WASTEWATER SYSTEM

STANDARD DETAILS

CITY AND COUNTY OF HONOLULU

July 2017
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DATE: 7/2017
NOTES:

1. SEE S-02 FOR PAYMENT WIDTHS AND BEDDING DIMENSIONS.

2. FILTER FABRIC NOT REQUIRED FOR CLSM BEDDING.

3. FOR SEWER JOINTS LOCATED 5' BEYOND ANTICIPATED Drip LINE OF TREES AND SHRUBS, WRAP WILL BE A GEOTEXTILE FABRIC WITH HERBICIDE

DATE: 7/2017
PAYMENT TRENCH WIDTH

SEE TABLE BELOW

1/2 TRENCH WIDTH

INDICATOR TAPE FOR NON-METALLIC PIPE

1/2 TRENCH WIDTH

PIPE OUTSIDE DIAMETER

12" MINIMUM

OVERLAP

FILTER FABRIC AROUND BEDDING MATERIAL

CRUSHED ROCK BEDDING MATERIAL

PIPE O.D.

NOMINAL PIPE I.D.

BELL

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DATE: 7/2017

SCALE: 1" = 1'-0"
PROVIDE DEFLECTION COUPLING OR BELL JOINT AT EACH END FACE OF CONCRETE JACKET (TYP.)

LENGTH AS REQUIRED

4 – #4 ON 8" PIPES,
4 – #5 ON 10" AND 12" PIPES,
LARGER THAN 12", A SPECIAL DETAIL MUST BE SUBMITTED FOR APPROVAL

#3 HOOPS, 10" O.C., LAPPED 12", AT ENDS

FILTER FABRIC, MIN. 6" OVERLAP AT CONCRETE

NOTES:

1. CONCRETE JACKET MAY EXTEND TO TRENCH WALL FOR NARROW TRENCH. TRENCH WALL SHALL BE CUT VERTICAL AND NEAT.

2. FORMS SHALL BE USED FOR CONSTRUCTION OF CONCRETE JACKET IN WIDE TRENCH WITH CRUSHED ROCK BEDDING BACKFILL. FORMS SHALL BE REMOVED.

3. FOR EXISTING PVC PIPES, PROVIDE SANDED SURFACE 2' IN LENGTH AT EACH END PRIOR TO INSTALLING CONCRETE JACKET PER STANDARD SPECIFICATIONS. DEFLECTION COUPLING OR BELL NOT REQUIRED AT ENDS.

DATE: 7/2017

SCALE: 3/4" = 1'-0"
* EASEMENT BOUNDARY WHERE APPLICABLE (TYP. FOR ALL DETAILS)

** FLUSH IN PAVED AREAS OR CONCRETE SLAB

*** APPLIES TO CLEANOUT LOCATION

NOTES:

1. PERMISSION IS TO BE SECURED FROM PROPERTY OWNER BEFORE CONSTRUCTION AT PROPERTY LINE IS STARTED.

2. EACH LATERAL SHALL SERVICE ONLY ONE LOT.

3. LATERALS REQUIRING PIPES 8" AND LARGER SHALL BE DESIGNED AS A BRANCH SEWER WITH A MANHOLE AT PROPERTY LINE.

4. TO THE EXTENT PRACTICAL, ALL LATERALS SHALL BE CONSTRUCTED PERPENDICULAR TO THE PROPERTY LINE.

5. PVC DWV (DRAIN WASTE VENT) FITTINGS SHALL BE SCHEDULE 80.

DATE: 7/2017
NOTE:
PVC DWV* FITTINGS SHALL BE SCHEDULE 80.

* DRAIN WASTE VENT
PRIVATE PROPERTY
(OWNER TO CONSTRUCT)

6" CLEANOUT WITH CAP
FINISHED GRADE

PROPERTY LINE

6" PVC SCHEDULE 80 PIPE

6" PVC DWV* 1/8 BEND
FROM DWELLING

AS REQUIRED
BY UNIFIED
PLUMBING CODE

6" PVC DWV* WYE

6" PVC SCHEDULE 80 PIPE

3" MIN.

TO SEWER MAIN

CONCRETE BLOCK

NOTE:
PVC DWV* FITTINGS
SHALL BE SCHEDULE 80.

* DRAIN WASTE VENT

DATE: 7/2017

SCALE: 3/4" = 1'-0"
NOTES:

1. FOR CIPP LINED PIPE, SAW CUT THROUGH LINING AND SMOOTH EDGES BEFORE INSTALLING COUPLING.

2. SADDLE TAPS WILL ONLY BE ALLOWED PER APPROVAL OF CITY INSPECTOR.
NOTES:

1. FOR CIPP LINED PIPE, CAREFULLY REMOVE HOST PIPE FROM AREA TO ALLOW FOR SADDLE WYE DRILL HOLE IN CIPP AND BRUSH EDGES TO PROVIDE CLEAR HOLE FREE OF OBSTRUCTIONS.

2. SUBSTITUTIONS WILL BE ALLOWED PER APPROVAL OF CITY INSPECTOR.

DATE: 7/2017
MANHOLE NOTES:

BUOYANCY:

1. MANHOLES SHALL BE DESIGNED TO RESIST BUOYANCY WITH A MINIMUM SAFETY FACTOR OF 1.5.

BASES:

1. WHEN PRE-CAST CONCRETE BASE IS USED, A MINIMUM 6” THICKNESS OF CRUSHED ROCK BEDDING MATERIAL SHALL BE USED FOR LEVELING. THE CRUSHED ROCK LEVELING COURSE SHALL BE ENVELOPED IN FILTER FABRIC AND EXTEND A MINIMUM 6” BEYOND THE CONCRETE BASE OUTER EDGES. FILTER FABRIC JOINTS SHALL BE OVERLAPPED 12”.

2. APPROVED PRE-CAST MONOLITHIC BASE WITH INTEGRAL RISER SECTION MAY BE USED IN LIEU OF SEPARATE PRE-CAST OR CAST-IN-PLACE BASE SLABS.

WALLS:

1. THE PRE-CAST MANHOLE RISER SECTION SHALL BE CAST WITH OPENINGS WHENEVER SEWER PIPES MUST PASS THROUGH THE WALL.

2. ANNULAR SPACE AT WALL PIPE PENETRATIONS SHALL BE FILLED WITH NON-SHRINK GROUT, EXCEPT WHERE APPROVED RESILIENT CONNECTORS ARE USED.

3. PREFORMED FLEXIBLE SEALING GASKETS SHALL BE PLACED BETWEEN ALL PRE-CAST SECTIONS.

FRAMES AND COVERS:

1. TYPE "SA" SHALL BE USED FOR MANHOLES WITH PIPES DIAMETERS 12” OR LESS.

2. TYPE "SB" SHALL BE USED FOR MANHOLES WITH PIPE DIAMETERS GREATER THAN 12”.

3. INSTALL WRAP SEAL AROUND MANHOLE COVER, FRAME, AND BRICKS/GRADE ADJUSTMENT RINGS TO REDUCE INFILTRATION.

4. PROVIDE 1/2” NON-SHRINK GROUT ABOVE AND BELOW BRICKS/GRADE RINGS.

5. PROVIDE MANHOLE INSERTS, RAIN CATCHER OR EQUIVALENT.

RUNGS:

1. RUNGS SHALL NOT BE INSTALLED IN MANHOLES.

DATE: 7/2017
MANHOLE NOTES (CONTINUED):

PIPE CONNECTION:


2. ALL PIPE CONNECTIONS TO THE MANHOLE SHALL BE WATERTIGHT PER STANDARD SPECIFICATIONS.

REINFORCING STEEL:

1. ALL REINFORCING BARS INTERFERING WITH PIPE SHALL BE BENT TO PROVIDE A MINIMUM 1.5" CLEAR DISTANCE FROM THE SEWER PIPE.
NOTES:

1. SEE SHEETS S-23 AND S-24 FOR PIPE CONNECTION.

2. SEE SHEET S-26 FOR PRE-CAST SECTIONS.

3. REINFORCING NOT SHOWN FOR CLARITY.

DATE: 7/2017

SCALE: 1/2" = 1'-0"
#5 BARS AT 12" O.C., EACH WAY

BASE MAY BE CIRCULAR OR RECTANGULAR

NOTES:

1. SEE SHEETS S-23 AND S-24 FOR PIPE CONNECTION.

2. SEE SHEET S-26 FOR PRE-CAST SECTIONS.

3. FOR MANHOLES WITH SPECIAL FOUNDATIONS, BASE SHALL BE DESIGNED BY LICENSED STRUCTURAL ENGINEER.

PRE-CAST RISER SECTION

BASE JOINT, SEE SHEET S-13

3/4D

FLOW

PIPE CONNECTION, SEE NOTE 1

SEWER PIPE

PRE-CAST OR CAST-IN-PLACE BASE SLAB

#5 BARS AT 10" O.C., EACH WAY

4" MIN.

5'-10" MINIMUM

FLOW

5'-10" MINIMUM

PLAN

SECTION

DATE: 7/2017

SCALE: 1/2" = 1'-0"

CITY AND COUNTY OF HONOLULU

STANDARD DETAILS

PRE-CAST CONCRETE MANHOLE - ALTERNATE BASE AND SECTION
MANHOLE RISER

NON-SHRINK GROUT AROUND ENTIRE MANHOLE

#5 BARS AT 10" O.C. EACH WAY

CONCRETE BASE SLAB

SCALE: 1/2" = 1'-0"

DATE: 7/2017
NOTES:

1. USE OF SHALLOW MANHOLE SHALL REQUIRE APPROVAL BY THE CITY.

2. SHALLOW MANHOLES SHALL BE USED ONLY FOR 10" DIAMETER PIPES OR SMALLER.

3. SEE SHEET S–12 FOR ALTERNATE BASE. ONLY ONE RISER SECTION SHALL BE USED.

4. SEE SHEETS S–23 AND S–24 FOR PIPE CONNECTION.

5. SEE SHEET S–26 FOR PRE–CAST SECTIONS.
NOTES:
1. SEE SHEETS S–23 AND S–24 FOR PIPE CONNECTION.
2. SEE SHEET S–27 FOR PRE–CAST SECTIONS.

DRAWING: 6–FOOT DIAMETER
PRE–CAST CONCRETE MANHOLE

DATE: 7/2017

SCALE: 3/8" = 1'–0"

CITY AND COUNTY OF HONOLULU
STANDARD DETAILS
S–16
NOTES:
1. DETAIL IS FOR PIPES 12" AND SMALLER.

2. FOR MAIN LINES GREATER THAN 8" IN DIAMETER, THE MANHOLE SHALL BE EPOXY COATED OR STEEL REINFORCED POLYMER CONCRETE.

3. DROP PIPE SHALL BE THE SAME DIAMETER AS THE INFLUENT PIPE.

4. SEE SHEET S-18 FOR SECTIONS.

DATE: 7/2017
6'-0" DIAMETER
PRE-CAST CONCRETE
MANHOLE (S-16) OR
STEEL REINFORCED
POLYMER CONCRETE
MANHOLE (S-15)

DEFLECTION COUPLING

FLOW
SEWER PIPE

PVC SDR 26
PIPE

PVC SDR 26
1/4 BEND, ROTATE BEND
AS REQUIRED

NOTES:

1. DETAIL IS FOR DROPS 1.5' TO 5'
(INVERT TO INVERT) AND PIPES 12"
AND SMALLER.

2. FOR MAIN LINES GREATER THAN 8" IN
DIAMETER, THE MANHOLE SHALL BE
EPoxy COATED OR STEEL REINFORCED
POLYMER CONCRETE.

3. INSTALL AND SIZE DROP BOWL PER
MANUFACTURER’S RECOMMENDATIONS.

4. PIPE BRACKETS, NUTS AND BOLTS
SHALL BE 316 STAINLESS STEEL.
EMBED BOLTS IN MANHOLE WALL WITH
EPoxy.

5. PIPE BRACKETS SHALL BE EVENLY
SPACED BETWEEN FITTINGS. THE
MAXIMUM DISTANCE BETWEEN PIPE
BRACKETS SHALL BE 3'.

6. MATCH CROWN OF 1/4 BEND WITH
CROWN OF OUTLET PIPE UNLESS
OTHERWISE APPROVED BY THE CITY.

7. NO MORE THAN ONE DROP BOWL
PER MANHOLE UNLESS OTHERWISE
APPROVED BY THE CITY.

DATE: 7/2017
NOTES:

1. CONFIGURATION AND DIMENSIONS SHOWN ARE FOR PRE-CAST CONCRETE MANHOLE. SEE SHEET S-15 FOR DIMENSIONS FOR STEEL REINFORCED POLYMER CONCRETE MANHOLE.

2. INVERT OF OUTGOING GRAVITY SEWER PIPE SHALL BE AT THE SAME ELEVATION AS THE CROWN OF THE FORCE MAIN.

3. SEE SHEET S-21 FOR MANHOLE CHANNELIZATION.

4. SEE SHEET S-27 FOR PRE-CAST SECTIONS.

DATE: 7/2017
NOTES:

1. GRAVITY BRANCH SEWERS ARE NOT PERMITTED IN THE DISCHARGE MANHOLE.

2. ANGULAR CHANGE IN THE FLOW DIRECTION SHALL NOT BE MORE THAN 10 DEGREES.
NOTE:

USE OF ECCENTRIC CONE SHALL BE USED ONLY AS APPROVED BY THE CITY.
NOTES:

1. FOR PVC PIPE, PROVIDE PRE-MANUFACTURED, APPROVED PVC SANDED MANHOLE ADAPTER WITH GASKETED BELL END. FOR VCP, PROVIDE GASKETED BELL END.

2. A GASKETED FLEXIBLE BELL END MAY BE USED IN LIEU OF A FLEXIBLE COUPLING.

3. BELL END FITTING USED ON INFUENT SEWER PIPE. PLAIN END USED ON EFFLUENT PIPE.

DATE: 7/2017

CITY AND COUNTY OF HONOLULU

STANDARD DETAILS

MANHOLE PIPE CONNECTION - WALL PIPE FITTING

S-23
NOTES:

1. RESILIENT CONNECTOR SHALL CONFORM WITH ASTM C923.

2. RESILIENT CONNECTOR SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

3. FOR PIPE CONNECTIONS AT EXISTING MANHOLES, THE CONTRACTOR MAY CORE OR DRILL AN OPENING IN THE MANHOLE WALL AND GROUT IN THE RESILIENT CONNECTOR PER THE RESILIENT CONNECTOR MANUFACTURER’S RECOMMENDATIONS.
PLAN A — PIPE DIAMETER < 12”

PLAN B — PIPE DIAMETER 12” TO 36”

PLAN C — 90 DEGREE BRANCH LINE

NOTES:
1. THE RADIUS OF THE CHANNEL CENTERLINE FOR PIPES SMALLER THAN 12” SHALL BE 1/2 X INSIDE DIAMETER OF MANHOLE.

2. THE RADIUS OF OUTER CHANNEL WALL FOR PIPES 12” AND LARGER PIPES SHALL BE 1/2 X INSIDE DIAMETER OF MANHOLE.

3. ALL CHANNEL EDGES SHALL BE PROVIDED WITH SMOOTH ROUNDED EDGES.

4. OTHER MANHOLE CHANNEL CONFIGURATIONS SHALL BE SHOWN ON THE CONSTRUCTION DRAWINGS.

DATE: 7/2017
NOTES:

1. PRE-CAST SECTIONS SHALL CONFORM TO ASTM C478 AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

2. PRIOR TO MANUFACTURING, DESIGNS OTHER THAN THOSE SHOWN ON THIS SHEET SHALL BE SUBMITTED TO THE CITY FOR APPROVAL.

3. INSTALL PRE-CAST FLEXIBLE SEALING GASKET CONFORMING TO ASTM C990 AT ALL MANHOLE JOINTS.

4. TOP SLAB SHALL BE DESIGNED FOR AASHTO HS-20 WHEEL LOADING.

5. STEEL INDICATED (A_s) IS MINIMUM REQUIRED.
TOP SLAB
SCALE: 3/8" = 1'−0"

AS = 0.18 IN²/L.F.

RISER
SCALE: 3/8" = 1'−0"

AS = 0.28 IN²/L.F.

#5 HOOPS (INNER AND OUTER) LAP 1'−6" OR WELD (TYP.)

#5 BARS AT 10" O.C., EACH WAY

#5 BAR VERTICAL AT 8" O.C.

BOTTOM SLAB WITH INTEGRAL RISER
SCALE: 3/8" = 1'−0"

#4 BARS 6" O.C., EACH WAY

MATCH BOTTOM OF FIRST RISER

NOTES:
1. PRE−CAST SECTIONS SHALL CONFORM TO ASTM C478 AND THE AASHTO LRFD SPECIFICATIONS.
2. MANUFACTURERS MAY SUBMIT TO THE CITY FOR APPROVAL, PRIOR TO MANUFACTURING, DESIGNS OTHER THAN THOSE ShOWN ON THIS SHEET.
3. INSTALL PRE−CAST FLEXIBLE SEALING GASKET CONFORMING TO ASTM C990 AT ALL MANHOLE JOINTS.
4. TOP SLAB SHALL BE DESIGNED FOR AASHTO HS−20 WHEEL LOADING.
5. STEEL INDICATED (AS) IS MINIMUM REQUIRED.
6. STRUCTURAL ANALYSIS REQUIRED.

DATE: 7/2017
DETAIL A - NEW MANHOLE IN NEW ROAD

DETAIL B - NEW MANHOLE IN EXISTING ROAD OR ADJUSTING MANHOLE FOR ROAD REPAVEMENT

NOTES:

1. APPLY GROUT TO INSIDE AND OUTSIDE OF BRICKS TO FORM CONTINUOUS CYLINDRICAL SURFACE.
CONCRETE CAP ROUNDED

4" D.I. PIPE FILLED WITH DWS 2500 CONC. PAINTED OSHA APPROVED "SAFETY YELLOW"

6" THICK CONCRETE SLAB WITH #4 @ 12" O.C.E.W.

SLOPE TO DRAIN AWAY FROM SMH FRAME

16" DIAMETER CONCRETE FOOTING, DWS 2500 SEE NOTE

NOTE:
TOP OF CONCRETE FOOTING SHALL BE CROWNED TO SHED WATER.

DATE: 7/2017
APPROXIMATE WEIGHT
158 POUNDS

NOTES:
1. THIS COVER IS USED WITH TYPE SA FRAME.
2. COVER SHALL CONFORM TO ASTM A48, CLASS NO. 30.

PLAN OF MANHOLE COVER

SECTION A–A

SECTION B–B

BOTTOM VIEW OF COVER

DATE: 7/2017

CITY AND COUNTY OF HONOLULU

STANDARD DETAILS

MANHOLE COVER – TYPE SA

S–30
NOTE:
FRAME SHALL CONFORM TO

PLAN OF MANHOLE FRAME

SECTION A–A

DATE: 7/2017

SCALE: 1 1/2" = 1'–0"
PLAN VIEW

1" DIAMETER HOLES

APPROXIMATE WEIGHT
260 POUNDS

NOTE:
COVER SHALL CONFORM TO
ASTM A48, CLASS NO. 30.

SECTION A–A

DATE: 7/2017

CITY AND COUNTY OF HONOLULU
STANDARD DETAILS MANHOLE COVER – TYPE SB, TOP VIEW S–32
BOTTOM VIEW OF MANHOLE COVER

SECTION A–A

DATE: 7/2017

CITY AND COUNTY OF HONOLULU
STANDARD DETAILS
MANHOLE COVER – TYPE SB, BOTTOM VIEW

SCALE: 1" = 1'-0"