STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

251'-0"

125'-6" | 125'-6"

90'-0" | 35'-6" | 35'-6" | 90'-0"

1°51'15" (typ.)

℄ Brg. S. Abut. — Int. Diaphragm (typ.) — ℄ Splice #1 — ℄ Pier & Int. Diaphragm — ℄ Splice #2 — ℄ Brg. N. Abut.

Stage I Const.

PG SB Lanes
℄ Median U.S. 51 & ℄ Structure
PG NB Lanes

Stage II Const.

Stage I Const.

47'-3"
9'-0"
47'-3"
112'-6"

7'-4"
3 Spa @ 7'-4" = 22'-0"
4 Spa @ 7'-7½" = 30'-6"
4 Spa @ 7'-7½" = 30'-6"
3 Spa @ 7'-4" = 22'-0"

Girders 1–16

3'-6" | 4 Spaces @ 24'-6" = 98'-0" | 24'-0" | 24'-0" | 4 Spaces @ 24'-6" = 98'-0" | 3'-6"
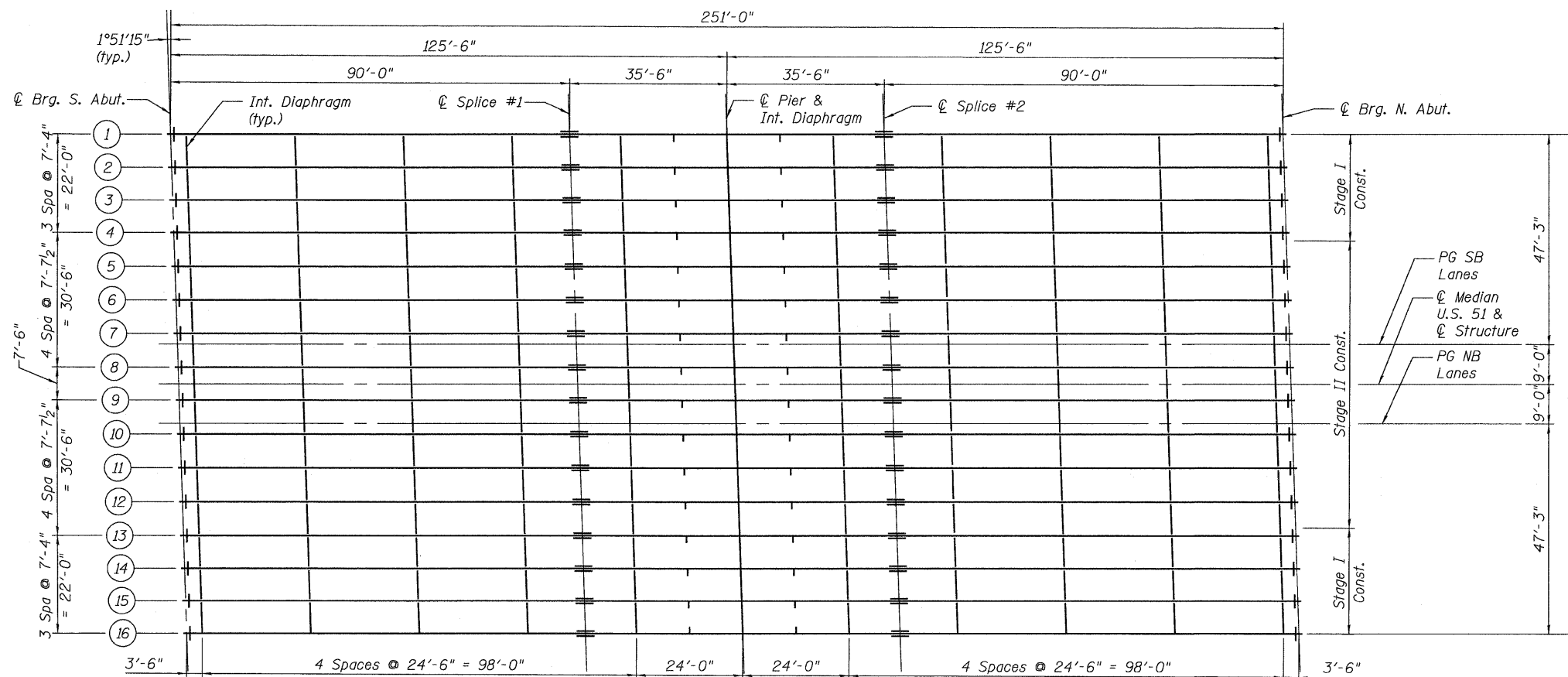
— Z —   **FRAMING PLAN**

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 ($in.^4$ and $in.^3$).

$I_c(n)$, $S_c(n)$: 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) due to short-term composite live loads ($in.^4$ and $in.^3$).

$I_c(3n)$, $S_c(3n)$: 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) due to long-term composite (superimposed) dead loads ($in.^4$ and $in.^3$).

Z: Plastic Section Modulus of the steel section in non-composite areas. Omit line in Moment Table if not used in design calculations ($in.^3$).

$DC1$: 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.).

$M_{LL + IM}$: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).

M_u (Strength I): Factored design moment (kip-ft.).
$1.25 (M_{DC1} + M_{DC2}) + 1.5 M_{DW} + 1.75 M_{LL + IM}$

$\phi_r M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 (kip-ft.).

$\phi_r M_{nc}$: Compact non-composite negative moment capacity computed according to Article A6.1.1 (kip-ft.).

f_s (Service II): Sum of stresses as computed from the moments below (ksi).
$M_{DC1} + M_{DC2} + M_{DW} + 1.3 M_{LL + IM}$

f_s (Total)(Strength I): Sum of stresses as computed from the moments below on non-compact sections (ksi).
$1.25 (M_{DC1} + M_{DC2}) + 1.5 M_{DW} + 1.75 M_{LL + IM}$

V_r: Maximum factored shear range in composite portion of span computed according to Article 6.10.10.

INTERIOR GIRDER MOMENT TABLE

		0.4 Sp. 1 or 0.6 Sp. 2	Pier
I_s	(in^4)	19095	49632
$I_c(n)$	(in^4)	47876	-
$I_c(3n)$	(in^4)	35465	-
S_s	(in^3)	823	1909
$S_c(n)$	(in^3)	1131	-
$S_c(3n)$	(in^3)	1038	-
$DC1$	$(k/')$	0.968	1.158
M_{DC1}	$('k)$	835	2606
$DC2$	$(k/')$	0.131	0.131
M_{DC2}	$('k)$	133	286
DW	$(k/')$	0.32	0.32
M_{DW}	$('k)$	325	699
$M_{LL + IM}$	$('k)$	1810	2084
M_u (Strength I)	$('k)$	4866	8310
* $\phi_r M_n$, $\phi_r M_{nc}$	$('k)$	5541	8702
f_s $DC1$	(ksi)	12.18	16.38
f_s $DC2$	(ksi)	1.54	1.80
f_s DW	(ksi)	3.76	4.39
f_s $1.3(LL+IM)$	(ksi)	24.97	17.03
f_s (Service II)	(ksi)	42.45	39.60
** f_s (Total)(Strength I)	(ksi)	-	-
V_r	(k)	62.6	-

* Compact sections
** Non-Compact and slender sections

INTERIOR GIRDER REACTION TABLE

		Abut.	Pier
R_{DC1}	(k)	40.9	174.6
R_{DC2}	(k)	5.9	21.0
R_{DW}	(k)	14.5	51.3
$R_{LL + IM}$	(k)	96.7	210.0
R_{Total}	(k)	158.0	456.9

Note:

All diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual diaphragms at supports may be temporarily disconnected to install bearing anchor rods. For diaphragm details and splice plate details see sheet 23 of 35.

FRAMING PLAN
SN 058-0136

Plotted by: jheper   3/15/2010 7:49:10 AM
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