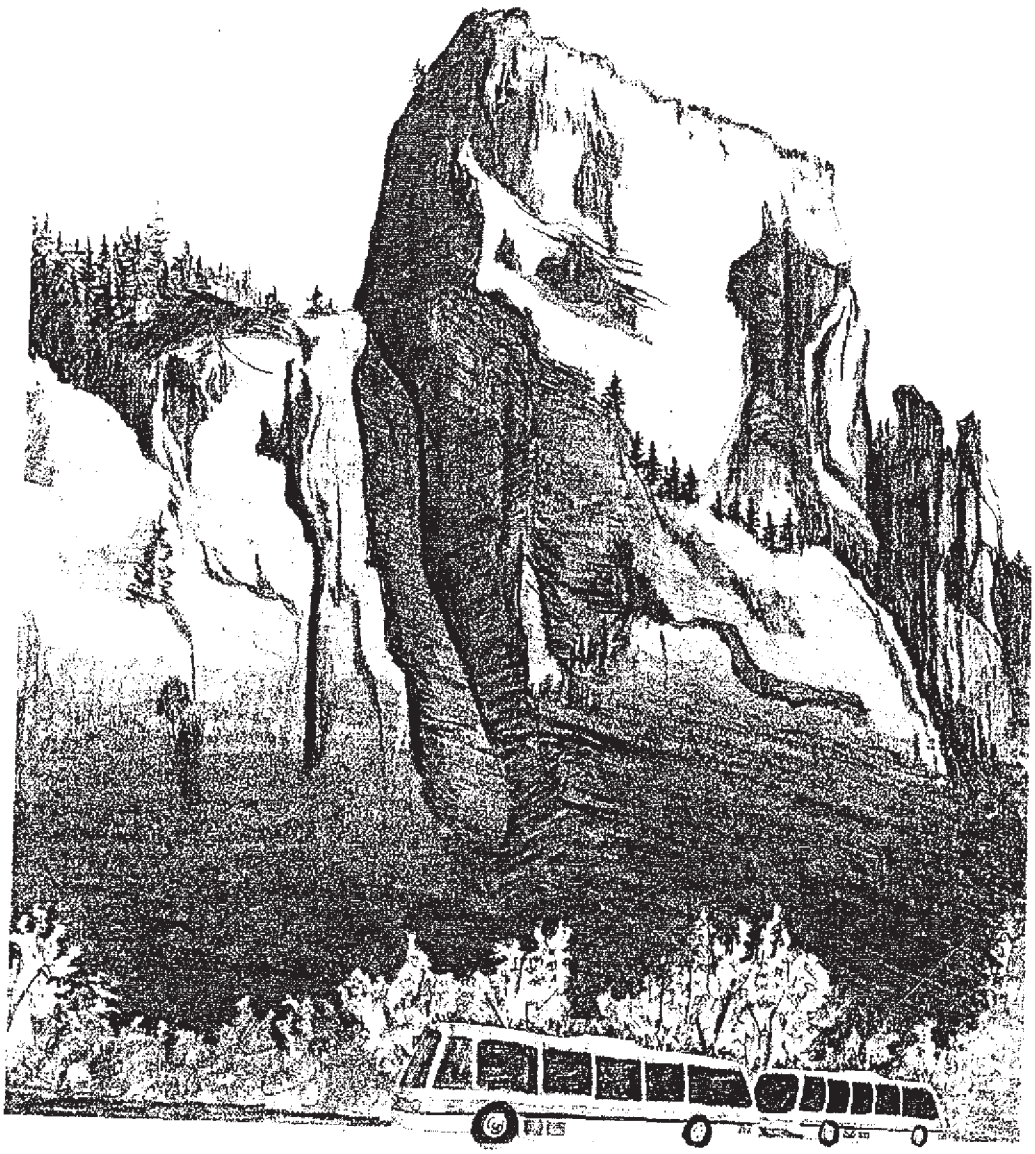
D-99

Environmental Assessment
November 1995



Canyon Transportation System

ZION

National Park • Utah

Environmental Assessment

Canyon Transportation System

ZION

National Park • Utah

In April 1994, a *Development Concept Plan for Zion Canyon Headquarters* was released to the public. That proposal included a mandatory transportation system to protect resources and reduce congestion in the canyon area. Since then, an implementation plan for the transportation system was developed. During development of that plan, it became necessary to revise the proposal as shown in the DCP. Primary changes are the new location of the transit/visitor contact center and the new location for the bus maintenance area. This environmental assessment analyzes the impacts of the new proposal on park resources. A no-action alternative is also considered. Impacts to natural, cultural, and socioeconomic resources and visitor use are described in the assessment.

This environmental assessment will be on public review for 30 days. Comments should be sent to:

Superintendent
Zion National Park
Springdale, UT 84767-1099

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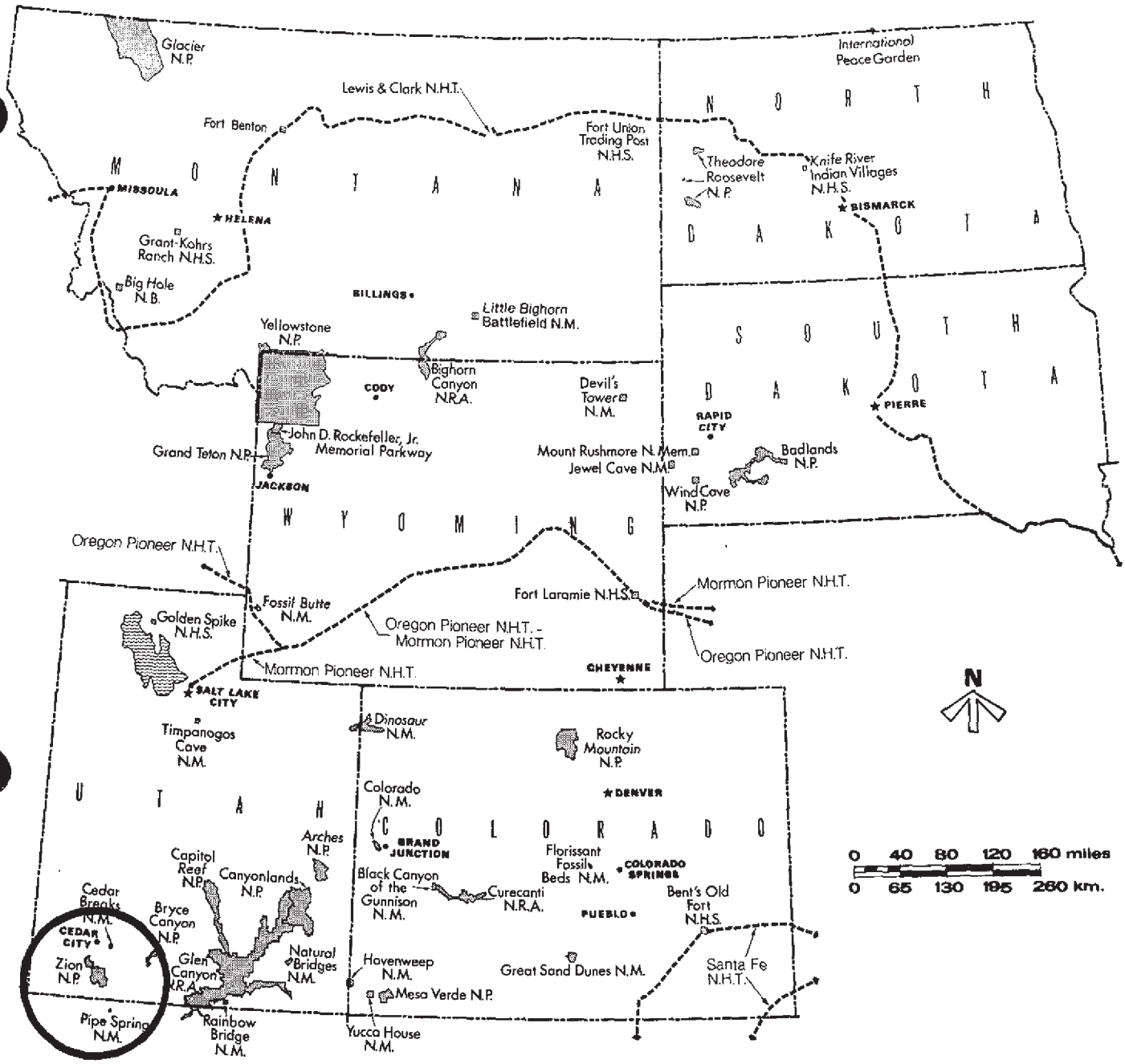

Legend

- Locations of Major Cities
- ★ Locations of State Capitals
- State Boundary Lines
- National Park Service Areas
- ----- National Park Service Historical Trails

COLORADO PLATEAU

National Park Service

United States Department of the Interior

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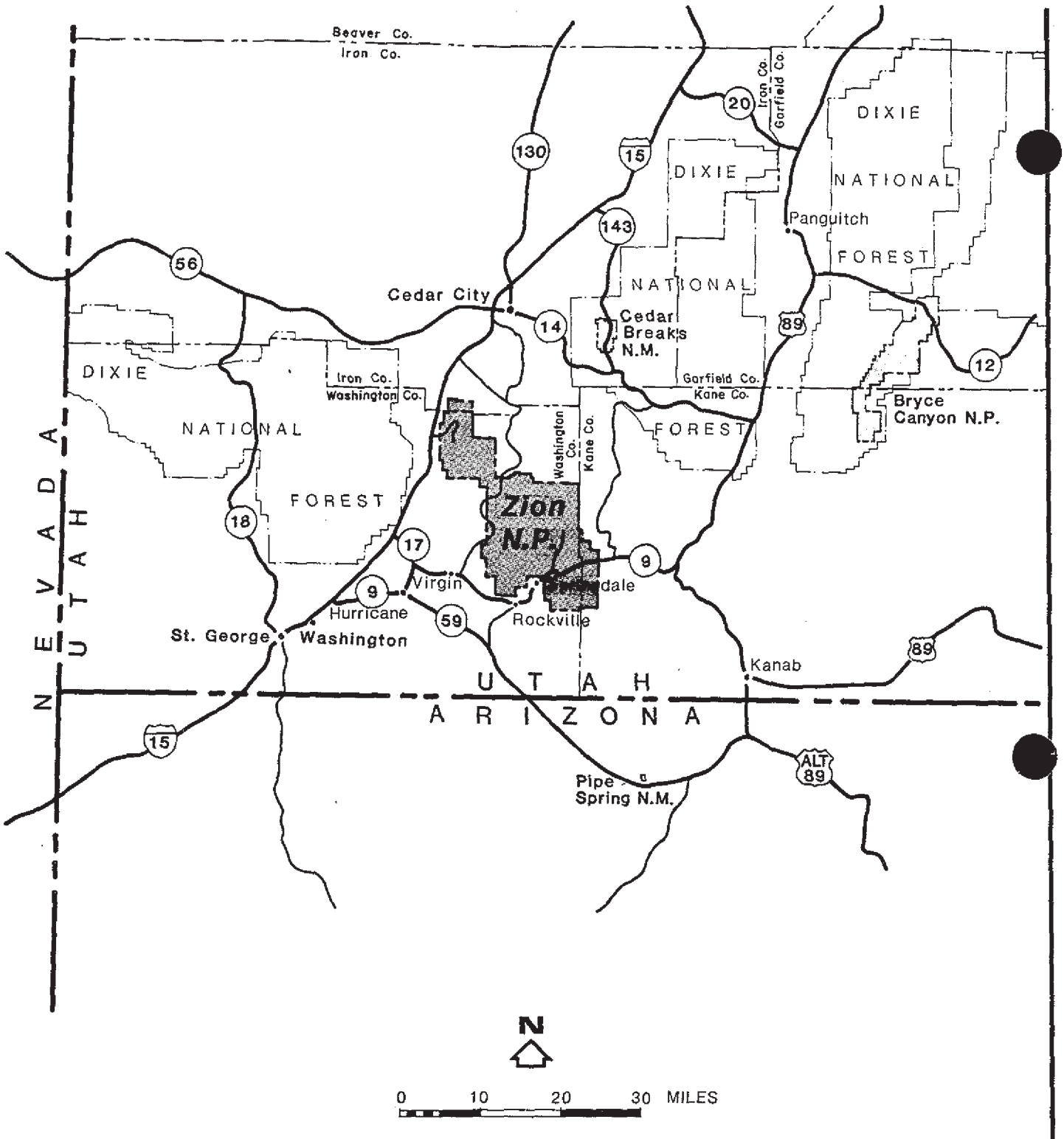

Vicinity Map

Zion National Park

United States Department of the Interior – National Park Service

ON MICROFILM

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JULY '84 | RMRO

PURPOSE OF AND NEED FOR THE PLAN

A *Master Plan,* which prescribed the management philosophy for the park and how areas would be used, was prepared for Zion National Park in 1977 (see Region and Vicinity maps). Since that time, visitation has grown dramatically and is impacting facilities and the visitor experience. Issues specific to the headquarters area, many of which are not covered in *1977 Master Plan,* were identified. Therefore, a new plan for this area was needed. In April 1994, a *Development Concept Plan (DCP) for Zion Canyon Headquarters* was released to the public. That proposal included a mandatory transportation system to protect resources and reduce congestion in the canyon area (see Upper Canyon map). Since then, an implementation plan for the transportation system was developed. During development of that plan, it became necessary to revise the proposal as shown in the DCP. Primary changes are the new location of the transit/visitor contact center (from in the Watchman campground to across the river from the Watchman campground) and the new location for the bus maintenance area (from Oak Creek to the headquarters area). This environmental assessment analyzes the impacts of the new proposal on park resources. For ease of reference, the proposal description and impact analyses from the DCP environmental assessment (EA) are reproduced to avoid referring to two separate documents.

The National Park Service (NPS) previously evaluated alternatives for managing traffic in the canyon. The 1977 master plan proposed implementation of a shuttle system in Zion Canyon as a solution to the congestion problem. The plan proposed that the shuttle staging area be located within the vicinity of headquarters. The 1983 DCP for Zion Canyon recommended a transit system operating under a voluntary ridership basis, and the 1989 *Environmental Assessment/Interim Visitor Transportation Plan* described a bus system that operated during peak visitation months. In August 1988, a five-day experiment was conducted to test a Canyon shuttle system, and today a concessioner operated shuttle bus system operates on a limited basis between Zion Lodge and the Temple of Sinawava. The 1995 *Draft Zion National Park Transportation Study and Implementation Plan*, prepared in May 1995, examined multiple transit service scenarios and presented an implementation plan for a 1997 system opening. Appendix A describes the public involvement during these previous planning efforts.

ALTERNATIVES AND THE PROPOSAL

The April 1994 development concept plan proposal included plans for a mandatory transportation system (see Development Concept Plan map). The DCP proposal changed slightly as the implementation plan for the transportation system was developed. This section details a no-action alternative and the new proposal. Although only the transit/visitor contact center and bus maintenance area locations have changed, this section describes the entire proposal for ease of reference.

NO-ACTION ALTERNATIVE

Under the no-action alternative, no formal transportation system would be developed. The existing system from the lodge to the Temple of Sinawava would be retained. The headquarters area would continue to be managed as a multi-use area. There are two entrance stations at the park's south boundary for collecting entrance fees, directing visitors to desired destinations, measuring oversized vehicles, and collecting fees from oversized vehicles traveling east through the tunnel. This function would continue under this alternative.

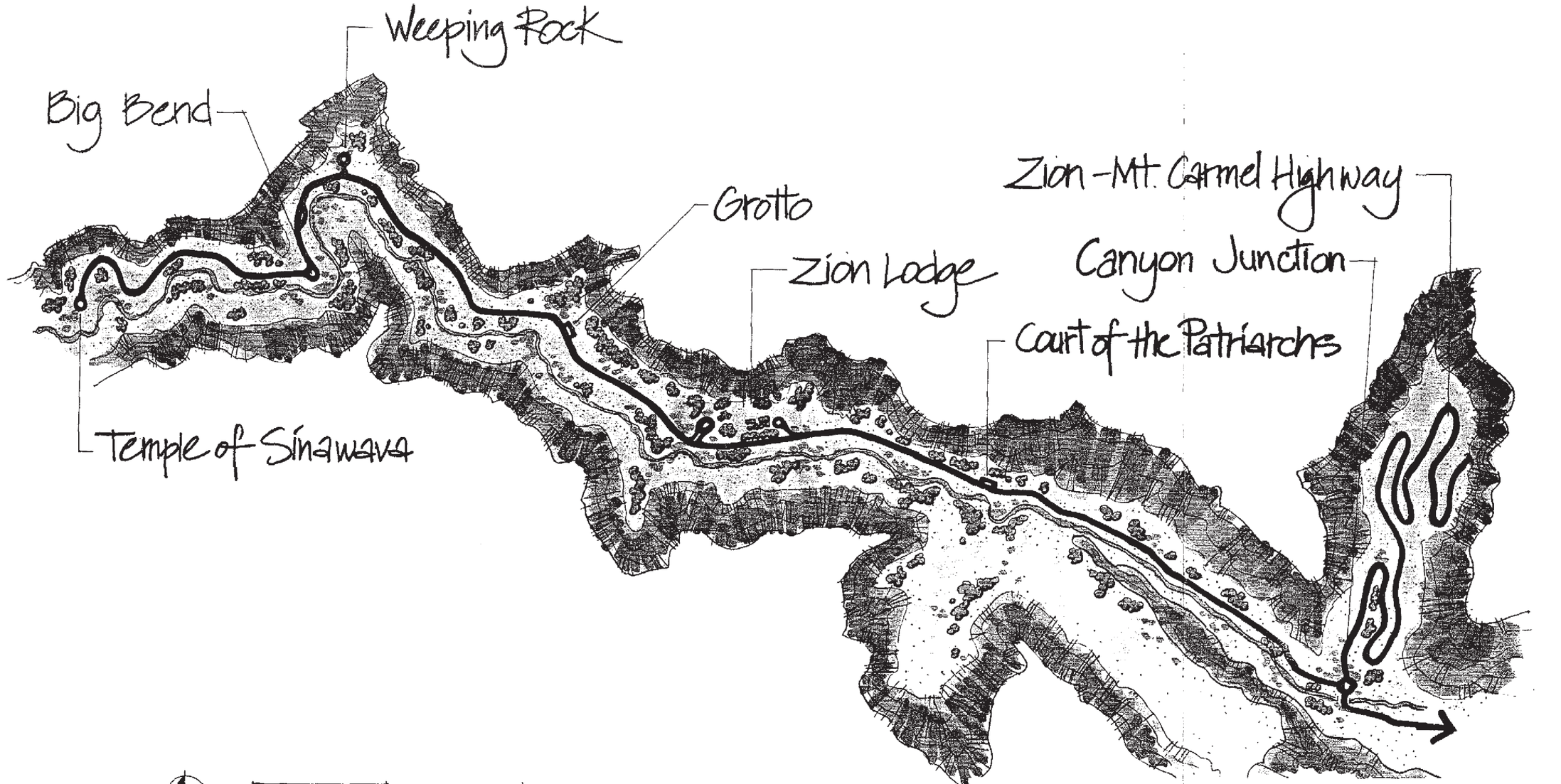
The 12,000 square-foot visitor center would continue to be the main orientation and interpretive facility. This facility includes the information desk, backcountry permitting desk, museum, auditorium, and Zion Natural History Association book sales area. There are public rest rooms directly outside of the visitor center entrance. A 70-vehicle parking lot serves the visitor center.

In the no-action alternative, both the Watchman and South campgrounds would be retained. There are 381 camping spaces in the headquarters area; 146 in the South campground and 235 in the Watchman campground. Both campgrounds are open to tent campers, recreation vehicle (RV) campers, and groups (including commercial camping tours). Facilities include comfort stations, two amphitheaters (one in each campground) with parking lots, refuse dump stations, and fee collection/information boards. Both campgrounds are on a first-come, first-served basis. There are spaces accessible to visitors with disabilities in the South campground.

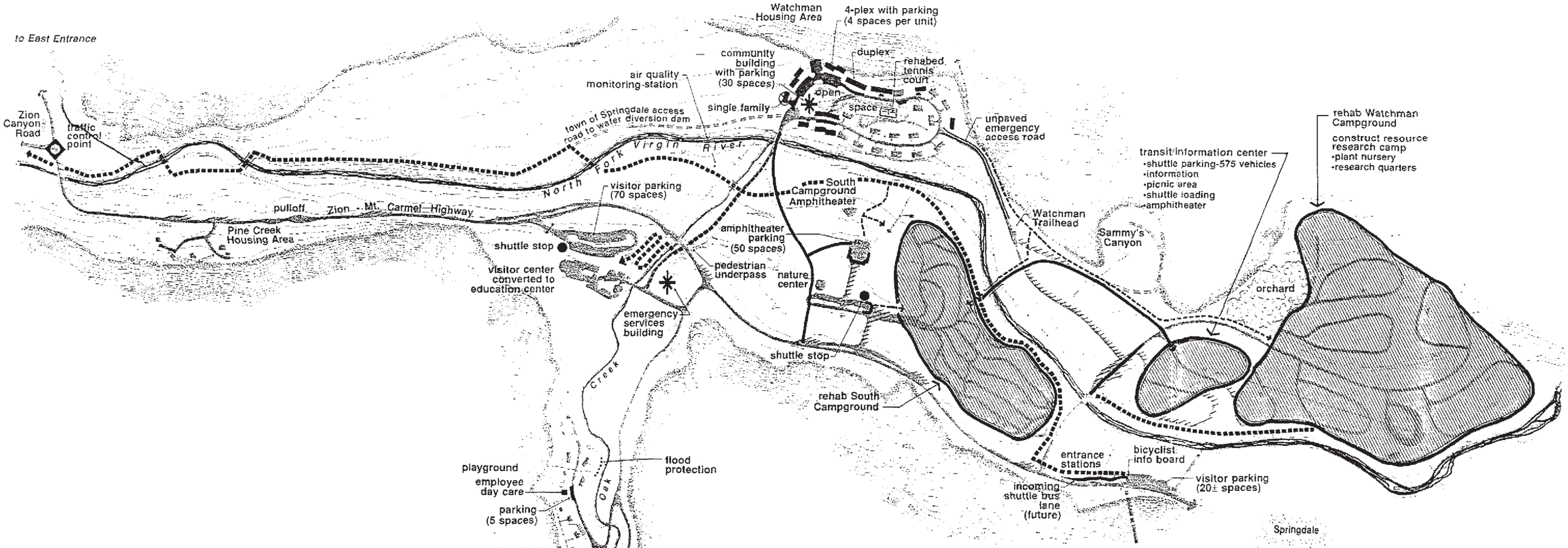
A portion of both campgrounds is within the flash flood hazard area, and a small number of sites in the Watchman campground are within the 100-year floodplain. The park has a warning and evacuation plan and is in regular contact with the National Weather Service, and when severe conditions occur, park personnel evacuate campers from the campgrounds. This system would remain in place.

There are three concessioners operating in the headquarters area and Zion Canyon. The Zion Natural History Association (ZNHA) has a concession permit for stamp and film sales at their sales area in the visitor center. A concession permit is not required for sales of other items offered by the association. TW Recreation Services, Inc. (TWRS), operates the 121-room Zion Lodge (which includes motel units, cabins, and suites), gift shop, snack bar, full service dining room, and interpretive tram rides. The tram operates between Zion Lodge and the Temple of Sinawava. A fee is charged to ride the tram. Bryce-Zion Trail Rides provides guided horseback rides in the canyon. Under the no-action alternative, all concessions would continue to operate.

There are five vehicle pulloffs in the canyon area. One near the park entrance has a bulletin board and provides information for bicyclists. The others were designed during the historic period and are a part of the road system. Under the no-action alternative, the five pulloffs along the main road would remain as informally designated areas.



Upper Canyon



* *shuttle maintenance facility outside the park*

Development Concept Plan

Zion National Park

United States Department of the Interior-National Park Service

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PROPOSAL

The plan is designed to eliminate vehicular congestion in Zion Canyon, improve the overall visitor experience, and promote protection of the natural and cultural resources. This will be accomplished by eliminating vehicles in Zion Canyon and promoting alternative means of transportation during the peak visitor season through the implementation of a shuttle bus system and a bike path.

The transportation system would initially be implemented during the peak visitor season (June to September). The system will be mandatory for all visitors wishing to go into Zion Canyon during the peak visitor season with the exception of Zion Lodge patrons, commercial tour buses, and others with special permits. The initial phase of operation will run between the transit/visitor contact center (across the river from the Watchman campground) and the Temple of Sinawava (see Lower Canyon Master Plan map). To reduce the size of parking required in the park, the system will extend outside the park with another loop that includes shuttle stops throughout town, picking up visitors at motels, campground, and other parking areas, using the transit/visitor contact center as the transfer point (see Springdale Master Plan map).

Initially, Zion Lodge patrons will be allowed to drive their vehicles to the lodge to check in and drop off luggage, but once there, will be required to ride the shuttle any time they tour the canyon. This may be adjusted later to allow elimination of vehicles from the canyon. Tour bus operators will be required to transfer their customers from the tour bus to the shuttle bus. Arrangements could be made to accommodate tour bus patrons and the tour operator on one shuttle bus to maintain a cohesive tour group. NPS and concession service vehicles will be allowed to drive the canyon road. The lodge parking area will remain until the shuttle system is in full operation.

The Zion-Mt. Carmel Highway through the park will continue to be open to through-traffic, connecting State Highway 9 between the south and east entrances of the park.

The park transportation system loop will be augmented with a loop operating from the south end of Springdale to the transit/visitor contact center. Visitors will be encouraged to leave their cars at their place of lodging and use the transit system, thus reducing the number of parking spaces needed in the park. Additional day use parking lots will also be available.

Visitors will be directed to enter the park through the transit/visitor contact center (see Discovery Center Complex and Discovery Center maps). The center will provide visitors with basic orientation, safety, and interpretive information about Zion National Park and the surrounding area at one place. Concessioners will also have space in the center to explain their services. This will facilitate trip planning so visitors can make the best use of their valuable time in the park. The proposed transit/visitor contact center complex outside the park will include an information area, shuttle bus information, backcountry permits, campground information, outdoor exhibits, audio visual programs, public announcements, Zion Natural History Association sales area, visitor comfort facilities (rest rooms, drinking fountain), park office space (interpretation and backcountry personnel), and information materials storage (park/ZNHA).

Outdoor facilities will include parking (about 350 spaces, including the required percentage designed to meet standards for accessible parking), shuttle bus loading/waiting plaza (with shade structure and bicycle racks), and an amphitheater. All facilities will be designed to meet accessibility standards. The entire outdoor area will function as the interpretive display, with

wayside exhibits, information boards, and native plant displays, as well as a riparian zone with a sandy beach for visitors to access the river.

The existing visitor center area will be used for administrative offices, emergency services, and shuttle bus maintenance facilities (see Bus Maintenance map). The existing sales area would be used for interpretive exhibits, the comfort station would be upgraded and the existing auditorium would be used as a multi-purpose room for park training and other park functions. Visitor parking here would be limited to those visiting the administrative offices and interpretive exhibits when the shuttle system is not operating.

The shuttle system may initially only operate during the summer season, with the potential for expansion into the shoulder and winter seasons as need dictates. The transit/visitor contact center will remain open year-round.

The shuttle route within the park is approximately 8 miles one way; from the transit/visitor contact center to the Temple of Sinawava (see Upper Canyon map). Intermediate stops include Canyon Junction, Court of the Patriarchs, Zion Lodge, Grotto picnic area, Weeping Rock, and Big Bend turnout. The canyon junction area will be redesigned to allow for traffic control. Current estimates are that ridership is expected to average 6,279 visitors per day during the summer visitor season (based on 1997 visitation projections). One-way travel time from the transit/visitor contact center takes about 44 minutes.

The shuttle will operate 14 hours a day (7:00 a.m. to 9:00 p.m.), June through September, with service in the shoulder season added as necessary. Schedules may change according to need. Thirteen vehicles (plus two reserve) will be used for the park loop. The town loop may use a different type of vehicle. The system could run on a limited basis earlier than 7:00 a.m. or later than 9:00 p.m., depending on visitor-use demand.

Shuttle buses/trams within the park will be designed to allow good views of surrounding scenery. Passenger trams will be accessible to visitors with disabilities and can be modified to provide storage (for coolers, backpacks, etc.). Trams will use propane for fuel and may be converted to natural gas in the future. The shuttle vehicle operating in town will also conform to accessibility standards. The shuttle system will be operated by a contractor. An operating fee structure will be developed upon contract negotiations.

Shuttle stops will include signs, tram pull-out areas, and seating available for passengers while they wait (see Shuttle Stop map). The pull-out area at the lodge would be redesigned to include comfort stations and telephones (see Zion Lodge map).

The Watchman campground will be partially displaced by the transit/visitor contact center parking. Although 80 sites will be lost, reconfiguring should restore 25 sites, and additional sites will be gained through reconfiguration of the South campground. Some redesign will be necessary throughout the campground to better define and improve access to campsites, and to remove sites from the 100-year floodplain. Areas will be designated for RVs-only and group sites. The RV sites will be close to the visitor/transit staging area so visitors could park their RVs in a campsite during the day and walk to the transit/visitor contact center, thereby reducing the amount of space required at the shuttle parking lot.

As the campground is redesigned, it will also be revegetated. To reestablish and maintain the vegetation, the irrigation system will be upgraded. The existing open irrigation ditches will be buried and a pressurized system using river water will be installed throughout the campgrounds.

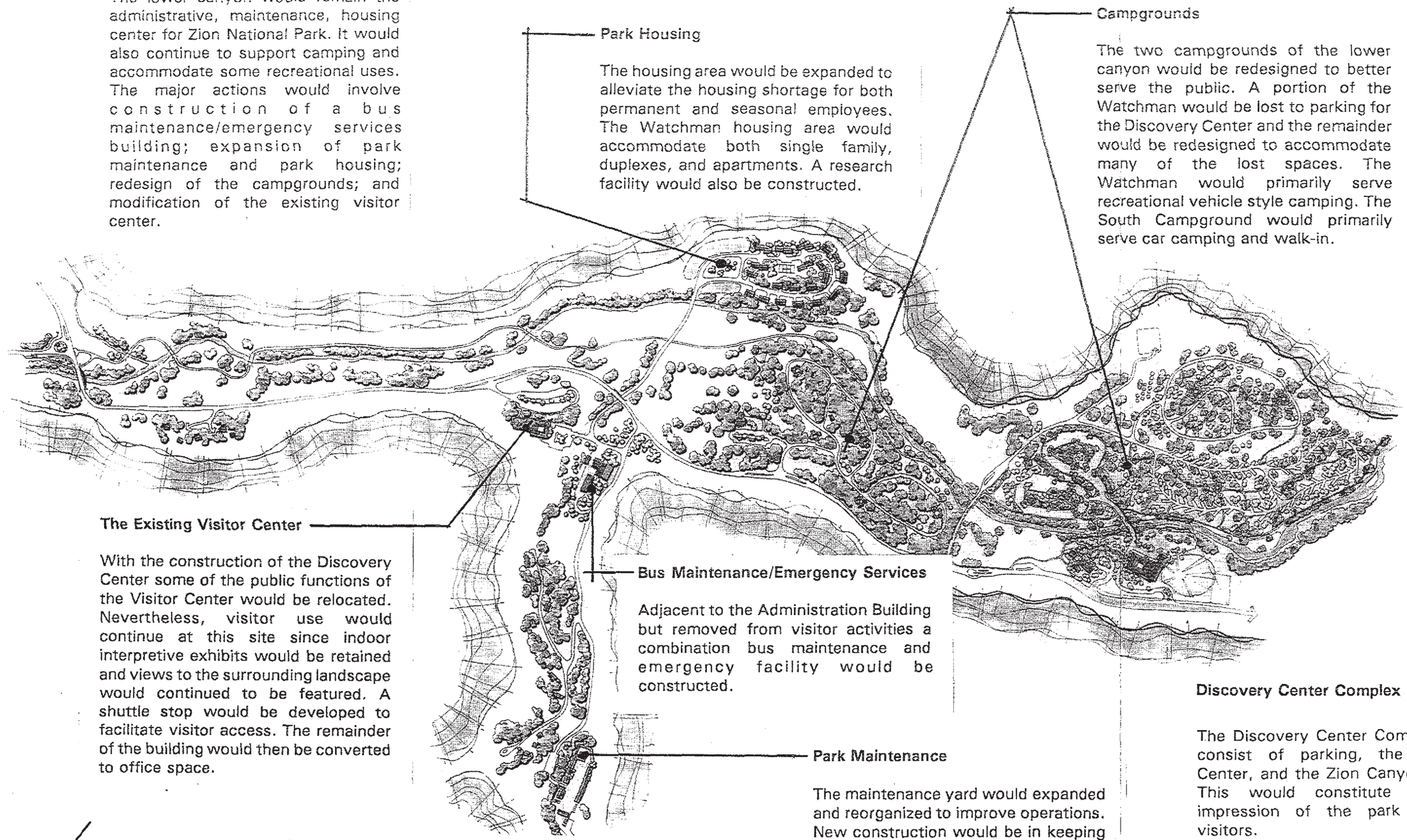
The lower canyon would remain the administrative, maintenance, housing center for Zion National Park. It would also continue to support camping and accommodate some recreational uses. The major actions would involve construction of a bus maintenance/emergency services building; expansion of park maintenance and park housing; redesign of the campgrounds; and modification of the existing visitor center.

Park Housing

The housing area would be expanded to alleviate the housing shortage for both permanent and seasonal employees. The Watchman housing area would accommodate both single family, duplexes, and apartments. A research facility would also be constructed.

Campgrounds

The two campgrounds of the lower canyon would be redesigned to better serve the public. A portion of the Watchman would be lost to parking for the Discovery Center and the remainder would be redesigned to accommodate many of the lost spaces. The Watchman would primarily serve recreational vehicle style camping. The South Campground would primarily serve car camping and walk-in.



The Existing Visitor Center

With the construction of the Discovery Center some of the public functions of the Visitor Center would be relocated. Nevertheless, visitor use would continue at this site since indoor interpretive exhibits would be retained and views to the surrounding landscape would continued to be featured. A shuttle stop would be developed to facilitate visitor access. The remainder of the building would then be converted to office space.

Bus Maintenance/Emergency Services

Adjacent to the Administration Building but removed from visitor activities a combination bus maintenance and emergency facility would be constructed.

Park Maintenance

The maintenance yard would expanded and reorganized to improve operations. New construction would be in keeping with the historic quality of the existing complex.

Discovery Center Complex

The Discovery Center Complex would consist of parking, the Discovery Center, and the Zion Canyon Theatre. This would constitute the initial impression of the park for many visitors.

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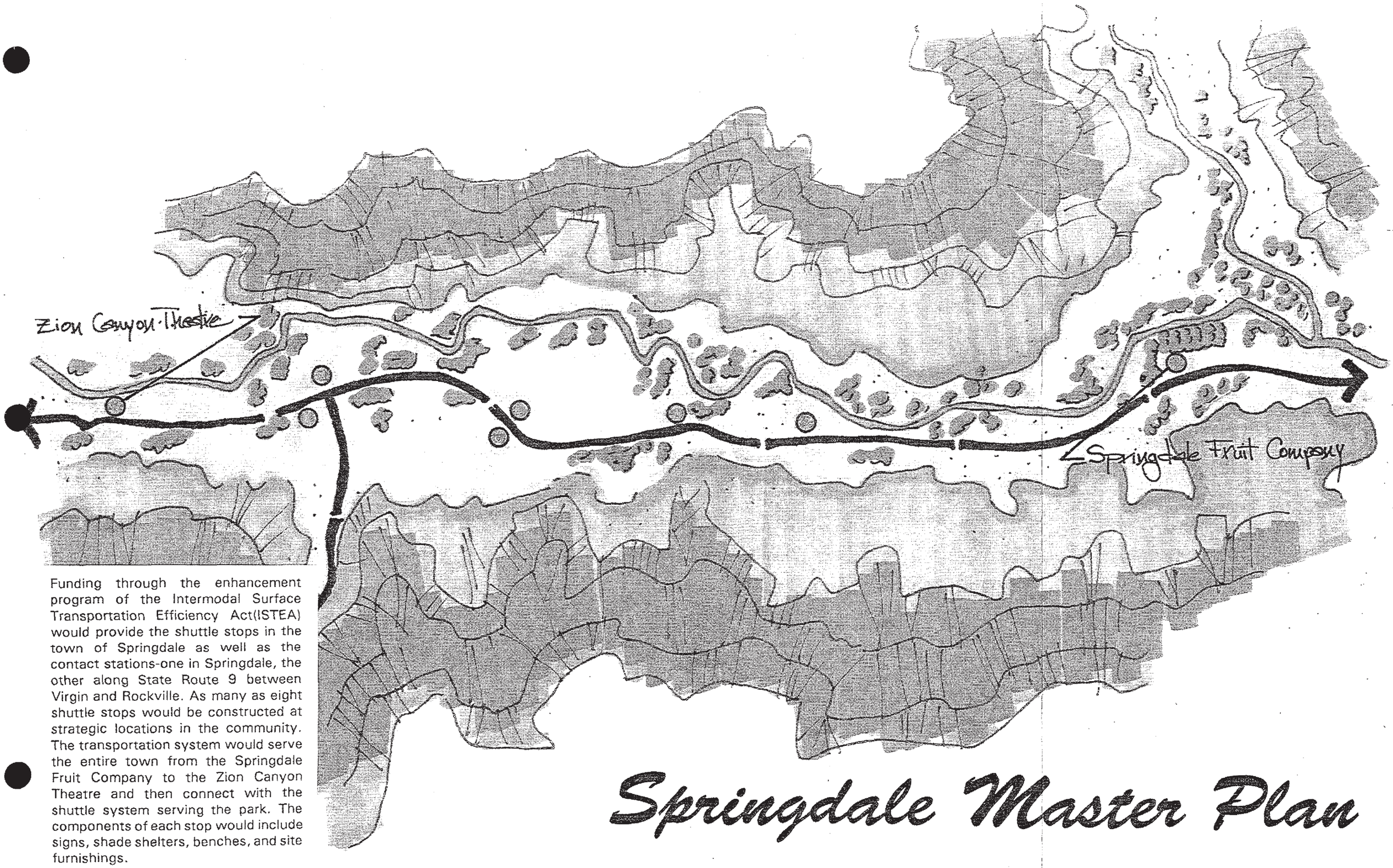
Lower Canyon Master Plan

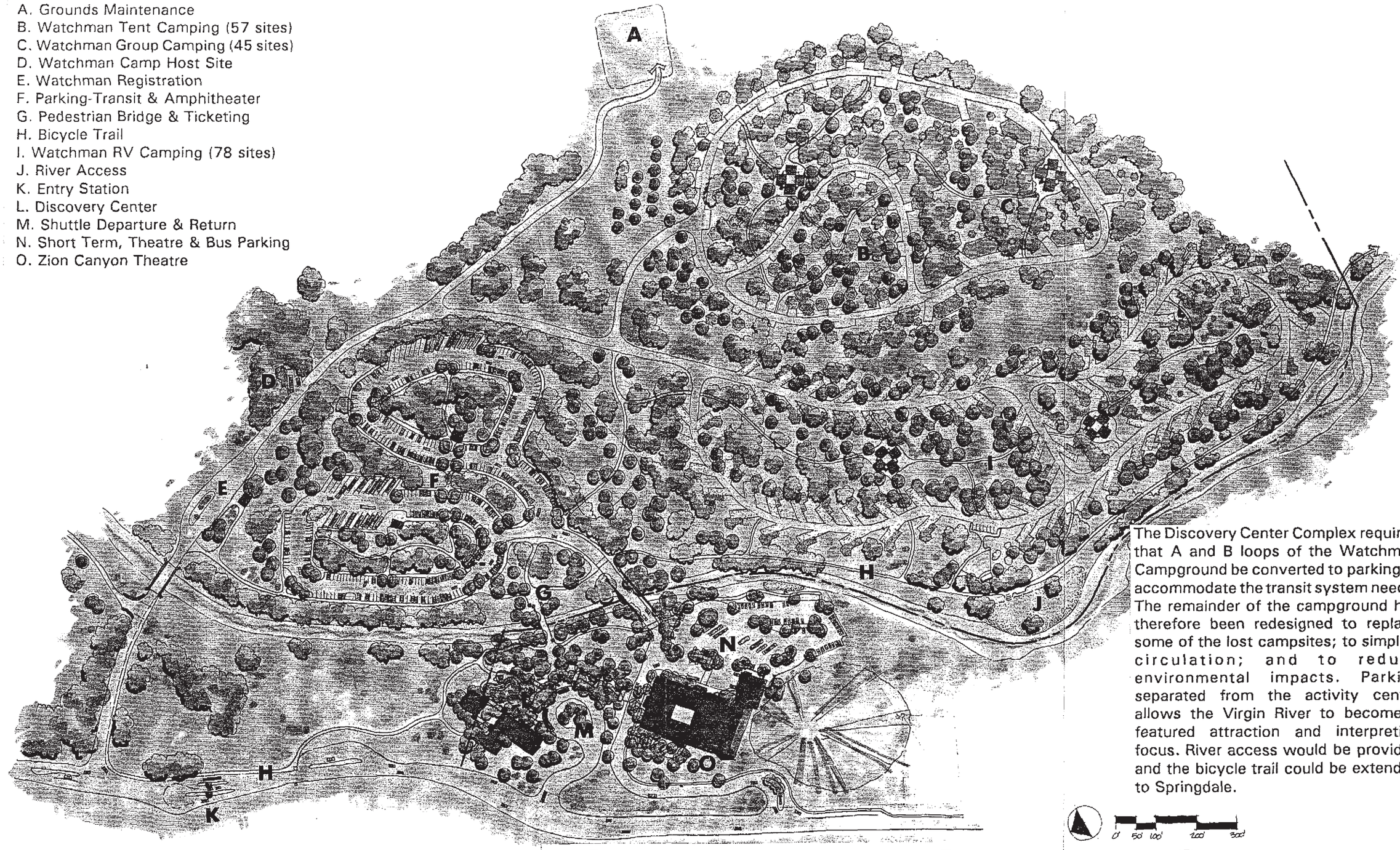


Funding through the enhancement program of the Intermodal Surface Transportation Efficiency Act(ISTEA) would provide the shuttle stops in the town of Springdale as well as the contact stations-one in Springdale, the other along State Route 9 between Virgin and Rockville. As many as eight shuttle stops would be constructed at strategic locations in the community. The transportation system would serve the entire town from the Springdale Fruit Company to the Zion Canyon Theatre and then connect with the shuttle system serving the park. The components of each stop would include signs, shade shelters, benches, and site furnishings.

Springdale Master Plan

Legend

A. Grounds Maintenance
B. Watchman Tent Camping (57 sites)
C. Watchman Group Camping (45 sites)
D. Watchman Camp Host Site
E. Watchman Registration
F. Parking-Transit & Amphitheater
G. Pedestrian Bridge & Ticketing
H. Bicycle Trail
I. Watchman RV Camping (78 sites)
J. River Access
K. Entry Station
L. Discovery Center
M. Shuttle Departure & Return
N. Short Term, Theatre & Bus Parking
O. Zion Canyon Theatre



The Discovery Center Complex required that A and B loops of the Watchman Campground be converted to parking to accommodate the transit system needs. The remainder of the campground has therefore been redesigned to replace some of the lost campsites; to simplify circulation; and to reduce environmental impacts. Parking separated from the activity center allows the Virgin River to become a featured attraction and interpretive focus. River access would be provided and the bicycle trail could be extended to Springdale.

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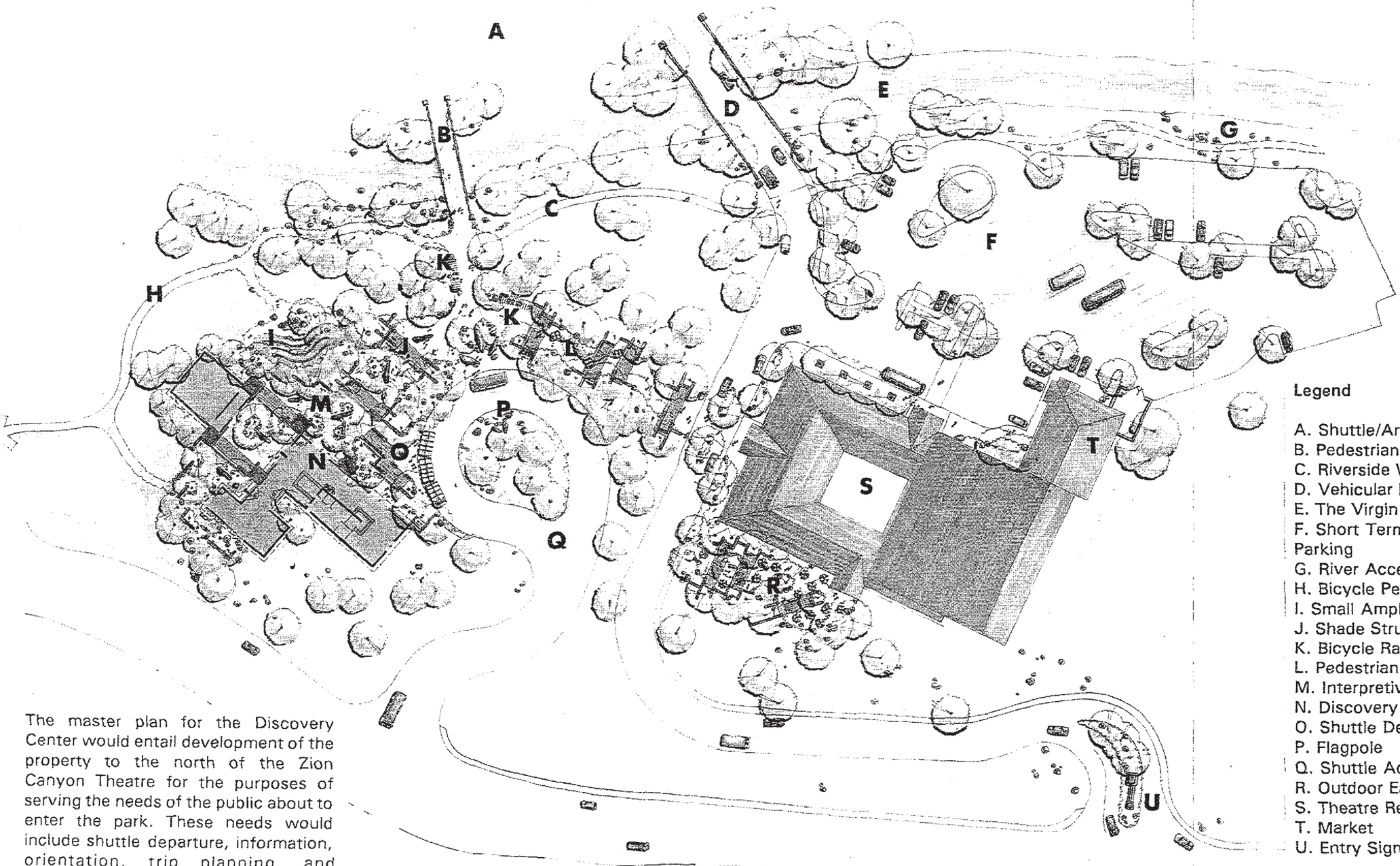
Discovery Center Complex

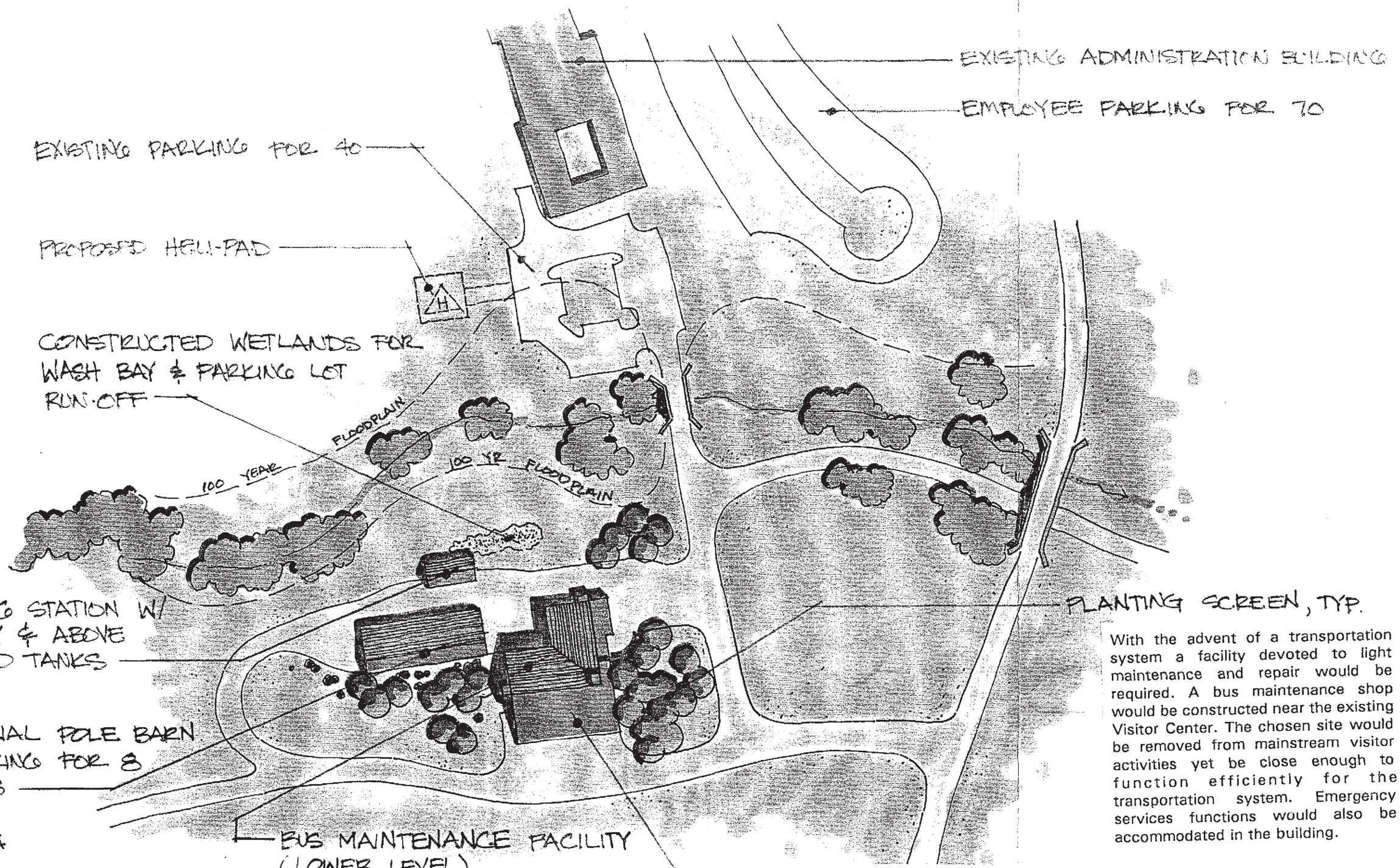


Legend

A. Shuttle/Amphitheater Parking
B. Pedestrian Bridge
C. Riverside Walk
D. Vehicular Bridge
E. The Virgin River
F. Short Term, Theatre, Bus & Market Parking
G. River Access
H. Bicycle Pedestrian Trail
I. Small Amphitheater
J. Shade Structure-Typical
K. Bicycle Racks
L. Pedestrian Corridor
M. Interpretive Plaza
N. Discovery Center Building
O. Shuttle Departure & Waiting Area
P. Flagpole
Q. Shuttle Access
R. Outdoor Eating Plaza
S. Theatre Retail Area
T. Market
U. Entry Sign & Monumentation

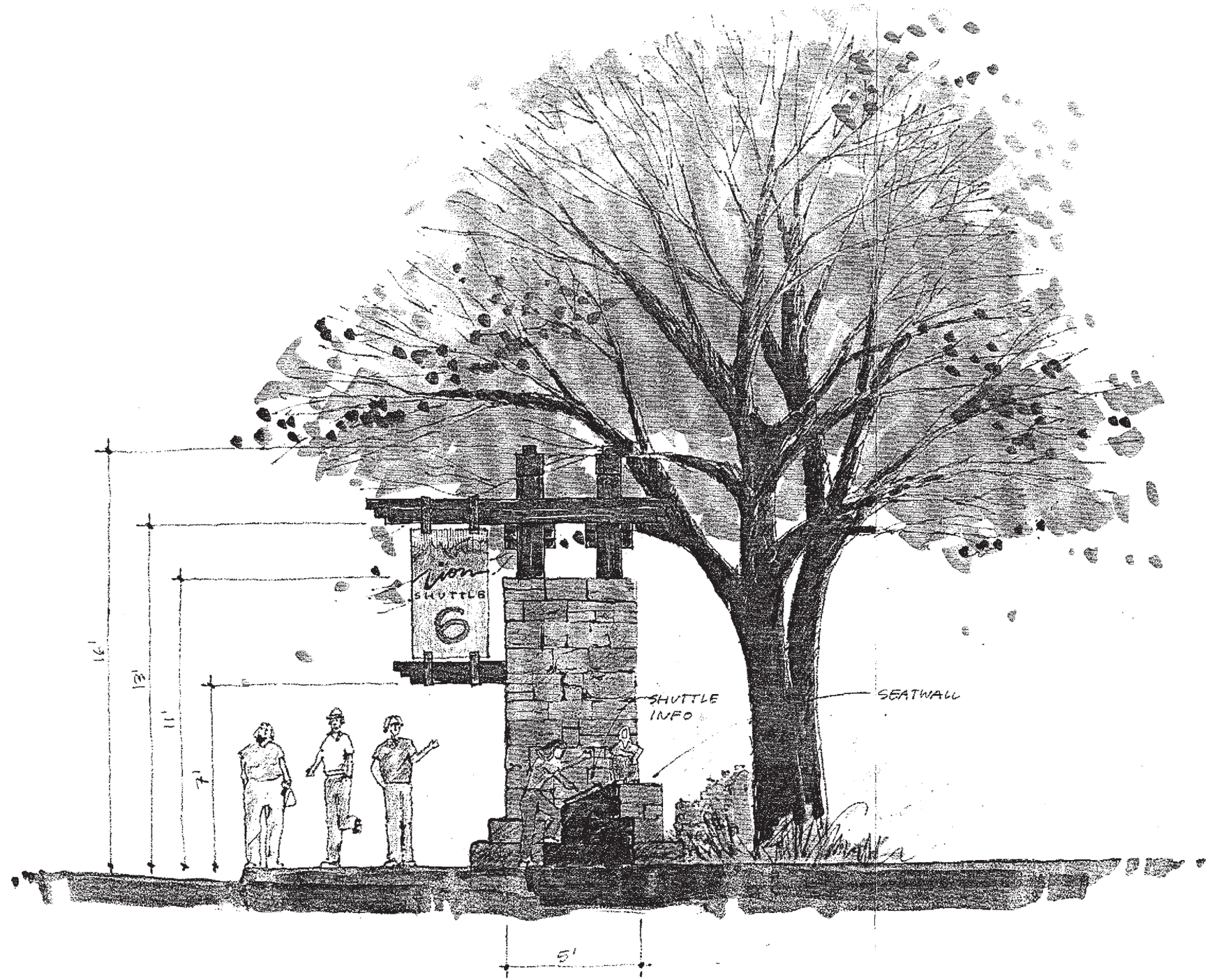
The master plan for the Discovery Center would entail development of the property to the north of the Zion Canyon Theatre for the purposes of serving the needs of the public about to enter the park. These needs would include shuttle departure, information, orientation, trip planning, and interpretive sales. The majority of parking would be constructed across the river and a strong pedestrian link would be created to both the Discovery Center and Zion Canyon Theatre. Access from State Route 9 would be separately provided for visitors and shuttles.

Discovery Center



With the advent of a transportation system a facility devoted to light maintenance and repair would be required. A bus maintenance shop would be constructed near the existing Visitor Center. The chosen site would be removed from mainstream visitor activities yet be close enough to function efficiently for the transportation system. Emergency services functions would also be accommodated in the building.

Bus Maintenance



SHUTTLE STOP W/ SIGN & SEATWALL CONCEPT
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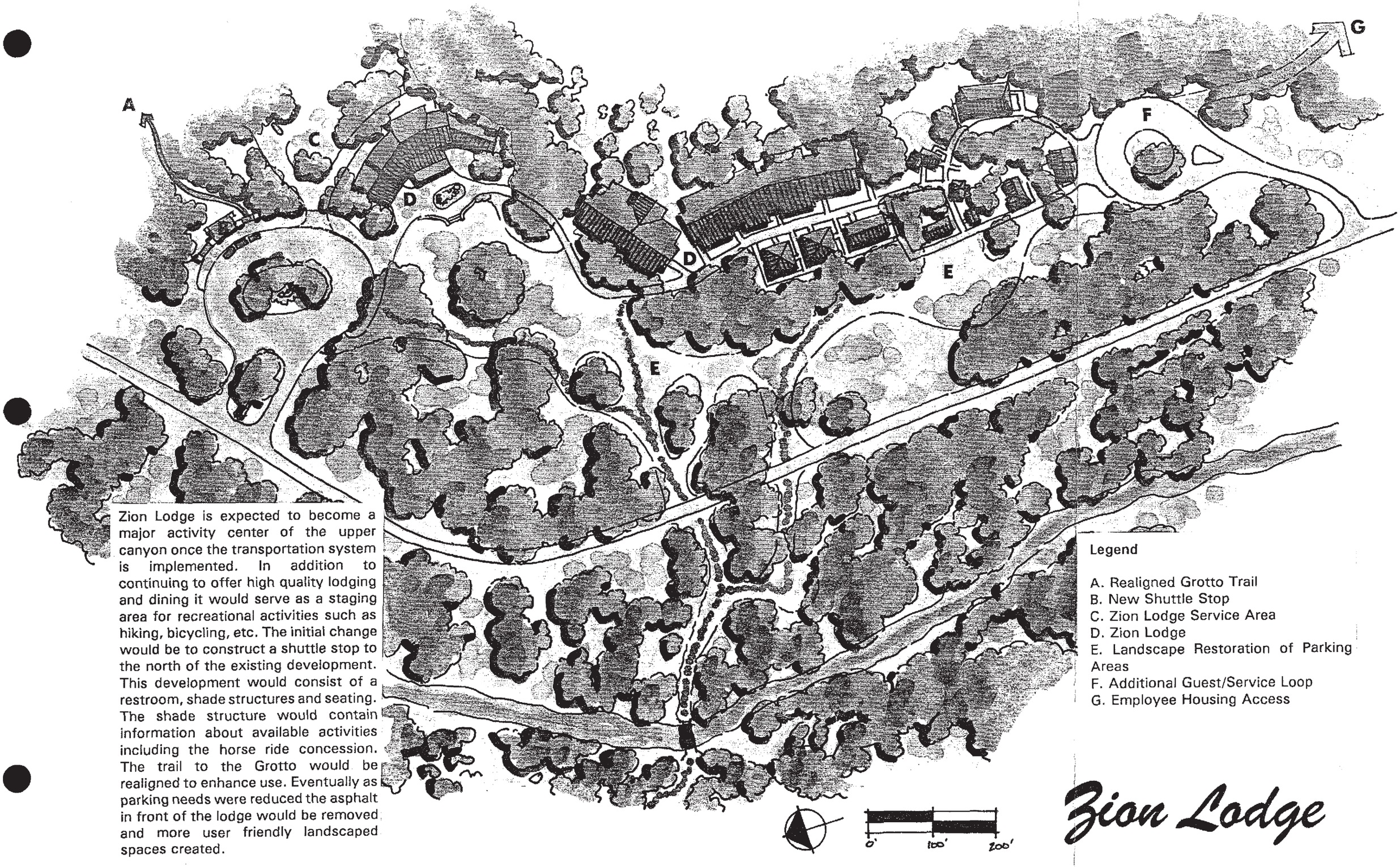


Zion Lodge is expected to become a major activity center of the upper canyon once the transportation system is implemented. In addition to continuing to offer high quality lodging and dining it would serve as a staging area for recreational activities such as hiking, bicycling, etc. The initial change would be to construct a shuttle stop to the north of the existing development. This development would consist of a restroom, shade structures and seating. The shade structure would contain information about available activities including the horse ride concession. The trail to the Grotto would be realigned to enhance use. Eventually as parking needs were reduced the asphalt in front of the lodge would be removed and more user friendly landscaped spaces created.

Legend

A. Realigned Grotto Trail
B. New Shuttle Stop
C. Zion Lodge Service Area
D. Zion Lodge
E. Landscape Restoration of Parking Areas
F. Additional Guest/Service Loop
G. Employee Housing Access

Zion Lodge

A bicycle/pedestrian path provides for alternative transportation through the headquarters area and the canyon. It begins at the south entrance station and generally parallels the river, connecting to the Zion Canyon Scenic Drive. Vehicular traffic volume during peak season will be reduced on the canyon road and bicyclists will share the road with the shuttle buses, lodge patrons, park and concession employees, and service vehicles. A bicycle trail may be constructed in the town of Springdale and connect to the park trail.

The canyon junction (intersection of Zion Canyon Scenic Drive and Zion-Mt Carmel Highway) will be reconstructed to provide turning lanes, an information kiosk, a comfort station, and connection to the Pa'rus Trail (see Highway Intersection map). If the kiosk is unstaffed, provisions will be made to provide access (alternatives under consideration include some type of "key card" system). Finishing treatments of the area will blend with the "NPS rustic" theme of Zion National Park. The intersection will be designed to allow transportation shuttles to enter Zion Canyon Scenic Drive while separating out private vehicles. There will be an information system to assist visitors in finding their way to the transit/visitor contact center. Visitors who are staying overnight at the lodge may drive their vehicles to the lodge, then use the shuttle system for the duration of their trip. Tour buses and commercial vehicles serving the lodge will also be allowed to pass by the control point at the canyon junction intersection.

A shuttle bus storage and maintenance facility will be required for this system and will be built near the park administrative offices. The facility will include maintenance bays, fueling tanks, a wash facility with a grease trap, a constructed wetland for wash bay and parking lot runoff, and a secured overnight and off-season bus storage area. Not all buses will be parked at this facility when not in use. Parking areas at the transit/visitor contact center and park administrative offices will also be used.

To provide adequate emergency services facilities and to facilitate efficient operations, emergency services vehicles, equipment, and personnel will be consolidated. An emergency services facility will be accommodated in the upper level of the bus maintenance facility. This facility will include four bays for parking the structural and wildland fire trucks and the ambulance, a fire cache, and showers. Office space for emergency services personnel will be in the nearby administration building.

Employee parking will be outside the maintenance area, but will be paved and identified.

Implementation of a shuttle system will be a major change in the way visitors use the park and will require changes to the park's interpretive and information programs. The interpretive plan (NPS 1995e) will guide these changes. In addition, the park's information system will be adjusted so potential visitors are informed about the shuttle system and campground requirements well before they get to the park. This will be done through the park brochure, signage along State Highway 9, the park's radio Traveller's Information System, at information areas throughout the region, in concessioner's marketing information, and through local, regional, state, and national travel networks. An unstaffed contact station will be constructed between Rockville and Virgin to provide initial visitor information. Visitors arriving from the east will also receive information through signs and wayside exhibits.

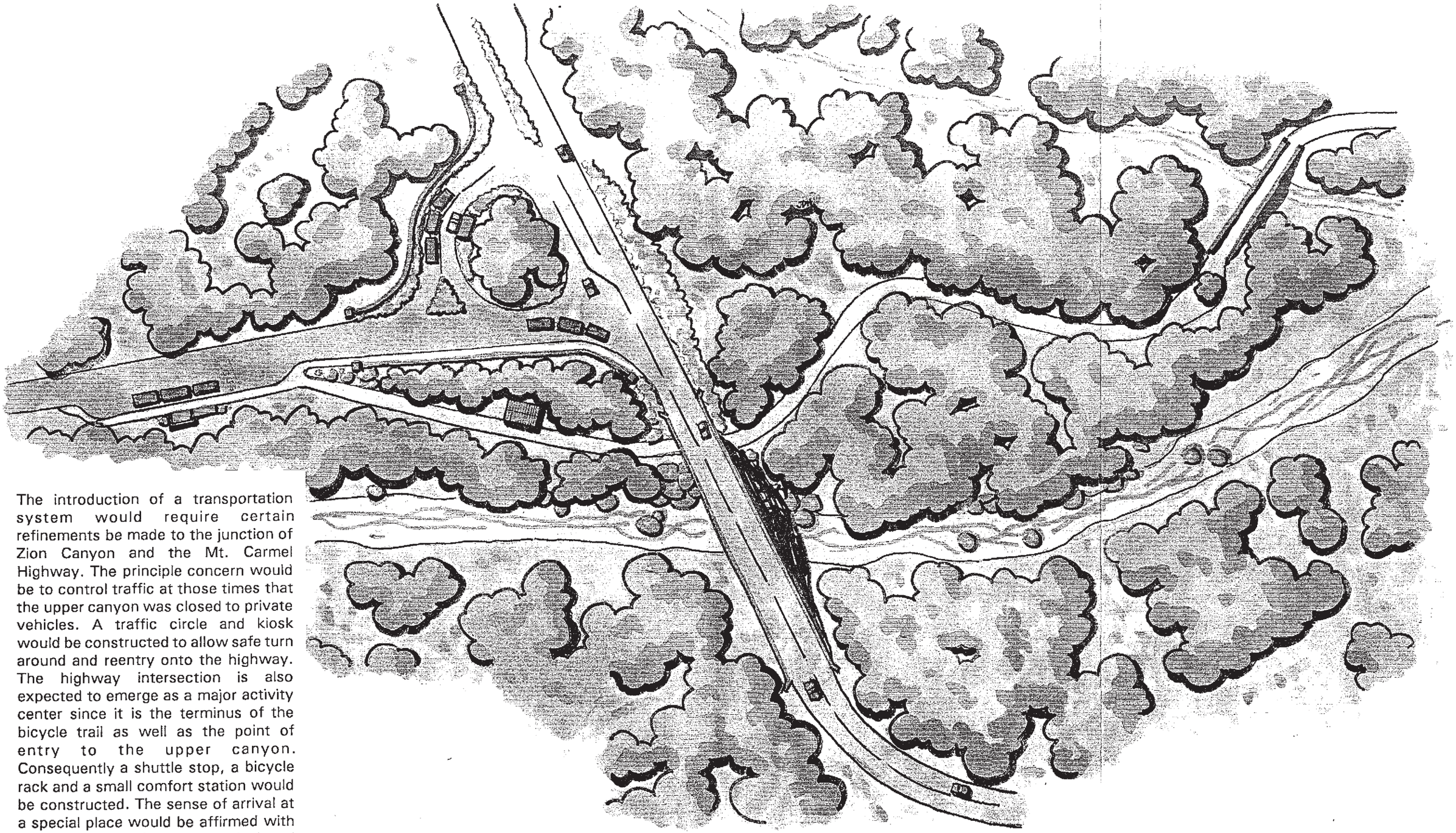
Because total funding will not be immediately available to implement the transportation system, the project will be phased. Phase 1 was construction of the Pa'rus Trail, allowing bicycle and pedestrian access from the south entrance to the Zion Canyon Scenic Drive. Phase 2 will consist of infrastructure development, including shuttle stop signs/seating, reconstruction of the canyon junction area, construction of the transit/visitor contact center and the parking in the

Watchman campground area with inter-connecting pedestrian and vehicle bridges, and modifications of the existing visitor center. Phase 3 will provide for construction of the bus maintenance and emergency services building, acquisition of shuttle vehicles, completion of campground modifications, and installation of shuttle signage in Zion Canyon. Future phases would include the redesign and revegetation of parking areas/shuttle stops to provide for possible expansion of the system to a year-round operation.

The 1994 development concept plan attempts to balance visitor demand and infrastructure needs with preservation and protection of natural and cultural resources. As detailed in that plan, in order to determine future needs, a visitor experience and resource protection process (VERP) will be developed. This process emphasizes the conditions desired in an area and requires managers to define desired conditions and actions required to achieve and maintain them. Development of the program will include input from local and regional community leaders, other public agencies, and the interested public.

Future Plans and Studies Needed

Visitor Experience and Resource Protection Program/Shuttle Operations Plan
Interpretive Prospectus
Campground Revegetation Plan
Baseline Conditions/Monitoring Plan
Design Development (preliminary drawings) for shuttle stops
Feasibility/Impact Analysis on Concessions Operations
Environmental Assessment/Assessment of Effect may be needed for future phases



The introduction of a transportation system would require certain refinements be made to the junction of Zion Canyon and the Mt. Carmel Highway. The principle concern would be to control traffic at those times that the upper canyon was closed to private vehicles. A traffic circle and kiosk would be constructed to allow safe turn around and reentry onto the highway. The highway intersection is also expected to emerge as a major activity center since it is the terminus of the bicycle trail as well as the point of entry to the upper canyon. Consequently a shuttle stop, a bicycle rack and a small comfort station would be constructed. The sense of arrival at a special place would be affirmed with the placement of a custom designed entry sign at a strategic location.

Highway Intersection

ENVIRONMENTAL CONSEQUENCES

Environmental consequences of the new proposal and the no-action alternative are evaluated in this section. Most of the descriptions and impacts are reproduced from the DCP EA to allow the reader to understand the total impact of the new proposal. Impacts to park/area resources result from the construction of the transit/visitor contact center, the redesign of the Watchman campground, construction at the park administrative office/bus maintenance area, redesign of the canyon junction, and construction associated with shuttle stops.

NATURAL RESOURCES

Soils

Affected Environment. Soils within Zion National Park are an extremely fragile resource and an almost ephemeral support for all of the vegetation and wildlife in the park. The type of sedimentary rocks from which Zion's soils are derived are characteristically deficient in some important plant nutrients and contain large amounts of alkali. Also most soils in the park are subject to erosion and water table lowering due to the impacts of slides and alluvial, dune, or lake deposition. Where disturbance is minimal, a thin, protective crust forms on the soil consisting of cyanobacteria, lichens, mosses, green algae, microfungi, and bacteria. Called microbiotic crust, this layer forms a surface that is highly resistant to wind and water erosion. On the Colorado Plateau, of which Zion National Park is a part, microbiotic crusts may account for 70-80% of the living ground cover (Belnap 1990).

After European settlement in the 1860s, the soil regime of the park was impacted from overgrazing by livestock, farming, and logging. The Virgin River drainage experienced severe erosional damage in the 1930s.

Today, many of the soils in the park have recovered from the effects of grazing, farming, and logging. However, the placement of roads, trails, and buildings has permanently altered soils in developed areas and human impacts in the form of social trailing continue to compact and erode soils. Once compacted and eroded, microbiotic crusts are damaged and plant life is difficult to reestablish.

Within the project area for the transportation system a more specific understanding of the natural characteristics and properties of affected soils was developed to define construction limitations. Soils between the transit/visitor contact center and Zion Canyon are primarily Naplene silt loam and Redbank silty clay loam. The Naplene silt loam is composed of sandy loam, loam, fine sand, and gravelly loam, and is found in broad alluvial valleys and on terraces along streams. These soils are found on shallow slopes of 2 to 6 percent. They are deep and well drained and runoff is medium. The permeability ranges from moderately rapid to very slow, and the erosion hazard is moderate. Depth to bedrock is usually greater than 5 feet. The high potential frost action of this soil results in rating of severe construction limitations for roads and dwellings.

Redbank silt clay loam consists of well-drained soils found on alluvial floodplains along the Virgin River. It is composed of a fine sandy loam with a surface layer of silty clay. Permeability is moderate. Slopes range from 0 to 2 percent. Runoff is slow and the hazard of erosion is slight. Depth to bedrock is greater than 5 feet. Moderate construction limitations apply to this soil type.

Currently, Naplene silt loam soils are compacted in Zion Canyon along the roadsides. Because inadequate parking spaces are available to visitors, vehicles are parked beyond established

paved lots to utilize the unpaved roadside. This has resulted in approximately 6 miles of compacted soils along roadsides with a width varying between 4 and 12 feet. The compacted conditions result in a loss of permeability and soil moisture, which also diminishes the water storage capacity. As a result, runoff is increased, causing erosion. The compaction from vehicles and foot trampling kills microbiotic crusts and vegetation, further exposing bare ground to the effects of runoff.

Impacts of the No-Action Alternative. The primary impact of soils would continue to be compaction along roadsides in Zion Canyon caused by a shortage of parking spaces. This condition would intensify and worsen as visitation to Zion increases and parking spaces become increasingly difficult to find. As a result, erosion would increase along roadsides, creating sediment and plant loss. The soil type that would be primarily affected is Naplene silt loam. Redbank silt clay loam would be affected by trampling from foot traffic along the alluvial floodplains of the Virgin River. This latter soil type occurs mainly around the Watchman and South Campgrounds, in the vicinity of the Pa'rus Trail. The erosion hazard of this soil type is slight; therefore, impacts are less.

Impacts of the Proposal. Implementation of the proposal would decrease the use of roadsides for parking by providing shuttle buses that would transport visitors through the canyon. This in turn would allow compacted roadsides to recover. However, without rehabilitation efforts such as decompaction of soil and planting with native species, the recovery will be slow. Also, if private vehicles are allowed in the canyon during winter months, the roadsides would likely still be used, preventing recovery. (Even when parking lots have available spaces, visitors sometimes park along roadsides for picture taking, wildlife viewing, etc.) If these areas are to be recovered while private vehicles are allowed in the canyon, they must be rehabilitated and signed to prevent continued use.

However, in the long-term future, private vehicles will be eliminated from the canyon. At this time, a full recovery of these roadside parking areas would be possible. Likely actions would include soil decompaction and improvements, seeding and/or planting of native species, barriers (such as large rocks), and interpretive efforts to seek compliance with the measures.

Construction for the redesign of Canyon Junction would involve minimal disturbance to Naplene silt loam soils because most of the impact would occur on currently paved surfaces. Rehabilitation with native species would help to reduce compaction and erosion.

Construction of the shuttle stops would occur on currently paved surfaces with minimal or no disturbance to soils.

The rest stop at the lodge would also be constructed on a currently-paved surface. A short trail (less than 100 yards) would be built to connect the new rest stop with the trail to the Grotto. The trail would be built on Naplene silt loam soil, which has slight to severe construction limitations. The grade for the new trail would be very slight, reducing soil impacts. The construction of this new trail would actually help to reduce future impacts by designating a path to connect with the Grotto Trail. If such a trail is not designed, social trails will develop as people establish their own multiple paths.

The construction of the transit/visitor contact center would disturb approximately 4-5 acres of Redbank silty clay loam and Naplene silt loam. After construction, about 1 acre of soil would be rehabilitated through revegetation with native species. Soils would also be disturbed along the river banks during construction of the pedestrian and vehicular bridges connecting the

transit/visitor contact center and the Watchman parking lots. The disturbance of these soils would amount to about one-half acre. After construction, the disturbed areas would be revegetated.

The new parking lot in Watchman campground would encompass 4-5 acres; however, currently one-third to one-half of the site is paved to form campground loops. Construction would be primarily in Redbank silty clay loam soils.

Construction of the maintenance building for the shuttle buses would disturb Naplene silt loam soil on approximately 4 acres. One-half acre of land would be rehabilitated through revegetation with native species. The constructed wetland for dissipation of runoff from the wash bay and parking lot would be on Naplene silt loam. To improve the holding capacity of the constructed wetland, it would be lined with clay or plastic.

Vegetation

Affected Environment. The North Fork of the Virgin River is a prominent focal point of the canyon bottom. It is fringed in much of its length with a riparian woodland dominated by Fremont poplar, velvet ash, and boxelder. The wetting effect of the river does not extend far from the stream bank. However, the irrigation system placed by pioneer settlers extends the riparian effect away from the main stream. Supported along the irrigation system are many of the same species that occur along the river. The sandy-rocky terraces and floodplains maintain prickly pear cactus, Utah yucca, muttongrass, golden aster, Palmer's penstemon, needle grass, hackberry, single-leaf ash, matchweed, rabbitbrush, sagebrush, and others. Arid sandy or rocky slopes adjacent to the terrace-floodplain system support Utah juniper, turbinella live-oak, and others. Hanging garden communities form where the Kayenta and Navajo sandstone layers meet, creating seeps and springs that support unique and lush plant life. Elevations range from 3800 feet at the south entrance to 6500 feet at East Rim observation point.

Man's presence in the canyon has created a modified vegetation system in many areas. The majority of construction for the transportation system would be done in currently or historically disturbed sites such as fields and roadways. Orchards or fruit and nut trees, ornamental plantings, and escapes from cultivation occur in much of the area. The weeds introduced through time since the earliest occupations are commonplace through all disturbed (man-induced or naturally) areas in the canyon. Vegetation has also been trampled and destroyed along 6 miles of roadsides in Zion Canyon where vehicles are parked along the road shoulder. Social trailing is also prevalent along heavily-used trails and walkways.

Impacts of the No-Action Alternative. The continuation of private vehicles in the canyon would result in further denudation of vegetation along 6 miles of roadside from off-road parking. Vehicle emissions containing cadmium, manganese, lead, and zinc would continue to accumulate in the vegetation and soil. The Watchman campground would be left in its current state, and although no mature trees would have to be removed, up to 2 acres of herbaceous vegetation would continue to be trampled and destroyed.

Impacts of the Proposal. The short-term reduction of private vehicles in the canyon would allow for up to half of the off-road parking areas to be rehabilitated. Complete rehabilitation would not be possible until all private vehicles are removed and only shuttle buses operate, reducing the opportunity to use off-road parking altogether.

The construction of the transit/visitor contact center would disturb approximately 4-5 acres of land. However 1 acre would be rehabilitated afterwards through landscaping. Native plants, boulders and other materials would be used for this process. At this time weedy species dominate the ground. A small parking lot and two commercial businesses would also be removed and relocated to accommodate the transit/visitor contact center.

During construction of the Watchman campground parking lot, approximately 4-5 acres of land would be disturbed. However, about one-third of this land is currently paved. Islands of vegetation would be left within the parking lot to provide shade, and trees would be planted to replace and augment existing ones.

Construction of the maintenance building for the shuttle system would remove 4 acres of vegetation consisting of rabbit brush, sage, native perennials, and non-native annuals such as cheat grass. One-half acre of vegetation would be restored with the planting of native trees to provide screening and shade. The constructed wetland would cover up to 600 square feet and hold up to 9,000 gallons of water. Irrigation water would be used to fill it, requiring an irrigation ditch be built for this purpose. Its perimeter would be curved to match contours of existing landforms. At the point closest to Oak Creek, it would have an outlet to adjust the water level. Within it, wetland plants would be transplanted from park or nursery stock. Species such as cattails, sedges, and rushes would be used to help with biological and physical filtering of hydrocarbons. Once favorable conditions were established (adequate water depth and soil conditions), aquatic plant species would naturally establish themselves.

At Canyon Junction, approximately one acre of vegetation would be disturbed during construction. No impact would occur to the population of the endemic plant species, *Eriogonum corymbosum* var. *matthewsiae*. At the conclusion of construction, approximately one-fourth acre of disturbed ground would be rehabilitated with native species. Most of the redesign work would occur on paved roadway.

An additional impact to 2-4 acres of vegetation would result from up to 60 people unloading from a shuttle bus at the designated stops. Though the stops are placed at currently-paved spots, trampling of vegetation would occur as people leave the pavement to find space. Together this could put as many as 80 people at a shuttle stop at one time. The shuttle stops are at the headquarters, Canyon Junction, Court of the Patriarchs, Lodge, Grotto, Weeping Rock, Big Bend, and Temple of Sinawava.

Threatened, Endangered, and Endemic Species

Affected Environment. Three threatened or endangered animals live within the area affected by the transportation system: the American peregrine falcon (*Falco peregrinus*), bald eagle (*Haliaeetus leucocephalus*), and Mexican spotted owl (*Strix occidentalis lucida*). The Virgin spinedace (*Lepidomeda mollispinis mollispinis*) is a threatened minnow that is proposed for listing, which lives in the Virgin River within the study area. Numerous other category 2 animals (candidates for which the U.S. Fish and Wildlife Service has information indicating the possible appropriateness of listing, but for which further information is still needed) may also occur: Arizona toad, desert sucker, flannelmouth sucker, spotted bat, western small-footed myotis, long-eared myotis, fringed myotis, Yuma myotis, big free-tailed bat, chuckwalla, and wet-rock physa (Zion Canyon snail).

In 1994 and 1995, a complete survey for category 2 and rare/endemic plants within the areas of potential impact was conducted by a researcher from Brigham Young University. On-site

surveys were done for 11 category 2 species and 10 rare and endemic species known to occur in Zion Canyon. To date all findings have been negative. None of the currently proposed category 2 species were found within the areas of potential impact. Although it is not a proposed species, *Eriogonum corymbosum* var. *matthewsiae* is an endemic plant found in only one location within the park. It grows at Canyon Junction in a small population on the east side of the road (Welsh 1994). Appendix B includes correspondence received from the U.S. Fish and Wildlife Service on endangered species.

Impacts of the No-Action Alternative. At current conditions, the numbers and concentrations of people in the canyon would not be restructured or managed in ways to protect threatened and endangered species. Monitoring for population trends of peregrine falcons, Mexican spotted owls, Virgin spinedace, and amphibians would continue. Impacts to rare, endemic and category 2 plants would be avoided, but indiscriminate damage from trampling or picking could occur.

Current prevention methods, such as building boardwalks and fences around seeps and hanging gardens to confine use and protect areas would continue to be implemented as needed.

Wading in the river would continue, resulting in unknown impacts to invertebrates and fish species.

Impacts of the Proposal. Overall, the implementation of the proposal (transportation system) would result in an increased ability to control the number and concentration of people in Zion Canyon through scheduling of the buses and regulating the number of riders. Also the planned development of the visitor experience and resource protection process would give managers the ability to measure impacts through changes in indicators.

The transit/visitor contact center and Watchman campground parking lot, together with the development of river access and two bridges would occur in proximity to several key fish and amphibian species. Virgin spinedace (proposed-threatened), flannelmouth suckers (Category 2), and desert suckers (Category 2) are species that inhabit this stretch of the river. The Arizona toad, and possibly the northern leopard frog, also live here. Consultation and permitting with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the Utah State Engineers Office would include mitigation measures to reduce impacts to these species during and after the construction process.

The results of this development around the south park entrance would be the introduction of potentially several thousand people each day crossing the Virgin River where there was previously no bridge access. The bridges would span the 100-year floodplain. No wetlands would be impacted. A potential exists for wading to occur in the river via the developed access.

In order to prevent adversely impacting the native fishes and their food supply of invertebrates and algae, visitor use would be limited by interpretive signage and, if necessary, law enforcement. In other words, part of the "story" of the Virgin River would be the need to protect it and visit it carefully. The designed features of the walkway leading to the river would be modified to invite visitors to, but not in, the river. River access would be provided outside the park.

Elsewhere along Zion Canyon, threatened, endangered, rare and endemic species would not be impacted directly by development of the transportation system. However, monitoring would continue for American peregrine falcons and Mexican spotted owls because these are the

longest-standing wildlife monitoring programs in the park, serving as indicators of the health of the environment.

The wet-rock physa (Zion snail) would most likely benefit from the proposal as off-road parking would be reduced near wet wall seeps where the snail lives.

Because limits on growth in visitation would be set, no threatened, endangered, rare or endemic plant would be harmed by the transportation system. The planned visitor experience and resource protection process would serve as the system of checks and balances to provide a warning if unacceptable limits are reached.

Developments at Canyon Junction (kiosk, comfort station, and rock wall) would avoid any specimens of the rare plant, *Eriogonum corymbosum matthewsiae*, which grows in the vicinity. The protected site would be flagged during construction to avoid accidental destruction by construction work.

TABLE 1: THREATENED, ENDANGERED, AND ENDEMIC SPECIES

NAME	CATEGORY	EFFECT
American peregrine falcon	Endangered	No effect
Bald eagle	Endangered	No effect
Mexican spotted owl	Proposed threatened	No effect
Virgin spinedace	Threatened	No effect
Eriogonum corymbosum var. *matthewsiae*	Endemic	No effect
Flannelmouth suckers	2	No effect
Desert sucker	2	No effect
Arizona toad	2	No effect
Northern leopard frog	Sensitive species	No effect
Wet-rock physa	2	No effect

Floodplains and Wetlands

Affected Environment. The North Fork of the Virgin River is the main drainage through Zion Canyon. The river experiences wide fluctuations in flow with a seasonal snowmelt peak in the spring followed by generally low summer and fall flows. Occasional heavy storms, which can occur at any time of the year but are most common in summer and early fall, produce the largest flows in the Virgin River system. These runoff events are usually of short duration and can occur suddenly.

The segment of the North Fork of the Virgin River through the study area is considered eligible for recreational classification under the Wild and Scenic Rivers Act. Under the *Natural Resources Management Guideline*, NPS-77, eligible wild and scenic rivers will be managed in

accordance with "National Wild and Scenic Rivers System: Final Revised Guidelines for Eligibility, Classification, and Management of River Areas."

An earthen levee system constructed between the 1920s and 1960s along the riverbanks in much of Zion Canyon has altered the historic floodplains of the lower canyon by containing flows up to approximately the 500-year flood.

The transit/visitor contact center and parking lot would be constructed within the regulatory floodplain, which is the maximum floodplain in a flash flood hazard area. The transit/visitor contact center is in the 100-year floodplain and the parking lot is in the probable maximum floodplain. (The parking lot is on the other side of the river and is protected by levees up to about a 500-year flow.) Other activities in the maximum floodplain that are exempt from floodplain regulations are the two new bridges and potential alterations to the banks of the Virgin River near the transit/visitor contact center for improved visitor access. The area proposed for the maintenance building for the shuttle busses and parking is on the margin of the 500-year floodplain and nearly entirely within the maximum floodplain of Oak Creek.

The eight shuttle stops will be built alongside the existing roadway and are considered to be excepted actions under NPS procedures for implementing E.O. 11988 because they are minor structures associated with the use of the road and do not involve overnight occupation. The new restroom facility within the Zion Lodge Historic District will be built adjacent to existing structures at the lodge. Floodplain maps for the Zion Lodge area are not available. However, the restroom facility is not considered to be subject to the NPS procedures because it represents a small incremental addition to the lodge facilities and will not place additional visitors in flood risk.

Wetland habitat within the project site, with the exception of artificially irrigated areas, is found only in very close association with the North Fork of the Virgin River and its tributaries. An underground, pressurized irrigation system that would eliminate these artificially created wetlands is not planned as part of phase 1 of the transportation system. However, necessary permits from the U.S. Army Corps of Engineers and Utah State Engineers Office will be obtained during future work phases involving the irrigation system.

The constructed wetland for dissipation of waters from the wash bay and parking lot would be built within the flash flood hazard area. Floating hydrocarbons from the wash bay would be filtered first through a grease trap in the shuttle bus maintenance building. Sediment from the grease trap would be collected and disposed of in a properly designated repository. The remaining residue from the wash bay and the parking lot would be filtered through the constructed wetland. It would take several days for water to filter through the wetland, during which time biological and physical processes of decomposition would reduce suspended solids to 20 parts per million or less. Finally, the filtered, residual effluent would flow into Oak Creek and the Virgin River. The combination of the grease trap and constructed wetland would enhance waste disposal and help protect water quality once proper filtering conditions were maintained. In the event of a flash flood, residual hydrocarbons, sand, and grit from the constructed wetland could potentially wash into Oak Creek. However, the majority of hydrocarbons are removed before they enter the wetland by the grease trap. The sand and grit that would wash into Oak Creek during a flash flood would either flow into the North Fork of the Virgin River or settle along the banks of Oak Creek.

Impacts of the No-Action Alternative. Existing conditions would still be consistent with recreational classification of this river segment.

Under the no-action alternative, no new development would occur in the flash flood hazard zone. Failure of the earthen levees under flood conditions would result in floodwaters encroaching in the campgrounds, housing areas, and roads. The earthen levees along the riverbanks would be maintained, continuing the pattern of altering historic floodplains in order to protect lives and property from floods.

Artificially-developed wetlands along the irrigation channels would not be altered, nor would any naturally-created wetlands in the canyon be impacted by new development.

Impacts of the Proposal. The development of the transportation system would not detract from the recreational character of this stream segment. This area already has substantial evidence of human activity, residential and commercial structures, and proposed actions are consistent with the recreational classification eligibility.

Portions or all of the transit/visitor contact center would be constructed within the flash flood hazard zone. Earthen levees would be maintained where previously constructed. The permits for construction of river access by the transit/visitor contact center would be accomplished through a joint permit application (§404) to the Army Corps of Engineers and Utah State Engineers Office. This permit would be applied for after completion of this environmental assessment and final design drawings.

In the event of a flash flood, occupants of the transit/visitor contact center and surrounding grounds and facilities in Zion Canyon would be personally warned in advance by town emergency rescue personnel or park rangers to evacuate the premises. Weather forecasts, including flash flood warnings, are regularly relayed to the dispatch office by the National Weather Service. The current standard operating procedure is to close the road above canyon junction to visitor traffic during large flash floods, while posting park rangers as scouts along the river beginning at the Watchman campground to personally warn visitors of impending danger.

The natural and beneficial values of wetlands (flood control, water quality nutrient cycling, habitat, and recreational) would not be altered by the proposal. No proposed actions would take place directly in wetlands, nor would any indirect actions affect wetlands.

The natural and beneficial values of floodplains (moderation of floodwaters, maintenance of water quality, and groundwater recharge) would not be adversely affected by the proposal. However new developments would be placed in the flash flood hazard and 100- and 500-year floodplains. An existing system of earthen levees would help protect human lives and structures from death or harm. Additional mitigation measures for these proposed actions are discussed in the draft floodplain statement of findings (appendix C).

Water Quality

Affected Environment. Water quality within the Virgin River in the park is generally good, as evidenced by a diverse assemblage of native aquatic invertebrates and fishes. Seeps and springs are also high in quality and are not heavily polluted by human impacts. They contain high amounts, in certain locations, of naturally occurring salts such as boron and sodium (NPS 1994d).

Where roadside parking is prevalent in Zion Canyon, vegetation has died and soil is exposed to the effects of erosion. During periods of runoff from rain or snow melt, sedimentation is increased, resulting in an increased sediment load in the tributary streams.

Numerous wet-wall seeps, springs and hanging gardens occur in the canyon in proximity to roads and trails. Groundwater that flows from these sites remains in a relatively pollution-free state. However, occasionally litter and human waste are found in these sites, resulting in bacterial pollution.

Impacts of the No-Action Alternative. Under the no-action alternative, roadside parking would continue due to crowded conditions in Zion Canyon. This would lead to the development of bare soil patches that are subject to the effects of erosion. The runoff from these barren areas carries sediment that can cause increased turbidity and reduced oxygen levels in stream flow. Pollution to seeps, springs, and handing gardens would continue at the same, or increasing levels, due to proximity to parking areas and trails.

Impacts of the Proposal. The construction of two bridges at the transit/visitor contact center would temporarily introduce sediment into the river; however, this effect would be minor because construction would not occur at the riverside. No heavy equipment would cross the river during the construction process because developed access routes exist on both sides of the river. Mitigation measures developed in the §404 permit would be adhered to in order to minimize this effect.

Long-term visitor access to the river by the bridges would have to be managed to avoid impacts to the native aquatic invertebrates and fishes. This would include the use of interpretation, law enforcement, and resource management to establish use levels for wading that do not degrade natural resources.

Elsewhere in the canyon, water quality would be expected to improve as a result of reducing off-road parking, which increases erosion that introduces sediment into waterways. The removal of people from parking in off-road areas would also benefit wet-wall seeps, springs, and hanging gardens where contamination can occur from human sources of litter and fecal material.

Air Quality/Night Sky

Affected Environment. Zion National Park is a mandatory class 1 clean air area under the Clean Air Act. The clear air and limited light pollution of the skies are mentioned in the park's statement for management as a significant resource.

Current sources of pollution include particulate matter from campfires and wood stoves, vehicle emissions (up to 5,000 vehicles/day in Zion Canyon), and long-distance transport emissions from regional pollution sources such as coal-fired generating plants and large urban areas. These sources of pollution effect visibility and introduce haze into the sky. No point-source pollution sources are currently visible from the park. A 14 MW cogeneration facility powered by natural gas is planned in Hildale, Utah, 10 miles south of Zion National Park. The National Park Service Air Quality Division performed a visibility analysis and determined that no coherent plume impact will occur as a result of the project inside Zion National Park. The final permit issued to Hildale included a permit condition limiting particulate matter emissions to a rate of 7.5 tons per year, well below the 250 tons per year level subject to Prevention of Significant Deterioration (PSD) requirements. (October, 1994 Correspondence from Chief, Air Quality Division, NPS to Regional Director, NPS).

The purity of night skies is optimal at higher elevations on the plateaus and mesas away from Zion Canyon. Within and around the canyon, artificial light sources and campfires slightly reduce the brightness of objects in the night sky. The quality of the night sky, while widely unaltered

from artificial sources from large urban areas, is diminished to a minor degree by light sources from current park development in Zion Canyon and in nearby Springdale and Rockville. Lights from Virgin, LaVerkin, Hurricane, St. George, Cedar City, and scattered homes and ranches are visible from elevated viewpoints in the park.

Impacts of the No-Action Alternative. Under this alternative, no actions are proposed to reduce or limit the number of vehicles or people in Zion Canyon; therefore, air quality would be affected over time by increasing emissions from vehicles and particulates from campfires.

As communities grow in southern Utah, artificial lights will continue to impinge on the quality of night skies in Zion National Park.

Impacts of the Proposal. Implementation of the transportation system would reduce the number of individual vehicles in Zion Canyon and replace them with shuttle buses. The shuttle buses would operate on propane fuel. The combination of fewer individual vehicles and the use of propane fuel would reduce emissions from unleaded gasoline and improve air quality (NPS 1993). However, vehicle emissions would be concentrated around the parking lots in the Watchman campground and transit/visitor contact center.

To mitigate the impact of lights on the park environment, night lighting for the transit/visitor contact center would be at subdued intensity. During hours when the transit/visitor contact center is closed, only the minimum number of lights needed for security would be left on. To provide visitors safe night time access to the Watchman parking lot, restroom and amphitheater path lighting from the transit/visitor contact center would be provided along walkways connecting the facilities. No overhead light poles would be used in the Watchman parking lot in order to preserve the darkness of the night sky for campers.

The Canyon Junction bulletin boards and kiosk would be illuminated with low-level lighting to provide needed light for visitors. No overhead pole lighting would be used.

In all facilities, attempts will be made to use low-level lighting that provides the minimal amount of light needed for safety, while protecting the integrity of the night sky.

As communities grow in southern Utah, artificial lights will continue to impinge on the quality of night skies in Zion National Park.

Lighting for the bus maintenance facility would also be minimal during hours of non-operation and of low intensity during hours of night-time operation.

The Canyon Junction kiosk would have minimal lighting during hours of night-time operation to reduce its impact on the night sky. The shuttle stops and rest room at the lodge would have the minimal amount of lighting necessary for safety and informational needs.

Noise

Affected Environment. Natural quiet is an important resource at Zion National Park. The park does not currently have monitoring devices installed to measure ambient sound levels; however, noise monitoring was instituted in the summer of 1995. A noise impact assessment conducted in the park in the spring of 1993 revealed that most of the traffic noise is created by tour buses and that these sounds would be distinctly audible at elevated viewpoints. The river sounds (a significant element of the natural history of the canyon) are not audible very far away from the

river, and do not carry well around big banks or barriers. Because of these characteristics, the river is not particularly successful at masking the vehicular noise.

Generators on recreational vehicles create the greatest localized auditory impacts in campgrounds. Noise impacts also result from large jets, small fixed-wing aircraft and helicopters flying above the canyon. Occasionally helicopters land at the Watchman helipad for emergency purposes such as search and rescue or wildland fire operations. Negotiations with the Federal Aviation Administration and a private fixed-wing aircraft tour company in 1994 resulted in the rerouting of commercial flights away from Zion Canyon to reduce noise.

Impacts of the No-Action Alternative. Under the no-action alternative, the major sources of noise would continue to be the tour buses. As visitation increases in the future, so too would the number of vehicles entering the canyon rise, resulting in a relative increases in overall noise levels.

Impacts of the Proposal. Implementation of a shuttle system would reduce noise levels in the canyon. Because tour buses would be eliminated during all or part of the year, the greatest generator of noise would be eliminated. Noise pollution at elevated viewpoints from canyon traffic would also be eliminated. In addition, the shuttle buses would have quieter engines than typical tour buses. However, because some cars would still be allowed to drive in the canyon during all or part of the year, this noise would still be an impact. These sounds would continue to create higher and more offensive noise levels than the natural sound of the Virgin River.

Noise levels would increase around the transit/visitor contact center, Watchman parking area, shuttle bus maintenance area, and at the 8 shuttle stops in the park, due to the movement of the buses and the human sounds associated with loading and unloading passengers. Noise levels associated with the shuttle bus maintenance area would continue into the night hours until bus operations are completed. This noise would be audible to residents living in the Oak Creek housing area.

Noise levels in the canyon from vehicles would decrease overnight during hours when the shuttle system is either not in operation or at reduced levels of use. Because the canyon would still be open to pedestrian and bicycle use, it would provide visitors with a quiet opportunity to visit the canyon and hear natural sounds.

Sound monitoring would continue after implementation of the transportation system to determine the effectiveness of shuttle buses on reducing noise levels.

Visual Quality

Affected Environment. The visual quality or scenery of the park is central to its establishment and purposes. The purpose statements in the 1994 statement for management interpret the legislative intent of Zion National Park to include preserving and protecting the scenic beauty and unique geologic features. Visitors entering Zion Canyon find their eyes being drawn upward to the nearly vertical canyon walls.

The developments in the canyon are on the canyon floor, often hidden by trees. Much of the development is of the "NPS-Rustic" architectural style. Most development, other than the Zion Lodge and the visitor center, is away from high visitor-use areas. Housing is off main roads and screened with mature vegetation, and the maintenance yard is out of view along Oak Creek Canyon.

On a smaller, more human scale, trampling of vegetation by visitors at the major-use areas, coupled with the closeness of the campgrounds to the main road, has degraded the visual quality of the park headquarters area. Recent improvements in the South Campground associated with the development of the bike (Pa'rus) trail have resulted in the rehabilitation of denuded river banks and the planting of native vegetation including trees. Approximately 75 trees were also planted in the Watchman campground to replace those lost by disease or old age.

Impacts of the No-Action Alternative. As visitation increases, trampling of vegetation would continue around high visitor-use areas and in the campgrounds. As the vegetation dies in these areas, the visual quality would be reduced. These impacts would continue to spread to frontcountry trails such as Emerald Pools that experience a heavy hiker demand.

Impacts of the Proposal. Implementation of a shuttle system would drastically reduce the number of vehicles and visitors on roads and at parking areas in the canyon. The number of people in the new Watchman campground parking area and transit/visitor contact center would increase. However, visitor use would decrease at the current visitor center, thus moving a heavy proportion of visitor use and congestion out of the park. The parking area and transit/visitor contact center would be built using sustainable design principles for energy flow and conservation and would complement existing rock architecture in the park. Native vegetation would be used to provide shade and screening. Except in the Watchman campground, utility lines would be buried to reduce their visual impact.

The shuttle bus stops and canyon junction kiosk would also be designed to complement existing rustic architecture and utilize native materials of sandstone and wood. They would be built on existing, disturbed areas. The shuttle bus maintenance area would be located away from major visitor-use areas and would be partially screened with vegetation. It would be built on an existing or historically disturbed area. The location west of the headquarters building would minimize visual impact on views of the Towers of the Virgin, one of the prime viewing areas in the canyon. However its proximity to Oak Creek residents would lessen visual quality for those people living in the housing area. Views from the Oak Creek residential area would be filtered by existing vegetation.

A major means of reducing the visual impact of the shuttle bus transportation system is the placement of the transit/visitor contact center and many of the parking areas outside the park. To preserve visual quality, however, all the shuttle stops inside and outside of the park would have similar design and materials to provide continuity to the system and complement existing park architecture.

CULTURAL RESOURCES

There are four cultural resource types to be considered when identifying the effects of a project or plan. *Archeological resources* are evidence of past (prehistoric and historic) human occupation or activity. *Historic structures* include standing architecture, roads and trails, and other designed features related to pioneer and park activities. *Ethnographic resources* are sites, objects or natural features having traditional, legendary, religious, sacred, ceremonial, or other values to a recognized group. *Cultural landscapes* are designed environments that include natural and cultural features and resources.

Ethnographic Resources

Cultural groups who may have ethnographic concerns or interests include the Southern Paiute Tribes of Arizona and Utah, the Hopi, and the local Mormon community. Ethnographic resources as described in this section apply throughout the project area. Zion's ethnographic resources reflect the cultural significance and traditional values of people who found Zion Canyon a favorable place to live. Research is currently underway to determine the cultural significance of Zion for the Kaibab Paiute Indian Tribe of Arizona and the Paiute Indian Tribe of Utah. In June 1994, a scoping session was conducted with tribal elders of the Southern Paiute to describe this proposal while they were in the park as part of the parkwide ethnographic overview and assessment study. A draft copy of the report will soon be available to the park. Ethnographic concerns in relation to the Hopi are reflected in the archeological resources found throughout the park. Both the Southern Paiute and the Hopi claim cultural affiliation with these prehistoric Puebloan remains. Further ethnographic study is needed to identify the concerns of the Hopi. Additional consultation will be conducted with the tribes and local interest groups prior to implementation of this plan.

In accordance with the provisions in the Native American Graves Protection and Repatriation Act, consultation will be conducted with the Southern Paiute Tribes of Arizona and Utah, Hopi, and other potential tribal groups if burials containing human remains or funerary objects are disturbed during construction. Construction will cease until consultation is completed.

Impacts of the No-Action Alternative. Under the no-action alternative, impacts to ethnographic resources may or may not continue depending upon the identification in the ethnographic study now underway (NPS 1995g).

Impacts of the Proposal. Under the proposal, impacts to ethnographic resources may or may not continue depending upon the identification in the ethnographic study now underway (NPS 1995f). Every effort would be made to avoid impacts (visual, audible and physical) to known ethnographic resources. If impacts cannot be avoided then consultation with the appropriate tribes, Mormon community, Utah State Historic Preservation Office (SHPO), and Advisory Council on Historic Preservation (ACHP) would be initiated.

Pending identification of ethnographic resources (NPS 1995f) in the area of potential effect, short- and long-term audible impacts would occur in the park administrative area. Due to the emergency nature of helicopter flights, mitigation of noise on ethnographic resources would not be possible.

Cultural Landscapes

Affected Environment. Cultural landscape evaluations are complete for the Watchman and South campgrounds, and the Zion Lodge area (NPS 1995c). The evaluation determined that none of the landscapes evaluated are eligible for inclusion in the National Register of Historic Places. The SHPO concurred with this determination (July 1995). A reconnaissance survey of the area of potential effect was conducted by a historical landscape architect and park staff to identify cultural landscape integrity and significance. Eligible landscape resources, other than those identified in the campgrounds and at the lodge, are not known at this time. A cultural sites inventory is scheduled during fiscal year 1996 to evaluate cultural landscape eligibility along the road system from the south entrance to the Temple of Sinawava. Based on this study, additional consultation with the SHPO will occur. Detailed attention will be given to construction designs

to minimize impacts to potentially eligible landscapes found elsewhere in the area of potential effect.

Impacts of No-Action Alternative. Under the no-action alternative there would be no impacts to potentially eligible cultural landscapes.

Impacts of the Proposal. In Zion Canyon, the proposal would visually alter existing pull-outs and parking lots by constructing signs, benches, and visitor facilities. Impacts to eligible landscapes at the transit/visitor contact center, park administrative offices and in Zion Canyon would be mitigated to ensure that new design elements are compatible with existing features. The designs would follow the *Secretary of Interior's Standards for Treatment of Historic Properties*. Preservation of changes within cultural landscape environments that have acquired historical significance in their own right would be retained.

Archeological and Historic Resources

Area of Potential Effect. The area of potential effect (see Historic Structures map) begins on private property adjacent to the park's southern boundary, near the south entrance, following the river corridor north for the entire length of the Zion Canyon Scenic Drive. It is confined to the west side of the river until Canyon Junction, shifting to the east side for the remainder of the drive. The area east of the Virgin River, known as Watchman campground, is also within the area of potential effect. The proposed bus maintenance facility expands south and west of park administrative offices including Oak Creek maintenance and residential area. It also includes the current visitor parking area. The Zion Lodge shuttle stop would include an area north and west of the present main lodge building.

The area of potential effect is within the primary visitor use area of the park. Within the area of potential effect a number of undertakings are identified by geographic location over a distance of eight miles, from the transit/visitor contact center north to the Temple of Sinawava. Further documentation and photographs can be found in appendix D.

Archeological surveys meeting the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* were completed in the area of potential effect (NPS 1986) and (NPS 1995a). A number of sites were found. Determinations of eligibility for listing on the National Register of Historic Places are complete for cultural resources directly impacted by the proposal. Sites pertaining to American Indian occupation of the park are typically lithic and ceramic scatters, rock art, and habitation sites. These sites are believed to have been occupied during Archaic, Basketmaker, Pueblo, and Historic times; the most intense use of the area appears to have been by the Virgin River Anasazi and the Southern Paiute.

Historic period sites pertaining to Euro-american expansion include evidence related to agricultural (orchards, irrigation ditches, etc.) and farmstead activities (buildings, fences, corrals) from the early 1860s until private lands were purchased for establishment of Mukuntuweap National Monument in 1909, later renamed and expanded as Zion National Park in 1919. Information on recorded sites is found in the park's cultural sites inventory.

A list of classified structures report and a multiple resources nomination for the National Register was completed for historic structures (NPS 1984a). Twenty-six properties, including structures, districts and sites are currently listed on the National Register. The significance of the historical resources in Zion derives from their association with three historic themes: 1) pioneer Mormon settlement, 2) landscape architecture and transportation, and 3) "NPS-Rustic" style architecture.

The remainder of the information in this section is presented geographically. Each of the remaining two resource types (archeology and historic structures) are described in detail.

Transit/Visitor Contact Center/Virgin River.

Affected Environment — The sites for the proposed transit/visitor contact center and beach development are outside the park boundary. This evaluation of cultural resources in those areas is included here to assist the town of Springdale with its portion of the planning for the transportation system. The area for the proposed transit/visitor contact center has been surveyed for archeological resources; no eligible resources were found in the project area. The area was extensively disturbed by previous development and cultivation, which makes the potential for finding significant resources unlikely. The current proposed location for the new building is in an area that has been extensively disturbed through farming activity.

Based on previous surveys along the river corridor, there is the potential to discover archeological resources. Where intensive survey work within this area on the east side of the river has not documented any surface remains, subsurface deposits may be present.

Impacts of the No-Action Alternative — Under the no-action alternative the transit/visitor contact center, bridges, and beach development would not occur. Therefore, there would be no new impacts to cultural resources.

Impacts of the Proposal — During the construction phase of the transit/visitor contact center, monitoring would be done by a qualified archaeologist for potential impacts to subsurface archeological resources. If archeological resources are found during ground disturbance, they will be evaluated for significance. If the project is unable to avoid eligible sites through design, data recovery pursuant to an approved data recovery plan would occur. The Utah SHPO, ACHP, and appropriate interest groups would be given an opportunity to review and comment on the data recovery plan.

If eligible historic structures are discovered during surveys, designs for new structures would be compatible with any historic features where possible. If eligible historic structures are discovered during surveys and cannot be avoided by construction, the structures would be recorded to the standards of the Historic American Buildings Survey prior to removal.

Roads and Bridges/Canyon Junction.

Affected Environment — Six years after Zion National Park was established, Congress appropriated funds to construct a park road. This "Floor of the Valley Road" (known today as the Zion Canyon Scenic Drive and a portion of the Zion-Mt. Carmel Highway) was the first automotive road in the park (see Historic Structures map). The road followed an earlier Mormon wagon route that extended into the canyon. The wagon route followed an earlier Indian trail used centuries before Europeans set foot in the region. The road has been realigned by man and nature but continues to carry visitors into the heart of Zion Canyon. The Floor of the Valley Road is about 7.5 miles in length and begins at the intersection of the Zion-Mt. Carmel Highway and ends at the Temple of Sinawava.

The Zion-Mt. Carmel Highway was constructed in 1930 and includes a 10-mile section of a 25-mile road that was listed on the National Register in 1987. The highway starts at the south boundary of the park and continues to the east boundary of the park encompassing the Zion tunnel, switchbacks, and associated road features. The National Register-eligible section of the

road begins on the west side of the Virgin River Bridge and continues to the east entrance. The Zion-Mt. Carmel Highway was the outgrowth of improvements in road-building technology, increased funding, and the persistence of the National Park Service and the Union Pacific Railroad. The highway completed the southwestern tourism route linking Zion, Bryce, Cedar Breaks, and the North Rim of the Grand Canyon with a touch of engineering magic. The highway has been widened, paved, and realigned, but the route scenery and engineering feat remain unaltered (see Canyon Junction Historic map).

The Zion-Mt. Carmel Highway and the Zion Canyon Scenic Drive would be affected by the proposal. A determination of eligibility is complete and was submitted to the SHPO for the Zion Canyon Scenic Drive from the Temple of Sinawava to the Canyon Junction, including a 1.5-mile segment of the Zion-Mt: Carmel Highway to the south boundary of the park near the south entrance checking station. The Zion Canyon Scenic Drive is recommended as eligible. Except for the 1.5-mile segment, the remainder of the Zion-Mt. Carmel Highway road segment is recommended as not eligible (NPS 1995d). The SHPO concurred with the park's determination of eligibility on October 6, 1995.

An intensive surface survey meeting the *Secretary of the Interior's Standards for Archeology and Historic Preservation* was conducted for the Canyon Junction area and identified no archeological resources in the project area.

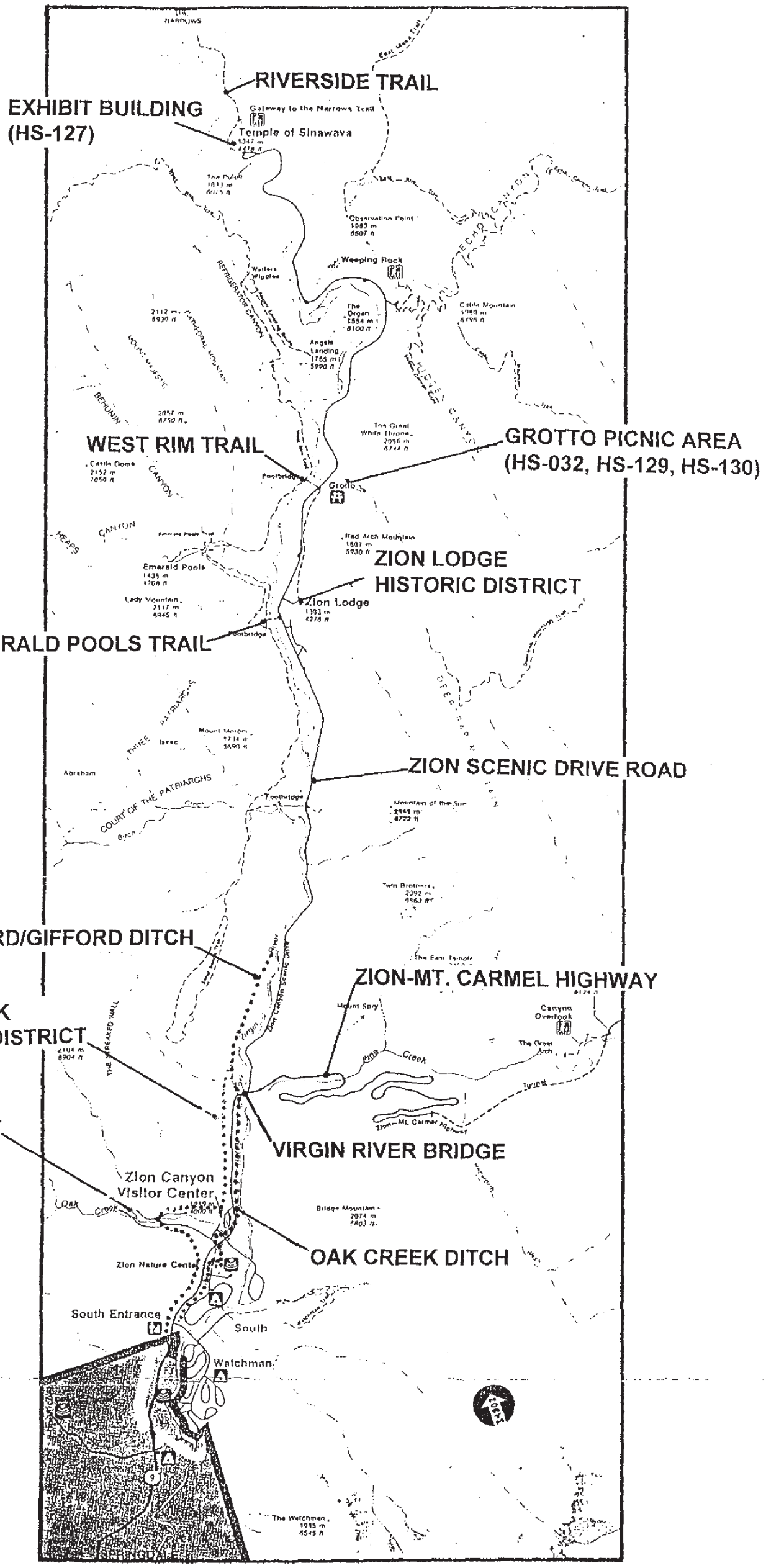
The Virgin River Bridge was built in 1929 to connect the new Zion-Mt.Carmel Highway with the Zion Scenic Drive. The architectural and engineering features of the bridge contribute to the historic significance of the highway. The bridge was nominated to the National Register along with the highway in 1987.

Impacts of the No-Action Alternative — If the transportation system is not developed there would be no effects on the cultural resources in the Canyon Junction area.

Impacts of the Proposal — Under the proposal, redesigning the road would include a center island, information kiosk station, comfort station, shuttle stop, and two new stone masonry retaining walls. Inclusion of these new features on two National Register eligible roads would have an effect. The configuration of the junction will be increased, staying within the footprint of the historical disturbance. By using native materials for construction, following the *Secretary of Interior's Standards for Treatment of Historic Properties*, and designing all features in the area to be compatible with "NPS-Rustic" style architecture, the effects would be categorized as "No Adverse Effect." The new additions to the area will not be historic replicas and will be distinguishable as modern features. Redesign of the road section connecting the two historic roads would suggest more of the original traffic flow pattern.

Watchman Campground.

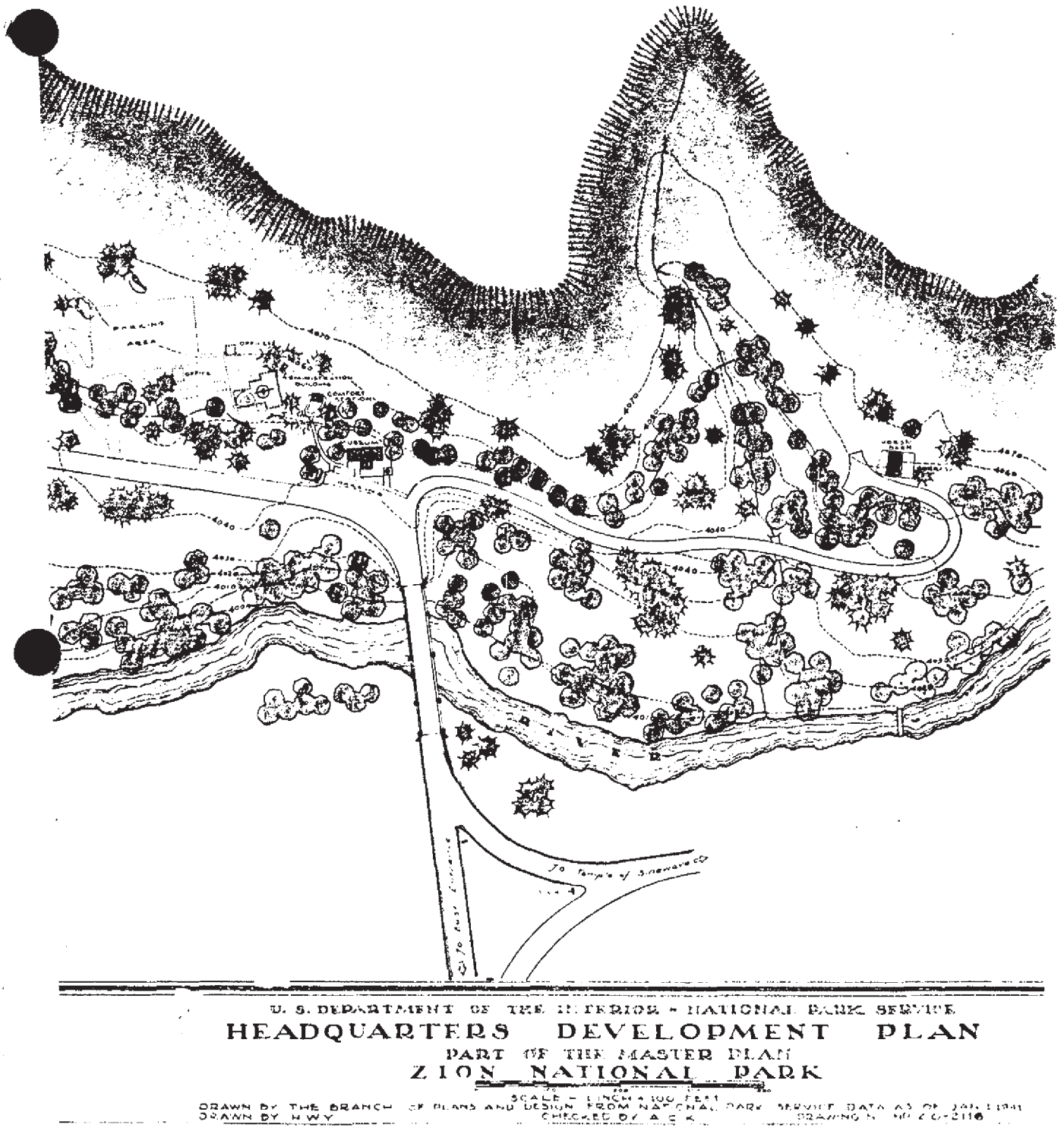
Affected Environment — Intensive archeological survey work (NPS 1986) documented one prehistoric site (42Ws1064) that could be impacted by the project. Methodologically, this survey was restricted to the documentation of prehistoric sites. Several historic sites (42WS3019 and 3020) were documented during a reconnaissance of the project area within the campground (NPS 1995a). A determination of eligibility for these sites is complete. Site 42WS1064 is recommended for listing on the National Register under criterion D (NPS 1995b). Sites eligible under criterion D are those that may yield important information to the knowledge of the prehistory or history in a certain area. Presently unidentified subsurface remains could be impacted by ground-disturbing activities.



HISTORIC STRUCTURES

Zion National Park

United States Department of the Interior
National Park Service



ON MICROFILM

Half-size drawing is from 1941 Headquarters Development Plan, prepared as part of the Master Plan for Zion National Park. It shows the former "Y" alignment at the Canyon Junction intersection of the Zion Canyon Scenic Drive and the Zion-Mt. Carmel Highway.

The construction of the Watchman campground in 1965 removed earlier evidence of pioneer settlement activity by obliterating former farming field patterns, roads, buildings and structures. Little remains except faint evidence of roads, homestead sites, and remnants of fruit orchards and an irrigation ditch; all of which are non-significant (NPS 1984a, 1995c, 1995a). No eligible historic structures were documented during the completion of the list of classified structures report (1984) or the multiple resource nomination for the National Register (1984) in Watchman campground.

Impacts of the No Action Alternative — Under the no-action alternative, the use and design of the campground would remain the same. As visitor use continues to increase, so would potential impacts to archaeological sites. Mitigation measures would continue to consist of public education programs to heighten awareness of cultural resource awareness and preservation programs.

Impacts of the Proposal — Under the proposal, the redesign of loops A and B for parking and expansion, redesign of the remaining loops to enhance camping sites, removal of two non-historic comfort stations, and construction of a new lavatory facility could impact presently unidentified subsurface archaeological remains. Every effort would be made to avoid archaeological site 42Ws1064. If the site cannot be avoided through design, data recovery pursuant to an approved data recovery plan would occur. The appropriate tribes, Utah SHPO, and ACHP would be given an opportunity to review and comment on the data recovery plan. The construction phase in the Watchman campground area would be monitored by a qualified archaeologist.

Park Administrative Office.

Affected Environment — An intensive archeological survey (NPS 1986) documented one historic homestead site (42WS1763) in the vicinity of the proposed bus maintenance facility and helipad. This site is part of the Crawford family homestead that was purchased by the park in the early 1930s. Building foundations and surface artifacts are present. A determination of eligibility and data recovery plan were prepared and recommend the site as significant under criterion D.

Oak Creek historic district is west of the proposed bus maintenance facility and serves as a utility and residential area. Buildings in the Oak Creek historic district represent "NPS-Rustic" architectural design. The buildings present today in the utility area replaced earlier buildings that were demolished in the 1930s to allow for the expansion of improved maintenance and storage facilities. The Oak Creek historic district was listed in the National Register in 1987.

The diversion point for the Gifford irrigation ditch begins one mile north of the canyon junction on the west side of the North Fork of the Virgin River. It runs south to the park administrative offices before turning northwest for 0.5 mile towards the Oak Creek historic district. The canal was built by Mormon settlers to irrigate farm lands in Oak Creek. The ditch was widened in 1933 by the Civilian Conservation Corp (CCC) but is no longer functional. The Gifford ditch was listed on the National Register in 1987.

The head of the Oak Creek ditch begins north of the Virgin River Bridge and runs south to the park administrative offices and runs through a flume on the east side of the Oak Creek Bridge before turning east towards the South campground. The ditch was designed in 1935 to water shade trees in South campground. The Oak Creek ditch was listed on the National Register in 1987.

Pine Creek historic district is approximately one-half mile north of the park administrative offices. The five buildings in this district include three residences and two garages. They are some to the earliest examples of "NPS-Rustic" architecture in the park. Buildings, HS-001, 002, 003, and 007 were built between 1928 and 1932. Building 102 was built in 1938. Other contributing features found within the district include stone retaining walls and a stone pathway that leads to the superintendent's residence. Pine Creek historic district was listed on the National Register in 1987.

The proposal will not affect the cultural integrity of the Oak Creek historic district, Gifford or Oak Creek ditches, or Pine Creek historic district. The proposal will affect the historic homestead site (42WS1763).

Impacts of the No-Action Alternative — Under the no-action alternative, there would be no ground disturbing activity and no historic structures impacted.

Impacts of the Proposal — Under the proposal, construction of the bus maintenance facility and the helipad south of Oak Creek would displace historic period artifacts on the western edge of archeological site, 42Ws1763. Potential unidentified subsurface deposits would be protected through monitoring and implementation of a data recovery plan. Collection of diagnostic artifacts would be done during monitoring and data recovery efforts. If construction and use of a helipad occurs west of the visitor center occurs, monitoring during construction would protect potential unidentified subsurface resources.

The cultural integrity of Oak Creek and Pine Creek historic districts will not be impacted.

The bus maintenance/emergency services facility will be visible from the Zion-Mt. Carmel Highway. Vegetative screening (trees) will be planted near the new facility to screen it from view, and the building will step with the grade to lessen the visual impact.

Shuttle Stops.

Affected Environment — There are eight shuttle stops within the park. The historic resources found along the Zion Canyon Scenic Drive as described above include districts, buildings, roads, and trails. All the proposed shuttle stops will be located in existing parking areas directly adjacent to the road. They are: visitor center, Canyon Junction, Court of the Patriarchs, Zion Lodge, Grotto picnic area, Weeping Rock, Great White Throne parking lot (also known as Big Bend), and Temple of Sinawava. The Temple of Sinawava, Court of the Patriarchs, Weeping Rock, Red Rock (now called Big Bend), and Great White Throne parking areas are all contributing features to the Floor of the Valley Road. The stop at Zion Lodge is within a historic district. The Zion Lodge Historic District includes tourist cabins, the men's and women's dorms, the bake shop, and the mattress shed. A portion of the parking area is also historic. After a fire in 1966, a prefabricated building was placed on the original foundation of the main lodge building. The shuttle stop at the Grotto picnic area will be within close proximity to three historic structures; two comfort stations built by the Civilian Conservation Corps (listed on the National Register, 1987); and the oldest building in the park dating to 1924, known as the Grotto residence. All three buildings are good examples of "NPS-Rustic" style architecture. The Temple of Sinawava trailside exhibit building was designed by NPS in 1936. The building provides hikers with information about the park including the Gateway to the Narrows Trail, which was completed in 1929. The exhibit building is on the National Register of Historic Places. There are no known cultural resources that would be affected by the proposal at Court of the Patriarchs, Weeping Rock, or the Great White Throne parking area.

There are four historic trails listed on the National Register within the proposed project area. They are the Emerald Pools Trail, Grotto Trail, West Rim Trail, and Gateway To The Narrows Trail (now known as the Riverside Trail). The Emerald Pools Trail was constructed in 1932 with native materials and is associated with the "NPS-Rustic"-style architecture. The Grotto Trail was constructed in 1932 providing a short hike between the museum and the lodge. Landscaping and rock work constructed on the trail by NPS personnel was aimed at establishing a rustic appearance. Work on the West Rim Trail began in 1925 and was dedicated in 1926. Built of native stone, rock used in the masonry switchback walls was quarried locally and shaped as little as possible to provide a rough appearance. The Gateway to the Narrows Trail was completed in 1929 and is constructed with native materials associated with the "NPS-Rustic" architectural style. Designed with vertical curves and winding alignments, the trail suggests nature's work rather than man's.

Areas around the designated shuttle stops have been intensively surveyed (NPS 1986) meeting the *Secretary of Interior's Standards for Archaeology and Historic Preservation*. Based on the results of the surveys, no known archeological sites would be affected.

Impacts of the No-Action Alternative — No actions are proposed under the no-action alternative that would affect the cultural resources at the seven shuttle stops.

Impacts of the Proposal — Under the proposal there would be visual impacts to the National Register eligible roads and associated features. Presently unidentified subsurface cultural remains would be impacted by ground disturbing activity during construction of shuttle stops, signs, comfort stations, utility lines, retaining walls, and visitor facilities. Zion Lodge, Grotto picnic area, and Temple of Sinawava shuttle stops would impact several eligible historic structures, and trails by the addition of new architectural and structural features within the historic scene. The existing trail alignment will be used connecting visitor use in the Grotto picnic area and the lodge area. The new comfort station would be placed on the north end of the parking lot north/northwest of the lodge. Because detailed design drawings are not yet available for the shuttle stops, further consultation will occur with the State Historic Preservation Officer under §106 once those drawings are prepared.

Mitigation measures would include monitoring of all ground disturbing activities during construction by a qualified archaeologist. Monitoring is done to identify any subsurface cultural sites so that construction would stop until appropriate evaluation and consultation has been completed. Using native materials in construction following the *Secretary of Interior's Standards for Treatment of Historic Properties*, and designing all features in the area to be compatible with "NPS-Rustic"-style architecture, would create a "No Adverse Effect" on the eligible historic features in Zion Canyon.

TABLE 1 - EFFECTS ON CULTURAL RESOURCES

RESOURCES BY AREA	LCS or ARCH #	LEVEL OF SIGNIFICANCE	ACTION	EFFECT*	MITIGATION AND TREATMENT	REMARKS/FURTHER §106 CONSULTATION
ROADS AND BRIDGES/CANYON JUNCTION						
Zion Canyon Scenic Drive	RT-0996	State	Shuttle stop facilities added	NAE	Follow *Secretary's Standards for Treatment of Historic Properties.*	Designs for all new features will be compatible with existing historic architecture. Additional consultation will occur when design drawings are available.
Zion-Mt. Carmel Highway	RT-1000	State	Shuttle stop facilities added	NAE	Follow *Secretary's Standards for Treatment of Historic Properties.*	Designs for all new features will be compatible with existing historic architecture. Additional consultation will occur when design drawings are available.
	RT-1000	State	Construction of bus maintenance area	NAE	Vegetative screening will be planted, building will step into grade	No further consultation needed
Virgin River Bridge	HS-0997	State	Shuttle stop facilities added	NAE	Follow *Secretary's Standards for Treatment of Historic Properties.*	Designs for all new features will be compatible with existing historic architecture. Additional consultation will occur when design drawings are available.
WATCHMAN CAMPGROUND						
Archeological Site (Prehistoric)	42WS1064	Regional	Ground disturbance	NE	Retain, preserve and avoid	Data recovery plan (DRP) needed if site cannot be avoided. If needed, consultation will occur on DRP.
PARK ADMINISTRATIVE OFFICES						
Archeological Site (Historic)	42WS1763	Local	Ground disturbance/artifact displacement	NAE	Monitoring and collection of diagnostic artifacts. Approved data recovery plan.	No further consultation needed.

RESOURCES BY AREA	LCS or ARCH #	LEVEL OF SIGNIFICANCE	ACTION	EFFECT*	MITIGATION AND TREATMENT	REMARKS/FURTHER §106 CONSULTATION
Oak Creek Historic District		State	Construction of bus maintenance facility	NE	Low level lighting, noise reduction, vegetative screening	No further consultation needed
Pine Creek Historic District		State	Proximity to shuttle traffic	NE		No further consultation needed
Irrigation Ditches: Oak Creek, Gifford	IR-0014, IR-0016	Local	No action	NE		No further consultation needed
SHUTTLE STOPS						
Zion Lodge Historic District		State	Shuttle stop facilities added	NAE	Follow *Secretary's Standards for Treatment of Historic Properties.*	Designs for all new features will be compatible with existing historic architecture. Additional consultation will occur when design drawings are available.
Residence (Grotto)	HS-0032	State	Shuttle stop facilities added	NAE	Follow *Secretary's Standards for Treatment of Historic Properties.*	Designs for all new features will be compatible with existing historic architecture. Additional consultation will occur when design drawings are available.
Comfort Station (Grotto)	HS-0129	State	Shuttle stop facilities added	NAE	Follow *Secretary's Standards for Treatment of Historic Properties.*	Designs for all new features will be compatible with existing historic architecture. Additional consultation will occur when design drawings are available.
Comfort Station (Grotto)	HS-0130	State	Shuttle stop facilities added	NAE	Follow *Secretary's Standards for Treatment of Historic Properties.*	Designs for all new features will be compatible with existing historic architecture. Additional consultation will occur when design drawings are available.

RESOURCES BY AREA	LCS or ARCH #	LEVEL OF SIGNIFICANCE	ACTION	EFFECT*	MITIGATION AND TREATMENT	REMARKS/FURTHER §106 CONSULTATION
Emerald Pools Trail	RT-0001	State	Shuttle may change traffic patterns and use. Impacts may increase or decrease.	NE	Trail use and activity will be monitored through VERP or other process to determine if there are any adverse effects.	If adverse effects are determined, consultation will be conducted with SHPO and ACHP on methods to reduce or minimize effects. Additional consultation will occur when design drawings are available.
Grotto Trail	RT-0002	State	Shuttle may change traffic patterns and use. Impacts may increase or decrease.	NE	Trail use and activity will be monitored through VERP or other process to determine if there are any adverse effects.	If adverse effects are determined, consultation will be conducted with SHPO and ACHP on methods to reduce or minimize effects. Additional consultation will occur when design drawings are available.
West Rim Trail	RT-0003	State	Shuttle may change traffic patterns and use. Impacts may increase or decrease.	NE	Trail use and activity will be monitored through VERP or other process to determine if there are any adverse effects.	If adverse effects are determined, consultation will be conducted with SHPO and ACHP on methods to reduce or minimize effects. Additional consultation will occur when design drawings are available.
Gateway to the Narrows Trail	RT-0005	State	Shuttle may change traffic patterns and use. Impacts may increase or decrease.	NE	Trail use and activity will be monitored through VERP or other process to determine if there are any adverse effects.	If adverse effects are determined, consultation will be conducted with SHPO and ACHP on methods to reduce or minimize effects. Additional consultation will occur when design drawings are available.
Temple of Sinawava Trailside Exhibit Building	HS-0127	State	Shuttle may change traffic patterns and use. Impacts may increase or decrease.	NE	Trail use and activity will be monitored through VERP or other process to determine if there are any adverse effects.	If adverse effects are determined, consultation will be conducted with SHPO and ACHP on methods to reduce or minimize effects. Additional consultation will occur when design drawings are available.

* NE = No Effect; NAE = No Adverse Effect, AE = Adverse Effect

SOCIOECONOMIC RESOURCES

Affected Environment

The population of Washington County continues to increase. Historically, the economy centered around small-scale farming, ranching, logging, and mining, the remnants of which are still visible today. However, improved access, specifically along Interstates 15 and 70 has encouraged vacationers — originating from once-remote metropolitan centers such as Los Angeles, Las Vegas, Salt Lake City, Denver, and Phoenix — to visit the area, and tourism has recently become a major factor in the regional economy. Indicative of the changing economy is the fact that St. George and Cedar City, the region's major urban centers, have both recorded economic upswings — in part, the result of the enterprises that have evolved to serve the needs of visitors. The dominant industries today are trade, services, government, manufacturing, and construction.

The region abounds in natural, cultural, and recreational attractions such as Bryce Canyon and Grand Canyon national parks, Glen Canyon National Recreation Area, Cedar Breaks and Pipe Spring national monuments, the Kaibab and Dixie national forests, and the Dixie and Kanab resource areas. The proximity of the Paiute and Navajo Indian reservations adds to the diversity of the visitor attractions in the area.

Zion National Park is bordered by public and private lands. Isolated parcels of state-owned lands are adjacent to the park. The watersheds and high plateaus are nearly all private, and ranchers are subdividing their land as more summer property owners are coming to the area. A number of private, state, and federal tent and RV campgrounds can be found in the region totalling approximately 1,700 campsites.

The town of Springdale, Utah, is just outside the south entrance to the park. The town is home to about 350 residents, many of whom own businesses that serve park visitors. The town encompasses 449 acres of land and is bordered by the national park boundary on the north, east, and west sides. Two hundred of the 449 acres are available for future development. Major land uses are agricultural, residential, and commercial. The commercial district includes fifteen motels and numerous restaurants and retail shops oriented to serving national park visitors. A 458-seat, large-screen theater, with 134 parking spaces, and an 8,500 square-foot retail center is directly across the Virgin River from the Watchman campground amphitheater. An expansion of or construction of new utilities is planned in the near future. The main road through town is narrow, two-lane, and is congested with vehicles during the peak visitor season. A convention center is under construction that includes gift shop, restaurant, motel rooms, and a residential area. Other large development projects in the planning stages include a resort complex and multiple subdivisions.

Impacts of the No-Action Alternative

If Zion National Park continues operating under current conditions, impacts to the surrounding communities would continue to grow. The town of Springdale would be impacted the most. Proposed expansion of the town's infrastructure should cover all currently planned expansion. Although retailers, hoteliers, and restaurateurs welcome visitors, their facilities simply cannot accommodate the large numbers of people coming to the park. Just as it is inside the park, area for expansion is limited in Springdale. Not only does the amount of visitation tax the town's infrastructure, it also taxes the townspeople and their community atmosphere.

Impacts of the Proposal

According to the results of the 1993 Zion transportation study, some park visitors would not ride the mandatory shuttle. These visitors could spend time in other parts of the park, could shorten their stay in the park and spend additional time and money in surrounding communities, or they could shorten their trip at the park and leave for other recreation areas in the region.

Under the proposal, the amount of camping in the park would be reduced, which would create additional demand on the private sector to provide this service.

New construction of the transit/visitor contact center, emergency services building, maintenance facilities, housing, and employee facilities would have a positive impact on the local economy during the construction period.

Implementation of a shuttle system based near the Watchman Campground, with a secondary staging area in the town of Springdale should have a positive impact on the local economy. Visitors would be encouraged to park in Springdale (if lodging in town, they could leave their cars at their place of lodging), giving merchants near shuttle stops and the transit/visitor contact center an opportunity to attract their business. However, for the length of time that visitors are on the transportation system, their vehicles occupy spaces that could be used by other potential customers. Parking would continue to be limited in town, adding to congestion as people drive around looking for spaces.

The transportation system will create new job opportunities and may also increase the need for additional housing construction.

Public restrooms will now be available at the transit/visitor contact center area and perhaps at another spot in town. This will reduce use of business restrooms, freeing those facilities for customers.

Local residents will continue to experience congestion in Springdale in peak visitor season. Traffic is expected to increase in town regardless of the proposal, but the addition of buses for the town loop of the transportation system may increase the adverse effects. Congestion causes visitors to park in front of homes, occupying owner and guest spaces. Pedestrians experience difficulty in crossing streets. Streets are fairly narrow, and adding buses to the mix will increase hazards for vehicles, pedestrians, and bicyclists. Residents will have more difficulty exiting driveways because of increased traffic. Sight distance problems will be worsened by the increase in view-obscuring buses. On the other hand, visitors who leave their cars at their place of lodging in town or other shuttle designated parking will not be adding their personal cars to the traffic flow.

Implementation of a mandatory shuttle system could provide an economic opportunity for the concessioner or private contractor. TWRS may have a contractual right of first refusal for new and additional services within the park areas including any type of transportation service that originates inside the park. Therefore, under this alternative, a determination might need to be made first as to whether or not TWRS wishes to exercise its option. TWRS would not have first right of refusal for transportation services originating outside the park. The specifics of what facilities and operational costs the concessioner would be responsible for would be negotiated, if the operation is determined to be economically feasible. Therefore, it is not known what the concessioner's investment would be. An economic feasibility study is currently underway to assess all economic impacts to the present concessioners.

Should TWRS decide not to operate the shuttle system, the National Park Service could issue a prospectus or other type of contract to attract other potential operators from the private sector. Under the proposal, the existing TWRS shuttle rides would be discontinued. The operator may be responsible for providing housing for the transportation system employees, if sufficient housing is not available in local communities or if the existing local labor pool is inadequate.

Park employees at the Oak Creek residential area may be affected by the activities at the bus maintenance area. This could include noise, smells, and night light.

VISITOR USE

Affected Environment

Annual visitation continues to rise. In 1994, 2,292, 771 people visited Zion National Park. Zion Canyon visitor center has 5,000 or more visitors per day during most of the busy season.

The park experiences a visitation season that begins in March and lasts through October. The increase in March occurs during school spring breaks. Easter vacation brings even larger numbers of visitors, filling both campgrounds. Spring weekends are usually quite busy. Heavy visitation in June, July, and August reflect school vacations across the country and throughout the world. Visitation begins to drop in mid-November depending on weather conditions. Holidays bring additional visitation. An increase in weekend visitation is particularly noticeable during the pleasant spring and fall months, as people from the Las Vegas and Salt Lake City areas make weekend escapes.

Of those visitors responding to a survey in one week of July 1992, 21 percent were international visitors. Of the U.S. citizens visiting the park, 24 percent were from California, 13 percent from Utah, with Nevada and Arizona at 7 percent and 5 percent, respectively. Over 65 percent of visitors are families, with the next largest segment of visitors being couples.

Seventy-three percent of visitors are day-use only and twenty-seven percent are overnight users. Sixty-five percent enter the park at the South Entrance. Over 90 percent of visitor use is concentrated along 25 miles of road, which includes the East Entrance road, the Kolob Canyons road, and the 6.5-mile Zion Canyon Scenic Drive.

The Zion Canyon visitor center is open every day of the year. According to the 1992 Visitor Services Project Study, sixty-four percent of all park visitors enter the visitor center and spend approximately 24 minutes viewing exhibits and receiving information. Interpretive programs, such as guided walks and evening programs, are offered from mid-March to early November.

Impacts of the No-Action Alternative

Under this alternative, impacts to visitors would include continued and increasing crowding at visitor facilities, along trails, and at parking areas. Depending on their expectations and personal recreational values, this may or may not impact the visitors' experience. Some visitors could curtail their trip because of crowded conditions, others might not be disturbed at all.

Impacts of the Proposal

A mandatory shuttle system could deter some people from spending time in the canyon. An adjustment period is expected until visitors become well informed and aware that they must ride

the shuttle to enter Zion Canyon. It is not known what effect the shuttle system would have on the visitor experience while in the canyon. Park managers believe that a shuttle system would improve the visitor experience (reduce crowding, improve opportunities for interpretation), however, experiences depend on visitor expectations and values and some may find the less crowded condition more appealing, while others are not bothered by or even prefer to have, a lot of people around.

The shuttle experience is still fairly unique in NPS areas, providing a different kind of experience for visitors. The transportation system will provide an excellent opportunity to educate visitors about the canyon resources and services available. All shuttle riders will be able to share this experience, which was not the case for at least the driver of personal vehicles. Safety will be improved because visitors will no longer stop at random along the roadside and drivers will not have their attention diverted by scenery or wildlife. With reduced levels of traffic on the Zion Canyon Scenic Drive, the cyclist or pedestrian would be able to leisurely and more safely ride to trailheads and viewpoints. Visitors will also have the ability to stop at each shuttle area, which was often not the case when parking spaces were overcrowded.

At the present time, 40 percent of park visitors elect to view the canyon. Because a round trip shuttle ride may take up to 1½ hours, these visitors may need to make choices about whether to increase their length of stay or forego the canyon experience.

Visitors will have a more structured experience in the canyon, which will not allow for random stops to sight-see, view wildlife, or take photographs. On the other hand, hikers and bicyclists will be able to take full advantage of the less crowded conditions at those areas not designated as shuttle stops. Periods of crowding at shuttle stops will still occur. Persons with mobility impairments will be limited to the more structured experience provided by the transportation system.

Depending on how charges to ride the transportation system are levied, large families may need to pay increased sums to ride the system. This may discourage their ridership, precluding their opportunity to experience the canyon. Increased fees may also affect local day users in the same fashion. Requiring riders to leave their vehicles may inconvenience those with substantial amounts of belongings and equipment, because of the difficulties of transferring from the car to the transit vehicle and storing this equipment while hiking. This also applies to visitors with mobility impairments, for whom transfers may be difficult and time-consuming. The transfer of equipment and persons with disabilities may increase the delay times between buses. This could be exacerbated by the use of two loops, requiring persons leaving their cars in Springdale to transfer twice, once from their cars to the Springdale loop, and then at the transit/visitor contact center to the park loop.

Construction of public restrooms at Zion Lodge will decrease wait times and inconvenience to visitors and will also free lodge facilities for guest use.

Visitors with pets may be inconvenienced, because the shuttle system round trip time may be too long to leave their pets in vehicles. However, this may also provide a business opportunity for kennel service in town.

Relocating the visitor center to the transit staging area would provide the visitor with a number of information, interpretive, and comfort facilities at one location. This would reduce the number of times the visitor must get on and off the shuttle to look for information.

Implementation of a shuttle system based in the Watchman campground and redesign of the campgrounds would reduce the total number of campsites, and potential campers would have to find camping outside the park. On the other hand, redesign of the campgrounds will reduce crowding and improve site conditions.

The primary entry for vehicles and buses to the transit/visitor contact center and the Cinemax Theater crosses the major pedestrian walkway connecting the two entities. Pedestrians and drivers must be cautious at this point to avoid accidents involving cars and people.

The close proximity of campsites to the transit/visitor contact center parking lot may affect campers by increasing noise, smells, and the opportunity for vandalism. Security lights at the parking area could disturb some campers. The provision of several parking lots may increase opportunities for theft and vandalism, which could be reduced by more frequent security patrols. Those patrols may require the addition of more security staff or divert existing staff from other duties.

CUMULATIVE EFFECTS

No cumulative effects were identified.

CONSULTATION/COORDINATION

The following agencies and organizations were contacted during preparation of this environmental assessment:

Advisory Council on Historic Preservation
Springdale City Council
Springdale Planning Commission
U.S. Fish and Wildlife Service
Utah State Historic Preservation Office

PREPARERS/REFERENCES

PREPARERS

Jack Burns, Cultural Resources Specialist, Zion National Park (NP)
Sheri Fedorchak, Natural Resources Specialist, Zion NP
Susan Garland, Legislative Staff Specialist, Intermountain Field Director's Office
Dave Karaszewski, Facility Manager, Zion NP
Judi Rozelle, Concessions Management Specialist, Zion NP
Chris Turk, Environmental Quality Program Coordinator, Colorado Plateau Systems Support Office

REFERENCES

JOHANSON, M.
1994 "Plant and Soil Cd, Mn, Pb, and Zn Concentrations as Function of Distance from a Roadway in Zion National Park, Utah." M.S. Thesis, Brigham Young University, Provo, Utah.

NATIONAL PARK SERVICE, U.S. DEPARTMENT OF INTERIOR
1995a "Archeological Evaluation and Data Recovery Plan for Historic Site, 42Ws1763 at the Proposed Bus Maintenance Facility, Zion National Park Transportation System" by Laird Naylor, III, and Matthew J. Betenson. Zion National Park, Utah.

1995b "Archeological Evaluation of the Proposed Discovery Center, the Bus Maintenance Facility, and the Watchman Campground Reconfiguration Area for Zion National Park Transportation System. Rocky Mountain Region Archeological Report" by Laird P. Naylor, III. Zion National Park, Utah.

1995c "Cultural Landscapes Evaluation for Properties to be Affected by the Zion Transportation System, Package #226 (Memorandum)" by Steve Burns. Denver Service Center, Denver, Colorado.

1995d "Determination of Eligibility for the National Register of Historic Places for Zion Canyon Scenic Drive and Zion-Mt. Carmel Highway - Zion National Park" by Robert J. Sontag. Intermountain System Support Office, Denver, Colorado.

1995e "Draft Comprehensive Interpretation Plan." In progress, Harpers Ferry Center, Harpers Ferry, West Virginia.

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1994a "Cultural Sites Inventory for Zion National Park." Midwest Archeological Center, Lincoln, Nebraska

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1994c "Historic American Engineering Record - Zion National Park Roads and Bridges" by Michael F. Anderson and Todd A. Croteau. Washington Office, Washington, D.C.

1994d "National Park Service Investigator's Annual Report" by Frank Williams. Zion National Park, Springdale, Utah.

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1986 "Archeological Investigations at Zion National Park" by Melissa Connor and Susan Vetter. Midwest Archeological Center, Lincoln, Nebraska.

1984a "List of Classified Structures Field Inventory Report" by James Jurale and Nancy Witherell. Rocky Mountain Region, Denver, Colorado.

1984b "National Register of Historic Places Inventory-Nomination Form for Multiple Resources for Zion National Park" by James Jurale and Nancy Witherell. Rocky Mountain Region, Denver, Colorado.

1983 *Zion Canyon Development Concept Plan.* Denver Service Center, Denver, Colorado.

1982 "National Register of Historic Places Inventory-Nomination Form for Multiple Resources for Zion Lodge Historic District" by Mary Shivers Culpin. Rocky Mountain Region, Denver, Colorado.

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1993 *Environmental Assessment for Hildale City Natural Gas and Powerline Project.* Filmore, Utah.

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1994 "Preliminary Sensitive Plant Surveys of the Proposed Areas of Modifications, Zion National Park, Shuttle System and Appurtenances." Zion National Park, Springdale, Utah.

APPENDIX A: PUBLIC INVOLVEMENT

The public has been extensively involved in planning efforts about a transportation system since 1980. The 1993 draft development concept plan/environmental assessment was made available for public review and comment during a 60-day period from October 24, 1993, to December 24, 1993. Public workshops were held on November 29, December 6, 15, and 16, 1993 to give the public an opportunity to comment on the plan. A total of 140 comments were received from the public and government organizations during the comment period. All but nine favored the concept of a shuttle bus system in Zion Canyon during the peak visitor use season.

This environmental assessment will be made available to the public for a 30-day review period.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
LINCOLN PLAZA
145 EAST 1300 SOUTH, SUITE 404
SALT LAKE CITY, UTAH 84115

In Reply Refer To
(ES)

May 5, 1995

MEMORANDUM

TO: Superintendent, Zion National Park, Springdale, Utah

FROM: Assistant Field Supervisor, Utah Field Office, U.S. Fish and Wildlife Service, Salt Lake City, Utah

SUBJECT: Updated species list

Attached is an updated list of threatened, endangered, proposed, and candidate species which could occur within Zion National Park, in response to your request received April 24, 1995. Candidate species are taken from Notices of Review published in the Federal Register November 15, 1994 (animals) and September 30, 1993 (plants).

If you have questions on any species, please contact Susan Linner, Fish and Wildlife Biologist, at (801) 524-5001.

Attachment

List of Threatened, Endangered, and Candidate Species
for Zion National Park
May, 1995

Listed

Southwestern willow flycatcher	Empidonax traillii extimus	E
American peregrine falcon	Falco peregrinus anatum	E
Bald eagle	Haliaeetus leucocephalus	E
Mexican spotted owl	Strix occidentalis lucida	T
Virgin spinedace	Lepidomeda mollispinis mollispinis	PT
Desert Tortoise	Gopherus agassizii	T

Candidate

Animals

Arizona southwestern toad	Bufo microscaphus microscaphus	2
Northern goshawk	Accipiter gentilis	2
Ferruginous hawk	Buteo regalis	2
Desert sucker	Catostomus clarki	2
Flannelmouth sucker	Catostomus latipinnis	2
Virgin Merriam's kangaroo rat	Dipodomys merriami frenatus	2
Spotted bat	Euderma maculatum	2
Allen's (Mexican) big-eared bat	Idionycteris (=Plecotus) phyllotis	2
Virgin River montane vole	Microtus montanus rivularis	2
Small-footed myotis (bat)	Myotis ciliolabrum	2
Long-eared myotis (bat)	Myotis evotis	2
Fringed myotis (bat)	Myotis thysanodes	2
Long-legged myotis (bat)	Myotis volans	2
Yuma myotis (bat)	Myotis yumanensis	2
Big free-tailed bat	Nyctinomops macrotis	2
Pale Townsend's (Western) big-eared bat	Plecotus townsendii pallescens	2
Wet-rock physa (Zion Canyon snail)	Physella zionis	2
Chuckwalla	Sauromalus obesus obesus	2

Plants

Zion Canyon carex	Carex haysii	2
Virgin River thistle	Cirsium virginensis	2
Nevada willow-herb	Epilobium nevadense	2
Canaan daisy	Erigeron canaani	2
Zion daisy	Erigeron sionis	2
Cedar Breaks goldenbush	Haplopappus zionis	2
Canyon goldenbush	Haplopappus leverichii	*
Cliff jamesia	Jamesia americana v. zionis	2

Plants (continued)

Paria scurf-pea	Pediomelum pariensis	2
Sand-loving beardtongue	Penstemon ammophilus	2
Zion tansy	Sphaeromeria ruthiae	2
Clausen's violet	Viola clauseniana	*

*Will be in the new Plant Notice of Review, to be published in 1995

APPENDIX C: DRAFT FLOODPLAIN STATEMENT OF FINDINGS

INTRODUCTION

Description of the Site

The Canyon Transportation System Environmental Assessment/Assessment of Effect (EA/AEF) for Zion National Park describes and analyzes the impacts of the no-action alternative and a new proposal on the human environment. The proposal was derived from the Development Concept Plan (DCP) EA for Zion Headquarters, which preceded this document (August 1993). Although a statement of findings was approved for the DCP EA in April 1994, several modifications were made to the proposal since then, requiring the preparation of a new statement of findings to address effects of the proposal on floodplains.

The affected area encompasses lands from the proposed location of the transit/visitor contact center (adjacent to the south entrance on private land) to the terminus of the paved road in Zion Canyon at the Temple of Sinawava. This includes the private land adjacent to south entrance, the South and Watchman campgrounds, the visitor center/administration building district, the Zion Lodge historic district, and the road corridor between the south entrance and the Temple of Sinawava.

Description of the Proposed Action

This statement of findings addresses the National Park Service proposal in the preceding EA/AEF to develop a transportation system to eliminate vehicular congestion in Zion Canyon. The transportation system will improve the overall visitor experience by removing congestion associated with limited parking spaces, and it will promote protection of natural and cultural resources by removing off-road parking and reducing vehicular emissions.

The following proposed developments must be evaluated:

- Transit/visitor contact center on private land
- Parking lot in Watchman campground
- Two bridges between the transit/visitor contact center and Watchman campground
- Maintenance facility, parking lot, and constructed wetland for operation of shuttle buses
- Eight shuttle stops
- Restroom facility within Zion Lodge historic district

Floodplain boundaries were mapped for the North Fork Virgin River in ZION from the south boundary up to the Canyon Junction bridge by the NPS Water Resources Division in 1991. These maps show the limits of the 100-, 500-, and probable maximum floodplains. The National Park Service Floodplain Management Guideline (1993) specifies that in flash flood hazard areas such as Zion National Park, the regulatory floodplain is the maximum floodplain. There are several accepted methods for estimating the maximum floodplain including the probable maximum floodplain technique used in the development of floodplain maps in lower Zion Canyon.

The proposal will place a transit/visitor contact center in the 100-year floodplain and an associated parking lot and two new bridges for vehicular and pedestrian use in the probable maximum floodplain. (In flash flood hazard areas such as Zion National Park, the probable maximum floodplain is included in the regulatory floodplain. Thus, developments in the flash flood hazard area are evaluated in the statement of findings, along with those in the 100- and 500-year floodplains.) The Watchman Campground parking lot is on the other side of the river

and is protected by levees up to about the 500-year flow. The maintenance building for the shuttle busses, the constructed wetland, and the shuttle bus parking lot are on the margin of the 500-year floodplain and nearly entirely within the maximum floodplain of Oak Creek.

The eight shuttle stops will be built alongside the existing roadway and are considered to be excepted actions under NPS procedures for implementing E.O. 11988 because they are minor structures associated with the use of the road and do not involve overnight occupation. The new restroom facility wihin the Zion Lodge historic district will be built adjacent to existing structures at the lodge. Floodplain maps for the Zion Lodge area are not available. However, the restroon facility is not considered to be subject to the NPS procedures because it represents a small incremental addition to the lodge facilities and will not place additional visitors in flood risk.

Flooding Characteristics in the Area

The North Fork of the Virgin River is the main drainage through Zion Canyon. The river experiences wide fluctuations in flow with a seasonal snowmelt peak in the spring, followed by generally low summer and fall flows. Occasional heavy storms, which can occur at any time of the year but are most common in summer and early fall, produce the largest flows in the Virgin River system. These runoff events are usually of short duration and can occur suddenly. Floods in desert regions such as Zion are often accompanied by large quantities of debris and sediment, increasing the impact of floods. One reservoir is two and one-half miles upstream of the park on a tributary of the Virgin River. The Kolob Reservoir releases into Kolob Creek, which runs southeast into the North Fork of the Virgin River.

Through much of lower Zion Canyon, the 100- and 500-year floodplains closely follow the banks of the river. The probable maximum flood area flows out into open areas, the housing areas, campgrounds, and much of the valley floor.

To protect lives and structures along Zion Canyon, a system of earthen levees was constructed along the river banks between the 1920s and 1960s. The levees have altered the historic floodplains of the lower canyon by containing flows up to approximately the 500-year flood. Removal or failure of this levee would result in flood waters encroaching into the campgrounds.

The park has an emergency action plan for response to emergencies such as the possible failure of the Kolob Reservoir. The plan details procedures for notification and evacuation of such an emergency. The flash flood warning and evacuation plan in place at the park consists of daily contact between Zion Dispatch and the National Weather Service during the summer to receive weather forecasts and storm potential conditions. Also observation of drainage conditions by park rangers are collected.

Currently, in the event of a substantial flash flood in Zion Canyon, visitors are warned in advance by park rangers to evacuate the riverbanks and the campsites near the shore. The current, standard operating procedure is to close the upper canyon road to visitor traffic during flash floods, while posting park rangers as scouts along the river to personally warn visitors and employees of impending danger.

JUSTIFICATION FOR USE OF THE FLOODPLAIN

Why the Proposal Would Build in the Floodplain

The transit/visitor contact center, parking lots, two bridges, and maintenance building (with a parking lot and constructed wetland) will be built in the floodplain because of lack of other, suitable sites on the narrow, canyon bottom. The existing system of earthen levees will help protect human lives and structures from death or harm.

Because of the natural configuration of Zion Canyon, it is very difficult to place developments without having a portion or all of them lie within the regulatory floodplain. The floodplain is closely bordered on both sides of the river by canyon walls that slope upward at a sharp angle. Therefore, the little canyon bottom that is level enough for development is also largely within the regulatory floodplain. None of the new structures proposed for development will be used for overnight facilities, and the park's flash flood warning and evacuation plan will be updated to include warning and evacuation procedures for the new facilities.

Alternatives Considered in the Environmental Assessment

Under the no-action alternative, the transportation system and associated infrastructure would not be developed, and congestion in Zion Canyon would continue. Environmental impacts related to soil compaction, denudation of vegetation, and pollution from vehicular emissions would continue. The earthen levees would be maintained where previously constructed.

The draft development concept plan EA (August 1993) contains 4 alternatives that led to the development of the proposal in this EA for implementation of a shuttle system.

DESCRIPTION OF SITE-SPECIFIC FLOOD RISK AND ACTIONS TO MINIMIZE HARM TO FLOODPLAIN VALUES AND TO MINIMIZE RISK TO LIFE OR PROPERTY

Floodplains would not be adversely affected by the proposal. However, new development would be placed in the flash flood hazard, 100- and 500-year floodplains. The proposed transit/visitor contact center will be within the 100-year floodplain, and the parking lot will be within the flash flood hazard area. Both are protected by earthen levees up to about a 500-year flow. An engineering study will be conducted to determine the structural integrity of the existing earthen levee in this area and the levee will be periodically monitored to ensure its effectiveness.

Mitigating measures can reduce the risk to the human environment for construction of the new transportation facilities construction. The existing earthen levees will be maintained. Providing flood protection to the transit/visitor contact center is problematic because structural protection using a levee would result in placing more hazard in the campground area on the other side of the river. Therefore, flood protection to the transit/visitor contact center will be enhanced by a combination of warning capability by park and other, local emergency services personnel and structural considerations of the building itself.

The most effective way to provide flood protection to the maintenance facility for the shuttle busses will be the location of the building as high up the slope above Oak Creek as possible. Some portion of the lower (north portion) is likely to be in the floodplain but would be in margin and not susceptible to the most hazardous hydraulics. Any storage of hazardous materials would be placed on the higher side of the facility (south side) if at all possible to minimize risk to this activity.

The Oak Creek bridge that presently provides access to the administration building employee parking lot would likely not withstand an extremely large flood. This could be important if this bridge were needed to mobilize emergency equipment in this area. The bridge over Oak Creek along the Zion-Mt. Carmel Highway could be expected to withstand even very large floods.

The shuttle stops are along existing roadway where immediate evacuation is possible. The restroom at the lodge will be built next to adjacent structures and roadways where evacuation is possible.

The natural and beneficial floodplain values include water resource values (natural moderation of floodwaters, water quality maintenance, and groundwater recharge), living resource values (fish, wildlife, and plant resources), and cultural resource values (natural beauty, scientific study, outdoor education, and recreation). Construction of the transit/visitor contact center, parking lot, bridges, maintenance facility, shuttle stops and restroom will cover a total of approximately 12 acres and could affect groundwater recharge. Paved surfaces prevent water absorption and increase runoff. However, the overall impact of this is expected to be minimal and mitigation includes using islands of trees within parking lots to increase absorption of groundwater and the use of a grease trap and constructed wetland at the shuttle bus maintenance facility to remove and break down hydrocarbons before they enter the watershed. No other impacts are anticipated to the natural or beneficial floodplain values.

There are no anticipated secondary effects to floodplains and there is no anticipated increase in flood loss potential to existing developments from the proposal.

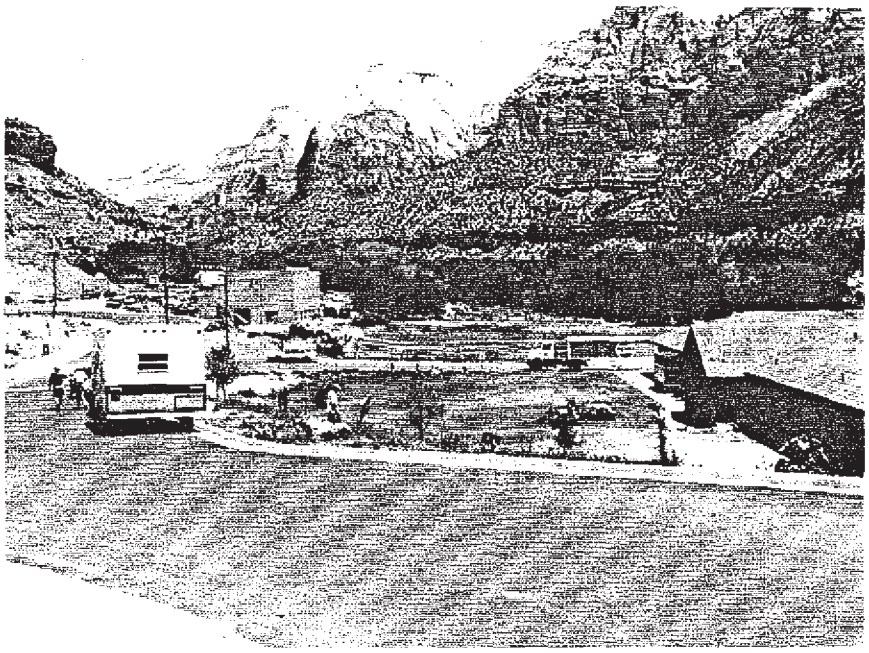
SUMMARY

Based on the proposed actions and mitigating measures described above and in more detail in the draft EA/AEF, the National Park Service has determined that the preferred plan is the most practicable compared to the other alternatives considered. This decision was based on the need to reduce congestion in Zion Canyon by providing a transportation system. The risk to human safety will be minimized by the flood warning systems, by the maintenance of the earthen levees, and by the placement of building of the transit/visitor contact center and maintenance facility on the far edge of the flash flood hazard area where flood risk is minimal.

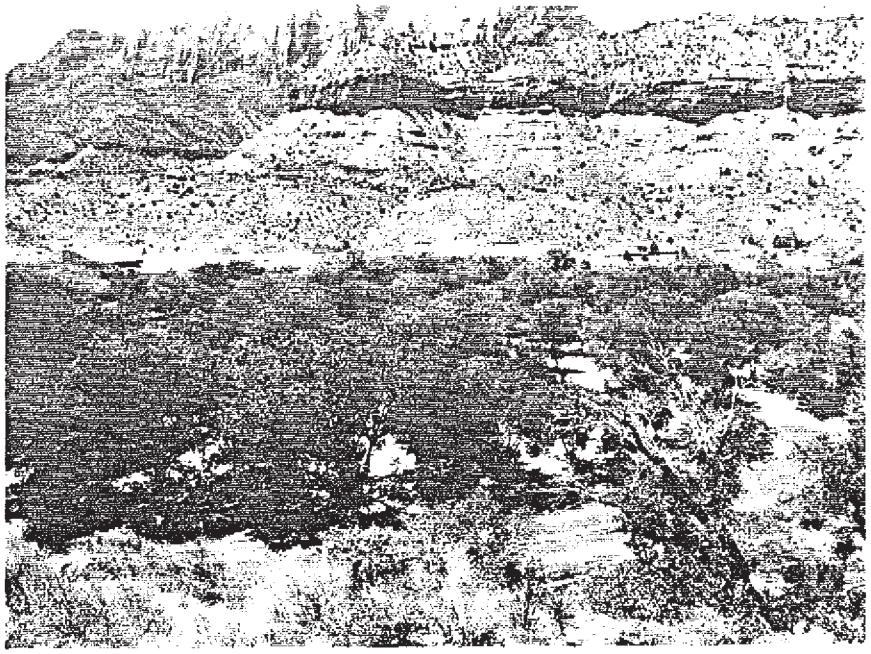
Recommended: _____ _____
Superintendent Date

Recommended: _____ _____
Water Resources Division Date

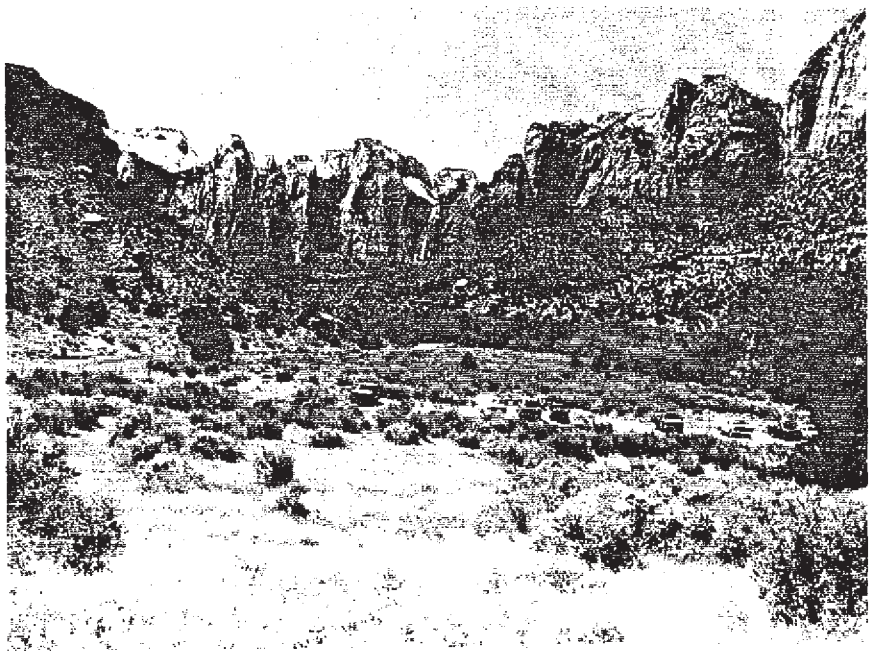
Approved: _____ _____
Field Director Date



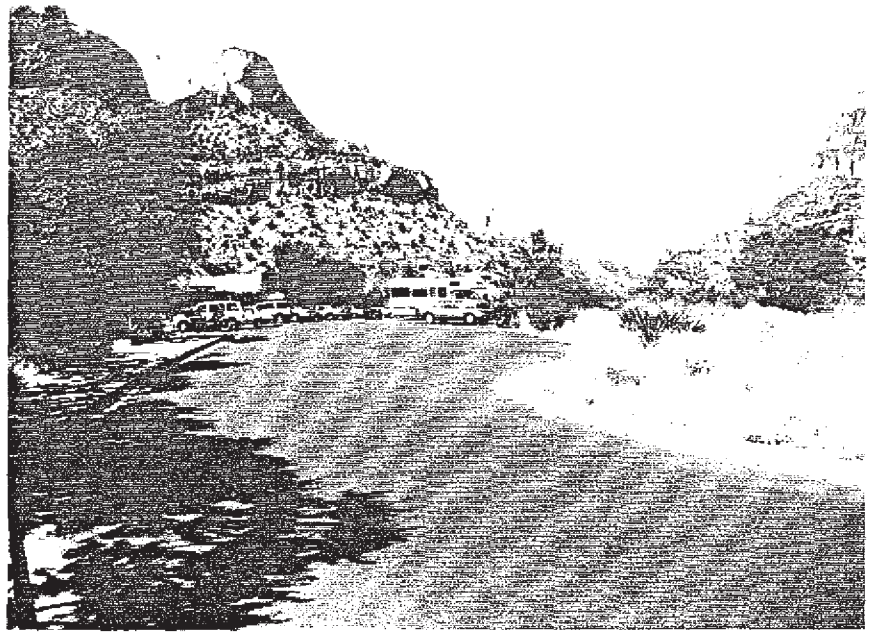
The proposed transit/visitor contact center will be located in approximately the center of this photograph. The fence (center-running left to right) marks the NPS boundary. The photo is taken from the southern end (looking north) of the Zion Canyon Theater complex.



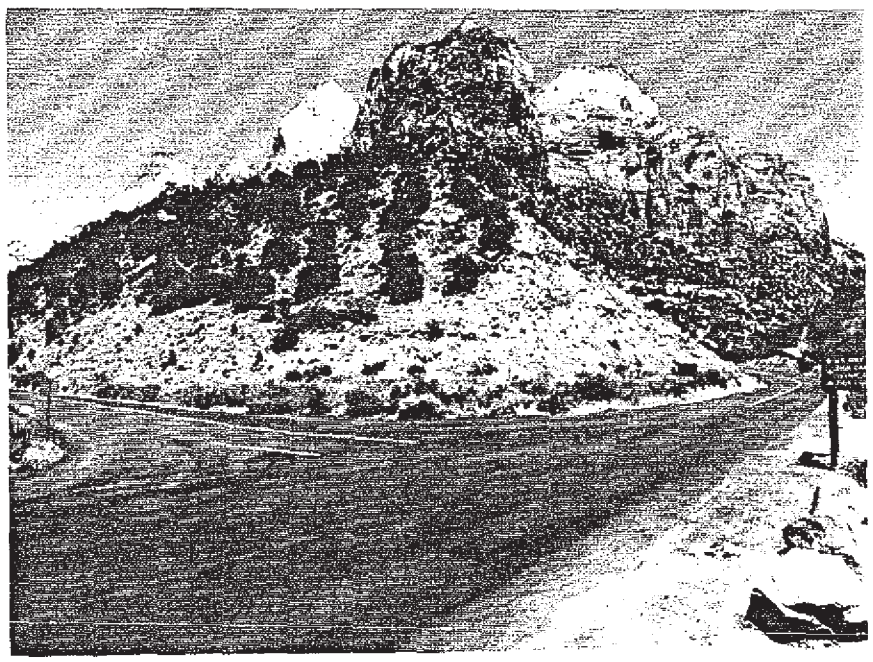
Aerial view of loops A and B in Watchman campground to be redesigned to accommodate a visitor parking area for the shuttle system. The roof of the Zion Canyon Theater is in view in the upper left corner of the photo. View is looking west.



View is taken from 42WS1763 looking west towards the proposed location of the bus maintenance area. The facility will be placed west of the parking area and north (right) of the road shown on the left side of the photo. Oak Creek historic district is in the cluster of trees west of the area of potential effect.



Overview of upper parking lot, east of the existing visitor center, where a proposed shuttle stop is to be located. View is looking north.



Canyon Junction: The Zion-Mt. Carmel Highway runs diagonally in the photo. The Zion Scenic Drive is shown to the left of the highway alignment. View is seen from the east abutment of the Virgin River Bridge.

COVER PAGE
Must Accompany All Project Reports
Submitted to Utah SHPO

Project Name: Archeological Evaluation of Discovery Center and Watchman Campground State Proj. No.: U-95-NA-341n,p

Report Date: July 20, 1995

Principal Investigator: Adrienne Anderson

Field Supervisor(s): Laird P. Naylor II

Acreage Surveyed
Intensive: 15 acres Recon/Intuitive: 80 acres

7.5' Series USGS Map Reference(s): Springdale East

Sites Reported	Count	Smithsonian Site Numbers
Archaeological Sites		
Revisits (no inventory form update)	1	No number-Nat Reg listed Oak Creek Ditch
Revisits (updated IMACS site inventory form attached)	1	42Ws1064
New recordings (IMACS site inventory form attached)	3	42Ws3019, 42Ws3020, 42Ws3021
Total Count of Archaeological Sites	5	
Historic Structures (USHS 106 site info form attached)	0	
Total National Register Eligible Sites	2	

Checklist of Required Items

1. x 1 Copy of the Final Report,

2. x Copy of 7.5' Series USGS Map With Surveyed/Excavated Area Clearly Identified.

3. Completed IMACS Site Inventory Forms, Including
   - x Parts A and B or C,
   - x the IMACS Encoding Form,
   - x Site Sketch Map,
   - x Photographs, and
   - x Copy of the Appropriate 7.5' Series USGS Map w/ the Site Location Clearly Marked and Labelled w/ the Smithsonian Site Number

4. x Completed "Cover Sheet" Accompanying Final Report and Survey Materials

COVER PAGE
Must Accompany All Project Reports
Submitted to Utah SHPO

Project Name: 42Ws1763 Evaluation and Data Recovery Plan State Proj. No.: None

Report Date: July 25, 1995

Principal Investigator: Adrienne Anderson

Field Supervisor(s): Laird P. Naylor II

Acreage Surveyed
Intensive: 0 acres Recon/Intuitive: 0 acres

7.5' Series USGS Map Reference(s): Springdale East

Sites Reported	Count	Smithsonian Site Numbers
Archaeological Sites		
Revisits (no inventory form update)	0	
Revisits (updated IMACS site inventory form attached)	1	42Ws1763
New recordings (IMACS site inventory form attached)	0	
Total Count of Archaeological Sites	1	
Historic Structures (USHS 106 site info form attached)	0	
Total National Register Eligible Sites	1	

Checklist of Required Items

1. x 1 Copy of the Final Report,

2. x Copy of 7.5' Series USGS Map With Surveyed/Excavated Area Clearly Identified.

3. Completed IMACS Site Inventory Forms, Including
   - x Parts A and B or C,
   - x the IMACS Encoding Form,
   - x Site Sketch Map,
   - x Photographs, and
   - x Copy of the Appropriate 7.5' Series USGS Map w/ the Site Location Clearly Marked and Labelled w/ the Smithsonian Site Number

4. x Completed "Cover Sheet" Accompanying Final Report and Survey Materials

Building construction dropped noticeably within Zion with the outbreak of World War II. Construction activity did not return until the advent of Mission 66. Beginning in 1955, the National Park Service launched a massive construction campaign to increase the carrying capacity of the parks. The architecture associated with this decade of activity has yet to receive scholarly examination and evaluation. One can, however, observe a trend away from the rustic style associated with earlier park structures. All structures built after 1941, including Mission 66 structures, are non-contributing resources within Zion.

DISTRICTS

1) Oak Creek Historic District

The buildings in the Oak Creek Historic District represent the architectural development of the "NPS-Rustic" style at Zion throughout the 1930s and early 1940s. The need for housing for park employees, the need for improved maintenance and storage facilities (previous utility buildings were demolished in the early 1930s to make space for the present utility buildings), and the availability of CCC labor and Public Works Project funds, resulted in the expansion of park buildings to the Oak Creek Canyon Area.

Buildings 5, 8, 9, 10, 21, 24, 25, 26, 76, 77, 78, 79, 80-83, 109, 110, 111, and 112 contribute to the theme of rustic architecture in Zion and are eligible for inclusion under Criterion C. Of these, buildings 21, 24, 25, 26, 109, 110, 111, and 112 date between 1936 and 1941 and reflect the later development of rustic architecture in Zion. To exclude these resources would result in an incomplete inventory of rustic style buildings at Zion. All other structures within the district, including buildings 6, 14, 15, 11, 27, and four wood utility sheds in the utility area are non-contributing because of their recent date of construction, style, and material. One of the non-contributing buildings, the original South Entrance Check Station, has been moved, resulting in a loss of historical context.

2) Pine Creek Historic District

These buildings are among the earliest examples of Zion-built resources in the rustic style, and are situated near the original headquarters area of the park. The three houses and two garages have always served as residences for the park Superintendent and other managers at Zion. All five buildings in the Pine Creek Area are included in the Pine Creek Historic District and are eligible under Criterion C. Buildings 001, 002, 003, and 107 were built between 1928 and 1932 and are examples of rustic construction in Zion. Building 102 was built in 1938 and in materials, construction technique, and style is related to the architecture theme defined for the park. Other contributing historic features within the district boundaries include stone retaining walls and a stone pathway which leads to the current Superintendent's Residence.

3) Zion Lodge/Birch Creek Historic District (Zion Lodge Historic District was enrolled individually in the National Register in 1982)

The buildings in this discontiguous district were constructed by the Utah Parks Company, concessionaire at Zion, and were designed by Gilbert Stanley Underwood. Hired by the Utah Parks Company, Underwood worked within the tenets of the "NPS-Rustic" style. His buildings at Zion are built predominantly of wood, with exposed stud construction. Stone is reserved for chimneys and porches. Near the non-contributing Zion Lodge (rebuilt in 1966), Underwood designed tourist cabins, of which 15 remain. The Men's and Women's Dormitories, the Bake Shop, and the Mattress Shed also remain. All buildings date from the late 1920s except the Men's Dormitory, built in 1937, which is integral to the rustic architectural character of the district and which is similar to the earlier buildings in style, construction, and materials.

The Birch Creek Utility Buildings were also designed by Underwood and built by the Utah Parks Company for their use as maintenance and storage facilities. The four remaining buildings include three which were originally used as garages for touring "auto-stages." The buildings, of corrugated iron with exterior wood studs, are similar to Underwood's buildings in the lodge area, and as utilitarian examples of rustic construction, contribute to the architecture theme of rustic construction identified at Zion. All structures built after 1937 in the discontinuous district do not contribute to the historical character of the Zion Lodge/Birch Creek Historic District.

Contributing buildings are:

Zion Lodge Area - Deluxe Quadraplexes 206, 207, 210, 216, and 217; Deluxe Quadraplexes 212, 213, 214, 215, 218, 219, 220, 221, and 222; Women's Dormitory 208 (NPS 83); Men's Dormitory 209 (NPS 84); Bake Shop 205 (NPS 79); and Mattress Shed 87 (NPS 87).

Birch Creek Utility Area - 86, 86A, 4, 223, and (unnumbered horse barn).

Buildings and Structures thematically related to the theme of "NPS-Rustic" style

While not associated with a historic district, these buildings are identified with the theme of "NPS-Rustic" style in Zion, date from the same period, and exhibit the same characteristics of style, material, and construction technique. This list includes the remaining historic buildings built by the National Park Service to expand tourist services and facilities. Some of the buildings were funded as Public Works Projects, and some were built with the labor of CCC enrollees. The Zion Inn was a concession-owned building designed by Gilbert Stanley Underwood and built by the Utah Parks Company. The museum, now the Grotto Residence, built in 1924, is the oldest extant building in the park. All other buildings and structures built in Zion (primarily buildings built during Mission 66) which are not included in a district or in the following list of individual contributing structures, are deemed non-

(Attach 4" x 5" Black and White Photograph)

REGION RMR PARK/AREA NAME ZION N.P. PARK NUMBER 1590

STRUCTURE NAME Emerald Pools Trail STRUCTURE NUMBER RT 1

LOCATION OF STRUCTURE Emerald Pools Trail Hist. D. PARK LOCATION CODE PG

NATIONAL REGISTER _____ DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT: No Mgnt. Agreeme

Check all of the following categories for which NPS has treatment responsibility:

Stabilization (X) Cyclic Maintenance (X) Routine Maintenance (X) Approved Ultimate Treatment (X)

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION:

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document _____ ( ) Document Date: / /

Estimated Treatment Costs

Stabilization: $_____ Date: / / Level of Estimate: (A) (B) (C)

Approved Treatment: $_____ Date: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE: N.P.S. built nature walk and hiking trail of architectural and historical significance.

Date of Construction: 07/15/1932 Date of Alterations: 19/67/68/69 1983/84

Architect/Designer: Harry Langley Historical Theme(s): Transportation

History of Structure: The Landscape Representative from Field Headquarters, Harry Langley, made a study of the trail location and Asst. Superintendent Thomas C. Parker and Superintendent P.P. Patraw agreed upon me thods of construction. Inspections made during progress of construction and approval in writing made to Supt. Patraw. Construction by small tools only, no compressor or jack hammers were used. Length of 1932 construction was 0.8 mile; cost $654.80. Work began 06/10/1932; ended 07/15/1932.

Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___

National Register Criteria: A_ B_ C X D_ (Include integrity statement)

Constructed with native materials and associated with "NPS-Rustic" architectural style, the Emerald Pools Trail possesses structural integrity. Stone masons were employed to construct all stone work to bring it to a high standard of strength and appearance.

Bibliography: Parker, Thomas C., "Final Construction Report on Miscellaneous Trail Construction, Account 502.1, 1932." Zion N.P. Work Completion Report for 1970.

Representation in Other Surveys: No.

If structure has been removed, how? _____ Date: / /

Report prepared by: James Jurale Date: 09/07/84

LOCATION: Section undetermined State Utah
Township 41 S County Washington
Range 10 W

USE: *CURRENT INTERIOR USE (NPS 28 CODE)* N/A
Original Use Hiking/nature trail
Intermediate Uses Hiking/nature trail
PERIOD OF CONSTRUCTION (NPS 28 CODE) HI
NEGATIVE No. ROLL #20, VIEW 2

OWNERSHIP: Present Owner: NPS
Original Owner: NPS
Intermediate Owner(s): NPS

PHYSICAL DESCRIPTION

(DESCRIPTION AND BACKGROUND HISTORY INCLUDING CONSTRUCTION DATE(S), PHYSICAL DIMENSIONS, MATERIALS, MAJOR ALTERATIONS, EXTANT EQUIPMENT, AND IMPORTANT BUILDERS, ARCHITECTS, ENGINEERS, ETC.)

78

The Emerald Pools Trail starts from two locations, is approximately 2.2 miles long and may be taken as a loop or as a two-way trail. The original trail began at a foot bridge across the highway from the Utah Parks (Zion) Lodge and proceeded in a westerly direction to the Lower Emerald Pool. In 1932, construction of an .8 mile trail from the Grotto Camp Ground foot bridge provided a northern access to the existing trail and established a two-way route.

Only one switch-back was constructed on the northern portion of the trail. It was constructed just to the west of the Campground foot bridge as it was necessary to climb from the river level to the top of a ledge approximately 60' above the river. In order to save distance and grade, stone steps were constructed on a 15% grade. These steps, along with other rock work found on the trail, were constructed by stone masons to be of high standards and fine appearance. The average work crew was composed of 1 foreman and 7 laborers who used small tools only. No compressors or jack hammers were used.

In 1967, slides and debris were removed from the trail, drainage repairs were accomplished, retaining walls were reconstructed and trail tred replaced where required. Improvements were carried out on the trail in 1969 to refurbish the stone slab and chisled steps. The Grotto bridge was replaced in 1983-84 and the lower trail paved for handicapped access.

Presently, a trail links the lower pool to the middle and upper pool. This trail leading up Heaps Canyon is rough but also contains representative examples of vintage Park Service stone work. The Lower Emerald Pools Trail and the Upper Emerald Pools Trail are naturalist-guided walks during the summer season.

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

(Attach 4" x 5" Black and White Photograph)

REGION RMR PARK/AREA NAME ZION N.P. PARK NUMBER 1590

STRUCTURE NAME Grotto Trail STRUCTURE NUMBER RT 2

LOCATION OF STRUCTURE Grotto Trail Historic Dist. PARK LOCATION CODE PG

NATIONAL REGISTER DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT: No Mgnt. Agreemer

Check all of the following categories for which NPS has treatment responsibility:

Stabilization (X) Cyclic Maintenance (X) Routine Maintenance (X) Approved Ultimate Treatment (X)

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION:

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document ( ) Document Date: / /

Estimated Treatment Costs

Stabilization: $ Date: / / Level of Estimate: (A) (B) (C)

Approved Treatment: $ Date: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE: N.P.S. built trail and hiking footpath of architectural and historic significance.

Date of Construction: 5/22/1932 Date of Alterations: / /

Architect/Designer: Harry Langley Historical Theme(s): Transportation

History of Structure: In August 1931, Superintendent Allen requested that a trail be constructed from the Zion Lodge to the Grotto Campground Museum. It was his intention that Lodge patrons would use this trail for the short hike to the museum and that campers would use it in going to and from the Lodge for supplies and mail. Work began on 5/9/1932. Location and construction was inspected by Landscape Representative and written approval made to Supt. Allen. Cost of the 0.2 mile trail section was $155.74.

Evaluation of Structure: Historic Theme Contributing X Non-Contributing

National Register Criteria: A B X C X D (Include integrity statement)

Sections of the trail are part of the old floor of the valley road associated with Mormon pioneer transportation in Zion. Landscaping and rock work constructed on the trail by N.P.S. personnel was aimed at establishing a rustic appearance.

Bibliography: Parker, Thomas C., "Final Construction Report on Miscellaneous Trail Construction, Account 502.1, 1932." Zion N.P. "Encyclopedia", Part I, (1935).

Representation in Other Surveys: No.

If structure has been removed, how? Date: / /

Report prepared by: James Jurale Date: 09/10/84

CONTINUATION FROM FRONT SHEET STRUCTURE NAME

LOCATION: Section undetermined State Utah
Township 40 S County Washington
Range 10 W

USE: *CURRENT INTERIOR USE (NPS 28 CODE)* N/A
Original Use access footpath/hiking trail
Intermediate Uses access footpath/hiking trail
PERIOD OF CONSTRUCTION (NPS 28 CODE) HI
NEGATIVE NO. ROLL #22, VIEW 5

OWNERSHIP: Present Owner: NPS
Original Owner: NPS
Intermediate Owner(s): NPS

PHYSICAL DESCRIPTION

(DESCRIPTION AND BACKGROUND HISTORY INCLUDING CONSTRUCTION DATE(S), PHYSICAL DIMENSIONS, MATERIALS, MAJOR ALTERATIONS, EXTANT EQUIPMENT, AND IMPORTANT BUILDERS, ARCHITECTS, ENGINEERS, ETC.)

80

The Grotto Trail begins just north of Zion Lodge and parallels the Canyon floor on the east side to the Grotto Picnic Area--a total distance of 0.5 mile. Part of the original floor of the Canyon road, it allows visitors to travel from the Grotto Picnic Area to Zion Lodge and vice versa, without walking on the highway. As the face of the stone walls on this trail are exposed to view from the highway, a deliberate effort was made during construction (1932) to have them look well from a landscape perspective. Weathered rocks were used and grape vines planted along the face of the walls,"giving the walls a rustic appearance, which was the result desired." These features, along with sandstone retaining walls and a 4'x6' square culvert are well preserved at present.

The ruling grade on this trail is very light, averaging 3%. At the south end, however, it was necessary to introduce a 15% grade for a distance of 75 feet, which avoided a high wall and the blasting out of a large rock. No switchbacks were needed in the construction of the Grotto Trail. The average trail crew consisted of a foreman who was paid $5.00 per day and 6 laborers paid $3.50 each. Only small tools were used in the construction of this trail which averaged 4 feet in width.

Ironically, the Grotto Campground Museum was remodled and converted into a private dwelling in 1932--the same year that the Grotto Trail was completed. While Zion Lodge patrons no longer used the trail for the short walk to the Museum, Grotto Campers continued to hike it to and from the Lodge for supplies and mail.

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

REGION RMR PARK/AREA NAME Zion N.P. PARK NUMBER 1590

STRUCTURE NAME Canyon Overlook Trail STRUCTURE NUMBER RT 3

LOCATION OF STRUCTURE Canyon Overlook Trail H.D. PARK LOCATION CODE PG

NATIONAL REGISTER _____ DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT: NO Mgnt. Agreemen

Check all of the following categories for which NPS has treatment responsibility:

Stabilization (X) Cyclic Maintenance (X) Routine Maintenance (X) Approved Ultimate Treatment (X)

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION:

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document _____ ( ) Document Date: / /

Estimated Treatment Costs

Stabilization: $ _____ Date: / / Level of Estimate: (A) (B) (C)

Approved Treatment: $ _____ Date: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE: N.P.S. built scenic trail and hiking footpath of architectural and historic significance.

Date of Construction: 11/01/1933 Date of Alterations: / /1968

Architect/Designer: Harry Langley Historical Theme(s): Transportation

History of Structure: C.C.C. enrollees of Camp N.P.2, Zion National Park, began construction of a 2450' trail from the east portal of the Zion-Mt Carmel Highway Tunnel to an observation point over the Great Arch in the summer of 1933. Camp N.P.2 Superintendent, F.R. Rozelle, supervised the work which was approved by Zion N.P. Superintendent, P.P. Patraw. Foot trail completed in November 1933 with the exception of guard railing at a few hazardous points which needed to be approved by Landscape Archit.

Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___

National Register Criteria: A_ B_ C X D_ (Include integrity statement)

Built with native materials, associated with "NPS-Rustic" architectural style and constructed by C.C.C. personnel, the Canyon Overlook Trail possesses structural integrity. All stone work and even pipe railings scrutinized by Field H.Q. representative.

Bibliography: U.S. Dept. of Interior, "C.C.C.---Narrative Reports, Miscellaneous, 1934" "Completion Report for Zion N.P. Pullout Parking Areas, 1968, #5104."

Representation in Other Surveys: No.

If structure has been removed, how? _____ Date: / /

Report prepared by: James Jurale Date: 09/12/1984

Canyon Overlook Trail

LOCATION: ction undetermined State Utah
Township 41 S County Washington
Range 10 W

USE: *CURRENT INTERIOR USE (NPS 28 CODE)*
Original Use scenic trail/hiking footpath
Intermediate Uses scenic trail/hiking footpath
PERIOD OF CONSTRUCTION (NPS 28 CODE) HI
NEGATIVE No. ROLL #20, VIEW 11

OWNERSHIP: Present Owner: NPS
Original Owner: NPS
Intermediate Owner(s): NPS

PHYSICAL DESCRIPTION

(DESCRIPTION AND BACKGROUND HISTORY INCLUDING CONSTRUCTION DATE(S), PHYSICAL DIMENSIONS, MATERIALS, MAJOR ALTERATIONS, EXTANT EQUIPMENT, AND IMPORTANT BUILDERS, ARCHITECTS, ENGINEERS, ETC.)

82

The Canyon Overlook Trail is 0.5 miles long and begins across the highway from the parking area at the east end of the Zion-Mt. Carmel Tunnel. Starting quite steeply by means of chiseled sandstone steps, the trail is constructed on a moderate grade after the initial 200' and follows the rock ledges above Pine Creek Canyon to a point directly above the Great Arch of Zion. This is one of Zion Park's most popular self-guiding nature walks. The environment along the trail is entirely different from that of the Canyon floor and the hiker has the opportunity to view a great variety of spectacular sandstone formations, animals and plant life.

The foot trail was completed by C.C.C, personnel of Camp N.P.2 in November 1933, with the exception of guard rails which needed to be approved by the Landscape Architect. Construction work was supervised by N.P.2 Camp Superintendent, F.R. Rozelle and approved by Zion N.P. Superintendent, P.P. Patraw. Originally called the Great Arch Trail, it was,and continues to be one of the most popular footpaths in the Park.

Man-made improvements along the trail include: rock hewn steps and observation platform, dry laid sandstone block retaining walls, steel strut and wood plank foot bridge, and metal pipe rails with brackets. The adjacent parking area built in 1968 to, "provide necessary parking space for visitor use for enjoyment of the geological features, ecological study, photo stops and improved roadway safety," cost $15,676 to construct.

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

(Attach 4" x 5" Black and White Photograph)

REGION RMR PARK/AREA NAME ZION N.P. PARK NUMBER 1590

STRUCTURE NAME Gateway To The Narrows Trail STRUCTURE NUMBER RT 5

LOCATION OF STRUCTURE Gateway to the Narrows H. D. PARK LOCATION CODE PG

NATIONAL REGISTER DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT: No Mgmt. Agreement

Check all of the following categories for which NPS has treatment responsibility:

Stabilization (X) Cyclic Maintenance ( ) Routine Maintenance (X) Approved Ultimate Treatment ( )

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION:

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document ( ) Document Date: / /

Estimated Treatment Costs

Stabilization: $ Date: / / Level of Estimate: (A) (B) (C)

Approved Treatment: $ Date: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE: N.P.S. built self-guiding nature walk and hiking trail of architectural and historical significance.

Date of Construction: /07/1929 Date of Alterations: 19/68/70/ 1982

Architect/Designer: Guy D. Edwards Historical Theme(s): Transportation

History of Structure: The Narrows Foot Trail was surveyed on 06/1928 by Guy D. Edwards, Asst. Engineer Field Headquarters Zion N.P. Edwards completed the trail blueprints in Jan. 1929 at the Office of Chief Engineer, San Francisco, Calif. and they were approved the following Feb. Trail construction began in the middle of April 1929 under the supervision of Park building foreman, Walter Ruesch. 20-25 men were employed in building the trail which was 70% complete by May. By July 1929, daily field trips held on trail.

Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___

National Register Criteria: A_ B_ C_X_ D_ (Include integrity statement)

Constructed with native materials and associated with the "NPS-Rustic" architectural style, the Gateway to the Narrows Trail possesses structural integrity. Designed with vertical curves and winding alignment to suggest Nature's work rather than man's.

Bibliography: Edwards, Guy D., "Report on Engineering Activities Zion N.P., 1928." "Reports to Supt., Zion N.P.,1929." Zion N.P. "Completion Reports" for 1929, 1970.

Representation in Other Surveys: No.

If structure has been removed, how? Date: / /

Report prepared by: James Jurale Date: 09/06/84

CONTINUATION FROM FRONT SHEET - STRUCTURE NAME [illegible]

LOCATION: Section undetermined State Utah
Township 40 S County Washington
Range 10 W

USE: CURRENT INTERIOR USE (NPS 28 CODE) N/A
Original Use Footpath
Intermediate Uses Self-guiding nature trail
PERIOD OF CONSTRUCTION (NPS 28 CODE) HI

OWNERSHIP: Present Owner: NPS
Original Owner: NPS
Intermediate Owner(s): NPS

Profile Note Book No. 19M-7, 19M-8
Negative No. Roll 21, View 3

PHYSICAL DESCRIPTION

(DESCRIPTION AND BACKGROUND HISTORY INCLUDING CONSTRUCTION DATE(S), PHYSICAL DIMENSIONS, MATERIALS, MAJOR ALTERATIONS, EXTANT EQUIPMENT, AND IMPORTANT BUILDERS, ARCHITECTS, ENGINEERS, ETC.)

84

Starting from the Temple of Sinawava at the end of the Zion Canyon Scenic Drive, the trail follows the Virgin River to the north for a distance of one mile. At this point the Canyon becomes so narrow that there is no longer room for both river and trail. One of the least strenuous and most popular trails in Zion, it is utilized as both a naturalist-guided and self-guided walk. It is entirely paved, climbs less than 100 feet from start to finish and was improved for handicapped access in 1982.

The trail was surveyed and designed by Guy D. Edwards, working out of the office of the Chief Engineer, San Francisco, California. Edwards was Assistant Engineer to Chief Engineer, F.A. Kittredge at Zion N.P. Field Headquarters in 1928 and 1929. Edwards designed the path--whose construction was supervised by Park building foreman Walter Ruesch--to be of a smooth surface and still blend in with the landscape as much as possible. Prior to its completion in July 1929, the Narrows path was only a narrow trail and, "pedestrians had to wade in loose powdery sand--ankle deep, and were choked by dust."

The original pavement was an asphalt and gravel mixture, the gravel being spread and rolled, and the bitumuls (emulsified asphalt) applied by the penetration me thod. Grading work was handled to avoid all damage to the surrounding landscape and avoid unnecessary scars to rocks. In all, about 112 cubic yards of cement rubblemasonry were built. Sections of the original serpentine sandstone retaining walls exist at present.

On August 1, 1968 a rock slide buried a 250' section of the trail under a pile of debris from 3 to 20 feet. Reconstruction work was started during Sept. 1968 and a helicopter was flown in from the Grand Canyon to transport men and equipment onto the cliffsabove the slide area. Rather than remove the small mountain created by the slide, the trail was reconstructed over the top. In the course of the project, which was completed in April 1970, rock retaining walls were constructed to help stabilize the loose slide material.

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

2121

REGION RMR PARK/AREA NAME Zion National Park PARK NUMBER 1590

STRUCTURE NAME Oak Creek Irrigation Canal STRUCTURE NUMBER IR 14

LOCATION OF STRUCTURE Oak Creek Canal Hist. D. PARK LOCATION CODE PG

NATIONAL REGISTER _____ DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT: No Mgnt. Agr

Check all of the following categories for which NPS has treatment responsibility:

Stabilization(X) Cyclic Maintenance(X) Routine Maintenance(X) Approved Ultimate Treatment

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document _____ ( )Document Date: / /

Estimated Treatment Costs

Stabilization: $ _____ Date: / / Level of Estimate: (A) (B) (C)

Approved Treatment: $ _____ Data: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE: Park Service operated irrigation canal of historical and architectural significance.

Date of Construction: / /1935 Date of Alterations:19- 41/ 59/61

Architect/Designer: Harry Langley Historical Theme(s): Landscape Architecture

History of Structure: The original irrigation canal, designed to deliver water to the S Campground, was completed by enrollees of CCC Camp N. P. #2 Zion N.P. in the summer of 1935. The work was supervised by F. R. Rozelle, Camp Supt. and approved by Zion N.P. Supt. P.P. Patraw. Reconstruction work carried out in summer of 1941 to replace wooden flumes and built new concrete diversion dams. Original rockwork extant.

Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___

National Register Criteria: A B C X D (Include integrity statement)

The canal retains much of its structural integrity, as it follows its original course and retains significant examples of its initial equipment such as the stone wnowing drops located just to the N of Nature Cen.

Bibliography: Firm, Howard. "Photo Documentation, 1935", ZNP Photo Collectic Rozelle, F.R. "CCC Narrative Reports, 1935." Excell inter. by Andrews, ZNP

Representation in Other Surveys: NO.

If structure has been removed, how? _____ Date: / /

Report prepared by: James Jurale Date: 9 /29/ 1984

LOCATION: Section 21,22, unmapped State Utah
Township 41 S County Washington
Range 10 W

USE: CURRENT INTERIOR USE (NPS 28 CODE) N/A
Original Use Irrigation Canal
Intermediate Uses Irrigation Canal
PERIOD OF CONSTRUCTION (NPS 28 CODE) HI
DRAWING No.
NEGATIVE No. HAER No. UT-38-B-1

OWNERSHIP: Present Owner: NPS
Original Owner: NPS
Intermediate Owner(s): NPS

PHYSICAL DESCRIPTION

(DESCRIPTION AND BACKGROUND HISTORY INCLUDING CONSTRUCTION DATE(S), PHYSICAL DIMENSIONS, MATERIALS, MAJOR ALTERATIONS, EXTANT EQUIPMENT, AND IMPORTANT BUILDERS, ARCHITECTS, ENGINEERS, ETC.)

98

The head of the Oak Creek Canal is located on the W side of the N Fork of the Virgin R., approx. 1/8 mile to the N of the Virgin River Bridge. The head works consst of a concrete diversion dam, which spans the River, a single, screw-type head gate and cast iron grizzly on the N end of an ashlar masonry diversion pier. A hand winch and swivel boom with ball and socket hand crank is located on the recessed deck of the pier. The winch is used to remove or insert a metal slide gat (by means of a wire cable) into a grooved, 5' wide spillway located to the immediate east of the headgate and extreme W of the diversion dam. The dam was constructed in 1941 and repaired, 1959.

Other structures located on the Canal prior to its passage under the Virgin R. Bridge include: a poured concrete 3'X6' holding cistern with dual, metal, screw-type headgates and 1 wooden flash board; a screening pumping station for the Visitor Center and Pine Creek Residential irrigation systems (constructed 3/1961); a concrete, steel rod enforced, measuring weir with 3' drop.

The Canal crosses to the W side of the highway just to the N of Park HQ's, and runs through a metal flume(replaced wooden flume 4/26/1941) on the E side of the Oak Creek Bridge. It passes through stone whowing drops (constructed 1935) N of the Nature Center, swings to the E and parallels the highway's west flank. The Canal sends a series of laterals E to irrigate the S Campground Area and terminates in a ditch which enters the Virgin R. on the N side of the Watchman Campground entrance road. The Canal is concrete lined for much of its approx. 2 mile course.

The Oak Creek Canal was enlarged to a carrying capacity of approx. 1 second foot by CCC enrollee in 1935, under the supervision of Engineer Cowell. The primary purpose of the Canal was to conv water to a network of laterals which irrigated trees and shrubs planted in a reforestation progr at the South Campground Area. A siphon connected the S Entrance Plaza to irrigation system.

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

(Attach 4" x 5" black and white photograph)

513.19

REGION RMR PARK/AREA NAME Zion National Park PARK NUMBER 1590

STRUCTURE NAME Crawford Irrigation Canal STRUCTURE NUMBER IR 16

LOCATION OF STRUCTURE Crawford Canal PARK LOCATION CODE PG

NATIONAL REGISTER ____ DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT: No Mgnt. Agrmt

Check all of the following categories for which NPS has treatment responsibility:

Stabilization (X) Cyclic Maintenance (X) Routine Maintenance (X) Approved Ultimate Treatment (X)

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION:

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document ____ ( ) Document Date: / /

Estimated Treatment Costs

Stabilization: $ ____ Date: / / Level of Estimate: (A) (B) (C)

Approved Treatment: $ ____ Date: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE: Inoperable Park owned irrigation canal of historical and architectural significance.

Date of Construction: approx. 1890's Date of Alterations: 1933/41

Architect/Designer: Mormon Pioneer Historical Theme(s): Pioneer settlement-irrig.

History of Structure: Designed and constructed by members of the Crawford and Gifford families in the 1890's to deliver water to the community of farms in the Oak Creek Canyon which was sometimes referred to as Crawfordville. The point of diversion was a primitive headworks located on the west bank of the Virgin River approximately one mile north of the present-day Virgin R. Bridge. Rehabilitated in 1933/41 by CCC and NPS.

Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___

National Register Criteria: A Bx Cx D (Include integrity statement)

Although no extant remains of irrigation mechanisms exist, the canal retains structural integrity. The canal's course is clearly visible for most of the approx 1½ mile length and point of diversion discernible.

Bibliography: J.L. Crawford interview by Jurale, 7/27/84. CCC Narative Reports for 1933. "ZNP Work Completion Report, 1941." On-site observations

Representation in Other Surveys: No.

If structure has been removed, how? ____ Date: / /

Report prepared by: James Jurale Date: 10/07/1984

...IRRIGATION FROM FRONT SHEET - STRUCTURE NAME Crawford Irrigation Canal

LOCATION: Section unsurveyed State Utah
Township 41 S County Washington
Range 10 W

USE: CURRENT INTERIOR USE (NPS 28 CODE) N/A
Original Use Irrigation Canal
Intermediate Uses Irrigation Canal
PERIOD OF CONSTRUCTION (NPS 28 CODE) HI
DRAWING No.
NEGATIVE No. HAER No. UT-38-A-4

OWNERSHIP: Present Owner: NPS
Original Owner: Private
Intermediate Owner(s): NPS

PHYSICAL DESCRIPTION

(DESCRIPTION AND BACKGROUND HISTORY INCLUDING CONSTRUCTION DATE(S), PHYSICAL DIMENSIONS, MATERIALS, MAJOR ALTERATIONS, EXTANT EQUIPMENT, AND IMPORTANT BUILDERS, ARCHITECTS, ENGINEERS, ETC.)

88 The Crawford Canal was built by Mormon settlers in Zion whose community of farms in the Oak Creek Canyon was sometimes referred to as Crawfordville. Water was originally diverted from the W bank of the Virgin River (approx. one mile N of the present-day Virgin River Bridge) by means of a pioneer-built wooden headgate. In 1931, the Oak Creek Canyon farms were purchased by the National Park Service which took possession of the water delivery system. In 1933, CCC personnel of Camp N.P.2 widened the Crawford Canal to eighteen inches for a distance of 5,178'. A concrete cyclopean-type diversion dam was installed at the head of the canal on December 23, 1941, by the Park Maintenance Dept.

Although the canal is no longer functional, its course is clearly visible. The point of diversion is marked by a large boulder just upstream from a rock slide on the W bank of the Virgin River. The channel of the canal is outlined by cottonwood trees and brush for most of its approx. 1½ mile course. The ditch runs south, following the River on its west bank, traverses the base of the Virgin Formation to the northwest of the Visitor's Center, then turns northwest for .5 mile up Oak Creek. The canal and its system of laterals provided water for livestock and irrigated fields of alfalfa and sorghum.

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

(Attach 4" x 5" Black and White Photograph)

10721

REGION RMR PARK/AREA NAME Zion National Park PARK NUMBER 1590

STRUCTURE NAME Grotto Residence STRUCTURE NUMBER 32

LOCATION OF STRUCTURE Grotto Picnic Area PARK LOCATION CODE LG

NATIONAL REGISTER _____ DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT: _____

Check all of the following categories for which NPS has treatment responsibility:

Stabilization() Cyclic Maintenance() Routine Maintenance() Approved Ultimate Treatment()

(ROCKY MOUNTAIN REGION-USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION:

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document _____ ( )Document Date: / /

Estimated Treatment Costs

Stabilization: $_____ Date: / / Level of Estimate: (A) (B) (C)

Approved Treatment: $_____ Date: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE:

Date of Construction: / / 1924 Date of Alterations: / / 1936; 1947

Architect/Designer: _____ Historical Theme(s): NPS rustic

History of Structure: The Grotto Residence is the oldest building extant in the Park. Built as the Park Museum in 1924, it was remodelled into a dwelling in 1936 by Harry Langley, Branch of Plans and Design. The remodelling was a CCC project completed that year. It received further interior remodelling in 1947 "to improve utilization of space".

Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___

National Register Criteria: A B Cx D (Include integrity statement)

Built of red sandstone, the exterior of the residence retains its original fabric and character typical of the NPS-Rustic style at Zion.

Bibliography: Form 10-768 (Maintenance files); Olivieri, Lance, LCS inventory, 1976; drawing ZIO-3066, Harry Langley, 3/14/36;

Representation in Other Surveys: LCS inventory, 1976;

If structure has been removed, how? _____ Date: / /

Report prepared by: Nancy Witherell Date: 10/10/84

CONTINUATION FROM FRONT SHEET - STRUCTURE NAME #32 Grotto Residence

LOCATION: Section _____ State _____
Township _____ County _____
Range _____

USE: *CURRENT INTERIOR USE (NPS 28 CODE)* NQ
Original Use VC
Intermediate Uses _____
PERIOD OF CONSTRUCTION (NPS 28 CODE) H1

OWNERSHIP: Present Owner: _____
Original Owner: _____
Intermediate Owner(s): _____

DRAWING No. Z10-3066
NEGATIVE No. ROLL #15, VIEW 8A

PHYSICAL DESCRIPTION

TYPE OF STRUCTURE (NPS 28 CODE): BU

ARCHITECTURAL CHARACTER (STYLE): NPS Rustic

SITE (INCLUDE ORIENTATION OF STRUCTURE): front door faces West to canyon drive

OVERALL BUILDING PLAN (FOOTPRINT): L-shaped

OVERALL DIMENSIONS: 39' x 32' 6"

COMPOSITION (NPS 28 CODE): ST

STORIES: 1-story

FOUNDATION: Stone

WALLS: Massive red sandstone ashlar with stepped lower courses; obvious quarry marks, courses up to 15" in height

ROOF: Cedar shingle, gable faces are stone (not wood) 4" x 4" purlins, 2" x 4" extended rafter tails.

CHIMNEYS: Red brick chimney at Gable Ridge

PORCHES: None

WINDOWS: Wood casements with 6 lights; casements are painted.

DOORS: Wood panel door on west, north and, east elevations

ADDITIONS: None

INTERIOR PLAN: Converted from museum to residence

INTERIOR FINISHES:

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:
Earliest extant building in Park, dated 1924. Building retains original wall fabric showing early style of building with massive quarry blocks, original fenestration.

CLASSIFIED STRUCTURE FIELD INVENTORY REPORT
(Attach 4" x 5" Black and White Photograph)

5121 2

REGION RMR PARK/AREA NAME Zion National Park PARK NUMBER 1590

STRUCTURE NAME Trailside Exhibit Building STRUCTURE NUMBER 127

LOCATION OF STRUCTURE Temple of Sinawava PARK LOCATION CODE TS

NATIONAL REGISTER _____ DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT: _____

Check all of the following categories for which NPS has treatment responsibility:

Stabilization() Cyclic Maintenance() Routine Maintenance() Approved Ultimate Treatment()

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION:

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document _____ ( )Document Date: / /
Estimated Treatment Costs _____

Stabilization: $_____ Date: / / Level of Estimate: (A) (B) (C)
Approved Treatment: $_____ Data: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE:

Date of Construction: / /1936 Date of Alterations: / /
Architect/Designer: _____ Historical Theme(s): NPS rustic
History of Structure: The Temple of Sinawava Trailside Exhibit Building was designed by the Park Service in 1936 and built for a cost of $1,200. It was constructed to provide hikers with information about the Park, including the Gateway to the Narrows Trail, which was completed in 1929. Designed by the Western Division Branch of Plans and Design (with the recommending signature of William G. Carnes, Acting Chief of Planning) the structure was built by CCC Camp NP 4 (CCC Job 75, Class 114), stationed at Zion.
Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___
National Register Criteria: A_ B_ C X D_ (Include integrity statement)
Built of local red sandstone with board and batten walls and shake roof, the Trailside Exhibit Building retains its original character and the fabric typical of the NPS-Rustic style.
Bibliography: Form 10-768 (maintenance file); drawing NP-Z10-2010-B, 1936;

Representation in Other Surveys: _____

If structure has been removed, how? _____ Date: / /

Report prepared by: Nancy Witherell Date: 10 / 10 / 84

CONTINUATION FROM FRONT SHEET - STRUCTURE NAME Temple of Sinawava Trailside Exhibit Building

LOCATION: Section _____ State Utah
Township _____ County Washington
Range _____

USE: CURRENT INTERIOR USE (NPS 28 CODE) VC
Original Use VC
Intermediate Uses VC
PERIOD OF CONSTRUCTION (NPS 28 CODE) HI

OWNERSHIP: Present Owner: NPS
Original Owner: NPS
Intermediate Owner(s): NPS

DRAWING No. Z10-2010-B
NEGATIVE No. ROLL #15, VIEW 10A

PHYSICAL DESCRIPTION

TYPE OF STRUCTURE (NPS 28 CODE): OT (information kiosk)
ARCHITECTURAL CHARACTER (STYLE): "NPS-Rustic"

SITE (INCLUDE ORIENTATION OF STRUCTURE):
Located at south end of Gateway to the Narrows Trail with long faces to N and S.

OVERALL BUILDING PLAN (FOOTPRINT): rectangular

OVERALL DIMENSIONS: 16' x 7'8"

COMPOSITION (NPS 28 CODE): ST

STORIES: n/a

FOUNDATION: sandstone. Kiosk rests on sandstone platform one step high.

WALLS: Kiosk consists of two sandstone piers with lower courses stepped; wall surface inbetween piers is wood board and batten from ground to sill; upper wall is glass information cases.

ROOF:
Gable roof covered with shakes; Extended beams are 8" x 8"; rafter ends are 4" x 6"..

CHIMNEYS: none

PORCHES: none

WINDOWS: none

DOORS: none

ADDITIONS: none

INTERIOR PLAN: none

INTERIOR FINISHES: none

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

stone piers, wood shake roof, board and batten wall, stone foundation steps, water fountain

(Attach 4" x 5" Black and White Photograph) 10732

REGION RMR PARK/AREA NAME Zion National Park PARK NUMBER 1590

STRUCTURE NAME Comfort Station STRUCTURE NUMBER 129

LOCATION OF STRUCTURE Grotto Picnic Area PARK LOCATION CODE LG

NATIONAL REGISTER DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST MANAGEMENT AGREEMENT:

Check all of the following categories for which NPS has treatment responsibility:

Stabilization() Cyclic Maintenance() Routine Maintenance() Approved Ultimate Treatment()

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION:

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document ( )Document Date: / /

Estimated Treatment Costs

Stabilization: $ Date: / / Level of Estimate: (A) (B) (C)

Approved Treatment: $ Date: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE:

Date of Construction: / / 1925 Date of Alterations: / / 1959

Architect/Designer: Historical Theme(s): NPS rustic

History of Structure: This comfort station, the more southern of the two in the Grotto Picnic Area, is the oldest extant comfort station in the Park. Built at an original cost of $1,500 one year after the Grotto Residence was built, it was remodelled in 1959 by Park maintenance crews. Like the nearby residence, it is an excellent example of the massive, heavily rusticated style found in structures built in Zion in the 1920s.

Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___

National Register Criteria: A_ B_ Cx D_ (Include integrity statement)

Built of massive and minimally-dressed sandstone ashlar blocks, the comfort station retains its original character and fabric typical of the NPS-Rustic style.

Bibliography: Form 10-768 (Maintenance files); Olivieri, Lance. LCS inventory, 1976;

Representation in Other Surveys: LCS inventory, 1976;

If structure has been removed, how? Date: / /

Report prepared by: Nancy Witherell Date: 10/10/84

LOCATION: Section _____ State Utah
Township _____ County Washington
Range _____

USE: *CURRENT INTERIOR USE (NPS 28 CODE)* VC
Original Use comfort station
Intermediate Uses comfort station
PERIOD OF CONSTRUCTION (NPS 28 CODE) H 1

OWNERSHIP: Present Owner: NPS
Original Owner: NPS
Intermediate Owner(s): NPS

NEGATIVE No. ROLL #15, VIEW 10

PHYSICAL DESCRIPTION

TYPE OF STRUCTURE (NPS 28 CODE): BU

ARCHITECTURAL CHARACTER (STYLE):
NPS-Rustic

SITE (INCLUDE ORIENTATION OF STRUCTURE):
located at Grotto Picnic area, E of Scenic Drive

OVERALL BUILDING PLAN (FOOTPRINT): Rectangle

OVERALL DIMENSIONS: 16'6" X 25' 6"

COMPOSITION (NPS 28 CODE): ST

STORIES: one

FOUNDATION: Stone, low foundation with buttressed foundation

WALLS: Massive quarried red sandstone blocks with courses of 15-18 inches in height at ground level.

ROOF: board and batten wood cladding in gable faces, asphalt roof; 6" X 8" beams, 4"X6" rafters; 2' overhang on roof sides with 3' projection of gable on front gable elevation.

CHIMNEYS: none

PORCHES: none

WINDOWS: 5 wood casement windows in row on each long facade

DOORS: wood doors on 3 sides (to each restroom, n and s) and on west elevation

ADDITIONS: none

INTERIOR PLAN: 2 rooms (men's and women's restrooms)

INTERIOR FINISHES: modernized - drywall plus tile in 1959

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

Structure retains original wall fabric and fenestration

CLASSIFIED STRUCTURE FIELD INVENTORY REPORT
(Attach 4" x 5" Black and White Photograph)

22752

REGION RMR PARK/AREA NAME Zion National Park PARK NUMBER 1590

STRUCTURE NAME Comfort Station STRUCTURE NUMBER 130

LOCATION OF STRUCTURE Grotto Picnic Area PARK LOCATION CODE LG

NATIONAL REGISTER _____ DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT: _____

Check all of the following categories for which NPS has treatment responsibility:

Stabilization() Cyclic Maintenance() Routine Maintenance() Approved Ultimate Treatment()

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION:

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document _____ ( )Document Date: / /
Estimated Treatment Costs _____

Stabilization: $_____ Date: / / Level of Estimate: (A) (B) (C)
Approved Treatment: $_____ Date: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE:

Date of Construction: / / 1930-31. Date of Alterations: / /
Architect/Designer: Harry Langley Historical Theme(s): NPS rustic
History of Structure: Although maintenance files record this comfort station as built in 1930, Harry Langley's drawing for the building is dated June, 1931, when he was in the field at Zion. The Grotto Picnic Area was the first camping ground in the Park, used for overnight camping until the South Campground was expanded in the early 1960s.

Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___
National Register Criteria: A_ B_ C_x D_ (Include integrity statement)
Built of red sandstone, the building retains its original character and fabric typical of the NPS-Rustic style at Zion.

Bibliography: Form 10-768 (Maintenance file). Olivieri, Lance. LCS inventory, 1976; drawing Z-323, signed "Harry Langley at Zion", 6/31;
Representation in Other Surveys: LCS inventory, 1976;

If structure has been removed, how? _____ Date: / /

Report prepared by: Nancy Witherell Date: 10/10/84

CONTINUATION FROM FRONT SHEET - STRUCTURE NAME Comfort Station (No. 130) - Grotto Picnic Area

LOCATION: Section _____ State _____
Township _____ County _____
Range _____

USE: *CURRENT INTERIOR USE (NPS 28 CODE)* VC
Original Use VC
Intermediate Uses _____
PERIOD OF CONSTRUCTION (NPS 28 CODE) H 1

OWNERSHIP: Present Owner: NPS
Original Owner: NPS
Intermediate Owner(s): NPS

DRAWING NO. Z-323
NEGATIVE NO. ROLL #15, VIEW 8

PHYSICAL DESCRIPTION

TYPE OF STRUCTURE (NPS 28 CODE): BU
ARCHITECTURAL CHARACTER (STYLE): NPS-Rustic

96 SITE (INCLUDE ORIENTATION OF STRUCTURE): Located in Grotto Picnic Area near Grotto Residence, East of Scenic Drive

OVERALL BUILDING PLAN (FOOTPRINT): Rectangle
OVERALL DIMENSIONS: 13' x 26'
COMPOSITION (NPS 28 CODE): ST
STORIES: One-story
FOUNDATION: Red sandstone

WALLS: Large red sandstone blocks with stepped lower courses

ROOF: Asphalt gable roof with 2" x 6" rafter tails and exposed purlins; gable faces are wood flushboard; Roof eaves extend 2'.

CHIMNEYS: None

PORCHES: None

WINDOWS: 5 wood casement windows attached in a row on each long elevation close to eaves.

DOORS: Doors are panelled wood. Projecting wood screens are built to extend from 2 entrances to restrooms.

ADDITIONS: None

INTERIOR PLAN: Two-room (men's and women's restrooms)

INTERIOR FINISHES: Modernized - drywall plus tile

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

Retains original wall fabric and fenestration.

(Attach 4" x 5" Black and White Photograph)

REGION RMR PARK/AREA NAME Zion National Park PARK NUMBER 1590

STRUCTURE NAME Virgin River Bridge STRUCTURE NUMBER ~~997~~ HS-997

LOCATION OF STRUCTURE Virgin River Bridge Hist. D. PARK LOCATION CODE PG

NATIONAL REGISTER _____ DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT: No Mgmt. Agreeme

Check all of the following categories for which NPS has treatment responsibility:

Stabilization (X) Cyclic Maintenance (X) Routine Maintenance (X) Approved Ultimate Treatment (X

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document _____ ( ) Document Date: / /

Estimated Treatment Costs _____

Stabilization: $_____ Date: / / Level of Estimate: (A) (B) (C)

Approved Treatment: $_____ Date: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE: Service built highway bridge of architectural and historical significance.

Date of Construction: 07/04/1930 Date of Alterations: 10/59/1960

Architect/Designer: Thos. Vint/ Angwin Historical Theme(s): Transportation

History of Structure: In Feb. 1928, Chief Landscape Engineer, Thomas C. Vint and Bridge Engineer from the Regional Office, Mr. Angwin, made inspections of the bridge sites on the Zion-Mt. Carmel Highway which was in the process of construction. Work on the Virgin R. Bridge lagged behind due to landscape design difficulty and construction finially commenced in October 1929. Although open for the Highway Dedication Ceremony on the 4th, the Bridge was not completed until the end of July. Widened, 1960.

Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___

National Register Criteria: A_ B_ C X D_ (Include integrity statement)

Although partially reconstructed in 1960, the Virgin River Bridge retains its structural integrity. Attractive and well executed, the bridge is a 3 span "I" beam structure which was skillfully camouflaged with 54" Redwood slabs to give it a rustic finish.

Bibliography: Scoyen, E.T. "ZNP Annual Report for 1930", Scoyen, E.T. "ZNP Superintendent's Monthly Reports, Feb., Oct., 1928." Jolley, D.J. " Report to Supt., 10/1929".

Representation in Other Surveys: Olivieri, Lance. "Classified Structure Inventory Report, 1978."

If structure has been removed, how? _____ Date: / /

Report prepared by: James Jurale Date: 09 / 26/ 1984

LOCATION: Section undetermined State Utah

Township 41 S County Washington

Range 10 W

USE: *CURRENT INTERIOR USE (NPS 28 CODE)* N/A

Original Use Highway bridge

Intermediate Uses Highway bridge

PERIOD OF CONSTRUCTION (NPS 28 CODE) HI

NEGATIVE No. HAER No. UT-39-C-1

OWNERSHIP: Present Owner: NPS

Original Owner: NPS

Intermediate Owner(s): NPS

PHYSICAL DESCRIPTION

(DESCRIPTION AND BACKGROUND HISTORY INCLUDING CONSTRUCTION DATE(S), PHYSICAL DIMENSIONS, MATERIALS, MAJOR ALTERATIONS, EXTANT EQUIPMENT, AND IMPORTANT BUILDERS, ARCHITECTS, ENGINEERS, ETC.)

86

Chief Ranger, Donal J Jolley, reported in Oct. 1929 that work commenced on the River Bridge, "which when completed will connect the New Zion Mt. Carmel highway with the present Zion road." Construction work on the Bridge had lagged behind due to a change in design and, according to Supt. Scoyen,"the difficulties in arriving at a practical solution of this problem which will also be satisfactory from the landscape standpoint." The Bridge across the Mukuntuweap(Virgin) River was completed late in July 1930.

The original River Bridge was 185 feet long, with a 20-foot driveway across the center and a five-foot sidewalk on each side, making a total width of 30 feet. Constructed as a 3 span steel "I" beam structure, it was camouflaged with 54" Redwood slabs to give it a rustic appearance. The spans were supported by two pieces of solid masonry 34 feet high.

On December 17, 1959, Park Service personnel commenced removing the sidewalks and enlarging the road surface of the brige. The old curb was dislodged by cutting and blasting, the edge of the pavement was leveled and the debris removed. Steel reinforcing rods were placed in the 5' wide trench on each side of the bridge. Then the gaps were filled with poured concrete and the enlarged road-bed resurfaced. Renovation of the bridge, which spans the Virgin River approximately 2 miles north of the Park administration building, was completed in March 1960.

The bridge's concrete and "I" beamed roadbed is supported by pitcher-faced, ashlar, sandstone, masonry, piers and abuttments. "Spanning the tops of the piers and imbedded in the masonry, are 1 1/2'x 3' (approx.) dia. beams which protrude from the piers on both sides. 1' X 4' fascia beams line the lower sides of the roadbed. 4"X 10" ballistrade,(sic) with 6" X 10" railings imbedded in spaced wood posts, form the guardrails."

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

REGION RMR PARK/AREA NAME ZION NATIONAL PARK PARK NUMBER 1590

STRUCTURE NAME Zion - Mt. Carmel Highway STRUCTURE NUMBER RT 1000

LOCATION OF STRUCTURE Zion Mt. Carmel Highway H.D. PARK LOCATION CODE PG

NATIONAL REGISTER _____ DATE: / / MANAGEMENT CATEGORY: (A) (B) (C) (D)

NPS LEGAL INTEREST FEE MANAGEMENT AGREEMENT No Mgmt. Agreemen

Check all of the following categories for which NPS has treatment responsibility:

Stabilization (X) Cyclic Maintenance (X) Routine Maintenance (X) Approved Ultimate Treatment (X)

(ROCKY MOUNTAIN REGION USE ONLY)

APPROVED ULTIMATE TREATMENT OR RESOURCE MANAGEMENT PLAN, CULTURAL COMPONENT DESIGNATION

Preservation	(PP)	Restoration	(RR)	Reconstruction	(CC)
Adaptive Preservation	(AP)	Adaptive Restoration	(AR)	Adaptive Reconstruction	(AC)
Neglect	(NG)	Remove	(RM)	No Approved Treatment	(NO)

Approval Document _____ ( ) Document Date: / /

Estimated Treatment Costs

Stabilization: $ _____ Date: / / Level of Estimate: (A) (B) (C)

Approved Treatment: $ _____ Date: / / Estimator: (Region) (DSC) (A&E)

STATEMENT OF SIGNIFICANCE: Scenic Highway of architectural and historical significance.

Date of Construction: 07/04/1930 Date of Alterations: 06/30/1968

Architect/Designer: Thomas H. MacDonald Historical Theme(s): Transportation

History of Structure: Thomas H. MacDonald, Chief of the Bureau of Public Roads and his engineering assistants completed the 3 year project in 1930. The original reconnaissance was made by U.S. District Engineer, B.J. Finch and Utah State Engineer H.C. Means assisted by Zion pioneer rancher, John Winder. Congressman Cramton, Chairman of the Sub-Committee on appropriations for National Parks and Stephen T. Mather, Director of the NPS were instrumental in obtaining the almost $2 million Federal funds.

Evaluation of Structure: Historic Theme Contributing X Non-Contributing ___

National Register Criteria: A_ B_ C X D_ (Include integrity statement)

Completed in 1930, the approx. 10 mile Park section of this 25 mile road is of great scenic interest and retains structural integrity. The conception, design and construction of this road was an artistic achievement which stands as a testimonial to NPS vision.

Bibliography: Markoff, Dena S. "The Dudes are always Right" ZNHA, 1980. U.S. Dept. of Interior. "Zion N.P. Dedications,1930." #ZP-101-01. Zion N.P. Completion Report#5104.

Representation in Other Surveys: Oliveri, Lance. "Classified Structure Inventory Report, 1978.

If structure has been removed, how? _____ Date: / /

Report prepared by: James Jurale Date: 09/24/1984

LOCATION: Section undetermined, 19, 20 State Utah
Township 41 S County Washington, Kane
Range 9 W, 10 W

USE: CURRENT INTERIOR USE (NPS 28 CODE) N/A
Original Use Scenic Highway
Intermediate Uses Scenic Highway
PERIOD OF CONSTRUCTION (NPS 28 CODE) HI

OWNERSHIP: Present Owner: NPS
Original Owner: NPS
Intermediate Owner(s): NPS

NEGATIVE No. HAER No. UT-39-5

PHYSICAL DESCRIPTION

(DESCRIPTION AND BACKGROUND HISTORY INCLUDING CONSTRUCTION DATE(S), PHYSICAL DIMENSIONS, MATERIALS, MAJOR ALTERATIONS, EXTANT EQUIPMENT, AND IMPORTANT BUILDERS, ARCHITECTS, ENGINEERS, ETC.)

100

After 4 years of planning, Zion - Mt. Carmel Highway construction began in 1927 for the purpose of linking up Zion National Park, Bryce Canyon National Park, Cedar Breaks and the North Rim of the Grand Canyon of the Colorado. Running east from the Virgin River Bridge, the road forms a connecting link between U.S. Highways 9. and 89, and completed the tourist loop envisioned by the Utah Parks Company in the early 1920's. The old road network from Zion measured 159 miles to Bryce, 139 miles to Cedar Breaks and 142 miles to the Grand Canyon. Upon completion in 1930, the Zion-Mt. Carmel Highway cut the distance to 88, 70 and 116 miles respectively. Ironically, this highway promoted by the UPC facilitated increased automobile traffic which eventually took the place of railroad transportation to the parks.

At the time of the dedication ceremony on July 4, 1930, 8 1/2 miles of highway, constructed at a cost of $1,440,000 (including the tunnels) to the Federal Government, were located within the boundaries of Zion National Park. The remaining 16 1/2 miles was a Federal Aid project and had been constructed at the joint expense of the United States and the State of Utah. Presently, the Highway extends for approximately 10 miles from the Zion Lodge turnoff to the Park's eastern border, located 1/2 mile beyond the East Entrance Visitor Contact Station. In addition to the Zion-Mt. Carmel Tunnel and the Pine Creek Bridge (inventoried in seperate "LCS Reports") other man-made structures located on the Park portion of the Highway include: a 1/10 mile long, rock-faced tunnel located approx. 1.2 miles to the east of the greater tunnel's east entrance; two 20 yard bridges with decorative concrete pylons; numerous galvanized pipe and sandstone culverts; and hundreds of cubic yards of random ashlar masonry retaining walls.

Six switchbacks cut into the soft sandstone of Pine Creek Canyon allow the roadway to drop 800' in its 3 1/2 mile course from the west end of the Zion-Mt. Carmel Tunnel to the floor of Zion Canyon. The maximum grade is 6 percent. Due to frequent rock falls onto the highway, CCC personnel picked loose rocks from the slopes above the Highway in

SIGNIFICANT ARCHITECTURAL FEATURES (INCLUDING INTERIOR AND SETTING) FOR PARK PLANNING PURPOSES:

the early 1930's. Rock falls are still a road hazard today. Several pulloffs where scenic views may be enjoyed were constructed along the Highway in 1968.

The nomination "Multiple Resources for Zion National Park" included the evaluation of a number of linear resources in the park, among them the Floor of the Valley Road (referred to in the documentation as the "Zion Canyon Scenic Drive") and the Zion-Mt. Carmel Highway. At that time, the decision was made to nominate only one park road, the Zion-Mt. Carmel Highway, under the context of "Landscape Architecture and Transportation." This road possesses obvious and outstanding qualities with regard to the areas of landscape architecture and engineering. This original evaluation did not recommend listing the Floor of the Valley Road because it "did not present significant civil engineering challenges" during its construction (see Item 7 page 5, original nomination cover form). In addition, although not mentioned in the original nomination, the built landscape features along the road are far more modest than those along the Zion-Mt. Carmel Road, perhaps another reason the surveyor deemed it less significant.

Subsequent research on the park road system, in particular the 1993 work of Historic American Engineering Record (HAER) historian Michael F. Anderson, has provided additional data which documents the historic significance of the Floor of the Valley Road and justifies its reevaluation. As the Zion National Park's first official road, and as an important link in a 465-mile "circle tourism route" cooperatively developed by the Union Pacific Railroad and the National Park Service in the 1920s and early 1930s, the road is now clearly eligible under National Register criterion A.

Also since the original nomination, much more research has been published on historic landscape design philosophy and practices of the National Park Service (NPS), most notably in NPS historian Linda McLelland's *Presenting Nature: The Historic Landscape Design of the National Park Service, 1916 to 1942* (1993). Such work has raised the awareness of cultural resource managers to some of the more subtly-executed park developments of roads and trails. The concern for providing visitor access to park areas while minimizing the impact to the landscape underlay the design, construction and revegetation efforts made throughout the National Park Service in the road building activities pre-dating World War II. The Floor of the Valley Road, while not possessing significant "engineering challenges," was designed and constructed according to these principles of harmonious design and retains a high degree of integrity and ability to convey those principles. Additional documentation on the road (and associated features) and one associated structure, the Cable Creek Bridge, accompanies this addendum as two individual nominations.

NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

1. Name of Property

HISTORIC NAME:
Floor of the Valley Road

OTHER NAMES/SITE NUMBER:
Floor of the Valley Highway; Zion Canyon Scenic Drive; Rt. 2; RT-0996 (park number)

2. Location

STREET & NUMBER: Located in Zion Naticnal Park, off of State Highway 9; beginning at the junction with the Zion-Mt. Carmel Highway, the road follows the North Fork of the Virgin River along the floor of Zion Canyon.

CITY OR TOWN: Springdale ___ **NOT FOR PUBLICATION**
PARK NAME: Zion X **VICINITY**
STATE: Utah, UT **COUNTY:** Washington **CODE:** UT053
ZIP CODE: 84767

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this ____ nomination _X_ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ____ meets ____ does not meet the National Register Criteria. I recommend that this property be considered significant ___ **nationally** ___ **statewide** _X_ **locally.**

_____ _____
Signature of certifying official/Title Date

National Park Service
Federal Agency

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

_____ _____
Signature of certifying official/Title Date

Utah State Historic Preservation Office
State Agency

4. National Park Service Certification

I hereby certify that this property is: Signature of Keeper/Date of Action

____ entered in the National Register.
___ See continuation sheet. _____

____ determined eligible for the National Register.
___ See continuation sheet. _____

____ determined not eligible for the National Register. _____

____ removed from the National Register _____

____ other, (explain): _____ _____

_____

5. Classification

Ownership of Property

__ private
__ public-local
__ public-State
X public-Federal

Category of Property

__ building
__ district
__ site
X structure
__ object

Name of related multiple property listing
Zion National Park MRA

Number of Resources within Property

Contributing	Noncontributing	
0	0	building
0	0	sites
1	0	structures
0	0	objects
1	0	Total

Number of contributing resources previously listed in the National Register 0

6. Function or Use

Historic Functions

Category:	Subcategory:
TRANSPORTATION	Road-related: park road

Current Functions

Category:	Subcategory:
TRANSPORTATION	Road-related: park road

7. Description

Architectural Classification:
N/A

Materials

foundation	N/A
walls	N/A
roof	N/A
other	road bed: asphalt over gravel road base

NARRATIVE DESCRIPTION (SEE CONTINUATION PAGES)

8. Statement of Significance

Applicable National Register Criteria

X A Property is associated with events that have made a significant contribution to the broad patterns of our history.
__ B Property is associated with the lives of persons significant in our past.
X C Property embodies the distinctive characteristics of a period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
__ D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

__ A owned by a religious institution or used for religious purposes.
__ B removed from its original location.
__ C a birthplace or a grave.
__ D a cemetery.
__ E a reconstructed building, object, or structure. structure.
__ F a commemorative property.
__ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
Landscape Architecture
Transportation

Period of Significance 1932-1942

Significant Dates 1932; 1940-1942

Significant Person N/A

Cultural Affiliation N/A

Architect/Builder

Bureau of Public Roads	Engineer
Merrit, Chapman and Scott Inc.	Builder
Civilian Conservation Corps	Builder
Carnes, W. G.	Landscape Arch.
Cornell, H.	Landscape Arch.

Narrative Statement of Significance (SEE CONTINUATION PAGES)

9. Major Bibliographical References

Bibliography (SEE CONTINUATION PAGE)

Previous documentation on file (NPS)

__ preliminary determination of individual listing (36 CFR 67) has been requested.
X previously listed in the National Register
__ previously determined eligible by the National Register
__ designated a National Historic Landmark
__ recorded by Historic American Buildings Survey

X recorded by Historic American Engineering Record
UT-73

Primary Location of Additional Data:

__ State Historic Preservation Office
__ Other State agency
X Federal agency
__ Local government
__ University
__ Other

Name of repository:
Intermountain Field Area, Colorado Plateau System Support Office; Zion National Park Archives

10. Geographical Data

Acreage of Property 42.7

UTM References

	Zone	Easting	Northing	
A)	12	324870	4120620	Junction with State Highway 9
B)	12	325280	4121220	
C)	12	326170	4122510	
D)	12	327100	4125240	
E)	12	327300	4125710	
F)	12	327900	4126230	
G)	12	328100	4126700	
H)	12	327680	4126800	
I)	12	327630	4127250	
J)	12	327680	4127980	
K)	12	327440	4128090	Temple of Sinawava Parking Area

Verbal Boundary Description
The property is located in unsurveyed areas of Townships 40S and 41S and in Sections 10, 15, 21, and 22, T41S, R9W in Washington County. The boundary encompasses the road and 10 feet to either side, as well as all associated features described in this document.

Boundary Justification
The boundary of the road is drawn to include the road, its immediate setting, and all the historically associated improvements made to the road as described in this document. The boundary excludes the southern one and one-half mile portion of road which was realigned, and several features which have become physically isolated from the road due to realignment (e.g., Oak Creek Bridge and one retaining wall).

11. Form Prepared By

Name/title: Robert Sontag and Kathy McKoy, Historians
Organization: National Park Service Date: 8/15/1995
Street & number: 12795 W. Alameda Parkway, PO 25287 Telephone: 303-969-2760
City/town: Lakewood State: CO Zip: 80225-5287

Property Owner

Name: Zion National Park
Street: N/A telephone: (801) 772-3256
City: Springdale, Utah State: Utah Zip Code: 84767-1099

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act as amended (16 U.S.C. 470 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reduction Projects (1024-0018), Washington, DC 20503.

DESCRIPTION

The Floor of the Valley Road is a paved, two-lane scenic park road, located in Zion National Park in southwestern Utah. Zion Canyon is a narrow, deep canyon carved by the North Fork of the Virgin River. The nine mile long road, whose width varies from twenty-two to twenty-six feet, is flanked by towering sandstone cliffs (including the Great White Throne) and passes through a variety of ecological areas. Vegetation includes Fremont cottonwoods, willows and velvet ashes.

The Floor of the Valley Road begins at the south park boundary and entrance station and continues north for one and one-half miles until just after it crosses the North Fork of the Virgin River. At the junction with the Zion-Mt. Carmel Highway, the Floor of the Valley Road branches off northward along the floor of Zion Canyon, closely following the alignment of the river on the east side, and terminating at the Temple of Sinawava. Only the seven and one-half mile portion from the Zion-Mt. Carmel junction to the terminus meets National Register criteria for listing.

The Floor of the Valley Road was designed and constructed to harmonize with its surroundings. This includes the usage of a red tinted chip-sealer on the roadbed itself and native sandstone blocks in construction of associated features. Road features include retaining walls, culverts and drop inlets, remnants of an original bridle trail, and six parking areas. Except for the bridle trail and the Grotto Parking Area, all contribute to the road's significance. In addition, there are two bridges historically associated with the early road, one located at Cable Creek and the other at Oak Creek. The Cable Creek Bridge retains integrity and is being individually nominated; Oak Creek Bridge lacks integrity and is discussed below. The road has been well-maintained and is in excellent condition.

The road surface consists of 2 inches average of cut-back plant mix asphalt and red chip-seal coat over 6 inches of crusher run gravel base. The red color of the chip-seal material is considered an important aspect of the road because it reflects and perpetuates the NPS landscape architects' initial intent to ensure minimum visual impact to the natural surroundings.

INTEGRITY

The one and one-half mile section of road that extends from the south entrance until just past the North Fork of the Virgin River Bridge is ineligible for listing due to poor integrity. In 1961-1962 this stretch of road was rebuilt following a different alignment, thus it no longer retains integrity of location, design, or workmanship. The point where the Floor of the Valley Road meets the Zion-Mt. Carmel Highway, known as Canyon Junction, was modified (also presumably during Mission 66) from a "Y"shaped

to a "T" shaped intersection. While the road does not retain its historic appearance at that particular location, this minor change does not erode the overall integrity of the road.

The remaining portion of the Floor of the Valley Road, and the majority of its associated features, retain a high degree of integrity. The road width has increased by four to eight feet, depending on the section. Otherwise, the road still appears much as it did when constructed. There have been minor modifications made, consisting mostly of routine maintenance, but these have not impacted the road's original design and appearance. The road has been carefully maintained to preserve its historic character, and strongly conveys the NPS design ethic of the 1930s.

Descriptions of contributing and noncontributing road features are described below.

CONTRIBUTING FEATURES

Culverts and Drop Inlets
There are forty-five culverts and drop inlets along the road which are either original structures or replacements patterned after the original design guidelines to minimize visual impact. These consist of stone headwalls and catchment basins with random laid ashlar stone with cement mortar pointing which feed into either a corrugated metal pipe or concrete box culvert. The dimensions for the headwalls from top to bottom vary from less than a foot to over 15 feet. The widths from side to side vary from 3 feet wide to over 15 feet. The rock wall portions are about 6 to 8 inches thick. Some of these have a metal grate over the up slope side of the road to prevent clogging by large rocks.

Retaining Walls
There are three retaining walls along the road, located between the entrance and Zion Lodge, constructed in random laid ashlar stone with cement mortar pointing. Dimensions for the walls from top to bottom vary from 5 feet to over 25 feet high. The width varies, end to end, from 50 to 150 feet. The stone is usually about 18 inches thick. Maintenance and repairs to the walls have been done sympathetically and have not resulted in a loss of integrity.

Temple of Sinawava Parking Area
The Temple of Sinawava Parking Area is located at the terminus of the Floor of the Valley Road. It is a one-way parking loop, approximately 420 feet long and 200 feet wide at its widest point, with parking spaces located on either side of the road. The entire parking area has red ashlar sandstone curbing along its inner and outer perimeter. The curbing was built to specifications that required 6" to 1' lengths of dressed stone to be approximately 9" high (above parking area grade) and 8" wide. Surrounding

the outside perimeter, are 5-foot wide gravel walkways which lead to the Gateway to the Narrows Trail. The east end of the parking area was expanded in the 1960s, when some of the original curbs were relocated to accommodate the construction of additional parking spaces. As the original curbing was reused and the expansion did not significantly alter the design of the parking area, it still retains sufficient integrity to be a contributing feature to the Floor of the Valley Road.

Red Point Parking Area
This 164-foot long, 68-foot wide semicircular parking area is separated from the road by a 20-foot wide crescent shaped island. The entire parking area is curbed with red ashlar sandstone curbing (which follows the same design specifications as the Temple of Sinawava Parking Area) and has a gravel walkway on the south and west side of the parking area.

Great White Throne Parking Area
This 180-foot long and 30-foot wide semicircular parking area is separated from the road by a 10-foot wide baguette shaped island. The entire parking area is curbed with red ashlar sandstone curbing (which follows the same design specifications as the Temple of Sinawava Parking Area) and is surrounded with 5-foot wide asphalt walkways. A stone stairway is located on the south side of the parking area, leading to the viewing area.

Weeping Rock Parking Area
This 230-foot long and 150-foot wide (at its widest point) teardrop shaped parking area is connected to the road by a single, two-lane driveway approximately 50 feet long. The parking area has red ashlar sandstone curbing (which follows the same design specifications as the Temple of Sinawava Parking Area) and is surrounded with 5-foot wide walkways (surfacing varies - gravel, asphalt, concrete). Two small islands jut into the parking area from the northeast and southeast. Two stone stairways lead from the parking area down to Cable Creek. Built in the 1970s, these are nonhistoric. Also located between the parking area and Cable Creek (but not visible from the parking lot) are several retaining walls. Additions were made to the original walls in the 1970s, approximately doubling their original height. Constructed or modified using compatible materials, the stairways and walls are nonintrusive to the setting, but are also considered noncontributing features of the parking area. A path leads from the south side of the parking area across a stone bridge and to Weeping Rock Trail (both previously listed on the National Register).

Court of the Patriarchs Parking and Viewing Area
This 220-foot long and 44-foot wide semicircular parking area is separated from the road by a 12-foot wide baguette shaped island. The entire parking area (including the island) has red ashlar sandstone curbing which follows the same design specifications as the Temple of Sinawava Parking Area.

There are no sidewalks around the parking area, only an approximately 150' long, 6' wide trail to the viewing area. (An original stone stairway that once led to the trail was removed in the 1960s.) The asphalt surfaced trail (once gravel surfaced) has sandstone curbing. The trail terminates at a circular viewing area, about 15' in diameter, and interpretive display. The parking area, and associated trail and viewing area are all part of the original design and are considered contributing features.

NONCONTRIBUTING FEATURES

Zion Lodge Entry Area
Originally constructed along with Zion Lodge by the Union Pacific Railroad in 1925, the loop drive historically provided vehicular access to the lodge entry, with a spur road off to a parking area for guests at lodge cabins (located south of Zion Lodge, referred to as the "Western Cabins"). The design for the layout of the lodge and cabins were prepared by the NPS Landscape Engineering Division in December 1924. This plan did not include the construction of parking areas, and we do not know how closely the plans were followed during actual construction.

The earliest "as constructed" site plan available, dated July 1934, indicates that a large rectangular parking area was constructed to the west of the guest cabins. A gravel walkway lined the parking area on its east side, closest to the cabins. This parking area still exists (slightly expanded) and is lined with sandstone curbing, similar to other parking areas associated with the Floor of the Valley Road. In addition, a swimming pool and bathhouse were prominently located in front of the lodge, connected to it by a walkway. Lawn was planted inside the area circumscribed by the loop drive, with the exception of a small, semi-circular area in the immediate vicinity of the lodge entrance. This area was planted in cacti. Scattered cottonwoods also grew within the drive area. To the north of the lodge, along the drive, there appears to have been a second parking area, considerably smaller than the one in front of the guest cabins.

A 1947 map indicates plans to construct a parking area immediately south of the swimming pool. This parking area was soon constructed, as it appears on a 1954 site map of the area. After the main lodge was destroyed by fire in 1968, the lodge was rebuilt. The swimming pool and bathhouse (and presumably the walkway) were removed in 1974. In the mid-1980s, the portion of the loop that was in front of the lodge was closed to vehicular traffic and replaced with concrete patio and pedestrian walkways. A new, larger parking area was built in the vicinity of the pool site (see "A" on 1982 site map) and a much larger, teardrop-shaped lot was superimposed over the parking area north of the lodge (see "B" on 1982 site map). In addition, the parking area at the guest cabins was lengthened on the north end (see

"C" on 1982 site map). Of all the features in the entry area, only this last parking lot retains any degree of integrity. Because of its historical association with the lodge guest cabins, it is considered a contributing landscape feature to the Zion Lodge Historic District rather than the Floor of the Valley Road (an amendment to the district nomination should be prepared at a later date). The Zion Lodge Entry Area does not meet National Register criteria as a designed landscape, nor is it a contributing feature to the Floor of the Valley Road due to loss of integrity.

Grotto Campground/Picnic and Parking Areas
The original Grotto Campground was modified into a picnic area in the 1960s. A vehicular drive and parking area were superimposed over the campground and all original camping sites were obliterated. At the same time, a second rectangular parking area was constructed directly across the road. Both parking areas allow visitor access to the Emerald Pools and East Rim trails. Other than two comfort stations (already listed on the National Register), there only water spigots remain to indicate the area's earlier use as a campground. Fire hearths installed by the CCC in the 1930s have been removed. The campground area no longer retains its historic appearance as a campground and is ineligible for the National Register, either as a designed campground or as a contributing road feature. Both parking areas are nonhistoric and are thus noncontributing road features.

Bridle Trail
Sited between the Floor of the Valley Road and the North Fork of the Virgin River, the gravel surfaced bridle trail was constructed in 1931 when work was begun on the Floor of the Valley Road. The original trail was just under 4 miles long and seven feet wide, constructed "in order that park visitors can walk or ride horseback in the narrow canyon without interference from automobile travel" (Aug. 31, 1931 report, Superintendent to the NPS Director). Its alignment paralleled the road, traversing up the canyon floor to the Temple of Sinawava. The trail's proximity to the road varied from being right next to it, to meandering as much as one-quarter mile away. The trail has suffered numerous changes through time: large portions have been washed out by floods, some sections have been incorporated into other trail systems, while others have been abandoned. Consequently, the trail no longer retains historic integrity. It is not considered a contributing feature to the road, nor is it individually eligible.

Oak Creek Bridge
The 1926 Oak Creek Bridge is located a one-quarter mile north of the current boundary and one-eighth of a mile east of the present day Floor of the Valley Road. The bridge is of a common construction with a concrete slab and nine post on each side with dual four-inch round metal rails

connecting the concrete post to form a guardrail. On the east side of the bridge is suspended a metal half pipe flume which carries irrigation water from the Crawford water diversion ditch to the South Campground. The bridge no longer retains its historic association with the Floor of the Valley Road. The section of road it is located on was realigned in 1961 leaving the original section functioning as an access road to the administrative parking area. Because it is no longer associated with the historic road, and lacking engineering and architectural significance, the bridge does not meet National Register criteria for listing. The rerouted portion of the road also lacks integrity due to change in alignment; both road and bridge are located outside the boundary drawn around the eligible section of road.

Revetments, North Fork of the Virgin River

The river revetments, located in Zion Canyon along the North Fork of the Virgin River, consists of a series of basket dams occurring along the river's length. The revetments consist of hand-placed river stone, dredged from the bottom of the river bed, anchored with wire mesh. The 1931 construction of two 1,500-foot "rock dykes," according to Superintendent Thomas, "enabled construction of the new road past the lodge on a new alignment, allowing it to follow the river to a point near the public campground, thus making available for parking and construction purposes a large area which formerly was a part of the river channel." Like other building activities in the park, their placement and installation was overseen by the Western Office of Design and Construction (later, the Bureau of Plans and Design) and their construction was executed by the Civilian Conservation Corps. This form of river control was, and still is, quite common. The revetments are physically associated with the river, rather than the road (except at locations the river channel has changed and left them "high and dry"). They do not contribute to the road's significance.

SUMMARY OF CONTRIBUTING AND NONCONTRIBUTING ROAD FEATURES:

Contributing	Noncontributing
Floor of the Valley Road	Zion Lodge Entry Area
Culverts and drop inlets	Grotto Campground/Picnic Area
Retaining walls	Bridle Trail
Parking areas:	Oak Creek Bridge
Temple of Sinawava	Revetments
Red Point	
Great White Throne	
Weeping Rock	
Court of the Patriarchs	

STATEMENT OF SIGNIFICANCE

Summary

The Floor of the Valley Road is associated with the Zion National Park multiple property nomination theme "Landscape Architecture and Transportation" (see Zion National Park Multiple Resource Area nomination, listed 1987). The road is eligible for listing at the local level of significance under criterion A, for its association with the early park development of its transportation system, and under criterion C, as design and placement clearly illustrate the design philosophy of road construction developed by National Park Service landscape architects in the Western Office of Design and Construction during the late 1920s and early 1930s. The period of significance dates from 1932, when the 1925 road was replaced by the current road, to 1942, when additional road features were completed. Significant dates are 1932, the road's date of construction, and 1940-1942, when additional parking areas were built.

Expanded Statement of Significance

The Floor of the Valley Road is the final generation of three roads to carry automobile traffic up the canyon. When President William H. Taft signed the presidential proclamation establishing Mukuntuweap National Monument in 1909 (to be designated Zion National Park in 1919) only a primitive wagon road provided access into the canyon.

In the 1916, Congress allotted $15,000 for construction of a new road. Engineer W. O. Tufts, was sent from Washington D.C. to survey the new road. By the summer of 1917 the first automobile road into the canyon was completed. This barely passable dirt road carried visitors as far as the Cable Works at what is now the Weeping Rock Parking Area. This road, along with the Wylie tourist camp, and the new Union Pacific depot at Lund, Utah helped to establish the development of automobile touring in Zion.

In 1925, a new gravel surfaced road was constructed, called the "Government Road," at a cost of $70,000. It began at the park's south entrance (at that time just below the North Fork of the Virgin River Bridge), continued north up the canyon, and terminated at the Temple of Sinawava. The completion of the road coincided (by design) with Union Pacific's construction of a spur line from Lund to Cedar City, and with their building of a new hotel in Cedar City and a new lodge in the park. These improvements marked the advent of a new era for Zion National Park tourism. Segments of the old Government Road can still be seen on the east slope of the canyon, up slope from the present road.

In addition to improving visitor access to the park, construction of the Government Road inaugurated the beginning of ten years of close cooperation between the National Park Service and the Union Pacific Railroad to bring

visitors to the parks of the Colorado Plateau. Known as the "Grand Circle," this tourism route looped through Southern Utah and Northern Arizona transporting tourists to Zion, Grand Canyon, and Bryce Canyon national parks; Cedar Breaks and Pipe Spring national monuments, and the Dixie, Powell, and Kaibab national forests. The Union Pacific transported tourists by train to the station in Cedar City, where passengers then paid a flat fee to take an automobile excursion through the loop. En route, they stayed at park lodges at Zion, Grand Canyon, and Bryce Canyon, all built and owned by Union Pacific. The automobile portion of the loop could take anywhere from three days to two weeks, depending on the preferences of the customer.

The present day Floor of the Valley Road was constructed from 1931 to 1932 (also referred to as the "Zion Canyon Scenic Drive"). The reconstruction of the road was part of the emergency employment program initiated by Congress in response to the Great Depression, even prior to President Franklin D. Roosevelt's public work programs. Superintendent Thomas J. Allen Jr. conveyed to the NPS Director in his August 29, 1931 report that "a road of modern standards [had been] substituted for the old unsatisfactory canyon road" and that the project "helped very materially in relieving unemployment conditions in this section."

The new road was located further down the canyon wall, closer to the canyon floor, hence the name. It continued approximately one mile further south to the new southern boundary (additional land having been acquired in 1931). Road design and construction followed the strict guidelines developed by the NPS Western Office of Design and Construction (WODC), Landscape Division.

The Western Office assigned landscape architect Harry Langley to work in Zion, Grand Canyon, and Bryce Canyon national parks and Cedar Breaks and Pipe Springs national monuments to ensure the office's design philosophy and guidelines were adhered. Langley reported to the Western Field Office but was to be responsive to park needs by assisting in the design and supervision of park projects (including the design and construction of the Floor of the Valley Road) while ensuring the preservation of the park's a natural appearance. Guidance from the WODC included guidelines on the design of the curbing, culverts, bridges, pullouts and overlooks, intersections, guardrails, river bank revetments, and the treatment of road banks, including placement of vegetation.

In addition to Langley's part-time supervision of landscaping issues, Thomas C. Parker, Associate Engineer from the Field Office, was appointed to supervise all construction work in the park during this time. According to the same 1931 report by Superintendent Thomas referenced earlier, Parker

"was in the park practically all summer supervising construction work in the park."

The project was constructed under two separate contracts at a total cost of $383,820.36. The first contract provided for the construction of 3.387 miles of gravel surfaced road, 18 feet wide, from the south entrance to a point 2,000 feet beyond Zion Lodge. The second contract covered the construction of 2.963 miles of gravel surface road, 16 feet wide, from the end of the first section to the Temple of Sinawava, and one masonry bridge at Cable Creek. In addition, a 3.7-mile long 7-foot wide bridle path was constructed on the embankment. Incorporated into the design were the already existing entry/parking area at the Zion Lodge and the loops for the Grotto Campground.

The Civilian Conservation Corps (CCC) was responsible for the work which took place during the remainder of the historic period (1933-1942). The modifications continued to be directed by landscape architects from the WODC, Landscape Division and its successor, the Branch of Plans and Design also located in San Francisco, California. Modifications to the road include: road bank sloping and planting done in 1933-1935 to disguise the cut and fill work required by the road; construction of several additional river revetments in 1934-1935; construction of the Temple of Sinawava Parking Area in 1934; and construction of the Court of the Patriarchs, Weeping Rock, Great White Throne, and Red Point (Now called Raspberry Point) parking areas in 1941-1942. The CCC was also responsible for the restoration of a road segment washed out after the sloughing of the slope dammed the river and forced it to change its course right through the roadbed in 1941. A similar event occurred again in the spring of 1995. At the present time, the Federal Highway Administration is planning to once again restore the roadbed to its original grade and location. The closing of the CCC Camps at Zion in July 1942 marked the end of Floor of the Valley Road construction projects during the historic period, and this year is the end-date for the road's period of significance.

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McClelland, Linda Flint
1993 *Presenting Nature: The Historic Landscape Design of the National Park Service, 1916 to 1942*

UNPUBLISHED SOURCES

Anderson, Michael F.
1993 "Zion National Park Roads And Bridges." Historic American Engineering Record (No. UT-72), Washington, D.C. Pages: 1 to 70

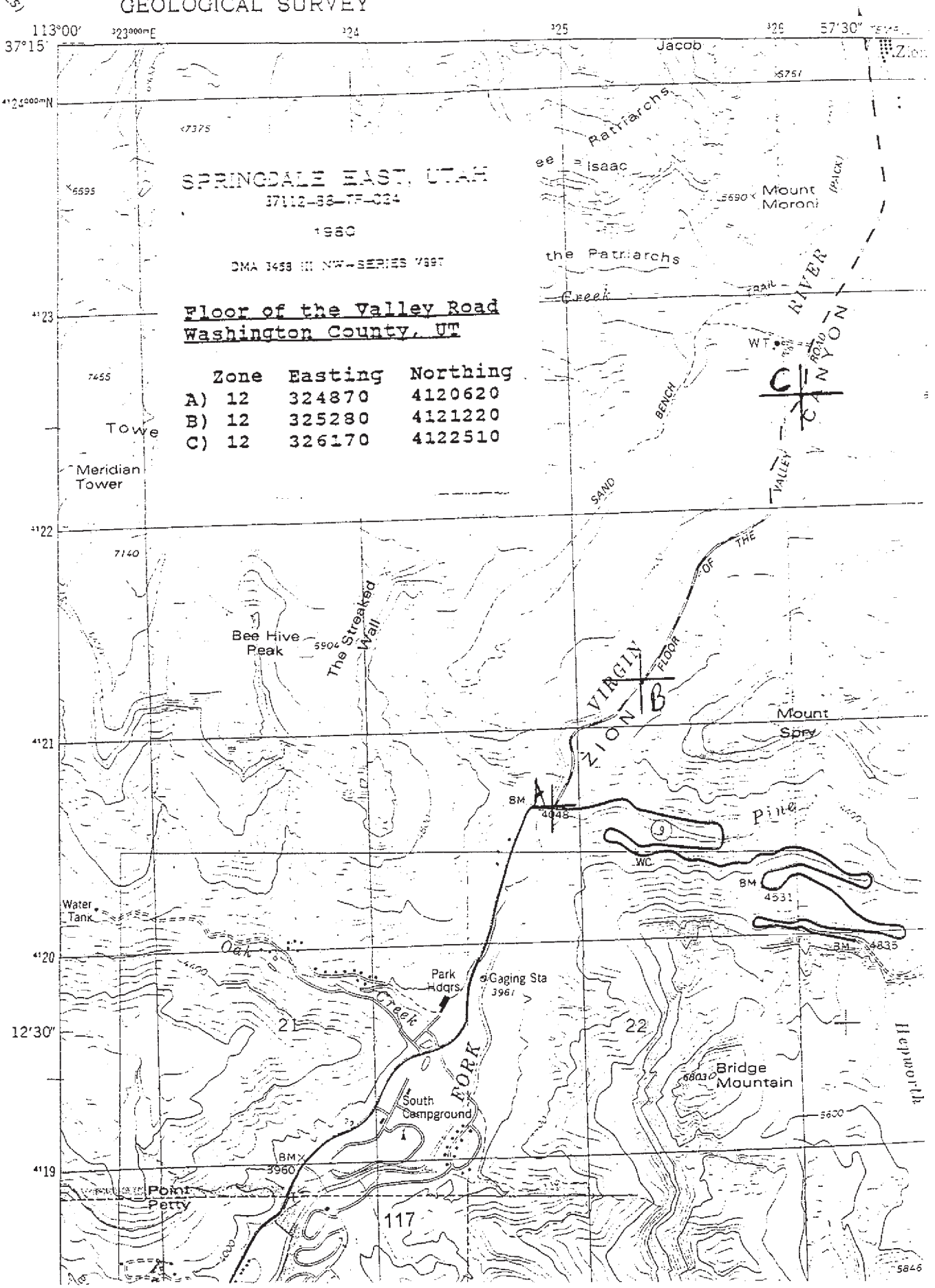
Harrison, Laura S.
1994 *By Motor Through Wonderland: Historic Roads in the National Park System* (draft). National Park Service, Denver, CO. Pages: 14 to 256

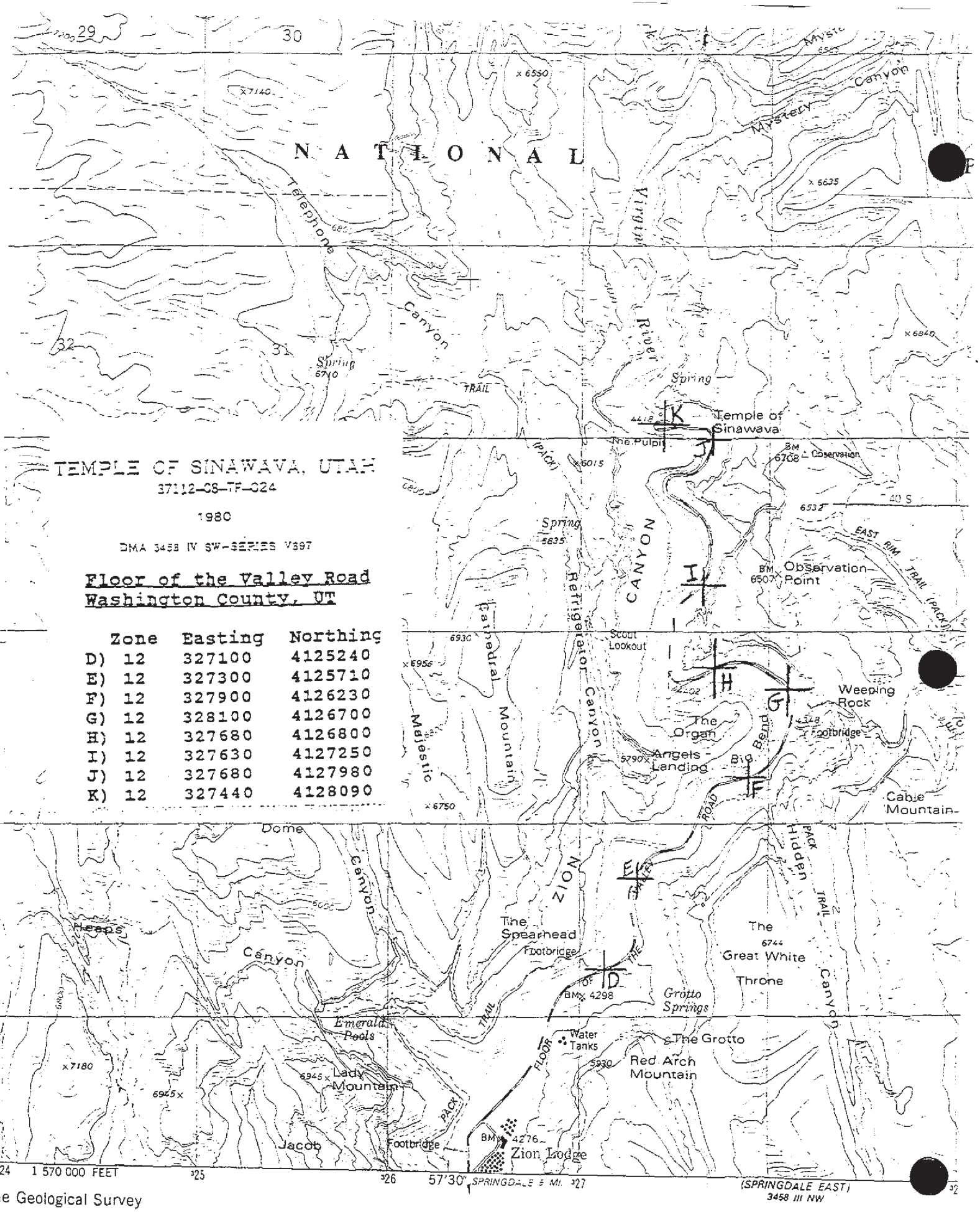
Jurale, Jim, and Nancy Witherall
1987 "Multiple Resources for Zion National Park." National Register nomination. National Park Service, Denver, CO. Pages: 7.4-7.5

Zion National Park archives: final construction reports, field reports, superintendents' reports, masterplans, drawings, and maps.

(THE GUARDIAN ANGELS) 3758 I SE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY





aerial photographs
d 1980

The following information applies to all photographs listed below:

1) Property: Floor of the Valley Road
2) Location: Zion National Park, Washington County, Utah
3) Photographer: Seyoha Harris
4) Date Taken: May-June 1992
5) Location of Negatives: Zion National Park Archives

PHOTO #	RESOURCE	DIRECTION OF VIEW
1.	Culvert Headwall/Retaining Wall	to north
2.	Concrete Lined Box Culvert	to northwest
3.	Retaining Wall	to north
4.	Spillway and Catchment Basin	to northeast
5.	Stone Catchment Basin and Culvert	to north
6.	Concrete Lined Drop Inlet	to east
7.	Bridle Trail Remnant	to northeast
8.	Great White Throne Parking Area, Steps down to trail	to north
9.	Great White Throne Parking Area, Shows the common construction details of all parking areas	to east
10.	Great White Throne Parking Area, Shows the common construction details of all parking areas	to northwest
11.	Concrete Lined Drop Inlet	to east
12.	Stone Catchment Basin and Culvert Headwall	to east
13.	Red Point Parking Area	to east
14.	Oak Creek Bridge	to northwest

Attached are the following architectural drawings and maps provided as supporting documentation:

Page No.	Title/Drawing No.	Date
1	Standard Detail of Stone Curbing, #3058	11/35
2	Curbing & Planting Plan for Parking Area, #3046 (Temple of Sinawava)	10/34
3	Parking Area Expansion, #41000 (Temple of Sinawava)	10/69
4	Red Point Parking Area, #3061-A	11/40
5	Great White Throne Parking Area, #2063A	2/41
6	Weeping Rock Parking Area, #2061	9/40
7	Court of the Patriarchs Parking Area, #2066	11/40
8	Union Pacific Camp Layout, #5 (Zion Lodge Entry/Parking Area)	12/24
9	Zion National Park, Topographic May, #2015 (Zion Lodge Entry/Parking Area)	7/34
10	Utilities Layout, Operator's Lodge, #5313 (Zion Lodge Entry/Parking Area)	10/47
11	Roadside Maintenance Plans, #2067 (Zion Lodge Entry/Parking Area)	1/54
12	Zion Lodge Development Plan	4/82
13	Grotto Campground (Picnic Area), #5078	1935
14	Map, Grand Circle Tourism Route (early development)	1926
15	Map, Grand Circle Tourism Route	1932

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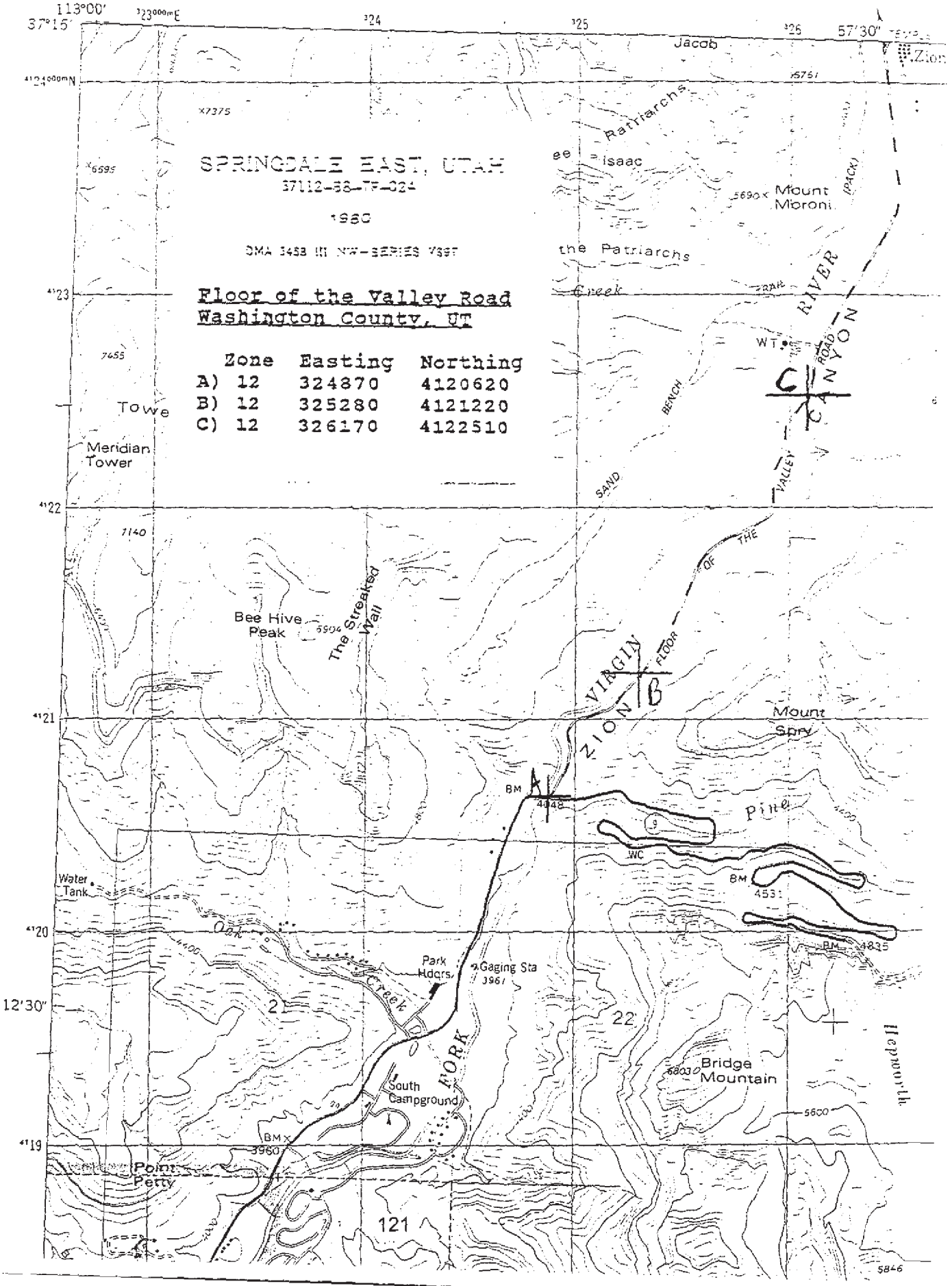
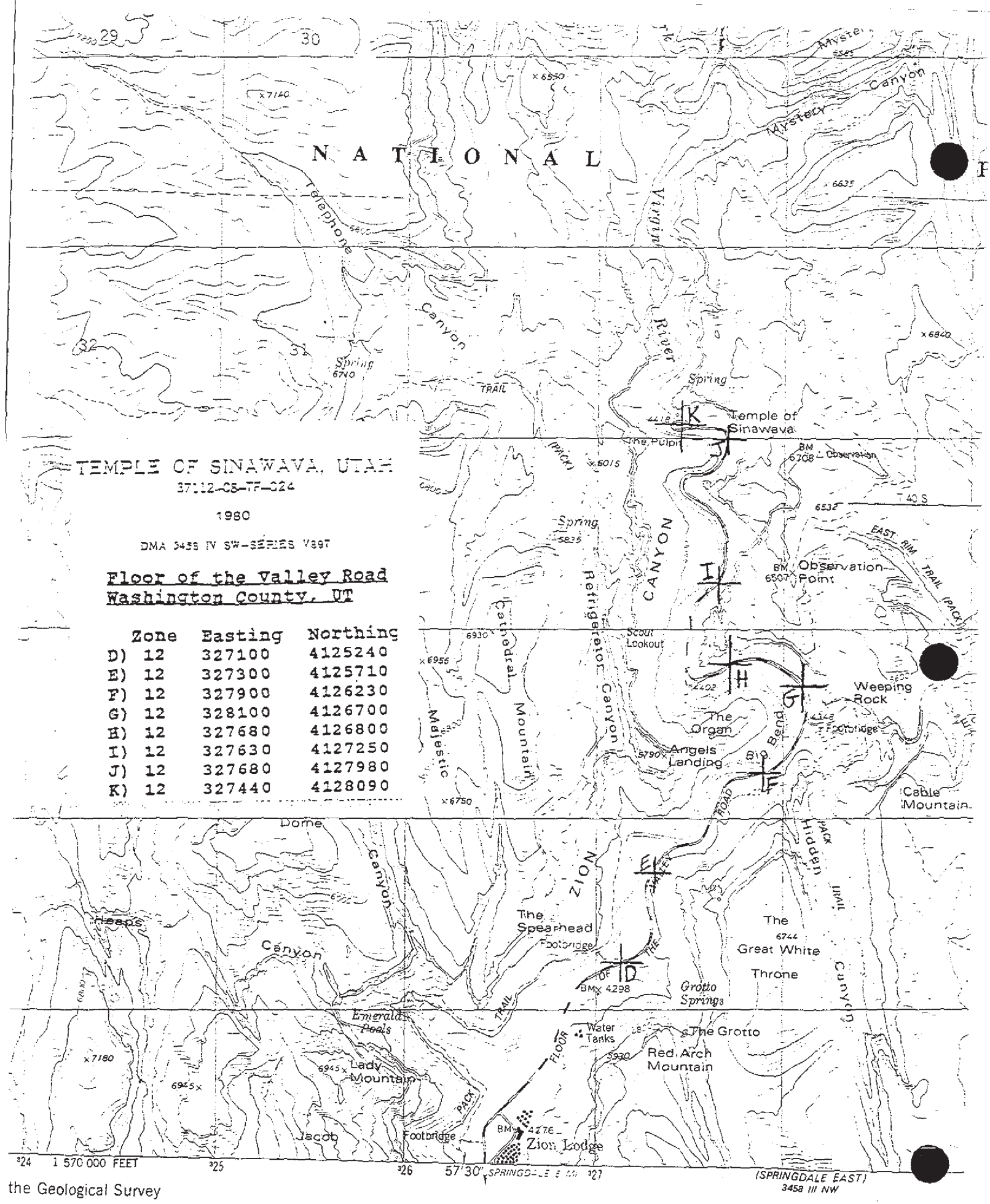
(THE GUARDIAN ANGELS)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY





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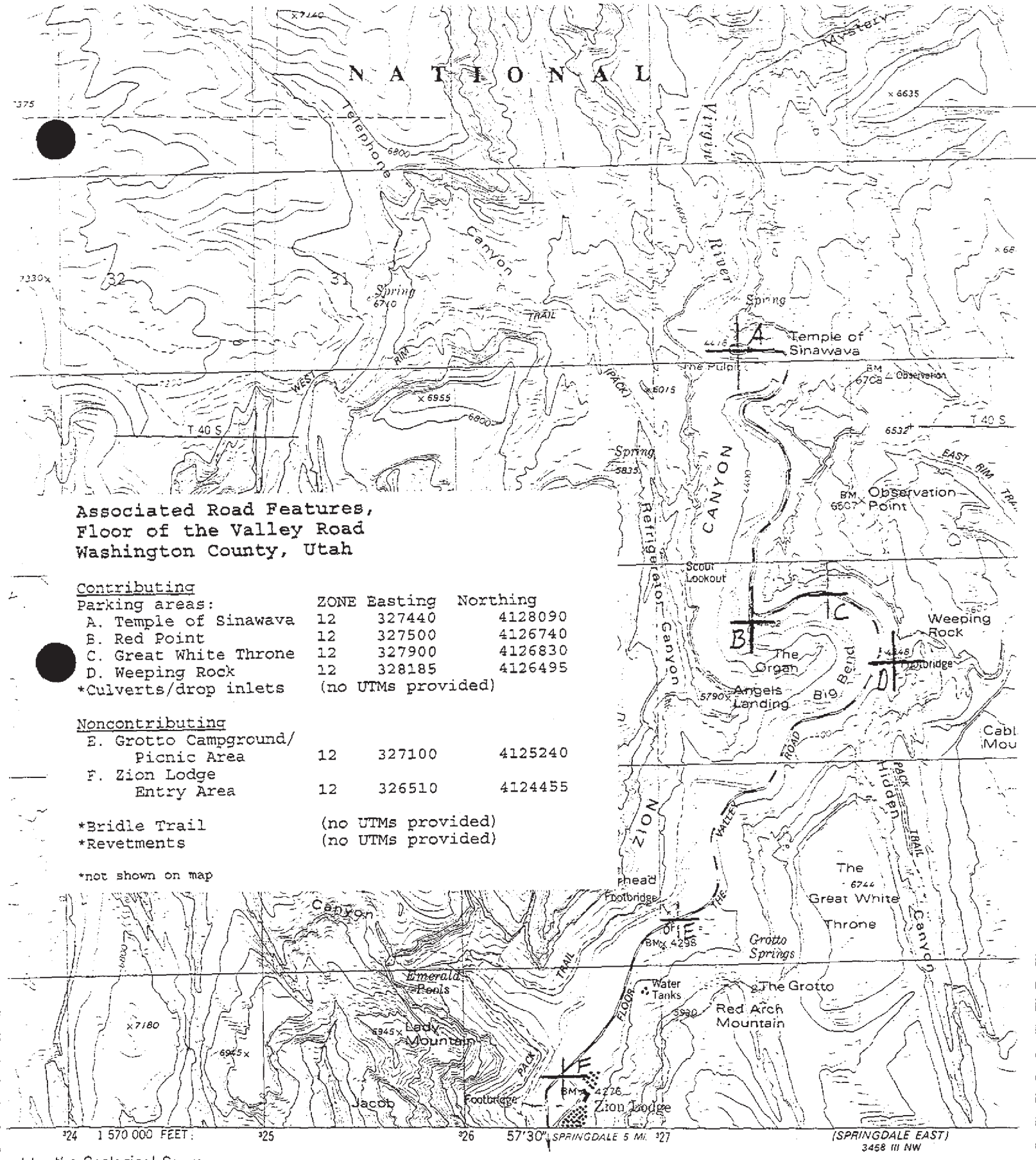

Associated Road Features,
Floor of the Valley Road
Washington County, Utah

	ZONE	Easting	Northing
Contributing			
Parking areas:			
A. Temple of Sinawava	12	327440	4128090
B. Red Point	12	327500	4126740
C. Great White Throne	12	327900	4126830
D. Weeping Rock	12	328185	4126495
*Culverts/drop inlets	(no UTMs provided)		
Noncontributing			
E. Grotto Campground/ Picnic Area	12	327100	4125240
F. Zion Lodge Entry Area	12	326510	4124455
*Bridle Trail	(no UTMs provided)		
*Revetments	(no UTMs provided)		

*not shown on map

ed by the Geological Survey

hods from aerial photographs
Map edited 1980

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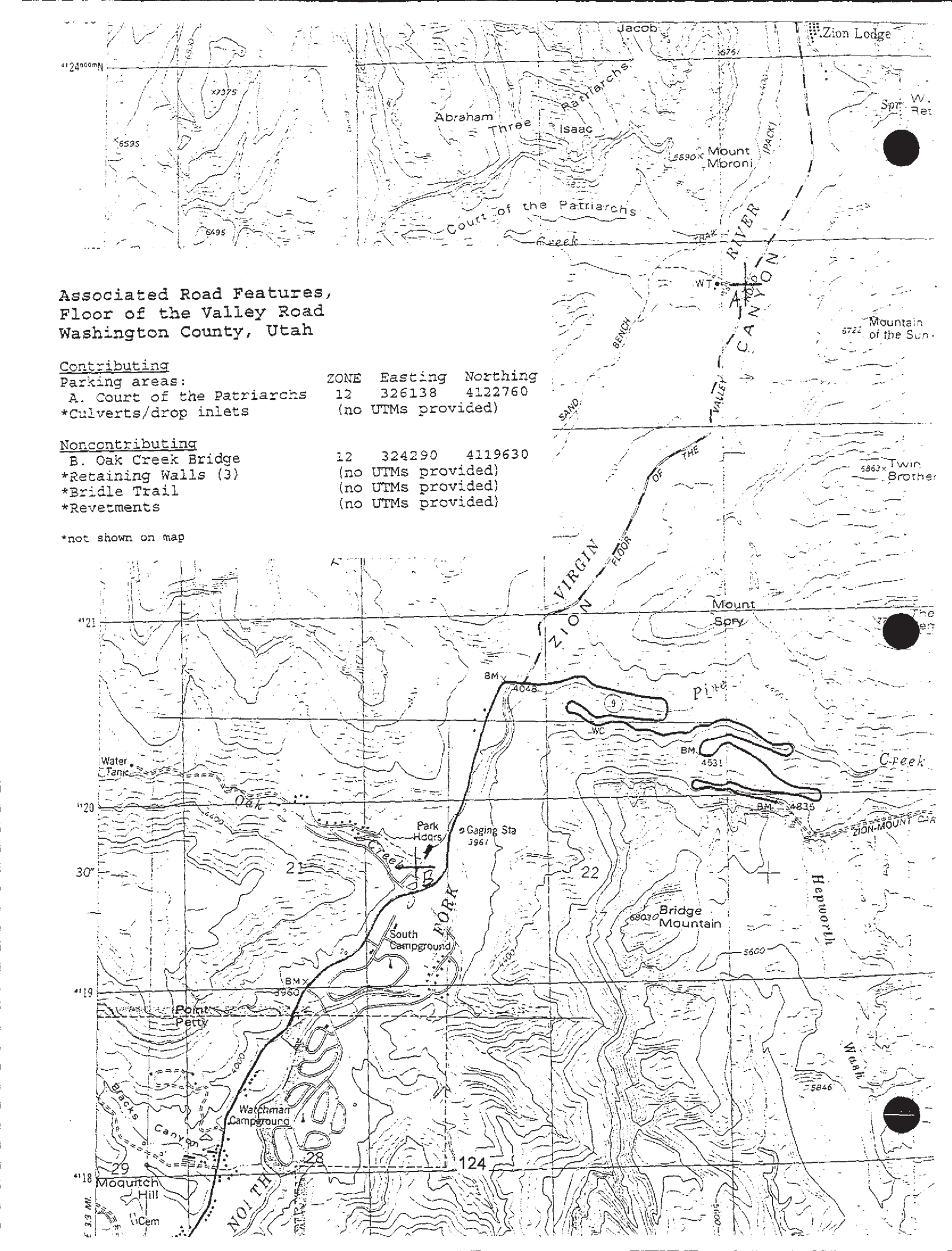
ercator grid, zone 12

erican Datum 1983

SCALE 1:24 000

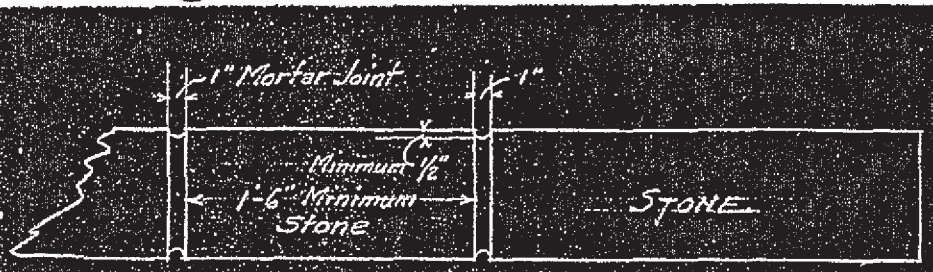
CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF



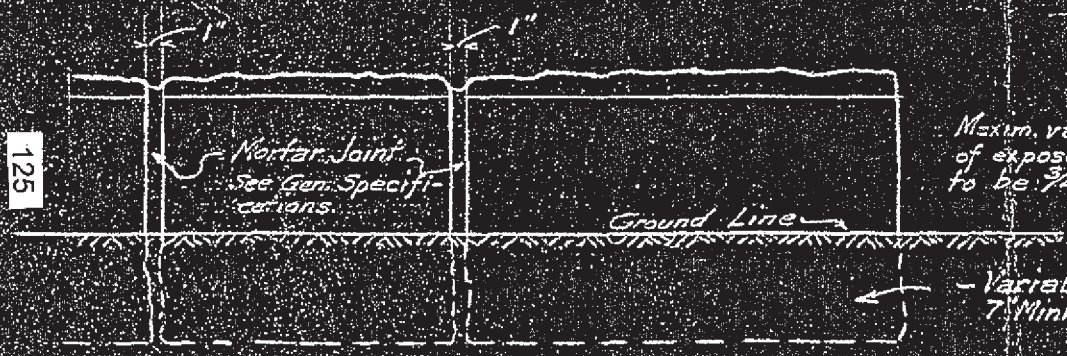
Associated Road Features, Floor of the Valley Road Washington County, Utah

	ZONE	Easting	Northing
Contributing			
Parking areas:			
A. Court of the Patriarchs	12	326138	4122760
*Culverts/drop inlets	(no UTMs provided)		
Noncontributing			
B. Oak Creek Bridge	12	324290	4119630
*Retaining Walls (3)	(no UTMs provided)		
*Bridle Trail	(no UTMs provided)		
*Revetments	(no UTMs provided)		

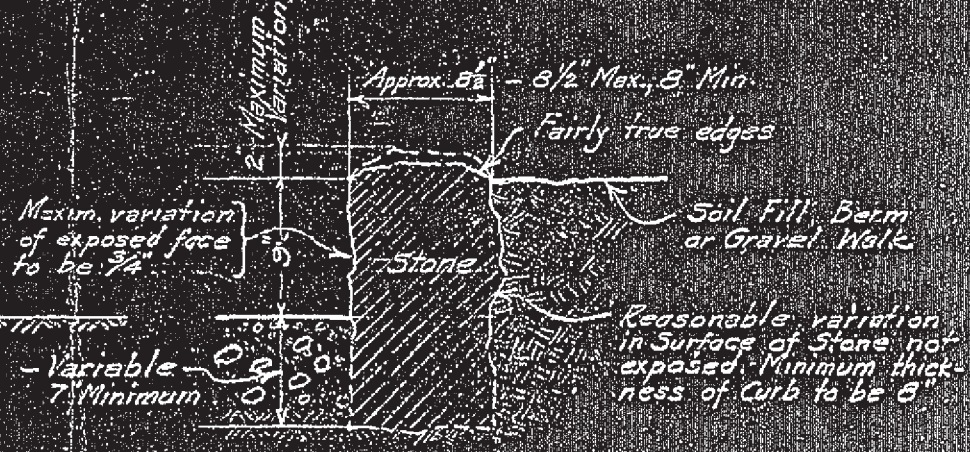
*not shown on map



PLAN OF CURB
Scale 1½"=1'-0"



ELEVATION
Scale 1½"=1'-0"



CROSS SECTION
Scale 1½"=1'-0"

GENERAL SPECIFICATIONS
Minimum length of Stone shall be 1'-6".
Average Mortar Joint shall be 1", none to be less than ¾" or greater than 1½".
All exposed Mortar Joints shall be raked out to a depth not less than ½" or greater than 1".

Note:– This is for Dressed Stone Curb only.

1-4-2

NO CHANGE IN EXISTING DESIGN

Same as E.C.W. Park Proj 17 Cl 132, 6th Per.

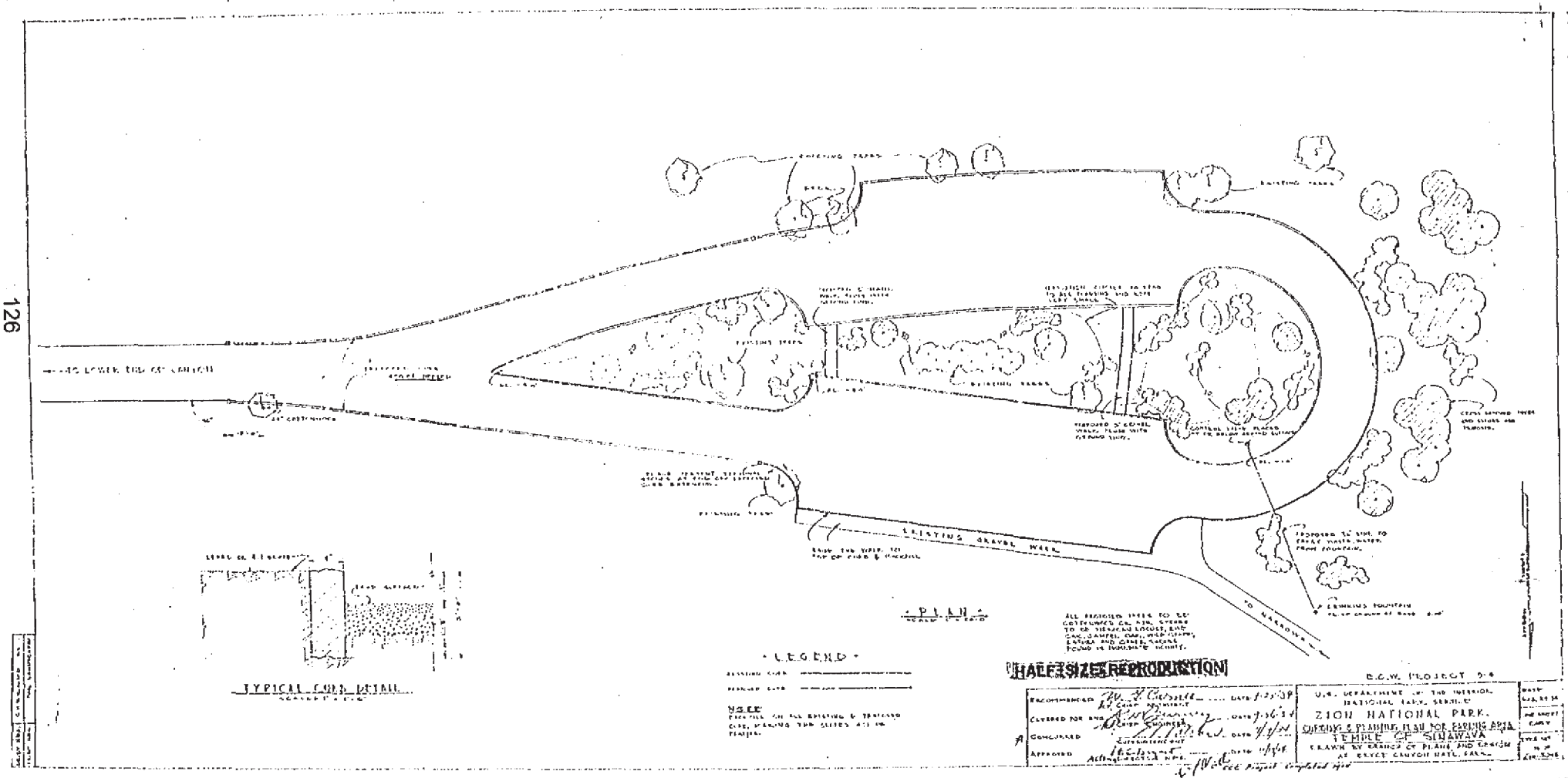
Cleared for F.W.A. 11-11-35

Recommended W. J. Carr Deputy Chief Architect — Date 11-4-35
Cleared for Eng. Acting Chief Engineer — Date 11-1-35
Concurred — Date
Concurred — Date 10/30/35
Approved Superintendent Director — Date 11-20-35

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
ZION NATIONAL PARK
STANDARD DETAIL OF STONE CURBING
Drawn By Branch of Plans and Design.

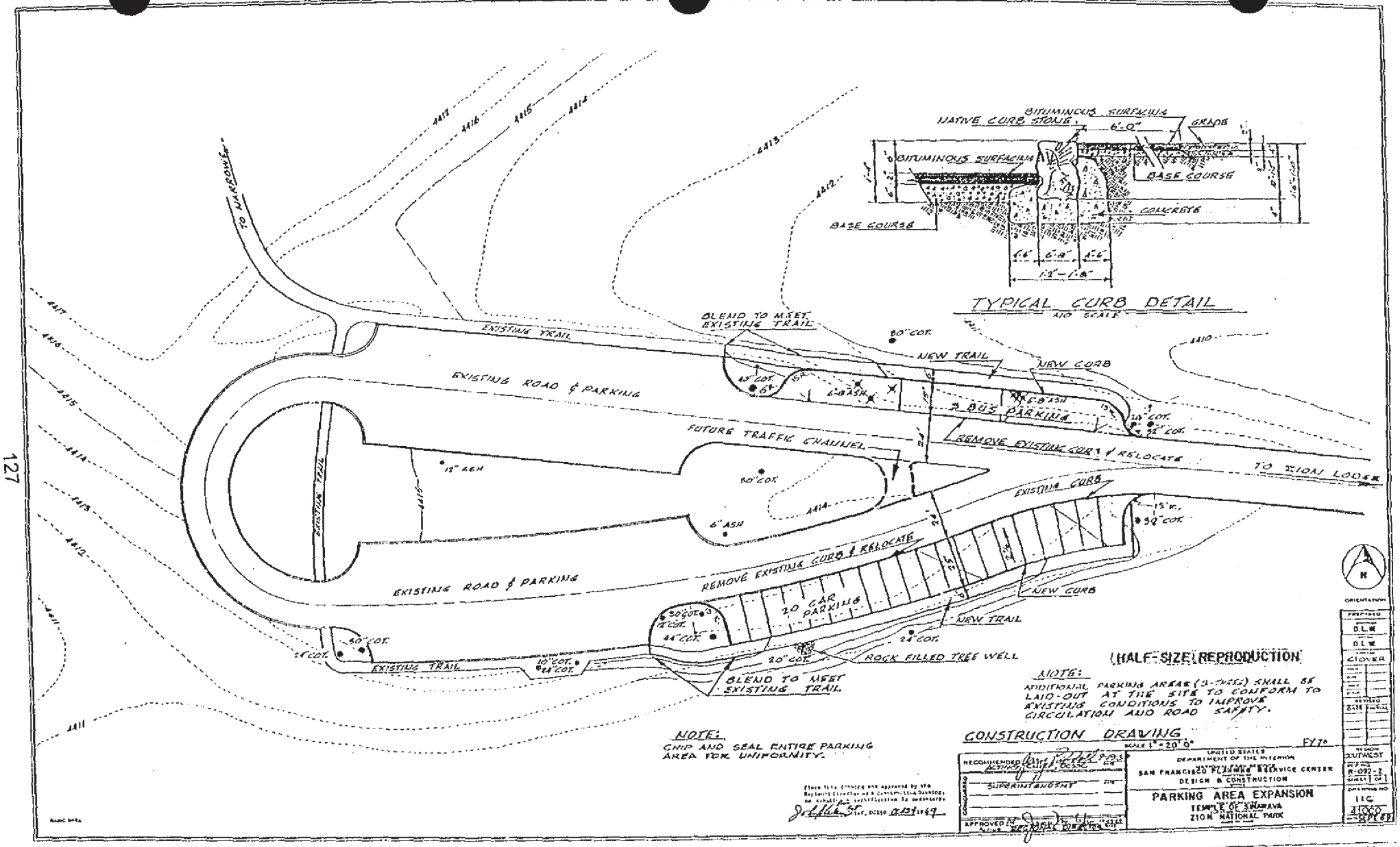
Date 10-30-35
Sheet No. 1
One Sheet
Drawing No. N.P. ZION-3058

125



Temple of Sinawava Parking Area, original design

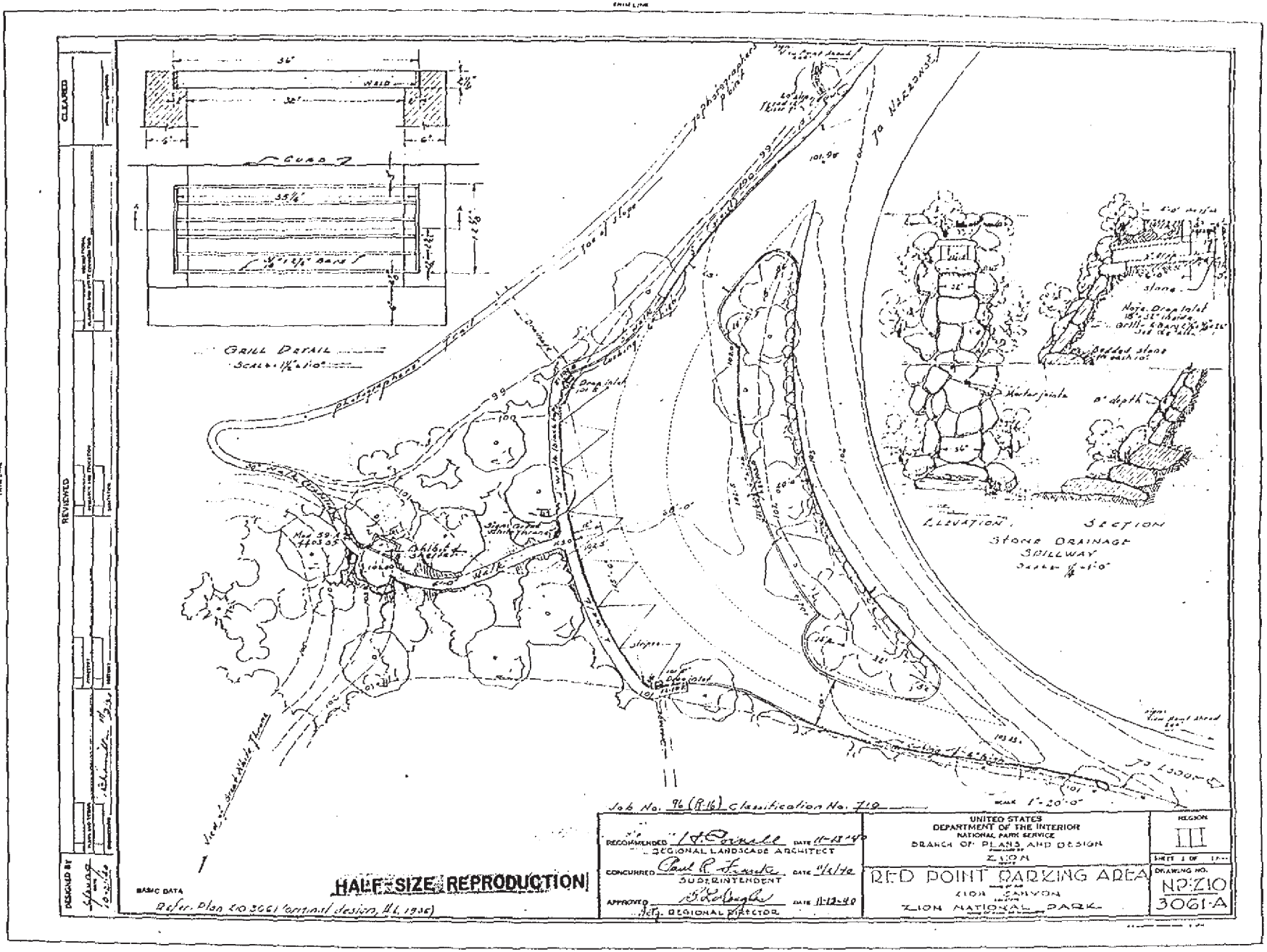
(2)

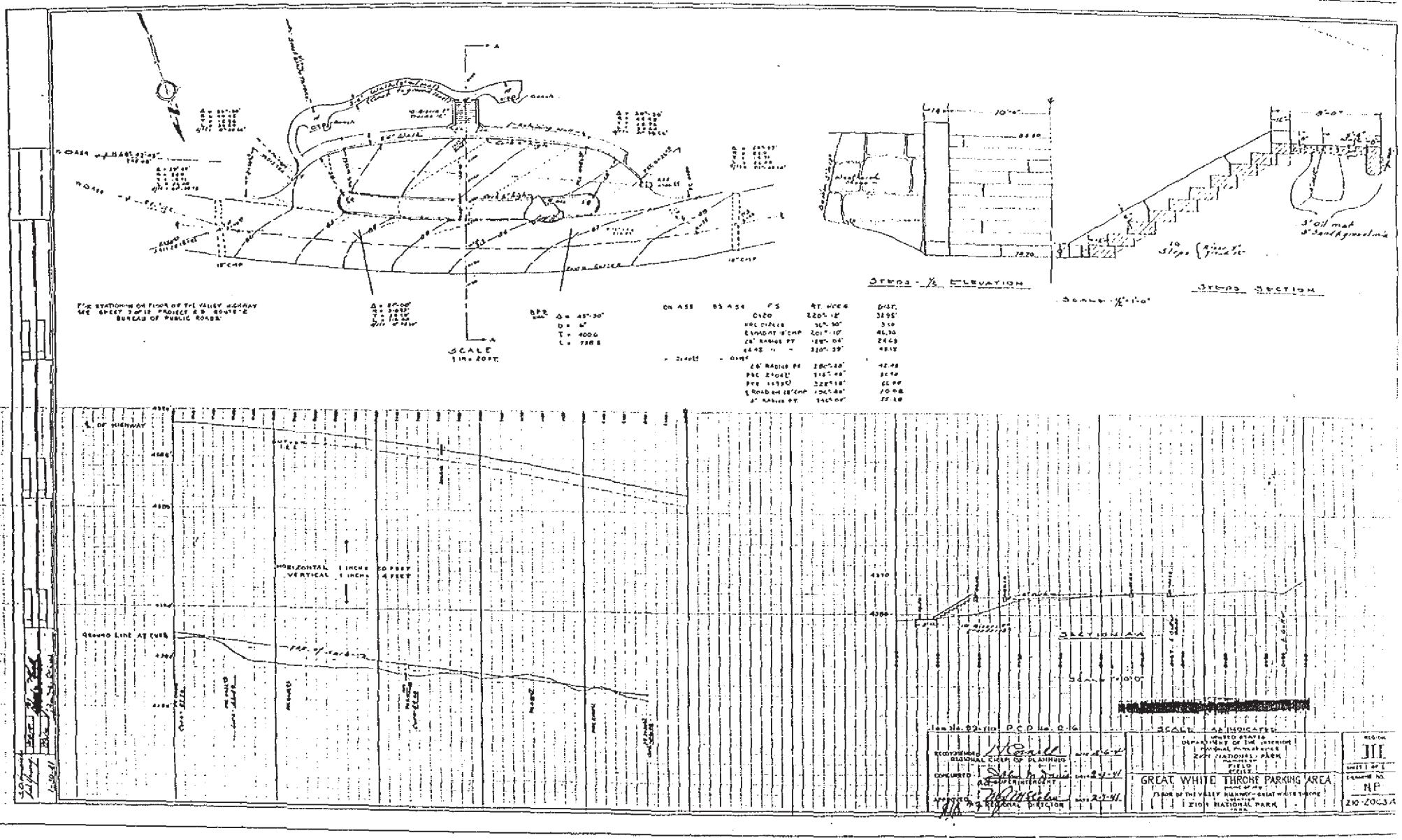


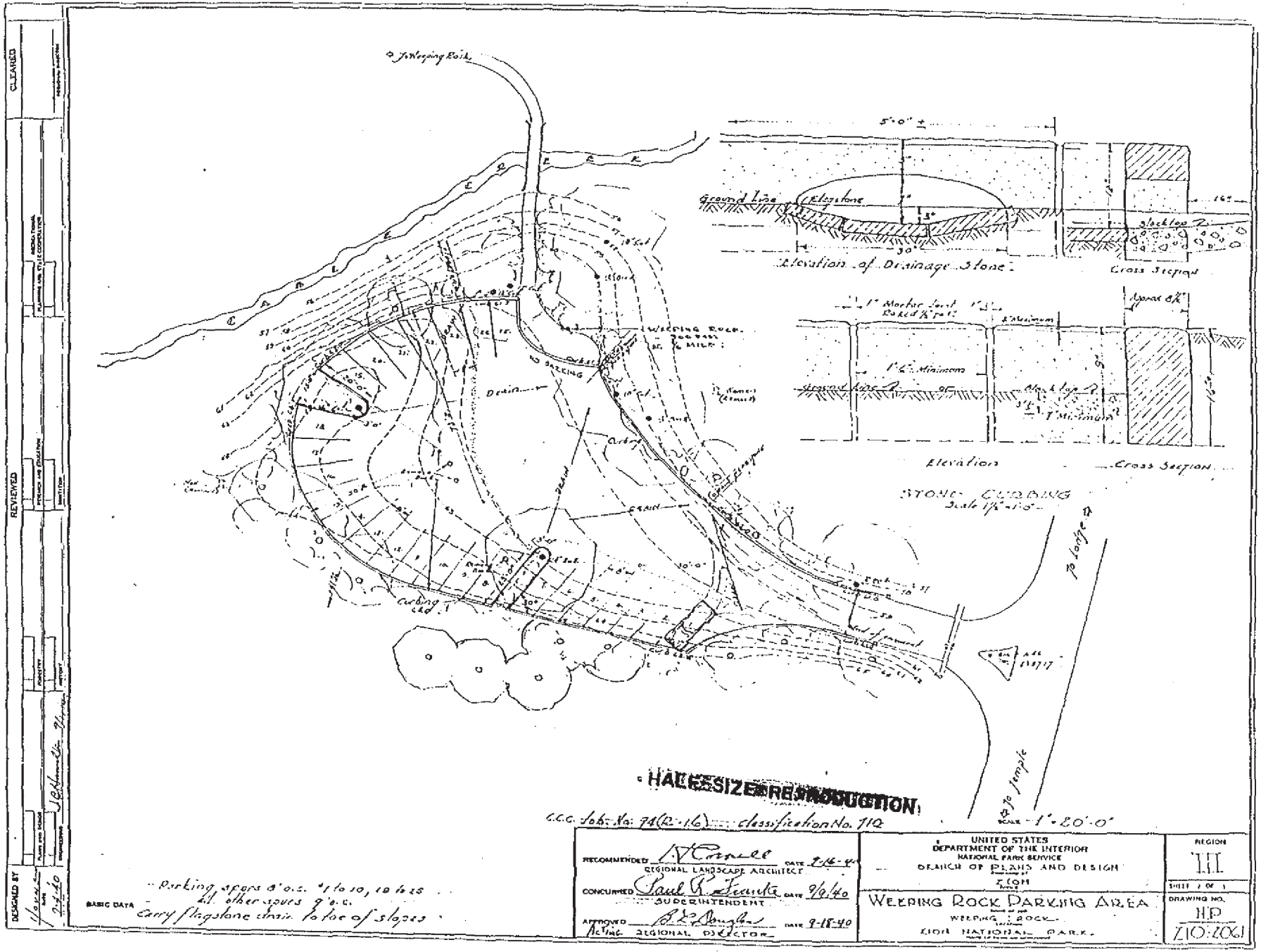
127

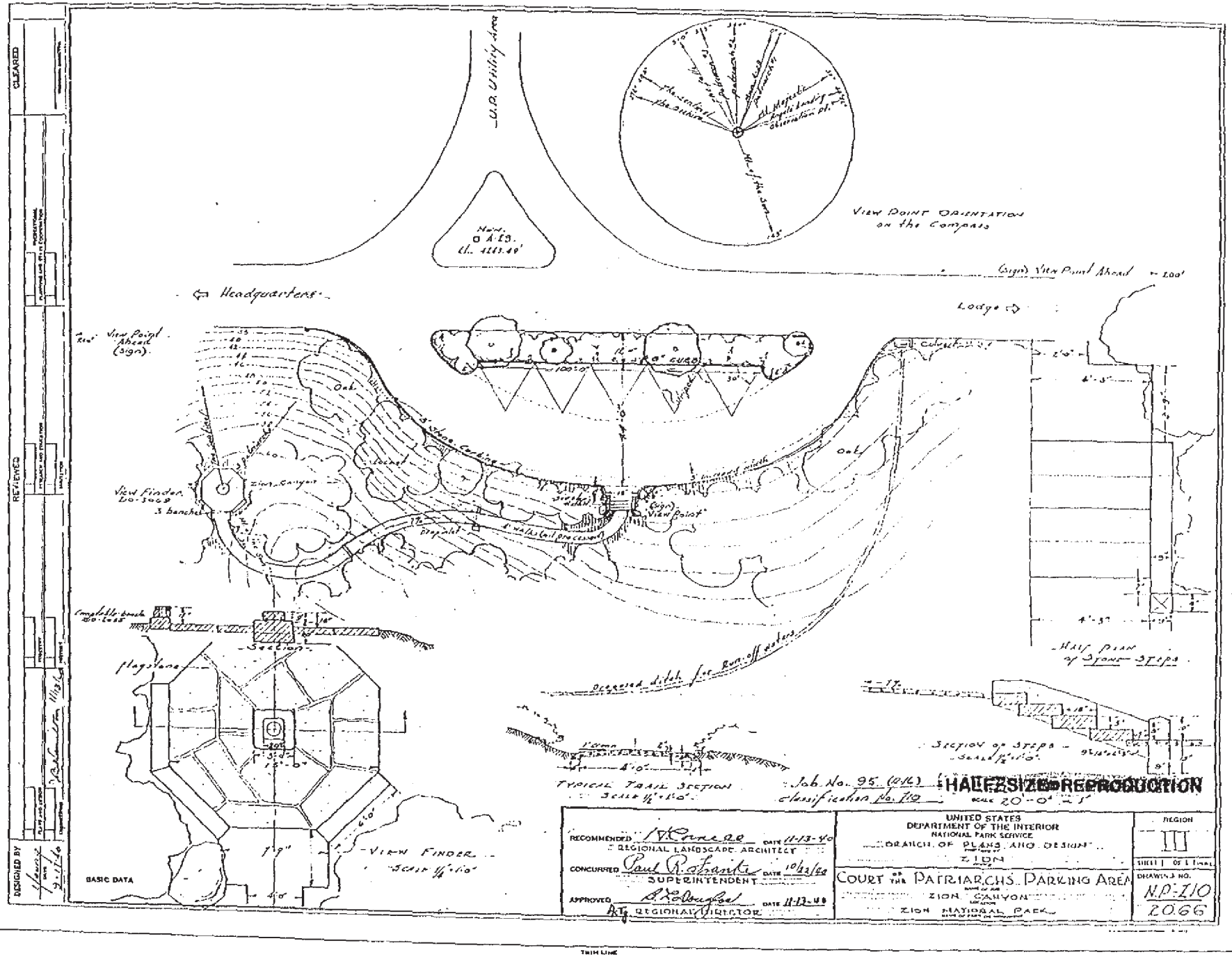
Temple of Sinawava Parking Area, 1969 modifications

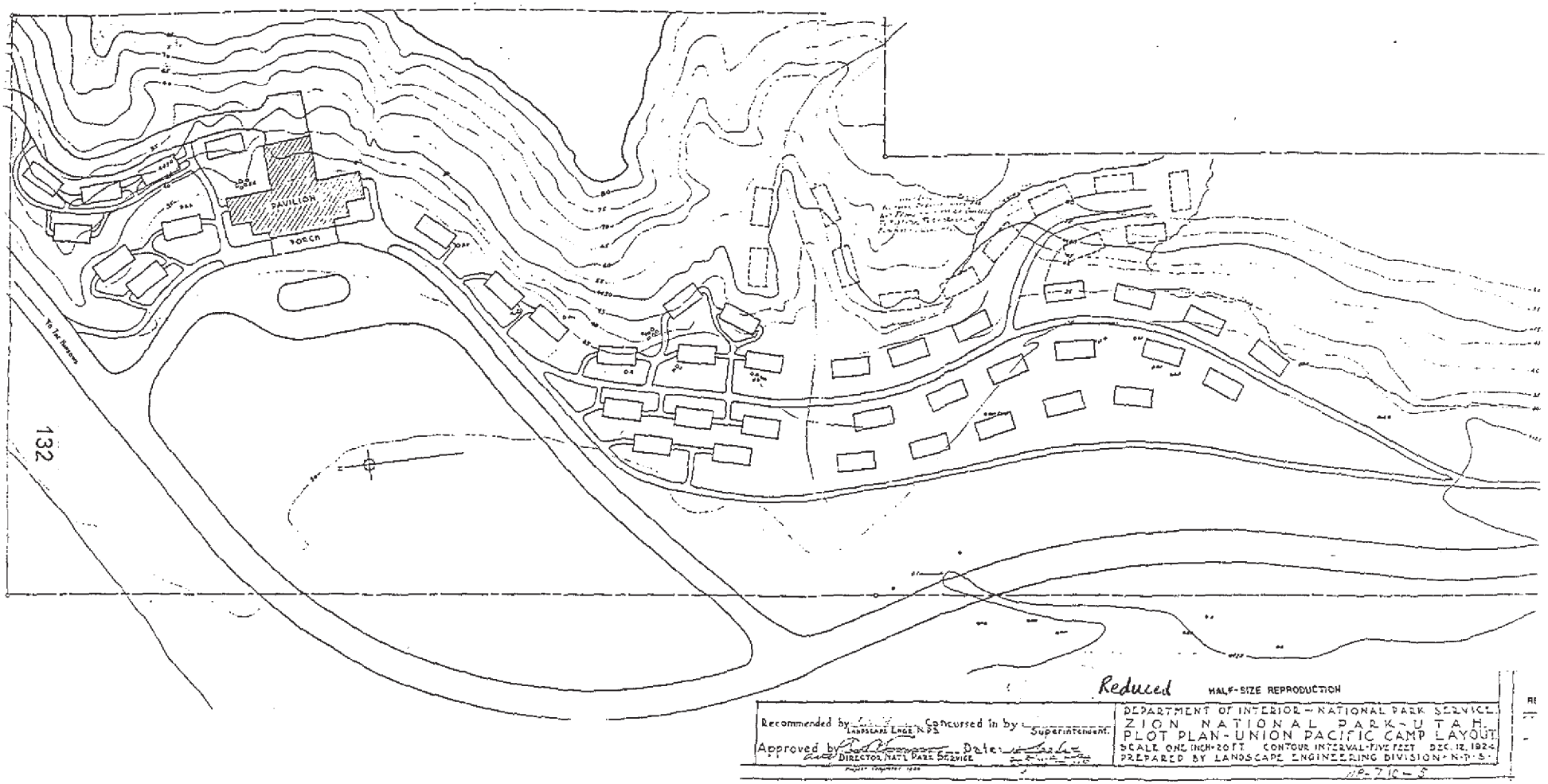
(3)











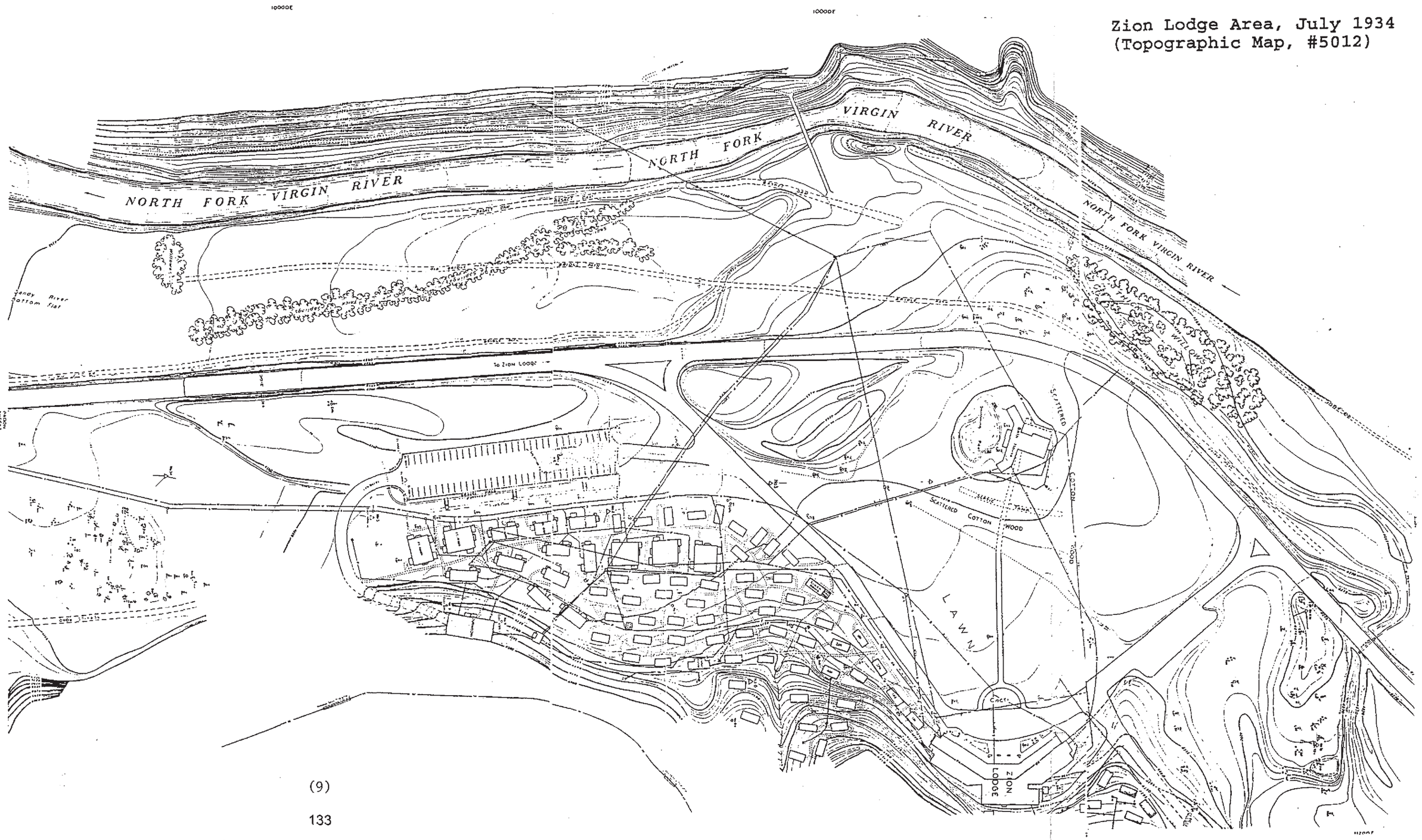
Reduced HALF-SIZE REPRODUCTION

Recommended by Landscape Engr. N.P.S. Concurred in by Superintendent. Approved by Director, Nat'l Park Service Date	DEPARTMENT OF INTERIOR – NATIONAL PARK SERVICE. ZION NATIONAL PARK – UTAH. PLOT PLAN – UNION PACIFIC CAMP LAYOUT. SCALE ONE INCH = 20 FT. CONTOUR INTERVAL FIVE FEET. DEC. 12, 1924. PREPARED BY LANDSCAPE ENGINEERING DIVISION – N.P.S. NP-ZIC-5

ON MICROFILM

NP Z-505-2

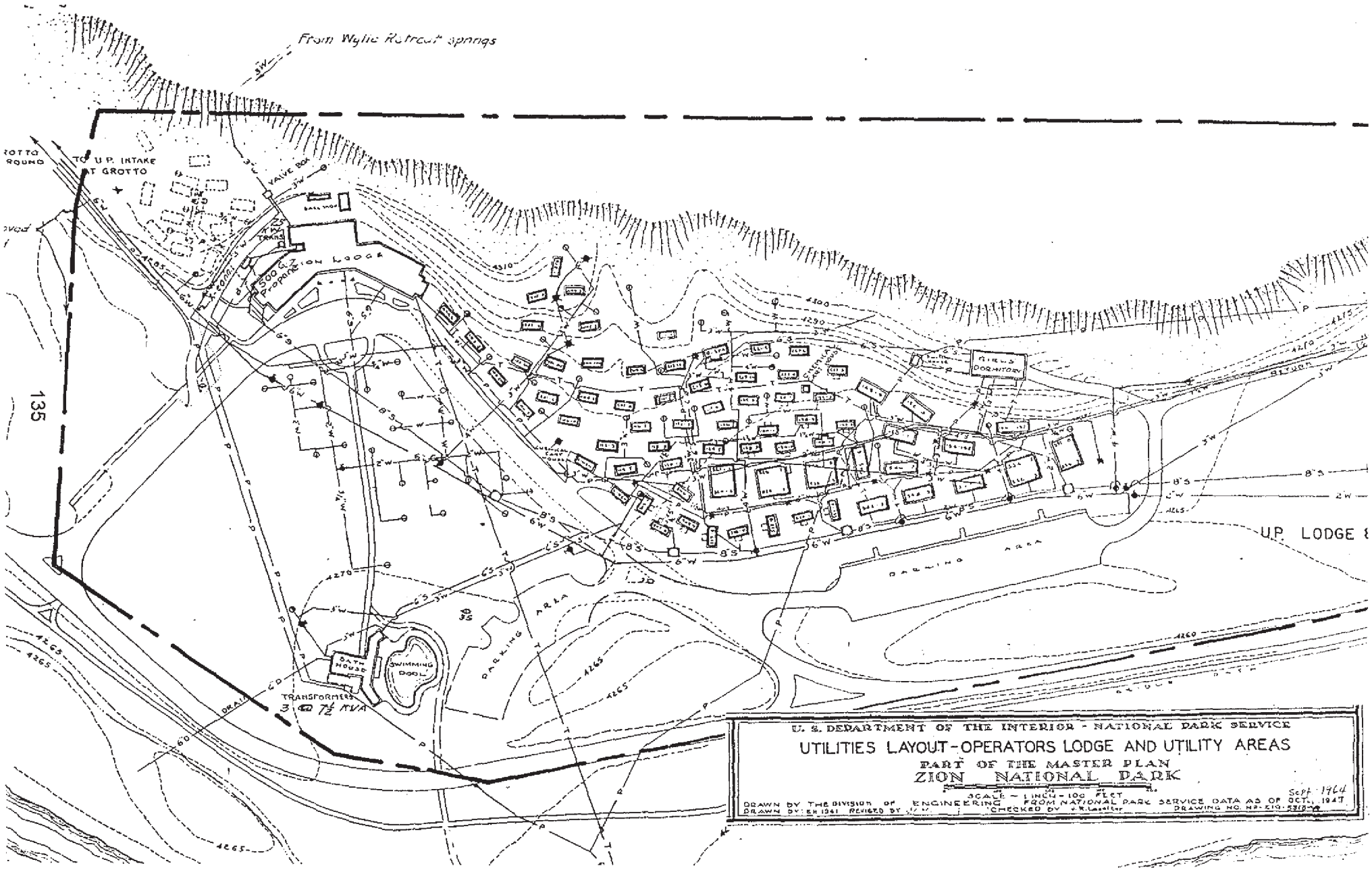
Zion Lodge Area, July 1934
(Topographic Map, #5012)

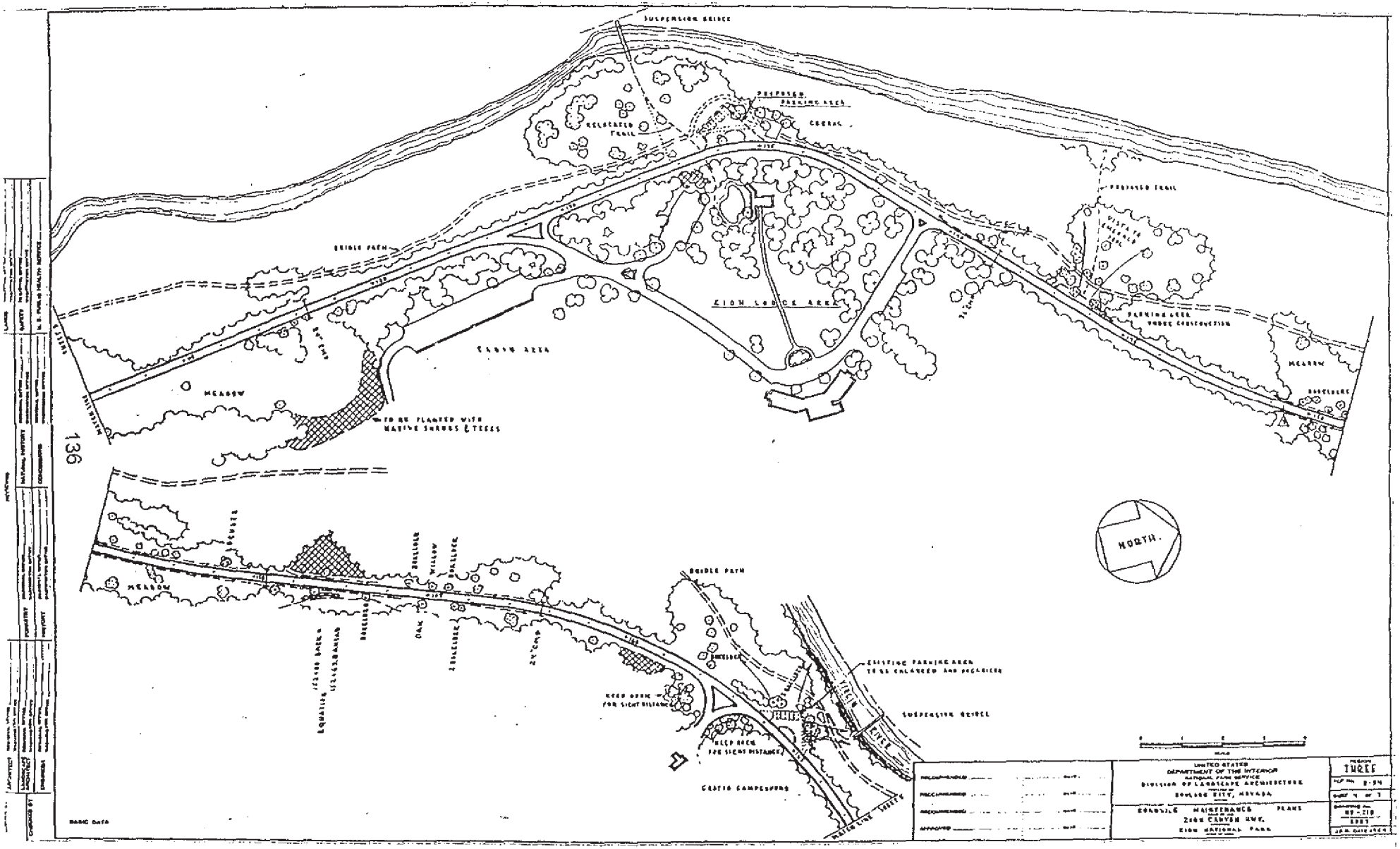


DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
ZION NATIONAL PARK
UTAH
PROPOSED DEVELOPMENT
OFFICE OF THE CHIEF ENGINEER
SAN FRANCISCO, CALIF.

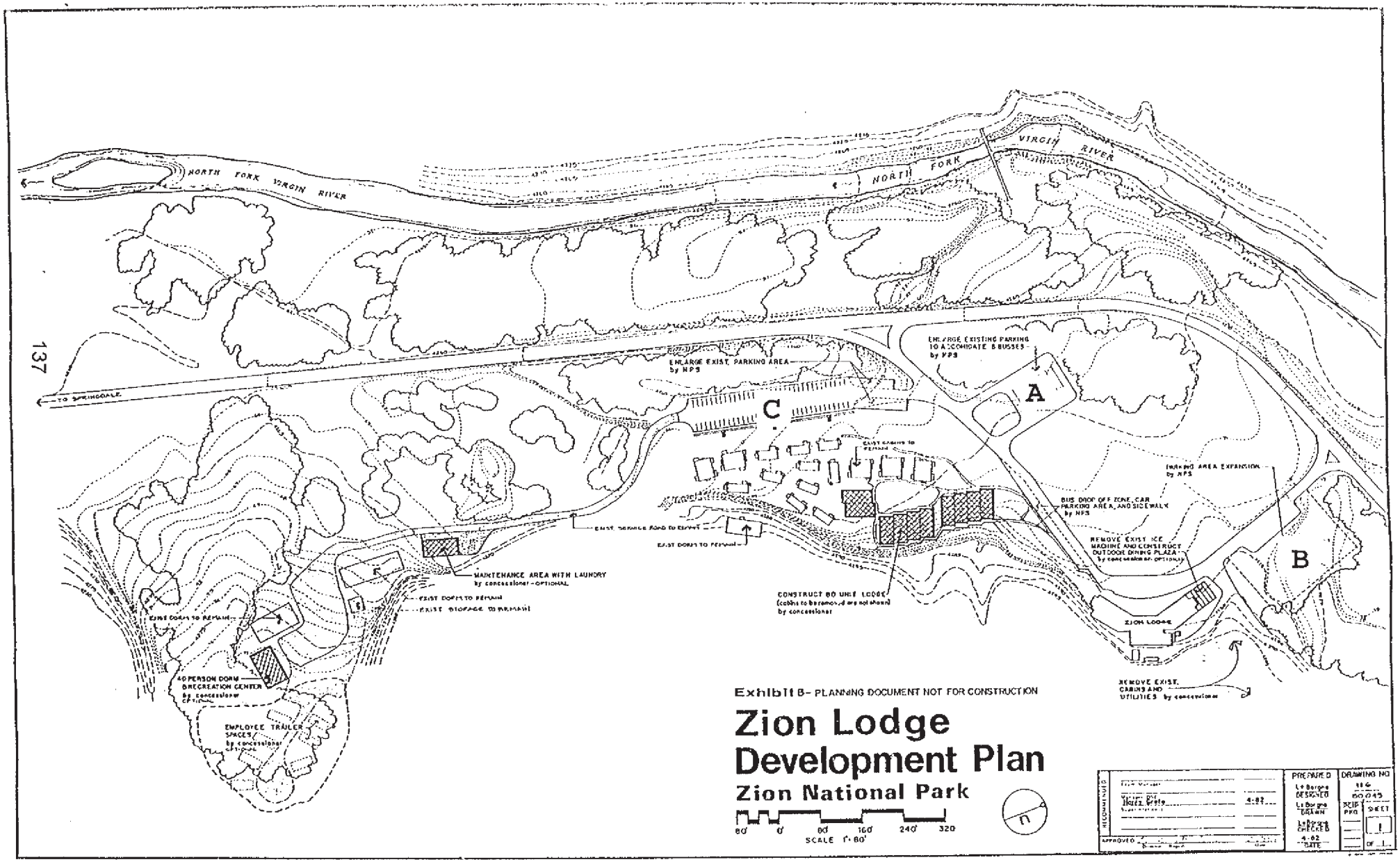
LODGE AREA

SHEET 4
SCALE: 1"=80FT

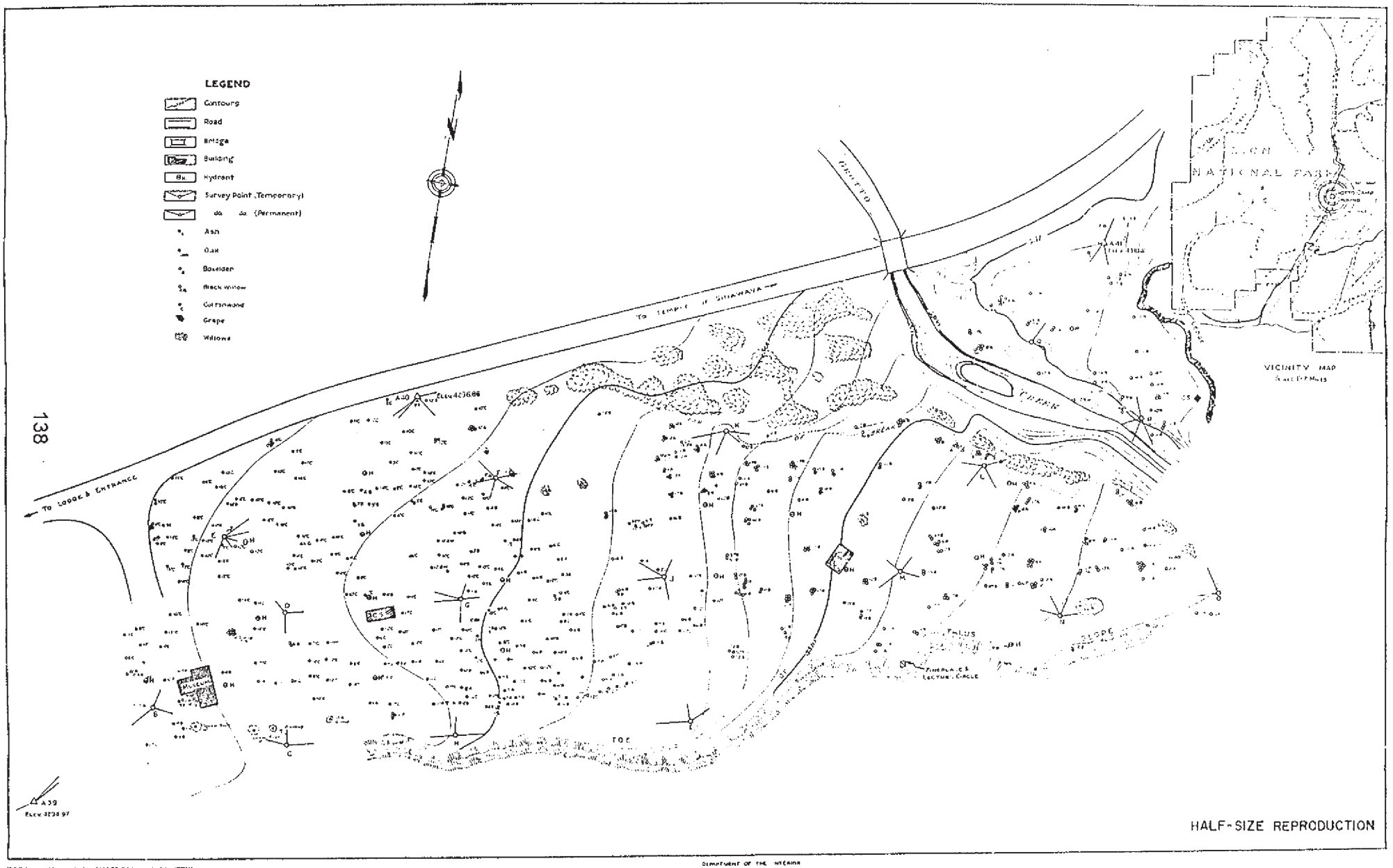




(11) Zion Lodge Entry/Parking Areas, 1954



(12) Zion Lodge Entry and Parking Areas (existing and proposed, 1982)



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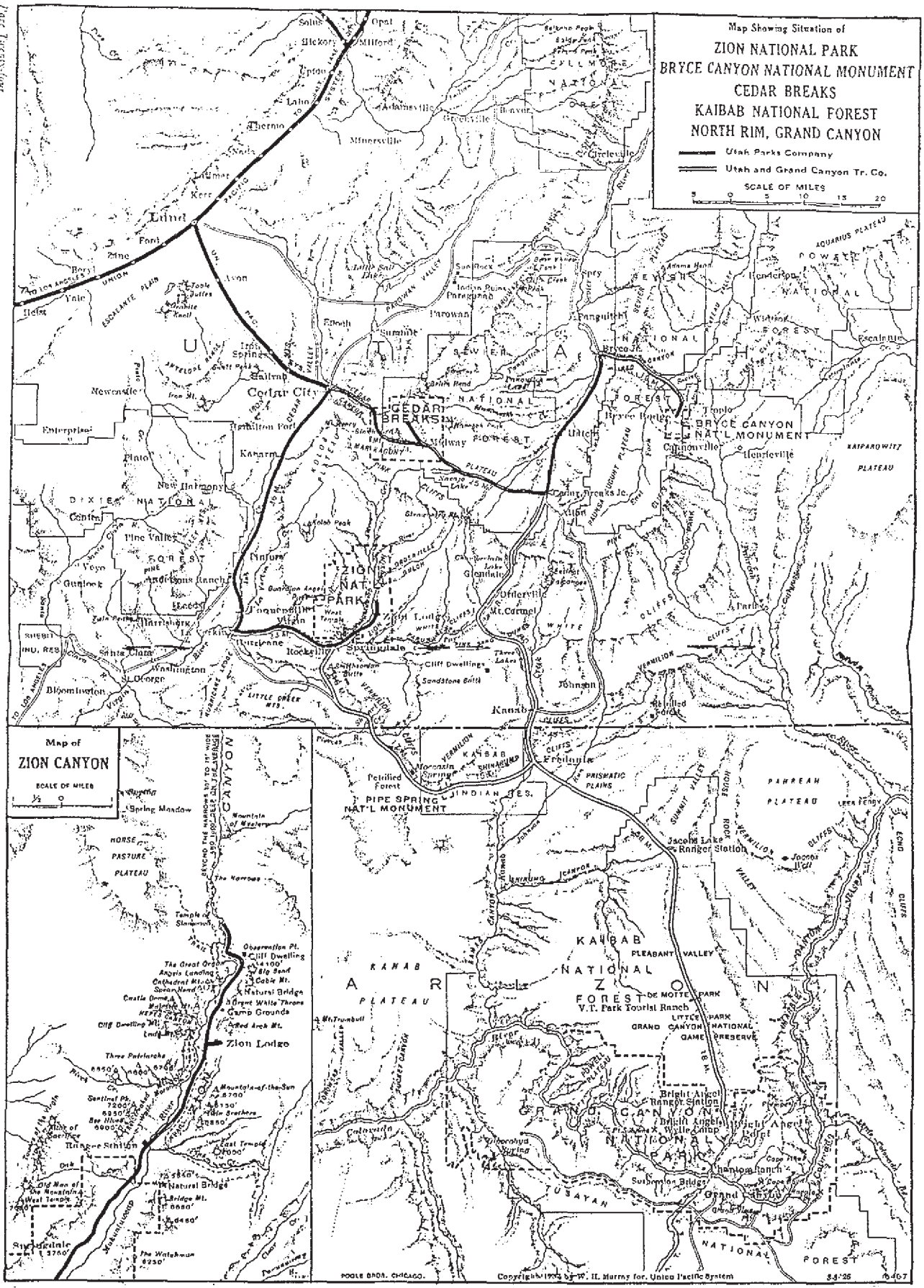
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
ZION NATIONAL PARK
TOPOGRAPHICAL MAP
OFFICE OF THE CHIEF ENGINEER
SAN FRANCISCO, CALIF.

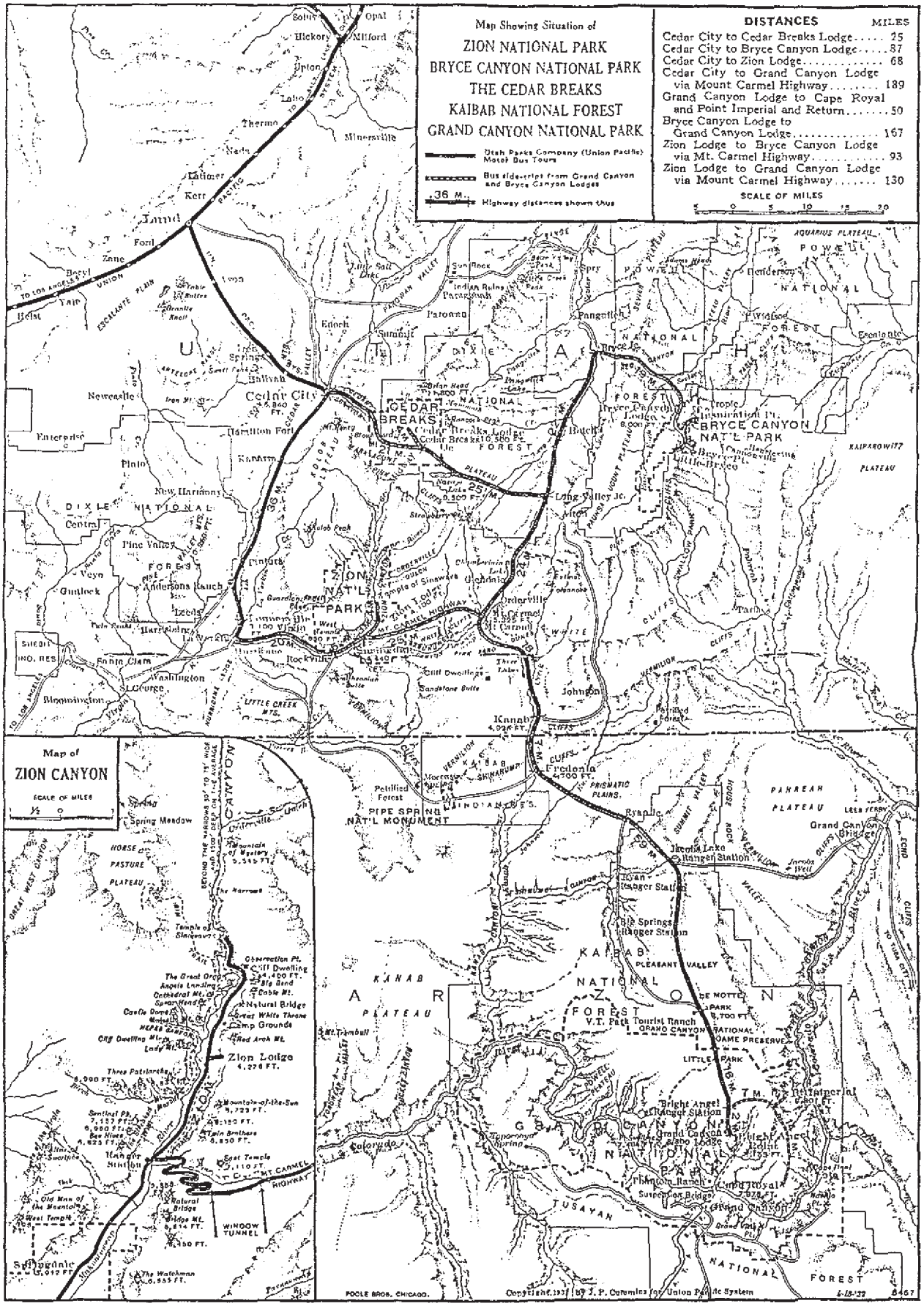
GROTTO CAMPGROUND AREA

COMPLETE IN ONE SHEET
SCALE-1 INCH

(13) Grotto Campground Area, 1935



Early development of the "Grand Circle" tourism route
(Union Pacific Railroad's "Red Book," 1926)



Map showing the completed "Grand Circle" tourism route
(Union Pacific Railroad's "Red Book," 1932)

APPENDIX E: CULTURAL RESOURCES SPECIALISTS REVIEW

CULTURAL SPECIALISTS REVIEW

I have reviewed this proposal for conformity with requirements for the Section 106 process, with the 1990 *Servicewide Programmatic Agreement* (if applicable), and applicable parts of the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation*, NPS *Management Policies*, and NPS-28. I have stated any additional stipulations that should apply, and I concur in the recommended assessment of effect above.

Signed: _____ 10/30/95
Historian — Date

Comments: _____

_____ 10/25/95
Archeologist — Date

Comments: _____

_____ 10/30/95
Historical Architect — Date

Comments _____

_____ _____
Ethnographer — Date

Comments _____

_____ _____
Curator — Date

Comments: _____

_____ 10/30/95
Historical Landscape Architect — Date

Approved: _____ 10/25/95
Compliance Coordinator — Date

Approved: _____ 10/25/95
Superintendent — Date