

A SET OF AS-BUILT PLANS FOR BEST EXPRESS

A TRACT OF LAND IN U.S. SURVEY 1780,
TOWNSHIP 47 NORTH, RANGES 2 AND 3 EAST
OF THE FIFTH PRINCIPAL MERIDIAN
ST. CHARLES COUNTY, MISSOURI

STANDARD SYMBOLS & ABBREVIATIONS

TREE OR BUSH	○
LIGHT POLE	☆
SANITARY SEWER & MANHOLE	—●—
STORM SEWER & INLET	—■—
MAILBOX	□
ELECTRIC LINE	—E—
GAS LINE	—G—
WATER LINE	—W—
TELEPHONE LINE	—T—
CABLE TV LINE	—CATV—
OVERHEAD WIRE	—OHW—
UTILITY POLE	○
UTILITY POLE W/ DOWN GUY	○—
FIRE HYDRANT	⊕
WATER VALVE	⊕
WATER METER	⊕
GAS VALVE	⊕
ROAD SIGN	□
TELEPHONE PEDESTAL	□ TEL. PED.
FENCE	—X—

PRINCIPLES & STANDARDS:

- All excavations, grading, or filling shall have a finished grade not to exceed a 3:1 slope (33%). Steeper grades may be approved by the designated official if the excavation is through rock or the excavation or the fill is adequately protected (a designed head wall or toe wall may be required). Retaining walls that exceed a height of four (4) feet shall require the construction of safety guards as identified in the appropriate section(s) of the adopted BOCA Codes and must be approved by the Building Department. Permanent safety guards will be constructed in accordance with the appropriate section(s) of the adopted BOCA Codes.
- Sediment and erosion control plans for sites that exceed 20,000 square feet of grading shall provide for sediment or debris basins, silt traps or filters, silted straw bales or other approved measures to remove sediment from run-off waters. The design to be approved by the Designated Official. Temporary siltation control measures (structural) shall be maintained until vegetative cover is established at a sufficient density to provide erosion control on the site.
- Where natural vegetation is removed during grading, vegetation shall be reestablished in such a density as to prevent erosion. Permanent type grasses shall be established as soon as possible during the next seeding period after grading has been completed.
- When grading operations are completed or suspended for more than 30 days permanent grass seedings periods, temporary cover shall be provided according to the City Engineer's recommendations. All finished grades (areas not to be disturbed by future improvement) in excess of 20% slopes (5:1) shall be mulched and tacked at the rate of 100 pounds per 1,000 square feet, when seeded.
- Provisions shall be made to accommodate the increased runoff caused by changed soils and surface conditions during and after grading. Unvegetated open channels shall be designed so that gradients result in velocities of 2 fps (feet per second) or less. Open channels with velocities more than 2 fps and less than 5 fps shall be established in permanent vegetation by use of commercial erosion control blankets or lined with rock rip rap or concrete or other suitable materials as approved by the City Engineer. Detention basins, diversions, or other appropriate structures shall be constructed to prevent velocities above 5 fps.
- The adjoining ground to development sites (lots) shall be provided with protection from accelerated and increased surface water, silt from erosion, and any other consequence of erosion. Run-off water from developed areas (parking lots, paved sites and buildings) above the area to be developed shall be directed to diversions, detention basins, concrete gutters and/or underground outlet systems. Sufficiently anchored straw bales may be temporarily substituted with the approval of the City Engineer.
- Development along natural watercourses shall have residential lot lines, commercial or industrial improvements, parking areas or driveways set back a minimum of 25 feet from the top of the existing stream bank. The watercourse shall be maintained and the responsibility of the subdivision trustees or in the case of a site plan by the property owner. Permanent vegetation should be left intact. Variations will include designed stream bank erosion control measures and shall be approved by the City Engineer, FEMA and U.S. Army Corps of Engineers guidelines shall be followed where applicable regarding site development areas designated as flood plains and wetlands.
- All lots shall be seeded and mulched at the minimum rates defined in Appendix A or sodded before an occupancy permit shall be issued except that a temporary occupancy permit may be issued by the Building Department in cases of undue hardship because of unfavorable ground conditions.

VEGETATIVE ESTABLISHMENT For Urban Development Sites APPENDIX A

Seeding Rates:

Permanent:
Tall Fescue - 30 lbs./ac.
Smooth Brome - 20 lbs./ac.
Combined Fescue @ 15 lbs./ac. and Brome @ 10 lbs./ac.

Temporary:

Wheat or Rye - 150 lbs./ac. (3.5 lbs. per square foot)
Oats - 120 lbs./ac. (2.75 lbs. per square foot)

Seeding Periods:

Fescue or Brome - March 1 to June 1
August 1 to October 1
Wheat or Rye - March 15 to November 1
Oats - March 15 to September 15

Mulch Rates:

100 lbs. per 1,000 sq. feet (4,356 lbs. per acre)

Fertilizer Rates:

Nitrogen 30 lbs./ac.
Phosphate 30 lbs./ac.
Potassium 30 lbs./ac.
Lime 600 lbs./ac. ENM*
* ENM = effective neutralizing material as per State evaluation of quarried rock.

LANDSCAPE LEGEND

	QTY. 10 INDICATES PROPOSED HARDWOOD TREE (ashes, oaks, maples, birches, sweet gum) (Minimum 2" caliper)
	QTY. 36 INDICATES PROPOSED EVERGREEN SHRUB (mugo pines, yews, junipers, hollies, boxwoods) (Minimum 4' in height)
	QTY. 5 INDICATES EXISTING TREES BEING REMOVED
	QTY. 5 INDICATES RELOCATED OR REPLACED TREES (Minimum 2" caliper)

LANDSCAPING AS DEPICTED IS SUBJECT TO FINAL DESIGN BY A QUALIFIED LANDSCAPE DESIGNER

GENERAL NOTES

- UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND THEREFORE THEIR LOCATIONS SHALL BE CONSIDERED APPROXIMATE ONLY. THE VERIFICATION OF THE LOCATION OF ALL UNDERGROUND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL BE LOCATED PRIOR TO ANY GRADING OR CONSTRUCTION OF THE IMPROVEMENTS.
- ALL TRENCH BACKFILLS SHALL BE COMPACTED TO 90% OF THE MAXIMUM DENSITY AS DETERMINED BY THE "MODIFIED AASHTO T-190 COMPACTION TEST" (A.S.T.M. D-1557). ALL TRENCH BACKFILLS UNDER PAVED AREAS INCLUDING SIDEWALKS SHALL BE GRANULAR FILL. ALL OTHER TRENCH BACK FILLS MAY BE EARTH MATERIAL (FREE OF LARGE CLODS OR STONES).
- NO AREA SHALL BE CLEARED WITHOUT THE PERMISSION OF THE PROJECT ENGINEER.
- ALL GRADES SHALL BE WITHIN 0.2 FEET OF THOSE SHOWN ON THE GRADING PLAN.
- NO SLOPE SHALL BE STEEPER THAN 3:1. ALL SLOPES SHALL BE SODDED OR SEEDED AND MULCHED.
- ALL CONSTRUCTION AND MATERIALS USED SHALL CONFORM TO CURRENT CITY OF O'FALLON STANDARDS.
- ALL UTILITIES SHOWN ARE EXISTING UNLESS OTHERWISE NOTED. ALL NEW UTILITIES SHALL BE LOCATED UNDERGROUND.
- ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.
- THE DEVELOPER SHALL COMPLY WITH CURRENT ARTICLE 13 PERFORMANCE STANDARDS.
- ONE LANE OF ROADWAY SHALL REMAIN OPEN AT ALL TIMES AND TRAFFIC CONTROL SHALL MEET MISSOURI DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.
- ALL CONSTRUCTION METHODS AND PRACTICES TO CONFORM WITH OSHA STANDARDS.
- DETENTION FOR THIS SITE WAS PROVIDED AS PART OF THE OVERALL KEATON CROSSING.
- OFF-SITE EASEMENTS WILL BE REQUIRED WHERE THEY ARE NECESSARY.
- THE DEVELOPER SHALL COMPLY WITH CURRENT TREE PRESERVATION ORDINANCE NUMBER 1689 AND PROVIDE LANDSCAPING AS SET FORTH IN ARTICLE 23 OF THE CITY OF O'FALLON ZONING ORDINANCES.
- THE DEVELOPER MUST SUPPLY CITY CONSTRUCTION INSPECTORS WITH SOIL REPORTS PRIOR TO OR DURING SITE SOIL TESTING.
- THE CONTRACTOR SHALL ASSUME COMPLETE RESPONSIBILITY FOR CONTROLLING ALL SILTATION AND EROSION OF THE PROJECT AREA. THE CONTRACTOR SHALL USE WHATEVER MEANS NECESSARY TO CONTROL EROSION AND SILTATION INCLUDING, BUT NOT LIMITED TO, STAKED STRAW BALES AND/OR SILTATION FABRIC FENCES (POSSIBLE METHODS OF CONTROL ARE DETAILED IN THE PLAN). CONTROL SHALL COMMENCE WITH GRADING AND BE MAINTAINED THROUGHOUT THE PROJECT UNTIL ACCEPTANCE OF THE WORK BY THE OWNER AND/OR THE CITY OF O'FALLON AND/OR MODOT. THE CONTRACTOR'S RESPONSIBILITIES DEPOSITING OF SILT. THE OWNER AND/OR THE CITY OF O'FALLON AND/OR MODOT MAY AT THEIR OPTION DIRECT THE CONTRACTOR IN HIS METHODS AS DEEMED FIT TO PROTECT PROPERTY AND IMPROVEMENTS. ANY DEPOSITING OF SILTS OR MUD ON NEW OR EXISTING PAVEMENT OR IN NEW OR EXISTING STORM SEWERS OR SWALES SHALL BE REMOVED AFTER EACH RAIN AND AFFECTED AREAS CLEANED TO THE SATISFACTION OF THE OWNER AND/OR THE CITY OF O'FALLON AND/OR MODOT.
- ALL FILLED PLACES UNDER PROPOSED STORM AND SANITARY SEWER AND/OR PAVED AREAS SHALL BE COMPACTED TO 90% OF THE MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED AASHTO T-190 COMPACTION TEST OR 90% OF THE MAXIMUM DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST AASHTO T-99. ALL FILLED PLACES IN PROPOSED ROADS SHALL BE COMPACTED FROM THE BOTTOM OF THE FILL UP. ALL TESTS SHALL BE VERIFIED BY A SOILS ENGINEER CONCURRENT WITH GRADING AND BACKFILLING OPERATIONS.
- ALL SIGN LOCATIONS AND SIZES MUST BE APPROVED SEPARATELY THROUGH THE PLANNING DIVISION. SIGN LOCATIONS NOT KNOWN AT THIS TIME.
- ALL SIGN POST AND BACKS AND BRACKET ARMS SHALL BE PAINTED BLACK USING CARBOLINE RUSTPROOF PENETRATING SEALER SG AND CARBOLINE 133 HB PAINT (OR EQUIVALENT AS APPROVED BY CITY AND MODOT). SIGNS DESIGNATING STREET NAME SHALL BE ON THE OPPOSITE SIDE OF THE STREET FROM TRAFFIC CONTROL SIGNS.
- LIGHTING VALUES WILL BE REVIEWED ON SITE PRIOR TO FINAL OCCUPANCY INSPECTION. CORRECTIONS WILL NEED TO BE MADE IF NOT IN COMPLIANCE WITH CITY STANDARDS.
- ALL STORM AND SANITARY STRUCTURES SHALL NOT BE CONSTRUCTED WITH BRICK. ALL STORM SEWER JOINTS SHALL BE GASKETED O-RING TYPE.
- EACH FIRE HYDRANT SHALL NOT HAVE LESS THAN TWO 2-1/2 INCH OUTLETS AND ONE 4-1/2 INCH OUTLET, A 5-1/4 INCH VALVE, A 6 INCH BARREL AND SHALL BE OF THE BREAKAWAY DESIGN, FROST FREE WITH CHAIN, LEFT HAND OPEN DESIGN AND HAVE NATIONAL STANDARD THREADS.
- FIRE HYDRANT SHALL BE PROVIDED WITH A CONTROL VALVE IN THE HYDRANT CONNECTION SUCH THAT THE HYDRANT CAN BE REMOVED FROM SERVICE WITHOUT SHUTTING OFF WATER SUPPLY TO OTHER FIRE HYDRANTS.
- THERE SHALL BE NO OBSTRUCTION, I.E. PLANTINGS, BUSHES, TREES, SIGNS, LIGHT STANDARDS MAILBOXES, ETC. WITHIN SIX (6) FEET OF ANY FIRE HYDRANT, AND/OR FIRE DEPARTMENT CONNECTION TO AN AUTOMATIC SPRINKLER SYSTEM.
- WHEN ELECTRIC SERVICE IS ESTABLISHED ALL TRANSFORMERS SHALL BE SCREENED FROM VIEW EXCEPT FOR ACCESS POINT ON TRANSFORMER.
- SIDEWALKS, CURB RAMPS, RAMP, AND ACCESSIBLE PARKING SPACES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT APPROVED "AMERICAN WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES" (ADAAG) ALONG WITH THE REQUIRED GRADES, CONSTRUCTION MATERIALS, SPECIFICATIONS AND SIGNAGE. IF ANY CONFLICT OCCURS BETWEEN THE ABOVE INFORMATION AND THE PLANS, THE ADAAG GUIDELINES SHALL TAKE PRECEDENCE AND THE CONTRACTOR PRIOR TO ANY CONSTRUCTION SHALL NOTIFY THE PROJECT ENGINEER.

GRADING NOTES:

- A Geotechnical Engineer shall be employed by the owner and be on site during grading operations. All soil tests shall be verified by the Geotechnical Engineer concurrent with the grading and back filling operations.
- The grading contractor shall perform a complete grading and compaction operation as shown on the plans, stated in these notes, or reasonably implied therefrom, all in accordance with the plans and notes as interpreted by the Geotechnical Engineer.
- The Contractor shall notify the Soils Engineer at least two days in advance of the start of the grading operation.
- All areas shall be allowed to drain. All low points shall be provided with temporary ditches.
- A sediment control plan that includes monitored and maintained sediment control basins and/or straw bales should be implemented as soon as possible. No graded area is to be allowed to remain bare over the winter without being seeded and mulched. Care should be exercised to prevent soil from damaging adjacent property and silted up existing downstream storm drainage system.
- Any existing trash and debris currently on this property must be removed and disposed of off-site.
- Soft soil in the bottom and banks of any existing or former pond sites or tributaries shall be removed, spread out and permitted to dry sufficiently to be used as fill. None of this material should be placed in proposed right-of-way locations or on storm sewer locations.
- Site preparation includes the clearance of all stumps, trees, bushes, shrubs, and weeds; the grubbing and removal of roots and other surface obstructions from the site; and the demolition and removal of any man-made structures. The unsuitable material shall be properly disposed of off-site. Topsoil and grass in the fill areas shall be thoroughly disc'd prior to the placement of any fill. The Soils Engineer shall approve the discing operation.
- Compaction equipment shall consist of tamping rollers, pneumatic-tired rollers, vibratory roller, or high speed impact type drum rollers acceptable to the Soils Engineer. The roller shall be designed so as to avoid the creation of a layered fill without proper blending of successive fill layers.
- The Soils Engineer shall observe and test the placement of the fill to verify that specifications are met. A series of fill density tests will be determined on each lift of fill. Interim reports showing fill quality will be made to the Owner at regular intervals.
- The Soils Engineer shall notify the Contractor of rejection of a lift of fill or portion thereof. The Contractor shall rework the rejected portion of fill and obtain notification from the Soils Engineer of its acceptance prior to the placement of additional fill.
- All areas to receive fill shall be scarified to a depth of not less than 6 inches and then compacted in accordance with the specifications given below. Natural slopes steeper than 1 vertical to 5 horizontal to receive fill shall have horizontal benches cut into the slopes before the placement of any fill. The width and height to be determined by the Soils Engineer. The fill shall be loosely placed in horizontal layers not exceeding 8 inches in thickness and compacted in accordance with the specifications given below. The Soils Engineer shall be responsible for determining the acceptability of soils placed. Any unacceptable soils placed shall be removed at the Contractor's expense.
- The sequence of operation in the fill areas will be fill, compact, verify acceptable soil density, and repetition of the sequence. The acceptable moisture contents during the filling operation are those at which satisfactory dry densities can be obtained. The acceptable moisture contents during the filling operation in the remaining areas are from 2 to 8 percent above the optimum moisture content.
- The surface of the fill shall be finished so that it will not impound water. If at the end of a days work it would appear that there may be rain prior to the next working day, the surface shall be finished smooth. If the surface has been finished smooth for any reason, it shall be scarified before proceeding with the placement of succeeding lifts. Fill shall not be placed on frozen ground, nor shall filling operations continue when the temperature is such as to permit the layer under placement to freeze.
- All siltation control devices shall be inspected by the contractor after any rain of 1/2" or more with any appreciable accumulation of mud to be removed and siltation measures repaired where necessary within 24 hours.
- No slope shall be steeper than 3(Horizontal):1(Vertical). All slopes shall be sodded or seeded and mulched.
- Fill and back fill shall be compacted to the criteria specified in the following table:

CATEGORY	MINIMUM PERCENT COMPACTION %
Fill in building areas below footings	95 %
Fill under slabs, walks, and pavement	95 %
Fill other than building areas	90 %
Natural sub grade	90 %
Pavement sub grade	90 %
Pavement base course	90 %

Measured as a percent of the maximum dry density as determined by Standard Proctor Test (ASTM-D-698). Moisture content must be within 2 percent below or 4 percent above optimum moisture content if fill is deeper than 10 feet.

18. Any contaminated soil encountered during excavation shall be hauled and placed as directed by the owners environmental engineering representative.

19. Developer must supply City construction inspectors with soil reports prior to or during site soil testing.

20. The Contractor shall assume complete responsibility for controlling all siltation and erosion of the project area. The Contractor shall use whatever means necessary to control erosion of the project area. The Contractor shall use whatever means necessary to control erosion and siltation including, but not limited to, staked straw bales and/or fabric fences (possible methods of control are detailed in the plan). Control shall commence with grading and be maintained throughout the project until acceptance of the work by the Owner and/or the City of O'Fallon and/or MoDOT. The Contractor's responsibilities include all design and implementation of the required erosion and siltation control. The Owner and/or the City of O'Fallon and/or MoDOT may at their option direct the Contractor in his methods as deemed fit to protect property and improvements. Any depositing of silts or mud on new or existing pavement or in new or existing storm sewers or swales shall be removed after each rain and affected areas cleaned to the satisfaction of the Owner and/or the City of O'Fallon and/or MoDOT.

DEVELOPMENT NOTES

- Area of Tract: 0.815 Acres (35,500 Sq. Ft.)
- Existing Zoning: C-2 General Business
- Proposed Use: Car Wash
- Area of Office: 497 sq. ft.
Area of Car Wash: 4,110 sq. ft.
Total Area of Building: 6,000 sq. ft.
- The required height and building setbacks are as follows:
Minimum Front Yard: 25 feet
Minimum Side Yard: None, 25' on street side of a corner lot
Minimum Rear Yard: None
Maximum Height of Building: Not to exceed 5'
- Site is served by:
City of O'Fallon Sewer
AmerenUE Electric Company
St. Charles Gas Company
City of O'Fallon Water
CIT Telephone Company

- According to the Flood Insurance Rate Map of the City of O'Fallon, (Community Panel number 290316 0240 E dated August 2, 1996) this property lies within zone X. Zone X is defined as "Area determined to be outside the 500yr flood plain."
- Parking Required: 1 space per 300 sq. ft. of floor area = 756 sq. ft. of office space/300 = 2.52 spaces required
Total Parking Provided: 4 spaces (Including 1 HC space)
- Landscape Required:
Interior Landscape Requirements:
3 (spa.) x 270 = 810 S.F.
810 sq. ft. x 0.06 (%) = 48.60
Total Interior Landscape Required: 48.60 S.F.
Total Interior Landscape Provided: 1,565 S.F.
Street Tree Requirements:
1 tree every 40' of frontage = 133.74 / 40 = 3.34 ~ 4
Open Space Landscape Requirements:
11,721 S.F. / 3,000 S.F. = 3.90 ~ 4 Trees
- Site Coverage Calculations:
Building = 6,000 sq. ft. = 17%
Pavement = 12,780 sq. ft. = 30%
Green Space = 11,721 sq. ft. = 33%
- All replaced and proposed utilities shall be placed underground.
- Graded areas that are to remain bare for more than 2 weeks are to be seeded and mulched.
- Any damage to existing pavement and curbing is to be repaired.

REFERENCE BENCHMARK

REFERENCE BENCHMARK ELEV 667.66 STANDARD DISK STAMPED "ORF 1931" SET IN A 12" SQUARE CONCRETE MONUMENT. LOCATE ABOUT 3 MILES SOUTHWEST OF THE TOWN OF O'FALLON, 2 MILES SOUTHWEST OF THE DAM FOR LAKE SAINT LOUIS AND 0.8 MILE NORTHEAST OF THE IMMACULATE CONCEPTION CATHOLIC CHURCH 107' NORTHWEST OF THE NORTHWEST CORNER OF A SHED ADDITION TO AN OLDER BARN; 25' SOUTHWEST OF A SMALL POND; 39' NORTHEAST OF A LONE PEAR TREE; AND 24.9' NORTHEAST OF A METAL WITNESS POST.

SITE BENCHMARK ELEV 625.38 (USGS DATUM)
IRON PIPE AT THE NORTHEAST CORNER OF SUBJECT PROPERTY.

AS-BUILTS NOTE:
ALL DISTANCE AND SLOPE CALCULATIONS ARE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.

SHEET INDEX

SHEET 1 COVER SHEET
SHEET 2 SITE PLAN
SHEET 3 PROFILES AND STRUCTURE DETAILS

GRADING QUANTITIES:

3,121 C.Y. FILL
977 C.Y. CUT (INCLUDES 15% SHRINKAGE)
2,144 C.Y. SHORT

THE ABOVE GRADING QUANTITY IS APPROXIMATE ONLY, NOT FOR BEDDING PURPOSES. CONTRACTOR SHALL VERIFY QUANTITIES PRIOR TO CONSTRUCTION.



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

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REVISIONS

NO.	DATE	DESCRIPTION



ENGINEERING
PLANNING
SURVEYING

1052 South Cloverleaf Drive
St. Peters, MO. 63376-6445
636-928-5552
FAX 928-1718

6-04-04

DATE

03-12-352

PROJECT NUMBER

1 OF 3

SHEET OF

12352ASB.DWG

FILE NAME

ECF

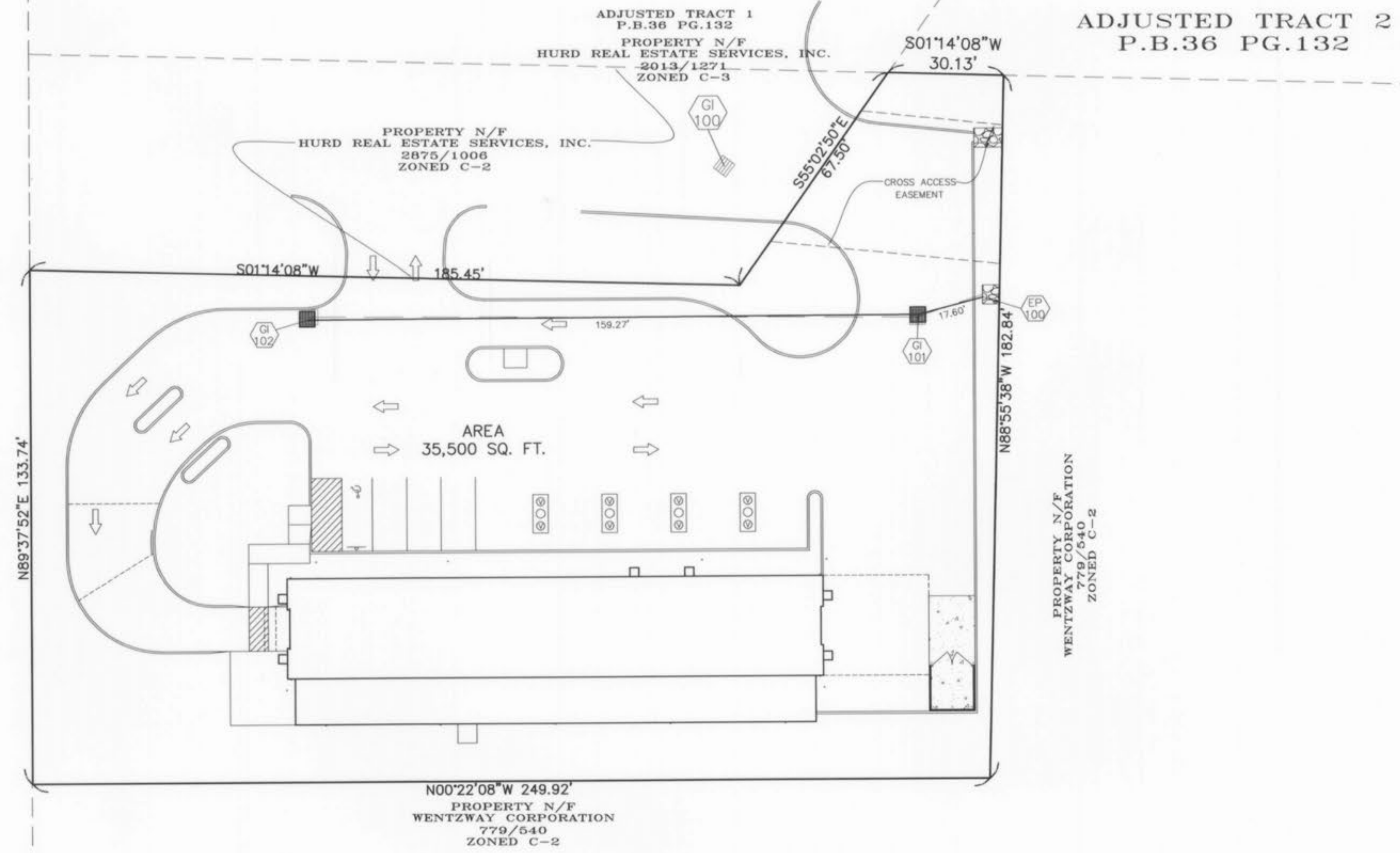
DRAWN

DESIGNED CHECKED

AS-BUILTS ADDED JUNE, 2004

Best Express Approved 7/22/04 HRC

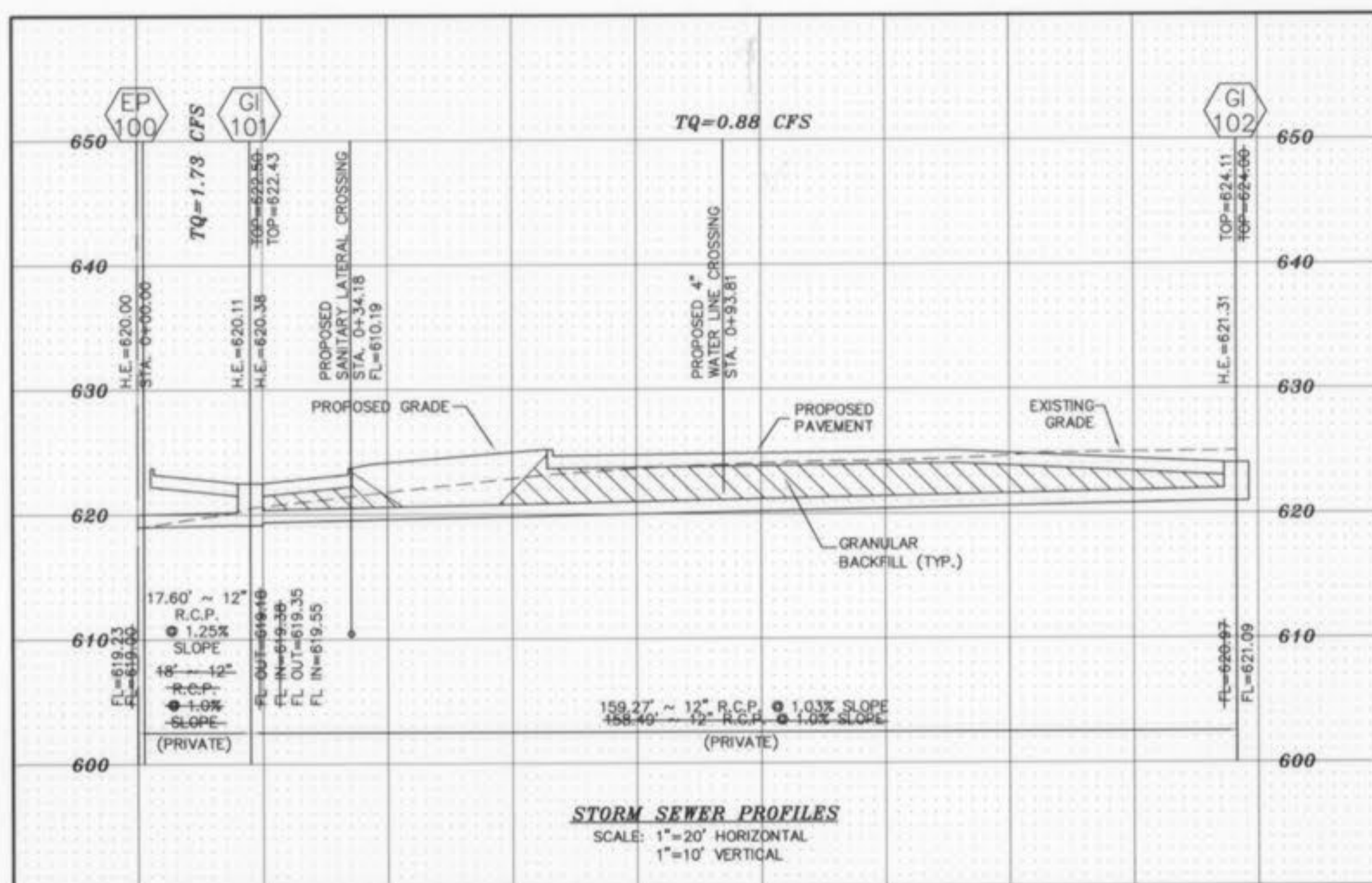
AS-BUILTS ADDED JUNE, 2004



UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND THEREFORE THEIR LOCATIONS SHALL BE CONSIDERED APPROXIMATE ONLY. THE VERIFICATION OF THE LOCATION OF ALL UNDERGROUND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL BE LOCATED PRIOR TO ANY GRADING OR CONSTRUCTION OF THE IMPROVEMENTS.

Best Express App 7/21/04 05K

AS-BUILTS ADDED JUNE, 2004



BAS PROJECT NAME : Best Express Carwash
 BAX PROJECT NO. : 03-12352
 DESIGN DATE : 3-23-03
 DESIGNED BY : AL

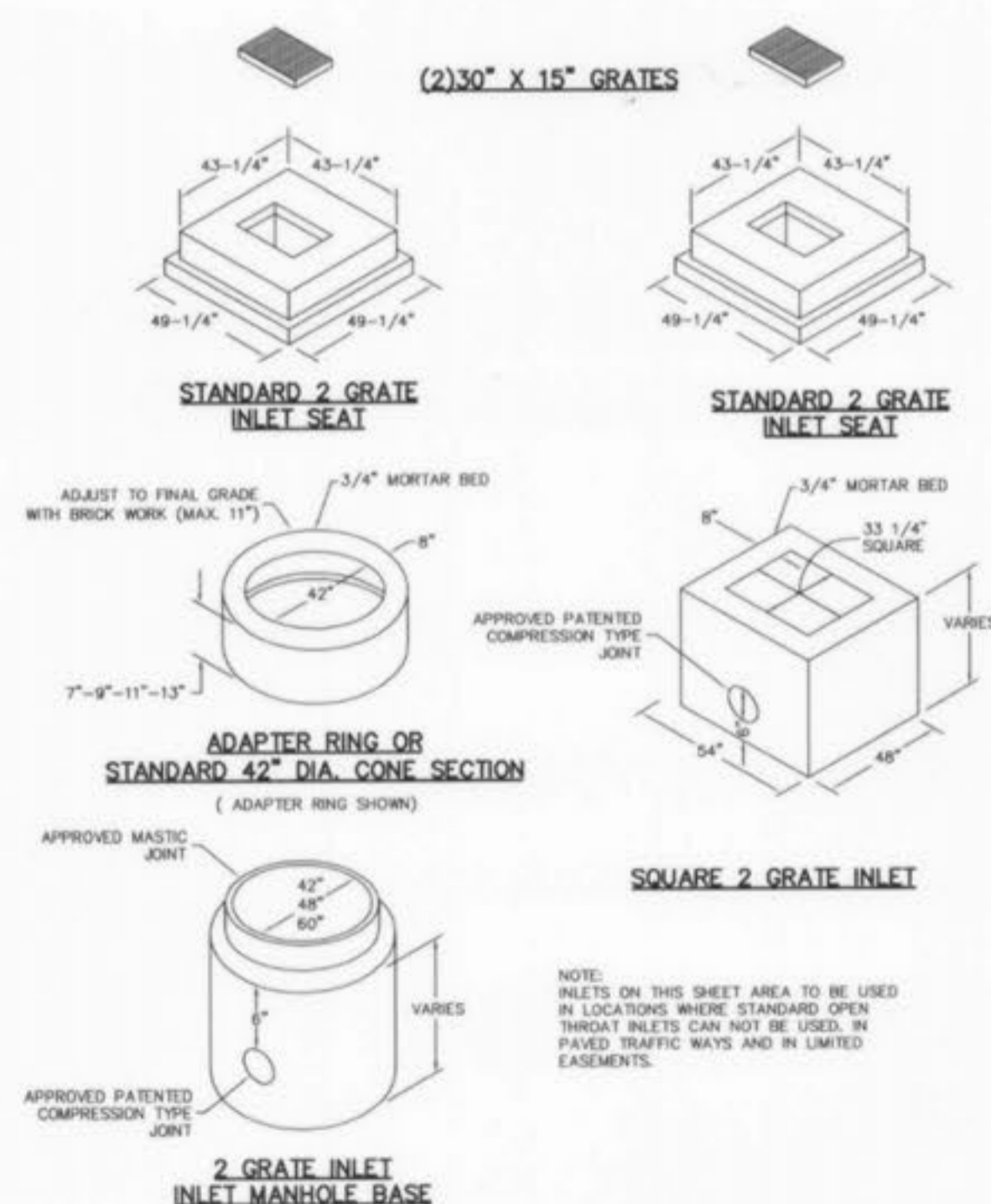
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OFF STR	LOW STR	L	DIA	UPPER FL LN	LOWER FL LN	RS	UPPER ST EL	DEPTH HY OF	UPPER HY EL	LOWER HY EL	HYD GRADE	FR HEAD	VEL HEAD	CHG LOSS	TURN LOSS	CURVE LOSS	STR GRADE	INL CAP	DR AREA	PI Q	TU	PIPE CAP	REMARKS	
02 102 GI 101	158	12	620.97	619.38	1.00	624.00	2.69	621.31*	620.38	+0.0040	0.13	1.12	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.88	3.57	1	
02 101 EP 100	18	12	619.18	619.00	1.00	622.50	2.39	620.11	620.00	+0.0240	0.04	2.20	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	1.73	3.56	2	HW=620.00

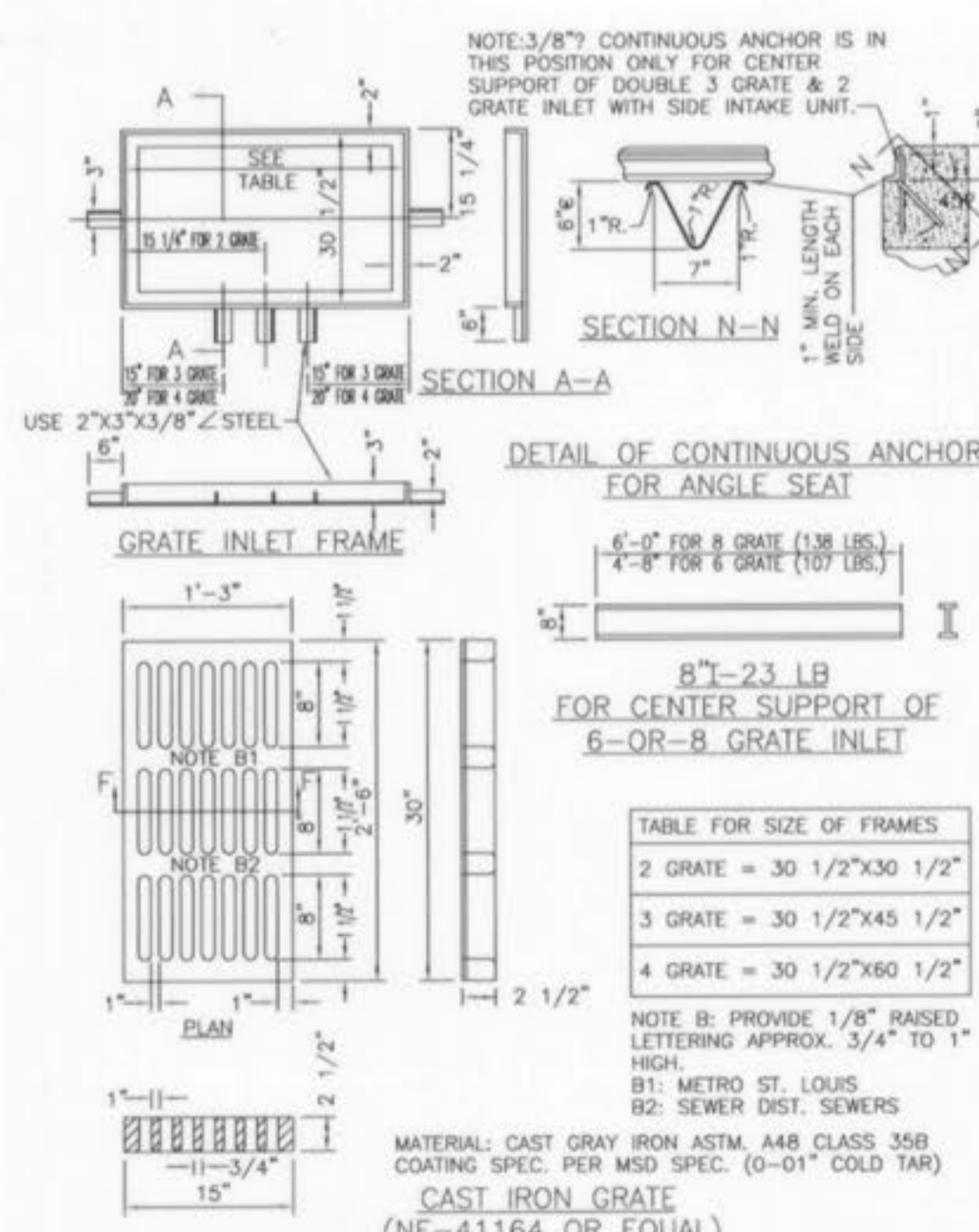
* INDICATES CRITICAL DEPTH

ROUND PIPE				HORIZONTAL ELLIPTICAL PIPE			
Inside Diameter of Pipe (Inches)	"W" Payline Width of Trench (Inches)	"W" Payline Width of Trench (Feet)	Pay-volumes cu. ft. per ft. of Concrete Encasement	Inside Diameter of Pipe (Inches)	"W" Payline Width of Trench (Inches)	"W" Payline Width of Trench (Feet)	Pay-volumes cu. ft. per ft. of Concrete Encasement
4	28	2.33	3.20				
6	28	2.33	3.46				
8	28	2.33	3.70				
10	28	2.33	3.86				
12	28	2.33	3.98				
15	32	2.67	4.89				
18	35	2.92	5.63	14 X 23	41	3.42	5.94
21	39	3.25	6.61				
24	42	3.50	7.39	19 X 30	49	4.08	7.68
27	45	3.75	8.18	22 X 34	53	4.42	8.61
30	49	4.08	9.30	24 X 38	58	4.83	9.70
33	53	4.42	10.53	27 X 42	62	5.17	10.71
36	56	4.67	11.43	29 X 45	66	5.50	11.72
39	DISCONTINUED			32 X 49	71	5.92	13.14
42	63	5.25	13.38	34 X 53	75	6.25	14.05
48	70	5.83	15.67	38 X 60	83	6.92	16.18
54	77	6.42	18.15	43 X 68	92	7.67	18.81
60	84	7.00	20.73	48 X 76	101	8.42	21.59
66	91	7.58	23.45	53 X 83	109	9.08	24.35
72	98	8.17	26.37	58 X 91	118	9.83	27.45
78	105	8.75	29.39	63 X 98	126	10.50	30.50
84	112	9.33	32.57	68 X 106	135	11.25	33.91
90	119	9.92	35.90	72 X 113	143	11.92	36.99
96	126	10.50	39.37	77 X 121	152	12.67	40.69
102	133	11.08	42.99	82 X 128	160	13.33	44.45
108	140	11.67	46.75	87 X 136	168	14.00	47.79
114	147	12.25	50.66	92 X 143	176	14.67	51.70
120	154	12.83	54.72	97 X 151	185	15.42	56.01
126	161	13.42	58.92				
132	168	14.00	63.27	106 X 166	202	16.83	64.48
144	182	15.17	72.40	116 X 180	218	18.17	73.59

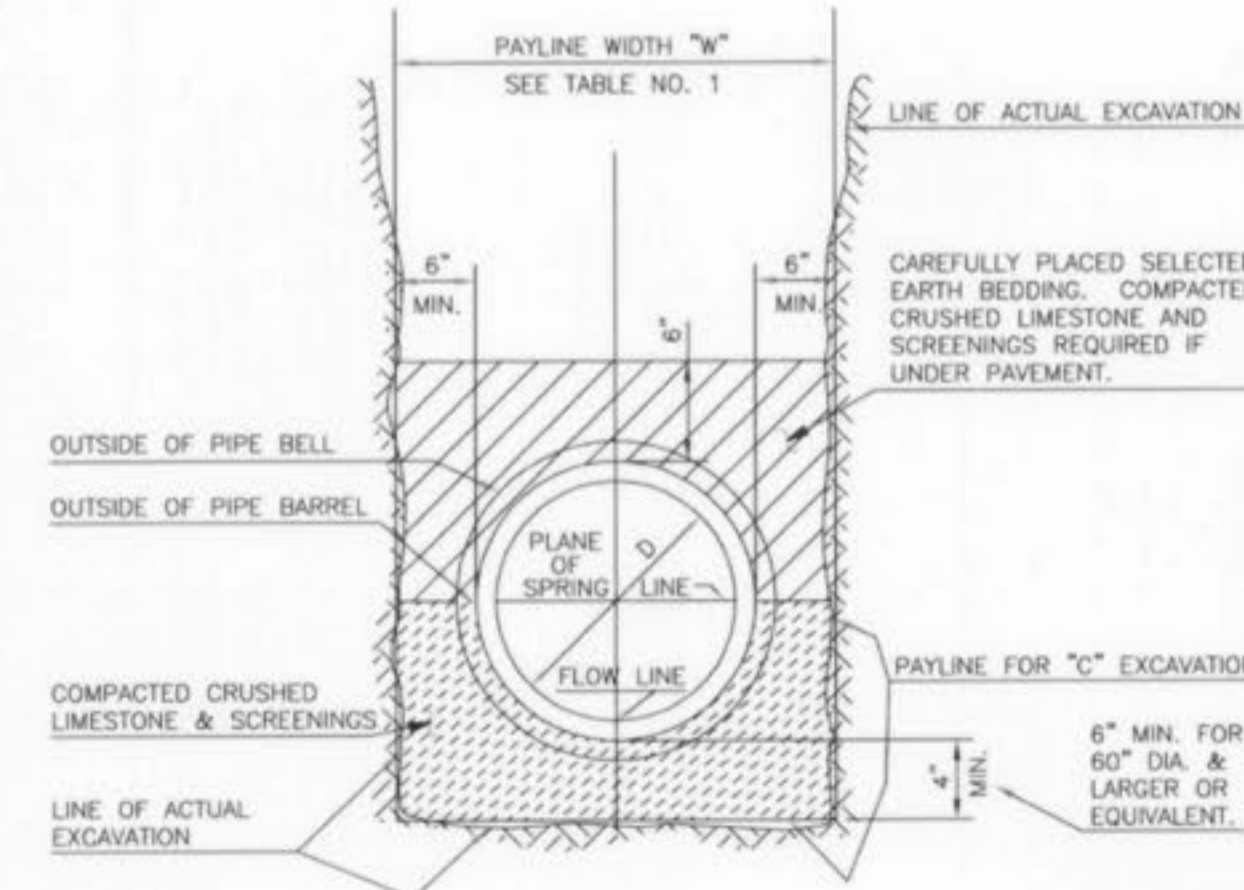
TABLE NO. 1
 PAYLINE WIDTHS OF TRENCH AND
 PAY-QUANTITIES OF CONCRETE



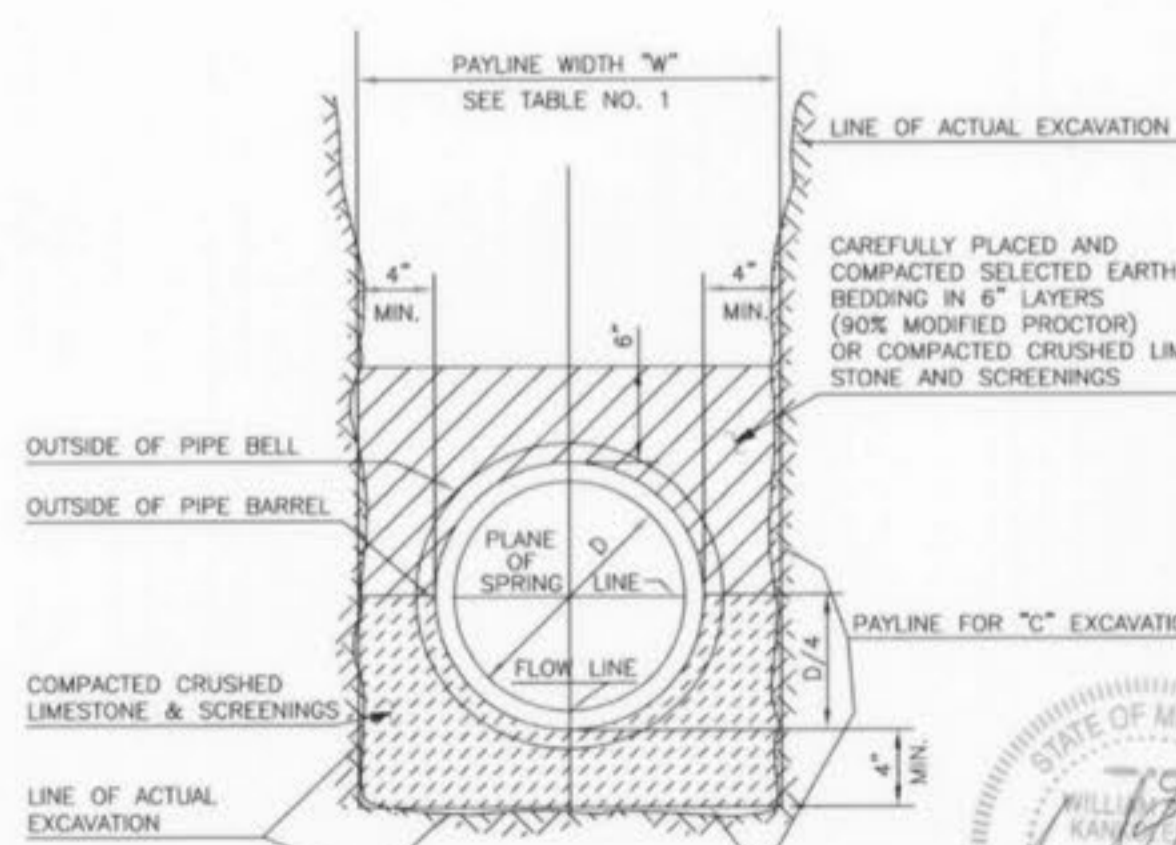
2 GRATE INLETS
 PRECAST CONCRETE
 NOT TO SCALE



DETAILS OF INLET
 FRAME AND GRATES



PIPE BEDDING CLASS "C"
 (MODIFIED FOR REINFORCED
 CONCRETE PIPE)



PIPE BEDDING CLASS "C"
 (FOR ALL PIPE EXCEPT
 REINFORCED CONCRETE PIPE)

