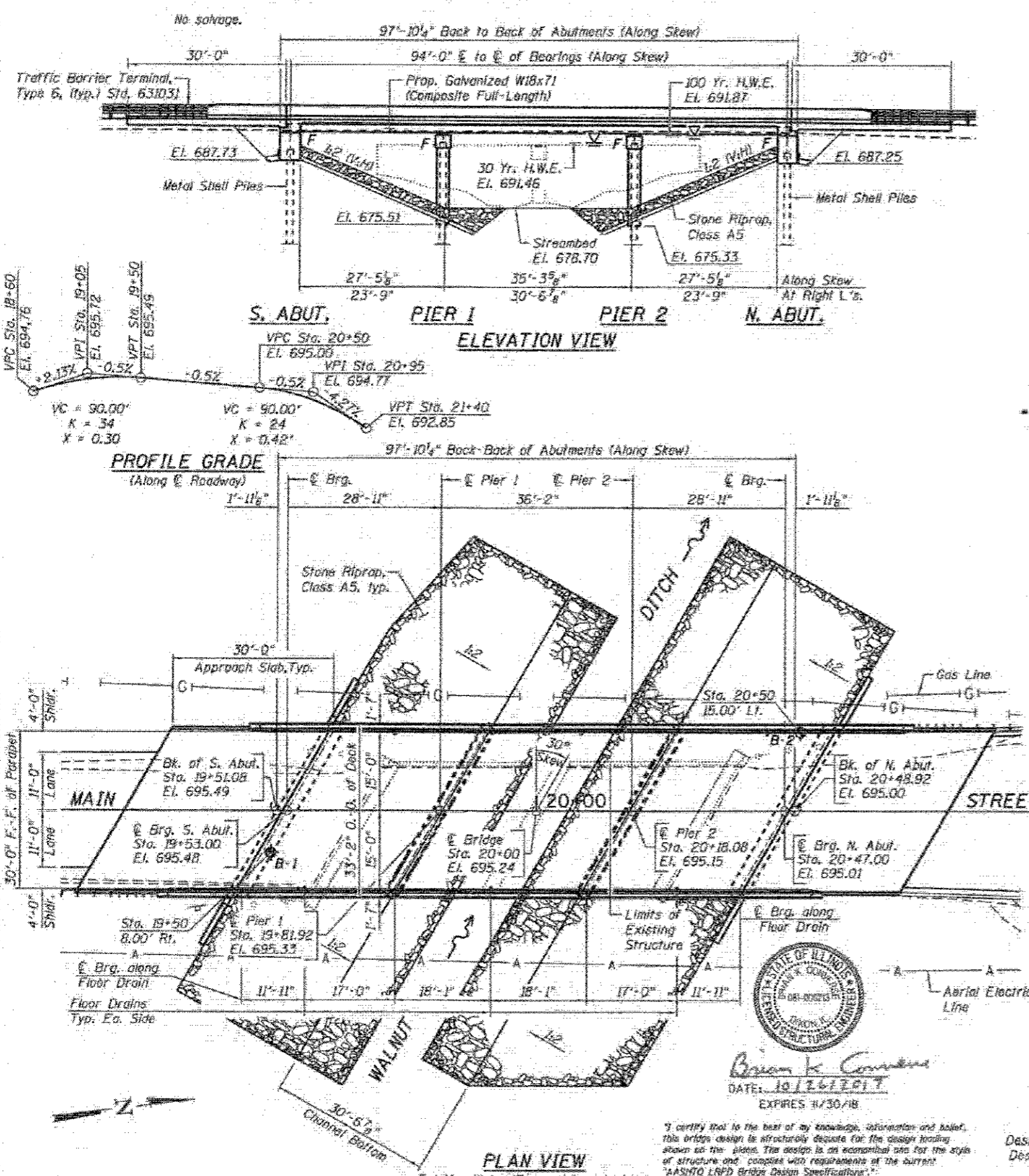
Event / Limit	Design Scour Elevations (ft.)				
	S. Abut.	Pier #1	Pier #2	N. Abut.	Item 113
Q100	-	677.46	677.38	-	B
Q200	-	677.46	677.38	-	
Design	687.73	676.20	676.20	687.76	
Check	687.73	676.20	676.20	687.76	

**GENERAL PLAN AND ELEVATION
MAIN STREET OVER WALNUT DITCH**

SEC. 13-00019-00-BR
VILLAGE OF WALNUT
STATION 20+00
STRUCTURE NO. 006-8100



LOCATION SKETCH



PLAN VIEW



Brian K. Conradi
DATE: 10/26/2017
EXPIRES 11/30/18

I certify that to the best of my knowledge, information and belief, this bridge design is structurally adequate for the design loading shown on the plans. This design is an approximate one for the style of structure and, consistent with requirements of the current AASHTO LRFD Bridge Design Specifications.

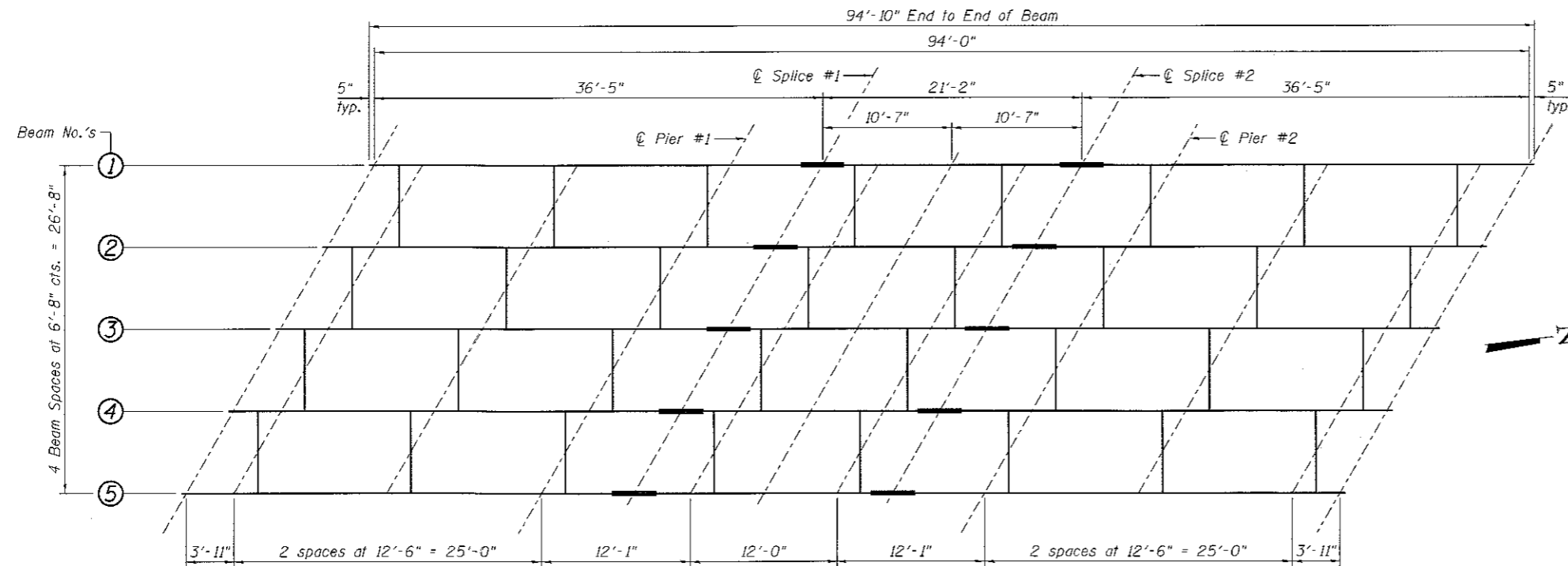


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CHECKED - BNC	REVISED
DRAWN - BSA	REVISED
CHECKED - BNC	REVISED

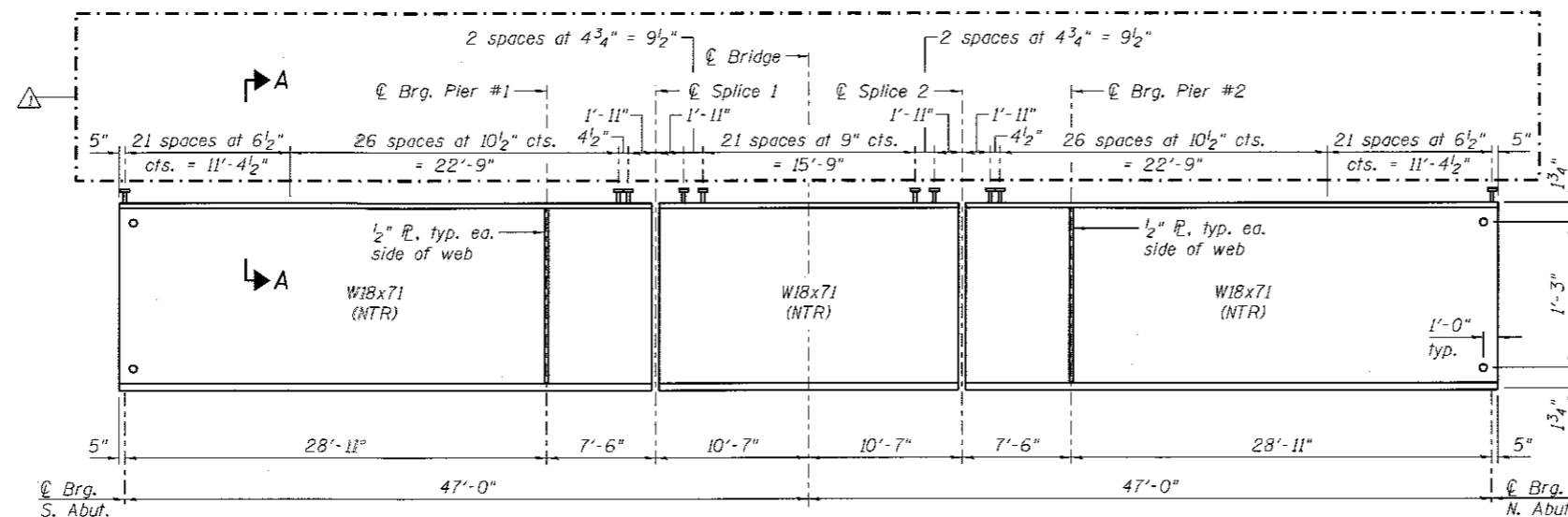
VILLAGE OF WALNUT
MAIN STREET OVER WALNUT DITCH
STATION 20+00

GENERAL PLAN AND ELEVATION
STRUCTURE NO. 006-8100
STRUCTURAL SHEET NO. 1 OF 21 SHEETS

M.S. R.T.E.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
6050A	13-00019-00-BR	BLAIREAU	45	13
WHA# D66D15			CONTRACT NO. 87680	

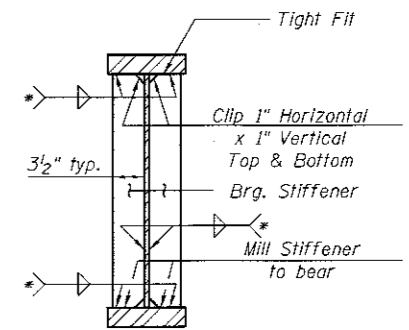
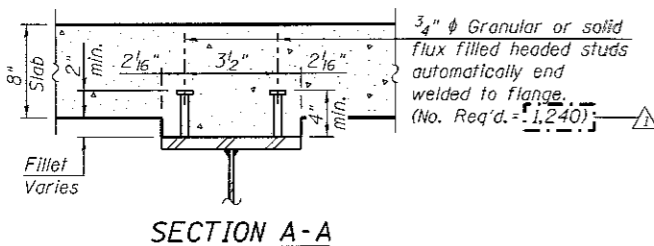


FRAMING PLAN



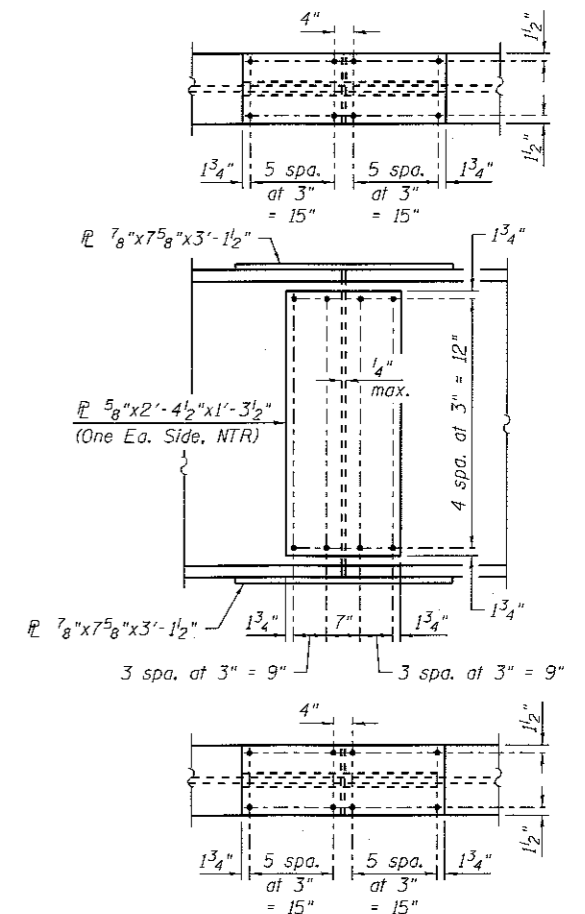
GIRDER ELEVATION

"CVN" denotes Charpy-V-Notch impact energy requirements, zone 2.



SECTION AT PIER

*Terminate 1/4" (± 1/8") from the end of ⌀ intersects.



FIELD SPLICE DETAIL

TOP OF BEAM ELEVATIONS (FOR FABRICATION ONLY)						
Beam Number	South Abutment	Pier #1	Splice #1	Splice #2	Pier #2	North Abutment
1	694.50	694.32	694.27	694.16	694.13	694.02
2	694.63	694.45	694.41	694.30	694.27	694.16
3	694.76	694.58	694.53	694.42	694.40	694.29
4	694.67	694.49	694.44	694.34	694.31	694.20
5	694.57	694.39	694.35	694.24	694.21	694.10

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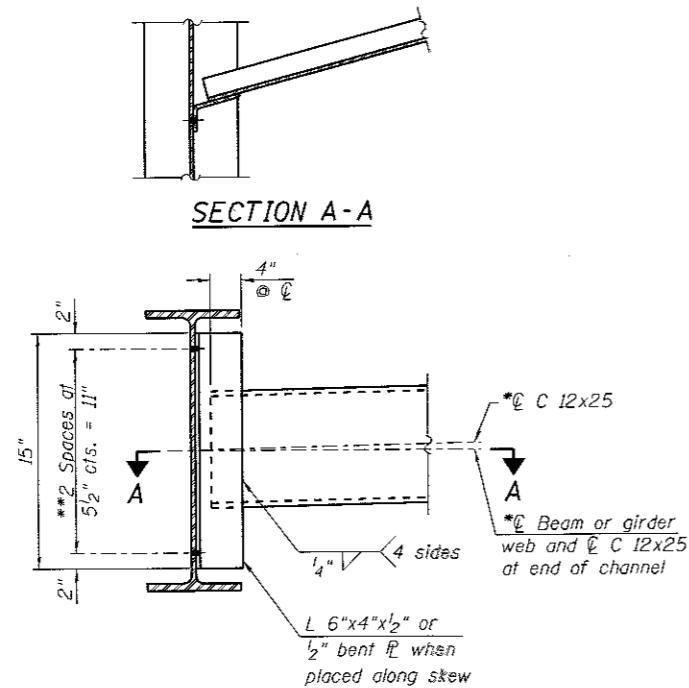
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VILLAGE OF WALNUT
MAIN STREET OVER WALNUT DITCH
STATION 20 + 00

STRUCTURAL STEEL DETAILS
STRUCTURE NO. 006-8100

STRUCTURAL SHEET NO. 11 OF 21 SHEETS

M.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
6050A	13-00019-00-BR	BUREAU	45	23
	WHA* 1160D15	BUREAU		
		CONTRACT NO. 87680		
		(ILLINOIS) FED. AID PROJECT 48C714451		



INTERIOR DIAPHRAGM

NOTE:
Two hardened washers required for each set of oversized holes.

* Alternate C 12X30 channels are permitted to facilitate material acquisition. Calculated weight of structural steel is based on the lighter section.

The alternate, if utilized, shall be provided at no additional cost to the Department.

** 3/4" φ HS bolts, 15/16" φ holes

	0.4 Sp. 1 or 0.6 Sp. 3	Pier	0.5 Sp. 2
I_s	1,170	1,170	1,170
$I_c(n)$	4,707	4,707	4,707
$I_c(3n)$	3,515	3,515	3,515
$I_c(cr)$		2,049	
S_s	127	127	127
$S_c(n)$	233	233	233
$S_c(3n)$	207	207	207
$S_c(cr)$		162	
DC1	0.791	0.791	0.791
M _{DC1}	43.4	80.8	42.2
DC2	0.180	0.180	0.180
M _{DC2}	10.4	19.3	10.1
DW	0.333	0.333	0.333
M _{DW}	19.2	35.8	18.7
LLDF	0.690	0.683	0.676
$M_{\frac{1}{2} + IM}$	239	216	253
M_u (Strength I)	514	556	536
$\phi_r M_n$	1,281		1,281
f_s DC1	4.10	7.63	3.99
f_s DC2	0.60	1.43	0.59
f_s DW	1.12	2.65	1.08
f_s ($\frac{1}{2} + IM$)	12.27	15.94	13.03
f_s (Service II)	21.77	32.43	22.56
$0.95R_n F_y f$	47.5	47.5	47.50
f_s (Total)(Strength I)		43.2	
$\phi_r F_n$	*	**	*
V_r	31.6	34.6	32.3

	Abut.	Pier
LLDF	0.800	0.800
OCF		
R _{DC1}	37.95	27.28
R _{DC2}	1.93	6.53
R _{DW}	3.58	12.09
R _{$\frac{1}{2}$}	51.8	61.1
R _{IM}	12.4	12.9
R _{Total}	107.7	119.9

* NA - Section is compact per AASHTO 6.10.6.2.2

** Section qualifies for AASHTO A6 per A6.1 ;
A moment-based check per AASHTO A6.1.1-1 is sufficient

I_s, S_s : Non-composite moment of inertia and section modulus of the steel section used for computing f_s (Total-Strength I, and Service II) due to non-composite dead loads (in⁴ and in³).

$I_c(n), S_c(n)$: Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing f_s (Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads (in⁴ and in³).

$I_c(3n), S_c(3n)$: Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing f_s (Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads (in⁴ and in³).

$I_c(cr), S_c(cr)$: Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing f_s (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads (in⁴ and in³).

DC1: Un-factored non-composite dead load (kips/ft.).
M_{DC1}: Un-factored moment due to non-composite dead load (kip-ft.).
DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).
M_{DC2}: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).
DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).
M_{DW}: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).
LLDF: Interior girder live load distribution factor (Lanes/Beam)
 $M_{\frac{1}{2} + IM}$: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).
 M_u (Strength I): Factored design moment (kip-ft.).
 $1.25 (M_{DC1} + M_{DC2}) + 1.5 M_{DW} + 1.75 M_{\frac{1}{2} + IM}$
 $\phi_r M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft.).
 f_s DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
 M_{DC1} / S_{nc}
 f_s DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
 $M_{DC2} / S_c(3n)$ or $M_{DC2} / S_c(cr)$ as applicable.
 f_s DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
 $M_{DW} / S_c(3n)$ or $M_{DW} / S_c(cr)$ as applicable.
 f_s ($\frac{1}{2} + IM$): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).
 $M_{\frac{1}{2} + IM} / S_c(n)$ or $M_{DW} / S_c(cr)$ as applicable.
 f_s (Service II): Sum of stresses as computed below (ksi).
 $f_{sDC1} + f_{sDC2} + f_{sDW} + 1.3 f_s (\frac{1}{2} + IM)$
 $0.95R_n F_y f$: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).
 f_s (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
 $1.25 (f_{sDC1} + f_{sDC2}) + 1.5 f_{sDW} + 1.75 f_s (\frac{1}{2} + IM)$
 $\phi_r F_n$: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).
 V_r : Maximum factored shear range in span computed according to Article 6.10.10.

BILL OF MATERIAL

Item	Unit	Quantity
Stud Shear Connectors	Each	1,240
Furnishing & Erecting Structural Steel	L. Sum	1

NOTES:
All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.

Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.

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DESIGNED - PLP	REVISION 10/26/2017 PLP
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CHECKED - BKC	REVISION

VILLAGE OF WALNUT
MAIN STREET OVER WALNUT DITCH
STATION 20 + 00

STRUCTURAL STEEL DETAILS
STRUCTURE NO. 006-8100
STRUCTURAL SHEET NO. 12 OF 21 SHEETS

M.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
6050A	13-00019-00-BR	BUREAU	45	24
WHA* 1160015		CONTRACT NO. 87680		
ILLINOIS FED. AID PROJECT 4BCY1445				