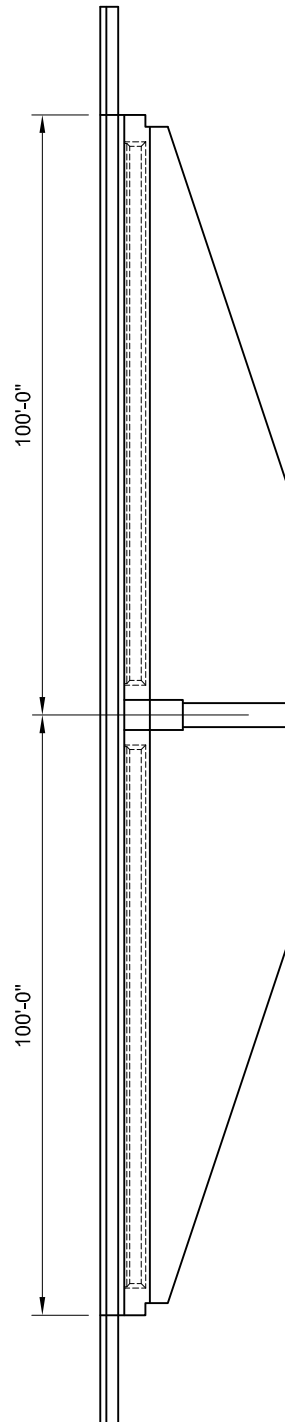


SD Attachments

Specimen Drawings

- Attachment SD1: Nonintegral Prototype Drawings
 - Design drawings for nonintegral prototype structure
- Attachment SD2: Cast-in-place Specimen Drawings
 - Design drawings for cast-in-place specimen
- Attachment SD3: Grouted Duct Specimen Drawings
 - Design drawings for grouted duct specimen
- Attachment SD4: Cap Pocket Full Ductility Specimen Drawings
 - Design drawings for cap pocket full ductility specimen
- Attachment SD5: Cap Pocket Limited Ductility Specimen Drawings
 - Design drawings for cap pocket limited ductility specimen
- Attachment SD6: Conventional Hybrid Specimen Drawings
 - Design drawings for conventional hybrid specimen
- Attachment SD7: Concrete Filled Pipe Hybrid Specimen Drawings
 - Design drawings for concrete filled pipe hybrid specimen
- Attachment SD8: Dual Steel Shell Hybrid Specimen Drawings
 - Design drawings for dual steel shell hybrid specimen
- Attachment SD9: Integral Specimen Drawings
 - Design drawings for integral hybrid specimen



ELEVATION



SACRAMENTO
STATE

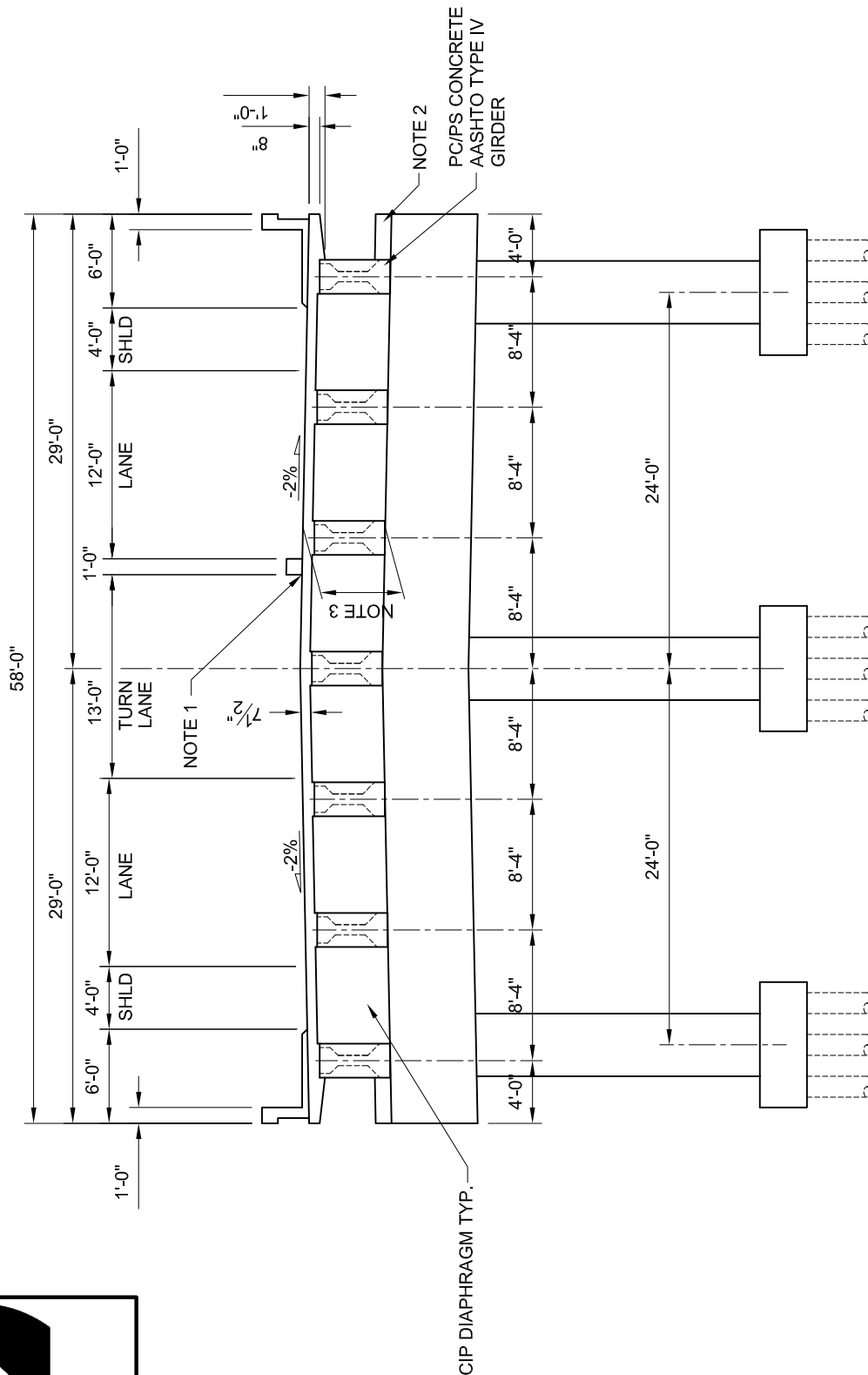
NCHRP PROJECT 12-74

ELEVATION

SEISMICITY: HIGH	SUPER. CONNECTION: NON-INTEGRAL	CONNECTION DETAIL: CAST-IN-PLACE PROTOTYPE
BY: WRIGHT	CHK:	DATE: 07/26/06
SCALE: 1/32" = 1'-0"	SHEET: 1	



SACRAMENTO
STATE



NOTES:

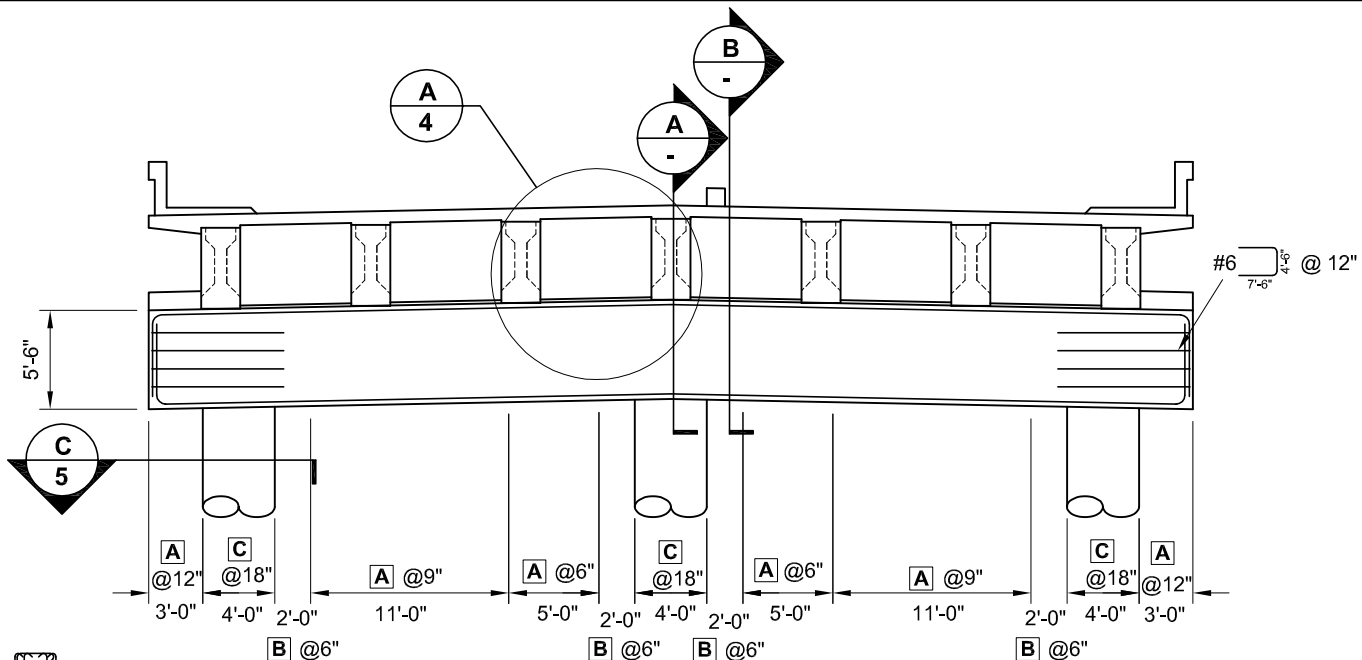
1. PROFILE GRADE ELEVATION AT ∇ BENT IS 100.00
2. OPTIONAL SHEAR KEY TO BE CONSTRUCTED AFTER GIRDER ERECTION
3. HEIGHT VARIES FROM 5'-1 1/2" AT ∇ BRG. TO 5'-3 1/2" AT MIDSPAN

TYPICAL SECTION

NCHRP PROJECT 12-74

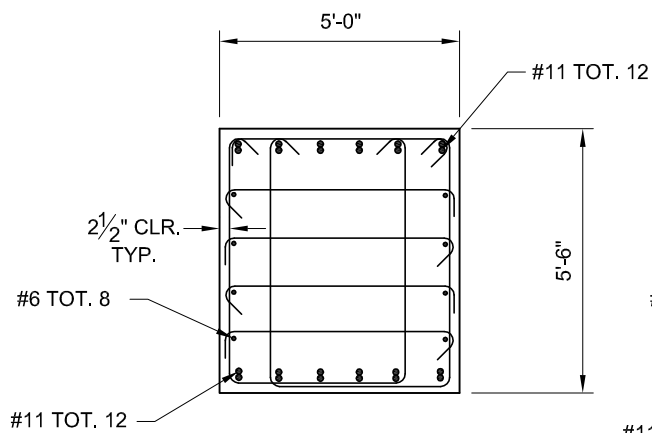
TYPICAL SECTION

SEISMICITY: HIGH	SUPER. CONNECTION: NON-INTEGRAL	CONNECTION DETAIL: CAST-IN-PLACE PROTOTYPE
BY: WRIGHT	CHK:	DATE: 07/26/06
SCALE: 3/32" = 1'-0"	SHEET: 2	

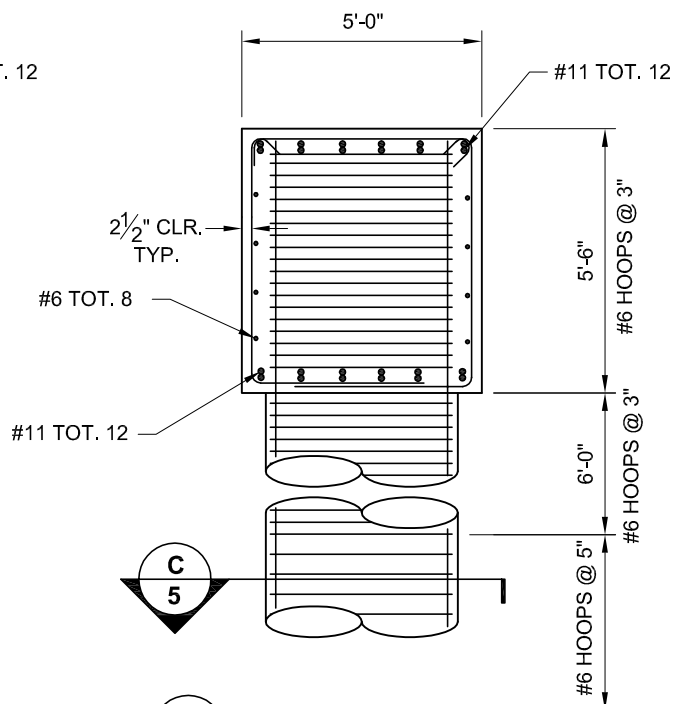


- A** #6 STIRRUP
- B** #6 JOINT SHEAR REINFORCEMENT
- C** #6 STIRRUP

BENT ELEVATION
SCALE: 3/32" = 1'-0"



BENT SECTION
SCALE: 1/4" = 1'-0"



BENT SECTION
SCALE: 1/4" = 1'-0"

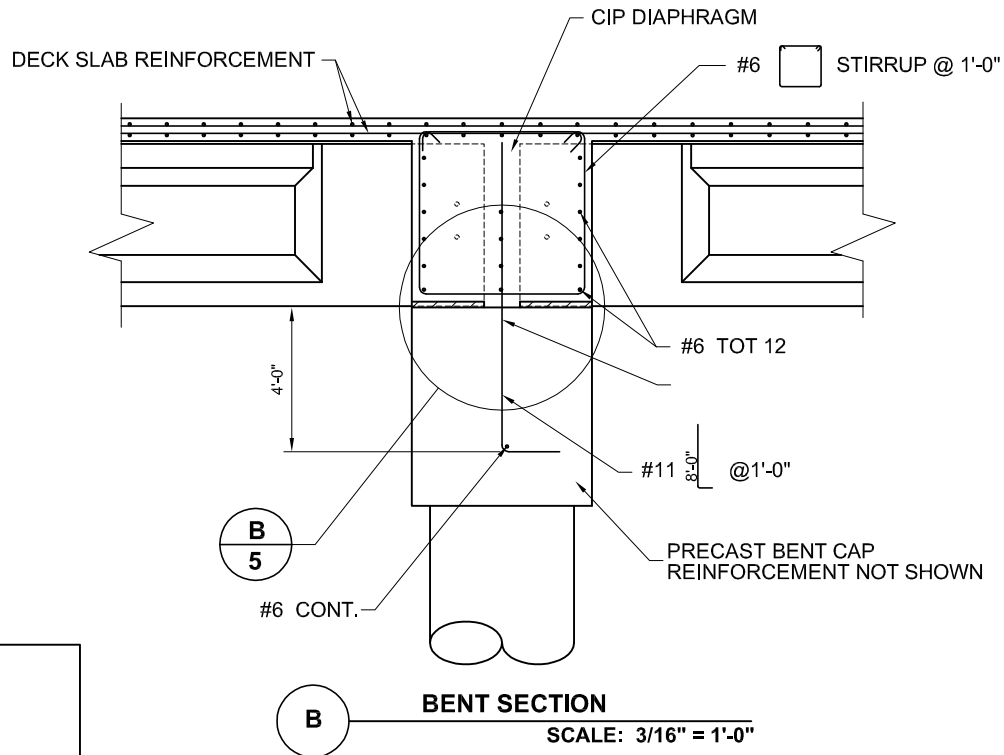
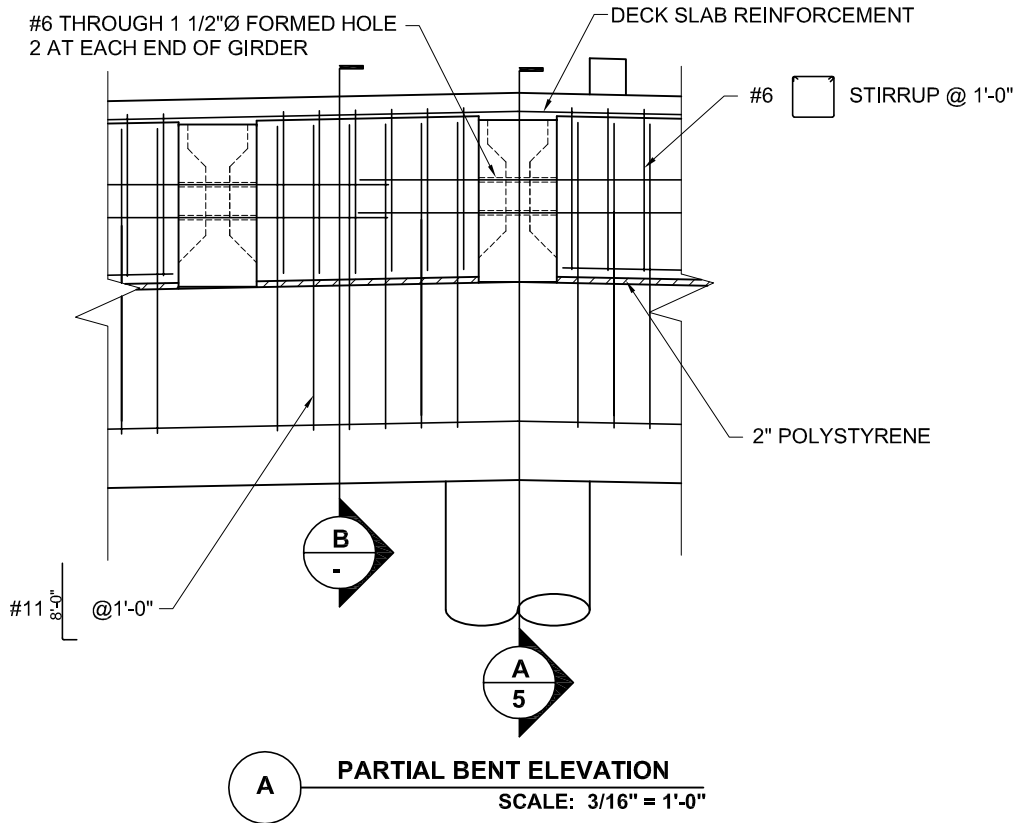


**SACRAMENTO
STATE**

NCHRP PROJECT 12-74

BENT DETAILS No. 1

SEISMICITY: HIGH	SUPER. CONNECTION: NON-INTEGRAL	CONNECTION DETAIL: CAST-IN-PLACE PROTOTYPE
BY: WRIGHT	CHK:	DATE: 07/26/06
SCALE: VARIES	SHEET: 3	

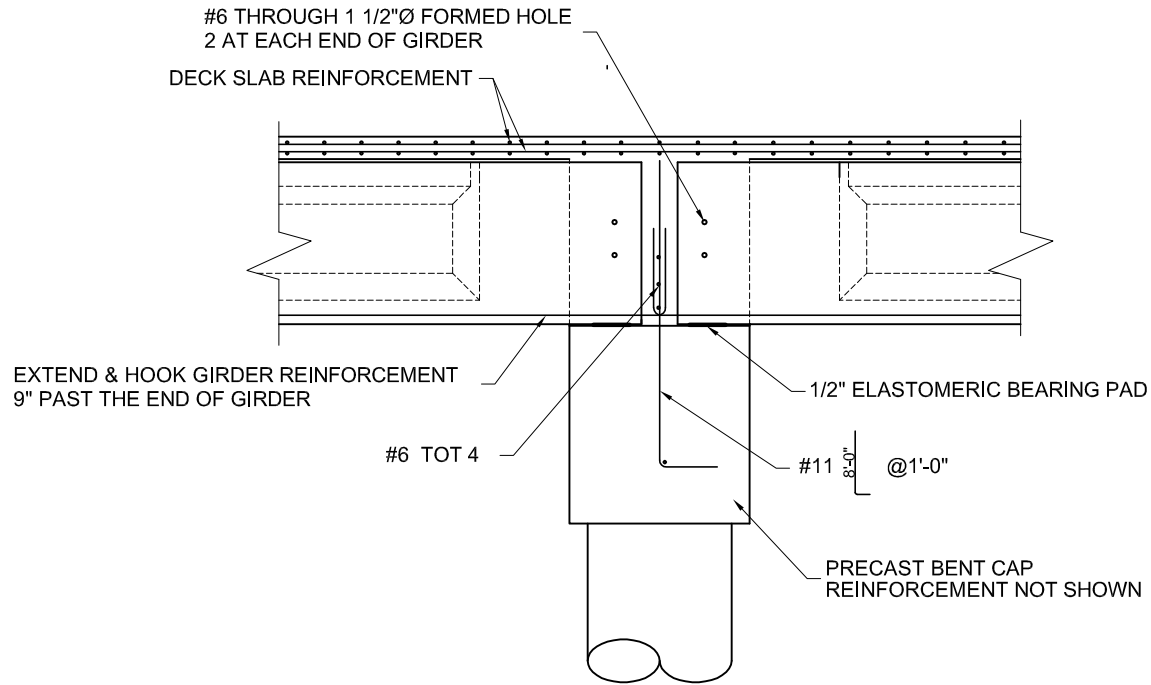


SACRAMENTO
STATE

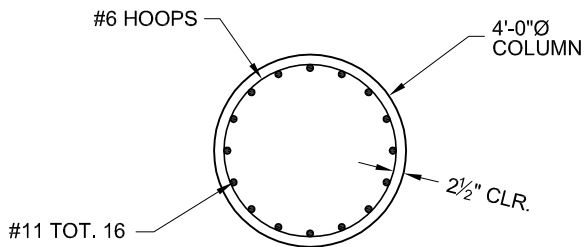
NCHRP PROJECT 12-74

BENT DETAILS No. 2

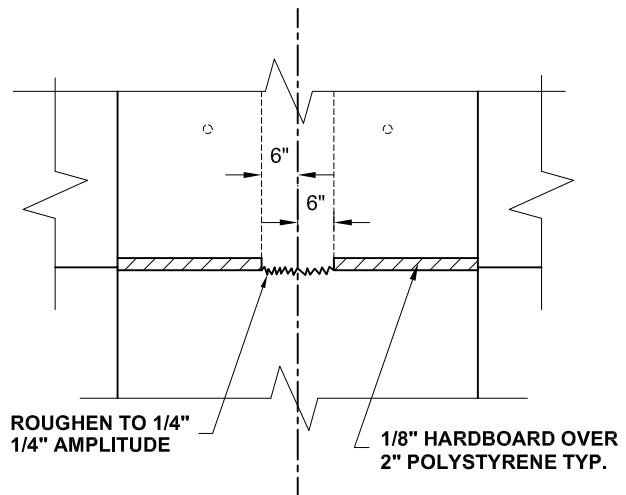
SEISMICITY: HIGH	SUPER. CONNECTION: NON-INTEGRAL	CONNECTION DETAIL: CAST-IN-PLACE PROTOTYPE
BY: WRIGHT	CHK:	DATE: 07/26/06
SCALE: VARIES	SHEET: 4	



A BENT SECTION
SCALE: 3/16" = 1'-0"



C COLUMN SECTION
SCALE: 3/16" = 1'-0"



B PIN DETAIL
SCALE: 1/2" = 1'-0"



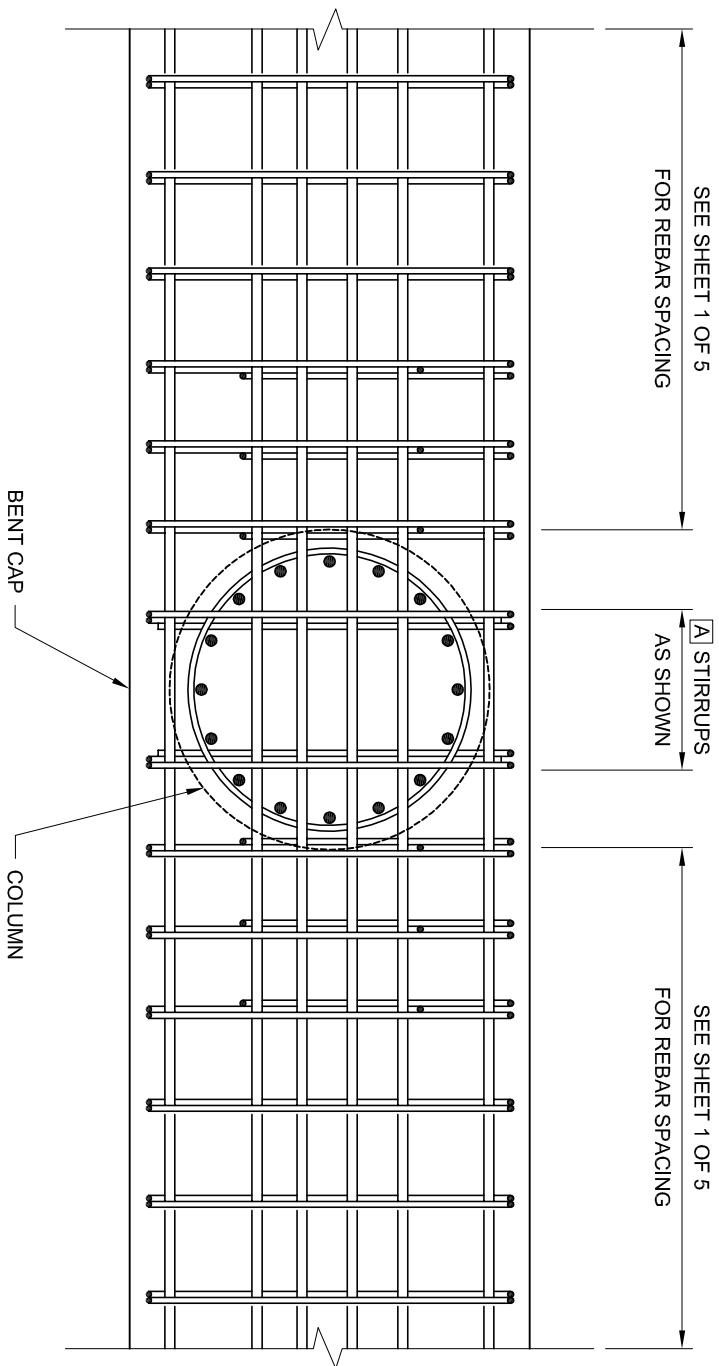
**SACRAMENTO
STATE**

NCHRP PROJECT 12-74

BENT DETAILS No. 3

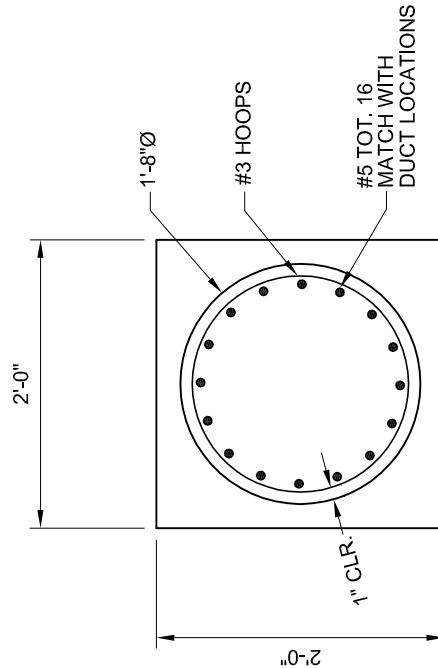
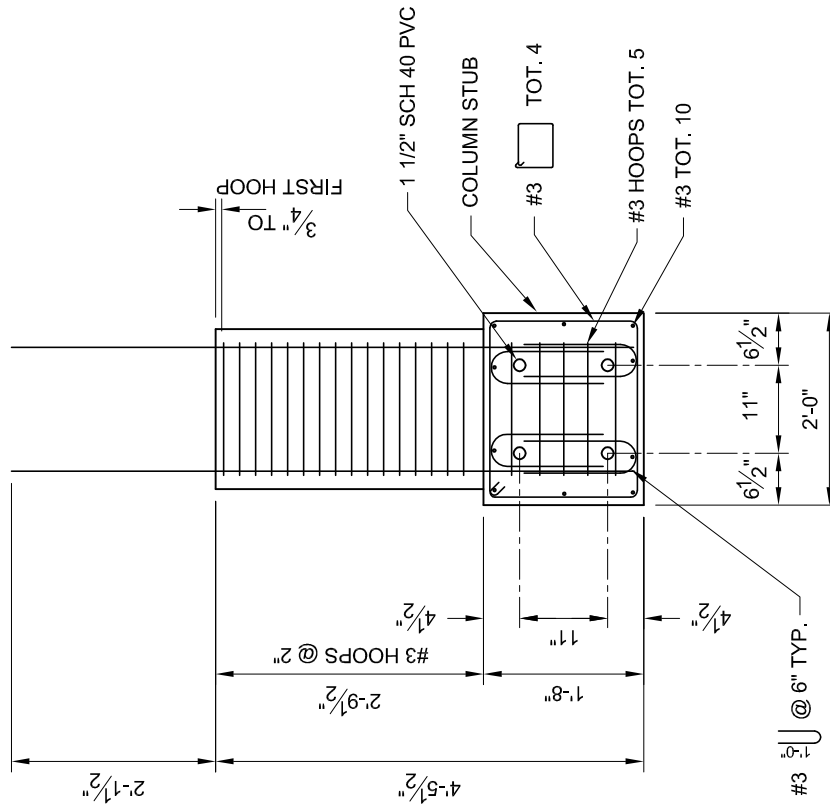
SEISMICITY: HIGH	SUPER. CONNECTION: NON-INTEGRAL	CONNECTION DETAIL: CAST-IN-PLACE PROTOTYPE
BY: WRIGHT	CHK:	DATE: 07/26/06
SCALE: VARIES	SHEET: 5	

BY: JW		CHK: AW	DATE: 08/21/09	SCALE: 1" = 1'-0"	SHEET: 3
SEISMICITY: HIGH		SUPER. CONNECTION: NON-INTEGRAL		CONNECTION DETAIL: CAST-IN-PLACE SPECIMEN	
REINFORCEMENT DETAIL					
NCHRP PROJECT 12-74					



NOTE:
1. ALL REINFORCEMENT NOT SHOWN FOR CLARITY

A REINFORCEMENT DETAIL
SCALE: 1" = 1'-0"

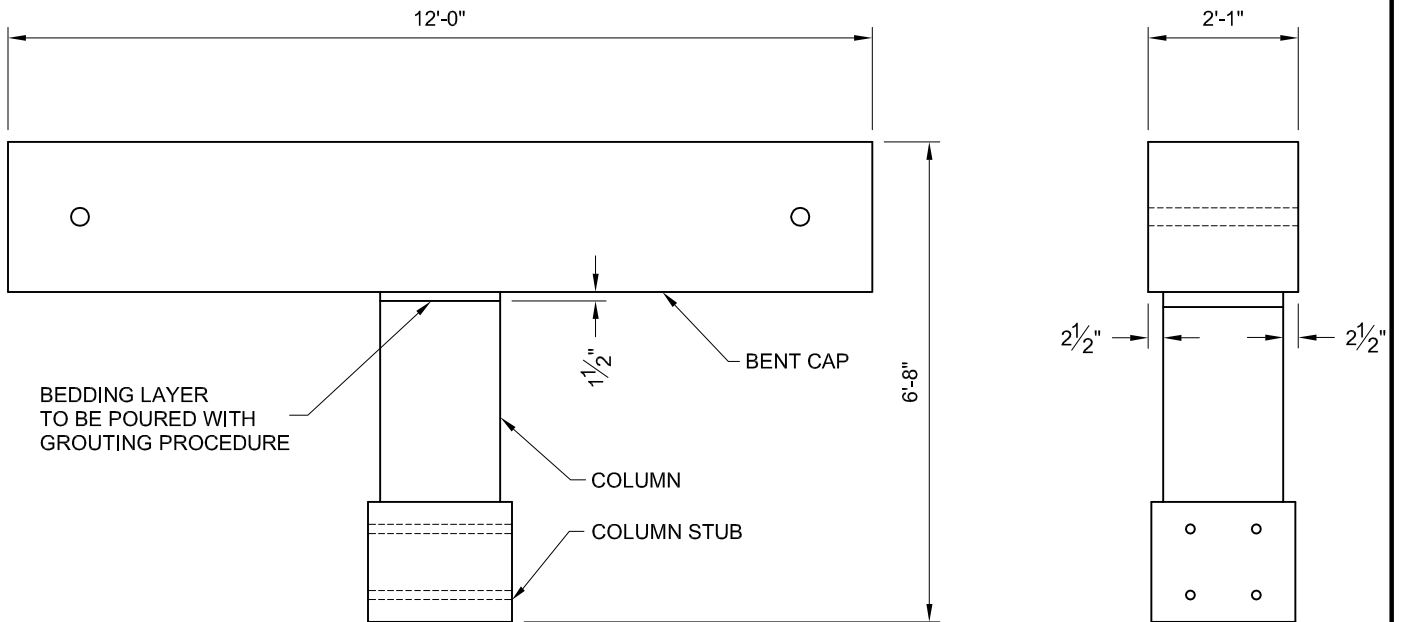


B COLUMN SECTION
SCALE: 1/2" = 1'-0"

A COLUMN SECTION
SCALE: 3/4" = 1'-0"

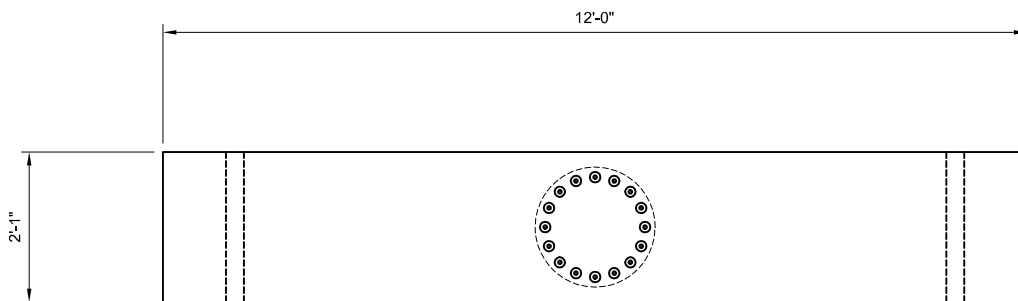
NCHRP PROJECT 12-74 **COLUMN ELEVATION & SECTION**

SEISMICITY: HIGH		SUPER. CONNECTION: NON-INTEGRAL		CONNECTION DETAIL: GROUTED DUCT SPECIMEN		
BY: JW	CHK: AW	DATE: 08/21/09	SCALE: VARIES	SHEET: 3		

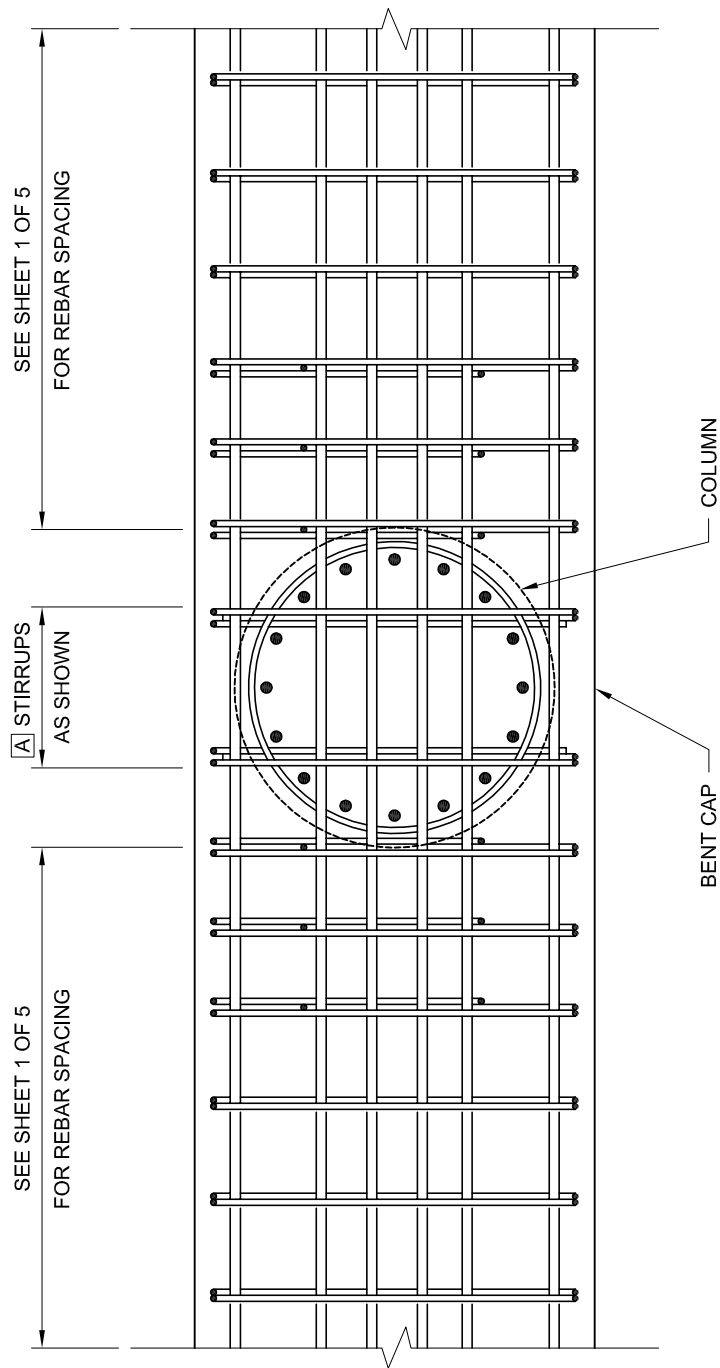


ASSEMBLY ELEVATION
SCALE: 3/8" = 1'-0"

ASSEMBLY END VIEW
SCALE: 3/8" = 1'-0"

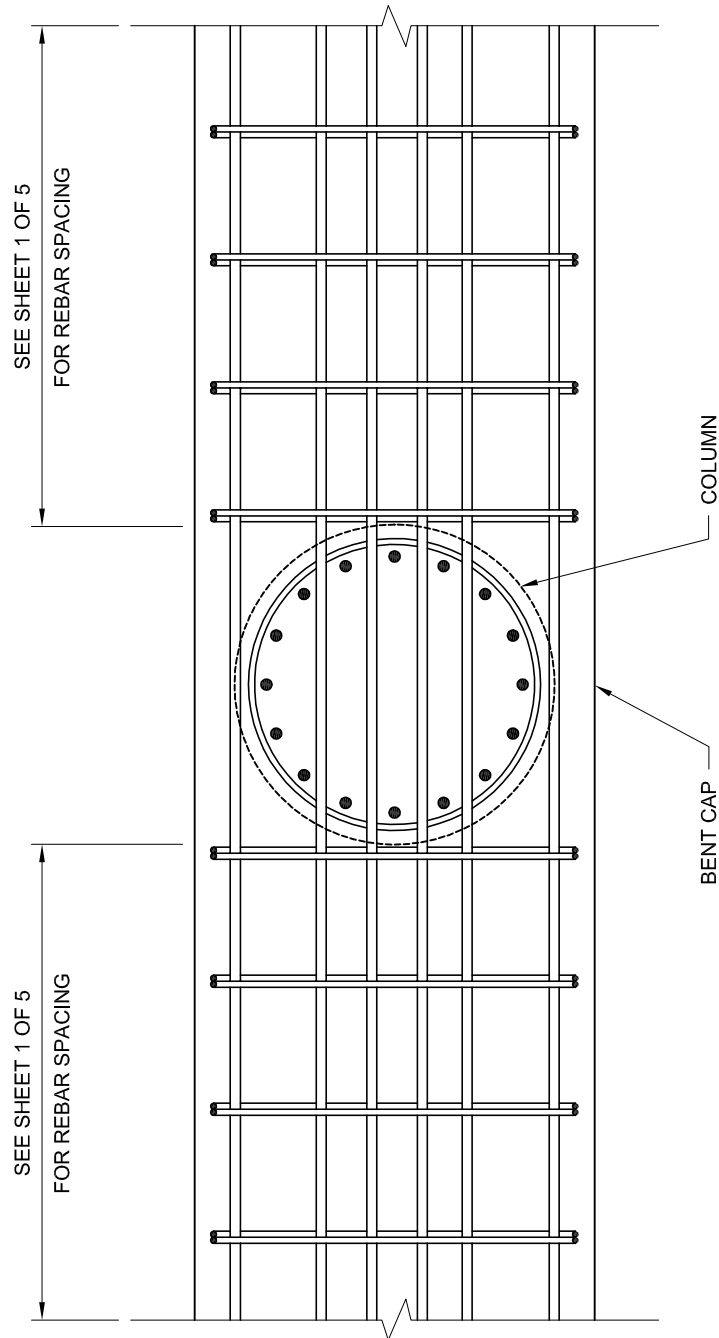


ASSEMBLY PLAN
SCALE: 3/8" = 1'-0"



A REINFORCEMENT DETAIL
SCALE: 1" = 1'-0"

NOTE:
1. ALL REINFORCEMENT NOT SHOWN FOR CLARITY



REINFORCEMENT DETAIL
A
 SCALE: 1" = 1'-0"

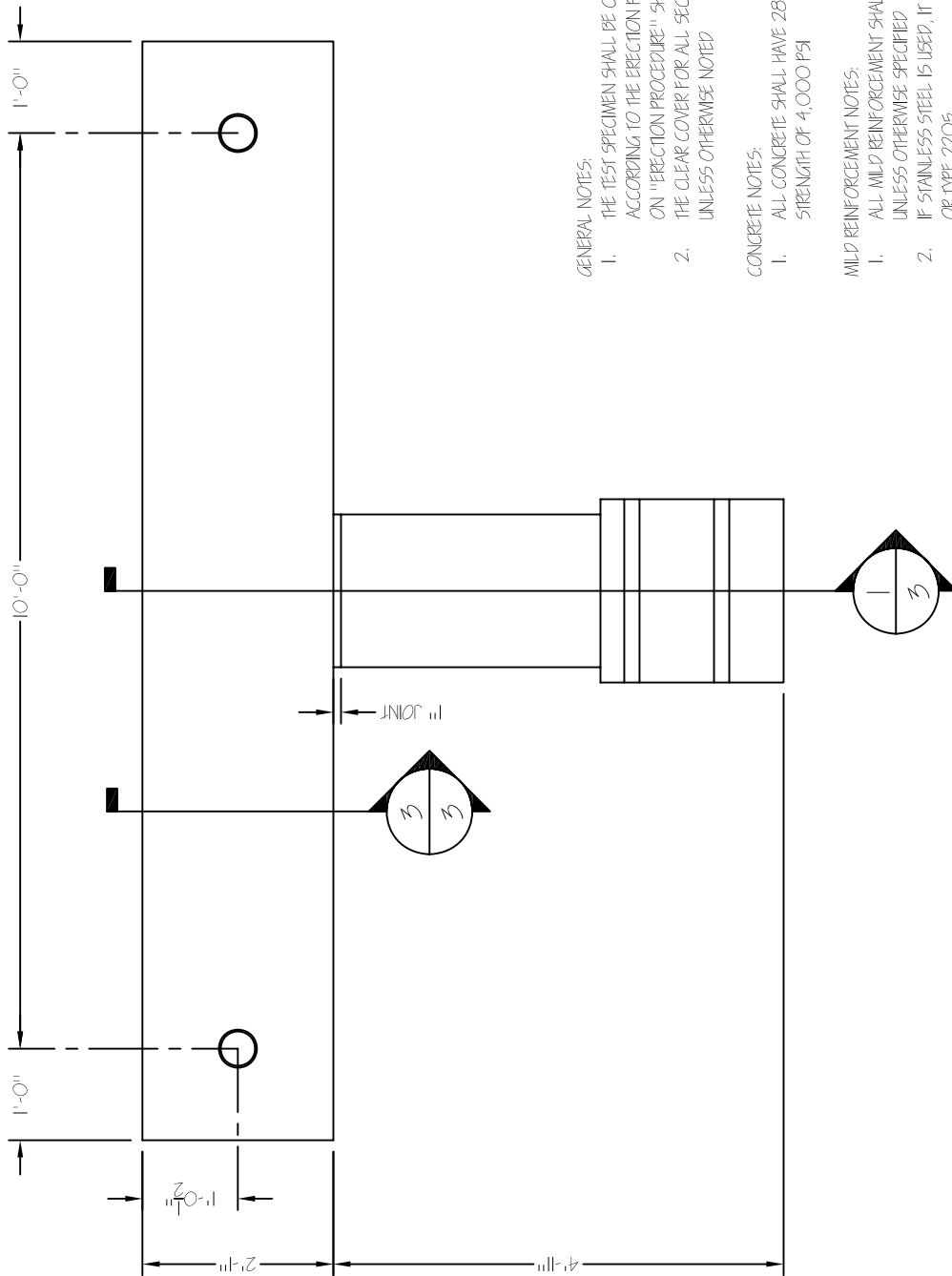
NOTE:
 1. ALL REINFORCEMENT NOT SHOWN FOR CLARITY



NCHRP PROJECT 12-74

REINFORCEMENT DETAIL

SEISMICITY: LOW		SUPER. CONNECTION: NON-INTEGRAL		CONNECTION DETAIL: CAP POCKET LIMITED DUCTILITY SPECIMEN		
BY: JW	CHK: AW	DATE: 08/21/09	SCALE: 1" = 1'-0"	SHEET: 5		



GENERAL NOTES:

1. THE TEST SPECIMEN SHALL BE CONSTRUCTED ACCORDING TO THE ERECTION PROCEDURE PRESENTED ON "ERECTION PROCEDURE" SHEET
2. THE CLEAR COVER FOR ALL SECTIONS SHALL BE 1" UNLESS OTHERWISE NOTED

CONCRETE NOTES:

1. ALL CONCRETE SHALL HAVE 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI

MILD REINFORCEMENT NOTES:

1. ALL MILD REINFORCEMENT SHALL BE A706 GRADE 60 UNLESS OTHERWISE SPECIFIED
2. IF STAINLESS STEEL IS USED, IT SHALL BE TYPE 316LN OR TYPE 2205

POST-TENSIONING NOTES:

1. ALL POST-TENSIONING SHALL BE A416 GRADE 270 LOW RELAXATION STEEL
2. POST-TENSIONING FORCE AFTER IMMEDIATE LOSSES SHALL BE 152 KIPS

1
SPECIMEN ELEVATION
1/2" = 1'-0"



NCHRP PROJECT 12-74

SPECIMEN ELEVATION

DUCTILITY:

FULL

SUPER. CONNECTION:

NON-INTEGRAL

CONNECTION DETAIL:

CONVENTIONAL HYBRID DETAIL

BY:

MJT

CHK:

DATE:

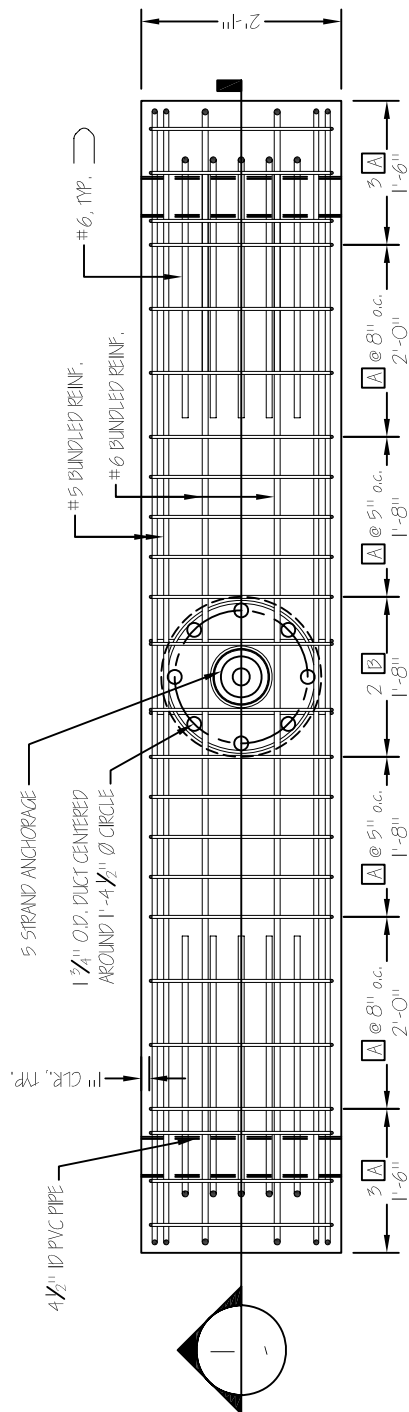
06/26/07

SCALE:

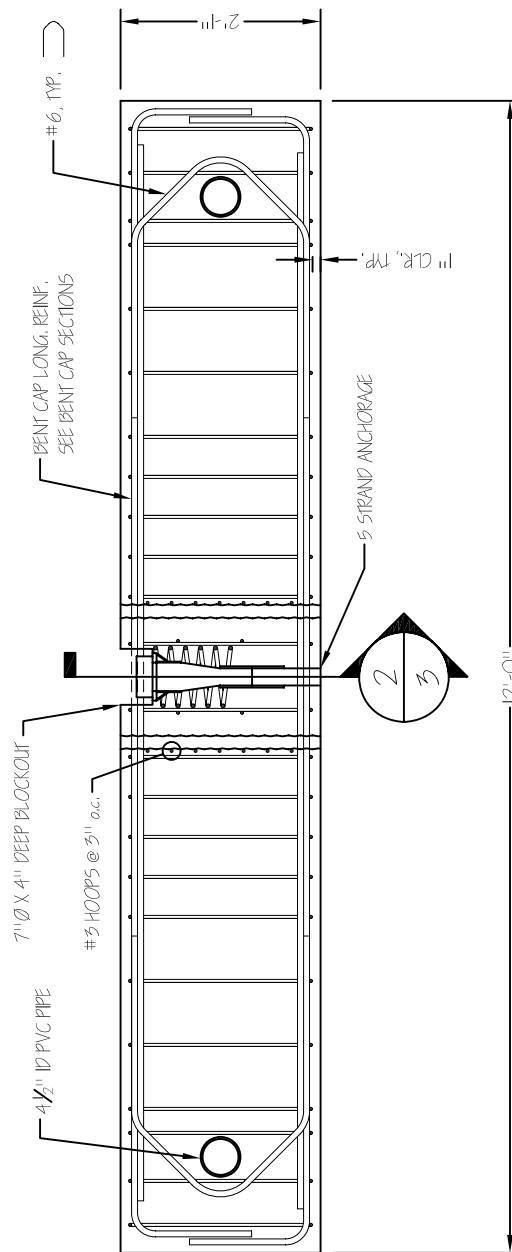
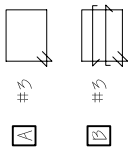
1/2" = 1'-0"

SHEET:

01



BENT CAP TOP SECTION
1/2" = 1'-0"



BENT CAP SECTION
1/2" = 1'-0"



NCHRP PROJECT 12-74

BENT CAP DETAILS

DUCTILITY:

FULL

SUPER. CONNECTION:

NON-INTEGRAL

CONNECTION DETAIL:

CONVENTIONAL HYBRID DETAIL

BY:

MJT

CHK:

DATE:

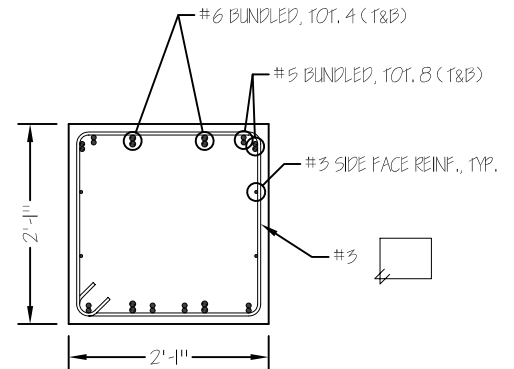
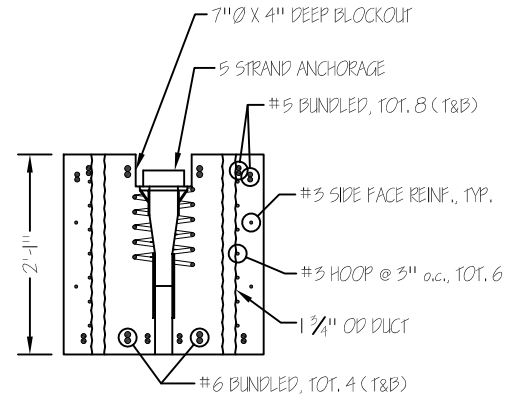
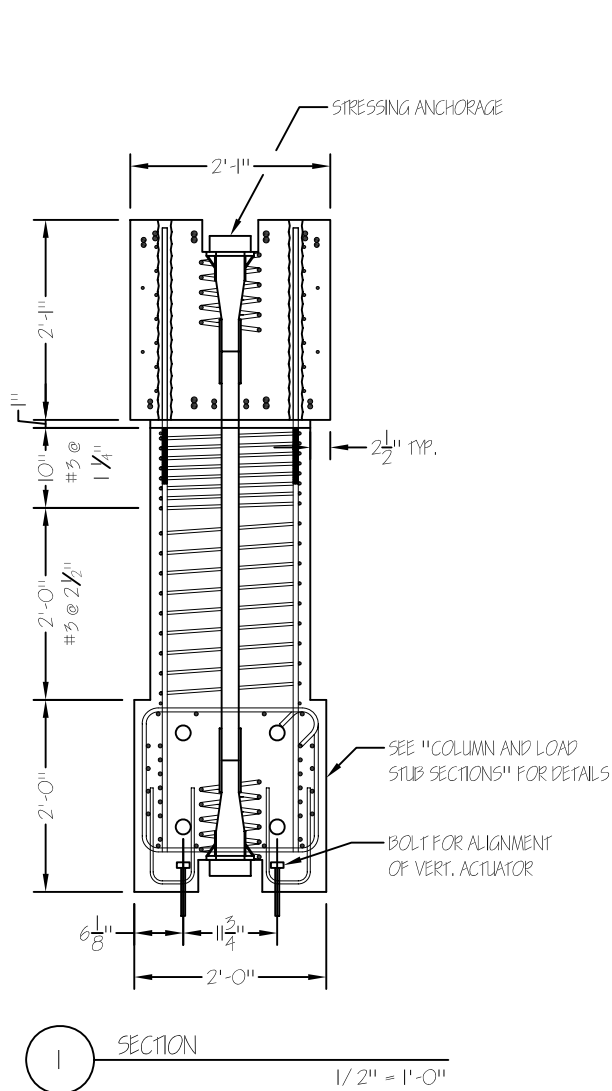
06/26/07

SCALE:

1/2" = 1'-0"

SHEET:

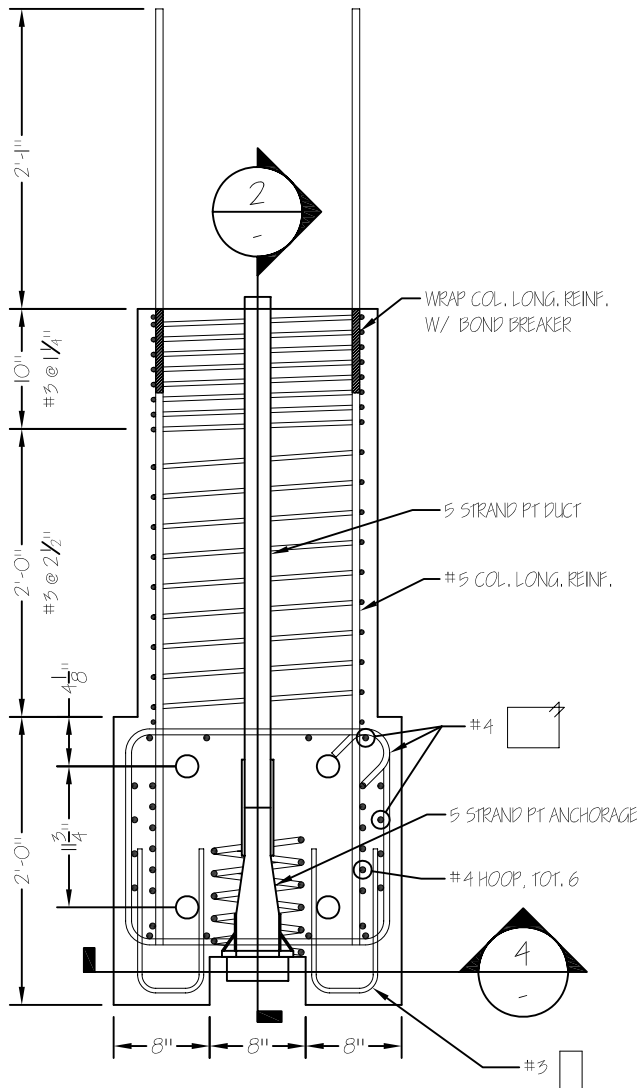
02



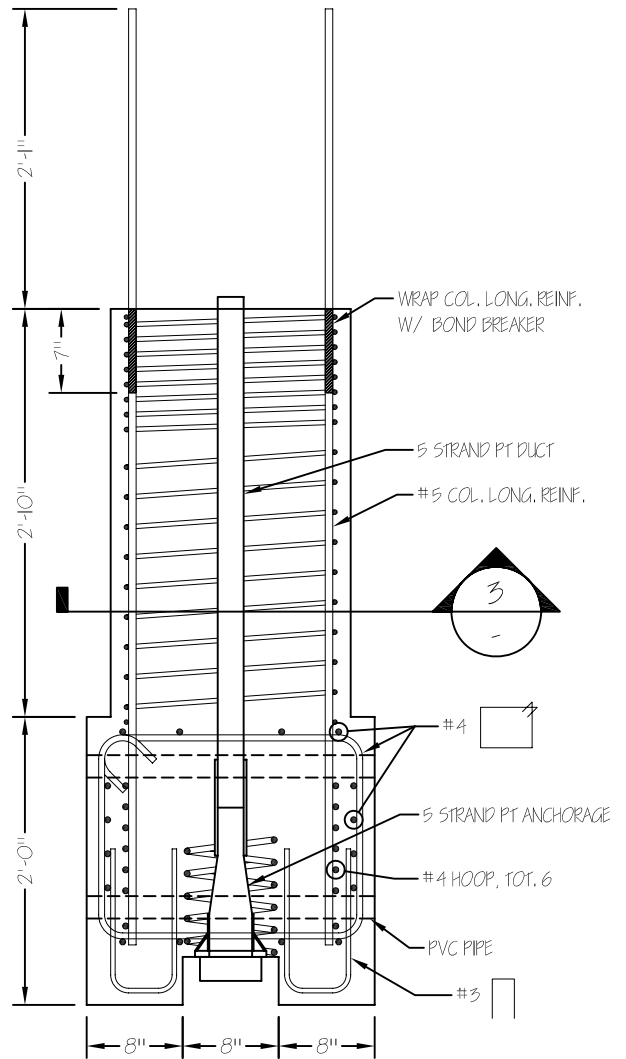
NCHRP PROJECT 12-74

GENERAL SECTION

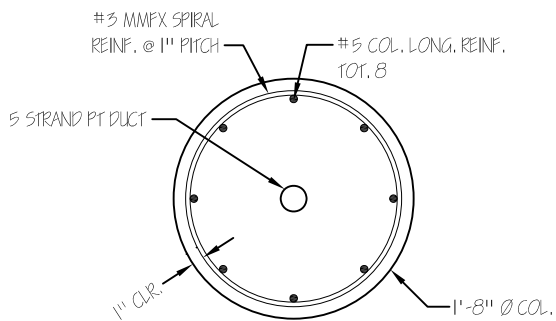
DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	CONVENTIONAL HYBRID DETAIL
BY:	MJT	CHK:	DATE:	SCALE:	1/2" = 1'-0"
				SHEET:	03



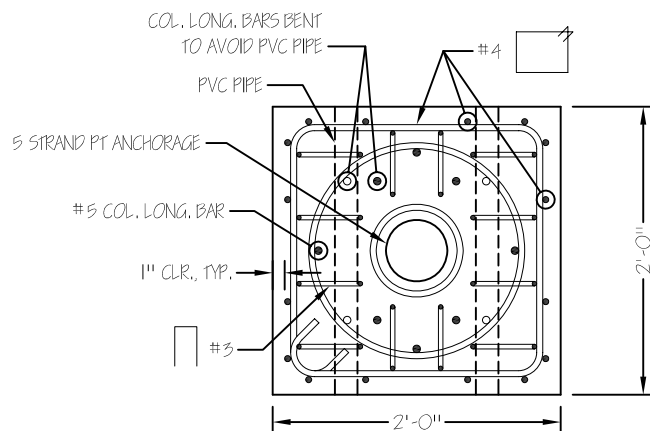
1 COLUMN ASSEMBLY SECTION
3/4" = 1'-0"



2 COLUMN ASSEMBLY SECTION
3/4" = 1'-0"



3 COLUMN SECTION
3/4" = 1'-0"



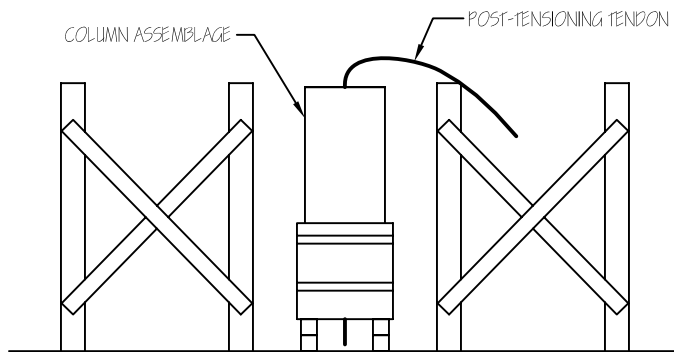
4 LOAD STUB TOP SECTION
3/4" = 1'-0"



NCHRP PROJECT 12-74

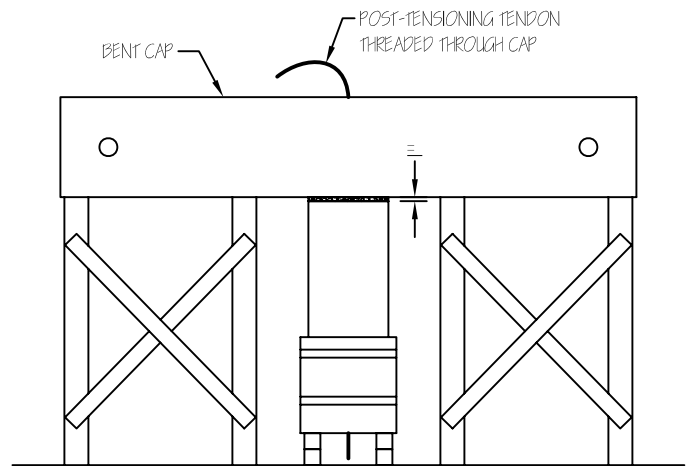
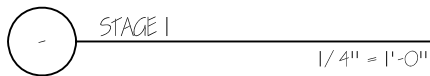
COLUMN AND LOAD STUB SECTIONS

DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	CONVENTIONAL HYBRID DETAIL
BY:	MJT	CHK:	DATE:	06/26/07	SCALE:
					3/4" = 1'-0"
					SHEET:
					04



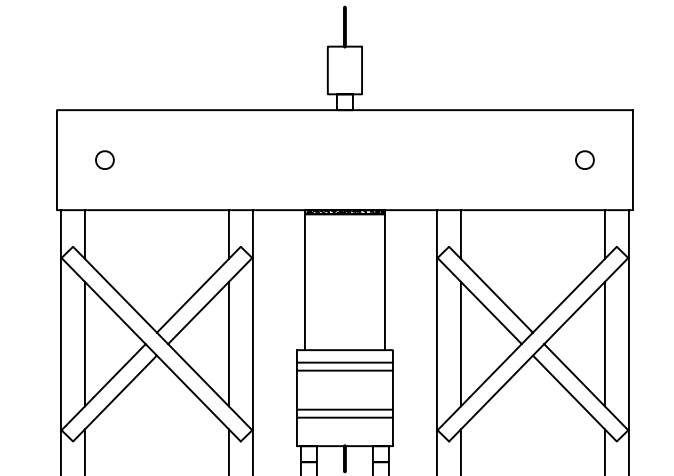
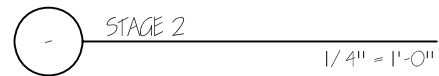
CONSTRUCTION STAGE ACTIVITIES:

1. SET COLUMN ASSEMBLAGE ON SUPPORTS
2. THREAD POST-TENSIONING TENDON THROUGH COLUMN AND SET IN DEAD END ANCHORAGE
3. CONSTRUCT BENT CAP SUPPORT STRUCTURE



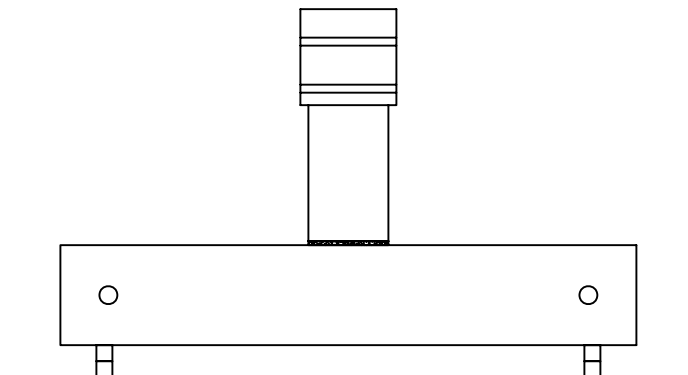
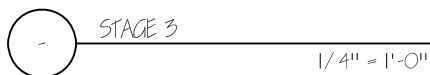
CONSTRUCTION STAGE ACTIVITIES:

1. SET BENT CAP ON SUPPORT STRUCTURE
2. THREAD POST-TENSIONING TENDON THROUGH BENT CAP
3. FORM AROUND BEDDING LAYER
4. GROUT BEDDING LAYER AND GROUTED DUCTS PER GROUTING PROCEDURE



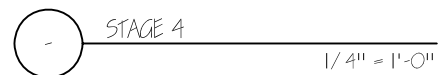
CONSTRUCTION STAGE ACTIVITIES:

1. ALLOW GROUT TO SET PER GROUT PROCEDURE
2. POST-TENSION TENDONS TO SPECIFIED LOAD
3. CUT EXCESS TENDON FROM BOTH ANCHORAGES



CONSTRUCTION STAGE ACTIVITIES:

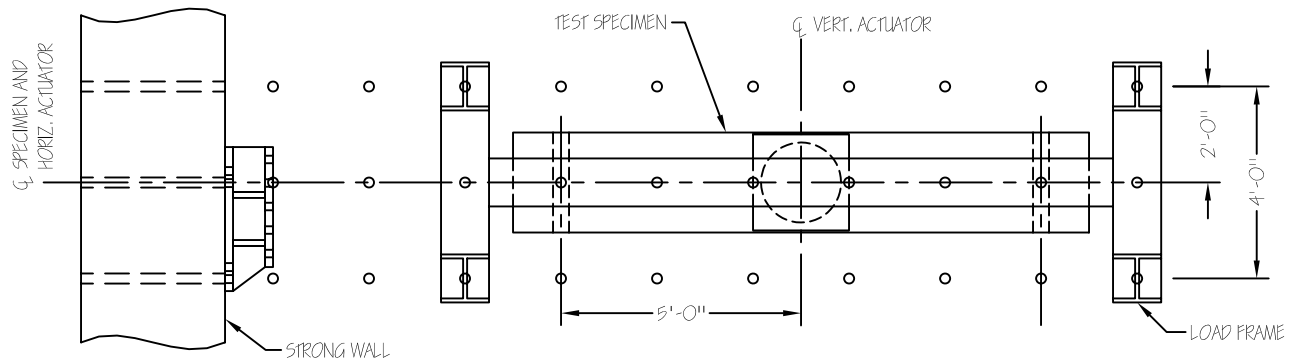
1. INVERT SPECIMEN PER "SPECIMEN INVERSION PROCEDURE"
2. MOVE SPECIMEN TO TEST SETUP
3. PAINT SPECIMEN
4. ATTACH ACTUATORS



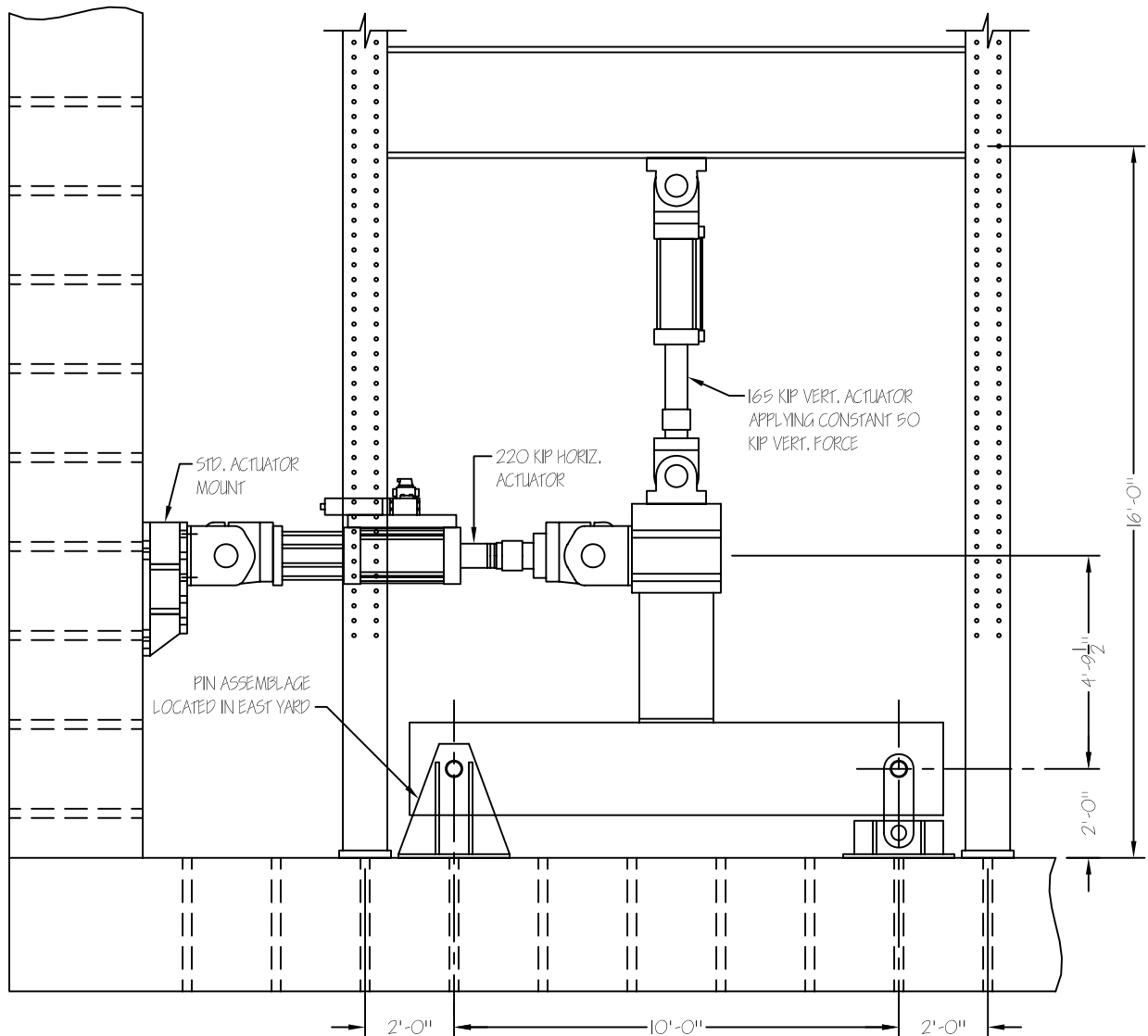
NCHRP PROJECT 12-74

ERECTION PROCEDURE

DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	CONVENTIONAL HYBRID DETAIL
BY:	MJT	CHK:		DATE:	06/26/07
				SCALE:	1/4" = 1'-0"
				SHEET:	05



TEST SETUP PLAN VIEW
1/4" = 1'-0"



TEST SETUP ELEVATION
1/4" = 1'-0"



NCHRP PROJECT 12-74

TEST SETUP OVERVIEW

DUCTILITY:		FULL		SUPER. CONNECTION:		NON-INTEGRAL		CONNECTION DETAIL:				CONVENTIONAL HYBRID DETAIL							
BY:		MJT		CHK:				DATE:		06/26/07		SCALE:		1/4" = 1'-0"		SHEET:		06	



NCHRP PROJECT 12-74

SPECIMEN ELEVATION

DUCTILITY:

FULL

SUPER. CONNECTION:

NON-INTEGRAL

CONNECTION DETAIL:

HYBRID SPECIMEN 2 - CONCRETE FILLED STEEL TUBE

BY:

MJT

CHK:

DATE:

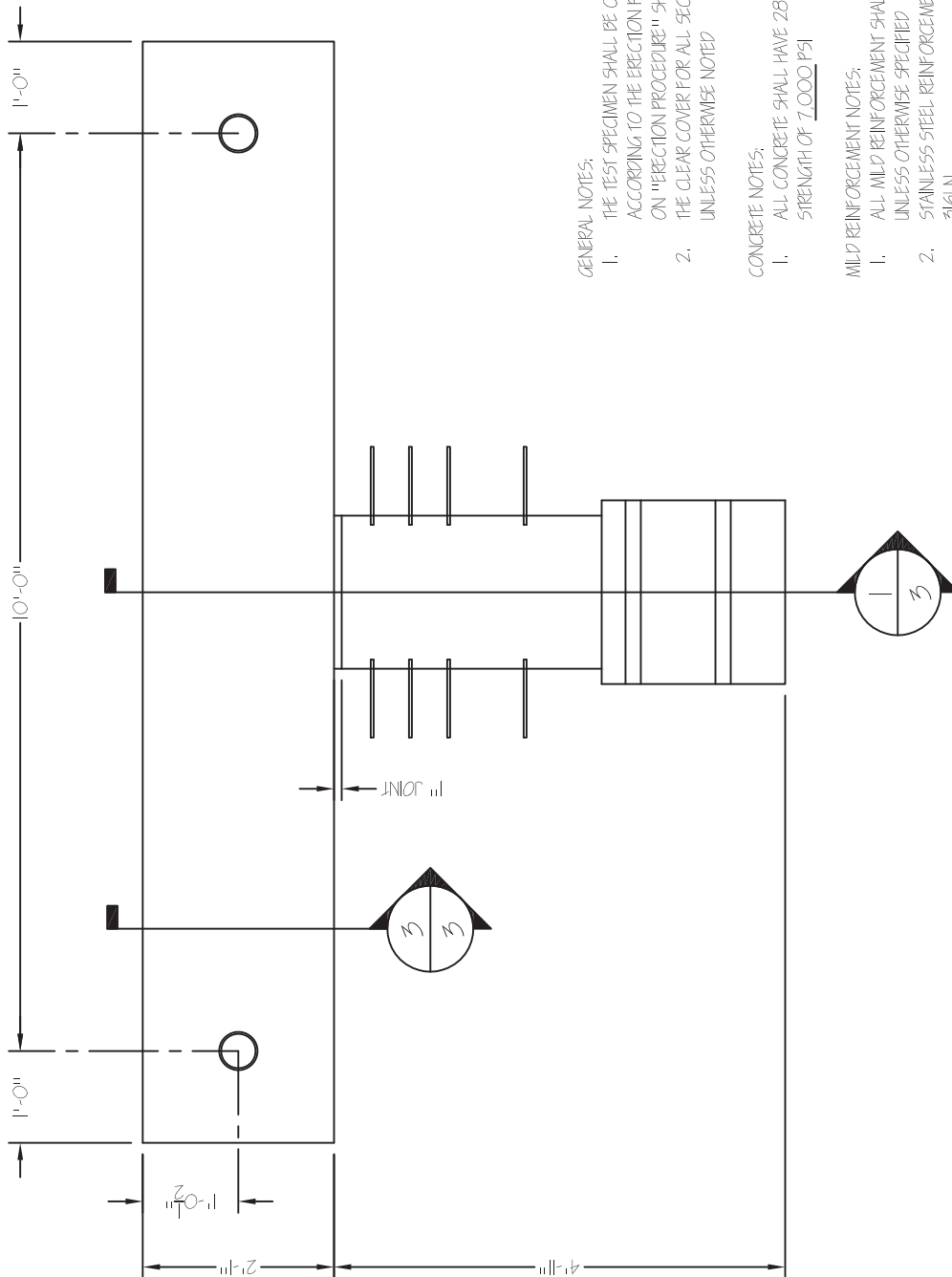
01/08/08

SCALE:

1/2" = 1'-0"

SHEET:

01



GENERAL NOTES:

1. THE TEST SPECIMEN SHALL BE CONSTRUCTED ACCORDING TO THE ERECTION PROCEDURE PRESENTED ON "ERECTION PROCEDURE" SHEET
2. THE CLEAR COVER FOR ALL SECTIONS SHALL BE 1" UNLESS OTHERWISE NOTED

CONCRETE NOTES:

1. ALL CONCRETE SHALL HAVE 28 DAY COMPRESSIVE STRENGTH OF 7,000 PSI

MILD REINFORCEMENT NOTES:

1. ALL MILD REINFORCEMENT SHALL BE A706 GRADE 60 UNLESS OTHERWISE SPECIFIED
2. STAINLESS STEEL REINFORCEMENT SHALL BE TYPE 316LN

POST-TENSIONING NOTES:

1. ALL POST-TENSIONING SHALL BE A416 GRADE 270 LOW RELAXATION STEEL
2. POST-TENSIONING FORCE AFTER IMMEDIATE LOSSES SHALL BE 152 KIPS

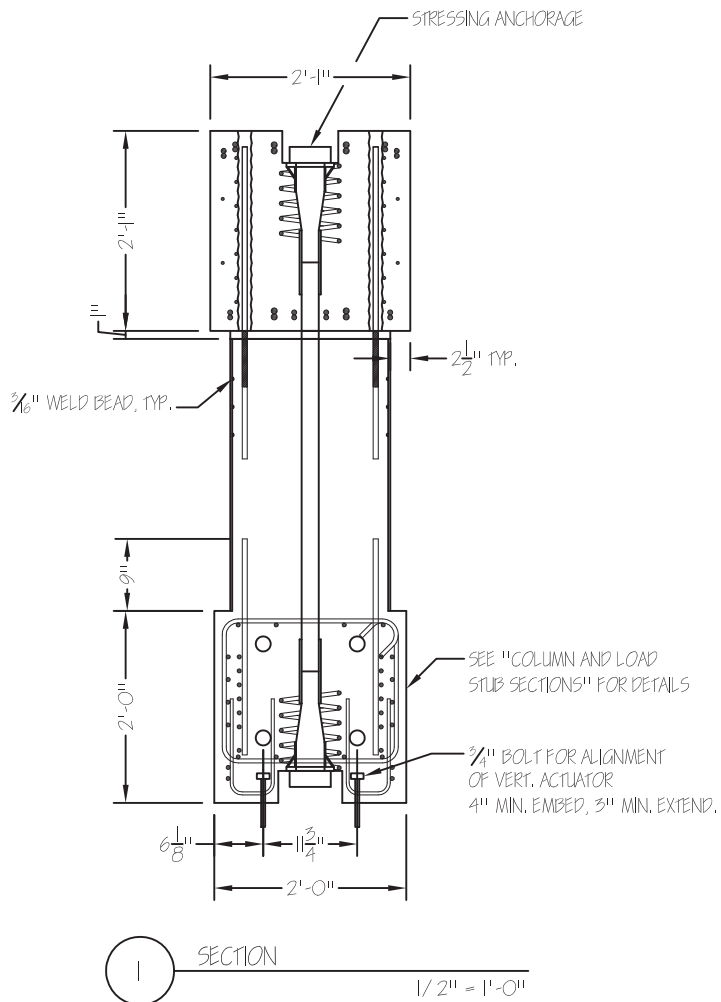
STEEL NOTES:

1. STEEL SHELL SHALL BE A572 GRADE 50

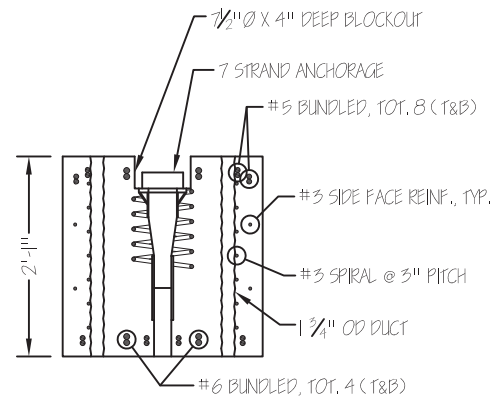
SPECIMEN ELEVATION

1/2" = 1'-0"

APPROVED FOR PRODUCTION

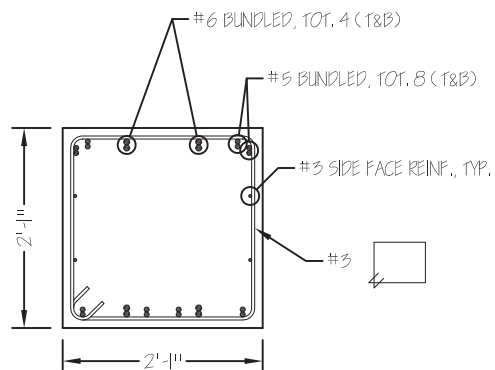


NOTE:
TWO COLUMN REINFORCING BARS AND FOUR BEAM
REINFORCING BARS CONTAINS STRAIN GAGES (SEE
INSTRUMENTATION PLAN)



2 BENT CAP SECTION

1/2" = 1'-0"



3 BENT CAP SECTION

1/2" = 1'-0"

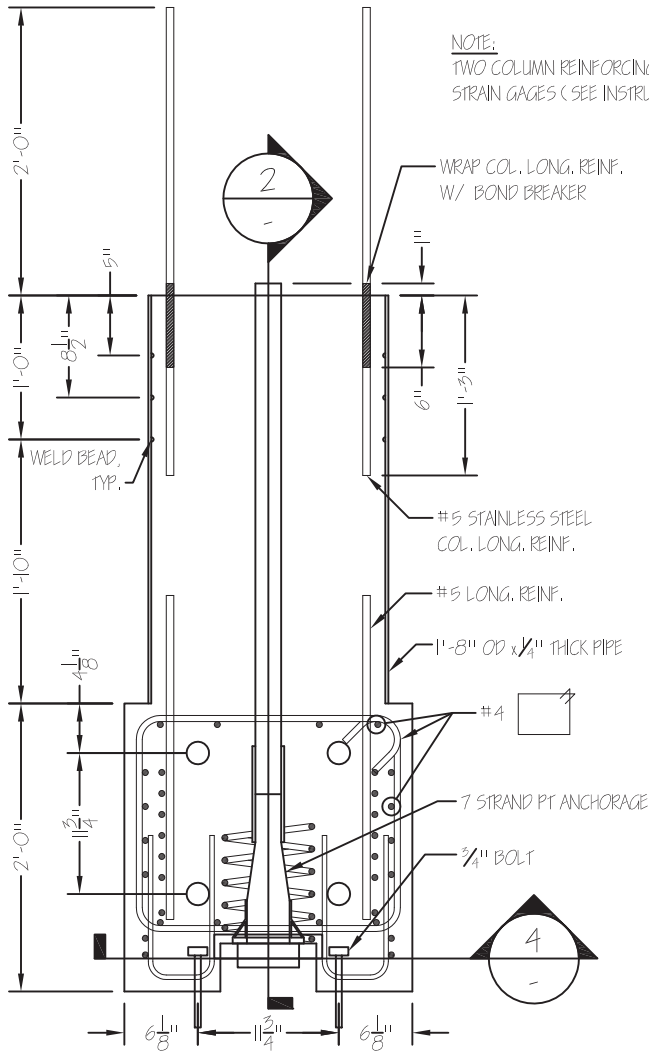
APPROVED FOR PRODUCTION



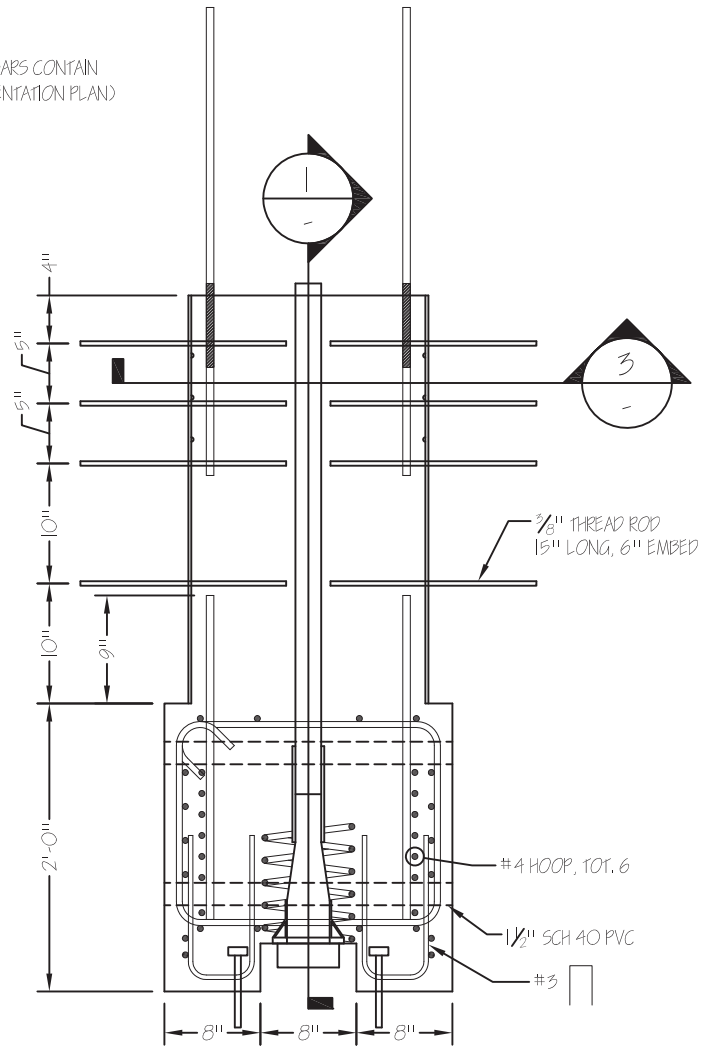
NCHRP PROJECT 12-74

GENERAL SECTION

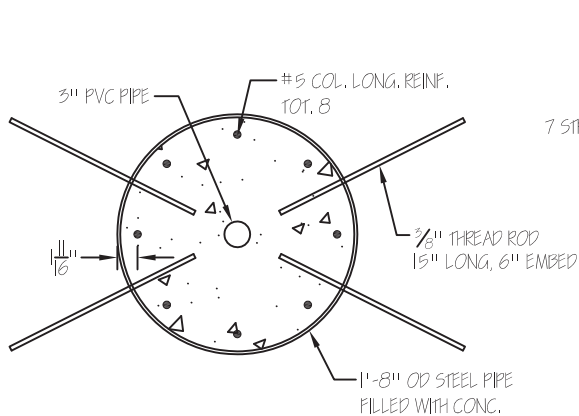
DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	HYBRID SPECIMEN 2 - CONCRETE FILLED STEEL TUBE	
BY:	MJT	CHK:		DATE:	01/08/08	SCALE: 1/2" = 1'-0"
						SHEET: 03



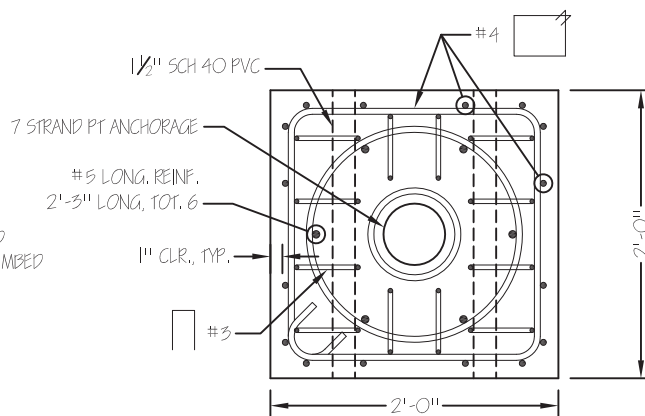
1 COLUMN ASSEMBLY SECTION
3/4" = 1'-0"



2 COLUMN ASSEMBLY SECTION
3/4" = 1'-0"



3 COLUMN SECTION
3/4" = 1'-0"



4 LOAD STUB TOP SECTION
3/4" = 1'-0"

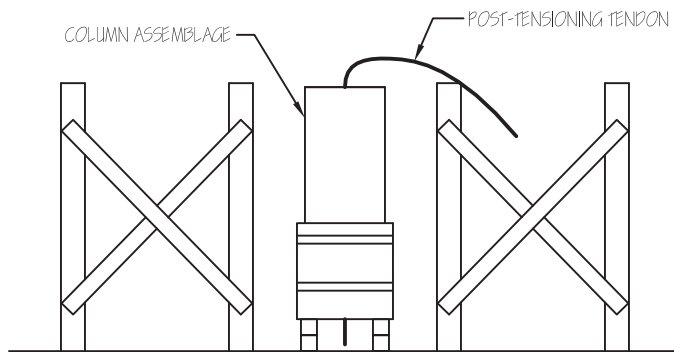
APPROVED FOR PRODUCTION



NCHRP PROJECT 12-74

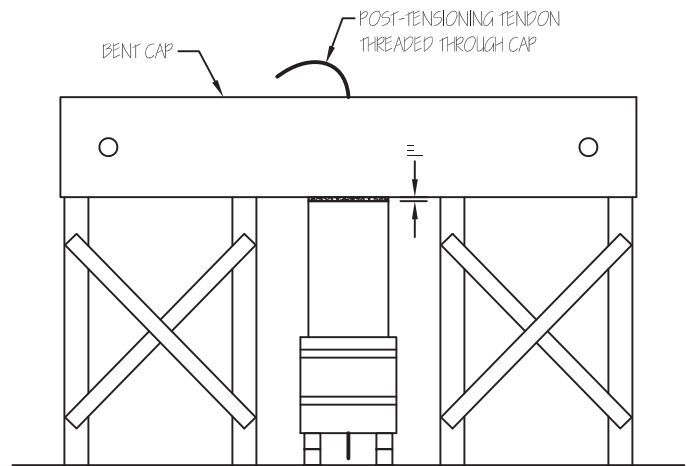
COLUMN AND LOAD STUB SECTIONS

DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	HYBRID SPECIMEN 2 - CONCRETE FILLED STEEL TUBE
BY:	MJT	CHK:	DATE:	01/08/08	SCALE: 3/4" = 1'-0"
					SHEET: 04



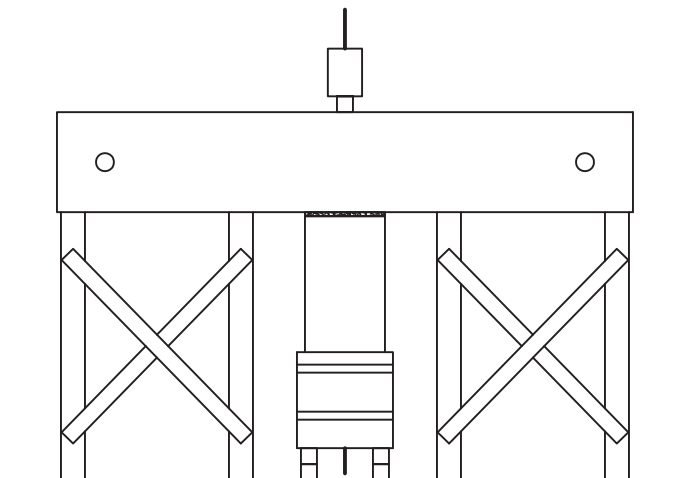
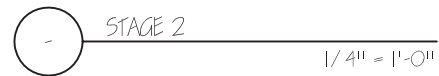
CONSTRUCTION STAGE ACTIVITIES:

1. SET COLUMN ASSEMBLAGE ON SUPPORTS
2. THREAD POST-TENSIONING TENDON THROUGH COLUMN AND SET IN DEAD END ANCHORAGE
3. CONSTRUCT BENT CAP SUPPORT STRUCTURE



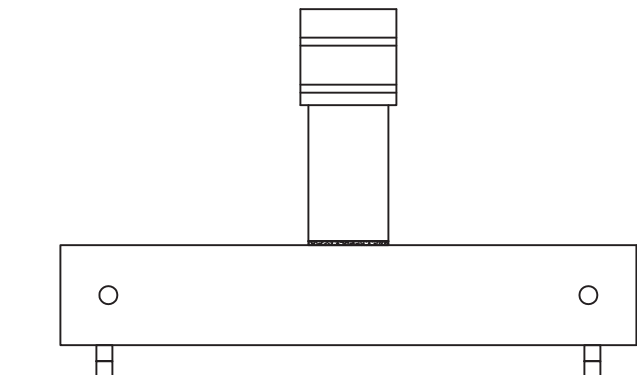
CONSTRUCTION STAGE ACTIVITIES:

1. SET BENT CAP ON SUPPORT STRUCTURE
2. THREAD POST-TENSIONING TENDON THROUGH BENT CAP
3. FORM AROUND BEDDING LAYER
4. GROUT BEDDING LAYER AND GROUTED DUCTS PER GROUTING PROCEDURE



CONSTRUCTION STAGE ACTIVITIES:

1. ALLOW GROUT TO SET PER GROUT PROCEDURE
2. POST-TENSION TENDONS TO SPECIFIED LOAD
3. CUT EXCESS TENDON FROM BOTH ANCHORAGES



CONSTRUCTION STAGE ACTIVITIES:

1. INVERT SPECIMEN PER "SPECIMEN INVERSION PROCEDURE"
2. MOVE SPECIMEN TO TEST SETUP
3. PAINT SPECIMEN
4. ATTACH ACTUATORS



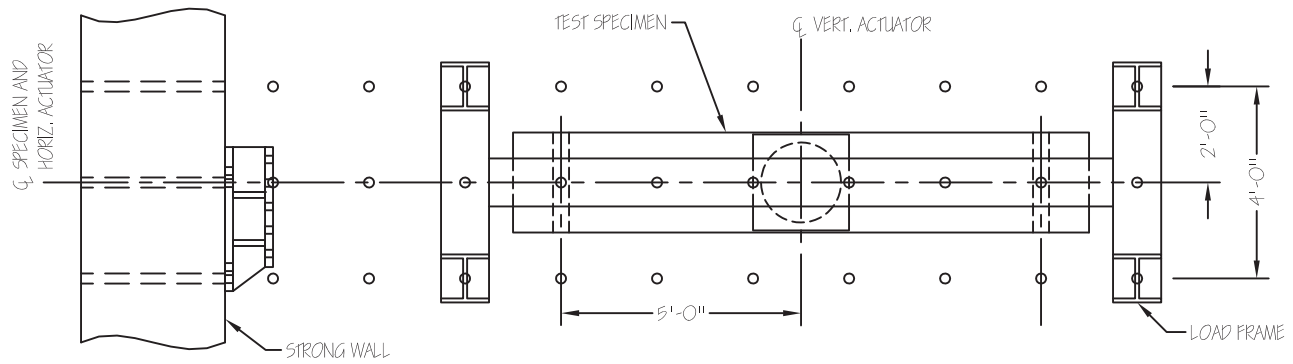
APPROVED FOR PRODUCTION



NCHRP PROJECT 12-74

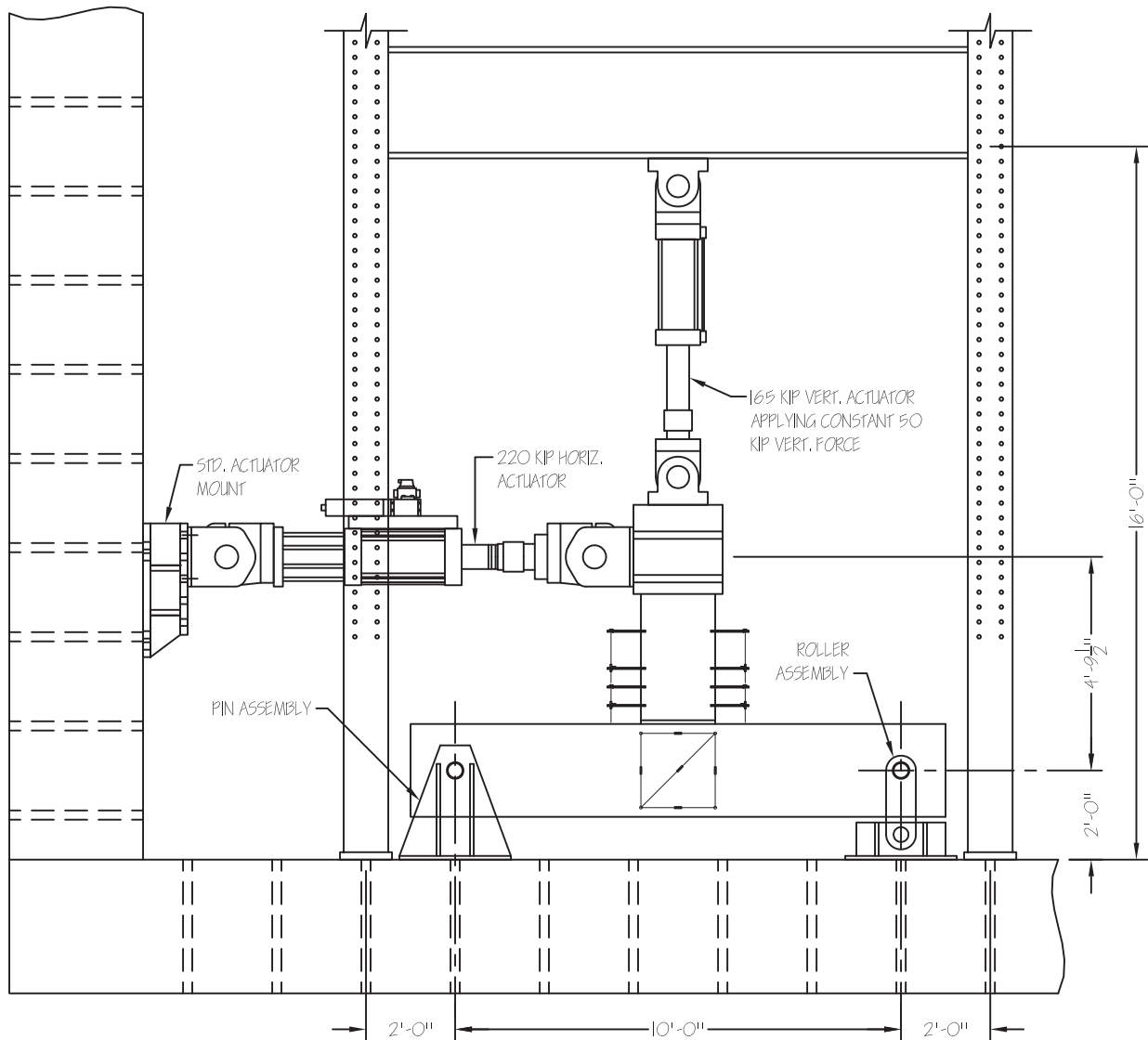
ERECTION PROCEDURE

DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	HYBRID SPECIMEN 2 - CONCRETE FILLED STEEL TUBE	
BY:	MJT	CHK:		DATE:	01/08/08	SCALE:
						1/4" = 1'-0"
						SHEET: 10



NOTE: ACTUATORS NOT SHOWN FOR CLARITY

TEST SETUP PLAN VIEW
1/4" = 1'-0"



TEST SETUP ELEVATION
1/4" = 1'-0"

APPROVED FOR PRODUCTION



NCHRP PROJECT 12-74

TEST SETUP OVERVIEW

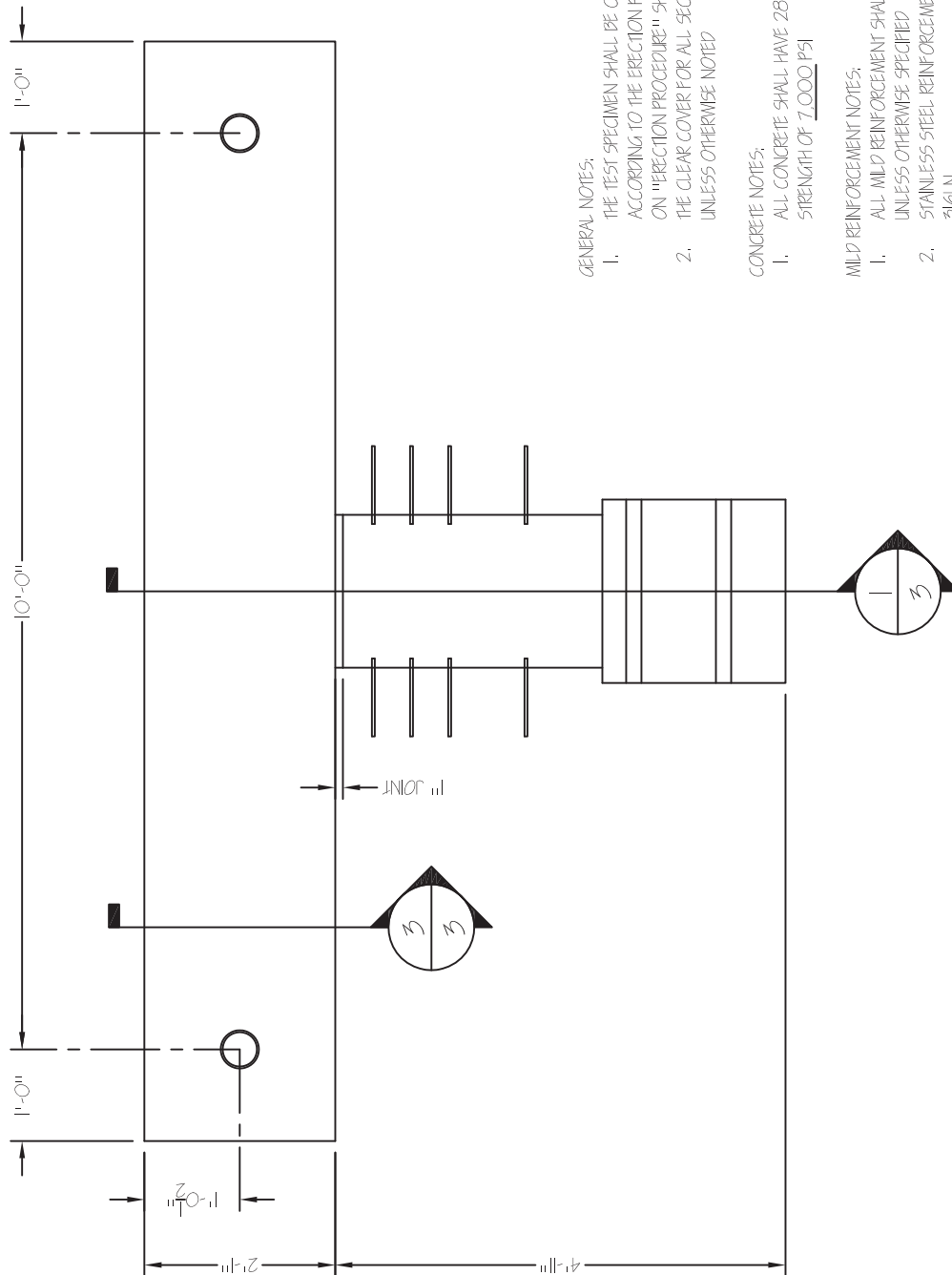
DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	HYBRID SPECIMEN 2 - CONCRETE FILLED STEEL TUBE
BY:	MJT	CHK:	DATE:	01/08/08	SCALE: 1/4" = 1'-0"
					SHEET: 11



NCHRP PROJECT 12-74

SPECIMEN ELEVATION

DUCTILITY: FULL		SUPER. CONNECTION: NON-INTEGRAL		CONNECTION DETAIL: HYBRID SPECIMEN 3 - DUAL SHELL COLUMN		
BY: MJT	CHK:	DATE: 01/08/08	SCALE: 1/2" = 1'-0"	SHEET: 01		



GENERAL NOTES:

1. THE TEST SPECIMEN SHALL BE CONSTRUCTED ACCORDING TO THE ERECTION PROCEDURE PRESENTED ON "ERECTION PROCEDURE" SHEET
2. THE CLEAR COVER FOR ALL SECTIONS SHALL BE 1" UNLESS OTHERWISE NOTED

CONCRETE NOTES:

1. ALL CONCRETE SHALL HAVE 28 DAY COMPRESSIVE STRENGTH OF 7,000 PSI

MILD REINFORCEMENT NOTES:

1. ALL MILD REINFORCEMENT SHALL BE A706 GRADE 60 UNLESS OTHERWISE SPECIFIED
2. STAINLESS STEEL REINFORCEMENT SHALL BE TYPE 316LN

POST-TENSIONING NOTES:

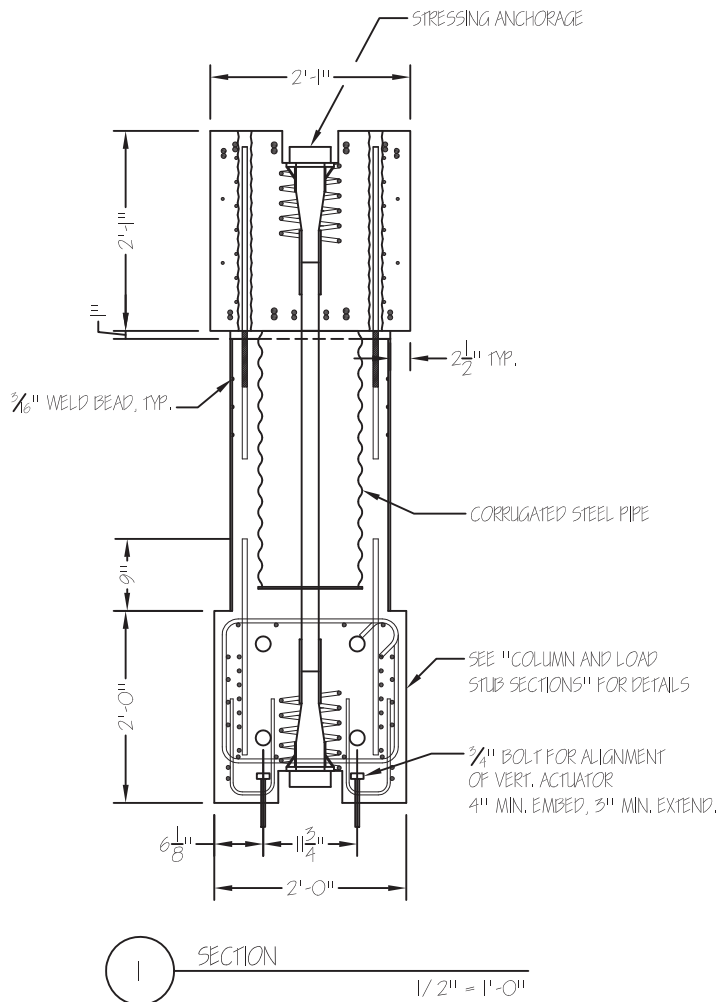
1. ALL POST-TENSIONING SHALL BE A416 GRADE 270 LOW RELAXATION STEEL
2. POST-TENSIONING FORCE AFTER IMMEDIATE LOSSES SHALL BE 152 KIPS

STEEL NOTES:

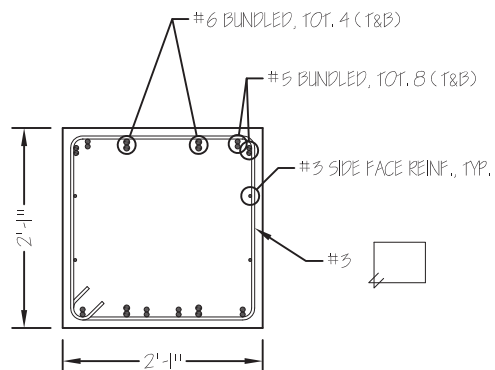
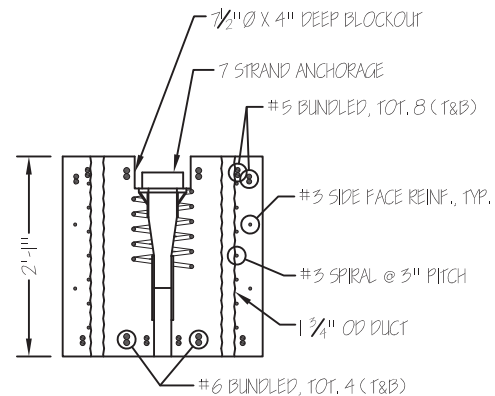
1. STEEL SHELL SHALL BE A572 GRADE 50

APPROVED FOR PRODUCTION

APPROVED FOR PRODUCTION



NOTE:
TWO COLUMN REINFORCING BARS AND FOUR BEAM
REINFORCING BARS CONTAINS STRAIN GAGES (SEE
INSTRUMENTATION PLAN)



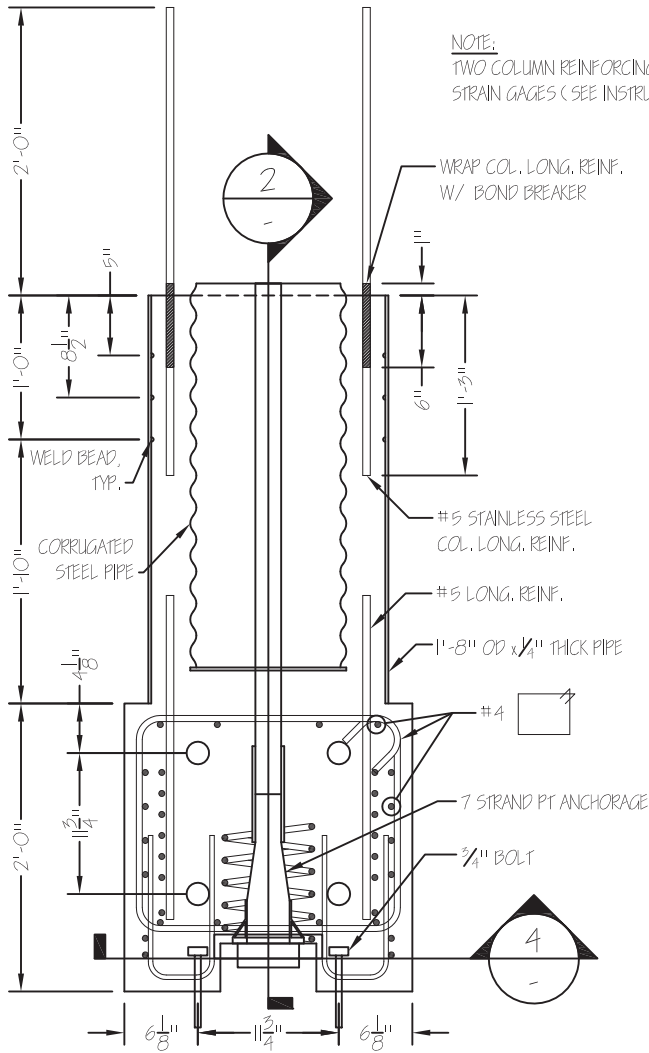
APPROVED FOR PRODUCTION



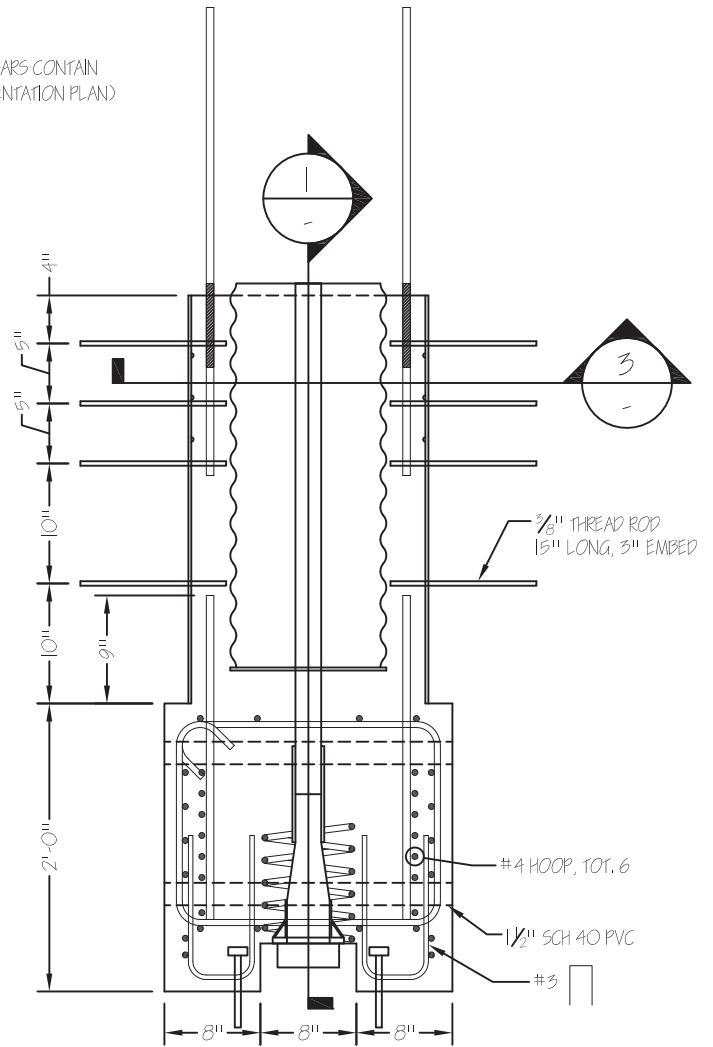
NCHRP PROJECT 12-74

GENERAL SECTION

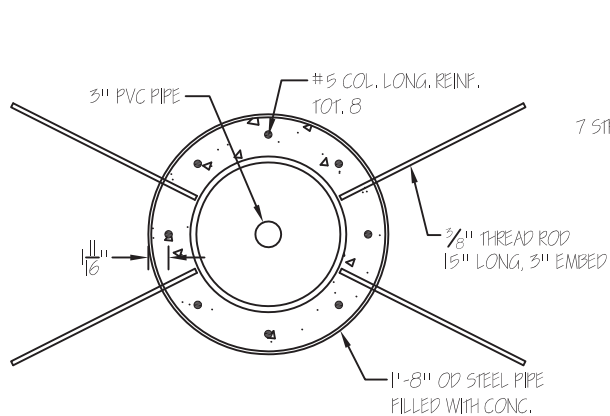
DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	HYBRID SPECIMEN 3 - DUAL SHELL COLUMN
BY:	MJT	CHK:	DATE:	01/08/08	SCALE: 1/2" = 1'-0"
					SHEET: 03



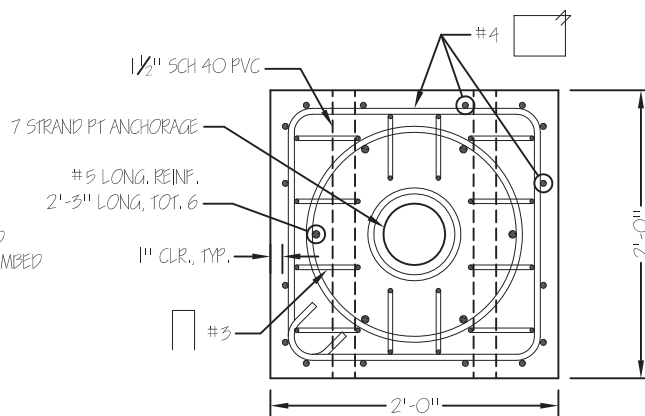
1 COLUMN ASSEMBLY SECTION
3/4" = 1'-0"



2 COLUMN ASSEMBLY SECTION
3/4" = 1'-0"



3 COLUMN SECTION
3/4" = 1'-0"



4 LOAD STUB TOP SECTION
3/4" = 1'-0"

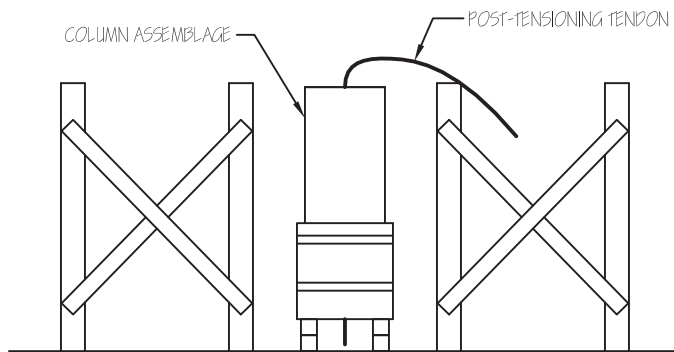
APPROVED FOR PRODUCTION



NCHRP PROJECT 12-74

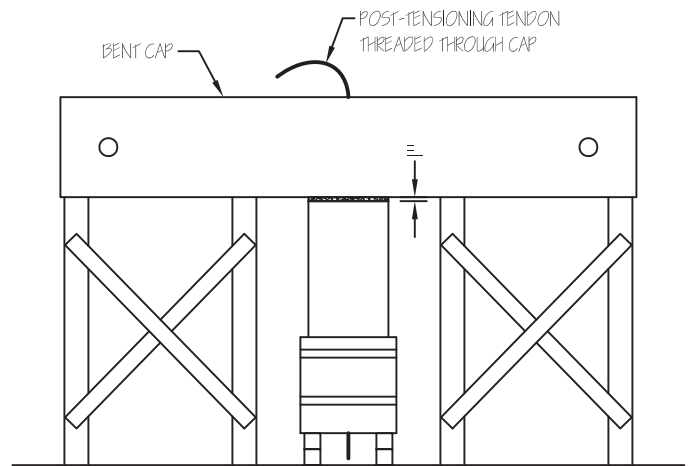
COLUMN AND LOAD STUB SECTIONS

DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	HYBRID SPECIMEN 3 - DUAL SHELL COLUMN
BY:	MJT	CHK:	DATE:	01/08/08	SCALE: 3/4" = 1'-0"
					SHEET: 04



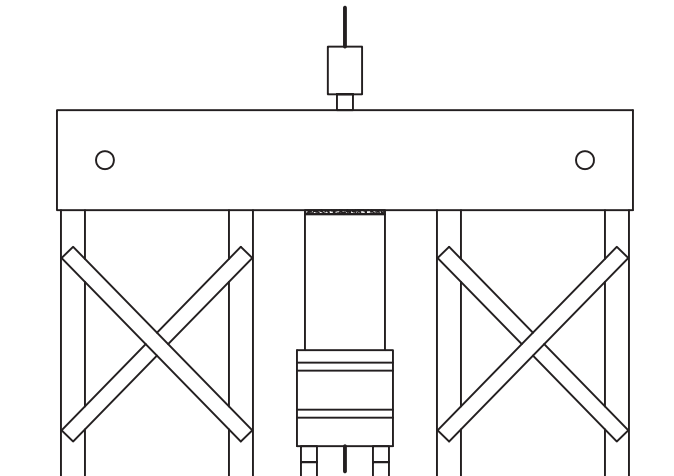
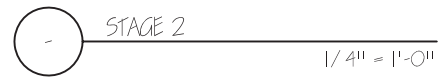
CONSTRUCTION STAGE ACTIVITIES:

1. SET COLUMN ASSEMBLAGE ON SUPPORTS
2. THREAD POST-TENSIONING TENDON THROUGH COLUMN AND SET IN DEAD END ANCHORAGE
3. CONSTRUCT BENT CAP SUPPORT STRUCTURE



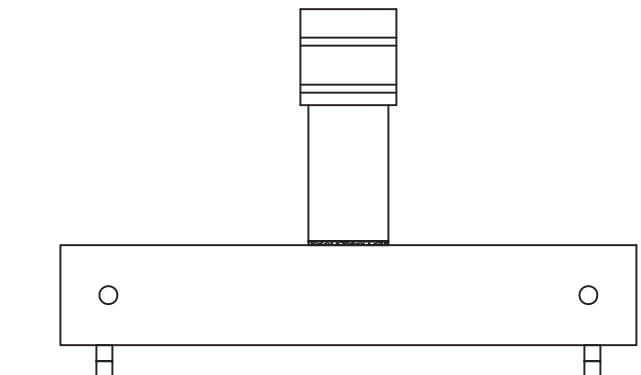
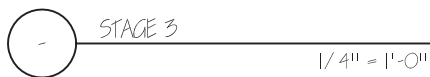
CONSTRUCTION STAGE ACTIVITIES:

1. SET BENT CAP ON SUPPORT STRUCTURE
2. THREAD POST-TENSIONING TENDON THROUGH BENT CAP
3. FORM AROUND BEDDING LAYER
4. GROUT BEDDING LAYER AND GROUTED DUCTS PER GROUTING PROCEDURE



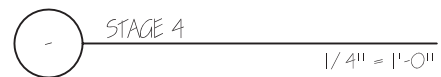
CONSTRUCTION STAGE ACTIVITIES:

1. ALLOW GROUT TO SET PER GROUT PROCEDURE
2. POST-TENSION TENDONS TO SPECIFIED LOAD
3. CUT EXCESS TENDON FROM BOTH ANCHORAGES



CONSTRUCTION STAGE ACTIVITIES:

1. INVERT SPECIMEN PER "SPECIMEN INVERSION PROCEDURE"
2. MOVE SPECIMEN TO TEST SETUP
3. PAINT SPECIMEN
4. ATTACH ACTUATORS



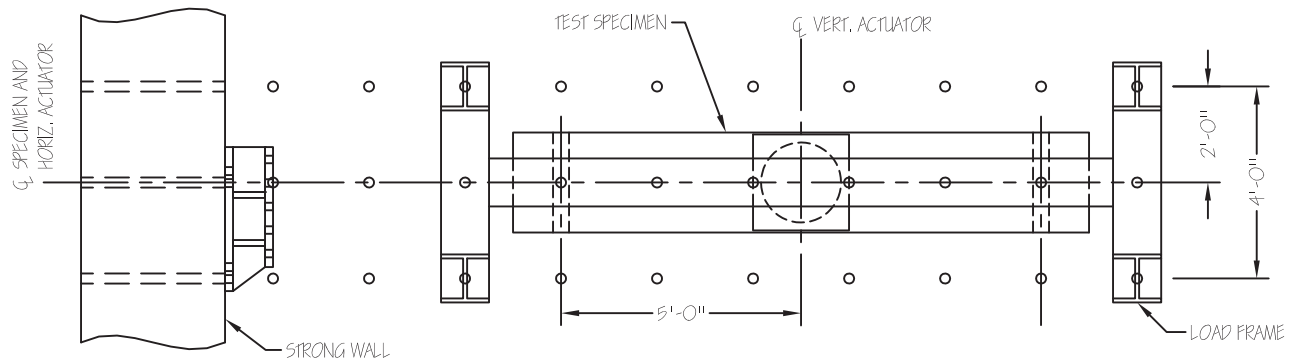
APPROVED FOR PRODUCTION



NCHRP PROJECT 12-74

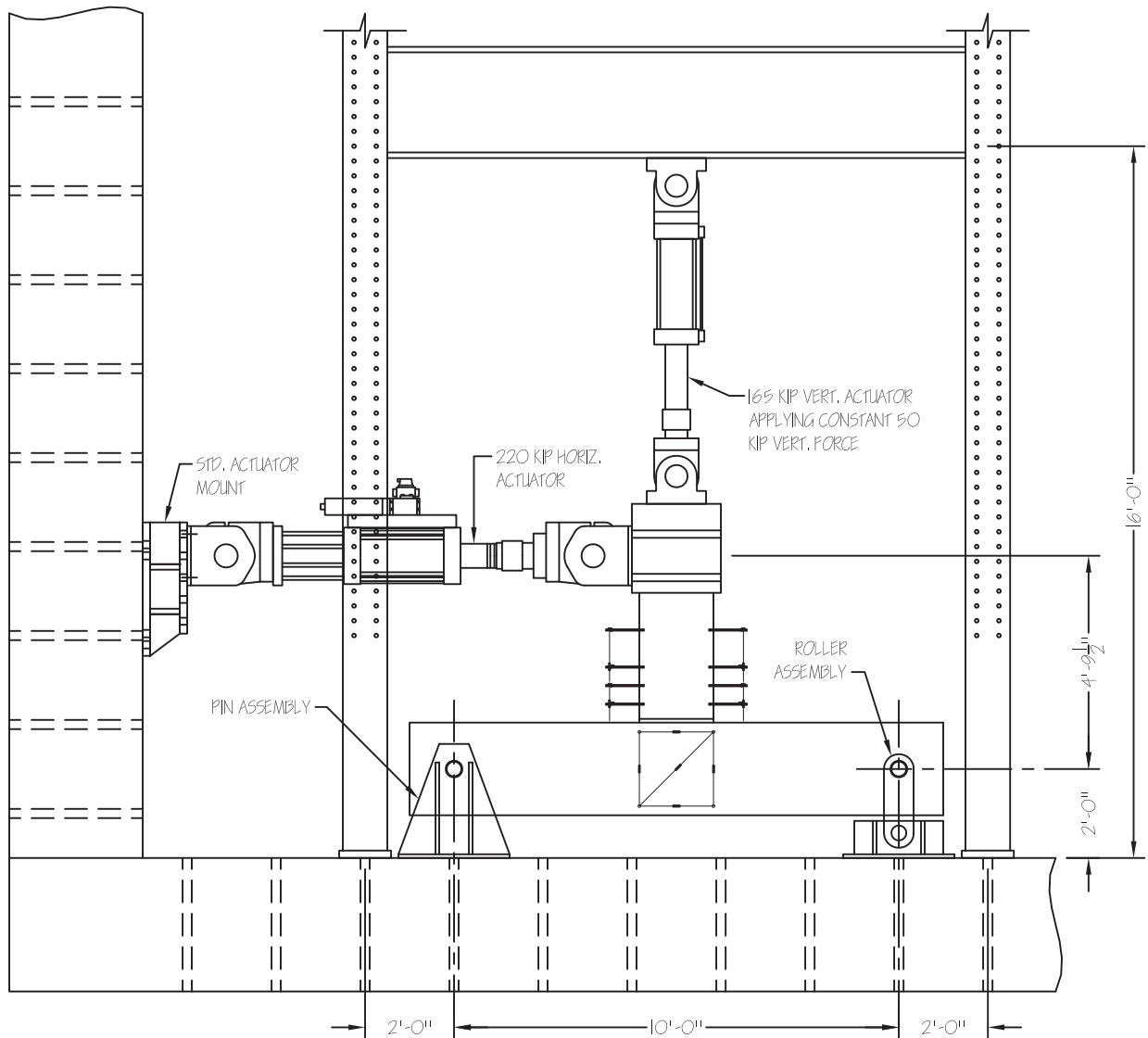
ERECTION PROCEDURE

DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	HYBRID SPECIMEN 3 - DUAL SHELL COLUMN		
BY:	MJT	CHK:	DATE:	11/08/07	SCALE:	1/4" = 1'-0"	SHEET: 10



NOTE: ACTUATORS NOT SHOWN FOR CLARITY

TEST SETUP PLAN VIEW
1/4" = 1'-0"



TEST SETUP ELEVATION
1/4" = 1'-0"

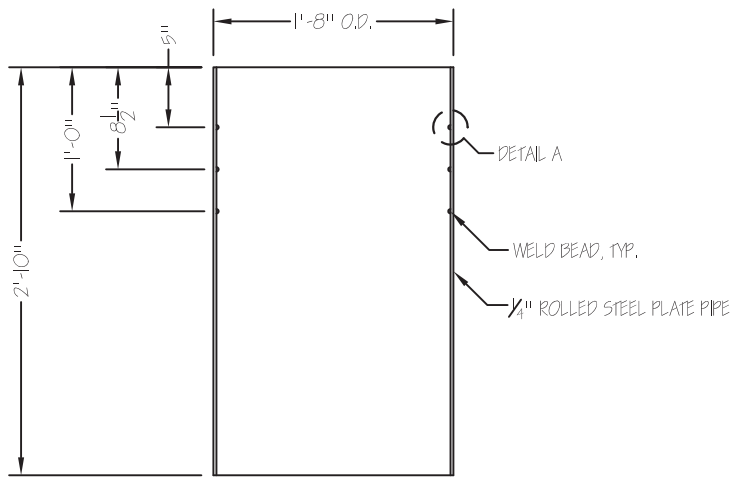
APPROVED FOR PRODUCTION



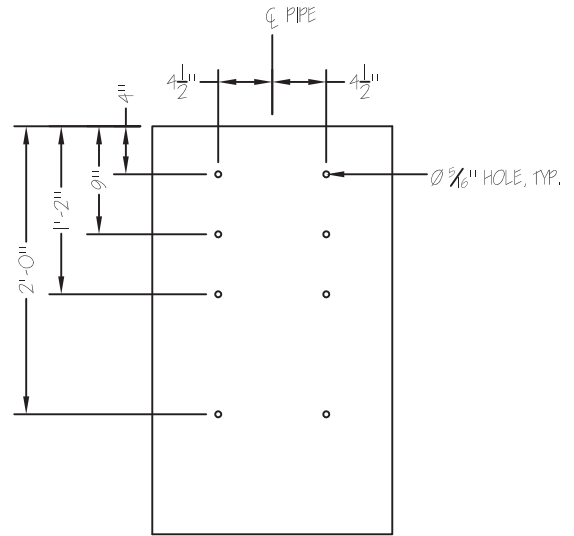
NCHRP PROJECT 12-74

TEST SETUP OVERVIEW

DUCTILITY: FULL		SUPER. CONNECTION: NON-INTEGRAL		CONNECTION DETAIL: HYBRID SPECIMEN 3 - DUAL SHELL COLUMN				
BY:	MJT	CHK:	DATE:	11/08/07	SCALE:	1/4" = 1'-0"	SHEET:	11



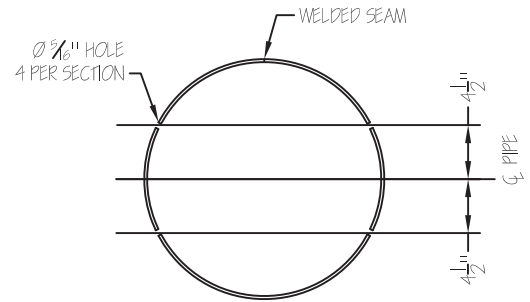
1 STEEL PIPE LONG SECTION
3/4" = 1'-0"



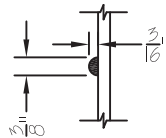
1 STEEL PIPE HOLE LOCATIONS
3/4" = 1'-0"

NOTES:

1. ROLLED STEEL PLATE PIPE SHALL BE A572 GRADE 50 AND WELDING SHALL BE COMPLETE JOINT PENETRATION.
2. ALL WELDING SHALL BE USING E70 ELECTRODE.
3. LOCATIONS OF WELD BEAD GIVEN TO CENTER OF BEAD.
4. WELD BEAD SHALL BE PLACED AROUND ENTIRE INNER CIRCUMFERENCE.
5. A TOTAL OF 2 PIPE SECTIONS SHALL BE FABRICATED.



1 STEEL PIPE SECTION
3/4" = 1'-0"



A WELD BEAD DETAIL
1/4" = 1"

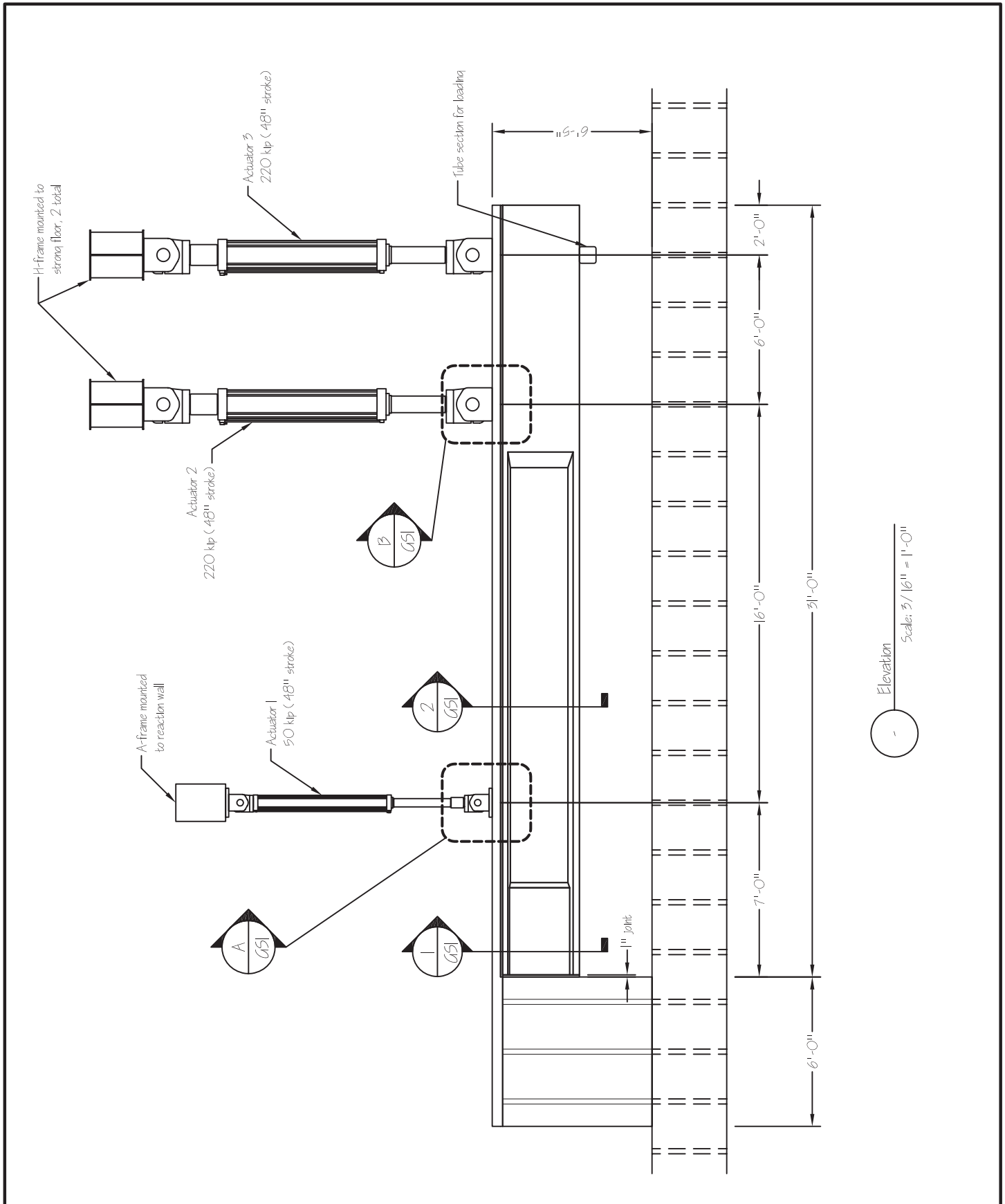
APPROVED FOR PRODUCTION



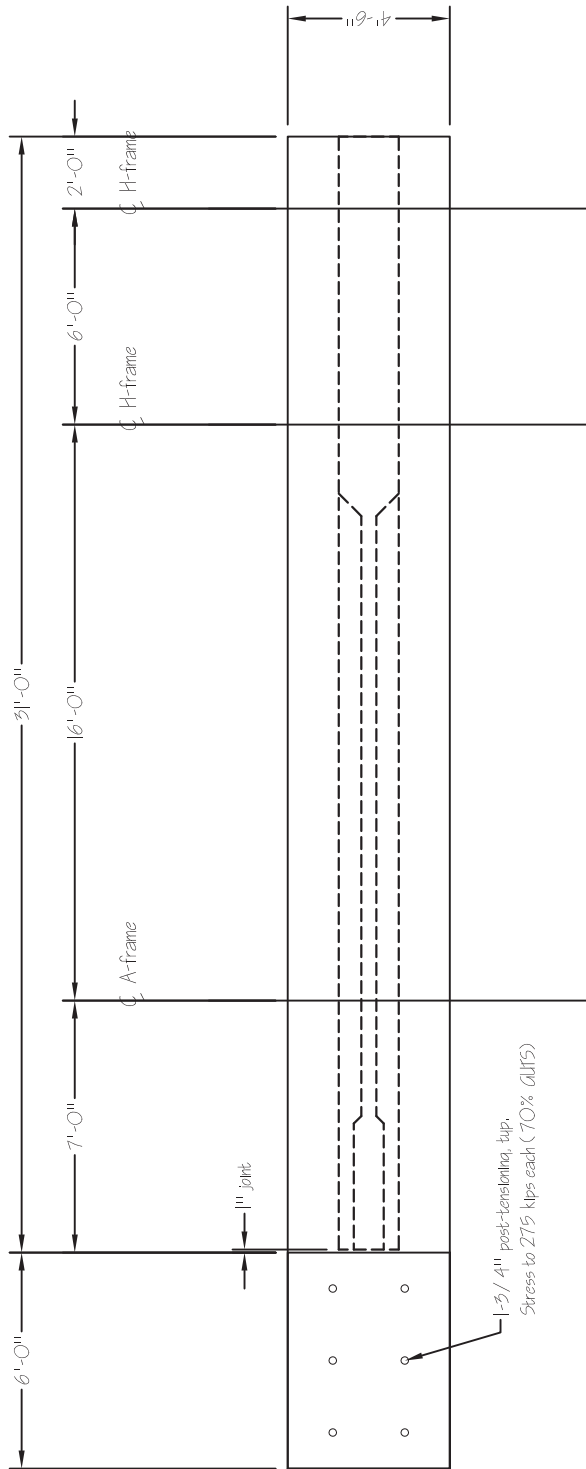
NCHRP PROJECT 12-74

COLUMN PIPE DETAIL

DUCTILITY:	FULL	SUPER. CONNECTION:	NON-INTEGRAL	CONNECTION DETAIL:	HYBRID SPECIMEN 3 - DUAL SHELL COLUMN
BY:	MJT	CHK:	DATE:	11/08/07	SCALE: AS SHOWN
					SHEET: 12



	NCHRP PROJECT 12-74 TEST SPECIMEN ELEVATION					
VISUAL SCALE: 	DUCTILITY: FULL	SUPER. CONNECTION: INTEGRAL	CONNECTION DETAIL: INTEGRAL COMPONENT TEST			
	BY: MJT	CHK:	DATE: 06/30/09	SCALE: 3/16" = 1'-0"	SHEET:	GPI



Plan View
Scale: 3/16" = 1'-0"



NCHRP PROJECT 12-74 TEST SPECIMEN GENERAL PLAN

Visual Scale:



Ductility:

FULL

Super. Connection:

Integral

Connection Detail:

Integral Component Test

By:

MJT

Chk:

Date:

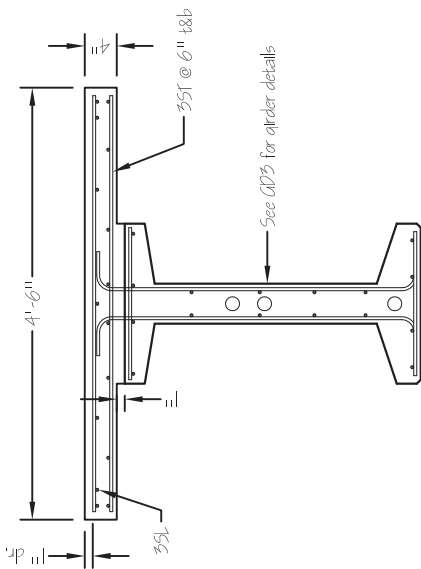
06/30/09

Scale:

3/16" = 1'-0"

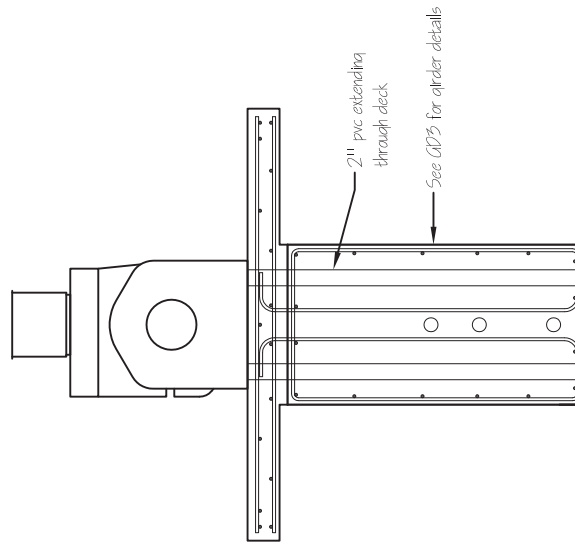
Sheet:

GP2



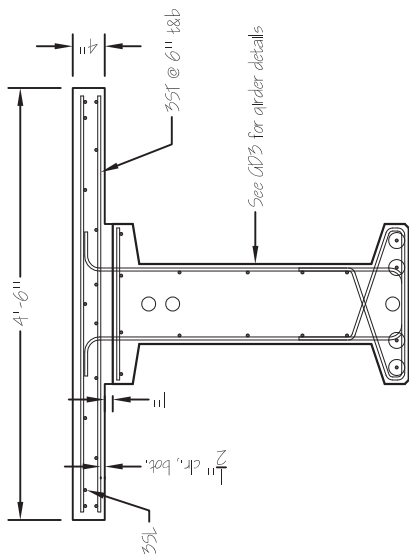
Section 2

Scale: 1/2" = 1'-0"



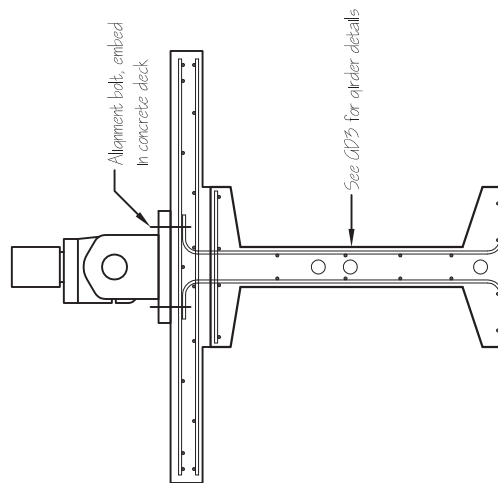
Section 3

Scale: 1/2" = 1'-0"



Section 1

Scale: 1/2" = 1'-0"



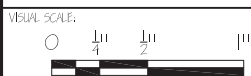
Section A

Scale: 1/2" = 1'-0"

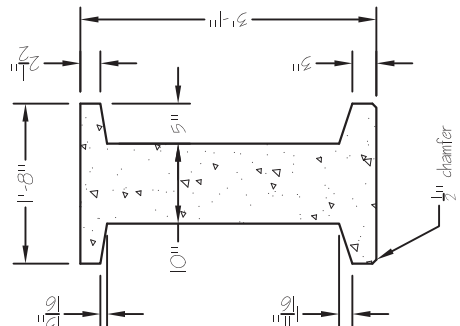
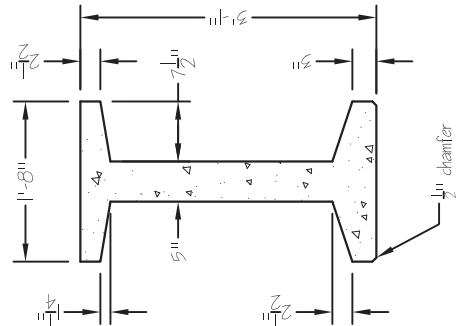
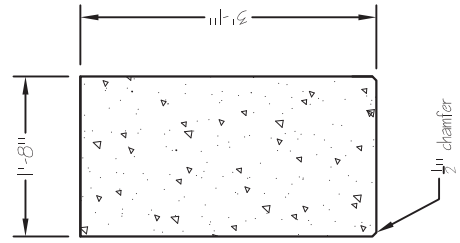
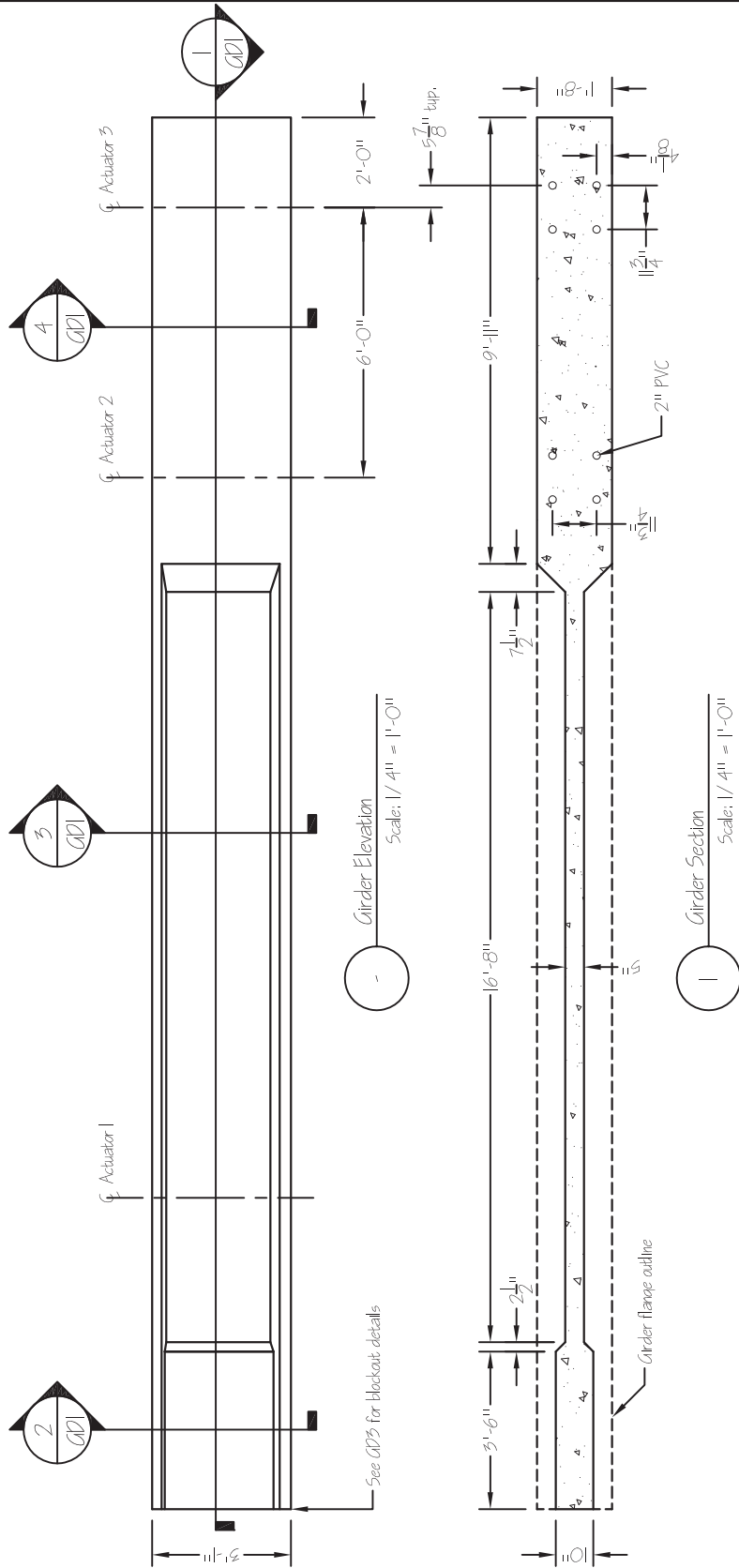


NCHRP PROJECT 12-74

TEST SPECIMEN GENERAL SECTIONS



Ductility: FULL		Super. Connection: INTEGRAL		Connection Detail: INTEGRAL COMPONENT TEST	
BY: MJT	CHK:	DATE: 06/30/09	SCALE: 1/2" = 1'-0"	SHEET: 651	



NCHRP PROJECT 12-74

GIRDER DETAILS 1

Visual Scale:



Ductility:

FULL

Super. Connection:

Integral

Connection Detail:

Integral Component Test

By:

MJT

Chk:

Date:

06/30/09

Scale:

As Noted

Sheet:

GDI



NCHRP PROJECT 12-74

GIRDER DETAILS 2

Visual Scale:



Ductility:

FULL

Super. Connection:

Integral

Connection Detail:

Integral Component Test

By:

MJT

Chk:

Date:

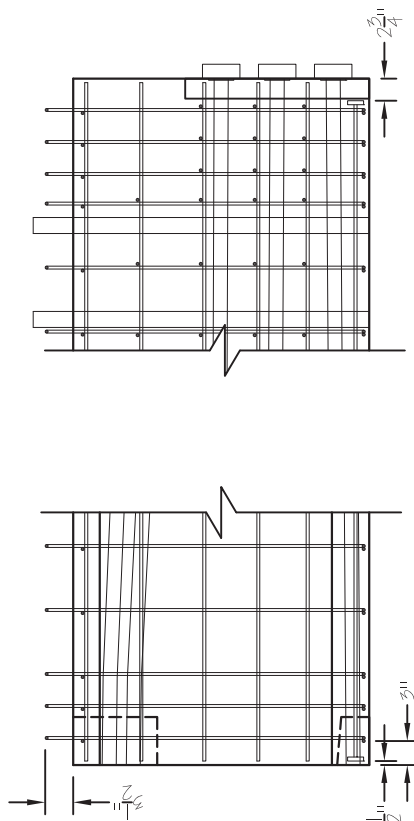
06/30/09

Scale:

As Noted

Sheet:

G02



Girder Section at Bent Cap

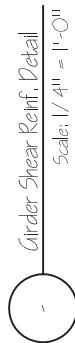
Scale: 1/2" = 1'-0"

Girder Section at Anchorage

Scale: 1/2" = 1'-0"

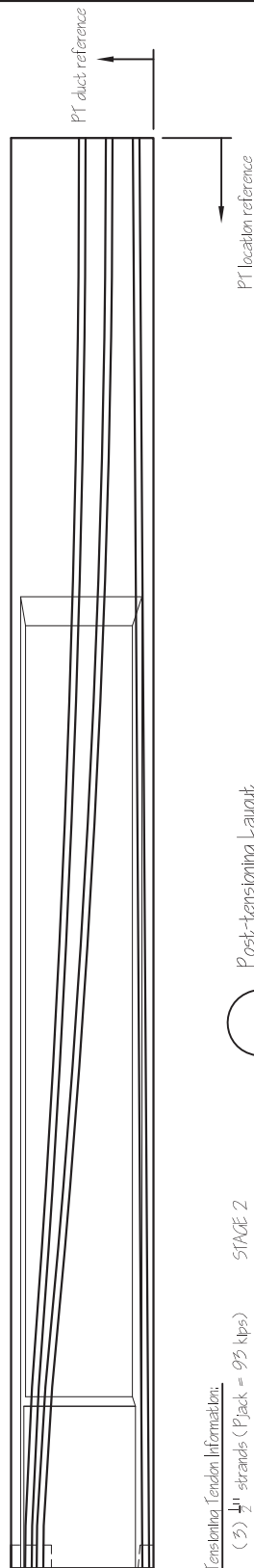
Post-Tensioning Tendon Information:

- Top: (3) 1/2" strands (Pack = 93 kips)
- Middle: (3) 1/2" strands (Pack = 93 kips)
- Bottom: (3) 1/2" strands (Pack = 0 kips)



Girder Shear Reinf. Detail

Scale: 1/4" = 1'-0"

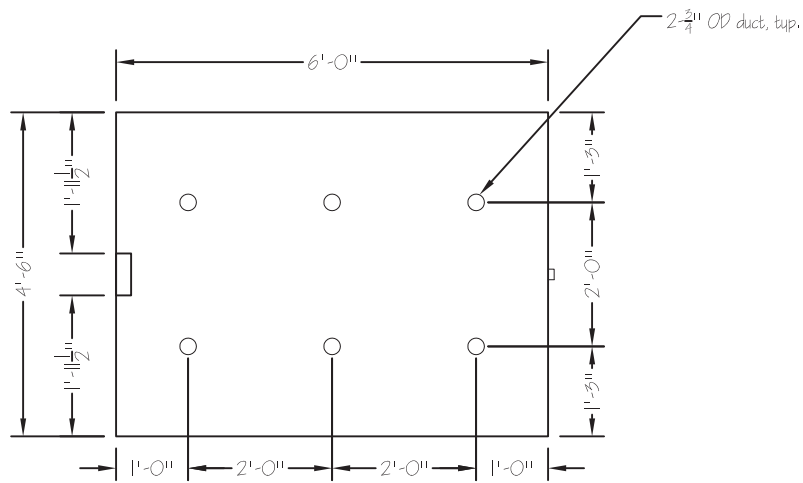


Post-tensioning Layout

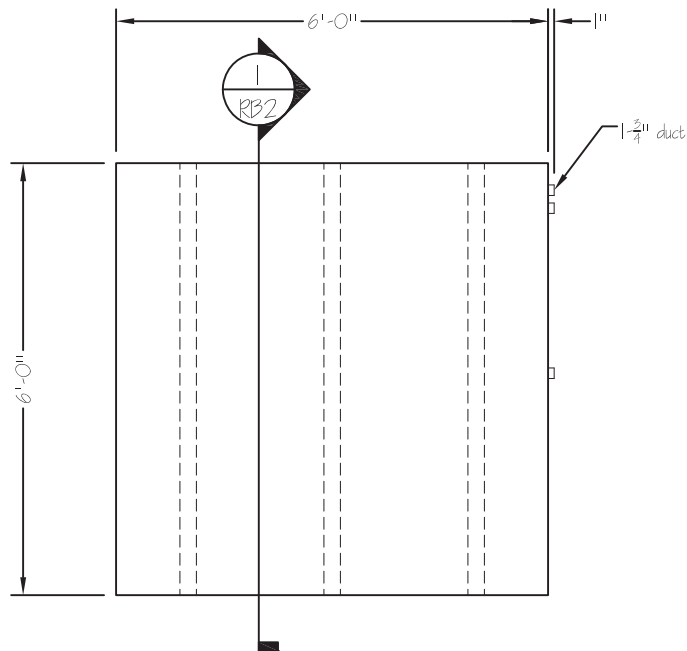
Scale: 1/4" = 1'-0"

CENTER OF POST-TENSIONING DUCTS				
Location (feet)	Bottom (inches)	Middle (inches)	Top (inches)	
0	4 - 1/2	11 - 1/2	18 - 1/2	
3	4 - 1/4	11 - 11/16	18 - 5/8	
6	4	12 - 1/4	19 - 1/8	
9	3 - 3/4	13 - 1/4	19 - 7/8	
12	3 - 9/16	14 - 5/8	20 - 15/16	
15	3 - 5/16	16 - 5/16	22 - 1/4	
18	3 - 1/16	18 - 7/16	23 - 15/16	
21	2 - 13/16	21	25 - 7/8	
24	2 - 9/16	23 - 7/8	28 - 1/8	
27	2 - 5/16	27 - 3/16	30 - 11/16	
30	2 - 1/16	29 - 3/8	32 - 3/8	
30'-11"	2	29 - 1/2	32 - 1/2	

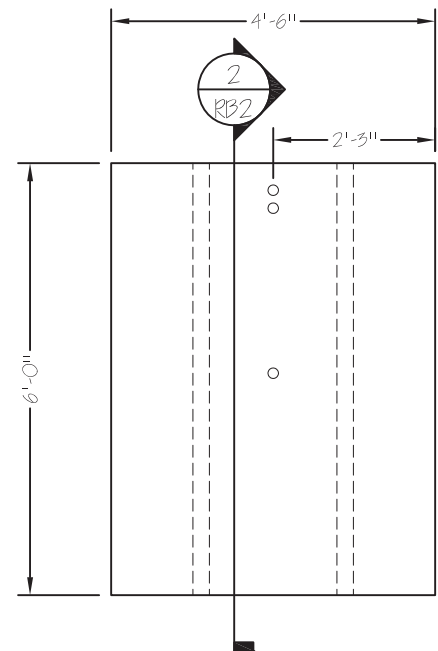
GP3



Reaction Block Plan View
Scale: 3/8" = 1'-0"



Reaction Block Front Elevation
Scale: 3/8" = 1'-0"



Reaction Block Side Elevation
Scale: 3/8" = 1'-0"



NCHRP PROJECT 12-74

REACTION BLOCK DETAILS 1

VISUAL SCALE:



DUCTILITY:

FULL

SUPER. CONNECTION:

INTEGRAL

CONNECTION DETAIL:

INTEGRAL COMPONENT TEST

BY:

MJT

CHK:

DATE:

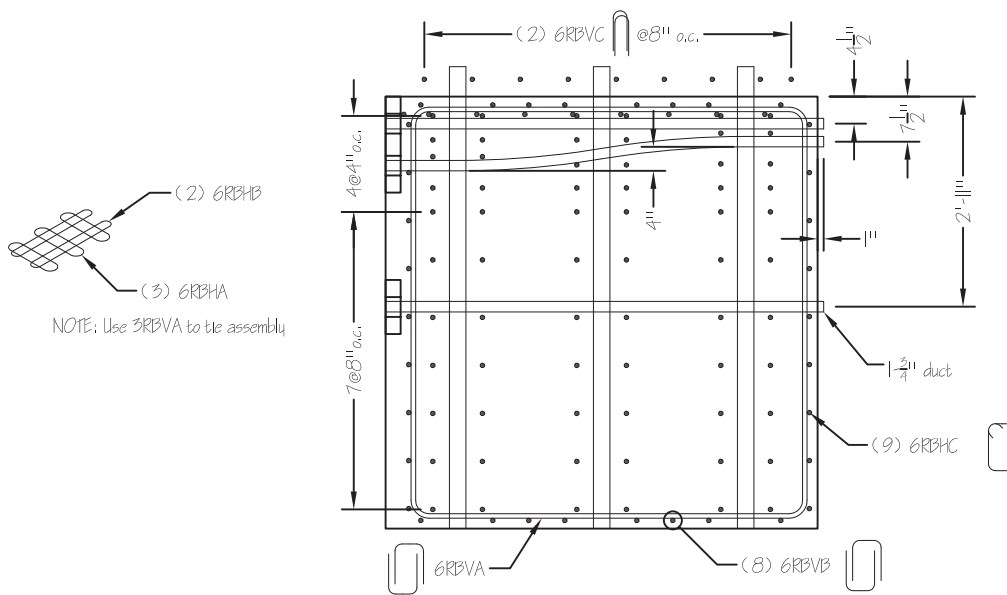
06/30/09

SCALE:

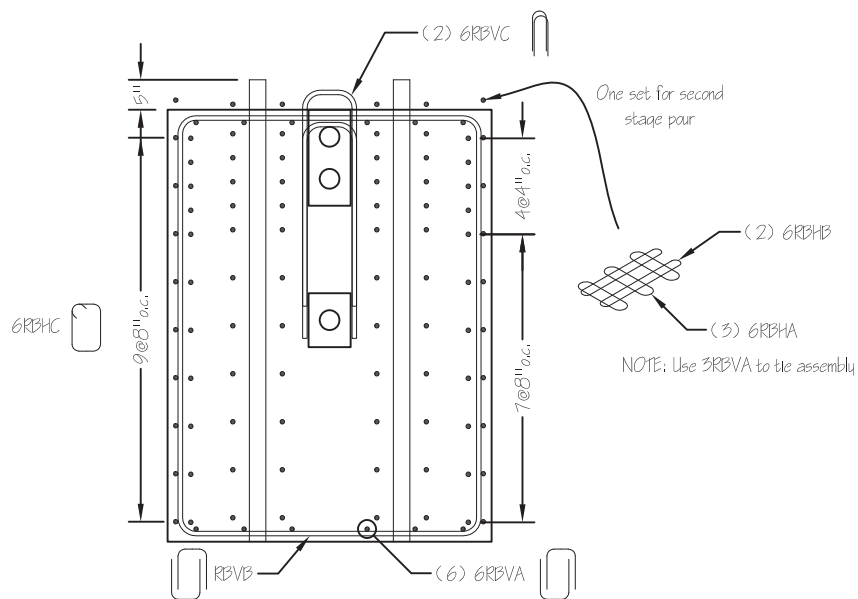
3/8" = 1'-0"

SHEET:

RB1



1 Reaction Block Section
Scale: 3/8" = 1'-0"



2 Reaction Block Section
Scale: 3/8" = 1'-0"



NCHRP PROJECT 12-74

REACTION BLOCK DETAILS 2

VISUAL SCALE:



DUCTILITY:

FULL

SUPER. CONNECTION:

INTEGRAL

CONNECTION DETAIL:

INTEGRAL COMPONENT TEST

BY:

MJT

CHK:

DATE:

06/30/09

SCALE:

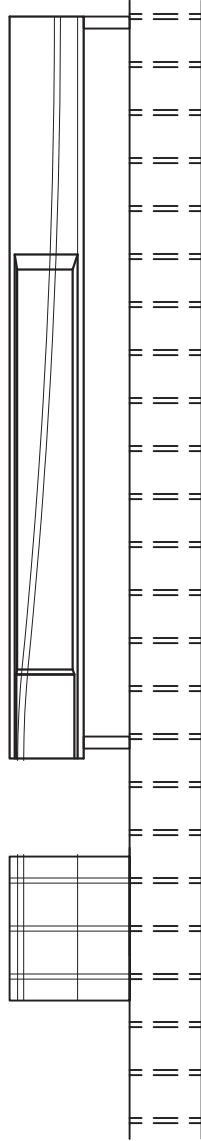
3/8" = 1'-0"

SHEET:

RB2

Construction Activities

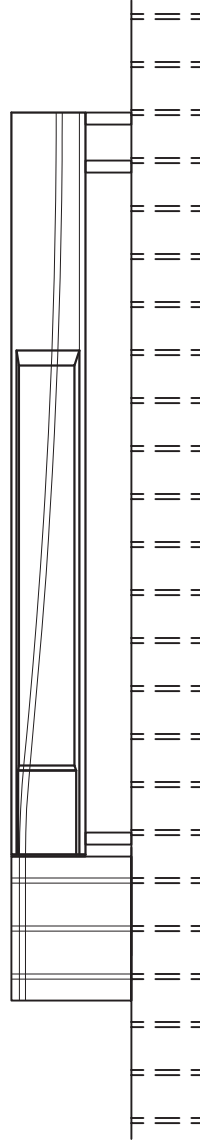
1. Construct forms for girder and reaction block.
2. Fabricate and install rebar capes and post-tensioning ducts.
3. Cast concrete.
4. Break forms.



Construction State 1
Scale: 1/8" = 1'-0"

Construction Activities

1. Lift girder and place on support structure in final location while also threading post-tensioning.
2. Splice post-tensioning ducts.
3. Form groat joint.
4. Groat joint and blockout.
5. Remove forms.



Construction State 2
Scale: 1/8" = 1'-0"



NCHRP PROJECT 12-74 CONSTRUCTION STAGING 1

Visual Scale:



Ductility:

FULL

Super. Connection:

INTEGRAL

Connection Detail:

INTEGRAL COMPONENT TEST

By:

MJT

CHK:

DATE:

06/30/09

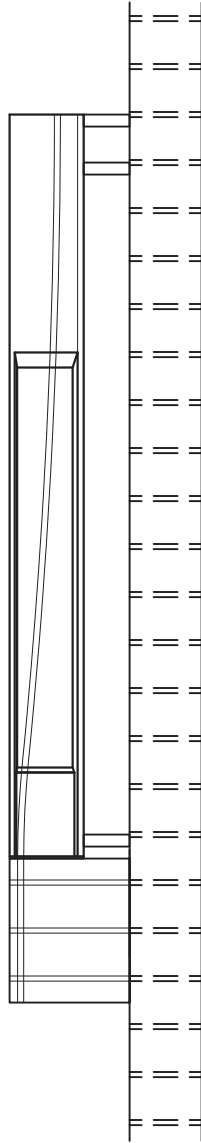
SCALE:

1/8" = 1'-0"

SHEET:

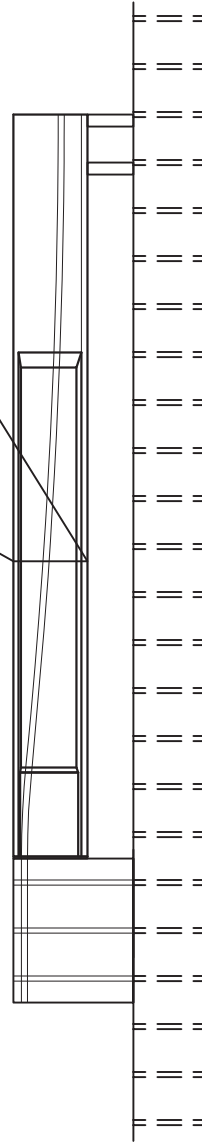
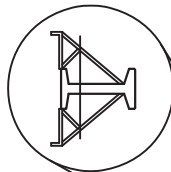
CSI

- Construction Activities
1. Post-tension middle tendon.
 2. Grout middle duct.
 3. Grout bottom duct.



Construction State 3
Scale: 1/8" = 1'-0"

- Construction Activities
1. Install deck formwork attached directly to older.
 2. Fabricate and install deck reinforcement.



Construction State 4
Scale: 1/8" = 1'-0"



NCHRP PROJECT 12-74

CONSTRUCTION STAGING 2

Visual Scale:



Ductility:

FULL

Super. Connection:

INTEGRAL

Connection Detail:

INTEGRAL COMPONENT TEST

BY:

MJT

CHK:

DATE:

06/30/09

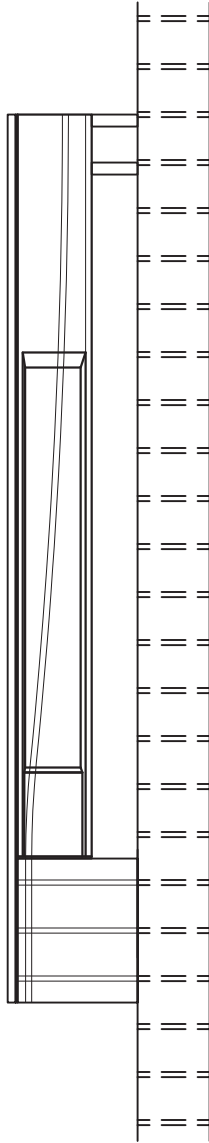
SCALE:

1/8" = 1'-0"

SHEET:

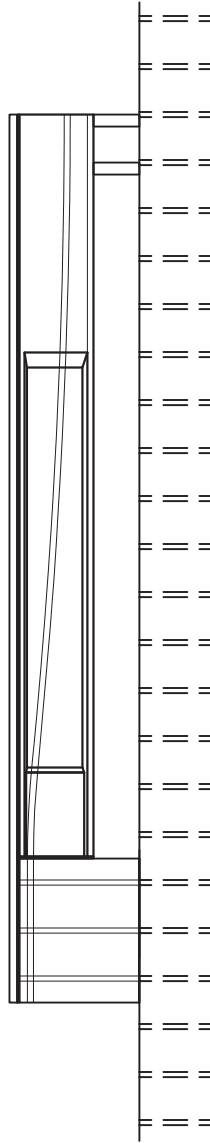
CS2

Construction Activities
 1. Cast deck.
 2. Remove formwork.



Construction State 5
 Scale: 1/8" = 1'-0"

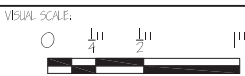
Construction Activities
 1. Post-tension reaction block to floor.
 2. Post-tension top tendon.
 3. Groat top duct.
 4. Install actuators.



Construction State 6
 Scale: 1/8" = 1'-0"



NCHRP PROJECT 12-74 CONSTRUCTION STAGING 3



Ductility: FULL		SUPER. CONNECTION: INTEGRAL		CONNECTION DETAIL: INTEGRAL COMPONENT TEST	
BY: MJT	CHK:	DATE: 06/30/09	SCALE: 1/8" = 1'-0"	SHEET: CS3	