PROJ. NO. 468-83317 O.C.A. NO. 743896

CONSTRUCTION PLANS

SANITARY SEWER EXTENSIONS

EQUESTRIAN ESTATES ADDITION - PHASE I

TO

THE CITY OF WICHITA, KANSAS

LATERAL 313, FOUR MILE CREEK SEWER

MICHAEL E. LINDEBAK, P.E. - CITY ENGINEER

PROJECT NO. 468-83317

OCA NO. 743896

GENERAL NOTES:

1. Existing utility lines and their location, as shown on the plans, represent the best information obtainable for design. The contractor will be required to work around existing utilities within the right-of-way which do not conflict with proposed construction.

2. Rubble from the removal of miscellaneous structures and excess excavation which is to be wasted shall be the disposed of on sites to be provided by the Contractor. These sites shall be approved by the Engineer as to suitability, appearance and site location. Locations that, in the opinion of the Engineer, will leave an unsightly appearance will not be approved.

   All disposal sites must be approved by the Kansas Department of Health and Environment. Material either stockpiled or disposed of in a flood plain would require a Kansas State Board of Agriculture permit. Any material dumped in waters of the United States or wetlands is subject to U.S. Corps. of Engineers permitting regulations. Any material buried or stockpiled beyond approved construction limits would require additional archaeological investigations unless buried in a previously approved borrow location.

3. The Contractor shall be responsible for maintaining continuous flow of sewage through construction. Contractor's proposed method for maintaining sewage flow shall be approved by the Engineer. Cost of maintaining flow of sewage through construction will not be paid for directly and this cost shall be considered as subsidiary to the other pay items of the work.

4. The Contractor shall be responsible for preserving property irons. The Contractor will be required to re-establish any property irons which are damaged or destroyed by his construction operations. Such irons shall be re-established by a licensed land surveyor in accordance with state laws.

5. Trees and shrubs in public right-of-way which are in direct conflict with proposed new construction shall be removed by the Contractor with the Engineer's approval. Trees and shrubs which are not in direct conflict with the proposed new construction shall be saved and protected from damage.

6. Contractor shall vacuum test all manholes according to the City of Wichita standard specifications.

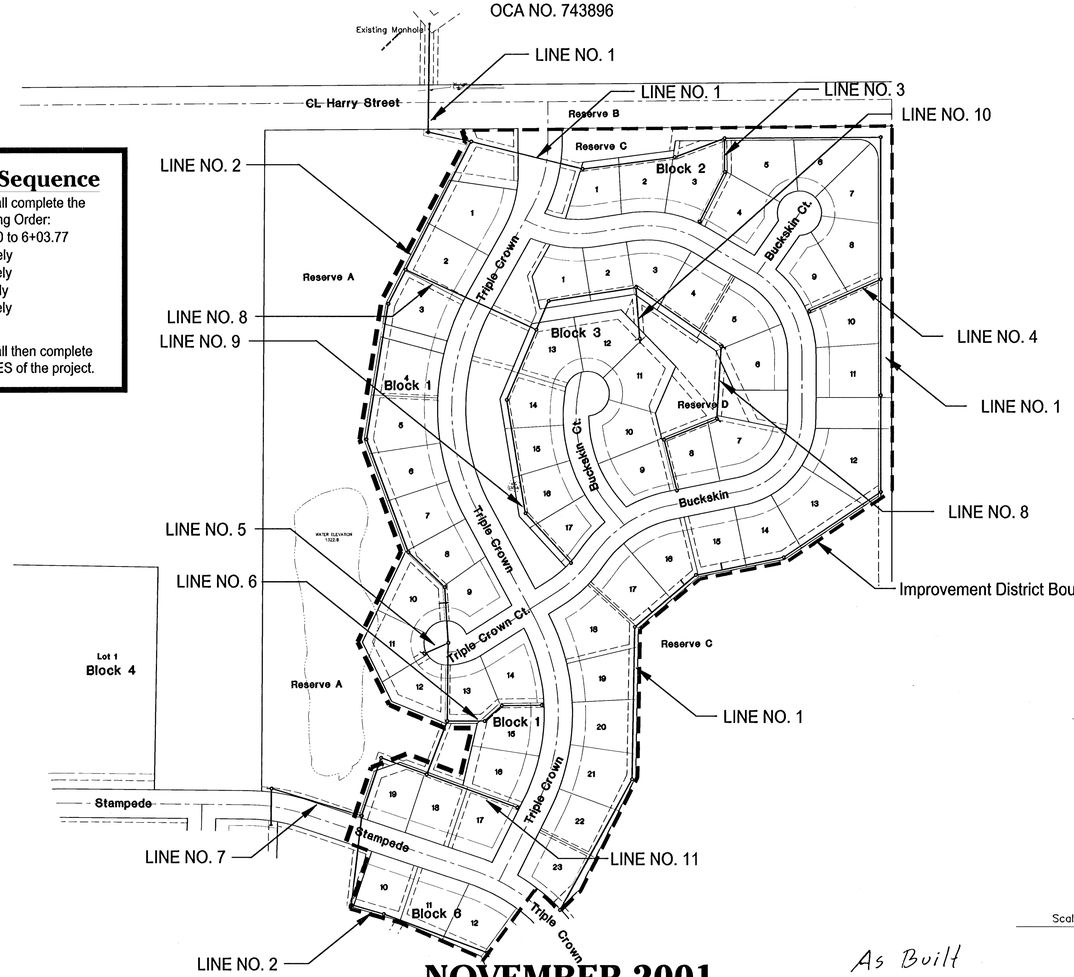
7. The tops of all Manholes to be set 0.4 feet above existing ground unless otherwise noted.

8. All areas disturbed by sewer construction, i.e. R/W, easements, and adjacent properties shall be restored with the same grass/ sod as per AR 78.

Construction Sequence

Sewer Contractor shall complete the Project in the Following Order:
Line No. 1 - Sta. 0+00 to 6+03.77
Line No. 2 - Completely
Line No. 5 - Completely
Line No. 7- Completely
Line No. 8 - Completely

Sewer Contractor shall then complete the REMAINING LINES of the project.



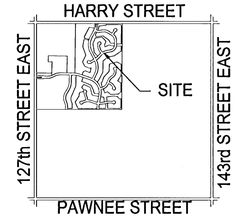
INDEX

TITLE SHEET	SHEET 1
LINE NO. 1	SHEET 2-5
LINE NO. 2	SHEET 6-8
LINE NO. 3, 4, & 5	SHEET 9
LINE NO. 6 & 7	SHEET 10
LINE NO. 8	SHEET 11
LINE NO. 8 & 11	SHEET 12
LINE NO. 9 & 10	SHEET 13
TYPE "P" MANHOLE	SHEET 14
RISER DETAIL	SHEET 15
EASEMENT GRADING PLAN	SHEET 16
EROSION CONTROL DETAIL	SHEET 17
COORDINATE POINT LIST	SHEET 18
EQUESTRIAN ESTATES PLAT	SHEET 19-20

BENCH MARKS

1. Railroad spike in power pole, approximately 25' south and 30' east of W 1/4 Corner, Section 35-27-2E. Elevation 1349.65
2. Square on south hub guard of RCBC just west of NW Corner of Section 35-27-2E. Elevation 1311.90

Scale 1" = 150'



LOCATION MAP
No Scale

NOVEMBER 2001

PLANS PREPARED BY

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS
5940 E. Central, Suite 200 ■ Wichita, KS 67208-4242
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As Built
9/30/02
RDL

JAMES M. USBERT 14698 KANSAS PROFESSIONAL ENGINEER

12-11-01

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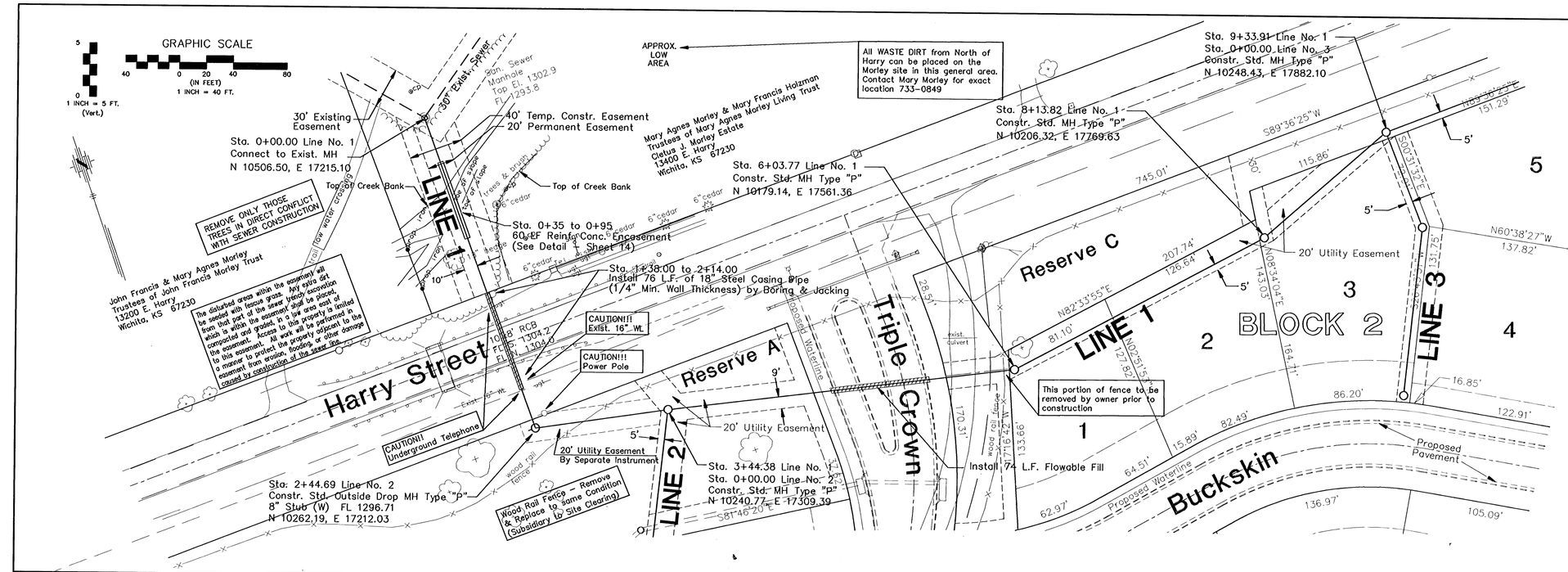

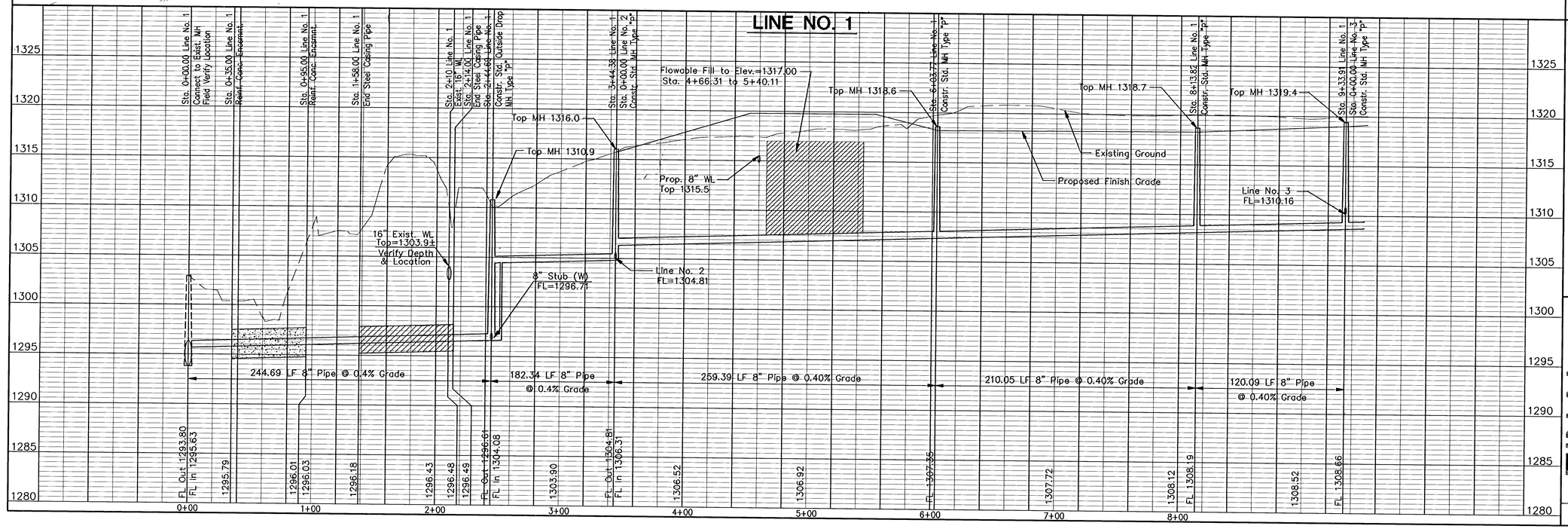

EQUESTRIAN ESTATES
SANITARY SEWER LINE NO. 1

CITY OF WICHITA, KANSAS
MICHAEL E. LINDEBAK, P.E. - CITY ENGINEER
Proj.# 468-83317 O.C.A.# 743896

No.	Date	By	Approved	Revision
1				
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Designed By: J. Ubert / B. Kulla
Drawn By: B. Kulla
Poe Job No.: 1694
Date: November 2001

Sheet 2 of 20

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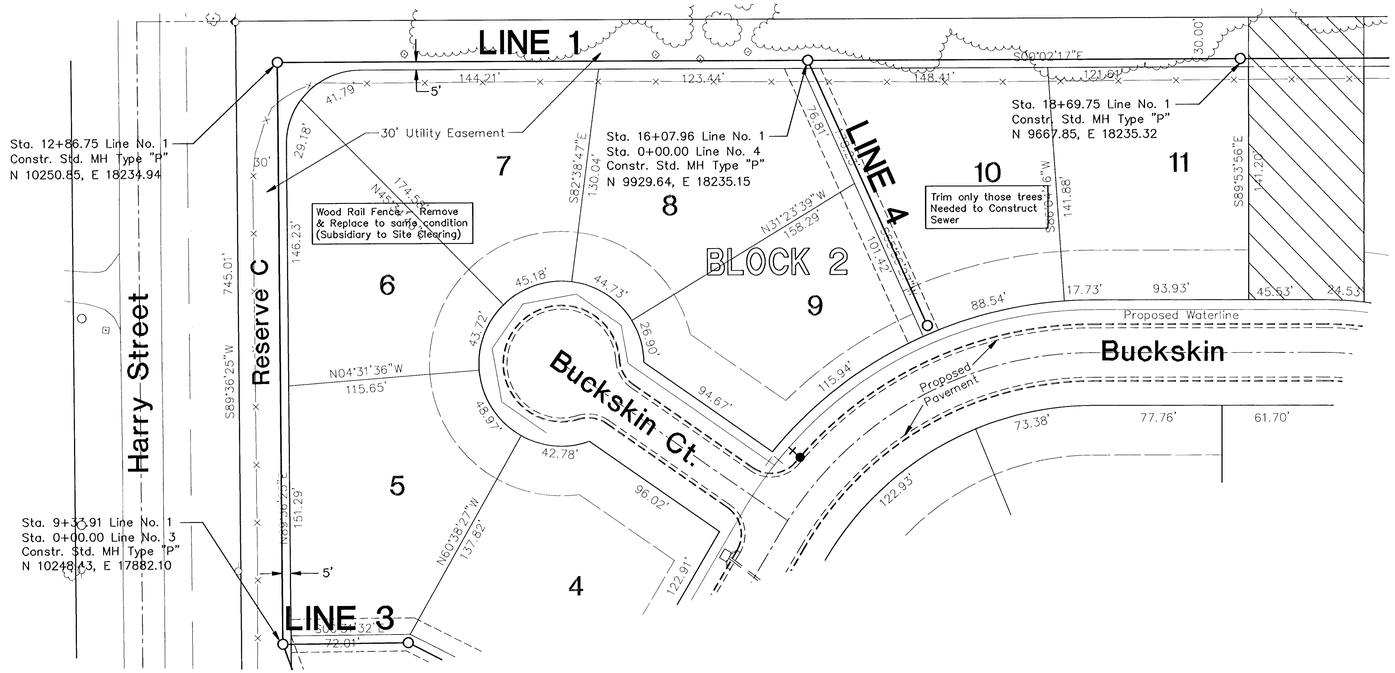

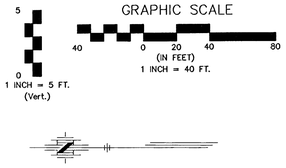

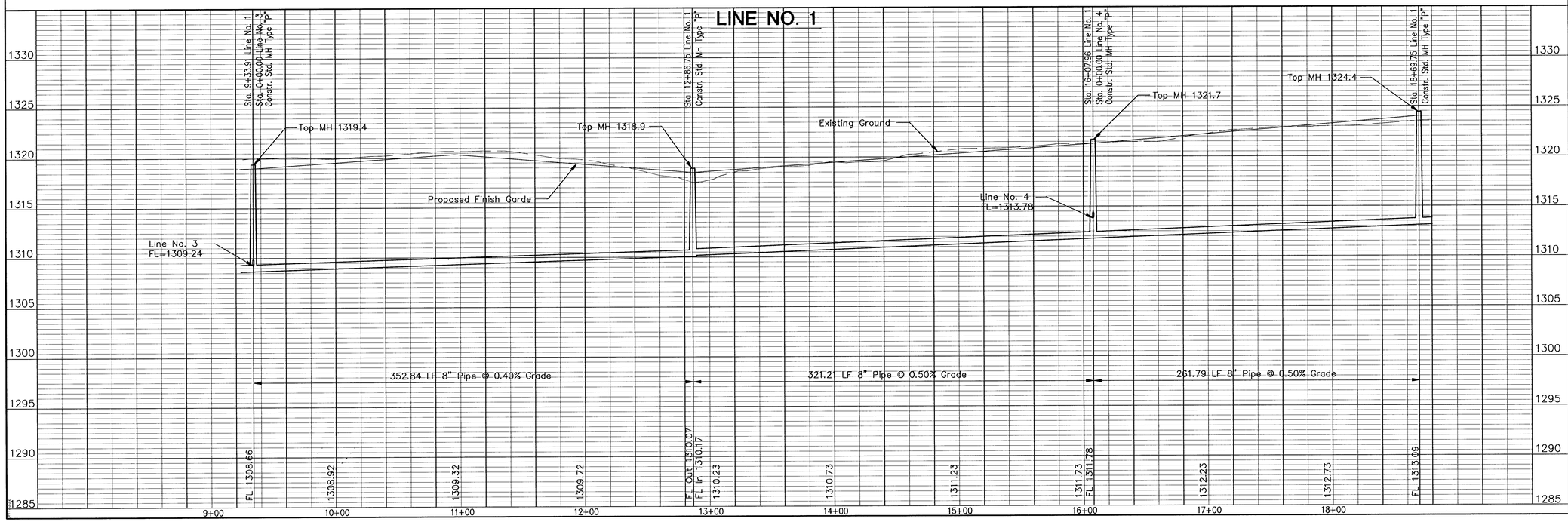

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Drawn By: B. Kulla
Poe Job No.: 1694
Date: November 2001

Sheet
3 of 20

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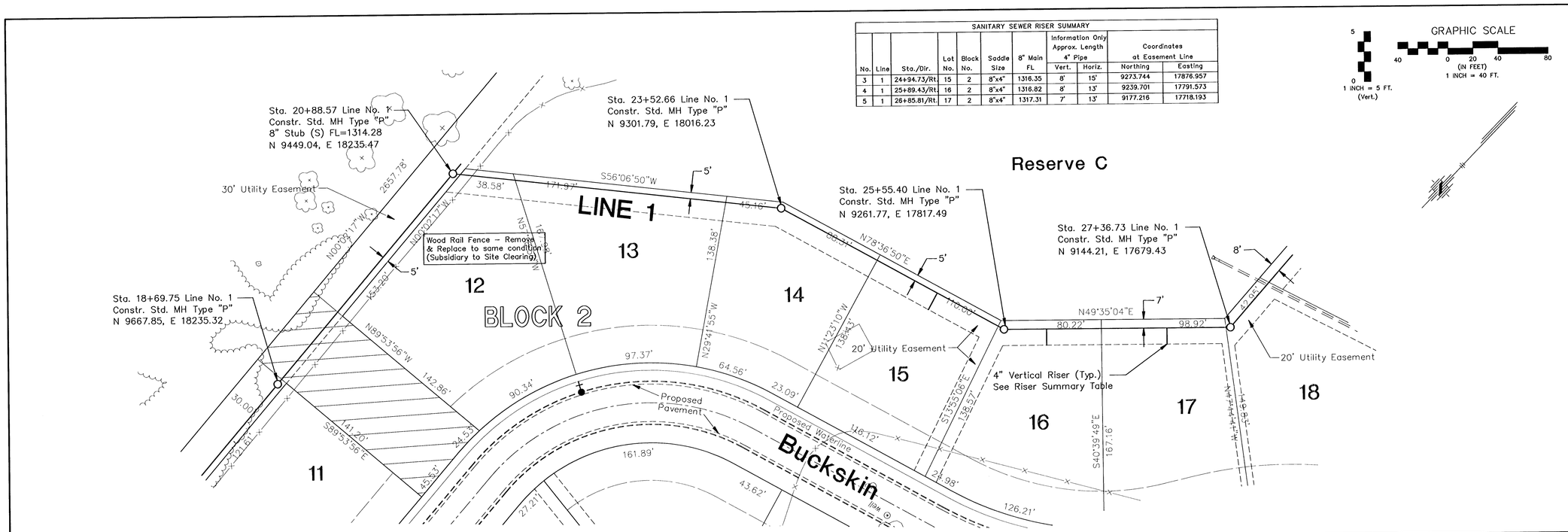
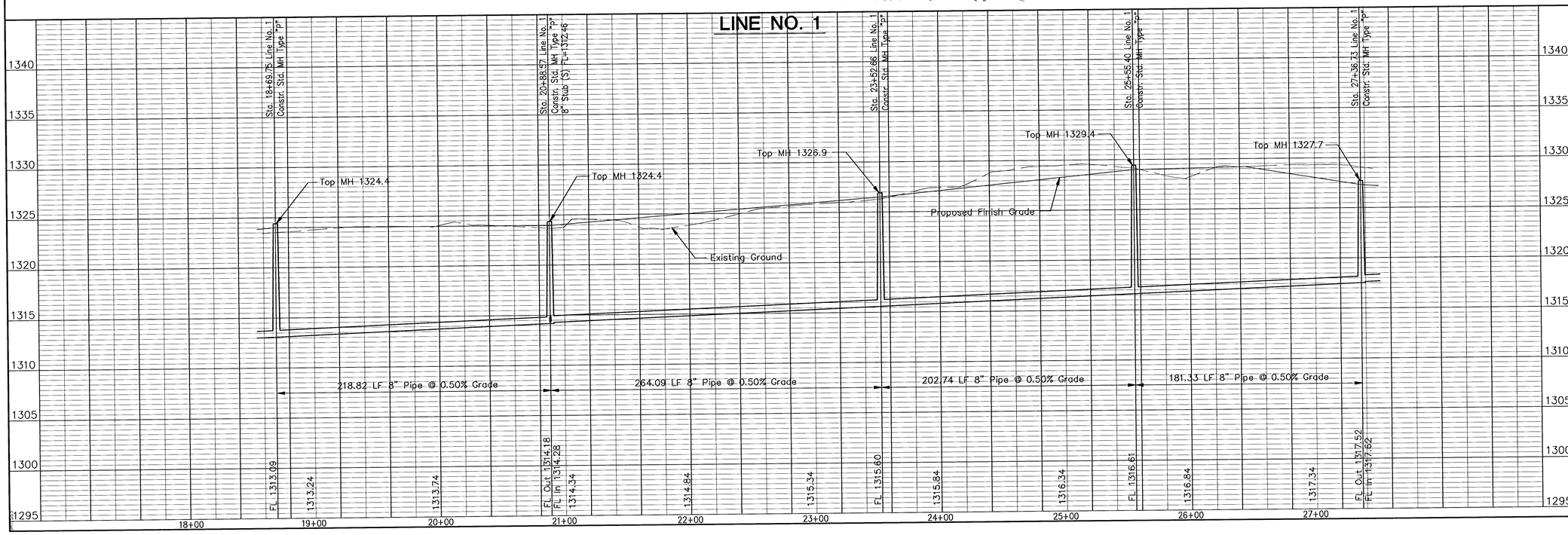
SANITARY SEWER RISER SUMMARY										
No.	Line	Sta./Dir.	Lot No.	Block No.	Saddle Size	8" Main FL	Information Only Approx. Length 4" Pipe Vert.	Information Only Approx. Length 4" Pipe Horiz.	Coordinates at Easement Line Northing	Coordinates at Easement Line Easting
3	1	24+94.73/Rt.	15	2	8"x4"	1316.35	8'	15'	9273.744	17876.957
4	1	25+89.43/Rt.	16	2	8"x4"	1316.82	8'	13'	9239.701	17791.573
5	1	26+85.81/Rt.	17	2	8"x4"	1317.31	7'	13'	9177.216	17718.193





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Date: November 2001

Sheet 4 of 20

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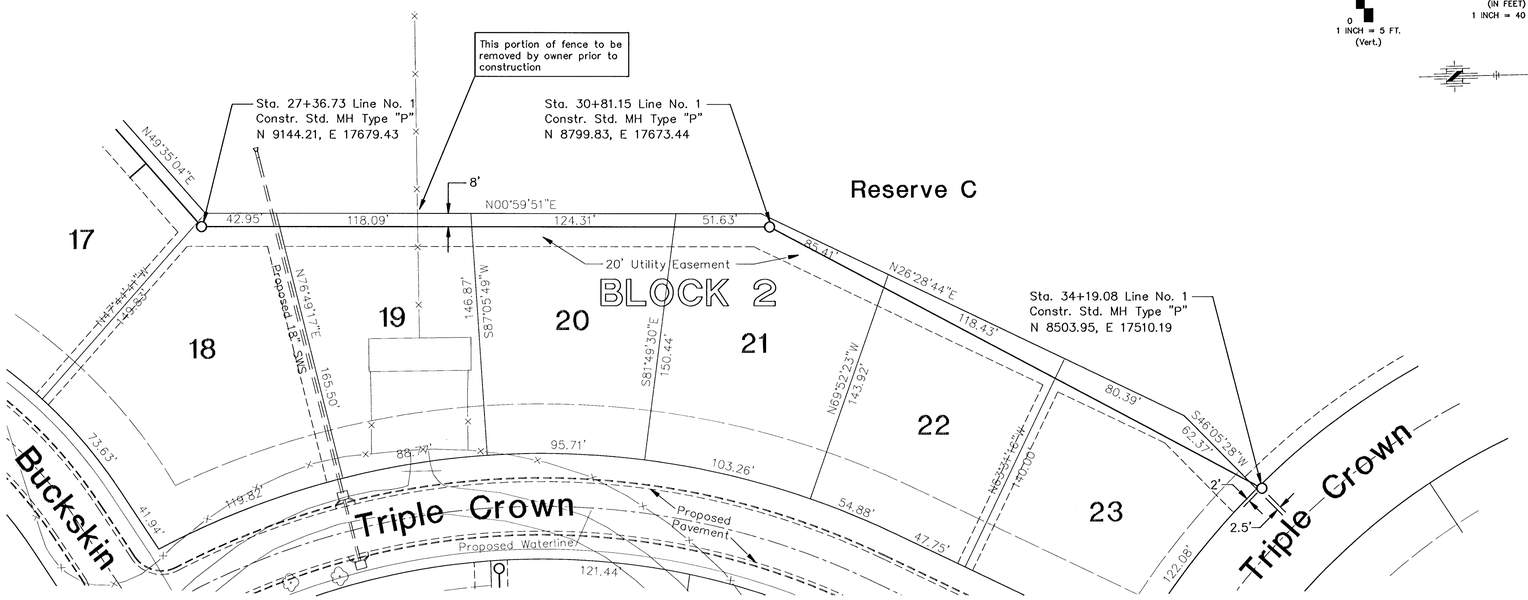

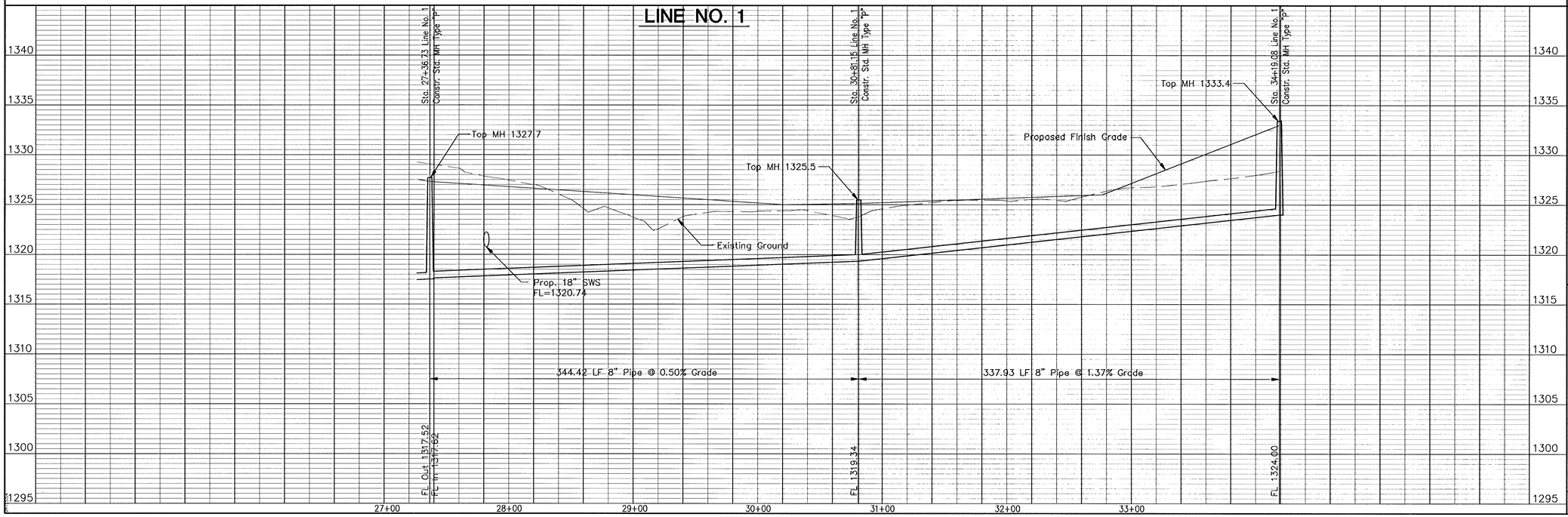

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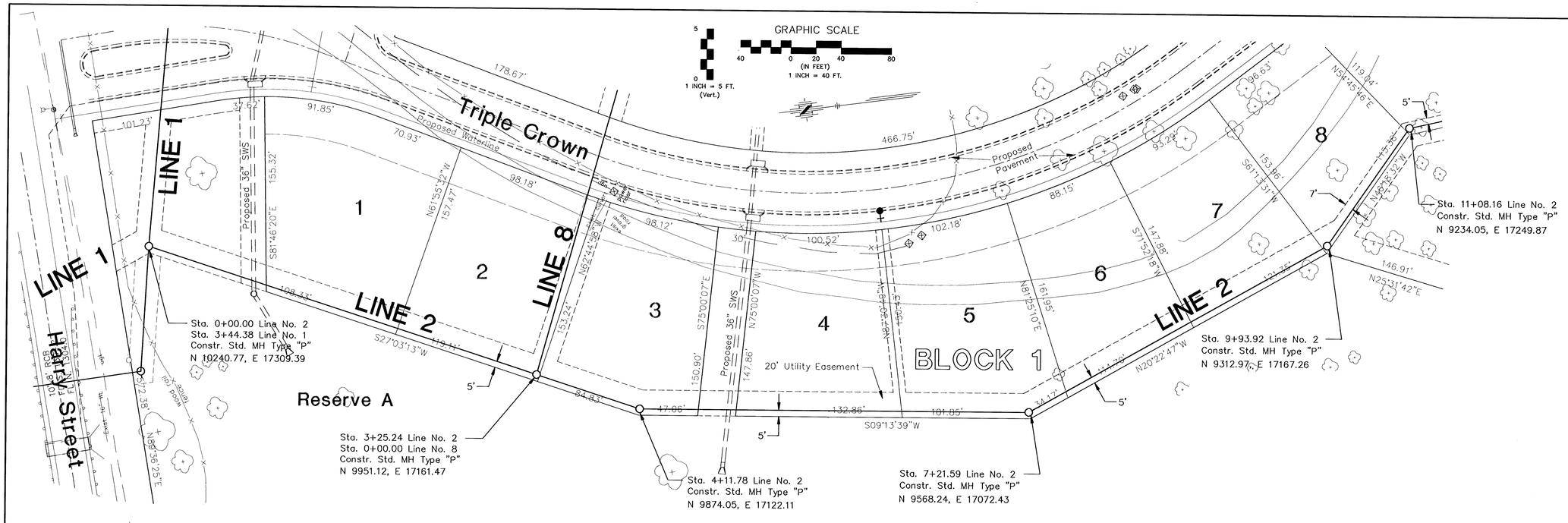

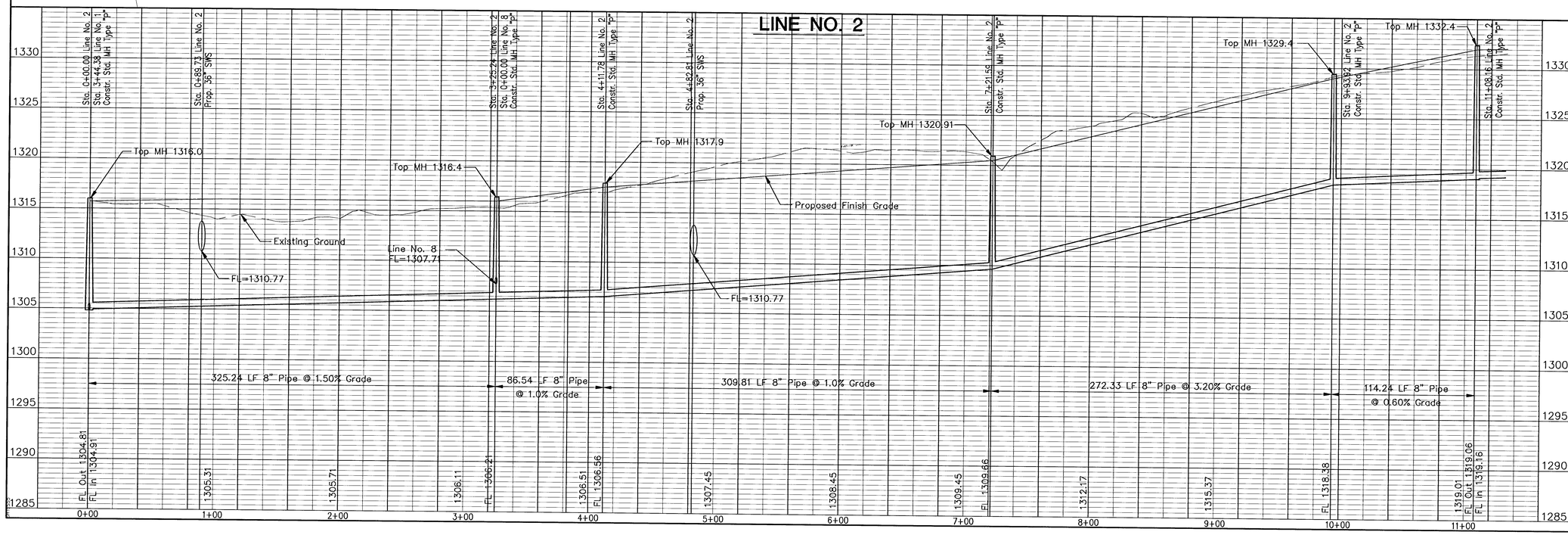

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SANITARY SEWER LINE NO. 2

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Sheet 6 of 20

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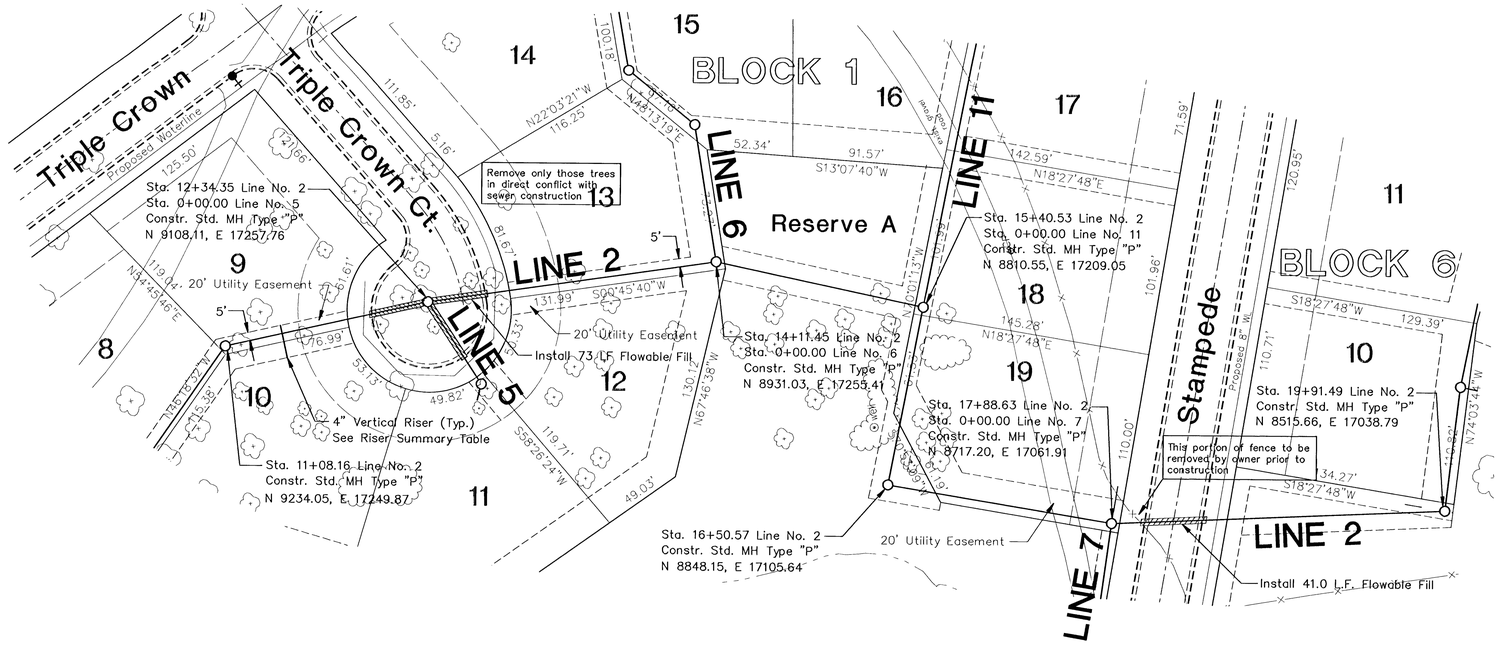


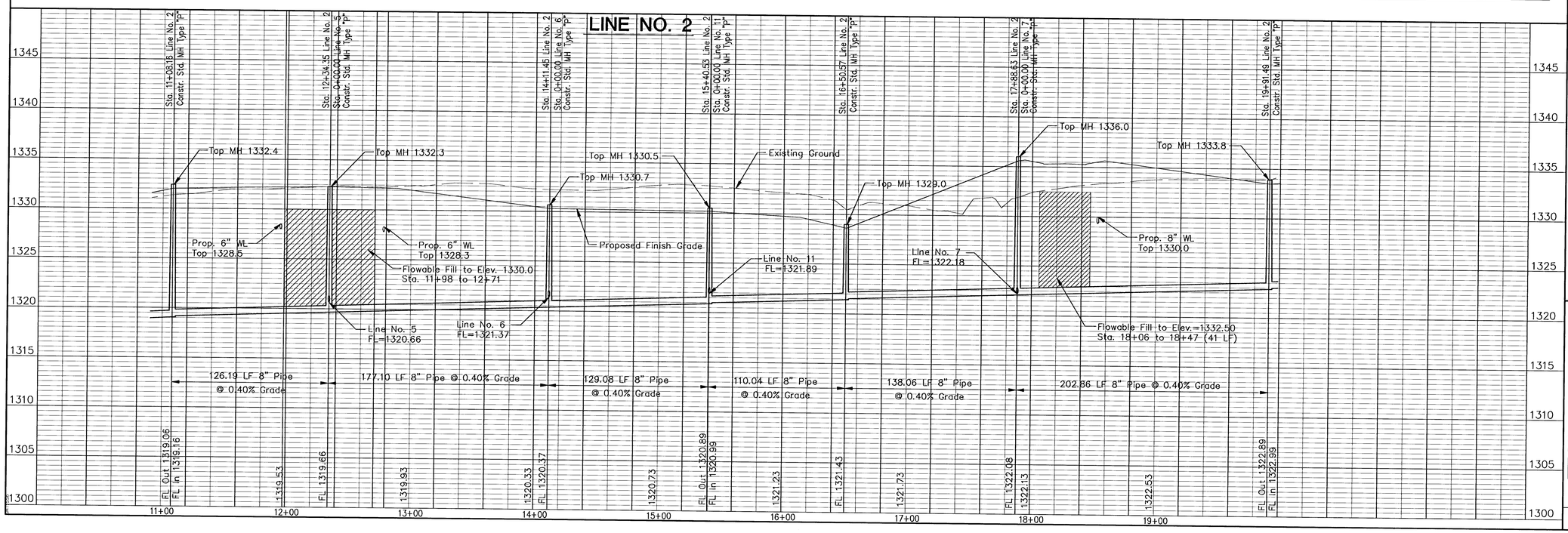
GRAPHIC SCALE

1 INCH = 5 FT. (Vert.)

(IN FEET) 1 INCH = 40 FT.

SANITARY SEWER RISER SUMMARY

No.	Line	Sta./Dir.	Lot No.	Block No.	Saddle Size	8" Main FL	Information Only Approx. Length 4" Pipe Vert.	Horiz.	Coordinates at Easement Line Northing	Easting
7	2	11+43.54/Lt.	9	1	8"x4"	1319.30	8'	5'	9198.734	17252.080
8	2	11+43.54/Rt.	10	1	8"x4"	1319.30	8'	15'	9198.734	17252.080



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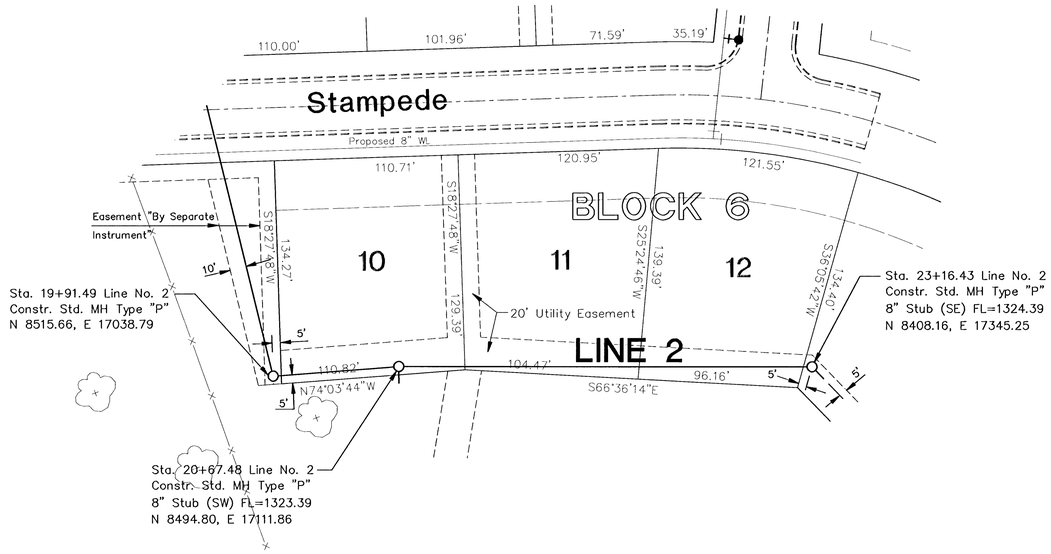

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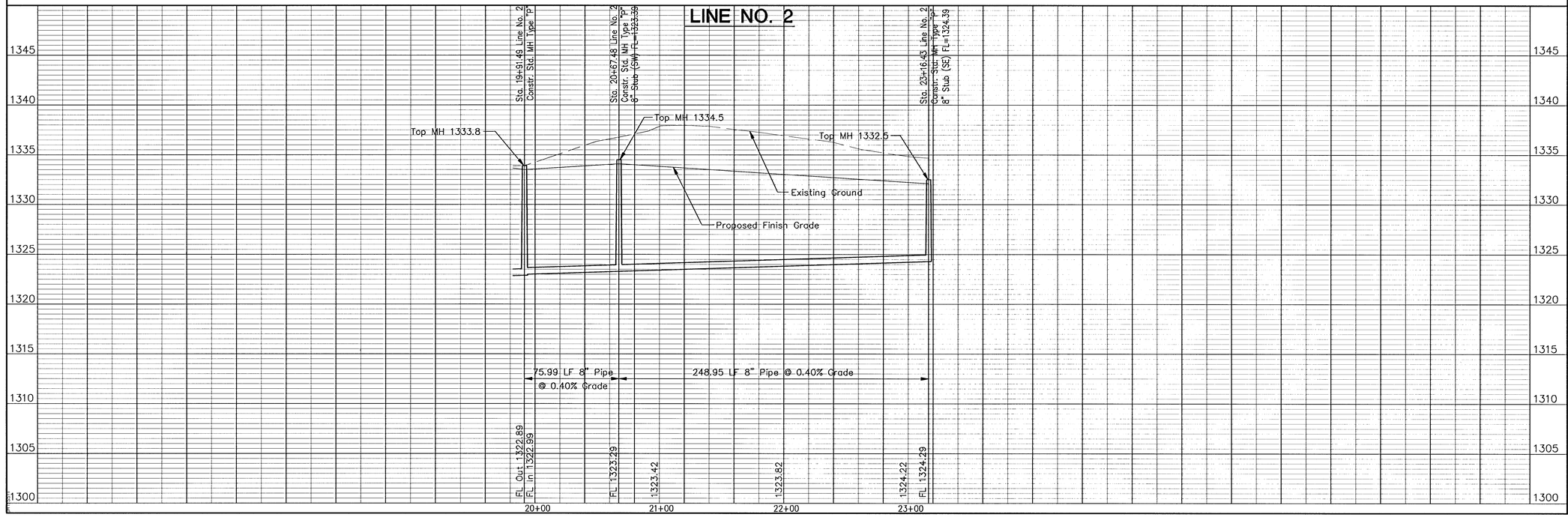

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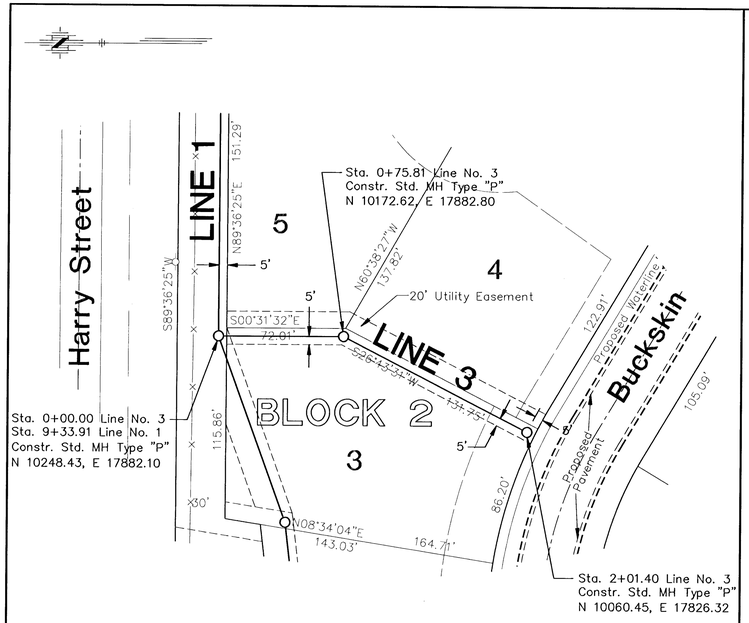

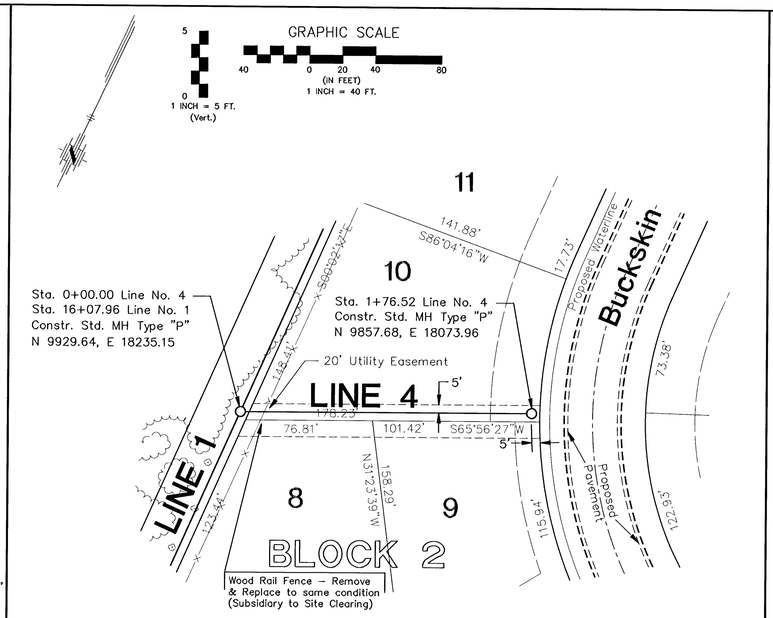

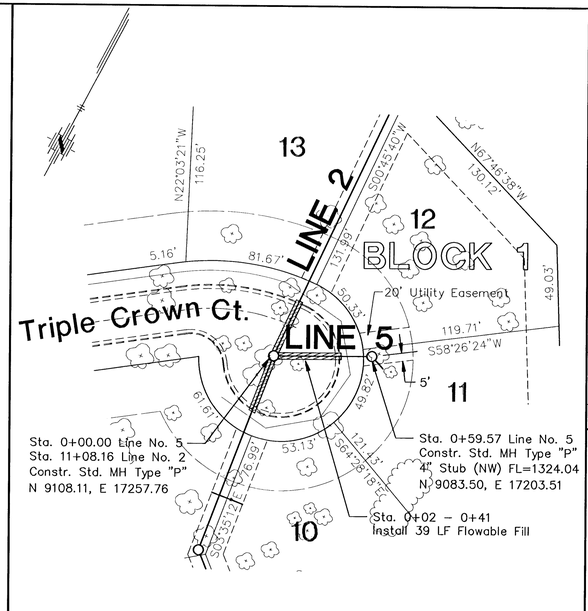

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EQUESTRIAN ESTATES
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MICHAEL E. LINDEBAK, P.E. – CITY ENGINEER
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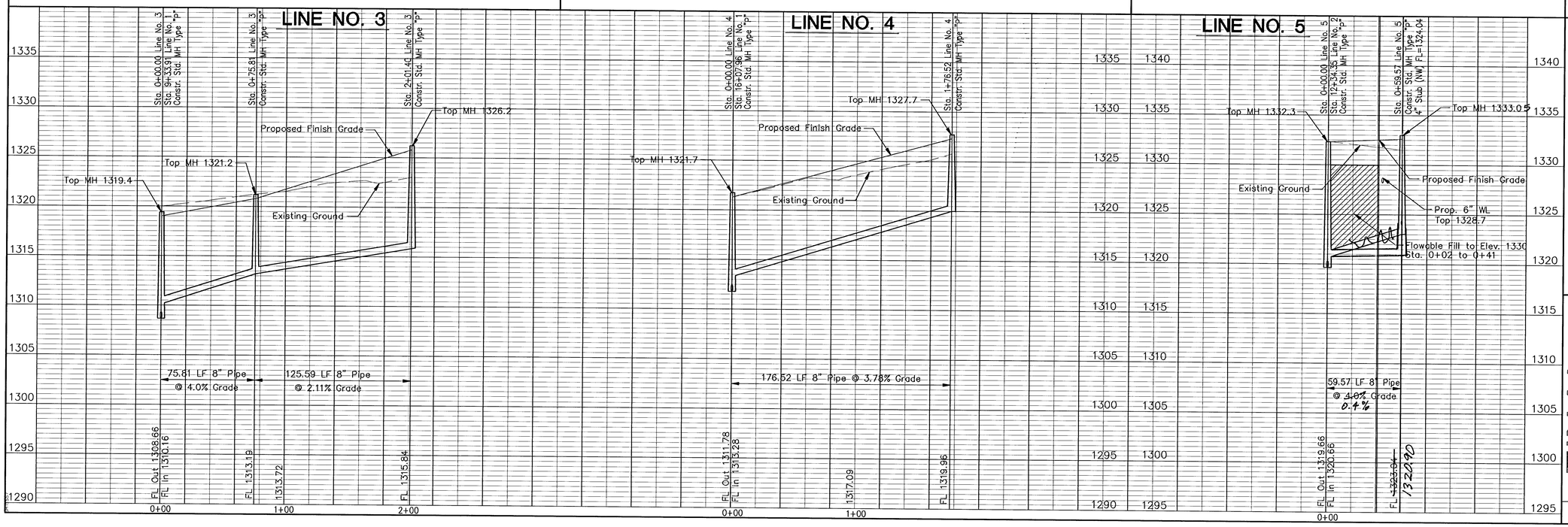

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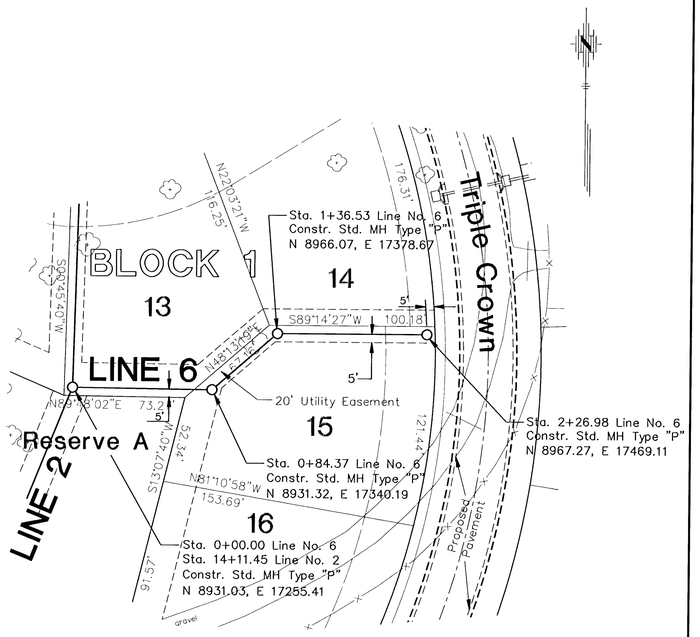

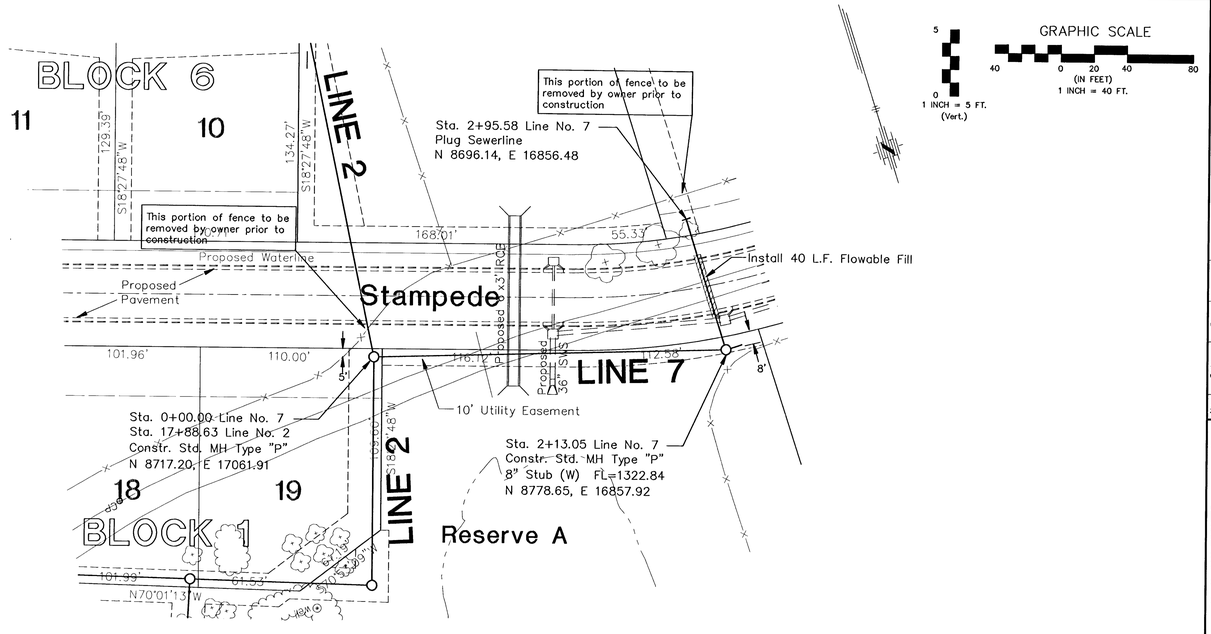

GRAPHIC SCALE

5 0 1 INCH = 5 FT. (Vert.)

40 0 20 40 80 (IN FEET) 1 INCH = 40 FT.

No.	Date	By	Approved	Revision
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EQUESTRIAN ESTATES
SANITARY SEWER LINE NO. 6 & 7
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MICHAEL E. LINDEBAK, P.E. – CITY ENGINEER
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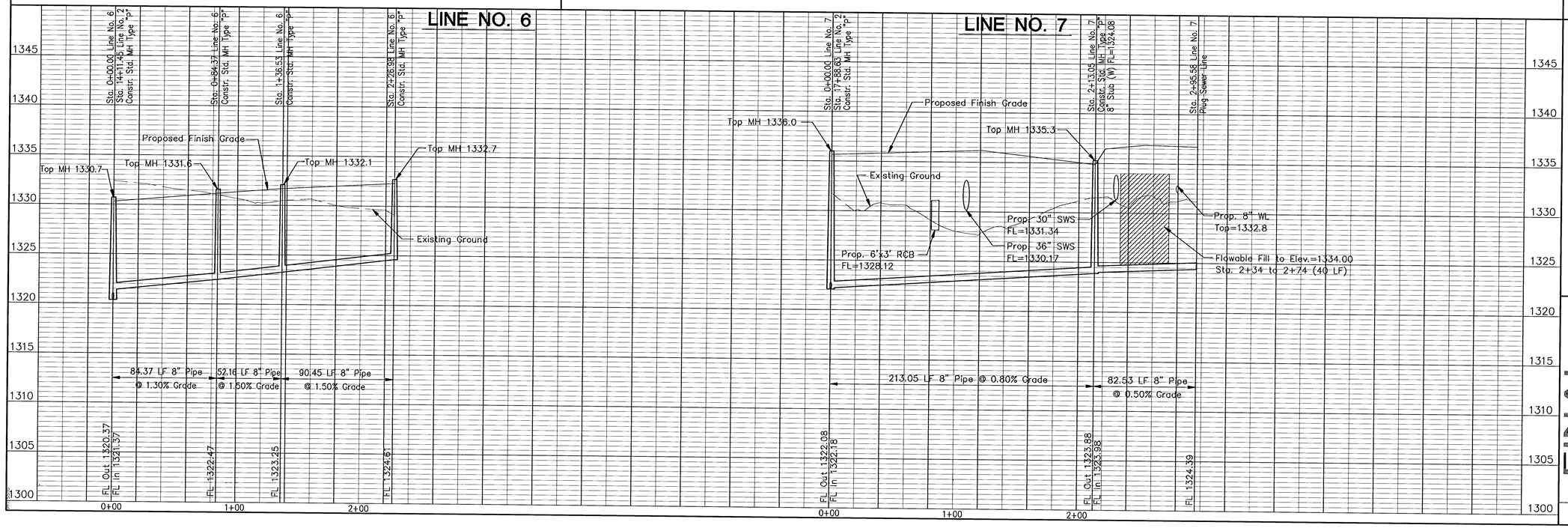

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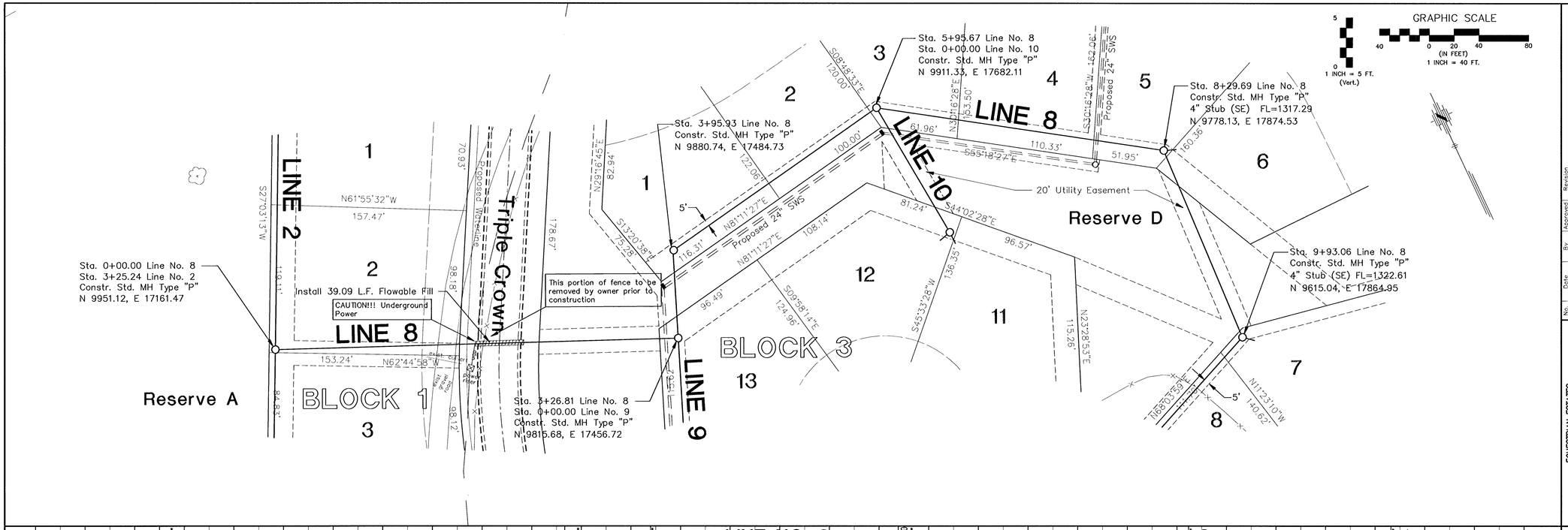

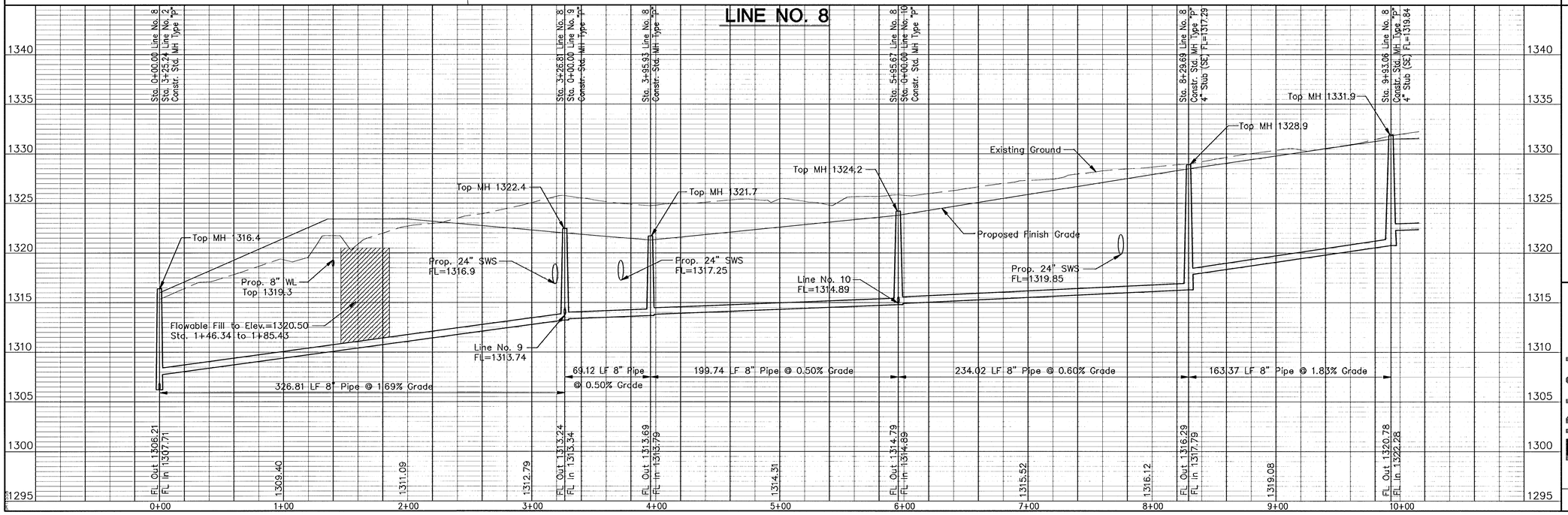

EQUESTRIAN ESTATES
SANITARY SEWER LINE NO. 8
CITY OF WICHITA, KANSAS
MICHAEL E. LINDEBAK, P.E. - CITY ENGINEER
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Sheet 11 of 20

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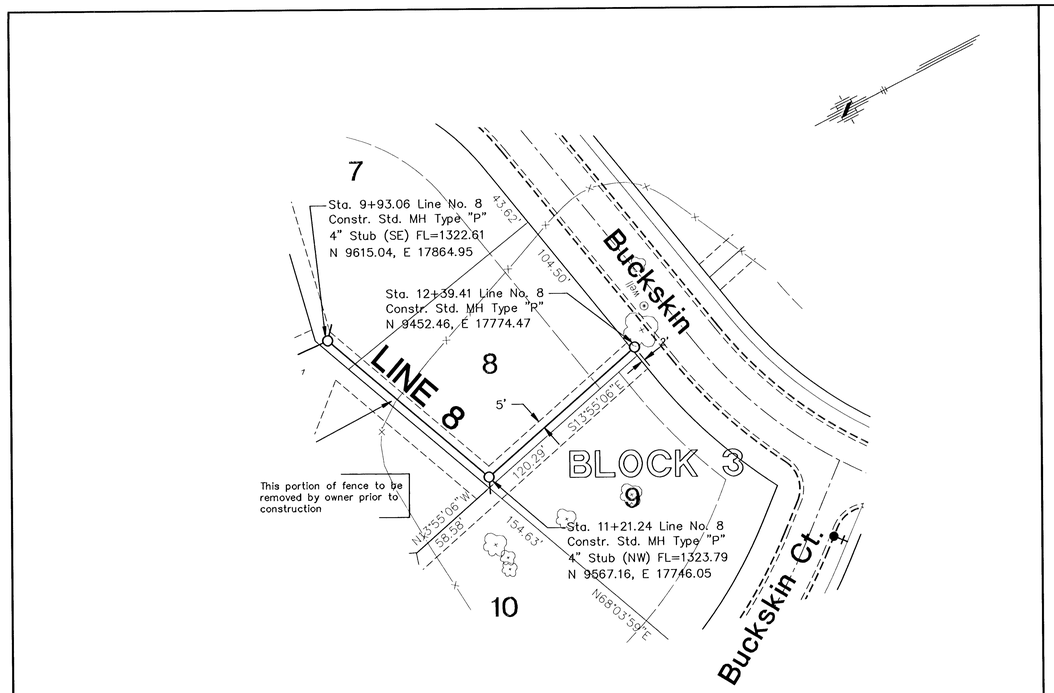

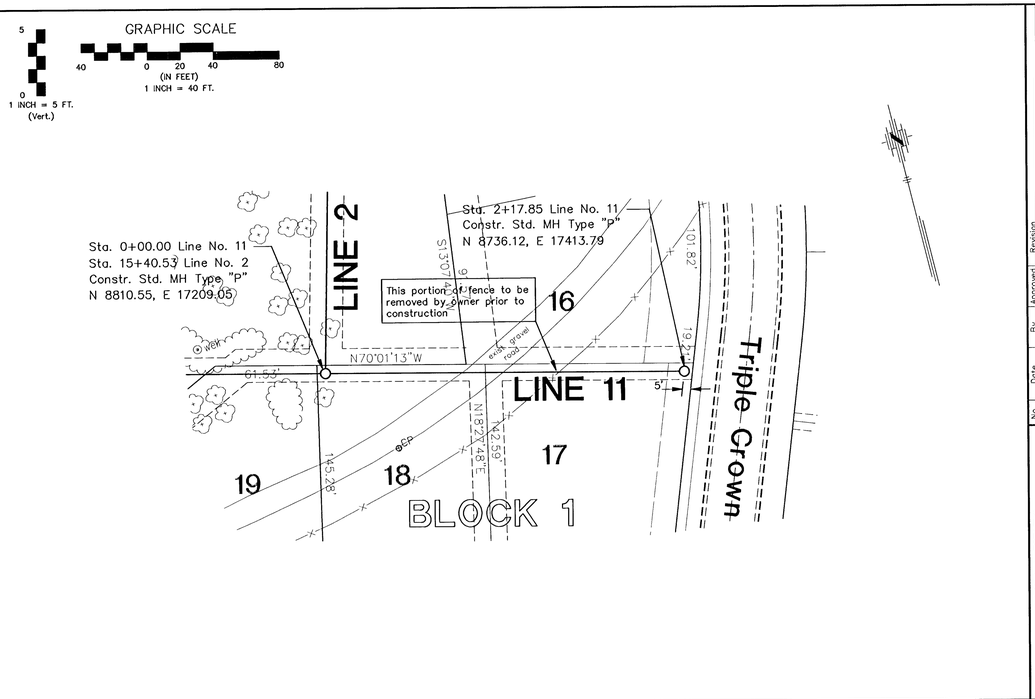

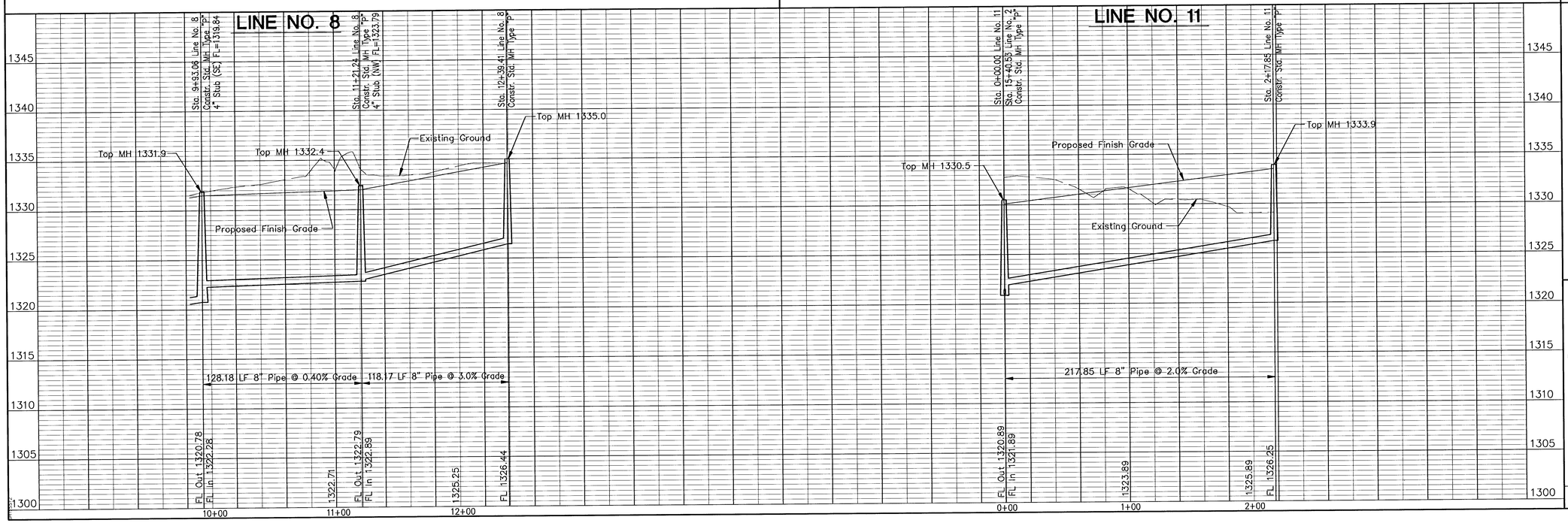

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CITY OF WICHITA, KANSAS
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Sheet 12 of 20

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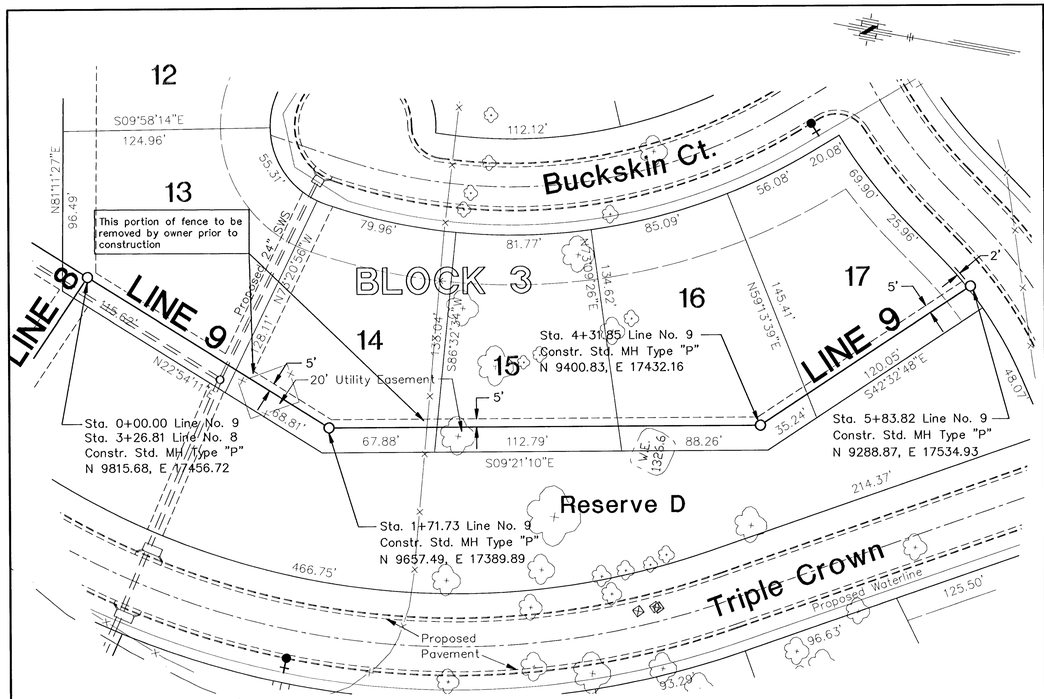

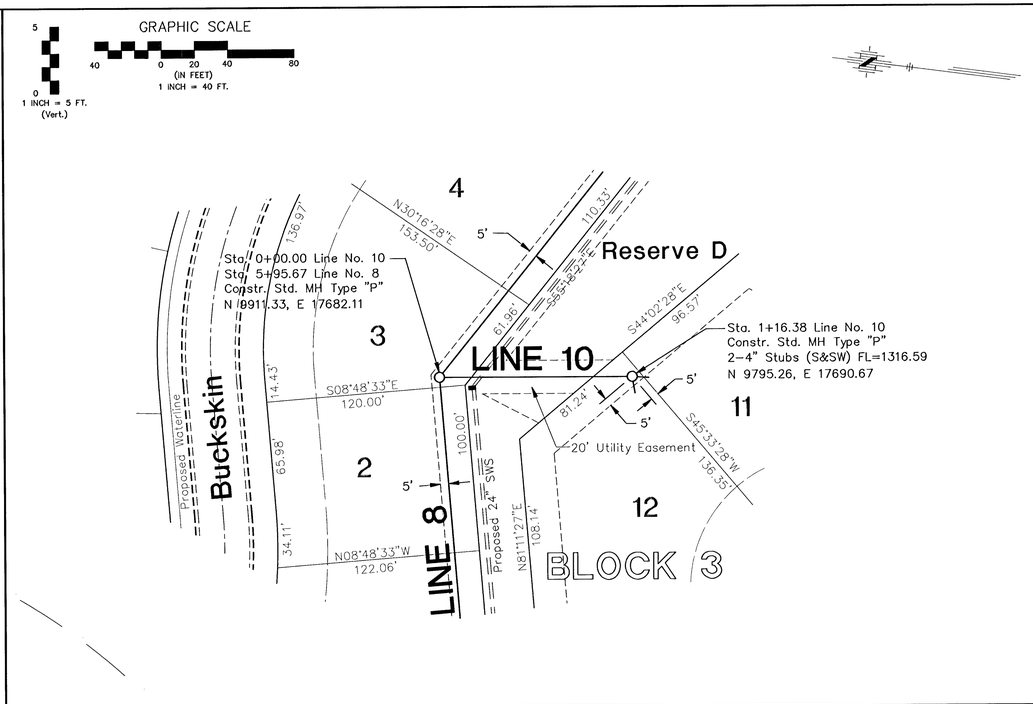

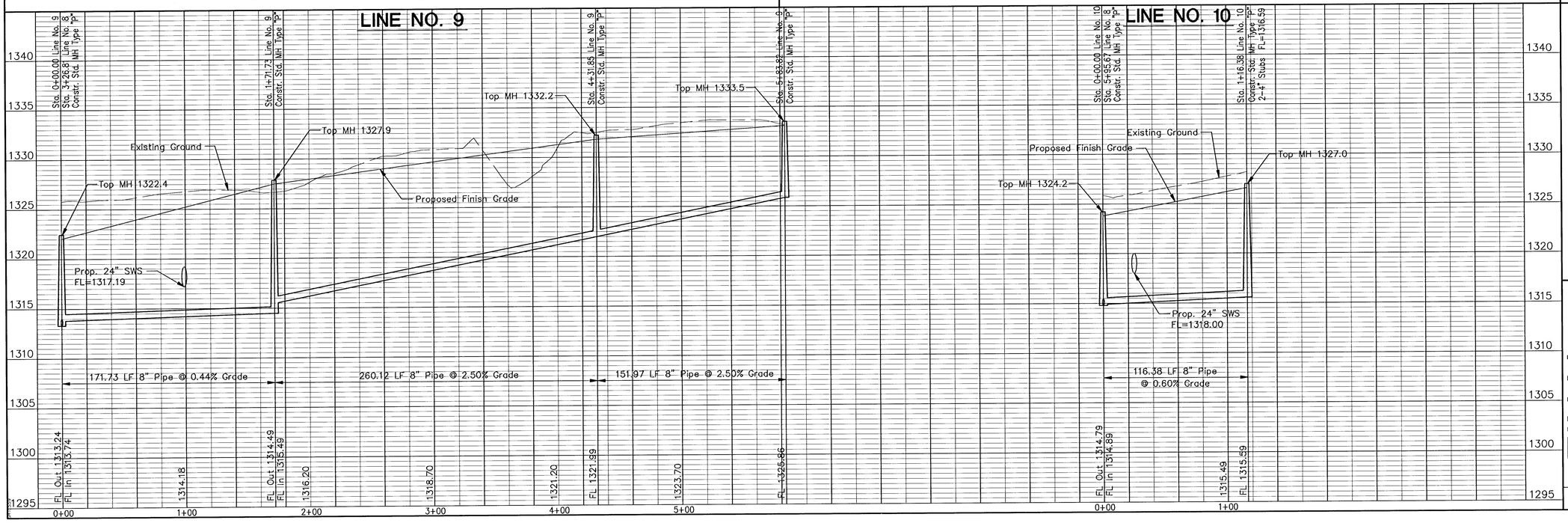

No.	Date	By	Approved	Revision
1				
2				
3				
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EQUESTRIAN ESTATES
SANITARY SEWER LINE NO. 9 & 10
CITY OF WICHITA, KANSAS
MICHAEL E. LINDEBAK, P.E. – CITY ENGINEER
Proj.# 468-83317 O.C.A.# 743896

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS
5940 E. Central, Suite 200 ■ Wichita, KS 67208-4242
Phone 316/685-4114 ■ FAX 316/685-4444

FINAL
Designed By: J. Ubert / B. Kulla
Drawn By: B. Kulla
Poe Job No.: 1694
Date: November 2001
Sheet
13 of 20

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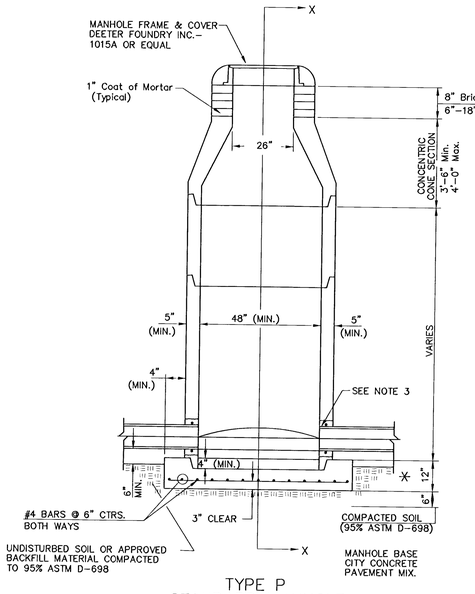
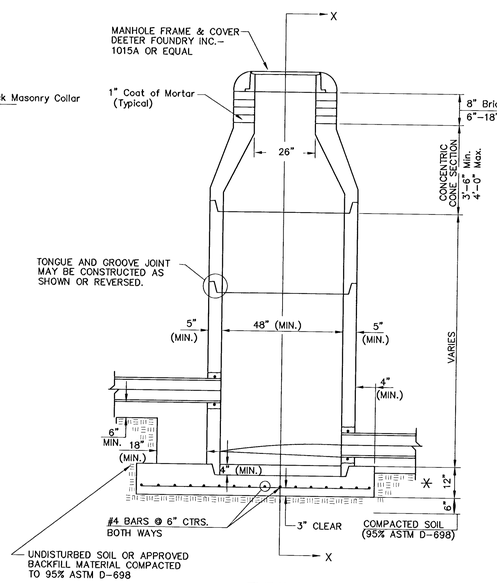
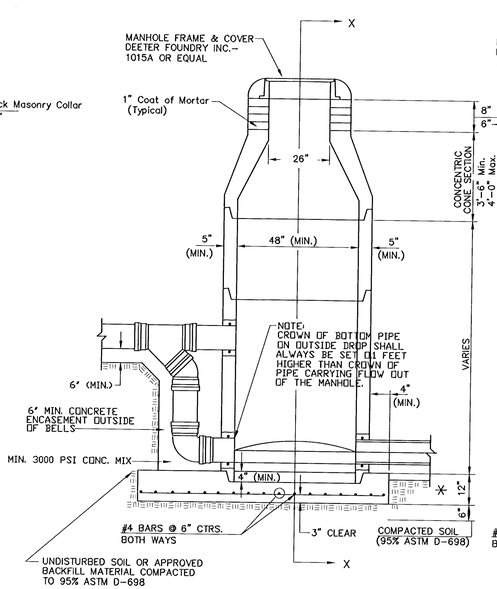
SEWER APPURTENANCES DETAILS



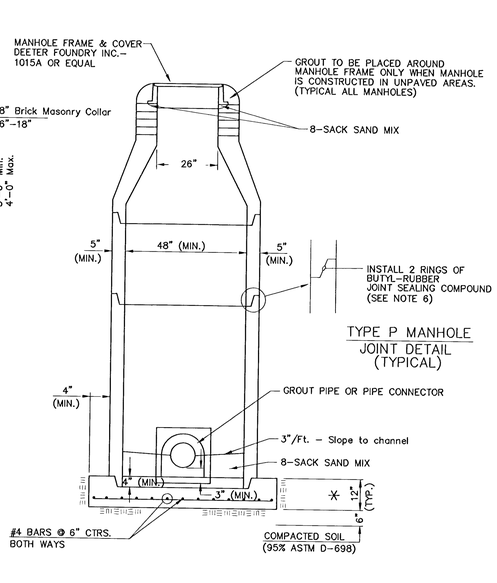
TYPE P
STANDARD MANHOLE



TYPE P
INSIDE DROP MANHOLE



TYPE P
OUTSIDE DROP MANHOLE



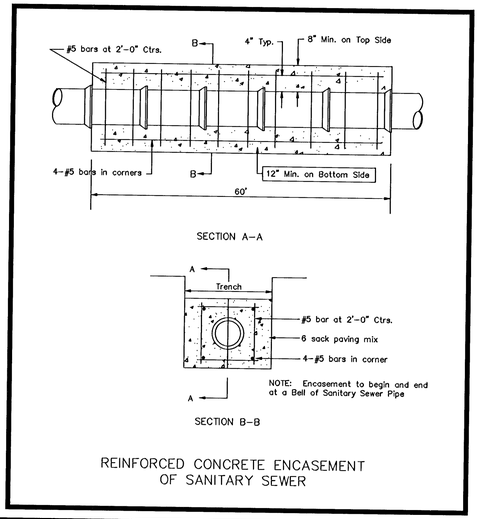
SECTION X
(TYPICAL)

GENERAL NOTES

PRECAST MANHOLE NOTES

1. ALL PRECAST CONCRETE MANHOLE SECTIONS SHALL CONFORM TO THE LATEST REVISIONS OF A.S.T.M. C478 AS MODIFIED BY THE SPECIFICATIONS.
2. NON–SHRINK GROUT SHALL BE NON–METALLIC TYPE.
3. APPROVED FLEXIBLE WATERSTOP GASKETS SHALL BE INSTALLED TO JOIN THE SEWER TO THE MANHOLE WALL WHEN A.B.S. COMPOSITE PIPE OR P.V.C. PIPE IS USED. FOR OTHER TYPES OF PIPE THE SEWER SHALL BE GROUTED IN PLACE WITH NON–SHRINK GROUT. THE SEWER PIPE SHALL BE SUPPORTED WITH CONCRETE ENCASEMENT A MINIMUM OF 3 FEET FROM THE MANHOLE WALL AND TO THE FIRST JOINT FOR V.C.P. SUCH THAT THE JOINT REMAINS FLEXIBLE.
4. ALL INSIDE SURFACES OF THE CONCRETE MANHOLE WHICH WOULD BE EXPOSED TO SEWER GAS SHALL BE COATED WITH 2 COATS TNEMEC SERIES 66 HI–BUILD EPOXOLINE, DRY THICKNESS OF 8 MILS (MIN.)
5. EXTERIOR MANHOLE WALLS SHALL BE COATED WITH 1 COAT MOBILARMA 633 BITUMINOUS COATING.
6. JOINT SEALING COMPOUND SHALL BE KENT SEAL NO. 2 OR APPROVED EQUAL.
7. PRECAST MANHOLES SHALL BE SET AT LEAST 4 INCHES INTO THE MANHOLE BASE.
8. TOP OF MANHOLE FLOOR SLAB SHALL BE AT LEAST 3 INCHES BELOW THE FLOW LINE OF THE OUTLET PIPE TO INSURE SUFFICIENT MINIMUM THICKNESS OF SHAPED INVERT.
9. LIFTING HOLES SHALL BE FILLED WITH NON–SHRINK GROUT AND THE INTERIOR SURFACE COATED AS SPECIFIED.
10. MORTAR USED IN MASONRY CONSTRUCTION SHALL CONTAIN 8 SACKS OF CEMENT PER CUBIC YARD. CONCRETE USED IN MANHOLE BASES SHALL CONFORM TO THE REQUIREMENTS OF CONCRETE FOR CONCRETE PAVEMENT CONSTRUCTION AS SPECIFIED IN THE CITY STANDARD PAVING SPECIFICATIONS USING CITY CONCRETE PAVEMENT MIX WITHOUT AIR ENTRAINING ADMIXTURE. MORTAR SHALL BE PLACED AROUND THE MANHOLE RING AS SHOWN ON THE DRAWINGS WHEN MANHOLES ARE CONSTRUCTED IN UNPAVED AREAS. MANHOLES CONSTRUCTED WHERE PIPE SIZES ARE SMALLER THAN 24" SHALL HAVE AN INSIDE DIAMETER OF 4'. MANHOLES CONSTRUCTED WHERE PIPE SIZES ARE 24" OR LARGER SHALL HAVE AN INSIDE DIAMETER OF 5'. COMPLETED MANHOLE SHALL BE WITHOUT LEAKS AND WATER TIGHT.
11. REINFORCING STEEL SHALL BE INSTALLED IN THE MANHOLE BASES AND SHALL CONSIST OF NO. 4 BARS PLACED ON 6" CENTERS IN BOTH DIRECTIONS. THE MANHOLE BASE REINFORCEMENT SHALL BE PLACED AT LEAST 3" ABOVE THE BOTTOM OF THE MANHOLE BASE. ALL COSTS FOR FURNISHING AND INSTALLING REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE MANHOLE.
12. OPENINGS SHALL BE CUT INTO THE MANHOLE WALL WHEN OUTSIDE DROPS ARE CONSTRUCTED ON EXISTING MANHOLES. SUCH OPENINGS CUT INTO EXISTING MANHOLES SHALL BE AS SMALL AS PRACTICAL TO FACILITATE INSTALLING AND GROUTING THE NEW PIPE IN PLACE. WATERSTOP GASKETS SHALL BE USED WITH P.V.C. AND A.B.S. COMPOSITE PIPE. THE NEW PIPE SHALL BE GROUTED INTO THE OPENING USING AN APPROVED NONSHRINK GROUT FOR THE FULL MANHOLE WALL THICKNESS. THE EXTERIOR OF THE COMPLETED CONNECTION SHALL BE SEALED WITH AN APPROVED BITUMINOUS COATING SUCH THAT THE CONNECTION WILL BE WATER TIGHT. FLOOR OF MANHOLE SHALL BE MODIFIED TO FORM NEW FLOW CHANNEL FOR THE NEW CONNECTION AS INDICATED BY THE DRAWNG. THIS WORK, INCLUDING MODIFICATION OF MANHOLE FLOOR, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR OUTSIDE DROP STACK CONSTRUCTED ON EXISTING MANHOLE.
13. THE FLOORS OF ALL MANHOLES SHALL BE SHAPED WITH FLOW CHANNELS SUCH THAT THE MANHOLES WILL BE SELF CLEANING AND FREE OF AREAS WHERE SOLIDS COULD BE DEPOSITED AS SEWAGE FLOWS THROUGH THE MANHOLE FROM ALL INLET PIPES TO THE OUTLET PIPE. FLOW CHANNELS SHALL BE FORMED TO MATCH THE BOTTOM HALVES OF THE INFLOWING PIPES AND THE OUTFLOWING PIPE AS SHOWN BY THE DRAWINGS EXCEPT FOR INSIDE DROP MANHOLES. FLOW CHANNELS FOR INSIDE DROP MANHOLES SHALL BE CONSTRUCTED AS INDICATED BY THE DRAWING. MANHOLE FLOORS SHALL HAVE SLOPES OF 3 INCHES PER FOOT IN THE AREAS OUTSIDE OF THE FLOW CHANNELS SLOPED TOWARD THE FLOW CHANNELS. PIPES LAID THROUGH MANHOLES SHALL HAVE THE TOP HALF REMOVED TO NEAT LINES FOR THE FULL INSIDE DIAMETER OF THE MANHOLE. MANHOLE FLOORS SHALL THEN BE SHAPED AROUND THE BOTTOM HALF OF THE PIPE WHICH FORMS THE FLOW CHANNEL.
14. PIPES INSTALLED WITHIN THE EXCAVATION MADE FOR THE MANHOLE SHALL BE CRADLED WITH CONCRETE TO THE LIMITS OF THE MANHOLE EXCAVATION. WHEN CLAY PIPE IS USED, THE CRADLE SHALL EXTEND TO THE FIRST JOINT OUTSIDE THE MAHOLE. THE CRADLE SHALL BE TERMINATED AT THE CLAY PIPE JOINT IN A MANNER WHICH WILL MAINTAIN THE FLEXIBILITY OF THE JOINT. COST OF CRADLE WITHIN MANHOLE EXCAVATION OR TO CLAY PIPE JOINTS ADJACENT TO MANHOLE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE MANHOLE.
15. MANHOLE COVER CASTINGS AND MANHOLE FRAME CASTINGS SHALL CONFORM TO THE REQUIREMENTS AS INDICATED IN THE STANDARD SPECIFICATIONS AND AS SHOWN IN THE STANDARD DETAIL DRAWING.
16. THE VERTICAL DROP IN INSIDE DROP MANHOLES SHALL NOT EXCEED 2' FOR INFLOWING PIPES SIZED 12" OR SMALLER AND 2' FOR INFLOWING PIPES LARGER THAN 12". THE CROWNS OF INFLOWING PIPES SHALL NEVER BE SET LOWER THAN THE CROWN OF THE OUTFLOWING PIPE.
17. STANDARD MANHOLES AND STANDARD INSIDE DROP MANHOLES SHALL BE BID AS STANDARD MANHOLES FOR THE TYPE AND DIAMETER INDICATED. OUTSIDE DROP MANHOLES SHALL BE BID AS STANDARD OUTSIDE DROP MANHOLES FOR THE TYPE AND DIAMETER INDICATED. ALL MANHOLE DIAMETERS WILL BE 4' UNLESS INDICATED OTHERWISE.
18. A BRICK MASONRY COLLAR SHALL BE INSTALLED BETWEEN THE CAST IRON FRAME AND THE CONCENTRIC CONE. THE COLLAR WILL HAVE 8" WALLS AND A VERTICAL HEIGHT OF 6" MINIMUM AND 18" MAXIMUM. A 1" COAT OF MORTAR WILL BE PLASTERED ON THE OUTSIDE OF THE COLLAR. THE USE OF PRE–CAST CONCRETE SPACERS FOR MANHOLE TOP ADJUSTMENT IS ALSO ALLOWED.

* 19. ALL MANHOLE BASE CONSTRUCTION THAT OCCURS IN THE FIELD MUST HAVE A MINIMUM OF EIGHT INCHES OF CONCRETE BELOW THE MANHOLE WALL AND THE WALL SECTION SHOULD EXTEND FOUR INCHES INTO THE BASE RESULTING IN A MINIMUM TOTAL BASE THICKNESS OF 12 INCHES. MONOLITHIC BASE SECTIONS CONSTRUCTED IN THE FACTORY AND CURED AS PER ASTM C478 MUST HAVE A MINIMUM EIGHT INCH THICK CONCRETE BASE. BASE SECTIONS CONSTRUCTED IN THE FACTORY UTILIZING A PREVIOUSLY MANUFACTURED MANHOLE WALL SECTION, AS OUTLINED IN THE ABOVE PARAGRAPH, MUST HAVE A MINIMUM BASE THICKNESS OF EIGHT INCHES WITH THE WALL SECTION EXTENDING FOUR INCHES INTO THE BASE AND BE MANUFACTURED IN COMPLIANCE WITH ASTM C478.



REINFORCED CONCRETE ENCASEMENT
OF SANITARY SEWER

No.	Date	By	Approved	Revision

EQUESTRIAN ESTATES
TYPE "P" MANHOLE DETAILS

CITY OF WICHITA, KANSAS
MICHAEL E. LINDEBAK, P.E. – CITY ENGINEER
Proj# 468–83317 O.C.A.# 743896

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS
5940 E. Central, Suite 200 ■ Wichita, KS 67208–4242
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FINAL

Designed By: J. Ubert / B. Kulla
Drawn By: B. Kulla
Poe Job No.: 1694
Date: November 2001

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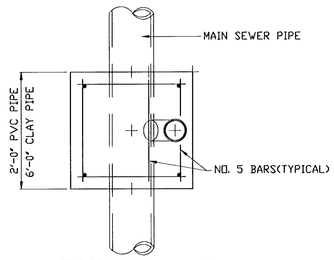
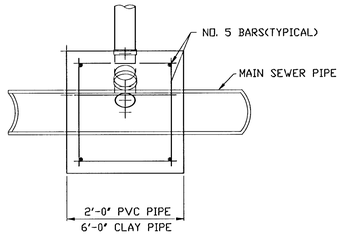
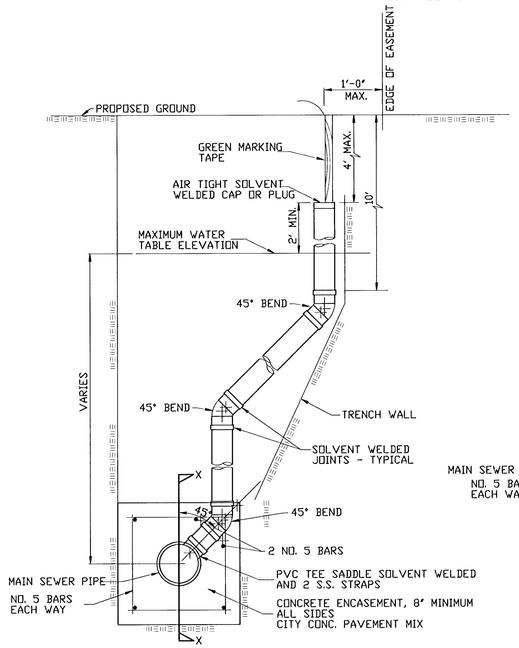
VERTICAL RISER DETAILS
ADOPTED AS STANDARD DESIGN
BY
CITY OF WICHITA, KANSAS
OCTOBER 1992



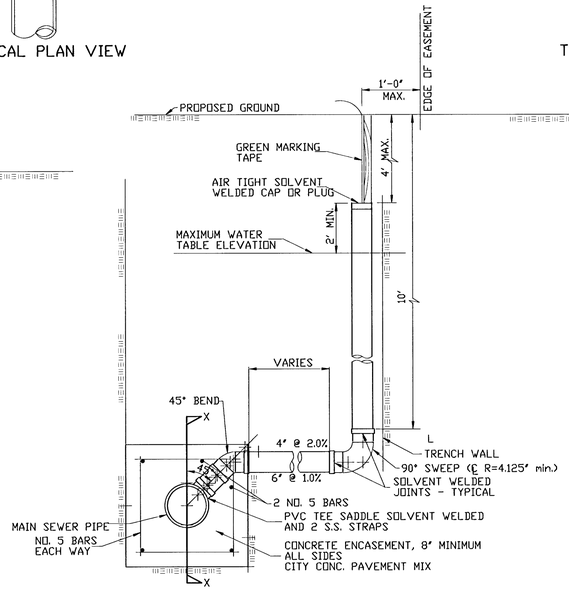
TYPICAL PLAN VIEW



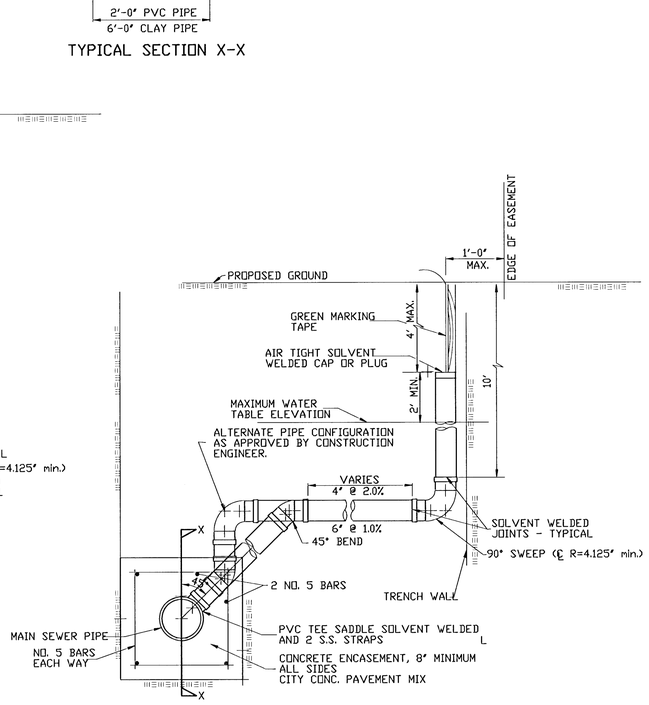
TYPICAL SECTION X-X



METHOD "A"



METHOD "B"



METHOD "C"

NOTE: RISER PIPE REQUIREMENTS AT MANHOLE STUBS SHALL BE SIMILAR TO THOSE SHOWN ABOVE.

GENERAL NOTES

1. RISERS. Risers shall be installed to serve all lots or tracts where the sanitary sewer main is below the water table. Risers shall also be installed to serve all lots and tracts where the sanitary sewer main depth is greater than 12 feet below the proposed ground elevation. Installation of risers because of field conditions shall be as approved by the Construction Engineer. The location of the risers to serve developed property shall be approved by the property owner and the Construction Engineer.

2. PIPE STUBS. Pipe stubs shall be installed in manholes where locations of manholes will provide satisfactory service connection as determined by the Construction Engineer. The vertical distance between the flowline of the manhole pipe stub and the flowline of the sanitary sewer main out of the manhole shall not exceed 2 feet. Risers shall be utilized at manhole pipe stubs as indicated in Note 1. Manhole pipe stubs shall be set such that the top of the stub is not lower than the top of the sanitary sewer main.

3. SIZING. Pipe stubs and risers shall be sized according to the plans and riser table where risers are indicated by the plans. Where risers or pipe stubs are required because of field conditions, the risers and stubs shall be six-inch diameter. For commercial or industrial properties and 4" or 6" diameter for residential properties, based on lot size and sanitary sewer main depth. Sizing of risers and stubs shall be approved by the Construction Engineer prior to installation.

4. RISER OR STUB MATERIAL. Risers and stubs shall be constructed of Schedule 40 PVC Pipe, meeting the requirements of the latest revision of A.S.T.M. . All pipe joints shall be solvent welded,

5. REINFORCED CONCRETE ENCASEMENT. Riser connections to clay pipe sanitary sewers shall be reinforced concrete encased both ways from the riser centerline. The reinforced concrete encasement shall extend three feet from the riser centerline or stop at the first sanitary sewer pipe joint within three feet of the riser centerline. Riser connections to PVC Sanitary Sewer mains shall be reinforced concrete encased one foot each way from the riser centerline. The concrete encasement shall be reinforced using reinforcing steel as shown in the appropriate drawing. The concrete shall conform to the City Standard Specifications for concrete pavement.

6. BEDDING. Bedding around the sanitary sewer riser shall be compacted Pipe Bedding Type 1 or 2. The bedding shall be placed and compacted from the depth of the sanitary sewer main to the top of the sanitary sewer riser pipe. Compacted Pipe Bedding Type 1 or 2 shall be required for all risers whether constructed in vertical wall or sloped wall trenches. Bedding material and construction practices shall be approved by the Construction Engineer prior to installation.

7. SUPPORT OF RISERS. Sanitary sewer riser pipe shall be supported during trench backfill. The riser pipe shall be held in a vertical position at all times until trench backfill and compaction has been completed. Contractor's methods for supporting and backfilling the riser pipe shall be approved by the Construction Engineer.

8. PLUGGING. The ends of the riser pipes and manhole stubs shall be plugged using an airtight solvent welded cap or plug. Cap or plug fittings shall be approved by the Construction Engineer prior to installation. Caps or plugs which do not provide an airtight seal will not be accepted.

9. TOP OF THE RISER PIPE. The top elevation of the sanitary sewer riser pipe shall be built per plan elevations, unless otherwise directed by the Construction Engineer. Where riser elevations are not shown on the plans, the top of the risers shall be set at an elevation four feet below the proposed ground surface. If ground water is encountered, the top of the riser pipe shall be set at an elevation two feet (min.) above the maximum water table elevation, regardless of the riser elevation shown on the plans.

10. MARKING. Locations of the ends of the sanitary sewer riser pipe shall be marked by fastening green colored plastic tape to the end of the riser. The tape shall be supported by a length of wooden 2 x 4, extending from the top of the riser pipe to the proposed ground surface. The green tape shall be visible and extend one foot above the proposed ground surface. The green tape shall be 4 mil Polyethylene film with a minimum width of three inches, specifically manufactured for the purpose of identification of underground sewers.

11. LOCATION MEASURES. The project inspector shall record and document the location of all risers constructed as measured from the nearest manhole, indicating the direction from the manhole, the direction and distance from the main, riser size, and elevation of the top of the riser.

12. RISER LOCATION. The riser shall be located per plan if shown. If not shown on the plan, the riser shall be located at the center of the lot, within one foot of the property side of the easement for the lot being served. All riser locations shall be approved by the Construction Engineer prior to installation.

13. PAYMENT. 'Sanitary sewer risers' shall be paid for at the contract unit price per each, which price shall be full compensation for all pipe, fittings, marking tape, length of wooden 2 x 4, reinforced concrete encasement, support during backfill, backfill, labor, site restoration, and any other items necessary to complete the work.

'Manhole stubs' shall be paid for at the contract unit price per each, which shall be full compensation for all labor, material, and incidentals necessary to complete the work including all pipe, fittings, reinforced concrete encasement, and all other items as required and listed for 'Sanitary Sewer Risers'.

No.	Date	By	Approved	Revision
1				
2				
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EQUESTRIAN ESTATES
VERTICAL RISER DETAIL
CITY OF WICHITA, KANSAS
MICHAEL E. LINDEBAK, P.E. - CITY ENGINEER
Proj.# 468-83317 O.C.A.# 743896

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FINAL

Designed By: J. Ubert / B. Kulla
Drawn By: B. Kulla
Poe Job No.: 1694
Date: November 2001

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LEGEND

20.9 = Proposed Elevation at Lot Corner

= Direction of Flow

= Easement Grading

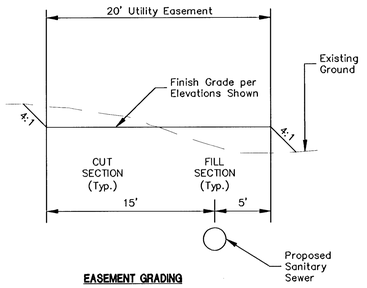
= Waste area (To Elevations Shown)

Staked Hay Bale = Staked Hay Bale Sediment Barrier (See Detail Sheet 17)

EARTHWORK SUMMARY

	Cut (C.Y.)	Fill (C.Y.)
Line No. 1	844	922
Line No. 2	1473	601
Line No. 3	239	110
Line No. 4	4	101
Line No. 5	5	39
Line No. 6	124	143
Line No. 7	75	11
Line No. 8	1043	295
Line No. 9	873	105
Line No. 10	1337	3
Line No. 11	234	343
	6251	2673

(Raw quantities – no shrinkage used)



EASEMENT GRADING
(Typical Section)

NOTE: Easements are to be graded flat, except where noted by differing elevations at edge of easements.

NOTES:

1. Contractor shall grade easements & reserves according to elevations shown. (Cost subsidiary to easement grading.)
2. Contractor shall waste earthwork in shaded areas. (Cost subsidiary to easement grading.)
3. Contractor shall seed all disturbed areas with temporary Rye grass at a rate of 250 lbs per acre. Total area = 5 acres. (Cost subsidiary to Site Clearing/Restoration.)

EASEMENT GRADING PLAN - PHASE I

EQUESTRIAN ESTATES ADDITION

TO WICHITA, SEDGWICK COUNTY, KANSAS

No.	Date	By	Approved	Revision

EQUESTRIAN ESTATES – PHASE 1
SANITARY SEWER IMPROVEMENTS
EASEMENT GRADING PLAN
CITY OF WICHITA, KANSAS
MICHAEL E. LINDSAY, P.E. – CITY ENGINEER
C.O.W. Project # 466-43317 O.C.A. # 743896

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FINAL

Designed By: J. Ubert / J. Dickman
Drawn By: J. Dickman
Poe Job No.: 1694A
Date: November 2001

Sheet 16 of 20

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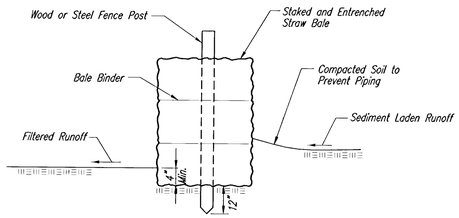


STRAW BALE BARRIERS

Material Specification:

Bale slope barriers may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture.
The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

Placement:

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment.
When practicable, bale slope barriers should be placed along contours to avoid a concentration of flow.
Bale slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

Proper installation method:

Excavate a trench the length of the planned slope barrier that is 4" deep and a bale's width wide. Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use.
Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.
Once all the bales have been installed and anchored, place the excavated soil against the upslope side of the check and compact it. The compacted soil should be no more than 3" to 4" deep.

List of common placement/installation mistakes to avoid:

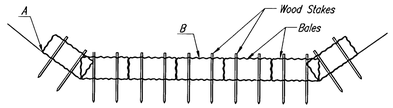
When practicable, do not place bale slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. Concentrated flow over a slope barrier creates a scour hole on the downslope side of the barrier. The scour hole eventually undermines the bales and the barrier fails.
Do not place bale slope barriers in areas with shallow soils underlain by rock. If the barrier is not anchored sufficiently, it will wash out.
Bale slope barriers must be dug into the ground. Bales at ground level do not work because they allow water to flow under the barrier.

Inspection and Maintenance:

Bale slope barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

Are there any points along the slope barrier where water is concentrating?
Does water flow under the slope barrier?
Does water flow through spaces between abutting bales?
Are any bales dislodged?
Are bales decomposing due to age and/or water damage?
Does sediment need to be removed from behind the slope barrier?

NOTE: Point A must be higher than Point B so that water flows over the bales and not around them.



STRAW BALE DITCH CHECKS

Material Specification:

Bale ditch checks may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture.
The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.
Optional: The downstream scour apron should be constructed of a double-netted straw erosion-control blanket at least 6' wide.
Optional: The metal landscape staples used to anchor the erosion-control blanket should be at least 8" long.

Placement:

Bale ditch checks should be placed perpendicular to the flowline of the ditch.
The ditch check should extend far enough so that the ground level at the ends of the check is higher than the top of the lowest center bale. This prevents water from flowing around the check.
Checks should not be placed in ditches where high flows are expected. Rock checks should be used instead.
Bales should be placed in ditches with slopes of 6% or less. For slopes steeper than 6%, rock checks should be used.
The following table provides check spacing for a given ditch grade:

Ditch Check Spacing

Ditch grade (%)	Check Spacing (feet)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

Proper installation method:

Excavate a trench perpendicular to the ditch flowline that is 4" deep and a bale's width wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on the upstream side of the trench–it will be used later.
Optional: On the downstream side of the trench, roll out a length of erosion-control blanket (scour apron) equal to the length of the trench. Place the upstream edge of the erosion-control blanket along the bottom upstream edge of the trench. The erosion control blanket should be anchored in the trench with one row of 8" landscape staples placed on 18" centers. The remainder of the erosion-control blanket (the portion that is not lying in the trench) will serve as the downstream scour apron. This section of the blanket should be anchored to the ground with 8" landscape staples placed around the perimeter of the blanket on 18" centers. The remainder of the blanket should be anchored using two evenly spaced rows of 8" landscape staples on 18" centers placed perpendicular to the flowline of the ditch.
Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.
Once all the bales have been installed and anchored, place the excavated soil against the upstream side of the check and compact it. The compacted soil should be no more than 3" to 4" deep and extend upstream no more than 24".

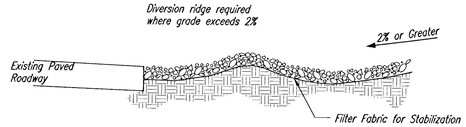
List of common placement/installation mistakes to avoid:

Do not place a bale ditch check directly in front of a culvert outlet. It will not stand up to the concentrated flow.
Do not place bale ditch checks in ditches that will likely experience high flows. They will not stand up to concentrated flow.
Follow prescribed ditch-check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks.
Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the check is higher than the top of the lowest center bale.
Do not place bale ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.
Bale ditch checks must be dug into the ground. Bales at ground level do not work because they allow water to flow under the check.

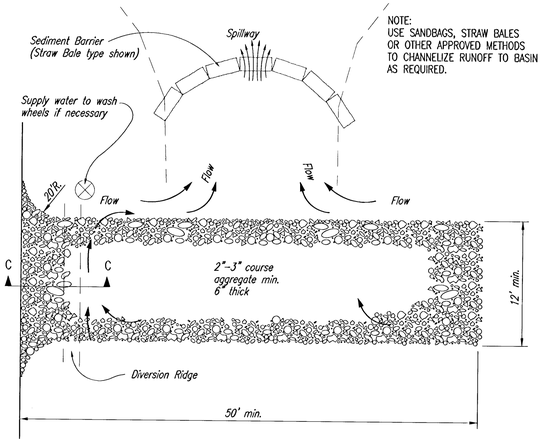
Inspection and Maintenance:

Bale ditch checks should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

Does water flow around the ditch check?
Does water flow under the ditch check?
Does water flow through spaces between abutting bales?
Are any bales and/or scour aprons (optional) dislodged?
Are bales decomposing due to age and/or water damage?
Does sediment need to be removed from behind the ditch check?



SECTION C-C



NOTE:
USE SANDBAGS, STRAW BALES OR OTHER APPROVED METHODS TO CHANNELIZE RUNOFF TO BASIN AS REQUIRED.

STABILIZED CONSTRUCTION ENTRANCE

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABLIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN, AS SHOWN ABOVE.
4. DRIVE ENTRANCES ONTO RESIDENTIAL LOTS WILL NOT BE REQUIRED TO HAVE THE SEDIMENT BARRIER SHOWN, BUT WHEEL WASHING MAY BE REQUIRED IF STABILIZED ENTRANCE IS NOT SUFFICIENT TO KEEP MUD FROM BEING TRACKED ONTO ADJACENT STREET. ENTRANCE SHALL EXTEND FROM BACK OF CURB TO DWELLING.

No.	Date	By	Approved	Revision
1				
2				
3				
4				

EQUESTRIAN ESTATES - PHASE 1
SANITARY SEWER IMPROVEMENTS
SOIL EROSION BMP DETAILS
CITY OF WICHITA, KANSAS
MICHAEL E. LINDEBAK, P.E. - CITY ENGINEER
Proj# 468-83317 O.C.A.# 743896

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS
5940 E. Central, Suite 200 ■ Wichita, KS 67208-4242
Phone 316/685-4111 ■ FAX 316/685-4444

FINAL

Designed By: J. Ubert / J. Dickman
Drawn By: J. Dickman
Poe Job No.: POE Project #1694
Date:

CITY OF WICHITA

SOIL EROSION BMP DETAILS

CHRISTOPHER M. CARRIER, P.E.
STORM WATER ENGINEER

PROJECT NUMBER	OCA NO.
468-83317	743896

DATE: MAY 2001

Sheet 17 of 20

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Scale 1" = 150'

COORDINATE POINTS LIST		
POINT #	NORTHING	EASTING
2, 538	7, 662. 418	15, 615. 996
2, 539	7, 670. 464	16, 938. 392
1, 007	7, 678. 243	18, 261. 644
1, 001	10, 336. 235	18, 259. 974
2, 546	10, 317. 973	15, 628. 839
300	10, 276. 022	18, 259. 919
301	10, 266. 300	16, 842. 555
302	10, 270. 226	17, 414. 926
303	10, 270. 912	17, 514. 923
304	10, 242. 402	17, 515. 119
305	10, 168. 996	17, 415. 620
306	10, 078. 463	17, 475. 619
307	10, 022. 056	17, 444. 188
308	10, 045. 015	17, 383. 688
309	9, 897. 509	17, 300. 981
310	9, 866. 208	17, 356. 805
311	9, 418. 822	17, 352. 720
312	9, 388. 546	17, 296. 334
313	9, 192. 842	17, 401. 415
314	9, 229. 957	17, 454. 128
315	9, 173. 358	17, 484. 398
316	9, 141. 511	17, 428. 787
317	9, 081. 445	17, 334. 436
318	9, 127. 508	17, 298. 790
319	9, 057. 989	17, 252. 197
320	8, 727. 559	17, 486. 613
321	8, 756. 094	17, 429. 326
322	8, 611. 826	17, 357. 463
323	8, 582. 915	17, 414. 563
324	9, 195. 879	17, 519. 774
325	9, 249. 867	17, 485. 404
326	9, 309. 385	17, 549. 226
327	9, 330. 263	17, 564. 663
328	9, 271. 335	17, 600. 666
329	9, 292. 212	17, 616. 123
330	9, 381. 346	17, 612. 163
331	9, 396. 735	17, 599. 272
332	9, 414. 952	17, 659. 672
333	9, 433. 979	17, 643. 733
334	9, 621. 827	17, 575. 575
335	9, 680. 051	17, 522. 509
336	9, 450. 242	17, 753. 331
337	9, 387. 502	17, 765. 966
338	9, 419. 916	17, 926. 925
339	9, 482. 656	17, 914. 290
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341	9, 617. 583	18, 089. 046
342	9, 757. 042	18, 089. 292
343	9, 757. 155	18, 025. 293
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347	10, 062. 544	18, 004. 420
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349	10, 045. 740	17, 843. 361
350	9, 990. 468	17, 811. 096
351	10, 016. 382	17, 674. 381
352	10, 079. 627	17, 664. 579
353	10, 067. 313	17, 585. 122
354	10, 004. 068	17, 594. 923
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366	8, 602. 857	15, 921. 562
367	8, 595. 117	15, 877. 284
368	8, 590. 432	15, 820. 410
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370	8, 676. 117	16, 231. 984
371	8, 731. 614	16, 200. 108
372	8, 717. 453	16, 175. 452
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374	9, 103. 987	16, 141. 175
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COORDINATE POINTS LIST		
POINT #	NORTHING	EASTING
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382	8, 710. 650	16, 731. 714
383	8, 709. 934	16, 806. 764
384	8, 773. 931	16, 807. 374
385	8, 772. 794	16, 835. 333
386	8, 750. 814	16, 945. 443
387	8, 690. 109	16, 925. 174
388	8, 624. 239	17, 324. 542
389	8, 563. 533	17, 304. 273
390	8, 106. 172	17, 630. 667
391	8, 117. 702	17, 567. 714
392	7, 885. 954	17, 590. 333
393	7, 891. 010	17, 526. 194
394	7, 833. 848	17, 516. 131
395	7, 828. 235	17, 580. 005
396	7, 739. 088	17, 573. 413
397	7, 738. 797	17, 509. 413
398	7, 673. 823	17, 509. 708
399	7, 674. 199	17, 573. 707
400	8, 487. 174	16, 727. 823
401	8, 488. 288	16, 663. 833
402	8, 274. 489	16, 601. 148
403	8, 240. 874	16, 655. 609
404	8, 155. 174	16, 602. 712
405	8, 188. 790	16, 548. 251
406	7, 894. 483	16, 521. 185
407	7, 917. 601	16, 580. 863
408	7, 862. 880	16, 602. 062
409	7, 839. 762	16, 542. 383
410	7, 760. 935	16, 557. 303
411	7, 761. 226	16, 621. 302
412	7, 668. 148	16, 557. 724
413	7, 668. 537	16, 621. 723
414	8, 335. 820	17, 614. 017
415	8, 279. 810	17, 629. 078
416	8, 293. 821	17, 681. 185
417	8, 349. 832	17, 666. 124
418	8, 465. 466	17, 794. 701
419	8, 444. 570	17, 848. 806
420	8, 454. 474	17, 852. 631
421	8, 437. 966	17, 895. 373
422	8, 344. 419	17, 984. 367
423	8, 360. 964	18, 039. 976
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425	8, 508. 579	17, 873. 527
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457	7, 843. 701	17, 743. 549
458	7, 863. 772	17, 831. 145
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461	7, 869. 950	17, 910. 680
462	7, 865. 180	17, 978. 529
463	7, 923. 037	17, 982. 597

No.	Date	By	Approved	Revision

EQUESTRIAN ESTATES - PHASE 1
SANITARY SEWER IMPROVEMENTS
COORDINATE POINTS LIST
CITY OF WICHITA, KANSAS
MICHAEL E. LINDEBAK, P.E. - CITY ENGINEER
C.O.W. Project # 468-83317 O.C.A. # 743896

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS
3940 E. Central, Suite 200 ■ Wichita, KS 67208-4242
Phone 316/685-4114 ■ FAX 316/685-4444

FINAL

Designed By: J. Ubert / J. Dickman
Drawn By: J. Dickman
Poe Job No.: 1694A
Date: November 2001

Sheet 18 of 20

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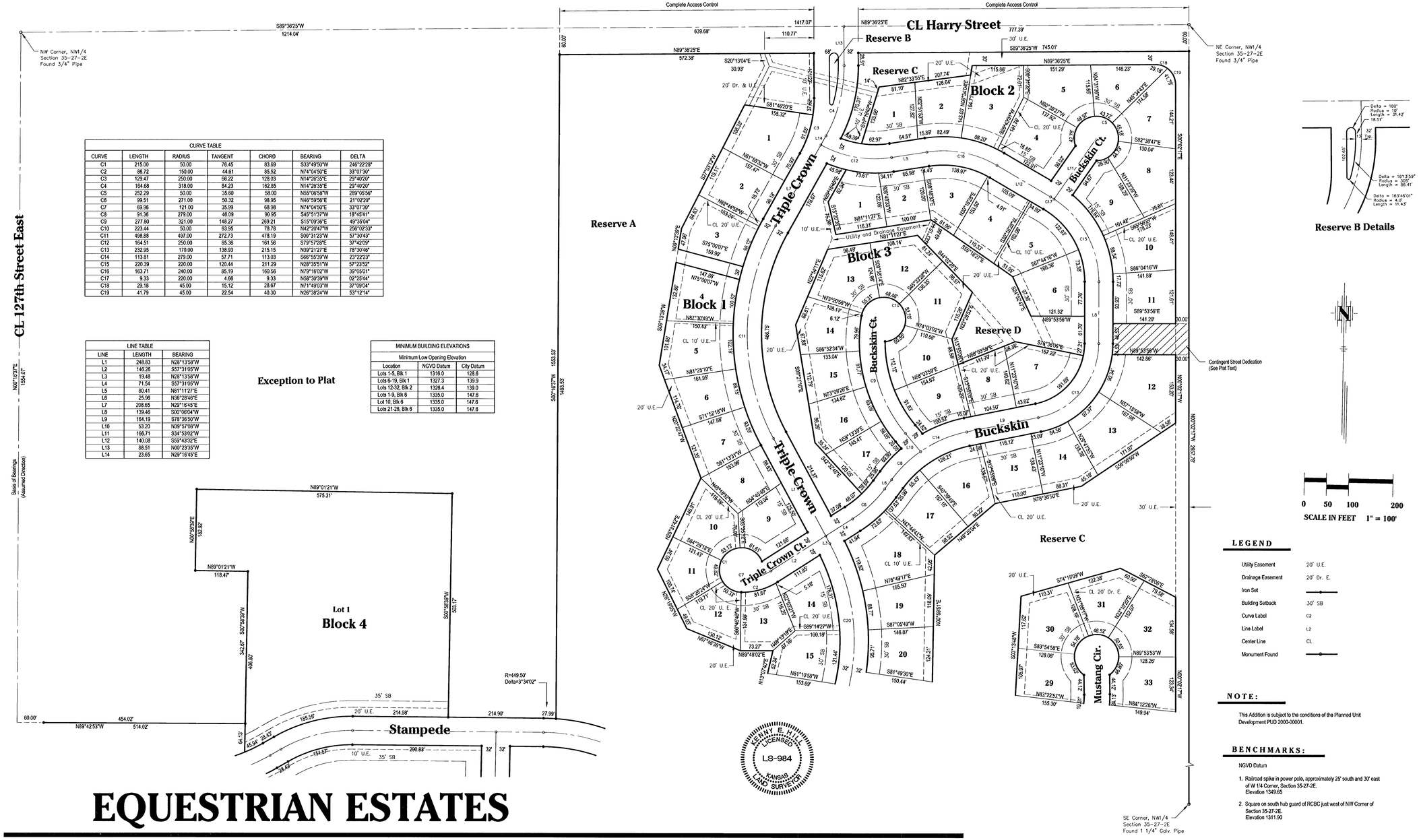

CURVE TABLE						
CURVE	LENGTH	RADIUS	TANGENT	CHORD	BEARING	DELTA
C1	215.00	50.00	76.45	83.69	S33°49'50"W	246°22'28"
C2	86.72	150.00	44.61	85.52	N74°04'50"E	33°07'30"
C3	129.47	250.00	66.22	128.03	N14°26'35"E	29°40'20"
C4	164.68	318.00	84.23	162.85	N14°26'35"E	29°40'20"
C5	252.29	50.00	35.60	58.00	N55°06'58"W	289°05'56"
C6	99.51	271.00	50.32	98.95	N46°59'56"E	21°02'20"
C7	69.96	121.00	35.99	68.98	N74°04'50"E	33°07'30"
C8	91.38	279.00	46.09	90.95	S45°51'37"W	18°45'41"
C9	277.80	321.00	148.27	269.21	S15°09'36"E	49°35'04"
C10	223.44	50.00	83.95	78.78	N42°20'47"W	256°02'33"
C11	498.88	497.00	272.73	478.19	S00°31'23"W	57°30'43"
C12	164.51	250.00	85.36	161.56	S79°57'28"E	37°42'09"
C13	232.95	170.00	138.93	215.15	N39°21'27"E	78°30'46"
C14	113.81	279.00	57.71	113.03	S68°56'39"E	23°22'23"
C15	220.39	220.00	120.44	211.29	N28°35'51"W	57°23'52"
C16	163.71	240.00	85.19	160.56	N79°16'02"W	39°05'01"
C17	9.33	220.00	4.66	9.33	N58°30'39"W	02°25'44"
C18	29.18	45.00	15.12	28.67	N71°49'03"W	37°09'04"
C19	41.79	45.00	22.54	40.30	N26°38'24"W	53°12'14"

LINE TABLE		
LINE	LENGTH	BEARING
L1	248.83	N28°13'58"W
L2	148.28	S57°31'05"W
L3	19.48	N28°13'58"W
L4	71.54	S57°31'05"W
L5	80.41	N81°11'27"E
L6	25.96	N36°28'46"E
L7	208.65	N29°16'45"E
L8	139.46	S00°06'04"W
L9	164.19	S78°36'50"W
L10	53.20	N39°57'08"W
L11	166.71	S34°53'02"W
L12	140.08	S59°43'32"E
L13	88.51	N00°23'35"W
L14	23.65	N29°16'45"E

MINIMUM BUILDING ELEVATIONS		
Minimum Low Opening Elevation		
Location	NGVD Datum	City Datum
Lots 1-5, Blk 1	1316.0	128.6
Lots 6-19, Blk 1	1327.3	139.9
Lots 12-32, Blk 2	1326.4	139.0
Lots 1-9, Blk 6	1335.0	147.6
Lot 10, Blk 6	1335.0	147.6
Lots 21-26, Blk 6	1335.0	147.6

LEGEND

Utility Easement	20' U.E.
Drainage Easement	20' Dr. E.
Iron Set	
Building Setback	30' SB
Curve Label	C2
Line Label	L2
Center Line	CL
Monument Found	

NOTE:

This Addition is subject to the conditions of the Planned Unit Development PUD 2000-00001.

BENCHMARKS:

NGVD Datum

1. Railroad spike in power pole, approximately 25' south and 30' east of W 1/4 Corner, Section 35-27-2E. Elevation 1349.65
2. Square on south hub guard of RCBC just west of NW Corner of Section 35-27-2E. Elevation 1311.90

EQUESTRIAN ESTATES

An Addition to Wichita - Sedgwick County, Kansas

(Associated Zone Case PUD 2000-0001)

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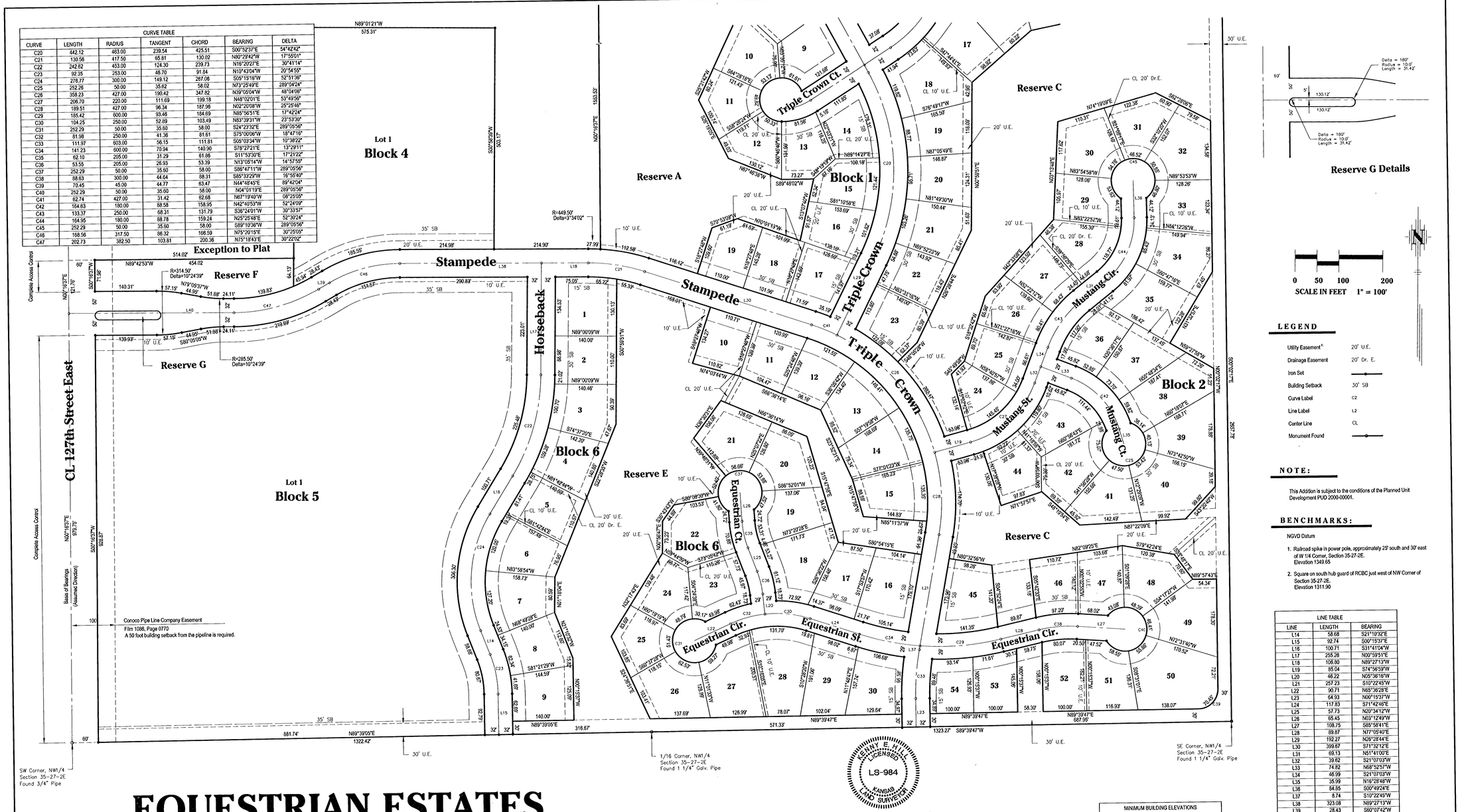

CURVE TABLE						
CURVE	LENGTH	RADIUS	TANGENT	CHORD	BEARING	DELTA
C20	442.12	463.00	239.54	425.51	S00°52'37"E	54°42'42"
C21	130.56	417.50	65.81	130.02	N80°29'42"W	17°55'01"
C22	242.62	453.00	124.30	239.73	N16°20'27"E	30°41'14"
C23	92.35	253.00	46.70	91.84	N10°43'04"W	20°54'55"
C24	276.77	300.00	149.12	267.08	S05°15'16"W	52°51'38"
C25	252.26	50.00	35.62	58.02	N73°25'49"E	289°04'04"
C26	358.23	427.00	190.42	347.82	N39°05'04"W	48°04'06"
C27	206.70	220.00	111.69	199.18	N48°02'01"E	53°49'56"
C28	189.51	427.00	96.34	187.96	N02°20'08"W	25°25'46"
C29	185.42	600.00	93.46	184.69	N85°56'51"E	17°42'24"
C30	104.25	250.00	52.89	103.49	N83°39'31"W	23°53'30"
C31	252.29	50.00	35.60	58.00	S24°23'32"E	289°05'56"
C32	81.98	250.00	41.36	81.61	S75°00'06"W	18°47'16"
C33	111.97	603.00	56.15	111.81	S09°03'34"W	10°38'22"
C34	141.23	600.00	70.94	140.90	S78°27'21"E	13°29'11"
C35	62.10	205.00	31.29	61.86	S11°53'30"E	17°21'22"
C36	53.55	205.00	26.93	53.39	N13°05'14"W	14°57'55"
C37	252.29	50.00	35.60	58.00	S86°47'11"W	289°05'56"
C38	88.83	300.00	44.64	88.31	S85°33'29"W	16°57'40"
C39	70.45	45.00	44.77	63.47	N44°48'45"E	89°42'04"
C40	252.29	50.00	35.60	58.00	N04°01'19"E	289°05'56"
C41	62.74	427.00	31.42	62.68	N67°19'40"W	08°25'05"
C42	164.63	180.00	88.58	158.85	N42°40'53"W	52°24'09"
C43	133.37	250.00	68.31	131.79	S36°24'01"W	30°33'57"
C44	164.95	180.00	88.78	159.24	N25°25'48"E	52°30'24"
C45	252.29	50.00	35.60	58.00	S89°10'36"W	289°05'56"
C46	168.56	317.50	86.32	166.59	N75°20'15"E	30°25'05"
C47	202.73	382.50	103.81	200.36	N75°18'43"E	30°22'02"

LINE TABLE		
LINE	LENGTH	BEARING
L14	58.68	S21°10'32"E
L15	92.74	S00°15'37"E
L16	100.71	S31°41'04"W
L17	255.28	N00°59'51"E
L18	106.80	N89°27'13"W
L19	85.04	S74°56'59"W
L20	48.22	N05°36'16"W
L21	257.23	S10°22'45"W
L22	90.71	N65°36'28"E
L23	64.93	N00°15'37"W
L24	117.83	S71°42'46"E
L25	57.73	N20°34'12"W
L26	65.45	N03°12'49"W
L27	108.75	S85°58'41"E
L28	89.87	N77°05'40"E
L29	192.27	N26°28'44"E
L30	399.67	S71°32'12"E
L31	68.13	N51°41'00"E
L32	39.62	S21°07'03"W
L33	74.82	N68°52'57"W
L34	46.99	S21°07'03"W
L35	35.99	N16°28'46"W
L36	84.85	S00°49'24"E
L37	8.74	S10°22'45"W
L38	323.08	N89°27'13"W
L39	28.43	S60°07'42"W
L40	376.66	N89°30'16"W

MINIMUM BUILDING ELEVATIONS		
Minimum Low Opening Elevation		
Location	NGVD Datum	City Datum
Lots 1-5, Blk 1	1316.0	128.6
Lots 6-19, Blk 1	1327.3	139.9
Lots 12-32, Blk 2	1328.4	139.0
Lots 1-9, Blk 6	1335.0	147.6
Lot 10, Blk 6	1335.0	147.6
Lots 21-26, Blk 6	1335.0	147.6

Reserve G Details

SCALE IN FEET 1" = 100'

LEGEND

Utility Easement	20' U.E.
Drainage Easement	20' Dr. E.
Iron Set	
Building Setback	30' SB
Curve Label	C2
Line Label	L2
Center Line	CL
Monument Found	

NOTE:

This Addition is subject to the conditions of the Planned Unit Development PUD 2000-00001.

BENCHMARKS:

NGVD Datum

1. Railroad spike in power pole, approximately 25' south and 30' east of W 1/4 Corner, Section 35-27-2E. Elevation 1349.65
2. Square on south hub guard of RCBC just west of NW Corner of Section 35-27-2E. Elevation 1311.90

EQUESTRIAN ESTATES

An Addition to Wichita - Sedgwick County, Kansas

(Associated Zone Case PUD 2000-0001)

Sheet No. 20 of 20

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10-03-30-01