



KEY MAP  
N.T.S.

- LEGEND:**
- EXISTING CATCHBASIN
  - EXISTING STORM/SANITARY MANHOLE
  - PROPOSED AREA DRAINS
  - PROPOSED STORM/SANITARY MANHOLE
  - PROPOSED CURB STOP/GATE VALVE
  - Ⓜ PROPOSED WATER METER
  - Ⓟ PROPOSED BACKFLOW PREVENTOR

**BENCH MARK NOTE:**  
ELEVATIONS ARE REFERRED TO THE CITY OF HAMILTON BENCHMARK NO. 65659 HAVING A ELEVATION OF 110.715 METRES.

01	OCT 31/16	SF	ISSUED FOR REZONING
NO.	DATE	BY	REVISIONS
DESIGN		CHK'D	DATE
DRAWN		CHK'D	Oct. 13, 16

SCALE: 1:200

**APPROVALS**

STAMP

# PRELIMINARY

S. LLEWELLYN & ASSOCIATES LIMITED  
CONSULTING ENGINEERS  
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8  
Tel. (905) 631-6978  
Fax (905) 631-6927  
email: info@slla.on.ca

CLIENT

**URBAN SOLUTIONS**  
105 MAIN STREET EAST

PROJECT NAME

**117 CATHARINE ST.  
& 175 FOREST AVE.**  
HAMILTON, ONTARIO

TITLE

**SERVICING PLAN**

PROJECT No. 16092      DRAWING No. C102

- SEWERS**
1. SANITARY AND STORM SEWERS
- A. CONSTRUCTION OF SANITARY & STORM SEWERS & PRIVATE DRAINS SHALL BE IN ACCORDANCE WITH CITY STANDARDS & SPECIFICATIONS (LATEST EDITION) AND MINISTRY OF ENVIRONMENT (MOE) GUIDELINES (LATEST EDITION).
  - B. COVER AND BEDDING MATERIAL FOR CONCRETE PIPE SHALL BE GRANULAR 'A' MATERIAL AS PER OPSD 802.030 OR 802.033, CLASS 'B' BEDDING.
  - C. COVER AND BEDDING MATERIAL FOR PVC PIPE SHALL BE GRANULAR 'A' MATERIAL AS PER OPSD 802.010 OR 802.013.
  - D. PVC PIPE WILL REQUIRE SPECIAL CONSTRUCTION PROCEDURES AS PER CITY SPECIFICATIONS.
  - E. ALL SEWERS TO BE VIDEO INSPECTED AS PER OPS 409.
  - F. ALL SEWERS TO BE FLUSHED PRIOR TO VIDEO INSPECTION.
  - G. MANHOLE FRAMES AND COVERS SHALL BE AS PER OPSD 401.010 (STORM-OPEN, SANITARY-CLOSED).
  - H. CATCHBASIN FRAMES AND GRATES SHALL BE AS PER OPSD 400.100 IN PAVED AREA AND 400.120 IN LANDSCAPED AREAS.
  - I. ALL REAR LOT CATCHBASINS SHALL BE SUPPLESS AND HAVE NO GOSS TRAPS.
  - J. SANITARY SEWERS 200mm TO 375mm IN DIAMETER SHALL BE PVC PIPE, CSA B182.2, SDR-35.
  - K. STORM SEWERS 250mm TO 600mm IN DIAMETER SHALL BE PVC PIPE, CSA B182.2, SDR-35.
  - L. STORM SEWERS GREATER THAN 600mm IN DIAMETER SHALL BE CONCRETE PIPE, CSA A257.2 (AS SPECIFIED).
  - M. ALL PVC STORM SEWERS ARE TO BE TESTED FOR DEFLECTION (MANDREL PASSAGE) AFTER INSTALLATION AS PER OPS 410. SANITARY SEWERS SHALL BE TESTED FOR DEFLECTION (MANDREL PASSAGE) AND LEAKAGE (LOW AIR PRESSURE METHOD) AS PER OPS 410. PRIOR TO ASSUMPTION BY THE CITY, PIPE DEFLECTION TESTING SHALL BE REPEATED.
2. PRIVATE DRAINS
- A. PRIVATE DRAINS TO BE 150mm PVC PIPE, CSA B182.1 M-1983, SDR 28 AS PER FORM 500. STORM PIPE SHALL BE WHITE AND SANITARY SHALL BE ANY COLOUR OTHER THAN WHITE. WOOD MARKING AT END OF SANITARY PRIVATE DRAIN SHALL BE PAINTED RED.
  - B. COVER AND BEDDING MATERIAL FOR PRIVATE DRAINS SHALL BE GRANULAR 'A' INSTALLED AS PER OPSD 802.010 OR 802.013.
  - C. MINIMUM FALL FOR PRIVATE DRAINS TO BE 2.0%.
  - D. TOP OF SANITARY PRIVATE DRAINS AT STREET LINE TO BE 2.2M (MIN.) BELOW CENTERLINE ROAD ELEVATION AT THAT POINT OR AS DETAILED.
  - E. TOP OF STORM PRIVATE DRAINS AT STREET LINE TO BE 1.2M (MIN.) BELOW CENTERLINE ROAD ELEVATION AT THAT POINT OR AS DETAILED.
  - F. BUILDING RAINWATER LEADERS SHALL NOT BE CONNECTED TO THE STORM PRIVATE DRAIN BUT SHALL DISCHARGE ONTO THE GROUND SURFACE VIA SPLASH PADS.
  - G. SUMP PUMPS WITH CHECK VALVES SHALL BE INSTALLED IN EACH DWELLING TO PUMP THE BUILDING KEEPING TILES TO THE STORM PRIVATE DRAINS. THE SUMP OUTLET PIPE SHALL EXTEND A MINIMUM OF 150mm ABOVE THE PROPOSED GRADE AT THE DWELLING (BASEMENT CEILING) PRIOR TO DISCHARGING TO THE STORM PRIVATE DRAIN.

- WATERMAINS AND WATER SERVICES**
1. WATERMAINS
- A. CONSTRUCTION OF WATERMAINS & PRIVATE SERVICES SHALL BE IN ACCORDANCE WITH CITY STANDARDS & SPECIFICATIONS (LATEST EDITION) AND MINISTRY OF ENVIRONMENT (MOE) GUIDELINES (LATEST EDITION).
  - B. TO BE INSTALLED TO A MINIMUM DEPTH OF 1.80M BELOW PROPOSED CENTERLINE ROAD GRADE ON ALL ROADS EXCEPT ON (NAME OF ROAD) WHERE THE MINIMUM DEPTH IS 1.6m.
  - C. PVC PIPE IN SIZES 100mm THROUGH 300mm SHALL BE CLASS 150 DR18 CONFORMING TO AWWA C900, FOR 400MM, SEE SECTION 7: SPECIAL NOTES.
  - D. TRACER WIRE SHALL BE INSTALLED WITH PVC PIPE IN ACCORDANCE WITH FORM 400. IT SHALL BE 12 GAUGE TW75, TWJ75 OR RW90XPLC COATED COPPER AND SHALL BE POSITIONED ALONG THE TOP OF THE PIPE AND FASTENED AT 6 METRE INTERVALS. THE WIRE IS TO BE INSTALLED BETWEEN EACH VALVE AND FOR THE END OF THE NEW PVC WATERMAIN, JOINTS IN THE WIRE BETWEEN VALVES ARE NOT PERMITTED. AT EACH GATE VALVE A LOOP WIRE IS TO BE BROUGHT UP INSIDE THE PIPE BOX TO THE CAP. THE TRACER WIRE SHALL BE BROUGHT TO THE SURFACE AT THE SECONDARY VALVE ON ALL FIRE HYDRANTS. THE TRACER WIRE SHALL ALSO BE CONNECTED TO THE CATHODIC PROTECTION SYSTEM AS REQUIRED.
  - E. MOLDED PVC FITTINGS FOR PIPE SIZES 100mm TO 300mm SHALL CONFORM TO AWWA C900 AND CERTIFIED TO CSA B137.2.
  - F. FABRICATED FITTINGS 250mm AND 300mm SHALL BE MANUFACTURED FROM SEGMENTS OF AWWA C900, CLASS 150 (DR18) PVC PIPE, BONDED TOGETHER AND OVER-WRAPPED WITH FIBREGLASS-REINFORCED POLYESTER TO MEET THE REQUIREMENTS OF CSA B137.3.
  - G. WHERE METAL FITTINGS ARE TO BE USED ON PVC MAINS SUFFICIENT CATHODIC PROTECTION AS PER FORM 400 AND MUST BE PROVIDED AS PER THE FOLLOWING REQUIREMENTS:
    - i. ONE (1) 5.4 kg ZINC ANODE WILL BE PROVIDED FOR EVERY 1000 m TRACER WIRE.
    - ii. ONE (1) 5.4 kg ZINC ANODE IS TO BE INSTALLED ON ALL COPPER SERVICE CONNECTIONS, BY MEANS OF A SERVICE GROUND CLAMP, COATED WITH T.C. MASTIC OR WRAPPED WITH SCOTCHTILL ELECTRICAL PUTTY OR APPROVED EQUAL. THE ANODE IS TO BE PLACED AT LEAST 1.0 m AWAY FROM THE WATER SERVICE AND AS DEEP AS THE SERVICE AND WITHIN 1.0 m OF THE CURB STOP.
    - iii. ONE (1) 10.8 kg ZINC ANODE IS TO BE INSTALLED ON EACH HYDRANT. IF PVC PIPE IS USED BETWEEN THE HYDRANT TEE OR ANCHOR TEE AND THE HYDRANT BOOT, TWO (2) 10.8 kg ZINC ANODES SHALL BE USED.
    - iv. ONE (1) 5.4 kg ZINC ANODE IS TO BE INSTALLED ON EVERY VALVE, AND EVERY METALLIC FITTING CONNECTED TO A PVC WATERMAIN. FITTINGS INCLUDE BENDS, TEES, CROSSES, SLEEVES, REDUCERS, PLUGS, CAPS, JOINT RESTRAINERS AND COUPLINGS.
    - v. ONE (1) 14.5 kg MAGNESIUM ANODE IS TO BE CONNECTED TO THE FIRST LENGTH OF AN EXISTING METALLIC WATERMAIN PIPE WHEN CONNECTED TO A NEW PVC WATERMAIN.
2. FLUSHING, SWABBING AND TESTING
- A. ALL NEW WATERMAINS ARE TO BE SWABBED IN ACCORDANCE WITH CITY SPECIFICATIONS.
  - B. A REDUCED PRESSURE ZONE BACKFLOW PREVENTER (WATTS SERIES 909 OR APPROVED EQUAL) IS REQUIRED ON THE TEMPORARY SUPPLY LINES USED FOR FILLING AND FLUSHING OR SWABBING OF WATERMAINS.
  - C. UPON COMPLETION OF INSTALLATION THE CONTRACTOR SHALL PERFORM A PRESSURE TEST ON THE WATERMAINS AS PER FORM 400. WATERMAIN IS TO BE TESTED PRIOR TO CONNECTION TO EXISTING WATERMAINS USING TEMPORARY CAPS OR PLUGS. PIPE CLOSURES, WHERE REQUIRED, ARE TO BE SUPPLIED BY THE CONTRACTOR. THE CONTRACTOR WILL ALSO SUPPLY AND INSTALL ALL ADAPTOR PIECES IN ORDER TO CONNECT TO EXISTING WATERMAINS.
3. WATER SERVICES
- A. WATER SERVICE TO BE 25mm DIA. TYPE K SOFT COPPER AS PER WM-207.01 OR AS DETAILED.
  - B. GRANULAR BEDDING AS PER WM-200.01 AND WM-200.02 TO BE GRANULAR 'D' AS PER FORM 600.
4. VALVES & VALVE BOXES
- A. ALL VALVE BOXES TO BE SET TO PROPOSED GRADES.
  - B. 100mm TO 300mm GATE VALVE & VALVE BOXES AS PER WM-202.
5. ANCHOR BLOCKS
- A. FOR 100mm TO 300mm WATERMAINS STANDARD CONCRETE ANCHOR BLOCKS AS PER WM-204.01.
6. HYDRANTS
- A. TO BE INSTALLED WITH SECONDARY VALVES AS PER WM-203.01 OR WM-203.02 AS DETAILED. THEY SHALL OPEN COUNTER-CLOCKWISE (LEFT) AND HAVE A 'L' PAINTED ON THE BARREL SECTION. THE 100mm PUMPER STORZ CONNECTION SHALL FACE THE ROADWAY AND BE PAINTED BLACK.

- H. BEDDING AND BACKFILL AS PER WM-200.01 AND WM-200.02 GRANULAR 'A' MATERIAL FOR MAINS AND SERVICES GREATER THAN 50mm.
- I. WATERMAIN DEFLECTION FOR PVC PIPE:
- i. MAXIMUM ALLOWABLE DEFLECTION OF 1.5 DEGREES PER JOINT UP TO 250mm DIAMETER (160mm PER 6.1m PIPE LENGTH) AND 1.2 DEGREES FOR 300mm DIAMETER (128mm PER 6.1m PIPE LENGTH) SHALL NOT BE EXCEEDED.
  - ii. ALL JOINTS SHALL BE DEFLECTED AN EQUAL AMOUNT.
- J. MINIMUM HORIZONTAL SEPARATION BETWEEN WATERMAINS AND SEWERS SHALL BE 2.5m. VERTICAL SEPARATION BETWEEN WATERMAINS AND SEWERS WHICH CROSS MUST BE 500mm BETWEEN THE OUTSIDE OF THE WATERMAIN AND THE OUTSIDE OF THE SEWER, WITH THE LENGTH OF WATER PIPE BEING CENTRED AT THE POINT OF CROSSING SUCH THAT JOINTS IN THE WATERMAIN WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER, CROSSING PERPENDICULAR IF POSSIBLE.
- K. ALL EXISTING WATER METERS BEING ABANDONED AS PART OF THE PROPOSED DEVELOPMENT MUST BE REMOVED AND SALVAGED BY THE CITY OF HAMILTON. THE SERVING CONTRACTOR SHOULD CONTACT THE WATER AND WASTEWATER SECTION, PUBLIC WORKS DEPARTMENT AT (905) 546-2424 X4426 TO ARRANGE FOR THE WORK.
- CONNECT TO EX. 375mm STORM SEWER (AS PER CITY OF HAMILTON STANDARD SEW-300) EX. INV. ± 98.25 PROP. INV. 98.40
- CONNECT TO EX. WATERMAIN (AS PER CITY OF HAMILTON STANDARD WM-207.04)

- B. ALL FIRE HYDRANTS SHALL CONFORM TO THE CITY OF HAMILTON (MUNICIPALITY) FIRE DEPARTMENT'S REQUIREMENTS AND SHALL BE OF SAME MANUFACTURE.
7. SPECIAL NOTES - FOR 400mm DIAMETER WATERMAIN
- A. TO BE D.I. CLASS 52, CEMENT-LINED WITH CEMENT-LINED FITTINGS OR CONCRETE PRESSURE PIPE AS PER AWWA C-301 OR C-303.
  - B. BEDDING AS PER WM-200.01 OR WM-200.02. (GRAN. 'A', FORM 600).
  - C. STANDARD CONCRETE ANCHOR BLOCKS AS PER WM-204.02 FOR 11 1/4" AND 22 1/2" BENDS, WM-204.03 FOR 45° BENDS, WM-204.07 FOR TEES AND WM-204.09 FOR PLUGS.
  - D. FOR D.I. PIPE USE 400x150mm HYDRANT TEE AND ANCHOR BLOCK AS PER WM-204.01
  - E. FOR CONCRETE PRESSURE PIPE, AT HYDRANTS USE CONCENTRIC FLAIN-END BRANCH AND ANCHOR BLOCK AS PER WM-204.01.
  - F. WATERMAIN DEFLECTION PER PIPE LENGTH:
    - i. DUCTILE IRON - MAXIMUM ALLOWABLE DEFLECTION OF 2.5° SHALL NOT BE EXCEEDED (266MM PER 6.1M PIPE LENGTH).
    - ii. CONCRETE - MAXIMUM ALLOWABLE DEFLECTIONS OF 1.6° SHALL NOT BE EXCEEDED (170MM PER 6.1M PIPE LENGTH).
    - iii. ALL JOINTS SHALL BE DEFLECTED AN EQUAL AMOUNT.
  - G. WATERMAIN TO BE TESTED PRIOR TO CONNECTION TO EXISTING WATERMAINS USING TEMPORARY CAPS OR PLUGS. PIPE CLOSURES, WHERE REQUIRED, TO BE SUPPLIED BY CONTRACTOR. CONTRACTOR TO SUPPLY AND INSTALL ALL ADAPTER PIECES AS REQUIRED IN ORDER TO CONNECT TO THE EXISTING WATERMAIN.
- COMPACTION REQUIREMENTS**  
UNLESS OTHERWISE NOTED OR DIRECTED BY THE GEOTECHNICAL CONSULTANT, THE FOLLOWING SHALL APPLY:
- A. ALL BEDDING AND BACKFILL MATERIAL, ROAD SUB-GRADES AND GENERALLY ALL MATERIAL USED FOR LOT GRADING AND FILL SECTIONS, ETC., SHALL BE COMPACTED TO MIN. 98% SPD. ALL MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING 300mm LIFTS.
  - B. ALL GRANULAR ROAD BASE MATERIALS SHALL BE COMPACTED TO 98% SPD.
  - C. FOR ALL SEWERS AND WATERMAINS IN FILL SECTIONS, THE COMPACTION SHALL BE CERTIFIED BY A GEOTECHNICAL ENGINEER PRIOR TO LAYING OF PIPE.
- SEWER/WATER ABANDONMENT**
1. ALL EXISTING UNUSED SEWERS MUST BE PROPERLY ABANDONED BY DISCONNECTING SEWER AT THE MAIN AND GROUTING EITHER END OF THE SEWER WITH A MINIMUM 300mm OF CONCRETE.
  2. UNUSED MAINTENANCE HOLES AND CATCHBASINS MUST BE COMPLETELY REMOVED.
  3. OPENINGS IN MAINTENANCE HOLES AND CATCHBASINS WHERE SERVICES WERE REMOVED OR ABANDONED MUST BE BRICKED AND PARGED.
  4. ALL EXISTING UNUSED WATER SERVICES MUST BE PROPERLY ABANDONED AS FOLLOWS:
    - 4.1. FOR COPPER SERVICES: REMOVE CURB STOP, SHUT OFF MAIN STOP, CUT & CRIMP WATER SERVICE AT THE MAIN.
    - 4.2. FOR PVC SERVICES: REMOVE GATE VALVE, REMOVE TEE AND REPLACE WITH SLEEVE. IF A TAPPING VALVE WAS USED, CONTACT THE CITY OF HAMILTON FOR FURTHER DIRECTION.