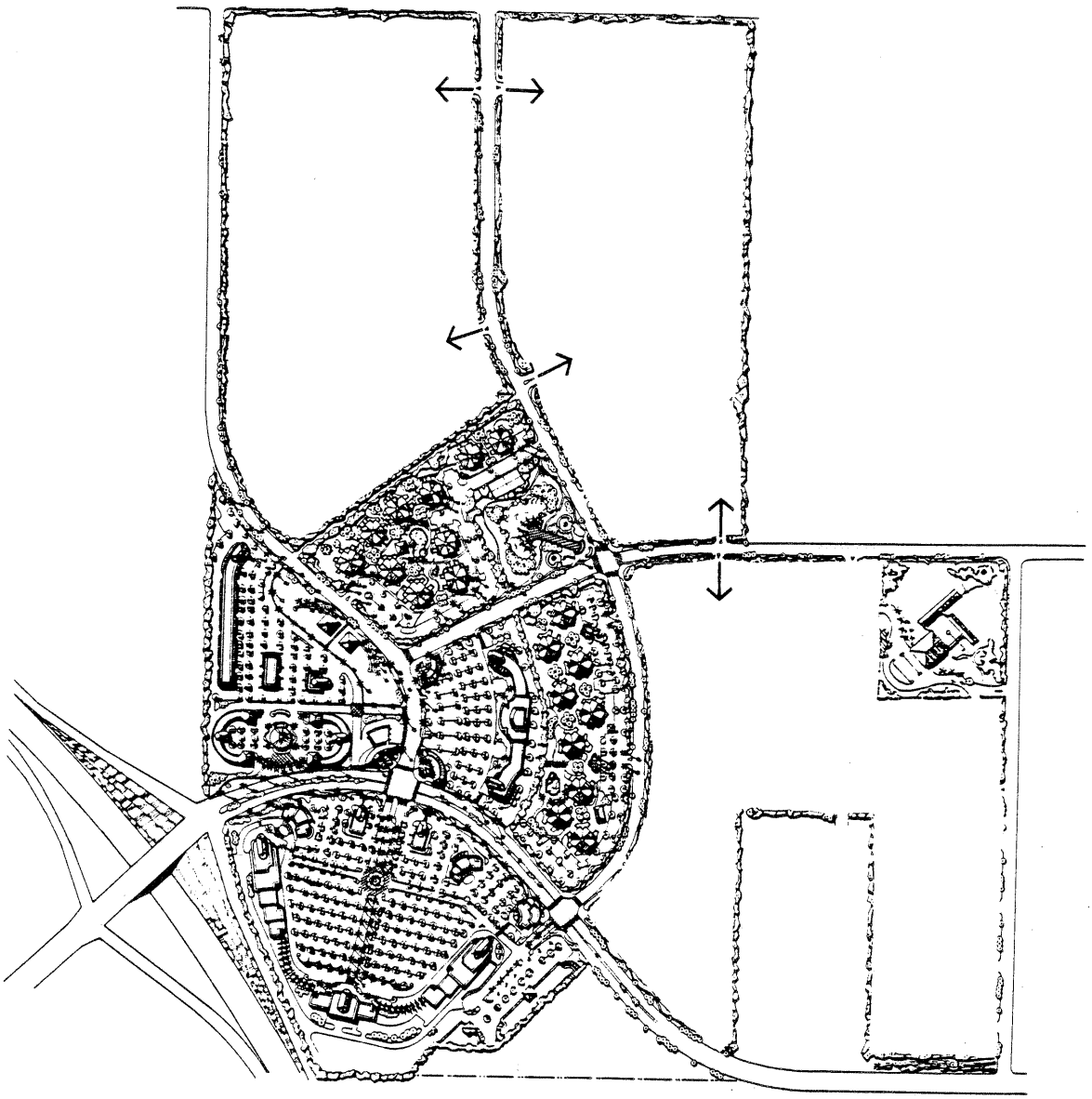


DRAWING TITLE:

URBAN DESIGN PLAN

100 300 700 1500 FEET

0

N

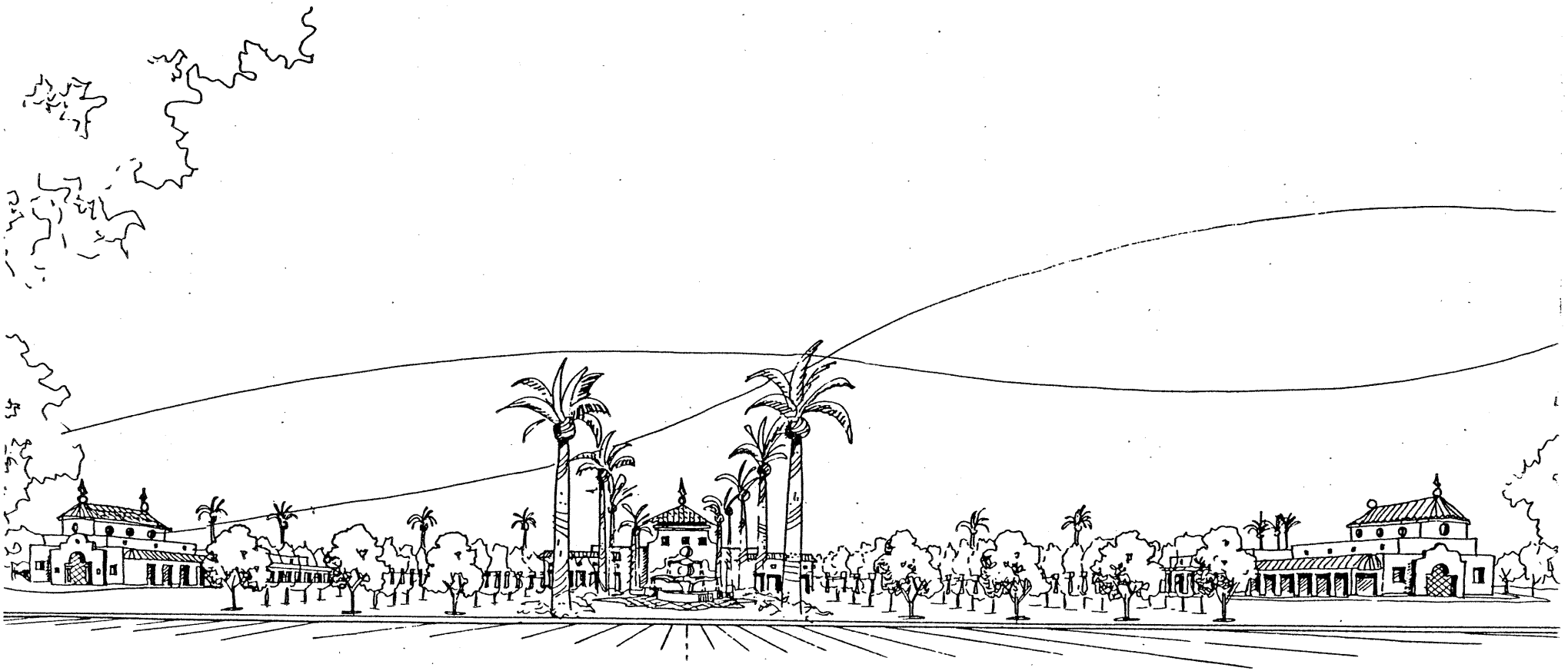
SOURCE:

Smith, Peroni & Fox

brandenburg | butters

C O A C H E L L A 3 8 0

FIGURE # 5.2



DRAWING TITLE:

ARCHITECTURAL CONCEPT - REGIONAL COMMERCIAL

FIGURE #

5.3

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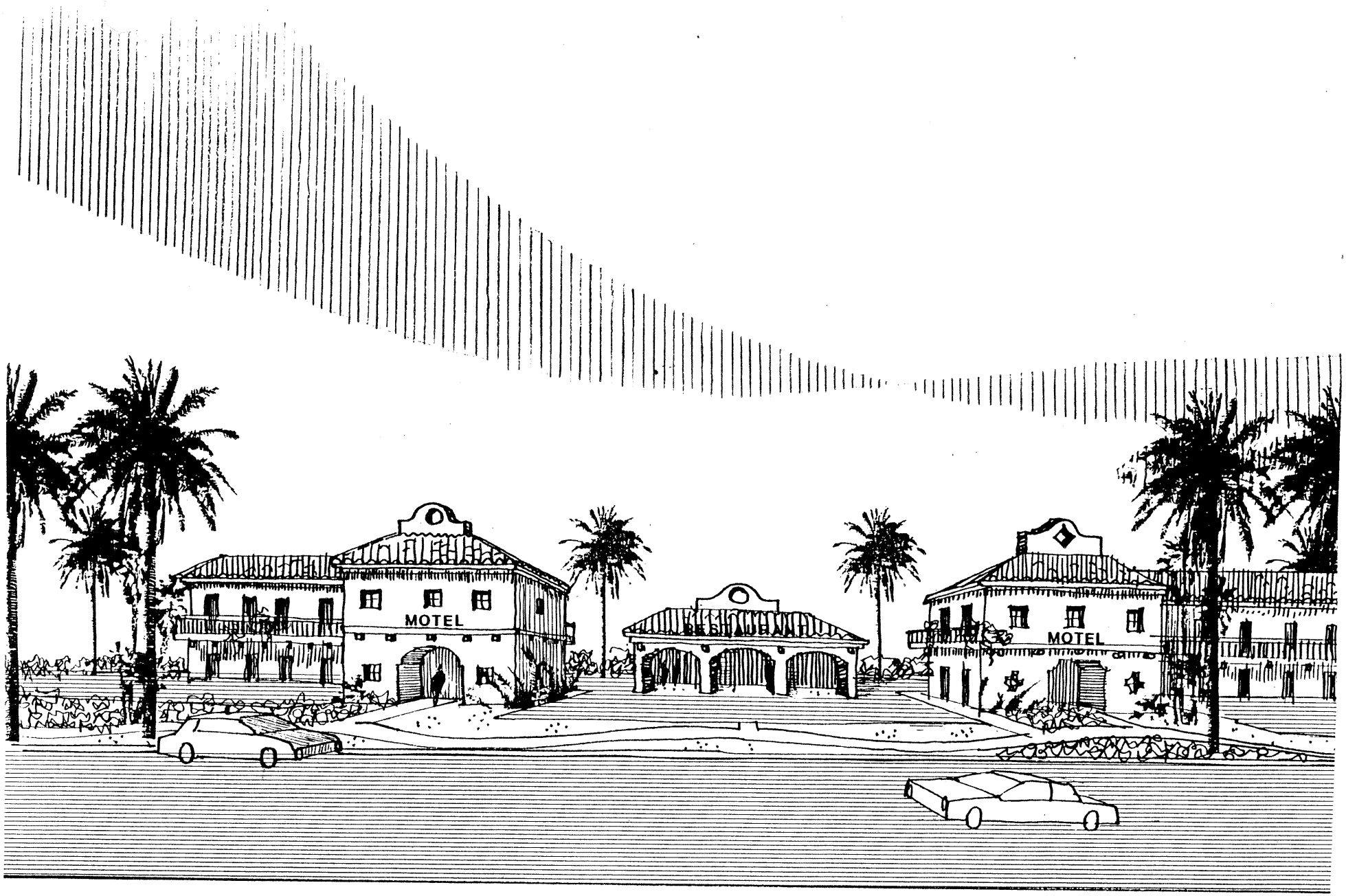
COACHELLA 380

Smith, Peroni & Fox



DRAWING TITLE:

ARCHITECTURAL CONCEPT - MIXED USE COMMERCIAL

FIGURE #

5.4

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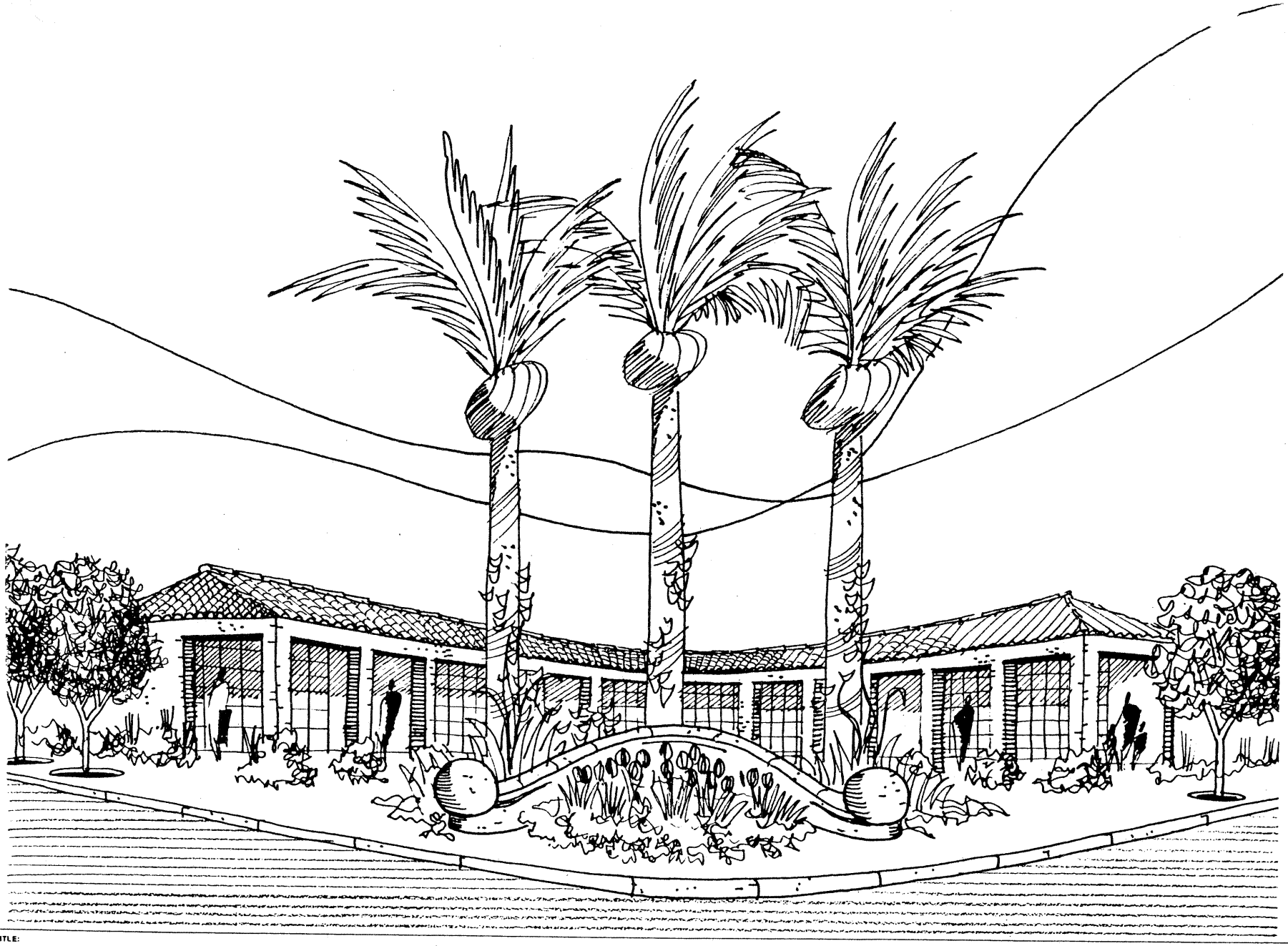
COACHELLA 380

Smith, Peroni & Fox



DRAWING TITLE:

ARCHITECTURAL CONCEPT - NEIGHBORHOOD COMMERCIAL

FIGURE #

5.5

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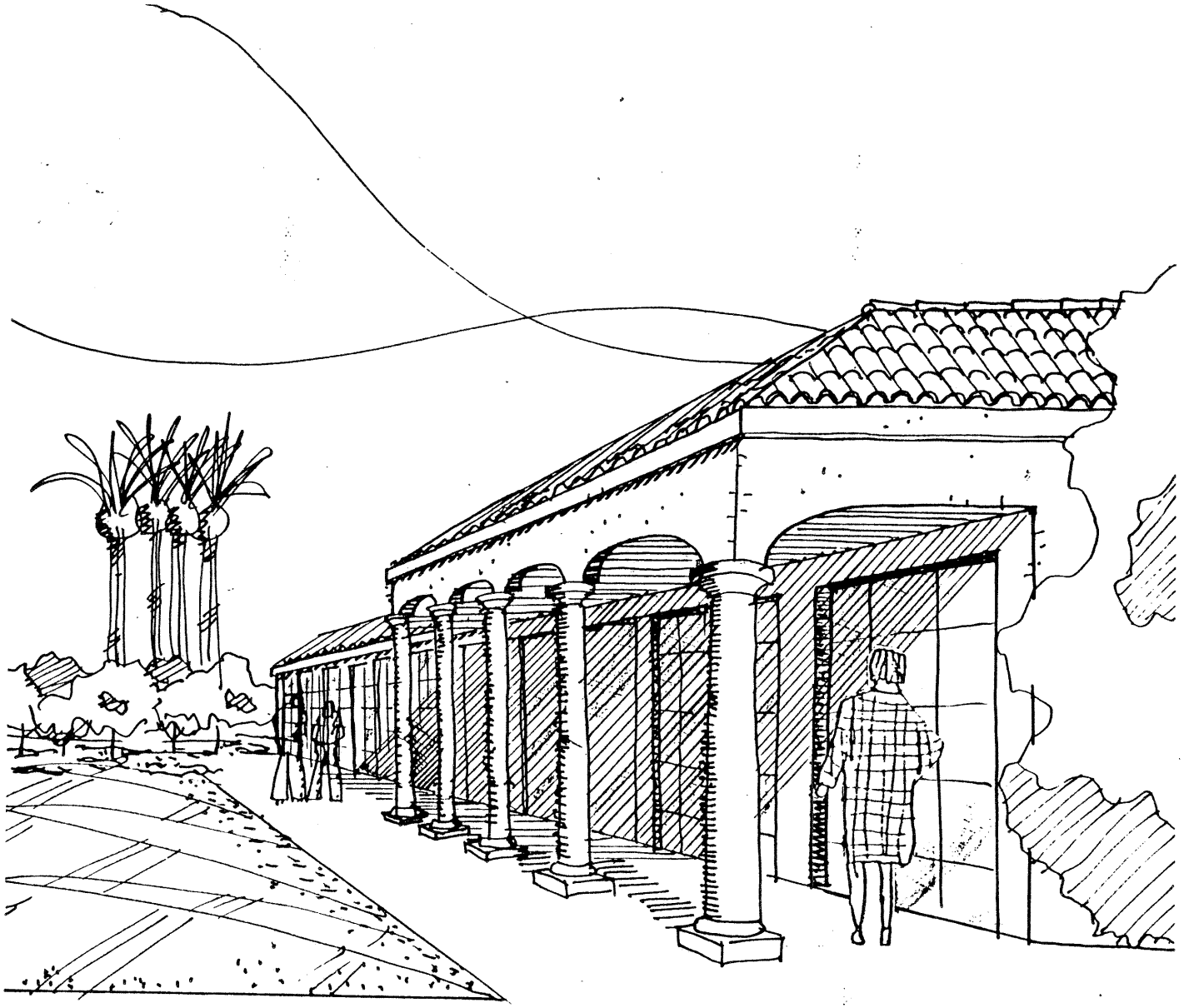
C O A C H E L L A 3 8 0

Smith, Peroni & Fox



DRAWING TITLE:

ARCHITECTURAL CONCEPT - COMMERCIAL DESIGN ELEMENTS

FIGURE #

5.6

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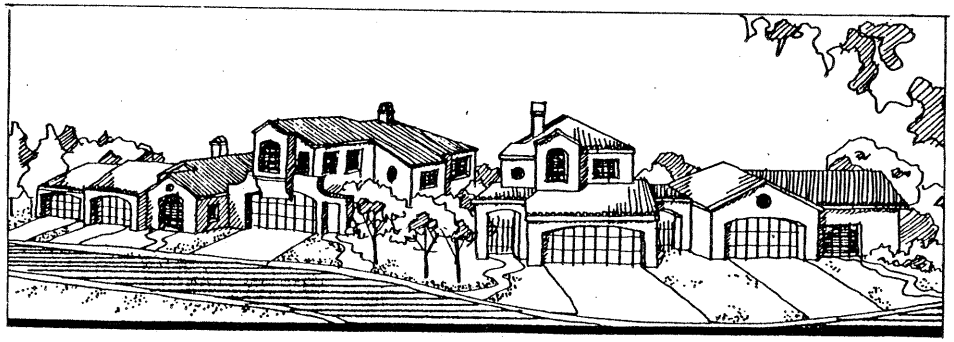
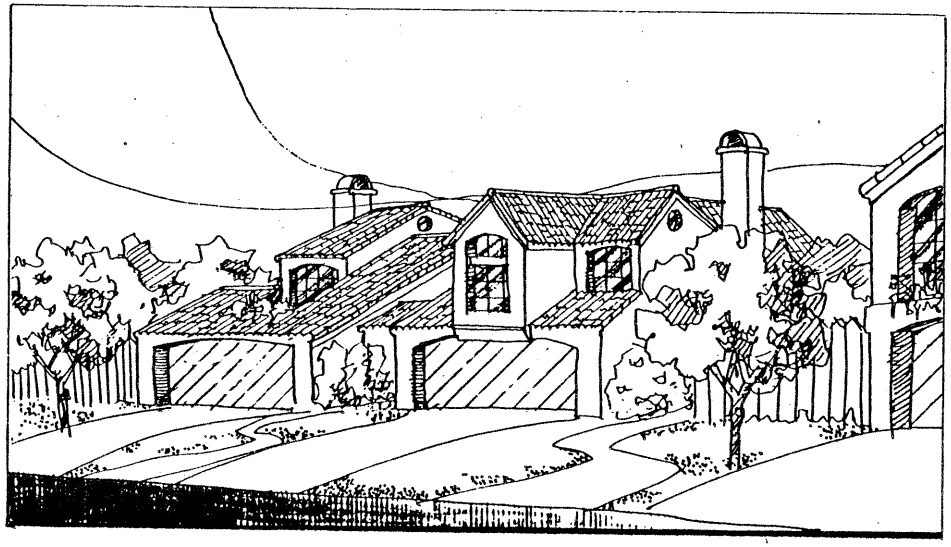
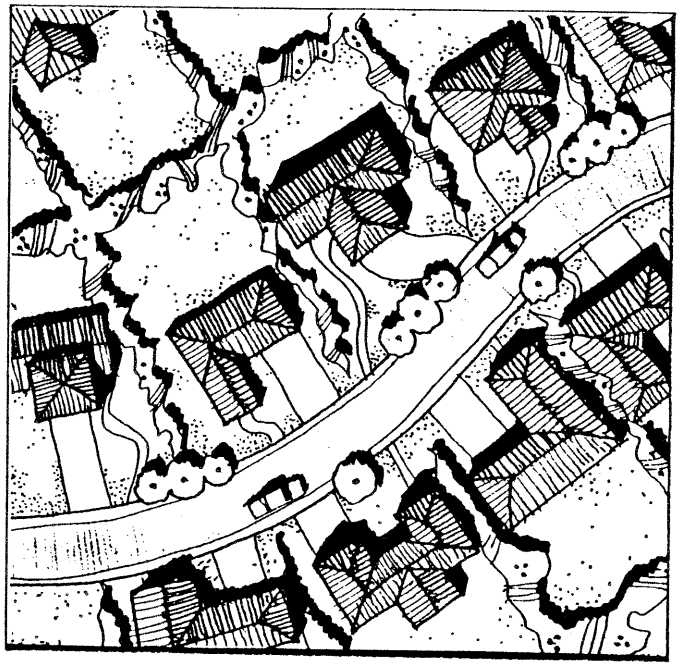
C O A C H E L L A 3 8 0

Smith, Peroni & Fox







DRAWING TITLE:

ARCHITECTURAL & SITING CONCEPT - MEDIUM LOW DENSITY RESIDENTIAL

FIGURE #

5.7

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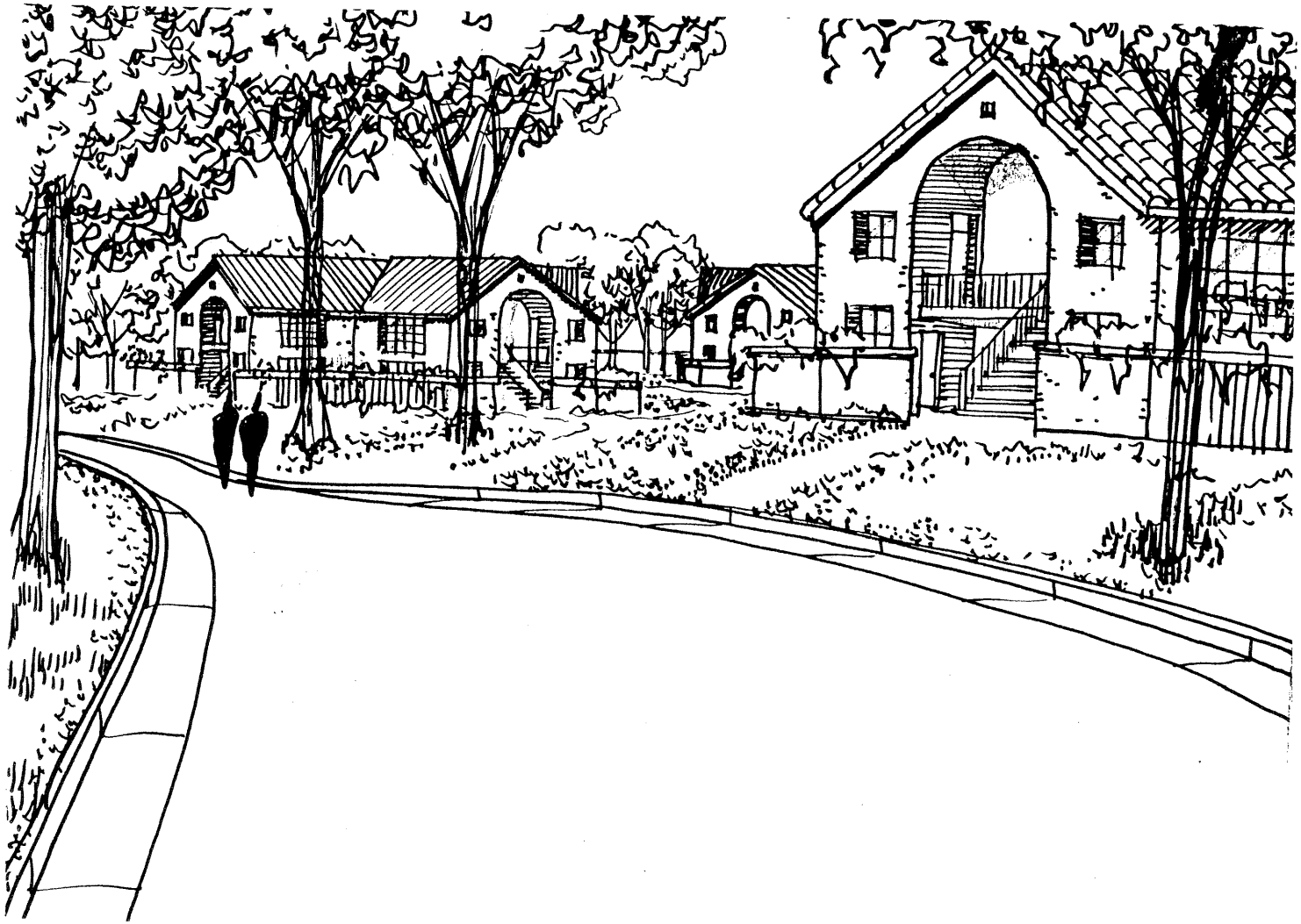
COACHELLA 380

Smith, Peroni & Fox



DRAWING TITLE:

STREET SCENE CONCEPT - HIGH DENSITY RESIDENTIAL

FIGURE #

5.8

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COACHELLA 380

Smith, Peroni & Fox

Avoid having a row of lots with a road on either side; try to provide lots on both sides of road.

(b) Commercial

Maintain large units of land, linked where necessary by reciprocal access and parking easements.

Individual pad parcelization is generally acceptable if it relates well to the design of the whole property.

(c) Grading Concepts

Minimize grading.

Balance cut and fill within phases and development areas.

Avoid large embankments, particularly as it relates to stormwater retention basins.

Create natural appearing terrain - avoid engineered slopes where required for lot or parcel drainage (vary steepness of slopes, etc.).

Finished grades will approximate a natural site appearance.

Grade soils which have been wet down to the optimum soil moisture content to reduce erosion.

Follow geotechnical recommendations found elsewhere in the Applicant's Project Specific Plan.

5.5.2 Site Planning

(a) Residential Detached

Provide a variety of site plans within an area. Utilize variable setbacks from front property lines and in side yards.

Vary building footprints.

Preserve view areas.

Promote privacy.

Orient structures for best solar exposure in winter and cooling through shading in summer.

Design structures to fit grades.

Where a floor plan is to be repeated no identical floor plans should be immediately adjacent to one another. Rather a different floor plan will be interspersed between identical plans. The minimum number of floor plans will be three (3).

(b) Residential Attached

Utilize variable setbacks from front property lines.

Garages will be at varying distances from streets where front entries are repeated continually along the frontage.

Vary building footprints.

Create useable open space areas.

Preserve view areas.

Promote Privacy.

Utilize designs which minimize grading.

Orient buildings in a variety of ways to avoid monotony.

Provide each unit with a separate entry.

Provide trash enclosures which are screened and which are conveniently and inconspicuously located and which are easily accessible to large trucks.

Define pedestrian and automobile circulation systems separately and clearly.

Cluster open parking along internal drives.

Provide landscaping in parking areas to screen these areas and to reduce monotony.

Every four open parking stalls will be separated with a landscaped island at least four-feet wide.

(c) Commercial

Create landscaped plazas in open areas.

Screen parking with landscaping and berms.

Define pedestrian and automobile circulation systems separately and clearly.

Provide trash enclosures which are screened and which are conveniently and inconspicuously located and which are easily accessible to large trucks.

Buildings should be contiguous where possible.

No more than eight parking spaces will be provided without a landscaped island at least four feet wide.

Parking areas will be separated from buildings with raised concrete walkways and/or landscaping.

Interior circulation will allow for uniform directions of traffic flow.

Shared parking between adjacent buildings is generally encouraged and mandated where buildings are a part of a larger complex.

5.5.3 Architectural Features

(a) Residential Detached

Utilize facade articulation (architectural elements will be used to break up large facades).

Balconies and porches are encouraged to provide articulation.

Entryways incorporated into balconies are encouraged.

Exterior stairways to second floors are not permitted.

Archways and columns should be used only when incorporated into building design.

Archways should have walls at least 12" thick and columns at least 18" in diameter.

Use of bold forms is encouraged.

Chimneys shall utilize compatible materials as the buildings they are designed for.

Chimneys which project from walls to provide surface articulation are encouraged.

Chimney caps can be made of roof matching tile.

Surface detail, ornaments and other elements that enrich architectural character are encouraged.

All additions will relate to existing structures in design.

Residential buildings will not be designed to attract excessive attention (i.e. over design and decoration with superfluous detail or imitations of structural elements).

Garages and/or blank (windowless) walls should be oriented to side yards along roadways.

(b) Attached Residential

Combine one and two story elements to reinforce a separate identity for each unit in a cluster.

Exterior stairways are permitted.

Use of bold forms is encouraged.

Use of balconies and porches is encouraged.

Chimney caps can be made of roof matching tile.

Chimneys which project from walls, surface details, and other elements that enrich architectural character are encouraged.

Entryways incorporated into porches are encouraged.

Orient bedrooms and other enclosed noise sensitive space away from arterial roadways.

(c) Commercial

Building will incorporate a continuity of scale and building features.

Curtain walls are not allowed.

Exterior walls should use shadow relief with the use of recesses, bays, and covered walkways.

Emphasize entryways.

Avoid false facades.

Architectural details will be painted to match the facade.

Continuous store fronts located in a single structure should use the same material, style, and scale.

Shaded walkways in high traffic areas for pedestrians shall be provided.

5.5.4 Height and Setback

(a) Residential Detached

First stories of adjacent homes will utilize different and varied setbacks.

Two story single family structures will have varied second story setbacks in front and side yards.

(b) Residential Attached

Within a cluster the first story facade of a structure will utilize variable setbacks.

Second stories shall utilize variable setbacks for enclosed portion and shall not be permitted to cantilever. Balconies may Cantilever.

5.5.5 Building Massing and Scale

(a) Residential Detached

Provide a sense of human scale by combining 1 and 2 story elements.

Thickness of walls should dominate while thin elements should be used to provide detail.

Proportions of building elements especially at the first floor level will be kept intimate and close to human proportions and size with relatively small parts.

Utilize simple but bold forms.

Recessed doors and windows are encouraged.

Projected window structures are permitted provided that the glass portion is recessed within the projected walls.

Arched and rectangular openings are encouraged.

Windows with divided glass panes are encouraged.

Varied proportions are encouraged. It is desirable that the spacing of elements in facades be varied rather than repetitive.

Projections will be designed to provide shade for building walls and opening.

Utilize roof lines which help give the appearance of a low profile structure.

(b) Residential Attached

Create an appearance of separate buildings side by side or a cluster of individual homes even though the building is a single structure.

Garage doors which are recessed into adjacent walls are encouraged.

Provide a sense of human scale by combining 1 and 2 story elements.

Varied proportions are encouraged. Elements in facades should be spaced at varying intervals to avoid too much repetition.

Recessed doors and windows are encouraged.

Projected window structures are permitted provided that the glass portion is recessed within the projected walls.

Arched and rectangular openings are encouraged.

Windows with divided glass panes are encouraged.

(c) Commercial

Commercial structures should be massed together to create feeling of continuity.

Varied proportions are encouraged. Elements in facades should be spaced at varying intervals and excessive repetition will be avoided.

5.5.6 Roofs

(a) Residential Detached

Hip, shed, and pitched gable roof forms are encouraged.

Ridge lines which are discontinuous or varied are encouraged.

One and two story roof elements may be combined. Slopes of roofs (pitch) may vary between elements of a structure.

No cooling or heating units may be roof mounted on pitched roofs.

(b) Residential Attached

Vary ridge lines in a single structure so that a separate identity for each unit is reinforced.

Slopes (pitch) of roofs may vary between elements of a structure.

Flat roofs may be combined with pitched roofs.

Use of flat roofs as outdoor space is encouraged.

Mechanical heating and cooling devices may be mounted on flat roofs if completely screened from surrounding views and if screening is incorporated into the design of the structure.

(c) Commercial

Appropriate use of flat, hip, shed, and pitched gable roof forms are encouraged; mansards, barns, and false roofs are not recommended.

Flat roofs may be used with a parapet alone, or in combination with other roof forms.

Vary ridge lines on a single structure.

Slopes of roofs may vary between elements of a structure.

Mechanical equipment may be placed only on flat portions of roofs provided that they are screened from public view and that the screening is incorporated into building design.

5.5.7 Details

(a) Residential (detached and attached)

All mechanical equipment not including utility meters shall be screened from public view.

Acceptable screening materials include the same materials (and colors) used on the main structure.

Skylights are permitted when integrated into the roof design so that they relate well to the rest of the structure.

Solar panels will be integrated into roof design, and associated equipment will be screened from view.

(b) Commercial

All Mechanical equipment including fuse boxes, heating and cooling devices will be completely screened from public views.

Preferred screening consists of materials and designs which match the structures the equipment is designed for.

5.5.8 Materials and Colors

(a) Residential (attached and detached)

Special attention to creating pleasing appearance and at the same time use of durable easily maintained materials is encouraged.

Buildings will use materials that are compatible with one another.

Use of exterior wood surfaces will be kept to a minimum.

Acceptable roofing materials are tile both ceramic and concrete or equivalent material for pitched roofs with no specific material being specified for flat roofs.

Acceptable construction materials are steel, wood, brass, stucco, brick, concrete, ceramic tile, plaster, aluminum and glass.

For each structure, restraint shall be used in the number of materials applied.

Colors shall be harmonious and will use compatible accents.

Muted colors are encouraged for large areas such as walls; brighter colors can be used for accents. (Examples of muted colors are off whites, pastels, browns, ochres, and rusts)

(b) Commercial

Facades will be an integral part of a buildings design and should continue use of the same materials.

False facade treatments as used on storefronts shall be avoided.

Acceptable materials for pitched roofs are ceramic and concrete tile.

Restraint will be exercised in the number of materials chosen for use on a structure.

Acceptable construction materials are steel, wood, brass, stucco, concrete, plaster, ceramic tile, aluminum and glass.

Colors shall be muted (eg off whites, pastels, browns, ochres and rusts) if they are intended for use on large areas.

Accent colors will complement colors used on structures and may be darker than colors used for large areas.

Accent colors will be limited to a maximum of two per structure but preferably one accent color is used per structure.

5.5.9 Fences/Barriers

(a) Residential Detached

Walls and Fences around outdoor living areas are encouraged.

Landscaping will be used to soften the walls.

Walls made of the same material as the structures are encouraged. For example block walls could be covered with stucco and painted to match structures.

Accent trim on walls is permitted provided that it complementary to other architectural detailing.

(b) Residential Attached

Walls and fences around outdoor living areas are encouraged.

Walls which are long straight lines shall be avoided.

Vegetation will be used to soften the appearance of walls.

(c) Residential Noise Barriers

Sound attenuating barriers consisting of walls (and earth berms as needed) with landscaping to add design or soften appearance will be used when any subdivision's specific acoustical report advises that residential property will be adversely impacted by roadway noise. Additional wall height (above 6 feet) may be gained by placing it on top of landscaped earth berms.

(d) Subdivision Boundary Walls

The exterior boundaries of a residential subdivision must be provided with a boundary wall, where none previously exists. Along street frontages subdivision walls shall be of a decorative design and finish.

(e) Commercial

The perimeter of commercial property will be surrounded by a wall and/or vegetative barrier; and where adjacent to residential uses, a wall with tree forms projecting above must be provided as a buffer.

Long straight lines shall be avoided in the design of walls.

Pedestrian routes will be provided for access through barriers at convenient intervals.

5.5.10 Landscaping

(See plant material list following this subsection in Table 5.1.)

(a) Residential Detached

Utilize water conserving vegetation.

Design irrigation systems to conserve water.

Zone water demands.

Creative use of meandering berms, and manufactured topography is encouraged, along with meandering walkways.

Formal and informal landscaping plans are acceptable for residential lots.

Plant materials should be selected from the plant list provided in Table 5.1.

Front yards and street side yards will be landscaped by the original subdivision developer prior to the time of permanent occupancy. A minimum one tree (24" box) shall be provided on each lot.

Consider building design, soil conditions, growth patterns of plants, colors, textures and compatibility with site activity.

(b) Residential Attached

The criteria and recommendations of (a), above, shall be incorporated in attached residential development as appropriate.

Use trees to shade parking areas.

Meander walkways and provide areas to sit which are shaded and sheltered from the prevailing winds.

Use informal landscaping with massed trees at varying intervals.

Avoid large flat expanses without ground cover.

Meander berms to create interest in the topography.

Design each development area as a whole to ensure good relationships between adjacent construction and to maintain privacy between units.

(c) Commercial

Landscape treatment shall be provided to enhance architectural features, strengthen vistas and important axes, and provide shade.

Unity of design will be achieved by repetition of certain plant varieties and other landscape materials and by correlation with adjacent developments and public parkway treatments.

Plant materials shall be selected from the plant list provided in Table 5.1.

In locations where plants will be susceptible to injury by pedestrian or motor traffic, they will be protected by appropriate curbs, tree guards or other devices.

(d) Special Landscaping Applications

As illustrated by their locations shown on Figure 5.9, a number of Applicant's Project Specific Plan areas will require special landscape attention.

- o A precise landscaping program should be developed for the major arterial roadways within the Specific Plan. The concept illustration of such a program is pictured in Figure 5.10.

- o Collector streets will add character and identity to the area by the use of street trees planted in the public parkway. The tree theme or grouping will change for each collector street, but shall be continuous along its entire alignment. (See Figure 5.11, which illustrates an enhanced parkway treatment.)

- o Noise buffers will be most aesthetically integrated into the project design by the use of earth berms with complementary landscaping (see Figure 5.12).

- o Phases of the proposed project may proceed before adjacent lands have ceased agricultural operations. Where this is the case a buffer consisting of appropriate landscaping material and a six foot block wall on the perimeter will provide to segregate activities. A sectional view of this concept may be seen on Figure 5.13.

5.5.11 Building Lighting

All Applications

Exterior lighting, when used, shall enhance the building design and the adjoining landscape.

Lighting standards and building fixtures shall be of a design and size compatible with the building and adjacent areas.

Lighting shall be restrained in design and excessive brightness avoided.

TABLE 5.1

TREES

Arid

Acacia smallii,
sweet acacia
Cercidium floridum,
blue palo verde
Cercidium praecox,
Sonoran palo verde
Chilopsis linearis,
desert willow
Cypressus glabra,
Arizona cypress
Dalea spinosa,
smoke tree
Fraxinus velutina,
Arizona ash
Lysiloma thornberi,
feather bush
Olneya tesota,
ironwood
Parkinsonia aculeata,
Mexican palo verde
Pithecellobium flexicaule,
Texas ebony
Platanus wrightii,
Arizona sycamore
Populus fremonti,
Fremont cottowood
Prosopis alba,
Argentine mesquite
Prosopis chilensis,
Chilean mesquite
Prosopis glandulosa,
honey mesquite
Prosopis juliflora velutina,
velvet mesquite
Vaquelinia californica,
Arizona rosewood

Non-Native

Acacia craspedocarpa,
leather leaf acacia
Acacia penatula,
Sierra Madre acacia
Acacia saligna,
willow acacia
Acacia stenophylla,
shoestring acacia
Bauhinia sp.,
orchid tree
Brachychiton populneus,
bottle tree
Callistemon viminalis,
bottle brush tree
Ceratonia siliqua,
carob tree
Chorisia speciosa,
silk floss tree
Citrus sp.,
orange, lemon, lime,
grapefruit, tangerine
Eucalyptus microtheca,
eucalyptus
Eucalyptus camaldulensis,
red gum
Eucalyptus spathulata,
swamp malee
Ficus carica,
fruiting fig
Fraxinus udeii,
majestic beauty ash
Geijera parviflora,
Australian willow
Grevillea robusta,
silk oak
Gleditsia triacanthos,
sunburst
Jacaranda mimosifolia,
Jacaranda, front
cover
Lagerstroemia indica,
crape myrtle
Nerium oleander,
oleander
Olea europea,
olive
Pinus canariensis,
Canary Island pine
Pinus eldarica,
Mondell pine
Pinus pinea,
Italian stone pine
Pinus roxburghii,
chir pine
Pittosporum philllyraeoides,
willow pittosporum
Populus alba,
poplar
Prunus vesuvious 'Krauteri',
purple plum
Quercus suber,
cork oak
Quercus ilex,
holly oak
Rhus lancea,
African sumac
Schinus molle,
California pepper
Schinus terebinthefolius,
Brazilian pepper
Vitex agnus-castus,
chaste tree

PALMS

Dwarf and Tall

Brahea armata,
Mexican blue fan palm
Brahea edulis,
Guadalupe palm
Butia capitata,
Pindo palm
Chaemerops humilis,
Dwarf fan palm
Cycas revoluta,
sago palm
Phoenix dactilifera,
date palm
Washingtonia filifera,
California fan palm
Washingtonia robusta,
Mexican fan palm

ORNAMENTAL GRASSES AND ACCENTS

Cortaderia selloana,
pampas grass
Hesperaloe parviflora,
red yucca
Liriope japonica,
giant lily turf
Muhlenbergia rigens,
dwarf mullee
Muhlenbergia dumosa,
giant mullee
Ophiopogan japonicus,
mondo grass
Pennisetum setaceum,
fountain grass
P. setaceum cupreum,
purple fountain grass
Yucca pendula,
pendulous yucca

VINES

Antigonon leptopus,
rosa de montana
Bougainvillea sp.,
bougainvillea
Bignonia violacea,
violet trumpet vine
Ficus pumila,
creeping fig
Gelsemium sempervirens,
Carolina jessamine
Lonicera japonica halliana,
Hall's honeysuckle
Macfadyena unguis-cati,
cat's claw
Parthenocissus
triscuspidata,
Boston ivy
Rosa banksiae,
Lady Banks' rose
Tecomaria capensis,
Cape honeysuckle
Trachelospermum
jasminoides,
star jasmine
Wisteria sinensis,
Chinese wisteria
Vitis pomifera,
grape

SHRUBS

Arid

Baccharis sarothroides,
desert broom
Caesalpinea cacalaca,
Mexican bird of
paradise
Caesalpinea gilliesii,
yellow bird of
paradise
Caesalpinea pulcherrima,
red bird of
paradise
Calliandra eriophylla,
fairy duster
Cassia artemisioides,
feathery cassia
Cassia nemophylla,
bushy senna
Cassia phyllodinea,
desert cassia,
Cassia wislizenii,
shrubby senna
Dalea pulchra,
indigo bush
Dodonea viscosa,
green hop bush
Encelia farinosa,
brittle bush
Justicia californica,
Ochuperosa
Larrea tridentata,
creosote bush
Leucophyllum candidum,
'Silver Cloud'
L. frutescens, Texas ranger,
'Green Cloud'
'White Cloud'
Leucophyllum laevigatum,
chihuahuan sage
Leucophyllum zygophyllum,
blue ranger
Rhus ovata,
sugar bush
Ruellia peninsularis,
blue ruellia
Salvia greggii,
red salvia
Simmondsia chinensis,
jojoba
Tecoma stans,
yellow bells
Tecoma stans augustata,
yellow bells

Non-Native

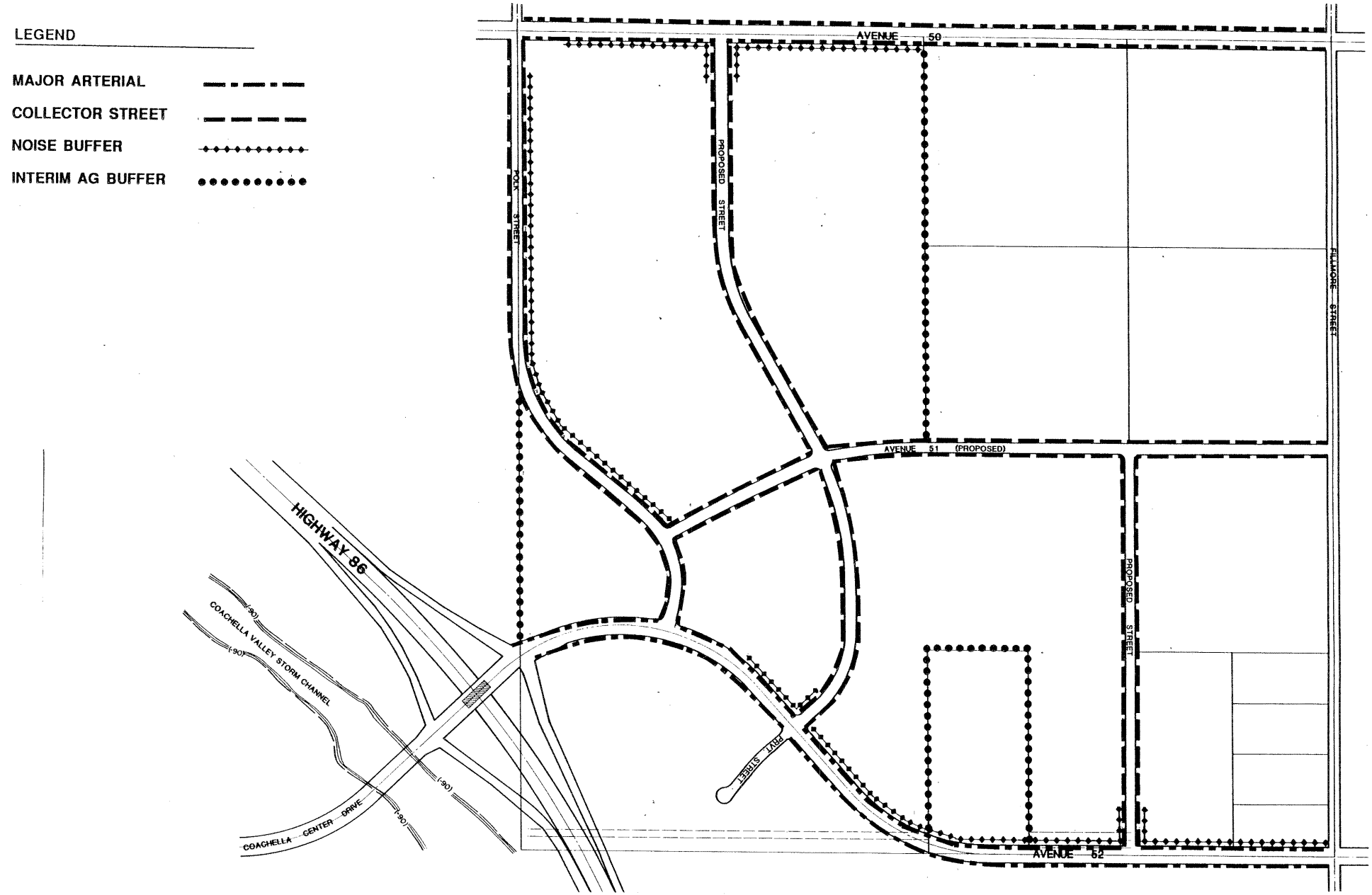
Asparagus densiflorus,
asparagus
Bougainvillea sp.,
La Jolla bougainvillea
Carissa grandiflora,
natal plum
Euphorbia milli,
crown of thorns
Euryops virides,
green euryops
Ilex vomitoria,
Stokes holly
Juniperus sp. 'Prostrata',
prostrate juniper
J. sabina 'Tameriscifolia',
Tam juniper
J. var. 'Seagreen',
seagreen juniper
Lantana camara,
bush lantana, back
cover
Nandina domestica,
heavenly bamboo
Nerium oleander 'Petite',
dwarf oleander
Philodendron selloum,
philodendron
Pittosporum tobira,
Wheeler's dwarf
Pyracantha sp.,
firethorn
Raphiolepis indica,
India hawthorn
Rosmarinus officinalis,
rosemary
Rosa sp.,
rose
Thevetia peruviana,
yellow oleander
Xylosma congestum,
xylosma

WILD FLOWERS

Aquilegia sp.,
columbine
Baileya multiradiata,
desert marigold
Dimorphotheca aurantica,
African daisy
Eschscholzia californica,
California poppy
Lastenia glabrata,
goldfield
Linum g. 'Rubrum',
scarlet flax
Lupinus ordoratus,
lupine
Orthocarpus purpurescens,
owl's clover
Penstemon eatoni,
Eaton's penstemon
Phacelia campanularia,
California blue bell

GROUND COVERS

Acacia redolens prostrata,
prostrate acacia
Baccharis sarothroides,
'Centennial'
Cerastium tomentosum,
snow in winter
Dalea greggii,
prostrate indigo
Fragaria chiloensis,
ornamental strawberry
Gazania sp.,
South African daisy
Lantana montevidensis,
purple training lantana
Lippia repens,
lippia
Oenothera berlandieri,
Mexican evening
primrose
Polygonum capitatum,
pink clover blossom
Potentilla verna,
spring cinquefoil
Rosmarinus o. prostratus,
prostrate rosemary
Verbena peruviana,
Peruvian verbena
Verbena tenuisecta,
moss verbena



DRAWING TITLE:

LANDSCAPING CONCEPT - SPECIAL PURPOSE APPLICATIONS

100 300 700 1500 FEET
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FIGURE #
5.9

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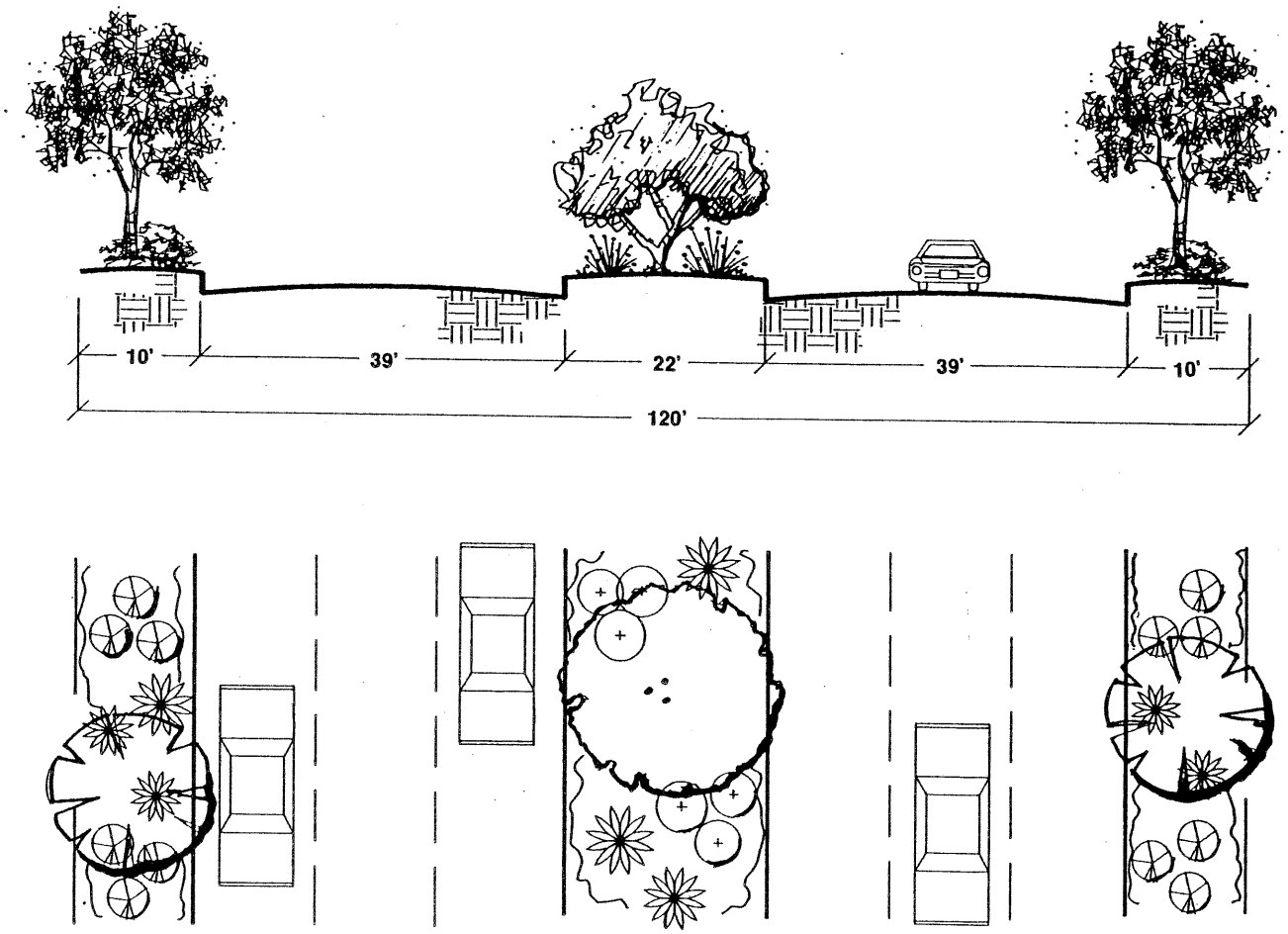
Smith, Peroni & Fox



DRAWING TITLE:

MAJOR ARTERIAL - AVENUE 50 AND 52 CONCEPT

Source: TKD Associates, Inc.

FIGURE #

5.10

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C O A C H E L L A 3 8 0

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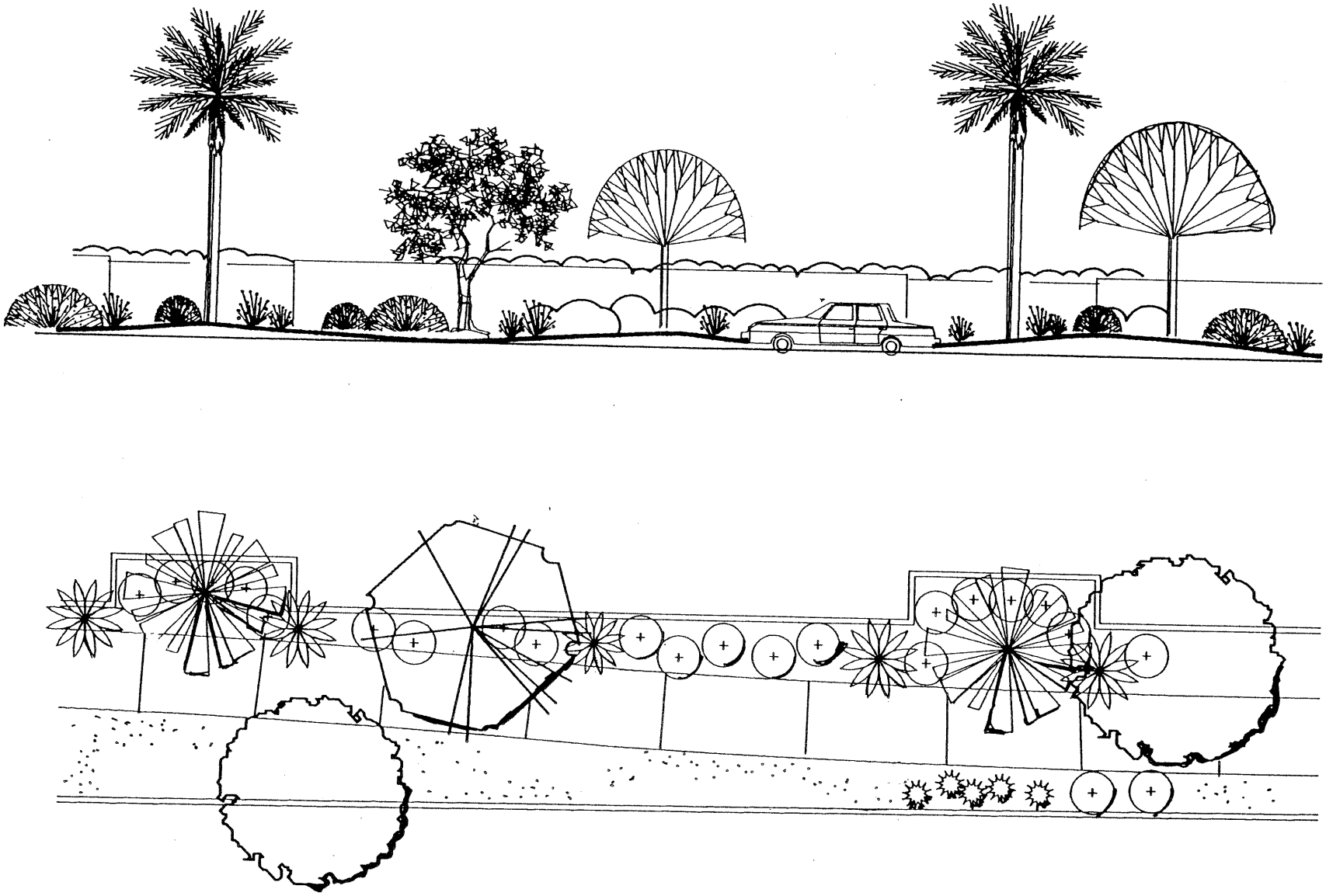

DRAWING TITLE:

ENHANCED PARKWAY TREATMENT

Source: TKD Associates, Inc.

FIGURE #

5.11

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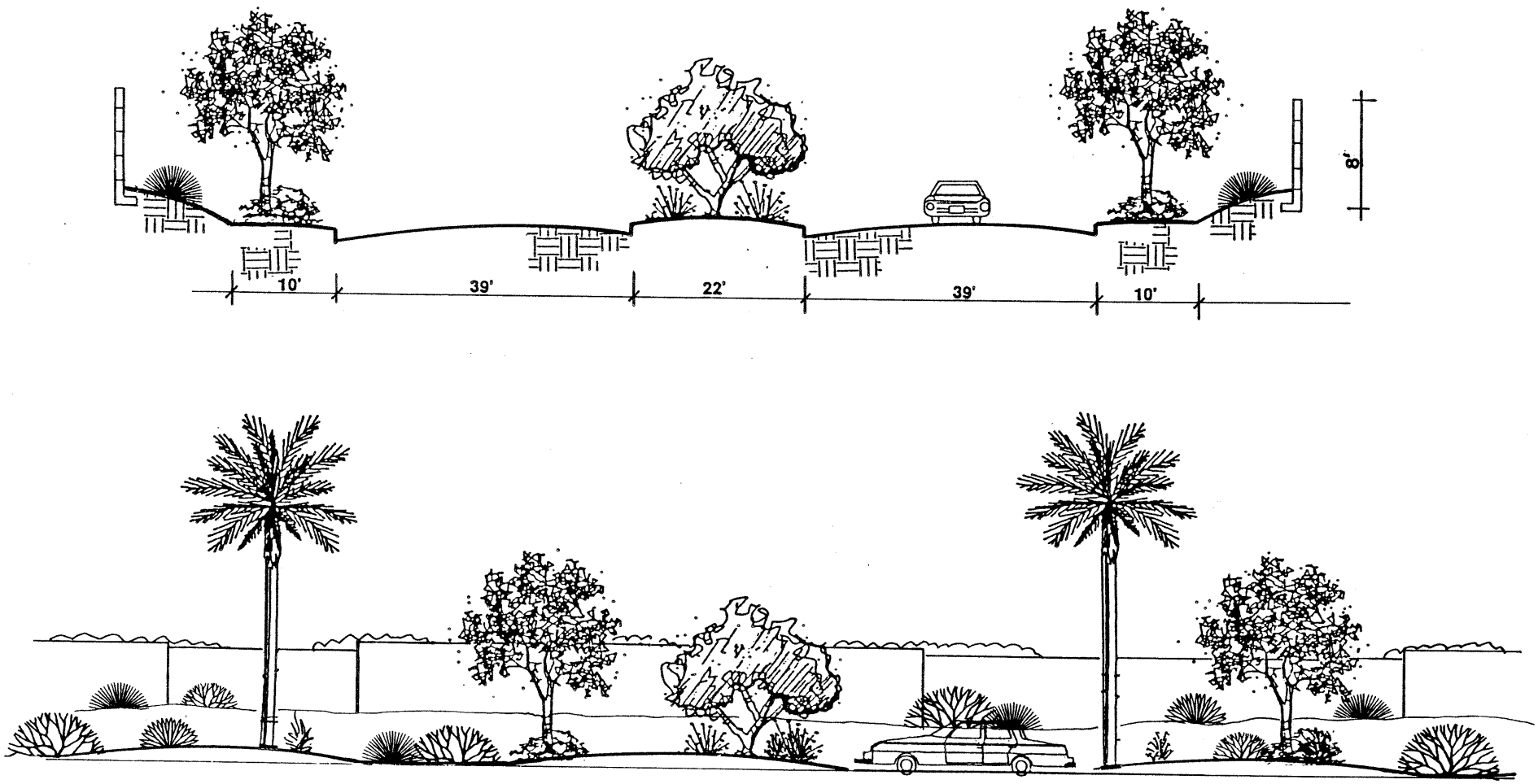
COACHELLA 380

Smith, Peroni & Fox



DRAWING TITLE:

ROADWAY NOISE BUFFER

FIGURE #

5.12

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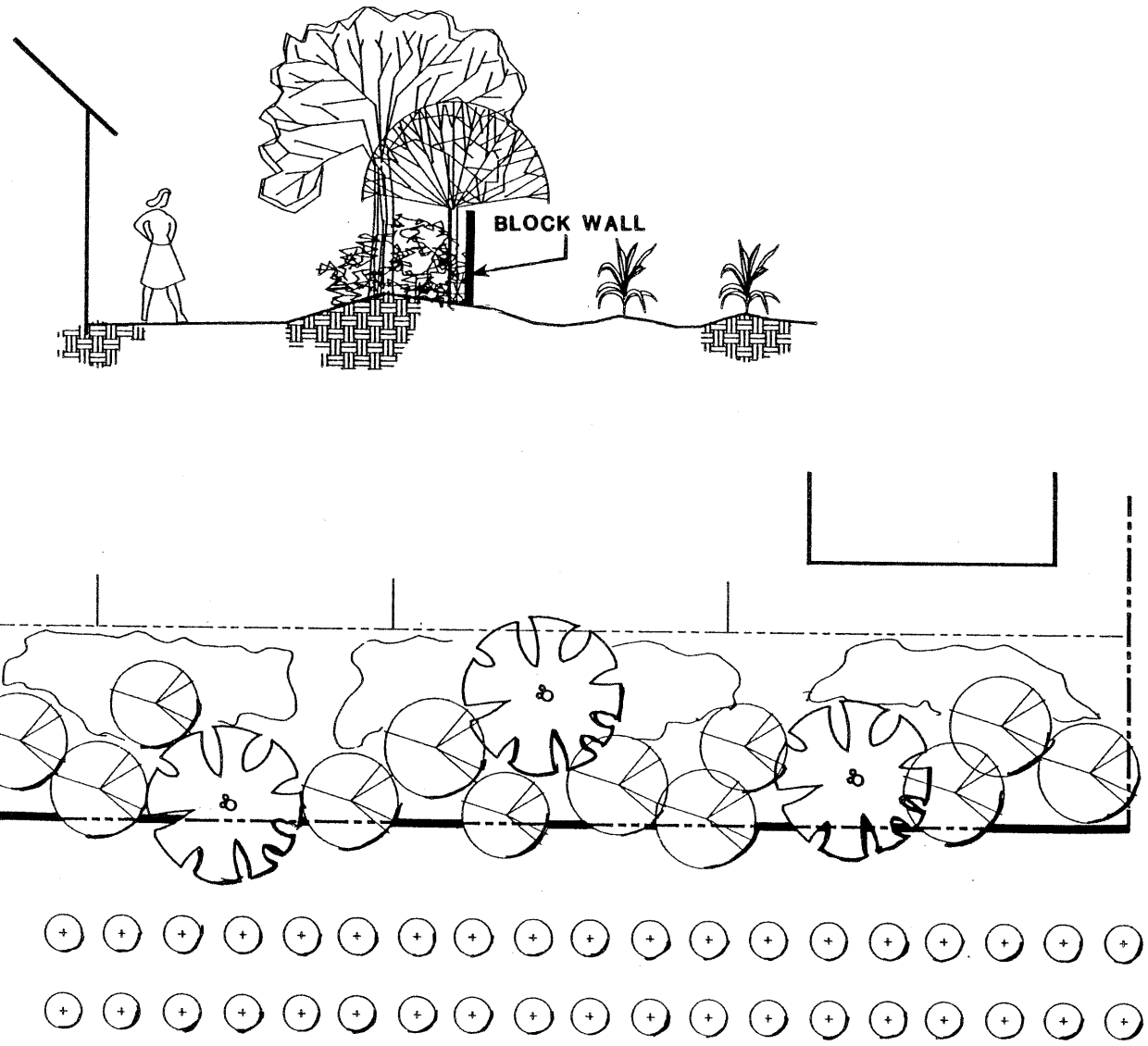

DRAWING TITLE:

AGRICULTURAL BUFFER

Source: TKD Associates, Inc.

FIGURE #

5.13

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COACHELLA 380

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5.5.12 Signs

Every sign shall have good scale and proportion in its design and in its visual relationship to buildings and surroundings.

Every sign will be designed as an integral architectural element of the building and site to which it principally relates.

The colors, materials, and lighting of every sign shall be restrained and harmonious with the building and site to which it principally relates.

The number of graphic elements on a sign will be held to the minimum needed to convey the sign's major message and shall be composed in proportion to the area of the sign face.

Accessory signs shall be given the same careful consideration of approval as that given for main signs.

Each sign shall be compatible with signs on adjoining premises and shall not compete for attention.

Identification signs of a prototype design and corporation logos shall conform to the criteria for all other signs.

5.5.13 Streetscape

The streetscape comprises features that are located in the public right-of-way such as street lighting, street furniture (benches, trash receptacles), landscaping and utility structures.

Lighting will be designed to create pools of light rather than a harsh overall ambient wash.

Special features such as Village entryways and selected landscape elements shall be treated with accent lighting (spots or floods).

Street furniture will be used to reinforce the identify and unity of a street through a common design or repeated motifs continuously appearing in the streetscape. Street elements such as street identification signs, trash receptacles, and planters shall be of compatible design, and of appropriate materials.

All utilities should be underground except those exceeding 12 Kw.

Signal controllers and power transformers shall have a design compatible with the project's design character or be screened.

5.5.14 Maintenance Considerations

Continued good appearance of structures and grounds depends upon the extent and quality of maintenance.

The choice of building materials and their use, together with the types of finishes and other protective measures, shall be conducive to easy maintenance and upkeep. Materials will be selected for their durability and wear as well as for their beauty. (Example: The finish coat on stucco buildings shall be colored to avoid the need for repainting; and, wood accent trim should be stained rather than painted to avoid blistering, peeling paint, with age and exposure to summer heat.)

5.5.15 Special Access and Transportation Considerations

All developments within the Applicant's project shall provide for incorporation of bike routes and pedestrian systems as appropriate and practical for the intended use.

Within residential developments pedestrian systems shall be provided to major site activities such as recreation areas. External to residential developments, pedestrian routes and bikeways will be provided to link the development to other residential projects, commercial shopping, schools and other public facilities.

Within major commercial developments special provisions shall be made for transit system loading/unloading and waiting areas.

6.0 environmental impacts

6.0 ENVIRONMENTAL IMPACTS

6.1 Seismic Safety

Context

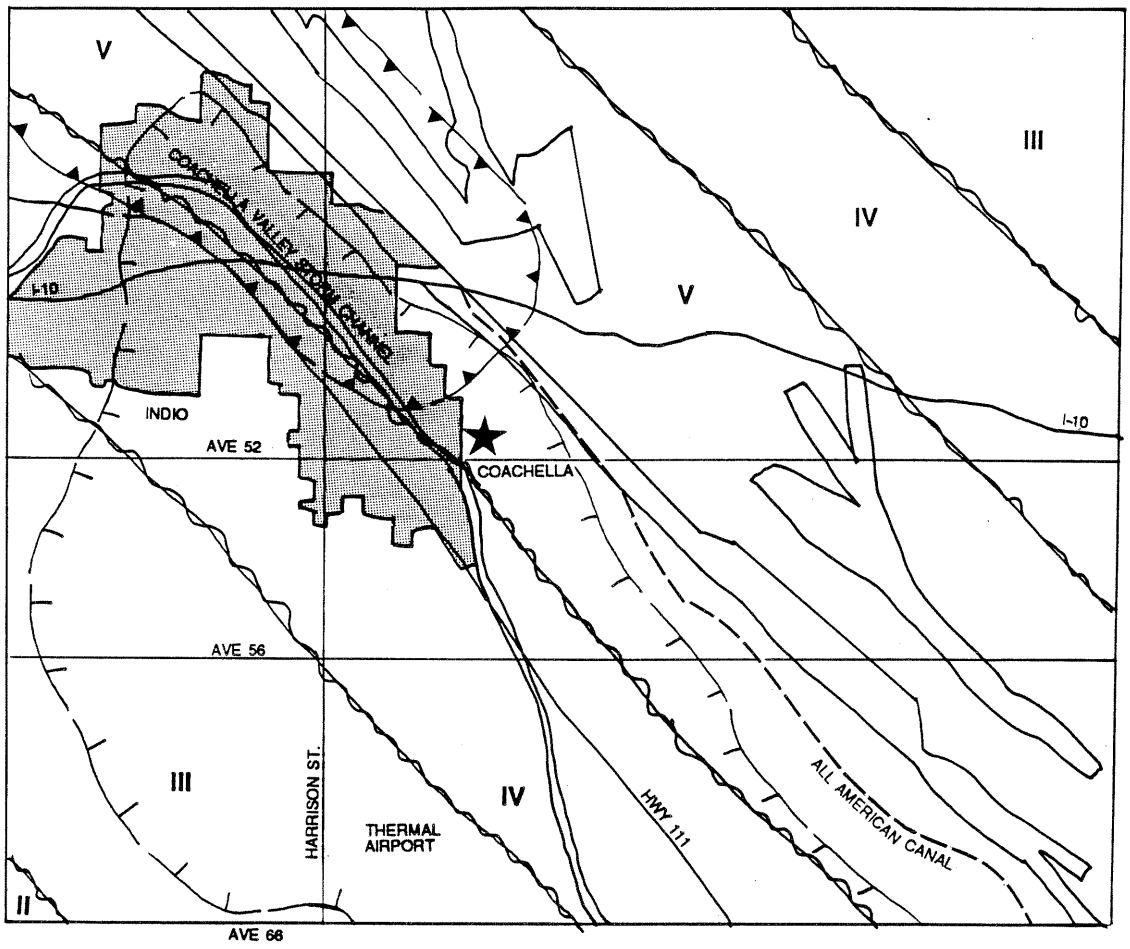
A seismic safety analysis is contained in the study titled Geotechnical Feasibility Report - "prepared for the proposed multiple use development to be located in Coachella, California", by Buena Engineers, Inc., transmittal dated February 24, 1988. That report is included in the appendix for reference to this section. The following summarizes the report's findings and conclusions.

No known faults have been mapped on this site. The primary geologic hazard relative to site development is severe ground shaking from earthquakes originating on nearby faults (see Figure 6.1, Geologic Hazards). The site is located in Southern California which is an active seismic area. A major seismic event originating on the San Andreas fault zone is considered to be the most likely cause of significant earthquake activity at the site, within the estimated design life of the proposed development. The subject property is located approximately 1.25 miles southwest of the San Andreas fault system. The City General Plan's Safety Element designates the site to be within Liquefaction Zone V.

Environmental Impacts

Based on published information and accepted methods, a design earthquake of 7.5 Richter magnitude can be calculated to originate from the San Andreas fault system. Other regional faults, including the San Jacinto and Imperial faults are capable of producing strong ground motions that will affect the site. However, because of their distance and design earthquake values, ground acceleration is not deemed to be a significant consideration.

Although some of the soils in the site area have a number of characteristics associated with liquefaction potential, the analysis of field and laboratory data indicates that the sand layers in question are generally considered too dense for liquefaction to occur. The need for additional site specific liquefaction investigation is identified.



LEGEND

- PROJECT SITE
- IV / V GROUNDSHAKING ZONE
- LIQUEFACTION ZONE
- URBAN AREA
- ACTIVE BLOWSAND AREA
- ALQUIST-PRIOLO SPECIAL STUDY ZONE

NO SCALE

DRAWING TITLE:

GEOLOGIC HAZARDS

N

Smith, Peroni & Fox

SOURCE: Riverside County Planning Dept., Jan 1983

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C O A C H E L L A 3 8 0

FIGURE # 6.1

Mitigation Measures

The geotechnical report presents a general understanding of seismic conditions affecting the property. Further studies will be required as detailed plans are prepared.

a. It is recommended that any permanent structure constructed on the site be designed to at least minimum requirements for Seismic Zone IV based on the latest edition of the Uniform Building Code.

b. Construction should allow for all plumbing and utility services to be connected with flexible connections and/or provided with convenient shutoffs.

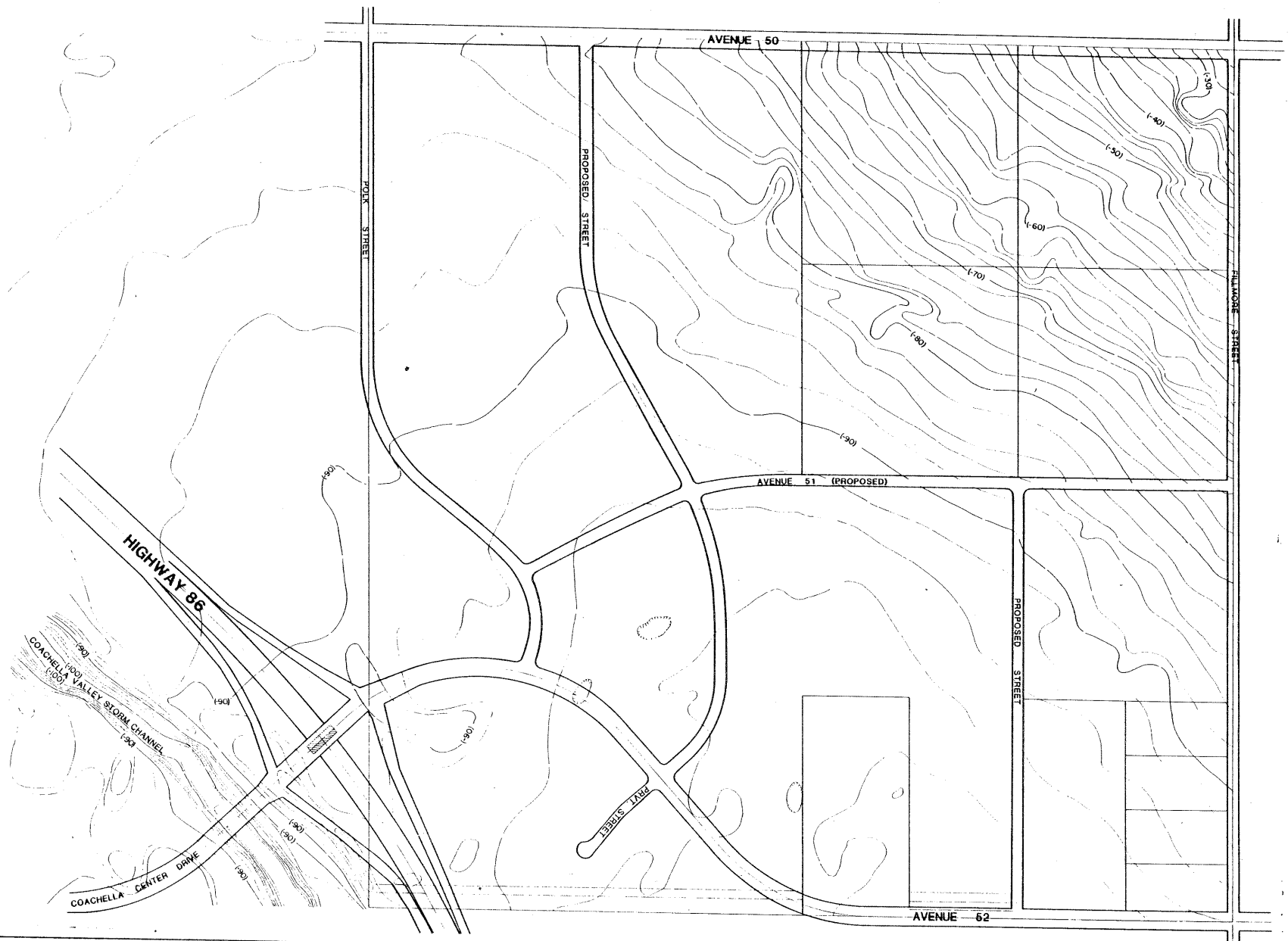
c. Relocatable structures if not supported on permanent type foundations should be designed to minimize the effects of ground shaking. Cross bracing and tie downs should be incorporated into the support structures. Actual recommendations should be provided by the manufacturer or structural engineer.

d. Site specific liquefaction potential should be evaluated with emphasis on areas of heavy loading (any multi-story commercial or office structures).

e. Further geotechnical investigations should be performed to adequately assess the engineering properties of the underlying soils with respect to development and secondary seismic hazards (liquefaction).

6.2 Topography, Geology, Slopes and Erosion Context

The site lies within the eastern Coachella Valley which is part of the Colorado Desert Physiographic province. The valley forms a flat, alluvial plain which gradually slopes southeastward from an elevation of 1,600 feet above sea level at the northwestern end of the valley to about 233 feet below sea level at the Salton Sea. The valley is bounded by the San Jacinto and Santa Rosa mountains to the west and the little San Bernardino mountains to the east. The subject property located west of the Little San Bernardino Mountains has a gentle northwest to southeast slope of about two feet vertical per one thousand feet horizontal (see Figure 6.2, Site Topography). The elevation of the property is about 90 feet below sea level.



DRAWING TITLE:

SITE TOPOGRAPHY

100 300 700 1500 FEET
0

FIGURE #
6.2

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Soil boring and other geotechnical factors were studied by the Buena Engineers Study referenced in Section 6.1. Results of that analysis and recommendations regarding development practices are summarized in the following.

Environmental Impacts

Site soils were found to consist primarily of silty sands and clayey silts (see Figure 6.3). Clay and silt contents of the soils exhibit low plasticity. Expansion tests indicate soils to be in the "very low" to "low" expansion category. Removal and recompaction of the soil will be necessary to limit settlement and improve bearing capacity.

No evidence of past land sliding was observed at the site nor are any known landslides mapped in or around the project site. The project site is not at the immediate base of any steep hills and is located on relatively flat ground.

Erosion is typically a consideration in arid regions. No evidence of scouring and channeling was observed at the site.

Mitigation Measures

The engineer's conclusion, based on field investigations and laboratory tests is that site soils are suitable for the intended development purposes if specific recommendations and practices are followed. The report contained in the Technical Appendix lists in great detail measures to mitigate problems which may be encountered in site development. In general overview mitigation should be accomplished by the following:

a. Prior to any construction operations, areas to be graded should be cleaned of vegetation and other deleterious materials.

b. Site grading should be visually checked by a qualified engineer prior to placement of fill. Local variations in soil conditions may warrant increasing the depth of recompaction and/or over excavation.

c. To control differential settlement and to produce a more uniform bearing condition, foundations should bear on compacted soils. Compaction should be verified by testing and consideration should be given to the type of building which may be constructed on the pad.

LEGEND

GcA Gilman fine sandy loam, wet, 0 to 2% slopes

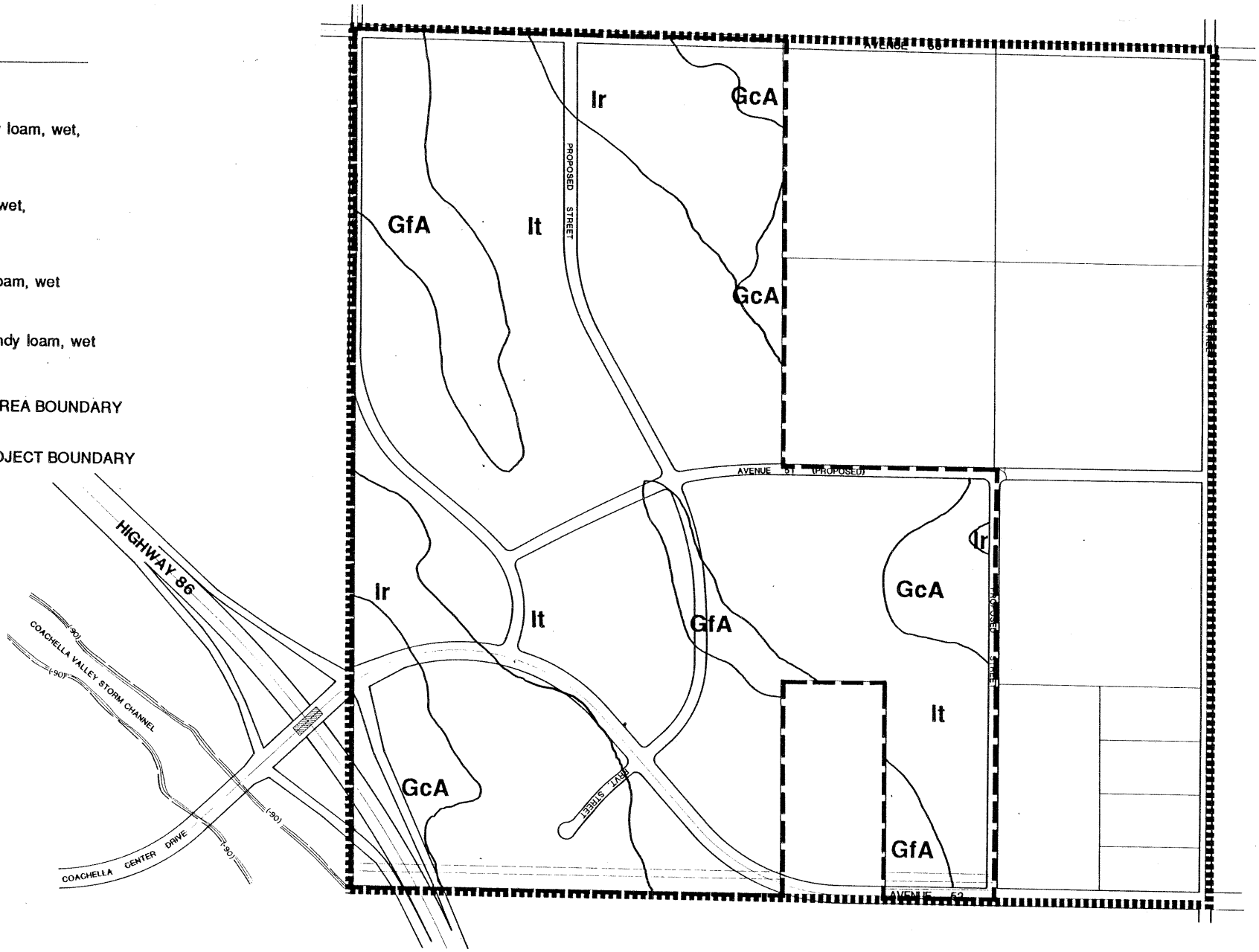
GfA Gilman silt loam, wet, 0 to 2% slopes

Ir Indio fine sandy loam, wet

It Indio very fine sandy loam, wet

SPECIFIC PLAN AREA BOUNDARY

APPLICANT'S PROJECT BOUNDARY



DRAWING TITLE:

SOILS MAP

Source: U.S. Dept. of Agriculture, Soil Survey Coachella Valley Area, Riverside County, California, 1980 Sheet 12

100 300 700 1500 FEET
0

FIGURE #
6.3

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d. Foundation designs should employ accepted engineering standards for the type and characteristic of the soils found on this site.

6.3 Wind Erosion

Wind erosion is not anticipated at the site because of the fallow vegetative cover and the absence of high wind patterns occurring in this area. Grading practices employing watering and re-vegetation should mitigate short term construction impacts. (See Figure 6.1 or Figure 6.10, for blowsand hazard mapping.)

6.4 Flooding and Drainage

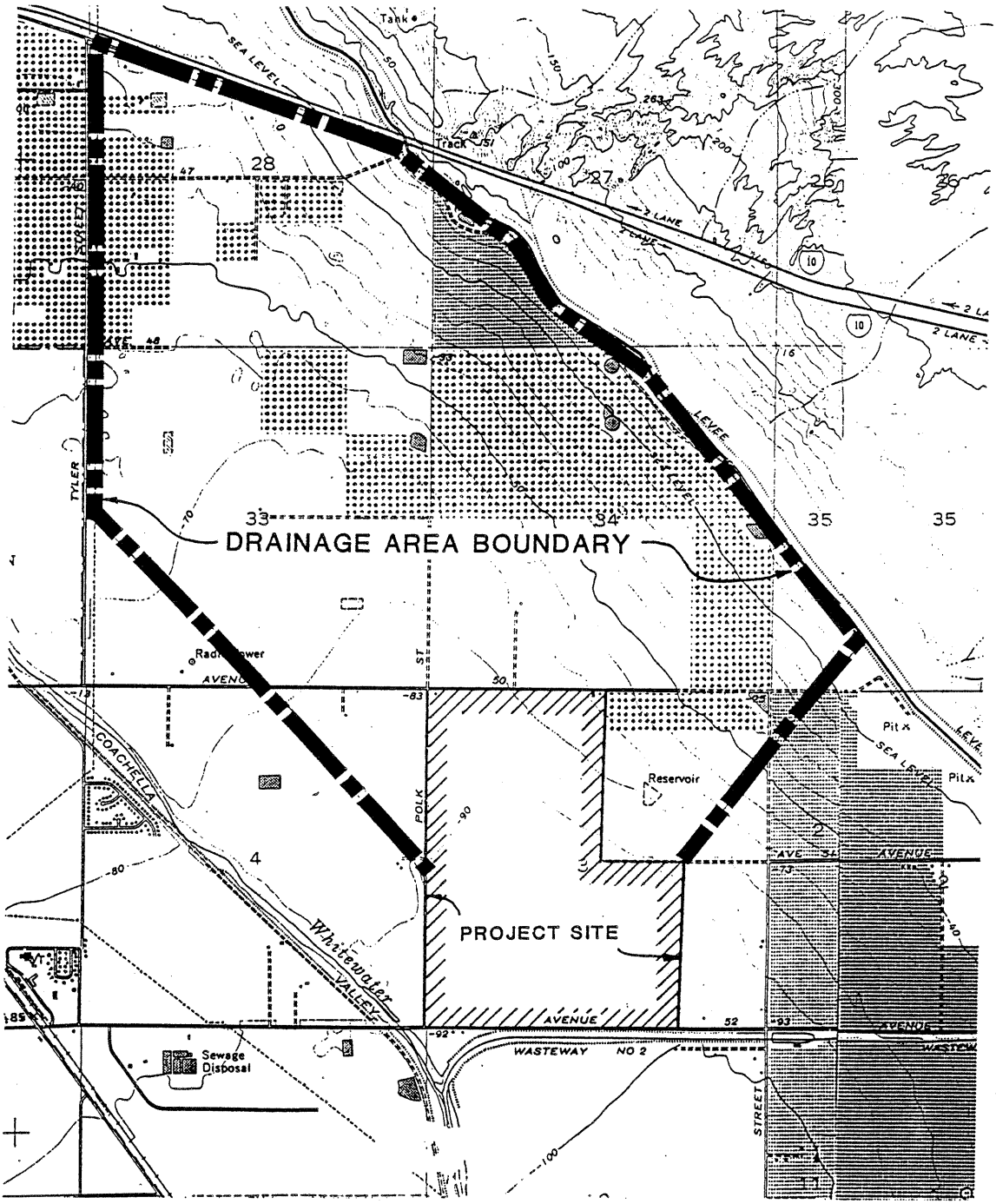
Context

The subject site is located in the Indio sub-basin of the Coachella Valley Drainage Basin. The drainage basin is a typical alluvial basin with a deep trough of unconsolidated alluvium sediments surrounded by an older basement complex. The drainage basin area is approximately 440 square miles and is bordered on the north and west by the San Bernardino and Little San Bernardino mountains and on the south by the San Jacinto and Santa Rosa mountains.

There are no natural perennial streams in the basin. The Whitewater River system flows from the northwest to the southeast year round due to agricultural drainage systems which direct excess irrigation water from neighboring farms into the Coachella Valley Stormwater Channel (Whitewater River). This water is conducted southeast to the Salton Sea.

The site is currently undeveloped with agricultural land to the north, east, and west. The existing topography creates an undefined sheet flow effect in a generally northwest to southeast direction across the site. This sheet flow could become channelized across a portion of the site and cause localized flooding.

The drainage area tributary to the site is approximately 4 square miles (see Figure 6.4, for drainage area boundary). This area historically was larger but the construction of Interstate Highway 10 and the Coachella Canal and Levee effectively reduced the drainage area by diverting all the flows north and east of these facilities around the site.



NO SCALE

DRAWING TITLE:

DRAINAGE AREA

N

SOURCE: ASL Engineering

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C O A C H E L L A 3 8 0

FIGURE # 6.4

The site is bordered on the south by Avenue 52 and Coachella Valley Water District's (CVWD) Wasteway No. 2. The wasteway carries the flows from an existing siphon under the Coachella Canal to the Whitewater River. It does not appear that any storm run-off enters the wasteway except via the siphon as the banks are elevated above the existing ground, thus causing a portion of the site to become inundated during a major storm. Figure 6.5, shows the approximate limits of flooding within the site that would presently occur during a 100 year, 24-hour storm event. The City has indicated that the site is in F.E.M.A.[1] Zone C, which are areas subject to minimal flooding.

Environmental Impacts

The proposed development will entail the construction of roads, buildings and hardscape which will decrease the pervious area of the site, and therefore increase the total peak storm run-off and volume.

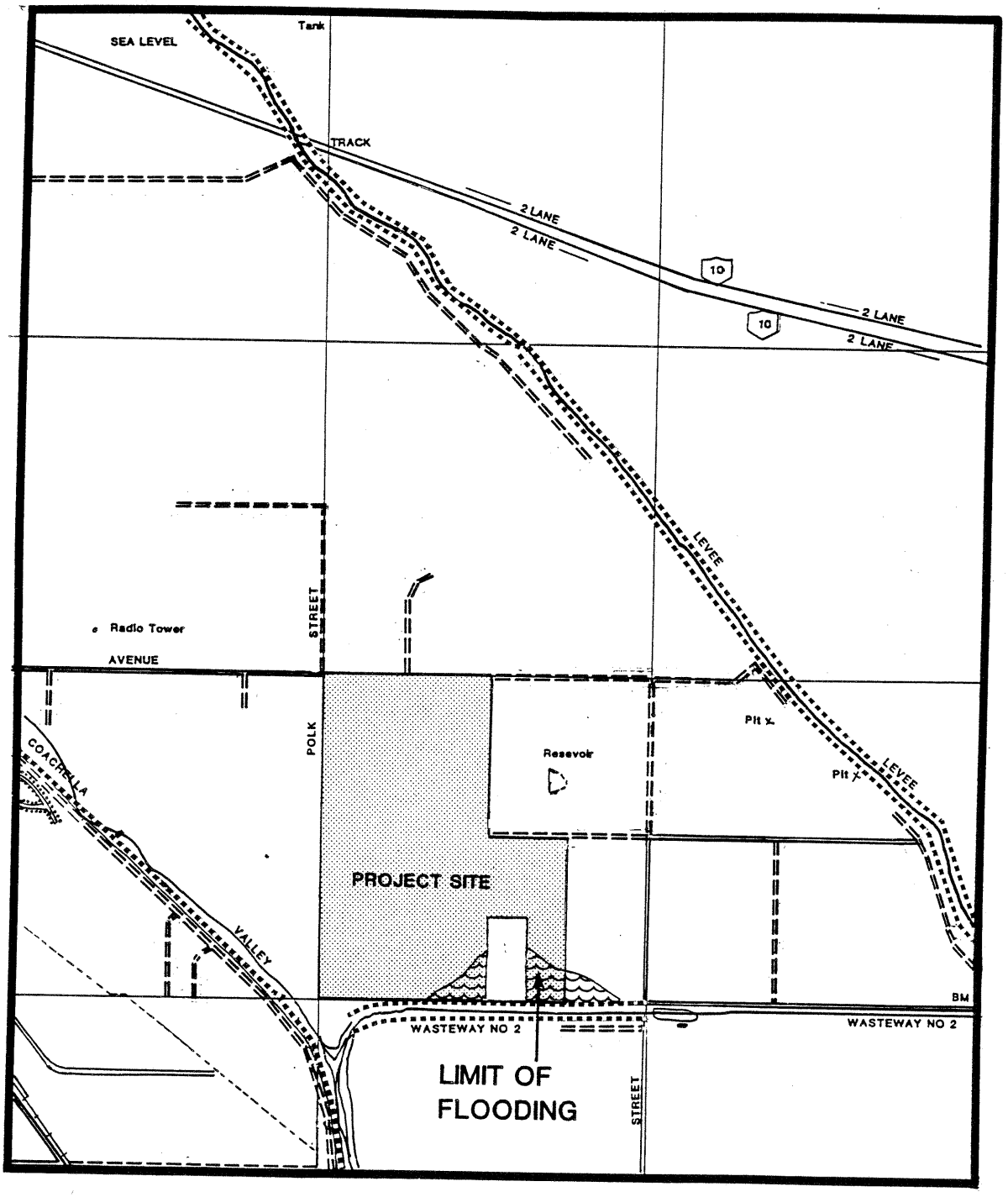
Off-site sheet flows which currently travel through the site will need to be intercepted to facilitate their channelization through the property. These flows would then be transported through the project using a combination of street surface flow and storm drains.

Without an outlet for the storm water flows, depth storage of approximately 67 acre feet would be required to contain the total storm volume reaching the site. This would be equivalent to one foot of water over 67 acres, or 18% of the total site. Since the proposed development of the site does not provide sufficient area for 100% retention a positive outlet or pumping of excess storm flows will be required.

After development the peak flow and volume of stormwater run-off generated within the site will be increased. The 100-year 24-hour storm peak run-off generated on-site will increase from 18 to 54 cfs and the on-site volume of stormwater will increase from 11.8 to 16.0 acre-feet (refer to technical appendices).

The on-site flows are proposed to be carried in the local streets and where necessary combined with the off-site flows in an underground storm drain system. These flows will then be conveyed to a detention basin which will retain the incremental flood volume and limit the peak flow discharging from the site.

[1] Federal Emergency Management Act, Flood Hazard Zone Study.



NO SCALE

DRAWING TITLE:

LIMIT OF FLOODING

N

Smith, Peroni & Fox

SOURCE: ASL Engineering

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C O A C H E L L A 3 8 0

FIGURE # 6.5

As noted in Section 3.4.1, Drainage and Grading Plan, a series of detention basins will be included in the site. Each phase of development will be responsible for detaining incremental flows and shall provide final engineering design as part of tract map design. There will be an opportunity for these basins to be incorporated in the park and open space areas, in addition to a primary basin to be located at the most downstream portion of the system.

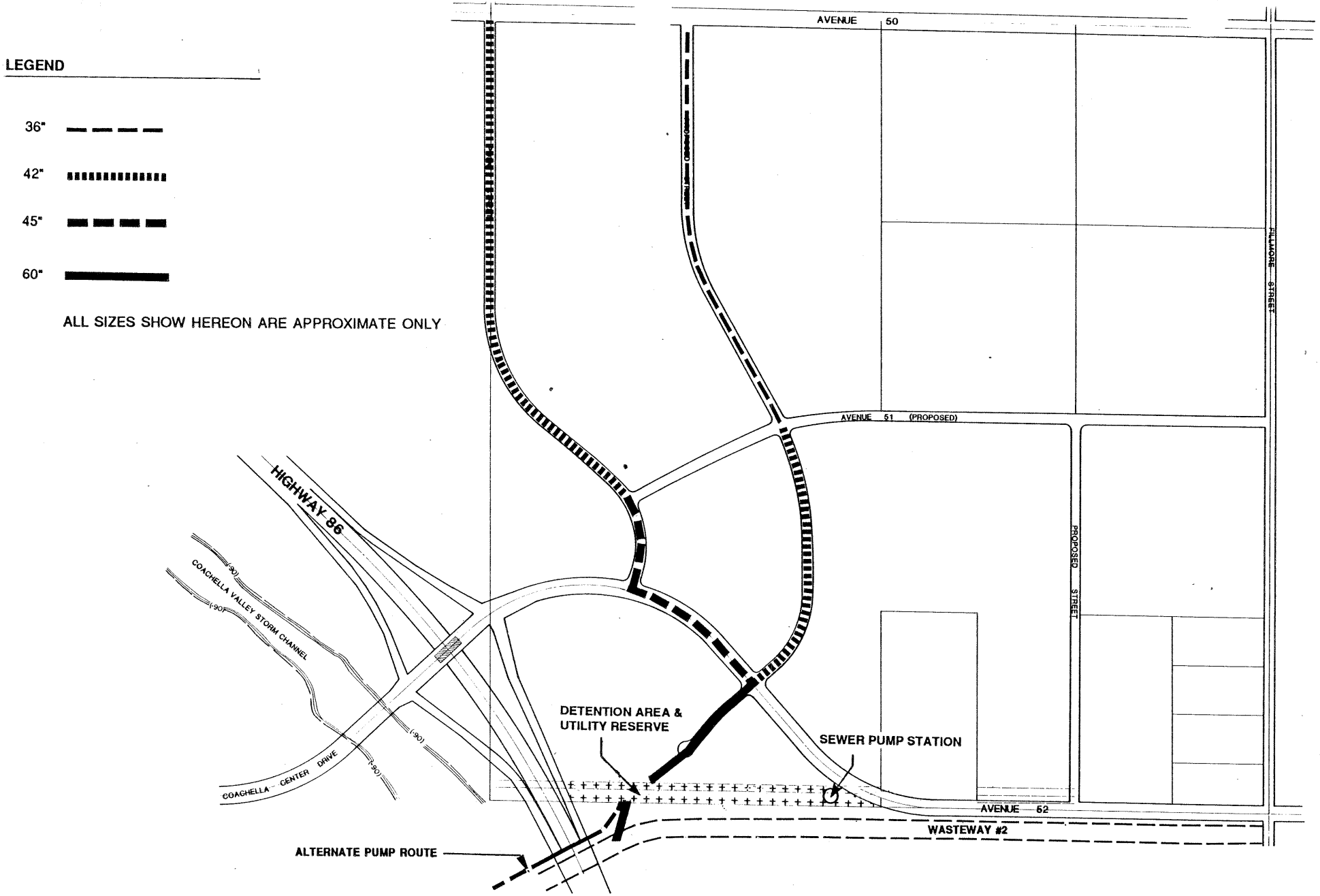
The necessity to protect the site from flooding and the inability to economically provide 100% storm retention will require a positive outlet (or pumping) to the Coachella Valley Stormwater Channel. This outlet will, if only very slightly, cause an increase in the storm flows and associated erosion in the Coachella Valley Stormwater Channel.

The storm drain master plan proposed for the site (Figure 6.6) would provide protection for the site from the 100-year storm event. The master plan system includes both a storm drain system to carry storm flows plus on-site detention areas to contain the incremental increase in peak flows and volumes of stormwater run-off caused by site development.

The precise storm drain system would be designed to ensure that the 10-year event storm would be contained within the street curbs, the 25-year storm event within the street right-of-way, and the 100-year storm within a combination of storm drains and street right-of-way.

The mentioned detention basins will be designed to ensure that the peak flow under development conditions does not increase from the current flows. The basins are included in the open areas proposed for the site such as public park, private open space and other designated open areas. The largest basin is anticipated to be located at the most downstream end of the system at the southern boundary of the proposed Regional Commercial area.

An outlet structure will be required to discharge the storm flows to either the wasteway or Coachella Valley Stormwater Channel. Due to the relatively high velocities associated with flow in storm drains an energy dissipater will be included in the outlet structure to lessen the erosive velocities of the storm flows. However, because of the silty nature of the soils in the existing stormwater channel and wasteway a certain amount of erosion can be expected.



DRAWING TITLE:

PROPOSED STORM DRAIN MASTER PLAN

Source: ASL Consulting Engineers, August 1989

100 300 700 1500 FEET
0

FIGURE #
6.6

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If a positive flow outlet to the wasteway facility is not available as an option, a pumping station may be necessary. This pumping station would be installed at the downstream basin and discharge the flows to the Coachella Valley Stormwater Channel.

Mitigation Measures

The Storm Drain Master Plan proposed as a part of the Specific Plan should be implemented with development of the project.

Further precise engineering studies should be preformed to:

a) Design the public right-of-way to contain the 10-year storm event within the street curbs, the 25-year storm within the street right-of-way, and the 100-year storm within a combination of storm drains and street right-of-way;
b) Provide final design of detention basins; and,
c) Select final outlet features and discharge route (via the wasteway or pumped into the Coachella Valley Stormwater Channel).

6.5 Noise

Context

A noise impact analysis is contained in the report titled Brandenburg Specific Plan/EIR Technical Studies, by Endo Engineering, transmittal dated March 3, 1988. That report is included in the appendix for reference to this Section. The following summarizes the reports' findings and conclusions.

The primary sources of noise in the project area are transportation facilities. Ambient noise levels in the project vicinity are currently affected primarily by motor vehicle noise emanating from area roadways. The project site is too distant from Highway 111 and Interstate 10 to be noise impacted. The project site is far removed from military, public and private airports, railroads, and other significant noise generators. However, the project site may be subject to the sight and sound of aircraft associated with Thermal Airport and will be adjacent to the planned Highway 86 - Avenue 52 interchange.

Noise levels at 100 feet from the centerline of roadways within the project vicinity currently range from a low of 45.7 CNEL* along Polk Street and Avenue 52 to a high of 68.0 CNEL along State Highway 111 (north of Avenue 52), Avenue 50,

Avenue 52, Airport Boulevard, Dillon Road, Tyler Street, Polk Street and Fillmore Street. In addition, the 60 CNEL contours presently fall within the right-of-way along Avenue 50 (from east of Tyler Street to west of Fillmore Street), Avenue 52 (from west of Highway 111 to east of Fillmore Street), Tyler Street, Polk Street, and Fillmore Street. The 70 CNEL contour is currently located 204 feet from the centerline of Interstate 10. The City General Plan Noise Element indicates that the future 70 CNEL contour will be located 251 feet from the centerline of Highway 86; this calculation will need to be adjusted based on resultant land uses contemplated for the East Valley Community Plan Area.

The City of Coachella has established standards and policies regarding land use compatibility with noise in the January 1987 General Plan Update. It has also provided review procedures for use in identifying noise hazards on a site specific basis. All development applications are reviewed for consistency with the standards and policies detailed in the General Plan.

Environmental Impacts

Short term acoustic impacts are those associated with construction activities necessary to implement the proposed land use on-site. The construction noise impact to surrounding land uses will be minimal. As the various buildings on the site are constructed, land uses adjacent to the areas under construction may be adversely impacted by construction noise. However, construction will take place only during days and hours specified by City of Coachella ordinances, when noise intrusion is less disruptive.

Long-term acoustic impacts could occur both on-site and off-site if the proposed project is implemented. Off-site noise impacts will result from project-related traffic travelling on site access roads. On-site acoustic impacts could result from motor vehicle noise generated by ultimate traffic volumes along Avenue 50, Avenue 52, Polk Street and Route 86 Freeway.

Based on the projected average daily traffic (ADT) for the mentioned project roadways, Endo Engineering has provided an August, 1989, update to their previous work, which reflects noise contours based on the subject project as it is now configured (plus), east valley traffic at project build-out. This has been referred to as "Cumulative Traffic Volumes" in Section 7.2, Traffic and Circulation. Table 6.1, appearing below, lists the distance from roadway centerline for the contours projected; and, Figure 6.7 graphically illustrates where the contours fall in relation to the project site.

Table 6.1
PROJECTED NOISE CONTOURS

Adjacent Roadway	A.D.T.[1] (Veh/Day)	CNEL @ 100 Feet[2]	Distance to Contours (Ft.)[3] 70 dBA	65 dBA	60dBA
Avenue 50	41,270	68.7	82	176	380
Avenue 52	50,830	69.6	94	203	437
Polk Street	11,260	62.4	31	67	145
State Route 86	46,050	74.5	200	430	926

[1] A.D.T. means average daily two-way traffic volume.
[2] CNEL values are given 100 fett from roadway centerlines.
[3] All distances are measured from the centerline. The contours may fall within the roadway right-of-way.

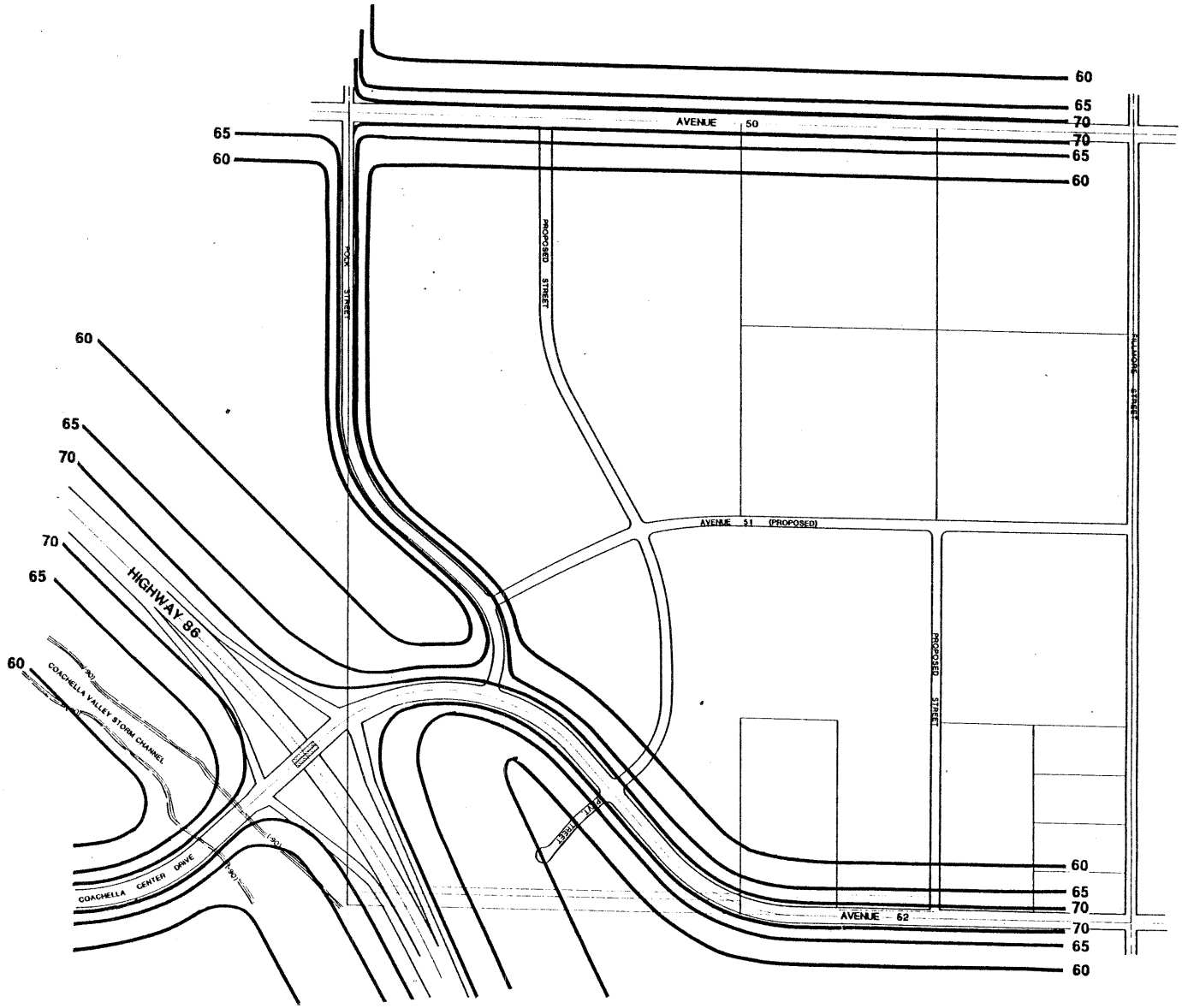
In this particular instance, the land use arrangement has recognized the criteria for placement of sensitive receptors by locating commercial uses in closest proximity to the Avenue 52 - Highway 86 interchange, while placing single family uses the furthest distance. Roadway noise from future improved Highway 86 will be dissipated over this separation distance. Therefore, project impacts will be focused to those which result from local street traffic.

Mitigation Measures

Noise standards are implemented at various points in the planning and design of a development. At the General Plan Amendment and Zone Change levels the land use type and density near noisy transportation facilities can be controlled. Later, at the Site Plan review level, proper structure arrangement and orientation can be evaluated, with approval conditioned upon setbacks, landscaped buffers, etc., that can resolve noise difficulties. At the subdivision or tentative tract level, detailed noise abatement requirements such as architectural design, acoustic construction techniques and the erection of noise barriers are established, as deemed necessary.

The following specific mitigation measures are recommended for incorporation in the project to minimize noise impacts and insure compliance with applicable noise standards:

* Community Noise Equivalent Level-day/night weighted average of noise exposure.



DRAWING TITLE:

NOISE CONTOUR MAP

Source: Endo Engineering

NO SCALE

FIGURE #

6.7

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1. During construction activities on-site, the following short-term acoustic mitigation measures should be implemented:
   - Construction activities adjacent to residential areas should take place only during the days and hours specified by City Ordinance.
   - All construction equipment, fixed or mobile, should be equipped with properly operating and maintained mufflers.
   - Stationary equipment should be placed such that emitted noise is directed away from sensitive noise receivers.
   - Stockpiling and vehicle staging areas should be located as far as practical from occupied dwellings.
   - Every effort shall be made to create the greatest distance between noise sources and sensitive receptors during construction activities.
   - The noisiest construction operations shall be arranged to occur together in the construction program to avoid continuing periods of greater annoyance.

2. Site design measures to reduce noise at the residential lots on-site over the long-term should include:
   - Carports and parking areas should be located adjacent to the heavily travelled roadways to create building setbacks and shield more sensitive uses.
   - Dwelling structures should be oriented away from adjacent roadways to insure that room arrangements, window size and placement, and roof and courtyard design minimize intrusive noise levels.
   - Noise sensitive courtyard or recreational open space areas should be shielded from intrusive noise levels by intervening structures or barriers.

3. Site design measures to reduce noise adjacent to the commercial uses on-site over the long-term should include:
   - Truck access, parking area design and air conditioning refrigeration units should be carefully designed and evaluated at more detailed levels of planning to minimize the potential for acoustic impacts to adjacent noise sensitive development.
   - Building setbacks, building design and orientation can be used to reduce intrusive noise levels at any building pads located adjacent to roadways.
   - Wherever feasible, parking areas should be located between the buildings and the roadway in order to create the greatest distance between noise source and receptor.

6.6 Climate and Air Quality

Context

Although significant air quality improvements have been made in California over the past twenty years, southern California still experiences severe air pollution problems. The study area is located within the Southeast Desert Air Basin, under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). This basin continues to exceed state and national ambient air quality standards (NAAQS) on as many as 166 days annually, despite efforts to control emissions from stationary pollutant sources and motor vehicles.

The air quality of the basin is determined by the primary pollutant emissions added daily,and by the primary and secondary pollutants already present in the air mass.[2] Motor vehicles are by far the most significant source of air pollutants in urban areas. For example, within the neighboring South Coast Air Basin, an estimated 2.3 million vehicles are on the roadways each day emitting hydrocarbons (unburned fuel), carbon monoxide, and oxides of nitrogen. These primary pollutants chemically react in the atmosphere with sunlight and the passage of time to form secondary pollutants such as ozone. Ozone levels peak in summer and early fall when the solar radiation exposure of the air mass is the greatest. Oxidants (90% of which are ozone) represent the major air quality problem basin-wide.

All metropolitan areas of the South Coast Air Basin contribute to the ozone levels experienced in downwind areas like the Southeast Desert Air Basin. Thus, the air quality in the study area is a function of the primary pollutants emitted locally, the existing regional ambient air quality, and the meteorological and topographic factors which influence the intrusion of pollutants into the area from sources outside the immediate vicinity.

[2] Primary pollutants are those emitted directly from a source and include: carbon monoxide (CO), nitric oxide and nitrogen dioxide (NO and NO2), sulfur dioxide (SO2), particulates, and various hydrocarbons (HC). Secondary pollutants are created with the passage of time in the air mass and include ozone (03), photochemical aerosols, peroxyacetylnitrate (PAN), and nitrogen dioxide (NO2).

Climate and Meteorology

The study area has a desert climate characterized by low annual rainfall, low humidity, hot days and very cool nights. The climatological station closest to the project site is located in Thermal. The annual precipitation monitored in 1987 and normalized over the past 39 years was 2.8 inches. Ninety percent of the precipitation occurred between October and January. The monthly average temperature ranged from a low of 54.1 degrees Fahrenheit during January to a high of 91.9 degrees Fahrenheit in July. Temperature extremes ranged from 25 to 115 degrees Fahrenheit.[3]

The Colorado River to the east and a series of high mountain ranges to the west (San Gabriel, San Bernardino and San Jacinto) form a physical and climatological barrier between the Southeast Desert Air Basin and the South Coast Air Basin. Thus, inversion conditions are less favorable than in the coastal areas of Southern California. Surface-based inversions are prevalent at night during certain periods of the year and occasionally persist throughout the day.

Wind direction and speed (which in turn affect atmospheric stability) are the most important climatological elements affecting the ambient air quality on-site. The on-shore dominant daytime winds occur between noon and 7:00 pm, following the peak travel period (6 am - 9 am) in the Los Angeles County/Orange County metropolitan areas. Consequently, during periods of low inversions and low wind speeds, the net transport for air pollutants generated in these more urbanized areas is predominantly onshore, through the Santa Ana Canyon, into Riverside County and San Bernardino County.

Four key elements are required to specify the meteorological conditions affecting the transport and dispersion of air pollutants. These include the wind direction,wind speed, atmospheric stability, and mixing height. Although regional meteorological conditions (such as temperature inversions, Santa Ana wind conditions, etc.) will dominate localized conditions, wind direction, wind speed, and localized turbulence generated by site specific topographical conditions can play a key role in determining site specific ambient air quality.

[3] Source: NOAA, "Climatological Data Annual Summary", 1987.

Effects of Pollutants on Receptors

There have been demonstrated effects of specific air contaminants on health, vegetation, and property. Some of these health effects are summarized in Table 6.2. A full discussion of the effects on air pollutants is provided in the technical appendix section on air quality.

Note that some groups of people are more likely to be affected by air pollution then others. These groups represent over 50% of the population of California and includes the elderly over 65; children under 14; athletes; and people with chronic respiratory disease.

Ambient Air Quality

The South Coast Air Quality Management District maintains ambient air quality monitoring stations at numerous locations throughout the basin. The project site is located within Source Receptor Area (SRA) 30. The monitoring stations in SRA 30 are located in the City of Palm Springs and the City of Indio. The Indio station monitors conditions which are most representative of the ambient air quality within the study area. Data from the Palm Springs station will be utilized to supplement Indio monitoring data wherever necessary.

Ambient air quality data is given in terms of state and federal standards which were adopted to protect public health with a margin of safety (see the Appendix). These standards are designed to protect that segment of the population most susceptible to respiratory distress or infection such as asthmatics, the very young, the elderly, people weak with illness or disease, or persons engaged in heavy work or exercise, (i.e. sensitive receptors). Healthy adults can tolerate periodic exposures to air pollutant levels well above these standards before adverse health effects are observed.

Two types of national standards have been established: (1) primary standards designed to safeguard the health of people considered to be sensitive receptors while outdoors, and (2) secondary standards designed to safeguard human welfare (by minimizing damage to plants, and the oxidation of rubber and paint, etc.). California has adopted health advisory levels or episode criteria for oxidant, carbon monoxide, sulfur dioxide and oxidant in combination with sulfur dioxide or sulfate. Episode criteria represent short-term exposures at concentrations which actually threaten public health.

Table 6.2
Health Effects of Air Pollutants[1]

Pollutant	Concentration/ Exposure Time	Observed Health Effects at Specified Concentrations
Ozone	0.25 ppm/1 hour	Increased frequency of asthma attacks.
	0.30 ppm/1 hour	Cough, chest discomfort and headache.
	0.37 ppm/2 hour	Decline in pulmonary function in healthy individuals.
Carbon Monoxide	15-18 ppm/8 hour	Can cause decreased exercise capacity in patients with angina pectoris.
	50 ppm/1 hour	Can cause impairment of time interval estimation and visual function.
Nitrogen Dioxide	0.11 ppm/few minutes	Sensory responses may be elicited or altered.
	Daily peak exceeds 0.45 ppm on 10% of days in 12 months	May cause some impairment of pulmonary function and increased incidence of acute respiratory disease.
	1.50 ppm/short term	Can cause difficulty in breathing in healthy as well as bronchitic groups.
Lead	3.2ug/m^3/7 weeks	Increase in blood lead levels which may impair or decrease hemoglobin synthesis.
Sulfur Dioxide/ Total Suspended Particulate (TSP)	0.037 ppm SO annual average association with 100 ug/m^3 smoke[2]	May cause higher frequencies of acute respiratory symptoms and diminished ventilatory function in children.

[1] Source: SCAQMD, "1983 Annual summary."
[2] Smoke is a British measure of particulate matter concentration.

The Indio station presently monitors three of the seven pollutants for which state or federal ambient air quality standards exist. The Palm Springs station monitors five of the seven air pollutants. Sulfur dioxide is not monitored in SRA 30 and therefore not considered a significant local pollutant. Lead monitoring in SRA 30 was terminated during 1987. Carbon monoxide is monitored at the Palm Springs station but not monitored at the Indio station. If these pollutants become a concern to the SCAQMD or CARB in the future, ambient air quality data will be collected.[4]

Air quality trends which have developed in SRA 30 between 1986 and 1988 are discussed below. From the ambient air quality data (see the Appendix), it can be seen that carbon monoxide, nitrogen dioxide, lead and sulfates have not equalled or exceeded the relevant state and federal standards; however, particulates and oxidant (ozone) have exceeded the standards.

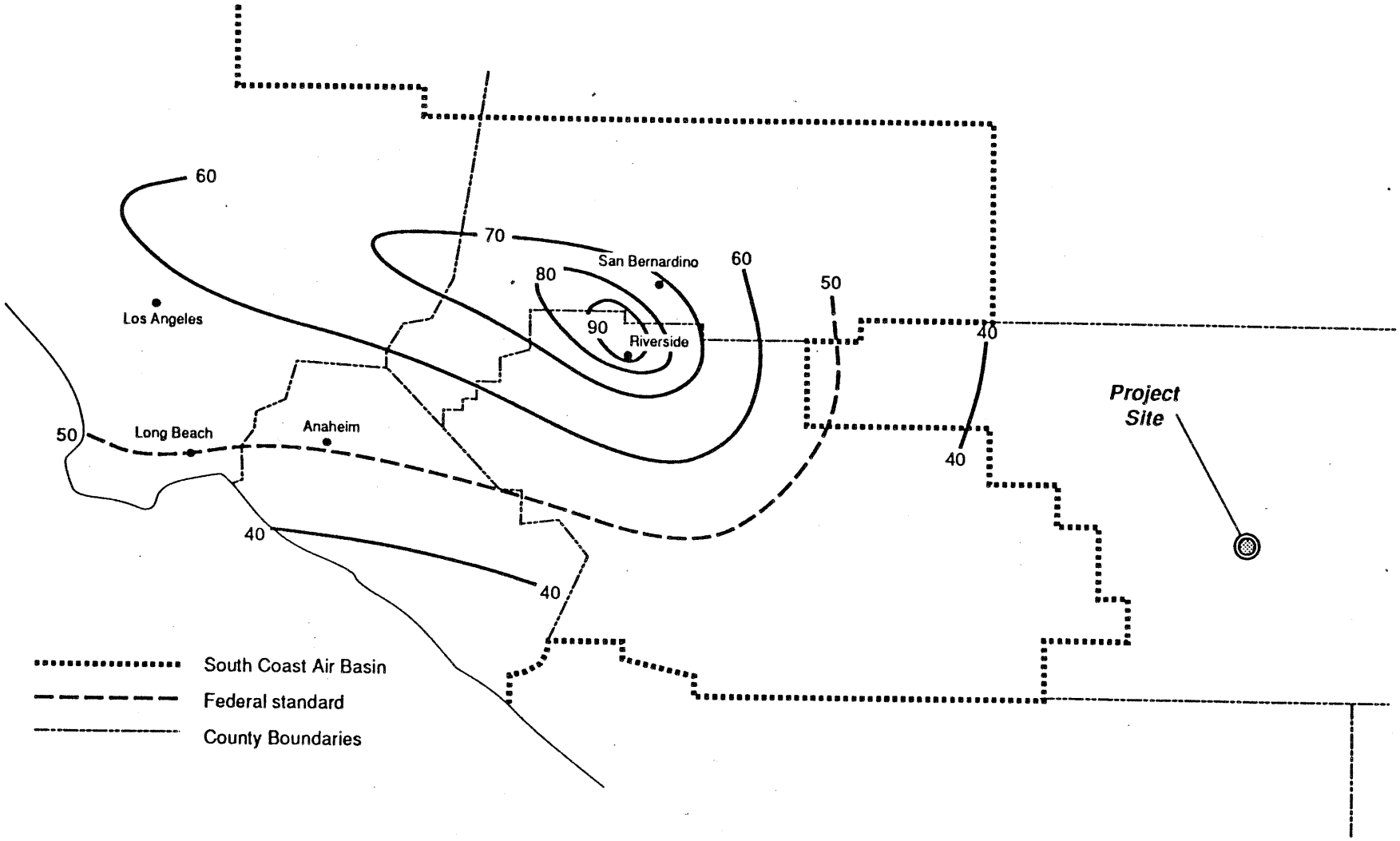
Of the pollutants monitored at the Indio station, particulate matter equalled or exceeded the California ambient air quality standard most often. Total suspended particulates (TSP) with an aerodynamic diameter equal to or less than 10 microns (PM_{10}) exceeded the California 24-hour PM_{10} standard of 50 micrograms per cubic meter on 41 percent of the days monitored. The maximum 24-hour particulate standard has not been exceeded since 1986.

Figure 6.8, identifies the annual average PM_{10} concentration contours throughout the area under the jurisdiction of the South Coast Air Quality Management District for the year 1987. As shown therein, the project site is outside of the 40 ppm air pollutant contour.

Oxidants equalled or exceeded the state 1-hour ozone standard (0.10 ppm) on 5.3 percent of the days monitored in Indio between 1986 and 1988. First stage (1-hour average > .20 ppm), second stage (1-hour average > .35 ppm) and third stage (1-hour average > .50 ppm) episodes were not declared between 1986 and 1988.

Figure 6.9 depicts the annual maximum 1-hour ozone concentration from 1980 to 1987 at the Indio station. For comparative purposes, maximum ozone concentrations measured at other air quality monitoring stations in Riverside County are also shown.

[4] Source: Mr. Brian Farris and Mr. Glen Wiler, SCAQMD, conversations in February, 1988.



DRAWING TITLE:

YEAR 1987 ANNUAL AVERAGE PM_{10} CONCENTRATION

Source: Draft 1988 AQMP, Chapter 2, Pg. 2-9; SCAQMD / Endo Engineering

Scale: 1"=15.5 Miles

FIGURE #

6.8

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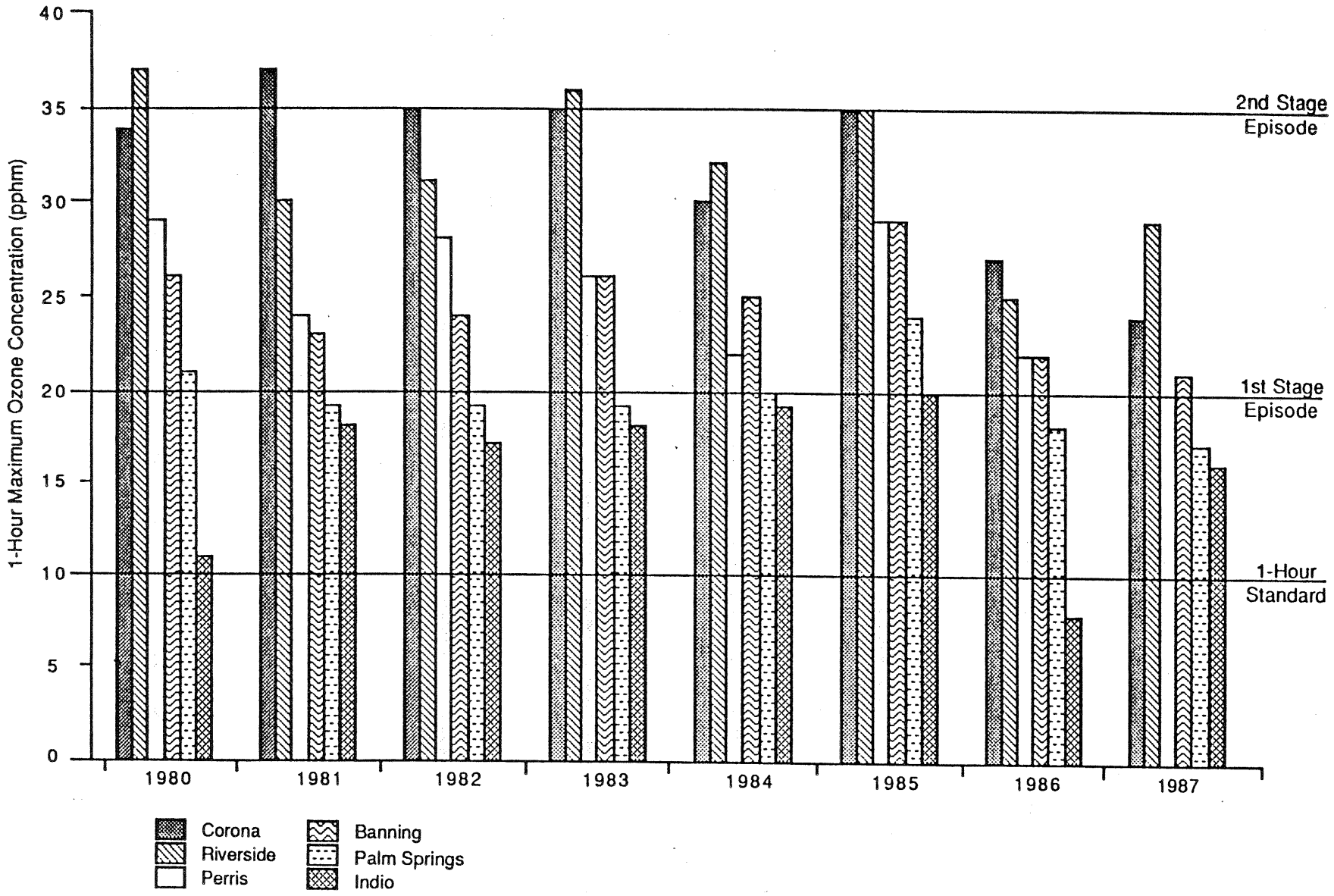
N

Smith, Peroni & Fox



DRAWING TITLE:

RIVERSIDE COUNTY OZONE DATA

Source: California Air Resources Board / Endo Engineering

FIGURE #

6.9

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C O A C H E L L A 3 8 0

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Figure 6.9 indicated that the maximum 1-hour ozone concentration is generally decreasing at all monitoring stations in Riverside County. The lowest total number of days exceeding the 1st and 2nd stage episode criteria in Riverside County occurred in the most recent years. Since 1980, monitoring at the Indio station does not indicate any exceedances of the 1st stage or 2nd stage ozone episode criteria. The 1-hour ozone standard was exceeded during seven of the eight years identified. However, the Indio station has consistently monitored the lowest maximum 1-hour concentration of all the stations. Conversely,the Corona and Riverside stations have monitored the highest 1-hour ozone maximums in the county (which is expected by their location with respect to the urban areas of Los Angeles and Orange Counties).

State and federal standards for carbon monoxide, sulfate and lead were not exceeded between 1986 and 1988 at the Indio and Palm Springs stations. The maximum sulfate concentration monitored was 11.2 ppm in Palm Springs and 10.3 ppm in Indio. The maximum lead concentration monitored was 0.27 ug/m^3. Lead was not monitored during 1987 and 1988 in SRA 30.

The maximum 1-hour carbon monoxide concentration measured at the Palm Springs station was 5.0 ppm. The highest 8-hour concentration monitored was 2.9 ppm. Carbon monoxide was not monitored at the Indio station between 1986 and 1988.

Local Sources of Air Contaminants

Blowsand is the most severe form of wind erosion, occurring when barren sand or sandy loam soils are exposed to high winds, in the absence of moisture. Blowsand can cause significant property damage and expensive clean-up procedures. It contributes to high suspended particulate levels and associated respiratory problems for sensitive receptors.

In the Coachella Valley is an area defined as a "Blowsand Hazard Zone" by the Coachella Valley Association of Governments (CVAG). This zone is defined as "... all land, by nature of its location or soil characteristics subject to real or potential sand accumulation and/or abrasion, or land which may cause sand damage to adjacent property.[5] Within the hazard zone is an "Active Blowsand Zone".

[5] Source: Coachella Valley Association of Governments, "Blowsand Control and Protection Plan", 6/77.

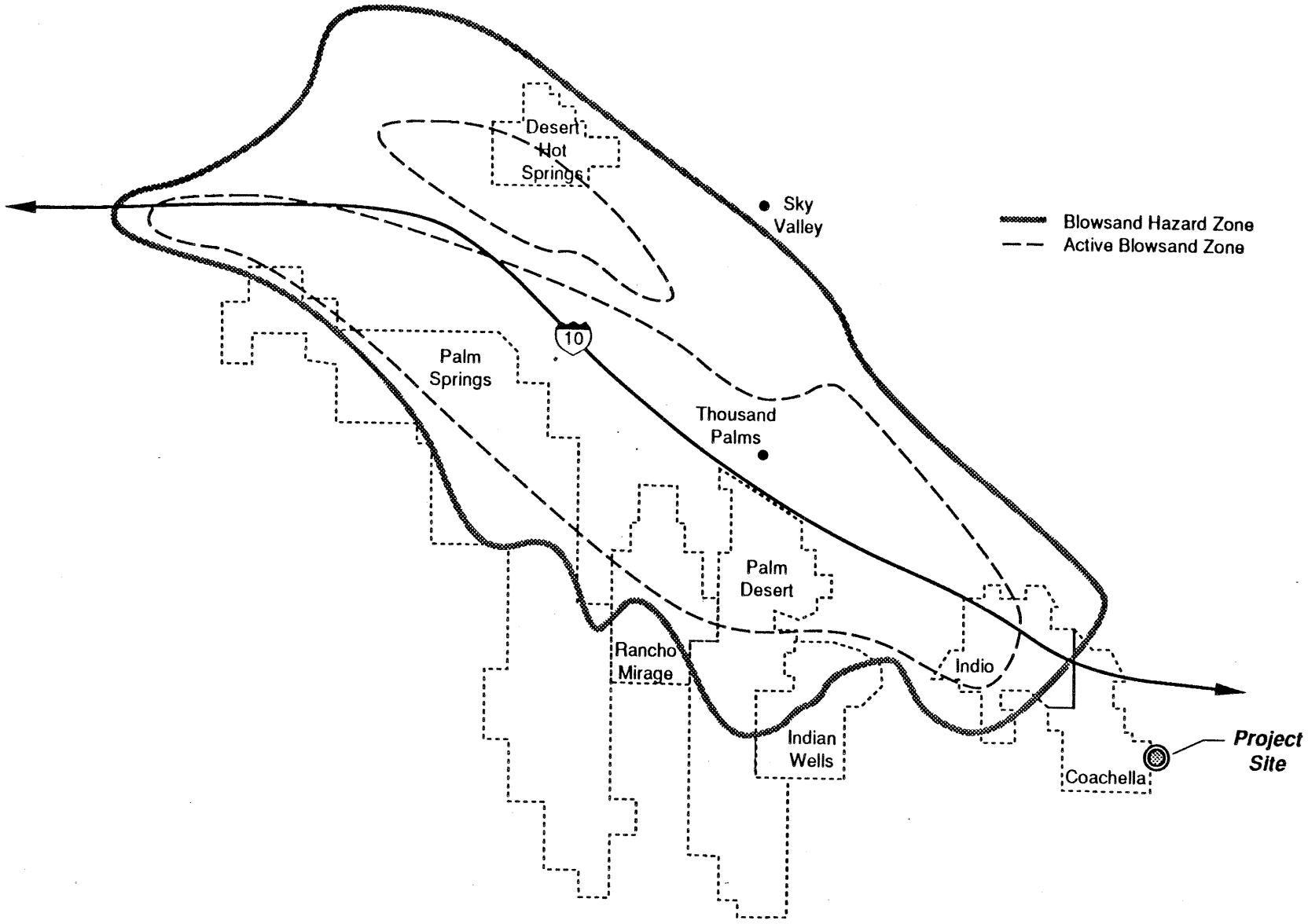
The project area is outside of the hazard zones as shown in Figure 6.10. However, the project area may be subject to blowsand during seasonal weather changes and what is considered to be the windy season from March until May. During these periods it is especially important to implement control measures to reduce air-borne particulate concentrations.

Controlling the blowsand problem is intended: (1) to protect the health, safety and general welfare of future residents of a proposed development; (2) to provide for the protection of adjacent property owners who are subject to soil erosion and/or soil accumulation resulting from development activities; and (3) to minimize the public cost of removing accumulated sand on public roads. Vegetative planting has been the most effective method of direct blowsand control and protection. Other possible methods include walls, screens, fences, ground covers, soil stabilizers, and watering techniques.

Air Quality Management Plan (AQMP)

The Federal Clean Air Act and the Lewis Air Quality Act required the preparation of a plan to demonstrate the attainment of both the federal and state air quality standards at the earliest date achievable (1987) using all reasonably available control measures. The AQMP (originally adopted in 1979 then revised by the "AQMP 1982 Revision" which was adopted in October 1982) is the South Coast Air Basin and South East Desert Air Basin portion of the Riverside County plan which defines the nature and source of air contaminants and quantifies the reductions necessary to meet federal and state air quality standards. A revision of the AQMP was released in September, 1988 and again in March of 1989.

The "AQMP 1982 Revision" identifies the control measures available for implementation by 1987 as well as long range strategies to bring the basin into later compliance. The purpose of the "AQMP 1989 Revision" is to set forth a comprehensive program that will lead the South Coast Air Basin into compliance with all federal and state air quality standards by the year 2007. The "1989 AQMP Revision" identifies needed control methods to reduce anticipated emissions and contingency measures that will be considered in the event that the control method strategy fails to meet the expected emission reductions by the year 2007. Control methods are categorized into three tiers, depending upon their readiness for implementation. The three tiers are:



DRAWING TITLE:

COACHELLA VALLEY BLOWSAND REGION

Source: Endo Engineering / Derived from C.V.A.G. Blowsand Control and Protection Plan, June 1977

NOT TO SCALE

FIGURE #

6.10

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Tier I - Full implementation of known technological applications and effective management practices.

Tier II - Significant advancement of today's technological applications and regulatory intervention where needed.

Tier III - Development of new technology.

The "Final 1989 AQMP Revision" was adopted by the SCAQMD District Board in March of 1989. Once adopted by the South Coast Air Quality Management District (SCAQMD) Governing Board, the AQMP was sent to the California Air Resources Board (CARB) and the federal Environmental Protection Agency for approval. When approved, the plan will serve as the framework for all future air pollution control efforts in the south Coast Air Basin. Until the plan is approved, the control measures contained therein should be considered "recommended for implementation wherever feasible".

The AQMP details future emission forecasts for the years 2000 and 2010. These forecasts were derived by: 1) using emissions from the base year 1985; 2) implementing emission reductions from SCAQMD and CARB rules adopted prior to December 31,1987; and 3) applying source category growth factors for the future years. The growth factors were determined by the Southern California Association of Governments (SCAG) for population, industry, and motor vehicle activity within the South Coast Air Basin.

A project can demonstrate consistency with the "1989 AQMP Revision" by showing consistency with the SCAG Regional Mobility Plan and Growth Management Plan, complying with all SCAQMD and CARB rules, and adopting all available and applicable control measures (Tier I). The Brandenburg-Butters Specific Plan is affected by Tier I control measures for other stationary source and transportation source categories.

Environmental Impacts

Two types of air pollutant sources must be considered with respect to the proposed project: stationary sources and mobile sources. Stationary source considerations include emissions on-site from construction activities and natural gas combustion, as well as emissions at the power plant associated with the electrical requirements of the project. Mobile source considerations include exhaust emissions resulting from short-term construction activities and long-term traffic generation associated with the project.

Short-Term Impacts

Short-term impacts on air quality will occur during the construction activities required to implement the proposed project. These temporary impacts will include:

- o particulate (fugitive dust) emissions from grading activities on-site;
- o air pollutant emissions at the power plant serving the site while temporary power lines are needed to operate construction equipment and provide lighting;
- o exhaust emissions from the construction equipment used on-site as well as the vehicles used to transport the equipment to and from the site; and
- o exhaust emissions from the motor vehicles of the construction crew.

Fugitive Dust Emissions

On a short-term basis, large dust particles that settle to earth near the construction area could create a temporary localized nuisance problem. Additionally, fine-grained particles may be emitted and dispersed over greater distances, settling on parked cars and occasionally annoying adjacent receptors (especially during Santa Ana wind conditions). Fugitive dust is typically chemically inert with large diameter particles that are readily filtered by human breathing passages and therefore do not represent a significant health concern.

An average particulate emission factor for construction activities of 1.2 tons of dust per month of activity per acre disturbed has been used to estimate construction emissions. This factor can be reduced by half through dust suppression techniques such as regular watering during the grading phase (particularly on unpaved roads used by construction vehicles).[6]

Typically, soil is only disturbed during the grading phase of construction and the impact due to grading is very localized. This material is composed primarily of inert silicates, rather than the complex particulates released during combustion (which are more detrimental to health). It has been estimated that only 30 to 40 percent of the particulate matter will be PM_{10} particles which are of concern from a public health perspective.[7]

[6] Source: EPA "Compilation of Air Pollutant Emission Factors", AP-42, Vol. II, September 1985.
[7] Source: Mr. Ranji George, SCAQMD Planning, telephone communication of 2/19/88.

To reduce the amount of fugitive dust generated during project construction (after clearing, grading, earth moving, or excavation activities) it is possible to:

- o seed and water until ground cover is established;
- o spread soil binders;
- o wet the area down sufficiently and repeatedly to form a crust on the surface; and
- o conduct street sweeping on local public thoroughfares where silt and sand from the project site has been deposited by the wind.

Construction Equipment Exhaust Emissions

Diesel construction equipment constitutes approximately 90 percent of the heavy construction machinery in use today. It emits on the average about one-half pound of NOx (and smaller amounts of CO and THC) for each gallon of fuel burned (EPA, AP-42). Construction equipment emission rates on very active days may total several hundred pounds of contaminants per hour.

Exhaust emissions during the construction activities will vary from day to day as construction activity levels change but should be minimal and dispersed without significant impact on sensitive receptors. Moreover, many of the activities proposed during the construction period will be set back from the surrounding development and the site boundaries. The construction crew, through motor vehicle travel, will generate an insignificant amount of air pollutants along with various site access routes.

Long-Term Impacts

Air Pollutant Emission Projections

Long-term impacts are associated with the permanent usage of the proposed development. Emission projections can be made for project build-out in the year 1993 by multiplying anticipated motor vehicle, natural gas, and electrical usage rates by the appropriate emission factors. The results obtained in this manner are detailed in the Appendix and summarized below.

As shown in Table 6.3, the proposed project would generate 4,193 pounds of carbon monoxide, 451 pounds of reactive organic gases, 873 pounds of NOx,and 194 pounds of particulates daily, once completed. Less than 2% of that total would be emitted by stationary sources and 98%+ would be emitted over a broad area by motor vehicles.

Table 6.3

Project-Related Air Pollutant Emissions[1] (Year 1999)

Primary Pollutant	Natural Gas (lbs./day)	Electricity (lbs./day)	Vehicular (lbs./day)	Total (lbs./day)
CO	6.5	10.5	3296.5	3313.5
ROG	1.7	0.5	329.3	331.5
NOx	29.6	60.2	710.1	799.9
Particulates	0.0	2.1	175.9	178.0

[1] See the Appendix for assumptions and calculations.

Table 6.4

Year 2000 Regional Emission Inventory Comparison[1] (Tons/Day)

Pollutant	Proposed Project	South Coast Air Basin
CO	1.61	3,885
ROG	0.13	1,019
NOx	0.39	905
Particulates	0.09	2,227

[1] Regional emission inventory was taken from "Draft Appendix No. III-B, "Future Baseline Emissions", SOCAB; May 1988.

Regional Emission Inventory Comparison

The project lies within SRA 30. In the absence of Source Receptor Area (SRA) data for SRA 30, a comparison was made between project-related emissions and regional emission inventory projections.[8]

As shown in Table 6.4, the regional emission inventories represent conditions in the year 2000. Consequently, the project-related emission levels shown therein also assume year 2000 conditions. The proposed project will generate less than four-hundredths of one percent of the basin-wide daily emissions of each pollutant (0.04% of the CO and NOx, 0.02% of the ROG, and 0.0004% of the particulates). The proposed project will have an incremental adverse impact on the ambient air quality of the region.

Air Quality Projections

An assessment of the project-related impact on localized ambient air quality requires that future ambient air quality levels be projected. Carbon monoxide concentrations can be estimated adjacent to nearby intersections carrying appreciable volumes of project-related traffic using the California Department of Transportation Line Source Dispersion Model (CALINE 3).

The purpose of the model is to assess air quality impacts near transportation facilities in what is shown as the microscale region. Given the source strength (number of vehicles), local meteorology, the site geometry and site characteristics, the model can reliably predict pollutant concentrations.

Because of the relative inertness of carbon monoxide in the photochemical smog formation process (and limitations of knowledge on dispersion characteristics of other air pollutant species) carbon monoxide is the most suitable tracer pollutant for microscale modeling. NOx and HC were not considered because they are unstable and undergo changes to become secondary pollutants; therefore, the roadway's contribution to these pollutant concentrations cannot be accurately assessed.

[8] SCAQMD, District staff, September 1988.

Nitric oxide (NO) concentrations can be predicted but there is no ambient air quality standard for NO. Nitrogen dioxide (which is the major constituent of NOx) is not directly predictable from conventional non-reactive models. Similarly, an accurate method to determine a roadway's contribution to local levels of SOx and particulate matter is not yet available. Secondary pollutants are a large-scale phenomenon, and should be analyzed on a regional basis rather than a local one.

Carbon monoxide levels in the project vicinity during peak hour traffic were assessed with the CALINE 3 computer model. Figure 7.10 identifies the intersections most affected by project-related traffic which were analyzed. (See Section 7.2, Traffic and Circulation.)

To simulate "worst case" meteorological conditions, a wind speed of 1 meter per second (2 mph) and Stability Class E were utilized for 1-hour averaging periods. A "worst case" wind direction of ten degrees from parallel on the highest volume roadway link was assumed (see the Appendix). Near parallel winds result in the highest carbon monoxide concentrations at receptors adjacent to the roadway.

A comparison of the projected carbon monoxide levels shown in Table 6.5 with state and federal standards indicates the significance of the projected concentrations. The standards for carbon monoxide are also presented in Table 6.5.

Since eight-hour traffic projections were unavailable, eight-hour carbon monoxide levels could not be projected directly with the CALINE 3 model. However, Caltrans has developed a recommended methodology for projecting 8-hour concentrations based on the 1-hour CALINE 3 forecasts. The methodology multiplies the concentrations generated by local roadways (total concentrations less background) by a persistence factor. This quantity is then added to a suitable 8-hour background concentration. It has been determined that the suitable persistence factor is 0.6.

Three scenarios were analyzed. The first scenario reflects existing traffic volumes in the project vicinity. The second scenario reflects existing + project traffic volumes. The third scenario reflects cumulative traffic volumes in the project area after build-out of State Route 86.

Table 6.5

Carbon Monoxide Concentrations at Nearby Intersections

Receptor Distances[1] (Feet)	1-Hour Average (ppm) 50	100	200	8-Hour Average (ppm) 50	100	200
Background						
Avenue 50 @						
- Polk Street	0.0	0.0	0.0	0.0	0.0	0.0
- Highway 111	0.3	0.2	0.0	0.2	0.1	0.0
Avenue 52 @						
- State Route 86	0.2	0.2	0.1	0.1	0.1	0.1
Background + Project						
Avenue 50 @						
- Polk Street	0.3	0.2	0.0	0.2	0.1	0.0
- Highway 111	0.5	0.2	0.2	0.3	0.1	0.1
Avenue 52 @						
- State Route 86	0.3	0.2	0.2	0.2	0.1	0.1
Cumulative + Project						
Avenue 50 @						
- Polk Street	0.9	0.5	0.2	0.5	0.3	0.1
- Highway 111	0.6	0.3	0.3	0.4	0.2	0.2
Avenue 52 @						
- State Route 86	0.7	0.5	0.3	0.4	0.3	0.2
Background Concentration	3.4	3.4	3.4	1.8	1.8	1.8
California State Standard	20.0	20.0	20.0	9.0	9.0	9.0
Federal Standard	35.0	35.0	35.0	9.0	9.0	9.0

[1] Receptor distances are measured from the roadway centerline.

As shown in Table 6.5, carbon monoxide concentrations adjacent to the intersections most affected by project traffic will be below the current 20 ppm state standard and the 35 ppm federal standard (1-hour average) under all three scenarios. Similarly, the state and federal 8-hour carbon monoxide standards (9.0 ppm) will not be exceeded at these intersections with or without the project being considered.

A comparison of the existing versus existing + project scenarios indicates that over a 1-hour and an 8-hour averaging period, "worst-case" project-related traffic will contribute 0.5 ppm or less to carbon monoxide concentrations at all receptor distances analyzed. The maximum carbon monoxide concentrations expected after project build-out is 5.9 ppm over a 1-hour averaging period and 2.6 ppm over an 8-hour averaging period at the intersection of Avenue 50 and Highway 111.

The project will not cause an exceedance of the carbon monoxide standards or make a substantial contribution to an existing exceedance. Moreover, air quality projections for the intersections most affected by project traffic do not show significant increases in carbon monoxide concentrations.

Air quality projections for the year 2000 indicate that after implementation of Tier I AQMP Control Measures, background levels will be low enough to not exceed the 1-hour and 8-hour state and federal standards in the project area. Under cumulative conditions the maximum concentrations projected are 5.3 ppm and 2.5 ppm at the Avenue 50/Polk Street intersection for 1-hour and 8-hour conditions, respectively.

Air quality impacts could occur on-site as a result of emissions from motor vehicles on State Route 86. CALINE 3 modeling was utilized to determine carbon monoxide concentration adjacent to the freeway.

At 100-feet from the State Route 86 centerline, future traffic volumes (46,050 vehicles per day) will generate 0.3 ppm over a 1-hour averaging period and 0.2 ppm over an 8-hour averaging period. Thus, emissions from State Route 86 should not cause exceedances of the carbon monoxide standards on-site. They will, however, contribute to the background carbon monoxide levels in the project vicinity.

Air Quality Management Plan

The Brandenburg-Butters Specific Plan project can demonstrate consistency with the 1989 AQMP by: (1) showing consistency with the SCAG Regional Mobility Plan and Growth Management Plan, (2) complying with all SCAQMD and CARB rules, and (3) adopting all available and applicable control measures (Tier I). The proposed project is a mixed-use development that creates employment opportunities in a job poor subregion of the South Coast Air Basin. This is consistent with the intent of the Growth Management Plan.

Final determination of Air Quality Management Plan (AQMP) consistency can only be made by the South Coast Air Quality Management District (SCAQMD). Consistency is determined from the projected regional growth and the application of District rules and regulations to all land uses in the region. The Brandenburg-Butters project proposes land uses on-site in excess of the general planned designations. However, regional forecasts for the desert regions of Riverside County show an increase in population of 177.2% that is not primarily based on land use designations but rather growth trends for the area. Even if growth provided by the project is determined to be inconsistent with the AQMP growth forecasts, the project will be consistent with the 1989 AQMP Revision if all District rules and regulations and all feasible AQMP control measures are implemented.

Significance of Air Quality Impacts

The South Coast Air Quality Management District suggests threshold levels defining "significant" for CEQA documentation. The Brandenburg-Butters Specific Plan will incorporate approximately 1,306 residential dwelling units and 73.3 acres of general commercial uses, thereby exceeding the threshold criteria. Similarly, the project would generate more than 2,000 vehicle trips per day. The project would be considered "significant" from an air quality perspective.

Cumulative and Growth Inducing Effects

The proposed project will generate air pollutant emissions that will represent less than 0.03 percent of the South Coast Air Basin pollutant burden by the year 2000. While the individual impact of this project is small, the cumulative impact of all such small sources may ultimately lead to the basin's inability to meet clean air standards.

The proposed project is the result of previous growth inducements in the area. It provides a logical extension of development with access to existing and planned arterial highways.

Mitigation Measures

Proper planning of the proposed project will ensure that needed air quality measures are incorporated. Land use planning measures support mixed uses in proximity to each other so that shorter motor vehicle trip distances and alternative forms of transportation are utilized. This can be seen in the following:

- The provision of low cost housing and employment opportunities in the region may decrease home-based work trip lengths, thereby reducing potential motor vehicle emissions.
- The provision of commercial opportunities in close proximity to residential land uses will generate shorter trip lengths and thereby reduce potential air pollutant emissions.
- The provision of employment opportunities in the project area may encourage the relocation of employee residences from more urbanized areas of the basin, thereby reducing air pollutant emissions.
- The provision of employment opportunities in the project are may encourage the relocation of employee residences from more urbanized areas of the basin, thereby reducing air quality emissions in those areas.

Appropriate project designs will further encourage air pollutant reductions. By providing an adequate circulation system to meet the projected travel demand associated with the project, congestion on-site can be minimized and subsequent motor vehicle emissions reduced. The design of recreational and green belt area can maximize the shading effect of landscaping for streets, parking areas and building walls. (AQMP control measure N7) This shading effect could result in reduced air conditioning demand for electrical energy.

Construction operations can result in air quality standard exceedances at sensitive receptors if not properly planned. Activities should be scheduled to occur first on the upwind portion of the project site to reduce blowsand and fugitive dust impacts in downwind areas. Construction activities which tend to create fugitive dust should be suspended under conditions of high wind velocity in the project area. Construction should also be suspended during ozone episodes so that project-related emissions do not further endanger sensitive receptors such as the elderly, the sickly and young children.

Specific Recommendations

The following measures have been incorporated in the project to reduce air pollutant emissions:

1. SCAQMD Rule 403 will be adhered to, insuring the clean up of construction-related dirt on approach routes to the site. (See the Appendix bound separately for additional details.)
2. Adequate watering techniques will be employed to partially mitigate the impact of construction-generated dust particulates.
3. Any earth transported will be covered and the wheels and lower portions of transport trucks will be sprayed with water before they leave the construction area.
4. Any construction equipment using diesel drive internal combustion engines will use a diesel fuel with a maximum of 0.05% sulfur and a four degree retard.
5. Building construction will comply with the energy use guidelines in Title 24 of California Administrative Code.

The following measures are recommended for further study and implementation, if feasible.

1. The preferential use of diesel-powered construction equipment rather than gasoline-powered equipment, to affect exhaust emission reductions and evaporative and crankcase HC emission reductions.
2. Construction equipment should be properly maintained and serviced to minimize exhaust emissions.
3. Construction activities should be minimized during the windy season from march through June.
4. Operations which tend to create fugitive dust should be suspended under conditions of high wind velocity in the project area.
5. Consideration should be given to using the accumulated blowsand on-site as a construction material.
6. If accumulated blowsand must be transported off-site, destinations downwind and outside of the blowsand hazard zone should be considered.
7. The use of energy efficient street lighting and parking lot lighting (low pressure sodium vapor lights) should be considered on-site to reduce emissions at the power plant serving the site. (AQMP Control Measure N11.)

8. Safe and convenient pedestrian facilities should be provided to encourage walking as a mode of transportation between the commercial facilities, employment opportunities and residences on-site. (AQMP Control Measure N16.)
9. Design features should be incorporated in the project to facilitate public transit usage.
10. Any traffic signals installed in conjunction with the project should be synchronized with other signals in the project vicinity.
11. Consideration should be given to the use of solar water heaters and solar pool heaters. (AQMP Control Measures N2 and N3.)
12. The project proponent should contact public transit, ridesharing, local public works, and other appropriate service organizations during early planning stages to ensure that needed facilities and services are available and will be incorporated in the project design.

6.7 Water Quality

Context

Groundwater in the Coachella Valley basin flows from the northeast to Southwest through various sub-basins and ultimately discharges into the Salton Sea. The primary source of natural recharge to the basin is runoff from the mountains surrounding the basin. In addition, subsurface inflow from the San Gorgonio Pass drainage area also provides recharge to the groundwater basin.

The Ocotillo Conglomerate formation is the principal aquifer in the Indio sub-basin in which the subject site lies. This is described as a confined aquifer at least 2,400 feet thick in the vicinity of the site. A shallow perched aquifer fed by infiltration of irrigation water overlays the Ocotillo formation. This shallow aquifer is not used as a water supply source because of the high salinity of the agricultural drain water which recharges it. Groundwater extracted from the Ocotillo formation provides most of the potable domestic water used in the area.

The proposed project would involve construction of urban uses and infrastructure. Roadways are known to be a collection point for petrochemical leaks and spills, along with other substances which are deposited in the course of use. These contaminants are washed into adjacent soils by the natural action of rain water.

Domestic water for the project site would be provided by an extension of the City of Coachella's municipal system; and, likewise, the City would provide for wastewater treatment. Drinking water currently meets all Federal and State primary and secondary standards.

Environmental Impacts

Development of urban improvements will result in a minor incremental impact on groundwater quality (i.e., roadway contaminants), but the aquifer being impacted is already degraded and not used as a source for potable water.

Provided that municipal services are used for domestic water supply and wastewater treatment, there should be no significant adverse impact on water quality.

Mitigation Measures

Implement water and sewer master plans which appear in subsections 3.4.2 and 3.4.3 of this Specific Plan.

6.8 Open Space and Conservation

Context

The Brandenburg-Butters property received the General Plan designation of "Specific Plan Area" in December of 1988. An urban density and intensity of development was contemplated in the City action. Other related actions included conditional approval of cancelation of an agricultural preserve contract, which had existed prior to City annexation of the area.

With land use policy having been set by the Coachella City Council, open space and conservation issues for the subject project primarily focus on topics related to development of facilities to satisfy the needs of future residents (i.e., neighborhood parks and community facilities).

A current records search (update) and a prior site reconnaissance did not reveal the existence of cultural resources. With a low probability of historic resources being found, there are no specific preservation issues.

The project site exists as a disturbed agricultural area. Plant and animal communities inhabiting the project are typical of such an area.

Environmental Impacts

The project will result in development of approximately 380 acres of land which now exists in an undeveloped state.

The subject project is anticipated to generate up to 3,938 persons residing within the project area. These residents will require public open space and recreation opportunities within their immediate neighborhood; as well as property to contain public services.

The proposed project will dedicate to the City of Coachella a six acre neighborhood park site, an amount equivalent to 1.5 (plus) acres of park land per 1,000 population. In addition, the project proposes to dedicate a 4.5 acre municipal facilities site; and, reserve some 9.9 acres as pocket parks within individual residential tracts. To satisfy the General Plan Park and Recreation Element the City would have to consider the population based guideline standards for facilities and acres of land devoted to park use. Each type of facility (i.e., baseball diamond, tennis court, etc.) has a standard for number of improvements per population, but it will require a city-wide overview to efficiently plan the grouping and location of specific recreational improvements. Other acreage/population guidelines found in the General Plan Recreation Element provide for 10 acres of "neighborhood" park per 4,500 persons. While this would appear to be excessive by most common municipal standards, the project will make available a total of 15.9 acres in dedication to the City, which would allow it to follow the guidelines.

The project involves grading and construction on lands within the general living environs of the historic and pre-historic Cahuilla Indians; the probability of cultural resources existing on the site is considered low.

No unique or endangered plant or animal communities exist on the site, as a result of previous agricultural operations.

Mitigation Measures

Dedicate a six acre neighborhood park site and reserve 9.9 acres for pocket parks to provide for recreation and open space needs of the project.

Given the low probability of cultural resources existing on the site, adequate mitigation of the potential for impact would be the requirement to bring in a qualified archaeologist should any discoveries be made during grading operations.

Restoration of the habitat conditions for flora and fauna which existed prior to agricultural operations may be partially addressed by the inclusion of, to the extent feasible, native and desert landscape material.

6.9 Agriculture

An agricultural assessment was prepared for the Brandenburg-Butters project by Pacific Consultants, dated August 25, 1989. A detailed summary of the report is presented here. The full study is found in the technical appendices.

Context

Coachella Valley

The Coachella Valley, lying east of the Peninsular Range's Santa Rosa Mountains, is one of the principal agricultural areas of Riverside County, with 637,491 acres located within the boundaries of the Coachella Valley Water District. Of this, 78,553 acres are considered to be irrigable, and 57,879 acres, some of which are double-cropped, are actually under cultivation. The Valley is about one mile wide at the north end, with an elevation of 1,000 feet, and it averages about twelve miles in width near the Imperial County line on the south, with an elevation of 235 feet below sea level.

Indio is the agricultural trading hub for the Valley. The southern portion of the Valley's economy is based on agriculture and tourism.

The northwesterly portion of the Valley, occupied by Palm Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells and La Quinta, is the center of the winter tourist trade.

Climate The Coachella Valley area is arid, with hot summers and mild winters. The average January air temperature at Indio is about 54 degrees Fahrenheit. The average July air temperature is about 92 degrees Fahrenheit. The average annual air temperature is about 73 degrees Fahrenheit. The lowest minimum temperature recorded was 13 degrees. The highest temperature recorded was 122 degrees Fahrenheit.

The frost-free period in Indio is more than 242 days in nine out of ten years, and is more than 350 days in three out of ten years. On the average, there are about eight days of frost per year in Indio. Average annual precipitation in Indio is about 3.1 inches.

Precipitation distribution in Coachella Valley is uneven, but probably averages less than three inches for the entire area covered by this report. June is the driest month, usually having no precipitation. In the Valley, one year in twenty can be expected to produce a low of less than 0.5 inches and a high totaling more than 8 inches. Snowfall is unusual, and melts very quickly, usually before any significant accumulation.

Prevailing winds are northwesterly in winter and spring. On windy days, velocities of 15 to 20 miles per hour are common, and some gusts exceed 30 miles per hour. Breezes in the hot months in summer usually have velocities below 15 to 20 miles per hour and tend to come from the southeast, bringing in humid air from the Gulf of California.

The average annual relative humidity is 20 percent in the Coachella area. The most humid period is late in summer through winter. The average monthly relative humidity reaches a maximum of 40% in August and a minimum of 20% in March and April.

The Coachella Valley is considered to be one of the warmest and earliest table grape producing areas in the United States. In addition to winter produce crops, grapefruit, lemons and exotic citrus crops, this area is the principal date producing area of the United States, with the largest concentration of dates outside the Middle East.

Water and Irrigation The Coachella Valley Water District (CVWD) was formed in 1918 for the purpose of delivering a stable water supply for irrigation and a main drainage system for reclamation and flood control purposes. As of this date, the fields of service include importation and distribution of irrigation water, irrigation drainage systems and water conservation. The CVWD obtained a stable water supply through the 123-mile Coachella Branch of the All American Canal in 1948. The CVWD's distribution system, designed and constructed by the Bureau of Reclamation, is largely underground. It consists of gravity flow concrete pipelines, with a few small pumping plants serving the higher areas. The network of laterals totals about 495 miles. Construction began in 1948 and was completed in 1954.

Completed in 1949, the protective flood works along the east side of the Coachella Valley consist of two detention dikes along the canal and three wasteways to carry flood waters impounded by the dikes to natural drainage channels, and protect the main canal and distribution system from possible storm damage.

Only approximately $10,700,000 of the original construction cost for the canal and distributions systems remains to be paid to the U.S. Government. This obligation is interest-free and is being repaid at a rate of approximately $1,131,000 annually. This payment is made from an annual assessment on all lands within the district and is collected on the semi-annual County Real Estate tax bills.

Colorado River irrigation water is delivered to the subject property by the CVWD at the cost of $13.25 per acre-foot, plus $2.00 per 24 hour period delivery gate charge. There is no limit to beneficial use. The CVWD's Colorado River water rights are considered to be valid, insuring a stable supply of irrigation water to the subject property. A $35.00 per acre standby charge is applicable to lands within the district and to all parcels with a water right and a water delivery outlet.

Coachella Valley is described as a lacrustine basin. The area was formerly occupied by Old Lake Cahuilla. The soils are very deep. They are, in general, moderately well drained to well drained. Perched water tables are present in many of the finer textured soils due to intensive irrigation.

Tile drains are used to eliminate these problems, as well as accumulation of saline salts. To date, in excess of 3,100 miles of on-farm tile drains have been installed. All tile designs are in conformance with the specifications of the Soil Conservation Service, U.S.D.A.

Economy The Coachella Valley area and community can be characterized as stable and tourist and agriculturally based. While efforts continue to be made to increase its light manufacturing economic base, it is unlikely these efforts will alter the character of the area in the foreseeable future.

Recent immigration legislation will have an effect on agricultural labor from all sources as expanded employment opportunities absorb labor now utilized within the agricultural industry. In these days of changing agricultural labor supply, the Valley is blessed by its proximity to a large source of residents (green card workers) of nearby Mexico and of skilled and experienced residents of the Valley. The proximity to Mexico places this area in a more advantageous position than other competitive areas located farther from a source of labor.

Agriculture In 1987, agricultural production was in excess of $252,571,500, or slightly over $3,553 average gross income per acre, on 71,081 acres. Of this acreage, 24,710 is farmed to fruit crops, with grapefruit, table grapes and dates being the primary crops. Winter vegetables, such as carrots, sweet corn, lettuce, melons and numerous other vegetables, are farmed on 19,465 acres. The remainder of the farming on 10,820 acres is cotton, alfalfa, barley, and other seed and field crops. Of the various products grown, 30 produced in excess of $1,000,000.

Markets Vegetable crops are marketed locally through produce brokers, with citrus, table grapes and dates all sold through several independent and cooperative packing houses. In the counties of Riverside, San Bernardino, San Diego and Imperial, there are commercial feed lots, dairies, and horse farms which utilize hay and grain crops grown locally.

The marketing of all crops grown locally have a well organized and developed outlet, within the valley or via the markets of the Los Angeles area, or direct to the eastern and southern markets via interstate trucks or rail.

Area and Neighborhood of the Site

The prevailing land uses in the area are permanent plantings on the more sloping, higher ground with citrus and table grapes being the most common. There are a few clusters of modest residences in the area. Many of the farms have one or two residences.

The character of the neighborhood is rural. There appears to be some demand from land uses which might compete with agriculture in anticipation of growth by the City of Coachella.

In the immediate neighborhood of the study site, there are other parcels of vacant land. A parcel to the west is presently being leached. The prevailing land uses indicate that the immediate neighborhood of the parcel suffers from soil and drainage problems as well as less than optimum climatic conditions.

Project Site Description

The site is comprised of ten fields lying in one block. A 20-acre field of different ownership intrudes into the parcel separating the two most easterly fields along the property's southern boundary, Avenue 52. Fields are of regular shape, and sizes consistent with those prevalent in the area.

CVWD's underground concrete Polk North Drain is located North-South in the center of Section 3. The drain empties into Detention Channel No. 2, south of and parallel to Avenue 52.

Irrigation water is delivered to the site from Laterals 103.0 (Gates 1250 and 1259) and 103.7 (Gates 1261, 1236 and 1285). According to records of the CVWD, irrigation water has not been delivered during the previous 5 years on the west half of Section 3 portion of the site, or the previous 15 years on the 60 acres in the Southeast quarter of Section 3.

The property is gently sloping to the south and west at the rate of 2 percent or less. The land, previously used for general field crops, is in need of relevelling if adequate irrigation control were to be achieved. This is due to the property having not been cultivated during the previous five to fifteen years.

The soils on the property are mostly Indio fine sandy loams, inter-disbursed with Gilman silt loam and Gilman fine sandy loam. Table 6.6 summarizes the soils on the site according to the Coachella Valley Soil Survey Map. A copy of a portion of this map, along with a description of the soils are included in the technical appendix. Refer to Figure 6.3 for a soils map.

The site's appearance is typical of a farm which has not been cultivated for five to fifteen years. That is, soils which are sodic or saline, particularly when they overlay an impermeable or semi-permeable barrier, as indicated by the soil classification, tend to accumulate salts on the surface. This is due to the wicking of salts upward through the soil profile as the hot desert sun draws moisture from the soil. The salts accumulate at or near the surface in ever increasing concentrations. The situation is exacerbated if a perched water table is present. Physical inspection of the site revealed the presence of saline conditions, which was confirmed by subsequent soil testing.

According to the Capability Classification, the principal limitation of the soils is wetness. This condition, along with the saline nature of the soils, compounded by the heavy salt concentrations of CVWD irrigation water, combine to require special management practices. The single most important management tool necessary to mitigate the effects of salt is the installation of drainage tile. According to the CVWD Tile Drainage Index, the west half of Section 3 portion of the site (315 acres$\pm$) has a tile drainage system. Not surprisingly the portion of the site with no tile drainage comprises most of the area which has not been farmed in fifteen years.

Farm tile drainage records obtained from CVWD are summarized in Table 6.7, Farm Tile Drainage System. Copies of these records are included in the technical appendix.

During the property inspection, the condition and efficacy of the tile was not determined. This is due in part to the absence of irrigation water deliveries. It would be normal to expect that tile of this age would need cleaning. It would be expected that the Orangeberg tile would require replacing. The overall spacing is considered to be marginal, with additional tile line installation desirable to necessary, depending on the field.

The surrounding areas' land utilization and field conditions indicate that land proximate to the Whitewater Storm Channel and Detention Channel No. 2 convergence do not reflect the degree of vigorous crop growth most commonly associated with the Coachella Valley. This appears to be the result of a combination of soil conditions, and the likely presence of a less desirable micro climate. An evaluation of the topography indicates that cold air pools in the area of the property are likely. These would be the result of heavier cold air drainage from the higher elevations and steeper slopes.

TABLE 6.6
SUMMARY OF SOILS

Soil	Map Symbol	Est. Acres	Percent	USDA Capability Classification
Indio very fine sandy loam, wet	It	255	68	IIw-2
Indio fine sandy loam, wet	Ir	60	16	IIw-1
Gilman silty loam, wet	FgA	41	11	IIw-2
Gilman fine sandy loam, wet	GcA	19	5	IIw-1

Source: Soil Survey of Riverside County, California, Coachella Valley area, SCS, USAD, Pacific Consultants.

TABLE 6.7
FARM TILE DRAINAGE SYSTEM

Tile Design Number	Section 3 Location	Typical Spacing (Feet)	Installation Date	Amount (Feet)	Size (Inch)
215	NW_4NW_4	100	1958	1,300	8
				5,650	5
			1962	7,570	4*
312	NE_4NW_4	50 to 135	1960	2,350	8
				10,566	5
			1964	2,928	10
				622	8
				3,755	5
			1968	2,215	4
304	S_2NW_4	75 to 150	1960	2,580	8
				5,725	5
			1962	1,150	8
				4,880	5
			1963	1,370	8
				12,500	5
			1968	1,320	8
			1975	4,580	5
223	SW_4	290	1959	3,785	8
				6,200	5
				17,275	4

*Note: The 7,750 feet of tile are made of Orangeberg material.

Source: Farm Tile Drainage System, Tile Design, Coachella Valley Water District, Pacific Consultants.

Site Agricultural Capability Assessment

Agricultural capabilities of a site are governed by the type, quality and extent of natural and economic resources which might be allocated to production.

The decision to produce, however, is only partially determined by the available combination of resources. For production to actually be undertaken, other factors, such as such as management, labor and capital, must be present in addition to the land-related resources . The production decision is ultimately made on the basis of anticipated profit. Regardless of the capabilities and infrastructure which might be available to a particular property, production cannot be sustained if an acceptable return to each of the factors of production, (land, labor capital and management), is not obtained. Profits must ultimately come from the market place and are dependent on price and yield. In areas such as the Coachella Valley where the effects of government programs are minimal, the market place efficiently values farm land capability. This is why some farm land goes unused while other land is extensively farmed.

Available Resources

The site's significant natural resources are its soils and climate. The soils on the property, according to the USDA Capability Classification system, are Class II. The system utilizes the capability groups to show in a general way a soil's suitability for most kind of field crops. A discussion of the capability grouping system is included as a part of the technical appendix. Class II soils are defined as those which have moderate limitations that reduce the choice of crops or require special conservation practices or both.

The site enjoys the same climate as that of the valley in general, a highly desirable winter and early spring climate with little rainfall. The climate is one of the principal reasons the agricultural industry of the Valley flourishes.

In terms of economic resources, the site enjoys several benefits which afford a comparative advantage over other regions. The most significant of these resources is the efficient distribution and moderate cost of irrigation water. The products which the property is suited to produce can be harvested and sold through a well developed infrastructure of processing and marketing. Communications, transportation and other essential and nonessential support and service resources are readily available. A skilled and energetic labor pool is available within the area. In short, the site benefits from a combination of natural and economic resources

which could make production possible although not necessarily profitable. Utilization for agricultural production necessarily implies the implementation of the steps necessary to overcome the property's constraints and limitations discussed in the following portion of this report.

Hazards and Constraints

While enjoying favorable specific resources, as well as those general to the area, the site is not without its limitations. Its most recent history of no production is indicative of these limitations. Four significant hazards and constraints which limit the site's utility are identified. They are: extreme salinity of the soils; a less desirable micro climate limiting the selection of the more profitable crops; non-existent, improper and unserviceable drainage; and the necessity to redevelop the site with extraordinary cultivation and tillage procedures.

The property's present condition indicated the need for more detailed evaluation of the soils. Soil scientist George Borst surveyed and tested the soils. A copy of his report is included in the technical appendix. The results of his findings are summarized in Table 6.8, Soil Extract Conductivity.

Electrical Conductivity (EC) is the reciprocal of the electrical resistivity. The resistivity is the resistance in ohms of a conductor, metallic or electrolytic, which is 1 cm. long and has a cross-sectional area of 1 cm. Hence, electrical conductivity is expressed in reciprocal ohms per centimeter, or mhos per centimeter.

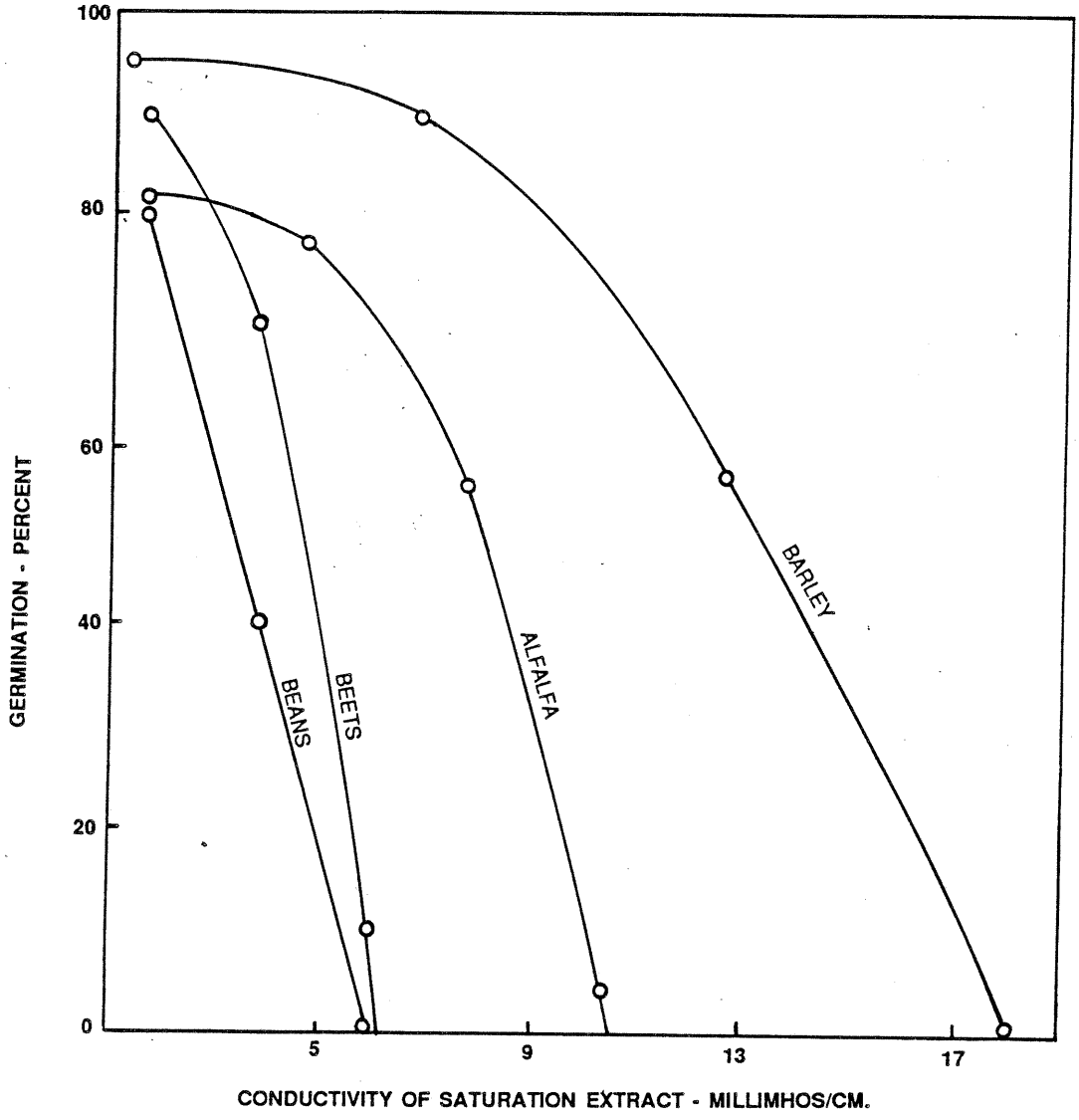
It is used as a standard measure of soil salinity, using the soil's saturated soil extract (EC_e) and irrigation water quality (EC_w). Over the years correlations and standards have been developed which are accurate predictors of crop response to various conductivities. The break even for economic crop production is considered to be in the area of 4.0 millimhos/cm($EC_e \times 10^3$). The results of the laboratory tests conducted on the site indicate values up to 5.5 times greater within the surface soils and nearly 6 times greater than the break even within the subsurface. The average for the parcel is 3.5 times greater on the surface and 3.4 times greater within the subsurface.

With average conductivities at levels such as presently exist on the site, it is unlikely that a crop could be germinated. Germination percentages at various EC_e's are shown in Figure 6.11, Percent Germination of Four Crops Related to Soil Extract Conductivities.

TABLE 6.8
SOIL EXTRACT CONDUCTIVITY

Sample Site	Location	Conductivity Surface 0-12 Inches ($EC_e \times 10^3$)	Subsurface 12-14 Inches ($EC_e \times 10^3$)
1	SW_4SW_4	2.9	11.1
2	NW_4SW_4	15.2	8.8
3	NW_4NW_4	22.4	7.8
4	NE_4NW_4	10.2	8.0
5	SE_4SW_4	11.5	20.8
6	SW_4SE_4	14.4	15.8
7	NE_4SW_4	22.0	23.9
Average	Section 3	14.0	13.7

Source: George Borst Laboratory Results, August 24, 1989; and Pacific Consultants.



DRAWING TITLE:

PERCENT GERMINATION OF FOUR CROPS RELATED TO SOIL EXTRACT CONDUCTIVITIES.

SOURCE: Diagnosis and Improvement of Saline and Alkali Soils, Agricultural Handbook No. 60, USDA, Page 66.

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FIGURE # 6.11

Without significant reclamation, which would include leaching over an extended period of time, the site is useless for economic agricultural production. Reclamation, while possible, is time consuming and costly, requiring significant expenditures in tillage, tile drains and irrigation.

A second hazard and constraint associated with the site is the micro climate which appears, based on observation, to occur in the area. The property description included a discussion of the likely effect of the area's topography contributing to the accumulation of cold air pools during periods of cold temperature.

The effect of this cold air pooling is reduced desirability of the area for frost sensitive permanent plantings such as citrus and table grapes. The site, with its low-lying location within this area, is almost assuredly to be affected by this condition.

Depending on the temperature and its duration, the cold air would adversely impact citrus yield and quality. If it were a particularly cold winter, the trees themselves would suffer injury. No doubt the absence of significant plantings of citrus in the neighborhood reflect this condition.

The production of table grapes in the area of the site is even more restricted due to the micro climate. Table grapes, due to their dormancy, would not suffer physically to the extent of citrus. However, profitable table grape production is highly dependent on climate. The market window occurring early in the season between the end of importation of Southern hemisphere fruit and the Central Valley's early production typically accounts for much of the industry's profit. Historically, this is a very short period of a two weeks or less, with production from vineyards on warmer lands accounting almost entirely for the fruit sold.

The limitation imposed as the result of the colder nature of the site decreasing its ultimate profitable utilization is significant. The inability to devote the site to more intensive higher valued crop production reduces the incentive to expend the capital and time necessary to commence reclamation of the site. The inability to recover the expense of reclamation using permanent crops or early season produce, such as those crops grown in the warmer areas of the valley, work towards defeating the economic feasibility of reclaiming the site.

The third and fourth constraints associated with the site are directly related to reclaiming the soil from its high salinity levels. The third constraint is the present state of drainage on the site, the fourth constraint the extraordinary cultivation and tillage procedures necessary to effectively reclaim the site.

Table 6.7, Farm Tile Drainage System, identified the extent of tile, its spacing and composition. No tile is located within the 60 acres in the SE_4 of Section 3. For all practical purposes, the Orangeberg tile in the NW_4 is useless. This is because tiles made of Orangeberg material are proven to be of no use after two or three years of installation. The remainder of the tile will require cleaning and quite likely some replacement. Based on the level of salinity associated with the site, reclamation should include "splitting" the existing tile, that is, installing additional tile lines between the existing one.

The present inadequacies of the site's drainage system hinder any reclamation effort. A substantial commitment of capital is necessary to convert these deficiencies. The capital necessary to be committed will range upward to $1,000 per acre.

To successfully bring the property back into cultivation, assuming the tile drainage is corrected, extra cultivation practices are necessary. Among these practices are deep plowing or slip plowing, leveling and leaching. To leach the salts from the soil, they must be dissolved into the drain water, and removed from the soil profile by means of the tile drainage system. Because the soils on the site are interstratified, there is a propensity for the leachate to move laterally rather than vertically. This inherent tendency is about at a ratio of 4 to 5 lateral movement to 1 vertical movement. For leaching to be efficient it is necessary to mechanically alter the soils interstratification to encourage vertical water movement. This quite likely will require cross plowing, and perhaps on certain fields cross plowing more than once.

Sprinkler leaching is most often used in reclamation to apply water. This is accomplished by leasing pipe and pumps and installing the sprinkler system on the soil's surface for the period of reclamation. We believe that due to the high salinity levels, it will be necessary to dike and pond the fields in order to leach. This is a more lengthy and costly procedure, which could take up to as long as two years on certain fields.

It will be necessary, both during and after leaching, to maintain field level. Current farming practices would indicate that once the site is leached, it should be lazer leveled. This is necessary so that irrigation water can be applied efficiently to continue reclamation efforts. It should be noted that the initial leaching only reclaims the property so that it can be farmed. It is necessary to continue the farming practices appropriate to reclamation so that the farm continues to improve to its full capability. Usually this should occur between the fifth and tenth year after initial reclamation.

The effects of these constraints are initial extraordinary expenditures of capital at the rate of $300 to $600 per acre. In addition, once cropping begins, additional cultural costs will be incurred as reclamation continues. The effects of these expenditures are compounded because they are not immediately offset by increased productivity. No return of capital is available during the initial leaching phase. When farming commences, the initial crops must necessarily be low value, salt tolerant crops such as barley. Even these crops will not produce average yields for some time. Only after a number of years will the productivity recover the reclamation expenditures. As noted, the recovery of capital is further hindered on the site due to reduced cropping alternatives due to climate.

Environmental Impacts

The proposed project site, in its unused state, has no impact on the area or regional agricultural sector. Its development, and thus its removal from the vacant land inventory, would have no effect until and unless the property were desired for reclamation and farming. Considering the hazards and constraints associated with this site, it is likely that lands which are more flexible in terms of crop alternatives would be brought into production prior to expending the funds necessary to reclaim this property. If the site were reclaimed and farmed, its productive capabilities would be limited most likely to lower-value flat crops such as hay, grain and cotton.

Some 315 acres (84% of the project site) is either Indio fine or very fine sandy loam, wet. This soil type is not untypical of other developed areas upon which urban landscape is grown in the Coachella Valley. The capabilities of the site for ornamental horticulture, given the residual saline condition and micro climate are governed by plant choice and economic resources which might be allocated to that purpose. Surface soil grading and soil amendments will assist in the implementation of specific landscape plans.

Mitigation Measures

None.

6.10 Wildlife and Vegetation

Context

A biological assessment of the subject property was performed by Michael P. Hamilton and Associates. A copy of the full study is attached in the appendix. A summary of the investigations and recommendations is provided by the following:

Existing Site - all of the property has been disturbed by conversion to tilled soils for dry field and irrigated crops. At the time of site investigation it had been 2 -5 years since the fields had been plowed. A number of individual and solitary native perennial had reestablished on the site.

Vegetation - The 380 acre property supports two general plant communities: Tamarisk Scrub residing in the central portion of the site which has soils exhibiting salt deposition due to evaporation of seasonally moist soils; and, plowed fields supporting weedy annuals and introduced perennials (see Figure 6.12, Site Vegetative Map). Natural succession would eventually lead to establishment of a simple saline sink plant community, which would not provide habitats important to sensitive species.

Wildlife - observed activities were limited to digging/rooting activities, and roosting/perching opportunities on the perennial vegetation. Both plant communities previously noted were very poorly developed with wildlife. Most of the species observed are closely associated with agricultural settings.

No state or federally protected species of plant, vertebrate, or arthropod, was found.

Environmental Impacts

Removal of open space resulting from development will reduce and/or eliminate the biological values of the property. The effect on biotic diversity will include the following:

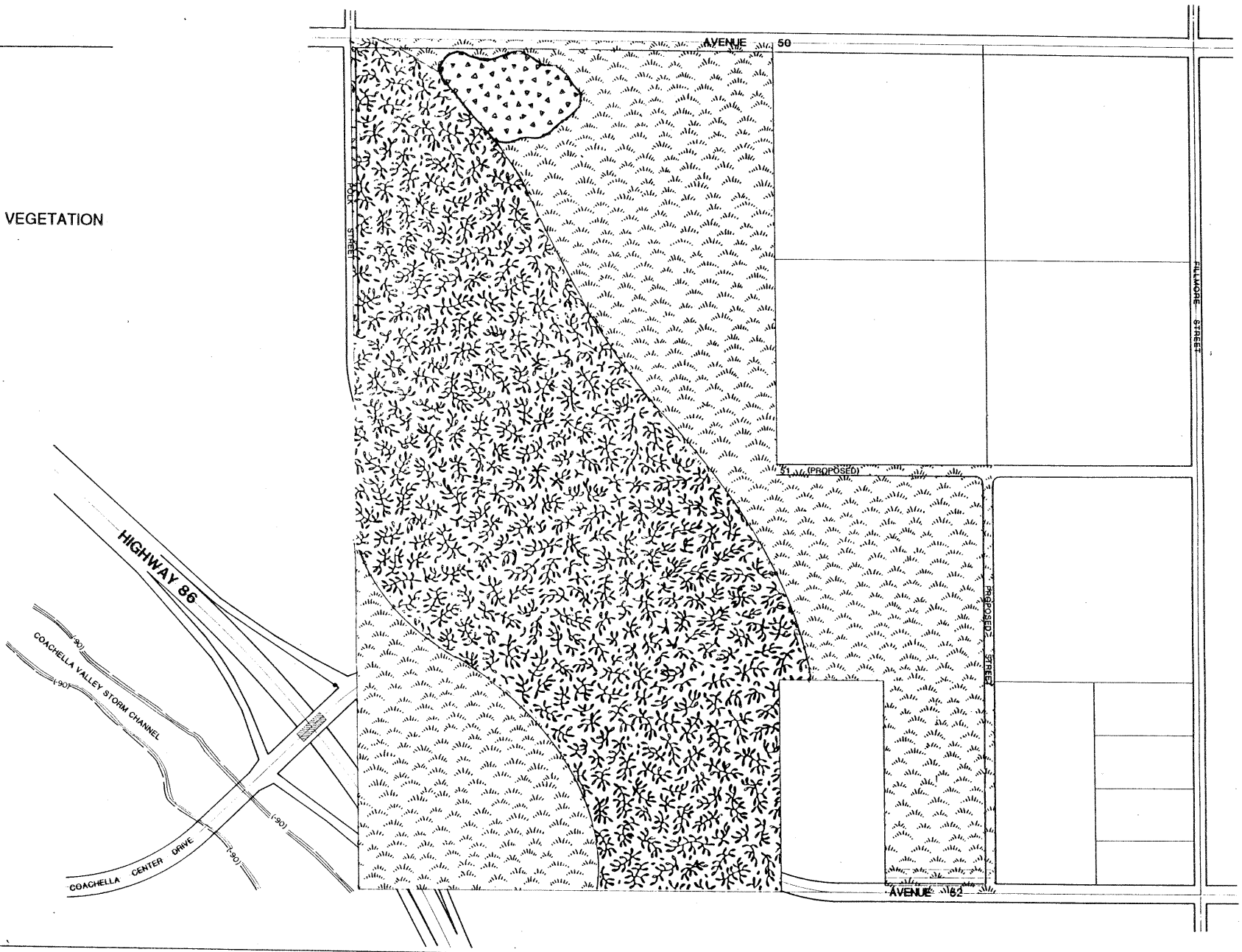
- Removal of all remnant native vegetation (not considered to be significant).

LEGEND

RESIDENCE

PLOWED FIELD

TAMARISK SCRUB VEGETATION



DRAWING TITLE:

SITE VEGETATIVE MAP

Source: J.F. Davidson Assoc., Inc., April 1988 / Micheal P. Hamilton Assoc., March 1988

100 300 700 1500 FEET
0

FIGURE #
6.12

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C O A C H E L L A 3 8 0

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- Elimination of most small animal habitats on the site (not considered significant).

- Increased potential for man-caused disturbances within adjacent native habitats.

Mitigation Measures

Due to the highly degraded nature of the property, the low quality of the habitats and plant communities and lack of any significant stands of native plant communities, the proposed development is not considered to have a serious impact on biological resources. Landscaping with native species should serve as adequate mitigation for loss of open space and the associated off-site impacts. Further biotic survey of the property is not warranted.

6.11 Energy Resources

Context

This section deals with the issue of energy consumption of electricity, natural gas and gasoline. The issue of the availability of electricity and natural gas is discussed in section 3.4.4, Other Utilities. Consumption of gasoline is related to Trip Generation Rates discussed in Traffic and Circulation (Section 7.2).

In the hot and arid climate of the Coachella Valley,the most critical use of electrical energy is for air conditioning. A study conducted in the Coachella Valley shows that over a period of one year 60 percent of all electrical consumption in a typical home goes toward air conditioning.[9] Clearly,any measures to reduce the cooling load will have a substantial impact.

In terms of gas consumption, the same study shows that 40% of gas is used for heating water and 30% for space heating. These two items combined account for 70% of gas consumption providing another area where measures to increase efficiency will have a substantial impact on gas consumption rates.

[9] California Energy Conservation Project, Living Systems - Indio, March 1977; PP 120-122.

Reductions of 70% and higher in the use of gas for hot water heating can be achieved through the use of solar energy. With the limited heating load in the area, solar energy is not cost effective using the more expensive active solar energy systems for space heating. However, passive design elements such as extensive insulation, as required today in the Uniform Building Code, can play a major role in reducing the heating and cooling loads.

Environmental Impacts

Table 6.9 below summarizes the estimated fuel consumption that would occur as a result of this development. The electrical and natural gas figures are based on the assumption that natural gas will be used for hot water heating, kitchen appliances,and space heating, and that there would be no all-electric homes. The calculations from which the summary (Table 6.9) is derived are in Table 6.10, Table 6.11, and Table 6.12 below.

Gasoline Consumption is related to the number of trips generated by the project and the length of these trips. These calculations are provided in Table 6.6. The estimates for gasoline consumption are based on an average consumption rate of 18.9 miles to the gallon.

Mitigation Measures

Mitigation measures provided below are intended to reduce energy consumption levels of electricity, natural gas, and gasoline. Those measures which reduce gasoline consumption are aimed at the reduction of the number and length of automobile trips.

1. Provide bicycle parking areas, pedestrian walkways, and bicycle routes on site to encourage people to walk or cycle rather than drive.
2. Ensure that bus transit is facilitated through provision of bus stop improvements.
3. Construction must meet or exceed UBC specifications especially for insulation.
4. Energy efficient appliances and fixtures shall be utilized.
5. Landscaping and building design should maximize the use of shade features and passive solar applications to minimize energy consumption for air conditioning in the summer, comfort heating in the winter and year round hot water demands.

TABLE 6.9
ENERGY CONSUMPTION SUMMARY

Project	Electricity KWHs Per Year	Gas CUFT Per Year	Gasoline Gallons Per Day
Proposed Project	29,760,406	112,146,612	15,608

TABLE 6.10
ESTIMATED ANNUAL ELECTRICITY CONSUMPTION*

Residential

1326 Units x 16,081 KWH/Unit/Year = 21,323,406 KWH/Year

Commercial (Retail)

715,000 sq.ft. x 11.8 KWH/sq.ft./Year = 8,437,000 KWH/Year

TOTAL 29,760,406 KWH/Year

TABLE 6.11
ESTIMATED ANNUAL NATURAL GAS CONSUMPTION*

Residential

- Single-family Detached
  739 Units x 6,665 CF/Mo/Unit x 12 = 59,105,220 CF/Year
- Single-family Attached
  250 Units x 4,105 CF/Mo/Unit x 12 = 12,315,000 CF/Year
- Multi-family Detached
  337 Units x 3,918 CF/Mo/Unit x 12 = 15,844,392

Subtotal Residential 87,264,612 CF/Year

Commercial (Shopping Centers/Retail Stores)
715,000 sq.ft. x 2.9 CF/Mo/sq.ft. x 12 Mos.= 24,882,000 CF/Year

TOTAL 112,146,612 CF/Year

* South Coast Air Quality Management District - Air Quality Handbook Revised April 1987, Appendix F1 & H1.

TABLE 6.12
ESTIMATED DAILY GASOLINE CONSUMPTION

	Estimated Daily Vehicle Miles	Gallons of Gasoline/Day*
Proposed Project	295,000	15,608

* 18.9 miles per gallon assumed per, "Fundamentals of Traffic Engineering," January 1988.

6.12 Aesthetics and Visual Analysis

Context

The site consists of flat agricultural land which has not been plowed or farmed for 2-5 years. (Figure 6.13 shows the east and west panoramas from the location depicted on Figure 6.14.) Topographical relief is minimal with slopes ranging from 0% to 2%. The site is no longer suitable for agriculture due in part to excessive salinity of the soil brought about by irrigation. The most saline portion of the site has been invaded by Tamarisk scrub; the remainder supports weedy annuals and perennials, largely introduced species. The land immediately adjacent to the site on all sides is topographically similar and in rural/agricultural use with associated low-density residential development.

The Coachella Valley Master Environmental Assessment (MEA) is adopted into this document by reference. In the MEA, which assigns scenic values to various areas in the Coachella Valley, the site is located in Area #9, "Coachella Valley," which is designated as having a low scenic value. The site affords panoramic views of the hills and mountain range which ring this part of the Coachella Valley, although all begin five miles or more from the site. To the northwest are the Indio Hills, with Little San Bernardino Mountains farther away to the north and east. The Mecca Hills are southeast of the site, and to the west are the Santa Rosa Mountains and, in the distance, the San Jacintos. Existing power lines and towers mar those views and generally have a negative impact on the visual quality of the area.

Environmental Impacts

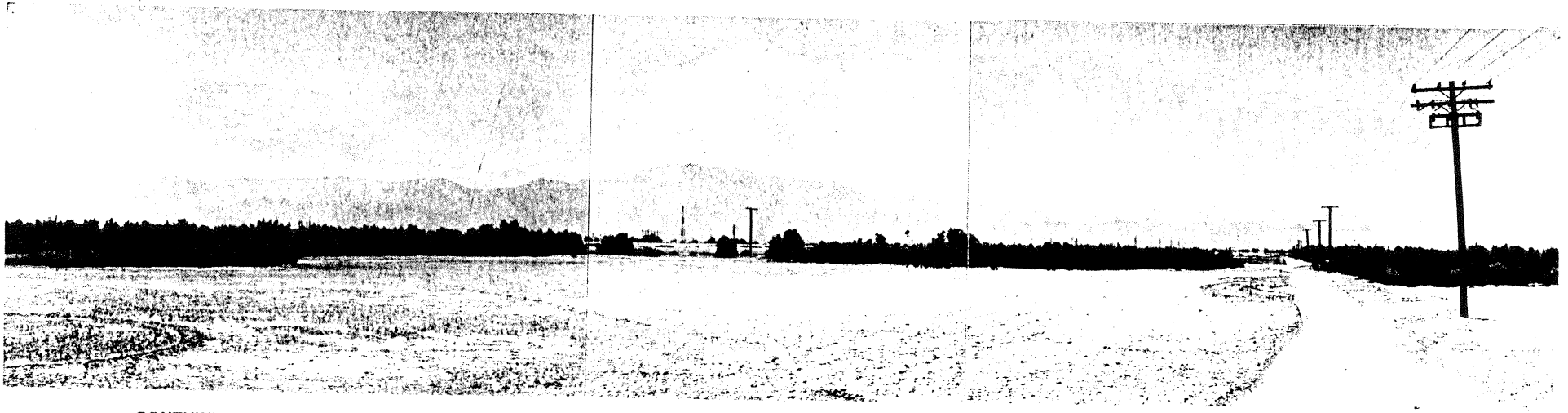
The proposed development will create a change in the vacant rural agricultural appearance of the entire site through the grading and construction necessary to facilitate residential and commercial uses.

The impact on landform is not considered significant due to the limited topographic relief over the project site and the minor grading necessary to develop the site. The site is considered highly degraded in terms of natural desert terrain and habitat due to agricultural use with few native species remaining or recolonizing; the resulting salinity of soil has led in principal part to its abandonment as productive agricultural land. The site lies entirely within the area which has been assigned a low scenic value by the MEA.

NORTHEAST

EAST

SOUTHEAST



SOUTHWEST

WEST

NORTHWEST

DRAWING TITLE:

PANORAMIC VIEWS

Source: Smith, Peroni & Fox

Note: See Figure 6.14 to identify view location

FIGURE #

6.13

brandenburg | butters

C O A C H E L L A 3 8 0

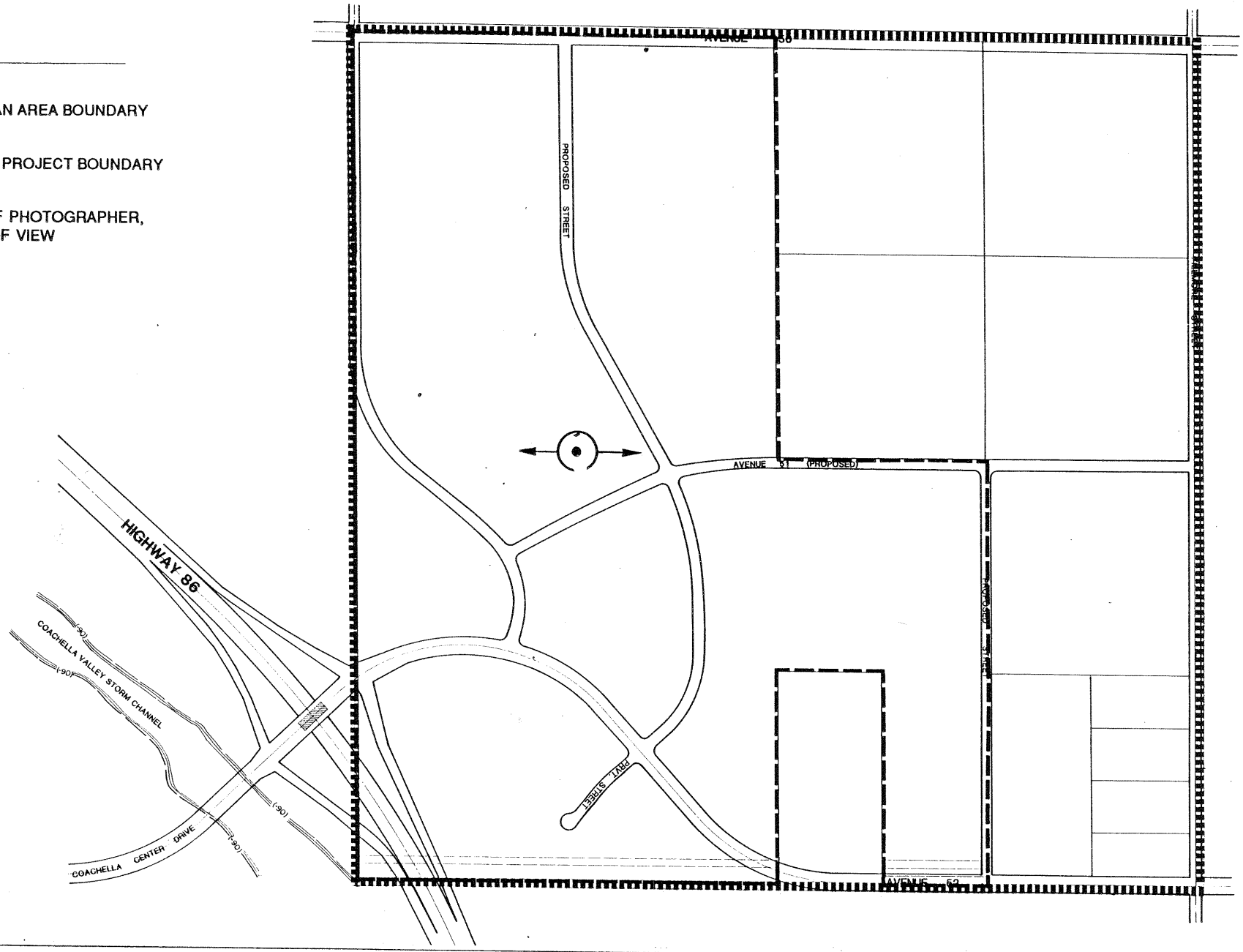
Smith, Peroni & Fox

LEGEND

SPECIFIC PLAN AREA BOUNDARY

APPLICANT'S PROJECT BOUNDARY

LOCATION OF PHOTOGRAPHER, DIRECTION OF VIEW



DRAWING TITLE:

LOCATION OF PHOTOGRAPHS

100 300 700 1500 FEET
0

FIGURE #

6.14

brandenburg | butters

C O A C H E L L A 3 8 0

N

Smith, Peroni & Fox

Thus, although the project will change the appearance of the site, it will not have a significant impact on aesthetic or visual quality.

Mitigation Measures

The developer would be required to implement the guidelines and policies of the Specific Plan upon construction of the development. If the project complies with the design guidelines promulgated in the Specific Plan, no significant aesthetic or visual quality impacts will occur.

6.13 Historic and Pre-historic Resources

Context

The project site consists of a disturbed agricultural area covered by modern alluvium; both of these characteristics are not known to produce paleontological resources.

The Coachella Valley was occupied in pre-historic and historic times by the Cahuilla Indians. The California Archaeological Inventory - Eastern Information Center, which is conducted by the Archaeological Research Unit of the University of California at Riverside, has reviewed their site records, maps, and manuscripts against the project site location.[10] Their records indicate that an archaeological survey was conducted over most of the subject site. No archaeological sites were recorded as a result of the site survey and the Archaeological Research Unit (ARU) indicates that no archaeological sites have been recorded within a one mile radius of the project area.

In the course of the Specific Plan research the Tribal Administrator for the Cabazon Band of Mission Indians was contacted in writing, for a report on any knowledge that he or tribal members may have regarding historic and pre-historic resources on the site. A direct telephone inquiry revealed that he was unaware of any resources on the site.[11]

[10] ARU, letter from Daniel F. McCarthy, Information Officer to Smith, Peroni and Fox, dated July 19, 1989.
[11] Telecommunication, May 2, 1989, between Murrel Crump, Smith, Peroni and Fox, and Tribal Administrator.

Environmental Impacts

The Archaeological Research Unit advises that based on existing information, there is a low probability of cultural resources being present, therefore, further archaeological study is not recommended. This recommendation is qualified by the caveat that it does not preclude the possibility of cultural resources being present on the subject property, but rather, it simply reflects a low probability of their occurrence based on existing information.

Mitigation Measures

If, during construction, cultural resources are encountered, the project area should be re-evaluated by a qualified archaeologist in order to prevent destruction of any such resources.

6.14 Light and Glare

Context

The site is currently vacant agricultural land with no permanent structures and no street lighting; it is not a source of light or glare. The sparsely populated agricultural land surrounding the site does not produce significant light.

Environmental Impacts

The proposed project will become a source of light from residences, commercial and municipal buildings (especially security and parking lot lighting), and street lighting. This nighttime illumination will be a significant source of light where none has existed before. The project will increase the total amount of ambient light in this presently rural area and will contribute to the growing night sky illumination that may be visible from distant areas. The use of unshielded fixtures for street, security, and parking lighting could create unacceptable glare for adjacent areas. Sun glaring from reflective surfaces on buildings and vehicles could also periodically occur.

Mitigation Measures

Sodium lamps in downward facing lamp fixtures are recommended to be used in street and parking lot lighting to reduce local increases in illumination. These shielded fixtures, as well as roofs constructed of low reflectance materials, should be used to reduce glare.