







Spruhan Engineering, P.C.

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27 WINCHESTER ROAD
NEWTON MASSACHUSETTS

PROPOSED CIVIL PLAN

REVISION BLOCK

Table with 2 columns: DESCRIPTION, DATE

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DATE: 2/11/20
DRAWN BY: P.S
CHECKED BY: E.S
APPROVED BY: E.S

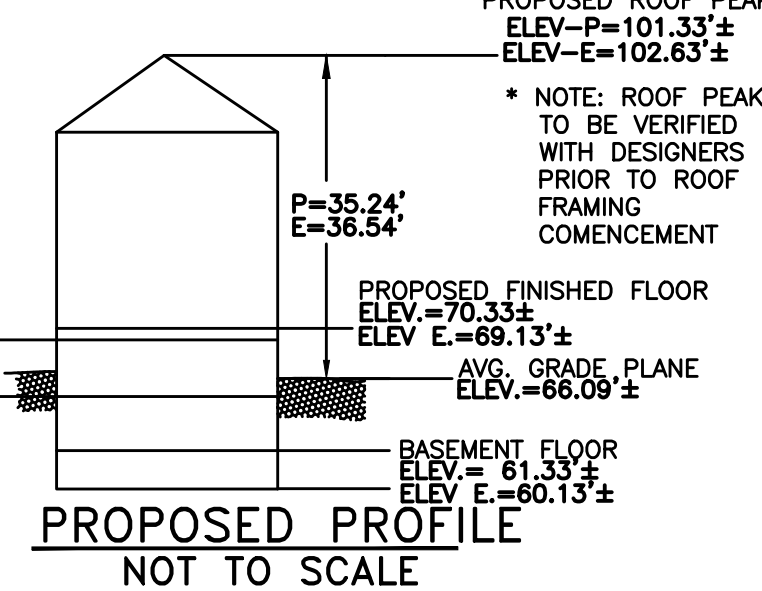
CIVIL PLAN

AVERAGE GRADE PLANE

ZONING LEGEND

ZONING LEGEND TABLE with columns: ZONING DISTRICT, REQUIRED, EXISTING, PROPOSED. Includes rows for MIN. AREA, MIN. YARD FRONT, SIDE REAR, MAX. LOT COVERAGE, MIN. OPEN SPACE, MIN. FRONTAGE, MAX. BLDG. HEIGHT.

\* SPECIAL PERMIT

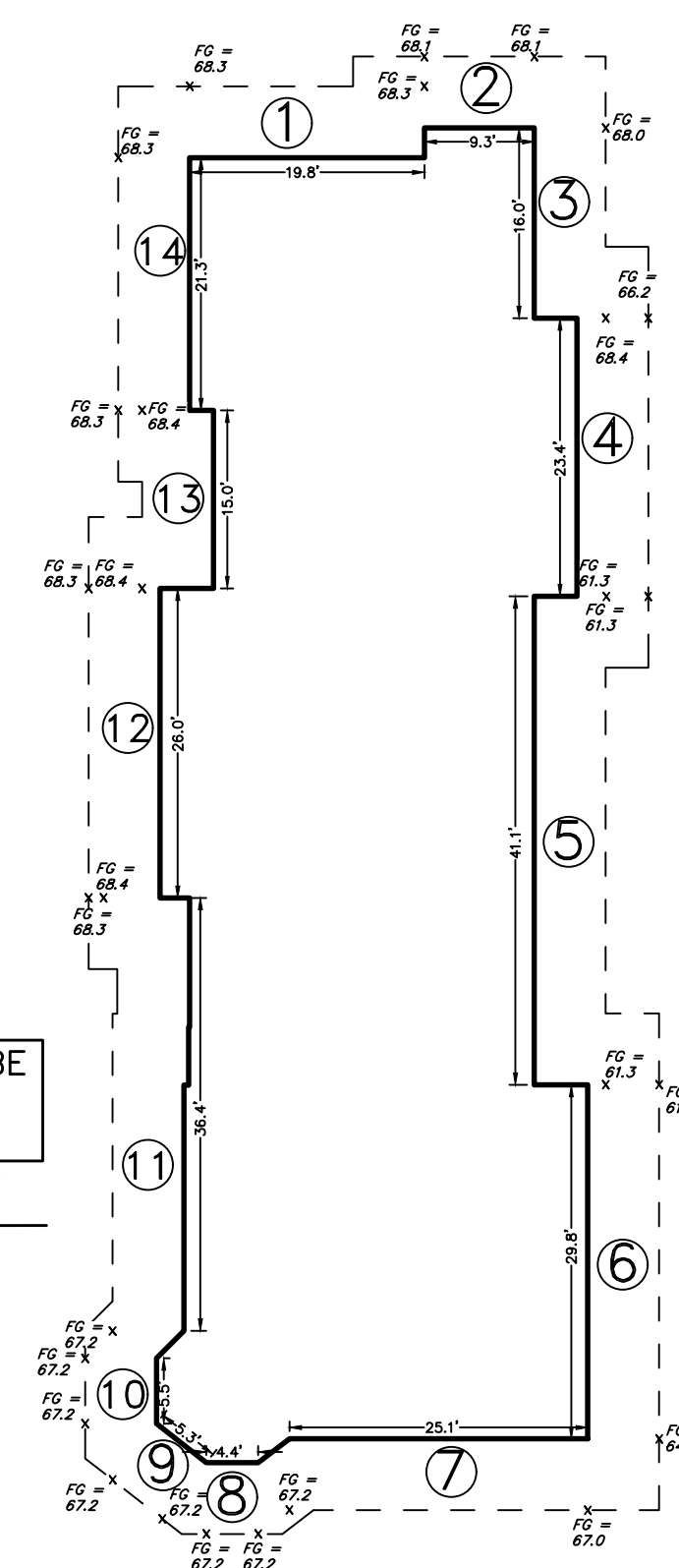


\* MIDPOINT OF BASEMENT ELEVATION LOWER THAN AVERAGE GRADE ELEVATION THEREFORE PROPOSED BASEMENT MEETS DEFINITION OF BASEMENT

AVERAGE GRADE CALCULATION

AVERAGE GRADE CALCULATION TABLE with columns: SEGMENT, LENGTH, POINT 1, POINT 2, MEAN 1 & 2, MEAN X LENGTH. Includes a summation row at the bottom.

AVERAGE GRADE PLANE



IMPERVIOUS AREA

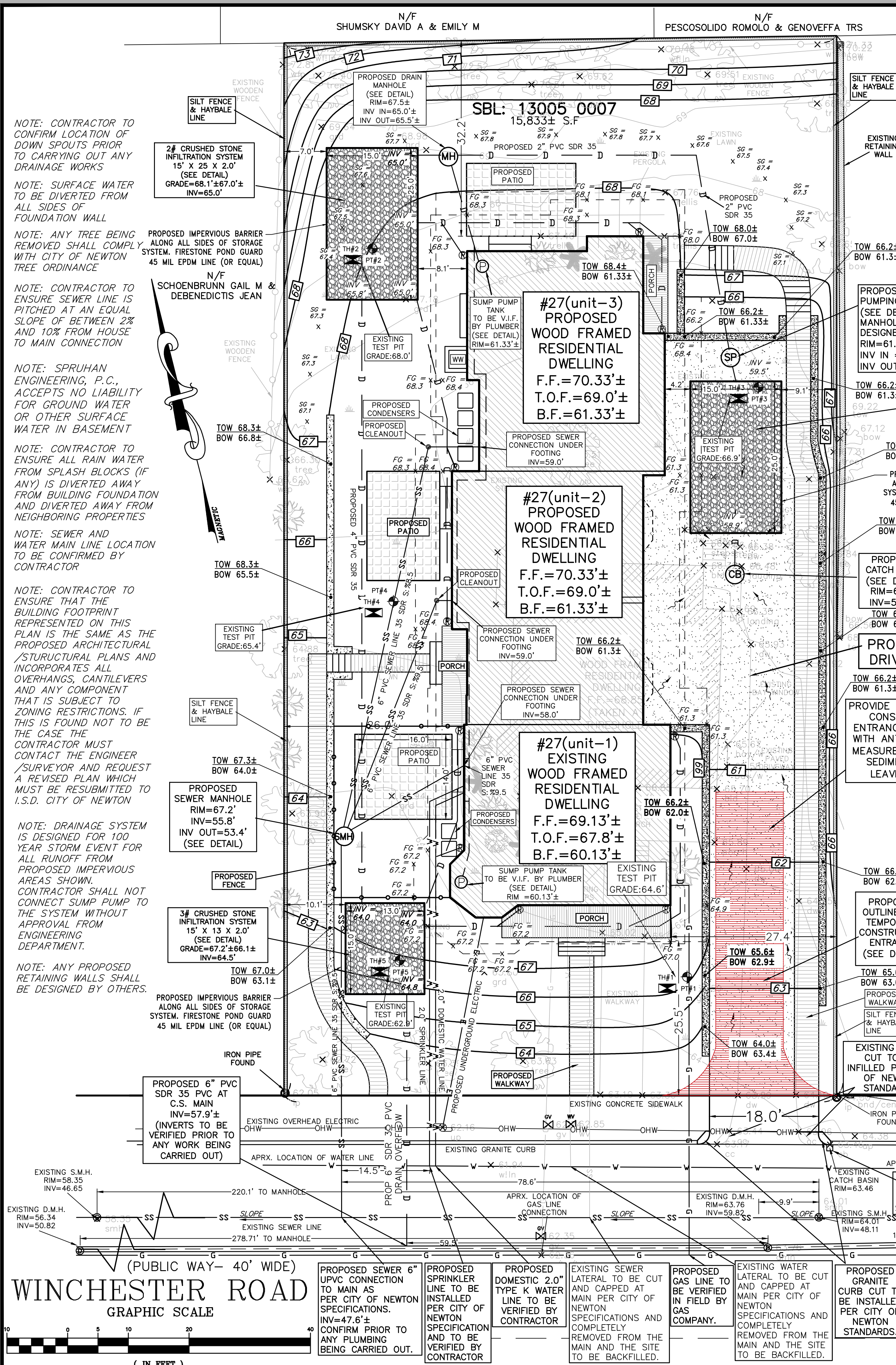
IMPERVIOUS AREA TABLE: EXISTING. Includes rows for HOUSE, STEPS (FRONT), DRIVEWAY, DECK (REAR), LANDING & STEPS, FRONT PORCH, WALKWAY, TOTAL.

IMPERVIOUS AREA

IMPERVIOUS AREA TABLE: PROPOSED. Includes rows for HOUSE, DRIVEWAY, RETAINING WALL, WALKWAYS & STEPS, PORCHES (FRONT), WINDOW WELL, TOTAL.

NOTES:

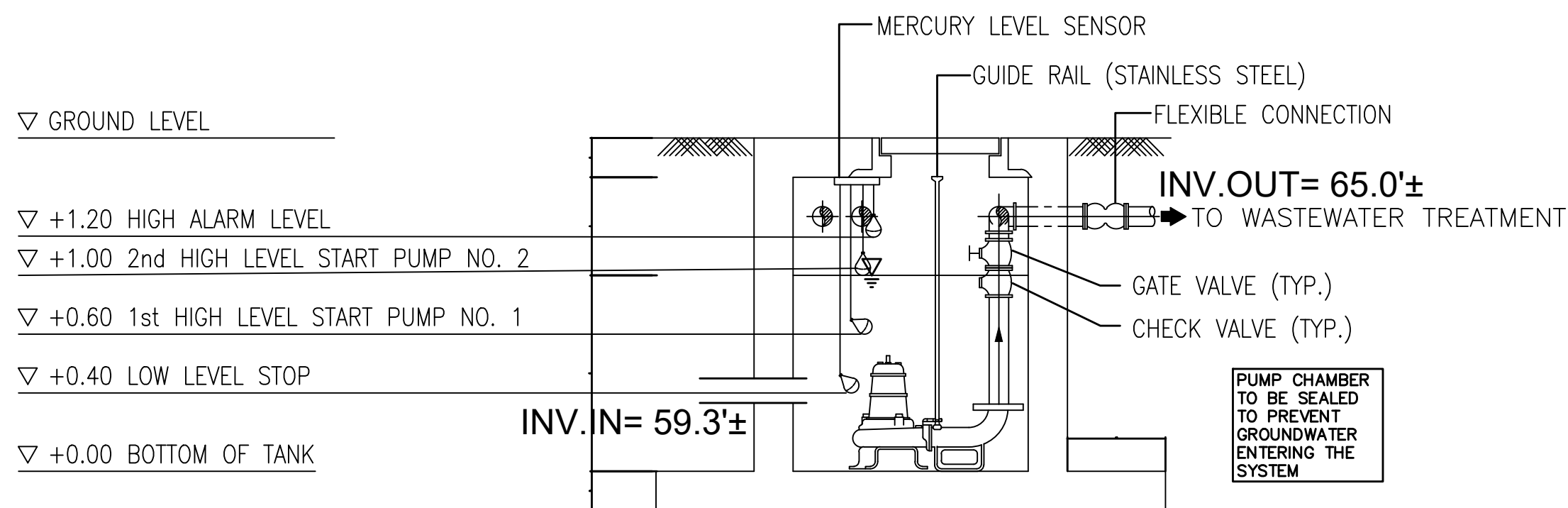
- List of 34 notes detailing construction requirements, zoning compliance, and engineering standards.



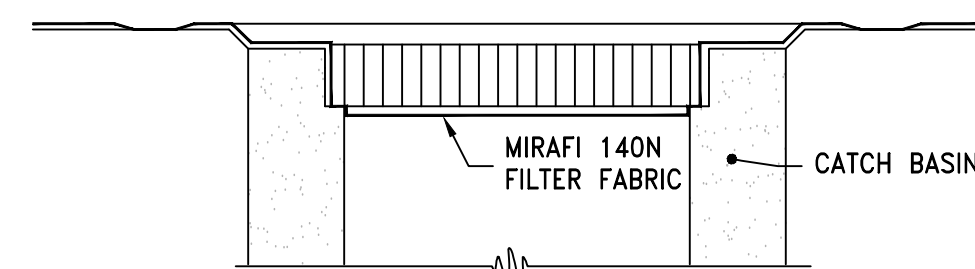
WINCHESTER ROAD GRAPHIC SCALE (IN FEET) 1 inch = 10 ft

Notes regarding plumbing and gas line connections, and confirmation of specifications.



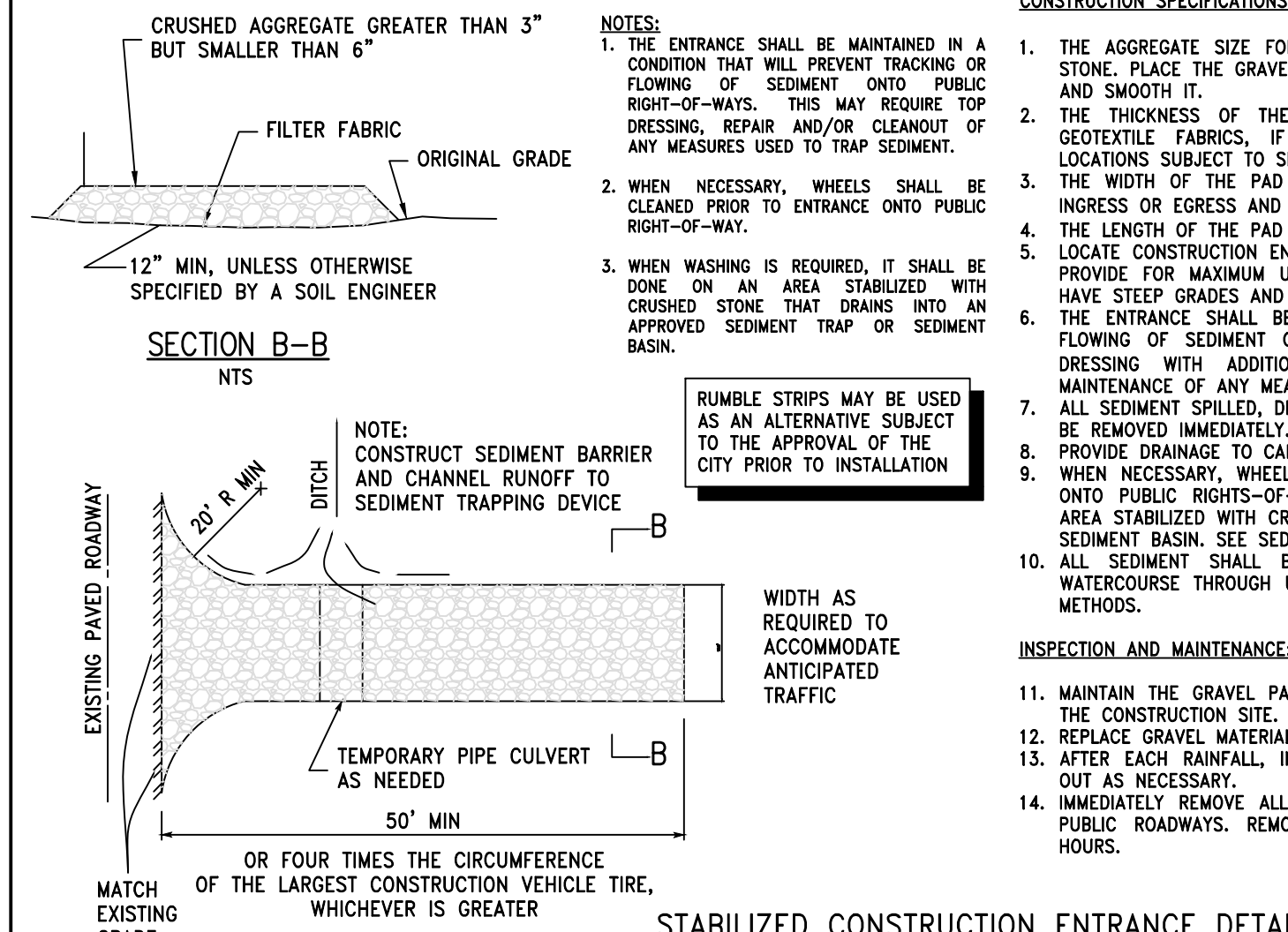


TYPICAL EXTERNAL PUMP DETAIL

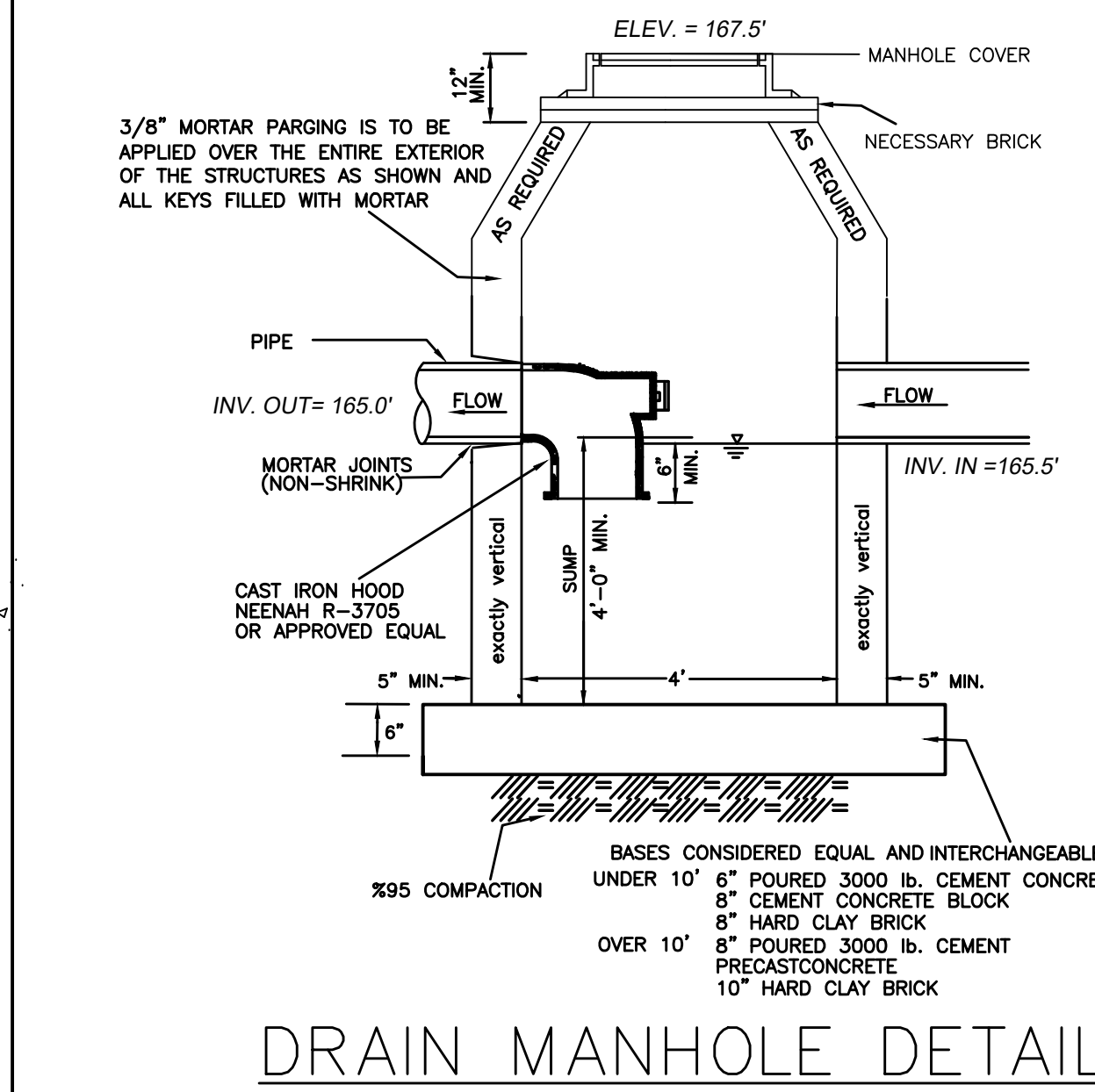
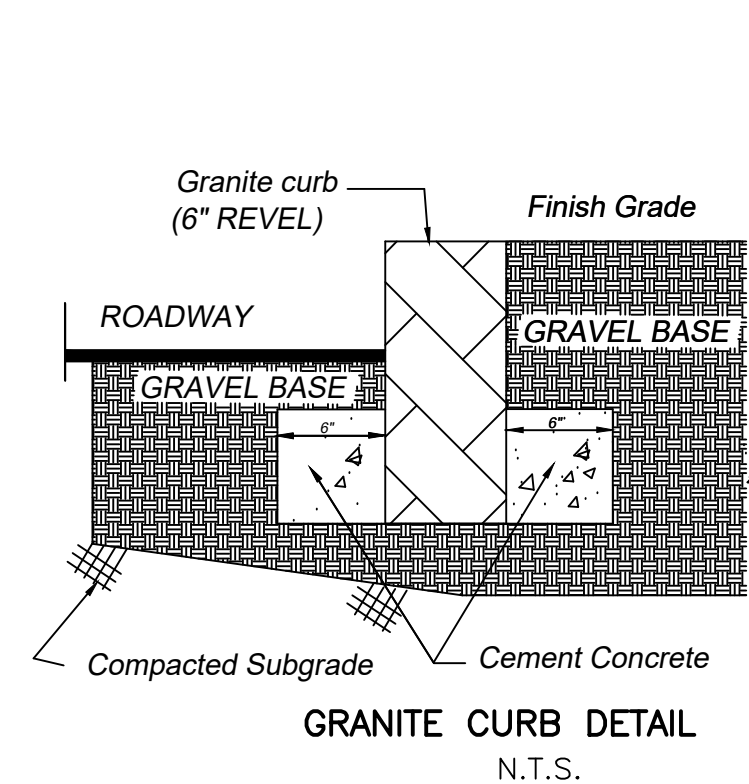
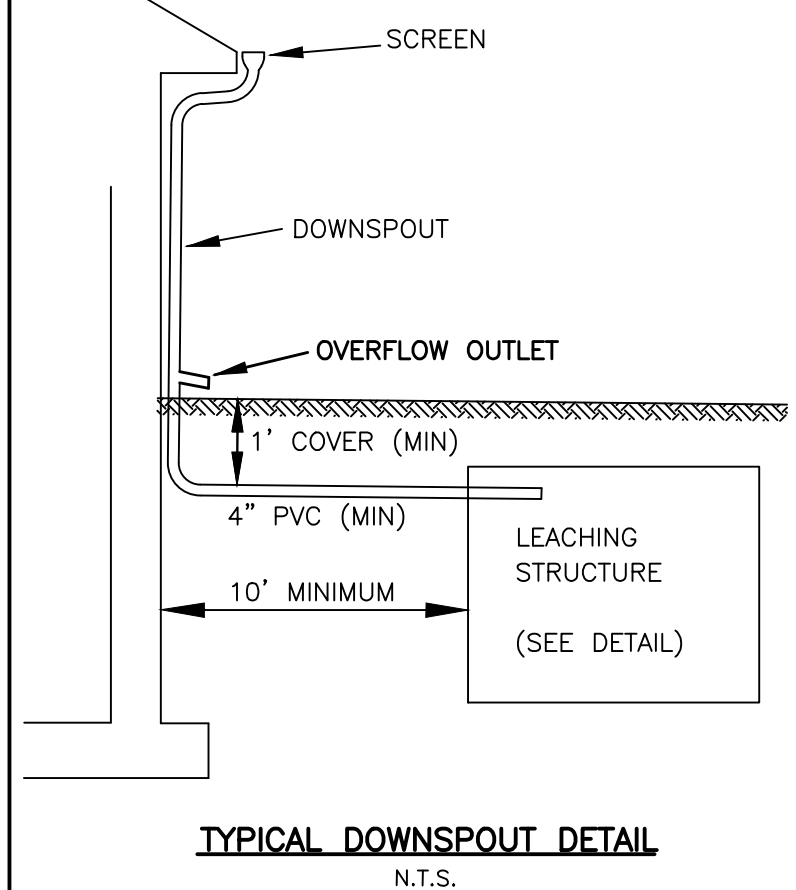
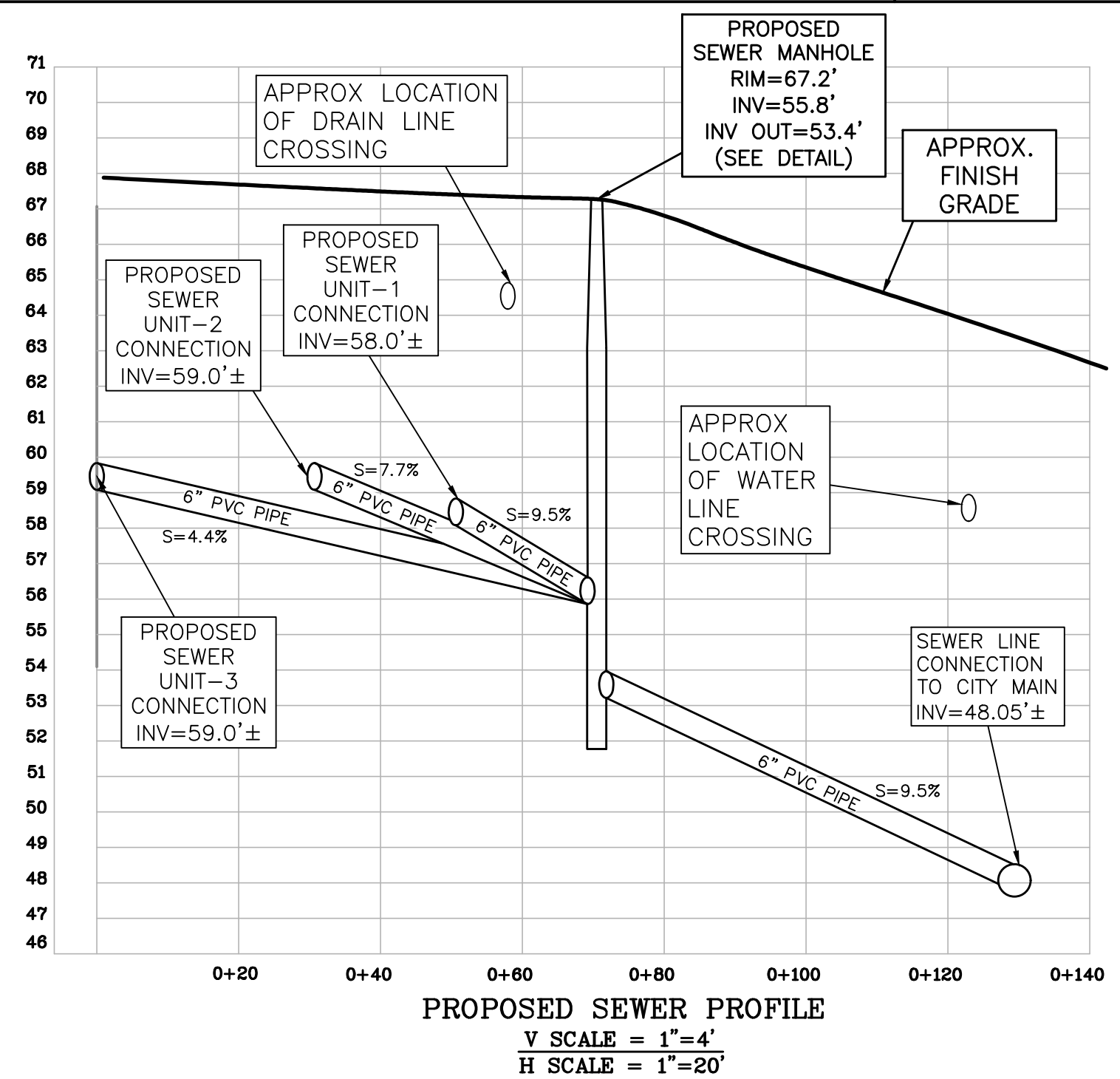
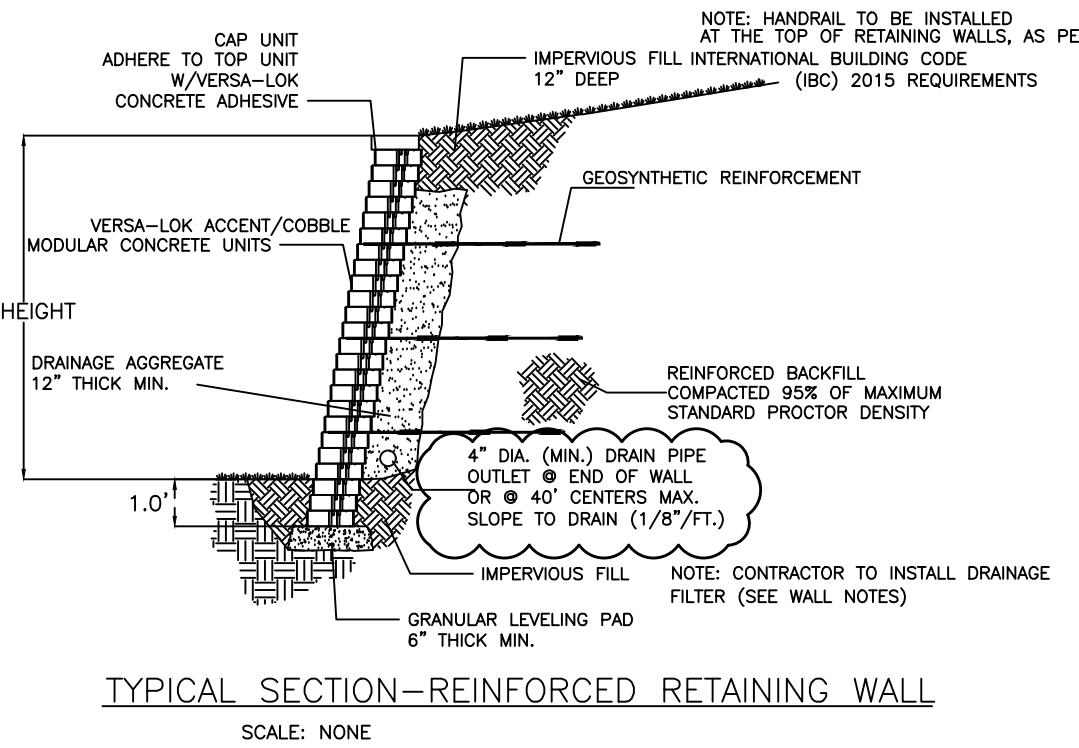


- INSPECTION AND MAINTENANCE:**
1. FILTER FABRIC BARRIERS SHALL BE INSPECTED WEEKLY AFTER EACH SIGNIFICANT STORM - 1 INCH RAINFALL (25.4 MM) IN 24 HOUR PERIOD. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
  2. SEDIMENT SHOULD BE REMOVED WHEN IT REACHES 0.5" MAXIMUM HEIGHT. AT THAT TIME INSPECT THE FILTER MATERIAL FOR TEARS AND CLEAN OR REPLACE AS REQUIRED.
  3. THE REMOVED SEDIMENT SHALL BE DISTRIBUTED EVENLY ACROSS AREAS ON-SITE, CONFORM WITH THE EXISTING GRADE AND BE REVEGETATED OR OTHERWISE STABILIZED PER EROSION CONTROL NOTES.

CATCH BASIN PROTECTION  
NTS



STABILIZED CONSTRUCTION ENTRANCE DETAIL  
N.T.S.



**SYSTEM 1#**

PROPOSED IMPERVIOUS BARRIER ALONG ALL SIDES OF STORAGE SYSTEM. FIRESTONE POND GUARD 45 MIL EPDM LINE (OR EQUAL)

PROPOSED DRIVEWAY WHOLE VOLUME OF CRUSHED STONE TAKEN INTO ACCOUNT FOR CALCULATION

GRADE=61.3' TO 61.2'

TOP OF STONE=59.7'

COVER 12" MIN

3/4" - 1 1/2" DRAIN ROCK

INV IN=58.9'

2'

INV OUT=59.5'

PEASTONE

BOTTOM OF STONE=57.7'

PROPOSED IMPERVIOUS BARRIER ALONG ALL SIDES OF STORAGE SYSTEM. FIRESTONE POND GUARD 45 MIL EPDM LINE (OR EQUAL)

UNDISTURBED MATERIAL

SCALE: NOT TO SCALE

IMPERVIOUS AREA = **2,326.85 S.F.**  
DESIGN FOR 100 YEARS STORM EVENT:

STORAGE REQUIRED: (8.78"=0.732 ft)(2,326.85 SQF)=1,703.25 CF

STORAGE VOLUME OF TRENCH: Length x Width x Height = Volume of trench  
[25 x 15] x 2' = **750 CF** (volume of trench)

Volume of stone (drain rock) in trench  
Vstone = (Vtrench) (Void Factor)  
Vstone = (750) (0.40)  
Vstone = **300 CF**

\*RULE OF THUMB FOR PERCOLATION CREDIT (5 TIMES SYSTEM CAPACITY)  
Vperc = (300 CF)(5)  
Vperc = 1,500 CF

Vlprovided = 1,500 CF +300  
Vlprovided = **1,800 CF**

PERCOLATION RATE = 2.41 INCH/HOUR (RAWLS RATE)  
V2provided = Area of base (25x15=375 SF) x infiltration rate per hour (0.2') x 24 hr = **1,800 CF +300 CF**  
V2provided = **2,100 CF**

Volume Provided = **1,800 CF** (Minimum Vol. Provided Governs)

Total Storage Volume Required = **1,800 CF**

Total Storage Volume Provided = **1703.25 CF (INCLUDING INFILTRATION)**

Since Vtotal=1,800 CF > Vr=1,703.25 CF (OK)

**SYSTEM 2#**

PROPOSED IMPERVIOUS BARRIER ALONG ALL SIDES OF STORAGE SYSTEM. FIRESTONE POND GUARD 45 MIL EPDM LINE (OR EQUAL)

PROPOSED REAR PORTION OF ROOF WHOLE VOLUME OF CRUSHED STONE TAKEN INTO ACCOUNT FOR CALCULATION

GRADE=68.1' TO 67.0'

TOP OF STONE=66.0'

COVER 12" MIN

3/4" - 1 1/2" DRAIN ROCK

INV IN=65.0'

2'

INV OUT=65.8'

PEASTONE

BOTTOM OF STONE=64.0'

PROPOSED IMPERVIOUS BARRIER ALONG ALL SIDES OF STORAGE SYSTEM. FIRESTONE POND GUARD 45 MIL EPDM LINE (OR EQUAL)

UNDISTURBED MATERIAL

SCALE: NOT TO SCALE

IMPERVIOUS AREA = **2,403.65 S.F.**  
DESIGN FOR 100 YEARS STORM EVENT:

STORAGE REQUIRED: (8.78"=0.732 ft)(2,403.65 SQF)=1,759.47 CF

STORAGE VOLUME OF TRENCH: Length x Width x Height = Volume of trench  
[15x25] x 2' = **750 CF** (volume of trench)

Volume of stone (drain rock) in trench  
Vstone = (Vtrench) (Void Factor)  
Vstone = (750) (0.40)  
Vstone = **300 CF**

\*RULE OF THUMB FOR PERCOLATION CREDIT (5 TIMES SYSTEM CAPACITY)  
Vperc = (300 CF)(5)  
Vperc = 1,500 CF

Vlprovided = 1,500 CF +300  
Vlprovided = **1,800 CF**

PERCOLATION RATE = 2 MIN / 1 INCH

V2provided = Area of base (15x25=450 SF) x infiltration rate per hour (2.5') x 24 hr = **22,500 CF +300 CF**  
V2provided = **22,800 CF**

Volume Provided = **1,800 CF** (Minimum Vol. Provided Governs)

Total Storage Volume Required = **1,759.47 CF**

Total Storage Volume Provided = **1,800 CF (INCLUDING INFILTRATION)**

Since Vtotal=1,800 CF > Vr=1,759.47 CF (OK)

**SYSTEM 3#**

PROPOSED IMPERVIOUS BARRIER ALONG ALL SIDES OF STORAGE SYSTEM. FIRESTONE POND GUARD 45 MIL EPDM LINE (OR EQUAL)

PROPOSED FRONT PORTION OF ROOF WHOLE VOLUME OF CRUSHED STONE TAKEN INTO ACCOUNT FOR CALCULATION

GRADE=67.2' TO 66.1'

TOP OF STONE=65.0'

COVER 12" MIN

3/4" - 1 1/2" DRAIN ROCK

INV IN=64.0'

2'

INV OUT=64.8'

PEASTONE

BOTTOM OF STONE=63.0'

PROPOSED IMPERVIOUS BARRIER ALONG ALL SIDES OF STORAGE SYSTEM. FIRESTONE POND GUARD 45 MIL EPDM LINE (OR EQUAL)

UNDISTURBED MATERIAL

SCALE: NOT TO SCALE

IMPERVIOUS AREA = **1,043 S.F.**  
DESIGN FOR 100 YEARS STORM EVENT:

STORAGE REQUIRED: (8.78"=0.732 ft)(1,043 SQF)=763.42 CF

STORAGE VOLUME OF TRENCH: Length x Width x Height = Volume of trench  
[15 x 13] x 2' = **390 CF** (volume of trench)

Volume of stone (drain rock) in trench  
Vstone = (Vtrench) (Void Factor)  
Vstone = (390) (0.40)  
Vstone = **156 CF**

\*RULE OF THUMB FOR PERCOLATION CREDIT (5 TIMES SYSTEM CAPACITY)  
Vperc = (156 CF)(5)  
Vperc = 780 CF

Vlprovided = 780 CF +156  
Vlprovided = **936 CF**

PERCOLATION RATE = 2.41 INCH/HOUR (RAWLS RATE)

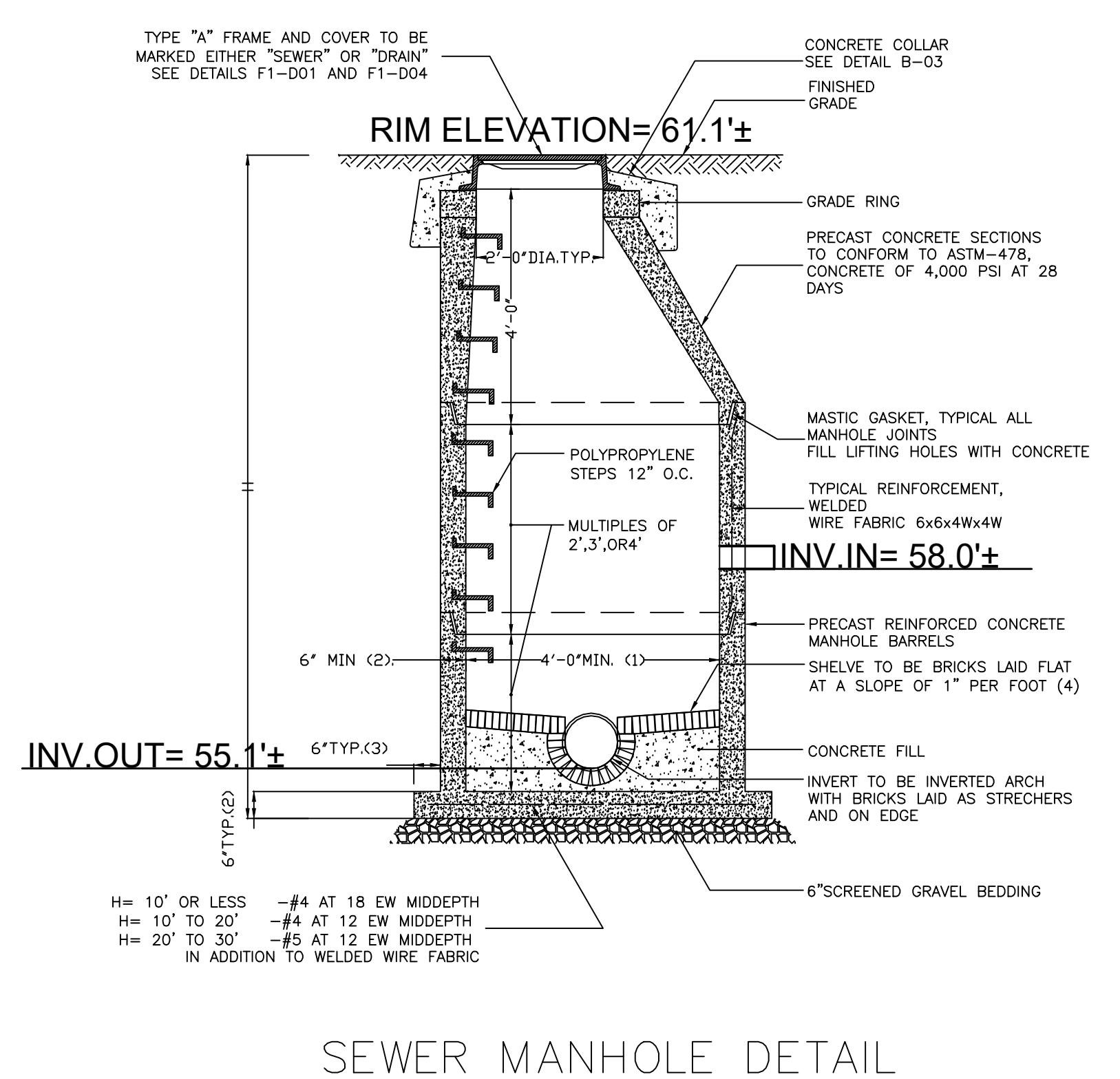
V2provided = Area of base (15x13=225 SF) x infiltration rate per hour (0.2') x 24 hr = **936 CF +156 CF**  
V2provided = **1092 CF**

Volume Provided = **936 CF** (Minimum Vol. Provided Governs)

Total Storage Volume Required = **763.42 CF**

Total Storage Volume Provided = **936 CF (INCLUDING INFILTRATION)**

Since Vtotal=936 CF > Vr=763.42 CF (OK)



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DESCRIPTION	DATE

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DATE:	2/11/20
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APPROVED BY:	E.S

DETAIL

3



