

FRASER ESTATES STORM SEWER REPLACEMENT PROJECT

G.P.1189

LOCATED IN FRASER ESTATES (PLAT BOOK 41, PAGE 6)
 LOCATED ON LOTS 39029, 39030, 39036, 39037, 39043, 39044, 39049 AND 39050
 IN THE CITY OF CANTON, STARK COUNTY, OHIO

APPROVALS

APPROVED BY:

Dan Moeglin
 CANTON CITY ENGINEER

DATE:

6/3/13

LEGEND:

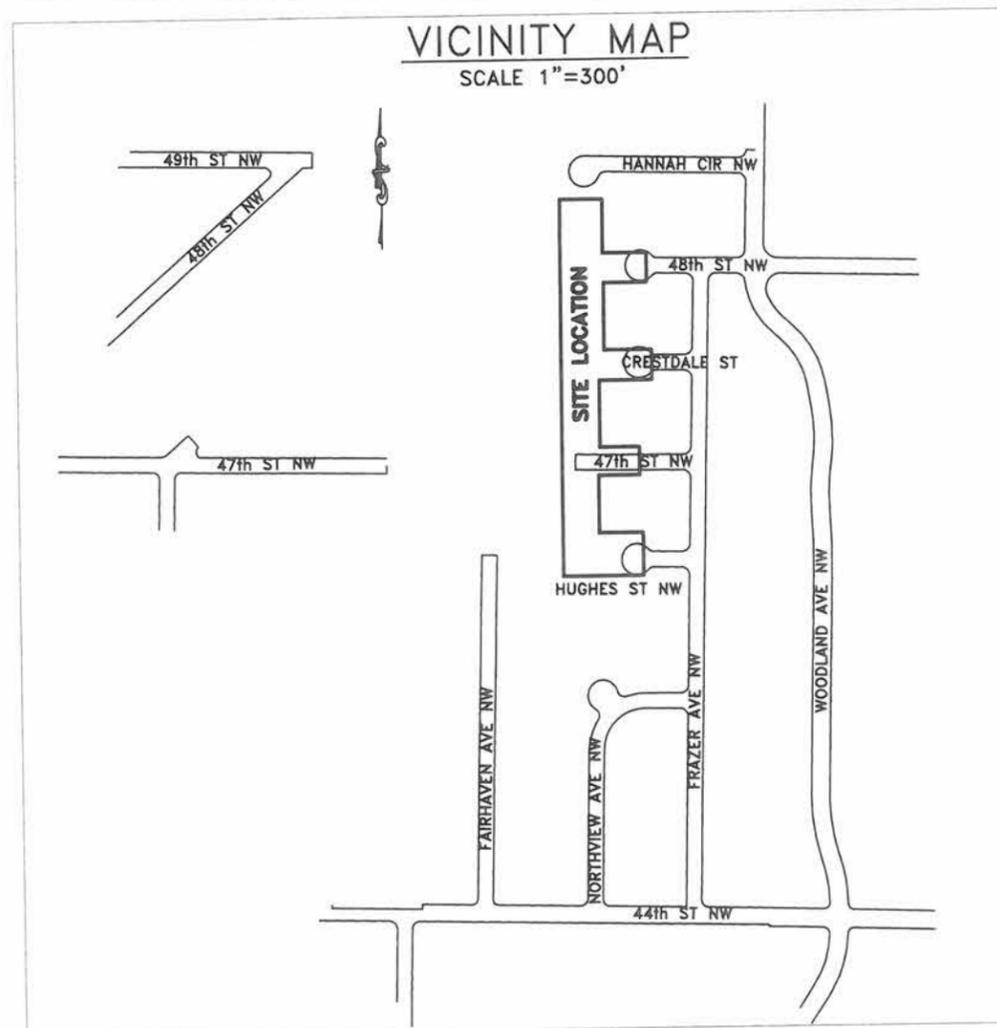
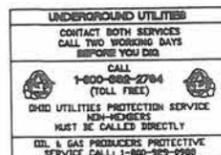
- ST— STORM SEWER LINE
- W— WATERLINE
- S— SANITARY SEWER LINE
- G— UNDERGROUND GAS LINE
- E— UNDERGROUND ELECTRIC
- C— UNDERGROUND CATV
- ⊗ WATER VALVE
- ⊙ FIRE HYDRANT
- LIGHT POLE
- UTILITY POLE
- ⊗ TREES
- ☐ TELEPHONE BOX
- ⊞ ELECTRIC BOX
- ⊞ CATV BOX
- ⊞ GAS METER
- GUY WIRE ANCHOR
- FENCE
- ⊞ CURB BOX
- CPP CORRUGATED PLASTIC PIPE
- CMP CORRUGATED METAL PIPE

SOURCES USED:

1. TAX MAPS:
 - CANTON CITY MAP 4E
 - CANTON CITY 4F
2. PLATS:
 - FRASER ESTATES - PLAT BOOK 41, PAGE 6
3. UTILITY MAPS:
 - DOMINION EAST OHIO
 - CANTON CITY WATER
 - AEP OHIO
4. STORM SEWER DATA PROVIDED BY CANTON CITY ENGINEERING
 - PROJECT 864 (5705)
 - STORM SEWER PLAN 5592, PAGES 2 OF 3
 - STORM SWER PLAN 6879, PAGES 59-61
5. STARK COUNTY GIS DATA

NOTE:

UNDERGROUND UTILITIES ARE FROM FIELD OBSERVATIONS AND/OR MAPS PROVIDED BY THE UTILITY COMPANIES. UTILITIES SHOULD BE VERIFIED PRIOR TO EXCAVATION.



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CITY OF CANTON OFFICIALS

WILLIAM J. HEALY II	MAYOR
WARREN PRICE	SERVICE DIRECTOR
DAN MOEGLIN	CITY ENGINEER
RICHARD A. MALLONN II	AUDITOR
JOSEPH MARTUCCIO	LAW DIRECTOR

CITY OF CANTON COUNCIL

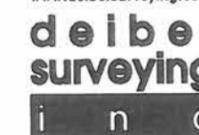
ALLEN SCHULMAN	COUNCIL PRESIDENT
MARY M. CIRELLI	MEMBER-AT-LARGE
JOE COLE	MEMBER-AT-LARGE
JAMES O. BABCOCK	MEMBER-AT-LARGE

COUNCILMEMBERS

GREG HAWK	WARD ONE
THOMAS E. WEST	WARD TWO
JAMES E. GRIFFIN	WARD THREE
CHRIS SMITH	WARD FOUR
KEVIN LEE FISHER	WARD FIVE
DAVID R. DOUGHERTY	WARD SIX
JOHN MARIOL II	WARD SEVEN
EDMOND MACK	WARD EIGHT
FRANK MORRIS	WARD NINE



BASE MAP PLANS BY:
www.deibelsurveying.com



1850 KIMBALL RD. S.E.
 CANTON, OHIO 44707
 OFFICE: (330) 455-2999
 FAX: (330) 455-3299
 E-mail: info@deibelsurveying.com

NOVEMBER 9, 2011

II. CONSTRUCTION INCIDENTALS (continued)

(J) PRESERVATION AND RESTORATION OF DISTURBED FEATURES:

EXISTING DRIVES, BERMS, LAWNS, PAVEMENTS, CURBS, SIDEWALKS, SIGNS, MAILBOXES, FENCES, RETAINING WALLS, LANDSCAPING ITEMS, OR OTHER APPURTENANCES DISTURBED DURING CONSTRUCTION BUT NOT SPECIFICALLY DESIGNATED FOR REMOVAL/REPLACEMENT SHALL BE RESTORED BY THE DEVELOPER/CONTRACTOR AT HIS EXPENSE TO A CONDITION EQUAL TO OR BETTER THAN THAT WHICH EXISTED PRIOR TO DISTURBANCE AND TO THE COMPLETE SATISFACTION OF THE CITY ENGINEER.

RESTORATION OF EXISTING ROADWAYS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY, TOWNSHIP, COUNTY, AND/OR OTHER AGENCIES HAVING AUTHORITY. COST FOR THE RESTORATION OF THESE ITEMS SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/CONTRACTOR, UNLESS OTHERWISE SPECIFIED IN THE PLANS OR SPECIFICATIONS. NO PUBLIC ROADWAY SHALL BE DISTURBED WITHOUT PRIOR WRITTEN APPROVAL FROM THE GOVERNING AGENCY AND ACQUISITION OF NECESSARY PERMITS.

(K) SALVAGED CASTINGS:

WHEN DIRECTED BY THE CITY ENGINEER, ALL METAL CASTINGS SHALL BE CAREFULLY REMOVED AND STORED ON SITE OR DELIVERED TO A LOCATION DESIGNATED BY THE CITY ENGINEER.

(L) PLUG EXISTING CONDUIT:

THIS ITEM SHALL CONSIST OF THE CONSTRUCTION OF BULKHEADS IN AN EXISTING CONDUIT TO BE ABANDONED.

BULKHEADS SHALL CONSIST OF BRICK AND/OR CONCRETE MASONRY WITH A MINIMUM THICKNESS OF 12 INCHES.

PAYMENT FOR PLUGGING OF EXISTING CONDUIT FOR ABANDONMENT SHALL BE INCLUDED IN THE UNIT BID OF THE VARIOUS ITEMS OF THE PROJECT.

(M) CONSTRUCTION LAYOUT:

THE DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT UTILIZING PERTINENT PLAN DATA. THE CITY ENGINEER WILL NOT BE RESPONSIBLE FOR STAKING HORIZONTAL OR VERTICAL CONTROL. CONSTRUCTION LAYOUT SHALL BE IN ACCORDANCE WITH ODOT 623 CONSTRUCTION LAYOUT STAKES.

AT THE CITY ENGINEER'S REQUEST, THE CONTRACTOR SHALL MAKE AVAILABLE ALL SURVEY FIELD NOTES FOR REVIEW.

(N) EXISTING MONUMENTATION:

THE CONTRACTOR SHALL PRESERVE ALL CORNERSTONES, IRON PINS, CONCRETE MONUMENTS AND/OR ANY TYPE OF LAND MONUMENT. THE CONTRACTOR SHALL HAVE ALL MONUMENTS IN THE PROXIMITY OF THE WORK REFERENCED. THE CONTRACTOR SHALL REPLACE/RESET ANY DISTURBED OR DAMAGED MONUMENTS AND SHALL FURNISH A CERTIFICATION BY A REGISTERED SURVEYOR THAT THE MONUMENTS HAVE BEEN RESTORED.

(O) ELEVATION DATUM:

ALL ELEVATIONS ARE BASED ON THE NAVD 83 DATUM.

(P) DEWATERING OPERATIONS:

WHEN DEEMED NECESSARY, THE DEVELOPER/CONTRACTOR MAY INSTALL DEWATERING EQUIPMENT PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

THE PROPOSED LOCATION OF WELL POINTS, HEADER PIPE, ELECTRICAL DISTRIBUTION, GENERATORS AND DISCHARGE PIPES, ETC. SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/CONTRACTOR.

THE DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS FOR THE INSTALLATION AND SUBSEQUENT REMOVAL OF DEWATERING EQUIPMENT AS WELL AS PROPER WATER DISCHARGE PROCEDURES AS MAY BE REQUIRED PER STATE AND LOCAL GOVERNING AGENCIES.

INSTALLATION OF ALL ELECTRICAL EQUIPMENT, INCLUDING GROUNDING AND PROTECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/CONTRACTOR.

DEVELOPER/CONTRACTOR SHALL PROVIDE ALL COMBUSTIBLE ENGINE DRIVEN GENERATORS WITH "HOSPITAL GRADE" MUFFLERS. MUFFLERS SHALL BE RATED, AT A MAXIMUM OF 67 dB AT 23 FEET AWAY RUNNING FULL LOAD.

(Q) INSPECTION:

FOLLOWING THE PRE-CONSTRUCTION MEETING(S) AND ESTABLISHMENT OF AN APPROVED SCHEDULE, THE CONTRACTOR SHALL GIVE A MINIMUM 48 HOUR NOTICE BEFORE STARTING ANY WORK ON THIS PROJECT AND SHALL KEEP THE CITY INFORMED OF HIS/HER CONSTRUCTION SCHEDULE. ALL WORK REQUIRED FOR THIS IMPROVEMENT SHALL BE SUBJECT TO INSPECTION BY THE CITY OF CANTON OR THEIR DESIGNATED REPRESENTATIVE. NO WORK SHALL BE PERFORMED WITHOUT AN AUTHORIZED INSPECTOR PRESENT, UNLESS OTHERWISE APPROVED.

(R) FIELD OFFICE:

IF A PAY ITEM IS PROVIDED, THE DEVELOPER/CONTRACTOR SHALL PROVIDE A FIELD OFFICE IN ACCORDANCE WITH ODOT 619. THE FIELD OFFICE SHALL BE TYPE 'A', UNLESS OTHERWISE SPECIFIED.

III. EARTHWORK / SITE WORK

(A) EASEMENTS AND RIGHT-OF-WAY:

THE DEVELOPER/CONTRACTOR SHALL STAY WITHIN THE DESIGNATED PROPERTIES, EASEMENTS, AND/OR RIGHT-OF-WAY PROVIDED FOR THE PROJECT AT ALL TIMES. NO MATERIAL SHALL BE STORED NOR ANY WORK PERFORMED ON PRIVATE PROPERTY UNLESS OTHERWISE APPROVED. DISTURBANCE OF EXISTING FEATURES AND/OR IMPROVEMENTS SHALL BE KEPT TO AN ABSOLUTE MINIMUM AND AS APPROVED BY THE CITY ENGINEER/PROPERTY OWNER.

(B) SUITABILITY OF SITE:

THE CITY OF CANTON SHALL NOT BE RESPONSIBLE FOR THE TYPE AND/OR SUITABILITY OF THE MATERIAL UNDERLYING THE PROJECT SITE. THE DEVELOPER/CONTRACTOR MUST APPRAISE THEMSELVES OF ANY EXISTING SITE CONDITIONS WHICH MAY AFFECT THEIR BID OR THE PERFORMANCE OF THE REQUIRED WORK. THE DEVELOPER/CONTRACTOR SHALL PERFORM ANY INVESTIGATIONS AND/OR TESTING NECESSARY TO ADEQUATELY DETERMINE/ESTIMATE TO THEIR SATISFACTION ALL SITE CONDITIONS WHICH COULD AFFECT THE PERFORMANCE OF THE PROPOSED IMPROVEMENTS. THIS COULD INCLUDE, BUT NOT BE LIMITED TO, UNSUITABLE AND/OR UNSTABLE SOIL/SUBSURFACE CONDITIONS, ROCK, WATER (PERCHED OR FREE), SPRINGS, ETC.

REFER TO CITY STANDARD DRAWING NO. 19 FOR ADDITIONAL DETAILS.

(C) REMOVAL/REPLACEMENT OF UNSUITABLE MATERIAL:

THE DEVELOPER/CONTRACTOR SHALL UNDERCUT AND REPLACE UNSUITABLE MATERIAL ENCOUNTERED DURING INSTALLATION OF THE PROPOSED UTILITIES AND ROADWAY IN ACCORDANCE WITH CITY STANDARD DRAWING NO. 19.

IV. ROADWAY / DRIVE APPROACHES / WALK / CURB

(A) PAVEMENT STANDARDS:

PAVEMENTS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH APPLICABLE CITY STANDARD DRAWINGS AND SPECIFICATIONS (LISTED BELOW) AND ODOT SPECIFICATIONS, UNLESS SPECIFIED OTHERWISE ON THE PLANS.

CITY STANDARD DRAWING NO.:

- DRIVEWAYS, CURBS, AND PAVEMENT
27 "DRIVE APPROACH WITH LAWNSTRIP BETWEEN SIDEWALK & CURB"
28 "DRIVE APPROACH WITH SIDEWALK AGAINST CURB"
29 "COMBINED CURB & WALK"
30 "CONCRETE CURB AND COMBINED CURB & GUTTER"
31 "BRICK PAVEMENT REPAIR & REPLACEMENT OVER TRENCHES/ALONG CURB"
32 "TYPICAL SECTION - LOCAL STREET"
33 "WHEELCHAIR RAMP"
34 "PAVEMENT TRANSITION, BRICK-ASPHALT"

CITY STREETScape

- 40 "TYPICAL STREETScape CORRIDOR"
41 "ROADWAY BRICK & CROSSWALK PAVEMENT DETAILS"
42 "STREETScape CONCRETE WALK PAVEMENT DETAILS"
44 "CONCRETE WALK OVER VAULT CONSTRUCTION DETAILS"
45 "BRICK WALK OVER VAULT CONSTRUCTION DETAILS"

CITY SPECIFICATIONS:

"CITY OF CANTON SPECIFICATIONS FOR THE CONSTRUCTION, REPAIR, AND REPLACEMENT OF SIDEWALKS, CURBS, AND DRIVEWAYS"

(B) RESTRICTED WORK SCHEDULE:

NO CONCRETE FINISH WORK OR PERMANENT ASPHALT SHALL BE PLACED FROM NOVEMBER 15TH TO APRIL 15TH UNLESS WRITTEN APPROVAL IS GRANTED BY THE CITY ENGINEER.

(C) ASPHALT/CONCRETE:

IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/CONTRACTOR TO NOTIFY THE ENGINEER 48 HOURS IN ADVANCE OF BEGINNING WORK WHICH REQUIRES COMPACTION TESTING AND/OR PRE-POUR INSPECTION PRIOR TO PLACEMENT OF ASPHALT OR CONCRETE. WORK SHALL NOT PROCEED UNTIL TESTING AND/OR INSPECTION HAS BEEN COMPLETED AND APPROVED BY THE CITY ENGINEER.

V. SANITARY SEWERS / STORM SEWERS

(A) SEWER STANDARDS:

ALL SANITARY/STORM SEWER CONDUITS AND APPURTENANCES SHALL BE CONSTRUCTED ACCORDING TO APPLICABLE CITY STANDARD DRAWINGS AND SPECIFICATIONS (LISTED BELOW) AND ODOT SPECIFICATIONS EFFECTIVE AT THE TIME OF CONSTRUCTION, UNLESS SPECIFIED OTHERWISE ON THE PLANS.

CITY STANDARD DRAWING NO.:

CATCH BASINS

- 1 "CURB INLET CATCH BASIN"
2 "CURB INLET WATER QUALITY CATCH BASIN"
3 "HILLSIDE CURB INLET CATCH BASIN"
4 "SQUARE-TOP CATCH BASIN"
5 "SQUARE-TOP WATER QUALITY CATCH BASIN"

MANHOLES

- 10 "PRECAST STORM OR SANITARY MANHOLE"
11 "OUTSIDE DROP CONNECTION FOR SANITARY MANHOLE"
12 "MANHOLE COVER"

CONDUITS AND TRENCHES

- 18 "HOUSE CONNECTION STACK"
19 "UTILITY TRENCH REQUIREMENTS"
20 "SANITARY SEWERS AND LATERALS"
21 "CONCRETE ENCASEMENT DETAIL"
22 "DOWNSPOUT OUTLET (NON-CURBED STREET)"
23 "DOWNSPOUT OUTLET (CURBED STREET)"
24 "GROUNDWATER DRAIN LINE CONNECTION"

DRIVEWAYS, CURBS, AND PAVEMENT

- 32 "TYPICAL SECTION - LOCAL STREET"

VI. STORM WATER POLLUTION PREVENTION:

(A) FOR PROJECTS ONE (1) ACRE OR MORE OF TOTAL LAND-DISTURBANCE:

THE OWNER/DEVELOPER SHALL APPLY FOR AND OBTAIN AN OHIO EPA NPDES PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY. SAID PERMIT REQUIRES THE PREPARATION AND IMPLEMENTATION OF A STORM WATER POLLUTION PREVENTION PLAN (SWP3) TO ADDRESS CONSTRUCTION SITE STORM WATER RUNOFF AS WELL AS POST-CONSTRUCTION STORM WATER MANAGEMENT. THE SWP3 MUST BE REVIEWED AND APPROVED BY THE STARK COUNTY SOIL & WATER CONSERVATION DISTRICT (SWCD).

THE OWNER/DEVELOPER AND HIS REPRESENTATIVES SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE PERMIT AS WELL AS THE SWP3. ALL ACTIVITIES AND PRACTICES SHALL ALSO COMPLY WITH THE CURRENT EDITIONS OF THE CITY OF CANTON STORM WATER MANAGEMENT MANUAL AND THE OHIO DEPARTMENT OF NATURAL RESOURCES' RAINWATER AND LAND DEVELOPMENT MANUAL, AS APPLICABLE. SUCH PROJECTS ARE ALSO SUBJECT TO INSPECTION BY THE CITY OF CANTON AND/OR ITS AUTHORIZED REPRESENTATIVES (I.E. STARK SWCD) TO ENSURE COMPLIANCE WITH PERMIT AND SWP3 REQUIREMENTS AND LOCAL STORM WATER QUALITY REGULATIONS.

A PRE-CONSTRUCTION MEETING INITIATED BY THE DEVELOPER/CONTRACTOR IS REQUIRED ON-SITE WITH THE STARK SWCD PRIOR TO ANY LAND-DISTURBING ACTIVITIES. THE DEVELOPER/CONTRACTOR SHALL ABIDE BY ALL ORDERS ISSUED BY THE CITY AND/OR STARK SWCD PURSUANT TO INSPECTION OF THE PROJECT SITE.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO SUBMIT CO-PERMITTEE APPLICATION TO OHIO EPA PRIOR TO BEGINNING WORK ON THE PROJECT. AS APPLICABLE, THE CONTRACTOR SHALL OBTAIN A COPY OF THE SWP3 AND FAMILIARIZE HIMSELF WITH IT, IMPLEMENTING ALL ITEMS AND ABIDING BY ALL PERMIT REQUIREMENTS AND REGULATIONS.

(B) FOR PROJECTS LESS THAN ONE (1) ACRE OF TOTAL LAND-DISTURBANCE:

AN EPA NPDES CONSTRUCTION STORM WATER PERMIT AND SWP3 IS NOT REQUIRED. HOWEVER, THE DEVELOPER/CONTRACTOR SHALL STILL ENSURE THAT APPROPRIATE PRACTICES ARE IN PLACE TO PROVIDE CONSTRUCTION RUNOFF AND EROSION AND SEDIMENT CONTROLS WITHIN THE PROJECT LIMITS. SUCH PRACTICES MAY INCLUDE THE USE OF SILT FENCE, STORM DRAIN INLET PROTECTION, JUTE MATTING, TEMPORARY SEEDING, MULCHING, CHECK DAMS, CONSTRUCTION ENTRANCES, CONCRETE WASHOUT AREAS, ETC. ALL PRACTICES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE CURRENT EDITION OF THE OHIO DEPARTMENT OF NATURAL RESOURCES' RAINWATER AND LAND DEVELOPMENT MANUAL, AS APPLICABLE.

EROSION AND SEDIMENT CONTROL PRACTICES MUST BE INSTALLED PRIOR TO BEGINNING CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUED INSPECTION AND MAINTENANCE OF ALL PRACTICES AND WILL BE HELD RESPONSIBLE FOR ADDRESSING ANY ON- OR OFF-SITE EROSION/SEDIMENT ISSUES RELATED TO THE PROJECT. THE OWNER/DEVELOPER/CONTRACTOR SHALL ABIDE BY ALL ORDERS ISSUED BY THE CITY PURSUANT TO INSPECTION OF THE PROJECT SITE.

VII. TRAFFIC:

(A) MAINTAINING TRAFFIC:

THE CONTRACTOR SHALL MAINTAIN TRAFFIC ADJACENT TO AND THROUGH THE PROJECT AS DESCRIBED BELOW AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE OHIO DEPARTMENT OF TRANSPORTATION MANUAL OF CONSTRUCTION AND MATERIALS SPECIFICATIONS ITEM 614 MAINTAINING TRAFFIC. THE CONTRACTOR SHALL FURNISH, MAINTAIN, AND REMOVE ALL SIGNS, FLAGS, FLAGMEN, WATCHMEN, BARRICADES, SIGN SUPPORTS, CONES, BARRELS, AND INCIDENTALS IN CONFORMANCE WITH THE MOST RECENT REVISIONS OF THE CURRENT EDITION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS. INTERFERENCE WITH VEHICULAR TRAFFIC SHALL BE KEPT TO A MINIMUM AT ALL TIMES. ALL OPEN TRENCHES AND EXCAVATIONS SHALL BE PROTECTED WITH DRUMS, BARRICADES, OR BARRIERS. ACCESS SHALL BE MAINTAINED AT ALL TIMES FOR EMERGENCY AND FIRE DEPARTMENT VEHICLES.

ANY TEMPORARY ROADWAY CLOSING MUST BE APPROVED IN WRITING BY THE CITY TRAFFIC ENGINEER AND ANY OTHER PUBLIC AGENCY HAVING JURISDICTION. THE CONTRACTOR SHALL NOTIFY THE TRAFFIC ENGINEER AT LEAST 72 HOURS IN ADVANCE OF ANY SUCH CLOSINGS FOR PUBLICATION AND EMERGENCY AGENCY NOTIFICATION.

(B) RESIDENTIAL AND BUSINESS AREAS:

THE CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL RESIDENCES AND BUSINESSES DURING CONSTRUCTION. IN THE EVENT A DRIVE ACCESS NEEDS TO BE CLOSED, THE CONTRACTOR SHALL GIVE NOTICE OF CLOSURE AND DURATION TO THE PROPERTY OWNER 24 HOURS IN ADVANCE. CONTRACTOR SHALL ARRANGE FOR ALTERNATE PARKING AND REASONABLE ACCESS FOR THOSE PROPERTY OWNERS AFFECTED BY DRIVE CLOSURES.

(C) EXISTING STREET NAME AND TRAFFIC CONTROL SIGNS:

WHERE WORK REQUIRES THE MOVEMENT OF EXISTING SIGNS (STOP SIGNS, SPEED LIMIT SIGNS, NO PARKING SIGNS, ETC.), THE CONTRACTOR IS REQUIRED TO MAINTAIN THE FUNCTION OF ALL TRAFFIC CONTROL SIGNS. ALL SIGNS REMOVED BY THE CONTRACTOR SHALL BE STORED ON SITE AND REINSTALLED BY THE CONTRACTOR.

(D) NEW STREET NAME & TRAFFIC CONTROL SIGNS:

ALL STREET NAME AND TRAFFIC CONTROL SIGNS SHALL COME COMPLETE AND BE MADE IN ACCORDANCE WITH THE CITY OF CANTON SIGN AND PAINT DEPARTMENT SPECIFICATIONS. GENERALLY, ALL SIGNS SHALL HAVE HI-INTENSITY SHEETING AND BE MADE WITH .080 50/52 ALUMINUM. STREET NAME SIGNS SHALL BE MADE WITH WHITE UPPER AND LOWER CASE LETTERING ON GREEN BACKGROUND USING 9" BLANKS, BE DOUBLED SIDED W/RADIUS CORNERS AND HAVE 6" NAME AND 3" SUFFIXES. ALL SIGN RELATED HARDWARE IS TO BE INCLUDED, SUCH AS 6" HEAVY DUTY U-CHANNEL CAPS AND STREET NAME CROSSES.

FOR SUBDIVISION DEVELOPMENTS, ALL PERMANENT STREET NAME SIGNS AND TRAFFIC CONTROL SIGNS SHALL BE FURNISHED AND INSTALLED BY THE DEVELOPER/CONTRACTOR.

Vertical sidebar containing project information: OFFICE OF THE CITY ENGINEER CANTON, OHIO; GENERAL NOTES; PROJECT REVISIONS table; FRASER ESTATES STORM SEWER REPLACEMENT PROJECT GP 1189; SHEET NO. 3 OF 19.

VII. TRAFFIC (continued)

(F) EXISTING TRAFFIC SIGNALS:

WHERE WORK REQUIRES INTERFERENCE WITH EXISTING SIGNALIZATION IN THE INTERSECTIONS, ALL WORK SHALL BE COORDINATED THROUGH THE CITY ENGINEER. THE CONTRACTOR SHALL NOT ALTER ANY SIGNALIZATION WITHOUT THE CITY ENGINEER'S AUTHORIZATION.

(F) NEW TRAFFIC SIGNALIZATION:

ALL NEW OR MODIFIED TRAFFIC SIGNALIZATION AT INTERSECTIONS SHALL BE IN ACCORDANCE WITH CITY TRAFFIC ENGINEERING TRAFFIC CONTROL GENERAL NOTES AND ODOT SPECIFICATIONS; WITH SPECIAL EMPHASIS ON ODOT ITEMS 625, 632, 633, 732, AND 733 WHICH DEALS WITH TRAFFIC CONTROL.

(G) TRAFFIC CONTROL PLAN:

THE DEVELOPER/CONTRACTOR SHALL SUBMIT TO THE CITY ENGINEER A TRAFFIC CONTROL PLAN IN ACCORDANCE WITH CITY SUPPLEMENTAL SPECIFICATION 01-00. DETOURS, IF NECESSARY, SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO PLAN SUBMISSION.

VIII. WATER MAIN / SERVICES:

(A) WATER MAINS/SERVICES:

ALL WATER MAINS, SERVICES AND APPURTENANCES SHALL BE DESIGNED AND CONSTRUCTED ACCORDING TO THE CITY OF CANTON WATER DEPARTMENT REQUIREMENTS AND SPECIFICATIONS IN EFFECT AT THE TIME OF CONSTRUCTION. ANY DEVIATION FROM THE PLANS AFFECTING THE WATER SYSTEM MUST BE APPROVED BY THE CANTON WATER DEPARTMENT.

FOR NEW DEVELOPMENTS INSIDE THE CITY, ALL WATER MAIN PIPE MATERIAL FITTINGS, BENDS, VALVES, VALVE BOXES, MEGALUGS, GASKETS AND HYDRANTS WILL BE SUPPLIED BY THE CITY OF CANTON. THE CONTRACTOR WILL BE RESPONSIBLE FOR TRANSPORTING MATERIALS TO THE PROJECT SITE. BACKFILL, BEDDING, THRUST BLOCKING, ETC. AND ASSOCIATED LABOR IS THE RESPONSIBILITY OF THE CONTRACTOR.

WATER MAINS SHALL BE CLASS 53 (12" AND UNDER) OR CLASS 54 (OVER 12") DUCTILE IRON MEETING AWWA C-151 WITH PUSH JOINTS. THE MINIMUM COVER OVER WATER MAINS SHALL BE 4'-6" FROM GROUND SURFACE TO THE BARREL OF THE PIPE. THE OUTSIDE SURFACE OF ALL DUCTILE IRON PIPE, FITTINGS, AND APPURTENANCES SHALL BE SHOP COATED WITH EITHER A COAL TAR OR ASPHALT BASE BITUMINOUS MATERIAL. IF THE COATING MATERIAL IS FOUND TO BE DAMAGED PRIOR TO THE PIPE TRENCH BEING BACKFILLED, THE CONTRACTOR SHALL PROVIDE AN ADDITIONAL APPROVED MATERIAL AS REQUIRED TO REPAIR THE DAMAGES. THE CONTRACTOR SHALL HAVE SUFFICIENT COATING MATERIAL AVAILABLE AT THE JOB SITE PRIOR TO LAYING THE PIPE. THE INTERIOR OF ALL PIPES AND FITTINGS SHALL BE LINED WITH DOUBLE CEMENT MORTAR AND SEAL COATED IN COMPLETE CONFORMANCE WITH AWWA C-104, OR THE LATEST REVISION. FITTINGS SHALL BE RATED FOR 250 PSI WORKING PRESSURE IN ACCORDANCE WITH AWWA C-153. PIPE LENGTHS MAY BE DEFLECTED AT THE JOINT IF REQUIRED, AT ONE-HALF THE DEGREE RECOMMENDED BY THE MANUFACTURER. WATER SERVICES WILL BE INSTALLED BY THE CITY OF CANTON AND PAID FOR BY THE OWNER/DEVELOPER. DISINFECTION OF WATER MAINS SHALL BE IN ACCORDANCE WITH AWWA C-651. ALL WATER LINE PRESSURE TESTING SHALL CONFORM TO AWWA C-600.

WATER MAINS SHALL BE INSTALLED AND BACKFILLED PER O.D.O.T. ITEM 638. WATERLINES LOCATED WITHIN THE LIMITS OF OR WITHIN A 1/2 TO 1 SLOPE OF EXISTING AND/OR PROPOSED ROADWAYS, PARKING AREAS, BUILDINGS, BUILDINGS, SIDEWALKS, AND/OR DRIVES SHALL BE INSTALLED AS TYPE B CONDUITS. ALL OTHER WATER MAINS MAY BE INSTALLED AS TYPE C CONDUITS. BEDDING SHALL BE AS SPECIFIED, EXCEPT THAT SLAG WILL NOT BE PERMITTED.

ALL BENDS, FITTINGS, TEES, VALVES, DEAD ENDS, ETC. SHALL BE SECURED EQUAL. POURED-IN-PLACED CONCRETE THRUST BLOCKS SHALL ALSO BE PROVIDED AT/FOR EACH BEND, FITTINGS, TEE, DEAD END, ETC. THIS BLOCKING SHALL BE CAREFULLY PLACED TO ENSURE IT IS POSITIONED PROPERLY TO WITHSTAND THE RESULTANT FORCES AT EACH BEND, FITTING, ETC. AND SHALL BEAR ON STABLE UNDISTURBED GROUND CAPABLE OF WITHSTANDING THE POTENTIAL LOADING.

IN ADDITION TO THE RESTRAINT OF ALL BENDS, FITTINGS, TEES, VALVES, DEAD END, ETC. THE CONTRACTOR SHALL ALSO SECURE/RESTRAIN ALL JOINTS FOR AT LEAST THREE (3) PIPE JOINTS (50' LF MIN.) ON BOTH SIDES OF EACH DEAD END, BEND, FITTING, VALVE, TEE, ETC. UTILIZING MEGALUGS, FIELD LOK GASKETS, OR APPROVED EQUAL.

THE CONTRACTOR SHALL PROVIDE 18" VERTICAL CLEARANCE BETWEEN PROPOSED WATERLINES AND ANY SANITARY SEWERS. WHEN 18" CLEARANCE BETWEEN A WATERLINE AND SANITARY SEWER CANNOT BE OBTAINED THE CONTRACTOR SHALL PROVIDE CONCRETE ENCASUREMENT AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE 12" MINIMUM CLEARANCE BETWEEN WATERLINE AND STORM SEWER. THE CONTRACTOR SHALL MAINTAIN TEN (10) FOOT HORIZONTAL CLEARANCE BETWEEN WATERLINES/SERVICES AND SANITARY SEWERS AND FOUR (4) FOOT HORIZONTAL CLEARANCE BETWEEN WATERLINES/SERVICES AND STORM SEWERS.

THE FIRE HYDRANT SETTING SHALL INCLUDE THE HYDRANT, ANCHOR TEE, VALVE, VALVE BOX, 6 INCH PIPING AND ALL FITTINGS NEEDED FOR PROPER INSTALLATION. FIRE HYDRANTS SHALL BE MUELLER A423 MEETING THE CITY OF CANTON WATER DEPARTMENT STANDARDS AND REQUIREMENTS. ALL COSTS FOR THE 6" PIPING ASSOCIATED WITH THE INSTALLATION OF FIRE HYDRANTS SHALL BE INCLUDED WITH THE FIRE HYDRANT PAY ITEM. ALL HYDRANTS WILL BE INSTALLED WITH THE PUMPER NOZZLE FACING THE STREET.

ALL WATER SERVICES MUST BE INSTALLED BEFORE ANY PAVEMENT FOR THE PROPOSED ROADWAYS HAS BEEN PLACED. CONTRACTOR IS NOT TO MAKE ANY SERVICE TAPS ON THE WATER MAIN. THE CANTON WATER DEPARTMENT WILL MAKE ALL SERVICE TAPS.

THE PROPOSED FACILITIES WILL MAINTAIN A MINIMUM 35 PSI PRESSURE DELIVERED TO THE CURB STOP DURING NORMAL OPERATING CONDITIONS.

BOOSTER PUMPS ARE NOT PERMITTED ON SERVICE CONNECTIONS.

ALL DUCTILE IRON PIPE, INCLUDING FITTINGS AND APPURTENANCES BURIED UNDERGROUND, SHALL BE ENCASED WITH 8 MIL POLYETHYLENE FILM CONFORMING TO AWWA C105.

POLYETHYLENE WATER MAIN AND SERVICE TUBING 2" AND UNDER SHALL BE COPPER TUBE SIZE AND MEET STANDARDS ASTM-D2737 PE3408 AND AWWA C906. THE ONLY ACCEPTED TUBING IS CP CHEM PERFORMANCE PIPE DRISCOPLEX 5100-ULTRA-LINE.

THE CONTRACTOR SHALL TAKE ANY AND ALL NECESSARY PRECAUTIONS TO PROTECT AND MAINTAIN IN SERVICE, ANY EXISTING WATER MAINS EXPOSED DURING CONSTRUCTION.

ANY WATER SERVICE LINE THAT IS BROKEN, CUT OR OTHERWISE DAMAGED, SHALL BE REPLACED FROM THE CORPORATION STOP TO THE CURB STOP WITH A SINGLE PIECE OF PLASTIC SERVICE LINE (DRISCOPLEX). NO SPLICING OF THE SERVICE LINE WILL BE PERMITTED.

SERVICE BRANCHES WILL BE INSTALLED AS PER O.D.O.T ITEM 638.16 WITH THE FOLLOWING EXCEPTIONS:

1. WHEN A SERVICE BRANCH IS DISTURBED FOR LOWERING, RAISING, EXTENDING OR SHORTENING ON THE PROPERTY SIDE ON THE SERVICE STOP, IT SHALL BE REPLACED WITH NEW MATERIALS FROM THE CORPORATION STOP TO THE SERVICE STOP.

IN A STREET IMPROVEMENT, NO EXISTING WATER CURB BOX WILL BE LEFT IN THE PAVEMENT, CURB AND GUTTER OR SIDEWALK. THE CURB BOX WILL BE MOVED TO A SUITABLE LOCATION DETERMINED BY THE CANTON WATER DEPARTMENT. WHEN THE CURB BOX IS MOVED ALL NEW MATERIAL WILL BE USED FROM THE CORPORATION STOP TO THE CURB STOP WHICH IS A SINGLE PIECE OF PLASTIC SERVICE LINE (DRISCOPLEX). NO SPLICING OF THE SERVICE LINE WILL BE PERMITTED. A NEW TAP (CORPORATION STOP) AND CURB STOP AND BOX MAY ALSO BE REQUIRED. THE DETERMINATION WILL BE MADE BY THE CANTON WATER DEPARTMENT.

ALL WATER MAINS WILL BE INSTALLED UNDER THE PAVEMENT WITH A MINIMUM OF 3 FEET FROM THE EDGE OF PAVEMENT OR THE CURB AND/OR GUTTER. IN EXISTING STREETS, A SAW CUT WILL BE MADE TO ENSURE A CLEAN EDGE.

WHEN AN EXISTING WATER MAIN MUST BE SHUT DOWN TO PERFORM REQUIRED WORK, THE PROPERTIES TO BE EFFECTED SHALL BE GIVEN A MINIMUM 24 HOUR NOTICE OF SAID SHUT DOWN. THE WORK WILL BE SCHEDULED AND COORDINATED TO MINIMIZE THE TIME THE MAIN IS OUT OF SERVICE.

THE CONTRACTOR SHALL NOTIFY THE CITY 48 HOURS IN ADVANCE OF ANY SHUT DOWN OF AN EXISTING WATER MAIN. THE CONTRACTOR WILL NOT OPERATE ANY VALVES. VALVES WILL BE OPERATED BY CANTON WATER DEPARTMENT PERSONNEL ONLY. VALVES DAMAGED BY THE CONTRACTOR'S OPERATION WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

ALL VALVE BOXES WILL BE ADJUSTED TO FINAL GRADE OF THE PAVEMENT WHEN THE PROJECT IS COMPLETED.

ANY COMMERCIAL OR INDUSTRIAL WATER SERVICE MUST HAVE SITE AND PLUMBING PLANS SUBMITTED TO THE CANTON WATER DEPARTMENT ENGINEERING OFFICE FOR APPROVAL. THE CANTON WATER DEPARTMENT WILL REVIEW THE PLANS AND MAKE COMMENTS. CORRECTIONS MUST BE MADE AND RESUBMITTED. PRICE ESTIMATES WILL NOT BE ISSUED AND SERVICE TAPS WILL NOT BE MADE UNTIL THE PLANS HAVE BEEN APPROVED BY THE CANTON WATER DEPARTMENT.

IX. POST CONSTRUCTION INCIDENTALS

(A) AS-BUILT DRAWINGS:

AS-BUILT REPRODUCIBLE MYLARS SHALL BE PROVIDED TO THE CITY OF CANTON BY THE DESIGN ENGINEER AT THE COMPLETION OF THE PROJECT. AS-BUILT INFORMATION CONSISTS OF POST-CONSTRUCTION FIELD SURVEY DATA OF THE LOCATION, FLOWLINE ELEVATIONS, AND TOP-OF-GRATE/RIM ELEVATIONS FOR ALL STORM AND SANITARY STRUCTURES CONSTRUCTED AND/OR IMPACTED BY THE PROJECT.

FOR PRIVATE PROJECTS, THE CONSTRUCTION BOND WILL NOT BE RELEASED UNTIL THE AS-BUILT DRAWINGS HAVE BEEN ACCEPTED.

(B) PROPOSED MONUMENTATION:

THE DEVELOPER'S/CONTRACTOR'S SURVEYOR SHALL NOTIFY THE CITY ENGINEER IN WRITING UPON THE COMPLETION OF MONUMENTS BEING SET AS PER PLAN OR RECORD PLAT.

(C) RELEASE OF RETAINER/BONDS:

PRIOR TO THE RELEASE OF RETAINER/CONSTRUCTION BOND BY THE CITY OF CANTON, THE CONTRACTOR SHALL HAVE COMPLETED THE ENGINEER'S PROJECT PUNCHLIST AND SUBMIT FINAL WAIVER OF LIEN, IN ACCORDANCE WITH CITY SS 01-00.

X. PROJECT SPECIFIC NOTES

(A) CATCH BASINS:

CITY STANDARD NO.4 CATCH BASINS SHALL BE MODIFIED FROM 24"x24" TO 48"x48" AS PER PLAN. CONTRACTOR SHALL USE BICYCLE-FRIENDLY GRATES AS SPECIFIED PER CITY STD. DWG. NO. 4. COSTS FOR RECONNECTION OF EXISTING STORM SEWERS TO PROPOSED CATCH BASINS SHALL BE INCLUDED IN THE COST OF CATCH BASINS.

(B) CONCRETE COLLARS:

CONCRETE COLLARS SHALL BE IN ACCORDANCE WITH ODOT STD. CONST. DWG. NO. DM-1.1. COST SHALL BE INCLUDED WITH COST OF PIPE.

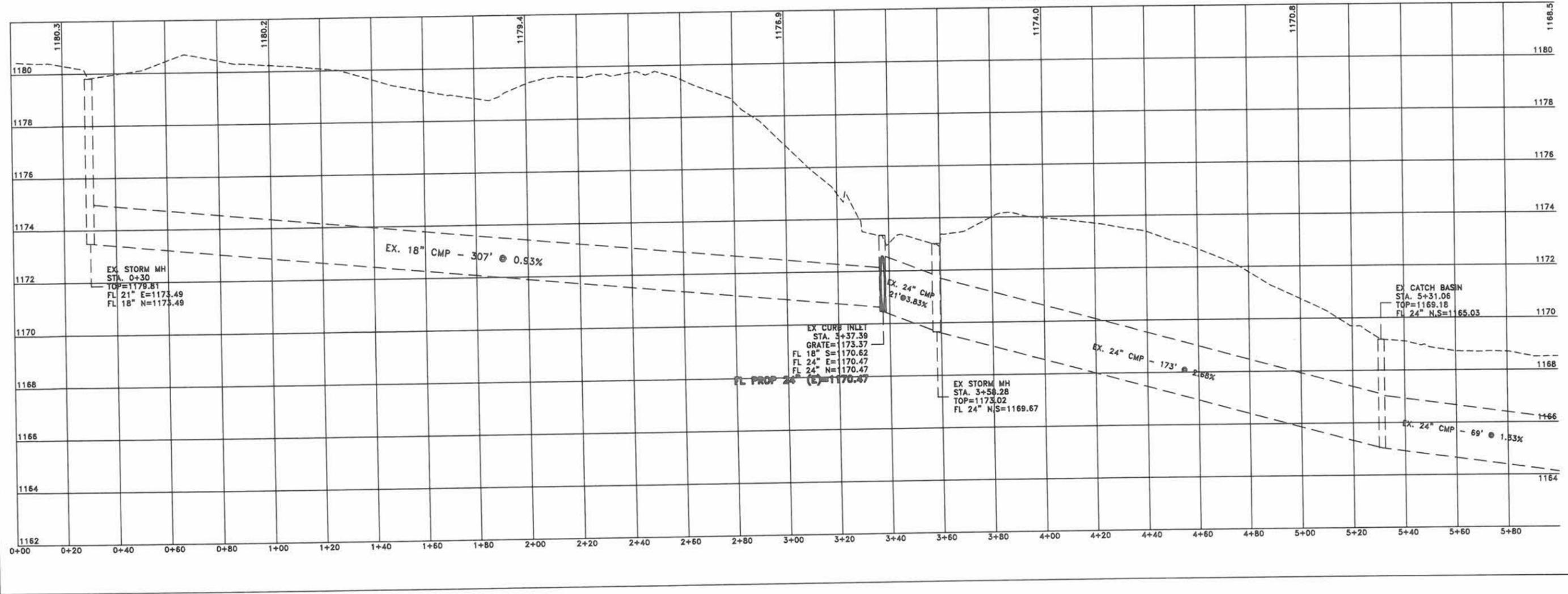
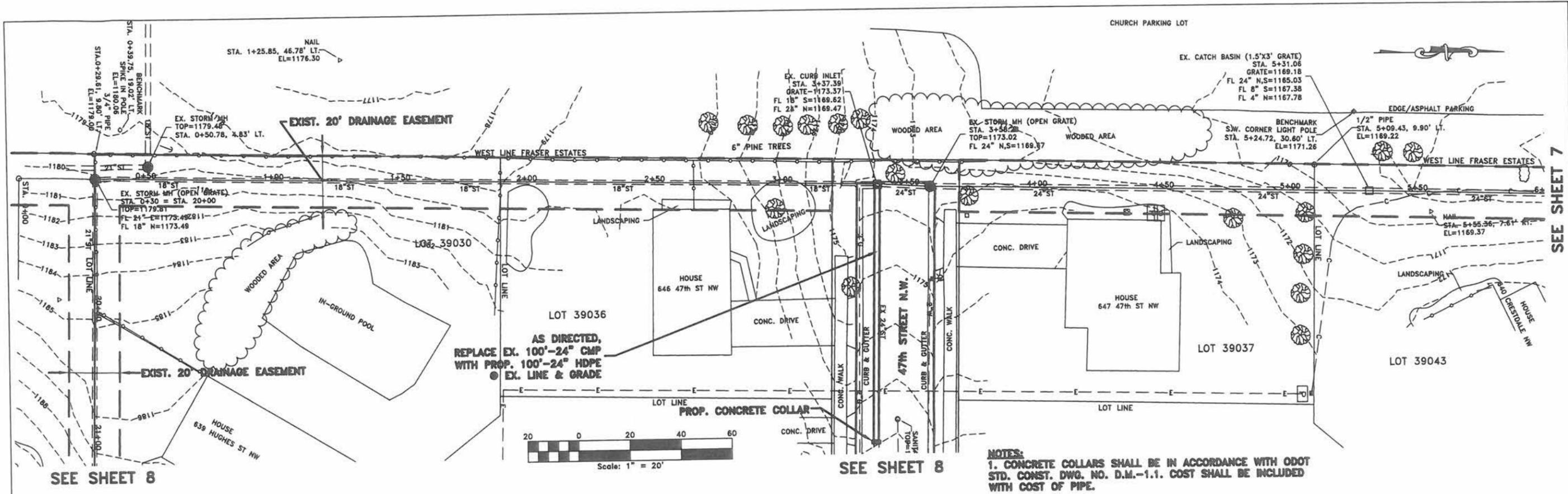
(C) ACCESS TO SITE:

INGRESS AND EGRESS TO AND FROM SITE SHALL BE AS DIRECTED BY CITY ENGINEER.

(D) GRADING:

CONTRACTOR SHALL GRADE ALL AREAS DISTURBED BY CONSTRUCTION TO THE SATISFACTION OF THE CITY ENGINEER. A SWALE SHALL BE PROVIDED OVER THE PROPOSED 30" STORM SEWER AS DIRECTED BY THE CITY ENGINEER.

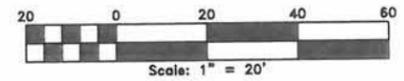
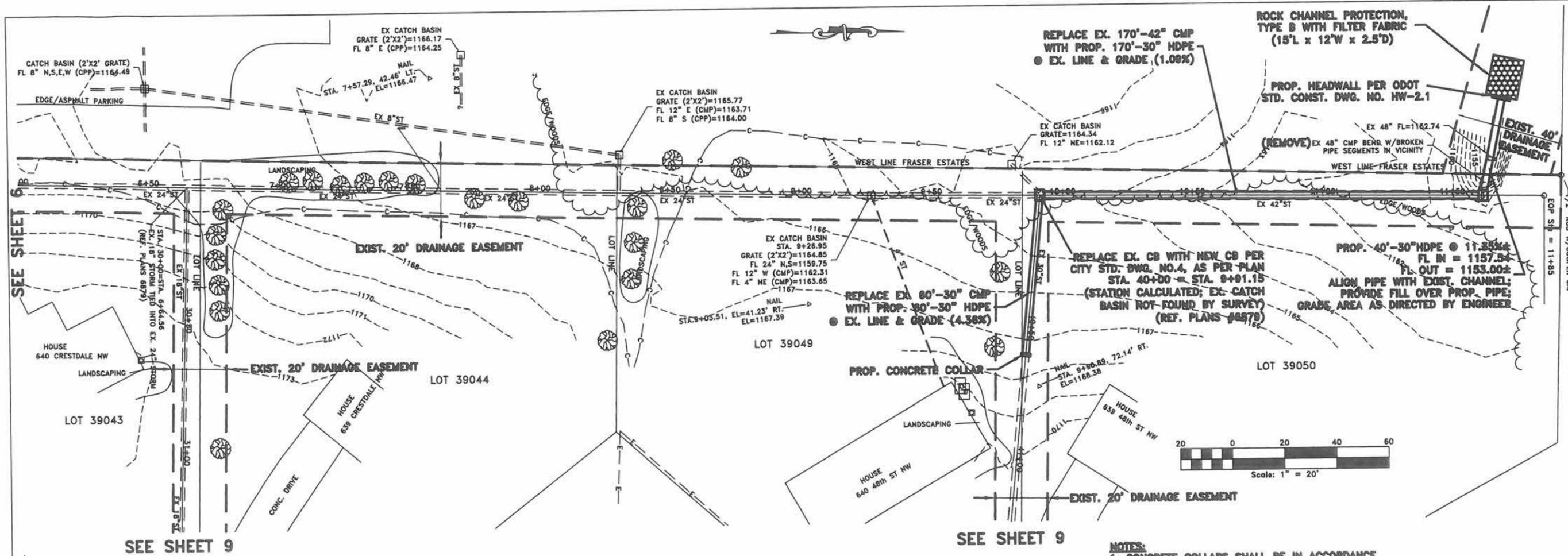
EFF. DATE: APR 2001 LAST REV: APR 2012 DRAWN BY: GHC APPROVED BY: RMB/CDB DWG# en_Gen-Notes	OFFICE OF THE CITY ENGINEER CANTON, OHIO DANIEL J. MOEGLIN, P.E., CITY ENGINEER 2438 30th STREET N.E. 44705 (330)489-3381	PROJECT REVISIONS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DATE</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	DATE	BY								
DATE	BY											
GENERAL NOTES												
FRASER ESTATES STORM SEWER REPLACEMENT PROJECT GP 1189												
SHEET NO. 4 OF 19												



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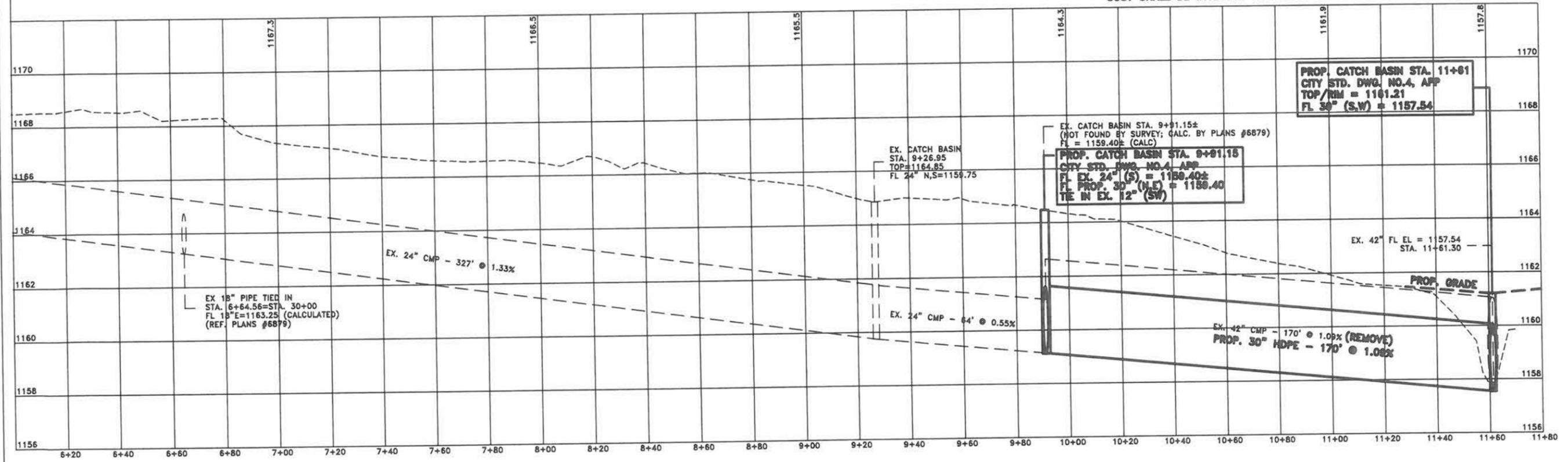
REV. LTR.	DESCRIPTION	DATE	BY	APP'D
	REVISIONS BY CITY ENGINEERING	10/19/12	CDB	

SCALES	HORIZ. 1" = 20'	VERT. 1" = 2'
PROJECT NO.		
SHEET NO.	6	OF 19



SEE SHEET 9

NOTES:
 1. CONCRETE COLLARS SHALL BE IN ACCORDANCE WITH ODOT STD. CONST. DWG. NO. D.M.-1.1. COST SHALL BE INCLUDED WITH COST OF PIPE.

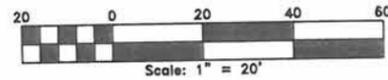
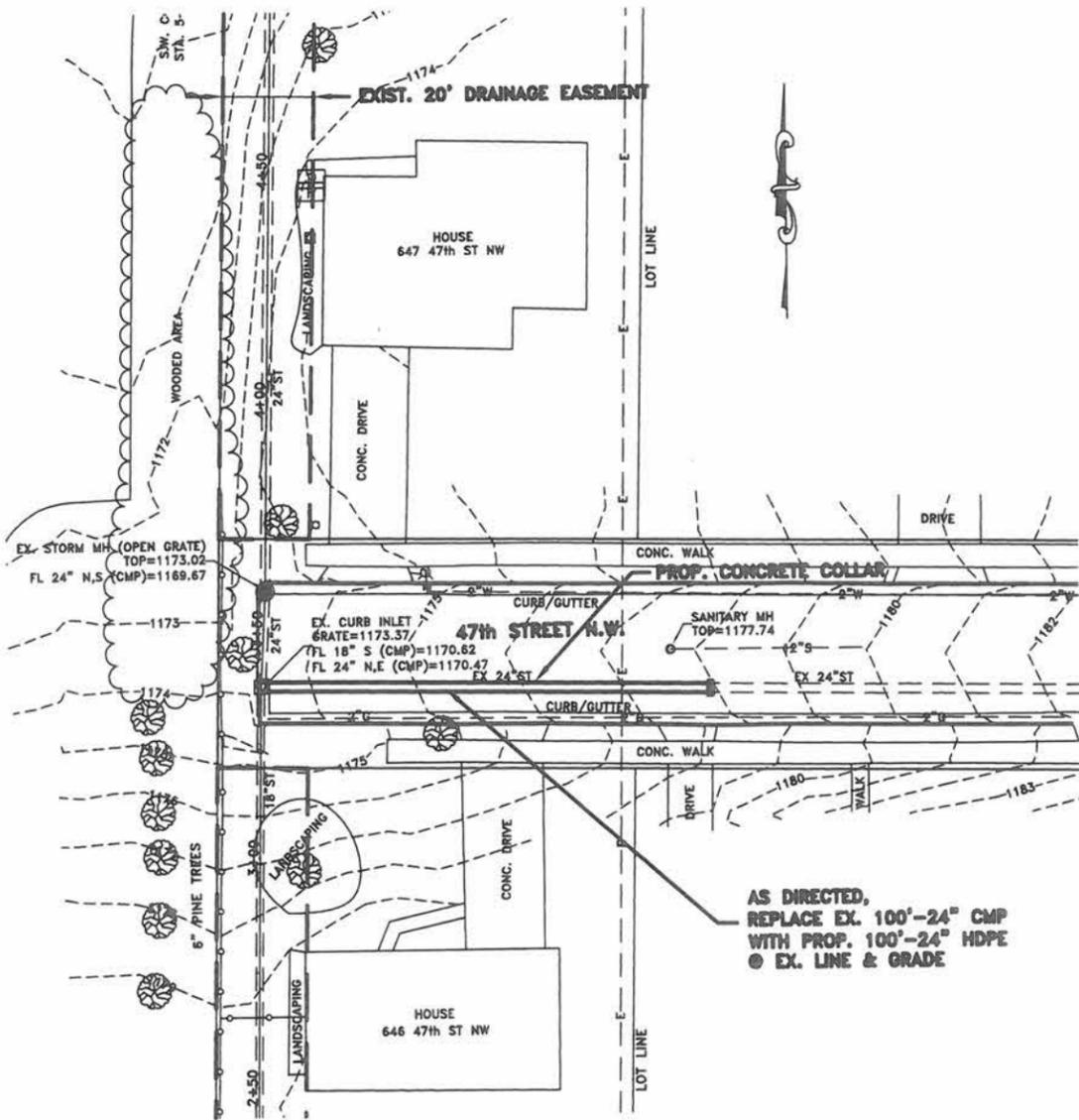
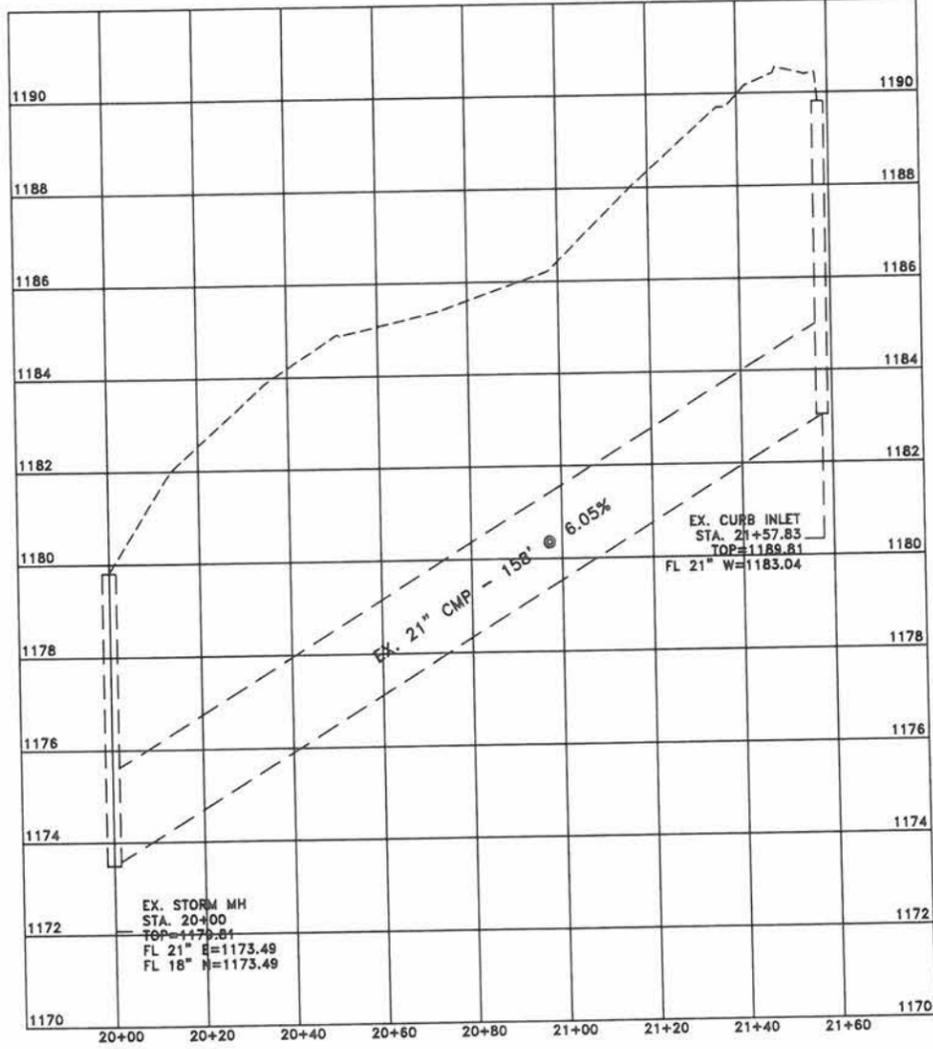
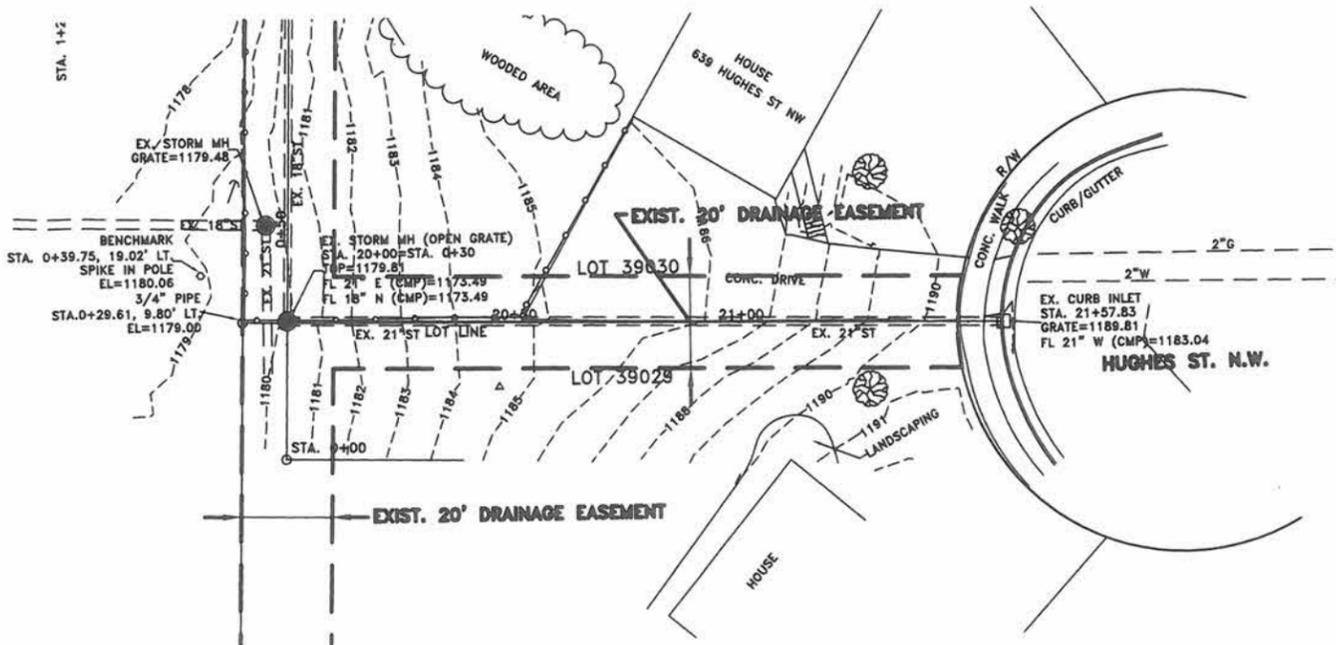


SCALES	HORIZ. 1" = 20'	VERT. 1" = 2'
PROJECT NO.		
SHEET NO. OF	7	19

FRASER ESTATES STORM SEWER REPLACEMENT PROJECT
PLAN & PROFILE
WEST LINE OF ALLOTMENT

REV. LTR.	DESCRIPTION	DATE	BY	APP'D	PLOTTED: 11/15/2011
	REVISIONS BY CITY ENGINEERING	10/19/12	CDB		DATE: 11/09/2011
					DRAWN BY: SLB
					CHECKED BY: CGD/DR
					APP'VD BY: CGD

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AS DIRECTED,
REPLACE EX. 100'-24" CMP
WITH PROP. 100'-24" HDPE
@ EX. LINE & GRADE

NOTES:
1. CONCRETE COLLARS SHALL BE IN ACCORDANCE WITH ODOT STD. CONST. DWG. NO. D.M.-1.1. COST SHALL BE INCLUDED WITH COST OF PIPE.

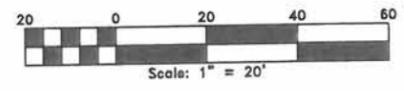
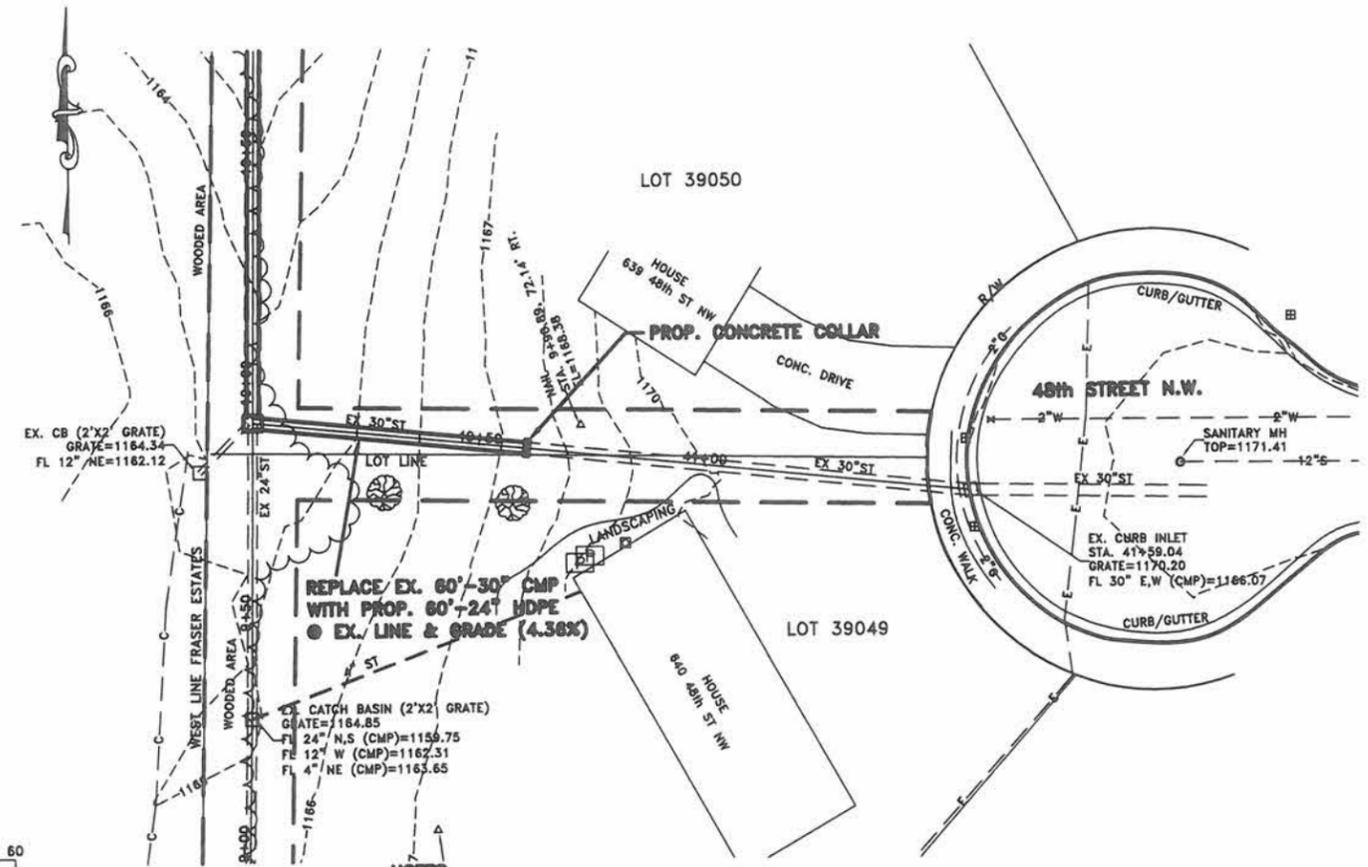
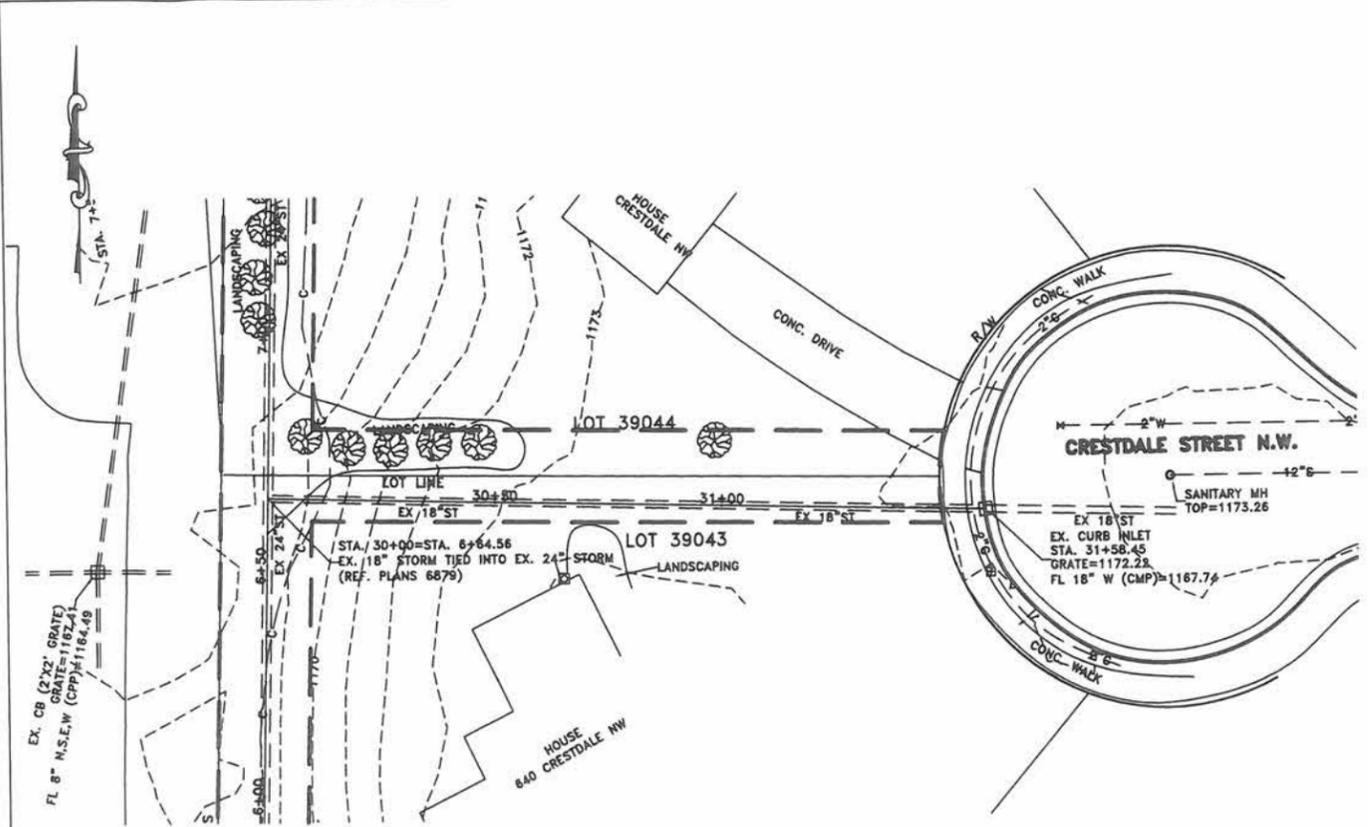
SCALES	
HORZ. 1" = 20'	VERT. 1" = 2'
PROJECT NO.	OF
SHEET NO. 8	19

FRASER ESTATES STORM SEWER REPLACEMENT PROJECT
PLAN & PROFILE
WEST OF HUGHES ST.
PLAN VIEW OF 47th ST.

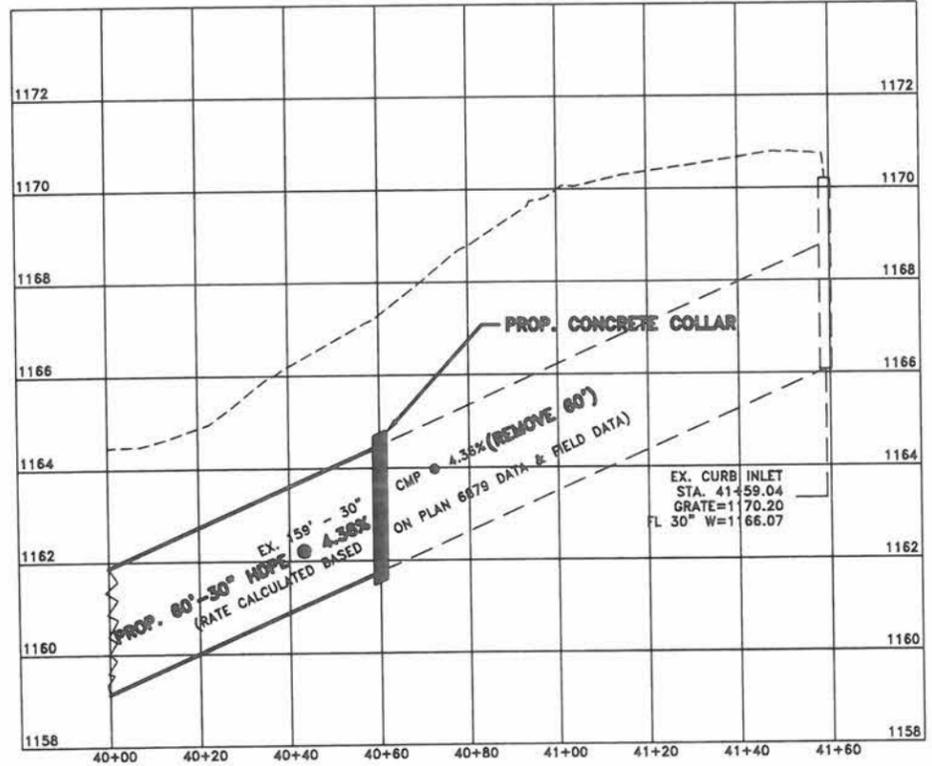
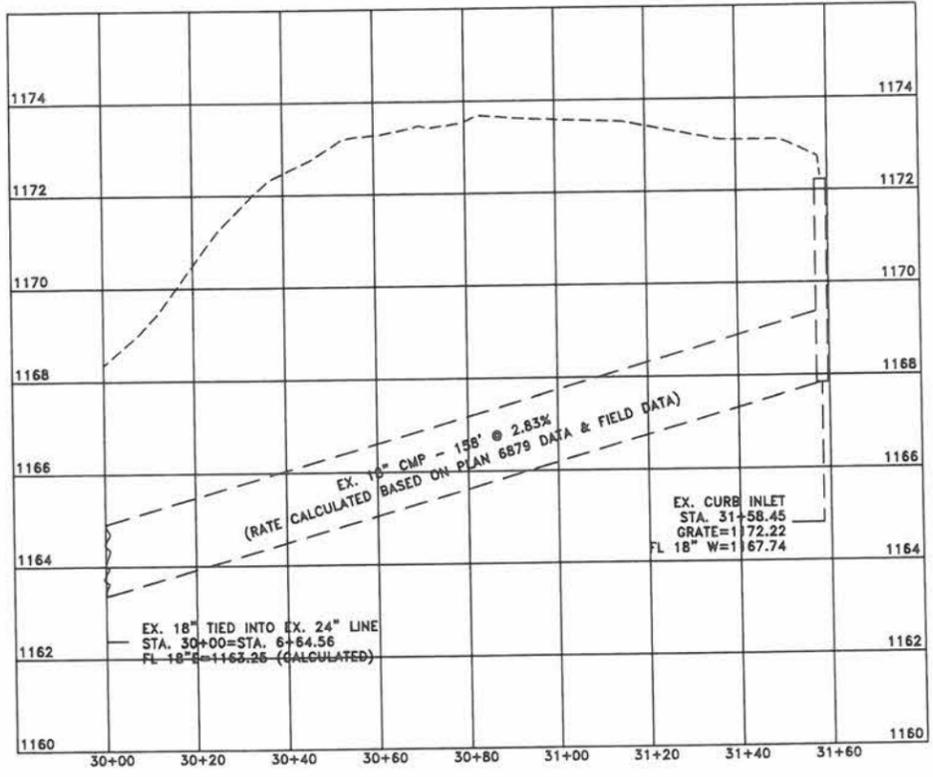
REV. LTR.	DESCRIPTION	DATE	BY	APP'D	PLOTTED: 11/15/2011
	REVISIONS BY CITY ENGINEERING	10/19/12	CDB		DATE: 11/09/2011
					DRAWN BY: SLB
					CHECKED BY: CDB/OR
					APPROV. BY: CCD

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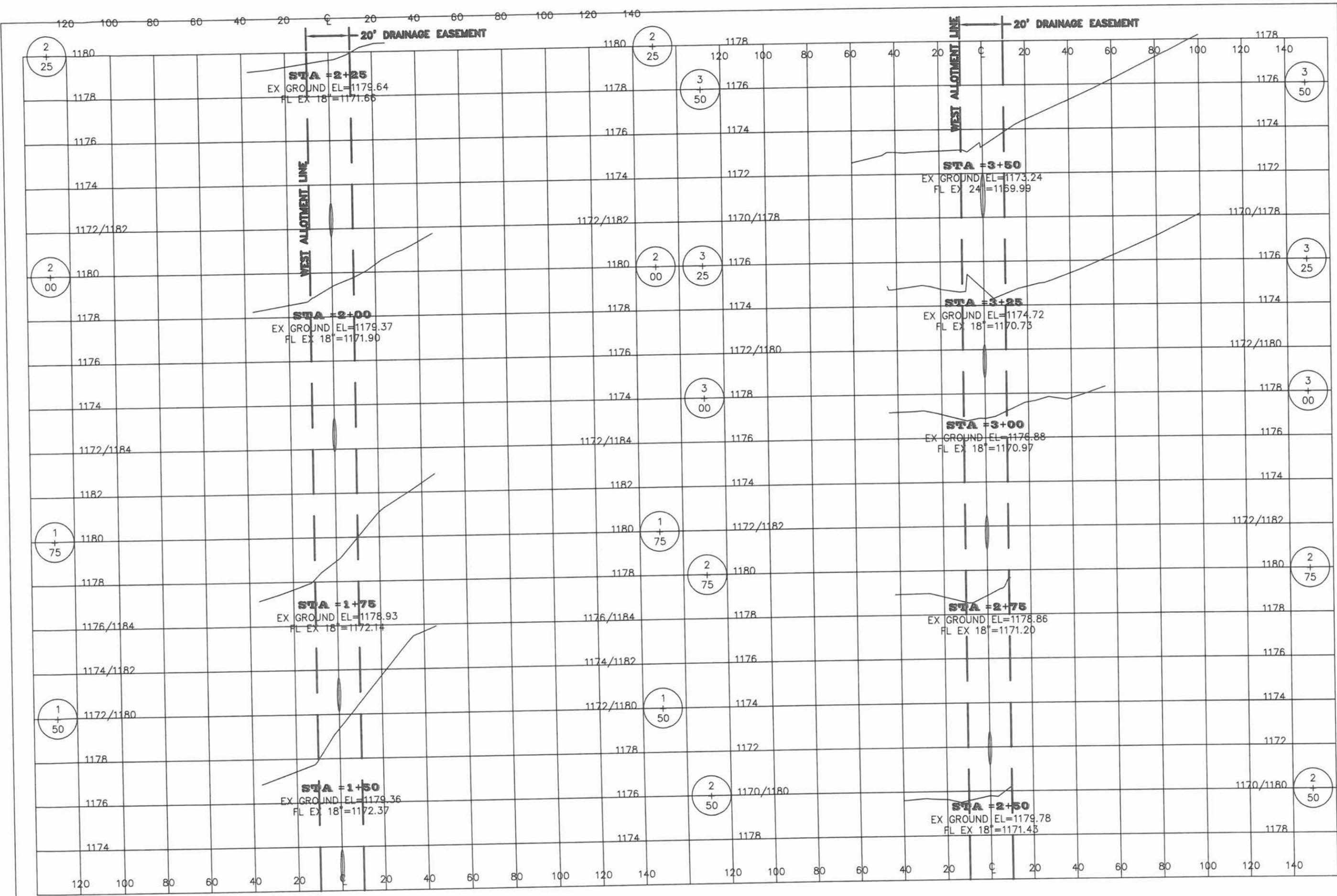


NOTES:
 1. CONCRETE COLLARS SHALL BE IN ACCORDANCE WITH ODOT STD. CONST. DWG. NO. D.M.-1.1. COST SHALL BE INCLUDED WITH COST OF PIPE.



FRASER ESTATES STORM SEWER REPLACEMENT PROJECT		SCALES HORZ. 1" = 20' VERT. 1" = 2'	
WEST OF CRESDALE ST. & 48th ST.		PROJECT NO.	
		SHEET NO. OF 9 19	
PLOTTED: 11/15/2011	APP'D	DATE	DESCRIPTION
DATE: 11/09/2011	BY: CDB	10/19/12	REVISIONS BY CITY ENGINEERING
DRAWN BY: SLB			
CHECKED BY: CGD/DR			
APP'D BY: CGD			
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FRASER ESTATES STORM SEWER REPLACEMENT PROJECT
CROSS SECTIONS
 STA. 1+50 - STA. 3+50
 10' EAST OF WEST ALLOTMENT LINE

REV. LTR. _____
 DESCRIPTION _____
 DATE _____
 BY _____
 APP'D _____

REVISIONS BY: _____
 ENGINEER: _____
 DATE: 11/09/2011
 DRAWN BY: _____
 CHECKED BY: CGD/DR
 APP'D BY: CGD

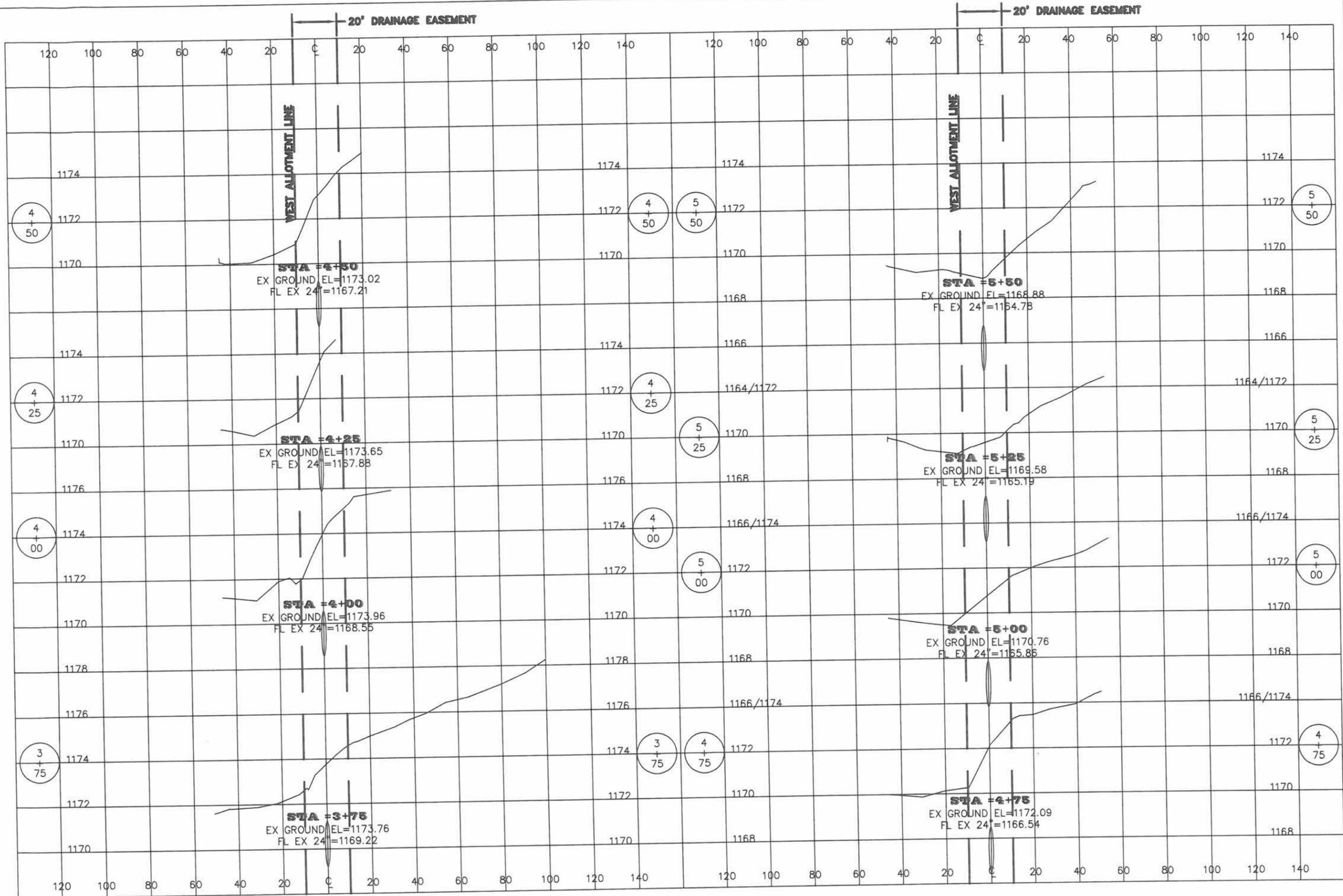
PLOTTED: 11/15/2011
 DATE: 11/09/2011

SCALES
 HORZ. 1" = 20'
 VERT. 1" = 4'

PROJECT NO. _____
 SHEET NO. 11 OF 19

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FRASER ESTATES STORM SEWER REPLACEMENT PROJECT
CROSS SECTIONS
 STA. 3+75 - STA. 5+50
 10' EAST OF WEST ALLOTMENT LINE

SCALES: HORZ. 1" = 20', VERT. 1" = 4'

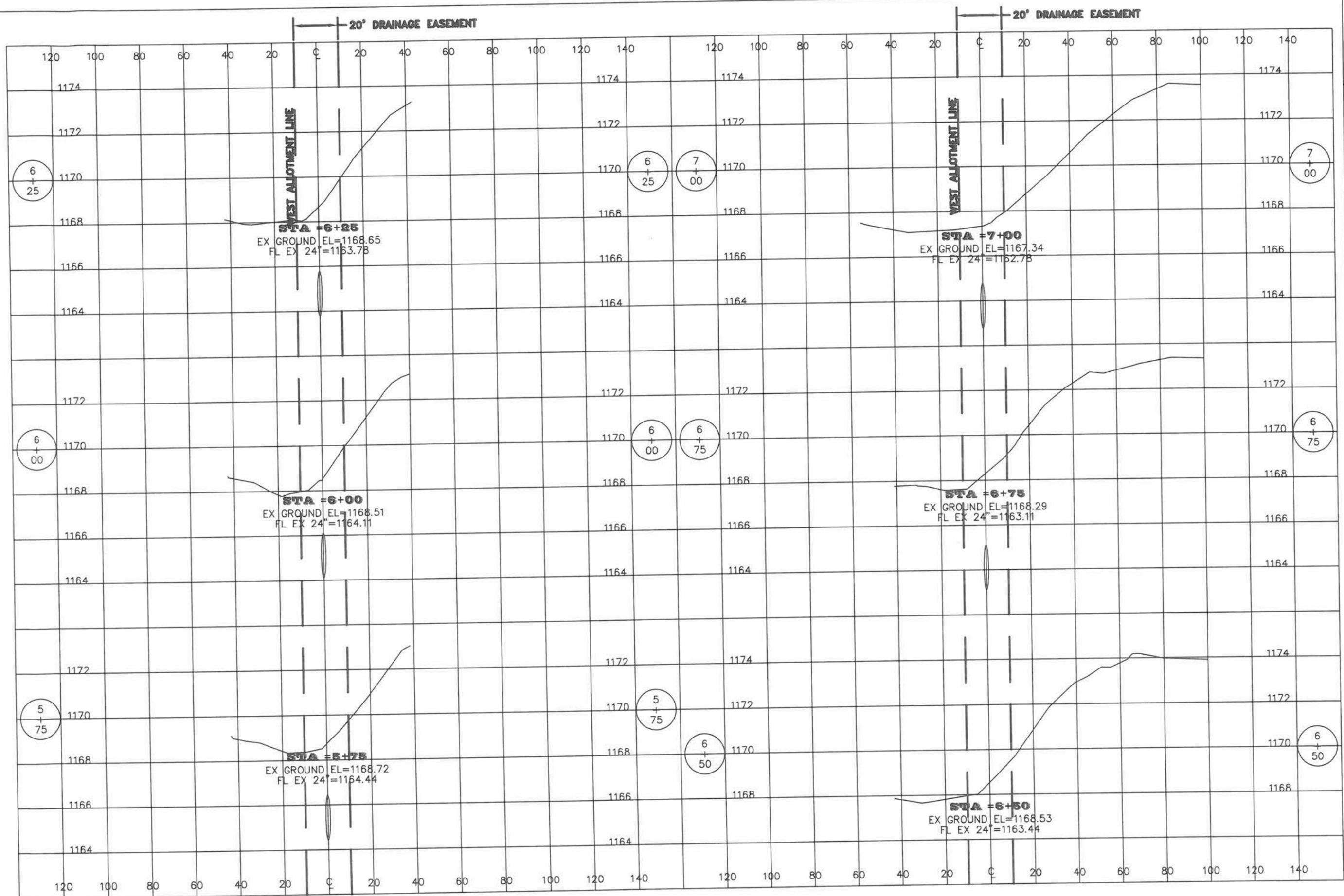
DATE: 11/09/2011
 DRAWN BY: SLB
 CHECKED BY: CGD/JP
 APP'D BY: CGD

REVISIONS BY: CITY ENGINEERING 10/19/12

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SHEET NO. 12 OF 19



FRASER ESTATES STORM SEWER REPLACEMENT PROJECT
CROSS SECTIONS
 STA. 5+75 - STA. 7+00
 10' EAST OF WEST ALLOTMENT LINE

SCALES
 HORZ. 1" = 20'
 VERT. 1" = 4'

REV. LTR.

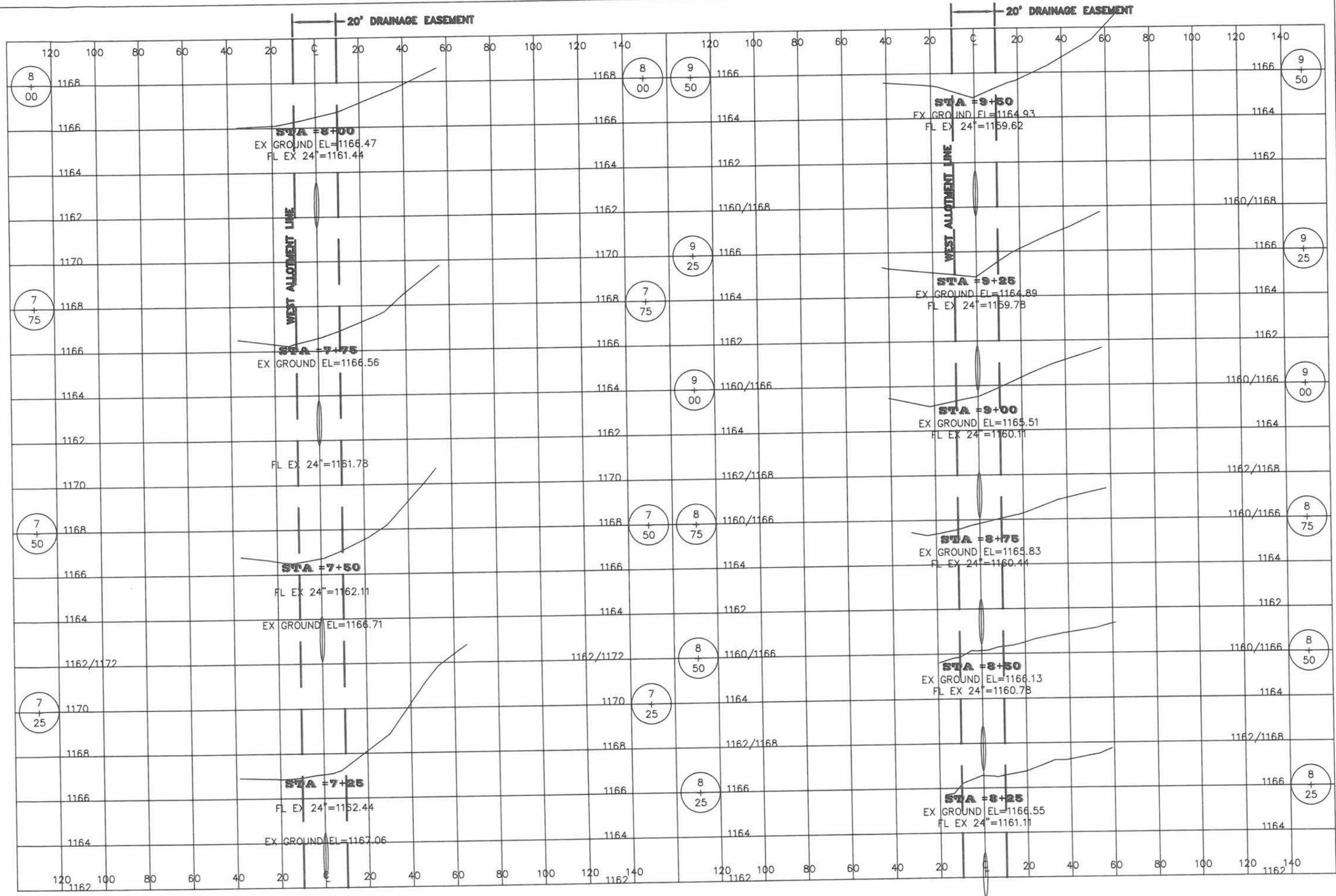
REV. LTR.	DESCRIPTION	DATE	BY	APP'D
	REVISIONS BY CITY ENGINEERING	10/19/12	CDB	

DATE: 11/15/2011
DATE: 11/09/2011
DRAWN BY: SLB
CHECKED BY: CGD/DR
APP'D BY: CGD

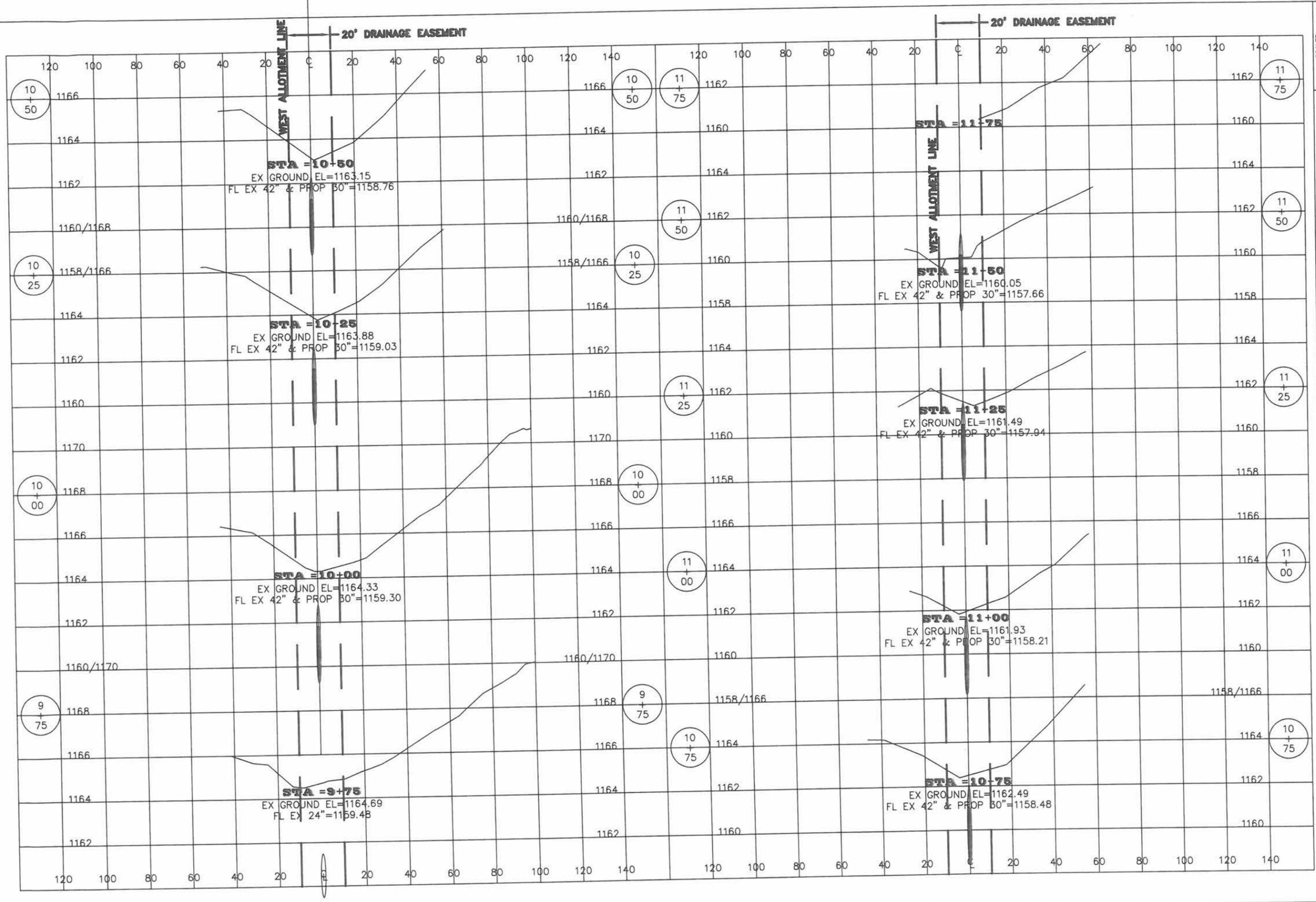
PROJECT NO.: _____
SHEET NO.: 13 **OF** 19

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FRASER ESTATES STORM SEWER REPLACEMENT PROJECT
CROSS SECTIONS
 STA. 9+75 - STA. 11+75
 10' EAST OF WEST ALLOTMENT LINE

SCALES
 HORIZ. 1" = 20'
 VERT. 1" = 4'

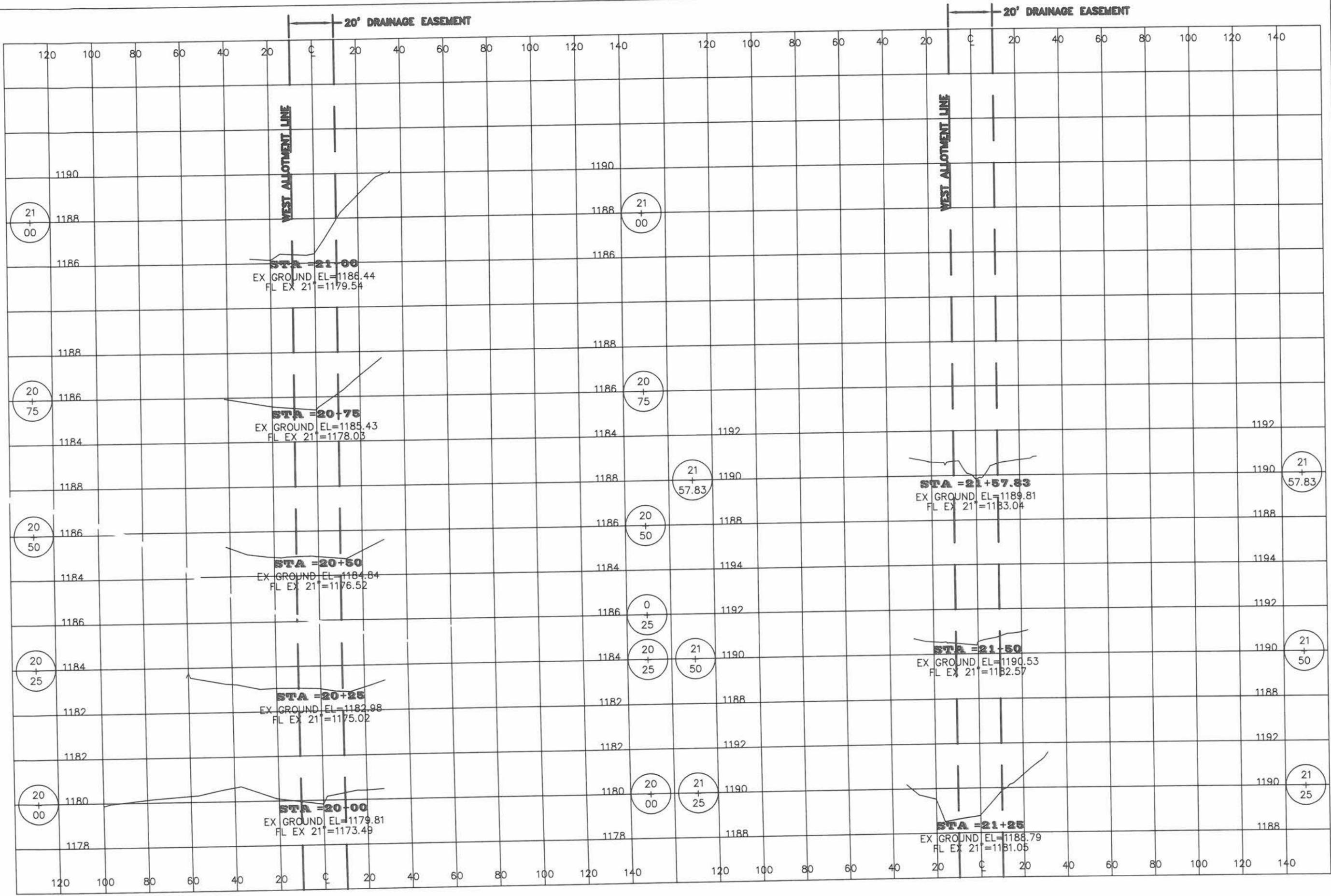
PROJECT NO. _____
 SHEET NO. 15 OF 19

PLOTTED: 11/15/2011
 DATE: 11/09/2011
 DRAWN BY: SLB
 CHECKED BY: CGD/DR
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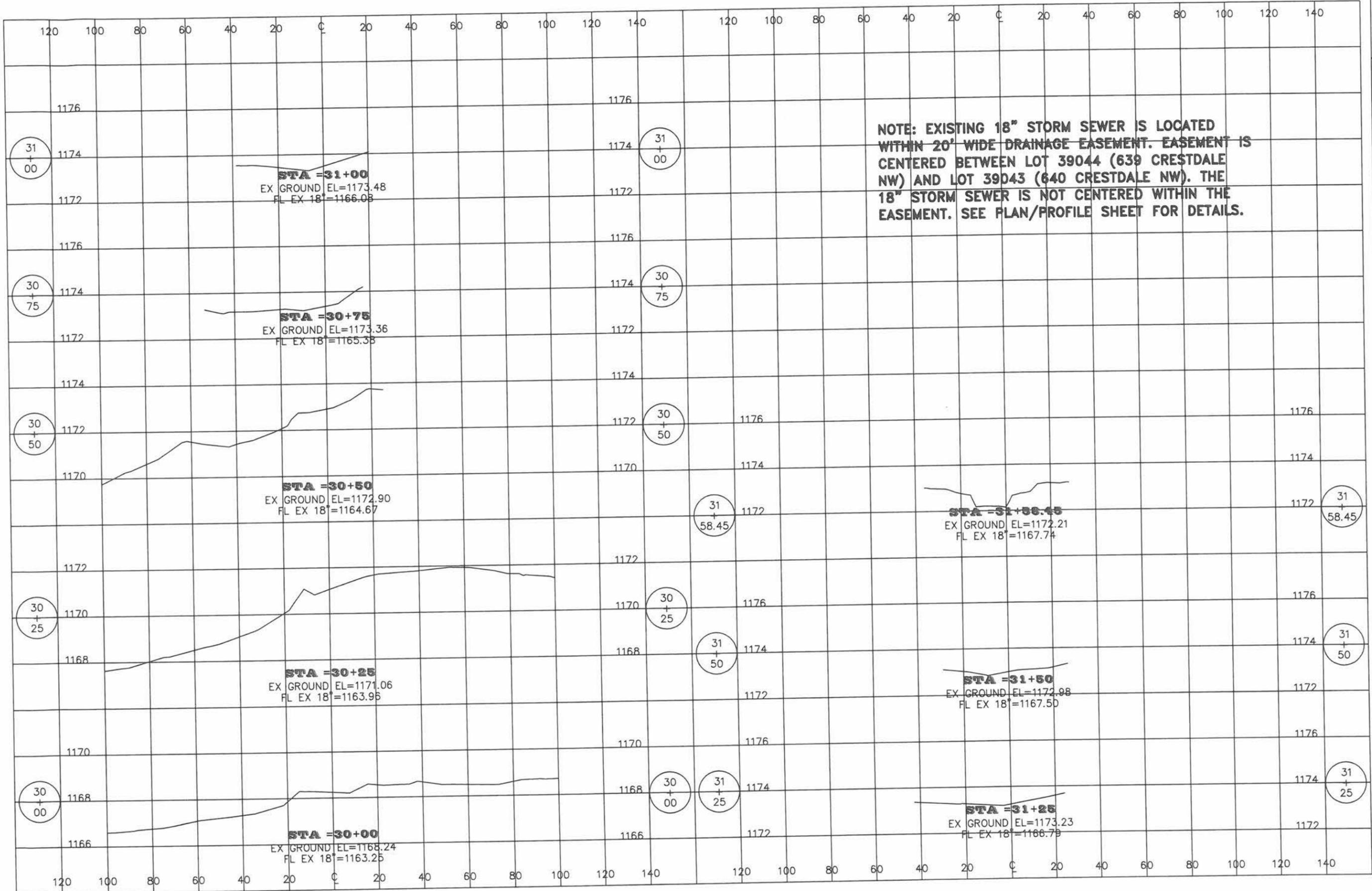


SCALES
 HORZ. 1" = 20'
 VERT. 1" = 4'
 PROJECT NO.
 SHEET NO. 16 OF 19

FRASER ESTATES STORM SEWER REPLACEMENT PROJECT
 CROSS SECTIONS
 STA. 20+00 - STA. 21+57.83
 WEST OF HUGHES ST. NW

APP'D BY: [] DATE: 11/09/2011
 DRAWN BY: SLB
 CHECKED BY: GGD/DR
 APP'D BY: GGD
 DATE PLOTTED: 11/15/2011

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NOTE: EXISTING 18" STORM SEWER IS LOCATED WITHIN 20' WIDE DRAINAGE EASEMENT. EASEMENT IS CENTERED BETWEEN LOT 39044 (639 CRESTDALE NW) AND LOT 39043 (640 CRESTDALE NW). THE 18" STORM SEWER IS NOT CENTERED WITHIN THE EASEMENT. SEE PLAN/PROFILE SHEET FOR DETAILS.

SCALES
 HORZ. 1" = 20'
 VERT. 1" = 4'
 PROJECT NO.
 SHEET NO. OF 17 19

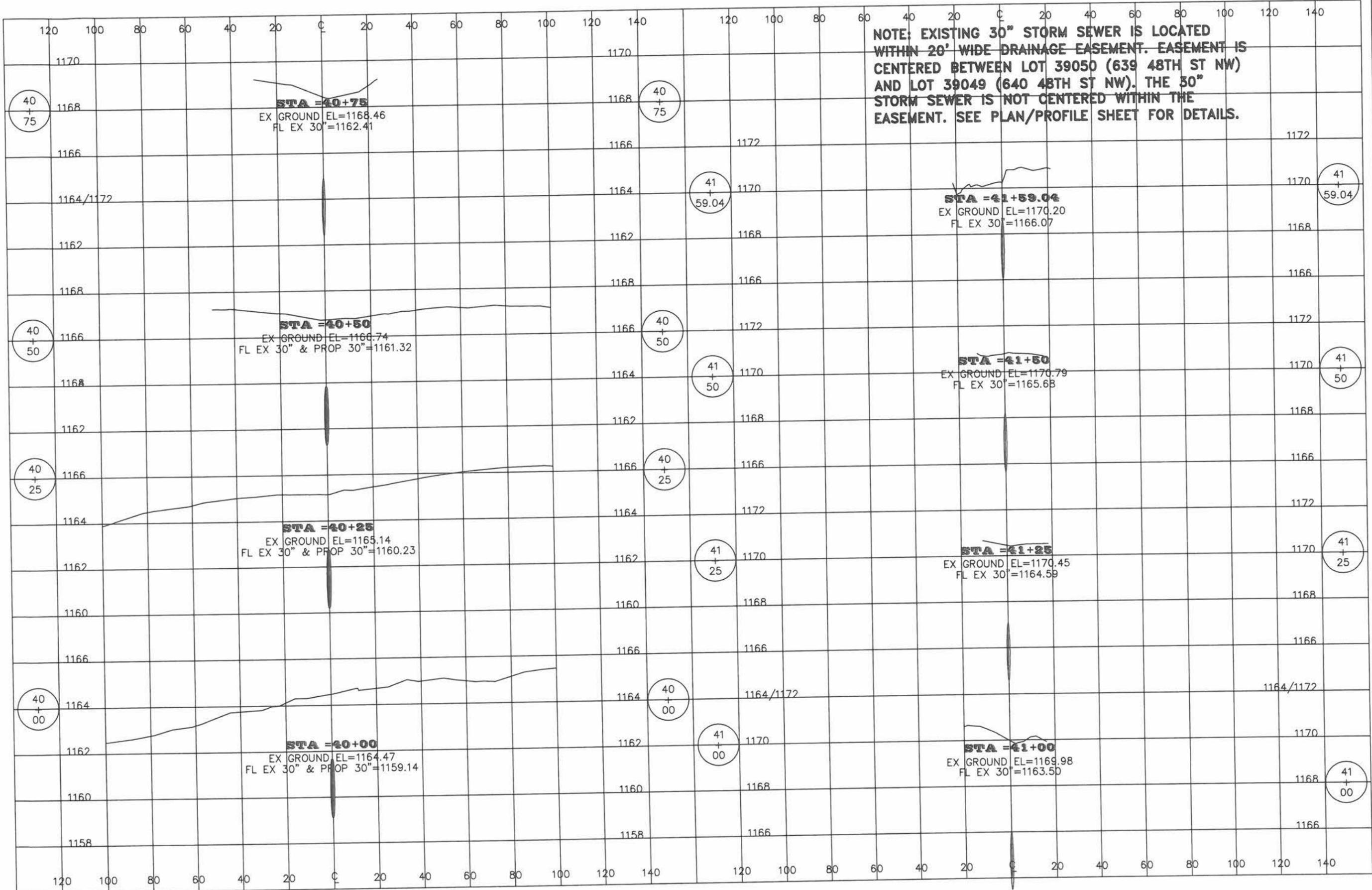
FRASER ESTATES STORM SEWER REPLACEMENT PROJECT
 CROSS SECTIONS
 STA. 30+00 - STA. 31+58.45
 WEST OF CRESTDALE ST. NW

PLOTTED: 11/15/2011
 DATE: 11/09/2011
 DRAWN BY: SLB
 CHECKED BY: CGD/DR
 APP'D BY: CGD

REV. LTR.	DESCRIPTION	DATE	BY	APP'D

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NOTE: EXISTING 30" STORM SEWER IS LOCATED WITHIN 20' WIDE DRAINAGE EASEMENT. EASEMENT IS CENTERED BETWEEN LOT 39050 (639 48TH ST NW) AND LOT 39049 (640 48TH ST NW). THE 30" STORM SEWER IS NOT CENTERED WITHIN THE EASEMENT. SEE PLAN/PROFILE SHEET FOR DETAILS.

SCALES
 HORZ. 1" = 20'
 VERT. 1" = 4'
 PROJECT NO.
 SHEET NO. OF 18 19

FRASER ESTATES STORM SEWER REPLACEMENT PROJECT
 CROSS SECTIONS
 STA. 40+00 - STA. 41+59.04
 WEST OF 48th ST. NW

REV. LTR.	DESCRIPTION	DATE	BY	APP'D	PLOTTED: 11/15/2011
					DATE: 11/09/2011
					DRAWN BY: SLB
					CHECKED BY: GGD/DR
					APPROV BY: GGD

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NOTES:

1. ALL WORK SHALL CONFORM TO ODOT ITEM 604 EXCEPT AS OTHERWISE NOTED HEREIN.
2. PRECAST CONCRETE OR BRICK CATCH BASINS ARE ALLOWED AS NOTED HEREIN.
3. IF THE CATCH BASIN WILL BE USED IN A TRAFFIC-BEARING APPLICATION, THE PRECAST CONCRETE PORTION OF AN ODOT 2-2B CATCH BASIN MAY BE USED. HOWEVER, THE INLET FRAME AND GRATE AS SPECIFIED HEREIN SHALL BE USED IN LIEU OF THE ODOT 2-2 "LAY-IN" GRATE. ALL ANNULAR SPACE REMAINING BETWEEN THE BOTTOM OF THE INLET FRAME AND THE TOP OF THE PRECAST SECTION SHALL BE FILLED WITH CEMENT GROUT OR CLASS 'C' CONCRETE. IF THE CATCH BASIN WILL BE USED IN A NON-TRAFFIC-BEARING APPLICATION, AN ODOT 2-2 CATCH BASIN MAY BE USED WITH THE STANDARD "LAY-IN" GRATE.
4. ALL CONCRETE SHALL CONFORM TO ODOT ITEM 499 CLASS C (4000 psi).
5. A CONCRETE CHANNEL SHALL BE POURED INTO THE BOTTOM OF THE CATCH BASIN USING CLASS 'C' CONCRETE. THE CHANNEL SHALL TAPER FROM 9" THICKNESS TO 2" MIN. THICKNESS AT THE LOWEST SEWER INVERT AND SHALL BE FINISHED WITH A SMOOTH SURFACE.
6. THE EXCAVATED AREA AROUND THE CATCH BASIN SHALL BE BACKFILLED WITH ODOT ITEM 703.11, TYPE 1 (304, 411, OR 617) COMPACTED IN 8" LIFTS. NO FOUNDRY SAND OR SLAG PERMITTED.
7. WHERE CATCH BASIN WILL BE LOCATED WITHIN CROSSWALK, AT ADA RAMP, OR IN DESIGNATED BIKE LANE, CASTING SHALL BE EAST JORDAN IRON WORKS (EJIW) 5250 INLET WITH V-5622080 ADA GRATE OR NEENAH R-3405-A INLET WITH TYPE 'L' GRATE, OR EQUAL APPROVED BY CITY ENGINEER. AS APPLICABLE, GRATE SHALL BE ORIENTED SUCH THAT THE LONG OPENINGS ARE PERPENDICULAR TO NORMAL DIRECTION OF BICYCLE TRAFFIC FLOW. IN OTHER LOCATIONS, CASTING SHALL BE EJIW 5250 OR NEENAH R-3405 INLET AND STANDARD GRATE MAY BE USED. IN ALL LOCATIONS, GRATE MUST INCLUDE "ECO-SENSITIVE" MARKINGS SUCH AS: "DUMP NO WASTE; DRAINS TO STREAM" AND AN AQUATIC LIFE LOGO. THE LETTERING AND LOGO SHALL BE RAISED OR RECESSED AND INTEGRAL WITH THE CASTING. ALTERNATE NOTATION OR LOGO IS SUBJECT TO THE CITY ENGINEER'S APPROVAL.
8. ALL OPENINGS AND KNOCKOUTS FOR INLET AND OUTLET PIPING SHALL BE FASHIONED NEATLY. ALL ANNULAR SPACE SHALL BE FILLED WITH CEMENT GROUT, BRICK AND MORTAR, OR CLASS 'C' CONCRETE.
9. ODOT REFERENCES ARE FROM THE CURRENT ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS. ANY DISCREPANCIES SHALL BE SUBJECT TO THE CITY ENGINEER'S DISCRETION.

BRICK CATCH BASINS ARE ACCEPTABLE AND SHALL BE CONSTRUCTED PER THIS DRAWING AND THE FOLLOWING SPECIFICATIONS:

1. PROVIDE CLAY BRICK (ASTM C-32-93) WALLS WITH FULL MORTAR (ASTM C-91 & C-150, AIR-ENTRAINED PORTLAND CEMENT) JOINTS. CONCRETE & CEMENT BLOCKS/BRICKS ARE PROHIBITED FOR NEW OR RECONSTRUCTED BASINS.
2. THE CATCH BASIN SHALL HAVE A CONCRETE BASE (MINIMUM 6" THICKNESS) EXTENDING 6" BEYOND OUTSIDE OF FOUR WALLS OF CATCH BASIN.
3. EVERY SEVENTH COURSE MUST BE A STRETCHER COURSE.
4. WALL SHALL BE MINIMUM 8" THICK.
5. PLASTER OUTSIDE WALLS WITH 1/2" NON-SHRINK MORTAR; INSIDE JOINTS MUST BE NEATLY STRUCK AND CLOSED.

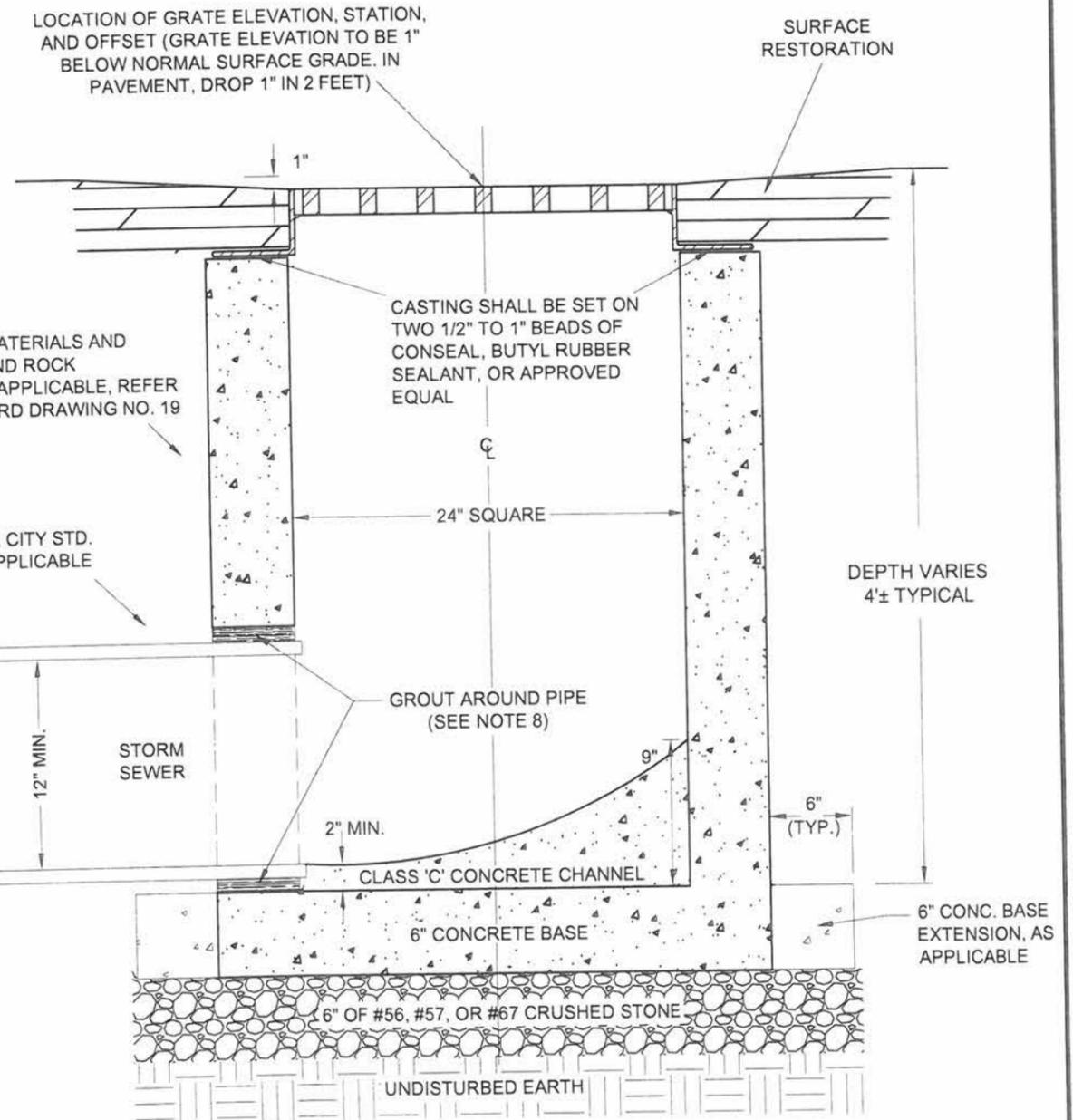
PRECAST CONCRETE CATCH BASINS ARE ACCEPTABLE AND SHALL BE CONSTRUCTED PER THIS DRAWING AND THE FOLLOWING SPECIFICATIONS:

1. THE PRECAST UNIT SHALL CONFORM TO ODOT ITEM 706.13.
2. PRECAST WALLS AND BOTTOM SHALL HAVE A MINIMUM THICKNESS OF 6".
3. A 6" CONCRETE BASE EXTENSION IS REQUIRED ON ALL FOUR SIDES WHEN DEPTH (TOP OF GRATE TO LOWEST PIPE INVERT) EXCEEDS 6 FEET.
4. STACKED PRECAST SECTIONS MUST HAVE A TONGUE/ GROOVE JOINT AND A BUTYL SEALANT.
5. SHOP DRAWING OF THE PRECAST UNIT SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.

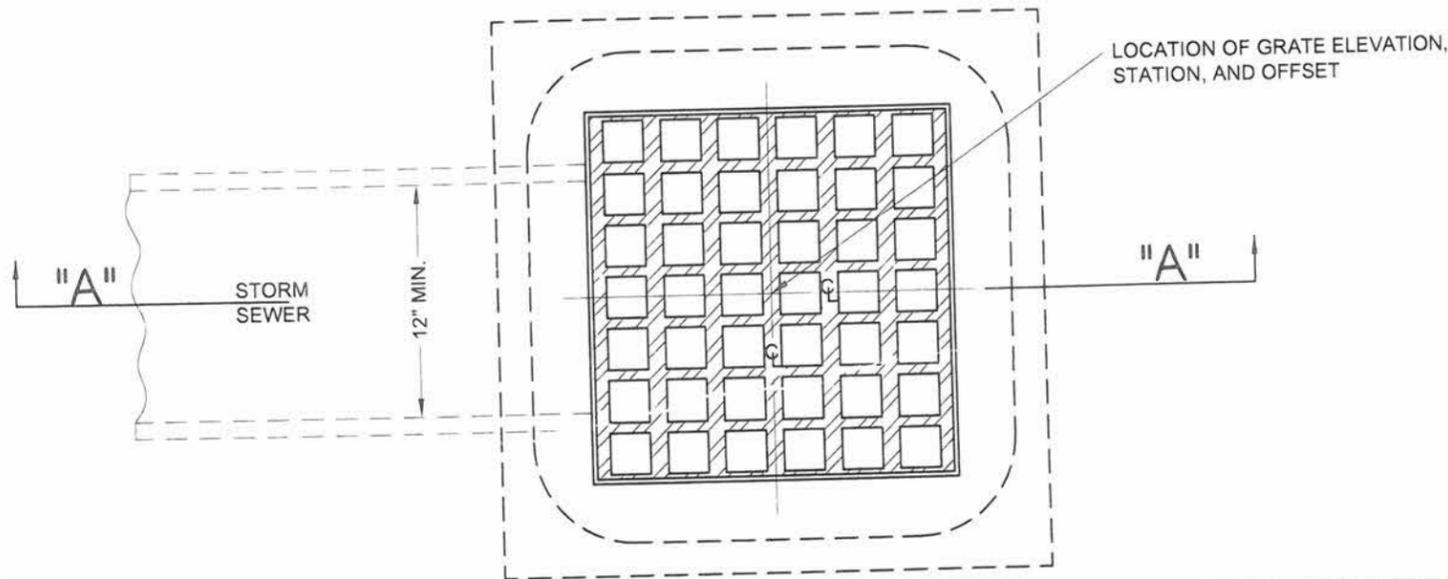
FOR BACKFILL MATERIALS AND COMPACTION, AND ROCK EXCAVATION, IF APPLICABLE, REFER TO CITY STANDARD DRAWING NO. 19

BEDDING AROUND PIPE PER CITY STD. DWG. NO. 19, AS APPLICABLE

SECTION A-A
NOT TO SCALE



PLAN VIEW
NOT TO SCALE



(PRECAST CONCRETE CATCH BASIN SHOWN)



OFFICE OF THE CITY ENGINEER
CANTON, OHIO

DANIEL J. MOEGLIN, P.E., CITY ENGINEER
2436 30th St. NE 44705 330-489-3381 www.cantonohio.gov/engineering

APPROVED DATE: MAR. 2012

APPROVED BY: CDB, RMB, SLH

DRAWING FILE NAME: ce_04.dwg

REVISIONS		
DESCRIPTION	DATE	BY

STANDARD DRAWING NO. 4
SQUARE-TOP CATCH BASIN

NOTES:

1. BEDDING:

MATERIALS SHALL BE AASHTO M 43 NO. 56, 57, OR 67 CRUSHED STONE. NO ALTERNATES UNLESS APPROVED BY THE CITY ENGINEER. PRIVATE UTILITIES MAY TYPICALLY PROVIDE ALTERNATIVE BEDDING MATERIAL AS APPROVED BY THE CITY ENGINEER.

BEDDING WIDTH TABLE

PIPE TYPE	MIN. WIDTH, TYP.	MAX. WIDTH, TYP.
NON-RIGID PIPE (PVC, HDPE, CMP, ALUMINUM)	PIPE I.D. x 1.25 + 1'-0"	PIPE O.D. + 2'-0"
RIGID PIPE (CONC., VIT. CLAY, DUCTILE IRON)	PIPE I.D. x 1.33	PIPE O.D. + 2'-0"

CENTER PIPE HORIZONTALLY WITHIN BEDDING AREA. ANY DEVIATION TO TYPICAL BEDDING REQUIREMENTS ARE SUBJECT TO THE DISCRETION OF THE CITY ENGINEER.

THE BEDDING LIMITS SHOWN APPLY IN ALL CASES EXCEPT FOR WHEN PIPE MANUFACTURER SPECIFIES A BEDDING WIDTH DIFFERENT FROM THAT SHOWN AND THE CITY ENGINEER PERMITS SAME.

2. BACKFILL:

BACKFILL WITHIN THE PUBLIC STREET R/W:

MATERIALS SHALL BE ODOT 703.11, TYPE '1' GRANULAR MATERIAL (304, 411, OR 617 AGGREGATE GRADATION) OR TYPE '2' GRANULAR MATERIAL, OR ODOT 613, LOW STRENGTH MORTAR; DEVIATIONS FROM THIS ARE AS FOLLOWS:

- A) NO FOUNDRY SAND OR SLAG IS PERMITTED.
- B) ALTERNATE GRANULAR MATERIAL SHALL BE PERMITTED ONLY WITH THE SUPPLEMENTAL APPROVAL OF THE CITY ENGINEER. TO PETITION FOR SUCH SUPPLEMENTAL APPROVAL, THE DEVELOPER/CONTRACTOR SHALL SUBMIT IN WRITING THE FOLLOWING:
 - * SOURCE OF THE ALTERNATE BACKFILL MATERIAL.
 - * GRADATION REPORT IN ACCORDANCE WITH AASHTO T II AND T 27.
 - * PROCTOR CURVE ANALYSIS IN ACCORDANCE WITH ASTM D 698.
 - * PROPOSED COMPACTION METHOD.

THE CITY ENGINEER RESERVES THE RIGHT TO REFUSE ANY ALTERNATE BACKFILL MATERIAL, REGARDLESS OF APPROVAL OF SIMILAR MATERIAL ON A PREVIOUS PROJECT.

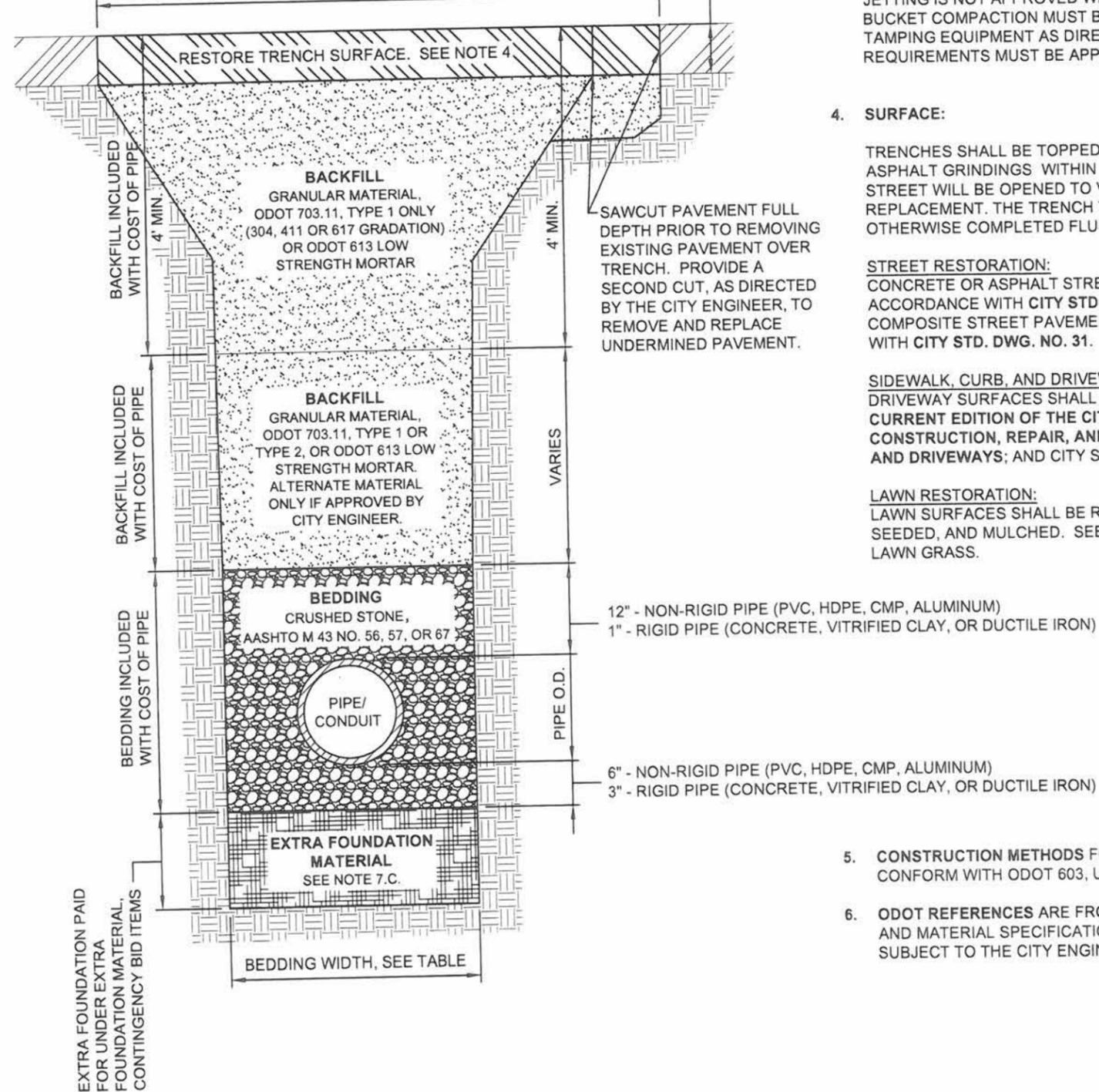
THE CITY ENGINEER FURTHER RESERVES THE RIGHT TO REFUSE ANY ALTERNATE BACKFILL MATERIAL THE CITY FINDS NOT CONSISTENT WITH THE APPROVED SOURCE, GRADATION REPORT, PROCTOR REPORT, OR COMPACTION METHOD.

- C) ODOT 703.11, TYPE 2, OR ALTERNATE MATERIALS ARE NOT PERMITTED WITHIN 4 FEET OF THE TRENCH SURFACE, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.

BACKFILL OUTSIDE OF THE PUBLIC STREET R/W:

FOLLOW MATERIAL AND METHODS FOR BACKFILL IN ACCORDANCE WITH ODOT 603.

PAVEMENT OR SURFACE REPLACEMENT MAXIMUM PAY LIMITS
 PIPE DEPTH OF 4' OR LESS = O.D. OF PIPE + 4'-0"
 PIPE DEPTH BETWEEN 4' TO 8' = O.D. OF PIPE + 5'-0"
 PIPE DEPTH GREATER THAN 8' = O.D. OF PIPE + 6'-0"
 (PIPE DEPTH BEING MEASURED FROM THE PIPE INVERT [FLOWLINE] TO THE SURFACE OF THE TRENCH)



NOTES: (CONTINUED)

3. COMPACTION:

ALL BACKFILL SHALL BE PLACED IN LAYERS NOT TO EXCEED 12-INCHES LOOSE DEPTH AND COMPACTED BY APPROVED MECHANICAL MEANS. JETTING IS NOT APPROVED WITHOUT THE CITY ENGINEER'S APPROVAL. BUCKET COMPACTION MUST BE SUPPLEMENTED WITH VIBRATION OR TAMPING EQUIPMENT AS DIRECTED. ANY MODIFICATIONS TO THESE REQUIREMENTS MUST BE APPROVED BY THE CITY ENGINEER.

4. SURFACE:

TRENCHES SHALL BE TOPPED WITH 4" OF ODOT 304 LIMESTONE OR ASPHALT GRINDINGS WITHIN EXISTING STREET PAVEMENTS WHEN THE STREET WILL BE OPENED TO VEHICULAR TRAFFIC PRIOR TO PAVEMENT REPLACEMENT. THE TRENCH TOPPING MATERIAL SHALL BE ROLLED OR OTHERWISE COMPLETED FLUSH WITH THE ADJOINING PAVEMENT.

STREET RESTORATION:

CONCRETE OR ASPHALT STREET PAVEMENT SHALL BE REPLACED IN ACCORDANCE WITH CITY STD. DWG. NO. 32. BRICK OR ASPHALT-BRICK COMPOSITE STREET PAVEMENT SHALL BE REPLACED IN ACCORDANCE WITH CITY STD. DWG. NO. 31.

SIDEWALK, CURB, AND DRIVEWAY RESTORATION:

DRIVEWAY SURFACES SHALL BE REPLACED IN ACCORDANCE WITH THE CURRENT EDITION OF THE CITY OF CANTON SPECIFICATIONS FOR THE CONSTRUCTION, REPAIR, AND REPLACEMENT OF SIDEWALKS, CURBS, AND DRIVEWAYS; AND CITY STD. DWG. NOS. 28 THRU 33.

LAWN RESTORATION:

LAWN SURFACES SHALL BE REPLACED WITH A MINIMUM OF 4" TOPSOIL, SEEDED, AND MULCHED. SEED MIX SHALL CONFORM TO ADJOINING LAWN GRASS.

- 5. CONSTRUCTION METHODS FOR BEDDING AND BACKFILL SHALL CONFORM WITH ODOT 603, UNLESS STATED OTHERWISE HEREIN.

- 6. ODOT REFERENCES ARE FROM THE CURRENT ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS. ANY DISCREPANCIES SHALL BE SUBJECT TO THE CITY ENGINEER'S DISCRETION.



OFFICE OF THE CITY ENGINEER
 CANTON, OHIO

DANIEL J. MOEGLIN, P.E., CITY ENGINEER
 2436 30th St. NE 44705 330-489-3381 www.cantonohio.gov/engineering

APPROVED DATE: JAN 2012

APPROVED BY: CDB, RMB, SLH

DRAWING FILE NAME: ce_19.dwg

REVISIONS

DESCRIPTION	DATE	BY
REVISIONS TO NOTES 7 & 8	6/4/2012	CDB

STANDARD DRAWING NO. 19

UTILITY TRENCH REQUIREMENTS

NOTES: (CONTINUED)

7. PAY LIMITS

- A) **BEDDING AND BACKFILL** IS INCLUDED IN WITH THE COST OF PIPE UNLESS BID OTHERWISE.
- B) **PAVEMENT RESTORATION:** THE WIDTH MEASUREMENT OVER THE TRENCH FOR PAVEMENT RESTORATION SHALL NOT EXCEED THE OUTSIDE DIAMETER (O.D.) OF PIPE PLUS A SET MEASUREMENT DEPENDENT ON DEPTH OF PIPE. AREA MEASUREMENTS AT MANHOLE AND CATCH BASIN STRUCTURES SHALL NOT EXCEED THE AREA OF THE BASE OF THE STRUCTURE + 3'-0" OFFSET AREA AROUND THE STRUCTURE'S BASE.
- C) **EXTRA FOUNDATION MATERIAL:**

WHEN IN THE OPINION OF THE CITY ENGINEER, SOFT/UNSTABLE MATERIALS ARE ENCOUNTERED WHICH ARE UNSUITABLE FOR BEDDING FOUNDATION, SAID MATERIAL SHALL BE REMOVED BY THE CONTRACTOR TO THE DEPTH DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE MATERIAL.

FOR CITY PROJECTS, THE PAYABLE WIDTH OF THE EXTRA FOUNDATION MATERIAL SHALL NOT EXCEED THE LESSER OF THE APPLICABLE MINIMUM OR MAXIMUM TYPICAL BEDDING WIDTH, AS NOTED ON SHEET 1 OF STD. DWG. NO. 19. THE CONTRACTOR SHALL BE PAID FOR OVER-EXCAVATION AND BEDDING FOUNDATION MATERIAL UNDER THE CONTINGENCY BID ITEMS FOR EXTRA FOUNDATION MATERIAL.

FOR PRIVATE WORK, ALL COSTS ARE AT THE OWNER'S EXPENSE.

EXTRA FOUNDATION MATERIAL, OPTION A, B, C, & D, MAY BE USED IN ANY COMBINATION AS DIRECTED BY THE CITY ENGINEER:

- OPTION A: CRUSHED STONE, AASHTO M 43 NO. 1 AND/OR 2
- OPTION B: CRUSHED STONE, AASHTO M 43 NO. 56, 57, OR 67
- OPTION C: ODOT 703.11, TYPE 1 (304, 411 OR 617 GRADATION)
- OPTION D: TENSAR GEOGRID T1100, OR APPROVED EQUAL

EXTRA FOUNDATION MATERIAL, CONTINGENCY BID ITEMS

ITEM	QTY.	UNIT	DESCRIPTION
603		C.Y.	EXTRA FOUNDATION, OPTION A (#1,#2 STONE)
603		C.Y.	EXTRA FOUNDATION, OPTION B (#56,57,67 STONE)
603		C.Y.	EXTRA FOUNDATION, OPTION C (304,411,617)
603		S.F.	EXTRA FOUNDATION, OPTION D (GEOGRID)

NOTES: (CONTINUED)

8. EXCAVATION OF ROCK OR BURIED/ABANDONED CONCRETE STRUCTURE REMOVAL

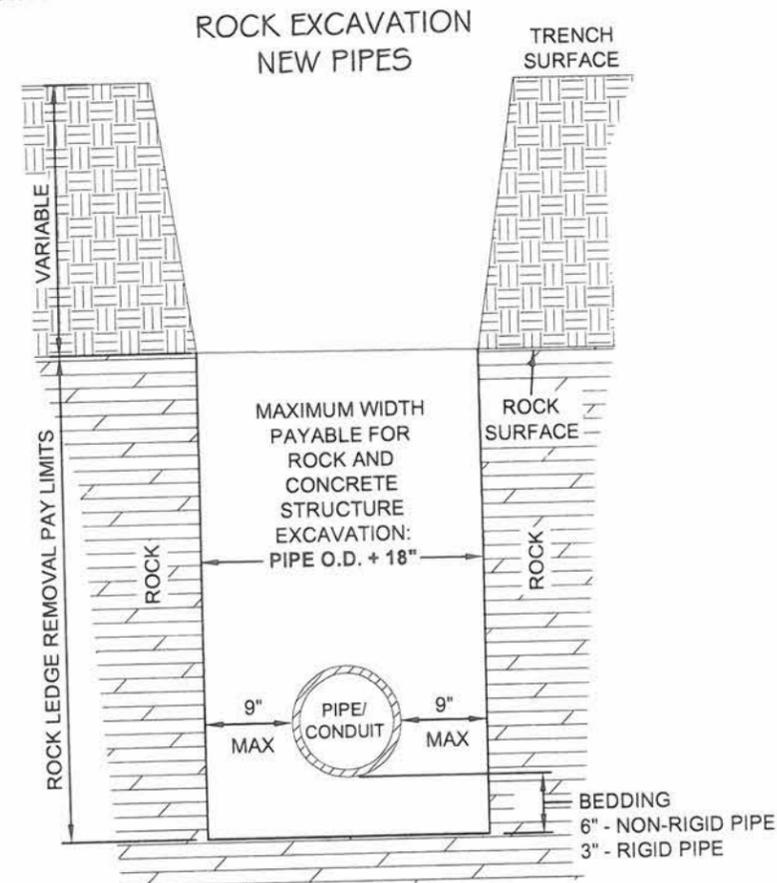
EXCAVATION FOR NEW MANHOLES AND CATCH BASINS, UNLESS OTHERWISE SPECIFIED OR SHOWN ON CONSTRUCTION PLANS, SHALL BE MEASURED BETWEEN VERTICAL PLANES ONE (1) FOOT BEYOND THE OUTSIDE EDGE OF THE FOUNDATION OF THE STRUCTURES ON ALL SIDES, AND PARALLEL THERETO, AND FROM THE SURFACE OF THE ROCK TO THE BOTTOM OF THE ROCK OR THE NEAT LINES OF THE BOTTOM OF THE STRUCTURES PLUS THE DEPTH OF THE BASE MATERIAL, USE THE MEASUREMENT WHICH IS LESSER.

EXCAVATION FOR NEW PIPES, UNLESS OTHERWISE SPECIFIED OR SHOWN ON CONSTRUCTION PLANS, SHALL BE MEASURED BETWEEN TRENCH WALLS (NOT TO EXCEED PIPE O.D. + 18", AND FROM THE SURFACE OF THE ROCK TO THE BOTTOM OF THE ROCK OR THE BOTTOM OF THE PIPE BEDDING, USE THE MEASUREMENT WHICH IS LESSER.

EXCAVATION OF BURIED AND ABANDONED CONCRETE STRUCTURES SHALL BE MEASURED IN THE SAME MANNER AS ROCK REMOVAL.

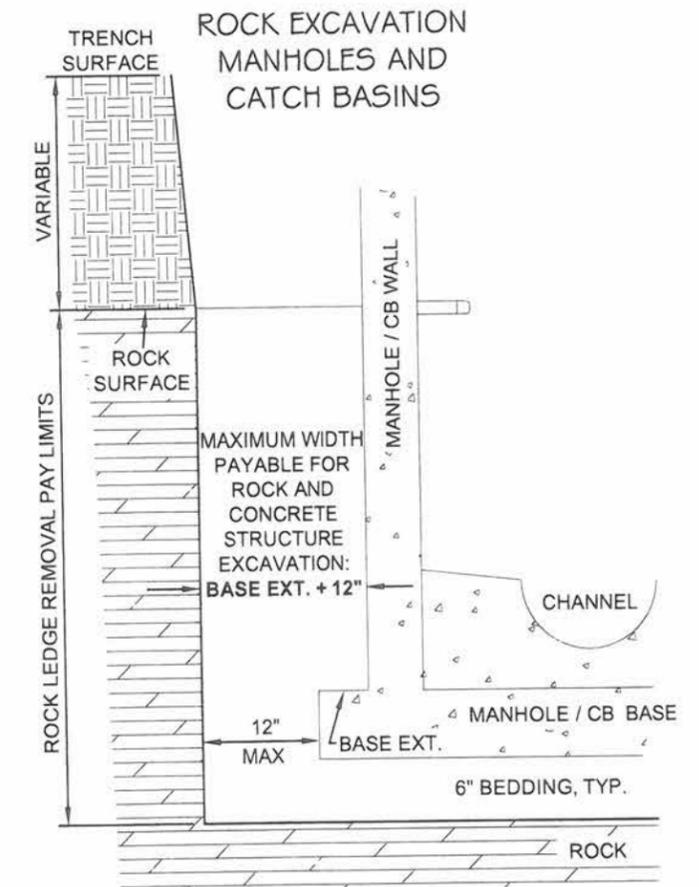
FOR CITY PROJECTS, THE CONTRACTOR SHALL BE PAID FOR ROCK REMOVAL AND CONCRETE STRUCTURE REMOVAL UNDER THE CONTINGENCY BID ITEMS FOR ROCK OR CONCRETE STRUCTURE REMOVAL. IF A CONTINGENCY BID ITEM IS NOT INCLUDED IN THE BID PROPOSAL, THE CONTRACTOR MAY SUBMIT A PROPOSAL (PRIOR TO WORK BEING STARTED) TO THE CITY ENGINEER FOR REVIEW AND APPROVAL.

FOR PRIVATE WORK, ALL COSTS ARE AT THE OWNER'S EXPENSE.



ROCK AND BURIED & ABANDONED CONCRETE STRUCTURE REMOVAL, CONTINGENCY BID ITEMS

ITEM	QTY.	UNIT	DESCRIPTION
603		C.Y.	ROCK REMOVAL
603		C.Y.	CONCRETE STRUCTURE REMOVAL



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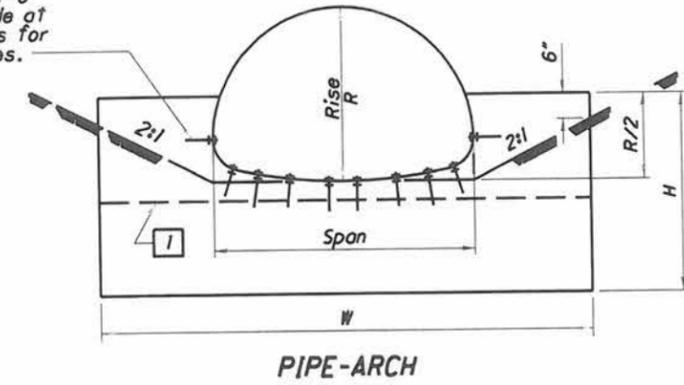
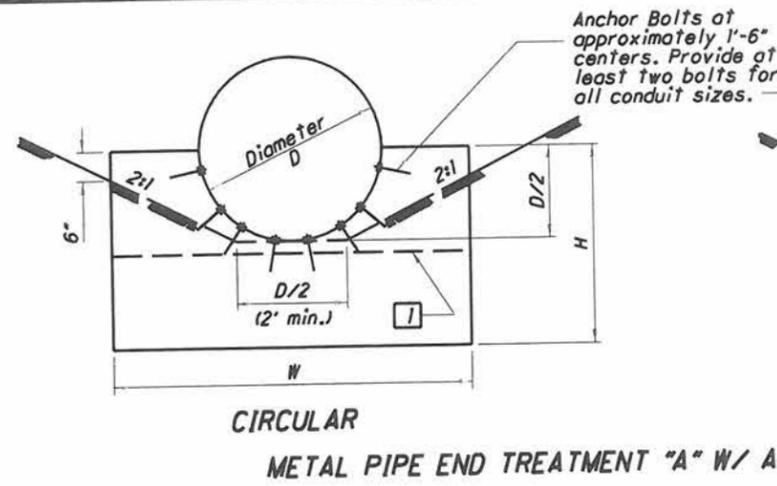
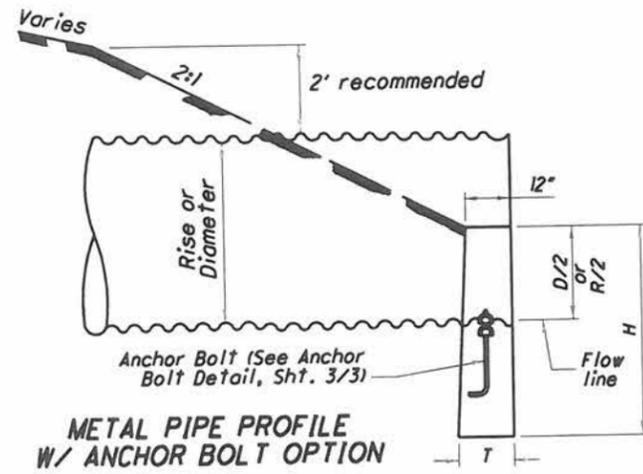
REVISIONS

DESCRIPTION	DATE	BY
REVISIONS TO NOTES 7 & 8	6/4/2012	CDB

STANDARD DRAWING NO. 19

**UTILITY TRENCH
REQUIREMENTS**

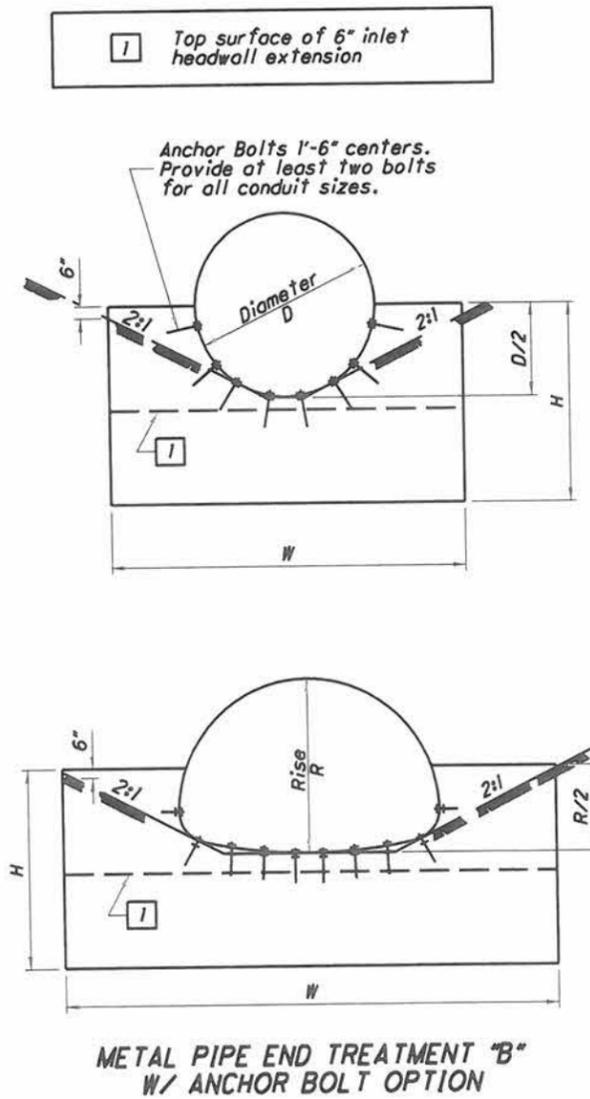
SHEET 2 OF 2

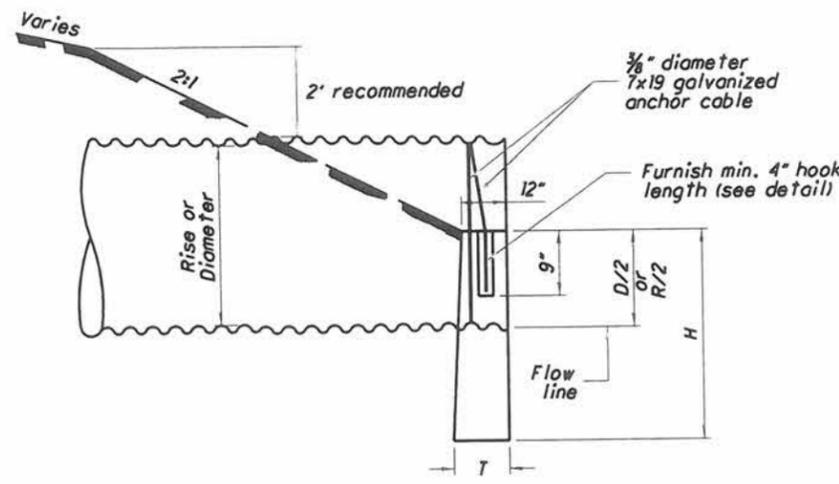


CAST-IN-PLACE HW FOR CORRUGATED METAL PIPE & PLASTIC PIPE (English)

CIRCULAR					PIPE ARCH					PIPE ARCH						
D	W	H	T	CONC. cu. yds.	SPAN	RISE	W	H	T	CONC. cu. yds.	SPAN	RISE	W	H	T	CONC. cu. yds.
2.67x1/2" Corrugations																
12"	2'-0"	3'-0"	12"	0.21	81"	59"	12'-4"	5'-5"	15"	2.14	81"	59"	12'-4"	5'-5"	15"	2.14
15"	2'-6"	3'-2"	12"	0.27	87"	63"	13'-0"	5'-7"	17"	2.50	87"	63"	13'-0"	5'-7"	17"	2.50
18"	3'-0"	3'-3"	12"	0.33	95"	67"	14'-0"	5'-9"	20"	3.14	95"	67"	14'-0"	5'-9"	20"	3.14
21"	3'-6"	3'-4"	12"	0.39	103"	71"	15'-0"	5'-11"	22"	3.54	103"	71"	15'-0"	5'-11"	22"	3.54
24"	4'-0"	3'-6"	12"	0.46	112"	75"	16'-0"	6'-1"	24"	3.96	112"	75"	16'-0"	6'-1"	24"	3.96
27"	4'-6"	3'-8"	12"	0.53	117"	79"	17'-9"	6'-3"	25"	4.89	117"	79"	17'-9"	6'-3"	25"	4.89
30"	5'-0"	3'-9"	12"	0.60	128"	83"	18'-0"	6'-5"	26"	5.01	128"	83"	18'-0"	6'-5"	26"	5.01
33"	5'-6"	3'-10"	12"	0.68	137"	87"	19'-0"	6'-7"	27"	5.45	137"	87"	19'-0"	6'-7"	27"	5.45
36"	6'-0"	4'-0"	12"	0.76	142"	91"	20'-9"	6'-9"	27"	6.31	142"	91"	20'-9"	6'-9"	27"	6.31
39"	6'-6"	4'-2"	12"	0.84	6"x2" Corrugations (118" Corner Radius)											
42"	7'-0"	4'-3"	12"	0.92	6'-1"	4'-7"	11'-8"	5'-7"	12"	1.89	6'-1"	4'-7"	11'-8"	5'-7"	12"	1.89
48"	8'-0"	4'-6"	12"	1.10	6'-4"	4'-9"	12'-0"	5'-8"	14"	2.12	6'-4"	4'-9"	12'-0"	5'-8"	14"	2.12
54"	9'-3"	4'-9"	12"	1.33	6'-9"	4'-11"	12'-4"	5'-9"	15"	2.42	6'-9"	4'-11"	12'-4"	5'-9"	15"	2.42
60"	10'-6"	5'-6"	12"	1.78	7'-0"	5'-1"	12'-8"	5'-10"	16"	2.44	7'-0"	5'-1"	12'-8"	5'-10"	16"	2.44
66"	11'-9"	5'-9"	12"	2.06	6"x2" Corrugations (131" Corner Radius)											
72"	13'-0"	6'-0"	12"	2.37	7'-3"	5'-3"	12'-11"	5'-11"	17"	2.69	7'-3"	5'-3"	12'-11"	5'-11"	17"	2.69
78"	14'-3"	6'-3"	14"	2.94	7'-8"	5'-5"	13'-2"	6'-0"	18"	2.77	7'-8"	5'-5"	13'-2"	6'-0"	18"	2.77
84"	15'-6"	6'-6"	14"	3.30	8'-2"	5'-9"	14'-8"	6'-2"	21"	3.45	8'-2"	5'-9"	14'-8"	6'-2"	21"	3.45
90"	16'-9"	6'-9"	16"	4.00	8'-7"	5'-11"	15'-0"	6'-3"	22"	3.75	8'-7"	5'-11"	15'-0"	6'-3"	22"	3.75
96"	18'-0"	7'-0"	16"	4.40	8'-10"	6'-1"	15'-10"	6'-4"	23"	4.15	8'-10"	6'-1"	15'-10"	6'-4"	23"	4.15
102"	19'-3"	7'-3"	18"	5.28	9'-4"	6'-3"	16'-0"	6'-5"	24"	4.65	9'-4"	6'-3"	16'-0"	6'-5"	24"	4.65
108"	20'-6"	7'-6"	20"	6.21	9'-9"	6'-7"	17'-9"	6'-7"	27"	5.41	9'-9"	6'-7"	17'-9"	6'-7"	27"	5.41
114"	21'-9"	7'-9"	22"	7.25	10'-3"	6'-9"	17'-10"	6'-8"	27"	5.45	10'-3"	6'-9"	17'-10"	6'-8"	27"	5.45
120"	23'-0"	8'-0"	24"	8.38	10'-8"	7'-1"	18'-10"	6'-9"	27"	5.59	10'-8"	7'-1"	18'-10"	6'-9"	27"	5.59
126"	23'-0"	8'-3"	26"	8.64	10'-11"	7'-3"	18'-11"	6'-10"	28"	5.97	10'-11"	7'-3"	18'-11"	6'-10"	28"	5.97
132"	23'-0"	8'-6"	28"	9.23	11'-5"	7'-5"	19'-9"	7'-0"	28"	6.52	11'-5"	7'-5"	19'-9"	7'-0"	28"	6.52
138"	24'-1"	8'-9"	30"	10.50	11'-10"	7'-7"	20'-9"	7'-1"	29"	6.94	11'-10"	7'-7"	20'-9"	7'-1"	29"	6.94
144"	25'-2"	9'-0"	32"	11.89	12'-4"	7'-9"	21'-8"	7'-3"	29"	7.12	12'-4"	7'-9"	21'-8"	7'-3"	29"	7.12
150"	26'-4"	9'-3"	34"	13.38	12'-8"	8'-1"	22'-7"	7'-4"	30"	7.95	12'-8"	8'-1"	22'-7"	7'-4"	30"	7.95
156"	27'-5"	9'-6"	36"	15.01	12'-10"	8'-4"	23'-7"	7'-5"	30"	8.48	12'-10"	8'-4"	23'-7"	7'-5"	30"	8.48
162"	28'-7"	9'-9"	38"	16.75	13'-5"	8'-5"	23'-7"	7'-6"	30"	8.63	13'-5"	8'-5"	23'-7"	7'-6"	30"	8.63
168"	29'-8"	10'-0"	40"	18.61	13'-11"	8'-7"	23'-7"	7'-7"	31"	8.81	13'-11"	8'-7"	23'-7"	7'-7"	31"	8.81
174"	30'-9"	10'-3"	42"	20.28	14'-3"	8'-11"	25'-6"	7'-9"	31"	9.78	14'-3"	8'-11"	25'-6"	7'-9"	31"	9.78
180"	31'-11"	10'-6"	43"	21.87	14'-10"	9'-1"	25'-6"	7'-10"	32"	10.25	14'-10"	9'-1"	25'-6"	7'-10"	32"	10.25
186"	33'-0"	10'-9"	44"	23.54	15'-4"	9'-3"	25'-6"	7'-11"	32"	10.25	15'-4"	9'-3"	25'-6"	7'-11"	32"	10.25
192"	34'-2"	11'-0"	45"	25.30	15'-6"	9'-5"	26'-5"	8'-0"	32"	10.74	15'-6"	9'-5"	26'-5"	8'-0"	32"	10.74
198"	35'-3"	11'-3"	46"	27.12	15'-8"	9'-7"	27'-5"	8'-1"	33"	11.28	15'-8"	9'-7"	27'-5"	8'-1"	33"	11.28
204"	36'-4"	11'-6"	47"	29.15	15'-10"	9'-10"	28'-5"	8'-2"	33"	12.00	15'-10"	9'-10"	28'-5"	8'-2"	33"	12.00
210"	37'-6"	11'-9"	48"	31.03	16'-5"	9'-11"	28'-5"	8'-3"	33"	12.09	16'-5"	9'-11"	28'-5"	8'-3"	33"	12.09
216"	38'-7"	12'-0"	49"	33.43	16'-7"	10'-1"	29'-4"	8'-4"	34"	12.64	16'-7"	10'-1"	29'-4"	8'-4"	34"	12.64
222"	39'-9"	12'-3"	50"	36.26	17'-1"	10'-4"	30'-7"	8'-11"	36"	14.84	17'-1"	10'-4"	30'-7"	8'-11"	36"	14.84
228"	40'-10"	12'-6"	51"	37.52	17'-5"	10'-6"	31'-5"	9'-0"	36"	15.42	17'-5"	10'-6"	31'-5"	9'-0"	36"	15.42
234"	42'-0"	12'-9"	52"	39.86	17'-11"	10'-8"	31'-7"	9'-1"	37"	15.83	17'-11"	10'-8"	31'-7"	9'-1"	37"	15.83
240"	43'-1"	13'-0"	53"	42.28	18'-1"	10'-10"	32'-5"	9'-2"	37"	16.43	18'-1"	10'-10"	32'-5"	9'-2"	37"	16.43
246"	44'-2"	13'-3"	54"	44.83	18'-7"	12'-0"	32'-6"	9'-3"	37"	16.78	18'-7"	12'-0"	32'-6"	9'-3"	37"	16.78
252"	45'-4"	13'-6"	55"	47.44	18'-11"	12'-2"	33'-4"	9'-4"	38"	17.43	18'-11"	12'-2"	33'-4"	9'-4"	38"	17.43
3"x1" Corrugations																
222"	39'-9"	12'-3"	50"	36.26	40"	31"	6'-6"	3'-7"	12"	0.70	15'-6"	9'-5"	26'-5"	8'-0"	32"	10.74
228"	40'-10"	12'-6"	51"	37.52	46"	36"	7'-8"	3'-9"	12"	0.85	15'-8"	9'-7"	27'-5"	8'-1"	33"	11.28
234"	42'-0"	12'-9"	52"	39.86	53"	41"	9'-0"	4'-0"	12"	1.06	15'-10"	9'-10"	28'-5"	8'-2"	33"	12.00
240"	43'-1"	13'-0"	53"	42.28	60"	46"	10'-0"	4'-4"	12"	1.27	16'-5"	9'-11"	28'-5"	8'-3"	33"	12.09
246"	44'-2"	13'-3"	54"	44.83	66"	51"	11'-0"	4'-8"	12"	1.54	16'-7"	10'-1"	29'-4"	8'-4"	34"	12.64
252"	45'-4"	13'-6"	55"	47.44	73"	55"	11'-8"	5'-3"	12"	1.81	--	--	--	--	--	--

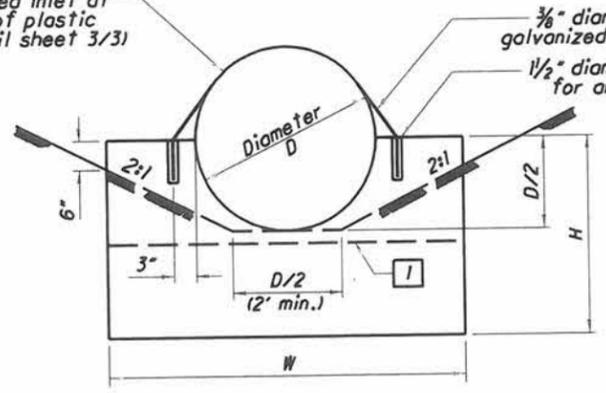
* Determine channel configuration for pipe sizes between end treatment "A" and end treatment "B" by 2:1 slopes passing through a point 6" below the top and at each side of the headwall. For end treatment "B", 2:1 slopes are tangent to pipe.



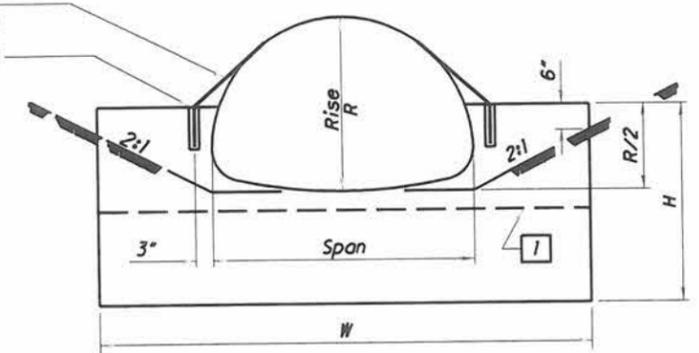


PLASTIC & METAL PIPE PROFILE
 W/ ANCHOR CABLE OPTION

Provide improved inlet at upstream end of plastic pipe (see detail sheet 3/3)



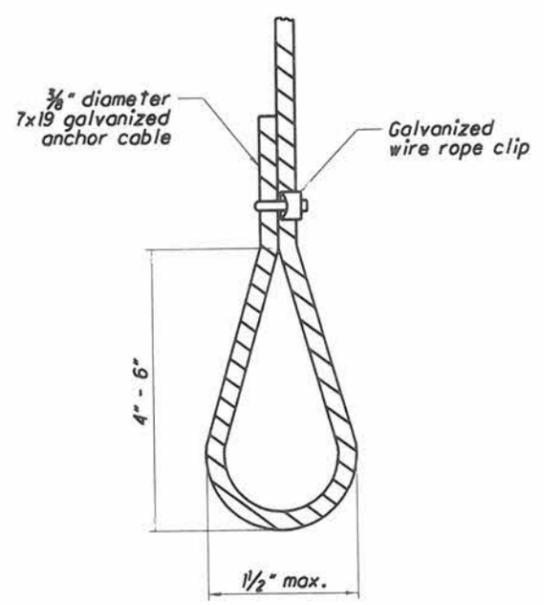
CIRCULAR



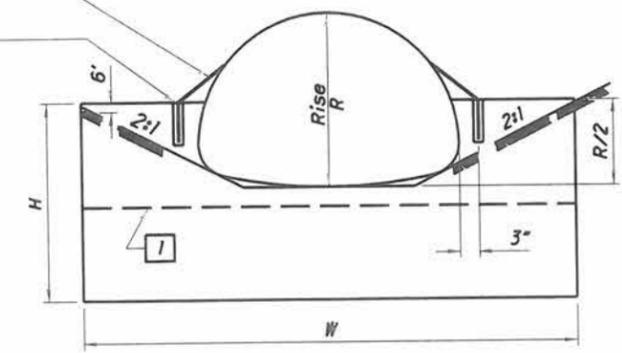
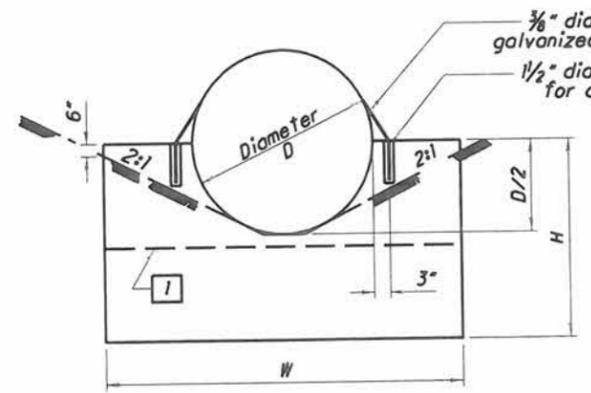
METAL PIPE-ARCH

PLASTIC & METAL PIPE END TREATMENT "A"
 W/ ANCHOR CABLE OPTION

1 Top surface of 6" inlet headwall extension



ANCHOR CABLE DETAIL



METAL PIPE END TREATMENT "B"
 W/ ANCHOR CABLE OPTION

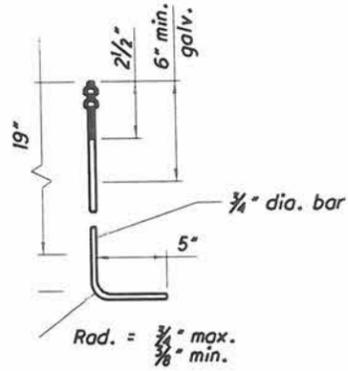
NOTES

Wrap galvanized anchor cable one time completely around the circumference of the conduit. Furnish hook at least 4" long at the ends of the anchor cable as shown above.

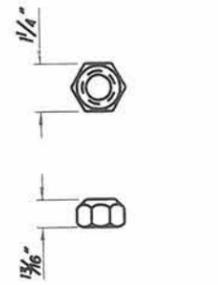
Cut galvanized anchor cable to length required.

Form or drill 1/2" diameter openings for anchor cable at locations shown. Alternatively, place anchor cable in wet concrete at the dimensions shown above to secure conduit to headwall.

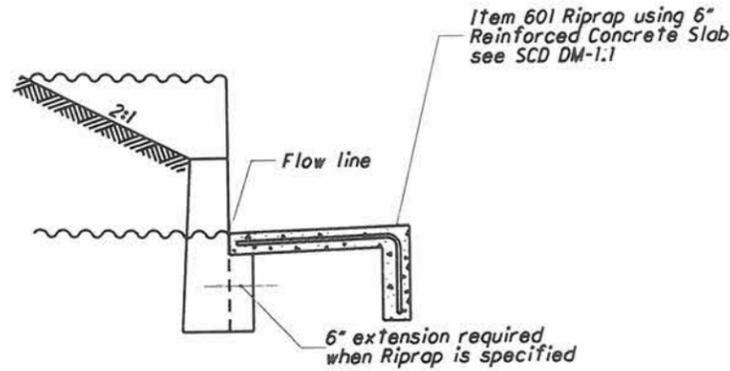
Fill any openings made for anchor cables with grout after anchor cables are placed to a tight fit.



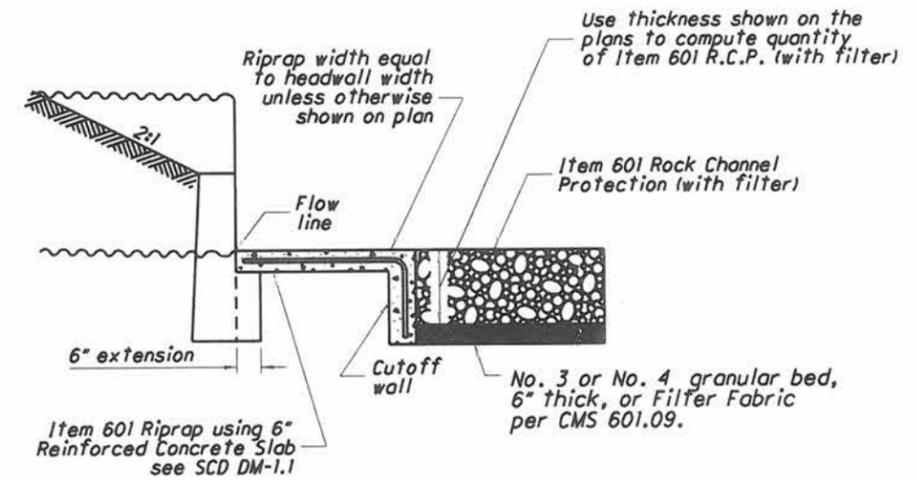
ANCHOR BOLT



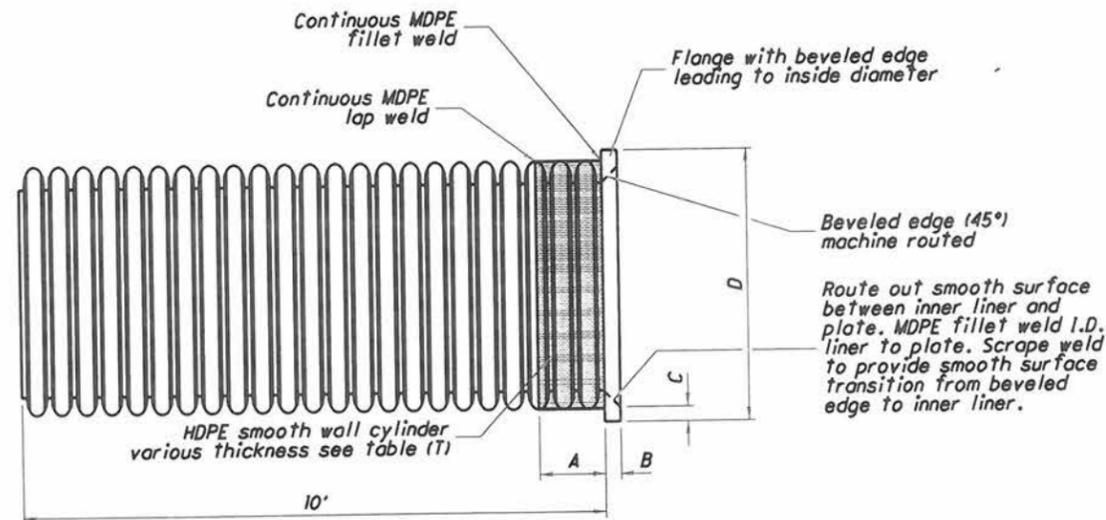
NUT
(ASTM A 325 and A 153)



**INLET CHANNEL PROTECTION
DETAIL**



OUTLET CHANNEL PROTECTION DETAIL



HDPE IMPROVED INLET - TYPE A CONDUITS

PIPE SIZE	A	B	C	D	T
12 in.	6.00 in.	0.50 in.	1.00 in.	15.15 in.	0.13 in.
15 in.	6.00 in.	0.63 in.	1.26 in.	18.73 in.	0.19 in.
18 in.	6.00 in.	0.75 in.	1.50 in.	22.57 in.	0.25 in.
24 in.	8.00 in.	1.00 in.	2.00 in.	30.08 in.	0.25 in.
30 in.	8.00 in.	1.25 in.	2.50 in.	37.50 in.	0.38 in.
36 in.	10.00 in.	1.50 in.	3.00 in.	45.00 in.	0.38 in.
42 in.	10.00 in.	1.75 in.	3.50 in.	51.90 in.	0.38 in.
48 in.	10.00 in.	2.00 in.	4.00 in.	59.60 in.	0.38 in.
60 in.	12.00 in.	2.50 in.	5.00 in.	74.50 in.	0.38 in.

NOTES

GENERAL: Provide a riprap reinforced concrete slab according to SCD DM-1.1 if the pipe is depressed or it is specified in the plan. Payment for the slab is made per square yard of Item 601 Riprap Using 6" Reinforced Concrete Slab and includes the cost of the cutoff wall.

This drawing is for cast-in-place half-height concrete headwalls. When furnishing precast half-height headwalls, conform to pre-approved designs on file with the Office of Materials Management. Precast half-height headwalls are only approved for round conduits with a maximum conduit diameter of 78". When precast headwalls are furnished, provide openings for the anchor cable as shown and fill with grout after placement of the anchor cable. If anchor bolts are to be used with a precast headwall, fill the anchor cable openings with grout.

CONCRETE: Use Class C concrete for headwall. Concrete quantities are based on headwalls without the 6" extension under the channel protection.

ANCHOR BOLTS: Furnish bolts (see detail sheet 2/3) that meet ASTM A 307 for anchoring both ends of metal pipe. The top 6" min. of the bolt must be galvanized according to ASTM A 153. Cost of anchors is included in the price bid per foot of Item 603.

Headwall dimensions are based on end treatment "A" for pipe sizes up to and including 120", 71"x47", and 66"x51", and on end treatment "B" for sizes over and including 132", 13'-3"x9'-4", and 7'-3"x5'-3".

PLASTIC PIPE: Plastic pipe may not be available in all the sizes specified on this drawing.

ANCHOR CABLE: Furnish anchor cable (see detail sheet 2/3) that meets ASTM A 603 for anchoring both ends of plastic pipe. Wire rope clip must be galvanized according to ASTM A 153. Cost of anchor cable and wire rope clip is included in the unit price bid per foot of Item 603.

IMPROVED INLET FOR HDPE PIPE: Furnish improved inlet at upstream end of culverts and open-ended storm sewers using plastic pipe.

Use HDPE smooth cap and flange materials according to ASTM D 3350 345464C.

NOTES:

1. ALL WORK SHALL CONFORM TO ODOT ITEM 604 EXCEPT AS OTHERWISE NOTED HEREIN.
2. PRECAST CONCRETE OR BRICK CATCH BASINS ARE ALLOWED AS NOTED HEREIN.
3. IF THE CATCH BASIN WILL BE USED IN A TRAFFIC-BEARING APPLICATION, THE PRECAST CONCRETE PORTION OF AN ODOT 2-2B CATCH BASIN MAY BE USED. HOWEVER, THE INLET FRAME AND GRATE AS SPECIFIED HEREIN SHALL BE USED IN LIEU OF THE ODOT 2-2 "LAY-IN" GRATE. ALL ANNULAR SPACE REMAINING BETWEEN THE BOTTOM OF THE INLET FRAME AND THE TOP OF THE PRECAST SECTION SHALL BE FILLED WITH CEMENT GROUT OR CLASS 'C' CONCRETE. IF THE CATCH BASIN WILL BE USED IN A NON-TRAFFIC-BEARING APPLICATION, AN ODOT 2-2 CATCH BASIN MAY BE USED WITH THE STANDARD "LAY-IN" GRATE.
4. ALL CONCRETE SHALL CONFORM TO ODOT ITEM 499 CLASS C (4000 psi).
5. A CONCRETE CHANNEL SHALL BE POURED INTO THE BOTTOM OF THE CATCH BASIN USING CLASS 'C' CONCRETE. THE CHANNEL SHALL TAPER FROM 9" THICKNESS TO 2" MIN. THICKNESS AT THE LOWEST SEWER INVERT AND SHALL BE FINISHED WITH A SMOOTH SURFACE.
6. THE EXCAVATED AREA AROUND THE CATCH BASIN SHALL BE BACKFILLED WITH ODOT ITEM 703.11, TYPE 1 (304, 411, OR 617) COMPACTED IN 8" LIFTS. NO FOUNDRY SAND OR SLAG PERMITTED.
7. WHERE CATCH BASIN WILL BE LOCATED WITHIN CROSSWALK, AT ADA RAMP, OR IN DESIGNATED BIKE LANE, CASTING SHALL BE EAST JORDAN IRON WORKS (EJIW) 5250 INLET WITH V-5622080 ADA GRATE OR NEENAH R-3405-A INLET WITH TYPE 'L' GRATE, OR EQUAL APPROVED BY CITY ENGINEER. AS APPLICABLE, GRATE SHALL BE ORIENTED SUCH THAT THE LONG OPENINGS ARE PERPENDICULAR TO NORMAL DIRECTION OF BICYCLE TRAFFIC FLOW. IN OTHER LOCATIONS, CASTING SHALL BE EJIW 5250 OR NEENAH R-3405 INLET AND STANDARD GRATE MAY BE USED. IN ALL LOCATIONS, GRATE MUST INCLUDE "ECO-SENSITIVE" MARKINGS SUCH AS: "DUMP NO WASTE; DRAINS TO STREAM" AND AN AQUATIC LIFE LOGO. THE LETTERING AND LOGO SHALL BE RAISED OR RECESSED AND INTEGRAL WITH THE CASTING. ALTERNATE NOTATION OR LOGO IS SUBJECT TO THE CITY ENGINEER'S APPROVAL.
8. ALL OPENINGS AND KNOCKOUTS FOR INLET AND OUTLET PIPING SHALL BE FASHIONED NEATLY. ALL ANNULAR SPACE SHALL BE FILLED WITH CEMENT GROUT, BRICK AND MORTAR, OR CLASS 'C' CONCRETE.
9. ODOT REFERENCES ARE FROM THE CURRENT ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS. ANY DISCREPANCIES SHALL BE SUBJECT TO THE CITY ENGINEER'S DISCRETION.

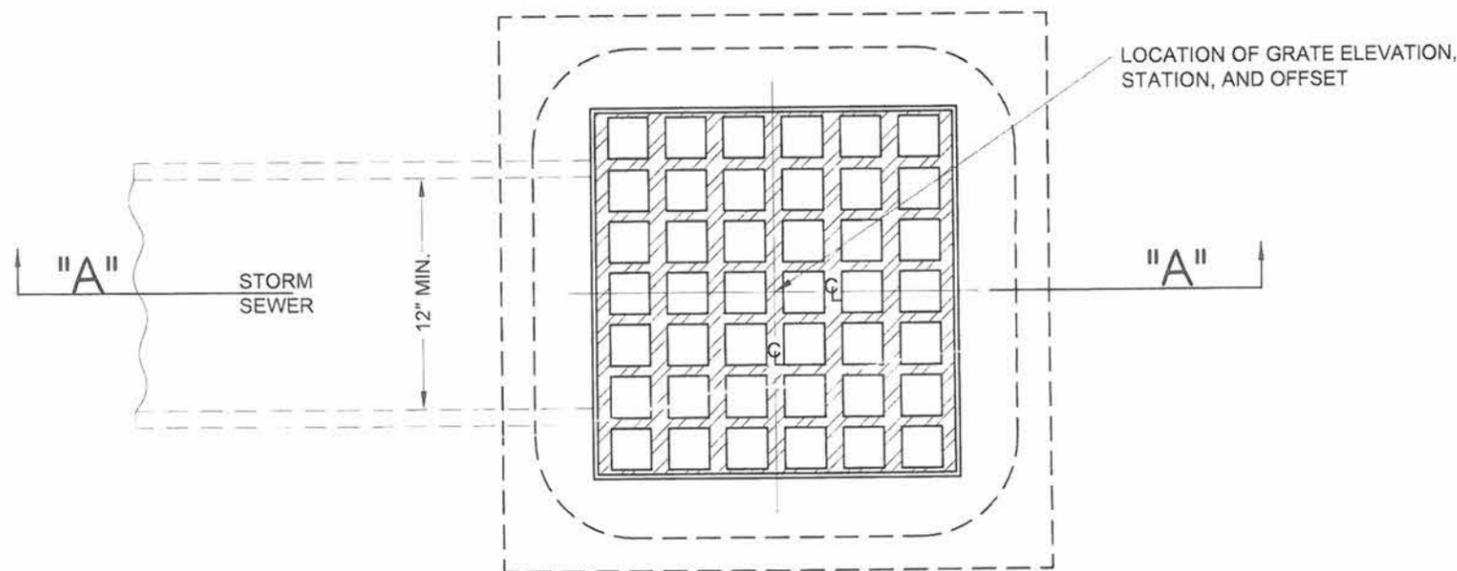
BRICK CATCH BASINS ARE ACCEPTABLE AND SHALL BE CONSTRUCTED PER THIS DRAWING AND THE FOLLOWING SPECIFICATIONS:

1. PROVIDE CLAY BRICK (ASTM C-32-93) WALLS WITH FULL MORTAR (ASTM C-91 & C-150, AIR-ENTRAINED PORTLAND CEMENT) JOINTS. CONCRETE & CEMENT BLOCKS/BRICKS ARE PROHIBITED FOR NEW OR RECONSTRUCTED BASINS.
2. THE CATCH BASIN SHALL HAVE A CONCRETE BASE (MINIMUM 6" THICKNESS) EXTENDING 6" BEYOND OUTSIDE OF FOUR WALLS OF CATCH BASIN.
3. EVERY SEVENTH COURSE MUST BE A STRETCHER COURSE.
4. WALL SHALL BE MINIMUM 8" THICK.
5. PLASTER OUTSIDE WALLS WITH 1/2" NON-SHRINK MORTAR; INSIDE JOINTS MUST BE NEATLY STRUCK AND CLOSED.

PRECAST CONCRETE CATCH BASINS ARE ACCEPTABLE AND SHALL BE CONSTRUCTED PER THIS DRAWING AND THE FOLLOWING SPECIFICATIONS:

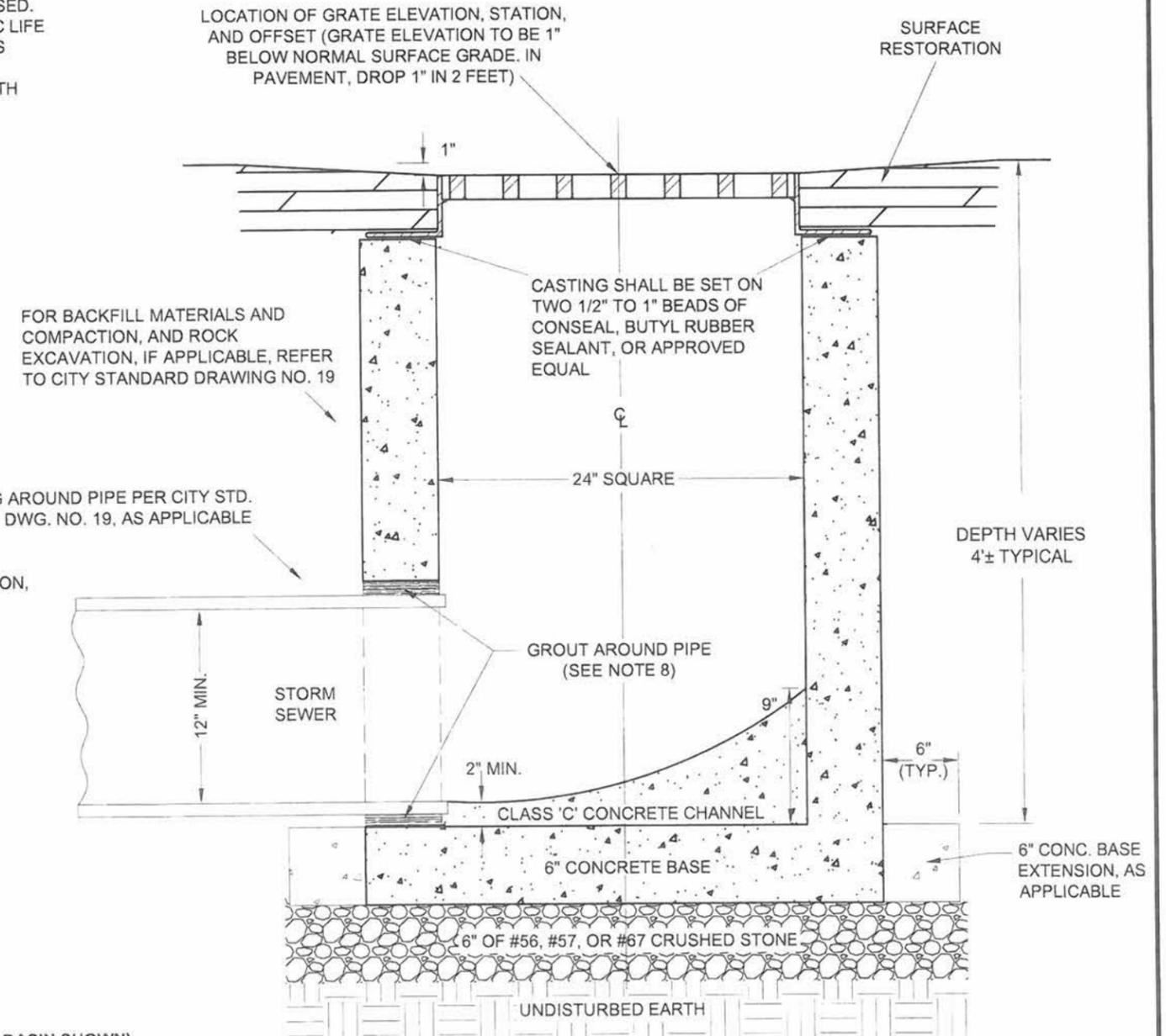
1. THE PRECAST UNIT SHALL CONFORM TO ODOT ITEM 706.13.
2. PRECAST WALLS AND BOTTOM SHALL HAVE A MINIMUM THICKNESS OF 6".
3. A 6" CONCRETE BASE EXTENSION IS REQUIRED ON ALL FOUR SIDES WHEN DEPTH (TOP OF GRATE TO LOWEST PIPE INVERT) EXCEEDS 6 FEET.
4. STACKED PRECAST SECTIONS MUST HAVE A TONGUE/ GROOVE JOINT AND A BUTYL SEALANT.
5. SHOP DRAWING OF THE PRECAST UNIT SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.

PLAN VIEW
NOT TO SCALE



(PRECAST CONCRETE CATCH BASIN SHOWN)

SECTION A-A
NOT TO SCALE



OFFICE OF THE CITY ENGINEER
CANTON, OHIO
 DANIEL J. MOEGLIN, P.E., CITY ENGINEER
 2436 30th St. NE 44705 330-489-3381 www.cantonohio.gov/engineering

APPROVED DATE: MAR. 2012
 APPROVED BY: CDB, RMB, SLH
 DRAWING FILE NAME: ce_04.dwg

REVISIONS		
DESCRIPTION	DATE	BY

STANDARD DRAWING NO. 4
SQUARE-TOP CATCH BASIN

NOTES: (CONTINUED)

7. PAY LIMITS FOR CITY PROJECTS

- A) **BEDDING AND BACKFILL** IS INCLUDED WITH THE COST OF PIPE UNLESS DIRECTED TO BID OTHERWISE.
- B) **PAVEMENT RESTORATION** IS INCLUDED WITH THE COST OF PIPE UNLESS A SEPARATE PAY ITEM IS PROVIDED, WHEREBY THE WIDTH MEASUREMENT OVER THE TRENCH FOR PAVEMENT RESTORATION SHALL NOT EXCEED THE OUTSIDE DIAMETER (O.D.) OF PIPE PLUS A SET MEASUREMENT DEPENDENT ON DEPTH OF PIPE. AREA MEASUREMENTS AT MANHOLE AND CATCH BASIN STRUCTURES SHALL NOT EXCEED THE AREA OF THE BASE OF THE STRUCTURE + 3'-0" OFFSET AREA AROUND THE STRUCTURE'S BASE.
- C) **EXTRA FOUNDATION MATERIAL:** THE CONTRACTOR SHALL BE PAID FOR OVER-EXCAVATION AND BEDDING FOUNDATION MATERIAL UNDER THE CONTINGENCY BID ITEMS FOR EXTRA FOUNDATION MATERIAL.

WHEN IN THE OPINION OF THE CITY ENGINEER, SOFT/UNSTABLE MATERIALS ARE ENCOUNTERED WHICH ARE UNSUITABLE FOR BEDDING FOUNDATION, SAID MATERIAL SHALL BE REMOVED BY THE CONTRACTOR TO THE DEPTH DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE MATERIAL.

FOR CITY PROJECTS, THE PAYABLE WIDTH OF THE EXTRA FOUNDATION MATERIAL SHALL NOT EXCEED THE LESSER OF THE APPLICABLE MINIMUM OR MAXIMUM TYPICAL BEDDING WIDTH, AS NOTED ON SHEET 1 OF STD. DWG. NO. 19.

FOR PRIVATE WORK, ALL COSTS ARE AT THE OWNER'S EXPENSE.

EXTRA FOUNDATION MATERIAL, OPTION A, B, C, & D, MAY BE USED IN ANY COMBINATION AS DIRECTED BY THE CITY ENGINEER:

- OPTION A: CRUSHED STONE, AASHTO M 43 NO. 1 AND/OR 2
- OPTION B: CRUSHED STONE, AASHTO M 43 NO. 56, 57, OR 67
- OPTION C: ODOT 703.11, TYPE 1 (304, 411 OR 617 GRADATION)
- OPTION D: TENSAR GEOGRID T1100, OR APPROVED EQUAL

EXTRA FOUNDATION MATERIAL, CONTINGENCY BID ITEMS

ITEM	QTY.	UNIT	DESCRIPTION
603		C.Y.	EXTRA FOUNDATION, OPTION A (#1,#2 STONE)
603		C.Y.	EXTRA FOUNDATION, OPTION B (#56,57,67 STONE)
603		C.Y.	EXTRA FOUNDATION, OPTION C (304,411,617)
603		S.F.	EXTRA FOUNDATION, OPTION D (GEOGRID)

NOTES: (CONTINUED)

8. EXCAVATION OF ROCK OR BURIED/ABANDONED CONCRETE STRUCTURE REMOVAL

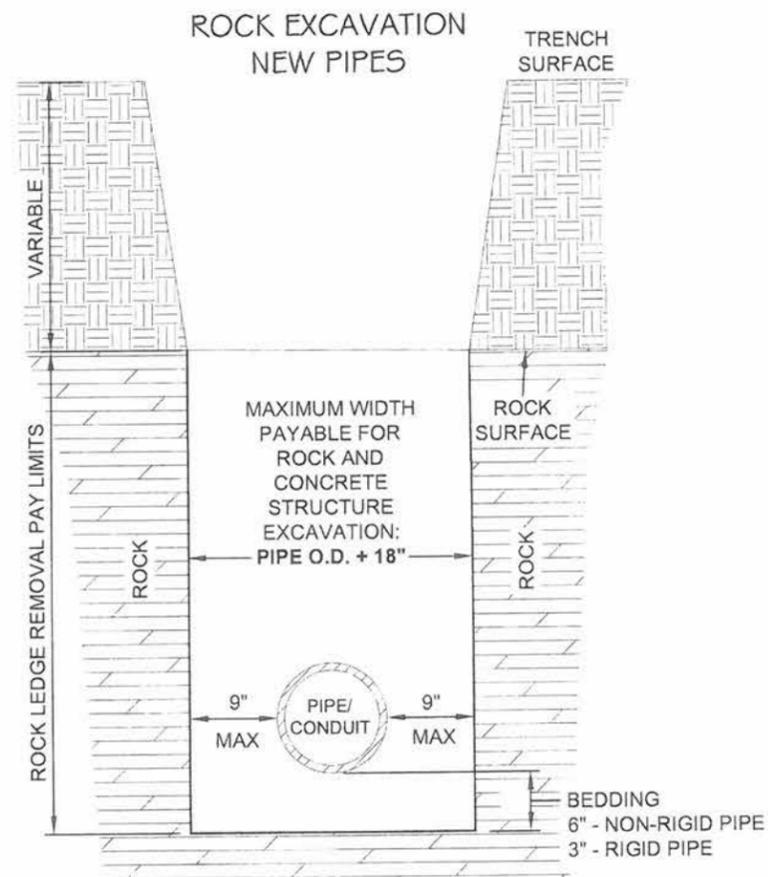
EXCAVATION FOR NEW MANHOLES AND CATCH BASINS, UNLESS OTHERWISE SPECIFIED OR SHOWN ON CONSTRUCTION PLANS, SHALL BE MEASURED BETWEEN VERTICAL PLANES ONE (1) FOOT BEYOND THE OUTSIDE EDGE OF THE FOUNDATION OF THE STRUCTURES ON ALL SIDES, AND PARALLEL THERETO, AND FROM THE SURFACE OF THE ROCK TO THE BOTTOM OF THE ROCK OR THE NEAT LINES OF THE BOTTOM OF THE STRUCTURES PLUS THE DEPTH OF THE BASE MATERIAL, USE THE MEASUREMENT WHICH IS LESSER.

EXCAVATION FOR NEW PIPES, UNLESS OTHERWISE SPECIFIED OR SHOWN ON CONSTRUCTION PLANS, SHALL BE MEASURED BETWEEN TRENCH WALLS (NOT TO EXCEED PIPE O.D. + 18", AND FROM THE SURFACE OF THE ROCK TO THE BOTTOM OF THE ROCK OR THE BOTTOM OF THE PIPE BEDDING, USE THE MEASUREMENT WHICH IS LESSER.

EXCAVATION OF BURIED AND ABANDONED CONCRETE STRUCTURES SHALL BE MEASURED IN THE SAME MANNER AS ROCK REMOVAL.

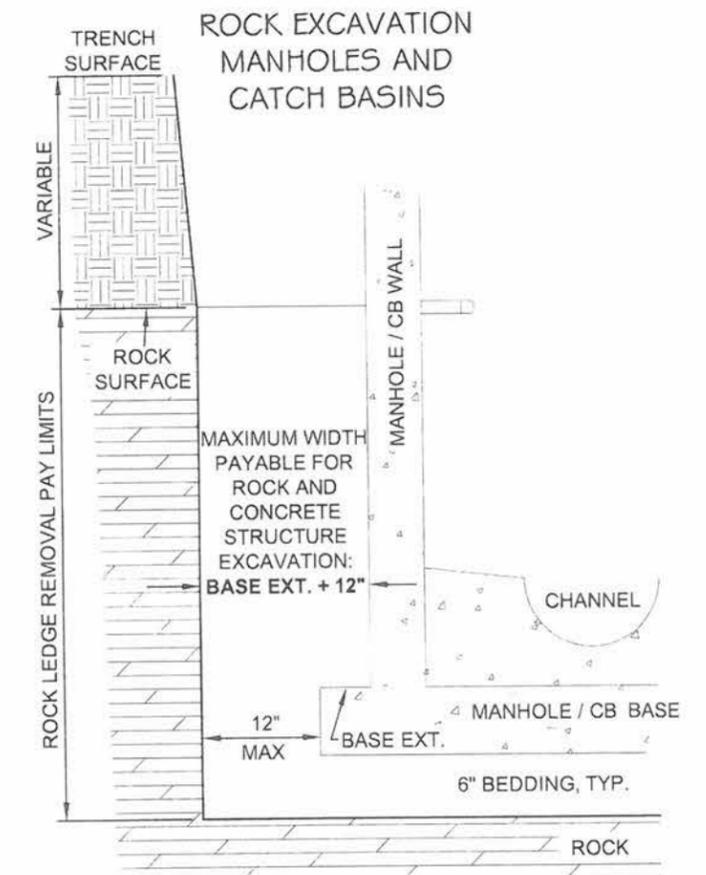
FOR CITY PROJECTS, THE CONTRACTOR SHALL BE PAID FOR ROCK REMOVAL AND CONCRETE STRUCTURE REMOVAL UNDER THE CONTINGENCY BID ITEMS FOR ROCK OR CONCRETE STRUCTURE REMOVAL. IF A CONTINGENCY BID ITEM IS NOT INCLUDED IN THE BID PROPOSAL, THE CONTACTOR MAY SUBMIT A PROPOSAL (PRIOR TO WORK BEING STARTED) TO THE CITY ENGINEER FOR REVIEW AND APPROVAL.

FOR PRIVATE WORK, ALL COSTS ARE AT THE OWNER'S EXPENSE.



ROCK AND BURIED & ABANDONED CONCRETE STRUCTURE REMOVAL, CONTINGENCY BID ITEMS

ITEM	QTY.	UNIT	DESCRIPTION
603		C.Y.	ROCK REMOVAL
603		C.Y.	CONCRETE STRUCTURE REMOVAL



**OFFICE OF THE CITY ENGINEER
CANTON, OHIO**

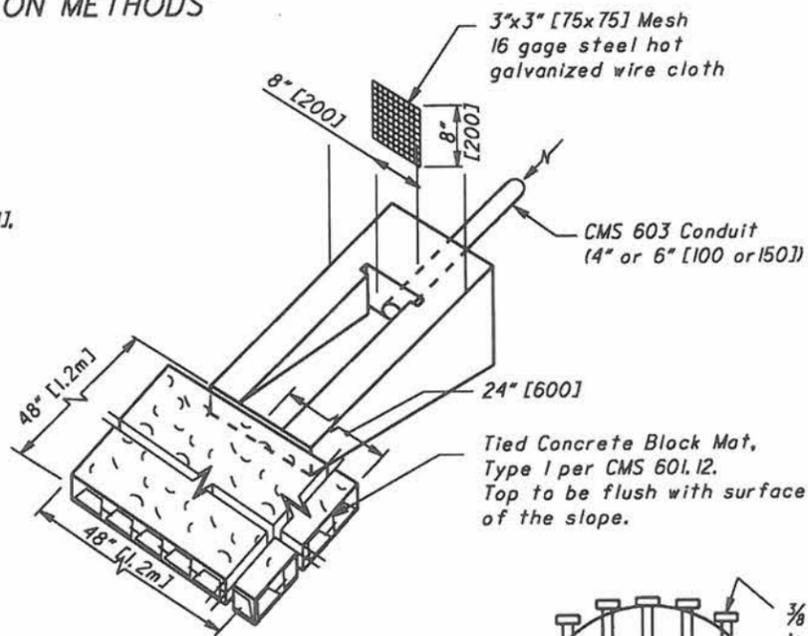
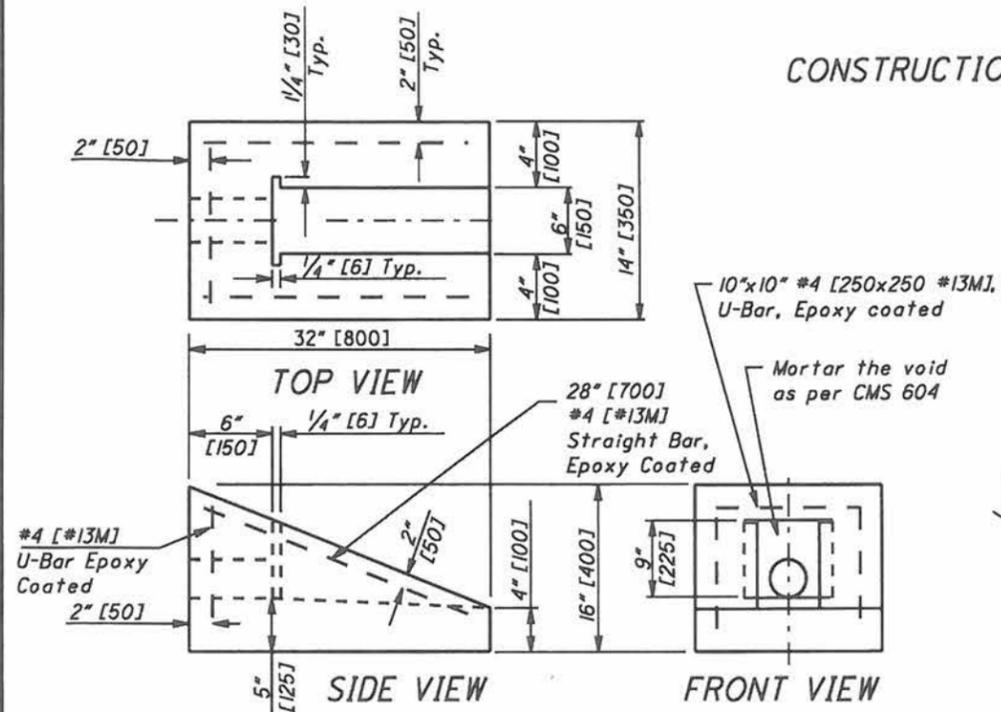
DANIEL J. MOEGLIN, P.E., CITY ENGINEER
2436 30th St. NE 44705 330-489-3381 www.cantonohio.gov/engineering

APPROVED DATE: JAN 2012
APPROVED BY: CDB, RMB, SLH
DRAWING FILE NAME: ce_19.dwg

REVISIONS		
DESCRIPTION	DATE	BY
REVISIONS TO NOTES 7 & 8	6/4/2012	CDB
REVISIONS TO NOTES 7	6/10/2013	CDB

STANDARD DRAWING NO. 19
UTILITY TRENCH REQUIREMENTS
SHEET 2 OF 2

CONSTRUCTION METHODS



NOTES
MASONRY COLLARS: A masonry collar shall be provided where plans require that a pipe extension be joined to the end of an existing pipe with a butt joint. The cost shall be included in the unit price bid for the new conduit.

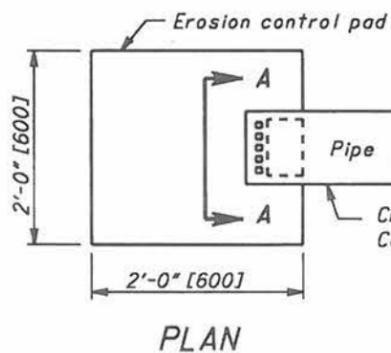
EROSION CONTROL PAD AND ANIMAL GUARDS: These items shall be provided at the outlet end of all farm drains except where they outlet into a drainage structure. The steel bolts or rods for the animal guard shall be galvanized per CMS 710.06. In lieu of drilling or punching the 1/2" [13] diameter holes into the pipe, a metal collar meeting all of the above requirements may be clamped onto the pipe if approved by the Engineer.

PAYMENT: Erosion control pads, masonry collars, and animal guards shall be included in the unit price bid for Item 603 - ... inch [mm] Conduit, Type ...

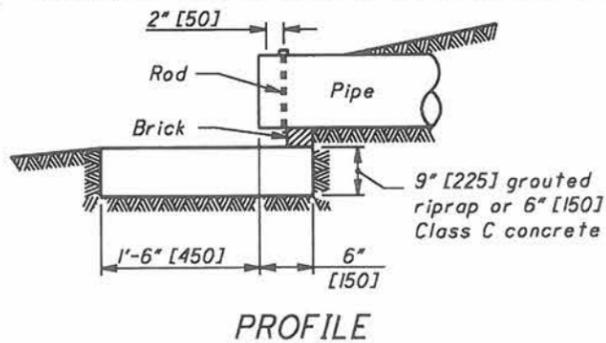
PRECAST REINFORCED CONCRETE OUTLET: The concrete outlet shall meet the requirements of CMS 604.

PAYMENT: The precast reinforced concrete outlet shall be paid at the contract unit price bid for Item 604 - Precast Reinforced Concrete Outlet. The Mortar; Tied Concrete Block Mat, Type I, and Wire Mesh shall be included in the unit price bid for Item 601 - Tied Concrete Block Mat, Type I.

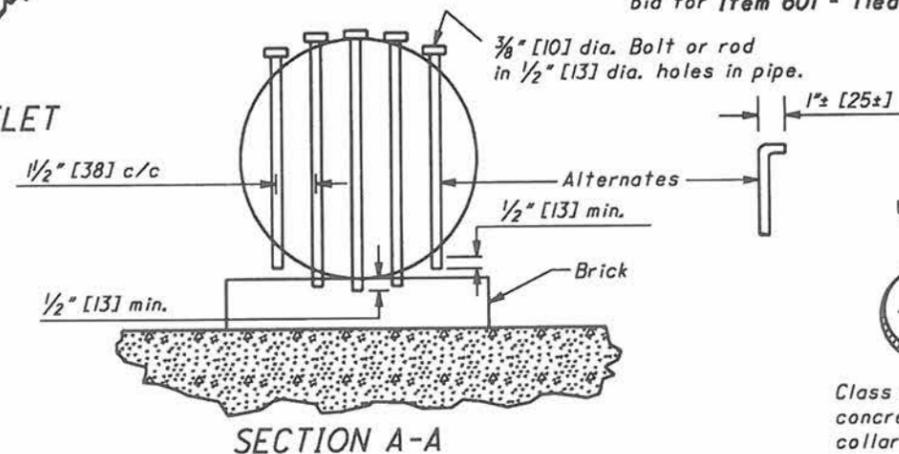
PRECAST REINFORCED CONCRETE OUTLET



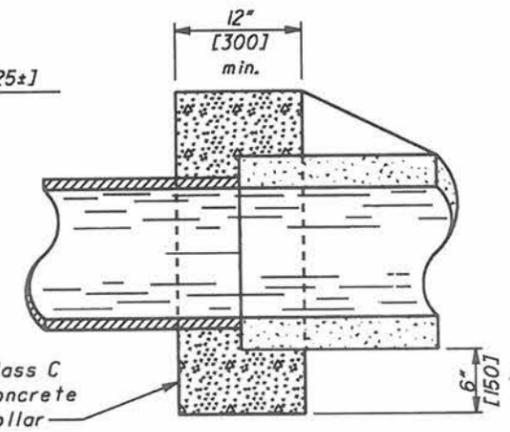
EROSION CONTROL PAD AND ANIMAL GUARD FOR OUTLET PIPE



PROFILE



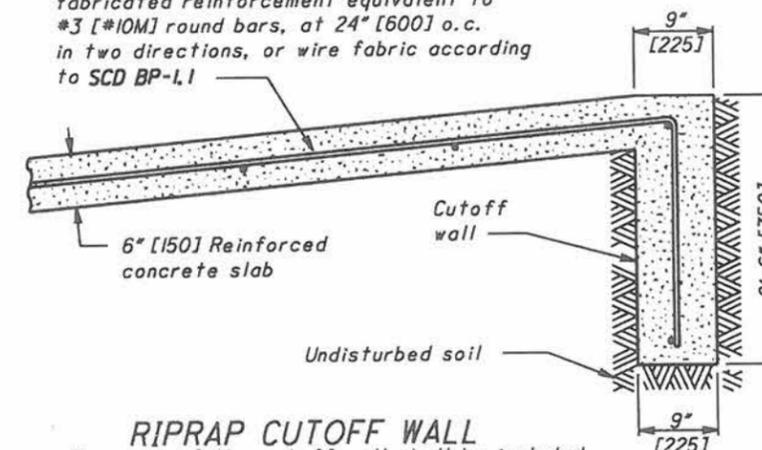
SECTION A-A



MASONRY COLLAR

CONDUIT SIZE	4" [100]	6" [150]	8" [200]	10" [250]	12" [300]	15" [375]	18" [450]
No. of Bolts	2	3	5	6	7	9	11

As per CMS 601.04.D, reinforce the slab approximately midway between the top and bottom of the slab, with steel bars or fabricated reinforcement equivalent to #3 [#10M] round bars, at 24" [600] o.c. in two directions, or wire fabric according to SCD BP-1.1



RIPRAP CUTOFF WALL

The cost of the cutoff wall shall be included in the unit price bid for Item 601 Riprap using 6" [150] reinforced concrete slab.

CONCRETE CRADLE

