Typical Installation Practices for P&C® Duct Type EB and Telephone Duct Type B

RUS Accepted

Trenching:

Whenever possible the walls of the trench for P&C Duct should act as forms for concrete encasement. The trench should be made no wider than necessary to provide the nominal size concrete thickness.

Duct Spacing:

Duct spacing, both vertical and horizontal, is accomplished with the use of Carlon PVC Snap-Loc® Spacers. Recommended interval between spacer assemblies is 8 to 10 feet.

Terminating:

For smooth cable pulling and properly engineered terminations into manholes, Carlon P&C Duct end bells should be used.

Concrete:

The concrete used with P&C Duct should be 3/8" aggregate with a nominal compressive strength of 2,500 lbs. per square inch. The slump should be at the upper end of the range, preferably 7 to 8 inches. It should have just enough slump to flow to the bottom of the formation and yet not be so wet as to cause the ducts to float. In placing concrete around P&C Duct, adjust the delivery chute so the fall of the concrete into the trench is minimal. Use a splash board to divert the flow of concrete away from the trench sides and avoid dislodging soil and stones.

Pressure Grouting:

This technique is used for ducts in a casing or bored construction. Hydraulic pressure exceeding 25 psi is common and thus dictates the use of a P&C Duct Type DB-120 or a Schedule 40® product. (See collapse pressure chart). Hydraulic pressure from grouting is a function of the line pressure at the nozzle and back pressure created by pumping. If the exhaust nozzle isn't withdrawn properly, the back pressure will rapidly build and equal the line pressure. Depending on the type casing and pumping distance, line pressures will go up to 90 psi.

Hydraulic Pressure:

The primary consideration for duct selection is the height of the duct bank. Since concrete exerts a force of 1.03 psi per foot of height, to determine the correct duct selection, consider the following examples:

1. 16 way duct bank, 5" conduit, 4 x 4 configuration with 3" separation, and 3" concrete cover

Concrete Height – 4 x 5.563" + 4 x 3 =
22.5 + 12" = 34.2"

Hydraulic Pressure – (34.2"/12) x 1.03 = 2.9 psi

In this instance the maximum force on the bottom ducts would be 2.9 psi, therefore, 5" EB-20 would be a satisfactory choice.

2. 16 way duct bank, 5" conduit, 8 x 2 configuration with 3" separation, and 3" concrete cover.

Concrete Height – 8 x 5.563" + 8 x 3 =
44.5 + 24" = 68.5"

Hydraulic Pressure — (68.5"/12) x 1.03 = 5.9 psi

In this instance the hydraulic force is equal to the theoretical collapse pressure of 5" EB-20, therefore, the use of 5" EB-35 or DB-60 would be a satisfactory choice.

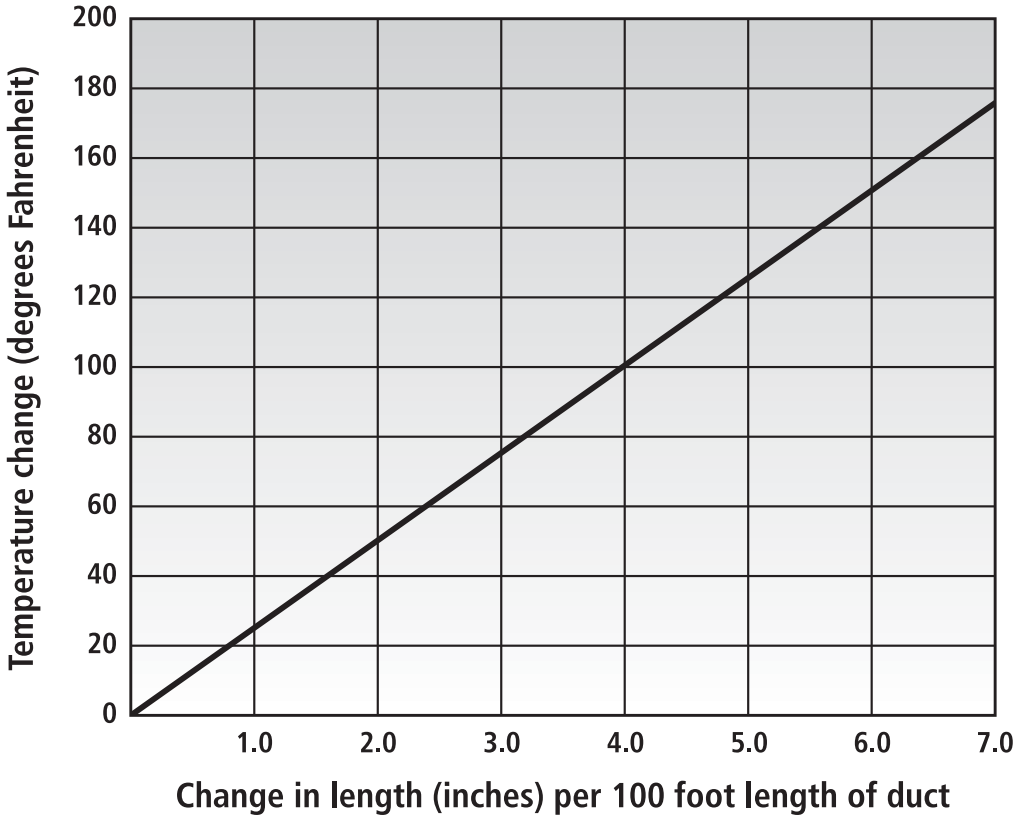
Another alternative would be to use a sequential pour technique. Pour approximately 1/2 the height, allow the concrete to set-up, and then pour the remaining distance. Using this method, 5" EB-20 would be satisfactory, since the hydraulic pressure has been reduced by 50%.

Expansion & Contraction

When duct temperature variations are anticipated during the installation of Carlon P&C® Duct and Telephone Duct, allow extra duct footage at each tie-in for contraction. Terminated duct runs should be covered with backfill from tie-in point toward the end of the duct run. If the trench must be left open, don't terminate the run. All plastic duct may expand or contract as concrete is poured and cured. When placing concrete encasement, always encase from one end of the duct section toward the other end of the section, to allow the free end to move. Never encase from each end of the section toward the center.

The coefficient of thermal expansion of Carlon P&C Duct and Telephone Duct is 3.30 x 10^{-5} in/in/°F. The following chart indicates what expansion or contraction can be expected at various temperature changes.

Expansion/Contraction Chart



Bridge Crossings and Exposed Applications

Type D Telephone Duct is designated specifically for use in bridge crossings and exposed applications. Using the expansion/contraction chart, calculate the number of expansion fittings required. Expansion fittings provide a 6" allowance for expansion/contraction. Utilize one expansion fitting for each 100 feet of exposed length for most installations. The duct should be free to move during expansion/contraction; the barrel should be securely clamped and the piston should be aligned properly with the barrel for easy movement.

Carlon® Split Duct

Carlon Split Duct is the fast and easy way to repair broken ductwork without the costly cutting and resplicing of your conductors.

Our unique tongue-and-groove design leads the industry in providing a strong, rigid solution for duct repair situations.

The interlocking design allows the split duct sections to be staggered and butted together. Joints may be sealed with tape and reinforced with plastic or metallic straps to produce a rigid, stable unit.

Manufactured from a compound designed specifically for power and telecommunications applications, Carlon Split Duct exhibits superior impact strength.

Available in 2" through 6" diameters, this product line also contains couplings and sweeps necessary to complete the system.

The fast and easy method of installing duct around existing cable for repair and temporary installations.

Recommended Installation Procedure

1. Place one 10-foot Split Duct section under cable.

2. In order to stagger joints, saw another section in half (about 5 feet long).

3. Place 5-foot sectIon over cable and snap the two sections together.

4. Place strap about one foot from the end and another strap about a foot from the joint where the ends of the top sections will butt.

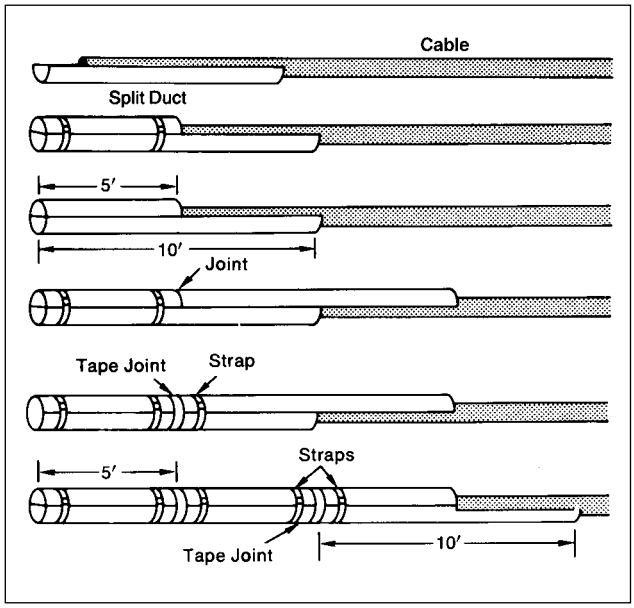
5. Place another 10-foot Split Duct section over the open half of the bottom section, butt the ends tightly together and snap the sections together.

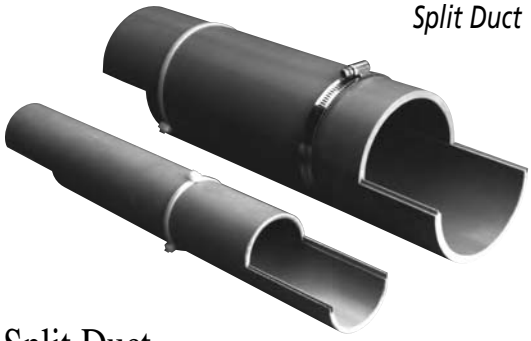
6. Place a length of tape around both sections of the Split Duct to cover the butted joint.

7. Place a strap about one foot beyond the taped joint.

8. Lay another length of Split Duct underneath cable, butt together, tape the butted joint and strap one foot on each side of the joint.

9. Repeat procedure.





Split Duct

Split Sleeve Coupling
For joining Split Duct to existing duct.

Split Duct

Part Number	Description	Std. Ctn. Qty.	Std. Ctn. Wt.(lbs.)	O.D.
Schedule 40				
49011SD-010	2" Schedule 40 Split Duct	700	523	2.375
49012SD-010	2 1/2" Schedule 40 Split Duct	460	562	2.875
49013SD-010	3" Schedule 40 Split Duct	500	802	3.500
49014SD-010	3 1/2" Schedule 40 Split Duct	290	560	4.000
49015SD-010	4" Schedule 40 Split Duct	290	662	4.500
49016SD-010	5" Schedule 40 Split Duct	230	718	5.563
49017SD-010	6" Schedule 40 Split Duct	130	523	6.625
Schedule 80				
49411SD-010	2" Schedule 80 Split Duct	700	702	2.375
49415SD-010	4" Schedule 80 Split Duct	290	890	4.500
C Duct				
68515SD-010	4" C Duct Split Duct	320	614	4.350

Split Sleeve Coupling

Part Number	Size	Description	length	Split	Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)
Schedule 40 and 80						
E200JS6	2"	Split Coupling	6"	1	25	6.1
E200KS7	2 1/2"	Split Coupling	7"	1	25	21
E200LS7	3"	Split Coupling	7"	1	25	15.5
E200LSS	3"	Split Coupling	6.5"	1	25	10
E200MS8	3 1/2"	Split Coupling	8"	1	25	41.2
E200NS8	4"	Split Coupling	8"	1	15	16
E200NSS	4"	Split Coupling	6"	1	25	17
E200PS8	5"	Split Coupling	8"	1	15	25
E200PS9	5"	Split Coupling	9"	1	8	16.4
E200RS1	6"	Split Coupling	10"	1	6	24.2
C Duct						
E900NS8 (White)	4"	C Duct Split Coupling	8"	1	15	19
E900NSW (White)	4"	C Duct Split Coupling	6"	1	25	22

Split Duct Sweeps

Split Duct Sweeps

Segment	Part No.	Nom. Size	Radius (in.)	Std.Ctn. Qty.	Std. Ctn. Wt. (lbs.)
45° Sweep	UA7DJSD	2"	24"	1	1.4
	UA7FJSD	2"	36"	1	2.1
	UA7FLSD	3"	36"	1	4.7
	UA7HJSD	2"	48"	1	2.7
	UA7HLSD	3"	48"	1	6.1
	UA7IJSD	2"	60"	1	3.2
	UA7ILSD	3"	60"	1	7.2
	UA7INSD	4"	60"	1	10.2
22 1/2° Sweep	UA5INSD	4"	60"	1	6.1
11 1/4° Sweep	UA3IJSD	2"	60"	1	1
	UA3ILSD	3"	60"	1	3.6
	UA3INSD	4"	60"	1	5.1

Two 45° Elbows may be segmented for 90°.