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
NOTE:
1. ALL REINFORCEMENT NOT SHOWN FOR CLARITY

REINFORCEMENT DETAIL

SCALE: 1" = 1'-0"

A

REINFORCEMENT DETAIL

SEE SHEET 1 OF 5 FOR REBAR SPACING

FOR REBAR SPACING

SEE SHEET 1 OF 5 FOR REBAR SPACING

AS SHOWN

BENT CAP

COLUMN

A STIRRUPS
**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.

**STEEL REINFORCEMENT NOTES:**
1. All steel reinforcement shall be A706 Grade 60 unless otherwise specified.
2. If stainless steel is used, it shall be type 316L or type 2205.

**POST-TENSIONING NOTES:**
1. All post-tensioning shall be A490 Grade 270 low-relaxation steel.
2. Post-tensioning force after immediate losses shall be 132 kips.

**SPECIMEN ELEVATION**

1/2" = 1'-0"
CONSTRUCTION STAGE ACTIVITIES:
1. SET COLUMN ASSEMBLY ON SUPPORTS
2. THREAD POST-TENSIONING TENDON THROUGH COLUMN AND SET IN DEAD END ACHORAGE
3. CONSTRUCT BENT CAP SUPPORT STRUCTURE

STAGE 1
1/6" = 1'-0"

CONSTRUCTION STAGE ACTIVITIES:
1. SET BENT CAP ON SUPPORT STRUCTURE
2. THREAD POST-TENSIONING TENDON THROUGH BENT CAP
3. FORM AROUND BEDDING LAYER
4. CIRCUM AROUND LAYER AND GROUNDED PAST PER CIRCUITING PASTURE

STAGE 2
1/6" = 1'-0"

CONSTRUCTION STAGE ACTIVITIES:
1. ALLOW COLUMN TO SET PER CIRCUIT PROCEDURE
2. POST-TENSION TENDON TO SPECIFIED LOAD
3. CUT EXCESS TENDO FROM COLUMN ANCHORAGE

STAGE 3
1/6" = 1'-0"

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

STAGE 4
1/6" = 1'-0"
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 S316.

POST-TENSIONING NOTES:
1. ALL POST-TENSIONING SHALL BE A490 GRADE 270 LOW-RELAXATION STEEL.
2. POST-TENSIONING FORCE AFTER IMMEDIATE LOSSES SHALL BE 152 KIPS.

STEEL NOTES:
1. STEEL SHELL SHALL BE A972 GRADE 50.

SPECIMEN ELEVATION

1/2" = 1'-0"
NCHRP PROJECT 12-74
GENERAL SECTION

Section 1: 2" Bend Cap Section
1/2" = 1'-0"

Section 2: 2" Bend Cap Section
1/2" = 1'-0"

NOTE:
Two column reinforcing bars and four beam reinforcing bars contain strain gages (see instrumentation plan.)

Approved for Production
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

STAGE 1
1/4" = 1'-0"

CONSTRUCTION STAGE ACTIVITIES:
1. Set bent cap on support structure
2. Thread post-tensioning tendon through bent cap
3. Form around bedding layer
4. Cast bedding layer and grouted ducts per grouting procedure

STAGE 2
1/4" = 1'-0"

CONSTRUCTION STAGE ACTIVITIES:
1. Allow group to set per group procedure
2. Post-tension tendons to specified load
3. Cut excess tendon from both anchorages

STAGE 3
1/4" = 1'-0"

CONSTRUCTION STAGE ACTIVITIES:
1. Invert specimen per "specimen inversion procedure"
2. Move specimen to test setup
3. Paint specimen
4. Attach actuators

STAGE 4
1/4" = 1'-0"
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.

STEEL REINFORCEMENT NOTES:
1. ALL STEEL REINFORCEMENT SHALL BE A36 GRADE 50, UNLESS OTHERWISE SPECIFIED.
2. STAINLESS STEEL REINFORCEMENT SHALL BE TYPE 304N.

POST-TENSIONING NOTES:
1. ALL POST-TENSIONING SHALL BE A490 GRADE 270 LOW-RELAXATION STEEL.
2. POST-TENSIONING FORCE AFTER IMMEDIATE LOSSES SHALL BE 152 KIPS.

STEEL NOTES:
1. STEEL SHELL SHALL BE A672 GRADE 50.
NOTE:
TWO COLUMN REINFORCING BARS AND FOUR BEAM
REINFORCING BARS CONTAIN STRAIN GAGES (SEE
INSTRUMENTATION PLAN)
CONSTRUCTION STAGE ACTIVITIES:
1. SET COLUMN ASSEMBLY ON SUPPORTS
2. THREAD POST-TENSIONING TENDON THROUGH COLUMN AND SET IN DEAD END ACHORAGE
3. CONSTRUCT BENT CAP SUPPORT STRUCTURE

STAGE 1
1/4" = 1'-0"

CONSTRUCTION STAGE ACTIVITIES:
1. SET BENT CAP ON SUPPORT STRUCTURE
2. THREAD POST-TENSIONING TENDON THROUGH BENT CAP
3. FORM AROUND BEDDING LAYER
4. GLUE BEDDING LAYER AND ROOTED DUCTS PER GLUING PROCEDURE

STAGE 2
1/4" = 1'-0"

CONSTRUCTION STAGE ACTIVITIES:
1. ALLOW GROUP TO SET PER GROUP PROCEDURE
2. POST-TENSION TENDON TO SPECIFIED LOAD
3. CUT EXCESS TENDON FROM BOTH ANCHORAGES

STAGE 3
1/4" = 1'-0"

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

STAGE 4
1/4" = 1'-0"

NCHRP PROJECT 12-74
ERECTION PROCEDURE

BY: M.J. DATE: 11/08/07
SCALE: 1/4" = 1'-0"
NOTES:

1. Rolled steel plate pipe shall be AS 92 Grade 90 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.

NCHRP PROJECT 12-74
COLUMN PIPE DETAIL

GIRDER PROJECT 12-74
GIRDER DETAILS 1

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

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

2 in. channel

3 in. channel

4 in. channel
Construction Activities
1. Construct forms for girder and reaction block.
2. Fabricate and install rebar cages and post-tensioning ducts.
3. Cast concrete.
4. Strike forms.

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

Construction Activities
1. Lift girder and place in support structure in final location while also threading post-tensioning ducts.
2. Splice post-tensioning ducts.
3. Form grade joint.
4. Grout joint and backfill.
5. Remove forms.

Construction State 2
Scale: 1" = 1'-0"
Construction Activities
1. Post-tension middle tendon.
2. Grate middle duct.
3. Grate bottom duct.

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

Construction Activities
1. Install deck framework attached directly to abutments.
2. Fabricate and install deck reinforcement.

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