

SANITARY SEWER, STORM SEWER AND WATER LINE AS-BUILTS FOR INDIAN SPRINGS

A TRACT OF LAND BEING PART OF SECTION 31 AND 32, TOWNSHIP 47 NORTH, RANGE 3 EAST, ST. CHARLES COUNTY, MISSOURI

GRADING NOTES

- A Geotechnical Engineer shall be employed by the owner and be on site during grading operations. All soils tests shall be verified by the Geotechnical Engineer concurrent with the grading and backfilling operations.
- The grading contractor shall perform a complete grading and compaction operation as shown on the plans, stated in these notes, or reasonably implied therefrom, all in accordance with the plans and notes as interpreted by the Geotechnical Engineer.
- The Contractor shall notify the Soils Engineer at least two days in advance of the start of the grading operation.
- All areas shall be allowed to drain. All low points shall be provided with temporary ditches.
- A sediment control plan that includes monitored and maintained sediment control basins and/or straw bales should be implemented as soon as possible. No graded area is to be allowed to remain bare over the winter without being seeded and mulched. Care should be exercised to prevent soil from damaging adjacent property and silting up existing downstream storm drainage system.
- Soft soil in the bottom and banks of any existing or former pond sites or tributaries should be removed, spread out and permitted to dry sufficiently to be used as fill. None of this material should be placed in proposed right-of-way locations or on storm sewer locations.
- Site preparation includes the clearance of all stumps, trees, bushes, shrubs, and weeds; the grubbing and removal of roots and other surface obstructions from the site; and the demolition and removal of any man-made structures. The unsuitable material shall be properly disposed of off-site. Topsoil and grass in the fill areas shall be thoroughly disced prior to the placement of any fill. The Soils Engineer shall approve the discing operation.
- Compaction equipment shall consist of tamping rollers, pneumatic-tired rollers, vibratory roller, or high speed impact type drum rollers acceptable to the Soils Engineer. The roller shall be designed so as to avoid the creation of a layered fill without proper blending of successive fill layers.
- The Soils Engineer shall observe and test the placement of the fill to verify that specifications are met. A series of fill density tests will be determined on each lift of fill. Interim reports showing fill quality will be made to the Owner at regular intervals.
- The Soils Engineer shall notify the Contractor of rejection of a lift of fill or portion thereof. The Contractor shall rework the rejected portion of fill and obtain notification from the Soils Engineer of its acceptance prior to the placement of additional fill.
- All areas to receive fill shall be scarified to a depth of not less than 6 inches and then compacted in accordance with the specifications given below. Natural slopes steeper than 1 vertical to 5 horizontal to receive fill shall have horizontal benches, cut into the slopes before the placement of any fill. The width and height to be determined by the Soils Engineer. The fill shall be loosely placed in horizontal layers not exceeding 8 inches in thickness and compacted in accordance with the specifications given below. The Soils Engineer shall be responsible for determining the acceptability of soils placed. Any unacceptable soils placed shall be removed at the Contractor's expense.
- The sequence of operation in the fill areas will be fill, compact, verify acceptable soil density, and repetition of the sequence. The acceptable moisture contents during the filling operation are those at which satisfactory dry densities can be obtained. The acceptable moisture contents during the filling operation in the remaining areas are from 2 to 8 percent above the optimum moisture control.
- All grades shall be within 0.2 feet of those shown on grading plan.
- No slope shall be steeper than 3:1 or as called for in the soils report for the project. All slopes shall be sodded or seeded and mulched.
- The surface of the fill shall be finished so that it will not impound water. If at the end of a days work it would appear that there may be rain prior to the next working day, the surface shall be finished smooth. If the surface has been finished smooth for any reason, it shall be scarified before proceeding with the placement of succeeding lifts. Fill shall not be placed on frozen ground, nor shall filling operations continue when the temperature is such as to permit the layer under placement to freeze.
- Fill and backfill should be compacted to the criteria specified in the following table:

CATEGORY	MINIMUM PERCENT COMPACTION
Fill in building areas below footings	90%
Fill under slabs, walks, and pavement	90%
Fill other than building areas	88%
Natural subgrade	88%
Pavement subgrade	90%
Pavement base course	90%

Measured as a percent of the maximum dry density as determined by modified Proctor Test (ASTM-D-1557).

Moisture content must be within 2 percent below or 4 percent above optimum moisture content if fill is deeper than 10 feet.

NOTE: Trash and debris shall be hauled off site.

GENERAL NOTES

- Underground utilities have been plotted from available information and therefore their locations shall be considered approximate only. The verification of the location of all underground utilities, either shown or not shown on these plans shall be the responsibility of the contractor, and shall be located prior to any grading or construction of the improvements.
- All manhole tops built without elevations furnished by the Engineer will be the responsibility of the sewer contractor.
- 8" P.V.C. sanitary sewer pipe shall meet the following standards. A.S.T.M.-D-3034 SDR-35, with wall thickness compression joint A.S.T.M.-D-3212. An appropriate rubber seal waterstop as approved by the sewer district shall be installed between P.V.C. pipe and masonry structures.
- All filled places, including trench backfills, under buildings, proposed storm and sanitary sewer lines and/or paved, areas, shall be compacted to 90% maximum density as determined by the "Modified AASHTO T-180 Compaction Test," (A.S.T.M.-D-1557). All filled places within public roadways shall be compacted to 95% of maximum density as determined by the "Standard Proctor Test AASHTO T-99, Method C" (A.S.T.M.D.-698).
- All trench backfills under paved areas shall be granular backfill, and shall be compacted to 90% of the maximum density as determined by the "Modified AASHTO T-180 Compaction Test," (A.S.T.M.-D.-1557). All other trench backfills may be earth material (free of large clods or stones). All trench backfills shall be water jetted.
- All sanitary house connections have been designed so that the minimum vertical distance from the low point of the basement to the flow line of a sanitary sewer at the corresponding house connection is not less than the diameter of the pipe plus the vertical distance of 2 1/2 feet.
- No area shall be cleared without the permission of the Project Engineer.
- All P.V.C. sanitary sewer is to be SDR-35 or equal with clean 1/2" to 1" granular stone bedding uniformly graded. This bedding shall extend from 4" below the pipe to the springline of the pipe. Immediate backfill over pipe shall consist of same size "clean" or minus stone from springline of pipe to 6" above the top of pipe.
- All soils test shall be verified by a Soils Engineer concurrent with the grading and backfilling operations.
- Easements shall be provided for sanitary sewers, and all utilities on the Record Plat. See Record Plat for location and size of easements.
- Maintenance and upkeep of the common ground area shall be the responsibility of the developer and/or successors.
- A 25' building line shall be established along all Public Right-Of-Way.
- All water lines shall be laid at least 10 feet horizontally, from any sanitary sewer, storm sewer, or manhole. 18" vertical clearance from outside of pipe to outside of pipe shall be maintained wherever water lines must cross sanitary sewers, laterals, or storm drains the water line shall be laid at such an elevation that the bottom of the water line is above the top of the drain or sewer. A full length of water pipe shall be centered over the sewer line to be crossed so that the joints will be equally distant from the sewer and as remote therefrom as possible. This vertical separation shall be maintained for that portion of the water line located within 10 feet horizontally, of any sewer or drain it crosses.
- All PVC water pipe 6" and larger in size shall be Class C-900 per St. Charles County Public Water District No. 2 Specifications. All other mains shall have a minimum pressure rating of PR-200 or SDR-21. NOTE: Ultra-Blue PVC (MO) Pressure Pipe with a minimum pressure rating of 200 p.s.i. shall also be considered acceptable.
- Water lines, valves, sleeves, meters, and fittings shall meet all specifications and installation requirements of St. Charles County Public Water District No. 2.
- All water hydrants and valves shall be ductile iron and installed in accordance with plans and details. All ductile iron pipe for water mains shall conform to A.W.W.A. Specifications C-106 and/or C-108. The ductile iron fittings shall conform to A.W.W.A. Specification CC-110. All rubber gasket joints for water ductile iron pressure pipe and fittings shall conform to A.W.W.A. Specification C-111.
- All sanitary manholes shall be waterproofed on the exterior in accordance with Missouri Department of Natural Resources specifications 10 CSR-8.120 (7)E.
- Brick will not be used in the construction of sanitary sewer manholes.
- All pipes shall have positive drainage through manholes. No flat base structures are allowed.
- The City of O'Fallon and Duckett Creek Sanitary District shall be notified 48 hours prior to construction for coordination and inspection.
- Gas, water and other underground utilities shall not conflict with the depth or horizontal location of existing or proposed sanitary or storm sewers, including house laterals.
- All existing site improvements disturbed, damaged or destroyed shall be repaired or replaced to closely match preconstruction conditions.
- The contractor shall prevent all storm, surface water, mud and construction debris from entering the existing sanitary sewer system.
- All construction and materials shall conform to the current construction standards of the City of O'Fallon and Duckett Creek Sanitary District.
- All sanitary and storm sewer trench backfills shall be water jetted. Granular backfill will be used under pavement areas.
- All existing improvements disturbed during construction of the offsite sewer line shall be repaired or replaced in kind.
- All creek crossings shall be grouted rip rap as directed by district inspector.
- No flushing hydrants or water meters shall be located in driveways and or walkways.
- No Flood Plain exists on this site per F.I.R.M. #29183C0240 E dated August 2, 1996.
- Tree preservation during development:
Area of existing trees 3.70 acres
Area of trees to be removed 1.00 acre
Total area of trees to be saved 2.70 acres

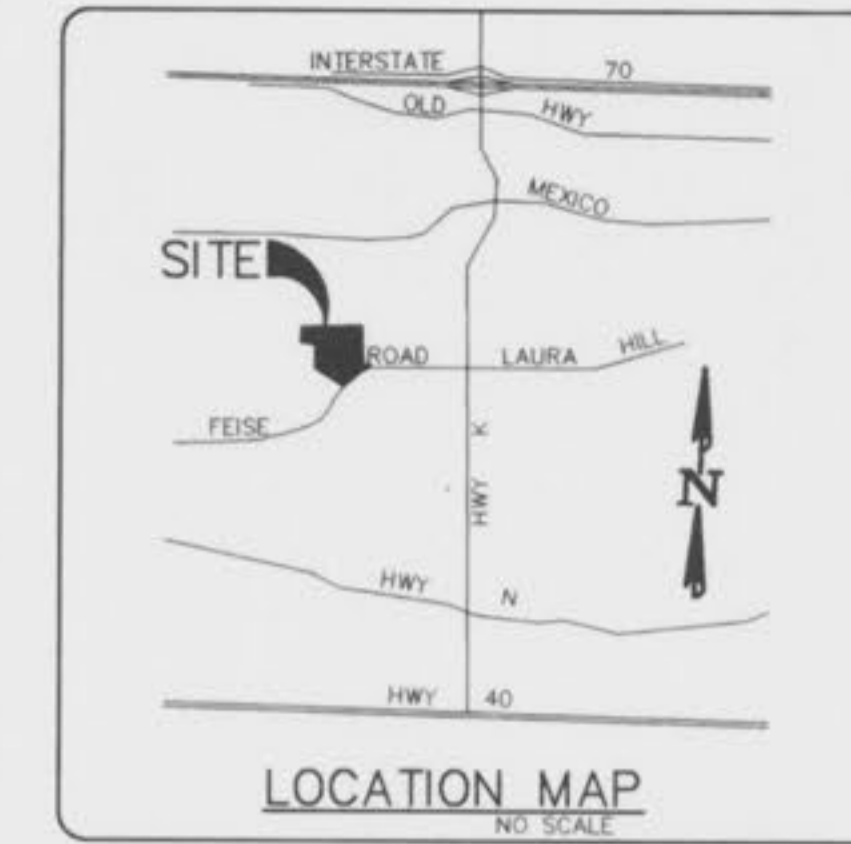
Trees required:
3.70 acres x 80% = 2.96 acres
3.70 acres - 2.96 acres = 0.74 acres
0.74 acres - 2.70 acres = -1.96 acres
15 trees/acre x -1.96 acres = 0 trees required
- The developer will provide two street trees per lot (4 trees on corner lots).
- Concrete pipe for storm sewers shall be Class III, A.S.T.M. C-76 with a minimum diameter of 12" except in the R.O.W. it shall be 15".
- All concrete pipe for storm sewers shall be "O-Ring" pipe with water tight joints.
- Concrete pipe joints shall be MSD type "A" approved compression-type joints and shall conform to the requirements of the specifications for joints for circular concrete sewer and culvert pipe, using flexible, watertight, rubber-type gaskets ASTM C443. Band-type gaskets depending entirely on cement for adhesion and resistance to displacement during jointing shall not be used.
- ADS pipe for storm sewers shall meet the following standards. Specification N-12 or ASTM D 2321 with water tight joints.
- Premanufactured adapters shall be used at all PVC & DIP connections. Rubber boot / mission type couplers will not be allowed.

SITE BENCHMARK

AN OLD IRON PIPE LOCATED AT THE INTERSECTION OF THE WESTERN RIGHT OF WAY OF FEISE RD. AND THE SOUTHWESTERN BOUNDARY OF THE TRACT. ELEVATION = 609.04

U.S.G.S. BENCHMARK

RM 62 - CHISELED SQUARE IN TOP OF SOUTH HEADWALL IN THE MIDDLE OF MEXICO RD. BRIDGE OVER BELLEAU CREEK TRIBUTARY. ELEVATION = 493.87



UTILITIES TO SERVE SITE

CITY OF O'FALLON SEWER
CLUMBE RIVER ELECTRIC COMPANY
LACLEDE GAS COMPANY
ST. CHARLES PUBLIC WATER DISTRICT #2
GTE TELEPHONE COMPANY
FORT ZUMWALT SCHOOL DISTRICT
O'FALLON FIRE PROTECTION DISTRICT
DUCKETT CREEK SANITARY DISTRICT

GRADING QUANTITY 90,000 cu.yds. (INCLUDES 15% SHRINKAGE)

The above yardage is an approximation only, NOT FOR BIDDING PURPOSES. Contractors shall verify quantities prior to construction.

It is the intention of the Engineer for the earthwork to balance on-site. The Engineer shall be notified if any difficulties arise in achieving the balance.



SHEET INDEX

1	COVER SHEET
2	SITE PLAN
3-5	SANITARY SEWER PROFILES
6-8	STORM SEWER PROFILES

AS OF JANUARY 19, 1998, I CERTIFY THAT THESE "AS BUILT" DRAWINGS INDICATE THE ACTUAL LOCATIONS, LENGTHS, SIZES, TYPE AND CLASS OF PIPE, FLOWLINES, DEPTHS, STRUCTURES, WYE LOCATIONS, AS APPROPRIATE, AND THAT THE PUBLIC SEWERS HAVE BEEN CONSTRUCTED WITHIN EXISTING OR PROPOSED EASEMENTS AS SHOWN ON THE SUBDIVISION PLAT WITH THE EXCEPTION OF THE FOLLOWING: NONE.

Darrel R. Oakley
BAX ENGINEERING CO., INC.
DARREL R. OAKLEY
MO REG. L.S. #2265

TOM JOHNSON CONSTRUCTION
 631 AVONDALE DRIVE
 ST. PETERS, MO 63376
 314-970-2900

PREPARED FOR:

DISCLAIMER OF RESPONSIBILITY
I hereby certify that the documents intended to be authorized by my seal are limited to this sheet, and I hereby disclaim any responsibility for all other drawings, specifications, estimates, reports or other documents or instruments relating to or intended to be used for any part or parts of the architectural or engineering project or survey.

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REVISIONS

NO.	DATE	DESCRIPTION



ENGINEERING
PLANNING
SURVEYING

1052 South Cloverleaf Drive
St. Peters, MO. 63376-6445
314-928-5552
FAX 928-1718

3-12-98
DATE
96-8861
PROJECT NUMBER
1 OF 8
SHEET OF
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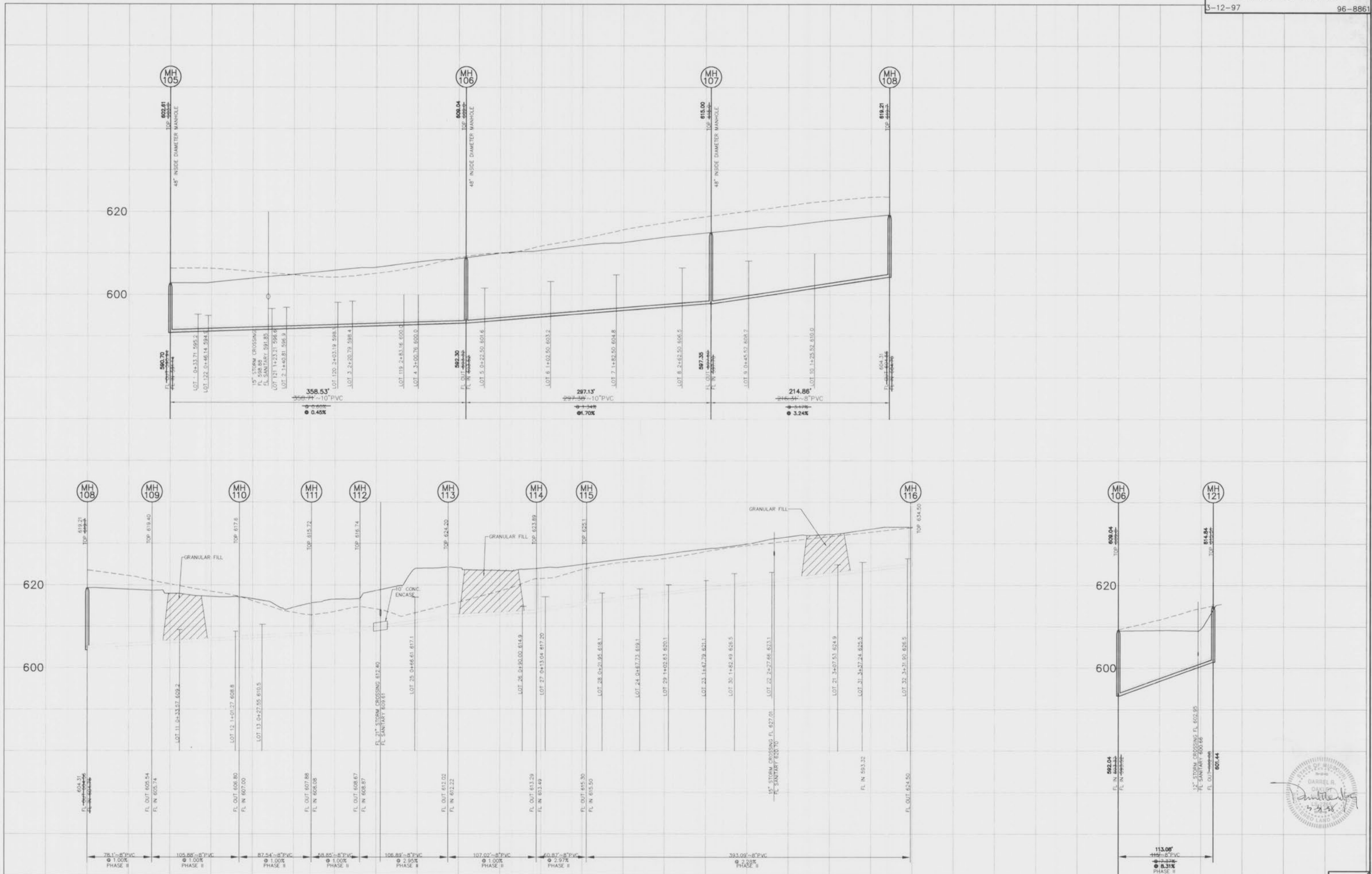
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 REVISED 5-31-97
 REVISED 6-17-97
 REVISED 7-01-97
 REVISED 7-22-97
 REVISED 9-02-97
 REVISED 9-17-97
 AS-BLT 1-19-98



PROPERTY N/F
 KAPLAN DEVELOPMENT CO
 ZONED R-1 (CITY OF O'FALLON)

TEA PARTY (50'W) LANE
 PATRIOTS LANDING
 PLAT THREE
 P.B.32 PGS.139-143
 ZONED PUD (CITY OF O'FALLON)

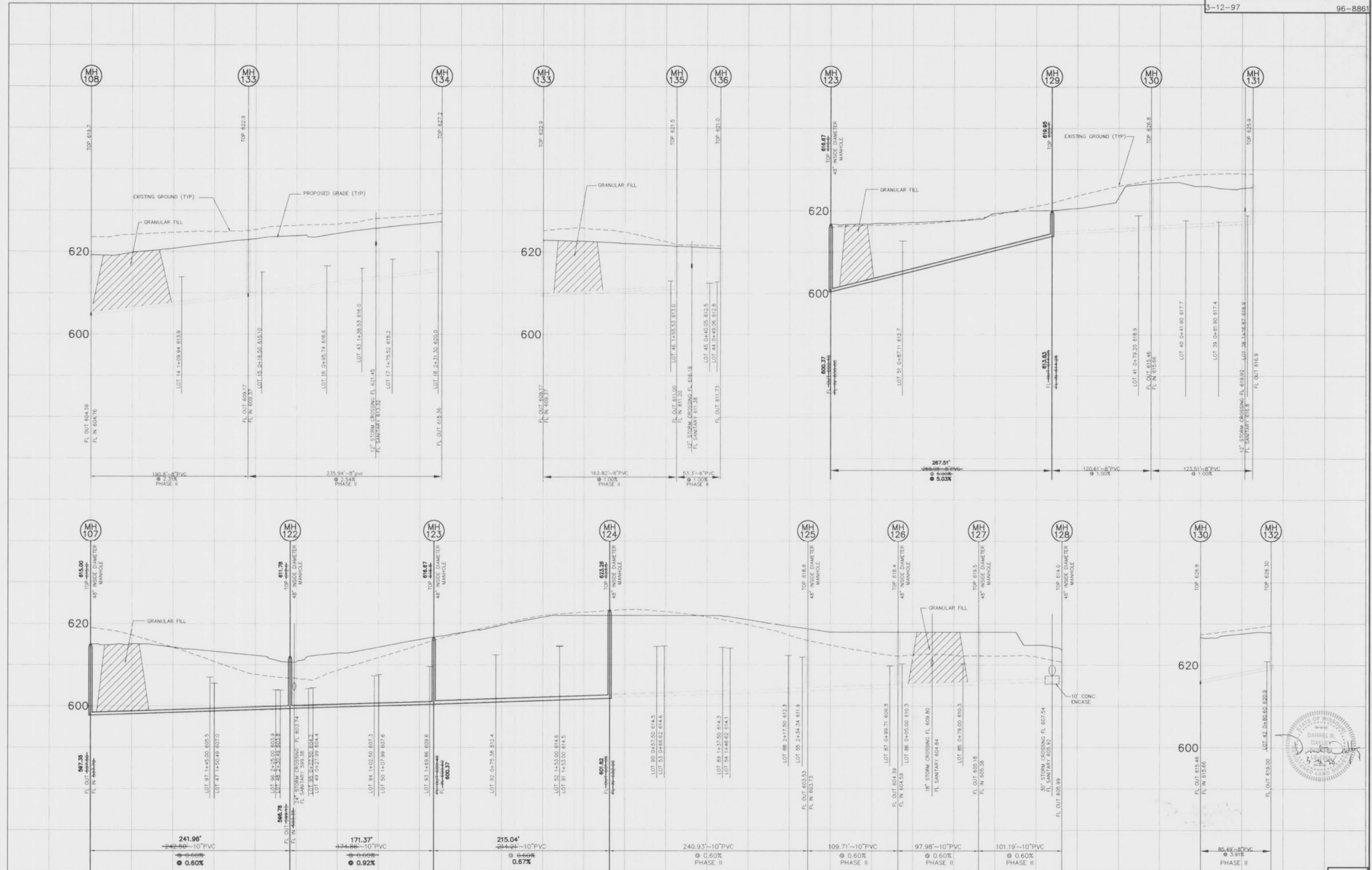


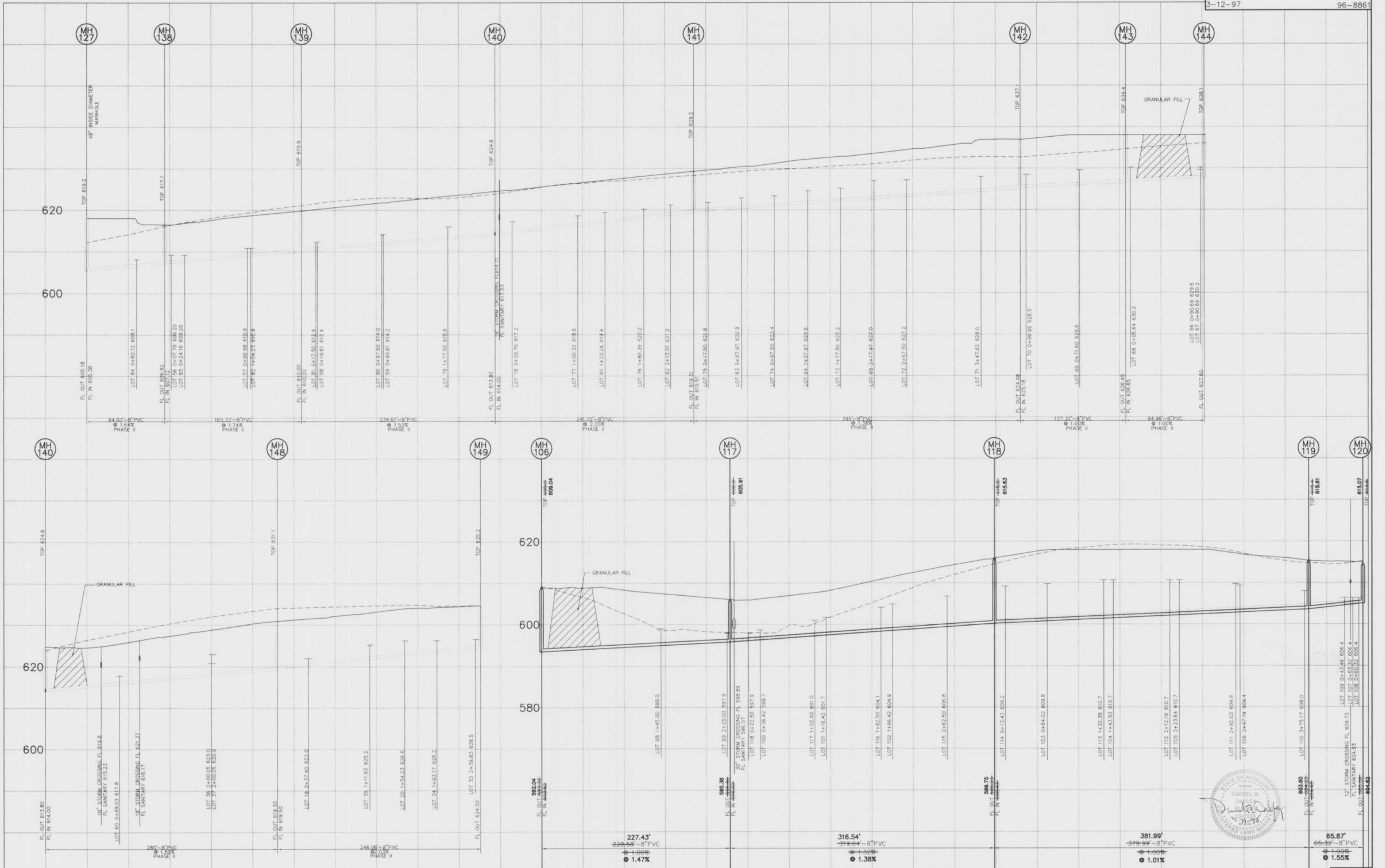


NOTE: AS-BUILTS AREA PHASE-ONE CONSTRUCTION ONLY. PHASE-TWO CONSTRUCTION NOT COMPLETED.

1" = 50' HORIZONTAL
1" = 10' VERTICAL



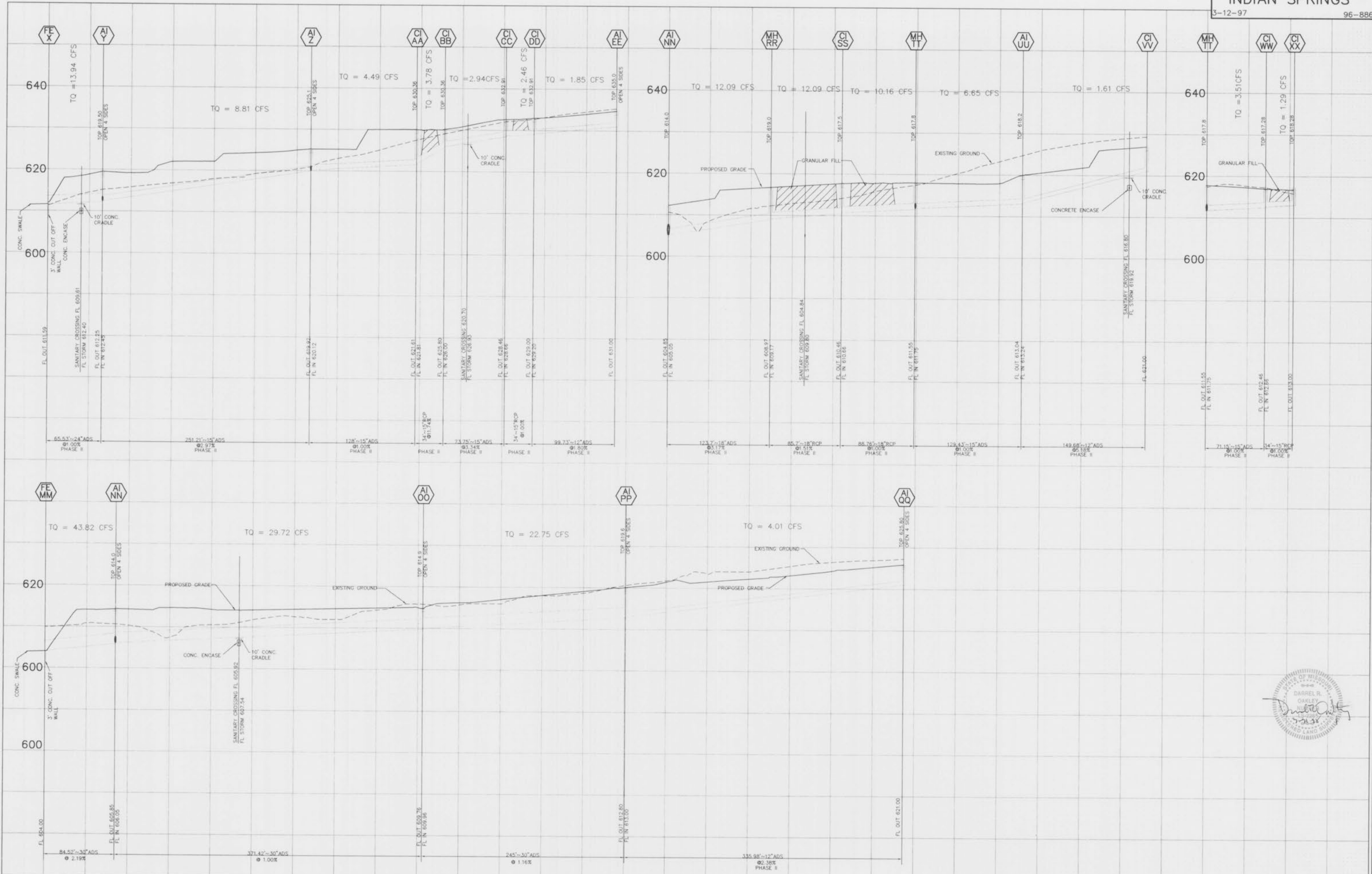




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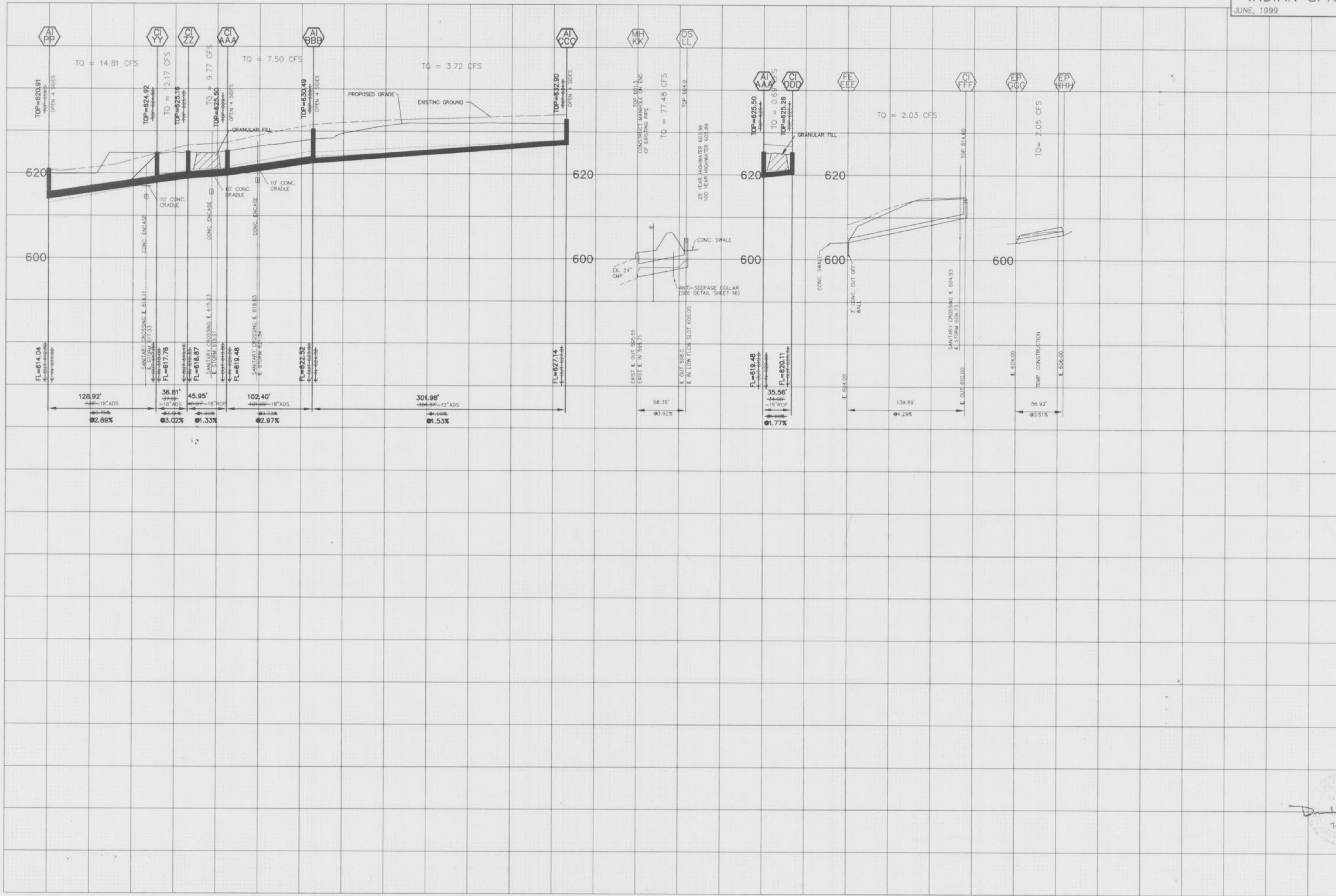


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REVISED 4-07-99
 REVISION 8-15-99
 REVISED 7-01-99
 REVISED 6-05-99



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Daniel P. Orr
 7-99

1" = 50' HORIZONTAL
 1" = 10' VERTICAL

"AS-BUILTS ADDED JUNE, 1999"

Indian Springs Plat 2
 As-BUILTS 818