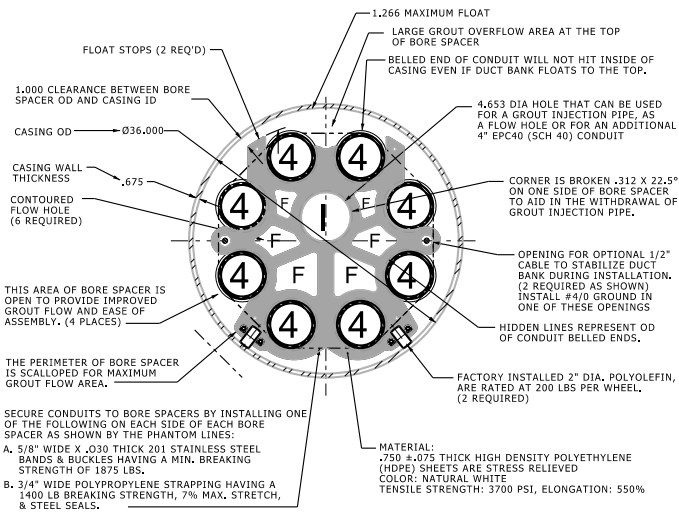


**STATIONARY SACRIFICIAL GROUT INJECTION  
PIPE SCHEME (TWO SACRIFICIAL - ONE FROM EACH OF CASING)**

NO SCALE

- FULL COMPLEMENT BORE SPACER NOTES:**
1. USE ONE BORE SPACER FOR EVERY 5 FEET OF DUCT BANK.
  2. THE CASING ID MUST BE SMOOTH AND FREE FROM RIDGES, PROJECTIONS AND SEAMS THAT MIGHT IMPEDE THE ROLLING OF WHEELS.
  3. INSTALL BORE SPACERS PERPENDICULAR TO CONDUITS TO REDUCE THE TENDENCY OF DUCT BANK TO CORKSCREW.
  4. A TROUGH OR FEEDER BRIDGE SHOULD BE CONSTRUCTED AT THE LEADING END OF THE CASING TO SUPPORT SECTIONS OF DUCT BANK AS THEY ARE ASSEMBLED AND PULLED INTO THE CASING.
  5. THIS BORE SPACER IS DESIGNED FOR A CASING THAT IS STRAIGHT AND TRUE.
  6. IT IS POSSIBLE THAT THE DUCT BANK WILL ROTATE (CORKSCREW) AS IT IS PULLED THRU THE CASING. CONTRACTOR TO USE AN "OFF CENTER WEIGHT TECHNIQUE" OR "STABILIZATION CABLES" TO ELIMINATE ROTATION POTENTIAL.
  7. THIS BORE SPACER WILL ACCOMMODATE THE "SINGLE-END", "FLUSH COUPLED EXTRACTABLE INJECTION PIPE" OR "STATIONARY SACRIFICIAL INJECTION PIPE" METHODS OF GROUT FILLING.
  8. IT IS ESSENTIAL THAT THE BORE SPACERS ARE HELD IN PLACE RELATIVE TO THE CONDUIT. REASON: AS THE GROUT IS PUMPED INTO THE CASING, THE COMPARTMENTS FORMED BETWEEN THE BORE SPACERS ARE MORE OR LESS FILLED SEQUENTIALLY, PLACING A TEMPORARY THRUST LOAD ON EACH BORE SPACER.
  9. THE DUCT BANK MUST BE HELD IN POSITION AT BOTH ENDS TO ACCOMMODATE POSSIBLE UNEVEN THRUST LOADS THAT MAY BE GENERATED DURING THE GROUTING OPERATION.
  10. WHEN FILLING THE AREA BETWEEN THE CONDUITS AND CASING WITH GROUT, TAKE CARE NOT TO EXCEED THE HYDRAULIC COLLAPSE PRESSURE OF THE CONDUITS.
  11. DEPENDING ON THE GROUT SPECIFIC GRAVITY AND GROUT FLOW, IT IS POSSIBLE THAT THE DUCT BANK WILL FLOAT TO THE TOP OF THE CASING.
  12. ACTUAL QUANTITY OF GROUT USED SHOULD BE MEASURED AND RECORDED.

MINIMUM DISTANCE BETWEEN CONDUITS		
CONDUIT SIZE	MIN. DISTANCE	
8 & 4	2,000	



**FULL COMPLEMENT BORE SPACER  
(With 8 Ea 4" EPC40 (Sch.40) PVC Conduits  
In A 36.000 OD X .675 Wall Steel Casing)**

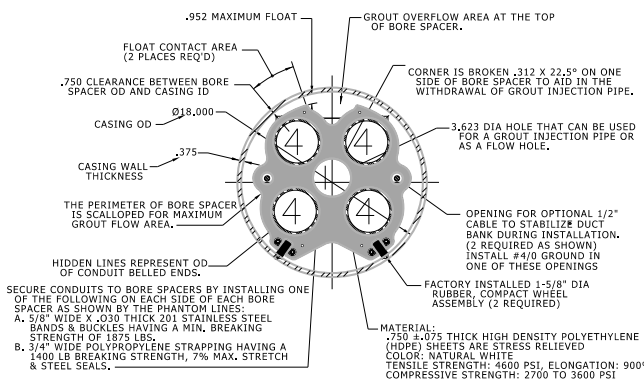
NOT TO SCALE

**CONSTRUCTION NOTES (CASING):**

1. AUGERS OR SIMILAR DEVICES USED FOR PIPE IMPLACEMENT SHALL BE PROVIDED WITH MECHANICAL ARRANGEMENT THAT WILL PREVENT THE CUTTING HEAD FROM LEADING THE PIPE SO THAT THERE WILL BE NO UNSUPPORTED EXCAVATION AHEAD OF PIPE.
2. THE USE OF WATER OR OTHER LIQUIDS TO FACILITATE THE CASING IMPLACEMENT AND SOIL REMOVAL IS PROHIBITED.
3. WHEN AN OBSTRUCTION IS ENCOUNTERED DURING INSTALLATION, AND IT BECOMES EVIDENT THAT IT IS IMPOSSIBLE TO ADVANCE THE PIPE, ALL OPERATIONS WILL CEASE, THE CASING PIPE SHALL BE ABANDONED IN PLACE AND FILLED COMPLETELY WITH 1:6 GROUT.
4. AFTER CONDUIT IS PULLED INTO PLACE VIA THE CONDUIT SLED, CASING PIPE IS TO BE COMPLETELY FILLED WITH PRESSURE GROUTING WITH A UNIFORM 1:6 MIXTURE.
5. GROUT PUMP TO BE MONITORED BY PRESSURE GAUGE, PRESSURE NOT TO EXCEED 100 PSI.
6. CONTRACTOR MAY SUBSTITUTE SLED AND SPACERS WITHIN CASING PIPE WITH BORING SPACERS MANUFACTURED BY UNDERGROUND DEVICES, CONTRACTOR MUST FOLLOW MANUFACTURERS INSTALLATION GUIDELINES.

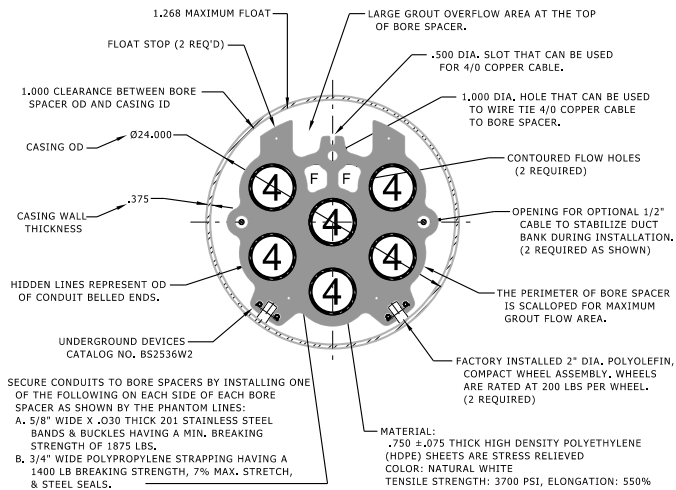
CONDUIT AND HOLE SIZES				
CONDUIT OD	FULL HOLE DIAMETER		PARTIAL HOLE DIAMETER	
NOMINAL	ACTUAL	BANDED	NON-BANDED	
4"	4,500	4,590	-	4,520

MINIMUM DISTANCE BETWEEN CONDUITS	
CONDUIT SIZE	MIN. DISTANCE
4 & 4	2,000



**FULL COMPLEMENT BORE SPACER  
(With 6 Ea 4" EPC40 (Sch.40) PVC Conduits  
In A 24.000 OD X .500 Wall Steel Casing)**

NOT TO SCALE



CONDUIT AND HOLE SIZES			
CONDUIT OD	FULL HOLE DIAMETER		
NOMINAL	ACTUAL	BANDED	NON-BANDED
4"	4,500	4,590	4,653

