PROJECT DESCRIPTION

The Mesa County Justice Center includes the construction of a Sheriff's Department headquarters, related administrative offices, staff support areas, and a Detention Facility. The Detention Facility is initially designed to house 192 inmates in single cells, with detention support facilities designed for a future expanded population of 300 inmates.

Building Concept

The Mesa County Justice Center is zoned in response to the various operations and functions being performed both inside and around the facility. A variety of individuals or services require access and entry to the building at any given time. Location of entry and degree of accessibility is dependant upon the business being conducted or purpose of the visit. The following will briefly describe how access to facility will be conducted on a day-to-day basis.

Public Visitors

In general terms, a visitor needing assistance from, or access to, the Sheriff's Department will enter the building as they would any typical office building. Entry is from the east, adjacent to a public parking area located along Rice Street. A passenger "drop-off/pick-up" point and 57 public parking stalls have been provided.

From this "main entry" location individuals have the choice of entering either the Sheriff's Department or Detention Facility lobbies. Staff will have the ability to restrict public access to the interior lobby areas of the Justice Center after normal business hours.

Patrol and Administrative Entry

Sheriff's Department administrative personnel and Patrol enter from the north east quadrant of the building. This also provides a more discreet means of entry when needed for investigations, questioning individuals by patrol officers or investigators. A total of 45 parking stalls have been provided.

Members of the public are occassionally invited and/or encourgaed to participate in meetings being held at the Sheriff's Department. Special access to the "meeting" room in the staff support area can be accomodated from this entry.

Staff Entry

Staff working in the Justice Center will park on the west side of the building, entering from northwest. The staff enter the building adjacent to the staff lockers and break room. This provides staff access to the facility without mixing with the general public. Staff can enter the parking area from either Rice Street or Crosby Avenue. A total of 95 parking stalls have been provided.

Visitors Access to Detention

All public visitors to the detention facility will enter from the main lobby. Those wishing to have meet with an inmate will use either secure non-contact visiting booths, open contact or restricted contact booths. Parking stalls provided are the same as those noted above for Public Visitors.

Inmate Entry to Detention

Individuals typically brought to the detention facility by law enforcement personnel will enter the detention facility via the vehicle sallyport. The vehicle sallyport is located on the east side opf the facility and is accessed from Rice

Street. This will include new arrests, court transfers and those being received from other custody jurisdictions. In limited situations, individuals can be taken into custody from the public lobby as well as from the Patrol and Investigation office areas.

Inmate Worker Entry

A secured sallyport entry is available for inmates in exterior work crews. This is located between Housing Pods C and D on the west side of the facility. A vehicle "turn around" is provided, parking for inmate vehicles is not. Access is from Crosby Avenue.

Service Delivery

Service delivery and dock facilities are on the west side of the Justice Center. Space has been provided for two delivery vehicles. A separate access is provided for trash storage and removal. The dock is enclosed and has one dock leveler for use with the delivery vehicles. Access is from Crosby Avenue.

SHERIFF'S DEPARTMENT

The Sheriff's Department is a single level structure designed to provide the following services:

- Administration
- Records
- Patrol
- Investigations
- Civil
- Reserve
- Search and Rescue.

Building Entry and Reception

A single Reception point serves the general public, although two distinct lobby areas are provided for the Sheriff's Department and Detention Facility respectively. This reception area may be staffed by more than one individual during busy periods and has the ability to observe the two lobby/waiting areas.

Public seating, access to pay telephones and public rest rooms are provided. Visitors will have restricted access to the Sheriff's Administration, Civil, Investigations, Patrol and staff support areas. Staff will enter the building from a different location to avoid problems often encountered when a single entry is shared.

Civil, Records and Warrants

The Civil , Records and Warrant divisions of the Sheriff's Department are located adjacent to the public lobby. Individual offices have been provided for the Administrative Division Chief and Chief Civil Officer. Two civil clerks have access to the public over an open work counter. A large open work and file space serves the department and a copy area is shared with Detention Administration.

Staff from this area will be responsible for the working with the public at a public information counter and the civil work counter. A finger printing counter is available in the adjacent corridor. Access to areas beyond the public lobby and information counters is restricted and will be controlled by staff members from this department.

Patrol Division

The Patrol Divison has been provided office space for the Patrol Division Commander, Shift Supervisor, Shift Commander, secretarial support, Patrol Officer's work room, conference/briefing room and two (2) interview rooms.

Specialized equipment and storage needs include an small armory, SPRT vehicle and equipment storage, SARC equipment storage.

Investigations

Public access to the Investigations Division is through the public lobby. Space has been provided for thirteen (13) investigators, secretarial support personnel, conference room, polygraph and observation rooms.

Additionally, major storage areas include space for evidence lockers, evidence processing and viewing, storage and vehicle evidence processing. A small laboratory space with film processing and drying are located within the larger evidence storage area.

A copy room located adjacent to the Investigations area is to be shared by MCNET and Patrol.

Staff Support

Staff Support area serving the combined needs of the Sheriff's Department and Detention Facility includes male/female locker and toilet rooms, physical training, meeting/briefing room(s), break room and a staff lunch room.

DETENTION FACILITY

The Detention Facility is a single level structure. The Detention Facility is designed to provide a secure and operationally efficient environment for the handling of individuals detained in Mesa County. The Detention Facility provides for the reception, booking, and housing of inmates. Support space has been provided for medical, food service, education, counseling, indoor and outdoor exercise areas to meet the operational and constitutional needs

Public Access

Public accessible areas are located outside the secure perimeter and are accessible from the main public entry of the Detention Facility. These areas include: lobby, waiting area, lockers, public toilets and telephones, visitor processing, jail administration, and inmate visiting booths.

Access to the detention facilities' administrative offices and visiting booths is restricted.

Official visitors, such as attorneys and bondsmen, can gain access to restricted-contact visitation with inmates via a secure sallyport This sallyport, which is accessed from the public lobby, is visually supervised by the Booking Desk. Inmates being released from the facility exit from the same sallyport.

Visiting

Three distinct types of Inmate Visitation spaces are provided: nine (9) non-contact visiting booths, two (2) open-contact and two (2) restricted-contact visiting booths in the Booking Area. Use of any visiting area requires authorization of staff. Entry to these areas can only be gained through staff review and approval.

Master Control

The Master Control Room has direct observation of the following: all major inmate movement corridors, visitation, access doors leading to Booking, Medical, Commissary, Video Arraignment, Counseling, Transportation Staging, Release, Indoor Exercise and the corridor leading to the Food Service, Laundry and Maintenance areas.

Master Control is responsibile for controlling and monitoring all doors that penetrate the secure perimeter of the detention facility. In addition, doors within major movement corridors which allow inmates to move from one zone in the building to another will be under the control of the Master Control officer.

Master Control will be responsible for all emergency monitoring systems including: CCTV, fire sprinkling, smoke evacuation, sallyport over-ride controls, master key and have the ability to cut power to control panels within the individual housing units.

Vehicle Sallyport

Inmates being brought into the Detention Facility will enter from the secure Vehicle Sallyport. The drive-through sallyport has space to allow parking for 4 patrol vehicles, secure weapon lockers and is located adjacent to a Pre-Screening Room where arresting officers complete the arrest procedures.

Pre-screening Room

Space has been provided in the Pre-Screening Room for breathlizer tests, inmate toilet and arresting officer report preparation. The pre-screening room is observable from the booking desk. Arresting officers will not enter the booking area itself.

Arresting officers can communicate directly with staff in the booking area at the work counter. A security window with space sufficient to pass paper work and some individual belongings will seperate the pre-screening area from the booking station.

Booking Area

The booking area contains secure holding cells (2), detoxification cells (3), observation and access to a court holding cell (1), open waiting room (for 25 inmates) with toilet and designated smoking area, identification, restricted visiting booths (2), property storage, secure storage, search/shower/issue and separate toilet rooms for both staff and inmate.

The entire booking area is concentrically designed around the booking desk. The booking desk is elevated thus giving staff maximum visibility of the entire booking area. Space has also been provided for an elevated K-9 pad.

Court Transfer

Court Staging and Transport Staging is located immediately adjacent to the Vehicle Sallyport. The area consists of an open inmate waiting area with benches, a transport officer work station, secure holding cell (also observable and accessible from the Booking Desk) and an equipment storage room.

Medical

Limited in-house Health Care services are provided to inmates, including: first aid, sick call, clinic, routine medical screening, minor medical treatment, medical and mental health examiniations, routine dental care, and some medical testing.

Space has been provided for an inmate waiting area with a toilet, a nurse's station which overlooks and controls inmate access to the medical suite, secure medication and record storage, a mental health office, medical exam rooms (2), a dental exam room (1), utility storage room, staff and inmate toilets, a janitors closet and a medical supervisors office.

Inmate Programs

A variety of inmate programs and services are provided throughout the Detention Facility. Centralized Inmate Programs include: active indoor multipurpose and weight rooms, library, legal library, commissary, counseling, classroom, video-arraignment and a group advisement room. Additionally, interview/counseling, outdoor exercise and passive activities are available to inmates within each housing module of 48 inmates.

Inmate Housing

Inmate housing is organized in 4 modules containing 48 cells each. Housing modules are further subdivided into groups of 4, 8, 16 and 32 cell groupings to maximize management and classification opportunities.

The detention facility management and operational philosophy, as well as building design is based on a podular, direct supervision configuration with groups of cells opening onto common dayrooms from the ground and mezzanine levels. The dayrooms are located concentrically about an officer

work station (or housing control room), for clear observation of cell fronts, dayroom and outdoor exercise.

Inmate housing is designed on two levels. Half of all inmate cells are located at ground level, the remainder on a mezzanine. The two housing levels generally share a common dayroom which is also at ground level.

Outdoor Exercise

Each housing module has access to outdoor exercise. Space is sufficient for use of basketball and handball games. The exercise yard is visibally open to the sky but secured by an overhead security mesh. A small outdoor storage room is provided for equipment in three of the four yards.

The yard area would serve as a potential evacuation area in time of emergency. Each yard provides a limited amount of shaded area and natural light into the immediately adjacent housing unit.

Officer Work Station and Adjacent Rooms

Design of the officer work station varies in response to the type of inmate anticipated to be housed within a specific dayroom. All officer work stations or housing control rooms are located at ground level.

Power to the Officer Work Station control consoles will be a "slave" unit to Master Control and can have its' power supply cutt-off from Master Control during an emergency.

Pod Support Rooms

The officer work station has visual observation of a small multi-use room, officer toilet, utlitity room and janitor's closet serving each housing module of 48. A conference room which is shared between two housing modules.

Work Crew Entry

A separate Work Crew Entry is provided for outside inmate workers. Located between Housing Modules C and D, secure space is provided for inmate waiting and search.

Food Service

A full service, in-house Food Service is being provided. Meals will be prepared by County staff and inmate workers. Food Service functions include: staging for decentralized bulk food service, bulk dry food storage, cooler and freezer storage; mixing, cooking and baking; dish and utensil washing; cart assembly, wash and storage; toilet and break areas for kitchen staff and inmate workers.

A separate kitchen serving work release inmates has not been provided as called for in the architectural space program.

Laundry

In-house laundry services will be provided. The laundry is located near the dock/receiving area. Space has been provided for receiving soiled linen, washing, drying, linen/mattress storage, mattress sanitization and sewing repairs.

Maintenance and Building Storage

Facility maintenance personnel have been provided office, tool storage, equipment storage, toxic storage and a maintenance shop area. This area is located outside the detention facility security perimeter adjacent to the receiving dock and building service entry.

CODES AND STANDARDS

The following building codes and standards will govern the design and construction of the Mesa County Justice Center:

- Uniform Building Code 1988
- Uniform Fire Code 1988
- Uniform Mechanical and Plumbing Codes 1988
- Uniform Building Code Standards 1988
- National Electrical Code (NFPA No. 70) 1990
- Life Safety Code (NFPA No. 101) 1988
- National Fire Codes (8 volumes by NFPA)
- American National Standard Safety Code 1978
- 2nd Edition - Owner of Colorado Model Energy Efficiency Construction and Renovation Standards for non-residential buildings. 1977
- Colorado Revised Statutes (C.R.S.), Title 24-82-601
- Colorado Revised Statutes (C.R.S.) Volume 3 - Title 9; Articles 2 and 5
- American Correctional Association Standards
- Model Energy Code (BOCA), 1983

Building Code Summary

Detention Facility

• Occupancy Classification:	Group I-3
• Construction Type:	Type I F.R.
• Allowable Floor Area:	Unlimited
• Fire Resistive Construction:	
– Exterior Bearing Walls	4 Hours
– Interior Bearing Walls	3 Hours
– Structural Frame	3 Hours
– Partitions	1 Hour
– Roof - Ceiling/Roof	2 Hour
– Automatic Fire Sprinkler System	Required
– Occupancy Separation	2 Hour

Sheriff's Department

• Occupancy Classification:	Group B-2
• Construction Type:	Type II F.R.
• Allowable Floor Area:	39,000
• Fire Resistive Construction:	
– Exterior Bearing Walls	4 Hours
– Interior Bearing Walls	2 Hours
– Exterior Non-Bearing Walls	4 Hours
– Structural Frame	2 Hours
– Permanent Partitions	1 Hour
– Roof - Ceiling/Roof	1 Hour

(H)

#90 90

Original
Do NOT Remove
From Office

D.R.G.W. Railroad
H.V. Eason
Manager - Real Estate
P.O. Box 5482
Denver, CO 80217

United Biscuit Co.
677 Larch Ave.
Elmhurst, Illinois 60126

Anthony Prinster
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Grand Junction, CO 81502

Mesa Beverage Co.
C/O George McElroy & Assoc.
2777 Stemmons Frwy. #1625
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Grand Junction, CO 81504

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Grand Junction, CO 81504

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First National Bank-
Trustee
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Grand Junction, CO 81501

James L. Voytilla
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John & Mary Carlson
200 Rice Street
Grand Junction, CO 81501

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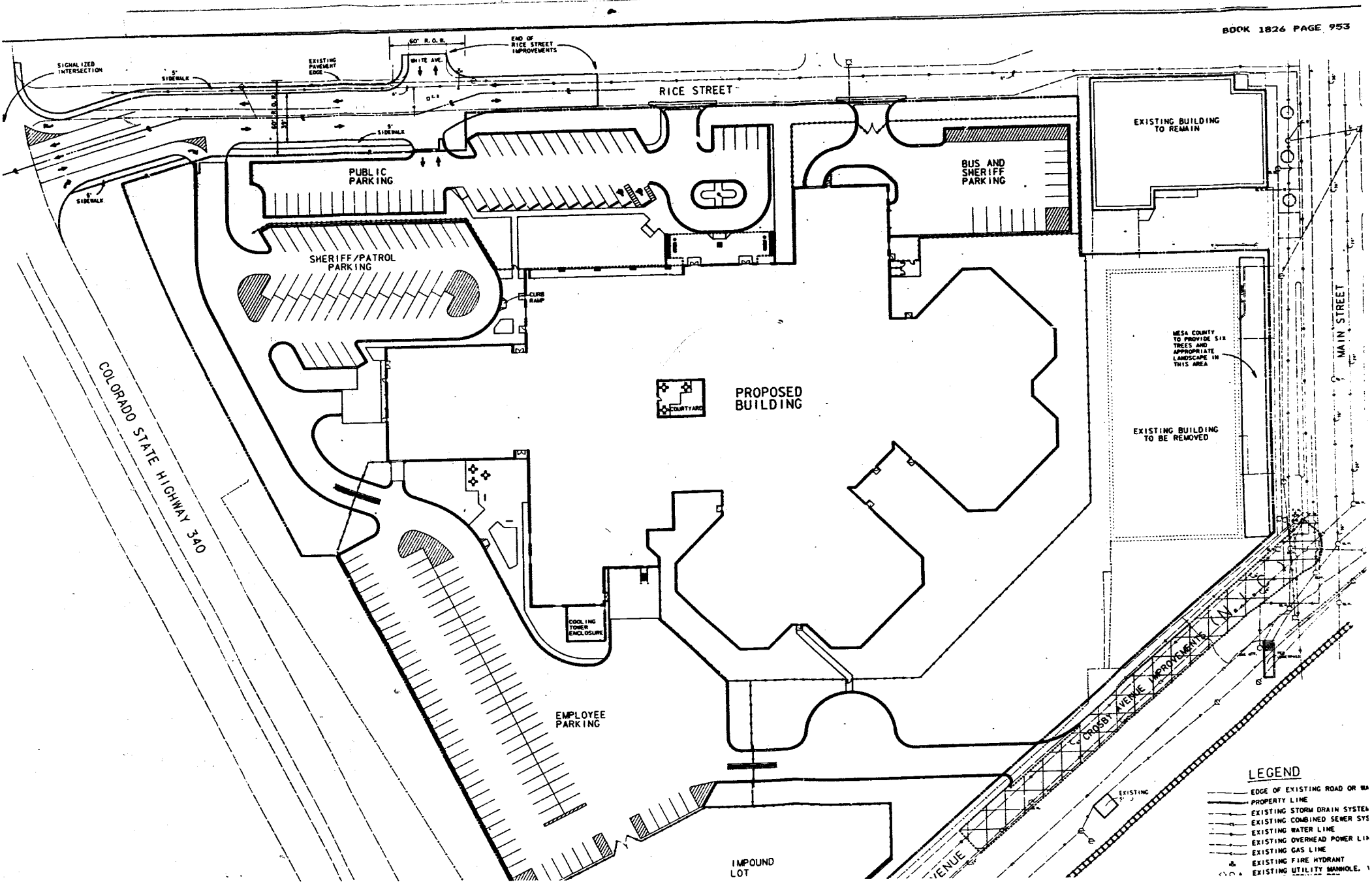
714 Golfmore Drive
Grand Junction, CO 81506

Henry J. Faussone
1745 Crestview Drive
Grand Junction, CO 81506

Mesa County Commissioners
c/o Mark Eckert-Admin.
P.O. Box 20,000-5010
Grand Junction, CO 81502


SIGNALIZED INTERSECTION
5' SIDEWALK
EXISTING PAVEMENT EDGE
60' R.O.W.
WHITE AVE.
END OF RICE STREET IMPROVEMENTS
RICE STREET
PUBLIC PARKING
SHERIFF/PATROL PARKING
CURB RAMP
BUS AND SHERIFF PARKING
EXISTING BUILDING TO REMAIN
MESA COUNTY TO PROVIDE SIX TREES AND APPROPRIATE LANDSCAPE IN THIS AREA
MAIN STREET
COLORADO STATE HIGHWAY 340
COURTYARD
PROPOSED BUILDING
EXISTING BUILDING TO BE REMOVED
COOLING TOWER ENCLOSURE
EMPLOYEE PARKING
IMPOUND LOT
CROSBY AVENUE IMPROVEMENTS
EXISTING
LEGEND
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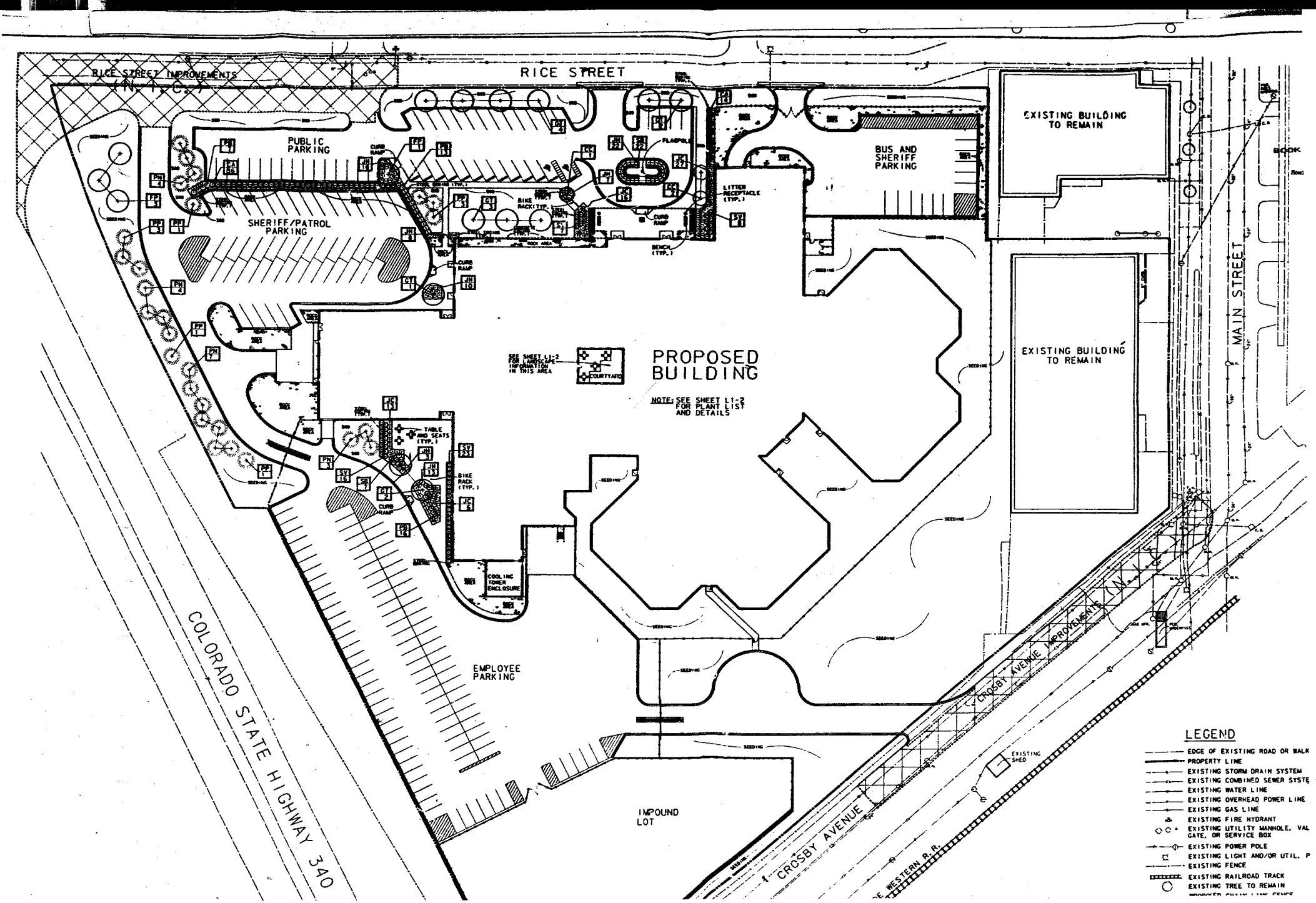
EXISTING COMBINED SEWER SYS
EXISTING WATER LINE
EXISTING OVERHEAD POWER LIN
EXISTING GAS LINE
EXISTING FIRE HYDRANT
EXISTING UTILITY MANHOLE,


RICE STREET IMPROVEMENTS
RICE STREET
PUBLIC PARKING
SHERIFF/PATROL PARKING
BUS AND SHERIFF PARKING
EXISTING BUILDING TO REMAIN
EXISTING BUILDING TO REMAIN
MAIN STREET
PROPOSED BUILDING
SEE SHEET L1:2 FOR LANDSCAPE INFORMATION IN THIS AREA
COURTYARD
NOTE: SEE SHEET L1:2 FOR PLANT LIST AND DETAILS
TABLE AND SEATS (TYP.)
BIKE RACK (TYP.)
CURB RAMP
BENCH (TYP.)
LITTER RECEPTACLE (TYP.)
FLAGPOLE
COOLING TOWER ENCLOSURE
EMPLOYEE PARKING
IMPOUND LOT
COLORADO STATE HIGHWAY 340
CROSBY AVENUE
CROSBY AVENUE IMPROVEMENTS
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E. WESTERN R.R.
LEGEND
EDGE OF EXISTING ROAD OR WALK
PROPERTY LINE
EXISTING STORM DRAIN SYSTEM
EXISTING COMBINED SEWER SYSTE
EXISTING WATER LINE
EXISTING OVERHEAD POWER LINE
EXISTING GAS LINE
EXISTING FIRE HYDRANT
EXISTING UTILITY MANHOLE, VAL GATE, OR SERVICE BOX
EXISTING POWER POLE
EXISTING LIGHT AND/OR UTIL. P
EXISTING FENCE
EXISTING RAILROAD TRACK
EXISTING TREE TO REMAIN

(32)

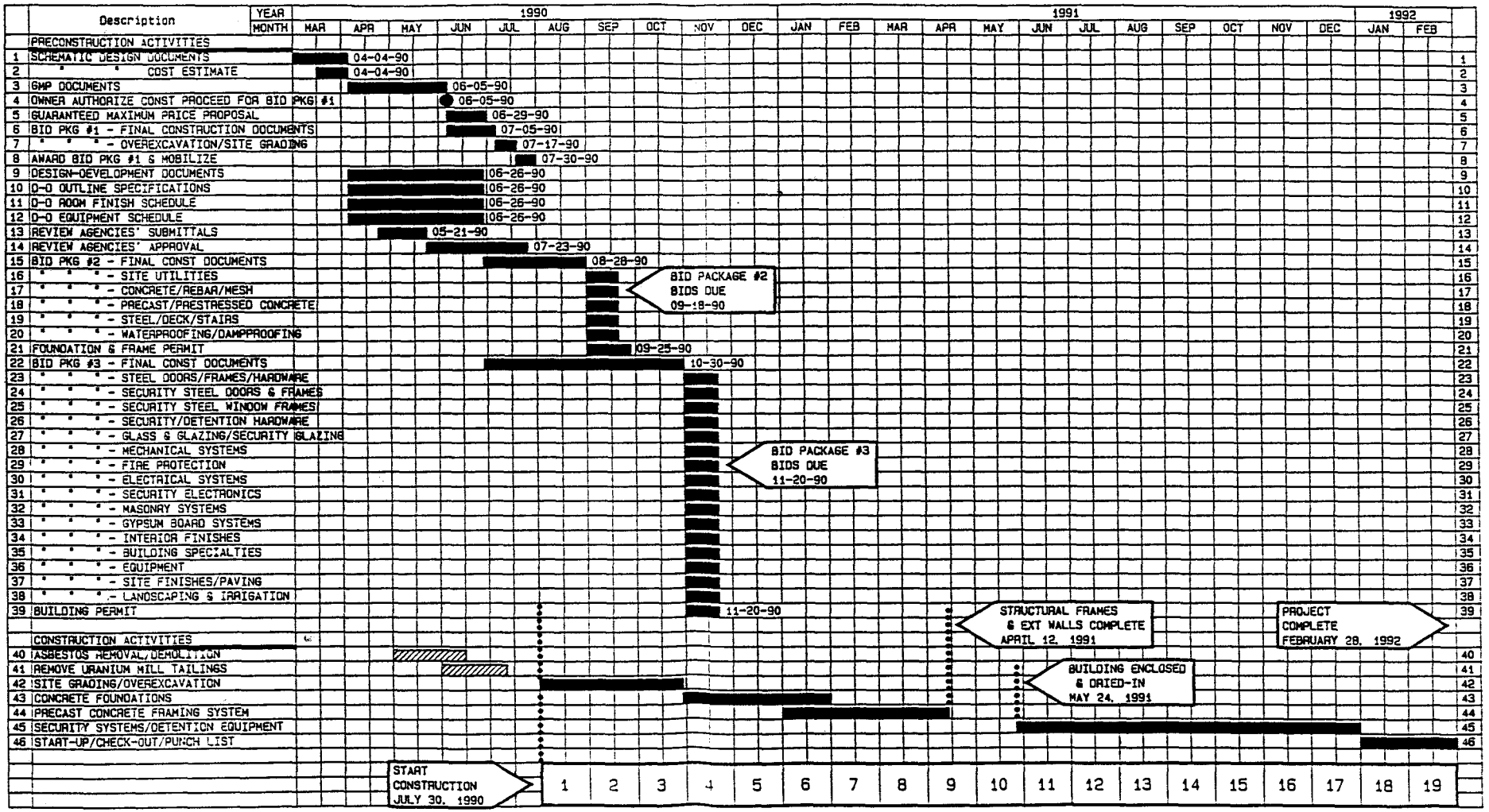
CONSTRUCTION PROGRESS SCHEDULE (PRELIMINARY)

START CONSTRUCTION: JULY 30, 1990
PROJECT COMPLETE: FEBRUARY 28, 1992

MESA COUNTY JUSTICE CENTER
GRAND JUNCTION, COLORADO

GE JOHNSON CONSTRUCTION COMPANY

MAY 25, 1990



CTL/THOMPSON, INC.
CONSULTING GEOTECHNICAL AND MATERIALS ENGINEERS

GEOTECHNICAL INVESTIGATION
PROPOSED MESA COUNTY JUSTICE CENTER
GRAND JUNCTION, COLORADO

Prepared For:

Mesa County Property Management
536 White Avenue
Grand Junction, Colorado 81501

Job No. 16,889

May 23, 1990

1971 WEST 12TH AVENUE • DENVER, COLORADO 80204 • (303) 825-0777

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SCOPE

This report presents the results of our Geotechnical Investigation for the proposed Mesa County Criminal Justice Center to be located in Grand Junction, Colorado. We explored the subsurface conditions at the site to provide foundation recommendations and pavement design alternatives. This report includes a description of the subsoils and groundwater conditions found in our test holes, recommend foundations and allowable design soil pressures for them, pavement alternatives and sections and construction criteria for details influenced by the subsoils. Our report was prepared from data developed during our field exploration, laboratory testing, engineering analysis and experience with similar conditions. A summary of our conclusion and recommendations is presented below.

SUMMARY OF CONCLUSIONS

1. The Justice Center site is in an older industrial section of Grand Junction. Several commercial business occupied the site.

2. We found man-made fill of mixed coal and debris above natural sandy to silty soft clays and clean to silty very loose sands underlain by dense cobbly gravels at 7.5 to 25 feet. Samples of the clays proved to be very compressible when tested in a consolidometer. Free groundwater was measured in 10 of 16 test holes at 15 to 18 feet at the time of drilling.

3. We believe the Justice Center buildings can be founded with spread footings bearing on densily compacted structural fill replacing the existing fill and natural clays and sands above the dense gravels or piles driven into the cobbly gravels. Similar settlements of footings and piles are anticipated.

4. In our opinion, the existing fill is not a satisfactory subgrade for slab-on-grade floors. The existing fill should be removed and placed with densely compacted structural fill. If a footing foundation is chosen to found the buildings we believe it would be best to remove and replace

all existing fill and natural clays and sands above the dense gravels and replace it with structural fill for footing bearing and floor subgrade. If the buildings are founded with driven piles using a structural floor supported by the piles would eliminate the need to remove existing fill under the buildings.

5. The performance of parking and drives will be related to the thickness of structural fill placed below the pavement. Several design pavement sections are discussed.

SITE CONDITIONS

The site for the Mesa County Justice Center is bounded by Colorado Highway 340 on the north, Rice Street on the east, Main Street on the south and Crosby Avenue on the west in Grand Junction, Colorado (Fig. 1). An abandoned railroad spur was just south of the building and aligned parallel to Main Street. The site was west of downtown Grand Junction in an older portion of the city currently undergoing several redevelopment projects. It sloped down from the northeast to the southwest at grades of 5 percent or less. A layer of aggreate base covered the site. Construction refuse littered the site. Vegetation consisted of weeds but was sparse.

A contractor was demolishing the existing buildings on the Center site. The largest building was next to Rice Street and had masonry block walls and steel roof trusses. We saw small cracks in the exterior block walls and several large cracks in the floor slab before the building was removed. A second large building, which previously housed a wood truss manufacturing company, was located on the southern portion of the site. The building had light steel framing, wood roof trusses and galvanized steel siding. The interior floor slab was badly cracked. The contractor salvaged materials and hauled them from the site. Several smaller buildings and sheds were on the site. None of the buildings had basements.

Soil was stockpiled along the northern property line adjacent to Colorado Highway 340. The soil smelled of petroleum. We understand the source of the stockpiled soils was an excavation at the corner of Colorado Highway 340 and Rice Street to remove storage tanks.

PROPOSED CONSTRUCTION

The Mesa County Justice Center will be a multi-building complex with paved drives and parking lots. We discussed the center with Messrs. Roy Blythe and David Hatch of Henningson, Durham and Richardson, Inc. to learn about the Center plans. Our understandings are written below. If final building designs are different from our understandings we should be advised to permit re-evaluation of our conclusions.

The center will have a main building with attached housing pods. The main building houses the Sheriff's office and detention cells. It will be one-story tall with a maximum height of 18 feet. The housing pods (cell blocks) will be one to two-stories tall (maximum height 24 feet). The second floor will be a mezzanine level containing the cells. The buildings may have basements but the probability of basements was low at this writing.

The buildings will be precast, concrete, panel tilt-up walls and Twin-Tee floors and roofs. Bay sizes will range from 30 feet x 30 feet to 30 feet x 60 feet. Maximum interior column loads will be 280 kips and bearing wall loads about 6 kips per lineal foot. We assumed maximum floor loads of the order of 60 psf for our analysis. Paved drives and parking will be adjacent to all sides of the buildings.

SUBSURFACE CONDITIONS

We investigated the site subsurface with eleven (11) test holes, TH-1 through TH-11, at the locations shown on Fig. 1. A drill rig equipped with 4-inch diameter continuous flight auger drilled the test holes. A representative of our firm logged the soils and samples from the holes. Logs of the soils from the test holes, results of field penetration resistance tests and data from laboratory tests are shown on Figs. 2 through 4. Laboratory test results are summarized on Table 1. Figures 5 through 8 show our interpredtions of depths to natural ground and the dense gravel and elevation contours of the natural ground and gravel surfaces.

Man-made fill overlay sandy, clays and clean to silty sands which are underlain by cobbly, gravels. Free groundwater was found in most of our borings between 15 and 18 feet. A thin layer of aggregate base covered the ground.

The man-made fill found was up to 12 feet thick. The fill contained coal waste and debris (e.g. glass, brick, etc.) at several locations and was uncompacted. The northwest half of the building area may have been a landfill. In our opinion, the man-made fill is not acceptable bearing for footings or subgrade for floors.

Below the fill we found sandy and silty clays and clean to silty sands. Thicker sand layers were found below the debris fill on the northwestern half of the building locations. Below the central and southern portions of the building footprint the soils were mostly clays, however, thin sand lenses were found throughout the clays. Clay samples from TH-1 and TH-2 contained severed decaying roots. Cobbly gravels lay below the natural clays and sands of 7.5 to 25 feet. The clays were soft to medium stiff, moist to wet and gray-brown or

brown. The sands were very loose to medium dense, moist to wet and tan. The cobbly gravels were dense.

Laboratory tests to verify field classifications and to judge volume change potential and strength of the soils were performed. Samples of the clays compressed 3.6 to 5.2 percent when loaded to 1,000 psf. Compressions up to 12.6 percent were observed at 5,000 psf loadings. Two samples were flooded during loading and one sample swelled and one sample compressed. Atterberg limits showed the clays were moderately plastic. Unconfined compressive strengths of two samples tested were 2,400 and 3,000 psf. Gradation analysis of two samples of the sands measured 15 to 19 percent silt and clay size particles (passing the No. 200 sieve).

Immediately after drilling we found water in TH-1 through TH-4, TH-6, TH-7, TH-10 and TH-11 at 15 to 18 feet. We encountered practical drill refusal or caving of the gravels at our other locations. The holes were cased with plastic pipe for future measurements to aid construction planning.

FOUNDATIONS

We considered several foundation alternatives including footings, mat, post-tensioned slab, driven piles and drilled piers and discussed them with Mesa County Property Management; Henningson, Durham and Richardson, Inc. and G.E. Johnson Construction personnel. The consensus opinion was for footings or driven piles. We suggest the following criteria for design of footings or piles. We would be pleased to provide geotechnical criteria for the other alternatives if requested to do so.

Footings. At footing elevations we found uncompacted man-made fill with and without debris, very loose natural sands and soft to medium stiff natural clays. Even lightly loaded footings bearing on this fill and these soils will settle differentially more than the proposed buildings can tolerate. The man-made fill and natural soils should be entirely removed beneath footings down to the dense gravels and replaced with structural fill. The buildings can be founded on spread footings bearing on densely compacted structural fill. We suggest the following geotechnical criteria for footing design.

1. Footings should bear on densely compacted structural fill replacing the man-made fill and natural soils above the gravels or a combination of the structural fill and dense gravels. The structural fill should extend down and out from the edge of footings at an angle of 1:1 horizontal to vertical or flatter. The structural fill should be constructed of sands or sands and gravels or gravels with 100 percent smaller than 3 inches, a maximum of 30 percent passing the No. 200 sieve (silt and clay size particles), a maximum liquid limit of 30 percent and a maximum plastic index of 10 percent. The fill soils should be placed in 8-inch maximum loose lifts to within 2 percent of optimum moisture content and compacted to at least 95 percent of maximum modified Proctor dry density (ASTM D 1557) with heavy tractor towed or self propelled compactors. Loose soils at footing elevations should be removed or compacted prior to placing concrete.

2. Footings bearing on the structural fill and/or dense gravels can be designed for a maximum soil bearing pressure of 5,000 psf. We estimate foundations designed as recommended above will result in total settlements of the order of 1 inch and differential settlements of one-half the actual total settlement between column footings. We expect about one-half inch of differential settlement in 15 feet along continuous footings.

3. Foundation walls for continuous footings should be reinforced top and bottom. We recommend the reinforcing steel equivalent to that necessary for a simply supported span of 10 feet or at least 2 continuous No. 5 bars, top and bottom, whichever is greater.

4. Minimum footing widths are desirable. We suggest a width of at least 16 inches for continuous footings and at least 2 feet x 2 feet for isolated column pads. Greater sizes may be required depending on column and wall loads.

5. The soils beneath exterior footings need to be protected from freezing. The City of Grand Junction building department did not recommend a specific depth. We recommend a minimum depth of 24 inches.

The excavation below the building will extend to the natural cobbly gravels (see Figs. 15 and 16) to remove all existing fill and loose soft natural soils. The excavation should extend beyond the outside building walls at least 7 feet. It will likely be more efficient and better to remove all the fill and loose and soft natural soils beneath the buildings as discussed below under "Floors" rather than removing one thickness beneath footings and another beneath floors. The resulting excavation bottom should be compacted and backfilled with densely compacted structural fill.

We encountered groundwater in our test holes below the top of the gravel except in TH-1 and TH-2. We believe groundwater will effect construction in the northern portions of the excavation. We recommend that water levels be measured at the site to evaluate changes in depth prior to construction. If a substantial rise is noted we should perform additional investigations to evaluate the impact on excavation and aid in determining the most effective dewatering system. Present conditions will likely require pumping with large pumps for several large sumps in the excavation.

Driven Piles. Several pile types are available including timber, precast concrete, steel pipe (closed or open end) and steel H. We believe the better for these buildings are closed-end, concrete filled steel pipe or steel H piles. Timber piles would broom on the gravels and precast concrete are not often used in the Grand Junction area. We recommend the following for piles.

1. Closed-end concrete filled pipe piles will penetrate the gravel about 6 feet. Steel H piles may penetrate the gravel of the order of 12 feet. The maximum pile capacity of a pile should not exceed the pile service stress capacity for each section as defined by the Uniform Building Code (1988 edition) or 120 kips whichever is less. Piles should be driven to "virtual refusal" in the gravel. We define "virtual refusal" as a penetration of 2 inches or less for the final 20 blows using a pile driving hammer rated for at least 18,000 foot pounds of energy per blow when operating at no less than 85 percent efficiency. We estimate a maximum pile settlement of 1 inch.

2. Laterial resistance to horizontal loads can be provided by battered piles or the soils. We would be pleased to provided the necessary Geotechnical criteria to analyze the piles for lateral load if you call.

3. Groups of piles placed closer than 3 diameters, center to center, should be evaluated to determine their reduced capacity as a result of group action.

4. The hammer for pile driving should be operated at the manufacture's recommended stroke and speed when "virtual refusal" is measured.

5. The contractor should select a driving hammer and cushion combination which is capable of installing the selected piles without over stressing the piles. The contractor should submit a pile driving plan and the pile hammer/cushion combination to the engineer in advance of pile driving.

6. All pile driving should be observed and records kept of penetration resistance, pile length and other factors which could effect the performance of the foundation.

FLOORS

The existing man-made fill is not adequate subgrade for slab-on-grade floors and should be removed and replaced with structural fill as discussed above under "Foundations" except it needs be compacted only to 90 percent maximum modified Proctor density (ASTM D 1557). The natural clays and sands will support lightly loaded (60 psf) slab-on-grade floors as we have assumed.

If driven piles are used to found the building a structural floor supported by the building foundation may be less expensive than removing and replacing the existing fill. Structural floor loads would be transfered to the gravels via the piles resulting in no loads transfered to the fill.

Selectively removing and replacing existing fill and natural clays and sands beneath footings and replacing with structural fill (95 percent) and selectively removing and replacing existing fill only beneath floors and replacing with structural fill (90 percent) can be done but, in our opinion, it would be more complicated and result in higher risk of differential movement between footings and slab-on-grade floors than removing all existing fill and natural clays and sands beneath all buildings and replacing them with structural fill compacted to 95 percent (ASTM D 1557). Removal of all fill and natural clays and sands down to the gravels should, in our opinion, result in better use of larger excavating and compacting machinery which will result in a better structural fill.

Vertical movement of slabs-on-grade floors should not be restricted. Non-load bearing walls may bear on thickened floor slab sections. The "footing" section of the slab should be reinforced to distribute the wall loads into the slab to minimize or prevent cracking. Load bearing walls should be footing supported and the footings should be separated from the floor slab.

Frequent control joints should be provided. The American Concrete Institue (ACI) recommends minimum joint spacing of 15 to 20 feet. Plumbing which passes through the floor slabs should be isolated from the slab and be constructed with flexible couplings. Interior backfill along foundation walls and utility trenches should be compacted to at least 95 percent of the maximum modified Proctor dry density (ASTM D 1557).

BASEMENTS

Basements were being considered, however, at this writing we understand unlikely. Basement walls would need to resist lateral earth pressures. Backfill of

the walls can be with on-site clays or sands if free of debris or other deleterious materials. Exterior backfill should be compacted to at least 90 percent of modified Proctor dry density. Basement walls are not free to rotate and should be designed for the "at rest" lateral earth pressure. We recommend calculating the lateral earth pressure on basement walls using an equivalent fluid density of 50 pcf where on-site soils are used as backfill. An equivalent fluid pressure of 40 pcf could be used if an imported sands or gravels are used. The above values do not include lateral earth pressure contributions from sloping backfill, hydrostatic pressure or other surchage loads.

Hydrostatic pressures may develop behind basement walls from water infiltrating into the backfill from irrigation or precipitation. To reduce hydrostatic pressure behond basement walls we recommend a drain system. An illustration of a typical drain is shown on Fig. 16. We have assumed a basement depth no greater than 8 feet in our analysis.

PAVEMENT

The existing subgrade soils consisted of man-made fill with and without debris and natural clays and sands. The majority of the material at subgrade elevation was fill. We do not believe the fill was compacted during placement. The soils at subgrade elevations would provide poor support for drives and parking areas. We obtained subgrade samples at two of five planned locations. We did not sample other locations because existing excavations and stockpiled soils did not allow access. We have based our design pavement thicknesses on laboratory testing performed on soils obtained from the subgrade sample locations and from test holes drilled for our foundation investigation.

The soils were fill and sandy to silty clays. Subgrade samples were tested in our laboratory and indicated 63 to 79 percent silt and clay size particles (passing the No. 200 sieve). Liquid limits were 22 to 30 percent and plastic indices were between 8 and 17 percent. The samples were classified as A-6 by the AASHTO classifications system.

For pavement areas for automobile parking and automobile traffic, we suggest 6.5 inches of full depth asphalt or 4.0 inches of asphaltic concrete over 7.0 inches of aggregate base course. If Portland cement concrete pavement is considered we recommend a minimum thickness of 5.0 inches. Areas subject to truck traffic and trash truck traffic should be paved with 6.0 inches of plain Portland cement concrete.

The performance of the pavement will depend on the amount of over excavation and structural fill placed below the pavements. Pavements can be placed directly on soils that presently exist at subgrade elevations or on a minimum thickness of 3 feet of structural fill. If the design pavement sections are constructed directly on the existing fill and soils much greather than normal maintenance cost should be expected. Large unslightly cracks in the pavement are likely and maintenance cost may be substantial. If the pavement bears on structural fill (minimum thickness 3 feet), maintenance will be higher but should be nearly normal. Maintenance costs can be expected to decrease directly with the thickness of fill supporting the pavement. To achieve normal maintenance costs all the existing fill and the natural clays and sands within 3 feet of the subgrade subsurface should be removed with structural fill.

Fill below pavements should be constructed of sands or sands and gravels or gravels with 100 percent no larger than 3 inches, 10 to 30 percent passing the No.

200 sieve (silt and clay size particles), a maximum liquid limit of 30 percent and a maximum plastic index of 10 percent. The fill should be moisture conditioned to within 2 percent of the optimum moisture content and placed in 8 inch maximum loose lifts and compacted to at least 95 percent of modified Proctor maximum dry density (ASTM D 1557).

The performance history of combination asphalt and aggregate base course sections have historically shown a higher maintenance cost and decreased serviceability compared to either full depth asphaltic concrete or Portland cement concrete pavements. We believe consideration should be given to using full depth asphaltic or asphaltic concrete Portland cement or concrete pavement sections, however, the actual performance of pavements will likely be most effected by the thickness of structural fill placed below the pavement.

Subgrade surfaces should be compacted to at least 95 percent of maximum standard Proctor dry density prior to placement of base course and/or pavement. The subgrade should be proof-rolled with a heavy, pneumatic tired vehicle (e.g. loaded 10 wheeled dump truck) and soils which deform excessively should be removed and replaced.

Concrete pavement will require careful material and construction control. Concrete should have a minimum Modulus of Rupture (flexural strength) of 600 psi. A laboratory mix design should have a compressive strength of at least 3,750 psi. We recommend the concrete contain a minimum of 5.5 sacks of cement per yard and between 5 and 7 percent entrained air. The Colorado Department of Highways Class P mix should satisfy the above requirements. Aggregate base course should have a minimum R value of 78. The base course should be moisture conditioned to near optimum moisture content and compacted to at least 95

percent of the maximum modified Proctor density (ASTM D 1557). Asphalt should have a total resistance (Rt) of at least 95 and should be compacted to at least 95 percent of the maximum laboratory density.

If construction materials cannot meet the above recommendations, then the pavement design should be evaluated based on the available materials. Materials and methods should conform to requirements listed in the Colorado Department of Highways publication "Standard Specifications for Road and Bridge Construction".

The primary cause of early pavement deterioration is water infiltrating into the pavement system. The water causes soft subgrades and eventually failure of the pavement. We recommend drainage be designed for rapid run-off of surface water. Curb and gutter should be backfilled and backfill compacted to reduce ponding adjacent to pavements. Final grading of the subgrade should be carefully controlled so that the design cross slopes are maintained and low spots in subgrade which would trap water are eliminated. Seals should be provided between curb and pavement and in all joints to reduce the possibility of water leaking under the pavement.

Routine maintenance is necessary to achieve long-term life of the pavement. If the design and construction recommendations cannot be followed or anticipated loadings are different than those we have assumed, we should be contacted to review our recommendations.

CONCRETE

Water soluble sulfates can attack concrete and destroy the integrity and strength of concrete members which come in contact with the soils. Water soluble sulfate tests on soil samples from the site indicate sulfate concentrations

between 5,100 and 23,000 part per million. This concentration is considered high and can be detrimental to concrete which comes in contact with the soils. We suggest Type V cement and a maximum water cement ratio of 0.45 be used in concrete which comes in contact with the soils.

SURFACE DRAINAGE

Performance of pavements, concrete flatwork and foundations are influenced by moisture conditions in the subsoils. Preliminary plans show much of the area adjacent to the structure will be paved. A good seal should be placed and maintained between the building walls and the pavement and the pavement surface should be sloped away from the buildings to cause rapid run-off of water away from the buildings. Roof run-off should be collected in downspouts and drained away from the buildings. Roof downspouts and drains should discharge well beyond the limits of all backfill. Splash blocks and downspout extentions should be provided. Water should not be allowed to pond over pavements or adjacent to the buildings. Concrete pans to control water flow divertions and promote rapid run-off of water from pavements should be used.

LIMITATIONS

Our test holes were spaced to obtain a reasonably accurate picture of underground conditions at the site. Variations of the subsurface conditions not indicated by our test holes will occur at this site. We recommend our firm be retained to perform the required material testing and construction observations during construction.

We appreciate the opportunity to work with you on this project. If you have questions, please call.

CTL/THOMPSON, INC.

John Mechling
Geotechnical Engineer

Reviewed by:

Frank J. Holliday, P.E.
Principal Engineer

COLORADO REGISTERED FRANK J. HOLLIDAY 6785 PROFESSIONAL ENGINEER

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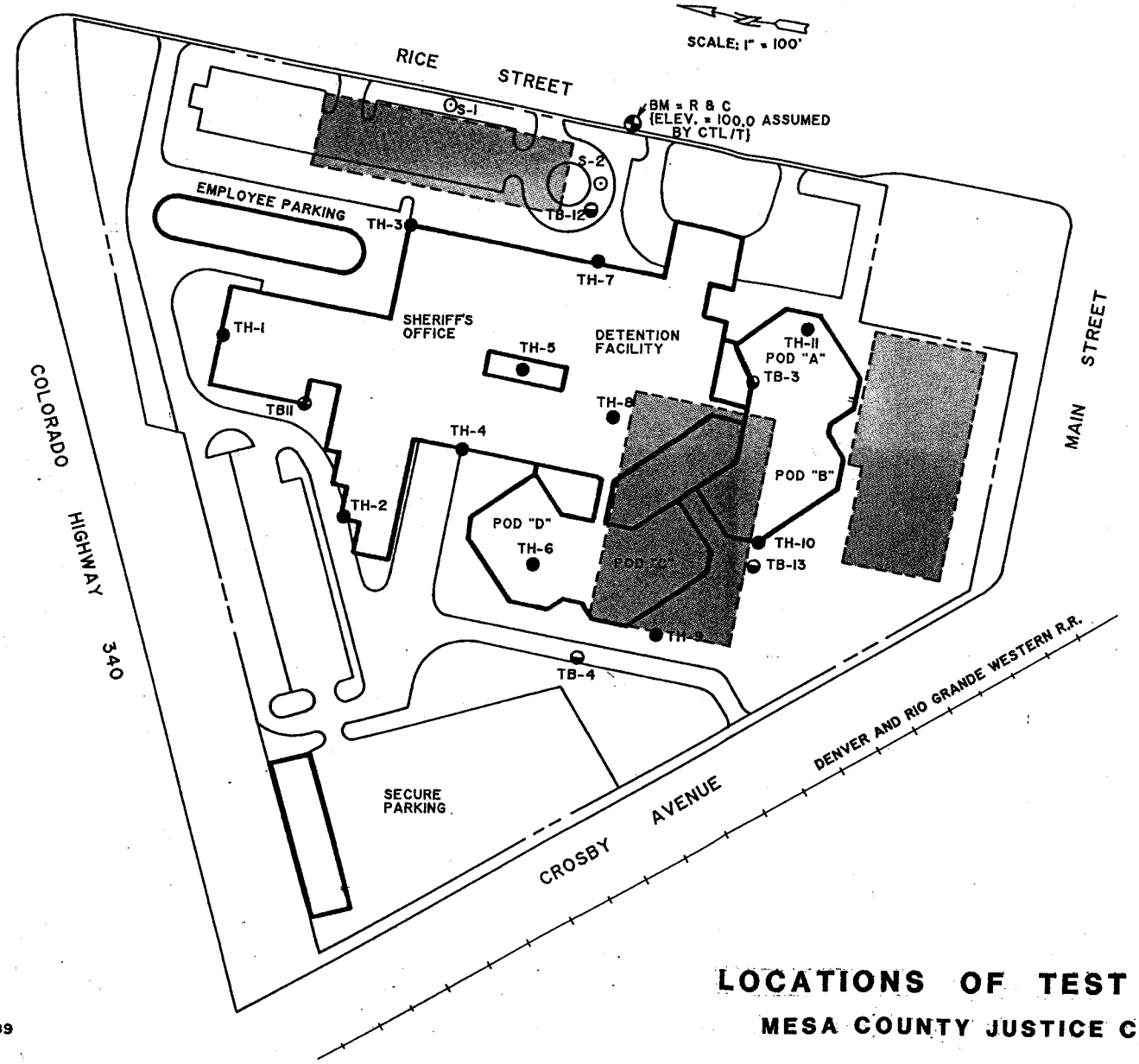
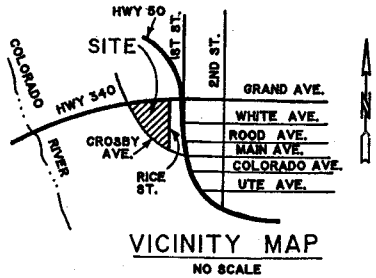




VICINITY MAP

NO SCALE

LEGEND:

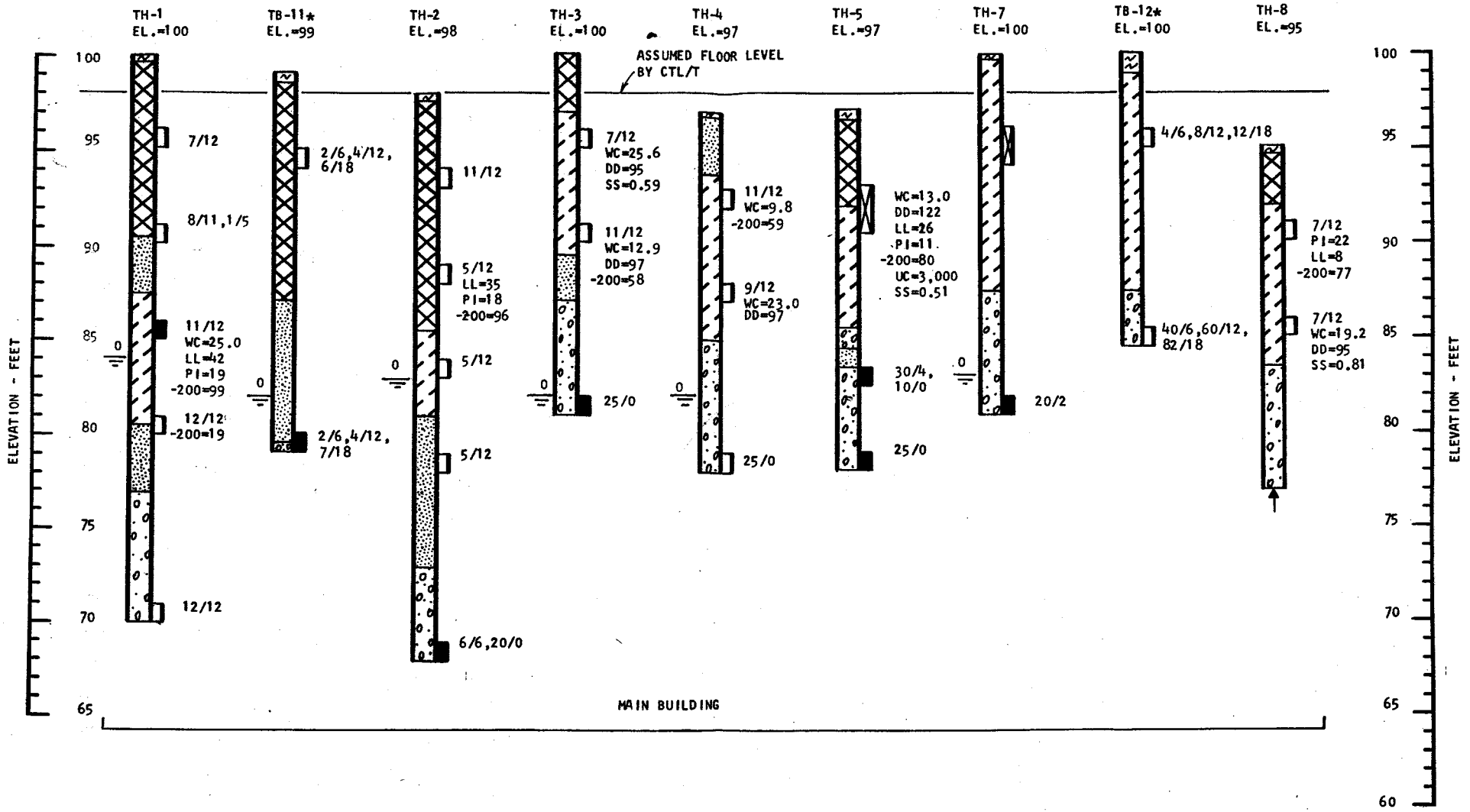
- TH-5 ● INDICATES LOCATION OF TEST HOLE DRILLED BY CTL/T.
- TB-13 ◒ INDICATES LOCATION OF TEST HOLE DRILLED BY LINCOLN DEVORE.
- S-4 ⊙ INDICATES LOCATION OF TEST HOLE DRILLED FOR PAVEMENT SUBGRADE INVESTIGATION.
- INDICATES EXISTING BUILDING LOCATION (NO BASEMENT)

LOCATIONS OF TEST HOLES

MESA COUNTY JUSTICE CENTER

JOB NO. 16,889

FIG. 1

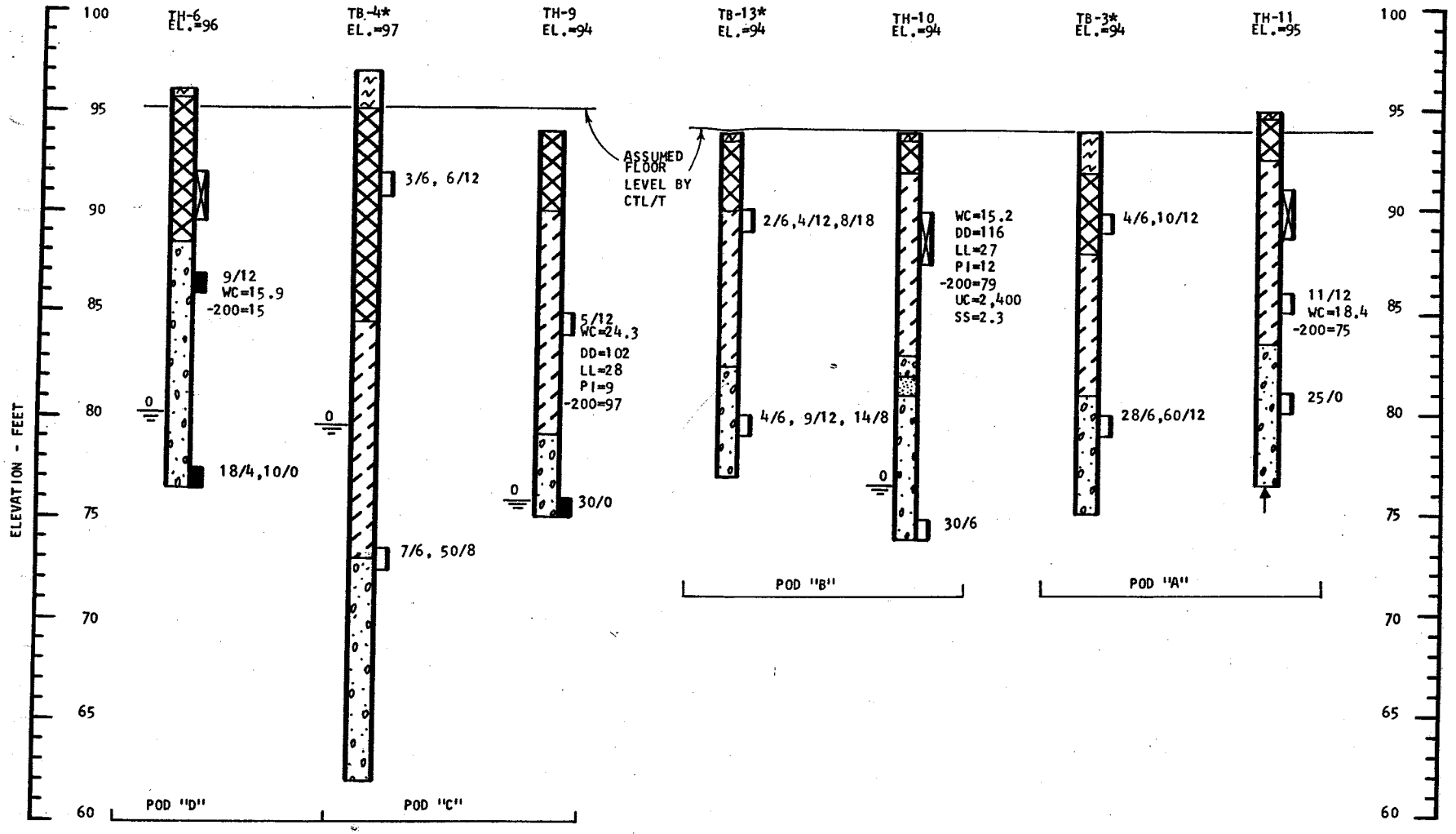


SUMMARY LOGS OF TEST HOLES

MESA COUNTY JUSTICE CENTER

JOB NO. 16,889

FIG. 2

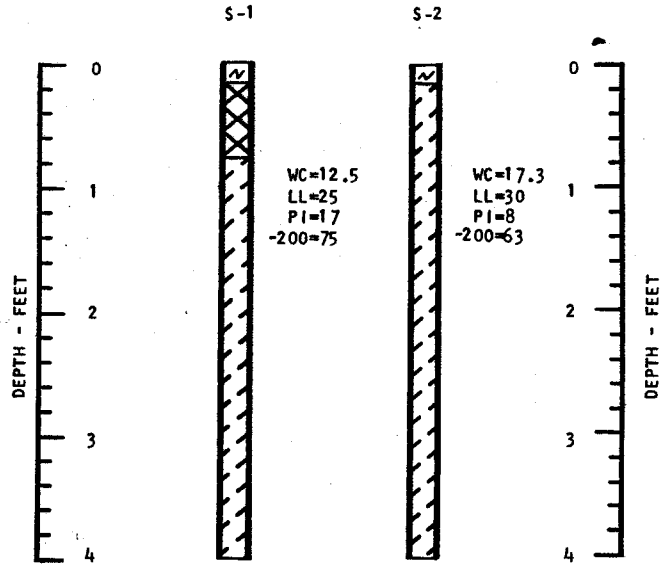


SUMMARY LOGS OF TEST HOLES

MESA COUNTY JUSTICE CENTER

JOB NO. 16,889

FIG. 3



NOTES:

1. OUR TEST HOLES WERE DRILLED APRIL 27 AND 28, 1990 WITH A 4-INCH DIAMETER CONTINUOUS FLIGHT POWER AUGER.

2. ELEVATIONS ARE APPROXIMATE. THEY WERE OBTAINED WITH A HAND LEVEL AND REFER TO BENCHMARK SHOWN ON FIG. 1.

3. THESE LOGS ARE SUBJECT TO THE EXPLANATIONS, LIMITATIONS AND CONCLUSIONS AS CONTAINED IN THIS REPORT.

4. WC-INDICATES NATURAL MOISTURE CONTENT (%)
   DD-INDICATES DRY DENSITY (PCF)
   LL-INDICATES LIQUID LIMIT (%)
   PI-INDICATES PLASTICITY INDEX (%)
   -200-INDICATES PERCENT PASSING THE NO. 200 SIEVE
   UC-INDICATES UNCONFINED COMPRESSIVE STRENGTH (PSF)
   SS-INDICATES WATER SOLUBLE SULFATE CONCENTRATIONS (%)

LEGEND:

FILL, AGGREGATE BASE COURSE (MAN-MADE FILL)

FILL, CLAY, SANDY, COAL WASTE, DEBRIS (EG. GLASS, WEEDS, BRICK ETC). VERY SOFT TO MEDIUM STIFF, MOIST TO VERY MOIST, BLACK, BROWN (MAN-MADE FILL)

CLAY, SANDY TO SILTY, SAND LENSES, ROOTS BELOW FILL AREAS, SOFT TO MEDIUM STIFF, MOIST TO WET, GRAY-BROWN, BROWN (CL)

SAND, CLEAN TO SILTY, CLAY LENSES, VERY LOOSE TO MEDIUM DENSE, MOIST TO WET, TAN (SP, SP-SM, SM)

GRAVEL, COBBLY, SANDY, DENSE, MOIST TO WET, TAN, TAN-BROWN (GP)

DRIVE SAMPLE. THE SYMBOL 7/12 INDICATES 7 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE A 2.5-INCH O.D. SAMPLER 12 INCHES.

DRIVE SAMPLE. THE SYMBOL 11/12 INDICATES 11 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE A 2.0-INCH O.D. SAMPLER 12 INCHES.

INDICATES THIN WALLED PUSH SAMPLE (SHELBY TUBE SAMPLE)

0 DEPTH TO GROUNDWATER. THE NUMERAL REPRESENTS DAYS AFTER DRILLING OF THE MEASUREMENT.

DEPTH OF PRACTICAL DRILL RIG REFUSAL

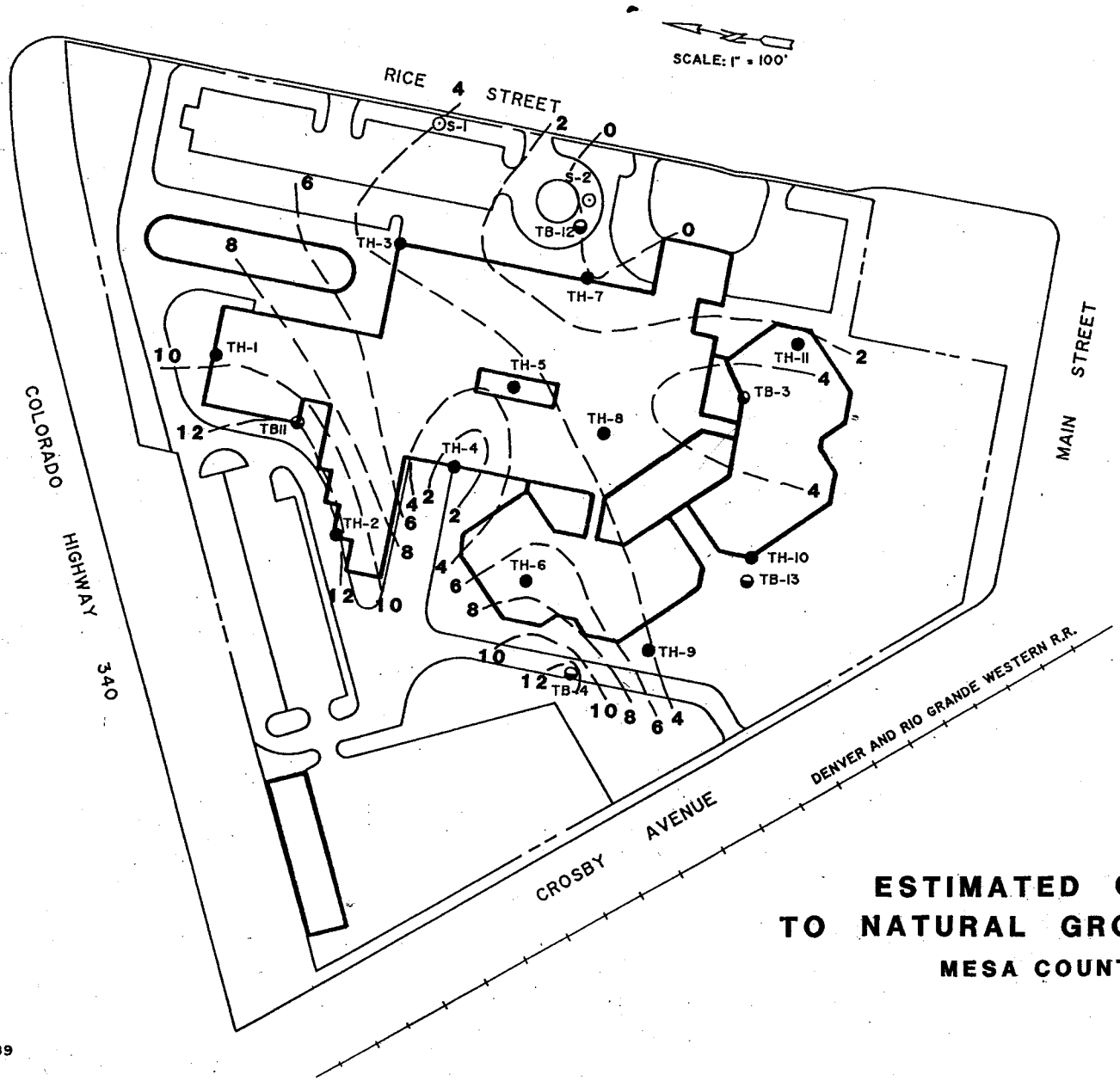
* SUMMARY LOGS OF TEST HOLES DRILLED FOR A PREVIOUS INVESTIGATION BY LINCOLN DEVORE. PENETRATION RESISTANCE VALUES ARE CUMULATIVE.

SUMMARY LOGS OF TEST HOLES

MESA COUNTY JUSTICE CENTER

JOB NO. 16,889

FIG. 4



LEGEND:

—4— DEPTH CONTOUR (2' CONTOUR INTERVAL)

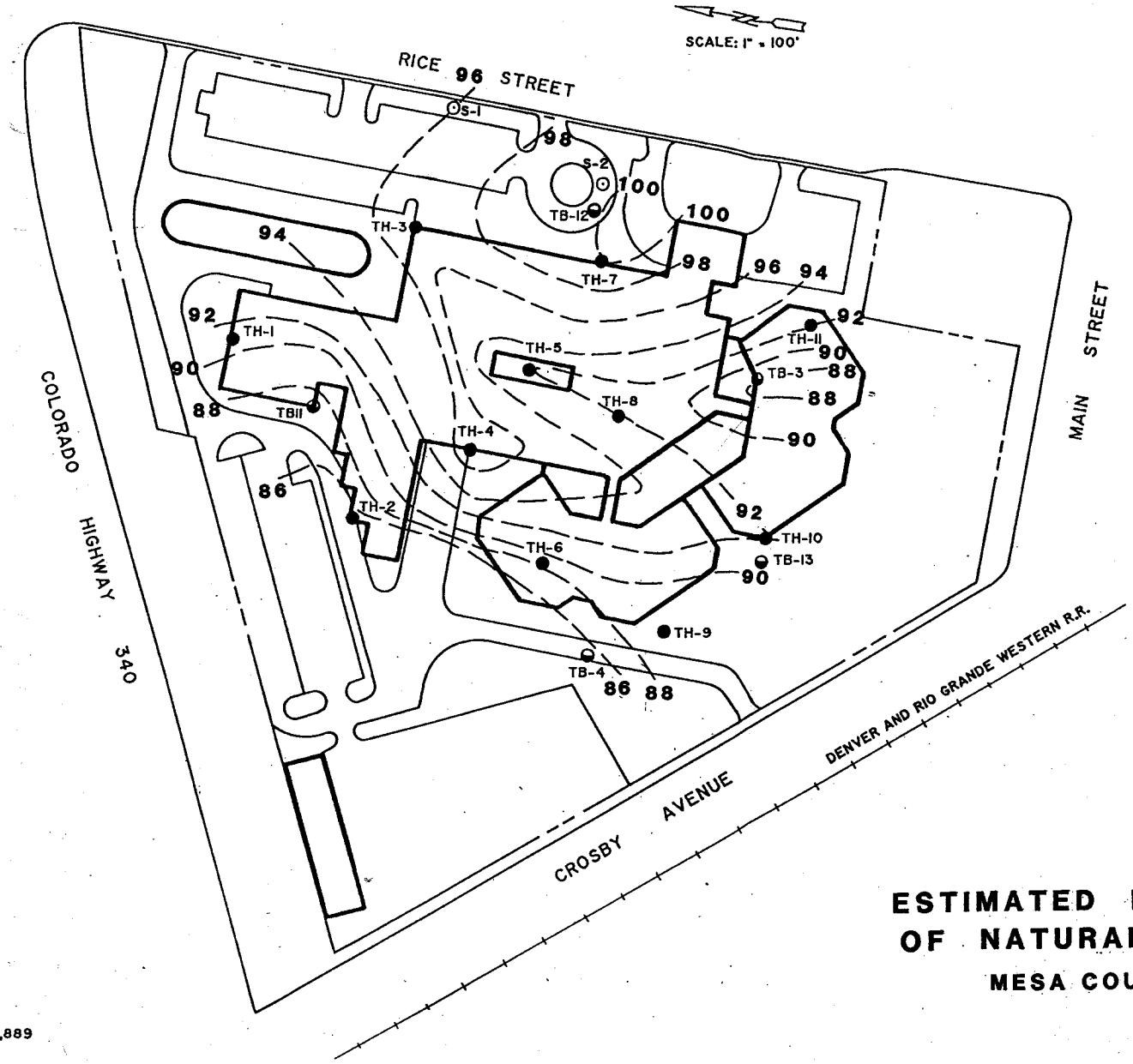
NOTE:
CONTOURS ARE SUBJECTIVE AND BASED ON DATA FROM TEST HOLES.

ESTIMATED CONTOURS OF DEPTH TO NATURAL GROUND (FILL THICKNESS)

MESA COUNTY JUSTICE CENTER

JOB NO. 16,889

FIG. 5



LEGEND:

—90— ELEVATION CONTOUR (2' CONTOUR INTERVAL)

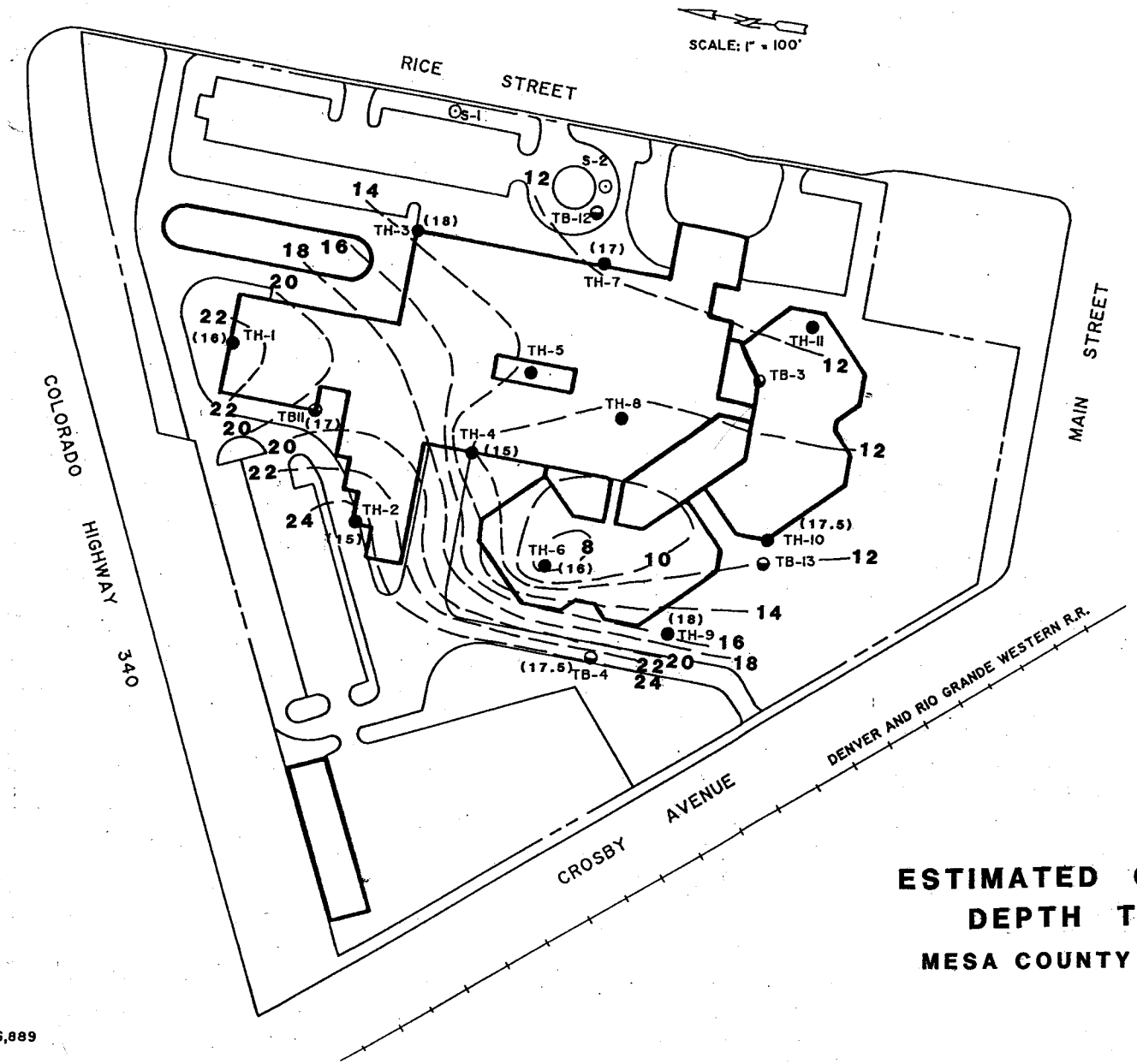
NOTE:
CONTOURS ARE SUBJECTIVE AND BASED ON DATA FROM TEST HOLES.

ESTIMATED ELEVATION CONTOURS OF NATURAL GROUND SURFACE

MESA COUNTY JUSTICE CENTER

JOB NO. 16,889

FIG. 6



LEGEND:

—10— DEPTH CONTOUR (2' CONTOUR INTERVAL)

NOTE:
CONTOURS ARE SUBJECTIVE AND BASED ON DATA FROM TEST HOLES.

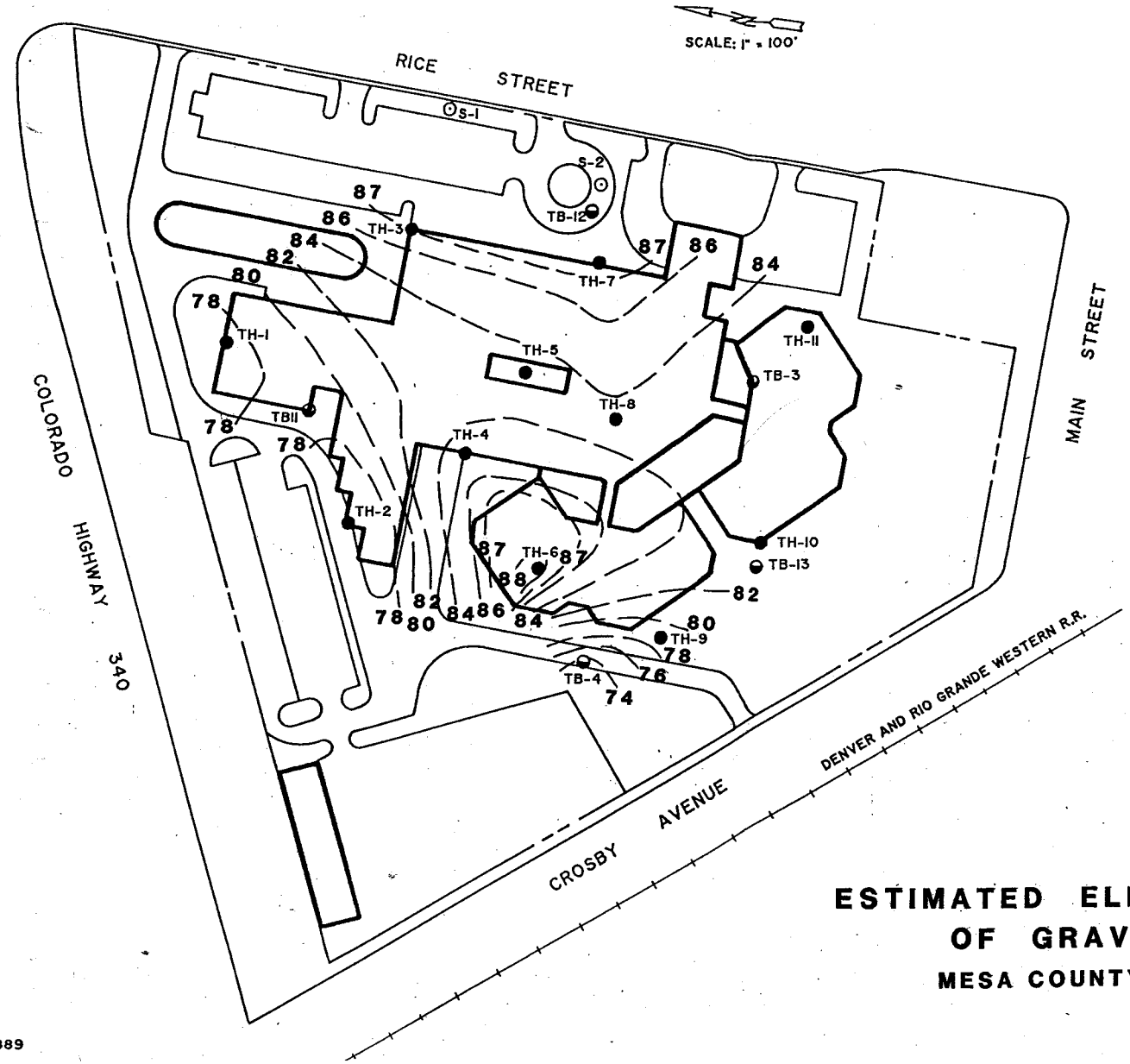
(16) DEPTH (FEET) AT WHICH GROUNDWATER WAS MEASURED IN TEST HOLE AT DRILLING.

ESTIMATED CONTOURS OF DEPTH TO GRAVEL

MESA COUNTY JUSTICE CENTER

JOB NO. 16,889

FIG. 7



LEGEND:

—80— ELEVATION CONTOUR (2' CONTOUR INTERVAL EXCEPT 86 TO 87)

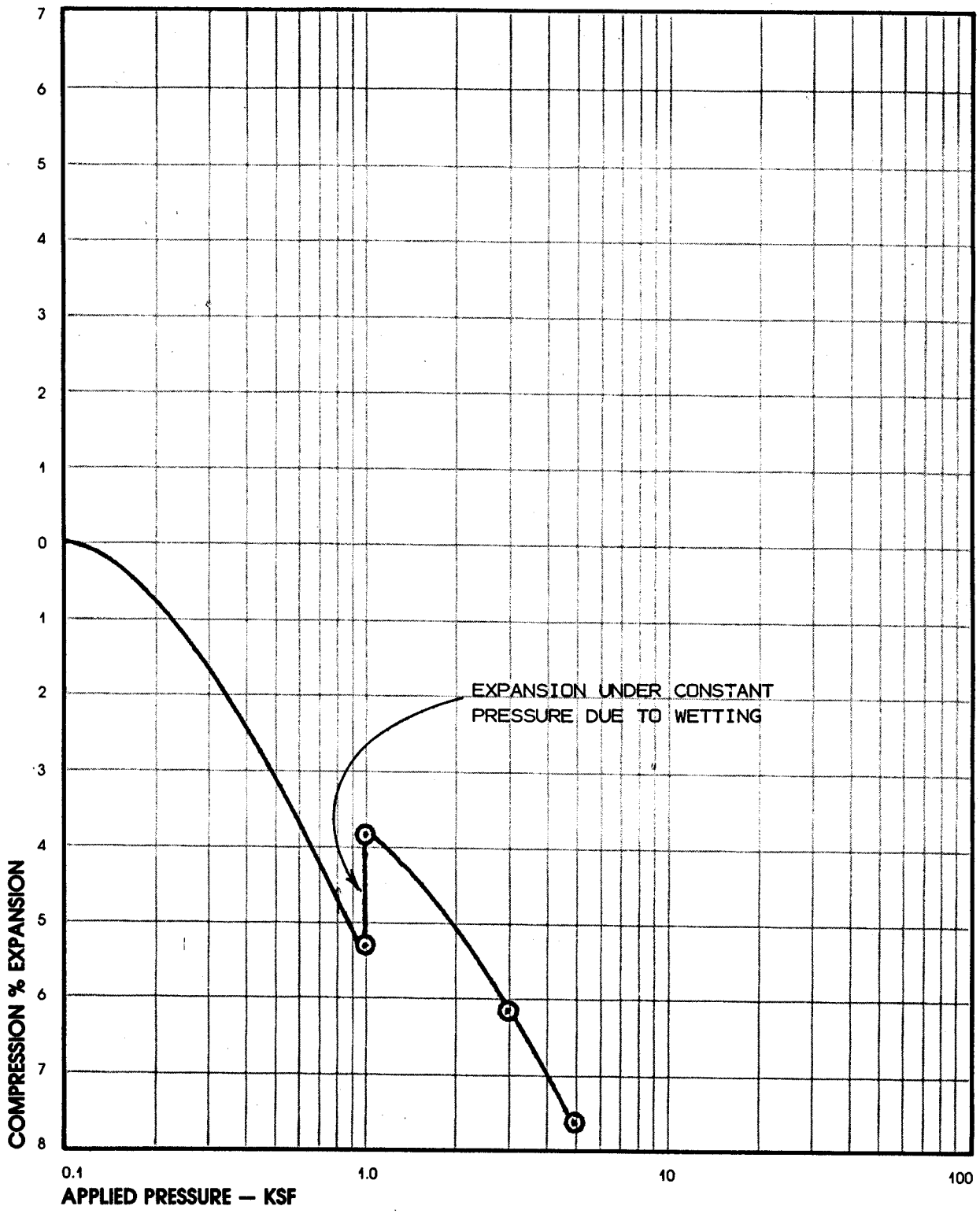
NOTE:
CONTOURS ARE SUBJECTIVE AND BASED ON DATA FROM TEST HOLES.

ESTIMATED ELEVATION CONTOURS OF GRAVEL SURFACE

MESA COUNTY JUSTICE CENTER

JOB NO. 16,889

FIG. 8

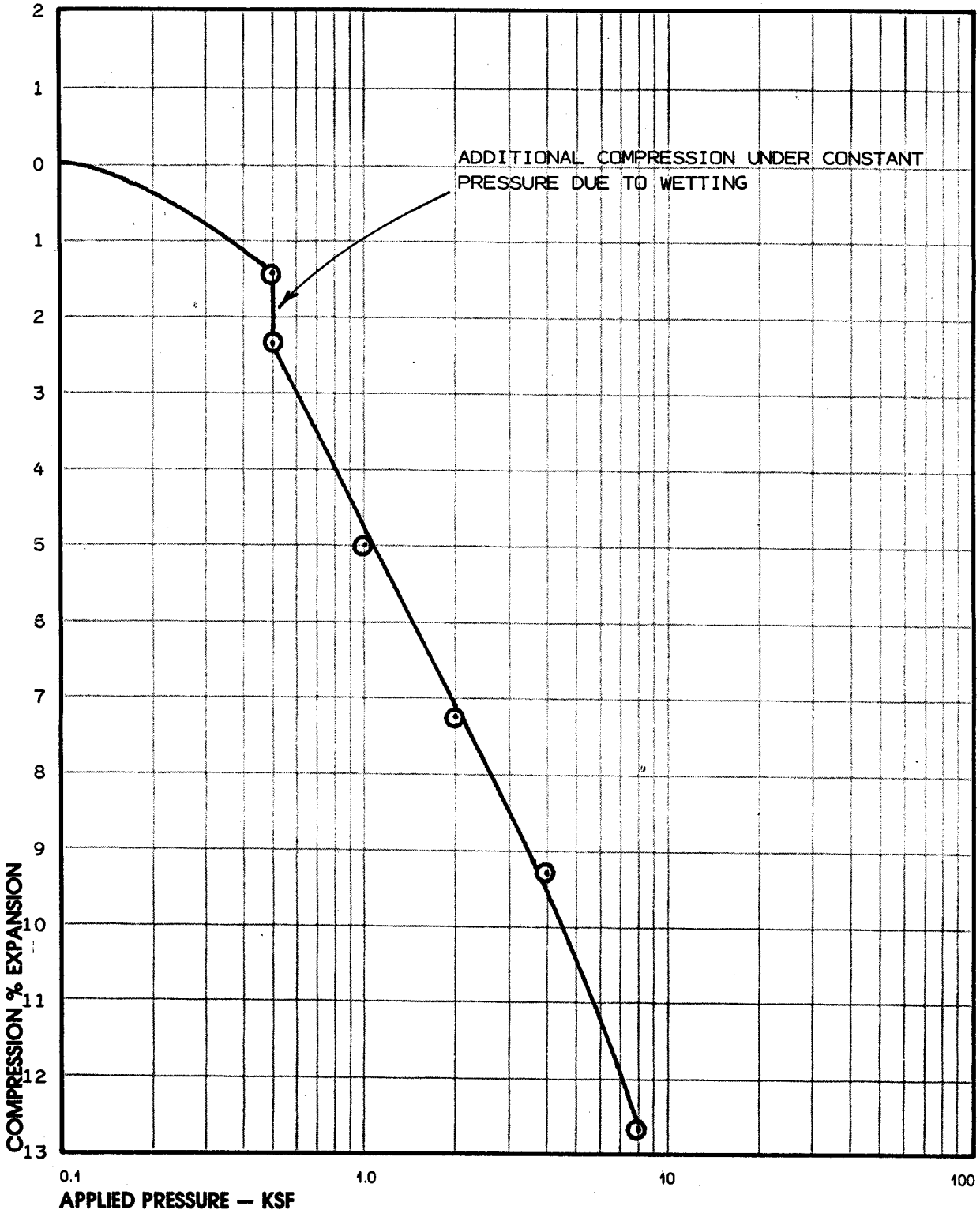


Sample of CLAY, SANDY (CL)
From TH-4 AT 9 FEET

NATURAL DRY UNIT WEIGHT = 97 PCF
NATURAL MOISTURE CONTENT = 23.0 %

JOB NO. 16,889

Swell Consolidation Test Results FIG. 9

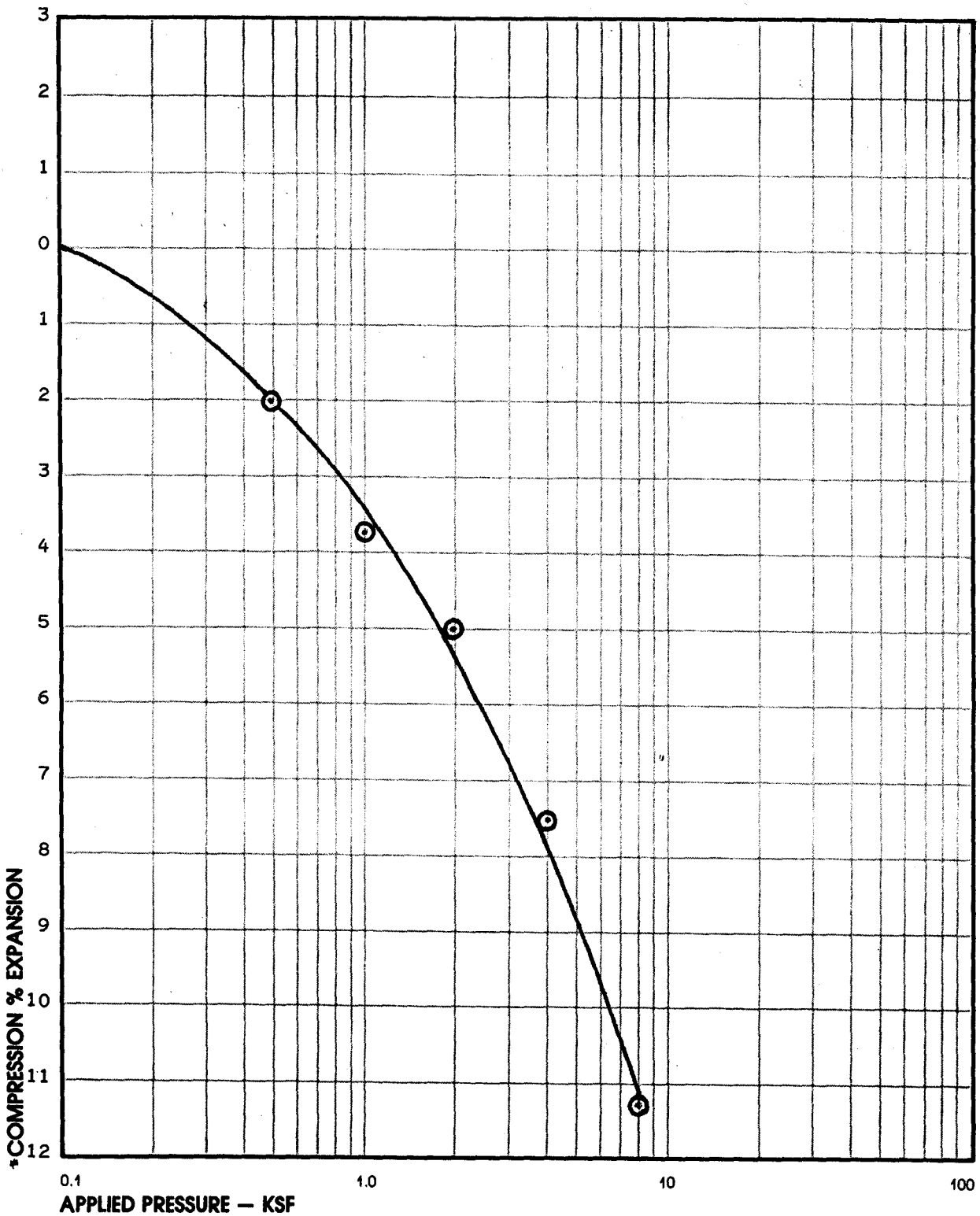


Sample of CLAY, SANDY (CL)
From TH-5 AT 4.0 TO 6.5 FEET

NATURAL DRY UNIT WEIGHT = 122 PCF
NATURAL MOISTURE CONTENT = 13.0 %

JOB NO. 16,889

Swell Consolidation Test Results FIG. 10

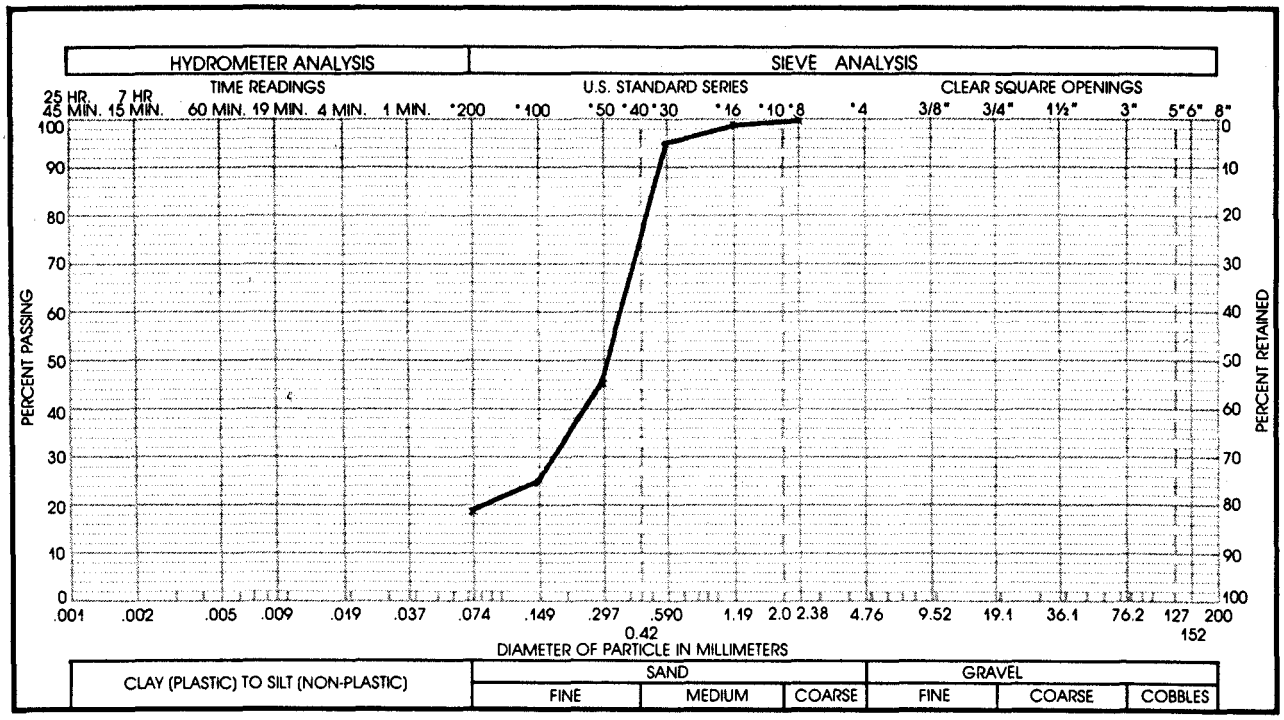


Sample of CLAY, SANDY (CL)
From TH-10 AT 4.0 TO 6.5 FEET

NATURAL DRY UNIT WEIGHT = 116 PCF
NATURAL MOISTURE CONTENT = 15.2 %

JOB NO. 16,889

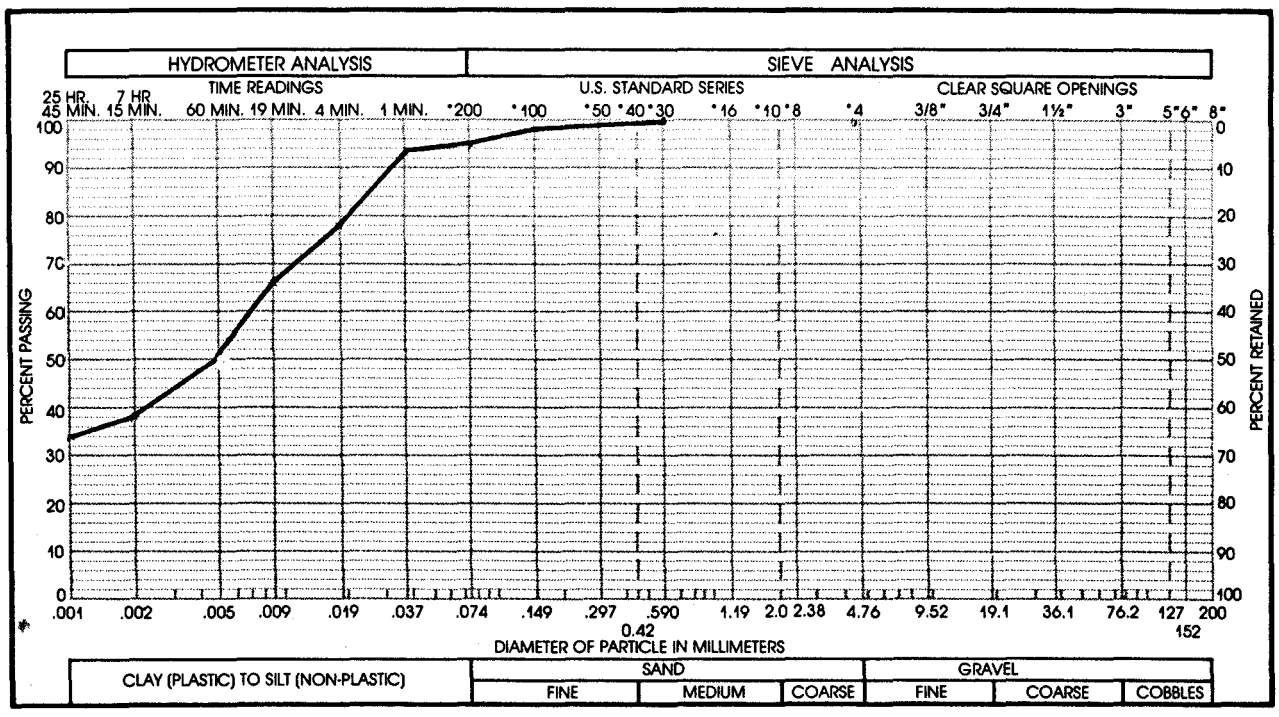
Swell Consolidation Test Results FIG. 11



Sample of SAND, SILTY (SM) GRAVEL 0 % SAND 81 %

From TH-1 AT 19 FEET SILT & CLAY 19 % LIQUID LIMIT ____ %

PLASTICITY INDEX ____ %



Sample of CLAY, SANDY (CL) GRAVEL 0 % SAND 4 %

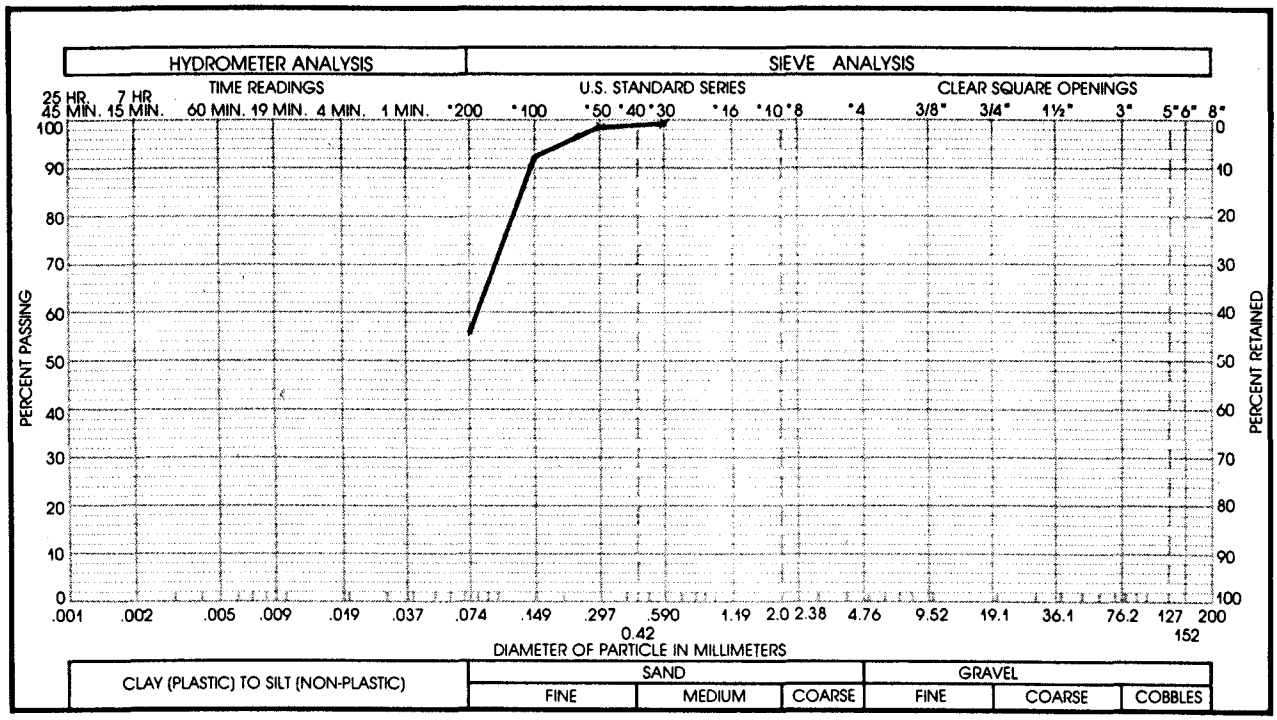
From TH-2 AT 9 FEET SILT & CLAY 96 % LIQUID LIMIT 35 %

PLASTICITY INDEX 18 %

Gradation Test Results

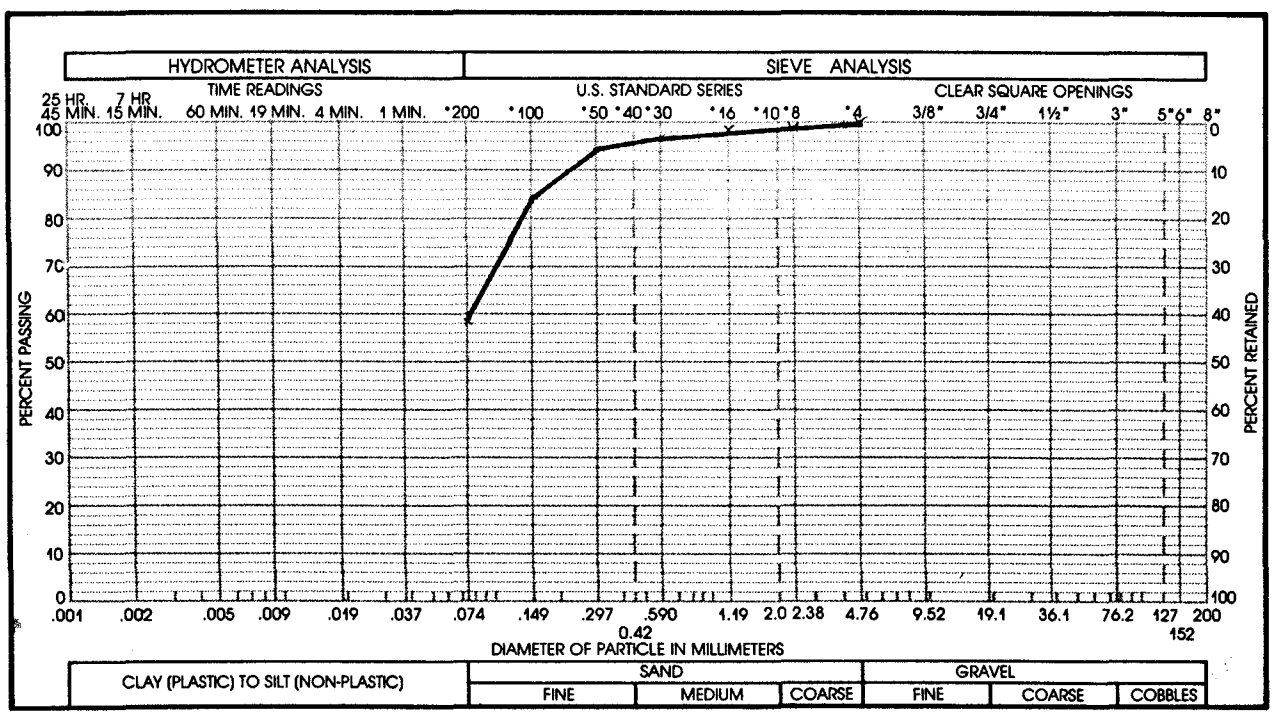
JOB NO. 16,889

FIG. 12



Sample of CLAY, SANDY (CL)
From TH-3 AT 9 FEET

GRAVEL 0 % SAND 42 %
SILT & CLAY 58 % LIQUID LIMIT – %
PLASTICITY INDEX – %



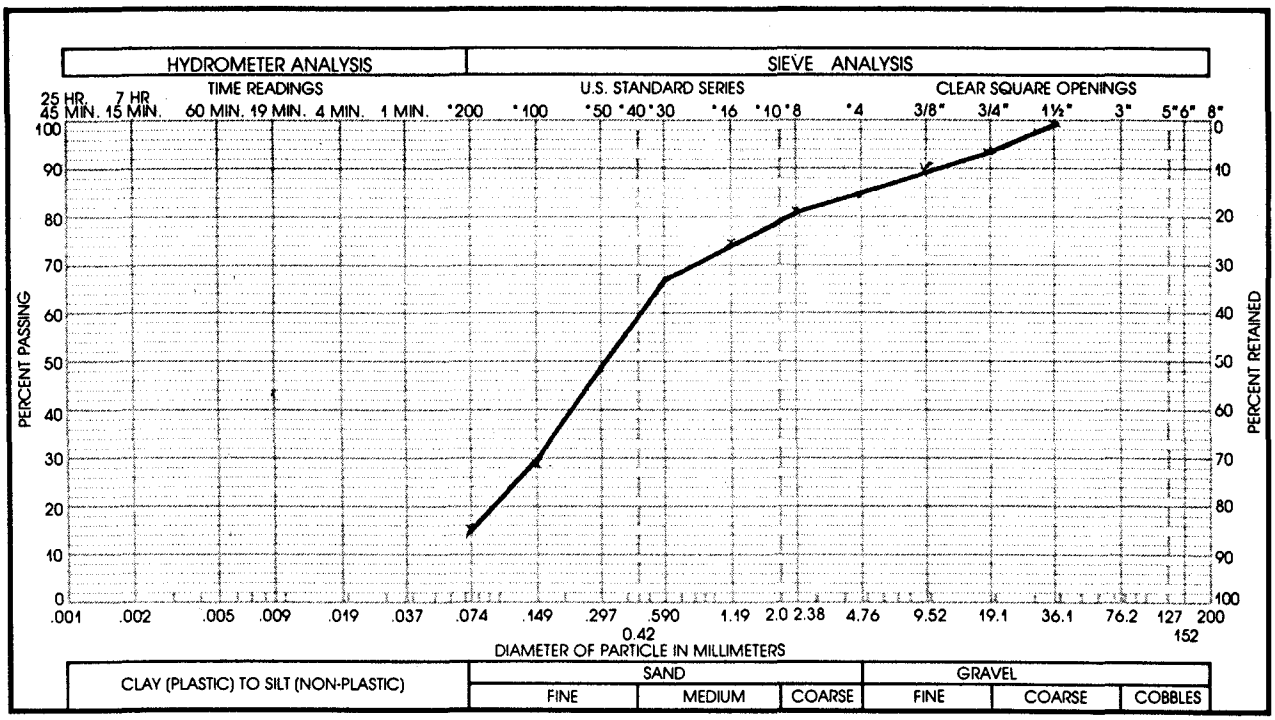
Sample of CLAY, SANDY (CL)
From TH-4 AT 4 FEET

GRAVEL 0 % SAND 41 %
SILT & CLAY 59 % LIQUID LIMIT – %
PLASTICITY INDEX – %

Gradation Test Results

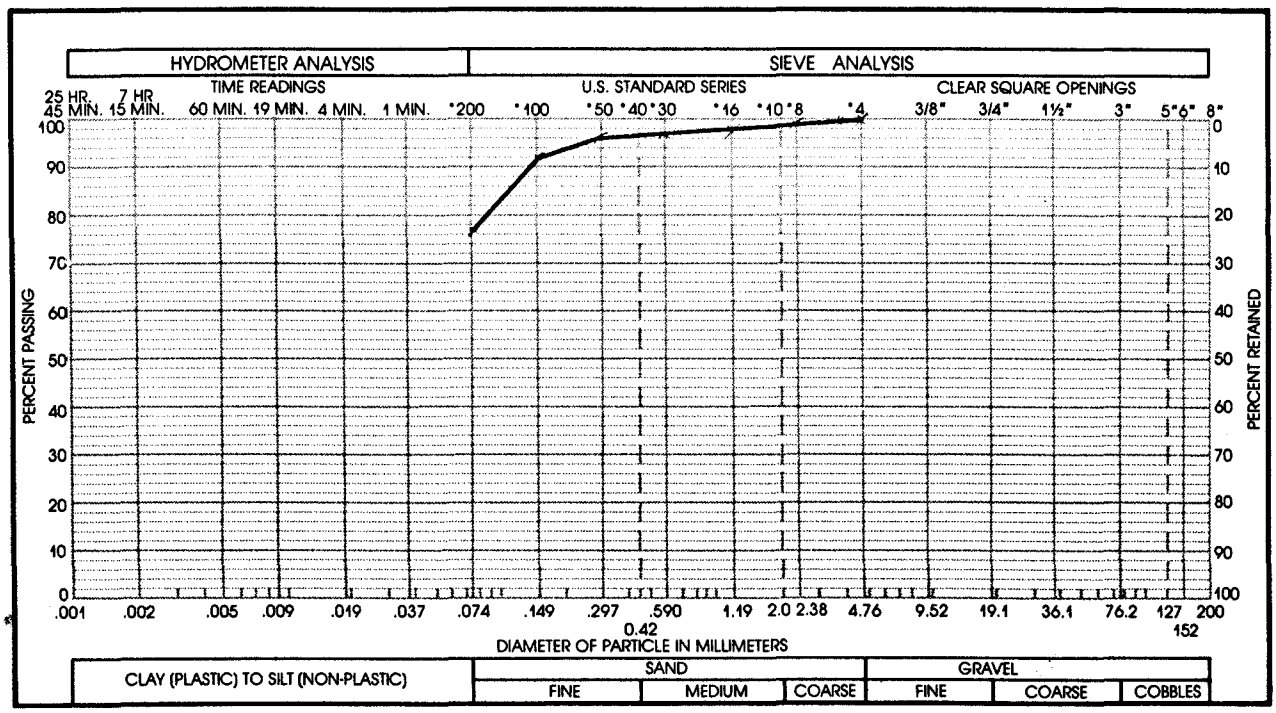
JOB NO. 16,889

FIG. 13



Sample of SAND, SILTY, SOME GRAVEL (SM)
From TH-6 AT 9 FEET

GRAVEL 15 % SAND 70 %
SILT & CLAY 15 % LIQUID LIMIT – %
PLASTICITY INDEX – %



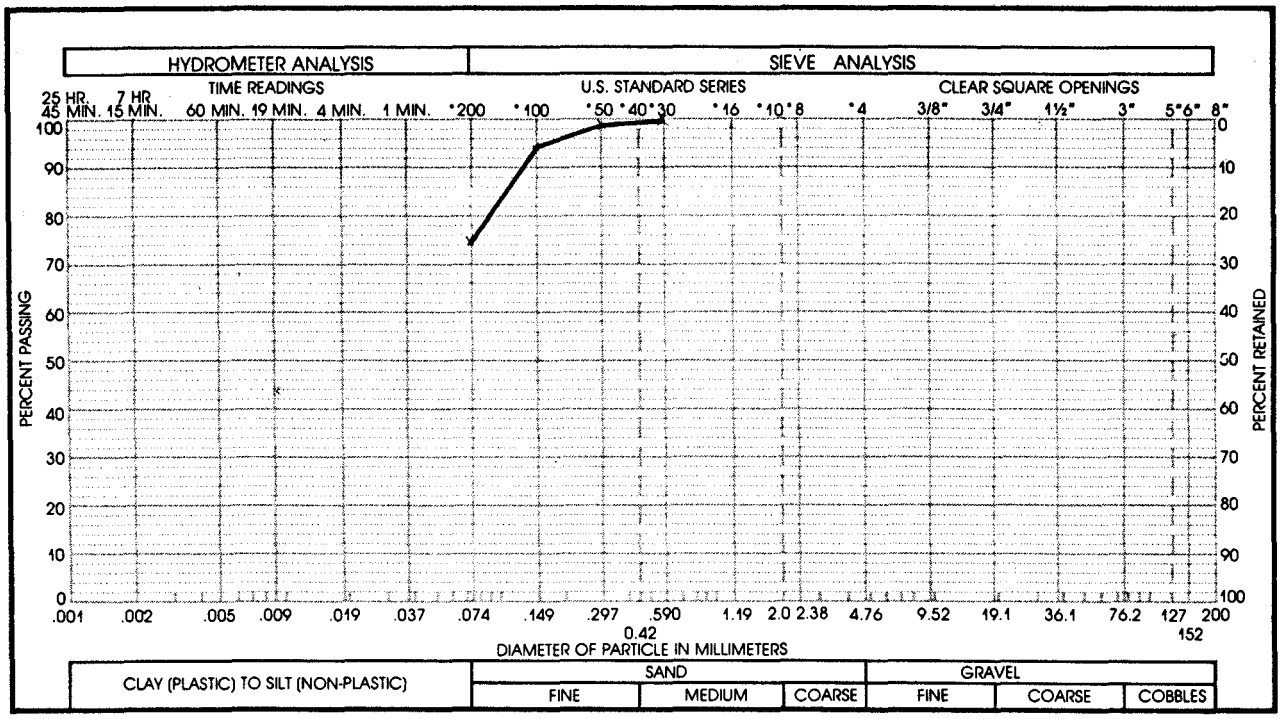
Sample of CLAY, SANDY TO SILTY (CL)
From TH-8 AT 4 FEET

GRAVEL 0 % SAND 23 %
SILT & CLAY 77 % LIQUID LIMIT 22 %
PLASTICITY INDEX 8 %

Gradation Test Results

JOB NO. 16,889

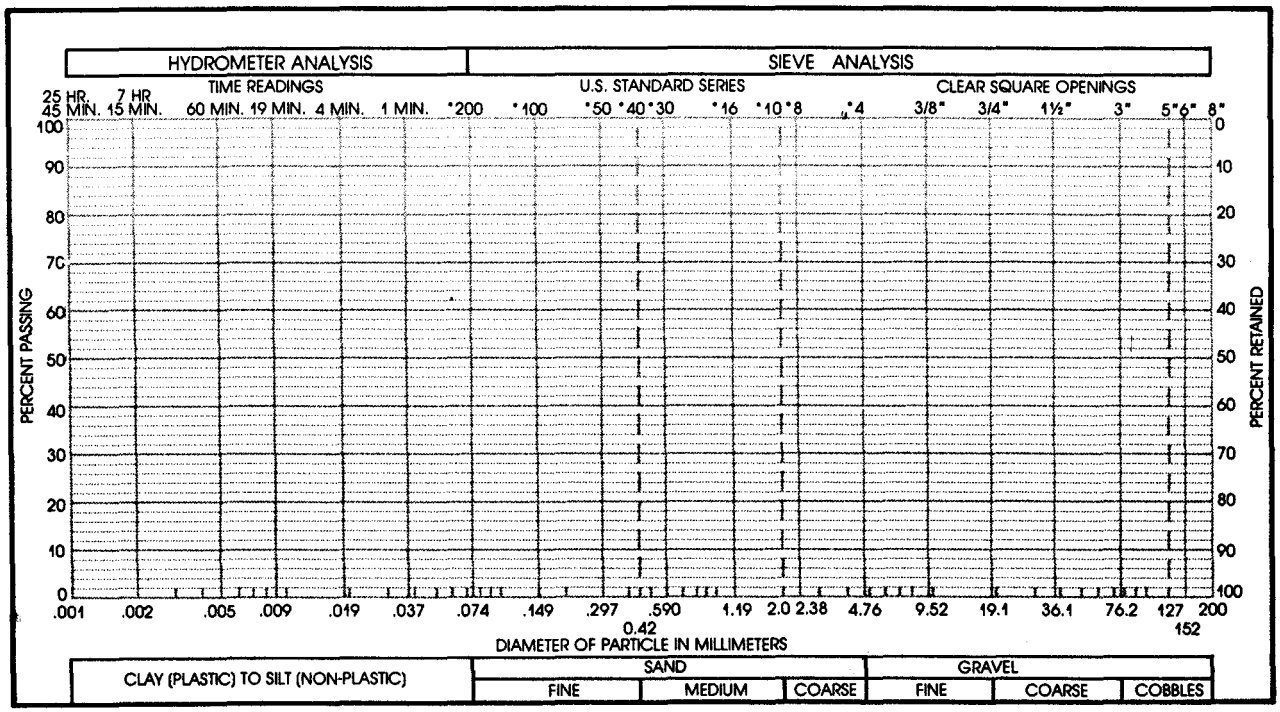
FIG. 14



Sample of CLAY, SANDY (CL) GRAVEL -0 % SAND 25 %

From TH-11 AT 9 FEET SILT & CLAY 75 % LIQUID LIMIT – %

PLASTICITY INDEX – %



Sample of _____ GRAVEL _____ % SAND _____ %

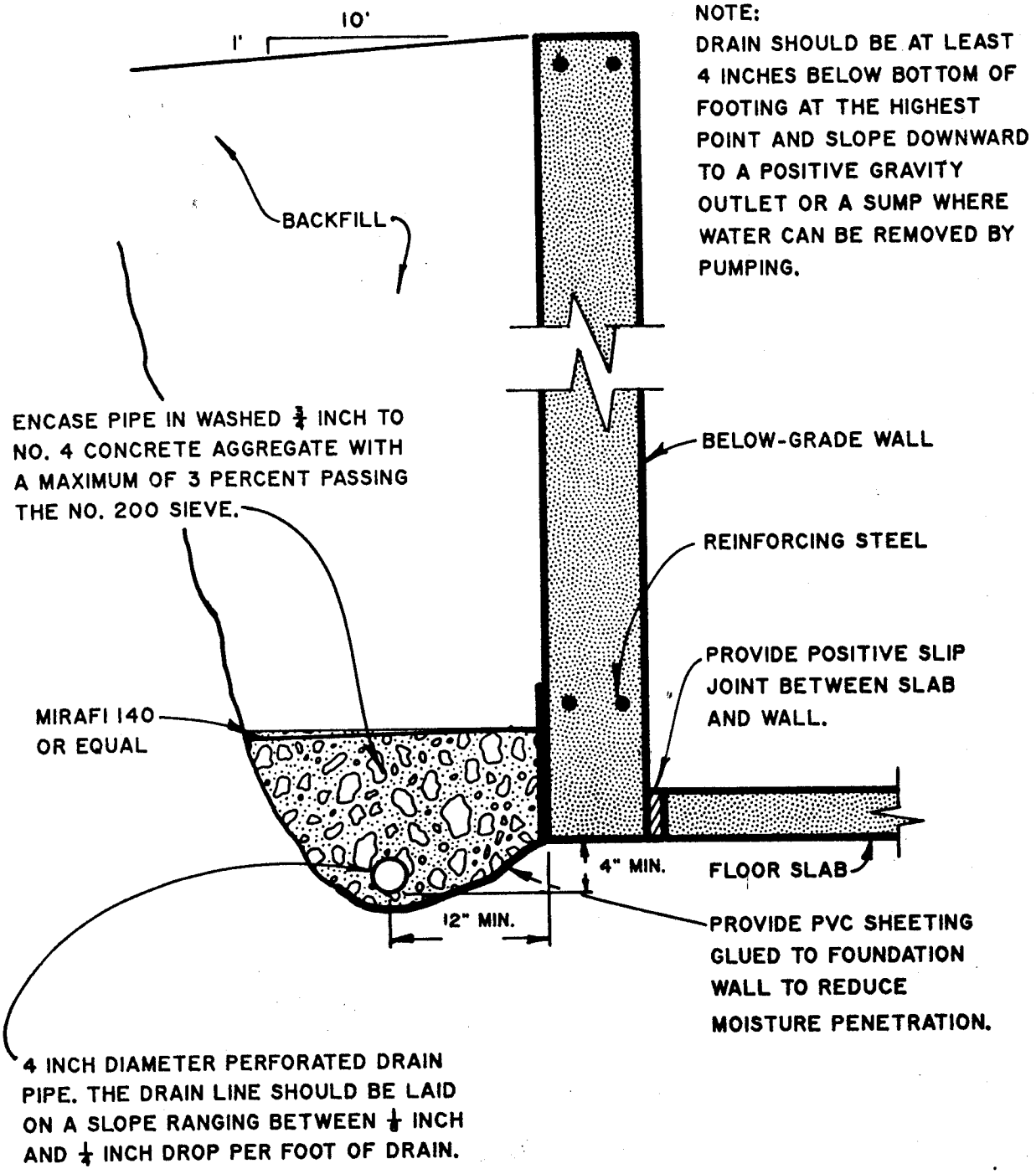
From _____ SILT & CLAY _____ % LIQUID LIMIT _____ %

PLASTICITY INDEX _____ %

Gradation Test Results

JOB NO. 16,889

FIG. 15



EXTERIOR FOUNDATION WALL DRAIN

JOB NO. 16,889

FIG. 16

JOB NO. 16,889

TABLE I

SUMMARY OF LABORATORY TEST RESULTS

HOLE	DEPTH (FEET)	NATURAL MOISTURE (%)	NATURAL DENSITY (pcf)	ATTERBERG LIMITS		UNCONFINED COMPRESSIVE STRENGTH (psf)	SOLUBLE SULFATES		PASSING NO. 200 SIEVE (%)	SOIL TYPE
				LIQUID LIMIT (%)	PLASTICITY INDEX (%)		(%)	(PPM)		
TH-1	14	25.0		42	19				99	CLAY, SANDY (CL)
	19								19	SAND, SILTY (SM)
TH-2	9			35	18				96	FILL, CLAY, SANDY
TH-3	4	25.6		95			0.59	5,900		CLAY, SANDY (CL)
	9	12.9		97					58	CLAY, SANDY (CL)
TH-4	9.8								59	CLAY, SANDY (CL)
	9	23.0	97							CLAY, SANDY (CL)
TH-5	4.0-6.5	13.0	122	26	11	3,000	0.51	5,100	80	CLAY, SANDY (CL)
TH-8	4			22	8				77	CLAY, SANDY (CL)
	9	19.2	95				0.81	8,100		CLAY, SANDY (CL)
TH-6	9	15.9							15	SAND, SILTY (SM)
TH-9	9	24.3	102	28	9				97	CLAY, SANDY (CL)
TH-10	4.0-6.5	15.2	116	27	12	2,400	2.30	23,000	79	CLAY, SANDY (CL)
TH-11	9	18.4							75	CLAY, SANDY (CL)
S-1	0.5-4.0	12.5		25	17				75	CLAY, SANDY (CL)
S-2	0.5-4.0	17.3		30	8				63	CLAY, SANDY (CL)

MESA COUNTY JUSTICE CENTER

TRAFFIC IMPACT ANALYSIS

rec'd 8/23/90

MESA COUNTY
PROJECT MANAGEMENT

MESA COUNTY, COLORADO

August 1990

HDR

MESA COUNTY JUSTICE CENTER

TRAFFIC IMPACT ANALYSIS

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August 1990

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SUMMARY

The Mesa County Justice Center is to be developed on the western edge of the CBD street grid and immediately south of SH 340. The proposed campus development will consist of approximately 14.5 acres and will be developed in two phases:

Phase I	Detention Facility and Sheriff's Office
Phase II	District Courts, County Courts, District Attorney's Office, Probation and the Victim/Witness Program.

The site is bordered by SH 340 on the north, Rice Street on the east, Colorado Avenue on the south, and Crosby Avenue and the Denver Rio Grande Western Railroad on the west.

The traffic impact analysis has been developed using the criteria established by Mesa County, the City of Grand Junction and applying normally accepted traffic engineering fundamentals and practices. Access into the Justice Center Campus is anticipated to be at the intersections of First Street and Main Street and at SH 340 and Rice Street. The trip generation associated with the development was developed from existing data which had been accumulated by various agencies and departments within Mesa County.

The intersections of First Street and Main Street, First Street and Rood Avenue and First Street and Grand Avenue will function at the same level of service during the PM peak hour as they do currently. The intersection of SH 340 and Rice Street will not require traffic signals when the campus has been completely developed.

The Rice Street right-of-way can be vacated to Mesa County, along with Main Street from the west side of Spruce Street to Crosby, and become a part of the internal campus street system. Rice Street will be realigned to match with Mulberry Street to he north. Crosby Avenue could be relocated to align with Colorado Avenue. And, Rood Avenue could become a T intersection when the campus is completed.

INTRODUCTION

Purpose

The purpose of this traffic impact analysis is to forecast the travel demand associated with the new Mesa County Justice Center. There will be several activities contained within this campus when the complex is completed. The activities which will be a part of the campus include; detention facilities, Sheriff's office, District Attorney's office, District Court, County Courts, Probation and the Victim/Witness Program. Phase one of the project will involve only the detention facilities and the Sheriff's office. The addition of the other activities will occur at a later date, possibly by 1996. This traffic impact analysis includes the impacts of all four of these activities upon the roadway network when they are all completed and operating. The results of this analysis is to identify acceptable levels of service and provide input regarding site planning, traffic operations and potential roadway improvements.

The intersections which have been evaluated in this analysis include; First Street and Main Street, First Street and Rood Avenue, First Street and Grand Avenue, and SH 340 and Rice Street/Mulberry Street. These intersections were identified in communications with City of Grand Junction, Mesa County and Colorado Department of Highways representatives. The locations were ones which have the most effect upon the quality of traffic movement in the area of the campus and which will be most impacted by the traffic generated by this project when it is completed.

Analytical Process

A detailed technical process was used in order to achieve the above objectives. Key steps in the process include:

- Trip Generation - The product of the trip generation analysis is the number of trips to and from each proposed activity within the development. Input includes statistics on the proposed development, (i.e., number of employees, normal hours of occurrence, etc.), and trip generation for each proposed use, (i.e., trips/employee; trips/peak hour period, etc.).

- Trip Distribution - The primary output of trip distribution is the quantification of the "desire" to travel from one location (the origin) to another location (the destination). No route or trip path is implied by the trip distribution process.

- Trips Assignment - The assignment process requires a roadway network be identified such that each trip can be assigned to a specific path connecting each origin-destination pair. The aggregation of all trips assigned to a given link in the roadway network is the final traffic forecast.

- Capacity Analysis - This step consists of determining the physical requirements needed to accommodate the forecasted traffic volumes. The Highway Capacity software is a key tool in this step.

PROJECT DESCRIPTION

Regional Setting

The Mesa County Justice Center is located on the western edge of the City of Grand Junction street grid system, adjacent to the Denver and Rio Grande Western Railroad. The site will have access to the street system primarily at First Street and Main Street and at SH 340/Grand Avenue and Rice Street/Mulberry Street as shown in Figure 1.

Site Characteristics

Upon completion, the Justice Center will become a major anchor for the west side of town. The new facility will replace several vacated and deteriorating structures and will be a major improvement of the general area. The project is compatible with existing and adjacent building zones.

Phase I of the Justice Center is designed to provide space for the Mesa County Sheriff's Department and Detention Facility. The project site is located south of Colorado Highway 340 and bordered by Rice Street, Main Street and Crosby Avenue (Denver and Rio Grand Western). This triangular shaped site contains approximately 10.3 acres that were rezoned by the City of Grand Junction to a public zone on July 8, 1990. It slopes from east to west and falls approximately 10 feet in elevation.

The Phase II site contains approximately 4.2 acres and is intended to be used for a new Judicial Building, currently projected to be under construction in 1995.

Project Phasing

The Detention Facility is designed to house 192 inmates in single cells. Inmate support facilities have been programmed and designed to handle a potential inmate population of 300.

The building is designed and positioned on the property to enable Mesa County to add a maximum of three (3) housing modules, should additional bed capacity be needed in the future. Design of the current housing module contains 96 single cells.

Project Schedule

It is Mesa County's goal to complete construction of the Justice Center by December of 1991. The Architect was authorized to begin work on December 19, 1989, and is developing the design of the project at an accelerated pace to help Mesa County achieve this goal.

TABLE 1

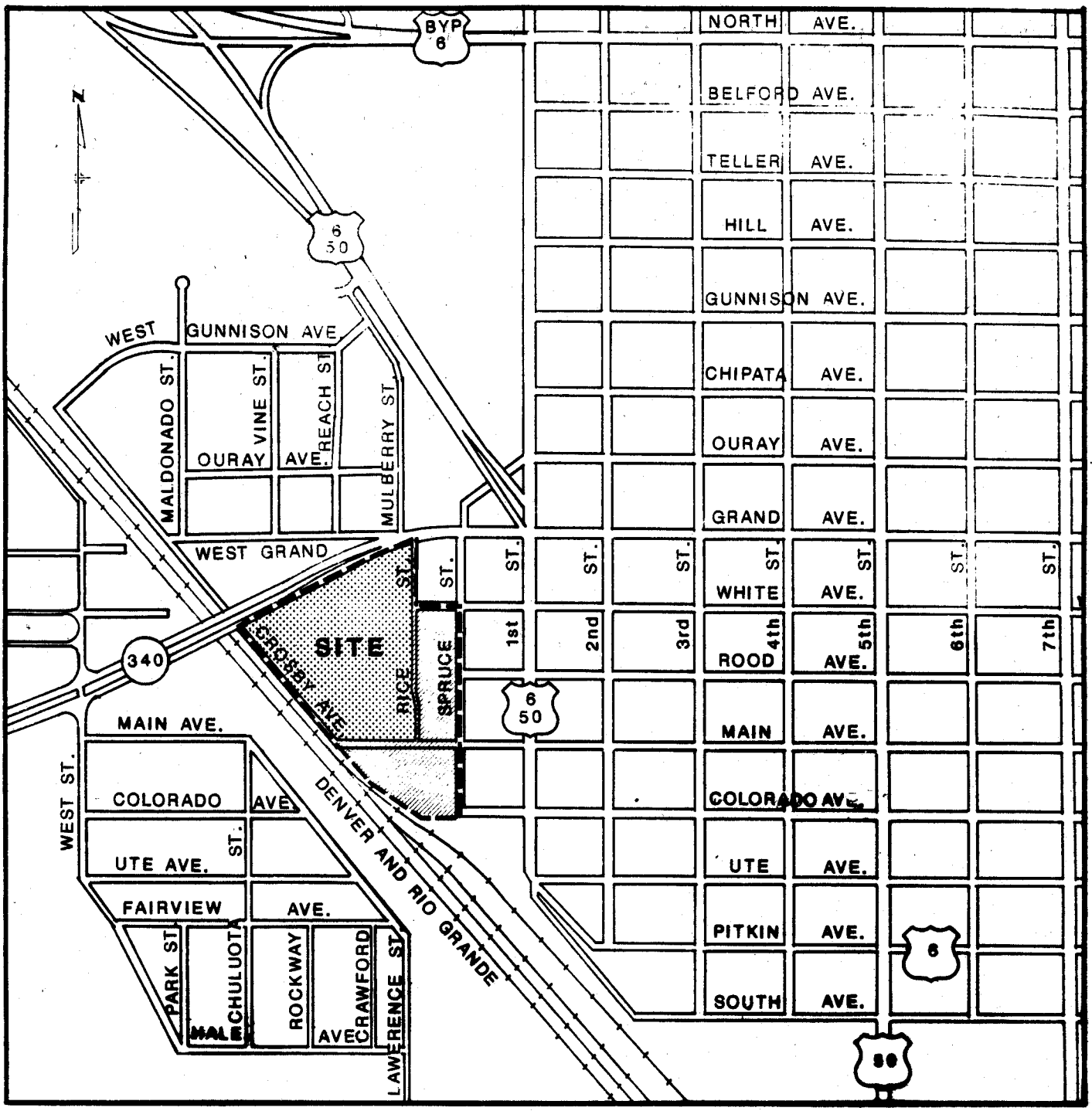
SUMMARY OF PROPOSED DEVELOPMENT

Phase I of the Justice Center will provide Mesa County the following services and law enforcement functions from this location:

- Sheriff's Administration
- Patrol Division
- Investigations Division
- Civil, Records and Warrants Division
- Reserve
- 192-Bed Adult Detention
- Inmate Work Crew
- Emergency Response Vehicles
- Search and Rescue
- Impound Lot

Phase II of the Justice Center will provide Mesa County the following:

- District Attorney's Office
- District Court
- County Court
- Probation
- Victim/Witness Program



PHASE I

PHASE II

MESA COUNTY
JUSTICE CENTER

FIGURE 1

REGIONAL LOCATION

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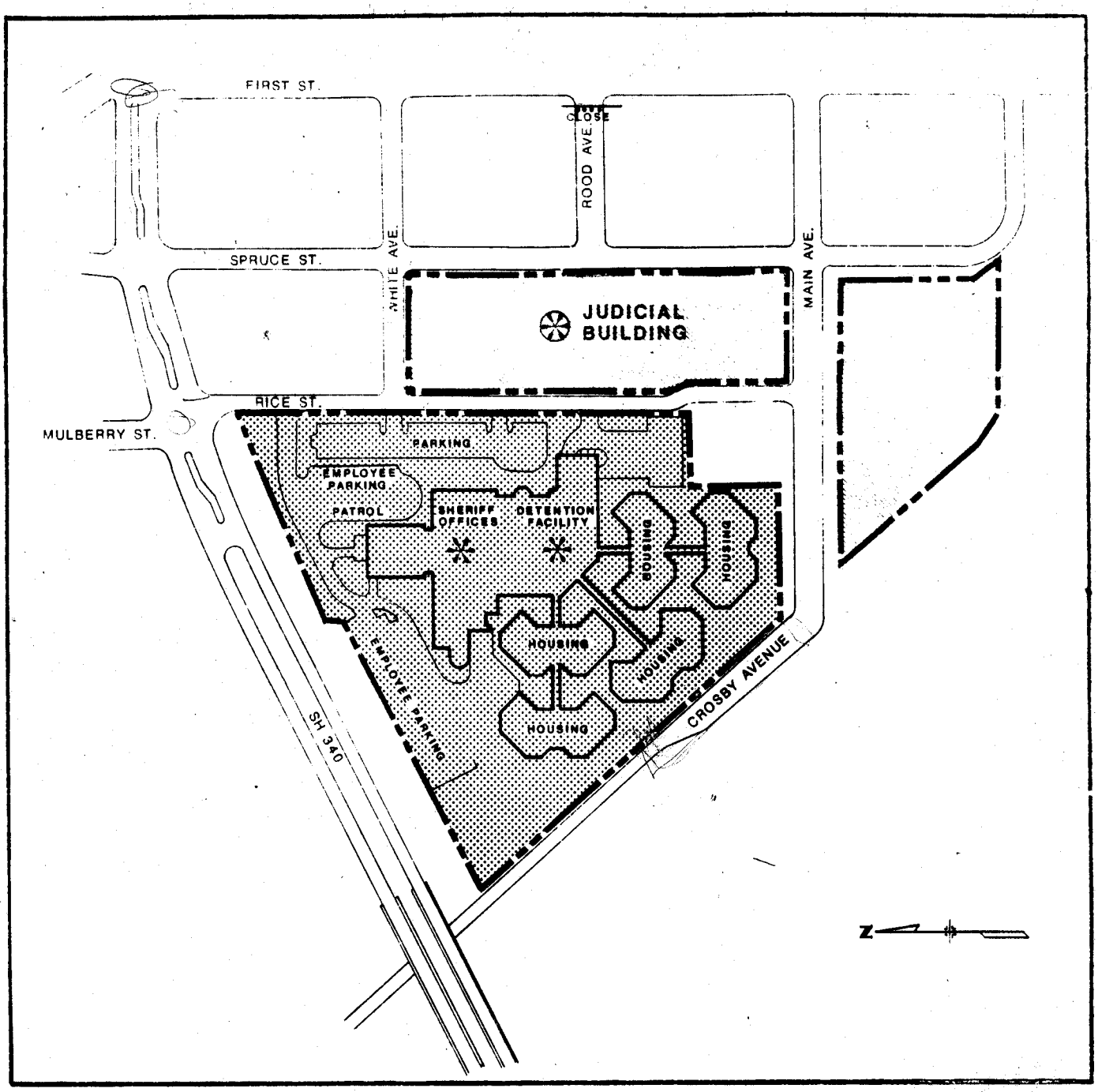
The roadway system which defines the Justice Center Campus is SH 340/Grand Avenue on the north, Crosby Avenue/Main Street on the south, First Street on the East and Crosby Avenue on the west. Figure 2 is the site plan for the detention facility and the Sheriff's office and also illustrates the boundaries for the future location of the Justice Building that will house the District Attorney's office, both County and District Courts, Probation and the Victim/Witness Program. The orientation of future development would close Rood Avenue at First Street and Rood Avenue would not penetrate the campus. This analysis will consider Rood Avenue closed at First Street and will analyze the future intersection as a "T" intersection.

Another modification to the existing street system that has been considered is relocating Crosby Avenue to the south and connecting at the intersection of Spruce Street and Colorado Avenue. To relocate Crosby Avenue will remove thru trips from the Justice Center campus, will help with distribution of traffic flows, will provide an added level of security for the campus and will allow more flexibility in planning the future expansion of the campus to include the Judicial Building that will house the District Attorney's office, both County and District Courts, Probation and the Victim/Witness Program. The effect of the relocation of Crosby Avenue has been included in this analysis.

The 1990 Federal Aid Urban System for the Grand Junction Urbanized Area has classified two of the major streets adjacent to the Justice Center campus. SH 340/Grand Avenue is classified as a Federal Aid Urban Arterial and First Street/Highway 6-50 is classified as an urban extension of the Federal Aid Plan (FAP). Both of these roadways are major arterials within the City of Grand Junction street grid system.



PHASE I

PHASE II

MESA COUNTY
JUSTICE CENTER

FIGURE 2

SITE PLAN
MESA COUNTY JUSTICE CENTER

HDR

TRAVEL DEMAND ANALYSIS

Site Trip Generation

Trip generation refers to the relationship between trip making and land use activity. The specialized land use activities associated with the Justice Center have not previously been evaluated for their trip generation characteristics in any publicized study or technical article. The associated trip generation rates have not been documented in recognized references such as the 4th edition of the ITE Trip Generation Manual. Because these land use activities did not have a documented trip generation rate, records were kept by the Sheriff's office, the County Jail, the District Attorney's office and the County and District Courts to use as a basis for determining the trip generation.

Site trip generation for the Mesa County Justice Center is summarized in Table 2. The trip generation table is arranged into five activity centers which includes the detention facilities, Sheriff's office, District Attorney's office, and the County and District Courts. The various classifications which have been detailed are unique for each activity center. The classifications include staff (employees), patrol division, lawyers, law enforcement personnel, witnesses and visitors. The volume for each classification has been estimated based upon the buildout scenario and represent the maximum activity expected. This will provide a conservative analysis of the traffic impacts. Selected classifications were assigned a discount value of 5 percent. This discount percent allows for a reduction in the daily trips associated with these classifications because of vacations, sick leave, late arrival, early departure, working after hours, etc. The five percent rate of discount is compatible with nationally accepted standards and a rate of ten percent is documented in the 4th edition of the ITE Trip Generation Manual for general office land uses. The daily hours for each of the classifications in Table 2 is used to determine which trips on the street grid system occur during the AM or PM peak hour and which trips occur during non-peak hour time periods. Such elements as shift hours, off-peak hour shift changes, visiting hours and normal activity center operations have created many travel patterns which do not occur during the peak hours of the day. At the completion of the Justice Center campus, it is anticipated that 120 vehicular trips will occur during the AM peak hour and 130 trips will occur during the PM peak hour, while 335 trips will occur during non-peak hours in the AM and 327 trips will occur during the PM non-peak hours.

Trip Distribution

Trip distribution refers to the process of allocating the site generated trips to regional destinations. Major considerations involved in this process are:

- General location and direction of major population areas, employment and shopping opportunities in the area; and
- Availability of roadways to connect these travel desires to the proposed development.

TABLE 2
SITE TRIP GENERATION

Jurors are under visitors?

Activity Center	Classification	Volume	Trips AM	Trips PM	Discount	Adjusted AM Trips	Adjusted PM Trips	Daily Hours	Peak Hour AM Trips	Non-Peak Hour Trips AM	Peak Hour Trips PM	Non-Peak Hour Trips AM
Detention Facilities	Staff	72	72	72	5%	68	68	6:00-2:30 2:00-10:30		68		68
	Visitors	51	51	51	0%	51	51	8:30-4:30		51		51
Sheriff's Office	Staff	25	25	25	5%	24	24	8:00-4:30	24		24	
	Patrol Division	9	N/A	N/A		N/A	N/A	7:00-3:00 3:00-11:00 11:00-7:00	N/A		N/A	
Dist Attorney	Visitors	52 per day	52	52	0%	52	52	9:00-5:30		52	8	44
District Court	Staff	28	28	28	5%	27	27	8:00-5:00	27		27	
	Lawyers	2	2	2	0%	2	2	9:00-3:00		2		2
	Visitors	38 per day	38	38	0%	38	38	9:00-4:00		38		38
	Law Enforcement Personnel	15 per day	15	15	5%	14	14	8:00-5:00	14		14	
District Court	Staff	40	40	40	5%	38	38	8:00-5:00	38		38	
	Witnesses	40 per day	40	40	0%	40	40	9:00-4:30		40		40
	Visitors	34 per day	34	34	0%	34	34	9:00-4:00		34		34
County Court	Staff	17	17	17	5%	16	16	8:00-5:00	16		16	
	Witnesses	27	27	27	0%	27	27	9:00-4:30		27		27
	Visitors	23	23	23	0%	23	23	9:00-4:00		23		23
							Total Trips		119	335	127	327
							Total for Analysis		120	852	130	844

114

287

287

287

6

Trip distribution characteristics for the Mesa County Justice Center campus in the cardinal directions of north, south, east and west are illustrated in Figure 3. These values were developed by analyzing the residential locations within the City and the related location to the campus site. The basic assumption is that the attraction between home and work related trips will be related to the general location of the residual areas and the work site. The percentages shown in Figure 3 were developed in conjunction with City of Grand Junction staff personnel.

Traffic Assignment

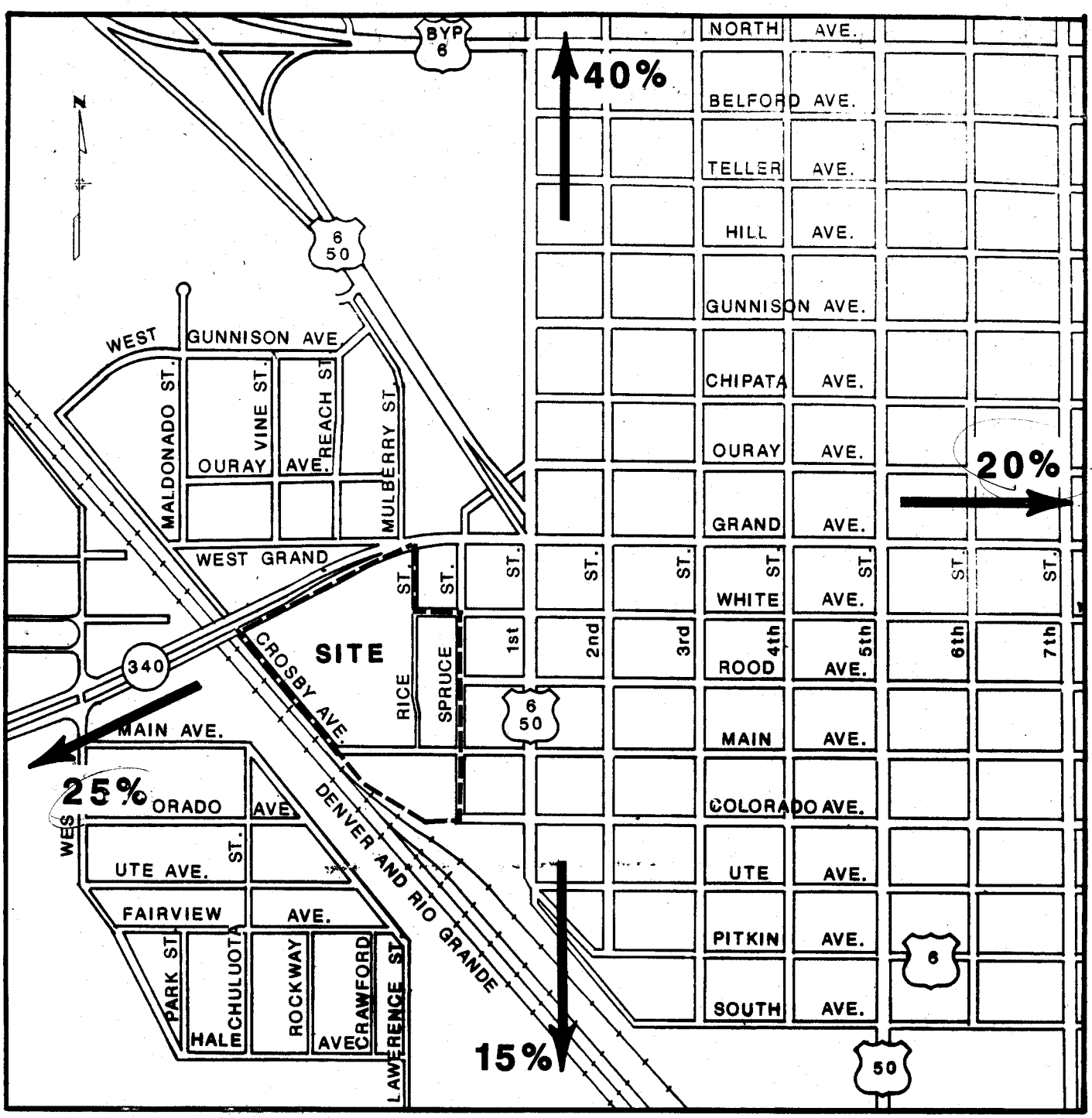
The trip assignment analysis focused on First Street intersections and SH 340. The first step in this process worked with the percent of the site-generated traffic for each of the cardinal directions and then summarized for all four directions. Figure 4 illustrates the percent of site generated traffic that has been assigned to the north. A total of 40 percent of the trips will go to the north with 10 percent exiting the site at SH 340 and Rice Street, progressing easterly to First Street and Grand Avenue where they turn north on to First Street. More people might select this route if the left turn movement at First Street and Grand Avenue were easier to negotiate. The remaining 30 percent will exit the site at First Street and Main Street where 20 percent will make a left turn and proceed north along First Street until they reach the intersection of First Street and Grand Avenue where 15 percent proceed north on First Street and 5 percent north on U.S. 6-50. At First Street and Main Street, 10 percent of the traffic movement will be east through the intersection and then north utilizing the street grid system of Second Street, Third Street, etc.

The southbound percent is presented in Figure 5 where 15 percent of the total site-generated traffic has been assigned. The movement out of the campus which services this movement is a right turn at the intersection of First Street and Main Street on to southbound First Street.

The movement to the east is 20 percent of the total site-generated traffic and has been assigned to the intersections of First Street and Main Street and SH 340 and Rice Street as shown in Figure 6. Five percent of the trips will make a right turn and go east on SH 340 through the intersection of First Street and Grand Avenue. Fifteen percent will exit the site and First Street and Main Street and continue to the east on Main Street.

The trips assigned to the west from the Justice Center are 25 percent of the site-generated traffic. Approximately 10 percent will exit the site at Rice Street, making a left turn on to SH 340 and proceeding to the west. The remaining 15 percent will make a left turn at the intersection of First Street and Main Street, proceed north along First Street, negotiate a left turn at First Street and Grand Avenue and continue to the east on SH 340. Please refer to Figure 7.

The total percentage of site-generated traffic is illustrated in Figure 8. The individual percentages from Figure 4, 5, 6 and 7 have been summarized in Figure 8. The trips which are associated with the Justice Center will exit the site during the peak hour at SH 340 and Rice Street (25 percent) and First Street and Main Street (75 percent). These trips have then been routed as detailed in Figures 4, 5, 6 and 7.



MESA COUNTY
JUSTICE CENTER

FIGURE 3

DIRECTIONAL DISTRIBUTION

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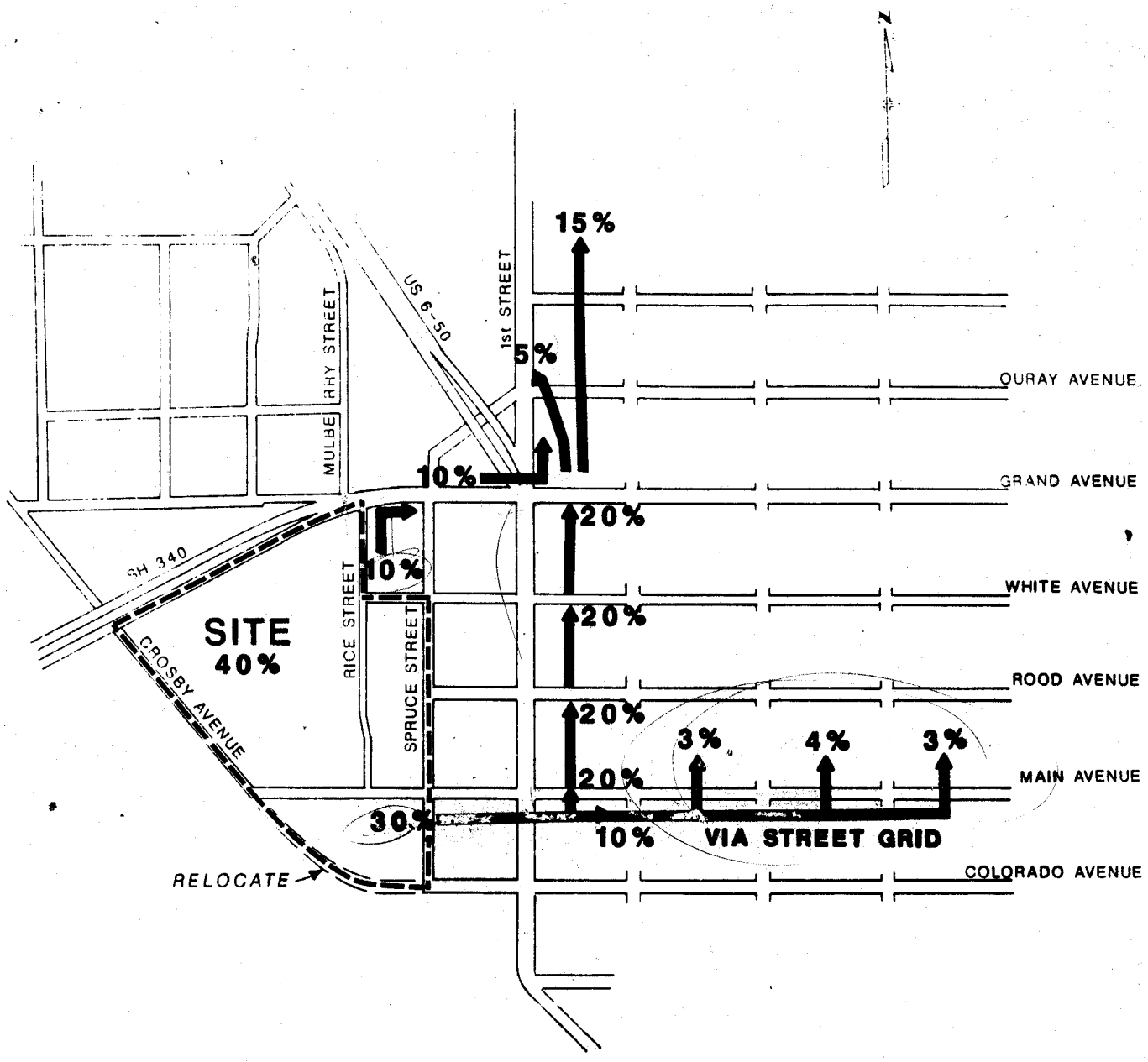

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FIGURE 4
NORTH PERCENT SITE-GENERATED TRAFFIC PM PEAK HOUR

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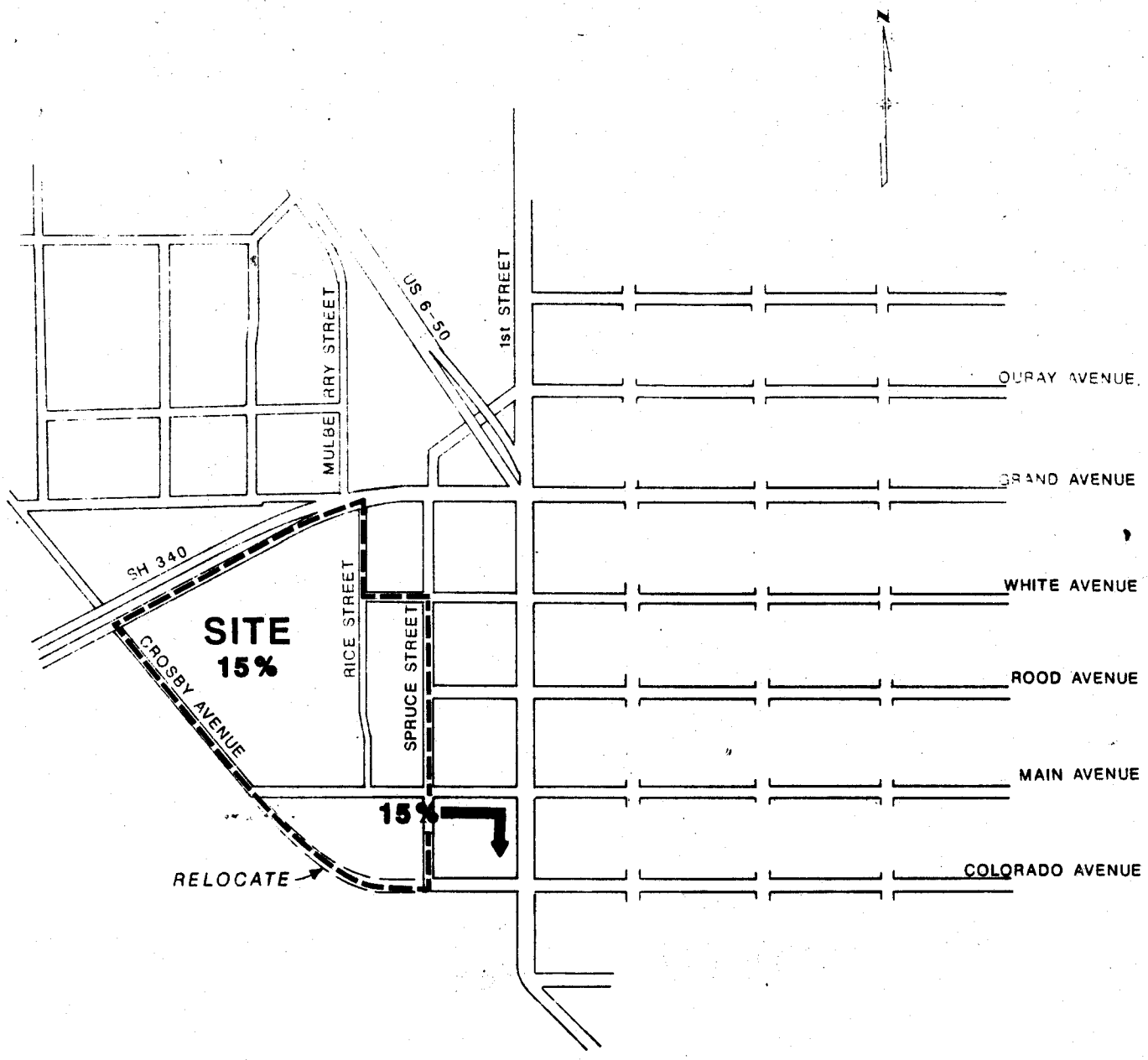

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FIGURE 5
SOUTH PERCENT SITE-GENERATED TRAFFIC PM PEAK HOUR

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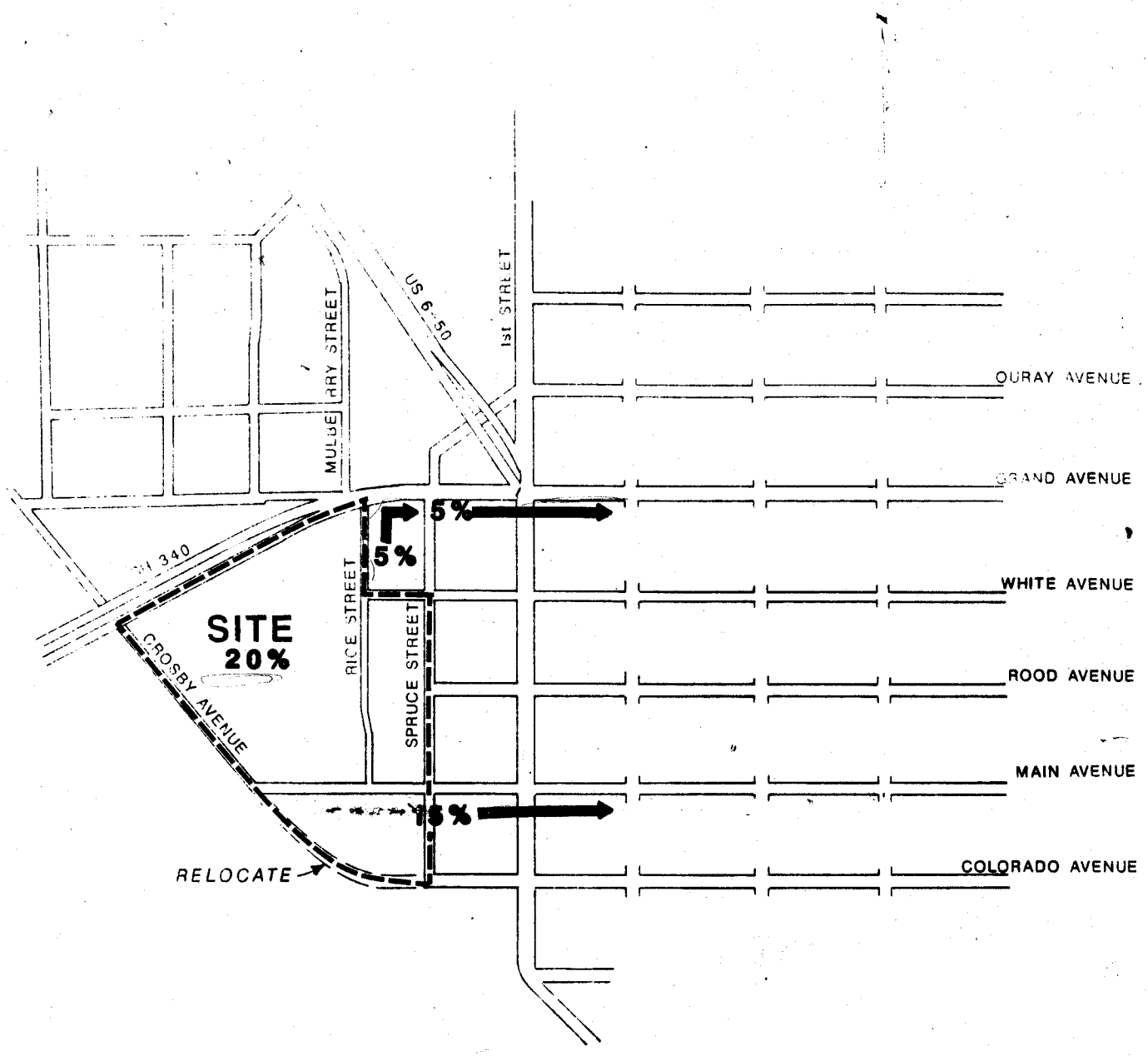

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FIGURE 6
EAST PERCENT SITE-GENERATED TRAFFIC PM PEAK HOUR

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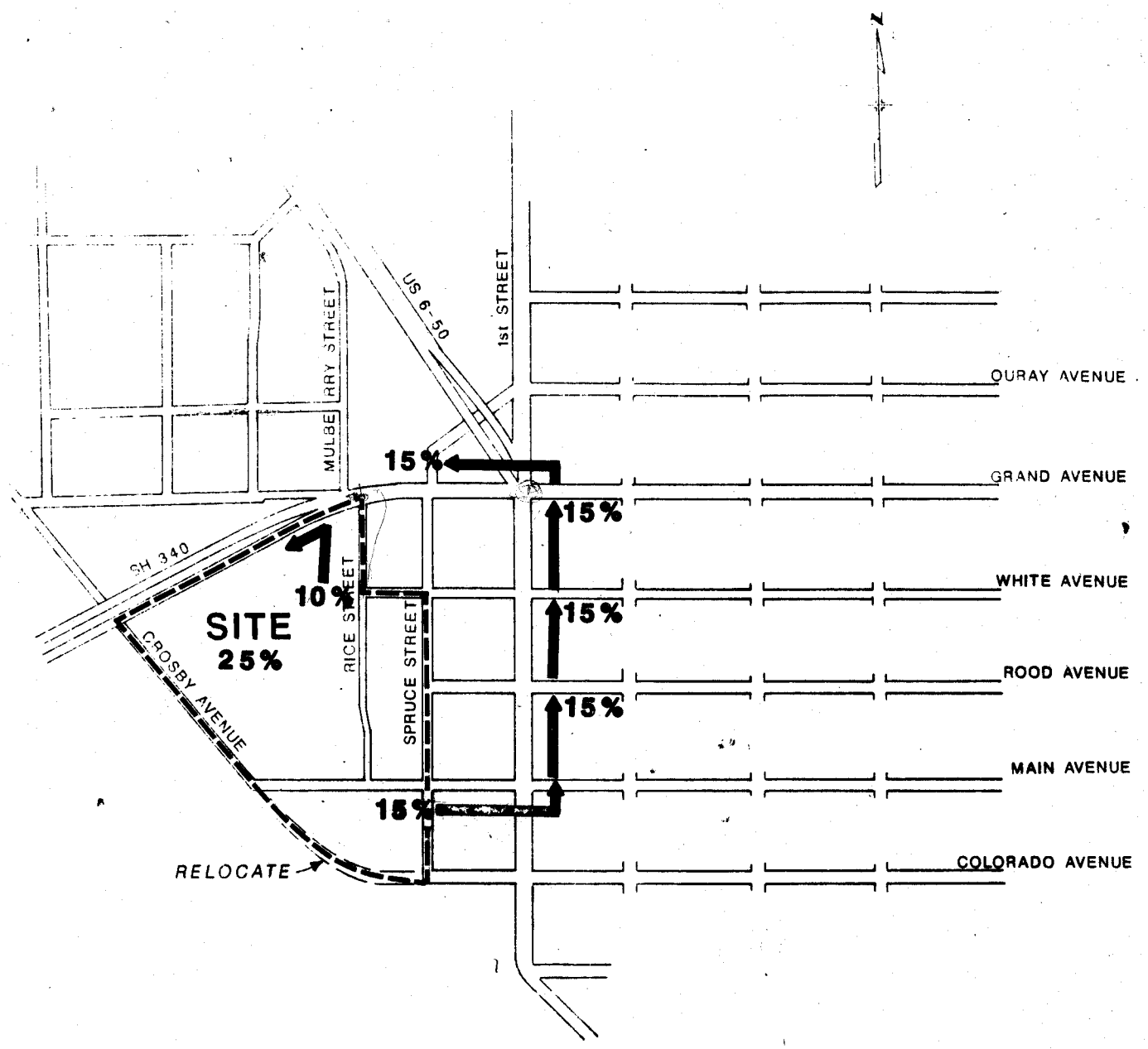

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FIGURE 7
WEST PERCENT SITE-GENERATED TRAFFIC PM PEAK HOUR

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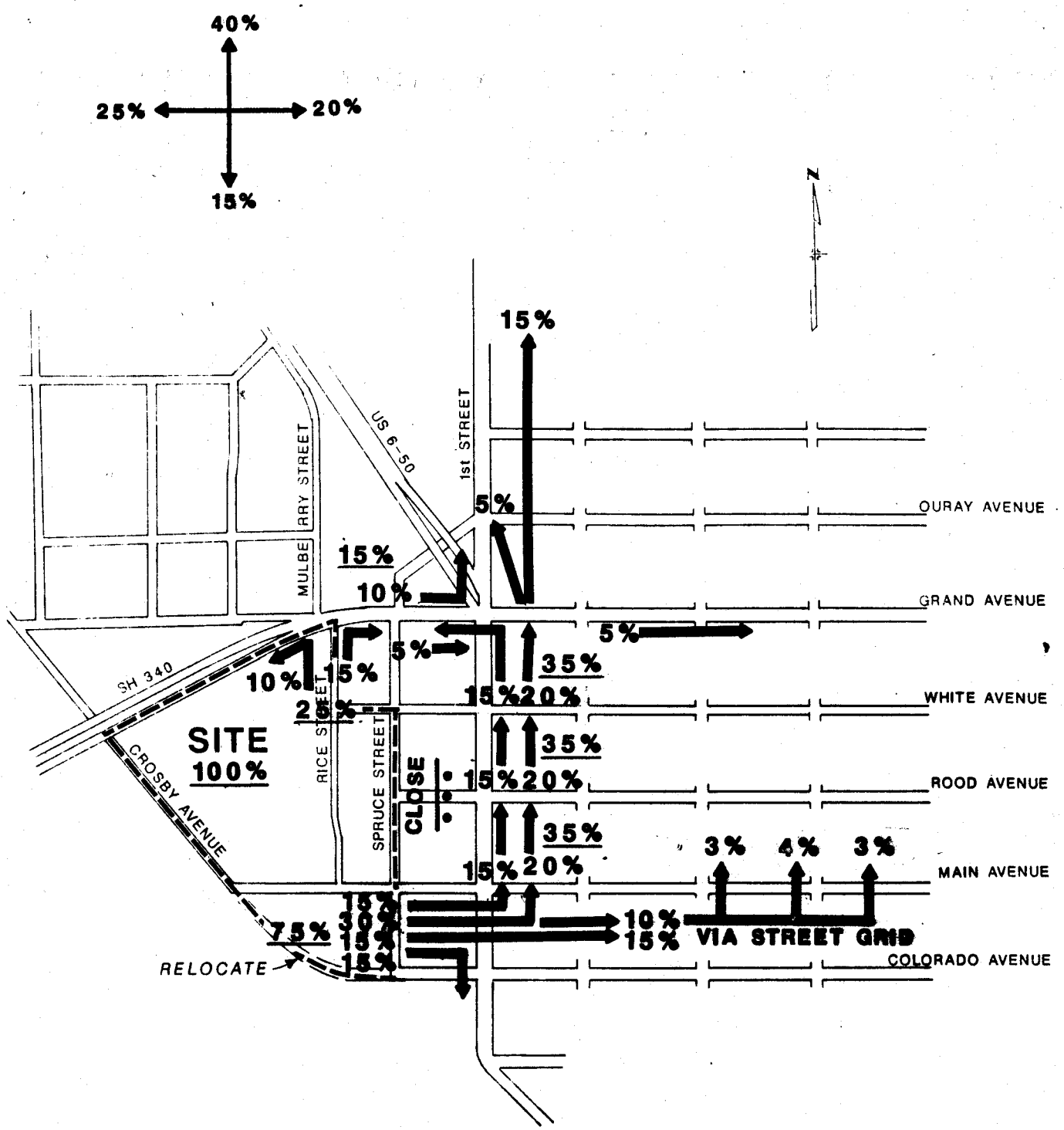

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FIGURE 8

TOTAL PERCENTAGE SITE-GENERATED TRAFFIC PM PEAK HOUR

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The site-generated traffic volumes have been assigned to the street system utilizing the percentages of total site-generated traffic which has just been detailed. To the north, 52 trips are expected to occur (Figure 9), 19 trips to the south (Figure 10), 26 trips to the east (Figure 11) and 32 trips to the west (Figure 11). The total trips which are projected to occur during the PM peak hour is 130 trips as developed in Table 2. These 130 trips have been assigned to the street system as shown in Figure 13.

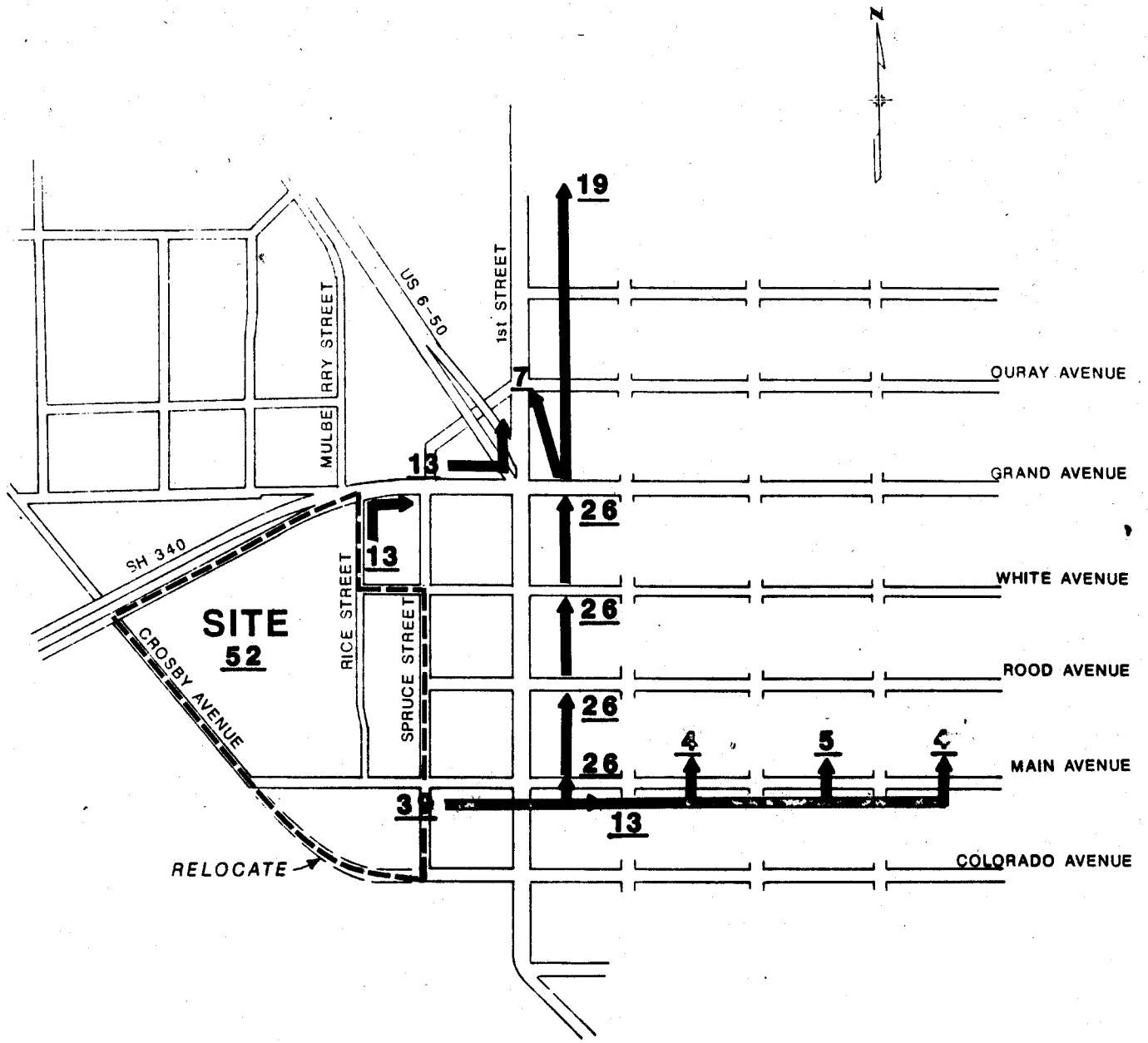

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FIGURE 8
NORTHBOUND SITE-GENERATED TRAFFIC PM PEAK HOUR

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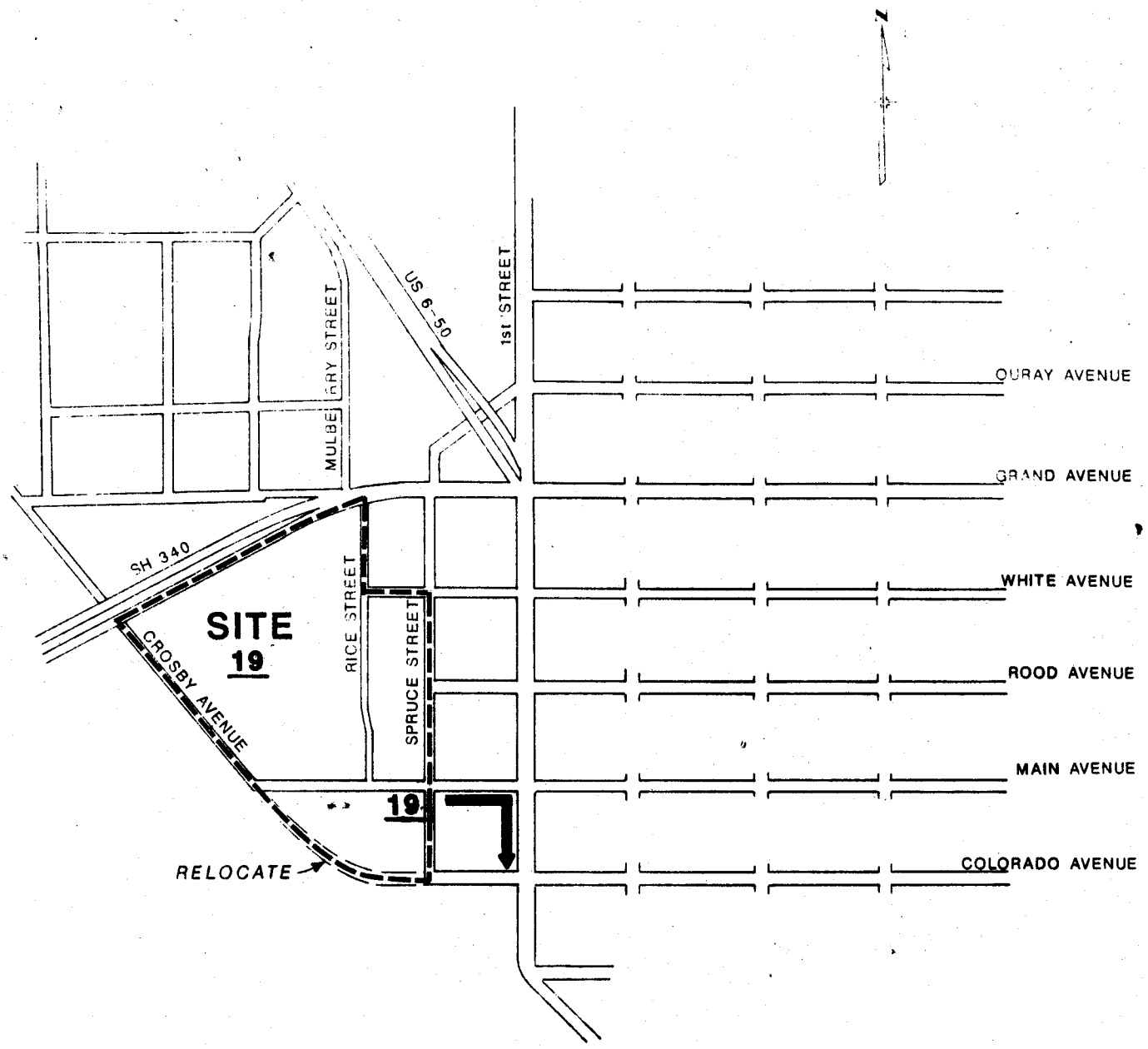

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FIGURE 10

SOUTHBOUND SITE-GENERATED TRAFFIC PM PEAK HOUR

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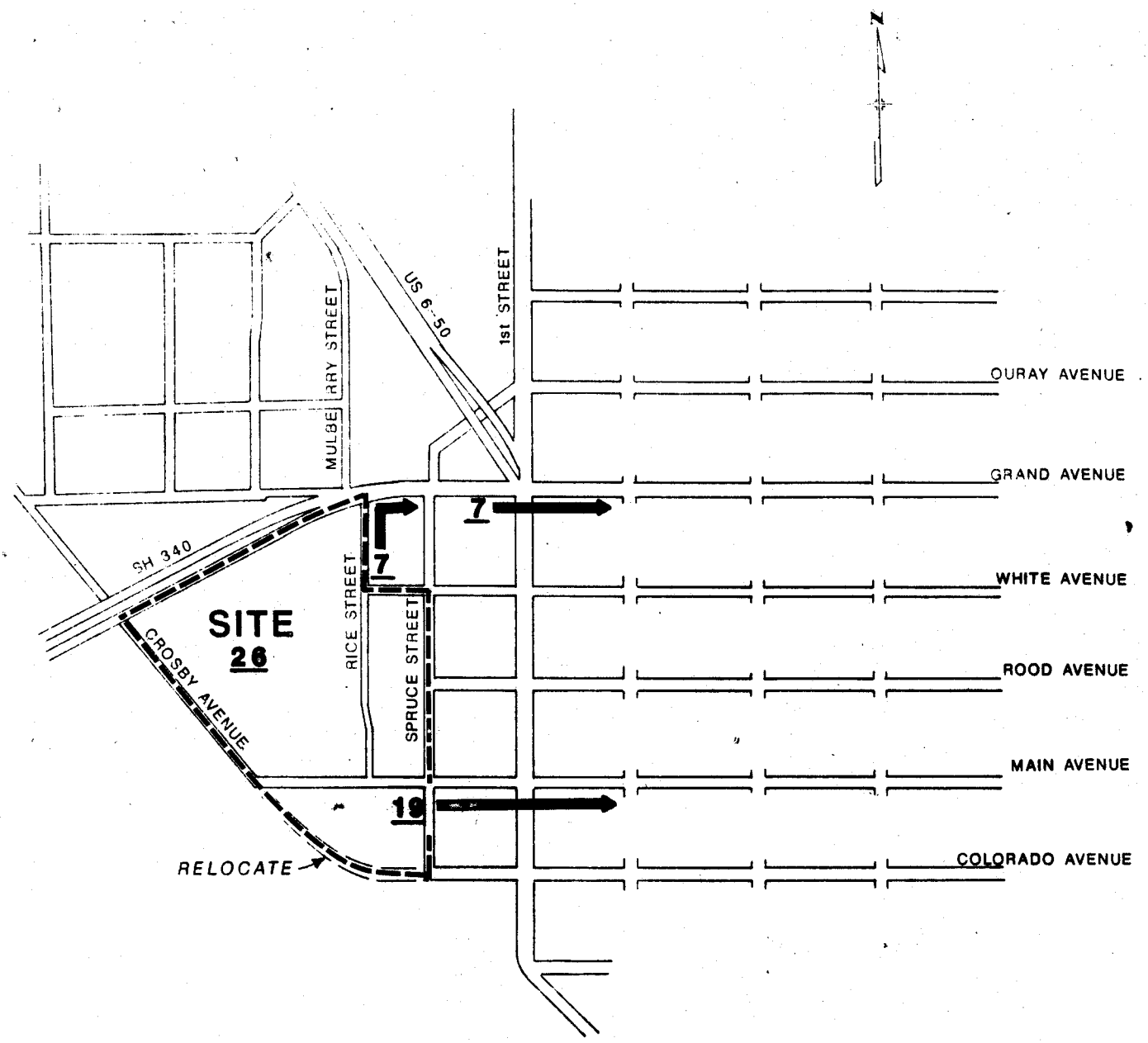

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FIGURE 11
EASTBOUND
SITE-GENERATED TRAFFIC
PM PEAK HOUR

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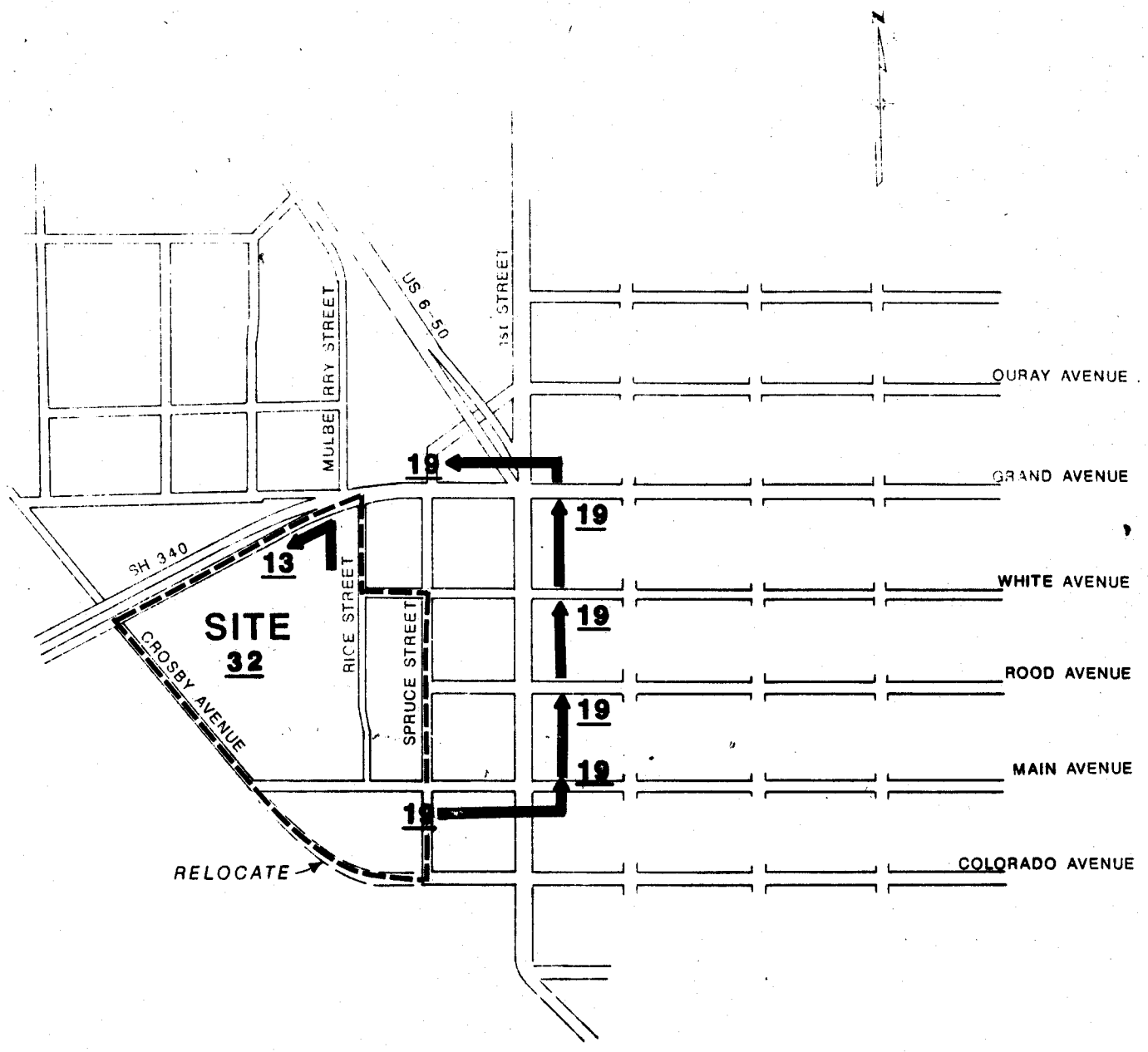

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FIGURE 12
WESTBOUND
SITE-GENERATED TRAFFIC
PM PEAK HOUR

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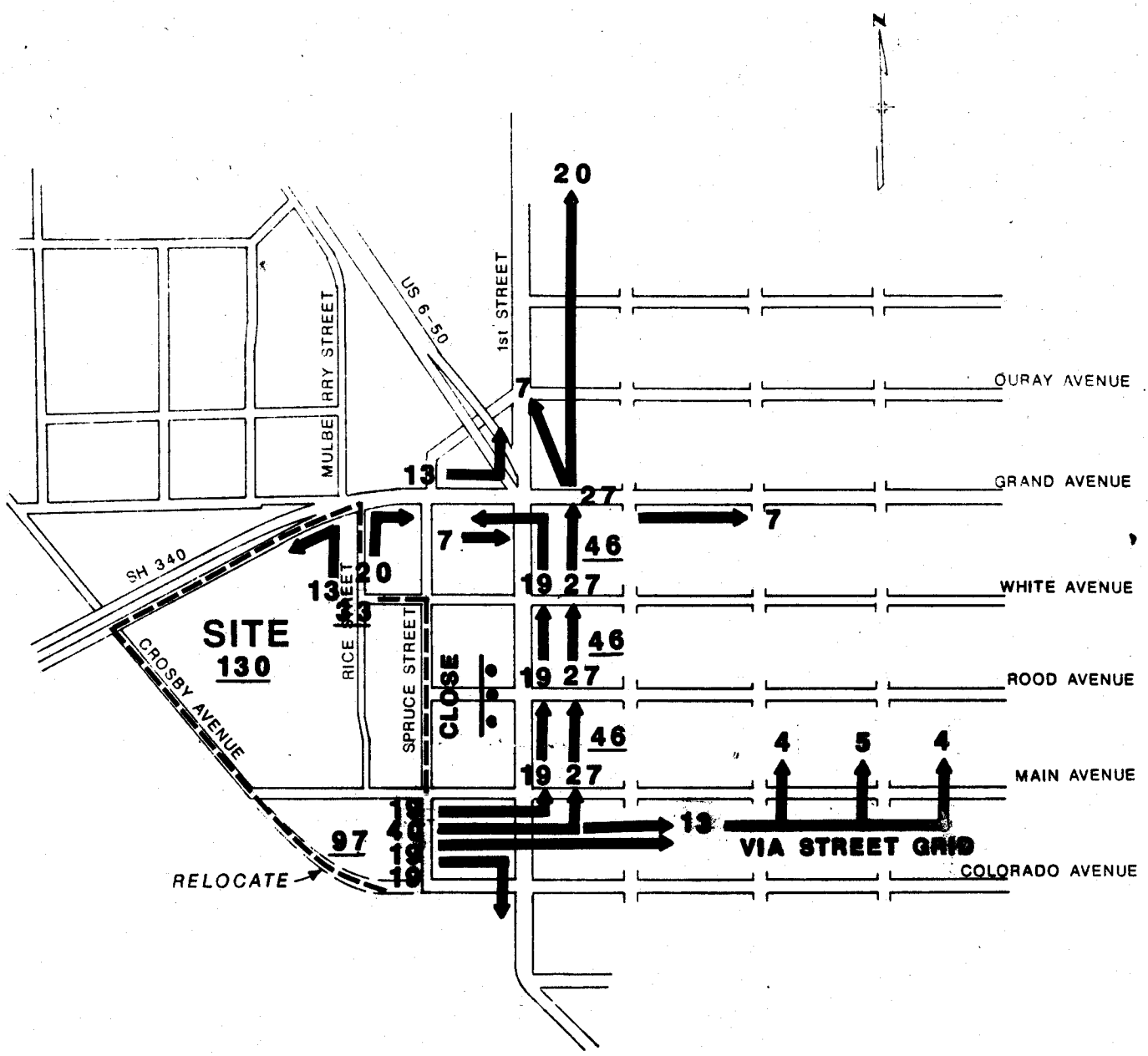

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FIGURE 13
TOTAL VOLUME
SITE-GENERATED TRAFFIC
PM PEAK HOUR

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IMPACT ANALYSIS

Capacity Analysis

Capacity is evaluated on the basis of a Level of Service (LOS) determination. Levels of Service are given letter designations from "A" through "F" corresponding to the relative ease of traffic movements. The letter designations range from "A - free flow and no delays" to "F - forced flow." Levels of service "E" and "F" are unacceptable and correspond to a non-functional situation. For signalized intersections, the interdependence of the various traffic movements, and corresponding time allocations, require LOS to be determined for the overall intersection operations. Urban traffic design criteria defines LOS "D" as acceptable for the major movements and for the overall operations of the intersection.

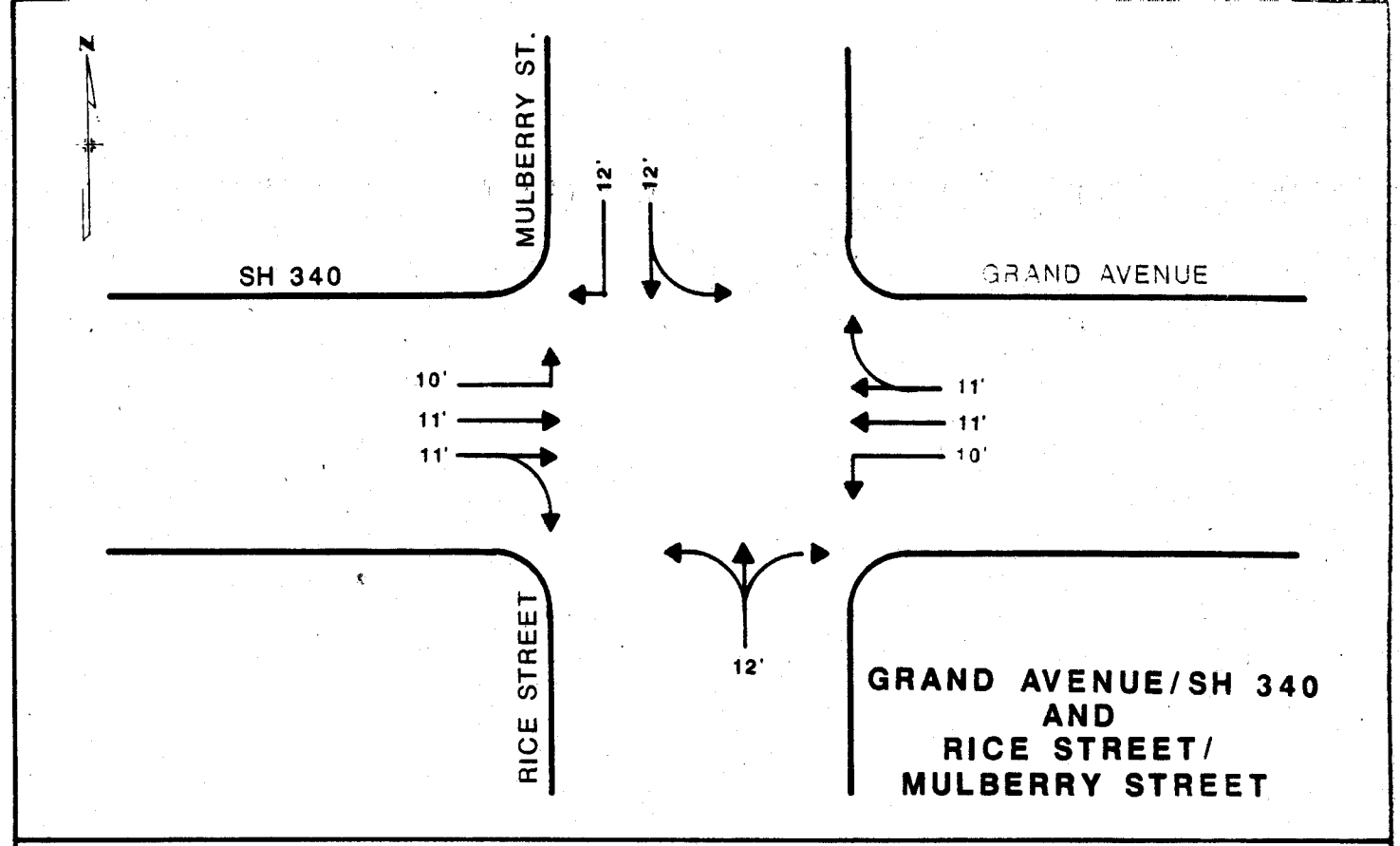
The individual intersections which were analyzed consisted of SH 340 and Rice Street, First Street and Grand Avenue, First Street and Rood Avenue, and First Street and Main Street. The 1985 Highway Capacity Manual (HCM) software was the Transportation Engineering program used for the impact analysis. It was used for the intersection analysis and determined the LOS for individual movement and the LOS for the overall intersection operations.

Traffic Lane Assignments

The lane assignments which were used in this analysis are illustrated in Figures 14 and 15. The intersection of SH 340 and Rice Street consists of two through lanes on SH 340 with left turn lanes for eastbound and northbound. Rice Street has one lane in each direction northbound and southbound with all movements turning from one lane while Mulberry Street has two lanes southbound, one right turn lane and one thru/left turn lane and one lane northbound.

The intersection of First Street and Grand Avenue includes the connection of U.S. 6-50. The analysis assumed a four-legged intersection because First Street is one-way northbound at the intersection. Grand Avenue has two through lanes, a left-turn lane and a right-turn lane for both eastbound and westbound. First Street consists of two through lanes, a left-turn lane and a right turn lane for northbound. The southbound entering volume utilizes U.S. 6-50 which has one thru lane, one thru/right turn lane and one left turn lane.

The existing traffic lane assignments for the intersections of First Street and Rood Avenue and First Street and Main Street are presented in Figure 15. The cross-section of First Street is the same at both of these intersections and includes two thru lanes for northbound and southbound, a left-turn lane and a right-turn lane. Rood Avenue has three lanes eastbound; a left, a thru, and a right turn lane; and two lanes for westbound; a left turn lane and a right/thru lane. Main Street has two lanes for eastbound which includes a left turn lane and a right/thru lane for both directions.



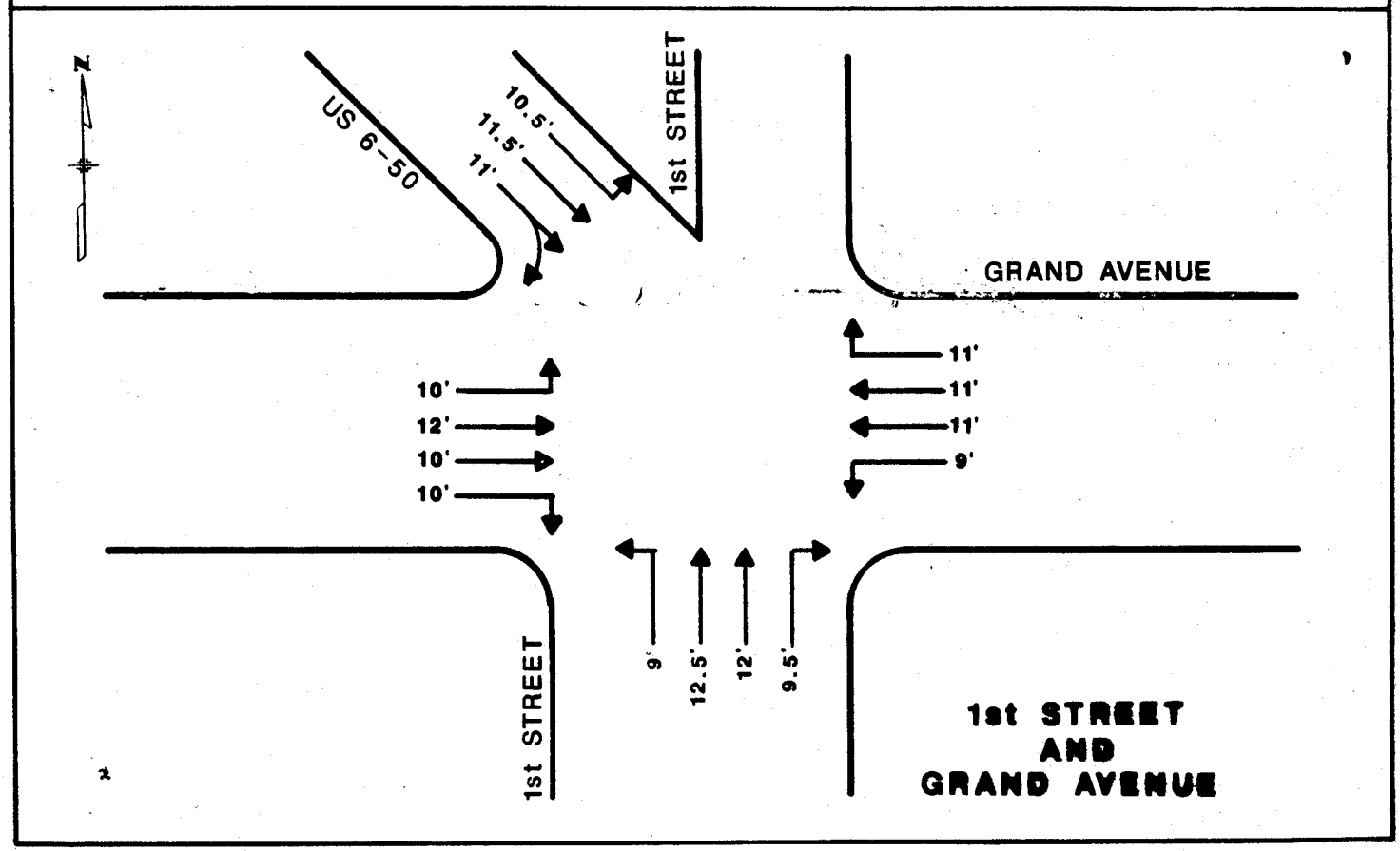


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FIGURE 14

EXISTING TRAFFIC LANE ASSIGNMENTS

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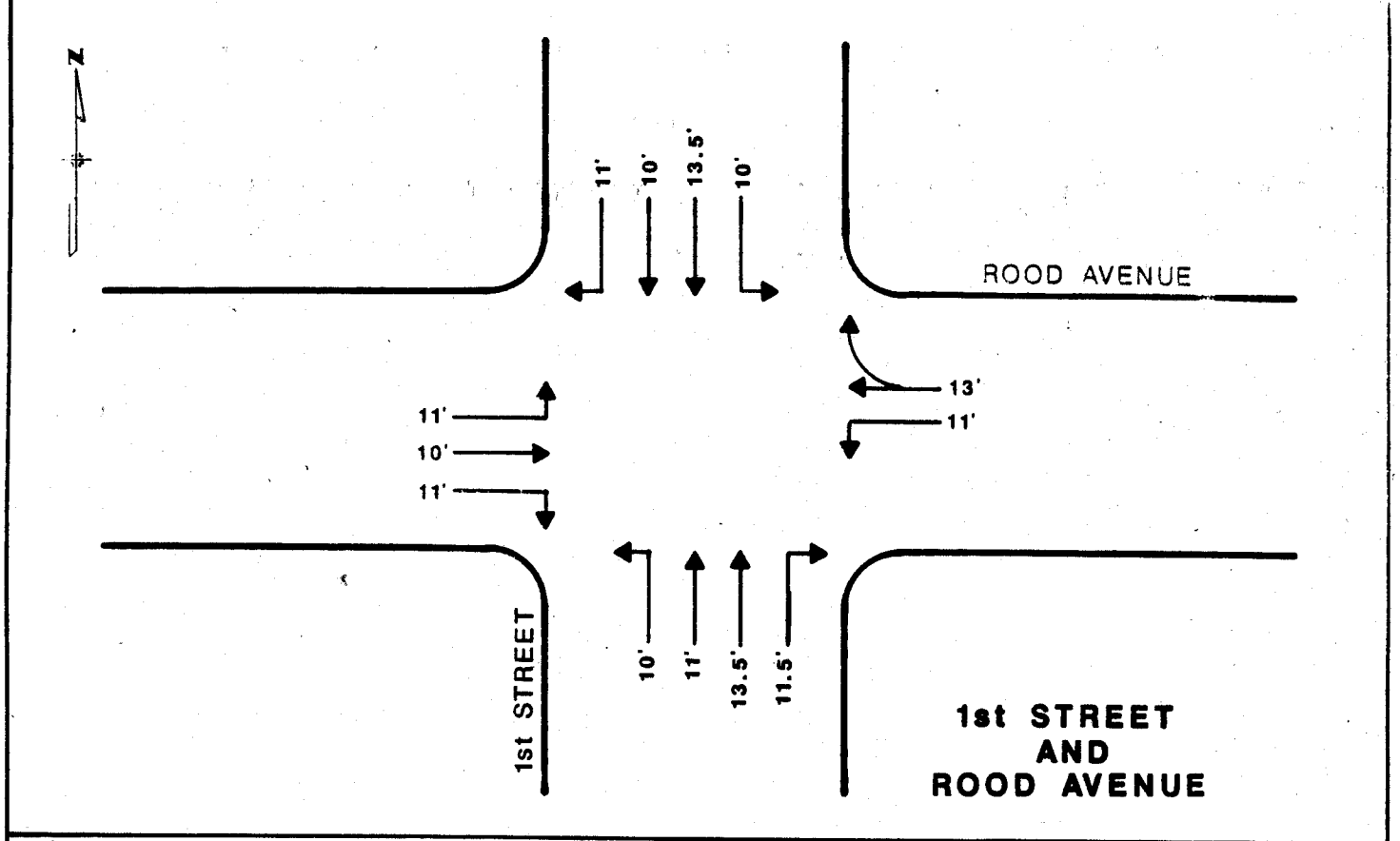
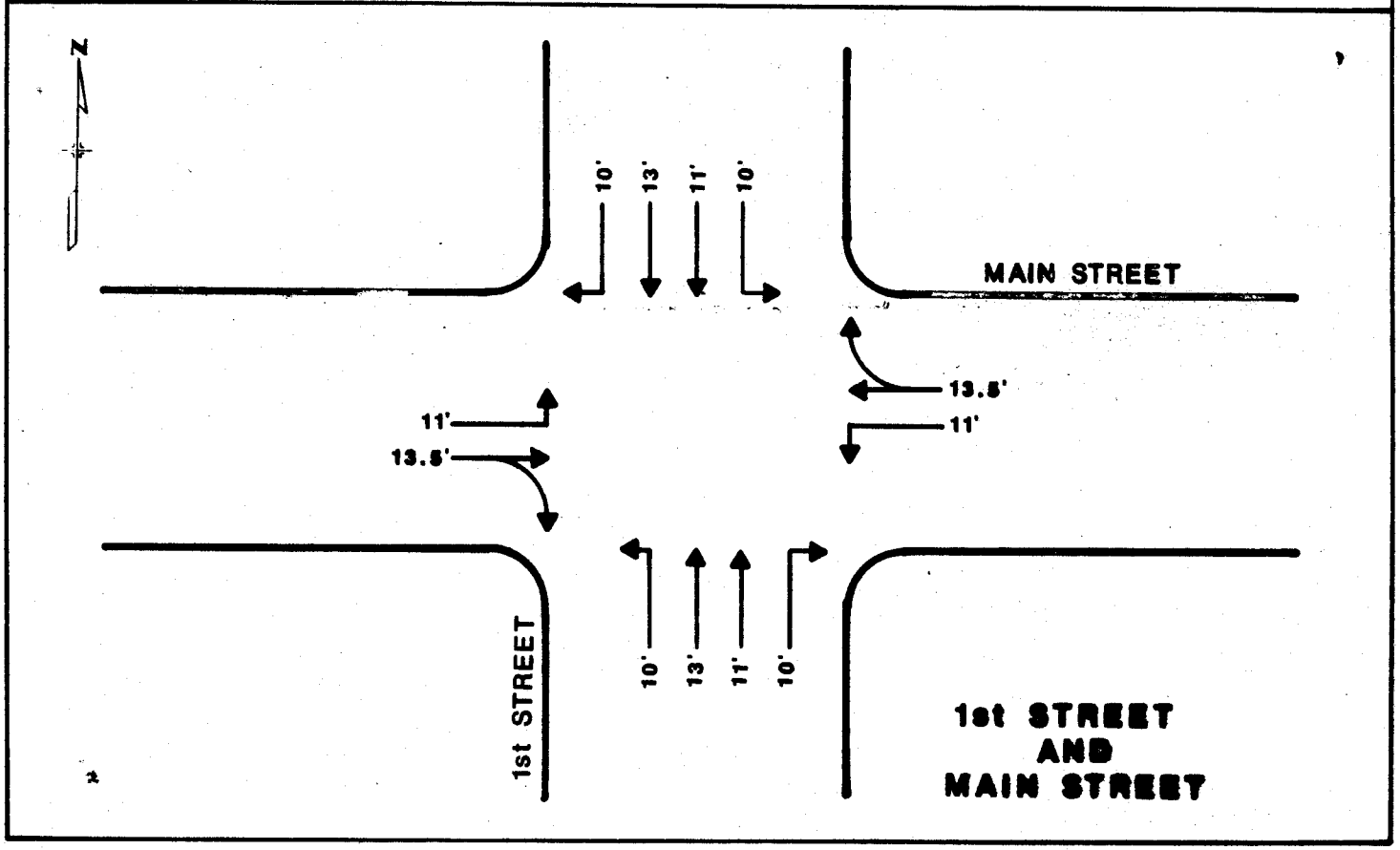




MESA COUNTY
JUSTICE CENTER

FIGURE 18

EXISTING TRAFFIC LANE ASSIGNMENTS

HDR

Existing Traffic Volumes

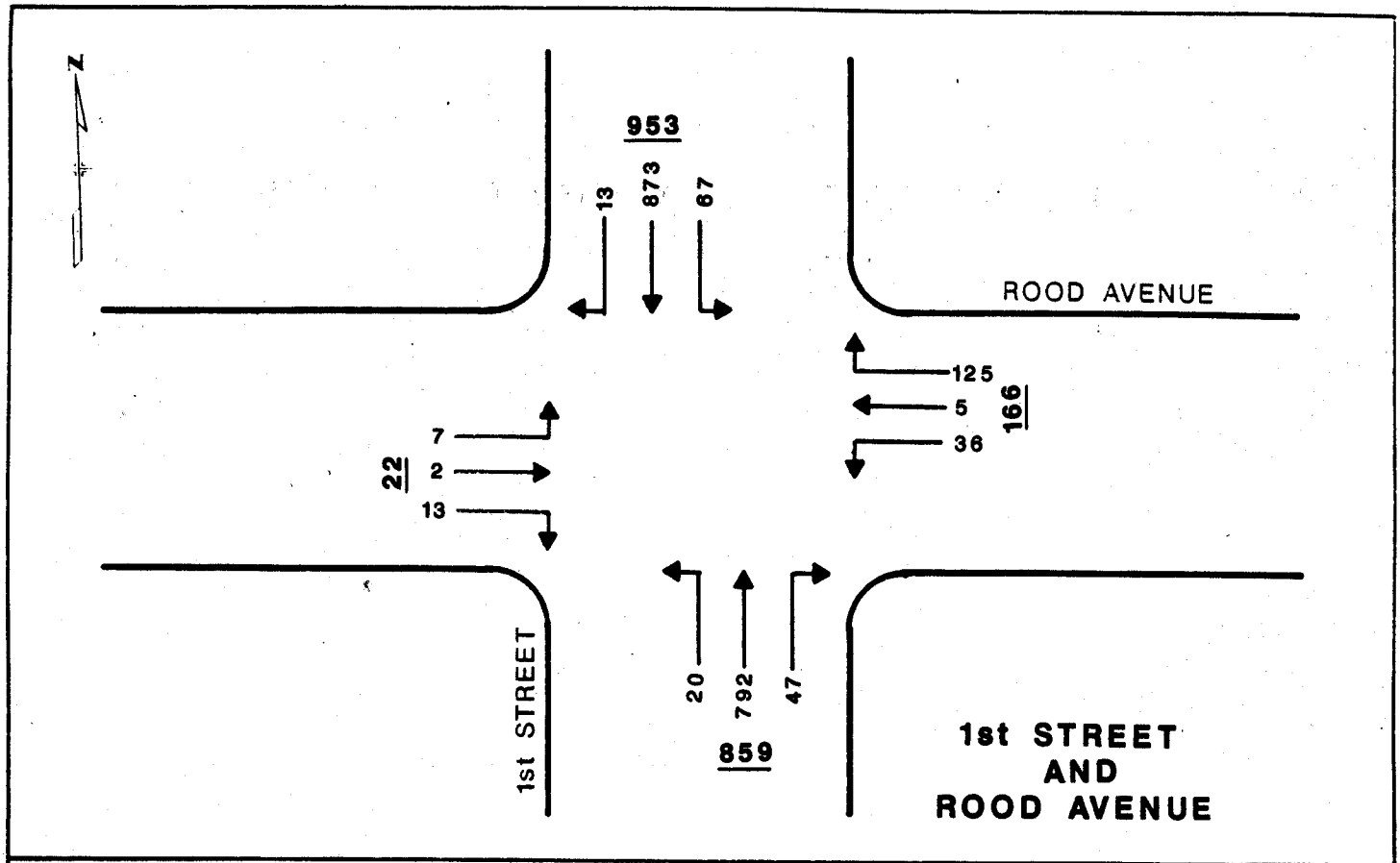
The existing traffic volumes for the peak-hour traffic flows were provided by Mesa County and the City of Grand Junction. The PM peak hour was used in this traffic impact analysis because the traffic volumes are higher than the AM peak hour. The PM peak hour is typically servicing more vehicular trips than the AM peak hour because there are shopping, recreational and social trips which occur in addition to the work to home trip during the PM peak hour. The existing traffic volumes for the PM peak hour are shown in Figures 16 and 17. The data sheets which were provided by Mesa County and the City of Grand Junction are included in the appendix.

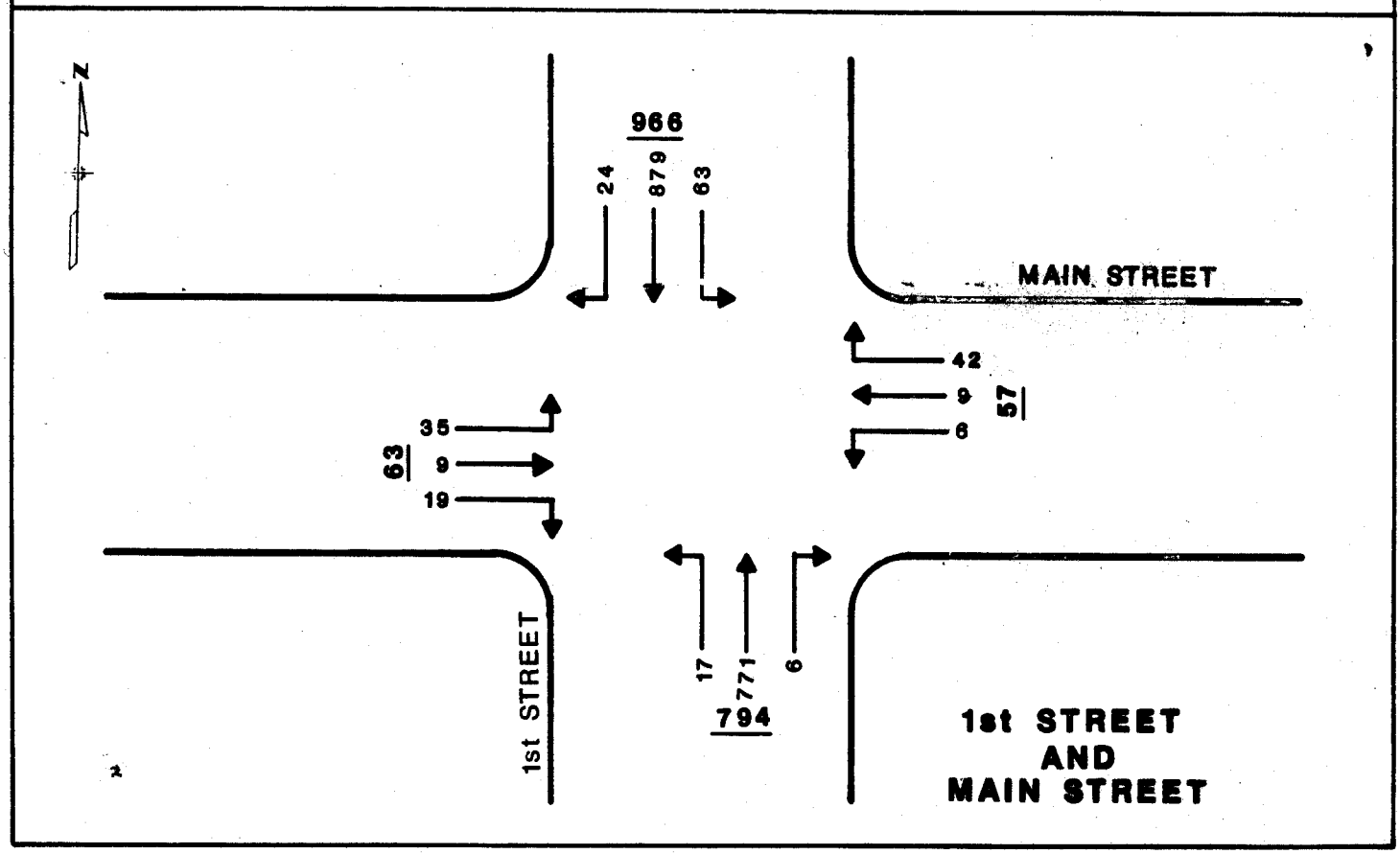
Site-Generated Traffic Volumes

The site-generated traffic volumes have been developed in Table 2, "Site Trip Generation," and include trips which occur during the peak hour and trips which occur at hours different from the peak hour. These trips were then distributed to the adjacent street grid system in all four directions, north, south, east and west. This distribution was illustrated in Figures 9 to 12 and the accumulative total volumes distributed from the site during the PM peak hour are contained in Figure 13. These accumulated volumes were brought forward and shown in Figures 18 and 19, entitled "Site-generated Traffic Volumes PM Peak Hour." Rood Avenue is planned to be closed when the Justice Center campus is completed. It has been shown as closed for this analysis which results in having no site-generated traffic for the eastbound movement. At all other locations, the projected site generated traffic volumes are radially assigned away from the site and inbound traffic volumes are anticipated to be negligible to non-existent.

Projected Traffic Volumes

The traffic volumes which were used to determine the impact that the new Mesa County Justice Center will have on the adjacent City street system are shown in Figures 20 and 21, entitled "Projected Traffic Volumes PM Peak Hour." These values were established by combining the existing traffic volumes and the site-generated traffic volumes. It has been noted earlier that Rood Avenue could be closed east of First Street and, as a result, there are no vehicular movements shown on the east leg. In addition, it is assumed that Crosby Avenue could be realigned to intersect the street grid system at the intersection of Spruce Street and Colorado Avenue. The volumes which are presented at the intersection of First Street and Main Street for the eastbound movement are the site-generated traffic volumes only. The existing traffic volumes, which are shown in Figure 16 for the eastbound movement of Crosby Avenue and First Street, now occur at the intersection of Spruce Street and Colorado Avenue and are not included in the traffic volumes for First Street and Main Street analysis.

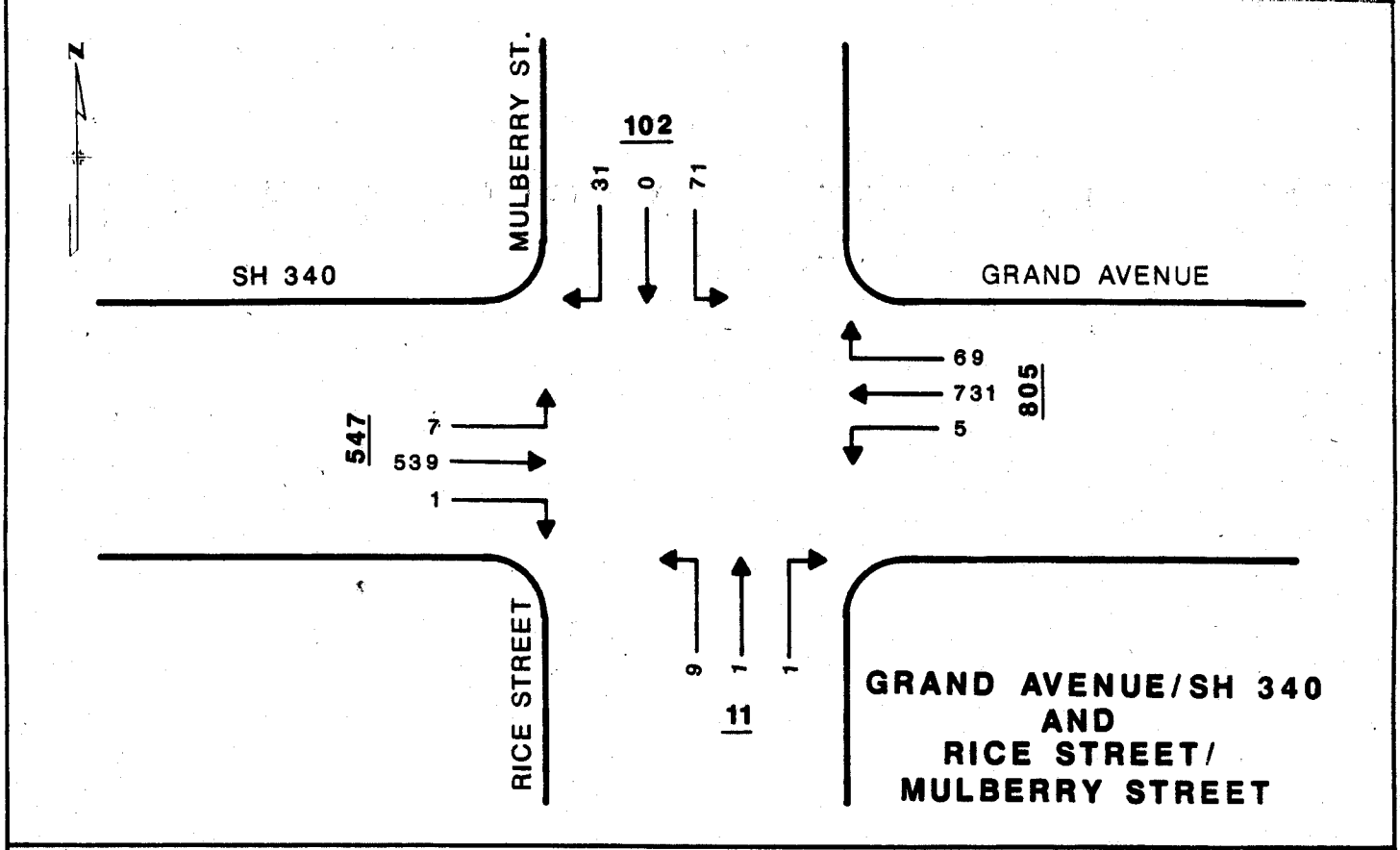


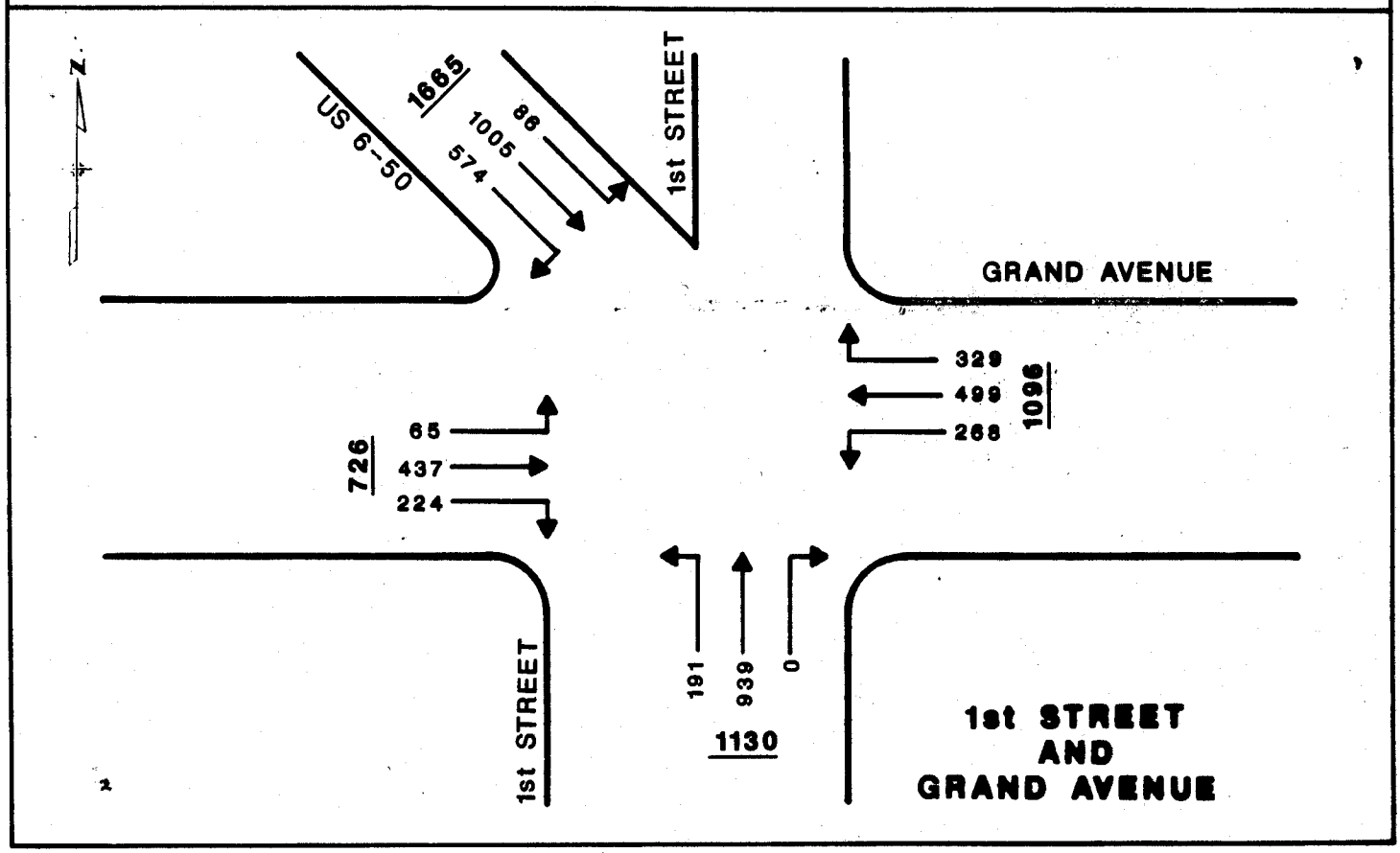


MESA COUNTY
JUSTICE CENTER

FIGURE 16
EXISTING TRAFFIC VOLUMES PM PEAK HOUR

HDR

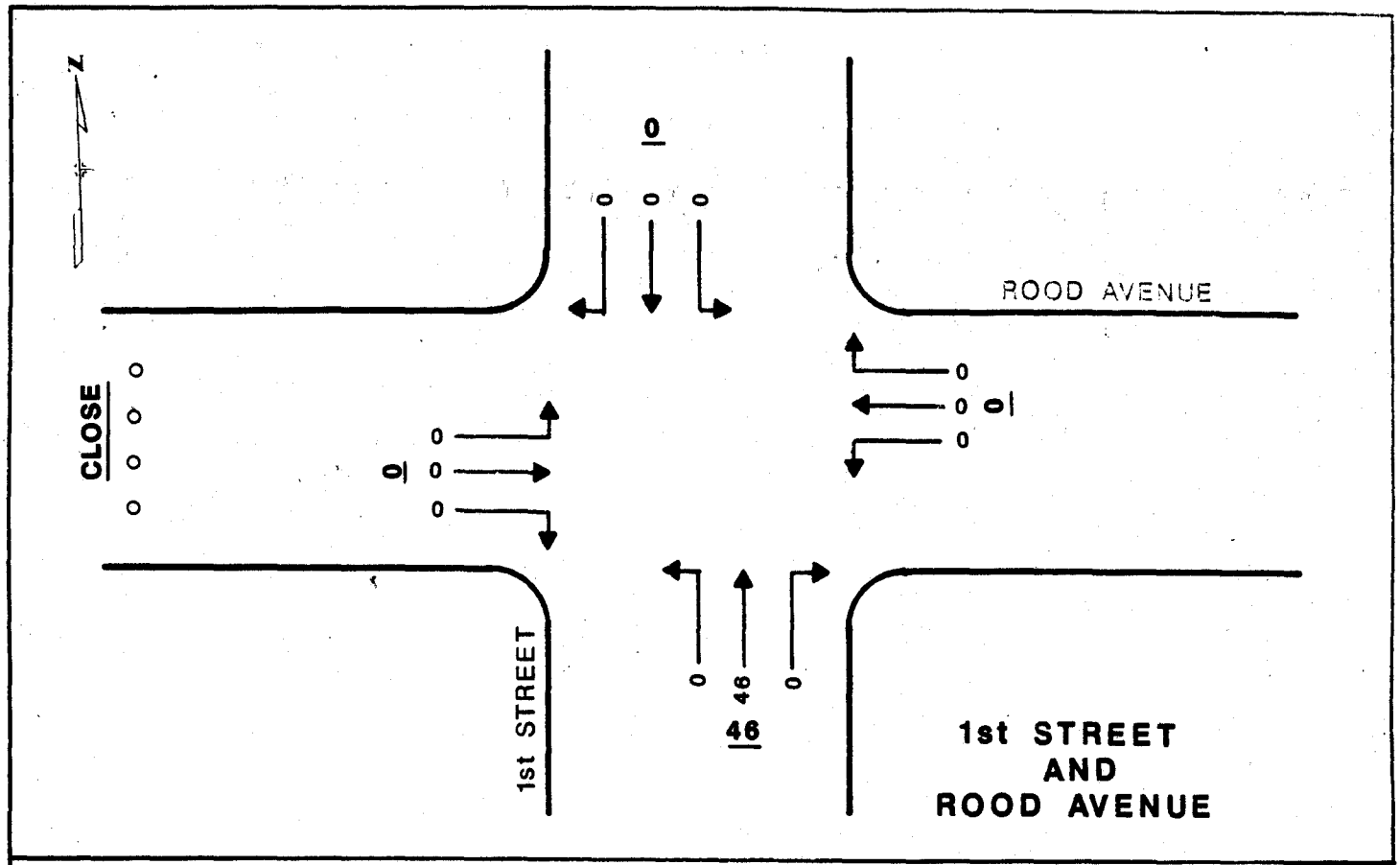


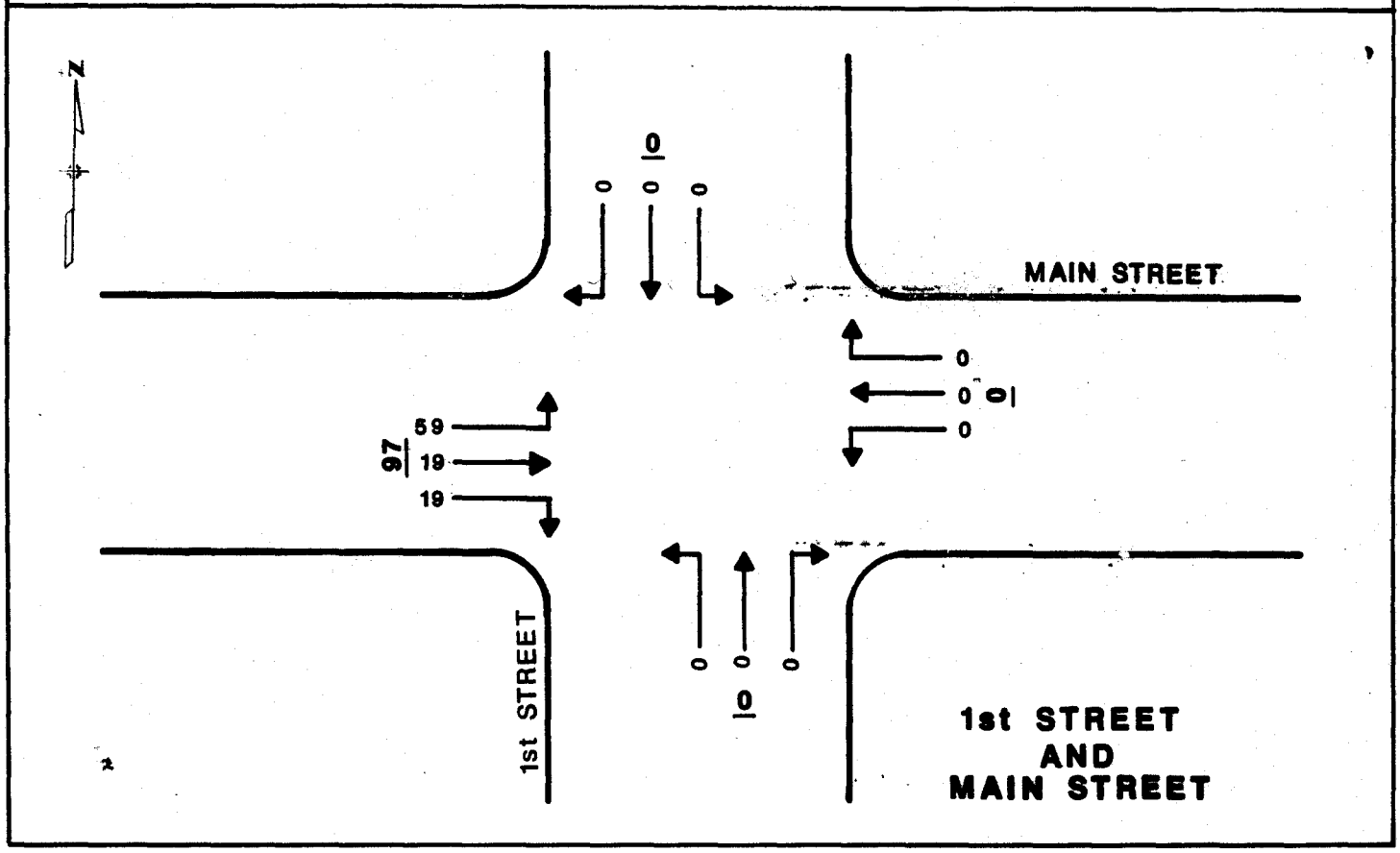


MESA COUNTY
JUSTICE CENTER

FIGURE 17
EXISTING TRAFFIC VOLUMES
PM PEAK HOUR

HDR

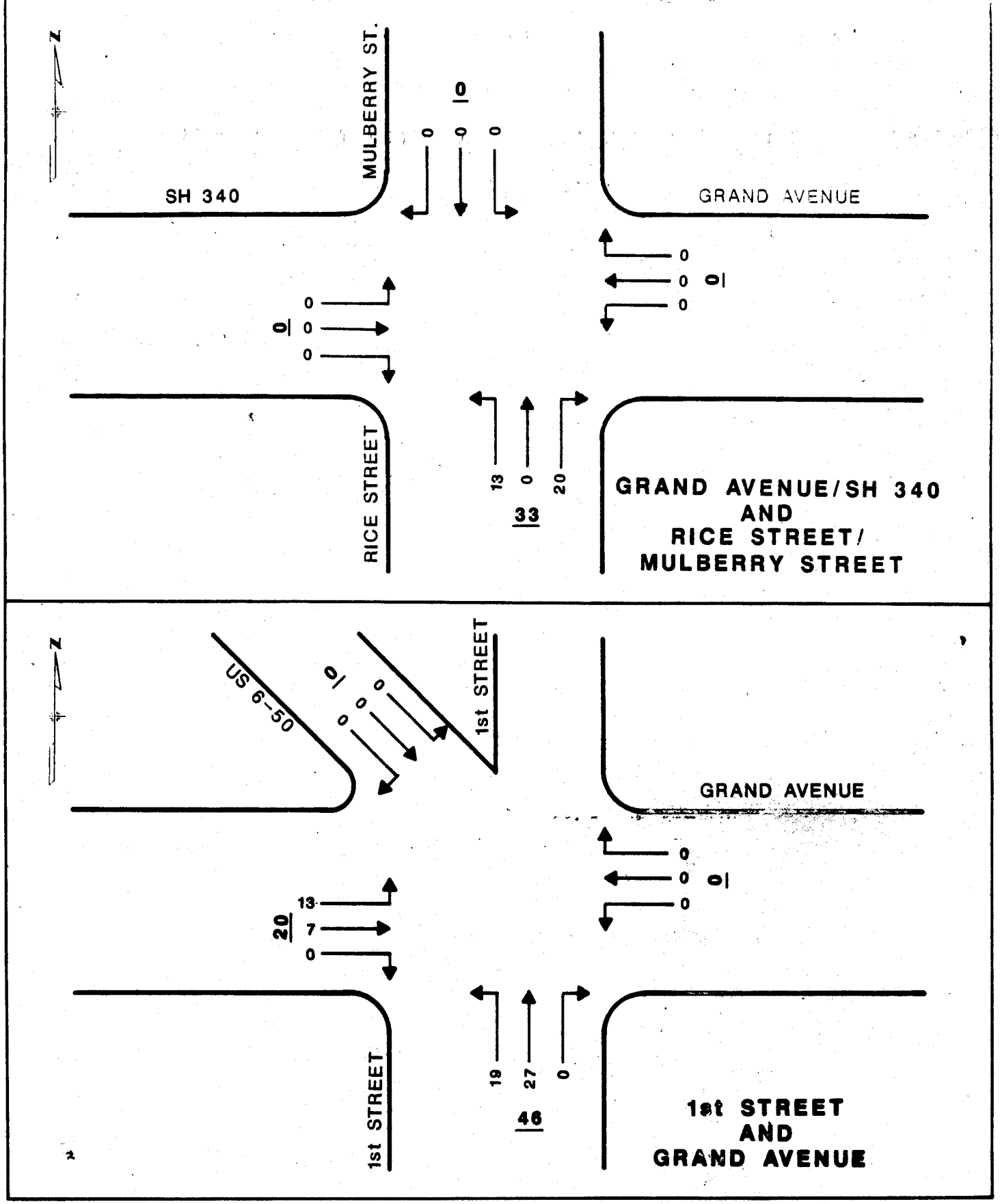




MESA COUNTY
JUSTICE CENTER

FIGURE 18
SITE GENERATED TRAFFIC VOLUMES PM PEAK HOUR

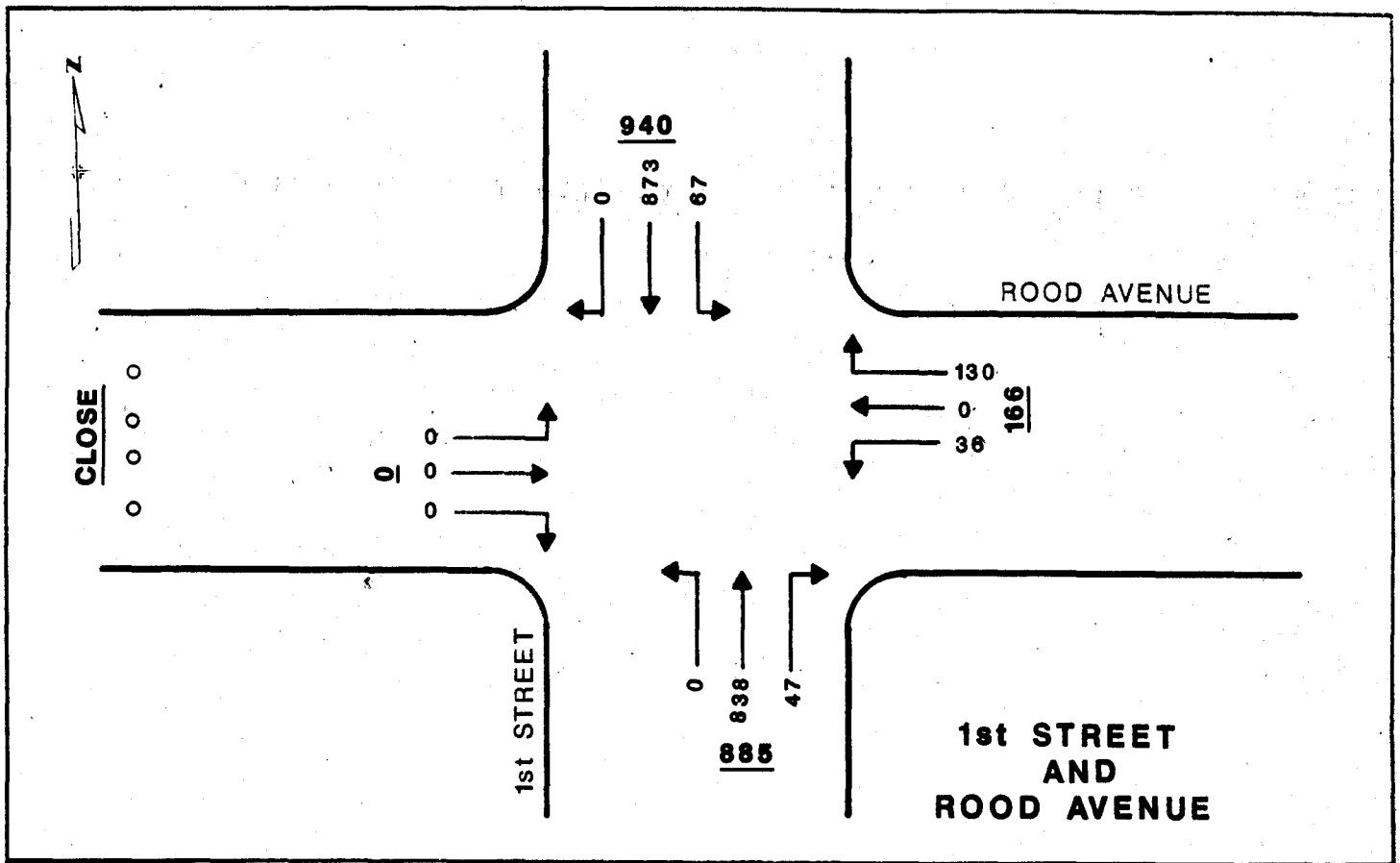
HDR

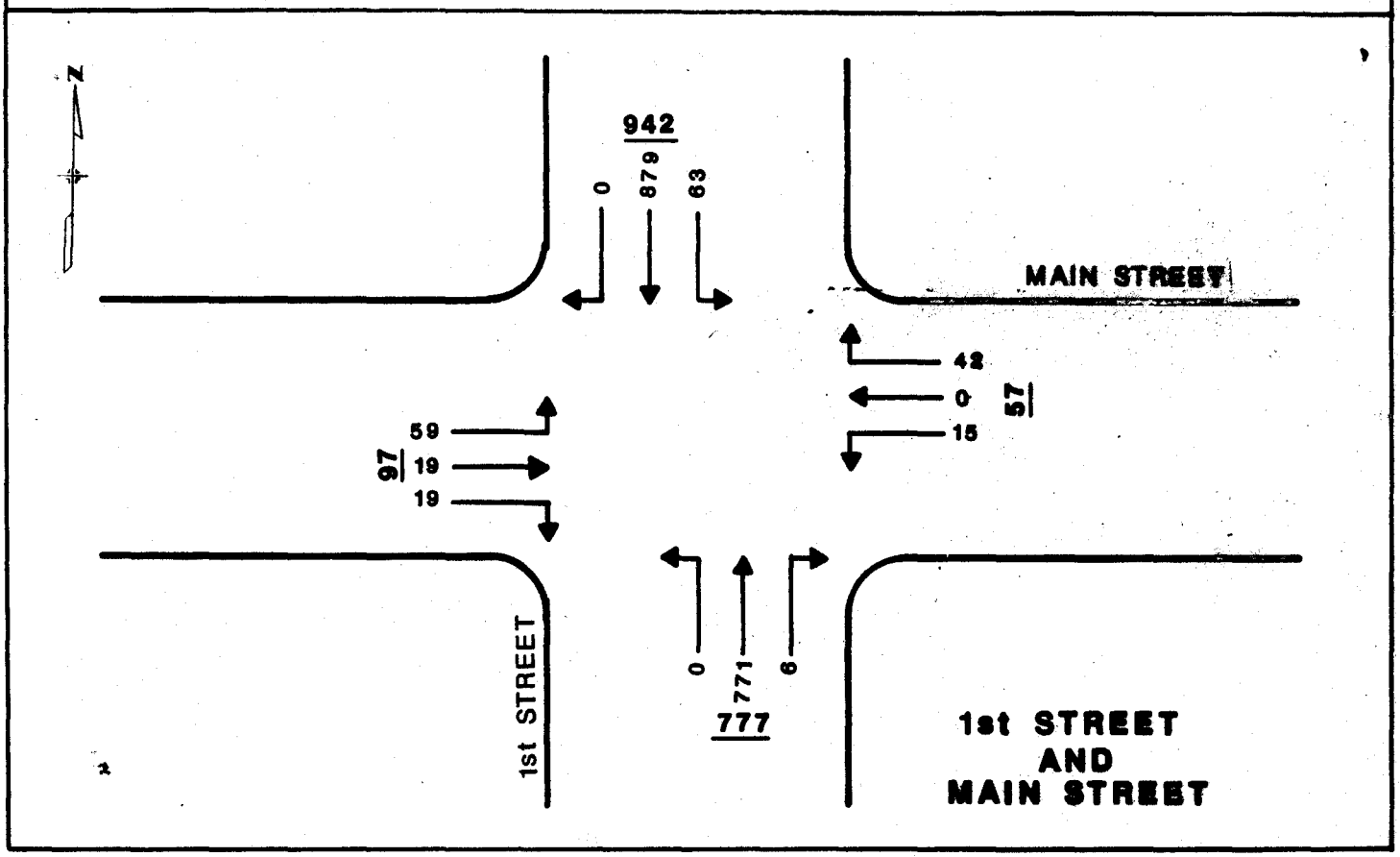


MESA COUNTY
JUSTICE CENTER

FIGURE 19
SITE GENERATED TRAFFIC VOLUMES PM PEAK HOUR

HDR

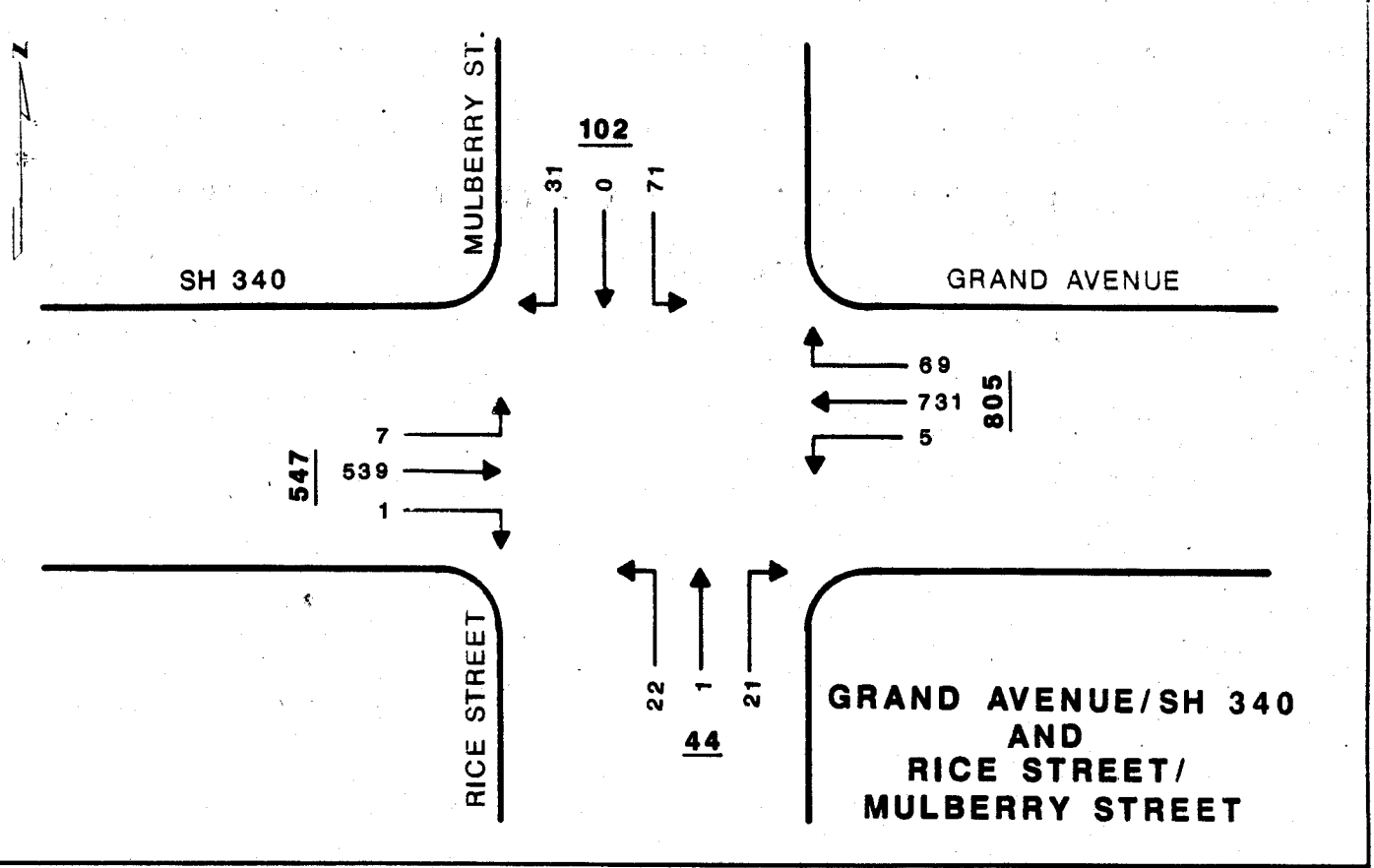


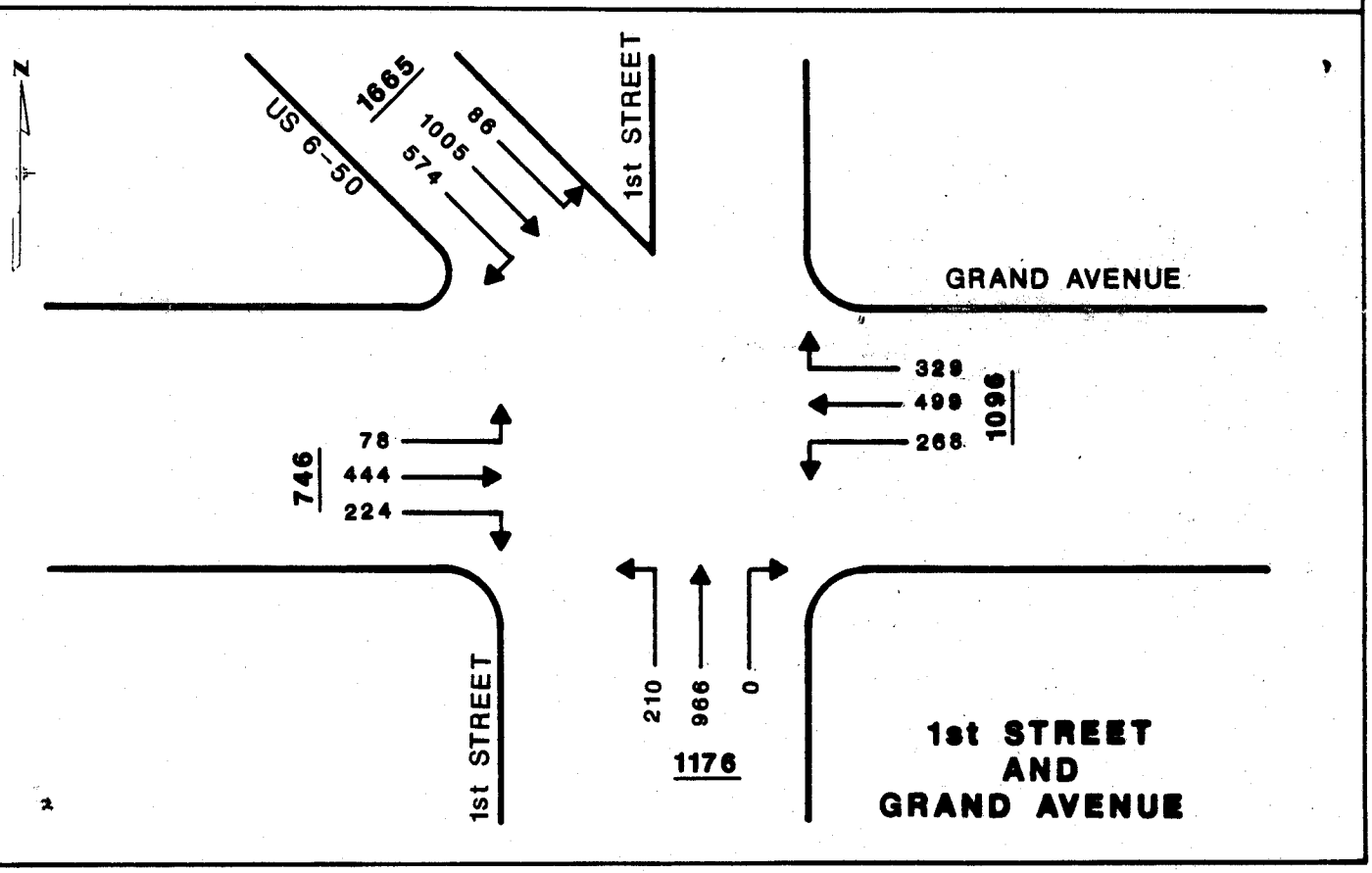


MESA COUNTY
JUSTICE CENTER

FIGURE 20
PROJECTED TRAFFIC VOLUMES PM PEAK HOUR

HDR





MESA COUNTY
JUSTICE CENTER

FIGURE 21
PROJECTED TRAFFIC VOLUMES PM PEAK HOUR

HDR

Capacity Analysis Results

The results of the intersection capacity analysis are presented in Table 3. Each movement LOS along with the overall intersection LOS is shown. All of the intersections are expected to function at the same LOS as exists today with current traffic volumes. The new justice center will not have a detrimental impact upon the operations of these intersections. The problem area which appeared in the analysis of this project was the southbound movement at First Street and Grand Avenue. The proposed development does not impact this movement and modifications to the intersection (i.e., separate right turn lane) would need to be considered by other governmental agencies. The analysis printouts are included in the appendix for reference.

Traffic Signal Analysis Results

The intersection of SH 340 and Rice Street was evaluated for the need of traffic signalization. The Counts PC computer program was utilized in this analysis. The traffic signal warrants which were evaluated include:

Warrant 1 - Minimum Vehicular Volume
Warrant 2 - Interruption of Continuous Traffic
Warrant 3 - Minimum Pedestrian Volume
Warrant 4 - School Crossing
Warrant 5 - Progressive Movement
Warrant 6 - Accident Experience
Warrant 7 - Systems
Warrant 8 - Combination of Warrants
Warrant 9 - Four-hour Volumes
Warrant 10 - Peak Hour Delay
Warrant 11 - Peak Hour Volume

This analysis did not show that any of these traffic signal warrants are met for the traffic volumes which are expected to occur when the Mesa County Justice Center campus is completed. The results for the before and after development conditions are located in the appendix.

TABLE 3

INTERSECTION CAPACITY ANALYSIS

Intersection	Movement	Level of Service Before	Level of Service After
First/Grand	NB L	D	D
	T	D	D
	R	B	A
	SB L	B	B
	T	F	F
	R	F	F
	EB L	C	C
	T	C	C
	R	D	D
	WB L	C	C
	T	C	C
	R	F	F
	Overall	F	F
First/Rood	NB L	A	N/A
	T	B	A
	R	B	A
	SB L	A	B
	T	B	B
	R	B	N/A
	EB L	A	N/A
	T	C	N/A
	R	C	N/A
	WB L	A	D
	T	C	C
	R	C	C
	Overall	F	F
First/Main	NB L	A	D
	T	B	B
	R	B	B
	SB L	A	B
	T	B	B
	R	B	D
	EB L	A	C
	T	C	C
	R	C	C
	WB L	A	C
	T	C	C
	R	C	C
	Overall	F	F

RECOMMENDATIONS

The overall roadway geometry and traffic lane assignments which were used in this analysis are adequate and no modifications are required to accommodate the project development traffic volumes.

Rice Street needs to be realigned to match with Mulberry Street to the north. This will require Rice Street to be moved slightly to the west and this modification should be shown on future site plans that are presented by Mesa County. The Rice Street right-of-way should be vacated to Mesa County and its classification changed to an internal street. The right-of-way vacation will allow Mesa County to make street improvements and alignment changes which are more compatible with the campus development than the current alignment. There are also benefits to the campus by eliminating through trips, improved security and specialized traffic movements can be accommodated.

The relocation of Crosby Avenue to the intersection of Spruce Street and Colorado Avenue will eliminate trips passing through the campus, will improve security and will distribute traffic volumes in the analysis envelope over a broader area.

Rood Avenue would not proceed beyond Spruce Street when the District Attorney's office and the County and District Courts are added to the development of a new correctional facility. Rood Avenue is not anticipated to penetrate the campus and would become a "T" intersection at Spruce Street.

CONCLUSION

The signalized intersections of First Street and Main Street, First Street and Rood Avenue and First Street and Grand Avenue will not be impacted negatively when the Mesa County Justice Center is completed and the resultant traffic volumes are experienced on the City street grid system. All of the intersections have an acceptable LOS except for First Street and Grand Avenue. At this location, the southbound movement currently experiences LOS F and will continue to function at that level in the future which results in an overall intersection LOS of F.

The unsignalized intersection of SH 340 and Rice Street will not require traffic signalization when the traffic volumes from the campus are experienced. Specific traffic movements into and out of the campus by the Sheriff's office need to be analyzed as the site plan is approved. Rice Street would be vacated from SH 340 to Main Street.

Crosby Avenue will be relocated to the south, out of the campus, and connect to the street system at Spruce Street and Colorado Avenue. This will benefit the general traveling public and will provide opportunities for campus planning and improved security.

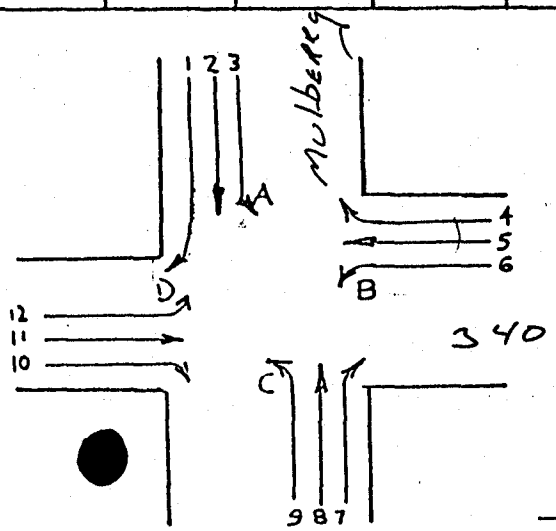
Rood Avenue will become a "T" intersection at Spruce Street and will not penetrate the site. The traffic volumes will be reduced at this intersection and planning for future expansions of the justice center campus will become easier.

8 HOUR

Date 7-12

INTERSECTION VOLUME COUNT

	3:30 4:45	3:45 4:00	4:00 4:15	4:15 4:30	4:30 4:45	4:45 5:00	5:00 5:15	5:15 5:30				TOTAL
1	5	9	10	3	4	14 [31]	12	5				62
2	0	0	0	0	0	0 [0]	0	0				0
3	7	13	6	30	12	27 [71]	17	7				115
4	27	35	20	16	19	14 [69]	8	7				146
5	101	129	208	159	140	224 [731]	163	150				1274
6	2	0	1	2	0	2 [5]	0	0				7
7	1	0	0	0	0	1 [1]	0	1				3
8	2	0	0	0	1	0 [1]	0	0				3
9	2	5	0	0	1	8 [9]	2	1				19
10	0	1	0	0	1	0 [1]	0	0				2
11	106	114	171	88	93	187 [579]	116	109				984
12	13	17	1	0	3	3 [7]	2	0				39
TOTAL	264	306	417	298	274	476 [1465]	323	280				
A												
B				1465								
C							Total Cars					2,708
D												
TOTAL												



Turning Movements

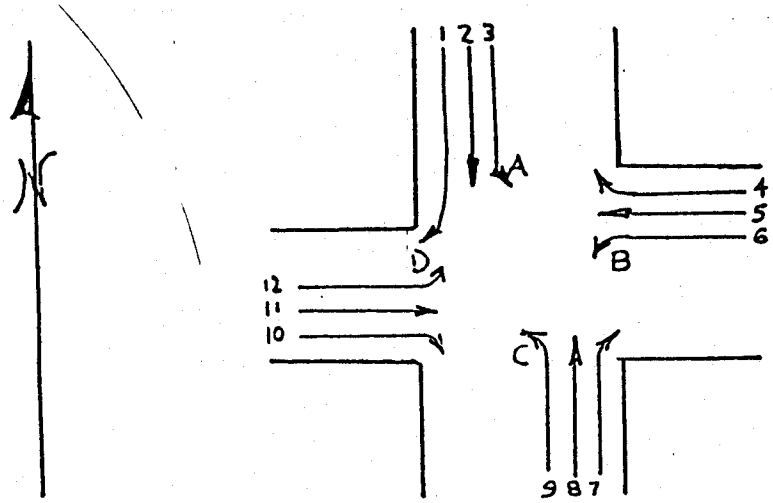
Hwy 340/mulberry
INTERSECTION

8 HOUR

Date 7-16-90

INTERSECTION VOLUME COUNT

	3:30 3:45	3:45 4:00	4:00 4:15	4:15 4:30	4:30 4:45	4:45 5:00	5:00 5:15	5:15 5:30				TOTAL
1	21	10	29	39	27	14	6 [86]	9				
2	201	220	246	295	240	181	289 [1005]	220				
3	81	97	117	136	151	121	166 [574]	100				
4	74	71	121	86	78	93	72 [329]	61				
5	129	148	139	194	110	124	71 [449]	59				
6	60	59	51	54	65	51	98 [268]	39				
7	0	0	0	0	0	0	0 [0]	0				
8	197	224	194	231	210	237	267 [939]	165				
9	30	39	78	44	52	45	50 [191]	40				
10	79	71	34	51	28	46	94 [228]	20				
11	65	77	121	103	125	80	129 [437]	112				
12	29	48	39	19	17	14	15 [165]	12				
TOTAL	966	1064	1169	1252	1103	1060	1256	837				
A					4671							
B			←	4584			→					
C												
D												
TOTAL												



Turning Movements

1st & Grand

INTERSECTION

ARMSTRONG CONSULTANTS, INC.

861 Rood Avenue — Grand Junction, Colorado — (303) 242-0101 — FAX (303) 241-1769

July 26, 1990

Mr. Mike Kelly
Mesa County Property Management
536 White Avenue
Grand Junction, CO 81501

RE: Traffic Counts for
1st & Main and 1st & Rood
Armstrong Project #905326

Dear Mr. Kelly:

Enclosed are the traffic count results for the above. If you have any questions, do not hesitate to call.

We appreciate this opportunity to be of service to Mesa County.

Sincerely,

ARMSTRONG CONSULTANTS, INC.

Ronald P. Rish

Ronald P. Rish, P.E.

RPR/ss
DALY24

Encl: Traffic Counts - 4 sheets

ARMSTRONG CONSULTANTS, INC.

PROJECT: Mesa County Traffic Counts

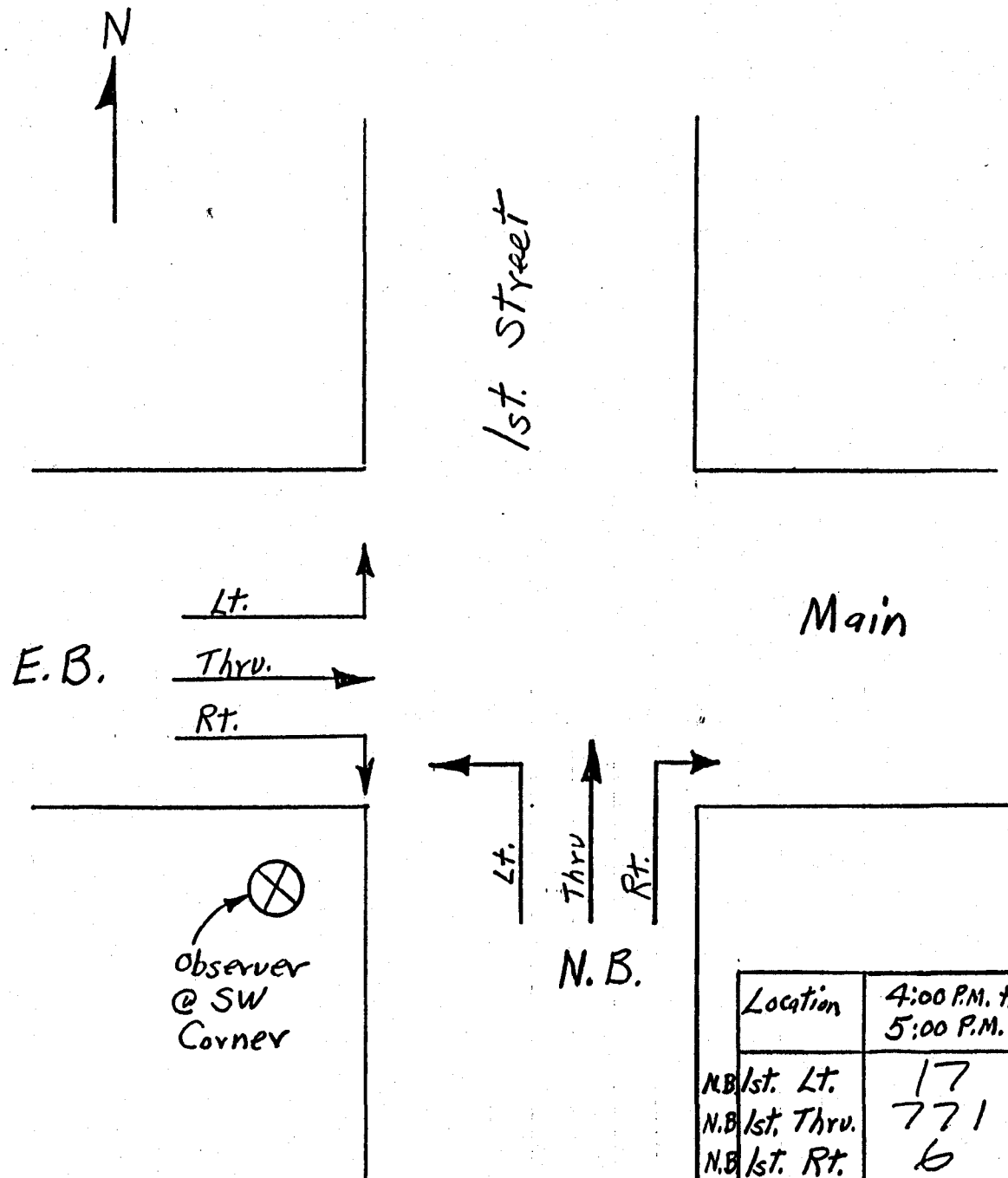
TITLE: 1st Street and Main

PROJECT NUMBER: 905326

SHEET NO. 1 OF 2

DATE: Tues 7/24/90

PREPARED BY: DAE



Location	4:00 P.M. to 5:00 P.M.	5:01 P.M. to 6:01 P.M.
N.B. 1st. Lt.	17	15
N.B. 1st. Thru.	771	721
N.B. 1st. Rt.	6	7
E.B. Main Lt.	35	22
E.B. Main Thru	9	7
E.B. Main Rt.	19	16

ARMSTRONG CONSULTANTS, INC.

PROJECT: Mesa County Traffic Counts

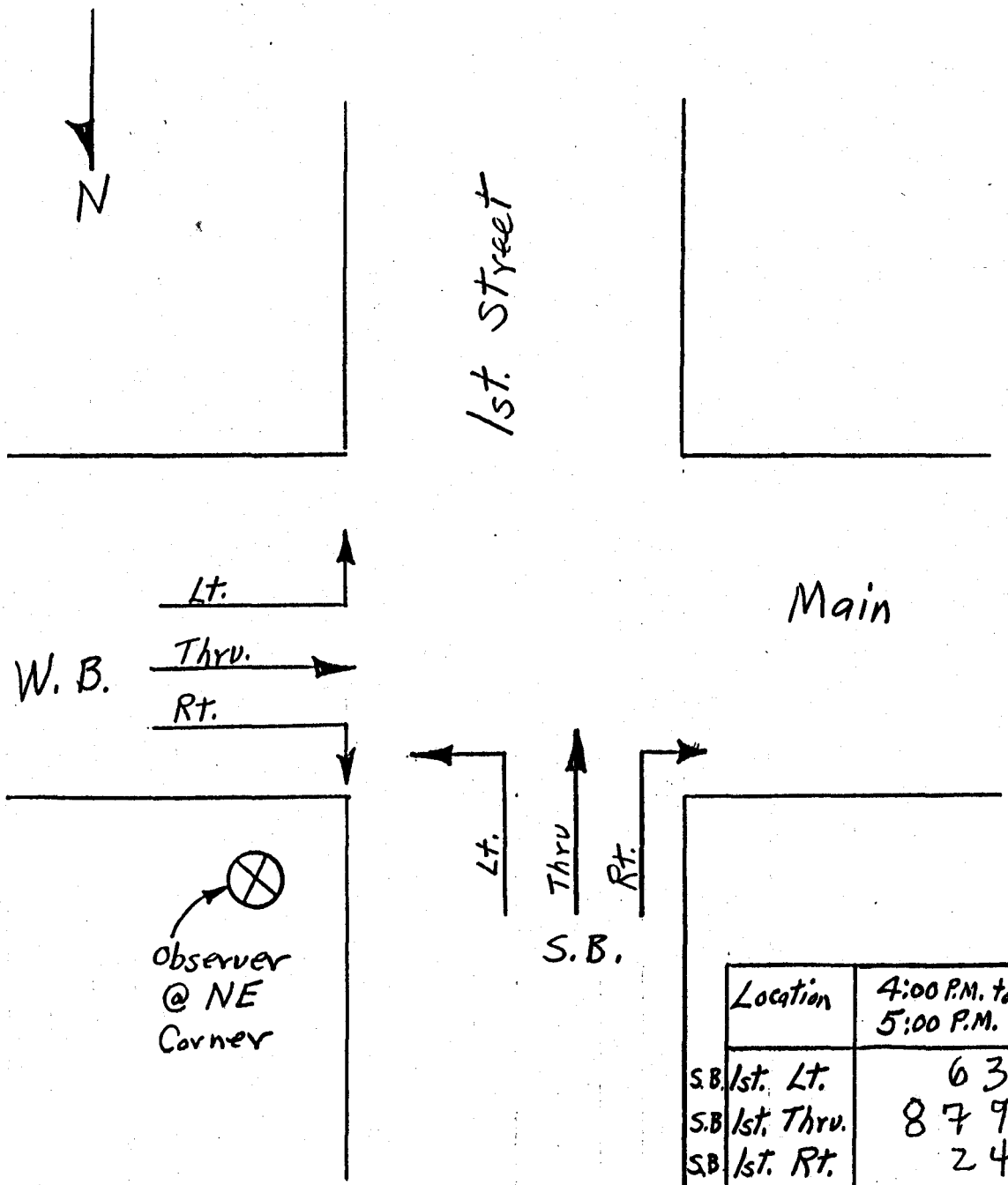
TITLE: 1st Street and Main

PROJECT NUMBER: 905326

SHEET NO. 2 OF 2

DATE: Tues 7/24/90

PREPARED BY: KDM



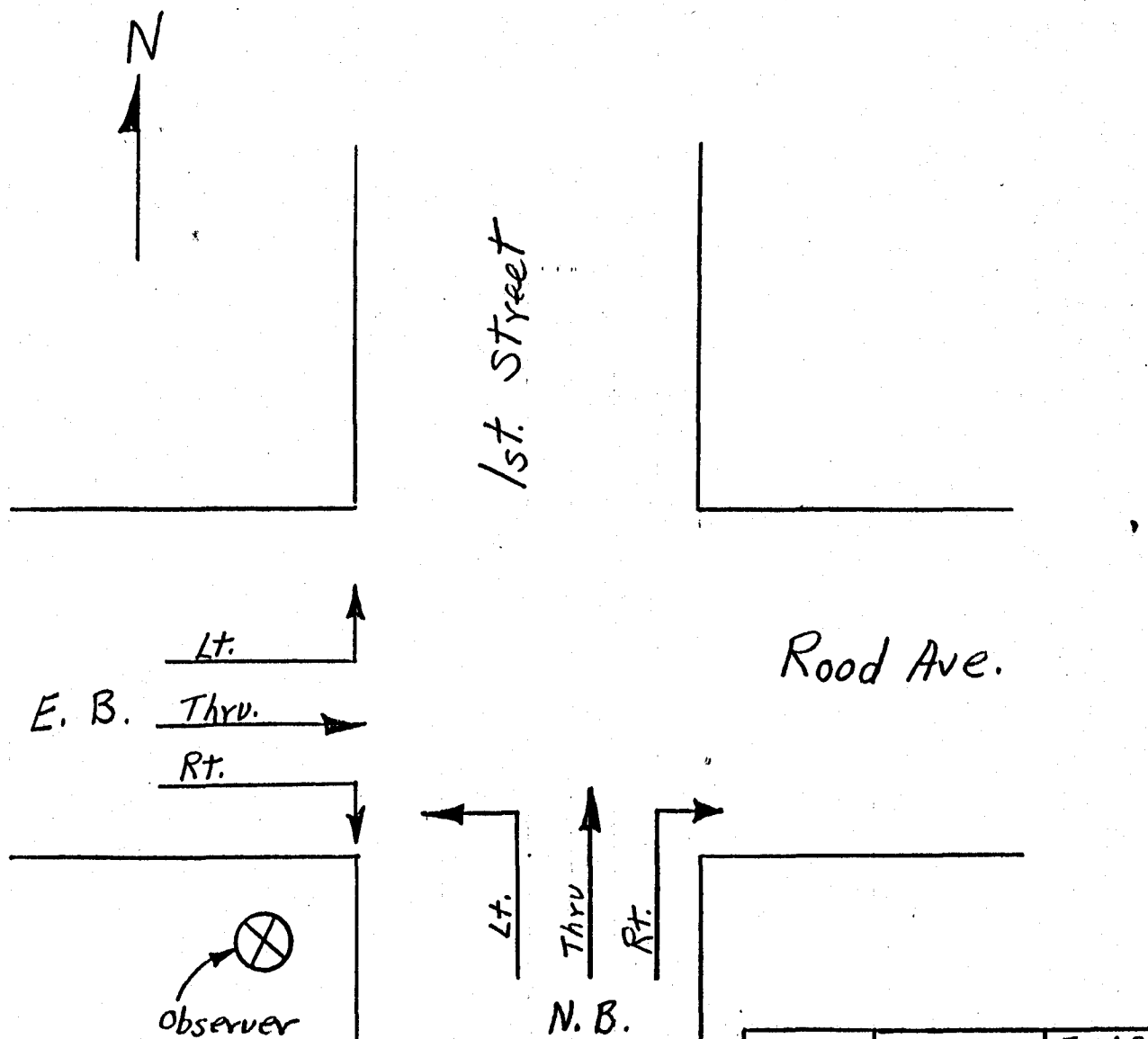
Location	4:00 P.M. to 5:00 P.M.	5:01 P.M. to 6:01 P.M.
S.B. 1st. Lt.	63	35
S.B. 1st. Thru.	879	793
S.B. 1st. Rt.	24	09
W.B. Main Lt.	6	08
W.B. Main Thru	9	15
W.B. Main Rt.	42	54

KDM

ARMSTRONG CONSULTANTS, INC.

PROJECT: Mesa County Traffic Counts
TITLE: 1st Street and Rood Ave.

PROJECT NUMBER: 905326
SHEET NO. 1 OF 2
DATE: Wed. 7/25/90
PREPARED BY: DAE



Location	4:00 P.M. to 5:00 P.M.	5:01 P.M. to 6:01 P.M.
N.B. 1st. Lt.	20	13
N.B. 1st. Thru.	710	691
N.B. 1st. Rt.	47	38
E.B. Rood Lt.	7	13
E.B. Rood Thru	2	5
E.B. Rood Rt.	13	15

ARMSTRONG CONSULTANTS, INC.

PROJECT: Mesa County Traffic Counts

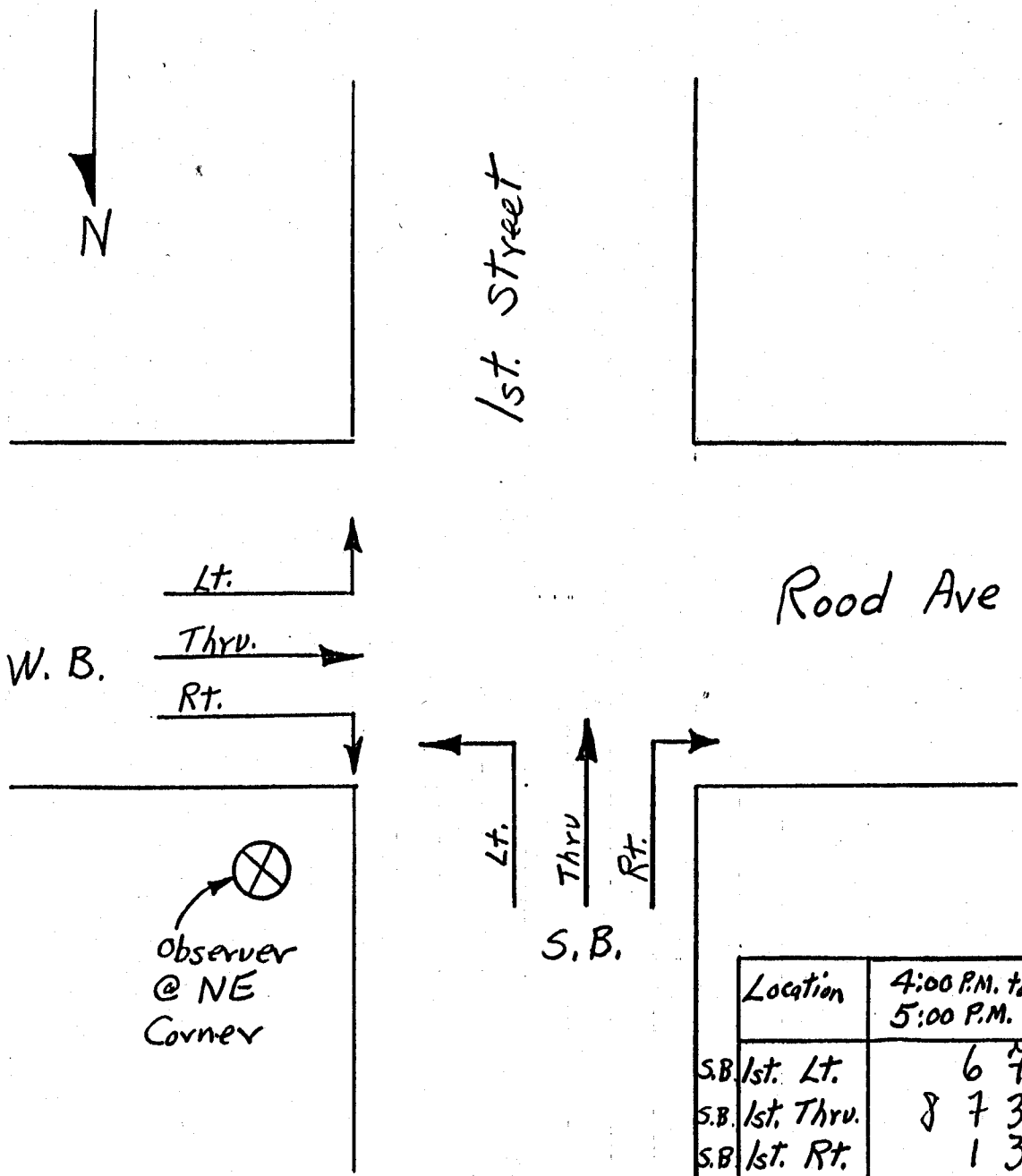
TITLE: 1st Street and Rood Ave.

PROJECT NUMBER: 905326

SHEET NO. 2 OF 2

DATE: Wed. 7/25/90

PREPARED BY: KDM



Location	4:00 P.M. to 5:00 P.M.	5:01 P.M. to 6:01 P.M.
S.B. 1st. Lt.	67	65
S.B. 1st. Thru.	873	796
S.B. 1st. Rt.	13	10
W.B. Rood Lt.	36	25
W.B. Rood Thru	05	09
W.B. Rood Rt.	125	152

APPENDIX B - CAPACITY ANALYSIS

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..GRAND AVENUE/1ST STREET
AREA TYPE.....OTHER
ANALYST.....JOE HENDERSON
DATE.....08-01-1990
TIME.....PM PEAK
COMMENT.....BEFORE DEVELOPMENT

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	65	268	191	86	: L	10.0	L	9.0	L	9.0	L	10.5	
TH	437	499	939	1005	: T	12.0	T	11.0	T	12.5	T	11.5	
RT	224	329	0	574	: T	10.0	T	11.0	T	12.0	TR	11.0	
RR	0	0	0	0	: R	10.0	R	11.0	R	9.5		12.0	
					:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	2.00	Y	20	0	0.90	50	N	26.8	4
WB	0.00	2.00	Y	20	0	0.90	50	N	26.8	4
NB	0.00	2.00	Y	20	0	0.90	50	N	28.8	4
SB	0.00	2.00	Y	20	0	0.90	50	N	28.8	4

SIGNAL SETTINGS — CYCLE LENGTH = 120.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X	X		
	TH		X				TH		X		
	RT		X				RT		X		
	PD		X				PD		X		
WB	LT	X	X			SB	LT	X	X		
	TH		X				TH		X		
	RT		X				RT		X		
	PD		X				PD		X		
GREEN		15.0	34.0	0.0	0.0	GREEN		11.0	40.0	0.0	0.0
YELLOW		5.0	5.0	0.0	0.0	YELLOW		5.0	5.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.000	0.467	20.1	C	19.4	C
	T	0.492	0.300	16.4	C		
	R	0.757	0.300	25.2	D		
WB	L	0.485	0.467	17.9	C	33.2	D
	T	0.561	0.300	17.0	C		
	R	1.067	0.300	71.6	F		
NB	L	0.749	0.483	28.6	D	26.0	D
	T	0.872	0.350	25.5	D		
	R	0.000	0.350	7.7	B		
SB	L	0.166	0.483	13.3	B	*	*
	TR	1.812	0.350	*	*		

INTERSECTION: Delay = * (sec/veh) V/C = 1.195 LOS = *

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..GRAND AVENUE/1ST STREET
AREA TYPE.....OTHER
ANALYST.....JOE HENDERSON
DATE.....08-01-1990
TIME.....PM PEAK
COMMENT.....AFTER DEVELOPMENT

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	78	268	210	86	L	10.0	L	9.0	L	9.0	L	10.5	
TH	444	499	966	1005	T	12.0	T	11.0	T	12.5	T	11.5	
RT	224	329	0	574	T	10.0	T	11.0	T	12.0	TR	11.0	
RR	0	0	0	0	R	10.0	R	11.0	R	9.5		12.0	
						12.0		12.0		12.0		12.0	
						12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	2.00	Y	20	0	0.90	50	N	26.8	4
WB	0.00	2.00	Y	20	0	0.90	50	N	26.8	4
NB	0.00	2.00	Y	20	0	0.90	50	N	28.8	4
SB	0.00	2.00	Y	20	0	0.90	50	N	28.8	4

SIGNAL SETTINGS — CYCLE LENGTH = 120.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X	X		
	TH		X				TH		X		
	RT		X				RT		X		
	PD		X				PD		X		
WB	LT	X	X			SB	LT	X	X		
	TH		X				TH		X		
	RT		X				RT		X		
	PD		X				PD		X		
GREEN		15.0	34.0	0.0	0.0	GREEN		11.0	40.0	0.0	0.0
YELLOW		5.0	5.0	0.0	0.0	YELLOW		5.0	5.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.000	0.467	20.1	C	19.4	C
	T	0.499	0.300	16.5	C		
	R	0.757	0.300	25.2	D		
WB	L	0.498	0.467	18.2	C	33.3	D
	T	0.561	0.300	17.0	C		
	R	1.067	0.300	71.6	F		
NB	L	0.853	0.483	39.8	D	29.0	D
	T	0.897	0.350	26.8	D		
	R	0.000	0.350	3.6	A		
SB	L	0.166	0.483	13.3	B	*	*
	TR	1.812	0.350	*	*		

INTERSECTION: Delay = * (sec/veh) V/C = 1.212 LOS = *

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..ROOD AVENUE/1ST STREET
AREA TYPE.....OTHER
ANALYST.....JOE HENDERSON
DATE.....08-01-1990
TIME.....PM PEAK
COMMENT.....BEFORE DEVELOPMENT

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	7	36	20	67	L	11.0	L	11.0	L	10.0	L	10.0	
TH	2	5	792	873	T	10.0	TR	13.0	T	11.0	T	13.5	
RT	13	125	47	13	R	11.0		12.0	T	13.5	T	10.0	
RR	0	0	0	0		12.0		12.0	R	11.5	R	11.0	
						12.0		12.0		12.0		12.0	
						12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	2.00	Y	20	0	0.90	50	N	30.4	4
WB	0.00	2.00	Y	20	0	0.90	50	N	30.4	4
NB	0.00	2.00	Y	20	0	0.90	50	N	21.8	4
SB	0.00	2.00	Y	20	0	0.90	50	N	21.8	4

SIGNAL SETTINGS — CYCLE LENGTH = 120.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X	X		
	TH		X				TH		X		
	RT		X				RT		X		
	PD		X				PD		X		
WB	LT	X	X			SB	LT	X	X		
	TH		X				TH		X		
	RT		X				RT		X		
	PD		X				PD		X		
GREEN		7.0	29.0	0.0	0.0	GREEN		7.0	57.0	0.0	0.0
YELLOW		5.0	5.0	0.0	0.0	YELLOW		5.0	5.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.000	0.358	0.0	A	10.7	B
	T	0.005	0.258	15.6	C		
	R	0.049	0.258	15.8	C		
WB	L	0.000	0.358	0.0	A	14.2	B
	TR	0.457	0.258	18.1	C		
NB	L	0.000	0.592	0.0	A	9.6	B
	T	0.523	0.492	10.0	B		
	R	0.092	0.492	7.7	B		
SB	L	0.000	0.592	0.0	A	9.8	B
	T	0.586	0.492	10.5	B		
	R	0.026	0.492	7.4	B		

INTERSECTION: Delay = 10.1 (sec/veh) V/C = 0.427 LOS = B

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..ROOD AVENUE/1ST STREET
AREA TYPE.....OTHER
ANALYST.....JOE HENDERSON
DATE.....08-01-1990
TIME.....PM PEAK
COMMENT.....AFTER DEVELOPMENT

	VOLUMES				:	GEOMETRY							
	EB	WB	NB	SB	:	EB		WB		NB		SB	
LT	0	36	0	67	:	12.0	L	11.0	T	11.0	L	10.0	
TH	0	0	838	873	:	12.0	R	13.0	T	13.5	T	13.5	
RT	0	130	47	0	:	12.0		12.0	R	11.5	T	10.0	
RR	0	0	0	0	:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	2.00	Y	20	0	0.90	50	N	25.1	4
WB	0.00	2.00	Y	20	0	0.90	50	N	25.1	4
NB	0.00	2.00	Y	20	0	0.90	50	N	11.3	4
SB	0.00	2.00	Y	20	0	0.90	50	N	11.3	4

SIGNAL SETTINGS — CYCLE LENGTH = 120.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT					NB	LT				
	TH						TH		X		
	RT						RT		X		
	PD						PD		X		
WB	LT	X				SB	LT	X	X		
	TH						TH		X		
	RT	X					RT		X		
	PD	X					PD		X		
GREEN		22.0	0.0	0.0	0.0	GREEN		7.0	76.0	0.0	0.0
YELLOW		5.0	0.0	0.0	0.0	YELLOW		5.0	5.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
WB	L	0.140	0.200	30.0	D	24.0	C
	R	0.595	0.200	22.3	C		
NB	T	0.419	0.650	4.8	A	4.7	A
	R	0.069	0.650	3.6	A		
SB	L	0.000	0.750	13.3	B	5.8	B
	T	0.498	0.650	5.2	B		

INTERSECTION: Delay = 6.8 (sec/veh) V/C = 0.412 LOS = B

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..MAIN AVENUE/1ST STREET
AREA TYPE.....OTHER
ANALYST.....JOE HENDERSON
DATE.....08-01-1990
TIME.,.....PM PEAK
COMMENT.....BEFORE DEVELOPMENT

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	35	6	17	63	L	11.0	L	11.0	L	10.0	L	10.0	
TH	9	9	771	879	TR	13.5	TR	13.5	T	13.0	T	11.0	
RT	19	42	6	24		10.0		11.0	T	11.0	T	13.0	
RR	0	0	0	0		10.0		11.0	R	10.0	R	10.0	
						12.0		12.0		12.0		12.0	
						12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	2.00	Y	20	0	0.90	50	N	29.3	4
WB	0.00	2.00	Y	20	0	0.90	50	N	29.3	4
NB	0.00	2.00	Y	20	0	0.90	50	N	20.0	4
SB	0.00	2.00	Y	20	0	0.90	50	N	20.0	4

SIGNAL SETTINGS — CYCLE LENGTH = 120.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X	X		
	TH		X				TH		X		
	RT		X				RT		X		
	PD		X				PD		X		
WB	LT	X	X			SB	LT	X	X		
	TH		X				TH		X		
	RT		X				RT		X		
	PD		X				PD		X		
GREEN		7.0	29.0	0.0	0.0	GREEN		7.0	57.0	0.0	0.0
YELLOW		5.0	5.0	0.0	0.0	YELLOW		5.0	5.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.000	0.358	0.0	A	7.1	B
	TR	0.091	0.258	15.9	C		
WB	L	0.000	0.358	0.0	A	14.6	B
	TR	0.171	0.258	16.3	C		
NB	L	0.000	0.592	0.0	A	9.7	B
	T	0.513	0.492	9.9	B		
	R	0.012	0.492	7.4	B		
SB	L	0.000	0.592	0.0	A	9.8	B
	T	0.585	0.492	10.5	B		
	R	0.050	0.492	7.5	B		

INTERSECTION: Delay = 9.8 (sec/veh) V/C = 0.349 LOS = B

APPENDIX C - WARRANT ANALYSIS

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..MAIN AVENUE/1ST STREET
AREA TYPE.....OTHER
ANALYST.....JOE HENDERSON
DATE.....08-01-1990
TIME.....PM PEAK
COMMENT.....AFTER DEVELOPMENT

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	59	15	0	63	L	11.0	L	11.0	L	10.0	L	10.0	
TH	19	0	771	879	TR	13.5	TR	13.5	T	13.0	T	11.0	
RT	19	42	6	0		10.0		11.0	T	11.0	T	13.0	
RR	0	0	0	0		10.0		11.0	R	10.0	R	10.0	
						12.0		12.0		12.0		12.0	
						12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	2.00	Y	20	0	0.90	50	N	29.3	4
WB	0.00	2.00	Y	20	0	0.90	50	N	29.3	4
NB	0.00	2.00	Y	20	0	0.90	50	N	20.0	4
SB	0.00	2.00	Y	20	0	0.90	50	N	20.0	4

SIGNAL SETTINGS — CYCLE LENGTH = 120.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X	X		
	TH		X				TH		X		
	RT		X				RT		X		
	PD		X				PD		X		
WB	LT	X	X			SB	LT	X	X		
	TH		X				TH		X		
	RT		X				RT		X		
	PD		X				PD		X		
GREEN		7.0	29.0	0.0	0.0	GREEN		7.0	57.0	0.0	0.0
YELLOW		5.0	5.0	0.0	0.0	YELLOW		5.0	5.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.000	0.358	20.1	C	18.5	C
	TR	0.120	0.258	16.1	C		
WB	L	0.000	0.358	17.9	C	16.6	C
	TR	0.146	0.258	16.2	C		
NB	L	0.000	0.592	28.6	D	9.9	B
	T	0.513	0.492	9.9	B		
	R	0.012	0.492	7.4	B		
SB	L	0.000	0.592	13.3	B	10.7	B
	T	0.585	0.492	10.5	B		
	R	0.000	0.492	28.3	D		

INTERSECTION: Delay = 10.9 (sec/veh) V/C = 0.640 LOS = B

GRAND AVENUE
RICE STREET/MULBERRY STREET
BEFORE DEVELOPMENT

HOUR OF DAY	**** MAIN STREET TOTAL VOLUME	PEAK DIRECTN	**** BIAS PRCNT	**** SIDE STREET TOTAL VOLUME	PEAK DIRECTN	**** PEAK VOLUME	INTER-SECTION VOLUME
12 AM	82	EAST	68	4	EVEN	2	86
1 AM	36	EVEN	50	5	SOUTH	4	41
2 AM	41	WEST	54	3	SOUTH	2	44
3 AM	32	EAST	88	0	EVEN	0	32
4 AM	66	WEST	56	8	SOUTH	5	74
5 AM	116	WEST	66	4	EVEN	2	120
6 AM	313	EAST	51	28	SOUTH	15	341
7 AM	940	EAST	70	40	SOUTH	25	980
8 AM	1180	EAST	73	64	SOUTH	35	1244
9 AM	1070	EAST	63	109	SOUTH	61	1179
10 AM	980	EAST	59	135	NORTH	71	1115
11 AM	1122	WEST	51	166	SOUTH	85	1288
12 PM	1154	EAST	53	218	SOUTH	138	1372
1 PM	1232	EAST	59	191	SOUTH	96	1423
2 PM	1162	EAST	53	134	NORTH	90	1296
3 PM	1133	EAST	51	160	NORTH	91	1293
4 PM	1338	WEST	54	195	SOUTH	102	1533
5 PM	1364	WEST	61	163	SOUTH	93	1527
6 PM	931	EAST	51	102	SOUTH	60	1033
7 PM	734	EAST	53	62	NORTH	45	796
8 PM	451	EAST	57	48	NORTH	26	499
9 PM	463	EAST	54	25	SOUTH	20	488
10 PM	260	EAST	56	12	NORTH	8	272
11 PM	142	WEST	54	19	NORTH	12	161

TOTAL INTERSECTION VOLUME IS 18,237

MAIN STREET TOTAL VOLUME IS 16,342
EASTBOUND APPROACH IS 8,938 (55 %)
WESTBOUND APPROACH IS 7,404 (45 %)

SIDE STREET TOTAL VOLUME IS 1,895
NORTHBOUND APPROACH IS 923 (49 %)
SOUTHBOUND APPROACH IS 972 (51 %)

REPORT PRODUCED THURSDAY, AUGUST 2, 1990.

COUNTS TAKEN ON THURSDAY, JANUARY 11, 1990 THROUGH WEDNESDAY, FEBRUARY 28, 1990.

GRAND AVENUE
RICE STREET/MULBERRY STREET
TRAFFIC SIGNAL WARRANT EVALUATION

INTRODUCTION

This review is based on the methodology presented in the Manual on Uniform Traffic Control Devices (MUTCD), 1978, as amended by the Federal Highway Administration. Please refer to part 4C of that manual.

The intersection under study has the following characteristics:

The 85th percentile speed on the main street is [30] MPH.
Existing traffic control is . . . SIDE STREET STOP.
Daily traffic volume of [18,237] was counted on
THURSDAY, JANUARY 11, 1990 through WEDNESDAY, FEBRUARY 28, 1990.
Estimated annual traffic volume is [6,656,505] vehicles.

1. INTERSECTING TRAFFIC VOLUMES

The installation of a traffic signal may be necessary to control an intersection with large volumes of conflicting traffic. The required traffic volumes must be present for at least 8 hours of an average weekday. The minimum volumes vary according to the number of lanes on the intersecting streets, the speed of traffic on the main street, and the community size.

Number of hours required traffic present = 0
Warrant 1 is NOT SATISFIED.

2. INTERRUPTION OF CONTINUOUS TRAFFIC

On major streets with high traffic volume, it may be necessary to use traffic signal control to provide an adequate number of gaps in traffic to allow vehicles to enter from a side street. The application of this warrant is identical to that of warrant 1, above.

Number of hours required traffic present = 2
Warrant 2 is NOT SATISFIED.

3. CROSSING PEDESTRIAN TRAFFIC

This warrant is similar to warrant 2, but is intended to identify locations where additional gaps are needed to provide safe pedestrian crossing of a major street. A signal installed solely for pedestrians should use a fully actuated controller and, if in a signal system, be coordinated with that system. A signal installed only under this warrant shall include pedestrian signals. When installed at a midblock location, additional restrictions may apply (See section 4C-5).

Number of hours required traffic present = 0
Warrant 3 is NOT APPLICABLE.

4. SCHOOL CROSSING

An established school crossing may require signal protection if an engineering study reveals that there is less than one gap per minute during the period of crossing usage. The restrictions on signals installed under this warrant are similar to those of warrant 3.

WARRANT 4 IS NOT APPLICABLE.

5. SIGNAL PROGRESSION

A traffic signal may occasionally be used to maintain vehicle grouping in a coordinated system. Such a signal should not be within 1,000 FT of adjacent signalized intersections in the system.

Warrant 5 is NOT APPLICABLE.

6. ACCIDENT PREVENTION

Many traffic signals are installed on the premise of reducing accidents; however, it must be recognized that signals may actually increase some types of accidents. The result is often contrary to the intended goal. Four conditions must be met before a signal is installed solely to reduce accidents:

(1) There has been five or more accidents of types preventable by traffic signals in the last 12 months;

(2) at least one volume requirement of warrant 8 must be satisfied;

(3) traffic progression would not be seriously disrupted, and

(4) less restrictive solutions have been tried and enforced with unsatisfactory results.

A signal installed solely under this warrant should be traffic actuated.

Total number of accidents = 1
Number of preventable accidents = 1
Accident rate is .15 per million vehicles
Number of warrant 8 volume requirements met = 0
Parts 1 and 2 are NOT SATISFIED.

7. TRAFFIC SYSTEM OPERATION

Traffic signal control may be used to encourage concentration and organization of vehicles on the major street network. Such a signal may be installed at the intersection of two major routes as defined by section 4C-9 of the MUTCD, with a total volume of 800 vehicles during the typical peak weekday hour, or for five (5) weekend hours.

Warrant 7 is NOT APPLICABLE.

8. COMBINATION OF WARRANTS

In exceptional cases, signal control may be justified where no single warrant is satisfied, but where at least two of warrants 1, 2, or 3 are met when the required volumes are reduced to 80% of normal. Adequate trial of other measures which cause less delay and inconvenience must be tried and enforced first.

Number of warrants satisfied at the 80% level = 0
Volume requirements for warrant 8 are NOT SATISFIED.

9. FOUR HOUR VOLUME WARRANT

This warrant was approved as an amendment to the MUTCD on December 31, 1984. This warrant is similar to warrant 1, except that the required traffic volumes must be present for at least four hours of an average weekday. The traffic volumes required are based on curves (Figures 4-3 & 4-4) shown in the MUTCD.

Warrant 9 is NOT SATISFIED.

10. PEAK HOUR DELAY

This warrant was approved as an amendment to the MUTCD on December 31, 1984. This warrant is intended for application where traffic conditions will cause undue delay to traffic entering or crossing the main street. The peak hour delay warrant is satisfied when the following conditions exist for one hour (any four consecutive 15-minute periods) of an average day:

(1) The total delay by the traffic on a side street controlled by a stop sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach;

(2) the volume on the side street equals or exceeds 100 VPH for one moving lane of traffic and 150 VPH for two moving lanes;

(3) the total traffic volume serviced during 1 hour equals or exceeds 800 VPH for an intersection with four (or more) approaches or 650 VPH for three approaches.

Warrant - 10
Part 1 - Delay to be determined by traffic engineer.

Part 2 - NOT SATISFIED
Part 3 - NOT SATISFIED

GRAND AVENUE
RICE STREET/MULBERRY STREET
AFTER DEVELOPMENT

HOUR OF DAY	**** MAIN STREET TOTAL VOLUME	PEAK DIRECTN	**** BIAS PRCNT	**** SIDE STREET TOTAL VOLUME	PEAK DIRECTN	**** PEAK VOLUME	INTER-SECTION VOLUME
12 AM	82	EAST	68	4	EVEN	2	86
1 AM	36	EVEN	50	5	SOUTH	4	41
2 AM	41	WEST	54	3	SOUTH	2	44
3 AM	32	EAST	88	0	EVEN	0	32
4 AM	66	WEST	56	8	SOUTH	5	74
5 AM	116	WEST	66	4	EVEN	2	120
6 AM	313	EAST	51	28	SOUTH	15	341
7 AM	940	EAST	70	40	SOUTH	25	980
8 AM	1180	EAST	73	64	SOUTH	35	1244
9 AM	1070	EAST	63	109	SOUTH	61	1179
10 AM	980	EAST	59	135	NORTH	71	1115
11 AM	1122	WEST	51	166	SOUTH	85	1288
12 PM	1154	EAST	53	218	SOUTH	138	1372
1 PM	1232	EAST	59	191	SOUTH	96	1423
2 PM	1162	EAST	53	134	NORTH	90	1296
3 PM	1133	EAST	51	160	NORTH	91	1293
4 PM	1338	WEST	54	211	NORTH	109	1549
5 PM	1364	WEST	61	180	SOUTH	93	1544
6 PM	931	EAST	51	102	SOUTH	60	1033
7 PM	734	EAST	53	62	NORTH	45	796
8 PM	451	EAST	57	48	NORTH	26	499
9 PM	463	EAST	54	25	SOUTH	20	488
10 PM	260	EAST	56	12	NORTH	8	272
11 PM	142	WEST	54	19	NORTH	12	161

TOTAL INTERSECTION VOLUME IS 18,270

MAIN STREET TOTAL VOLUME IS 16,342
EASTBOUND APPROACH IS 8,938 (55 %)
WESTBOUND APPROACH IS 7,404 (45 %)

SIDE STREET TOTAL VOLUME IS 1,928
NORTHBOUND APPROACH IS 956 (50 %)
SOUTHBOUND APPROACH IS 972 (50 %)

REPORT PRODUCED THURSDAY, AUGUST 2, 1990.

COUNTS TAKEN ON THURSDAY, JANUARY 11, 1990 THROUGH WEDNESDAY, FEBRUARY 28, 1990.

GRAND AVENUE
RICE STREET/MULBERRY STREET
TRAFFIC SIGNAL WARRANT EVALUATION

INTRODUCTION

This review is based on the methodology presented in the Manual on Uniform Traffic Control Devices (MUTCD), 1978, as amended by the Federal Highway Administration. Please refer to part 4C of that manual.

The intersection under study has the following characteristics:

The 85th percentile speed on the main street is [30] MPH.
Existing traffic control is . . . SIDE STREET STOP.
Daily traffic volume of [18,270] was counted on
THURSDAY, JANUARY 11, 1990 through WEDNESDAY, FEBRUARY 28, 1990.
Estimated annual traffic volume is [6,668,550] vehicles.

1. INTERSECTING TRAFFIC VOLUMES

The installation of a traffic signal may be necessary to control an intersection with large volumes of conflicting traffic. The required traffic volumes must be present for at least 8 hours of an average weekday. The minimum volumes vary according to the number of lanes on the intersecting streets, the speed of traffic on the main street, and the community size.

Number of hours required traffic present = 0
Warrant 1 is NOT SATISFIED.

2. INTERRUPTION OF CONTINUOUS TRAFFIC

On major streets with high traffic volume, it may be necessary to use traffic signal control to provide an adequate number of gaps in traffic to allow vehicles to enter from a side street. The application of this warrant is identical to that of warrant 1, above.

Number of hours required traffic present = 2
Warrant 2 is NOT SATISFIED.

3. CROSSING PEDESTRIAN TRAFFIC

This warrant is similar to warrant 2, but is intended to identify locations where additional gaps are needed to provide safe pedestrian crossing of a major street. A signal installed solely for pedestrians should use a fully actuated controller and, if in a signal system, be coordinated with that system. A signal installed only under this warrant shall include pedestrian signals. When installed at a midblock location, additional restrictions may apply (See section 4C-5).

Number of hours required traffic present = 0
Warrant 3 is NOT APPLICABLE.

4. SCHOOL CROSSING

An established school crossing may require signal protection if an engineering study reveals that there is less than one gap per minute during the period of crossing usage. The restrictions on signals installed under this warrant are similar to those of warrant 3.

WARRANT 4 IS NOT APPLICABLE.

5. SIGNAL PROGRESSION

A traffic signal may occasionally be used to maintain vehicle grouping in a coordinated system. Such a signal should not be within 1,000 FT of adjacent signalized intersections in the system.

Warrant 5 is NOT APPLICABLE.

6. ACCIDENT PREVENTION

Many traffic signals are installed on the premise of reducing accidents; however, it must be recognized that signals may actually increase some types of accidents. The result is often contrary to the intended goal. Four conditions must be met before a signal is installed solely to reduce accidents:

(1) There has been five or more accidents of types preventable by traffic signals in the last 12 months;

(2) at least one volume requirement of warrant 8 must be satisfied;

(3) traffic progression would not be seriously disrupted, and

(4) less restrictive solutions have been tried and enforced with unsatisfactory results.

A signal installed solely under this warrant should be traffic actuated.

Total number of accidents = 1
Number of preventable accidents = 1
Accident rate is .14 per million vehicles
Number of warrant 8 volume requirements met = 0
Parts 1 and 2 are NOT SATISFIED.

7. TRAFFIC SYSTEM OPERATION

Traffic signal control may be used to encourage concentration and organization of vehicles on the major street network. Such a signal may be installed at the intersection of two major routes as defined by section 4C-9 of the MUTCD, with a total volume of 800 vehicles during the typical peak weekday hour, or for five (5) weekend hours.

Warrant 7 is NOT APPLICABLE.

8. COMBINATION OF WARRANTS

In exceptional cases, signal control may be justified where no single warrant is satisfied, but where at least two of warrants 1, 2, or 3 are met when the required volumes are reduced to 80% of normal. Adequate trial of other measures which cause less delay and inconvenience must be tried and enforced first.

Number of warrants satisfied at the 80% level = 0
Volume requirements for warrant 8 are NOT SATISFIED.

9. FOUR HOUR VOLUME WARRANT

This warrant was approved as an amendment to the MUTCD on December 31, 1984. This warrant is similar to warrant 1, except that the required traffic volumes must be present for at least four hours of an average weekday. The traffic volumes required are based on curves (Figures 4-3 & 4-4) shown in the MUTCD.

Warrant 9 is NOT SATISFIED.

10. PEAK HOUR DELAY

This warrant was approved as an amendment to the MUTCD on December 31, 1984. This warrant is intended for application where traffic conditions will cause undue delay to traffic entering or crossing the main street. The peak hour delay warrant is satisfied when the following conditions exist for one hour (any four consecutive 15-minute periods) of an average day:

(1) The total delay by the traffic on a side street controlled by a stop sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach;

(2) the volume on the side street equals or exceeds 100 VPH for one moving lane of traffic and 150 VPH for two moving lanes;

(3) the total traffic volume serviced during 1 hour equals or exceeds 800 VPH for an intersection with four (or more) approaches or 650 VPH for three approaches.

Warrant - 10
Part 1 - Delay to be determined by traffic engineer.

Part 2 - NOT SATISFIED
Part 3 - NOT SATISFIED

REVIEW SHEET SUMMARY

FILE NO. #30-90 **TITLE HEADING:** Mesa County Justice Center

ACTIVITY: Special Use

PETITIONER: Mesa County

REPRESENTATIVE: Roy "Andy" Anderson

original

LOCATION: 215 Rice Street

PHASE: **ACRES:** 12.5

PETITIONER'S ADDRESS: 750 Main Street, Grand Junction, CO 81501

ENGINEER:

NOTE: WRITTEN RESPONSE BY THE PETITIONER TO THE REVIEW COMMENTS IS REQUIRED A MINIMUM OF 48 HOURS PRIOR TO THE FIRST SCHEDULED PUBLIC HEARING.

PARKS & RECREATION 06/25/90

None

CITY ATTORNEY 06/25/90

1. County attorney had suggested that the County intended to close "Crosby Avenue", has this changed?

2. Page 20 of Schematic Design indicates "toxic storage"...Fire Department needs to be aware of this.

3. Page 21 of Schematic Design omits the fact that City Engineering and development codes/standards also apply to this project.

4. My packet did not include any maps or site plans....

U.S. WEST 06/25/90

Service entrance facilities (conduit) will be required and provided by owner.

CITY PLANNING 07/09/90

1. Chain link fence along parking and storage fronting Broadway should be a 6 foot solid fence.

2. Auto impoundment lot will be very visible from 340 Bridge. Consider relocating to somewhere where it can be properly screened. Parcel to the south?

3. Is there proper sight distance at concrete wall along Rice? What is the purpose of the wall? What is the function of area being screened?

4. Street improvements as per City Engineer

5. Landscaping does not appear to meet shrub coverage requirements as per code. Also need species and planting size of landscape materials.

CITY PLANNING 07/09/90 continued

6. West side of site is very visible from 340 Bridge and is particularly devoid of landscaping. Can a few more trees be added in this area?

7. Landscaping should be provided around future housing and perimeter landscaping along Crosby, Main and Broadway.

8. What are proposed heights of fences and walls?

9. What is the "hole" in the middle of main building?

10. Designate sizes of parking spaces and aisles.

11. Designate width of interior roads and dimension setbacks to property lines.

COUNTY PLANNING 07/02/90

1. All street frontages should be landscaped with shade trees especially along parking areas.

2. Landscaping important as this is a major entry point to downtown and is highly visible along Highway 340 - which is main access to Colorado National Monument (See Mesa County Roadway Landscape Guideline.)

3. Will concrete screen wall on Rice Street be textured, colored?

4. Crosswalk should be provided on Crosby Avenue for railroad pedestrian underpass and signage on Crosby - Yield to Pedestrian.

5. Sidewalks should be provided along Rice and Main Streets.

6. No signage plan was included for review.

7. If the West Main Street - Crosby Avenue Streets are to be abandoned - the pedestrian/bicycle trail should be improved with a new ramp at the end of West Main Street.

PUBLIC SERVICE 07/03/90

GAS: No objections to plan. Will consult with necessary parties for service locations. C.B. 6/27/90

ELECTRIC: No objections. F.B. 6/28/90

CITY FIRE DEPARTMENT 07/05/90

Our department doesn't have a problem with this Special Use at this time. We need to review the building plans to ensure code compliance and determine the required fire flow and fire hydrant placement. Access for emergency vehicles needs to be reviewed to determine it if is adequate.

If there are any questions please contact our office.

GRAND JUNCTION DRAINAGE DISTRICT 06/26/90

There are no open or tiled drains of the Grand Junction Drainage District which require easements through this tract.

DDA 06/29/90

I have no concerns.

CITY ENGINEER 07/09/90

Grading plan shows all drainage from the site being collected in a storm sewer and discharged into an existing 24" sanitary sewer in Crosby Avenue. This is not an acceptable point of discharge. This was previously discussed at a meeting with HDR on June 5. Grading plan lacks adequate detail for construction of the site grading, parking lots and drainage facilities.

Paving Plan: What are the proposed pavement sections? Where will trash dumpsters be located? Access to dumpsters should be designed to withstand HS-20 truck loading. No pavement detail shown on plan.

Street Improvements: Rice Street will be classified as a commercial street requiring 60' of R.O.W. width. Existing R.O.W. width is 30'. Rice Street should be relocated at Highway 340 so that it lines up with Mulberry Street. Half street width improvements to City standards will be required along the property frontage on Rice Street and Crosby Avenue. Provide street designs including plan and profile sheets, cross-sections and typical street sections for review by this office.

A traffic signal may be warranted at the intersection of Rice, Mulberry and Highway 340. The County may be required to pay for a portion of the traffic signal cost.

An acceptable format improvements guarantee will be required for the cost of the improvements on Rice Street and Crosby Avenue, and for the appropriate share of the cost for a traffic signal at Highway 340.

A traffic study is needed to determine the impacts of this development on existing roadways and intersections.

The redesign of the intersection of Rice Street and Highway 340 will require approval by the State Highway Department, as well as the City of Grand Junction.

CITY UTILITIES ENGINEER 07/05/90

Storm Drainage - The "Grading Plan" shows that all storm drainage will be dumped into a sanitary sewer on Crosby Avenue. This will not be allowed. No drainage of any type will be allowed in the sanitary sewer system as was discussed with the Engineer during the review meeting on June 5.

Sanitary Sewers - Unless approved by the Public Works Department, all sewer lines servicing the property will be the responsibility of the property owner. No new lines will be taken over for "operation and maintenance" unless approved by the City. If the City is to acquire the new lines, more design information will be needed. P.I.F. = 73.87 E.Q.U. (69.12 + 4.75)

Water - Design information will be required for the water lines if they are to be taken over by the City.

CITY POLICE DEPARTMENT 07/09/90

There are no specific police concerns other than the traffic flow issues outlined by Public Works in their review.

"Planning Only"

FF — ACTION

Original
Do NOT Remove
From Office

SPECIAL USE

ACRES _____
UNITS _____
DENSITY _____
ACTIVITY Special Use - Mesa County Jail
PHASE _____
COMMON LOCATION 215 Rice St

FILE NUMBER #30
ZONE PZ
TAX SCHEDULE # 2945-154-09

DATE SUBMITTED _____ DATE MAILED OUT _____ DATE POSTED _____

_____ DAY REVIEW PERIOD RETURN BY _____

OPEN SPACE DEDICATION (acreage) _____ OPEN SPACE FEE REQUIRED $ NONE PAID RECEIPT # _____

RECORDING FEE REQUIRED $ _____ PAID (Date) _____ DATE RECORDED _____

REVIEW AGENCIES

	A	B	C	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	GG
● Planning Department OK	●	●		●	●		●	●						●		●	●		●	●	●		●	●	●	●	●	●	●		●	
● City Engineer OK	●	●												●		●			●		●		●	●	●			●				
○ Transportation Engineer	●	●												●		●			●	●	●		●	●	●			●				
● City Parks/Recreation OK	●	●		●										●		●			●	●	●		●	●	●			●				
● City Fire Department OK	●	●												●		●			●		●		●	●	●			●				
● City Police Department	●	●												●		●			●		●		●	●	●			●				
● County Planning OK	●	●												●		●			●		●		●	●	●			●				
○ County Engineer	●	●												●		●			●		●		●	●	●			●				
○ County Health	●	●												●		●			●		●		●	●	●			●				
○ Floodplain Administration	●	●												●		●			●		●		●	●	●			●				
○ G.J. Dept. of Energy	●	●												●		●			●		●		●	●	●			●			●	
○ Walker Field	●	●												●		●			●		●		●	●	●			●				
○ School District	●	●												●		●			●		●		●	●	●			●				
● Irrigation GRAND VALLEY	●	●												●		●			●		●		●	●	●			●				
● Drainage GRAND JUNCTION OK	●	●												●		●			●		●		●	●	●			●				
○ Water (Ute, Clifton)	●	●												●		●			●		●		●	●	●			●				
○ Sewer Dist. (FV, CGV, OM)	●	●												●		●			●		●		●	●	●			●				
● U.S. West OK	●	●												●		●			●		●		●	●	●			●				
● Public Service (2 sets) OK	●	●												●		●			●		●		●	●	●			●				
● State Highway Department	●	●												●		●			●		●		●	●	●			●				
○ State Geological	●	●												●		●			●		●		●	●	●			●				
○ State Health Department	●	●												●		●			●		●		●	●	●			●				
● City Property Agent	●	●												●		●			●		●		●	●	●			●				
● City Utilities Engineer OK	●	●												●		●			●		●			●	●			●				
● City Attorney OK	●	●		●										●		●									●			●				
○ Building Department	●	●												●		●					●				●			●				
● DDA OK	●	●												●		●												●				
○ GJPC (7 packets)	●	●												●							●		●	●	●			●	●			
○ CIC (11 packets)	●	●												●										●				●	●			
○ Other	●	●												●		●			●		●		●	●	●			●				
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BOARDS	DATE	
P.C.	8/7/90	approved subject to review comments + strip parking for impound ment area + crosby to be dedicated to city + revised title plan recorded prior to bldg permit
SENIOR		
CiC	8/29/90	Approved - ATTY TO DRAFT RESOLUTION of findings for 9/5/90 CiC hrg - Rec'd 9/19/90 approved

APPLICATION FEE REQUIREMENTS

$115

GRAND JUNCTION PLANNING

development summary

File # 30-90 Name Mesa County Jail Date August 10, 1990

PROJECT LOCATION: 215 Rice Street

PROJECT DESCRIPTION: Special Use application in a PZ zone to allow Mesa County to construct a new jail and sherriff's office.

REVIEW SUMMARY (Major Concerns)

POLICIES COMPLIANCE	YES	NO *	TECHNICAL REQUIREMENTS	SATISFIED	NOT SATISFIED *
Complies with adopted policies	X		Streets/Rights Of Way		X
Complies with adopted criteria	X		Water/Sewer	X	
Meets guidelines of Comprehensive Plan			Irrigation/Drainage	?	
			Landscaping/Screening	X	
			Other:		

* See explanation below

Outstanding issue is the dedication and improvment of Crosby Ave. Mesa County Claims fee simple ownership of Crosby Ave. and contends they are not obligated to provide 1/2 street improvements as per the City Engineer review. City Engineer requires a revised drainage plan to show that storm waters are conveyed to the storm sewer in West Main Street.

STATUS & RECOMMENDATIONS:

A special use application is normally approved on a staff level. City Council requested that this project be heard by Planning Commission and council because of it's scope and potential impact.

Planning Commission Action

Recommend approval (7-0) subject to review sheet comments, that the impound lot be stripped like a regular parking lot, Crosby Avenue be dedicated to the City, and that a revised site plan be recorded prior to building permit.

To: File 30-90
From: Karl M.
Re: Outstanding issues, Mesa County Justice Center Building Permit Application

- Mesa County To pay $36,600 Towards signalization & median improvements at Hwy 340 & Rice St.

- Deed for 10ft. additional right of way west side of Rice from White Ave To Hwy 340

- Dedication of Crosby Ave as city public right of way.

- Final plan, as revised to meet all approval conditions, to be recorded prior To issuance of building permit.

- Drainage plan and Rice / Crosby improvements To be approved by city engineer.

- Responde To review comments indicates additional Trees (west part of site) to be provided in areas where security would not be compromised.

- Landscape requirements of code have been met. However, large areas shown to be seeded do not have an irrigation system.