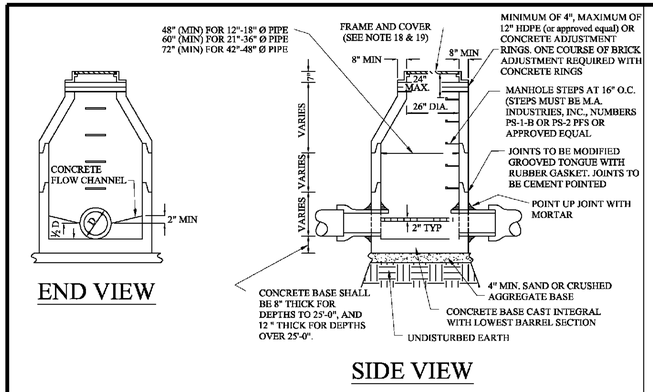
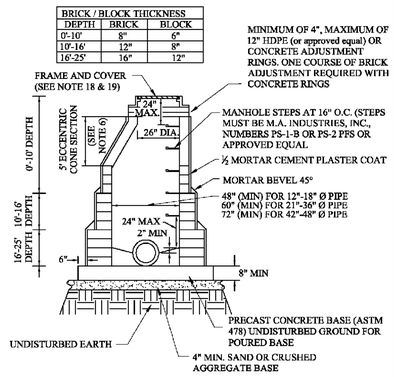


END VIEW

SIDE VIEW

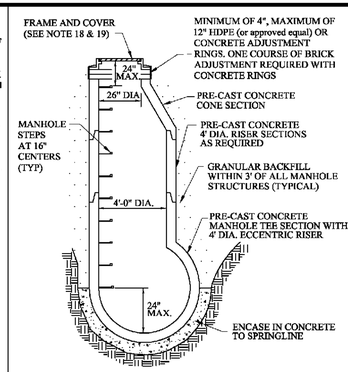
PRE-CAST STORM MANHOLE

BRICK / BLOCK THICKNESS		
DEPTH	BRICK	BLOCK
0'-10'	8"	6"
10'-16'	12"	8"
16'-25'	16"	12"

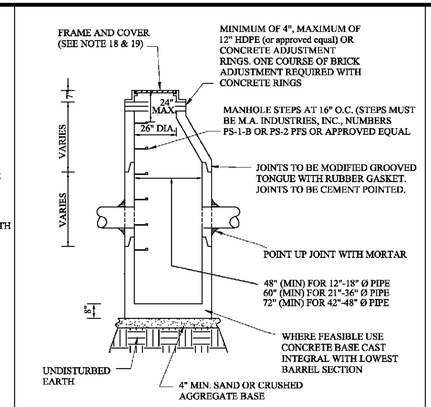


BRICK OR BLOCK MANHOLE

(NOTE: PERMITTED BY CITY ONLY FOR SPECIAL CIRCUMSTANCES)



PRE-CAST TEE MANHOLE DETAIL



PRECAST STORM CATCH BASIN

GENERAL NOTES:

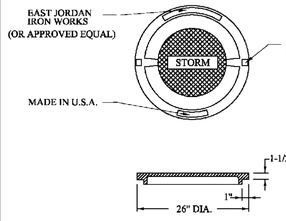
1. ALL EXISTING AND NEW STORM SYSTEMS SHALL BE CLEANED AND FLUSHED ONCE SITE IS 90% BUILT OUT AND VEGETATED. SEDIMENT, ROCK AND OTHER DEBRIS SHALL BE COLLECTED AND DISPOSED OF IN A PROPER MANNER. IN NO CASE SHALL DEBRIS BE FLUSHED DOWN A STORM OR SANITARY SEWER FOR DISPOSAL. ALL DAMAGED IRRIGATION AND HOUSE DRAINAGE PIPE , DRAIN TILES, SEWER LATERALS AND CULVERTS SHALL BE REPAIRED EXPEDITIOUSLY. DEBRIS COLLECTED SHALL BE DISPOSED IN A COMMERCIAL LANDFILL OR OTHER APPROVED LOCATION.
2. STORM SEWER PIPE SHALL BE OF SIZE AND TYPE NOTED ON THE APPROVED PLANS.
3. REINFORCED CONCRETE PIPE (RCP) SHALL BE MODIFIED GROOVED TONGUE JOINTS WITH O-RING TYPE RUBBER GASKET, PER ASTM C443.
4. ALL CATCH BASIN LEADS AND INLET LEADS SHALL BE ASTM C76-CLASS IV PIPE.
5. MINIMUM PIPE SIZE FOR SEWERS, CATCH BASINS LEADS, AND INLET LEADS SHALL BE 12" NOMINAL INTERNAL DIAMETER.
6. ECCENTRIC CONES SHALL BE PROVIDED ON ALL STRUCTURES, REGARDLESS OF THE MATERIAL USED. PRECAST REINFORCED CONCRETE MANHOLE, BLOCK, OR BRICK TO PROVIDE A TRUE VERTICAL FACE FOR PLACEMENT OF MANHOLE STEPS.
7. THE INSIDE JOINTS OF PIPES SIZES 42" AND LARGER DIAMETER SHALL BE POINTED UP WITH MORTAR UPON COMPLETION OF BACKFILLING OPERATIONS.
8. ALL PIPES SHALL HAVE CLASS, LOT NUMBER, AND DATE OF MANUFACTURED CONSPICUOUSLY MARKED ON EACH LENGTH BY MANUFACTURER.
9. ALL END SECTIONS 18" AND LARGER SHALL BE PROVIDED WITH A GALVANIZED BAR SCREEN.
10. PRECAST REINFORCED CONCRETE SECTIONS SHALL CONFORM TO ASTM 2478.
11. IN DRY, STABLE SOILS, PEASTONE (EQUIVALENT TO M.D.O.T. 34R SPECIFICATIONS) MAY BE SUBSTITUTED FOR THE STANDARD BEDDING. IF THE TRENCH IS WET OR UNSTABLE A GEOTEXTILE FABRIC MUST BE USED TO LINE THE TRENCH PRIOR TO THE PLACEMENT OF THE 2NS SAND, PEASTONE, OR 1/4" -1/2" ANGULAR GRADED STONE.
12. SCHEDULE INSPECTIONS 48 HOURS PRIOR TO START OF CONSTRUCTION BY CALLING THE CITY'S INSPECTION LINE AT 248-841-2510. FULL TIME INSPECTION SHALL BE REQUIRED FOR ALL UNDERGROUND STORM SEWER CONSTRUCTION.
13. THE CONTRACTOR SHALL CONTACT MISS DIG 72 HOURS BEFORE CONSTRUCTION AT (811) TO LOCATE EXISTING UNDERGROUND UTILITIES.
14. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL HAVE IN HIS POSSESSION A CURRENT SOIL EROSION CONTROL PERMIT AS ISSUED BY THE O.C.D.C.
15. MINIMUM SUMP DEPTH IS 2' FOR CATCH BASINS.
16. A FLOATABLE SLAB TRAP IS REQUIRED PRIOR TO THE OUTLET, IN ACCORDANCE WITH CURRENT CITY OF ROCHESTER HILLS DESIGN STANDARDS.
17. AS A MEANS OF INSURING PROPER INSTALLATION OF THE STORM SEWER PIPE, AT THE DISCRETION OF THE CITY ENGINEER, THE CONTRACTOR SHALL VIDEO INSPECT, ACCORDING TO THE CITY OF ROCHESTER HILLS VIDEO INSPECTION STANDARDS, 100% OF THE STORM SEWER PIPE 12" AND LARGER IN DIAMETER. IF VIDEO INSPECTION IS REQUIRED BY THE CITY ENGINEER THE CONTRACTOR SHALL PROVIDE 24 HOURS NOTICE TO THE CITY OF ROCHESTER HILLS PRIOR TO VIDEO INSPECTION, SO A REPRESENTATIVE MAY BE PRESENT. ROCHESTER HILLS WILL BE PROVIDED WITH A DIGITAL COPY OF THE VIDEO INSPECTION AND LOG IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS VIDEO INSPECTION STANDARDS.

PROJECTS THAT THE CITY ENGINEER MAY IMPOSE THESE REQUIREMENTS ARE:
1. ALL PUBLIC PROJECTS OR PROJECTS BEING CONSTRUCTED ON PUBLIC PROPERTY.
2. ANY PROJECT INVOLVING A DEVELOPMENT, SUBDIVISION, SITE CONDOMINIUM, CONDOMINIUM, OR ASSOCIATION.
3. ANY PROJECT THAT WILL RESULT IN MORE THEN ONE OWNER RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE COMPLETE STORM DRAINAGE SYSTEM

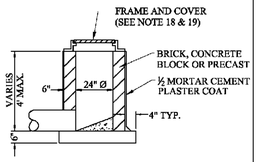
COVERS FOR MANHOLES, CATCH BASINS, AND INLETS

18. MANHOLE FRAME AND COVER SHALL BE EJIW 1040, TYPE A COVER OR EQUIVALENT.
19. CATCH BASINS AND INLET FRAME AND COVER SHALL BE AS FOLLOWS:
    a. EJIW 7045 WITH TYPE M1 GRATE AND 7050 T1 BACK, OR EQUAL, FOR USE WITH CONCRETE CURB AND GUTTER, (STRAIGHT CURB/ M.D.O.T. F CURB) AND WITH CONCRETE PAVEMENT WITH INTEGRAL CURB.
    b. EJIW 7085 WITH TYPE M1 GRATE OR EQUAL, FOR USE WITH CONCRETE B-2 MODIFIED MODIFIED CURB AND GUTTER, AND WITH CONCRETE WITH B-2 MODIFIED INTEGRAL CURB.
    c. EJIW 7065 WITH TYPE M1 GRATE AND 7060 T1 BACK, OR EQUAL,FOR USE WITH MOUNTABLE CURB AND GUTTER, AND WITH CONCRETE PAVEMENT WITH MOUNTABLE INTEGRAL CURB.
    d. EJIW FRAME 1040 WITH TYPE N OVAL GRATE OR TYPE 02 BEEHIVE GRATE, OR EQUAL, FOR USE ON OPEN DITCH STRUCTURES AND ON CATCH BASINS LOCATED IN SWALES, AND IN BASEMENTS OUTSIDE THE PUBLIC STREET RIGHT-OF-WAY.
    e. EJIW FRAME 7030 WITH TYPE M6 VANE GRATE AND T1 BACK, OR EQUAL, FOR USE WITH RELIEF BASINS WHICH ARE ON LONGITUDINAL ROAD SLOPES OF 4% OR GREATER.
    f. EJIW FRAME 5105 WITH TYPE M1 SINUSOIDAL GRATE, OR EQUAL, FOR USE IN NON-CURB PAVEMENT AREAS.

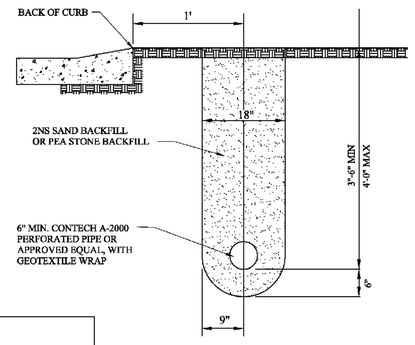
NOTE: COVERS MUST HAVE THE "DUMP NO WASTE! DRAINS TO WATERWAY" LETTERING (WHEN APPLICABLE).



LETTERED MANHOLE COVER

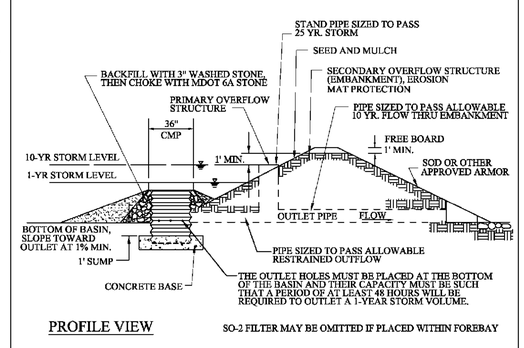


INLET DETAIL



EDGE DRAIN DETAIL

FOR PUBLIC AND PRIVATE ROADS

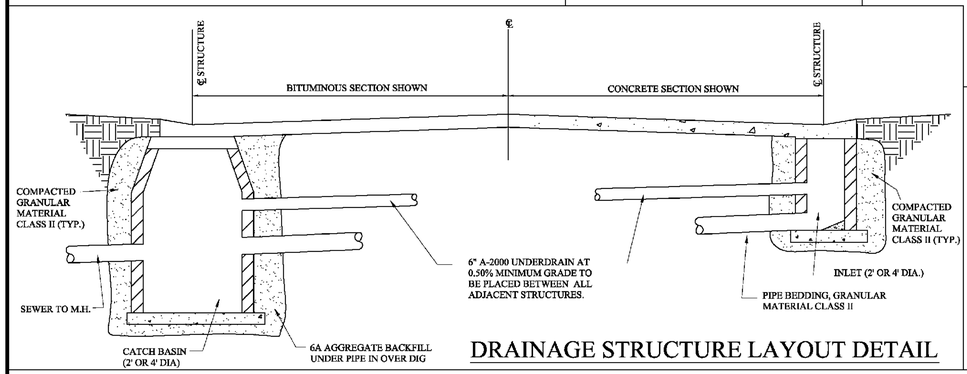


PROFILE VIEW

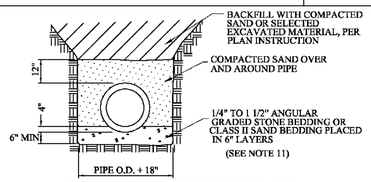
SO-2 FILTER MAY BE OMITTED IF PLACED WITHIN FOREBAY

SO-2 DETENTION BASIN OUTLET FILTER (CMP)

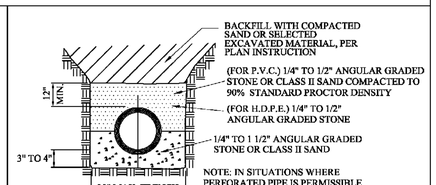
(SEE OCDC STANDARD DETAILS FOR SEDIMENT BASIN OR FOREBAY OUTLET STRUCTURE)



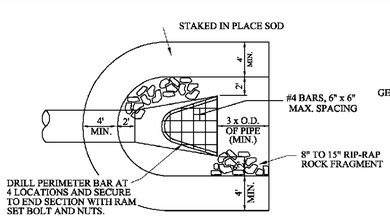
DRAINAGE STRUCTURE LAYOUT DETAIL



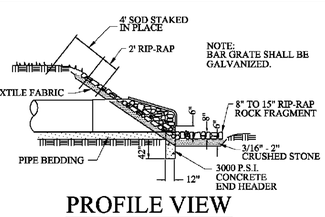
CLASS "B" BEDDING TRENCH DETAIL FOR 24" DIAMETER AND SMALLER PIPE (CONCRETE OR METAL)



H.D.P.E. OR P.V.C. BEDDING DETAIL

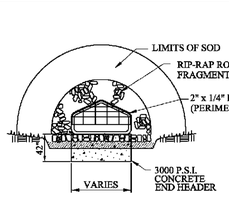


PLAN VIEW

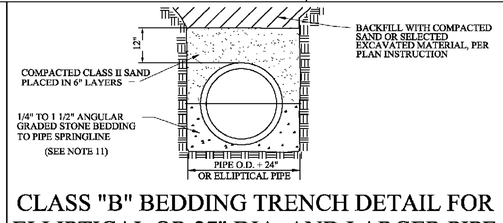


PROFILE VIEW

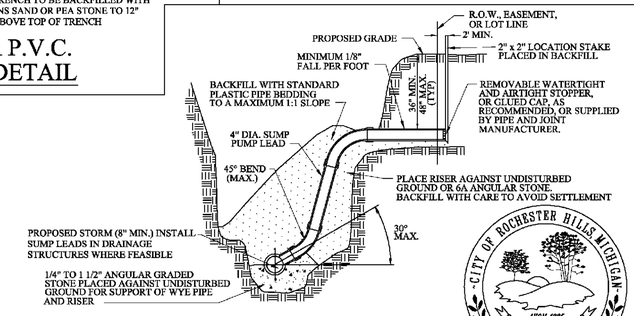
END SECTION AND BAR GRATE DETAIL



END VIEW



CLASS "B" BEDDING TRENCH DETAIL FOR ELLIPTICAL OR 27" DIA. AND LARGER PIPE (CONCRETE OR METAL)



HOUSE LEAD DETAIL FOR 3" OR 4" DIA. PLASTIC SUMP PUMP LEADS

NOT TO BE USED AS CONSTRUCTION DRAWINGS

ISSUED FOR PLANNING REVIEW – 03.15.2012
CITY FILE NUMBER 11-009

REVISIONS	DATE

APPROVED BY CITY COUNCIL, DATE: JULY 21, 2008

PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES

NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION

City of Rochester Hills

1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

STORM SYSTEM STANDARD DETAILS

NOT TO SCALE | DATE: 7/21/2008

SHEET 1 OF 1

KES JOB NO. 2011-03

SCALE: NONE

APPLICANT:
JONES LANG LASALLE/BANK OF AMERICA
C/O STEPHANIE LIEB
135 S. LASALLE, SUITE 1225
CHICAGO, IL 60601
PHONE: 815.717.8131 / FAX: 302.601.1283
EMAIL: STEPHANIE.LIEB@AM.JLL.COM

Three full working days before you dig, call the MISS DIG System at **1-800-482-7171**

PREPARED BY:
KRAFT ENGINEERING & SURVEYING, INC.
engineers - surveyors - planners
409 WEST SEVENTH STREET FLINT, MICHIGAN 48503
PHONE: 810.234.2694 or 810.234.2695 FAX: 810.234.2696
E-MAIL: MAIL@KRAFTENGINEERING.COM

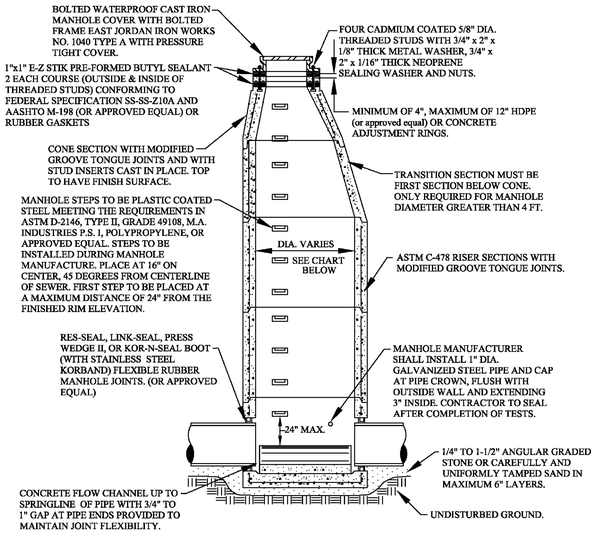
BANK OF AMERICA BRANCH AT ROCHESTER HILLS
NW CORNER OF ADAMS ROAD & MARKETPLACE CIRCLE
PART OF THE SOUTHWEST 1/4 OF SECTION 30, T3N-R11E
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

STORM SEWER STANDARD DETAILS

REVISIONS
09.28.2012

DRN. BY:	RADO	03.09.2012
DSN. BY:	M.R.P.	"
CKD. BY:	M.R.P.	"
APPR. BY:	M.R.P.	"

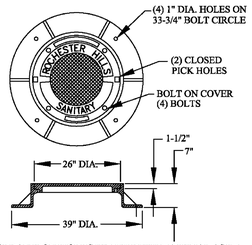
SHEET NO: C-10



STANDARD MANHOLE

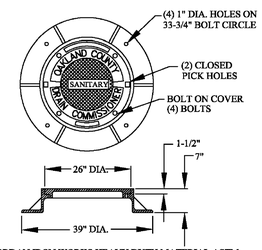
MANHOLE SIZING CHART

MANHOLE DIAMETER	MAX. PIPE SIZE FOR STRAIGHT THRU INST.	MAX. PIPE SIZE FOR RIGHT ANGLE INST.
4'	24"	18"
5'	36"	24"
6'	42"	36"
7'	60"	42"



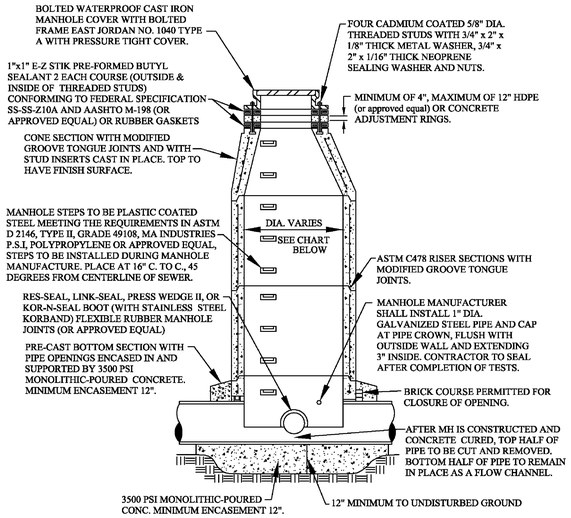
EAST JORDAN IRON WORKS HEAVY DUTY MATERIAL ASTM A48 CL.35 COVER WT., 150 LBS., CATALOG NO. 1040 TYPE A

ROCHESTER HILLS MANHOLE COVER



EAST JORDAN IRON WORKS HEAVY DUTY MATERIAL ASTM A48 CL.35 COVER WT., 150 LBS., CATALOG NO. 1040 TYPE A

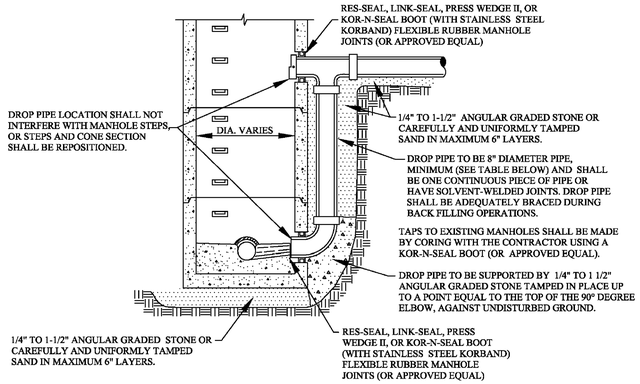
O.C.D.C. LETTERED MANHOLE COVER



MANHOLE CONSTRUCTED OVER EXISTING SEWER

MANHOLE SIZING CHART

MANHOLE DIAMETER	MAX. PIPE SIZE FOR STRAIGHT THRU INST.
4'	24"
5'	36"
6'	42"
7'	60"



EXTERIOR DROP CONNECTION

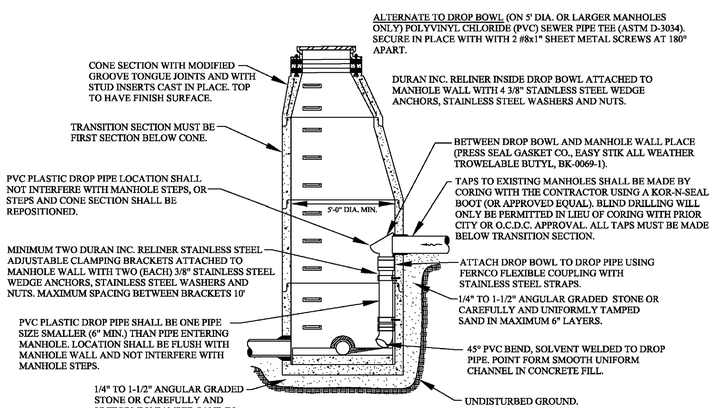
SEWER SIZE	DROP SIZE	MH SIZE
UP TO 10"	8"	4'
UP TO 18"	10"	4'
UP TO 30"	18"	5'

SANITARY SEWER CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ROCHESTER HILLS AND THE OAKLAND COUNTY DRAIN COMMISSIONER (OCDC). ALL SANITARY SEWER CONSTRUCTION SHALL HAVE FULL-TIME INSPECTION SUPERVISED BY THE CITY OF ROCHESTER HILLS INSPECTION SERVICES.
2. NO SEWER INSTALLATION SHALL HAVE AN INFILTRATION EXCEEDING 100 GALLONS PER INCH DIAMETER PER MILE OF PIPE IN A 24 HOUR PERIOD, AND NO SINGLE RUN OF SEWER BETWEEN MANHOLES SHALL EXCEED 100 GALLONS PER INCH DIAMETER PER MILE. AIR TESTS IN LIEU OF INFILTRATION TESTS SHALL BE AS SPECIFIED IN THE OAKLAND COUNTY DRAIN COMMISSIONER STANDARDS. PRELIMINARY-AIR TESTS ARE WITNESSED BY THE CITY AND FINAL AIR TESTS ARE WITNESSED BY BOTH THE CITY AND THE OCDC. ONLY PIPE AND PIPE JOINTS APPROVED BY THE CITY MAY BE USED FOR SANITARY SEWER CONSTRUCTION.
3. LOCATED IN THE FIRST MANHOLE UPSTREAM FROM THE POINT OF ALL CONNECTIONS TO AN EXISTING SEWER, OR EXTENSION, A TEMPORARY 12-INCH DEEP SUMP SHALL BE PROVIDED IN THE FIRST MANHOLE ABOVE THE CONNECTION WHICH WILL BE FILLED IN AFTER SUCCESSFUL COMPLETION OF ANY ACCEPTANCE TEST UP TO THE STANDARD FILLET PROVIDED FOR THE FLOW CHANNEL. A WATERTIGHT BULKHEAD SHALL BE PROVIDED ON THE DOWNSTREAM SIDE OF THE SUMP MANHOLE.
4. AT ALL TIMES WHEN LAYING OF NEW PIPE IS NOT ACTUALLY IN PROGRESS, THE UPSTREAM OPEN END OF THE PIPE SHALL BE CLOSED BY TEMPORARY WATERTIGHT PLUGS OR BY OTHER APPROVED MEANS. IF WATER IS IN THE TRENCH WHEN WORK IS RESUMED, THE PLUG SHALL NOT BE REMOVED UNTIL THE DANGER OF WATER ENTERING THE PIPE HAS PASSED. ALL MAIN LINE PIPE SHALL BE LAID WITH A PIPE LASER BEAM FOR LINE AND GRADE. A TARGET MUST BE INSTALLED AT THE END OF THE PIPE BEING LAYED.
5. ALL BUILDING LEADS AND RISERS SHALL BE SIX INCH SDR 23.5 PVC PIPE WITH CHEMICALLY FUSED JOINTS OR GASKETED JOINTS APPROVED BY CITY ENGINEER. BUILDING LEADS TO BE FURNISHED WITH REMOVABLE AIRTIGHT AND WATERTIGHT STOPPERS.
6. ALL SEWER PIPE SHALL BE INSTALLED IN CLASS "B" BEDDING OR BETTER.
7. ALL NEW MANHOLES SHALL HAVE CITY APPROVED FLEXIBLE, WATERTIGHT SEALS WHERE PIPES PASS THROUGH WALLS. MANHOLES SHALL BE OF PRE CAST SECTIONS WITH MODIFIED GROOVE TONGUE AND RUBBER GASKET TYPE JOINTS. PRE CAST MANHOLE CONE SECTIONS SHALL BE CITY APPROVED MODIFIED ECCENTRIC CONE TYPE. ALL MANHOLES SHALL BE PROVIDED WITH BOLTED, WATERTIGHT COVERS.
8. AT ALL CONNECTIONS TO MANHOLES IN ALL SEWERS, OR EXTENSIONS, DROP CONNECTIONS WILL BE REQUIRED WHEN THE DIFFERENCE IN INVERT ELEVATIONS EXCEEDS 18 INCHES.
9. GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWN SPOUT DRAINAGE OR WEEP TILE DRAINAGE SHALL NOT BE ALLOWED TO ENTER ANY SANITARY SEWER INSTALLATION.
10. PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL TELEPHONE MISS DIG THREE (3) DAYS IN ADVANCE (811) FOR THE LOCATION OF UNDERGROUND PIPELINE AND CABLE FACILITIES AND SHALL ALSO NOTIFY REPRESENTATIVES OF OTHER UTILITIES LOCATED IN THE VICINITY OF THE WORK.
11. AN 18 INCH MINIMUM VERTICAL SEPARATION AND A 10 FOOT MINIMUM HORIZONTAL SEPARATION MUST BE MAINTAINED BETWEEN SANITARY SEWER AND ALL OTHER UTILITIES.
12. AS A MEANS OF INSURING PROPER INSTALLATION OF THE SANITARY SEWER PIPE, THE CONTRACTOR SHALL VIDEO INSPECT, ACCORDING TO THE CITY OF ROCHESTER HILLS VIDEO INSPECTION STANDARDS, 100% OF THE SANITARY SEWER PIPE. THE CONTRACTOR SHALL PROVIDE 24 HOURS NOTICE TO THE OAKLAND COUNTY DRAIN COMMISSIONER OR THE CITY OF ROCHESTER HILLS PRIOR TO VIDEO INSPECTION, SO A REPRESENTATIVE MAY BE PRESENT. ROCHESTER HILLS WILL BE PROVIDED WITH A DIGITAL COPY OF THE VIDEO INSPECTION AND LOG IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS INSPECTION STANDARDS.

SANITARY SEWER MATERIALS

1. THE FOLLOWING MATERIALS MAY BE USED FOR PUBLIC SANITARY SEWER CONSTRUCTION, APPROVED PIPE MATERIALS MUST CONFORM TO STANDARDS ADOPTED BY THE OFFICE OF THE OAKLAND COUNTY DRAIN COMMISSIONER:
   A. FOR SEWERS 8" TO 15" TO BE PVC TRUSS PIPE, ASTM D-2680, WITH GASKET JOINTS, OTHER TYPES OF PIPE AS APPROVED BY CITY ENGINEER.
   B. FOR 6" SEWER LEADS SHALL BE SOLID WALLED PVC, SDR 23.5, D-2751. PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 150 P.S.I., AND A MINIMUM DEFLECTION OF 15% AT FAILURE. THE SEWER LED MATERIAL SHALL BE COMPATIBLE WITH SEWER MAIN MATERIAL.
   C. FOR SEWERS GREATER THAN 15" TO BE REINFORCED CONCRETE PIPE (RCP) SHALL CONFORM TO THE CURRENT ASTM D C76 WALL B. JOINTS SHALL BE SYNTHETIC RUBBER AND MEET OR EXCEED THE REQUIREMENTS ESTABLISHED BY ASTM C361.



INTERIOR DROP CONNECTION

NOTE: INTERIOR DROP CONNECTION PERMITTED ONLY WHEN APPROVED BY CITY ENGINEER.

NOT TO BE USED AS CONSTRUCTION DRAWINGS

ISSUED FOR PLANNING REVIEW – 03.15.2012
CITY FILE NUMBER 11-009

REVISIONS	DATE

APPROVED BY CITY COUNCIL, DATE: JULY 21, 2008

PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES

NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION

City of Rochester Hills

1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

SANITARY SEWER STANDARD DETAILS

NOT TO SCALE | DATE: 7/21/2008

SHEET 1 OF 2

KES JOB NO. 2011-03

SCALE: NONE

APPLICANT:
JONES LANG LASALLE/BANK OF AMERICA
C/O STEPHANIE LIEB
135 S. LASALLE, SUITE 1225
CHICAGO, IL 60601
PHONE: 815.717.8131 / FAX: 302.601.1283
EMAIL: STEPHANIE.LIEB@AM.JLL.COM

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PREPARED BY:
KRAFT ENGINEERING & SURVEYING, INC.
engineers - surveyors - planners
409 WEST SEVENTH STREET FLINT, MICHIGAN 48503
PHONE: 810.234.2694 or 810.234.2695 FAX: 810.234.2696
E-MAIL: MAIL@KRAFTENGINEERING.COM

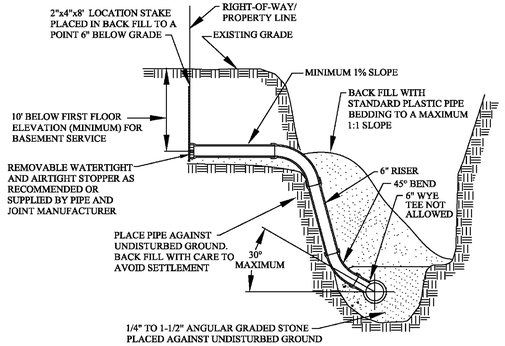
BANK OF AMERICA BRANCH AT ROCHESTER HILLS
NW CORNER OF ADAMS ROAD & MARKETPLACE CIRCLE
PART OF THE SOUTHWEST 1/4 OF SECTION 30, T3N-R11E
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

SANITARY SEWER STANDARD DETAILS

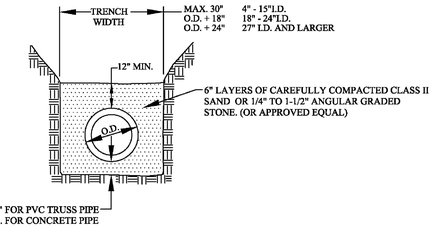
REVISIONS
09.28.2012

DRN. BY:	RADO	03.09.2012
DSN. BY:	M.R.P.	"
CKD. BY:	M.R.P.	"
APPR. BY:	M.R.P.	"

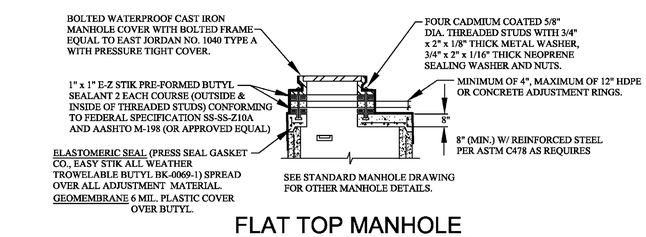
SHEET NO: C-11



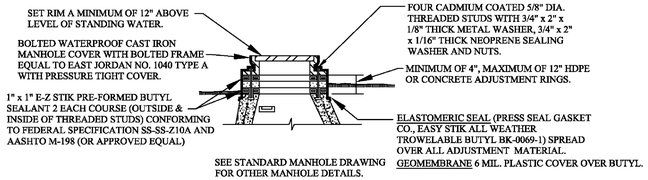
HOUSE LEAD DETAIL



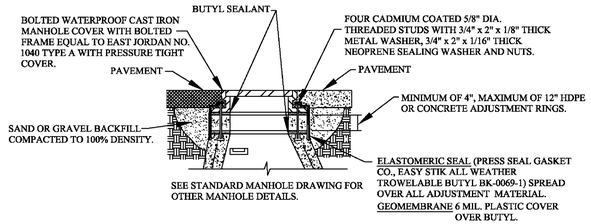
STANDARD BEDDING (CLASS B)



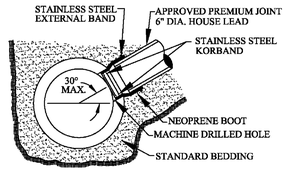
FLAT TOP MANHOLE



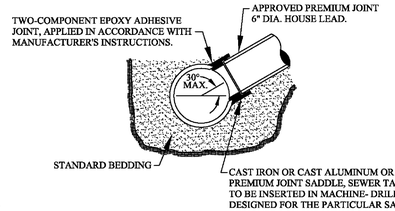
ADJUSTMENT DETAIL FOR MANHOLE TOPS WITHIN FLOOD PRONE AREAS



ADJUSTMENT DETAIL MANHOLE TOPS WITHIN PAVEMENT AREAS

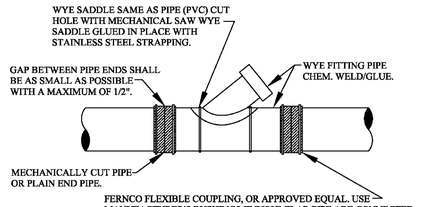


KOR-N-TEE TAP FOR CONCRETE PIPE



NOTE: SURFACE OF MAIN SEWER SHALL BE CLEANED WITH AN ABRASIVE GRINDER PRIOR TO EPOXY APPLICATION. DUE TO VARIATION OF SET-UP TIME OF EPOXY ADHESIVE WITH TEMPERATURE, ANCHOR STRAPS SHALL BE USED TO SECURE SADDLE IN POSITION IN COLD WEATHER OR WHENEVER WORK IS TO PROCEED PRIOR TO COMPLETE CURE OF EPOXY.

SEWER TAP-ALL SIZES OF MAIN SEWER PIPES VITRIFIED CLAY



NOTE: PIPE SHALL BE BEDDED IN STANDARD PLASTIC PIPE BEDDING.

WYE PIPE INSERTION WITH FLEXIBLE COUPLINGS (RIGID PIPE)

CITY OF ROCHESTER HILLS GRAVITY BUILDING LEAD REQUIREMENTS AND DETAILS

1. ALL BUILDING LEAD WORK MUST BE PERFORMED UNDER THE CITY OF ROCHESTER HILLS INSPECTION.
2. FOR ALL CITY OF ROCHESTER HILLS SYSTEMS CALL 248-841-2510 48-HOURS PRIOR TO SCHEDULING INSPECTION.

   FOR ALL OCDC-OPERATED SYSTEMS, CALL 248-858-1110 48-HOURS IN ADVANCE PRIOR TO SCHEDULING INSPECTION.
3. SANITARY SEWER MAY NOT BE USED AS A DEWATERING OUTLET.
4. WHERE AN EXISTING BUILDING LEAD IS BEING EXTENDED, DISSIMILAR TYPES AND SIZES OF PIPE SHALL BE JOINED USING A CITY OF ROCHESTER HILLS APPROVED ADAPTER.
5. APPROVED BUILDING LEAD PIPE FOR GRAVITY SEWER LEADS:
   A. PVC PLASTIC, ASTM D2751, SDR 23.5.
   B. DUCTILE IRON PIPE, AMERICAN WATER WORKS ASSOCIATION (AWWA) C-104/A21.4, CLASS 54. JOINTS SHALL BE SUPER BEL TITE, TYTON, TY-SEAL, MULTI-TITE, DUAL- TITE, OR VERI-TITE.
   C. ANY DEVIATIONS FROM ABOVE SPECIFICATIONS REQUIRES APPROVAL BY CITY ENGINEER.
6. ALLOWABLE TYPES OF SEWER PIPE ADAPTERS: FERNCO ADAPTER OR FERNCO FLEXIBLE COUPLING.
7. FOR 6" LEADS A CLEANOUT MUST BE INSTALLED EVERY 100 FT. FOR 4" LEADS A CLEANOUT MUST BE INSTALLED EVERY 50 FT. 90° BENDS NOT ALLOWED EXCEPT FROM THE HORIZONTAL TO THE VERTICAL-WITHIN 5 FEET OF THE BUILDING

CITY OF ROCHESTER HILLS SANITARY SEWER SYSTEM AS-BUILT DRAWING SPECIFICATIONS

IN AREAS WHERE SANITARY SEWER SYSTEMS ARE OPERATED AND MAINTAINED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICES, FINAL ACCEPTANCE OF THE SANITARY SEWER SYSTEM MUST BE RENDERED BY THE DEPARTMENT OF PUBLIC SERVICES, BEFORE THE SYSTEM CAN BE USED FOR THE SERVICE INTENDED.

ONE ITEM REQUIRED FOR FINAL ACCEPTANCE SHALL BE THE SUBMISSION OF AS-BUILT DRAWINGS TO THE CITY OF ROCHESTER HILLS ENGINEERING DIVISION, BY THE DESIGN ENGINEER. AS-BUILT DRAWINGS SHALL BE DEFINED AS AND CONTAIN THE FOLLOWING INFORMATION:

1. FINAL AS-BUILT DRAWINGS SHALL BE PROVIDED ON MYLAR. XEROX OR ANY HEAT PROCESS REPRODUCTIONS WILL NOT BE ACCEPTED.
2. ALONG WITH THE MYLAR PLAN SET, PROVIDE THREE (3) SETS OF BLUEPRINTS, PRODUCED FROM THE MYLARS AND THE PLANS ON ELECTRONIC MEDIA IN AUTOCAD FORMAT (LATEST VERSION).
3. THE COVER SHEET SHALL BE SEALED BY THE PROJECT DESIGN ENGINEER, ALONG WITH THE FOLLOWING CERTIFICATION STATEMENT.

I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE AS-BUILT DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE THOSE IMPROVEMENTS NOTED AS "AS BUILT" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS; AND ALSO THAT THE SANITARY SEWER AND STRUCTURES, AS CONSTRUCTED, LIE WITHIN THE EASEMENT DESCRIPTIONS REQUIRED BY THE CITY OF ROCHESTER HILLS.

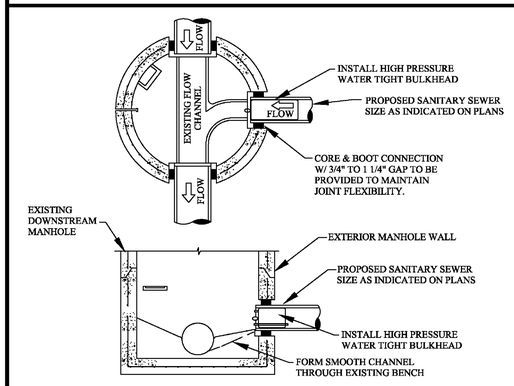
(COMPANY NAME)

(ENGINEER'S SIGNATURE)

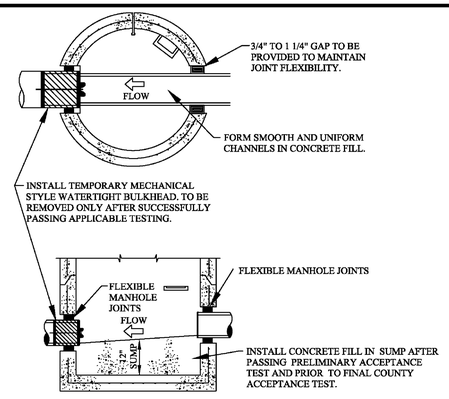
PROFESSIONAL ENGINEER NO. _____

ENGINEER SEAL

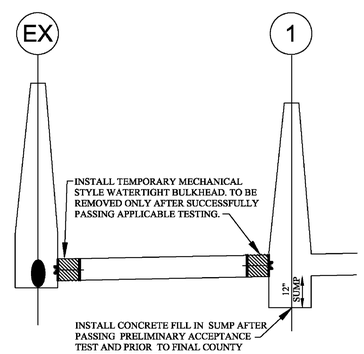
4. THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
5. THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
6. THE SIZE, MANUFACTURER AND MODEL NUMBERS OF ALL VALVES AND PUMPS INSTALLED SHALL BE INDICATED.
7. A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED.
8. THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
9. THE OFFSET OF THE SANITARY MAIN FROM PROPERTY LINES SHALL BE INDICATED.
10. ALL MANHOLES, VALVE WELLS, PUMPS AND ALL SANITARY SYSTEM APPURTENANCES SHALL BE LOCATED FROM TWO FIXED OBJECTS (MANHOLES, BUILDING CORNERS ETC.).
11. ALL UNDERGROUND APPURTENANCES, SUCH AS TFC/ARV WELLS, METER PITS, GRINDER PUMPS AND PUMP STATION PITS, ETC. SHALL BE LOCATED FROM THE NEAREST MANHOLE THAT IS CONNECTED TO THE SAME SANITARY MAIN AS THE APPURTENANCE.
12. THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE VERTICAL SEPARATION. IS LESS THAN 18" SHALL BE NOTED.
13. AS-BUILTS SHALL BE PREPARED IN ACCORDANCE WITH CITY OF ROCHESTER HILLS AS-BUILT GUIDELINES AS PROVIDED AT THE PRE-CONSTRUCTION MEETING



TESTING BULKHEAD IN EXISTING MANHOLE



FIRST MANHOLE UPSTREAM FROM SANITARY TAP



PROFILE OF BULKHEADS AND ONE FOOT SUMP

CITY OF ROCHESTER HILLS MICHIGAN AVON 1835 1984

NOT TO BE USED AS CONSTRUCTION DRAWINGS

ISSUED FOR PLANNING REVIEW – 03.15.2012
CITY FILE NUMBER 11-009

REVISIONS	DATE

APPROVED BY CITY COUNCIL, DATE: JULY 21, 2008

PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES

NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION

City of Rochester Hills
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

SANITARY SEWER STANDARD DETAILS

NOT TO SCALE | DATE: 7/21/2008

SHEET 2 OF 2

KES JOB NO. 2011-03

SCALE: NONE

APPLICANT:
JONES LANG LASALLE/BANK OF AMERICA
C/O STEPHANIE LIEB
135 S. LASALLE, SUITE 1225
CHICAGO, IL 60601
PHONE: 815.717.8131 / FAX: 302.601.1283
EMAIL: STEPHANIE.LIEB@AM.JLL.COM

Three full working days before you dig, call the MISS DIG System at **1-800-482-7171**

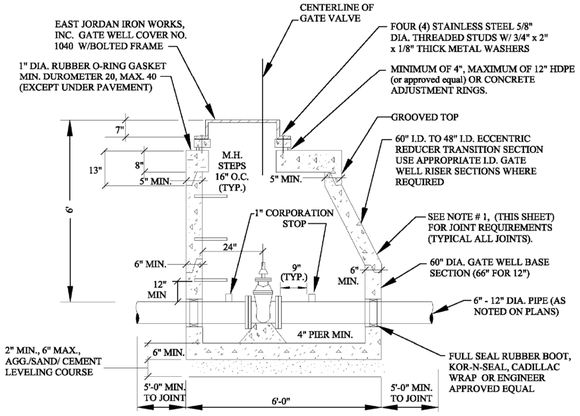
PREPARED BY:
KRAFT ENGINEERING & SURVEYING, INC.
engineers - surveyors - planners
409 WEST SEVENTH STREET FLINT, MICHIGAN 48503
PHONE: 810.234.2694 or 810.234.2695 FAX: 810.234.2696
E-MAIL: MAIL@KRAFTENGINEERING.COM

BANK OF AMERICA BRANCH AT ROCHESTER HILLS
NW CORNER OF ADAMS ROAD & MARKETPLACE CIRCLE
PART OF THE SOUTHWEST 1/4 OF SECTION 30, T3N-R11E
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

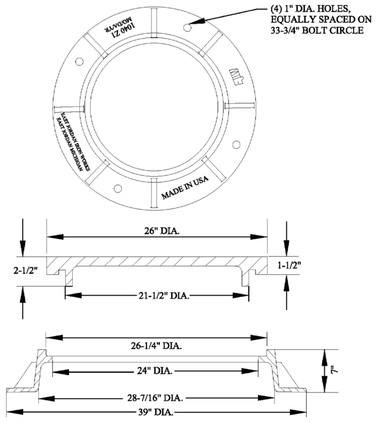
SANITARY SEWER STANDARD DETAILS

REVISIONS	DRN. BY:	RADO	03.09.2012
09.28.2012	DSN. BY:	M.R.P.	"
	CKD. BY:	M.R.P.	"
	APPR. BY:	M.R.P.	"

SHEET NO: C-12



ALL GATE WELLS



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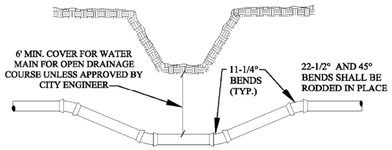
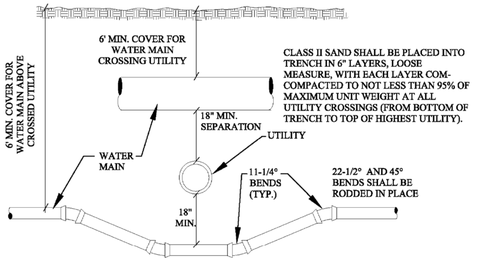
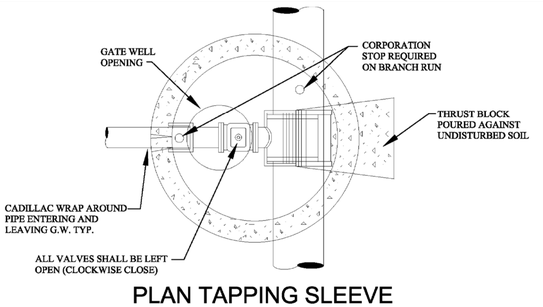


DITCH CROSSING

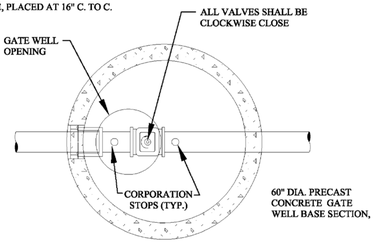


UTILITY CROSSING

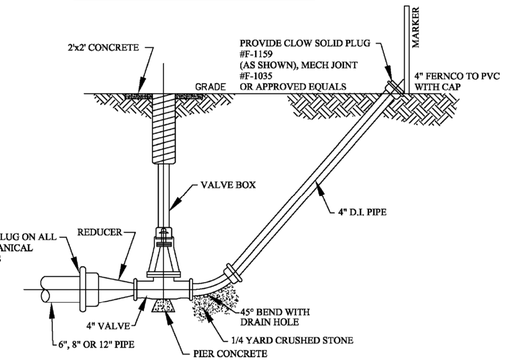


PLAN TAPPING SLEEVE VALVE & WELL (TYPICAL)

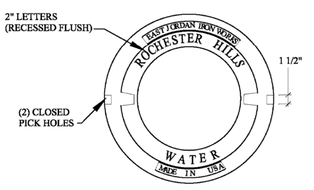
MANHOLE STEPS TO BE PLASTIC COATED STEEL MEETING THE REQUIREMENTS IN ASTM D 2146, TYPE II, GRADE 49108. MA. INDUSTRIES P.S.I. POLYPROPYLENE OR APPROVED EQUAL. STEPS TO BE INSTALLED DURING MANHOLE MANUFACTURE, PLACED AT 16" C. TO C.



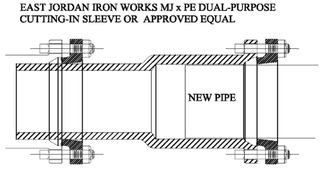
GATE WELL (TYPICAL)



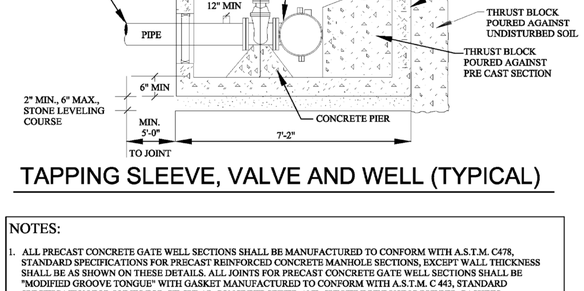
DETAIL OF 4" BLOWOFF



LETTERING LAYOUT FOR GATE WELL COVERS



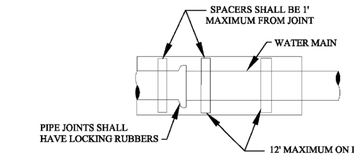
BOTTLE SLEEVE



TAPPING SLEEVE, VALVE AND WELL (TYPICAL)

NOTES:

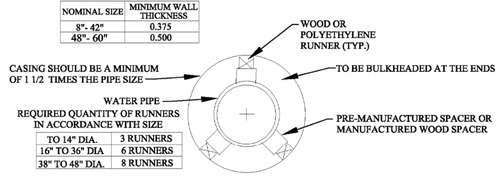
1. ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE MANUFACTURED TO CONFORM WITH A.S.T.M. C478, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, EXCEPT WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
2. CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 1(i.e. 2'-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NUT) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATE WELL OPENING. FAILURE TO DO SO WILL REQUIRE CONTRACTOR TO CORRECT AT HIS EXPENSE.
3. TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES; MUELLER; EAST JORDAN; SMITH-BLAIR OR APPROVED EQUAL AND APPROVED BY THE CITY OF ROCHESTER HILLS. FULL BODY SLEEVES MUST BE USED EXCEPT FOR REINFORCED CONCRETE PRESSURE PIPE OR A.C. PIPE.
4. FOR ALL PIPE USE A 1" CORPORATION STOP. NO CORPS SHALL BE USED IN CONCRETE PRESSURE PIPE.
5. RUBBER O-RINGS SHALL NOT BE USED IN PAVEMENT.



WATER MAIN IN CASING SECTION

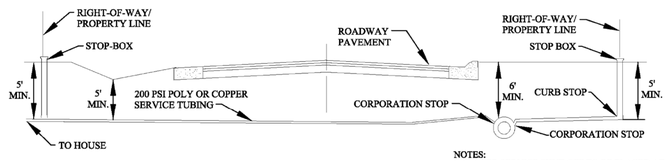
UNLESS OTHERWISE SPECIFIED, MINIMUM CASING PIPE SHALL BE ASTM A-139 GRADE B, WALL THICKNESS AS FOLLOWS:

NOMINAL SIZE	MINIMUM WALL THICKNESS
8"- 42"	0.375
48"- 60"	0.500



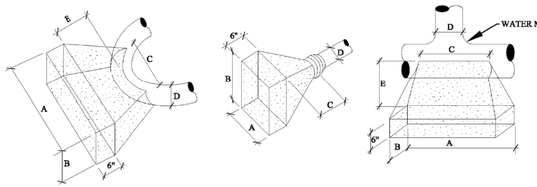
TO 14" DIA.	3 RUNNERS
16" TO 36" DIA	6 RUNNERS
38" TO 48" DIA.	8 RUNNERS

SUPPORT FOR WATER MAIN CONSTRUCTED IN CASING PIPE



TYPICAL PUBLIC ROAD WATER SERVICE CONNECTION

NOTES:
1. WATER SERVICE SHUT-OFF TO BE PLACED AT PROPERTY LINE.
2. LATERAL LOCATION SHALL BE AS REQUESTED BY THE ABUTTING PROPERTY OWNER.
3. ROCHESTER HILLS DPW PERFORMS SERVICE LEAD TAPS UP TO 2" DIAMETER..



FOR 90° BENDS OR SMALLER

D	A	B	C	E MIN.
20"	8'	6.5'	3.5'	2.5'
16"	6'	4'	2.5'	2'
12"	4'	3'	2'	1.75'
10"	3'	3'	2'	1.75'
8"	3'	2'	2'	1.5'
6"	2'	1.5'	2'	1.25'

FOR PLUGS

D	A	B	C MIN.
20"	7'	5'	2.5'
16"	4'-10"	4'-10"	2'
12"	4'-4"	3'	1'-9"
10"	3'	2'	1'-6"
8"	2'-10"	2'-6"	1'-6"
6"	1'-6"	1'-6"	3'

FOR TEES

D	A	B	C	E MIN.
20"	6.5'	4.5'	3.5'	3'
16"	4'-8"	4'-8"	2.5'	2.75'
12"	4'	3'	2.5'	2.5'
10"	3'	2'	2'	2.25'
8"	2'-6"	2'	2'	2.25'
6"	2'	2'	2'	2.25'

THRUST BLOCK DETAILS

CITY OF ROCHESTER HILLS MICHIGAN — AVON 1835 — 1984

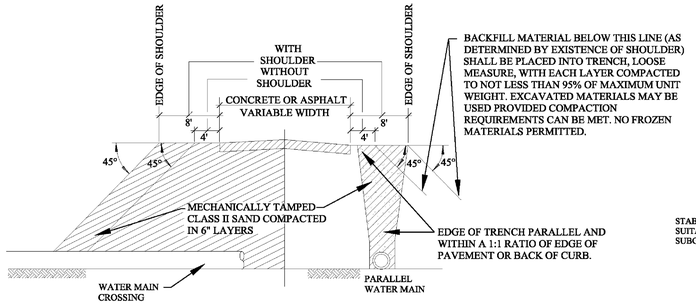
NOT TO BE USED AS CONSTRUCTION DRAWINGS

ISSUED FOR PLANNING REVIEW – 03.15.2012
CITY FILE NUMBER 11-009

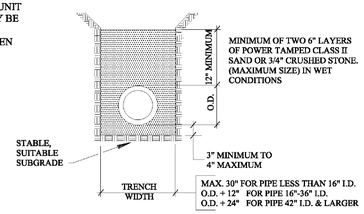
REVISIONS	DATE	APPROVED BY CITY COUNCIL, DATE: JULY 21, 2008	NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION	City of Rochester Hills 1000 Rochester Hills Drive, Rochester Hills, Michigan 48309	WATER MAIN STANDARD DETAILS	NOT TO SCALE	DATE: 7/21/2008
		PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES				SHEET 1 OF 2	

KES JOB NO. 2011-03

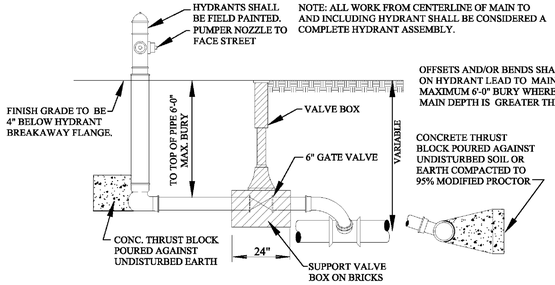
SCALE: NONE	APPLICANT: JONES LANG LASALLE/BANK OF AMERICA C/O STEPHANIE LIEB 135 S. LASALLE, SUITE 1225 CHICAGO, IL 60601 PHONE: 815.717.8131 / FAX: 302.601.1283 EMAIL: STEPHANIE.LIEB@AM.JLL.COM	Three full working days before you dig, call the MISS DIG System at 1-800-482-7171	PREPARED BY: KRAFT ENGINEERING & SURVEYING, INC. engineers - surveyors - planners 409 WEST SEVENTH STREET FLINT, MICHIGAN 48503 PHONE: 810.234.2694 or 810.234.2695 FAX: 810.234.2696 E-MAIL: MAIL@KRAFTENGINEERING.COM	BANK OF AMERICA BRANCH AT ROCHESTER HILLS NW CORNER OF ADAMS ROAD & MARKETPLACE CIRCLE PART OF THE SOUTHWEST 1/4 OF SECTION 30, T3N-R11E CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI	WATERMAIN STANDARD DETAILS	REVISIONS 09.28.2012	DRN. BY: RADO 03.09.2012 DSN. BY: M.R.P. " CKD. BY: M.R.P. " APPR. BY: M.R.P. "	SHEET NO: C-13



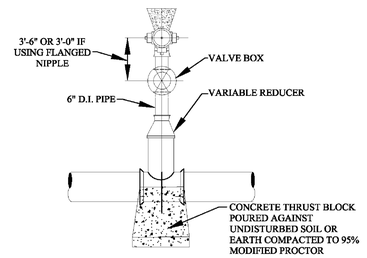
MINIMUM BACKFILL UNDER OR WITHIN PAVEMENT INFLUENCE



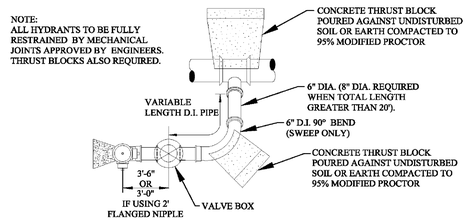
STANDARD BEDDING FOR WATER MAIN



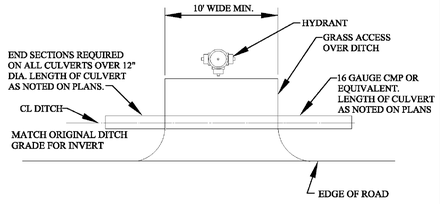
HYDRANT SIDE OUTLET OPTION



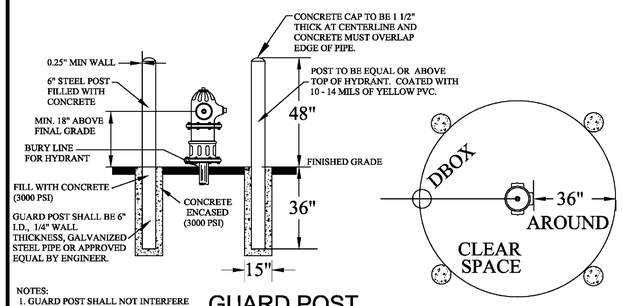
HYDRANT CONNECTION (TYPICAL)



HYDRANT SIDE OUTLET OPTION

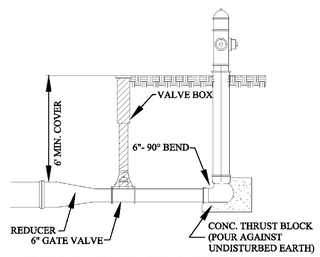


DITCH ENCLOSURE AT HYDRANT/ GATE WELL



GUARD POST

NOTES:
1. GUARD POST SHALL NOT INTERFERE WITH HYDRANT OPERATION
2. TO BE INSTALLED IN ALL PAVED AREAS WHERE VEHICLE EQUIPMENT DAMAGE TO HYDRANT IS POSSIBLE.



DEAD END BLOWOFF CONNECTION

HYDRANT & BLOWOFF DETAILS

GENERAL NOTES

1. ALL CONSTRUCTION PROCEDURES AND MATERIALS SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ROCHESTER HILLS.
2. A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED BY THE CITY OF ROCHESTER HILLS AND HELD PRIOR TO THE START OF CONSTRUCTION.
3. CONTRACTOR MUST CONTACT MISS DIG (811) AT LEAST THREE WORKING DAYS PRIOR TO THE START OF CONSTRUCTION FOR UNDERGROUND UTILITY LOCATIONS. ALL UTILITIES SHALL BE STAKED BEFORE CONSTRUCTION BEGINS.
4. ALL WATER MAIN EASEMENTS SHALL BE PROVIDED PRIOR TO CONSTRUCTION AND ACCEPTANCE OF THE WATER DISTRIBUTION SYSTEM.
5. WATER MAINS SHALL BE CONSTRUCTED WITH A MINIMUM COVER OF 6 FEET BELOW FINISHED GRADES, INCLUDING OPEN DRAINAGE COURSES.
6. ALL TRENCHES UNDER OR WITHIN A 1:1 RATIO OF EXISTING OR PROPOSED PAVEMENT OR DRIVEWAYS, SHALL BE BACKFILLED WITH COMPACTED CLASS II SAND TO GRADE (95% MAXIMUM UNIT DENSITY).
7. WHERE TWO UTILITIES CROSS, PROVIDE CLASS II BACKFILL MATERIAL IN SIX (6) INCH COMPACTED LAYERS TO TOP OF HIGHEST UTILITY.
8. WHERE WATER MAINS DIP UNDER OTHER UTILITIES, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE CONSTRUCTED WITH 11-1/4° VERTICAL BENDS, 22 1/2° OR 45° BENDS MUST BE RODDED AND PROPERLY ANCHORED.
9. ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE IN ACCORDANCE WITH A.S.T.M. C478, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
10. CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 1 (2'-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NUT) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATE WELL OPENING.
11. ALL CROSS-CONNECTION CONTROL DEVICES SHALL BE INSTALLED AS REQUIRED BY THE ROCHESTER HILLS PLUMBING INSPECTOR AND IN ACCORDANCE WITH THE STANDARDS OF THE OAKLAND COUNTY DRAIN COMMISSIONER OPERATION AND MAINTENANCE DIVISION AND THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF DRINKING WATER AND RADIOLOGICAL PROTECTION.
12. ALL WATER SERVICE CONNECTIONS TWO (2) INCHES AND SMALLER SHALL BE MADE BY THE CITY OF ROCHESTER HILLS, DEPARTMENT OF PUBLIC SERVICES AFTER WATER MAIN ACCEPTANCE AND APPLICABLE PERMITS ARE OBTAINED.
13. ALL FITTINGS AND BENDS SHOULD BE BLOCKED IN ACCORDANCE WITH THRUST BLOCK DETAILS, UNLESS ALTERNATE THRUST RESTRAINT SYSTEM, AS INDICATED PLANS AND SPECIFICATIONS, IS APPROVED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICE.

WATER MAIN MATERIALS NOTES

1. TEMPORARY CONNECTIONS, WHICH MAY BE MADE FOR CHLORINATING AND FLUSHING PURPOSES, SHALL INCLUDE A TESTABLE DOUBLE CHECK VALVE BACKFLOW PREVENTER WITH CURRENT CERTIFICATION.
2. CORPORATION STOPS USED FOR INSERTION INTO MAINS SHALL BE FORD TYPE B-44. ALL STOPS SHALL HAVE BRONZE CAST BODIES, KEYS, STEM WASHERS AND NUTS. INLET THREADS SHALL CONFORM TO THE LATEST VERSION OF AWWA C800.
3. ALL DUCTILE IRON PIPE (D.I.P.) WATER MAIN SHALL BE DESIGNED FOR 150 PSI MINIMUM WORKING PRESSURE.
4. THE DUCTILE IRON PIPE TO BE FURNISHED AND DELIVERED UNDER THIS SPECIFICATION SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C151 (ANSI A21.5), EXCEPT AS OTHERWISE SPECIFIED HEREIN. PIPE SHALL BE DOUBLE CEMENT-LINED AND SEAL COATED WITH AN APPROVED BITUMINOUS SEAL COAT IN ACCORDANCE WITH AWWA C104 (ANSI A21.4).
5. DUCTILE IRON PIPE SHALL BE CLASS 54 FOR SIZES THREE (3) INCH THROUGH TWENTY (20) INCHES SIZE. TWENTY-FOUR (24) INCH AND LARGER SHALL BE CLASS 55 DUCTILE IRON PIPE.
6. PIPES TWENTY-FOUR (24) INCHES AND LARGER IN NOMINAL DIAMETER SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C100 FOR DUCTILE IRON WATER PIPE.
7. MECHANICAL JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C111 (ANSI A21.11).
8. FLANGE JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C110 (ANSI A21.10).
9. FITTINGS FOR DUCTILE IRON PIPE SHALL BE DUCTILE IRON AND SHALL MEET REQUIREMENTS OF AWWA C110 (ANSI A21.10) OR AWWA C153 (ANSI A21.53). DUCTILE IRON FITTINGS SHALL BE RATED FOR 350 PSI, PIPE SIZES TWENTY-FOUR (24) INCH DIAMETER AND LESS, AND 250 PSI FOR PIPE SIZES OVER TWENTY-FOUR (24) INCH DIAMETER. DUCTILE IRON FLANGE FITTINGS SHALL BE RATED FOR 250 PSI FOR ALL PIPE DIAMETERS.
10. ALL DUCTILE IRON PIPE, FITTINGS AND HYDRANTS SHALL BE ENCASED WITH POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH THE REQUIREMENTS OF A.N.S.I./A.W.W.A. STANDARD SPECIFICATION D1248 AND AWWA C105. POLYETHYLENE TUBE MATERIAL SHALL HAVE A THICKNESS OF .008" (8-MILS). ADHESIVE TAPE SHALL BE A GENERAL PURPOSE ADHESIVE TAPE 2" WIDE AND APPROXIMATELY 10-MILS THICK, SUCH AS SCOTCHRAP. NO.50, POLYKEN NO. 900, OR TAPECOAT CT.

VALVE AND SLEEVE NOTES

1. GATE VALVES, SIZES THREE (3) INCH THROUGH SIXTEEN (16) INCH AND TAPPING VALVES SHALL MEET THE CITY OF ROCHESTER HILLS STANDARD AS DETAILED WITH NON-RISING STEM. (EAST JORDAN IRON WORKS, AMERICAN FLOW CONTROL, MUELLER)
2. ALL IN LINE GATE VALVES EIGHT (8) INCH AND LARGER SHALL BE IN WELLS. SPECIFICATIONS SHALL INCLUDE THE DIRECTION OF OPERATION OF ALL VALVES (CLOCKWISE CLOSURE). VALVE BOX USE TO BE APPROVED BY ENGINEERING DIVISION.
3. ALL GATE WELL COVERS SHALL BE CITY OF ROCHESTER HILLS STANDARD AS DETAILED.
4. ALL GATE VALVES WITH OPERATING NUTS AT A DISTANCE GREATER THAN FIVE (5) FEET BELOW GROUND SURFACE SHALL BE PROVIDED WITH AN EXTENSION STEM. THE LENGTH OF THE EXTENSION STEM SHALL REACH WITHIN FIVE (5) FEET FROM THE GROUND SURFACE. WHEN AN EXTENSION STEM IS USED, IT SHALL BE HELD IN PLACE BY AN EXTENSION STEM GUIDE SUITABLY FASTENED TO THE WALL OF THE GATE WELL. THE EXTENSION STEM SHALL BE MECHANICALLY ATTACHED TO THE OPERATING NUT. DETAILS OF THE EXTENSION SYSTEM AND THE METHOD OF INSTALLATION SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
5. BUTTERFLY VALVES SHALL BE USED FOR VALVES GREATER THAN 16-INCH DIAMETER AND SHALL BE MODEL 2F11 AS MANUFACTURED BY HENRY PRATT COMPANY OR APPROVED EQUAL.
6. TAPPING VALVES SHALL BE SERIES "A" AS MANUFACTURED BY EAST JORDAN IRON WORKS OR RESILIENT SEATED GATE VALVES AS APPROVED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES.
7. TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES; MUELLER; EAST JORDAN; SMITH-BLAIR OR APPROVED EQUAL AND APPROVED BY THE CITY OF ROCHESTER HILLS. FULL BODY SLEEVES MUST BE USED EXCEPT FOR REINFORCED CONCRETE PRESSURE PIPE OR A.C. PIPE.

HYDRANT REQUIREMENTS

1. ALL HYDRANTS SHALL BE CONSTRUCTED WITH A SIX (6) INCH COMPANION GATE VALVE IN A THREE (3) PIECE, ADJUSTABLE DUCTILE IRON VALVE BOX, WHICH SHALL INCLUDE A FIVE AND ONE-QUARTER (5-1/4) INCH SCREW SHAFT. VALVE BOXES SHALL BE SERIES 6860 AS MANUFACTURED BY TYLER PIPE OR APPROVED EQUAL.
2. ALL HYDRANTS SHALL BE EAST JORDAN IRON WORKS NO. 5-BR-250 TRAFFIC MODEL, OR AMERICAN FLOW CONTROL MODEL WB-67250. SELF-DRAINING HYDRANTS SHALL NOT BE USED. HYDRANTS SHALL HAVE BREAKAWAY FLANGE.
3. ALL HYDRANTS SHALL BE PAINTED RED ABOVE GROUND AND BLACK BELOW GROUND WITH A FINISH COAT OF GLAMORTEX 501 ENAMEL, COLOR 314 VERMILLION OR APPROVED EQUAL. HYDRANT CAPS SHALL BE PAINTED SAME COLOR AS THE HYDRANT.
4. ALL FIRE HYDRANT JOINTS SHALL BE TOTALLY RESTRAINED BY THE USE OF RESTRAINED JOINT. THRUST BLOCKS ARE ALSO REQUIRED.

ACCEPTANCE OF NEW WATER MAINS

1. PRIOR TO WATER MAIN ACCEPTANCE THE FOLLOWING CONDITIONS MUST BE MET: 1) PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS 2) ALL EASEMENT AND RIGHT-OF-WAY ACQUISITION MUST BE ACCEPTED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES 3) THE CITY OF ROCHESTER HILLS MUST BE PROVIDED WITH THE BILL OF SALE AND 4) ALL MYLAR "AS - BUILT DRAWINGS" MUST BE ACCEPTED AND APPROVED BY THE CITY OF ROCHESTER HILLS, ENGINEERING SERVICES. THE CITY OF ROCHESTER HILLS INSPECTION DIVISION MUST WITNESS THE CONNECTION OF THE WATER MAIN TO THE EXISTING WATER MAIN, AFTER WHICH RESIDENTIAL AND COMMERCIAL TAPS WILL BE ALLOWED.
2. THE CONTRACTOR SHALL NOTIFY THE CITY OF ROCHESTER HILLS, INSPECTION DEPARTMENT (248.841.2510) FOR PRESSURE TESTING, BACTERIOLOGICAL SAMPLING, CONNECTIONS TO EXISTING WATER MAIN AND FINAL FIELD REVIEW. A FORTY-EIGHT (48) HOUR ADVANCE NOTICE IS REQUIRED.
3. THE CONTRACTOR SHALL DISINFECT AND PRESSURE TEST ALL NEW WATER MAIN IN ACCORDANCE WITH ROCHESTER HILLS STANDARDS. THE WATER MAIN SHALL PASS A 150 PSI PRESSURE TEST FOR A TWO (2) HOUR PERIOD. WATER LOSS SHALL NOT EXCEED A RATE OF 11.65 U.S. GALLONS PER INCH DIAMETER PER MILE OF WATER MAIN IN TWENTY-FOUR (24) HOURS.
4. WHERE CONTRACTOR SUPPLIED GAUGES ARE REQUIRED, MINIMUM SIZE SHALL BE 3 1/2" DIAMETER OR LARGER GRADUATED IN ONE (1) OR TWO (2) POUND INCREMENTS FROM 1 TO 160 P.S.I. OR HIGHER AND HAVE CURRENT CERTIFICATION.
5. PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED AND APPROVED PRIOR TO CONNECTING TO THE EXISTING WATER MAIN.

CITY OF ROCHESTER HILLS WATER SYSTEMS AS-BUILT DRAWING SPECIFICATIONS

IN AREAS WHERE WATER SYSTEMS ARE OPERATED AND MAINTAINED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICES, FINAL ACCEPTANCE OF THE WATER SYSTEM MUST BE RENDERED BY THE DEPARTMENT OF PUBLIC SERVICES, BEFORE THE SYSTEM CAN BE USED FOR THE SERVICE INTENDED.

ONE ITEM REQUIRED FOR FINAL ACCEPTANCE SHALL BE THE SUBMISSION OF AS-BUILT DRAWINGS TO THE CITY OF ROCHESTER HILLS, DPS, BY THE DESIGN ENGINEER. AS-BUILT DRAWINGS SHALL BE DEFINED AS AND CONTAIN THE FOLLOWING INFORMATION:

1. FINAL AS-BUILT DRAWINGS SHALL BE PROVIDED ON THREE (3) MIL. MYLAR. XEROX OR ANY HEAT PROCESS REPRODUCTIONS WILL NOT BE ACCEPTED.
2. ALONG WITH THE MYLAR PLAN SET, PROVIDE THREE (3) SETS OF BLUEPRINTS, PRODUCED FROM THE MYLARS AND THE PLANS ON ELECTRONIC MEDIA IN AUTOCAD FORMAT (LATEST VERSION).
3. EACH AND EVERY SHEET SHALL BE SEALED BY THE DESIGN ENGINEER, ALONG WITH THE FOLLOWING CERTIFICATION STATEMENT ON THE COVER SHEET:

I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE AS-BUILT DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE THOSE IMPROVEMENTS NOTED AS "AS BUILT" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS; AND ALSO THAT THE WATER MAIN AND STRUCTURES, AS CONSTRUCTED, LIE WITHIN THE EASEMENT DESCRIPTIONS REQUIRED BY THE CITY OF ROCHESTER HILLS.

(COMPANY NAME)

(ENGINEER'S SIGNATURE)

PROFESSIONAL ENGINEER NO.

ENGINEER SEAL

4. THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
5. THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
6. THE SIZE, BRAND AND MODEL NUMBERS OF ALL VALVES AND HYDRANTS INSTALLED SHALL BE INDICATED.
7. A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED, AS WELL AS AN AS-BUILT DRAWING QUANTITY LIST ON EACH INDIVIDUAL SHEET.
8. THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
9. THE OFFSET OF THE WATER MAIN FROM PROPERTY LINES SHALL BE INDICATED.
10. ALL GATE VALVE WELLS, HYDRANTS AND ALL WATER SYSTEM APPURTENANCES SHALL BE LOCATED FROM TWO FIXED OBJECTS (MANHOLES, BUILDING CORNERS ECT.).
11. ALL UNDERGROUND APPURTENANCES, SUCH AS GATE VALVE WELLS, METER PITS, PRESSURE REDUCING VALVE PITS, ETC. SHALL BE LOCATED FROM THE NEAREST HYDRANT THAT IS CONNECTED TO THE SAME WATER MAIN AS THE APPURTENANCE.
12. THE LOCATION AND SIZE OF EVERY RESTRAINED JOINT SHALL BE NOTED.
13. THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE VERTICAL SEPARATION, IS LESS THAN 18" SHALL BE NOTED.
14. AS-BUILT SHALL BE PREPARED IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS AS-BUILT GUIDELINES AS PROVIDED AT THE PRE-CONSTRUCTION MEETING.

CITY OF ROCHESTER HILLS MICHIGAN — AVON 1835 — 1984

NOT TO BE USED AS CONSTRUCTION DRAWINGS

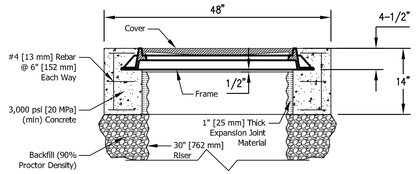
ISSUED FOR PLANNING REVIEW - 03.15.2012
CITY FILE NUMBER 11-009

REVISIONS	DATE	APPROVED BY CITY COUNCIL, DATE: JULY 21, 2008	NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION	City of Rochester Hills 1000 Rochester Hills Drive, Rochester Hills, Michigan 48309	WATER MAIN STANDARD DETAILS	NOT TO SCALE	DATE: 7/21/2008
		PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES				SHEET 2 OF 2	

KES JOB NO. 2011-03

SCALE: NONE	APPLICANT: JONES LANG LASALLE/BANK OF AMERICA C/O STEPHANIE LIEB 135 S. LASALLE, SUITE 1225 CHICAGO, IL 60601 PHONE: 815.717.8131 / FAX: 302.601.1283 EMAIL: STEPHANIE.LIEB@AM.JLL.COM	Three full working days before you dig, call the MISS DIG System at 1-800-482-7171	PREPARED BY: KRAFT ENGINEERING & SURVEYING, INC. engineers - surveyors - planners 409 WEST SEVENTH STREET FLINT, MICHIGAN 48503 PHONE: 810.234.2694 or 810.234.2695 FAX: 810.234.2696 E-MAIL: MAIL@KRAFTENGINEERING.COM	BANK OF AMERICA BRANCH AT ROCHESTER HILLS NW CORNER OF ADAMS ROAD & MARKETPLACE CIRCLE PART OF THE SOUTHWEST 1/4 OF SECTION 30, T3N-R11E CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI	WATERMAIN STANDARD DETAILS	REVISIONS 09.28.2012	DRN. BY: RADO 03.09.2012 DSN. BY: M.R.P. " CKD. BY: M.R.P. " APPR. BY: M.R.P. "	SHEET NO: C-14

THE AQUA SWIRL structure shall be designed for H-20 loading. A 4-foot [1.22 m] diameter, 14-inch [356 mm] thick reinforced concrete pad must be placed over the Stormwater Treatment System Riser to support and level the manhole frame, as shown. The top of riser pipe must be wrapped with compressible expansion joint material to a minimum 1-inch [25 mm] thickness to allow transfer of wheel loads from manhole cover to concrete slab. Manhole cover shall bear on concrete slab and not on riser pipe. The concrete slab shall have a minimum strength of 3,000 psi [20 MPa] and be reinforced with #4 [13 mm] reinforcing steel as shown. Minimum cover over reinforcing steel shall be 1-inch [25 mm]. Top of manhole cover and concrete slab shall be level with finish grade.



Manhole Frame & Cover Detail
For Traffic Loading Areas
NTS

AQUA-SWIRL™ PCS SPECIFICATION NOTES

1. MANUFACTURER SHALL BE RESPONSIBLE FOR COMPLETE ASSEMBLY OF SWIRL CONCENTRATOR.

2. POLYMER COATED STEEL (PCS) SWIRL CONCENTRATOR SHALL BE FABRICATED FROM POLYMER PRE-COATED STEEL SHEET FOR CORRUGATED STEEL PIPE, AND SHALL COMPLY WITH ASTM A 760 AND ASTM A 742.

3. STUB OUTS AND INTERNAL COMPONENTS SHALL BE SUPPLIED BY MANUFACTURER AND MIG WELDED USING ACCEPTED WELDING PRACTICES.

4. MANUFACTURER SHALL SUPPLY DIRECT ACCESS TO SWIRL CONCENTRATOR VIA 30-INCH ID RISER(S). RISER SHOULD NOT BE FIELD CUT BY CONTRACTOR, RISER SHOULD MAINTAIN ITS FINISH CUT LENGTH AS SUPPLIED BY MANUFACTURER TO MATCH FINAL GRADE PER APPROVED SITE ELEVATIONS (AS INDICATED ON APPROVED SHOP DRAWING). IF NECESSARY TO EXTEND RISER, CONTRACTOR SHOULD USE ADJUSTING RINGS TO BRING TOP OF STRUCTURE TO GRADE.

5. CONTRACTOR SHALL SUPPLY PIPE COUPLINGS TO AND FROM SWIRL CONCENTRATOR, WHICH SHALL BE MAR-MAC, FERNCO, OR MISSION STYLE FLEXIBLE BOOT WITH STAINLESS STEEL TENSION BANDS AND SHEAR GUARD.

6. CONTRACTOR SHALL PREPARE EXCAVATION AND OFF-LOAD SWIRL CONCENTRATOR. CONTRACTOR IS RESPONSIBLE FOR BEDDING AND BACKFILL AROUND SWIRL CONCENTRATOR AS DETAILED ON SITE PLAN. (SEE NOTES 11 AND 12)

7. MANUFACTURER SHALL SUPPLY STANDARD MANHOLE FRAME(S) AND COVER(S). (TRAFFIC RATED H20)

8. WHERE TRAFFIC LOADING (H-20) IS REQUIRED OR ANTICIPATED, A 4-FOOT DIAMETER, 14-INCH THICK REINFORCED CONCRETE PAD MUST BE PLACED OVER THE SWIRL CONCENTRATOR TO SUPPORT AND LEVEL THE MANHOLE FRAME. THE TOP OF RISER PIPE MUST BE WRAPPED WITH COMPRESSIBLE EXPANSION JOINT MATERIAL TO A MINIMUM 1-INCH THICKNESS TO ALLOW TRANSFER OF WHEEL LOADS FROM MANHOLE COVER TO CONCRETE SLAB. MANHOLE COVER SHALL BEAR ON CONCRETE SLAB AND NOT ON RISER PIPE. THE CONCRETE SLAB SHALL HAVE A MINIMUM STRENGTH OF 3,000 PSI AND BE REINFORCED WITH #4 REINFORCING STEEL (PER DRAWING). MINIMUM COVER OVER REINFORCING STEEL SHALL BE 1-INCH. TOP OF MANHOLE COVER AND CONCRETE SLAB SHALL BE LEVEL WITH FINISH GRADE.

9. UNLESS OTHER TRAFFIC BARRIERS ARE PRESENT, BOLLARDS SHALL BE PLACED AROUND ACCESS RISERS IN NON-TRAFFIC AREAS TO PREVENT INADVERTENT LOADING BY MAINTENANCE VEHICLES. SAMPLE OF TYPICAL BOLLARD INSTALLATION DETAIL AND RECOMMENDED LOCATIONS OF BOLLARDS AROUND THE SWIRL CONCENTRATOR CAN BE PROVIDED UPON REQUEST.

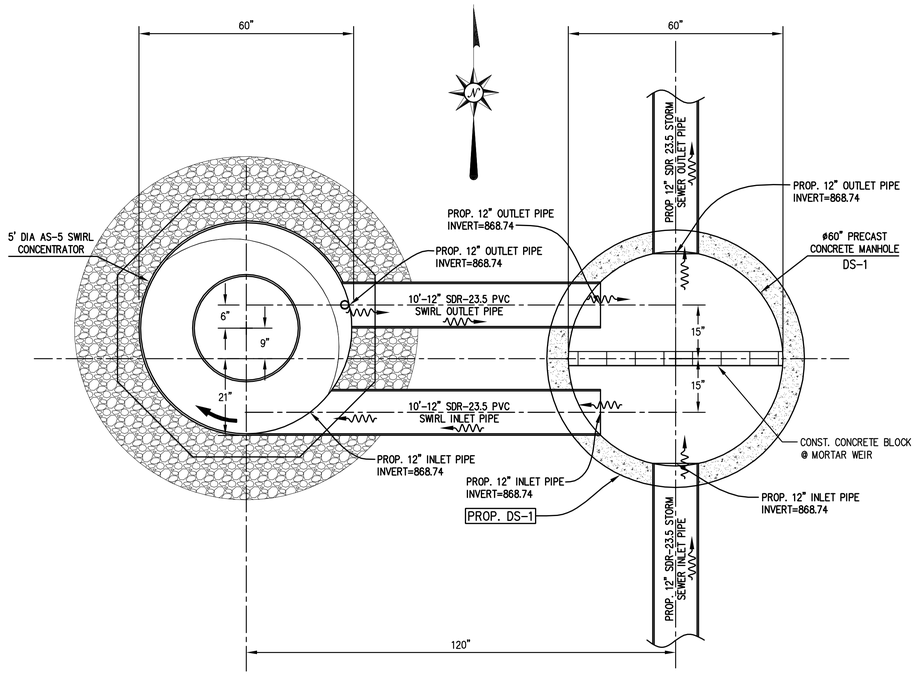
10. WHERE HIGH GROUNDWATER ELEVATIONS ARE PRESENT OR ANTICIPATED, CONTRACTOR SHALL SUPPLY CONCRETE ANTI-FLOATATION PAD UNDERNEATH AND POURED OVER THE OCTAGONAL BASE PLATE OF THE SWIRL (SEE ANTI-FLOATATION BASE DETAIL) TO PREVENT BUOYANCY AND BASE PLATE DEFLECTION (DETAILS, IF NECESSARY, AVAILABLE UPON REQUEST).

11. EXCAVATION AND BEDDING – THE TRENCH AND TRENCH BOTTOM SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM A 798 SECTION 5, TRENCH EXCAVATION, SECTION 6, FOUNDATION, AND SECTION 7, BEDDING. THE PCS SWIRL CONCENTRATOR SHALL BE INSTALLED ON A STABLE BASE CONSISTING OF AT LEAST 6-INCHES OF FINE, READILY COMPACTED SOIL OR GRANULAR FILL MATERIAL, AND COMPACTED TO 95% PROCTOR DENSITY. BEDDING SHALL NOT CONTAIN STONES RETAINED ON A 3-INCH RING, FROZEN LUMPS, HIGHLY PLASTIC CLAY, ORGANIC MATERIAL, CORROSIVE MATERIAL, OR OTHER DELETERIOUS FOREIGN MATERIALS. ALL REQUIRED SAFETY PRECAUTIONS FOR SWIRL CONCENTRATOR INSTALLATION ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PER OSHA APPROVED METHODS.

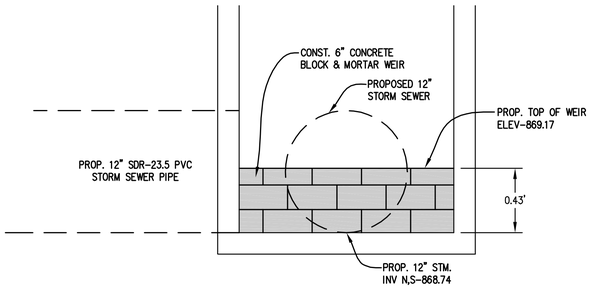
12. BACKFILL REQUIREMENTS – BACKFILL MATERIALS SHALL BE FINE, READILY COMPACTED SOIL OR GRANULAR FILL MATERIAL, AND COMPACTED TO 90% PROCTOR DENSITY. PROCESSED GRANULAR MATERIALS WITH EXCELLENT STRUCTURAL CHARACTERISTICS ARE PREFERRED. COARSE GRAINED SOILS OF USCS GROUPS GW, GP, GM, GC, SW, AND SP AS DESCRIBED IN ASTM D 2487 ARE GENERALLY ACCEPTABLE MATERIALS WHEN COMPACTED TO 90% PROCTOR DENSITY. BACKFILL SHALL NOT CONTAIN STONES RETAINED ON A 3-INCH RING, FROZEN LUMPS, HIGHLY PLASTIC CLAY, ORGANIC MATERIAL, CORROSIVE MATERIAL, OR OTHER DELETERIOUS FOREIGN MATERIALS. BACKFILLING SHALL CONFORM TO ASTM A 798, SECTION 10, STRUCTURAL BACKFILL PLACEMENT. BACKFILL SHALL BE PLACED IN 6 TO 12 INCH LAYERS OR "LIFTS" AND COMPACTED BEFORE ADDING THE NEXT LIFT. BACKFILL SHALL EXTEND AT LEAST 18 INCHES OUTWARD FROM SWIRL CONCENTRATOR AND FOR THE FULL HEIGHT OF THE SWIRL CONCENTRATOR (INCLUDING RISER(S)) EXTENDING LATERALLY TO UNDISTURBED SOILS.

13. THE CONTRACTOR MUST FURNISH DETAILED SHOP DRAWINGS PREPARED BY THE SUPPLIER AND SEALED BY A LICENSED ENGINEER SHOWING ALL INFORMATION REQUIRED TO CONSTRUCT THE AQUA SWIRL STRUCTURE AND COMPONENTS IN ACCORDANCE WITH THE PLANS, THE CITY OF ROCHESTER HILLS REQUIREMENTS, AND ALL OTHER APPLICABLE STANDARDS. THE SHOP DRAWINGS MUST BE APPROVED BY THE PROJECT ENGINEER AND THE CITY PRIOR TO FABRICATION OF THE TREATMENT STRUCTURE.

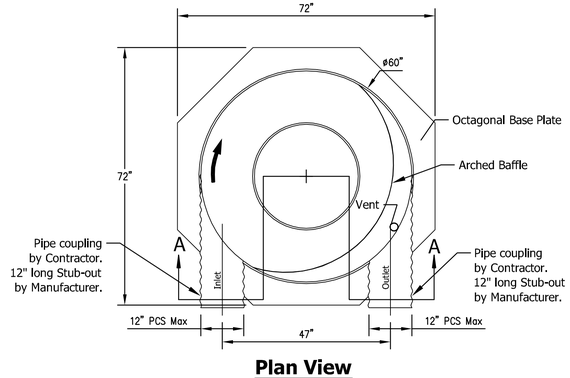
*** See Site Plan for actual system orientation.**
**** Orientation may vary from 90°, 180°, or custom angles to meet site conditions.**



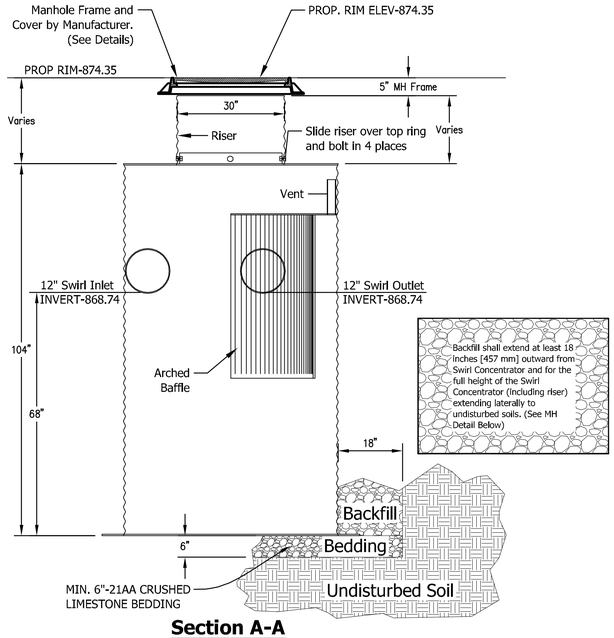
PLAN VIEW LAYOUT DETAIL



DETAIL OF CONCRETE BLOCK WEIR DETAIL IN DS-1



Plan View



Section A-A

STORM WATER TREATMENT FLOW:

Q_T = CIA
C_T = 0.85 (AVERAGE SITE RUNOFF COEFFICENT)
I_T = 0.5" RAINFALL WITHIN 15 MINUTES = 2 IN/HR
A = 0.80 ACRES (TOTAL SITE DRAINAGE AREA)

Q_T = 0.85 x 2 IN/HR x 0.80 ACRES
Q_T = 1.36 CFS

NOTE: AN AS-5 AQUA SWIRL TREATMENT SYSTEM IS RATED TO TREAT UP TO 1.41 CFS

AquaShield
STORMWATER TREATMENT SOLUTIONS
2705 Kanasita Drive, Chattanooga, TN 37343
Phone (888) 344-9044 Fax (423) 826-2112
www.aquashieldinc.com

KES JOB NO. 2011-03
Bank of America

Aqua-Swirl Concentrator Model AS-5 Horseshoe PCS Standard Detail
Aqua-Swirl Polymer Coated Steel (PCS)
Stormwater Treatment System

NOT TO BE USED AS CONSTRUCTION DRAWINGS
ISSUED FOR PLANNING REVIEW – 03.15.2012
CITY FILE NUMBER 11-009

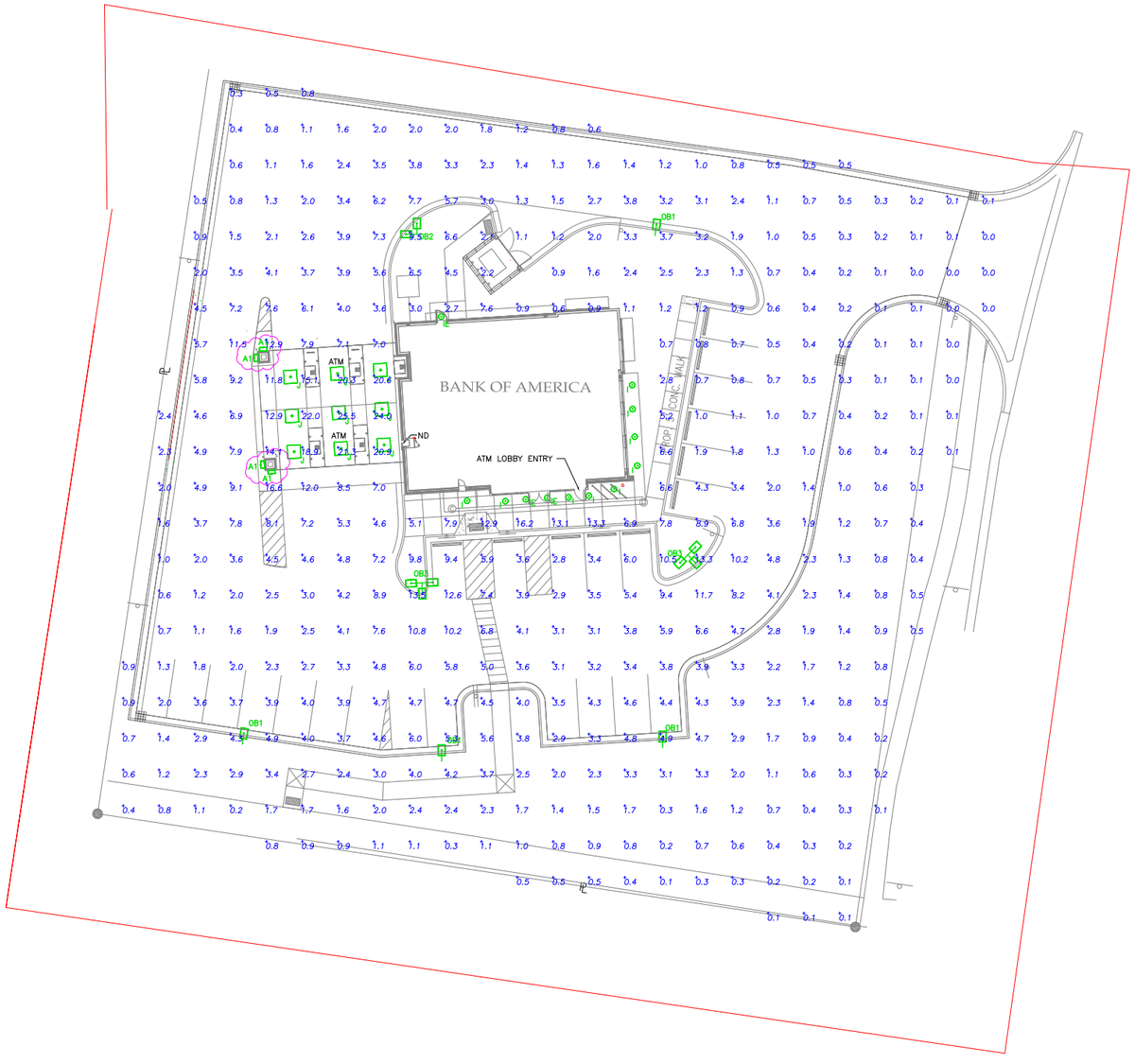
SCALE: NONE	APPLICANT: JONES LANG LASALLE/BANK OF AMERICA C/O STEPHANIE LIEB 135 S. LASALLE, SUITE 1225 CHICAGO, IL 60601 PHONE: 815.717.8131 / FAX: 302.601.1283 EMAIL: STEPHANIE.LIEB@AM.JLL.COM	Three full working days before you dig, call the MISS DIG System at **1-800-482-7171**	PREPARED BY: KRAFT ENGINEERING & SURVEYING, INC. engineers - surveyors - planners 409 WEST SEVENTH STREET FLINT, MICHIGAN 48503 PHONE: 810.234.2694 or 810.234.2695 FAX: 810.234.2696 E-MAIL: MAIL@KRAFTENGINEERING.COM	BANK OF AMERICA BRANCH AT ADAMS MARKETPLACE NW CORNER OF ADAMS ROAD & MARKETPLACE CIRCLE PART OF THE SOUTHWEST 1/4 OF SECTION 30, T3N-R11E CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI	STORM WATER TREATMENT STRUCTURE DETAILS	REVISIONS	DRN. BY: RADO 09.28.2012 DSN. BY: M.R.P. " CKD. BY: M.R.P. " APPR. BY: M.R.P. "	SHEET NO: C-15

GENERAL/PLAN NOTES:

1. THIS LIGHTING DESIGN IS BASED ON THE BANK OF AMERICA'S CURRENT POLICY FOR EXTERIOR ATM/AFTER-HOUR DEPOSITORIES/ASSOCIATE ENTRY LIGHTING.
2. WASH LENS, RE-LAMP, AND RE-BALLAST ALL LIGHTING FIXTURES THAT IMPACT THE 60' RADIUS AROUND ALL ATMS AND AFTER-HOUR DEPOSITORIES AS WELL ALL LIGHTING FIXTURES THAT IMPACT THE 10' RADIUS AROUND ALL ASSOCIATE ENTRIES.
3. IF NECESSARY, REPAIR OR REPLACE ANY DAMAGED LIGHT FIXTURES THAT IMPACT THE 60' RADIUS AROUND ALL ATMS AND AFTER-HOUR DEPOSITORIES AS WELL ALL LIGHTING FIXTURES THAT IMPACT THE 10' RADIUS AROUND ALL ASSOCIATE ENTRIES. IF REPLACEMENT IS NECESSARY, REPLACE WITH SAME OR EQUIVALENT TYPE AND WATTAGE.
4. TRIM ALL TREES/LANDSCAPING TO MINIMIZE IMPEDING LIGHT FROM ANY LIGHT FIXTURES THAT IMPACT THE 60' RADIUS AROUND ALL ATMS AND AFTER-HOUR DEPOSITORIES, AS WELL AS ANY LIGHTING FIXTURES THAT IMPACT THE 10' RADIUS AROUND ALL ASSOCIATE ENTRIES. CONSIDERATION MUST BE GIVEN TO TREES/LANDSCAPING IN A STATE OF FULL FOLIAGE/BLOOM AND FUTURE GROWTH.
5. FIXTURES NOT PERTINENT TO THIS SCOPE OF SERVICES MAY NOT BE IDENTIFIED ON THE DRAWING. THE UNIDENTIFIED FIXTURES WILL NOT BE PART OF THIS PROJECT CONSTRUCTION.
6. ALL SITE PLAN INFRASTRUCTURE HAS BEEN PROVIDED ELECTRONICALLY IN AUTOCAD FROM AN OUTSIDE SOURCE. THE SCALING ACCURACY IS DETERMINED BY THE DRAWING PROVIDED.

REFERENCE DOCUMENTS

SEE BANK OF AMERICA STANDARDS FOR SECURITY LIGHTING CUT SHEETS.



SITE PHOTOMETRICS

CALCULATION SUMMARY							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
SITE CALCS @GRADE	Illuminance	Fc	3.39	25.5	0.0	N/A	N/A
–	–	–	–	–	–	–	–

LUMINAIRE SCHEDULE (PROPOSED OR MODIFIED FIXTURES)

SYMBOL	QTY	LABEL	FIXTURE ARRANGEMENT	TOTAL FIXTURE COUNT	FIXTURE TYPE	FIXTURE DETAILS	MANUFACTURER	MOUNTING HEIGHT	NOTES
	4	A1	SINGLE	4	TWSMC-150MH-FT-DB-MT	150W MH	SECURITY LIGHTING	13'-0"	ADD 4
	9	I	SINGLE	10	RHD8-L45-120/277-ABARW	100w MH	SECURITY LIGHTING	11'-0"	ADD 10
	3	IE	SINGLE	4	CFTD832HEB-STFD802HMFC-EM	32w CF	SECURITY LIGHTING	11'-0"	ADD 4
	9	J	SINGLE	9	WT22-232U6G-FFA12125-EU-F0835	32w FLUORESCENT	SECURITY LIGHTING	11'-0"	ADD 9
	4	OB1	SINGLE	4	RCS-x-P32-H3	320w PSMH, TYPE 3	SECURITY LIGHTING	25'	ADD 4
	1	OB2	DOUBLE (2@90°)	2	RCS-x-P32-H4	320w PSMH, TYPE 4	SECURITY LIGHTING	25'	ADD 3
	2	OB3	TRIPLE (3@90°)	6	RCS-x-P32-H4	320w PSMH, TYPE 4	SECURITY LIGHTING	25'	ADD 2

Bank of America

N

0 20 40

SCALE: 1"=40'

REVISION NO.	DESCRIPTION	REVISION DATE	REVISED BY
3			
2			
1	REVISED LIGHTING LAYOUT PER CUSTOMER	12/03/12	BLE
	ISSUE TO CUSTOMER	03/08/12	BLE

NOTE: THIS LIGHTING PLAN ILLUSTRATES ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA) APPROVED METHODS. ACTUAL SITE ILLUMINATION LEVELS AND PERFORMANCE OF LUMINARIES MAY VARY DUE TO VARIATIONS IN WEATHER, ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS AND OTHER RELATED VARIABLE FIELD CONDITIONS.

GMR
PROTECTION RESOURCES, INC.
P.O. Box 645, Rockwall, Texas 75087
www.gmr1.com
Office: (972) 771-6038 FAX: (972) 722-2762

NWC ADAMS & MARKETPLACE
ROCHESTER HILLS, MI

SITE PHOTOMETRIC PLAN

DESIGN BY:	DRAWN BY:	DATE DRAWN:	DRAWING SCALE:
MHT	TLE	03/07/12	1"=40'
REVIEWED BY:	APPROVED BY:	PLOT DATE:	PROJECT NO.:
BLE	BLE	03/08/12	–

SHEET NO.

LU-1A