In Response to CEC & BLM Data Requests 1-52
Set 1, Part 1
Application for Certification (08-AFC-5)
SES Solar Two, LLC

Submitted to:
Bureau of Land Management
1661 S. 4th Street, El Centro, CA 92243

Submitted to:
California Energy Commission
1516 9th Street , MS 15, Sacramento, CA 95814-5504

Submitted by:
SES Solar Two, LLC
2920 E. Camelback Road, Suite 150, Phoenix, AZ 85016

With Support From:
URS Corporation

December 2008

December 8, 2008

Mr. Christopher Meyer
Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: SES Solar Two (08-AFC-5)
Responses to CEC and BLM Data Requests 1-52 Set 1, Part 1
URS Project No. 27657106.00500

Dear Mr. Meyer:

On behalf of SES Solar Two, LLC, URS Corporation Americas (URS) hereby submits the Applicant's Data Responses in response to CEC and BLM Data Requests 1-52, Set 1, Part 1 (SES Solar Two 08-AFC-5).

I certify under penalty of perjury that the foregoing is true, correct, and complete to the best of my knowledge. I also certify that I am authorized to submit the AFC Responses on behalf of Solar Two, LLC.

Sincerely,

Angela Leiba
Project Manager

AL:ml

Enclosure

URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
Tel: 619.294.9400
Fax: 619.293.7920

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 1: Please provide the wetland delineation report and the final determination from the USACE regarding whether or not jurisdiction will be asserted. Should the USACE assert jurisdiction, please explain the project-specific circumstances that would necessitate substantial temporary or permanent impacts to jurisdictional waters.

Response: A Jurisdictional Delineation Form was provided by URS to USACE and CEC on November 20, 2008 and has been provided as Attachment BIO-1 to this response. USACE staff is reviewing the information and will provide a determination as to whether they will assert jurisdiction over the flood channels onsite. USACE are expected to confirm the determination during a field visit scheduled for January 7, 2009.

ATTACHMENT BIO-1

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Los Angeles District, SES Solar Two, SPL-2008-0XXXX-LAM

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:CA County/parish/borough: Imperial City: Plaster City
Center coordinates of site (lat/long in degree decimal format): Lat. 32.7925584° N, Long. -115.8586183° W.
Universal Transverse Mercator:
Name of nearest waterbody: Coyote Wash, Yuha Wash
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: N/A
Name of watershed or Hydrologic Unit Code (HUC): Imperial Hydrological Unit

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☒ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 11/21/08
☒ Field Determination. Date(s): 11/24/08

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are no** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or acres.
      Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Pick List**
      Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **A field visit was conducted by Corps staff on November 24, 2008. The onsite drainages are tributary to Coyote Wash, which flows north of the site in a northeasterly direction. The entire site is covered by fine, loose sand.**

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

Six ephemeral drainages were identified based on surface flow indicators of geomorphology. All of the drainages are tributaries to Coyote Wash. Hydrologic regime was observed in the form of discontinous distinct beds and banks and patterns of drainage and sheet flow. Field observations, USGS mapping, and regional hydrology maps indicate that surface flows from the site collect at the Borrego Sink (approximately two miles northeast of the site). The Borrego Sink does not exhibit any evidence of surface connectivity with the Salton Sea. It is hydrologically separated from the nearest creek system, San Felipe Creek, which terminates in the Salton Sea. Furthermore, groundwater would need to cross over multiple fault zones to reach the Salton Sea, so it seems as though there is not subsurface connectivity either. There are no indications that the Borrego Sink or any associated wetlands or tributaries have an effect on interstate commerce.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **Pick List**
Drainage area: **Pick List**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW[5]: .
Tributary stream order, if known: .

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[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):
☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank ☐ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☐ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting
☐ leaf litter disturbed or washed away ☐ scour
☐ sediment deposition ☐ multiple observed or predicted flow events
☐ water staining ☐ abrupt change in plant community
☐ other (list):
☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain: .

Surface flow is**: Pick List**

Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List.**

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters: .

3. Non-RPWs[8] that flow directly or indirectly into TNWs.

☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters: **.**

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.[9]

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

☐ Demonstrate that impoundment was created from "waters of the U.S.," or

☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ which are or could be used for industrial purposes by industries in interstate commerce.

☐ Interstate isolated waters. Explain: .

☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

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[8]See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☒ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

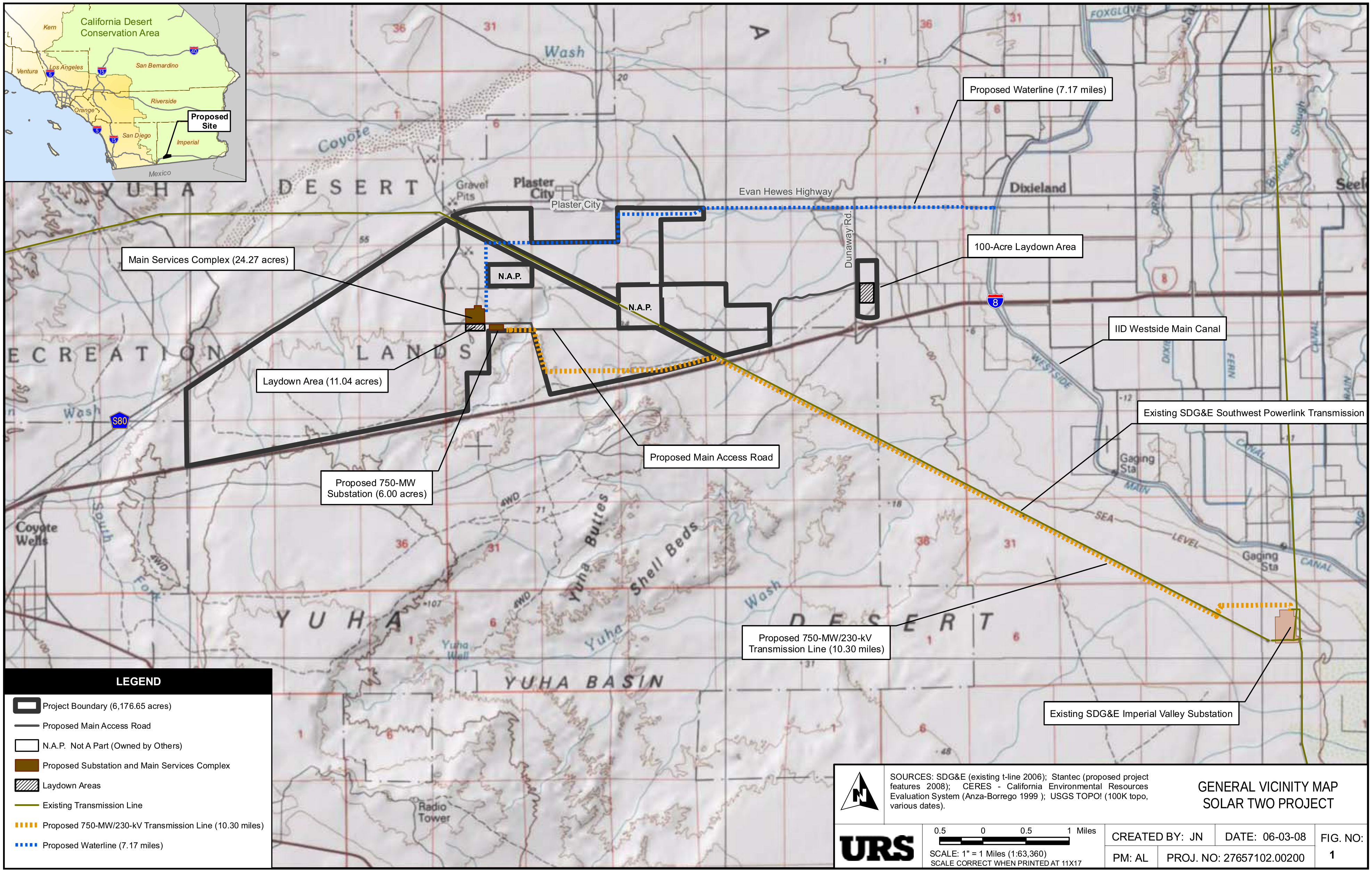
Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☒ Non-wetland waters (i.e., rivers, streams): **Six drainages: 71,467** linear feet **4-390+**width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Various maps and photos provided by URS Corporation, San Diego.
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name:1:24000 scale of Painted Gorge, Plaster City, Seeley, Coyote Wells, Yuha Basin Quadrangle maps.
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: NRCS, 1981. Soil Survey of Imperial County, CA, Imperial Valley Area , California.
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☐ Photographs: ☐ Aerial (Name & Date): .
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☒ Other information (please specify):The California Department of Water Resources Hydrologic Region Colorado River; California Regional Water Quality Control Board, Colorado River Basin. 2006. Water Quality Control Plan, Colorado River Basin; URS Corp. provided maps and Photos.

B. ADDITIONAL COMMENTS TO SUPPORT JD: .



SOURCES: SDG&E (existing t-line 2006); Stantec (proposed project features 2008); CERES - California Environmental Resources Evaluation System (Anza-Borrego 1999); USGS TOPO! (100K topo, various dates).

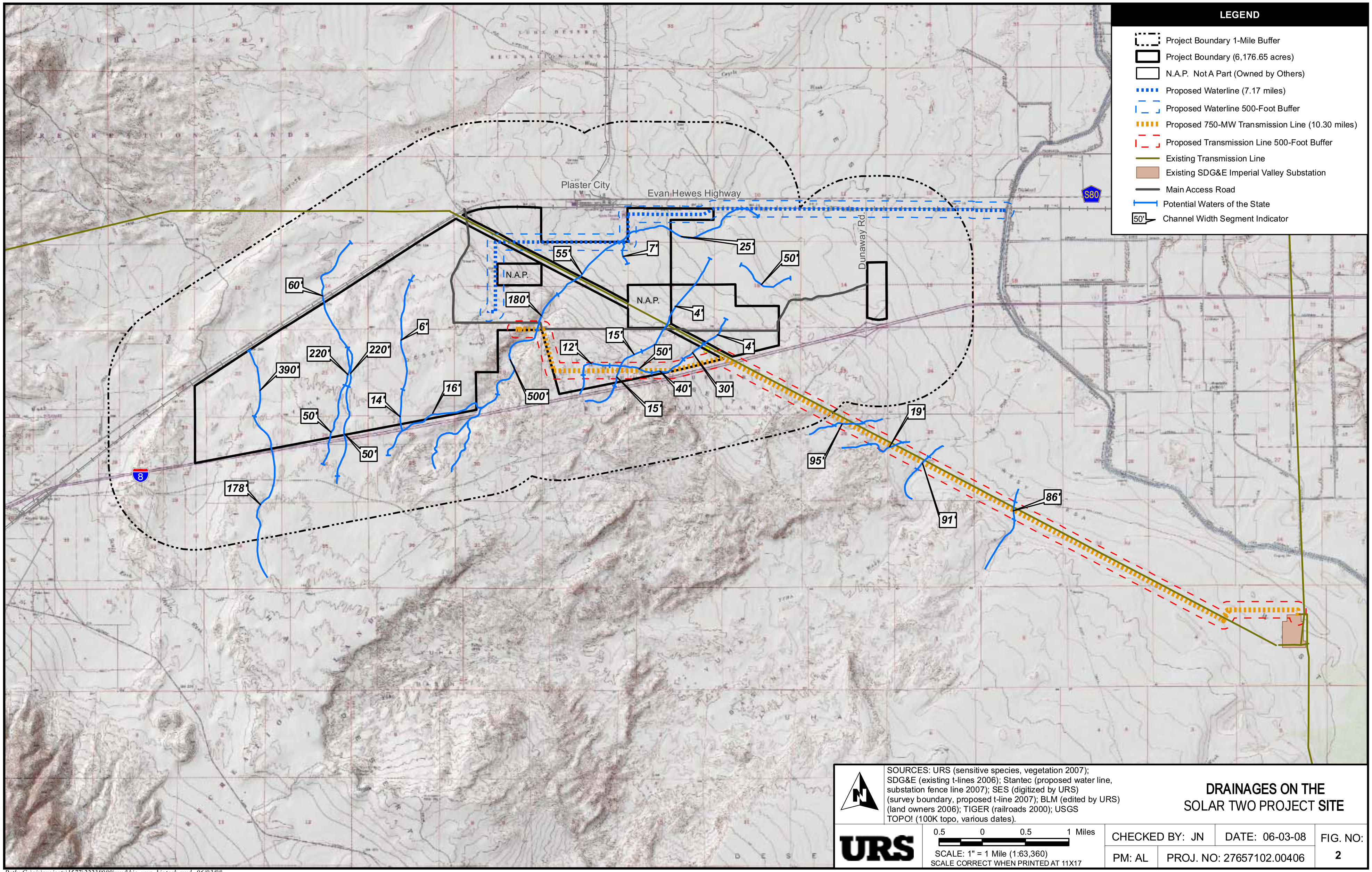
URS

SCALE: 1" = 1 Miles (1:63,360)
SCALE CORRECT WHEN PRINTED AT 11X17

GENERAL VICINITY MAP
SOLAR TWO PROJECT

CREATED BY: JN	DATE: 06-03-08	FIG. NO: 1
PM: AL	PROJ. NO: 27657102.00200	

Path: G:\gis\projects\1577\22238980\mxd\bio_vicinitymap.mxd, 06/03/08,



SOURCES: URS (sensitive species, vegetation 2007); SDG&E (existing t-lines 2006); Stantec (proposed water line, substation fence line 2007); SES (digitized by URS) (survey boundary, proposed t-line 2007); BLM (edited by URS) (land owners 2006); TIGER (railroads 2000); USGS TOPO! (100K topo, various dates).

URS

0.5 0 0.5 1 Miles

SCALE: 1" = 1 Mile (1:63,360)
SCALE CORRECT WHEN PRINTED AT 11X17

DRAINAGES ON THE SOLAR TWO PROJECT SITE

CHECKED BY: JN	DATE: 06-03-08	FIG. NO: 2
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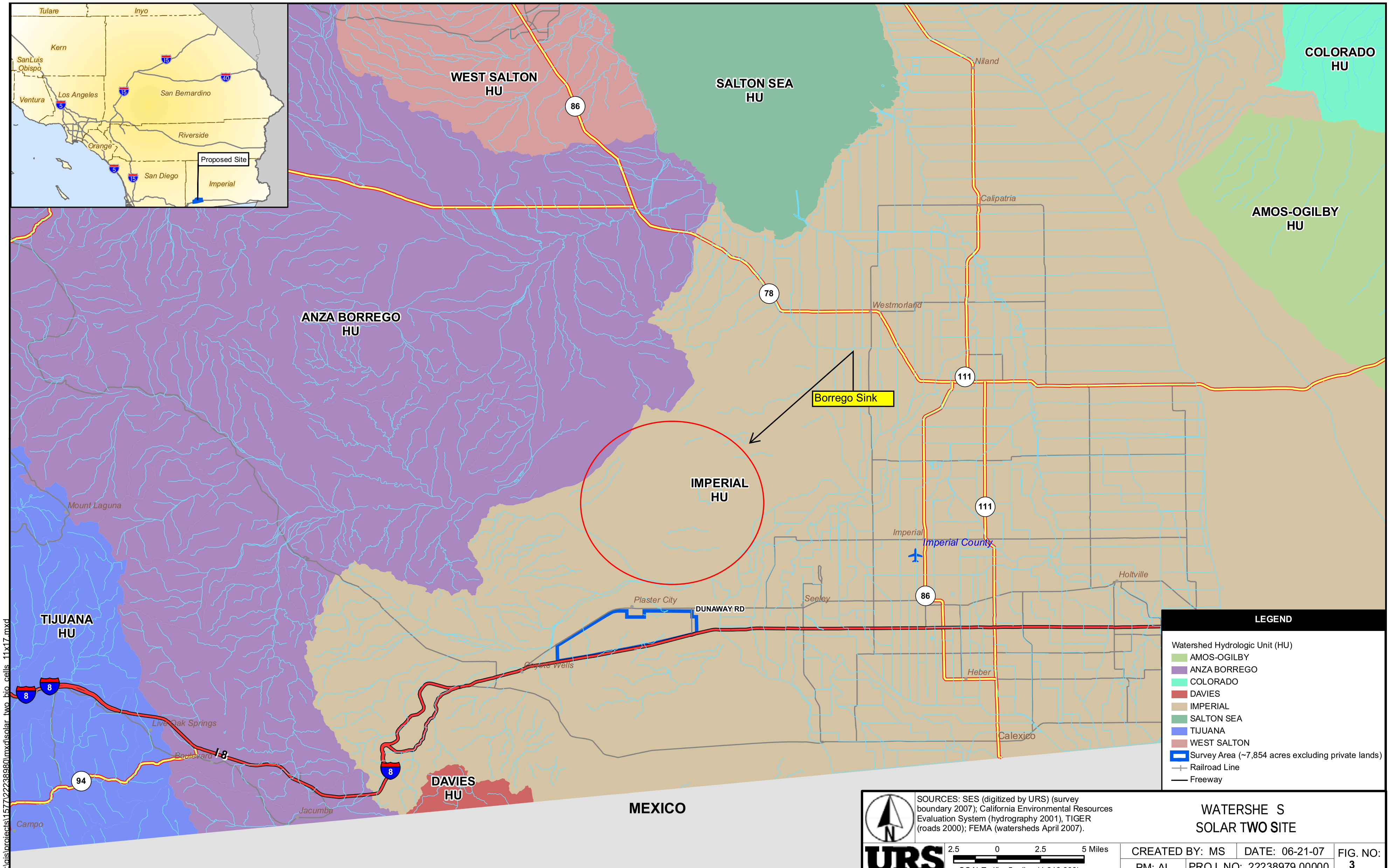

SOURCES: SES (digitized by URS) (survey boundary 2007); California Environmental Resources Evaluation System (hydrography 2001), TIGER (roads 2000); FEMA (watersheds April 2007).

2.5 0 2.5 5 Miles

SCALE: 1" = 5 miles (1:316,800)

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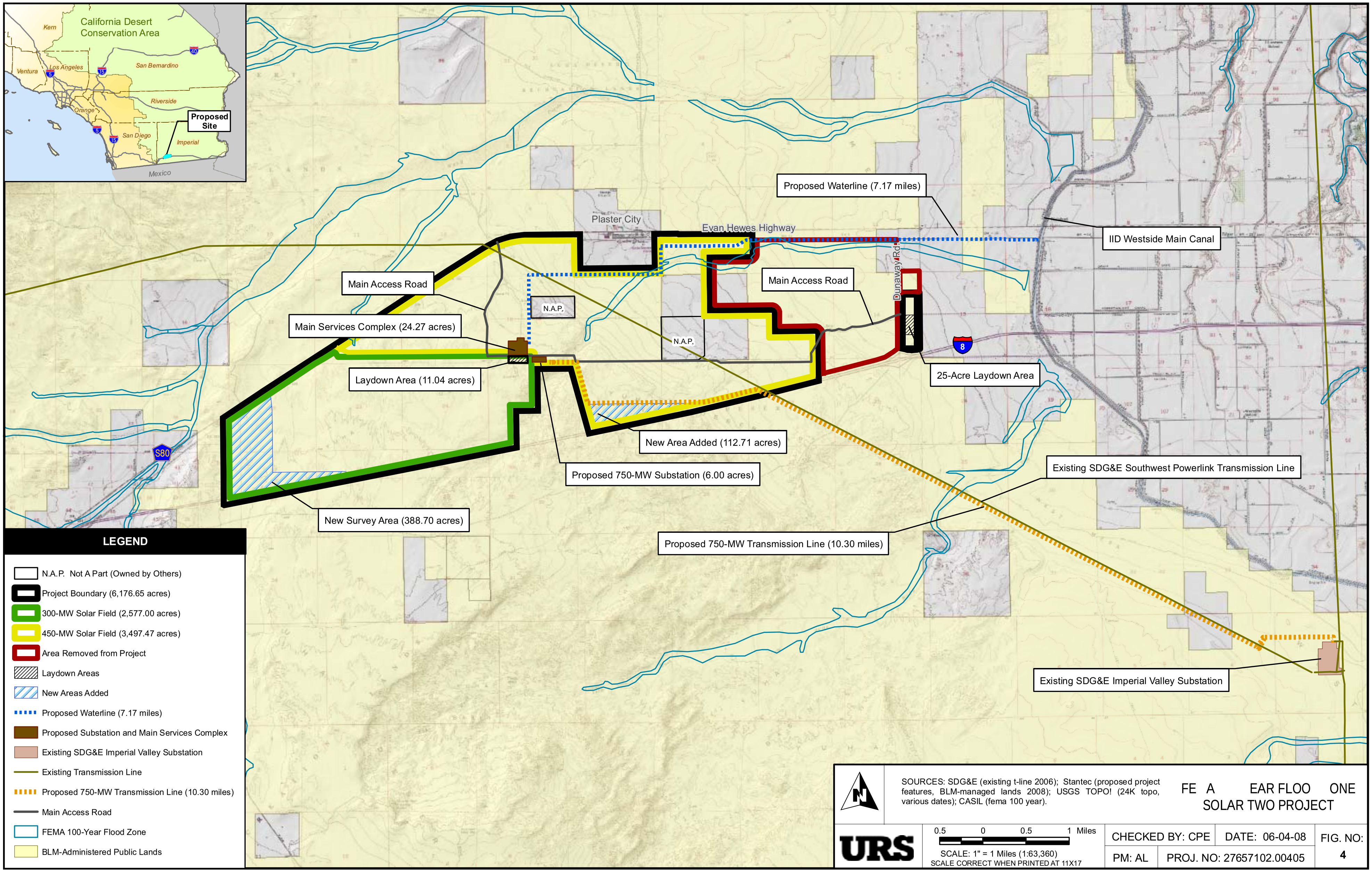
WATERSHE S
SOLAR TWO SITE

CREATED BY: MS	DATE: 06-21-07	FIG. NO: 3
PM: AL	PROJ. NO: 22238979.00000	

G:\gis\projects\1577\22238980\mxd\solar_two_bio_cells_11x17.mxd



LEGEND

- N.A.P. Not A Part (Owned by Others)
- Project Boundary (6,176.65 acres)
- 300-MW Solar Field (2,577.00 acres)
- 450-MW Solar Field (3,497.47 acres)
- Area Removed from Project
- Laydown Areas
- New Areas Added
- Proposed Waterline (7.17 miles)
- Proposed Substation and Main Services Complex
- Existing SDG&E Imperial Valley Substation
- Existing Transmission Line
- Proposed 750-MW Transmission Line (10.30 miles)
- Main Access Road
- FEMA 100-Year Flood Zone
- BLM-Administered Public Lands

SOURCES: SDG&E (existing t-line 2006); Stantec (proposed project features, BLM-managed lands 2008); USGS TOPO! (24K topo, various dates); CASIL (fema 100 year).

0.5 0 0.5 1 Miles

SCALE: 1" = 1 Miles (1:63,360)
SCALE CORRECT WHEN PRINTED AT 11X17

URS

FE A EAR FLOO ONE
SOLAR TWO PROJECT

CHECKED BY: CPE	DATE: 06-04-08	FIG. NO:
PM: AL	PROJ. NO: 27657102.00405	4

Path: G:\gis\projects\1577\22238980\mxd\water_fema.mxd, 06/04/08,

Solar Two Photos of Washes

Solar Two Photos of Washes

Solar Two Photos of Washes

Solar Two Photos of Washes

Solar Two Photos of Washes

Solar Two Photos of Washes

Solar Two Photos of Washes

Solar Two Photos of Washes

Solar Two Photos of Washes

Solar Two Photos of Washes

Solar Two Photos of Washes

Solar Two Photos of Washes

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 2: Please contact CDFG and provide a record of correspondence regarding the need to complete a Streambed Alteration Agreement. Should a Streambed Alteration Agreement be needed, please explain the project-specific circumstances that would necessitate substantial temporary or permanent impacts to jurisdictional waters of the State.

Response: CDFG has indicated that a Stream Bed Alteration Agreement would be required if the channels onsite are to be modified (see attached correspondence provided as Attachment BIO-2 to this response). Channels will be modified through the construction of road crossings or SunCatcher placement. See Figures 3-3, 3-29 and 3-30 in Section Three, Project Description of the AFC.

ATTACHMENT BIO-2

Patrick Mock/SanDiego/URSCorp
11/26/2008 03:11 PM

To "Monarres, Laurie A SPL" <Laurie.A.Monarres@usace.army.mil>
cc Cheryl Rustin/SanDiego/URSCorp, Theresa Miller/SanDiego/URSCorp, Corinne Lytle/SanDiego/URSCorp
bcc
Subject RE: JD form for Solar Two

I put it on my schedule. We do not think there is a connection to the canals except perhaps in years with extreme rainfall events.

Patrick J. Mock, PhD, CSE, CWB®
Senior Project Manager
Principal Scientist
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
619-294-9400
619-293-7920 Fax
619-888-6159 Cell

"Monarres, Laurie A SPL" <Laurie.A.Monarres@usace.army.mil>

"Monarres, Laurie A SPL" <Laurie.A.Monarres@usace.army.mil>
11/26/2008 12:38 PM

To <Patrick_Mock@URSCorp.com>
cc
Subject RE: JD form for Solar Two

Hi Pat,

Thank you for submitting this info. I've been studying the aerial view of the project site and associated washes on Google Earth, and it appears to me that Coyote Wash (just north of the project site) flows east below the Borrego Sink and continues to an agricultural canal and then to the Salton Sea. The Corps is conducting a JD for another project associated with Coyote Wash, so we will probably be conducting a site visit for both projects to determine if the washes associated with each have a significant nexus with the Salton Sea and are thus Corps jurisdictional. Would you be available to meet us at the site on the afternoon of January 7?

Thanks and have a great holiday!

take care,
Laurie

Laurie Ikuta Monarres
U.S. Army Corps of Engineers Regulatory Division
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011
(760) 602-4832
Laurie.A.Monarres@usace.army.mil

From: Patrick_Mock@URSCorp.com [mailto:Patrick_Mock@URSCorp.com]
Sent: Thursday, November 20, 2008 1:15 PM
To: Monarres, Laurie A SPL
Cc: JNishida@energy.state.ca.us; Corinne_Lytle@URSCorp.com; Theresa_Miller@URSCorp.com; Cheryl_Rustin@URSCorp.com; Dallas_Pugh@URSCorp.com
Subject: JD form for Solar Two

(See attached file: Draft JD Form Solar Two URS final.doc)(See attached file: Figures & Photos Solar Two JD form.pdf)

Here is the draft JD form. Please reply ASAP if you have any questions or concerns.
Reminder: Next Monday afternoon (11/24/08) is the Scoping Meeting for the joint CEC/BLM review process for the project. They will be doing a site visit too.

Thank you for your prompt attention to this issue.

Patrick J. Mock, PhD, CSE, CWB®
Senior Project Manager
Principal Scientist
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
619-294-9400
619-293-7920 Fax
619-888-6159 Cell

Patrick Mock/SanDiego/URSCorp
09/25/2008 05:13 PM

To "Craig Weightman" <cweightman@dfg.ca.gov>
cc Corinne_Lytle@URSCorp.com, "Joy Nishida" <JNishida@energy.state.ca.us>
bcc
Subject Re: Fw: SES Solar Two: DA needs for Biological Resources

Thank you for your prompt reply.

In addition to 1602 permits, will CDFG coordinate with CEC regarding CEQA compliance and any non-wetlands/waters issues?

If so, will you be the point of contact?

Patrick J. Mock, PhD, CSE, CWB®
Senior Project Manager
Principal Scientist
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
619-294-9400
619-293-7920 Fax
619-888-6159 Cell

"Craig Weightman" <cweightman@dfg.ca.gov>

"Craig Weightman " <cweightman@dfg.ca.gov>
09/25/2008 03:54 PM

To <Patrick_Mock@URSCorp.com>
cc "Joy Nishida" <JNishida@energy.state.ca.us>, <Corinne_Lytle@URSCorp.com>
Subject Re: Fw: SES Solar Two: DA needs for Biological Resources

I am concerned with the following statement in the application:

"Sections 1600-1609 of the Fish and Game Code requires any person who proposes a Project that
will substantially divert or obstruct the natural flow or substantially change the bed, channel, or
bank of any river, stream, or lake or use materials from a streambed to notify the CDFG before
beginning the Project. Such a change requires a Streambed Alteration Agreement with the
CDFG per Section 1602, and review in accordance with CEQA (Public Resources Code, §21000
et seq.). Solar Two will obtain a Streambed Alteration Agreement (if

required by BLM for
federal lands or if streambeds on private property will be modified)
before work beginning on
the Project; thus, the Project will be in compliance with this
regulation."

Private projects undertaken on federal land are required to be in compliance with state laws. Compliance with section 1600 of Fish & Game Code is not up to the discretion of BLM but is a requirement of the project proponent to be in compliance with. Additionally, any information which is supplied to the DFG after the CEQA process is complete will not have been subject to the public review requirements of CEQA. In this instance, the Department has three choices: 1) refuse to issue the SAA; 2) not file the Notification because CEQA has not been complied with and return the package to the lead agency for further CEQA action; or 3) become the lead agency. Mitigation measures that may be proposed for impacts to jurisdictional streambed must be analyzed under CEQA.

The washes indicated in the attachment are subject to Fish and Game Code Section 1600 regardless of wheter they are under public or private ownership.

Thank You

Craig J Weightman
Acting Senior Environmental Scientist
Calif. Dept. of Fish and Game
78-078 Country Club Drive, Ste 109
Bermuda Dunes, CA 92203
(760) 200-9394
(760) 200-9358 fax

>>> <Patrick_Mock@URSCorp.com> 9/25/2008 11:20 AM >>>

(See attached file: Figure 3 - Potential Waters of the State.pdf)

Mr. Weightman:

Joy Nishida (see email below) requested that I contact the CDFG
regarding
potential permit requirements for the SES Solar Two Power Project
located
west of El Centro, north of Interstate 8. In the AFC document prepared
for
the CEC review, URS concluded that that the flood flow channels were
potential Waters of the State, but not federal jurisdictional waters
due to
a lack of connection to a navigable waters. A figure from the AFC
document
is attached.

Please provide a list of what CDFG permit processes may be required.

The AFC document is at the following website:
http://www.energy.ca.gov/sitingcases/solartwo/documents/applicant/afc/index.ph
p

Section 5.6 is the Biological Resources assessment.

Please reply with any questions or additional information that you may require.

Patrick J. Mock, PhD, CSE, CWB®
Senior Project Manager
Principal Scientist
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
619-294-9400
619-293-7920 Fax
619-888-6159 Cell

----- Forwarded by Patrick Mock/SanDiego/URSCorp on 09/25/2008 11:06 AM

"Joy Nishida"

<JNishida@energy.state.ca.us>

To

<Patrick_Mock@URSCorp.com>

09/25/2008 09:11 AM

cc

Subject

Fwd: Fw: SES Solar Two: DA needs for Biological Resources

Pat,

As the biologist assigned to this project, Rick York directed me to answer
your questions. The reason to contact the agencies is to discuss what the
project is and what the possible impacts are. From this information, the
agencies can give you an idea of what permits may be required. The Energy
Commission requires contact with various agencies for data adequacy, even
if you believe these agencies may not have jurisdiction over any aspect of
the Project.

I don't have a contact for RWQCB, but for the USACE, you'll need to contact
Lori Minares (760) 602-4832. She is somewhat familiar with the project and
despite what you may believe regarding the jurisdictionality of the
ephemeral washes, the AFC stated that the waters from the site drain to the
Salton Sea, which is under Corps jurisdiction. You'll need to discuss the
possibility of having to do a wetland delineation with the Corps.

The CDFG contact is Craig Weightman (760) 200-9158. If the Corps doesn't
take jurisdiction of the ephemeral washes on the Project site, then it is
under the jurisdiction of the State. According to Craig, even though the
Project is on BLM land, you still may be required to get a Streambed
Alteration Agreement with CDFG. You'll need to give these agencies a call
and provide the Energy Commission a summary of what was discussed, who was
contacted, and when this discussion took place. The agencies can get a
copy of the AFC by contacting our Project Manager, Christopher Meyer.

I hope this answers your questions.

Joy

Joy Nishida
California Energy Commission
Siting, Transmission, and Environmental Protection Division
Biological Resources Unit
1516 Ninth Street, MS 40
Sacramento, CA 95814-5512

(916) 654-3947
JNishida@energy.state.ca.us

----- Message from "Rick York" <Ryork@energy.state.ca.us> on Thu, 25 Sep
2008 08:19:44 -0700 -----

To: "Joy Nishida" <JNishida@energy.state.ca.us>

Subject: Fwd: Fw: SES Solar Two: DA needs for Biological Resources

I'm going to ask that you answer his questions. Thanks. Rick

>>> <Patrick_Mock@URSCorp.com> 9/24/2008 6:42 PM >>>
Rick:

Can you please provide us direction as to what type of correspondance you
need from CDFG, ACOE and RWQCB regarding the Solar II AFC?

Do you want us to send the AFC document to each agency? Doesn't the CEC
coordinate directly with state agencies as part of the AFC process?
There are no ACOE jurisdictional waters associated with the Solar II site.
Do we still get ACOE involved?

Please reply ASAP, as we are trying to close out outstanding CEC Data
Requests.

Thank you,

Pat

Patrick J. Mock, PhD, CSE, CWB®
Senior Project Manager
Principal Scientist
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
619-294-9400
619-293-7920 Fax
619-888-6159 Cell

----- Forwarded by Patrick Mock/SanDiego/URSCorp on 09/24/2008 06:31 PM

Corinne
Lytle/SanDie
go/URSCorp

To
09/23/2008
09:25 PM Angela
Leiba/SanDiego/URSCorp@URSCo
rp

cc

Patrick
Mock/SanDiego/URSCorp@URSCOR
P

Subject

Re: Fw: SES Solar Two:

DA

needs for Biological

ResourcesPatrick Mock

Hi Pat,

Where are we on this? Is it something that can be completed and have the
response finalized tomorrow?

Thanks,

Corinne Lytle
Environmental/Visual Specialist
URS Corporation
1615 Murray Canyon Road
Suite 1000
San Diego, CA 92108
www.urscorp.com
tel: 619.294.9400 ext. 1176
direct: 619.243.2876
fax:619.293.7920
corinne_lytle@urscorp.com

-----Angela Leiba/SanDiego/URSCorp wrote: -----

To: Patrick Mock/SanDiego/URSCorp@URSCORP
From: Angela Leiba/SanDiego/URSCorp
Date: 09/22/2008 04:12PM
cc: "Christine Henning" <CHenning@stirlingenergy.com>, Corinne Lytle/SanDiego/URSCorp@URSCorp
Subject: Re: Fw: SES Solar Two: DA needs for Biological Resources

Pat - please contact the CEC bio lead directly - might just call Rick and
ask. We want to make sure whatever we submit as our official "data adequacy
response" the CEC actually deems as adequate. Please work off-line with the
CEC to ensure our response is going to get us there, thanks!

Angela Leiba, GISP
Senior Project Manager/
Environmental Group Leader
URS Corporation
1615 Murray Canyon Road

Suite 1000
San Diego, CA 92108
www.urscorp.com
cell: 619.888.5542
tel: 619.294.9400
fax:619.293.7920
angela_leiba@urscorp.com

Patrick Mock/SanDiego/URSCorp

Patrick Mock/SanDiego/URSCorp

09/22/2008 04:05 PM

To

Corinne

Lytle/SanDiego/URSCorp@URSCo
rp

cc

Angela

Leiba/SanDiego/URSCorp@URSCo
rp, "Christine Henning"

<CHenning@stirlingenergy.com
>

Subject

Re: Fw: SES Solar Two:

DA

needs for Biological

Resources

Has BLM given direction that CDFG and RWQCB needs to be contacted for Federal Lands?
There are no juisdictional waters associated with the site so does ACOE
need to get involved?

Patrick J. Mock, PhD, CSE, CWB®
Senior Project Manager
Principal Scientist
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
619-294-9400
619-293-7920 Fax
619-888-6159 Cell

Corinne Lytle/SanDiego/URSCorp

Corinne Lytle/SanDiego/URSCorp

09/22/2008 03:34 PM

To

Angela

Leiba/SanDiego/URSCorp

cc

"Christine Henning"

<CHenning@stirlingenergy.co

m>, Patrick

Mock/SanDiego/URSCorp@URSCo

rp

Subject

Re: Fw: SES Solar Two:

DA

needs for Biological

Resources

The packet of resumes we gave them did not include Seth's, but that will be
an easy fix. Christine, I am attaching the resume to this email for you to
forward to Chris per his request.

The BLM Habitat conservation issue is an easy fix as well. He has the BLM
comments and response to comments, which contain the discussion, but it
might help to separate the discussion for him (Comment 74).

Pat, I looked through all the correspondence you gave us and it does not
include any with CDFG, USACE and RWCB. Have we already done this and just
need to find the correspondence or do we need to contact them now?

[attachment "Hopkins, Seth L. (Master) 8-2-07.doc" deleted by Angela Leiba/SanDiego/URSCorp]

Thanks,

Corinne Lytle
Environmental/Visual Specialist
URS Corporation
1615 Murray Canyon Road
Suite 1000
San Diego, CA 92108
www.urscorp.com
tel: 619.294.9400 ext. 1176
direct: 619.243.2876
fax:619.293.7920
corinne_lytle@urscorp.com

Angela Leiba/SanDiego/URSCorp

Angela Leiba/SanDiego/URSCorp

09/22/2008 03:02 PM

To

Corinne Lytle/SanDiego/URSCorp@URSCorp, Patrick Mock/SanDiego/URSCorp@URSCORP

cc

"Christine Henning"

<CHenning@stirlingenergy.co
m>

Subject

Fw: SES Solar Two: DA
needs
for Biological
Resources

CL,
Didn't we give them all this already??
And obviously we have the habitat compensation they are recommending
in
their response to BLM comments.

Angela Leiba, GISP
Senior Project Manager/
Environmental Group Leader
URS Corporation
1615 Murray Canyon Road
Suite 1000
San Diego, CA 92108
www.urscorp.com
cell: 619.888.5542
tel: 619.294.9400
fax:619.293.7920
angela_leiba@urscorp.com

----- Forwarded by Angela Leiba/SanDiego/URSCorp on 09/22/2008 03:00 PM

"Christine Henning"

<CHenning@stirlingenergy.com>

To
09/22/2008 01:10 PM

<Angela_Leiba@URSCo
rp.com>

cc

Subject

Two:
FW: SES Solar
DA needs for
Biological
Resources

FYI - Can we discuss this items.

Thanks Christine

-----Original Message-----
From: Christopher Meyer [mailto:Cmeyer@energy.state.ca.us]
Sent: Monday, September 22, 2008 1:10 PM
To: Christine Henning
Subject: SES Solar Two: DA needs for Biological Resources

Christine,

It won't take much for the application to be data adequate in
Biological
Resources. Here's a summary of what's needed:

1. Seth Hopkins' resume is missing.
2. The applicant needs to talk to BLM about habitat compensation and
management.
3. The applicant needs to contact USACE, CDFG, and RWCB.

The missing resume can be emailed as an attachment and added to the
AFC.
You may have already addressed many of these issues.

Thanks,
Christopher

Figure 3 - Potential Waters of the State.pdf

Patrick Mock/SanDiego/URSCorp
09/25/2008 02:31 PM

To: JNishida@energy.state.ca.us, Corinne Lytle/SanDiego/URSCorp@URSCorp
cc:
bcc:
Subject: Fw: SES Solar Two: DA needs for Biological Resources

----- Forwarded by Patrick Mock/SanDiego/URSCorp on 09/25/2008 02:31 PM -----

"John Carmona " <jcarmona@waterboards.ca.gov>
09/25/2008 01:37 PM

To: <Patrick_Mock@URSCorp.com>
cc: "Cliff Raley" <CRaley@waterboards.ca.gov>, "Doug Wylie" <dwylie@waterboards.ca.gov>, "Jose Figueroa-Acevedo" <jfigueroa-acevedo@waterboards.ca.gov>, "Jay Mirpour" <JMirpour@waterboards.ca.gov>, "Kirk Larkin" <klarkin@waterboards.ca.gov>, "Suhas Chakraborty" <schakraborty@waterboards.ca.gov>
Subject: Re: Fw: SES Solar Two: DA needs for Biological Resources

I have forwarded your message to our Regional Board CEQA contact, Jon Rokke, jrokke@waterboards.ca.gov . His phone number is 760 776-8959.

As discussed with you, here are the following permits we normally would issue:

1. If waters are determined to be jurisdictional by Army Corp then we would issue 401 Water Quality Certification, if not determined to be jurisdiction we would evaluate to determine whether Waste Discharge Requirements would be required for protection of state wetlands.
Web link -
http://www.waterboards.ca.gov/coloradoriver/water_issues/programs/401_certification/

2. Construction disturbing over 1 acre of land would require obtaining a construction storm water permit.
Web link -
http://www.waterboards.ca.gov/coloradoriver/water_issues/programs/stormwater/

3. An Industrial storm water permit may be required, based on Standard Indentification Classification.
Web link -
http://www.waterboards.ca.gov/coloradoriver/water_issues/programs/stormwater/

4. An NPDES permit would be required if discharging waste to a water of the United States.
Web link -
http://www.waterboards.ca.gov/coloradoriver/water_issues/programs/npdes/

5. Waste Discharge Requirements would be required for discharging to land (i.e., recycled water, septic tanks or waste ponds, etc.)
Web link -
http://www.waterboards.ca.gov/coloradoriver/water_issues/programs/non_chapter_

15/

I hope this helps.

John

John Carmona
Senior Water Resources Control Engineer
Phone: (760) 340-4521
Fax: (760) 341-6820
email: jcarmona@waterboards.ca.gov
}><((((°>`·..·`·..·`·...}><((((°>.
·`·.. , . .·`·.. }><((((°>`·..·`·..·`·...}><((((°>
California Regional Water Quality Control Board
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

>>> <Patrick_Mock@URSCorp.com> 9/25/2008 11:15 AM >>>

(See attached file: Figure 3 - Potential Waters of the State.pdf)

Mr. Carmona:

Joy Nishida (see email below) requested that I contact the RWQCB regarding potential permit requirements for the SES Solar Two Power Project located west of El Centro, north of Interstate 8. In the AFC document prepared for the CEC review, URS concluded that that the flood flow channels were potential Waters of the State, but not federal jurisdictional waters due to a lack of connection to a navigable waters. A figure from the AFC document is attached.

Please provide a list of what RWQCB permit processes may be required.

The AFC document is at the following website:
http://www.energy.ca.gov/sitingcases/solartwo/documents/applicant/afc/index.php

Please reply with any questions or additional information that you may require.

Patrick J. Mock, PhD, CSE, CWB®
Senior Project Manager
Principal Scientist
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
619-294-9400
619-293-7920 Fax
619-888-6159 Cell

----- Forwarded by Patrick Mock/SanDiego/URSCorp on 09/25/2008 11:06 AM -----

"Joy Nishida"
<JNishida@energy.state.ca.us>
09/25/2008 09:11 AM

To
<Patrick_Mock@URSCorp.com>

cc

Subject
Fwd: Fw: SES Solar Two: DA needs for Biological Resources

Pat,

As the biologist assigned to this project, Rick York directed me to answer
your questions. The reason to contact the agencies is to discuss what the
project is and what the possible impacts are. From this information, the
agencies can give you an idea of what permits may be required. The Energy
Commission requires contact with various agencies for data adequacy, even
if you believe these agencies may not have jurisdiction over any aspect of
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I don't have a contact for RWQCB, but for the USACE, you'll need to contact
Lori Minares (760) 602-4832. She is somewhat familiar with the project and
despite what you may believe regarding the jurisdictionality of the
ephemeral washes, the AFC stated that the waters from the site drain to the
Salton Sea, which is under Corps jurisdiction. You'll need to discuss the
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The CDFG contact is Craig Weightman (760) 200-9158. If the Corps doesn't
take jurisdiction of the ephemeral washes on the Project site, then it is
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Alteration Agreement with CDFG. You'll need to give these agencies a call
and provide the Energy Commission a summary of what was discussed, who was
contacted, and when this discussion took place. The agencies can get a
copy of the AFC by contacting our Project Manager, Christopher Meyer.

I hope this answers your questions.

Joy

Joy Nishida
California Energy Commission
Siting, Transmission, and Environmental Protection Division
Biological Resources Unit
1516 Ninth Street, MS 40
Sacramento, CA 95814-5512

(916) 654-3947
JNishida@energy.state.ca.us

----- Message from "Rick York" <Ryork@energy.state.ca.us> on Thu, 25 Sep
2008 08:19:44 -0700 -----

To: "Joy Nishida" <JNishida@energy.state.ca.us>

Subject: Fwd: Fw: SES Solar Two: DA needs for Biological Resources

I'm going to ask that you answer his questions. Thanks. Rick

>>> <Patrick_Mock@URSCorp.com> 9/24/2008 6:42 PM >>>
Rick:

Can you please provide us direction as to what type of correspondance you
need from CDFG, ACOE and RWQCB regarding the Solar II AFC?

Do you want us to send the AFC document to each agency? Doesn't the CEC
coordinate directly with state agencies as part of the AFC process?
There are no ACOE jurisdictional waters associated with the Solar II site.
Do we still get ACOE involved?

Please reply ASAP, as we are trying to close out outstanding CEC Data Requests.

Thank you,

Pat

Patrick J. Mock, PhD, CSE, CWB®
Senior Project Manager
Principal Scientist
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
619-294-9400
619-293-7920 Fax
619-888-6159 Cell

----- Forwarded by Patrick Mock/SanDiego/URSCorp on 09/24/2008 06:31
PM

Corinne
Lytle/SanDie
go/URSCorp

To
09/23/2008
09:25 PM Angela

Leiba/SanDiego/URSCorp@URSCo
rp

cc

Patrick

Mock/SanDiego/URSCorp@URSCOR
P

Subject

Re: Fw: SES Solar Two:
DA
needs for Biological
ResourcesPatrick Mock

Hi Pat,

Where are we on this? Is it something that can be completed and have the
response finalized tomorrow?

Thanks,

Corinne Lytle
Environmental/Visual Specialist
URS Corporation
1615 Murray Canyon Road
Suite 1000
San Diego, CA 92108
www.urscorp.com
tel: 619.294.9400 ext. 1176
direct: 619.243.2876
fax:619.293.7920
corinne_lytle@urscorp.com

-----Angela Leiba/SanDiego/URSCorp wrote: -----

To: Patrick Mock/SanDiego/URSCorp@URSCORP
From: Angela Leiba/SanDiego/URSCorp
Date: 09/22/2008 04:12PM
cc: "Christine Henning" <CHenning@stirlingenergy.com>, Corinne Lytle/SanDiego/URSCorp@URSCorp
Subject: Re: Fw: SES Solar Two: DA needs for Biological Resources

Pat - please contact the CEC bio lead directly - might just call Rick and
ask. We want to make sure whatever we submit as our official "data adequacy
response" the CEC actually deems as adequate. Please work off-line with the
CEC to ensure our response is going to get us there, thanks!

Angela Leiba, GISP
Senior Project Manager/
Environmental Group Leader
URS Corporation
1615 Murray Canyon Road
Suite 1000
San Diego, CA 92108
www.urscorp.com
cell: 619.888.5542
tel: 619.294.9400
fax:619.293.7920
angela_leiba@urscorp.com

Patrick Mock/SanDiego/URSCorp

Patrick Mock/SanDiego/URSCorp

09/22/2008 04:05 PM

To

Corinne

Lytle/SanDiego/URSCorp@URSCo

rp

cc

Angela

Leiba/SanDiego/URSCorp@URSCo

rp, "Christine Henning"

<CHenning@stirlingenergy.com

>

Subject

Re: Fw: SES Solar Two:

DA

needs for Biological

Resources

Has BLM given direction that CDFG and RWQCB needs to be contacted for
Federal Lands?
There are no juisdictional waters associated with the site so does
ACOE
need to get involved?

Patrick J. Mock, PhD, CSE, CWB®
Senior Project Manager
Principal Scientist
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
619-294-9400
619-293-7920 Fax
619-888-6159 Cell

Corinne Lytle/SanDiego/URSCorp

Corinne Lytle/SanDiego/URSCorp

09/22/2008 03:34 PM

To

Angela

Leiba/SanDiego/URSCorp

cc

"Christine Henning"

<CHenning@stirlingenergy.co

m>, Patrick

Mock/SanDiego/URSCorp@URSCo
rp

Subject

DA

Re: Fw: SES Solar Two:
needs for Biological
Resources

The packet of resumes we gave them did not include Seth's, but that will be
an easy fix. Christine, I am attaching the resume to this email for you to
forward to Chris per his request.

The BLM Habitat conservation issue is an easy fix as well. He has the BLM
comments and response to comments, which contain the discussion, but it
might help to separate the discussion for him (Comment 74).

Pat, I looked through all the correspondence you gave us and it does not
include any with CDFG, USACE and RWCB. Have we already done this and just
need to find the correspondence or do we need to contact them now?

[attachment "Hopkins, Seth L. (Master) 8-2-07.doc" deleted by Angela
Leiba/SanDiego/URSCorp]

Thanks,

Corinne Lytle
Environmental/Visual Specialist
URS Corporation
1615 Murray Canyon Road
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corinne_lytle@urscorp.com

Angela Leiba/SanDiego/URSCorp

Angela Leiba/SanDiego/URSCorp

09/22/2008 03:02 PM

To

Corinne

Lytle/SanDiego/URSCorp@URSC

orp, Patrick

Mock/SanDiego/URSCorp@URSCO

RP

cc

"Christine Henning"

<CHenning@stirlingenergy.co

m>

Subject

Fw: SES Solar Two: DA

needs

for Biological

Resources

CL,
Didn't we give them all this already??
And obviously we have the habitat compensation they are recommending
in
their response to BLM comments.

Angela Leiba, GISP
Senior Project Manager/
Environmental Group Leader
URS Corporation
1615 Murray Canyon Road
Suite 1000
San Diego, CA 92108
www.urscorp.com
cell: 619.888.5542
tel: 619.294.9400
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angela_leiba@urscorp.com

----- Forwarded by Angela Leiba/SanDiego/URSCorp on 09/22/2008 03:00
PM

"Christine Henning"

<CHenning@stirlingenergy.com>

To
09/22/2008 01:10 PM

<Angela_Leiba@URSCo
rp.com>

cc

Subject

Two:

FW: SES Solar
DA needs for
Biological
Resources

FYI - Can we discuss this items.

Thanks Christine

-----Original Message-----
From: Christopher Meyer [mailto:Cmeyer@energy.state.ca.us]
Sent: Monday, September 22, 2008 1:10 PM
To: Christine Henning
Subject: SES Solar Two: DA needs for Biological Resources

Christine,

It won't take much for the application to be data adequate in Biological Resources. Here's a summary of what's needed:

1. Seth Hopkins' resume is missing.
2. The applicant needs to talk to BLM about habitat compensation and management.
3. The applicant needs to contact USACE, CDFG, and RWCB.

The missing resume can be emailed as an attachment and added to the AFC.
You may have already addressed many of these issues.

Thanks,

Christopher

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 3: Please provide the anticipated schedule of USACE and Regional Water Quality Control Board (RWQCB) permitting for (and verification of) jurisdictional waters, and expected mitigation measures likely to be included in USACE and RWQCB permits, if appropriate.

Response: Please refer to the response to Data Request 1 for a discussion of USACE jurisdictional water. The Regional Water Quality Control Board would take jurisdiction under either Clean Water Act Section 401 or Porter Cologne Water Quality Control Act if channels are to be modified. Once the jurisdictional waters determination is complete, the Applicant will enter into discussions with RWQCB as to which law (state or federal) is applicable. CWA 401 certification would be part of the 404 permit process and would proceed in parallel with that permit process. If a 404 permit is not required, water quality certification would be sought via Porter-Cologne.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 4: Please provide an analysis of the biological resource impacts expected to occur to flat-tailed horned lizard and burrowing owls during grading for the proposed project. Also provide species-specific measures to mitigate project-related grading impact.

Response: Species-specific measures to mitigate grading related impacts are discussed in Section 5, Mitigation and Monitoring of the Biological Resources Technical Report (Appendix Y of the AFC) and in Section 5.6.4.1, Species-Specific Mitigation Measures, in the Biological Resources section of the AFC.

Potential impacts to burrowing owl habitat may occur as a result of the grading of the proposed Project. No owl burrows were detected in the impact area, although owls were detected near the agricultural fields east of the project site. Mortality due to burrow collapse, site grading, and loss of suitable forage habitat are the most likely impacts to burrowing owl of burrows are detected during pre-construction surveys. Thirty days before the start of initial ground disturbance activities, a preconstruction survey for burrowing owls will be completed. If any owls are encountered, measures will be taken to minimize effects to them. Initial disturbance of the site would also occur outside the burrowing owl breeding season (1 February through 31 August) to ensure that no breeding birds, eggs, or chicks are harmed by construction activities.

Impacts on flat-tailed horned lizard with respect to grading and other construction activities are discussed in Section 4.1.1 of the Biological Technical Report (BTR) (URS 2008) and in Section 5.6.2.1 – *Solar Two Project Site* of the AFC (URS 2008). All FTHL within the proposed impact area are assumed to be impacted directly, both on-site and along the Project's linears (Transmission Line, Water Line, Access Road, etc.). A translocation program is proposed to minimize mortality of FTHL. Habitat would be mitigated offsite.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 5: Please provide a detailed monitoring plan for the evaporation ponds, including:

a. A discussion of the frequency and nature of monitoring;

b. Elements that will be monitored (e.g., sodium);

c. A list of resident and migratory species that could be at risk;

d. Remedial actions that could be taken if the ponds become a hazard for wildlife; and

e. Events that might trigger implementation of those remedial actions.

Response: Waterfowl are common in the project vicinity (Salton Sea) and have many existing sources of fresh water available east of the project site. Because Waterfowl associated with the Salton Sea are accustomed to highly saline water, it is not anticipated that they would be at risk to the saline water in the evaporation ponds. No waterfowl were detected onsite during biological surveys and site assessment.

It is not anticipated that most resident birds and other small wildlife species would ingest large amounts of the saline water that may be present in the evaporation ponds since the majority of their water needs is derived from their food. Therefore, wildlife impacts from evaporation ponds are not expected to be significant.

a) The Applicant will test the water quarterly for threshold levels of trace elements that may be harmful to wildlife, such as selenium, arsenic, and sodium. Should the water contain substantial concentrations of trace elements, the potential risk for wildlife mortality would increase. In which case a detailed initial monitoring program of the evaporation pond water will be designed and implemented (Bradford et al. 1991).

b) Trace elements that have the potential to harm wildlife are selenium, arsenic, and sodium.

c) A list of wildlife species potentially at risk of being impacted by the evaporation ponds is provided below and is a subset from the list included in the *Wildlife Species Observed on the Solar Two Project Site* table in the Biological Resources Technical Report (URS 2008). In addition, a 5-mile radius query of the California Natural Diversity Data Base (CNDDB) revealed that LeConte's thrasher (*Toxostoma lecontei*) and black-tailed gnatcatcher (*Polioptila melanura*) are the only sensitive species that historically occur within the Project vicinity; neither of which would be expected to use the evaporation ponds since they obtain their water via their food (free water and metabolic water).

Larger seed-eating birds (doves) and grackle would be most at risk since they typically require a source of free water. Other wildlife that may attempt to use the evaporation ponds include moderate to large mammals, but water present in the evaporation ponds is anticipated to be unattractive due to the saline taste.

Rock dove	*Columba livia*
Great-tailed grackle	*Quiscalus mexicanus*
Mourning dove	*Zenaida macroura*
Black-tailed jackrabbit	*Lepus californicus*
California ground squirrel	*Spermophilus beecheyi*
Coyote	*Canis latrans*
Kit fox	*Vulpes macrotis*

d) Remedial actions that could be taken if the ponds become a hazard for wildlife include quarterly monitoring of trace elements and salts in the ponds being evaporated to determine status; rotating the ponds more often than once a year; and frequent decanting of the pond water to increase the percent solids and reclaim some of the water.

e) Events that might trigger implementation of the aforementioned remedial actions include results of the quarterly monitoring of the pond water that suggest a high concentration of harmful trace elements or detection of wildlife mortality directly linked to the pond water. Covering and fencing of the ponds could be implemented should adverse effects on wildlife be detected.

References:

Bradford, D.F., L.A. Smith, D.S. Drezner, and J.D. Shoemaker. 1991. Minimizing contamination hazards to waterbirds using agricultural drainage evaporation ponds. Environmental Management 15 (6): 785-795.

Gordus, A.G., H.L. Shivaprasad, and P.K. Swift. 2002 Salt toxicosis in ruddy ducks that winter on an agricultural evaporation basin in California Journal of Wildlife Diseases*,* 38(1): 124-131.

Stolley, D.S. and C.U. Meteyer. 2004. Peracute Sodium Toxicity in Free-ranging Black-bellied Whistling Duck Ducklings. Journal of Wildlife Diseases*,* 40(3): 571-574.

Windingstad, R.M., F.X. Kartch, R.K. Stroud, and M.R. Smith. 1987. Salt Toxicosis in Waterfowl in North Dakota. Journal of Wildlife Diseases, 23(3):443-446.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 6: Please provide details on how the evaporation ponds will be designed, built, and operated to discourage wildlife use.

Response: Trace element concentrations (i.e., selenium, arsenic, and sodium) of the evaporation pond water will be monitored quarterly to determine if there is a concern regarding wildlife access to the pond water. If toxicity effects on wildlife become apparent, the evaporation ponds could be covered to minimize wildlife access. For instance, the covers will be designed to minimize attraction of predator and scavenger species. The evaporation ponds could be designed to discourage wildlife use by constructing perimeter fences and installing wire mesh screens above the ponds. Specific design could be implemented, regarding wire mesh size and fencing design, to ensure that implementation of these exclusion methods will be successful and that smaller wildlife will not be trapped by the pond covers.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 7: Please provide a detailed raven monitoring and control plan that discusses:

a. How the monitoring and control plan will be coordinated with CDFG and USFWS;

b. Area covered by the plan;

c. Potential use of perch-deterrent devices and locations of their installation;

d. Measures that might reduce raven presence and nesting activities (e.g., removing food items, garbage, and access to water);

e. A monitoring plan, including discussion of survey methods and frequency for establishing baseline data on pre-project raven numbers and activities, assessing post-project changes from this baseline, and the funding mechanism for the monitoring plan;

f. Remedial actions that would be employed (e.g., nest removal) if raven predation of flat-tailed horned lizard is detected; and

g. The circumstances that would trigger the implementation of remedial actions.

Response: A raven monitoring and control plan will be developed and submitted during first quarter 2009. CEC, BLM and the wildlife agencies will review the final version of the plan prior to initiation of ground disturbing activities.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 8: Please describe the likely components of a facility closure plan (e.g., decommissioning methods, timing of any proposed restoration, restoration performance criteria) and discuss each relative to biological resources and specifically species of concern such as flat-tailed horned lizard and burrowing owl.

Response: The Closure Plan shall:

1. Identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site;
2. Identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
3. Identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
4. Address conformance of the plan with all applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of facility closure, and applicable conditions of certification. Prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner, BLM, and the Energy Commission for the purpose of discussing the specific contents of the plan.

In the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Energy Commission may hold public hearings as part of its approval procedure.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities until the Energy Commission and BLM approves the facility closure plan.

Habitat restoration performance criteria will be developed in coordination with the resource agencies as part of the mitigation and conditions of certification. Details on site decommissioning methods, the timing of habitat restoration and habitat restoration performance criteria will be provided pending the outcome of these discussions. Additionally, facility closure requirements of the BLM, Imperial County, USACE, USFWS, CDFG and other pertinent agencies will be identified, evaluated, and incorporated into these mitigation and site rehabilitation discussions.

Once the facility structures are removed from the site, vegetation similar in species composition and percent cover would be established in areas previously developed. An assessment of food resources for horned lizards would be made to determine whether the restored site is suitable for the reintroduction of lizards into previously developed areas. Burrowing owls would likely occupy the site if prey species reoccupy the site. Owls currently do not occupy the site, but occur east of the site near the agricultural fields.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 9: Please describe the potential funding (e.g., a bond) and/or legal mechanisms for decommissioning and restoration of the project site that could be used at the end of operations.

Response: This plant is expected to have an operational lifetime of at least 40 years. A complete plan for decommissioning will be developed toward the end of the projects lifetime. Given the nature of the SunCatcher units standing on individual steel pedestals which have been hydraulically driven into the ground, decommissioning of the individual units allows for easier removal of the foundations.

When the project is decommissioned. at the end of its lifetime, the scrap value of the metal steel and copper alone will cover decommissioning costs of the entire facility including buildings and associated facilities.

Site restoration is discussed in the response to Data Request 8. It will continue to be developed as the Project moves through regulatory review and will be included in the decommissioning plan, which will likely be a condition of certification.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 10: Please describe the potential funding and/or legal mechanisms for decommissioning and restoration of the project site that could be used in the event of bankruptcy or the untimely closure for financial reasons.

Response: In the unlikely event of bankruptcy or untimely closure of the project, a scrap company could be retained to salvage all the steel, copper, and other valuable materials on the site, with the revenue earned on recycling covering the expense of the full decommissioning and site restoration. It is important to note that the planned foundation system will allow for complete removal of the foundation.

Information on funding mechanisms, including those that may be in-place in the event of bankruptcy or other financial reasons will also be supplied to the resource agencies during the Project's regulatory review.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 11: Provide a discussion of closure requirements of the County of Imperial, USFWS, CDFG, and any other agency that may have facility closure requirements.

Response: No agency closure requirements are known at this time. Because the conditions that would affect the decommissioning decision are currently largely unknown, these conditions would be presented to the CEC, BLM, and other responsible resource agencies (i.e., County of Imperial, USACE, USFWS, CDFG) when more information is available and the timing for decommissioning is more imminent. In this regard, agency requirements for addressing facility closer are similar for power generation facilities throughout California.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 12: Please provide an analysis of the potential impacts to sensitive wildlife that could result from noise and vibration associated with the construction of the solar facility and water pipeline. As appropriate, provide species-specific measures to mitigate potential noise and vibration impact.

Response: No noise sensitive wildlife has been detected on the project site. The AFC assessment assumed a complete loss of biological values onsite that would be mitigated offsite. Translocation of horned lizards is assumed to minimize direct mortality where practicable. The area affected by vibration during installation of the SunCatcher footings is on the order of 10 to 40 feet and would be of limited duration (minutes). Noise impacts to wildlife are not considered significant.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 13: Please identify the BMPs to be implemented to minimize noise and vibration impacts during project construction to wildlife.

Response: See response to Data Request 12 above. Noise impacts to wildlife are not considered significant due to a lack of noise sensitive species.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 14: Please prepare and submit a Weed Management Plan to staff and BLM that includes a discussion of all methods to be implemented (e.g., equipment cleaning) to prevent the spread of weeds and herbicides to be used in control of undesirable plants.

Response: A draft Weed Management Plan will provided during first quarter 2009. CEC, BLM and the wildlife agencies will review the final version of the plan prior to initiation of ground disturbing activities.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 15: Please describe specific methods for weed management under the SunCatcher structures (e.g., pre-emergent herbicide or other methods).

Response: A draft Weed Management Plan will provided during first quarter 2009. Typical methods used by BLM on federal lands would be applied to the Solar Two site.

TECHNICAL AREA: LAND USE

Data Request 16: Please clarify the exact amount of Project-related private land acreage under the jurisdiction of Imperial County (360 acres or 480 acres).

Response: The amount of Project-related private land acreage under the jurisdiction of Imperial County is 360 acres.

TECHNICAL AREA: LAND USE

Data Request 17: Please indicate which parcels comprise the private land portions of the Project within the jurisdiction of Imperial County.

Response: The private parcels that are part of the project are comprised of the following Assessor Parcel Numbers: 034-360-054, 034-360-055, 034-360-058, 034-360-79, 034-360-80, 034-360-81, 034-360-82, 034-360-83, 034-360-84, 034-360-85 and 034-360-86.

TECHNICAL AREA: LAND USE

Data Request 18: Please clarify the statement above regarding ownership status of Project parcels. Does the applicant currently own the parcels within the non-BLM portion of Project lands? If not, please provide the timing for the applicant's acquisition of these parcels.

Response: The Applicant will finalize the purchase or lease of these private properties prior to the issuance of the final decision on this application.

TECHNICAL AREA: LAND USE

Data Request 19: Please specify if and when the applicant intends to merge the Project parcels within the non-BLM portions of Project lands into one legal parcel.

Response: If the purchase option is exercised, the Applicant may merge or combine these private properties into one legal parcel after final decision by the CEC/BLM.. However, if the lease option is carried out, these private parcels will have to remain under separate ownership.

TECHNICAL AREA: LAND USE

Data Request 20: If the applicant intends to merge the private parcels, when would the parcel merger process be initiated with Imperial County? Please provide the timing for completion of this process.

Response: If the private parcels are merged, the parcel merger process will occur after the CEC/BLM decision..

TECHNICAL AREA: LAND USE

Data Request 21: If the applicant does not intend to merge the private parcels, please specify the reasons.

Response: In the event that property is purchased, SES will consider a number of factors including setback requirements and taxation in deciding whether to merge the parcels.

In the event that the property owners elect to exercise the lease option, these private parcels will remain under separate ownerships and cannot be merged into one parcel.

TECHNICAL AREA: LAND USE

Data Request 22: Please provide the California Department of Conservation (DOC) Farmland Mapping and Monitoring Program (FMMP) land use designation for the privately owned portions of the Project site and any off-site associated facilities (i.e., linear facilities).

Response: The FMMP land use designation for the privately owned portions of the Project site and off-site associated facilities is either unclassified or considered Other Land. Parts of the site have not been mapped for soil type because the Anza Borrego Area soil mapping has not been completed. Portions of the site for which soil mapping has been completed include the private and public lands within Township 16 South, Range 11 East. Sections 15, 16, 9, 22 (full sections), and portions of Sections 21 and 17. These Sections are designated Other Land.

The Other Land designation refers to land that is neither farmland nor is included in any other mapping category. Common examples include low density rural developments, brush, timber, wetland, and riparian areas not suitable for livestock grazing, confined livestock, poultry, or aquaculture facilities, strip mines, borrow pits, and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

TECHNICAL AREA: LAND USE

Data Request 23: For the BLM-owned federal land portions of the site, please provide the US Department of Agriculture (USDA) Natural Resources Conservation Service soil information regarding soil types. Note that the FMMP is also based on NRCS soil data. These two sources will help provide consistent data for both the private and federal lands that comprise the Project.

Response: NRCS soil types for the project site are discussed in Section 5.4, Soils of the AFC. All known soil types within the project site boundary are discussed in this section.

According to discussion with Glenn Stanisewski of the NRCS, there is no digital soils data available at this time for the portion of the project area covered by the CA804 - Anza Borrega Area, CA soil survey area. Most of the land contained within CA804 is BLM land that has not been surveyed. BLM land is mapped in small parcels through Reimbursable Agreements with NRCS. Currently there is no timetable for the completion of soil mapping in this area. However, Digital (SSURGO) soils data is available (through Web Soil Survey) for a portion of the project area. Figure 5.4-1 located in Section 5.4, Soils of the AFC exhibits the soil types in the project vicinity.

TECHNICAL AREA: POWER PLANT EFFICIENCY

Data Request 24: Please provide information on how much hydrogen would be required to initially fill all 30,000 Stirling engines, as well as the project hydrogen supply and storage system.

Response: Each Stirling engine requires 14 cubic feet of hydrogen gas and each storage cylinder contains 196 cubic feet of hydrogen gas. The initial build out of the 750 MW SES Solar Two facility will utilize 6.3 million cubic feet of hydrogen. Stirling Energy Systems is reviewing the feasibility of installing a distributed hydrogen system.

TECHNICAL AREA: POWER PLANT EFFICIENCY

Data Request 25: Please provide information on how much hydrogen would be required annually to replenish leakage.

Response: Each Stirling engine requires less than 200 cubic feet per year of hydrogen gas to replenish leakage. The annual leak replenishment consumption of hydrogen for the 750 MW Solar Two Project is approximately 6.0 million cubic feet.

TECHNICAL AREA: POWER PLANT EFFICIENCY

Data Request 26: Please describe the source of hydrogen for the project, including a description of the process employed and the consumption of natural gas and/or electricity by that process.

Response: The Solar Two Project will procure hydrogen through a competitive bidding process with suppliers of industrial gases. Oxidation is a typical method for industrial hydrogen production as a gas or liquid. This entails a reaction of hydrocarbons in natural gas with oxygen to produce hydrogen and carbon monoxide. The efficiency conversion is stated to be between sixty-five and seventy-five percent. Assuming 65 percent production efficiency, approximately 24,400 therms of natural gas would be utilized in the production process.

TECHNICAL AREA: PROJECT DESCRIPTION

Data Request 27: Please clarify the proposed post-construction use(s) for the areas currently proposed for the three SunCatcher assembly buildings and the 100-acre construction laydown area east of Dunaway Road.

Response: When construction is complete, the assembly buildings will be dismantled and removed from the site. The assembly area will be utilized for the production of electricity. As the assembly buildings are removed, SunCatchers will be installed on the land where the buildings previously existed. The vacated pads may be used to site 5-6 SunCatchers per pad.

The 100-acre construction laydown area will be used for a combination of potential SunCatcher placement, parking or other project use.

TECHNICAL AREA: SOCIOECONOMICS

Data Request 28: Please verify the year for all economic estimates (e.g., construction cost, construction and operation payroll, property taxes, sales taxes, school impact fees, etc.), and IMPLAN construction and operation economic impacts (which include secondary impacts). Some dollar estimates in the AFC (Section 5.10.2.1 Construction Workforce for construction payroll page 5.10-14) are in 2008 dollars while in Fiscal Effect (Section 5.10.2.4 pages 5.10-22 to 25) are in 2007 dollars. 2007 dollars were also used in the AFC Supplement for Socioeconomics.

Response: Economic estimates are based on 2008 dollars. These include: the estimated school impact fee (provided in Data Adequacy Response 3 of the AFC Supplement); total construction payroll (Section 5.10.2.4 of the AFC and Data Adequacy Response 4); operational payroll (Data Adequacy Response 4); estimated construction and operation sales tax (Data Adequacy Response 5); and estimated property tax, in the event that the property tax exemption lapses (Data Adequacy Response 6).

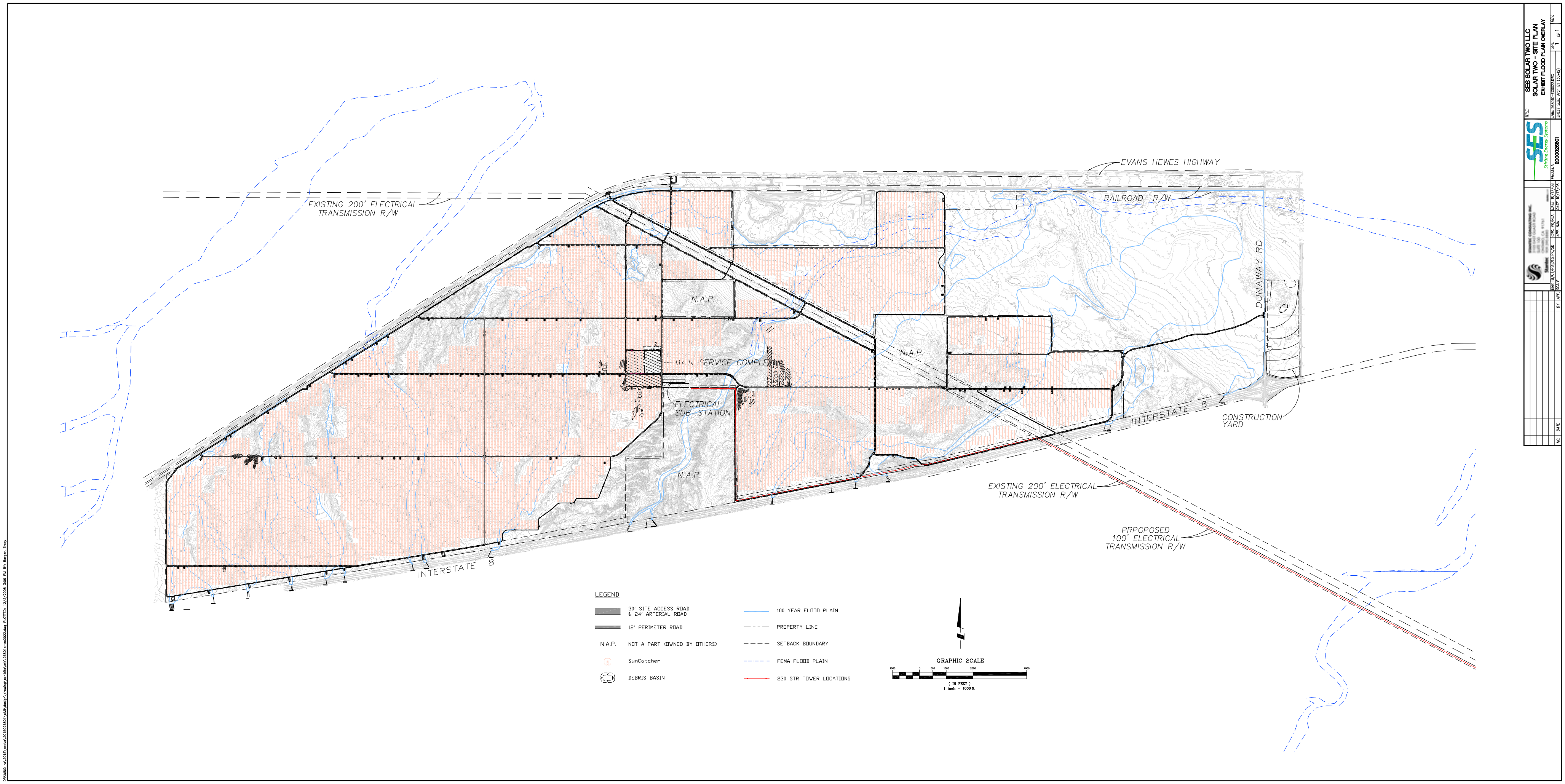
Indirect and induced economic effects for Project operation (updated in Data Adequacy Response 4) and Project construction (pages 5.10-22 and 5.10-23 of the AFC) were modeled based on 2008 dollar estimates. References to 2007 dollars in the indirect and induced economic effects analyses were incorrectly reported (whereas the actual year of economic estimates were based on 2008 dollars).

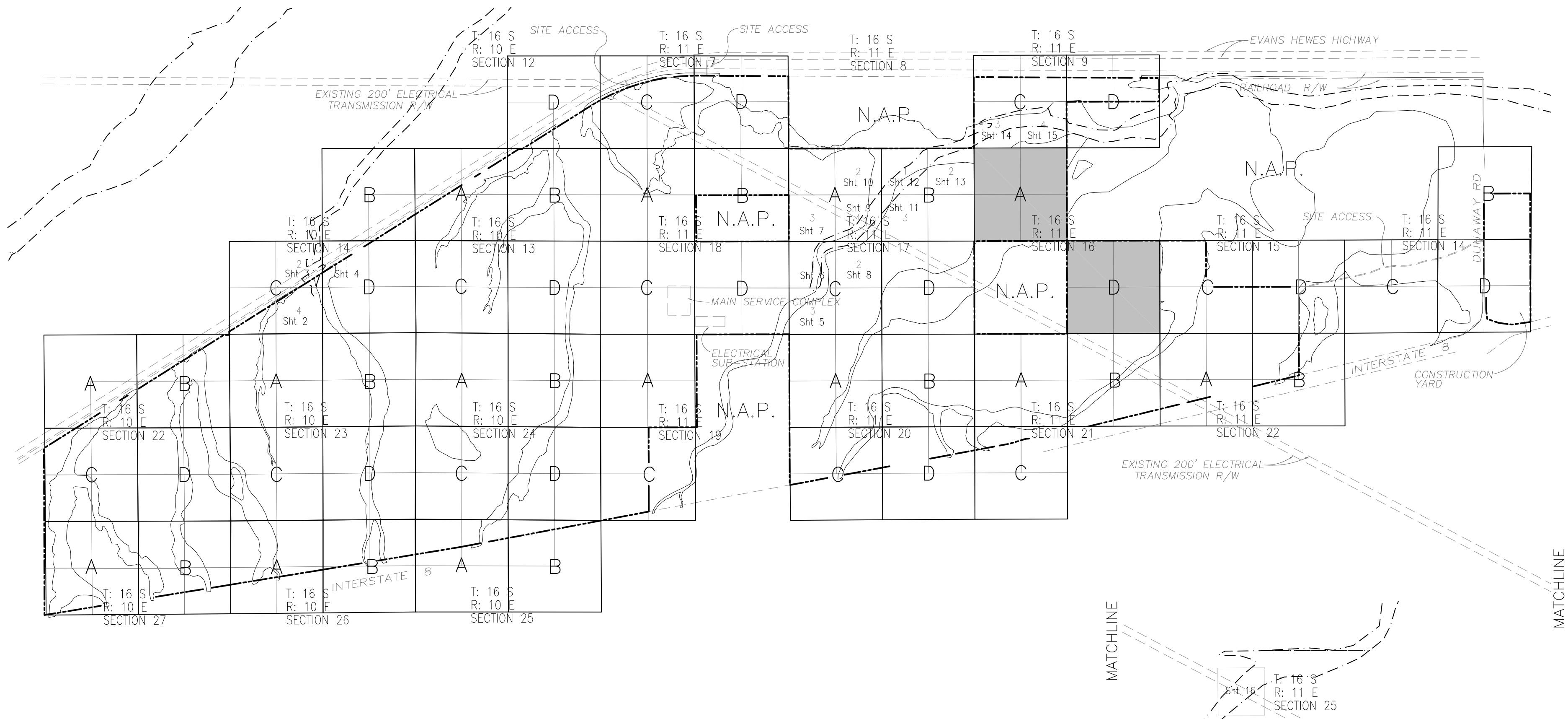
TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 29: Please provide a map depicting all proposed project structures in the vicinity of the mapped 100-year flood zones.

Response: The maps are provided as Attachment SWR-1 to this response.

ATTACHMENT SWR-1





	GRADING AND DRAINAGE CONSTRUCTION NOTES:	QUANTITY	UNITS
1	ARTERIAL ACCESS ROADWAY, PER DETAIL D ON SHEET 5	4,325,700	S.F.
2	PERIMETER ROADWAY, PER DETAIL E ON SHEET 5	798,000	S.F.
3	SUNCATCHER ACCESS ROADS AND MAINTENANCE ROADWAY, PER DETAIL F ON SHEET 5	40,000,000	S.F.
4	APPLY ADDITIONAL SOIL BINDER FOR ARIZONA CROSSING, PER DETAIL A ON SHEET 4		S.F.
5	SOIL BINDER FOR DUST CONTROL PER MANUFACTURER'S SPEC.	100,000,000	S.F.
10	DEBRIS BASIN TYPE "A" 200 CY PER DETAIL B ON SHEET 4	65	EA
11	DEBRIS BASIN TYPE "B" 400 CY PER DETAIL B ON SHEET 4	13	EA
12	DEBRIS BASIN TYPE "C" 600 CY PER DETAIL B ON SHEET 4	11	EA
21	CONST. 30" DOUBLE WALL HDPE CULVERT W/ MITERED END SECTION TO MATCH SLOPE	3,239	L.F.
	WATER CONSTRUCTION NOTES:		
30	CONST. 4" PVC WATERLINE	1,870	L.F.
31	CONST. 3" PVC WATERLINE	10,270	L.F.
32	CONST. 2" PVC WATERLINE	4,850	L.F.
33	CONST. TRUCK FILLING STATION	2	EA
	TRAFFIC CONTROL NOTES:		
41	INSTALL SIGN PER DESIGNATION. SEE DETAIL		EA.
42	REMOVE SIGN PER DESIGNATION. SEE DETAIL		EA
43	REMOVE SIGN PER DESIGNATION. SEE DETAIL		EA.
44	PROTECT SIGN IN PLACE PER DESIGNATION. SEE DETAIL		EA
45	REMOVE WATER CARRYING BARRIER		EA

LEGEND

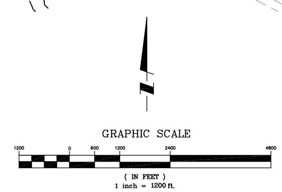
- PRIVATELY OWNED PROPERTY
- D — QUARTER SECTION
- 4 — QUARTER - QUARTER SECTION
- Sht 83 — DRAWNING SHEET SET NO.
- T: 16 S — TOWNSHIP
- R: 10 E — RANGE
- SECTION 24 — SECTION

FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

NOTE:

SHEETS 151, 152, 158, 159, 164, 165, 169, AND 170 IS PRIVATELY OWNED PROPERTY AND ALL OTHER PROPERTY/SHEETS IS BLM LANDS.



NO.	DATE	BY	APP.

STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880

DRN. TB/CT/RB	DES. PK/SD	CHK. PK/NJA
DATE 10/17/08	SCALE 1" = 1200'	APP. NJA
DATE 10/17/08		

SES
Stirling Energy Systems

PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
INDEX MAP, CONSTRUCTION NOTES, AND QNTS.

DWG: 01-URS-INDEX.DWG
SHEET SIZE: Arch E1 (30x42)
SHT. 1 OF 16
REV.

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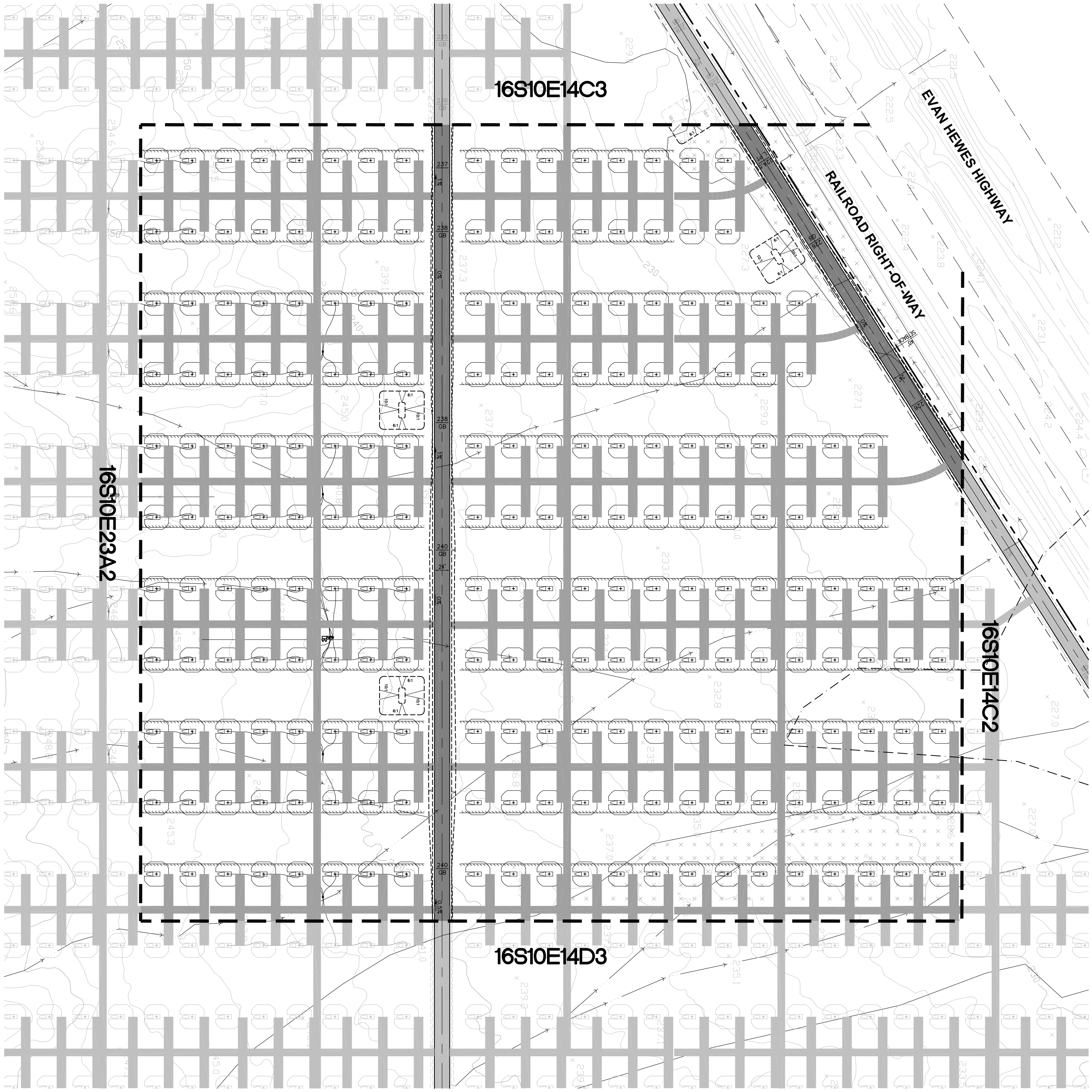

FLOOD LEGEND

100 YEAR FLOOD PLAIN

FEMA FLOOD PLAIN

GRADING CONSTRUCTION NOTES:

1 — ARTERIAL ACCESS ROADWAY, PER DETAIL D ON SHEET 5
2 — PERIMETER ROADWAY, PER DETAIL E ON SHEET 5
3 — SunCatcher ACCESS ROADS AND MAINTENANCE ROADWAY, PER DETAIL F ON SHEET 5
4 — APPLY ADDITIONAL SOIL BINDER FOR ARIZONA CROSSING, PER DETAIL A ON SHEET 4
5 — SOIL BINDER FOR DUST CONTROL PER MANUFACTURER'S SPEC.
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12 — DEBRIS BASIN TYPE "C" PER DETAIL B ON SHEET 4
21 — CONST. 30" HDPE CULVERT W/ MITERED END SECTION MATCH SLOPE

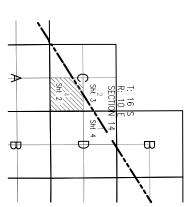
WATER CONSTRUCTION NOTES:

30 — CONST. 4" PVC WATERLINE
31 — CONST. 3" PVC WATERLINE
32 — CONST. 2" PVC WATERLINE
33 — CONST. TRUCK FILLING STATION

LEGEND

30' SITE ACCESS ROAD & 24' ARTERIAL ROAD
12' PERIMETER ROAD
15' MAINTENANCE ROAD & 12' ACCESS ROAD
N.A.P. NOT A PART (OWNED BY OTHERS)
SunCatcher
PROPOSED FLOWLINE
EXISTING FLOWLINE
100 YEAR FLOOD PLAIN
LIMITS OF DISTURBANCE
DEBRIS BASIN
PROPERTY LINE
SETBACK BOUNDARY

INDEX MAP



GRAPHIC SCALE
(IN FEET)
1 inch = 60 ft.

NO.	DATE		BY	APP.

STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880
Stantec

SES Stirling Energy Systems

DRN. TB/CT/RB	DES. PK/SD	CHK. PK/NJA	DATE 10/17/08
SCALE 1" = 60'		APP. NJA	DATE 10/17/08

PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S10E14C4-FLD

DWG: 02-URS-16S10E14C4.DWG
SHEET SIZE: Arch E1 (30x42)
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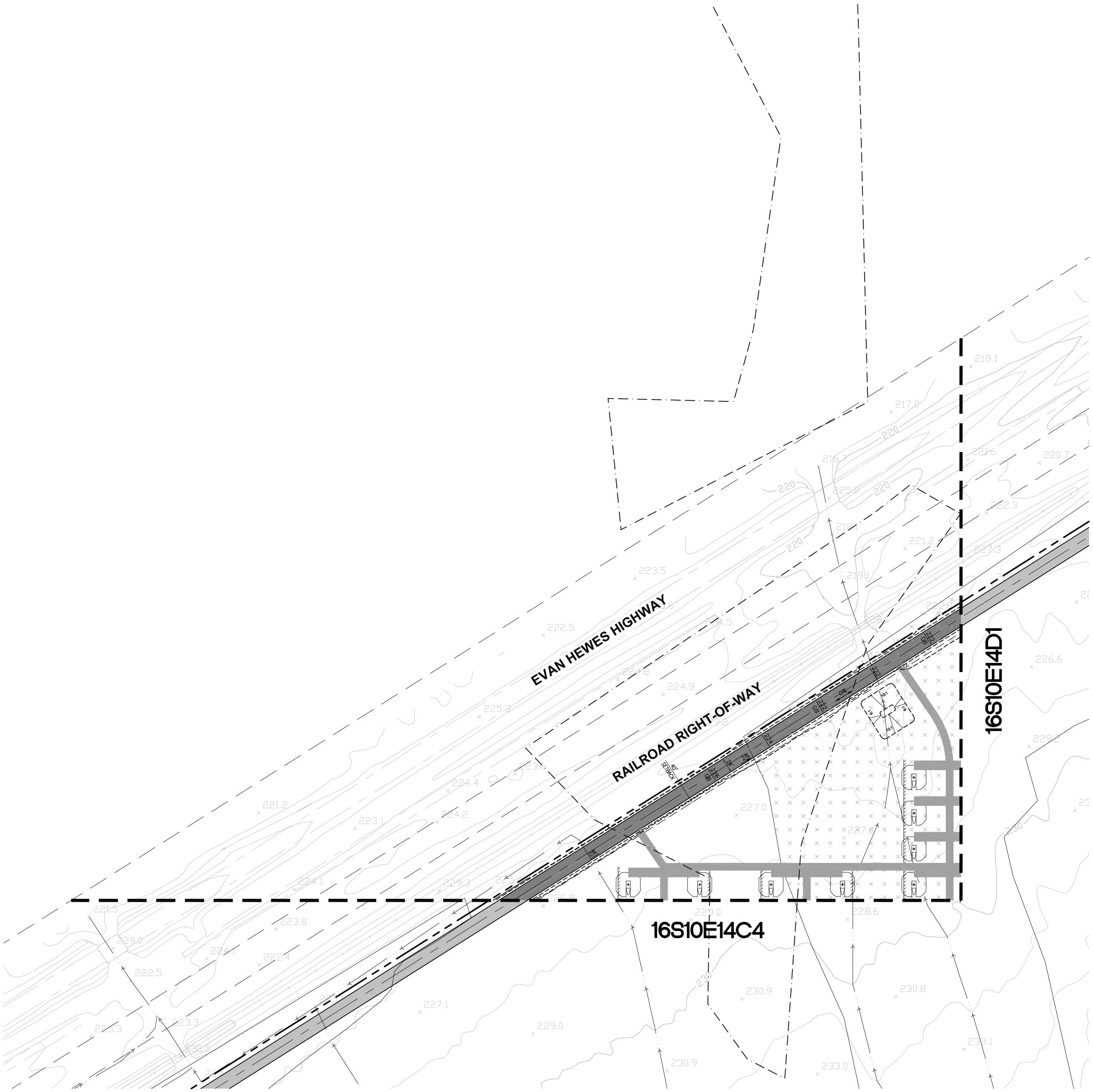
REV.



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FEMA FLOOD PLAIN

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EXISTING FLOWLINE

100 YEAR FLOOD PLAIN

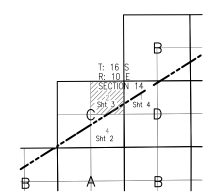
LIMITS OF DISTURBANCE

DEBRIS BASIN

PROPERTY LINE

SETBACK BOUNDARY

INDEX MAP



GRAPHIC SCALE

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(IN FEET)
1 inch = 60 ft.

NO.	DATE	BY	APP.

STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880

DRN. TB/CT/RB	DES. PK/SD	CHK. PK/NJA	DATE 10/17/08
SCALE 1" = 60'		APP. NJA	DATE 10/17/08

SES Stirling Energy Systems

PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S10E14C2-FLD

DWG: 03-URS-16S10E14C2.DWG
SHEET SIZE: Arch E1 (30x42)

SHT. 3 OF 16 REV.

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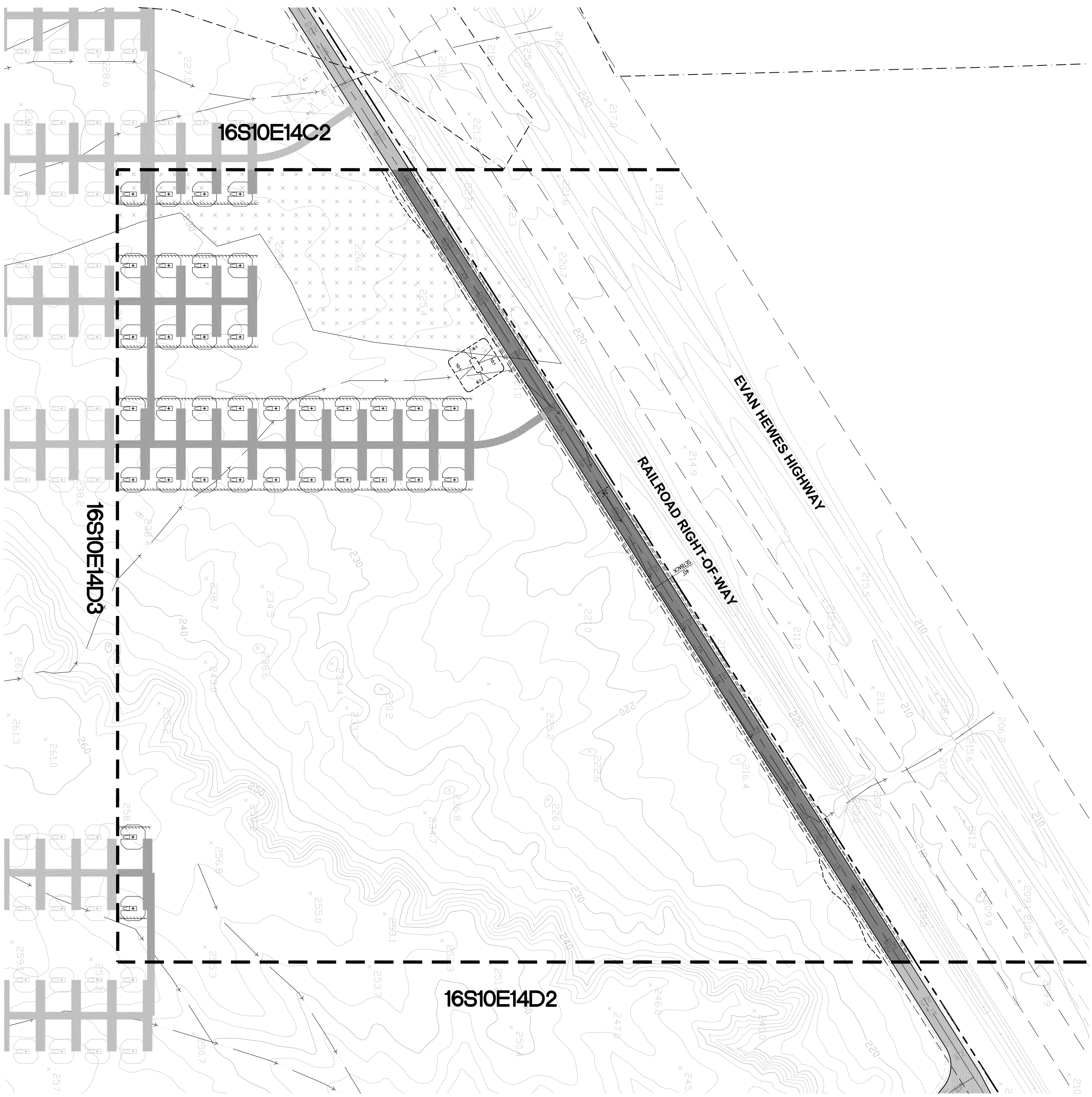

FLOOD LEGEND

100 YEAR FLOOD PLAIN

FEMA FLOOD PLAIN

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PROPOSED FLOWLINE

EXISTING FLOWLINE

100 YEAR FLOOD PLAIN

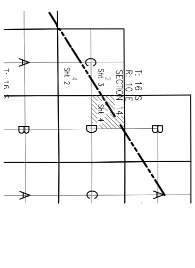
LIMITS OF DISTURBANCE

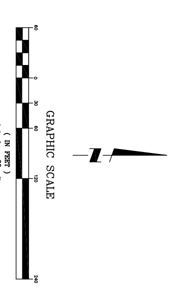
DEBRIS BASIN

PROPERTY LINE

SETBACK BOUNDARY

INDEX MAP





NO.	DATE		BY	APP.

STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880

DRN. TB/CT/RB	DES. PK/SD	CHK. PK/NJA	DATE 10/17/08
SCALE 1" = 60'		APP. NJA	DATE 10/17/08

SES Stirling Energy Systems

PROJECT: 2000026801

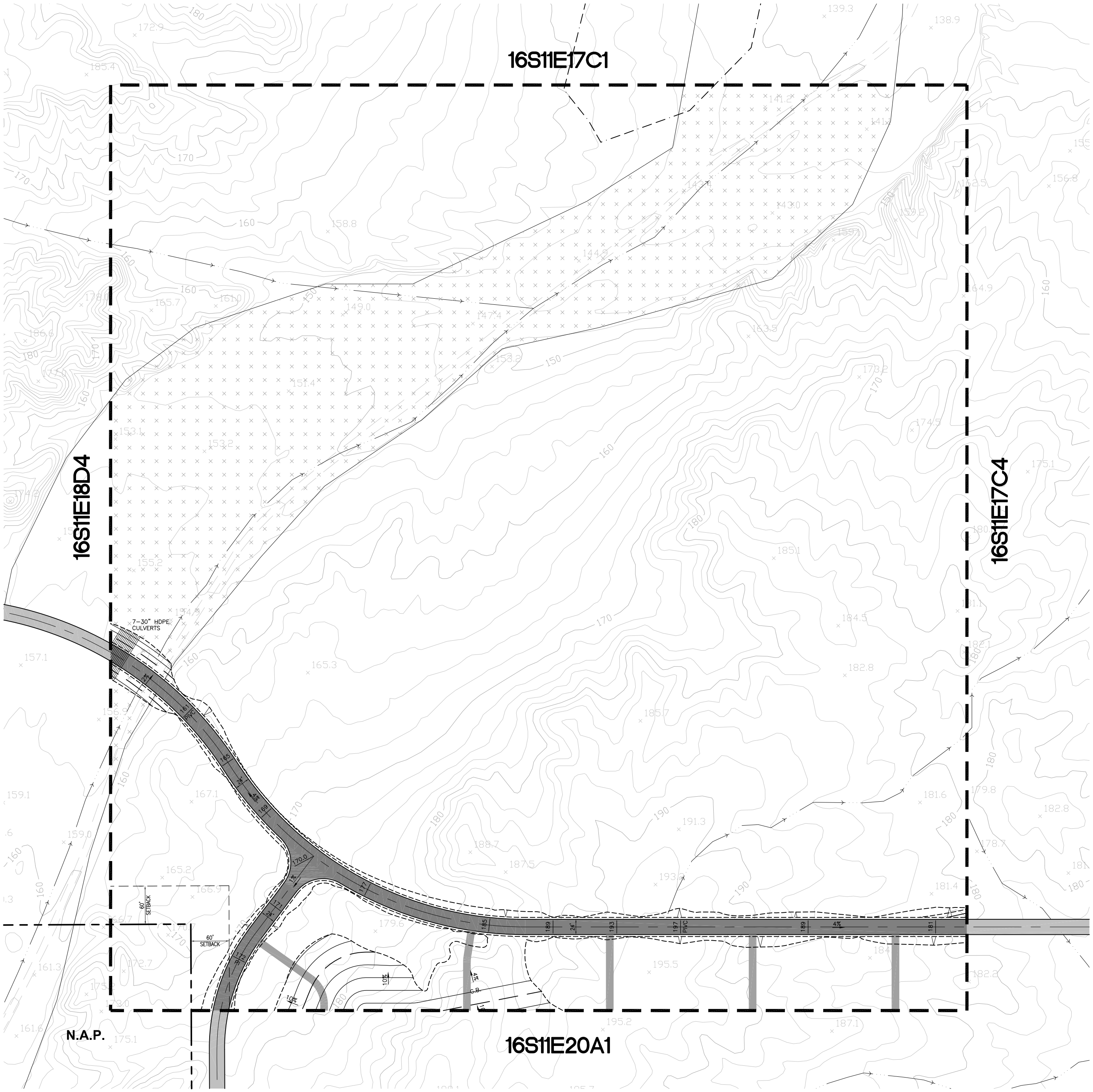
TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S10E14D1-FLD

DWG: 04-URS-16S10E14D1.DWG

SHEET SIZE: Arch E1 (30x42)

SHT. 4 OF 16

REV.



FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

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- LIMITS OF DISTURBANCE
- DEBRIS BASIN
- PROPERTY LINE
- SETBACK BOUNDARY

INDEX MAP

GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S11E17C3-FLD

SES Stirling Energy Systems

PROJECT: 2000026801

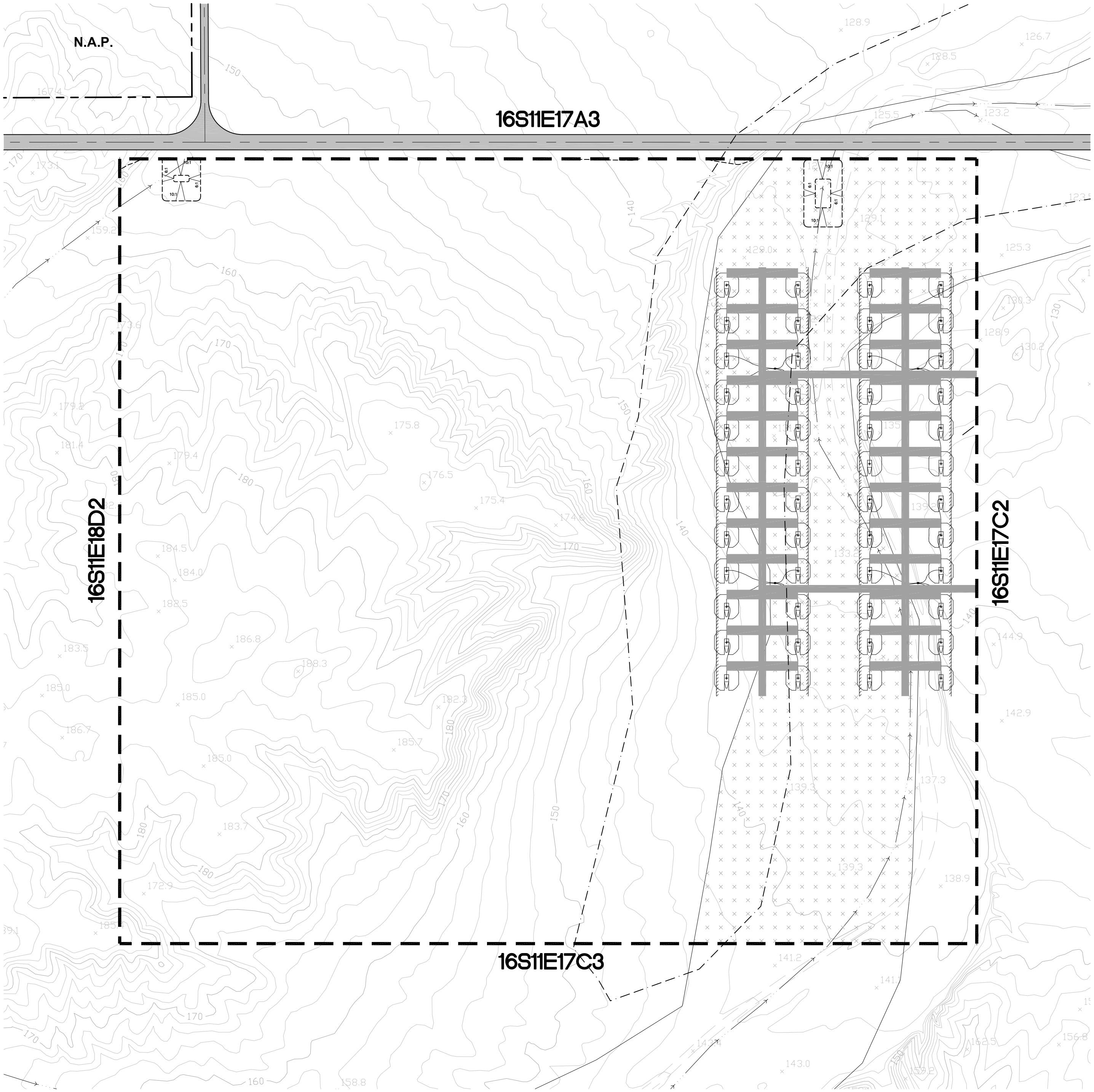
DWG: 05-URS-16S11E17C3.DWG

SHEET SIZE: Arch E1 (30x42)

SHT: 5 OF 16

Stantec
STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909 390 8880

DRN: TB/CT/RB | DES: PK/SD | CHK: PK/NJA | APP: NJA | DATE 10/17/08 | SCALE 1" = 60'



FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

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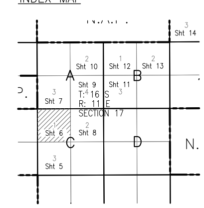

GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

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DWG: 06-URS-16S11E17A3.DWG		SHT. 6 OF 16	REV.
SHEET SIZE: Arch E1 (30x42)			
SES Stirling Energy Systems	PROJECT: 2000026801		
STANTEC CONSULTING INC. 3105 EAST GUASTI ROAD SUITE 100 ONTARIO, CA 91761 909.390.8880			
DRN. TB/CT/RB	DES. PK/SD	CHK. PK/NJA	DATE 10/17/08
SCALE 1" = 60'		APP. NJA	DATE 10/17/08
NO.	DATE	BY	APP.

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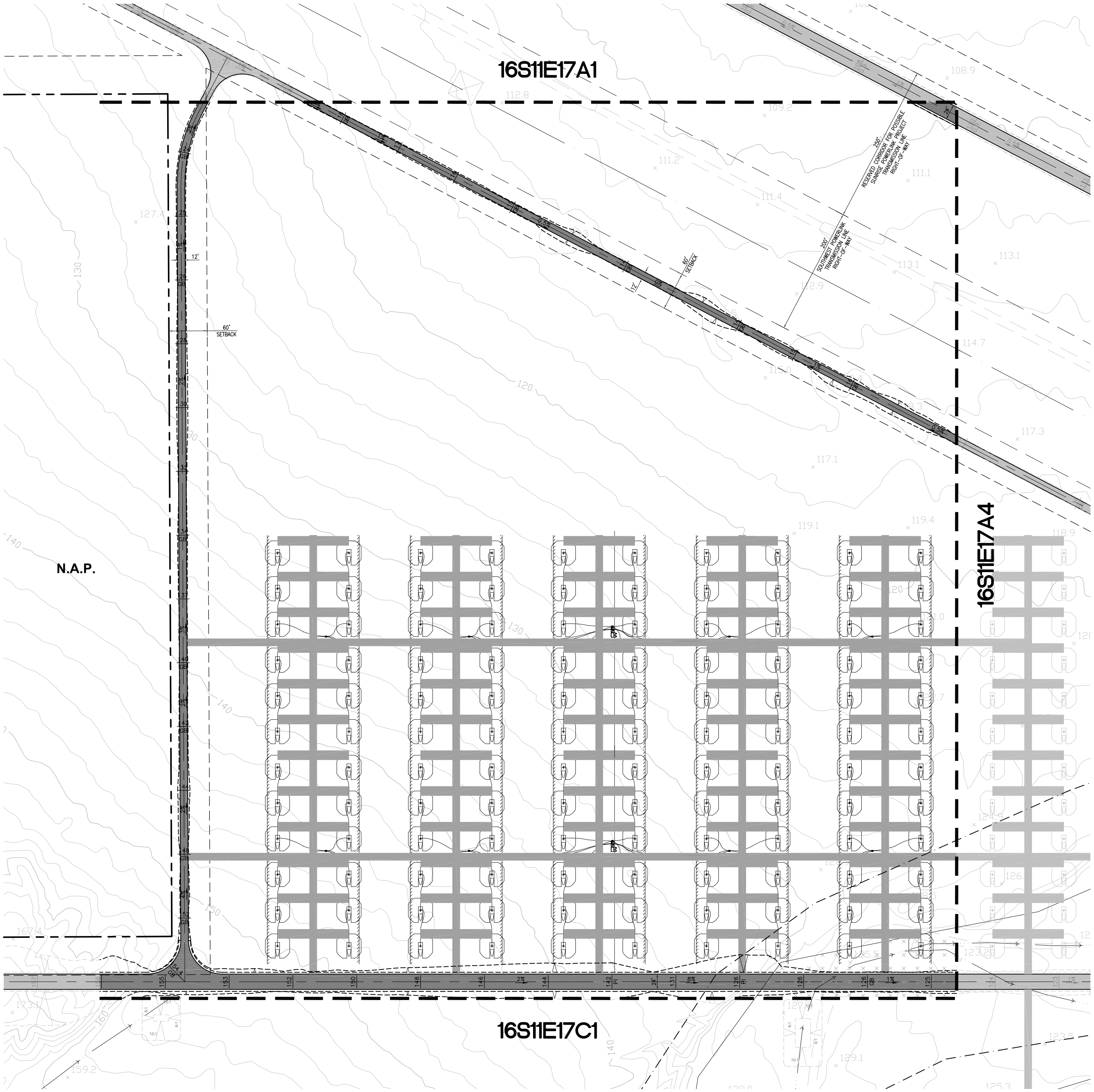

FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

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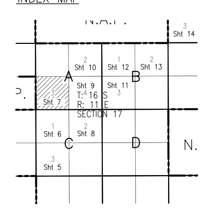
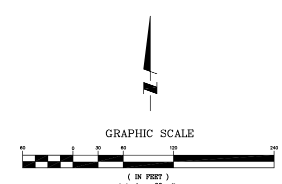
INDEX MAP





TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S11E17A3-FLD

SES Stirling Energy Systems

PROJECT: 2000026801

STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880

NO.	DATE		BY	APP.

DRN. TB/CT/RB | DES. PK/SD | CHK. PK/NJA | DATE 10/17/08
SCALE 1" = 60' | APP. NJA | DATE 10/17/08

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SHEET SIZE: Arch E1 (30x42)
SHT. 7 OF 16
REV.

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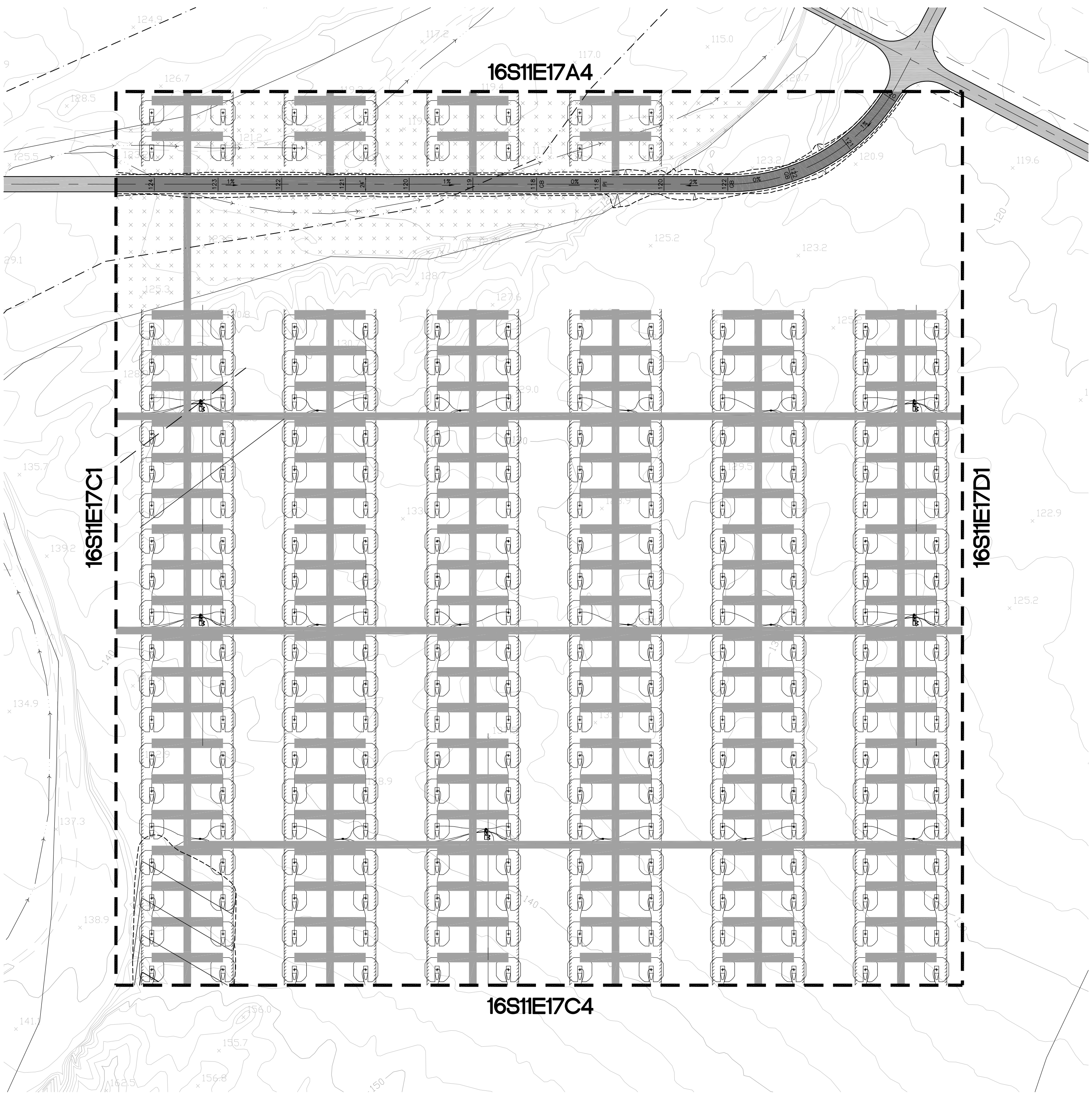

FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

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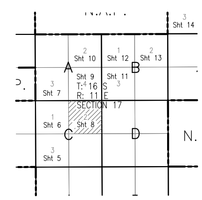


GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

NO.	DATE	BY / APP.
DRN. TB/CT/RB	DES. PK/SD	CHK. PK/NJA
DATE 10/17/08	SCALE 1" = 60'	APP. NJA
DATE 10/17/08		

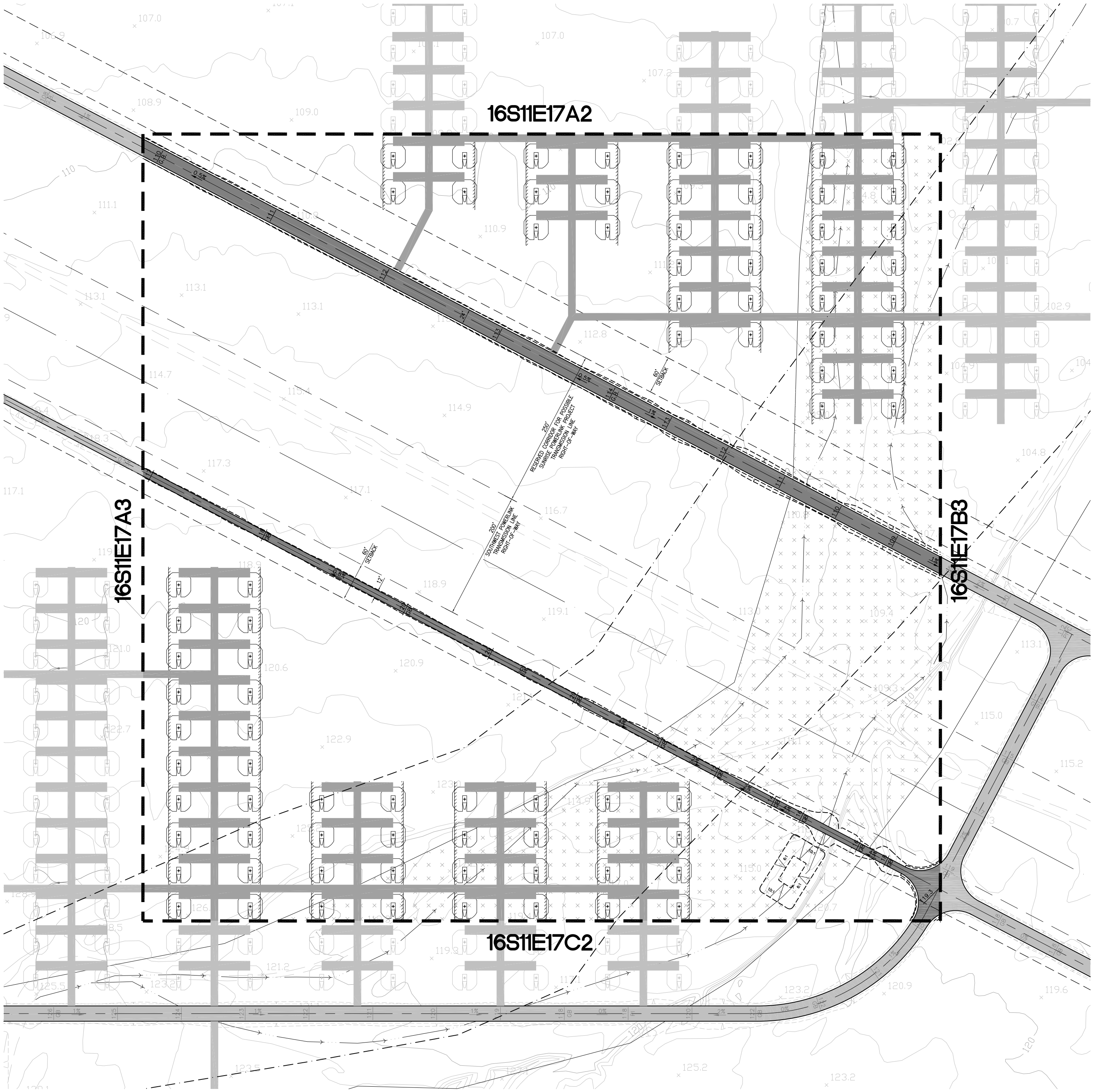
STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880

SES Stirling Energy Systems

PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S11E17C1-FLD

DWG: 08-URS-16S11E17C2.DWG
SHEET SIZE: Arch E1 (30x42)
SHT. 8 OF 16
REV.



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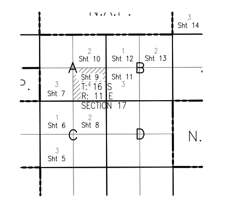

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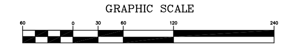

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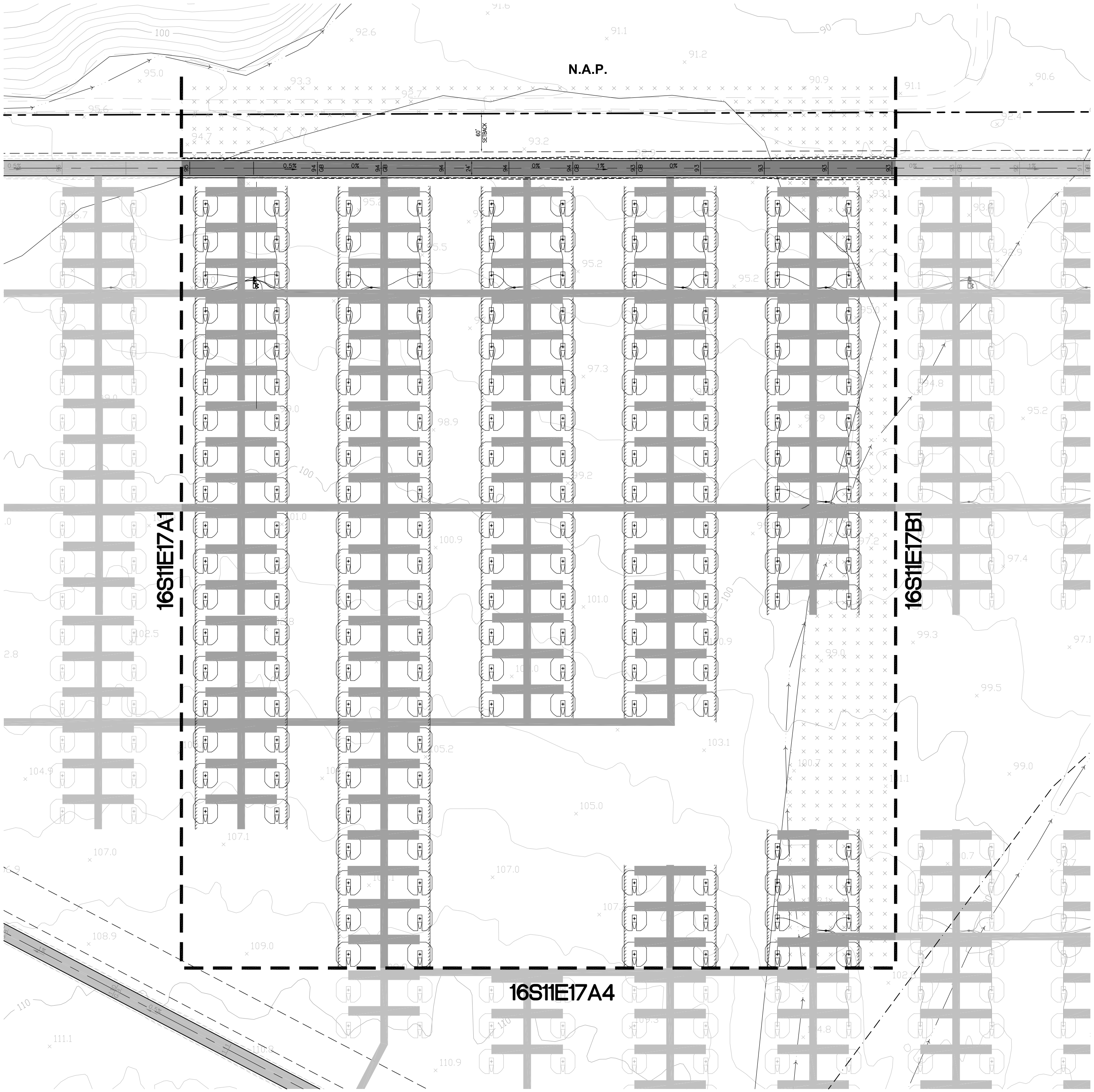
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880

DRN. TB/CT/RB | DES. PK/SD | CHK. PK/NJA | DATE 10/17/08
SCALE 1" = 60' | APP. NJA | DATE 10/17/08

SES Stirling Energy Systems
PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S11E17A4-FLD

DWG: 09-URS-16S11E17A4.DWG
SHEET SIZE: Arch E1 (30x42)
SHT. 9 OF 16
REV.



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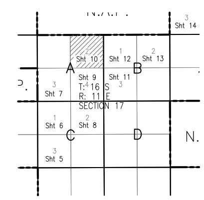
33. CONST. TRUCK FILLING STATION

LEGEND

- 30' SITE ACCESS ROAD & 24' ARTERIAL ROAD
- 12' PERIMETER ROAD
- 15' MAINTENANCE ROAD & 12' ACCESS ROAD
- N.A.P. NOT A PART (OWNED BY OTHERS)
- SunCatcher
- PROPOSED FLOWLINE
- EXISTING FLOWLINE
- 100 YEAR FLOOD PLAIN
- LIMITS OF DISTURBANCE
- DEBRIS BASIN
- PROPERTY LINE
- SETBACK BOUNDARY

INDEX MAP



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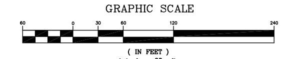

NO.	DATE		BY	APP.

Stantec CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761

DRN: TB/CT/RB	DES: PK/SD	DATE: 10/17/08
SCALE: 1" = 60'	CHK: PK/NJA	DATE: 10/17/08
APP:	APP: NJA	

SES Stirling Energy Systems

PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S11E17A2-FLD

DWG: 10-URS-16S11E17A2.DWG
SHEET SIZE: Arch E1 (30x42)

SHT. 10 OF 16

REV.

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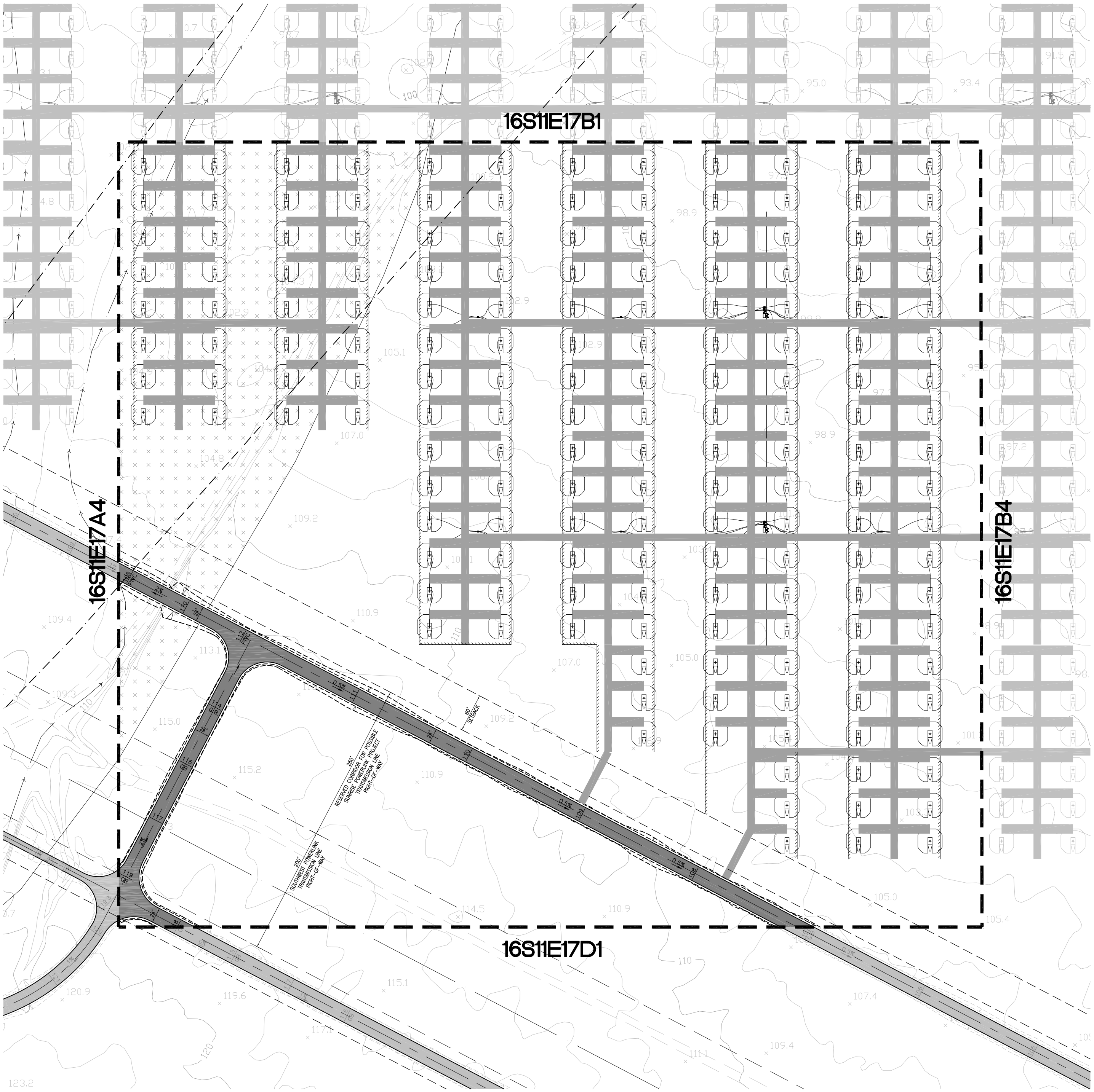

FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

GRADING CONSTRUCTION NOTES:

1. ARTERIAL ACCESS ROADWAY, PER DETAIL D ON SHEET 5
2. PERIMETER ROADWAY, PER DETAIL E ON SHEET 5
3. SunCatcher ACCESS ROADS AND MAINTENANCE ROADWAY, PER DETAIL F ON SHEET 5
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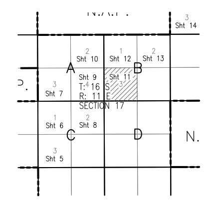
- LIMITS OF DISTURBANCE
- DEBRIS BASIN
- PROPERTY LINE
- SETBACK BOUNDARY

INDEX MAP



GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

NO.	DATE		BY	APP.

STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880

DRN: TB/CT/RB DES: PK/SD DATE 10/17/08
CHK: PK/NJA DATE 10/17/08
APP: NJA
SCALE: 1" = 60'

SES Stirling Energy Systems

PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S11E17B3-FLD

DWG: 11-URS-16S11E17B3.DWG
SHEET SIZE: Arch E1 (30x42)
SHT. 11 OF 16
REV.

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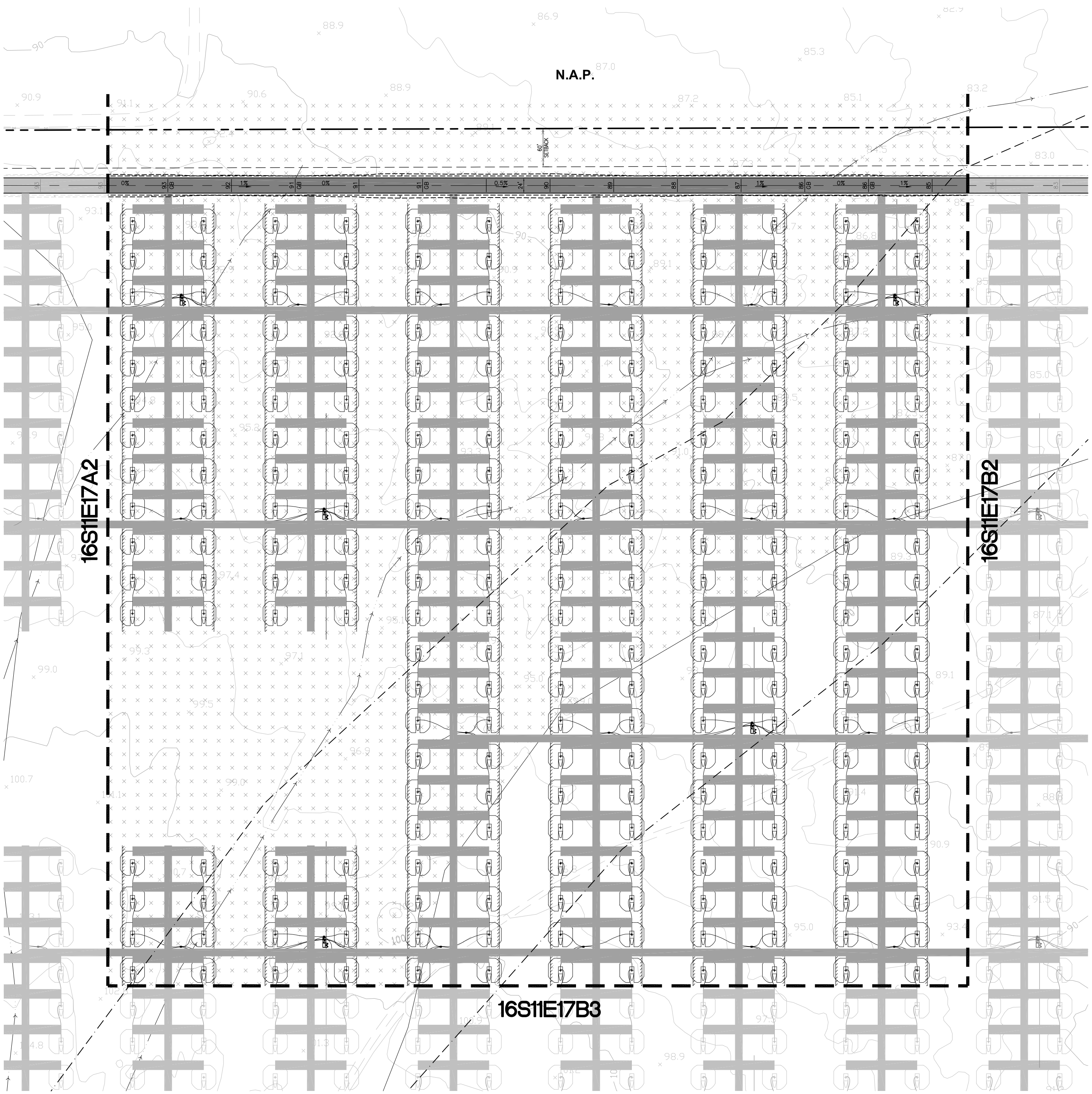

FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

GRADING CONSTRUCTION NOTES:

1. ARTERIAL ACCESS ROADWAY, PER DETAIL D ON SHEET 5
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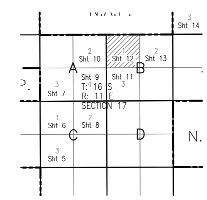
- 100 YEAR FLOOD PLAIN
- LIMITS OF DISTURBANCE
- DEBRIS BASIN
- PROPERTY LINE
- SETBACK BOUNDARY

INDEX MAP



GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

NO.	DATE		BY	APP.	

STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880

DRN. TB/CT/RB	DES. PK/SD	CHK. PK/NJA	DATE 10/17/08
SCALE 1" = 60'		APP. NJA	DATE 10/17/08

SES Stirling Energy Systems

PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S11E17B1-FLD

DWG: 12-URS-16S11E17B1.DWG
SHEET SIZE: Arch E1 (30x42)

SHT. 12 OF 16

REV.

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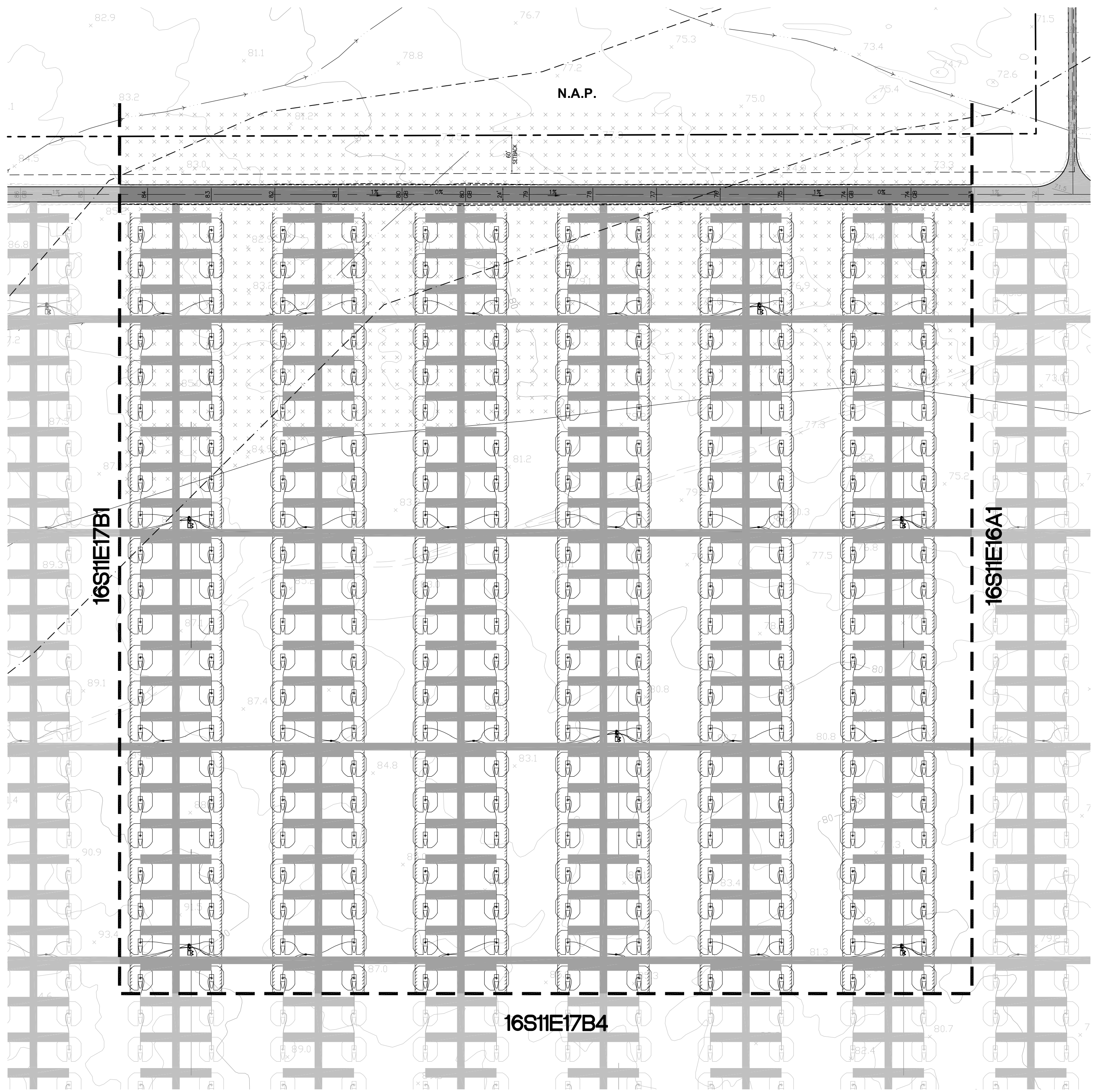

FLOOD LEGEND

100 YEAR FLOOD PLAIN

FEMA FLOOD PLAIN

GRADING CONSTRUCTION NOTES:

1 — ARTERIAL ACCESS ROADWAY, PER DETAIL D ON SHEET 5
2 — PERIMETER ROADWAY, PER DETAIL E ON SHEET 5
3 — SunCatcher ACCESS ROADS AND MAINTENANCE ROADWAY, PER DETAIL F ON SHEET 5
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21 — CONST. 30" HDPE CULVERT W/ MITERED END SECTION MATCH SLOPE

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30 — CONST. 4" PVC WATERLINE
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32 — CONST. 2" PVC WATERLINE
33 — CONST. TRUCK FILLING STATION

LEGEND

30' SITE ACCESS ROAD & 24' ARTERIAL ROAD

12' PERIMETER ROAD

15' MAINTENANCE ROAD & 12' ACCESS ROAD

N.A.P. NOT A PART (OWNED BY OTHERS)

SunCatcher

PROPOSED FLOWLINE

EXISTING FLOWLINE

100 YEAR FLOOD PLAIN

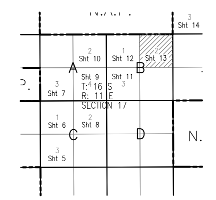
LIMITS OF DISTURBANCE

DEBRIS BASIN

PROPERTY LINE

SETBACK BOUNDARY

INDEX MAP



GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

TITLE:	SES SOLAR TWO LLC SOLAR TWO - SITE PLAN FEMA FLOOD PLAIN URS-16S11E17B2-FLD
DWG: 13-URS-16S11E17B2.DWG	SHT. 13 OF 16
SHEET SIZE: Arch E1 (30x42)	REV.
SES Stirling Energy Systems	PROJECT: 2000026801
Stantec — STANTEC CONSULTING INC. 3105 EAST GUASTI ROAD SUITE 100 ONTARIO, CA 91761 909.390.8880	
DRN. TB/CT/RB	DES. PK/SD
CHK. PK/NJA	DATE 10/17/08
SCALE 1" = 60'	APP. NJA
DATE 10/17/08	
NO.	DATE
BY	APP.

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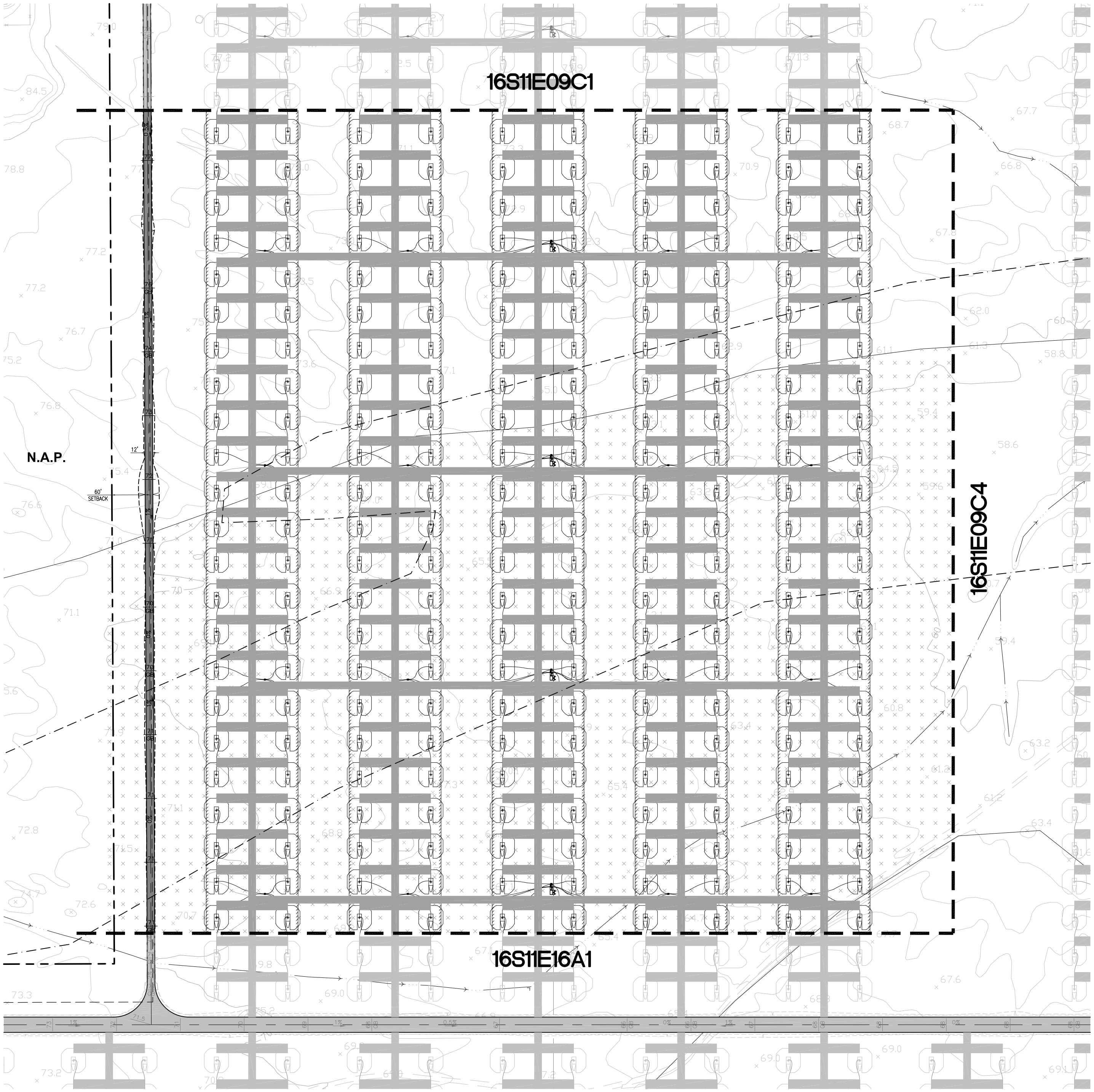

FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

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1. ARTERIAL ACCESS ROADWAY, PER DETAIL D ON SHEET 5
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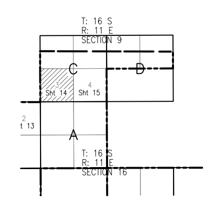

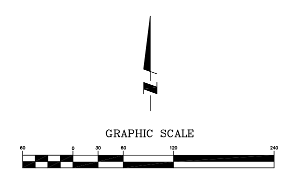

GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

NO.	DATE		BY	APP.

STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880

DRN. TB/CT/RB | DES. PK/SD | CHK. PK/NJA | DATE 10/17/08
SCALE 1" = 60' | APP. NJA | DATE 10/17/08

SES Stirling Energy Systems

PROJECT: 2000026801

TITLE: **SES SOLAR TWO LLC**
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S11E09C3-FLD

DWG: 14-URS-16S11E09C3.DWG
SHEET SIZE: Arch E1 (30x42)
SHT. 14 OF 16
REV.

DRAWING: v:\2015\active\2015026801\civil\design\drawing\exhibits\afc\15-urs-16s11e09c4.dwg PLOTTED: 12/2/2008 1:40 PM BY: Barger, Tracy

FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

GRADING CONSTRUCTION NOTES:

1. ARTERIAL ACCESS ROADWAY, PER DETAIL D ON SHEET 5
2. PERIMETER ROADWAY, PER DETAIL E ON SHEET 5
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- LIMITS OF DISTURBANCE
- DEBRIS BASIN
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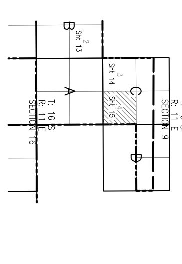
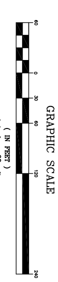
INDEX MAP





GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

NO.	DATE		BY	APP.

STANTEC CONSULTING INC.
3105 EAST GUASTI ROAD
SUITE 100
ONTARIO, CA 91761
909.390.8880

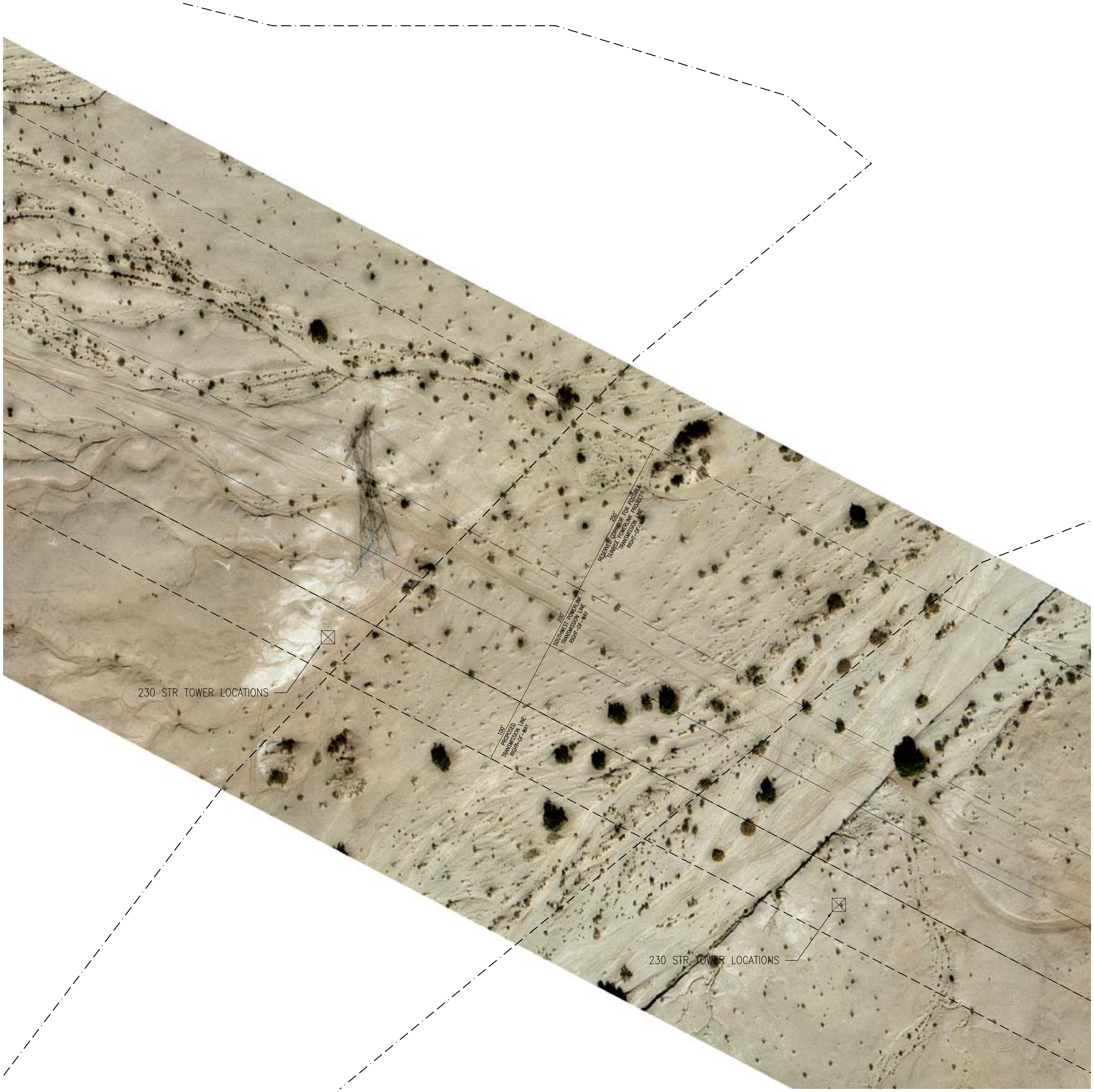
SES Stirling Energy Systems

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S11E09C4-FLD

DRN. TB/CT/RB	DES. PK/SD	CHK. PK/NJA	DATE 10/17/08
SCALE 1" = 60'	APP. NJA	DATE 10/17/08	

PROJECT: 2000026801

DWG: 15-URS-16S11E09C4.DWG
SHEET SIZE: Arch E1 (30x42)
SHT. 15 OF 16
REV.



FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

GRADING CONSTRUCTION NOTES:

1. ARTERIAL ACCESS ROADWAY, PER DETAIL D ON SHEET 5
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- DEBRIS BASIN
- PROPERTY LINE
- SETBACK BOUNDARY

INDEX MAP

SH 15 T: 16 S R: 11 E SECTION 25

GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

NO.	DATE		BY	APP.

DRN: TB/CT/RB DES: PK/SD CHK: PK/NJA APP: NJA SCALE: 1" = 60' DATE: 10/17/08 DATE: 10/17/08

Stantec — STANTEC CONSULTING INC. 3105 EAST GUASTI ROAD SUITE 100 ONTARIO, CA 91761 909.390.8880

SES Stirling Energy Systems

PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO - SITE PLAN
FEMA FLOOD PLAIN
URS-16S11E25-FLD

DWG: 16-URS-16S11E25.DWG
SHEET SIZE: Arch E1 (30x42)
SHT. 15 OF 16
REV.

DRAWING: v:\2015\active\2015026801\civil\design\drawing\exhibits\sfd\16-urs-16s11e25.dwg PLOTTED: 12/2/2008 3:52 PM BY: Barger, Tracy

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 30: The transmission line alignment traverses an area designated as being within the 100-year flood zone. Please provide a scaled map showing the proposed locations of the transmission tower foundations within the 100-year flood zone and provide an explanation of how the towers may affect/be affected by the 100-year flood.

Response: No transmission line structures will be within the FEMA 100 year flood zone. Only one 100 year flood zone is located across the proposed transmission line. The flood zone will be avoided by placing transmission towers to span the length of that 100-year flood zone. This is detailed in Attachment SWR-2 to this response, an aerial photography drawing.

ATTACHMENT SWR-2

FLOOD LEGEND

- 100 YEAR FLOOD PLAIN
- FEMA FLOOD PLAIN

GRADING CONSTRUCTION NOTES:

1. ARTERIAL ACCESS ROADWAY, PER DETAIL D ON SHEET 5
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- 100 YEAR FLOOD PLAIN
- LIMITS OF DISTURBANCE
- DEBRIS BASIN
- PROPERTY LINE
- SETBACK BOUNDARY

INDEX MAP

T: 16 S
R: 11 E
SECTION 25

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

TITLE:	SES SOLAR TWO LLC SOLAR TWO - SITE PLAN FEMA FLOOD PLAIN URS-16S11E25-FLD
DWG: 16-URS-16S11E25.DWG	SHT. 16 OF 16
SHEET SIZE: Arch E1 (30x42)	REV.
SES Stirling Energy Systems	PROJECT: 2000026801
Stantec — STANTEC CONSULTING INC. 3105 EAST GUASTI ROAD SUITE 100 ONTARIO, CA 91761 909.390.8880	
DRN. TB/CT/RB	DES. PK/SD
CHK. PK/NJA	DATE 10/17/08
SCALE 1" = 60'	APP. NJA
DATE 10/17/08	
NO. DATE	BY APP.

DRAWING: v:\2015\active\2015026801\civil\design\drawing\exhibits\sfd\16-urs-16s11e25.dwg PLOTTED: 12/2/2008 3:52 PM BY: Borger, Tracy

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 31: Please provide a draft Erosion and Sedimentation Control Plan (DESCP) that ensures protection of water quality and soil resources of the project site and all linear facilities for both the construction and operation phases of the project. This plan shall address appropriate methods and actions, for the protection of water quality and soil resources, demonstrate no increase in off-site flooding potential, meet local requirements, and identify all monitoring and maintenance activities. The draft plan shall be consistent with the grading and drainage plan and may incorporate by reference any storm water pollution prevention plan developed in conjunction with any NPDES permit.

Response: The applicant will prepare a DESCP to comply with the CEC and BLM request. The first draft will include all of the items identified above and will be consistent with the grading and drainage plan. It is anticipated the plan will be submitted for agency review during the first quarter 2009.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 32: Please provide a draft Storm Water Pollution Prevention Plan (SWPPP) consistent with the requirements for a NPDES General Permit for construction and operation of the site and associated linear facilities. This plan may be combined with the DESCP or modified to include those elements identified for a DESCP.

Response: A SWPPP will be combined with the DESCP. It is anticipated the plan will be submitted for agency review during the first quarter 2009.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 33: Please provide a description of the methodology, sequence, schedule, and estimated average and maximum water use for SunCatcher mirror washing operations.

Response: SunCatcher mirror washing protocol as currently envisioned consists of an average of nine washes per year, eight high-pressure spray washes with demineralized water and one scrubbing, using soft mechanical mops. The scrubbing would occur in the late Spring months prior to the peak power demand summer months. Each spray wash will consume approximately 14 gallons of water per dish and take approximately 10 minutes. Including travel time between dishes, work breaks, etc., a single washing crew of 1 to 2 people (the AFC assumes 2) can wash an average of 4.25 dishes per hour or 34 dishes per eight-hour shift. There will be 24 washing teams per shift for two shifts per day, resulting in a complete washing of all 30,000 SunCatchers each month (weekdays only). Total water consumption for a normal washing of all 30,000 dishes would be 420,000 gallons or about 1.3 acre-feet of water.

These water consumption estimates assume the water has been pre-filtered for demineralization, a process that consumes in bypass and filter flushing operations approximately 28% of the filtered water. The average consumption, then, of raw water for mirror washing is approximately 1.65 acre-feet of water, and the scrubbing wash will consume about 5 acre-feet of water. Total projected raw water consumption for mirror washing per year is about 18.2 acre-feet of water. (The remaining water usage described in the AFC is for dust control, potable drinking water, sanitary water, etc.)

It is likely that some areas of the total solar field (particularly in the outer perimeter areas) will experience a higher rate of soiling than the other areas (which are shielded by the other SunCatchers). For this reason, it is likely that some dishes will be washed more than 9 times a year, whereas others will be washed less frequently. We will use the efficiency trend data in the SCADA system to determine when it is economically justified to dispatch a washing team to a SunCatcher for a routine high-pressure spray wash.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 34: Please provide a description of the management measures US Gypsum employs to mitigate their generation of fugitive dust.

Response: US Gypsum has been contacted regarding dust mitigation management measures. In October 2008, Mr. Harper (SES) spoke with Mr. Carter (US Gypsum) and Mr. Carter indicated during discussion that US Gypsum was bound by the conditions of their EIS. The EIS is publically available.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 35: Please evaluate the potential for airborne gypsum to be deposited on the mirrors and explain whether additional water, beyond that estimated in the AFC, will be required for mirror washing.

Response: The Applicant has evaluated the prevailing winds on the Project site. Because they are primarily east to west, the potential for gypsum from the plant to be deposited on mirrors is minimized. It is not anticipated that additional water, beyond what was presented in the AFC, will be used to wash mirrors.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 36: Please provide a water balance flow diagram that shows the correct balance.

Response: The water balance flow diagram has been revised to show the correct balance and is provided as Attachment SWR-3 to this response.

ATTACHMENT SWR-3

NOTES:
1. FLOW RATES BASED ON GALLONS PER MINUTE.
2. RAW WATER PEAK FLOW RATE DOES NOT INCLUDE SUNCATCHER MIRROR WASHING WATER.

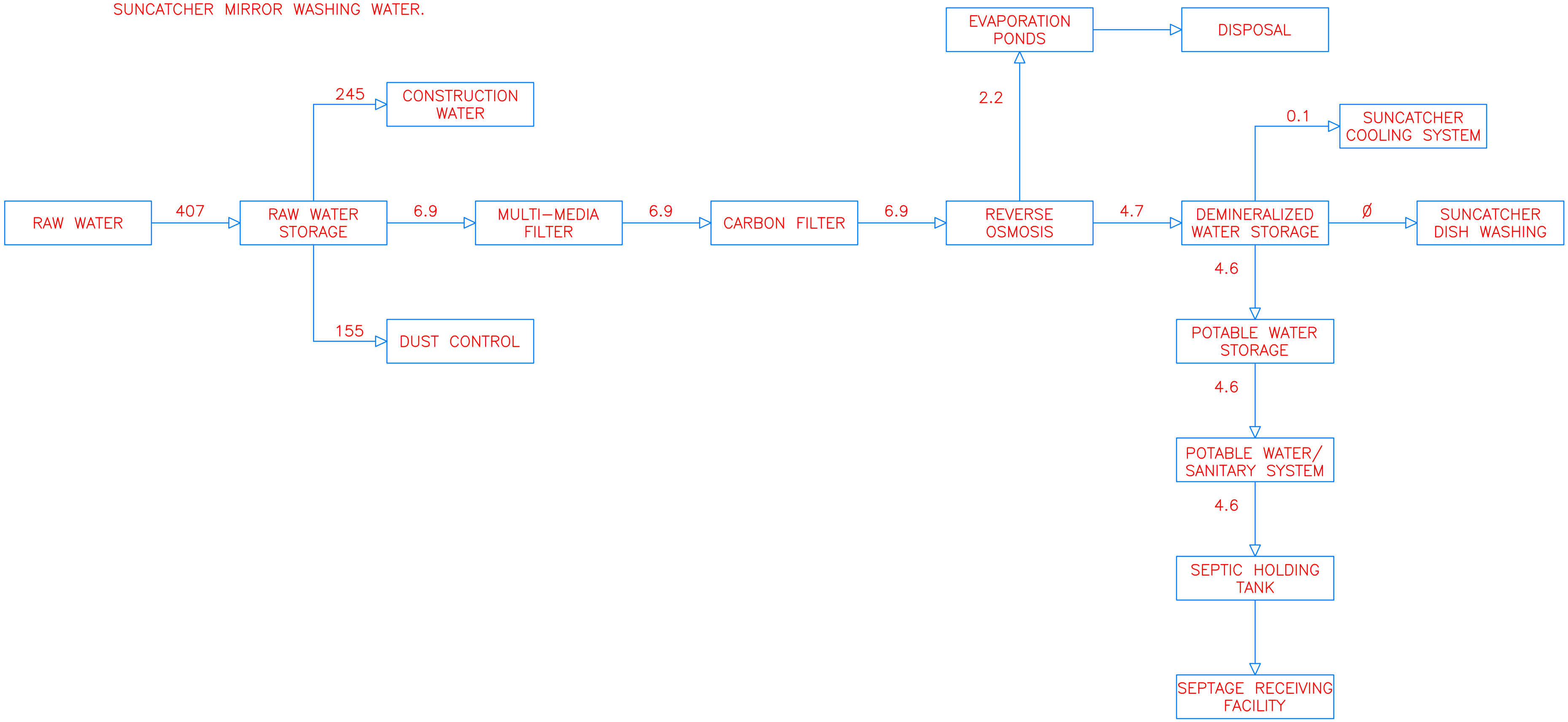

FIGURE B-4

PRELIMINARY

NO.	DATE		BY	APP.
P1	04/23/07	ISSUED FOR PRELIMINARY REVIEW	PH	
P2	02/27/08	ISSUED FOR PRELIMINARY REVIEW	NA	
P3	04/18/08	REVISION FROM 37,440 TO 30,000 SUN CATCHERS		
P4	11/18/08	REVSION PER NOVEMBER 14, 2008 DATA REQUEST		

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Stirling Energy Systems

TITLE: SES SOLAR TWO LLC
WATER BALANCE FLOW DIAGRAM
SUMMER PEAK DURING CONSTRUCTION

DRN. STC/GSP	DES. STC/PH	CHK. STC/	DATE 04/18/08	PROJECT: 2000026801	S2-P-0150	SHT. 4 of 4	REV. P4
SCALE NONE		APP.	DATE				

DRAWING: v:\2015\active\2000024301\civil\design\drawing\afc\exhibits\s2 - exhibits\s2-p-0150-04.dwg PLOTTED: 11/18/2008 8:47 AM BY: Barger, Tracy

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 37: Please discuss in detail the reliability of IID for providing the required water and the historical performance of the Westside Main Canal. This detailed discussion should include:

a. The amount of IID water that can be obtained reliably on a month-to-month and year-to-year basis.

b. Citations from the IID, and other water agency planning documents to support the reliability discussed above.

c. The effect of the following on the available water supply over the life of the project: (1) single dry and multiple dry years; and (2) increased water supply demand as the region's population and economy grow.

Response: Applicant submitted a letter (dated 12/4/08) for additional time to respond to this data request.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 38:

Since the project has only one source of water with no backup supply, please discuss the dependability of the water source. The discussion should include:

a. The available historical data for any interruptions to the proposed water supply or delivery reductions that have been required over the last 10 years.

b. A copy of a draft water supply agreement showing:

c. The agreed upon term of delivery;

d. The volume of water to be delivered;

e. A description of what, if any, reductions in delivery the applicant will be required to take in dry or drought years, or other reasons beyond the applicant's control; and

f. A description of what, if any, other activities may be undertaken if water delivery from IID is reduced or temporarily halted.

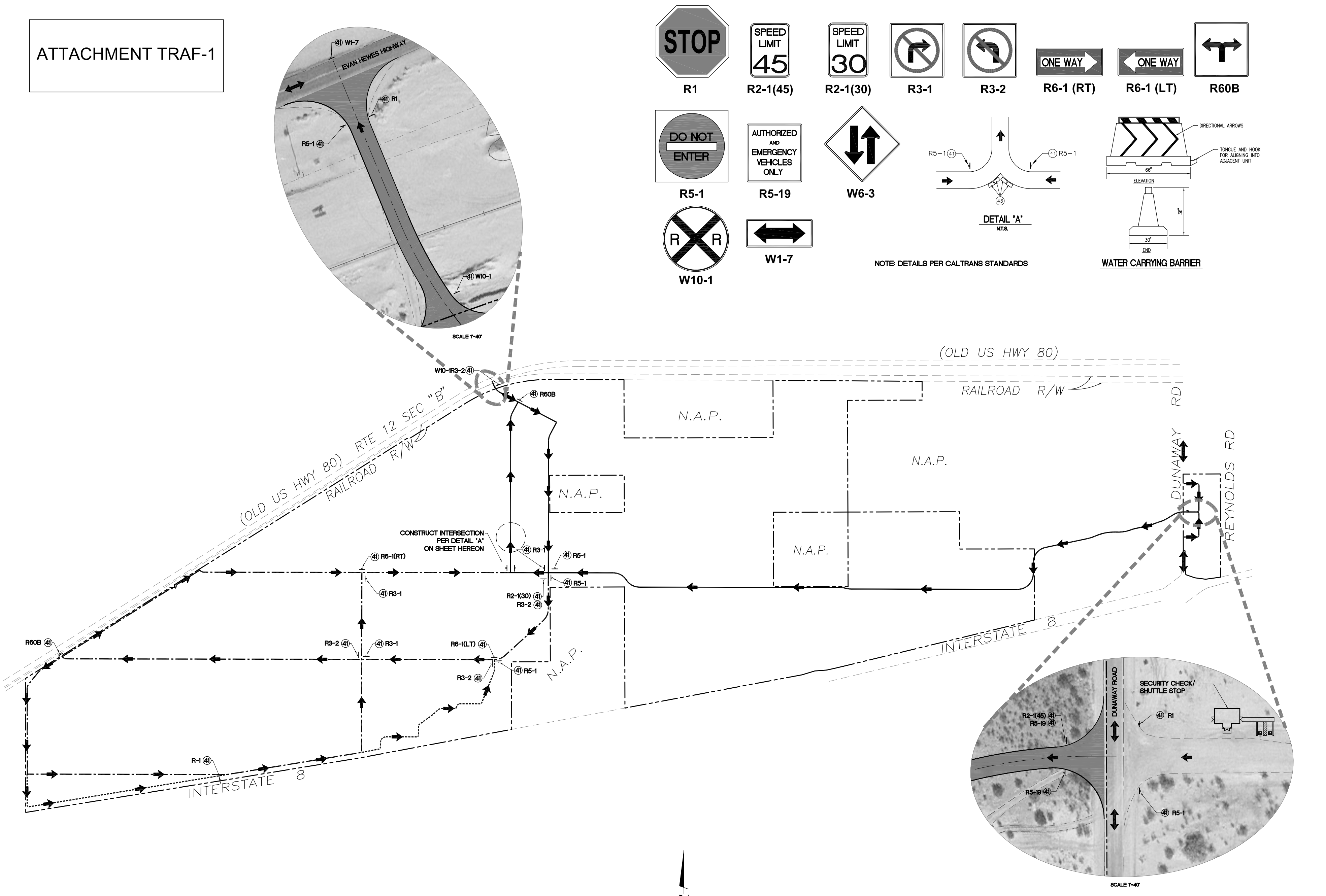
Response: Applicant submitted a letter (dated 12/4/08) for additional time to respond to this data request.

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 39: Please provide scaled plans (40-scale) for each access to the site and the access to the laydown/construction area to the east of Dunaway Road, so that proper analysis of on-site access can be performed.

Response: The scaled plans are provided as Attachment TRAF-1 to this response.

ATTACHMENT TRAF-1



LEGEND

- PROJECT BOUNDARY
- SITE ACCESS ROAD / EMERGENCY ACCESS ROAD
- PHASE 1 PERIMETER ROAD
- PHASE 1 ARTERIAL ROAD
- DIRECTION OF TRAFFIC

TRAFFIC CONTROL NOTES:

41 INSTALL SIGN PER DESIGNATION. SEE DETAIL THIS SHEET
42 REMOVE SIGN PER DESIGNATION. SEE DETAIL THIS SHEET
43 INSTALL WATER CARRYING BARRIER PER DETAIL THIS SHEET
44 PROTECT SIGN IN PLACE PER DESIGNATION. SEE DETAIL THIS SHEET
45 REMOVE WATER CARRYING BARRIER

GRAPHIC SCALE

1200 0 600 1200 2400 4800

(IN FEET)
1 inch = 1200 ft.

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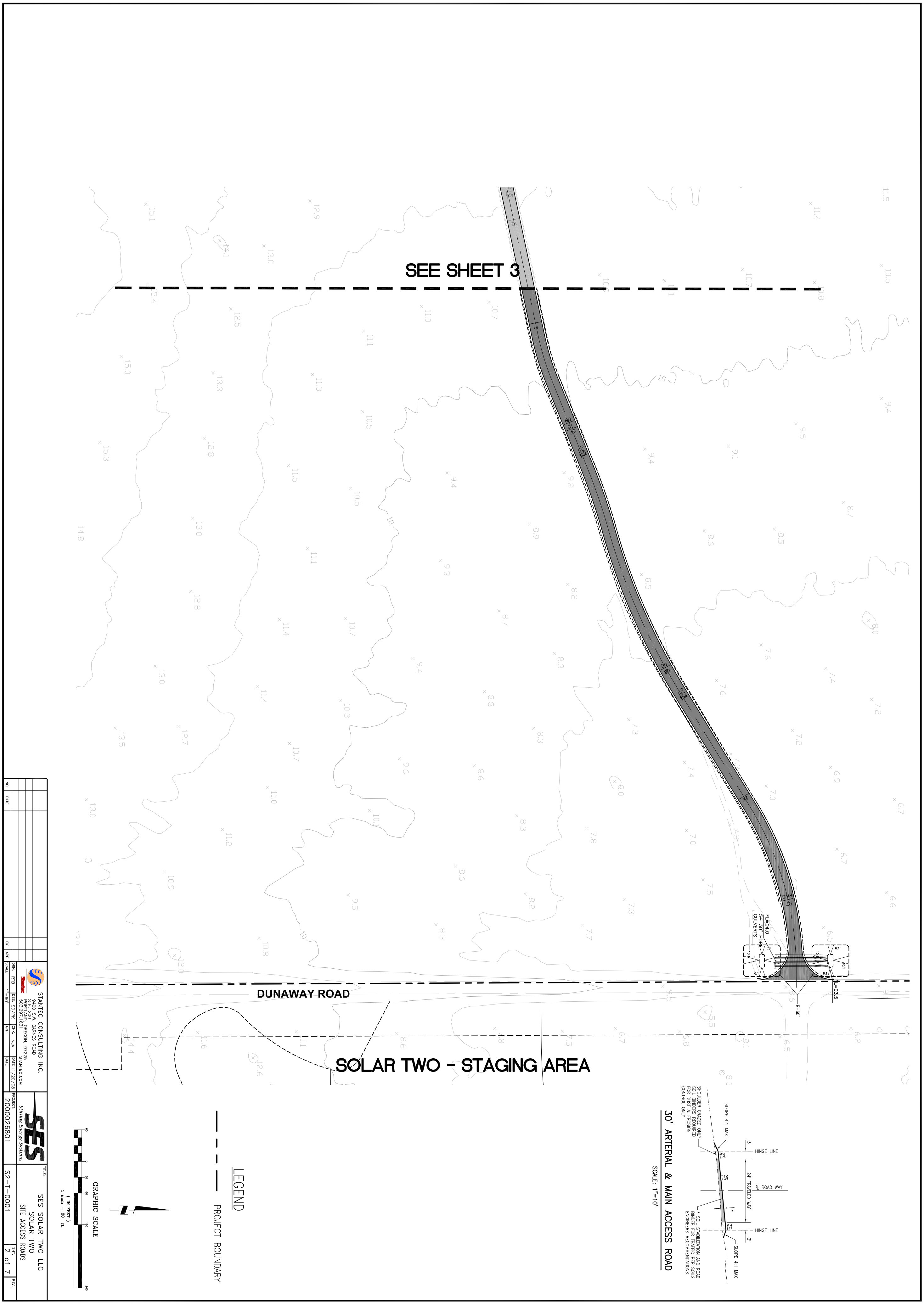
TITLE: SES SOLAR TWO LLC
SOLAR TWO
SITE ACCESS ROADS

NO.	DATE	BY	APP.	DRN. RTB	DES. SD/PK	CHK. NJA	DATE 11/20/08	PROJECT: 2000026801	S2-T-0001	SHT. 1 of 7	REV.
				SCALE 1"=120'		APP.	DATE				


SEE SHEET 3
DUNAWAY ROAD
SOLAR TWO - STAGING AREA
30' ARTERIAL & MAIN ACCESS ROAD
SCALE: 1"=10'
HINGE LINE
ROAD WAY
24' TRAVELED WAY
SLOPE 4:1 MAX
LEGEND
PROJECT BOUNDARY
GRAPHIC SCALE
1 inch = 60 ft.
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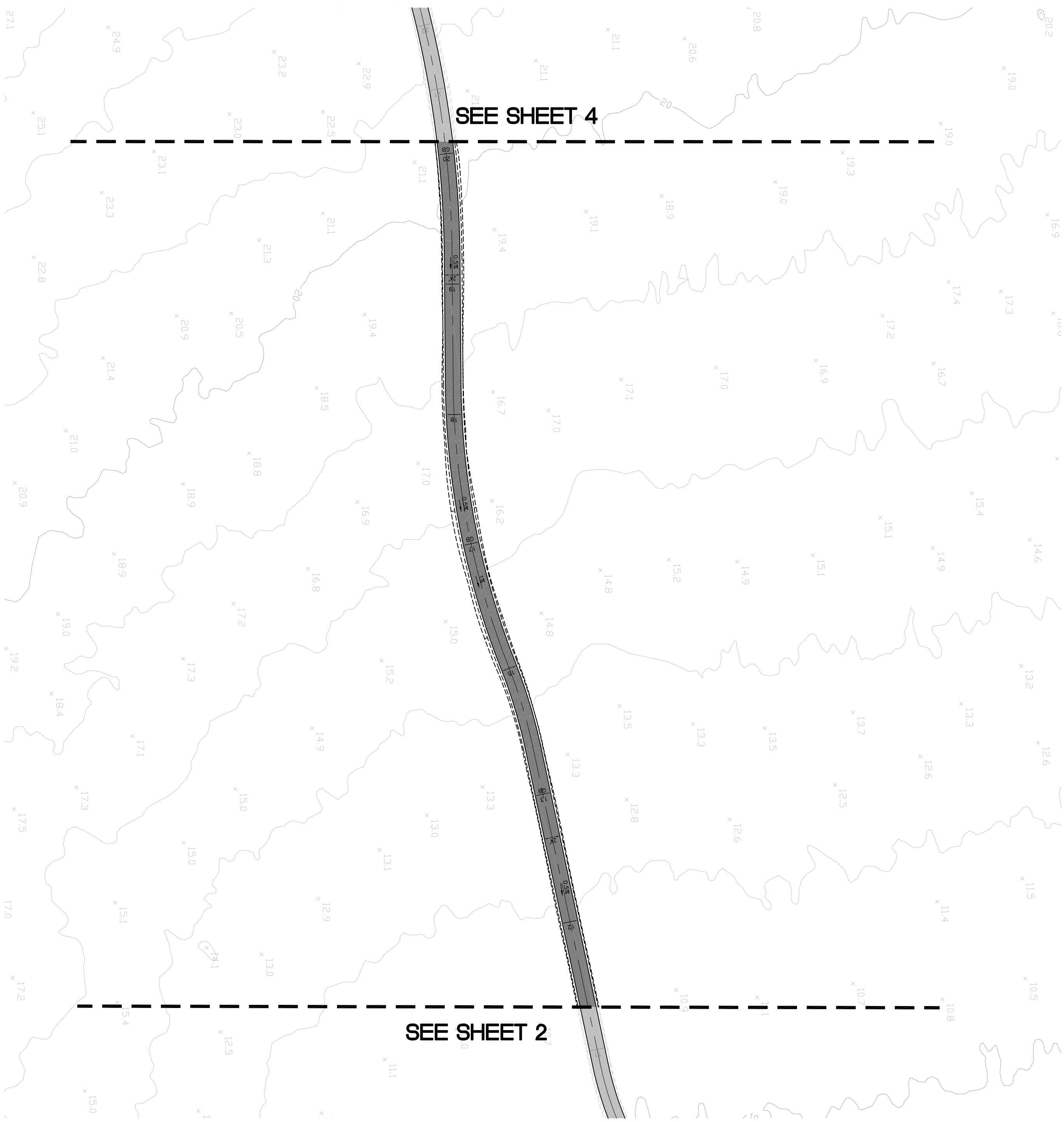
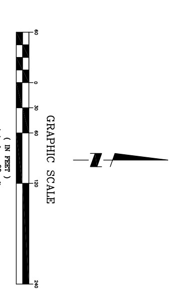
Stirling Energy Systems
SES SOLAR TWO LLC
SOLAR TWO
SITE ACCESS ROADS
2000026801
S2-T-0001
2 of 7





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NO.	DATE	BY	APP.

DRN. RTB	DES. SD/PK	CHK. NJA	DATE 11/20/08
SCALE 1"=60'		APP.	DATE

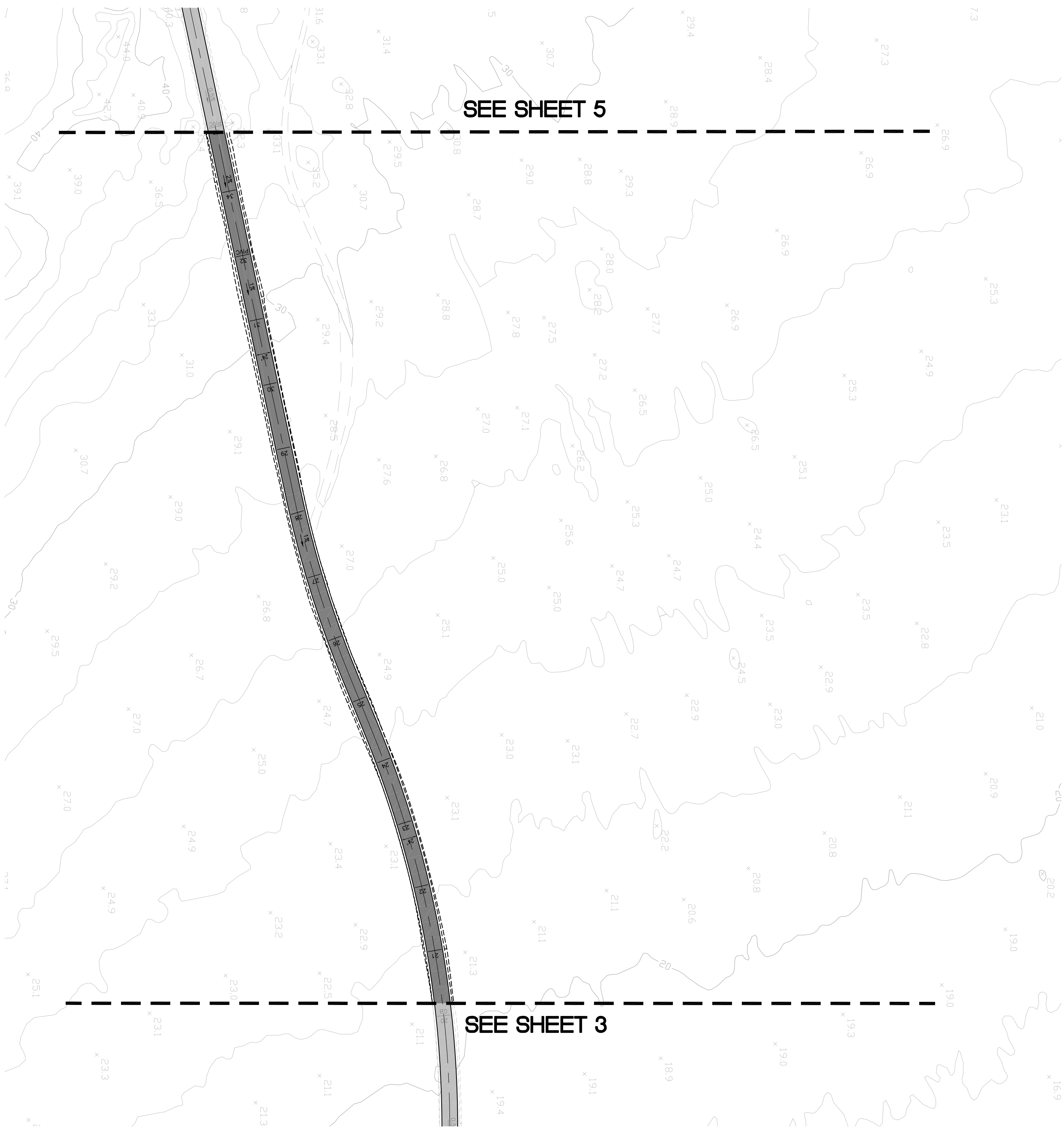
TITLE: SES SOLAR TWO LLC
SOLAR TWO
SITE ACCESS ROADS

PROJECT: 2000026801

S1-T-0001

SHT. 3 of 7

REV.



GRAPHIC SCALE
(IN FEET)
1 inch = 60 ft.

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DRN. RTB | DES. SD/PK | CHK. NJA | DATE 11/20/08
SCALE 1"=60'

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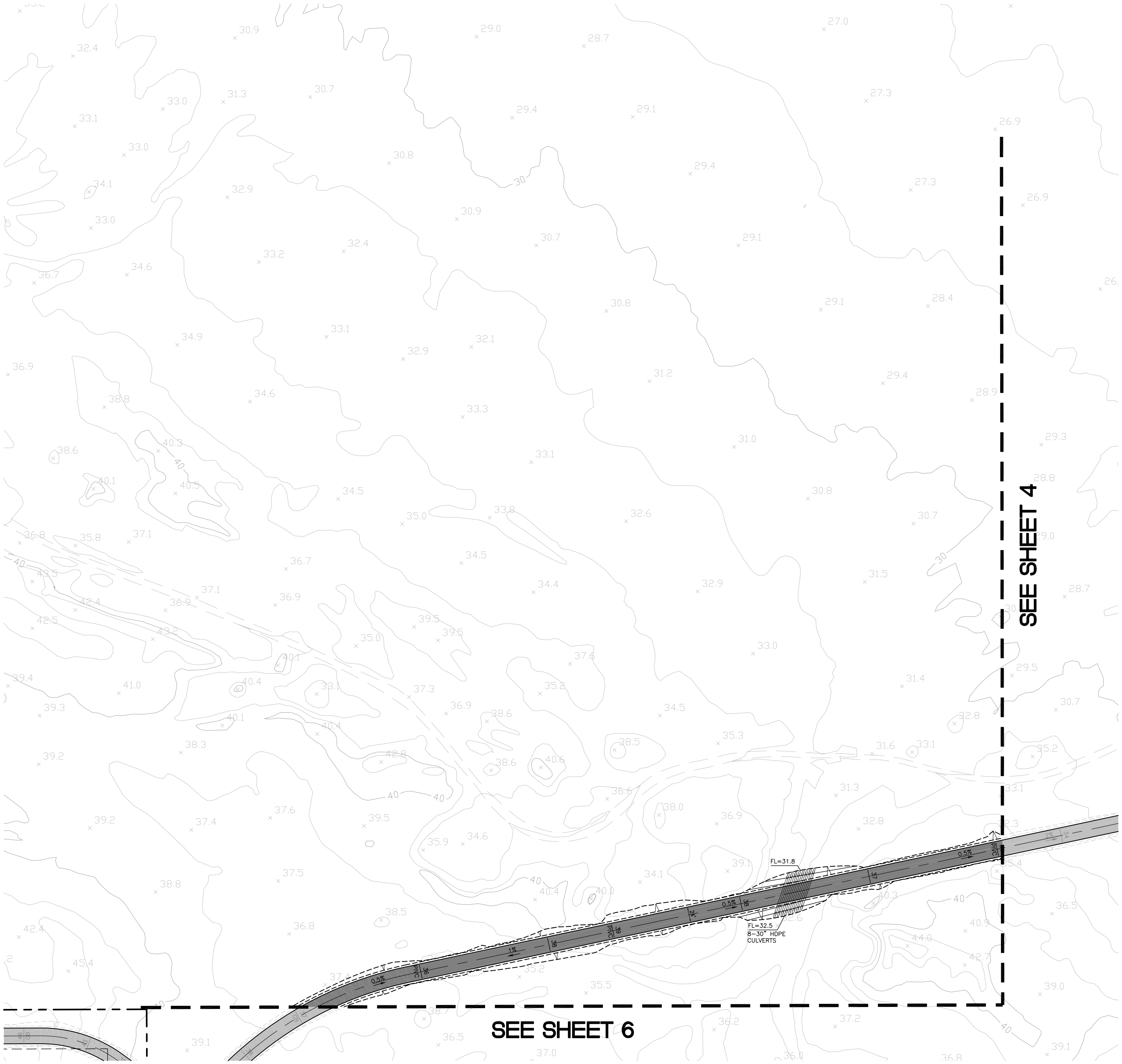
PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO
SITE ACCESS ROADS

S1-T-0001

SHT. 4 of 7



GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

NO.	DATE		BY	APP.

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DRN. RTB	DES. SD/PK	CHK. NJA	DATE 11/20/08
SCALE 1"=60'		APP.	DATE

SES
Stirling Energy Systems

PROJECT: 2000026801

TITLE: SES SOLAR TWO LLC
SOLAR TWO
SITE ACCESS ROADS

S1-T-0001

SHT. 5 of 7

REV.

LEGEND

PROJECT BOUNDARY

GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

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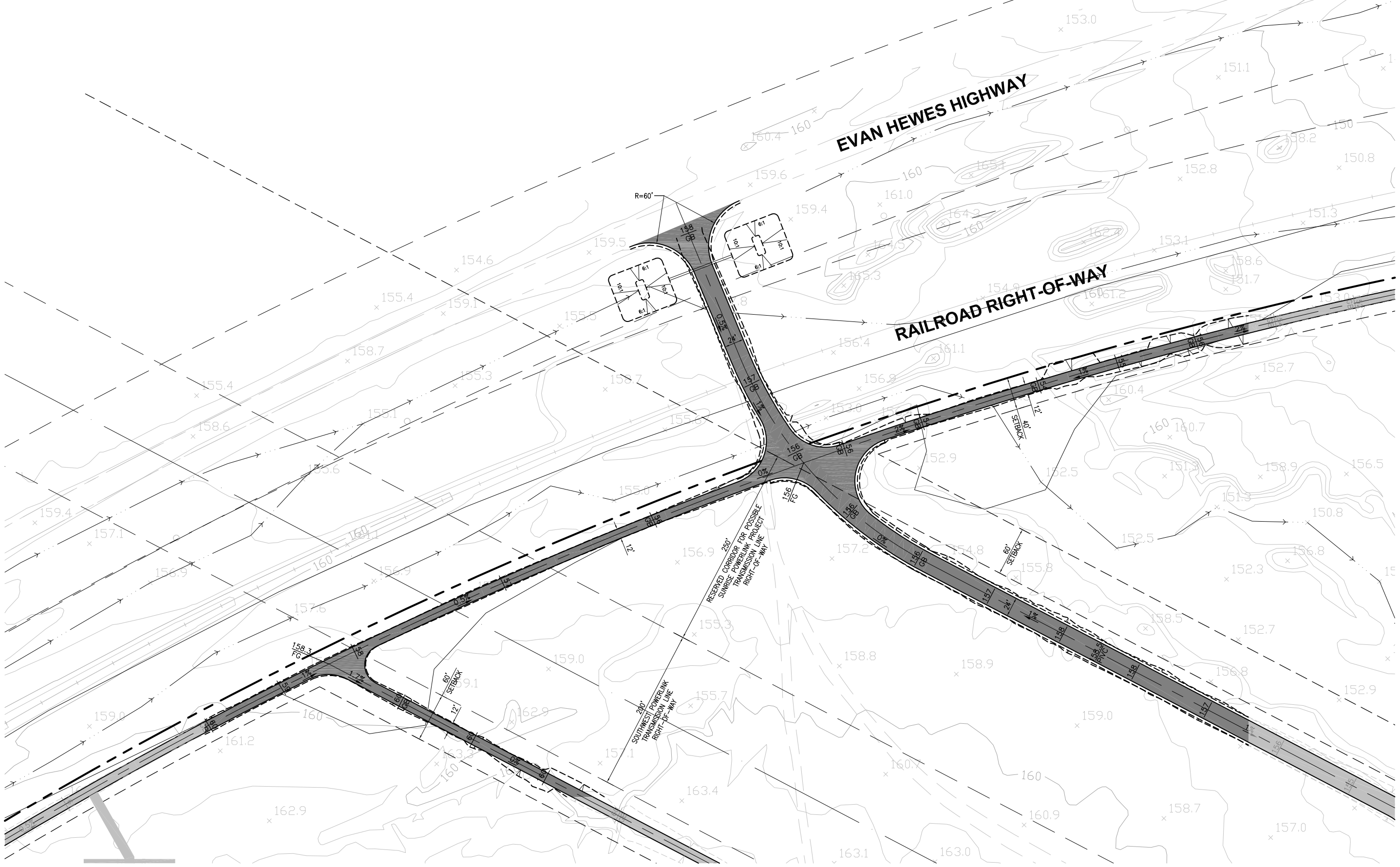
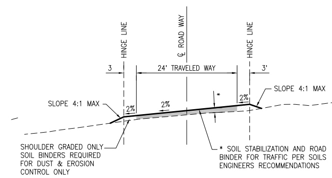
SES SOLAR TWO LLC
SOLAR TWO
SITE ACCESS ROADS

NO.	DATE		BY	APP.

DRN. RTB	DES. SD/PK	CHK. NJA	DATE 11/20/08
SCALE 1"=60'	APP.		DATE

PROJECT: 2000026801 | S1-T-0001 | SHT. 6 of 7 | REV.





30' ARTERIAL & MAIN ACCESS ROAD

SCALE: 1"=10'

LEGEND

— — — PROJECT BOUNDARY

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

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TITLE: SES SOLAR TWO LLC
SOLAR TWO
SITE ACCESS ROADS

NO.	DATE		BY	APP.	DRN. RTB	DES. SD/PK	CHK. NJA	DATE 11/20/08	PROJECT: 2000026801	S2-T-0001	SHT. 7 of 7	REV.
					SCALE 1"=60'		APP.	DATE				

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 40: Caltrans has procedures for analysis of freeway road segments during the AM and PM peak hour. Please provide the peak hour delay and Level of Service for the freeway road segments during the AM and PM peak hours for the eastbound and westbound directions on Interstate 8, west of Imperial Highway, between Imperial Highway and Dunaway Road and east of Dunaway Road for all studied scenarios. Also, please provide the associated back up data (i.e. peak hour volumes and analysis worksheets).

Response: The results of the AM and PM peak hour analysis for the aforementioned Interstate 8 segments are presented below for all studied scenarios. The associated back up data is provided as Attachment TRAF-2 to this response.

Table 1 provides the summary of existing Levels of Service for various segments of I-8 in the vicinity of the project. As can be seen in the table, all segments operate at LOS A in both AM and PM peak hours. Table 2 provides the summary of Levels of Service for various segments of I-8 in the vicinity of the project for the year 2010 without the project. As can be seen in the table, all segments operate at LOS A or B in both AM and PM peak hours. Table 3 provides the summary of Levels of Service for various segments of I-8 in the vicinity of the project for the year 2010 with the project. As can be seen in the table, all segments operate at LOS A or B in both AM and PM peak hours. Table 4 provides the summary of Levels of Service for various segments of I-8 in the vicinity of the project for the year 2017 without the project. As can be seen in the table, all segments operate at LOS A or B in both AM and PM peak hours. Table 5 provides the summary of Levels of Service for various segments of I-8 in the vicinity of the project for the year 2017 with the project. As can be seen in the table, all segments operate at LOS A or B in both AM and PM peak hours.

Table 1
Existing Roadway Level of Service

Roadway	Location	Classification	Direction	Traffic Volumes[1]	LOS 2
I-8	West of Imperial Highway	Freeway	Eastbound	1046 / 1222	A/A[2]
I-8	West of Imperial Highway	Freeway	Westbound	944 / 1124	A/A[2]
I-8	Between Imperial Highway and Dunaway Road	Freeway	Eastbound	1074 / 1215	A/A[2]
I-8	Between Imperial Highway and Dunaway Road	Freeway	Westbound	952 / 1126	A/A[2]
I-8	East of Dunaway Road	Freeway	Eastbound	1089 / 1233	A/A[2]
I-8	East of Dunaway Road	Freeway	Westbound	955 / 1130	A/A[2]

Source: URS Corporation 2008

Notes:
[1] AM/PM Volumes. Source: 2007 Traffic Volumes (Caltrans 2008a)
[2] Peak Hour LOS
I-8 = Interstate 8
LOS = level of service

Table 2

Roadway Level of Service – Year 2010 No Project Conditions

Roadway	Location	Classification	Direction	Traffic Volumes[1]	LOS 2
I-8	West of Imperial Highway	Freeway	Eastbound	1110 / 1295	A/A[2]
I-8	West of Imperial Highway	Freeway	Westbound	1000 / 1190	A/A[2]
I-8	Between Imperial Highway and Dunaway Road	Freeway	Eastbound	1140 / 1290	A/A[2]
I-8	Between Imperial Highway and Dunaway Road	Freeway	Westbound	1010 / 1195	A/A[2]
I-8	East of Dunaway Road	Freeway	Eastbound	1155 / 1305	A/B[2]
I-8	East of Dunaway Road	Freeway	Westbound	1010 / 1200	A/A[2]

Source: URS Corporation 2008

Notes:
[1] AM/PM Volumes. Source: 2007 Traffic Volumes (Caltrans 2008a)
[2] Peak Hour LOS
I-8 = Interstate 8
LOS = level of service

Table 3

Roadway Level of Service – Year 2010 Project Construction Conditions

Roadway	Location	Classification	Direction	Traffic Volumes[1]	LOS 2
I-8	West of Imperial Highway	Freeway	Eastbound	1295 / 1295	B/B
I-8	West of Imperial Highway	Freeway	Westbound	1000 / 1375	A/B[2]
I-8	Between Imperial Highway and Dunaway Road	Freeway	Eastbound	1348 / 1290	B/A[2]
I-8	Between Imperial Highway and Dunaway Road	Freeway	Westbound	1010 / 1195	A/A[2]
I-8	East of Dunaway Road	Freeway	Eastbound	1155 / 1838	A/B[2]
I-8	East of Dunaway Road	Freeway	Westbound	1543 / 1200	B/A[2]

Source: URS Corporation 2008

Notes:
[1] AM/PM Volumes. Source: 2007 Traffic Volumes (Caltrans 2008a)
[2] Peak Hour LOS
I-8 = Interstate 8
LOS = level of service

Table 4
Roadway Level of Service - Year 2017 No Project Conditions

Roadway	Location	Classification	Direction	Traffic Volumes[1]	LOS 2
I-8	West of Imperial Highway	Freeway	Eastbound	1275 / 1490	A/B[2]
I-8	West of Imperial Highway	Freeway	Westbound	1150 / 1370	A/B[2]
I-8	Between Imperial Highway and Dunaway Road	Freeway	Eastbound	1310 / 1480	B/B[2]
I-8	Between Imperial Highway and Dunaway Road	Freeway	Westbound	1160/ 1375	A/B[2]
I-8	East of Dunaway Road	Freeway	Eastbound	1330 / 1505	B/B[2]
I-8	East of Dunaway Road	Freeway	Westbound	1165 / 1380	A/B[2]

Source: URS Corporation 2008

Notes:
[1] AM/PM Volumes. Source: 2007 Traffic Volumes (Caltrans 2008a)
[2] Peak Hour LOS
I-8 = Interstate 8
LOS = level of service

Table 5
Roadway Level of Service - Year 2017 Project Operations Conditions

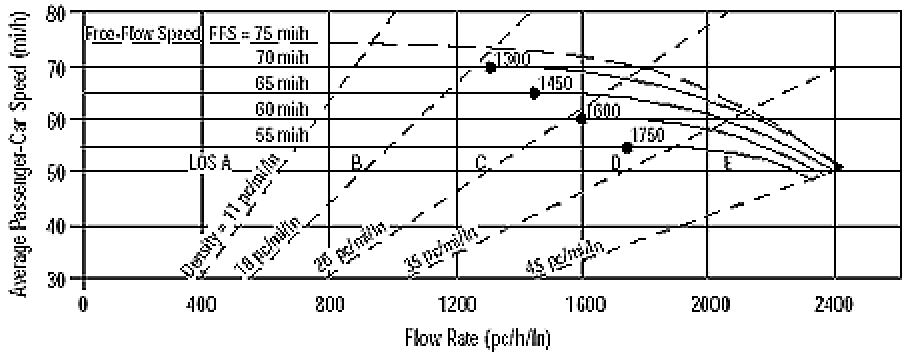
Roadway	Location	Classification	Direction	Traffic Volumes[1]	LOS 2
I-8	West of Imperial Highway	Freeway	Eastbound	1293 / 1491	B/B[2]
I-8	West of Imperial Highway	Freeway	Westbound	1157 / 1387	A/B[2]
I-8	Between Imperial Highway and Dunaway Road	Freeway	Eastbound	1310 / 1480	B/B[2]
I-8	Between Imperial Highway and Dunaway Road	Freeway	Westbound	1160 / 1375	A/B[2]
I-8	East of Dunaway Road	Freeway	Eastbound	1338 / 1601	B/B[2]
I-8	East of Dunaway Road	Freeway	Westbound	1265 / 1384	A/B[2]

Source: URS Corporation 2008

Notes:
[1] AM/PM Volumes. Source: 2007 Traffic Volumes (Caltrans 2008a)
[2] Peak Hour LOS
I-8 = Interstate 8
LOS = level of service

ATTACHMENT TRAF-2

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*
Agency or Company	
Date Performed	*11/18/2008*
Analysis Time Period	*Existing AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-8 Eastbound*
From/To	*West of Imperial H*
Jurisdiction	*Imperial County*
Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1046*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*624*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*8.9*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exh
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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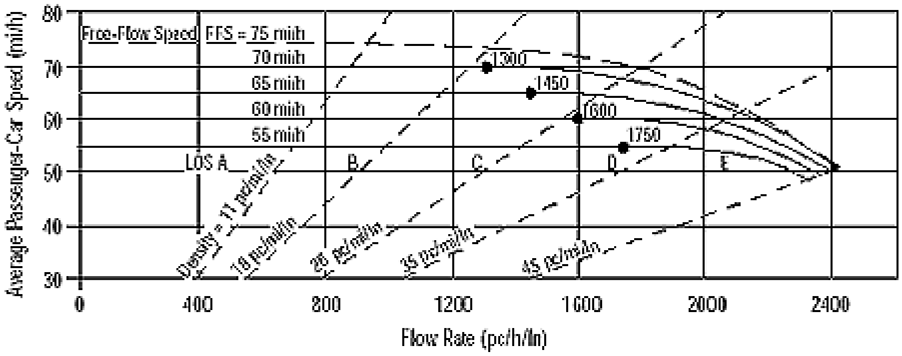
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*Existing AM Peak Hour*	Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*944*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

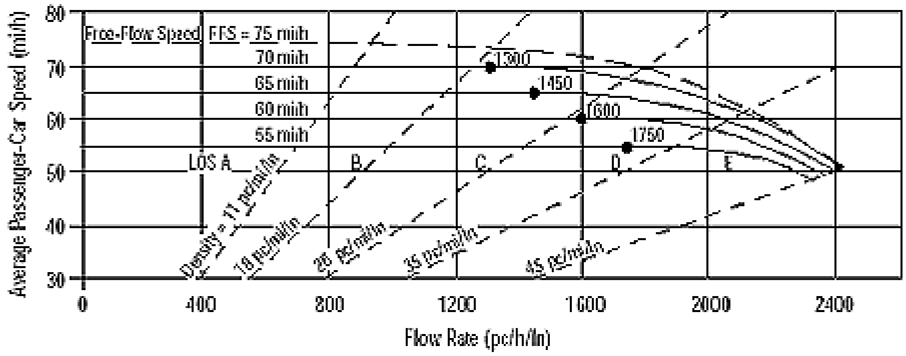
Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*563*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*8.0*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary		Factor Location
N - Number of lanes	S - Speed	

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		**Site Information**	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*Existing PM Peak Hour*	Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1222*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
			Design (N)
Operational (LOS)			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*729*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*10.4*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary		**Factor Location**
N - Number of lanes	S - Speed	

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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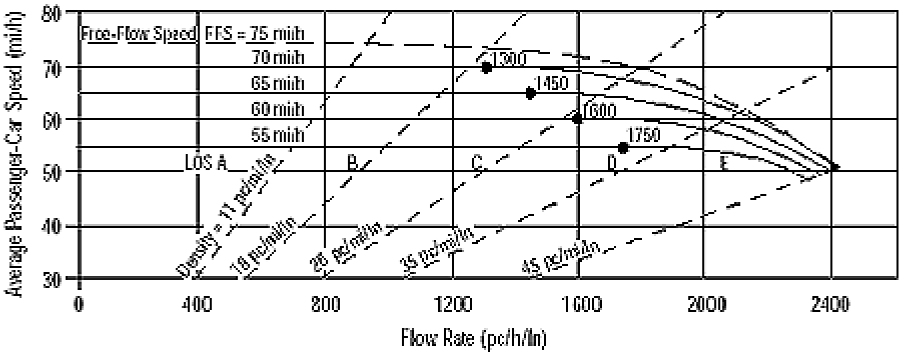
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*Existing PM Peak Hour*	Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1124*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*671*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*9.6*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary / Factor Location

N - Number of lanes S - Speed

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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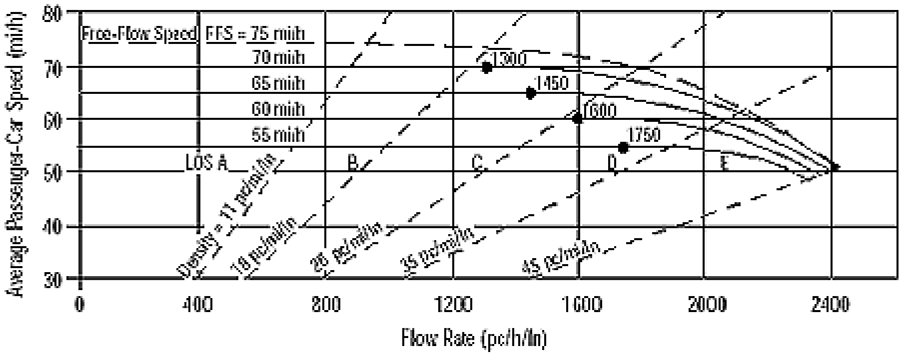
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 AM Peak No Proj*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1110*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*662*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*9.5*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary		**Factor Location**
N - Number of lanes	S - Speed	

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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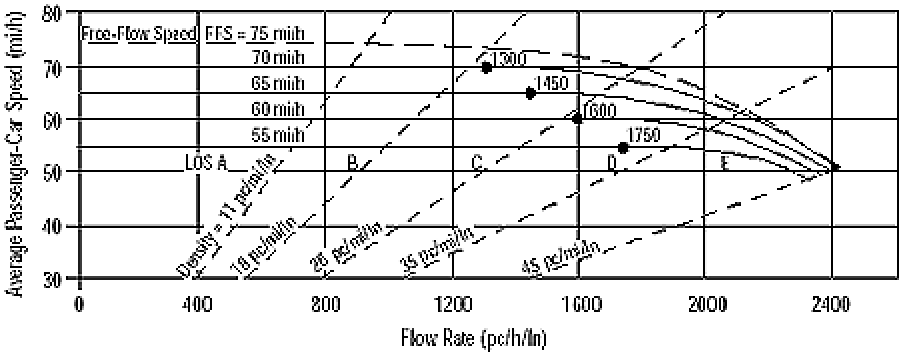

Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 AM Peak No Proj*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1000*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*597*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*8.5*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary / Factor Location

N - Number of lanes S - Speed

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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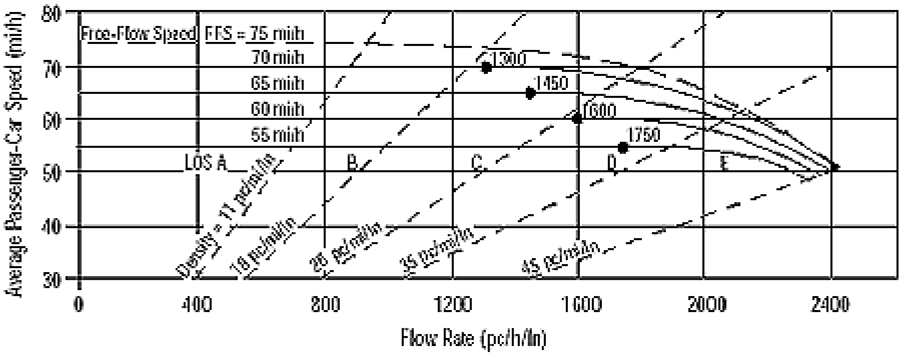
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 PM Peak No Proj*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1295*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*773*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
$D = v_p / S$	*11.0*	pc/mi/ln	$D = v_p / S$
LOS	*B*		Required Number of Lanes, N

Glossary / Factor Location

N - Number of lanes S - Speed

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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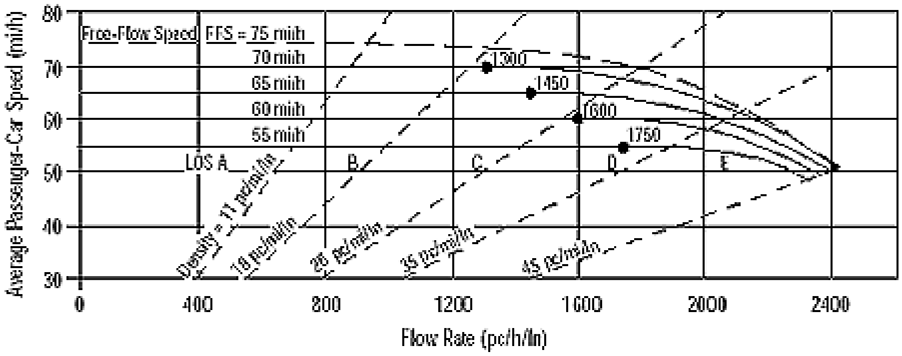
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*		
Agency or Company			
Date Performed	*11/18/2008*		
Analysis Time Period	*2010 PM Peak No Proj*		

Site Information

Highway/Direction of Travel	*I-8 Westbound*
From/To	*West of Imperial H*
Jurisdiction	*Imperial County*
Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1190*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*710*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*10.1*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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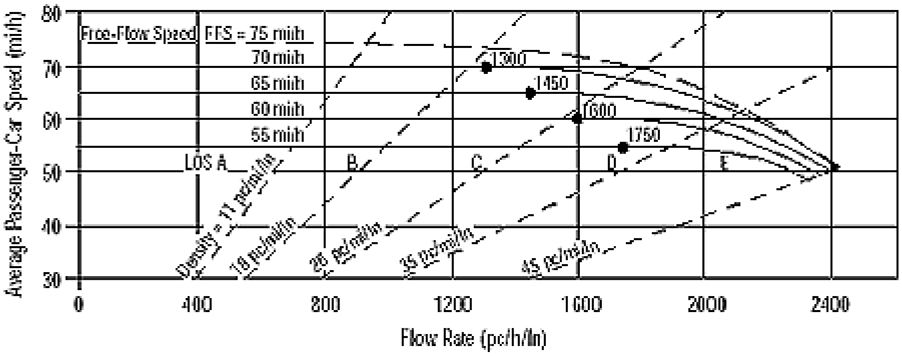
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 AM Pk No Proj + Proj Cons*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1295*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*773*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*11.0*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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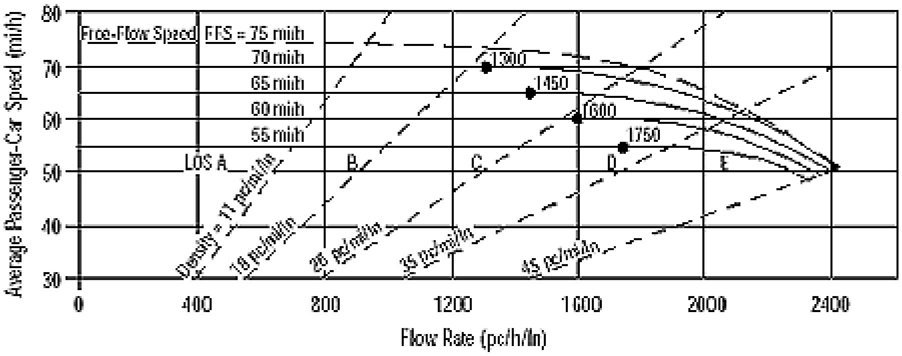
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 AM Pk No Proj + Proj Cons*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1000*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*597*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*8.5*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary	Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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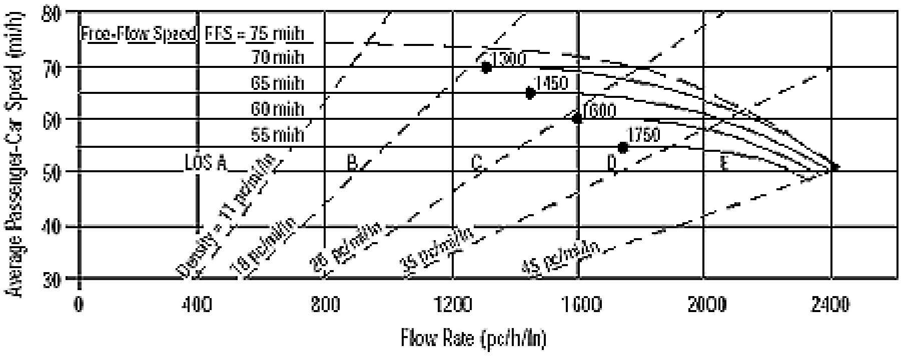
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*		
Agency or Company			
Date Performed	*11/18/2008*		
Analysis Time Period	*2010 PM Pk No Proj + Proj Cons*		

Site Information

Highway/Direction of Travel	*I-8 Eastbound*
From/To	*West of Imperial H*
Jurisdiction	*Imperial County*
Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1295*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*773*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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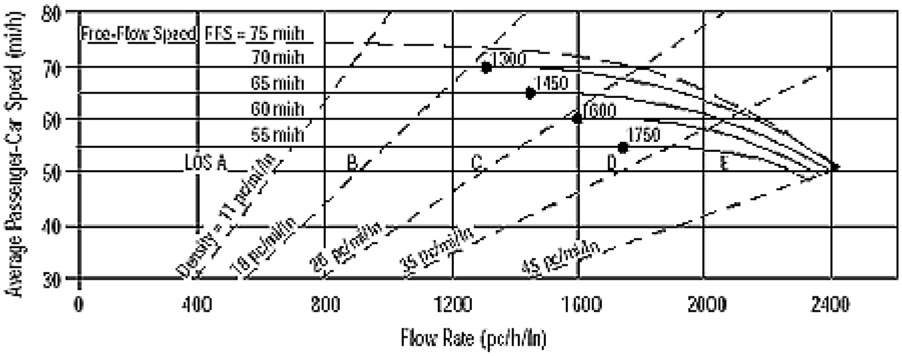
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 PM Pk No Proj + Proj Cons*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1375*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*820*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*11.7*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary	Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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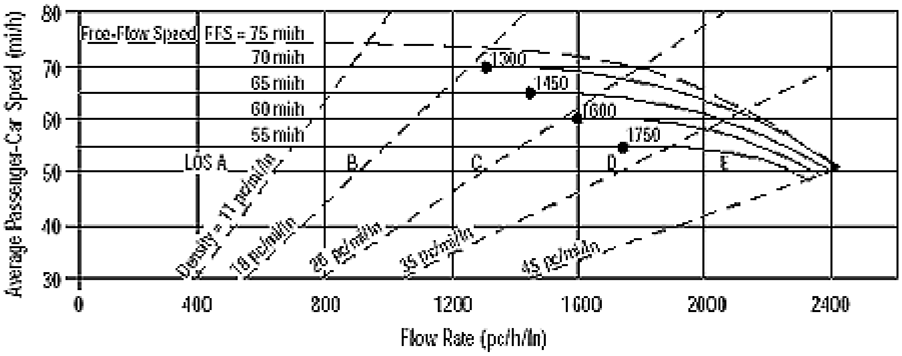
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*		
Agency or Company			
Date Performed	*11/18/2008*		
Analysis Time Period	*2017 AM Peak No Proj*		

Site Information

Highway/Direction of Travel	*I-8 Eastbound*
From/To	*West of Imperial H*
Jurisdiction	*Imperial County*
Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1275*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*761*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*10.9*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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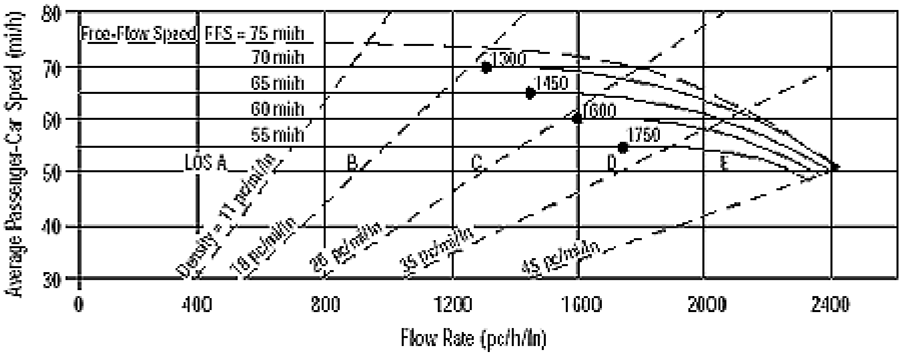
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*		
Agency or Company			
Date Performed	*11/18/2008*		
Analysis Time Period	*2017 AM Peak No Proj*		

Site Information

Highway/Direction of Travel	*I-8 Westbound*
From/To	*West of Imperial H*
Jurisdiction	*Imperial County*
Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1150*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*686*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*9.8*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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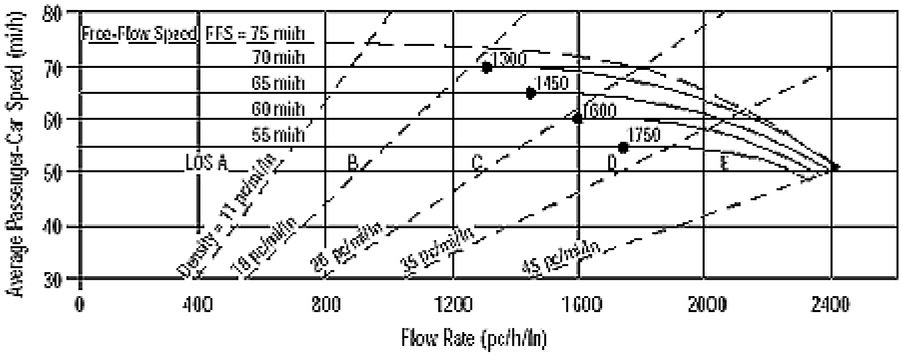
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*		
Agency or Company			
Date Performed	*11/18/2008*		
Analysis Time Period	*2017 PM Peak No Proj*		

Site Information

Highway/Direction of Travel	*I-8 Eastbound*
From/To	*West of Imperial H*
Jurisdiction	*Imperial County*
Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1490*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*889*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*12.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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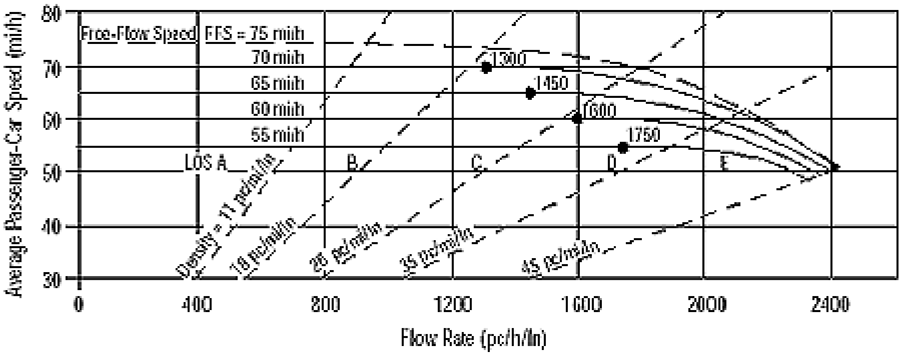
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 PM Peak No Proj*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1370*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures / Design (N)

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*817*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*11.7*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary / Factor Location

Glossary		Factor Location
N - Number of lanes	S - Speed	

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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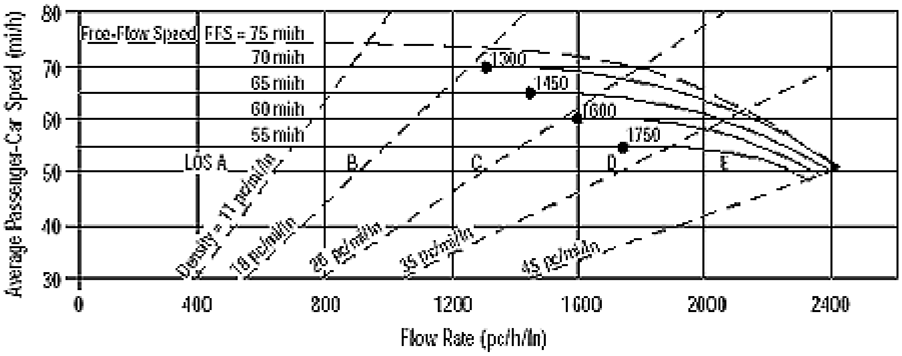
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*
Agency or Company	
Date Performed	*11/18/2008*
Analysis Time Period	*2017 AM Pk No Proj + Proj Oprs*

Site Information

Highway/Direction of Travel	*I-8 Eastbound*
From/To	*West of Imperial H*
Jurisdiction	*Imperial County*
Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1293*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*771*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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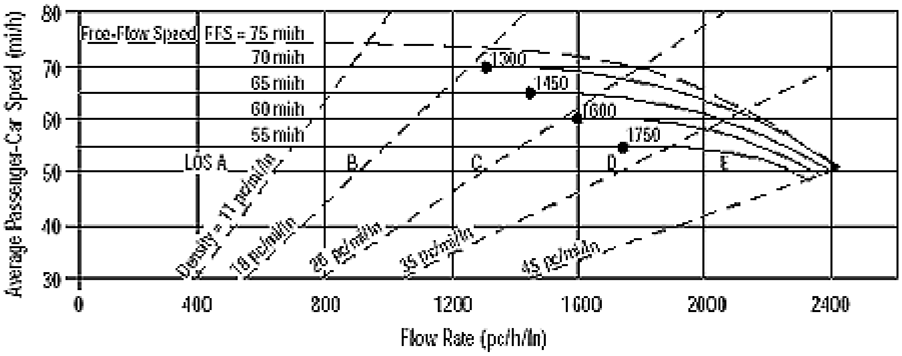
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 AM Pk No Proj + Proj Oprs*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1157*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*690*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*9.9*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary	Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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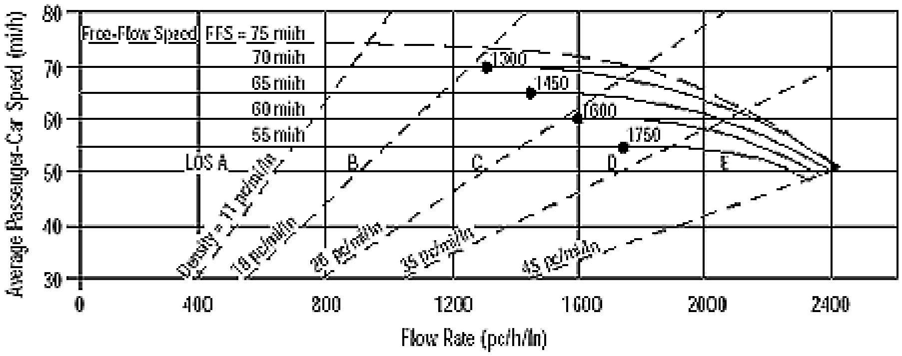
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 PM Pk No Proj + Proj Oprs*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1491*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

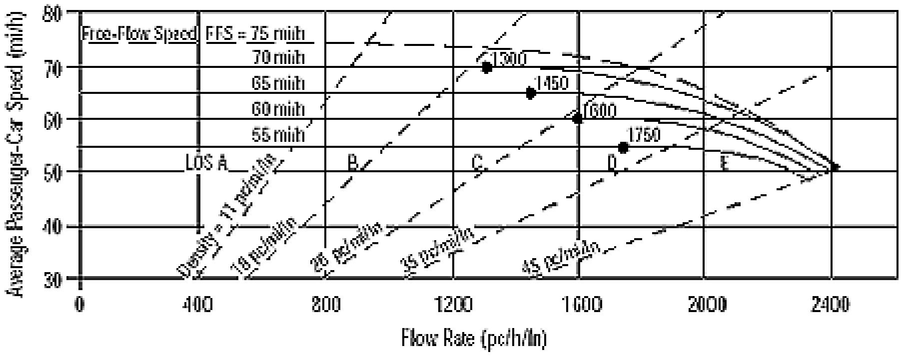
Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*890*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*12.7*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary	Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*West of Imperial H*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 PM Pk No Proj + Proj Oprs*	Analysis Year	*2017*

Site Information

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1387*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*828*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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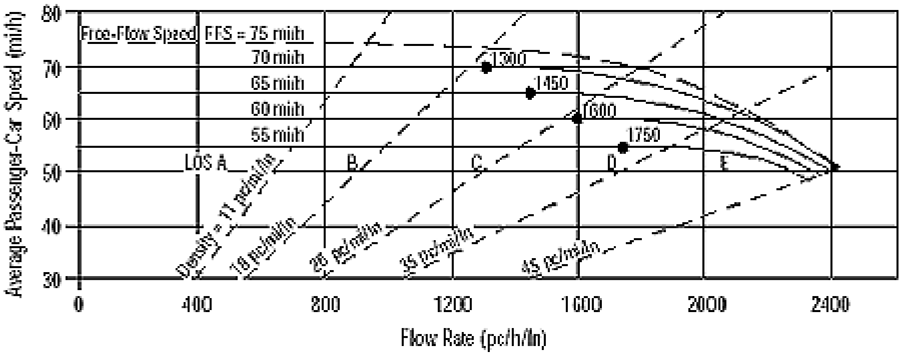
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*Existing AM Peak Hour*	Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1074*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*641*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*9.2*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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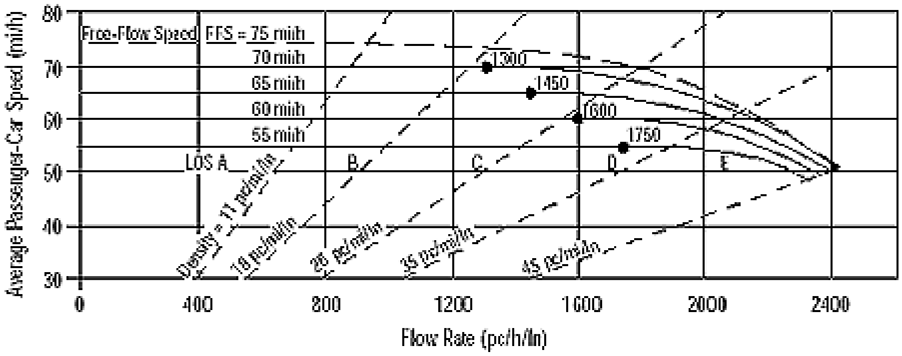
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*Existing AM Peak Hour*	Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*952*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*568*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*8.1*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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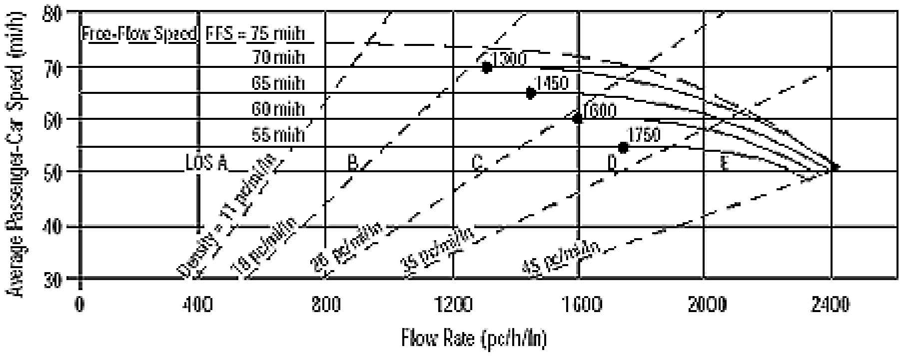
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*Existing PM Peak Hour*	Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1215*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*725*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*10.4*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary	Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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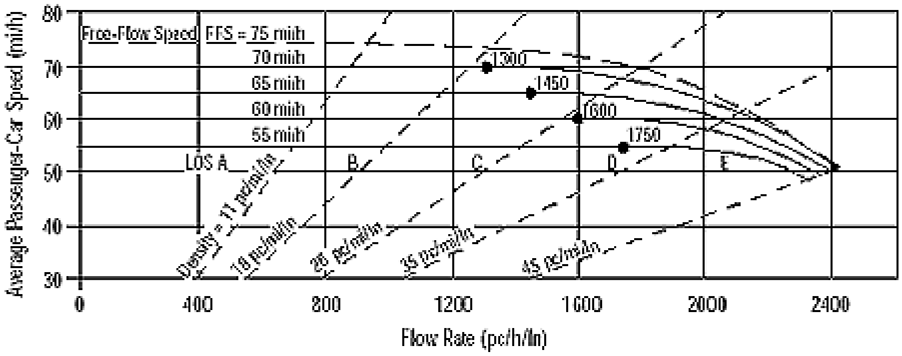
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	SMA
Agency or Company	
Date Performed	11/18/2008
Analysis Time Period	Existing PM Peak Hour

Site Information

Highway/Direction of Travel	I-8 Westbound
From/To	Between Imperial Dunaway
Jurisdiction	Imperial County
Analysis Year	2008

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	1126	veh/h	Peak-Hour Factor, PHF	0.90
AADT		veh/day	%Trucks and Buses, P_T	14
Peak-Hr Prop. of AADT, K			%RVs, P_R	2
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
Driver type adjustment	1.00		Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.931

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	70.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	70.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	672	pc/h/ln
S	70.0	mi/h
D = v_p / S	9.6	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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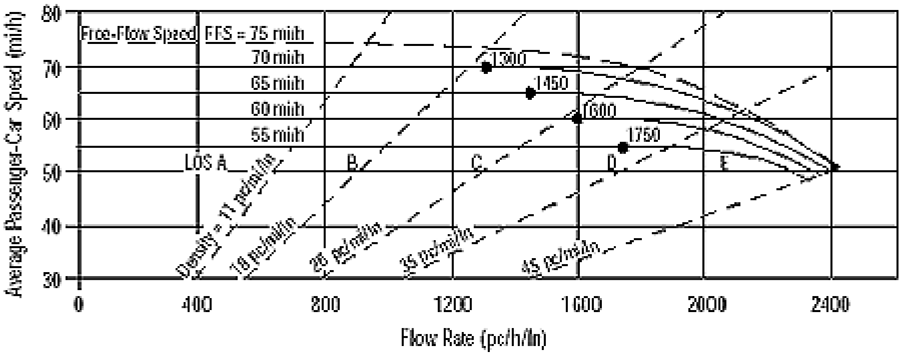
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 AM Peak No Proj*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs				
Volume, V	*1140*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*680*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*9.7*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary	**Factor Location**

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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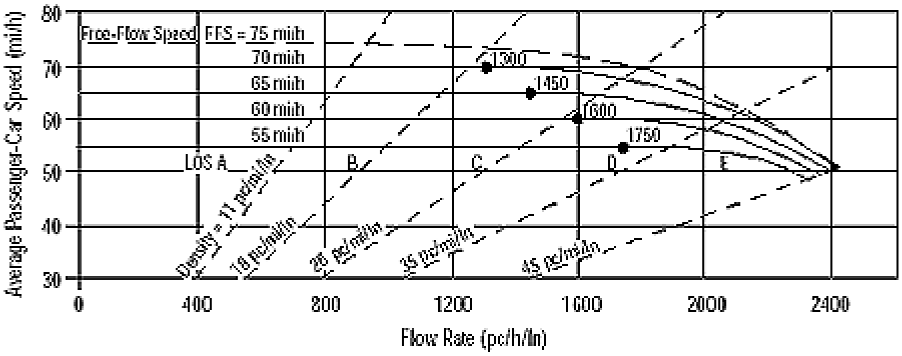
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*
Agency or Company	
Date Performed	*11/18/2008*
Analysis Time Period	*2010 AM Peak No Proj*

Site Information

Highway/Direction of Travel	*I-8 Westbound*
From/To	*Between Imperial Dunaway*
Jurisdiction	*Imperial County*
Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1010*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*603*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*8.6*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

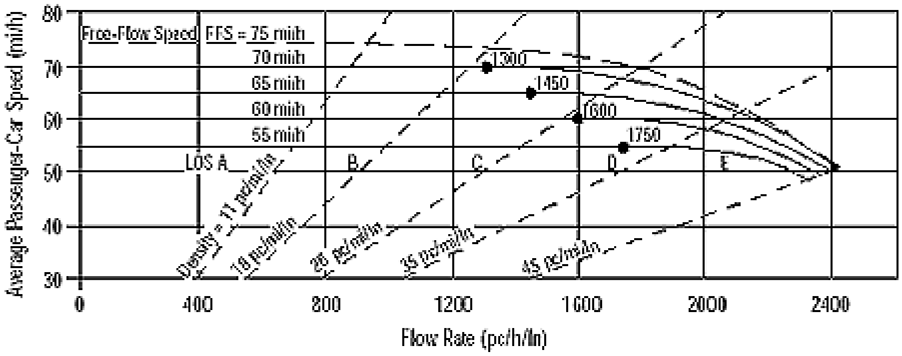
Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 PM Peak No Proj*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1290*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*770*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*11.0*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary	Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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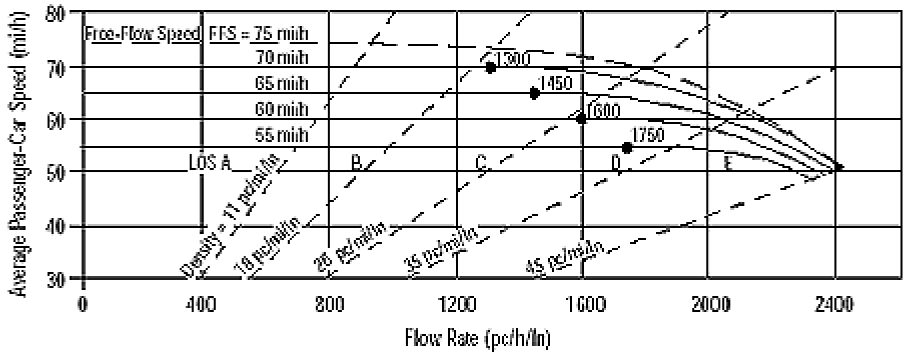
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 PM Peak No Proj*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1195*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*713*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*10.2*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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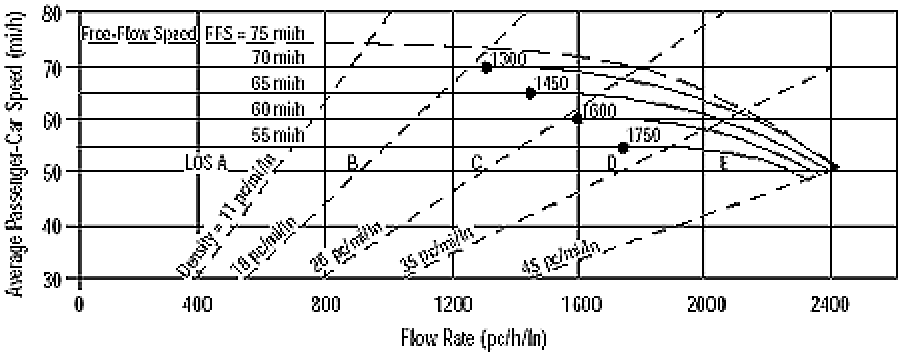
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 AM Pk No Proj + Proj Cons*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1348*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*804*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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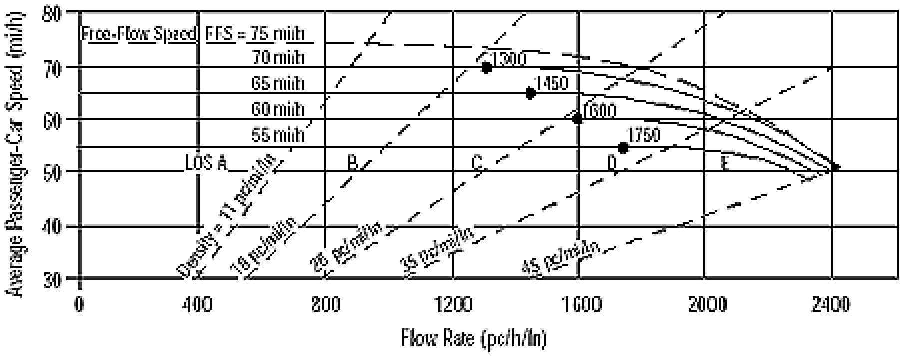
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		**Site Information**	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 AM Pk No Proj + Proj Cons*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1010*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*603*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*8.6*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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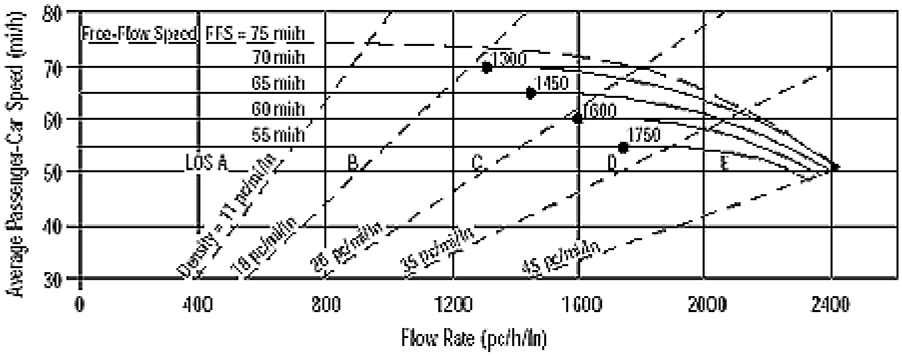
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*
Agency or Company	
Date Performed	*11/18/2008*
Analysis Time Period	*2010 PM Pk No Proj + Proj Cons*

Site Information

Highway/Direction of Travel	*I-8 Eastbound*
From/To	*Between Imperial Dunaway*
Jurisdiction	*Imperial County*
Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1290*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*770*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.0*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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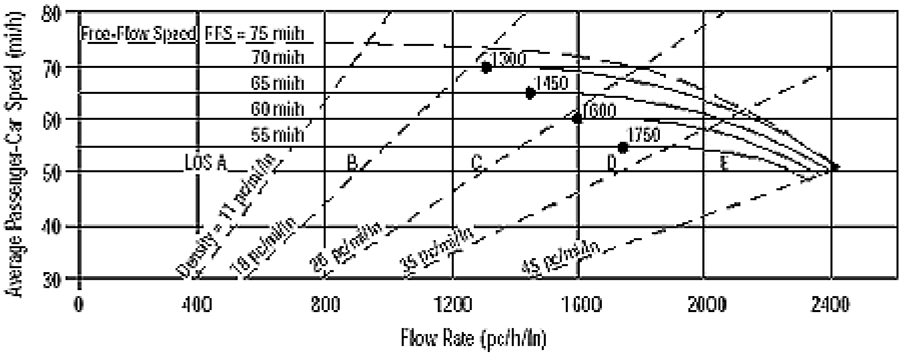
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 PM Pk No Proj + Proj Cons*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1195*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*713*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*10.2*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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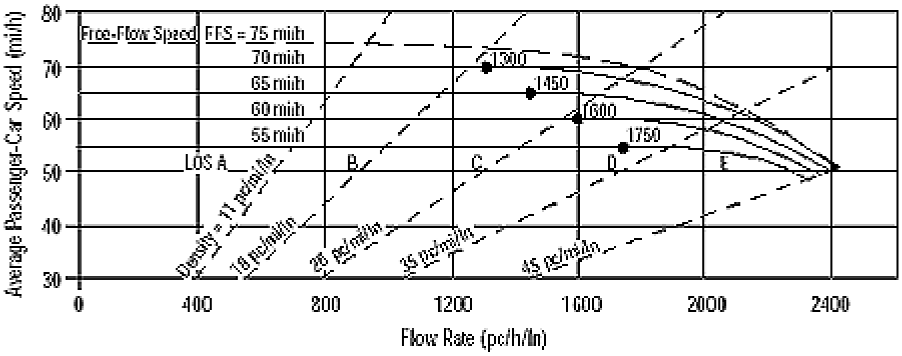
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*		
Agency or Company			
Date Performed	*11/18/2008*		
Analysis Time Period	*2017 AM Peak No Proj*		

Site Information

Highway/Direction of Travel	*I-8 Eastbound*
From/To	*Between Imperial Dunaway*
Jurisdiction	*Imperial County*
Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1310*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*782*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

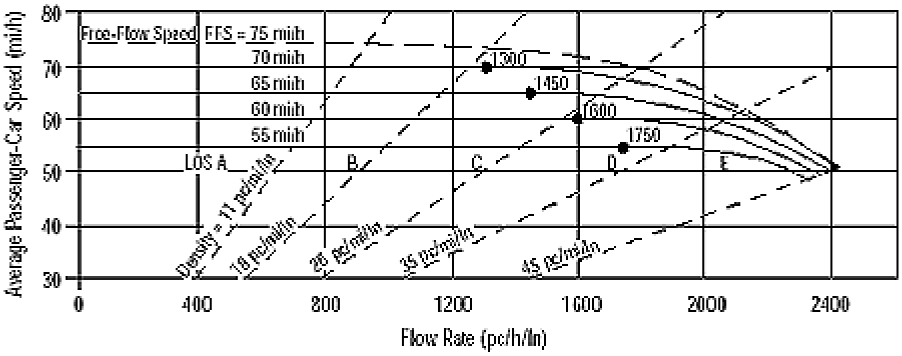
Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 AM Peak No Proj*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1160*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*692*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*9.9*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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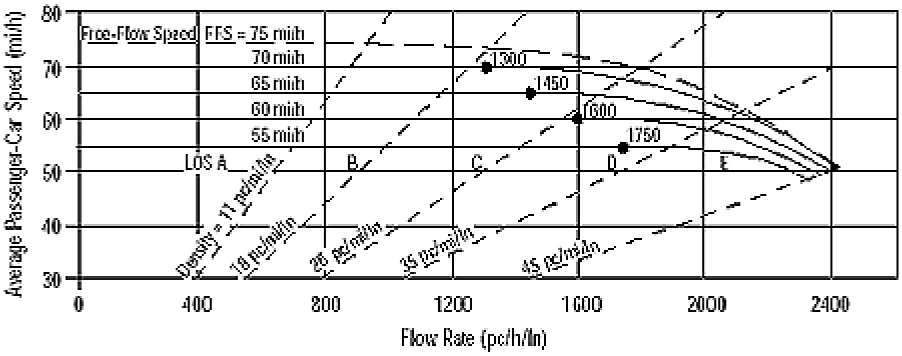
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 PM Peak No Proj*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1480*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*883*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*12.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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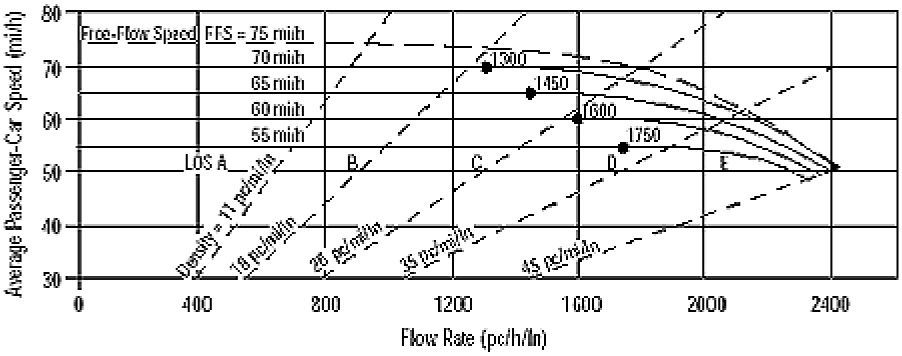
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 PM Peak No Proj*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1375*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*820*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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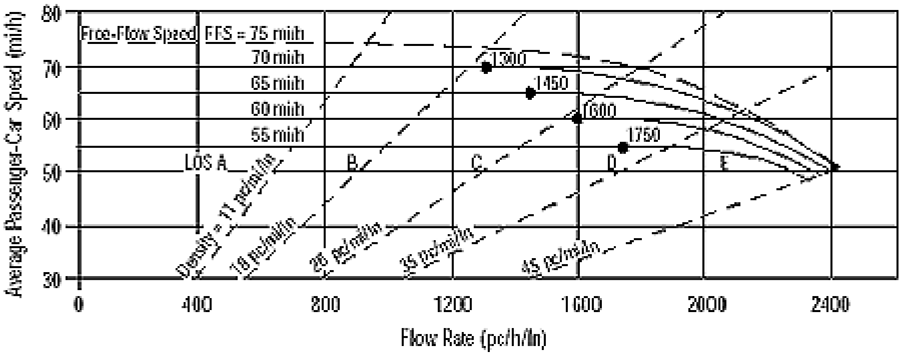
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*
Agency or Company	
Date Performed	*11/18/2008*
Analysis Time Period	*2017 AM Pk No Proj + Proj Oprs*

Site Information

Highway/Direction of Travel	*I-8 Eastbound*
From/To	*Between Imperial Dunaway*
Jurisdiction	*Imperial County*
Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1310*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*782*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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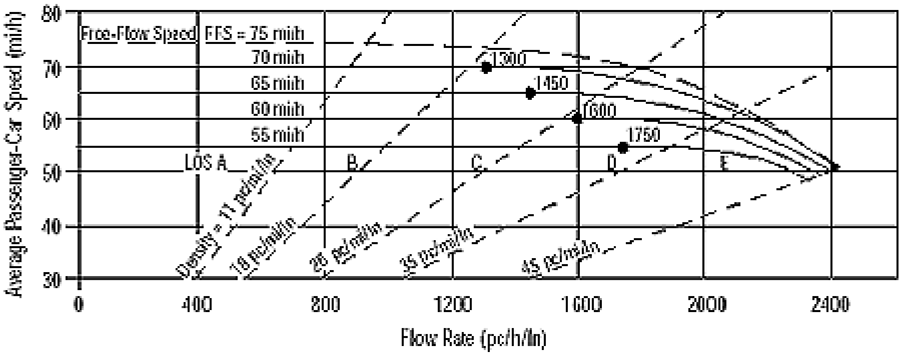
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 AM Pk No Proj + Proj Oprs*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1160*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*692*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*9.9*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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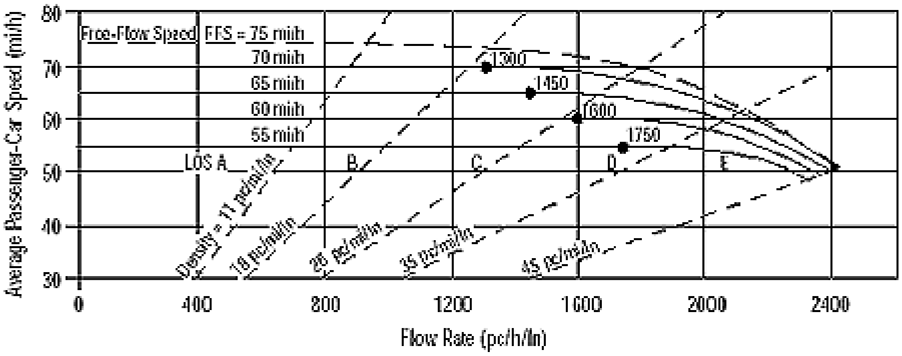
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 PM Pk No Proj + Proj Oprs*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1480*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*883*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*12.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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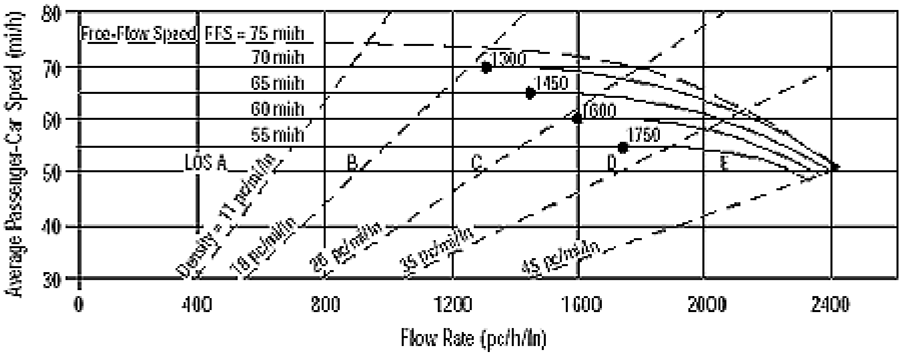
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*Between Imperial Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 AM Pk No Proj + Proj Oprs*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1375*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*820*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*11.7*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exh
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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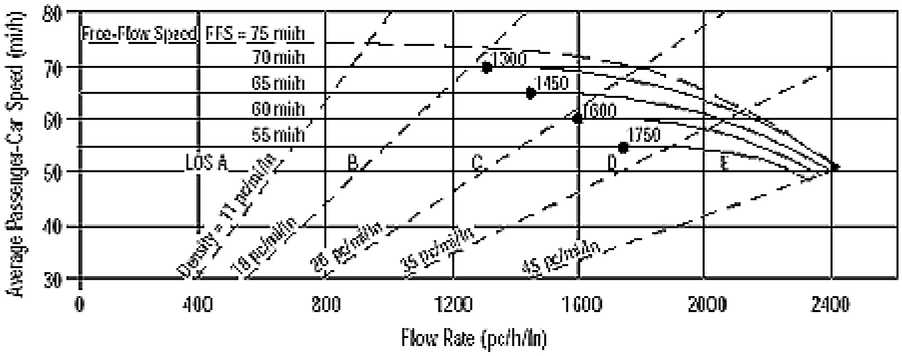
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*Existing AM Peak Hour*	Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1089*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*650*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*9.3*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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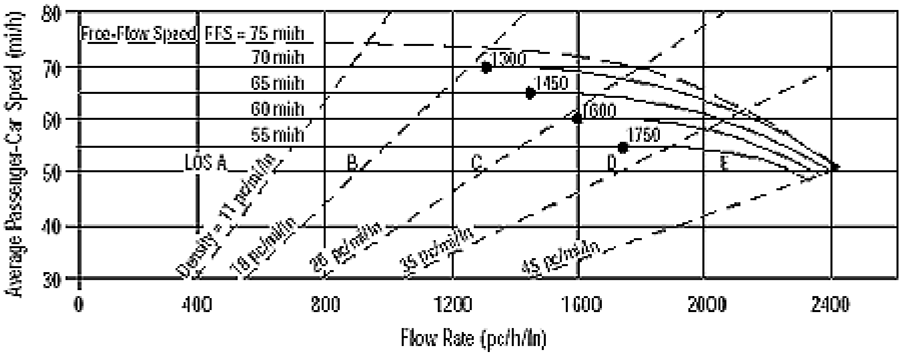
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*
Agency or Company	
Date Performed	*11/18/2008*
Analysis Time Period	*Existing AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-8 Westbound*
From/To	*East of Dunaway*
Jurisdiction	*Imperial County*
Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*955*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*570*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*8.1*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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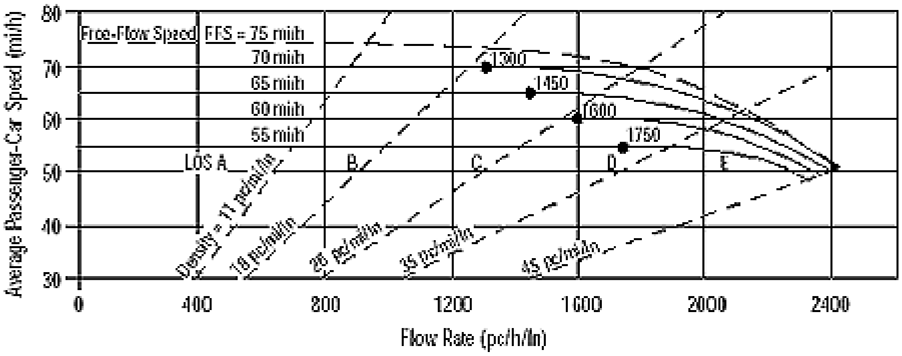
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*
Agency or Company	
Date Performed	*11/18/2008*
Analysis Time Period	*Existing PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-8 Eastbound*
From/To	*East of Dunaway*
Jurisdiction	*Imperial County*
Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1233*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*736*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*10.5*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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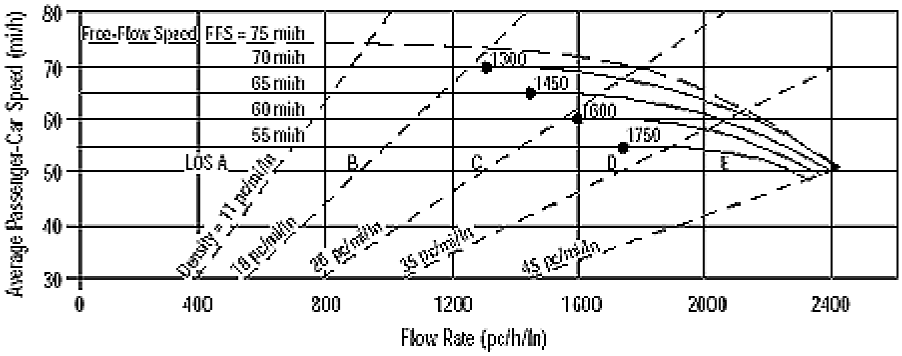
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*
Agency or Company	
Date Performed	*11/18/2008*
Analysis Time Period	*Existing PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-8 Westbound*
From/To	*East of Dunaway*
Jurisdiction	*Imperial County*
Analysis Year	*2008*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1130*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*674*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*9.6*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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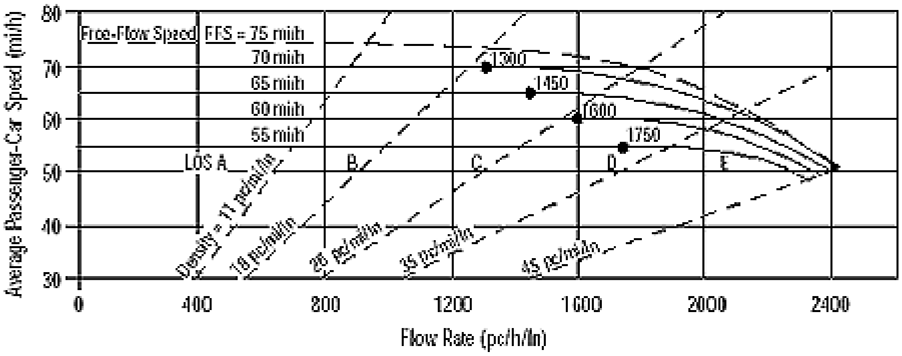
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 AM Peak No Proj*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1155*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*689*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*9.8*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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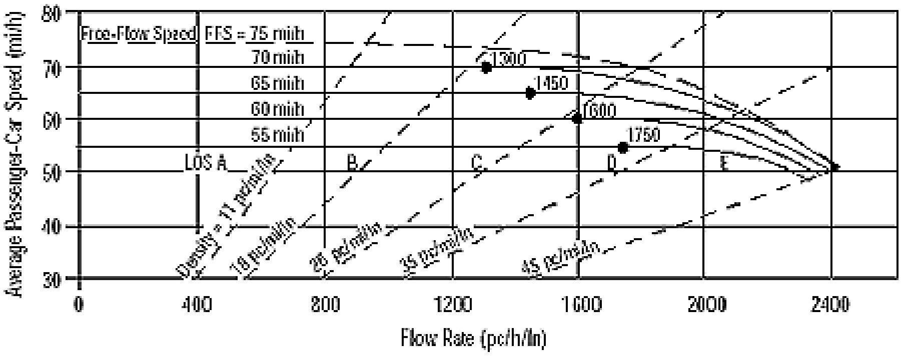
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*
Agency or Company	
Date Performed	*11/18/2008*
Analysis Time Period	*2010 AM Peak No Proj*

Site Information

Highway/Direction of Travel	*I-8 Westbound*
From/To	*East of Dunaway*
Jurisdiction	*Imperial County*
Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1010*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*603*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*8.6*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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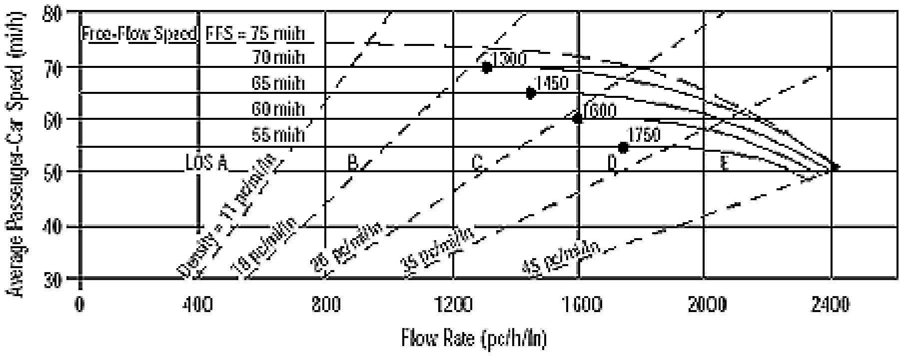
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 PM Peak No Proj*	Analysis Year	*2010*

Site Information

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1305*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*779*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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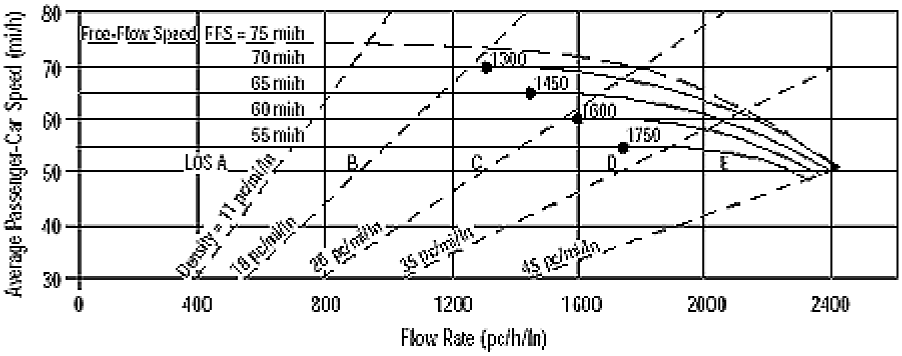
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 PM Peak No Proj*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1200*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*716*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*10.2*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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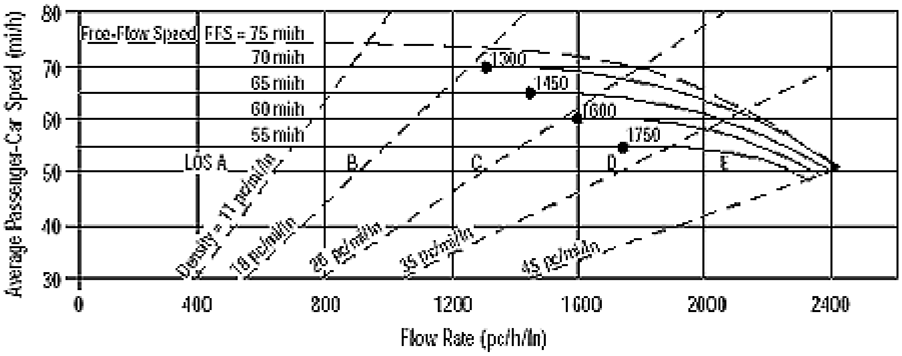
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 AM Pk No Proj+ Proj Cons*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1155*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*689*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*9.8*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary	**Factor Location**

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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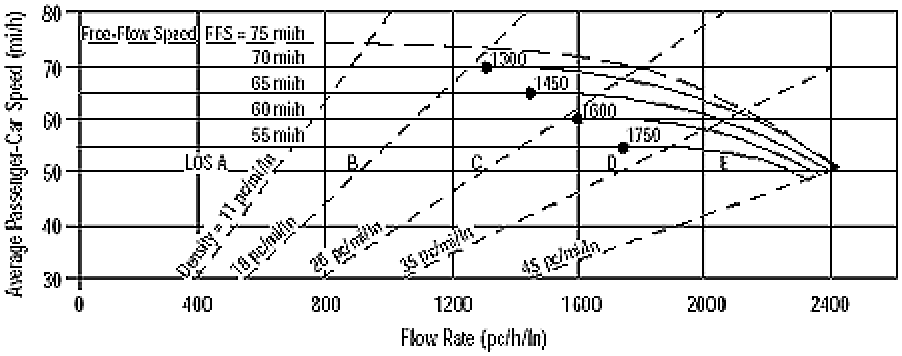
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 AM Pk No Proj+ Proj Cons*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1543*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*921*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*13.2*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary	Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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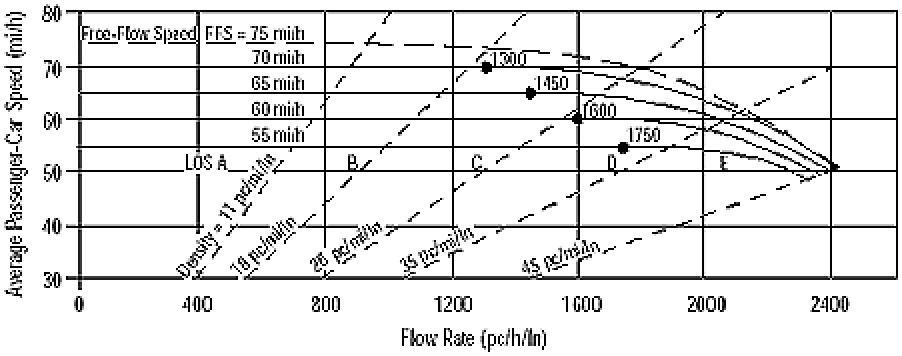
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 PM Pk No Proj+ Proj Cons*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1838*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1097*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	*70.0*	mi/h	S	
D = v_p / S	*15.7*	pc/mi/ln	D = v_p / S	
LOS	*B*		Required Number of Lanes, N	

Glossary	Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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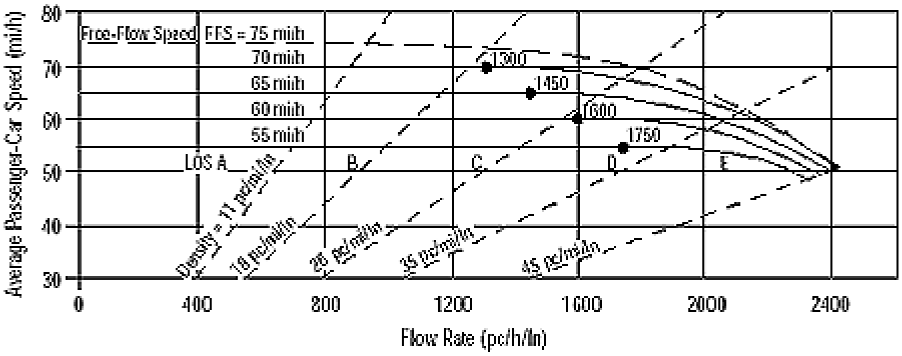
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2010 PM Pk No Proj+ Proj Cons*	Analysis Year	*2010*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1200*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*716*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*10.2*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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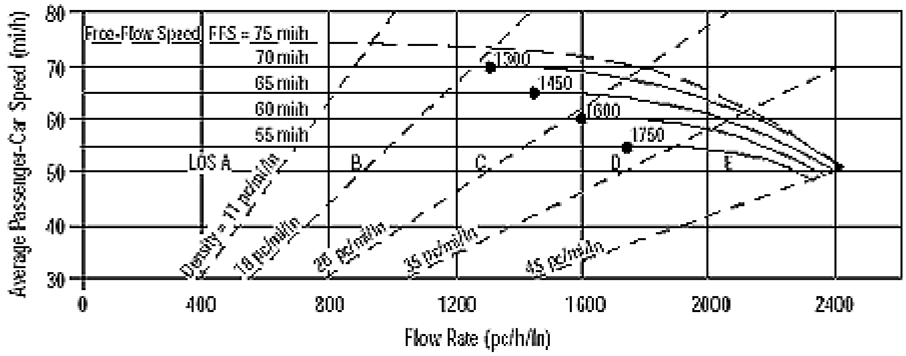
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	*SMA*
Agency or Company	
Date Performed	*11/18/2008*
Analysis Time Period	*2017 AM Peak No Proj*

Site Information

Highway/Direction of Travel	*I-8 Eastbound*
From/To	*East of Dunaway*
Jurisdiction	*Imperial County*
Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1330*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	*70.0*

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*794*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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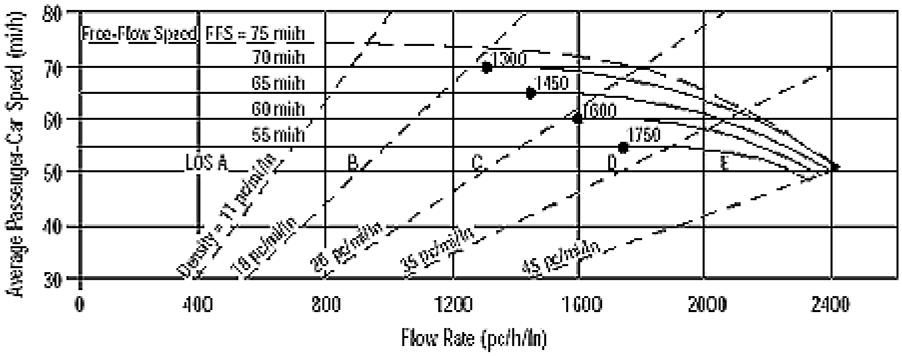
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 AM Peak No Proj*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1165*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*695*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*9.9*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary		Factor Location
N - Number of lanes	S - Speed	

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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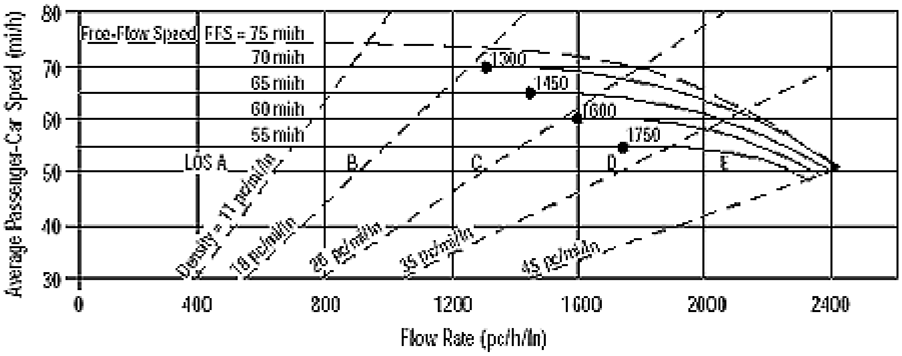
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 PM Peak No Proj*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1505*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*898*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*12.8*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary / Factor Location

N - Number of lanes   S - Speed

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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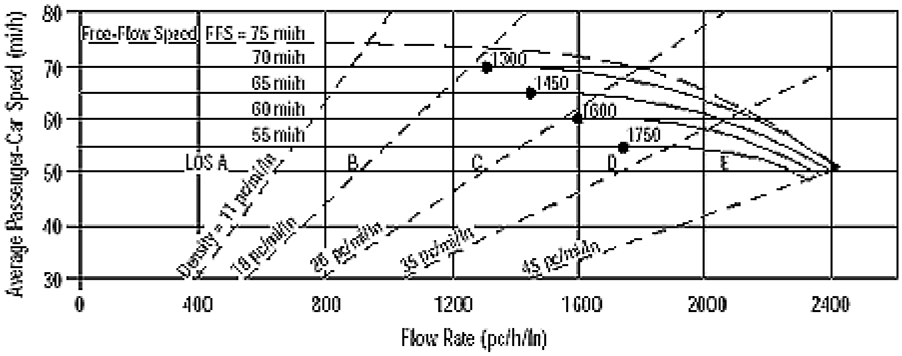
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 PM Peak No Proj*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1380*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*823*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*11.8*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary		Factor Location
N - Number of lanes	S - Speed	

V - Hourly volume	D - Density	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exh
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh

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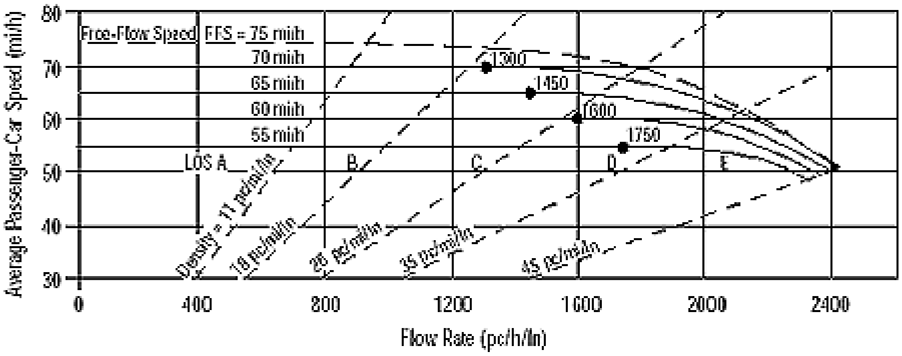
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 AM Pk No Proj+ Proj Oprs*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs				
Volume, V	*1338*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*798*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*11.4*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary	Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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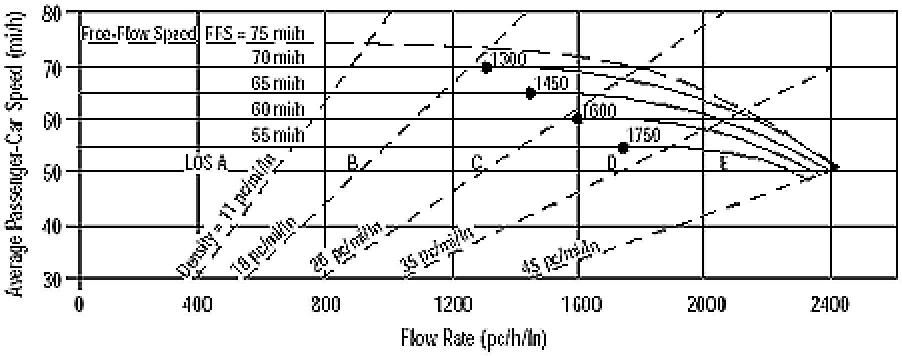
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		**Site Information**	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 AM Pk No Proj+ Proj Oprs*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1265*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	mi
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*755*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*10.8*	pc/mi/ln	D = v_p / S
LOS	*A*		Required Number of Lanes, N

Glossary	**Factor Location**

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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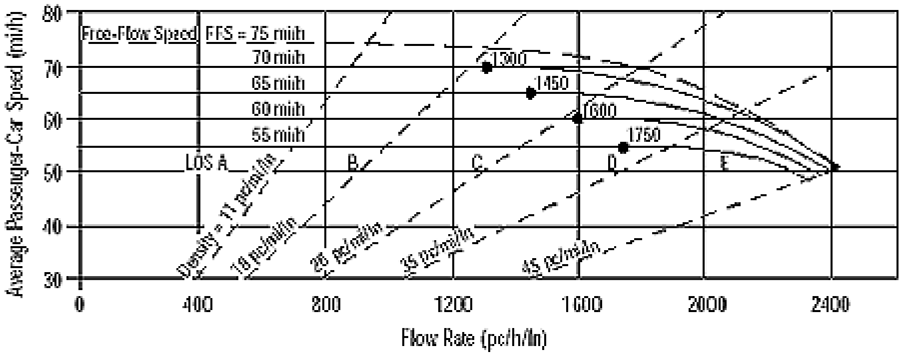
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		Site Information	
Analyst	*SMA*	Highway/Direction of Travel	*I-8 Eastbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 PM Pk No Proj+ Proj Oprs*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1601*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs			Calc Speed Adj and FFS	
Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			Design (N)
Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*955*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*13.6*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary	Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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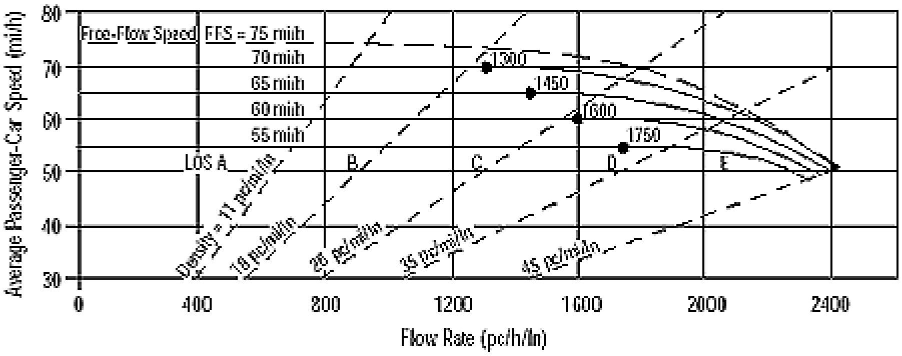
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information / Site Information

Analyst	*SMA*	Highway/Direction of Travel	*I-8 Westbound*
Agency or Company		From/To	*East of Dunaway*
Date Performed	*11/18/2008*	Jurisdiction	*Imperial County*
Analysis Time Period	*2017 PM Pk No Proj+ Proj Oprs*	Analysis Year	*2017*

Project Description Solar Two AFC

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	*1384*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*14*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*2*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	mi
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.931*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	
Interchange Density	*0.50*	I/mi	f_{ID}	
Number of Lanes, N	*2*		f_N	
FFS (measured)	*70.0*	mi/h	FFS	*70.0*
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)
			Design LOS
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*826*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	*70.0*	mi/h	S
D = v_p / S	*11.8*	pc/mi/ln	D = v_p / S
LOS	*B*		Required Number of Lanes, N

Glossary / Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exl
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exh
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exh
DDHV - Directional design hour volume			

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URS

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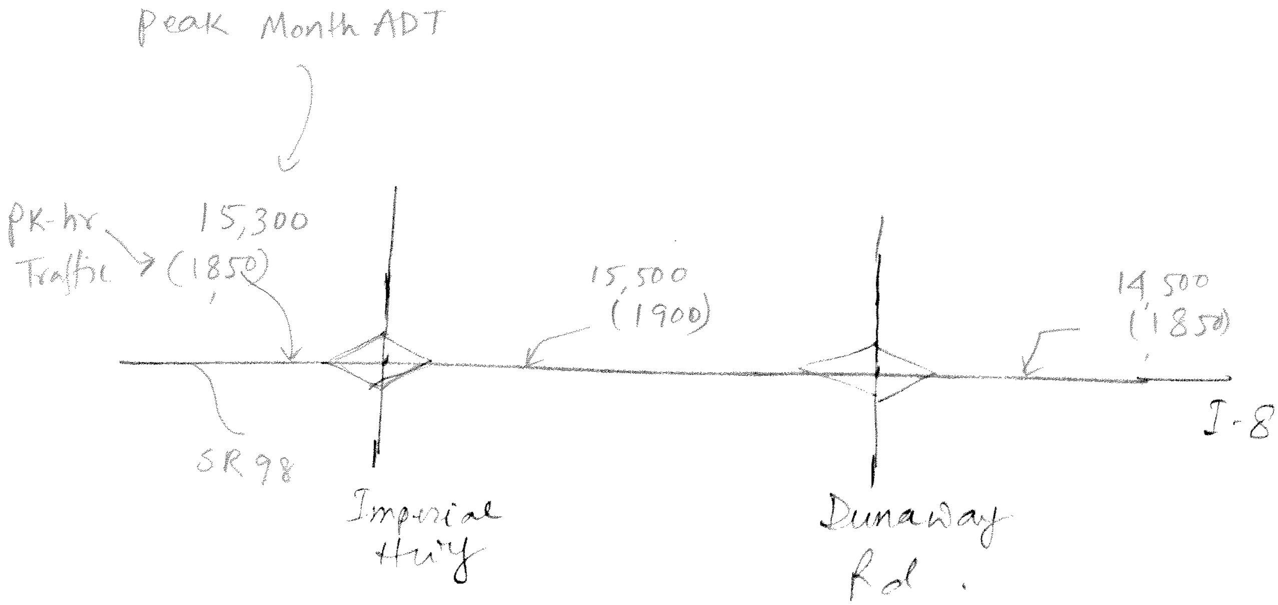
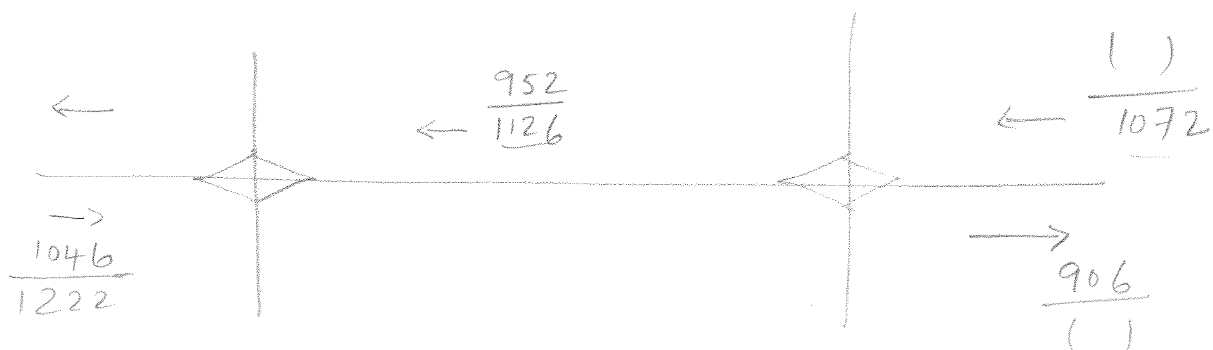
Description | Computed by ASM ALAM | Date 11/18/08

Checked by | Date

Reference

Existing (2007) Traffic





12% = K = AM
15% = K = PM

D = 64% = AM
D = 60% = PM.

URS

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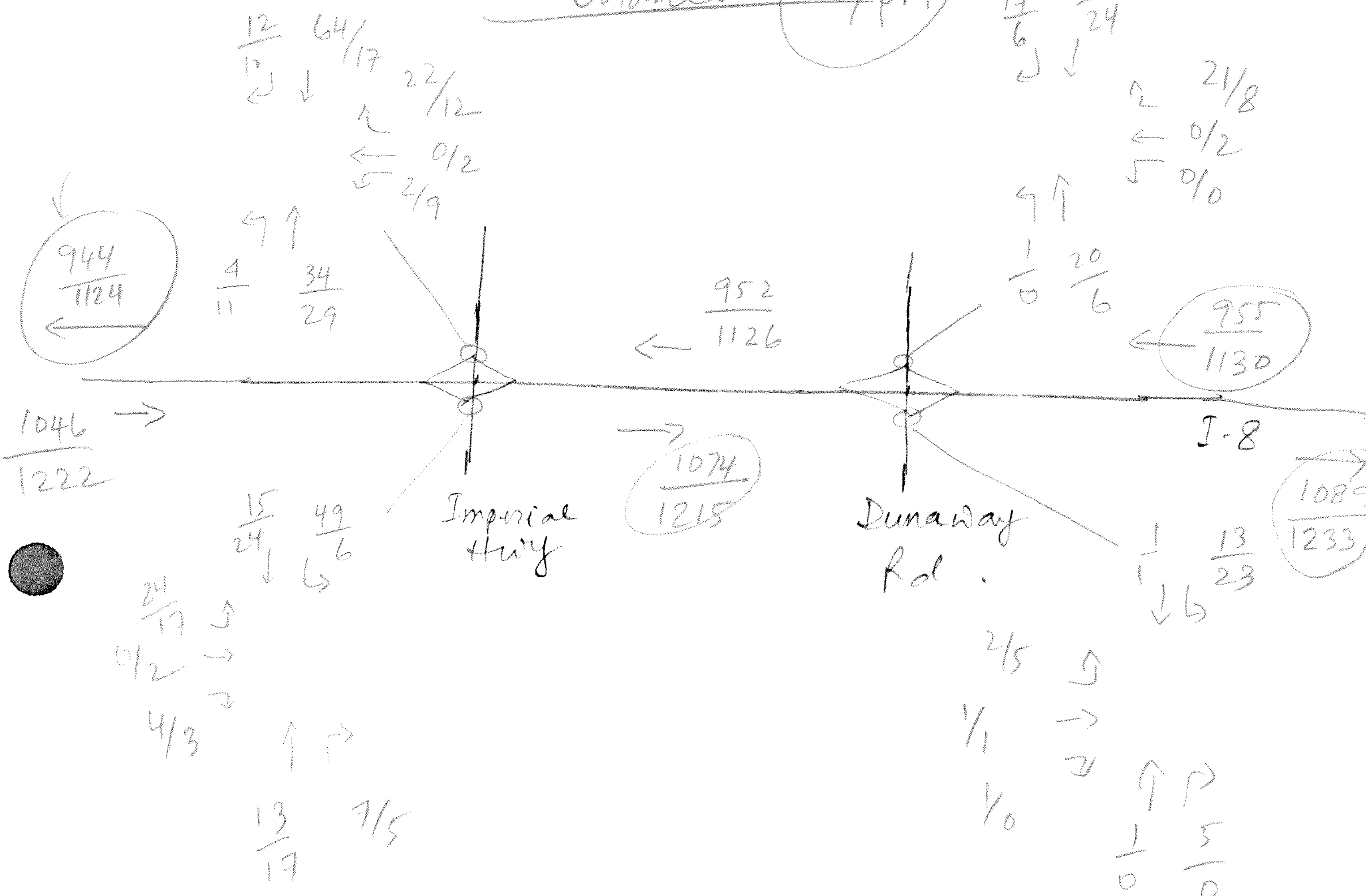
Date | Reference

existing traffic Balanced AM/PM



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Job SOLAR 2

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Project No.

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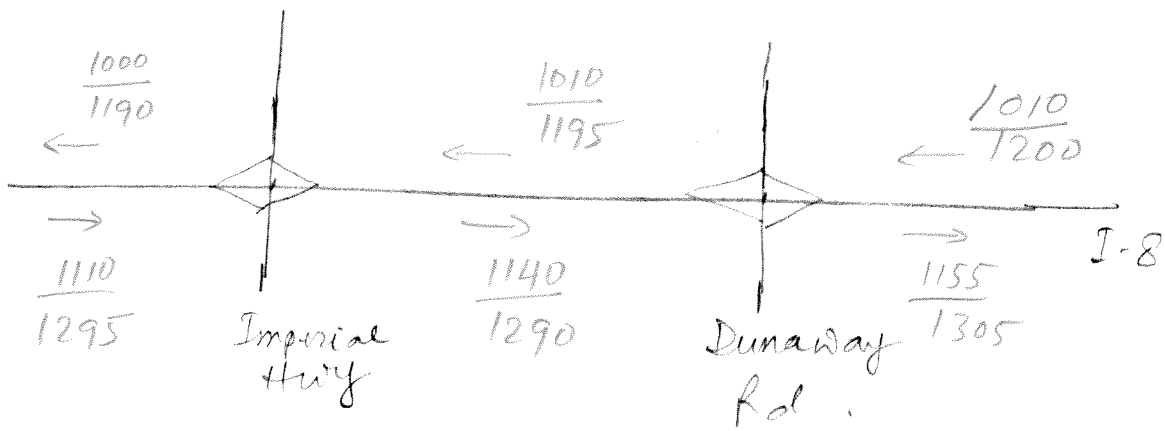
Date 11/18/08

Date

Reference

2010
NO project

AM
PM



URS

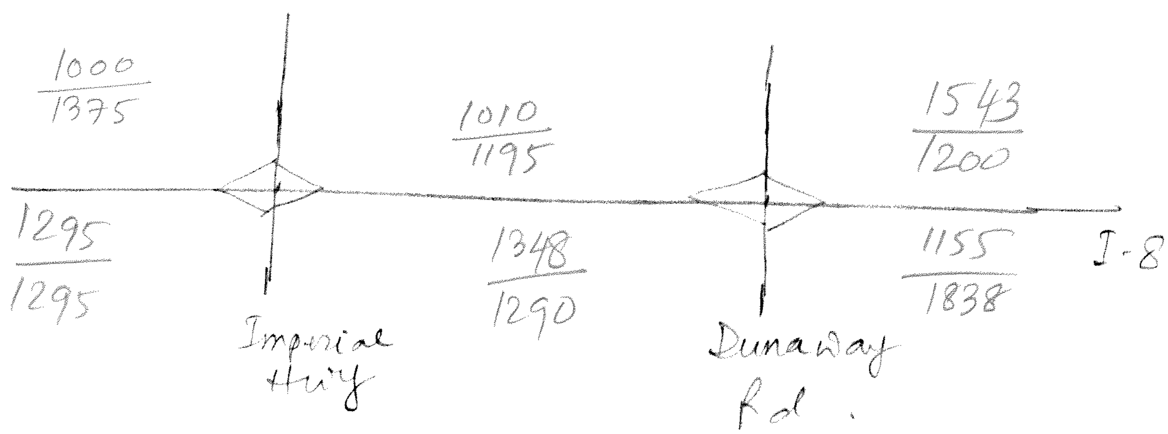
Job SOLAR 2 | Project No. | Page ___ of ___ | Sheet ___ of ___

Description ___ | Computed by ASM ALAM | Date 11/18/08

Checked by ___ | Date ___

Reference

2010
No proj + proj const traffic



URS

Job SOLAR 2

Description

Project No.

Computed by ASM ALAM

Checked by

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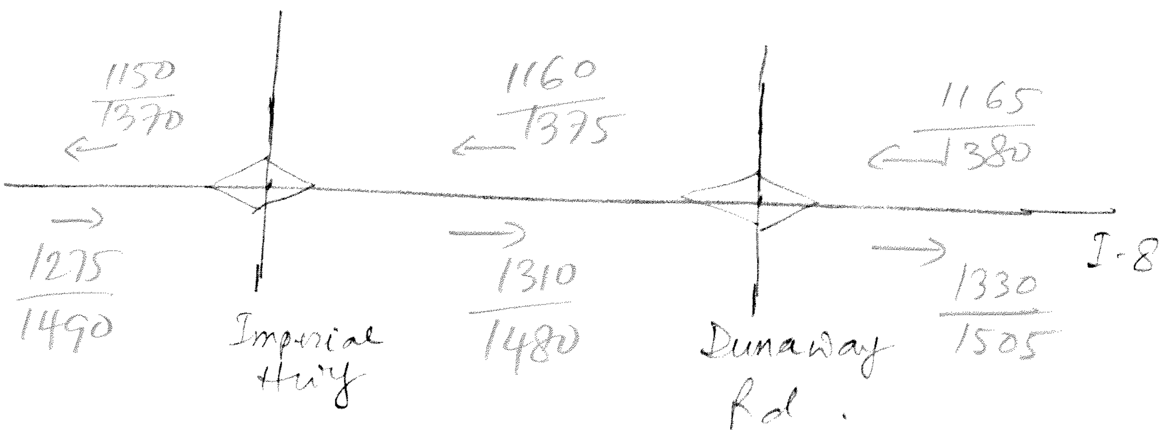
Date 11/18/18

Date

Reference

2017
No Project
AM/PM



URS

Job SOLAR 2

Description

Project No.

Computed by ^ S M ALAM

Checked by

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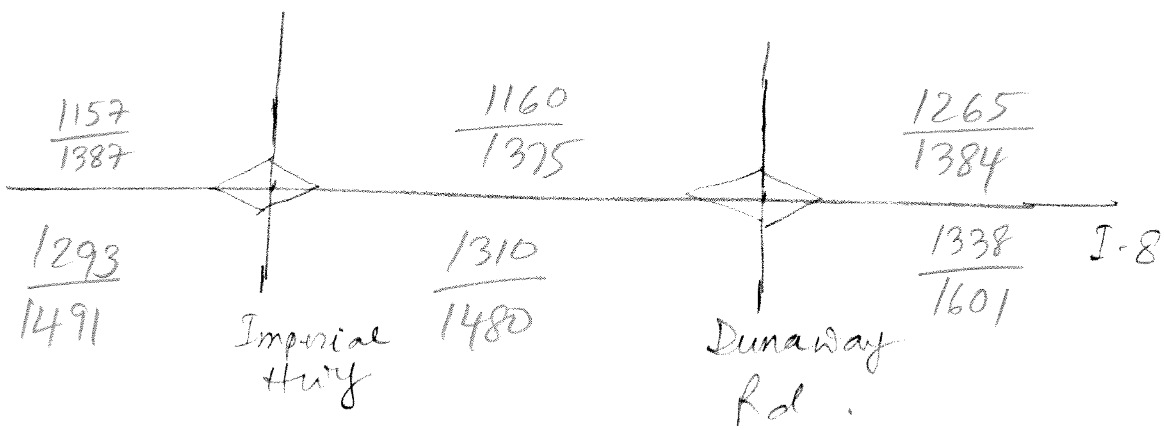
Sheet ___ of ___

Date 11/18/08

Date

Reference

2017 No Proj + proj ops traffic



URS

Job SOLAR 2

Description

Project No.

Computed by ASM ALAM

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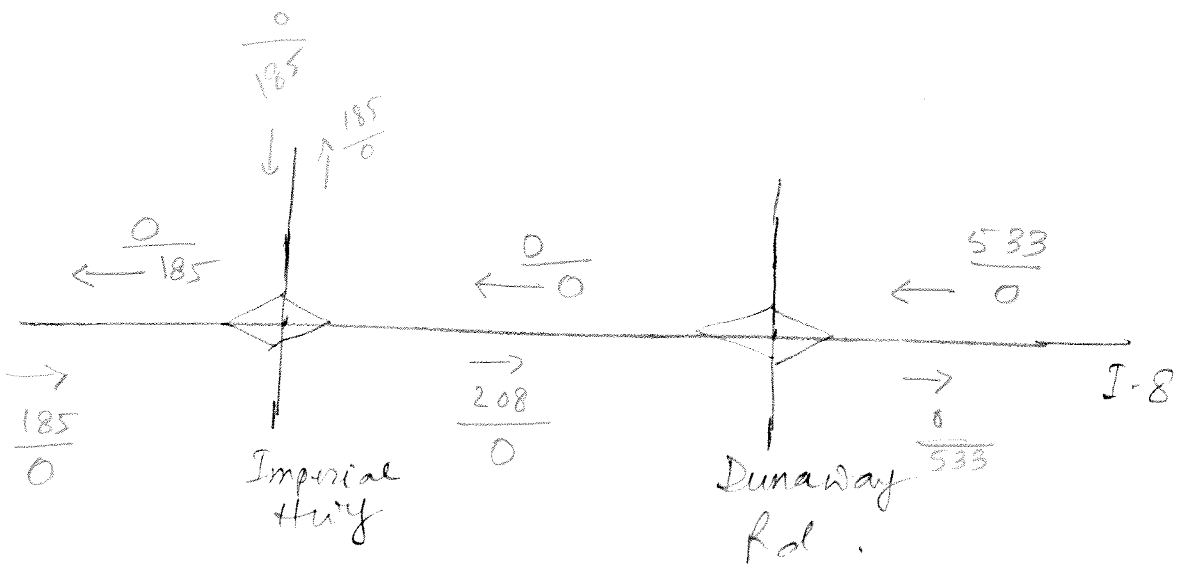
Date

Reference

2010 Site generated Traffic



URS

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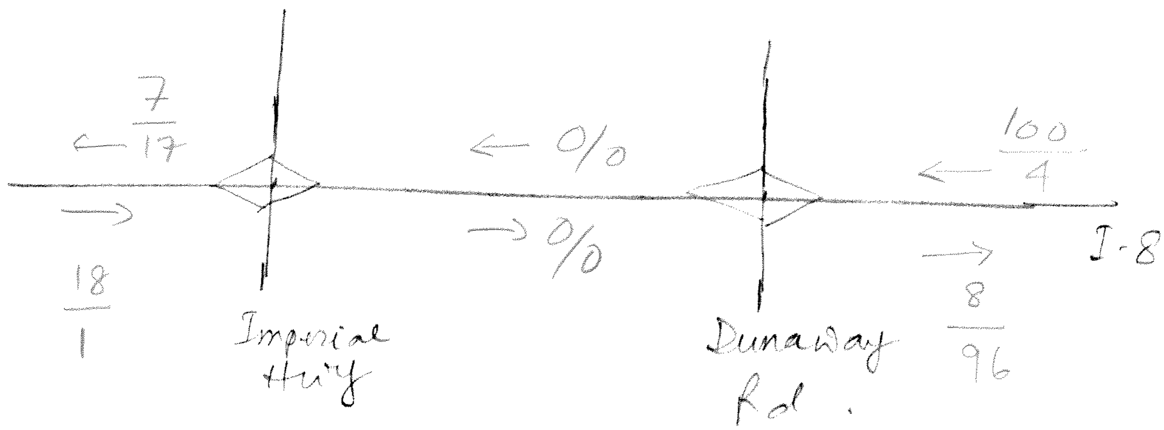
Description ______________ | Computed by ASM ALAM | Date 11/18/08

______________ | Checked by ______________ | Date ______________

Reference

2017 Site Generated Traffic



CALTRANS TRAFFIC VOLUMES
LATEST TRAFFIC YEAR SELECTED
PEAK HOUR VOLUME DATA

									AM PEAK								PM PEAK						
DI	RTE	CO	PRE	PM	CS	LEG	YR	Dir	1 WAY PHV	% K	% D	% KD	HR	DAY	MNTH	Dir	1 WAY PHV	% K	% D	% KD	HR	DAY	MNTH
11	008	SD	R	18.73	824	B	07	W	4625	6.92	69.23	4.79	7	THU	AUG	E	4300	7.5	59.43	4.46	16	MON	MAR
11	008	SD	R	23.64	979	O	07	W	2472	6.17	66.2	4.09	7	WED	JAN	E	3006	7.95	62.47	4.97	17	FRI	APR
11	008	SD	R	37.83	811	A	07	W	1156	9.29	59.04	5.49	12	SUN	JUL	E	1393	10.2	64.82	6.61	17	FRI	MAR
11	008	SD	R	51.98	621	B	07	W	1122	10.87	60.78	6.6	11	SAT	JUN	E	1331	12.98	60.34	7.83	18	FRI	MAY
11	008	SD	R	65.90	981	A	07	W	978	8.83	70.56	6.23	11	SUN	SEP	W	1028	9.86	66.41	6.55	13	SAT	JUN
11	008 RTE 98	IMP	R	10.29	993	B	07	E	1046	11.39	61.28	6.98	10	FRI	NOV	E	1222	14.33	56.89	8.15	15	MON	SEP
11	008 Imperial Hwy	IMP	R	10.29	994	A	07	W	952	11.53	63.38	7.31	12	SAT	JUN	W	1126	13.78	62.7	8.64	13	MON	FEB
11	008 Dunaway Rd	IMP	R	23.48	624	A	07	E	906	12.45	54.68	6.81	10	THU	NOV	W	1072	13.53	59.52	8.05	14	TUE	DEC
11	008	IMP	R	36.97	982	B	07	E	1078	9.87	57.19	5.64	10	SAT	DEC	W	1256	11.6	56.68	6.57	15	TUE	DEC
11	008	IMP	R	40.94	638	B	07	W	1515	7.49	58.81	4.4	12	SUN	MAR	E	1889	8.95	61.35	5.49	17	FRI	FEB
11	008	IMP	R	96.54	688	X	07	E	741	10.79	52.82	5.7	12	SUN	JUL	E	817	9.8	64.08	6.28	16	SUN	JUL
11	008	IMP	R	96.55	995	B	07	W	1058	9	59.67	5.37	10	MON	MAY	E	1068	9.1	59.57	5.42	14	SUN	JUL
11	008	IMP	R	96.99	988	B	07	W	861	8.23	61.11	5.03	9	SAT	SEP	E	940	9.24	59.38	5.49	13	TUE	MAR
05	009	SCR		.046	48	A	05	S	1383	12.07	59.64	7.2	12	MON	NOV	S	1299	10.67	63.34	6.76	15	WED	NOV
05	009	SCR		.63	681	A	05	S	263	6.57	84.57	5.56	7	MON	FEB	N	337	10.88	65.44	7.12	17	WED	SEP
05	009	SCR		8.11	430	B	05	S	1202	7.63	74.71	5.7	7	WED	MAY	N	1285	9.11	66.93	6.1	17	FRI	AUG
05	009	SCR		13.04	169	B	05	S	658	7.99	63.09	5.04	7	TUE	AUG	N	736	9.57	58.88	5.63	15	FRI	MAY
05	009	SCR		27.09	49	B	05	N	314	12.91	92.35	11.93	7	MON	NOV	S	256	12.19	79.75	9.72	17	FRI	MAY
04	009	SCL		7.09	170	A	07	S	456	10.67	61.13	6.52	11	SAT	JUL	N	537	9.69	79.2	7.68	22	SAT	JUL
04	009	SCL		11.45	171	B	07	N	1613	7.59	60.8	4.62	8	WED	OCT	N	1841	8.84	59.64	5.27	15	TUE	JAN
07	010	LA		19.71	783	O	07	W	872	10.62	93.46	9.93	9	WED	MAR	E	581	9.11	72.63	6.61	17	THU	MAR
07	010	LA		24.31	785	A	07	W	1532	6.38	87.14	5.56	9	THU	JAN	E	1561	9.78	57.9	5.66	15	SAT	DEC
07	010	LA	R	3.89	402	B	06	W	7499	7.61	52.15	3.97	7	WED	SEP	E	6834	6.82	53.07	3.62	14	WED	MAY
07	010	LA		19.67	752	O	07	W	9883	6.51	61.11	3.98	7	THU	JAN	E	10297	6.84	60.59	4.14	17	THU	MAY
07	010	LA		24.32	721	A	07	E	7435	6.26	52.11	3.26	11	SAT	JAN	E	7636	6.05	55.31	3.35	17	MON	FEB
07	010	LA		30.3	429	A	07	E	7780	6.36	54.98	3.49	12	FRI	APR	E	7808	6.25	56.09	3.51	14	THU	NOV
07	010	LA		34.28	48	O	07	E	7338	5.9	55.9	3.3	12	WED	NOV	E	7613	6.12	55.93	3.42	14	THU	DEC
07	010	LA		40.84	173	A	07	W	7051	5.52	59.03	3.26	6	TUE	JUN	E	7780	6.9	52.1	3.6	17	THU	SEP
07	010	LA		47.11	54	B	06	W	9375	6.41	56.03	3.59	7	FRI	MAY	E	8876	6.17	55.07	3.4	13	SAT	MAY
08	010	SBD		3.468	842	B	05	W	8690	6.43	53.01	3.41	8	THU	FEB	W	9072	6.62	53.74	3.56	18	FRI	NOV
08	010	SBD		9.936	707	O	05	W	5484	6.59	54.11	3.57	7	WED	JUL	W	5299	6.57	52.48	3.45	14	FRI	JUL
08	010	SBD		13.17	824	B	06	W	7819	6.37	54.25	3.46	12	SUN	APR	W	7640	6.49	52.05	3.38	13	SAT	NOV
08	010	SBD	R	24.24	858	B	06	E	7273	6.68	52.41	3.5	7	THU	JAN	E	7395	6.79	52.46	3.56	14	FRI	OCT

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT TOTAL By Axle 2	3	4	5+	% TRUCK AADT By Axle 2	3	4	5+	EAL 2-WAY (1000)	YEAR VER/ EST
008	11	SD	T.407	A	SAN DIEGO, SUNSET CLIFFS BOULEVARD	21800	218	1	179	16	6	16	82.3	7.4	2.9	7.4	14	78E
008	11	SD	L2.379	B	JCT RTE 5 LT LANES	104000	1248	1.2	1058	89	9	92	84.8	7.1	.7	7.4	78	78V
008	11	SD	L2.379	A	JCT RTE 5 LT LANES	140000	3920	2.8	2622	564	169	564	66.9	14.4	4.3	14.4	363	83V
008	11	SD	2.41	B	SAN DIEGO, JCT. RTE. 163	212000	5724	2.7	4430	618	143	532	77.4	10.8	2.5	9.3	416	83E
008	11	SD	2.41	A	SAN DIEGO, JCT. RTE. 163	215000	6020	2.8	4702	602	144	572	78.1	10	2.4	9.5	438	83E
008	11	SD	4.378	B	SAN DIEGO, JCT. RTE. 805	203000	6496	3.2	4878	643	221	754	75.1	9.9	3.4	11.6	523	83E
008	11	SD	5.638	B	JCT. RTE. 15	248000	7440	3	4352	945	312	1830	58.5	12.7	4.2	24.6	916	83V
008	11	SD	5.638	A	JCT. RTE. 15	224000	7840	3.5	5018	902	353	1568	64	11.5	4.5	20	851	84E
008	11	SD	10.57	B	FLETCHER PARKWAY	192000	7104	3.7	4248	902	249	1705	59.8	12.7	3.5	24	856	84V
008	11	SD	10.57	A	FLETCHER PARKWAY	176000	7744	4.4	4375	1193	395	1781	56.5	15.4	5.1	23	935	78V
008	11	SD	15.8	B	EL CAJON, JCT. RTE. 67 NORTH	183000	8601	4.7	4636	1127	396	2443	53.9	13.1	4.6	28.4	1167	78V
008	11	SD	15.8	A	EL CAJON, JCT. RTE. 67 NORTH	141000	4089	2.9	2265	462	143	1219	55.4	11.3	3.5	29.8	563	78V
008	11	SD	R18.727	A	GREENFIELD DRIVE	84000	5796	6.9	3054	452	139	2150	52.7	7.8	2.4	37.1	911	86V
008	11	SD	R37.831	B	JCT. RTE. 79 NORTH, JAPATUL VALLEY ROAD	26500	3180	12	1250	188	95	1647	39.3	5.9	3	51.8	643	86E
008	11	SD	R37.831	A	JCT. RTE. 79 NORTH, JAPATUL VALLEY ROAD	21100	2870	13.6	933	224	83	1630	32.5	7.8	2.9	56.8	628	00E
008	11	SD	R51.98	B	CAMERON ROAD	17000	2319	13.64	873	106	47	1293	37.66	4.57	2.03	55.74	493	07V
008	11	SD	R65.904	B	JCT. RTE. 94 SOUTH	15900	2209	13.89	790	101	51	1267	35.78	4.59	2.29	57.34	482	05V
008	11	SD	R65.904	A	JCT. RTE. 94 SOUTH	15700	2223	14.16	795	102	51	1275	35.78	4.59	2.29	57.34	485	05V
008	11	IMP	R10.01	B	JCT. RTE. 98	15000	2085	13.9	746	96	48	1195	35.8	4.6	2.3	57.3	454	05E
008	11	IMP	R10.01	A	JCT. RTE. 98	13000	1807	13.9	647	83	42	1035	35.8	4.6	2.3	57.3	394	05E
008	11	IMP	R23.48	A	DUNAWAY ROAD	13300	2091	15.72	642	98	43	1308	30.69	4.68	2.06	62.57	489	07V

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 41: Please provide a copy of the traffic study for the Desert Springs Resort development, so the traffic associated with this cumulative project can be reviewed.

Response: The traffic study for Desert Springs Resort development is provided as Attachment TRAF-3 to this response.

ATTACHMENT TRAF-3

Desert Springs Resort Traffic Impact Study

Desert Springs Resort, LLC
5776 Ruffin Road
San Diego, California 92123

Stantec

August 31, 2007

Executive Summary

Stantec prepared a traffic impact study to evaluate the impacts of the Desert Springs Resort project on local and regional traffic and to recommend applicable mitigation measures. The project is located in southwest Imperial County, California on a 1,236-acre site northwest of the Boley Road/Westmorland Road intersection. The project constructs 900 RV sites, 400 water ski lots, 20 one-acre estate lots, and a resort community containing recreational and water sports communities, four lakes, interconnected waterways, clubhouse facilities, a golf course, and race tracks among other components. The project evaluates operations under existing, baseline 2013, baseline 2013 with project, cumulative 2030, and cumulative 2030 with project conditions. Study intersections include the Interstate 8 Eastbound and Westbound Ramps at Dunaway Road, Evan Hewes Highway at Dunaway Road and Huff Road, and Boley Road at Huff Road and Westmorland Road.

All intersections currently operate at an acceptable LOS A. Under 2013 conditions, based on a 1.65 percent escalation factor compounded annually, intersections will operate at an acceptable LOS B or better.

The project generates 5,518 average weekday, 290 AM peak, 540 PM peak, 5,359 Saturday, 634 Saturday peak, and 634 Sunday peak hour trips. Most trips distribute south toward Interstate 8.

All intersections will operate at an LOS C or better under 2013 baseline plus project conditions.

Intersections continue to operate acceptably under both 2030 cumulative and 2030 cumulative with-project conditions.

Mitigation measures include the construction of site frontage improvements, equitable share contributions to the north-south facility which connects SR-78 to I-8, and construction of a full intersection at the site access.

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Appendices

1.0 Introduction

This report documents the results of a traffic impact analysis prepared for the Desert Springs Resort project in unincorporated Imperial County. Study intersections include (1) Interstate 8 Eastbound Off-Ramp/Dunaway Road, (2) Interstate 8 Westbound Off-Ramp/Dunaway Road, (3) West Evan Hewes Highway/Dunaway Road, (4) West Evan Hewes Highway/Huff Road, (5) Huff Road/Boley Road, and (6) Boley Road/Westmorland Road. Study periods include (1) AM (2) PM (3) Saturday, and (4) Sunday peak hours. Study scenarios include (1) Existing 2007, (2) Baseline 2013, (3) Baseline 2013 Plus Project, (4) Cumulative 2030, and (5) Cumulative 2030 Plus Project. Imperial County is the lead agency regulating California Environmental Quality Act (CEQA) compliance. The study is prepared pursuant to *County of Imperial Department of Public Works Traffic Study and Report Policy* dated March 12, 2007 (Policy). The *2002 Imperial County Transportation Plan Highway Element Final Report* dated November 2002 (Plan), the *Kitsap County Motorsports Complex* (Kitsap Motorsports) *Preliminary Transportation Assessment* dated January 2004, the *Otay River Valley Regional Park (Otay) Staging Areas Traffic Impact Assessment* dated February 21, 2006, and the *F1 Long Island Sports Facility (F1 Facility) Traffic Impact Study* dated March 2006 serve as source documents. The Institute of Transportation Engineers (ITE) *Trip Generation, Seventh Edition (2003)* and the *Highway Capacity Manual (HCM) (2000)* serve as technical references.

1.1 PROJECT LOCATION

Desert Springs Resort, LLC submitted a tentative map to develop a 1,236-acre property into the Desert Springs Resort Recreational Development. The site is located approximately 35 miles south of the Salton Sea, 20 miles northwest of Calexico, 8 miles north of Mexico, 5 miles west of El Centro, 2 miles west of the El Centro Naval Facility, and 0.8 miles west of Huff Road. The site is northwest of the Westmorland Road/Boley Road intersection. The property is located on APN 034-240-014; 034-290-027, 029 to 032, 034-300-003, 006, 011, 029, and 032 to 036. The existing *Imperial County General Plan* Land Use Designation is Agricultural. The existing zoning consists of A3 Heavy Agriculture, GS Government/Special Public, and S2 Open Space/Preservation. Property conversion to a destination resort with a variety of land uses requires preparation of a specific plan. This traffic impact report serves as a specific plan component.

1.2 REGIONAL SETTING

Figure 1.2-1 shows the project regional setting within the context of the Interstate and State Highway Systems. The California portion of Interstate 10 (I-10) runs east-west between Los Angeles to the west and the Arizona state line to the east. I-10 is approximately 80 miles north of the project site on the north side of the Salton Sea. Interstate 8 (I-8) runs east-west between San Diego to the west and the interchange with I-10 to the east approximately 35 miles southeast of Phoenix Arizona. State Route 86 (SR-86) runs north south between I-10 to the north and I-8 to the south. SR-78 shares a portion of the right-of-way with SR-86 between Westmorland and the West Main Street junction with SR-86.

1.3 LOCAL SETTING

Figure 1.3-1 shows the project local setting within the context of the local and regional roads. Dunaway Road and Drew Road provide access to I-8. West Evan Hewes Highway (County Road S80) runs east-west approximately 2 miles south of the project site. Forrester Road is a primary north-south arterial approximately 3 miles east of the project site. Imler Road runs east-west approximately 3 miles north of the project site, joining Huff Road to the west with Forrester Road to the east. Huff Road runs north-south approximately 0.8 miles east of the project site with its southern terminus at West Evan Hewes Highway. Boley Road runs east-west between its western terminus east of the project site and its eastern terminus with Huff Road. Westmorland Road runs north-south between Evan Hewes Highway to the south and Boley Road to the north.

1.4 PROJECT DESCRIPTION

Figure 1.4-1 shows the site plan. The Desert Springs Resort is a self-contained destination recreational resort complex with diverse land uses as follows:

1. Recreational Vehicle Resort Community with 900 40-foot by 100-foot recreational vehicle (RV) lots, a primary clubhouse with restaurant, pool, tennis courts, and a boat dock
2. Water Sports Community with 400 40-foot by 100-foot recreation lots. These water ski lots border the four water ski / wakeboard lakes and interconnecting waterways
3. Road Course and Off-Road Track complexes
4. An 18-hole golf course
5. Boat launch and marina with community-wide primary beach
6. A 45-acre Gasoline Alley with food court, lawn area, and storage garages
7. Trailer storage area
8. Public Works area serving water treatment, storage, waste water collection, and treatment needs
9. Boat basin offering water and land race viewing

The project proposes a main access at the Boley Road/Westmorland Road intersection in the southeast corner of the project. A secondary access from Payne Road is available for emergency use.

A primary access loop circles the development and circles the water sports community. Secondary roads connect the primary access loop with the remainder of the diverse land uses.

Desert Springs is a “members-only” resort with approximately 1,000 members. Only a portion of these members are expected to use the resort on a given day with more members on a weekend than a weekday. The resort is open year round but members are subject to 210-days maximum annual use or 58% of the calendar year. There are no permanent residents on site.

2.0 Existing Conditions

This section presents the existing transportation setting, traffic volumes, intersection traffic control and geometrics, and Imperial County standards of significance.

2.1 EXISTING TRANSPORTATION SETTING

The freeways and roads that serve the study intersections constitute the transportation setting. These freeways and roads include I-8, Dunaway Road, Evan Hewes Highway, Huff Road, Boley Road, and Westmorland Road. Appendix A shows an overview of the existing transportation setting. Appendix B shows the I-8/Dunaway Road interchange.

I-8 is a four-lane interstate freeway with a 70-mile-per-hour posted speed. It has a year 2000 Average Daily Traffic (ADT) of 12,000 vehicles per day and an LOS A between the Imperial County Line and Imperial Avenue. Between Imperial Avenue and State Route 111, the ADT elevates to 29,000 while the LOS remains at A (Reference: Plan Table 2-1, page 20).

Photograph 2.1-1 shows the Interstate 8 off-ramp at Dunaway Road.

Photograph 2.1-1
Interstate 8 Off-ramp at Dunaway Road

Source: Stantec 2007

Photograph 2.1-2 shows Dunaway Road at Evan Hewes Highway.

Photograph 2.1-2
Dunaway Road at Evan Hewes Highway Looking North

Source: Stantec 2007

Dunaway Road is a two-lane arterial with two 11-foot wide travel lanes and 4-foot wide paved shoulders. The assumed design speed is 35 miles per hour.

Photograph 2.1-3 shows the Evan Hewes Highway at Dunaway Road.

Photograph 2.1-2
Evan Hewes Highway at Dunaway Road Looking East

Source: Stantec 2007

Evan Hewes Highway, also referred to Imperial County Road S80, is a two-lane east-west regional arterial within the project site vicinity. The highway runs parallel to and approximately three miles north of I-8 between just east of the Imperial County Line and the City of Holtville, approximately midway across Imperial County. (Source: Plan Figure 2-1, page 27) Most segments carry around 1,000 vehicles per day except for the four-lane portion known as Adams Avenue which carries 9,000 vehicles per day across a four-lane cross section. (Source: Plan, page 26). The assumed design speed is 60 miles per hour.

Photograph 2.1-4 shows Huff Road at Evan Hewes Highway.

Photograph 2.1-4
Huff Road at Evan Hewes Highway Looking South

Source: Stantec 2007

Huff Road is a two-lane local arterial with two 11-foot wide lanes and 2-foot-wide paved shoulders. The assumed design speed is 45 miles per hour.

Photograph 2.1-5 shows Boley Road at Huff Road.

Photograph 2.1-5
Boley Road at Huff Road Looking East

Source: Stantec 2007

Boley Road is a two-lane collector road with 10-foot wide lanes and dirt shoulders. The assumed design speed is 25 miles per hour.

Photograph 2.1-6 shows Westmorland Road at Boley Road.

Photograph 2.1-6
Westmorland Road at Boley Road Looking North

Source: Stantec 2007

Westmorland Road is a two-lane collector road with 11-foot wide lanes and dirt shoulders. The proposed site access connection point is located along the curve between the two guide arrows.

2.2 EXISTING TRAFFIC VOLUMES

Figure 2.2-1 shows the existing weekday AM and PM peak hour turning movement volumes at the five study intersections. These counts were conducted during the Tuesday, August 14 to Thursday, August 16 timeframe during the AM (7:00 to 9:00) and PM (4:00 to 6:00) time periods. Appendix C shows the count data.

Figure 2.2-2 shows the Saturday peak and Sunday peak hour traffic volumes at these same intersections. These volumes were derived by taking the larger of the weekday AM or PM turning movements for each analysis intersection. The existing Saturday peak volumes are identical to the Sunday peak volumes. This methodology is based on the assumption that weekend volumes are comparable to weekday volumes except that weekend volumes do not have a predominant direction.

2.3 EXISTING INTERSECTION TRAFFIC CONTROL AND GEOMETRICS

Figure 2.3-1 shows the existing intersection traffic control and geometrics. All intersections are un-signalized. The minor street approaches are stop sign control. The Huff Road approach has dedicated left and right turn lanes. The Eastbound I-8 Off-ramp approach has a painted island separating the shared through/left and dedicated right turn movements. The remaining approaches are shared left/right.

2.4 IMPERIAL COUNTY STANDARDS OF SIGNIFICANCE

The Imperial County LOS standard is “C.” (Source: Policy page 5). A traffic impact that degrades an intersection operation to worse than LOS C is considered significant.

3.0 Traffic Forecasts

This section presents related projects, growth projections, trip generation, distribution, and assignment.

3.1 RELATED PROJECTS

The destination resort nature and the combination of water and land recreation activities makes this resort unique. However, research on similar recreational traffic studies reveals three projects which are related by land use characteristics.

The Kitsap County Motorsports Complex (Source: Kitsap Motorsports) located eight miles southwest of the City of Bremerton, Washington is a racetrack facility operated by the International Speedway Corporation (ISC). Unlike Desert Springs Resort, this complex is a major public raceway with 22,000 to 34,000 automobiles expected on a given race day.

The Otay River Valley Regional Park (Source: Otay) constructs seven staging areas along the park's trail network in San Diego County for pedestrian and equestrian riding uses. The average daily trip generation of 50 trips per staging area correlates to 350 daily trips. Unlike Desert Springs, Otay River Valley is geared toward non-motorized low-volume-generating recreational activities.

The F1 Long Island Sports Facility (Source: F1 Facility) constructs one mile of go-kart race tracks; a 14,800-square-foot clubhouse with restaurant, bar, out-sourced catering, retail space, and conference and meeting rooms; and a 5,000-square-foot maintenance building. Unlike the Desert Springs Resort, this Long Island Sports Facility caters toward go-karts instead of full-sized race cars. The estimated typical weekday trip generation is 1,042 trips (Source: F1 Facility, page S-34).

There are no significant approved projects that are expected to have a significant impact on the study area network. Therefore, no approved projects were assumed.

3.2 GROWTH PROJECTIONS

Growth projections are calculated through the comparison of ADT on a roadway segment for two different years. ADT's for 2000 (Source: Plan Figure 2-2, page 29) and 2020 (Source: Plan Figure 2-3, page 31) are compared for I-8 and SR-86 count stations. The I-8 count stations show a 0.77 percent growth rate compounded annually between 2000 and 2020. The SR-86 count stations show a 2.54 percent growth rate compounded annually. A weighted average of these growth rates based on segment volumes yields a 1.65 percent growth rate compounded annually. Therefore a 1.65 percent growth rate was used to escalate existing traffic volumes to future volumes.

3.3 BASELINE TRAFFIC VOLUMES

Baseline traffic serves as a benchmark for the evaluation of project impacts. The baseline traffic volumes typically include an escalation of existing traffic volumes out to the project completion year and the addition of approved projects. No approved projects were assumed for Desert Springs Resort. Therefore the baseline traffic volumes only account for existing volumes escalated to the project completion year. Desert Springs Resort, LLC anticipates the following schedule: (1) project approval by 2008, (2) project construction completion by 2013. Therefore 2013 serves as the baseline and project completion year. Figure 3.3-1 shows the weekday baseline 2013 traffic volumes. Figure 3.3-2 shows these volumes for the weekend.

3.4 TRIP GENERATION

The project generates weekday, Saturday, and Sunday trips. Project components include 900 RV sites, 400 water ski lake lots, and 20 one-acre estate lots for a total of 1,320 lots. The ITE reference provides trip generation rates for diverse land uses. The Campground/Recreational Vehicle Park Land Use (ITE Land Use Code 416) rates are selected as a function of occupied units during the peak hour of generator. While expected club membership is around 1,000 and it is unlikely that all club members will arrive on the same day, occupancy of all 1,320 lots was assumed to ensure a conservative analysis. The ITE reference has trip generation rates for the weekday AM and PM peak hours. The ITE reference does not have trip generation rates for the total daily weekday, Saturday, and Sunday traffic as well as the Saturday and Sunday peak hour traffic. Therefore, it was necessary to derive these rates through the proportioning of the related Recreation Homes Land Use (ITE Land Use Code 260). The formulas for these calculations are as follows:

- Average Weekday Rate = PM Rate x [Recreation Homes (Weekday/PM Peak)] = 0.41 x (3.16/0.31) = 4.18 (50% Enter/50% Exit).

- Average Saturday Rate = Weekday Rate x [Recreation Homes (Saturday/Weekday)] = 4.18 x (3.07/3.16) = 4.06.(50% Enter/50% Exit).

- Saturday Peak Hour Rate = Average Saturday Rate x [Recreation Homes (Saturday Peak/Saturday)] = 4.06 x (0.36/3.07) = 0.48. Enter/Exit split is based on Recreation Homes Enter/Exit Split (48% Enter/52% Exit).

- Average Sunday Rate = Weekday Rate x [Recreation Homes (Sunday/Weekday)] = 4.18 x (2.93/3.16) = 3.88.

- Sunday Peak Hour Rate = Average Sunday Rate x [Recreation Homes (Sunday Peak/Sunday)] = 3.88 x (0.36/2.93) = 0.48. Enter/Exit split is based on Recreation Homes Enter/Exit Split (46% Enter/54% Exit).

Use of a single land use such as Campground/Recreational Vehicle park already accounts for the internal captured trips which hare shared among components of the project site. No pass-by deductions were assumed due to the project's remote location and restriction to members only.

Table 3.4-1 shows the weekday rates and values.

Table 3.4-1
Weekday Trip Generation

Description	Trip Generation								
	Total Daily Trips (Weekday)			AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Input Parameters									
Campground/Recreational Vehicle Park (Code: 416, 1,320 Occupied Camp Sites)	4.18			0.22			0.41		
Ingress/Egress (%)	50%	50%	100%	42%	58%	100%	62%	38%	100%
Ingress/Egress Values	2.09	2.09	4.18	0.09	0.13	0.22	0.25	0.16	0.41
Values									
Trip Generation	2,759	2,759	5,518	119	171	290	330	211	541

Source: ITE 2003
Source: Stantec 2007

- **Conclusion: The project generates 5,518 total daily (weekday), 290 AM, and 541 PM peak hour trips.**

Table 3.4-2 shows the weekend rates and values

Table 3.4-2
Weekend Trip Generation

Description	Trip Generation								
	Total Daily Trips (Saturday/(Sunday)			Saturday Peak Hour			Sunday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Input Parameters									
Campground/Recreational Vehicle Park (Code: 416, 1,320 Occupied Camp Sites)	4.06 3.88			0.48			0.48		
Ingress/Egress (%)	50%	50%	100%	48%	52%	100%	46%	54%	100%
Ingress/Egress Values (Saturday / Sunday Daily)	2.03 1.94	2.03 1.94	4.06 3.88	0.23	0.25	0.48	0.22	0.26	0.48
Values									
Trip Generation (Saturday / Sunday Daily)	2,680 2,561	2,679 2,561	5,359 5,122	304	330	634	291	343	634

Source: ITE 2003
Source: Stantec 2007

- **Conclusion: The project generates 5,359 total Saturday, 5,122 total Sunday, 634 Saturday peak, and 634 Sunday peak hour trips.**

Appendix D provides the trip generation calculation details.

The above-referenced trip generation analysis is based on the following assumptions:

1. This resort is members only with no permanent residents. Members may use the resort exclusively for recreation. Not all members are present on a given weekend.
2. Estimated membership is 1,000. Occupancy is limited to 210 days use per year per member or 58% percent of the calendar year.
3. Weekend only use is 104 days/year, plus 10 federal holidays = 114 days/year
4. The land use components include 900 RV lots, 400 water ski lots, 22 commercial lots, and 20 estate lots for a total of 1,342 lots. Additional land uses include a race course

and a series of four water ski lakes, both restricted to members only. Therefore, only lot count is considered for land use trip generation purposes.

5. Trip generation characteristics resemble those of a typical campground and recreational vehicle park except for the annual use limit.

6. Trip generation rates for the Campground/RV Park (416) Land Use produce reasonable weekday peak hour results.

7. Daily peak hour proportions resemble those of the related Regional Park (417) Land Use. Application of these conversions produces reasonable daily and weekend peak hour rates.

8. Trip generation is based on lot supply adjusted to 58% use.

9. Special events are insignificant. Grandstands are not provided at either the race course or the waterways.

3.5 TRIP DISTRIBUTION

The project distributes trips based on likely origin and destination locations for Desert Springs Resort clientele. Figure 3.5-1 shows the trip distribution. Appendix D lists the trip distribution percentages by street segment. The trip distribution analysis is based on the following assumptions:

1. Boley and Westmorland Roads intersection is the primary access point. **Estimate 100% use.** Payne Road and a south road access is the secondary access. **Estimate 0% use.**

2. San Diego area residents are the primary Desert Springs Resort membership. Most of these members use Interstate 8 to the Dunaway Road interchange. **Estimate 55% members arrive via eastbound I-8.**

3. Los Angeles area residents comprise a secondary portion of the Resort membership. These members use one of two routes: 1) Interstate 10 to State Route 86/76 to Forrester to Imler to Huff to Payne or Boley; 2) Interstate 5 or Interstate 15 to Interstate 8 to Dunaway to Evans Hewes to Huff to Boley. **Estimate 30% arrive from north.**

4. Some Phoenix and Blythe area residents may join. Most Phoenix residents choose I-8 to Drew. Some Blythe residents may trickle in from State Route 78 to SR 115 to Worthington to Boley. Yuma, AZ is geographically closer to the resort than to San Diego. However, Yuma's significantly smaller population makes it a very small contributor to the Desert Springs Resort membership composition. Yuma residents take Interstate 8 to Drew to Evans Hewes to Huff to Boley. The Resort draws its service and delivery trips primarily from El Centro to the east. These trips use the Evan Hewes Highway or

Worthington rather than Interstate 8 as El Centro is centered north of Interstate 8. **Estimate 15% arrive from points east.**

5. Signage at the State Route 78/Forrester could direct motorists south on Forrester. Signage at the Forrester/Imler could direct motorists west on Imler. However, a small portion of the motorists familiar with the area may continue south on Forrester and west on Worthington to Boley.

6. Interstate 10 has 2.5 times the Interstate 8 average daily traffic (ADT) but the Resort has a greater impact on Interstate 8. This is due to the closer proximity of this facility that carries both Los Angeles and San Diego area residents.

7. A roundabout is a viable traffic control alternative for the Boley/Westmorland intersection.

3.6 TRIP ASSIGNMENT

The project impacts elements of the study area network based on the trip distribution. Figure 3.6-1 shows the weekday trip assignment. Figure 3.6-2 shows the weekend trip assignment. These trip assignments are calculated by multiplying the trip generation values by the trip distribution percentages. Appendix D shows the trip assignment calculations.

4.0 Traffic Impacts

This section evaluates the intersection, roadway, and off-site improvement impacts, and presents Level of Service (LOS) results.

4.1 INTERSECTION IMPACTS

Based on the Figure 3.6-1 weekday and Figure 3.6-2 weekend trip assignment, the project impacts the analysis intersections by the number of trips indicated in Table 4.1-1.

Table 4.1-1
Intersection Trip Impacts

Intersection	AM Peak	PM Peak	Saturday Peak	Sunday Peak
I-8 EB/Dunaway	65	182	160	167
I-8 WB/Dunaway	160	299	349	349
Evan Hewes/Dunaway	160	299	349	349
Evan Hughes/Huff	197	370	432	432
Huff/Boley	291	542	634	635
Boley/Westmorland	291	542	634	635

Source: Stantec 2007

- **Conclusion: The project has the greatest impact on the Boley/Westmorland intersection, impacting it by 291 AM, 542 PM, 634 Saturday, and 635 Sunday peak hour trips.**

4.2 ROADWAY IMPACTS

Based on the Figure 3.6-1 weekday and Figure 3.6-2 weekend trip assignment, the project impacts the study roadway segments by the number of trips indicated in Table 4.1-2.

Table 4.1-2
Segment Trip Impacts

Intersection	AM Peak	PM Peak	Saturday Peak	Sunday Peak
Boley	290	541	634	634
Huff North of Boley	73	135	159	159
Worthington East of Huff	21	38	44	44
Forrester North of Worthington	15	27	32	32
Worthington East of Forrester	6	11	13	13
Forrester North of Imler	87	163	190	190
Huff South of Boley	197	368	431	431
Evan Hewes East of Huff	38	70	82	83
Drew Road	29	54	63	63
I-8 East of Drew	29	54	63	63
Even Hewes East of Drew	9	16	19	19
Evan Hewes West of Huff	159	298	349	349
Dunaway Road	159	298	349	349
I-8 West of Dunaway	159	298	349	349

Source: Stantec 2007

- **Conclusion: The project has the greatest impact on the Boley/Westmorland intersection, impacting it by AM, PM, Saturday, and Sunday trips.**

4.3 OFF-SITE IMPROVEMENT IMPACTS

The project has a slight impact on the construction of the new north-south facility from SR-78 to I-8. (Source: Plan, page 57) The project does not impact any other identified improvement projects.

4.4 OPERATIONS

According to *Traffic and Highway Engineering (1988)* by Nicholas J Garber and Lester A. Hoel, Level of Service is defined as "a qualitative measure of the operating conditions within a traffic system and how these conditions are perceived by drivers and passengers." It is a capacity analysis that is used to assess the adequacy of highway and roadway facilities relative to the demand for these facilities. These facilities may include lanes, lane widths, turn pocket storage lengths, and traffic control devices. Planners evaluate the need for existing and future facilities to meet the projected demand by evaluating the Level of Service relative to a standard.

The HCM is the recognized published authority on highway and roadway capacity evaluation. Level of service is the recognized measure of effectiveness for examining capacity relative to demand. According to the *Highway Capacity Manual (2000 Edition)*, Level of Service ratings are assigned as a function of control delay based on the definitions identified in Table 4.4-1.

Table 4.4-1

Intersection LOS Definitions

Rating	Un-Signalized		Signalized	
	Delay (sec/veh)	Description	Delay (sec/veh)	Description
A	≤10	Long, frequent gaps	≤10	Some slowing on green, but most vehicles do not stop.
B	>10 and <15	Shorter, less frequent gaps, no more than one vehicle in queue	>10 and <20	Some vehicles stop, but the majority do not stop
C	>15 and <25	Less frequent gaps and typically around two vehicles in queue	>20 and <35	More vehicles stop, but many still pass through without stopping
D	>25 and <35	Less frequent gaps and typically two or three vehicles in queue	>35 and <55	Most vehicles stop
E	>35 and <50	Less frequent gaps and typically three or more vehicles in queue	>55 and <80	Most vehicles stop, but are able to clear the intersection within one cycle
F	≥50	Excessive delays waiting for suitable gaps, longer queues	≥80	All vehicles stop and some may not be able to clear the intersection within one cycle

Source: HCM 2000

Stantec used TRAFFIX Version 7.9 to calculate LOS for each of the intersections under the scenarios indicated below.

4.4.1 Existing 2007 LOS

Table 4.4-2 shows the 2007 existing weekday LOS.

Table 4.4-2
2007 Existing Weekday LOS

Intersection LOS Analysis					
No.	Intersection	AM Peak Hour		PM Peak Hour	
		Average Control Delay (sec/veh)	LOS	Average Control Delay (sec/veh)	LOS
1	I-8 EB Ramps/Dunaway Road	9.1	A	9.2	A
2	I-8 WB Ramps/Dunaway Road	8.7	A	7.3	A
3	Evan Hewes Highway/Dunaway Road	9.0	A	8.9	A
4	Evan Hewes Highway/Huff Road	9.9	A	9.5	A
5	Huff Road/Boley Road[1]	8.7	A	0.0	A
6	Boley Road/Westmorland Road	8.3	A	9.0	A

[1] 0.0 average control delay reflects no side street traffic volumes.
Source: Stantec (2007).

- **Conclusion: All intersections currently operate at an acceptable LOS.**

Table 4.4-3 shows the 2007 weekend LOS.

Table 4.4-3
2007 Existing Weekend LOS

Intersection LOS Analysis					
No.	**Intersection**	**Saturday Peak Hour**		**Sunday Peak Hour**	
		Average Control Delay (sec/veh)	**LOS**	**Average Control Delay (sec/veh)**	**LOS**
1	I-8 EB Ramps/Dunaway Road	9.2	A	9.2	A
2	I-8 WB Ramps/Dunaway Road	8.7	A	8.7	A
3	Evan Hewes Highway/Dunaway Road	9.4	A	9.4	A
4	Evan Hewes Highway/Huff Road	9.8	A	9.8	A
5	Huff Road/Boley Road	8.8	A	8.8	A
6	Boley Road/Westmorland Road	8.3	A	8.3	A

Source: Stantec (2007).

- **Conclusion: All intersections currently operate at an acceptable LOS.**

4.4.2 Baseline 2013 LOS

Table 4.4-4 shows the 2013 baseline weekday LOS.

Table 4.4-4

2013 Baseline Weekday LOS

Intersection LOS Analysis					
No.	Intersection	AM Peak Hour		PM Peak Hour	
		Average Control Delay (sec/veh)	LOS	Average Control Delay (sec/veh)	LOS
1	I-8 EB Ramps/Dunaway Road	9.1	A	9.2	A
2	I-8 WB Ramps/Dunaway Road	8.7	A	8.4	A
3	Evan Hewes Highway/Dunaway Road	9.1	A	8.9	A
4	Evan Hewes Highway/Huff Road	10.1	B	9.6	A
5	Huff Road/Boley Road [1]	8.7	A	0.0	A
6	Boley Road/Westmorland Road	8.3	A	9.0	A

[1] 0.0 average control delay reflects no side street traffic volumes.
Source: Stantec (2007).

- **Conclusion: All intersections will continue to operate at an acceptable LOS.**

Table 4.4-5 shows the 2013 baseline weekend LOS.

Table 4.4-5
2013 Baseline Weekend LOS

Intersection LOS Analysis					
No.	Intersection	Saturday Peak Hour		Sunday Peak Hour	
		Average Control Delay (sec/veh)	LOS	Average Control Delay (sec/veh)	LOS
1	I-8 EB Ramps/Dunaway Road	9.2	A	9.2	A
2	I-8 WB Ramps/Dunaway Road	8.7	A	8.7	A
3	Evan Hewes Highway/Dunaway Road	9.5	A	9.5	A
4	Evan Hewes Highway/Huff Road	10.0	A	10.0	A
5	Huff Road/Boley Road	8.8	A	8.8	A
6	Boley Road/Westmorland Road	8.3	A	8.3	A

Source: Stantec (2007).

- **Conclusion: All intersections will continue to operate at an acceptable LOS.**

4.4.3 Baseline 2013 Plus Project Volumes and LOS

Figure 4.4-1 shows the weekday baseline 2013 plus project volumes. Figure 4.4-2 shows the weekend baseline 2013 plus project volumes. These volumes were calculated by adding the project trip assignment volumes to the 2013 baseline volumes.

Table 4.4-6 shows the 2013 Weekday Baseline Plus Project LOS.

Table 4.4-6

2013 Weekday Baseline Plus Project LOS

Intersection LOS Analysis					
No.	Intersection	AM Peak Hour		PM Peak Hour	
		Average Control Delay (sec/veh)	LOS	Average Control Delay (sec/veh)	LOS
1	I-8 EB Ramps/Dunaway Road	9.2	A	10.5	B
2	I-8 WB Ramps/Dunaway Road	9.1	A	9.4	A
3	Evan Hewes Highway/Dunaway Road	9.9	A	9.9	A
4	Evan Hewes Highway/Huff Road	10.1	B	11.7	B
5	Huff Road/Boley Road	10.6	B	14.1	B
6	Boley Road/Westmorland Road	9.6	A	9.6	A

Source: Stantec (2007).

- **Conclusion: All intersections will continue to operate at an acceptable LOS.**

Table 4.4-7 shows the 2013 Weekend Baseline Plus Project LOS.

Table 4.4-7

2013 Weekend Baseline Plus Project LOS

Intersection LOS Analysis					
No.	Intersection	Saturday Peak Hour		Sunday Peak Hour	
		Average Control Delay (sec/veh)	LOS	Average Control Delay (sec/veh)	LOS
1	I-8 EB Ramps/Dunaway Road	10.4	B	10.3	B
2	I-8 WB Ramps/Dunaway Road	9.9	A	9.8	A
3	Evan Hewes Highway/Dunaway Road	11.7	B	11.8	B
4	Evan Hewes Highway/Huff Road	14.0	B	14.0	B
5	Huff Road/Boley Road	19.9	C	19.9	C
6	Boley Road/Westmorland Road	13.2	B	13.4	B

Source: Stantec (2007).

- **Conclusion: All intersections will continue to operate at an acceptable LOS.**

4.4.4 Cumulative 2030 Volumes and LOS

Figure 4.4-3 shows the weekday cumulative 2030 volumes. Figure 4.4-4 shows the weekend cumulative 2030 volumes. These volumes were calculated by escalating the existing 2007 volumes by a 1.65 percent growth factor compounded annually.

Table 4.4-8 shows the weekday cumulative 2030 LOS.

Table 4.4-8

2030 Weekday Cumulative LOS

Intersection LOS Analysis					
No.	Intersection	AM Peak Hour		PM Peak Hour	
		Average Control Delay (sec/veh)	LOS	Average Control Delay (sec/veh)	LOS
1	I-8 EB Ramps/Dunaway Road	9.1	A	9.4	A
2	I-8 WB Ramps/Dunaway Road	8.9	A	8.4	A
3	Evan Hewes Highway/Dunaway Road	9.4	A	9.1	A
4	Evan Hewes Highway/Huff Road	11.0	B	10.2	B
5	Huff Road/Boley Road [1]	8.8	A	0.0	A
6	Boley Road/Westmorland Road	8.3	A	9.0	A

[1] 0.0 average control delay reflects no side street traffic volumes.
Source: Stantec (2007).

- **Conclusion: All intersections will continue to operate at an acceptable LOS.**

Table 4.4-9 shows the weekend cumulative LOS.

Table 4.4-9

2030 Weekend Cumulative LOS

Intersection LOS Analysis					
No.	**Intersection**	**Saturday Peak Hour**		**Sunday Peak Hour**	
		Average Control Delay (sec/veh)	**LOS**	**Average Control Delay (sec/veh)**	**LOS**
1	I-8 EB Ramps/Dunaway Road	9.5	A	9.5	A
2	I-8 WB Ramps/Dunaway Road	8.9	A	8.9	A
3	Evan Hewes Highway/Dunaway Road	10.0	A	10.0	A
4	Evan Hewes Highway/Huff Road	10.8	B	10.8	B
5	Huff Road/Boley Road	8.9	A	8.9	A
6	Boley Road/Westmorland Road	8.3	A	8.3	A

Source: Stantec (2007).

- **Conclusion: All intersections will continue to operate at an acceptable LOS.**

4.4.5 Cumulative 2030 Volumes and LOS

Figure 4.4-5 shows the weekday cumulative 2030 plus project traffic volumes. Figure 4.4-6 shows the weekend cumulative 2030 plus project traffic volumes. These volumes were obtained by adding the project trip assignment volumes to the cumulative 2030 volumes.

Table 4.4-10 shows the weekday 2030 cumulative plus project LOS.

Table 4.4-10

2030 Weekday Cumulative Plus Project LOS

Intersection LOS Analysis					
No.	Intersection	AM Peak Hour		PM Peak Hour	
		Average Control Delay (sec/veh)	LOS	Average Control Delay (sec/veh)	LOS
1	I-8 EB Ramps/Dunaway Road	9.4	A	10.9	B
2	I-8 WB Ramps/Dunaway Road	9.3	A	9.4	A
3	Evan Hewes Highway/Dunaway Road	10.4	B	10.2	B
4	Evan Hewes Highway/Huff Road	10.8	B	12.7	B
5	Huff Road/Boley Road	10.9	B	14.5	B
6	Boley Road/Westmorland Road	9.9	A	9.6	A

Source: Stantec (2007).

- **Conclusion: All intersections will continue to operate at an acceptable LOS.**

Table 4.4-11 shows the weekend 2030 cumulative plus project LOS.

Table 4.4-11

2030 Weekend Cumulative LOS

Intersection LOS Analysis					
No.	**Intersection**	**Saturday Peak Hour**		**Sunday Peak Hour**	
		Average Control Delay (sec/veh)	**LOS**	**Average Control Delay (sec/veh)**	**LOS**
1	I-8 EB Ramps/Dunaway Road	10.8	B	10.8	B
2	I-8 WB Ramps/Dunaway Road	10.1	B	10.1	B
3	Evan Hewes Highway/Dunaway Road	13.2	B	13.2	B
4	Evan Hewes Highway/Huff Road	16.9	C	16.9	C
5	Huff Road/Boley Road	22.1	C	22.1	C
6	Boley Road/Westmorland Road	13.3	B	13.5	B

Source: Stantec (2007).

- **Conclusion: All intersections will continue to operate at an acceptable LOS.**

Please see Appendix E for LOS worksheets.

5.0 Mitigation Measures

This section identifies the mitigation measures necessary to comply with Imperial County requirements.

5.1 ROADWAY IMPROVEMENTS

The project constructs site frontage improvements along Boley Road and Westmorland Road.

5.2 IMPERIAL COUNTY TRANSPORTATION PLAN IMPROVEMENTS

The project provides equitable share contributions to the construction of the north-south facility between SR-78 and I-8 to run parallel to Forrester Road.

5.3 INTERSECTION IMPROVEMENTS

The project constructs a full intersection at the Boley Road/Westmorland Road/Site Access intersection. A roundabout design is recommended.

6.0 Project Team & References

6.1 PROJECT TEAM

Managing Principal:	John A. Klemunes, PE
Project Manager:	Steven W. Sowers, PE, PMP
Project Engineer:	Huabing (Koby) Wang, PE
Project Traffic Engineer:	David M. Schwegel, PE, TE, PTOE

6.2 REFERENCES

California Department of Transportation (Caltrans) District 11, *2002 Imperial County Transportation Plan, Highway Element, Final Report,* November 2002.

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Legend

Project Site

Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
1.2-1

Title
REGIONAL MAP

Stantec

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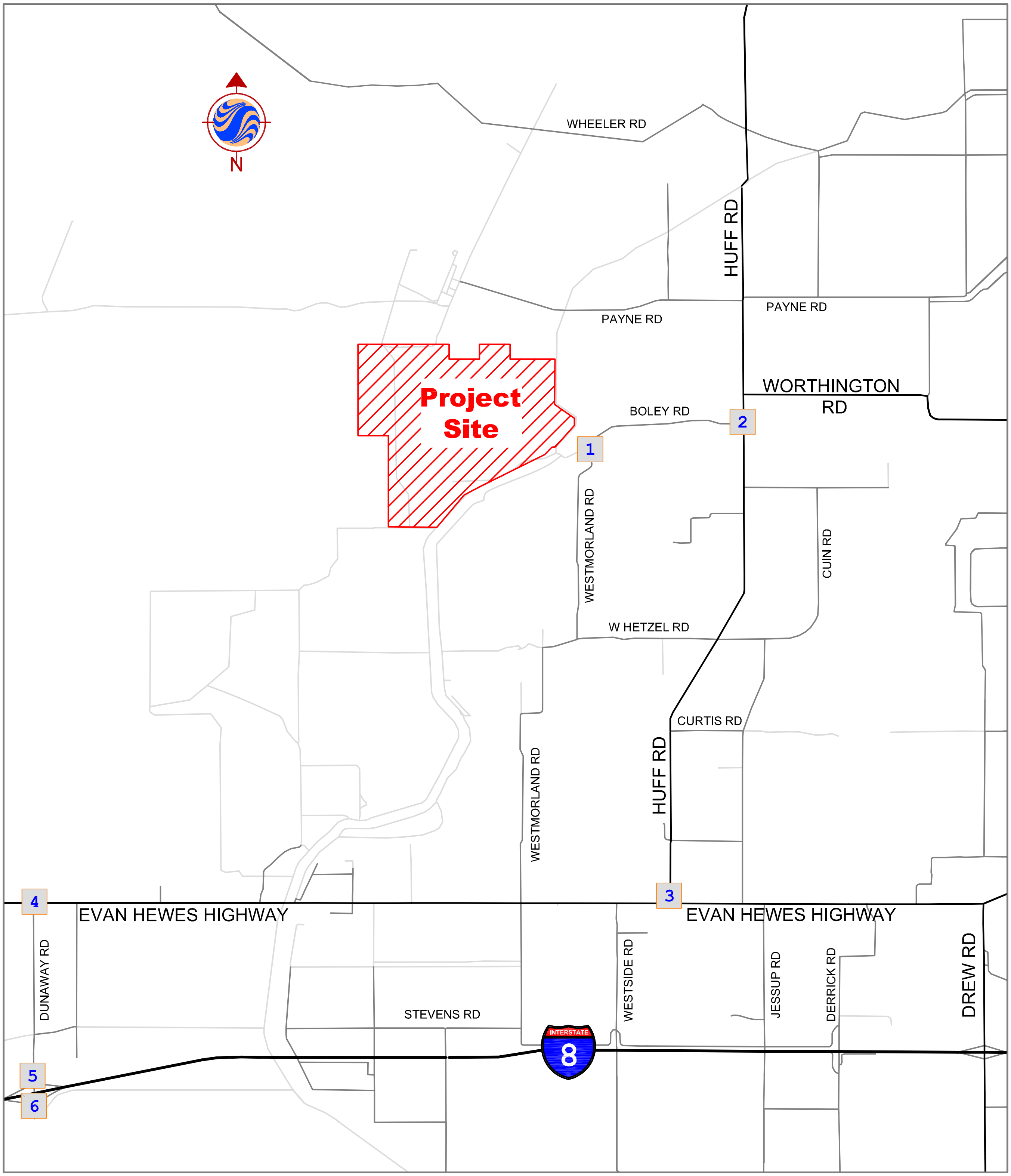
Date: August 31, 2007
Project Number: 2062034000



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Project Site

Study Intersection

Stantec

Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
1.3-1

Title
VINCINITY MAP

Date: August 31, 2007
Project Number: 2062034000

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The Barone Group

Desert Springs Oasis

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2590 Venture Oaks Way
Sacramento CA U.S.A.
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Tel. 916.569.2500
Fax. 916.921.9274
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Legend

Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
1.4-1

Title
SITE PLAN

Date: August 31, 2007
Project #: 2062034000

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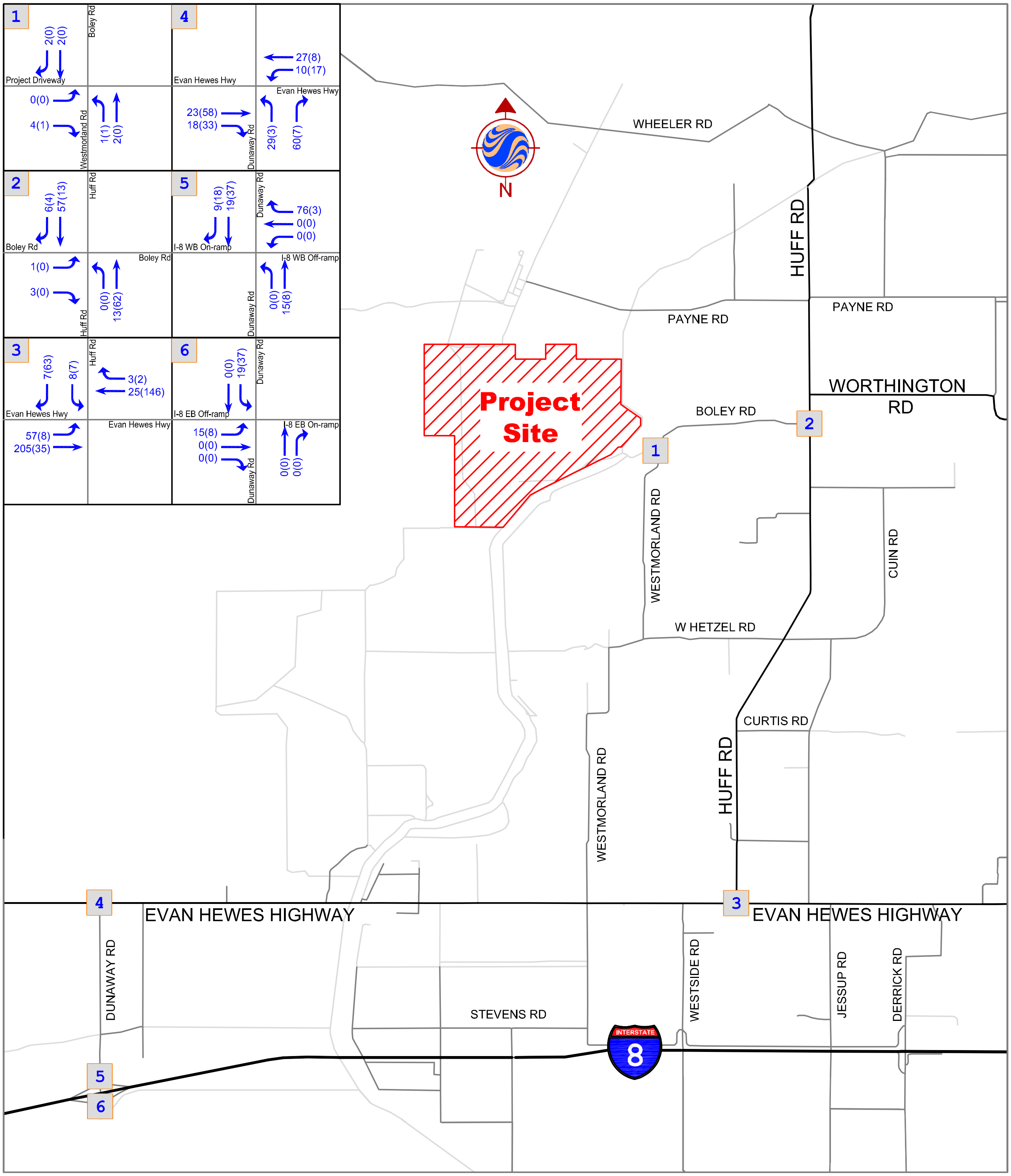

Legend

Project Site

\# Study Intersection

#(#) AM(PM) Peak Turning Volume

Stantec

Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
2.2-1

Title **2007 EXISTING CONDITIONS WEEKDAY AM/PM PEAK HOUR TRAFFIC VOLUMES**

Date: August 31, 2007
Project Number: 2062034000

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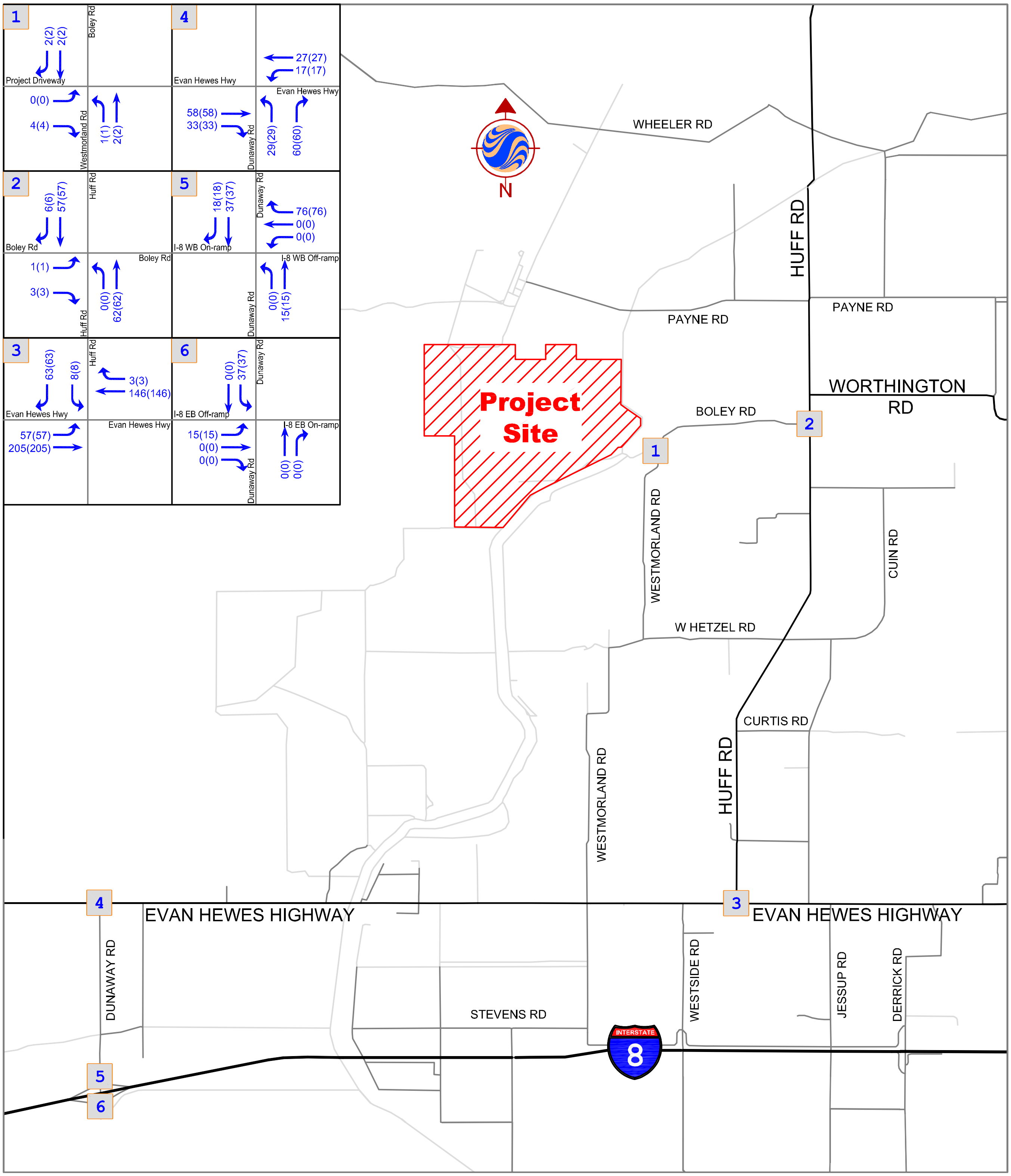


Legend

Project Site

Study Intersection

#(#) Saturday(Sunday) Peak Hour Turning Volume

Stantec

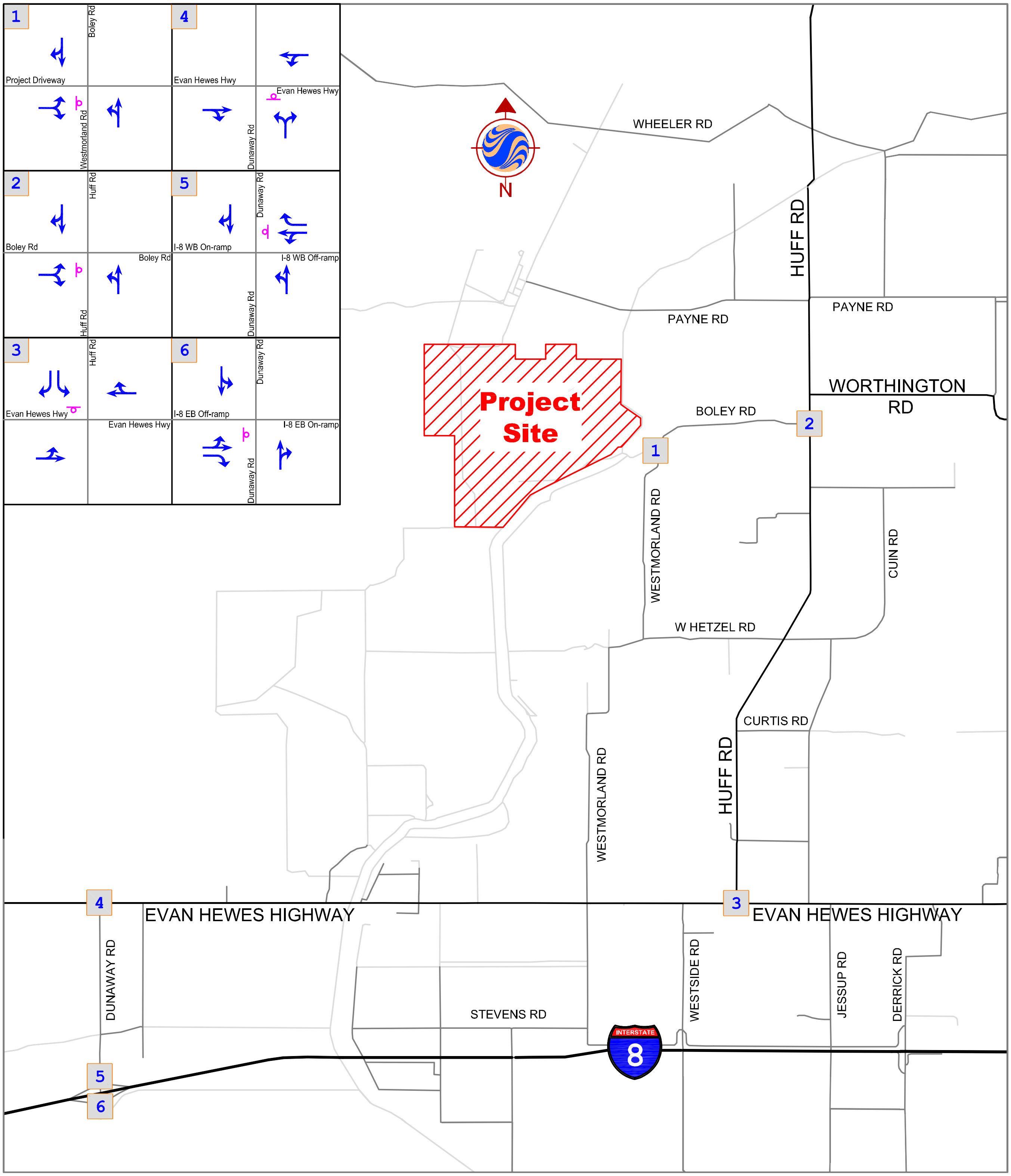
Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
2.2-2

Title
2007 EXISTING CONDITIONS SATURDAY/SUNDAY PEAK HOUR TRAFFIC VOLUMES

Date: August 31, 2007
Project Number: 2062034000

V:\1841\active\2062034000\drawings\t-ex_2_2_2_2007_existing_weekend_volumes.dwg



Legend

Project Site

\# Study Intersection

Turning Movement

STOP Control

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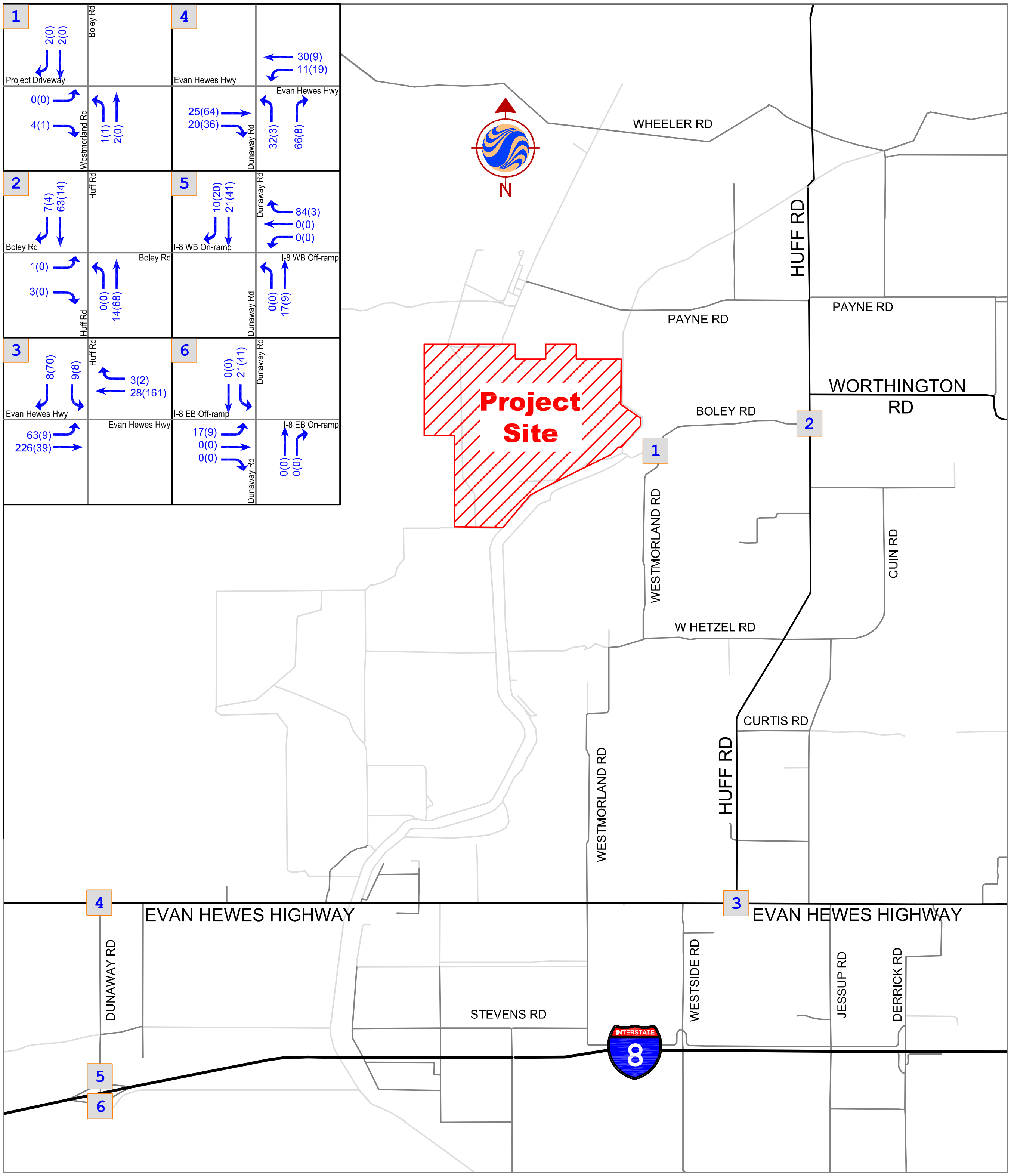
Stantec

Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
2.3-1

Title **2007 EXISTING CONDITIONS INTERSECTION TRAFFIC CONTROLS AND GEOMETRICS**

Date: August 31, 2007
Project Number: 2062034000



Legend

Project Site

Study Intersection

#(#) AM(PM) Peak Turning Volume

Stantec

Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
3.3-1

Title
2013 BASELINE CONDITIONS WEEKDAY AM/PM PEAK HOUR TRAFFIC VOLUMES

Date: August 31, 2007
Project Number: 2062034000

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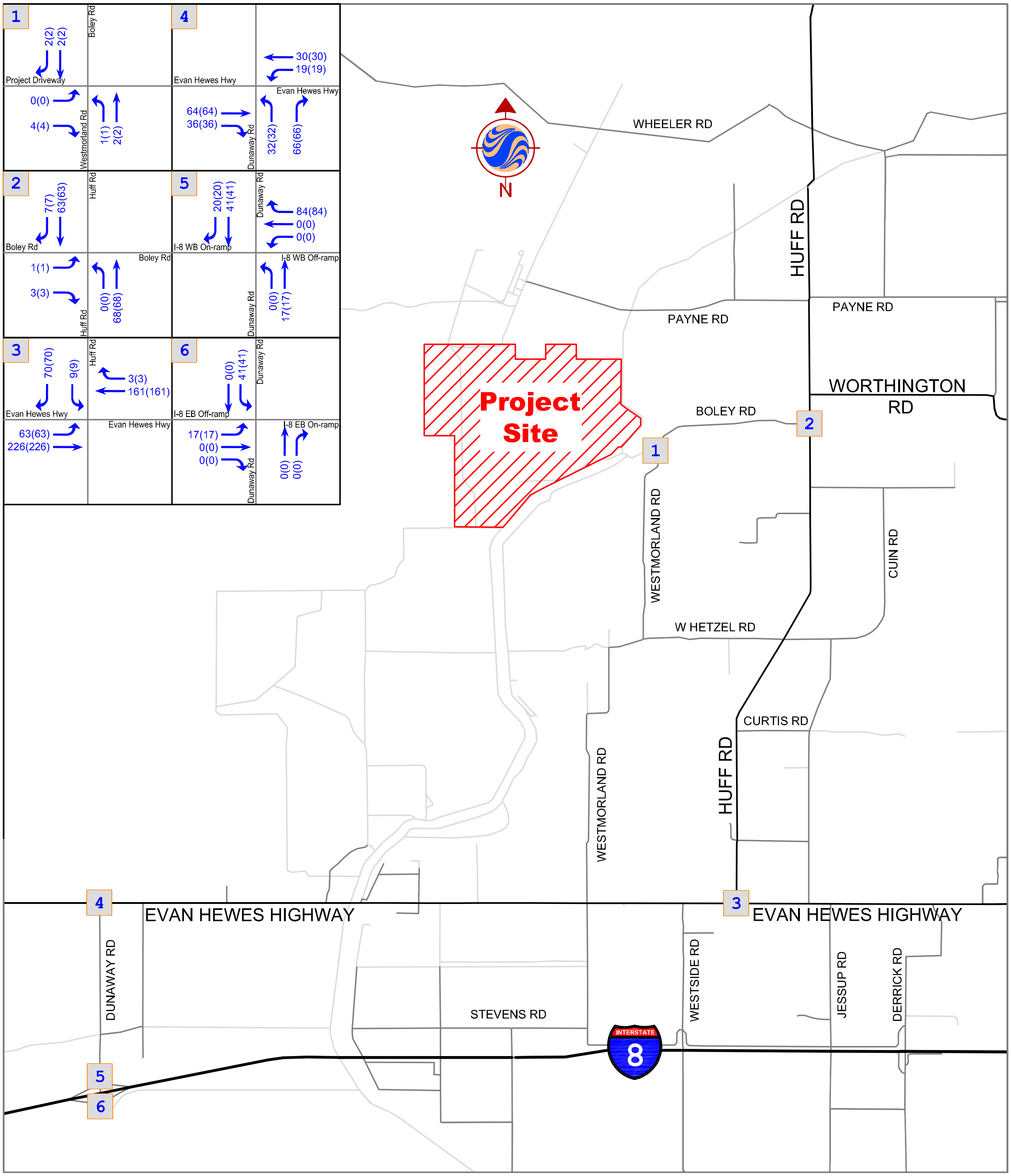

Legend

Project Site

Study Intersection

#(#) Saturday(Sunday) Peak Hour Turning Volume

Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
3.3-2

Title **2013 BASELINE CONDITIONS SATURDAY/SUNDAY PEAK HOUR TRAFFIC VOLUMES**

Date: August 31, 2007
Project Number: 2062034000

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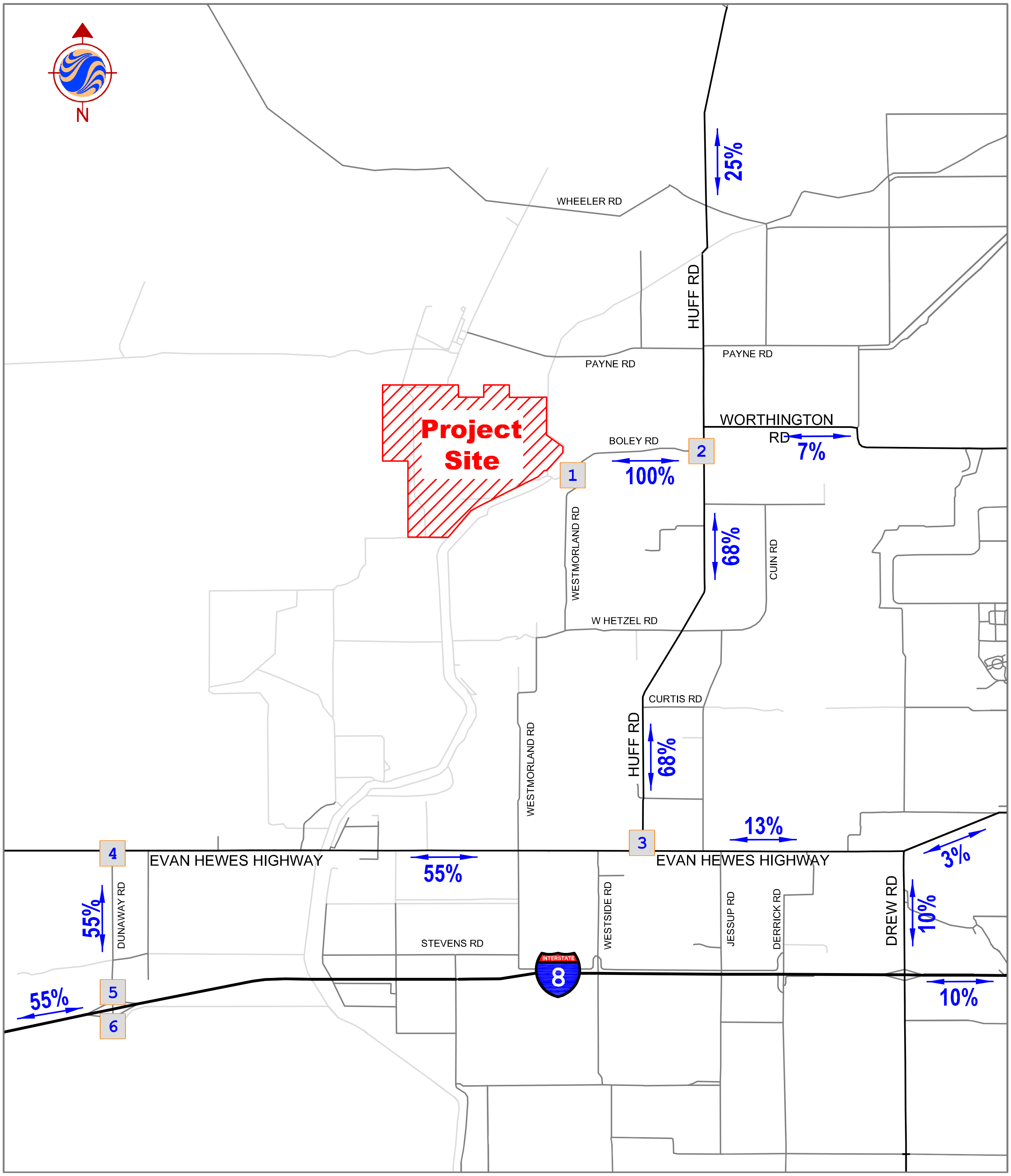

Legend

Project Site

Study Intersection

#% Trip Distribution

Stantec

Client/Project

Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
3.5-1

Title
TRIP DISTRIBUTION

Date: August 31, 2007
Project Number: 2062034000

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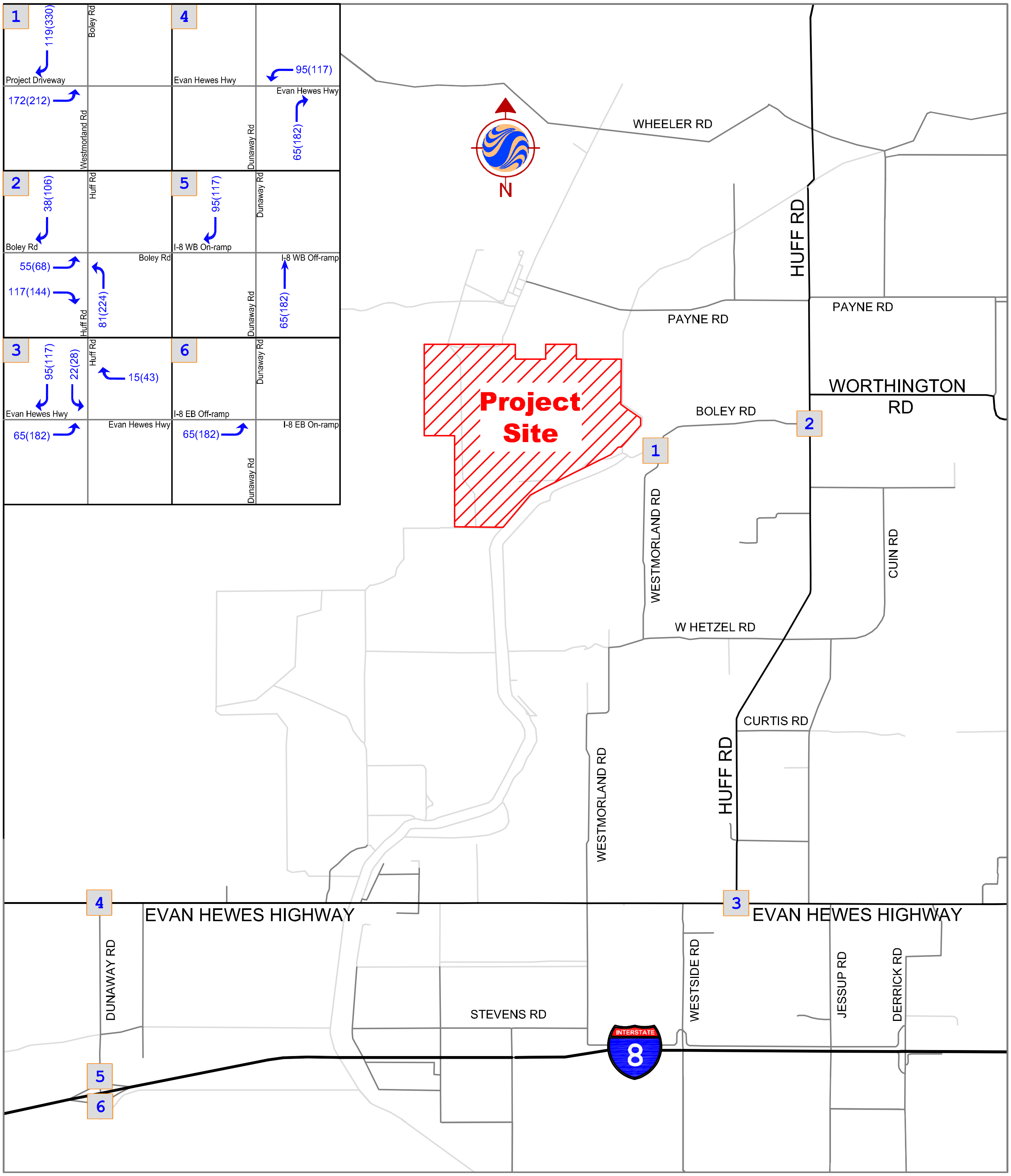

Legend

Project Site

Study Intersection

#(#) AM(PM) Peak Turning Volume

Stantec

Client/Project

Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.

3.6-1

Title

WEEKDAY AM/PM PEAK HOUR TRIP ASSIGNMENT

Date: August 31, 2007
Project Number: 2062034000

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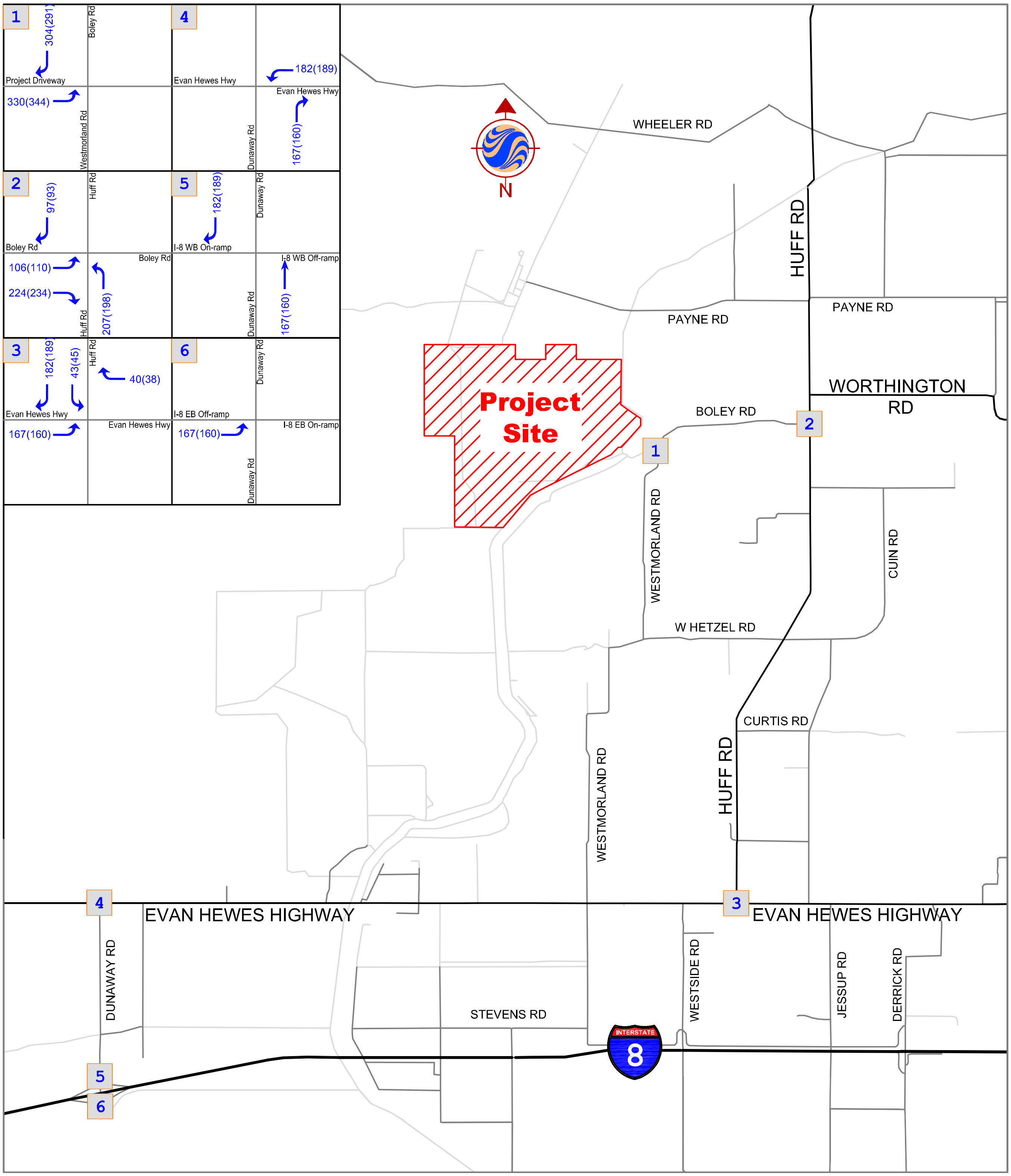

Legend

Project Site

Study Intersection

#(#) Saturday(Sunday) Peak Hour Turning Volume

Stantec

Client/Project

Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
3.6-2

Title
SATURDAY/SUNDAY PEAK HOUR TRIP ASSIGNMENT

Date: August 31, 2007
Project Number: 2062034000

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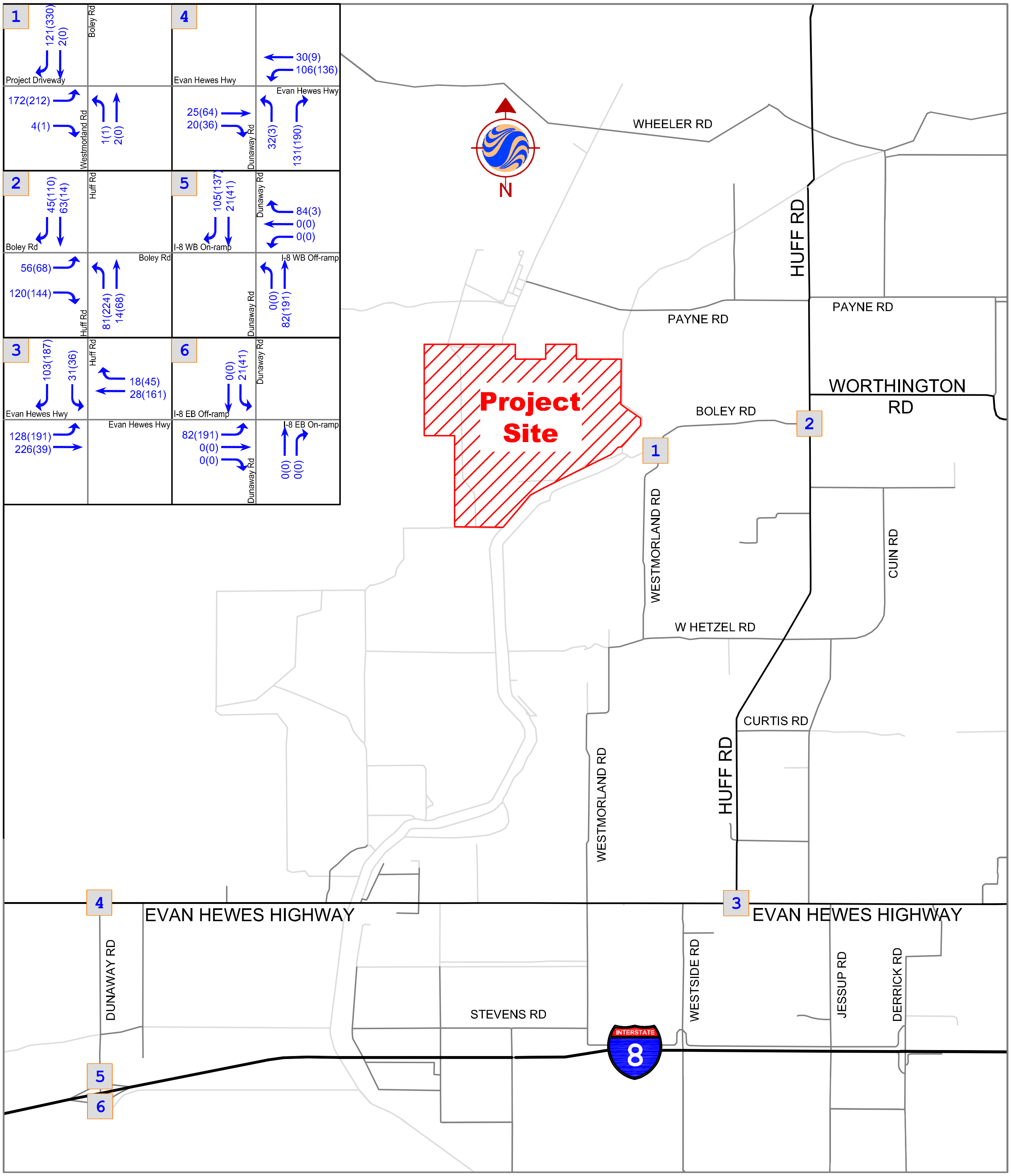

Legend

Project Site

Study Intersection

AM(PM) Peak Turning Volume

Stantec

Client/Project

Desert Springs Oasis, LLC

Desert Springs Resort Development

Traffic Impact Study

Figure No.

4.4-1

Title **2013 PROJECT CONDITIONS WEEKDAY AM/PM PEAK HOUR TRAFFIC VOLUMES**

Date: August 31, 2007

Project Number: 2062034000

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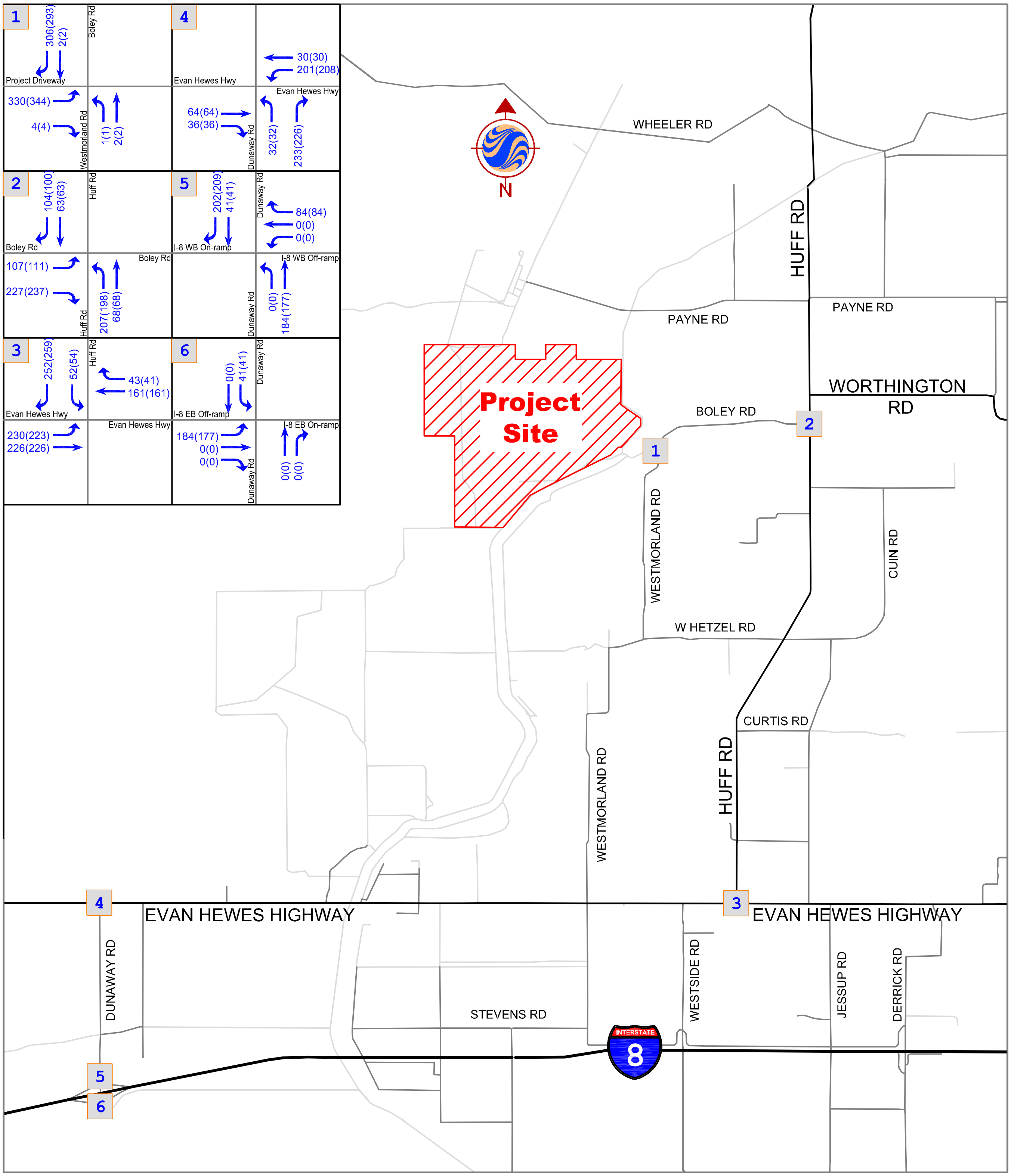


Legend

Project Site

Study Intersection

#(#) Saturday(Sunday) Peak Hour Turning Volume

Stantec

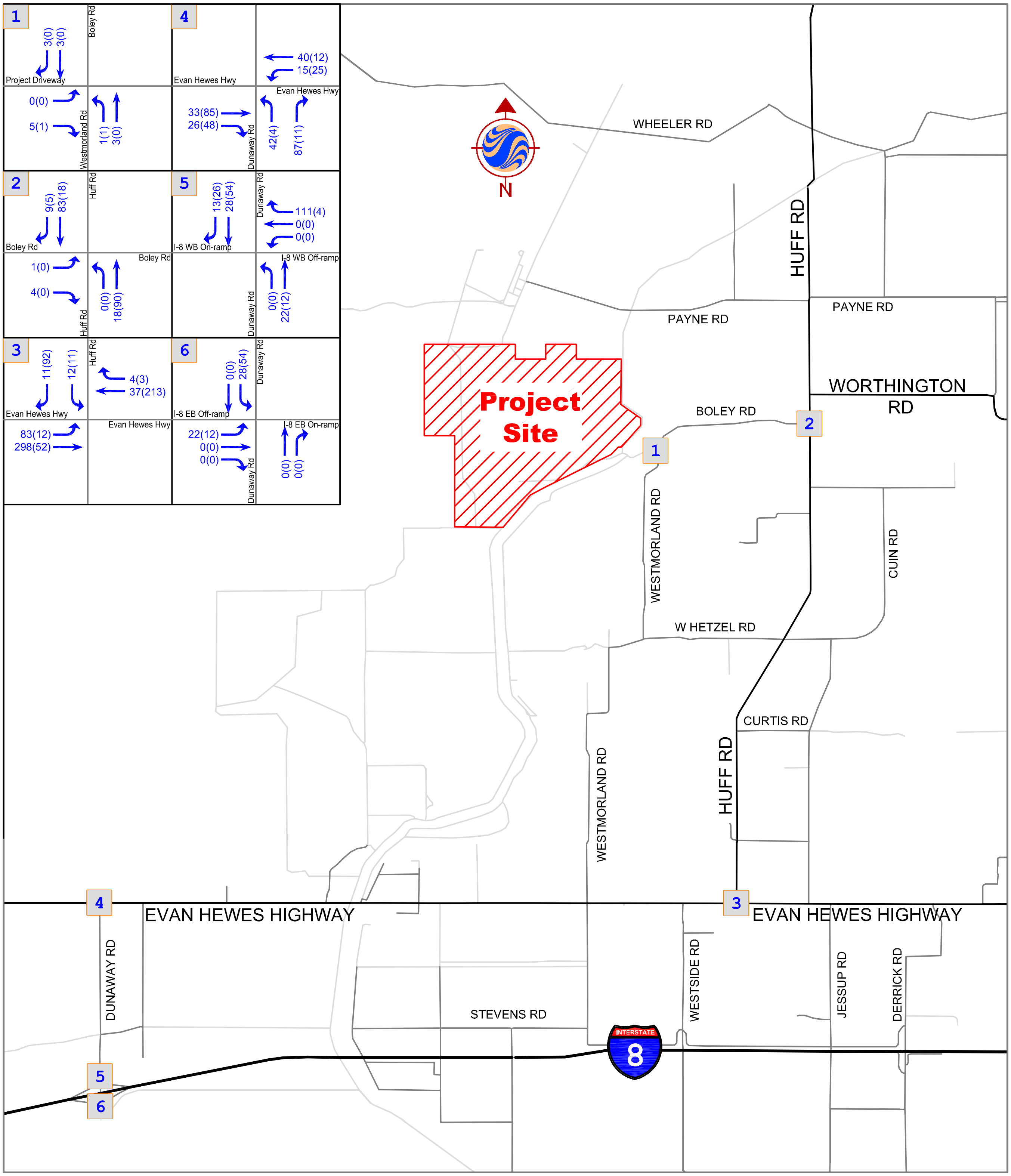
V:\1841\active\2062034000\drawings\t-ex_4_4_2_2013_baseline+project_weekend_volumes.dwg

Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
4.4-2

Title **2013 PROJECT CONDITIONS SATURDAY/SUNDAY PEAK HOUR TRAFFIC VOLUMES**

Date: August 31, 2007
Project Number: 2062034000



Legend

Project Site

Study Intersection

\#(#) AM(PM) Peak Turning Volume

Stantec

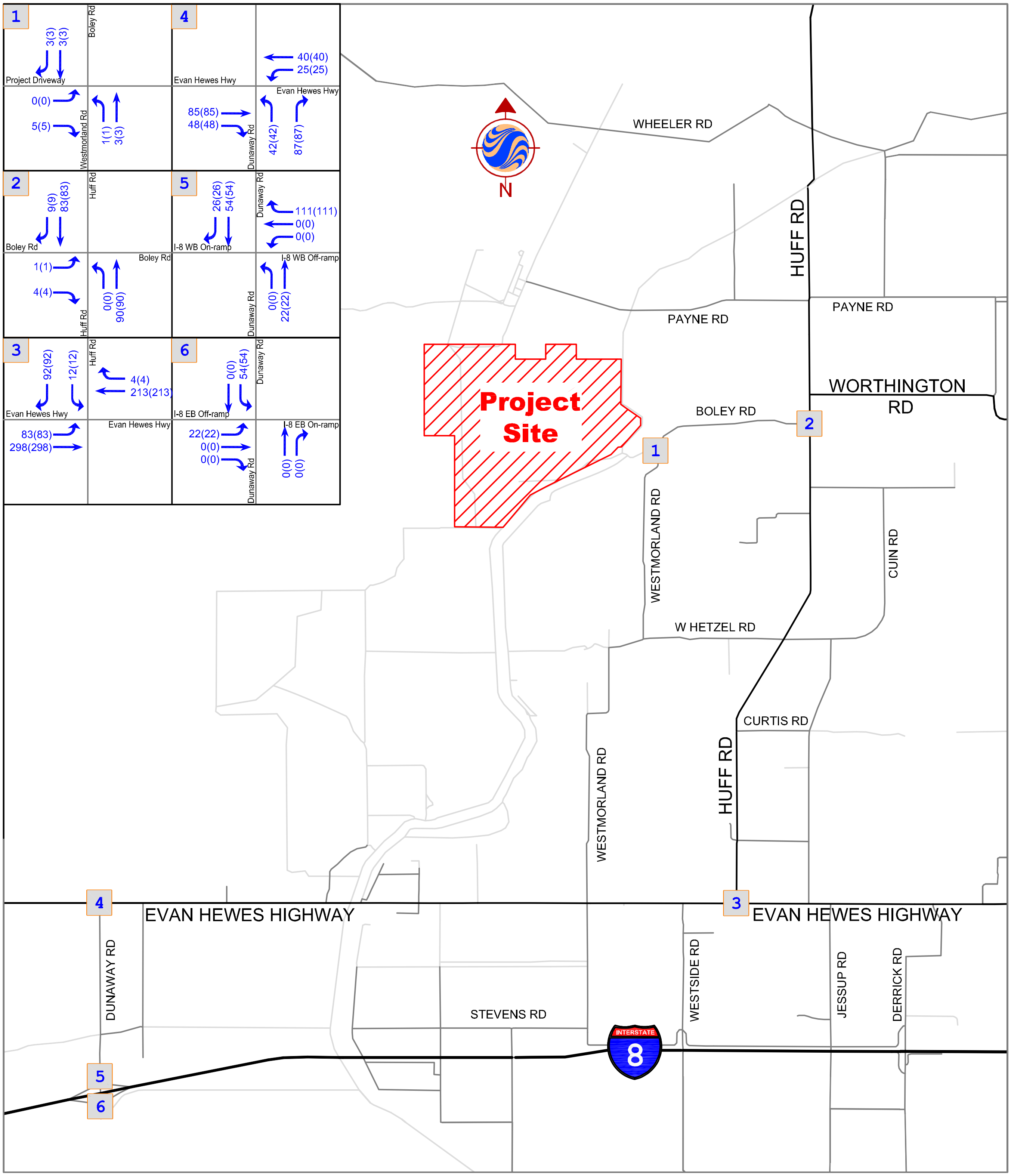
Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
4.4-3

Title **2030 CUMULATIVE CONDITIONS WEEKDAY AM/PM PEAK HOUR TRAFFIC VOLUMES**

Date: August 31, 2007
Project Number: 2062034000

V:\1841\active\2062034000\drawings\t-ex_4_4_3_2030_cumulative_weekday_volumes.dwg



Legend

Project Site

Study Intersection

#(#) Saturday(Sunday) Peak Hour Turning Volume

Stantec

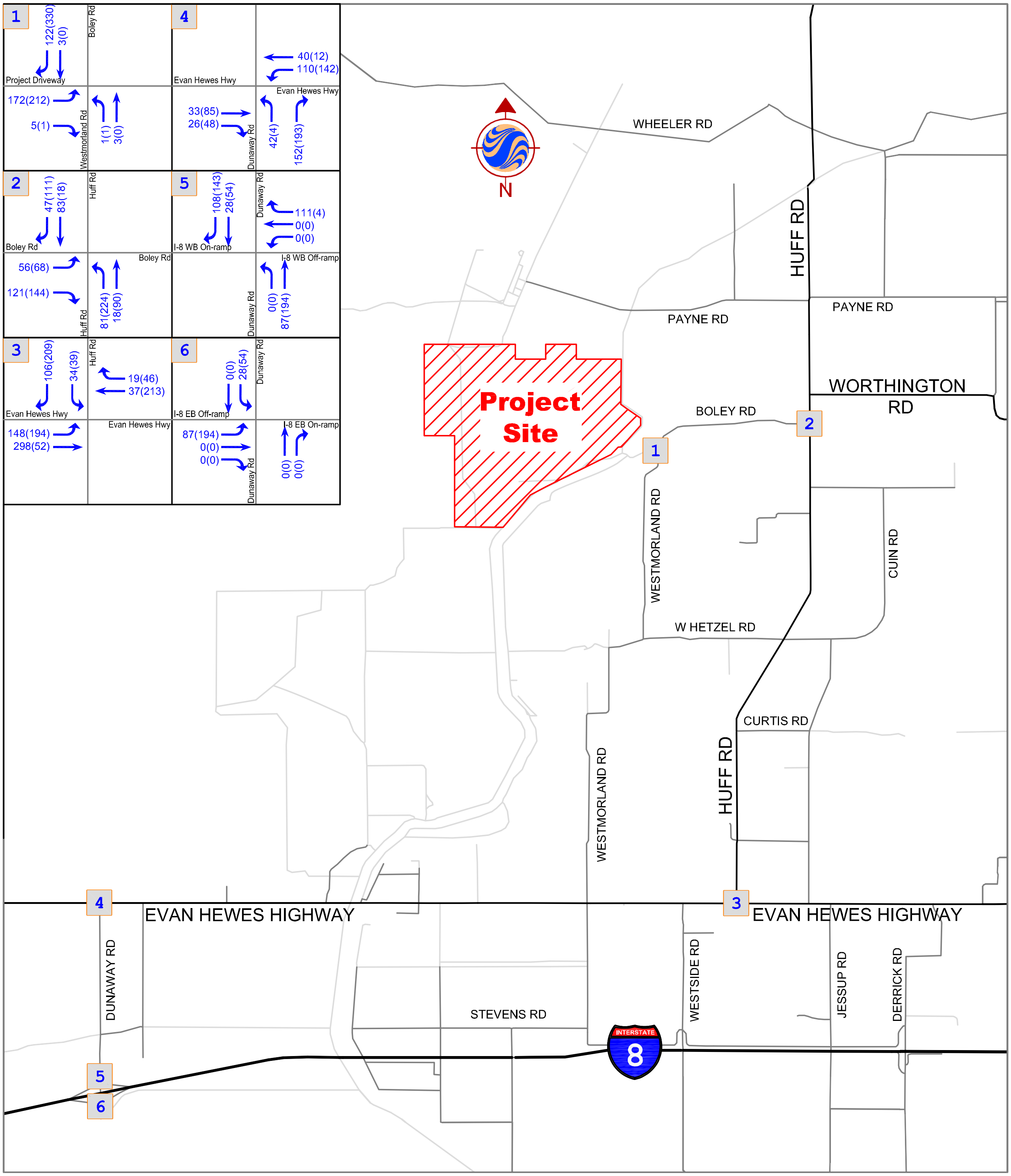
Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
4.4-4

Title **2030 CUMULATIVE CONDITIONS SATURDAY/SUNDAY PEAK HOUR TRAFFIC VOLUMES**

Date: August 31, 2007
Project Number: 2062034000

V:\1841\active\2062034000\drawings\t-ex_4_4_4_2030_cumulative_weekend_volumes.dwg



Legend

Project Site

\# Study Intersection

#(#) AM(PM) Peak Turning Volume

Stantec

V:\1841\active\2062034000\drawings\t-ex_4_4_5_2030_cumulative+project_weekday_volumes.dwg

Client/Project

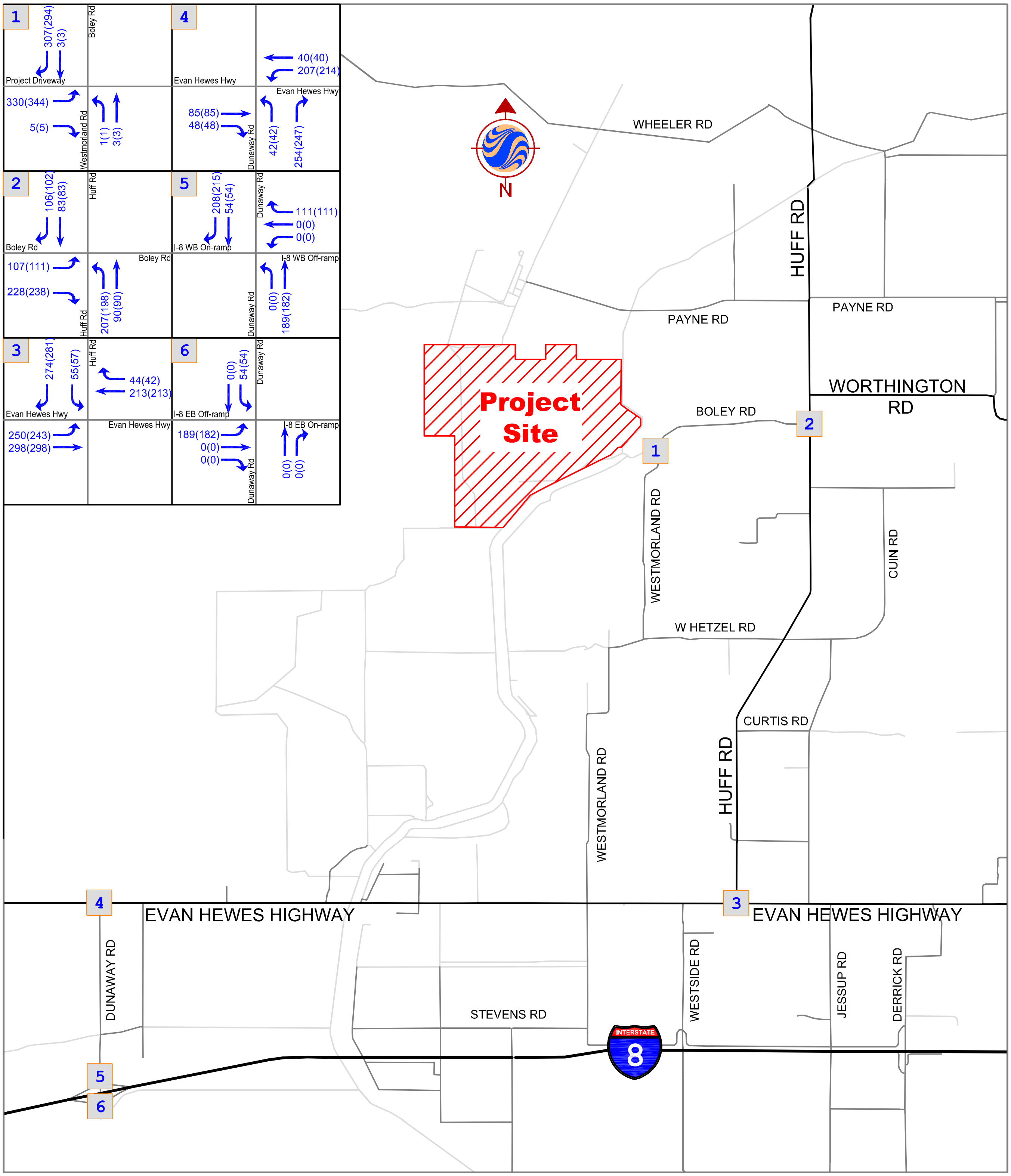
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.

4.4-5

Title **2030 PROJECT CONDITIONS WEEKDAY AM/PM PEAK HOUR TRAFFIC VOLUMES**

Date: August 31, 2007
Project Number: 2062034000



Legend

Project Site

Study Intersection

#(#) Saturday(Sunday) Peak Hour Turning Volume

Stantec

V:\1841\active\2062034000\drawings\t-ex_4_4_6_2030_cumulative+project_weekend_volumes.dwg

Client/Project
Desert Springs Oasis, LLC
Desert Springs Resort Development
Traffic Impact Study

Figure No.
4.4-6

Title
2030 PROJECT CONDITIONS SATURDAY/SUNDAY PEAK HOUR TRAFFIC VOLUMES

Date: August 31, 2007
Project Number: 2062034000

TECHNICAL AREA: VISUAL RESOURCES

Data Request 42: Please clarify which off-highway vehicle recreation area is adjacent to the project.

Response: The Plaster City Open Area is adjacent to the northern boundary of the Solar Two site. This is demonstrated on Figure 5.9-1, located in Section 5.9, Land Use of the AFC.

TECHNICAL AREA: VISUAL RESOURCES

Data Request 43: Please provide the number of users at the adjacent off-highway vehicle recreation area for the most recent year.

Response: Per Visual Resources Data Adequacy Request 1 there were approximately 32,457 users of Plaster City Open area for the most recent year (2007). This data was obtained from the Bureau of Land Management, El Centro Field Office.

TECHNICAL AREA: VISUAL RESOURCES

Data Request 44: Please provide a draft landscaping plan.

Response: A draft landscaping plan is being developed and will be submitted for agency review during the first quarter 2009.

TECHNICAL AREA: VISUAL RESOURCES

Data Request 45: Please provide new simulations from all the KOPs reflecting the visual impact of the security fence.

Response: Simulations to KOPs where the security fence is visible have been revised and are provided as Attachment VIS-1 to this response.

ATTACHMENT VIS-1

Simulated Traveler View Approaching Project on I-8 West

PROPOSE IEW FRO OP
SOLAR TWO PROJECT

URS	NO SCALE	CREATED BY: AG	DATE: 12.3.08	FIG. NO: 5.13-26
		PM:AL	PROJ. NO: 27657102.00413	

TECHNICAL AREA: WASTE MANAGEMENT

Data Request 46: Please clarify whether the waste quantities in Tables 5.14-2 and 5.14-3 are only for Phase I or include waste quantities for both Phase I and II.

Response: Waste quantities identified in Tables 5.14-2 and 5.14-3 are for both Phase I and Phase II.

TECHNICAL AREA: WASTE MANAGEMENT

Data Request 47: Please provide the number of months expected for construction. Also, please specify how this timeframe pertains to Phases I and II.

Response: As described in Section 3.0, Project Description and Location, on page 3-51, construction is expected to last for 40 months. Construction of Phase I will start following CEC/BLM approval and is expected to end during the third quarter of the second year. Construction of Phase II will start during the first quarter of the second year and end the second quarter of the fourth year.

TECHNICAL AREA: WASTE MANAGEMENT

Data Request 48: Please list and quantify any waste streams expected from the construction and decommissioning of the SunCatcher assembly buildings.

Response: The assembly buildings are portable buildings that will be removed from the site after construction. The waste stream table presented in the AFC (Table 5.14-2) includes the construction of the assembly buildings. It is anticipated that approximately 780 cubic yards of waste will be generated and disposed of. The waste will consist of foundation materials, lumber, crating, cardboard, etc.

The mechanical and electrical systems will be skid mounted for easy relocation. There will be utilities associated with the buildings that will be disassembled and moved, and there may be some wastes associated with that removal. There will be concrete pads under the buildings that will remain after the buildings are removed. Decommissioning and removing the Assembly buildings will generate approximately 80 cubic yards of waste consisting of surplus packing materials, lumber, cardboard, lighting, gaskets and wiring.

TECHNICAL AREA: WASTE MANAGEMENT

Data Request 49: Please list and quantify any waste streams expected from the construction of the substation.

Response: During construction of the substation, it is estimated that 1,050 cubic yards of waste will be generated and disposed of. The waste will consist of foundation materials, lumber, crating, cardboard, etc. See AFC Table 5.14-2, Summary of Construction Waste Streams and Management Methods.

TECHNICAL AREA: WASTE MANAGEMENT

Data Request 50: Please discuss how these wastes will be managed and disposed.

Response: During construction, wastes will be separated between recyclable and non-recyclable wastes and stored in dumpsters until removed from the site. Approved commercial waste disposal firms will haul and dispose of non-recyclable construction debris in a landfill approved for construction waste. The management methods are further described in AFC Table 5.14-2, Summary of Construction Waste Streams and Management Methods.

TECHNICAL AREA: WASTE MANAGEMENT

Data Request 51: If Imperial County or a nearby city operates a Construction and Demolition Waste Diversion Program, please cite the jurisdiction to which the applicant would be accountable.

Response: The Imperial Integrated Waste Management Authority (IWMA) does not have a County Demolition Waste Diversion Program. However, the jurisdictions of Brawley, Calexico and El Centro have passed a construction and demolition (C&D) ordinance. The C&D ordinance applies to all construction and renovation projects with a projected cost of greater than $50,000, and all demolition projects having a total square footage of more than 1,000 square feet. Applicants for covered C&D projects must complete and submit a C&D reuse/recycling plan prior to the issuance of a building or demolition permit. Covered projects are required to divert at least 50 percent of the waste generated by the project (Imperial County Integrated Waste Management Authority website http://www.iwma.com).

TECHNICAL AREA: WASTE MANAGEMENT

Data Request 52: Please describe how the applicant will meet the requirements of the Construction and Demolition Waste Diversion Program.

Response: During construction, wastes will be separated between recyclable and non-recyclable wastes. The management methods are further described in Table 5.14-2, Summary of Construction Waste Streams and Management Methods presented in the AFC.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
For the SES SOLAR TWO PROJECT

Docket No. 08-AFC-5

PROOF OF SERVICE
Revised 11/26/08

INSTRUCTIONS: All parties shall either (1) send an original signed document plus 12 copies or (2) mail one original signed copy AND e-mail the document to the address for the Docket as shown below, AND (3) all parties shall also send a printed or electronic copy of the document, which includes a proof of service declaration to each of the individuals on the proof of service list shown below:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-5
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Sacramento, CA 95814-5512
docket@energy.state.ca.us

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DECLARATION OF SERVICE

I, Angela Leiba, declare that on December 8, 2008, I deposited copies of the attached Data Responses 1-52 in the United States mail at San Diego, California with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.

Original Signed By:
Angela Leiba

Attachments