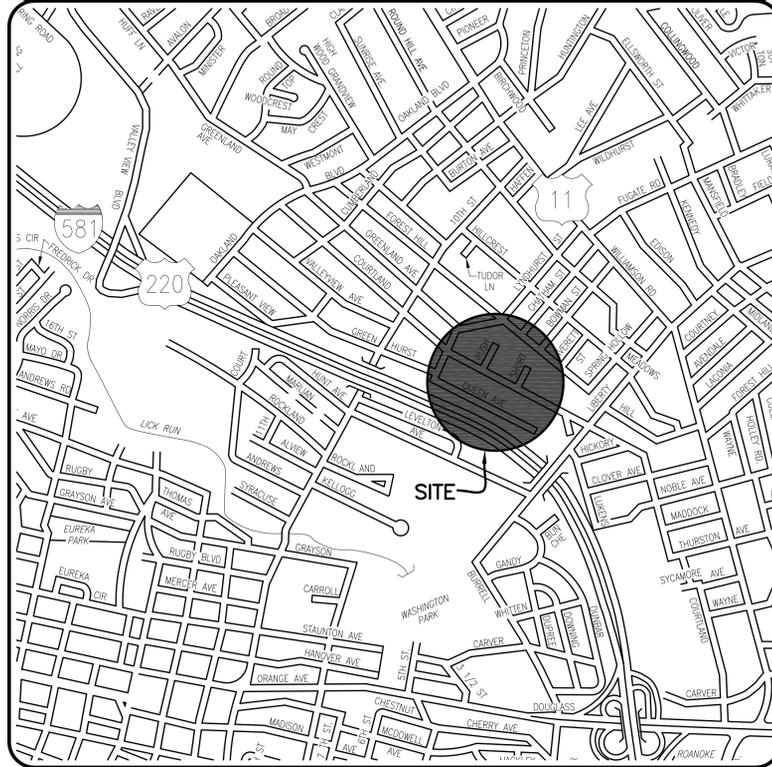


PROJECT LOCATION MAP



OFFICE OF THE CITY ENGINEER
 215 CHURCH AVENUE, SW
 ROOM 350
 ROANOKE, VIRGINIA 24011-1587
 PHONE: (540) 853-2731
 FAX: (540) 853-1364
 ENGINEER@ROANOKEVA.GOV

INDEX OF SHEETS

1. [CS] COVER SHEET
2. [G1] GENERAL NOTES
3. [ES1] EROSION AND SEDIMENT CONTROL NARRATIVE AND MS-19
4. [ES2] PHASE I – EROSION AND SEDIMENT CONTROL PLAN
5. [ES3] PHASE II – EROSION AND SEDIMENT CONTROL PLAN 1
6. [ES4] PHASE II – EROSION AND SEDIMENT CONTROL PLAN 2
7. [U1] PHASE I – QUEEN PLAN AND PROFILE 1
8. [U2] PHASE I – QUEEN PLAN AND PROFILE 2
9. [U3] PHASE I – LYNDHURST COURTLAND PLAN AND PROFILE 1
10. [U4] PHASE I – LYNDHURST COURTLAND PLAN AND PROFILE 2
11. [U5] PHASE II – QUEEN PLAN AND PROFILE
12. [U6] PHASE II – QUEEN COURTLAND PLAN AND PROFILE
13. [U7] PHASE II – COURTLAND PLAN AND PROFILE
14. [M1] E&S CONTROL AND MISCELLANEOUS DETAILS

NOTICE: ALL LANDOWNERS, DEVELOPERS AND CONTRACTORS

FAILURE TO COMPLY WITH THE CONSTRUCTION PROCEDURE REQUIREMENTS LISTED BELOW MAY RESULT IN THE COSTLY REMOVAL OF STRUCTURES, TIME DELAYS OR THE ISSUANCE OF A STOP WORK ORDER.

CONSTRUCTION PROCEDURE REQUIREMENTS

1. RIGHT OF WAY EXCAVATION PERMIT – PRIOR TO THE COMMENCEMENT OF ANY DIGGING, ALTERATION OR CONSTRUCTION WITHIN THE PUBLIC RIGHT OF WAY (STREETS, ALLEYS, PUBLIC EASEMENTS), A RIGHT OF WAY EXCAVATION PERMIT SHALL BE APPLIED FOR AND OBTAINED BY THE CONTRACTOR FROM THE CITY OF ROANOKE.
2. LAND DISTURBANCE PERMIT – AN APPROVED EROSION AND SEDIMENT CONTROL PLAN FOR ANY BORROW/FILL SITES ASSOCIATED WITH THE PROJECT MUST BE SUBMITTED PRIOR TO THE ISSUANCE OF A LAND DISTURBING PERMIT.
3. PLANS AND PERMITS – A COPY OF THE PLANS APPROVED BY THE CITY (SIGNED BY PROPER CITY OFFICIALS) AND ALL PERMITS ISSUED BY THE CITY SHALL BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES OF ONGOING CONSTRUCTION.
4. LOCATION OF UTILITIES – THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
5. CONSTRUCTION ENTRANCE – THE CONTRACTOR SHALL INSTALL AN ADEQUATE CONSTRUCTION ENTRANCE FOR ALL CONSTRUCTION RELATED EGRESS FROM THE SITE. SIZE AND COMPOSITION OF THE CONSTRUCTION ENTRANCE SHALL BE AS SHOWN ON THE PLANS.
6. STREETS TO REMAIN CLEAN – IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE THAT THE PUBLIC STREET ADJACENT TO THE CONSTRUCTION ENTRANCE REMAINS FREE OF MUD, DIRT, DUST AND/OR ANY TYPE OF CONSTRUCTION MATERIALS OR LITTER AT ALL TIMES.
7. BARRICADES/DITCHES – THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF ALL EXCAVATED DITCHES AND SHALL FURNISH AND ENSURE THAT ALL BARRICADES PROPER AND NECESSARY FOR SAFETY OF THE PUBLIC ARE IN PLACE.
8. SEWER AND PAVEMENT REPLACEMENT – CONSTRUCTION OF SANITARY SEWERS AND THE REPLACEMENT OF PAVEMENT SHALL BE IN ACCORDANCE WITH APPROVED STANDARDS AND SPECIFICATIONS OF THE CITY OF ROANOKE AND WESTERN VIRGINIA WATER AUTHORITY.
9. APPROVED PLANS/CONSTRUCTION CHANGES – ANY CHANGE OR VARIATION FROM CONSTRUCTION DESIGN AS SHOWN ON THE OFFICIALLY APPROVED PLANS SHALL BE APPROVED BY THE EROSION AND SEDIMENT CONTROL AGENT PRIOR TO SAID CHANGE OR VARIATION IN CONSTRUCTION BEING MADE.
10. FINAL ACCEPTANCE/CITY – THE OWNER OR DEVELOPER SHALL FURNISH THE CITY OF ROANOKE'S PLANNING BUILDING AND DEVELOPMENT DEPARTMENT WITH A FIELD SURVEYED FINAL CORRECT SET OF AS-BUILT PLANS OF THE NEWLY CONSTRUCTED STORM DRAIN AND/OR STORMWATER MANAGEMENT FACILITIES PRIOR TO FINAL ACCEPTANCE AND ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE CITY. AS-BUILT PLANS SHALL BE PROVIDED IN THE STATE PLANE VIRGINIA SOUTH COORDINATE SYSTEM, NAD 1983, FIPS 4502 FEET, US SURVEY FEET, DATUM NA 83, IN THE FORM OF 1 PAPER COPY AND 1 DIGITAL AUTOCAD FILE.

APPROVED FOR CONSTRUCTION

Philip C. Galloway
 ROANOKE CITY ENGINEER

7-17-13
 DATE

Robert K. Bennett
 DIRECTOR OF PUBLIC WORKS

7-17-13
 DATE

Sheena M. Stovall
 ASSISTANT CITY MANAGER FOR OPERATIONS

7/17/13
 DATE

SHEET NUMBER: 1 OF 14

PROJECT NAME

QUEEN AVENUE – COURTLAND ROAD
 DRAINAGE PROJECT
 TAX MAP 9999998 (CITY ROW)

CITY ENGINEERING PLAN NUMBER: 6736

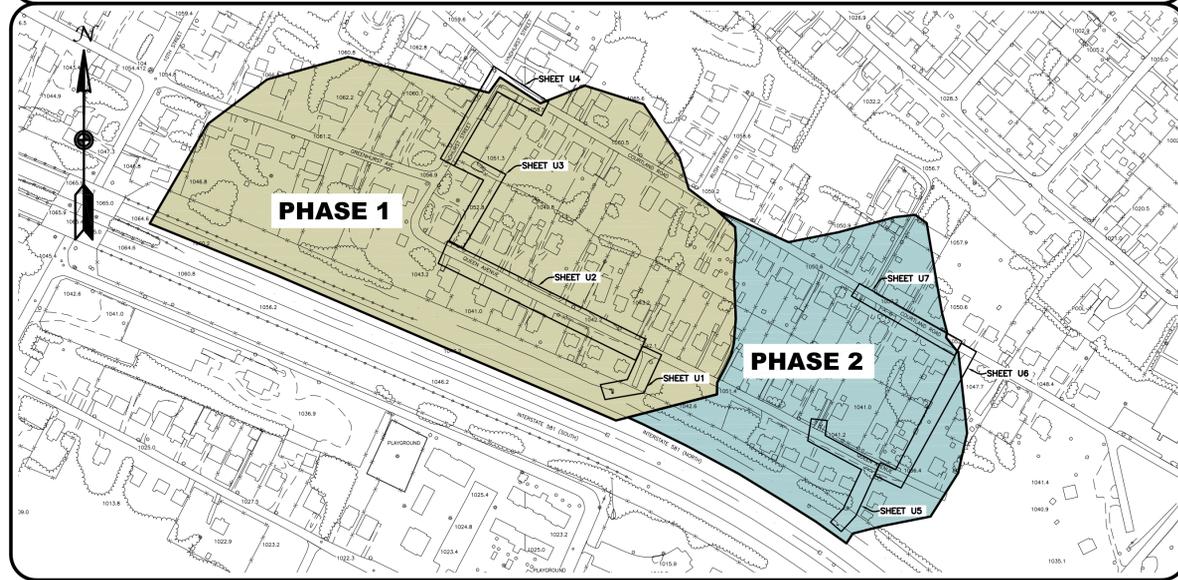
CITY PLANNING NUMBER: CP 130013

STATE PROJECT NUMBER: U000-128-R20, P101, R201
UPC 102768



REVISION BY	DESCRIPTION:	DATE

PROJECT PHASE MAP



NOT TO SCALE

SYMBOLS

	EXISTING	PROPOSED
GROUND ELEVATION	X 900.00	
OLD IRON PIN	⊙	⊙
SURVEYING NAIL	⊙	⊙
MONUMENT	⊙	⊙
TREE	⊙	⊙
SHRUB	⊙	⊙
STORM CURB INLET		⊙
STORM DROP INLET		⊙
STORM MANHOLE		⊙
STORM HEADWALL / ENDWALL		⊙
STORM FLARED SECTION		⊙
GAS VALVE	⊙	⊙
GAS METER	⊙	⊙
WATER METER	⊙	⊙
FIRE HYDRANT	⊙	⊙
WATER VALVE	⊙	⊙
WATER MANHOLE	⊙	⊙
SANITARY MANHOLE	⊙	⊙
SANITARY CLEANOUT	⊙	⊙
UTILITY POLE	⊙	⊙
GUY WIRE	⊙	⊙
MAILBOX	⊙	⊙
SIGN	⊙	⊙
DRIVEWAY/SIDEWALK		⊙
HOUSE/BUILDING		⊙
RIPRAP STONE		⊙
RESIDENTIAL/COMMERCIAL ENTRANCE		⊙

UTILITY NOTES:

- AEP CONTACT: BILL ROGERS (540-985-2971)
- ROANOKE GAS CONTACT: PETE ORR (540-777-3817)
- WESTERN VIRGINIA WATER AUTHORITY CONTACTS:
CARL SINK (540-853-5359) FOR SANITARY SEWER / LATERAL INSTALLATIONS.
DAVID BARNHART (540-853-3272) FOR WATER
- VERIZON CONTACT: ROBERT TERRY (540-769-7702) (CAMCOM).
- COX CABLE CONTACT: STEVE BOWER (540-293-2683)
- FOR CLARITY, STORM DRAIN PROFILES DO NOT SHOW ALL SANITARY SEWER LATERAL AND OVERHEAD ELECTRICAL, CABLE, OR TELEPHONE LINES.

LINETYPES

	EXISTING	PROPOSED
EDGE OF ASPHALT PAVEMENT	---	---
PROPERTY BOUNDARY	---	---
CONTOUR	---1042---	---1042---
STORM DRAIN PIPE	---SD---	---SD---
24" STORM DRAIN PIPE	---24"SD---	---24"SD---
30" STORM DRAIN PIPE	---30"SD---	---30"SD---
GAS LINE	---GAS---	---GAS---
WATER LINE	---W---	---W---
2" WATER LINE	---2"W---	---2"W---
6" WATER LINE	---6"W---	---6"W---
SANITARY SEWER LINE	---SAN---	---SAN---
8" SANITARY SEWER LINE	---8"SAN---	---8"SAN---
OVERHEAD ELECTRIC	---	---
UNDERGROUND TELEPHONE	---UGT---	---UGT---
OVERHEAD CABLE	---OHC---	---OHC---
RESIDENTIAL FENCE	---	---

STORM DRAIN UTILITY NOTES:

- SEE PROJECT MANUAL FOR STORM DRAINAGE SPECS, SECTION 2636.
- THE INSIDE DEPTH (IDP) OF THE MANHOLES, AS SHOWN/LABELED ON THE PROFILES, IS BASED ON THE RIM TOP ELEVATION TO THE LOWEST PIPE INVERT. IDP IS NOT THE TOTAL MANHOLE DEPTH. THE TOTAL MANHOLE DEPTH IS CALCULATED BY ADDING THE THICKNESS OF THE PIPE, GAP AROUND THE PIPE, AND THICKNESS OF THE BASE.
- CONTRACTOR SHALL SLOPE ALL MANHOLES RIMS IN THE DIRECTION OF THE PAVEMENT. ALL MANHOLE RIMS SHALL BE FLUSH WITH THE PAVEMENT. CURB INLETS SHALL BE SLOPED IN DIRECTION OF PAVEMENT.
- CONTRACTOR SHALL USE VDOT NO. 57 STONE AS PIPE BEDDING. BACKFILL, IN PAVEMENT, SHALL BE VDOT NO. 21A TO WITHIN 5" OF THE TOP OF PAVEMENT. CONTRACTOR SHALL USE 5" OF VDOT BM-25 TO BRING THE TRENCH FLUSH WITH EXISTING ASPHALT. THE VDOT BM-25 SHALL BE THE TEMPORARY RIDING SURFACE UNTIL THE ROADWAY IS MILLED AND THE OVERLAY INSTALLED. VDOT BM-25 SHALL BE INSTALLED IN ACCORDANCE WITH VDOT SPECIFICATIONS. NOTE THAT ROADWAY SHALL BE MILLED AND OVERLAIN AS PART OF THE PROJECT CLOSE OUT. EXCAVATED TRENCH MATERIAL SHALL BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL. DO NOT BACKFILL TRENCH WITH EXISTING MATERIAL IN THE PAVEMENT.
- DI-12A INLETS SHALL BE INSTALLED ALONG THE SLOPE OF DITCH / EXISTING GRADE.
- ALL DRAINAGE STRUCTURES SHALL HAVE VDOT INLET SHAPING.
- MANHOLES SHALL UTILIZE ECCENTRIC RISERS SO THAT ACCESS STEPS ALIGN.

RIGHT OF WAY (ROW) NOTES:

- ALL WORK FOR THIS PROJECT OCCURRING WITHIN THE CITY RIGHT OF WAY IS TO BE PERFORMED PER THE CITY OF ROANOKE RIGHT OF WAY EXCAVATION AND RESTORATION STANDARDS.

DRAINAGE EASEMENT NOTES:

- A PUBLIC DRAINAGE EASEMENT AND TEMPORARY CONSTRUCTION EASEMENT SHALL BE OBTAINED FOR WORK TO BE PERFORMED ON PROPERTIES WITH TAX MAP # 2060701, 2060762 AND 2060746.
- A CHANGE TO THE RIGHT-OF-WAY LIMITS ON COURTLAND ROAD WILL BE OBTAINED FOR PROPERTIES WITH TAX MAP # 2060702, 2060704, 2060706, 2060708, 2060710, 2060712, 2060714, 2060733, 2060735, 2060737, 2060741, 2060743, 2060744, AND 2060745.

TRAFFIC CONTROL:

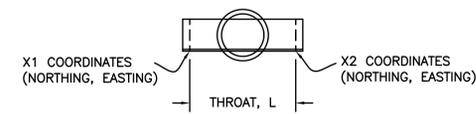
- CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE CITY TRAFFIC ENGINEER (TRANSPORTATION DIVISION: 540-853-2210) FOR APPROVAL BEFORE THE START OF CONSTRUCTION ACTIVITIES IN THE RESIDENTIAL AREA.
- THERE IS A DEAD END ON QUEEN AVENUE. PAVEMENT WIDTH ON QUEEN, COURTLAND AND LYNDRHURST ARE RELATIVELY NARROW. CONTRACTOR SHALL COORDINATE WORK TO MINIMIZE DELAY TO VEHICULAR TRAFFIC DURING THE CONSTRUCTION ON THE PROJECT.

ABBREVIATIONS

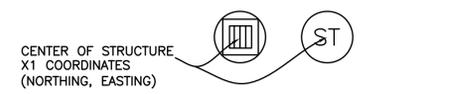
CL = CENTERLINE	PVC = POLYVINYL CHLORIDE
ELEV = ELEVATION	HDPE = HIGH DENSITY POLYETHYLENE
EL = ELEVATION	BLDG = BUILDING
FG = FINISHED GRADE	CRNR = CORNER
EG = EXISTING GROUND	PROP = PROPOSED
RCP = REINFORCED CONCRETE PIPE	CO = CLEANOUT
CMP = CORRUGATED METAL PIPE	WSE = WATER SURFACE ELEVATION
INV IN = INVERT IN	HP = HIGH POINT
INV OUT = INVERT OUT	TYP = TYPICAL
FF = FINISHED FLOOR	MH = MANHOLE
PUE = PUBLIC UTILITY EASEMENT	SD = STORM DRAIN
CONC = CONCRETE	MAX = MAXIMUM
MIN = MINIMUM	EXST = EXISTING
CB = CATCH BASIN	EXIST = EXISTING
DI = DROP INLET	PVMT = PAVEMENT
DIA = DIAMETER	LF = LINEAR FEET
W/ = WITH	APPROX = APPROXIMATELY
RR = RAILROAD	SDMH = STORM DRAIN MANHOLE
ROW = RIGHT OF WAY	LW = LIMIT OF WORK
Ø = DIAMETER	MECH = MECHANICAL
WWA = WESTERN VIRGINIA WATER AUTHORITY	N = NORTHING
VDOT = VIRGINIA DEPARTMENT OF TRANSPORTATION	E = EASTING
DCR = VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION	TOC = TOP OF CURB ELEVATION
TW = TOP OF WALL ELEVATION	BOC = BOTTOM OF CURB ELEVATION
BW = BOTTOM OF WALL ELEVATION	FH = FIRE HYDRANT
HT = HEIGHT	PSI = POUNDS PER SQUARE INCH
RD = ROOF DRAIN	PSF = POUNDS PER SQUARE FOOT
TK = THICK	GPM = GALLONS PER MINUTE
L = LENGTH	FT = FOOT, FEET
NO. = NUMBER	IN = INCH, INCHES
R = RADIUS	OC = ON CENTER
	SAN = SANITARY SEWER

CONSTRUCTION STAKEOUT FOR DRAINAGE STRUCTURES

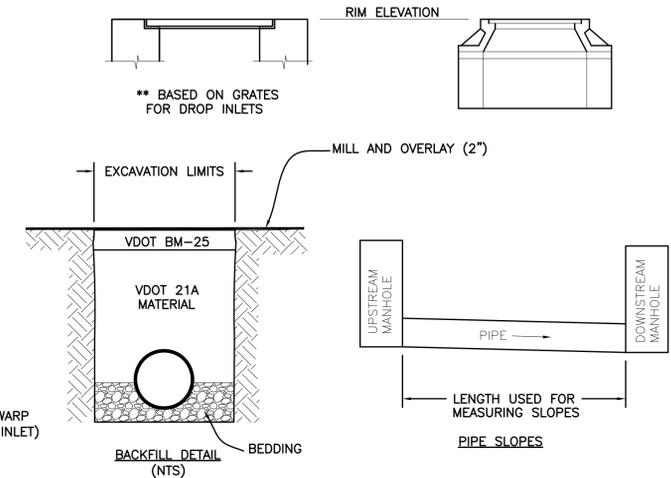
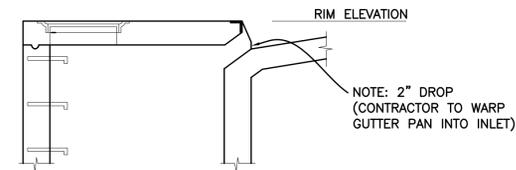
HORIZONTAL LOCATION - CURB INLET (GRADE/SAG)



HORIZONTAL LOCATION - DROP INLET / MANHOLES



*** SEE PROFILE SHEETS FOR RIM (VERTICAL) ELEVATIONS



SURVEY NOTES:

- SURVEY WAS CONDUCTED IN FALL 2012/WINTER 2013 BY THE CITY OF ROANOKE ENGINEERING DEPARTMENT.

HORIZONTAL DATUM: VIRGINIA SOUTH NAD 83/93
VERTICAL DATUM: NAVD 88

- CONTROL MONUMENTS FOR STORM DRAIN WORK WILL BE PROVIDED BY THE PROJECT MANAGER BEFORE MOBILIZATION ACTIVITIES BEGIN.

Label	Point Location X1		Point Location X2	
	N	E	N	E
111	3,633,949.09	11,062,532.37		
110	3,634,007.33	11,062,426.68		
109	3,633,854.87	11,062,337.00		
108	3,633,836.23	11,062,326.00		
107	3,633,778.54	11,062,427.47		
106	3,633,696.64	11,062,379.93		
105	3,633,597.41	11,062,322.33		
104	3,633,472.05	11,062,572.53		
103	3,633,394.08	11,062,728.50		
102	3,633,362.59	11,062,791.49		
101	3,633,283.16	11,062,759.26		
100	3,633,283.37	11,062,718.15	3,633,271.50	11,062,719.84
111-A	3,633,941.90	11,062,524.57	3,633,938.93	11,062,529.78
111	3,633,949.09	11,062,532.37		
109-A	3,633,858.64	11,062,331.88		
109	3,633,854.87	11,062,337.00		
109-B	3,633,843.18	11,062,348.87	3,633,848.36	11,062,351.88
109	3,633,854.87	11,062,337.00		
103-A	3,633,387.70	11,062,730.34	3,633,391.62	11,062,722.24
103	3,633,394.08	11,062,728.50		
104-A	3,633,464.41	11,062,571.20	3,633,467.06	11,062,565.82
104	3,633,472.05	11,062,572.53		
104-B	3,633,491.26	11,062,579.02		
104	3,633,472.05	11,062,572.53		
105-A	3,633,599.05	11,062,303.04	3,633,601.70	11,062,297.66
105	3,633,597.41	11,062,322.33		
207	3,633,503.05	11,063,298.78		
206	3,633,443.09	11,063,404.28		
205	3,633,394.08	11,063,540.17		
204	3,633,225.95	11,063,464.20		
203	3,633,069.75	11,063,382.72		
202	3,633,100.35	11,063,316.87		
201	3,632,991.16	11,063,266.47		
200	3,632,975.53	11,063,243.24	3,632,967.25	11,063,251.91
207-A	3,633,494.99	11,063,301.67	3,633,498.00	11,063,296.47
207	3,633,503.05	11,063,298.78		
203-A	3,633,060.29	11,063,385.22	3,633,062.76	11,063,379.76
203	3,633,069.75	11,063,382.72		
301	3,633,184.32	11,063,191.81		
300	3,633,167.30	11,063,188.26		
202	3,633,100.35	11,063,316.87		

Phase 1 Land Disturbing Activities (Residential Area)		
Structure	Disturbed Area (sf)	Comments
111	0.00	In Pavement
110	0.00	In Pavement
109	0.00	In Pavement
108	0.00	In Pavement
107	2761.89	Grass
106	1377.55	Grass
105	0.00	In Pavement
104	0.00	In Pavement
103	0.00	In Pavement
102	0.00	In Pavement
101	0.00	In Pavement
100	1017.38	Grass
111-A	1865.86	Curb/Storm Land Disturbance
111	0.00	In Pavement
109-A	81.83	Storm land Disturbance
109	0.00	In Pavement
109-B	1340.94	Curb/Storm Land Disturbance
109	0.00	In pavement
103-A	1492.02	Curb/Storm Land Disturbance
103	0.00	In Pavement
104-A	883.28	Curb/Storm Land Disturbance
104	0.00	In Pavement
104-B	166.57	Storm Land Disturbance
104	0.00	In Pavement
105-A	1110.55	Curb/Storm Land Disturbance
105	0.00	In Pavement
Total (sf) =	12087.87	
Total (Acres) =	0.28	

Phase 2 Land Disturbing Activities (Residential Area)		
Structure	Disturbed Area (sf)	Comments
207	0.00	In Pavement
206	0.00	In Pavement
205	0.00	In Pavement
204	2505.24	Grass
203	0.00	In Pavement
202	0.00	In Pavement
201	951.50	Grass
200	1117.47	Grass
207-A	2049.66	Curb/Storm Land Disturbance
207	0.00	In Pavement
203-A	2421.79	Curb/Storm Land Disturbance
203	0.00	In Pavement
301	0.00	In Pavement
300	0.00	In Pavement
202	0.00	In Pavement
Total (sf) =	9045.66	
Total (Acres) =	0.21	



OFFICE OF THE
CITY ENGINEER
215 CHURCH AVENUE, S.W.
ROOM 350
PHONE: (540) 853-2731
FAX: (540) 853-1364
WWW.ROANOKEVA.GOV

DESIGNED: JJK
DRAWN: JJK
CHECKED: LEP



REV.	DATE:	DESCRIPTION

DATE: 03/01/13
SCALE: AS SHOWN
24"x36" SHEET

QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
GENERAL NOTES
CITY OF ROANOKE, VIRGINIA

SHEET G1
PLAN NO. 6736

I. PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO CONSTRUCT A NEW STORM DRAIN SYSTEM ON QUEEN AVENUE, LYNDRHURST STREET, AND COURTLAND ROAD TO ELIMINATE A LONG-SUFFERING DRAINAGE PROBLEM IN THIS NEIGHBORHOOD. THIS PROJECT IS DIVIDED INTO TWO PHASES BECAUSE OF A DRAIN DIVIDE WITHIN THE PROJECT AREA AS SHOWN ON SHEET G1. THE DISTURBED AREA, OUTSIDE OF PAVEMENT, FOR PHASE I IS APPROXIMATELY 0.28 ACRES (12,098 SF); AND THAT OF PHASE II IS APPROXIMATELY 0.21 ACRES (9,046 SF).

II. EXISTING SITE CONDITIONS

THE PHASE I AND II SITES ARE LOCATED IN AN EXISTING RESIDENTIAL (SINGLE FAMILY HOMES) NEIGHBORHOOD. THIS RESIDENTIAL SECTION CONSIST OF A MIXTURE OF ASPHALT PAVEMENT, EARTH/GRAVELED AND PAVED DRIVEWAYS, GRASS AND TREES. PHASE I DRAINAGE AREA IS APPROXIMATELY 17.17 ACRES. PHASE II DRAINAGE AREA IS APPROXIMATELY 8.44 ACRES. BOTH AREAS DRAIN TO TWO SEPARATE CONCRETE PIPE CULVERTS ON INTERSTATE 581.

III. ADJACENT PROPERTIES

THE NORTHERN PORTION OF THE PROJECT SITE IS BOUNDED BY RESIDENTIAL PROPERTIES ON COURTLAND ROAD, THE SOUTHERN PORTION BY THE NORTH BOUND LANE OF INTERSTATE 581, THE EASTERN PORTION BY LIBERTY ROAD AND WESTERN PORTION BY 10TH STREET NW.

IV. OFF-SITE AREAS

FILL MATERIAL SHALL BE OBTAINED FROM AN APPROVED SOURCE. UNSUITABLE MATERIAL SHALL BE HAULED FROM THE SITE AND DISPOSED OF IN AN APPROVED MANNER TO AN APPROVED DISPOSAL SITE. ANY BORROW/FILL SITES ASSOCIATED WITH THE PROJECT MUST HAVE A VALID LAND DISTURBANCE PERMIT AND THAT SITE MUST BE APPROVED BY THE PLANNING DEPARTMENT BEFORE ANY HAULING OCCURS.

V. SOILS

ACCORDING TO THE USDA SCS SOILS MAPPING, THE PROJECT SITE LIES ON:

6C - CHISWELL-LITZ-URBAN LAND COMPLEX, 2 TO 15 PERCENT SLOPES.

6C - CONSISTS OF GENTLY SLOPING AND STRONGLY SLOPING, WELL DRAINED SOILS ON UPLAND SIDE SLOPES AND SUMMITS AND AREAS OF URBAN LAND. THE CHISWELL SOIL IS SHALLOW, AND THE LITZ SOIL IS MODERATELY DEEP. THE SOILS AND AREAS OF URBAN LAND ARE SO INTERMINGLED THAT IT WAS NOT PRACTICAL TO MAP THEM SEPARATELY. THIS MAP UNIT IS ABOUT 35 PERCENT CHISWELL SOIL, 25 PERCENT LITZ SOIL, 22 PERCENT URBAN LAND, AND 18 PERCENT OTHER SOILS.

CHISWELL SOIL SEQUENCE, DEPTH, AND COMPOSITION OF LAYERS:
 SURFACE LAYER: 0 TO 2 INCHES, DARK BROWN CHANNERY SILT LOAM
 SUBSOIL: 2 TO 12 INCHES, REDDISH BROWN VERY CHANNERY SILT LOAM
 BEDROCK: 12 INCHES, MOTTLED REDDISH BROWN, BROWN, AND BROWNISH YELLOW SOFT SHALE

THE URBAN LAND CONSISTS OF ASPHALT, CONCRETE, BUILDINGS, OR OTHER IMPERVIOUS SURFACES. THE ORIGINAL SOIL HAS BEEN SO ALTERED OR OBSCURED THAT CLASSIFICATION OF THE SOIL IS NOT FEASIBLE.

VI. CRITICAL AREAS

THE ENTIRE PHASES OF THIS PROJECT IS NOT CONSIDERED TO BE CRITICAL AS STORM WATER RUNOFF FROM EACH PHASE DRAINS TO TWO SEPARATE ADEQUATE CONCRETE PIPE CULVERTS ON INTERSTATE 581 AND THERE IS NO EROSION PROBLEM DOWNSTREAM FROM THESE CULVERTS.

VII. EROSION AND SEDIMENT CONTROL MEASURES

ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED BY THE CONTRACTOR IN ACCORDANCE WITH THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK. SYMBOLS, DETAILS, AND DIMENSIONS ARE TAKEN FROM THE HANDBOOK, AS WELL AS THE VIRGINIA DEPARTMENT OF TRANSPORTATION'S ROAD AND BRIDGE STANDARDS, VOLUME 1, 2001.

A. STRUCTURAL PRACTICES

1. SILT FENCE (SF), SPEC 3.05 WILL BE PROVIDED AS A PERIMETER EROSION AND SEDIMENT CONTROL MEASURE.
2. INLET PROTECTION (IP), SPEC 3.07 SHALL BE PROVIDED TO PREVENT SEDIMENT FROM ENTERING STORM DRAIN PIPE SYSTEMS.
3. CULVERT INLET PROTECTION (CIP), SPEC 3.08 SHALL BE PROVIDED TO PREVENT MINIMISE EROSION AND PREVENT SEDIMENT FROM ENTERING CULVERTS ON INTERSTATE 581.
4. OUTLET PROTECTION (OP), SPEC 3.18 SHALL BE PROVIDED AS A GROUND COVER FOR THE PIPE OUTFALLS ON INTERSTATE 581.

B. VEGETATIVE PRACTICES

1. PERMANENT SEEDING (PS), SPEC 3.32 IS NOT PART OF THE CONSTRUCTION WORK FOR THIS PROJECT BUT WILL BE PROVIDED, IF NECESSARY, ON THE EDGES OF DISTURBED AREAS.
2. TEMPORARY SEEDING (TS), SPEC 3.31 IS NOT PART OF THE CONSTRUCTION WORK FOR THIS PROJECT BUT WILL BE PROVIDED, IF NECESSARY, ON THE EDGES OF DISTURBED AREAS.
3. MULCHING (MU), SPEC 3.35 WILL BE USED IN CONJUNCTION WITH PERMANENT SEEDING.

C. MANAGEMENT STRATEGIES

1. EROSION CONTROL PRACTICES SHALL BE INSTALLED AND FUNCTIONAL PRIOR TO PROCEEDING WITH CONSTRUCTION ACTIVITIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES.
3. ALL STORM SEWER INLETS SHALL BE PROTECTED SO THAT SEDIMENT LADEN WATER CAN NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED.
4. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED ONLY AFTER AUTHORIZATION BY THE LOCAL PROGRAM AUTHORITY (CITY OF ROANOKE).

D. MAINTENANCE

ALL EROSION AND SEDIMENT CONTROL STRUCTURES AND SYSTEMS SHALL BE MAINTAINED, INSPECTED, AND REPAIRED AS NEEDED TO INSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED AFTER EACH RAINFALL EVENT.

1. DAMAGE TO EROSION CONTROL MEASURES CAUSED BY CONSTRUCTION TRAFFIC OR OTHER ACTIVITY SHALL BE REPAIRED BEFORE THE END OF EACH WORKING DAY.

2. PROVIDE EQUIPMENT WASHING AS NEEDED TO PREVENT THE TRANSPORT OF SOIL ONTO EXISTING PAVED ROADWAYS. ANY SEDIMENT ON THE PAVEMENT SHALL BE REMOVED IMMEDIATELY.

3. SILT FENCE BARRIERS WILL BE CHECKED DAILY FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL REACHES HALF WAY TO THE TOP OF THE BARRIER.

VIII. MINIMUM STANDARDS (MS):

ALL APPLICABLE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS AND MINIMUM STANDARDS SHALL BE ADHERED TO DURING ALL PHASES OF CONSTRUCTION. THESE INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

MS-1: STABILIZATION OF DENUDED AREAS:
 PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO BARE AREAS WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE UNLESS OTHERWISE SHOWN. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN 7 DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE, BUT REMAIN DORMANT OR UNDISTURBED FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

RESPONSE: DISTURBED AREAS WILL BE STABILIZED WITH SEEDING AS SHOWN ON PLAN DRAWINGS.

MS-2: STABILIZATION OF SOIL STOCKPILES
 DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL STOCKPILES ON THE SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.

RESPONSE: NO STOCKPILING IS ALLOWED WITHIN THE CITY OF ROANOKE RIGHT-OF-WAY IN THE RESIDENTIAL AREA FOR THIS PROJECT. HOWEVER, STOCKPILING MAY BE ALLOWED IN PRIVATE UPON COORDINATION WITH PROPERTY OWNER. THIS AREA WILL BE PROTECTED WITH SILT FENCE AND/OR STRAW BALE BARRIERS, IF NECESSARY.

MS-3: PERMANENT VEGETATIVE COVER
 A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT, IN THE OPTION OF THE LOCAL AUTHORITY (CITY OF ROANOKE), IS UNIFORM AND MATURE ENOUGH TO SURVIVE.

RESPONSE: DISTURBED AREAS WILL BE STABILIZED WITH SEEDING AS SHOWN ON PLAN DRAWINGS.

MS-4: TIMING AND STABILIZATION OF SILT TRAPPING MEASURES
 SEDIMENT TRAPS, STORM DRAIN INLET PROTECTION, SILT FENCING AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND DISTURBING ACTIVITY. THE STRUCTURES SHALL BE MADE FUNCTIONAL BEFORE UP SLOPE LAND DISTURBANCE TAKES PLACE.

RESPONSE: INLET PROTECTION AND SILT FENCE SHALL BE INSTALLED AS SHOWN ON PLANS PRIOR TO ANY UP SLOPE LAND DISTURBANCE ACTIVITY.

MS-5: STABILIZATION OF EARTHEN STRUCTURES:
 STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.

RESPONSE: NOT APPLICABLE.

MS-6: SEDIMENT BASINS:
 A SEDIMENT BASIN SHALL CONTROL SURFACE RUNOFF FROM DISTURBED AREAS THAT ARE COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO 3 ACRES. THE SEDIMENT BASIN SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE THE ANTICIPATED SEDIMENT LOADING FOR THE LAND DISTURBING ACTIVITY. THE OUTFALL DEVICE OR SYSTEM DEVICE SHALL TAKE INTO ACCOUNT THE TOTAL DRAINAGE AREA FLOWING THROUGH THE DISTURBED AREA TO BE SERVED BY THE BASIN.

RESPONSE: NOT APPLICABLE.

MS-7 CUT AND FILL SLOPES:
 CUT AND FILL SLOPES SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL PROBLEM IS CORRECTED.

RESPONSE: NOT APPLICABLE.

MS-8 CONCENTRATED RUNOFF DOWN CUT OR FILL SLOPES:
 CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.

RESPONSE: NOT APPLICABLE.

MS-9 WATER SEEPS FROM A SLOPE FACE:
 WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.

RESPONSE: NOT APPLICABLE.

MS-10 STORM SEWER INLET PROTECTION:
 ALL STORM SEWER INLETS SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.

RESPONSE: STORM INLET PROTECTION WILL BE PROVIDED AS SHOWN ON PLAN AFTER THE INSTALLATION OF EACH STORM SEWER INLET.

MS-11 STABILIZATION OF OUTLETS:
 BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.

RESPONSE: AS SHOWN ON PLANS, RIPRAP SHALL BE PROVIDED AS OUTLET PROTECTION AT POINT OF DISCHARGE TO BOTH CULVERTS ON INTERSTATE 581.

MS-12 WORK IN LIVE WATERCOURSES:
 PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT AND SEDIMENT TRANSPORT WHEN WORKING IN LIVE WATERCOURSES. THE WORK AREA SHALL BE STABILIZED TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NON-ERODIBLE COVER MATERIALS.

RESPONSE: NOT APPLICABLE.

MS-13 CROSSING A LIVE WATERCOURSE:
 WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ONE MONTH PERIOD, A TEMPORARY STREAM CROSSING CONSTRUCTED OF NON-ERODIBLE MATERIALS SHALL BE PROVIDED.

RESPONSE: NOT APPLICABLE.

MS-14 APPLICABLE REGULATIONS:
 ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING A LIVE WATERCOURSE SHALL BE MET.

RESPONSE: NOT APPLICABLE.

MS-15 STABILIZATION OF BED AND BANKS
 THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.

RESPONSE: NOT APPLICABLE.

MS-16 UNDERGROUND UTILITIES
 UNDERGROUND UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:

- A. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPEN AT ONE TIME.
- B. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.

C. EFFLUENT FOR DE-WATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFFSITE PROPERTY.

D. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.

E. RE-STABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.

F. APPLICABLE SAFETY REGULATIONS SHALL BE COMPILED WITH AT ALL TIMES

RESPONSE: CONTRACTOR SHALL FOLLOW THIS UNDERGROUND UTILITY CRITERIA AT ALL TIMES.

MS-17 CONSTRUCTION ACCESS ROUTES:
 WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ON TO PAVED SURFACES.

RESPONSE: WORK SHALL COMMENCE FROM PAVED AREAS FOR STORM DRAIN WORK. ANY DIRT TRACKED ONTO CITY STREETS SHALL BE REMOVED IMMEDIATELY.

MS-18 TEMPORARY E&S CONTROL MEASURE REMOVAL:
 ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL AUTHORITY (CITY OF ROANOKE).

RESPONSE: CONTRACTOR SHALL INSTALL E&S MEASURES AS SHOWN ON PLANS, STABILIZE THE DISTURBED AREAS, AND REQUEST PERMISSION FROM THE PLANNING DEPARTMENT TO REMOVE THE E&S MEASURES.

MS-19 ADEQUACY OF RECEIVING CHANNELS
 PROPERTIES AND WATERWAYS DOWNSTREAM FROM THE DEVELOPMENT SITE SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION, AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY, AND PEAK FLOW RATES OF STORM WATER RUNOFF FOR STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA:

A. CONCENTRATED STORMWATER RUNOFF LEAVING A DEVELOPMENT SITE SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN-MADE RECEIVING CHANNEL, PIPE OR STORM SEWER SYSTEM, FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR PIPE SYSTEM, DOWNSTREAM STABILITY ANALYSES AT THE OUTFALL OF THE PIPE OR PIPE SYSTEM SHALL BE PERFORMED.

B. ADEQUACY OF ALL CHANNELS AND PIPES SHALL BE VERIFIED IN THE FOLLOWING MANNER:

1. THE APPLICANT SHALL DEMONSTRATE THAT THE TOTAL DRAINAGE AREA TO THE POINT OF ANALYSIS WITHIN THE CHANNEL IS ONE HUNDRED TIMES GREATER THAN THE CONTRIBUTING DRAINAGE AREA OF THE PROJECT IN QUESTION; OR
2. a. NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS; AND

b. ALL PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP ITS BANKS AND BY THE USE OF A TWO-YEAR STORM TO DEMONSTRATE THAT STORMWATER WILL NOT CAUSE EROSION OF CHANNEL BED OR BANKS; AND

c. PIPES AND STORM SEWER SYSTEMS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM.

C. IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL:

1. IMPROVE THE CHANNEL TO A CONDITION WHERE A TEN-YEAR STORM WILL NOT OVERTOP THE BANKS AND A TWO-YEAR WILL NOT CAUSE EROSION TO THE CHANNEL BED OR BANKS; OR

2. IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE TEN-YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES; OR

3. DEVELOP A SITE DESIGN THAT WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TWO-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A NATURAL CHANNEL OR WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TEN-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A MAN-MADE CHANNEL; OR

4. PROVIDE A COMBINATION OF CHANNEL IMPROVEMENT, STORMWATER DETENTION OR OTHER MEASURES WHICH IS SATISFACTORY TO THE PLAN-APPROVING AUTHORITY TO PREVENT DOWNSTREAM EROSION.

D. THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.

E. ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT OF THE SUBJECT PROJECT.

F. IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION HE SHALL OBTAIN APPROVAL FROM THE LOCALITY OF A PLAN FOR MAINTENANCE OF THE DETENTION FACILITIES. THE PLAN SHALL SET FORTH THE MAINTENANCE REQUIREMENTS OF THE FACILITY AND THE PERSON RESPONSIBLE FOR PERFORMING THE MAINTENANCE.

G. OUTFALL FROM A DETENTION FACILITY SHALL BE DISCHARGED TO A RECEIVING CHANNEL, AND ENERGY DISSIPATORS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL.

H. ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.

I. INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSED EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTFLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.

J. IN APPLYING THESE STORMWATER RUNOFF CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT, AS A WHOLE, SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT CONDITION SHALL BE USED IN ALL ENGINEERING CALCULATIONS.

K. ALL MEASURES USED TO PROTECT PROPERTIES AND WATERWAYS SHALL BE EMPLOYED IN A MANNER WHICH MINIMIZES IMPACTS ON THE PHYSICAL, CHEMICAL AND BIOLOGICAL INTEGRITY OF RIVERS, STREAMS AND OTHER WATERS OF THE STATE.

RESPONSE: THIS PROJECT IS CLASSIFIED AS A LINEAR DEVELOPMENT PROJECT SINCE ITS CONSTRUCTION WILL PREDOMINANTLY BE CARRIED OUT WITHIN THE CITY OF ROANOKE RIGHT-OF-WAY. THE LAND DISTURBING ACTIVITIES ARE LINEAR IN NATURE WITH THE INSTALLATION OF APPROXIMATELY 1,318 FEET AND 970 FEET OF REINFORCED CONCRETE PIPE, ON PHASE I AND PHASE II RESPECTIVELY OF THE PROJECT. AS EACH INLET STRUCTURE IS CONSIDERED TO BE AN OUTFALL, THE CONSTRUCTION OF THIS LINEAR DEVELOPMENT PROJECT WILL BE EXEMPTED FROM STORMWATER MANAGEMENT REQUIREMENTS FOR THE FOLLOWING REASONS:
 1. LESS THAN ONE (1) ACRE OF LAND WILL BE DISTURBED PER OUTFALL. SEE SHEET G1 FOR ALL DISTURBED AREA MEASURE.
 2. THERE IS NO CHANGE TO THE PEAK FLOW RATE FOR PHASE I OF THIS PROJECT SINCE THE PROPOSED STORM DRAIN SYSTEM DOES NOT INFLUENCE THE GOVERNING TIME OF CONCENTRATION FOR THIS DRAINAGE AREA. THERE IS AN INCREASE IN THE PEAK FLOW RATE COMPARING EXISTING AND PROPOSED CONDITION FOR PHASE II USING THE INTERSTATE 581 CULVERTS INLET POINTS AS THE POINT OF ANALYSIS. FOR THE EXISTING CONDITION, THE PEAK FLOW RATE FOR A 10-YEAR STORM IS 16.95 ft³/s; THE PROPOSED CONDITION FOR A 10-YEAR STORM HAS A PEAK FLOW OF 23.36 ft³/s. SEE STORMWATER CALCULATIONS FOR THE PROPOSED PIPE SYSTEM AND EXISTING GRASS CHANNEL. DESPITE THIS INCREASE, STORM WATER IS DIRECTED TO AN ADEQUATE PIPE CULVERT ON INTERSTATE 581 AND THERE ARE NO EROSION PROBLEMS DOWNSTREAM FROM THIS CULVERT.

IX. STORMWATER MANAGEMENT:

SEE MS-19 RESPONSE.

X. SOIL STOCKPILES AND BORROW AREAS:

FILL MATERIAL FOR PIPE WORK SHALL BE VDOT 21A AGGREGATE. SEE MS-2 RESPONSE.

XI. SEQUENCE OF CONSTRUCTION

1. INSTALL THE NECESSARY EROSION AND SEDIMENT CONTROL MEASURES, AS REQUIRED BY PLAN DRAWINGS, WHERE CONSTRUCTION WORK WILL BE COMMENCE.
2. INSTALL STORM DRAIN PIPES AND STRUCTURES AS SHOWN ON PLAN DRAWINGS.
3. CONSTRUCT CURB AND GUTTER, SIDEWALK, RESIDENTIAL AND COMMERCIAL ENTRANCES AS SHOWN ON PLANS.
4. MILL AND OVERLAY QUEEN, LYNDRHURST AND COURTLAND ROAD.
5. STABILIZE ALL DISTURBED AREAS.
6. REMOVE ALL EROSION AND SEDIMENT CONTROL MEASURE AFTER STABILIZATION AND CITY PLANNING DEPARTMENT APPROVAL.
7. CLOSE OUT PROJECT

XII. PROPERTY OWNER

RESIDENTIAL - RIGHT OF WAY
 CITY OF ROANOKE
 215 CHURCH AVENUE, SW
 ROANOKE, VA 24011

EROSION AND SEDIMENT CONTROL NOTES (VA DCR HANDBOOK, VI-15, TABLE 6-1):

ES-1: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS VR 625-02-00 EROSION AND SEDIMENT CONTROL REGULATIONS.

ES-2: THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRECONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.

ES-3: ALL EROSION AND SEDIMENT CONTROL MEASURE ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP AT ALL TIMES.

ES-4: A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.

ES-5: PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION AND CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.

ES-6: THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY.

ES-7: ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.

ES-8: DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.

ES-9: THE CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENT CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

PS TS MU PERMANENT SEEDING, TEMPORARY SEEDING, AND MULCHING

15 OCTOBER TO 1 FEBRUARY
 K-31 FESCUE @ 5 LB / 1000 SF
 BORZY WINTER RYE @ 1/2 LB / 1000 SF

1 JUNE TO 1 SEPTEMBER
 K-31 FESCUE @ 5 LB / 1000 SF
 GERMAN MILLET @ 1/2 LB / 1000 SF

1 FEBRUARY TO 1 JUNE
 K-31 FESCUE @ 5 LB / 1000 SF
 ANNUAL RYE @ 1/2 LB / 1000 SF

1 SEPTEMBER TO 15 OCTOBER
 K-31 FESCUE @ 5 LB / 1000 SF
 ANNUAL RYE @ 1/2 LB / 1000 SF

LIME: 140 LB / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE

FERTILIZER: 5-20-10 @ 25 LB / 1000 SF
 38-0-0 @ 7 LB / 1000 SF

MULCH: IF REQUIRED, SHALL BE USED OVER ALL SEEDED AREAS AND SHALL BE APPLIED IN ACCORDANCE WITH SECTION 1.75 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

SOIL CONDITIONING:
 INCORPORATION OF LIME AND FERTILIZER, SELECTION OF CERTIFIED SEED, MULCHING, MAINTENANCE OF NEW SEEDLINGS, AND RESEEDING SHALL BE IN ACCORDANCE WITH SPECIFICATIONS CONTAINED WITHIN THE VIRGINIA SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. ADDITIONAL SEEDING TO BE PERFORMED AS REQUIRED BY THE INSPECTOR.

SEED APPLICATION: APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.



OFFICE OF THE
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 215 CHURCH AVENUE, S.W.
 ROOM 350
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 WWW.ROANOKEVA.GOV



DESIGNED: JJK
 DRAWN: JJK
 CHECKED: LEP

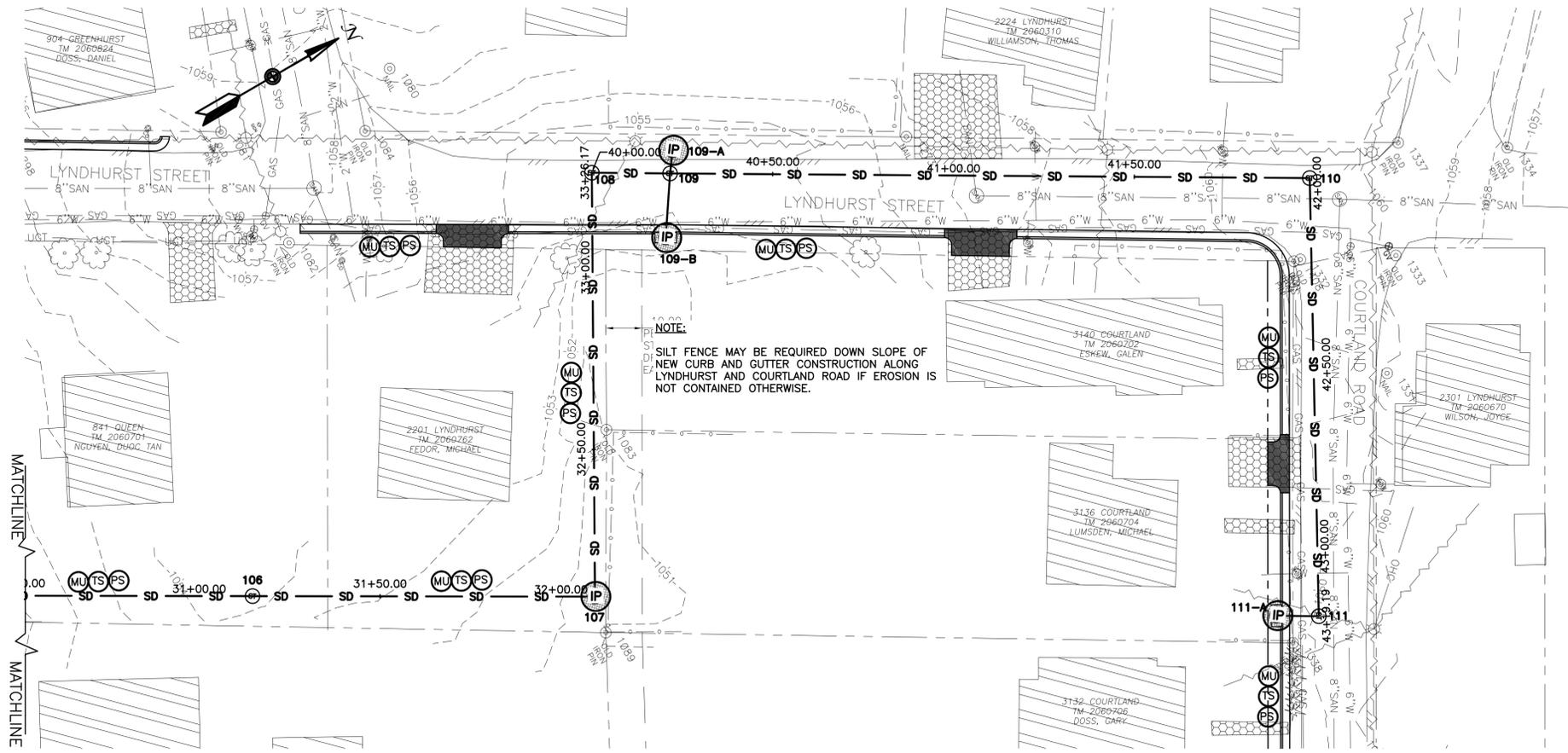


REV.	DATE:	DESCRIPTION

DATE: 03/01/13
 SCALE: AS SHOWN
 24"x36" SHEET

QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
 EROSION & SEDIMENT CONTROL NARRATIVE AND MS-19
 CITY OF ROANOKE, VIRGINIA

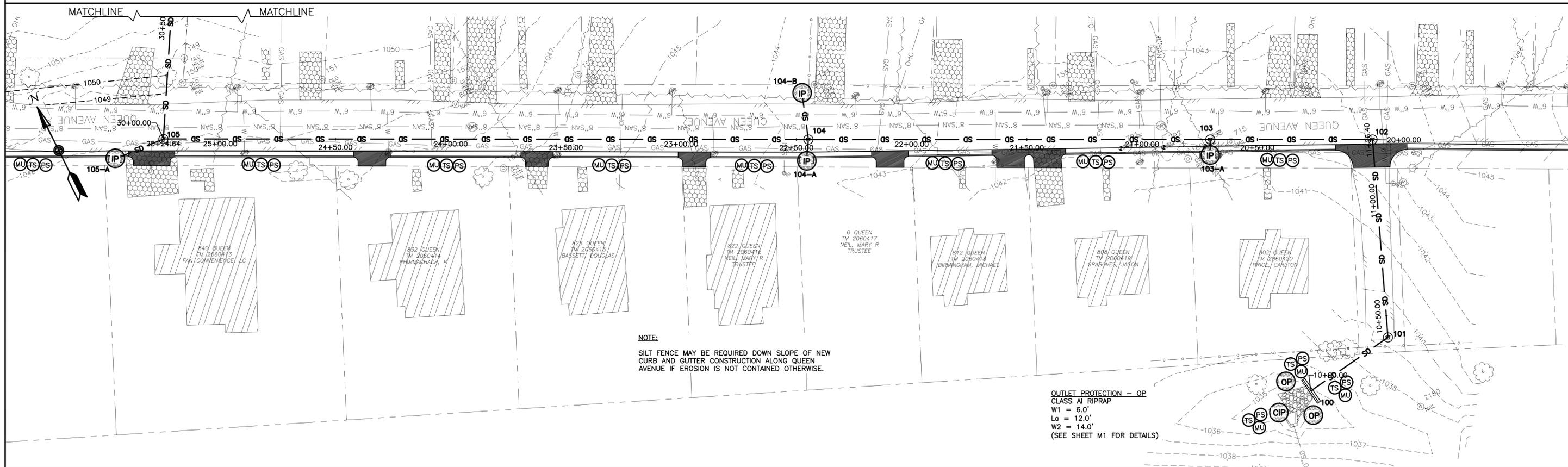
SHEET ES1
 PLAN NO. 6736



NOTE:
SILT FENCE MAY BE REQUIRED DOWN SLOPE OF NEW CURB AND GUTTER CONSTRUCTION ALONG LYNDHURST AND COURTLAND ROAD IF EROSION IS NOT CONTAINED OTHERWISE.

IF THIS DRAWING IS A REDUCTION GRAPHIC SCALE MUST BE USED

 SCALE 1" = 20'



NOTE:
SILT FENCE MAY BE REQUIRED DOWN SLOPE OF NEW CURB AND GUTTER CONSTRUCTION ALONG QUEEN AVENUE IF EROSION IS NOT CONTAINED OTHERWISE.

OUTLET PROTECTION - OP
 CLASS A1 RIPRAP
 W1 = 6.0'
 L1 = 12.0'
 W2 = 14.0'
 (SEE SHEET M1 FOR DETAILS)



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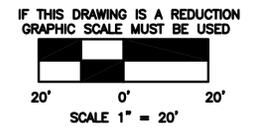
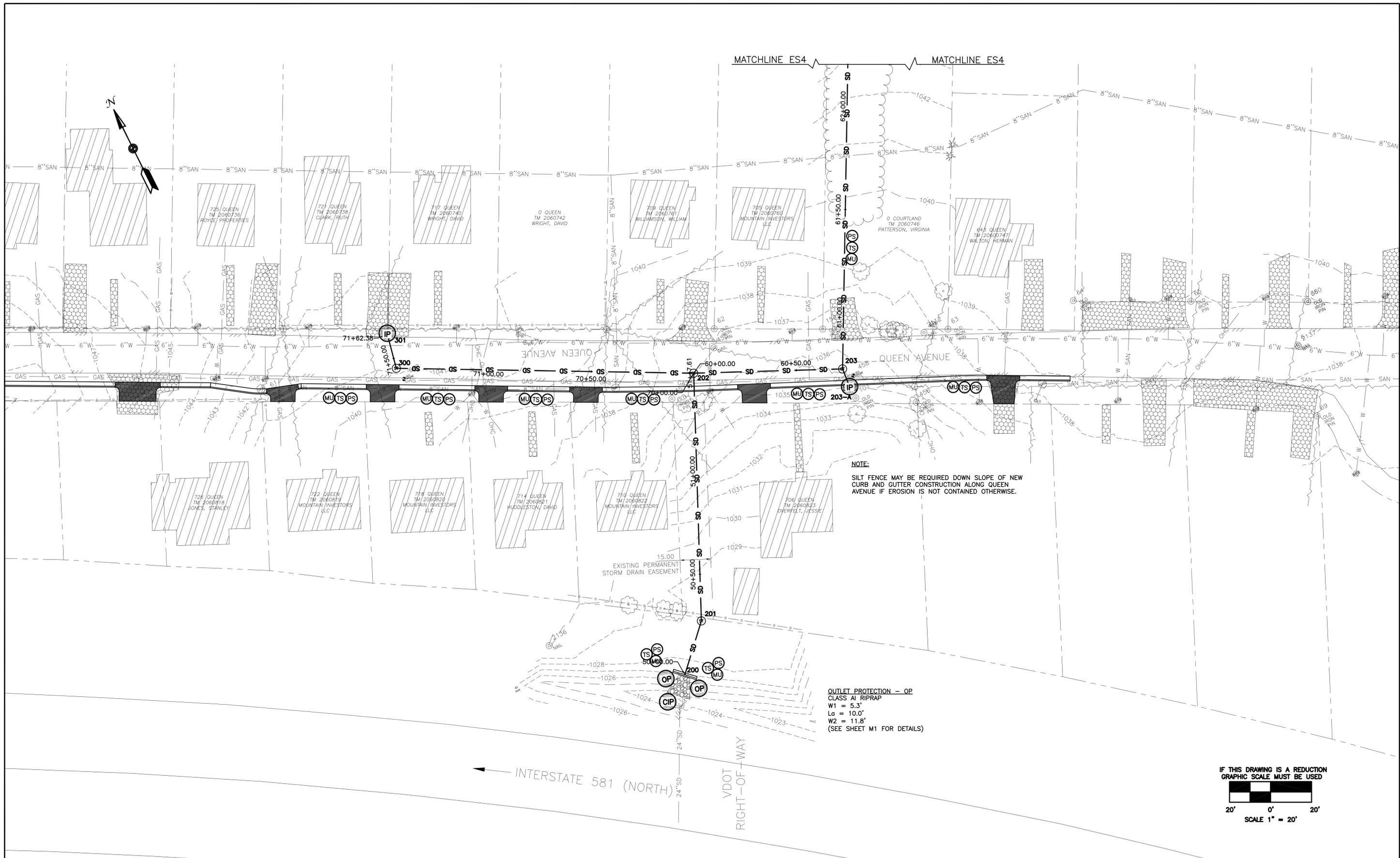
REV.	DATE	DESCRIPTION

DATE: 03/01/13
 SCALE: AS SHOWN
 24"x36" SHEET

QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
PHASE I - EROSION & SEDIMENT CONTROL PLAN

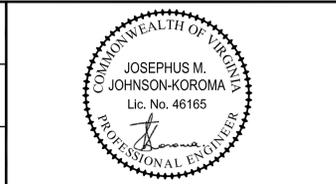
CITY OF ROANOKE, VIRGINIA

SHEET ES2
 PLAN NO. 6736



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DESIGNED: JJK
DRAWN: JJK
CHECKED: LEP



REV.	DATE	DESCRIPTION

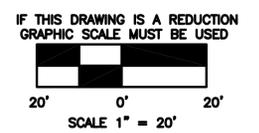
DATE: 03/01/13
SCALE: AS SHOWN
24"x36" SHEET

QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
PHASE II - EROSION & SEDIMENT CONTROL PLAN 1
CITY OF ROANOKE, VIRGINIA

SHEET ES3
PLAN NO. 6736



NOTE:
 SILT FENCE MAY BE REQUIRED DOWN SLOPE OF NEW CURB AND GUTTER CONSTRUCTION ALONG COURTLAND ROAD IF EROSION IS NOT CONTAINED OTHERWISE.




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DESIGNED:	JJK
DRAWN:	JJK
CHECKED:	LEP

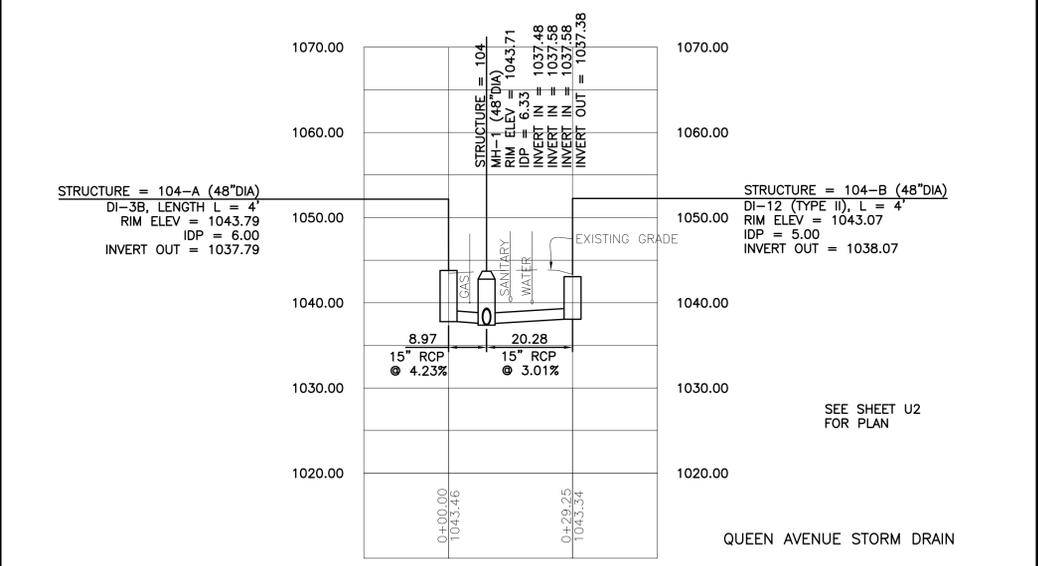
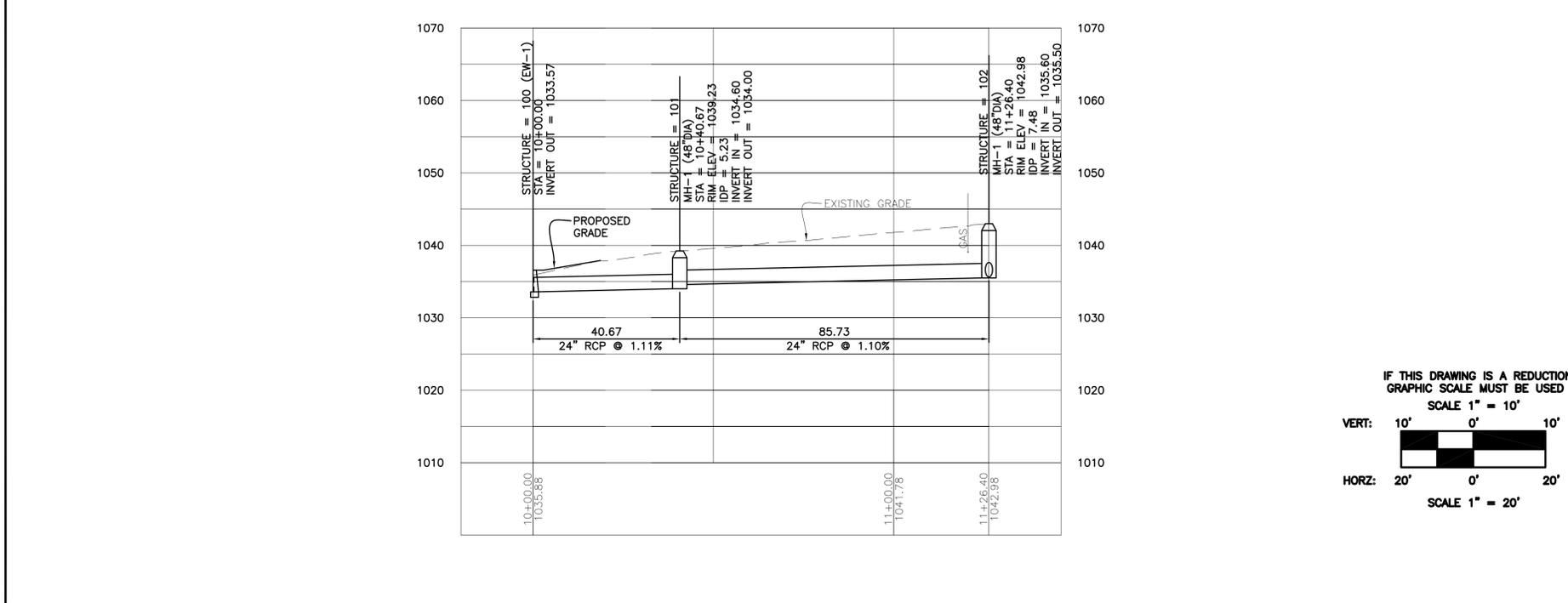
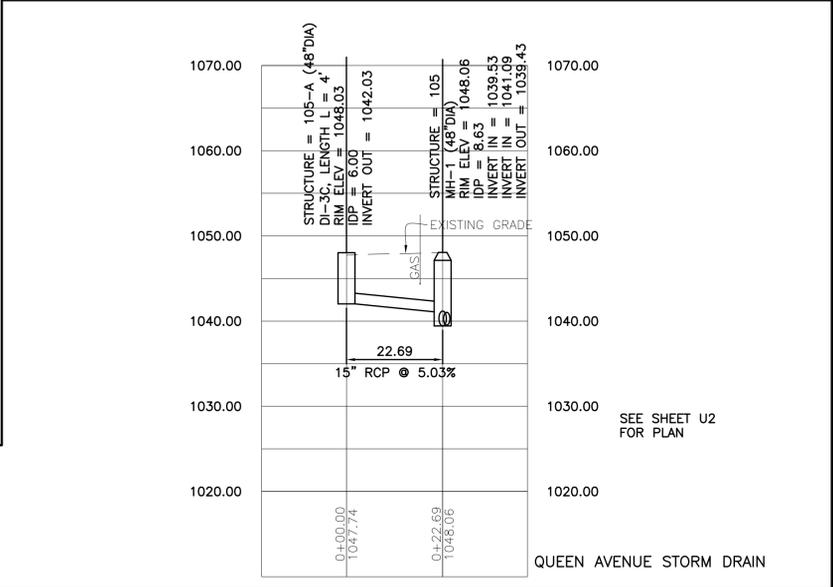
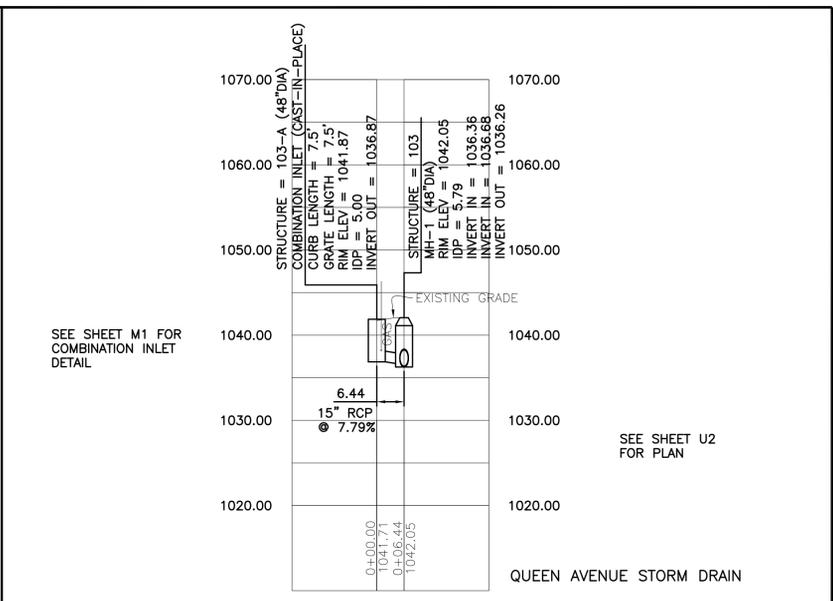
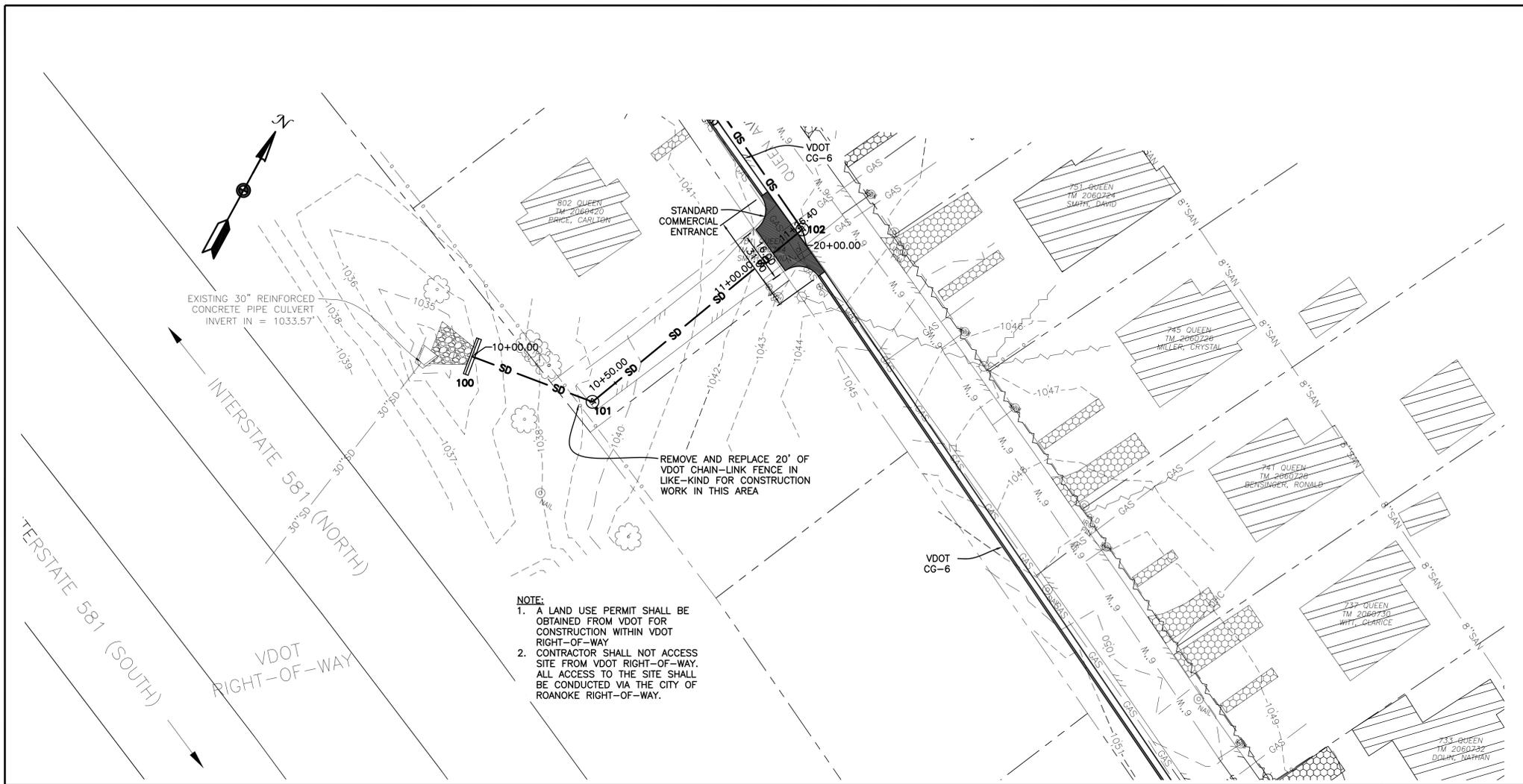


REV.	DATE:	DESCRIPTION

DATE:	03/01/13
SCALE:	AS SHOWN 24"x36" SHEET

QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
 PHASE II - EROSION & SEDIMENT CONTROL PLAN 2
 CITY OF ROANOKE, VIRGINIA

SHEET	ES4
PLAN NO.	6736



OFFICE OF THE
CITY ENGINEER
215 CHURCH AVENUE, S.W.
ROOM 350
PHONE: (540) 853-2731
FAX: (540) 853-1364
WWW.ROANOKEVA.GOV

DESIGNED: JJK
DRAWN: JJK
CHECKED: LEP

JOSEPHUS M.
JOHNSON-KOROMA
Lic. No. 46165
PROFESSIONAL ENGINEER

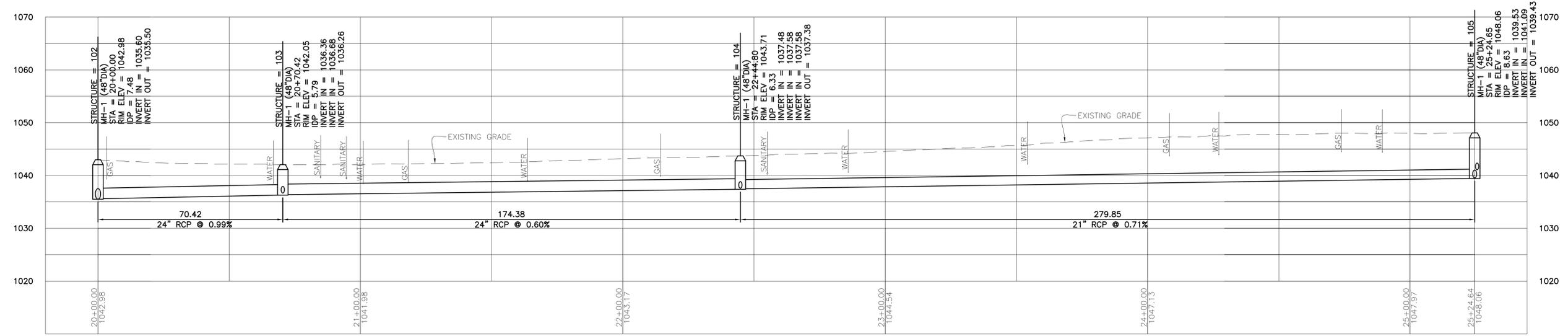
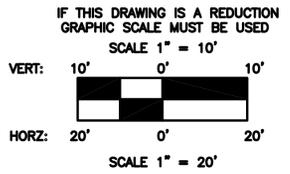
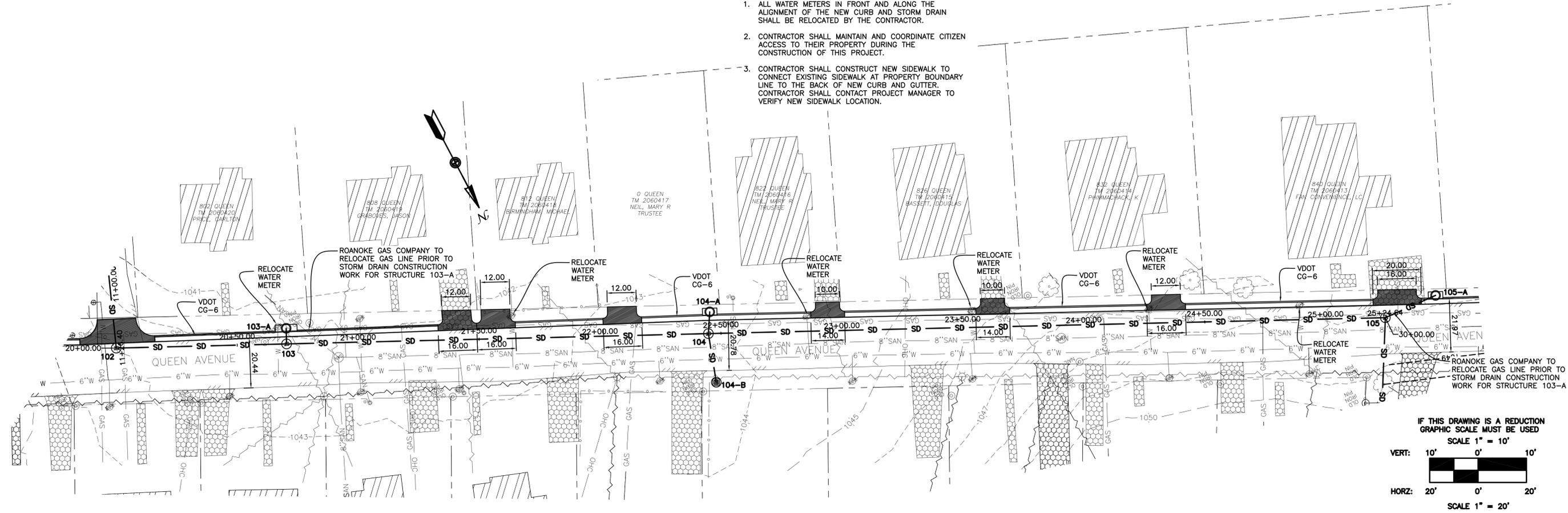
REV.	DATE:	DESCRIPTION

DATE: 03/01/13
SCALE: AS SHOWN
24"x36" SHEET

QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
PHASE I - QUEEN PLAN AND PROFILE 1
CITY OF ROANOKE, VIRGINIA

SHEET U1
PLAN NO. 6736

- NOTE:
- ALL WATER METERS IN FRONT AND ALONG THE ALIGNMENT OF THE NEW CURB AND STORM DRAIN SHALL BE RELOCATED BY THE CONTRACTOR.
 - CONTRACTOR SHALL MAINTAIN AND COORDINATE CITIZEN ACCESS TO THEIR PROPERTY DURING THE CONSTRUCTION OF THIS PROJECT.
 - CONTRACTOR SHALL CONSTRUCT NEW SIDEWALK TO CONNECT EXISTING SIDEWALK AT PROPERTY BOUNDARY LINE TO THE BACK OF NEW CURB AND GUTTER. CONTRACTOR SHALL CONTACT PROJECT MANAGER TO VERIFY NEW SIDEWALK LOCATION.



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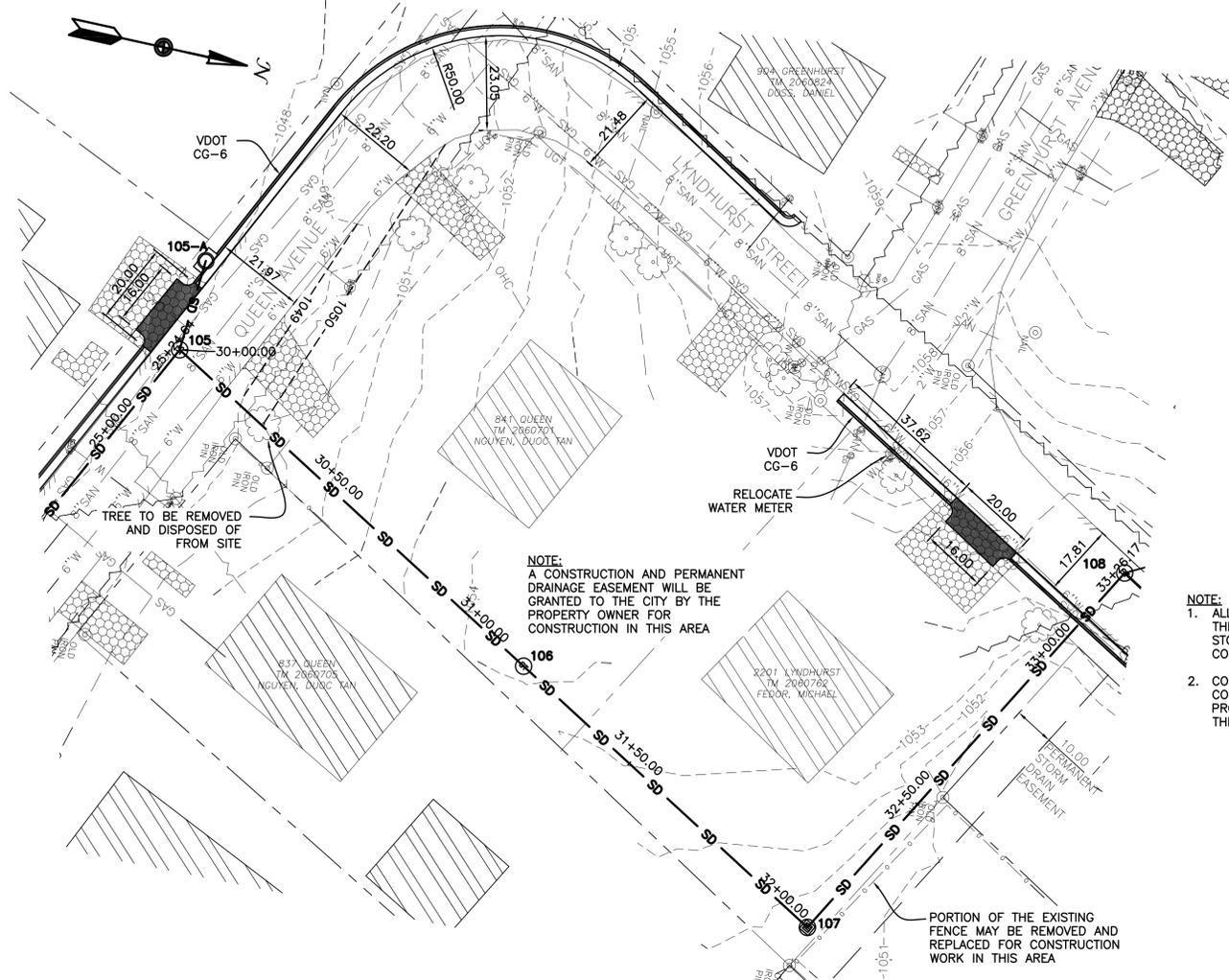


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DATE: **03/01/13**
SCALE: **AS SHOWN**
24"x36" SHEET

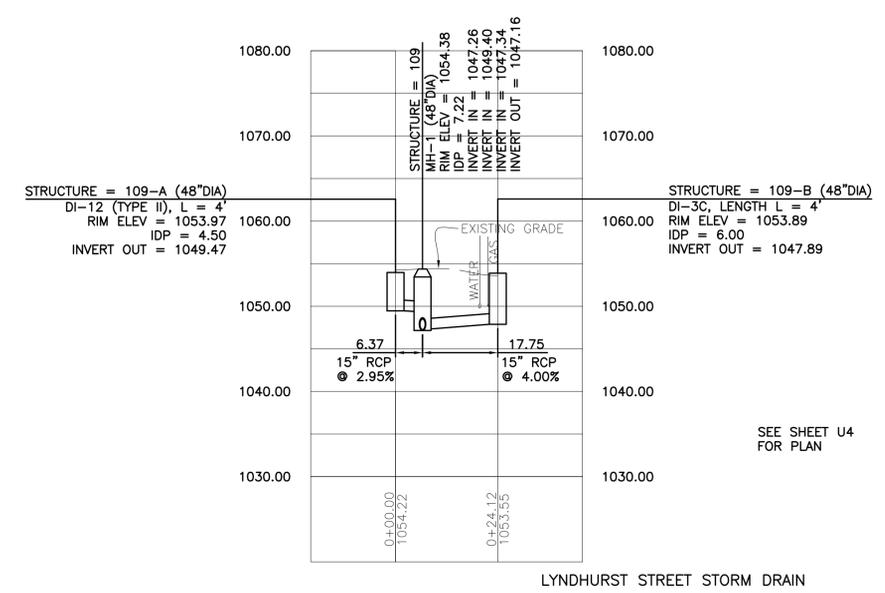
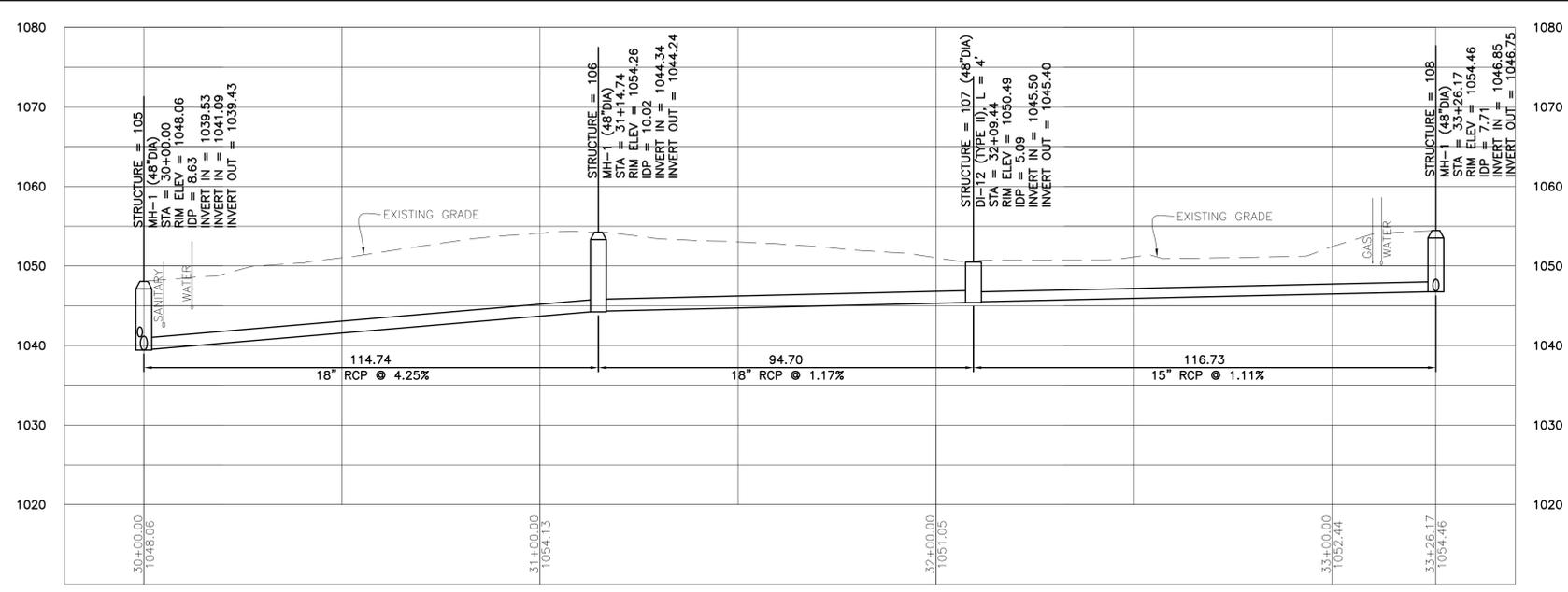
QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
PHASE I - QUEEN PLAN AND PROFILE 2
CITY OF ROANOKE, VIRGINIA

SHEET **U2**
PLAN NO. **6736**

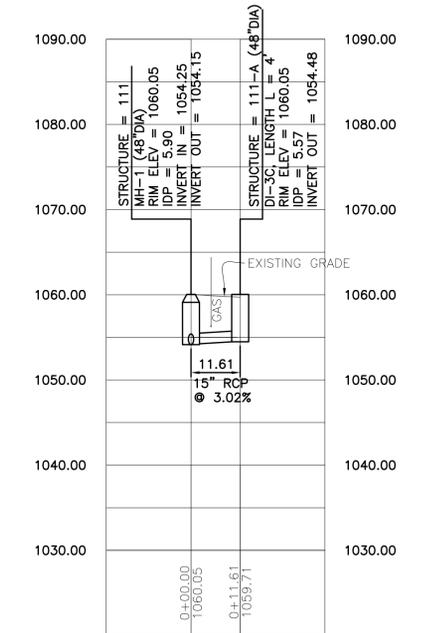


NOTE:
A CONSTRUCTION AND PERMANENT DRAINAGE EASEMENT WILL BE GRANTED TO THE CITY BY THE PROPERTY OWNER FOR CONSTRUCTION IN THIS AREA

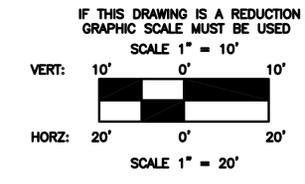
- NOTE:
1. ALL WATER METERS IN FRONT AND ALONG THE ALIGNMENT OF THE NEW CURB AND STORM DRAIN SHALL BE RELOCATED BY THE CONTRACTOR.
 2. CONTRACTOR SHALL MAINTAIN AND COORDINATE CITIZEN ACCESS TO THEIR PROPERTY DURING THE CONSTRUCTION OF THIS PROJECT.



LYNDHURST STREET STORM DRAIN



LYNDHURST STREET STORM DRAIN



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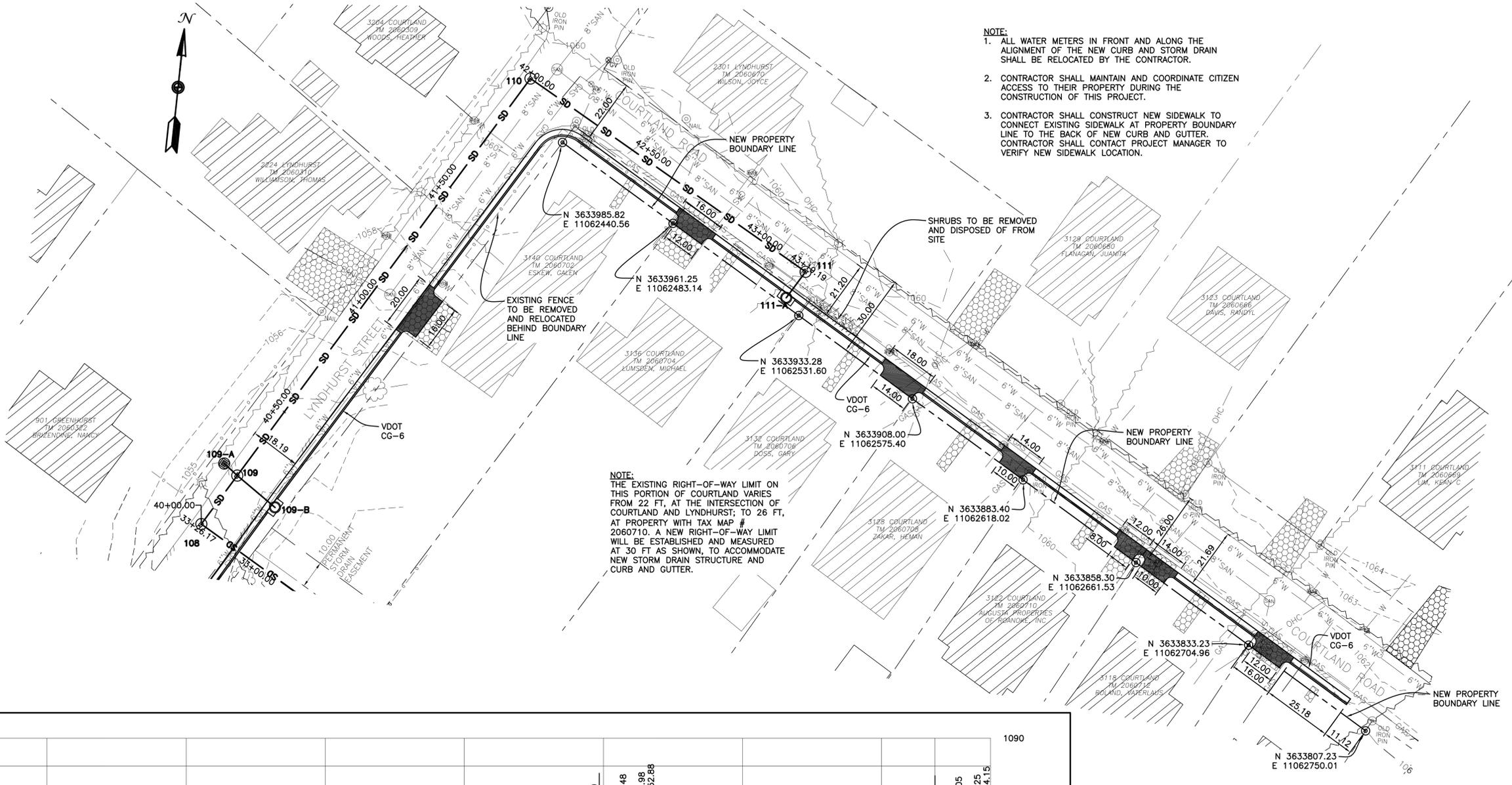


REV.	DATE:	DESCRIPTION

DATE: **03/01/12**
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24"x36" SHEET

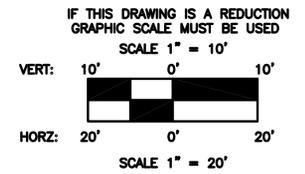
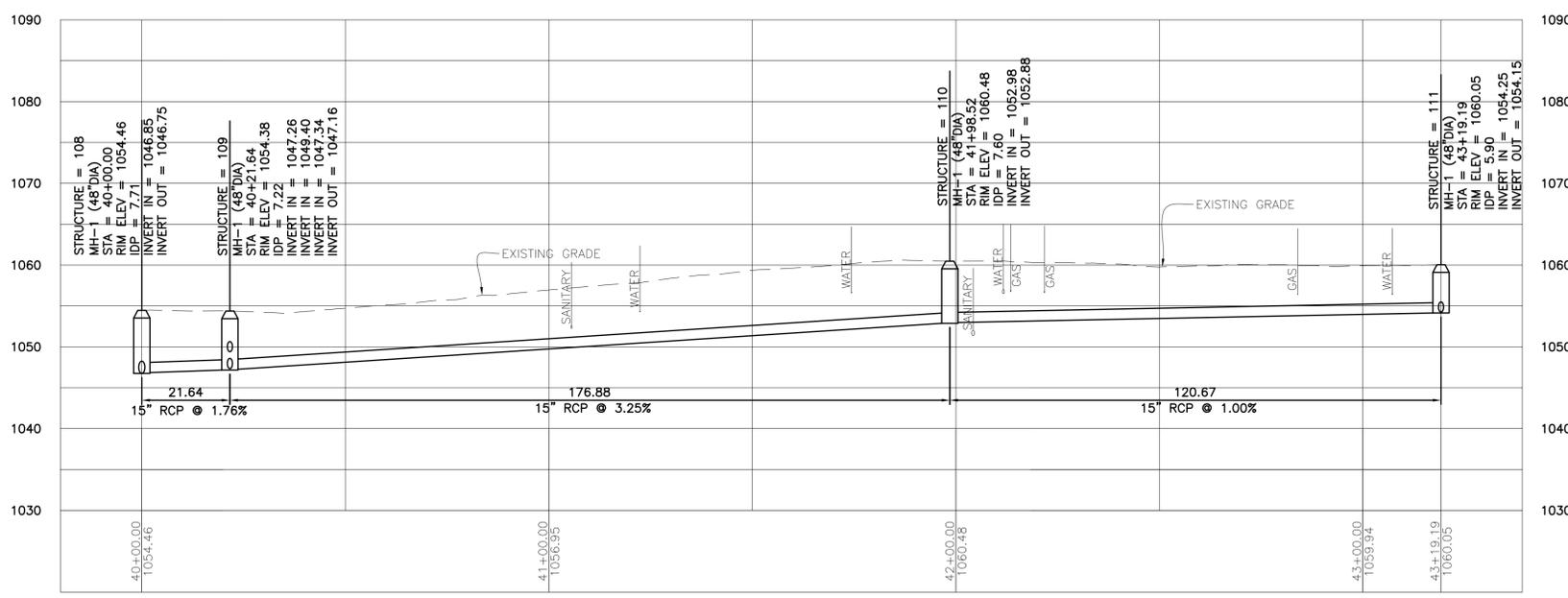
QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
PHASE I - LYNDHURST COURTLAND PLAN AND PROFILE 1
CITY OF ROANOKE, VIRGINIA

SHEET **U3**
PLAN NO. **6736**



- NOTE:**
1. ALL WATER METERS IN FRONT AND ALONG THE ALIGNMENT OF THE NEW CURB AND STORM DRAIN SHALL BE RELOCATED BY THE CONTRACTOR.
 2. CONTRACTOR SHALL MAINTAIN AND COORDINATE CITIZEN ACCESS TO THEIR PROPERTY DURING THE CONSTRUCTION OF THIS PROJECT.
 3. CONTRACTOR SHALL CONSTRUCT NEW SIDEWALK TO CONNECT EXISTING SIDEWALK AT PROPERTY BOUNDARY LINE TO THE BACK OF NEW CURB AND GUTTER. CONTRACTOR SHALL CONTACT PROJECT MANAGER TO VERIFY NEW SIDEWALK LOCATION.

NOTE:
 THE EXISTING RIGHT-OF-WAY LIMIT ON THIS PORTION OF COURTLAND VARIES FROM 22 FT, AT THE INTERSECTION OF COURTLAND AND LYNDHURST; TO 26 FT, AT PROPERTY WITH TAX MAP # 2060710. A NEW RIGHT-OF-WAY LIMIT WILL BE ESTABLISHED AND MEASURED AT 30 FT AS SHOWN, TO ACCOMMODATE NEW STORM DRAIN STRUCTURE AND CURB AND GUTTER.



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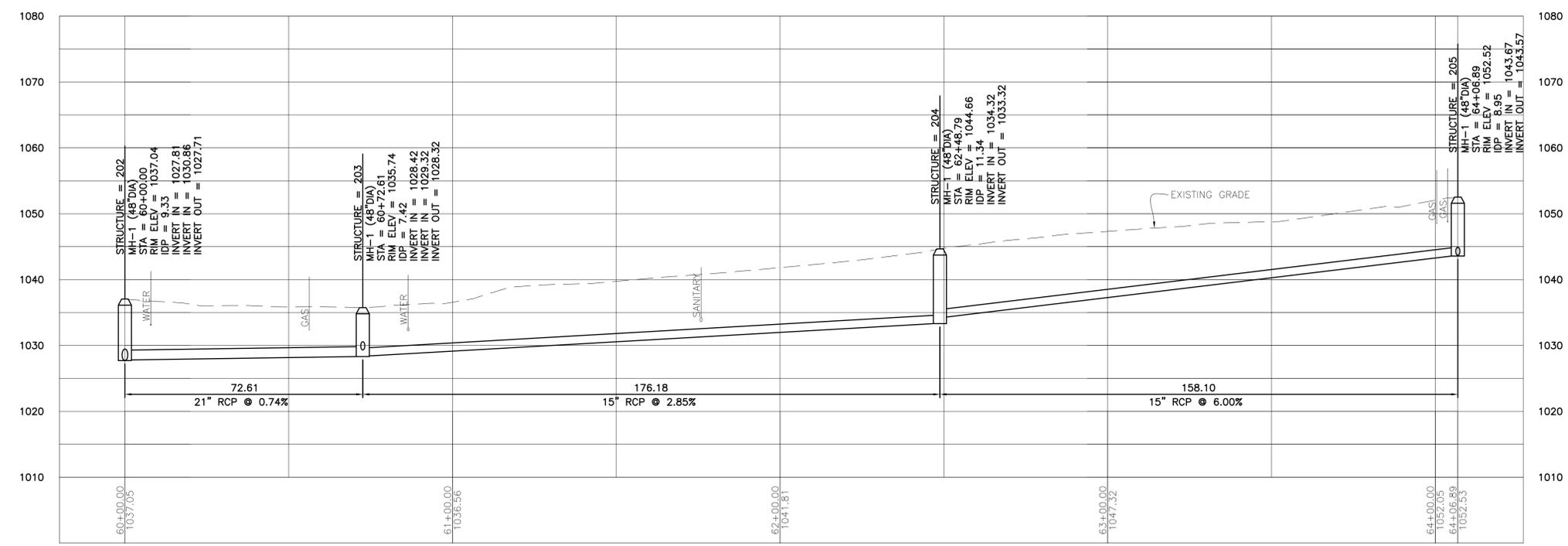
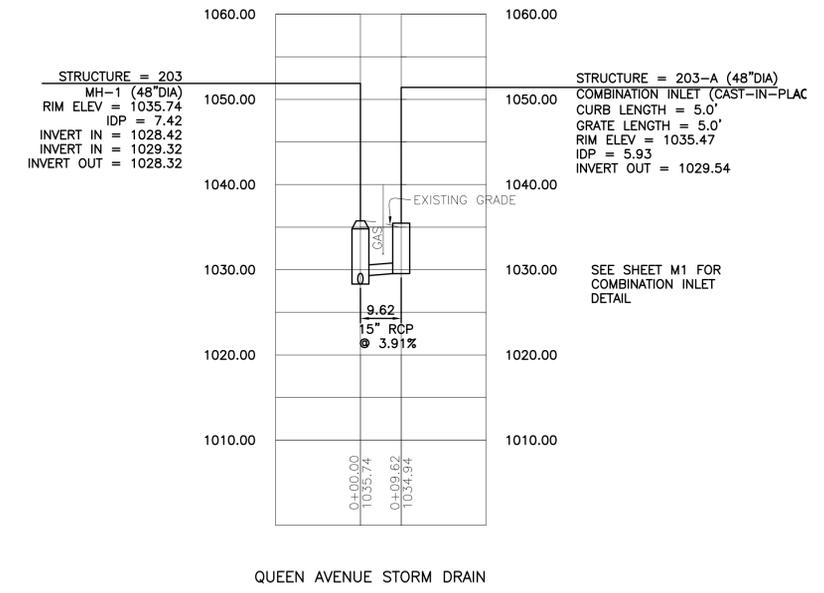
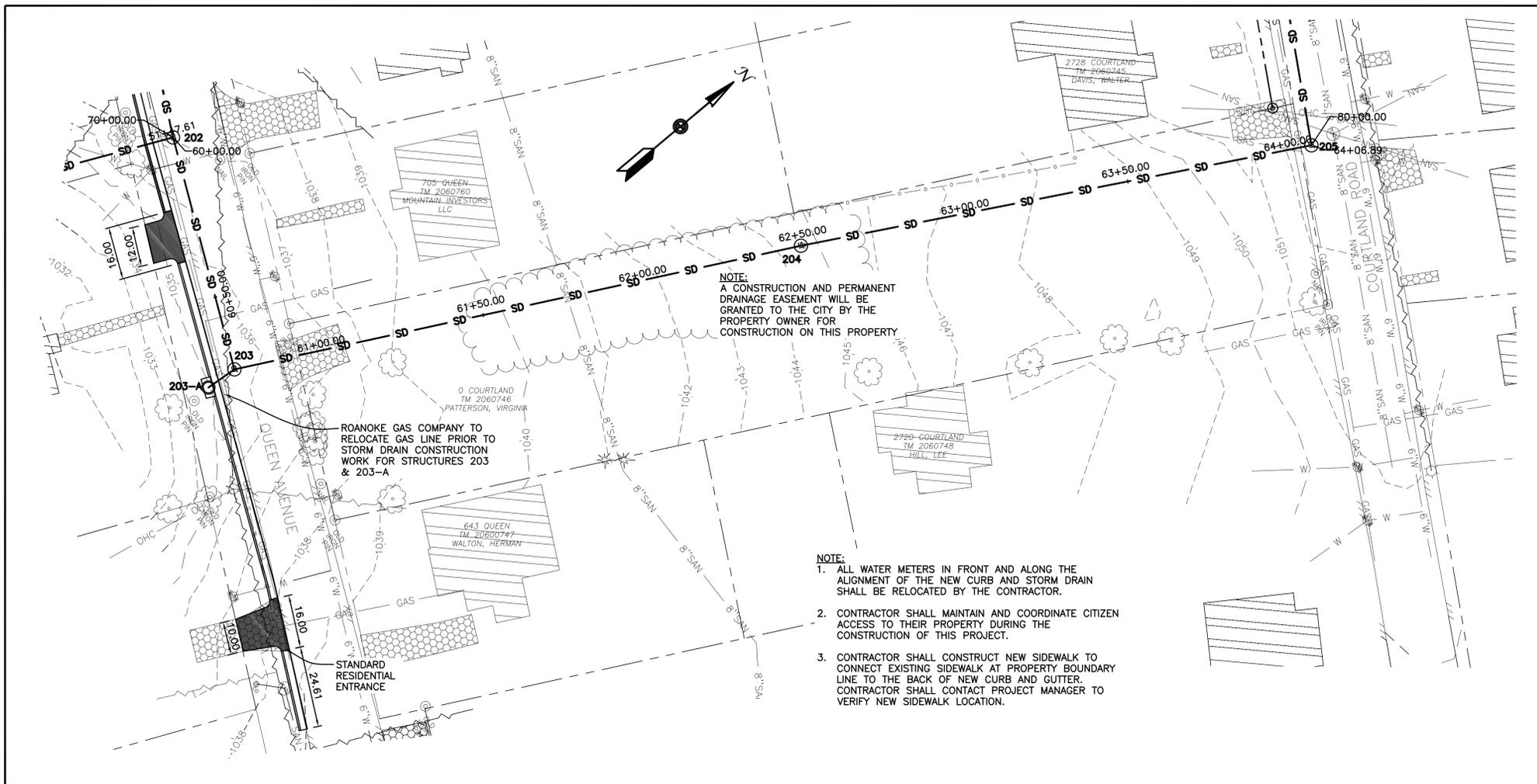


REV.	DATE:	DESCRIPTION

DATE: **03/01/13**
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QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
PHASE I - LYNDHURST COURTLAND PLAN AND PROFILE 2
 CITY OF ROANOKE, VIRGINIA

SHEET **U4**
 PLAN NO. **6736**



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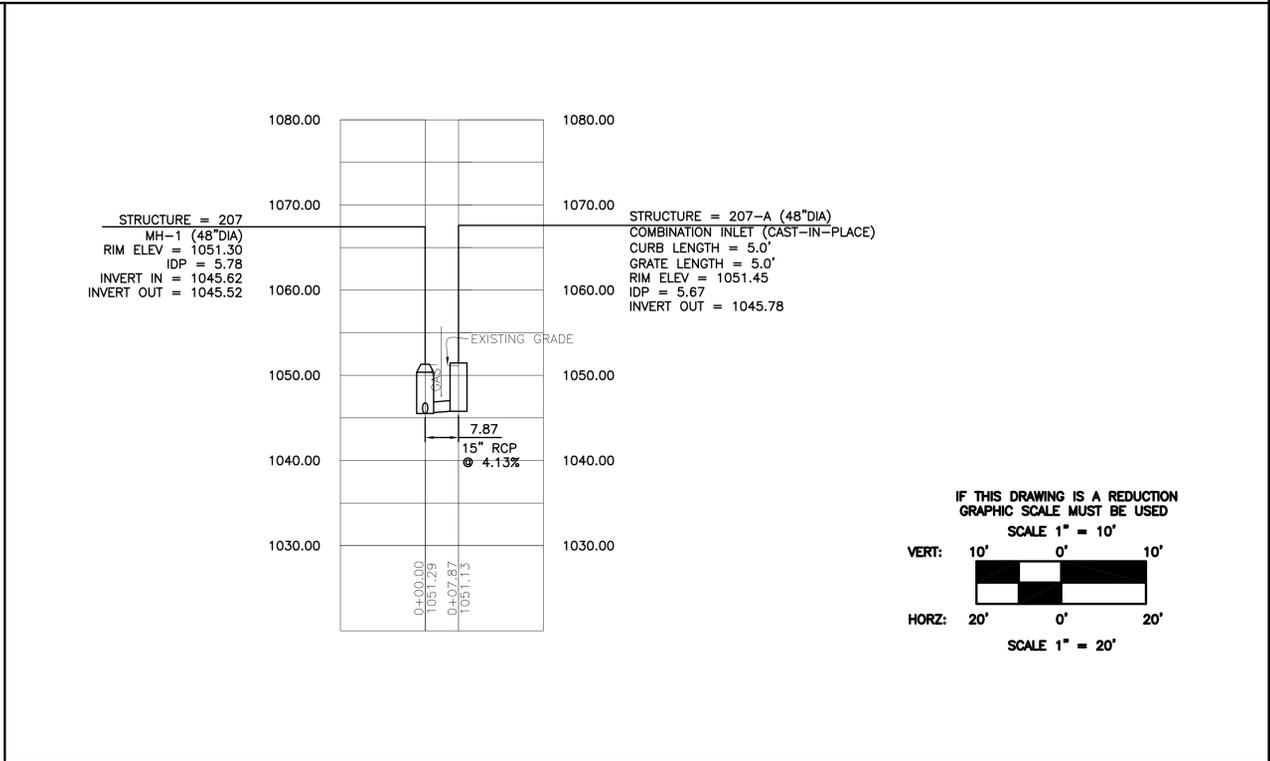
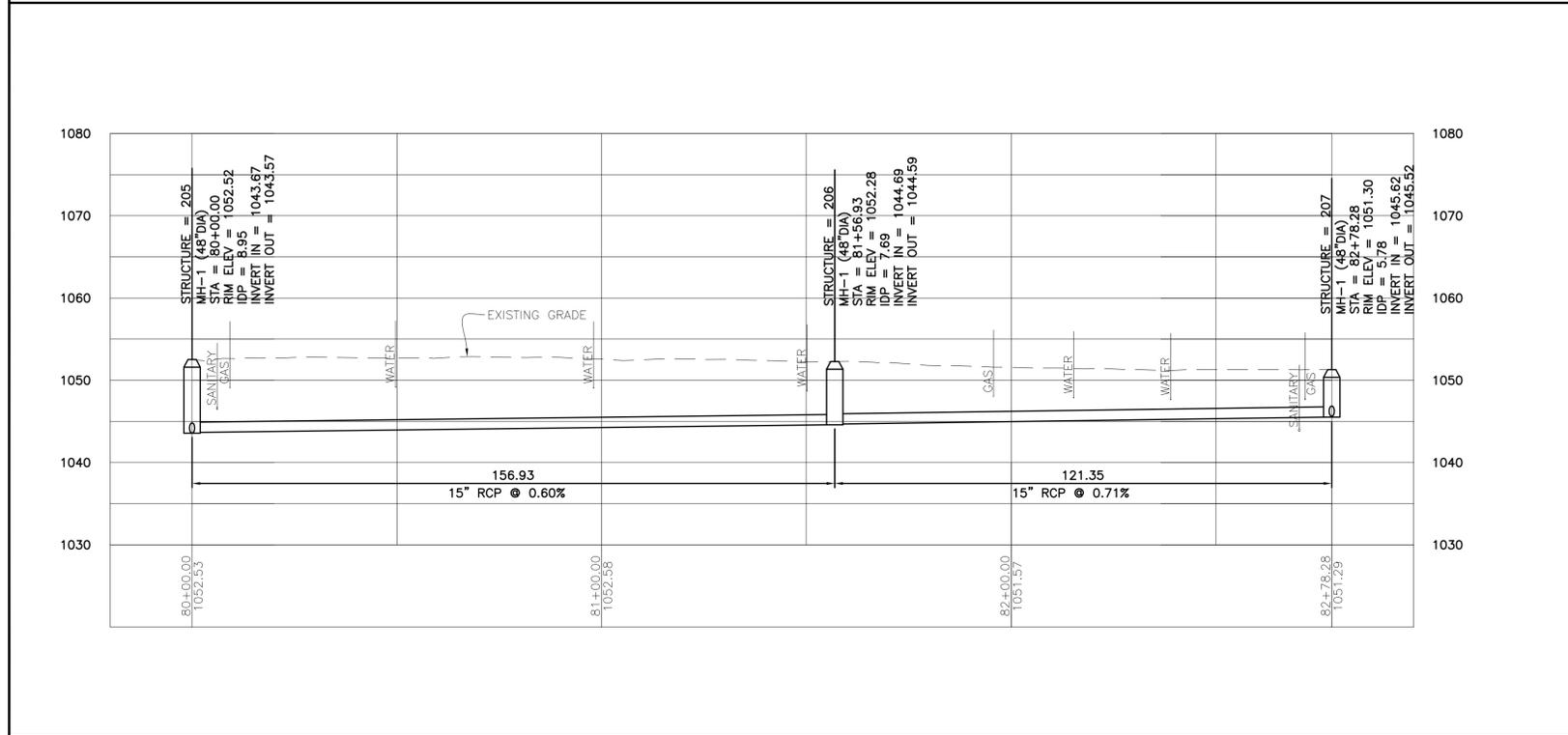
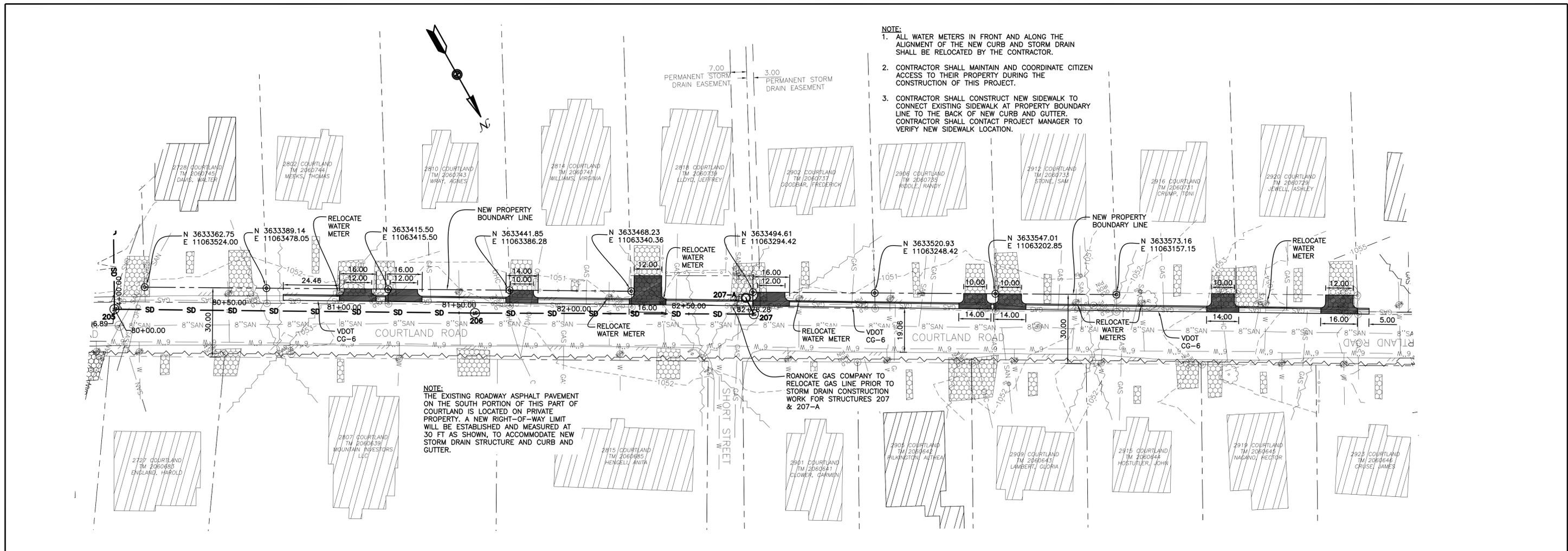
JOSEPHUS M. JOHNSON-KOROMA
Lic. No. 46165
PROFESSIONAL ENGINEER

REV.	DATE:	DESCRIPTION

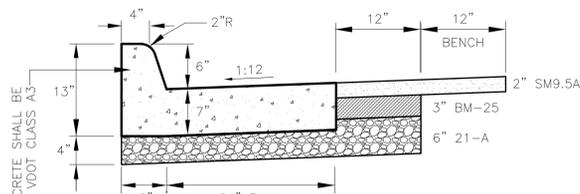
DATE: **03/01/13**
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24"x36" SHEET

QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
PHASE II - QUEEN COURTLAND PLAN AND PROFILE
CITY OF ROANOKE, VIRGINIA

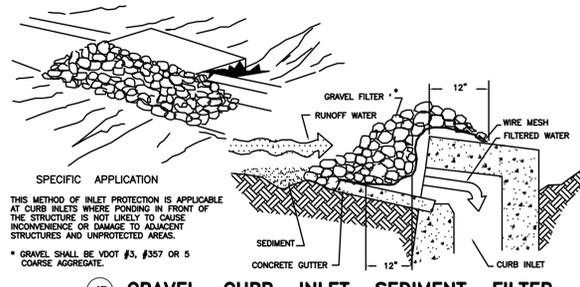
SHEET **U6**
PLAN NO. **6736**



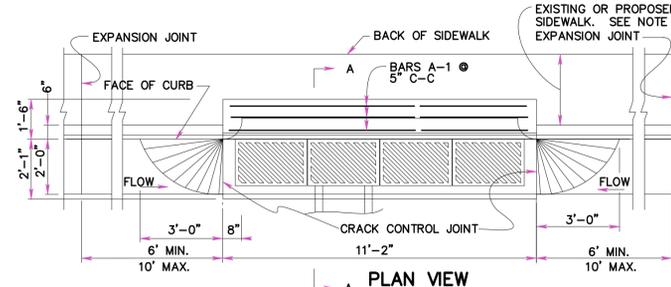
<p>OFFICE OF THE CITY ENGINEER 215 CHURCH AVENUE, S.W. ROOM 350 PHONE: (540) 853-2731 FAX: (540) 853-1364 WWW.ROANOKEVA.GOV</p>	DESIGNED: JJK		REV.	DATE:	DESCRIPTION:	DATE:	QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT PHASE II - COURTLAND PLAN AND PROFILE CITY OF ROANOKE, VIRGINIA	SHEET
	DRAWN: JJK					03/01/13		
	CHECKED: LEP					SCALE: AS SHOWN 24"x36" SHEET		PLAN NO. 6736



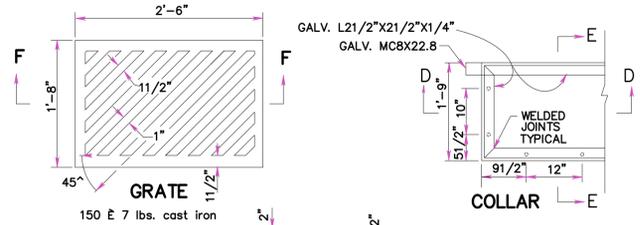
STANDARD 6" CURB AND GUTTER
WITH ASPHALT RESTORATION
(CG-6) NTS



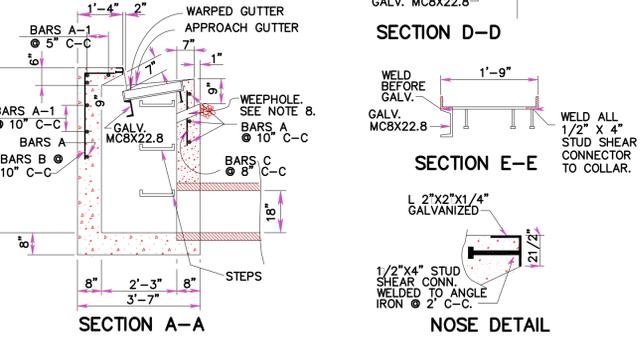
IP GRAVEL CURB INLET SEDIMENT FILTER



PLAN VIEW



SECTION F-F



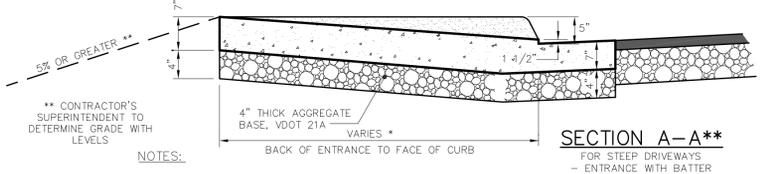
SECTION A-A

NOSE DETAIL

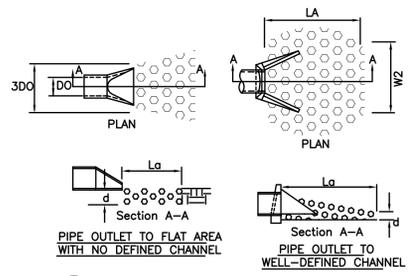
BARS A		BARS A-1		BARS B		BARS C	
No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.
5	11'-0"	5	11'-0"	14	4'-6"	18	3'-0"

- THE DETAIL SHOWN ABOVE IS FOR A COMBINATION INLET WITH GRATE LENGTH OF 10 FEET. COMBINATION INLETS USED ON THIS PROJECT HAVE A GRATE LENGTH OF 7.5 AND 5 FEET. CONTRACTOR SHALL MAKE MODIFICATIONS TO THE LENGTH OF TRANSVERSE STEEL BARS, STRUCTURAL STEEL, COLLAR, AND ANGLE IRON FOR THE CONSTRUCTION OF ALL COMBINATION INLETS ON THIS PROJECT, APPROVED BY THE PROJECT MANAGER.
- THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
- THIS ITEM IS A CAST-IN-PLACE STRUCTURE.
- #4 X 8" SMOOTH DOWELS AT APPROXIMATELY 12" C-C TO BE PLACED IN ALL AREAS ADJACENT TO ABUTTING CONCRETE TO PREVENT SETTLEMENT.
- 3" DIAMETER WEEP HOLE TO BE LOCATED TO DRAIN SUBBASE MATERIAL. WEEP HOLE WITH 12" X 12" PLASTIC HARDWARE CLOTH * MESH OR GALVANIZED STEEL WIRE. MINIMUM WIRE DIAMETER 0.03", NUMBER 4 MESH HARDWARE CLOTH ANCHORED FIRMLY TO THE OUTSIDE OF THE STRUCTURE.
- ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 2".
- THIS AREA MAY BE EARTHEN, IN WHICH CASE THE EXPANSION JOINTS WILL APPLY ONLY TO CURB AND GUTTER.
- ALL REINFORCING BARS TO BE #5.
- GRATE TO BE INSTALLED SO SLOTS WILL DIRECT WATER TOWARD THE INLET THROAT.

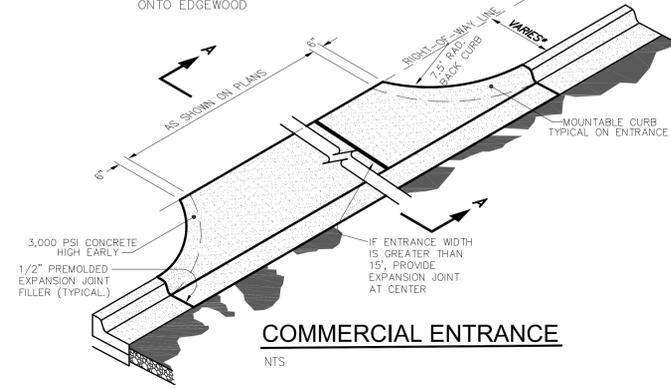
CAST-IN-PLACE COMBINATION INLET DETAIL
(STRUCTURES 103-A, 203-A & 207-A)



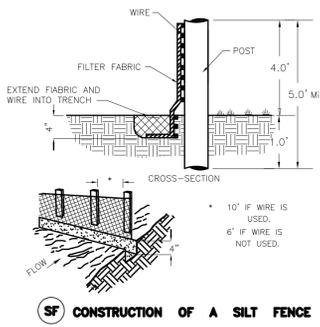
SECTION A-A**
FOR STEEP DRIVEWAYS
ENTRANCE WITH BATTER



OP OUTLET PROTECTION

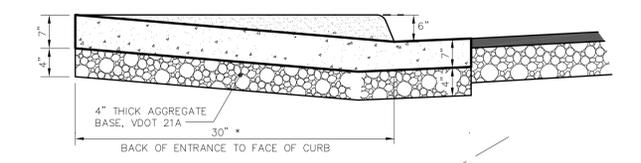


COMMERCIAL ENTRANCE
NTS

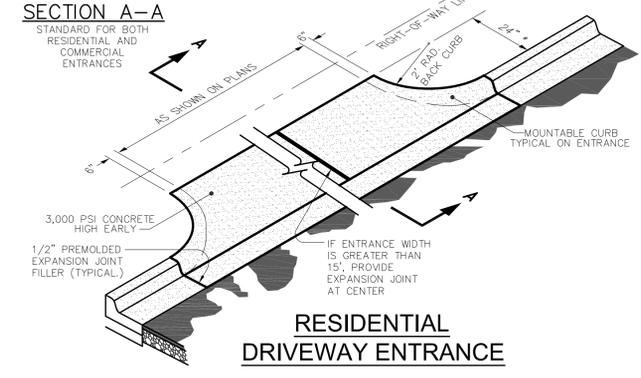


SF CONSTRUCTION OF A SILT FENCE

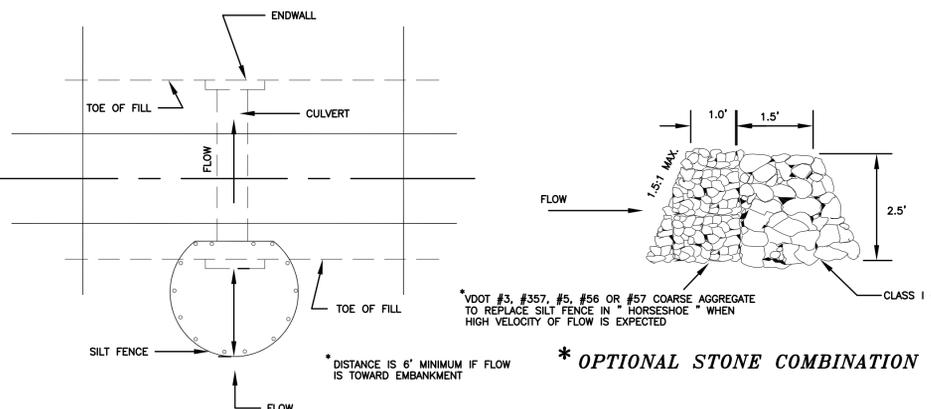
NO.	TITLE	KEY	SYMBOL
3.05	SILT FENCE	SF	XXXXXX
3.07	STORM DRAIN INLET PROTECTION	IP	⊗
3.08	CULVERT INLET PROTECTION	CIP	⊗
3.18	OUTLET PROTECTION	OP	⊗
3.31	TEMPORARY SEEDING	TS	⊗
3.32	PERMANENT SEEDING	PS	⊗
3.35	MULCHING	ML	⊗



SECTION A-A
STANDARD FOR BOTH
RESIDENTIAL AND
COMMERCIAL
ENTRANCES

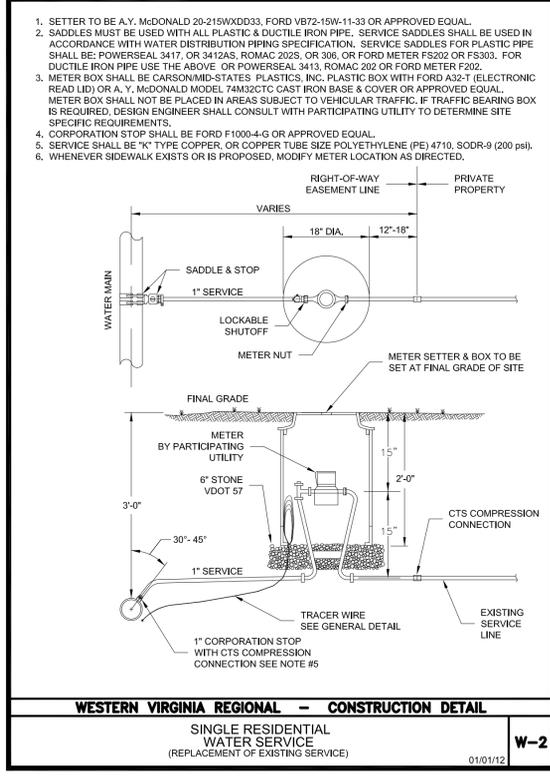


RESIDENTIAL DRIVEWAY ENTRANCE



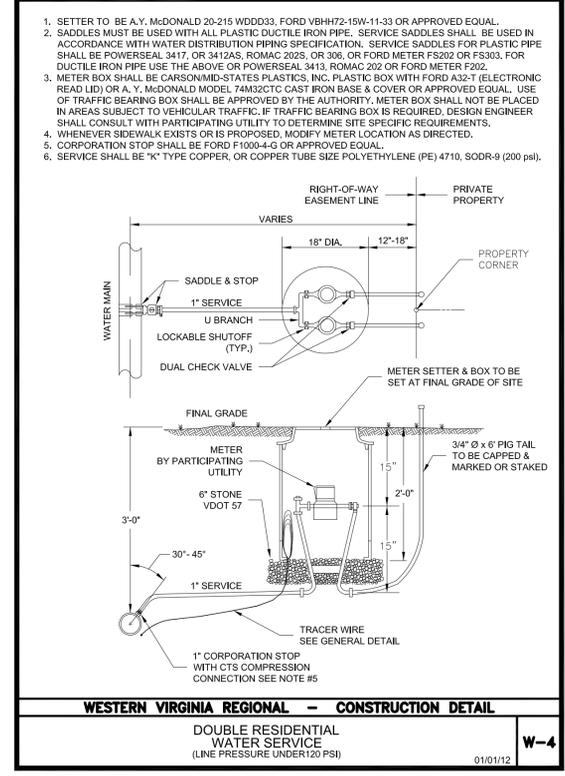
SILT FENCE CULVERT INLET PROTECTION

*** OPTIONAL STONE COMBINATION**



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

SINGLE RESIDENTIAL WATER SERVICE
(REPLACEMENT OF EXISTING SERVICE) 01/01/12 **W-2**



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

DOUBLE RESIDENTIAL WATER SERVICE
(LINE PRESSURE UNDER 120 PSI) 01/01/12 **W-4**

ROANOKE
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DATE: **03/01/13**
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24"x36" SHEET

QUEEN AVENUE - COURTLAND ROAD DRAINAGE PROJECT
E & S CONTROL AND MISCELLANEOUS DETAILS
CITY OF ROANOKE, VIRGINIA

SHEET **M1**
PLAN NO. **6736**