CONCRETE ENCASED DUCT BANK

I. GENERAL

I.1. SCOPE

The work under this section is limited to the assembly of the spacers and ducts required to form the duct bank. Formwork, reinforcement and concrete placing specifications will be found in the Concrete and Piles section.

I.2. SPACERS

Interlocking PVC spacers to provide 1-1/2" spacing between ducts and 3" cover of concrete for the outer ducts, spaced 5 feet on centers will be used. Spacers will be assembled to form the duct bank specified. Concrete blocks shall be utilized to support the spacers and provide 3" of concrete between the reinforcing steel and the ground.

I.3. REINFORCING STEEL

Rebar of the size specified in the Rebar Schedule will be placed in the duct bank, located as specified in the Construction Details. Longitudinal rebar will be tied to the spacers so as to provide as much space between the duct and the rebar as possible. Transverse rebar, as specified, will be tied to the longitudinal steel on centers specified in the Construction Details.

I.4. DUCT

Direct burial PVC grade duct will be placed in the spacers, and joined with owner furnished PVC cement in accordance with the manufacturer's instructions.

I.5. DUCT BANK ALIGNMENT

Any shorter radius bends must be accomplished with preformed sweeps. Five (5) degree bends will not be used in duct bank construction.

I.6. EXISTING CABLE

In the event that existing cable(s) are to be placed in the duct being constructed, the duct shall be cut longitudinally so as to place it around the cable. After the cable is placed in the split duct another longitudinal section of duct will be glued to the duct to cover the split. Manufactured two (2) piece locking duct may be used if available.

I.7. TERMINATION INTO STRUCTURE

The termination of the conduit into the structure must be water tight and capable of withstanding non-uniform loads without cracking or breaking.

Pre-cast manholes are to be constructed with the reinforcing steel continuous through the splay opening. The Builder shall completely cut this steel out of the splay opening. Manhole steel and duct bank steel shall not be tied. This will allow expansion and contraction of the duct bank due to temperature changes without damaging the manhole.

I.7.1. Longitudinal conduit steel shall extend within the structure wall so as to provide 1-1/2" cover of concrete between the finished inside surface of the structure and the reinforcing steel.

I.7.2. The concrete encasement of the conduit shall be enlarged by 1 inch on all sides for four (4) feet from where it enters a structure.

I.7.3. Bell-Ends shall be installed where feasible. In the event the duct enters at such an angle that bell-ends cannot be used, the edges of the duct shall be finished in such a manner that cable will not be damaged during pulling operations.

I.7.4. All voids between the ducts and the structure shall be filled with non-shrinking mortar applied to make a water tight joint. The inside surface of the manhole wall shall be finished flush with the bell-ends or duct ends.

I.8. DUCT BANK INSPECTION

Upon completion of duct bank construction prove duct satisfactory for use by pulling a mandrel 1/2" smaller than the conduit I.D. through each individual duct installed. Record and notify engineer of ducts that failed to pass the mandrel immediately. Leave a pull string in all acceptable ducts. Duct will not be accepted until this test is satisfactorily completed.

I.9. ADDITIONAL PLATE(S)

Listed below are plates not otherwise covered by a Construction Standard and Drawing.

PLATE	DESCRIPTION	UNIT
MEAS-PL-TAPE	To Install Measuring Pull Tape In Duct. One Foot (1') Measuring Pull Tape 1/4" Wide & 500 # Tensile Strength.	LF
ROD-DUCT*_	To Include Cleaning Out Duct Suitable For Pulling Cable, Washing, Augering, Brushing and other necessary operations to clean out existing duct until proper mandrel or slug can be pulled through proving duct satisfactory for use. Leave pull string in duct proved satisfactory for use. (Contractor supplied rods & pull string) Available Options: ROD-DUCT *2, 3, 4, 6	LF
SLUG-DUCT	Pull correct size mandrel through duct proving duct satisfactory for use. Leave a pull string in all satisfactory duct.	LF
MDB-2	Install a 2" PVC conduit (Not Encased) in existing trench.	LF

II. REMOVAL AND ABANDONMENT

II.1. REMOVAL

Removing of existing facilities shall include the removal of the existing structure or conduit. The existing structure shall be removed from the job site. Any or all the existing ducts in and out of the structure to be removed, which are not themselves to be removed, shall be sealed, or as shown on the plans, connected to a new structure.

II.2. ABANDONMENT REMOVAL

Abandoning of existing facilities shall include the removal of that portion of the structure or conduit which is 30" below the proposed finished grade. Any or all ducts into the structure being abandoned shall be sealed. Any partially removed ducts in abandoned conduit shall be sealed. The remaining portion of an abandoned structure shall be filled with sand or other granular fill material and compacted to 100% of the maximum density as determined by the Modified Proctor ASTM 698. The abandonment shall be completed by backfilling and replacing the pavement as specified.

II.3. SEALING DUCTS

The sealing should be completed by placing rubble and cement grout for a distance of 18 inches minimum in the end of each duct and forming a waterproof seal. Where feasible, PVC

duct may be sealed with an approved PVC end plug attached with PVC adhesive to form a waterproof seal.

II.4. CASTINGS

Cast iron castings, covers, frames, etc. shall be cleaned and delivered to the JEA Commonwealth Storeroom.

II.5. ADDITIONAL PLATES

Listed below are plates not otherwise covered by a Construction Standard and Drawing.

II.5.1. Bulk Units for Removal and Abandonment

OPTIONS:

H - (HOT), CLASS II
C - (COLD), CLASS I

PLATE	DESCRIPTION	UNIT
REM-CONC*OPTION	Remove Non-Reinforced Concrete	CF
REM-RECONC*OPTION	Remove Reinforced Concrete	CF

EXAMPLE: REM-CONC *H

II.5.2. Removal of Concrete Encased Duct

OPTIONS:

H - (HOT), CLASS II
C - (COLD), CLASS I

PLATE	DESCRIPTION	UNIT
REM-4*OPTION	1-4 Ducts, Non-Reinforced Concrete	LF
REM-8*OPTION	5 - 8 Ducts, Non-Reinforced Concrete	LF
REM-12*OPTION	9 - 12 Ducts, Non-Reinforced Concrete	LF
REM-16*OPTION	13-16 Ducts, Non-Reinforced Concrete	LF
REM-20*OPTION	17-20 Ducts, Non-Reinforced Concrete	LF
REM-30*OPTION	21-30 Ducts, Non-Reinforced Concrete	LF
REM-R4*OPTION	1-4 Ducts, Reinforced Concrete	LF
REM-R8*OPTION	5-8 Ducts, Reinforced Concrete	LF
REM-R12*OPTION	9-12 Ducts, Reinforced Concrete	LF
REM-R16*OPTION	13-16 Ducts, Reinforced Concrete	LF
REM-R20*OPTION	17-20 Ducts, Reinforced Concrete	LF
REM-R30*OPTION	21-30 Ducts, Reinforced Concrete	LF

II.5.3. Additional Plates

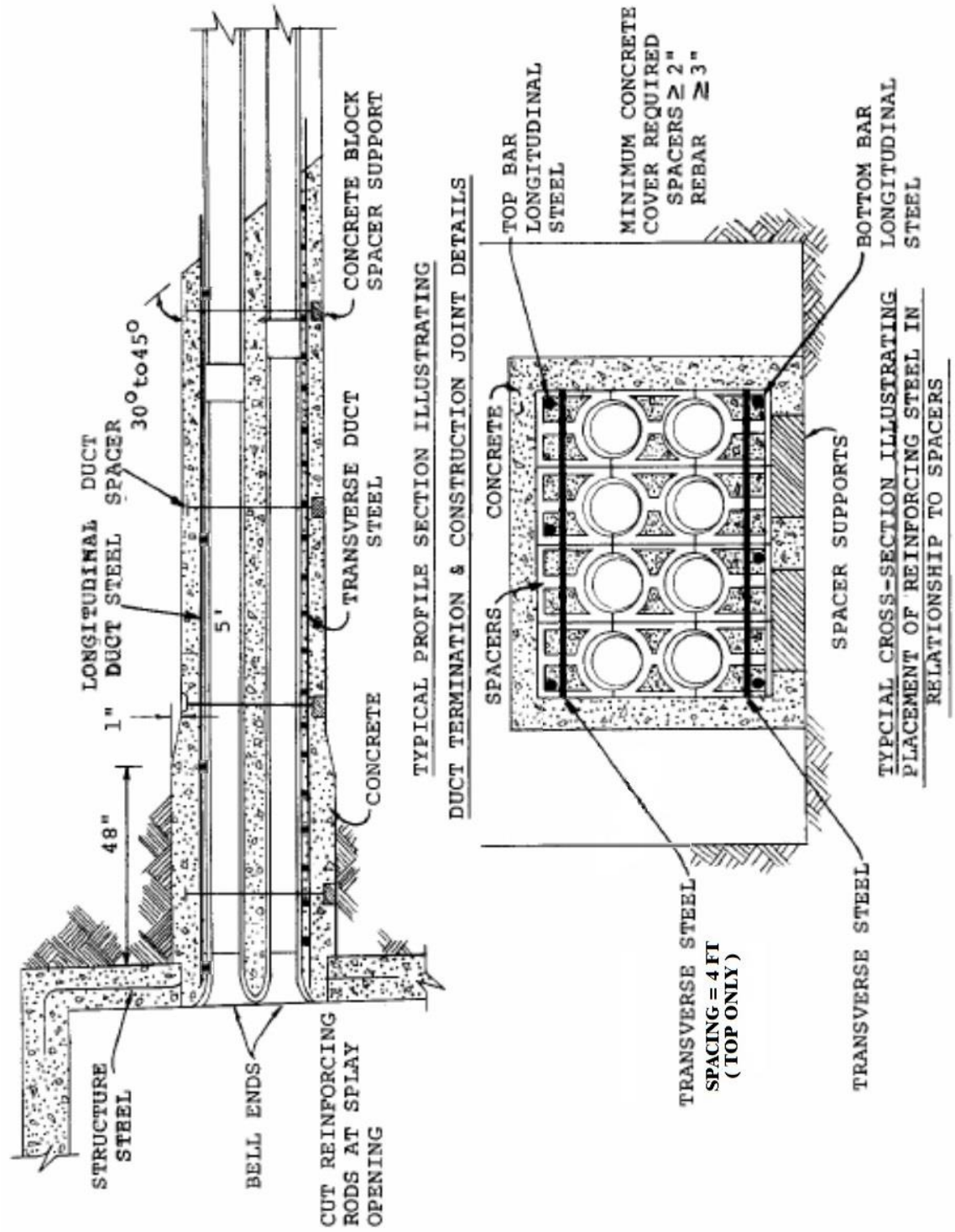
PLATE	DESCRIPTION	UNIT
REM-MOD-BRK	Remove modular brick structures	CF
SEAL-DUCT1	Seal duct / pipe up to 6" diameter	EA
SEAL-DUCT2	Seal duct/ pipe up to 18" diameter	EA
SEAL-DUCT3	Seal duct/ pipe up to 36" diameter	EA

II.5.4. Overburden

The following plates are designed for the replacement of the overburden in the removal, replacement and abandonment of concrete structures, to include backfill and compaction.

PLATE	DESCRIPTION	UNIT
BKFL	To place select uncompacted backfill.	CY
BKFL-COMP	To place and compact select backfill.	CY

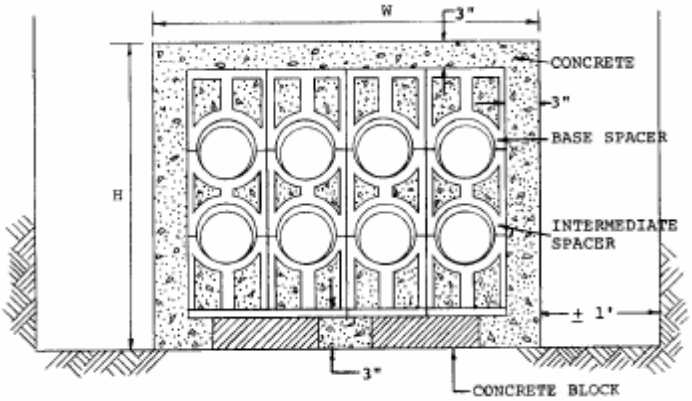
TYPICAL - CONCRETE ENCASED DUCT BANK



BLD-_/_-_

CONCRETE ENCASED DUCT BANK

10 FOOT SECTION



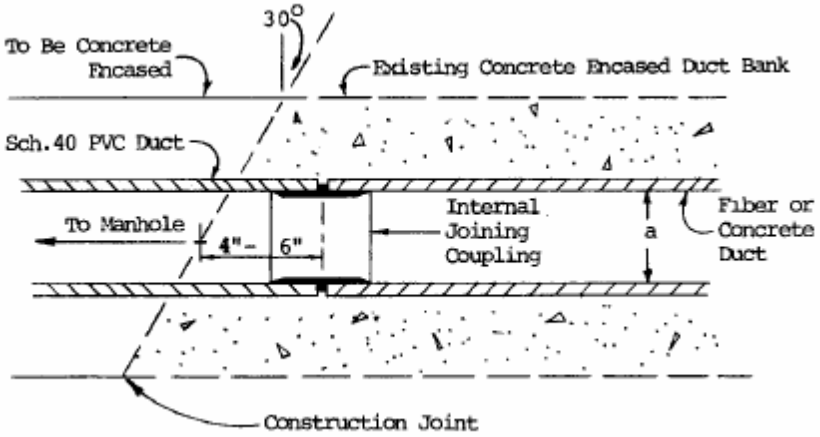
			CONCRETE	CONDUIT	BASE	INT
OPTION	W	H	CF	CODPC030	SPAPC001	SPAPC002
BLD-2/2-4	17	23	23	40	8	4
BLD-2/3-4	25	23	34	60	12	6
BLD-2/4-4	30	23	40	80	16	8
BLD-2/5-4	35	23	47	100	20	10
BLD-3/3-4	25	30	44	90	12	12
BLD-3/4-4	30	27	37	120	16	16
BLD-4/3-4	25	33	47	120	12	18
BLD-4/4-4	30	33	54	160	16	24

				CODPC031	SPAPC003	SPAPC004
BLD-2/2-6	22	27	33	40	8	4
BLD-2/3-6	31	27	46	60	12	6
BLD-2/4-6	40	27	59	80	16	8
BLD-2/5-6	48	27	70	100	20	10
BLD-3/3-6	31	35	58	90	12	12
BLD-3/4-6	40	35	74	120	16	16
BLD-4/3-6	31	44	71	120	12	18
BLD-4/4-6	40	44	91	160	16	24

NOTES:

1. PVC Cement must be itemized.
2. Issue one (1) quart can, item I.ADCMI002, for each 500 lineal feet of conduit, or for each 25 conduit joints.

COUPLE -3-1/2*_
COUPLE -4*_
COUPLING OF EXISTING DUCT BANK



NOTES:

1. When a = 3.5 inches use 3-1/2 inch schedule 40 PVC duct and internal joining coupling for 3-1/2 inch I.D. duct.
2. When a=4.0 inches use 4 inch Schedule 40 PVC duct and internal joining coupling for 4 inch I.D. duct.
3. Use bell ends for 3-1/2 inch and 4 inch Schedule 40 PVC duct as required.
4. Special order Schedule 40 PVC duct and bell ends as required.
5. For split duct applications:
6. Saw cut Schedule 40 PVC duct into two halves or plate SPLT-DCT-_
7. Place around existing cable.
8. Cover saw cut joints with 2 inch wide sealing tape.
9. Band the 2 halves together using plastic straps on 2 foot centers.

REQUIRED MATERIAL: (PER DUCT)	INSTALLATION OPTIONS:
Internal joining coupling - 1 each	*C – Cold - New Construction
PVC bell end - 1 each	*H – Hot - Around existing cables
Schedule 40 PVC duct - length as required	
Plastic straps - 1 each for every 2 feet of PVC split duct.	
Sealing tape 2 inch wide - as required.	

EXAMPLE: COUPLE-4*H

SPLT-DCT-_

SPLIT DUCT

NOTE:

Conduit may be assembled by application of PVC Cement along seams and by banding with tie wraps or tape.

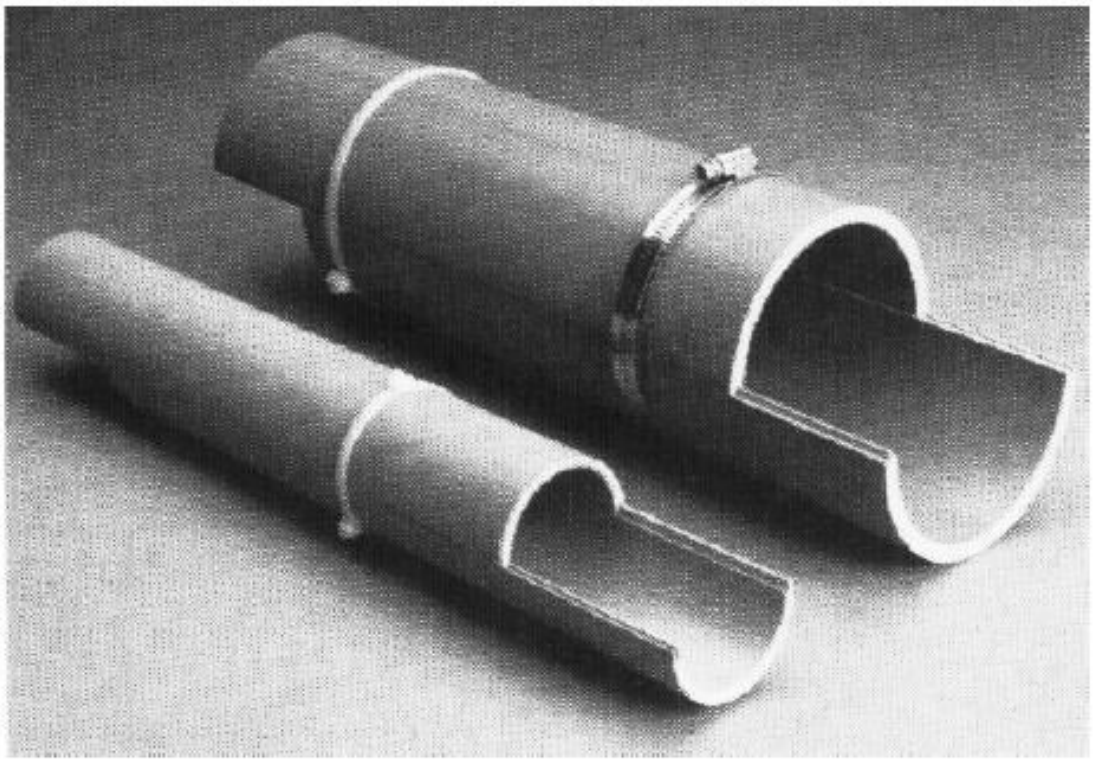


PLATE NAME	ITEM ID	QTY	DESCRIPTION
SPLT-DCT-2	CODPC014	1	Conduit, Polyvinyl Chloride, Split, SCH. 40, 2”
SPLT-DCT-3	CODPC015	1	Conduit, Polyvinyl Chloride, Split, SCH. 40, 3”
SPLT-DCT-4	CODPC012	1	Conduit, Polyvinyl Chloride, Split, SCH. 40, 4”
SPLT-DCT-6	CODPC013	1	Conduit, Polyvinyl Chloride, Split, SCH. 40, 6”