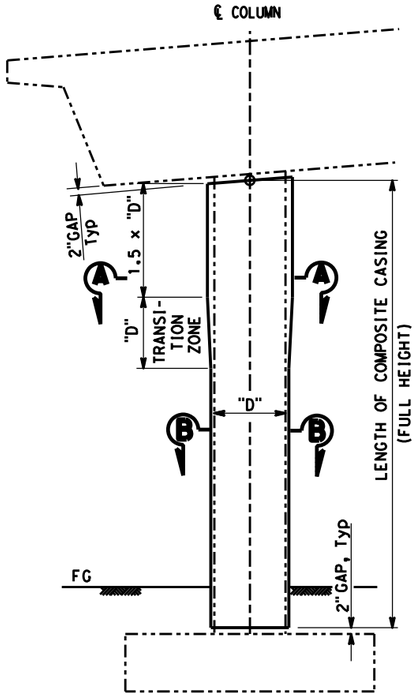
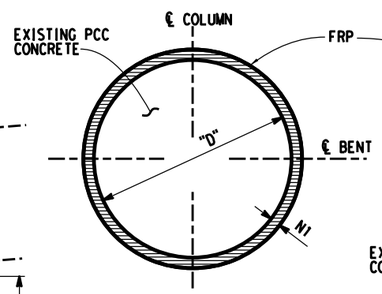
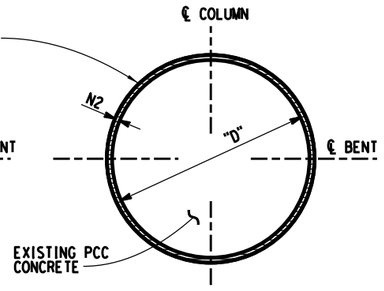


COLUMN RETROFIT



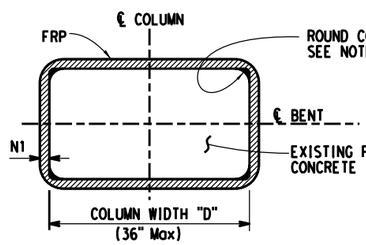
SECTION A-A



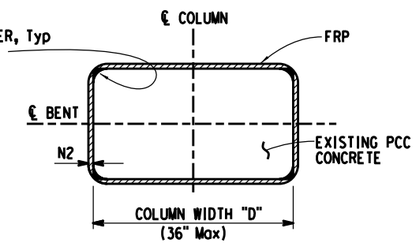
SECTION B-B

E-GLASS FRP SYSTEM		
ROUND COLUMN, NUMBER OF LAYERS (Min)		
COLUMN DIAMETER	N1	N2
12"	4	2
24"	7	4
36"	11	6
48"	14	7
60"	17	9
72" Max	21	11

E-GLASS FRP SYSTEM		
RECTANGULAR COLUMN, NUMBER OF LAYERS (Min)		
COLUMN WIDTH	N1	N2
12"	6	3
18"	8	4
24"	11	6
30"	13	7
36" Max	16	8



SECTION A-A



SECTION B-B

CARBON FRP SYSTEM		
ROUND COLUMN, NUMBER OF LAYERS (Min)		
COLUMN DIAMETER	N1	N2
12"	3	3
24"	6	3
36"	8	4
48"	11	6
60"	14	7
72" Max	16	8

CARBON FRP SYSTEM		
RECTANGULAR COLUMN, NUMBER OF LAYERS (Min)		
COLUMN WIDTH	N1	N2
12"	4	3
18"	6	3
24"	8	4
30"	10	5
36" Max	12	6

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER _____ DATE _____

PLANS APPROVAL DATE _____

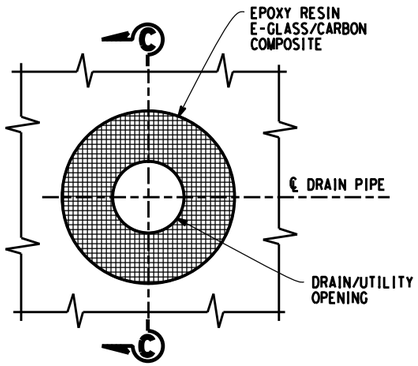
REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of scanned copies of this plan sheet.

The Registered Civil Engineer for the project is responsible for the selection and proper application of the component design and any modifications shown.

E-GLASS/CARBON NOTES:

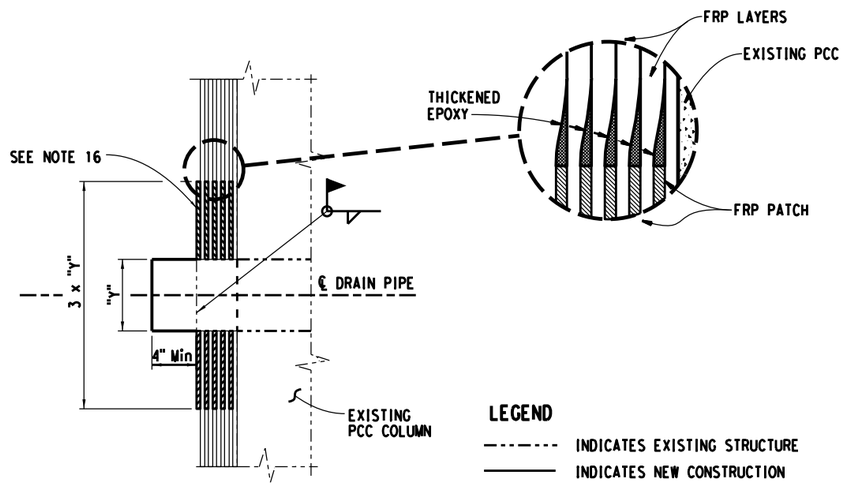
1. For all subsequent notes, surfaces shall be defined as the surface to receive the composite. Fabric refers to the unidirectional or bi-directional fiber. Fiber Reinforced Polymer (FRP) composite is either E-Glass or Carbon fiber and Epoxy resin
2. All surfaces shall be prepared for bonding by means of abrasive blasting or grinding
3. All surfaces shall be cleaned by hand or by oil-free compressed air. All surfaces shall be free of moisture, oils, loose material, debris, or dust
4. All cutting of fabrics, mixing of epoxy, and wetting out of fabric and handling, shall be done in a manner to ensure that the composite materials are free of moisture, oils, debris or dust
5. For non-circular columns remove any sharp corners/edges to a 1½" radius minimum
6. A primer coat of epoxy shall be applied to the surface and allowed to cure for a minimum of one hour
7. Surfaces shall be free of voids, protrusions, and sharp edges. Any voids or uneven surfaces shall be filled with a thickened epoxy
8. E-Glass or Carbon composite system used shall be selected from a list of Caltrans Prequalified composite systems
9. Fabric shall be completely saturated prior to application to the surface. No dry fiber placement is allowed, unless fabric used has removable backing or procedure has been approved by prequalification
10. The composite casing shall adhere firmly to the existing column surface
11. Detail/feather all fabric edges, including termination points, edges and seams with a thickened epoxy. Detailing/feathering shall extend a minimum of 6"
12. Each composite section shall be wrapped using continuous fabric not less than 2'-0" in height. All wraps of continuous weave shall be terminated a minimum of 12" past the starting point of the initial wrap. Subsequent wraps shall be started (butted) at the ending point of the last wrap
13. The casing thickness shall taper evenly over the full length of the transition zone
14. For non-circular columns use number of layers specified in the "RECTANGULAR COLUMN" table
15. Existing non-circular column surfaces shall be straight or slightly convexed outward at all areas, otherwise, the surface shall be filled with thickened epoxy
16. Drainage opening reinforcement shall be the same fiber and resin material used for the column casing. Alternate continuous layer with local bi-axial weave patch at drainage opening
17. Minimum number of layers for Carbon System is based on minimum effective fiber layer thickness of 0.0065 inches. Fewer number of layers can be installed for effectively thicker (fiber) layers provided that an equivalent stiffness is maintained



E-GLASS/CARBON OPENING

NOTE:

THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABICATING ANY MATERIAL.



SECTION C-C

LEGEND

INDICATES EXISTING STRUCTURE

INDICATES NEW CONSTRUCTION

N1,N2 DENOTES MINIMUM NUMBER OF LAYERS INSIDE THE PLASTIC HINGE ZONE AND OUTSIDE THE PLASTIC HINGE ZONE

NO SCALE

BRIDGE STANDARD DETAILS

xs7-020	July 2014	The components of the Bridge Standard Details have been prepared under the responsible charge of the Technical Owner, a registered civil engineer in the State of California
FILE NO.	APPROVAL DATE	

Refer to: http://www.dot.ca.gov/hq/esc/techpubs/manual/bridgemanuals/bridge-standard-detail-sheets/index.html

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

BRIDGE NO.

POST MILE

COLUMN CASING - FRP COMPOSITE SYSTEM

FILE => $REQUEST
USERNAME => $USER
TIME PLOTTED => $TIME
DATE PLOTTED => $DATE

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT:
PROJECT NUMBER & PHASE:
CONTRACT NO.:

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES			SHEET	OF
4-14-14	12-16-14	7-8-16		