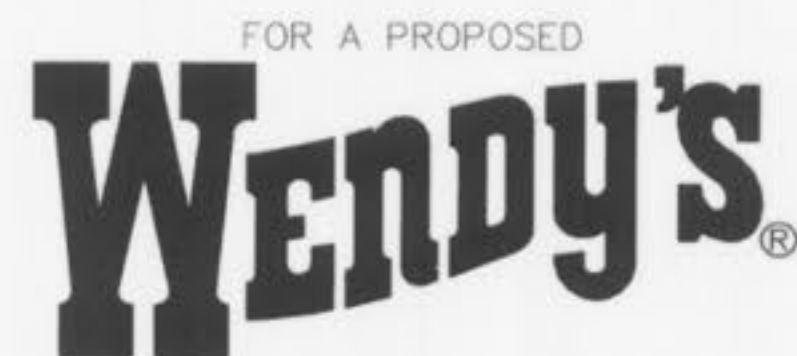


# IMPROVEMENT PLANS



FOR A PROPOSED  
LOT 2B OF WATERBURY COMMERCIAL PLAT 2,  
AS PER PLAT BOOK , PAGE  
ST. CHARLES COUNTY, MISSOURI



LOCATION MAP  
(NOT TO SCALE)

### PROPERTY DATA

OWNER UNDER CONTRACT = WENDY'S INTERNATIONAL, INC.  
ADDRESS = 4210 HIGHWAY K  
LOCATOR NO. = NOT YET ASSIGNED  
ACREAGE = 0.933 ACRES  
EXISTING ZONING = C2 CITY OF O'FALLON  
PROPOSED USE = RESTAURANT WITH DRIVE THRU  
FIRE DISTRICT = COTTLEVILLE FIRE PROTECTION DIST.  
SCHOOL DISTRICT = FRANCIS HOWELL  
SEWER DISTRICT = DUCKETT CREEK SANITARY DISTRICT  
WATER SHED = CROOKED CREEK  
FEMA MAP = 29183C0430 E  
ELECTRIC COMPANY = AMERENUE  
GAS COMPANY = LACLEDE GAS COMPANY  
PHONE COMPANY = ATT  
WATER COMPANY = PUBLIC WATER SUPPLY DISTRICT No. 2

### UTILITIES AND REVIEW AGENCIES

ELECTRIC COMPANY = AMEREN UE - ST. CHARLES DISTRICT  
200 NORTH CALLAHAN ROAD  
WENTZVILLE, MO 63385  
PH. (314) 412-7291  
CONTACT: TARA DOLDE

PHONE COMPANY = AT&T  
402 N. 3RD ST.  
ST. CHARLES, MO 63301  
PH. (xxx) xxx-xxxx  
CONTACT: ENGINEERING

GAS COMPANY = LACLEDE GAS COMPANY  
1999 TRADE CENTER DRIVE  
ST. PETERS, MO 63376  
PH. (636) 978-2663, X-103  
CONTACT: MIKE LANGAN

CABLE TELEVISION = CHARTER COMMUNICATIONS  
MAPPING AND DESIGN DEPARTMENT  
941 CHARTER COMMONS  
TOWN & COUNTRY COMMONS, MO 63017-0609  
CONTACT: LARRY SAAFIR

WATER COMPANY = PUBLIC WATER SUPPLY DISTRICT  
NO. 2 OF ST. CHARLES COUNTY  
100 WATER DRIVE  
O'FALLON, MO 63368  
PH. (636) 561-3737  
CONTACT: MARK MAHLER

SEWER DISTRICT = DUCKETT CREEK SANITARY DISTRICT  
3550 HIGHWAY K  
O'FALLON, MO 63368  
PH. (636) 441-1244  
ATTN: MICHAEL MERKT

FIRE DISTRICT = COTTLEVILLE COMMUNITY FIRE PROTECTION DISTRICT  
1385 MOTHERHEAD RD.  
ST. CHARLES, MO 63304  
PH. (636) 441-8799  
CONTACT: FIRE MARSHAL MARK BOEHLE

STORM SEWER = CITY OF O'FALLON  
100 NORTH MAIN STREET  
O'FALLON, MO 63366  
PH. (636) 379-5557  
CONTACT: JEANNIE GREENLEE

*As built Storm & Water*  
INDEX OF SHEETS

- C1 TITLE SHEET
- C2 SPECIFICATION SHEET
- C3 EXISTING CONDITIONS & FACILITIES REMOVAL PLAN
- C4 SITE AND GRADING PLAN
- C5 SITE GEOMETRY & UTILITY PLAN
- C6 SEWER PROFILES, DETAILS & HYDRAULIC CALCULATIONS
- C7 SITE & PAVEMENT DETAILS
- C8 DRAINAGE AREA PLAN
- C9 STORM WATER POLLUTION PREVENTION PLAN & DETAILS
- L1 PLANTING PLAN
- E7 ELECTRICAL PHOTOMETRIC PLAN

### CONDITIONS OF APPROVAL

- Under the current design, the storm water runoff from the site will be diverted to two existing detention basins located on other parcels. Because of a lack of maintenance and a lack of siltation control and vegetation on the Waterbury commercial sites (also owned by the same property owner - Dong In Development), the existing collection system is not adequate to handle storm water runoff from this site. Therefore, applicant shall seek an alternative means to handle the storm water runoff or the property owner shall install proper siltation control and vegetation on all its Waterbury commercial sites in order to make current collection system adequate to handle the storm water runoff from this site.
- The petitioner shall revise the lighting plan to show 0.5 foot candles or less at the property line in accordance with the City's Exterior Lighting Standards.

### NOTE:

CIVIL ENGINEERING DESIGN CONSULTANTS, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR SERVICES PROVIDED BY OTHERS TO IMPLEMENT THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS WHERE THE UNDERSIGNED ENGINEER'S SEAL APPEARS. THE CONSTRUCTION MEANS, METHODS & MATERIALS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. CIVIL ENGINEERING DESIGN CONSULTANTS, INC. HAS NO RESPONSIBILITY TO VERIFY FINAL IMPROVEMENTS AS SHOWN ON THIS PLAN UNLESS SPECIFICALLY ENGAGED AND AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

### UTILITY NOTE:

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS, RECORDS AND INFORMATION, AND, THEREFORE DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NON-EXISTENCE, SIZE, TYPE, NUMBER OR LOCATION OF THESE FACILITIES, STRUCTURES AND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS. THE UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY ABSOLVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 319 RSMo.

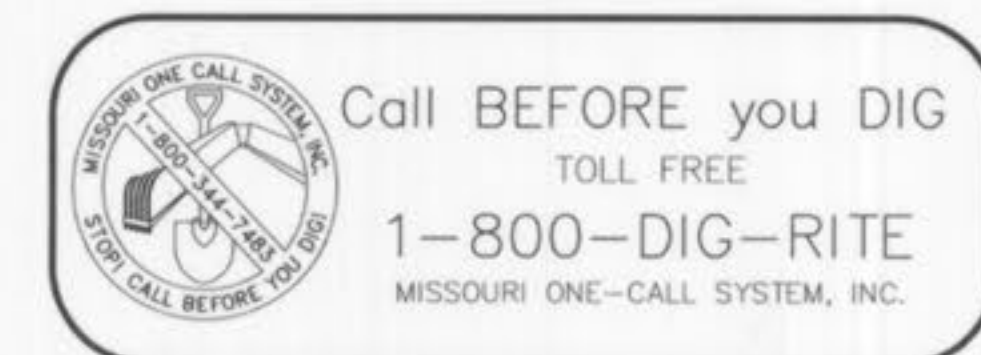
### NOTE TO CONTRACTOR:

CONTRACTOR/SUBCONTRACTOR SHALL INVESTIGATE, ASCERTAIN AND CONFORM TO ANY AND ALL PERMIT REQUIREMENTS OF THE (ANY) VARIOUS AFFECTED UTILITY COMPANIES AND/OR REGULATORY AGENCIES WITH REGARDS TO MAKING CONNECTIONS TO, OR CROSSINGS OF THEIR FACILITIES, WORKING WITHIN THEIR RIGHT-OF-WAY OR EASEMENTS; INSPECTIONS AND ASSOCIATED MONETARY CHARGES; AND/OR SPECIAL BACKFILL REQUIREMENTS. SUCH INVESTIGATION TO INCLUDE BUT NOT LIMITED TO THE MAKING OF NECESSARY APPLICATIONS AND PAYMENTS OF ALL REQUIRED FEES.

THE LOCATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS OR PROFILES ARE APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR/SUBCONTRACTOR TO VERIFY THE FIELD LOCATIONS, ANTICIPATED CLEARANCES AND THE EXISTENCE OF ANY FACILITIES NOT SHOWN HEREON, AS PART OF THE INVESTIGATIONS IN THE PARAGRAPH ABOVE.

THE DISCONNECT AND REMOVAL OF EXISTING OVERHEAD AND UNDERGROUND SERVICE LINES CALLED OUT TO BE REMOVED SHALL BE COORDINATED WITH THE RESPECTIVE UTILITY COMPANIES.

THE DEMOLITION PLAN IS FOR ILLUSTRATION OF THE GENERAL DEMOLITION ANTICIPATED FOR THIS PARTICULAR SITE. THE DEMOLITION PLAN DOES NOT REPRESENT ALL CONDITIONS THAT MAY BE ENCOUNTERED DURING DEMOLITION/CONSTRUCTION. THE CONTRACTOR SHALL MAKE HIMSELF THOROUGHLY FAMILIAR WITH THE SITE AND THE DEMOLITION/CONSTRUCTION REQUIREMENTS PRIOR TO BIDDING. THE INTENT OF THE DEMOLITION IS TO PROVIDE A CLEAN STABLE SITE, READY FOR CONSTRUCTION OF THE PROJECT IN CONFORMANCE WITH THE CONSTRUCTION PLANS. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR CONDITIONS THAT ARE IN KEEPING WITH THIS INTENT.



MISSOURI ONE CALL TICKET NUMBER 73052813



### LEGEND

EXISTING CONTOURS	--- 433 ---	WATER MANHOLE	WMH
PROPOSED CONTOURS	--- 433 ---	TELEPHONE MANHOLE	TMH
EXISTING STORM SEWER	== [ ] ==	BRUSH & SHRUB LINE	[ ]
PROPOSED STORM SEWER	== [ ] ==	TREE & SIZE	[ 36" ]
EXISTING SANITARY SEWER	== [ ] ==	BUSH & SIZE	[ 96" ]
PROPOSED SANITARY SEWER	== [ ] ==	BOLLARD	[ ]
RIGHT-OF-WAY	--- [ ] ---	SIGN	[ ]
EASEMENT	--- [ ] ---	ELECTRIC YARD LIGHT	[ ]
CENTERLINE	--- [ ] ---	BORING LOCATION	[ ]
EXISTING TREE	[ 12" ]	MAIL BOX	MB
EXISTING SPOT ELEVATION	433.28	ELECTRIC BOX	EB
PROPOSED SPOT ELEVATION	433.28	CLEAN OUT	CO
SWALE/DRAINAGE PATH	[ ]	GAS VALVE	GV
TO BE REMOVED	T.B.R.	GAS METER	GM
TO BE REMOVED & RELOCATED	T.B.R. & R.	GAS DRIP	GD
TO BE USED IN PLACE	U.I.P.		
ADJUST TO GRADE	A.T.G.		
BACK OF CURB	B.C.		
FACE OF CURB	F.C.		
WATER MAIN	--- W ---		
GAS MAIN	--- G ---		
UNDERGROUND TELEPHONE	--- T ---		
OVERHEAD WIRE	--- O.H. ---		
UNDERGROUND ELECTRIC	--- E ---		
FIRE HYDRANT	[ ]		
POWER POLE	[ ]		
WATER VALVE	[ ]		

### ABBREVIATIONS

N	NORTH
S	SOUTH
E	EAST
W	WEST
CONC	CONCRETE
ASPH	ASPHALT
PB	PLAT BOOK
DB	DEED BOOK
PG	PAGE
SF	SQUARE FEET
AC	ACRES
ELEV	ELEVATION
FF	FINISH FLOOR
FL	FLOWLINE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
STM	STORM
SAN	SANITARY
(S)	SAVE
(R)	REMOVE
(T.B.R.)	TO BE REMOVED

### LAND DESCRIPTION

A TRACT OF LAND BEING PART OF LOT 3 OF WATERBURY COMMERCIAL PLAT TWO, A SUBDIVISION RECORDED IN PLAT BOOK 41 PAGES 116 & 117 AND PART OF A TRACT OF LAND CONVEYED TO DONG-IN DEVELOPMENT BY DEED BOOK 4736 PAGE 1089 OF THE ST. CHARLES COUNTY LAND RECORDS OFFICE IN ST. CHARLES COUNTY

### BENCHMARK

#### BENCHMARK

STATION SC-07, ELEV. 549.21' - THE STATION IS A STANDARD MISSOURI DNR GRS ALUMINUM DISK STAMPED "SC-07 1990" AND IS SET IN A 12" DIAMETER CONCRETE MONUMENT. THIS STATION IS LOCATED ON THE SOUTH SIDE OF MISSOURI HIGHWAY 94 IN THE SOUTH PART OF THE COMMUNITY OF HOWELL ON THE NORTH SIDE OF THE EAST END OF RIDGEWAY DRIVE. IT IS 19.5 FEET NORTHEAST OF A GAS DRIP VALVE HOUSING; 40.7 FEET SOUTHEAST OF THE SOUTH LEG OF A HIGHWAY SIGN; 34.6 FEET SOUTHWEST OF A NAIL AND SHINER IN THE NORTHWEST SIDE OF A POWER POLE; 21.6 FEET SOUTHWEST OF THE CENTER OF A FIRE HYDRANT AND 2.0 FEET NORTHWEST OF A CARSONITE WITNESS POST.

#### SITE BENCHMARK

ELEV. 547.46' - "X" ON THE EASTERN RIM OF SANITARY MANHOLE AS SHOWN ON SURVEY.

### PREPARED FOR:

Wendy's International, Inc.  
C/O MIKE GOLDEN  
3330 WEST ESPLANADE AVE.  
SUITE 612  
METAIRIE, LA 70002  
PHONE (504) 849-0349  
FAX (504) 828-1235

### PREPARED BY:

**CEDC**  
CIVIL ENGINEERING  
DESIGN CONSULTANTS

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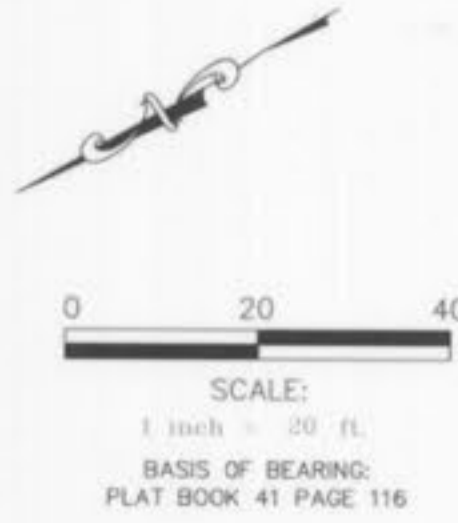
Improvement Plans  
**Wendy's Restaurant**  
4210 Highway K  
O'Fallon, Missouri 63368

Proj. # 0812		
No.	Description	Date
Agency	Submittal	09/15/08
per City		01/05/09

Title Sheet

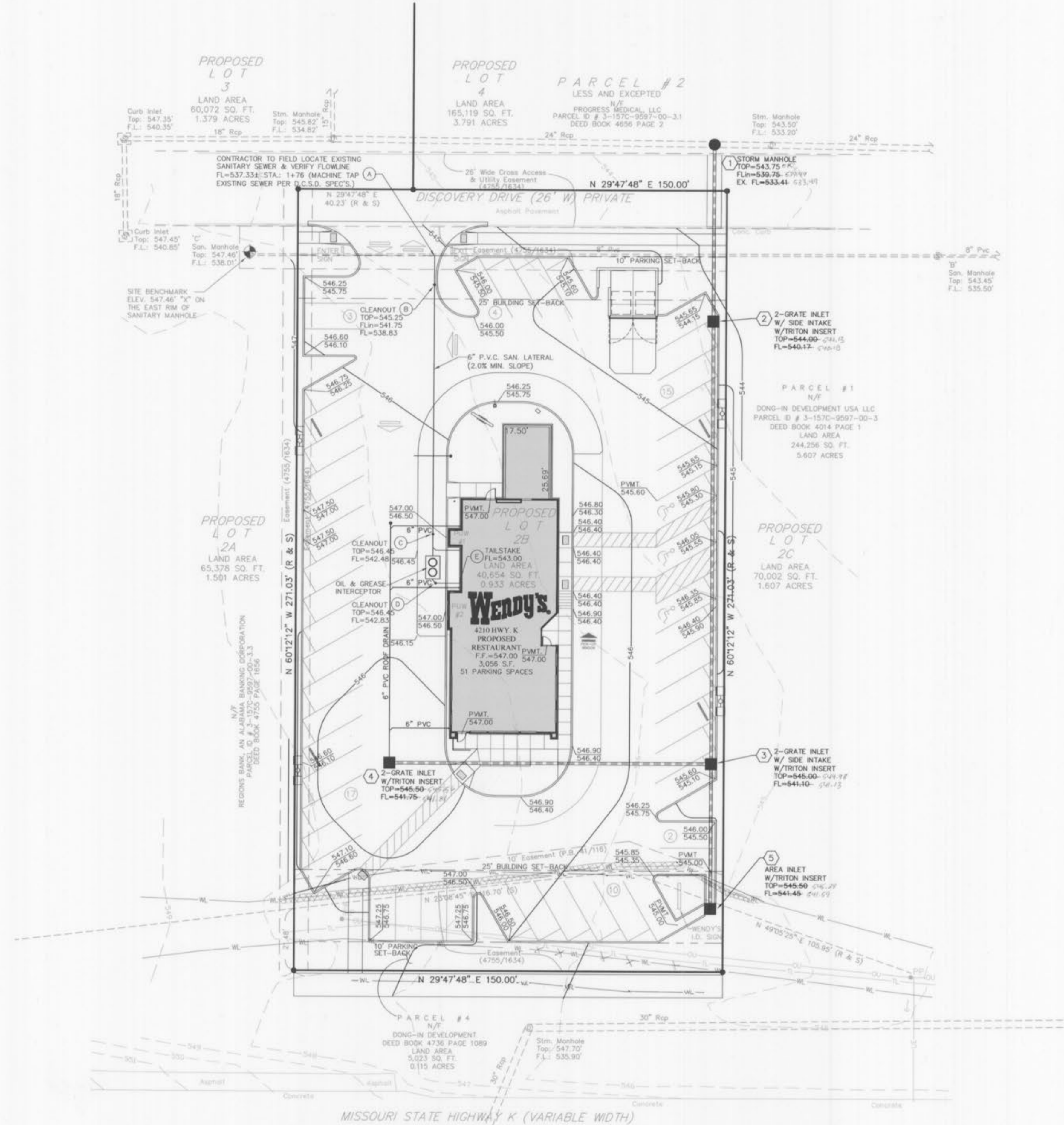
C1

Planning and Development No. 9950.14  
P & Z Commission Approval - August 7, 2008  
City Council Approval - August 28, 2008



**GENERAL NOTES**

- 1.) UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS, RECORDS AND INFORMATION, AND, THEREFORE, DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NON-EXISTENCE, SIZE, TYPE, NUMBER, OR LOCATION OF THESE FACILITIES, STRUCTURES AND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS. THE UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY ABSOLVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 319 RSMO. CONTRACTOR SHALL SCHEDULE A UTILITY MEETING WITH REPRESENTATIVES OF ALL UTILITY COMPANIES PRIOR TO BIDDING AND CONSTRUCTION.
- 2.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING CONSTRUCTION ACTIVITIES WITH POTENTIAL CONFLICTS AND/OR DISRUPTION OF SERVICE WITH THE RESPECTIVE UTILITY COMPANIES, FOR SEWER AND UTILITY INSTALLATIONS AND ALL OTHER ON-SITE ACTIVITIES.
- 3.) THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING CONSTRUCTION PARKING WITH THE CITY OF OTTAWA AND WITH THE OWNER.
- 4.) CONTRACTOR SHALL VERIFY EXISTING UTILITY SERVICES ARE CAPPED OR REMOVED AND/OR ABANDONED AS REQUIRED PER THE SPECIFICATIONS OF THE APPROPRIATE GOVERNING AGENCY.
- 5.) PROVIDE PROTECTIONS NECESSARY TO PREVENT DAMAGE TO EXISTING IMPROVEMENTS AND UTILITIES INDICATED TO REMAIN IN PLACE.
- 6.) PROTECT IMPROVEMENTS ON ADJOINING PROPERTIES AND ON OWNER'S PROPERTY.
- 7.) RESTORE DAMAGED IMPROVEMENTS TO THEIR ORIGINAL CONDITION AND GRADES, AS ACCEPTABLE TO PROPERTY OWNERS.
- 8.) CONTRACTOR SHALL COORDINATE ALL PAVEMENT/HARDSCAPE INSTALLATION WITH PROPOSED UTILITY INSTALLATIONS TO AVOID THE CONDITION WHERE NEW PAVEMENT IS SAWCUT OR REMOVED FOR A REQUIRED UTILITY INSTALL. CONDUIT LOCATIONS AND UTILITY SERVICES SHALL BE REVIEWED BY CONTRACTOR, PRIOR TO PAVEMENT/HARDSCAPE INSTALLATIONS.
- 9.) WALKWAYS ALONG THE ACCESSIBLE ROUTE SHALL NOT HAVE A SLOPE EXCEEDING 1"V:20" H. SLOPES GREATER THAN 1"V:20" H MUST BE DESIGNED AS A RAMP.
- 10.) SIDEWALKS, CURB RAMPS, RAMPS AND ACCESSIBLE PARKING SPACES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT APPROVED "AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES" (ADAAG) ALONG WITH THE REQUIRED GRADES, CONSTRUCTION MATERIALS, SPECIFICATIONS AND SIGNAGE. IF ANY CONFLICT OCCURS BETWEEN THE ADAAG GUIDELINES AND THE INFORMATION ON THE PLANS, THE ADAAG GUIDELINES SHALL TAKE PRECEDENCE AND THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER PRIOR TO ANY CONSTRUCTION.
- 11.) TRAFFIC CONTROL IS TO BE PER CITY OF OTTAWA OR MUTCD WHICHEVER IS MORE STRINGENT.
- 12.) EXISTING SANITARY SEWER SERVICE SHALL NOT BE INTERRUPTED.
- 13.) CONNECTION TO DCSD SANITARY MAINS REQUIRES DCSD INSPECTION. CONTACT MR. STEVE OVERBEY, DCSD CHIEF INSPECTOR, AT 636-441-1244 TO SCHEDULE INSPECTION. 24 HOUR ADVANCE NOTICE IS REQUIRED.



BRANDON A. HARP, P.E. E-28650  
CIVIL ENGINEER

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Saint Louis, Missouri 63126  
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Fax: 314.729.1404  
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Improvement Plans  
**Wendy's Restaurant**  
4210 Highway K  
O'Fallon, Missouri 63368

Proj. # 0812		
No.	Description	Date
Agency Submittal		09/15/08
per City, DCSD		01/05/09
per water mains		02/24/09
per City		07/16/09

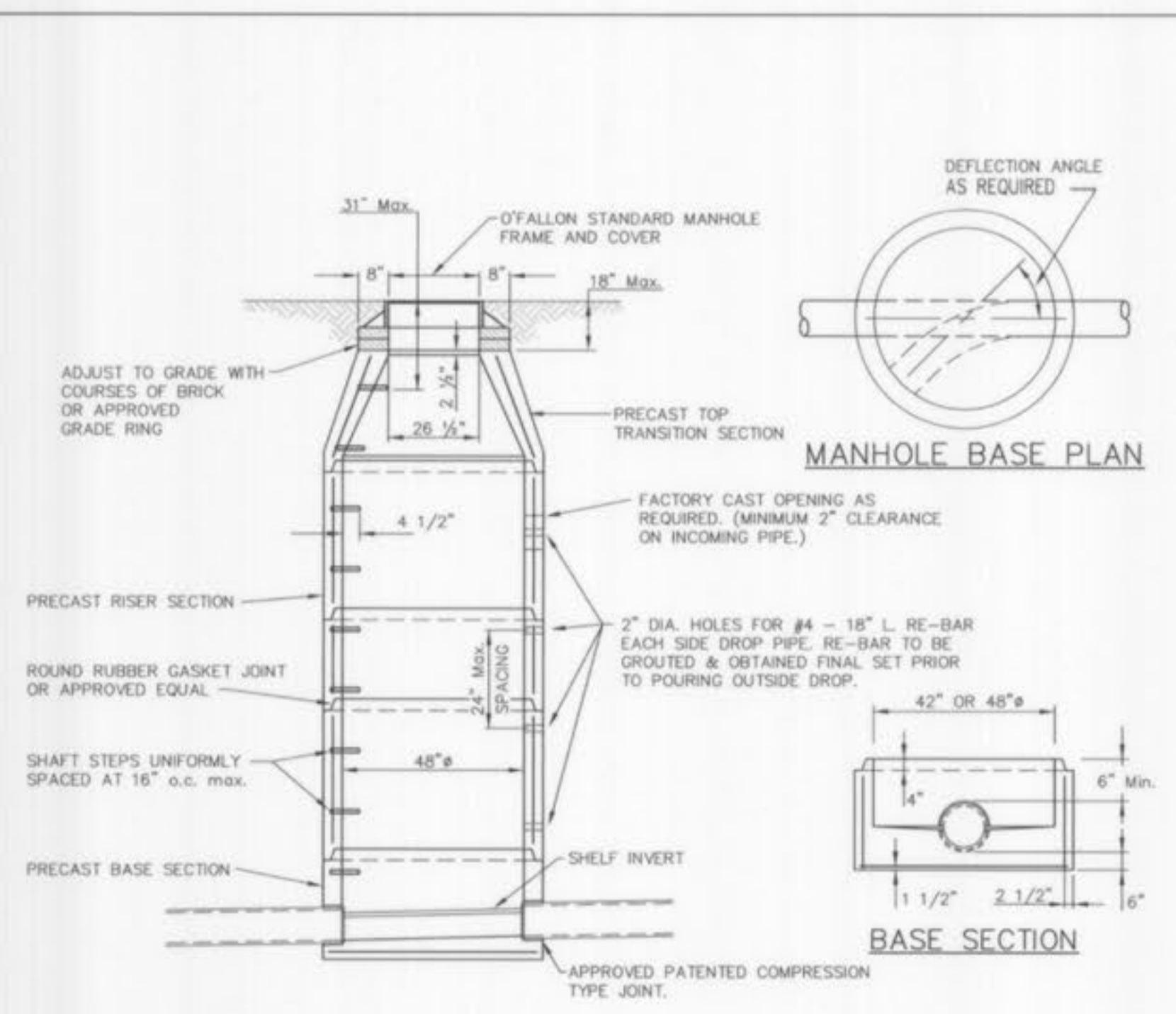
Site and  
Grading Plan

**C4**

OF 9

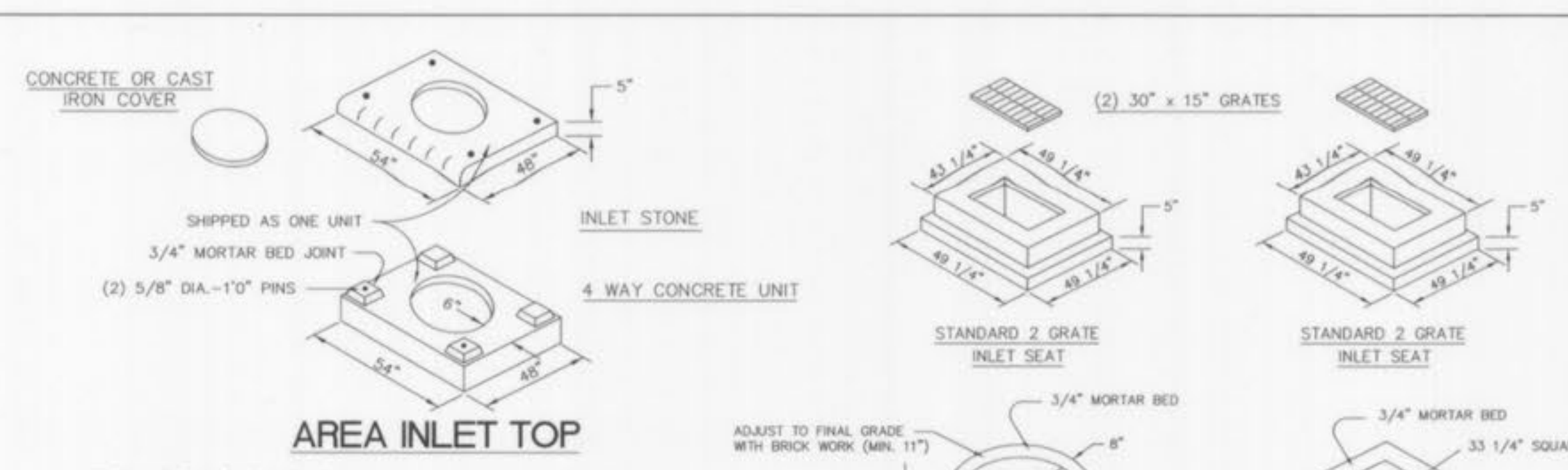


Planning and Development No. 9950.14  
P & Z Commission Approval - August 7, 2008  
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**PRECAST MANHOLE**

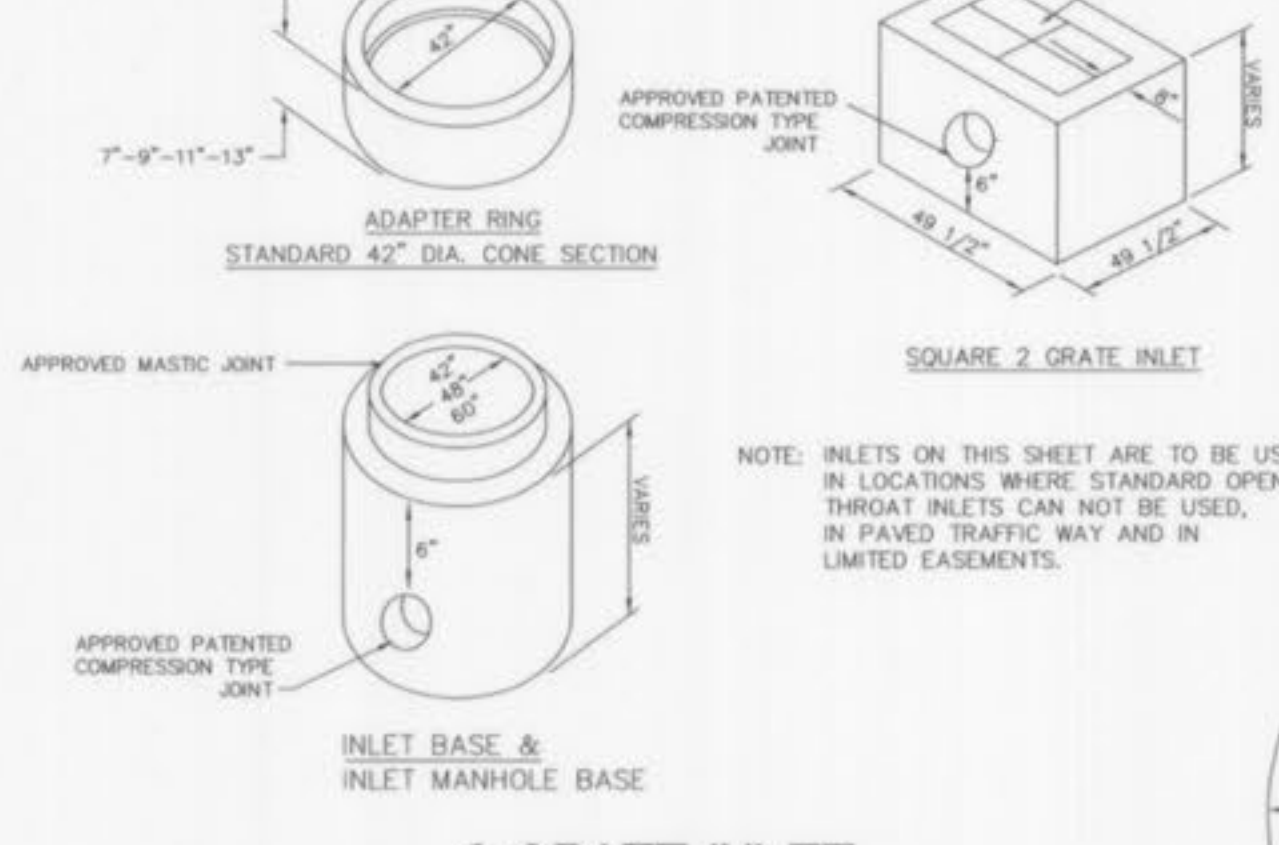
1. PROVIDE 31 mil WATERPROOFING PER CITY REQUIREMENTS.
2. INLETS AND MANHOLES SHALL HAVE A 0.2" DROP THROUGH THE STRUCTURE.



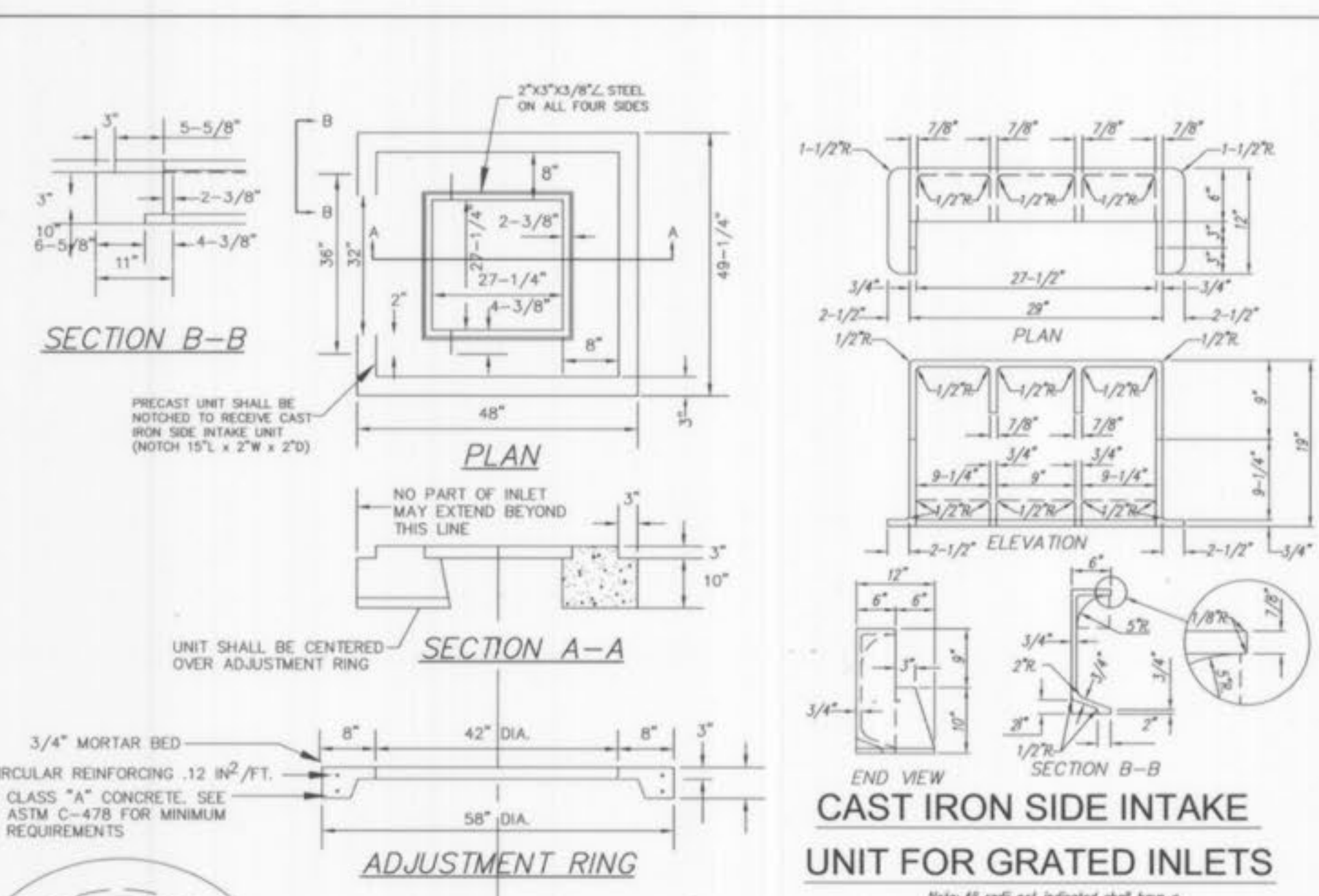
**Triton Catch Basin Inserts**



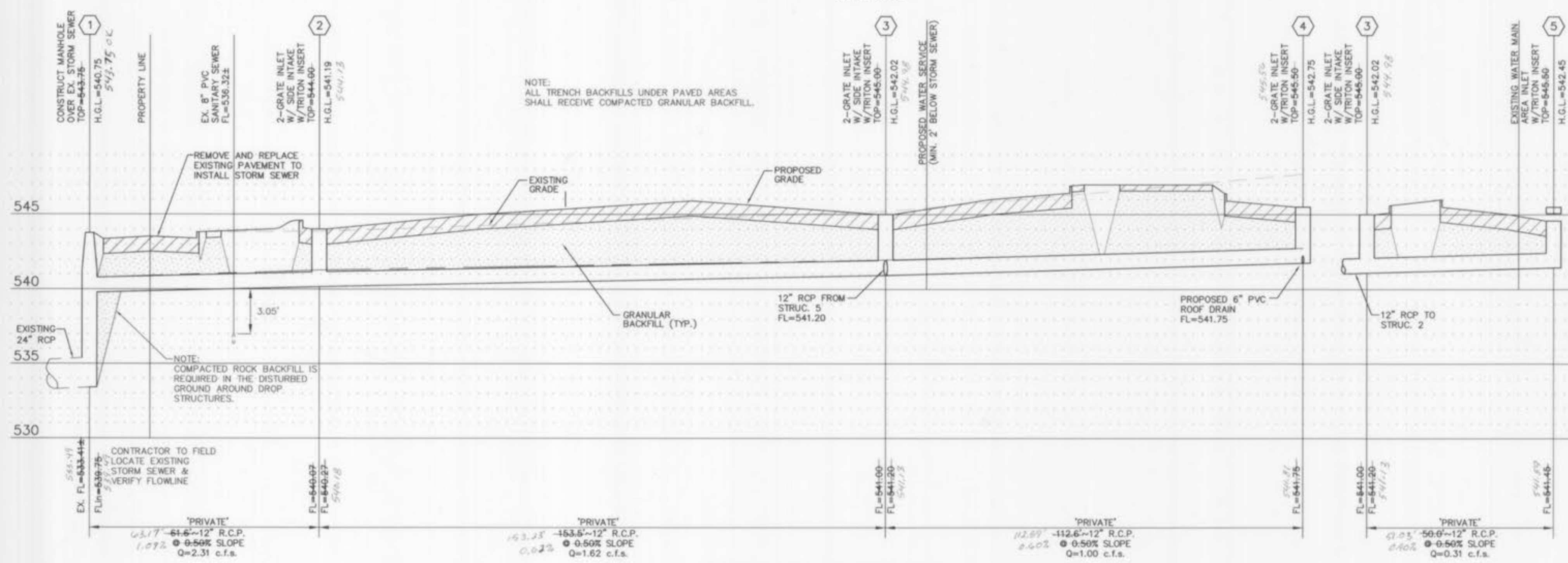
Standard Dimensions (in inches)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Area	1	4	9	16	25	36	49	64	81	100	121	144	169	196	225	256	289	324	361	400	441	484	529	576	625	676	729	784	841	900	961	1024	1089	1156	1225	1296	1369	1444	1521	1600	1681	1764	1849	1936	2025	2116	2209	2304	2401	2500	2601	2704	2809	2916	3025	3136	3249	3364	3481	3600	3721	3844	3969	4096	4225	4356	4489	4624	4761	4900	5041	5184	5329	5476	5625	5776	5929	6084	6241	6400	6561	6724	6889	7056	7225	7396	7569	7744	7921	8100	8281	8464	8649	8836	9025	9216	9409	9604	9801	10000
Perimeter	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184	188	192	196	200	204	208	212	216	220	224	228	232	236	240	244	248	252	256	260	264	268	272	276	280	284	288	292	296	300	304	308	312	316	320	324	328	332	336	340	344	348	352	356	360	364	368	372	376	380	384	388	392	396	400



**NOTES:**  
 THE CITY OF O'FALLON REQUIRES MARKERS ON STORM INLETS WITH THE MESSAGE "NO DUMPING DRAINS TO WATERWAYS" OR "NO DUMPING DRAINS TO STREAM" AS MANUFACTURED BY ACP INTERNATIONAL, DAS MANUFACTURING, INC., ALMETEK INDUSTRIES OR APPROVED EQUAL. MARKERS SHALL BE ATTACHED TO STRUCTURE USING EPOXY ADHESIVE. "PEEL AND STICK" ADHESIVE PADS WILL NOT BE ALLOWED. SEE CITY OF O'FALLON SPECIFICATIONS FOR DETAILS.

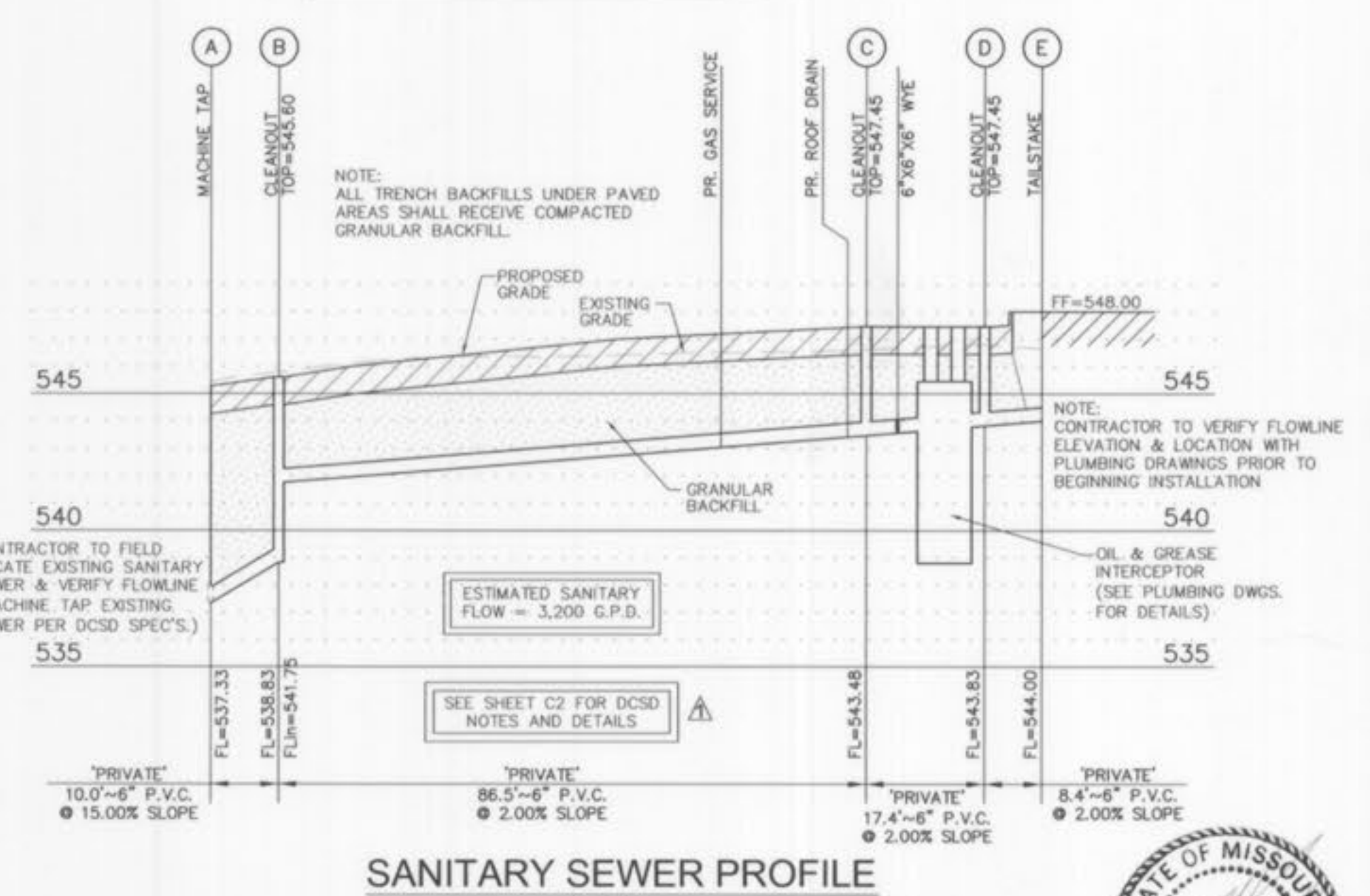


**GRATE SEAT FOR 2-GRATE INLET WITH SIDE INTAKE**



**STORM SEWER PROFILE**

SCALE: HORIZONTAL: 1"=20' VERTICAL: 1"=5'



**SANITARY SEWER PROFILE**

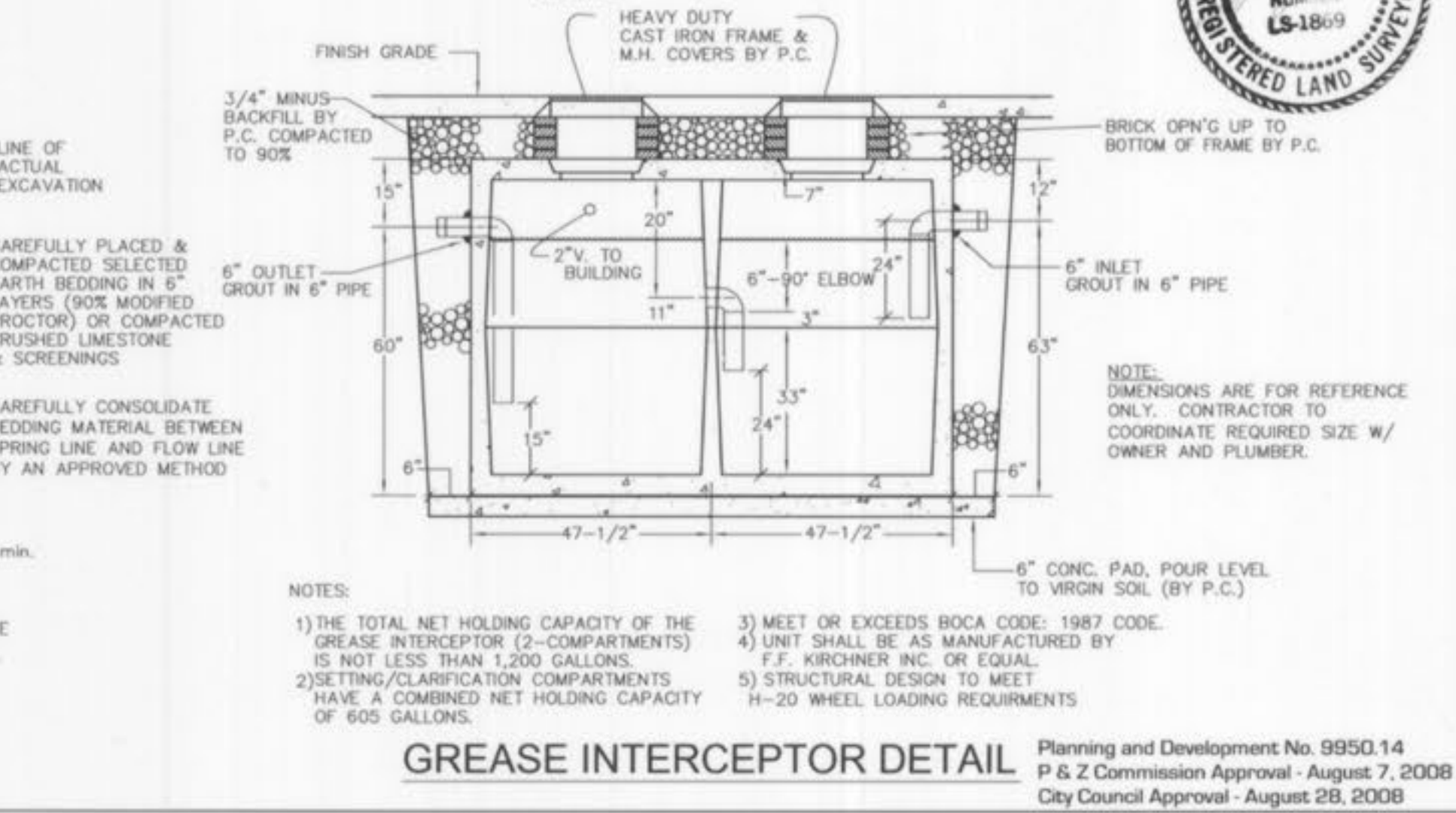
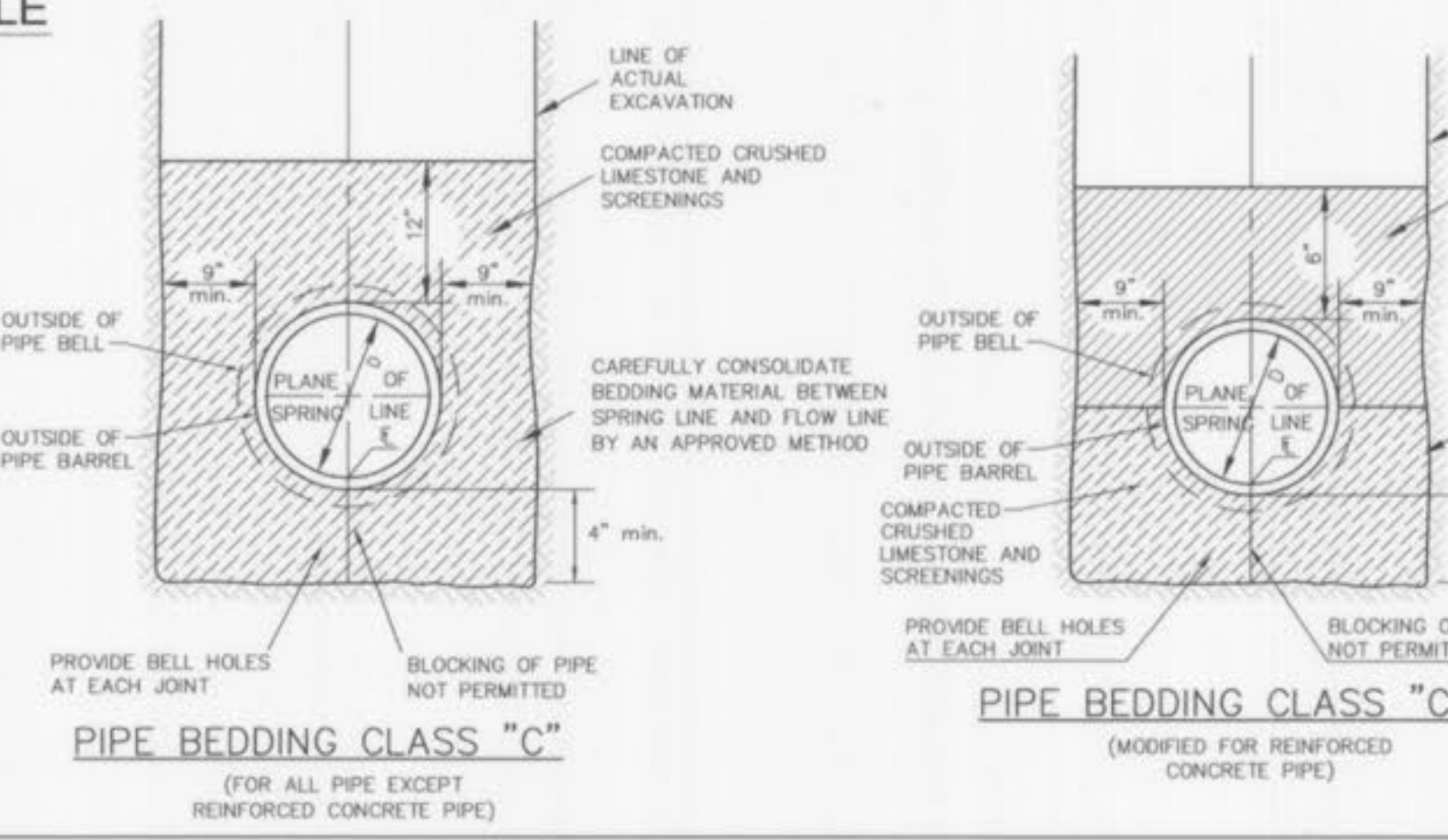
SCALE: HORIZONTAL: 1"=20' VERTICAL: 1"=5'

**HYDRAULIC CALCULATION SHEET (SEE DRAINAGE AREA MAP SHEET C-7 FOR PL AND Q (inches) FOR EACH STRUCTURE)**

Project name: WENDY'S Calculated By: MPT  
 Project number: 0812 Checked By: R.H.F.  
 Project Location: Watertony Falls Drive Date: 7/8/09

Structure Number	Upper Structure	Lower Structure	Length (ft)	Flowline Grade	Pipe Size (in)	Full Flow Cap. (cfs)	Total Q (cfs)	Mean Full Flow Vel. (ft/s)	Bend Coef.	Velocity Head (ft)	Q <sup>2</sup> /V <sup>5</sup> (ft <sup>3</sup> /s <sup>5</sup> )	Pipe Cor. (ft)	K <sub>1</sub>	Junction Loss (ft)	Bend Loss (ft)	Total Loss (ft)	Upper Elev. (+ft)	Lower Elev. (-ft)	Structure Elev. (+ft)	Free Board	Structure Number				
																						Head Loss	Hydraulic Head		
5	5	3	541.45	541.20	50.00	0.0050	12	2.51	0.33	0.39	0	0.00	0.00	0.00	0.00	542.41	542.02	542.02	542.41	545.3	3.09	5			
4	4	3	541.75	541.20	112.00	0.0400	12	2.20	1.00	1.27	0	0.00	0.00	0.00	0.00	542.70	542.20	542.20	545.1	2.75	4				
1	3	2	541	540.27	153.90	0.0400	12	2.46	1.62	1.98	0.7	0.07	0.11	0.03	0.32	0.00	0.02	0.02	543.00	541.79	541.77	542.02	545	2.98	1
2	2	1	540.07	539.75	63.60	0.0052	12	2.27	2.31	2.94	0	0.11	0.31	0.03	0.26	0.12	0.00	0.12	543.07	541.01	540.75	541.19	544	2.83	2

**FORMULAS:**  
 MEAN FULL FLOW VELOCITY =  $Q_{full} / A_{full}$   
 FRICTION LOSS (ft) =  $H_f = 2.87 n^2 (L/V^{4.75})$   
 VELOCITY HEAD =  $V_v = V^2/2g$   
 JUNCTION LOSSES (ft) =  $[Q_1 V_{1max} / \sum (Q_n V_{nmax})] \times 1.33 Q_{1max}$   
 BEND LOSSES (ft) =  $(V^2/2g) \times \text{ANGLE COEFFICIENT}$   
 NOTE: 1. IF MORE THAN ONE INCOMING LINE, CALCULATE EACH BEND LOSS AND ADD TOGETHER.  
 2. NO STRUCTURE LOSSES TO BE CALCULATED AT A DROP.  
 3. IF  $Q_{inlet} > Q_{V_{max}}$ , NO JUNCTION LOSSES TO BE CALCULATED.



- NOTES:**
- 1) THE TOTAL NET HOLDING CAPACITY OF THE GREASE INTERCEPTOR (2-COMPARTMENTS) IS NOT LESS THAN 1,200 GALLONS.
  - 2) SETTING/CLARIFICATION COMPARTMENTS HAVE A COMBINED NET HOLDING CAPACITY OF 600 GALLONS.
  - 3) MEET OR EXCEEDS BOCA CODE: 1987 CODE.
  - 4) UNIT SHALL BE AS MANUFACTURED BY F.F. KIRCHNER, INC. OR EQUAL.
  - 5) STRUCTURAL DESIGN TO MEET H-20 WHEEL LOADING REQUIREMENTS.
- Planning and Development No. 9950.14  
 P & Z Commission Approval - August 7, 2008  
 City Council Approval - August 28, 2008

BRANDON A. HARP, P.E. E-28650  
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 O'Fallon, Missouri 63368

Proj. # 0812

No.	Description	Date
Agency Submittal	09/15/08	
per City, DCSD	01/05/09	
per watermain	02/24/09	

**Sewer Profiles, Details, & Hydraulic Calculations**

**C6**

MJC 07/11/09  
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