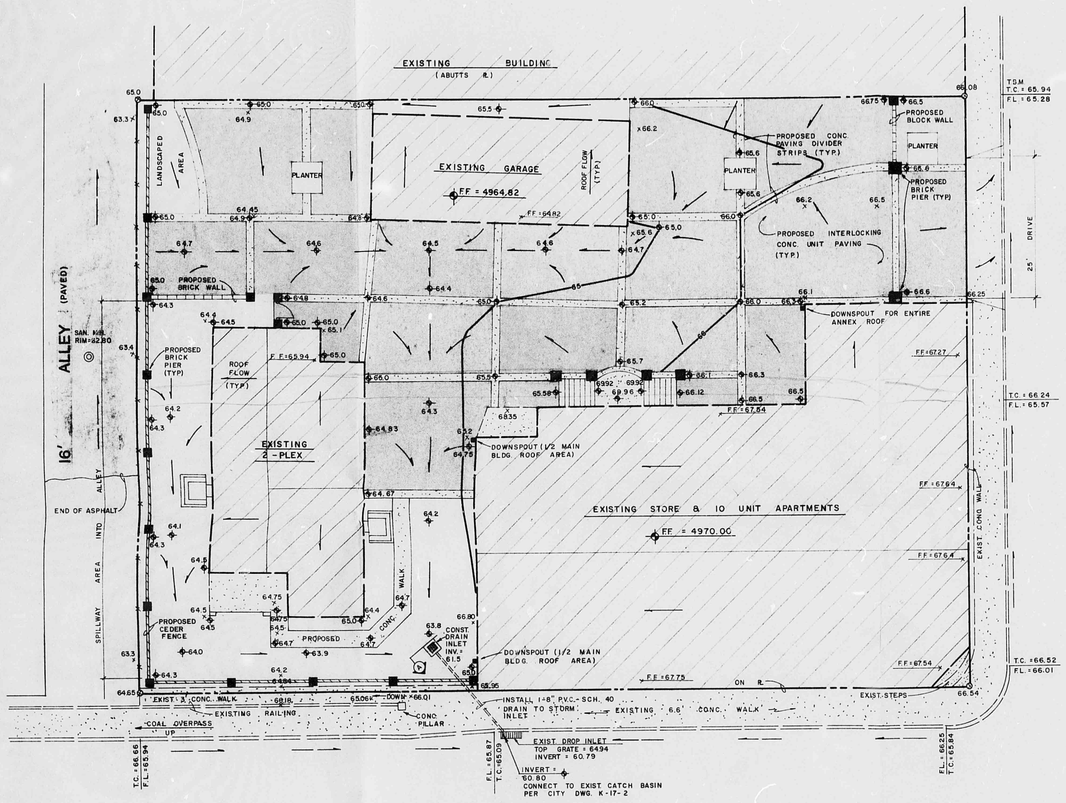
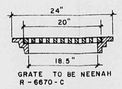
HYDROLOGY K14/D21 1 PLAN

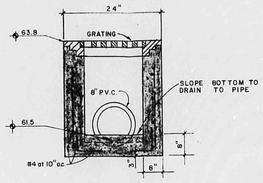
K14/D21
1 PLAN

CITY OF ALBUQUERQUE

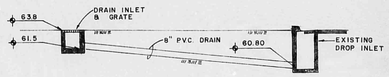



GRATE DETAIL




INLET DETAIL



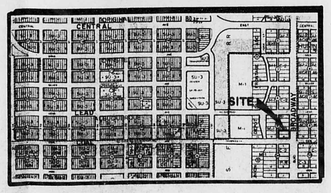

PROFILE

SECTION (A)

## LEGEND

- SIDEWALK, CURB & GUTTER ( EXISTING, PROPOSED )
- PROPOSED ASPHALT
- BUILDING ( EXISTING, PROPOSED )
- PROPERTY LINE
- X12.7 — EXISTING SPOT ELEVATION
- 12.7 — EXISTING CONTOUR
- 12.5 — PROPOSED SPOT ELEVATION
- 10 — PROPOSED CONTOUR
- SURFACE FLOW DIRECTION

VICINITY MAP K 14




SCALE: 1" = 10'

SCOPE:

The proposed project concerns the renovation of the Broadway Market, located at the NW corner of Coal and Broadway S.E. The present site is occupied by three buildings, a store with 10 unit apartments, garages, and a 2-plex building. The site renovation will involve regrading the site for drainage discharge to Coal Ave. and covering the present open area with paving blocks, concrete walks and landscaping.

The intent of this plan is to show:

a) Grading relationships between the existing ground elevations and proposed finished elevations in order to facilitate positive drainage flow to designated points.

b) The extent of proposed site improvements. including buildings, walks, and pavement.

c) The flow rate per/volume of rainfall runoff across or around these improvements and methods of handling these flows to meet City requirements for drainage management.

d) The relationship of onsite improvements with existing neighboring property to insure an orderly transition between proposed/surrounding grades.

CONSTRUCTION NOTES:

1. Before beginning construction, the Contractor shall check and verify pertinent figures shown here on and all applicable field measurements. Should any conflict, error or discrepancy be discovered, the Contractor shall notify the Engineer at once to resolve the problem.

2. The Contractor shall be responsible for following the plans using his best skill and attention. Any departure from the plans must be approved by the Engineer and the City Hydrology Department prior to construction.

3. The Contractor shall check the site plan for locations of existing utilities within or adjacent to streets and shall take all necessary precautions and efforts to locate and protect these utilities. He shall give 48 hours notice to Line Locating Service, 765-1234, for any work that he contemplates would interfere with said utilities.

GENERAL NOTES:

LEGAL:
Lots numbered 5 and 6, block 5 of Honing's Highland Addition, Albuquerque, New Mexico (0.3: Ac)

SURVEYOR:
Carl R. Harrington, NMLS #7909, April 1984.

B.M.:
City datum benchmark "11-E14" located at intersection of Broadway Blvd. and Silver Ave. S.E. in the SW quadrant, square chiselled on top of concrete curb at SSW curb return. Elevation = 4961.904.

T.B.M.:
NE corner of site, north 1st line projection to T.C. Elevation 4965.94

SOILS:
SCS Soils Map #30, Soil Type "Cu", Hydrologic Soil Group "A".

FLOOD HAZARD:
Site is not located in or adjacent to a Flood Hazard Are. (AMDS E-14)

OFF-SITE DRAINAGE:
Site has a slight slope from east to west and presently drains to a paved alley along the west side of the site. The site is isolated from the effects of off-site runoff due to the presence of paved streets on the east and south side, and an existing building constructed on the north PL.

EROSION CONTROL:
The proposed construction will center on building renovation, with site grading occurring at the end of the construction phase, with minimum disruption of surface soils. Potential erosion will be minor.

CALCULATIONS: Based on a pre-design meeting with City of Albuquerque Hydrology, on August 1, 1984, the following criteria was established:

a. Discharge to catch basin on Coal Ave. is recommended. Controlled discharge required otherwise. Subsequent information from Jim Fluka office indicated study points at Lead and Broadway, and Iron and Broadway, of 174 cfs and 170 cfs, respectfully, peaking at 16 minutes in a 72" diameter storm drain with a hydraulic depth of 6.5'.

Calculations are based on the City of Albuquerque D.P.M. Manual, Vol. II for the 100 year-6 hour storm, using the Rational Formula to compare the existing and proposed runoff rates.

RATIONAL METHOD- Q = CIA

Area of site: 14,200 sq.ft.= 0.33 Ac.

Run-off Coefficient:

| Existing site: | Developed Site: |
|---|---|
| A imp. = 0.17 Ac | A imp. = 0.31 Ac. |
| % imp. = 0.17/0.33=50% | % imp. = 0.31/0.33=93% |
| "C" = 0.42(DPM 22.2 C-1) | "C" = 0.82(DPM 22.2 C-1) |

Rainfall Intensity:

$I = P_6 (6.86) Tc^{-0.54}$ = 4.76" per hour

where $P_6$ = 2.25 in.(DPM 22.2 D-1)

Tc = 10 minutes

| Existing Condition: Drains to Alley | Developed Condition: Drains to Coal |
|---|---|
| Q100 = (0.42)(4.76)(0.33) = 0.7cfs | Q100 = (0.82)(4.76)(0.33) = 1.3cfs |
| V100 = (Q100)(5 Tc)(60 sec/in)/2 = 1050 cu. ft. (hydrograph method) | V100 = (1.3)(5)(5) 60 1/2 = 1950 cu. ft. |

Summary:

$\Delta$Q100 = (1.3)-(0.7) = 0.6cfs (increase)

$\Delta$V100 = (1950 )-(1050) = 900 cu. ft. (increase)

Downstream Capacity:

Capacity of single "C" in sump conditions on Coal Street.
Curb opening length = 3'
Curb opening height = 6"
Grate clear opening = 4 sq. ft. for each 3' long section
Allowable ponding depth over grate:
Depth at depression = 2"
Depth at curb = 4"
6"

Gate Capacity = 4 sq. ft. x 3.5 cfs/sq. ft. (capacity/sq. ft. for 6" head from Fig. 4-1, DECC) = 14 cfs.

Curb Opening capacity = 3' length x 0.6 cfs/ft. (fig. 3-1 capacity of opening for To = 4", DECC) = 2 cfs

Total theoretical capacity of inlet:
Grate = 14 cfs
Curb = 2 cfs
16 cfs

Capacity of 25' of 12" storm lateral from inlet to storm MH =4.8 cfs for a 1.0' head (DPM-SECTION 22.3, FG.7B)
Therefore, controlling factor is storm lateral at 4.8 cfs.

Areas Draining to Inlet:

1. Coal street flows to storm inlet.
Area draining to inlet on north side of Coal is one half street width (24.65'), length from top of overpass to PC of curb return Coal and Broadway (600') = 14,790 sq. ft. = 0.34 Ac.
Elevation difference = 84.3' at top of overpass to 65.1' at inlet. Slope = 19.2'/520' = 3.7%
At an average velocity of 2'/sec., Tc = 520'/(2'/sec.) x (60 sec/min) = 4 min.

$I = P_6 (6.86) Tc^{-0.54}$ = 7.58"/hr.
where $P_6$ = 2.25"
Tc = 4 min.

Q100 = CIA =(0.95)(7.58)(0.34 Ac)
= 2.4 cfs(Capacity of lateral

2. Drainage from on-site will be routed to collection drain to inlet. Q100 = 1.3 cfs at Tc = 10 min. Flows from site will discharge into catch basins after street flow (Tc = 4 min.), but before main line reaches peak (16 min.). Therefore, downstream capacity exists for discharge of site into the City storm inlet.

On-Site Storm Inlet: (Neenah Model R-6670-C)
(24" sq.-outside dimension-grate)
Capacity of inlet in sump conditions (from Neenah flow curves)
K(grate inlet coefficient) = 20.5
D (depth upstream from grate) = 0.3
$Q = KD^{3/2}$
=(20.5)(0.3)
=2.7 cfs >1.3 cfs discharge from site

Pipe-Lateral:
Slope available = 3.5%
PVC pipe, n = 0.010
Q = 3 cfs (Eastern formula) >1.3 cfs discharge from site.

If the on-site grate inlet becomes clogged due to debris, with no outfall into the storm drain at all, the water would back-up to elevation 64.3 before it started spilling over onto the alley along the west side of the site. The present flow path of the site is into the alley, but in the proposed state, this route would be used only for spillway purposes. Total volume stored on-site at elevation 64.3 would be 240 cu. ft. The remaining 1950 cu. ft. generated for the design storm would exit the site to the alley. The closest structure to be affected by ponded waters would be the 2-plex, but with the size of the spillway available, there is little likelihood of the ponded waters ever rising up to the lowest proposed elevations around the building of 64.5.

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HYDROLOGY SECTION

C.T.S. INC.
ENGINEERING
1100 ALVARADO N.E. SUITE A
ALBUQUERQUE, NEW MEXICO 87110
( 505 ) 266 - 3444

| REVISIONS | DATE |
|---|---|
| | |

DESIGNED CWJ 5/84
DRAWN RWJ 8/84
CHECKED CWJ 8/84

# DRAINAGE / GRADING PLAN
# BROADWAY MARKET
# 419 BROADWAY S.E.

CHRISTOPHER L. WOLF
NEW MEXICO
8-30-84
REGISTERED PROFESSIONAL ENGINEER

SHEET 1 OF 1

CITY OF ALBUQUERQUE
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