KAW VALLEY ENGINEERING

STORM DRAINAGE REPORT
SONIC AMERICA'S DRIVE-IN
21st Street and CARMEN
WICHITA, KS

Prepared for:

SONIC CORPORATION
300 Johnny Bench Drive
Oklahoma City, Oklahoma 73104

Prepared by:

KAW VALLEY ENGINEERING, INC.
14700 West 114th Terrace
Lenexa, Kansas 66215

February 10, 2006

KVE Project No. **A05D2222**

Consulting Engineers

STORM DRAINAGE REPORT

Sonic America's Drive-In
21st Street and Carmen
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Project No. A05D2222

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Detention System Stage vs. Storage & Stage vs. Discharge Curves

REVISIONS

Revision 0 - December 1, 2005 Initial Issue
Revision 1 – February 10, 2006

INTRODUCTION

Sonic Corporation is proposing the construction of a drive-in restaurant on the lot directly to the southwest of the intersection of 21st Street and Carmen in Wichita, KS. With authorization from Sonic Corporation, Kaw Valley Engineering, Inc. has completed a study of the proposed storm drainage systems associated with the development.

PURPOSE OF STUDY

The purpose of this study is to calculate the runoff that will be generated by the proposed site plan and design a detention basin that will adequately control the release of storm water to the pre-development release rate for the 1%, 20%, and 50% storm as specified by the City of Wichita and in Accordance with the city's Design and Construction Manual.

EXISTING CONDITIONS

The site is a 1.16-acre lot with land cover consisting of mostly open space with a grassy cover. Runoff from the property currently drains offsite to the south and west of the property. The following table is a summary of the existing runoff coefficient and flows from the existing site for the 1%, 20%, and 50% storm.

Existing Runoff Coefficients				Table 1		
				Storm Flows (cfs)		
DA	Description	Area (acres)	CN	1%	20%	50%
Drainage Area 1	Undetained	1.16	75	8.50	3.58	2.14

See Exhibit A for the existing site topography.

DESCRIPTION OF PROPOSED IMPROVEMENTS

Sonic is proposing the construction of a new drive-in restaurant. The majority of the post development runoff will be collected by an onsite storm sewer system. As part of the proposed design for the site, the City is requiring the incorporation of a detention system into the drainage system design. The onsite storm sewer will capture the majority of the onsite runoff. An orifice plate with an overflow weir will be installed over the system outlet to limit the discharge from the system. The proposed grading will route the storm water into above ground basins and a flare end section with a trash guard. The following table is a summary of the proposed runoff coefficients and flows generated by the proposed site.

Proposed Runoff Coefficients				Table 2		
				Storm Flows (cfs)		
DA	Description	Area (acres)	CN	1%	20%	50%
Drainage Area 1	Detained	0.76	97	7.66	4.37	3.27
Drainage Area 2	Undetained	0.4	81	3.23	1.50	0.96

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DRAINAGE ANALYSIS

The storm runoff and detention storage for the project site were analyzed for the 1%, 20% and 50% storm events.

PondPack v7.5 was used to perform the runoff and detention routing. Runoff was calculated using the SCS method and rainfall amounts were determined using rainfall maps from TR-55.

Time of concentration (Tc) for the proposed conditions was calculated using methods outlined in TR55. In most cases, time of concentration (Tc) for the existing and proposed improvements was conservatively assumed to be 5-minutes.

The Curve Numbers for the drainage areas to be used in the calculations are identified in Table 2. This number was based upon the percentage of impervious and pervious surfaces as specified in section 5600 of APWA.

Refer to Exhibit C for the Runoff and Detention Calculations for the project site.

PROPOSED STORM & DETENTION SYSTEM

The City Wichita stipulated that runoff generated by the site be detained to the pre-developed release rate for the 1%, 20%, and 50% storm events. To meet these requirements, Kaw Valley Engineering, Inc. has designed a detention system to control runoff from the property. The detention system will consist of one curb inlet, two grate inlets, and one open ended section of 12" pipe. This system will be headwater controlled by a 4" orifice at an elevation of 1339.75' and a five-foot rectangular weir at an elevation of 1342.90', refer to Exhibit B for the detention wall detail. During high intensity, low-frequency storm events stormwater will back up into the pipe network and eventually into the detention area in the southwest corner of the site. The parking lot will act as an emergency spillway. As stormwater inundates the detention system, additional runoff will collect into the parking lot to an approximate elevation of 1343.9', at which point the storm water will spill into 21st Street thru the driveway. With the elevation of the parking lot being 1343.30' at the flume, this will produce 0.6 feet of water in the southwest corner of the parking lot. The detention level during the 1% storm event will only reach an elevation of 1343.78', resulting in 5.76 inches of water at the parking lot flume. The detention area has a top of berm elevation of 1344.8 resulting in a freeboard of 1.02' during the 1% storm event. Refer to Exhibit B for the site Grading Plan, Drainage Area Map/Erosion Control Plan and Site Details.

DRAINAGE ANALYSIS RESULTS

The results of the PondPack Analysis indicate that the proposed storm water detention system provides adequate storm water mitigation for the onsite runoff. The proposed detention system will limit the site discharge to the north to less than the pre-developed design storms for each corresponding post-development design storm. The following is a summary of the results of the PondPack Analysis for the detention system.

DRAINAGE ANALYSIS RESULTS SUMMARY

Detention Basin Conditions - Headwater Control 4" Orifice and Rectangular Weir (Table 3)							
Proposed Conditions							Existing Conditions
Drainage Area 1(detained area)					Drainage Area 2 (undetained)	Total Site Discharge	Allowable Flow
Design Storm	Inflow (cfs)	Outflow (cfs)	Storage (ac-ft)	Max W.S. Elev.	Inflow/Outflow	Outflow * (cfs)	(cfs)
50%	3.27	0.90	0.053	1343.08	0.96	1.67	2.14
20%	4.37	1.73	0.072	1343.42	1.5	2.63	3.58
1%	7.66	5.75	0.101	1343.78	3.23	8.44	8.50

* The sum of runoff from Drainage Area 1 and Drainage Area 2 is greater than the total outflow from the site because of offsetting peaks in the hydrograph caused by routing stormwater through a controlled release point.

The PondPack v7.5 output for the area served by the detention basin is in Exhibit C.

CONCLUSION

With the addition of the detention, runoff generated by the proposed site will be limited to 8.44 cfs (5.75 cfs via detention system release) during the 1% design storm. The maximum water surface elevation for onsite runoff will be 1343.78', approximately 1.02' below the level of the detention basin berm. The detained storm water will discharge into the storm sewer system located north of 21st Street via a new storm extension across 21st Street. The storm water not detained by the system will reach a flow of 3.23 cfs during the 1% design storm. The majority of the flow will discharge to the south and west of the site (grassed and landscaped area), as was the case in pre-development. The remainder of the flow not detained by the system will discharge down the entrances to 21st Street on the north and Carmen on the east (driveways).

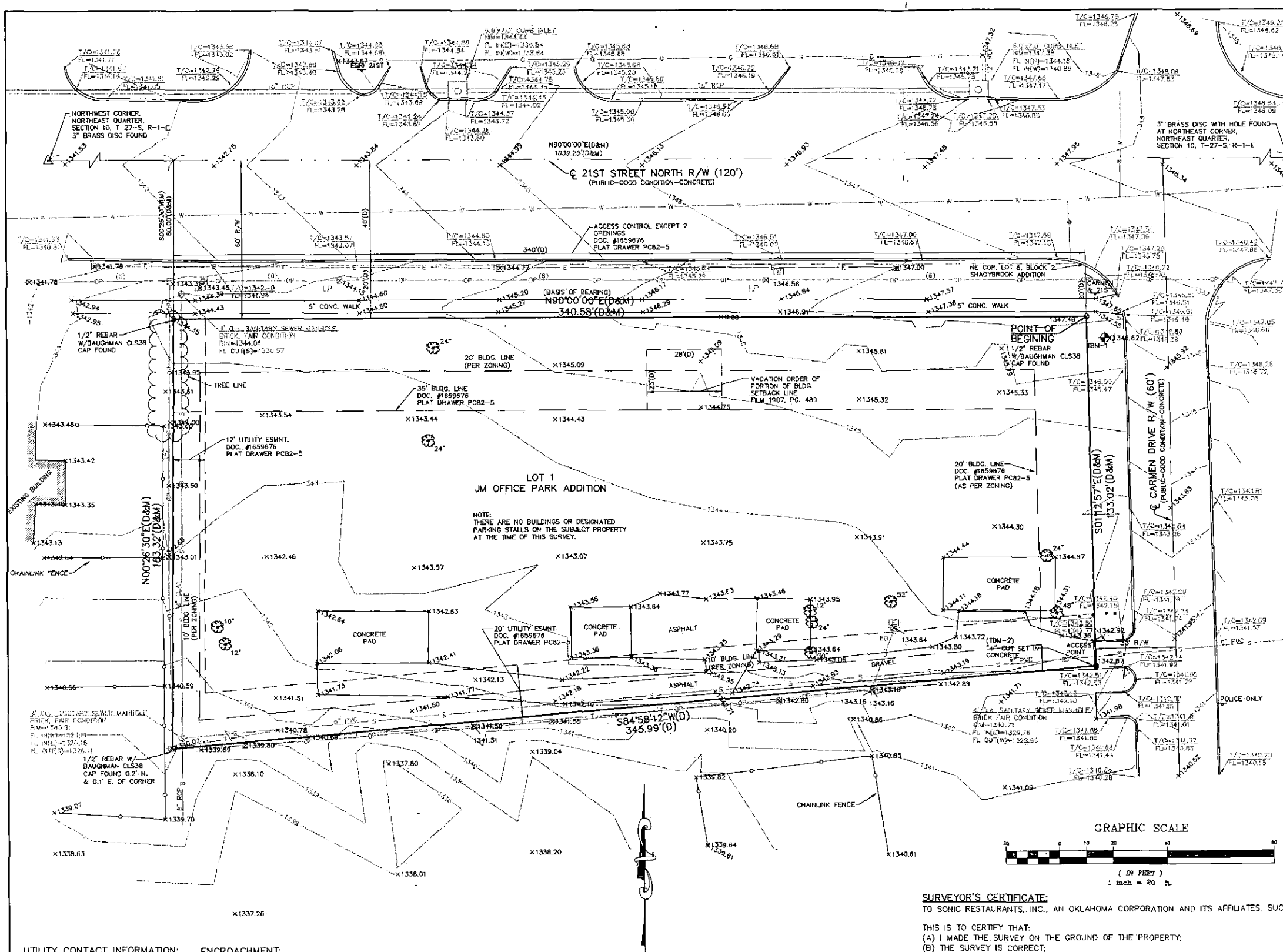
Respectfully submitted,
Kaw Valley Engineering, Inc.

Mike J. Sandbo, E.I.T.
Intern Engineer

GARY A. LEEDS LICENSED 15150 2-14-04 KANSAS PROFESSIONAL ENGINEER

Gary A. Leeds, P.E.
Project Engineer

Exhibit A
Existing Site Topography



VICINITY MAP
NOT TO SCALE

ONE CALL
316-687-2470
1-800-DIG-SAFE

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

UTILITY NOTE:
THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

SURVEY REFERENCE:
TITLE COMMITMENT NUMBER: 0618170
EFFECTIVE DATE: SEPTEMBER 26, 2005 @ 7:00 AM
KANSAS SECURED TITLE – SEDGWICK COUNTY
AGENT FOR: CHICAGO TITLE INSURANCE COMPANY
232 NORTH MEAD
WICHITA, KANSAS 67202

- RESTRICTIVE COVENANT FOR ZONING OVERLAY RECORDED ON FILM 1741 PAGE 2072. (AFFECTS THE SUBJECT PROPERTY AND IS BLANKET IN NATURE)
- SIDEWALK CERTIFICATE RECORDED ON FILM 1741 PAGE 2074. (AFFECTS THE SUBJECT PROPERTY AND IS OF A NATURE WHICH CANNOT BE PLOTTED)
- MATTERS INCLUDING BUT NOT LIMITED TO EASEMENTS, BUILDING SET-BACK LINES, MINIMUM ELEVATIONS AND ACCESS CONTROLS, IF ANY, ESTABLISHED BY THE RECORDED PLAT OF JM OFFICE PARK ADDITION, FILED JANUARY 14, 1998, AS DOCUMENT NO. 1659676, IN PLAT DRAWER PC82-5, AS AMENDED BY VACATION ORDER RECORDED ON FILM 1907 PAGE 489. (PLOTTED AND SHOWN)
- EASEMENTS, IF ANY, FOR PUBLIC UTILITIES INSTALLED IN, UNDER OR UPON THE VACATED BUILDING SETBACK PRIOR TO THE VACATION THEREOF, AND FOR WHICH NO NOTICE APPEARS IN THE OFFICE OF THE REGISTER OF DEEDS. (PLOTTED AND SHOWN)

NOTES:
1. PER THE CITY OF WICHITA, KANSAS ZONING REGULATIONS THIS PROPERTY IS ZONED "LC" – LIMITED COMMERCIAL DISTRICT.
2. "LC" ZONING REQUIREMENTS:
   SETBACKS:
   FRONT: 20 FEET. *(PROVIDED THAT THE MINIMUM REQUIRED FRONT SETBACK MAY BE REDUCED PURSUANT TO SEC. III-E.2.E(5)).*
   SIDE: 10 FEET.
   REAR: 10 FEET.
   MAXIMUM BUILDING HEIGHT: 80 FEET. (AND TWO FEET OF ADDITIONAL HEIGHT FOR EACH FOOT OF SETBACK BEYOND THE MINIMUM REQUIRED SETBACKS).
   PARKING REQUIREMENTS: 1 SPACE FOR EVERY 3 OCCUPANTS.
3. THERE WERE NO BUILDINGS OR DESIGNATED PARKING STALLS ON THE SUBJECT PROPERTY AT THE TIME OF THIS SURVEY.
4. THIS PROPERTY IS LOCATED IN AN AREA LABELED ZONE "C" (AREAS OF MINIMAL FLOODING) AS DETERMINED BY FEMA FLOOD INSURANCE RATE MAP NUMBER 200328 0010 B, EFFECTIVE DATE MAY 15, 1986.
5. ACCESS TO THE PROPERTY VIA PUBLIC RIGHT OF WAY, CARMEN DRIVE & N. 21ST STREET.
6. THE BASIS OF BEARING USED FOR THIS SURVEY WAS N90°00'00"E ON THE NORTH LINE OF LOT 1 JM OFFICE PARK ADDITION.

DESCRIPTION:
LOT 1, JM OFFICE PARK ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS

SURVEYOR'S METE'S & BOUND DESCRIPTION:
A TRACT OF LAND BEING ALL OF LOT 1, JM OFFICE PARK, AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT THE NORTHEAST CORNER OF SAID LOT 1; THENCE S01°12'57"E ON THE EAST LINE OF SAID LOT 1 A DISTANCE OF 133.02 FEET TO THE SOUTHEAST CORNER OF SAID LOT 1; THENCE S84°58'12"W ON THE SOUTH LINE OF SAID LOT 1 A DISTANCE OF 345.99 FEET TO THE SOUTHWEST CORNER OF SAID LOT 1; THENCE N00°26'30"E ON THE WEST LINE OF SAID LOT 1 A DISTANCE OF 163.32 FEET TO THE NORTHWEST CORNER OF SAID LOT 1; THENCE N90°00'00"E ON THE NORTH LINE OF SAID LOT 1 A DISTANCE OF 340.58 TO THE POINT OF BEGINNING. CONTAINS 50,773 SQUARE FEET OR 1.17 ACRES MORE OR LESS. SUBJECT TO EASEMENTS, RESTRICTIONS AND RESERVATIONS NOW OF RECORD.
END DESCRIPTION

SURVEYOR'S CERTIFICATE:
TO SONIC RESTAURANTS, INC., AN OKLAHOMA CORPORATION AND ITS AFFILIATES, SUCCESSORS AND ASSIGNS, ANBW PROPERTIES, INC. AND CHICAGO TITLE INSURANCE COMPANY:

THIS IS TO CERTIFY THAT:
(A) I MADE THE SURVEY ON THE GROUND OF THE PROPERTY;
(B) THE SURVEY IS CORRECT;
(C) I FOUND NO DISCREPANCIES, CONFLICTS OR SHORTAGES IN AREA, BOUNDARY LINE CONFLICTS, PROTRUSIONS, ENCROACHMENTS OR OVERLAPPING OF IMPROVEMENTS, EASEMENTS, WATERWAYS OR RIGHTS OF-WAYS, EXCEPT AS SHOWN ON THE SURVEY PLAN AND IDENTIFIED IN THE COMMENTS TO THE SURVEY.
(D) THE SURVEY CORRECTLY SHOWS THE LOCATION OF ANY PAVED OR UNPAVED ROADWAYS;
(D) THE SURVEY SHOWS ALL VISIBLE OR RECORDED EASEMENTS ACCORDING TO THE TITLE REPORT FURNISHED BY THE TITLE COMPANY;
(E) THE SURVEY SHOWS ALL IMPROVEMENTS, SIGNS, FENCES, DRAINAGE DITCHES, WATERWAYS, STREAMS, RAILROAD TRACKS, BUILDING SETBACK LINES, ENCROACHMENTS AND PROTRUSIONS;
(F) THE SURVEY SHOWS THE *100-YEAR FLOOD OF ANY STREAM;*
(G) THE SURVEY SHOWS THE ELECTRIC, TELEPHONE, SEWER, WATER, GAS AND OTHER UTILITY SERVICES ON OR ADJACENT TO THE PROPERTY AS MARKED BY THE LOCAL *UTILITY* COMPANIES;
(H) THE SURVEY SHOWS A TOTAL AREA CONTAINED WITHIN THE BOUNDARY LINES OF THE PROPERTY EQUAL TO A SPECIFIED NUMBER OF SQUARE FEET;
(I) THE SURVEY PLAT IS TRUE, CORRECT AND AN ACCURATE REPRESENTATION OF THE PROPERTY; AND

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH "MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS," JOINTLY ESTABLISHED AND ADOPTED BY ALTA, ACSM AND NSPS IN 1999, AND INCLUDES ITEMS 1, 2, 3, 4, 5, 6, 7(A), 7(B), 7(C), 8, 9, 10, 11 & 12 OF TABLE A THEREOF. PURSUANT TO THE ACCURACY STANDARDS (AS ADOPTED BY ALTA, NSPS AND ACSM AND IN EFFECT ON THE DATE OF THIS CERTIFICATION, UNDERSIGN FURTHER CERTIFIES THAT THE POSITIONAL UNCERTAINTIES RESULTING FROM THE SURVEY MEASUREMENTS MADE ON THE SURVEY DO NOT EXCEED THE ALLOWABLE POSITIONAL TOLERANCE. THIS SURVEY WAS EXECUTED IN ACCORDANCE WITH THE MINIMUM KANSAS STANDARDS FOR PROPERTY BOUNDARY SURVEYS.
DATE OF SURVEY: OCTOBER 19, 2005
ERROR OF CLOSURE: 1:71,625

DAVID J. SCHAFFER _____
KANSAS LS-1240

UTILITY CONTACT INFORMATION:
ELECTRIC & NATURAL GAS:
KANSAS GAS & ELECTRIC
120 E. 1ST STREET
WICHITA, KANSAS 67201-0208
(316) 261-6734
CONTACT: CAROLYN KONECNY

WATER:
CITY OF WICHITA
455 N. MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4555
CONTACT: ANY REPRESENTATIVE

TELEPHONE:
SOUTHWESTERN BELL
154 N. BROADWAY, ROOM 460
WICHITA, KANSAS 67202
(316) 268-2222
CONTACT: KEN TILLOSON

SANITARY SEWER:
CITY OF WICHITA
455 N. MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4501
CONTACT: VICKY YOUNG

ENCROACHMENT:
THERE ARE NO ENCROACHMENTS ON THE SUBJECT PROPERTY AT THE TIME OF THIS SURVEY.

BENCHMARK:
BM-1: 2" BRASS DISK FOUND ON BASE OF TRAFFIC CONTROL POLE AT THE NORTHWEST QUADRANT OF 21ST STREET AND HILLSIDE. ELEVATION: 1358.88

TBM-1: NORTH FLANGE BOLT ON FIRE HYDRANT AT NORTHEAST CORNER OF PROPERTY. ELEVATION: 1349.49

TBM-2: "+" CUT SET IN CONCRETE AT THE SOUTHEAST CORNER OF LOT 1 JM OFFICE PARK ADDITION. ELEVATION: 1342.67

PROPERTY ADDRESS:
21ST STREET NORTH & CARMEN, WICHITA, KANSAS

LAND AREA:
50,773 SQUARE FEET OR 1.17 ACRES, MORE OR LESS.

REFERENCE PLAT:
– SHADYBROOK ADDITION
– JM OFFICE PARK ADDITION

LEGEND:

GM	GAS METER
WM	WATER METER
	UTILITY POLE
	UTILITY POLE W/ TRANSFORMER
	CHAIN LINK FENCE
	WOOD FENCE
	EXISTING TREE W/SIZE
(D)	DESCRIBED
(M)	MEASURED
	DEADMAN ANCHOR
	SANITARY SEWER MANHOLE
TC=1340.70	TOP OF CURB ELEVATION
FL=1340.18	FLOWLINE OF CURB ELEVATION
	FIRE HYDRANT
	TELEPHONE PEDESTAL
	BREAKER BOX
	ELECTRIC METER
	POWER POLE W/LIGHT
	WOOD BOLLARD
639	EXISTING GRADE CONTOUR
X639.05	EXISTING GRADE SPOT ELEVATION
G	BURIED GAS LINE
S	SANITARY SEWER FORCE MAIN
OH	OVERHEAD POWER W/NO. OF LINES
E	BURIED ELECTRIC LINE
W	WATER LINE
	WATER LINE VALVE
	LIGHT POLE
	BENCHMARK
	MONUMENT FOUND
	1/2"x24" REBAR SET W/CAP (UNLESS OTHERWISE NOTED)
	STREET SIGN
	ELECTRIC PEDESTAL
	TRAFFIC LIGHT CONTROL BOX
T	BURIED TELEPHONE LINE

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	10/12/05	INITIAL ISSUE	CP		

KAW VALLEY ENGINEERING, INC. – CONSULTING ENGINEERS
Offices: Junction City, Ks. Kansas City, Mo. Lenexa, Ks.
14700 W. 114TH TERRACE
LENEXA, KANSAS 66215
913-894-5150 FAX 913-894-5977
E-MAIL kv@kveng.com
WEB SITE www.kveng.com

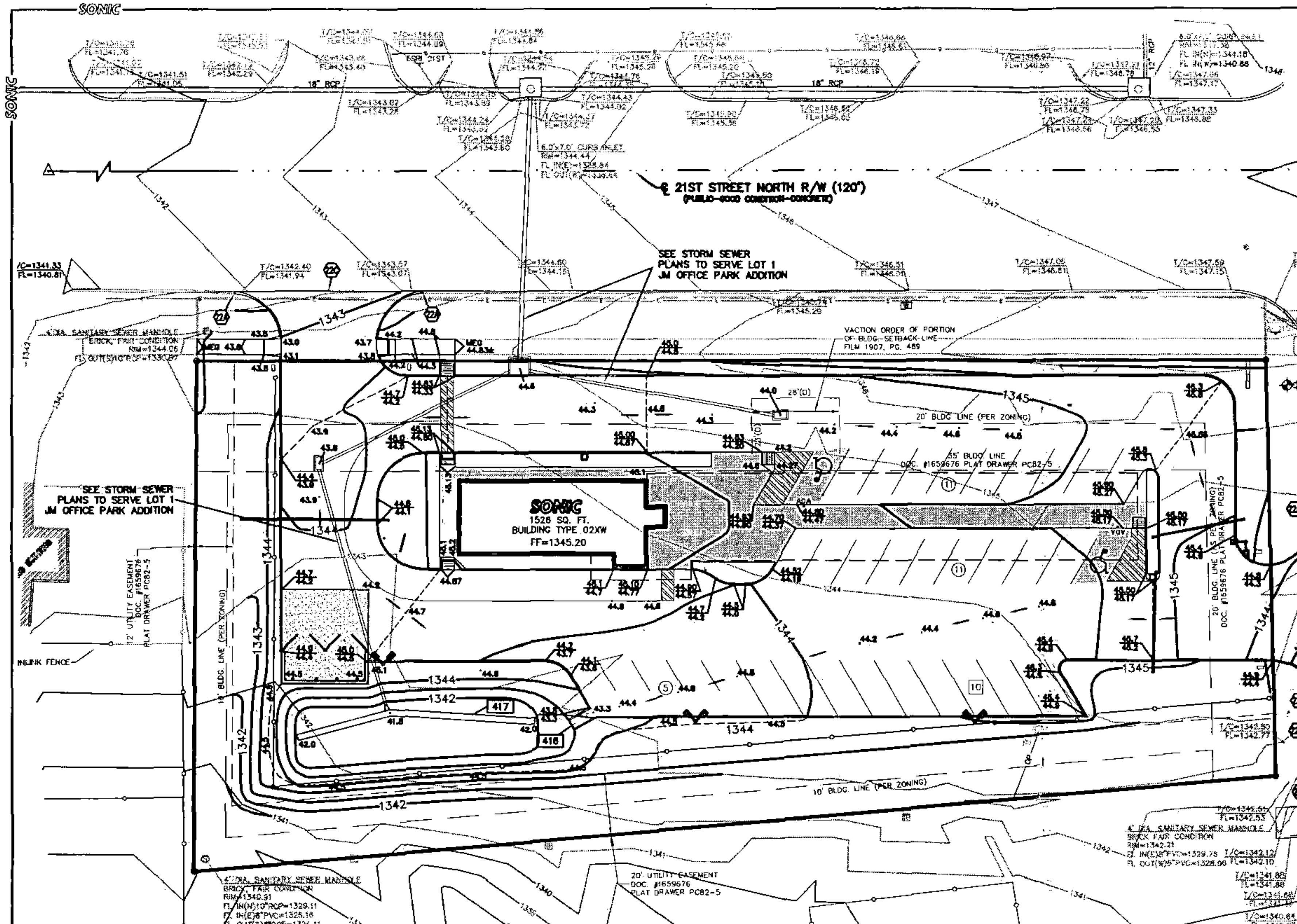
SONIC RESTAURANTS, INC.
21ST STREET NORTH AND CARMEN
WICHITA, KANSAS

ALTA/ACSM LAND TITLE SURVEY

PROJ. NO.	C05S2894
DATE	10/12/05
DESIGNER	
DRAWN BY	CP
CFN	2894ALTA
REV	0
SHEET	1 OF 1

21ST STREET NORTH AND CARMEN, WICHITA, SEDGWICK COUNTY, KANSAS

Exhibit B
Proposed Grading Plan
Drainage Area Map
Site Details



THE COORDINATES PROVIDED IN THESE PLANS ARE FOR INFORMATION AND CHECKING PURPOSES ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CALCULATE CONSTRUCTION STAKING COORDINATES ACCORDING TO THE DIMENSIONS SHOWN ON THESE PLANS. CONTRACTOR SHALL VERIFY THE ACCURACY OF THE COORDINATES SHOWN IN THE TABLE HEREON BEFORE CONSTRUCTION.

NOTE:
THE MAXIMUM SLOPE IN HANDICAP PARKING IS NOT TO EXCEED 2% IN ANY DIRECTION AND ALONG ACCESSIBLE ROUTES THE SLOPE IS NOT TO EXCEED 5% RUNNING SLOPE OR 2% CROSS SLOPE.

IF DISCREPANCIES EXIST BETWEEN THE GRADING NOTES BELOW AND THE RECOMMENDATIONS OUTLINED IN THE PROJECT GEOTECHNICAL REPORT, THE RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT SHALL GOVERN.

NOTES:
22A MATCH EXISTING TOP OF CURB ELEVATION
22C MATCH EXISTING PAVEMENT ELEVATION

DETAILS – SEE DETAIL SHEET NO. C-10 FOR THE FOLLOWING DETAILS
416 CONCRETE DRAINAGE FLUME
417 CONCRETE DRAINAGE SWALE

– ADA ACCESSIBLE ROUTE

BENCHMARK:

BM-1: 2" BRASS DISK FOUND ON BASE OF TRAFFIC CONTROL POLE AT THE NORTHWEST QUADRANT OF 21ST STREET AND HILLSIDE. **ELEVATION: 1358.65**

TBM-1: NORTH FLANGE BOLT ON FIRE HYDRANT AT NORTHEAST CORNER OF PROPERTY. **ELEVATION: 1349.49**

TBM-2: "+" CUT SET IN CONCRETE AT THE SOUTHEAST CORNER OF LOT 1 JM OFFICE PARK ADDITION. **ELEVATION: 1342.67**

SAFETY NOTICE TO CONTRACTOR:

IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

WARRANTY / DISCLAIMER:

THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, NEITHER KAW VALLEY ENGINEERING, INC NOR ITS PERSONNEL CAN OR DO WARRANTY THESE DESIGNS OR PLANS AS CONSTRUCTED, EXCEPT IN THE SPECIFIC CASES WHERE KAW VALLEY ENGINEERING PERSONNEL INSPECT AND CONTROL THE PHYSICAL CONSTRUCTION ON A CONTEMPORARY BASIS AT THE SITE.

CAUTION – NOTICE TO CONTRACTOR:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICTS PRIOR TO ANY CONSTRUCTION.

GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.

LEGEND (PROPOSED)
x 43.0 SPOT ELEVATION, TOP OF PAVEMENT (ADD 1300 TO ELEVATION)
H.P. HIGH POINT
44.50 TOP OF CURB (ADD 1300 TO ELEVATION)
44.00 FLOW LINE OF CURB (ADD 1300 TO ELEVATION)
FLOW DIRECTION
44 FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT (ADD 1300 TO ELEVATION)
BREAKLINE

NOTE:
1. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRANCE, SLOPED PAVING, EXIT PORCHES, RAMPS, TRUCK DOCKS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
2. THESE PLANS HAVE NOT BEEN VERIFIED WITH FINAL ARCHITECTURAL CONTRACT DRAWINGS. CONTRACTOR SHALL VERIFY AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES. CONTRACTOR IS FULLY RESPONSIBLE FOR REVIEW AND COORDINATION OF ALL DRAWINGS AND CONTRACTOR DOCUMENTS.
3. ALL DIMENSIONS ARE TO BACK OF CURB UNLESS NOTED OTHERWISE.
4. ALL DIMENSIONS ARE PERPENDICULAR TO PROPERTY LINE.
5. ACTUAL SIGN LOCATIONS TO BE COORDINATED WITH CONSTRUCTION MANAGER.

GRADING NOTES:

1. THE CONSTRUCTION AREA SHALL BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL AND ORGANIC MATTER FROM ALL AREAS TO BE OCCUPIED BY BUILDING AND PAVING. TOPSOIL FOR REPLACEMENT ON SLOPES MAY BE STOCKPILED ON SITE. EXCESS TOPSOIL MAY BE WASTED IN FILL SLOPES PROVIDED THAT NO TOPSOIL WILL BE WASTED WITHIN 10 FEET OF THE EDGE OF THE BUILDING OR PARKING AREA. BURNING OF TIMBER WILL NOT BE PERMITTED UNLESS APPROVAL IS OBTAINED FROM GOVERNING OFFICIALS. STRIPPING EXISTING TOPSOIL AND ORGANIC MATTER SHALL BE TO A MINIMUM DEPTH OF 6 INCHES.
2. AREAS TO RECEIVE FILL SHALL BE SCARIFIED AND THE TOP 8-INCH DEPTH COMPACTED TO 95% STANDARD PROCTOR DENSITY. ANY UNSUITABLE AREAS SHALL BE UNDERCUT AND REPLACED WITH SUITABLE MATERIAL BEFORE ANY FILL MATERIAL CAN BE APPLIED.
3. OFF-SITE FILL MATERIAL SHALL HAVE A PLASTICITY INDEX OF 25 OR LESS, A LIQUID LIMIT OF 45 OR LESS AND CONTAIN NO ROCK LARGER THAN FOUR INCHES. OFF-SITE FILL MATERIAL SHALL BE APPROVED BY THE OWNER PRIOR TO BRINGING ON SITE.
4. EARTHWORK UNDER THE BUILDING SHALL COMPLY WITH THE PROJECT ARCHITECTURAL PLANS. OTHER FILL MATERIAL SHALL BE MADE IN LIFTS NOT TO EXCEED EIGHT INCHES DEPTH COMPACTED TO 95% STANDARD PROCTOR DENSITY. FILL MATERIAL MAY INCLUDE ROCK FROM ON-SITE EXCAVATION IF CAREFULLY PLACED SO THAT LARGE STONES ARE WELL DISTRIBUTED AND VOIDS ARE COMPLETELY FILLED WITH SMALLER STONES, EARTH, SAND OR GRAVEL TO FURNISH A SOLID EMBANKMENT. NO ROCK LARGER THAN THREE INCHES IN ANY DIMENSION NOR ANY SHALE SHALL BE PLACED IN THE TOP 12 INCHES OF EMBANKMENT.
5. ALL AREAS OF THE SUB GRADE THAT ARE TO BE STABILIZED SHALL BE DONE IN ACCORDANCE WITH THE SITE WORK SPECIFICATIONS.
6. AREAS THAT ARE TO BE CUT TO SURGED LEVELS SHALL BE PROOF ROLLED WITH A MODERATELY HEAVY LOADED DUMP TRUCK OR SIMILAR APPROVED CONSTRUCTION EQUIPMENT TO DETECT UNSUITABLE SOIL CONDITIONS.
7. IN ALL AREAS OF EXCAVATION, IF UNSUITABLE SOIL CONDITIONS ARE ENCOUNTERED, A QUALIFIED GEOTECHNICAL ENGINEER SHALL RECOMMEND TO THE OWNER ON THE METHODS OF UNDERCUTTING AND REPLACEMENT OF PROPERLY COMPACTED, APPROVED FILL MATERIAL. ALL PROOF ROLLING AND UNDERCUTTING SHOULD BE PERFORMED DURING A PERIOD OF DRY WEATHER.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF DUST AND DIRT RISING AND SCATTERING IN THE AIR DURING CONSTRUCTION AND SHALL PROVIDE WATER SPRINKLING OR OTHER SUITABLE METHODS OF CONTROL. THE CONTRACTOR SHALL COMPLY WITH ALL GOVERNING REGULATIONS PERTAINING TO ENVIRONMENTAL PROTECTION.
9. ALL SLOPES ARE TO BE 4:1 OR FLATTER UNLESS OTHERWISE INDICATED.
10. ALL SLOPES EXCEEDING 3:1 SHALL BE PROTECTED BY RIP RAP, CONCRETE PAVING, OR OTHER METHODS INDICATED ON THESE PLANS, THAT WILL PREVENT EROSION AND PLACED SUCH THAT THE SURFACE IS FLUSH WITH SURROUNDING GROUND AND SHAPED TO CHANNEL WATER IN DIRECTIONS INDICATED.
11. ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH AND FOUR INCHES OF TOPSOIL APPLIED. IF ADEQUATE TOPSOIL IS NOT AVAILABLE ON-SITE, THE CONTRACTOR SHALL PROVIDE TOPSOIL, APPROVED BY THE OWNER, AS NEEDED. THE AREA SHALL THEN BE SEEDED, FERTILIZED, MULCHED, WATERED AND MAINTAINED UNTIL HARDY GRASS GROWTH IS ESTABLISHED IN ALL AREAS. ANY AREAS DISTURBED FOR ANY REASON SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
12. CONTRACTOR SHALL USE SILT FENCE, BALES OF HAY OR OTHER MEANS OF CONTROLLING EROSION ALONG THE EDGE OF THE PROPERTY OR OTHER BOTTOM OF SLOPE LOCATIONS.
13. CONTRACTOR IS TO REMOVE AND DISPOSE OF ALL DEBRIS, RUBBISH AND OTHER MATERIALS RESULTING FROM PREVIOUS AND CURRENT DEMOLITION OPERATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. THE CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
15. THE DUTY OF THE ENGINEER, ARCHITECT, AND OWNER TO CONDUCT CONSTRUCTION REVIEW OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON OR NEAR THE CONSTRUCTION SITE.
16. THE SITE WORK FOR THIS PROJECT SHALL MEET OR EXCEED THE STANDARD SITE WORK SPECIFICATIONS.

GENERAL NOTES:

1. ALL DIMENSIONS AT CURBS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.
2. PROPOSED UTILITIES ARE SHOWN IN SCHEMATIC ONLY. EXACT LOCATIONS SHALL BE DETERMINED TO ALLOW FOR THE MOST ECONOMICAL AND PRACTICAL INSTALLATION.
3. THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES TO DETERMINE EXACT POINT OF SERVICE CONNECTION AT EXISTING UTILITY. REFER TO THE BUILDING ELECTRICAL AND PLUMBING DRAWINGS FOR UTILITY SERVICE ENTRANCE LOCATIONS, SIZES AND CIRCUITING.
4. LOCATIONS OF PYLON / MONUMENT SIGNS AND ENTER / EXIT SIGNS ARE NOT EXACT. THE CONTRACTOR SHALL VERIFY EXACT LOCATIONS WITH OWNER / CONSTRUCTION MANAGER.
5. ALL LANDSCAPE AREAS SHALL BE ROUGH GRADED TO 6" BELOW TOP OF ALL WALKS AND CURBS. TOP SOIL TO BE ADDED TO THE LEVEL OF THE WALKS OR CURBS.

SITE PLAN KEYNOTES

ITEM	NOTE
1	TRAFFIC FLOW ARROW (TYPICAL), REF: SD4.23
2	4" PAINTED STRIPES (TYPICAL), REF: SPECIFICATIONS, SECTION 02500, SHEET SP1
3	CURB RAMP (TYPICAL), REF: SD4.05
4	TRASH ENCLOSURE, REF: SD3.01
5	- NOT USED -
6	BOLLARD, REF: SD2.20
7	GREASE TRAP, REF: P2.02
8	4" SANITARY SEWER LINE
9	2" UNDERGROUND GAS LINE
10	1-1/4" UNDERGROUND WATER LINE W/1" METER
11	UNDERGROUND ELECTRIC LINE
12	2" UNDERGROUND TELEPHONE LINE
13	4" PVC PIPE SLEEVE UNDER DRIVE FOR IRRIGATION SYSTEM
14	ORDER BOARD AND DETECTOR LOOP, REF: SD2.01 AND SD2.21
15	MENU / CANOPY POST (TYPICAL), REF: CA1.23
16	CONCRETE DRIVE, BUILD IN ACCORDANCE WITH CITY AND OR STATE SPECIFICATIONS
17	CONCRETE PAVING
18	8" THICK CONCRETE PAVING IN THIS AREA
19	"CARHOP CROSSING" SIGNAGE, REF: SD2.17
20	- NOT USED -
21	- NOT USED -
22	POLE MOUNTED FLOOD LIGHTS, REF: SD3.23 AND FIXTURE SCHED. ON SHEET E2
23	- NOT USED -
24	- NOT USED -
25	CONC. WALKS AND PATIO REF: CIVIL DRAWINGS
26	MOVEABLE TABLES AND CHAIRS. ALL TABLES ARE ADA ACCESSIBLE. SEE SHEET SD5 FOR DETAILED INFORMATION.
27	TRASH CAN W/ 2x2 CONCRETE PAD
28	- NOT USED -
29	- NOT USED -

SIGN SCHEDULE

ITEM	QTY.	REFERENCE	SIGN TYPE
A	1	SD2.11	PYLON SIGN
B	2	SD2.23	ENTER SIGN
C	2	SD2.23	EXIT SIGN
D	1	A2.01	SIGN ON BLDG.
E	2	SD2.19	HANDICAPPED PARKING SIGN

LEGEND:

PROPERTY LINE
EASEMENT / BUFFERS
BUILDING SETBACK LINE
SITE PLAN NOTE
CUSTOMER PARKING STALL
EMPLOYEE PARKING STALL
SIGN (SEE SCHEDULE)
UNDERGROUND ELECTRIC LINE
UNDERGROUND TELEPHONE LINE
UNDERGROUND GAS LINE
WATER LINE
SANITARY SEWER LINE

NO	DATE	ISSUES AND REVISIONS
0	12/02/05	INITIAL SUBMITTAL
1	02/02/06	PER CITY COMMENTS

PROJECT MANAGER: GARY A. LEEDS
FIRM NAME: KAW VALLEY ENGINEERING
PROJECT No: A05D2222
CFN:

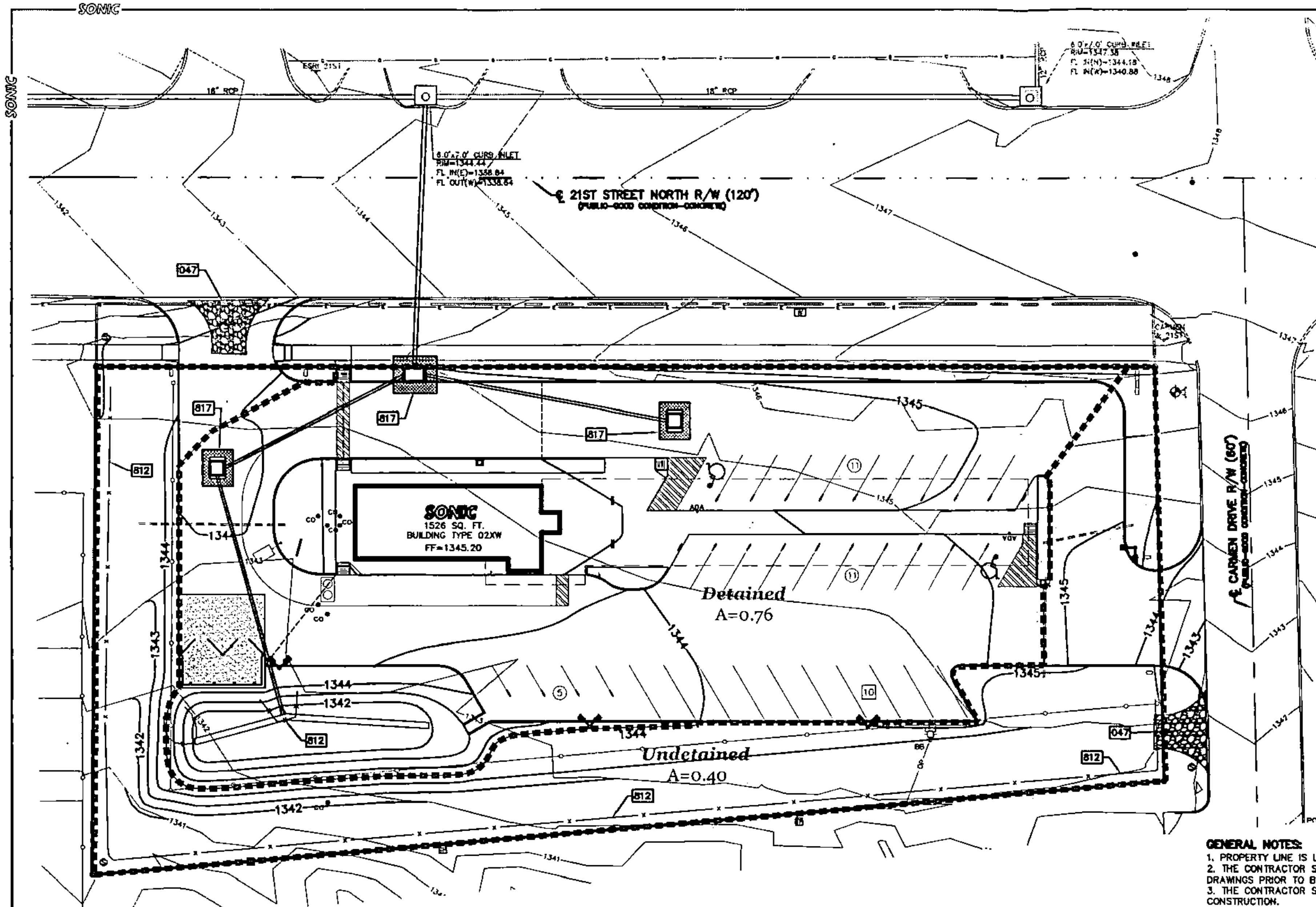
Kaw Valley Engineering, Inc.

SONIC CORPORATION
300 JOHNNY BENCH DR
OKLAHOMA CITY, OK 73104
OFFICES: 405-225-5000
FAX: 405-225-5991

SONIC DRIVE-IN
BUILDING TYPE: 02XW
21ST & CARMEN, WICHITA, KS
GRADING PLAN

SHEET

DWG:



DETAILS - SEE DETAIL SHEET NO. C-10 FOR THE FOLLOWING DETAILS

047 CONSTRUCTION ENTRANCE DETAIL
812 SEDIMENTATION FENCE

NOTES:

817 BLOCK AND GRAVEL CURB INLET PROTECTION REFER TO SEPARATE STORM SEWER PLANS FOR DETAIL

GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.

LEGEND (PROPOSED)

- SEDIMENTATION FENCE
- LIMITS OF DRAINAGE AREA
- BLOCK & GRAVEL CURB INLET PROTECTION
- CONSTRUCTION ENTRANCE

SAFETY NOTICE TO CONTRACTOR:
IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

WARRANTY / DISCLAIMER:
THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, NEITHER KAW VALLEY ENGINEERING, INC NOR ITS PERSONNEL CAN OR DO WARRANTY THESE DESIGNS OR PLANS AS CONSTRUCTED, EXCEPT IN THE SPECIFIC CASES WHERE KAW VALLEY ENGINEERING PERSONNEL INSPECT AND CONTROL THE PHYSICAL CONSTRUCTION ON A CONTEMPORARY BASIS AT THE SITE.

CAUTION - NOTICE TO CONTRACTOR:
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICTS PRIOR TO ANY CONSTRUCTION.

TEMPORARY AND PERMANENT SEEDING

TEMPORARY SEEDING
SEEDBED PREPARATION - SEEDBED SHOULD BE WELL-PULVERIZED, LOOSE AND UNIFORM. LIME AND FERTILIZER SHOULD BE APPLIED ACCORDING TO SOIL TEST RECOMMENDATIONS. IF pH IS UNKNOWN, APPLY LIME AT A RATE OF 2 TONS/ACRE. APPLY A 10-10-10 GRADE FERTILIZER AT 700-1,000 LB/ACRE. INCORPORATE BOTH INTO THE TOP 4-6 INCHES OF SOIL.
PLANT SELECTION - ANNUAL RYE GRASS, WHEAT OR OATS FOR TEMPORARY SEEDING
SEEDING - EVENLY APPLY SEED USING A CYCLONE SEEDER (BROADCAST), DRILL, CULTIPACKER SEEDER OR HYDROSEEDER. ANNUAL RYE GRASS SHOULD BE APPLIED AT A RATE OF 120 LBS/ACRE, WHEAT OR OATS SHOULD BE APPLIED AT A RATE OF 100 LBS/ACRE. BROADCAST SEEDING AND HYDROSEEDING ARE APPROPRIATE FOR STEEP SLOPES WHERE EQUIPMENT CANNOT BE DRIVEN. HAND BROADCASTING IS NOT RECOMMENDED BECAUSE OF THE DIFFICULTY IN ACHIEVING A UNIFORM DISTRIBUTION. SMALL GRAINS SHOULD BE PLANTED NO MORE THAN 1 INCH DEEP, AND GRASSES AND LEGUMES NO MORE THAN 1/2 INCH. BROADCAST SEED MUST BE COVERED BY RAKING OR CHAIN DRAGGING, AND THEN LIGHTLY FIRMED WITH A ROLLER OR CULTIPACKER. HYDROSEEDED MIXTURES SHOULD INCLUDE A WOOD FIBER (CELLULOSE) MULCH.
MULCHING - THE USE OF MULCH WILL HELP ENSURE ESTABLISHMENT UNDER NORMAL CONDITIONS AND IS ESSENTIAL TO SEEDING SUCCESS UNDER HARSH CONDITIONS SUCH AS SEEDING IN FALL OR WINTER COVER (WOOD FIBER MULCHES ARE NOT CONSIDERED ADEQUATE FOR THIS USE), SLOPES STEEPER THAN 3:1, EXCESSIVELY HOT OR DRY WEATHER, ADVERSE SOILS (SHALLOW, ROCKY, HIGH IN CLAY OR SAND), AND AREAS RECEIVING CONCENTRATED FLOW. IF AREA TO BE MULCHED IS SUBJECT TO CONCENTRATED WATER FLOW, AS IN CHANNELS, ANCHOR MULCH WITH NETTING.
MAINTENANCE - RESEED, REFERTILIZE AND MULCH AREAS OF INSUFFICIENT GROWTH. RESEED, REFERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

PERMANENT SEEDING
THE FOLLOWING PERCENTAGES ARE THE MINIMUM REQUIREMENTS IN THE ACCEPTANCE OF SEED:

GRASS	PURITY	GERMINATION
KENTUCKY BLUE GRASS	90%	75%
PERENNIAL RYE GRASS	95%	90%
TALL FESCUE	95%	85%

MIX I: SUNNY LOCATIONS WITH SLOPES LESS THAN TEN PERCENT (10%)
TURF TYPE RYE GRASS: ONE OF THE FOLLOWING AT 20% BY VOLUME ... DERBY, PALMER, PRELUDE, MANHATTAN, MANHATTAN II, PREMIER, PEN FINE, TURF STAR, REGAL
BLUE GRASS: THREE OF THE FOLLOWING TO TOTAL 80% BY VOLUME ... BARRON, ADELPHI, TOUCHDOWN, MERIT, PARADE, GLADE, RAM I, RUGBY (FOR SHADY SITES USE GLADE AT 60% BY VOLUME PLUS 20% OF ONE OF THE OTHERS)
MIX II: ON SUNNY SLOPES STEEPER THAN 10% USE ONE OF THE FOLLOWING AT 90% PER VOLUME PLUS ONE BLUE GRASS FROM ABOVE AT 10%. FOR SHADY SLOPES USE GLADE BLUE GRASS AT 10% WITH ONE OF THE FOLLOWING:
TURF FESCUE TYPE: REBEL, REBEL II, APACHE, OLYMPIC, FALCON, HOUNDOG, BONANZA, TRIDENT
SEEDING RATE:
MIX I - APPLY THE RYE GRASS/BLUE GRASS MIX AT 100 LBS OF MIX PER ACRE
MIX II - APPLY THE TALL FESCUE/BLUE GRASS MIX AT 195 LBS PER ACRE
SEE ABOVE NOTES FOR SEEDBED PREPARATION, SEEDING, MULCHING AND MAINTENANCE. HYDROSEEDING MAY BE REQUIRED WHERE PERMANENT SEEDING CANNOT BE EASILY ESTABLISHED.
SOD: FINE BLADE PREMIUM GRADE FESCUE.

GENERAL NOTES:
1. PROPERTY LINE IS LIMITS OF CONSTRUCTION EXCEPT AS SHOWN.
2. THE CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE DRAWINGS PRIOR TO BEGINNING EARTHWORK OPERATIONS.
3. THE CONTRACTOR SHALL MAINTAIN ALL SILT CONTROL MEASURES DURING CONSTRUCTION.
4. ALL SILT SHALL REMAIN ON SITE AND SURROUNDING STREETS SHALL BE KEPT CLEAR OF ALL MUD AND DEBRIS.
5. A SEDIMENTATION BARRIER IS TO BE INSTALLED AS SHOWN.
6. ACCUMULATED SEDIMENT SHALL BE REMOVED AND THE SEDIMENTATION BARRIERS MAINTAINED AS NEEDED TO PREVENT SEDIMENTATION BYPASS OF THE BARRIER.
7. SLOPES ARE TO BE LEFT IN A ROUGH CONDITION DURING GRADING.
8. CURB INLET SEDIMENTATION BARRIERS ARE TO BE INSTALLED AROUND INLETS AND WEIRS WHERE SEDIMENTATION IS A CONCERN. INLET BARRIERS SHALL BE EITHER BLOCK AND GRAVEL, OR SECURED STRAW BALES, OR SILT FENCE.
9. SEDIMENT IS TO BE REMOVED FROM STORM WATER DRAINAGE SYSTEMS.
10. RIP RAP IS TO BE INSTALLED AT AREAS OF CONCENTRATED FLOW (I.E. CULVERT OUTLETS).
11. CONTRACTOR IS RESPONSIBLE FOR INSTALLING ANY ADDITIONAL EROSION CONTROL AS HE/SHE DEEMS NECESSARY.
12. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, TOOLS, EQUIPMENT AND LABOR AS NECESSARY TO INSTALL AND MAINTAIN ADEQUATE EROSION AND SILTATION CONTROLS REQUIRED TO PREVENT SOIL EROSION FROM LEAVING THE PROJECT SITE. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THAT METHODS UTILIZED ARE ADEQUATE AND COMPLY WITH REQUIREMENTS OF THE SPECIFICATIONS AND GOVERNMENTAL AGENCIES HAVING JURISDICTION OVER THE WORK.
13. TEMPORARY SEDIMENT FENCE/STRAW BALES TO REMAIN UNTIL ADEQUATE VEGETATION IS ESTABLISHED.
14. MUD AND DEBRIS SHALL BE CLEANED UP AT THE CONCLUSION OF EACH WORKING DAY, OR AFTER EACH RAINFALL IF SILT IS PRESENT.
15. INSPECTION, MAINTENANCE AND REPAIR OF EROSION CONTROL DEVICES SHALL BE ONGOING THROUGHOUT THE LIFE OF BUILDING CONSTRUCTION TO KEEP THE DEVICES IN OPERABLE CONDITION AT ALL TIMES. ADDITIONAL MEASURES SHALL BE INSTALLED AS REQUIRED BY ACTUAL FIELD CONDITIONS AND/OR GOVERNING INSPECTION AGENCIES.
16. THERE ARE NO EXISTING TREES ON THIS SITE SCHEDULED TO REMAIN AFTER CONSTRUCTION UNLESS OTHERWISE NOTED ON PLANS.
17. INSTALL CONSTRUCTION ENTRANCE AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING THE SITE AND AS SHOWN ON PLANS.
18. AT COMPLETION OF SITE GRADING AND OTHER RELATED CONSTRUCTION ACTIVITIES, ALL DISTURBED AREAS WITHIN THE PROJECT SITE SHALL BE SEEDED, SODDED, OR LANDSCAPED AS SHOWN ON THE LANDSCAPE PLAN WITHIN 14 DAYS.
19. TOPSOIL IS TO BE PLACED IN AREAS UNSUITABLE FOR VEGETATIVE GROWTH.
20. STRIP TOPSOIL PRIOR TO EXCAVATION, STOCKPILE AND SPREAD ONTO DISKED SUB GRADE (4" MIN.) A THICKNESS OF 4 INCHES.
21. ROCK LINING (RIP RAP) SHALL BE DURABLE STONE CONTAINING A COMBINED TOTAL OF NOT MORE THAN 10 PERCENT OF EARTH, SAND, SHALE AND NON-DURABLE ROCK. AT LEAST 60 PERCENT OF THE MASS SHALL BE OF PIECES HAVING A MINIMUM WEIGHT OF 150 POUNDS OR MORE PER CUBIC FOOT.
22. THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY FOR RESOLVING COMPLAINTS IN THE EVENT THAT COMPLAINTS OR DAMAGE CLAIMS ARE FILED DUE TO DAMAGES OCCURRING ADJACENT TO OR DOWNSTREAM FROM PROPERTY BY SEDIMENT RESULTING FROM EROSION ON THE PROJECT SITE.
23. RIGHT OF WAY TO BE STABILIZED AS REQUIRED BY APWA SECTION 2400.

GENERAL NOTES:

1. ALL DIMENSIONS AT CURBS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.
2. PROPOSED UTILITIES ARE SHOWN IN SCHEMATIC ONLY. EXACT LOCATIONS SHALL BE DETERMINED TO ALLOW FOR THE MOST ECONOMICAL AND PRACTICAL INSTALLATION.
3. THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES TO DETERMINE EXACT POINT OF SERVICE CONNECTION AT EXISTING UTILITY. REFER TO THE BUILDING ELECTRICAL AND PLUMBING DRAWINGS FOR UTILITY SERVICE ENTRANCE LOCATIONS, SIZES AND CIRCUITING.
4. LOCATIONS OF PYLON / MONUMENT SIGNS AND ENTER / EXIT SIGNS ARE NOT EXACT. THE CONTRACTOR SHALL VERIFY EXACT LOCATIONS WITH OWNER / CONSTRUCTION MANAGER.
5. ALL LANDSCAPE AREAS SHALL BE ROUGH GRADED TO 6" BELOW TOP OF ALL WALKS AND CURBS. TOP SOIL TO BE ADDED TO THE LEVEL OF THE WALKS OR CURBS.

SITE PLAN KEYNOTES

ITEM	NOTE
1	TRAFFIC FLOW ARROW (TYPICAL), REF: SD423
2	4" PAINTED STRIPES (TYPICAL), REF: SPECIFICATIONS, SECTION 02500, SHEET SP1
3	CURB RAMP (TYPICAL), REF: SD405
4	TRASH ENCLOSURE, REF: SD3.01
5	- NOT USED -
6	BOLLARD, REF: SD220
7	GREASE TRAP, REF: P2.02
8	4" SANITARY SEWER LINE
9	2" UNDERGROUND GAS LINE
10	1-1/4" UNDERGROUND WATER LINE W/1" METER
11	UNDERGROUND ELECTRIC LINE
12	2" UNDERGROUND TELEPHONE LINE
13	4" PVC PIPE SLEEVE UNDER DRIVE FOR IRRIGATION SYSTEM
14	ORDER BOARD AND DETECTOR LOOP, REF: SD2.01 AND SD2.21
15	MENU / CANOPY POST (TYPICAL), REF: CA123
16	CONCRETE DRIVE, BUILD IN ACCORDANCE WITH CITY AND OR STATE SPECIFICATIONS
17	CONCRETE PAVING
18	8" THICK CONCRETE PAVING IN THIS AREA
19	"CARHOP CROSSING" SIGNAGE, REF: SD2.17
20	- NOT USED -
21	- NOT USED -
22	POLE MOUNTED FLOOD LIGHTS, REF: SD323 AND FIXTURE SCHED. ON SHEET E2
23	- NOT USED -
24	- NOT USED -
25	CONC. WALKS AND PATIO REF: CIVIL DRAWINGS
26	MOVEABLE TABLES AND CHAIRS. ALL TABLES ARE ADA ACCESSIBLE. SEE SHEET SD5 FOR DETAILED INFORMATION.
27	TRASH CAN W/ 2x2 CONCRETE PAD
28	- NOT USED -
29	- NOT USED -

SIGN SCHEDULE

ITEM	QTY.	REFERENCE	SIGN TYPE
A	1	SD2.11	PYLON SIGN
B	2	SD2.23	ENTER SIGN
C	2	SD2.23	EXIT SIGN
D	1	A2.01	SIGN ON BLDG.
E	2	SD2.19	HANDICAPPED PARKING SIGN

LEGEND:

- PROPERETY LINE
- EASEMENT / BUFFERS
- BUILDING SETBACK LINE
- SITE PLAN NOTE
- CUSTOMER PARKING STALL
- EMPLOYEE PARKING STALL
- SIGN (SEE SCHEDULE)
- UNDERGROUND ELECTRIC LINE
- UNDERGROUND TELEPHONE LINE
- UNDERGROUND GAS LINE
- WATER LINE
- SANITARY SEWER LINE

NO	DATE	ISSUES AND REVISIONS
0	12/02/05	INITIAL SUBMITTAL
1	02/02/06	PER CITY COMMENTS

PROJECT MANAGER: GARY A. LEEDS
FIRM NAME: KAW VALLEY ENGINEERING
PROJECT No.: A05D2222
CPN: A2000C06_2222ECP.dwg

Kaw Valley Engineering, Inc.

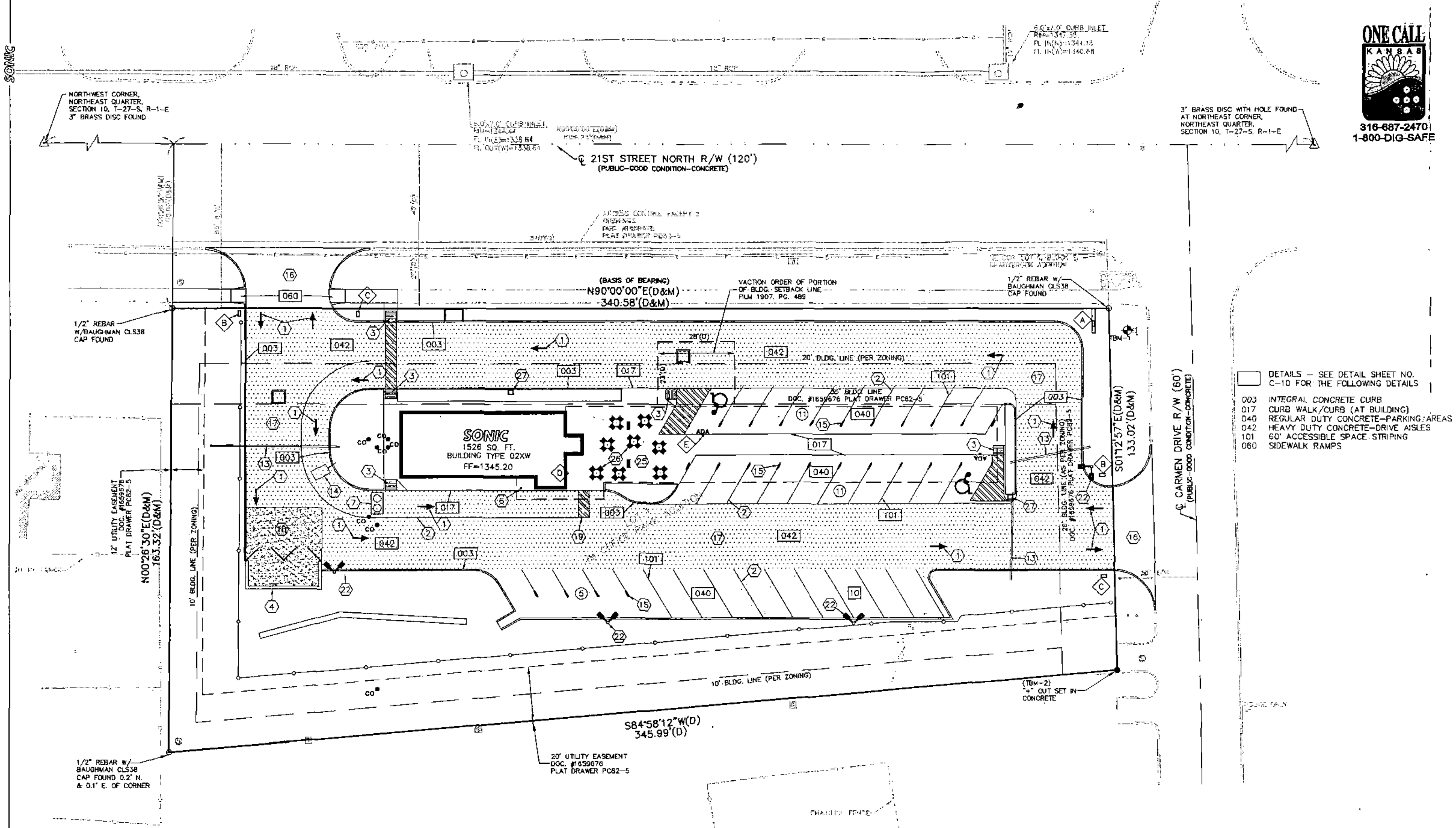
SONIC CORPORATION
300 JOHNNY BENCH DR
OKLAHOMA CITY, OK 73104
OFFICES: 405-225-5000
FAX: 405-225-5991

SONIC DRIVE-IN
BUILDING TYPE: 02XW
21ST & CARMEN, WICHITA, KS
DRAINAGE AREA & EROSION CONTROL PLAN

SHEET
A20

DWG: A2000C06_2222ECP.dwg

[redacted]



ONE CALL KANSAS
316-687-2470
1-800-DIG-SAFE

DETAILS — SEE DETAIL SHEET NO. C-10 FOR THE FOLLOWING DETAILS

003 INTEGRAL CONCRETE CURB
017 CURB WALK/CURB (AT BUILDING)
040 REGULAR DUTY CONCRETE-PARKING AREAS
042 HEAVY DUTY CONCRETE-DRIVE AISLES
101 60' ACCESSIBLE SPACE STRIPING
060 SIDEWALK RAMPS

GENERAL NOTES:

1. ALL DIMENSIONS AT CURBS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
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SITE PLAN KEYNOTES

ITEM	NOTE
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2	4" PAINTED STRIPES (TYPICAL), REF. SPECIFICATIONS, SECTION 02500, SHEET SP1
3	CURB RAMP (TYPICAL), REF. SD4.05
4	TRASH ENCLOSURE, REF. SD3.01
5	- NOT USED -
6	BOLLARD, REF. SD2.20
7	GREASE TRAP, REF. P1.01
8	4" SANITARY SEWER LINE
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14	ORDER BOARD AND DETECTOR LOOP, REF. SD2.01 AND SD2.21
15	MENU / CANOPY POST (TYPICAL), REF. CA1.23
16	CONCRETE DRIVE, BUILD IN ACCORDANCE WITH CITY AND OR STATE SPECIFICATIONS
17	CONCRETE PAVING
18	8" THICK CONCRETE PAVING IN THIS AREA
19	"CARHOP CROSSING" SIGNAGE, REF. SD2.11
20	- NOT USED -
21	- NOT USED -
22	POLE MOUNTED FLOOD LIGHTS, REF. SD3.23 AND FIXTURE SCHED. ON SHEET E2
23	- NOT USED -
24	- NOT USED -
25	CONC. WALKS AND PATIO REF. CIVIL DRAWINGS
26	PATIO TABLES & CHAIRS
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28	- NOT USED -
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LEGEND:

- PROPERTY LINE
- EASEMENT / BUFFERS
- BUILDING SETBACK LINE
- SITE PLAN NOTE
- CUSTOMER PARKING STALL
- EMPLOYEE PARKING STALL
- SIGN (SEE SCHEDULE)
- UNDERGROUND ELECTRIC LINE
- UNDERGROUND TELEPHONE LINE
- UNDERGROUND GAS LINE
- WATER LINE
- SANITARY SEWER LINE

CAUTION - NOTICE TO CONTRACTOR:
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICTS PRIOR TO ANY CONSTRUCTION.

NOTE:
1. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRANCE, SLOPED PAVING, EXIT PORCHES, RAMPS, TRUCK DOCKS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
2. THESE PLANS HAVE NOT BEEN VERIFIED WITH FINAL ARCHITECTURAL CONTRACT DRAWINGS. CONTRACTOR SHALL VERIFY AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES. CONTRACTOR IS FULLY RESPONSIBLE FOR REVIEW AND COORDINATION OF ALL DRAWINGS AND CONTRACTOR DOCUMENTS.
3. ALL DIMENSIONS ARE TO BACK OF CURB UNLESS NOTED OTHERWISE.
4. ALL DIMENSIONS ARE PERPENDICULAR TO PROPERTY LINE.
5. ACTUAL SIGN LOCATIONS TO BE COORDINATED WITH CONSTRUCTION MANAGER.

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

CONSTRUCTION NOTES:
1. COORDINATE START-UP AND ALL CONSTRUCTION ACTIVITIES WITH OWNER.
2. CONSTRUCTION METHODS AND MATERIALS NOT SPECIFIED IN THESE PLANS ARE TO MEET OR EXCEED THE "STANDARD SPECIFICATIONS".
3. ALL CONSTRUCTION WORK AND UTILITY WORK OUTSIDE OF PROPERTY BOUNDARIES SHALL BE PERFORMED IN COOPERATION WITH AND IN ACCORDANCE WITH REGULATIONS OF THE AUTHORITIES CONCERNED.
4. PUBLIC CONVENIENCE AND SAFETY: THE CONTRACTOR SHALL CONDUCT THE WORK IN A MANNER THAT WILL INSURE, AS FAR AS PRACTICABLE, THE LEAST OBSTRUCTION TO TRAFFIC, AND SHALL PROVIDE FOR THE CONVENIENCE AND SAFETY OF THE GENERAL PUBLIC AND RESIDENTS ALONG AND ADJACENT TO HIGHWAYS IN THE CONSTRUCTION AREA.
5. ALL DIMENSIONS SHOWN ARE TO THE BACK OF CURB UNLESS OTHERWISE NOTED.
6. ACCESSIBLE STALLS SHOWN WITH A "V" SHALL BE 16'-0" MIN. AND SHALL HAVE A SIGN DESIGNATING "VAN-ACCESSIBLE". SEE DETAIL 101.
7. ALL TRAFFIC CONTROL DEVICES, INSTALLATION AND OPERATIONS SHALL CONFORM WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
8. PAINT FOR STRIPING ON PUBLIC STREETS, HIGHWAYS AND ENTRANCES SHALL BE REFLECTORIZED PAINT CONFORMING TO THE SPECIFICATIONS OR REQUIREMENTS OF THE AUTHORITY GOVERNING THE STREET OR HIGHWAY.
9. WHEN ASPHALT PAVING IS USED 001 CURB AND GUTTER SHALL BE USED. WHEN CONCRETE PAVING IS USED 003 CURB AND GUTTER SHALL BE USED.

CERTIFICATION:
I, GARY A. LEEDS, P.E. DO HEREBY SPECIFY THAT THE DOCUMENTS TO BE AUTHENTICATED BY MY SEAL ARE LIMITED TO DRAWING NUMBERS: C-2 THRU C-10.

GARY A. LEEDS
PROFESSIONAL ENGINEER

SAFETY NOTICE TO CONTRACTOR:
IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

WARRANTY / DISCLAIMER:
THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, NEITHER KAW VALLEY ENGINEERING, INC NOR ITS PERSONNEL CAN OR DO WARRANTY THESE DESIGNS OR PLANS AS CONSTRUCTED, EXCEPT IN THE SPECIFIC CASES WHERE KAW VALLEY ENGINEERING PERSONNEL INSPECT AND CONTROL THE PHYSICAL CONSTRUCTION ON A CONTEMPORARY BASIS AT THE SITE.

NO	DATE	ISSUES AND REVISIONS
A	12/02/05	CLIENT REVIEW

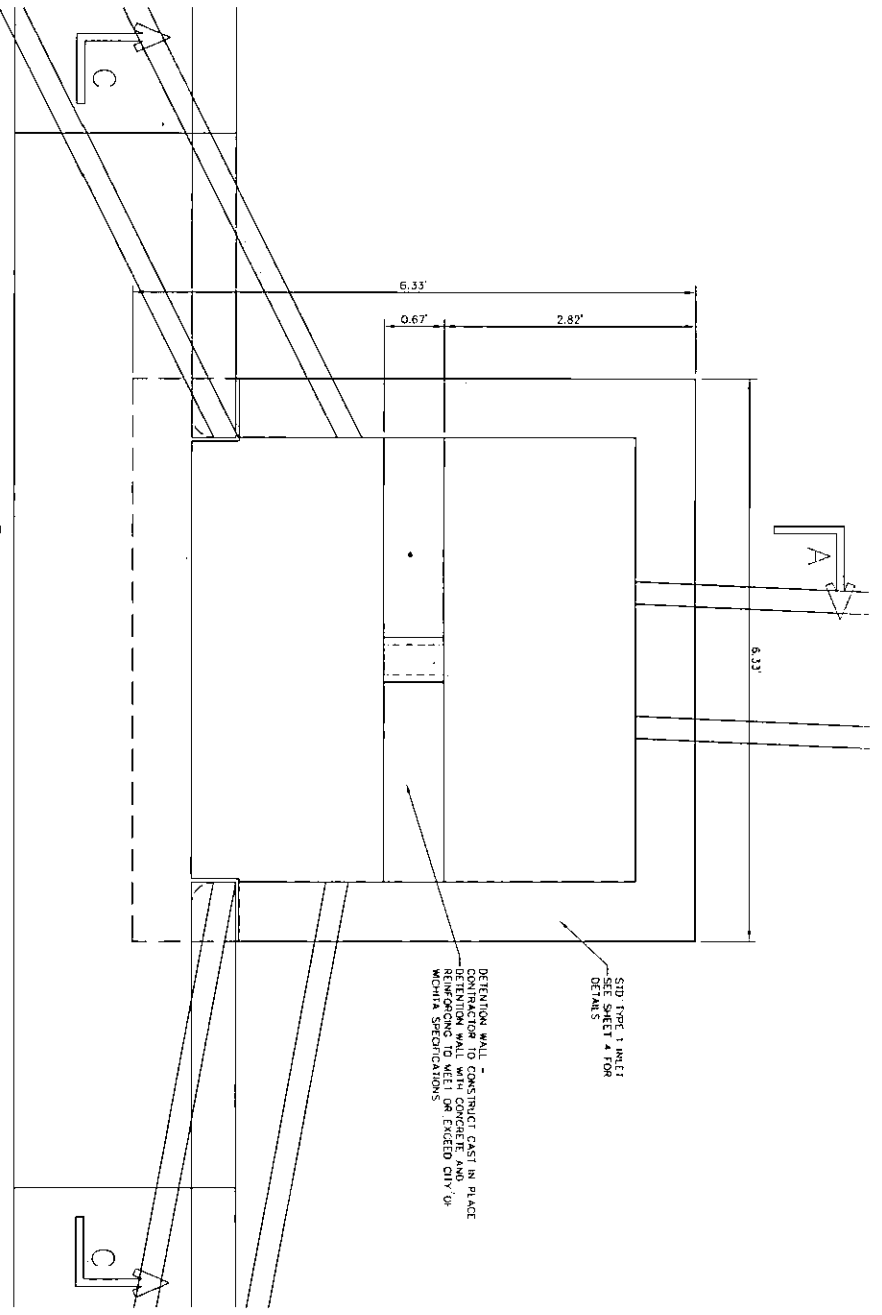
PROJECT MANAGER: GARY A. LEEDS
FIRM NAME: KAW VALLEY ENGINEERING
PROJECT No.: A05022222
DFN: C03_2222SP.dwg
Kaw Valley Engineering, Inc.

SONIC CORPORATION
300 JOHNNY BENCH DR
OKLAHOMA CITY, OK 73104
OFFICES: 405-225-5000
FAX: 405-225-5991

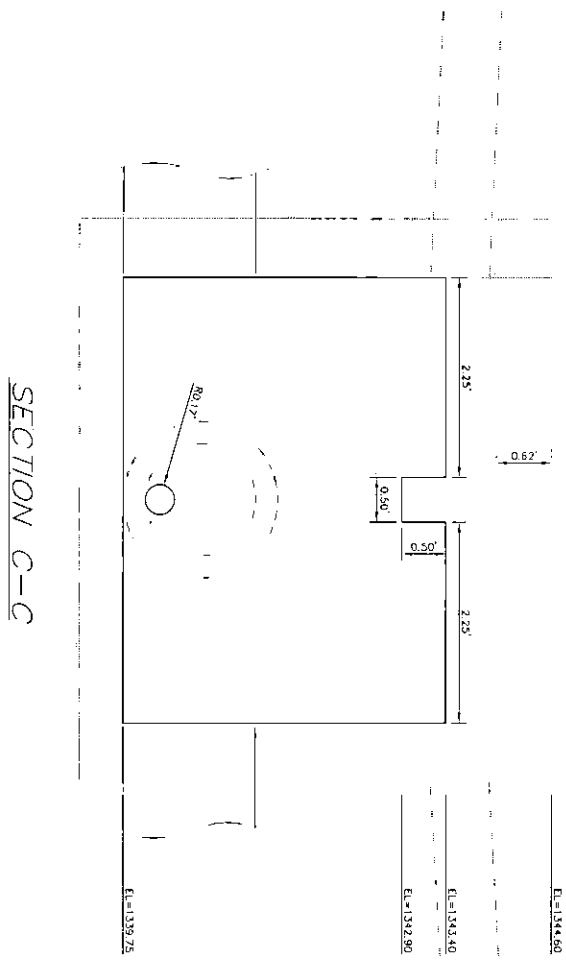
SONIC DRIVE-IN
BUILDING TYPE: 02XW
21ST & CARMEN, WICHITA, KS
SITE PLAN

SHEET C03
DWG: C03_2222SP.dwg

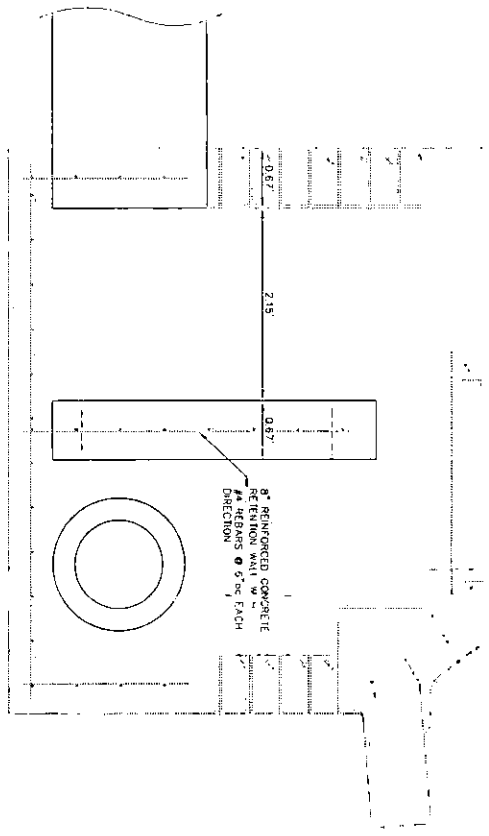
PLAN



SECTION C–C



SECTION A–A



SONIC DRIVE-IN
21ST & CARMEN DRIVE
WICHITA, KANSAS

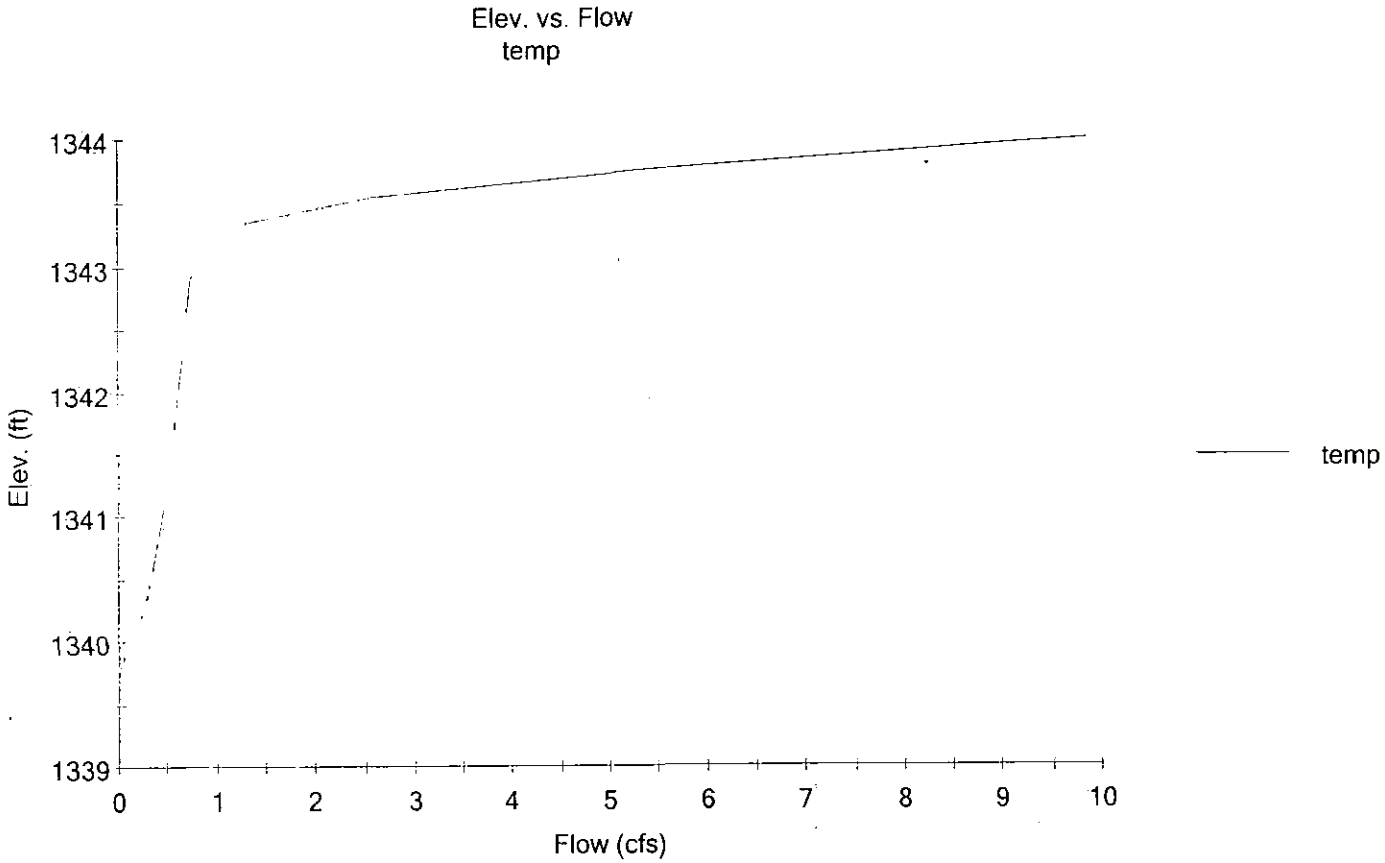
INLET DETENTION WALL DETAIL

PROJ. NO. A05_2222
DATE 12/1/05
DESIGNER MJS
DRAWN BY JRW
CHK CAL
CFN 2222DET
REV 2
SHEET 3 OF 7

KAW VALLEY ENGINEERING, INC. – CONSULTING ENGINEERS
Offices: Junction City, Ks. Kansas City, Mo. Lenexa, Ks.
2319 NORTH JACKSON
P.O. BOX 1304
JUNCTION CITY, KANSAS 66441
785-762-5040 FAX 785-762-7744
E-MAIL jc@kveng.com
WEB SITE www.kveng.com

REV	DATE	DESCRIPTION	DSN	DWN	CHK
2	02/10/06	PER CITY COMMENTS	CAL	TDL	
1	02/02/06	PER CITY COMMENTS	CAL	TDL	CAL
0	12-1-05	INITIAL ISSUE	MJS	JRW	CAL

Exhibit C
PondPack v7.5 Analysis Output
Detention System Stage vs. Storage & Stage vs. Discharge Curves


Elev. vs. Flow
temp
1344
1343
1342
1341
1340
1339
Elev. (ft)
0
1
2
3
4
5
6
7
8
9
10
Flow (cfs)
temp

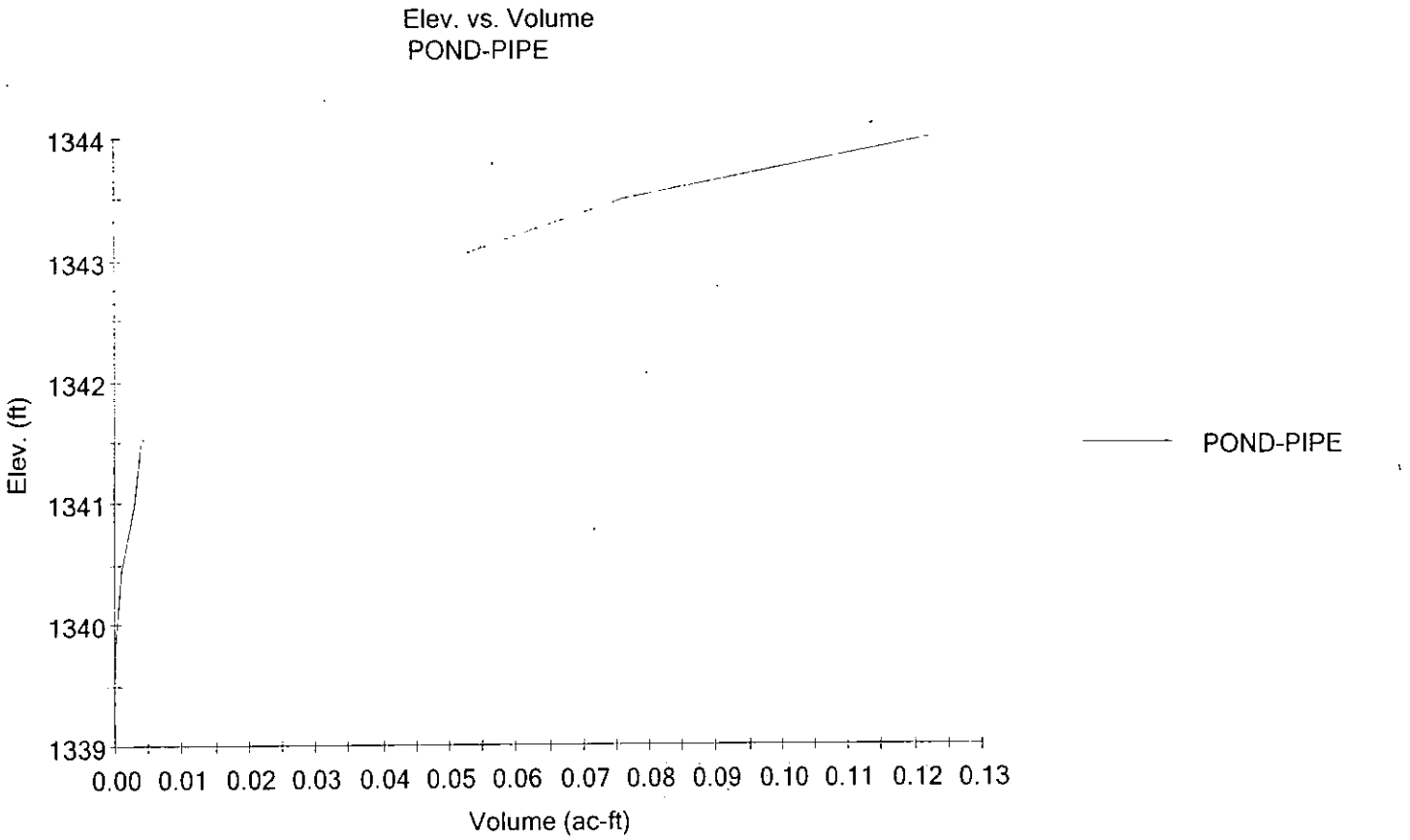

Elev. vs. Volume
POND-PIPE
1344
1343
1342
1341
1340
1339
Elev. (ft)
0.00 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13
Volume (ac-ft)
POND-PIPE

Table of Contents

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Wichita

Return Event	Total Depth in	Rainfall Type	RNF ID
5	4.5000	Synthetic Curve	TypeII 24hr
100	7.8000	Synthetic Curve	TypeII 24hr
2	3.4000	Synthetic Curve	TypeII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUT 10		JCT	5	.349		12.0500	2.63		
*OUT 10		JCT	100	.658		12.0000	8.44		
*OUT 10		JCT	2	.249		11.9500	1.67		
POND-PIPE	IN	POND	5	.266		11.9000	4.37		
POND-PIPE	IN	POND	100	.477		11.9000	7.66		
POND-PIPE	IN	POND	2	.196		11.9000	3.27		
POND-PIPE	OUT	POND	5	.266		12.0500	1.73	1343.42	.072
POND-PIPE	OUT	POND	100	.477		12.0000	5.75	1343.78	.101
POND-PIPE	OUT	POND	2	.196		12.1000	.90	1343.08	.053
*PREDEVELOPEDOUT		JCT	5	.198		11.9500	3.58		
*PREDEVELOPEDOUT		JCT	100	.470		11.9000	8.50		
*PREDEVELOPEDOUT		JCT	2	.119		11.9500	2.14		
PRESTORM		AREA	5	.198		11.9500	3.58		
PRESTORM		AREA	100	.470		11.9000	8.50		
PRESTORM		AREA	2	.119		11.9500	2.14		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
SUBAREA 30	AREA	5	.266		11.9000	4.37		
SUBAREA 30	AREA	100	.477		11.9000	7.66		
SUBAREA 30	AREA	2	.196		11.9000	3.27		
UNDETAINED	AREA	5	.083		11.9000	1.50		
UNDETAINED	AREA	100	.180		11.9000	3.23		
UNDETAINED	AREA	2	.053		11.9500	.96		

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USER DEFINED VOLUME RATING TABLE

Elevation (ft)	Volume (ac-ft)
1339.75	.000
1340.45	.001
1341.00	.003
1341.50	.004
1342.00	.010
1342.50	.027
1343.00	.049
1343.50	.076
1344.00	.122

File.... C:\Documents and Settings\Sandbo\My Documents\Sonic A05_2222\SONICANALYSIS2-9-06.PPW

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 1339.75 ft
Increment = .20 ft
Max. Elev.= 1344.00 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Weir-XY Points	w	--->	TW	1342.900	1344.000
Orifice-Circular	O1	--->	TW	1339.750	1344.000

TW SETUP, DS Channel

OUTLET STRUCTURE INPUT DATA

Structure ID = w
Structure Type = Weir-XY Points

# of Openings = 1
WEIR X-Y GROUND POINTS

X, ft	Elev, ft
.00	1344.60
.00	1343.40
2.25	1343.40
2.25	1342.90
2.75	1342.90
2.75	1343.40
5.00	1343.40
5.00	1344.60

Lowest Elev. = 1342.90 ft

Weir Coeff. = 3.367000

Weir TW effects (Use adjustment equation)

Structure ID = O1
Structure Type = Orifice-Circular

# of Openings = 1
Invert Elev. = 1339.75 ft
Diameter = .3330 ft
Orifice Coeff. = .610

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 30
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .10 cfs
Max. Q tolerance = .10 cfs

File.... C:\Documents and Settings\Sandbo\My Documents\Sonic A05_2222\SONICANALYSIS2-9-06.PPW

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = w (Weir-XY Points)

Upstream ID = (Pond Water Surface)
DNstream ID = TW (Pond Outfall)

WS Elev, Device Q	Tail Water	Notes
WS Elev. ft	Q cfs	TW Elev ft	Converge +/-ft	Computation Messages
1339.75	.00	Free Outfall		E < Y min=1342.90
1339.95	.00	Free Outfall		E < Y min=1342.90
1340.15	.00	Free Outfall		E < Y min=1342.90
1340.35	.00	Free Outfall		E < Y min=1342.90
1340.55	.00	Free Outfall		E < Y min=1342.90
1340.75	.00	Free Outfall		E < Y min=1342.90
1340.95	.00	Free Outfall		E < Y min=1342.90
1341.15	.00	Free Outfall		E < Y min=1342.90
1341.35	.00	Free Outfall		E < Y min=1342.90
1341.55	.00	Free Outfall		E < Y min=1342.90
1341.75	.00	Free Outfall		E < Y min=1342.90
1341.95	.00	Free Outfall		E < Y min=1342.90
1342.15	.00	Free Outfall		E < Y min=1342.90
1342.35	.00	Free Outfall		E < Y min=1342.90
1342.55	.00	Free Outfall		E < Y min=1342.90
1342.75	.00	Free Outfall		E < Y min=1342.90
1342.90	.00	Free Outfall		E = Y min=1342.90

File.... C:\Documents and Settings\Sandbo\My Documents\Sonic A05_2222\SONICANALYSIS2-9-06.PPW

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = w (Weir-XY Points)

Upstream ID = (Pond Water Surface)
DNstream ID = TW (Pond Outfall)

WS Elev, Device Q	Tail Water	Notes
WS Elev. ft	Q cfs	TW Elev ft	Converge +/-ft	Computation Messages
1342.95	.02	Free Outfall		Max.H=.05; Max.Htw=free out;; W(ft)=.50
1343.15	.21	Free Outfall		Max.H=.25; Max.Htw=free out;; W(ft)=.50
1343.35	.51	Free Outfall		Max.H=.45; Max.Htw=free out;; W(ft)=.50
1343.55	1.76	Free Outfall		Max.H=.65; Max.Htw=free out;; W(ft)=5.00
1343.75	4.45	Free Outfall		Max.H=.85; Max.Htw=free out;; W(ft)=5.00
1343.95	7.99	Free Outfall		Max.H=1.05; Max.Htw=free out;; W(ft)=5.00
1344.00	8.98	Free Outfall		Max.H=1.10; Max.Htw=free out;; W(ft)=5.00

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RATING TABLE FOR ONE OUTLET TYPE

Structure ID = O1 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
DNstream ID = TW (Pond Outfall)

WS Elev, Device Q	Tail Water	Notes
WS Elev. ft	Q cfs	TW Elev ft	Converge +/-ft	Computation Messages
1339.75	.00	Free Outfall		Upstream HW & DNstream TW < Inv.El
1339.95	.07	Free Outfall		CRIT.DEPTH CONTROL Vh= .053ft Dcr= .146ft CRIT.DEPTH
1340.15	.21	Free Outfall		H =.23
1340.35	.28	Free Outfall		H =.43
1340.55	.34	Free Outfall		H =.63
1340.75	.39	Free Outfall		H =.83
1340.95	.43	Free Outfall		H =1.03
1341.15	.47	Free Outfall		H =1.23
1341.35	.51	Free Outfall		H =1.43
1341.55	.54	Free Outfall		H =1.63
1341.75	.58	Free Outfall		H =1.83
1341.95	.61	Free Outfall		H =2.03
1342.15	.64	Free Outfall		H =2.23
1342.35	.66	Free Outfall		H =2.43
1342.55	.69	Free Outfall		H =2.63
1342.75	.72	Free Outfall		H =2.83
1342.90	.74	Free Outfall		H =2.98
1342.95	.74	Free Outfall		H =3.03
1343.15	.77	Free Outfall		H =3.23
1343.35	.79	Free Outfall		H =3.43
1343.55	.81	Free Outfall		H =3.63
1343.75	.83	Free Outfall		H =3.83
1343.95	.86	Free Outfall		H =4.03
1344.00	.86	Free Outfall		H =4.08

LEVEL POOL ROUTING DATA

HYG Dir = C:\Documents and Settings\Sandbo\My Documents\Sonic A05_2222\
Inflow HYG file = NONE STORED - POND-PIPE IN 5
Outflow HYG file = NONE STORED - POND-PIPE OUT 5

Pond Node Data = POND-PIPE
Pond Volume Data = POND-PIPE
Pond Outlet Data = temp

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	= 1339.75	ft
Starting Volume	= .000	ac-ft
Starting Outflow	= .00	cfs
Starting Infiltr.	= .00	cfs
Starting Total Qout	= .00	cfs
Time Increment	= .0500	hrs

Elevation ft	Outflow cfs	Storage ac-ft	Infilt. cfs	Q Total cfs	2S/t + O cfs
1339.75	.00	.000	.00	.00	.00
1339.95	.07	.000	.00	.07	.21
1340.15	.21	.001	.00	.21	.48
1340.35	.28	.001	.00	.28	.70
1340.55	.34	.001	.00	.34	1.00
1340.75	.39	.002	.00	.39	1.40
1340.95	.43	.003	.00	.43	1.80
1341.15	.47	.003	.00	.47	2.07
1341.35	.51	.004	.00	.51	2.30
1341.55	.54	.005	.00	.54	2.77
1341.75	.58	.007	.00	.58	3.97
1341.95	.61	.009	.00	.61	5.16
1342.15	.64	.015	.00	.64	7.95
1342.35	.66	.022	.00	.66	11.26
1342.55	.69	.029	.00	.69	14.83
1342.75	.72	.038	.00	.72	19.11
1342.90	.74	.045	.00	.74	22.32
1342.95	.76	.047	.00	.76	23.41
1343.15	.98	.057	.00	.98	28.61
1343.35	1.30	.068	.00	1.30	34.16

Type.... Pond E-V-Q Table
Name.... POND-PIPE
File.... C:\Documents and Settings\Sandbo\My Documents\Sonic A05_2222\SONICANALYSIS2-9-06.PPW

LEVEL POOL ROUTING DATA

HYG Dir = C:\Documents and Settings\Sandbo\My Documents\Sonic A05_2222\
Inflow HYG file = NONE STORED - POND-PIPE IN 5
Outflow HYG file = NONE STORED - POND-PIPE OUT 5

Pond Node Data = POND-PIPE
Pond Volume Data = POND-PIPE
Pond Outlet Data = temp

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	1339.75 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

Elevation ft	Outflow cfs	Storage ac-ft	Infilt. cfs	Q Total cfs	2S/t + O cfs
1343.55	2.57	.081	.00	2.57	41.59
1343.75	5.29	.099	.00	5.29	53.21
1343.95	8.84	.117	.00	8.84	65.66
1344.00	9.84	.122	.00	9.84	68.89

Index of Starting Page Numbers for ID Names