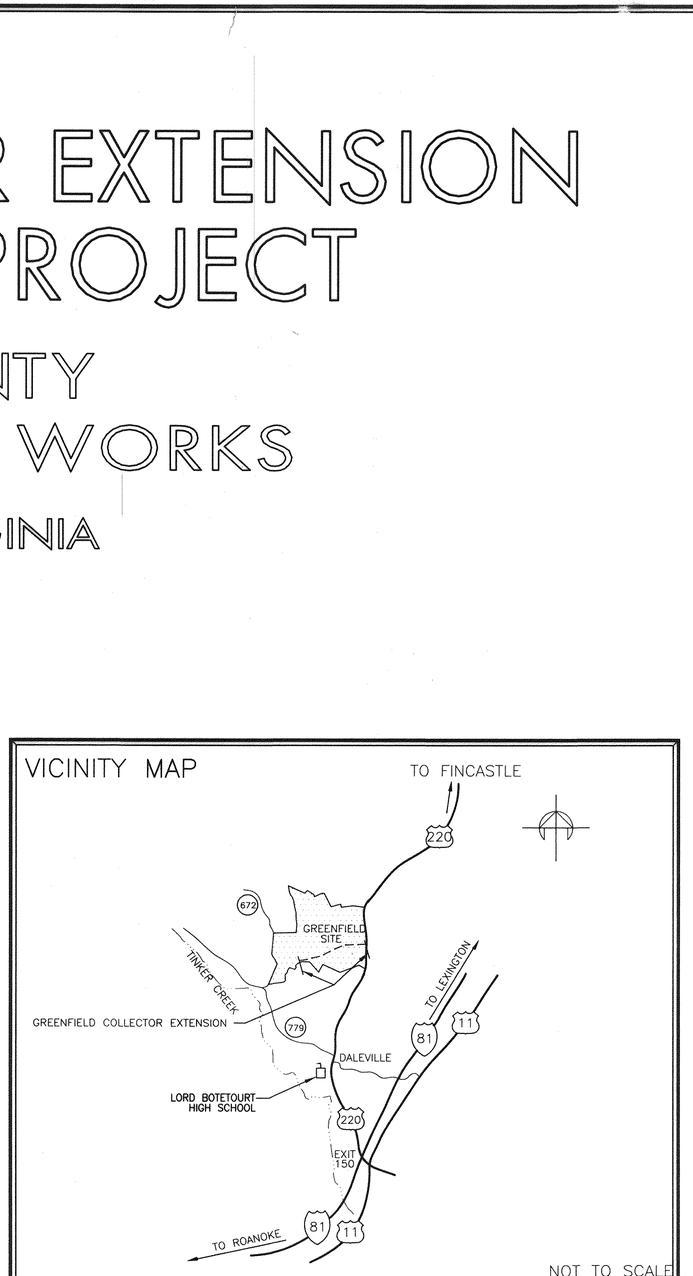
# GREENFIELD COLLECTOR EXTENSION
# SANITARY SEWER PROJECT

## BOTETOURT COUNTY
## DEPARTMENT OF PUBLIC WORKS

### BOTETOURT COUNTY, VIRGINIA
### MAY, 1997

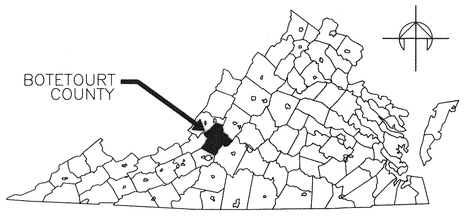
(AB) GREENFIELD COLLECTOR Extension
PROJECT NAME: Sanitary Sewer Project
DATE: May 1997
TYPE: Sewer
LOCATION: Greenfield/Eagon
TOTAL SHEETS: 17
AGI FIRM: EGI
# OF SETS: 1

VICINITY MAP




NOT TO SCALE

VIRGINIA COUNTY LOCATION MAP

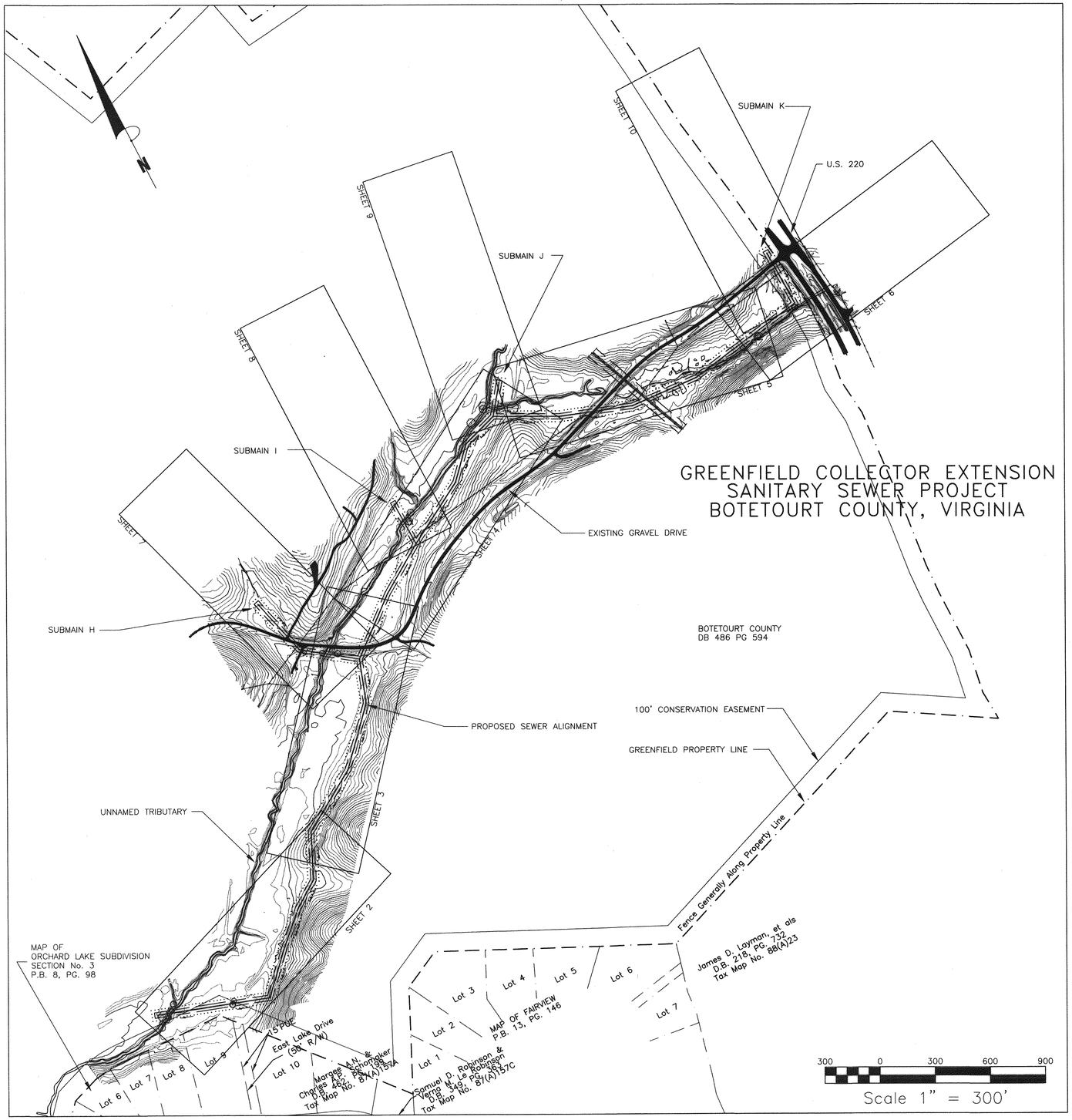



AS-BUILT

**ENGINEERING CONCEPTS, INC.**
20 S. ROANOKE ST., PO BOX 619
FINCASTLE, VIRGINIA 24090
540.473.1253 FAX: 540.473.1254

**OWNER: BOTETOURT COUNTY**
DEPARTMENT OF PUBLIC WORKS
1 WEST MAIN
FINCASTLE, VA

N:\DWGS\97XXX\97024\KEY.DWG




# GREENFIELD COLLECTOR EXTENSION
# SANITARY SEWER PROJECT
# BOTETOURT COUNTY, VIRGINIA

## DRAWING INDEX



## KEY CONTACTS

1. BOTETOURT COUNTY DEPT. OF PUBLIC WORKS
   COUNTY ENGINEER: KEVIN SHEARER, P.E.
   DIRECTOR OF PUBLIC WORKS: KURT HODGEN
   540-473-8316
2. ENGINEERING CONCEPTS, INC.
   PROJECT ENGINEER: SEAN GOLDSMITH, EIT
   540-473-1253
3. ROANOKE GAS COMPANY
   GARY FERGUSON
   540-992-3981

## LEGEND

- ASPHALT ROAD
- GRAVEL ROAD
- PROPERTY LINE
- RIGHT-OF-WAY
- PERMANENT EASEMENT (30' WIDE TYPICAL)
- TEMPORARY CONSTRUCTION EASEMENT (60' WIDE TYPICAL)
- W W W — WATER LINE
- G G — GAS LINE
- SS SS — SEWER LINE
- X X X X — FENCE
- OHE OHE — OVERHEAD ELECTRIC
- SSFM SSFM — SANITARY SEWER FORCEMAIN (EXISTING)
- SSFM SSFM — SANITARY SEWER FORCEMAIN (PROPOSED)

## GENERAL NOTES

1. INFORMATION ON THESE DRAWINGS CONCERNING THE LOCATION AND ELEVATION OF EXISTING UTILITIES, STRUCTURES, AND OBSTRUCTIONS HAS BEEN PREPARED FROM THE MOST RELIABLE INFORMATION AVAILABLE TO THE ENGINEER. THE ACCURACY AND COMPLETENESS OF THIS INFORMATION ARE NOT GUARANTEED, HOWEVER, NOR DOES THE ENGINEER ACCEPT ANY RESPONSIBILITY WHATSOEVER FOR DEVIATIONS OF THE EXISTING UTILITIES, STRUCTURES, OTHER FACILITIES, AND OBSTRUCTIONS FROM THE LOCATIONS AND ELEVATIONS INDICATED OR FOR THE EXISTENCE OF UTILITIES, STRUCTURES, OTHER FACILITIES, AND OBSTRUCTIONS NOT INDICATED ON THESE DRAWINGS.

2. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION TO ELIMINATE ANY POSSIBILITY OF ANY DISTURBANCE OF OR DAMAGE TO PUBLIC AND PRIVATELY-OWNED UTILITIES, STRUCTURES, OTHER FACILITIES, AND OBSTRUCTION RESULTING FROM HIS ACTIVITIES. TO THIS END, CONTRACTOR SHALL, AT NO ADDITIONAL COST TO THE OWNER, TAKE ALL MEASURES NECESSARY TO PROVIDE, AND SHALL BE SOLELY RESPONSIBLE FOR, TEMPORARY SUPPORT AND SHORING, ADEQUATE PROTECTION, AND MAINTENANCE OF CONTINUOUS OPERATION OF ALL UNDERGROUND AND ABOVEGROUND WATER, SEWER, AND GAS MAINS AND SERVICE LINES; PETROLEUM LINES; TELEPHONE, TELEVISION, AND ELECTRICAL LINES, CABLES, AND POLES; EQUIPMENT CABLES AND CONDUITS; STORM SEWERS; BUILDINGS; TANKS; FENCES; AND ALL OTHER UTILITIES, STRUCTURES, BRIDGES, FACILITIES, AND OBSTRUCTIONS, WHETHER OR NOT INDICATED ON THESE DRAWINGS. ALL DISTURBED OR DAMAGED UTILITIES, STRUCTURES, BRIDGES, OTHER FACILITIES, AND OBSTRUCTIONS SHALL BE IMMEDIATELY REPAIRED, REPLACED, OR COMPENSATED FOR BY THE CONTRACTOR TO OWNER'S SATISFACTION, AND AT NO ADDITIONAL COST TO THE OWNER.

3. THE CONTRACTOR SHALL BEAR SOLE RESPONSIBILITY FOR THE CHARACTER AND ACTUAL LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES, STRUCTURES, BRIDGES, OTHER FACILITIES, AND OBSTRUCTIONS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL, AT NO ADDITIONAL COST TO THE OWNER, CONTACT THE OWNERS/OPERATORS OF ALL UTILITIES AND ARRANGE FOR THE VERIFICATION AND MARKING OF UTILITY LOCATIONS BY SAID OWNERS/OPERATORS. THE CONTRACTOR SHALL ASSIST THE UTILITY OWNERS/OPERATORS BY EVERY MEANS POSSIBLE TO DETERMINE THE LOCATION OF UTILITIES. THE CONTRACTOR SHALL BEAR SOLE RESPONSIBILITY FOR ALL DISTURBANCE OF ANY DAMAGE TO UTILITIES RESULTING FROM THE CONTRACTOR'S FAILURE TO ARRANGE FOR THE LOCATION OF UTILITIES BY THE OWNERS/ OPERATORS OF THE UTILITIES. CONTACT MISS UTILITY (800) 552-7001.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL NEW ABOVE AND BELOW GRADE PIPING, STRUCTURES, ELECTRICAL EQUIPMENT AND CONDUIT, AND OTHER FACILITIES AT THE PROJECT SITE, FROM ALL DISTURBANCE OR DAMAGE WHICH MAY RESULT FROM THE PERFORMANCE OF WORK ON THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE REPAIR OR REPLACEMENT OF ALL NEW ABOVE AND BELOW GRADE PIPING STRUCTURES, ELECTRICAL EQUIPMENT AND CONDUIT, AND OTHER FACILITIES AT THE PROJECT SITE WHICH MAY BE DISTURBED OR DAMAGED AS A RESULT OF THE PERFORMANCE OF WORK ON THIS PROJECT.

5. SITE CONDITIONS MAY NECESSITATE SLIGHT DEVIATIONS IN ALIGNMENT, GRADE, AND/OR LOCATION OF NEW FACILITIES FROM THE ALIGNMENT, GRADE, AND/OR LOCATION INDICATED ON THESE DRAWINGS. THE CONTRACTOR SHALL CONSTRUCT THE NEW FACILITIES TO SUCH DEVIATIONS AS DIRECTED BY THE ENGINEER WITHOUT INCREASE IN THE CONTRACT PRICE OR FINE.

6. THE CONTRACTOR SHALL MAINTAIN A CLEAR FLOW PATH TO AND THROUGH ALL SURFACE WATER AND STORM WATER DRAINAGE FACILITIES AT ALL TIMES.

7. THE CONTRACTOR SHALL GRADE, SEED, AND/OR SOD, AND MULCH THE ENTIRE AREA(S) DISTURBED BY CONSTRUCTION ACTIVITIES.

8. CONSTRUCTION AND START-UP OF ALL WORK SHALL NOT INTERFERE WITH THE OPERATION OF WATER AND SEWERAGE FACILITIES. THE CONTRACTOR SHALL COORDINATE AND SCHEDULE ALL WORK WITH THE OWNERS AS REQUIRED.

9. MINIMUM COVER ON ALL PIPE SHALL BE 3 FEET, UNLESS OTHERWISE SPECIFICALLY INDICATED ON THESE DRAWINGS. ALL PIPE SHALL BE INSTALLED WITH WARNING/CAUTION DETECTOR TAPE 18" FROM FINISHED GRADE.

10. WHERE IT IS NECESSARY TO DEFLECT PIPE EITHER HORIZONTALLY OR VERTICALLY, PIPE JOINT DEFLECTION OR BARREL BEND RADIUS SHALL NOT EXCEED 75% OF THE MANUFACTURER'S RECOMMENDED DEFLECTION ANGLE OR BEND RADIUS.

11. ALL PIPING SHALL BE PROPERLY SUPPORTED. ALL PIPING WHICH WILL BE PRESSURIZED DURING OPERATION SHALL BE PROPERLY RESTRAINED.

12. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE CURRENT BOCA AND/OR STATE AND LOCAL BUILDING CODES.

13. CONTRACTOR SHALL MAINTAIN THE CONSTRUCTION AREA IN A MANNER ACCEPTABLE TO OWNER AND SHALL BE RESPONSIBLE FOR REMEDIATING ANY DAMAGES RESULTING FROM FAILURE TO DO SO.

14. EXCEPT FOR ROCK, ALL EXCAVATION SHALL BE UNCLASSIFIED.

15. CONTRACTOR SHALL MAINTAIN LIMITS OF CONSTRUCTION WITHIN THE BOUNDARIES OF THE PROPERTY AND EASEMENTS AS INDICATED.

16. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND MAINTAINING COMPLIANCE WITH ALL NECESSARY PERMITS, INCLUDING BUT NOT LIMITED TO LAND DISTURBING PERMIT, VDOT ROAD CROSSING PERMITS AND BUILDING PERMITS.

17. ALL MANHOLE FRAMES AND COVERS SHALL BE WATERTIGHT UNLESS OTHERWISE NOTED.

18. ALL MANHOLES SHALL BE 48" DIAMETER UNLESS OTHERWISE NOTED.


**ENGINEERING CONCEPTS, INC.**
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FINCASTLE, VIRGINIA 24090
540.473.1253 FAX: 540.473.1254


AS-BUILT

| | | |
|---|---|---|
| Drawn JHG | GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT | AS SHOWN |
| Designed SCG | | MAY 1997 |
| Checked WPJ/JST | GENERAL NOTES AND KEYSHEET | PROJECT: 97024 |
| Approved WPJ | | 1 of 16 |

N:\PROJECTS\97\97024\AS_BUILTS\SS010101.DWG

62
Existing Manhole=62, 5' Dia. w/vent
STA 0+00
Rim=1292.5'

24" SYCAMORE TO BE PROTECTED

24" DOUBLE SYCAMORE TO BE PROTECTED

SYCAMORE CLUSTER TO BE PROTECTED

12" SYCAMORE TO BE PROTECTED

SYCAMORE CLUSTER TO BE PROTECTED

100' CONSERVATION EASEMENT

60' TEMPORARY CONSTRUCTION EASEMENT

30' PERMANENT CONSTRUCTION EASEMENT

LOT 8

GREENFIELD PROPERTY LINE

LOT 9 – MAP OF ORCHARD LAKE SUBDIVISION SECTION No. 3, P.B. 8, PG 98

15' PUE

EAST LAKE DRIVE (50' R/W)

LOT 10

SCALES:
1" =50' HOR
1" =5' VER

SEE SHEET 1 OF 16 FOR LEGEND

1
Manhole=1
STA 2+92.4
Rim=1291.6'

SYCAMORE CLUSTER

2
Manhole=2
STA 6+19.1
Rim=1301.5'

3
Manhole=3 w/vent
STA 8+92.1
Rim=1302.7'

4
Manhole=4
STA 11+29.1
Rim=1305.0'

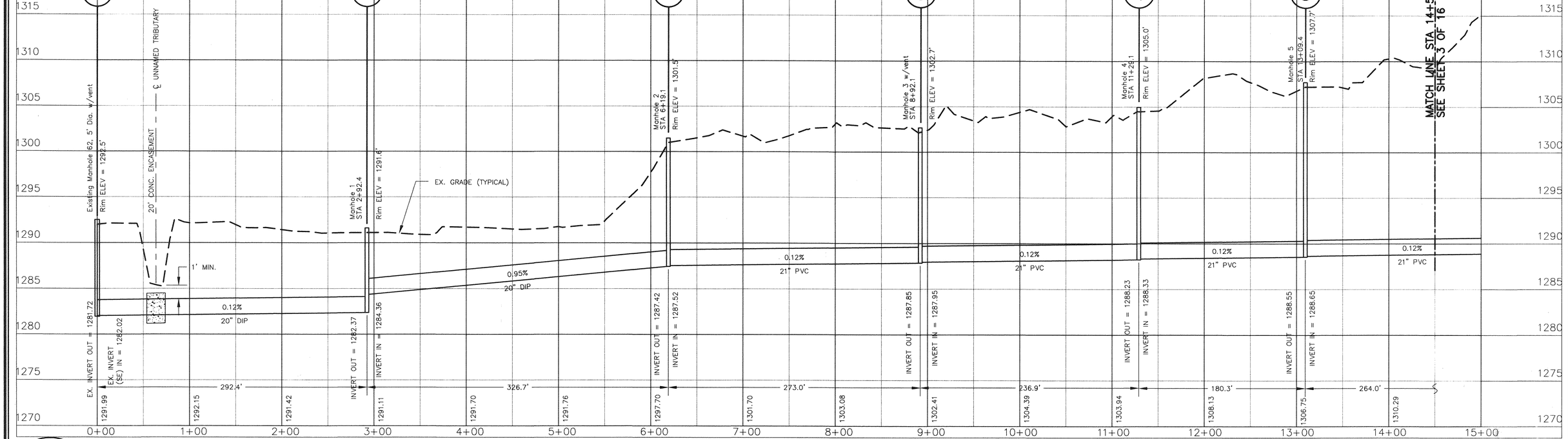
5
Manhole=5
STA 13+09.4
Rim=1307.7'

6
Manhole=6
STA 15+73.4
Rim=1308.2'

UNNAMED TRIBUTARY

MATCH LINE STA 14+50
SEE SHEET 3 OF 16

*FONT DESIGNATES AS BUILT CHANGES TO DESIGN PLANS*





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AS–BUILT

| | |
|---|---|
| Drawn | JHG |
| Designed | SCG |
| Checked | WPJ/JST |
| Approved | WPJ |

**GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT**

**PLAN & PROFILES STA 0+00 – 15+00**

HOR: 1"=50' VER: 1"=5'
MAY 1997
PROJECT: 97024
2 of 16

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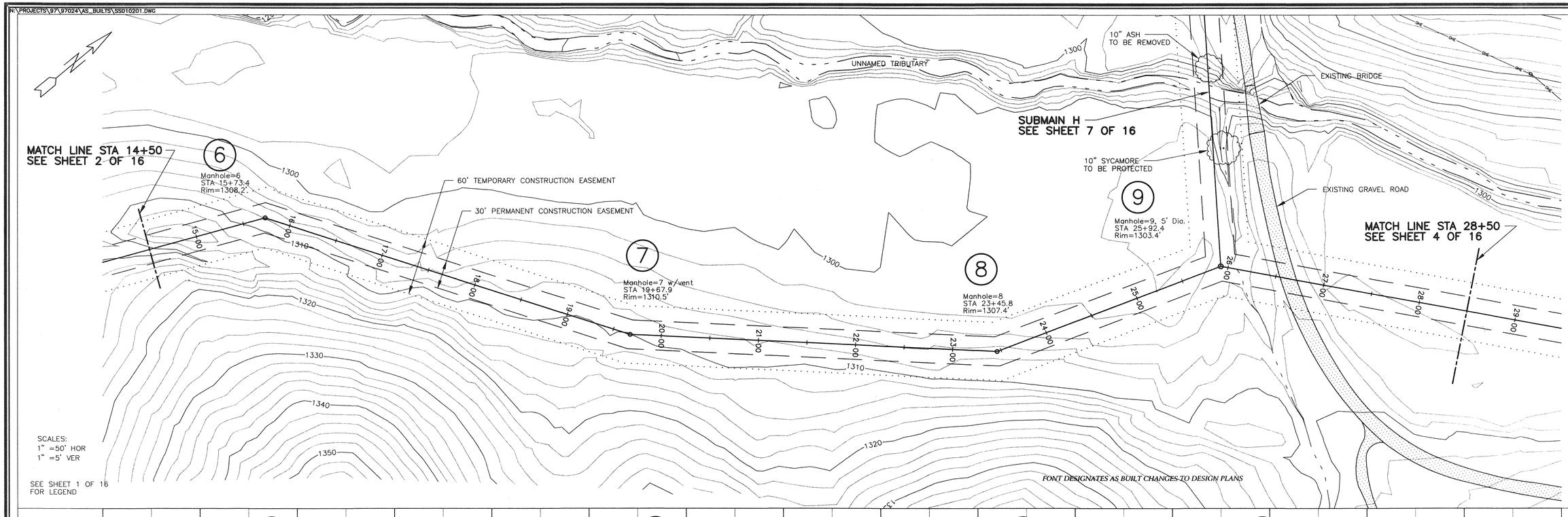


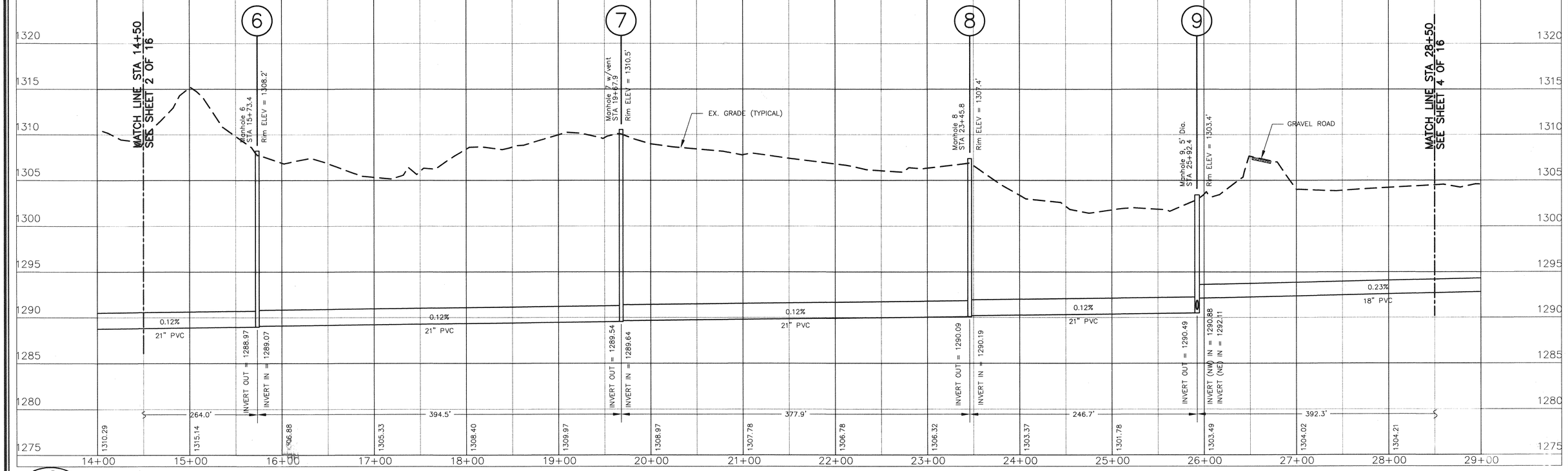



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AS-BUILT

| | |
|---|---|
| Drawn | JHG |
| Designed | SCG |
| Checked | WPJ/JST |
| Approved | WPJ |

**GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT**

**PLAN & PROFILES STA 14+00 – 29+00**

HOR: 1"=50' VER: 1"=5'
MAY 1997
PROJECT: 97024

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SUBMAIN I
SEE SHEET 8 OF 16

MATCH LINE STA 28+50
SEE SHEET 3 OF 16

60' TEMPORARY CONSTRUCTION EASEMENT

30' PERMANENT CONSTRUCTION EASEMENT

10
Manhole=10 w/vent
STA 29+84.8
Rim=1305.6'

11
Manhole=11, 5' Dia.
STA 32+97.5
Rim=1309.4'

12" SYCAMORE
TO BE PROTECTED

14" SYCAMORE
TO BE PROTECTED

*REPAIR SLEEVE*
*6-6-98*

UNNAMED TRIBUTARY

12
Manhole=12
STA 36+97.2
Rim=1309.9'

13
Manhole=13 w/vent
STA 39+15.4
Rim=1310.7'

15" SYCAMORE

18" DOUBLE SYCAMORE

SUBMAIN J
SEE SHEET 9 OF 16

10" SYCAMORE
TO BE PROTECTED

14
Manhole=14, 5' Dia.
STA 41+26.9
Rim=1312.2'

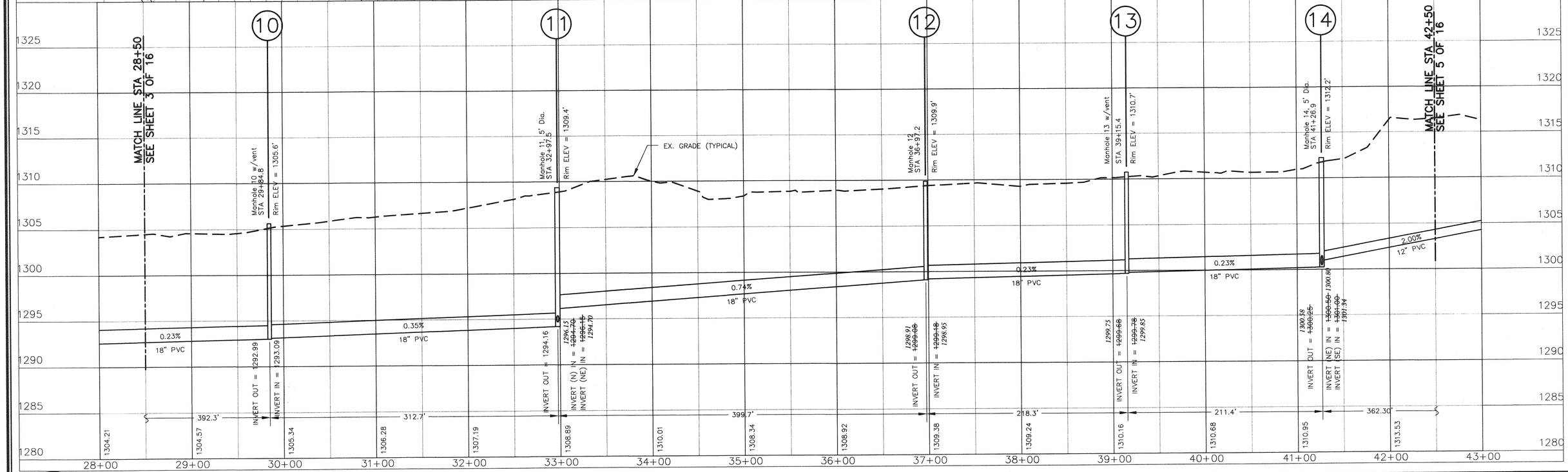
EXISTING GRAVEL ROAD

MATCH LINE STA 42+50
SEE SHEET 5 OF 16

SCALES:
1" =50' HOR
1" =5' VER

SEE SHEET 1 OF 16
FOR LEGEND

*FONT DESIGNATES AS BUILT CHANGES TO DESIGN PLANS*





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AS-BUILT

| No. | Revision | By | Appd. | Date |
|---|---|---|---|---|
| 1 | Deleted MH 15 | SCG | WPJ | Oct. 1997 |

Drawn JHG
Designed SCG
Checked WPJ/JST
Approved WPJ

**GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT**

**PLAN & PROFILES STA 28+00 – 43+00**

HOR: 1"=50' VER: 1"=5'
MAY 1997
PROJECT: 97024
4 of 16

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MATCH LINE STA 42+50
SEE SHEET 4 OF 16

60' AEP EASEMENT

EXISTING GRAVEL ROAD

UNNAMED TRIBUTARY

48" RCP

EXISTING CONCRETE BRIDGE

36" RCP

EQUALIZATION STATION 43+61.6 = 43+80.4

10" SYCAMORE TO BE PROTECTED

16
Manhole=16
STA 45+07.9
Rim=1315.3'

17
Manhole=17 w/vent
STA 49+07.4
Rim=1317.5'

18
Manhole=18
STA 52+90.2
Rim=1322.3'

19
Metering Manhole=19, 6' Dia. w/vent
(See sheet 13 for detail)
STA 55+65.8
Rim=1322.7'

REPAIR SLEEVE
6-10-98

30' PERMANENT CONSTRUCTION EASEMENT

60' TEMPORARY CONSTRUCTION EASEMENT

18" WALNUT TO BE PROTECTED

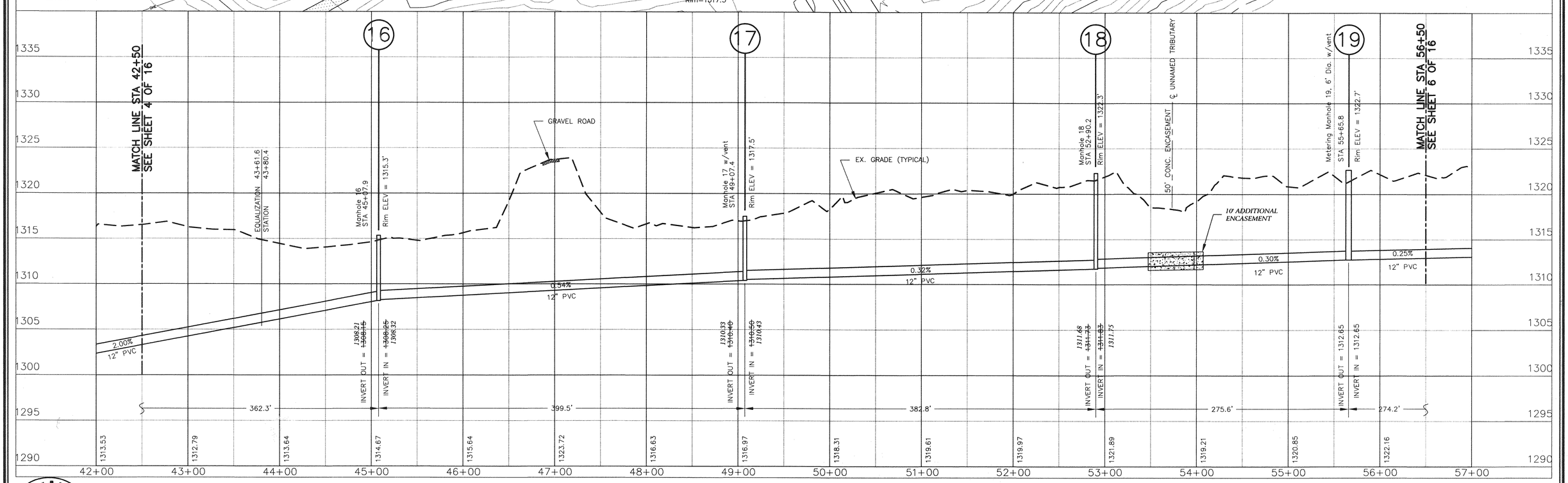
18" DOUBLE SYCAMORE TO BE PROTECTED

MATCH LINE STA 56+50
SEE SHEET 6 OF 16

SCALES:
1" =50' HOR
1" =5' VER

SEE SHEET 1 OF 16 FOR LEGEND

*FONT DESIGNATES AS BUILT CHANGES TO DESIGN PLANS*





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AS-BUILT

| No. | Revision | By | Appd. | Date |
|---|---|---|---|---|
| 1 | Deleted MH 15 | SCG | WPJ | Oct. 1997 |
| 2 | CHANGE SLOPE B/W 18-19 | JST | WPJ | 4/21/98 |
| 3 | CHANGE INVERTS ON MH 19 | JST | WPJ | 4/21/98 |

Drawn JHG
Designed SCG
Checked WPJ/JST
Approved WPJ

**GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT**

**PLAN & PROFILES STA 42+00 - 57+00**

HOR: 1"=50' VER:1"=5'
MAY 1997
PROJECT: 97024
5 of 16

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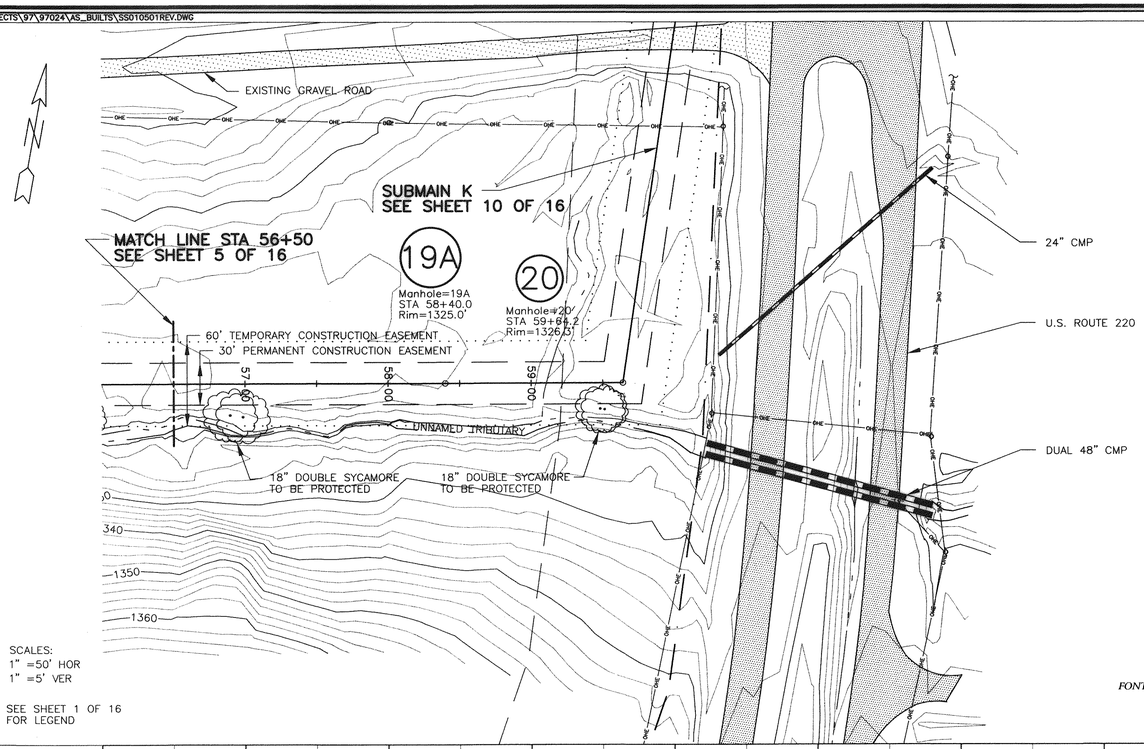


SCALES:
1" =50' HOR
1" =5' VER

SEE SHEET 1 OF 16
FOR LEGEND

*FONT DESIGNATES AS BUILT CHANGES TO DESIGN PLANS*



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AS-BUILT

| No. | Revision | By | Appd. | Date |
|---|---|---|---|---|
| 1 | ADDED MANHOLE 19A | JST | WPJ | 4/21/98 |

Drawn JHG
Designed SCG
Checked WPJ/JST
Approved WPJ

**GREENFIELD COLLECTOR EXTENSION**
**SANITARY SEWER PROJECT**

**PLAN & PROFILES**
**STA 56+00 – 59+64.2**

HOR: 1"=50' VER:1"=5'
MAY 1997
PROJECT: 97024

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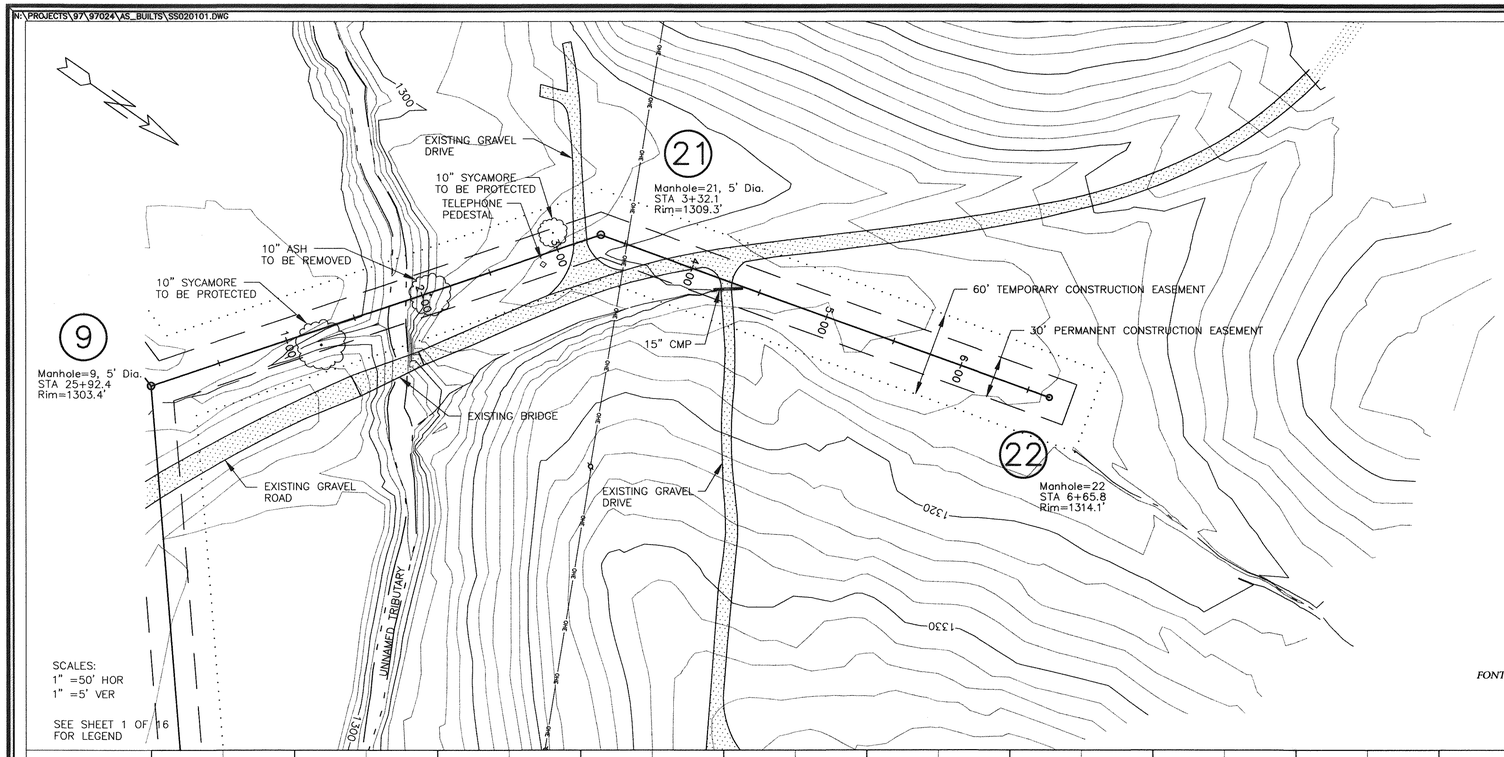


*FONT DESIGNATES AS BUILT CHANGES TO DESIGN PLANS*



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AS-BUILT

| No. | Revision | By | Appd. | Date |
|---|---|---|---|---|
| 1 | Extended line betw. MH 21-22 | SCG | WPJ | 12/5/97 |

Drawn JHG
Designed SCG
Checked WPJ/JST
Approved WPJ

# GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT

## PLAN & PROFILES SUBMAIN "H" STA 0+00 - 6+65.8

HOR: 1"=50' VER:1"=5'
MAY 1997
PROJECT: 97024
7 of 16

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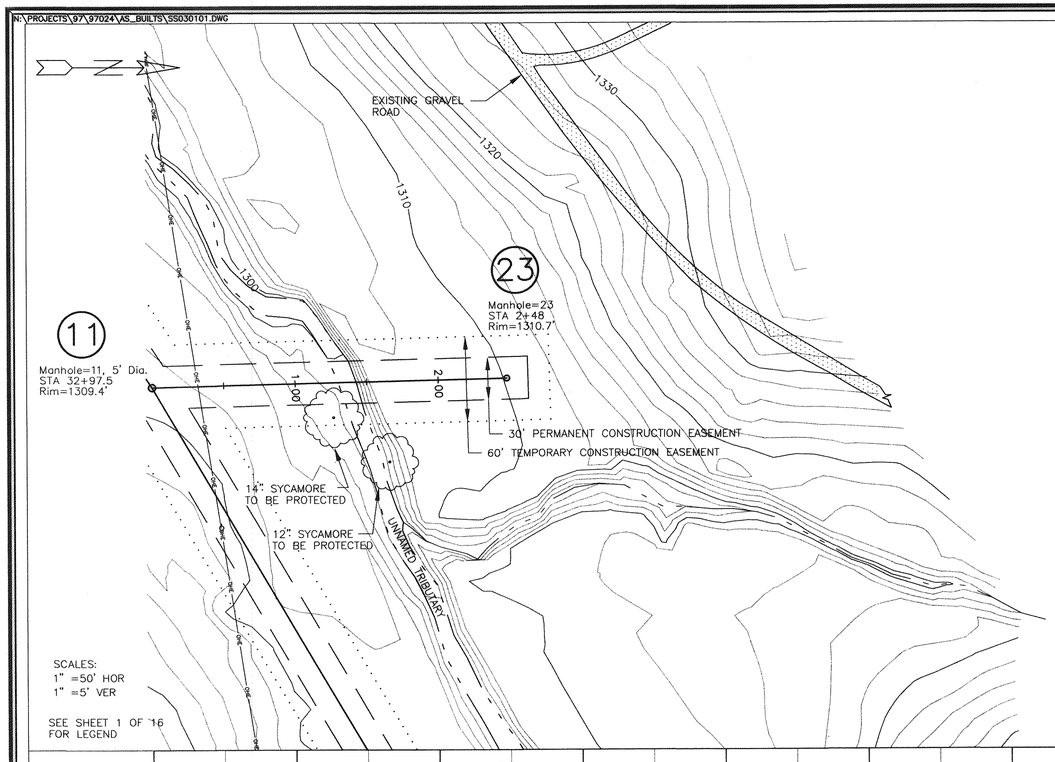
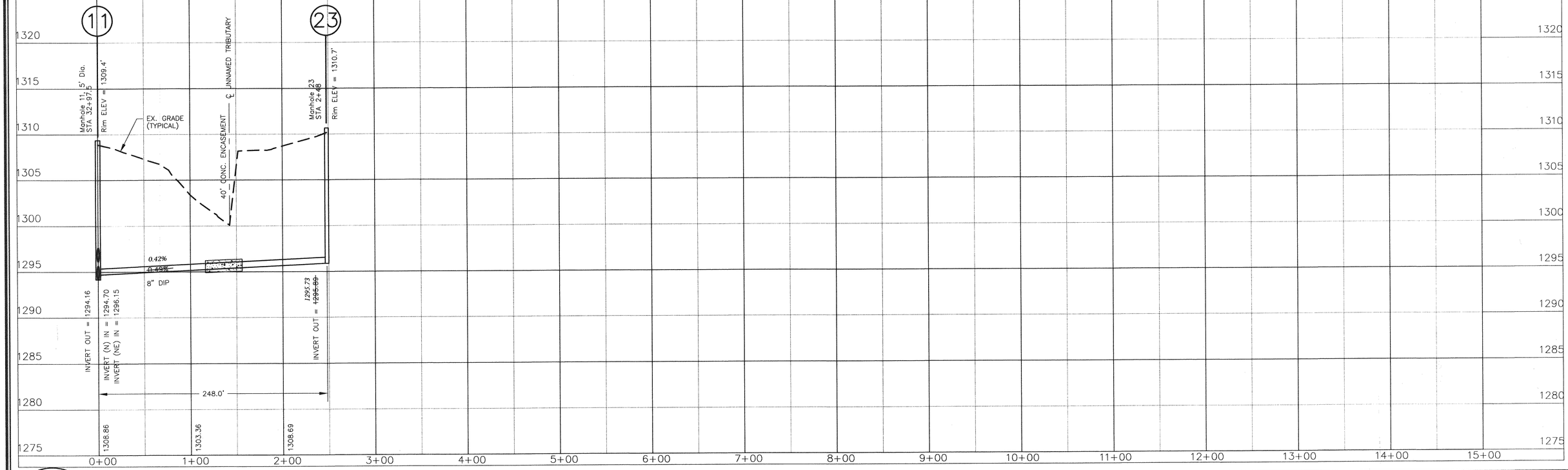



SCALES:
1" =50' HOR
1" =5' VER

SEE SHEET 1 OF 16 FOR LEGEND

*FONT DESIGNATES AS BUILT CHANGES TO DESIGN PLANS*





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AS-BUILT

| | |
|---|---|
| Drawn | JHG |
| Designed | SCG |
| Checked | WPJ/JST |
| Approved | WPJ |

**GREENFIELD COLLECTOR EXTENSION**
**SANITARY SEWER PROJECT**

**PLAN & PROFILES**
**SUBMAIN "1" STA 0+00 – 2+48**

HOR: 1"=50' VER:1"=5'
MAY 1997
PROJECT: 97024
8 of 16

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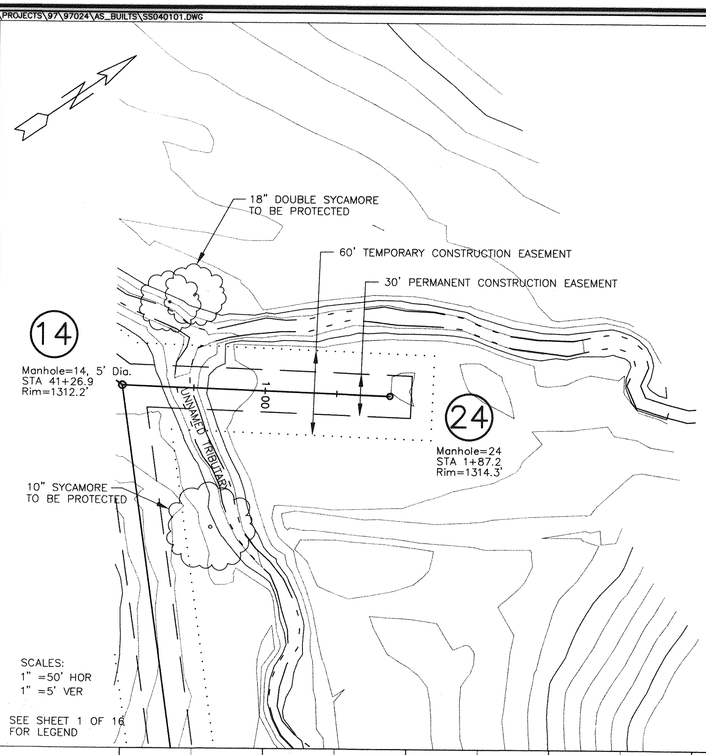
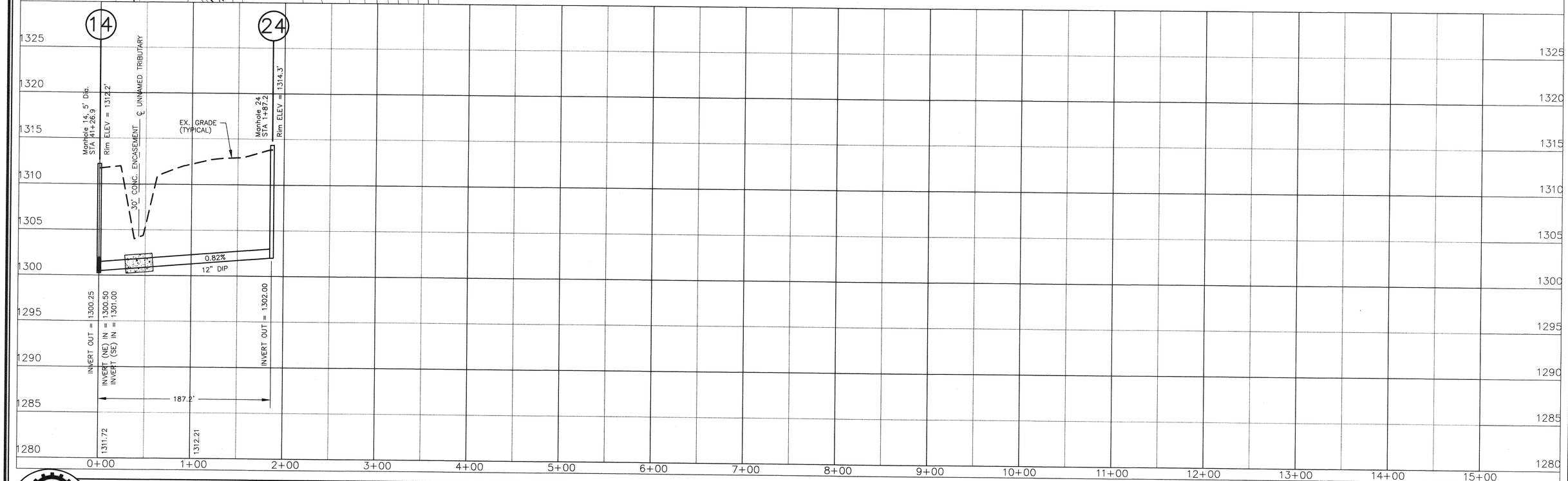



*FONT DESIGNATES AS BUILT CHANGES TO DESIGN PLANS*





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| | | | |
|---|---|---|---|
| Drawn JHG | GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT | HOR: 1"=50' VER:1"=5' | |
| Designed SCG | | MAY 1997 | |
| Checked WPJ/JST | PLAN & PROFILES | PROJECT: 97024 | |
| Approved WPJ | SUBMAIN "J" STA 0+00 – 1+87.2 | 9 of 16 | |

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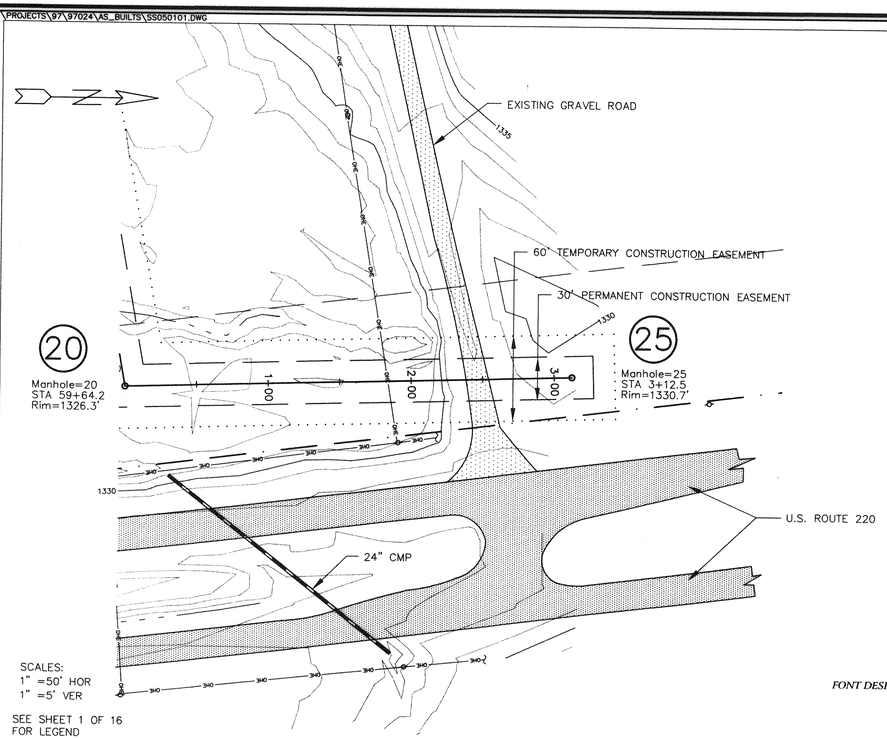
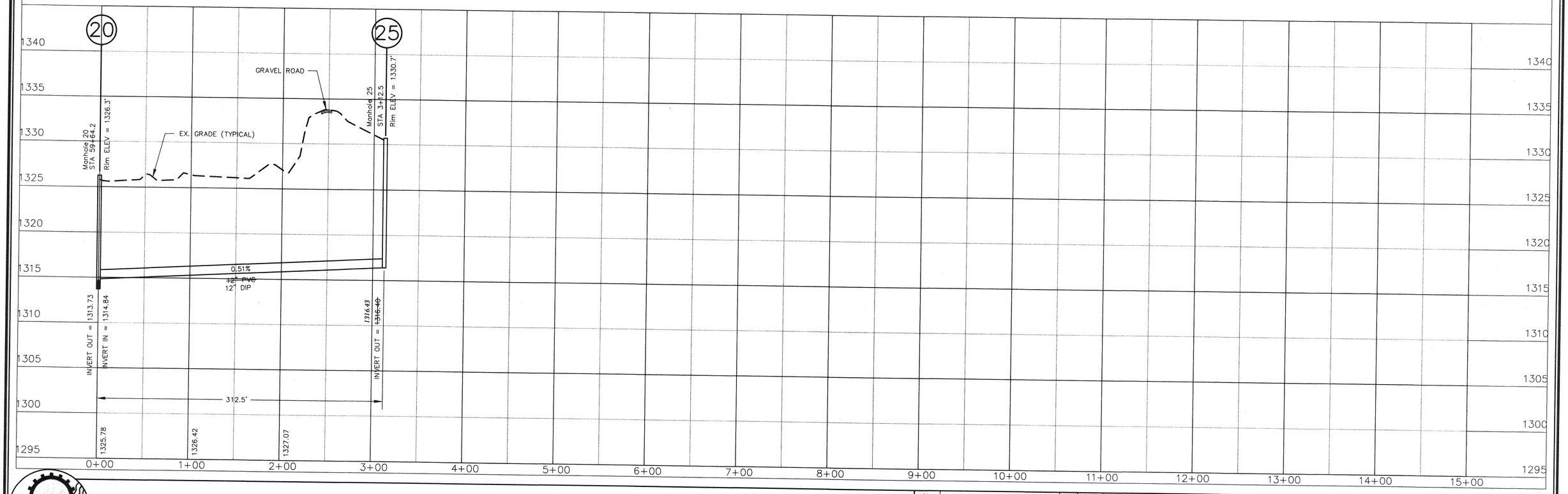



SEE SHEET 1 OF 16 FOR LEGEND

*FONT DESIGNATES AS BUILT CHANGES TO DESIGN PLANS*





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AS-BUILT

| No. | Revision | By | Appd. | Date |
|---|---|---|---|---|
| 1 | Revised Manhole 20 Invert Out | SCG | WPJ | 6/30/97 |

| | |
|---|---|
| Drawn | JHG |
| Designed | SCG |
| Checked | WPJ/JST |
| Approved | WPJ |

**GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT**

**PLAN & PROFILES SUBMAIN "K" STA 0+00 – 3+12.5**

HOR:1"=50' VER:1"=5'
MAY 1997
PROJECT: 97024
10 of 16

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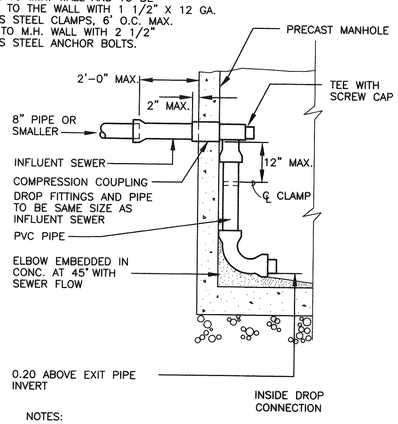
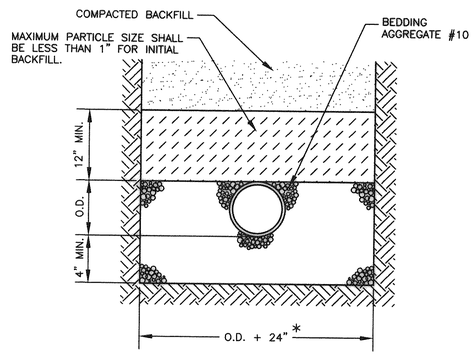
PIPE TO BE PLACED AS CLOSE AS POSSIBLE TO M.H. WALL AND TO BE SECURED TO THE WALL WITH 1 1/2" X 12 GA. STAINLESS STEEL CLAMPS, 6' O.C. MAX. ANCHOR TO M.H. WALL WITH 2 1/2" STAINLESS STEEL ANCHOR BOLTS.




NOTES:

1. DROP CONSTRUCTION IS TO BE AT EVERY LOCATION WHERE THE INFLUENT INVERT IS GREATER THAN OR EQUAL TO 2'-0" ABOVE THE EFFLUENT SEWER INVERT.

## DROP CONSTRUCTION AT STANDARD MANHOLE



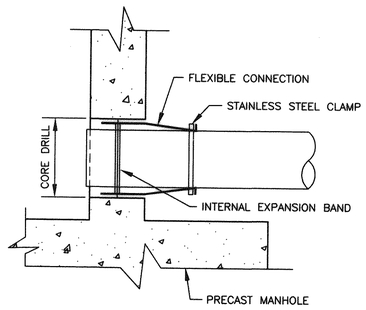

NOTES:

1. WHERE THE TRENCH BOTTOM IS IN ROCK, IT SHALL BE EXCAVATED TO A MINIMUM OF 8" BELOW THE BOTTOM OF THE PIPE AND BACKFILLED WITH BEDDING MATERIAL.
2. WHERE PIPE FOUNDATIONS ARE YIELDING, PIPE SHALL BE BEDDED ON A MINIMUM OF 8" BEDDING MATERIAL.

* FOR PIPE LESS THAN 12" THE TRENCH WIDTH MAY BE 36" MAXIMUM.

## UTILITY BEDDING DETAIL – TYPE 3

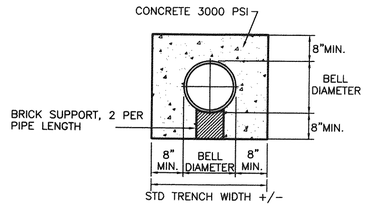
REF: 1993 VDOT ROAD AND BRIDGE STANDARDS DETAIL 1401.01



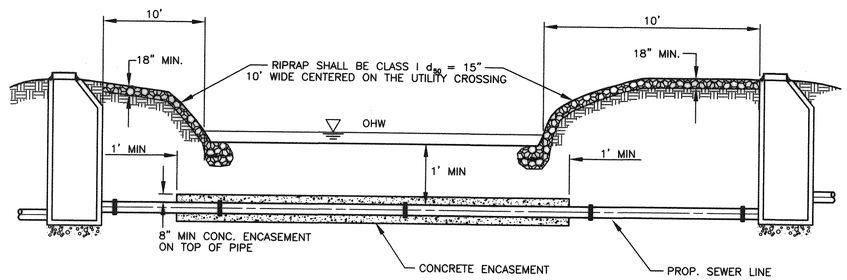

ALL PIPELINE CONNECTIONS TO PRECAST MANHOLES SHALL BE MADE WITH A FLEXIBLE BOOT. THE BOOT SHALL MEET ASTM SPECIFICATION C-923. BOOT SHALL BE MADE FROM NEOPRENE RUBBER AND HAVE A 3/8" MINIMUM WALL THICKNESS THROUGHOUT. THE INTERNAL EXPANSION BAND TO SECURE THE BOOT IN PLACE SHALL CONFORM TO ALUMINUM MATERIAL SPECIFICATION 6061-T6. THE EXTERNAL BAND TO CLAMP AND SEAL THE BOOT TO THE PIPE SHALL BE STAINLESS STEEL-CORROSION RESISTANT CONFORMING TO ASTM SPECIFICATION A-167. THE PORT TO RECEIVE THE BOOT SHALL BE CORE DRILLED AND SHALL ALLOW FOR LATERAL AND VERTICAL ANGULAR ADJUSTMENT THRU 20 DEGREES IN ALL DIRECTIONS. ALL FIELD INSTALLATION OF PIPE THRU FLEXIBLE CONNECTION SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.

## FLEXIBLE CONNECTION DETAIL

REF: 1993 VDOT ROAD AND BRIDGE STANDARDS DETAIL 1411.02




## CONCRETE ENCASED PIPE




## ENCASED CREEK CROSSING – SEWER

NOT TO SCALE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AS-BUILT

| | | | |
|---|---|---|---|
| Drawn JHG | GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT | SCALE:NONE | |
| Designed SCG | | MAY 1997 | |
| Checked WPJ/JST | SANITARY SEWER DETAILS | PROJECT: 97024 | |
| Approved WPJ | | 11 of 16 | |

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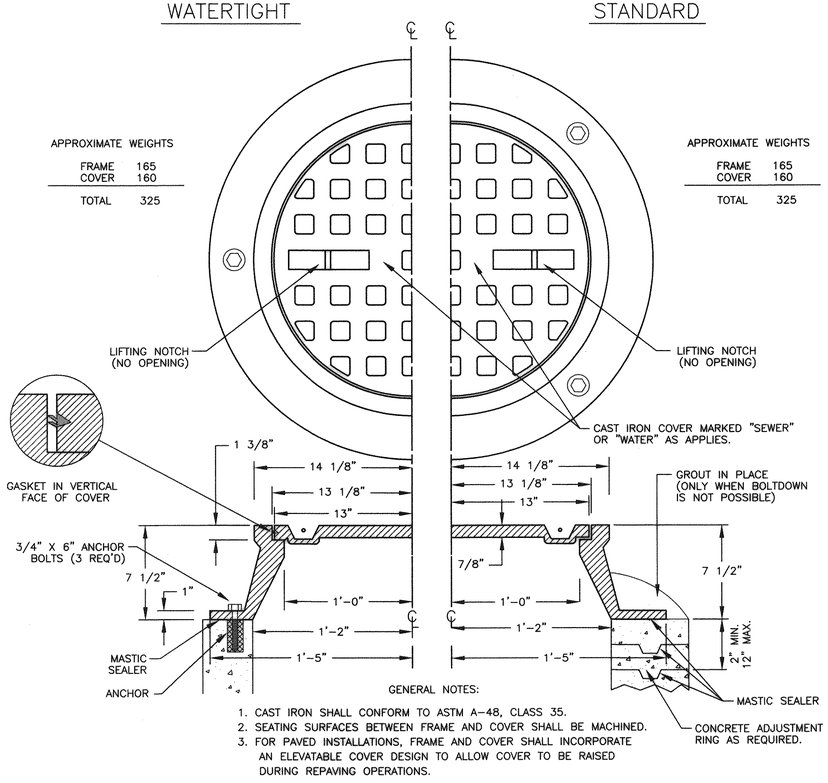
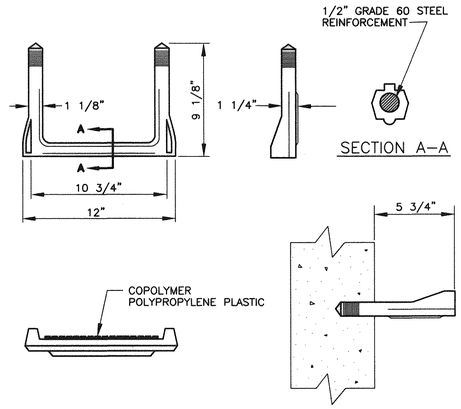


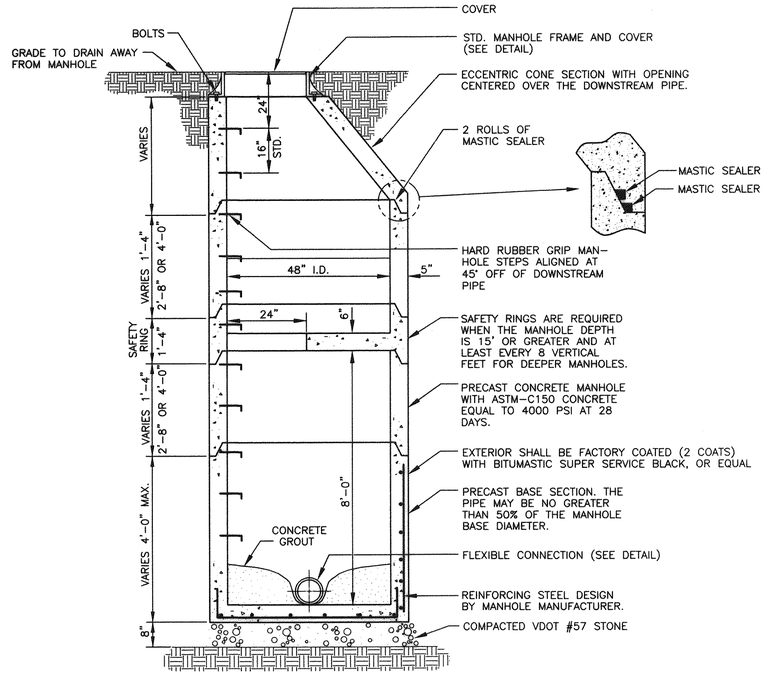

GENERAL NOTES:

1. CAST IRON SHALL CONFORM TO ASTM A-48, CLASS 35.
2. SEATING SURFACES BETWEEN FRAME AND COVER SHALL BE MACHINED.
3. FOR PAVED INSTALLATIONS, FRAME AND COVER SHALL INCORPORATE AN ELEVATABLE COVER DESIGN TO ALLOW COVER TO BE RAISED DURING REPAVING OPERATIONS.

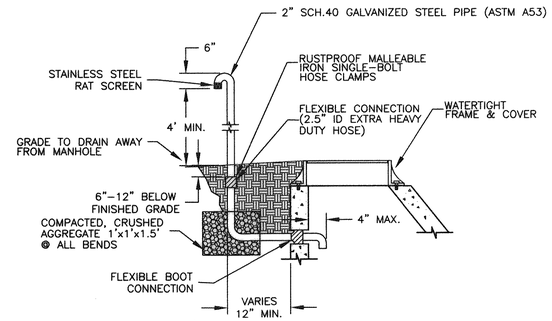
## MANHOLE FRAME AND COVER




## MANHOLE STEP DETAIL




## PRECAST ECCENTRIC MANHOLE




## MANHOLE VENT DETAIL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|---|---|---|
| Drawn JHG | GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT | SCALE:NONE |
| Designed SCG | | MAY 1997 |
| Checked WPJ/JST | SANITARY SEWER DETAILS | PROJECT: 97024 |
| Approved WPJ | | 12 of 16 |

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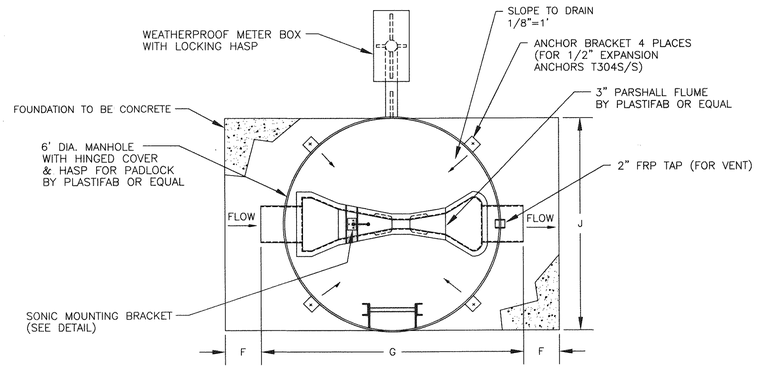
## MANHOLE DIMENSIONS

| MANHOLE | STATION | A | B | C | D | E | F | G | H | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 55+65.8 | 1322.7' | 10.05' | 1312.75' | 0'-6" | 1312.75' | 1'-0" | 7'-4" | 1'-0" | 6'-0" | 1321.7' |
| | | | | | | | | | | | |

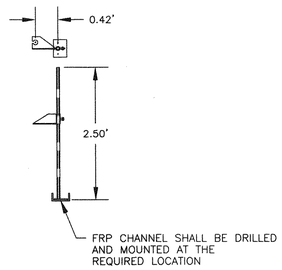
NOTES:
1. MATERIAL SHALL BE FRP (FIBERGLASS REINFORCED POLYESTER).
2. NEOPRENE BOOTS SHALL BE SECURED WITH STAINLESS STEEL BANDS.
3. THE MINIMUM MANHOLE BARREL THICKNESS SHALL BE 1/2" FRP.
4. HINGE, HASP, ANCHOR BRACKET & BOLTS SHALL BE TYPE 304 S/S.
5. FLUME AND MANHOLE MUST BE INSTALLED LEVEL.
6. LEVEL TOLERANCE SHALL BE LESS THAN 1/8", TROWELLED SMOOTH.
7. METER PANEL SHALL BE INSTALLED WITH PANEL ON DOWNSTREAM FACE OF PLYWOOD.
8. CONTRACTOR SHALL PAINT ENTIRE METER PANEL ASSEMBLY. COLOR TO BE SELECTED BY OWNER.




NOTE: HINGED COVER IS NOT SHOWN THIS VIEW FOR CLARITY

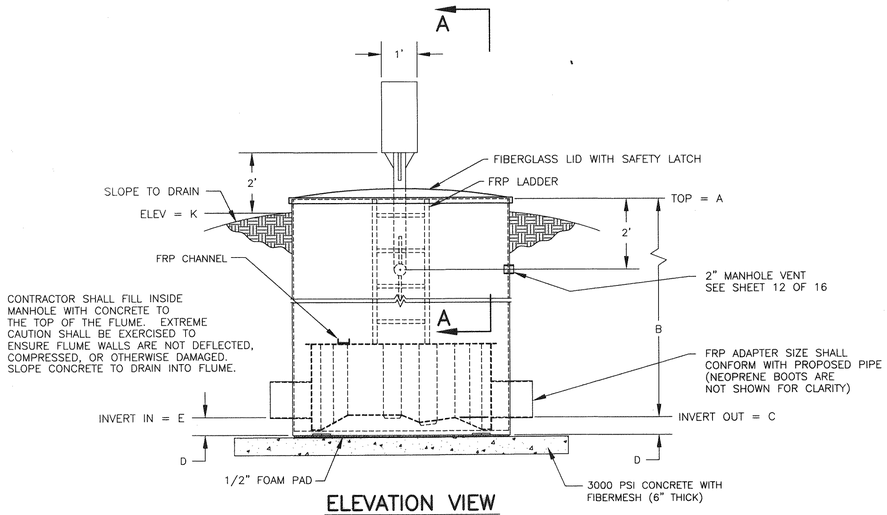
PLAN

NOT TO SCALE



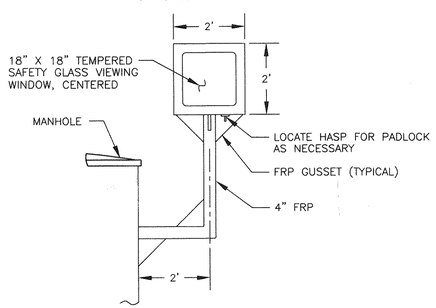

ADJUSTABLE SONIC MOUNTING BRACKET

TYPE 304 STAINLESS STEEL



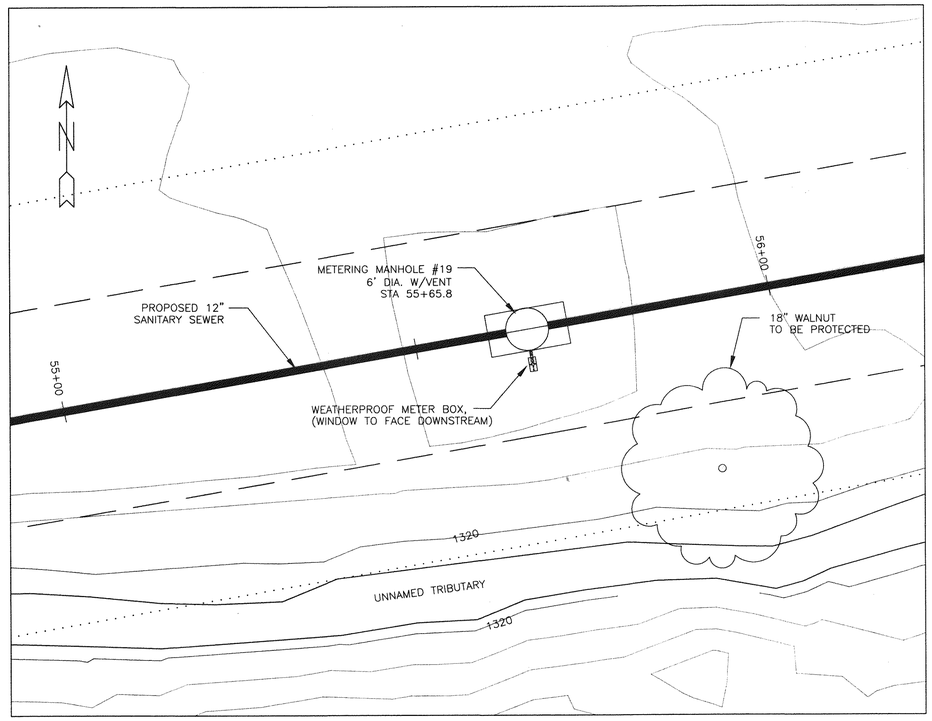

ELEVATION VIEW

NOT TO SCALE




SECTION A-A

NOT TO SCALE




METERING MANHOLE #19 SITE PLAN

SCALE: 1" = 10'

## EQUIPMENT SCHEDULE

| | |
|---|---|
| FIBERGLASS MANHOLE: | PLASTIFAB 6' DIAMETER FIBERGLASS PACKAGED METERING MANHOLE, OR APPROVED EQUAL<br>DEPTH: SEE MANHOLE DIMENSIONS TABLE<br>MANHOLE SHALL BE STRUCTURALLY STRONG, WATERTIGHT AND CORROSION RESISTANT TO MANY INDUSTRIAL CHEMICALS<br>MANHOLE BARREL SHALL BE A MINIMUM OF 1/2" THICK<br>INTERIOR OF BARREL SHALL HAVE A 15-20 MIL THICK WHITE GEL COAT |
| FLOWMETER: | ISCO MODEL 4210 (NO SUBSTITUTIONS ALLOWED)<br>FLOWMETER SHALL YIELD:<br>FLOWRATE<br>TOTAL FLOW<br>PEAK FLOW<br>FLOWMETER SHALL HAVE A 4 TO 20 mA OUTPUT<br>FLOWMETER SHALL CAPABLE OF COMPUTER INTERFACE WITH ISCO FLOW LINK SOFTWARE<br>PROVIDE INTERCONNECTING CABLE AS REQUIRED |
| FLUME: | PLASTIFAB 3" PARSHALL FLUME<br>FLUME SHALL ALLOW SMOOTH FLOW TRANSITION FROM PIPE FLOW TO FLUME FLOW<br>FLUME SHALL BE ABLE TO HANDLE FROM .018 TO 1.20 MGD<br>FLUME SHALL BE INTEGRALLY BONDED INTO FIBERGLASS MANHOLE<br>FLUME SHALL BE PROVIDED WITH REMOVABLE FIBERGLASS GRATING OVER FLUME INSIDE OF MANHOLE |
| POWER SUPPLY: | ISCO MODEL 60-1394-023 EXTERNAL DC POWER CONNECT CABLE |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| | |
|---|---|
| Drawn | JHG |
| Designed | SCG |
| Checked | WPJ/JST |
| Approved | WPJ |

GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT

FLOW METERING MANHOLE SITE PLAN & DETAILS

SCALE: AS SHOWN

MAY 1997

PROJECT: 97024

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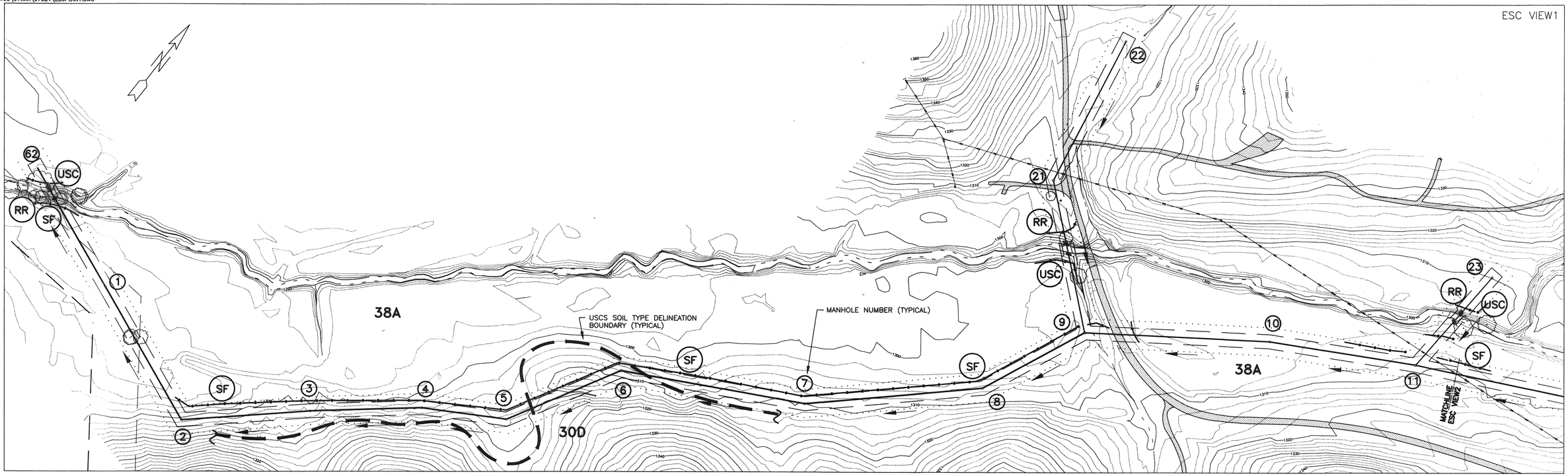
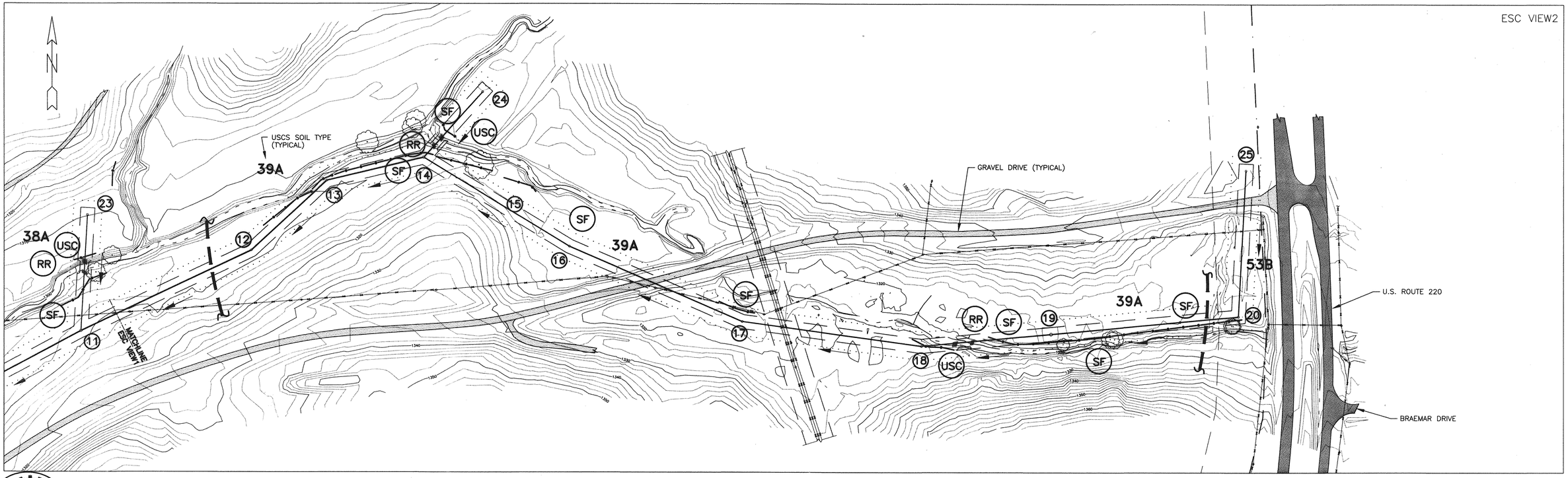
ESC VIEW1




ESC VIEW2





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AS-BUILT

| | | |
|---|---|---|
| Drawn JHG | GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT | 1"=100' |
| Designed SCG | | MAY 1997 |
| Checked WPJ/JST | EROSION & SEDIMENT CONTROL PLAN | PROJECT: 97024 |
| Approved WPJ | | 14 of 16 |

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PROJECT DESCRIPTION

The purpose of this project is to provide sanitary sewer service within the Botetourt Center at Greenfield. The site is located in the south central portion of Botetourt County, adjoining US Route 220, known as Roanoke Road, and State Route 672, known as Etzler Road. The sewer service will include, a 21 inch diameter, 2,592 foot extension of the Greenfield Collector followed by a 18 inch diameter, 1,534 foot extension followed by a 12 inch diameter, 1,838 foot extension to the proposed south entrance intersection with US Route 220. This will extend the sanitary sewer trunk line through the center of Greenfield.

EXISTING SITE CONDITIONS

The property along the onsite alignment is rolling with elevations ranging from 1250' where an unnamed drainage course leaves the property at its southwest corner to 1510' at the top of a knob near the northern boundary of the property. Approximately one third of the site is wooded while the remainder is in meadow and open pasture. The majority of the alignment is open pasture, with occasional brush and/or wooded areas. The grades along the onsite alignment typically range from 0% to 12%.

ADJACENT PROPERTY

State Route 672, known as Etzler Road, and US Route 220, known as Roanoke Road, adjoin the property. Since the project is entirely within the boundary of the Greenfield property, there are no significant tracts of adjacent property that will border the construction.

CRITICAL EROSION AREAS

Critical erosion areas include steep slopes along the proposed stormwater pond and locations where the project crosses the unnamed tributary that bisects Greenfield. The drainage areas contributing to these critical erosion areas are small enough to permit the application of silt fence. Silt fence will be installed around these areas to alleviate the potential for significant erosion, and rip rap will be installed on the creek banks at all crossing locations.

EROSION AND SEDIMENT CONTROL MEASURES

Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the 1992 Virginia Erosion and Sediment Control Handbook. The minimum standards of the Virginia Erosion and Sediment Control Regulations shall be adhered to unless otherwise waived or approved by a variance.

STRUCTURAL PRACTICES

1. TEMPORARY CONSTRUCTION ENTRANCE – 3.02
A temporary construction entrance shall be installed where the access area intersects with the existing paved area. During muddy conditions, drivers of construction vehicles may be required to wash their wheels before entering paved areas.

2. SILT FENCE BARRIER – 3.05
Silt fence barriers will be installed downslope of areas with minimal grade to filter sediment laden runoff from sheet flow.

3. CULVERT INLET PROTECTION – 3.08
All storm sewer culverts shall be protected during construction. Sediment–laden water shall be filtered before entering storm sewer inlets.

4. TEMPORARY DIVERSION DIKE – 3.09
Temporary diversion dikes will be installed downslope of drainage areas to divert storm runoff from a disturbed area to a sediment trapping facility such as a sediment trap.

5. TEMPORARY SEDIMENT TRAP – 3.13
A small ponding area is to be formed in order to detain sediment–laden runoff from small disturbed areas for enough time to allow most of the suspended solids to settle out.

6. OUTLET PROTECTION – 3.18
Riprap is to be placed at the outlet of all pipes.

7. RIPRAP – 3.19
Riprap is to be placed at the critical erosion areas to protect the soil from the erosive forces of concentrated runoff.

8. ROCK CHECK DAMS – 3.20
Rock check dams will be installed upstream of the sediment trap to reduce the velocity of concentrated flows.

9. TEMPORARY CULVERT CROSSING – 3.24
VDOT #1 Coarse Aggregate or larger will be used to form the crossing. The depth of stone cover over the culvert shall be equal to one–half the diameter of the culvert or 12 inches, whichever is greater. To protect the sides of the stone from erosion, riprap shall be used.

10. TEMPORARY BRIDGE CROSSING – 3.24
Structural materials used to construct the bridge must be able to withstand the anticipated loading of the construction traffic.

11. COFFERDAM CROSSING – 3.25
A coffer dam crossing will be used when stream diversion is not practical and stream is wide enough (10 feet or wider). Cofferdam construction is to be performed in low flow periods.

12. FLUME PIPE CROSSING – 3.25
Flume pipe crossing will be used when stream construction will last less than 72 hours and stream is narrow (less than 10 feet wide).

VEGETATIVE PRACTICES

1. TOPSOILING – 3.30
Topsoil will be stripped from areas to be graded and stockpiled for later use. Stockpiled locations are to be stabilized with temporary vegetation and the perimeter of the stockpile is to have siltfence installed.

2. TEMPORARY SEEDING – 3.31
All denuded areas which will be left dormant for more than 30 days shall be seeded with fast germinating temporary vegetation immediately following grading.

3. PERMANENT SEEDING – 3.32
All final–graded areas where permanent cover is desired or rough–graded areas that will not be brought to final grade for a year or more shall be seeded with perennial vegetation.

4. MULCHING – 3.35
Mulch (straw or fiber) will be used on relatively flat areas and will be applied as the second step in the seeding operation.

5. SOIL STABILIZATION BLANKETS & MATTING – 3.36
A protective covering (blanket) or a soil stabilization mat will be installed on prepared planting areas of steep slopes, channels, or shorelines where noted.

6. TREES, SHRUBS, VINES AND GROUND COVERS – 3.37
All disturbed areas where turf is not preferred shall be covered with trees, shrubs, vines, and other ground coverings.

7. TREE PRESERVATION AND PROTECTION – 3.38
Tree preservation and protection practices will be observed at all locations unless otherwise noted.

MANAGEMENT STRATEGIES

1. Construction will be sequenced so that grading operations can begin and end as quickly as possible.

2. Sediment trapping measures will be installed as a first step in grading and will be seeded and mulched immediately following installation.

3. Temporary seeding or other stabilization will immediately follow grading.

4. Areas which are not to be disturbed will be clearly marked by flags, signs, etc.

5. The job superintendent shall be responsible for the installation and maintenance of all erosion and sediment control practices.

6. After achieving adequate stabilization, the temporary E&S controls will be cleaned out or converted to permanent stormwater management control structures.

PERMANENT STABILIZATION

All areas disturbed by construction shall be stabilized with permanent seeding immediately following final grading. Seeding shall be done with Kentucky 31 Tall Fescue according to Std. and Spec. 3.32, PERMANENT SEEDING, of the 1992 Virginia Erosion and Sediment Control Handbook. Mulch (straw or fiber) will be used on all seeded areas. In all seeding operations, seed, fertilizer and lime will be applied prior to mulching. Erosion control blankets may be installed over fill slopes which have been brought to final grade and have been seeded to protect the slopes properly.

STORMWATER MANAGEMENT

Stormwater management will not be necessary on this project due to the nominal increase in stormwater generation that will result from the proposed improvements.

MAINTENANCE

In general, all erosion and sediment control measures will be checked daily and after each significant rainfall. The following items will be checked in particular:

1. The sediment traps will be checked regularly for sediment cleanout.

2. The gravel outlets will be checked regularly for sediment buildup which will prevent drainage. If the gravel is clogged by sediment, it shall be removed and cleaned, or replaced.

3. The silt fence barriers will be checked regularly for undermining or deterioration of the fabric. Sediment shall be removed when the level of sediment deposition reaches half way to the top of the barrier.

4. The seeded areas will be checked regularly to ensure that a good stand is maintained. Areas should be fertilized and reseeded as needed.

SOILS

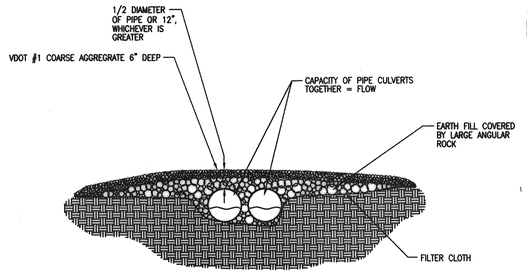
The predominant soils on the site are Groseclose–Litz Complex, Lindside Silt Loam, Massanetta Silt Loam and Timberville Silt Loam.

The Groseclose–Litz Complex (30D) is composed of 50 percent very deep, well drained Groseclose soil, 35 percent moderately deep, well drained Litz soil and 15 percent other soils. The soils are moderately steep and are found on narrow shoulders and side slopes in a limestone valley with significant management concerns due to their severe erodibility. The soil area are so intermingled that mapping them separately is not practical. The Groseclose soil material ranges from a dark yellowish brown silt loam from 0 to 7 inches, to a yellowish brown clay from 7 to 13 inches, to a strong brown clay from 13 to 26 inches, to a strong brown silty clay loam from 26 to 37 inches, to a yellowish brown silty clay loam from 37 to 50 inches, to a yellowish brown, light gray and red silty clay loam from 50 to 65 inches. The Litz soil material ranges from a dark brown channery silt loam from 0 to 5 inches, to a yellowish brown channery silt loam from 5 to 9 inches, to a yellowish brown very channery silt loam from 9 to 13 inches, to a yellowish brown extremely channery silt loam from 13 to 20 inches, to a yellowish brown, weak red and gray weathered shale from 20 to 29 inches, to shale bedrock at 29 inches. The permeability rate for Groseclose soil ranges from 0.06 – 6.0 inches per hour and Litz soil ranges from 0.6 – 2.0 inches per hour. The erosion factor, (K) for Groseclose soil is 0.43 for the surface layer and 0.24 for the subsoil and substratum; Litz soil is 0.32 for the surface, subsurface, subsoil and substratum layers. The slopes generally range from 15% to 30%.

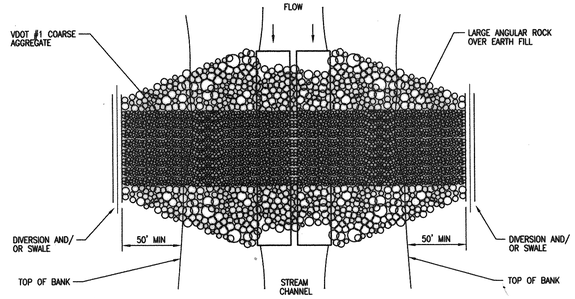
The Lindside Silt Loam (38A) soil is typically very deep, nearly level and moderately well drained. It is normally found on the flood plains along major streams and rivers and has a low potential for erodibility. The soil material ranges from a brown silt loam from 0 to 5 inches, to a yellowish brown silt loam that has pale brown mottles from 5 to 14 inches, to a yellowish brown silt loam that has pale brown and light brownish gray mottles from 14 to 24 inches, to a yellowish brown silt loam that has light gray and pale brown mottles and thin strata of fine sandy loam from 24 to 33 inches, to a pale brown silt loam that has light gray and strong brown mottles from 33 to 46 inches, to a pale brown and dark grayish brown stratified loam and silt loam from 46 to 65 inches. The permeability rate ranges from 0.6 – 6.0 inches per hour. The erosion factor, (K) is 0.32 for the surface layer, 0.37 for the subsoil and 0.32 for the substratum. The slopes generally range from 0% to 2% and are occasionally flooded.

The Massanetta Silt Loam (39A) soil is typically very deep, nearly level and moderately well drained. It is normally found on the flood plains along small streams in a limestone valley and has a low potential for erodibility. The soil material ranges from a very dark grayish brown loam from 0 to 11 inches, to a very dark gray silt loam from 11 to 17 inches, to a dark grayish brown silty clay loam from 17 to 28 inches, to a grayish brown gravelly loam from 28 to 34 inches, to a dark gray silt loam from 34 to 40 inches, to a grayish brown silt loam that has pale brown mottles from 40 to 52 inches, to a dark gray silt loam from 52 to 65 inches. The permeability rate ranges from 0.6 – 2.0 inches per hour. The erosion factor, (K) is 0.37 for the surface layer and subsoil, and 0.28 for the substratum. The slopes generally range from 0% to 3% and are occasionally flooded.

The Timberville Silt Loam (53B) is typically nearly level and gently sloping soil that is very deep and well drained. It is normally found on narrow to moderately broad foot slopes and in upland drainageways in a limestone valley and has a medium potential for erodibility. The soil material ranges from a dark yellowish brown silt loam from 0 to 14 inches, to a dark yellowish brown silt loam that has yellowish brown mottles from 14 to 30 inches, to a yellowish brown silty clay loam from 30 to 43 inches, to a strong brown clay from 43 to 55 inches, to a yellowish brown clay from 55 to 65 inches. The permeability rate ranges from 0.6 – 6.0 inches per hour. The erosion factor, (K) is 0.32 for the surface layer, 0.24 for the subsoil. The slopes generally range from 0% to 7% and are occasionally flooded.

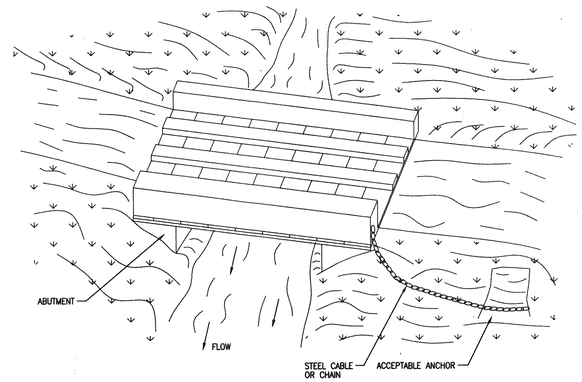


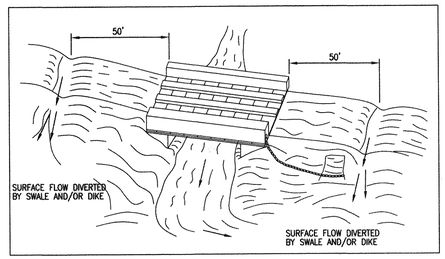

ELEVATION



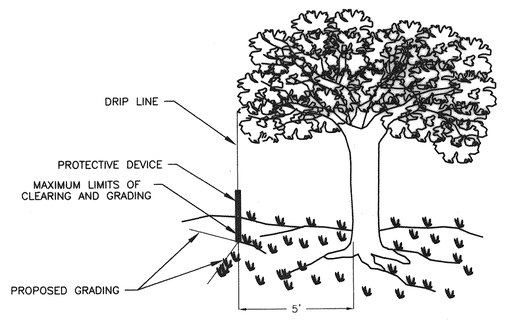

PLAN VIEW

VSC TEMPORARY CULVERT CROSSING




VSC TEMPORARY BRIDGE CROSSING




WHERE DRIP LINE IS LESS THAN 5'–0"

TP TREE PROTECTION

SOURCE: 1992 VA. EROSION AND SEDIMENT CONTROL HANDBOOK, STD. & SPEC. 3.38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AS–BUILT

| | | |
|---|---|---|
| Drawn JHG | GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT | SCALE:NONE |
| Designed SCG | | MAY 1997 |
| Checked WPJ/JST | EROSION & SEDIMENT CONTROL NOTES AND DETAILS | PROJECT: 97024 |
| Approved WPJ | | 15 of 16 |

N:\DWGS\97XXX\97024\ESCDET.DWG

## GENERAL NOTES

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 MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING

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 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 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.

| TYPE A | TYPE B (SLOPES 3:1 OR STEEPER) |
|---|---|
| 15 OCTOBER TO 1 FEBRUARY<br>K-31 FESCUE @ 5 LB / 1000 SF<br>BORZY WINTER RYE @ 1/2 LB / 1000 SF | 15 MARCH TO 1 MAY<br>CROWN VETCH @ 1/2 LB / 1000 SF<br>PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF<br>RED TOP @ 1/8 LB / 1000 SF |
| 1 FEBRUARY TO 1 JUNE<br>K-31 FESCUE @ 5 LB / 1000 SF<br>ANNUAL RYE @ 1/2 LB / 1000 SF | 15 AUGUST TO 1 OCTOBER<br>CROWN VETCH @ 1/2 LB / 1000 SF<br>PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF<br>RED TOP @ 1/8 LB / 1000 SF |
| 1 JUNE TO 1 SEPTEMBER<br>K-31 FESCUE @ 5 LB / 1000 SF<br>GERMAN MILLET @ 1/2 LB / 1000 SF | |
| 1 SEPTEMBER TO 15 OCTOBER<br>K-31 FESCUE @ 5 LB / 1000 SF<br>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

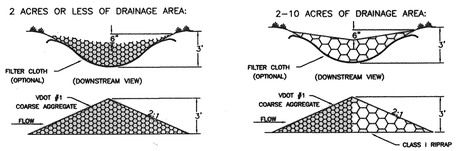
MULCH: IF REQUIRED, SHALL BE USED OVER ALL SEEDED AREAS AND SHALL BE APPLIED IN ACCORDANCE WITH SECTION 1.75 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

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.

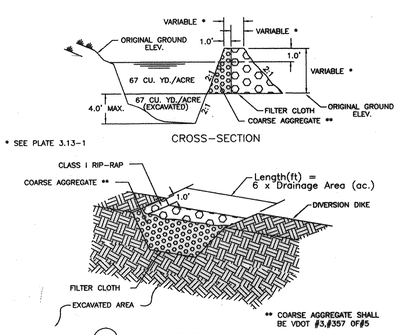
SEED APPLICATION: APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.

TOTAL DISTURBED AREA = APPROXIMATELY 27.5 AC.

(PS) PERMANENT SEEDING MIXTURE



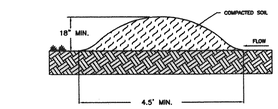

(CD) ROCK CHECK DAM




(ST) SEDIMENT TRAP

NOTES

For areas less than 3.0 acres. For areas larger than 3.0 acres, A SEDIMENT TRAP, is required Please see Va' ESC manual for design.

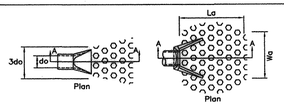



(DD) TEMPORARY DIVERSION DIKE

(FD) TEMPORARY FILL DIVERSION

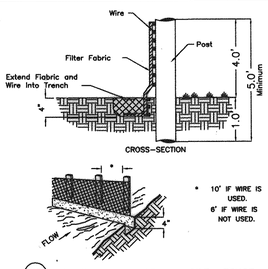
(RWD) TEMPORARY RIGHT-OF-WAY DIVERSION

(DV) DIVERSION

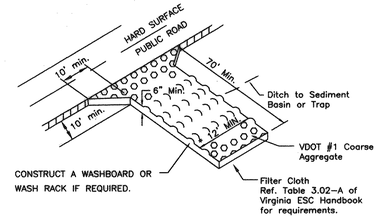



NOTES
1. Apron lining may be rip-rap, grouted rip-rap, or concrete.
2. La is the length of the rip-rap apron as calculated using plates 1.36d and 1.36e.
3. d = 1.5 times the maximum stone diameter, but not less than 6".

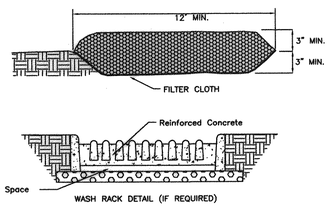
(OP) OUTLET PROTECTION



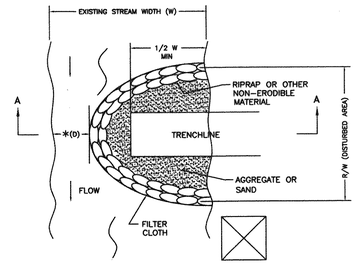

(SF) CONSTRUCTION OF A SILT FENCE




* MUST EXTEND FULL WIDTH OF INGRESS & EGRESS OPERATION.

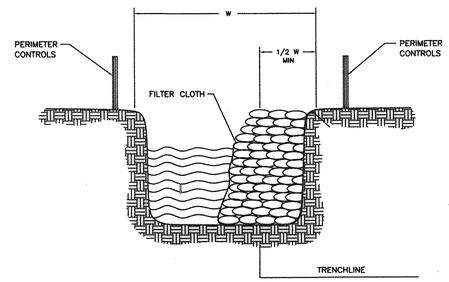



(CE) TEMPORARY GRAVEL CONSTRUCTION ENTRANCE



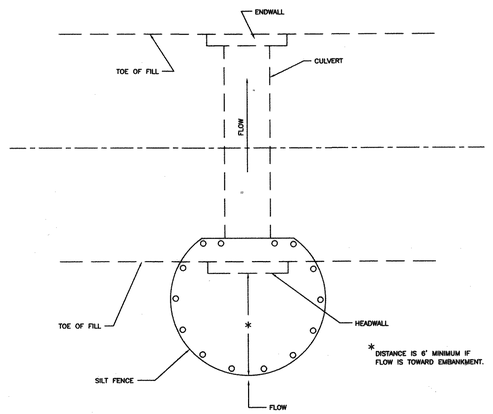

* (D) MINIMUM DISTANCE TO BE 25% OF TOTAL WIDTH (W) OF THE STREAM

PLAN VIEW




SECTION A-A

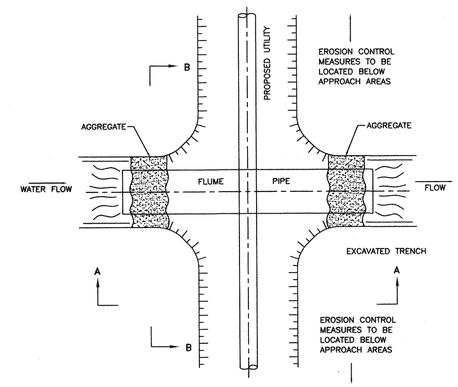
(USC) COFFERDAM CROSSING



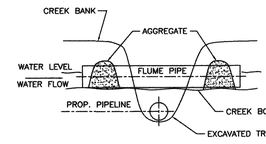

NOTES:
If silt fence culvert inlet protection is not sufficient due to expected high velocity of flow, contractor shall install optional stone and inlet sediment trap protection per STD. & SPEC. 3.08.

(CIP) SILT FENCE CULVERT INLET PROTECTION

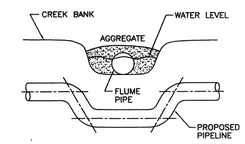
SOURCE: 1992 VA. EROSION AND SEDIMENT CONTROL HANDBOOK, STD. & SPEC. 3.08




PLAN VIEW




SECTION A-A




SECTION B-B

(USC) FLUME PIPE CROSSING

| NO. | TITLE | KEY | SYMBOL | NO. | TITLE | KEY | SYMBOL |
|---|---|---|---|---|---|---|---|
| 3.01 | SAFETY FENCE | SAF | | 3.20 | ROCK CHECK DAMS | CD | |
| 3.02 | TEMPORARY GRAVEL CONSTRUCTION ENTRANCE | CE | | 3.21 | LEVEL SPREADER | LS | |
| 3.03 | CONSTRUCTION ROAD STABILIZATION | CRS | | 3.22 | VEGETATIVE STREAMBANK STABILIZATION | VSS | |
| 3.04 | STRAW BALE BARRIER | STB | | 3.23 | STRUCTURAL STREAMBANK STABILIZATION | SSS | |
| 3.05 | SILT FENCE | SF | | 3.24 | TEMPORARY VEHICULAR STREAM CROSSING | VSC | |
| 3.06 | BRUSH BARRIER | BB | | 3.25 | UTILITY STREAM CROSSING | USC | |
| 3.07 | STORM DRAIN INLET PROTECTION | IP | | 3.26 | DEWATERING STRUCTURE | DS | |
| 3.08 | CULVERT INLET PROTECTION | CIP | | 3.27 | TURBIDITY CURTAIN | TC | |
| 3.09 | TEMPORARY DIVERSION DIKE | DD | | 3.28 | SUBSURFACE DRAIN | SD | |
| 3.10 | TEMPORARY FILL DIVERSION | FD | | 3.29 | SURFACE ROUGHENING | SR | |
| 3.11 | TEMPORARY RIGHT-OF-WAY DIVERSION | RWD | | 3.30 | TOPSOILING | TO | |
| 3.12 | DIVERSION | DV | | 3.31 | TEMPORARY SEEDING | TS | |
| 3.13 | TEMPORARY SEDIMENT TRAP | ST | | 3.32 | PERMANENT SEEDING | PS | |
| 3.14 | TEMPORARY SEDIMENT BASIN | SB | | 3.33 | SODDING | SO | |
| 3.15 | TEMPORARY SLOPE DRAIN | TSD | | 3.34 | BERMUDA GRASS AND ZOYSIAURASS ESTABLISHMENT | B OR M | B OR M |
| 3.16 | PAVED FLUME | PF | | 3.35 | MULCHING | MU | |
| 3.17 | STORMWATER CONVEYANCE CHANNEL | SCC | | 3.36 | SOIL STABILIZATION BLANKETS AND MATTING | BC OR TM | TREAT. 1 TREAT. 2 |
| 3.18 | OUTLET PROTECTION | OP | | 3.37 | TREES, SHRUBS, VINES AND GROUND COVERS | VEG | |
| 3.19 | RIPRAP | RR | | 3.38 | TREE PRESERVATION AND PROTECTION | TP | |
| | | | | 3.39 | DUST CONTROL | DC | |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AS-BUILT

| | |
|---|---|
| Drawn | JHG |
| Designed | SCG |
| Checked | WPJ/JST |
| Approved | WPJ |

# GREENFIELD COLLECTOR EXTENSION SANITARY SEWER PROJECT

## EROSION & SEDIMENT CONTROL DETAILS

SCALE : NONE
MAY 1997
PROJECT: 97024