JOHNSON CITY

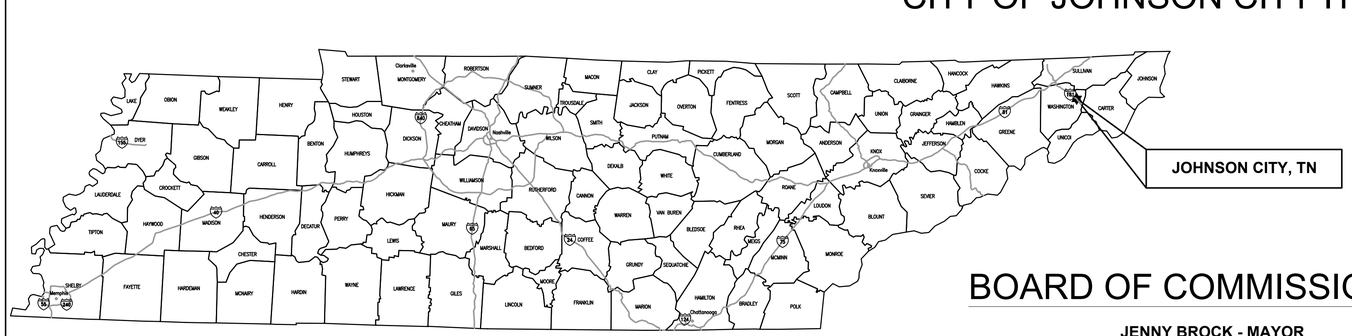
WASHINGTON COUNTY, TENNESSEE

CITY OF JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER CONTRACT #1

TDEC WASTEWATER PROJECT NO. 17.0413R

SRF # 2020-441

CITY OF JOHNSON CITY ITB NO. 6441



VICINITY MAP

NOT TO SCALE

BOARD OF COMMISSIONERS

JENNY BROCK - MAYOR
JOE WISE - VICE MAYOR
DR. LARRY CALHOUN - COMMISSIONER
DR. TODD FOWLER - COMMISSIONER
JOHN HUNTER - COMMISSIONER

CITY STAFF

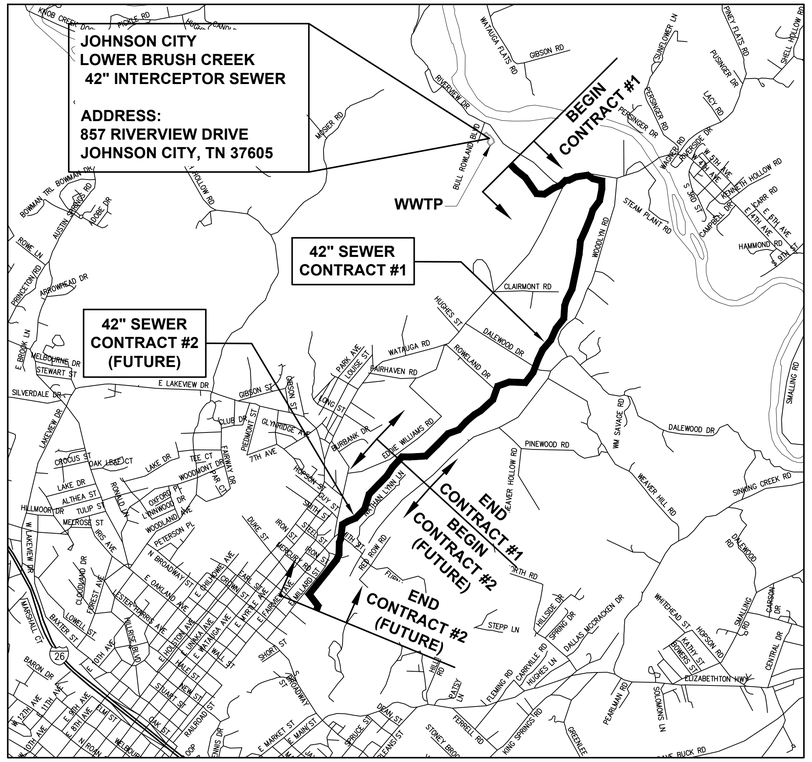
M. DENIS PETERSON - CITY MANAGER
TOM WITHERSPOON - DIRECTOR WSS
SUNNY R. SANDOS - STAFF ATTORNEY
JON LANE - ASSISTANT DIRECTOR - CAPITAL PLANNING

SEPTEMBER 2020

Hazen

HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

HAZEN Project No. 50079-001



LOCATION MAP

NOT TO SCALE

BID PLAN SET

GENERAL NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR FIELD STAKING.
2. CONTRACTOR SHALL ACCESS SITE FROM VARIOUS LOCATIONS.
3. CONTRACTOR SHALL RESTORE ALL CULVERTS, FENCES, WALLS, HEDGES, SHRUBS, FLOWERING TREES, FRUIT TREES, SIGNS, LIGHT POSTS, POWER POLES, STREET MARKERS, AND BOXES (INCLUDING SHUT OFFS), PROPERTY CORNER MARKERS, AND LAWNS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITION, UNLESS INDICATED OTHER WISE ON THE PLANS.
4. CONTRACTOR SHALL PROTECT AND RESTORE SAID PROPERTY TO A CONDITION EQUAL OR BETTER THAN THAT WHICH EXISTED PRIOR TO CONSTRUCTION.
5. EXISTING UTILITIES ARE SHOWN IN AN APPROXIMATE MANNER, THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR BY A FAILURE TO DO SO.
6. CONTRACTOR SHALL ERECT EROSION CONTROL MEASURES PRIOR TO CONSTRUCTION. ONCE CONSTRUCTION IS COMPLETE AND SITE HAS BEEN STABILIZED, CONTRACTOR SHALL REMOVE EROSION CONTROL MEASURES.
7. CONTRACTOR SHALL REPAIR AND MAINTAIN ALL EROSION CONTROL MEASURES DURING CONSTRUCTION AND REMOVE TRAPPED SEDIMENT AS NEEDED AND/OR AS DIRECTED.
8. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL CODES AND OBTAIN ALL PERMITS PRIOR TO BEGINNING WORK.
9. THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IMMEDIATELY SHOULD ANY FIELD CONDITIONS BE ENCOUNTERED THAT VARY FROM THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS.
10. CONTRACTOR SHALL NOTIFY TN-ONE-CALL (811) AT LEAST THREE (3) WORKING DAYS PRIOR TO ANY EXCAVATION.
11. NO TREES SHALL BE REMOVED AND/OR VEGETATION DISTURBED EXCEPT AS NECESSARY FOR GRADING PURPOSES AND ONLY AS APPROVED BY ARCHITECT/ENGINEER. TREES AND BRUSH WITHIN THE PROPOSED PATH SHALL BE GROUND TO CHIPS AND SPREAD THROUGHOUT THE DISTURBED AREA.
12. THE CONTRACTOR SHALL PROTECT ALL TREES DESIGNATED TO REMAIN, IN ACCORDANCE WITH THE SPECIFICATIONS. DO NOT OPERATE OR STORE HEAVY EQUIPMENT, NOR HANDLE OR STORE MATERIALS, WITHIN THE DRIPLINES OF TREES.
13. IN THE EVENT OF ANY DISCREPANCIES AND/OR ERRORS FOUND IN THE DRAWINGS OR IF PROBLEMS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
14. ALL DAMAGE TO ASPHALT PAVEMENT RESULTING FROM NEW CONSTRUCTION SHALL BE REPLACED WITH LIKE MATERIALS AT THE CONTRACTOR'S EXPENSE. ASPHALT SHALL BE NEATLY SAW-CUT PRIOR TO FINAL PAVING. STREET PLATES OR TEMPORARY PAVING ARE REQUIRED AT THE END OF EACH DAY.
15. PERMANENT PAVEMENT REPAIR SHALL BE DESIGNATED AS A PART OF THIS CONTRACT. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE TEMPORARY REPAIR AND MAINTENANCE OF STREETS AND DRIVEWAYS UNTIL THE PROJECT IS SUBSTANTIALLY COMPLETE. THIS ALSO INCLUDES THE PULLING OF DITCHES AND RESTORING SHOULDERS DAMAGED DURING CONSTRUCTION. CONTRACTOR SHALL ALSO TAKE APPROPRIATE MEASURES TO MITIGATE EROSION DURING CONSTRUCTION.
16. CONTRACTOR SHALL CLOSELY COORDINATE ALL CONSTRUCTION WITH OWNER'S DESIGNATED FIELD REPRESENTATIVE.
17. CONTRACTOR SHALL NOTIFY ENGINEER AT LEAST TWO WEEKS IN ADVANCE PRIOR TO WORK WHICH WILL PLACE RESIDENTS OUT OF SEWAGE SERVICE.
18. THE CONTRACTOR SHALL CHECK ALL FINISHED ELEVATIONS AND DIMENSIONS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO BEGINNING WORK.
19. PROVIDE A SMOOTH SAWCUT TRANSITION BETWEEN EXISTING PAVEMENT AND NEW PAVEMENT. FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY. INSTALL ALL UTILITIES PRIOR TO INSTALLATION OF PAVEMENT.
20. EXCESS MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR AT A PERMITTED SITE OFF THE OWNER'S PROPERTY AT NO ADDITIONAL COST.
21. INSTALL WATER TIGHT PLUG AT END OF EACH WORK DAY.
22. NO BLASTING WITH 60' OF EDGE OF STREAM. LIMITS INDICATED ON DRAWINGS.
23. CONTRACTOR SHALL VERIFY ALL INVERTS & DEFLECTION ANGLES PRIOR TO ORDERING MANHOLES. NO ADDITIONAL PAYMENT SHALL BE MADE FOR MHS W/INCORRECT COMPONENTS.
24. CONTRACTOR REQUIRED TO STAY WITHIN ROW OR EASEMENT.
25. CONTRACTOR SHALL POTHOLE EXISTING UTILITIES TO VERIFY DEPTHS AND LOCATIONS. ANY ADJUSTMENTS TO HORIZONTAL OR VERTICAL ALIGNMENTS TO AVOID UTILIITES SHALL BE APPROVED BY UTILITY.
26. ELEVATIONS SHOWN ON THE DRAWINGS FOR CONTOURS AND EXISTING UTILITIES ARE APPROXIMATE.

STORMWATER EROSION PREVENTION AND SEDIMENT CONTROL REQUIREMENTS:

1. CONTRACTOR SHALL SIGN ON TO PROJECT SWPPP AND KEEP IT CURRENT UNTIL NOT IS SUBMITTED.
2. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE DESIGNED TO CONTROL THE RAINFALL AND RUNOFF FROM A 5 YEAR, 24 HOUR STORM, AS A MINIMUM.
3. EROSION PREVENTION AND SEDIMENT CONTROLS MUST BE INSPECTED ONCE A WEEK AND 24 HOURS BEFORE A RAIN EVENT, AFTER A 0.25 INCH RAIN EVENT AND DOCUMENTED ON THE INSPECTION SITE CHECKLIST.
4. SEDIMENT THAT HAS ESCAPED THE CONSTRUCTION SITE AND HAS COLLECTED IN THE STREET OR DRAINAGE STRUCTURES MUST IMMEDIATELY BE PHYSICALLY REMOVED.
5. STABILIZATION MEASURES MUST BE PERFORMED WITHIN SEVEN (7) DAYS IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, AND WITHIN FIFTEEN (15) DAYS AFTER FINAL GRADING. (COVER CROP WITH AT LEAST 75% COVERAGE).
6. STRAW MULCH MUST BE APPLIED AT 3.0 TONS PER ACRE.
7. STRAW MULCH WITH MULCH CONTROL NETTING OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 3:1 AND STEEPER.
8. STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.
9. EXCAVATED TOPSOIL TO BE REUSED MUST BE STOCKPILED AND ENCIRCLED WITH SILT FENCING.
10. OFF-SITE SPOIL OR BORROW AREAS MUST HAVE APPROVED SEDIMENT CONTROL PLANS.
11. A 25 FOOT UNDISTURBED STREAMSIDE BUFFER ZONE WILL BE LEFT FROM TOP OF BANK ON BOTH SIDES FOR THE ENTIRE LENGTH OF STREAMS THAT TDEC DETERMINES TO BE A PERENNIAL OR INTERMITTENT STREAM. THE STREAMSIDE BUFFER SHALL BE FENCED OFF WHERE THERE IS NO ENCROACHMENT. BUFFER MEANS A VEGETATED AREA, INCLUDING TREES AND SHRUBS THAT EXISTS OR IS ESTABLISHED TO PROTECT A STREAM SYSTEM, LAKE, OR RESERVOIR AREA. THIS BUFFER ALSO APPLIES TO OTHER SENSITIVE AREAS SUCH AS SPRINGS, WETLANDS AND SINKHOLES. TDEC REQUIRES A 60 FOOT CONSTRUCTION BUFFER ON SOME STREAMS.
12. AN ORANGE CONSTRUCTION FENCE IS REQUIRED TO DESIGNATE THE BUFFER AREA BEFORE CLEARING OR TREE REMOVAL HAS BEGUN.
13. THIS STREAMSIDE BUFFER WILL BE LEFT IN UNDISTURBED OR ENHANCED (WHEN REQUIRED BY THE CITY) AND WILL BE PART OF OPEN SPACE AND RECOGNIZED ON COVENANTS WITH RESTRICTIONS OF HOW IT IS TO BE MAINTAINED BY HOMEOWNER ASSOCIATION OR NONRESIDENTIAL PROPERTY OWNER. IF MORE THAN REGULAR MAINTENANCE IS EVER NEEDED, I.E. REMOVAL OF SMALL BRUSH OR TREES THAT HAVE FALLEN, A LANDSCAPE PLAN AND A TREE CUTTING PERMIT IS REQUIRED.
14. ALL SEDIMENT BASINS, TRAP EMBANKMENTS, SWALES, PERIMETER DIKES, AND PERMANENT SLOPES STEEPER OR EQUAL TO 3:1 SHALL BE STABILIZED WITH SOD, SEED, AND ANCHORED STRAW MULCH OR OTHER APPROVED STABILIZATION MEASURES, WITHIN SEVEN (7) CALENDAR DAYS OF ESTABLISHMENT. ALL AREAS DISTURBED OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST BE MINIMIZED AND STABILIZED IMMEDIATELY. MAINTENANCE MUST BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. RESTABILIZATION OR OVERSEEDING WILL BE REQUIRED, IF NECESSARY.
15. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE CONTRACTOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES.
16. CONSTRUCT AND STABILIZE SEDIMENT POND AND CONVEYANCES FIRST. STABILIZE MEANS:
    - A.) A UNIFORM EVENLY DISTRIBUTED, WITHOUT LARGE BARE AREAS PERENNIAL VEGETATIVE COVER WITH A DENSITY OF A MINIMUM OF 75 PERCENT OF THE NATIVE BACKGROUND VEGETATIVE COVER FOR THE AREA ESTABLISHED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES, OR
    - B.) EQUIVALENT PERMANENT STABILIZATION MEASURES (SUCH AS THE USE OF RIPRAP, GABIONS, OR GEOTEXTILE) HAVE BEEN EMPLOYED WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.
17. IF THERE IS A GRAVEL ENVELOPE IN FRONT OF THE OUTLET ORIFICE, IT WILL BE REMOVED AS SOON AS THE SITE IS STABILIZED AND BEFORE BONDS ARE RELEASED.
18. INCLUDE A FOREBAY IN ANY DETENTION POND TO FACILITATE EASIER MAINTENANCE.
19. WITH EARTHEN WALLS, PLACE AN ANTISEEP COLLAR (OR COLLARS) AROUND THE OUTLET PIPE.
20. SEDIMENT FENCES OR OTHER SEDIMENT BARRIERS, SHALL BE INSTALLED PROPERLY ALONG TOPOGRAPHICAL CONTOURS DOWNSLOPE OF THE AREA TO BE DISTURBED PRIOR TO ANY GRADING, CLEARING AND/OR ANY OTHER CONSTRUCTION ACTIVITY.
21. SEDIMENT FENCES:

    USE PRINCIPALLY IN AREAS WHERE SHEET FLOW OCCURS. INSTALL ALONG A LEVEL CONTOUR, SO WATER DOES NOT POND MORE THAN 1.5 FEET (0.5 M) AT ANY POINT. THE MAXIMUM SLOPE PERPENDICULAR TO THE FENCE LINE SHOULD BE 1:1. NO MORE THAN 0.25 ACRE (0.1 HA) PER 100 FT. (31.4 M), OR 0.5 CFS (1.4 X 10-2 M3/S) OF CONCENTRATED FLOW SHOULD DRAIN TO ANY POINT ALONG THE SILT FENCE. TURN ENDS OF FENCE UPHILL TO PREVENT SCOUR FROM WASH AROUND. INTERMITTENTLY, TURN FENCE UPHILL. PROVIDE AREA BEHIND THE FENCE FOR RUNOFF TO POND AND SEDIMENT TO SETTLE (APPROX. 1200 SQ. FT. (111.5 M2) PER ACRE (0.4 HA) DRAINING TO THE SILT FENCE). SELECT FILTER FABRIC THAT RETAINS 85% OF THE SOIL, BY WEIGHT, BASED ON SIEVE ANALYSIS, BUT IS NOT FINER THAN AN EQUIVALENT OPENING SIZE OF 70.
22. STRAW/HAY BALES ARE PROHIBITED.
23. INLET PROTECTION: WHERE APPLICABLE, INLET PROTECTIONS FOR NEARBY STORM SEWER CURB AND DROP INLETS SHALL BE INSTALLED.
24. IDENTIFY STORM DRAIN PROTECTION: WHERE APPLICABLE, INSTALL PROTECTIONS FOR NEARBY STORM SEWER CURB AND DROP INLETS.
25. SAND BAG BARRIER: USE TO CREATE A SMALL SEDIMENT TRAP UPSTREAM OF INLETS ON SLOPED, PAVED STREETS.
26. EXCAVATED DROP INLET SEDIMENT TRAP: AN EXCAVATED AREA AROUND THE INLET TO TRAP SEDIMENT PRIOR TO REACHING INLET SEDIMENT LOG.
27. SEDIMENT MUST BE REMOVED FROM SEDIMENT BARRIERS, PONDS AND OTHER SEDIMENT CONTROLS WHEN DESIGN CAPACITY HAD BEEN REDUCED BY 33%. ALL EP&SC DEVICES ARE TO REMAIN IN PLACE UNTIL THE SITE HAS BEEN STABILIZED AND A GOOD STAND OF GRASS HAS BEEN ESTABLISHED.
28. WHEN A SEDIMENT FENCE'S CAPACITY HAS BEEN REDUCED 33%, IT SHALL BE CLEANED OUT.
29. EROSION PREVENTION AND SEDIMENT CONTROL DEVICES, EP&SC, SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD; GENERALLY CONSIDERED TO BE THROUGH THE COMPLETION OF RESTORATION. A COPY OF YOUR EP&SC PLAN ALONG WITH AN INSPECTION CHECKLIST AND STORMWATER PERMIT, IF APPLICABLE, MUST BE AT THE PROJECT SITE AT ALL TIMES. THE INSPECTION CHECKLIST SHALL HAVE A RECORD OF DATES EP&SC DEVICES ARE INSPECTED AND ANY CORRECTION ACTION TAKEN OR MAJOR OBSERVATIONS.
30. A CONSTRUCTION ENTRANCE IS REQUIRED WHEN CONSTRUCTION ACCESS ROADS ABUT PUBLIC PAVED ROADS. IT MUST BE INSTALLED WITHIN 24 HOURS OF GRADING OR THE PERMIT WILL BE REVOKED. THE USE OF FILTER CLOTH BENEATH CONSTRUCTION ENTRANCE IS REQUIRED. STONES SHOULD BE 3 INCH CRUSHED, WASHED, AND WELL GRADED ROCK TO AT LEAST A 6-INCH (15.2) DEEP AND SHALL BE KEPT CLEAN BY ADDING STONE AS NEEDED. IT SHALL BE 20 FEET WIDE.
31. CONSTRUCTION SCHEDULE: 548 DAYS, APRIL 2020 THRU OCTOBER 2021
32. DISTURBED AREA IS = 39.78 ACRES.
33. THE AVERAGE STREAM BUFFER TO LOWER BRUSH CREEK IS 135'.
34. IN AREAS WHERE WORK WILL BE DONE ON THE EXISTING SEWER THAT IS WITHIN THE 30' MINIMUM BUFFER, TWO ROWS OF PARALLEL WIRE BACKED SILT FENCE SHALL BE REQUITED.
35. A QUALIFIED PERSON WHO HAS TAKEN AN APPROVED TDEC EROSION AND SEDIMENTATION COURSE MUST INSPECT BMPS.
36. BUILDING AND WASTE MATERIALS, AND NON-STORM WATER DISCHARGES, SUCH AS CONCRETE, PAINT WASHWATER, OR MACHINERY LEAKAGE OR SPILLAGE MUST BE MANAGED TO PREVENT THEM FROM ENTERING THE STORMWATER SYSTEM, GROUND WATER OR NEARBY WATER BODY.
37. EP&SC AND STORMWATER CONTROLS SHALL BE INSTALLED AND MAINTAINED.
38. STORMWATER DETENTION/RETENTION AND SEDIMENT PONDS WILL BE INSTALLED AT THE BEGINNING OF THE PROJECT, IF REQUIRED.
39. LARGE CONSTRUCTION SITES SHALL BE BUILT IN PHASES.

DEMOLITION NOTES:

1. ALL DEMOLISHED MATERIALS BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE DESIGNATED. DISPOSE OF OFF THE OWNER'S PROPERTY AT AN APPROVED AND PERMITTED SITE.
2. ALL PAVEMENT, BASE COURSES, SIDEWALKS, CURBS, ETC., IN THE AREA TO BE REMOVED SHALL BE REMOVED TO FULL DEPTH UNLESS OTHERWISE DIRECTED.
3. THE CONTRACTOR SHALL USE WATER SPRINKLING AND OTHER SUITABLE METHODS AS NECESSARY TO CONTROL DUST AND DIRT CAUSED BY THE WORK.
4. ALL ITEMS OF CONSTRUCTION REMAINING AND NOT SPECIFICALLY MENTIONED THAT INTERFERE WITH THE NEW CONSTRUCTION SHALL BE REMOVED AS DIRECTED BY THE ENGINEER.
5. CONTRACTOR SHALL PROVIDE PROTECTION TO ALL STREETS, FENCES, TREES, UTILITIES AND STRUCTURES THAT ARE TO REMAIN. REPAIR CONTRACTOR-CAUSED DAMAGE AT NO ADDITIONAL COST TO THE OWNER.
6. ANY CAVITIES LEFT BY THE REMOVAL OF STRUCTURES SHALL BE FRACTURED SO AS TO NOT HOLD WATER, BACKFILLED AND COMPACTED WITH #57 STONE.
7. CONTRACTOR SHALL FIELD LOCATE AND MARK ALL EXISTING UTILITIES PRIOR TO COMMENCING WORK. COORDINATE WITH LOCAL UTILITY COMPANIES PRIOR TO DISCONNECTING ANY UTILITIES.

OFFSITE NOTES:

1. THE CONTRACT SHALL SUBMIT TO THE OWNER/ENGINEER COPIES OF ANY AGREEMENTS THE CONTRACTOR HAS MADE WITH PARCEL OWNERS ALONG THE ALIGNMENT OR ASSOCIATED WITH THE PROJECT. SUCH AGREEMENTS SHALL INCLUDE STATEMENTS THAT HOLD BOTH THE CITY OF JOHNSON CITY AND HAZEN HARMLESS OF ANYTHING THAT TAKES PLACE ON AFOREMENTIONED PARCELS.

ABBREVIATIONS

CP	CONCRETE PLANK OR CONTROL PANEL, OR CONTROL POINT
EL	ELEVATION
ESMT	EASEMENT
IINV	INVERT
L	LENGTH/ANGLE
LN	LANE
LOC	LIMIT OF CONSTRUCTION
MANUF	MANUFACTURER
MATL	MATERIAL
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
N	NORTH
NAVD '88	NORTH AMERICAN VERTICAL DATUM OF 1988
NTS	NOT TO SCALE
OC	ON CENTER
PERM	PERMANENT
RD.	ROAD
SS	SANITARY SEWER
TEMP	TEMPORARY
UG	UNDERGROUND

LINETYPES LEGEND

- PROPOSED LINE
- EXISTING LINE
- HIDDEN LINE
- REMOVE AND REPLACE
- ABANDON IN PLACE
- MATCH LINE
- EX. PROPERTY LINE
- EXISTING DRIVEWAY
- TEMP CONSTRUCTION EASMENT
- PERMANENT CONSTRUCTION EASEMENT
- STREAM BUFFER
- BOTTOM OF CREEK

INDEX OF DRAWINGS

42" SEWER

LEGEND

- ROAD/GRAVEL
- TREE
- RAILROAD
- FENCE
- CONSTRUCTION FENCE
- SILT FENCE (SF)
- TREE PROTECTION FENCE (TPF)
- FIBER FILTRATION TUBE
- PROPOSED MANHOLE
- EX. MANHOLE
- ABANDON IN PLACE
- REMOVE AND REPLACE
- DIRECTION OF WATER FLOW
- CLAY CHECKDAM
- CLEANOUT (CO.)
- CHECK DAM

Tennessee 811

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

STATE OF TENNESSEE — JOHNSON CITY — DEPARTMENT OF AGRICULTURE — 9/16/2020 — DEPARTMENT OF COMMERCE AND INSURANCE

Hazen
HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

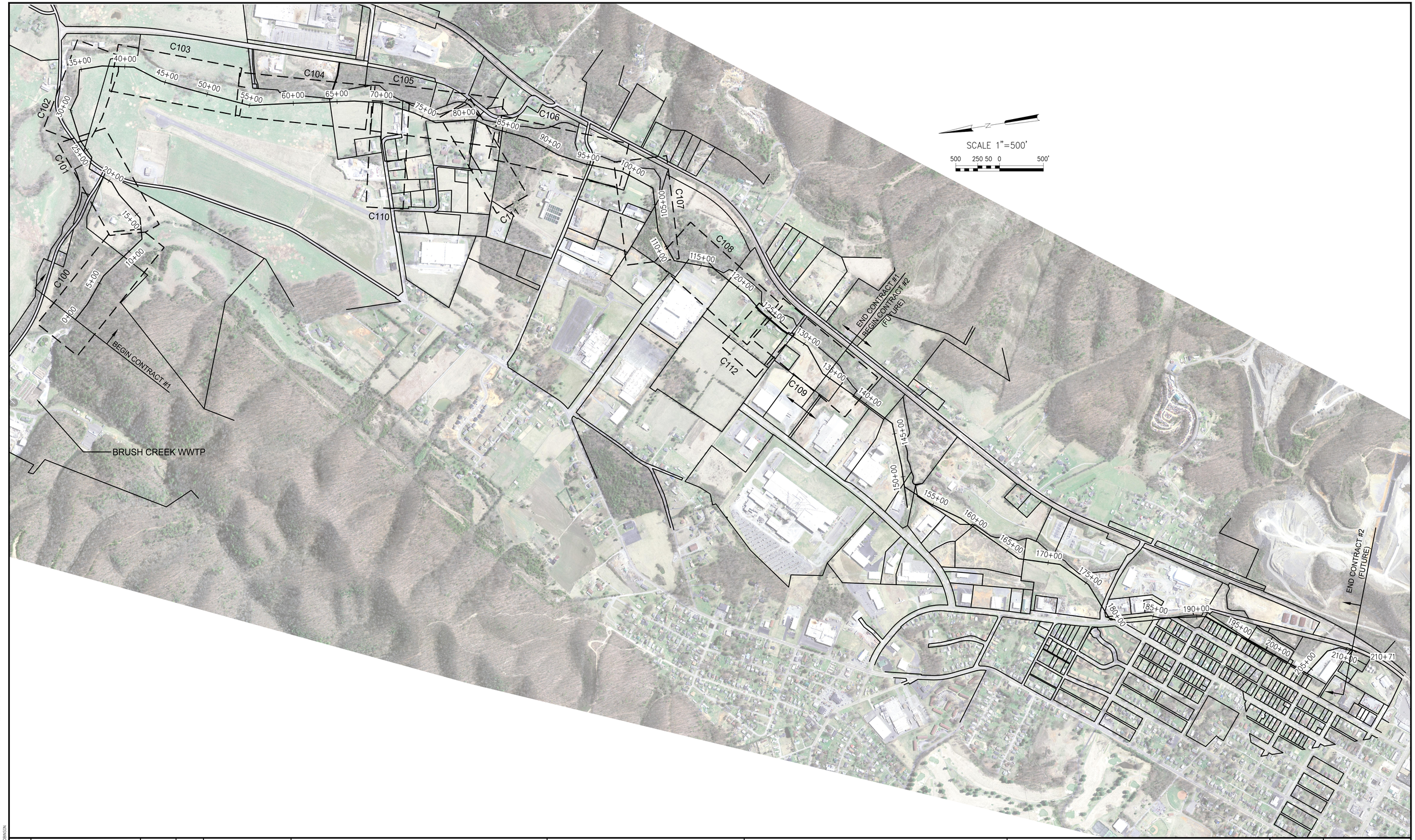
WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

LEGEND ABBREVIATIONS EROSION AND SEDIMENT CONTROL

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER G02



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JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

OVERALL PROJECT MAP

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C01

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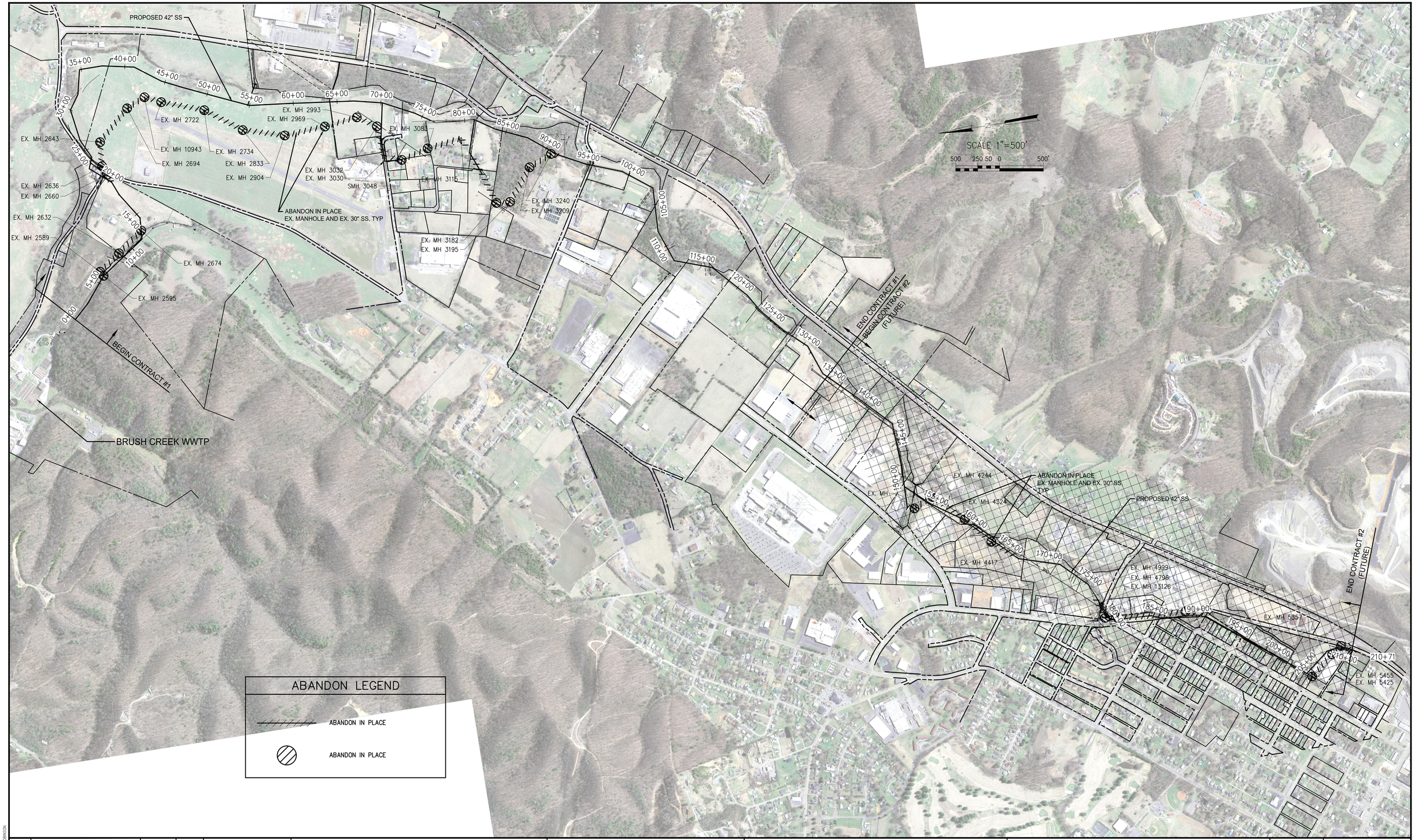

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CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

OVERALL ABANDONMENT MAP

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C02

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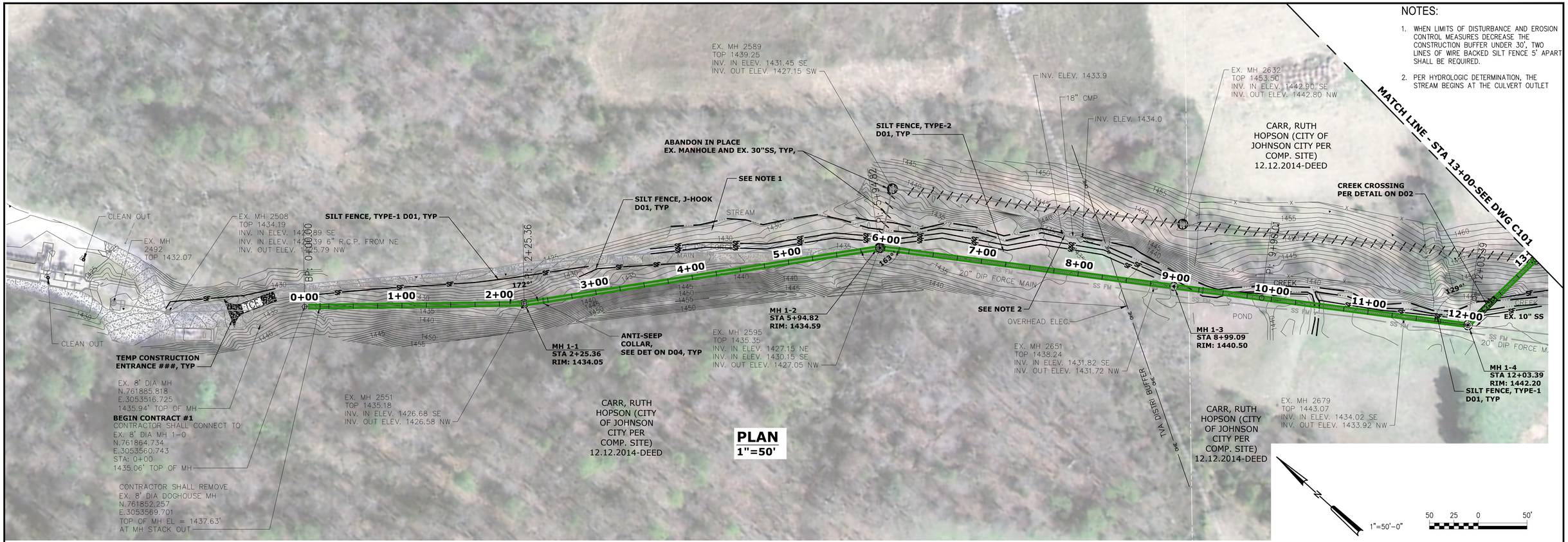
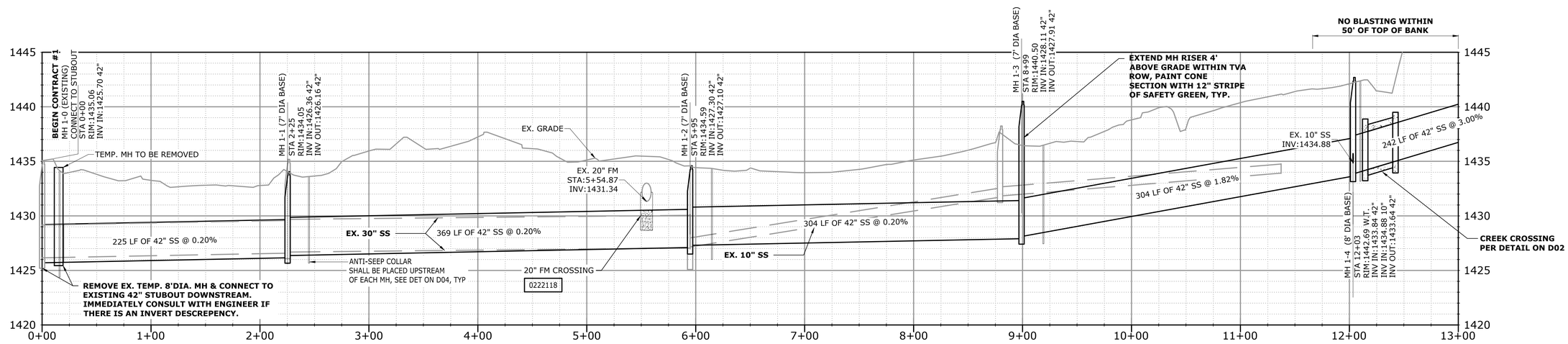
NOTES:

1. WHEN LIMITS OF DISTURBANCE AND EROSION CONTROL MEASURES DECREASE THE CONSTRUCTION BUFFER UNDER 30', TWO LINES OF WIRE BACKED SILT FENCE 5' APART SHALL BE REQUIRED.
2. PER HYDROLOGIC DETERMINATION, THE STREAM BEGINS AT THE CULVERT OUTLET



PLAN
1"=50'



PROFILE
H:1"=50'
V:1"=5'

1"=5'-0" 5 2.5 0 5'
1"=50'-0" 50 25 0 50'

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JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

42" INTERCEPTOR

STA. 0+00 TO STA. 13+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C100

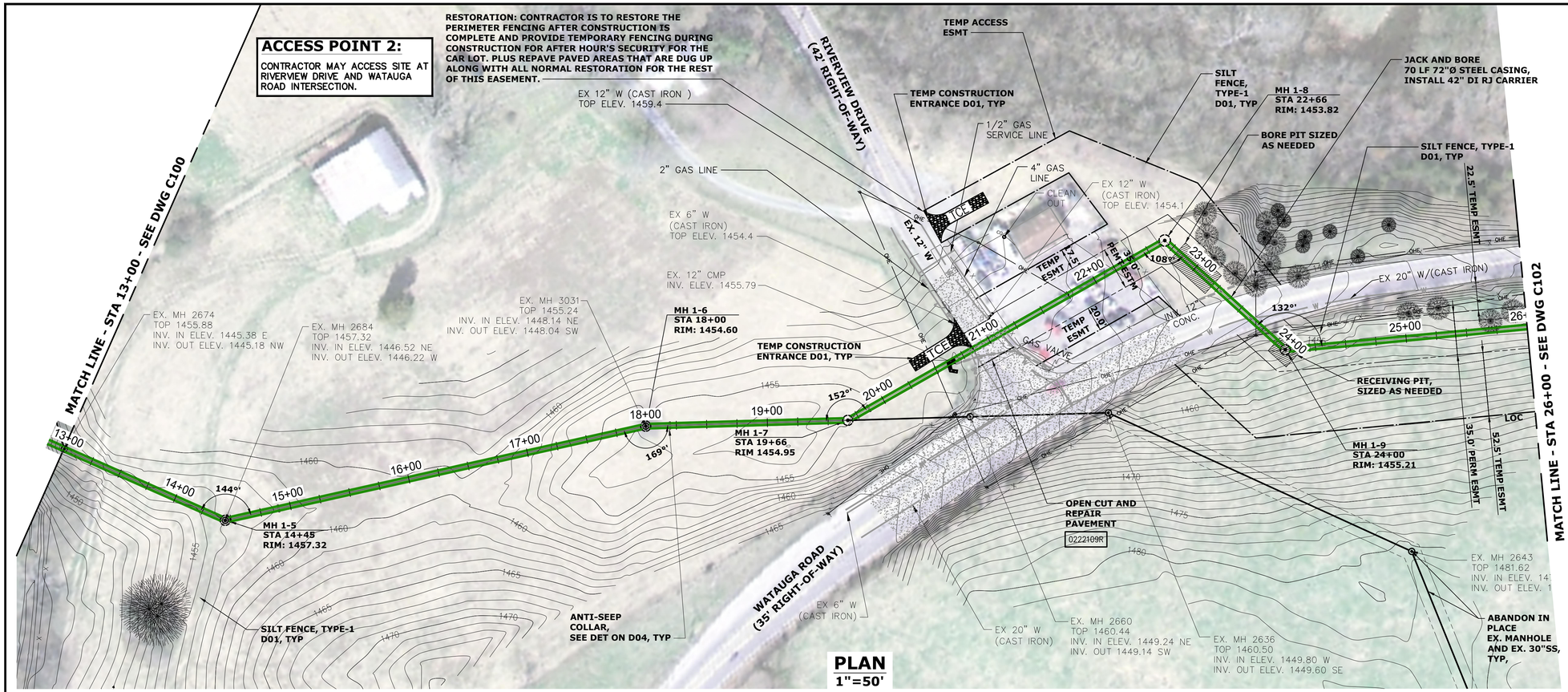
ACCESS POINT 2:

CONTRACTOR MAY ACCESS SITE AT RIVERVIEW DRIVE AND WATAUGA ROAD INTERSECTION.

RESTORATION: CONTRACTOR IS TO RESTORE THE PERIMETER FENCING AFTER CONSTRUCTION IS COMPLETE AND PROVIDE TEMPORARY FENCING DURING CONSTRUCTION FOR AFTER HOUR'S SECURITY FOR THE CAR LOT. PLUS REPAVE PAVED AREAS THAT ARE DUG UP ALONG WITH ALL NORMAL RESTORATION FOR THE REST OF THIS EASEMENT.

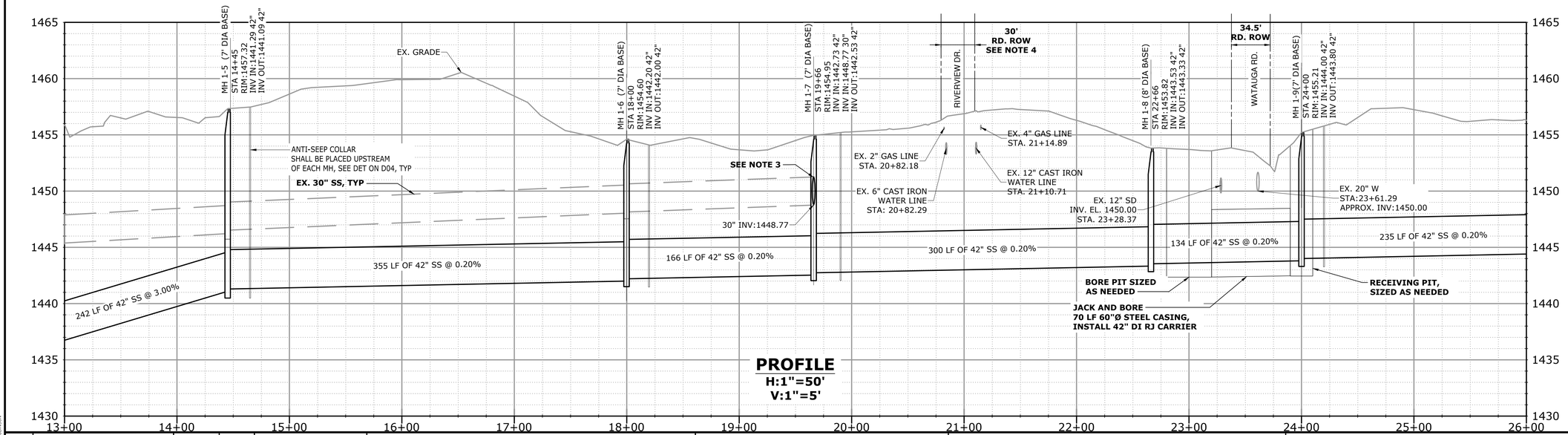
NOTES:

1. OPEN CUT ROADS. MAINTAIN ONE LANE OF TRAFFIC OPEN AT ALL TIMES.
2. VACUUM EXCAVATE ALL UTILITIES TO DETERMINE SIZE/DEPTH PRIOR TO SEWER INSTALLATION.
3. AT MH 1-7, PROVIDE TEMPORARY CONNECTION TO EXISTING SEWER UNTIL UPSTREAM CONNECTION IS COMPLETE. WHEN CONNECTION IS NO LONGER NEEDED REPLACE RISER SECTION WHERE TEMPORARY CONNECTION WAS MADE.
4. COORDINATE OPEN-CUT ROAD CROSSING WITH LOCAL AUTHORITIES.



PLAN
1"=50'

SCALE 1"=50'
50 25 0 50'



PROFILE
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WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

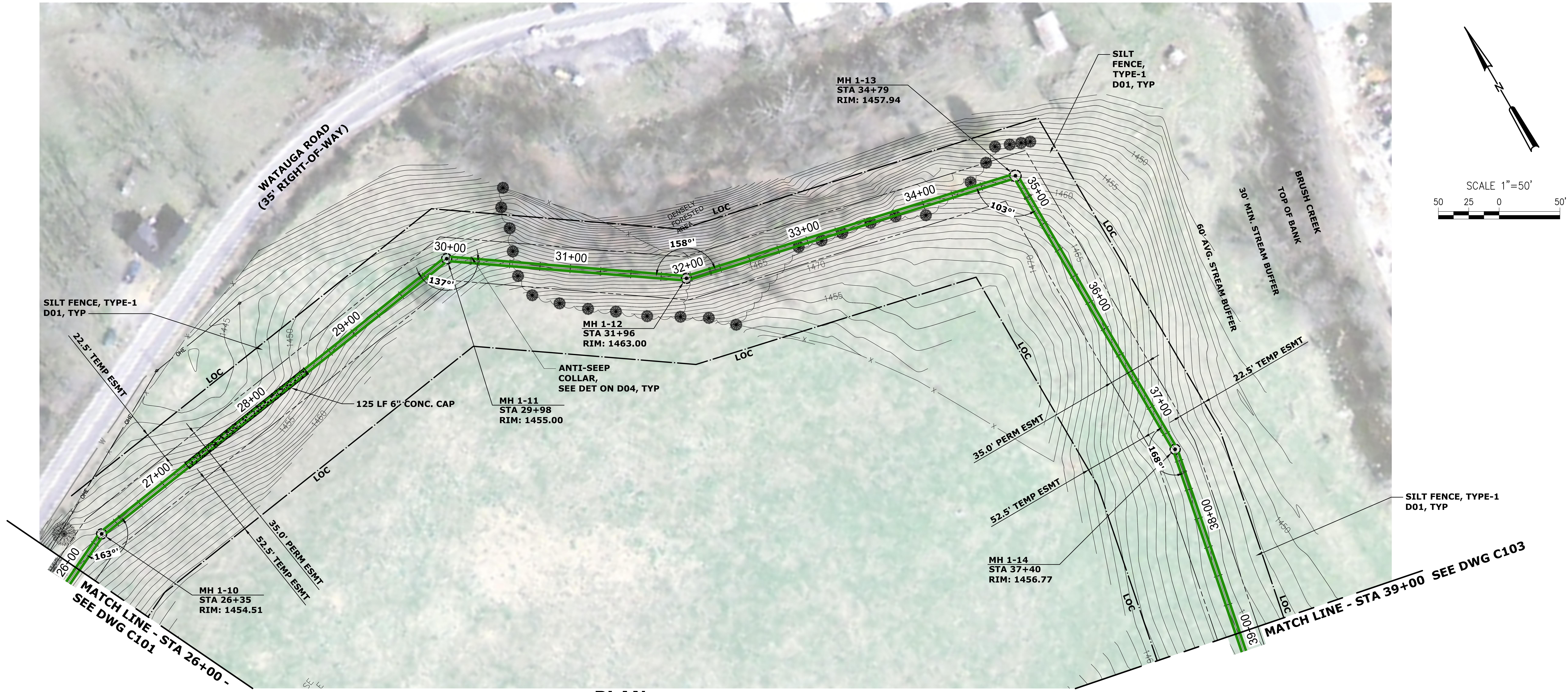
JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

42" INTERCEPTOR

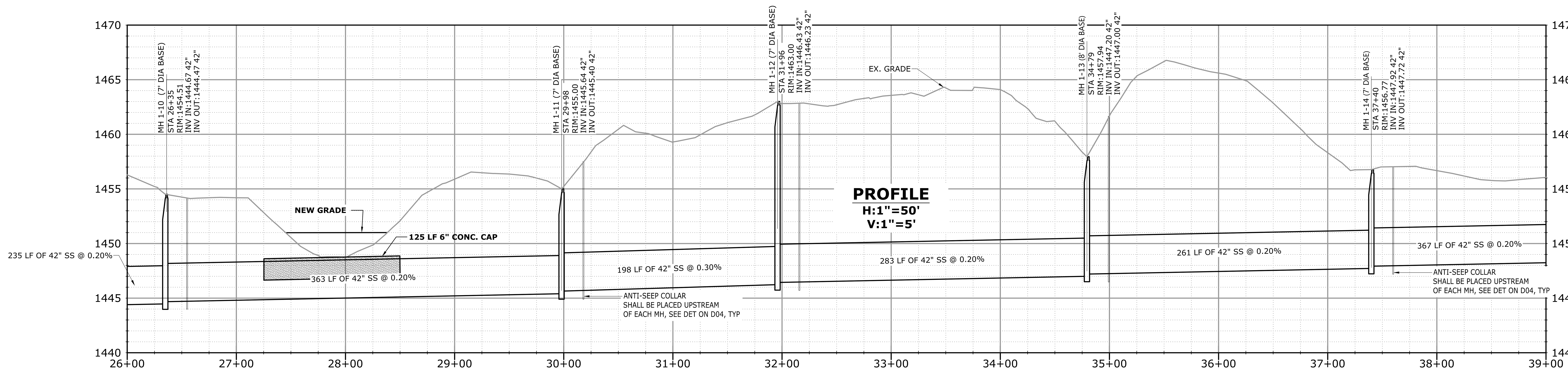
STA 13+00 TO STA 26+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C101



PLAN
1"=50'



NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen

HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

42" INTERCEPTOR

STA 26+00 TO STA 39+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001

CONTRACT NUMBER	DRAWING NUMBER
1	C102

MATCH LINE - STA 39+00 - SEE DWG C102

MATCH LINE - STA 54+00 - SEE DWG C104

SILT FENCE, TYPE-1
D01, TYP

30' MIN. STREAM BUFFER

60' AVG. STREAM BUFFER

TOP OF BANK

PI 41+06.62

LOC

39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00 54

155°

169°

179°

179°

ANTI-SEEP
COLLAR,
SEE DET ON D04, TYP

MH 1-15
STA 41+07
RIM: 1460.82

MH 1-16
STA 44+56
RIM: 1463.25

MH 1-17
STA 47+06
RIM: 1471.84

MH 1-18
STA 51+05
RIM: 1473.01

PI 44+55.96

PI 47+06.20

PI 51+04.45

ROCK OUTCROP AREA

ROCK OUTCROP AREA

ROCK OUTCROP AREA

ST. JOHN
CORP.
ID. 24016
PARCEL
ID. 031
023.00

ST. JOHN CORP.
ID. 24016
PARCEL
ID. 031 023.00

ST. JOHN CORP.
ID. 24016
PARCEL
ID. 031 023.00

ST. JOHN CORP.
ID. 24016
PARCEL
ID. 031 023.00

SILT FENCE, TYPE-1,
INSTALL INTERMEDIATE
J-HOOKS WHEN NOT
FOLLOWING CONTOURS
D01, TYP

SILT
FENCE,
TYPE-1
D01, TYP

TPF

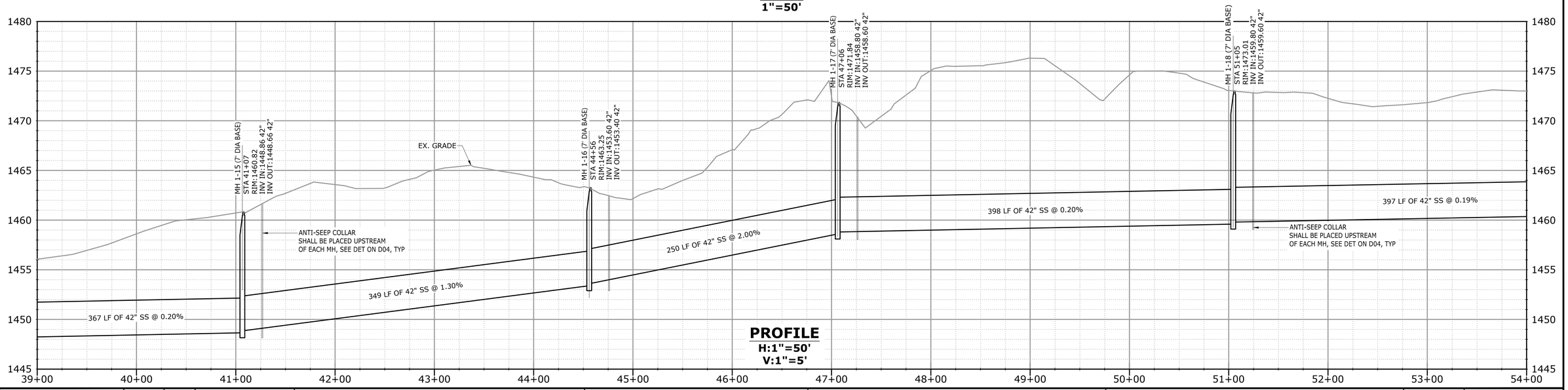
22.5' TEMP. ESMT

52.5' TEMP. ESMT

35.0' PERM ESMT

SCALE 1"=50'
50 25 0 50'

PLAN
1"=50'



PROFILE
H:1"=50'
V:1"=5'

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen

HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

42" INTERCEPTOR

STA 39+00 TO STA 54+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C103

NOTES:

1. ON LAWS PARCEL, REMOVE 18" TOPSOIL, STOCKPILE AND REPLACE AFTER PIPE INSTALLATION. TOP SOIL SHALL CONTAIN NO ROCKS.
2. PROVIDE TEMPORARY FENCING TO PROTECT LIVESTOCK. PROVIDE TEMPORARY ACCESS OF LIVESTOCK TO CREEK AT ALL TIMES OR PROVIDE WATERING TROUGH AND FILL PLAN.

SCALE 1"=50'
50 25 0 50'

CITY OF JOHNSON CITY
ID. 24629 PARCEL ID. 031 025.00
ID. 2489 PARCEL ID. 031 026.00
ID. 31580 PARCEL ID. 039 027.00
ID. 37662 PARCEL ID. 039 027.00
ID. 43868 PARCEL ID. 039 082.00

ST. JOHN CORP. ID. 24016 PARCEL ID. 031 023.00

MATCH LINE - STA 54+00 - SEE DWG C103

MATCH LINE - STA 69+00 - SEE DWG C105

SMH 11896
TOP 1467.72
INV. IN ELEV. 1461.42 SE
INV. OUT ELEV. 1461.22 NW

UTILITIES GO UNDERGROUND

8" PVC

EXISTING WOODLYN LIFT STATION
TOP 1465.71
INV. ELEV. WET WELL 1454.41
INV. 6"D.I. FORCE MAIN ELEV. 1462.01

CONTROL PANEL CANOPY

GATE

WATER SPIGOT

WATER VALVE

6" FORCE MAIN

BRUSH CREEK

TOP OF BANK

30' MIN. STREAM BUFFER

60' AVG. STREAM BUFFER

75' POWER LINE EASE

15' DRAINAGE EASE

SILT FENCE, TYPE-1 D01, TYP

ANTI-SEEP COLLAR, SEE DET ON D04, TYP

CONNECT EX. 6" FM TO NEW MH D03

MH 1-19
STA 55+01
RIM: 1474.14

MH 1-20
STA 59+16
RIM: 1473.40

MH 1-21
STA 63+15
RIM: 1480.97

MH 1-22
STA 66+96
RIM: 1478.94

ABANDON IN PLACE EX. MANHOLE , TYP

ABANDON IN PLACE EX. 30"SS, TYP

EX. 6" FM (ABANDON IN PLACE)

22.5' TEMP. ESMT

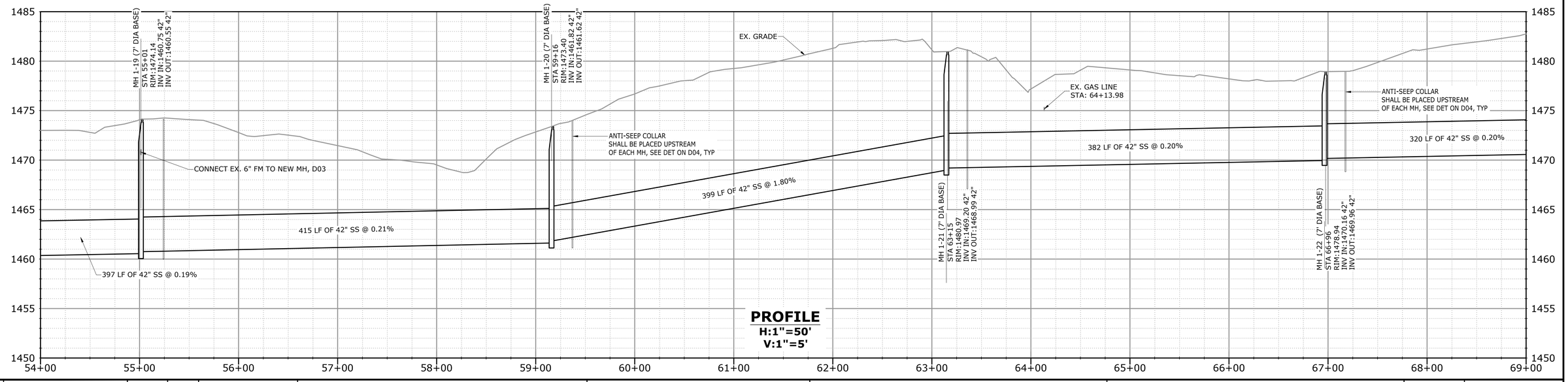
52.5' TEMP. ESMT

35.0' PERM ESMT

FIELD VERIFY GAS LINE DEPTH AND SIZE

CLARENCE E. LAWS
TAX MAP 39, PARCEL 52
ROLL 133, IMAGE 1423

PLAN
1"=50'



PROFILE
H:1"=50'
V:1"=5'

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

STATE OF TENNESSEE — MICHAEL L. OSBORNE — REGISTERED ENGINEER — 9/16/20

Hazen

HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

42" INTERCEPTOR

STA 54+00 TO STA 69+00

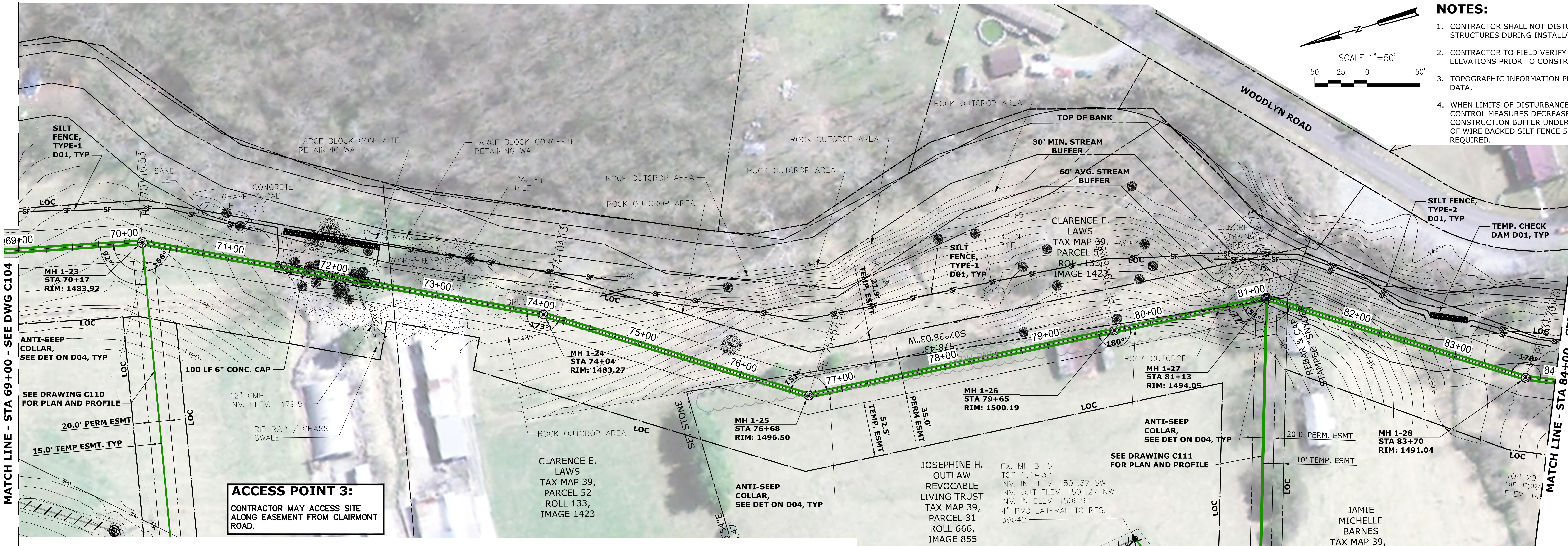
THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C104

File = Q:\50079-HSH\50079-001\drawings\CIVIL\CONTRACT 1\C104-C11 Saved by krobinson Save date = 9/4/2020 9:11 AM
PLOT DATE: 9/16/2020 10:16 AM BY: KROBINSON

NOTES:

1. CONTRACTOR SHALL NOT DISTURB ANY STRUCTURES DURING INSTALLATION.
2. CONTRACTOR TO FIELD VERIFY LOCATIONS AND ELEVATIONS PRIOR TO CONSTRUCTION.
3. TOPOGRAPHIC INFORMATION PROVIDED VIA GIS DATA.
4. WHEN LIMITS OF DISTURBANCE AND EROSION CONTROL MEASURES DECREASE THE CONSTRUCTION BUFFER UNDER 30', TWO LINES OF WIRE BACKED SILT FENCE 5' APART SHALL BE REQUIRED.



SCALE 1"=50'
50 25 0 50'
WOODLYN ROAD
MATCH LINE - STA 69+00 - SEE DWG C104
MATCH LINE - STA 84+00 - SEE DWG C106
SILT FENCE, TYPE-1 D01, TYP
SAND PILE
GRAVEL PILE
CONCRETE PAD
LARGE BLOCK CONCRETE RETAINING WALL
PALLET PILE
ROCK OUTCROP AREA
TOP OF BANK
30' MIN. STREAM BUFFER
60' AVG. STREAM BUFFER
SILT FENCE, TYPE-2 D01, TYP
TEMP. CHECK DAM D01, TYP
CLARENCE E. LAWS TAX MAP 39, PARCEL 52 ROLL 133, IMAGE 1423
BURN PILE
MH 1-23 STA 70+17 RIM: 1483.92
MH 1-24 STA 74+04 RIM: 1483.27
MH 1-25 STA 76+68 RIM: 1496.50
MH 1-26 STA 79+65 RIM: 1500.19
MH 1-27 STA 81+13 RIM: 1494.05
MH 1-28 STA 83+70 RIM: 1491.04
ANTI-SEEP COLLAR, SEE DET ON D04, TYP
100 LF 6" CONC. CAP
SEE DRAWING C110 FOR PLAN AND PROFILE
SEE DRAWING C111 FOR PLAN AND PROFILE
20.0' PERM ESMT
15.0' TEMP ESMT. TYP
12" CMP INV. ELEV. 1479.57
RIP RAP / GRASS SWALE
ACCESS POINT 3:
CONTRACTOR MAY ACCESS SITE ALONG EASEMENT FROM CLAIRMONT ROAD.
CLARENCE E. LAWS TAX MAP 39, PARCEL 52 ROLL 133, IMAGE 1423
JOSEPHINE H. OUTLAW REVOCABLE LIVING TRUST TAX MAP 39, PARCEL 31 ROLL 666, IMAGE 855
EX. MH 3115 TOP 1514.32 INV. IN ELEV. 1501.37 SW INV. OUT ELEV. 1501.27 NW INV. IN ELEV. 1506.92 4" PVC LATERAL TO RES. 39642
JAMIE MICHELLE BARNES TAX MAP 39,
REBAR & CAP STAMPED "SNYDER"
20.0' PERM. ESMT
10' TEMP. ESMT
TOP 20" DIP FORCE ELEV. 14
S07°38'03"W

PLAN
1"=50'

NO BLASTING
EX. GRADE
MH 1-23 (8' DIA BASE) W.T. COVER STA 70+17 RIM:1483.92 INV IN:1471.00 42" INV IN:1480.50 8" OUTSIDE DROP INV OUT:1470.80 42"
MH 1-24 (7' DIA BASE) W.T. COVER STA 74+04 RIM:1483.27 INV IN:1473.22 42" INV OUT:1473.02 42"
MH 1-25 (7' DIA BASE) STA 76+68 RIM:1496.50 INV IN:1479.10 42" INV OUT:1478.89 42"
MH 1-26 (7' DIA BASE) STA 79+65 RIM:1500.19 INV IN:1479.89 42" INV OUT:1479.69 42"
MH 1-27 (8' DIA BASE) W.T. COVER STA 81+13 RIM:1494.05 INV IN:1480.39 42" INV IN:1490.50 8" OUTSIDE DROP INV OUT:1480.19 42"
MH 1-28 (7' DIA BASE) W.T. COVER STA 83+70 RIM:1491.04 INV IN:1481.36 42" INV OUT:1481.16 42"
INSTALL RECM ON SLOPED AREAS 71+50 TO 72+50 MIN. 700 SY
0227014
NEW 8" SS INV:1480.50 (SEE C117)
8" SS INV:1471.00 OUTSIDE DROP CONN.
320 LF OF 42" SS @ 0.20%
100 LF 6" CONC. CAP
388 LF OF 42" SS @ 0.51%
ANTI-SEEP COLLAR SHALL BE PLACED UPSTREAM OF EACH MH, SEE DET ON D04, TYP
264 LF OF 42" SS @ 2.15%
297 LF OF 42" SS @ 0.20%
148 LF OF 42" SS @ 0.20%
258 LF OF 42" SS @ 0.30%
387 LF OF 42" SS @ 0.79%
NEW 8" SS INV:1490.50 (SEE C118)
8" SS INV:1479.57 OUTSIDE DROP CONN.
1470 1475 1480 1485 1490 1495 1500 1505
69+00 70+00 71+00 72+00 73+00 74+00 75+00 76+00 77+00 78+00 79+00 80+00 81+00 82+00 83+00 84+00

PROFILE
H:1"=50'
V:1"=5'

NO.	ISSUED FOR	DATE	BY

DESIGNED	MLO
DRAWN	KAR
CHECKED	RMH
PROJ.ENGR.	MLO
APPROVED	

Hazen
HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

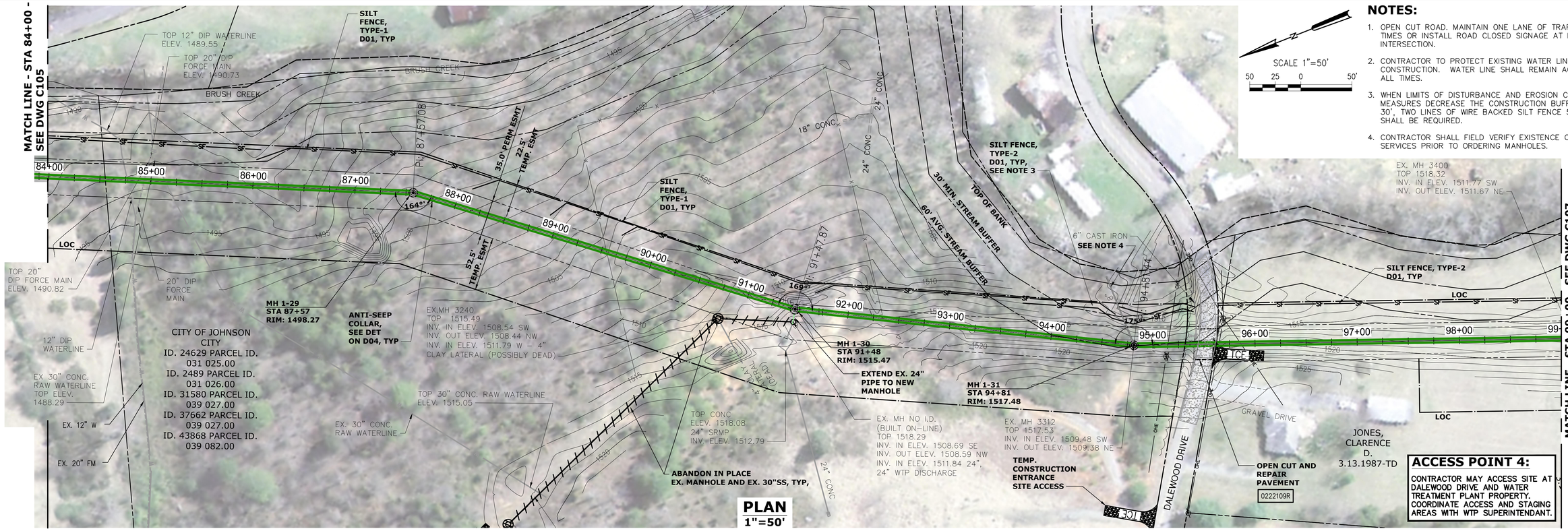
JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

42" INTERCEPTOR

STA 69+00 TO STA 84+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE	SEPTEMBER 2020
H&S JOB NUMBER	50079-001
CONTRACT NUMBER	1
DRAWING NUMBER	C105

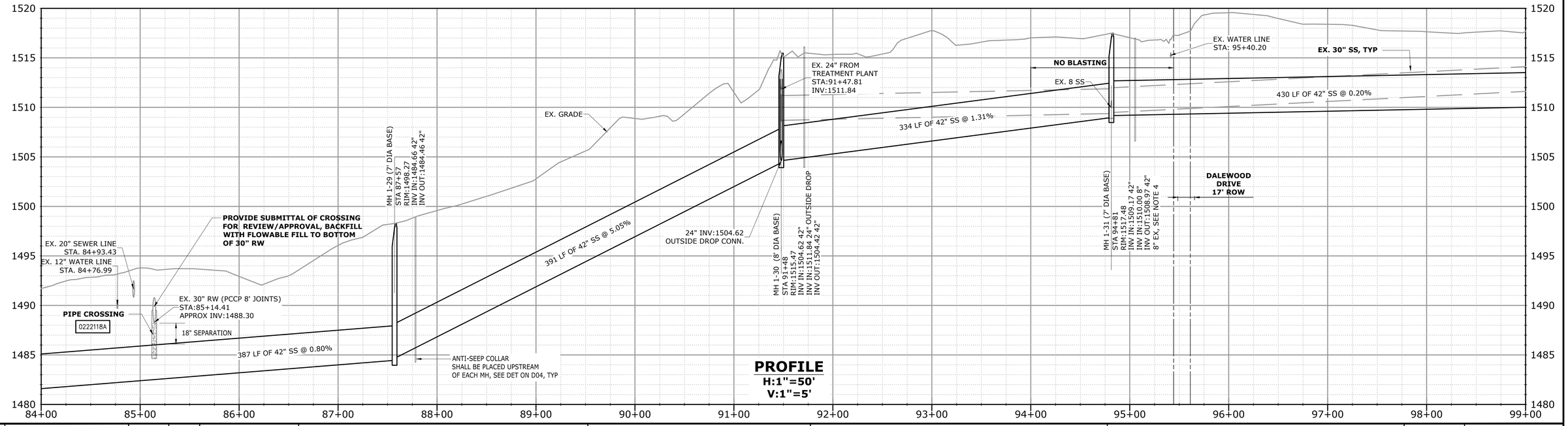


NOTES:

1. OPEN CUT ROAD. MAINTAIN ONE LANE OF TRAFFIC AT ALL TIMES OR INSTALL ROAD CLOSED SIGNAGE AT EACH INTERSECTION.
2. CONTRACTOR TO PROTECT EXISTING WATER LINE DURING CONSTRUCTION. WATER LINE SHALL REMAIN ACTIVE AT ALL TIMES.
3. WHEN LIMITS OF DISTURBANCE AND EROSION CONTROL MEASURES DECREASE THE CONSTRUCTION BUFFER UNDER 30', TWO LINES OF WIRE BACKED SILT FENCE 5' APART SHALL BE REQUIRED.
4. CONTRACTOR SHALL FIELD VERIFY EXISTENCE OF SEWER SERVICES PRIOR TO ORDERING MANHOLES.

PLAN
1"=50'

ACCESS POINT 4:
CONTRACTOR MAY ACCESS SITE AT DALEWOOD DRIVE AND WATER TREATMENT PLANT PROPERTY. COORDINATE ACCESS AND STAGING AREAS WITH WTP SUPERINTENDANT.



NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen
HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

42" INTERCEPTOR

STA 84+00 TO STA 99+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C106

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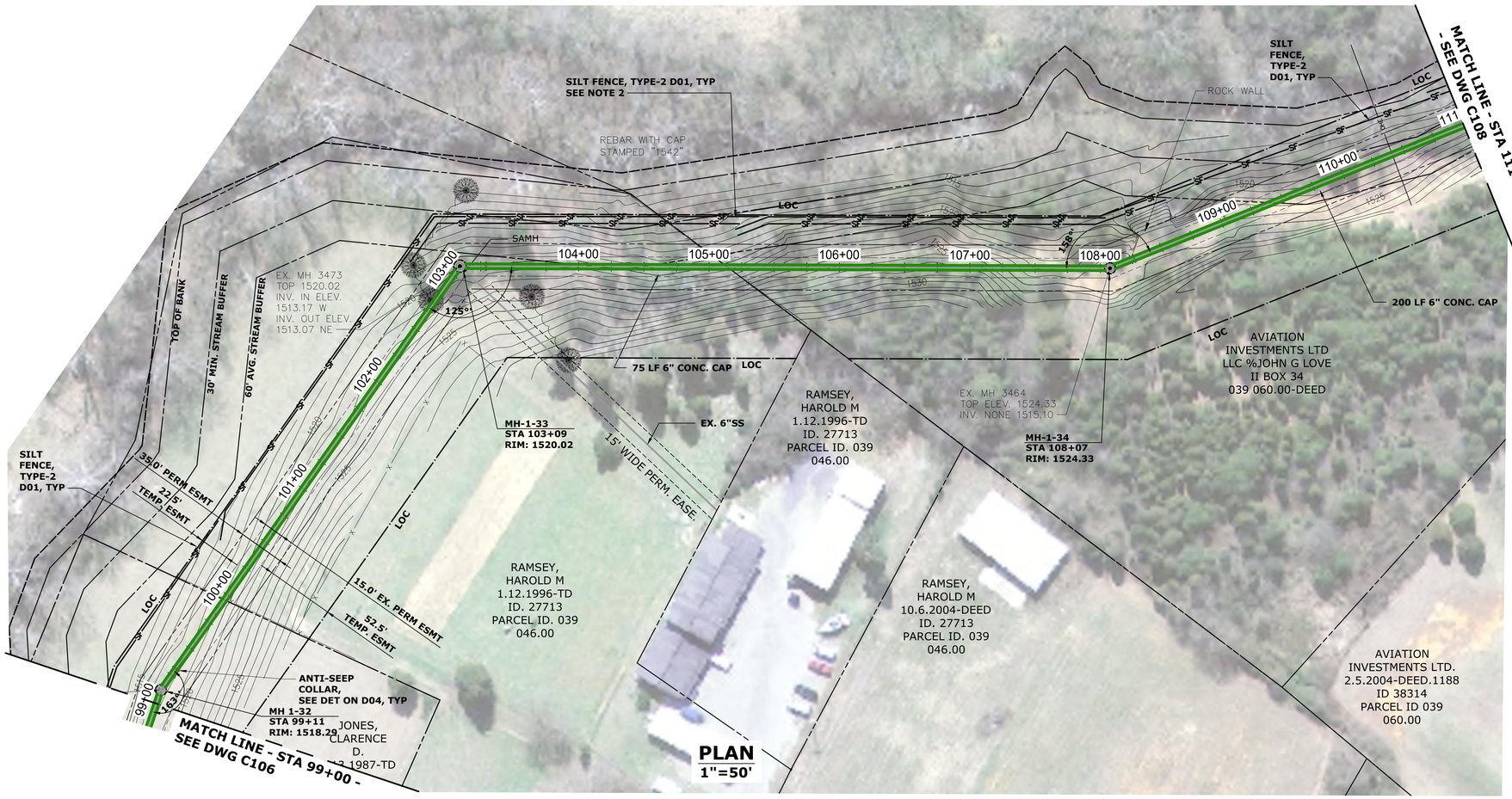
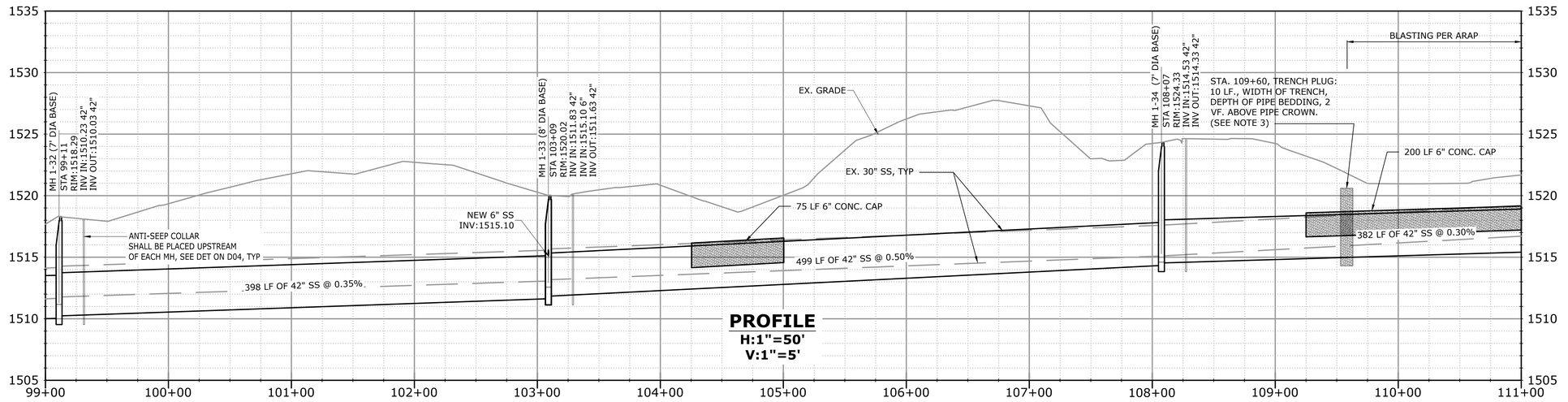


PLAN
1"=50'



PROFILE
H:1"=50'
V:1"=5'

NOTES:

1. NEAR STATION 103+00 MAINTAIN EXISTING SEWER SERVICE LATERAL OPERATION AT ALL TIMES.
2. WHEN LIMITS OF DISTURBANCE AND EROSION CONTROL MEASURES DECREASE THE CONSTRUCTION BUFFER UNDER 30', TWO LINES OF WIRE BACKED SILT FENCE 5' APART SHALL BE REQUIRED.
3. TRENCH PLUGS: FLOWABLE FILL

a. TRENCH PLUGS ARE BARRIERS PLACED WITHIN AN OPEN PIPELINE EXCAVATION IN ORDER TO SLOW FLOW AND REDUCE EROSION IN THE TRENCH AND TO PREVENT THE TRENCH FROM BECOMING A SUBSURFACE DRAINAGE PATH. SINCE THE BEDDING AND EMBEDMENT ARE CONSTRUCTED USING COHESIONLESS, FREE-DRAINING SOILS, A PATH IS CREATED FOR WATER TO FLOW EASILY (FRENCH DRAIN effect) ALONGSIDE THE PIPE. IN AREAS WHERE THERE IS HIGH GROUNDWATER, WHERE THE PIPELINE CROSSES STREAMS OR AQUIFERS, OR WHERE THE NATURAL GROUNDWATER FLOW WOULD BE AFFECTED OR EVEN DIVERTED BY THE SELECT MATERIAL, TRENCH PLUGS OF COMPACTED, COHESIVE, SOILS OR IMPERVIOUS MATERIALS SHOULD BE CONSTRUCTED AT INTERVALS ALONG THE PIPELINE.

b. THE TRENCH PLUG AREA WILL HAVE A BEDDING OF COMPACTED, COHESIVE SOILS OR IMPERVIOUS MATERIALS, WHEREAS THE BEDDING ON BOTH SIDES OF THE TRENCH PLUG WILL HAVE A BEDDING OF UNCOMPACTED, COHESIONLESS SOIL.

c. LOCATION AND SPACING OF TRENCH PLUGS: MINIMUM OF ONE TRENCH PLUG BETWEEN MANHOLES, AND ONE TRENCH PLUG AT EACH END OF THE STREAM CROSSING OR WETLAND. THE TRENCH PLUGS BETWEEN MANHOLES SHALL BE LOCATED NEAR THE UPSTREAM MANHOLE.

N

SCALE 1"=50'
50 25 0 50'

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen
HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

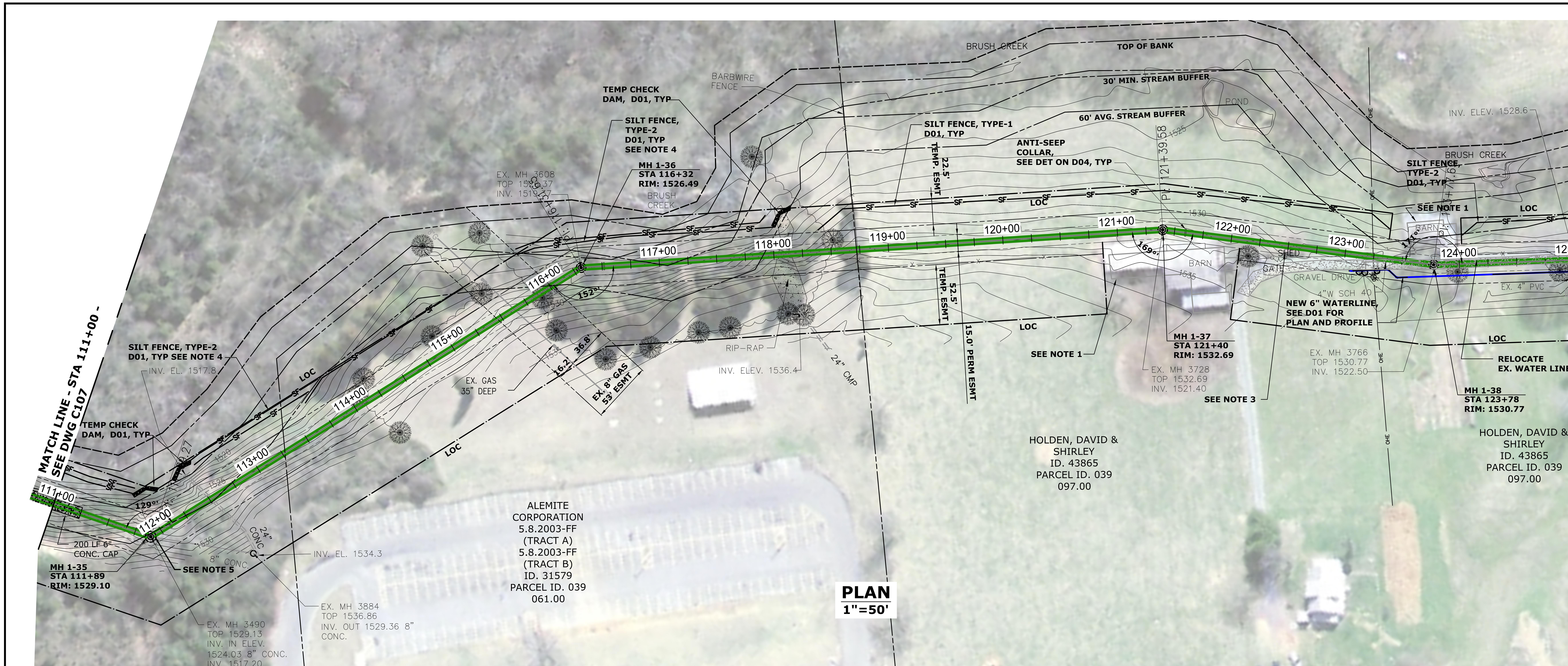
JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

42" INTERCEPTOR

STA 99+00 TO STA 111+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C107



NOTES:

1. CONTRACTOR SHALL NOT DISTURB ANY STRUCTURES DURING INSTALLATION.
2. COPIES OF THE PLANS SHALL BE SUBMITTED TO SPECTRA ENERGY 30 DAYS PRIOR TO COMMENCEMENT OF WORK. SPECTRA ENERGY SHALL BE GIVEN AT LEAST 3 WORKING DAYS ADVANCE NOTICE PRIOR TO THE ACTUAL COMMENCEMENT OF ANY CONSTRUCTION, EXCAVATION, OR CROSSING ACTIVITIES OVER OR NEAR ITS PIPELINE ROW. 24 HR EMERGENCY NO. 1-888-231-2294.
3. RELOCATE/REMOVE EXISTING SHED PER ESMT. INSTRUCTIONS.
4. WHEN LIMITS OF DISTURBANCE AND EROSION CONTROL MEASURES DECREASE THE CONSTRUCTION BUFFER UNDER 30', TWO LINES OF WIRE BACKED SILT FENCE 5' APART SHALL BE REQUIRED.
5. CONSULT WITH ENGINEER FOR CONNECTION OF 8" SERVICE LATERAL TO MH TO AVOID CONFLICT WITH INTERCEPTION.
6. TRENCH PLUGS: FLOWABLE FILL

a. TRENCH PLUGS ARE BARRIERS PLACED WITHIN AN OPEN PIPELINE EXCAVATION IN ORDER TO SLOW FLOW AND REDUCE EROSION IN THE TRENCH AND TO PREVENT THE TRENCH FROM BECOMING A SUBSURFACE DRAINAGE PATH. SINCE THE BEDDING AND EMBEDMENT ARE CONSTRUCTED USING COHESIONLESS, FREE-DRAINING SOILS, A PATH IS CREATED FOR WATER TO FLOW EASILY (FRENCH DRAIN EFFECT) ALONGSIDE THE PIPE. IN AREAS WHERE THERE IS HIGH GROUNDWATER, WHERE THE PIPELINE CROSSES STREAMS OR AQUIFERS, OR WHERE THE NATURAL GROUNDWATER FLOW WOULD BE AFFECTED OR EVEN DIVERTED BY THE SELECT MATERIAL, TRENCH PLUGS OF COMPACTED, COHESIVE, SOILS OR IMPERVIOUS MATERIALS SHOULD BE CONSTRUCTED AT INTERVALS ALONG THE PIPELINE.

b. THE TRENCH PLUG AREA WILL HAVE A BEDDING OF COMPACTED, COHESIVE SOILS OR IMPERVIOUS MATERIALS, WHEREAS THE BEDDING ON BOTH SIDES OF THE TRENCH PLUG WILL HAVE A BEDDING OF UNCOMPACTED, COHESIONLESS SOIL.

c. LOCATION AND SPACING OF TRENCH PLUGS: MINIMUM OF ONE TRENCH PLUG BETWEEN MANHOLES, AND ONE TRENCH PLUG AT EACH END OF THE STREAM CROSSING OR WETLAND. THE TRENCH PLUGS BETWEEN MANHOLES SHALL BE LOCATED NEAR THE UPSTREAM MANHOLE.

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen

HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

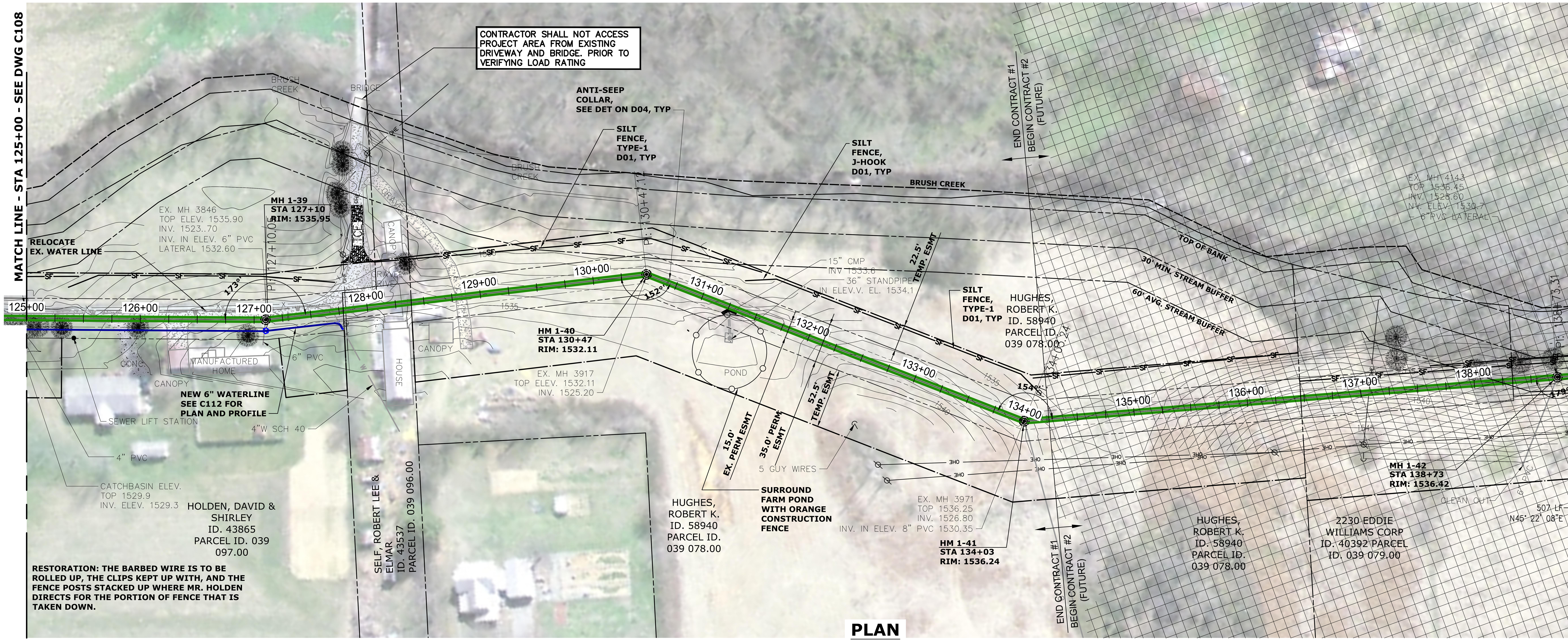
JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

42" INTERCEPTOR

STA 111+00 TO STA 125+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C108

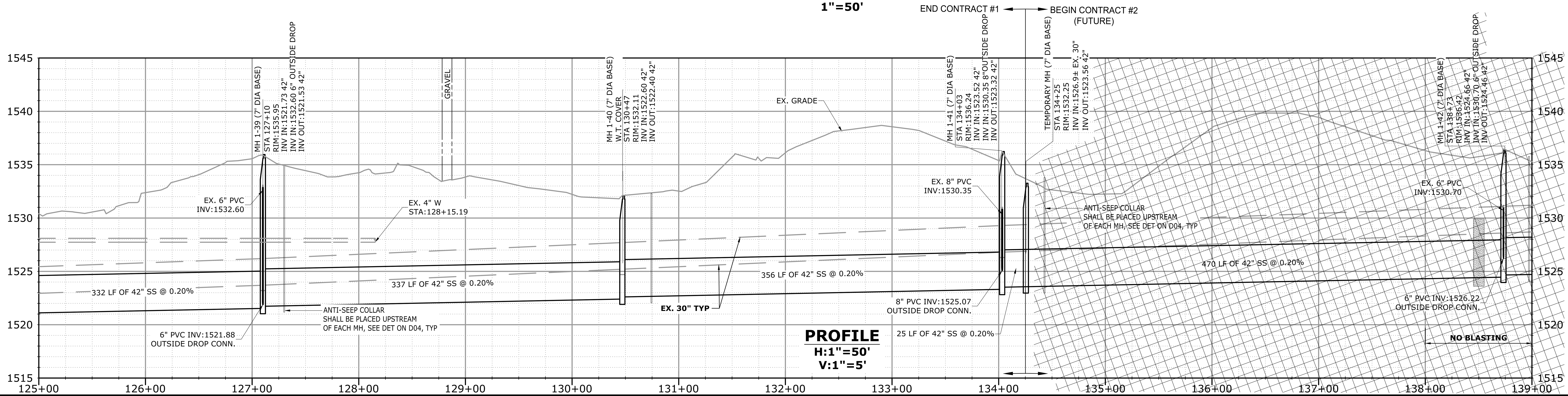

MATCH LINE - STA 125+00 - SEE DWG C108
CONTRACTOR SHALL NOT ACCESS PROJECT AREA FROM EXISTING DRIVEWAY AND BRIDGE. PRIOR TO VERIFYING LOAD RATING
ANTI-SEEP COLLAR, SEE DET ON D04, TYP
SILT FENCE, TYPE-1 D01, TYP
SILT FENCE, J-HOOK D01, TYP
END CONTRACT #1
BEGIN CONTRACT #2 (FUTURE)
BRUSH CREEK
BRIDGE
MH 1-39
STA 127+10
RIM: 1535.95
EX. MH 3846
TOP ELEV. 1535.90
INV. 1523..70
INV. IN ELEV. 6" PVC LATERAL 1532.60
RELOCATE EX. WATER LINE
HM 1-40
STA 130+47
RIM: 1532.11
EX. MH 3917
TOP ELEV. 1532.11
INV. 1525.20
NEW 6" WATERLINE SEE C112 FOR PLAN AND PROFILE
SEWER LIFT STATION
MANUFACTURED HOME
CANOPY
HOUSE
POND
15" CMP
36" STANDPIPE
22.5' TEMP. ESMT
52.5' TEMP. ESMT
15.0' EX. PERM ESMT
35.0' PERM ESMT
5 GUY WIRES
SURROUND FARM POND WITH ORANGE CONSTRUCTION FENCE
TOP OF BANK
30' MIN. STREAM BUFFER
60' AVG. STREAM BUFFER
HUGHES, ROBERT K. ID. 58940 PARCEL ID. 039 078.00
EX. MH 3971
TOP 1536.25
INV. 1526.80
INV. IN ELEV. 8" PVC 1530.35
HM 1-41
STA 134+03
RIM: 1536.24
MH 1-42
STA 138+73
RIM: 1536.42
EX. MH 4143
2230 EDDIE WILLIAMS CORP ID. 40392 PARCEL ID. 039 079.00
CATCHBASIN ELEV. TOP 1529.9 INV. ELEV. 1529.3
HOLDEN, DAVID & SHIRLEY ID. 43865 PARCEL ID. 039 097.00
SELF, ROBERT LEE & ELMAR ID. 43537 PARCEL ID. 039 096.00
RESTORATION: THE BARBED WIRE IS TO BE ROLLED UP, THE CLIPS KEPT UP WITH, AND THE FENCE POSTS STACKED UP WHERE MR. HOLDEN DIRECTS FOR THE PORTION OF FENCE THAT IS TAKEN DOWN.
125+00
126+00
127+00
128+00
129+00
130+00
131+00
132+00
133+00
134+00
135+00
136+00
137+00
138+00

NOTE:

1. WHEN LIMITS OF DISTURBANCE AND EROSION CONTROL MEASURES DECREASE THE CONSTRUCTION BUFFER UNDER 30', TWO LINES OF WIRE BACKED SILT FENCE 5' APART SHALL BE REQUIRED.

SCALE 1"=50'

PLAN
1"=50'


END CONTRACT #1
BEGIN CONTRACT #2 (FUTURE)
MH 1-39 (7' DIA BASE)
STA 127+10
RIM:1535.95
INV IN:1521.73 42"
INV IN:1532.60 6" OUTSIDE DROP
INV OUT:1521.53 42"
GRAVEL
MH 1-40 (7' DIA BASE)
W.T. COVER
STA 130+47
RIM:1532.11
INV IN:1522.60 42"
INV OUT:1522.40 42"
EX. GRADE
MH 1-41 (7' DIA BASE)
STA 134+03
RIM:1536.24
INV IN:1523.52 42"
INV IN:1530.35 8" OUTSIDE DROP
INV OUT:1523.32 42"
TEMPORARY MH (7' DIA BASE)
STA 134+25
RIM:1532.25
INV IN:1526.9± EX. 30"
INV OUT:1523.56 42"
MH 1-42 (7' DIA BASE)
STA 138+73
RIM:1536.42
INV IN:1524.66 42"
INV IN:1530.70 6" OUTSIDE DROP
INV OUT:1524.46 42"
EX. 6" PVC INV:1532.60
EX. 4" W STA:128+15.19
EX. 8" PVC INV:1530.35
EX. 6" PVC INV:1530.70
ANTI-SEEP COLLAR SHALL BE PLACED UPSTREAM OF EACH MH, SEE DET ON D04, TYP
332 LF OF 42" SS @ 0.20%
337 LF OF 42" SS @ 0.20%
356 LF OF 42" SS @ 0.20%
470 LF OF 42" SS @ 0.20%
25 LF OF 42" SS @ 0.20%
EX. 30" TYP
6" PVC INV:1521.88 OUTSIDE DROP CONN.
8" PVC INV:1525.07 OUTSIDE DROP CONN.
6" PVC INV:1526.22 OUTSIDE DROP CONN.
NO BLASTING
1545
1540
1535
1530
1525
1520
1515
125+00
126+00
127+00
128+00
129+00
130+00
131+00
132+00
133+00
134+00
135+00
136+00
137+00
138+00
139+00

PROFILE
H:1"=50'
V:1"=5'

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen
HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

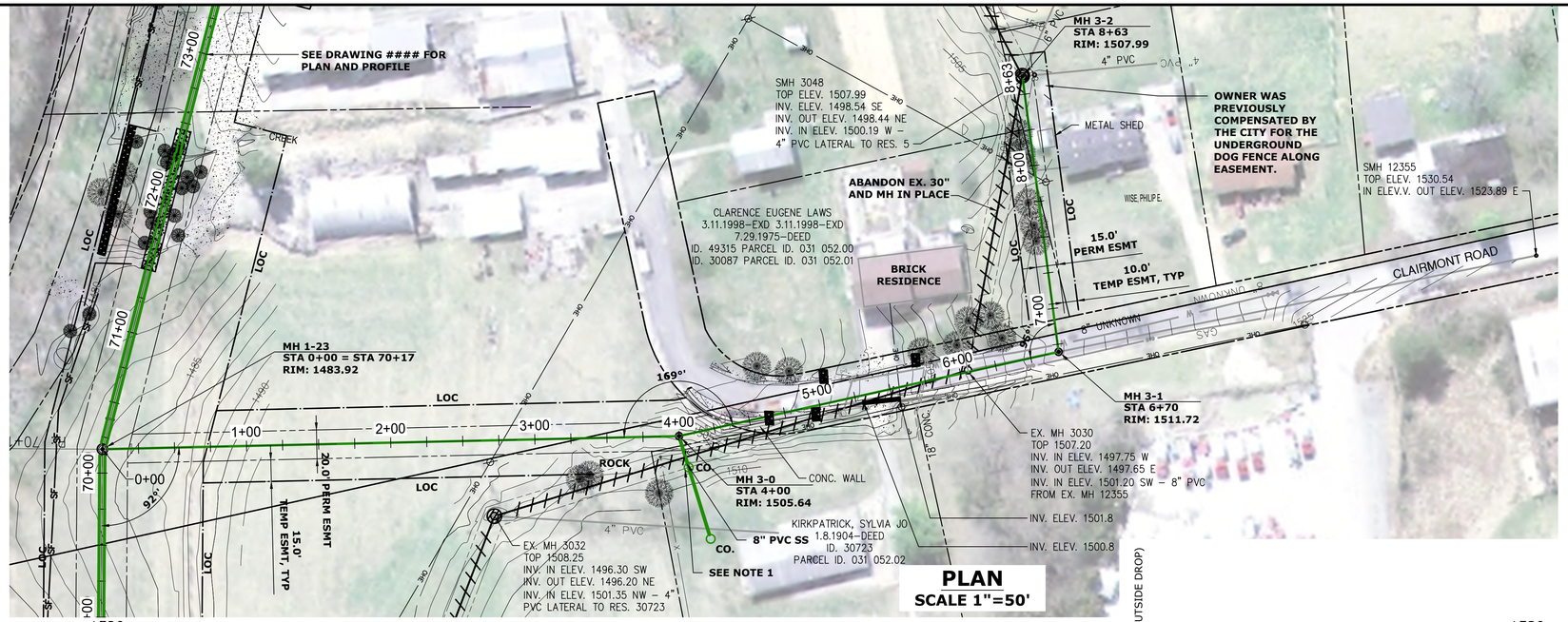
JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

42" INTERCEPTOR

STA 125+00 TO STA 139+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C109



PLAN
SCALE 1"=50'

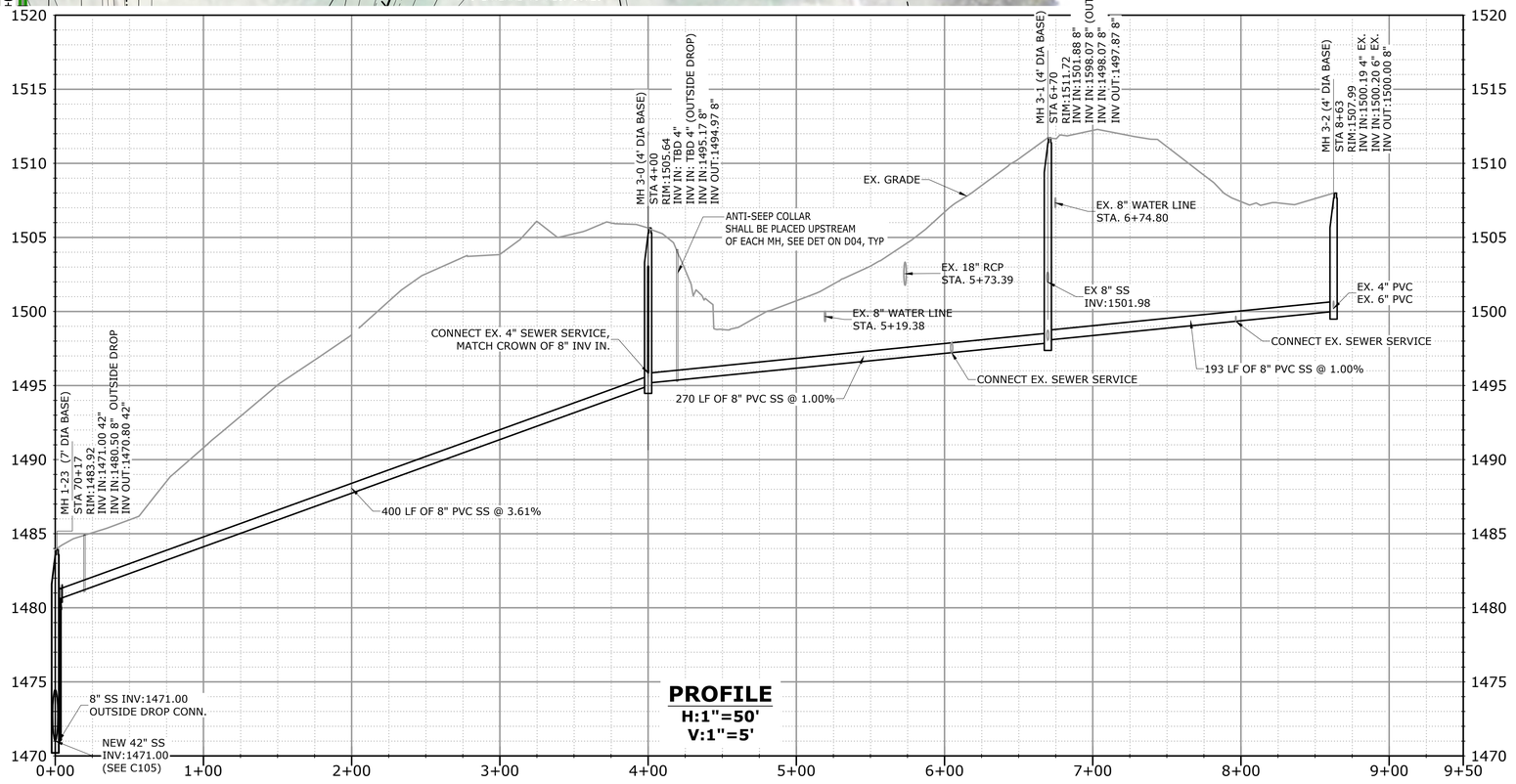
NOTE:

1. A LICENSED PLUMBER SHALL BE REQUIRED FOR SEWER SERVICE WORK ON THE CUSTOMER SIDE OF THE CLEANOUT AT THE EDGE OF THE PERMANENT EASEMENT.

N

SCALE 1"=50'
50 25 0 50'

ACCESS POINT 3:
CONTRACTOR MAY ACCESS SITE ALONG EASEMENT FROM CLAIRMONT ROAD.



PROFILE
H:1"=50'
V:1"=5'

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen
HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

8" GRAVITY SEWER

STA 0+00 TO STA 9+50

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C110

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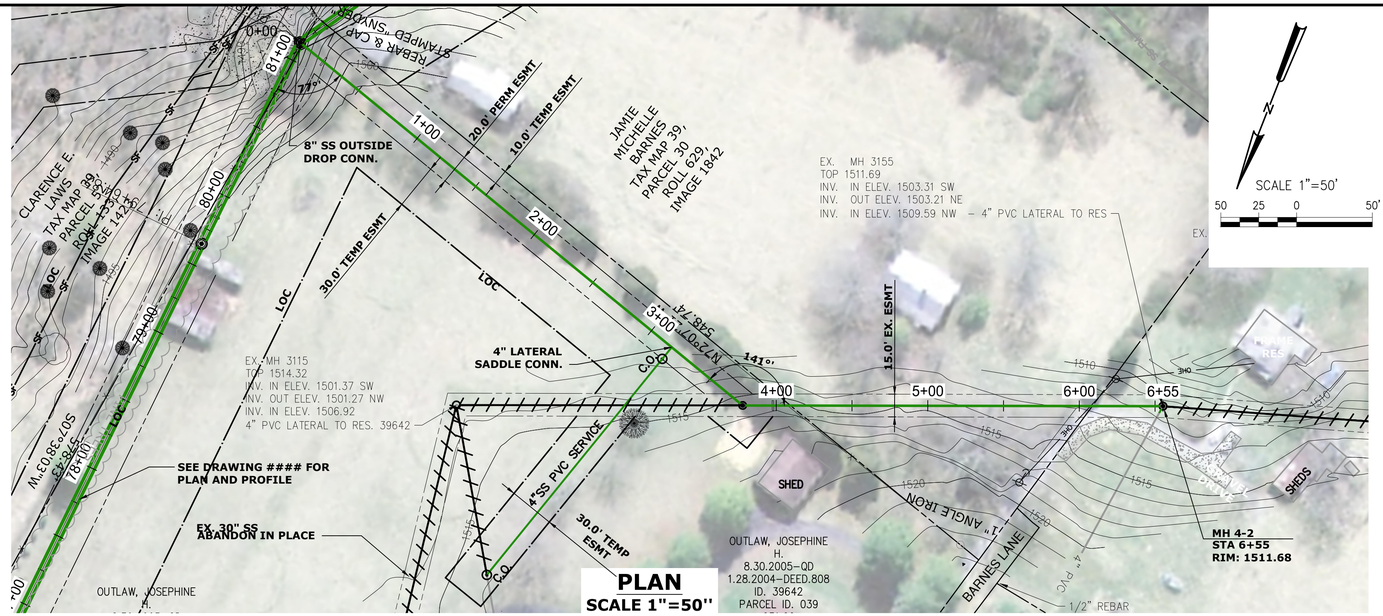
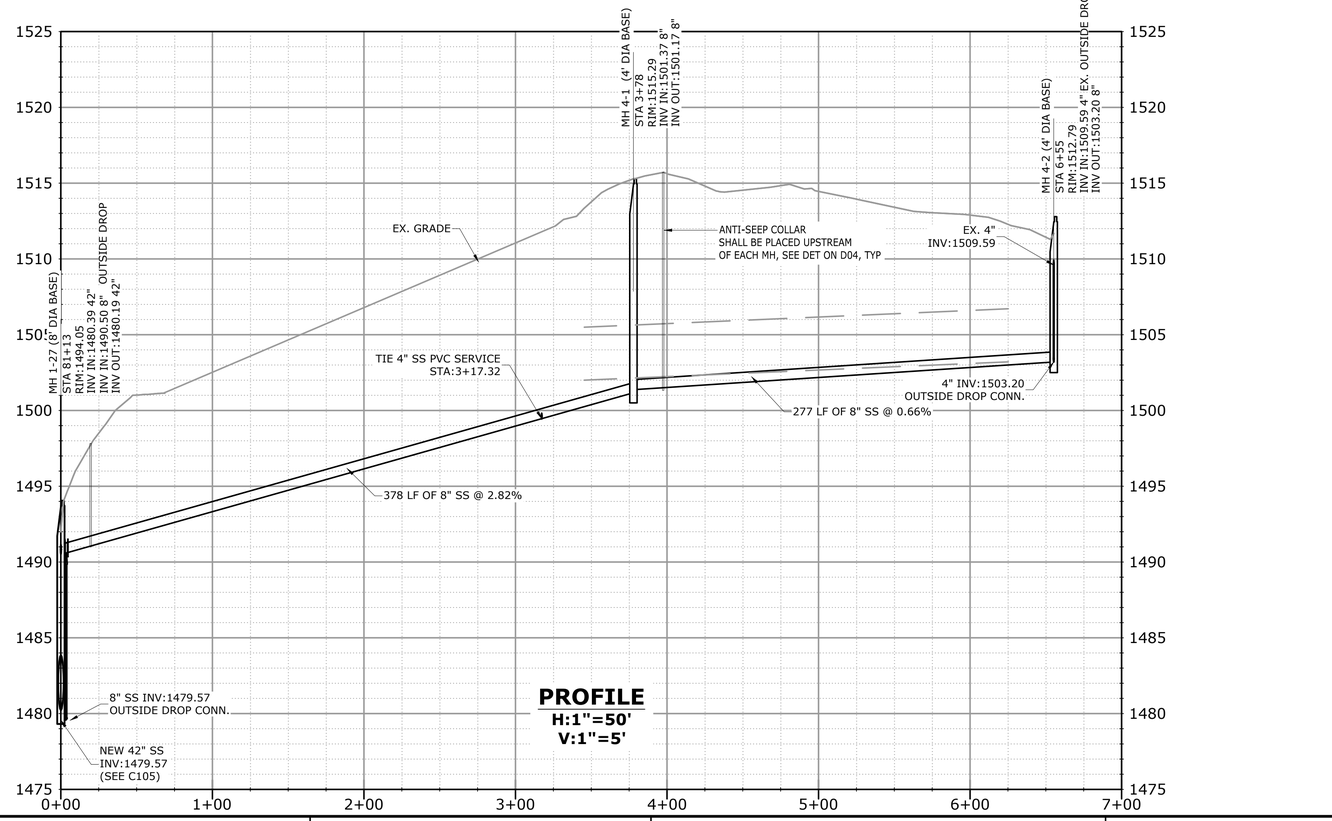


PLAN
SCALE 1"=50"



PROFILE
H:1"=50'
V:1"=5'

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen
HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

8" GRAVITY SEWER

STA 0+00 TO STA 7+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C111

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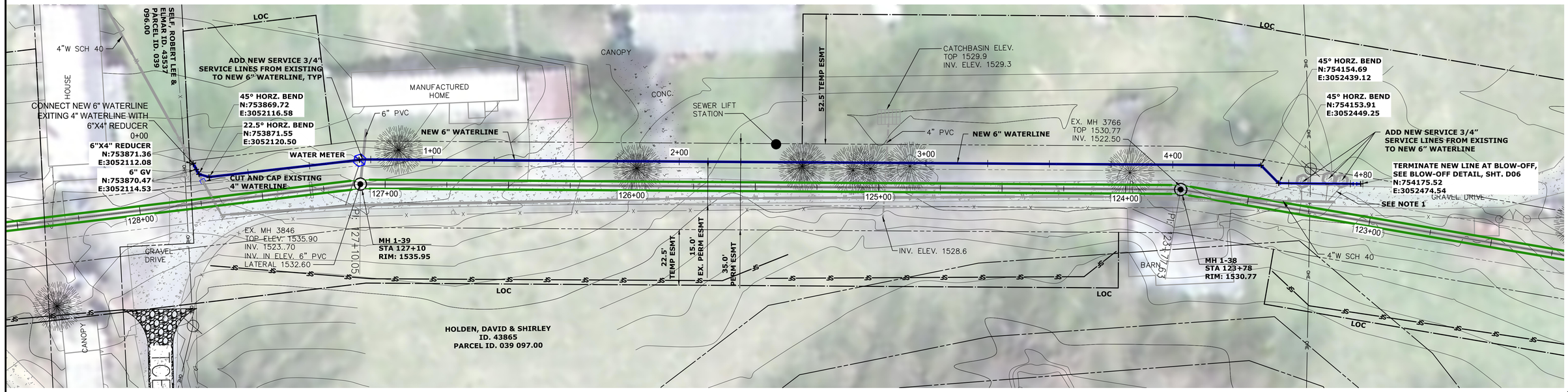
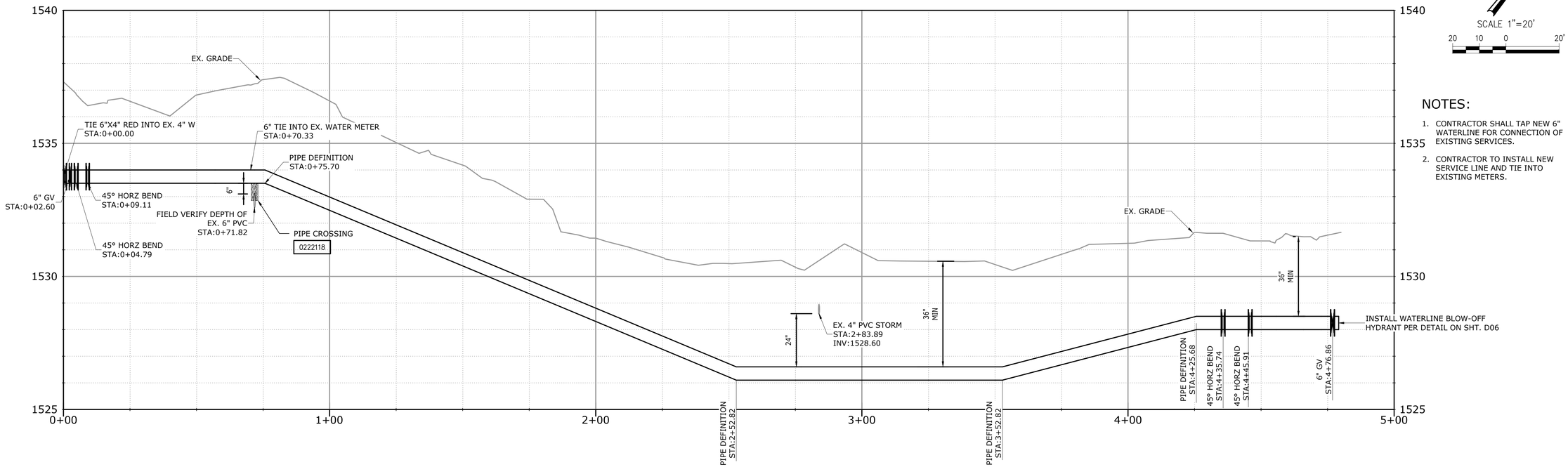
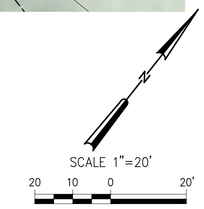


6" WATERLINE PLAN
SCALE 1"=20''



6" WATERLINE PROFILE
H:1"=20' V:1"=2'



NOTES:

1. CONTRACTOR SHALL TAP NEW 6" WATERLINE FOR CONNECTION OF EXISTING SERVICES.
2. CONTRACTOR TO INSTALL NEW SERVICE LINE AND TIE INTO EXISTING METERS.

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen
HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

6" WATER LINE

STA 0+00 TO STA 5+00

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER C112

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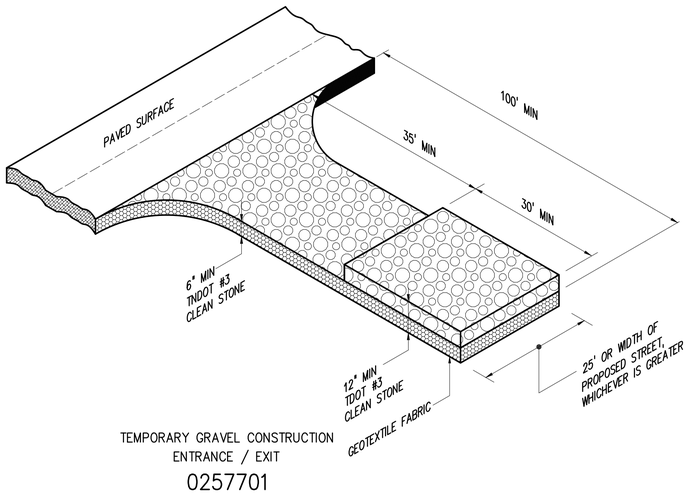


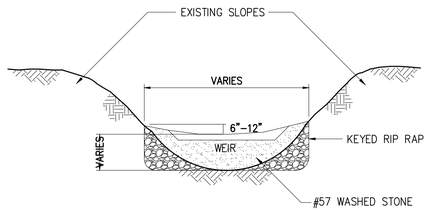
TEMPORARY GRAVEL CONSTRUCTION ENTRANCE / EXIT

0257701

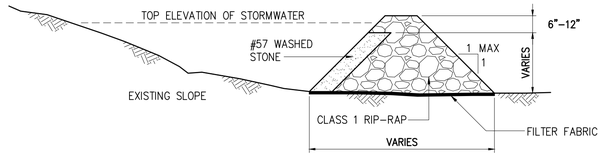
DESIGN OF SPILLWAYS

DRAINAGE AREA (ACRES)	WEIR LENGTH† (FT)
1	4.0
2	6.0
3	8.0
4	10.0
5	12.0

†DIMENSIONS SHOWN ARE MINIMUM



FRONT VIEW

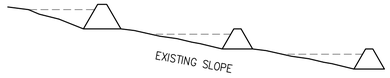


SIDE VIEW

NOTES:

HEIGHT & WIDTH DETERMINED BY EXISTING TOPOGRAPHY AND SEDIMENT STORAGE REQUIRED.

KEY RIP RAP INTO THE DAM FOR STABILIZATION.

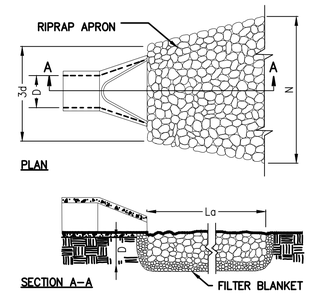


STEP SEQUENCE

CHECK DAM

N.T.S.

INSTALL WHERE DIRECTED BY ENGINEER



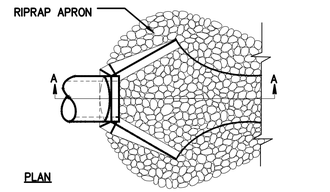
PIPE OUTLET TO FLAT AREA -- NO WELL DEFINED CHANNEL

Minimum Tailwater Condition			
Pipe Diameter (in)	$3D_o$ (in)	L_a (ft)	W (ft)
12	36	18	19
15	45	22	23.25
18	54	26	27.5
24	72	34	36
30	90	42	44.5
36	108	50	53

Maximum Tailwater Condition			
Pipe Diameter (in)	$3D_o$ (in)	L_a (ft)	W (ft)
12	36	40	17
15	45	50	21.25
18	54	60	25.5
24	72	80	34
30	90	90	38.5
36	108	120	51

RIPRAP OUTLET PROTECTION

N.T.S.

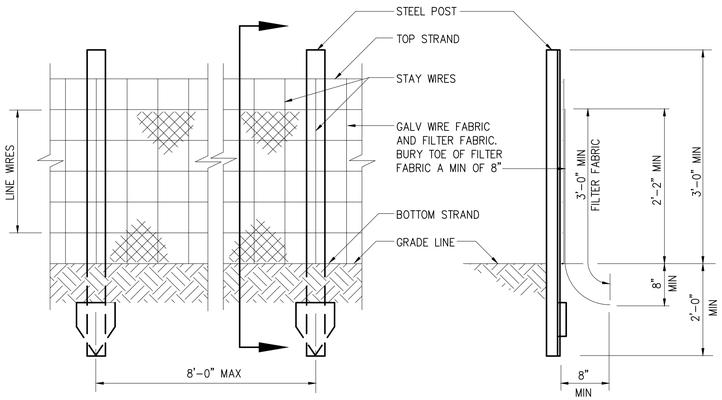


NOTES:

1. La IS THE LENGTH OF THE RIPRAP APRON.
2. D = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESSTHAN 6".
3. IN A WELL–DEFINED CHANNEL, EXTEND THE APRON UP THE CHANNEL BANKS TO AN ELEVATION OF 6" ABOVE THE MAXIMUM TAILWATER DEPTH OR TO THE TOP OF THE BANK (WHICHEVER IS LESS).
4. A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND THE SOIL FOUNDATION.

PIPE OUTLET TO WELL DEFINED CHANNEL

PLAN VIEW



ELEVATION SILT FENCE

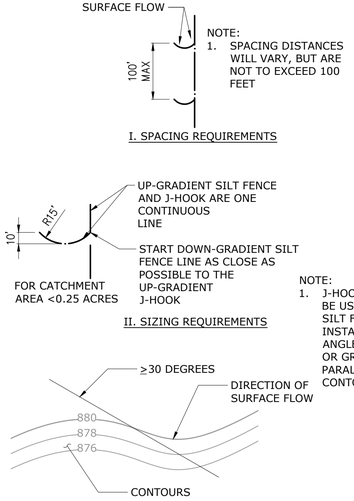
SECTION SILT FENCE

NOTE:

1. EXTRA STRENGTH FILTER FABRIC (AS APPROVED BY ENGINEER) WITH 6'–0" POST SPACING.
2. FILTER FABRIC SHALL BE WIRED DIRECTLY TO POST.
3. SILT FENCE IS SHOWN ON THE DRAWINGS AT AN APPROXIMATE LOCATION, IT SHOULD ALWAYS BE INSTALLED TO FOLLOW CONTOURS.

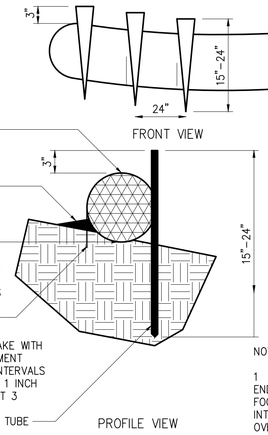
SILT FENCE (WIRE BACKED) TYPE 2

N.T.S.



J-HOOK

N.T.S



GENERAL GUIDELINES FOR SPACING OF TUBE TRENCHES FOR SLOPE INSTALLATIONS	
SLOPE GRADIENT	TUBE INTERVAL
1H:1V	15 FEET
2H:1V	25 FEET
3H:1V	35 FEET
4H:1V	50 FEET

GENERAL GUIDELINES FOR SPACING OF TUBE TRENCHES FOR CHANNEL INSTALLATIONS	
SLOPE GRADIENT	TUBE INTERVAL
2%	25 FEET

FIBER FILTRATION TUBE (FFT)

0227039

NOTES:

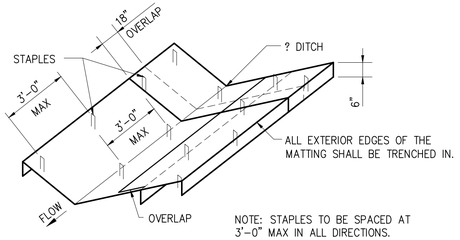
1 OVERLAP ADJACENT ROLL ENDS BY A MINIMUM OF ONE FOOT AND REDUCE STAKING INTERVAL TO ONE FOOT WITHIN OVERLAP SECTION.

2 SMOOTH SOIL SURFACE AND REMOVE ALL OBSTRUCTIONS GREATER THAN 1"–2" IN DIAMETER.

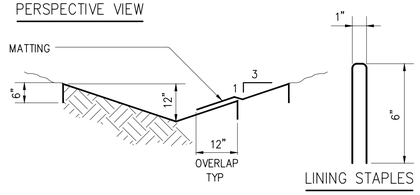
3 FOR CHANNEL APPLICATIONS, BOTH UPSTREAM AND DOWNSTREAM ANCHORING SHOULD BE AT 1 FOOT INTERVALS.

4 FOR CHANNEL APPLICATIONS, FFTs SHALL BE STAND–ALONE PRODUCTS WITHOUT PERFORMANCE–ENHANCING POLYMERS.

5 FOR SLOPE APPLICATIONS, FFTs MAY CONTAIN PERFORMANCE–ENHANCING POLYMERS EXCEPT FOR THE MOST DOWNSTREAM FFT, WHICH WILL BE A STAND–ALONE PRODUCT.



PERSPECTIVE VIEW



LINING STAPLES

RECM AND TRM INSTALLATION

0227014

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen

HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

STANDARD DETAILS

EROSION CONTROL

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER D01

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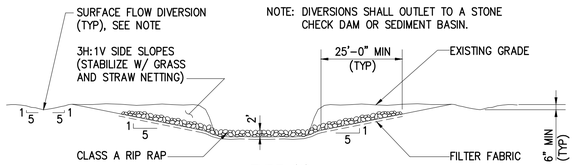
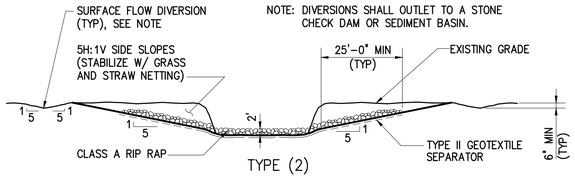
PLOT DATE: 9/16/2020 10:24 AM BY: KROBINSON



TYPE (1)



TYPE (2)

TEMPORARY STREAM CROSSING (FORD)

N.T.S.

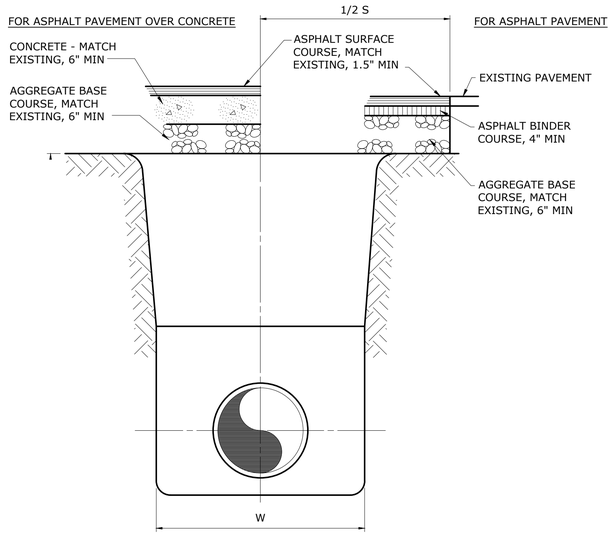
INSTALL WHERE DIRECTED BY ENGINEER

TRENCH EXCAVATION LIMITS		
INTERNAL DIAMETER OF PIPE	W WIDTH OF TRENCH MAX	W=MIN
4"–6"	3'–9"	2'–0"
8"–10"	3'–9"	2'–2"
12"	3'–9"	O.D.+2'
14"–16"	4'–2"	O.D.+2'
18"	4'–4"	O.D.+2'
20",21"	4'–8"	O.D.+2'
24"	4'–11"	O.D.+2'
27"	5'–9"	O.D.+2'
30"	6'–7"	O.D.+2'
36"	7'–4"	O.D.+4'
42"	8'–2"	O.D.+4'
48"	8'–9"	O.D.+4'
54"	9'–4"	O.D.+4'
60"	9'–10"	O.D.+4'
72"	11'–0"	O.D.+6'
78"	11'–8"	O.D.+6'
84"	12'–0"	O.D.+6'
90"	12'–6"	O.D.+6'
96"	13'–0"	O.D.+6'
108"	14'–0"	O.D.+6'
DEPTH OF CUT	S MAXIMUM PAVEMENT REPLACEMENT WIDTH	
0–6'	S=W+4'	
>6–8'	S=W+8'	
>8–10'	S=W+12'	
>10–12'	S=W+16'	
>12–14'	S=W+20'	
>14–16'	S=W+24'	
>16–18'	S=W+28'	
>18'	S=W+32'	

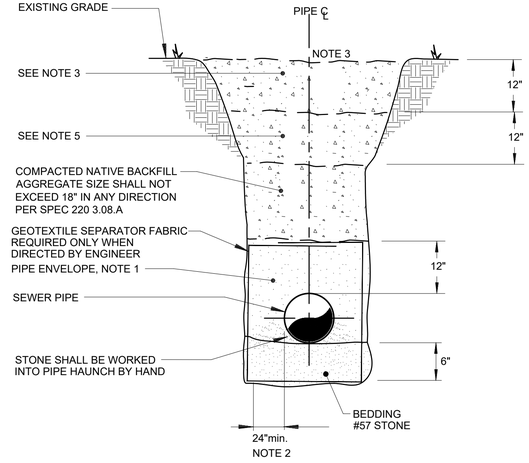
W = TRENCH WIDTH AT BOTTOM OF PIPE. TRENCH SIDE SLOPES SHALL BE IN ACCORDANCE WITH OSHA REQUIREMENTS.

TYPICAL EXCAVATION LIMITS

0222109



PAVEMENT CUT DETAIL

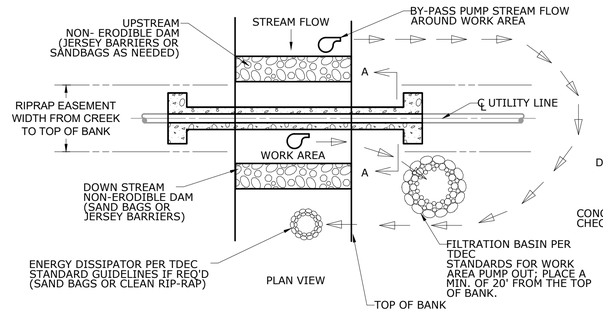


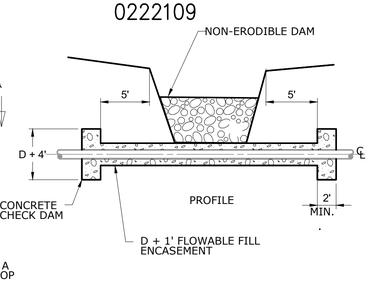
TRENCH DETAIL NOTES:

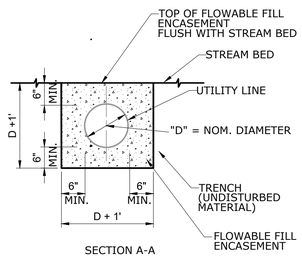
1. PIPE ENVELOPE AGGREGATE, #57 STONE, SHALL BE COMPACTED IN PLACE AROUND AND OVER PIPE UP TO A 12-INCH MINIMUM DEPTH OF COVER.
2. A MINIMUM OF 24 INCHES OF CLEAR SPACE IS REQUIRED BETWEEN EACH SIDE OF THE PIPE AND THE TRENCH WALL OR INSIDE FACE OF THE TRENCH BOX (IF USED).
3. TRENCH SHALL BE CAPPED OFF WITH 12" OF TOP SOIL. ADDITIONAL OFFSITE MATERIAL REQUIRED SHALL BE INCIDENTAL TO THE UNIT PRICES.
4. PIPE BEDDING AND COMPACTED BACKFILL SHALL BE INCIDENTAL TO THE UNIT PRICE FOR SEWER LINE.
5. A MINIMUM OF 12" OF SOIL BACKFILL IS REQUIRED OVER NATIVE SHOT ROCK BACKFILL. THIS LAYER SHALL BE FREE OF ROCKS OVER 2" DIAMETER IN ANY DIRECTION. MATERIAL SHALL BE PLACED IN 6" LIFTS AND ROLLER COMPACTED IN PLACE.
6. DUCTILE IRON CARRIER PIPE SHALL REQUIRE A POLY-WRAP ANYWHERE INSTALLED.

TRENCH DETAILS

N.T.S







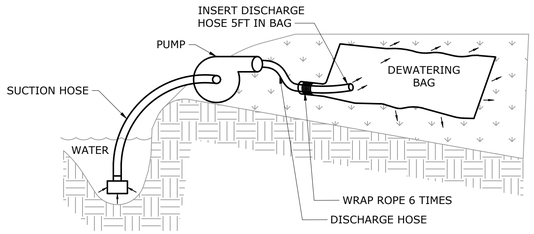
SECTION A-A

NOTES:

1. MINIMIZE BANK DISTURBANCE.
2. MINIMIZE STREAM SILTATION (MUDDY WATER).
3. REMOVE INSTREAM DAMS IMMEDIATELY AFTER CONSTRUCTION IS COMPLETE.
4. FLOWABLE FILL TO BE PLACED 16 HOURS BEFORE BACKFILL IS PLACED AND IN SUCH A MANNER AS TO PREVENT PIPE FROM FLOATING.

CONVENTIONAL CREEK CROSSING DETAIL

N.T.S



INSTALLATION AND USE:

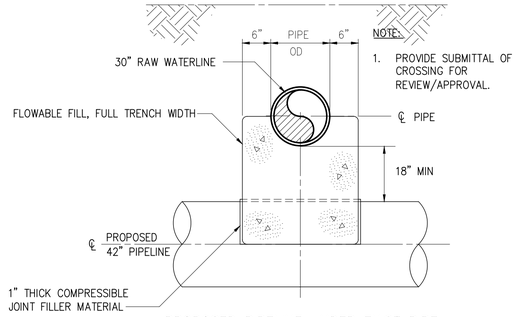
1. PLACE DEWATERING BAG ON THE GROUND OR ON A TRAILER OVER A RELATIVELY LEVEL, STABILIZED AREA.

2. INSERT DISCHARGE PIPE A MINIMUM OF 5 FT. INSIDE DEWATERING BAD AND SECURE WITH A ROPE WRAPPED 6 TIMES AROUND THE SNOUT OVER A 6 INCH WIDTH OF THE BAG.

3. REPLACE DEWATERING BAG WHEN HALF FULL OF SEDIMENT OR WHEN THE SEDIMENT HAS REDUCED THE FLOW RATE OF THE PUMP DISCHARGE TO AN IMPRACTICAL AMOUNT.

DEWATERING BAG DETAIL

N.T.S.

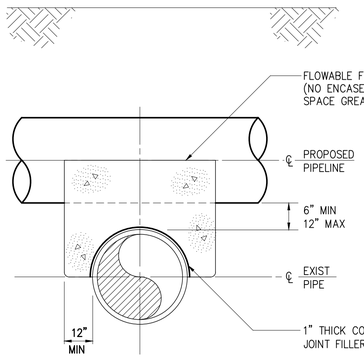


PROPOSED PIPELINE UNDER EXIST PIPE

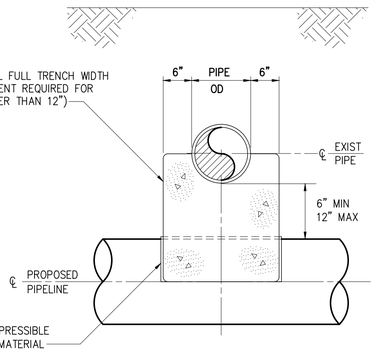
30" RAW WATERLINE CROSSING DETAIL

SEE ####.

0222118A



PROPOSED PIPELINE OVER EXIST PIPE



PROPOSED PIPELINE UNDER EXIST PIPE

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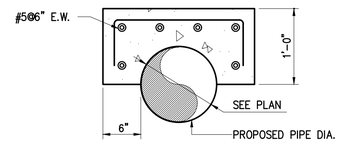

CONCRETE CAP

0222128

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen

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545 MAINSTREAM DR, SUITE 320
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WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

STANDARD DETAILS

SITE & SEWER DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER D02

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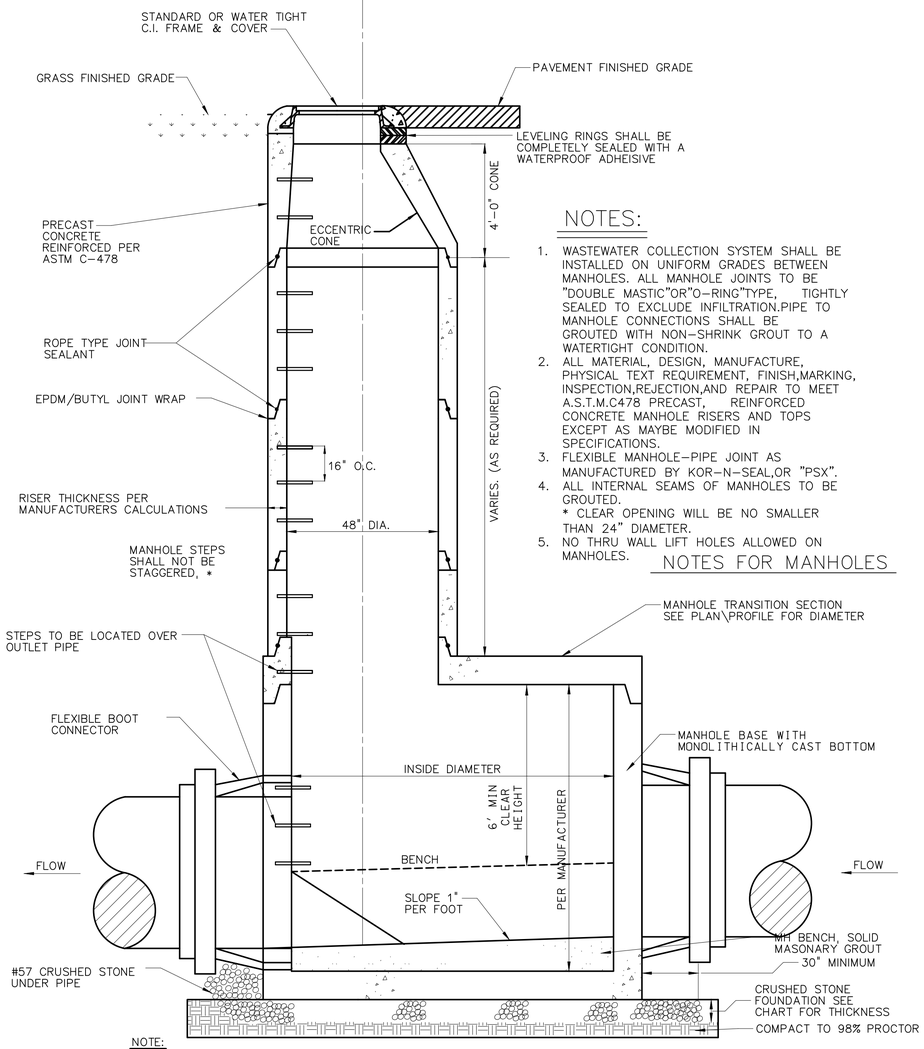
FOUNDATION BACKFILL	
DEPTH OF MH	THK. STONE
0'–10'	12"
10'–20'	24"
20'–30'	30"
30'–40'	36"



NOTES:

1. WASTEWATER COLLECTION SYSTEM SHALL BE INSTALLED ON UNIFORM GRADES BETWEEN MANHOLES. ALL MANHOLE JOINTS TO BE "DOUBLE MASTIC"OR"O-RING"TYPE, TIGHTLY SEALED TO EXCLUDE INFILTRATION.PIPE TO MANHOLE CONNECTIONS SHALL BE GROUTED WITH NON-SHRINK GROUT TO A WATERTIGHT CONDITION.
2. ALL MATERIAL, DESIGN, MANUFACTURE, PHYSICAL TEXT REQUIREMENT, FINISH,MARKING, INSPECTION,REJECTION,AND REPAIR TO MEET A.S.T.M.C478 PRECAST, REINFORCED CONCRETE MANHOLE RISERS AND TOPS EXCEPT AS MAYBE MODIFIED IN SPECIFICATIONS.
3. FLEXIBLE MANHOLE-PIPE JOINT AS MANUFACTURED BY KOR-N-SEAL,OR "PSX".
4. ALL INTERNAL SEAMS OF MANHOLES TO BE GROUTED.
   * CLEAR OPENING WILL BE NO SMALLER THAN 24" DIAMETER.
5. NO THRU WALL LIFT HOLES ALLOWED ON MANHOLES.

NOTES FOR MANHOLES

NOTE:

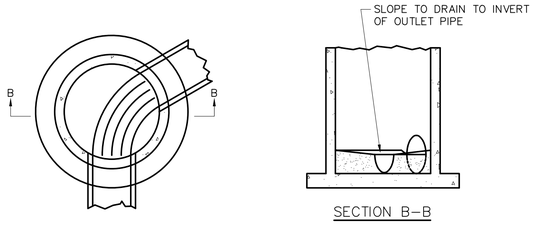
1. BENCHES ARE TO BE GENTLY SLOPED AND TROWELED SMOOTH FROM M.H. WALL TO INVERT WALL AND CONSTRUCTED OF SOLID MASONRY.
2. BASES LARGER THAN 48" (INCH) DIAMETER MUST USE TRANSITION SLAB AND 48" (INCH) RISER SECTIONS.
3. MANHOLES GREATER THAN 15 FEET DEEP SHALL REQUIRE A DOUBLE MAT REINFORCED BASE.
4. THE DISTANCE FROM BENCH (CENTER OF PIPE) TO BOTTOM OF TRANSITION SECTION SHALL BE 6' MINIMUM. MANUFACTURER MAY USE A RISER EQUAL IN DIAMETER TO BOTTOM SECTION TO MEET HEIGHT REQUIREMENT. SEAM MAY NOT OCCUR WITHIN PIPE PENETRATION. FULL PAYMENT SHALL BE INCLUDED WITHIN MANHOLE BASE LINE ITEMS.

STANDARD PRECAST CONCRETE MANHOLE

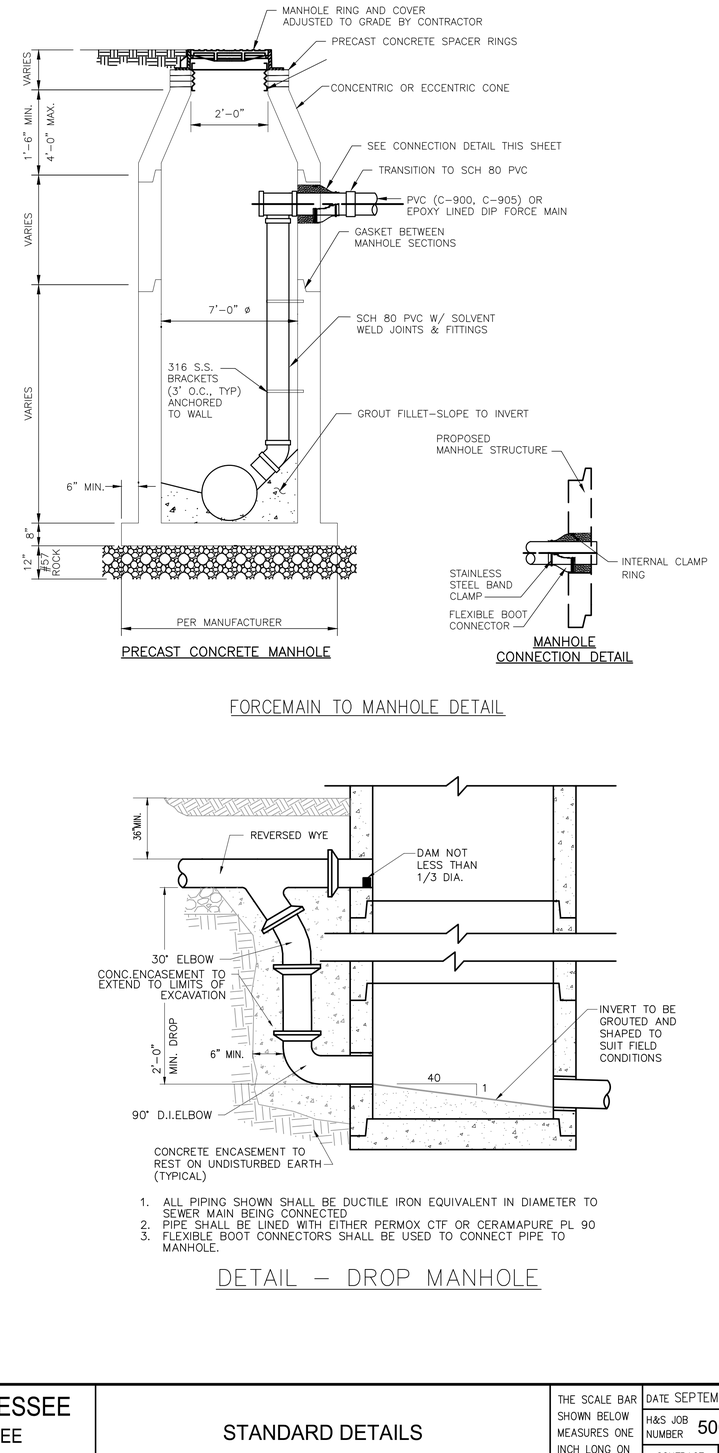
N.T.S.

NOTES:

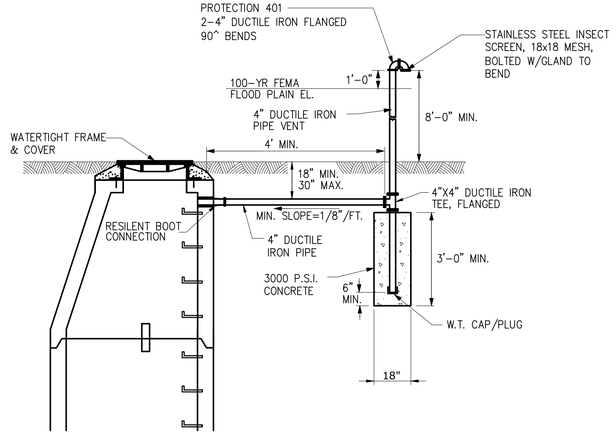
1. SHAPING OF MANHOLE AND INLET INVERTS IN ACCORDANCE WITH THIS DRAWING IS TO APPLY TO THOSE STRUCTURES SPECIFIED ON PLANS. THE COST OF FURNISHING AND PLACING ALL MATERIALS IS TO BE INCLUDED IN THE PRICE BID FOR THE PARTICULAR DROP INLET COMPLETE, AND/OR VERTICAL FEET OF MANHOLE.
2. MANHOLE OR DROP INLET IS TO BE FORMED AND CONSTRUCTED IN ACCORDANCE WITH APPLICABLE STANDARD OR SPECIAL DRAWING. THE INVERT SHAPING AS DETAILED HEREON IS TO CONSIST OF A PORTLAND CEMENT CONCRETE MIX CONFORMING TO A CLASS A OR CLASS C, EXCEPT THAT 25% OF COARSE AGGREGATE MAY BE UP TO 4" IN DIAMETER AND CONSIST OF STONE, BROKEN BRICK, BROKEN CONCRETE OR BROKEN CONCRETE BLOCK. THE SURFACE SHALL BE LEFT SMOOTH BY MEANS OF HAND TROWELLING. NONE OF THE COARSE AGGREGATE SHALL REMAIN EXPOSED.
3. DETAILS OF INVERT SHAPING AS SHOWN HEREON ARE FOR EXAMPLE PURPOSES ONLY. EACH MANHOLE OR DROP INLET IS TO BE SHAPED INDIVDUALLY TO BEST FIT THE PARTICULAR INLET AND OUTLET CONFIGURATION AND FLOW LINES.
4. A 1" GAP SHALL BE MAINTAINED BETWEEN THE GROUTED CHANNEL AND THE SEWER PIPE AT BOTH THE MANHOLE INLET AND OUTLET. GROUT SHOULD NOT COME INTO CONTACT WITH THE SEWER PIPE.



STANDARD SHAPING OF MANHOLE INVERTS



FORCEMAIN TO MANHOLE DETAIL



WATERTIGHT MANHOLE

NOTES:

1. VENT PIPE TO BE PAINTED WITH ONE COAT OF RED LEAD PRIMER, AND TWO COATS OF TNEMEC SERIES 66 GREEN ENAMEL (4-6 MILS DFT).
2. VENT TO BE MINIMUM OF 1' ABOVE 100-YR FLOOD ELEVATION AND NO MORE THAN 9' ABOVE SURFACE GRADE
3. VENT PIPE SHALL BE LOCATED OUT OF A TRAVELED WAY, BEHIND CURB AND SIDEWALK, OR AS SHOWN ON PLANS.

MANHOLE VENT

N.T.S.

1. ALL PIPING SHOWN SHALL BE DUCTILE IRON EQUIVALENT IN DIAMETER TO SEWER MAIN BEING CONNECTED
2. PIPE SHALL BE LINED WITH EITHER PERMOX CTF OR CERAMAPURE PL 90
3. FLEXIBLE BOOT CONNECTORS SHALL BE USED TO CONNECT PIPE TO MANHOLE.

DETAIL – DROP MANHOLE

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen

HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
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WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

STANDARD DETAILS

SEWER DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER D03

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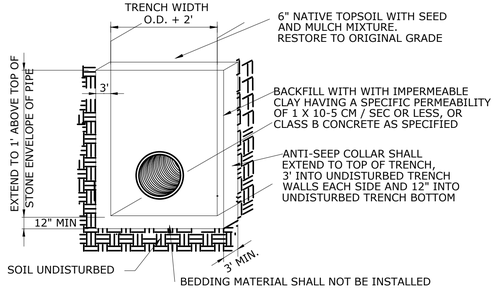


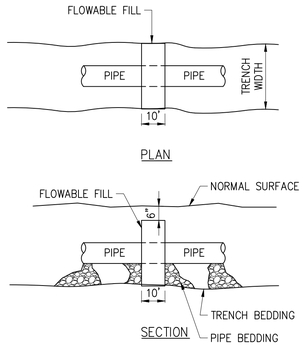
CLASS B CONCRETE SPECIFICATIONS	
A) MINIMUM CEMENT CONTENT, SACKS PER CUBIC YARD WITH ROUNDED COURSE AGGREGATE	5.0
B) MINIMUM CEMENT CONTENT, SACKS PER CUBIC YARD WITH ANGULAR COURSE AGGREGATE	5.5
C) MAXIMUM WATER-CEMENT RATIO GALLONS PER SACK	6.8
D) SLUMP RANGE	2" TO 4"
E) MINIMUM STRENGTH - 28 DAY PSI	2,500

NOTES:

1. EXISTING TOPSOIL SHALL BE REMOVED STOCKPILED AND PROTECTED FROM CONTAMINATION AND SHALL BE REPLACED AS TOPSOIL AFTER UTILITY INSTALLATION.
2. ANTI-SEEP COLLAR SHALL BE PLACED AT UPSTREAM OF EACH MANHOLE.
3. ANTI-SEEP COLLARS MAY BE CONSTRUCTED WITH COMPACTED CLAY OR CLASS B CONCRETE.
4. CROSSINGS THAT ARE DIRECTIONALLY DRILLED DO NOT REQUIRE ANTI-SEEP COLLARS.
5. CONTRACTOR SHALL PROVIDE SUITABLE FORMING (TO BE REMOVED) TO CONTAIN CONCRETE FOR PROPER SHAPE AND DIMENSIONS.
6. ANTI-SEEP COLLAR MATERIAL AND INSTALLATION SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACING AND BACKFILLING

CHECK DAM: TRENCH ANTI-SEEP COLLAR DETAIL

N.T.S



FLOWABLE FILL TRENCH PLUG DETAIL

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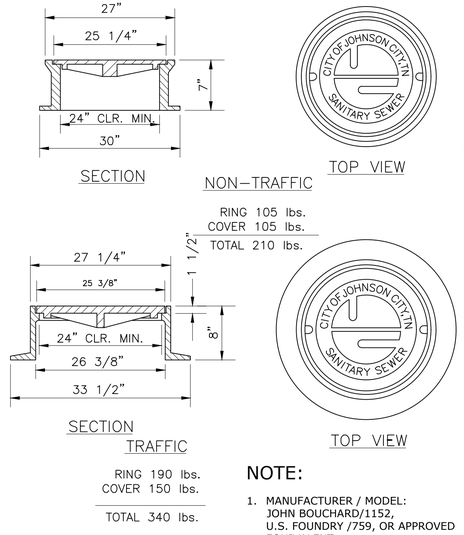
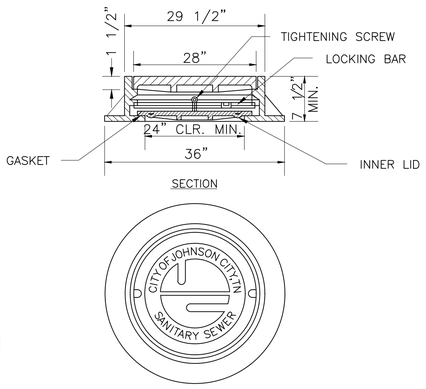


NOTE:

1. MANUFACTURER / MODEL: JOHN BOUCHARD/1152, U.S. FOUNDRY /759, OR APPROVED EQUIVALENT.

TRAFFIC & NON-TRAFFIC MANHOLE FRAME & COVER

N.T.S



WATERTIGHT MANHOLE

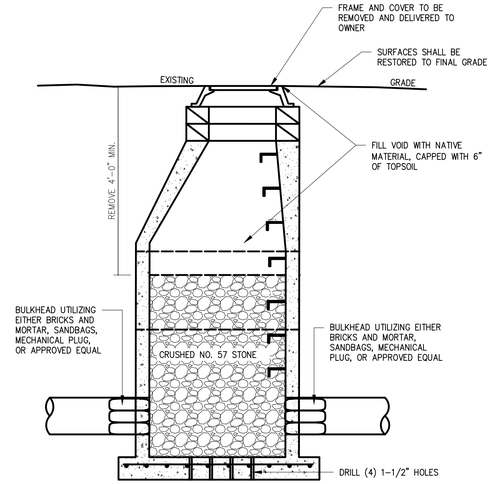
TOTAL WEIGHT 500 lbs.

NOTE:

1. MANUFACTURER / MODEL: JOHN BOUCHARD/1123, U.S. FOUNDRY /759 WATERTIGHT WEDGE CAM LOCK OR APPROVED EQUIVALENT.

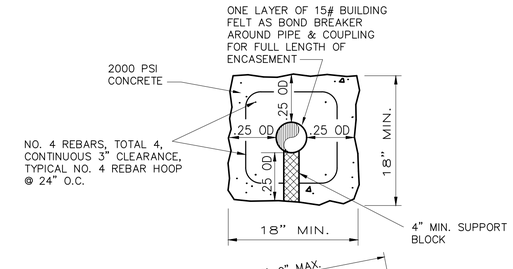
MANHOLE FRAME AND COVER (WATER-TIGHT)

N.T.S



MANHOLE ABANDONMENT DETAIL

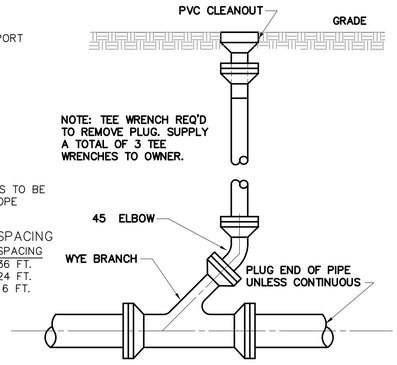
N.T.S.



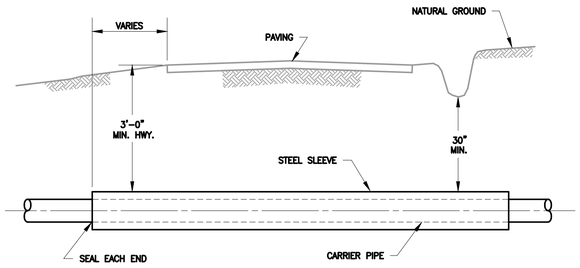
NOTE:
ANCHOR BLOCKS TO BE USED WHEN SLOPE EXCEEDS 20%

SLOPE ANCHOR SPACING	
SLOPE	SPACING
20% TO 35%	36 FT.
35% TO 50%	24 FT.
50% AND OVER	16 FT.

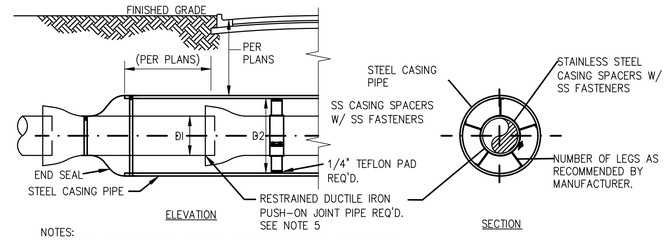
DETAIL SHOWING CONCRETE ENCASEMENT & ANCHOR BLOCK



DETAIL OF CLEANOUT



HIGHWAY CROSSING



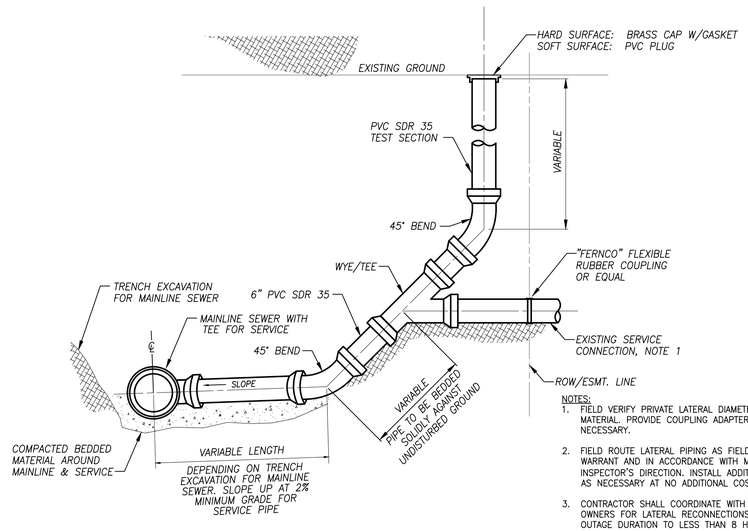
NOTES:

1. WHEN CONSTRUCTION IS WITHIN TDOT OR RAILROAD JURISDICTION, ADDITIONAL REQUIREMENTS OF EACH AGENCY SHALL BE MET.
2. STAINLESS STEEL CASING SPACERS ARE REQUIRED AS SHOWN.
3. WHERE PRACTICAL, CASING SHALL EXTEND A MIN. OF 8' BEYOND EDGE OF PAVEMENT OR EVEN WITH R.O.W. OR EASEMENT.
4. A MINIMUM OF 3 CASING SPACERS PER 20 LINEAR FEET OF INSTALLED CARRIER PIPE SHALL BE PROVIDED.
5. CARRIER PIPE SHALL BE RESTRAINED JOINT.

CARRIER PIPE AND CASING PIPE SIZES (MIN.)												
CARRIER PIPE NOM. DIA. (DI)	2	4	6	8	10	12	14	16	20	24	36	42
CASING PIPE NOM. DIA. (D2)	6	14	16	18	22	24	28	30	36	48	60	72
WALL THICKNESS (IN.) R.O.W.	0.188	0.188	0.219	0.250	0.281	0.312	0.375	0.406	0.469	0.625	0.781	0.938
WALL THICKNESS (IN.) RAILROAD	0.188	0.250	0.281	0.312	0.344	0.375	0.438	0.469	0.532	0.688	0.844	1.0

BORE AND JACK CASING

N.T.S.



NOTES:

1. FIELD VERIFY PRIVATE LATERAL DIAMETER AND MATERIAL. PROVIDE COUPLING ADAPTER AS NECESSARY.
2. FIELD ROUTE LATERAL PIPING AS FIELD CONDITIONS WARRANT AND IN ACCORDANCE WITH MCES INSPECTOR'S DIRECTION. INSTALL ADDITIONAL FITTINGS AS NECESSARY AT NO ADDITIONAL COST.
3. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS FOR LATERAL RECONNECTIONS TO MINIMIZE OUTAGE DURATION TO LESS THAN 8 HOURS AND AVOID SEWAGE RELEASES.

STANDARD SEWER SERVICE CONNECTION

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

STEPHEN R. HAWKINS — REGISTERED PROFESSIONAL ENGINEER — AGRICULTURE / COMMERCIAL / HIGHWAY — STATE OF TENNESSEE — 9/16/20

Hazen

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545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

STANDARD DETAILS

SEWER DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER D04

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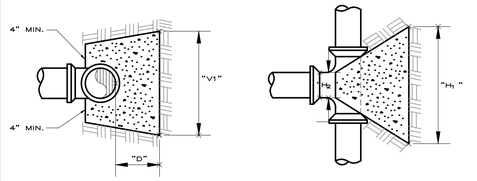
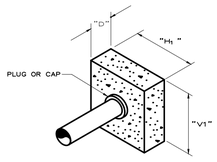
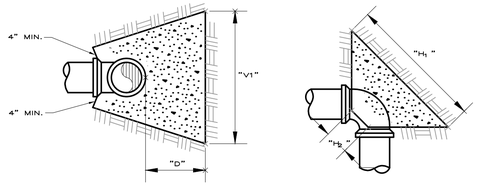


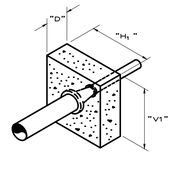
DETAIL OF HORIZONTAL & VERTICAL TEE
SEE TABLE BELOW FOR DIMENSIONS



DETAIL DEAD END



DETAIL OF HORIZONTAL BENDS
SEE TABLE BELOW FOR DIMENSIONS



DETAIL AT REDUCER

MECHANICAL THRUST RESTRAINT TABLE

Horizontal Bends			Vertical Bends				Tees				Reducers			Dead Ends	
Size (in.)	Angle (°)	Min. Restrained Length (ft)	Size (in.)	Angle (°)	Min. Lower Restrained Length (ft)	Min. Upper Restrained Length (ft)	Size Main (in.)	Size Branch (in.)	Total Length Between First Joint and Tee (ft)	Min. Restrained Length (ft)	Large End (in.)	Small End (in)	Min. Retrained Length for Large End (ft)	Size (in.)	Min. Restrained Length for Large End (ft)
2	11.25	3	2	11.25	3	3	8	2	3	15	6	2	36	2	15
2	22.5	5	2	22.5	6	5	8	4	3	29	6	4	22	4	29
2	45	10	2	45	13	10	8	8	3	54	8	2	51	6	42
2	90	23	4	11.25	6	5	12	6	3	41	8	4	40	8	55
4	11.25	5	4	22.5	12	9	12	8	3	54	8	6	23	10	67
4	22.5	9	4	45	24	18	12	12	3	79	16	12	45	12	80
4	45	18	6	11.25	9	6	16	8	3	54	24	16	85	16	105
4	90	43	6	22.5	17	13	16	10	3	67					
6	11.25	6	6	45	35	26	16	12	3	79					
6	22.5	13	8	11.25	11	8	16	16	3	104					
6	45	26	8	22.5	22	16									
6	90	61	8	45	45	33									
8	11.25	8	12	11.25	16	12									
8	22.5	16	12	22.5	32	23									
8	45	33	12	45	66	48									
8	90	80	12	90	159	116									
10	11.25	10	16	11.25	21	15									
10	22.5	20	16	22.5	42	31									
10	45	41	16	45	87	63									
10	90	98	16	90	209	152									
12	11.25	12													
12	22.5	23													
12	45	48													
12	90	116													
16	11.25	15													
16	22.5	31													
16	45	63													
16	90	152													

NOTE:
These tables follow the design methodology from the *DIPRA Thrust Restraint Design For Ductile Iron Pipe (Fifth Edition)* with the following design criteria:

1. Pressure = 200 psi
2. Safety Factor = 1.5
3. Cover = 2.5 ft.
4. Clay 1 Soil Type
5. Type 2 Laying Condition

These values are the most conservative. If different criteria are used, Consult City of Johnson City Water & Sewer Engineering

CONCRETE THRUST BLOCK TABLE

Horizontal Bends

Size (in.)	Angle (°)	H1 (in)	V1 (in)	H2 (in)	D (in)	Conc Vol (cy)
2	11.25	6	4	4	18	0.1
	22.5	9	5	4	18	0.1
	45	11	8	4	18	0.1
	90	15	10	4	18	0.1
4	11.25	11	7	8	18	0.1
	22.5	16	10	8	18	0.1
	45	22	14	8	18	0.1
	90	28	20	8	18	0.2
6	11.25	16	10	12	18	0.1
	22.5	22	15	12	18	0.1
	45	29	22	12	18	0.2
	90	41	28	12	18	0.3
8	11.25	20	14	16	18	0.1
	22.5	28	20	16	18	0.2
	45	38	28	16	18	0.4
	90	52	38	16	18	0.6
10	11.25	25	17	20	18	0.2
	22.5	34	24	20	18	0.3
	45	48	34	20	18	0.6
	90	65	46	20	18	0.9
12	11.25	29	20	24	24	0.3
	22.5	42	28	24	24	0.6
	45	57	40	24	24	1.0
	90	75	56	24	24	1.6
16	11.25	39	26	32	24	0.6
	22.5	53	38	32	24	1.2
	45	76	52	32	24	1.9
	90	104	70	32	24	3.1

Vertical Bends

Size (in.)	Angle (°)	H1 (in)	V1 (in)	H2 (in)	D (in)	Conc Vol (cy)
2	11.25	7	6	4	18	0.1
	22.5	10	9	4	18	0.1
	45	13	12	4	18	0.1
4	11.25	13	12	8	18	0.1
	22.5	18	17	8	18	0.1
	45	24	24	8	18	0.2
6	11.25	18	18	12	18	0.2
	22.5	25	25	12	18	0.2
	45	34	34	12	18	0.4
8	11.25	24	23	16	18	0.3
	22.5	33	33	16	18	0.4
	45	45	44	16	18	0.6
12	11.25	35	33	24	24	0.7
	22.5	48	48	24	24	1.1
	45	67	63	24	24	1.7
	90	78	76	24	24	2.3
16	11.25	45	45	32	24	1.5
	22.5	64	62	32	24	2.2
	45	88	83	32	24	3.3
	90	103	100	32	24	4.4

Dead Ends - Plugs

Size (in.)	H1 (in)	V1 (in)	H2 (in)	D (in)	Conc Vol (cy)
2	12	9	12	18	0.1
4	23	17	23	18	0.2
6	34	24	34	18	0.4
8	44	32	44	18	0.6
10	53	40	53	20	1.0
12	65	46	65	24	1.6
16	86	60	86	32	3.6

Dead Man

Size (in.)	H1 (in)	V1 (in)	H2 (in)	D (in)	Conc Vol (cy)
2	13	9	13	18	0.1
4	25	17	25	18	0.2
6	36	24	36	18	0.4
8	46	32	46	18	0.6
10	55	40	55	20	1.0
12	65	48	65	24	1.6
16	90	60	90	32	3.6

Reducers

Large End (in.)	Small End (in)	H1 (in)	V1 (in)	H2 (in)	D (in)	Conc Vol (cy)
6	2	32	22	32	18	0.3
6	4	24	18	24	18	0.2
8	2	43	30	43	18	0.5
8	4	39	26	39	18	0.4
8	6	30	20	30	18	0.3
16	12	55	40	55	32	1.6
24	16	95	65	95	48	6.4

Closed Valve

Size (in.)	H1 (in)	V1 (in)	H2 (in)	D (in)	Conc Vol (cy)
2	12	9	12	18	0.1
4	23	17	23	18	0.2
6	34	24	34	18	0.4
8	44	32	44	18	0.6
10	56	38	56	20	1.0
12	65	46	65	24	1.6
14	74	54	74	28	2.4
16	83	62	83	32	3.6

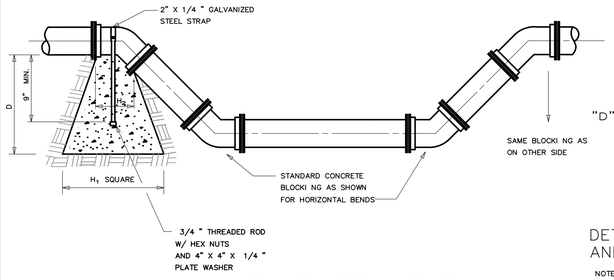
Tees

Size Main (in.)	Size Branch (in.)	H1 (in)	V1 (in)	H2 (in)	D (in)	Conc Vol (cy)
8	2	12	9	4	18	0.1
8	4	25	16	8	18	0.1
8	8	45	31	16	18	0.4
12	6	34	24	12	18	0.3
12	8	44	32	16	18	0.4
12	12	65	46	24	24	1.2
16	8	44	32	16	18	0.4
16	10	56	38	20	18	0.7
16	12	65	46	24	24	1.2
16	16	86	60	32	24	2.3

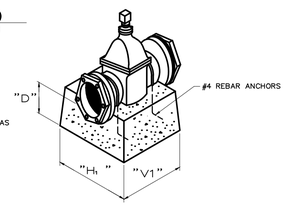
NOTE:
These tables follow the design methodology from the *DIPRA Thrust Restraint Design For Ductile Iron Pipe (Fifth Edition)* with the following design criteria:

1. Pressure = 200 psi
2. Safety Factor = 1.5
3. Pressure 2 for Closed Valve = 0 psi
4. Soil Bearing Capacity = 2000 psf

These values are conservative. If different criteria are used, Consult City of Johnson City Water & Sewer Engineering



DETAIL OF VERTICAL BENDS

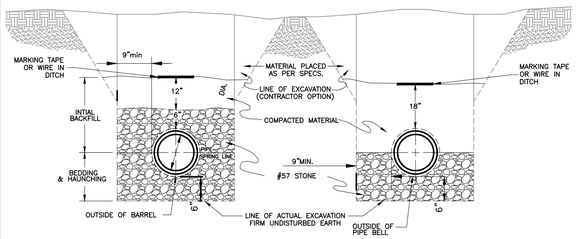


DETAIL AT GATE VALVE AND BUTTERFLY VALVE

NOTE: SADDLE BLOCKING ON EITHER SIDE OF THE VALVE MAY BE USED AS AN ALTERNATE.

SEE TABLES FOR DIMENSIONS

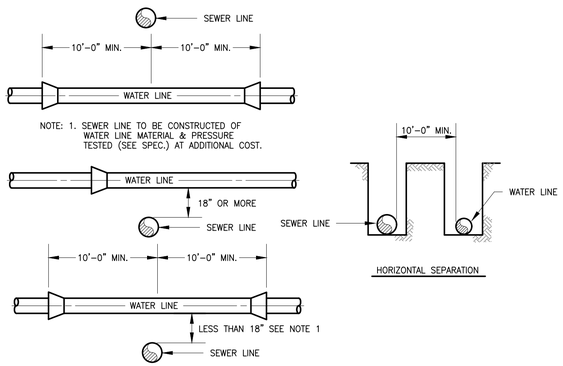
THRUST BLOCKS & DATA



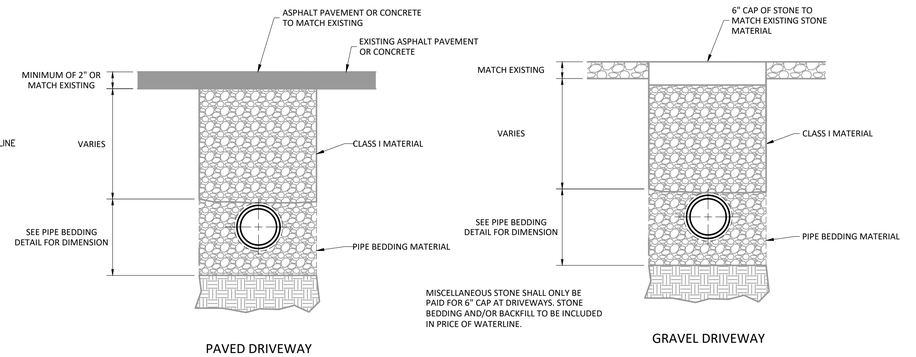
— PVC PIPE BEDDING DETAIL — — DUCTILE IRON PIPE BEDDING —

BEDDING AS SHOWN FOR DUCTILE IRON PIPE SHALL ONLY BE REQUIRED WHEN UNSUITABLE SOIL OR SOLID ROCK IS ENCOUNTERED AT THE TRENCH BOTTOM. STONE BEDDING AND/OR BACKFILL SHALL BE INCLUDED WITH THE PIPE. THE MISCELLANEOUS STONE PAY ITEM SHALL ONLY BE APPLIED TO AREAS AGREED UPON BY THE ENGINEER & CONTRACTOR.

SMALL DIA. WATER/SEWER PIPE BEDDING DETAILS



WATER & SEWER SEPARATION



DRIVEWAY CROSSING DETAIL

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen
HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

STANDARD DETAILS

WATER DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER D05

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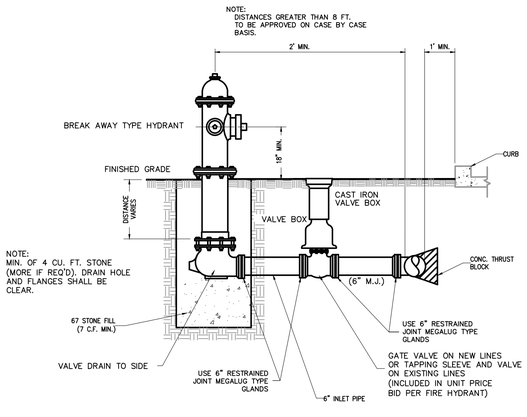
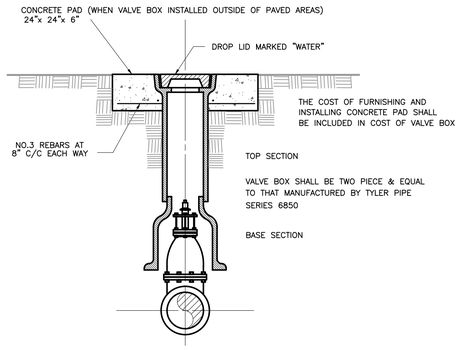


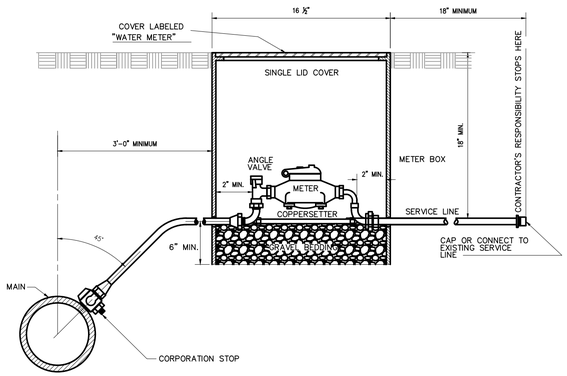
DETAIL OF FIRE HYDRANT

NOTE: MECHANICAL RESTRAINT MUST BE PROVIDED FOR VALVE AND HYDRANT. CONTRACTOR MUST SUBMIT ANY ALTERNATIVE MECHANICAL RESTRAINT METHOD. CONCRETE "KICKERS" WILL NOT BE ACCEPTED.

FIRE HYDRANT INSTALLATION

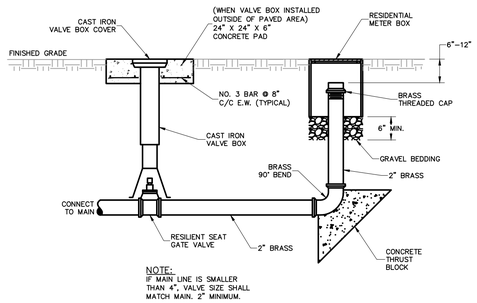


VALVE BOX (TWO PIECE)



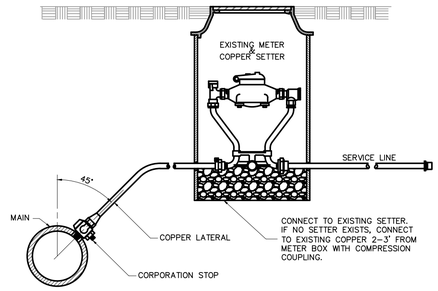
NEW SERVICE CONNECTION TO BE INSTALLED ONLY AS DIRECTED BY THE PROJECT ENGINEER.

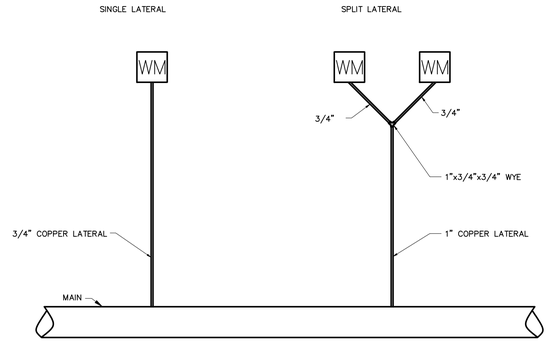
NEW SERVICE CONNECTION



BLOW-OFF

N.T.S





1. COPPER LATERAL SHALL BE ¾" FOR A SINGLE LATERAL.
2. COPPER LATERAL SHALL BE 1" WITH A 1"x¾"x¾" WYE ON SPLIT LATERAL APPLICATIONS.
3. SPLIT LATERALS MAY BE USED WHEN WATER METERS ARE LOCATED WITHIN 10' HORIZONTAL DISTANCE OR CALLED OUT ON PLANS.

COPPER LATERAL TO EXISTING METER

NO.	ISSUED FOR	DATE	BY

DESIGNED MLO
DRAWN KAR
CHECKED RMH
PROJ.ENGR. MLO
APPROVED

Hazen

HAZEN AND SAWYER
545 MAINSTREAM DR, SUITE 320
NASHVILLE, TN 37228

WASHINGTON COUNTY, TENNESSEE
CITY OF JOHNSON CITY, TENNESSEE

JOHNSON CITY - LOWER BRUSH CREEK 42" INTERCEPTOR SEWER - CONTRACT #1

STANDARD DETAILS

WATER DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE SEPTEMBER 2020
H&S JOB NUMBER 50079-001
CONTRACT NUMBER 1
DRAWING NUMBER D06