Buchanan County, Iowa State, USA
SUPER CONCRETE BRIDGE
DRAWINGS

AUGUST 2014

KICT KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY

DRAWING LIST

Buchanan County, Iowa State, USA
SUPER CONCRETE BRIDGE
DRAWINGS

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REINFORCEMENT OF END CROSS BEAM	1	D-007	
REINFORCEMENT OF MID CROSS BEAM	1	D-008	
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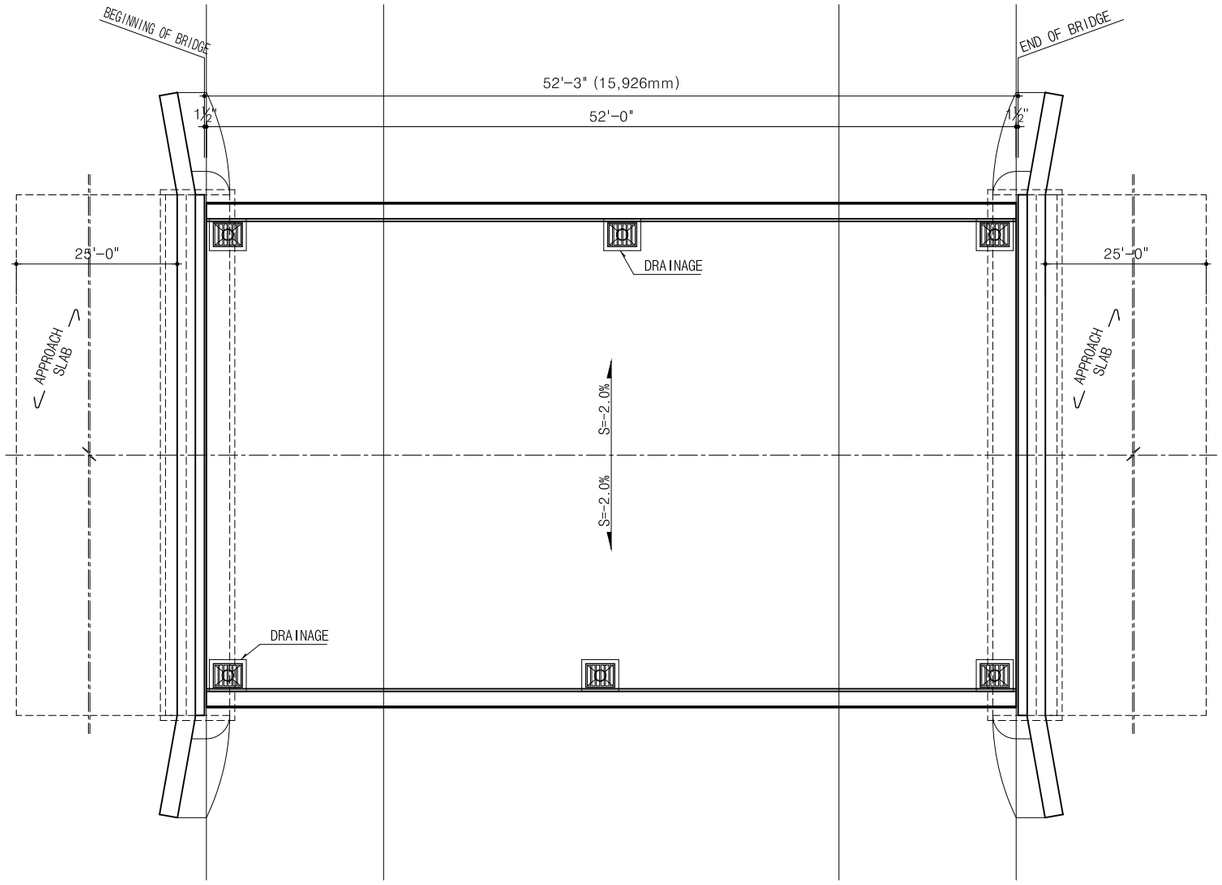
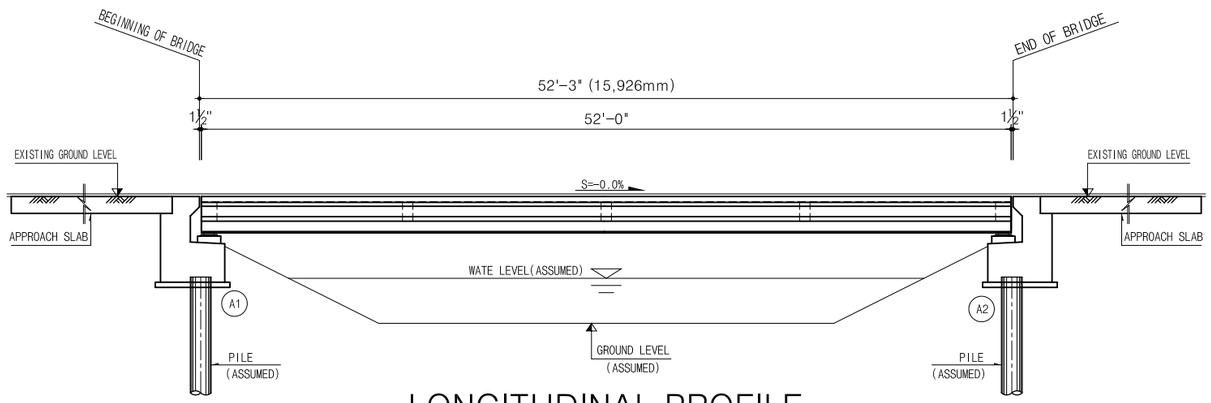


PLAN

SCALE 1/60



LONGITUDINAL PROFILE

SCALE 1/60

GENERAL NOTES

1. THE DESIGNED WEIGHT OF ONE GIRDER DOSE NOT EXCEED 35,000 POUNDS SO, THE GIRDER CAN BE TRANSPORTED BY TRAILER.

2. THE MATERIAL PROPERTIES ARE BELOW.
   - UHPC GIRDER(PRECAST G1~G6) : fck= 26.1 ksi (180 MPa)
   - UHPC SHEAR BALL(CAST IN SITU) : fck= 26.1 ksi (180 MPa)
   - CURB & PAVEMENT : fck= 4.1 ksi (28 MPa)
   - REINFORCING BAR : fy= 60.9 ksi (420 MPa)
   - PT STRANDS : fpu= 269.8 ksi (1860 MPa)

3. IF YOU CHANGE SIZE OF BEARING PAD, YOU SHOULD MODIFY SIZE OF BEARING PAD SEAT OF GIRDER SOFFIT.

4. PAVEMENT WAS DESIGNED BY 2" (50MM) DEPTH CONCRETE, BUT IT CAN BE CHANGED IF NEEDED.

5. ALL PT STRANDS SHALL BE 0.6"ϕ LOW RELAXATION STRANDS.

6. UNITS IN ( ) IS THE SI UNIT.

SPECIFICATION AND DESIGN ASSUMPTIONS

1. HIGH PERFORMANCE CONCRETE (UHPC) IS APPLIED TO SUPERSTRUCTURE OF THIS BRIDGE, IT IS DESIGNED TO SATISFY K-UHPC DESIGN STANDARD. AND AASHTO-LRFD STANDARD IS APPLIED TO THE OTHER STRUCTURE DESIGN.

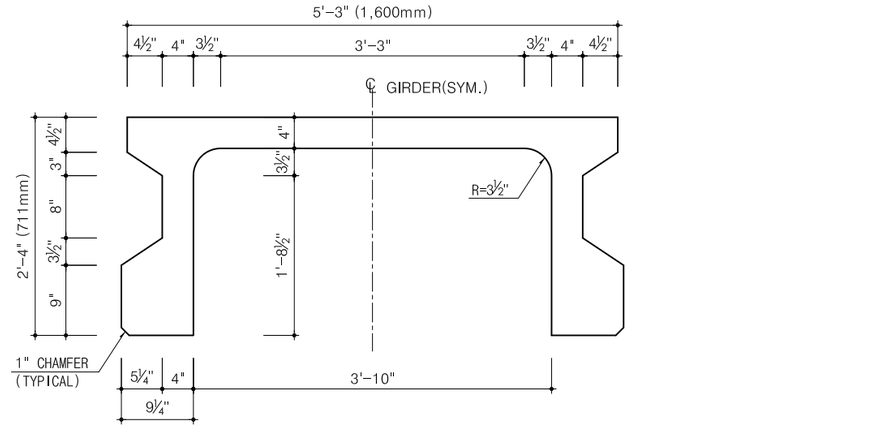
2. THIS BRIDGE IS DESIGNED BY LOAD, FACTORS AND LOAD COMBINATIONS OF AASHTO-LRFD. SERVICE LOAD STRESS CHECKING IS APPLIED TO PC STRUCTURE AND ULTIMATE STRENGTH DESIGN IS APPLIED TO GIRDER DECK AND ABUTMENT.

3. CONCRETE COVER OF THIS BRIDGE SHALL BE THICKER THAN MAXIMUM VALUE BETWEEN 20MM AND 1.5 TIMES OF REBAR DIAMETER ACCORDING TO K-UHPC SPECIFICATION.

4. HEIGHT OF ABUTMENT AND GEOLOGICAL CONDITION FOR PILES ARE ASSUMED. SO IT CAN BE ADJUSTED.

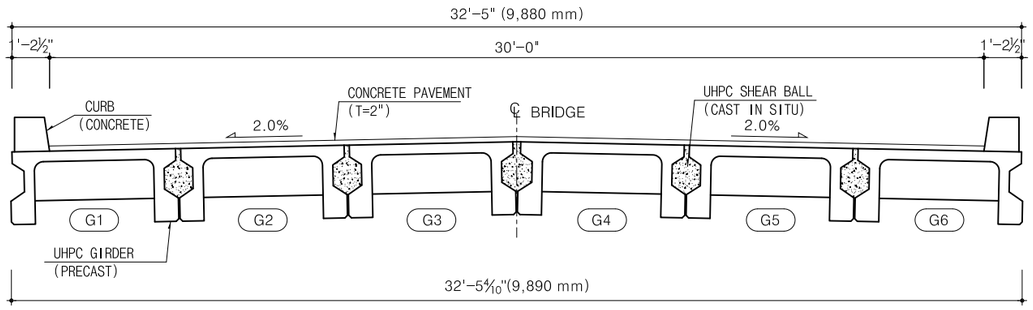
5. SUPPORT SETTLEMENT ARE ASSUMED AS 0.4"(10MM) CONSIDERING SITE CONDITION.

6. THE PRE-CAMBER IS NEGLECTED IN GIRDERS LONGITUDINALLY.



TYPICAL SECTION OF GIRDER UNIT

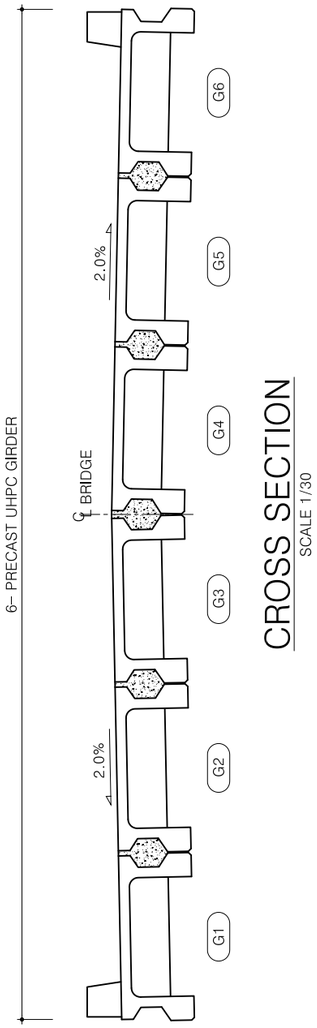
SCALE 1/10



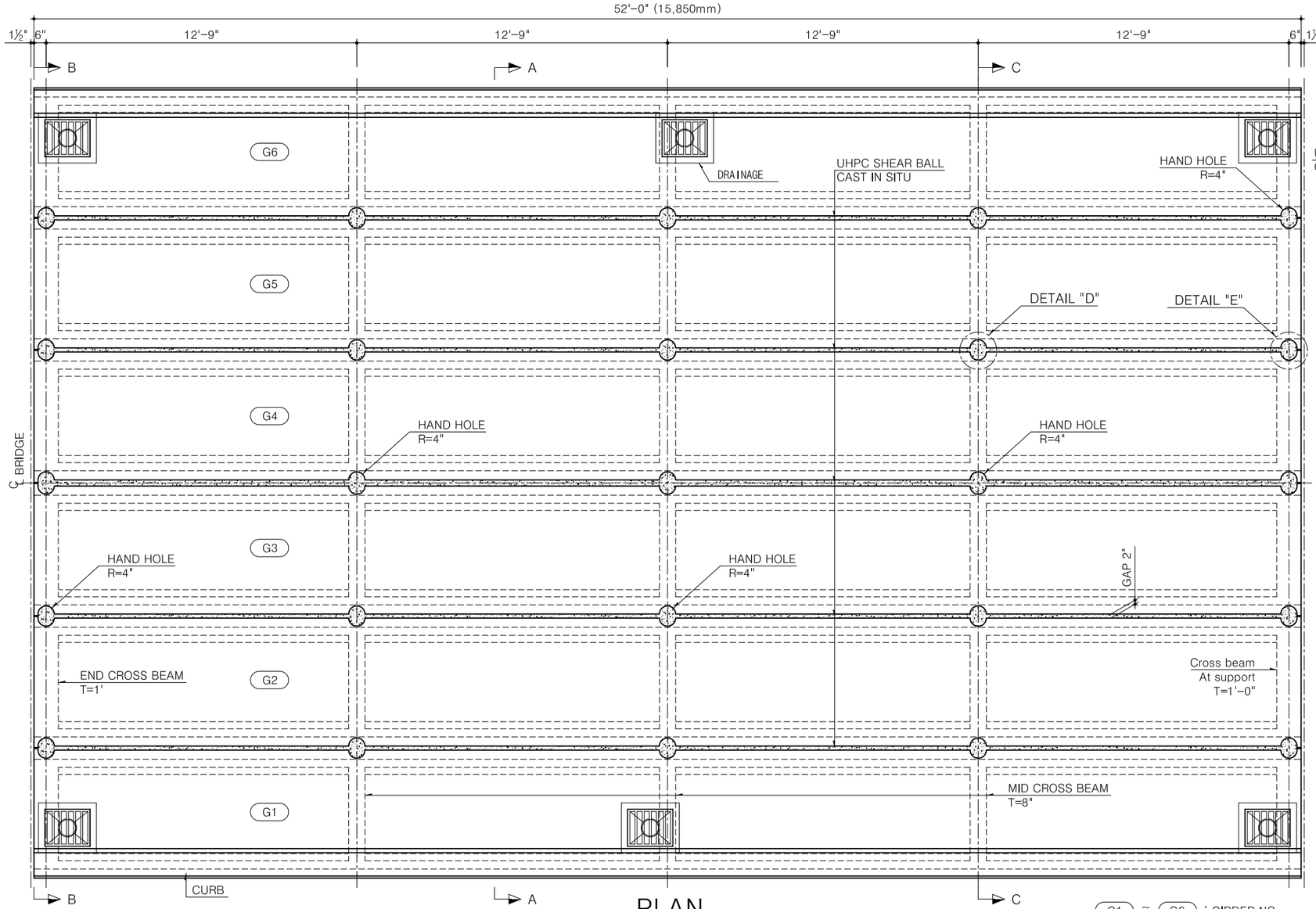
TYPICAL CROSS SECTION

SCALE 1/30

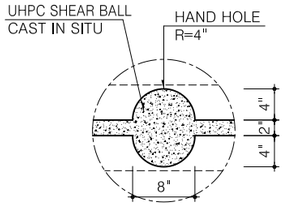
CLIENT	DESIGN PROJECT NAME	CONSULTANT	ENGINEER	DATE	SCALE	DRAWING NAME	DRAWING NO.
KICT KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY	SUPER CONCRETE BRIDGE	DM ENGINEERING Co., Ltd	DESIGNED BY An,Ki-Up Cho,Kyung-Sik DRAWN BY Lee,Sang-Won CHECKED BY Kim,Woo-Jong	AUGUST 2014	AS SHOWN	GENERAL PLAN & PROFILE	D-001



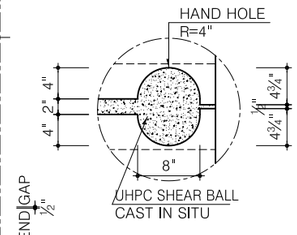
CROSS SECTION
SCALE 1/30



PLAN
SCALE 1/30



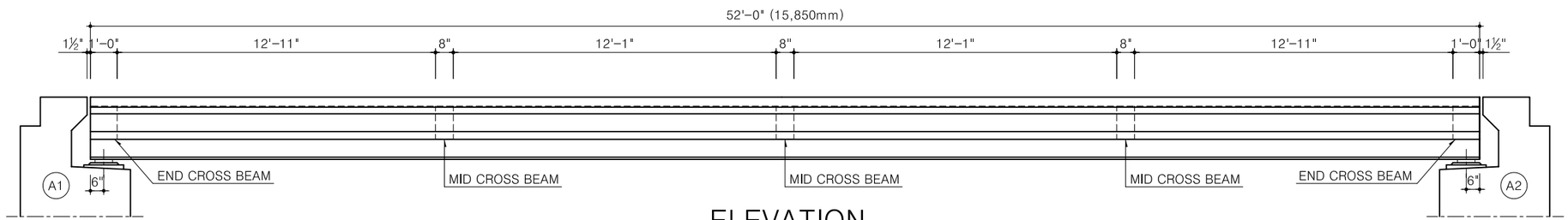
DETAIL D
SCALE 1/15



DETAIL E
SCALE 1/15

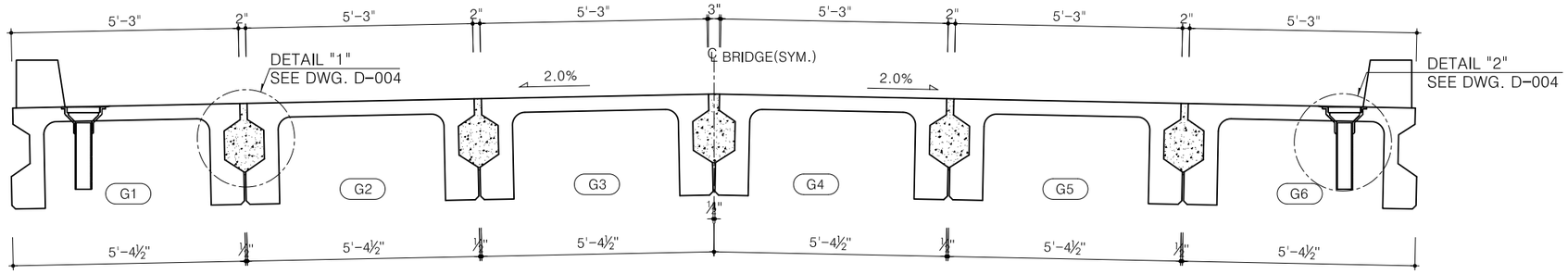
G1 ~ G6 : GIRDER NO.

A1 ~ A2 : ABUTMENT NO.



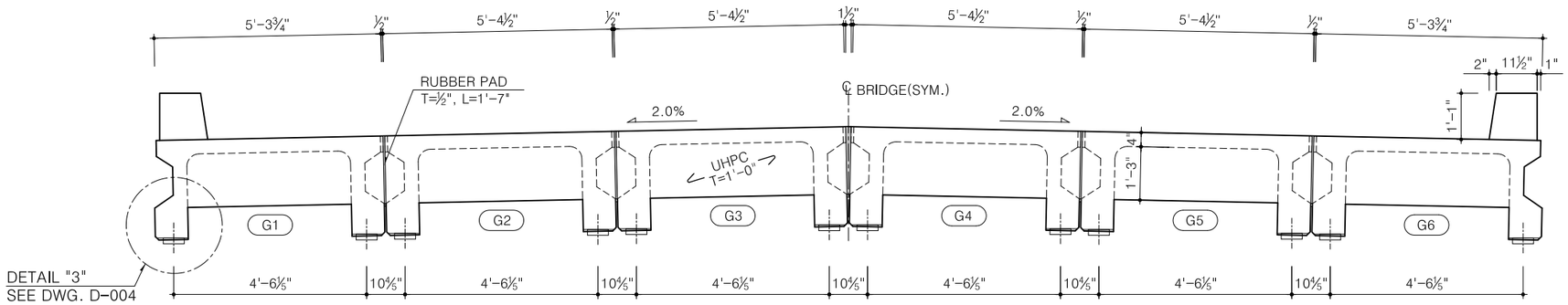
ELEVATION
SCALE 1/30

CLIENT	DESIGN PROJECT NAME	CONSULTANT	ENGINEER	DATE	SCALE	DRAWING NAME	DRAWING NO.
KICT KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY	SUPER CONCRETE BRIDGE	DM ENGINEERING Co., Ltd	DESIGNED BY: An,Ki-Up Cho,Kyung-Sik DRAWN BY: Lee,Sang-Won CHECKED BY: Kim,Woo-Jong	AUGUST 2014	AS SHOWN	GENERAL LAYOUT	D-002



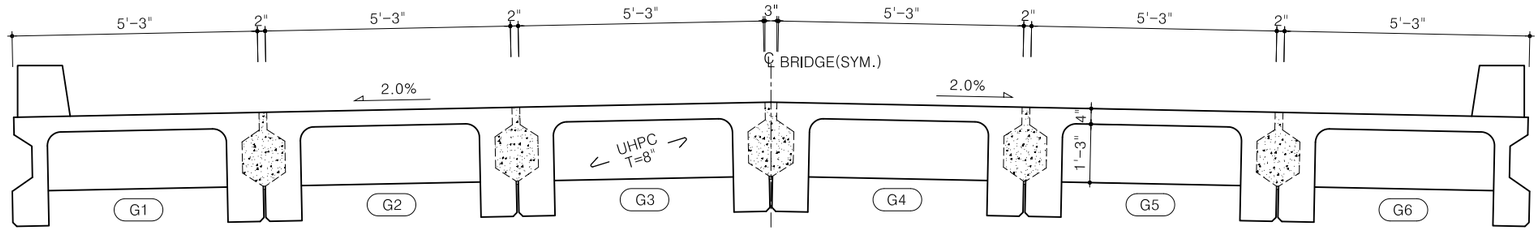
SECTION A

SCALE 1/20
TYPICAL SECTION
SEE DWG. D-002



SECTION B

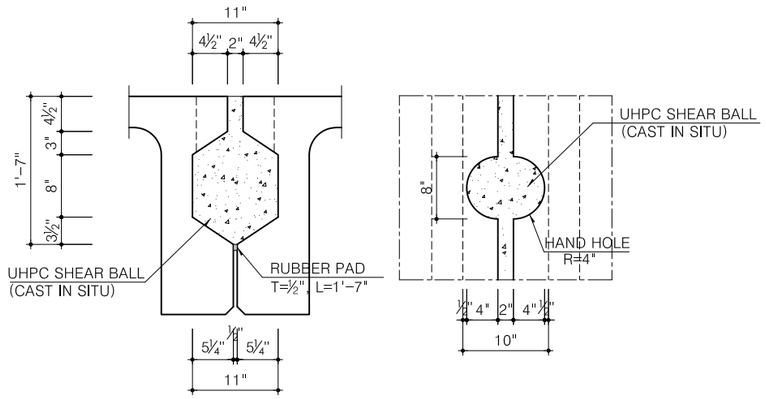
SCALE 1/20
SECTION OF END CROSS BEAM
SEE DWG. D-002



SECTION C

SCALE 1/20
SECTION OF MID CROSS BEAM
SEE DWG. D-002

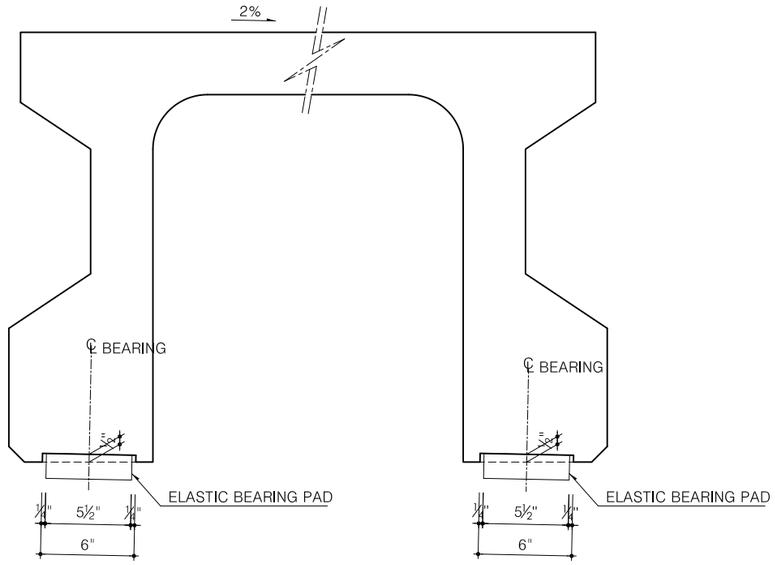
CLIENT	DESIGN PROJECT NAME	CONSULTANT	ENGINEER	DATE	SCALE	DRAWING NAME	DRAWING NO.
KICT KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY	SUPER CONCRETE BRIDGE	DM ENGINEERING Co., Ltd	DESIGNED BY An,Ki-Up Cho,Kyung-Sik DRAWN BY Lee,Sang-Won CHECKED BY Kim,Woo-Jong	AUGUST 2014	AS SHOWN	SECTIONS OF BRIDGE	D-003



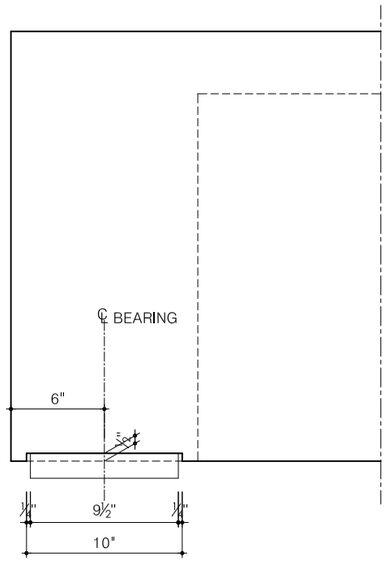
DETAIL 1

SCALE 1/10

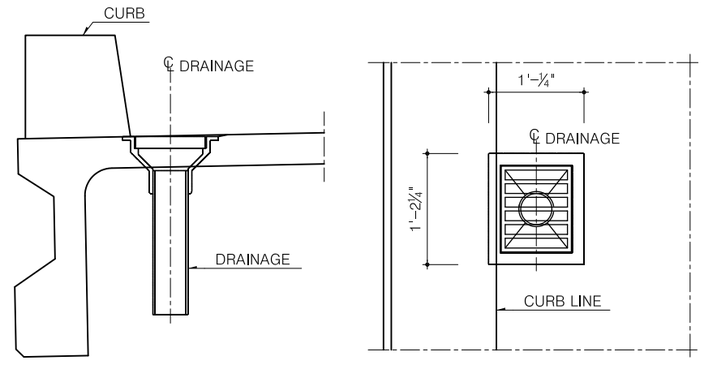
UHPC SHEAR BALL(CAST IN SITU)
SEE DWG. D-003



FRONT VIEW



ELEVATION



* REFER TO DOT BRIDGE STANDARD DRAWING.

FRONT VIEW PLAN

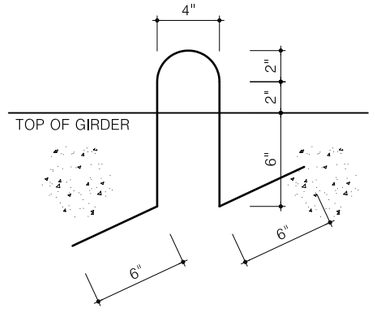
DETAIL 2

SCALE 1/10
DETAIL OF DRAINAGE
SEE DWG. D-003

DETAIL 3

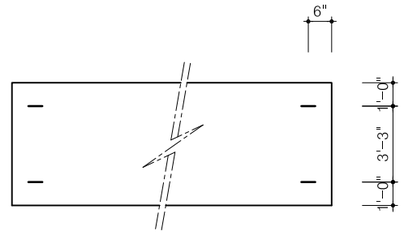
SCALE 1/10

DETAIL OF GIRDER BOTTOM AT BRIDGE SUPPORT
SEE DWG. D-003



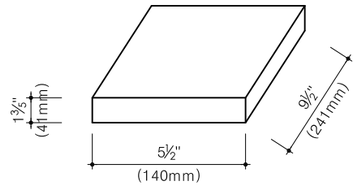
LIFTING LOOP DETAIL

SCALE 1/5



PLAN VIEW

SCALE NONE



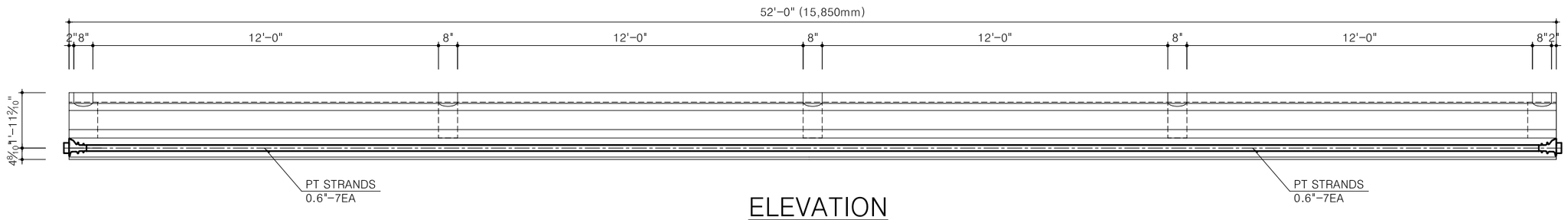
ELASTIC BEARING PAD

SCALE 1/5
FOR GENERAL NOTES SEE DWG. D-001

LIFTING LOOP

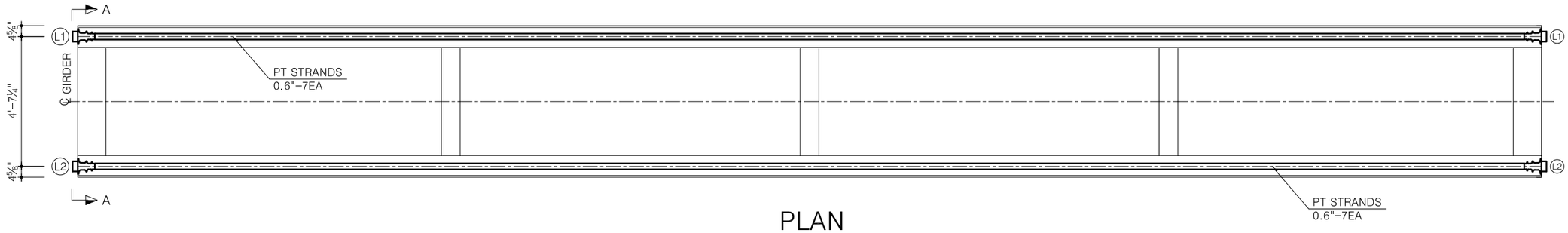
- GRADE 58 ksi REINFORCING BAR #4
- MINIMUM OF 4 LIFTING LOOPS

CLIENT	DESIGN PROJECT NAME	CONSULTANT	ENGINEER	DATE	SCALE	DRAWING NAME	DRAWING NO.
KICT KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY	SUPER CONCRETE BRIDGE	DM ENGINEERING Co., Ltd	DESIGNED BY An,Ki-Up Cho,Kyung-Sik DRAWN BY Lee,Sang-Won CHECKED BY Kim,Woo-Jong	AUGUST 2014	AS SHOWN	MISCELLANEOUS DETAILS	D-004



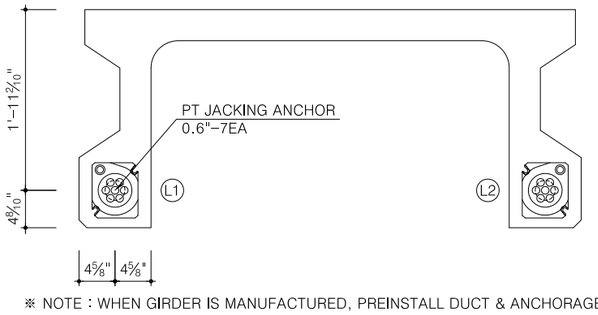
ELEVATION

SCALE 1/25



PLAN

SCALE 1/25

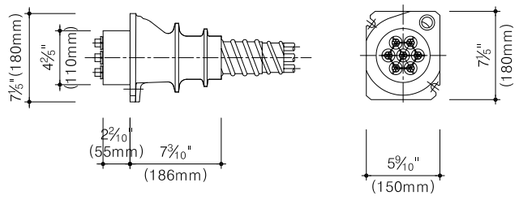


※ NOTE : WHEN GIRDER IS MANUFACTURED, PREINSTALL DUCT & ANCHORAGE.

VIEW A

SCALE 1/10

CROSS SECTION AT ANCHORAGE
FOR REINFORCEMENT SEE DWG. D-007



ANCHORAGE DETAILS

SCALE NONE

PT TABLE

(FOR EACH GIRDER)

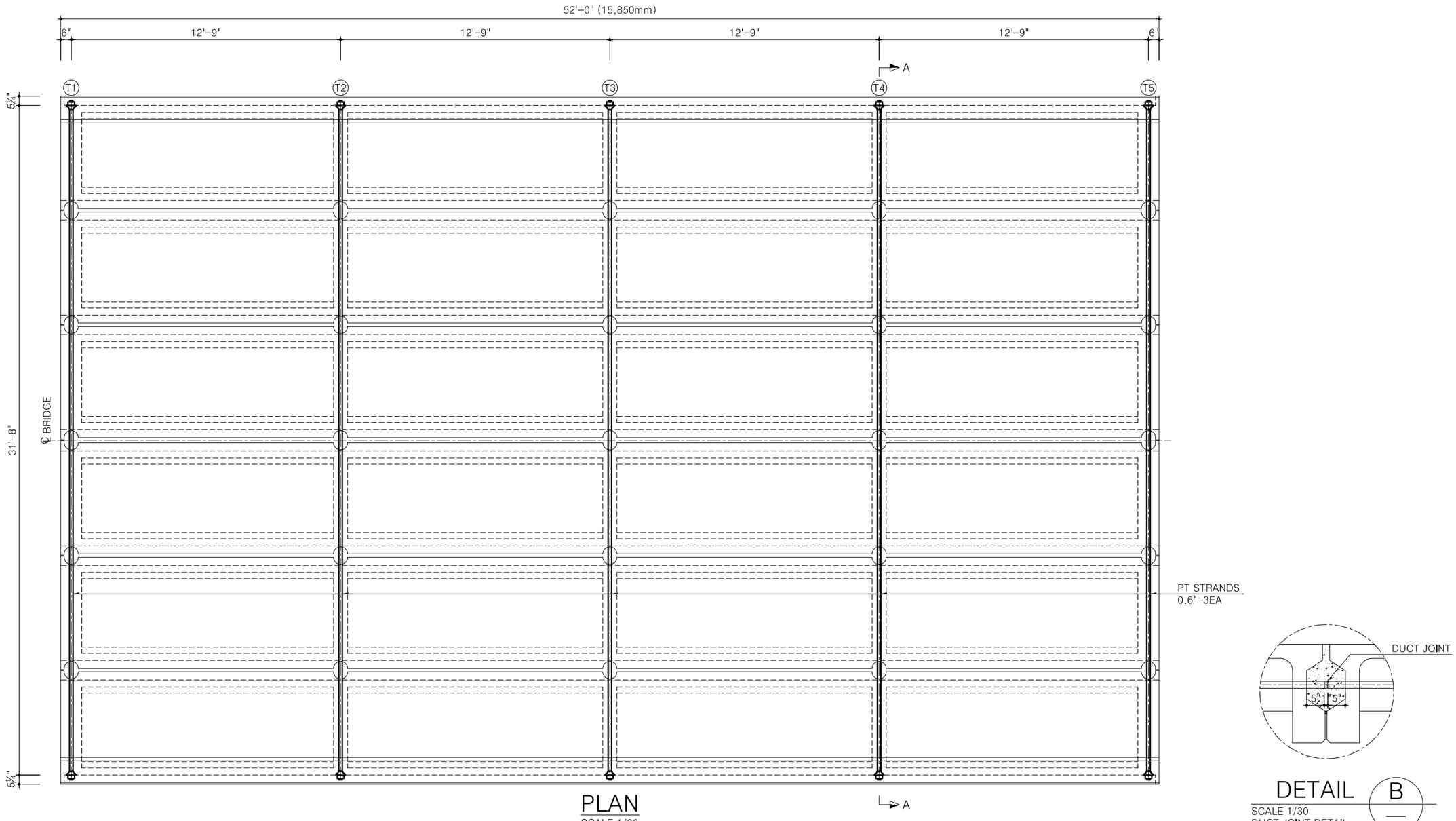
NO OF TENDON	STRANDS SIZE	TOTAL LENGTH OF STRANDS ft-in(m)	TOTAL LENGTH OF DUCT ft-in(m)	TENSIONING FORCE kips(kN)
L1	0.6"-7EA	56'-7 1/8"(17.25m)	52'-0"(17.25m)	295.4(1314)
L2	0.6"-7EA	56'-7 1/8"(17.25m)	52'-0"(17.25m)	295.4(1314)

* PT : POST-TENSIONING

POST-TENSIONING NOTES

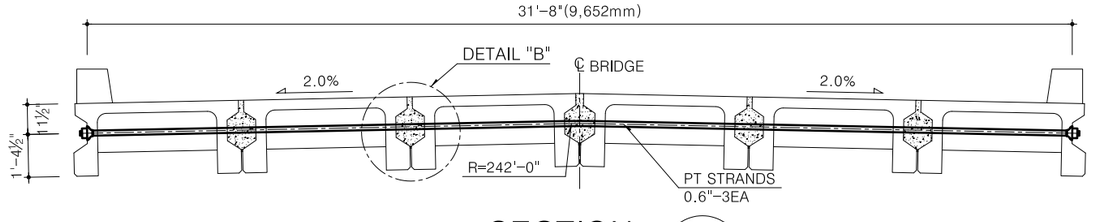
1. THE MINIMUM COMPRESSIVE STRENGTH OF THE GIRDERS AT THE TIME OF POST-TENSIONING SHALL BE 26.1 ksi (180 MPa).
2. THE DESIGN IS BASED ON 0.6'' DIAMETER LOW RELAXATION STRANDS WITH A JACKING LOAD FOR EACH GIRDER AS SHOWN IN THE POST-TENSIONING TABLE, AN ANCHOR SET OF CURVATURE FRICTION COEFFICIENT, C=0.15 AND A WOBBLE FRICTION COEFFICIENT, k=0.00046/ft (0.0015/m). THE ACTUAL ANCHOR SET USED BY THE CONTRACTOR SHALL BE SPECIFIED IN THE SHOP PLANS AND INCLUDED IN THE TRANSFER FORCE CALCULATIONS.
3. THE MAXIMUM "DRAW-IN" ALLOWANCE ON ANY STRAND AT LIVE END ANCHORAGE, ON RELEASE OF THE JACK IS TO BE 0.24'' (6mm).

CLIENT	DESIGN PROJECT NAME	CONSULTANT	ENGINEER	DATE	SCALE	DRAWING NAME	DRAWING NO.
KICT KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY	SUPER CONCRETE BRIDGE	DM ENGINEERING Co., Ltd	DESIGNED BY An,Ki-Up Cho,Kyung-Sik DRAWN BY Lee,Sang-Won CHECKED BY Kim,Woo-Jong	AUGUST 2014	AS SHOWN	LONGITUDINAL PT LAYOUT	D-005

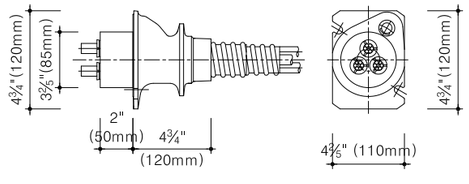


PLAN
SCALE 1/30

DETAIL B
SCALE 1/30
DUCT JOINT DETAIL



SECTION A
SCALE 1/30



ANCHORAGE DETAILS
SCALE NONE

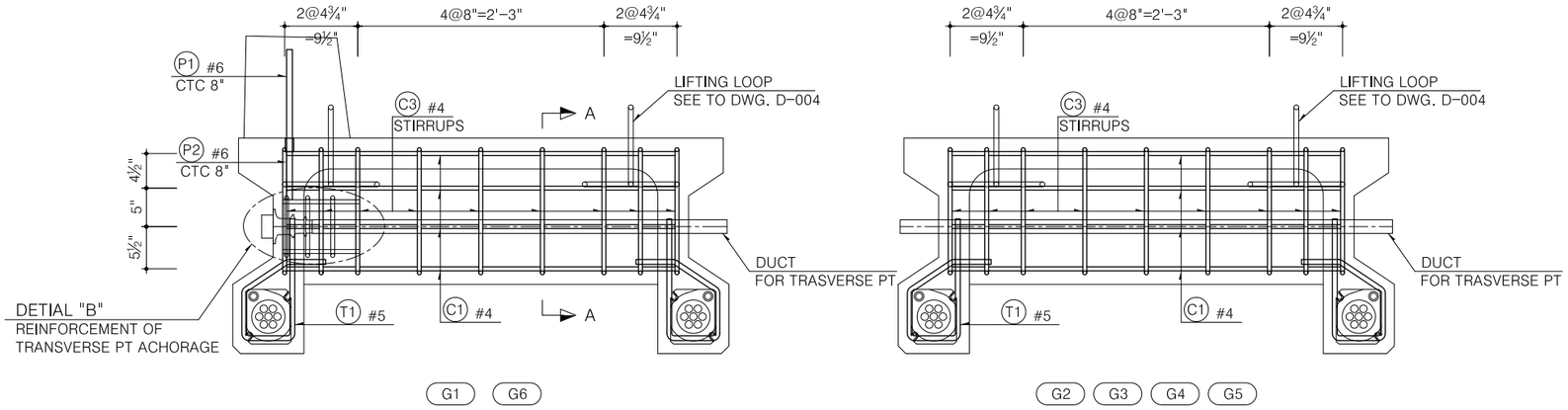
PT TABLE

(FOR EACH GIRDER)

NO OF TENDON	STRANDS SIZE	TOTAL LENGTH OF STRANDS ft-in(m)	TOTAL LENGTH OF DUCT ft-in(m)	TEMSIONING FORCE kips(kN)
T1~T5	0.6"-3EA	36'-3"(11.05m)	31'-8"(9.65m)	105.5(469.4)

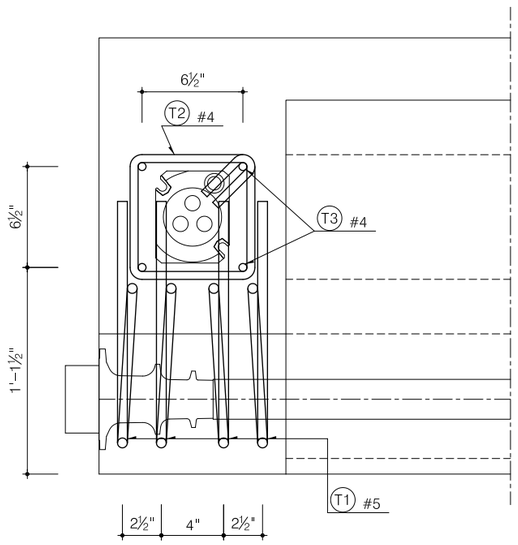
* PT : POST-TENSIONING

CLIENT	DESIGN PROJECT NAME	CONSULTANT	ENGINEER	DATE	SCALE	DRAWING NAME	DRAWING NO.
KICT KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY	SUPER CONCRETE BRIDGE	DM ENGINEERING Co., Ltd	DESIGNED BY An,Ki-Up Cho,Kyung-Sik DRAWN BY Lee,Sang-Won CHECKED BY Kim,Woo-Jong	AUGUST 2014	1:30	TRANSVERSE PT LAYOUT	D-006



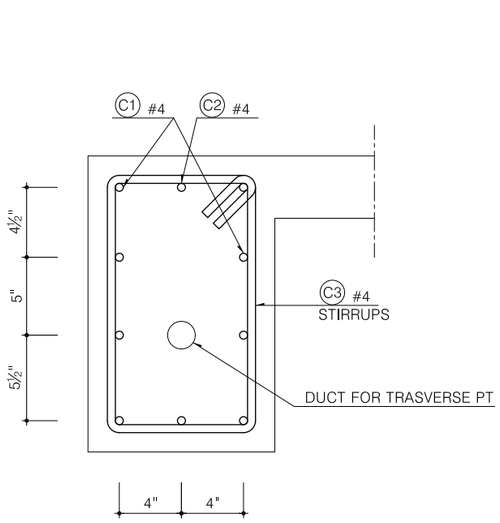
FRONT VIEW AT END CROSS BEAM

SCALE 1/10



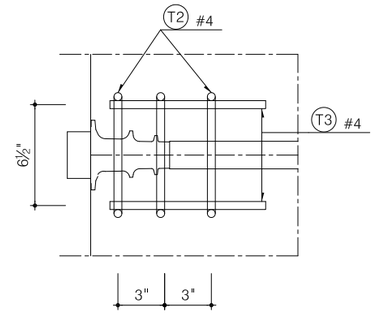
LONGITUDINAL PT ACHORAGE

SCALE 1/5



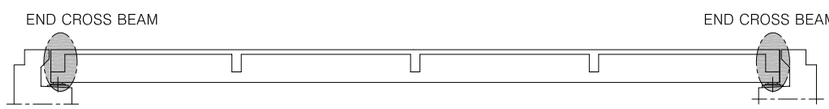
SECTION A

SCALE 1/5



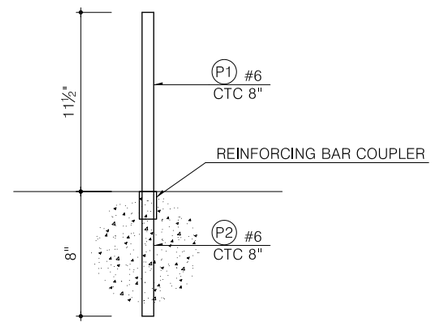
DETAIL B

SCALE 1/5



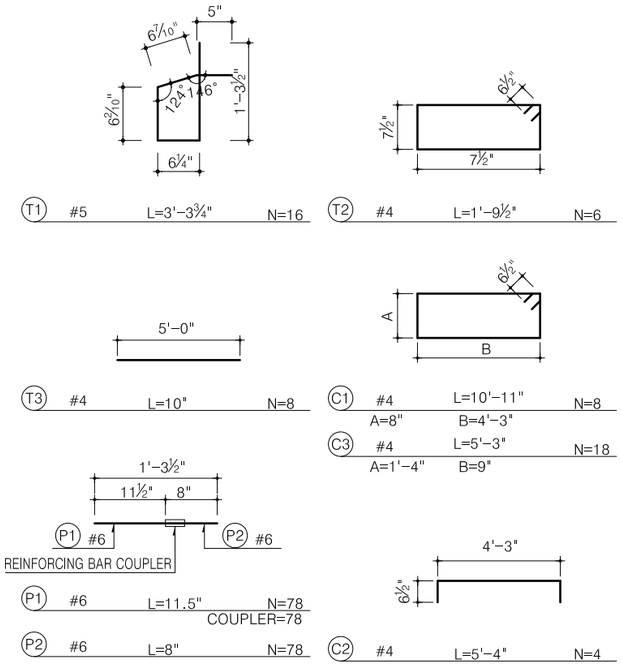
KEY MAP

SCALE NONE



REINFORCEMENT OF CURB

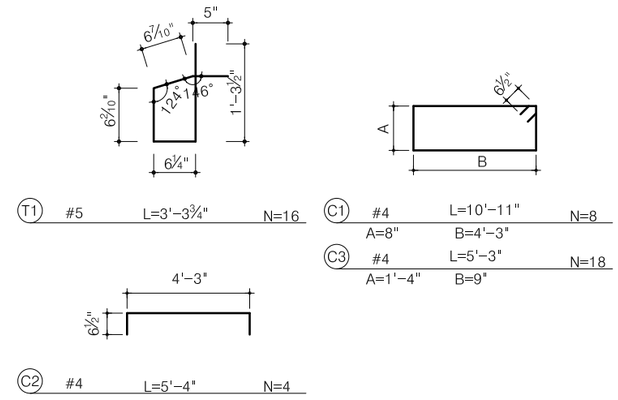
SCALE 1/5



REINFORCING BAR LIST (G1, G6)

PER GIRDER

SCALE NONE

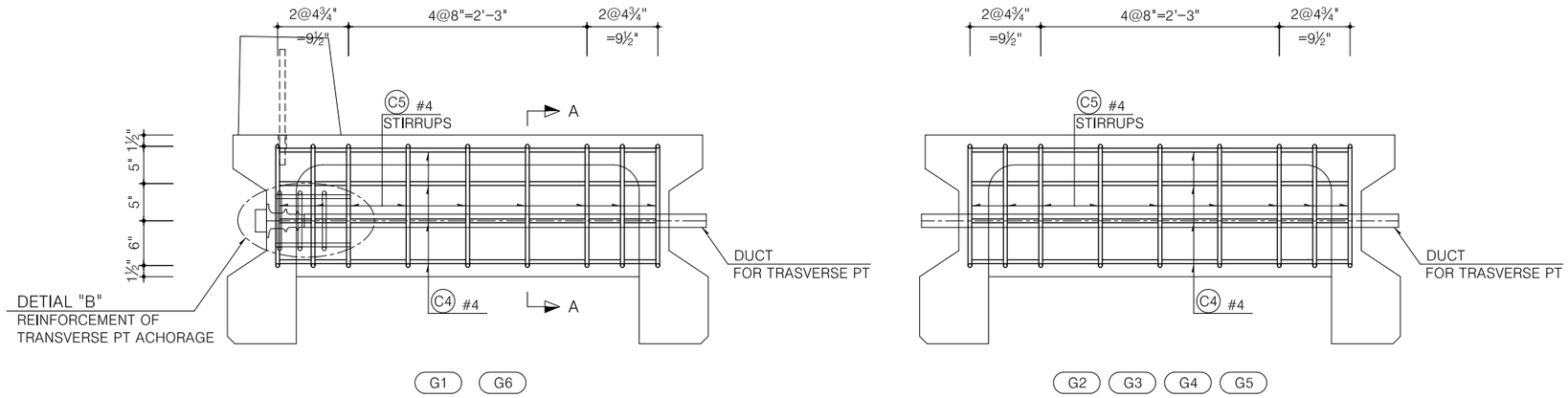


REINFORCING BAR LIST (G2~G5)

PER GIRDER

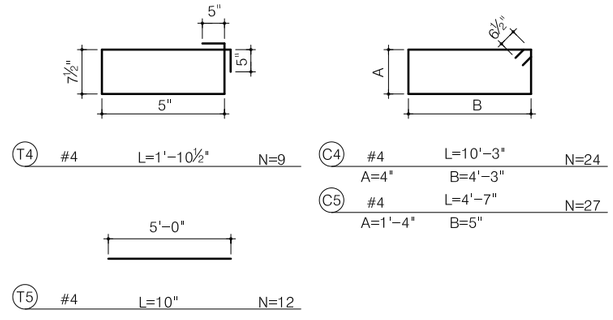
SCALE NONE

CLIENT	DESIGN PROJECT NAME	CONSULTANT	ENGINEER	DATE	SCALE	DRAWING NAME	DRAWING NO.
KICT KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY	SUPER CONCRETE BRIDGE	DM ENGINEERING Co., Ltd	DESIGNED BY An,Ki-Up Cho,Kyung-Sik DRAWN BY Lee,Sang-Won CHECKED BY Kim,Woo-Jong	AUGUST 2014	AS SHOWN	REINFORCEMENT OF END CROSS BEAM	D-007



FRONT VIEW AT MID CROSS BEAM

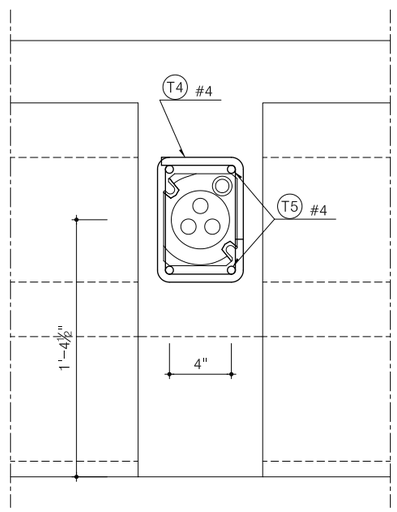
SCALE 1/10



REINFORCING BAR LIST (G1, G6)

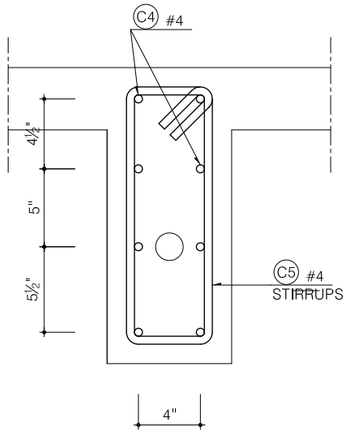
PER GIRDER

SCALE NONE



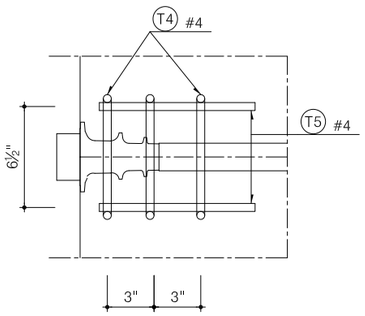
TRANSVERSE PT ACHORAGE

SCALE 1/5



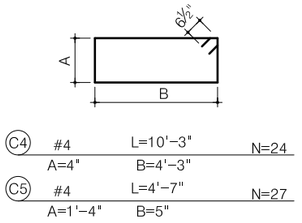
SECTION A

SCALE 1/5



DETAIL B

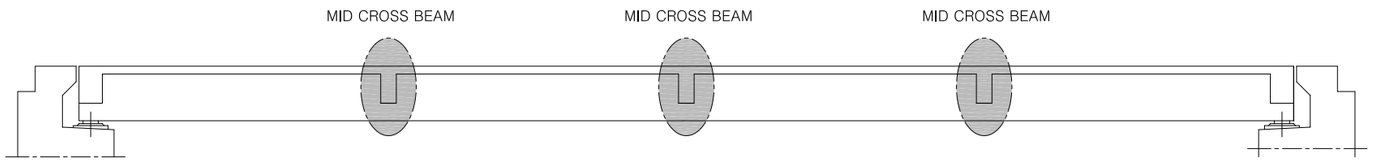
SCALE 1/5



REINFORCING BAR LIST (G2~G5)

PER GIRDER

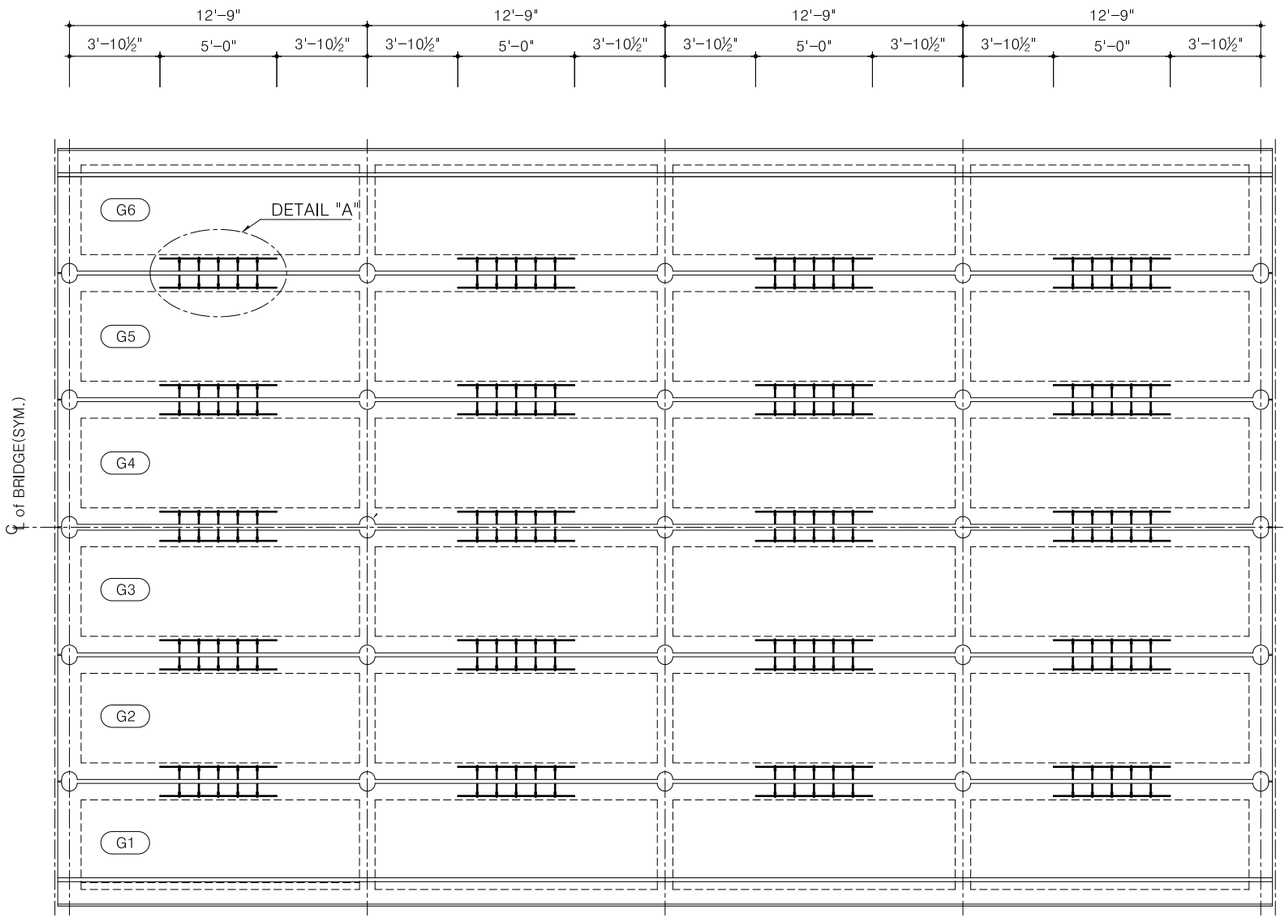
SCALE NONE



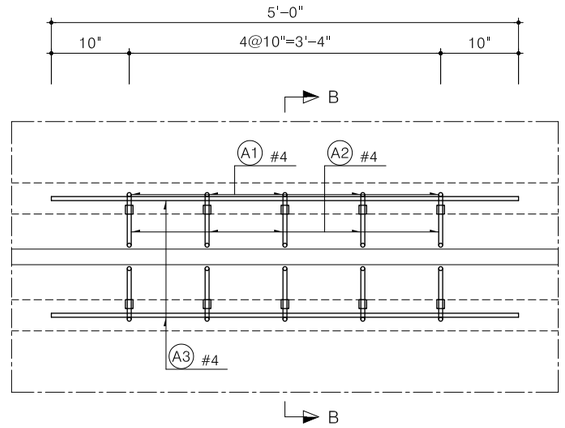
KEY MAP

SCALE NONE

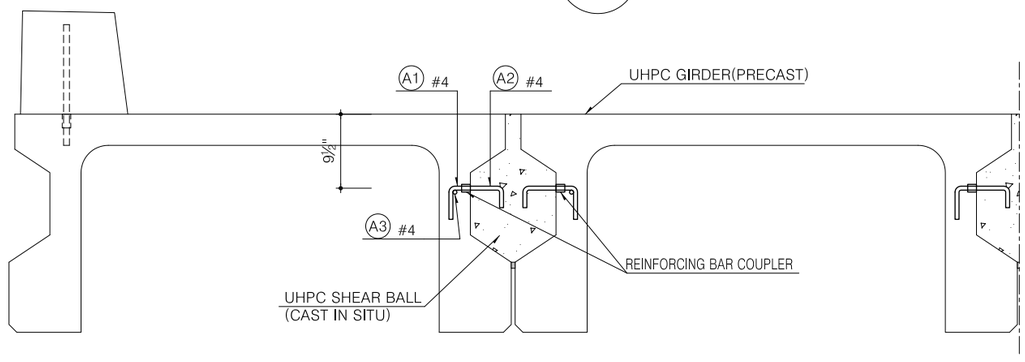
CLIENT	DESIGN PROJECT NAME	CONSULTANT	ENGINEER	DATE	SCALE	DRAWING NAME	DRAWING NO.
KICT KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY	SUPER CONCRETE BRIDGE	DM ENGINEERING Co., Ltd	DESIGNED BY An,Ki-Up Cho,Kyung-Sik DRAWN BY Lee,Sang-Won CHECKED BY Kim,Woo-Jong	AUGUST 2014	AS SHOWN	REINFORCEMENT OF MID CROSS BEAM	D-008



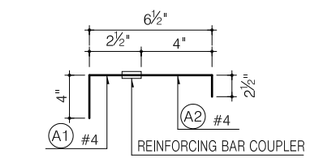
PLAN
SCALE 1/40



DETAIL A
SCALE 1/10

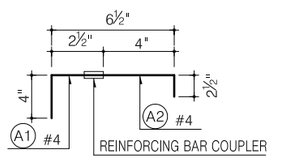


SECTION B
SCALE 1/10



A1 #4	L=6.5"	N=20	COUPLER=20
A2 #4	L=6.5"	N=20	* ASSEMBLED IN THE FIELD
A3 #4	L=5'-0"	N=4	

REINFORCING BAR LIST
PER GIRDER
(G1, G6)
SCALE NONE



A1 #4	L=6.5"	N=40	COUPLER=40
A2 #4	L=6.5"	N=40	* ASSEMBLED IN THE FIELD
A3 #4	L=5'-0"	N=8	

REINFORCING BAR LIST
PER GIRDER
(G2~G5)
SCALE NONE

CLIENT	DESIGN PROJECT NAME	CONSULTANT	ENGINEER	DATE	SCALE	DRAWING NAME	DRAWING NO.
KICT KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY	SUPER CONCRETE BRIDGE	DM ENGINEERING Co., Ltd	DESIGNED BY An,Ki-Up Cho,Kyung-Sik DRAWN BY Lee,Sang-Won CHECKED BY Kim,Woo-Jong	AUGUST 2014	AS SHOWN	REINFORCEMENT OF SHEAR BALL	D-009