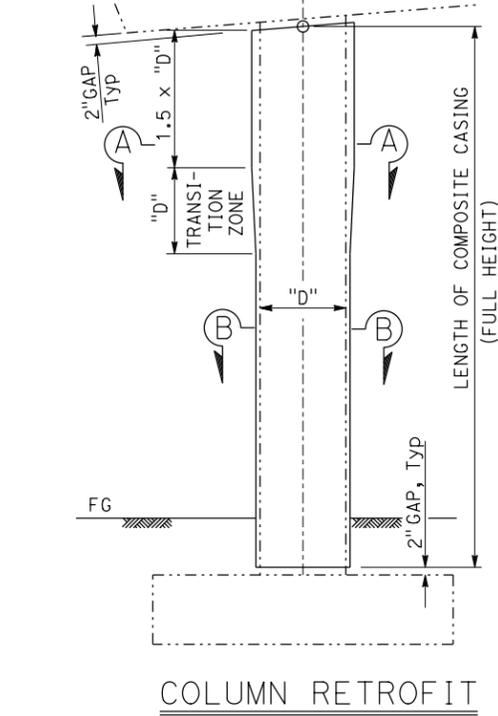
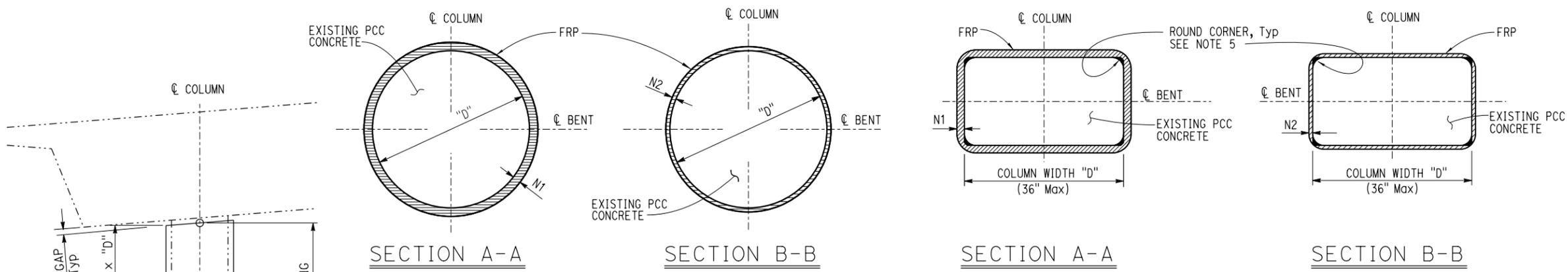


Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
REGISTERED CIVIL ENGINEER			X	DATE	
MM/DD/YYYY					
PLANS APPROVAL DATE					
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					
THE REGISTERED CIVIL ENGINEER FOR THE PROJECT IS RESPONSIBLE FOR THE SELECTION AND PROPER APPLICATION OF THE COMPONENT DESIGN AND ANY MODIFICATIONS SHOWN.					



E-GLASS FRP SYSTEM		
ROUND COLUMN, NUMBER OF LAYERS (Min)		
COLUMN DIAMETER	N1	N2
12"	3	2
18"	5	3
24"	6	3
36"	9	5
48"	11	6
60"	14	7
72" Max	17	9

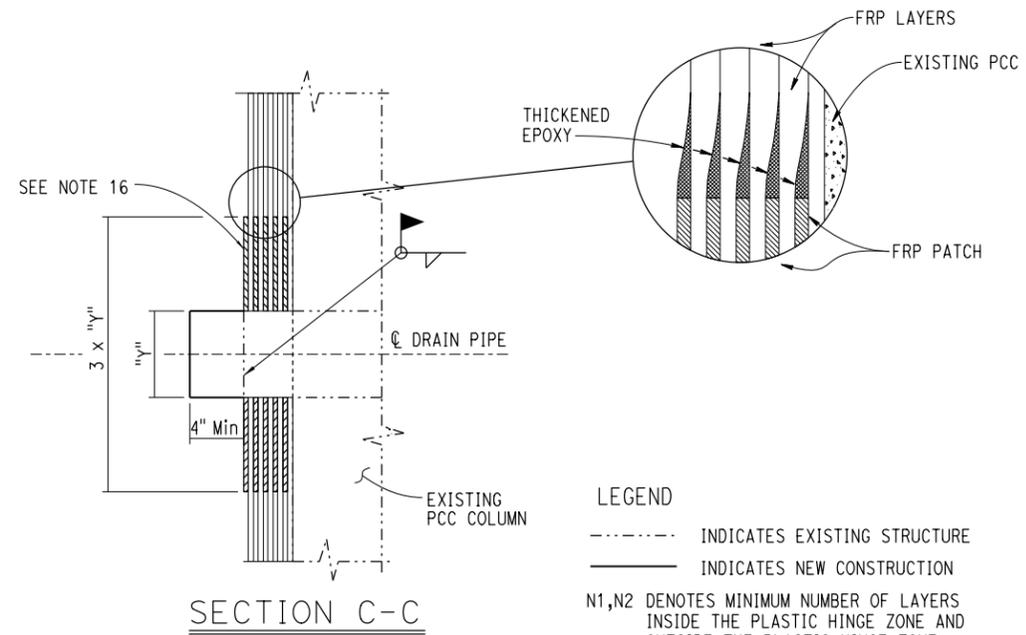
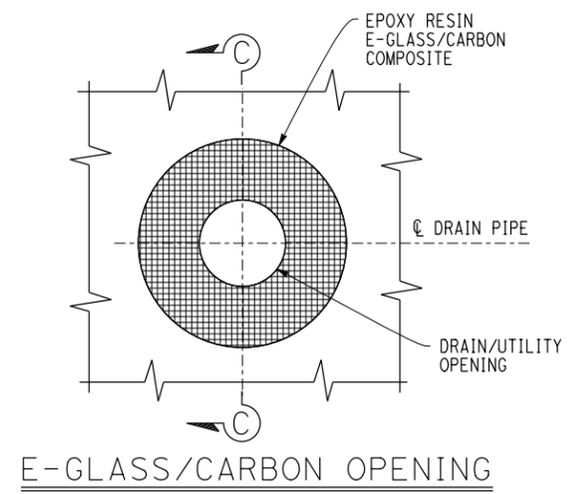
CARBON FRP SYSTEM		
ROUND COLUMN, NUMBER OF LAYERS (Min)		
COLUMN DIAMETER	N1	N2
12"	2	1
18"	3	2
24"	3	2
36"	5	3
48"	6	3
60"	8	4
72" Max	9	5

E-GLASS FRP SYSTEM		
RECTANGULAR COLUMN, NUMBER OF LAYERS (Min)		
COLUMN WIDTH	N1	N2
12"	5	3
18"	7	4
24"	9	5
30"	11	6
36" Max	13	7

CARBON FRP SYSTEM		
RECTANGULAR COLUMN, NUMBER OF LAYERS (Min)		
COLUMN WIDTH	N1	N2
12"	3	2
18"	4	2
24"	5	3
30"	6	3
36" Max	7	4

E-GLASS/CARBON NOTES:

- 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.
- All surfaces shall be prepared for bonding by means of abrasive blasting or grinding.
- 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.
- 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.
- For non-circular columns remove any sharp corners/edges to a 1/2" radius minimum.
- A primer coat of epoxy shall be applied to the surface and allowed to cure for a minimum of one hour before the application of the FRP composite, or when a tacky surface is obtained.
- Surfaces shall be free of voids, protrusions, and sharp edges. Any voids or uneven surfaces shall be filled with a thickened epoxy.
- E-Glass or Carbon composite system used shall be selected from a list of Caltrans Prequalified composite systems.
- 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.
- The composite casing shall adhere firmly to the existing bearing column surface.
- Detail/feather all fabric edges, including termination points, edges and seams with a thickened epoxy; no fiber or cross stitching shall protrude from the surface. Detailing/feathering shall extend a minimum of 6".
- 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 (buted) at the ending point of the last wrap.
- The casing thickness shall taper evenly over the full length of the transition zone.
- For non-circular columns use number of layers specified in the "RECTANGULAR COLUMN" table.
- Existing non-circular column surfaces shall be straight or slightly convexed outward at all areas, otherwise, the surface shall be filled with thickened epoxy.
- 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.
- Minimum number of layers for the FRP System is based on minimum nominal composite layer thickness of 0.05" for E-Glass, and 0.04" for carbon.



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

NOTE:
 THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

NO SCALE

BRIDGE STANDARD DETAILS xs7-020 FILE NO. JULY 2022 APPROVAL DATE <i>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</i>		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION		DIVISION OF ENGINEERING SERVICES		BRIDGE No. XX-XXXX POST MILE X.X	COMPOSITE COLUMN CASING		
Refer to: http://www.dot.ca.gov/hq/esc/techpubs/manual/bridgemanuals/bridge-standard-detail-sheets/Index.html		DATE PLOTTED => 25-JUL-2022 FILE => 20220721_xs7-20_.dgn	TIME PLOTTED => 14:11 USERNAME => s155182	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3	UNIT: XXXX PROJECT NUMBER & PHASE: XXXXXXXXXX1	XXX/XXX CONTRACT No.: XX-XXXXX4	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES	SHEET OF X X