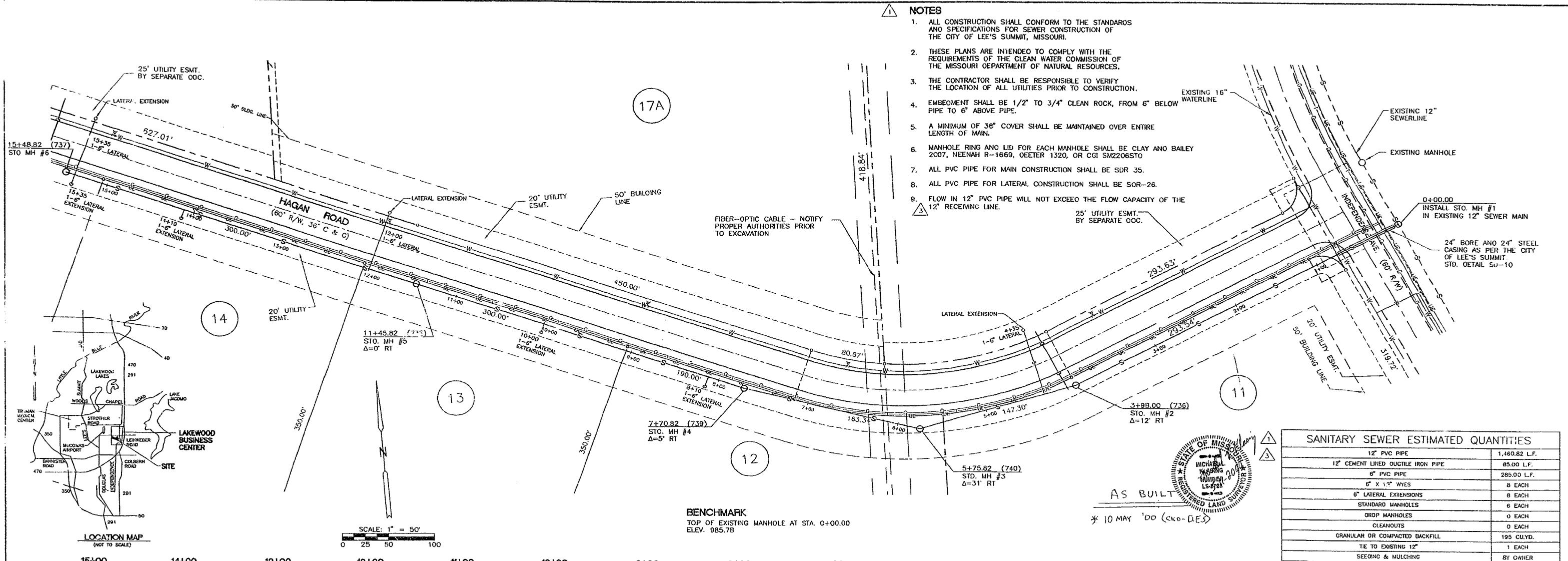
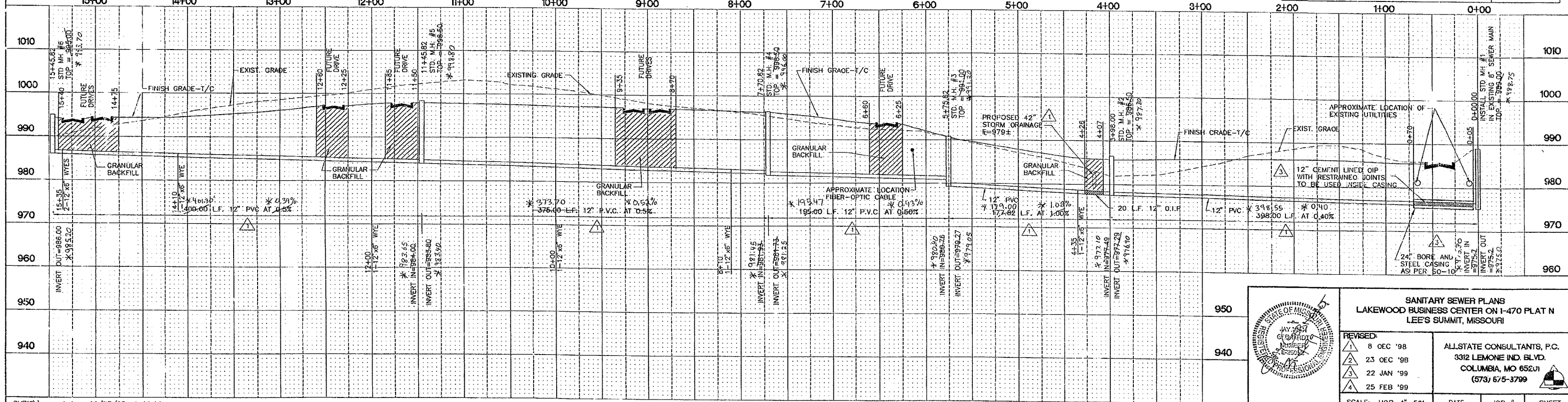


10989



SANITARY SEWER ESTIMATED QUANTITIES	
12" PVC PIPE	1,460.82 L.F.
12" CEMENT LINED DUCTILE IRON PIPE	85.00 L.F.
6" PVC PIPE	285.00 L.F.
8" X 12" WYES	8 EACH
6" LATERAL EXTENSIONS	8 EACH
STANDARD MANHOLES	6 EACH
DROP MANHOLES	0 EACH
CLEANOUTS	0 EACH
GRANULAR OR COMPACTED BACKFILL	195 CU.YD.
TIE TO EXISTING 12"	1 EACH
SEEDING & MULCHING	BY OWNER



SANITARY SEWER PLANS
LAKEWOOD BUSINESS CENTER ON I-470 PLAT N
LEE'S SUMMIT, MISSOURI

REVISED:

1	8 DEC '98
2	23 DEC '98
3	22 JAN '99
4	25 FEB '99

ALLSTATE CONSULTANTS, P.C.
3312 LEMONE IND. BLVD.
COLUMBIA, MO 65201
(573) 675-3799

SCALE: HOR. 1"=50'
VER. 1"=10'

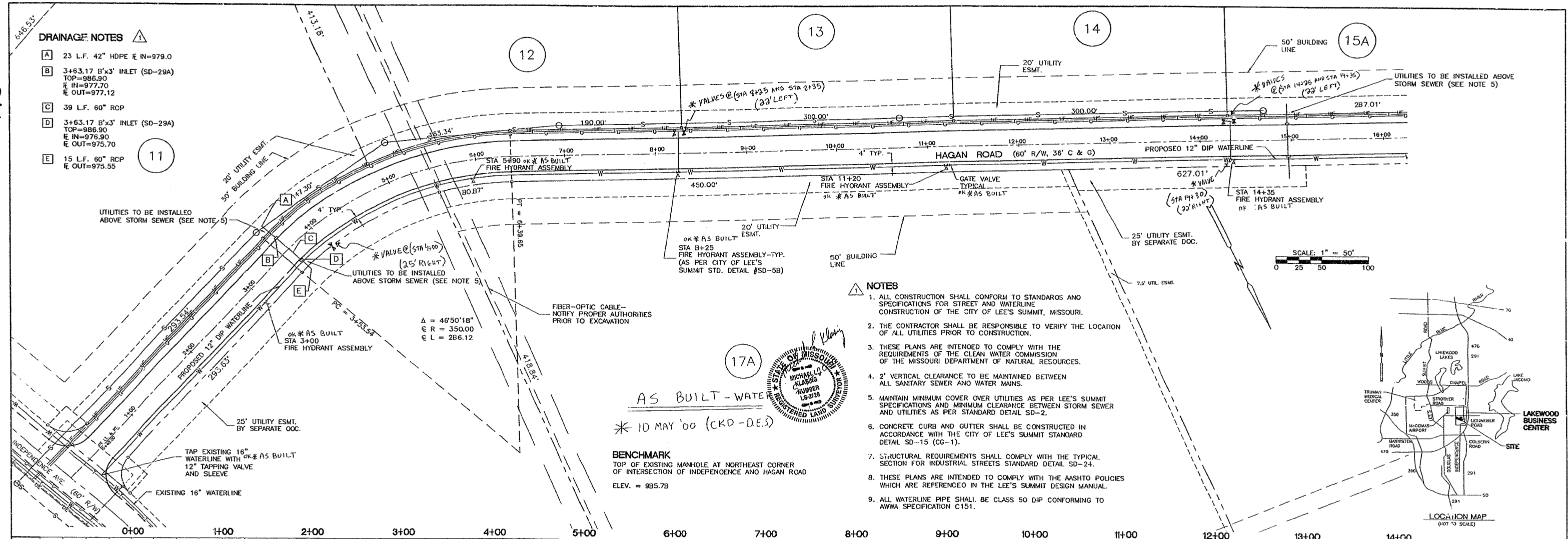
DATE 20 JULY '98
JOB # 98077.11
SHEET 1 OF 2

10990

DRAINAGE NOTES

- A 23 L.F. 42" HDPE IN=979.0
- B 3+63.17 8"x3" INLET (SD-29A)
TOP=986.90
IN=977.70
OUT=977.12
- C 39 L.F. 60" RCP
- D 3+63.17 8"x3" INLET (SD-29A)
TOP=986.90
IN=976.90
OUT=975.70
- E 15 L.F. 60" RCP
OUT=975.55

11



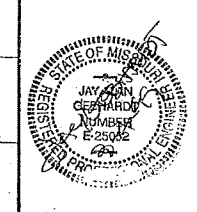
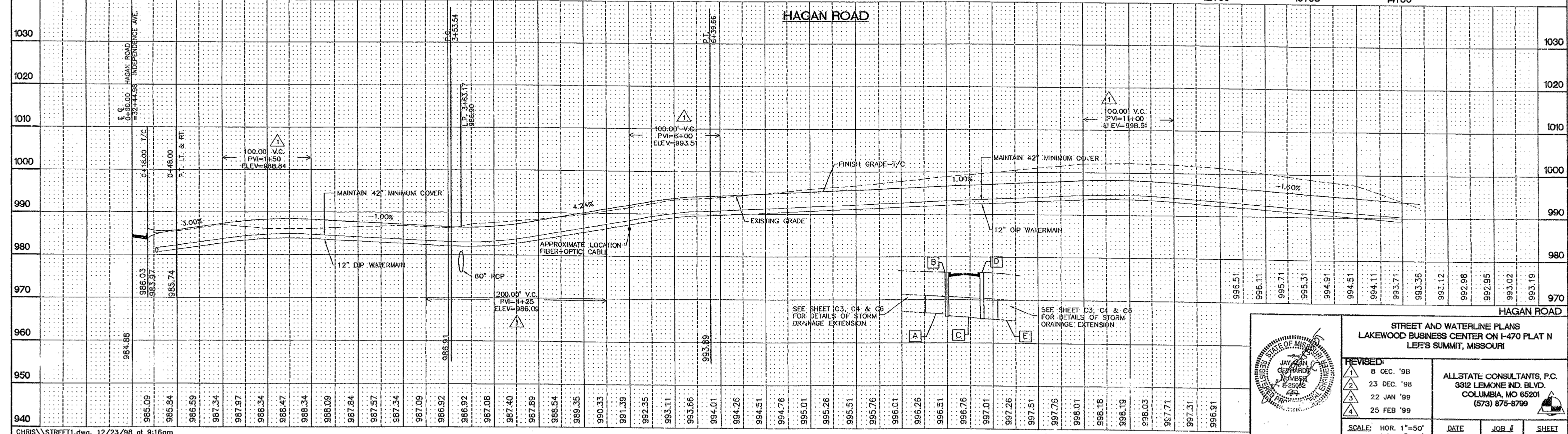
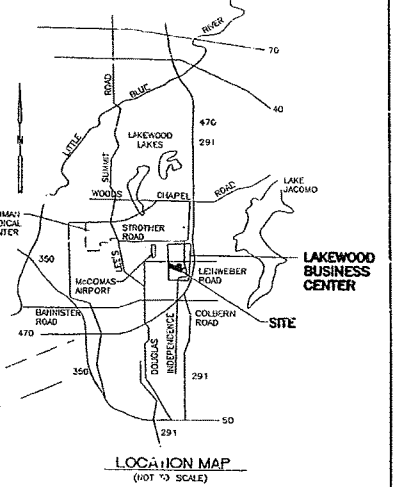
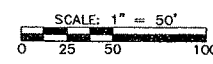
NOTES

- ALL CONSTRUCTION SHALL CONFORM TO STANDARDS AND SPECIFICATIONS FOR STREET AND WATERLINE CONSTRUCTION OF THE CITY OF LEE'S SUMMIT, MISSOURI.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
- THESE PLANS ARE INTENDED TO COMPLY WITH THE REQUIREMENTS OF THE CLEAN WATER COMMISSION OF THE MISSOURI DEPARTMENT OF NATURAL RESOURCES.
- 2' VERTICAL CLEARANCE TO BE MAINTAINED BETWEEN ALL SANITARY SEWER AND WATER MAINS.
- MAINTAIN MINIMUM COVER OVER UTILITIES AS PER LEE'S SUMMIT SPECIFICATIONS AND MINIMUM CLEARANCE BETWEEN STORM SEWER AND UTILITIES AS PER STANDARD DETAIL SD-2.
- CONCRETE CURB AND GUTTER SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF LEE'S SUMMIT STANDARD DETAIL SD-15 (CG-1).
- STRUCTURAL REQUIREMENTS SHALL COMPLY WITH THE TYPICAL SECTION FOR INDUSTRIAL STREETS STANDARD DETAIL SD-24.
- THESE PLANS ARE INTENDED TO COMPLY WITH THE AASHTO POLICIES WHICH ARE REFERENCED IN THE LEE'S SUMMIT DESIGN MANUAL.
- ALL WATERLINE PIPE SHALL BE CLASS 50 DIP CONFORMING TO AWWA SPECIFICATION C151.

AS BUILT - WATER

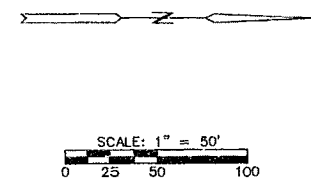
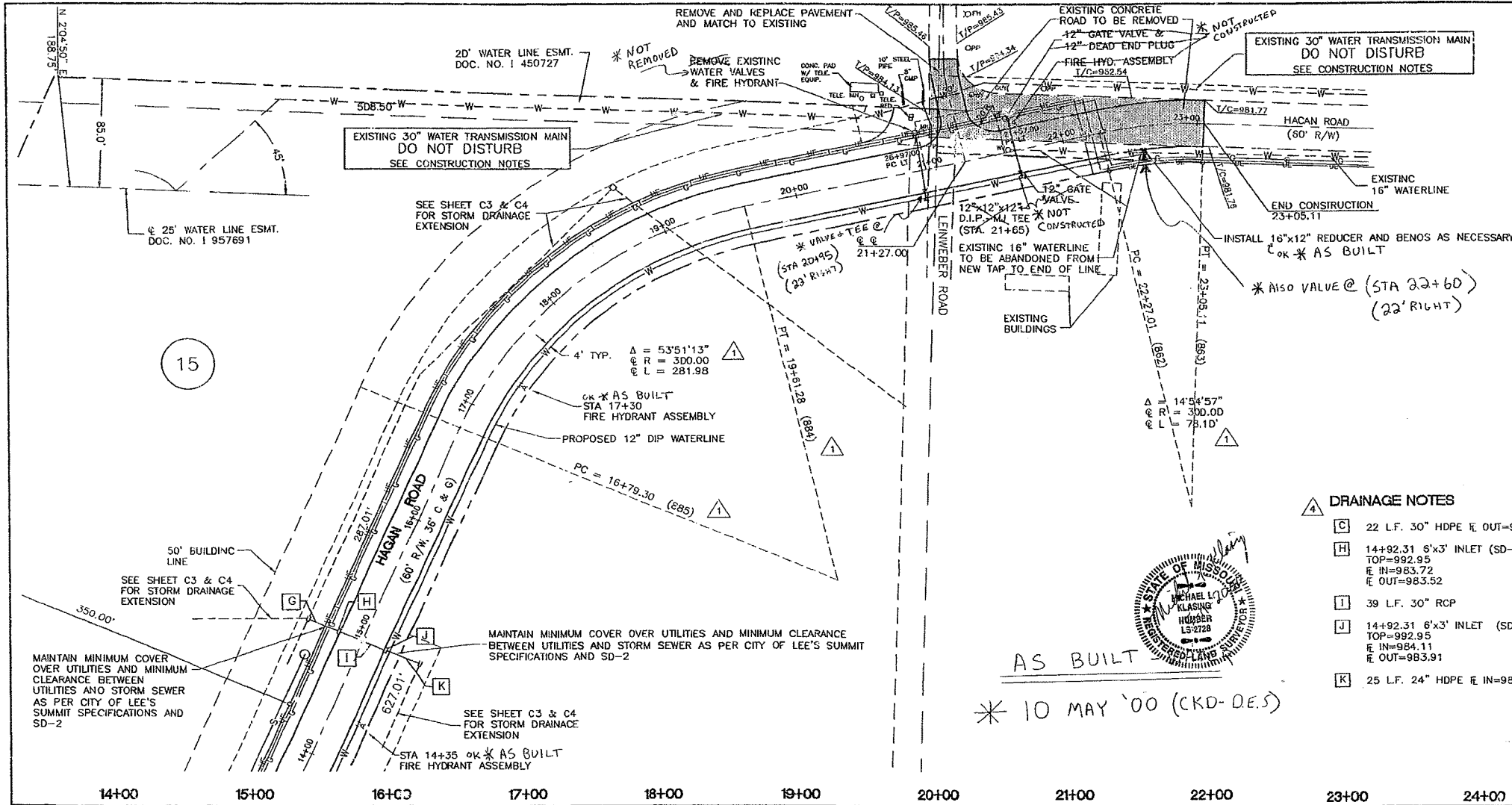
* 10 MAY '00 (CKD-DES)

BENCHMARK
TOP OF EXISTING MANHOLE AT NORTHEAST CORNER
OF INTERSECTION OF INDEPENDENCE AND HAGAN ROAD
ELEV. = 985.78



STREET AND WATERLINE PLANS LAKEWOOD BUSINESS CENTER ON I-470 PLAT N LEE'S SUMMIT, MISSOURI			
REVISED:			
1	8 DEC. '98	ALLSTATE CONSULTANTS, P.C. 3312 LEMONE IND. BLVD. COLUMBIA, MO 65201 (573) 875-8799	SHEET 1 OF 2
2	23 DEC. '98		
3	22 JAN '99		
4	25 FEB '99		
SCALE: HOR. 1"=50' VER. 1"=10'		DATE 2 SEPT '98	JOB # 98077.11

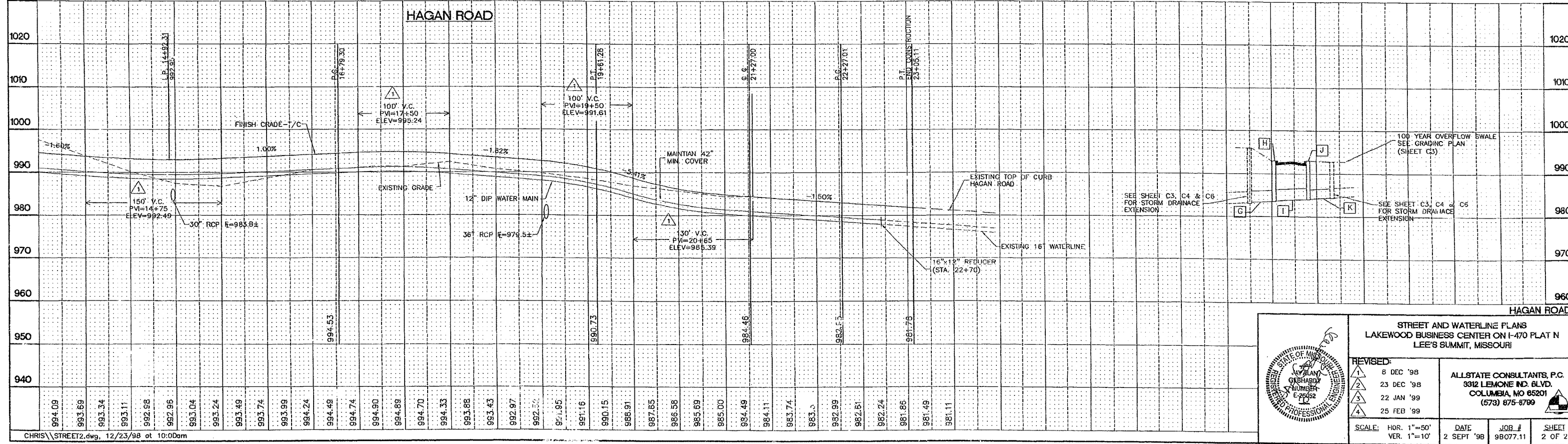
16901



- ### CONSTRUCTION NOTES
1. THE CONTRACTOR SHALL NOTIFY THE WATER UTILITIES DEPARTMENT (989-7606) FOR A LOCATION OF THE 30" WATER TRANSMISSION MAIN WITHIN THE 20'-FOOT EASEMENT PRIOR TO ANY CONSTRUCTION AROUND THE WATER MAIN.
 2. THE CONTRACTOR SHALL NOTIFY THE PUBLIC WORKS INSPECTIONS DEPARTMENT (969-7307) PRIOR TO ANY EXCAVATION WITHIN THE EASEMENT.
 3. THE CONTRACTOR SHALL MAINTAIN EXISTING COVER OVER THE EXISTING 30" WATER MAIN. NO DECREASE IN THE EXISTING DEPTH OF COVER (PERMANENT OR TEMPORARY) WILL BE PERMITTED.
 4. CONSTRUCTION EQUIPMENT SHOULD NOT UTILIZE THIS AREA AS ACCESS TO THE CONSTRUCTION PROJECT.
 5. THE CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR REIMBURSEMENT TO THE CITY FOR ANY WATER LOST AND COST OF REPAIR FOR ANY DAMAGE SUSTAINED TO THE 30" WATER MAIN AS A RESULT OF CONSTRUCTION ACTIVITIES DIRECTLY ASSOCIATED WITH THIS PROJECT.
 6. THE CONTRACTOR IS RESPONSIBLE TO HAVE A REPAIR CREW, ACCEPTABLE TO THE CITY, ON A STANDBY BASIS TO REPAIR ANY DAMAGE TO THE 30" WATER MAIN DIRECTLY ASSOCIATED WITH THIS PROJECT. THE CONTRACTOR SHALL HAVE THE 30" WATER MAIN RETURNED TO NORMAL SERVICE WITHIN TWELVE (12) HOURS OF A REPORTED BREAK.

- ### △ DRAINAGE NOTES
- △ C 22 L.F. 30" HDPE R. OUT=983.37
 - △ H 14+92.31 6"x3" INLET (SD-29A) TOP=992.95 R. IN=983.72 R. OUT=983.52
 - △ I 39 L.F. 30" RCP
 - △ J 14+92.31 6"x3" INLET (SD-29A) TOP=992.95 R. IN=984.11 R. OUT=983.91
 - △ K 25 L.F. 24" HDPE R. IN=984.96

AS BUILT
* 10 MAY '00 (CKD-DES)



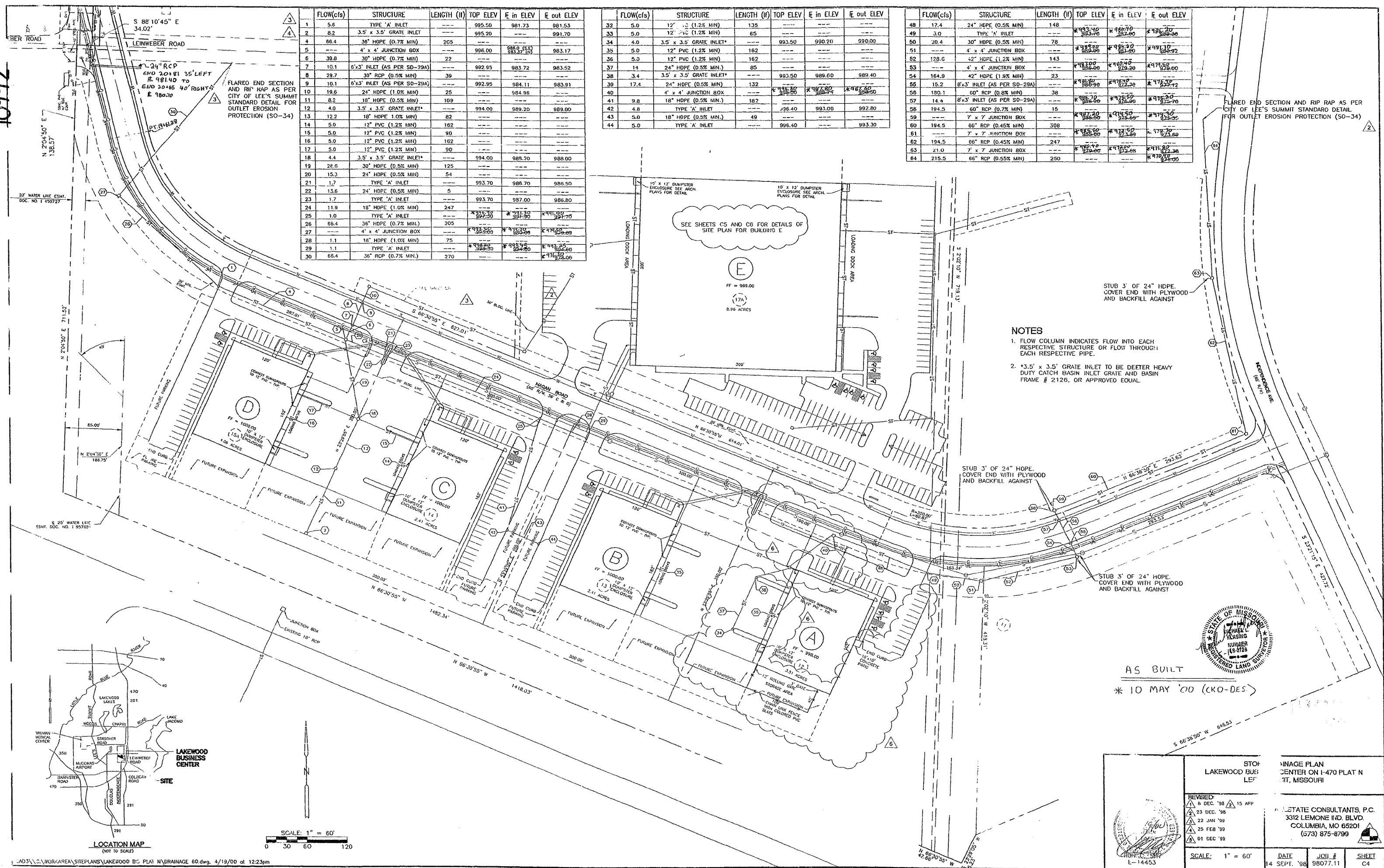
STREET AND WATERLINE PLANS
LAKEWOOD BUSINESS CENTER ON I-470 PLAT N
LEE'S SUMMIT, MISSOURI

REVISED:	
1	8 DEC '98
2	23 DEC '98
3	22 JAN '99
4	25 FEB '99

SCALE:	DATE	JOB #	SHEET
HOR. 1"=50' VER. 1"=10'	2 SEPT '98	98077.11	2 OF 2

ALLSTATE CONSULTANTS, P.C.
3312 LEMONE IND. BLVD.
COLUMBIA, MO 65201
(573) 875-8799

10992



	FLOW(cfs)	STRUCTURE	LENGTH (ft)	TOP ELEV	E in ELEV	E out ELEV
1	5.6	TYPE 'A' INLET	---	995.50	981.73	981.53
2	8.2	3.5' x 3.5' GRATE INLET	---	995.20	---	991.70
4	66.4	36" HDPE (0.7% MIN)	205	---	---	---
5	---	4' x 4' JUNCTION BOX	---	996.00	986.0 (5.5)	983.17
6	39.8	30" HDPE (0.7% MIN)	22	---	---	---
7	10.1	6'x3' INLET (AS PER SD-29A)	---	992.95	983.72	983.52
8	29.7	30" RCP (0.5% MIN)	39	---	---	---
9	10.1	6'x3' INLET (AS PER SD-29A)	---	992.95	984.11	983.91
10	19.6	24" HDPE (1.0% MIN)	25	---	984.96	---
11	8.2	18" HDPE (0.5% MIN)	109	---	---	---
12	4.0	3.5' x 3.5' GRATE INLET*	---	994.00	989.20	989.00
13	12.2	18" HDPE (1.0% MIN)	82	---	---	---
14	5.0	12" PVC (1.2% MIN)	162	---	---	---
15	5.0	12" PVC (1.2% MIN)	90	---	---	---
16	5.0	12" PVC (1.2% MIN)	162	---	---	---
17	5.0	12" PVC (1.2% MIN)	90	---	---	---
18	4.4	3.5' x 3.5' GRATE INLET*	---	994.00	989.20	988.00
19	26.6	30" HDPE (0.5% MIN)	125	---	---	---
20	15.3	24" HDPE (0.5% MIN)	54	---	---	---
21	1.7	TYPE 'A' INLET	---	993.70	988.70	988.50
22	13.6	24" HDPE (0.5% MIN)	5	---	---	---
23	1.7	TYPE 'A' INLET	---	993.70	987.00	986.80
24	11.9	18" HDPE (1.0% MIN)	247	---	---	---
25	1.0	TYPE 'A' INLET	---	993.30	991.30	991.00
26	66.4	36" HDPE (0.7% MIN)	205	---	---	---
27	---	4' x 4' JUNCTION BOX	---	993.30	993.30	993.30
28	1.1	18" HDPE (1.0% MIN)	75	---	---	---
29	1.1	TYPE 'A' INLET	---	993.30	993.30	993.30
30	66.4	36" RCP (0.7% MIN)	270	---	---	---

	FLOW(cfs)	STRUCTURE	LENGTH (ft)	TOP ELEV	E in ELEV	E out ELEV
32	5.0	12" PVC (1.2% MIN)	135	---	---	---
33	5.0	12" PVC (1.2% MIN)	65	---	---	---
34	4.0	3.5' x 3.5' GRATE INLET*	---	993.50	990.20	990.00
35	5.0	12" PVC (1.2% MIN)	162	---	---	---
36	5.0	12" PVC (1.2% MIN)	162	---	---	---
37	14	24" HDPE (0.5% MIN)	85	---	---	---
38	3.4	3.5' x 3.5' GRATE INLET*	---	993.50	989.60	989.40
39	17.4	24" HDPE (0.5% MIN)	132	---	---	---
40	---	4' x 4' JUNCTION BOX	---	993.50	993.50	993.50
41	9.8	18" HDPE (0.5% MIN)	182	---	---	---
42	4.8	TYPE 'A' INLET	---	996.40	993.00	992.80
43	5.0	18" HDPE (0.5% MIN)	49	---	---	---
44	5.0	TYPE 'A' INLET	---	996.40	---	993.30

	FLOW(cfs)	STRUCTURE	LENGTH (ft)	TOP ELEV	E in ELEV	E out ELEV
48	17.4	24" HDPE (0.5% MIN)	148	---	---	---
49	3.0	TYPE 'A' INLET	---	993.70	982.80	982.60
50	20.4	30" HDPE (0.5% MIN)	78	---	---	---
51	---	4' x 4' JUNCTION BOX	---	993.70	991.20	991.00
52	128.6	42" HDPE (1.2% MIN)	143	---	---	---
53	---	4' x 4' JUNCTION BOX	---	993.70	991.20	991.00
54	164.9	42" HDPE (1.9% MIN)	23	---	---	---
55	15.2	6'x3' INLET (AS PER SD-29A)	---	993.70	991.20	991.00
56	180.1	60" RCP (0.8% MIN)	38	---	---	---
57	14.4	6'x3' INLET (AS PER SD-29A)	---	993.70	991.20	991.00
58	194.5	60" RCP (0.7% MIN)	15	---	---	---
59	---	7' x 7' JUNCTION BOX	---	993.70	991.20	991.00
60	194.5	66" RCP (0.45% MIN)	308	---	---	---
61	---	7' x 7' JUNCTION BOX	---	993.70	991.20	991.00
62	194.5	66" RCP (0.45% MIN)	247	---	---	---
63	21.0	7' x 7' JUNCTION BOX	---	993.70	991.20	991.00
64	215.5	66" RCP (0.55% MIN)	250	---	---	---

NOTES

1. FLOW COLUMN INDICATES FLOW INTO EACH RESPECTIVE STRUCTURE OR FLOW THROUGH EACH RESPECTIVE PIPE.
2. *3.5' x 3.5' GRATE INLET TO BE DEETER HEAVY DUTY CATCH BASIN INLET GRATE AND BASIN FRAME # 2126, OR APPROVED EQUAL.

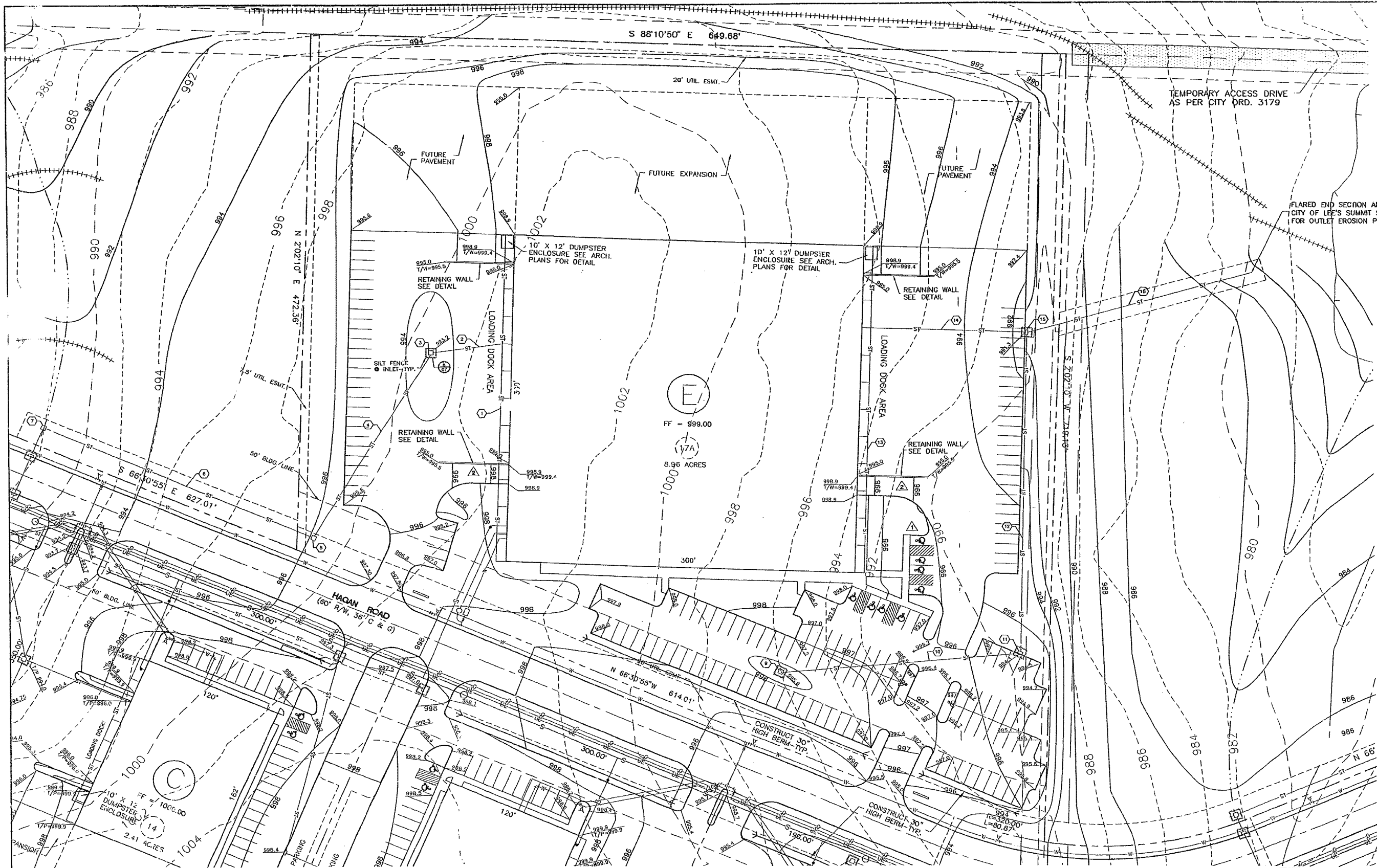


AS BUILT
* 10 MAY '00 (CKD-DES)

STATE CONSULTANTS, P.C.
3312 LEMONE HWY. BLVD.
COLUMBIA, MO 65201
(573) 875-8799

DATE: 14 SEPT. '98
JOB #: 98077.11
SHEET: C4

10993

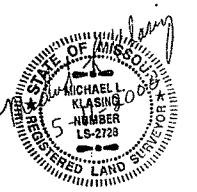


NOTES

1. FLOW COLUMN INDICATES FLOW INTO EACH RESPECTIVE STRUCTURE OR FLOW THROUGH EACH RESPECTIVE PIPE.
2. *3.5' x 3.5' GRATE INLET TO BE DEETER HEAVY DUTY CATCH BASIN INLET GRATE AND BASIN FRAME # 2126, OR APPROVED EQUAL.

	FLOW(cfs)	STRUCTURE	LENGTH (lf)	TOP ELEV	ff in ELEV	ff out ELEV
1	11.4	18" HDPE (1.0% MIN)	300	---	---	---
2	11.4	18" HDPE (1.0% MIN)	60	---	---	---
3	8.2	3.5' x 3.5' GRATE INLET*	---	993.20	990.0	989.8
4	19.6	24" HDPE (1.0% MIN)	195	---	---	---
5	19.6	4' x 4' JUNCTION BOX	---	987.50	987.65	987.65
6	19.6	24" HDPE (1.0% MIN)	249	---	---	---
7	19.6	4' x 4' JUNCTION BOX	---	987.50	987.65	987.65

	FLOW(cfs)	STRUCTURE	LENGTH (lf)	TOP ELEV	ff in ELEV	ff out ELEV
9	3.9	3.5' x 3.5' GRATE INLET*	---	995.40	---	991.90
10	3.9	18" HDPE (0.5% MIN)	205	---	---	---
11	2.1	TYPE 'A' INLET	---	994.30	990.80	990.60
12	6.0	18" HDPE (0.5% MIN)	291	---	---	---
13	11.4	18" HDPE (1.0% MIN)	300	---	---	---
14	11.4	18" HDPE (1.0% MIN)	132	---	---	---
15	12.2	G' TYPE 'M' INLET	---	987.50	987.50	987.50
16	29.6	24" HDPE (1.0% MIN.)	200	---	---	980.00



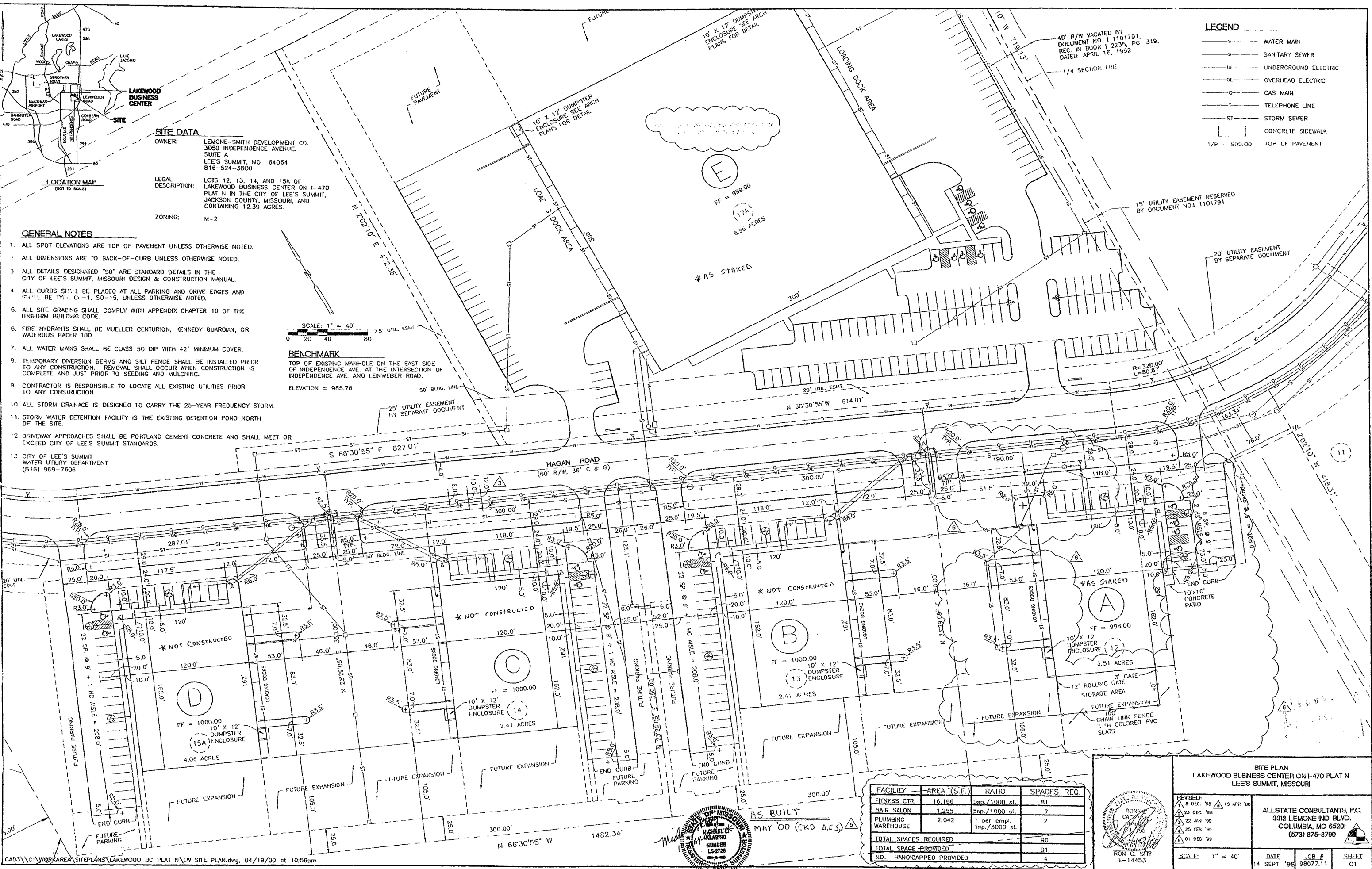
AS BUILT
* 10 MAY '00 (CRD-D.E.S)

FILE
DATE



GRADING AND EROSION CONTROL PLAN LOT 17A OF REPLAT NO. 1 OF LAKEWOOD BUSINESS CENTER ON I-470 PLAT N LEE'S SUMMIT, MISSOURI			
REVISED: 1 FEB. '99 25 FEB. '99		ALLSTATE CONSULTANTS, P.C. 8312 LEMONE IND. BLVD. COLUMBIA, MO 65201 (573) 875-8799	
SCALE: 1" = 40'	DATE: 12 JAN '99	JOB #: 98077.17	SHEET: C6

11024



SITE DATA
OWNER: LEMONE-SMITH DEVELOPMENT CO.
3050 INDEPENDENCE AVENUE
SUITE A
LEE'S SUMMIT, MO 64064
816-524-3800
LEGAL DESCRIPTION: LOTS 12, 13, 14, AND 15A OF
LAKEWOOD BUSINESS CENTER ON I-470
PLAT N IN THE CITY OF LEE'S SUMMIT,
JACKSON COUNTY, MISSOURI, AND
CONTAINING 12.39 ACRES.
ZONING: M-2

- GENERAL NOTES**
1. ALL SPOT ELEVATIONS ARE TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
 2. ALL DIMENSIONS ARE TO BACK-OF-CURB UNLESS OTHERWISE NOTED.
 3. ALL DETAILS DESIGNATED "S0" ARE STANDARD DETAILS IN THE CITY OF LEE'S SUMMIT, MISSOURI DESIGN & CONSTRUCTION MANUAL.
 4. ALL CURBS SHALL BE PLACED AT ALL PARKING AND DRIVE EDGES AND SHALL BE TYPE C-1, S0-15, UNLESS OTHERWISE NOTED.
 5. ALL SITE GRADING SHALL COMPLY WITH APPENDIX CHAPTER 10 OF THE UNIFORM BUILDING CODE.
 6. FIRE HYDRANTS SHALL BE MUELLER CENTURION, KENNEDY GUARDIAN, OR WATEROUS PACER 100.
 7. ALL WATER MAINS SHALL BE CLASS 50 DIP WITH 42" MINIMUM COVER.
 8. TEMPORARY DIVERSION BERMS AND SILT FENCE SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION. REMOVAL SHALL OCCUR WHEN CONSTRUCTION IS COMPLETE AND JUST PRIOR TO SEEDING AND MULCHING.
 9. CONTRACTOR IS RESPONSIBLE TO LOCATE ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION.
 10. ALL STORM DRAINAGE IS DESIGNED TO CARRY THE 25-YEAR FREQUENCY STORM.
 11. STORM WATER DETENTION FACILITY IS THE EXISTING DETENTION POND NORTH OF THE SITE.
 12. DRIVEWAY APPROACHES SHALL BE PORTLAND CEMENT CONCRETE AND SHALL MEET OR EXCEED CITY OF LEE'S SUMMIT STANDARDS.
 13. CITY OF LEE'S SUMMIT WATER UTILITY DEPARTMENT (816) 969-7606

SCALE: 1" = 40'
BENCHMARK
TOP OF EXISTING MANHOLE ON THE EAST SIDE OF INDEPENDENCE AVE. AT THE INTERSECTION OF INDEPENDENCE AVE. AND LEINWEBER ROAD.
ELEVATION = 985.78

- LEGEND**
- WATER MAIN
 - SANITARY SEWER
 - UNDERGROUND ELECTRIC
 - OVERHEAD ELECTRIC
 - CAS MAIN
 - TELEPHONE LINE
 - STORM SEWER
 - CONCRETE SIDEWALK
 - 1/F = 900.00
 - TOP OF PAVEMENT

FACILITY	AREA (S.F.)	RATIO	SPACES REQ.
FITNESS CTR.	16,166	5sp./1000 sf.	81
HAIR SALON	1,255	5sp./1000 sf.	7
PLUMBING WAREHOUSE	2,042	1 per empl. 1sp./3000 sf.	2
TOTAL SPACES REQUIRED			90
TOTAL SPACE PROVIDED			91
NO. HANDICAPPED PROVIDED			4

SITE PLAN
LAKEWOOD BUSINESS CENTER ON I-470 PLAT N
LEE'S SUMMIT, MISSOURI

ALLSTATE CONSULTANTS, P.C.
3312 LEMONE IND. BLVD.
COLUMBIA, MO 65201
(573) 875-8799

REVISIONS:
8 DEC '98
23 DEC '98
22 JAN '99
25 FEB '99
01 DEC '99

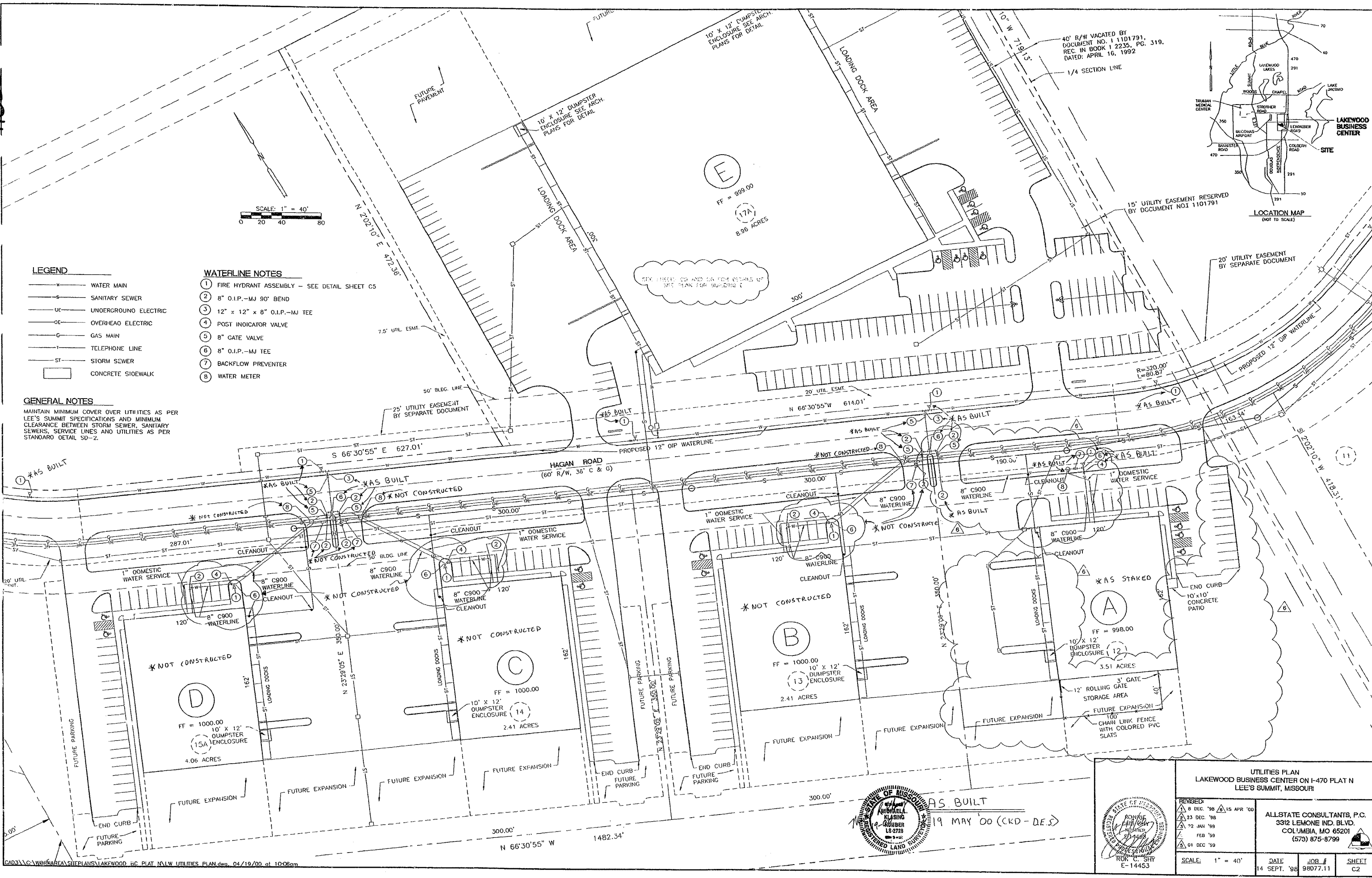
SCALE: 1" = 40'

DATE: 14 SEPT, '98

JOB #: 98077.11

SHEET: C1

11025

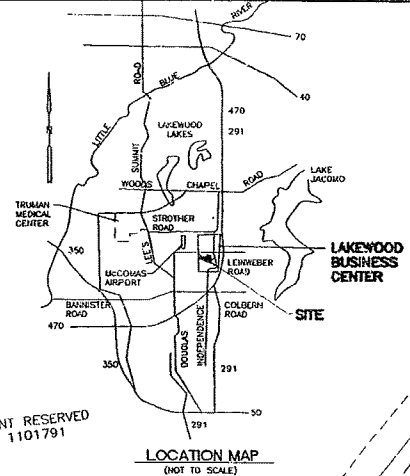


- LEGEND**
- WATER MAIN
 - SANITARY SEWER
 - UNDERGROUND ELECTRIC
 - OVERHEAD ELECTRIC
 - GAS MAIN
 - TELEPHONE LINE
 - STORM SEWER
 - CONCRETE SIDEWALK

- WATERLINE NOTES**
- 1 FIRE HYDRANT ASSEMBLY - SEE DETAIL SHEET C5
 - 2 8" O.I.P.-MJ 90° BEND
 - 3 12" x 12" x 8" O.I.P.-MJ TEE
 - 4 POST INDICATOR VALVE
 - 5 8" GATE VALVE
 - 6 8" O.I.P.-MJ TEE
 - 7 BACKFLOW PREVENTER
 - 8 WATER METER

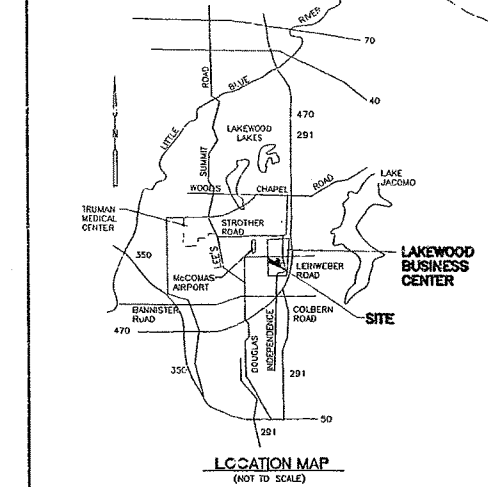
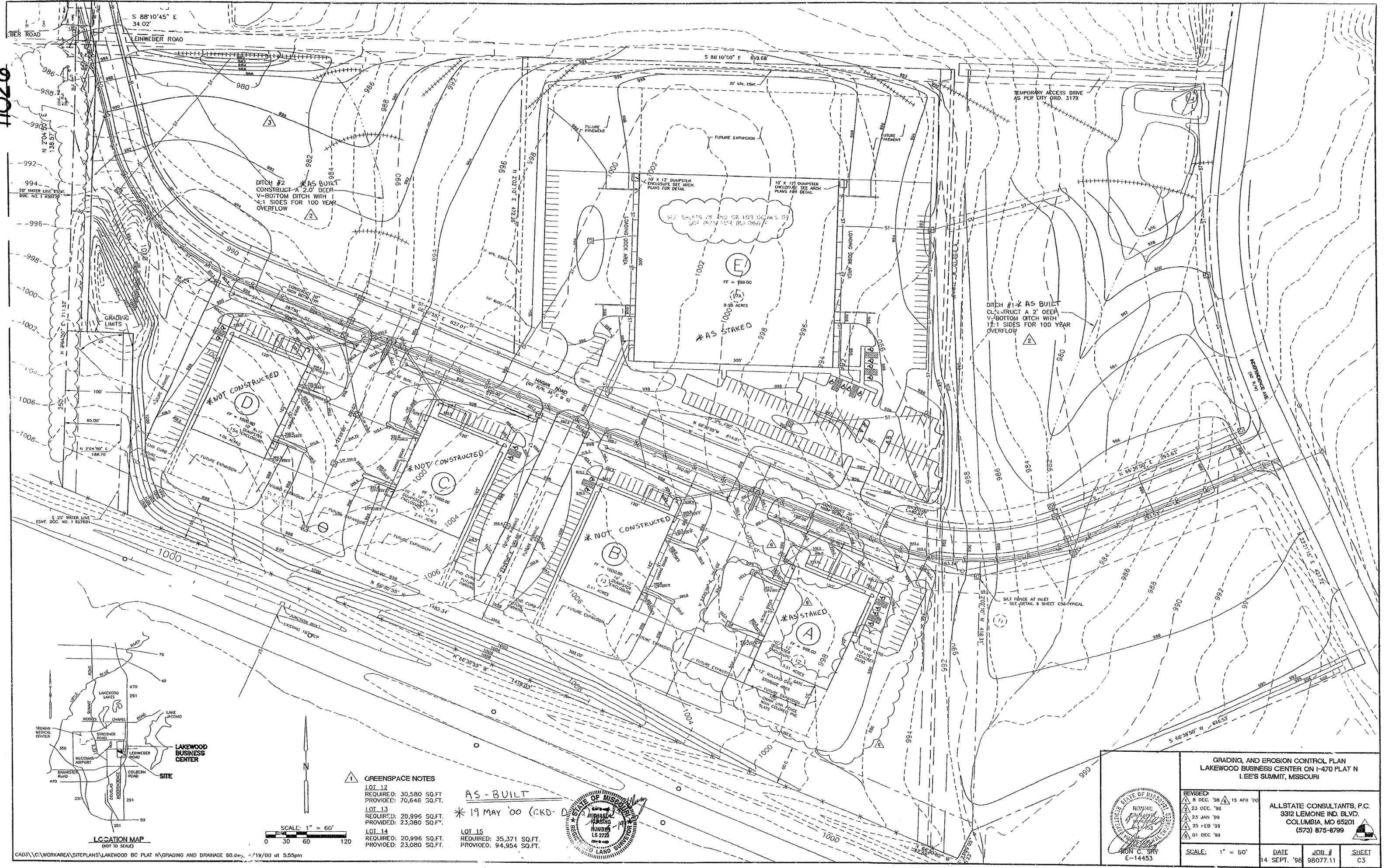
GENERAL NOTES

MAINTAIN MINIMUM COVER OVER UTILITIES AS PER LEE'S SUMMIT SPECIFICATIONS AND MINIMUM CLEARANCE BETWEEN STORM SEWER, SANITARY SEWERS, SERVICE LINES AND UTILITIES AS PER STANDARD DETAIL SD-2.



UTILITIES PLAN LAKESIDE BUSINESS CENTER ON I-470 PLAT N LEE'S SUMMIT, MISSOURI			
REVISED:		ALLSTATE CONSULTANTS, P.C. 3312 LEMONE IND. BLVD. COLUMBIA, MO 65201 (573) 875-8799	
1	6 DEC '98	2	15 APR '00
3	23 DEC '98	4	72 JAN '99
5	FEB '99	6	01 DEC '99
SCALE: 1" = 40'		DATE: 14 SEPT. '98	JOB # 98077.11
SHEET C2			

11026



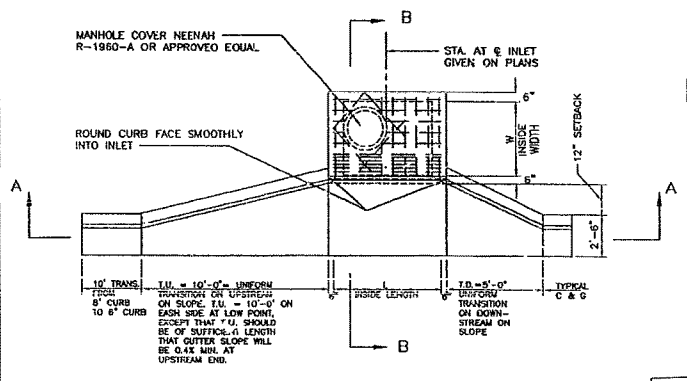
GREENSPACE NOTES	
LOT 12	REQUIRED: 30,580 SQ.FT. PROVIDED: 70,646 SQ.FT.
LOT 13	REQUIRED: 20,996 SQ.FT. PROVIDED: 23,080 SQ.FT.
LOT 14	REQUIRED: 20,996 SQ.FT. PROVIDED: 23,080 SQ.FT.
LOT 15	REQUIRED: 35,371 SQ.FT. PROVIDED: 94,954 SQ.FT.

AS-BUILT
* 19 MAY '00 (CKD-D)

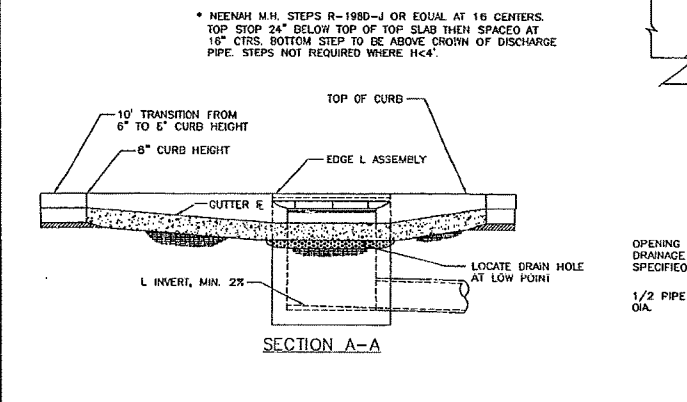


GRADING AND EROSION CONTROL PLAN LAKEWOOD BUSINESS CENTER ON I-470 PLAT N LEE'S SUMMIT, MISSOURI	
REVISED: 15 APR '00 23 DEC '98 23 JAN '99 25 FEB '99 01 DEC '99	ALLSTATE CONSULTANTS, P.C. 3312 LEMONE IND. BLVD. COLUMBIA, MO 65201 (573) 875-8799
SCALE: 1" = 60'	DATE: 14 SEPT. '98 JOB #: 98077.11 SHEET: C3

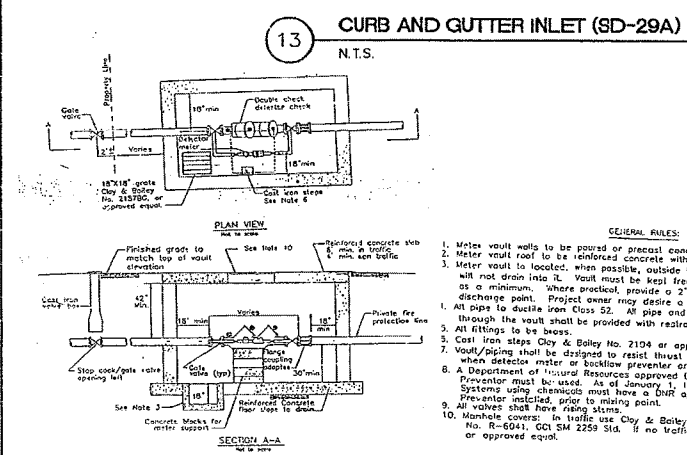
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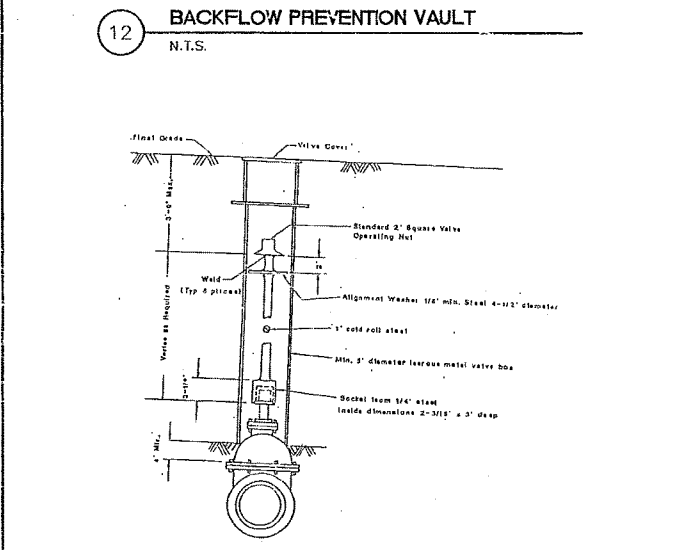
1 HANDICAP ACCESSIBLE PARKING
N.T.S.



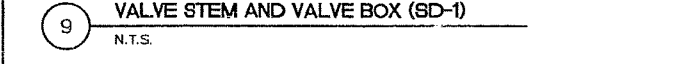
2 SIDEWALK / CURB DETAIL
N.T.S.



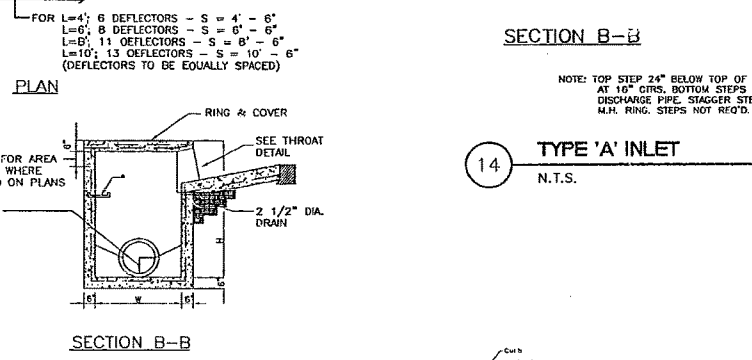
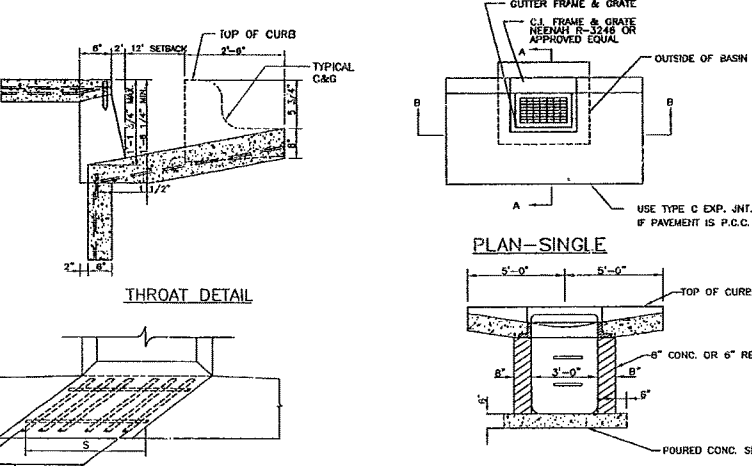
13 CURB AND GUTTER INLET (SD-29A)
N.T.S.



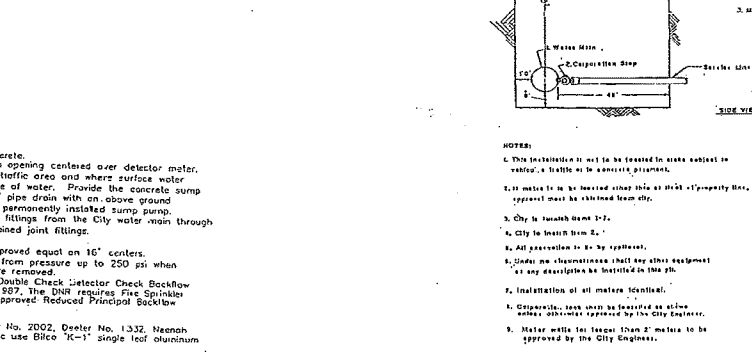
12 BACKFLOW PREVENTION VAULT
N.T.S.



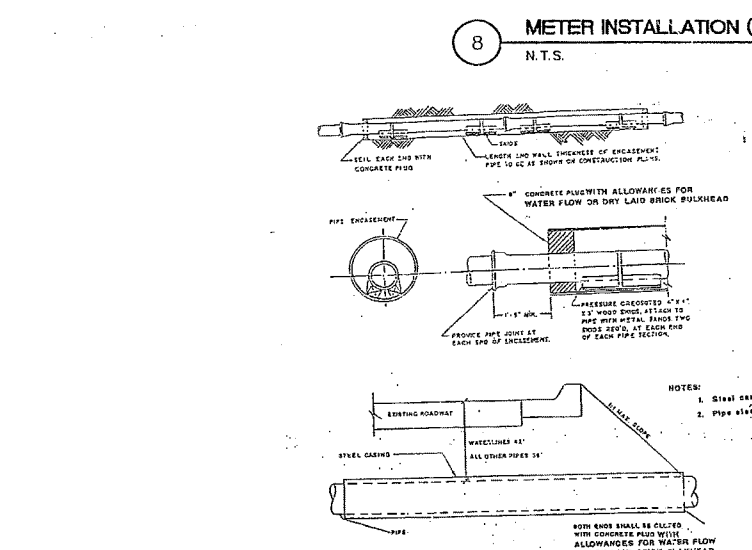
9 VALVE STEM AND VALVE BOX (SD-1)
N.T.S.



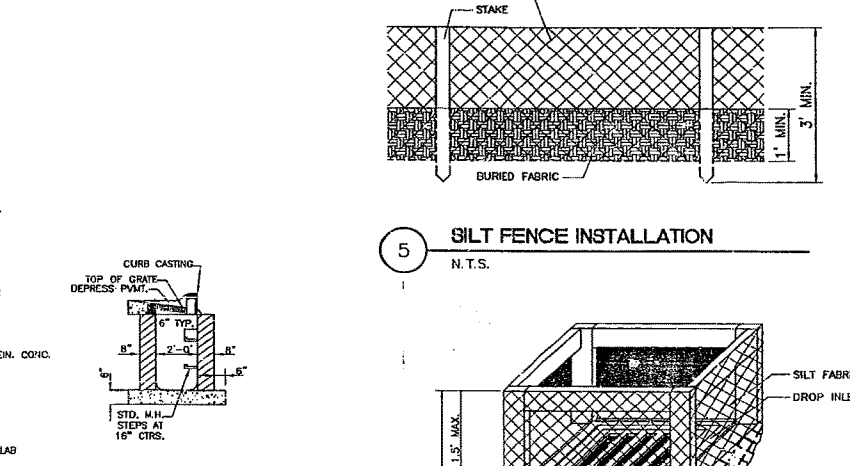
14 TYPE 'A' INLET
N.T.S.



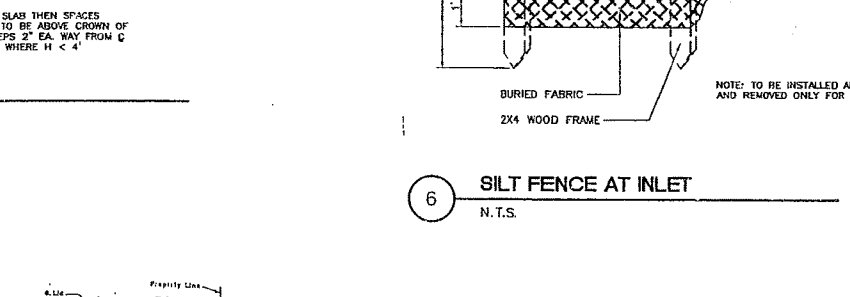
8 METER INSTALLATION (SD-6)
N.T.S.



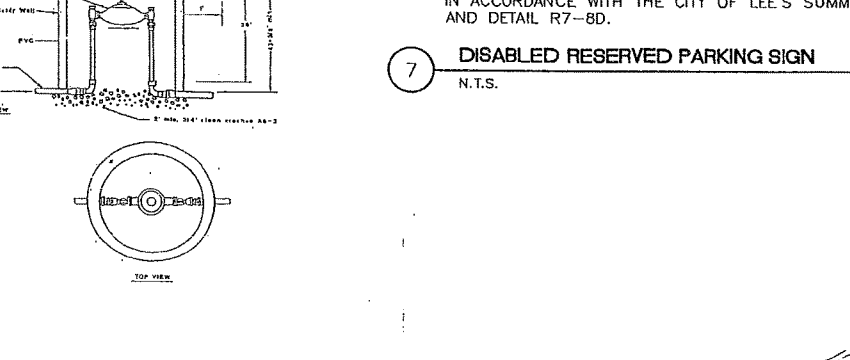
10 BORING DETAIL (SD-10)
N.T.S.



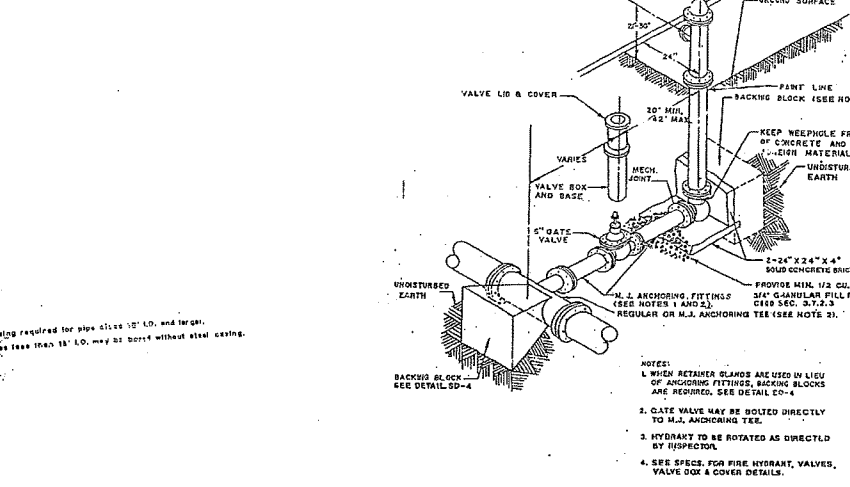
SECTION A-A



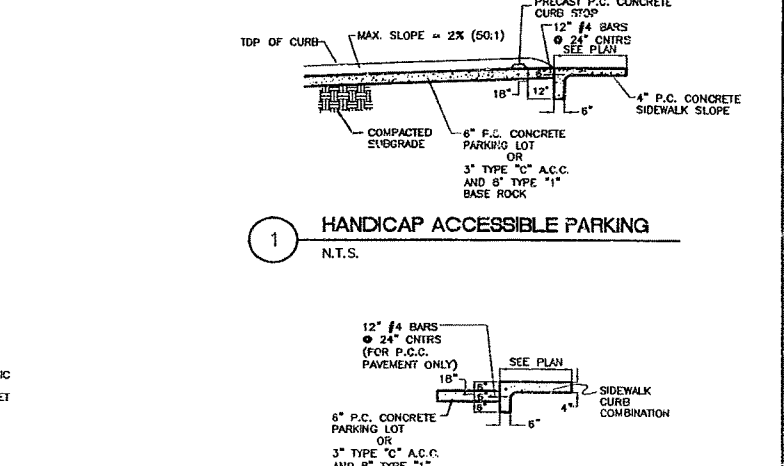
SECTION B-B



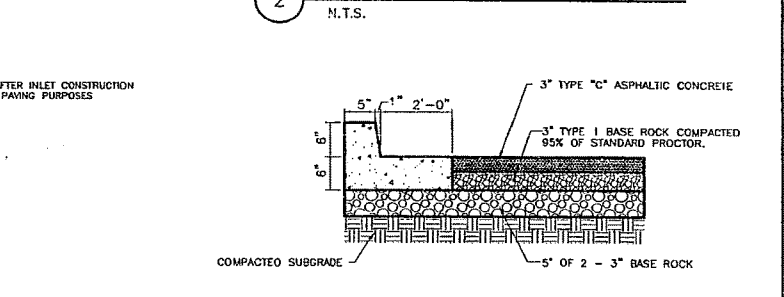
14 TYPE 'A' INLET
N.T.S.



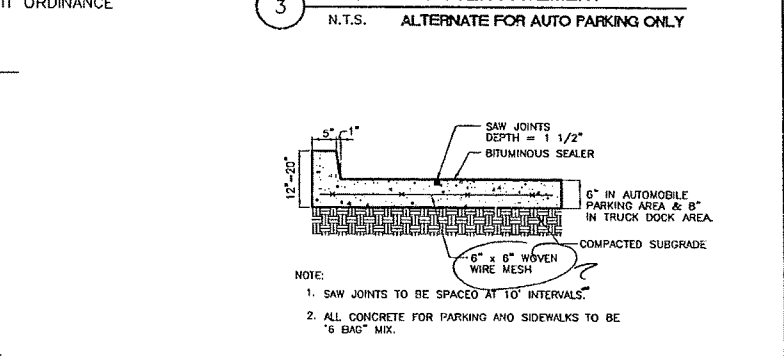
11 FIRE HYDRANT ASSEMBLY (SD-5B, SD-5A)
N.T.S.



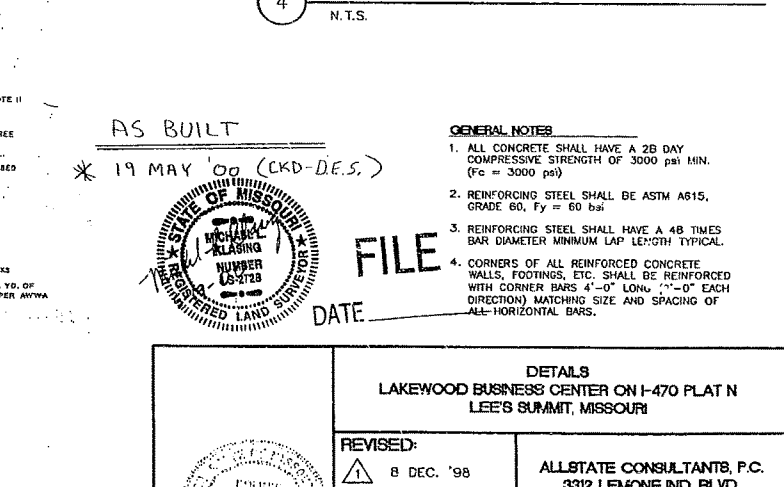
1 HANDICAP ACCESSIBLE PARKING
N.T.S.



2 SIDEWALK / CURB DETAIL
N.T.S.



3 ASPHALT W/ CONCRETE CURB + GUTTER PAVEMENT
N.T.S. ALTERNATE FOR AUTO PARKING ONLY



4 PORTLAND CEMENT CONCRETE INTEGRAL CURB + GUTTER PAVEMENT
N.T.S.

AS BUILT
* 19 MAY '99 (CKD-DES.)

FILE
DATE

DETAILS
LAKEWOOD BUSINESS CENTER ON I-470 PLAT N
LEE'S SUMMIT, MISSOURI

REVISED:
1 8 DEC. '98
2 23 DEC. '98

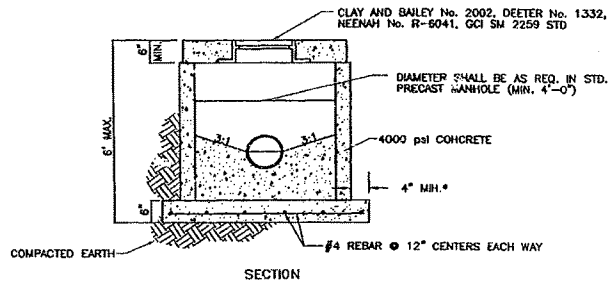
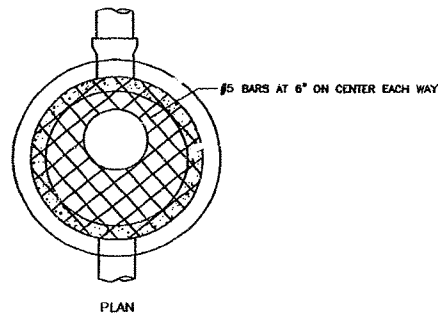
SCALE: N.T.S.

DATE 14 SEPT. '98

JOB # 98077.11

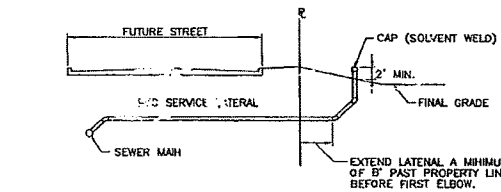
SHEET C7

ALLSTATE CONSULTANTS, P.C.
3312 LEMONE IND. BLVD.
COLUMBIA, MO 65201
(573) 875-8799



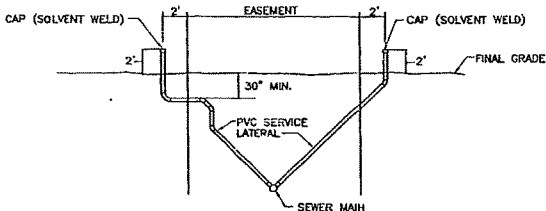
*A WALL THICKNESS NOT LESS THAN ONE-TWELFTH (1/12) OF THE INSIDE DIAMETER OR 4", WHICHEVER IS GREATER, SHALL BE USED.

**SHALLOW MANHOLE
SD-13**

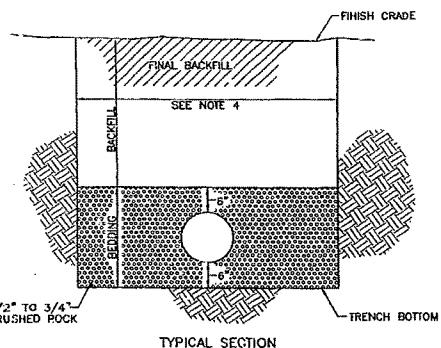


NOTE: THIS DETAIL IS FOR USE WHENEVER SERVICE LATERALS ARE EXTENDED FROM THE SEWER MAIN DURING NEW CONSTRUCTION. IN ALL CASES WHEN SERVICE LATERALS ARE EXTENDED, THE PIPE SHALL EXTEND A MINIMUM OF TWO (2) FEET ABOVE THE PROPOSED FINAL GRADE AND SHALL BE FITTED WITH A CAP THAT IS SOLVENT WELDED IN PLACE.

SERVICE LATERAL EXTENSION UNDER FUTURE STREETS

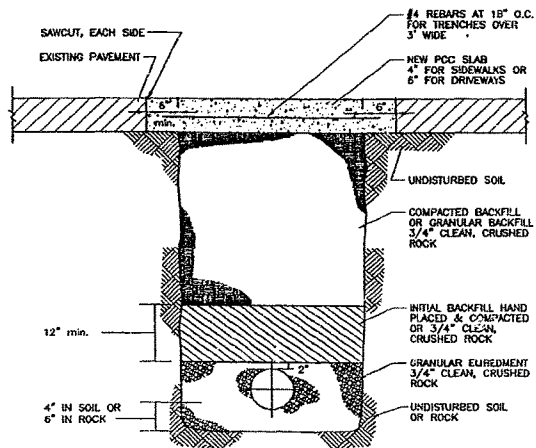


SERVICE LATERAL EXTENSION FROM DEEP SEWER



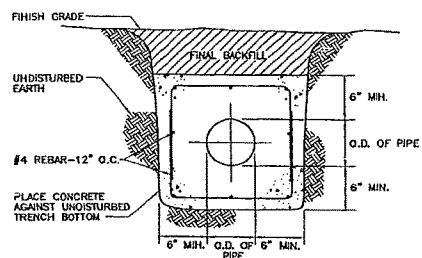
- NOTES:
1. BACKFILL SHALL BE JOB EXCAVATED MATERIAL FREE FROM DEBRIS AND STONES COMPACTED TO 90% OF STANDARD PROCTOR DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698. FOR BACKFILL UNDER PAVEMENT (EXISTING OR PROPOSED) SEE SD-9 AND SD-11.
 2. BEDDING MATERIAL SHALL BE 1/2" TO 3/4" CLEAN CRUSHED ROCK.
 3. TRENCH BANKS WILL BE LEFT BACK ON SLOPES IN ACCORDANCE WITH CURRENT OSHA REGULATIONS. SLOPES MUST NOT EXTEND BELOW TOP OF BEDDING.
 4. MINIMUM AND MAXIMUM WIDTHS SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURER'S RECOMMENDATION AS APPROVED ON ENGINEERING PLANS.

PIPE EMBEDMENT



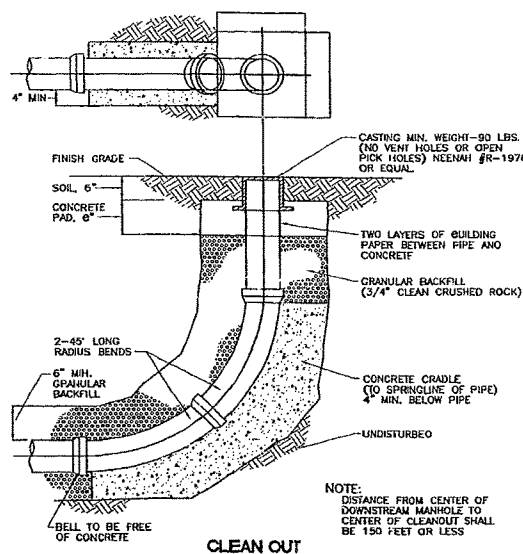
NOTE: FOR ASPHALT PAVEMENT USE 6" PCC SLAB OVERLAP BY A MINIMUM OF 2" ASPHALTIC CONCRETE TO MATCH EXISTING GRADE

PAVEMENT REPLACEMENT



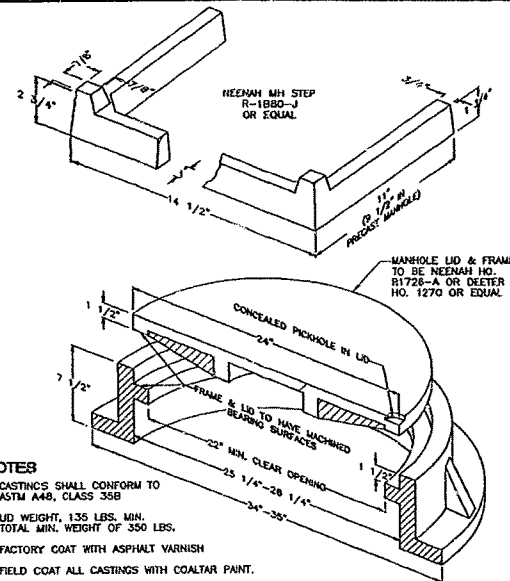
- NOTES:
1. FOR PIPE LARGER THAN 12" DIAMETER THE MINIMUM CONCRETE COVER SHALL BE 8" WITH #5 REBAR, 12" ON CENTER EACH WAY.
 2. BRACE OR THE PIPE TO PREVENT FLOATATION OR DEFLECTION.
 3. FOR ARCH ENCASEMENT OF PIPE SUBSTITUTE GRANULAR EMBEDMENT MATERIAL FOR CONCRETE BELOW SPRINGLINE OF PIPE.

CONCRETE ENCASEMENT



NOTE: DISTANCE FROM CENTER OF DOWNSTREAM MANHOLE TO CENTER OF CLEANOUT SHALL BE 150 FEET OR LESS

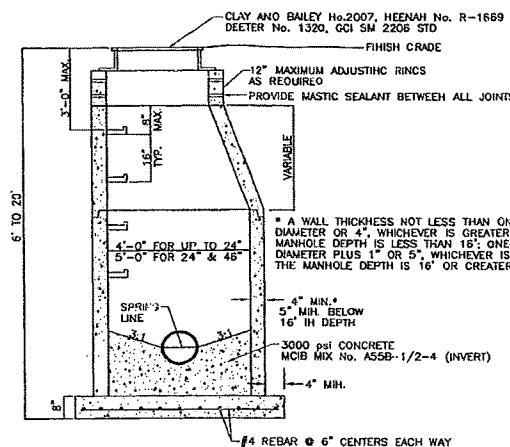
CLEAN OUT



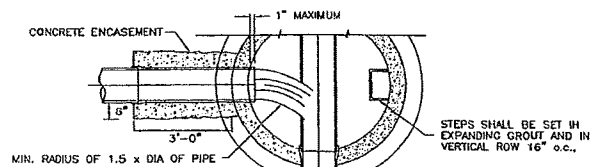
NOTES

1. CASTINGS SHALL CONFORM TO ASTM A48, CLASS 35B.
2. LID WEIGHT, 135 LBS. MIN. TOTAL MIN. WEIGHT OF 350 LBS.
3. FACTORY COAT WITH ASPHALT VARNISH.
4. FIELD COAT ALL CASTINGS WITH COAL TAR PAINT.
5. WATER TIGHT LID AND FRAME TO BE HEENAH NO. R-1916-F WITH FOUR 3/4" ANCHOR BOLTS OR EQUAL.

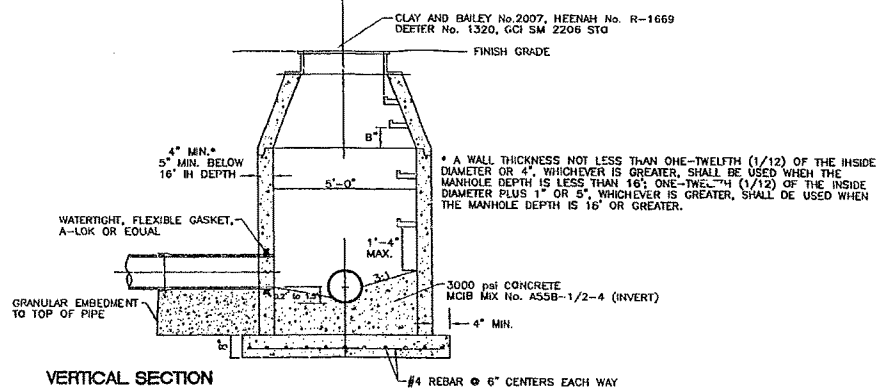
**MANHOLE CASTINGS
(STEPS, FRAME & LID)**



**STANDARD MANHOLE
SD-12**



HORIZONTAL SECTION



VERTICAL SECTION

CONCENTRIC STANDARD MANHOLE

**SPECIFICATIONS
SANITARY SEWERS**

Sewer Pipe

1. Reinforced Concrete Pipe - Reinforced concrete pipe and fittings shall conform to the requirements of ASTM C76. Gaskets shall be neoprene or other synthetic rubber. Natural rubber will not be accepted.
2. Ductile Iron Pipe - Ductile iron pipe shall conform to AWWA C151, Class 50 minimum. Joints shall be mechanical or push-on joints and conform to the current specification AWWA C111. Gaskets shall be neoprene or synthetic rubber material. Natural rubber gaskets will not be acceptable.

Fittings shall conform to the current AWWA Specifications C110 and C153 and shall have a pressure rating of not less than that specified for the pipe.

3. Polyvinyl Chloride Pipe (PVC) - Polyvinyl chloride pipe shall conform to ASTM D3034, Type PSM. The minimum wall thickness shall conform to SOR 35 or ASTM F789. Servicelines shall be SOR 26 (minimum).

Flexible gasketed joints shall be compression-type with an integral bell. The integral bell shall have an elastomeric gasket ring conforming to the requirements of ASTM F477. Gaskets shall be neoprene or other material. Natural rubber gaskets will not be acceptable.

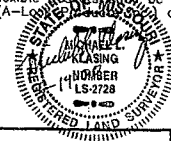
Fittings, tee's and bends, cleanouts, reducers, or other configurations required, shall be the same material as the pipe.

For sewer pipe with depth of cover exceeding 15 feet, the Engineer shall make earth loading analysis to determine if increased pipe strength is required in accordance with manufacturer specifications.

Manholes

Manholes shall be constructed complete with ring and cover, step, fittings, and other appurtenances, in accordance with the following criteria and standard details.

1. Concrete - 4000 PSI MCIB Mix No. A558-1-2, 3000 PSI MCIB Mix No. A535-1/2-4
2. Precast Sections - Circular precast concrete shall meet the requirements of ASTM C478. The exterior of all joints shall be sealed with 6" Hamilton-Kent "Kent Seal" tape or approved equal.
3. Dimensions - Standard Details SD-12 and SD-13.
4. Flexible Joint - Hamilton-Kent "Kent Seal", Ridco Sealants, Inc. "Bidco C56" or approved equal. The minimum bead dimensions shall be one square inch.
5. Cool Tar Point - Koppers "Bitumastic Super Service Black", Tremac "46-450 Heavy Tremecol", Porter "Tor Mastic 100" or approved equal.
6. Flexible Gaskets - Flexible gaskets shall be Press-wedge, PSX (Press Seal Gasket Corporation), A-Lok (A-Lok Products, Inc.) or approved equal.
7. Portland Cement - Portland Cement shall conform to ASTM C150, Type I or II. When high early strength is required, Type III can be used.
8. Fine Aggregate - Fine aggregate shall meet the requirements of ASTM C33.
9. Coarse Aggregate - Coarse aggregate shall meet the requirements of ASTM C33.
10. Mortar - One part Portland Cement, Type II, three parts sand, one-fourth part Hydrated lime, conforming to ASTM C207.
11. Manhole Steps - All manholes shall be constructed with plastic manhole steps. M.A. Industries polypropylene plastic steps No. PS-2-PF or approved equal.
12. Reinforcing Steel - ASTM A615, Grade 40 or Grade 60.
13. Precast concrete manholes shall conform to ASTM C478 except as modified by the specifications.
14. Bases not built monolithic with bottom section shall be poured of 4000 PSI concrete.
15. Manhole may be transitioned to 4'0" diameter, 8' above F.L. of outfall for 5'0" and 6'0" manholes.
16. The bottom section of all precast manholes not built monolithic with the base shall be set into a steel-reinforced poured concrete base a minimum of 4". (#4@6"E.W.)
17. Waterproofing will be required on the outside of manholes. The bitumen shall consist of two (2) six (6) mil coats of cool tar point.
18. The compressive strength of concrete used in the construction of precast reinforced concrete manholes shall be not less than 4000 PSI.
19. Only eccentric manhole cones will be allowed unless otherwise approved by the City Engineer.
20. Contractor shall provide steps spaced at 1'4" O.C. where inlet or manhole depth is greater than 4'0". Steps shall be M.A. Industries, Inc. model PS-2-PF or approved equal.
21. The fill concrete flow channel for side branches shall be placed to provide a smooth transition into the line flow.
22. Manholes shall not be constructed within limits of stream banks.
23. Flexible gaskets shall be Press-Wedge, PSX (Press Wedge Corp.), A-Lok (A-Lok Products, Inc.) or approved equal.



AS BUILT
* 19 MAY '00 (CKD-D.E.S.)

**SANITARY SEWER DETAILS
LAKEWOOD BUSINESS CENTER ON I-470 PLAT N
LEE'S SUMMIT, MISSOURI**

REVISED:
1 8 DEC. '98
2 23 DEC. '98

ALLSTATE CONSULTANTS, P.C.
3312 LEMONE IND. BLVD.
COLUMBIA, MO 65201
(573) 875-8799

SCALE:
NO SCALE

DATE
2 SEPT '98

JOB #
98077.11

SHEET
2 OF 2

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