Ameritrack
WEST

ENGINEERING DIVISION

Ameritrack West, Inc. 12469 SW 15th Benton, KS 67017 Tel: (316) 778-2215 Fax: (316) 778-1204

October 12, 2009

City Hall
City Engineer's Office
455 N. Main, 8th Floor
Wichita, KS 67202

OCT 15 2009

Attention: Scott Lindebak, P.E.

Reference: Center for Health and Wellness addition
2707 E. 21st Street

The purpose of this letter is to provide you with information regarding the referenced project near 21st Street North and Grove in Wichita, Kansas. The site is currently undeveloped and generally drains from east to west. All runoff leaves the site along the south property line and eventually flows to the intersection of Stadium and Grove, which frequently floods. We are proposing to expand the current facility to the west with the required parking spaces (See the attached plan sheets). We intend to construct a detention area on the west end of the property to account for the increase in runoff. We will extend the existing 12" RCP from 21st and Grove to our detention area. This pipe is the control for our detention basin and can only carry 3 cfs, assuming that the pipe is running full. We are providing enough detention to detain the 100-Yr event with 1 foot of freeboard on our berm, assuming that 3 cfs is flowing through the 12" RCP continuously during the storm event. I have included a HEC-1 printout and other calculations for your review. As you can see, we will decrease runoff leaving the site and help reduce storm water that flows to the intersection of Stadium and Grove.

If you have any questions, please feel free to contact me by phone at (316) 778-2215 or e-mail at bbarkus@awirr.com. Thank you for your time and consideration of this work.

Sincerely,

Bryce L Barkus

Bryce L. Barkus, P.E.

Cc: Cheri Hulse, Gordon & Associates

Project: **Center for Health & Wellness**
Date: 10/9/2009
Prep. By: BLB

Manual Input

BASIN

Total Area 1.40 Acres

Soil Group	**A** (% of Total Area)	**B** (% of Total Area)	**C** (% of Total Area)	**D** (% of Total Area)	**Total**
	0%	0%	0%	100%	100%
Acres	0.00	0.00	0.00	1.40	1.40

Land Use	**Commercial** (% of Total Area)	**Industrial** (% of Total Area)	**Multi-Family** (% of Total Area)	**Public** (% of Total Area)	**Single Family** (% of Total Area)	**Vacant/Agriculture** (% of Total Area)
Existing	0%	0%	0%	100%	0%	0%
Acres	0.00	0.00	0.00	1.40	0.00	0.00
Future	100%	0%	0%	0%	0%	0%
Acres	1.40	0.00	0.00	0.00	0.00	0.00

	Existing	**Future**	
Length of Flow	715 ft	715 ft	
Slope	2.80 %	2.80 %	
Waterflow Desc	bare / short grass	pavement/grass	5 min <= Tc <= 24 hrs
Avg Velocity	2.50 ft/sec	4.50 ft/sec	
Tc	0.08 hours	0.04 hours	

Runoff Coefficients * Used Soil Group D To Be Conservative

Return Period (Years)	Commercial	Industrial	Multi-Family	Public	Single Family	Vacant/Agriculture
2	0.68	0.68	0.70	0.49	0.50	0.54
5	0.69	0.69	0.73	0.51	0.54	0.56
10	0.73	0.73	0.79	0.56	0.62	0.61
25	0.75	0.75	0.81	0.59	0.66	0.64
50	0.77	0.77	0.83	0.62	0.70	0.67
100	0.80	0.80	0.86	0.66	0.76	0.70

Existing Conditions

Return Period (Years)	Runoff Coefficient *	Rainfall Intensity (in/hr)	Area (Acres)	Runoff (cfs)
2	0.49	5.64	1.40	3.87
5	0.51	6.64	1.40	4.74
10	0.56	7.38	1.40	5.79
25	0.59	8.48	1.40	7.00
50	0.62	9.34	1.40	8.11
100	0.66	10.20	1.40	9.42

Future Conditions

Return Period (Years)	Runoff Coefficient *	Rainfall Intensity (in/hr)	Area (Acres)	Runoff (cfs)
2	0.68	5.64	1.40	5.37
5	0.69	6.64	1.40	6.41
10	0.73	7.38	1.40	7.54
25	0.75	8.48	1.40	8.90
50	0.77	9.34	1.40	10.07
100	0.80	10.20	1.40	11.42

MCCA Construction, Inc.

12469 SW 15th Benton, KS 67017 PH: (316) 778-2268 FAX: (316) 778-1204

PROJECT: Center for Health & Wellness DATE: 9-2-09

ITEM: Total Runoff from Site Improvements BY: BLB

Total Rainfall for 6Hr Storm (Proposed Condition)

CN = 95 (Proposed Condition)
CN = 80 (Existing Condition)

$P_5 = (0.55 in/hr)(6 hr) = 3.3 in$

$P_{100} = (0.98 in/hr)(6 hr) = 5.9 in$

$S = \frac{1000}{CN} - 10 = \frac{1000}{95} - 10 = 0.526$

$Pe_5 = \frac{(P - 0.2S)^2}{P + 0.8S} = \frac{(3.3 - 0.2(0.526))^2}{3.3 + 0.8(0.526)} = 2.74 in$

$Pe_{100} = \frac{(5.9 - 0.2(0.526))^2}{5.9 + 0.8(0.526)} = 5.31 in$

Total Runoff for 6Hr Storm (Existing Condition)

$P_5 = 3.3 in$

$P_{100} = 5.9 in$

$S = \frac{1000}{80} - 10 = 2.50$

$Pe_5 = \frac{(3.3 - 0.2(2.50))^2}{3.3 + 0.8(2.50)} = 1.48 in$

$Pe_{100} = \frac{(5.9 - 0.2(2.50))^2}{5.9 + 0.8(2.50)} = 3.69 in$

Increase in Runoff due to development

5 Yr Storm = 2.74 − 1.48 = 1.26 in

100 Yr Storm = 5.31 − 3.69 = 1.62 in

Detention required on-site

$(1.62 in)\left(\frac{1 ft}{12 in}\right)(60,984 sf) = 8,232.84 cf$

Actual Storage Provided = 8,802 cf at Elevation of Top of Berm 1325.50

10-9-09 BLB

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*               JUN  1998              *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   09OCT09  TIME  08:16:28  *
*                                      *
****************************************
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```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
          LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
            1           ID      Center for Health & Wellness - Wichita, Kansas
            2           ID      Proposed Conditions through Detention Pond
            3           ID      5 & 100-YR 24-HR STORM EVENTS
            4           ID      By:  BLB     Date:  10/09/09
 *** LIST ***
 *** FREE ***
                        *DIAGRAM
                        *
                        *
            5           IT      15 02JUL08    1200       0 06JUL08    2000
            6           IN      15 02JUL08    1200
            7           IO       0       5
            8           JR    PREC    4.56    7.68
                        *
                        *
                        *

            9           KKProposed Conditions
                        *
           10           KO       5
           11           BA   0.002
           12           PB    1.00
           13           PC   0.000   0.003   0.006   0.008   0.011   0.014   0.017   0.019   0.022   0.025
           14           PC   0.029   0.032   0.035   0.038   0.042   0.045   0.048   0.052   0.056   0.060
```

```
          15           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
          16           PC   0.110   0.115   0.120   0.127   0.134   0.140   0.147   0.155   0.163   0.172
          17           PC   0.181   0.193   0.204   0.220   0.235   0.259   0.283   0.387   0.663   0.699
          18           PC   0.735   0.754   0.772   0.786   0.799   0.810   0.820   0.828   0.835   0.843
          19           PC   0.850   0.858   0.865   0.873   0.880   0.885   0.889   0.894   0.898   0.903
          20           PC   0.907   0.912   0.916   0.921   0.925   0.929   0.934   0.938   0.943   0.947
          21           PC   0.952   0.955   0.958   0.961   0.964   0.967   0.970   0.973   0.976   0.979
          22           PC   0.982   0.985   0.988   0.991   0.994   0.997   1.000
          23           LS       0      94       0
          24           UD   0.040
                       *
                       *
                       *

          25           KK    POND
                       *  Control Structure = 2'x2' Drop Inlet Top Elevation at 1321.00
          26           KO       5
          27           RS       1    ELEV  1321.0
          28           SA    0.00    0.12
          29           SE  1321.0  1325.5
          30           SQ     0.0     2.8     2.8
          31           SE  1321.0 1321.25 1325.50
                       *
                       *
                       *
                       *
          32           ZZ
1
                  SCHEMATIC DIAGRAM OF STREAM NETWORK

 INPUT
  LINE       (V) ROUTING           (--->) DIVERSION OR PUMP FLOW

   NO.       (.) CONNECTOR         (<---) RETURN OF DIVERTED OR PUMPED FLOW

     9     Proposed
                 V
                 V
    25          POND

  (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *                JUN   1998             *
 *              VERSION 4.1              *
 *                                       *
 *  RUN DATE   09OCT09  TIME  08:16:28   *
 *                                       *
 *****************************************

*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************

                        Center for Health & Wellness - Wichita, Kansas
                        Proposed Conditions through Detention Pond
                        5 & 100-YR 24-HR STORM EVENTS
                        By:  BLB     Date:  10/09/09

     7 IO          OUTPUT CONTROL VARIABLES
                         IPRNT          0  PRINT CONTROL
                         IPLOT          5  PLOT CONTROL
```

```
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                       NMIN          15  MINUTES IN COMPUTATION INTERVAL
                      IDATE      2JUL 8  STARTING DATE
                      ITIME        1200  STARTING TIME
                         NQ         417  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      6JUL 8  ENDING DATE
                     NDTIME        2000  ENDING TIME
                      ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL      .25 HOURS
                       TOTAL TIME BASE  104.00 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT

     JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                    4.56      7.68


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


               **************
               *              *
   9 KK        *  Proposed    *      Conditions
               *              *
               **************

  10 KO            OUTPUT CONTROL VARIABLES
                        IPRNT           5  PRINT CONTROL
                        IPLOT           5  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


               **************
               *              *
  25 KK        *      POND    *
               *              *
               **************

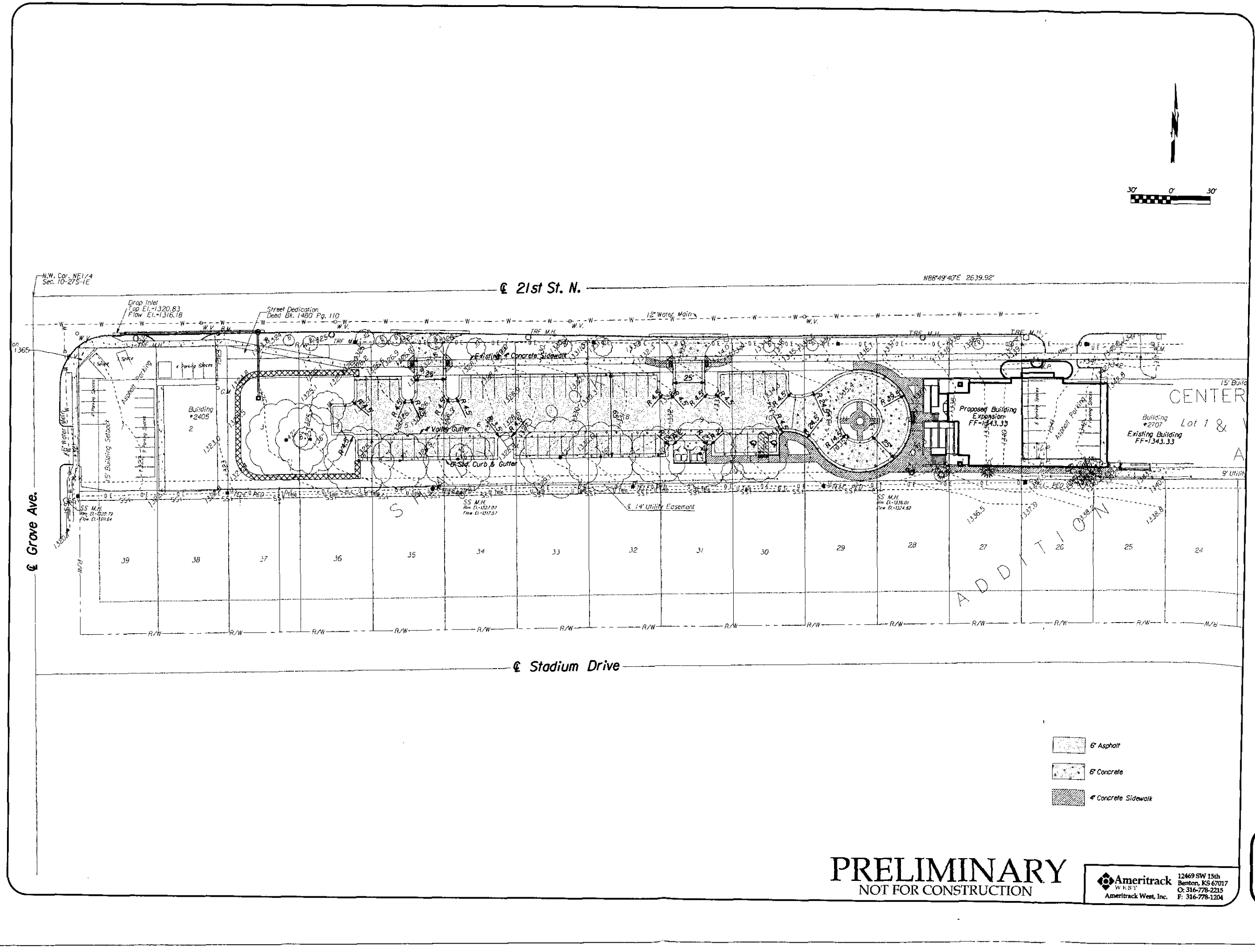
  26 KO            OUTPUT CONTROL VARIABLES
                        IPRNT           5  PRINT CONTROL
                        IPLOT           5  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE
```

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1	RATIO 2
					4.56	7.68
HYDROGRAPH AT						
+	Proposed	.00	1	FLOW	5.	9.
				TIME	12.00	12.00
ROUTED TO						
+	POND	.00	1	FLOW	3.	3.
				TIME	12.00	11.75
			** PEAK STAGES IN FEET **			
			1	STAGE	1322.16	1324.52
				TIME	12.25	12.25

*** NORMAL END OF HEC-1 ***

DATE: 09-30-09



PRELIMINARY
NOT FOR CONSTRUCTION

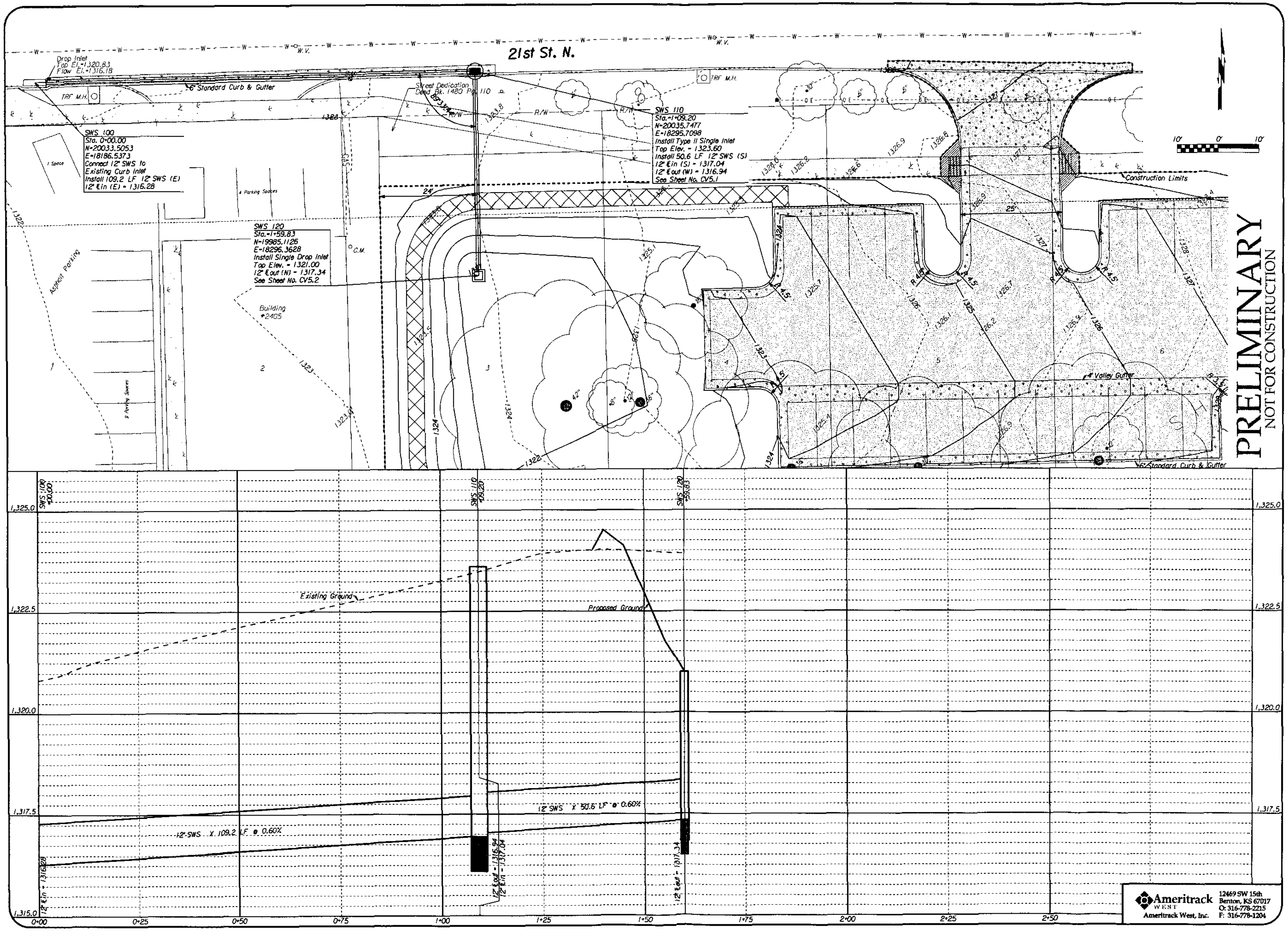
Ameritrack WEST
Ameritrack West, Inc.
12469 SW 15th
Benton, KS 67017
O: 316-778-2215
F: 316-778-1204

Architectural Innovations, LLC

project no. 0819

CONSTRUCTION DOCUMENTS - 75%
ADDITION AND ALTERATIONS TO:
CENTER FOR HEALTH AND WELLNESS
2707 E. 21ST STREET
WICHITA, KANSAS

sheet
CV 1.0
SITE PLAN



DATE: 09-10-09

Architectural Innovations, LLC

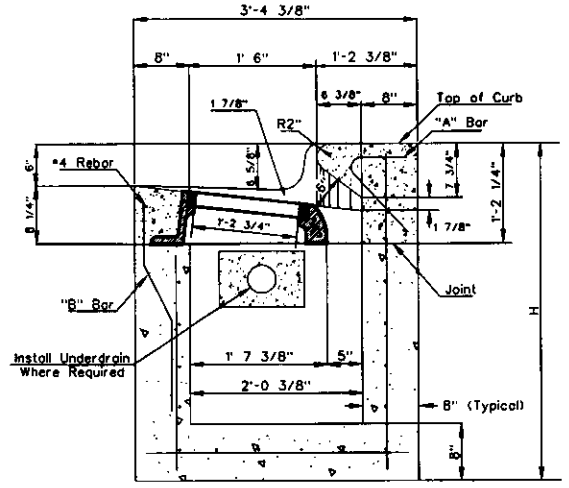
project no. 0819

CONSTRUCTION DOCUMENTS - 75%
ADDITION AND ALTERATIONS TO:
CENTER FOR HEALTH AND WELLNESS
2707 E. 21ST STREET
WICHITA, KANSAS

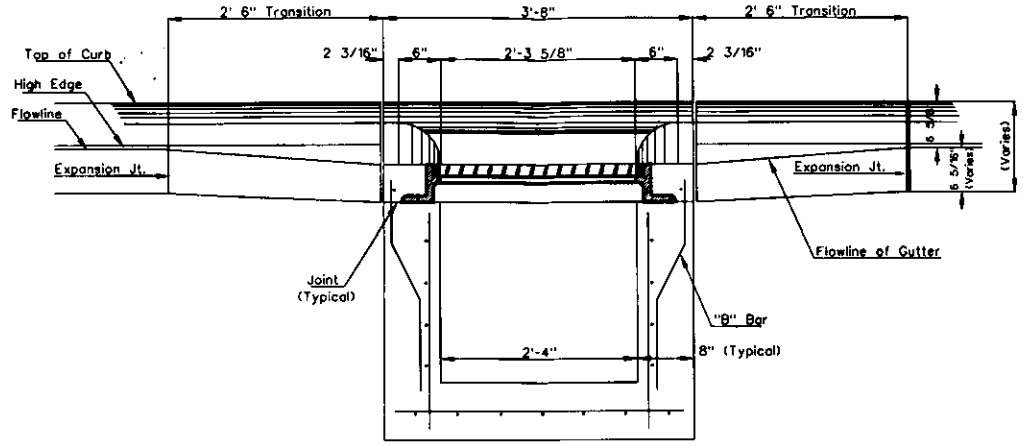
sheet

CV 5.0

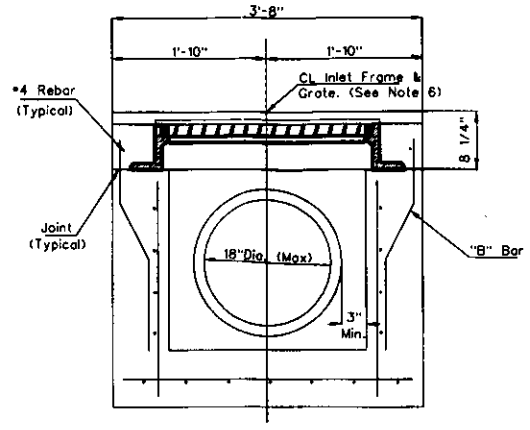
SWS PLAN & PROFILE



SECTION A-A

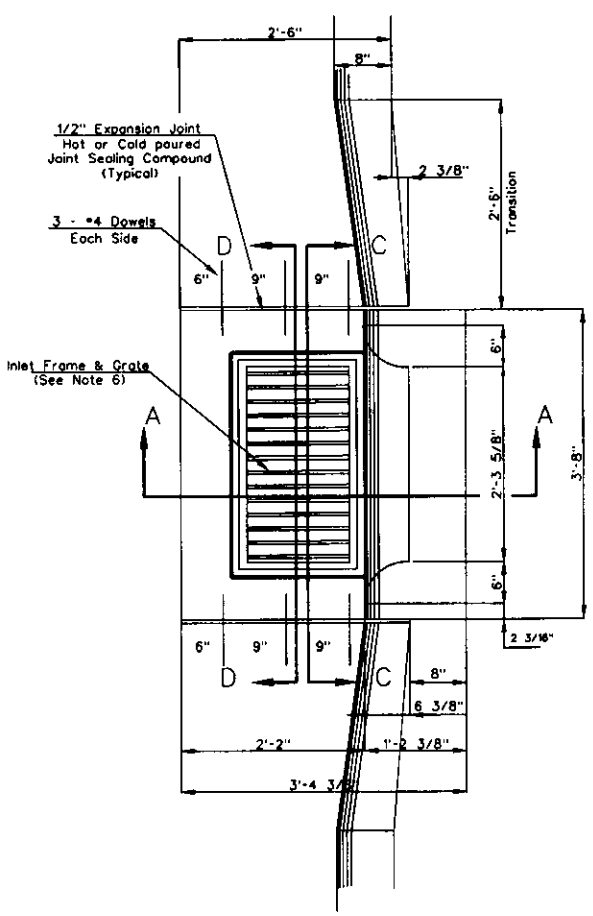


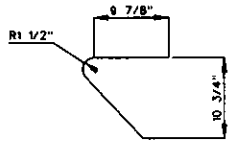
SECTION C-C



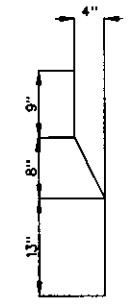
SECTION D-D

REAR WALL





"A" Bar



"B" Bar

General Notes

1. Use the concrete mix specified for the City of Wichita concrete pavement throughout. All exposed edges shall be finished with an edging tool. Reinforcing bars shall be bent around pipe.
2. Inlet invert shall be shaped with 8 sack mix concrete to create flow channels and to increase hydraulic efficiency such that the inlet will be self cleaning between all inlet and/or outlet pipes.
3. All bars are #4 with 6" spacing and shall have a minimum clearance of 1 1/2" inches unless otherwise noted on the plans.
4. When directed by the Engineer, a small opening may be required in the back of the inlet in order to drain a low area. Reinforcing bars will extend through the openings. No deductions in concrete quantities will be made for these openings.
5. No deductions will be made in pay length of curb, gutter, or curb and gutter through the inlet area.
6. Use DEETER FOUNDRY, Inc. casting No. 2442/2443 with style H grate. Inlet frame to be proof load tested to 40,000 lbs. on unsupported side.
7. Reinforcing bars shall be cut or bent around pipes. No deduction in concrete quantities shall be made for pipe openings.
8. The vanes of the grate shall be oriented with respect to the flow arrows shown on the plans.

REV. 8-20-01

CITY OF WICHITA PUBLIC WORKS ENGINEERING

STANDARD SINGLE TYPE II CURB INLET

CITY ENGINEER: JAMES L. ARMOUR, P.E., L.S. ACTING

PROJECT NUMBER	OCK NUMBER	DATE
XXX-XXXXX	XXXXXX	MM/YY

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202-1620
(316) 268-4501
(316) 268-4174 FAX

DESIGN	DRAWN
ABC	DEF

SHEET: X OF X

TYPE 2 INLET SINGLE.DWG

PRELIMINARY
NOT FOR CONSTRUCTION

DATE: 09-30-09

Architectural Innovations, LLC
architects
master planners
www.arch-innov.com
1271 Kelly Johnson Blvd., Suite 18
Colorado Springs, CO. 80920
Phone 719.260.8990
Fax 719.260.8999

7701 E. Kellogg, Suite 690
Wichita, Kansas 67207-1705
Phone 316.609.8979
Fax 316.609.7669

project no. 0819

CONSTRUCTION DOCUMENTS - 75%
ADDITION AND ALTERATIONS TO:
CENTER FOR HEALTH AND WELLNESS
2707 E. 21ST STREET
WICHITA, KANSAS

sheet
CV 5.1
INLET DETAILS

Ameritrack WEST
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Benton, KS 67017
O: 316-778-2215
F: 316-778-1204