North Town Plaza

Retail Pad & Expansion
Albuquerque, New Mexico

Drainage Report

January 22, 2009

Prepared for:

Weingarten Realty
Albuquerque, New Mexico

Prepared By:

Community Sciences Corporation
P.O. Box 1328 / 4481 Corrales Road
Corrales, New Mexico 87048
505/897.0000

Reference No. N776-03

JAN 26 2009

Boleslo A. Romero, P.E.

DRAINAGE REPORT
NORTHTOWN PLAZA
RETAIL PAD & EXPANSION
ALBUQUERQUE, NM

Developer:
Weingarten Realty
Albuquerque, NM

Prepared by:

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January 21, 2009

INTRODUCTION

TYPE OF APPROVAL

This report represents the requisite drainage management plan for proposed retail pad and expansion construction located in Northtown Plaza within Tract A-4, which is located on the northwest corner of Wyoming Blvd. and Academy Road. The site is pending building permit approval subject to the acceptance of this report.

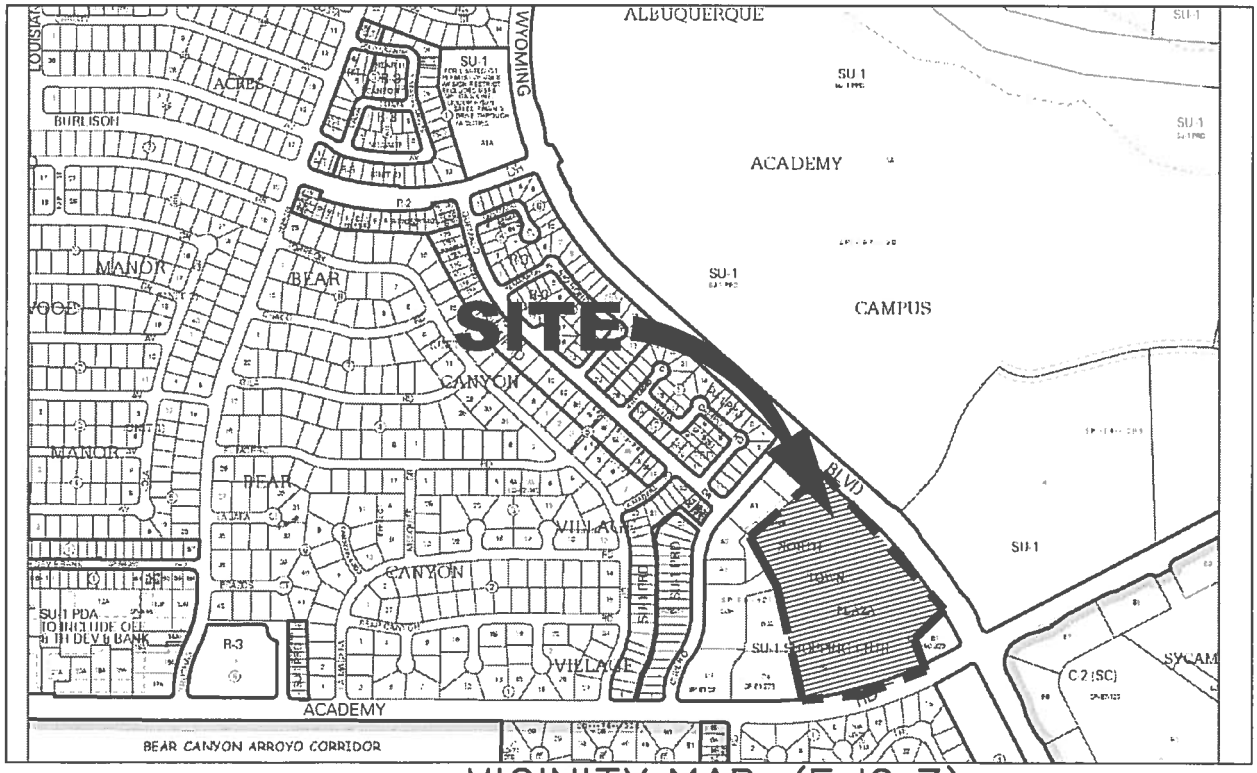
SCOPE OF REPORT

This report quantifies and provides analysis of:

- The rainfall and runoff for the basins affecting the site.
- The future conditions criteria outlined in the DPM.
- The effects of the proposed development on this data.

PROJECT LOCATION AND DESCRIPTION

The site is located on the northwest corner of Wyoming Blvd. and Academy Road. The site is currently a developed shopping center. The proposed improvements include renovations/expansions of the existing building structure and conversion of an area of parking to a retail building site. A map of the area site surrounding the site is shown in Figure 1.

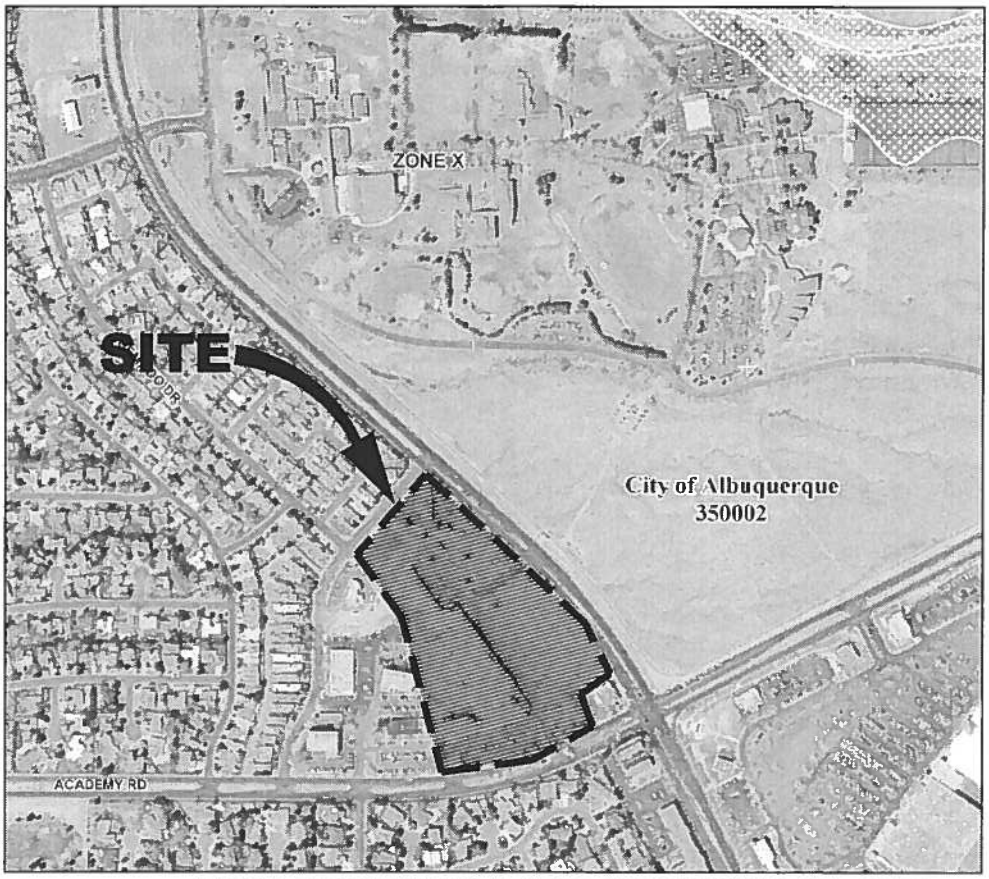


VICINITY MAP (E-19-Z)

Figure 1 Vicinity Map

REFERENCES & DRAINAGE / PLANNING HISTORY

FLOOD PLAIN INFORMATION



FIRM MAP 35001-35001C0143G DATED SEPTEMBER 26, 2008

Figure 3 - Flood Zones FIRM 35043C0911 C

MASTER PLANNING INFO

The drainage plan presented in this report has been prepared in accordance with the:

- City of Albuquerque DPM (Sections 22.2 through 22.8)

The report and analysis also reference the:

- Drainage Report for Northtown Shopping Center (April 1994)
- Drainage Report for Northtown Shopping Center (1977)

DRAINAGE BASIN DESCRIPTION

The drainage basins are large expanses of parking area. A small portion of the parking is renovated with a building pad and structure. The basins within the site surface drain to an existing pond, and there are no offsite basins affecting the site. The pond then discharges to Cubero St. through an outlet control consisting of two 12 inch storm drain pipes. The proposed construction does not affect the calculations of land use runoff areas analyzed the previous reports for the property.

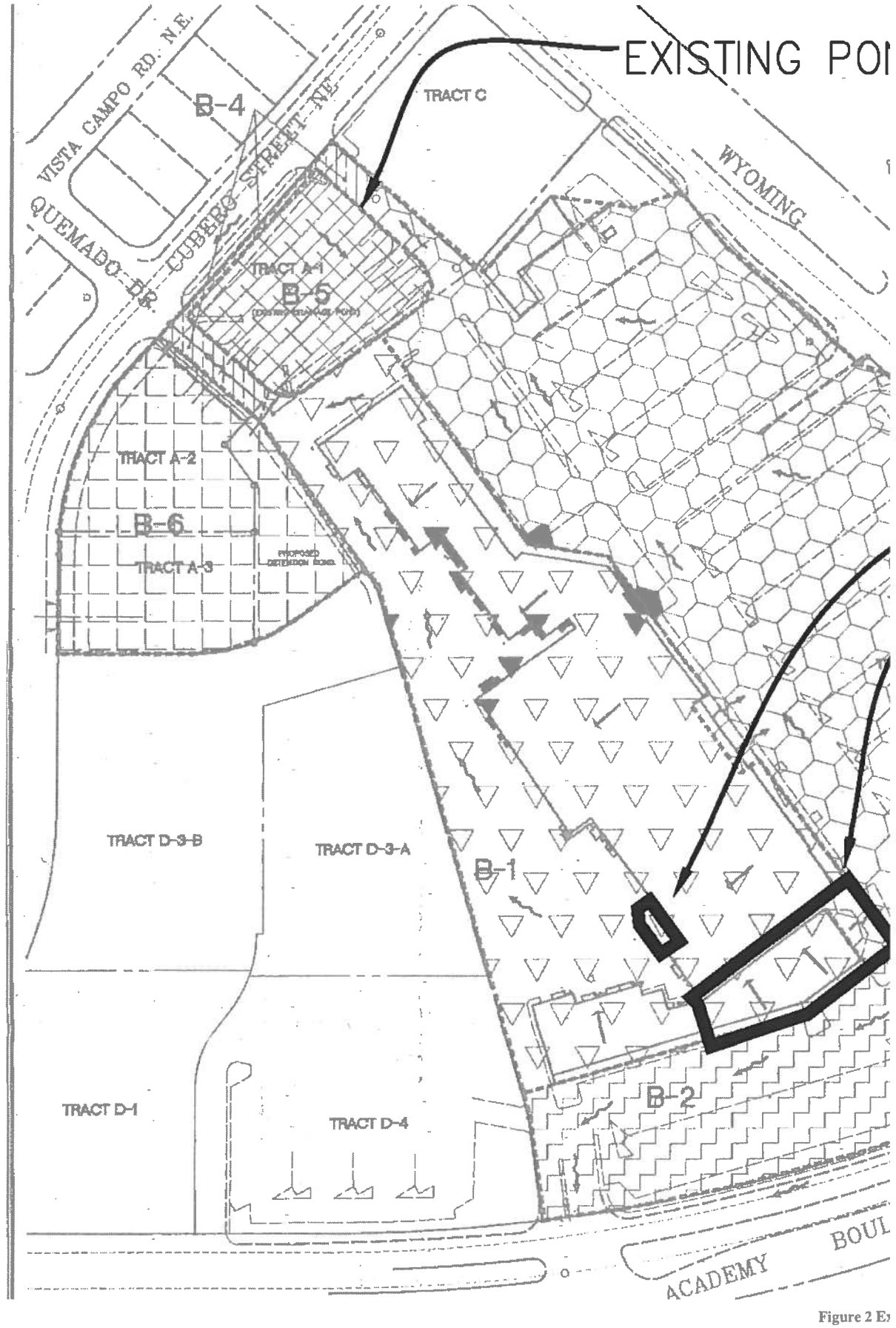

EXISTING POI
TRACT C
VISTA CAMPO RD. N.E.
QUEMADO DR.
CUBERO STREET NE
WYOMING
B-4
TRACT A-1
B-5
TRACT A-2
B-6
TRACT A-3
PROPOSED DETENTION POND
TRACT D-3-B
TRACT D-3-A
B-1
TRACT D-1
TRACT D-4
B-2
ACADEMY
BOUL

Figure 2 E

CLIMATE

The climate of the area around Albuquerque, New Mexico is mild, arid or semi-arid continental type, which is characterized by fairly hot summers and mild winters with warm spring and fall seasons. The air is normally clear and dry with considerable annual and diurnal fluctuations in temperature. Most of the rainfall occurs in the form of summer thunderstorms and moderate winter snowfall. These storms are of short duration and result from convective and/or orographic lifting of air masses. The more intense of these storms follow a period of inflow of warm air originating in the Gulf of Mexico. Occasional precipitation occurs as a result of an invasion of tropical pacific air. Frontal activity is most prevalent in the area and is accompanied by rain or snow of light intensity.

GEOTECHNICAL

LAND TREATMENTS

The land treatments outlined for commercial development as represented in Section 22, Part A, Hydrology, of the Development Process Manual, are shown in Table 1.

Treatment Type	A	B	C	D
Existing & Proposed	0.0 %	0.0 %	10.0 %	90.0 %

Table 1 Land Use Percentages

HYDROLOGY

RAINFALL

Rainfall data, shown in Table 2, was derived in conformance with the "Peak Rate of Discharge for Small Watersheds" using an AHYMO analysis. The precipitation depths are on the 100-year frequency, 1, 6 and 24 hour duration storms, as represented in Section 22, Part A, Hydrology, of the Development Process Manual.

Zone	P60	P360	P1440
2	2.14	2.60	3.10

Table 2 Land Use Percentages

RUNOFF

Runoff data was derived in conformance with the "Peak Rate of Discharge for Small Watersheds" using an AHYMO analysis. The hydrological analysis is based on the 100-year frequency, 6-hour duration storm for conveyance, as represented in Section 22, Part A, Hydrology, of the Development Process Manual. Design analysis utilized the 24-hour precipitation data for calculating pond volume requirements. Table 3 shows the computed major event storm discharge for each sub-basin. The details of the calculations are shown in the Appendix.

CONCLUSIONS & RECOMMENDATIONS

The previous reports referenced by this document have analyzed the drainage requirements due to runoff from this site. As stated in the 1994 report the existing pond was not built in accordance with the requirements of the 1977 study. However, the verification AHYMO analysis in this report includes a theoretical pond to model the performance of the existing pond and structures. As indicated in the analysis the existing pond should be operating within the established parameters for storage and discharge. As stated in the previous reports the discharge from this site to Cubero St. is limited to 9.6 cfs. The two each 10" pipes which discharge the pond act as the outlet control for the pond.

A site inspection of the pond noted that there have been no adverse conditions or events to date which indicate that the pond has overtopped and that the pond has operated without incident. However, sediment has accumulated in the pond since its construction and a note is to be placed on the current grading plan to clean the detention pond out level with the inverts of the existing drainage rundowns per the original pond design and capacity.

Should the existing pond be used for an additional retail pad in the future, the proposed pond designed in the 1994 study would be required to be constructed in order to continue to limit the discharge to Cubero St.

As shown in the analysis, the development of the site with the addition of the new retail site and expansion will have no adverse impact to the areas adjacent to the site.

Sincerely,

Boleslo A. Romero, PE
Principal Engineer

APPENDIX

HYDROLOGY CALCULATIONS

AHYMO INPUT – Existing and Proposed Conditions

```
*S**********************************
*S  NORTHTOWN PLAZA
*S  100 YEAR 24 HOUR EXISTING & PROPOSED CONDITIONS
*S  VERIFICATION OF POND REQUIREMENTS
*S  FOR VOLUME AND DISCHARGE
*S
*S**********************************
*S
*S
*
START                TIME=0.0 HR PUNCH CODE=0 PRINT LINES=-1
*
RAINFALL             TYPE=2 RAIN QUARTER=0.0
                     RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                     RAIN DAY=3.10 IN DT=0.0333 HRS
*
*
*S**********************************
*S  BASIN B-1
*S  WEST PORTION OF SITE
*S
*S**********************************
COMPUTE NM HYD       ID=1 HYD NO=B1 DA=0.00659 SQ MI
                     PER A=0.0 PER B=0.0 PER C=0 PER D=100.0
                     TP=0 HR MASS RAIN=-1
*                    ***********
*
*
*S**********************************
*S  BASIN B-2
*S  EAST PORTION OF SITE
*S
*S**********************************
COMPUTE NM HYD       ID=2 HYD NO=B3 DA=0.01696 SQ MI
                     PER A=0.0 PER B=0.0 PER C=0 PER D=100.0
                     TP=0 HR MASS RAIN=-1
*                    ***********
*
ADD HYD              ID=3 HYD NO=B1B3 ID I=1 ID II=2
*
*S**********************************
*S  BASIN B-5
*S  UNDEVELOPED PORTION OF SITE
*S
*S**********************************
COMPUTE NM HYD       ID=1 HYD NO=B5 DA=0.00103 SQ MI
                     PER A=0.0 PER B=0.0 PER C=100.0 PER D=0.0
                     TP=0 HR MASS RAIN=-1
*                    ***********
*
ADD HYD              ID=2 HYD NO=ADDB5 ID I=1 ID II=3
*
*S**********************************
*S  BASIN B-6
*S  UNDEVELOPED PORTION OF SITE
*S
*S**********************************
COMPUTE NM HYD       ID=1 HYD NO=B6 DA=0.00221 SQ MI
                     PER A=0.0 PER B=0.0 PER C=98.0 PER D=2.0
                     TP=0 HR MASS RAIN=-1
*                    ***********
*
ADD HYD              ID=3 HYD NO=PONDIN ID I=1 ID II=2
```

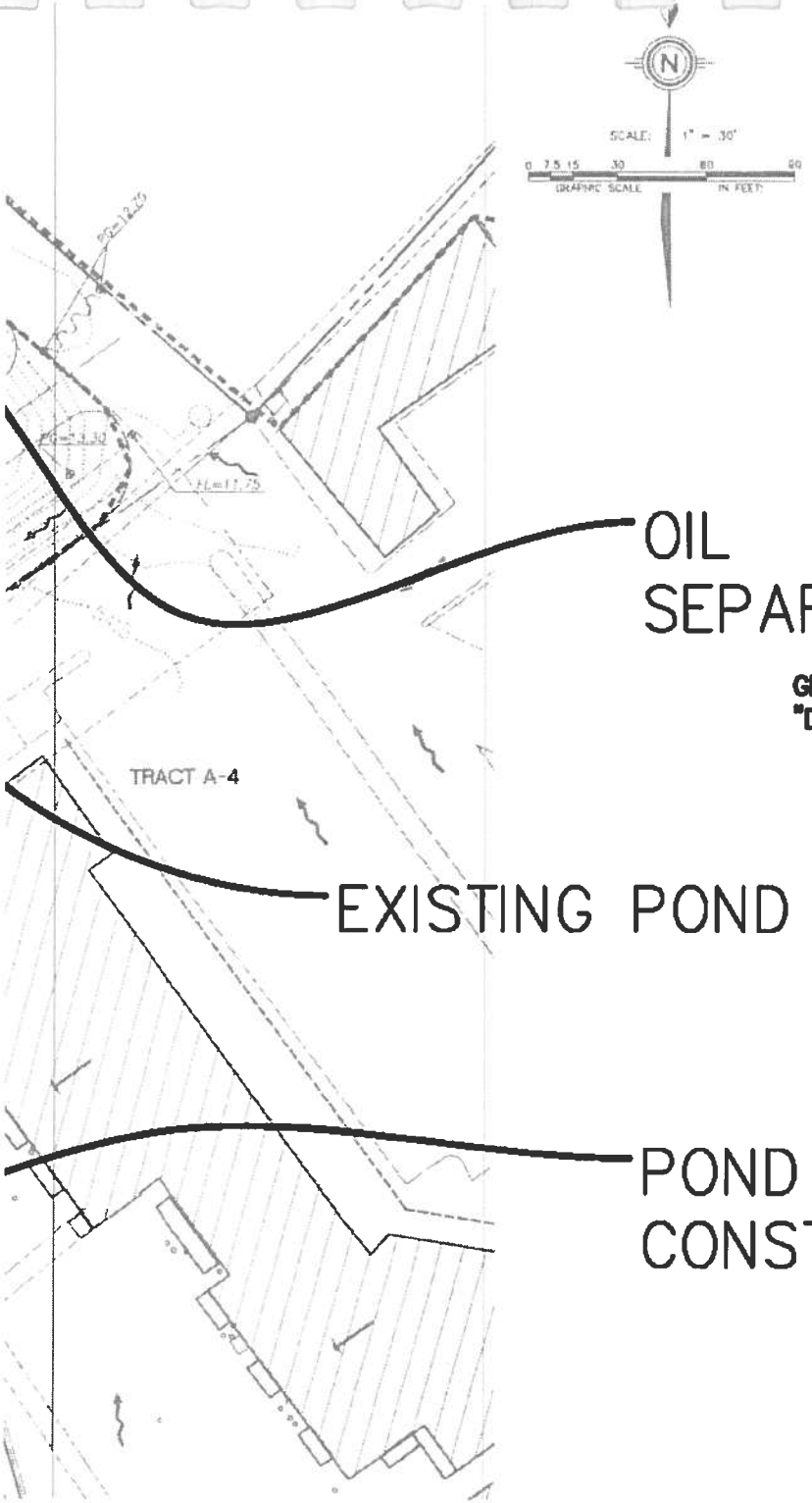
```
*
*S*********************************
*S  POND ROUTING 12 INCH DISCHARGE
*S*********************************
ROUTE RESERVOIR      ID=1   HYD NO=POND1   INFLOW=3   CODE=5
                     OUTFLOW(CFS)    STORAGE(AC-FT)    ELEV(FT)
                          0.00             0.000         5405
                          2.40             0.255         5406
                          5.20             0.681         5407
                          6.80             1.124         5408
                          8.10             1.642         5409
                          9.20             2.238         5410
*
FINISH
```

AHYMO Existing Conditions – AHYMO 24 Hour 100 Year Storm Summary Output

```
AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) -                    - VERSION:  1997.02c      RUN DATE (MON/DAY/YR) =12/18/2008
INPUT FILE = F:\N776BE~1\03NORT~2\030GRA~1\DRAINA~1\N776-0~1.DAT                      USER NO.= AHYMO-I-9702c01000Q29-AH

                              FROM  TO                 PEAK       RUNOFF               TIME TO   CFS      PAGE =   1
                  HYDROGRAPH   ID   ID       AREA    DISCHARGE    VOLUME     RUNOFF     PEAK     PER
COMMAND       IDENTIFICATION  NO.  NO.     (SQ MI)     (CFS)      (AC-FT)   (INCHES)  (HOURS)   ACRE      NOTATION

*S************************************
*S  NORTHTOWN PLAZA
*S  100 YEAR 24 HOUR EXISTING & PROPOSED CONDITIONS
*S  VERIFICATION OF POND REQUIREMENTS
*S  FOR VOLUME AND DISCHARGE
*S
*S************************************
*S
*S
START                                                                                                 TIME=       .00
RAINFALL  TYPE= 2                                                                                     RAIN24=   3.100
*S************************************
*S  BASIN B-1
*S  WEST PORTION OF SITE
*S
*S************************************
COMPUTE NM HYD            B1   -     1       .00659      21.17        .973    2.76806    1.499    5.020 PER IMP= 100.00
*S************************************
*S  BASIN B-2
*S  EAST PORTION OF SITE
*S
*S************************************
COMPUTE NM HYD            B3   -     2       .01696      54.48       2.504    2.76805    1.499    5.019 PER IMP= 100.00
ADD HYD                 B1B3  1& 2   3       .02355      75.65       3.477    2.76805    1.499    5.019
*S************************************
*S  BASIN B-5
*S  UNDEVELOPED PORTION OF SITE
*S
*S************************************
COMPUTE NM HYD            B5   -     1       .00103       2.28        .071    1.28987    1.499    3.463 PER IMP=    .00
ADD HYD                ADDB5  1& 3   2       .02458      77.93       3.548    2.70610    1.499    4.954
*S************************************
*S  BASIN B-6
*S  UNDEVELOPED PORTION OF SITE
*S
*S************************************
COMPUTE NM HYD            B6   -     1       .00221       4.94        .156    1.31945    1.499    3.493 PER IMP=   2.00
ADD HYD               PONDIN  1& 2   3       .02679      82.87       3.702    2.59123    1.499    4.833
*S*************************************
*S  POND ROUTING 12 INCH DISCHARGE
*S************************************
ROUTE RESERVOIR        POND1    3    1       .02679       9.30       3.665    2.56520    2.164     .542 AC-FT=     2.293
FINISH
```



OIL
SEPARATOR

GRADING PLAN EXCERPT FROM REPORT
"DRAINAGE REPORT FOR NORTHTOWN SHOPPING CENTER (MAP#E-19)"
DATED 4-21-95

EXISTING POND

POND REQUIRED FOR
CONSTRUCTION ON TRACT A-1

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