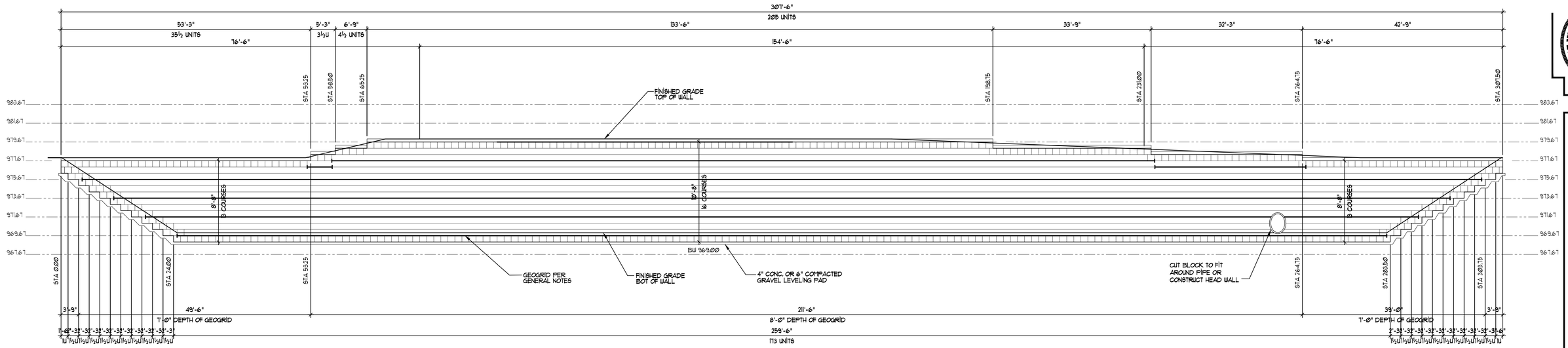
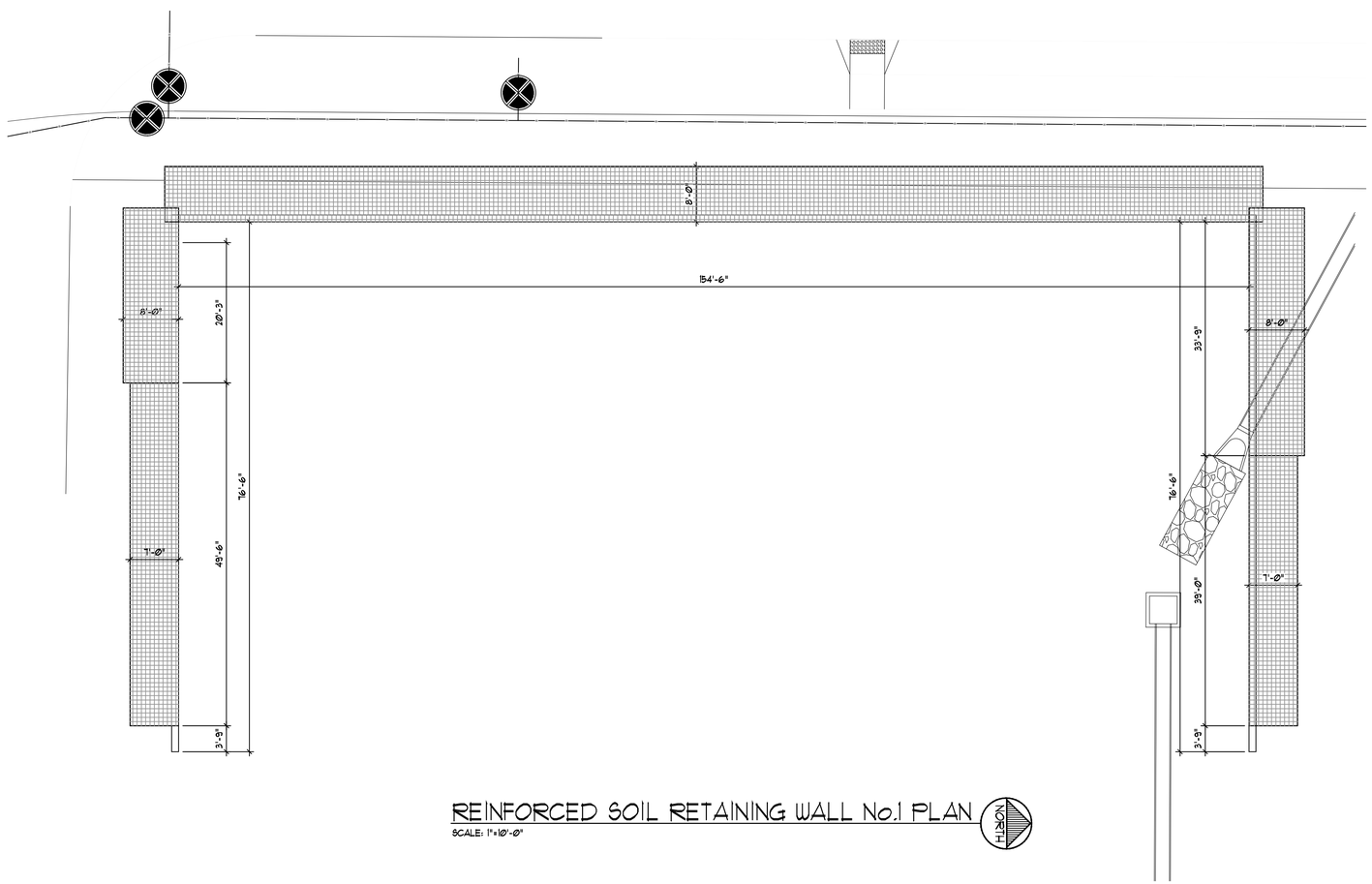


REINFORCED SOIL RETAINING WALL No.1 ELEVATION

SCALE: 1"=10'-0" HORIZ.
1"=5'-0" VERT.



REINFORCED SOIL RETAINING WALL No.1 PLAN

SCALE: 1"=10'-0"

SCHLAGEL
ENGINEERS PLANNERS SURVEYORS LANDSCAPE ARCHITECTS

- [x] REVIEWED
- [ ] REVIEWED AS NOTED
- [ ] REVISE AND RESUBMIT
- [ ] REJECTED
- [ ] FOR INFORMATION ONLY

BY rmcginnis DATE 9/28/2021

STATE OF MISSOURI
CHAD A. STREETER
PE-2006018017
PROFESSIONAL ENGINEER
09/28/2021

DATE: 05/10/2021
REVISED: 06/25/2021, 9/28/2021
JOB NO:
DRAWN BY: MEJ
DESIGNED BY: CMS

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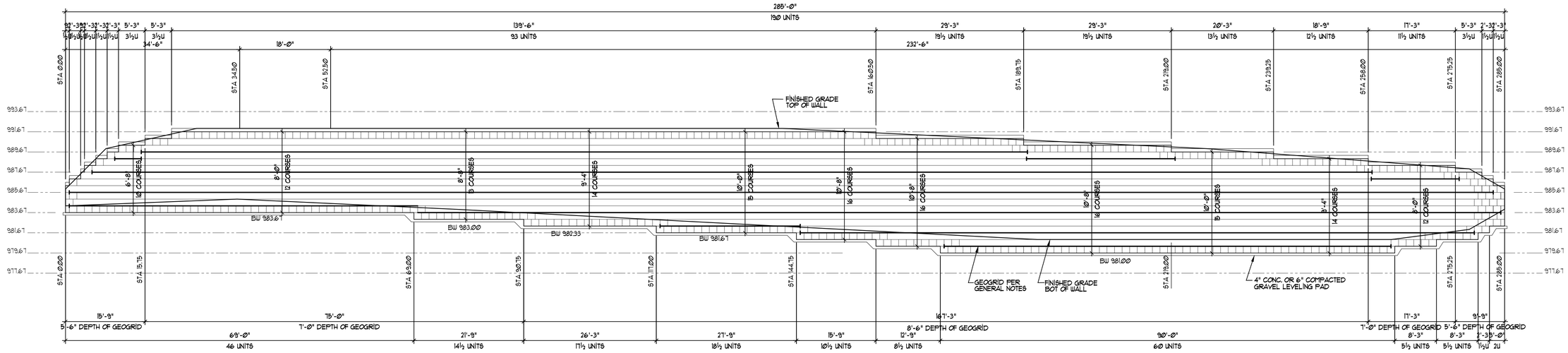
KEYSTONE

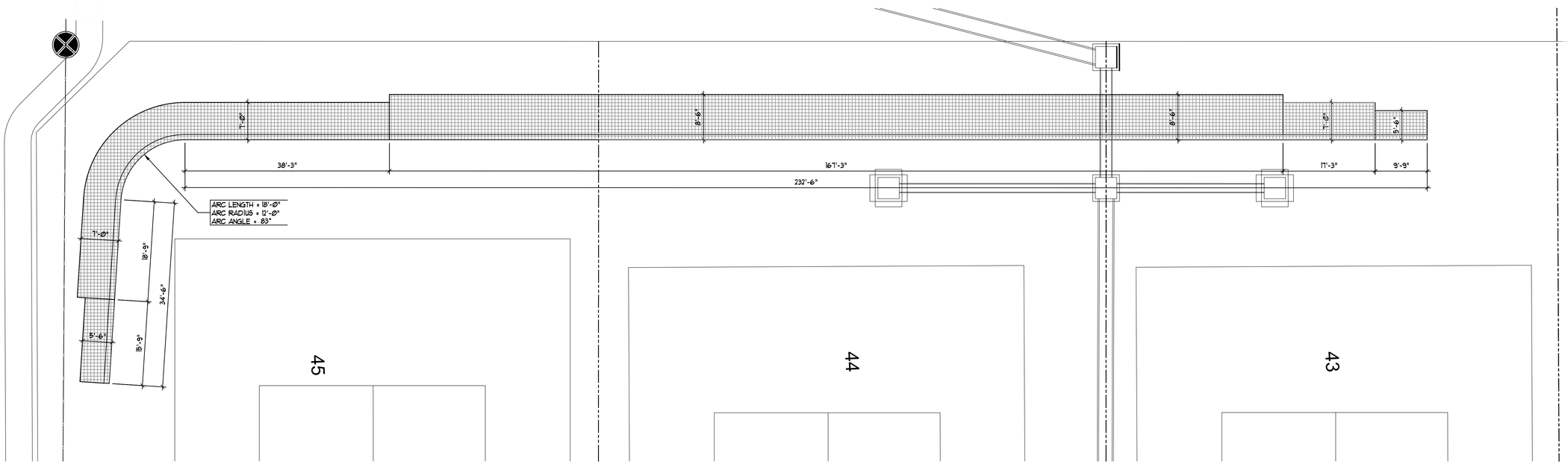
REINFORCED SOIL RETAINING WALL FOR:
WOODLAND GLEN 2ND PLAT
LEE'S SUMMIT, MISSOURI

SHEET NO:
RW1.1



REINFORCED SOIL RETAINING WALL No.2 ELEVATION

SCALE: 1"=10'-0" HORIZ.
1"=5'-0" VERT.



REINFORCED SOIL RETAINING WALL No.2 PLAN

SCALE: 1"=10'-0"

NORTH

STATE OF MISSOURI
CHAD STREETER
NUMBER PE-2006001817
LICENSED PROFESSIONAL ENGINEER
09/28/2021

DATE: 05/10/2021
REVISED: 06/25/2021, 9/28/2021
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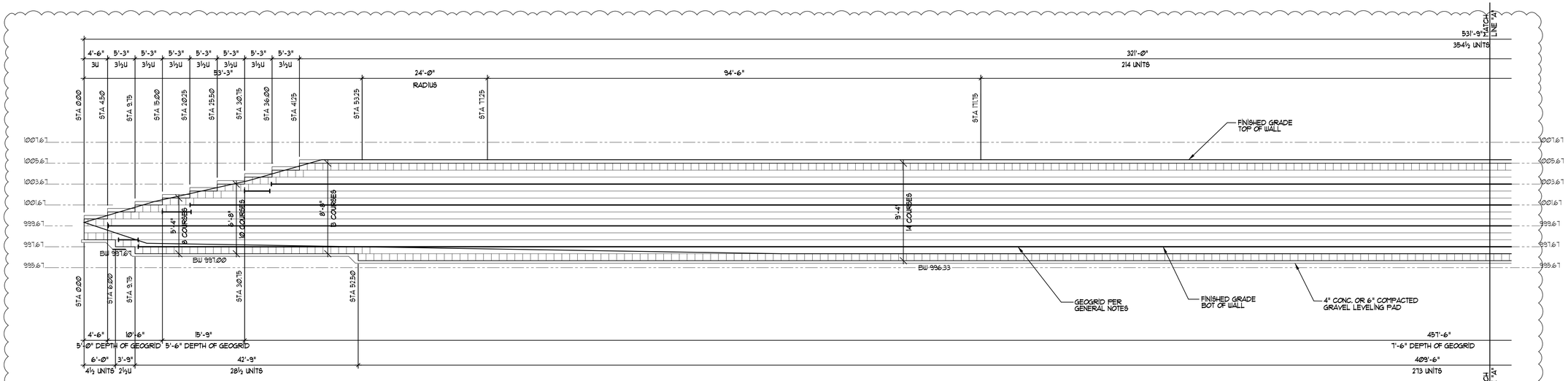
KEYSTONE

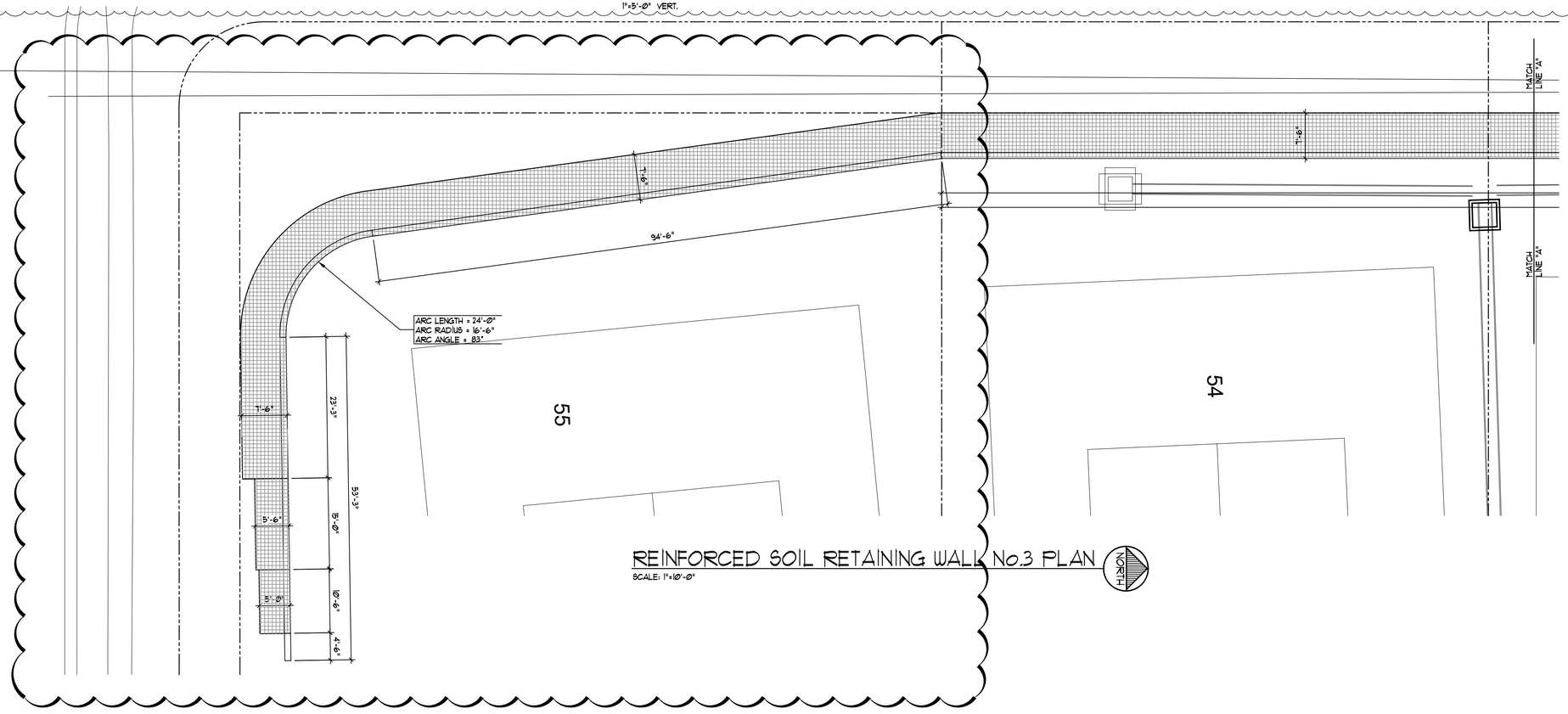
REINFORCED SOIL RETAINING WALL FOR:
WOODLAND GLEN 2ND PLAT
LEE'S SUMMIT, MISSOURI

SHEET NO:
RW1.2



REINFORCED SOIL RETAINING WALL No.3 ELEVATION

SCALE: 1"=10'-0" HORIZ.
1"=5'-0" VERT.



REINFORCED SOIL RETAINING WALL No.3 PLAN

SCALE: 1"=10'-0"

STATE OF MISSOURI
CHAD STREETER
PE-2006010817
LICENSED PROFESSIONAL ENGINEER
09/28/2021

DATE: 05/10/2021
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REINFORCED SOIL RETAINING WALL FOR:
WOODLAND GLEN 2ND PLAT
LEE'S SUMMIT, MISSOURI

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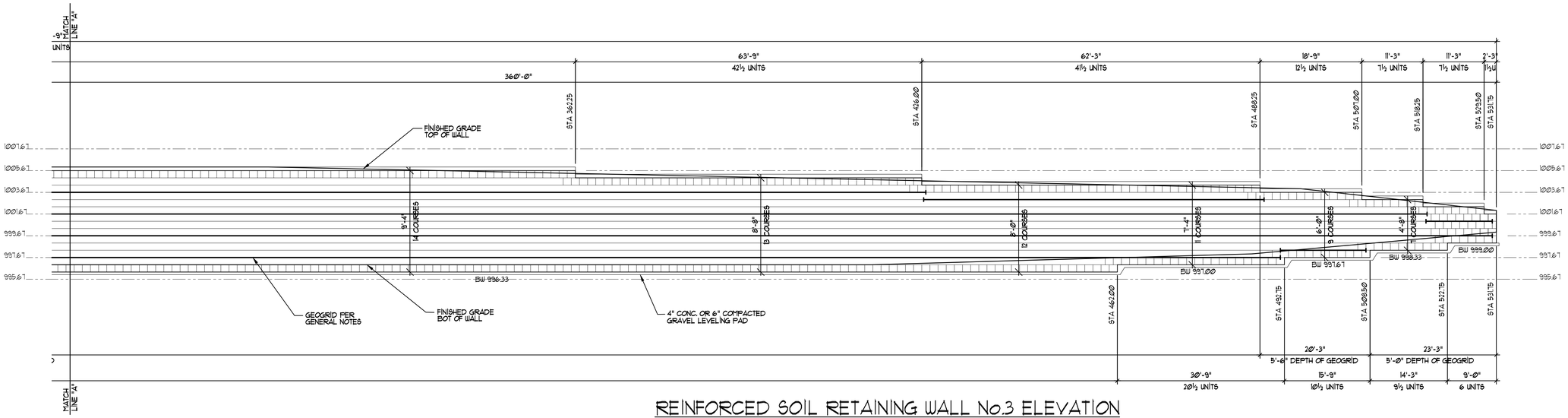
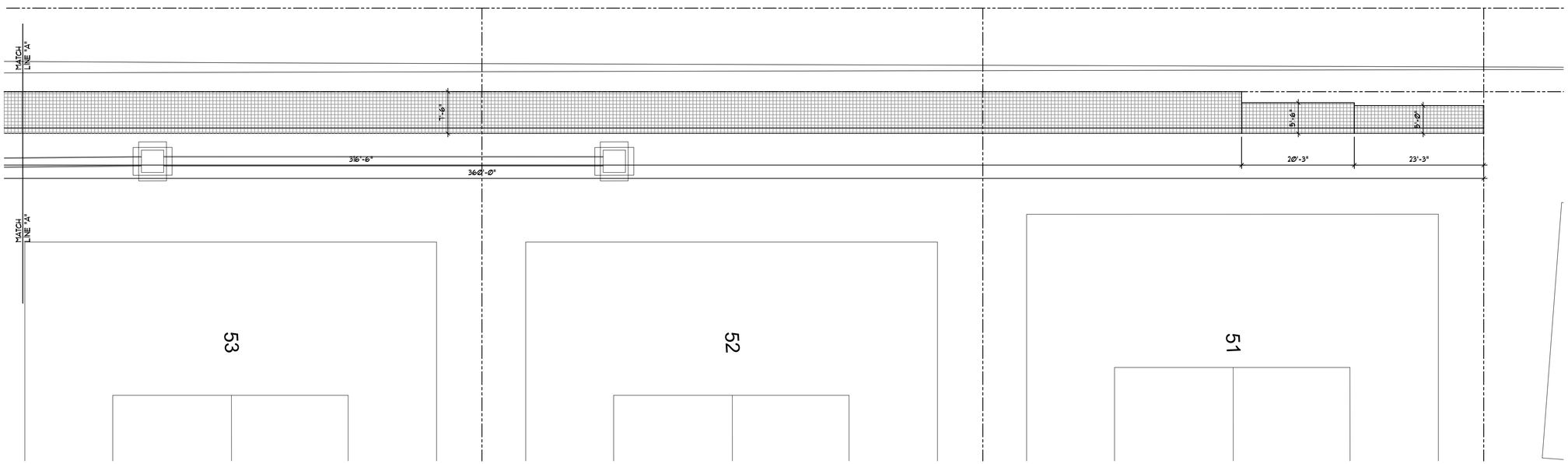
SHEET NO:
RW1.3



REINFORCED SOIL RETAINING WALL No.3 ELEVATION

SCALE: 1"=10'-0" HORIZ.
1"=5'-0" VERT.



REINFORCED SOIL RETAINING WALL No.3 PLAN

SCALE: 1"=10'-0"

NORTH

STATE OF MISSOURI
STREETER
PE-2006010817
PROFESSIONAL ENGINEER
09/28/2021

DATE: 05/10/2021
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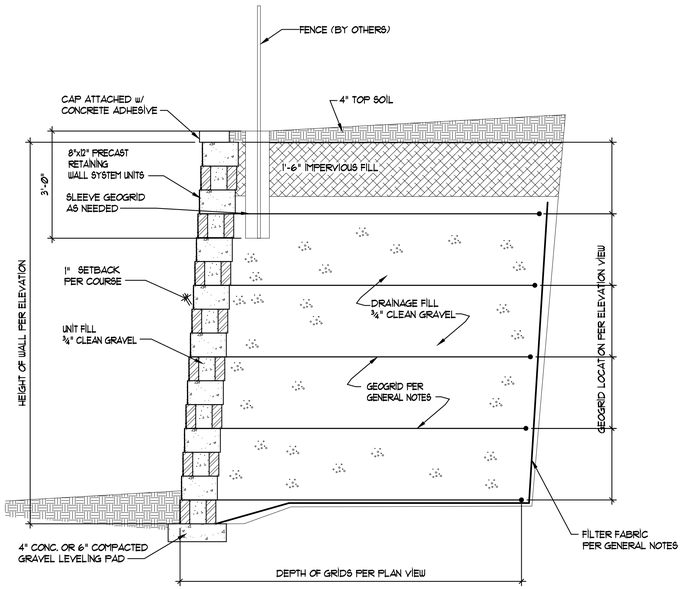
KEYSTONE

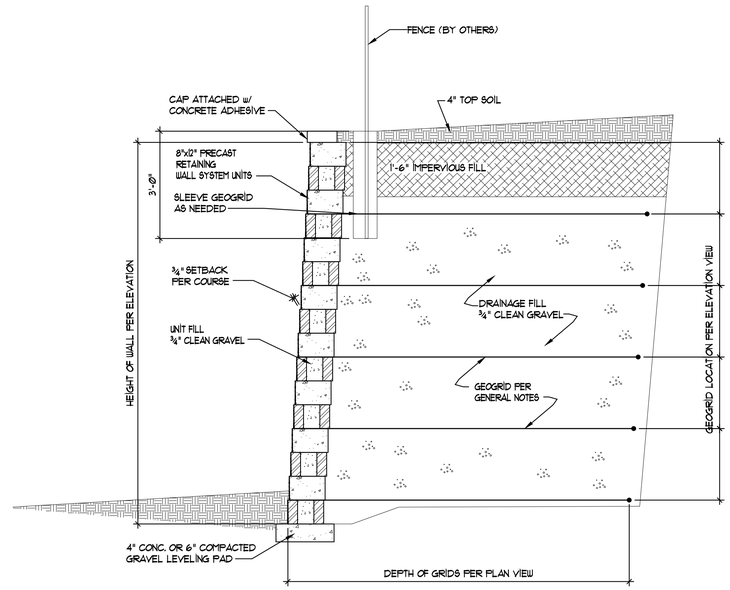
REINFORCED SOIL RETAINING WALL FOR:
WOODLAND GLEN 2ND PLAT
LEE'S SUMMIT, MISSOURI

SHEET NO:
RW1.4



REINFORCED SOIL RETAINING WALL No.1 SECTION

SCALE: ½" = 1'-0"



REINFORCED SOIL RETAINING WALL No.2-3 SECTION

SCALE: ½" = 1'-0"

RETAINING WALL GENERAL NOTES

1. GENERAL REQUIREMENTS
   A. Design and construction work for this project shall conform to the requirements of the 2018 International Building Code.

   B. Design Loads:
      Retained Soil---------- phi = 26 degrees
      Live Load Surcharge---------- 0 psf
      Backslope---------- 0 degrees
      Applied Bearing Pressure---------- 2500 psf

   C. Modular concrete facing units shall be Brutus Retaining Wall Units having a minimum 28 Day compressive strength of 3000 psi, and a maximum moisture absorption of 8 percent.

   D. Drainage fill shall consist of free draining crushed stone, 3/8" to 3/4", or coarse gravel. No more than 5% shall pass the No. 200 sieve with a maximum size of 1". A minimum of 12 inches of drainage fill must extend behind the wall units to within 18 inches of final grade.

   E. Impervious fill shall consist of material having a minimum plasticity index of 10 and a maximum plasticity index of 30. No more than 10% particles shall be retained on the No. 4 sieve and no less than 20% shall pass the No. 200 sieve. 18 inches of impervious fill shall extend over the reinforced zone.

   F. The geogrid shall be a high density polyethylene expanded sheet or polyester woven fiber materials, specifically fabricated for use as soil reinforcement.
      Geogrid shall be Stratagrid 200 as manufactured by Strata Systems, Inc. or Miragrid 3XT as manufactured by Mirafi Inc, or Raugrid 3/3-20 as manufactured by Luckenhaus North America, or Versa-Grid 30 as manufactured by Versa-Lok or Hp200 as manufactured by Geostar.

   G. Filter Fabric consist of Mirafi 140 N as manufactured by Mirafi, Inc., or C-35NW as manufactured by Synthetic Industries.

   H. Excavation shall be to the lines and grades shown on the construction drawings. Care shall be taken not to disturb embankment materials beyond lines shown.

2. FOUNDATION SOIL PREPARATION:
   A. Foundation soil shall be excavated as required for leveling pad per drawings.
   B. Foundation soil shall be examined by the Engineer of Record or Geotechnical Engineer to assure that the actual foundation soil strength meets or exceeds assumed design strength. Soils not meeting required strength shall be removed and replaced with acceptable material.
   C. Over-excavated areas shall be filled with approved compacted backfill material.

3. BASE LEVELING PAD:
   A. Leveling pad materials shall be placed as shown on the drawings, on undisturbed insitu soils to a minimum thickness of 4 inches for concrete and 6" for sand or gravel type materials.
   B. Material shall be compacted so as to provide a level hard surface on which to place the first course of units. Compaction shall be 95% of standard proctor for sand or gravel type materials.
   C. Leveling pad shall be prepared to insure complete contact of retaining wall unit with base.

4. UNIT INSTALLATION:
   A. First course of concrete wall units shall be placed on the base leveling pad. The units shall be checked for level and alignment and in full contact with base.
   B. Units shall be placed side by side for full length of wall alignment. Alignment shall be done by means of a string line or offset from base line.
   C. The contractor shall follow manufacturer's installation instructions when making radius curves.
   D. Compact unit fill, drainage fill, and backfill. Excess material shall be swept from top of units to install next course, insuring the area between each unit is completely filled prior to proceeding to next course.
   E. Lay each course with the lip of the units placed against the back of the preceding course. Pull units forward as far as possible. Backfill and compact soil behind wall units.

5. GEOGRID INSTALLATION:
   A. The geogrid soil reinforcement shall be laid horizontally on compacted backfill on top of the concrete wall units. The next course of units shall be placed such that the geogrid is aligned to the backslide and under the lip of the top units. Embed the geogrid a minimum of eight inches into the units. Pull geogrid taut and anchor prior to placing backfill.
   B. Slack in the geogrid at the wall unit connections shall be removed.
   C. Geogrid shall be laid at the proper elevation and orientation as shown on the drawings.
   D. Correct orientation (roll direction) of the geogrid shall be verified.
   E. To pretension geogrid, anchored geogrid shall be pulled taut to eliminate loose folds, and secured prior to and during backfill and compaction.
   F. In outside corners and radii provide a minimum of 3 inches of backfill or drainage fill between overlapping geogrid layers.

6. FILL PLACEMENT:
   A. Clean gravel backfill shall be compacted by a minimum of 3 passes of a tracked construction equipment or a vibratory compactor. Placement of clean rock fill shall be monitored during placement to assure that an equivalent maximum dry density of 95% standard proctor is achieved.
   B. Backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack or loss of pretension of the geogrid.
   C. Backfill shall be placed from the wall rearward into the embankment to insure that the geogrid remains taut.
   D. Compact backfill within three feet of the back of the wall to prevent displacement of modular units.
   E. Tracked construction equipment shall not be operated directly on the geogrid. A minimum backfill thickness of 6 inches shall be maintained to operate tracked vehicles over the geogrid. Turning of tracked vehicles shall be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.

7. CAP INSTALLATION:
   A. Cap units shall be placed over preceding course and on a bed of construction adhesive, pulled forward, backfilled and compacted in place to finished grade.

8. PROTECTION OF WORK
   A. At the end of each day's operation, slope backfill away from the facing to direct runoff away Prevent runoff from adjacent areas from entering the retaining wall backfill.
   B. A minimum of three feet shall be maintained between the face of the retaining wall and the operation of heavy equipment.

STATE OF MISSOURI
STREETER
PE-2000021087
PROFESSIONAL ENGINEER
09/28/2021

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KEYSTONE

REINFORCED SOIL RETAINING WALL FOR:
WOODLAND GLEN 2ND PLAT
LEE'S SUMMIT, MISSOURI

SHEET NO:
RW1.5