HOW TO CONTRUCT AND INSTALL AN OBSERVATION PORT TO MEASURE WATER DEPTH

MATERIALS:

- 2–10 FEET OF 3–INCH DIAMETER PVC PIPE (SCH40 IF IN FACILITY, SCH80 IF OFFSET).
- 4 FEET OF 3–INCH DIAMETER WELL SCREEN (CANAL LAKE SCREEN) (0.01–INCH SLOTS)
- 3–INCH DIAMETER COUPLING
- TEST PLUG (EXPANDING) AND/OR LOOSE FITTING TOP CAP
- 3–INCH DIAMETER PVC END CAP
- BENTONITE (USE MEDIUM–SIZED CHIPS) OR CONCRETE
- SAND PACK (20/30 MESH)

INSTRUCTIONS:

1. AUGER THE PORT HOLE.
   BORE THE PORT HOLE IN BOTTOM OF FACILITY OR RUN PIPE FROM TOP OF FACILITY ALONG BOTTOM TO OBSERVATION PORT VERTICAL PIPE IN BERM (SEE DETAIL A) USING A FOUR–INCH DIAMETER HAND AUGER OR POST–HOLE DIGGER. THE PORT HOLE SHOULD EXTEND 6" BELOW THE BOTTOM OF THE FACILITY.
2. CONSTRUCT THE OBSERVATION PORT CASING.
   MEASURE THE DISTANCE FROM THE EXISTING GRADE TO THE BOTTOM OF THE PORT HOLE AND RECORD THIS DISTANCE PERMANENTLY IN THE STORMWATER OPERATIONS & MAINTENANCE MANUAL AND ON THE AS–BUILT DRAWING. CUT THE WELL SCREEN AND RISER TO FIT. WHEN ASSEMBLED, THE PVC COUPLING, WHICH JOINS THE WELL SCREEN AND THE RISER, SHOULD BE 14 INCHES BELOW THE GROUND SURFACE. THE SOLID PVC RISER SHOULD EXTEND ABOVE THE OVERFLOW ELEVATION. DRILL ONE–QUARTER INCH HOLES IN THE BOTTOM AND SIDES OF THE WELL POINT TO ALLOW WATER TO FREELY FLOW. ASSEMBLE THE COMPONENTS.
3. PACK THE CASING WITH SAND.
   PLACE SAND IN THE BOTTOM 2 TO 6 INCHES OF THE BORE HOLE. CENTER THE CASING IN THE PORT HOLE. POUR SAND AROUND THE OUTSIDE OF THE CASING. TAMP THE SAND AS YOU POUR. ADD SAND TO A DEPTH OF FOUR INCHES ABOVE THE COUPLING.
4. SEAL WITH BENTONITE OR CONCRETE.
   TO PREVENT SURFACE WATER FROM FLOWING DOWN THE OUTSIDE OF THE CASING, FILL THE REMAINER OF THE HOLE WITH A LAYER OF BENTONITE OR CONCRETE ON TOP OF THE SAND. IF CONCRETE IS USED, IT SHOULD RISE ONE–HALF INCH ABOVE THE GROUND AND SHOULD SLOPE AWAY FROM THE CASING.
5. LABEL AND MARK THE CASING.
   USE A PERMANENT MARKER TO WRITE AN IDENTIFICATION NUMBER ON THE SIDE OF THE CASING. MARK A REFERENCE POINT ON THE TOP EDGE OF RISER FROM WHICH ALL MEASUREMENTS WILL BE TAKEN.
6. READ WATER TABLE DEPTH:
   A. MEASURE DISTANCE FROM TOP EDGE OF RISER TO SOIL SURFACE.
   B. MEASURE DISTANCE FROM TOP EDGE OF RISER TO WATER SURFACE INSIDE OF PIPE.
   C. SUBTRACT A FROM B FOR DEPTH TO WATER TABLE.

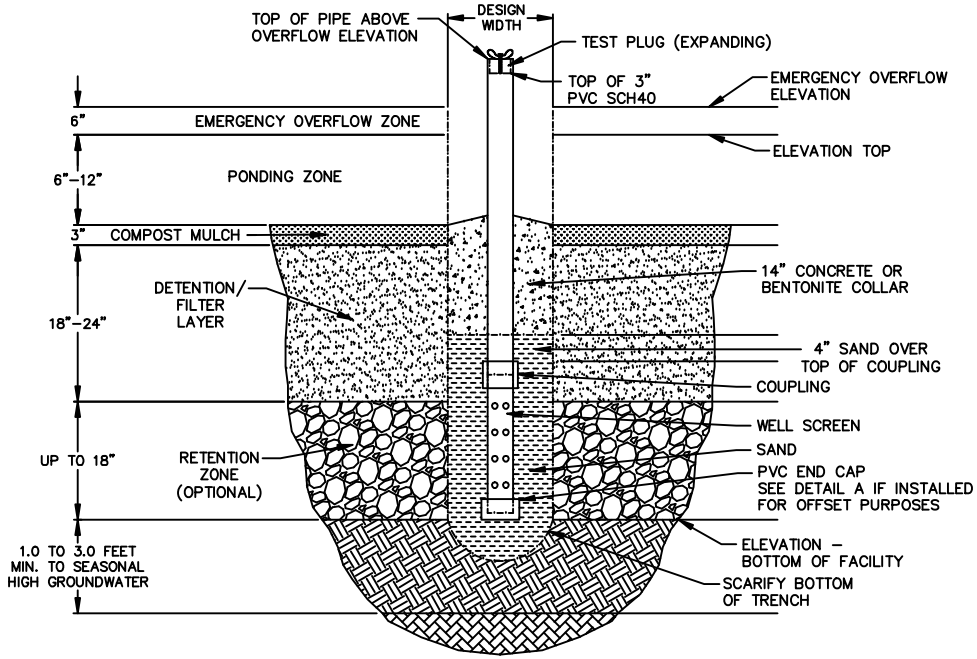
MODIFICATION FOR CREST GAGE (OPTIONAL)

MATERIALS:

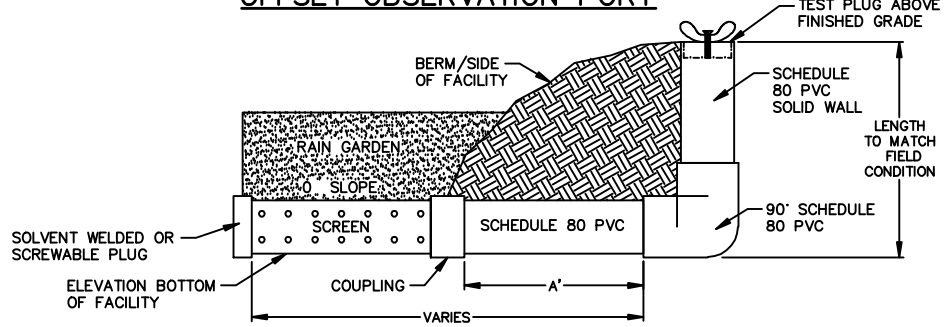
- 4–6 FEET OF 1–INCH DIAMETER PVC
- CORK DUST

INSTRUCTIONS:

1. CUT THE CREST GAGE TO LENGTH.
   SIZE THE CREST GAGE TO FIT INSIDE THE OBSERVATION PORT CASING. THE CREST GAGE SHOULD SIT IN THE BOTTOM OF THE CASING AND BE FLUSH WITH THE TOP OF THE CASING.
2. ADD CORK DUST.
   REMOVE THE CREST GAGE FROM THE OBSERVATION PORT CASING. ADD ABOUT ONE–HALF TEASPOON OF CORK DUST INTO THE OBSERVATION PORT CASING. IF YOU MAKE YOUR OWN CORK DUST, GRIND IT TO THE TEXTURE OF COARSELY GROUND COFFEE. PLACE THE CREST GAGE IN THE OBSERVATION PORT. REPLACE THE OBSERVATION PORT TOP PLUG OR CAP.
3. READING THE MAXIMUM WATER LEVEL.
   A CREST GAGE RECORDS THE MAXIMUM WATER LEVEL BETWEEN READINGS. AS THE WATER TABLE RISES, SO WILL THE CORK DUST. AS THE WATER LEVEL DROPS, A RING OF CORK DUST REMAINS ON THE CREST GAGE. REMOVE THE CREST GAGE FROM THE OBSERVATION PORT. MEASURE FROM THE TOP OF THE CREST GAGE TO THE CORK DUST RING. CONVERT THE MEASUREMENT TO DEPTH OF WATER TABLE BELOW GROUND SURFACE BY SUBTRACTING THE LENGTH OF THE RISER ABOVE THE GROUND. THIS MEASUREMENT IS THE DEPTH OF THE MAXIMUM WATER LEVEL SINCE THE LAST READING.
4. RINSE DOWN CORK DUST.
   AFTER YOU RECORD THE MEASUREMENT, REMOVE THE CORK DUST FROM THE CREST GAGE. RINSE THE INSIDE WALLS OF THE OBSERVATION PORT CASING WITH A SQUIRT BOTTLE. PLACE THE CREST GAGE IN THE OBSERVATION PORT. REPLACE THE OBSERVATION PORT TOP CAP.
5. INSTALL WITHIN THE 3" PVC OBSERVATION PORT.



DETAIL A
OFFSET OBSERVATION PORT



DETAIL A NOTES:

1. EXTEND OBSERVATION PORT ACROSS BOTTOM OF FACILITY

City of Bellevue

STORM AND SURFACE WATER UTILITY

TITLE

OBSERVATION PORT FOR RAIN GARDEN

NO. NDP–9

JANUARY 2010

NO SCALE