(cont.)

An excerpt from the MND, viewed below, reflects how the SSCMPP is relying upon an expansion of the easement agreement for the off-site basin below MBV. By expansion, is obvious that due to a 37% increase in impervious surface, the present basin will not achieve NPDES Numeric Sizing Criteria attenuation goals and objectives. By our calculation, this basin just below the terminus of Pompeii Street in the MBV subdivision is roughly 1,000 square feet maximum, or about 1/43rd of an acre.

SSC must provide up-to-date compliance parameters to justify this pitifully small pond as adequate even at present standards. CWN! believes that the SCCMPP would provoke a need, to be compliant with the current NPDES R9-2009-0002 after completion, for an area at minimum 4-5 times this present size to achieve mitigation and meet the newest water quality objectives.

Moreover, how can SSC exclaim they'll be compliant with prescriptions as yet unannounced, undeveloped or approved by the SDRWQCB, especially when by 2021 there will be a TMDL program for the **Dana Point HSA**? One must add that the City may change or update its LIP at least once in the next 10 years, which adds to our concern that compliance cannot be guaranteed as falsely alleged.

I-42-1

SSC cannot be allowed to boast of compliance with unknown future, possibly altered, amended and/or more prescriptive conditions and goals that have yet to be proposed. Nor should SSC be allowed to project compliance if its SSCMPP buildout involves integrating and possibly altering via its ***"Lessons Learned"*** for these evolving living documents, these multiple NPDES Permits, etc.

SSC is vowing to address in their vaguely-worded IOU/TBD/TBA mode that the pollutants associated with this type of project (a) sediment (soil disturbance), (b) nutrients (fertilizers, eroded soils), (c) metals (vehicles), (d) volatile organic compounds (pesticides, solvents, cleaning compounds), (e) trash and debris, (f) oxygen-demanding substances (leaves and lawn clippings), and (g) oil and grease (vehicles) will all be reduced and/or removed proactively. All will be accomplished via a promise of temporary (during construction) and ultimate compliance (post construction). They just can't tell us how they'll do it, and they expect the public to believe an already non-compliant site and City. How the acquisition of this holding pond basin expansion could be accomplished, the reconfiguring of the present system and the 10 year buildout installation logistics therefore becomes questionable, basically unknown. SSC has not provided ANY

(cont.)

agreement for such a sizable expansion or increase of its easement rights. Nor has the SSC provided any proof positive documentation (evidence) that it could get a building permit from the appropriate regulatory agencies to allow such expansion in the WEP (ESHA) area.

"The Proposed Conditions Hydrology Map by Adams-Streeter addresses surface run- off and properties of the proposed drainage system acknowledging attenuation to be achieved via on- site detention design means and methods and/or by evoking the rights granted in the easement agreement on record to do so off-site. The increase in surface run-off and any attenuation thereof will be addressed and final design provided during construction documentation and permitting, employing water quality management measures as required. Mitigation measures relative to hydrology/drainage are presented in Section 3.8(a). Therefore, no significant impacts to drainage are anticipated to occur as a result of the project."

I-42-1

CWN! firmly believes that in lieu of this critical information, three (3) key studies and attendant water quality testing should be initiated NOW, be a required mitigation per th MMRP for the SSCMPP. Because Salt Creek is an ESA as determined by the LIP of the City, then it makes sense to perform the following:

(1) A Macro-invertebrate Biotic Index assessment or survey. This would entail an inventory of the portion of Salt Creek that receives discharges from the SSC project area presently. A "bug assessment " should start NOW so that a pre-construction, during construction and post construction database can be created. This would enable SSC to prove that they have not degraded Salt Creek with their activities, thus confirming their mitigation strategies truly hav merit. The assessment should include a total of about 5-600 meters of the Creek's mainstem: Begin just upstream of the upper discharge zone, include that 5-600 meters to just past the lower storm drain system discharge near th shopping center. Subsequent to the initial inventory/assessment, this should b performed once every 6 months should be adequate.

(cont.)

Macroinvertebrates as Biological and Water Quality Indicators

"Aquatic invertebrates live in the bottom parts of our waters. They are also called benthic macroinvertebrates, or benthos, (benthic = bottom, macro = large, invertebrate = animal without a backbone) and make good indicators of watershed health because they: (a) Live in the water for all or most of their life (b) Stay in areas suitable for their survival (c) Are easy to collect (d) Differ in their tolerance to amount and types of pollution (e) Are easy to identify in a laboratory (f) Often live for more than one year (g) Have limited mobility (h) Are integrators of environmental condition." **Source:** USEPA
http://www.epa.gov/bioindicators/html/invertebrate.html

I-42-1

(2) Water quality sampling. A minimum of 4 sites that drain the SSC and coastal bluff should be sampled:

(a) An instream location in the mixed zone just above the upper stormdrain discharge near the apartments,

(b) The actual Point of Discharge (POD) from the upper MS4,

(c) The actual POD of the lower MS4,

(d) An instream location in the mixed zone just below the lower POD.

This would require the same pre, during and post construction mentality as the MBI to fulfill MMRP requirements per CPR Codes. The Creek needs to be initiated, assessed and inventoried immediately so that a long-term study can accurately ascertain SSCMPP impacts. Without a pre-construction sampling regime, there is no way anyone can deduce the eventual efficacy of implemented LID strategies and BMPs for the SSCMPP.

Water quality sampling should include the usual gamut of microinvertebrates that are causal factors in the current 303 (d) Listing (bacteria) at the Salt Creek POD (Monarch Beach), but due to the sediment transport factor and attendant contaminants that could discharge from the site while construction is occurring, a wider range of analysis seems intuited.

(cont.)

Without knowing the actual composition of the deeper soil level at the SSC, this should be important.

SSC seems to have no clue regarding NPDES R9-2009-0002 compliance, even though it has been going through review since 2007. A few minor amendments or alterations, and errata have occurred, but nonetheless when the MND was on the verge of approval by the City's Planning Commission last Spring it was basically 99% completed. Yet here again the SSCMPP did not reflect how it intends to achieve the LID goals and techniques for compliance the MND itself embraced:

Item Technique:
1. Minimizing impervious footprint
2. Conservation of natural areas
3. Use of permeable paving or other surfaces
4. Design to minimize streets, sidewalks and parking aisle widths as necessary
5. Incorporation of landscaped buffers
6. Reduced street widths
7. Maximize canopy interception I-42-1
8. Use of native or drought tolerant trees/shrubs
9. Minimizing impervious surfaces in landscaping
10. Use of natural drainage systems
11. Low flow infiltration
12. Onsite ponding areas or retention facilities
13. Other site design features

In contradiction to LID and therefore the NPDES Permit itself, SSC once again seems Hell-bent on increasing its impervious surface area alarmingly by the mentioned 37% increase, going from 54% impermeable to 74%, 75% being the allowable limit per City building codes and regulations. This is like promising to conserve gasoline or increase your mpg by driving your car 69 mph in a 70 mph zone!

As mentioned, the SSCMPP verbiage in the MND should alarm any progressive water quality protectionist:

"The South Shores Church Master Plan project is proposed to be developed in phases over time and therefore site design, source control

(cont.)

and treatment Control BMPs will be implemented in a phased approach. As such, it is anticipated that the technology and water quality priority concerns will change over time. Treatment Control BMPs will be selected and designed during final planning and design within each specific development phase to ensure that the treatment controls meet the requirements at the time and address the priority issues. The Water Quality Management Plan (WQMP) will be amended at each phase and will be subject to review and approval by the City. Other treatment control BMPs will also be considered with advancing technology, performance evaluations and water quality private priorities at the time of amendments.

Implementation of the WQMP, along with implementation of a Storm Water Pollution Prevention Plan (SWPPP), including recommended mitigation measures which outline requirements to prevent violations of water quality standards and waste discharge requirements will reduce potential impacts to less than significant levels.
MM 3.8-1 Prior to the commencement of any grading activities for each phase, a Storm Water Pollution Prevention Plan (SWPPP) addressing the phase will be prepared and a Notice of Intent (NOI) filed with the State Water Quality Control Board. The SWPPP shall identify Best Management Practices (BMPs) that will be utilized on-site to control pollution runoff during construction activities. The project applicant shall comply with and implement all the applicable requirements of the NPDES permit.
MM 3.8-2 The site design and maintenance shall be in accordance with the requirements of the approved WQMP and Hydrology/Drainage study. The WQMP and Hydrology/Drainage reports shall be subject to review and approval prior to each phase by the City of Dana Point."

I-42-1

The onerous and unacceptable burden CWN! has pointed out is reflected in this MND excerpt. This literally forces locals to monitor and track an endless daisy chain or permits, and once again there could be cumulative impacts (impairments) that when submitted individually APPEAR to mitigate but collectively do not.

It must also be noted as the entire field of LID is an emerging, evolving one, therefore local residents would of necessity be required to pay for their own independent, trustworthy professional peer review consultant(s) to track these

technologies and strategies regarding protection compliance. The City does not have the SCSC confidence, so once more a greater fiscal burden is placed upon residents.

Besides pursuing permeable instead of impervious surfaces, partial mitigation strategies for the SSCMPP would be the integration of green roofs throughout the site and as noted in **Exhibit C** an onsite urban runoff treatment plant.

Green roofs are more expensive, but you have to look at the whole site and its lifecycle. A simple green roof will pay for itself in five to seven years. A green roof, which consists of a roof covered with soil and plants, generally costs about $10 per foot, but it lasts longer than a standard roof and provides insulation that cuts down energy costs. In addition, just three inches of plant growth can reduce runoff by about 50 percent. So there are carbon footprint implications as well as water quality protection.

IX. Land Use and Planning I-42-1

CWN! will defer to the SCSC residents, VoMB and especially Robert and Deanna Saint-Aubin. After reviewing their submissions, we believe that the ECF and MND review of this section too is fatally flawed and insufficiently addresses both singular and cumulative PSI. Not to mention gross violations and/or numerous variances required of the General Plan and MBRSAP. Ditto for **XII Population and Housing** Sections, which we believe **Item a)** is a PSI. .

XI. Noise
Items a), b), c) and **d)** will have PSI.

The intensification of use, the increase in site visitation traffic therefore equals increase in noise and it will be a significant one . Doubling the building space and parking spaces obviously results in this increase.

Ignored are the USFWS guidelines regarding construction noise and the Endangered Species gnatcatcher. It is well known that a pair of breeding gnatcatchers reside in the ESHA immediately adjacent to the project. As the Wildlife Enhancement Project wherein they reside is also just below the site, any idiot acoustical engineer can explain the natural amphitheater qualities of this site and sound wave transmission effects/impacts. USFWS: ***"No construction activities within 300 feet of active nesting territories***

(cont.)

Levels must be below 60 dBA along the habitat edge." As the "edge" coincides with the proposed retaining wall installation space for masons and landscapers using power soil compactors/excavators, saws, etc., this will be interesting to mitigate, now won't it? The original MND blithely, ignorantly and callously states that the gnatcatcher will not be affected, yet ignores these critical analytical tools and USFWS guidelines.

It should be noted that CWN! has also read, and agrees with, the analysis, concerns and complaints provided by Brian and Lisa Manning of Monarch Terrace regarding the improperly named Community Facility. This site has benefitted by City Hall partisanship to the detriment of the entire SCSC neighborhood.

XV. Transportation/Traffic
Items a), b), d) and **f)** will have PSI.

I-42-1

The SSC must:

(1) Confirm trip generators, trip distribution, and traffic assignments to adjacent roadway networks.
(2) Determine project built-out for Levels of Service (LOS) both with and without project, before, during and after completion.
(3) Determine why SSC is already using CVP as offsite parking when they were supposed to have 100% onsite capacity. This addresses inadequate parking capacity AFTER buildout. SSC members already refuse to use the existing onsite and park on the hazardous shoulders of CVP.
(4) Determine why the City has failed to produce the records of the agreed Parking Management or Monitoring Program/Survey: SSC was supposed to turn over logs that the City would analyze, then charge SSC for staff time to analyze the database according to the 1995 parking lot expansion mitigation list per CEQA (MMRP).
(5) Staging: The Strands Parking Lot agreement between SSC and OCRDMD (now defunct) cannot be submitted as is and **SHALL** be rescinded: ***"The church has obtained a letter of intent dated December 27, 2007 from the County of Orange (Resources & Development Management Department-RDMD) to allow off-site parking in the vicinity of the church."***

CWN! believes that the County abused and exceeded its discretionary authority and responsibilities to recreationalists by affixing its signature to such a proposal. This off-site parking plan is in violation of previously agreed upon, contractual obligations, those spaces are already spoken for as elements of Public Beach access under the CUP, LCP

(cont.)

and CDP for the site. OCRDMD **SHALL** be required to get an amended CUP from the County Planning Commission AFTER a noticed hearing, and whether it's a TUP or CUP amendment is up to the County but a public hearing **MUST** take place. Secondly, this altered CUP or a TUP **MUST** have CCC approval. ALL presently engaged/interested parties in the SSCMPP **SHALL** be placed on said OCPC public hearing list.

The SSCMPP should not be allowed to progress beyond the DEIR until the SSC can provide these compliant CUP/LCP/CDP alterations for the Strands Parking Lot. SSC should not be allowed to progress any further, to delay this approval process is unacceptable as there will no guarantee until this off-site staging plan is confirmed.

The increased usage due to the funicular, coupled with the FREE PARKING the public will increasingly avail itself of in tough economic times, make this questionable. 100 spaces, taken by SSC contemporaneously with peak visitation months, is counter-intuitive. Where is a legitimate, independent monitoring program to ensure that only 100 spaces are being taken and when they are taken? What about indemnification of the shuttle service alluded to? Moreover, typifying this lot several miles away as ***"in the vicinity of the church"*** is hysterically funny but inaccurate.

The I/A and ECF failed to accurately assess traffic and circulation problems. I-42-1

As observed by CWN!, the City employees when asked at the March 4, 2010, SS acknowledged that the MND submitted for this institutional project did not include a complete assessment of impacts upon Lumeria Lane, Crown Valley Parkway and Pacific Coast Highway. Therefore, the results of that declaration must be rejected in favor of a study that actually focuses on all areas that will be affected by construction and post-construction (SSCMPP completed buildout) traffic.

Lumeria Lane is the only entrance and exit out of MBV. There are no other streets that flow onto Crown Valley Parkway or other city streets. Currently, Lumeria Lane is already hazardous due to fast moving traffic accelerating from PCH up Crown Valley Parkway. The traffic moving towards PCH from inland has a limited line of sight as Sea Island Drive is at the crest of the hill in the southerly direction. Left turns are already difficult, sometimes impossible to make, right hand turns are subject to the accelerating vehicles traveling inland.

(cont.)

Impatient motorists driving in both directions can presently be observed impairing access from Lumeria onto Crown Valley Parkway and also pass erratically. Slower moving or merging vehicles are endangered, especially those that are not in the immediate line of sight. Those in line to emerge from Lumeria become candidates to be hit by the anxious, impatient commuting drivers who seem unmotivated to anticipate traffic transitioning onto Crown Valley Parkway from Lumeria Lane.

Construction traffic will slow and impair smooth, continuous traffic circulation along and onto Crown Valley Parkway. Left turns from Lumeria Lane or from other streets between Lumeria Lane and PCH will be dangerous and next-to-impossible. If the larger trucks are staged (while awaiting access) on the right hand, uphill, north-facing shoulder then line of sight becomes even more difficult for Lumeria drivers. And where will guests or visitors to MBV park? Are the spaces on CVP already dedicated as off-site parking for MBV as originally included in the County permits, and if so where are the mitigation measures to assure MBV adequate guest parking? As the County has failed to provide the pre-incorporation land use records, CWN! cannot discern if these spaces are dedicated, that is already spoken for.

I-42-1

It doesn't take a rocket scientist to realize the "Chinese Fire Drill" that will be triggered at the Sea Island signal both during and after construction activities cease. This signal will be changing in increasingly chaotic, random patterns not presently occurring due to site visitations by vendors and visitors, more profoundly impacted by the larger excavation and grading vehicles accessing and egressing the site. The confusion during construction will be a PSI that appears to have no mitigation(s) possible to attenuate the debacle. Line of sight will be limited for emerging

The residents of MBV will encounter significant disruption in their normal driving patterns and incur significant and unpredictable delays in their ability to go to the store, the doctor and other necessary and regular trips. Those who are the most elderly, but still safely licensed to drive, will be most endangered by erratic drivers and unsafe conditions and will suffer significant loss in quality of life. Furthermore, accidents will increase in frequency and severity. If approved, the City will in essence have contributed to the creation of a hazardous, negligent condition. What are specific mitigations for the above-mentioned traffic problems for Lumeria Lane (MBV residents and visitors)? What are the plans to keep the residents of MBV safe and able to meet their needs for access to the larger community?

(cont.)

XVI. Utilities & Service Systems

Items b) & c) will have PSI.

It is unclear, once again due to the lack of information provided by the City and SSC, whether there will be an onsite urban runoff treatment train, where it will be located, where it will discharge, etc.. As noted in our previous critique (MND Comments EXHIBIT C) the necessity for such an advanced treatment system seems a no-brainer.

That said, will the treated and filtered storm water evacuate/discharge to the v-ditches on the undersized, difficult to maintain and inaccessible already poorly maintained coastal bluff, to SCWD municipal (common) wastewater system, or to both and in what volumes and state of cleansing to each?

If diverted to the municipal wastewater system, then new, upgraded and significantly altered infrastructure will be necessary. CWN! cannot discern the volumes to receive pre-treatment and/or polished (advanced) treatment. CWN! can only estimate volumes from rainy events to be diverted for treatment or pre-treatment because SSC has failed to provide enough specificity regarding exact total volumes eventual destinations (offsit and/or onsite).

I-42-1

Our best guess is approximately 100,000 gallons will be deposited onsite in a 24-hour period. SOCWA, the parent JPA for wastewater, may only allow diversions up to 50,000 g/d per diversion under the permitted element by the SDRWQCB regarding their NPDES

This is another example of poor planning. The upper limits placed on stormdrain to wastewater diversions was a direct result of CWN! complaints and petitioning to the SDRWQCB some 10 years ago. The Board agreed that due to the gamut of toxic constituents in urban runoff that SOCWA regional waste treatment plants are not designed to remove or reduce, a cap would have to be placed to avoid exceeding the NPDES requirements for the ocean outfall pipes where they discharge.

Nowhere in the MND or supporting documents are there more instances of the IOU/TBD/TBA type mentality. Merely waving a magic wand and declaring that a City already observed to be in violation of water quality regulations will miraculously comply is absurd. That the City will provide the proper oversight, the enforcement it has abject failed in regards to at this site previously, is also unsupported and refuted by the recent history of complaints filed by CWN! with the SDRWQCB.

(cont.)

XVII. Mandatory Findings of Significance

This summation is completely incorrect, **Items a), b), c)** and **d)** are erroneously found to be of either **No Impact** or **LTSIWM**. There will be an overwhelming number of mitigations required by the time LSA has digested, analyzed and created the DEIR.

CWN! believes that some of the singular or cumulative impacts cannot be mitigated as the SSCMPP is now configured and proposed. ALL of the conclusions reached in this section are due to the under-valued ECF items previously cited by CWN!.

There appear to be no impacts for **Section II (Agriculture Resources)**, none for **Section X (Mineral Resources)**, possibly none for **Section XIII (Public Services)**, and none for **Section XIV (Recreation)**.

I-42-1

There are a total of 87 checklist boxes in the sections CWN! feels applicable. Of those 87, CWN! finds 53 that may have PSI, obviously ALL 53 were not deemed so by the ECI generated by Cheryle Hodge. That means approximately 60% were undervalued significantly to some degree or level.This correlates, unfortunately, with the previously rescinded-yet-not-rescinded MND that required over 400+ mitigations to comply with CEQA. This present SSCMPP is also fatally flawed, the MND without merit.

This leads CWN! to conclude that the entire MND needs to be disposed of. NOW. It no longer bears any resemblance to a potentially compliant buildout. It no longer has any relevance and in fact has biased LSA in their analytical processes. Not to mention wasted yet more personal time and money of the City's own population. An entirely new ECF needs to be drafted if Legal Defensibility is actually desired.

Roger von Bütow

March 22, 2010

Roger von Bütow Founder & Executive Director
Clean Water Now! Coalition (Established 1998)
P.O. Box 4711 Laguna Beach CA 92652
Home Office: (949) 715.1912 (Voicemail AFTER 6 rings)

Beach Cleanup Information/Messages (949) 280.2225
Website: www.cleanwaternow.com
"The Clean Water Now! Coalition is dedicated to the protection, restoration and preservation of aquatic and riparian ecologies worldwide."

EXHIBIT A

Ms. Carol McDermott of GSI E-mail

I-42-1

From: Carol McDermott <carol@govsol.com>
Subject: **Meeting regarding South Shores Church**
Date: November 20, 2009 9:57:26 AM PST
To: "Robert F. Saint-Aubin" <rfs@coastmediator.com>, Roger Butow <rogerbutow@mac.com>
Cc: Mark McGuire <mrmcguirelaw@cox.net>

Robert and Roger: I am sorry for the delay in our meeting, but as the church leadership has wrestled with the additional costs of preparing an EIR, there have been considerable meetings and discussions that have taken time. We are now ready to meet and I have listed the times below that Mark McGuire and I are available. I am hopeful one of them will work for both of you. (I will be gone Nov. 25 through Nov. 30). Please let us know of your availability and where you would like to meet. We look forward to meeting with you. Thank you, cmmc

- Monday, Nov. 23, 4:00 on
- Tuesday, Nov. 24, anytime prior to 4:00
- Wednesday, Dec. 2, anytime
- Thursday, Dec. 3, 11 to 3:00

I-42-1

"Turning Challenges into Victories"

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For scheduling, please contact Cookie Chrysler at (949) 717-7943 or cookie@govsol.com

From: Carol McDermott
Sent: Wednesday, November 18, 2009 3:11 PM
To: GG Kohlhagen
Cc: Vicki Fetterman
Subject: RE: SSC - RE: First Steps

2009 NOV 22 P 1:31

GG: please see attached and see if it is more what you need to send forward. I am off to a 3:30 meeting that should be over by 4:30 and then I am available until a meeting at 6:45. cmmc

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I-42-1

From: GG Kohlhagen [mailto:ggkohlhagen@cox.net]
Sent: Wednesday, November 18, 2009 12:14 PM
To: Carol McDermott
Subject: SSC - RE: First Steps

Hey Carol –

Yes, my wife & I did enjoy ourselves in San Francisco – thank you. Glad your travels were rewarding also.

Per our conversation on Monday morning – I am still trying to get to the bottom of the "No Stopping Entire Block" posting north of the signalized intersection / north-bound lanes of Crown Valley. Kyle & Doug "had no knowledge" of posting – encouraging me to speak with Brad Fowler – as of finally connecting with Brad this morning – he could not cite the specifics either & is going to look into it... However, most disturbing were his initial comments acknowledging "staff recommendations" for doing so per everything brought up & otherwise regarding our project recently – which I immediately took issue with. He immediately backed-off, stating he may be wrong, & would look into it & get back with me... Just spoke with Doug – tickets will be "taken care of" (I can share this with church – this is good news) – signage requires further efforts to address – according to Doug this was strictly driven by OCTA / bus stop location...I am to hear from Matt or Brad as a follow-up & in turn will be able to share further with the church at that time on the signage, etc.

Regarding the status of the EIR & Building Committee – this too was among my efforts Monday & somewhat yesterday during my travels. A few on the committee remain vocal & are requesting further meetings to discuss moving forward with the EIR, etc. As you aptly pointed-out previously – yes – this is wearing me out... I-42-1

Nonetheless, I intend to send out an update to the committee later today, inclusive of acknowledging your strategy – so – here are my comments from reviewing what you provided:

Initial Strategy for South Shores Church Entitlement and Community Issues

November 17, 2009

In recognition of the concerns of some of the Church leadership with regard to the strategy for proceeding to retain/obtain city support for the Church Master Plan, Government Solutions, Inc. is outlining a first phase scope of work that is consistent with our scope of work in our contract but spells out specific actions as follows:
Generally, for each of the items listed, any date forecasting on these efforts would be most helpful – some want a schedule of sorts from you - ? – to have assurance that these items will be in the works...

Again, I have been given the task to "instruct you to meet with the neighbors – specifically Aubin & Butow" irrespective of whether or not we have sent any payments in on the EIR per "what business is this of theirs"... So, I yield to your expertise regarding the unfortunate issues management we are both dealing with on this matter...

- Meet with city staff to understand their perspective on our project, on our opponents and reconfirm their support –
- Meet or call key elected officials to give status update and assess their positions on the project
- Meet with project team, to review citizen complaints and summarize the issues
- Map the addresses of known supporters and opponents (per your message)
- Meet with key opponents (Roger Butow and Robert Saint-Aubin) to confirm their issues and assess their strategy to assist in refining our strategy
- Develop a list of select adjacent neighbors for one-on-one interviews to better understand the depth of their concerns/opposition
- Develop a summary of neighbor concerns and recommend a strategy for addressing their issues which may include small groups meetings, email blasts of project information, presentation of our side of the issues to the press, etc.

I-42-1

Subsequent actions will depend on the findings of the above and the ongoing direction of the client. Actions with the staff regarding the progress of the preparation of the EIR will be conducted separately by Mark McGuire but in coordination with our efforts.

Regarding the EIR & your strategy list – here are the most recent comments I am battling to allay the final concerns & gain a consensus for sending in the first installment & otherwise following our BC meeting last Tuesday that I believe overlap somewhat with your strategy:

1) Urge our P.R. person to proceed to meet with our opponents. This is not dependent on our payment to the City for an EIR or anything else. It is to put to rest their claim that we won't' meet. – acknowledged above

2) GG (and others) to meet with the City and tell them of our concern with the plan for LSA to only assemble/write the summary for the proposed EIR and for our church to contract for the various technical portions, such as traffic, drainage, critters, etc. We want LSA or whoever the consultant is to be to include the cost estimate for and to contract for all of the work- not just to oversee it and edit and assemble it into a report. Thus we decided not to submit the first $50,000 until this is done. Here was my (personal response) to these two items with the idea my update today would include similar references: On Wednesday, Mark McGuire & I met with Cheryle & Bill to discuss the final concerns on the EIR with the city that you point out. I opted to go this route in lieu of going through the city as originally considered for two primary reasons: (1) I trust Mark & his assessment of our circumstances & feel we should be relying on him in lieu of the city (2) I did not want to incur the costs associated with having the city attorney & otherwise sit & discuss these matters since our attorney is telling us to move forward Without encumbering the process any further (Wednesday he spent over an hour / hour & half thoroughly explaining all of this to Cheryle & Bill from the legal perspective & his intimate knowledge of our circumstances with city). I-42-1

Nonetheless, per the meeting Wednesday, Mark placed a courtesy call to the city attorney on our behalf per the concerns Cheryle & Bill have expressed in our meetings.

Per their conversation, Mark's understanding has been confirmed further by their discussion & he advises us to proceed with the EIR "as is" at this point.

Mark has unequivocally stated that these final matters are of no legal merit & of no need for further delay of our engaging on the EIR. He is confident; that once we engage with LSA, any necessary updating of the tech. studies & the subsequent hiring of those consultants can be handled at that time - fully taking into account the churches best interests. Keep in mind that LSA still needs to review the original studies & that at that time they will be able to more credibly address what needs augmenting & what needs a more in depth effort. To reiterate, Mark is confident that at that time, the concept of having the contracts directly with LSA or otherwise can be properly addressed & finalized.

Lastly, Mark cautioned that to press on this at this juncture would work against us with the city, possibly the consultant (LSA) & in turn may actually give credence (perception of anyway) to VOMB's previous allegations, bringing into question any use of the current technical studies whatsoever - meaning, where do you draw the line on this type of thinking? I-42-1
Based upon Mark's understanding of our circumstances & advisement that we
should engage LSA, I am going to recommend per my return on Monday that we submit the first installment of the $50,000.00 immediately to get this process underway.

Finally, I met with Carol McDermott Wednesday evening from approx. 5 - 6:15pm. I provided her additional information for the data base she seeks to establish & will be supplying her additional information as well. She will be getting back to me on scheduling with Aubin & Butow.

3) This is among the more recent correspondence: I believe some or all of my concerns are also concerns of others on our committee and our membership. Some on our committee believe there are problems with the suggested path of preparing an EIR, in that we are looking at spending

several hundred thousand $ and being subject to criticism by our opponents regarding the procedure of engaging the sub-consultants..Our attorney may be good but we have been burned several times on this and I think it is prudent to be very careful. Also in view of our discussions regarding next Nov. election, we should be in no hurry to get the EIR going within days or weeks. I think we need a political consultant more than a P.R. and legal consultant and that we need to get more members involved in our overall project and possible alternatives before starting the EIR.

My sharing of this is to assist us both in our efforts to move this forward. Anything you can offer me to share with committee to lay this to rest would be most helpful. The passage of time & correspondence & meetings is not necessarily helping & it is evident I am unable to explain this well enough for some... Perhaps in your strategy you could add something I could share with the committee speaking to the importance for moving forward on the EIR – specifically addressing these final hurdles: (1) I believe (per your advice, Mark's & city's & my understanding of our circumstances) time is actually of the essence & delaying the EIR by speculating on the future elections (& other) is more detrimental than proceeding at this juncture... - ? (2) We need to follow Mark's advice / your advice – how to convey better? (3) Moving forward on the alternatives – on our own – "before starting the EIR" – I have stated I am more than willing to assess our plans & move to consider alternatives – but to the delay of the EIR - ? – I disagree... I-42-1

By the way, integral to this, Doug was very congenial this morning when I explained to him the difficulties the church is experiencing in grappling with all of this when he too asked if we are going move this forward with EIR, etc.

The update I am intending to send to the BC later today will likely include a "vote" option requesting the opportunity to proceed immediately – this, because it is obvious a consensus cannot be reached in a timely manner, or perhaps ever... My only other thought is the opportunity for a vote on scheduling another meeting to discuss further the concerns raised by the correspondence during my travels – etc. I have been urged by one committee member to allow for this in an effort to be most respectful & most inclusive of everyone...unfortunately, key individuals are already traveling for Thanksgiving & other delaying this option.

Lastly, I would greatly appreciate direction on what I can share with the committee & what is most sensitive & how to best handle the conveyance of

your strategy.

Thanks Carol – G.G.

I-42-1

Exhibit B

Corrected Environmental Checklist Form

I-42-1

City of Dana Point
Environmental Checklist

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
I.	**AESTHETICS**				
	Would the project:				
a)	Have a substantial adverse effect on a scenic vista?	●	☐	☑	☐
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	●	☐	☑	☐
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	●	☐	☑	☐
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	●	☐	☑	☐
II.	**AGRICULTURE RESOURCES**				
	Would the project:				
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☑
III.	**AIR QUALITY**				
	Would the project:				
a)	Conflict with or obstruct implementation of the applicable air quality plan?	●	☐	☐	☑
b)	Violate any air quality standard or contribute to an existing or projected air quality violation?	●	☑	☐	☐
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	●	☐	☑	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	●	☐	☑	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☑

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	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES				
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☑	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impeded the use of native wildlife nursery sites?	☐	☐	☐	☑
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑
V. CULTURAL RESOURCES				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☑
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☑	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☑	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☑	☐
VI. GEOLOGY AND SOILS				
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☑	☐
ii) Strong seismic ground shaking?	☐	☑	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☑	☐
iv) Landslides?	☐	☑	☐	☐

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	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b) Result in substantial soil erosion or the loss of topsoil?	☐	☑	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☑	☐	☐
d) Be located on expansive soil, as defined in Table 18- 1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☑	☐
e) Have soils incapable of adequately supporting the use septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☑
VII. HAZARDS AND HAZARDOUS MATERIALS				
Would the project:				
a) Create a significant hazard to the public or the environment through routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☑
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☑	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☑	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites which complied pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☑
e) For a project within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☑	☐
VIII. HYDROLOGY AND WATER QUALITY				
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☑	☐	☐

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		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local ground-water table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☑
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?		☐	☑	☐
d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of a course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off-site?		☐	☑	☐
e)	Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?		☑	☐	☐
f)	Otherwise substantially degrade water quality?		☑	☐	☐
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☑
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☑
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑
k)	Result in an increase in pollutant discharges to receiving waters? Consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical storm water pollutants (e.g. heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash.		☑	☐	☐
l)	Result in significant alteration of receiving water quality during or following construction?		☑	☐	☐
m)	Could the proposed project result in increased erosion downstream?		☑	☐	☐
n)	Result in increased impervious surfaces and associated increased runoff?		☑	☐	☐
o)	Create a significant adverse environmental impact to drainage patterns due to changes in runoff flow rates or volumes?		☑	☐	☐
p)	Tributary to an already impaired water body, as listed on Clean Water Act Section 303(d) list? If so, can it result in an increase in any pollutant for which the water body is already impaired?		☑	☐	☐
q)	Tributary to other environmentally sensitive areas? If so, can it exacerbate already existing sensitive conditions?		☑	☐	☐
r)	Have a potentially significant environmental impact on surface water quality to either marine, fresh, or wetland waters?		☑	☐	☑

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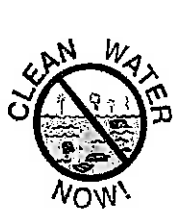

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
s) Have a potentially significant adverse impact on groundwater quality?	☐	☑	☐	☐
t) Cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?	☐	☑	☐	☐
u) Impact aquatic, wetland, or riparian habitat?	☐	☑	☐	☐
IX. LAND USE AND PLANNING				
Would the proposal:				
a) Physically divide an established community?	☐	☐	☐	☑
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☑
X. MINERAL RESOURCES				
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☑
XI. NOISE				
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☑	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☑	☐	☐
e) For a project located within an airport land use land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

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	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
XII. POPULATION AND HOUSING				
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
XIII. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☑	☐
i. Fire protection?	☐	☐	☑	☐
ii. Police protection?	☐	☐	☐	☑
iii. Schools?	☐	☐	☐	☑
iv. Parks?	☐	☐	☐	☑
v. Other public facilities?	☐	☐	☐	☑
XIV. RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b) Does the project include recreational facilities or require the construction of or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☑
XV. TRANSPORTATION/TRAFFIC				
Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☑	☐
b) Exceed either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☑	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☑
e) Result in inadequate emergency access?	☐	☐	☐	☑

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	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
f) Result in inadequate parking capacity?	☐	☑	☐	☐
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☑
XVI. UTILITIES & SERVICE SYSTEMS				
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☑	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☑	☐
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☑	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☑	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☑
XVII. MANDATORY FINDINGS OF SIGNIFICANCE.				
A) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major period of California history or prehistory?	☐	☑	☐	☐
b) Does the project have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals?	☐	☐	☐	☑
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☐	☑
d) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☑	☐	☐

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Source List

The following enumerated documents are available at the offices of the City of Dana Point, Community Development Department, 33282 Golden Lantern, Suite 212, Dana Point, CA 92629.

1. California Environmental Quality Act as amended January 1, 2008. §§21000-21178 of the *Public Resources Code*, State of California.
2. Guidelines for California Environmental Quality Act as amended July 27, 2007. §15000-15387 of the California Code of Regulations, Title 14, Chapter 3, State of California.
3. South Shores Church Master Plan, Project Plans prepared by Matlock Associates, Inc., dated May 2008.
4. City of Dana Point General Plan, approved July 9, 1991.
5. South Shores Church Master Plan, Conceptual Water Quality Management Plan, prepared by Adams-Streeter Civil Engineers, Inc. dated January 25, 2008.
6. South Shores Church Master Plan, Hydrology/Drainage Analysis prepared by Adams-Streeter Civil Engineers, Inc. dated September 2008.
7. South Shores Church Master Plan, Geotechnical Study prepared by G.A. Nicoll and Associates, Inc. dated February 20, 2008 and April 6, 2006.
8. South Shores Church Master Plan, Report of Supplemental Geotechnical Investigation for the Proposed Christian Education Buildings 1 and 2, prepared by G.A. Nicoll and Associates, Inc., dated May 21, 2007.
9. South Shores Church Master Plan, Response to Geotechnical Review prepared by G.A. Nicoll and Associates, Inc., dated November 28, 2007, October 31, 2007, and July 26, 2007.

The following enumerated documents are available in "Appendix B" of this document:

1. South Shores Church Master Plan, Air Quality Study prepared by Mestre Greve Associates, Inc. dated April 2006 and updated May 2008 and November 2008.
2. South Shores Church Master Plan, Parking and Traffic Study, prepared by RK Engineering Group, Inc. dated May 9, 2006 and updated May 12, 2008.
3. South Shores Church Master Plan, Biological Resources Assessment, prepared by Califauna (Jeffrey B. Froke, Ph.D.), dated October 30, 2007, April 25, 2008, and January 8, 2009.
4. South Shores Church Master Plan, Noise Study prepared by Mestre Greve Associates, Inc. dated April 2006 and updated May 2008 and November 2008.

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Exhibit C

Previously Submitted MND Comments

I-42-1

CLEAN WATER NOW! COALITION
P.O. Box 4711, Laguna Beach, CA 92652 - 949.280.2225 - www.cleanwaternow.com

"The Clean Water Now! Coalition is dedicated to the protection, restoration and preservation of aquatic and riparian ecologies worldwide.."

I-42

To: City of Dana Point (CDP)

Date: July 16, 2009

Re: Mitigated Negative Declaration (MND) for South Shores Church (SSC) Master Plan (MP)

Address: 31712 Crown Valley Parkway (Monarch Beach) Dana Point CA 92629

City of Dana Point:

The proposed SSC project purports to require a Conditional Use Permit (CUP), a Coastal Development Permit (CDP) and a Site Development Permit (SDP) for the SSC project. This is patently false. It is in reality a **series** of CUP's, CDPs and SDPs that should be denied outright by the CDP Planning Commission.

Moreover, it violates or fails to comply with one of the basic prohibitions specifically noted in CEQA: Sequential (aka piecemeal) filings. Sequential filings, exemplified in this particular project by the absurd succession of Water Quality Management Plans (WQMP), this project is more akin to a haphazard, truncated, loosely cobbled together algorithmic SERIES of experiments, a daisy-chain which lacks cohesive, coherent land use development planning.

I-42-1

A MND is the wrong mechanism for this project and should be rejected outright by the CDP. The entire 10-year MP approach seems conveniently predicated upon internal financial restraints by the SSC, yet economics and the proponents budget have no bearing, are to have no influence in lead agency deliberations.

Funding is the problem of the proponent and as this appears to be a project in the range of $40-50 million total in my estimation it is absurd to allow them to even break ground if their professed funds at present are only 10% of that needed sum. They shouldn't be allowed to proceed if they cannot provide proof of 100% funding capability.

Although the SSC purportedly held a series of small, individual meetings with the neighbors and HOAs, what should have occurred is what CEQA strongly encourages: **A Community Scoping Session (SS)**. A SS would have proactively uncovered innumerable disparities and/or issues of concern.

A SS would have allowed for ALL interested parties to conveniently attend communally, to initiate or instigate

(cont.)

negotiable issues in a civil format, to informally arbitrate ***"en masse,"*** thus allowing for more transparency and information sharing in a shared venue. It also gathers and helps coherently configure concerns by the use of a professional facilitator, thus potentially driving a consensual set of guidelines. Non-binding legally, it would have in my opinion concurred that an EIR was necessary.

The CDP, as a ***de facto*** referee, should be faulted for not strongly encouraging the SSC to do so as this now has become a vibrantly polarized adversarial endeavor, distastefully pitting residents who are religious themselves against a family-oriented religious facility.

The multi-phased, MP approach (5 or more phases) is a thinly-veiled attempt to circumvent CEQA. The MP is in fact boldly, completely ***"speculative"*** and CEQA inherently denies or forbids speculation in either project strategies or even written submissions/analyses in support of projects. The proponent argues a case for a future that may or may not happen. Typifying it as **"Master Plan"** is a farce. It is a succession of projects that will surpass the threshold of significantly adverse without credible known, mentioned or offered mitigations.

Many of the impacts on the checklist appear to have been intentionally portrayed as individually without significance, under-valued, falsely skewed towards justification of the resulting MND. I-42-1

In my professional opinion, in approximately 12 of the noted 17 Environmental Checklist Categories this project has singular Potentially Significant Adverse Impacts---Yet the consultant myopically fails to note even one (1) as Potentially Significant, let alone the cumulative impacts.

This is a blatant example of a pre-determined MND. The Evaluation of Environmental Impacts is seriously deficient and lacks credibility. The MND was drafted and the analyst simply de-valued both individual and accumulative to sustain that supposition in spite of known/knowable evidence to the contrary.

Each phase literally "builds upon" (piggy-backs) upon the mitigation measures and permits of the previous one in an intentionally nebulous fashion. If SSC doesn't know exactly what will emerge during the process of build-out, what changes might become necessary, certainly neither the CDP or the public can. No one can analyze or come to conclusions about possible complexities or restraints that have not occurred.

(cont.)

It is unclear, if not impossible to the standard of ***"proof positive"*** how this approach will drive compliance or avoid violations either during construction or after 100% completion of construction.

The project not only intensifies the general use of the parcel by doubling the size of the current facilities, but could easily treble site activities. The proponent wishes to alter the very uses it admits to, uses that will change/vary considerably over the MP evolution, each phase morphing it into a new conglomeration or configuration of uses over the course of the 10-year MP.

The proponent purports to hold the right to modify the project as the site is altered geomorphically, as the drainage patterns and flow values and directions evolve, as discoveries are made. It is, as we say in construction, one giant ***"as built"*** project, defying environmental oversight as it necessitates extraordinary flexibility disallowed under CEQA.

CEQA clearly discourages instruments like MND if they fail to address easily anticipated or discernible adverse impacts. It is no small leap to see that the SSC is doing this in a ***"Ready, Fire, Aim"*** mode, that the CDP is accepting IOU's where failure of the SSC to provide data dictates, at minimum should determine that more investigation is necessary. I-42-1

Undoubtedly, the CDP will be continuously revising the plans, allowing questionable addenda and/or variances over the counter at City Hall, perhaps onsite allowances by City inspectors that the public can't possibly track---Let alone object to. This is also in contradiction to transparency and public oversight, core values of CEQA. How and in what manner will the public track alterations that exceed the original intent? This places an onerous and unfair burden upon relatively unknowledgeable residents.

The MND completely ignores the incremental and cumulative prohibitions of CEQA, and thus declares the MP acceptable in advance of actually knowing what adverse effects could emerge, whether they constitute individual or cumulatively significantly adverse impacts. The MP attempts to project results/conclusions in a ***carte blanche*** fashion without providing any substantial proof that they will not accumulate into significantly adverse ones at later phases when the project cannot be stopped. Then the proponent will claim irreversibility, find shelter in a ***"point-of-no-return"*** logic.

(cont.)

If the proponent is unable to construct the entire project ***in toto***, wants it reviewed and amended in progress, overall analysis is then **speculative** for the SSC, the CDP, even the projects supporters and critics.

As a professional environmental consultant myself, I am astounded by the conclusion that led the analyst Cheryl Hodge to deem a Mitigated Negative Declaration (MND) adequate fulfillment of the various mandated CEQA prescriptions, not to mention honoring the CDP Master Plan, Monarch Beach Area Plan, Salt Creek Scenic Corridor prescriptions as they relate to the CDP Local Coastal Plan.

This project should have required at minimum an extensive EIR with updated reports drafted within the past year, not allowed studies/analyses piled upon previous, now antiquated ones. There is such a dearth of specific supporting information, such an absence of details as to leave the arc of the project ambiguous and uncertain.

It is nearly impossible to independently analyze let alone discern the low-ball or under-value impacts leading to a meritless MND. That the analyst deducing a MND failed to note even one (1) Significant Adverse Impact says it all.

I-42-1

If another professional in this field can't discern compliance and potential violations, possible variances necessitated due to the absence and omissions of critical information, one must assume this was a conspiratorial attempt by proponent, analyst and CDP regarding their MND conclusion. The CDP should be the gauntlet, a litmus test not a facilitator. It should make monolithic development difficult, not act as passive enablers.

The initial analysis and MND read like a variation of ***"reverse rationalization,"*** a blatant attempt at reaching a foregone conclusion of minimal environmental review. The twisted, pretzel logic of the analysis and chosen path of a MND essentially justifies and sustains a poorly thought out plan. The MND hides behind the MP concept without facing this reality.

It is also an insult to the public, as local residents and interested parties who object will be required to attend an endless series of public hearings trying to track the various permits noted over the course of 10 years or more. This constitutes cruel and unusual punishment of the CDP own taxpayers. Inordinate hours of research, hiring their own consultants to defend what the CDP should in their fiduciary responsibilities disallow.

(cont.)

As a 38 year builder in Laguna Beach, I see smoke and mirrors, I am unable to even discern how anyone in the construction field could bid on, let alone successfully construct the more massive elements like the parking structure in a region historically prone to groundwater intrusion, slope failure, and attendant liabilities for contractors---Not to mention the liability exposure of the CDP for allowing such an intrusive monstrosity to be built in this ecologically fragile, already damaged zone.

There is an enormous amount of segmented/sequential permitting aspects, building a house-of-cards totality that is weakened as it travels chronologically through the multiple phases proposed.

Substantial historical evidence of the site's instability hence unsuitability alone should have constituted a CEQA red flag for Ms. Hodges and the CDP, triggering a Draft EIR, not the MND:

A **CEQA requires that the Lead Agency, through its initial study, review the <u>whole</u> of a project. A project must NOT be broken into smaller parts, each of which alone might qualify for a Negative Declaration, in an attempt to avoid preparing an EIR** ***(Association for Sensible Development of Bishop Area v. County of Inyo (1985) 172 Cal.App.3d 151).***

C **The decision to prepare a Mitigated Negative Declaration (and a Negative Declaration for that matter) must be grounded in an objective, good faith effort on the part of the Lead Agency to review the project's potential for significant impacts** ***(Sundstrom v. County of Mendocino, supra).***

I-42-1

Pursuant to Section 21080, substantial evidence includes "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts." It does not include "speculation..."

The proponent is speculating, as are its consultants and the CDP. The initial MND analyst perhaps failed to declare the initiation of an DEIR in part because this is only a **CONCEPT**, actually a series of concepts involving myriad alterations all dependent upon lessons learned from massive, sequentially phased modifications of the site.

Pursuant to Section 15370 of the CEQA Guidelines, mitigation includes:

B **"Effective mitigation measures are those written in clear, declaratory language specifying what is required to be done, how it is to be done, when it is to be done, and who will be responsible for doing it. The words "will" and "shall" are preferred to "may" and "should" when directing an action. Furthermore, measures must be feasible to undertake and complete. Avoid measures that are conditional upon feasibility (i.e., required only "when feasible"), rather than applied directly or at a specified project stage."**

(cont.)

It doesn't even achieve or merit MND standards as there isn't an actual project per se, simply a theoretical series of sequential submissions, subsequent alterations as yet undetermined, filings and innumerable unknowable, admittedly yet-to-be-discovered impacts. This SSC project is one humungous IOU, To-Be-Determined, To-Be-Announced *"Pandora's Box."*

Like the Big Dig in Boston, once the hole is dug, Dana Point residents and concerned parties will be stuck with these potentially adverse impacts, bound by a fatally flawed MND.

Realistically, this site is too small for the both the increased and multiple intended uses as portrayed. The SSC either needs a satellite facility of equal or greater area, or it needs to maintain good neighbor parameters by remaining as is. Cramming, basically stuffing or compressing all of it desires into a site grossly under-sized reflects poor planning. It is not the problem of the neighborhood or the CDP to solve either the growing pains or ambitions of a corporation.

I-42-1

Although a non-profit, SSC ***is*** a corporate venture, a business that should stay within its own sustainable fiscal abilities during an uncertain economic period.

PHASES: OUT OF ORDER

If this MP is approved, the parking structure should be built first. This will accomplish several goals, among them alleviating/attenuating any off-site slope impacts, any impacts due to traffic/circulation/parking difficulties, perhaps lessen or negate requisite off-site parking plans, plus give the project more reasonably achievable hydrologic and water quality compliance capability in one fell swoop.

(1) Building the structure first will assure that as the project goes through multiple phases there will ALWAYS be adequate spaces onsite for not only the SSC activities but construction ones as well.

(2) The $5 million the SSC purports to have in its coffers is a significant portion of the funds required to initiate this phase first, NOT last.

(3) As it is to contain the major water quality and hydrology infrastructural device or component for mitigation (the subterranean cistern), then this seems intuited as the greatest, highest priority. It guarantees compliance proactively, preemptively, and

(cont.)

the SSC will have proven itself a caring and sensitive neighbor. Not to mention its proclaimed interest in the protection of the surrounding general environmental habitats.

(4) The pollutants of concern can be reduced or eliminated at the source if this buried, subterranean drainage and sediment transport reduction/removal system works, the basic component of the NPDES process itself. Completion assures that whether during initial demolishing of edifices or subsequent installation the site is protected to the Maximum Extent Practicable (MEP), also a NPDES prescription.

(5) Building it first will proactively lessen anxiety levels in the adjacent neighborhoods, making the project's goals more realistically achievable and timely without acrimony.

(6) Building this monolithic structure first makes the major discomfort, the greatest site soil intrusions, the major dislocations/disruptions within the neighborhood and the severest of impacts experienced at the onset of the project. What happens if the SSC runs out of money AFTER completing all of the buildings first? Where is that calamitous contingency dealt with in the MND or the SSC supporting docs? I-42-1

COMMUNITY FACILITY (CF)

In a rather disingenuous and intentionally false portrayal, typifying the gymnasium (Life Center) as in accord with zoning requirements or even allowing unchallenged the CF designation itself is flawed. First, SSC will have sole control or discrimination over the activities that take place onsite, SSC will determine use unilaterally, decide access and availability.

Second, there is no mechanism or instrument proposed that assures the general public (read community) the implied egalitarian access to this facility. Surely no one believes that a Planned Parenthood rally would ever be allowed, do they? And couldn't SSC just claim that the facility was already booked in a pre-disposed, biased and discriminatory fashion, difficult if not impossible to prove short of litigation?

Therefore it qualifies as a CF in name only, there is no written guarantee that can force CF conformity or compliance. The potential for mischief or conflict of interest has been

(cont.)

unchallenged or even broached by the SSC consultants and CDP.

This "bait and switch" approach should be investigated further and some surety, some oversight mechanism should be created to guarantee fair and equitable access. The SSC has its own interests to consider and cannot be trusted in a blanket fashion to whom it might book this venue.

ALTERNATIVES

Where in the analyses and supporting docs posted by the CDP is there a discussion of alternatives as environmental law and CEQA give specific guidance about?

(1) **No Project Alternative:** What if SSC made no alterations to the site?

(2) **Rehab of Existing Site:** Why can't the SSC simply renovate/upgrade the existing facilities and parking lot, reconfigure the site at present grade to avoid massive geomorphic alterations? This would leave the existing slope and crest undisturbed, require few if any monolithic retaining walls, jeopardize little if any of the surrounding habitat. It also seems to be within the SSC professed budget capabilities.

Pursuant to Section 15370 of the CEQA Guidelines, mitigation includes:

I-42-1

"(a) Avoiding the impact altogether by not taking a certain action or parts of an action.

"(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

"(c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment."

STAGING PLAN

It is unclear as to how the SSC intends to continue operating a full capacity and yet stage construction materials, heavy equipment, and workers/vendors vehicles. As a builder, I can personally attest to the inherent difficulties of the traffic circulation aspects as well---None of these potential are fully addressed.

The contrivance of proposing off-site parking and commuter mechanisms at Dana Strands is ridiculous. Yes, SSC attendees already impatiently refuse to avail themselves of onsite

(cont.)

parking, preferring to park dangerously along CVP and walk to the facility so they might enter and leave more expeditiously. That is a choice that involves little waiting time and very little truncated effort. These people are not going to bus from Dana Strands---They'll park up in the adjacent neighborhood first.

Increased usage (hence vehicular visits) will occur dramatically as the site goes through the numerous phases, and the increased stress on the artery feeding the site (Crown Valley Parkway---CVP) seems a no-brainer. The signal will change more often, requiring CVP traffic to slow down and thus become mildly gridlocked. In the case of Monarch Bay Villas, access and egress could become significantly impaired, yet no mention of that is made.

Parking in the adjacent neighborhood must be forbidden to avoid this conundrum. Perhaps a permanent "RESIDENTS ONLY" parking permit program with stickers needs to be implemented to guarantee SSC visitors do not pursue over-loading of the residential frontage spaces available across CVP. I-42-1

Did anyone either at the CDP or the analyst interview the OC Sheriff's Department in great detail, explain the proposed parking/traffic complications, procure a written estimation of potential glitches? Surely non-biased traffic officers familiar with the existing line of sight restraints, the aggressive use of CVP parking spaces by the SSC attendees, the potential traffic pattern alterations due to increased, frequent signal changes and other dynamics particular to this area should have been consulted and made public (NOT through ex-parte communications).

The CDP and SSC studies, the conclusions of same are open to mischief hence suspect, what's needed is independent 3rd party expertise and input.

Section VIII: Hydrology and Water Quality

This section contains the most egregious example of Pollyanna speculation and absurd conclusions in the MND.

This site cannot fulfill the prescriptions of the present NPDES Permit, let alone future ones. How can anyone believe that a site which admittedly increases impervious surfaces by 37% yet refuses to upgrade downstream capacities proportionately possibly comply?

(cont.)

This site will violate the present NPDES, it will increase the pollutant loading and sediment transport to an already federally listed 303 (d) Impaired Waterbody.

The Salt Creek pollutant-reduction treatment plant near the termination and Point of Discharge (POD) for Salt Creek is fragile, prone to going offline constantly if overwhelmed with Totally and Partially Dissolved Solids---Constituents commonly transported by runoff. It will be adversely affected by loading which will originate from this site, will occur for lengthy periods subsequent to rainy events.

The Water Quality Management Plan (WQMP) is filled with off-the-shelf, boilerplate elements and propositions. It is so vague, perhaps intentionally so as to be practically worthless. A project this complex should have necessitated a more detailed supporting report. Truly a minimalist, cheap-fast-and-out-of-control approach. This section epitomizes my IOU contentions. Lacking in specificity, it is completely unclear as to how water quality compliance will be achieved.

The CDP Planning Department (Erica Demkowicz) claims that Phase 1 will require compliance with the existing Cal/EPA R9-2002-0020 NPDES for South Orange County, that subsequent Phases 2---??? will be required to comply with subsequent NPDES permits. This will require a series of WQMP as each phase will require modification and/or amending, perhaps each requiring subsequent Cal/EPA hearings. I-42-1

Once again, the public will be required to travel vast distances (inland San Diego), be required to procure on its own expensive investigative analyses from independent disinterested 3rd party consultants. CDP residents cannot trust their own City as it has failed them already via allowing the MND to get this far.

In October of this year, Cal/EPA (San Diego Regional Water Quality Control Board-SDRWQCB) is scheduled to ratify R9-2009-0002. The NPDES process is really an ongoing, evolving series of permits, each a gradual ratcheting down of greater restrictions intended to reverse PRIOR water quality impairment due to decades of degradation.

The existing drainage infrastructure on the slope below (v-ditches, detention basins, etc.) is already of insubstantial configuration and capacity. It's size and pollution-reduction capability is not only minimal, but antiquated and below even R9-2002-0020 standards or requirements. How it could possibly EVER achieve future compliance if not increased substantially to

today's standards boggles the mind.

This is just one of the reasons why the parking structure, attendant pollutant and flow control/reduction/detention systems must be installed first.

The Dynamic Separator mentioned is a type of continuous deflection system that only removes coarse debris and only functions well during peak rainy events. It is NOT, per se, a Low Impact Development water-borne pollution reduction or elimination system. During low flow, nuisance water (runoff) conditions the holding wells of these systems acquire pooled water, become vectors for pests like rats and mosquitos (West Nile).

This project should require a mini-treatment UV and RO system that filters, removes and reduces California Toxic Rule and Prop 65 substances, not to mention AB 411 bacteria, viruses and hydrocarbon detritus.

It should include hydrocarbon filters at ALL major storm drain intakes. This would reflect REAL mitigations:

Pursuant to Section 15370 of the CEQA Guidelines, mitigation includes:

"(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

"(e) Compensating for the impact by replacing or providing substitute resources or environments."

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I see absolutely no way that the SSC or the CDP can guarantee CWA or Porter-Cologne Water Quality Act compliance even if these recommendations were ratified. This is due to the enormity of the project's size, its increased impervious surfaces, its proximity to Salt Creek and the under-valued drainage system provided by the CDP.

I also need to include that I cannot find any assurance that slope erosion and adverse impacts to USFWS eco-restoration will not take place. Claiming the breeding gnatcatchers can take high decibel levels of constant noise during construction would be hysterically funny in other circumstances.

There are so many things wrong, so little right about this project that time and space don't allow proper consideration. Robert & Deanna Saint-Aubin's submission contains many of my mutual concerns so I need not be redundant but concur **1,000%**.

(cont.)

CONCLUSION

The amount of weight to be placed upon the parking area raises serious issues unexplored by the CDP and/or the MND.

I estimate that the SSC will need to detain over 100,000 gallons of water, which weighs nearly 1,000,000 pounds. Added to that are the concrete and steel necessary to contain it---Add a million or more pounds. Placing the cistern in a subterranean area nearly impossible to view, difficult to monitor or access for efficient, water quality-compliant subsequent operation and maintenance.

Now add that weight to the incredible weight of the dual level structure itself coupled with the new buildings.

Now add in the factor of ***"liquefaction"*** due to the known soil moisture content in the area. A relatively minor seismic event could amplify the potential for destruction. The homeowners below the site will live under the Sword of Damocles as long as they reside in proximity.

I would challenge anyone to guarantee that this slope won't fail, and that when it does so I contend that will occur at an oblique angle to CVP, not perpendicular towards the base of the slope at Salt Creek. This would bury the residences on Pompeii in Monarch Bay Villas and continue on a vector towards Coast Highway.

I-42-1

Monolithic structures provoke monumentally catastrophic events. It is quite conceivable that adjacent slopes and supporting concrete devices throughout the area will be impacted. CVP may become impassable or impaired, neighborhood utilities affected.

Why is the upper 20-30 feet of a slope cut off and rebuilt only to create a potential "pancake," that is to collapse, to flatten and expand in an unpredictable avalanche type fashion?

This project poses dangerous negative consequences that have not be addressed thoroughly due to the "de minimis" MND drafted.

The SSC needs to go back to the drawing board and rethink its project, to understand that the MND is inadequate, insufficient.

The CDP needs to make up its mind: Will it protect the existing rights and lives of the neighborhood or allow a corporate venture to potentially create a calamity that will drag on endlessly through subsequent judicial proceedings?

That will eat up unpredictable amounts of staff time, City

(cont.)

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Attorney time, DPCC time, everyone's time and irk the taxpayers and voters of the CDP?

How can SSC comply, and the CDP guarantee compliance with future WQMPs (plural) years away that haven't even been created?

The SSC needs to re-evaluate its spiritual path as well, the ramifications and consequences of risky business in a known geologically active zone, take its own Bible as guidance:

"Do unto others as you would have them do to you". Luke 6:31

I-42-1

Respectfully submitted,

Roger von Bütow

Roger von Bütow Founder & Executive Director
Home Office: (949) 715.1912 (Voicemail AFTER 6 rings)

Friends of the Aliso Creek Steelhead: www.alisocreeksteelhead.org

A Proud Communities Affiliate for KEEP CALIFORNIA BEAUTIFUL: www.keepcaliforniabeautiful.org

I-42

Comments for the Notice of Intent to Prepare a Draft Environmental Impact Report South Shores (Baptist) Church Master Plan, SCH NO. 2009041129 submitted by Robert and Deanna Saint-Aubin Monarch Beach 3/22/2010

I-42-1

SAINT-AUBIN MEDIATION 2010 MAR 22 A 11:01

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53 CASSIS MONARCH BEACH CA 92629
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RFS@COASTMEDIATOR.COM

March 19, 2010

City of Dana Point
Attention Saima Qureshy
33282 Golden Lantern
Dana Point, CA 92629-1805

Re: South Shores Church Proposed Master Plan

Please request that the EIR Consultant, LSA, confirm by email to rfs@coastmediator.com and deanna@saint-aubin.org that it received the original colored Scoping Session Comments highlighted in YELLOW, ORANGE AND RED and the accompanying CD.

To LSA and the City of Dana Point:

This letter and the accompanying documents and disk comprise our analysis and comments for the Scoping Session as requested by the February 4, 2010, Notice of Preparation. I-42-1

I am an attorney representing only my wife and myself. We reside 768 feet due east of the proposed project in a direct line of sight above and across the Salt Creek Basin. I am secretary of the Corniche Sur Mer Homeowner's Association and authorized to speak on their behalf.

While not the best solution, if the developer must have all the new square feet, there is a very simple solution that maintains the bluff, the view corridor, and the existing elevations: Move the parking garage, constructed at grade, to the northwest corner of the site and then build the four new buildings on top of the garage. Zero additional impact on Salt Creek.

We respectfully request that the proposed project be thoroughly reviewed and analyzed in light of all the Dana Point Plans and Planning documents, in light of *all* of the comments, including ours (contained on the CD), with respect to the previous MND, and in light of all of the comments, requests and observations herein.

We could have ended our analysis by stating that LSA should review the project in light of the Dana Point Plan Elements. We went further, reviewing each page and highlighting in yellow all relevant provisions. The provisions showing the most grievous errors and infractions by the developer we highlighted in orange. The highlighted pages are reproduced directly from the Dana Point Plans on the City website. We then added separate analytical comments as a guide to LSA's analysis of the project. We request that LSA treat each highlighted provision as a comment and evaluate the project in light of the Plans and our comments. In assembling the documentation, we removed Plan pages with no comments of relevance to this analysis.

The proposed project is too big for a steeply sloped, bluff top site. At the February 21, 1962, Orange County Planning Commission meeting, approval of the project was deferred pending resolution of plat discrepancies and pending resolution of dedication of part of the church parcel for Crown Valley. To obtain a conditional use permit for the site in 1970, the developer set a not-to-exceed occupancy or use of 125 people with parking for 45 cars.

The Dana Point Plan Elements build a vision of Dana Point based upon the importance of coast, bluffs, hills, ridges, natural land forms, scenic corridors and the environment. The vision is that of an integrated community. The developers, building upon variances and prior overexpansion, at the MND level cared naught for the Dana Point vision and their interaction with Monarch Beach. I-42-1

The Dana Point Plans describe and define the entire city as a *coastal* community comprised of three regions, one of which is and historically was Monarch Beach, the land making up the Salt Creek Basin from Crown Valley to Niguel Road. The Land Use Element describes the Monarch Beach Resort Specific Plan as co-extensive with the Salt Creek Basin – from Crown Valley to Niguel Road -- even though we all recognize that the St. Regis property never touched Crown Valley. The General Plan reference incorporates the relevant aspects of the Specific Plan discussed in this presentation to all of the Salt Creek Basin. The St. Regis Plan, including an area 768 feet wide, extends across an open canyon from the church property due east to our residential property. Monarch Beach development, including this project, must as a matter of law be evaluated by its impact on the entire Salt Creek Basin.

The Dana Point Planning Elements and Specific Plans refer to bluffs both at the coast and along the drainages inland from the coast, but all part of a coastal city. The bluff that is to be built upon ascends from the area included in the Monarch Beach Specific Plan. The church's discredited, biased consultant, in the MND, and on the church's website, properly describes the church as an ocean view, bluff top facility. To expand their overuse of the site they are estopped from denying that it is on a bluff. It is also on a steep slope of 2:1. The slope has been unstable with catastrophic building slides on the adjoining property and more than 30 years of geologic, geophysical reports stating that

the slope is unstable. Developers, under the Plan Elements, are prohibited from building on steep slopes, on bluff tops and on land subject to landslides. The plans prohibit retaining walls for new construction on steep slopes, on 2:1 slopes, on bluffs and in areas subject to landslides. This project fails to meet the standard on all four conditions.

The unnecessary retaining wall will intrude into the ocean view from Camino del Avion, from the length of the Salt Creek Scenic Corridor and along the length of the Salt Creek Trail. The construction will interfere with the coastal sage scrub and endangered gnat catchers, while polluting Salt Creek, overloading the Salt Creek Treatment Plant and causing additional closures of Salt Creek Beach. At the March 4, 2010, Scoping Session two new troubling facts were revealed: the developers intend to create an excavation 100 feet deep, destroying the entire bluff; the developers also intend to abandon the project mid-stream for two extended periods – for 3 years from 2014 to 2017 and for 18 months from 2019 to 2021.

A field examination of views from Crown Valley Parkway shows no ocean view across the church site except between the sanctuary and the Monarch Bay Villas. The proposed Administration building to be built at this location will entirely block the only view of the ocean from Crown Valley.

I-42-1

The site was zoned residential until the church obtained a variance for a church and small school. The site remains zoned residential.

As recently as February 25, 2010, the City of Dana Point protested proposed action by the CUSD planning to construct a similar oversized facility in a residential neighborhood for failing to meet similar standards. The City is very concerned about a 55-foot building height on the school property. The church project will aggregate more than 55 feet of monolithic, unaesthetic structures rising above the Salt Creek Trail, including the bluff top building on the 25-30 foot high retaining wall.

Attached hereto and incorporated by reference are a detailed analysis and examination of some of the Dana Point Planning Documents. Please incorporate the comments into the items to which LSA responds on a line-by-line basis for each highlighted clause or point.

You may call us for questions or discussion.

DEANNA SAINT-AUBIN
ROBERT SAINT-AUBIN
Monarch Beach

(949)496-5025 or
(949)466-2400

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I-42

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View of the South Shores Baptist Church property from our home in Corniche Sur Mer, Ritz Pointe.

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CITY OF DANA POINT
GENERAL PLAN

COMMENTS

1. For planning purposes, the Salt Creek Scenic Corridor defines Dana Point. Also note that the entire city is deemed "coastal." Protecting coastal assets and a coastal community requires detailed management of *all* upstream areas.

2. Natural physical form is integral to the place; by unnecessarily overbuilding a project too large for the site, the developer proposes to destroy the natural physical form and unified and unifying character of the Salt Creek Basin.

3. The proposed project destroys the unified value of the natural form of the Salt Creek Basin.

4. All of Dana Point contributes to the coastal values of Dana Point. The developers can not treat the proposed development as a stand alone project with no relation to its surroundings.

5. Preservation of Monarch Beach, the community centered on the Salt Creek Scenic corridor, is integral to the Dana Point Plan. I-42-1

6. Monarch Beach provides one of the foundations for Dana Point's integrated development.

7. Dana Point development must be focused on conservation of natural resources and preservation of open spaces. To overbuild this behemoth project on a tiny site, the developer improperly proposes cut and fill of natural bluff top topography to extend its project into and over the Salt Creek Scenic Corridor.

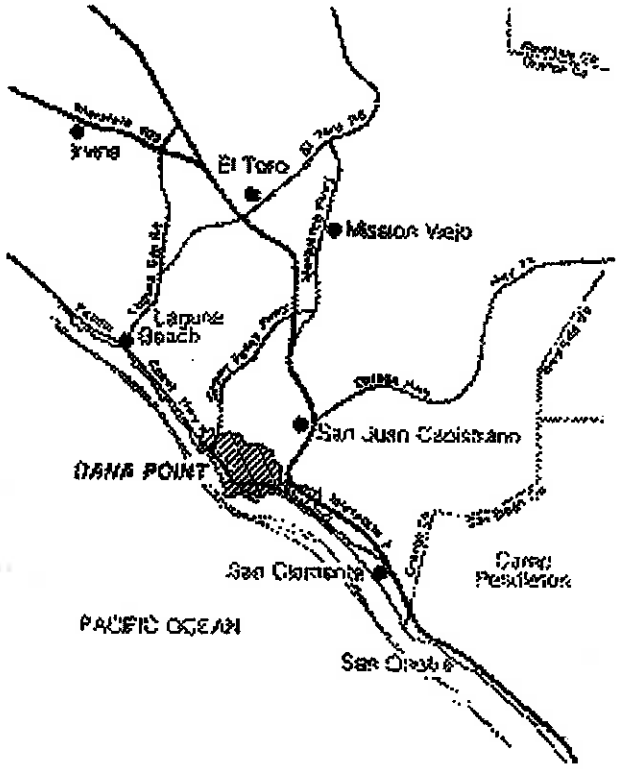
8. It's all about preserving a coastal community. Let me make clear–we do not want the occupant removed from the bluff top site. We want their new (and old) facilities to be fully compliant with the law and for them to act as good neighbors. However, because the project is too big for the site, and unrealistic, there is no way at full size they can fit it on the site and be in compliance. Allowing them to proceed will destroy Monarch Beach. Illustrative of the attitude of the developer is that repeatedly they describe it as a K through 8th grade campus orally and in writing, but then assert it's only a preschool. The EIR should address this discrepancy.

INTRODUCTION TO THE GENERAL PLAN

Dana Point became an incorporated city on January 1, 1989. The City includes the original "Dana Point" named after Richard Henry Dana, and the surrounding coastal area, a total area of 6.5 square miles. The City lies in the southwest portion of Orange County and is part of the larger Southern California region, an area in which the population and economy have grown substantially over the past 40 years. Dana Point is a coastal city with a picturesque Pacific coastline extending almost seven miles from Laguna Beach on the north to San Clemente on the south. This interface between water and land is characterized by rugged coastal bluffs separated by two major freshwater drainages, San Juan Creek and Salt Creek, which empty into the Pacific Ocean. See comment 1

I-42-1

Development in the Dana Point area began in the early 1900's, but substantial development did not occur until the decades following World War II. Over time, that development created the tree pre-incorporate communities of Dana Point, Capistrano Beach, and Monarch Beach. A 2,500-boat harbor with many water related facilities and a major State Park make the City a destination for many visitors.



THE FUTURE OF DANA POINT

The future of Dana Point, like that of all cities, will be the cumulative result of past and current decision making by those who have a local role in the development process, such as residents, property and business owners, elected officials and staff. In addition, Dana Point's future will be influenced by large-scale economic, social, and environmental events and trends. Participates who have a local role in the development process may have little control over large-scale forces, but can utilize the authority and resources they possess to create change in the physical development of the City over time, to create positive results are most likely to be achieved through concerted efforts to build upon those significant natural and man-made characteristics of the community which constitute fundamental strengths or opportunities commonly acknowledged by the local participants. These significant natural and man-made characteristics include Dana Point's natural physical form, its coastline as a unique area of interface between land and water, and the diversity of its man-made physical development.

See comment 2

Natural Physical Form

I-42-1

The physical landform of Dana Point is characterized by nearly seven miles of Pacific Ocean coastline consisting of prominent coastal bluffs and rolling hills, separated by two major drainage basins, which flow into the ocean. Between these two basins is a unique apex of land, a promontory known as the "Headlands" which overlooks Dana Point Harbor, one of the most significant man-made alterations of the Orange County coastline. This consummate blend of the natural and man-made environment can be duplicated in very few places. The strong visual image created by this blend is a unifying element of physical form, easily recognized and remembered, having fundamental importance and value.

See comment 3

Coastline

The coastline of Dana Point is an exceptional area where the interface between land and water can be experienced in different ways. With its combination of high coastal bluffs and coastal access where the San Juan and Salt Creek basins meet the ocean, both inhabitants and visitors to Dana Point have the opportunity to enjoy the coastline by viewing it from visual vantage points along the bluffs or further inland, or by utilizing community beaches and the

Harbor. Maintaining these different ways of experiencing the attractions offered by a beautiful coastline setting is fundamental in the establishment of an image of Dana Point's future.

See comment 4

Diversity of Development

The pre-incorporation development of the Dana Point area as three communities – Dana Point, Capistrano Beach, and Monarch Beach – has created diversity in the physical development of the City. This has provided a certain eclectic quality characteristic of communities, which have developed over relatively long periods of time. The City's diversity is not simply a range of land use types, but is a rich collection of structures having different functions and exhibiting a variety of architectural styles and influences. This sense of diversity and variety is an important fundamental trait of present-day Dana Point, and is a source of interest and charm for inhabitants and visitors alike. See comment 5

I-42-1

Future of Dana Point

These three significant natural and man-made characteristics provide a commonly acknowledged basis for future development, growth, and sense of place. Together, they act as a foundation for the continuation of Dana Point as a successful community in the future – desirable, attractive, and functional, for those who live, work, or visit there. See comment 6

PURPOSE OF THE GENERAL PLAN

California State law requires each city and county to adopt a comprehensive, long-term general plan for its own physical development. In essence, a city's general plan serves as the blueprint for future growth and development. As a blueprint for the future, the plan must contain policies and programs designed to provide decision makers with a solid basis for land use related decisions.

The general plan must address many issues which are directly related to and influence land use decisions. In addition to land use, State law requires that the plan address circulation, housing, the conservation of natural resources, the preservation of open space, the noise environment and the protection of public safety (Section 65302 of the California Government Code). These issues are to be

discussed to the extent that each applies to the particular jurisdiction. The general plan may also cover topics of special or unique interest to a city or county, such as urban design and economic development. See comment 7

Adopted in 1976, the purpose of the California Coastal Act is to generally protect the natural and scenic qualities of the California Coastal Zone. Approximately one-half of the City's land area lies within the California Coastal Zone and is therefore, subject to requirements of the California Coastal Act (Division 20 of the Public Resources Code commending with Section 30000). To meet these requirements, the City must have a California Coastal Commission certified Local Coastal Program (LCP) consisting of its "(a) land use plans, (b) zoning ordinances, (c) zoning district maps, and (d) within sensitive coastal resources area, other implementing actions, which, when taken together, meet the requirements of, and implement the provisions of policies of, this division at the local level." (Public Resources Code § 30108.6). Therefore, the portions of the City's General Plan, Zoning Ordinance, Zoning Map and other implementing actions effectively certified by the Coastal Commission will constitute its LCP for that portion of the Coastal Zone within its jurisdiction. California Coastal Commission certification of the City's LCP allows the City to assume responsibility for administering coastal development permits in those areas of its coastal zone that are not on submerged lands, tide lands, public trust lands, or state universities or colleges. As a component of the City's LCP, the portions of the General Plan effectively certified by the Coastal Commission includes required coastal resources planning and management policies which are in conformance with and intended to carry out the Chapter Three policies of the California Coastal Act of 1976. These coastal resources planning and management policies shall be applied in a manner which is most protective of coastal resources and public access. See comment 8

I-42-1

ORGANIZATION OF THE GENERAL PLAN

The City of Dana Point General Plan contains goals, policies and programs which are intended to guide land use and development decisions into the twenty-first century. The Plan consists of a Land Use Policy Map and the following nine elements, or chapters, which together fulfill the state requirements for a general plan. The nine

CITY OF DANA POINT
CIRCULATION ELEMENT

COMMENTS

1. The additional circulation for ten years of construction, including traffic patterns, worker vehicles, construction vehicles, deliveries, earth moving, hazardous waste removal, facility employees, facility services, parishioners and for students attending the new school facilities to be constructed, must be fairly evaluated. The existing activities on the site infringe on Dana Point circulation before the facilities are expanded to triple the current size.

2. The entire construction phase and use phase circulation needs to be examined.

3. At the previous Planning Commission hearing the developer testified that the concept for the project started with an analysis of parking needs. A review of the reports, records and anecdotal experience shows that the now fully built-out site has inadequate parking for its current level of use. They are going to increase both the build out and the level of use without completing proper traffic measurements and surveys. The facility interferes with existing traffic flows on Pacific Coast Highway and Crown Valley Parkway. Construction will adversely impact Camino del Avion and Niguel Road. Only after ten years of disruptive construction will the developers provide parking barely adequate for their current facilities. I-42-1

4. The proposed facility is a perfect place to park for access to the shore and beach. Patrons of the existing facility currently park in the bicycle lanes on Crown Valley Parkway instead of in the facility's own parking lot, demonstrating that the existing facilities are too large for the site and unable to provide the mandated access parking.

5. The developers do not currently provide adequate off-street or on-street parking and have not in their proposed project plans provided for sufficient off-street parking during the ten-year construction phases or after build out. The developers currently plan to use 100 parking spaces at the Selva Road Strands Beach parking lot and bus the parishioners to the church on Sunday mornings during the construction. This is not a workable solution since the parking lot is used to capacity on weekends by beach goers. The buses will also add to the pollution and noise.

6. The developers have not provided for all of the additional traffic required for ten years of construction or use thereafter. Inevitably, the residents of Monarch Beach will be

subjected to increased truck fumes and noise on all of the major public arterials of Monarch Beach. Access to the site by hauling trucks will also endanger all the major roads in Monarch Beach.

I-42-1

7. Downsize the project to fit within the existing infrastructure.

INTRODUCTION TO THE CIRCULATION ELEMENT

The Circulation Element is one of seven mandated Elements of the General Plan and is intended to guide the development of the City's circulation system in a manner that is compatible with the Land Use Element. A well-planned circulation system is important, and the State of California has mandated the adoption of a citywide Circulation Element since 1955. The anticipated level and pattern of development by the year 2010, as identified in the Land Use Element, will increase capacity demands on the City's roadways. To help meet these demands and achieve balanced growth, the City has adopted specific goals and policies which serve as the basis for the Circulation Element. See comment 1

PURPOSE OF THE CIRCULATION ELEMENT

The purpose of the Circulation Element is to provide a safe, sensible, and efficient circulation system for the City. The current State mandate for a Circulation Element states that the General Plan shall include:

> "...a Circulation Element consisting of the general location for proposed major thoroughfares, transportation routes, terminals, and other local public utilities and facilities, all correlated with the Land Use Element of the Plan."

I-42-1

To meet these objectives, the Circulation Element addresses the circulation improvements needed to relieve traffic congestion due to future land uses. It also addresses potential demand management strategies and mass transit services. Corresponding goals and policies have been adopted to ensure that all components of the circulation system will meet the needs of the City of Dana Point. See comment 2

The Element establishes a hierarchy of transportation routes with specific development standards described for each category of roadway. The "City of Dana Point, General Plan Traffic Analysis," prepared by Austin-Foust Associates, provides background information and acts as a supporting document for the Element.

tion of easements and/or rights-of-way along flood control channels, public utility rights-of-way, railroad rights-of-way, and street rights-of-way wherever possible for the use of bicycles and/or hiking trails.

Policy 5.7: Explore possible link-up of trails within the City to regional trail systems.

Policy 5.8: Improve the safety of pedestrians crossing Pacific Coast Highway. (Coastal Act/30252)

Policy 5.9: Support and coordinate the development and maintenance of bikeways and trails in conjunction with the master plans of the appropriate agencies.

Policy 5.10: Encourage safe biking by supporting the clinics sponsored by the County Sheriff's Department.

Policy 5.11: Consider the provision of unique non-motorized circulation methods for special events.

Policy 5.12: Provide for a non-vehicular circulation system that encourages mass-transit, bicycle transportation, pedestrian circulation. (Coastal Act/30252, 30253)

I-42-1

PARKING

Adequate and convenient parking facilities should be provided as a part of all development in the City. Where possible, and especially in commercial areas, parking should be consolidated or shared. Access and egress to parking areas should be carefully planned so as to facilitate the safe flow of traffic on major streets and to minimize conflicts with pedestrians. See comment 3

GOAL 6: Provide for well-designed and convenient parking facilities.

Policy 6.1: Consolidate parking, where appropriate, to reduce the number of ingress and egress points onto arterials.

Policy 6.2: Maintain public access to the coast by providing better transit and parking opportunities. (Coastal Act/30252)

See comment 4

Policy 6.3: Provide sufficient off-street parking. (Coastal Act/30250)

See comment 5

Policy 6.4: Encourage the use of shared parking facilities, such as through parking districts or other mechanisms.

TRUCK CIRCULATION

The establishment of well-defined circulation routes for truck traffic will help to increase the efficiency of the street system and also address safety concerns. One of the major concerns of City residents is noise and safety from large vehicle traffic in or near residential areas. See comment 6

GOAL 7: Provide for a truck circulation system that provides for the effective transport of commodities while minimizing the negative impacts throughout the City.

Policy 7.1: Provide primary truck routes on selected arterial streets to minimize the impacts of truck traffic on residential areas.

I-42-1

Policy 7.2: Provide appropriately designed and maintained roadways for the primary truck routes. (Coastal Act/30254)

Policy 7.3: Develop berms, landscape screening or barriers along truck routes to minimize noise impacts on sensitive land uses.

Policy 7.4: Provide loading areas and accessways that are designed and located so as to avoid conflicts with efficient traffic circulation.

Policy 7.5: Consider safety regulations addressing trucks hauling materials within the City. See comment 7

HARBOR

The Harbor is one of Dana Point's greatest assets. Through sound planning the City can ensure the continued adequacy of the Harbor for boating, fishing and other recreational activities.

CITY OF DANA POINT
CONSERVATION AND OPEN SPACE ELEMENT

COMMENTS

1. Planning must provide for the preservation of open space. The project seriously degrades the open space of the Salt Creek Scenic Corridor through the heart of Monarch Beach by drastically changing the bluff topography.

2. The project will adversely impact water, drainage, endangered species, wildlife and golfers, all of which will be wastefully exploited, degraded and destroyed.

3. Seriatim, with each prior development activity, the developer has expanded its overbuilt agenda while ignoring the open space mandates. To fully understand the developer's path of overbuild and under comply contrary to the short-term and long-term interests of the community, LSA should examine all of the title, survey, planning and zoning documents applicable to the site in the records of Dana Point, Orange County, Laguna Niguel and Rancho Niguel which from the beginning reflect the developers' demand to build more and do less followed by reneging on their prior commitments – most significantly "not to exceed 125 parishioners at the site." I-42-1

4. Each of the following described "Related Plans and Programs" has important and relevant elements that must be considered in the EIR analysis. Most have been ignored by the developer. All have potentially significant impacts on the neighbors, community and the Salt Creek Basin.

5. As a community facility adjoining open space, the modifications to the project site must conform to the open space mandates.

6. The developer essentially considers the Salt Creek Trail to be nonexistent.

7. The developer fails to respect any of these criteria by ignoring everything to the east, and by cutting, backfilling, disturbing and destroying the bluff.

8. Rather than conserving sensitive lands and open spaces, by overbuilding on the site, the developer will destroy the sensitive bluff and slope while encroaching upon the open spaces of the Salt Creek Scenic Corridor.

9. Having failed to comply with any prior drainage requirements, the developer proposes

to increase the impervious cover and destroy the natural bluff's drainage patterns while making no alternative arrangements. This will result in increased and continuing destruction of the Salt Creek drainage basin, increased number of days the Salt Creek Water Treatment Plant is off-line, and consequently additional closures of Salt Creek Beach because of contamination.

10. The project's ten-year construction build-out and the resulting facilities will destroy existing drainage courses into Salt Creek, eliminating the natural hydrologic functioning while increasing polluted storm-water run-off.

11. The project, during construction and after completion, will seriously add to groundwater pollution throughout the Salt Creek Basin.

12. The project cavalierly ignores the mandate to preserve groundwater, streams, estuaries and the Pacific Ocean.

13. The project will damage riparian habitat, drainage courses and creeks, thereby destroying the sanctuary for the endangered California gnatcatcher.

I-42-1

14. This project does not meet any of the allowed exceptions.

15. Rather than minimizing the project's impact, the developer has chosen to overbuild, thereby maximizing the adverse effects of ill-conceived waste water discharges, storm water runoff, and interference with surface water flow, while destroying the bluff's mature vegetative buffer areas.

16. The Salt Creek watershed, the bluffs and inland hills are protected from insensitive development. The developer believes it can do whatever it wants with the site, ignoring everything to the east, including specifically the Salt Creek watershed, the bluffs and inland hills.

17. By constructing buildings to the east beyond existing foundation lines, the developer will destroy significant features, including watershed areas and soils, thereby polluting Salt Creek Beach.

18. The Salt Creek bluffs which the project will desecrate are ecologically sensitive and, as can be seen by the historical geophysical analyses and the current erosion and recent landslides, actually hazardous.

19. The project destroys the natural land form along the Salt Creek Scenic Corridor by

dumping more than 100,000 cubic yards of dirt (cumulatively deposited during several phases of construction) over the side of the bluff. The cut and fill constitute maximum grading and visual impact along the Salt Creek Scenic Corridor and to the east.

20. The recent rains demonstrate that the current project management is incapable of managing or controlling erosion, grading, vegetation or drainage.

21. The facility owner has failed to implement any soil management practices over decades of ownership.

22. For more than 40 years the current developers have failed to conduct proper geotechnical studies. The site is an inland bluff in a geologic area known for historic and recent landslides, the latest of which destroyed two multi-story apartment buildings adjacent to this project.

23. Of all the planning concepts, Policy 2.8 is the most relevant to the current analysis. The project must be sited within the existing building perimeters with no change of elevation and sited away from the ridge line and bluff with no removal and backfilling. The developers intend to backfill over the steep slope and build upon a known geologically unstable, steeply sloped scenic but unstable bluff. The 2:1 slope area comprising almost two acres of the original site must be excluded from usable area, not allowed to be cut, backfilled, and overbuilt.

I-42-1

24. The bluff, bluff top, slope and ridge line define the Salt Creek View Corridor and the heart of Monarch Beach, the trail and the golf course provide significant natural features that can and should be preserved. The development should and can be sited within the existing developed perimeter.

25. The developers propose, by cut and backfill, to extend their construction east from the bluff edge rather than back from it. During the 2010 rains, bluff slope erosion made the Salt Creek trail immediately below the site impassable. Historical geotechnical reports show severe potential damage from landslides for the site. The existence of geotechnical recommendations that have been ignored by the developer suggests that new contractors should be required to totally reevaluate the site under this policy.

26. The developers have not considered any aspect of this policy.

27. Without question, the slope is geologically sensitive with no geologic stability. The policy prohibits the proposed cut and backfill with enormous retaining walls (up to 30 feet) forever altering the natural land form along Salt Creek View Corridor, the golf

course, the Salt Creek Trail and the Salt Creek Regional Park.

28. The developers propose the construction of retaining walls to enable excess new construction on a site too small for the intended facilities and purpose. The proposal will significantly alter the natural character of the bluffs. A 30-foot retaining wall built midway down the slope with a 35+foot building on top of it cannot be visually ignored.

29. The developers ignore their impact on the existing endangered species sanctuary for the California black-tailed gnatcatcher.

30. The bluff contains significant old growth vegetation and trees buffering the Salt Creek View Corridor from the existing structures. The developers propose obliterating the trees to cut away 35 feet of the bluff top and backfill over the edge of the bluff.

31. The development does not provide any uses dependent on either the endangered species, the Salt Creek View Corridor or the trail and park.

32. Building within the existing foundation line at the existing elevations will prevent the proposed significant degradation. Instead the developers are expanding the site so they can overbuild.

33. For the length of the ten-year build out, the project will disburse excessive amounts of dirt, dust, contaminants and diesel exhaust fumes over the surrounding areas. I-42-1

34. The construction vehicular traffic has not been adequately addressed, nor has the increased permanent traffic load on Crown Valley Parkway after the build out.

35. This project improperly extends the urban use into the Monarch Beach open space.

36. Without regard to this mandate, the project does not mitigate impacts on the steep slope adjoining the Salt Creek Scenic Corridor.

37. The developers fail to preserve and protect open space, cultural resources, and environmentally sensitive habitat.

38. With regard to this policy, the developers have done the opposite–positioned their facilities as far as possible from the level, stable ground beside Crown Valley and placed them atop the sensitive slope and bluff, which they intend to cut and backfill.

39. The developer should preserve the sensitive bluff.

40. The developers ignore the historical use of the site by the Juaneno Indians. The ranch buildings are also of historic interest.

41. Again, Salt Creek and its bluffs are designated as open spaces to be preserved.

42. The developers flagrantly violate this mandate. Examine the more than 30 years of site specific geologic/soils studies which actually recommended against the prior expansion projects. The site will not support the massive destructive excavation and backfilling, a fact the developers have known and ignored for forty years.

43. The proposed development site was an historic gathering place for the Juaneno Native Americans.

44. The developer as a "community facility" has an obligation to comply with the open space mandates. The developer intends to use the facility for semi-commercial activities well beyond the described wide range of public and private activities. I-42-1

45. This trail extends right through the Salt Creek Scenic Corridor.

46. The golf course is at the center of the Salt Creek Scenic Corridor.

47. The developers have ignored the Salt Creek Scenic Corridor, desecrating the scenic resources.

INTRODUCTION TO THE CONSERVATION AND OPEN SPACE ELEMENT

The Conservation and Open Space Element addresses the preservation and use of the City's important natural resources and open space areas. The goals and policies in this Element build upon those in the other elements of the General Plan, especially the Land Use Element and Urban Design Element. The City's Master Environmental Assessment and the Conservation and Open Space Technical Report provide necessary background information and are supporting documents for this Element.

The Conservation and Open Space Element also addresses the City's park system. However, detailed planning and operation of parks and recreation facilities is the responsibility of the Capistrano Bay Park and Recreation District. The City has both public and private parks and facilities at the community and neighborhood level. Opportunities exist to expand and enhance the recreational components of the City. As a regional center for tourist activities, the City also has a strong interest in providing open space, cultural, and recreational opportunities for visitors to the area. By providing expanded open space, cultural, and recreational opportunities, the City will balance the long term economic viability of the visitor serving segment of its economy with the livability of the City for its residents. See comment 1

PURPOSE OF THE CONSERVATION AND OPEN SPACE ELEMENT

I-42-1

This Element meets State requirements concerning the Conservation and Open Space Elements as defined in Sections 65302d and 65302e of the Government Code. According to these requirements, the Conservation Element must contain goals and policies that further the protection and maintenance of the State's natural resources such as water, soils, wildlife, minerals, and other natural resources, and prevents their wasteful exploitation, degradation, and destruction. See comment 2

The Open Space Element must contain goals and policies concerned with managing all open space areas, including undeveloped lands and outdoor recreation areas. Specifically, the Open Space Element includes open space that is used for the preservation of natural resources, for the managed production

of resources, for outdoor recreation, and that which is left undeveloped for public health and safety reasons. See comment 3

RELATED PLANS AND PROGRAMS See comment 4

There are a number of existing plans and programs which are directly applicable to the aims and objectives of this Element. These plans and programs were enacted through Federal, State, and local legislation and are administered by agencies or special districts that have been delegated with powers to enforce Federal, State and local laws. Federal laws that are concerned with the protection of significant cultural and natural resources include the Endangered Species Act of 1973 (as amended in 1978), the Antiquities Act and the National Historic Preservation Act of 1966 and the National Environmental Protection Act (NEPA).

California Environmental Quality Act Law and Guidelines

The California Environmental Quality Act (CEQA) was adopted by the State legislature in response to a public mandate that called for a thorough environmental analysis of those projects that might adversely affect the environment. The provisions of the law, review procedure, and any subsequent analysis are described in the CEQA Law and Guidelines as amended in 1986. CEQA will continue to be instrumental in ensuring that the impacts of all potentially significant projects are assessed by City officials (both appointed and elected) and the general public.

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California Fish and Game Regulations

The California Fish and Game Code was adopted by the State legislature to protect the fish and wildlife resources of the State. Special permits are required for any lake or stream alterations, dredging or other activities that may affect fish and game habitat.

California Coastal Act

The 1976 California Coastal Act is intended to protect the natural and scenic qualities of the California coast. The City's General Plan, Zoning Ordinance and other implementing action will comprise the City's Local Coastal Program. The goals and

policies of the Conservation/Open Space Plan implement many of the objectives and requirements of the California Coastal Act.

City of Dana Point Land Use Element

The City's Land Use Element contains two land use designations that encompass open space land uses: Recreation/Open Space and Community Facility. The Recreation/Open Space land use designation encompasses most of the open space that exists in the City including active and passive parkland and natural open space. Distinctions between the active recreation/open spaces and the passive recreation/open areas including natural open space areas will be made in the Zoning Ordinance and the Zoning Map in implementing the General Plan. The Community Facility land use designation contains more intensive recreational and/or cultural facilities such as community or cultural facilities, museums, and art galleries.

See comment 5

Plans and programs that have contributed to the planning in Dana Point related to conservation and open space include the following documents:

I-42-1

The Master Plan of Parks and Recreation

This Plan was completed in 1990 by the Capistrano Bay Park and Recreation District and is the official Master Plan of the District. The parks and recreation facilities in Dana Point are operated and maintained by the District. An update to the Master Plan will be completed in 1991. This Plan, when completed, will describe the master plan of public parkland for the City including specific locations, standards, and design guidelines. The Plan should be consistent with the goals and policies contained in this Conservation and Open Space Element relating to the provision of parkland.

County of Orange Master Plan of Local Parks

The County's Master Parks Plan provides goals, objectives and policies and provides implementation programs for a comprehensive county-wide park plan. In conjunction with the County's Local Park Code, specific criteria are intended to provide an adequate supply of usable county parkland. This Plan provides a regional park planning context for the Dana Point Conservation/Open Space Element.

County of Orange Master Plan of Regional Riding and Hiking Trails

The County's trails plan provides policies and programs to implement the future development and operation of the County-wide trails system. The Plan includes an inventory of existing and proposed trails and standards and criteria for new trails. The City has incorporated the County's trails criteria into the Conservation and Open Space Element. See comment 6

County of Orange Recreation Element

The Recreation Element of the County of Orange General Plan provides an inventory of existing and proposed parks and open space and includes the Master Plan of Local Parks and Trails component.

County of Orange Resources Element

The County's Resources Element includes an inventory of the County-wide resources such as agricultural, mineral, and wildlife resources, energy, water, air, open space, and cultural-historic resources. The element also includes goals, policies and programs for the development, management, preservation, and conservation of the county's resources. This Element provides sources of regional information affecting the Dana Point area.

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County of Orange Master Plan of Regional Recreation Facilities

The Orange County Harbors, Beaches and Parks Department (HBPD) develops and manages six coastal recreational facilities in the City. The Master Plan of Regional Recreation Facilities component of the Orange County Recreation Element establishes policies for developing and maintaining these facilities.

State Park Recreation Plan

The State of California Parks and Recreation Department oversees the plan for Doheny Beach State Park which extends from Del Obispo Street southeast to Capistrano Beach County Park. The plan includes recreational facilities and allowances for overnight camping with tents and trailers.

CONSERVATION AND OPEN SPACE GOALS AND POLICIES

A substantial portion of the City's natural open space and biological habitat has been replaced with urban development. However, there are significant portions of the community that remain in a natural state. These areas include the Headlands, portions of Monarch Beach, and the Salt Creek and San Juan Creek Basins. Although portions of these areas are planned to be developed in the future, the conservation of open space and the natural landforms can help to preserve the character of the area. The future development of the areas should respect these natural features of the community. See comment 7

The goals and supporting policies included in this Element address specific issues and opportunities to conserve the City's remaining sensitive lands and to enhance the open space within the City. See comment 8

CONSERVATION AND PROTECTION OF WATER RESOURCES

I-42-1

Although the City of Dana Point has a high percentage of land that has been developed, areas for future revitalization may have a significant effect on the water resources of the community. Therefore, it is essential to protect the existing drainage courses in as natural condition as possible. The depletion or pollution of groundwater resources is a concern. Water conservation measures should be adopted by the City to effectively reclaim water and encourage water conservation throughout the development process. See comment 9

GOAL 1: Conserve and protect surface water, groundwater and imported water resources.

Policy 1.1: Retain, protect and enhance local drainage courses, channels, and creeks in their natural condition, where feasible and desirable, in order to maximize their natural hydrologic functioning so as to minimize adverse impacts from polluted storm water run-off. (Coastal Act/30231) See comment 10

Policy 1.2: Protect groundwater resources from depletion and

sources of pollution. See comment 11

Policy 1.3: Conserve imported water by providing water conservation techniques, and using reclaimed water, water conserving appliances, and drought-resistant landscaping when feasible.

Policy 1.4: Protect water quality by seeking strict quality standards and enforcement with regard to water imported into the County, and the preservation of the quality of water in the groundwater basin, streams, estuaries, and the ocean. (Coastal Act/30231) See comment 12

Policy 1.5: Retain, maintain, protect, and enhance existing riparian habitat adjacent to drainage courses, channels, and creeks through methods such as, but not limited to, the establishment of buffer areas adjacent to such habitats. (Coastal Act/30231) See comment 13

Policy 1.6: Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible to mitigate the loss of any riparian habitat and any downstream impacts, and shall be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat. (Coastal Act/30236) See comment 14

I-42-1

Policy 1.7: Maintain and, where feasible, restore the biological productivity and the quality of coastal waters, creeks, and groundwater, appropriate to maintain optimum populations of marine organisms and to protect human health. Measures including, but not limited to, minimizing the adverse effects of waste water discharges, controlling runoff, preventing the depletion of ground water supplies, preventing substantial interference with surface water flow, maintaining vegetation buffer areas protecting riparian habitats, minimizing alteration of natural streams, and street sweeping, shall be encouraged. (Coastal Act/30231) See comment 15

Policy 1.8: Coordinate with the appropriate Regional Water Quality Control Board, the County of Orange and other agencies and organizations in the implementation of the

National Pollution Discharge Elimination System Permits (NPDES) regulations to minimize adverse impacts on the quality of coastal waters. (Coastal Act/30231)

CONSERVATION OF SIGNIFICANT NATURAL FEATURES

The natural features in the Dana Point area have helped to create the desirable character of the area. Topographical features such as the Headlands, Salt Creek and the San Juan Creek watershed, the bluffs, the inland hills, and the beachfront should be protected from insensitive development. Public views should be conserved and the natural vegetation retained as much as possible. The beach areas and bluff area have potential for excessive erosion if not protected. See comment 16

GOAL 2: Conserve significant topographical features, important watershed areas, resources, soils and beaches. See comment 17

Policy 2.1: Place restrictions on the development of floodplain areas, beaches, sea cliffs, ecologically sensitive areas and potentially hazardous areas. (Coastal Act/30235, 30236, 30240, 30253) See comment 18

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Policy 2.2: Site and architectural design shall respond to the natural landform whenever possible to minimize grading and visual impact. (Coastal Act/30250) See comment 19

Policy 2.3: Control erosion during and following construction through proper grading techniques, vegetation replanting, and the installation of proper drainage, and erosion control improvements. (Coastal Act/30243) See comment 20

Policy 2.4: Require the practice of proper soil management techniques to reduce erosion, sedimentation, and other soil-related problems. (Coastal Act/30243) See comment 21

Policy 2.5: Lessen beach erosion by minimizing any natural changes or man-caused activities which would reduce the replenishment of sand to the beaches. (Coastal Act/30235)

Policy 2.6: Encourage public acquisition of significant land resources for open space when funds or opportunities are available. (Coastal Act/30240)

Policy 2.7: Require geotechnical studies for developments that are proposed for steep slopes (4:1 or steeper), on or adjacent to coastal or inland blufftops, and where geological instability may be suspected. (Coastal Act/30253) See comment 22

Policy 2.8: Minimize risks to life and property, and preserve the natural environment, by siting and clustering new development away from areas which have physical constraints associated with steep topography and unstable slopes; and where such areas are designated as Recreation/Open Space or include bluffs, beaches, or wetlands, exclude such areas from the calculation of net acreage available for determining development intensity or density potential. (Coastal Act/30233, 30253) See comment 23

Policy 2.9: Preserve significant natural features as part of new development. Permitted development shall be sited and designed to minimize the alteration of natural landforms. Improvements adjacent to beaches shall protect existing natural features and be carefully integrated with landforms. (Coastal Act/30240, 30250, 30251) See comment 24

Policy 2.10: Adopt setback standards which include, at a minimum, a 25 foot setback from the bluff edge or which take into consideration fifty years of bluff erosion, whichever is most restrictive for a particular blufftop site. When necessary, require additional setbacks of buildings and site improvements from bluff faces which will maximize public and structural safety, consistent with detailed site-specific geotechnical report recommendations. (Coastal Act/30253) See comment 25

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Policy 2.11: Preserve Dana Point's bluffs as a natural and scenic resource and avoid risk to life and property through responsible and sensitive bluff top development, including, but not limited to, the provision of drainage which directs runoff away from the bluff edge and towards the street, where feasible, and restricting irrigation and use of water-intensive landscaping within the setback area to prevent bluff erosion. (Coastal Act/30251, 30253) See comment 26

Policy 2.12: New bluff top development shall minimize risks to life and property in geologically sensitive areas and be designed and located so as to ensure geological stability and structural integrity. Such development shall have no

detrimental affect, either on-site or off-site, on erosion or geologic stability, and shall be designed so as not to require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. (Coastal Act/30253) See comment 27

Policy 2.13: Bluff repair and erosion control measures such as retaining walls and other similar devices shall be limited to those necessary to protect existing structures in danger from erosion, to minimize risks to life and property and shall avoid causing significant alteration to the natural character of the bluffs. (Coastal Act/30251, 30253) See comment 28

Policy 2.14: Shoreline or ocean protective devices such as revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply and minimize adverse impacts on public use of sandy beach areas. (Coastal Act/30210-12, 30235)

Policy 2.15: Assure that public safety is provided for in all new seaward construction or seaward additions to existing beachfront single family structures in a manner that does not interfere, to the maximum extent feasible, with public access along the beach. (Coastal Act/30210-212, 30214, 30253)

I-42-1

Policy 2.16: Identify flood hazard areas and provide appropriate land use regulations, such as but not limited to the requirement that new development shall have the lowest floor, including basement, elevated to or above the base flood elevation, for areas subject to flooding in order to minimize risks to life and property. (Coastal Act/30235, 30253)

Policy 2.17: Establish building code, setback, site design and landscaping requirements that assure adequate fire protection to minimize risks to life and property. (Coastal Act/30253)

Policy 2.18: Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore

current systems. (Coastal Act/30233)

Policy 2.19: Whenever feasible, the material removed from erosion control and flood control facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of the Local Coastal Program, and where feasible mitigation measures have been provided to minimize adverse environmental effects. Aspects that shall be considered before issuing a coastal development permit for such purposes are the method of placement, time of year of placement, and sensitivity of the placement area. (Coastal Act/30233)

CONSERVATION OF BIOLOGICAL RESOURCES

See comment 29

The existing development and urbanization of Dana Point has nearly eliminated sizable expanses of undisturbed native vegetation. The remaining vegetation includes small isolated pockets of chaparral and coastal sage scrub. The shoreline areas from north of Dana Point Harbor and extending along Doheny State Beach provide a habitat for a wide variety of marine animals and plants. These areas have been designated by the State of California as Marine Life Refuges. Although there are limited quantities of undisturbed vegetation several sensitive species have been observed with the City including the California Black Tailed Gnatcatcher, the Monarch Butterfly, and the Turkish Ruggish (plant).

I-42-1

GOAL 3: Conserve significant natural plant and animal communities.

Policy 3.1: Environmentally sensitive habitat areas, including important plant communities, wildlife habitats, marine refuge areas, riparian areas, wildlife movement corridors, wetlands, and significant tree stands, such as those generally depicted on Figure COS-1, shall be preserved. Development in areas adjacent to environmentally sensitive habitat areas shall be sited and designed to prevent impacts which would significantly degrade those areas through such methods as, the practice of creative site planning, revegetation, and open space easement/dedications, and shall be compatible with the continuance of those habitat areas. A definitive determination of the existence of environmentally sensitive habitat areas on a specific site shall be made through the coastal development

permitting process. (Coastal Act/30230, 30240)

Policy 3.2: Require development proposals in areas expected to contain important plant and animal communities and environmentally sensitive habitat areas, such as but not limited to marine refuge areas, riparian areas, wildlife movement corridors, wetlands, and significant tree stands, to include biological assessments and identify affected habitats. (Coastal Act/30230, 30240)

Policy 3.3: Encourage retention of natural vegetation and require revegetation of graded areas. See comment 30

Policy 3.4: Ensure urban use of open space lands that have conservation or open space easements is limited to only those uses expressly allowed by the easements. Document those easements to increase knowledge of their existence. (Coastal Act/30240)

Policy 3.5: Ensure that public access to the shore of the marine life refuge is not detrimental to the resources of the refuge. (Coastal Act/30230)

Policy 3.6: The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall only be permitted in accordance with Section 30233 of the Coastal Act. (Coastal Act/30233) I-42-1

Policy 3.7: Environmentally sensitive habitat areas (ESHA) shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas. (Coastal Act/30240) See comment 31

Policy 3.8: Development in areas adjacent to parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas through, among other methods, creative site planning and minimizing visual impacts, and shall be compatible with the continuance of those parks and recreation areas. (Coastal Act 30240) See comment 32

Policy 3.9: Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes. (Coastal Act

REDUCTION OF AIR POLLUTION See comment 33

Air Pollution is a major problem in the rapidly growing areas of Orange County. Regional efforts to control air pollution should be supported by the City. Through effective land use and circulation planning, air pollution can be reduced. The City can also reduce vehicular travel by encouraging alternative modes of circulation by providing pedestrian, bicycle and transit routes serving the entire City.

GOAL 5: Reduce air pollution through land use, transportation and energy use planning.

Policy 5.1: Design safe and efficient vehicular access to streets to ensure efficient vehicular ingress and egress. (Coastal Act/30252) See comment 34

Policy 5.2: Locate multiple family developments close to commercial areas to encourage pedestrian rather than vehicular travel.

Policy 5.3: Encourage neighborhood parks close to concentrations of residents to encourage pedestrian travel to public recreation facilities.

I-42-1

Policy 5.4: Provide commercial areas that are conducive to pedestrian and bicycle circulation.

Policy 5.5: Actively participate in regional discussions regarding new regional airport facilities and analyze and evaluate potential impacts on the City.

Policy 5.6: Encourage bicycle/trail systems to reduce air pollution.

Policy 5.7: Consider the development of shuttle systems, train or transit facilities, to help reduce vehicular trips and air pollution.

PRESERVATION OF NATURAL RESOURCES AS OPEN SPACE AREAS

The City of Dana Point recognizes the importance of conserving natural resources by preserving open space throughout the

community. The City will encourage sensitive planning of its remaining open space lands to provide an appropriate transition between urban uses and open space. By designating open space in key locations significant views and public access to the ocean and harbor can be provided. See comment 35

GOAL 6: Encourage open space areas to preserve natural resources.

Policy 6.1: Mitigate the impacts of development on sensitive lands such as, but not limited to, steep slopes, wetlands, cultural resources, and environmentally sensitive habitat areas through the development review process; (Coastal Act/30233, 30240, 30244, 30253) See comment 36

Policy 6.2: Protect and preserve the public views of the Dana Point Harbor. (Coastal Visual Resources/30251)

Policy 6.3: Maintain an inventory of existing natural resources in the City through periodic updates of the City's Master Environmental Assessment.

I-42-1

Policy 6.4: Preserve and protect the scenic and visual quality of the coastal areas as a resource of public importance as depicted in figure COS-5 "Scenic Overlooks from Public Lands", of this Element. Permitted development shall be sited and designed to protect public views from identified scenic overlooks on public lands to and along the ocean and scenic coastal areas, to minimize the alteration of natural landforms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. (Coastal Act/30251)

Policy 6.5: Preserve and protect open space, steep slopes, cultural resources, and environmentally sensitive habitat areas through open space deed restrictions, dedication, or other similar means as a part of the development and subdivision review process. (Coastal Act/30250) See comment 37

Policy 6.6: Concentrate higher intensity uses in areas containing less sensitive landforms and preserve the most sensitive landforms and natural resources as open space. See comment 38

Policy 6.7: Evaluate non-developable or constrained areas for possible use as open space or recreational use. (Coastal

AU

Act/30240) See comment 39

Policy 6.8: Preserve public access to the coastal areas through easement dedications thereby providing marine-oriented recreational uses so that transportation corridors may augment the City's open space system. (Coastal Act/30210, 30211, 30212)

I-42-1

COORDINATION WITH THE PARK AND RECREATION DISTRICT

Local parks and recreation services are provided to the City of Dana Point through the Capistrano Bay Park and Recreation District. Detail planning of specific parks and recreation areas is the responsibility of the District. However, the plans of the Park District must be consistent with the General Plan. In order to assure this consistency the City should work closely with the District to review and provide input into the District's master planning efforts.

GOAL 7: Encourage the development and maintenance of a balanced system of public and private park and recreation facilities in cooperation with the Capistrano Bay Park and Recreation District.

Policy 7.1: Encourage the provision of a range of recreational facilities and programs to meet the needs of City residents and visitors.

Policy 7.2: Utilize utility easements as open space linkages where feasible. I-42-1

Policy 7.3: Preserve public and private open space lands for active and passive recreational opportunities. (Coastal Act/30213)

Policy 7.4: Encourage priority acquisition and development of parkland in neighborhoods deficient in park facilities.

Policy 7.5: Coordinate park and open space planning with the appropriate State and County agencies.

Policy 7.6: Encourage the development of parks and acquisition of open space areas to serve the needs of visitors as well as local residents.

PRESERVATION OF HISTORIC AND CULTURAL RESOURCES

Although the City of Dana Point is relatively new as an incorporated City, the area has an established heritage that should be

preserved and protected. The historical and cultural assets of the community should be inventoried and preserved as much as possible. See comment 40

GOAL 8: Encourage the preservation of significant historical or culturally significant buildings, sites or features within the community.

Policy 8.1: Require reasonable mitigation measures where development may affect historical, archaeological or paleontological resources. (Coastal Act/30244, 30250)

Policy 8.2: Retain and protect resources of significant historical, archaeological, or paleontological value for education, visitor-serving, and scientific purposes. (Coastal Act/30244, 30250, 30253)

I-42-1

Policy 8.3: Development adjacent to a place, structure or object found to be of historic significance should be designed so that the uses permitted and the architectural design will protect the visual setting of the historical site. (Coastal Act/30250)

Policy 8.4: Develop and maintain a cultural resource inventory.

RELATED GOALS AND POLICIES

Certain goals and policies included in the Conservation/Open Space Element constitute coastal resources planning and management policies that are part of the City's Local Coastal Program (LCP). Table COS-1 identifies the regional components or issue areas of the LCP included in the Conservation/Open Space Element.

THE CONSERVATION PLAN

The Conservation Plan describes the approach to be used in implementing the Conservation/Open Space Element goals and policies. The Conservation Plan identifies those undeveloped lands that contain open space for the preservation of natural resources, open space for the managed production of resources, and open space for public health and safety. The undeveloped portions of Dana Point include primarily the Headlands area, parcels in the Monarch Beach area and areas near the San Juan Creek Channel. Several exiting canyon areas have been developed and/or designated as private recreation areas. The Conservation Element's goals and policies were formulated in order to effectively preserve portions of these remaining areas as open space opportunities for the City.

CONSERVATION/OPEN SPACE FOR THE PRESERVATION OF NATURAL RESOURCES

I-42-1

The most significant natural resources in Dana Point include the Pacific Ocean, land with open space potential, lands with significant biological resources, water resources, significant landforms, and those sites or structures which have historical, archaeological or paleontological significance. The Headlands is the largest remaining undeveloped area within the City. This area contains coastal sage scrub vegetation which supports a variety of animal species. The Pacific Ocean and shoreline provides important marine habitats for many species. Certain sections of the City's coast have been designated by the California Department of Fish and Game as three separate but contiguous marine life refuges. The other area of natural resource open space includes San Juan Creek and Salt Creek and the beaches and bluff areas along the coast.

These important natural resource areas are shown on Figure COS-1. Other areas of natural resource open space include San Juan Creek and Salt Creek and the beaches and bluff areas along the coast. See comment 41

CONSERVATION/OPEN SPACE USED FOR THE MANAGED PRODUCTION OF RESOURCES

Open Space areas for the managed production of resources with regard to this section include agricultural lands, areas of economic importance for the production of food or fiber, and areas containing major mineral deposits.

The City of Dana Point is a predominantly residential community and contains limited undeveloped land. None of this undeveloped land is currently used for commercial agriculture, and it is unlikely that any will be used in the future.

No mineral resources have been identified within the City of Dana Point. However, sand and gravel resources are located in San Juan Creek north of the City. The extraction of these resources may affect the preservation of the City's and region's beaches. Offshore oil drilling could have a significant effect on the water resources and beaches in the City.

The conservation of open space areas for the managed production of resources does not directly affect lands within the City of Dana Point. However, activities relating to mineral extractions and offshore drilling in areas outside the City limits could have a substantial effect on the open space resources within the City.

I-42-1

CONSERVATION AND OPEN SPACE FOR PUBLIC HEALTH AND SAFETY

Dana Point must protect the public health and safety of the community. This involves the identification of areas that pose a potential threat to health and safety; along with the implementation of proper planning techniques to minimize potential threats to health and safety. Figure COS-2 depicts the areas in the community which require special planning considerations to avoid potential hazards. These areas include the floodplain zones along the San Juan Creek and Salt Creek as well as along the coastal areas. In addition, areas along the coast that may have potential for coastal erosion are also identified. Specific public safety recommendations and emergency preparedness procedures are addressed in the Public Safety Element of the General Plan.

CONSERVATION MEASURES

To protect and conserve sensitive lands that occur within the City, the following measures will be utilized:

- Excavation or grading shall not be permitted unless site specific geologic/soils study indicates no safety problems will result from such grading. See comment 42

- Archaeological and biological surveys shall be required for any development projects on lands identified in this Element as potentially paleontologically, historically or biologically sensitive. Mitigation measures shall be developed and implemented to mitigate any significant impacts. See comment 43

I-42-1

The following techniques may be used to acquire or dedicate land for open space purposes:

Open Space Easements - pursuant to the Open Space Easement Act of 1974 (Government Code Section 51070 et seq.).

Conservation Easements - pursuant to the Conservation Easement Act (Civil Code Sections 815-816).

THE OPEN SPACE PLAN

The Open Space Plan describes the approach to be used in implementing the Conservation/Open Space Element goals and policies. The open space in Dana Point plays an important part in the lives of Dana Point residents. Dana Point has been developed with several open space amenities including local, County and State parks, public and private recreational facilities, pedestrian and bicycle trails, equestrian trails and other public open spaces. Opportunities exist to provide strong linkages between these open space resources to form a contiguous system of open space.

RELATION TO LAND USE ELEMENT

The City's Land Use Plan places open space, parkland and recreational facilities into the two designations of Recreation/Open Space and Community Facility. The following is a description of each of these land use designations.

Recreation/Open Space

The Recreation/Open Space designation includes both public and private recreational uses necessary to meet the active and passive recreational needs of area residents and visitors. Recreational activities include golf courses/driving ranges, community recreational facilities, public parklands and indoor and outdoor sports/athletic facilities. Recreation uses include museums, galleries, outdoor theater, designated open space and similar uses.

I-42-1

Community Facility

The Community Facility designation includes a wide range of public and private uses distributed throughout the community such as schools, churches, child care centers, transportation facilities, government offices and facilities, public utilities, libraries, museums, art galleries, community theaters, hospitals and cultural and recreational activities. In addition, open space and recreation uses can be accommodated in the other land use designation including the Harbor Marine and Transportation Corridor Designations. See comment 44

Neighborhood Parks

A neighborhood park is any general use local park developed to serve the active recreation needs of a particular neighborhood within the City. The size of a neighborhood park depends on the population within its service area and the extent of desired amenities. Typically, neighborhood parks have a maximum service radius of one-half mile to be within walking or cycling distance of park patrons. The neighborhood parks in Dana Point feature such amenities as landscaping, children's play areas, active ball fields, multi-purpose play fields, game courts, open turf areas and lighting for night use. In some cases, the neighborhood parks provide off-street parking and rest rooms. Most of the parks in Dana Point are categorized as neighborhood parks serving individual neighborhoods. Preferably, a neighborhood park should be located adjoining an elementary school and near the center of a defined neighborhood so that it can best serve the local pedestrian user.

I-42-1

Community Parks

The community park is typically designed to meet the active recreational needs of several neighborhoods. These parks are intended to serve pedestrian and motorists within a radius of up to three miles. They contain facilities which require more space than neighborhood parks and which may include: extensive landscaping; nature areas; multi-purpose playfields for softball, baseball, soccer and football; court sport facilities for basketball, racquetball/handball and tennis; swimming pools; and community centers with adequate off-street parking. Community parks provide the greatest economy of scale in terms of active and passive recreation benefit versus cost of maintenance and operation.

Open Space Linkages

Open space linkages are usually linear strips of open space along lands such as easements, floodplains, and canyons. These linkages form trails and open space systems that connect parkland or neighborhoods. Pedestrian, bicycle, and equestrian trails are usually located along the open space linkages. Natural open space along hilltops, within canyons, or along riparian corridors form excellent linkages to other open space. Continuation of the blufftop trail represents an Open Space Linkage that can provide access to scenic vistas and provide pedestrian

connections between lookouts and park areas.

County Parks and Facilities

The County of Orange owns and maintains several regional recreational facilities in the City of Dana Point. Policy for the development, maintenance and improvement of these parks is provided by the Orange County Recreation Element, which includes a Master Plan for regional recreational facilities in the County.

County parks and recreational areas in the City include two beach areas, Salt Creek Beach Park and Capistrano Beach County Park. Dana Point Harbor, created in the late 1960s and early 1970s, is also managed by the County, as are the nine-acre Bluff Top Park, near the Ritz-Carlton Resort, and the 16-acre Lantern Bay Park overlooking Dana Point Harbor.

State Recreation Areas

Doheny Beach State Park (62 acres) extends along the beach from Del Obispo Street southeast to Capistrano Beach County park. Doheny Beach is the only park in Dana Point that permits overnight camping with tents and trailers. I-42-1

School Playgrounds

Three school playgrounds under the jurisdiction of the Capistrano Unified School District are within the City of Dana Point and open to the public after school hours. Organized sports leagues such as those for baseball, soccer and football utilize ballfields through a permit process with the School District. The playgrounds are: Dana Hills High School (16.4 acres), Palisades Elementary School (6.8 acres) and Richard Henry Dana School (3.9 acres). The high school offers the most facilities including handball courts, a community pool, volleyball courts and three softball fields.

Other Parks and Facilities

The City of Dana Point includes a variety of other recreational facilities open to the general public. These include: the Marine Studies Institute, which offers sailing from Dana Point Harbor; the Dana Hills Tennis Center with six courts; and the Links at Monarch Beach 18-hole golf course. Several residential developments also include their own tennis courts and swim-

ming pools, which are available only to residents and guests.

Biking/Hiking Trails

The Capistrano Bay Park and Recreation District operates a coordinated system of trails, including bikeways, equestrian trails and hiking trails. The District's trails system is described in the District Master Plan which is updated annually and constitutes the most current source of trail information. Figure COS-3 shows the location of these trails. The one existing hiking trail in Dana Point extends approximately one mile through Salt Creek Beach Park. See comment 45

Bikeways comprise the most extensive part of the District's trail network. There are three categories of bikeways:

- **Class I:** a paved path that is separate from any motor vehicle travel lane;
- **Class II:** a restricted lane within the right of way of a paved roadway for the exclusive or semi-exclusive use of bicycles; and
- **Class III:** a bikeway that shares the street with motor vehicles or the sidewalk with pedestrians.

I-42-1

The biking network in Dana Point connects with other trails and paths in adjacent communities and throughout Orange County. Several new bike trails and paths have been proposed.

Other Recreational Facilities

In addition to its beaches, parks, and trails, Dana Point includes many private recreational facilities, such as those identified in Figure COS-3 and Table COS-3. While some private facilities (e.g., private parks, tennis courts, swimming pools) are available only to the residents of the general particular complex in which they are located, others are available to the public for a fee (e.g., The Links at Monarch Beach). See comment 46

In addition, the City offers resort accommodations for tourists. Therefore, the City's open space and recreational opportunities must be planned not only for Dana Point residents, but also for regional and even international visitors and tourists.

benches, bike lanes, and graphic markers) should be developed along Santa Clara Avenue.

Scenic Resources

The scenic resources in Dana Point are a major asset of the community. In the western portion of the City, including Monarch Beach, high points provide sweeping views of the southern California coast and Catalina Island while the lower elevations provide whitewater views of the shoreline. In the central portion of the City, including the "Headlands", there are views and panoramas of the Pacific Ocean, the Dana Point harbor, distant views as far as the Palos Verdes Peninsula to the north, La Jolla to the south and Catalina Island to the west, and inland views to the foothills and valleys. In the Capistrano Beach area of the City the blufftops offer panoramic views of the coastline.

A unique sequence of parks and lookouts on the coastal terrace offer outstanding views of the ocean. These include the Pine Bluffs Park, Gazebo Park, Leyton Park, Lantern Bay Park, Heritage Park, Blue Lantern Lookout Point, and Salt Creek Beach Park.

As new development is considered public views should be preserved as much as possible. Consideration should be given to protecting public views along the ridge lines, views toward the inland mountains and along scenic transportation corridors. Figure COS-5 conceptually identifies significant public scenic view resources in Dana Point. Because of the unique character and the environmental setting of the City consideration of scenic resource opportunities should be a key factor in development and revitalization decisions. See comment 47

I-42-1

GENERAL PLAN POLICIES AND FUTURE RECREATION FACILITIES

The Land Use Element describes a land use designation that is applicable for identifying areas of the City where existing and future parks, trails, and other recreational facilities are or may be located. Other sites adjacent to these designated areas may be purchased or acquired as development exactions for more intensive recreational uses when land is made available. Figure COS-6 includes those areas designated on the Land Use Plan

CITY OF DANA POINT
DESIGN GUIDELINES

COMMENTS

1. The proposed project totally violates the concept of minimizing impacts on neighboring properties. Dana Point is defined by topography and natural surroundings, which development must respect. The proposed project, by overbuilding, removing the ridge top and backfilling, cavalierly destroys natural bluff scenic corridor features. A tax-exempt project does not promote the long-term economic development of the city. There must be a comprehensive review of the impact on neighboring properties and the community as a whole. This project has been promoted continuously with a total disregard for the residents and the communities to the east. Contrary to the plan mandate, the developer fails to create a positive relationship with its neighbors, socially, aesthetically, visually or environmentally.

2. The project is on the edge of Monarch Beach, a community defined by the Salt Creek Basin.

3. The project diminishes and destroys the adjacent public spaces and resources. I-42-1

4. The developer violates the mandate for citywide visual linkages, does not preserve the individual and positive character, fails to maintain or enhance the resources of Salt Creek Corridor, and is void of design excellence. Erecting an expansive stacked 25- to 30-foot high retaining wall, in violation of the bluff plans, cannot be classified as design excellence.

5. The developers propose destroying the bluff and slope, natural features of the Salt Creek Basin. The EIR must analyze existing conditions with respect to neighboring properties and the community at large. The developer totally ignored the neighboring environment, focusing only on Crown Valley Parkway, which offers only one ocean view at the south end of the site, a view that will be totally eradicated by the construction of the new administration building. At no point in any of the Dana Point documents does it say that a developer must consider ONLY the neighbors within 500 feet of their project. By the nature of the Salt Creek Basin topography every activity on one side of the basin impacts everything on the other side existing in a direct line of sight from the project.

6. The project has not been analyzed in relation to the Salt Creek Basin. The developer ignores existing conditions, including an adjacent landslide.

7. The developer ignores that part of its original six acres was dedicated to Crown Valley Parkway and that another part is unusable, non-buildable slope and bluff.

8. The project will destroy mature trees that help define the western edge of the Salt Creek Basin.

9. The most important site details to the east are the Salt Creek Scenic Corridor and the Salt Creek Basin. City records indicate that the church exists pursuant to a variance to residential zoning.

10. The project must be reevaluated in the context of its impacted neighbors, including every neighbor within a direct line of the site. The developers intend to destroy mature trees along the bluff which serve to buffer the existing facilities from the Salt Creek Scenic Corridor. They fail to develop compatible relationships with the Salt Creek Corridor and the open spaces. The project violates the privacy, sun and light to the adjoining villas. The surface drainage is washing away the site, the slope, the wilderness sanctuary, the trail, creek and golf course. No on-site drainage has been proposed. Existing non-functioning drainage is intended to be used for the expanded site without repairs.

I-42-1

11. Neighbors, including the public spaces, currently experience the deleterious effects of excessive, non-complying storm water run-off. The developers plan no remedial action.

12. Designed as a stand alone project, the developers remove all of the softening vegetation and mature trees.

13. The MND design treats everything to the east of the project as an undeveloped wasteland. Continuation and completion of the project will eliminate the outdoor life for everyone to the south and east. Building the parking garage ten years out shows a total disregard of the need for parking and circulation.

14. Everything to the east, particularly the Salt Creek trail, a pedestrian walkway and bike path, as well as the golf course, have been ignored by the developers.

15. The project has not been evaluated in the context of a bluff above the Salt Creek Basin and Scenic Corridor. Again, this mandate includes consideration of all neighboring properties, not just those within 500 feet.

16. The developers attempt to present a stand alone project independent of its neighbors; the model ignores the Salt Creek Basin.

17. The developers must consider relationships to neighbors. This NOP disregards all of its neighbors and flaunts the entire community. The developer intentionally disregards all existing developments. The design presented fails to include the entire community context.

18. The project has only considered the minimal exposure to Crown Valley Parkway. All new construction is oriented toward, with maximum adverse exposure to, the neighboring residential communities. The nonresident developers focus only on Crown Valley, which frames Monarch Beach around the Salt Creek View Corridor. Crown Valley Parkway does not create Monarch Beach.

19. The only ocean view from Crown Valley Parkway, across the property is at the extreme south end of the parking lot, between the sanctuary and the adjacent villas. This view will be completely eradicated by the proposed administration building.

20. Better to have the bulk of the structure on Crown Valley Parkway than in the Salt Creek Basin and Scenic Corridor.

I-42-1

21. The project design places multiple blank, illegal retaining walls along the Salt Creek Trail and Scenic Corridor.

22. The project, overbuilt for the site and location, is not scaled to human size. One portion of the retaining wall is about 30 feet high and will have a building on it that is at least 35 feet high. No consideration of the project from across the Salt Creek Basin has been included.

23. The developers have not considered views from surrounding sites and hillsides.

24. City records show that the church exists by a zoning variance in an area zoned residential.

25. The project will destroy public views of the ocean and the significant slope features.

26. The developer proposes to cavalierly destroy the historic ranch buildings and the architecturally significant original sanctuary. The ranch, Indian encampments, and the original church comprise an undesignated historic site to be obliterated by this project.

27. Current city records indicate that the site is zoned residential with a variance for a church and a small school. The church has submitted documents and orally stated that the new bluff top buildings will eventually house K through 8th grade classrooms.

28. This project will destroy the usability of the residential open space across the Salt Creek Basin.

29. The design guidelines for site infrastructure requiring protection from neighbors have been ignored. The project also ignores the use of landscape buffers.

30. Forcing an unreasonable amount of development on an inadequate site inevitably creates loss of continuity, patterns and visual linkages, especially from the perspective of the residents to the east and the users of the Salt Creek Corridor and the Monarch Beach golf links. All of the ground level elevation is oriented toward the Salt Creek Scenic Corridor and the residences due east. The net elevation of monolithic construction in front of the bluff will exceed 70 feet. Excavation of the bluff will exceed a depth of 100 feet.

30A. If the developer places the elevation adjacent to the street, as dictated by the plan, the encroachment on the Salt Creek Basin disappears.

I-42-1

31. The developer plans further desecration of the Salt Creek Basin, Trail, Scenic Corridor and golf course by destroying the bluff and then using the ridge to pile excavated dirt–more than 100,000 cubic yards in several phases, and as a staging area for all of its construction. The developer claims that no more than 33,000 cubic yards of dirt will be deposited in any one phase, but there is no provision for the removal of the dirt between phases. For ten years, the developer will be cutting, removing, returning and back filling cumulative 100,000+ cubic yards of dirt initially removed from the site created by excavating the existing site 35 feet deep. This blowing dirt and daily noise of construction equipment at the staging area are all in line of sight of several residential communities directly to the east. The project has several years during which no construction activity will occur, but the dirt deposited on the slope will still be present, blowing over the Salt Creek Basin, golfers and residences to the east.

32. The site is along a scenic corridor, a main drainage basin, an environmentally sensitive creek, a golf course, a county park, a scenic trail and is at the top of a bluff with a 2:1 slope. The site and its surroundings have significant special environmental characteristics which the developers ignore. Look at the hillside building requirements. By cutting off the bluff top and backfilling, the developers violate all of the principles contained in this plan and destroy existing historical and protective mature trees and vegetation.

33. This zoning variance site in a residential neighborhood is visible from most of Monarch Beach. Note that despite repeated requests by an affected neighbor, the City has

failed to provide any documentation of an official action by either Orange County or the City of Dana Point changing the zoning from an R-1 variance to Community Facilities.

34. Compare the plans for this site to the existing unmanaged, nonfunctional drainage. The natural slopes, land forms and bluff will be destroyed.

35. This site has a 2:1 slope.

36. Some parts of the retaining walls will be 25-30 feet high, topped by buildings in excess of an additional 35 feet, making the man-made structures the predominant feature of the Salt Creek Basin, changing it from a pastoral natural environment. Salt Creek Basin and its residential neighborhoods are not the proper location for a cathedral on the hill.

37. Existing grades and contours must be maintained. The proposed project is too big for the site. The prior developers already built to the site limits to the east. Earth fills must be avoided. Instead of honoring existing slopes, to overbuild on the site the developer proposes removal of more than 35 feet of the top of the slope across the site.

38. The only public view of the ocean from Crown Valley Parkway across the entire church property is at the south end of the property between the sanctuary and the villas. This view will be eradicated by the construction of the Church's administration building.

I-42-1

39. The only thing that the IS/MND had correct was that the project will destroy an existing bluff along Salt Creek Scenic Corridor. This project ignores the public views from the east. The project ignores impacts on the Salt Creek Scenic Corridor. Pacific Coast Highway, Crown Valley Parkway, Niguel Road and Stonehill Drive either encircle the Salt Creek Scenic Corridor or abut it.

40. The developers ignore the public view mandates. More than two-thirds of the impacted Salt Creek Basin is within 500 feet of the project. All of the residences to the east have a line-of-sight view of the entire project.

41. This developer refuses to acknowledge any view impacts. The single ocean view across the property from Crown Valley Parkway will be entirely eradicated by the intended new administration building.

42. Rather than using step set back, this developer intends to project the maximum height of each building to the east of the property and facilities, directly above the Salt Creek Scenic Corridor. The only ocean view from across this property will be eliminated by the

construction of the administration building.

43. "Bluff topping" is also a bad and illegal solution to incompetent design.

I-42-1

NOP COMMENTS

LETTER CODE: I-42

DATE: February 4, 2010

RESPONSE I-42-1

The comment provides a list of persons who submitted comments on the NOP issued in 2010, and each of their respective comment letters have been provided.

The purpose of a public scoping meeting and request for written comments is to solicit written input from interested individuals regarding environmental issues that should be addressed in the Draft EIR and to assist the lead agency in determining the scope and content of the environmental information to be contained in the Draft EIR. The California Environmental Quality Act (CEQA) does not require written responses to each comment made in response to a scoping meeting or Notice of Preparation (NOP). As stated in the *State CEQA Guidelines* Section 15084(c), the information or comments received by the lead agency may be included in the draft EIR in whole or in part. The comment letters received during the NOP review period were included in their entirety in Appendix A, and issues were summarized in Section 2.2.2 (Page 2-4) of the Draft EIR. Environmental topics raised in the scoping letters were included in the content and analysis of the Draft EIR. In summary, the Draft EIR acknowledged and included the scoping letters, summarized the environmental areas of concern, and addressed these issues in the scope of the analysis, consistent with CEQA.

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Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following: I-43-1

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-43-2 I-43-3 I-43-4

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work. I-43-5 I-43-6

3) **Ingress/Egress:** Egress and ingress to the church premises is limited to the single driveway at Sea Island Drive and Crown Valley Parkway. The multiple daily operations contemplated by the applicant along with a decade of construction would overload an already busy parkway. For example, there are three uncontrolled right and left turn lanes between PCH and the entrance to the Church premises, a distance less than a tenth of a mile. Traversing through such turn lanes will become Greater challenges as well as greater safety hazards for all vehicular traffic. Likewise, ingress/egress from Monarch Bay Villas will be compromised, as the community has only one point of entry, on Crown Valley Parkway at Lumeria Lane. The intersection is frequently compromised by vehicles making u-turns and others speeding up and down Crown Valley Parkway. I-43-7

4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website. I-43-8

5) **Wildlife and Water:** Salt Creek harbors many species of wildlife, including an endangered bird species. The noise and pollutants emanation from the Church property during and after construction will adversely and materially impact such wildlife as well as much of the natural vegetation. The area, which is serving as drainage for South Shores Church, is both mitigation for another project and habitat for an endangered species. Currently, the storm water runoff from existing site is eroding this protected area. Plans for post-construction storm water management are inadequate for the proposed and alternate proposed project. I-43-9 I-43-10

6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents. I-43-11

NAME: DATE: ADDRESS

Marjorie A. Anderson Oct 23, 2014 23287 Pompeii Drive Dana Point, CA 92629

Email: Margie271@aol.com Telephone: 949-240-5822

PETITION-MARJORIE ANDERSON

LETTER CODE: I-43

DATE: October 23, 2014

RESPONSE I-43-1

This comment expresses objection to the proposed project, and serves as an introduction to the following comments provided by the commenter. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

RESPONSE I-43-2

This comment asserts that the South Shores Church property is geologically strategic to the Monarch Bay Villas, and that areas north of the Church are subject to slippage, erosion, and subsidence due to slope instability. The comment further asserts that a cursory review of the geological facts indicates that any material grading on the site may trigger damaging earth movement.

The technical criteria used to analyze the proposed project's impacts related to seismic and geologic hazards are described in detail in the geotechnical analyses prepared for the proposed project (refer to Appendix E, Geotechnical Reports, of the Draft EIR).

Section 4.5, Geology and Soils, of the Draft EIR discusses the potential impacts of the proposed project. As described throughout this Section, potential soils and geotechnical impacts associated with the proposed project would be addressed through proper site preparation and design, including on-site geotechnical investigations and implementation of site-specific grading recommendations and structural engineering design criteria. Incorporation of the recommendations included in the Geotechnical Evaluation, as described in Mitigation Measure 4.5.1, and the ongoing implementation of slope maintenance procedures on the unimproved slopes on the project site, as described in Mitigation Measure 4.5.2, would reduce the proposed project's impacts related to landslides to a less than significant level (refer to page 4.5-13 of the Draft EIR). See Common Response No. 12 for additional discussion of geotechnical concerns regarding the project site.

RESPONSE I-43-3

This comment requests an agreement of indemnification for the Monarch Bay Villa residents.

See Common Response No. 4.

RESPONSE I-43-4

This comment discusses a landfill containing pollutants. This comment does not indicate the location of the landfill in relation to the project site. The *Phase I Environmental Site Assessment* (*Phase I ESA*), (Advantage Environmental Consultants, LLC [AEC], September 16, 2011) prepared for the proposed project did not identify any properties adjacent to the project site that were anticipated to have adversely impacted the project site due to hazardous materials/waste, and none were identified as landfills. In addition, the Phase I ESA revealed no evidence of recognized environmental conditions in connection with the project site (refer to Appendix F of the Draft EIR).

RESPONSE I-43-5

This comment expresses concern over the proposed project's 10-year construction period, and the potential noise and air quality impacts associated with construction during this time frame.

See Common Response No. 3. Construction emissions associated with the proposed project are not anticipated to exceed the SCAQMD daily emissions thresholds. Further, implementation of the construction emissions control measures required in Standard Conditions 4.2.1 and 4.2.2 (pages 4.2-26 and 4.2-27 of the Draft EIR) would reduce project impacts related to fugitive dust during construction to a less than significant level. Additionally, compliance with Standard Condition 4.10.1 (page 4.10-27 of the Draft EIR) would reduce construction-related noise impacts resulting from the proposed project to a less then significant level.

RESPONSE I-43-6

This comment suggests a performance bond to protect the community from delay or unfinished construction work.

See Common Response No. 4.

RESPONSE I-43-7

This comment asserts that the egress and ingress to South Shores Church and the Monarch Bay Villas would be adversely impacted by the proposed project by exacerbating already unsafe traffic conditions.

See Response to Comment I-9-5.

RESPONSE I-43-8

This comment asserts that there may be potential impacts to the Salt Creek designated view corridor due to the height and size of structures as part of both the proposed project and the proposed project's Alternative.

Please refer to Common Response No. 9, Protection of Private Views/Views from Crown Valley Parkway and the Salt Creek Bike Trail.

RESPONSE I-43-9

This comment asserts that there may be potential impacts to species that inhabit the Salt Creek harbors because the area also serves as mitigation for another project and habitat for endangered species.

The known federally-listed species in the Salt Creek canyon area is the coastal California gnatcatcher, which is listed as "threatened," not "endangered." This listing was based on the threat of development of the Coastal Sage Scrub (CSS) habitat for the species, which has a limited distribution. As described in more detail in Response to Comment I-29-47, extensive planning and habitat preservation have taken place in Orange County following the gnatcatcher's listing. The nearest federally designated critical habitat for the species is located approximately 900 feet to the northeast (i.e., "upstream") of the project location. The project's compliance with the provisions of the approved NCCP/HCP for Central/Coastal Orange County ensures that the project's impacts to CSS are mitigated to a less than significant level.

RESPONSE I-43-10

This comment asserts that storm water run-off from the existing project site, is eroding this area a protected area. The comment asserts that the post-construction SSWMP is inadequate for both the proposed and the Alternative project.

See Common Response Nos. 6 and 13.

RESPONSE I-43-11

This comment protests any approval by the City to approve the proposed project without a thorough review by City engineers, independent engineers and Regional Water Authorities. The comment further asserts that the project would be grossly invasive and transformational in a multitude of ways.

Project-specific engineering reports were prepared for the proposed project and reviewed and approved by the City. These include the *Geotechnical Evaluation and Slope Stabilization Design for Environmental Impact Report Purposes, for Proposed Structures at the South Shores Church, City of Dana Point, California* (Geotechnical Evaluation*)* (LGC Geotechnical Inc. [LGC], May 20, 2013), the *Supplemental Geotechnical Evaluation and Slope Stabilization Design for Proposed Master Plan Alternative, for Environmental Impact Report Purposes, South Shores Church, City of Dana Point, California* (Supplemental Geotechnical Evaluation*)* (LGC, December 5, 2013), the *Preliminary Water Quality Management Plan* (Adams-Streeter Civil Engineers, Inc., November 21, 2012) and the *Master Plan Hydrology Report* (Adams-Streeter Civil Engineers, Inc., February 29, 2012). In addition, the Notice of Availability and a copy of the Draft EIR were sent to Responsible Agencies, including the South Coast Water District and the

State Water Resources Control Board. Also, see Common Response Nos. 6, 12, and 13. In addition, the Preliminary WQMP is submitted to SDRWQCB for review.

Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-44-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

3) **Ingress/Egress:** Egress and ingress to the church premises is limited to the single driveway at Sea Island Drive and Crown Valley Parkway. The multiple daily operations contemplated by the applicant along with a decade of construction would overload an already busy parkway. For example, there are three uncontrolled right and left turn lanes between PCH and the entrance to the Church premises, a distance less than a tenth of a mile. Traversing through such turn lanes will become Greater challenges as well as greater safety hazards for all vehicular traffic. Likewise, ingress/egress from Monarch Bay Villas will be compromised, as the community has only one point of entry, on Crown Valley Parkway at Lumeria Lane. The intersection is frequently compromised by vehicles making u-turns and others speeding up and down Crown Valley Parkway.

4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website.

5) **Wildlife and Water:** Salt Creek harbors many species of wildlife, including an endangered bird species. The noise and pollutants emanation from the Church property during and after construction will adversely and materially impact such wildlife as well as much of the natural vegetation. The area, which is serving as drainage for South Shores Church, is both mitigation for another project and habitat for an endangered species. Currently, the storm water runoff from existing site is eroding this protected area. Plans for post-construction storm water management are inadequate for the proposed and alternate proposed project. I-44-1

6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents.

NAME:	DATE:	ADDRESS
Roberta Margolis	10/22/14	23296 Pompeii Drive

Email: rsmargolis@cox.net Telephone: (949) 493-5685

PETITION- ROBERTA MARGOLIS

LETTER CODE: I-44

DATE: October 22, 2014

RESPONSE I-44-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-45

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-45-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

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4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website.

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6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents. I-45-1

NAME:	DATE:	ADDRESS
Peter & Kathryn Elespuru	10.25.14	23246 Atlantis Way
	10/25/14	Dana Point, 92629

Email: pfelespuru@gmail.com Telephone: 9492185488

PETITION- PETER AND KATHRYN ELESPURA

LETTER CODE: I-45

DATE: October 25, 2014

RESPONSE I-45-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-46

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-46-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

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I-46-1

6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents.

NAME:	DATE:	ADDRESS
MARY & JOHN STANDER	10/16/14	32781 LUMERIA LANE Dana Point, 92629

Email: MSTANDER@COX.NET Telephone: 949)487-7619

PETITION- MARK AND LUANN STANDER

LETTER CODE: I-46

DATE: October 16, 2014

RESPONSE I-46-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-47

In Opposition To

South Shores Church Master Plan, SCH No. 200941129

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2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

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NAME: LU TU CHAU DATE: ADDRESS

TU CHAU - TU 10/22/14 23256 ATLANTIS WAY Dana Point 92629

Email: BLOKC128@HOTMAIL Telephone: (714) 928-7876

PETITION- LU TU CHAU

LETTER CODE: I-47

DATE: October 22, 2014

RESPONSE I-47-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

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2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

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4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website.

5) **Wildlife and Water:** Salt Creek harbors many species of wildlife, including an endangered bird species. The noise and pollutants emanation from the Church property during and after construction will adversely and materially impact such wildlife as well as much of the natural vegetation. The area, which is serving as drainage for South Shores Church, is both mitigation for another project and habitat for an endangered species. Currently, the storm water runoff from existing site is eroding this protected area. Plans for post-construction storm water management are inadequate for the proposed and alternate proposed project.

6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents. I-48-1

NAME:	DATE:	ADDRESS
Carole Corallino	12-17-14	23264 Atlantis Way Dana Pt., CA. 92629

Email: CAROLECORALLINO@gmail.com. Telephone: 949-496-1939
248-842-0004 cell

PETITION- CARBLE CORALLINO

LETTER CODE: I-48

DATE: October 17, 2014

RESPONSE I-48-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-49

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-49-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

3) **Ingress/Egress:** Egress and ingress to the church premises is limited to the single driveway at Sea Island Drive and Crown Valley Parkway. The multiple daily operations contemplated by the applicant along with a decade of construction would overload an already busy parkway. For example, there are three uncontrolled right and left turn lanes between PCH and the entrance to the Church premises, a distance less than a tenth of a mile. Traversing through such turn lanes will become Greater challenges as well as greater safety hazards for all vehicular traffic. Likewise, ingress/egress from Monarch Bay Villas will be compromised, as the community has only one point of entry, on Crown Valley Parkway at Lumeria Lane. The intersection is frequently compromised by vehicles making u-turns and others speeding up and down Crown Valley Parkway.

4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website.

5) **Wildlife and Water:** Salt Creek harbors many species of wildlife, including an endangered bird species. The noise and pollutants emanation from the Church property during and after construction will adversely and materially impact such wildlife as well as much of the natural vegetation. The area, which is serving as drainage for South Shores Church, is both mitigation for another project and habitat for an endangered species. Currently, the storm water runoff from existing site is eroding this protected area. Plans for post-construction storm water management are inadequate for the proposed and alternate proposed project.

6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents. I-49-1

NAME:	DATE:	ADDRESS
GERALD WOODS	10-22-14	23262 ATLANTIS WAY
Gerald Woods		Dana Point 92629

Email: _____ Telephone: 949-661-9458

PETITION- GERALD WOODS

LETTER CODE: I-49

DATE: October 22, 2014

RESPONSE I-49-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-50-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

3) **Ingress/Egress:** Egress and ingress to the church premises is limited to the single driveway at Sea Island Drive and Crown Valley Parkway. The multiple daily operations contemplated by the applicant along with a decade of construction would overload an already busy parkway. For example, there are three uncontrolled right and left turn lanes between PCH and the entrance to the Church premises, a distance less than a tenth of a mile. Traversing through such turn lanes will become Greater challenges as well as greater safety hazards for all vehicular traffic. Likewise, ingress/egress from Monarch Bay Villas will be compromised, as the community has only one point of entry, on Crown Valley Parkway at Lumeria Lane. The intersection is frequently compromised by vehicles making u-turns and others speeding up and down Crown Valley Parkway.

4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website.

5) **Wildlife and Water:** Salt Creek harbors many species of wildlife, including an endangered bird species. The noise and pollutants emanation from the Church property during and after construction will adversely and materially impact such wildlife as well as much of the natural vegetation. The area, which is serving as drainage for South Shores Church, is both mitigation for another project and habitat for an endangered species. Currently, the storm water runoff from existing site is eroding this protected area. Plans for post-construction storm water management are inadequate for the proposed and alternate proposed project.

6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents. I-50-1

NAME:	DATE:	ADDRESS
Celine Capone Celine Capone	10/23/14	23266 Atlantica Dana Point, 92629

Email: _____ Telephone: 949-496 2258

PETITION- CELINA CAPONE

LETTER CODE: I-50

DATE: October 23, 2014

RESPONSE I-50-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-51

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-51-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

3) **Ingress/Egress:** Egress and ingress to the church premises is limited to the single driveway at Sea Island Drive and Crown Valley Parkway. The multiple daily operations contemplated by the applicant along with a decade of construction would overload an already busy parkway. For example, there are three uncontrolled right and left turn lanes between PCH and the entrance to the Church premises, a distance less than a tenth of a mile. Traversing through such turn lanes will become Greater challenges as well as greater safety hazards for all vehicular traffic. Likewise, ingress/egress from Monarch Bay Villas will be compromised, as the community has only one point of entry, on Crown Valley Parkway at Lumeria Lane. The intersection is frequently compromised by vehicles making u-turns and others speeding up and down Crown Valley Parkway.

4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website.

5) **Wildlife and Water:** Salt Creek harbors many species of wildlife, including an endangered bird species. The noise and pollutants emanation from the Church property during and after construction will adversely and materially impact such wildlife as well as much of the natural vegetation. The area, which is serving as drainage for South Shores Church, is both mitigation for another project and habitat for an endangered species. Currently, the storm water runoff from existing site is eroding this protected area. Plans for post-construction storm water management are inadequate for the proposed and alternate proposed project.

6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents. I-51-1

NAME:	DATE:	ADDRESS
Tom + Lori Knudson	10/21/14	23268 Atlantis Way Dana Point, 92629

Email: 10isandtom@gmail. Telephone: 949-489-2945

PETITION- TOM AND LOIS KNUDSON

LETTER CODE: I-51

DATE: October 21, 2014

RESPONSE I-51-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident I-52

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-52-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

3) **Ingress/Egress:** Egress and ingress to the church premises is limited to the single driveway at Sea Island Drive and Crown Valley Parkway. The multiple daily operations contemplated by the applicant along with a decade of construction would overload an already busy parkway. For example, there are three uncontrolled right and left turn lanes between PCH and the entrance to the Church premises, a distance less than a tenth of a mile. Traversing through such turn lanes will become Greater challenges as well as greater safety hazards for all vehicular traffic. Likewise, ingress/egress from Monarch Bay Villas will be compromised, as the community has only one point of entry, on Crown Valley Parkway at Lumeria Lane. The intersection is frequently compromised by vehicles making u-turns and others speeding up and down Crown Valley Parkway.

4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website.

5) **Wildlife and Water:** Salt Creek harbors many species of wildlife, including an endangered bird species. The noise and pollutants emanation from the Church property during and after construction will adversely and materially impact such wildlife as well as much of the natural vegetation. The area, which is serving as drainage for South Shores Church, is both mitigation for another project and habitat for an endangered species. Currently, the storm water runoff from existing site is eroding this protected area. Plans for post-construction storm water management are inadequate for the proposed and alternate proposed project. I-52-1

6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents.

NAME: DATE: ADDRESS

Susan & Robert Baker 10/16/19 23271 Atlantis Way Dana Point CA 92629

Email: bobandsue79 @ cox.net Telephone: 949.240.2057

PETITION- SUSAN AND ROBERT BAKER

LETTER CODE: I-52

DATE: October 16, 2014

RESPONSE I-52-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident I-53

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-53-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

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4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website.

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6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents.

NAME:	DATE:	ADDRESS
Dulcie L. Pate	10/28/14	23272 ATLANTIS, DANA PT, CA 92629

Email: dulciepate@cox.net Telephone: 949 496 4070

PETITION- Dulei Pate

LETTER CODE: I-53

DATE: October 18, 2014

RESPONSE I-53-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

In Opposition To

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

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2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

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I-54-1

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NAME: Diane M Saporakis DATE: 10/22/14 ADDRESS

Michael M Saporakis 10/22/14 23275 Atlantis Way Dana Point, 92629

Email: 2sapo@cox.net Telephone: 949 831-6682

PETITION- DIANE AND WIDEAL SAPORAKIS

LETTER CODE: I-54

DATE: October 22, 2014

RESPONSE I-54-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-55

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-55-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

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I-55-1

6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents.

NAME:	DATE:	ADDRESS
MAURICE FARAH	10/17/2014	23277 ATLANTIS WAY DANA POINT

Email: _____ Telephone: 702-588-8720

PETITION- MAURICE FARAH

LETTER CODE: I-55

DATE: October 17, 2014

RESPONSE I-55-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-56

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-56-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

3) **Ingress/Egress:** Egress and ingress to the church premises is limited to the single driveway at Sea Island Drive and Crown Valley Parkway. The multiple daily operations contemplated by the applicant along with a decade of construction would overload an already busy parkway. For example, there are three uncontrolled right and left turn lanes between PCH and the entrance to the Church premises, a distance less than a tenth of a mile. Traversing through such turn lanes will become Greater challenges as well as greater safety hazards for all vehicular traffic. Likewise, ingress/egress from Monarch Bay Villas will be compromised, as the community has only one point of entry, on Crown Valley Parkway at Lumeria Lane. The intersection is frequently compromised by vehicles making u-turns and others speeding up and down Crown Valley Parkway.

4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website.

5) **Wildlife and Water:** Salt Creek harbors many species of wildlife, including an endangered bird species. The noise and pollutants emanation from the Church property during and after construction will adversely and materially impact such wildlife as well as much of the natural vegetation. The area, which is serving as drainage for South Shores Church, is both mitigation for another project and habitat for an endangered species. Currently, the storm water runoff from existing site is eroding this protected area. Plans for post-construction storm water management are inadequate for the proposed and alternate proposed project. I-56-1

6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents.

NAME:	DATE:	ADDRESS
Phyllis A. Burke Phyllis A Burke	10/23/14	23276 Atlantis Way Dana Point, CA 92629

Email: phyllisburke1@cox.net Telephone: 443-9478

PETITION- PHYLLIS A. BURKE

LETTER CODE: I-56

DATE: October 23, 2014

RESPONSE I-56-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-57

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-57-1

2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

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NAME:	DATE:	ADDRESS
Gloria Ruston	10/17/2014	23278 Atlantis Way Dana Point 92629

Email: _____ Telephone: (949) 493-6932

PETITION- GLORIA RUSTON

LETTER CODE: I-57

DATE: October 19, 2014

RESPONSE I-57-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

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2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

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NAME: DATE: ADDRESS

CLAIRE VANTFAELT 8219 LA SIERRA
Whittier CA 90605

Email: Telephone: (562) 693 2205

23281 ATLANTIS WAY
DANA POINT

PETITION- CLARE VAN HAELST

LETTER CODE: I-58

DATE: October 29, 2014

RESPONSE I-58-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

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NAME: [signature] DATE: 10/16/14 ADDRESS 33286 Atlantic Way Dana Point 92629

Email: Telephone: 949-248-9933

PETITION- JULIEN MUNSILL

LETTER CODE: I-59

DATE: October 16, 2014

RESPONSE I-59-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-60

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

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I-60-1

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NAME:	DATE:	ADDRESS
Irv Rem / Irv Rem Binnie Rem / Binnie Rem	10-17-14	23289 Atlantis Way Dana Point 92629

Email: irvr@cox.net Telephone: 949-388-3089

PETITION- IRV AND BINNIE REM

LETTER CODE: I-60

DATE: October 17, 2014

RESPONSE I-60-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-61

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

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2) **A Decade of Construction**. It is patently unreasonable to burden this community with an on and off construction process spanning over a period of 10 years. The prospect of living with the roar of heavy equipment, and other disconcerting construction noises echoing thought out the community for at least a decade and concomitantly fighting off the dust, noxious fumes and other pollutants that inevitably sift through the doors and windows of adjacent residents is simply intolerable and unacceptable. I request a performance bond be required in order to protect the community from delayed and/or unfinished construction work.

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NAME:	DATE:	ADDRESS
ERICH A. KRUECK JOYCE E. JOHNSON	16 OCT 14	23292 ATLANTIS WAY DANA POINT, CA 92629

Email: eakrueck51@quail.com Telephone: 949-240-3536
jejohnson51@cox.net

PETITION- ERICH KRUECLE AND JOYCE JOHNSON

LETTER CODE: I-61

DATE: October 16, 2014

RESPONSE I-61-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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I-62

Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

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I-62-1

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NAME:	DATE:	ADDRESS
Beauford H. Phelps BEAUFORD H. PHELPS	Oct. 18, 2014	23294 ATLANTIS WAY DANA POINT, CA 92629

Email: BEAUFORD@COX.NET Telephone: (949) 488-3308

PETITION- Beauford H. Phelps

LETTER CODE: I-62

DATE: October 18, 2014

RESPONSE I-62-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

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4) **Salt Creek Corridor**: Salt Creek is a designated view corridor. The height and size of the structure as depicted in the South Shores Church General Plan, both the proposed and alternate proposed project, would materially impair and /or interfere with the existing views. This was demonstrated by the "Staking of the proposed project" in July of 2009. See VoMB's website.

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6) **Transformational General Plan.** The undersigned protests any attempt by the Planning Commission, the Dana Point City Council and/or the City of Dana Point to approve the proposed project, or alternate proposed project, without a thorough review by City Engineers, independent engineers and Regional Water Authorities. The proposed expansion and commercialization of South Shores Church beyond serving the congregants would be grossly invasive and transformational in a multitude of ways. It would dramatically and irrevocably alter the character of the area and adversely and materially impact and impair the ambience and quality of life historically enjoyed by nearby residents.

MICHAEL TIBSHRAENY
NAME: JILL D. TIBSHRAENY DATE: ADDRESS

Michael Tibshraeny
Jill D. Tibshraeny 10/25/14 32785 LUMERIA LANE
DANA POINT CA 92629

Email: JILLTIBS @gmail.com Telephone: 602 6256687

PETITION- MICHAEL AND JILL TIBSHRAENY

LETTER CODE: I-63

DATE: October 25, 2014

RESPONSE I-63-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

1) **Geological Integrity**. The church property is geologically strategic to the Monarch Bay Villas (MBV) in that it supplies the primary structural footing for our hillside community and the adjacent hillsides. The continuing slippage, erosion, and subsidence of the properties immediately adjacent to the north of the Church demonstrate the existing instability of the angle of repose of the underlying property. This condition is characteristic of much of the property along Crown Valley Parkway. The alluvial fill along Salt Creek and immediately below the Church lends little or no structural support to the steep up-slopes. Acerbating the concerns of the undersigned is the fact that the slopes are composed primarily of rubble with little or no strata formation and laced with numerous underground water flows. A cursory review of the geological facts compels a conclusion that any material grading may trigger damaging earth movement. Accordingly, an expressed agreement of the indemnification running in favor of the MBV residents is mandated under the circumstance. Furthermore, there is landfill and no one knows what pollutants are therein contained. I-64-1

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I-64-1

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NAME: SERGIO LANDAU DATE: 10/22/14 ADDRESS

23293 POMPEII DRIVE
D.P., CA. 92629

Email: SERGIO@ONDAMOTION.COM Telephone: 949-510-5282

PETITION- SERGIO LANDAU

LETTER CODE: I-64

DATE: October 22, 2014

RESPONSE I-64-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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I request confirmation of delivery from the City of Dana Point & consultant LSA which should be sent to roxannewillinger@cox.net

Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

The undersigned resident of Monarch Bay Villas hereby objects to the South Coast Master Plan, SCH No. 200941129, ("the Church"), both the original and the alternate projects as proposed and/or any structural or operational expansion thereof. The Undersigned objections are based in part on the following:

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I-65-1

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NAME:	DATE:	ADDRESS
Leoda Deutsch	10/23/14	23275 Pompeii Drive Dana Point

Email: drdppt@yahoo.com Telephone: (410) 798-9241

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PETITION- LEODA DEUTSCH

LETTER CODE: I-65

DATE: October 23, 2014

RESPONSE I-65-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

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NAME:	DATE:	ADDRESS
Ed Van Deusen ED VAN DEUSEN	10-22-2014	23294 Pompeii Dr Dana Point CA 92629

Email: VAN DEUSER@COX.NET Telephone: 949-661-6687

PETITION- ED VAN DEUSEN

LETTER CODE: I-66

DATE: October 22, 2014

RESPONSE I-66-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

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NAME:	DATE:	ADDRESS
DIRK VAN DEUSEN	10-22-14	23294 POMPEII DR. DANA POINT, CA 92629
Dirk Van Deusen		

Email: dirk@konavistas realestate.com Telephone: 949-661-6687

PETITION- DIRK VAN DEUSEN

LETTER CODE: I-67

DATE: October 22, 2014

RESPONSE I-67-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

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NAME:	DATE:	ADDRESS
DIANA VAN DEUSEN	10-22-14	23294 POMPEII DR. DANA POINT, CA 92629
Diana Van Deusen		

Email: VANDEUSER@COX.NET Telephone: 949-661-6687

PETITION- DIANA VAN DEUSEN

LETTER CODE: I-68

DATE: October 22, 2014

RESPONSE I-68-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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Petition of Monarch Bay Villas Resident

I-69

In Opposition

to

South Shores Church Master Plan, SCH No. 200941129

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NAME: DATE: ADDRESS

Barbara Marlatt 10-22-2014 23289 Camino Del Avion Dana Point

Patricia Marlatt

Email: PatriciaMarlatt@Me.Com Telephone: 323 323-874-2818

PETITION- PATRICIA MARLATT

LETTER CODE: I-69

DATE: October 22, 2014

RESPONSE I-69-1

This comment is a petition that is a duplicate of comment letter I-43. Please see Responses to Comments I-43-1 through I-43-11.

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October 08, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

I am a resident of Dana Point and wish to offer this letter of support for the South Shores Church Master Building Plan.

I have lived in Dana Point for 16 years and have seen new development of our beautiful city offer growth and prosperity. I attend South Shores Church and am in total support of the building enhancement plans the church has submitted, knowing it will only be an asset for the community. The pastors, teachers, and congregation are kind, loving, and caring people with a genuine interest for their surroundings, keeping the needs of others at the forefront of their actions. I-70-1

Please consider this a request to allow the plans to be accepted, and the building to begin.

Sincerely,
Linda Doucette
33936 Golden Lantern
Dana Point, CA 92629

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

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LINDA DOUCETTE

LETTER CODE: I-70

DATE: October 8, 2014

RESPONSE I-70-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: Sondra Darby <sjdarby@earthlink.net>
Sent: Thursday, October 09, 2014 12:50 PM
To: DENISE JACOBO
Subject: SSC Building Project

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Chairwoman Denise Jacobo:

I have visited the town of Merced, Ca, where my Daughter and grand kids live.

Many of the churches have Gyms where the young people can have team sports on a city wide basis. I went to 3 different churches to watch my grand son play basketball and my grand daughter do cheer leading.
That is why I think it is very important for the Dana Point Commission to Ok the plans and let the building begin!

I-71-1

Thank You Sincerely
Mrs Sondra Darby
Member SSC
Sent from my iPhone

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SONDRA DARBY

LETTER CODE: I-71

DATE: October 9, 2014

RESPONSE I-71-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: Don Yamano <dyamano@cox.net>
Sent: Thursday, October 09, 2014 5:16 PM
To: DENISE JACOBO
Subject: South Shores Church

Dear Chairwoman Claus

Thank you for taking the time to work on this matter.

I have attended South Shores for many years. I have been part of work crews to clean, paint, and generally freshen up our campus. I have personally experienced how pitifully old and worn out many area have become. There is serious need for new construction. I have also been part of group meetings that have had difficulty scheduling due to lack of space. I believe there is need for more facilities. I also know our community has grown greatly since the church's early days. We would like to accommodate the changing and expanding community. We will need more facilities to do this.

It is my understanding that we, as the church, are using an alternative plan for our construction with no variance to code. Furthermore, we have considerably lowered the size of the project down to 71,000 sq. ft. The new construction will not block views as the height is planned to actually be lower than at current time. I-72-1

The church has made great effort to comply to rules and listen to the neighbors. Now it is time for us to build. Please approve our plans.

Sincerely,

Peggy Yamano

7 Hastings

Laguna Niguel

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PEGGY YAMANO

LETTER CODE: I-72

DATE: October 9, 2014

RESPONSE I-72-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: Cheryl Henderson <1cherelle@cox.net>
Sent: Friday, October 10, 2014 12:59 PM
To: DENISE JACOBO
Subject: SUPPORT for the South Shores Church Master Plan

October 10, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

We are writing to express our support for the South Shores Church Master Plan.

We have been attending South Shores Church for 7 years and reside in the Ritz Pointe community in Monarch Beach. In previous residences across Orange County where we lived, we wanted to be an active part and involved in a local, community church. We were glad that, not only does South Shores Church meet that need for us being in our backyard, but some of its attributes that impressed us when we first visited to the present time was its welcoming attitude, its love for all who attend, as well as its desire to be a place of hope and encouragement for all age groups and demographics in the surrounding community. To be able to keep up with the growing needs of our community, South Shores needs your approval. I-73-1

From the beginning of our nation's history, places of worship such as churches and synagogues have been at the center of our communities, offering strength, stability, and encouragement during good times and bad. It is our opinion that South Shores Church more than fulfills that need.

Although there are some residents in Ritz Pointe who oppose the South Shores Plan and claim to represent everyone here, this is simply not the case. We fully support the South Shores plan and understand its benefit to the overall community.

Thanks in advance for your time and support.

Sincerely,

Mark Henderson
Cheryl Henderson
10 Monaco

Monarch Beach, CA 92629

I-73

cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

MARK HENDERSON

LETTER CODE: I-73

DATE: October 10, 2014

RESPONSE I-73-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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I-74

DENISE JACOBO

From: Christina Manta <christina@christinamanta.com>
Sent: Wednesday, October 15, 2014 11:11 AM
To: DENISE JACOBO
Subject: support for the South Shores Church master plan

Dear Chairwoman Claus:

I have been attending South Shores Church for 11 years now and it is a wonderful place full of people that truly care for one another. I would love to see it grow and spread the love of Jesus to our community. I am a realtor in this area and live here myself. Please come to our Sunday service and see for yourself the kind of church that it is. My kids go to CUSD so this church is truly a place for them to come and get away from the stuff that goes on in our public school system. My kids can't wait to see their friends, play some basketball on the courts, and have a bible study. My kids are grounded in Gods word and would love to see others come and join in on the wonderful family of God in our community. I-74-1

There have been many families praying about the expansion of our church.....and if its Gods will..... then the building will be built!

Thank you for your time and have a great day!
Christina

Where excellence and integrity come together.

Christina Manta
Keller Williams Realty
Direct: 949-422-1863
Fax: 949-495-5182
christinamanta.com
christina@christinamanta.com

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CHRISTINA MANTA

LETTER CODE: I-74

DATE: October 15, 2014

RESPONSE I-74-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: bonnieh2os5@aol.com
Sent: Monday, October 20, 2014 7:25 PM
To: DENISE JACOBO
Subject: South Shores Church

We are writing to encourage you to vote yes on the request for the church to build. We have been attending South Shores for years and during this time no expansion has taken place eventhough attendance has increased. It has reached
the point where we can not accomodate people who wish to attend, due to space restrictions. It is sad to see cars come into the parking lot and then leave because no space is available. We cannot meet the needs of children, youth and families because of limited space.

I-75-1

During the years that the church has requested to build, you have granted permission for extensive building on private and public land. The church has met the
requests you have made for exploration and is not making a request for exemptions.

South Shores is a wonderful church and serves the community in so many ways. Please vote to approve so the church can continue to serve effectively.
Thank you

Clint and Bonnie Harwick
26865 Calle Real
Capistrano Beach, 92624

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CLINT AND BONNIE HARWICK

LETTER CODE: I-75

DATE: October 20, 2014

RESPONSE I-75-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 21, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

As a member of South Shores Church, Dana Point, CA, I am contacting you to express my desire for your approval of the master plan submitted by the church. The church has for many years served the spiritual, economic and social needs of people living in the community of Orange County. Members of the church consist of residents and nonresidents of Dana Point; however, nonresidents, regularly purchase food, products and services and patronize businesses and programs in the city as they travel to and from South Shores Church, Dana Point. Much like the ongoing transformation of Dana Point and the PCH project, South Shores Church wishes to become a modern institution, with excellent program efficiencies, equipped to deliver significant programs which bless the entire community into the foreseeable future. I-76-1

The proposed South Shores Church Master Plan has been modified with community input and is well conceived following many years of dialogue with concerned parties. It is compliant with building codes, makes no request for variances, and the design allows more open space than allowed under current regulation. While the construction may cause some temporary inconvenience, like all construction does, the long term benefits and improvement to the City of Dana Point will be substantial. I respectfully ask for your approval to build as proposed in the master plan submitted.

Sincerely,

George A. Green
2524 Costero Magestuoso, San Clemente, CA 92673

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

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GEORGE A. GREEN

LETTER CODE: I-76

DATE: October 21, 2014

RESPONSE I-76-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 25, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, Ca 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

My wife and I have been members of South Shores Church for the past nine years. During this time we have seen many lives changed for the positive including our own. Our pastoral staff have created a positive environment for numerous people that are hurting due to economic loss or a love one.

I-77-1

Because of this positive condition, our church membership has grown substantially over the past 10 years. We have outgrown our current facility and desperately need to expand to continue to reach the hurting or lost.

We request your support to approve our master plan to expanded our facility and allow additional people to be positively impacted.

Sincerely,

Gary and Letty Skeen
30802 Coast Hwy., G4
Laguna Beach, Calif. 92651

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys. City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

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GARY AND LETTY SKEEN

LETTER CODE: I-77

DATE: October 25, 2014

RESPONSE I-77-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 25, 2014

Ms. Liz Claus, Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: **SUPPORT for the South Shores Church Master Plan**

Dear Chairwoman Claus:

South Shores Church has a long history of providing facilities, service and support for many organizations in the City, and can continue to do so and even expand value to the community through implementation of the Master Plan as proposed.

Rehabilitation of the existing antiquated buildings at the north end of the campus is not really an option and not a viable investment. Combined with the existing sanctuary which will remain, the new buildings will add both functional and aesthetic value to the community.

I-78-1

Finally, we are most pleased that everything in the program meets applicable codes and that no variances are being requested, and hope that you and your fellow commissioners can support the program and recommend approval to the City Council.

Thank you for your consideration.

Sincerely,

Don & Kate Moe
53 St. Michael
Dana Point, CA 92629

cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saimna Qureshy, AICP, Senior Planner

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DON AND KATE MOE

LETTER CODE: I-78

DATE: October 25, 2014

RESPONSE I-78-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 26, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

I write to you in support of South Shores Church and the approval of their Master Plan. South Shores is a tremendous asset to the City of Dana Point.

Nearly four years ago the church was hosting a community event and we happened to attend. Our family was not looking for a new church, but South Shores' welcoming nature drew us to it. After visiting, I remembered meeting Pastor Ty Guy and his wife two years earlier at a school function. Their friendly and caring nature impressed me back then.

I-79-1

In the four years we have been attending, everything we have seen the church do is for the benefit of others, including Dana Point. We can also say that as a direct result of attending South Shores, my family and I end up patronizing many of the businesses in this beautiful coastal city, even though we live in Aliso Viejo. The growth of the church in every way, including larger facilities, can only result in an improvement in the community of Dana Point.

Sincerely,

Steven Reyes & Family
24 Dunlin Lane, Aliso Viejo, California 92656

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

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STEVEN REYES AND FAMILY

LETTER CODE: I-79

DATE: October 26, 2014

RESPONSE I-79-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 27, 2014

Ms. Liz Claus
Chairwoman, Planning Commission, City of Dana Point
33282 Golden Lantern, Dana Point, CA 92629

Dear Ms. Claus,

As a Dana Point resident I wanted to write to you regarding the Master Plan of South Shores Church. Obviously you've already heard in multiple occasions the ***HUGE*** impact South Shores Church has had in our community and beyond. My family and I have been attending this church since 2007 and it's been such a ***BLESSING***! I truly think we need more places like this Church that provide an avenue for our Youth to grow, strengthen good moral values and develop strong character so that ultimately they can become good and productive citizens. My kids, Javier (11) and Natalie (8) are at South Shores Church at least 3 days a week with several activities ranging from: Karate, Kid Zone, The Ride, Pioneer Club and of course Sunday School. Personally. No doubt kids these days are already exposed to so much Destructive Input that we need to counter that as much as possible. I actually live in one of the neighboring communities of the church, specifically Pointe Monarch. As a matter of fact, I am blessed to be able to see the church sanctuary from my own backyard.

As you said, at the end of the day this is a Business Proposition seeking approval from its city officials, so one should look it as such. As a Real Estate Investor myself, I ask "Why would anyone not want to see an improvement in a property?", "Why would people not want to see the surroundings of their community being beautified?". Probably the answer is due to a temporary inconvenience and lack of future vision. From a pure ***ECONOMIC*** standpoint it makes ***TOTAL SENSE*** for the City of Dana Point as well as all for its residents to be eager to see this Master Plan happen. One thing is clear, NOBODY wants to see a run down property or a Boarded property. One of the best ways to preserve the value of a community is that its residents and businesses invest resources in remodeling and updating the place where they live/work/play. The last thing a community wants is to have structures that are so run down and abandoned that not only become an eye sore but also a liability.

I-80-1

Bottom line, for any of the above reasons, be it spiritual, social or economic I ask that you please allow South Shores Church to build their Master Plan. Yes it will be a sacrifice but I believe the benefits are so much greater in comparison. ***IT SIMPLY MAKES SENSE.***

Sandra Traver

Sandra B Traver
16 Via Sienna, Dana Point, CA 92629 Ph 949-637-1423

I-80

I-80-1

Beautiful View of South Shores Church from our backyard.

SANDRA B. TRAVER

LETTER CODE: I-80

DATE: October 27, 2014

RESPONSE I-80-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: cindywestbrook@cox.net
Sent: Monday, October 27, 2014 1:31 PM
To: DENISE JACOBO
Subject: South Shores Church

October 27, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

My husband and I are regular attenders of South Shores Church in Dana Point and are in favor of the plans to make improvements to our current buildings on the property. We are a growing church and would like to update and enlarge our buildings to better serve our congregation and the public. I-81-1

Please approve these plans.

Sincerely,

Mr. & Mrs. Edwin R. Westbrook
26622 Mission Street
San Juan Capistrano, CA 92675

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development Ms. Saima

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EDWIN R. WESTBROOK

LETTER CODE: I-81

DATE: October 27, 2014

RESPONSE I-81-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

I have been a member of South Shores Church for approximately 11 years. In March of 2005, I was involved in the implementation of the GriefShare program there. We have been meeting regularly since then and have ministered to over 350 people during that time. Many of those who have joined our group are not members of the church. They come to our group grieving, broken-hearted, devastated, angry, bitter, hopeless, depressed, etc. It has been a blessing to me to see God at work in these people's lives; to see that first smile break through, to hear their laughter after hearing their sobbing. GriefShare is only one of the many ministries of South Shores Church. I've also seen how much the congregation has grown and how much this church needs expansion in order to continuing God's work. I-82-1

In the October 26th edition of the Orange County Register, there was an article regarding the Majestic Housing project in downtown Dana Point. Mayor Lisa Barlett was quoted, saying "she voted against the proposal because of parking concerns, acknowledging that it is difficult to find spaces sometimes." She went on to say "I don't want people to come down to the Town Center, not have parking and leave."
If I may use her words, I also say "I don't want people to come to South Shores Church, not have parking (and adequate meeting rooms) and leave."

Please give your approval for the South Shores Church Master Plan!

Sincerely,

Judy Leonard
33 Winslow Street, Ladera Ranch, Ca 92694

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

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JUDY LEONARD

LETTER CODE: I-82

DATE: October 28, 2014

RESPONSE I-82-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 27, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

Thank you very much for listening to me speak on October 13th. I have been in our community for just under 40 years. I have seen my home area grow in so many wonderful ways but do miss the cows and sheep that used to roam the hills. As a child I remember driving down the 2 lane road called Crown Valley Pkwy to my other home base, South Shores Church! Dr. Don Cole was my first pastor I heard and was a huge part of my life. Every Sunday I looked forward to a big hug from Dr. Cole, I remember it as if it were yesterday.

SSC has been a part of me for almost 40 years and helped me become who I am today. My grandparents and parents started attending this church in the early 70's and when I was born in 1974, I began my journey here too. South Shores is where I attended preschool along with Sunday school. I was part of so many camps, VBS and youth groups, even through my years at Dana Hills High School. I-83-1

It was amazing in 1995 when we got to go church in the new sanctuary but I couldn't help but to think what about the rest of our campus, what about the classrooms for the children, our future generation.

In 2009, I chose to put our daughter at South Shores for preschool and as I walked in the classroom, it hit me "Wow this room still smells the same that I remember as a child". South Shores campus is so worn down now because of the thousands of kids that have been blessed by being there. Our son is currently attending Kindergarten at South Shores so I see daily how badly it needs a better campus. It is time to give our future

generation's new buildings that aren't falling apart and have air conditioning and even audio and visual technology.

This church has done amazing things for our growing community with these same structures that serviced a much smaller population. I feel and know it is time to lay this new foundation so we can continue to give this community what it needs. I-83-1

In closing, please accept my thanks for your time and please give your favorable consideration to my church's desire to make an even better setting for our growing community.

Sincerely,

Keanne Nemeth
20 Mercato, Laguna Niguel

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

KEANE NEMETH

LETTER CODE: I-83

DATE: October 27, 2014

RESPONSE I-83-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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From: Barney <barney.graves@cox.net>
Sent: Tuesday, October 28, 2014 11:39 AM
To: DENISE JACOBO
Subject: SUPPORT for the South Shores Church Master Plan

October 28, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

I wish to include my support to South Shores Church for their proposed building program. My residence is 33 San Raphael DP. I own my home in the Ritz Point Community (Corniche Sur Mer). I am telling you this because of the location of my house. It is approximately the same elevation of the church property. I have included a photo showing the view from my family room.
I understand there may be a possible inconvenience during portions of this building program but I strongly believe it is important for the future of South Shores church and the future of Dana Point.
I believe that the community is fortunate that a church owns this property. It could a been possibly a shopping mall or a hotel with many stories blocking the view of the homes on the West Side of Crown Valley parkway.

Thank You for your considerations, I-84-1

Wm. Bernard Graves
949.481.7011

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WM BERNARD GRAVES

LETTER CODE: I-84

DATE: October 28, 2014

RESPONSE I-84-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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Ted Quinn

From: Ted Quinn <tedquinn@cox.net>
Sent: Thursday, October 23, 2014 1:44 PM
To: squreshy@danapoint.org
Cc: 'Todd Glen'; 'Ted Quinn'
Subject: RE: Comments on Final EIR for the South Shores Church proposed Master Plan SCH No. 2009041129, as requested by the City of Dana Point at the March 4, 2010 Scoping Meeting REV 1

(NOTE: Additional relevant and related information added in Rev 1)
Attention: Saima Qureshy, AICP, Senior Planner
City of Dana Point

The purpose of this email is to provide my comments on the draft EIR(See Subject Line) as stated in my public comment at last week's Scoping Meeting.

I am a 17 year resident of Dana Point in Monarch Bay Villas and a 32 year resident of Laguna Niguel/Dana Point and am very familiar with the issues related to the proposed expansion for the South Coast Church. I am also an engineer with 37 years of experience in multiple large projects all over the world. As stated in my public comment, I think highly of South Coast Church and my two daughters both went to the preschool many years ago. I support the church's ability to replace the buildings at the north end. My strong concern is with the new Preschool/Administrative building and 62,500 sq. ft. garage structure at the south end of the property which is over the top of the hill coming down to Monarch Bay Villas. The concern I have is with the seismic criteria for the development and the ability of the hill to withstand the development. My basis for concern is in the factual history of the Monarch Coast apartments, which were built approximately 20 years ago at 32400 Crown Valley Parkway. Approximately 5 years after being built, the most southern apartment building slid into the canyon and had to be destroyed. Noone was hurt in this case because the slide was into an unoccupied canyon. In the case of the new buildings on the same hill for South Coast Church, the new building and garage structure at the south end, if it were to slide, would slide right into multiple homes in Monarch Bay Villa's, risking the lives of anyone in the church building as well as the inhabitants of our homes in Monarch Bay Villas. Since the apartment building at Monarch Coast apartments was built to the latest code and still slid down the hill, what guarantee do we have that this won't happen again on the same hill with the new build at the church. In addition to the new Preschool/Administrative building, the garage structure covers a large area and since it slants down toward the Monarch Bay Villa's development below, it provides additional force vector in the event of a slide of the structure. The liability for the city is very large in such a case with such a clear history of instability on this hill. I-85-1

I recommend that the construction project be redone to remove the new buildings and modify the parking structure on the hillside immediately on top of the Monarch Bay Villa's. Otherwise, the risk to the city and our residents is unacceptably high.

Sincerely yours,

10-23-2014

Edward (Ted) L. Quinn
President, Technology Resources
23292 Pompeii Drive
Dana Point, CA 92629
(949) 632-1369

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TED QUINN

LETTER CODE: I-85

DATE: October 23, 2014

RESPONSE I-85-1

This comment is a duplicate of comment letter I-18 with minor clarifications regarding the buildings addressed in letter I-18.

See Response to Comments I-18-1 through I-18-4.

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ART AND MARILYN ZEINER
13 Cala D'Or
Laguna Niguel, CA 92677

October 30, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

Churches need a presence in our community and in the lives of people in need of spiritual guidance. The church helps the needy, poor and disabled, distributes food and clothing, and assists the homeless. Government can't do it all.

South Shores church teaches the bible **and moral direction** and values to its **children** from pre-school through high school.

The church cultivates a sense of belonging to anyone who attends and shows love and compassion toward others, which brings **unity to the community**. I-86-1

The church and its people reach out to others who need their lives transformed in some way and by so doing, reach **one person at a time**.

We realize that churches are tax-exempt and therefore don't contribute to the City's coffers. However, money cannot buy the goodwill and assistance the church provides the community.

PLEASE VOTE TO LET SOUTH SHORES CHURCH CONTINUE TO EXIST AND DO GOOD THINGS.

Sincerely,

Art & Marilyn Zeiner

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

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ART AND MARILYN ZEINER

LETTER CODE: I-86

DATE: October 30, 2014

RESPONSE I-86-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: Dwight Hamro <mdhelectronics@att.net>
Sent: Thursday, October 30, 2014 12:14 PM
To: DENISE JACOBO
Subject: South Shores Church Master Plan

October 30, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus,

My name is Dwight Hamro. My wife, Helena, and I have been members of South Shores Church for over 51 years. Our 5 children grew up attending SSC. Now our grandchildren attend South Shores Church. SSC has loved us and we love SSC!!

When we joined SSC the facilities included a 2 bedroom ranch house, a covered patio and a 2 car garage. There were 90 members. There was no residential or commercial buildings as far as you could see. I-87-1

Of course, today, you see residential and commercial cover the canyon and hills including a hotel and golf course across the canyon.

Along with the community, our church ministry has grown too! But our facilities have not: Even though we added a new Sanctuary in 1995, our educational, administrative, multipurpose and parking facilities have not kept up. We recognized this was needed over 10 years ago and submitted a Master Plan for your approval in 2004. Consequently I am writing this letter to encourage your approval of our plan for new facilities serving our community.

Sincerely,
Dwight and Helena Hamro
215 Via Montego
San Clemente, CA 92672
(949) 492-3122
mdhelectronics@att.net

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

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DWIGHT AND HELENA HAMRO

LETTER CODE: I-87

DATE: October 30, 2014

RESPONSE I-87-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: Keith Kenaston <kenaston@cox.net>
Sent: Thursday, October 30, 2014 12:21 PM
To: DENISE JACOBO
Subject: South Shores Church Buidling Project

Good Morning,

I have been a member of South Shores Church for 22 years and it is a wonderful Church that touches many people's lives and is always there to support the Community. This building project is such a very positive expansion for the Community. I am reaching out asking for you to please support us in this project. I-88-1

Thank You

Alice and Keith Kenaston
30781 Marilyn Dr.

Laguna Beach

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ALICE AND KEITH KENASTON

LETTER CODE: I-88

DATE: October 30, 2014

RESPONSE I-88-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: Sharon Graves <sharon.graves@cox.net>
Sent: Thursday, October 30, 2014 9:12 AM
To: DENISE JACOBO
Subject: RE: Please vote Yes for the Church

October 30, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

Dear Ms. Claus,

Please vote yes for the Church Construction.

I live in the Ritz Point Community and there is construction, tree trimming and landscaping going on continuously.

Would VOMB rather have a shopping center? A multistory Hotel? A 24 hour fitness center?

I would much rather have a Church that supports and helps Dana Point Community.

I understand that South Shores Church has modified their original plans trying to accommodate their neighbors.

Help me to understand why the city council would NOT want the church to update their facilities?

Kind Regards and thanks for serving our community,

I-89-1

Sharon Graves
Ritz Point Resident (949) 481.7011

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SHARON GRAVES

LETTER CODE: I-89

DATE: October 30, 2014

RESPONSE I-89-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 30, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:

My wife and I moved to Dana Point in 2005 when we were first married so I could accept a full time job at South Shores Church. Our first seven years of marriage saw us in two different apartments centrally located in the Lantern District. Those first years of caused us to fall in love with the City of Dana Point. We loved running through the lantern streets, going to the Festival of Whales, sampling at farmer's markets, listening to the bike races and of course, visiting the beaches and harbor. We started our family in Dana Point, we became zealous for its festivities and its local business, and though two years ago we purchased a home in San Juan, Dana Point is still our home. I-90-1

South Shores Church brought us to this city, and for us it is synonymous with Dana Point. It is a gateway to the city from the North and a light that seeks to help people move beyond manicured lawns and perfectly toned abs to develop a spiritual health and vitality of life found in Jesus Christ; South Shores Church provides something unique.

We want the best for our city. Our hope is that you will look at the plans for the church and see it with an eye toward the future and continuing generations of people who love Dana Point.

Sincerely,

Derick & Rebecca Zeulner
25865 Avenida Mariposa
San Juan Capistrano, CA 92675

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

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DERICK AND REBECCA ZEULNER

LETTER CODE: I-90

DATE: October 30, 2014

RESPONSE I-90-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 27, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: Support for the South Shores Church Master Plan

Dear Chairwoman Claus:

I am a member of this church. I have attended for over 20 years as a member in good standing. I have served several churches as a member of the council. These have been in Indiana and California. I am 80 years old. I know there is a process to come to a final decision on matters such as this. My community here in Dana Point seems to have had adequate study time on this very important community project. The price tag keeps going up with the unjust negative efforts of a minor group that doesn't seem the way America works. I-91-1

I look forward to having you come to a positive conclusion on this vital project for our community.

Thank you for allowing me to voice my opinion and vote to conclude this.

Sincerely,

Charles E. Deckard, corporate business owner
34145 PCH, #739
Dana Point, CA 92629

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Mamager
Ursala Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

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CHARLES E. DECKARD

LETTER CODE: I-91

DATE: October 27, 2014

RESPONSE I-91-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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SAIMA QURESHY

From: URSULA LUNA-REYNOSA
Sent: Thursday, October 30, 2014 10:27 AM
To: SAIMA QURESHY
Subject: FW: South Shores Church

From: Jim & June [mailto:j-j1@cox.net]
Sent: Wednesday, October 29, 2014 2:15 PM
To: URSULA LUNA-REYNOSA
Cc: rdeklotz@southshores.org
Subject: South Shores Church

To: Ursula Luna-Reynosa
Director, Community Development
City of Dana Point

Re: Proposed construction @ South Shores Church, Dana Point.

Dear Ms. Luna-Reynosa,

We are continuous residents of the area since 1976, antedating the incorporation of our city. We have always lived in the area of Dana Point in proximity to the church altho in several different homes.

During that time, we have found the church to be excellent neighbors. They have provided space for community and neighborhood meetings, allowed precinct voting on their property and maintained the property in a neat, tidy and appealing fashion. I-92-1

Additionally, church members have been active in the community, for example,participating in beach clean-ups and much, much more.

The church also has opened it's doors to some of their wonderful performances @ holiday times.

Altho not formal members, we have always felt welcome occasionally attending services.

The plans, which we've reviewed, are very reasonable for the location and for the neighborhood. Not only will the new facilities allow the church to serve its members better but will be an asset for all of us here in Dana Point. I-92-1

We appreciate your forwarding of our support for the South Shores Church project to the appropriate decision makers in the city.

Thank you,

Respectfully,

Dr. & Mrs. Jim & June Mullen
23242 Tasmania Circle
Dana Point

JIM AND JUNE MULLEN

LETTER CODE: I-92

DATE: October 30, 2014

RESPONSE I-92-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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Ms. Liz Claus, Chairwoman,
Planning Commission,
Dana Point, CA

Dear Ms. Claus,

Thank you for allowing us to express our feelings and experiences as residents of Dana Point and members of South Shores Church.

We chose to move to Dana Point 10 years ago for several reasons. It is a very special community in many ways and also is the home of South Shores Church a very special house of worship.

The home owners in Dana Point and especially Monarch Beach are very conscientious in keeping their homes and neighborhoods in excellent condition. As residents we appreciate this as it especially makes our area appealing and keeps property values up.

I-93-1

South Shores Church also needs to be provided the opportunity to improve their facilities which are greatly in need of replacement. This would certainly enhance our property and contribute to the overall beauty of the area.

South Shores Church has contributed in reaching out to families and individuals of all ages for many years. The pre-school is well filled before the beginning of the school year and the facility has long been in need of changes and upgrading. Our church is also assisting those who are in need of food and others who have difficulty after losses of various kinds. These benefits are not just provided for members of South Shores but for anyone in need. South Shores Church is a very positive benefit to the city of Dana Point and this makes us even more pleased to be a part of the Dana Point family.

Thank you for your consideration of our request,

John - Marlene Huffman

John and Marlene Huffman
24126 Gourami Bay
Dana Point, CA 92629

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JOHN AND MARLENE HUFFMAN

LETTER CODE: I-93

DATE: October 28, 2014

RESPONSE I-93-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 27, 2014

Ms. Liz Claus, Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92677

Dear Ms. Claus:

Thanks to you and all members of the Planning Commission for all the time you have devoted these many months/years to study and consider the merits of approving South Shore Church's modernization and growth plan. As a forty year resident of Laguna Niguel and a thirty plus year member of South Shores Church (SSC), my family has seen so many changes in the area we call home.

I-94-1

As our homes need repair and some improvement over the years, I imagine each of you have had similar occurrences both at your homes and your workplaces. The same is true of SSC. Please allow us to grow.

In this regard, my wife and I ask for your approval to the SSC project.

Respectfully,

Paul W. Kraft
Kathy E. Kraft
24271 La Hermosa
Laguna Niguel, CA 92677

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PAUL AND KATHY KRAFT

LETTER CODE: I-94

DATE: October 27, 2014

RESPONSE I-94-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 26, 2014

Ms. Liz Claus
Chairwoman, Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, Ca. 92629

Dear Ms Claus,

I am a Senior Citizen that attends South Shores Church. It is a Multigenerational that serves us all. I'm involved with "GALS" Group which stands for "Get a Life Sister" and we help the women after they've attended "Grief Share" To get a life, plus any other lady that's not married whether you attend our Church or go to other Churches, we welcome all. We put on a luncheon once a month including a speaker. We serve between 45+50 ladies and we all enjoy each others company.
Our Church needs room to expand. We are a useful addition to the Community.
Thank you for your help

Sincerely,
Elaine Stanley
9 Niguel Pointe Dr.
Laguna Niguel, Ca. 92677

I-95-1

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ELAINE STANLEY

LETTER CODE: I-95

DATE: October 26, 2014

RESPONSE I-95-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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From: Pamela Spalding <spald61@cox.net>
Sent: Tuesday, October 28, 2014 3:02 PM
To: DENISE JACOBO
Subject: South Shores Church Building

October 28, 2014

To whom it may concern,

For the past 5 years I have been serving in a volunteer capacity in the front office of South Shores Church one afternoon a week. I answer the telephone, greet anyone who enters the office, direct traffic and generally monitor the office. I don't hesitate to say that there have been few if any afternoons when I have been there that at least one person has not come into the office in need of some kind of personal assistance, ranging from help with monthly housing cost, food provision, transportation, spiritual counseling and family counseling. They are never turned away. In every situation someone has been ready to help these people with their needs. Sometimes those in need have been homeless people, sometimes church members, sometimes I cannot tell. What I do know is that help is provided and needs are met. I-96-1
South Shores Church is meeting real needs to real human beings in real and practical ways, and in doing so representing the love of Christ to this community. I encourage you to grant allowance for the church to proceed with their building program in order to continue their generous Christian work in our community.

Pamela Spalding
238 Monarch Bay
Dana Point, CA
92629

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PAMELA SPALDING

LETTER CODE: I-96

DATE: October 28, 2014

RESPONSE I-96-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: Joan Beckham - Long <jabeckham@cox.net>
Sent: Tuesday, October 28, 2014 7:21 PM
To: DENISE JACOBO
Subject: Re: Planning Commission regarding South shores Church.

----- Original Message -----
From: Joan Beckham - Long
To: dijacobo@danapoint.org
Sent: Tuesday, October 28, 2014 11:30 AM
Subject: Planning Commission regarding South shores Church.

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus,

I Joan Beckham, first started attending South Shores Church in 1998. I had heard about the Widows Group there called "Get a Life Sister". I had been a widow for two years and wanted to get connected to other widows. I felt so welcomed and at home there.

I have been very active as a member and served as Church Clerk for three years, started a Pastor's Dessert in my home and started the after Church lunch each Sunday. I am also Greeter.

I met a wonderful man at South Shores and had a beautiful wedding there in 2005. I-97-1

South Shores Church has been a blessing to me and to many that attend there and also within the community. The church is used as a community location for Government elections, Homeowner's Board Meetings Blood Drives, Life Screenings and etc. We support Camp Pendleton, the VFW and most and above all our growing congregation and a very large Senior Ministry, Nursery, Grade school, Jr. High School, and our wonderful Pre School for students in and around our church. **WE NEED MORE ROOM.**

As you know the Master Plan is beautiful and it would be such a beautiful asset to the community and to visitors traveling along Crown Valley.

Thank you for considering this letter as you are about to vote.

I-97-1

Sincerely,
Joan Beckham
29651 Placida Ave.
Laguna Niguel, CA 92677

Cc: April O'Connor, vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

JOAN BECKHAM

LETTER CODE: I-97

DATE: October 28, 2014

RESPONSE I-97-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: mysskitty@att.net
Sent: Tuesday, October 28, 2014 9:39 PM
To: DENISE JACOBO
Subject: SUPPORT FOR THE SOUTH SHORES CHURCH MASTER PLAN

October 28, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT FOR THE SOUTH SHORES CHURCH MASTER PLAN

Dear Chairwoman Clause:

Though we now live in San Clemente, we are owners of a condo at 64E Corniche Drive, Dana Point (Monarch Beach), CA. – an area that may have represented as opponent to expansion of South Shores Church in Monarch Beach.

WE ARE DEFINITELY NOT IN OPPOSITION TO THE EXPANSION INCLUDED IN THE MASTER PLAN!!!

We are members of South Shores Church for the past 8 years – we were married at South Shores Church in 2008 – South Shores is our Family and have supported us while we endured the loss of our Son, Tim, in 2009 and, again, through the loss of our daughter, Joy, in 2013. The worship of our Lord and the services at South Shores Church are extended toward all who attend our Church – and that population is ever increasing. The space there cannot contain the need! I-98-1

We are aware of ever increasing building and expansion of many businesses within Dana Point – why would the expansion of God's love through services – both worshipful and needs of support – be hindered. Please remember and consider, we pray, that God's plan for good will prevail over dissention.

Sincerely,

Barbara (Whitman) and John Dricker
46 Mira Las Olas
San Clemente, CA 92673
949-498-3070

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BARBARA AND JOHN DRICKER

LETTER CODE: I-98

DATE: October 28, 2014

RESPONSE I-98-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: mysskitty@att.net
Sent: Tuesday, October 28, 2014 9:44 PM
To: DENISE JACOBO
Subject: Fw: SUPPORT FOR THE SOUTH SHORES CHURCH MASTER PLAN

From: mysskitty@att.net
Sent: Tuesday, October 28, 2014 9:38 PM
To: djacobo@danapoint.org
Subject: SUPPORT FOR THE SOUTH SHORES CHURCH MASTER PLAN

October 28, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT FOR THE SOUTH SHORES CHURCH MASTER PLAN

Dear Chairwoman Clause:

Though we now live in San Clemente, we are owners of a condo at 64E Corniche Drive, Dana Point (Monarch Beach), CA. – an area that
may have represented as opponent to expansion of South Shores Church in Monarch Beach.

WE ARE DEFINITELY NOT IN OPPOSITION TO THE EXPANSION INCLUDED IN THE MASTER PLAN!!!

We are members of South Shores Church for the past 8 years – we were married at South Shores Church in 2008 – South Shores is our Family and have
supported us while we endured the loss of our Son, Tim, in 2009 and, again, through the loss of our daughter, Joy, in 2013. The worship
of our Lord and the services at South Shores Church are extended toward all who attend our Church – and that population is
ever increasing. The space there cannot contain the need! I-99-1

We are aware of ever increasing building and expansion of many businesses within Dana Point – why would the expansion of God's love
through services – both worshipful and needs of support – be hindered. Please remember and consider, we pray, that God's plan for good will prevail over dissention.

Sincerely,

Barbara (Whitman) and John Dricker

46 Mira Las Olas
San Clemente, CA 92673
949-498-3070

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

BARBARA AND JOHN DRICKER

LETTER CODE: I-99

DATE: October 28, 2014

RESPONSE I-99-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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From: Charlotte <chardavis@hotmail.com>
Sent: Wednesday, October 29, 2014 8:50 AM
To: DENISE JACOBO
Subject: Letter of Support - South Shores Church

Charlotte Davis
9 Wildflower
Laguna Niguel, CA 92677

October 28, 2014

Ms. Liz Claus, Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

To the Members of the Planning Commission:

This letter is written in support of the decision before you to approve the building plans for South Shores Church.

My husband and I have lived in this community for 16 years and attended South Shores for more than 10 years. Si his death last year, the Church has, more than ever, become a focal point of my life. Although I live just across street from the city limits, South Shores has brought me to center all of my activities in Dana Point. I soon wil selling my home in Laguna Niguel and most assuredly moving into your City. It is the roots that have been establis through this Church that keep me here, rather than moving out of state to where my children and grandchildren resid I-100-1

I want other families to share the blessings of this community through the expanded programs and services provide South Shores Church. I urge you to approve the plans and give a positive recommendation to the City Council.

Thank you for your consideration of this request.

Sincerely,

Charlotte Davis

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CHARLOTTE DAVIS

LETTER CODE: I-100

DATE: October 28, 2014

RESPONSE I-100-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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Charlotte Davis
9 Wildflower
Laguna Niguel, CA 92677

October 28, 2014

Ms. Liz Claus, Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

To the Members of the Planning Commission:

This letter is written in support of the decision before you to approve the building plans for South Shores Church.

My husband and I have lived in this community for 16 years and attended South Shores for more than 10 years. Since his death last year, the Church has, more than ever, become a focal point of my life. Although I live just across the street from the city limits, South Shores has brought me to center all of my activities in Dana Point. I soon will be selling my home in Laguna Niguel and most assuredly moving into your City. It is the roots that have been established through this Church that keep me here, rather than moving out of state to where my children and grandchildren reside. I-101-1

I want other families to share the blessings of this community through the expanded programs and services provided by South Shores Church. I urge you to approve the plans and give a positive recommendation to the City Council.

Thank you for your consideration of this request.

Sincerely,

Charlotte Davis

Charlotte Davis

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CHARLOTTE DAVIS

LETTER CODE: I-101

DATE: October 28, 2014

RESPONSE I-101-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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From: Vincent Negrette <genesis_negrette@aol.com>
Sent: Wednesday, October 29, 2014 2:29 PM
To: DENISE JACOBO
Subject: RE: Support for the South Shores Church Master Plan - October 29, 2014

Vincent Negrette
1335 South Coast Highway
Laguna Beach, CA 92651

October 29, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

Dear Chairwoman Claus:

Please accept this letter of support for the South Shores Church Master Plan. Recently I have had an opportunity to join the fellowship at South Shores, and may be one of the few new members whom recently began serving at the Church. I believe there is room for growth at South Shores Church, and that the development of South Shores would lead to more community involvement.

During my growth within the Church the fellowship and devotion experienced have led me through many of life's greatest moments. I believe such moments should be experienced by the Dana Point Community. South Shores is providing a good initiative in the building proposal. The new facility would meet the needs facing the church today, while also providing for some anticipated growth. I-102-1

Please accept this letter on behalf of not only my recommendation but as well as on behalf of the environmental and awareness training that has aided me in my conclusion. Attached are a few training certificates to support my statements, please contact me with any questions or concerns.

Make it a great day,

Vincent Negrette
(714)794-5396

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL. NEGRETTE.

VINCENT NEGRETTE

LETTER CODE: I-102

DATE: October 29, 2014

RESPONSE I-102-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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DENISE JACOBO

From: Doug Burt <dougmargie@cox.net>
Sent: Wednesday, October 29, 2014 3:03 PM
To: DENISE JACOBO
Subject: South Shores Church Building Project

October 29, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

RE: SUPPORT for the South Shores Church Master Plan

Dear Chairwoman Claus:
My name is Margie Burt. My husband and I live in Mission Viejo where he was a teacher at Mission Viejo High for thirty three years. South Shores has been a blessing to us for over forty years. We're a church family that cares about each other. We raised three children at South Shores and all of them were very involved. South Shores offers a many programs for kids like VBS, camps, Bible study, helping the homeless, mission trips, Sunday school, youth groups just to name a few. Now our kids have their own families and are doing good for their communities. Our buildings are falling apart. The pre-school needs to be torn down. What would you do? We need more space. There is not enough space for Sunday School classes. PLEASE, the time to build is now. We have done what you asked us to do and after 10 years and a lot of money spent, IT'S TIME.

I-103-1

Thanks for reading this.
You have all been in our prayers.

Sincerely,
Margie Burt
26792 Via Victoria
Mission Viejo, CA 92691

Cc: April O'Connor, Vice Chairwoman
Norman Denton, Commissioner
Gary Newkirk, Commissioner
Susan Whittaker, Commissioner
Doug Chotkevys, City Manager
Ursula Luna-Reynosa, Director of Community Development
Ms. Saima Qureshy, AICP, Senior Planner

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MARGIE BURT

LETTER CODE: I-103

DATE: October 29, 2014

RESPONSE I-103-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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Oct 15, 2014

Dear Ms. Liz Claus,

I'm writing to you regarding the South Shores Church building project. I've been a member there since 1968. I am now 62. I've seen the church grow from one service in the small chapel when it was new to multiple services in the "new" Sanctuary. I was married there as were my two sisters. The people there are also my family.

I used to hunt rabbits where Bear Brand is now & I've seen many changes in the area. Changes that include what was once open area between the church & PCH. We did not protest the building of homes in that area when the owners of that land wanted to build. I-104-1

I continue to live in Dana Point (in this house since '85) & want what is good for the city. I believe we have been good neighbors and have met the requests for mitigation & consideration of those adjacent to use.

Please vote for us to go forward and build.

Sincerely,

Bill Davis
24341 Timothy Dr
Dana Point 496-7341

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BILL DAVIS

LETTER CODE: I-104

DATE: October 15, 2014

RESPONSE I-104-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 13, 2014

Mr. Gary Newkirk
Commissioner
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, Ca. 92629

Dear Commissioner Newkirk,

We are Dana Point residents and we urge you to APPROVE the South Shores Church Building Project.

We have reviewed the Church's Plan and believe it to be within the City's rules and regulations with no variances.

I-105-1

We believe property owners should be allowed to build on their property within permissible rules and regulations. Just like in our neighborhood, we have property owners who are adding major remodels to their homes. While we may not like the noise, dust, and inconvenience, they have the right to build within allowable rules and regulations.

South Shores Church should be allowed those same considerations as homeowners in Dana Point.

Thanks for your consideration.

Richard & Eleanor Kichline
33721 Crossjack Dr.
Dana Point, Ca. 92629

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RICHARD AND ELEANOR KICHLINE

LETTER CODE: I-105

DATE: October 13, 2014

RESPONSE I-105-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 13, 2014

Ms. April O'Connor
Vice Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, Ca. 92629

Dear Vice Chairwoman O'Connor,

We are Dana Point residents and we urge you to APPROVE the South Shores Church Building Project.

We have reviewed the Church's Plan and believe it to be within the City's rules and regulations with no variances.

I-106-1

We believe property owners should be allowed to build on their property within permissible rules and regulations. Just like in our neighborhood, we have property owners who are adding major remodels to their homes. While we may not like the noise, dust, and inconvenience, they have the right to build within allowable rules and regulations.

South Shores Church should be allowed those same considerations as homeowners in Dana Point.

Thanks for your consideration.

Richard & Eleanor Kichline
33721 Crossjack Dr.
Dana Point, Ca. 92629

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RICHARD AND ELEANOR KICHLINE

LETTER CODE: I-106

DATE: October 13, 2014

RESPONSE I-106-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 13, 2014

Ms. Liz Claus
Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, Ca. 92629

Dear Chairwoman Claus,

We are Dana Point residents and we urge you to APPROVE the South Shores Church Building Project.

We have reviewed the Church's Plan and believe it to be within the City's rules and regulations with no variances.

We believe property owners should be allowed to build on their property within permissible rules and regulations. Just like in our neighborhood, we have property owners who are adding major remodels to their homes. While we may not like the noise, dust, and inconvenience, they have the right to build within allowable rules and regulations. I-107-1

South Shores Church should be allowed those same considerations as homeowners in Dana Point.

Thanks for your consideration.

Richard & Eleanor Kichline
33721 Crossjack Dr.
Dana Point, Ca. 92629

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RICHARD AND ELEANOR KICHLINE

LETTER CODE: I-107

DATE: October 13, 2014

RESPONSE I-107-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 13, 2014

Mr. Norman Denton
Commissioner
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, Ca. 92629

Dear Commissioner Denton,

We are Dana Point residents and we urge you to APPROVE the South Shores Church Building Project.

We have reviewed the Church's Plan and believe it to be within the City's rules and regulations with no variances.

I-108-1

We believe property owners should be allowed to build on their property within permissible rules and regulations. Just like in our neighborhood, we have property owners who are adding major remodels to their homes. While we may not like the noise, dust, and inconvenience, they have the right to build within allowable rules and regulations.

South Shores Church should be allowed those same considerations as homeowners in Dana Point.

Thanks for your consideration.

Richard & Eleanor Kichline
33721 Crossjack Dr.
Dana Point, Ca. 92629

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RICHARD AND ELEANOR KICHLINE

LETTER CODE: I-108

DATE: October 13, 2014

RESPONSE I-108-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 22, 2014
25 Veracruz
Dana Point, CA 92629

City of Dana Point Planning Commission
33282 Golden Lantern
Dana Point, CA

Ms. Claus,

We are residents of Dana Point and we support the building project proposed by South Shores Church. I-109-1

Thank you.

Cordially,

Gerald C Hiles

Sharon L. Hiles

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GERALD AND SHARON HILES

LETTER CODE: I-109

DATE: October 22, 2014

RESPONSE I-109-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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24592 Priscilla Drive
Dana Point , CA 92629
949-496-6993

To the Dana Point Building Commission:

We are residents of Dana Point and are concerned why South Shores Church have not been able to expand buildings on their own property for YEARS now. They are a wonderful organization and they just want to update and expand buildings. This will only add to the value and beauty of Dana Point. They offer wonderful family and community services. I-110-1

We have seen their plans and they have been thoughtfully designed. Please do not let a few negative and chronic complainers block this positive project.

Mary and JR Herron

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MARY AND J.R. HERRON

LETTER CODE: I-110

DATE: October 29, 2014

RESPONSE I-110-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 13, 2014

Ms. Susan Whittaker
Commissioner
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, Ca. 92629

Dear Commissioner Whittaker,

We are Dana Point residents and we urge you to APPROVE the South Shores Church Building Project.

We have reviewed the Church's Plan and believe it to be within the City's rules and regulations with no variances.

We believe property owners should be allowed to build on their property within permissible rules and regulations. Just like in our neighborhood, we have property owners who are adding major remodels to their homes. While we may not like the noise, dust, and inconvenience, they have the right to build within allowable rules and regulations. I-111-1

South Shores Church should be allowed those same considerations as homeowners in Dana Point.

Thanks for your consideration.

Richard & Eleanor Kichline

Richard & Eleanor Kichline
33721 Crossjack Dr.
Dana Point, Ca. 92629

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RICHARD AND ELEANOR KICHLINE

LETTER CODE: I-111

DATE: October 13, 2014

RESPONSE I-111-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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October 29, 2014
San Juan Capo

Ms. Liz CLaus, Chairwoman
PLanN Commission, City of Dana Point
33282 GoLden Lantern
Dana Point, CA 92629

Dear Ms. CLaus:

Re: South Shores "A time to Build."

As a regular attendee of South Shores Church, I would like to go on record as asking You to please consider the great need of the Church to be granted the opportunity to tear down old buildings and then replace them as outlined in the pLans submitted to your PLanning Commission.

From what I have read recently, Dana Point is growing with new buildings; perhaps it is, also, a time to allow So. Shores Church to grow, so that we can better serve the community of Dana Point.

Thank you for your consideration in this matter.

I-112-1

Respectfully,
Mr. and Mrs. B.J. Wallen
B A Wallen

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B.J. WELLEN

LETTER CODE: I-112

DATE: October 29, 2014

RESPONSE I-112-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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From: Maxine Jacobson <maxinesjc@gmail.com>
Sent: Thursday, October 30, 2014 1:56 PM
To: DENISE JACOBO
Subject: Supporting the South shores Church project

To whom it may concern;

I would like to support the building program at South Shores church the way South Shores Church has supported me.
This group of people helped me 'reenter' life after my husband's death.
My husband was an Alzheimer's Disease victim and I watched him die for ten years.
He was a very productive man. During World War 2 he was Communication Officer on an Admiral's staff on the U.S.S. Bennington.
Before enlisting, he was a civilian instructor for the Air Force; after the war he was employed by Purdue University as a Math teacher.
If you have had a loved one with this devastating disease you understand.
We were always extremely close. We did virtually everything together.
So, when he was ill, he wanted me close by--always. If I went out--which was not often--he would stand at the door and ask my son or daughter in law, "Where is she?" I-113-1
After his passing, it was a tremendous adjustment to return to normal life. My family gave me wonderful support as they did during his losing battle--and now.
The South Shores people played a huge part in my recovery and return back into the world. I shall ever be grateful to them.
This church has a helping ministry to many people and not just to members of the congregation but to the community as well.
We have some people who are quite alone in life and this church means everything to them.
We have a need at South Shores for more space to meet our needs and outreach.
Please excuse this lengthy and rather personal letter but I feel so strongly and want to support South Shores Church.
Thank you.
Maxine Jacobson
San Juan Capistrano

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MAXINE JACOBSON

LETTER CODE: I-113

DATE: October 30, 2014

RESPONSE I-113-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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I-114

Attn: Ms Liz Claus
Chairwoman
Planning Commission
Dana Point

10-28-14

Dear Ms Claus:

I am writing in support of South Shores Church and their plan for improvement of their property on Crown Valley parkway.

I believe this will be an enhancement to the surrounding area and the City of Dana point. It will furthermore, allow the Church to continue their work to strengthen our community through faith and the support of our families. I-114-1

I urge you and your team to approve this project wholeheartedly.

Respectfully,

Michael L. Helm
San Clemente, Ca. 92672

CC: File

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MICHAEL HELM

LETTER CODE: I-114

DATE: October 28, 2014

RESPONSE I-114-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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Charlotte Davis
9 Wildflower
Laguna Niguel, CA 92677

October 28, 2014

Ms. Liz Claus, Chairwoman
Planning Commission
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

To the Members of the Planning Commission:

This letter is written in support of the decision before you to approve the building plans for South Shores Church.

My husband and I have lived in this community for 16 years and attended South Shores for more than 10 years. Since his death last year, the Church has, more than ever, become a focal point of my life. Although I live just across the street from the city limits, South Shores has brought me to center all of my activities in Dana Point. I soon will be selling my home in Laguna Niguel and most assuredly moving into your City. It is the roots that have been established through this Church that keep me here, rather than moving out of state to where my children and grandchildren reside. I-115-1

I want other families to share the blessings of this community through the expanded programs and services provided by South Shores Church. I urge you to approve the plans and give a positive recommendation to the City Council.

Thank you for your consideration of this request.

Sincerely,

Charlotte Davis

Charlotte Davis

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CHARLOTTE DAVIS

LETTER CODE: I-115

DATE: October 28, 2014

RESPONSE I-115-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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Dana Point Planning Commission
City of Dana Point
3282 Golden Lantern
Dana Point, Ca. 92629

October 29, 2014

Judy L. Smith
25231 Yacht Drive
Dana Point, Ca. 92629

Dear Commissioners,

I am a member of South Shores Church. I want to urge you to please approve their building plan.

I transferred my membership there because of the beautiful choir that sings two services. Most churches do not sing that type of music anymore. It means so much to me, and I suggest you attend their Christmas program the second week-end of December and you will see what I mean.

The church meets so many needs of people, but the buildings are old and need redone. One of the classes I attended had no air conditioning and this summer it was so hot. I-116-1

In 2000, I was on the Sea Terrace, Fine Arts, and Library Commission and I know it is difficult to listen to many different opinions. We had a lot of people against the first phase of Sea Terrace Park, but we did it.

In conclusion, please approve the building project as it will be a great asset to Dana Point.

Sincerely,

Judy L. Smith

Judy L. Smith

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JUDY L. SMITH

LETTER CODE: I-116

DATE: October 29, 2014

RESPONSE I-116-1

This comment expresses support for the proposed project. The comment does not contain any substantive statements or questions about the Draft EIR or the analysis therein. Therefore, no further response is necessary. This comment will be forwarded to the decision-makers for their review and consideration.

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3.0 ERRATA

This section of the Final Environmental Impact Report (EIR) provides changes to the Draft EIR that have been made to clarify, correct, or add to the environmental impact analysis for the proposed South Shores Church Master Plan project (proposed project). Such changes are a result of further review of, and public comments related to, the Draft EIR. The changes described in this section are generally minor changes that do not constitute significant new information, change the conclusions of the environmental analysis, or require recirculation of the document (*State California Environmental Quality Act [CEQA] Guidelines* Section 15088.5).

Such changes to the Draft EIR are indicated in this section under the appropriate Draft EIR section. With the exception of changes to tables and figures, deletions are shown with ~~strikethrough~~ and additions are shown with <u>underline.</u>

1) Chapter 1.0, Executive Summary

Page 1-17 of Table 1.A in Chapter 1.0, Executive Summary, has been revised to clarify that fuel modification activities would not affect any the 0.12 ac of undisturbed coastal sage scrub or chaparral preserved as part of the project [area currently within fuel mod will be graded as part of project, but the undisturbed patch of CSS/Chap in the corner will remain undisturbed—no grading and no fuel mod]. This revision clarifies the proposed project's impacts on biological resources and has no effect on the analysis or conclusions contained in the Draft EIR.

<u>According to the Preliminary Fire Master Plan submitted to the OCFA, the proposed project would not result in fuel modification activities within the 0.12 ac of undisturbed coastal sage scrub and chaparral in the northeastern corner of the project site.</u>

In addition, Mitigation Measure 4.3.1 on page 1-13 of Table 1.A in Chapter 1.0, Executive Summary, has been revised to include a requirement for submitting a letter report documenting the acreage of coastal sage scrub impacts and fee calculation with provision of the fee to the Nature Reserve of Orange County. The revision also clarifies that a copy of this documentation shall be provided to the California Department of Fish and Wildlife (CDFW) and the United States Fish and Wildlife Service (USFWS). This revision clarifies the requirements of the mitigation measure and has no effect on the analysis or conclusions contained in the Draft EIR.

Mitigation Measure 4.3.1: **Orange County Central and Coastal Subregion NCCP/HCP.** Prior to issuance of any demolition and/or grading permits, the project Applicant shall provide evidence to the City of Dana Point (City) Community Development Director, or designee, of in-lieu fees paid to the Nature Reserve of Orange County (NROC). The exact acreage of impact shall be determined during final site plan review, <u>and a letter report documenting the acreage of coastal sage scrub impacts and fee calculation with</u>

provision of the fee to the Nature Reserve of Orange County shall be provided to CDFW and the United States Fish and Wildlife Service. The in-lieu fees shall be based on $65,000 per impacted acre or the most current in-lieu fee amounts. These fees are considered mitigation within signatory agencies of the Natural Communities Conservation Plan (NCCP)/Habitat Conservation Plan (HCP) per the City's Section 10(a) permit. In addition, the NCCP/HCP requires implementation of the following construction minimization measures during the authorized removal of coastal sage scrub habitat. The project Applicant shall retain a qualified biological monitor to assist with the implementation of these measures as approved by the City Community Development Director, or designee, prior to issuance of any demolition or grading permit, or any impacts on the on-site sensitive habitat.

- All natural vegetation shall only be removed outside the coastal California gnatcatcher breeding season (February 15 through July 15).
- Prior to the commencement of grading operations or other activities involving significant soil disturbance, all areas of coastal sage scrub habitat to be avoided under the provisions of the NCCP/HCP shall be identified with temporary fencing or other markers clearly visible to construction personnel. Additionally, prior to the commencement of grading operations or other activities involving disturbance of coastal sage scrub, a survey shall be conducted to locate coastal California gnatcatchers and cactus wrens within 100 feet (ft) of the outer extent of projected soil disturbance activities, and the locations of any such species shall be clearly marked and identified on the construction/grading plans.
- A monitoring biologist, acceptable to USFWS/CDFW, shall be on site during any clearing of coastal sage scrub. The project Applicant or relevant public agency/utility shall advise USFWS/CDFW at least seven (7) calendar days (and preferably fourteen [14] calendar days) prior to the clearing of any habitat occupied by Identified Species to allow USFWS/CDFW to work with the monitoring biologist in connection with bird flushing/capture activities. The monitoring biologist shall flush Identified Species (avian or other mobile Identified Species) from occupied habitat areas immediately prior to brush-clearing and earth-moving activities. If birds cannot be flushed, they shall be captured in mist nets, if feasible, and relocated to areas of the site to be protected or to the NCCP/HCP Reserve System. It shall be the responsibility of the monitoring biologist to assure

that identified bird species shall not be directly impacted by brush-clearing and earth-moving equipment in a manner that also allows for construction activities on a timely basis.

- Following the completion of initial grading/earth movement activities, all areas of coastal sage scrub habitat to be avoided by construction equipment and personnel shall be marked with temporary fencing or other appropriate markers clearly visible to construction personnel. No construction access, parking, or storage of equipment or materials shall be permitted within such marked areas.
- Coastal sage scrub identified in the NCCP/HCP for protection and located within the likely dust drift radius of construction areas shall be periodically sprayed with water to reduce accumulated dust on the leaves as recommended by the monitoring biologist.

Mitigation Measure 4.8.3 on pages 1-47 and 1-48 of Table 1.A in Chapter 1.0, Executive Summary, has been revised to clarify the type of BMPs that may be contained in the Final WQMP. This revision clarifies the requirements of the mitigation measure and has no effect on the analysis or conclusions contained in the Draft EIR.

Mitigation Measure 4.8.3: **Water Quality Management Plan.** Prior to issuance of grading permits, the Applicant shall submit a Final Water Quality Management Plan (WQMP) to the City Director of Public Works for review and approval. The WQMP shall be consistent with the City's Model Water Quality Management Plan (Model WQMP) and the project's preliminary WQMP, as conceptually approved on January 14, 2013. Project-specific Low-Impact Development, Detention~~Retention~~/Biofiltration Site Design, Source Control, or~~and~~ Treatment Control BMPs contained in the Final WQMP shall be incorporated into final design and comply with the Model WQMP requirements in effect at the time of submittal of each phase. The BMPs shall be properly designed and maintained to target pollutants of concern and reduce runoff from the project site. The WQMP shall include an operations and maintenance (O&M) Plan for the prescribed BMPs to ensure their long-term performance. Operation and inspection requirements for the Low-Impact Development, Detention~~Retention~~/Biofiltration Site Design, Source Control, or~~and~~ Treatment Control BMPs shall be included. The O&M Plan shall include, but not be limited to, the following requirements:

- Operation and maintenance records shall be retained a minimum of 5 years.

- Training and educational activities and BMP operation and maintenance shall be documented to verify compliance with the O&M Plan.
- A WQMP Verification Form shall be submitted to the City of Dana Point annually by September 1.
- BMPs shall be inspected for standing water on a regular basis.
- Operation and inspection requirements for the Low-Impact Development, DetentionRetention/Biofiltration Site Design, Source Control, or~~and~~ Treatment Control BMPs shall be included.

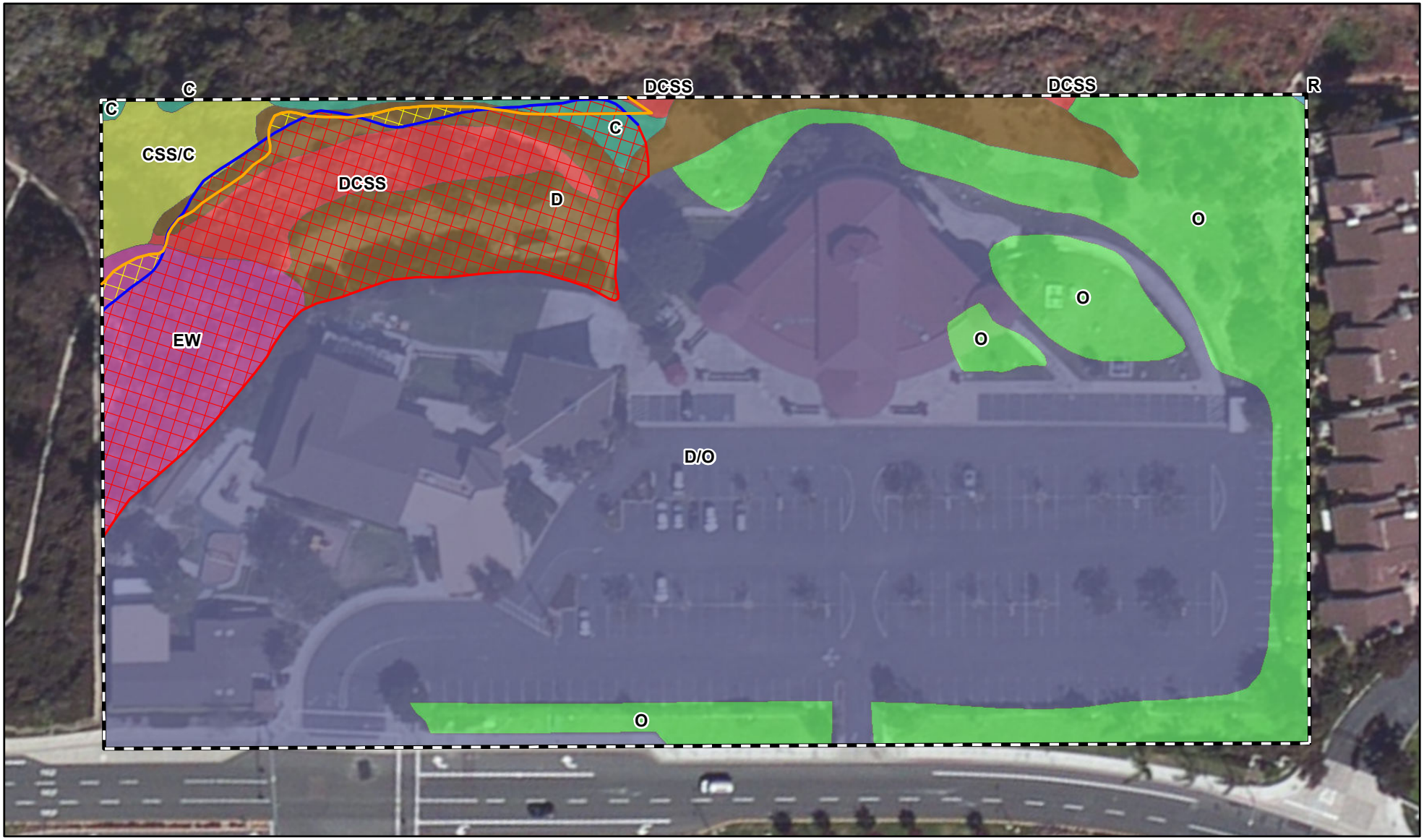
Page 1-77 of Table 1.A in Chapter 1.0, Executive Summary, has been revised to clarify that the proposed project would result in less than significant impacts with respect to the construction of wastewater treatment or collection facilities and the capacity of the wastewater treatment providers when compared to both existing conditions and future conditions at the time of project build out. This revision has no effect on the analysis or conclusions contained in the Draft EIR.

The increase of wastewater generated by the proposed project is anticipated to be accommodated within the existing design capacity of the J.B. Latham Plant, which currently accepts 72.6~~62.5~~ percent of its capacity. Although it is assumed that the available daily treatment capacity of the J.B. Latham Plant would be reduced over the next ten years as a result of increased demand for wastewater treatment associated future growth within the SOCWA, it is expected that the J.B. Latham Plant would have sufficient available daily capacity in 2024 to accommodate the treatment of the additional wastewater generated by the proposed project~~and is projected to be operating at 62.5 percent of its capacity at the time of project build out~~.

2) Section 4.3, Biological Resources

The first paragraph on page 4.3-9 in Section 4.3, Biological Resources, has been revised to refer to a new figure that illustrates the boundaries of the proposed project's coastal sage scrub impacts and fuel modification zones and clarify that fuel modification activities would not affect any areas of coastal sage scrub or chaparral that are not already subject to fuel modification. This revision clarifies the proposed project's impacts on biological resources and has no effect on the analysis or conclusions contained in the Draft EIR.

The proposed project would result in the preservation of 0.12 ac of undisturbed coastal sage scrub and chaparral and the removal of approximately 0.18 ac of disturbed coastal sage scrub and chaparral (see Figure 4.3.~~1~~2), which are each sensitive habitat types covered under the Orange County Central and Coastal NCCP/HCP. According to the Preliminary Fire Master Plan submitted to the OCFA, the proposed project would not result in fuel modification activities within the 0.12 ac of undisturbed coastal sage scrub and chaparral preserved as part of the project.



LSA

FIGURE 4.3.2

Property Line (6.0 ac)
Grading Limit
Fuel Modification Zone Limit

Impact Areas
Permanent Impact (0.77 ac)
Fuel Modification (0.03 ac)

Plant Communities
Chaparral (C) (0.14 ac)
Coastal Sage Scrub (CSS) (0.18 ac)
Disturbed Coastal Sage Scrub (DCSS) (0.07ac)
Coastal Sage Scrub/ Chaparral (CSS/C) (0.15 ac)

Developed with Ornamental Landscape (D/O) (3.8 ac)
Disturbed (D) (0.52 ac)
Eucalyptus Woodland (EW) (0.29 ac)
Ornamental (O) (0.83 ac)
Ruderal (R) (0.008 ac)

0 40 80
FEET

SOURCE: AirPhoto (2008)

I:\DPC0902\GIS\FuelMod_GradingLimit_Proposed.mxd (12/3/2014)

South Shores Church Master Plan

Fuel Modification Zone and Grading Limit

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In addition, Mitigation Measure 4.3.1 on page 4.3-14 in Section 4.3, Biological Resources, has been revised to include a requirement for submitting a letter report documenting the acreage of coastal sage scrub impacts and fee calculation with provision of the fee to the Nature Reserve of Orange County. The revision also clarifies that a copy of this documentation shall be provided to the CDFW and the USFWS. This revision clarifies the requirements of the mitigation measure and has no effect on the analysis or conclusions contained in the Draft EIR.

Mitigation Measure 4.3.1: **Orange County Central and Coastal Subregion NCCP/HCP.** Prior to issuance of any demolition and/or grading permits, the project Applicant shall provide evidence to the City of Dana Point (City) Community Development Director, or designee, of in-lieu fees paid to the Nature Reserve of Orange County (NROC). The exact acreage of impact shall be determined during final site plan review, and a letter report documenting the acreage of coastal sage scrub impacts and fee calculation with provision of the fee to the Nature Reserve of Orange County shall be provided to CDFW and the United States Fish and Wildlife Service. The in-lieu fees shall be based on $65,000 per impacted acre or the most current in-lieu fee amounts. These fees are considered mitigation within signatory agencies of the Natural Communities Conservation Plan (NCCP)/Habitat Conservation Plan (HCP) per the City's Section 10(a) permit. In addition, the NCCP/HCP requires implementation of the following construction minimization measures during the authorized removal of coastal sage scrub habitat. The project Applicant shall retain a qualified biological monitor to assist with the implementation of these measures as approved by the City Community Development Director, or designee, prior to issuance of any demolition or grading permit, or any impacts on the on-site sensitive habitat.

- All natural vegetation shall only be removed outside the coastal California gnatcatcher breeding season (February 15 through July 15).
- Prior to the commencement of grading operations or other activities involving significant soil disturbance, all areas of coastal sage scrub habitat to be avoided under the provisions of the NCCP/HCP shall be identified with temporary fencing or other markers clearly visible to construction personnel. Additionally, prior to the commencement of grading operations or other activities involving disturbance of coastal sage scrub, a survey shall be conducted to locate coastal California gnatcatchers and cactus wrens within 100 feet (ft) of the outer extent of projected soil disturbance activities, and the locations of any such species shall be clearly marked and identified on the construction/grading plans.

- A monitoring biologist, acceptable to USFWS/CDFW, shall be on site during any clearing of coastal sage scrub. The project Applicant or relevant public agency/utility shall advise USFWS/CDFW at least seven (7) calendar days (and preferably fourteen [14] calendar days) prior to the clearing of any habitat occupied by Identified Species to allow USFWS/CDFW to work with the monitoring biologist in connection with bird flushing/capture activities. The monitoring biologist shall flush Identified Species (avian or other mobile Identified Species) from occupied habitat areas immediately prior to brush-clearing and earth-moving activities. If birds cannot be flushed, they shall be captured in mist nets, if feasible, and relocated to areas of the site to be protected or to the NCCP/HCP Reserve System. It shall be the responsibility of the monitoring biologist to assure that identified bird species shall not be directly impacted by brush-clearing and earth-moving equipment in a manner that also allows for construction activities on a timely basis.
- Following the completion of initial grading/earth movement activities, all areas of coastal sage scrub habitat to be avoided by construction equipment and personnel shall be marked with temporary fencing or other appropriate markers clearly visible to construction personnel. No construction access, parking, or storage of equipment or materials shall be permitted within such marked areas.
- Coastal sage scrub identified in the NCCP/HCP for protection and located within the likely dust drift radius of construction areas shall be periodically sprayed with water to reduce accumulated dust on the leaves as recommended by the monitoring biologist.

3) Section 4.8, Hydrology and Water Quality

Mitigation Measure 4.8.3 on pages 4.8-27 and 4.8-28 in Section 4.8, Hydrology and Water Quality, has been revised to clarify the type of BMPs that may be contained in the Final WQMP. This revision clarifies the requirements of the mitigation measure and has no effect on the analysis or conclusions contained in the Draft EIR.

Mitigation Measure 4.8.3: **Water Quality Management Plan.** Prior to issuance of grading permits, the Applicant shall submit a Final Water Quality Management Plan (WQMP) to the City Director of Public Works for review and approval. The WQMP shall be consistent with the City's Model Water Quality Management Plan (Model WQMP) and the project's preliminary WQMP, as conceptually approved on January 14, 2013. Project-specific Low-Impact Development, Detention~~Retention~~/Biofiltration Site Design, Source Control,

orand Treatment Control BMPs contained in the Final WQMP shall be incorporated into final design and comply with the Model WQMP requirements in effect at the time of submittal of each phase. The BMPs shall be properly designed and maintained to target pollutants of concern and reduce runoff from the project site. The WQMP shall include an operations and maintenance (O&M) Plan for the prescribed BMPs to ensure their long-term performance. The O&M Plan shall include, but not be limited to, the following requirements:

- Operation and maintenance records shall be retained a minimum of 5 years.
- Training and educational activities and BMP operation and maintenance shall be documented to verify compliance with the O&M Plan.
- A WQMP Verification Form shall be submitted to the City of Dana Point annually by September 1.
- BMPs shall be inspected for standing water on a regular basis.
- Operation and inspection requirements for the Low-Impact Development, DetentionRetention/Biofiltration Site Design, Source Control, orand Treatment Control BMPs shall be included.

4) Section 4.11, Public Services and Utilities

A new paragraph has been added below the third paragraph under "Wastewater" on page 4.11-5 of the Draft EIR explaining that the available daily treatment capacity of the J.B. Latham Wastewater Treatment Plant is anticipated to be reduced as a result of increased demand for wastewater treatment associated future growth within the service area of the South Orange County Wastewater Authority (SOCWA).

Although SOCWA's planning documents do not provide estimates of future demand for wastewater treatment capacity at the J.B. Latham Plant, it is assumed that the J.B. Latham Plant would accept increased wastewater flows over the next 10 years from future development elsewhere in SOCWA's service area, primarily from residential development within the planned Rancho Mission Viejo project.

The third paragraph on page 4.11-26 has been revised to clarify that the proposed project would result in less than significant impacts with respect to the construction of wastewater treatment or collection facilities and the capacity of the wastewater treatment providers when compared to both existing conditions and future conditions at the time of project build out. This revision has no effect on the analysis or conclusions contained in the Draft EIR.

~~As described above, t~~The estimated increase in wastewater associated with the proposed project would represent 0.~~00~~1[2] percent of the J.B. Latham Plant's total available daily capacity. The increase of wastewater generated by the proposed project is anticipated to be accommodated within the existing design capacity of the J.B. Latham Plant, which currently accepts 72.6~~62.5~~ percent of its capacity. Although it is assumed that the available daily treatment capacity of the J.B. Latham Plant would be reduced over the next ten years as a result of increased demand for wastewater treatment associated future growth within the SOCWA, it is expected that the J.B. Latham Plant would have sufficient available daily capacity in 2024 to accommodate the treatment of the additional wastewater generated by the proposed project~~and is projected to be operating at 62.5 percent of its capacity at the time of project build out~~.

5) Section 4.12, Transportation/Traffic

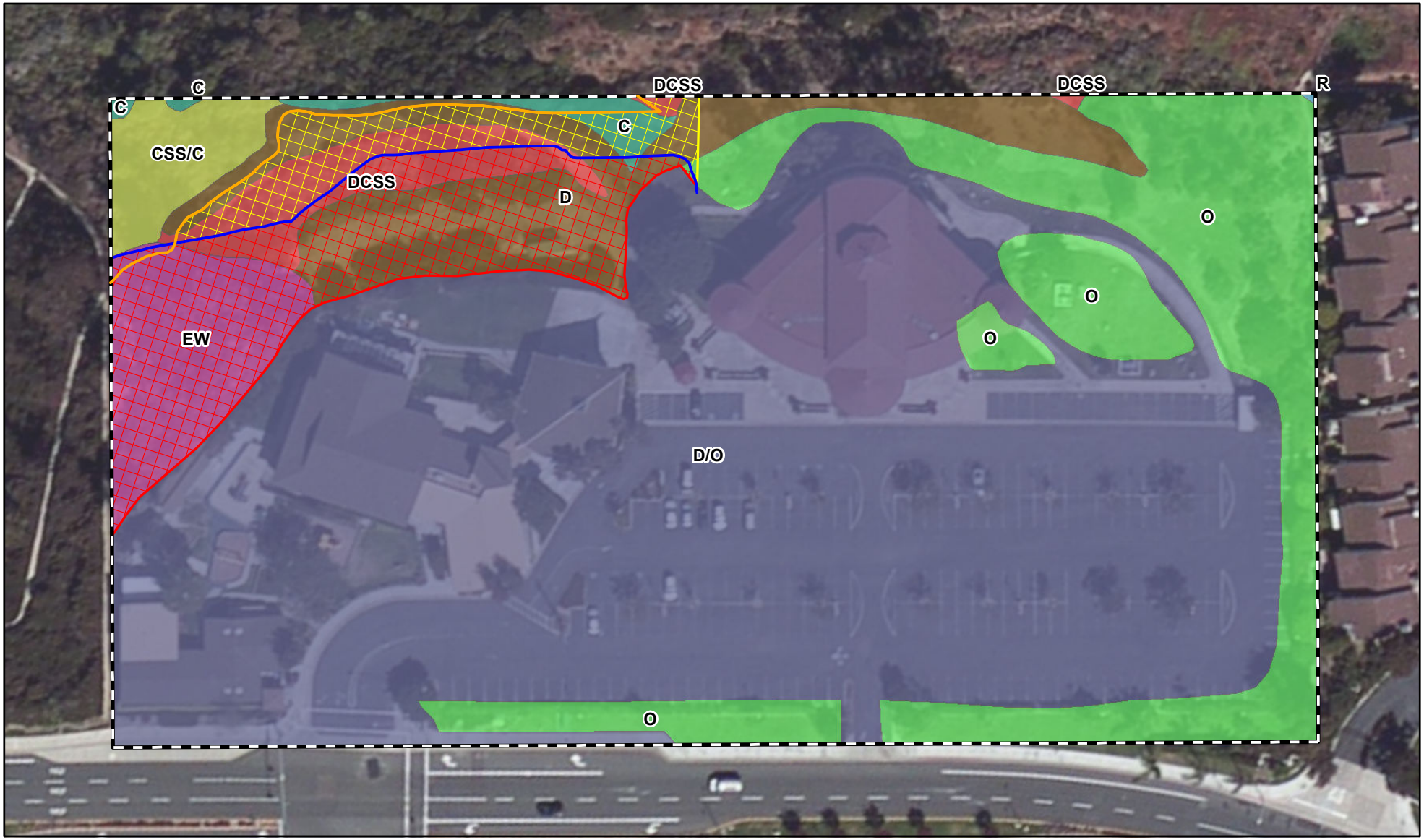
Table 4.12.H on page 4.12-15 of Section 4.12, Transportation/Traffic, incorrectly identifies the number of spaces at completion of the Master Plan to be 150, when it should be 411. Table 4.12.H has been corrected to reflect the correct number of parking spaces to be provided. This revision corrects a typographical error and has no effect on the analysis or conclusions contained in the Draft EIR.

6) Chapter 5.0, Alternatives

The first paragraph on page 5-22 in Chapter 5.0, Alternatives, has been revised to refer to a new figure that illustrates the boundaries of Alternative 2's coastal sage scrub impacts and fuel modification zones and clarify the effects of the fuel modification activities associated with Alternative 2. This revision clarifies Alternative 2's impacts on biological resources and has no effect on the analysis or conclusions contained in the Draft EIR.

Alternative 2, like the proposed project, would preserve 0.12 ac of undisturbed coastal sage scrub and remove approximately 0.18 ac of disturbed coastal sage scrub (see Figure 5.17) in the northeastern portion of the project site. Unlike the proposed project, which would not result in fuel modification activities on any areas of coastal sage scrub or chaparral that are not already subject to fuel modification activities, Alternative 2 would result in fuel modification activities on approximately 0.02 ac of chaparral that is not currently subject to fuel modification activities.

In addition, Mitigation Measure 4.3.1 on page 5-22 in Chapter 5.0, Alternatives, has been revised to include a requirement for submitting a letter report documenting the acreage of coastal sage scrub impacts and fee calculation with provision of the fee to the Nature Reserve of Orange County. The revision also clarifies that a copy of this documentation shall be provided to the CDFW and the USFWS. This revision clarifies the requirements of the mitigation measure and has no effect on the analysis or conclusions contained in the Draft EIR.



LSA

FIGURE 5.17

Property Line (6.0 ac)
Grading Limit
Fuel Modification Zone Limit

Impact Areas
Permanent Impact (0.60 ac)
Fuel Modification (0.20 ac)

Plant Communities
Chaparral (C) (0.14 ac)
Coastal Sage Scrub (CSS) (0.18 ac)
Disturbed Coastal Sage Scrub (DCSS) (0.07ac)
Coastal Sage Scrub/ Chaparral (CSS/C) (0.15 ac)

Developed with Ornamental Landscape (D/O) (3.8 ac)
Disturbed (D) (0.52 ac)
Eucalyptus Woodland (EW) (0.29 ac)
Ornamental (O) (0.83 ac)
Ruderal (R) (0.008 ac)

0 40 80
FEET

SOURCE: AirPhoto (2008)

South Shores Church Master Plan Alternative

Fuel Modification Zone and Grading Limit

I:\DPC0902\GIS\FuelMod_GradingLimit_Alternative.mxd (12/3/2014)

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Table 4.12.H: Project Parking Adequacy

Phase	Time Period	Parking Demand	On-Site Parking Supply	Surplus/(Deficit)
Existing Conditions	Weekday[1]	193	228	35
	Sunday[2]	254	228	(26)
1A	Weekday[3]	34	161	127
	Sunday	262	161	(101)
1B	Weekday[3,4]	34	190	156
	Sunday	262	218	(44)
1B-E1	Weekday[3,4]	34	188	154
	Sunday	262	216	(46)
1B-E2	Weekday[3,4]	34	188	154
	Sunday	262	216	(46)
1C	Weekday[3,4]	34	109	75
	Sunday	262	137	(125)
2	Weekday[3,4]	35	253	218
	Sunday	267	281	14
3	Weekday[3,4]	36	196	160
	Sunday	271	224	(47)
4	Weekday[3,5]	37	91	54
	Sunday[6]	276	91	(185)
5	Weekday[3]	38	150	112
	Sunday	281	150	(131)
Master Plan Completion	Weekday	333	411	78
	Sunday	352	411	59

Source: LSA Associates, Inc. *Traffic Impact Analysis and Parking Analysis* (July 2014) (Appendix J).
Note: Parking demand estimates developed from surveys conducted at the project site on April 27 (Sunday) and April 30 (Wednesday), 2014.

1 April 30, 2014.
2 April 27, 2014.
3 The Women's Bible Study Fellowship held on Wednesdays would be discontinued during project construction.
4 The on-site parking supply would be reduced by 28 spaces during weekdays to accommodate the temporary outdoor play area for the preschool.
5 After the first 2 months of Phase 1C, the on-site parking supply on weekdays increases to 253 parking spaces.
6 After the first 2 months of Phase 1C, the on-site parking supply on Sundays increases to 281 parking spaces.

Mitigation Measure 4.3.1: **Orange County Central and Coastal Subregion NCCP/HCP.** Prior to issuance of any demolition and/or grading permits, the project Applicant shall provide evidence to the City of Dana Point (City) Community Development Director, or designee, of in-lieu fees paid to the Nature Reserve of Orange County (NROC). The exact acreage of impact shall be determined during final site plan review, and a letter report documenting the acreage of coastal sage scrub impacts and fee calculation with provision of the fee to the Nature Reserve of Orange County shall be provided to CDFW and the United States Fish and Wildlife Service. The in-lieu fees shall be based on $65,000 per

impacted acre or the most current in-lieu fee amounts. These fees are considered mitigation within signatory agencies of the Natural Communities Conservation Plan (NCCP)/Habitat Conservation Plan (HCP) per the City's Section 10(a) permit. In addition, the NCCP/HCP requires implementation of the following construction minimization measures during the authorized removal of coastal sage scrub habitat. The project Applicant shall retain a qualified biological monitor to assist with the implementation of these measures as approved by the City Community Development Director, or designee, prior to issuance of any demolition or grading permit, or any impacts on the on-site sensitive habitat.

- All natural vegetation shall only be removed outside the coastal California gnatcatcher breeding season (February 15 through July 15).
- Prior to the commencement of grading operations or other activities involving significant soil disturbance, all areas of coastal sage scrub habitat to be avoided under the provisions of the NCCP/HCP shall be identified with temporary fencing or other markers clearly visible to construction personnel. Additionally, prior to the commencement of grading operations or other activities involving disturbance of coastal sage scrub, a survey shall be conducted to locate coastal California gnatcatchers and cactus wrens within 100 feet (ft) of the outer extent of projected soil disturbance activities, and the locations of any such species shall be clearly marked and identified on the construction/grading plans.
- A monitoring biologist, acceptable to USFWS/CDFW, shall be on site during any clearing of coastal sage scrub. The project Applicant or relevant public agency/utility shall advise USFWS/CDFW at least seven (7) calendar days (and preferably fourteen [14] calendar days) prior to the clearing of any habitat occupied by Identified Species to allow USFWS/CDFW to work with the monitoring biologist in connection with bird flushing/capture activities. The monitoring biologist shall flush Identified Species (avian or other mobile Identified Species) from occupied habitat areas immediately prior to brush-clearing and earth-moving activities. If birds cannot be flushed, they shall be captured in mist nets, if feasible, and relocated to areas of the site to be protected or to the NCCP/HCP Reserve System. It shall be the responsibility of the monitoring biologist to assure that identified bird species shall not be directly impacted by brush-clearing and earth-moving equipment in a manner that also allows for construction activities on a timely basis.

- Following the completion of initial grading/earth movement activities, all areas of coastal sage scrub habitat to be avoided by construction equipment and personnel shall be marked with temporary fencing or other appropriate markers clearly visible to construction personnel. No construction access, parking, or storage of equipment or materials shall be permitted within such marked areas.
- Coastal sage scrub identified in the NCCP/HCP for protection and located within the likely dust drift radius of construction areas shall be periodically sprayed with water to reduce accumulated dust on the leaves as recommended by the monitoring biologist.

Mitigation Measure 4.8.3 on page 5-37 in Chapter 5.0, Alternatives, has been revised to clarify the type of BMPs that may be contained in the Final WQMP. This revision clarifies the requirements of the mitigation measure and has no effect on the analysis or conclusions contained in the Draft EIR.

Mitigation Measure 4.8.3: **Water Quality Management Plan.** Prior to issuance of grading permits, the Applicant shall submit a Final Water Quality Management Plan (WQMP) to the City Director of Public Works for review and approval. The WQMP shall be consistent with the City's Model Water Quality Management Plan (Model WQMP) and the project's preliminary WQMP, as conceptually approved on January 14, 2013. Project-specific Low-Impact Development, Detention~~Retention~~/Biofiltration Site Design, Source Control, or~~and~~ Treatment Control BMPs contained in the Final WQMP shall be incorporated into final design and comply with the Model WQMP requirements in effect at the time of submittal of each phase. The BMPs shall be properly designed and maintained to target pollutants of concern and reduce runoff from the project site. The WQMP shall include an operations and maintenance (O&M) Plan for the prescribed BMPs to ensure their long-term performance. Operation and inspection requirements for the Low-Impact Development, Detention~~Retention~~/Biofiltration Site Design, Source Control, or~~and~~ Treatment Control BMPs shall be included. The O&M Plan shall include, but not be limited to, the following requirements:

- Operation and maintenance records shall be retained a minimum of 5 years.
- Training and educational activities and BMP operation and maintenance shall be documented to verify compliance with the O&M Plan.

- A WQMP Verification Form shall be submitted to the City of Dana Point annually by September 1.
- BMPs shall be inspected for standing water on a regular basis.
- Operation and inspection requirements for the Low-Impact Development, Detention~~Retention~~/Biofiltration Site Design, Source Control, or~~and~~ Treatment Control BMPs shall be included.

7) Chapter 7.0, Mitigation Monitoring and Reporting Program

Mitigation Measure 4.3.1 in Table 7.A on page 7-3 in Chapter 7.0, Mitigation Monitoring and Reporting Program, has been revised to include a requirement for submitting a letter report documenting the acreage of coastal sage scrub impacts and fee calculation with provision of the fee to the Nature Reserve of Orange County. The revision also clarifies that a copy of this documentation shall be provided to the CDFW and the USFWS. This revision clarifies the requirements of the mitigation measure and has no effect on the analysis or conclusions contained in the Draft EIR.

Mitigation Measure 4.3.1: **Orange County Central and Coastal Subregion NCCP/HCP.** Prior to issuance of any demolition and/or grading permits, the project Applicant shall provide evidence to the City of Dana Point (City) Community Development Director, or designee, of in-lieu fees paid to the Nature Reserve of Orange County (NROC). The exact acreage of impact shall be determined during final site plan review, and a letter report documenting the acreage of coastal sage scrub impacts and fee calculation with provision of the fee to the Nature Reserve of Orange County shall be provided to CDFW and the United States Fish and Wildlife Service. The in-lieu fees shall be based on $65,000 per impacted acre or the most current in-lieu fee amounts. These fees are considered mitigation within signatory agencies of the Natural Communities Conservation Plan (NCCP)/Habitat Conservation Plan (HCP) per the City's Section 10(a) permit. In addition, the NCCP/HCP requires implementation of the following construction minimization measures during the authorized removal of coastal sage scrub habitat. The project Applicant shall retain a qualified biological monitor to assist with the implementation of these measures as approved by the City Community Development Director, or designee, prior to issuance of any demolition or grading permit, or any impacts on the on-site sensitive habitat.

- All natural vegetation shall only be removed outside the coastal California gnatcatcher breeding season (February 15 through July 15).

- Prior to the commencement of grading operations or other activities involving significant soil disturbance, all areas of coastal sage scrub habitat to be avoided under the provisions of the NCCP/HCP shall be identified with temporary fencing or other markers clearly visible to construction personnel. Additionally, prior to the commencement of grading operations or other activities involving disturbance of coastal sage scrub, a survey shall be conducted to locate coastal California gnatcatchers and cactus wrens within 100 feet (ft) of the outer extent of projected soil disturbance activities, and the locations of any such species shall be clearly marked and identified on the construction/grading plans.
- A monitoring biologist, acceptable to USFWS/CDFW, shall be on site during any clearing of coastal sage scrub. The project Applicant or relevant public agency/utility shall advise USFWS/CDFW at least seven (7) calendar days (and preferably fourteen [14] calendar days) prior to the clearing of any habitat occupied by Identified Species to allow USFWS/CDFW to work with the monitoring biologist in connection with bird flushing/capture activities. The monitoring biologist shall flush Identified Species (avian or other mobile Identified Species) from occupied habitat areas immediately prior to brush-clearing and earth-moving activities. If birds cannot be flushed, they shall be captured in mist nets, if feasible, and relocated to areas of the site to be protected or to the NCCP/HCP Reserve System. It shall be the responsibility of the monitoring biologist to assure that identified bird species shall not be directly impacted by brush-clearing and earth-moving equipment in a manner that also allows for construction activities on a timely basis.
- Following the completion of initial grading/earth movement activities, all areas of coastal sage scrub habitat to be avoided by construction equipment and personnel shall be marked with temporary fencing or other appropriate markers clearly visible to construction personnel. No construction access, parking, or storage of equipment or materials shall be permitted within such marked areas.
- Coastal sage scrub identified in the NCCP/HCP for protection and located within the likely dust drift radius of construction areas shall be periodically sprayed with water to reduce accumulated dust on the leaves as recommended by the monitoring biologist.

In addition, Mitigation Measure 4.8.3 in Table 7.A on page 7-17 in Chapter 7.0, Mitigation Monitoring and Reporting Program, has been revised to clarify the type of BMPs that may be

contained in the Final WQMP. This revision clarifies the requirements of the mitigation measure and has no effect on the analysis or conclusions contained in the Draft EIR.

Mitigation Measure 4.8.3: **Water Quality Management Plan.** Prior to issuance of grading permits, the Applicant shall submit a Final Water Quality Management Plan (WQMP) to the City Director of Public Works for review and approval. The WQMP shall be consistent with the City's Model Water Quality Management Plan (Model WQMP) and the project's preliminary WQMP, as conceptually approved on January 14, 2013. Project-specific Low-Impact Development, Detention~~Retention~~/Biofiltration Site Design, Source Control, or~~and~~ Treatment Control BMPs contained in the Final WQMP shall be incorporated into final design and comply with the Model WQMP requirements in effect at the time of submittal of each phase. The BMPs shall be properly designed and maintained to target pollutants of concern and reduce runoff from the project site. The WQMP shall include an operations and maintenance (O&M) Plan for the prescribed BMPs to ensure their long-term performance. The O&M Plan shall include, but not be limited to, the following requirements:

- Operation and maintenance records shall be retained a minimum of 5 years.
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- BMPs shall be inspected for standing water on a regular basis.
- Operation and inspection requirements for the Low-Impact Development, Detention~~Retention~~/Biofiltration Site Design, Source Control, or~~and~~ Treatment Control BMPs shall be included.

8) Appendix G, Hydrology Reports

The *Preliminary Water Quality Management Plan* (WQMP) and *Master Plan Hydrology Report* have been revised to reflect Revised Alternative 2, address storm water harvest and reuse, and correct the name of the watershed that receives runoff from the project site (Salt Creek). These revisions clarify or correct the information provided and have no effect on the analysis or conclusions contained in the Draft EIR.

The *Supplemental Master Plan Hydrology Report* by Adams-Streeter, dated February 17, 2015, is included as Attachment A to this Final EIR. The *Preliminary Water Quality Management Plan* (WQMP) by Adams-Streeter, approved by the City on March 3, 2015, is included as Attachment B to this Final EIR.

ATTACHMENT A

SUPPLEMENTAL MASTER PLAN HYDROLOGY REPORT

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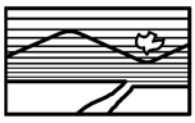
SUPPLEMENTAL MASTER PLAN HYDROLOGY REPORT

PREPARED FOR:

SOUTH SHORES CHURCH
CITY OF DANA POINT

PREPARED BY:



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Senior Vice President
nstreeter@adams-streeter.com

DATE PREPARED:

February 17, 2015

TABLE OF CONTENTS

APPENDICES

I. INTRODUCTION

This report supplements the Master Plan Hydrology Report dated February 29, 2012. The report has been prepared in order to address the proposed project alternative that South Shores Church is now seeking approval for as well as to address certain questions that have arisen during the review of the environmental impact report prepared for the project.

II. METHODOLOGY

The hydrology calculations were performed in accordance with the requirements of the Orange County Hydrology Manual. The rational method calculations were developed utilizing Advanced Engineering Software (AES). The 25-year frequency and 100-year frequency storm calculations are located in the Appendix. The project site has soil with hydrologic classifications of principally Type "D".

The methodology used for analyzing the existing flow through retention basin located at the Pointe Monarch Community is based on the submerged orifice equation and the given data located in the Hydrology and Hydraulic Analysis for Tract 14605 as prepared by Hunsaker and Associates on August 19, 2002.

For analysis of the existing concrete v-ditch, the hydraulic calculations were calculated using the Los Angeles County Department of Public Works "Water Surface and Pressure Gradient Windows" (WSPG) computer program, Version 14.06. The WSPG program is written using hydraulic theory based on solving Bernoulli's equation for the total energy at each section and Manning's formula for friction loss between the sections in a reach.

III. EXISTING CONDITIONS

The existing hydrology conditions were presented accurately in the Master Plan Hydrology Report with the exception that a limited number of condominium units from the Monarch Bay Villas development have modified their drainage systems to collect runoff and direct it to a v-ditch located on the southern boundary of the South Shores Church property. Approximately 0.2 acres of off-site runoff is directed onto the site as a result of these modifications. The runoff discharges into the existing off-site basin discussed in the Master Plan Hydrology Report.

Further clarification of the off-site basin as originally designed and as it currently operates is also warranted. The existing off-site basin was originally constructed in conjunction with the Sanctuary Building, in the early 1990s. It was the first of two basins constructed at that time. The basins were envisioned as a temporary means to collect runoff from the site and discharge it to the existing v-ditch that originally discharged onto a graded pad and now discharges into a flow through retention basin constructed as part of the Pointe Monarch project. Eventually, per an agreement with the then owner of the property where the temporary basins, v-ditch and the future Pointe Monarch development are all located, all runoff collected from the South Shores Church property and directed to its southeast corner was to be accepted by that property owner and conveyed through a storm drain system that would be constructed at the time the property was developed.

However, the original plan of development on that property was eventually scaled back. The "hillside village" component that would have abutted the Monarch Beach Villas and the South Shores Church property was eliminated and only the part now known as Pointe Monarch moved forward. The hillside village portion of the property became permanent open space, and habitat restoration efforts were undertaken within this area. As part of those efforts, v-ditches within the property that were constructed at the time mass-grading had occurred in the 1970s were partially filled in, and the banks of the second temporary basin constructed by the Church in the early 1990s were modified such that the basin was rendered non-functional.

Consequently, the one remaining basin would receive runoff from the South Shore Church site (and from a limited number of condominiums within the Monarch Beach Villas) and discharge some of the runoff to the existing v-ditch via the stand-pipe within the basin. Additional runoff during larger events would flow through to where the second basin had previously been, but would no longer be held and conveyed to the v-ditch via the stand-pipe located in the second basin.

Therefore, the outlet pipe that previously discharged some runoff from the first basin into the second basin has been capped. Now runoff from South Shores Church discharges into the one remaining basin before being discharged into the v-ditch via the stand-pipe within the basin. It should be noted that during larger less frequent events (i.e., storms expected once every 25-100 years), overtopping of the basin would likely occur. As discussed below, this potential problem is eliminated with completion of the Master Plan alternative proposed by South Shores Church because the design includes an on-site underground detention system that can be sized adequately to ensure runoff is metered into the off-site v-ditch at an acceptable rate.

IV. PROPOSED CONDITIONS

In its ultimate condition the project will be developed as shown on the Alternative Master Site Plan. The majority of the proposed site, Area "A", is comprised of approximately 3.6 acres. To reduce peak flows, flows from Area "A" will enter a proposed underground detention system. This underground detention system will be comprised of a series of precast rectangular concrete vaults, such as the SingleTrap Precast Concrete Modular Stormwater Management System provided by StormTrap. The flows will be regulated at the outlet of the vault with a smaller diameter pipe. See Section VI for calculations and sizing of the detention system. The location of the underground detention system is shown on the Developed Condition Hydrology Map. From the detention system, a 12" storm drain pipe will continue to collect flows from Area "B" and Area "C" downstream of the detention system before discharging to the existing concrete v-ditch at the property's south-east corner. A v-ditch connection will have to be constructed to properly convey flows from the 12" pipe to the existing v-ditch.

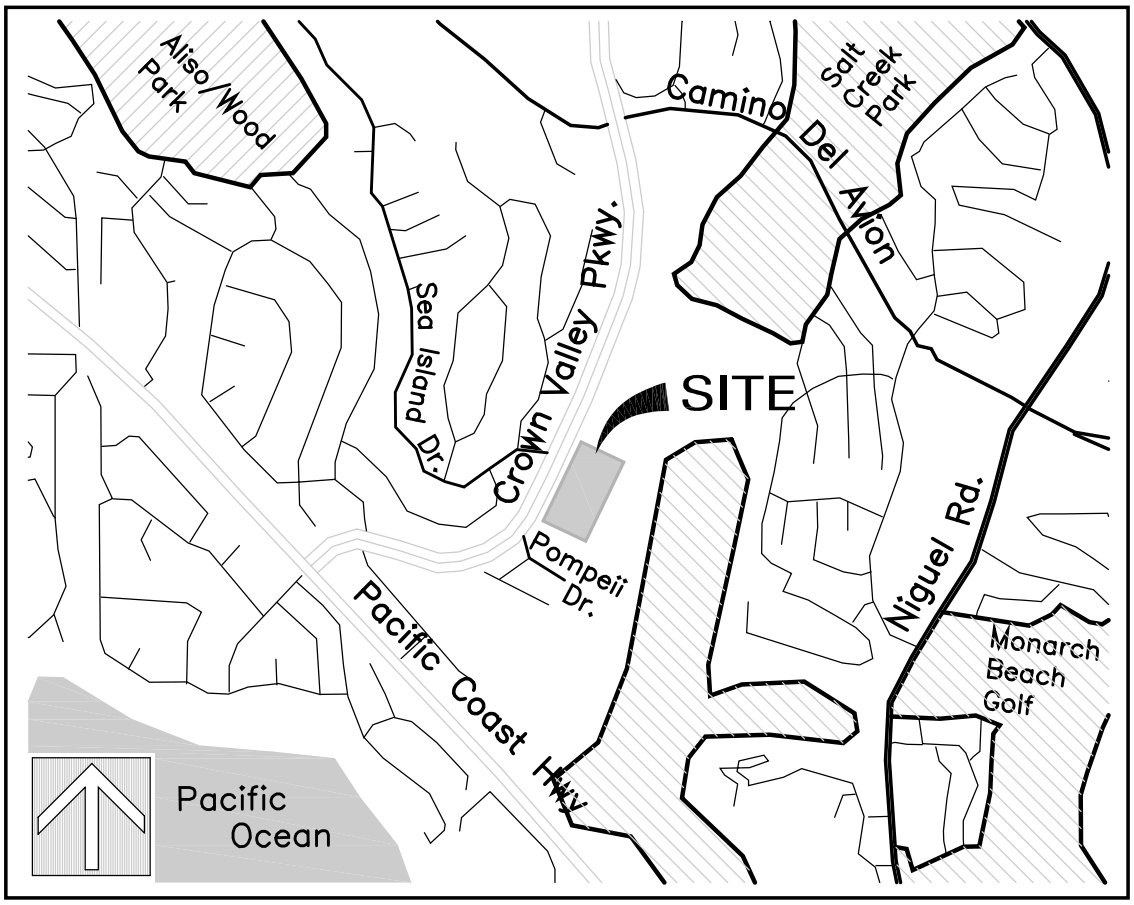
As shown in Table A-1 below, the developed condition's 100-year storm flow for Areas "A", "B", and "C" is equal to 9.2 cfs. Of this 9.2 cfs, 1.0 cfs is being contributed by the Monarch Bay Villas, as discussed in the Existing Conditions of Section 4. Since this 1.0 cfs was considered in the original sizing of the retention basin, it is considered already accounted for and will be ignored from the church's contribution. To insure that the existing concrete v-ditch is adequate to handle flows from the church, a hydraulic analysis of the v-ditch can be found in Section XII.

TABLE A-1

LOCATION	AREAS		25-YEAR PEAK FLOW		100-YEAR PEAK FLOW	
	EXISTING (ACRES)	DEVELOPED (ACRES)	EXISTING (CFS)	DEVELOPED (CFS)	EXISTING (CFS)	DEVELOPED (CFS)
"A", "B" & "C"	3.4	5.2	13.6	7.3 *6.6 cfs (from project site) + 0.7 cfs (run-on from Monarch Bay Villas)*	17.5	9.2 *8.2 cfs (from project site) + 1.0 cfs (run-on from Monarch Bay Villas)*
"D"	2.4	0.8	11.3	3.4	14.3	4.4
"E"	0.4	0.2	1.7	0.6	2.1	0.8
TOTAL	6.2 AC	6.2 AC	26.6 cfs	11.3 cfs	33.9 cfs	14.4 cfs

Table A-1 shows the 25-year and 100-year storm peak event flows for the existing and post-development conditions assuming completion of the Master Plan alternative South Shores Church has proposed. With inclusion of the underground detention system, the site's developed peak flow into the v-ditch that leads to the Pointe Monarch flow-through retention basin will be 8.2 cfs during a 100-year storm event. As demonstrated by the analyses contained in Sections XI and XII, both the existing v-ditch and the Pointe Monarch basin would have adequate capacity to receive this level of peak flows from the Church site in a 100-year event. A copy of the Developed Condition Hydrology Map that shows the concept drainage system is included in the Appendices.

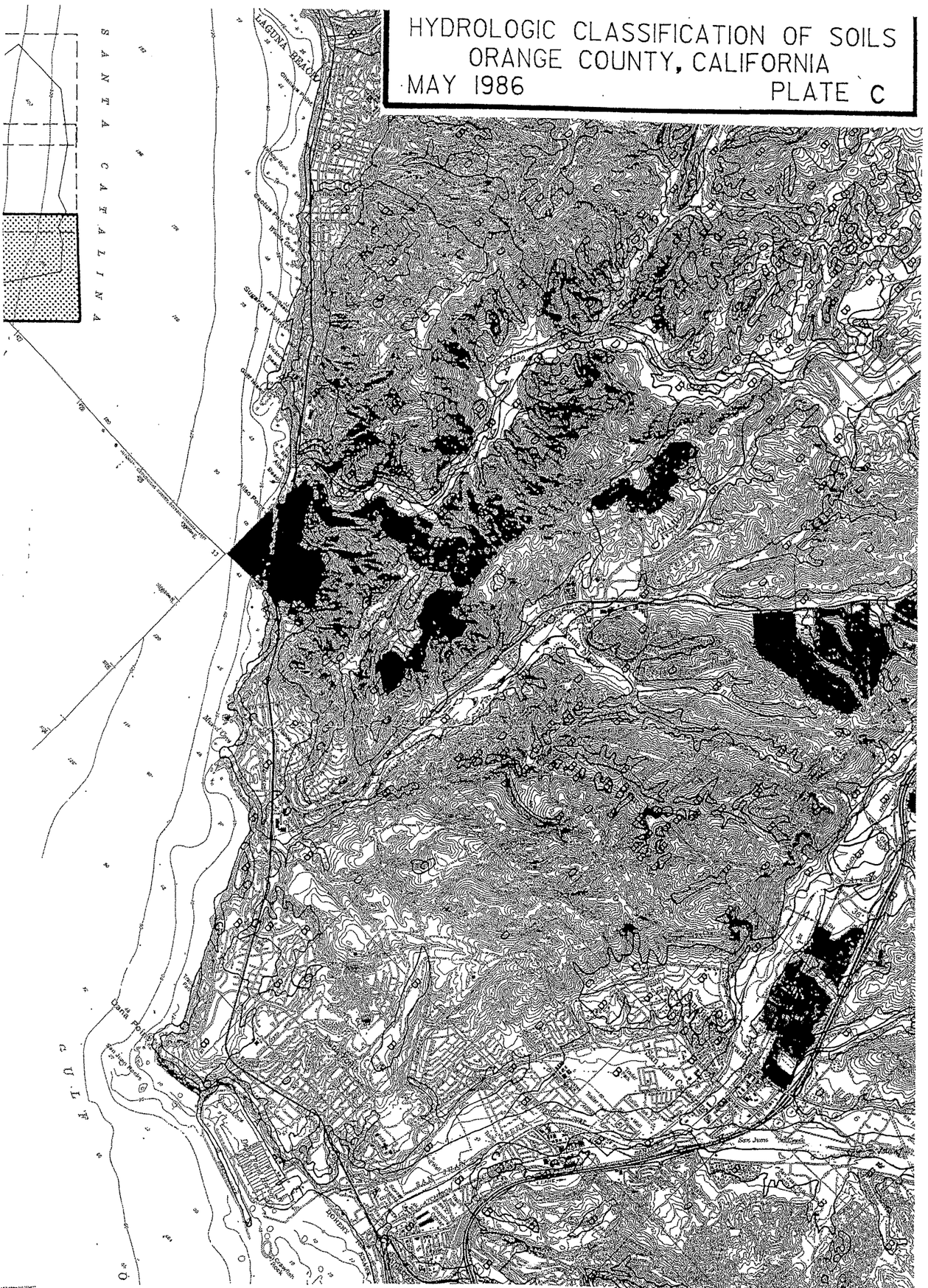
V. VICINITY MAP



VICINITY MAP

VI. SOIL GROUP MAP

HYDROLOGIC CLASSIFICATION OF SOILS
ORANGE COUNTY, CALIFORNIA
MAY 1986 PLATE C



LEGEND

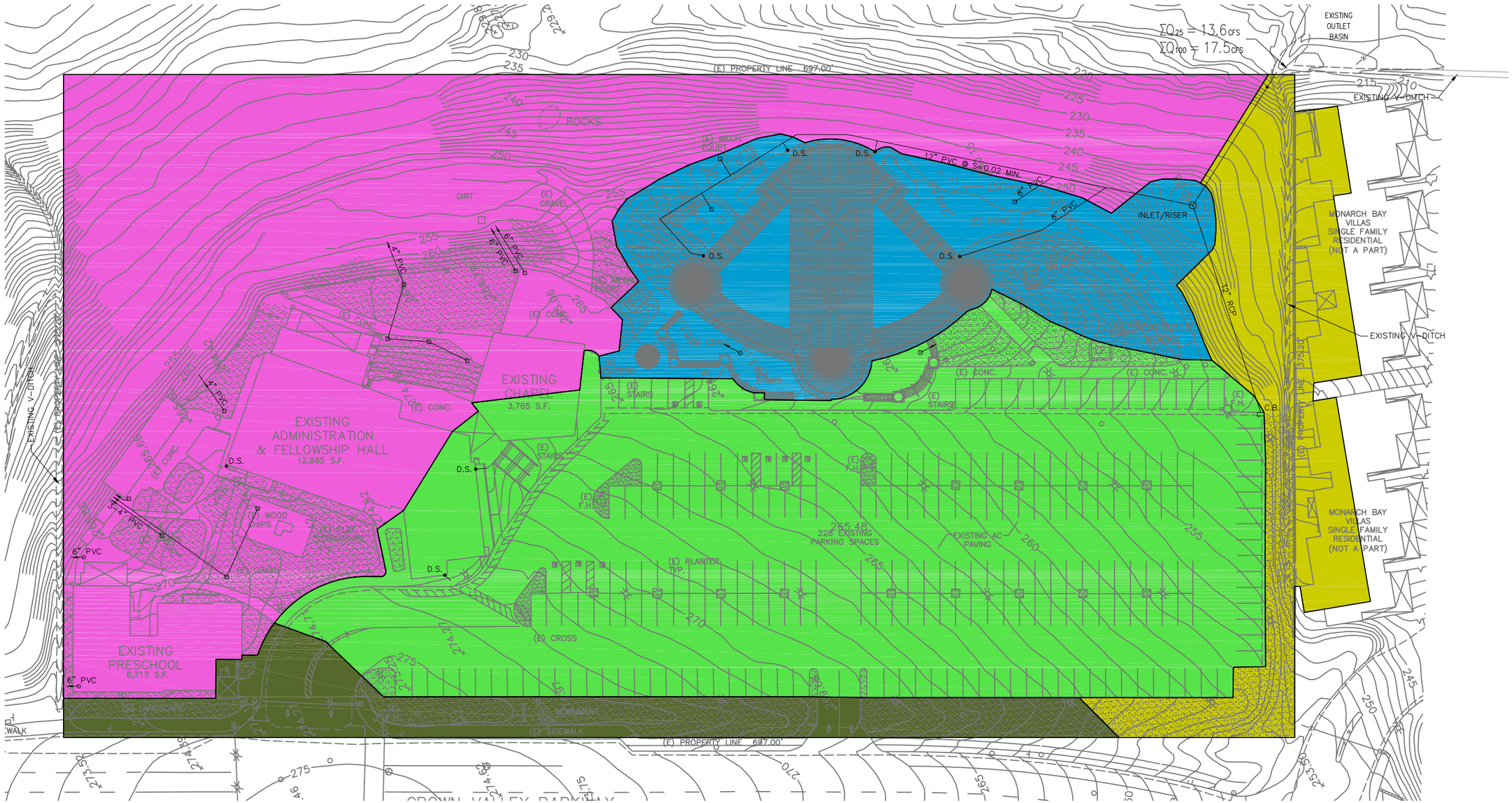
A B C D HYDROLOGIC SOIL GROUPS

HYDROLOGIC SOIL GROUP BOUNDARY

COUNTY BOUNDARY

VII. DRAINAGE AREA EXHIBITS

- **Existing Condition**
- **Developed Condition**



1" = 60'

DRAINAGE AREA EXHIBIT

EXISTING CONDITION

AREA	ACREAGE	Q_{25}	ΣQ_{25}	Q_{100}	ΣQ_{100}
AREA "A"	2.1 ACRES	9.2 CFS	13.6 CFS	11.8 CFS	17.5 CFS
AREA "B"	0.8 ACRES	2.9 CFS		3.8 CFS	
AREA "C"(1)	0.5 ACRES	1.5 CFS		1.9 CFS	
AREA "D"	2.4 ACRES	11.3 CFS	11.3 CFS	14.3 CFS	14.3 CFS
AREA "E"	0.4 ACRES	1.7 CFS	1.7 CFS	2.1 CFS	2.1 CFS
TOTAL	6.2 ACRES				

(1) INCLUDES OFF-SITE AREA FROM THE ROOFS OF MONARCH BAY VILLAS

1"=60'

DRAINAGE AREA EXHIBIT

DEVELOPED CONDITION

AREA	ACREAGE	Q_{25}	ΣQ_{25}	Q_{100}	ΣQ_{100}
AREA "A"	3.6 ACRES	2.4 (2) CFS		2.9 (2) CFS	
AREA "B"	1.1 ACRES	3.1 CFS	7.3 CFS	4.0 CFS	9.2 CFS (1)
AREA "C" (1)	0.5 ACRES	1.8 CFS		2.3 CFS	
AREA "D"	0.8 ACRES	3.4 CFS	3.4 CFS	4.4 CFS	4.4 CFS
AREA "E"	0.2 ACRES	0.6 CFS	0.6 CFS	0.8 CFS	0.8 CFS
TOTAL	6.2 ACRES				

(1) INCLUDES OFF-SITE AREA FROM THE ROOFS OF MONARCH BAY VILLAS

(2) INCLUDES FLOW REDUCTION DUE TO ON-SITE DETENTION SYSTEM

(3) 9.2 CFS = 8.2 CFS FROM PROJECT SITE + 1.0 CFS FROM MONARCH BAY VILLAS RUN-ON

VIII. 25-YEAR HYDROLOGY CALCULATIONS

- **Existing 25-Year**
- **Developed 25-Year**

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2008 Advanced Engineering Software (aes)
            Ver. 15.0  Release Date: 04/01/2008  License ID 1204

                          Analysis prepared by:

                   Adams-Streeter Civil Engineers, Inc.
                            15 Corporate Park
                            Irvine, CA 92606
                              949-474-2330

 ************************ DESCRIPTION OF STUDY ************************
* 25-YEAR STORM FREQUENCY                                             *
* EXISTING CONDITION                                                  *
* SOUTH SHORES CHURCH, DANA POINT, CA                                 *
 **********************************************************************

  FILE NAME: CHURCHEX.DAT
  TIME/DATE OF STUDY: 10:49 12/30/2014
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    78.00
  ELEVATION DATA: UPSTREAM(FEET) =    274.60  DOWNSTREAM(FEET) =    274.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.757
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.068
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  SCHOOL                       D        0.20      0.20     0.600    75    6.76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA RUNOFF(CFS) =      0.71
  TOTAL AREA(ACRES) =      0.20   PEAK FLOW RATE(CFS) =      0.71

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   272.20  DOWNSTREAM(FEET) =   264.50
  FLOW LENGTH(FEET) =   126.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.83
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.82 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =   4.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.71
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    7.12
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     204.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.12
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.950
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       D        0.27      0.20     0.500    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA AREA(ACRES) =    0.27      SUBAREA RUNOFF(CFS) =    0.94
  EFFECTIVE AREA(ACRES) =      0.47   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.54
  TOTAL AREA(ACRES) =        0.5       PEAK FLOW RATE(CFS) =       1.62

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    264.50  DOWNSTREAM(FEET) =    237.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   115.80   CHANNEL SLOPE =  0.2375
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.50
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.903
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.12      0.20     0.900    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.74
  AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   0.15
```

```
  Tc(MIN.) =    7.27
  SUBAREA AREA(ACRES) =     0.12       SUBAREA RUNOFF(CFS) =    0.40
  EFFECTIVE AREA(ACRES) =      0.59     AREA-AVERAGED Fm(INCH/HR) =   0.12
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.62
  TOTAL AREA(ACRES) =        0.6         PEAK FLOW RATE(CFS) =       2.01

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =  12.94
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     319.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    237.00  DOWNSTREAM(FEET) =    227.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    34.00   CHANNEL SLOPE =  0.2794
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.50
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.01
  FLOW VELOCITY(FEET/SEC.) =  13.59   FLOW DEPTH(FEET) =   0.38
  TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =    7.31
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     353.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    31.50
  ELEVATION DATA: UPSTREAM(FEET) =    265.30  DOWNSTREAM(FEET) =    265.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 D        0.07      0.20     0.200    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.07   PEAK FLOW RATE(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   263.00  DOWNSTREAM(FEET) =   262.50
  FLOW LENGTH(FEET) =    24.90   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.34
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
```

```
 AT DEPTH = 0.82 * DIAMETER)
 GIVEN PIPE DIAMETER(INCH) =   4.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.30
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    5.12
 LONGEST FLOWPATH FROM NODE    110.00 TO NODE    112.00 =      56.40 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    112.00 TO NODE    104.00 IS CODE =  82
----------------------------------------------------------------------------
 >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
 >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   102.10
 ELEVATION DATA: UPSTREAM(FEET) =    262.50  DOWNSTREAM(FEET) =    227.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 RESIDENTIAL
 ".4 DWELLING/ACRE"         D        0.11      0.20     0.900    75    5.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
 SUBAREA AREA(ACRES) =    0.11   INITIAL SUBAREA RUNOFF(CFS) =    0.46

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =    5.12
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.757
 SUBAREA AREA(ACRES) =    0.11      SUBAREA RUNOFF(CFS) =    0.45
 EFFECTIVE AREA(ACRES) =      0.18   AREA-AVERAGED Fm(INCH/HR) =  0.13
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.63
 TOTAL AREA(ACRES) =        0.2       PEAK FLOW RATE(CFS) =       0.75

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        0.75    5.12    4.757  0.20( 0.13) 0.63       0.2     110.00
 LONGEST FLOWPATH FROM NODE    110.00 TO NODE    104.00 =      56.40 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        2.01    7.31    3.891  0.20( 0.12) 0.62       0.6     100.00
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     353.80 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        2.48    5.12    4.757  0.20( 0.12) 0.62       0.6     110.00
     2        2.62    7.31    3.891  0.20( 0.12) 0.62       0.8     100.00
   TOTAL AREA(ACRES) =         0.8

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =        2.62  Tc(MIN.) =    7.311
 EFFECTIVE AREA(ACRES) =      0.77  AREA-AVERAGED Fm(INCH/HR) =  0.12
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.62
  TOTAL AREA(ACRES) =        0.8
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     353.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    33.70
  ELEVATION DATA: UPSTREAM(FEET) =    265.30  DOWNSTREAM(FEET) =    264.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 D        0.06      0.20     0.200    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.06   PEAK FLOW RATE(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   171.20
  ELEVATION DATA: UPSTREAM(FEET) =    264.60  DOWNSTREAM(FEET) =    190.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.39      0.20     0.900    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA AREA(ACRES) =    0.39   INITIAL SUBAREA RUNOFF(CFS) =    1.63

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    5.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA AREA(ACRES) =    0.39      SUBAREA RUNOFF(CFS) =    1.63
  EFFECTIVE AREA(ACRES) =      0.45   AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =        0.4       PEAK FLOW RATE(CFS) =       1.89

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    68.00
  ELEVATION DATA: UPSTREAM(FEET) =    274.30  DOWNSTREAM(FEET) =    264.50
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      D        0.09      0.20     0.400    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.09   PEAK FLOW RATE(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    132.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   262.50  DOWNSTREAM(FEET) =   254.50
  FLOW LENGTH(FEET) =    58.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   1.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.77
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.38
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    5.12
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    132.00 =     126.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    132.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.12
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.757
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.09      0.20     0.900    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA AREA(ACRES) =    0.09      SUBAREA RUNOFF(CFS) =    0.37
  EFFECTIVE AREA(ACRES) =      0.18   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.65
  TOTAL AREA(ACRES) =        0.2       PEAK FLOW RATE(CFS) =       0.75

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    97.00
  ELEVATION DATA: UPSTREAM(FEET) =    254.50  DOWNSTREAM(FEET) =    225.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
```

```
  ".4 DWELLING/ACRE"         D        0.18      0.20     0.900    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA AREA(ACRES) =    0.18   INITIAL SUBAREA RUNOFF(CFS) =    0.75

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    5.12
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.757
  SUBAREA AREA(ACRES) =    0.18      SUBAREA RUNOFF(CFS) =    0.74
  EFFECTIVE AREA(ACRES) =      0.36   AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.78
  TOTAL AREA(ACRES) =        0.4       PEAK FLOW RATE(CFS) =       1.49

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    141.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    67.00
  ELEVATION DATA: UPSTREAM(FEET) =    265.50  DOWNSTREAM(FEET) =    264.70

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.070
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.786
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       D        0.09      0.20     0.500    75    5.07
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.09   PEAK FLOW RATE(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    142.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   262.70  DOWNSTREAM(FEET) =   254.50
  FLOW LENGTH(FEET) =    88.50   MANNING'S N =  0.013
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   2.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.76
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.38
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    5.29
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    142.00 =     155.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    142.00 TO NODE    143.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    88.50
  ELEVATION DATA: UPSTREAM(FEET) =    254.50  DOWNSTREAM(FEET) =    235.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.17      0.20     0.900    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA AREA(ACRES) =    0.17   INITIAL SUBAREA RUNOFF(CFS) =    0.71

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    5.29
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.673
  SUBAREA AREA(ACRES) =    0.17      SUBAREA RUNOFF(CFS) =    0.69
  EFFECTIVE AREA(ACRES) =      0.26   AREA-AVERAGED Fm(INCH/HR) =  0.15
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.76
  TOTAL AREA(ACRES) =        0.3       PEAK FLOW RATE(CFS) =       1.06

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   132.00
  ELEVATION DATA: UPSTREAM(FEET) =    265.00  DOWNSTREAM(FEET) =    235.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.21      0.20     0.900    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA RUNOFF(CFS) =      0.88
  TOTAL AREA(ACRES) =      0.21   PEAK FLOW RATE(CFS) =      0.88

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    87.50
  ELEVATION DATA: UPSTREAM(FEET) =    251.00  DOWNSTREAM(FEET) =    216.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.32      0.20     0.900    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA RUNOFF(CFS) =      1.34
  TOTAL AREA(ACRES) =      0.32   PEAK FLOW RATE(CFS) =      1.34

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   172.00
  ELEVATION DATA: UPSTREAM(FEET) =    265.80  DOWNSTREAM(FEET) =    251.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               D        0.19      0.20     0.350    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.81
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.81

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.11      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.11      SUBAREA RUNOFF(CFS) =    0.48
  EFFECTIVE AREA(ACRES) =      0.30   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =        0.3       PEAK FLOW RATE(CFS) =       1.29

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   249.00  DOWNSTREAM(FEET) =   247.00
  FLOW LENGTH(FEET) =   101.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.14
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.29
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =    5.33
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     273.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.654
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.12      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.12      SUBAREA RUNOFF(CFS) =    0.50
  EFFECTIVE AREA(ACRES) =      0.42   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.21
  TOTAL AREA(ACRES) =        0.4       PEAK FLOW RATE(CFS) =       1.74

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   247.00  DOWNSTREAM(FEET) =   245.00
  FLOW LENGTH(FEET) =   101.50   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.58
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.74
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    5.63
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     374.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    311.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   141.00
  ELEVATION DATA: UPSTREAM(FEET) =    252.50  DOWNSTREAM(FEET) =    249.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.489
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.838
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          D        0.23      0.20     0.800    75    7.49
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.800
  SUBAREA RUNOFF(CFS) =      0.76
  TOTAL AREA(ACRES) =      0.23   PEAK FLOW RATE(CFS) =      0.76

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    311.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.49
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.838
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.11      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.11      SUBAREA RUNOFF(CFS) =    0.38
```

```
  EFFECTIVE AREA(ACRES) =      0.34   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.57
  TOTAL AREA(ACRES) =        0.3       PEAK FLOW RATE(CFS) =       1.14

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    303.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   247.80  DOWNSTREAM(FEET) =   245.00
  FLOW LENGTH(FEET) =    26.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   8.0 INCH PIPE IS   3.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.46
  GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.14
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    7.53
  LONGEST FLOWPATH FROM NODE    310.00 TO NODE    303.00 =     167.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        1.14    7.53    3.824  0.20( 0.11) 0.57       0.3     310.00
  LONGEST FLOWPATH FROM NODE    310.00 TO NODE    303.00 =     167.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        1.74    5.63    4.510  0.20( 0.04) 0.21       0.4     300.00
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     374.50 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        2.75    5.63    4.510  0.20( 0.07) 0.35       0.7     300.00
      2        2.61    7.53    3.824  0.20( 0.07) 0.37       0.8     310.00
    TOTAL AREA(ACRES) =         0.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        2.75  Tc(MIN.) =    5.630
  EFFECTIVE AREA(ACRES) =      0.67  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.37
  TOTAL AREA(ACRES) =        0.8
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     374.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    403.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   245.00  DOWNSTREAM(FEET) =   225.70
  FLOW LENGTH(FEET) =    81.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.58
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.75
```

```
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    5.72
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    403.00 =     455.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.72
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.471
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.05      0.20     0.900    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA AREA(ACRES) =    0.05      SUBAREA RUNOFF(CFS) =    0.19
  EFFECTIVE AREA(ACRES) =      0.72   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =        0.8       PEAK FLOW RATE(CFS) =       2.86

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    62.00
  ELEVATION DATA: UPSTREAM(FEET) =    275.20  DOWNSTREAM(FEET) =    273.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.10      0.20     0.100    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.43
  TOTAL AREA(ACRES) =      0.10   PEAK FLOW RATE(CFS) =      0.43

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    402.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   509.00
  ELEVATION DATA: UPSTREAM(FEET) =    273.00  DOWNSTREAM(FEET) =    250.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.862
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.032
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL               D        2.03      0.20     0.100    75    6.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.03   INITIAL SUBAREA RUNOFF(CFS) =    7.33

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    5.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA AREA(ACRES) =    2.03      SUBAREA RUNOFF(CFS) =    8.78
  EFFECTIVE AREA(ACRES) =      2.13   AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.1       PEAK FLOW RATE(CFS) =       9.21

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    403.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   243.60  DOWNSTREAM(FEET) =   225.70
  FLOW LENGTH(FEET) =   123.30   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.82
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.21
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    5.12
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    403.00 =     185.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.21    5.12    4.762  0.20( 0.02) 0.10       2.1     400.00
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    403.00 =     185.30 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        2.86    5.72    4.471  0.20( 0.08) 0.39       0.7     300.00
      2        2.71    7.62    3.799  0.20( 0.08) 0.41       0.8     310.00
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    403.00 =     455.50 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       11.94    5.12    4.762  0.20( 0.03) 0.17       2.8     400.00
      2       11.51    5.72    4.471  0.20( 0.03) 0.17       2.9     300.00
      3       10.05    7.62    3.799  0.20( 0.04) 0.18       2.9     310.00
    TOTAL AREA(ACRES) =         2.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       11.94  Tc(MIN.) =    5.115
  EFFECTIVE AREA(ACRES) =      2.78  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.17
  TOTAL AREA(ACRES) =        2.9
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    403.00 =     455.50 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    404.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   225.70  DOWNSTREAM(FEET) =   209.30
  FLOW LENGTH(FEET) =    79.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.66
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.94
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    5.18
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    404.00 =     534.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    502.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   211.00  DOWNSTREAM(FEET) =   210.50
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.96
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.82 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.94
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    5.19
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    502.00 =     544.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   143.00
  ELEVATION DATA: UPSTREAM(FEET) =    263.50  DOWNSTREAM(FEET) =    252.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.869
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.405
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.07      0.20     0.900    75    5.87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
```

```
 SUBAREA RUNOFF(CFS) =      0.27
 TOTAL AREA(ACRES) =      0.07   PEAK FLOW RATE(CFS) =      0.27

****************************************************************************
 FLOW PROCESS FROM NODE    501.00 TO NODE    502.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    252.00  DOWNSTREAM(FEET) =    210.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =   336.00   CHANNEL SLOPE =  0.1235
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.50
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.112
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"         D        0.24      0.20     0.900    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.69
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.38
 AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   0.76
 Tc(MIN.) =    6.63
 SUBAREA AREA(ACRES) =     0.24       SUBAREA RUNOFF(CFS) =    0.85
 EFFECTIVE AREA(ACRES) =      0.31     AREA-AVERAGED Fm(INCH/HR) =   0.18
 AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.90
 TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.10

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   8.34
 LONGEST FLOWPATH FROM NODE    500.00 TO NODE    502.00 =     479.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    6.63
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.112
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 D        0.20      0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.20      SUBAREA RUNOFF(CFS) =    0.74
 EFFECTIVE AREA(ACRES) =      0.51   AREA-AVERAGED Fm(INCH/HR) =  0.12
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.59
 TOTAL AREA(ACRES) =        0.5       PEAK FLOW RATE(CFS) =       1.83

****************************************************************************
 FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        1.83    6.63    4.112  0.20( 0.12) 0.59       0.5     500.00
 LONGEST FLOWPATH FROM NODE    500.00 TO NODE    502.00 =     479.00 FEET.
```

```
  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       11.94    5.19    4.722  0.20( 0.03) 0.17       2.8     400.00
      2       11.51    5.79    4.438  0.20( 0.03) 0.17       2.9     300.00
      3       10.05    7.70    3.778  0.20( 0.04) 0.18       2.9     310.00
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    502.00 =     544.50 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       13.60    5.19    4.722  0.20( 0.04) 0.22       3.2     400.00
      2       13.24    5.79    4.438  0.20( 0.05) 0.23       3.3     300.00
      3       12.70    6.63    4.112  0.20( 0.05) 0.24       3.4     500.00
      4       11.73    7.70    3.778  0.20( 0.05) 0.24       3.4     310.00
    TOTAL AREA(ACRES) =         3.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       13.60  Tc(MIN.) =    5.191
  EFFECTIVE AREA(ACRES) =      3.18  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =        3.4
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    502.00 =     544.50 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        3.4  TC(MIN.) =      5.19
  EFFECTIVE AREA(ACRES) =      3.18  AREA-AVERAGED Fm(INCH/HR)=  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.220
  PEAK FLOW RATE(CFS)   =      13.60

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       13.60    5.19    4.722  0.20( 0.04) 0.22       3.2     400.00
      2       13.24    5.79    4.438  0.20( 0.05) 0.23       3.3     300.00
      3       12.70    6.63    4.112  0.20( 0.05) 0.24       3.4     500.00
      4       11.73    7.70    3.778  0.20( 0.05) 0.24       3.4     310.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
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                          Analysis prepared by:

                    Adams-Streeter Civil Engineers, Inc.
                            15 Corporate Park
                             Irvine, CA 92606
                               949-474-2330

 ************************ DESCRIPTION OF STUDY ************************
* AREA "E" - EXISTING CONDITION                                       *
* 25-YEAR FREQUENCY                                                   *
* SOUTH SHORES CHURCH, DANA POINT, CA                                 *
 **********************************************************************

  FILE NAME: EXIST-E.DAT
  TIME/DATE OF STUDY: 09:45 02/29/2012
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  1.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    601.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   131.00
  ELEVATION DATA: UPSTREAM(FEET) =    274.40  DOWNSTREAM(FEET) =    274.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.805
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.052
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  COMMERCIAL                  D        0.15      0.20     0.100    75    6.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.54

****************************************************************************
  FLOW PROCESS FROM NODE    601.00 TO NODE    602.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  274.00  DOWNSTREAM ELEVATION(FEET) =  260.00
  STREET LENGTH(FEET) =   420.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.86
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    2.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.96
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.79
  STREET FLOW TRAVEL TIME(MIN.) =   1.77   Tc(MIN.) =    8.57
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.556
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                D        0.21      0.20     0.850    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  SUBAREA AREA(ACRES) =    0.21      SUBAREA RUNOFF(CFS) =    0.64
  EFFECTIVE AREA(ACRES) =      0.36    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.54
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       1.12

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.23   HALFSTREET FLOOD WIDTH(FEET) =   3.97
  FLOW VELOCITY(FEET/SEC.) =  3.34   DEPTH*VELOCITY(FT*FT/SEC.) =   0.78
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    602.00 =     551.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.4  TC(MIN.) =      8.57
  EFFECTIVE AREA(ACRES) =      0.36  AREA-AVERAGED Fm(INCH/HR)=  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.537
  PEAK FLOW RATE(CFS)   =       1.12
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

♀

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**************************************************************************
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                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* DEVELOPED CONDITION - 25-YEAR FREQUENCY                               *
* AREAS A, B, AND C                                                     *
* SOUTH SHORES CHURCH, DANA POINT, CA                                   *
 ************************************************************************

  FILE NAME: SSC.DAT
  TIME/DATE OF STUDY: 10:21 12/30/2014
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```

```
+----------------------------------------------------------------------------+
| AREA "A"                                                                   |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    94.00
  ELEVATION DATA: UPSTREAM(FEET) =    259.50  DOWNSTREAM(FEET) =    259.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.333
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.651
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.03      0.20     0.100    75    5.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.03   PEAK FLOW RATE(CFS) =      0.13

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   258.00  DOWNSTREAM(FEET) =   256.70
  FLOW LENGTH(FEET) =   131.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN   8.0 INCH PIPE IS   1.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.57
  GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.13
  PIPE TRAVEL TIME(MIN.) =   0.85    Tc(MIN.) =    6.18
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     225.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.18
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.278
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.09      0.20     0.100    75
  COMMERCIAL                 D        0.30      0.20     0.100    75
  PUBLIC PARK                D        0.07      0.20     0.850    75
  COMMERCIAL                 D        0.12      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.191
  SUBAREA AREA(ACRES) =    0.58      SUBAREA RUNOFF(CFS) =    2.21
  EFFECTIVE AREA(ACRES) =      0.61   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.19
  TOTAL AREA(ACRES) =        0.6       PEAK FLOW RATE(CFS) =       2.33

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   256.70  DOWNSTREAM(FEET) =   256.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.14
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.33
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    6.35
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.35
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.215
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.23      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.23      SUBAREA RUNOFF(CFS) =    0.87
  EFFECTIVE AREA(ACRES) =      0.84   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.16
  TOTAL AREA(ACRES) =        0.8       PEAK FLOW RATE(CFS) =       3.16

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   256.00  DOWNSTREAM(FEET) =   255.25
  FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.90
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.16
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    6.63
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     369.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =    6.63
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.111
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.40      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.40      SUBAREA RUNOFF(CFS) =    1.47
  EFFECTIVE AREA(ACRES) =      1.24   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.14
  TOTAL AREA(ACRES) =        1.2       PEAK FLOW RATE(CFS) =       4.56

********************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  41
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   255.25  DOWNSTREAM(FEET) =   254.30
  FLOW LENGTH(FEET) =    95.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.62
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.56
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    6.91
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =     464.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =    6.91
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.016
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.29      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.29      SUBAREA RUNOFF(CFS) =    1.04
  EFFECTIVE AREA(ACRES) =      1.53   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.13
  TOTAL AREA(ACRES) =        1.5       PEAK FLOW RATE(CFS) =       5.49

********************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  41
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   254.30  DOWNSTREAM(FEET) =   248.00
  FLOW LENGTH(FEET) =   207.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.8 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.90
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.49
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    7.30
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =     671.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   237.00
  ELEVATION DATA: UPSTREAM(FEET) =    277.00  DOWNSTREAM(FEET) =    269.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.335
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.650
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.52      0.20      0.100    75    5.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.17
  TOTAL AREA(ACRES) =      0.52   PEAK FLOW RATE(CFS) =      2.17

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   263.00  DOWNSTREAM(FEET) =   257.00
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.47
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.17
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    5.71
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     407.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.71
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.473
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                D        0.81      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.81      SUBAREA RUNOFF(CFS) =    3.25
  EFFECTIVE AREA(ACRES) =      1.33   AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.3       PEAK FLOW RATE(CFS) =       5.33

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    106.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   257.00  DOWNSTREAM(FEET) =   248.00
  FLOW LENGTH(FEET) =   147.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.35
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.33
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    5.93
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    106.00 =     554.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        5.33    5.93    4.380  0.20( 0.02) 0.10       1.3     200.00
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    106.00 =     554.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        5.49    7.30    3.894  0.20( 0.03) 0.13       1.5     100.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =     671.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       10.35    5.93    4.380  0.20( 0.02) 0.12       2.6     200.00
      2       10.23    7.30    3.894  0.20( 0.02) 0.12       2.9     100.00
    TOTAL AREA(ACRES) =         2.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       10.35  Tc(MIN.) =    5.930
  EFFECTIVE AREA(ACRES) =      2.57  AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.12
  TOTAL AREA(ACRES) =        2.9
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =     671.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    5.93
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.380
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 D        0.52      0.20     0.100    75
 COMMERCIAL                 D        0.21      0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.73      SUBAREA RUNOFF(CFS) =    2.86
 EFFECTIVE AREA(ACRES) =      3.30   AREA-AVERAGED Fm(INCH/HR) =  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.11
 TOTAL AREA(ACRES) =        3.6       PEAK FLOW RATE(CFS) =      12.95

****************************************************************************
 FLOW PROCESS FROM NODE    106.00 TO NODE    107.10 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   248.00  DOWNSTREAM(FEET) =   247.50
 FLOW LENGTH(FEET) =    28.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.81
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      12.95
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    5.98
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.10 =     699.00 FEET.

+----------------------------------------------------------------------------+
| ON-SITE DETENTION SYSTEM                                                   |
| PEAK FLOW REDUCTION FROM Q25=12.95 CFS TO Q25= 2.39 CFS                    |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE    107.10 TO NODE    107.20 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN.) =    5.89   RAINFALL INTENSITY(INCH/HR) =  4.40
 EFFECTIVE AREA(ACRES) =     0.61
 TOTAL AREA(ACRES) =     3.60        PEAK FLOW RATE(CFS) =      2.39
 AREA-AVERAGED Fm(INCH/HR) =   0.02  AREA-AVERAGED Fp(INCH/HR) =   0.20
 AREA-AVERAGED Ap =  0.10
 NOTE: EFFECTIVE AREA IS USED AS THE TOTAL CONTRIBUTING AREA FOR ALL
       CONFLUENCE ANALYSES.

****************************************************************************
 FLOW PROCESS FROM NODE    107.20 TO NODE    108.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   242.00  DOWNSTREAM(FEET) =   229.00
  FLOW LENGTH(FEET) =   128.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.25
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.39
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    6.08
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =     827.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| AREA "B"                                                                 |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   121.00
  ELEVATION DATA: UPSTREAM(FEET) =    250.00  DOWNSTREAM(FEET) =    248.75

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.001
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.987
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  SCHOOL                     D        0.22      0.20     0.600    75    7.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA RUNOFF(CFS) =      0.77
  TOTAL AREA(ACRES) =      0.22   PEAK FLOW RATE(CFS) =      0.77

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   247.00  DOWNSTREAM(FEET) =   245.50
  FLOW LENGTH(FEET) =   152.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN   8.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.37
  GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.77
  PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =    7.58
```

```
 LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     273.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    302.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    7.58
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.811
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     D        0.14      0.20     0.600    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
 SUBAREA AREA(ACRES) =    0.14      SUBAREA RUNOFF(CFS) =    0.47
 EFFECTIVE AREA(ACRES) =      0.36   AREA-AVERAGED Fm(INCH/HR) =  0.12
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.60
 TOTAL AREA(ACRES) =        0.4       PEAK FLOW RATE(CFS) =       1.20

****************************************************************************
 FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   245.50  DOWNSTREAM(FEET) =   243.90
 FLOW LENGTH(FEET) =   159.00   MANNING'S N =  0.010
 DEPTH OF FLOW IN  10.0 INCH PIPE IS   4.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.91
 GIVEN PIPE DIAMETER(INCH) =  10.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.20
 PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =    8.12
 LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     432.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    8.12
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.666
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 D        0.11      0.20     0.100    75
 COMMERCIAL                 D        0.12      0.20     0.100    75
 COMMERCIAL                 D        0.11      0.20     0.100    75
 SCHOOL                     D        0.11      0.20     0.600    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.222
 SUBAREA AREA(ACRES) =    0.45      SUBAREA RUNOFF(CFS) =    1.47
 EFFECTIVE AREA(ACRES) =      0.81   AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.39
 TOTAL AREA(ACRES) =        0.8       PEAK FLOW RATE(CFS) =       2.62

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    303.00 TO NODE    304.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   243.90  DOWNSTREAM(FEET) =   243.00
 FLOW LENGTH(FEET) =    95.00   MANNING'S N =  0.010
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.83
 GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.62
 PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    8.39
 LONGEST FLOWPATH FROM NODE    300.00 TO NODE    304.00 =     527.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    304.00 TO NODE    304.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    8.39
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.598
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     D        0.09      0.20     0.600    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
 SUBAREA AREA(ACRES) =    0.09      SUBAREA RUNOFF(CFS) =    0.28
 EFFECTIVE AREA(ACRES) =      0.90   AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.41
 TOTAL AREA(ACRES) =        0.9       PEAK FLOW RATE(CFS) =       2.85

****************************************************************************
 FLOW PROCESS FROM NODE    304.00 TO NODE    305.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   243.00  DOWNSTREAM(FEET) =   242.00
 FLOW LENGTH(FEET) =    73.00   MANNING'S N =  0.010
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.85
 GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.85
 PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =    8.57
 LONGEST FLOWPATH FROM NODE    300.00 TO NODE    305.00 =     600.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    305.00 TO NODE    305.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    8.57
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.556
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  SCHOOL                       D        0.09      0.20     0.600    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =    0.09      SUBAREA RUNOFF(CFS) =    0.28
  EFFECTIVE AREA(ACRES) =      0.99   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.43
  TOTAL AREA(ACRES) =        1.0       PEAK FLOW RATE(CFS) =       3.09

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    108.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   242.00  DOWNSTREAM(FEET) =   229.00
  FLOW LENGTH(FEET) =    86.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.83
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.09
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    8.65
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    108.00 =     686.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        3.09    8.65    3.536  0.20( 0.09) 0.43       1.0     300.00
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    108.00 =     686.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        2.39    6.08    4.318  0.20( 0.02) 0.10       0.6     100.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =     827.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        5.05    6.08    4.318  0.20( 0.05) 0.27       1.3     100.00
      2        5.05    8.65    3.536  0.20( 0.06) 0.30       1.6     300.00
    TOTAL AREA(ACRES) =         4.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        5.05  Tc(MIN.) =    6.080
  EFFECTIVE AREA(ACRES) =      1.31  AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.30
  TOTAL AREA(ACRES) =        4.6
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =     827.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    109.00 IS CODE =  41
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   229.00  DOWNSTREAM(FEET) =   221.00
  FLOW LENGTH(FEET) =    36.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.37
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.05
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    6.11
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    109.00 =     863.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.11
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.305
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.13      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.13      SUBAREA RUNOFF(CFS) =    0.50
  EFFECTIVE AREA(ACRES) =      1.44   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =        4.7       PEAK FLOW RATE(CFS) =       5.50

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   221.00  DOWNSTREAM(FEET) =   210.00
  FLOW LENGTH(FEET) =    47.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.13
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.50
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    6.15
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     910.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

+----------------------------------------------------------------------+
| AREA "C"                                                             |
|                                                                      |
|                                                                      |
+----------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   160.00
  ELEVATION DATA: UPSTREAM(FEET) =    262.00  DOWNSTREAM(FEET) =    248.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.987
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.356
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                D        0.09      0.20     0.850    75    5.99
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  SUBAREA RUNOFF(CFS) =      0.34
  TOTAL AREA(ACRES) =      0.09   PEAK FLOW RATE(CFS) =      0.34

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    402.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    248.00  DOWNSTREAM(FEET) =    217.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   270.00   CHANNEL SLOPE =  0.1148
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.50
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.120
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                D        0.20      0.20     0.850    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.28
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   0.62
  Tc(MIN.) =    6.61
  SUBAREA AREA(ACRES) =     0.20       SUBAREA RUNOFF(CFS) =    0.71
  EFFECTIVE AREA(ACRES) =      0.29     AREA-AVERAGED Fm(INCH/HR) =   0.17
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.85
  TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   7.95
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    402.00 =     430.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
  MAINLINE Tc(MIN.) =    6.61
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.120
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.20      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.20      SUBAREA RUNOFF(CFS) =    0.74
  EFFECTIVE AREA(ACRES) =      0.49   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.54
  TOTAL AREA(ACRES) =        0.5       PEAK FLOW RATE(CFS) =       1.77

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   217.00  DOWNSTREAM(FEET) =   210.00
  FLOW LENGTH(FEET) =    22.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.46
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.77
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    6.63
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    110.00 =     452.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        1.77    6.63    4.112  0.20( 0.11) 0.54       0.5     400.00
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    110.00 =     452.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        5.50    6.15    4.289  0.20( 0.05) 0.26       1.4     100.00
      2        5.40    8.73    3.519  0.20( 0.06) 0.29       1.7     300.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     910.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        7.21    6.15    4.289  0.20( 0.07) 0.33       1.9     100.00
      2        7.25    6.63    4.112  0.20( 0.07) 0.33       2.0     400.00
      3        6.91    8.73    3.519  0.20( 0.07) 0.34       2.2     300.00
    TOTAL AREA(ACRES) =         5.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        7.25  Tc(MIN.) =    6.629
```

```
  EFFECTIVE AREA(ACRES) =      1.98  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.33
  TOTAL AREA(ACRES) =        5.2
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     910.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   210.00  DOWNSTREAM(FEET) =   209.75
  FLOW LENGTH(FEET) =     4.50   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.77
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.25
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    6.64
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    111.00 =     914.50 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        5.2  TC(MIN.) =      6.64
  EFFECTIVE AREA(ACRES) =      1.98  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.334
  PEAK FLOW RATE(CFS)   =       7.25

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        7.21    6.16    4.287  0.20( 0.07) 0.33       1.9     100.00
      2        7.25    6.64    4.110  0.20( 0.07) 0.33       2.0     400.00
      3        6.91    8.74    3.518  0.20( 0.07) 0.34       2.2     300.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
_____________________________________________________________________________
*****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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              Ver. 15.0  Release Date: 04/01/2008  License ID 1204

                           Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* PROPOSED CONDITION - AREA "D" AND "E"                                     *
* 25-YEAR FREQUENCY STORM                                                   *
* SOUTH SHORES CHURCH, DANA POINT, CA                                       *
 *****************************************************************************

  FILE NAME: SSC-D-E.DAT
  TIME/DATE OF STUDY: 16:39 12/29/2014
=============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
=============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

+---------------------------------------------------------------------------+
| AREA D                                                                    |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

*****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    501.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=============================================================================
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   225.00
  ELEVATION DATA: UPSTREAM(FEET) =    270.00  DOWNSTREAM(FEET) =    229.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.440
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.180
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,NARROWLEAF"     D        0.06      0.20     1.000    91    6.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.21
  TOTAL AREA(ACRES) =      0.06   PEAK FLOW RATE(CFS) =      0.21

****************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   175.00
  ELEVATION DATA: UPSTREAM(FEET) =    250.00  DOWNSTREAM(FEET) =    192.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.168
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.735
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,NARROWLEAF"     D        0.24      0.20     1.000    91    5.17
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.98
  TOTAL AREA(ACRES) =      0.24   PEAK FLOW RATE(CFS) =      0.98

****************************************************************************
  FLOW PROCESS FROM NODE    700.00 TO NODE    701.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    54.00
  ELEVATION DATA: UPSTREAM(FEET) =    250.00  DOWNSTREAM(FEET) =    224.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,NARROWLEAF"     D        0.34      0.20     1.000    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.41
  TOTAL AREA(ACRES) =      0.34   PEAK FLOW RATE(CFS) =      1.41
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    42.00
  ELEVATION DATA: UPSTREAM(FEET) =    249.00  DOWNSTREAM(FEET) =    227.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,NARROWLEAF"     D        0.18      0.20     1.000    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.75

+----------------------------------------------------------------------------+
| AREA E                                                                     |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    901.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    71.50
  ELEVATION DATA: UPSTREAM(FEET) =    275.50  DOWNSTREAM(FEET) =    275.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.824
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.07      0.20     0.100    75    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.07   PEAK FLOW RATE(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    902.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  275.00  DOWNSTREAM ELEVATION(FEET) =  260.00
  STREET LENGTH(FEET) =   415.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
```

```
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.49
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    2.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.82
  STREET FLOW TRAVEL TIME(MIN.) =   1.68   Tc(MIN.) =    6.68
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.096
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.10      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.10      SUBAREA RUNOFF(CFS) =    0.37
  EFFECTIVE AREA(ACRES) =      0.17    AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.2        PEAK FLOW RATE(CFS) =       0.62

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.20   HALFSTREET FLOOD WIDTH(FEET) =   2.00
  FLOW VELOCITY(FEET/SEC.) =  4.13   DEPTH*VELOCITY(FT*FT/SEC.) =   0.82
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    902.00 =     486.50 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.2  TC(MIN.) =      6.68
  EFFECTIVE AREA(ACRES) =      0.17  AREA-AVERAGED Fm(INCH/HR)=  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =       0.62
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

IX. 100-YEAR HYDROLOGY CALCULATIONS

- **Existing 100-Year**
- **Developed 100-Year**

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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             Ver. 15.0  Release Date: 04/01/2008  License ID 1204

                          Analysis prepared by:

                   Adams-Streeter Civil Engineers, Inc.
                            15 Corporate Park
                            Irvine, CA 92606
                              949-474-2330

 ************************ DESCRIPTION OF STUDY ************************
* 100-YEAR STORM FREQUENCY                                            *
* EXISTING CONDITION                                                  *
* SOUTH SHORES CHURCH, DANA POINT, CA                                 *
 **********************************************************************

  FILE NAME: CHURCHEX.DAT
  TIME/DATE OF STUDY: 10:48 12/30/2014
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    78.00
  ELEVATION DATA: UPSTREAM(FEET) =    274.60  DOWNSTREAM(FEET) =    274.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.757
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.207
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  SCHOOL                       D        0.20      0.20     0.600    91    6.76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA RUNOFF(CFS) =      0.92
  TOTAL AREA(ACRES) =      0.20   PEAK FLOW RATE(CFS) =      0.92

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   272.20  DOWNSTREAM(FEET) =   264.50
  FLOW LENGTH(FEET) =   126.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.83
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.82 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =   4.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.92
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    7.12
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     204.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.054
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       D        0.27      0.20     0.500    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA AREA(ACRES) =    0.27      SUBAREA RUNOFF(CFS) =    1.20
  EFFECTIVE AREA(ACRES) =      0.47   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.54
  TOTAL AREA(ACRES) =        0.5       PEAK FLOW RATE(CFS) =       2.09

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    264.50  DOWNSTREAM(FEET) =    237.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   115.80   CHANNEL SLOPE =  0.2375
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.997
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.12      0.20     0.900    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.54
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   0.14
```

```
  Tc(MIN.) =    7.26
  SUBAREA AREA(ACRES) =     0.12       SUBAREA RUNOFF(CFS) =    0.52
  EFFECTIVE AREA(ACRES) =      0.59     AREA-AVERAGED Fm(INCH/HR) =   0.12
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.62
  TOTAL AREA(ACRES) =        0.6         PEAK FLOW RATE(CFS) =       2.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =  13.87
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     319.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    237.00  DOWNSTREAM(FEET) =    227.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    34.00   CHANNEL SLOPE =  0.2794
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.50
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.59
  FLOW VELOCITY(FEET/SEC.) =  14.50   FLOW DEPTH(FEET) =   0.42
  TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =    7.30
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     353.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    31.50
  ELEVATION DATA: UPSTREAM(FEET) =    265.30  DOWNSTREAM(FEET) =    265.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 D        0.07      0.20     0.200    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.39
  TOTAL AREA(ACRES) =      0.07   PEAK FLOW RATE(CFS) =      0.39

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   263.00  DOWNSTREAM(FEET) =   262.50
  FLOW LENGTH(FEET) =    24.90   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.34
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
```

```
 AT DEPTH = 0.82 * DIAMETER)
 GIVEN PIPE DIAMETER(INCH) =   4.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.39
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    5.12
 LONGEST FLOWPATH FROM NODE    110.00 TO NODE    112.00 =      56.40 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    112.00 TO NODE    104.00 IS CODE =  82
----------------------------------------------------------------------------
 >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
 >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   102.10
 ELEVATION DATA: UPSTREAM(FEET) =    262.50  DOWNSTREAM(FEET) =    227.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 RESIDENTIAL
 ".4 DWELLING/ACRE"          D        0.11      0.20     0.900    91    5.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
 SUBAREA AREA(ACRES) =    0.11   INITIAL SUBAREA RUNOFF(CFS) =    0.59

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =    5.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.101
 SUBAREA AREA(ACRES) =    0.11      SUBAREA RUNOFF(CFS) =    0.59
 EFFECTIVE AREA(ACRES) =      0.18   AREA-AVERAGED Fm(INCH/HR) =  0.13
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.63
 TOTAL AREA(ACRES) =        0.2       PEAK FLOW RATE(CFS) =       0.97

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        0.97    5.12    6.101  0.20( 0.13) 0.63       0.2     110.00
 LONGEST FLOWPATH FROM NODE    110.00 TO NODE    104.00 =      56.40 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        2.59    7.30    4.982  0.20( 0.12) 0.62       0.6     100.00
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     353.80 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        3.20    5.12    6.101  0.20( 0.12) 0.62       0.6     110.00
     2        3.37    7.30    4.982  0.20( 0.12) 0.62       0.8     100.00
   TOTAL AREA(ACRES) =         0.8

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =        3.37  Tc(MIN.) =    7.299
 EFFECTIVE AREA(ACRES) =      0.77  AREA-AVERAGED Fm(INCH/HR) =  0.12
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.62
  TOTAL AREA(ACRES) =        0.8
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     353.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    33.70
  ELEVATION DATA: UPSTREAM(FEET) =    265.30  DOWNSTREAM(FEET) =    264.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 D        0.06      0.20     0.200    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.06   PEAK FLOW RATE(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   171.20
  ELEVATION DATA: UPSTREAM(FEET) =    264.60  DOWNSTREAM(FEET) =    190.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.39      0.20     0.900    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA AREA(ACRES) =    0.39   INITIAL SUBAREA RUNOFF(CFS) =    2.11

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    5.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA AREA(ACRES) =    0.39      SUBAREA RUNOFF(CFS) =    2.11
  EFFECTIVE AREA(ACRES) =      0.45   AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =        0.4       PEAK FLOW RATE(CFS) =       2.44

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    68.00
  ELEVATION DATA: UPSTREAM(FEET) =    274.30  DOWNSTREAM(FEET) =    264.50
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      D        0.09      0.20     0.400    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =      0.49
  TOTAL AREA(ACRES) =      0.09   PEAK FLOW RATE(CFS) =      0.49

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    132.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   262.50  DOWNSTREAM(FEET) =   254.50
  FLOW LENGTH(FEET) =    58.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   2.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.37
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.49
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    5.12
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    132.00 =     126.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    132.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.107
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.09      0.20     0.900    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA AREA(ACRES) =    0.09      SUBAREA RUNOFF(CFS) =    0.48
  EFFECTIVE AREA(ACRES) =      0.18   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.65
  TOTAL AREA(ACRES) =        0.2       PEAK FLOW RATE(CFS) =       0.97

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    97.00
  ELEVATION DATA: UPSTREAM(FEET) =    254.50  DOWNSTREAM(FEET) =    225.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
```

```
  ".4 DWELLING/ACRE"         D        0.18      0.20     0.900    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA AREA(ACRES) =    0.18   INITIAL SUBAREA RUNOFF(CFS) =    0.97

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    5.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.107
  SUBAREA AREA(ACRES) =    0.18      SUBAREA RUNOFF(CFS) =    0.96
  EFFECTIVE AREA(ACRES) =      0.36   AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.78
  TOTAL AREA(ACRES) =        0.4       PEAK FLOW RATE(CFS) =       1.93

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    141.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    67.00
  ELEVATION DATA: UPSTREAM(FEET) =    265.50  DOWNSTREAM(FEET) =    264.70

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.070
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.138
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       D        0.09      0.20     0.500    91    5.07
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA RUNOFF(CFS) =      0.49
  TOTAL AREA(ACRES) =      0.09   PEAK FLOW RATE(CFS) =      0.49

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    142.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   262.70  DOWNSTREAM(FEET) =   254.50
  FLOW LENGTH(FEET) =    88.50   MANNING'S N =  0.013
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   2.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.27
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.49
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    5.27
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    142.00 =     155.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    142.00 TO NODE    143.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    88.50
  ELEVATION DATA: UPSTREAM(FEET) =    254.50  DOWNSTREAM(FEET) =    235.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
```

```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.17      0.20     0.900    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA AREA(ACRES) =    0.17   INITIAL SUBAREA RUNOFF(CFS) =    0.92

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    5.27
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.002
  SUBAREA AREA(ACRES) =    0.17      SUBAREA RUNOFF(CFS) =    0.89
  EFFECTIVE AREA(ACRES) =      0.26   AREA-AVERAGED Fm(INCH/HR) =  0.15
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.76
  TOTAL AREA(ACRES) =        0.3       PEAK FLOW RATE(CFS) =       1.37

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   132.00
  ELEVATION DATA: UPSTREAM(FEET) =    265.00  DOWNSTREAM(FEET) =    235.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.21      0.20     0.900    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA RUNOFF(CFS) =      1.14
  TOTAL AREA(ACRES) =      0.21   PEAK FLOW RATE(CFS) =      1.14

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    87.50
  ELEVATION DATA: UPSTREAM(FEET) =    251.00  DOWNSTREAM(FEET) =    216.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.32      0.20     0.900    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA RUNOFF(CFS) =      1.73
  TOTAL AREA(ACRES) =      0.32   PEAK FLOW RATE(CFS) =      1.73

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   172.00
  ELEVATION DATA: UPSTREAM(FEET) =    265.80  DOWNSTREAM(FEET) =    251.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               D        0.19      0.20     0.350    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.05
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      1.05

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.11      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.11      SUBAREA RUNOFF(CFS) =    0.61
  EFFECTIVE AREA(ACRES) =      0.30   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =        0.3       PEAK FLOW RATE(CFS) =       1.66

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   249.00  DOWNSTREAM(FEET) =   247.00
  FLOW LENGTH(FEET) =   101.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.51
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.66
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    5.31
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     273.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.981
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.12      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.12      SUBAREA RUNOFF(CFS) =    0.64
  EFFECTIVE AREA(ACRES) =      0.42   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.21
  TOTAL AREA(ACRES) =        0.4       PEAK FLOW RATE(CFS) =       2.24

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   247.00  DOWNSTREAM(FEET) =   245.00
  FLOW LENGTH(FEET) =   101.50   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.96
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.24
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    5.59
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     374.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    311.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   141.00
  ELEVATION DATA: UPSTREAM(FEET) =    252.50  DOWNSTREAM(FEET) =    249.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.489
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.909
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          D        0.23      0.20     0.800    91    7.49
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.800
  SUBAREA RUNOFF(CFS) =      0.98
  TOTAL AREA(ACRES) =      0.23   PEAK FLOW RATE(CFS) =      0.98

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    311.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.909
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.11      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.11      SUBAREA RUNOFF(CFS) =    0.48
```

```
  EFFECTIVE AREA(ACRES) =      0.34   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.57
  TOTAL AREA(ACRES) =        0.3       PEAK FLOW RATE(CFS) =       1.47

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    303.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   247.80  DOWNSTREAM(FEET) =   245.00
  FLOW LENGTH(FEET) =    26.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   8.0 INCH PIPE IS   3.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.11
  GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.47
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    7.53
  LONGEST FLOWPATH FROM NODE    310.00 TO NODE    303.00 =     167.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        1.47    7.53    4.893  0.20( 0.11) 0.57       0.3     310.00
  LONGEST FLOWPATH FROM NODE    310.00 TO NODE    303.00 =     167.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        2.24    5.59    5.805  0.20( 0.04) 0.21       0.4     300.00
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     374.50 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        3.54    5.59    5.805  0.20( 0.07) 0.35       0.7     300.00
      2        3.36    7.53    4.893  0.20( 0.07) 0.37       0.8     310.00
    TOTAL AREA(ACRES) =         0.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        3.54  Tc(MIN.) =    5.589
  EFFECTIVE AREA(ACRES) =      0.67  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.37
  TOTAL AREA(ACRES) =        0.8
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     374.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    403.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   245.00  DOWNSTREAM(FEET) =   225.70
  FLOW LENGTH(FEET) =    81.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.74
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.54
```

```
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    5.67
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    403.00 =     455.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.757
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.05      0.20     0.900    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA AREA(ACRES) =    0.05      SUBAREA RUNOFF(CFS) =    0.25
  EFFECTIVE AREA(ACRES) =      0.72   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =        0.8       PEAK FLOW RATE(CFS) =       3.69

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    62.00
  ELEVATION DATA: UPSTREAM(FEET) =    275.20  DOWNSTREAM(FEET) =    273.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.10      0.20     0.100    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.56
  TOTAL AREA(ACRES) =      0.10   PEAK FLOW RATE(CFS) =      0.56

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    402.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   509.00
  ELEVATION DATA: UPSTREAM(FEET) =    273.00  DOWNSTREAM(FEET) =    250.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.862
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.161
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL               D        2.03      0.20     0.100    91    6.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.03   INITIAL SUBAREA RUNOFF(CFS) =    9.39

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    5.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA AREA(ACRES) =    2.03      SUBAREA RUNOFF(CFS) =   11.27
  EFFECTIVE AREA(ACRES) =      2.13   AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.1       PEAK FLOW RATE(CFS) =      11.82

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    403.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   243.60  DOWNSTREAM(FEET) =   225.70
  FLOW LENGTH(FEET) =   123.30   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.59
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.82
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    5.11
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    403.00 =     185.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       11.82    5.11    6.110  0.20( 0.02) 0.10       2.1     400.00
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    403.00 =     185.30 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        3.69    5.67    5.757  0.20( 0.08) 0.39       0.7     300.00
      2        3.49    7.61    4.862  0.20( 0.08) 0.41       0.8     310.00
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    403.00 =     455.50 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       15.36    5.11    6.110  0.20( 0.03) 0.17       2.8     400.00
      2       14.83    5.67    5.757  0.20( 0.03) 0.17       2.9     300.00
      3       12.89    7.61    4.862  0.20( 0.04) 0.18       2.9     310.00
    TOTAL AREA(ACRES) =         2.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       15.36  Tc(MIN.) =    5.111
  EFFECTIVE AREA(ACRES) =      2.78  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.17
  TOTAL AREA(ACRES) =        2.9
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    403.00 =     455.50 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    404.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   225.70  DOWNSTREAM(FEET) =   209.30
  FLOW LENGTH(FEET) =    79.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.35
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.36
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    5.17
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    404.00 =     534.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    502.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   211.00  DOWNSTREAM(FEET) =   210.50
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.96
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.82 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.36
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    5.18
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    502.00 =     544.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   143.00
  ELEVATION DATA: UPSTREAM(FEET) =    263.50  DOWNSTREAM(FEET) =    252.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.869
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.644
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.07      0.20     0.900    91    5.87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
```

```
  SUBAREA RUNOFF(CFS) =      0.34
  TOTAL AREA(ACRES) =      0.07   PEAK FLOW RATE(CFS) =      0.34

****************************************************************************
  FLOW PROCESS FROM NODE    501.00 TO NODE    502.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    252.00  DOWNSTREAM(FEET) =    210.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   336.00   CHANNEL SLOPE =  0.1235
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.284
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         D        0.24      0.20     0.900    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.82
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   0.72
  Tc(MIN.) =    6.59
  SUBAREA AREA(ACRES) =     0.24       SUBAREA RUNOFF(CFS) =    1.10
  EFFECTIVE AREA(ACRES) =      0.31     AREA-AVERAGED Fm(INCH/HR) =   0.18
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   8.76
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    502.00 =     479.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.59
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.284
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.20      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.20      SUBAREA RUNOFF(CFS) =    0.95
  EFFECTIVE AREA(ACRES) =      0.51   AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.59
  TOTAL AREA(ACRES) =        0.5       PEAK FLOW RATE(CFS) =       2.37

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        2.37    6.59    5.284  0.20( 0.12) 0.59       0.5     500.00
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    502.00 =     479.00 FEET.
```

```
  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       15.36    5.18    6.060  0.20( 0.03) 0.17       2.8     400.00
      2       14.83    5.74    5.714  0.20( 0.03) 0.17       2.9     300.00
      3       12.89    7.69    4.835  0.20( 0.04) 0.18       2.9     310.00
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    502.00 =     544.50 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       17.51    5.18    6.060  0.20( 0.04) 0.22       3.2     400.00
      2       17.07    5.74    5.714  0.20( 0.05) 0.23       3.3     300.00
      3       16.36    6.59    5.284  0.20( 0.05) 0.24       3.4     500.00
      4       15.05    7.69    4.835  0.20( 0.05) 0.24       3.4     310.00
    TOTAL AREA(ACRES) =         3.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       17.51  Tc(MIN.) =    5.185
  EFFECTIVE AREA(ACRES) =      3.18  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =        3.4
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    502.00 =     544.50 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        3.4  TC(MIN.) =      5.18
  EFFECTIVE AREA(ACRES) =      3.18  AREA-AVERAGED Fm(INCH/HR)=  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.220
  PEAK FLOW RATE(CFS)   =      17.51

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       17.51    5.18    6.060  0.20( 0.04) 0.22       3.2     400.00
      2       17.07    5.74    5.714  0.20( 0.05) 0.23       3.3     300.00
      3       16.36    6.59    5.284  0.20( 0.05) 0.24       3.4     500.00
      4       15.05    7.69    4.835  0.20( 0.05) 0.24       3.4     310.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                          Analysis prepared by:

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                             Irvine, CA 92606
                               949-474-2330

 ************************* DESCRIPTION OF STUDY *************************
* AREA "E" - EXISTING CONDITION                                         *
* 100-YEAR FREQUENCY                                                    *
* SOUTH SHORES CHURCH, DANA POINT, CA                                   *
 ************************************************************************

  FILE NAME: EXIST-E.DAT
  TIME/DATE OF STUDY: 09:46 02/29/2012
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  1.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    601.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   131.00
  ELEVATION DATA: UPSTREAM(FEET) =    274.40  DOWNSTREAM(FEET) =    274.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.805
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.186
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  COMMERCIAL                  D        0.15      0.20     0.100    91    6.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.70
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.70

****************************************************************************
  FLOW PROCESS FROM NODE    601.00 TO NODE    602.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  274.00  DOWNSTREAM ELEVATION(FEET) =  260.00
  STREET LENGTH(FEET) =   420.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.10
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    3.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.77
  STREET FLOW TRAVEL TIME(MIN.) =   2.10   Tc(MIN.) =    8.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.445
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                D        0.21      0.20     0.850    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  SUBAREA AREA(ACRES) =    0.21      SUBAREA RUNOFF(CFS) =    0.81
  EFFECTIVE AREA(ACRES) =      0.36    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.54
  TOTAL AREA(ACRES) =        0.4        PEAK FLOW RATE(CFS) =       1.41

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   5.03
  FLOW VELOCITY(FEET/SEC.) =  3.35   DEPTH*VELOCITY(FT*FT/SEC.) =   0.84
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    602.00 =     551.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.4  TC(MIN.) =      8.90
  EFFECTIVE AREA(ACRES) =      0.36  AREA-AVERAGED Fm(INCH/HR)=  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.537
  PEAK FLOW RATE(CFS)   =       1.41
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

♀

```
*****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
        (c) Copyright 1983-2008 Advanced Engineering Software (aes)
            Ver. 15.0  Release Date: 04/01/2008  License ID 1204

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* DEVELOPED CONDITION - 100-YEAR FREQUENCY                              *
* AREAS A, B, AND C                                                     *
* SOUTH SHORES CHURCH, DANA POINT, CA                                   *
 ************************************************************************

  FILE NAME: SSC.DAT
  TIME/DATE OF STUDY: 10:27 12/30/2014
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
```

```
+-------------------------------------------------------------------------+
| AREA "A"                                                                |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

*************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    94.00
  ELEVATION DATA: UPSTREAM(FEET) =    259.50  DOWNSTREAM(FEET) =    259.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.333
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.963
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.03      0.20     0.100    91    5.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.03   PEAK FLOW RATE(CFS) =      0.16

*************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  41
-------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
=========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   258.00  DOWNSTREAM(FEET) =   256.70
  FLOW LENGTH(FEET) =   131.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN   8.0 INCH PIPE IS   1.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.84
  GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.16
  PIPE TRAVEL TIME(MIN.) =   0.77    Tc(MIN.) =    6.10
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     225.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
-------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=========================================================================
  MAINLINE Tc(MIN.) =    6.10
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.521
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.09      0.20     0.100    91
  COMMERCIAL                 D        0.30      0.20     0.100    91
  PUBLIC PARK                D        0.07      0.20     0.850    91
  COMMERCIAL                 D        0.12      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.191
  SUBAREA AREA(ACRES) =    0.58      SUBAREA RUNOFF(CFS) =    2.86
  EFFECTIVE AREA(ACRES) =      0.61   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.19
  TOTAL AREA(ACRES) =        0.6       PEAK FLOW RATE(CFS) =       3.01

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   256.70  DOWNSTREAM(FEET) =   256.00
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.54
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.01
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    6.25
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.443
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.23      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.23      SUBAREA RUNOFF(CFS) =    1.12
  EFFECTIVE AREA(ACRES) =      0.84   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.16
  TOTAL AREA(ACRES) =        0.8       PEAK FLOW RATE(CFS) =       4.09

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   256.00  DOWNSTREAM(FEET) =   255.25
  FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.25
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.09
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    6.52
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     369.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =    6.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.314
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.40      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.40      SUBAREA RUNOFF(CFS) =    1.91
  EFFECTIVE AREA(ACRES) =      1.24   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.14
  TOTAL AREA(ACRES) =        1.2       PEAK FLOW RATE(CFS) =       5.90

********************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  41
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   255.25  DOWNSTREAM(FEET) =   254.30
  FLOW LENGTH(FEET) =    95.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.00
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.90
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    6.78
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =     464.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =    6.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.195
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.29      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.29      SUBAREA RUNOFF(CFS) =    1.35
  EFFECTIVE AREA(ACRES) =      1.53   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.13
  TOTAL AREA(ACRES) =        1.5       PEAK FLOW RATE(CFS) =       7.12

********************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  41
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   254.30  DOWNSTREAM(FEET) =   248.00
  FLOW LENGTH(FEET) =   207.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.9 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.53
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.12
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    7.15
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =     671.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   237.00
  ELEVATION DATA: UPSTREAM(FEET) =    277.00  DOWNSTREAM(FEET) =    269.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.335
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.962
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.52      0.20      0.100    91    5.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.78
  TOTAL AREA(ACRES) =      0.52   PEAK FLOW RATE(CFS) =      2.78

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   263.00  DOWNSTREAM(FEET) =   257.00
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.97
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.78
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    5.69
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     407.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.69
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.746
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                D        0.81      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.81      SUBAREA RUNOFF(CFS) =    4.17
  EFFECTIVE AREA(ACRES) =      1.33   AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.3       PEAK FLOW RATE(CFS) =       6.85

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    106.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   257.00  DOWNSTREAM(FEET) =   248.00
  FLOW LENGTH(FEET) =   147.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.19
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.85
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    5.89
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    106.00 =     554.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.85    5.89    5.632  0.20( 0.02) 0.10       1.3     200.00
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    106.00 =     554.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        7.12    7.15    5.042  0.20( 0.03) 0.13       1.5     100.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =     671.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       13.41    5.89    5.632  0.20( 0.02) 0.12       2.6     200.00
      2       13.25    7.15    5.042  0.20( 0.02) 0.12       2.9     100.00
    TOTAL AREA(ACRES) =         2.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       13.41  Tc(MIN.) =    5.891
  EFFECTIVE AREA(ACRES) =      2.59  AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.12
  TOTAL AREA(ACRES) =        2.9
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =     671.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.89
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.632
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.52      0.20     0.100    91
  COMMERCIAL                 D        0.21      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.73      SUBAREA RUNOFF(CFS) =    3.69
  EFFECTIVE AREA(ACRES) =      3.32   AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =        3.6       PEAK FLOW RATE(CFS) =      16.77

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.10 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   248.00  DOWNSTREAM(FEET) =   247.50
  FLOW LENGTH(FEET) =    28.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.49
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.77
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    5.94
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.10 =     699.00 FEET.

+--------------------------------------------------------------------------+
| ON-SITE DETENTION SYSTEM                                                 |
| PEAK FLOW REDUCTION FROM Q100=16.77 CFS TO Q100=2.89 CFS                 |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    107.10 TO NODE    107.20 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN.) =    5.89   RAINFALL INTENSITY(INCH/HR) =  5.63
  EFFECTIVE AREA(ACRES) =     0.57
  TOTAL AREA(ACRES) =     3.60        PEAK FLOW RATE(CFS) =      2.89
  AREA-AVERAGED Fm(INCH/HR) =   0.02  AREA-AVERAGED Fp(INCH/HR) =   0.20
  AREA-AVERAGED Ap =  0.10
  NOTE: EFFECTIVE AREA IS USED AS THE TOTAL CONTRIBUTING AREA FOR ALL
        CONFLUENCE ANALYSES.

****************************************************************************
  FLOW PROCESS FROM NODE    107.20 TO NODE    108.00 IS CODE =  41
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   242.00  DOWNSTREAM(FEET) =   229.00
  FLOW LENGTH(FEET) =   128.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.85
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.89
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =    6.07
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =     827.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| AREA "B"                                                                 |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   121.00
  ELEVATION DATA: UPSTREAM(FEET) =    250.00  DOWNSTREAM(FEET) =    248.75

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.001
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.102
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  SCHOOL                     D        0.22      0.20     0.600    91    7.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA RUNOFF(CFS) =      0.99
  TOTAL AREA(ACRES) =      0.22   PEAK FLOW RATE(CFS) =      0.99

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   247.00  DOWNSTREAM(FEET) =   245.50
  FLOW LENGTH(FEET) =   152.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN   8.0 INCH PIPE IS   4.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.65
  GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.99
```

```
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =    7.55
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     273.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.55
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.887
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     D        0.14      0.20     0.600    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =    0.14      SUBAREA RUNOFF(CFS) =    0.60
  EFFECTIVE AREA(ACRES) =      0.36   AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.60
  TOTAL AREA(ACRES) =        0.4       PEAK FLOW RATE(CFS) =       1.54

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   245.50  DOWNSTREAM(FEET) =   243.90
  FLOW LENGTH(FEET) =   159.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  10.0 INCH PIPE IS   5.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.23
  GIVEN PIPE DIAMETER(INCH) =  10.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.54
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =    8.05
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     432.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.05
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.708
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.11      0.20     0.100    91
  COMMERCIAL                 D        0.12      0.20     0.100    91
  COMMERCIAL                 D        0.11      0.20     0.100    91
  SCHOOL                     D        0.11      0.20     0.600    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.222
  SUBAREA AREA(ACRES) =    0.45      SUBAREA RUNOFF(CFS) =    1.89
  EFFECTIVE AREA(ACRES) =      0.81   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =        0.8       PEAK FLOW RATE(CFS) =       3.38
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    304.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   243.90  DOWNSTREAM(FEET) =   243.00
  FLOW LENGTH(FEET) =    95.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.17
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.38
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    8.31
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    304.00 =     527.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.625
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     D        0.09      0.20     0.600    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =    0.09      SUBAREA RUNOFF(CFS) =    0.36
  EFFECTIVE AREA(ACRES) =      0.90   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =        0.9       PEAK FLOW RATE(CFS) =       3.68

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    305.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   243.00  DOWNSTREAM(FEET) =   242.00
  FLOW LENGTH(FEET) =    73.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.27
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.68
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    8.48
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    305.00 =     600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.48
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.572
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                   D        0.09      0.20     0.600    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =    0.09      SUBAREA RUNOFF(CFS) =    0.36
  EFFECTIVE AREA(ACRES) =      0.99   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.43
  TOTAL AREA(ACRES) =        1.0       PEAK FLOW RATE(CFS) =       4.00

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    108.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   242.00  DOWNSTREAM(FEET) =   229.00
  FLOW LENGTH(FEET) =    86.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.11
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.00
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    8.56
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    108.00 =     686.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        4.00    8.56    4.548  0.20( 0.09) 0.43       1.0     300.00
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    108.00 =     686.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        2.89    6.07    5.537  0.20( 0.02) 0.10       0.6     100.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =     827.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.35    6.07    5.537  0.20( 0.06) 0.28       1.3     100.00
      2        6.37    8.56    4.548  0.20( 0.06) 0.31       1.6     300.00
    TOTAL AREA(ACRES) =         4.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        6.37  Tc(MIN.) =    8.557
  EFFECTIVE AREA(ACRES) =      1.56  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.28
  TOTAL AREA(ACRES) =        4.6
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =     827.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    108.00 TO NODE    109.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   229.00  DOWNSTREAM(FEET) =   221.00
 FLOW LENGTH(FEET) =    36.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.55
 GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.37
 PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    8.59
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    109.00 =     863.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    8.59
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.538
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 D        0.13      0.20     0.100    91
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.13      SUBAREA RUNOFF(CFS) =    0.53
 EFFECTIVE AREA(ACRES) =      1.69   AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.29
 TOTAL AREA(ACRES) =        4.7       PEAK FLOW RATE(CFS) =       6.81

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        6.90    6.10    5.521  0.20( 0.05) 0.26       1.4     100.00
     2        6.81    8.59    4.538  0.20( 0.06) 0.29       1.7     300.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =       6.90  Tc(MIN.) =    6.10
 AREA-AVERAGED Fm(INCH/HR) =  0.05  AREA-AVERAGED Fp(INCH/HR) =  0.20
 AREA-AVERAGED Ap =  0.26  EFFECTIVE AREA(ACRES) =       1.40

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   221.00  DOWNSTREAM(FEET) =   210.00
 FLOW LENGTH(FEET) =    47.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  20.33
 GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.90
 PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    6.14
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     910.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| AREA "C"                                                                 |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   160.00
  ELEVATION DATA: UPSTREAM(FEET) =    262.00  DOWNSTREAM(FEET) =    248.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.987
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.581
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                D        0.09      0.20     0.850    91    5.99
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.09   PEAK FLOW RATE(CFS) =      0.44

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    402.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    248.00  DOWNSTREAM(FEET) =    217.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   270.00   CHANNEL SLOPE =  0.1148
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.291
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                D        0.20      0.20     0.850    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.72
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   0.58
  Tc(MIN.) =    6.57
  SUBAREA AREA(ACRES) =     0.20       SUBAREA RUNOFF(CFS) =    0.92
  EFFECTIVE AREA(ACRES) =      0.29     AREA-AVERAGED Fm(INCH/HR) =   0.17
  AREA-AVERAGED Fp(INCH/HR) =   0.20  AREA-AVERAGED Ap =   0.85
```

```
  TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   8.56
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    402.00 =     430.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.57
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.291
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.20      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.20      SUBAREA RUNOFF(CFS) =    0.95
  EFFECTIVE AREA(ACRES) =      0.49   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.54
  TOTAL AREA(ACRES) =        0.5       PEAK FLOW RATE(CFS) =       2.29

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   217.00  DOWNSTREAM(FEET) =   210.00
  FLOW LENGTH(FEET) =    22.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.69
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.29
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    6.59
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    110.00 =     452.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        2.29    6.59    5.281  0.20( 0.11) 0.54       0.5     400.00
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    110.00 =     452.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.90    6.14    5.501  0.20( 0.05) 0.26       1.4     100.00
      2        6.81    8.63    4.527  0.20( 0.06) 0.29       1.7     300.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     910.00 FEET.
```

```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.12    6.14    5.501  0.20( 0.07) 0.33       1.9     100.00
      2        9.17    6.59    5.281  0.20( 0.07) 0.34       1.9     400.00
      3        8.77    8.63    4.527  0.20( 0.07) 0.35       2.2     300.00
    TOTAL AREA(ACRES) =         5.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        9.17  Tc(MIN.) =    6.592
  EFFECTIVE AREA(ACRES) =      1.94  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.33
  TOTAL AREA(ACRES) =        5.2
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     910.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   210.00  DOWNSTREAM(FEET) =   209.75
  FLOW LENGTH(FEET) =     4.50   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.68
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.17
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    6.60
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    111.00 =     914.50 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        5.2  TC(MIN.) =      6.60
  EFFECTIVE AREA(ACRES) =      1.94  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.339
  PEAK FLOW RATE(CFS)   =       9.17

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.12    6.15    5.497  0.20( 0.07) 0.33       1.9     100.00
      2        9.17    6.60    5.278  0.20( 0.07) 0.34       1.9     400.00
      3        8.77    8.63    4.525  0.20( 0.07) 0.35       2.2     300.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
         (c) Copyright 1983-2008 Advanced Engineering Software (aes)
             Ver. 15.0  Release Date: 04/01/2008  License ID 1204

                          Analysis prepared by:
```

```
 ************************** DESCRIPTION OF STUDY **************************
* PROPOSED CONDITION - AREA "D" AND "E"                                  *
* 100-YEAR FREQUENCY STORM                                               *
* SOUTH SHORES CHURCH, DANA POINT, CA                                    *
 ************************************************************************

  FILE NAME: SSC-D-E.DAT
  TIME/DATE OF STUDY: 16:35 12/29/2014
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

+------------------------------------------------------------------------+
| AREA D                                                                 |
|                                                                        |
|                                                                        |
+------------------------------------------------------------------------+

************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    501.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   225.00
  ELEVATION DATA: UPSTREAM(FEET) =    270.00  DOWNSTREAM(FEET) =    229.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.440
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.352
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,NARROWLEAF"     D        0.06      0.20     1.000    98    6.44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.06   PEAK FLOW RATE(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   175.00
  ELEVATION DATA: UPSTREAM(FEET) =    250.00  DOWNSTREAM(FEET) =    192.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.168
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.071
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,NARROWLEAF"     D        0.24      0.20     1.000    98    5.17
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.27
  TOTAL AREA(ACRES) =      0.24   PEAK FLOW RATE(CFS) =      1.27

****************************************************************************
  FLOW PROCESS FROM NODE    700.00 TO NODE    701.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    54.00
  ELEVATION DATA: UPSTREAM(FEET) =    250.00  DOWNSTREAM(FEET) =    224.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,NARROWLEAF"     D        0.34      0.20     1.000    98    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.83
  TOTAL AREA(ACRES) =      0.34   PEAK FLOW RATE(CFS) =      1.83
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    42.00
  ELEVATION DATA: UPSTREAM(FEET) =    249.00  DOWNSTREAM(FEET) =    227.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,NARROWLEAF"     D        0.18      0.20     1.000    98    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.97
  TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.97

+----------------------------------------------------------------------------+
| AREA E                                                                     |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    901.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    71.50
  ELEVATION DATA: UPSTREAM(FEET) =    275.50  DOWNSTREAM(FEET) =    275.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 D        0.07      0.20     0.100    91    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.39
  TOTAL AREA(ACRES) =      0.07   PEAK FLOW RATE(CFS) =      0.39

****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    902.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  275.00  DOWNSTREAM ELEVATION(FEET) =  260.00
  STREET LENGTH(FEET) =   415.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
```

```
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.62
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    2.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.82
  STREET FLOW TRAVEL TIME(MIN.) =   1.68   Tc(MIN.) =    6.68
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.243
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 D        0.10      0.20     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.10      SUBAREA RUNOFF(CFS) =    0.47
  EFFECTIVE AREA(ACRES) =      0.17    AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.2        PEAK FLOW RATE(CFS) =       0.80

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.20   HALFSTREET FLOOD WIDTH(FEET) =   2.00
  FLOW VELOCITY(FEET/SEC.) =  4.13   DEPTH*VELOCITY(FT*FT/SEC.) =   0.82
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    902.00 =     486.50 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.2  TC(MIN.) =      6.68
  EFFECTIVE AREA(ACRES) =      0.17  AREA-AVERAGED Fm(INCH/HR)=  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =       0.80
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

X. On-Site Detention Basin Calculations

- **Detention Basin Volume & Outflow Calculations**
- **Y-Bar Calculations**
- **25-Year Frequency**
- **100-Year Frequency**

DETENTION BASIN SIZING

CALCULATION OF DETENTION BASIN OUTLET CAPACITY THE OUTLET CONSISTS OF A 7" HDPE PIPE AT THE OUTLET OF THE DETENTION BASIN. THE CAPACITY OF THE OUTLET IS BASED UPON THE SUBMERGED ORIFICE EQUATION. THE OUTFLOW RATE FOR THE SUBMERGED ORIFICE IS BASED, IN PART, BY THE HEAD DIFFERENCE BETWEEN THE WATER SURFACES ON EACH SIDE OF THE ORIFICE OPENING.

THE SUBMERGED ORIFICE EQUATION IS: $Q=0.60A(2G\Delta H)^{1/2}$ WHERE A IS THE OPENING AREA IN SF, ΔH IS THE DIFFERENCE IN DEPTHS ON EACH SIDE OF THE ORIFICE OPENING (MEASURED FROM THE CENTROID OF THE ORIFICE OPENING). G IS EQUAL TO 32.2 FPS.

AREA OF 7 INCH OPENING= 0.267 SQUARE FEET

DEPTH OF WATER IN BASIN (FTS)	ASSUMED DEPTH OF FLOW AT ORIFICE (FT)	CALCULATED, Q $Q=0.60A(2G\Delta H)^{1/2}$ (FT)	BASIN OUTLET INVERT ELEVATION (FT)	PONDED WATER SURFACE ELEVATION (FT)
0.50	0.292	0.59	242	242.50
1.00	0.292	1.08	242	243.00
1.50	0.292	1.41	242	243.50
2.00	0.292	1.68	242	244.00
2.50	0.292	1.91	242	244.50
3.00	0.292	2.12	242	245.00
3.50	0.292	2.30	242	245.50
4.00	0.292	2.48	242	246.00
4.50	0.292	2.64	242	246.50
5.00	0.292	2.79	242	247.00
5.67	0.292	2.98	242	247.67

SIZE AND INVERT ELEVATIONS OF UNDERGROUND STORAGE BASIN

BASIN NO	BASIN LENGTH	BASIN WIDTH	BASIN HEIGHT	BASIN AREA (SF)	OUTLET INVERT ELEV (FT)
1	75	28	5.67	2100	242

VOLUME OF UNDERGROUND STORAGE BASIN

DEPTH OF WATER IN BASIN (FT)	INCREMENTAL VOLUME (CUBIC FEET)	ACCUMULATED VOLUME (CUBIC FEET)	ACCUMULATED VOLUME (ACRE-FEET)
0	0	0	0
0.50	1050	1050	0.024
1.00	1050	2100	0.048
1.50	1050	3150	0.072
2.00	1050	4200	0.096
2.50	1050	5250	0.121
3.00	1050	6300	0.145
3.50	1050	7350	0.169
4.00	1050	8400	0.193
4.50	1050	9450	0.217
5.00	1050	10500	0.241
5.67	1407	11907	0.273

OUTFLOW RATING DATA FOR:
OUTFLOW WITH RESTRICTOR PLATE AT 18" DIAMETER OUTLET OF BASIN
SET TO CONSTRICT FLOWS WITH ONLY THE BOTTOM 0.875 FEET (10.5") OPEN.

PONDED WATER SURFACE ELEVATION (FT)	DEPTH OF FLOW AT BASIN OUTLET (FT)	ACCUMULATED VOLUME (ACRE-FEET)	OUTFLOW CFS
242	0	0.000	0
242.50	0.50	0.024	0.59
243.00	1.00	0.048	1.08
243.50	1.50	0.072	1.41
244.00	2.00	0.096	1.68
244.50	2.50	0.121	1.91
245.00	3.00	0.145	2.12
245.50	3.50	0.169	2.30
246.00	4.00	0.193	2.48
246.50	4.50	0.217	2.64
247.00	5.00	0.241	2.79
247.67	5.67	0.273	2.98

SOUTH SHORES CHURCH - DANA POINT
CALCULATION OF LOW LOSS RATE, Y_{BAR}

The low loss rate is required to perform hydrograph calculations. The low loss rate, Y_{BAR} is defined in the A38, formula (C.5) as:

$Y_{BAR} = 1-Y$

Where: $Y = \frac{(P_{24}-Ia)^2}{(P_{24}-Ia+S)P_{24}}$

P_{24}= 24-hour storm rainfall
Ia= 0.2 * S
$S = \frac{1000}{CN} - 10$

CN is found by utilizing the Orange County Hydrology Manual Figure C-3 and Figure C-4.
The AES software used to develop the peak flow rates lists the CN value for each sub-area.
A composite CN value is shown on Table 1. That composite is shown herein.

CN= 75

The CN value of 75 is for AMC Condition II
AMC I is used for 2- and 5- year storm events; AMC II is used for 10-, 25- and 50- year events; AMC III is used for the 100-year event.

Table C.1 of the Orange County Hydrology Manual shows that for an AMC II CN of 75 the AMC I CN is 57 and the AMC III CN is 91

The calculated values of S are:

(AMC III) $S = \frac{1000}{CN} - 10 = \frac{1000}{91} - 10 = 0.99$

(AMC II) $S = \frac{1000}{CN} - 10 = \frac{1000}{75} - 10 = 3.33$

(AMC I) $S = \frac{1000}{CN} - 10 = \frac{1000}{57} - 10 = 7.54$

And Ia= 02 * S

(AMCIII) Ia 0.99 * 0.2 = 0.20

(AMCII) Ia= 3.33 * 0.2 = 0.67

(AMCI) Ia= 7.54 * 0.2 = 1.51

SOUTH SHORES CHURCH - DANA POINT
CALCULATION OF LOW LOSS RATE, Y_{BAR}

Y_{BAR} = 1-Y and $Y = \frac{(P_{24}-Ia)^2}{(P_{24}-Ia+S)P_{24}}$

For 100-year event, AMC III

P_{24}= 5.63 inches per the Table B.1 from the Orange County Hydrology Manual

$Y = \frac{(5.63-0.20)^2}{(5.63-0.20+0.92)*5.63}$

= 0.82

AMC III Y_{BAR} = 1-Y

= 0.18

For 25-year event, AMC II

P_{24}= 4.49 inches per the Table B.1 from the Orange County Hydrology Manual

$Y = \frac{(4.49-0.67)^2}{(4.49-0.67+3.09)*4.49}$

= 0.45

AMC II Y_{BAR} = 1-Y

= **0.55**

For 10-year event, AMC II

P_{24}= 3.68 inches per the Table B.1 from the Orange County Hydrology Manual

$Y = \frac{(3.68-0.67)^2}{(3.68-0.67+3.09)*3.68}$

= 0.39

AMC II Y_{BAR} = 1-Y

= 0.61

For 5-year event, AMC I

P_{24}= 3.03 inches per the Table B.1 from the Orange County Hydrology Manual

$Y = \frac{(3.03-1.51)^2}{3.03-1.51+7.18)*3.03}$

= 0.08

AMC I Y_{BAR} = 1-Y

= 0.92

SOUTH SHORES CHURCH - DANA POINT
CALCULATION OF LOW LOSS RATE, Y_{BAR}

For 2-year event, AMC I

P_{24}= 2.05 inches per the Table B.1 from the Orange County Hydrology Manual

$$Y = \frac{(2.05-1.44)^2}{2.05-1.44+7.18)*2.05}$$

$$= 0.02$$

AMC I Y_{BAR} = 1-Y

= 0.98

SOUTH SHORES CHURCH - DANA POINT

WEIGHTED CN (AMC II) BASED UPON RATIONAL METHOD (AES)
PRINTOUT FOR THE 25YEAR-YEAR PEAK FLOW RATES

SUB-AREA	AREA	CN (AMCII)	WEIGHTED CN
A-1	0.03	75	2.25
A-2	0.09	75	6.75
A-3	0.30	75	22.50
A-4	0.07	75	5.25
A-5	0.12	75	9.00
A-6	0.23	75	17.25
A-7	0.40	75	30.00
A-8	0.29	75	21.75
A-9	0.52	75	39.00
A-10	0.81	75	60.75
A-11	0.52	75	39.00
A-12	0.21	75	15.75
SUM	3.59		269.25
AVERAGE		**75.0**	

SOUTH SHORES CHURCH - DANA POINT

WEIGHTED CN (AMC II) BASED UPON RATIONAL METHOD (AES)
PRINTOUT FOR THE 25YEAR-YEAR PEAK FLOW RATES

SUB-AREA	AREA	CN (AMCII)	% Pervious	Weighted %
A-1	0.03	75	0.10	0.00
A-2	0.09	75	0.10	0.01
A-3	0.30	75	0.10	0.03
A-4	0.07	75	0.10	0.01
A-5	0.12	75	0.10	0.01
A-6	0.23	75	0.10	0.02
A-7	0.40	75	0.10	0.04
A-8	0.29	75	0.10	0.03
A-9	0.52	75	0.10	0.05
A-10	0.81	75	0.10	0.08
A-11	0.52	75	0.10	0.05
A-12	0.21	75	0.10	0.02
SUM	2.86			0.286
AVERAGE				**10%**

```
**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
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             Ver. 15.0  Release Date: 04/01/2008  License ID 1204

                          Analysis prepared by:




**************************************************************************
--------------------------------------------------------------------------

 Problem Descriptions:
  25-YEAR FREQUENCY
  HYDROGRAPH
  SOUTH SHORES CHURCH, DANA POINT, CA
--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    3.59
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.200
    LOW LOSS FRACTION = 0.550
    TIME OF CONCENTRATION(MIN.) =  5.89
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =  25
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.40
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.87
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.15
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  1.94
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.71
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  4.49

--------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.67
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.67

**************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.10      0.0004      0.10  Q         .         .         .         .
  0.20      0.0012      0.10  Q         .         .         .         .
  0.29      0.0020      0.10  Q         .         .         .         .
  0.39      0.0028      0.10  Q         .         .         .         .
  0.49      0.0036      0.10  Q         .         .         .         .
  0.59      0.0045      0.10  Q         .         .         .         .
  0.69      0.0053      0.10  Q         .         .         .         .
  0.78      0.0061      0.10  Q         .         .         .         .
  0.88      0.0069      0.10  Q         .         .         .         .
  0.98      0.0078      0.10  Q         .         .         .         .
  1.08      0.0086      0.10  Q         .         .         .         .
  1.18      0.0094      0.10  Q         .         .         .         .
  1.28      0.0103      0.10  Q         .         .         .         .
  1.37      0.0111      0.10  Q         .         .         .         .
  1.47      0.0120      0.10  Q         .         .         .         .
```

1.57	0.0128	0.11	Q	.	.	.	.
1.67	0.0137	0.11	Q	.	.	.	.
1.77	0.0146	0.11	Q	.	.	.	.
1.86	0.0154	0.11	Q	.	.	.	.
1.96	0.0163	0.11	Q	.	.	.	.
2.06	0.0172	0.11	Q	.	.	.	.
2.16	0.0180	0.11	Q	.	.	.	.
2.26	0.0189	0.11	Q	.	.	.	.
2.35	0.0198	0.11	Q	.	.	.	.
2.45	0.0207	0.11	Q	.	.	.	.
2.55	0.0216	0.11	Q	.	.	.	.
2.65	0.0225	0.11	Q	.	.	.	.
2.75	0.0234	0.11	Q	.	.	.	.
2.85	0.0243	0.11	Q	.	.	.	.
2.94	0.0252	0.11	Q	.	.	.	.
3.04	0.0261	0.11	Q	.	.	.	.
3.14	0.0270	0.11	Q	.	.	.	.
3.24	0.0279	0.11	Q	.	.	.	.
3.34	0.0289	0.11	Q	.	.	.	.
3.43	0.0298	0.11	Q	.	.	.	.
3.53	0.0307	0.12	Q	.	.	.	.
3.63	0.0317	0.12	Q	.	.	.	.
3.73	0.0326	0.12	Q	.	.	.	.
3.83	0.0336	0.12	Q	.	.	.	.
3.93	0.0345	0.12	Q	.	.	.	.
4.02	0.0355	0.12	Q	.	.	.	.
4.12	0.0365	0.12	Q	.	.	.	.
4.22	0.0374	0.12	Q	.	.	.	.
4.32	0.0384	0.12	Q	.	.	.	.
4.42	0.0394	0.12	Q	.	.	.	.
4.51	0.0404	0.12	Q	.	.	.	.
4.61	0.0414	0.12	Q	.	.	.	.
4.71	0.0423	0.12	Q	.	.	.	.
4.81	0.0433	0.12	Q	.	.	.	.
4.91	0.0444	0.12	Q	.	.	.	.
5.01	0.0454	0.13	Q	.	.	.	.
5.10	0.0464	0.13	Q	.	.	.	.
5.20	0.0474	0.13	Q	.	.	.	.
5.30	0.0484	0.13	Q	.	.	.	.
5.40	0.0495	0.13	Q	.	.	.	.
5.50	0.0505	0.13	Q	.	.	.	.
5.59	0.0516	0.13	Q	.	.	.	.
5.69	0.0526	0.13	Q	.	.	.	.
5.79	0.0537	0.13	Q	.	.	.	.
5.89	0.0547	0.13	Q	.	.	.	.
5.99	0.0558	0.13	Q	.	.	.	.
6.09	0.0569	0.13	Q	.	.	.	.
6.18	0.0580	0.13	Q	.	.	.	.
6.28	0.0591	0.14	Q	.	.	.	.
6.38	0.0602	0.14	Q	.	.	.	.
6.48	0.0613	0.14	Q	.	.	.	.
6.58	0.0624	0.14	Q	.	.	.	.
6.67	0.0635	0.14	Q	.	.	.	.
6.77	0.0647	0.14	Q	.	.	.	.
6.87	0.0658	0.14	Q	.	.	.	.
6.97	0.0669	0.14	Q	.	.	.	.
7.07	0.0681	0.14	Q	.	.	.	.
7.17	0.0693	0.14	Q	.	.	.	.
7.26	0.0704	0.14	Q	.	.	.	.
7.36	0.0716	0.15	Q	.	.	.	.
7.46	0.0728	0.15	Q	.	.	.	.
7.56	0.0740	0.15	Q	.	.	.	.
7.66	0.0752	0.15	Q	.	.	.	.

7.75	0.0764	0.15	Q	.	.	.	.
7.85	0.0776	0.15	Q	.	.	.	.
7.95	0.0789	0.15	Q	.	.	.	.
8.05	0.0801	0.15	Q	.	.	.	.
8.15	0.0814	0.15	Q	.	.	.	.
8.24	0.0826	0.16	Q	.	.	.	.
8.34	0.0839	0.16	Q	.	.	.	.
8.44	0.0852	0.16	Q	.	.	.	.
8.54	0.0865	0.16	Q	.	.	.	.
8.64	0.0878	0.16	Q	.	.	.	.
8.74	0.0891	0.16	Q	.	.	.	.
8.83	0.0904	0.16	Q	.	.	.	.
8.93	0.0917	0.17	Q	.	.	.	.
9.03	0.0931	0.17	Q	.	.	.	.
9.13	0.0944	0.17	Q	.	.	.	.
9.23	0.0958	0.17	Q	.	.	.	.
9.32	0.0972	0.17	Q	.	.	.	.
9.42	0.0986	0.17	Q	.	.	.	.
9.52	0.1000	0.17	Q	.	.	.	.
9.62	0.1014	0.18	Q	.	.	.	.
9.72	0.1029	0.18	Q	.	.	.	.
9.82	0.1043	0.18	Q	.	.	.	.
9.91	0.1058	0.18	Q	.	.	.	.
10.01	0.1073	0.18	Q	.	.	.	.
10.11	0.1088	0.19	Q	.	.	.	.
10.21	0.1103	0.19	Q	.	.	.	.
10.31	0.1118	0.19	Q	.	.	.	.
10.40	0.1133	0.19	Q	.	.	.	.
10.50	0.1149	0.19	Q	.	.	.	.
10.60	0.1165	0.20	Q	.	.	.	.
10.70	0.1181	0.20	Q	.	.	.	.
10.80	0.1197	0.20	Q	.	.	.	.
10.90	0.1213	0.20	Q	.	.	.	.
10.99	0.1230	0.21	Q	.	.	.	.
11.09	0.1247	0.21	Q	.	.	.	.
11.19	0.1264	0.21	Q	.	.	.	.
11.29	0.1281	0.21	Q	.	.	.	.
11.39	0.1298	0.22	Q	.	.	.	.
11.48	0.1316	0.22	Q	.	.	.	.
11.58	0.1334	0.22	Q	.	.	.	.
11.68	0.1352	0.22	Q	.	.	.	.
11.78	0.1370	0.23	Q	.	.	.	.
11.88	0.1389	0.23	Q	.	.	.	.
11.98	0.1408	0.24	Q	.	.	.	.
12.07	0.1427	0.25	Q	.	.	.	.
12.17	0.1450	0.32	Q	.	.	.	.
12.27	0.1477	0.32	Q	.	.	.	.
12.37	0.1503	0.33	Q	.	.	.	.
12.47	0.1530	0.33	Q	.	.	.	.
12.56	0.1557	0.34	Q	.	.	.	.
12.66	0.1585	0.34	Q	.	.	.	.
12.76	0.1613	0.35	Q	.	.	.	.
12.86	0.1642	0.35	Q	.	.	.	.
12.96	0.1671	0.36	Q	.	.	.	.
13.05	0.1700	0.36	Q	.	.	.	.
13.15	0.1730	0.37	Q	.	.	.	.
13.25	0.1760	0.38	Q	.	.	.	.
13.35	0.1791	0.39	Q	.	.	.	.
13.45	0.1823	0.39	Q	.	.	.	.
13.55	0.1855	0.40	Q	.	.	.	.
13.64	0.1888	0.41	Q	.	.	.	.
13.74	0.1922	0.42	Q	.	.	.	.
13.84	0.1956	0.43	Q	.	.	.	.

13.94	0.1991	0.44	Q	.	.	.	.	
14.04	0.2027	0.45	Q	.	.	.	.	
14.13	0.2064	0.46	Q	.	.	.	.	
14.23	0.2101	0.46	Q	.	.	.	.	
14.33	0.2139	0.48	Q	.	.	.	.	
14.43	0.2179	0.49	Q	.	.	.	.	
14.53	0.2220	0.51	.Q	.	.	.	.	
14.63	0.2262	0.53	.Q	.	.	.	.	
14.72	0.2307	0.58	.Q	.	.	.	.	
14.82	0.2355	0.61	.Q	.	.	.	.	
14.92	0.2408	0.69	.Q	.	.	.	.	
15.02	0.2465	0.73	.Q	.	.	.	.	
15.12	0.2528	0.82	.Q	.	.	.	.	
15.21	0.2597	0.88	.Q	.	.	.	.	
15.31	0.2674	1.01	. Q	.	.	.	.	
15.41	0.2757	1.04	. Q	.	.	.	.	
15.51	0.2841	1.02	. Q	.	.	.	.	
15.61	0.2929	1.15	. Q	.	.	.	.	
15.71	0.3038	1.53	. Q	.	.	.	.	
15.80	0.3180	1.97	. Q	.	.	.	.	
15.90	0.3383	3.02	. Q	.	.	.	.	
16.00	0.3681	4.31	. Q	.	.	.	.	
16.10	0.4403	13.49	.	.	.	Q	.	
16.20	0.5046	2.38	. Q	.	.	.	.	
16.29	0.5196	1.31	. Q	.	.	.	.	
16.39	0.5286	0.91	.Q	.	.	.	.	
16.49	0.5362	0.94	.Q	.	.	.	.	
16.59	0.5431	0.77	.Q	.	.	.	.	
16.69	0.5489	0.65	.Q	.	.	.	.	
16.79	0.5538	0.55	.Q	.	.	.	.	
16.88	0.5580	0.50	.Q	.	.	.	.	
16.98	0.5620	0.47	Q	.	.	.	.	
17.08	0.5657	0.45	Q	.	.	.	.	
17.18	0.5693	0.43	Q	.	.	.	.	
17.28	0.5727	0.41	Q	.	.	.	.	
17.37	0.5760	0.40	Q	.	.	.	.	
17.47	0.5792	0.38	Q	.	.	.	.	
17.57	0.5822	0.37	Q	.	.	.	.	
17.67	0.5852	0.36	Q	.	.	.	.	
17.77	0.5880	0.35	Q	.	.	.	.	
17.87	0.5908	0.34	Q	.	.	.	.	
17.96	0.5935	0.33	Q	.	.	.	.	
18.06	0.5961	0.32	Q	.	.	.	.	
18.16	0.5983	0.23	Q	.	.	.	.	
18.26	0.6002	0.23	Q	.	.	.	.	
18.36	0.6020	0.22	Q	.	.	.	.	
18.45	0.6038	0.21	Q	.	.	.	.	
18.55	0.6055	0.21	Q	.	.	.	.	
18.65	0.6072	0.20	Q	.	.	.	.	
18.75	0.6088	0.20	Q	.	.	.	.	
18.85	0.6104	0.19	Q	.	.	.	.	
18.94	0.6120	0.19	Q	.	.	.	.	
19.04	0.6135	0.19	Q	.	.	.	.	
19.14	0.6150	0.18	Q	.	.	.	.	
19.24	0.6165	0.18	Q	.	.	.	.	
19.34	0.6179	0.18	Q	.	.	.	.	
19.44	0.6193	0.17	Q	.	.	.	.	
19.53	0.6207	0.17	Q	.	.	.	.	
19.63	0.6221	0.17	Q	.	.	.	.	
19.73	0.6234	0.16	Q	.	.	.	.	
19.83	0.6247	0.16	Q	.	.	.	.	
19.93	0.6260	0.16	Q	.	.	.	.	
20.02	0.6273	0.16	Q	.	.	.	.	

20.12	0.6285	0.15	Q	.	.	.	.
20.22	0.6297	0.15	Q	.	.	.	.
20.32	0.6310	0.15	Q	.	.	.	.
20.42	0.6322	0.15	Q	.	.	.	.
20.52	0.6333	0.14	Q	.	.	.	.
20.61	0.6345	0.14	Q	.	.	.	.
20.71	0.6356	0.14	Q	.	.	.	.
20.81	0.6368	0.14	Q	.	.	.	.
20.91	0.6379	0.14	Q	.	.	.	.
21.01	0.6390	0.13	Q	.	.	.	.
21.10	0.6401	0.13	Q	.	.	.	.
21.20	0.6412	0.13	Q	.	.	.	.
21.30	0.6422	0.13	Q	.	.	.	.
21.40	0.6433	0.13	Q	.	.	.	.
21.50	0.6443	0.13	Q	.	.	.	.
21.60	0.6453	0.13	Q	.	.	.	.
21.69	0.6463	0.12	Q	.	.	.	.
21.79	0.6473	0.12	Q	.	.	.	.
21.89	0.6483	0.12	Q	.	.	.	.
21.99	0.6493	0.12	Q	.	.	.	.
22.09	0.6503	0.12	Q	.	.	.	.
22.18	0.6512	0.12	Q	.	.	.	.
22.28	0.6522	0.12	Q	.	.	.	.
22.38	0.6531	0.12	Q	.	.	.	.
22.48	0.6541	0.11	Q	.	.	.	.
22.58	0.6550	0.11	Q	.	.	.	.
22.68	0.6559	0.11	Q	.	.	.	.
22.77	0.6568	0.11	Q	.	.	.	.
22.87	0.6577	0.11	Q	.	.	.	.
22.97	0.6586	0.11	Q	.	.	.	.
23.07	0.6595	0.11	Q	.	.	.	.
23.17	0.6603	0.11	Q	.	.	.	.
23.26	0.6612	0.11	Q	.	.	.	.
23.36	0.6621	0.11	Q	.	.	.	.
23.46	0.6629	0.10	Q	.	.	.	.
23.56	0.6637	0.10	Q	.	.	.	.
23.66	0.6646	0.10	Q	.	.	.	.
23.76	0.6654	0.10	Q	.	.	.	.
23.85	0.6662	0.10	Q	.	.	.	.
23.95	0.6670	0.10	Q	.	.	.	.
24.05	0.6679	0.10	Q	.	.	.	.
24.15	0.6683	0.00	Q	.	.	.	.

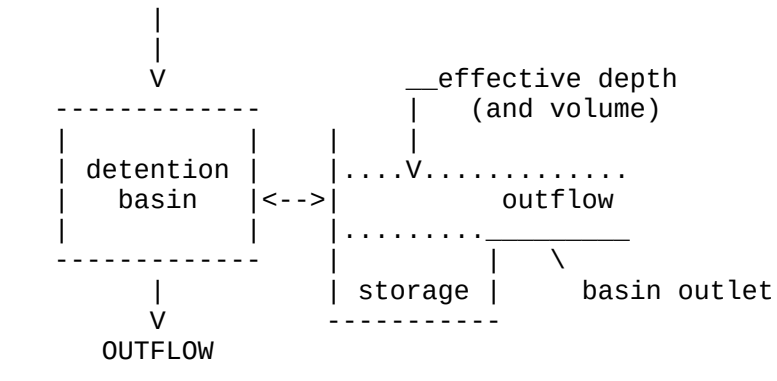
Problem Descriptions:
25-YEAR FREQUENCY
ON-SITE DETENTION SYSTEM
SOUTH SHORES CHURCH, DANA POINT, CA

==========

FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 5.890
DEAD STORAGE(AF) = 0.00
SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00

INFLOW
|



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 12

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	**BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)
0.000	0.000	0.000**	0.500	0.024	0.590*
1.000	0.048	1.080**	1.500	0.072	1.410*
2.000	0.096	1.680**	2.500	0.121	1.910*
3.000	0.145	2.120**	3.500	0.169	2.300*
4.000	0.193	2.480**	4.500	0.217	2.640*
5.000	0.241	2.790**	5.670	0.273	2.980*

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	DEPTH (FEET)	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)
1	0.00	0.00000	0.00000
2	0.50	0.02161	0.02639
3	1.00	0.04362	0.05238
4	1.50	0.06628	0.07772
5	2.00	0.08919	0.10281
6	2.50	0.11325	0.12875
7	3.00	0.13640	0.15360
8	3.50	0.15967	0.17833
9	4.00	0.18294	0.20306
10	4.50	0.20629	0.22771
11	5.00	0.22968	0.25232
12	5.67	0.26091	0.28509

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)

DETENTION BASIN ROUTING RESULTS:
NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	EFFECTIVE DEPTH(FT)	OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.097	0.000	0.10	0.02	0.01	0.001
0.195	0.000	0.10	0.03	0.03	0.001
0.293	0.000	0.10	0.04	0.04	0.002
0.392	0.000	0.10	0.05	0.05	0.002
0.490	0.000	0.10	0.05	0.06	0.003
0.588	0.000	0.10	0.06	0.07	0.003
0.686	0.000	0.10	0.06	0.07	0.003
0.784	0.000	0.10	0.07	0.08	0.003
0.882	0.000	0.10	0.07	0.08	0.003
0.981	0.000	0.10	0.07	0.09	0.004
1.079	0.000	0.10	0.08	0.09	0.004
1.177	0.000	0.10	0.08	0.09	0.004
1.275	0.000	0.10	0.08	0.09	0.004

1.373	0.000	0.10	0.08	0.10	0.004
1.471	0.000	0.10	0.08	0.10	0.004
1.570	0.000	0.11	0.08	0.10	0.004
1.668	0.000	0.11	0.09	0.10	0.004
1.766	0.000	0.11	0.09	0.10	0.004
1.864	0.000	0.11	0.09	0.10	0.004
1.962	0.000	0.11	0.09	0.10	0.004
2.060	0.000	0.11	0.09	0.10	0.004
2.159	0.000	0.11	0.09	0.10	0.004
2.257	0.000	0.11	0.09	0.11	0.004
2.355	0.000	0.11	0.09	0.11	0.004
2.453	0.000	0.11	0.09	0.11	0.004
2.551	0.000	0.11	0.09	0.11	0.004
2.649	0.000	0.11	0.09	0.11	0.004
2.748	0.000	0.11	0.09	0.11	0.004
2.846	0.000	0.11	0.09	0.11	0.004
2.944	0.000	0.11	0.09	0.11	0.004
3.042	0.000	0.11	0.09	0.11	0.004
3.140	0.000	0.11	0.09	0.11	0.005
3.238	0.000	0.11	0.09	0.11	0.005
3.337	0.000	0.11	0.09	0.11	0.005
3.435	0.000	0.11	0.10	0.11	0.005
3.533	0.000	0.12	0.10	0.11	0.005
3.631	0.000	0.12	0.10	0.11	0.005
3.729	0.000	0.12	0.10	0.11	0.005
3.827	0.000	0.12	0.10	0.11	0.005
3.926	0.000	0.12	0.10	0.12	0.005
4.024	0.000	0.12	0.10	0.12	0.005
4.122	0.000	0.12	0.10	0.12	0.005
4.220	0.000	0.12	0.10	0.12	0.005
4.318	0.000	0.12	0.10	0.12	0.005
4.416	0.000	0.12	0.10	0.12	0.005
4.515	0.000	0.12	0.10	0.12	0.005
4.613	0.000	0.12	0.10	0.12	0.005
4.711	0.000	0.12	0.10	0.12	0.005
4.809	0.000	0.12	0.10	0.12	0.005
4.907	0.000	0.12	0.10	0.12	0.005
5.005	0.000	0.13	0.10	0.12	0.005
5.104	0.000	0.13	0.10	0.12	0.005
5.202	0.000	0.13	0.10	0.12	0.005
5.300	0.000	0.13	0.11	0.12	0.005
5.398	0.000	0.13	0.11	0.12	0.005
5.496	0.000	0.13	0.11	0.13	0.005
5.594	0.000	0.13	0.11	0.13	0.005
5.693	0.000	0.13	0.11	0.13	0.005
5.791	0.000	0.13	0.11	0.13	0.005
5.889	0.000	0.13	0.11	0.13	0.005
5.987	0.000	0.13	0.11	0.13	0.005
6.085	0.000	0.13	0.11	0.13	0.005
6.183	0.000	0.13	0.11	0.13	0.005
6.282	0.000	0.14	0.11	0.13	0.005
6.380	0.000	0.14	0.11	0.13	0.005
6.478	0.000	0.14	0.11	0.13	0.005
6.576	0.000	0.14	0.11	0.13	0.005
6.674	0.000	0.14	0.11	0.13	0.005
6.772	0.000	0.14	0.12	0.14	0.006
6.871	0.000	0.14	0.12	0.14	0.006
6.969	0.000	0.14	0.12	0.14	0.006
7.067	0.000	0.14	0.12	0.14	0.006
7.165	0.000	0.14	0.12	0.14	0.006
7.263	0.000	0.14	0.12	0.14	0.006
7.361	0.000	0.15	0.12	0.14	0.006
7.460	0.000	0.15	0.12	0.14	0.006

7.558	0.000	0.15	0.12	0.14	0.006
7.656	0.000	0.15	0.12	0.14	0.006
7.754	0.000	0.15	0.12	0.14	0.006
7.852	0.000	0.15	0.12	0.15	0.006
7.950	0.000	0.15	0.13	0.15	0.006
8.049	0.000	0.15	0.13	0.15	0.006
8.147	0.000	0.15	0.13	0.15	0.006
8.245	0.000	0.16	0.13	0.15	0.006
8.343	0.000	0.16	0.13	0.15	0.006
8.441	0.000	0.16	0.13	0.15	0.006
8.539	0.000	0.16	0.13	0.15	0.006
8.637	0.000	0.16	0.13	0.15	0.006
8.736	0.000	0.16	0.13	0.16	0.006
8.834	0.000	0.16	0.13	0.16	0.006
8.932	0.000	0.17	0.14	0.16	0.006
9.030	0.000	0.17	0.14	0.16	0.007
9.128	0.000	0.17	0.14	0.16	0.007
9.227	0.000	0.17	0.14	0.16	0.007
9.325	0.000	0.17	0.14	0.16	0.007
9.423	0.000	0.17	0.14	0.17	0.007
9.521	0.000	0.17	0.14	0.17	0.007
9.619	0.000	0.18	0.14	0.17	0.007
9.717	0.000	0.18	0.14	0.17	0.007
9.816	0.000	0.18	0.15	0.17	0.007
9.914	0.000	0.18	0.15	0.17	0.007
10.012	0.000	0.18	0.15	0.18	0.007
10.110	0.000	0.19	0.15	0.18	0.007
10.208	0.000	0.19	0.15	0.18	0.007
10.306	0.000	0.19	0.15	0.18	0.007
10.405	0.000	0.19	0.16	0.18	0.007
10.503	0.000	0.19	0.16	0.18	0.008
10.601	0.000	0.20	0.16	0.19	0.008
10.699	0.000	0.20	0.16	0.19	0.008
10.797	0.000	0.20	0.16	0.19	0.008
10.895	0.000	0.20	0.16	0.19	0.008
10.993	0.000	0.21	0.17	0.19	0.008
11.092	0.000	0.21	0.17	0.20	0.008
11.190	0.000	0.21	0.17	0.20	0.008
11.288	0.000	0.21	0.17	0.20	0.008
11.386	0.000	0.22	0.17	0.20	0.008
11.484	0.000	0.22	0.18	0.21	0.008
11.583	0.000	0.22	0.18	0.21	0.009
11.681	0.000	0.22	0.18	0.21	0.009
11.779	0.000	0.23	0.18	0.21	0.009
11.877	0.000	0.23	0.19	0.22	0.009
11.975	0.000	0.24	0.19	0.22	0.009
12.073	0.000	0.25	0.19	0.22	0.009
12.171	0.000	0.32	0.21	0.23	0.010
12.270	0.000	0.32	0.22	0.25	0.010
12.368	0.000	0.33	0.23	0.26	0.011
12.466	0.000	0.33	0.24	0.28	0.011
12.564	0.000	0.34	0.25	0.29	0.012
12.662	0.000	0.34	0.26	0.30	0.012
12.760	0.000	0.35	0.26	0.31	0.013
12.859	0.000	0.35	0.27	0.31	0.013
12.957	0.000	0.36	0.28	0.32	0.013
13.055	0.000	0.36	0.28	0.33	0.014
13.153	0.000	0.37	0.29	0.34	0.014
13.251	0.000	0.38	0.29	0.34	0.014
13.350	0.000	0.39	0.30	0.35	0.014
13.448	0.000	0.39	0.31	0.36	0.015
13.546	0.000	0.40	0.31	0.36	0.015
13.644	0.000	0.41	0.32	0.37	0.015

13.742	0.000	0.42	0.33	0.38	0.016
13.840	0.000	0.43	0.33	0.39	0.016
13.939	0.000	0.44	0.34	0.40	0.016
14.037	0.000	0.45	0.35	0.40	0.017
14.135	0.000	0.46	0.35	0.41	0.017
14.233	0.000	0.46	0.36	0.42	0.017
14.331	0.000	0.48	0.37	0.43	0.018
14.429	0.000	0.49	0.38	0.44	0.018
14.528	0.000	0.51	0.39	0.45	0.019
14.626	0.000	0.53	0.40	0.46	0.019
14.724	0.000	0.58	0.42	0.48	0.020
14.822	0.000	0.61	0.43	0.50	0.021
14.920	0.000	0.69	0.46	0.53	0.022
15.018	0.000	0.73	0.49	0.56	0.023
15.116	0.000	0.82	0.53	0.60	0.025
15.215	0.000	0.88	0.57	0.64	0.027
15.313	0.000	1.01	0.62	0.68	0.030
15.411	0.000	1.04	0.68	0.74	0.032
15.509	0.000	1.02	0.72	0.78	0.034
15.607	0.000	1.15	0.77	0.83	0.037
15.706	0.000	1.53	0.88	0.91	0.042
15.804	0.000	1.97	1.04	1.03	0.050
15.902	0.000	3.02	1.34	1.21	0.064
16.000	0.000	4.31	1.83	1.45	0.088
16.098	0.000	13.49	3.75	1.99	0.181
16.196	0.000	2.38	3.75	2.39	0.181
16.295	0.000	1.31	3.57	2.36	0.172
16.393	0.000	0.91	3.34	2.28	0.161
16.491	0.000	0.94	3.13	2.20	0.151
16.589	0.000	0.77	2.90	2.12	0.140
16.687	0.000	0.65	2.67	2.03	0.129
16.785	0.000	0.55	2.44	1.93	0.118
16.884	0.000	0.50	2.22	1.83	0.107
16.982	0.000	0.47	2.02	1.73	0.097
17.080	0.000	0.45	1.82	1.63	0.087
17.178	0.000	0.43	1.63	1.53	0.078
17.276	0.000	0.41	1.46	1.43	0.070
17.374	0.000	0.40	1.30	1.33	0.062
17.472	0.000	0.38	1.16	1.23	0.056
17.571	0.000	0.37	1.03	1.14	0.049
17.669	0.000	0.36	0.91	1.04	0.044
17.767	0.000	0.35	0.81	0.94	0.039
17.865	0.000	0.34	0.72	0.85	0.035
17.963	0.000	0.33	0.65	0.77	0.031
18.061	0.000	0.32	0.58	0.70	0.028
18.160	0.000	0.23	0.51	0.64	0.025
18.258	0.000	0.23	0.46	0.57	0.022
18.356	0.000	0.22	0.41	0.51	0.020
18.454	0.000	0.21	0.37	0.46	0.018
18.552	0.000	0.21	0.33	0.41	0.016
18.651	0.000	0.20	0.30	0.37	0.015
18.749	0.000	0.20	0.28	0.34	0.013
18.847	0.000	0.19	0.26	0.32	0.012
18.945	0.000	0.19	0.24	0.29	0.012
19.043	0.000	0.19	0.23	0.28	0.011
19.141	0.000	0.18	0.21	0.26	0.010
19.240	0.000	0.18	0.20	0.24	0.010
19.338	0.000	0.18	0.19	0.23	0.009
19.436	0.000	0.17	0.18	0.22	0.009
19.534	0.000	0.17	0.18	0.21	0.008
19.632	0.000	0.17	0.17	0.20	0.008
19.730	0.000	0.16	0.16	0.20	0.008
19.828	0.000	0.16	0.16	0.19	0.008

19.927	0.000	0.16	0.15	0.18	0.007
20.025	0.000	0.16	0.15	0.18	0.007
20.123	0.000	0.15	0.15	0.18	0.007
20.221	0.000	0.15	0.14	0.17	0.007
20.319	0.000	0.15	0.14	0.17	0.007
20.418	0.000	0.15	0.14	0.16	0.007
20.516	0.000	0.14	0.13	0.16	0.006
20.614	0.000	0.14	0.13	0.16	0.006
20.712	0.000	0.14	0.13	0.15	0.006
20.810	0.000	0.14	0.13	0.15	0.006
20.908	0.000	0.14	0.13	0.15	0.006
21.007	0.000	0.13	0.12	0.15	0.006
21.105	0.000	0.13	0.12	0.14	0.006
21.203	0.000	0.13	0.12	0.14	0.006
21.301	0.000	0.13	0.12	0.14	0.006
21.399	0.000	0.13	0.12	0.14	0.006
21.497	0.000	0.13	0.11	0.14	0.006
21.595	0.000	0.13	0.11	0.13	0.005
21.694	0.000	0.12	0.11	0.13	0.005
21.792	0.000	0.12	0.11	0.13	0.005
21.890	0.000	0.12	0.11	0.13	0.005
21.988	0.000	0.12	0.11	0.13	0.005
22.086	0.000	0.12	0.11	0.13	0.005
22.184	0.000	0.12	0.11	0.12	0.005
22.283	0.000	0.12	0.10	0.12	0.005
22.381	0.000	0.12	0.10	0.12	0.005
22.479	0.000	0.11	0.10	0.12	0.005
22.577	0.000	0.11	0.10	0.12	0.005
22.675	0.000	0.11	0.10	0.12	0.005
22.774	0.000	0.11	0.10	0.12	0.005
22.872	0.000	0.11	0.10	0.12	0.005
22.970	0.000	0.11	0.10	0.11	0.005
23.068	0.000	0.11	0.10	0.11	0.005
23.166	0.000	0.11	0.09	0.11	0.005
23.264	0.000	0.11	0.09	0.11	0.005
23.362	0.000	0.11	0.09	0.11	0.004
23.461	0.000	0.10	0.09	0.11	0.004
23.559	0.000	0.10	0.09	0.11	0.004
23.657	0.000	0.10	0.09	0.11	0.004
23.755	0.000	0.10	0.09	0.11	0.004
23.853	0.000	0.10	0.09	0.11	0.004
23.951	0.000	0.10	0.09	0.10	0.004
24.050	0.000	0.10	0.09	0.10	0.004
24.148	0.000	0.00	0.07	0.09	0.003

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**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
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                          Analysis prepared by:

                         Adams-Streeter Civil Engineers, Inc.
                         15 Corporate Park, Irvine, CA 92606



**************************************************************************
--------------------------------------------------------------------------

 Problem Descriptions:
  100-YEAR FREQUENCY
  HYDROGRAPH
  SOUTH SHORES CHURCH, DANA POINT, CA
--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    3.59
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.200
    LOW LOSS FRACTION = 0.180
    TIME OF CONCENTRATION(MIN.) =  5.89
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.52
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  1.09
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.45
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.43
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.36
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.63

--------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.26
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.42

**************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.10      0.0009      0.23  Q         .         .         .         .
  0.20      0.0028      0.23  Q         .         .         .         .
  0.29      0.0047      0.23  Q         .         .         .         .
  0.39      0.0066      0.23  Q         .         .         .         .
  0.49      0.0085      0.24  Q         .         .         .         .
  0.59      0.0104      0.24  Q         .         .         .         .
  0.69      0.0123      0.24  Q         .         .         .         .
  0.78      0.0143      0.24  Q         .         .         .         .
  0.88      0.0162      0.24  Q         .         .         .         .
  0.98      0.0181      0.24  Q         .         .         .         .
  1.08      0.0201      0.24  Q         .         .         .         .
  1.18      0.0221      0.24  Q         .         .         .         .
  1.28      0.0240      0.24  Q         .         .         .         .
  1.37      0.0260      0.24  Q         .         .         .         .
  1.47      0.0280      0.24  Q         .         .         .         .
```

1.57	0.0300	0.25	Q	.	.	.	.
1.67	0.0320	0.25	Q	.	.	.	.
1.77	0.0340	0.25	Q	.	.	.	.
1.86	0.0360	0.25	Q	.	.	.	.
1.96	0.0380	0.25	Q	.	.	.	.
2.06	0.0401	0.25	Q	.	.	.	.
2.16	0.0421	0.25	Q	.	.	.	.
2.26	0.0442	0.25	Q	.	.	.	.
2.35	0.0462	0.25	Q	.	.	.	.
2.45	0.0483	0.26	Q	.	.	.	.
2.55	0.0504	0.26	Q	.	.	.	.
2.65	0.0525	0.26	Q	.	.	.	.
2.75	0.0546	0.26	Q	.	.	.	.
2.85	0.0567	0.26	Q	.	.	.	.
2.94	0.0588	0.26	Q	.	.	.	.
3.04	0.0609	0.26	Q	.	.	.	.
3.14	0.0631	0.26	Q	.	.	.	.
3.24	0.0652	0.27	Q	.	.	.	.
3.34	0.0674	0.27	Q	.	.	.	.
3.43	0.0695	0.27	Q	.	.	.	.
3.53	0.0717	0.27	Q	.	.	.	.
3.63	0.0739	0.27	Q	.	.	.	.
3.73	0.0761	0.27	Q	.	.	.	.
3.83	0.0783	0.27	Q	.	.	.	.
3.93	0.0806	0.28	Q	.	.	.	.
4.02	0.0828	0.28	Q	.	.	.	.
4.12	0.0850	0.28	Q	.	.	.	.
4.22	0.0873	0.28	Q	.	.	.	.
4.32	0.0896	0.28	Q	.	.	.	.
4.42	0.0919	0.28	Q	.	.	.	.
4.51	0.0942	0.28	Q	.	.	.	.
4.61	0.0965	0.28	Q	.	.	.	.
4.71	0.0988	0.29	Q	.	.	.	.
4.81	0.1011	0.29	Q	.	.	.	.
4.91	0.1035	0.29	Q	.	.	.	.
5.01	0.1058	0.29	Q	.	.	.	.
5.10	0.1082	0.29	Q	.	.	.	.
5.20	0.1106	0.29	Q	.	.	.	.
5.30	0.1130	0.30	Q	.	.	.	.
5.40	0.1154	0.30	Q	.	.	.	.
5.50	0.1178	0.30	Q	.	.	.	.
5.59	0.1203	0.30	Q	.	.	.	.
5.69	0.1227	0.30	Q	.	.	.	.
5.79	0.1252	0.30	Q	.	.	.	.
5.89	0.1277	0.31	Q	.	.	.	.
5.99	0.1302	0.31	Q	.	.	.	.
6.09	0.1327	0.31	Q	.	.	.	.
6.18	0.1352	0.31	Q	.	.	.	.
6.28	0.1378	0.32	Q	.	.	.	.
6.38	0.1403	0.32	Q	.	.	.	.
6.48	0.1429	0.32	Q	.	.	.	.
6.58	0.1455	0.32	Q	.	.	.	.
6.67	0.1481	0.32	Q	.	.	.	.
6.77	0.1507	0.32	Q	.	.	.	.
6.87	0.1534	0.33	Q	.	.	.	.
6.97	0.1560	0.33	Q	.	.	.	.
7.07	0.1587	0.33	Q	.	.	.	.
7.17	0.1614	0.33	Q	.	.	.	.
7.26	0.1641	0.34	Q	.	.	.	.
7.36	0.1669	0.34	Q	.	.	.	.
7.46	0.1696	0.34	Q	.	.	.	.
7.56	0.1724	0.34	Q	.	.	.	.
7.66	0.1752	0.35	Q	.	.	.	.

7.75	0.1780	0.35	Q	.	.	.	.
7.85	0.1809	0.35	Q	.	.	.	.
7.95	0.1837	0.35	Q	.	.	.	.
8.05	0.1866	0.36	Q	.	.	.	.
8.15	0.1895	0.36	Q	.	.	.	.
8.24	0.1924	0.36	Q	.	.	.	.
8.34	0.1954	0.36	Q	.	.	.	.
8.44	0.1984	0.37	Q	.	.	.	.
8.54	0.2014	0.37	Q	.	.	.	.
8.64	0.2044	0.37	Q	.	.	.	.
8.74	0.2074	0.38	Q	.	.	.	.
8.83	0.2105	0.38	Q	.	.	.	.
8.93	0.2136	0.38	Q	.	.	.	.
9.03	0.2167	0.39	Q	.	.	.	.
9.13	0.2199	0.39	Q	.	.	.	.
9.23	0.2231	0.39	Q	.	.	.	.
9.32	0.2263	0.40	Q	.	.	.	.
9.42	0.2295	0.40	Q	.	.	.	.
9.52	0.2328	0.40	Q	.	.	.	.
9.62	0.2361	0.41	Q	.	.	.	.
9.72	0.2394	0.41	Q	.	.	.	.
9.82	0.2428	0.42	Q	.	.	.	.
9.91	0.2462	0.42	Q	.	.	.	.
10.01	0.2496	0.43	Q	.	.	.	.
10.11	0.2531	0.43	Q	.	.	.	.
10.21	0.2566	0.43	Q	.	.	.	.
10.31	0.2601	0.44	Q	.	.	.	.
10.40	0.2637	0.44	Q	.	.	.	.
10.50	0.2673	0.45	Q	.	.	.	.
10.60	0.2710	0.45	Q	.	.	.	.
10.70	0.2747	0.46	Q	.	.	.	.
10.80	0.2784	0.46	Q	.	.	.	.
10.90	0.2822	0.47	Q	.	.	.	.
10.99	0.2860	0.48	Q	.	.	.	.
11.09	0.2899	0.48	Q	.	.	.	.
11.19	0.2938	0.49	Q	.	.	.	.
11.29	0.2978	0.49	Q	.	.	.	.
11.39	0.3018	0.50	.Q	.	.	.	.
11.48	0.3059	0.51	.Q	.	.	.	.
11.58	0.3101	0.51	.Q	.	.	.	.
11.68	0.3142	0.52	.Q	.	.	.	.
11.78	0.3185	0.53	.Q	.	.	.	.
11.88	0.3228	0.53	.Q	.	.	.	.
11.98	0.3272	0.54	.Q	.	.	.	.
12.07	0.3317	0.57	.Q	.	.	.	.
12.17	0.3369	0.70	.Q	.	.	.	.
12.27	0.3426	0.71	.Q	.	.	.	.
12.37	0.3484	0.72	.Q	.	.	.	.
12.47	0.3543	0.73	.Q	.	.	.	.
12.56	0.3603	0.74	.Q	.	.	.	.
12.66	0.3664	0.75	.Q	.	.	.	.
12.76	0.3725	0.77	.Q	.	.	.	.
12.86	0.3788	0.78	.Q	.	.	.	.
12.96	0.3851	0.79	.Q	.	.	.	.
13.05	0.3916	0.80	.Q	.	.	.	.
13.15	0.3982	0.82	.Q	.	.	.	.
13.25	0.4049	0.83	.Q	.	.	.	.
13.35	0.4117	0.85	.Q	.	.	.	.
13.45	0.4187	0.86	.Q	.	.	.	.
13.55	0.4258	0.89	.Q	.	.	.	.
13.64	0.4331	0.90	.Q	.	.	.	.
13.74	0.4405	0.93	.Q	.	.	.	.
13.84	0.4480	0.94	.Q	.	.	.	.

13.94	0.4558	0.97	.Q	.	.	.	.	
14.04	0.4637	0.99	.Q	.	.	.	.	
14.13	0.4719	1.03	. Q	.	.	.	.	
14.23	0.4803	1.05	. Q	.	.	.	.	
14.33	0.4890	1.09	. Q	.	.	.	.	
14.43	0.4979	1.11	. Q	.	.	.	.	
14.53	0.5071	1.16	. Q	.	.	.	.	
14.63	0.5166	1.19	. Q	.	.	.	.	
14.72	0.5265	1.25	. Q	.	.	.	.	
14.82	0.5367	1.28	. Q	.	.	.	.	
14.92	0.5474	1.36	. Q	.	.	.	.	
15.02	0.5586	1.40	. Q	.	.	.	.	
15.12	0.5703	1.50	. Q	.	.	.	.	
15.21	0.5827	1.56	. Q	.	.	.	.	
15.31	0.5959	1.69	. Q	.	.	.	.	
15.41	0.6098	1.74	. Q	.	.	.	.	
15.51	0.6240	1.76	. Q	.	.	.	.	
15.61	0.6388	1.90	. Q	.	.	.	.	
15.71	0.6557	2.28	. Q	.	.	.	.	
15.80	0.6754	2.57	. Q	.	.	.	.	
15.90	0.7013	3.80	. Q	.	.	.	.	
16.00	0.7387	5.42	. Q	.	.	.	.	
16.10	0.8323	17.67	.	.	.	.	Q	.
16.20	0.9161	2.99	. Q	.	.	.	.	
16.29	0.9366	2.06	. Q	.	.	.	.	
16.39	0.9517	1.65	. Q	.	.	.	.	
16.49	0.9650	1.62	. Q	.	.	.	.	
16.59	0.9774	1.45	. Q	.	.	.	.	
16.69	0.9886	1.32	. Q	.	.	.	.	
16.79	0.9989	1.22	. Q	.	.	.	.	
16.88	1.0084	1.13	. Q	.	.	.	.	
16.98	1.0173	1.07	. Q	.	.	.	.	
17.08	1.0257	1.01	. Q	.	.	.	.	
17.18	1.0337	0.96	.Q	.	.	.	.	
17.28	1.0413	0.91	.Q	.	.	.	.	
17.37	1.0485	0.88	.Q	.	.	.	.	
17.47	1.0555	0.84	.Q	.	.	.	.	
17.57	1.0622	0.81	.Q	.	.	.	.	
17.67	1.0687	0.78	.Q	.	.	.	.	
17.77	1.0749	0.76	.Q	.	.	.	.	
17.87	1.0810	0.74	.Q	.	.	.	.	
17.96	1.0869	0.72	.Q	.	.	.	.	
18.06	1.0926	0.70	.Q	.	.	.	.	
18.16	1.0977	0.54	.Q	.	.	.	.	
18.26	1.1020	0.52	.Q	.	.	.	.	
18.36	1.1062	0.51	.Q	.	.	.	.	
18.45	1.1102	0.50	Q	.	.	.	.	
18.55	1.1142	0.48	Q	.	.	.	.	
18.65	1.1181	0.47	Q	.	.	.	.	
18.75	1.1219	0.46	Q	.	.	.	.	
18.85	1.1256	0.45	Q	.	.	.	.	
18.94	1.1292	0.44	Q	.	.	.	.	
19.04	1.1327	0.43	Q	.	.	.	.	
19.14	1.1362	0.42	Q	.	.	.	.	
19.24	1.1396	0.41	Q	.	.	.	.	
19.34	1.1429	0.41	Q	.	.	.	.	
19.44	1.1462	0.40	Q	.	.	.	.	
19.53	1.1494	0.39	Q	.	.	.	.	
19.63	1.1526	0.39	Q	.	.	.	.	
19.73	1.1557	0.38	Q	.	.	.	.	
19.83	1.1587	0.37	Q	.	.	.	.	
19.93	1.1617	0.37	Q	.	.	.	.	
20.02	1.1647	0.36	Q	.	.	.	.	

20.12	1.1676	0.36	Q	.	.	.	.
20.22	1.1704	0.35	Q	.	.	.	.
20.32	1.1733	0.34	Q	.	.	.	.
20.42	1.1760	0.34	Q	.	.	.	.
20.52	1.1788	0.34	Q	.	.	.	.
20.61	1.1815	0.33	Q	.	.	.	.
20.71	1.1841	0.33	Q	.	.	.	.
20.81	1.1868	0.32	Q	.	.	.	.
20.91	1.1894	0.32	Q	.	.	.	.
21.01	1.1919	0.31	Q	.	.	.	.
21.10	1.1945	0.31	Q	.	.	.	.
21.20	1.1970	0.31	Q	.	.	.	.
21.30	1.1994	0.30	Q	.	.	.	.
21.40	1.2019	0.30	Q	.	.	.	.
21.50	1.2043	0.30	Q	.	.	.	.
21.60	1.2067	0.29	Q	.	.	.	.
21.69	1.2090	0.29	Q	.	.	.	.
21.79	1.2114	0.29	Q	.	.	.	.
21.89	1.2137	0.28	Q	.	.	.	.
21.99	1.2159	0.28	Q	.	.	.	.
22.09	1.2182	0.28	Q	.	.	.	.
22.18	1.2204	0.27	Q	.	.	.	.
22.28	1.2227	0.27	Q	.	.	.	.
22.38	1.2248	0.27	Q	.	.	.	.
22.48	1.2270	0.27	Q	.	.	.	.
22.58	1.2292	0.26	Q	.	.	.	.
22.68	1.2313	0.26	Q	.	.	.	.
22.77	1.2334	0.26	Q	.	.	.	.
22.87	1.2355	0.26	Q	.	.	.	.
22.97	1.2376	0.25	Q	.	.	.	.
23.07	1.2396	0.25	Q	.	.	.	.
23.17	1.2417	0.25	Q	.	.	.	.
23.26	1.2437	0.25	Q	.	.	.	.
23.36	1.2457	0.25	Q	.	.	.	.
23.46	1.2477	0.24	Q	.	.	.	.
23.56	1.2496	0.24	Q	.	.	.	.
23.66	1.2516	0.24	Q	.	.	.	.
23.76	1.2535	0.24	Q	.	.	.	.
23.85	1.2554	0.24	Q	.	.	.	.
23.95	1.2573	0.23	Q	.	.	.	.
24.05	1.2592	0.23	Q	.	.	.	.
24.15	1.2602	0.00	Q	.	.	.	.

Problem Descriptions:
100-YEAR FREQUENCY
ON-SITE DETENTION SYSTEM
SOUTH SHORES CHURCH, DANA POINT, CA

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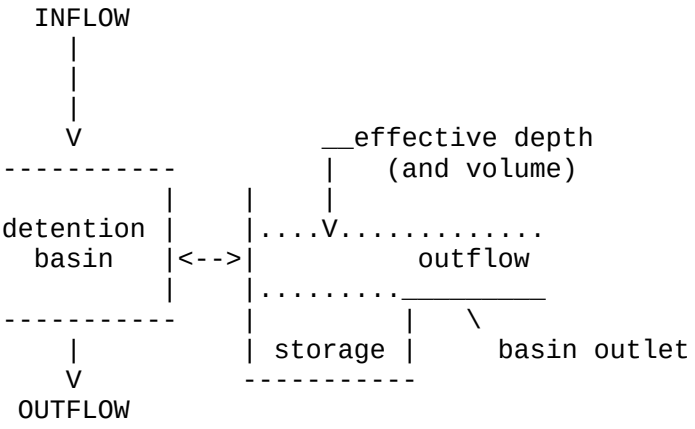
FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 5.890
DEAD STORAGE(AF) = 0.00
SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 12

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	**BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)
0.000	0.000	0.000**	0.500	0.024	0.590*
1.000	0.048	1.080**	1.500	0.072	1.410*
2.000	0.096	1.680**	2.500	0.121	1.910*
3.000	0.145	2.120**	3.500	0.169	2.300*
4.000	0.193	2.480**	4.500	0.217	2.640*
5.000	0.241	2.790**	5.670	0.273	2.980*

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	DEPTH (FEET)	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)
1	0.00	0.00000	0.00000
2	0.50	0.02161	0.02639
3	1.00	0.04362	0.05238
4	1.50	0.06628	0.07772
5	2.00	0.08919	0.10281
6	2.50	0.11325	0.12875
7	3.00	0.13640	0.15360
8	3.50	0.15967	0.17833
9	4.00	0.18294	0.20306
10	4.50	0.20629	0.22771
11	5.00	0.22968	0.25232
12	5.67	0.26091	0.28509

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)

DETENTION BASIN ROUTING RESULTS:
NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES
OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE
AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	EFFECTIVE DEPTH(FT)	OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.097	0.000	0.23	0.04	0.02	0.002
0.195	0.000	0.23	0.06	0.06	0.003
0.293	0.000	0.23	0.09	0.09	0.004
0.392	0.000	0.23	0.11	0.12	0.005
0.490	0.000	0.24	0.13	0.14	0.006
0.588	0.000	0.24	0.14	0.16	0.007
0.686	0.000	0.24	0.15	0.17	0.007
0.784	0.000	0.24	0.16	0.18	0.008
0.882	0.000	0.24	0.17	0.19	0.008
0.981	0.000	0.24	0.17	0.20	0.008
1.079	0.000	0.24	0.18	0.21	0.009
1.177	0.000	0.24	0.18	0.21	0.009
1.275	0.000	0.24	0.19	0.22	0.009
1.373	0.000	0.24	0.19	0.22	0.009
1.471	0.000	0.24	0.19	0.23	0.009
1.570	0.000	0.25	0.20	0.23	0.009
1.668	0.000	0.25	0.20	0.23	0.010
1.766	0.000	0.25	0.20	0.24	0.010
1.864	0.000	0.25	0.20	0.24	0.010
1.962	0.000	0.25	0.20	0.24	0.010
2.060	0.000	0.25	0.21	0.24	0.010
2.159	0.000	0.25	0.21	0.24	0.010
2.257	0.000	0.25	0.21	0.25	0.010
2.355	0.000	0.25	0.21	0.25	0.010
2.453	0.000	0.26	0.21	0.25	0.010
2.551	0.000	0.26	0.21	0.25	0.010
2.649	0.000	0.26	0.21	0.25	0.010
2.748	0.000	0.26	0.21	0.25	0.010
2.846	0.000	0.26	0.22	0.25	0.010
2.944	0.000	0.26	0.22	0.26	0.010
3.042	0.000	0.26	0.22	0.26	0.010
3.140	0.000	0.26	0.22	0.26	0.011
3.238	0.000	0.27	0.22	0.26	0.011
3.337	0.000	0.27	0.22	0.26	0.011
3.435	0.000	0.27	0.22	0.26	0.011
3.533	0.000	0.27	0.22	0.26	0.011
3.631	0.000	0.27	0.22	0.26	0.011
3.729	0.000	0.27	0.23	0.27	0.011
3.827	0.000	0.27	0.23	0.27	0.011
3.926	0.000	0.28	0.23	0.27	0.011
4.024	0.000	0.28	0.23	0.27	0.011
4.122	0.000	0.28	0.23	0.27	0.011
4.220	0.000	0.28	0.23	0.27	0.011
4.318	0.000	0.28	0.23	0.27	0.011
4.416	0.000	0.28	0.23	0.28	0.011
4.515	0.000	0.28	0.23	0.28	0.011
4.613	0.000	0.28	0.24	0.28	0.011
4.711	0.000	0.29	0.24	0.28	0.011
4.809	0.000	0.29	0.24	0.28	0.011
4.907	0.000	0.29	0.24	0.28	0.012
5.005	0.000	0.29	0.24	0.28	0.012
5.104	0.000	0.29	0.24	0.29	0.012
5.202	0.000	0.29	0.24	0.29	0.012
5.300	0.000	0.30	0.25	0.29	0.012
5.398	0.000	0.30	0.25	0.29	0.012

5.496	0.000	0.30	0.25	0.29	0.012
5.594	0.000	0.30	0.25	0.29	0.012
5.693	0.000	0.30	0.25	0.30	0.012
5.791	0.000	0.30	0.25	0.30	0.012
5.889	0.000	0.31	0.25	0.30	0.012
5.987	0.000	0.31	0.26	0.30	0.012
6.085	0.000	0.31	0.26	0.30	0.012
6.183	0.000	0.31	0.26	0.30	0.012
6.282	0.000	0.32	0.26	0.31	0.012
6.380	0.000	0.32	0.26	0.31	0.013
6.478	0.000	0.32	0.26	0.31	0.013
6.576	0.000	0.32	0.26	0.31	0.013
6.674	0.000	0.32	0.27	0.31	0.013
6.772	0.000	0.32	0.27	0.32	0.013
6.871	0.000	0.33	0.27	0.32	0.013
6.969	0.000	0.33	0.27	0.32	0.013
7.067	0.000	0.33	0.27	0.32	0.013
7.165	0.000	0.33	0.27	0.32	0.013
7.263	0.000	0.34	0.28	0.33	0.013
7.361	0.000	0.34	0.28	0.33	0.013
7.460	0.000	0.34	0.28	0.33	0.013
7.558	0.000	0.34	0.28	0.33	0.014
7.656	0.000	0.35	0.28	0.33	0.014
7.754	0.000	0.35	0.29	0.34	0.014
7.852	0.000	0.35	0.29	0.34	0.014
7.950	0.000	0.35	0.29	0.34	0.014
8.049	0.000	0.36	0.29	0.34	0.014
8.147	0.000	0.36	0.29	0.35	0.014
8.245	0.000	0.36	0.30	0.35	0.014
8.343	0.000	0.36	0.30	0.35	0.014
8.441	0.000	0.37	0.30	0.35	0.014
8.539	0.000	0.37	0.30	0.36	0.015
8.637	0.000	0.37	0.31	0.36	0.015
8.736	0.000	0.38	0.31	0.36	0.015
8.834	0.000	0.38	0.31	0.37	0.015
8.932	0.000	0.38	0.31	0.37	0.015
9.030	0.000	0.39	0.32	0.37	0.015
9.128	0.000	0.39	0.32	0.37	0.015
9.227	0.000	0.39	0.32	0.38	0.015
9.325	0.000	0.40	0.32	0.38	0.016
9.423	0.000	0.40	0.33	0.38	0.016
9.521	0.000	0.40	0.33	0.39	0.016
9.619	0.000	0.41	0.33	0.39	0.016
9.717	0.000	0.41	0.34	0.39	0.016
9.816	0.000	0.42	0.34	0.40	0.016
9.914	0.000	0.42	0.34	0.40	0.016
10.012	0.000	0.43	0.35	0.41	0.017
10.110	0.000	0.43	0.35	0.41	0.017
10.208	0.000	0.43	0.35	0.41	0.017
10.306	0.000	0.44	0.36	0.42	0.017
10.405	0.000	0.44	0.36	0.42	0.017
10.503	0.000	0.45	0.36	0.43	0.017
10.601	0.000	0.45	0.37	0.43	0.018
10.699	0.000	0.46	0.37	0.44	0.018
10.797	0.000	0.46	0.38	0.44	0.018
10.895	0.000	0.47	0.38	0.44	0.018
10.993	0.000	0.48	0.38	0.45	0.018
11.092	0.000	0.48	0.39	0.45	0.019
11.190	0.000	0.49	0.39	0.46	0.019
11.288	0.000	0.49	0.40	0.47	0.019
11.386	0.000	0.50	0.40	0.47	0.019
11.484	0.000	0.51	0.41	0.48	0.020
11.583	0.000	0.51	0.41	0.48	0.020

11.681	0.000	0.52	0.42	0.49	0.020
11.779	0.000	0.53	0.42	0.50	0.020
11.877	0.000	0.53	0.43	0.50	0.021
11.975	0.000	0.54	0.43	0.51	0.021
12.073	0.000	0.57	0.44	0.52	0.021
12.171	0.000	0.70	0.47	0.54	0.023
12.270	0.000	0.71	0.49	0.57	0.024
12.368	0.000	0.72	0.52	0.59	0.025
12.466	0.000	0.73	0.54	0.62	0.026
12.564	0.000	0.74	0.55	0.63	0.027
12.662	0.000	0.75	0.57	0.65	0.027
12.760	0.000	0.77	0.59	0.67	0.028
12.859	0.000	0.78	0.60	0.68	0.029
12.957	0.000	0.79	0.62	0.70	0.030
13.055	0.000	0.80	0.63	0.71	0.030
13.153	0.000	0.82	0.65	0.73	0.031
13.251	0.000	0.83	0.66	0.74	0.032
13.350	0.000	0.85	0.68	0.76	0.033
13.448	0.000	0.86	0.70	0.77	0.033
13.546	0.000	0.89	0.71	0.79	0.034
13.644	0.000	0.90	0.73	0.81	0.035
13.742	0.000	0.93	0.75	0.82	0.036
13.840	0.000	0.94	0.76	0.84	0.037
13.939	0.000	0.97	0.78	0.86	0.038
14.037	0.000	0.99	0.80	0.88	0.038
14.135	0.000	1.03	0.82	0.90	0.040
14.233	0.000	1.05	0.85	0.92	0.041
14.331	0.000	1.09	0.87	0.94	0.042
14.429	0.000	1.11	0.89	0.96	0.043
14.528	0.000	1.16	0.92	0.99	0.044
14.626	0.000	1.19	0.95	1.02	0.046
14.724	0.000	1.25	0.98	1.05	0.047
14.822	0.000	1.28	1.02	1.08	0.049
14.920	0.000	1.36	1.06	1.11	0.051
15.018	0.000	1.40	1.11	1.13	0.053
15.116	0.000	1.50	1.16	1.17	0.056
15.215	0.000	1.56	1.22	1.21	0.059
15.313	0.000	1.69	1.30	1.25	0.062
15.411	0.000	1.74	1.37	1.30	0.066
15.509	0.000	1.76	1.44	1.35	0.069
15.607	0.000	1.90	1.52	1.40	0.073
15.706	0.000	2.28	1.66	1.46	0.080
15.804	0.000	2.57	1.83	1.54	0.088
15.902	0.000	3.80	2.19	1.68	0.105
16.000	0.000	5.42	2.77	1.89	0.134
16.098	0.000	17.67	5.34	2.46	0.257
16.196	0.000	2.99	5.36	2.89	0.258
16.295	0.000	2.06	5.22	2.87	0.252
16.393	0.000	1.65	5.02	2.82	0.242
16.491	0.000	1.62	4.83	2.77	0.233
16.589	0.000	1.45	4.61	2.71	0.223
16.687	0.000	1.32	4.39	2.64	0.212
16.785	0.000	1.22	4.16	2.57	0.201
16.884	0.000	1.13	3.93	2.49	0.190
16.982	0.000	1.07	3.70	2.41	0.179
17.080	0.000	1.01	3.48	2.33	0.168
17.178	0.000	0.96	3.26	2.25	0.158
17.276	0.000	0.91	3.05	2.18	0.147
17.374	0.000	0.88	2.84	2.10	0.137
17.472	0.000	0.84	2.64	2.01	0.128
17.571	0.000	0.81	2.46	1.93	0.119
17.669	0.000	0.78	2.28	1.85	0.110
17.767	0.000	0.76	2.12	1.77	0.102

17.865	0.000	0.74	1.96	1.70	0.094
17.963	0.000	0.72	1.81	1.62	0.087
18.061	0.000	0.70	1.67	1.54	0.080
18.160	0.000	0.54	1.51	1.46	0.073
18.258	0.000	0.52	1.37	1.37	0.066
18.356	0.000	0.51	1.24	1.28	0.059
18.454	0.000	0.50	1.12	1.20	0.054
18.552	0.000	0.48	1.01	1.12	0.049
18.651	0.000	0.47	0.92	1.04	0.044
18.749	0.000	0.46	0.83	0.96	0.040
18.847	0.000	0.45	0.76	0.88	0.036
18.945	0.000	0.44	0.70	0.81	0.033
19.043	0.000	0.43	0.64	0.76	0.031
19.141	0.000	0.42	0.59	0.71	0.029
19.240	0.000	0.41	0.55	0.66	0.027
19.338	0.000	0.41	0.52	0.62	0.025
19.436	0.000	0.40	0.48	0.59	0.023
19.534	0.000	0.39	0.46	0.55	0.022
19.632	0.000	0.39	0.43	0.52	0.021
19.730	0.000	0.38	0.41	0.50	0.020
19.828	0.000	0.37	0.39	0.48	0.019
19.927	0.000	0.37	0.38	0.46	0.018
20.025	0.000	0.36	0.37	0.44	0.018
20.123	0.000	0.36	0.35	0.43	0.017
20.221	0.000	0.35	0.34	0.41	0.017
20.319	0.000	0.34	0.33	0.40	0.016
20.418	0.000	0.34	0.33	0.39	0.016
20.516	0.000	0.34	0.32	0.38	0.015
20.614	0.000	0.33	0.31	0.37	0.015
20.712	0.000	0.33	0.31	0.36	0.015
20.810	0.000	0.32	0.30	0.36	0.014
20.908	0.000	0.32	0.29	0.35	0.014
21.007	0.000	0.31	0.29	0.34	0.014
21.105	0.000	0.31	0.28	0.34	0.014
21.203	0.000	0.31	0.28	0.33	0.013
21.301	0.000	0.30	0.28	0.33	0.013
21.399	0.000	0.30	0.27	0.32	0.013
21.497	0.000	0.30	0.27	0.32	0.013
21.595	0.000	0.29	0.26	0.31	0.013
21.694	0.000	0.29	0.26	0.31	0.013
21.792	0.000	0.29	0.26	0.31	0.012
21.890	0.000	0.28	0.25	0.30	0.012
21.988	0.000	0.28	0.25	0.30	0.012
22.086	0.000	0.28	0.25	0.29	0.012
22.184	0.000	0.27	0.25	0.29	0.012
22.283	0.000	0.27	0.24	0.29	0.012
22.381	0.000	0.27	0.24	0.28	0.012
22.479	0.000	0.27	0.24	0.28	0.011
22.577	0.000	0.26	0.23	0.28	0.011
22.675	0.000	0.26	0.23	0.28	0.011
22.774	0.000	0.26	0.23	0.27	0.011
22.872	0.000	0.26	0.23	0.27	0.011
22.970	0.000	0.25	0.23	0.27	0.011
23.068	0.000	0.25	0.22	0.26	0.011
23.166	0.000	0.25	0.22	0.26	0.011
23.264	0.000	0.25	0.22	0.26	0.011
23.362	0.000	0.25	0.22	0.26	0.010
23.461	0.000	0.24	0.22	0.26	0.010
23.559	0.000	0.24	0.21	0.25	0.010
23.657	0.000	0.24	0.21	0.25	0.010
23.755	0.000	0.24	0.21	0.25	0.010
23.853	0.000	0.24	0.21	0.25	0.010
23.951	0.000	0.23	0.21	0.24	0.010

24.050	0.000	0.23	0.20	0.24	0.010
24.148	0.000	0.00	0.17	0.22	0.008

XI. Off-Site Retention Basin Calculations

Off-site Retention Basin Calculations

The purpose of this section of the report is to determine the maximum increase in flow the existing retention basin at the Pointe Monarch Community can handle. Per the Hydrology and Hydraulic Analysis Report prepared by Hunsaker & Associates (2002), the retention basin was designed to keep the post-development peak runoff rates from the developed site from not exceeding the pre-development levels for the 2-year 24-hour storm runoff event. Adams-Streeter Civil Engineers has performed a field investigation of the retention basin and have noted that there is vegetation in the basin and the outlet structures are free of debris. Adams-Streeter feels that the basin is working as originally designed in the Hunsaker & Associates report, therefore the assumptions and calculations assumed in the report can be relied upon.

The retention basin was originally designed to accept storm flows, via the existing concrete v-ditch, from approximate 5.83 acres, comprising of the Monarch Bay Villas and the natural sloped areas south-east of the villas. Since the original Hydrology and Hydraulic report prepared by Hunsaker and Associates incorrectly assumed that flows from the church property did not drain to the existing v-ditch at the south-easterly corner of the property, the capacity of the retention basin has to be reevaluated to see how much additional flows the church property can contribute to the basin. Since the existing retention basin was designed with approximately 2.2 feet of freeboard during a 100 year storm event, it is assumed that the basin can adequately handle approximately an additional 1.2 feet of storage and still meet the minimum 1.0 feet of free-board during a 100 year storm event.

The existing retention basin has two separate outlets. Each has a reinforced concrete wingwall headwall with an 18” storm drain outlet pipe. Each 18” storm drain pipe will be analyzed using the Submerged Orifice Equation.

It should be noted that the Discharge Coefficient used was determined from the Hydrology and Hydraulic Report prepared by Hunsaker and Associates (2002). Using information from Section F of the report, the following C_d was determined for one of the two outlets:

$$C_d = \frac{A\sqrt{2g\Delta h}}{Q}$$

Where,
Cd = Discharge Coefficient
Q = Flow, 8.2 cfs
g = 32.2 fps
h = Water Depth at Outlet (113.3 – (111.9-0.75)=0.65'
A = Area of outlet, 18" Pipe = 1.77 ft^2

Therefore, C_d = 0.71

For the purpose of this report, a C_d value of 0.70 will be used.

The below calculations, using the submerged orifice equation, show the maximum flows the two outlet pipes can handle and still maintain 1.0 feet of freeboard.

The lower outlet, Outlet #1, has an invert elevation of 110.5. The second outlet, Outlet #2, has an invert elevation of 111.9. The retention basin's top of berm is as at elevation of approximately 115.50. To insure a minimum 1.0 feet of freeboard, the calculation below assumes a maximum water surface elevation of 114.5.

<u>Submerged Orifice Equation</u>

$$Q = C_d A\sqrt{2g\Delta h}$$

Where,
Q = Flow, cfs
Cd = Discharge Coefficient, 0.70
g = 32.2 fps
h = Water Depth at Outlet
A = Area of outlet, 18" Pipe = 1.77 ft^2

Outlet #1 – *18" Pipe, 110.5 Invert Elevation*

$Q = (0.7)(1.77\ ft^2)[2 \times 32.2\ fps \times (114.5-(110.5+0.75))]^{1/2}$

Q = 17.9 cfs

Outlet #2 – *18" Pipe, 111.9 Invert Elevation*

$Q = (0.7)(1.77\ ft^2)[2 \times 32.2\ fps \times (114.5-(111.9+0.75))]^{1/2}$

Q_{100} = 13.5 cfs

Maximum Q_{total} = 17.9 cfs + 13.5 cfs = 31.4 cfs

Per the Hunsaker report, the basin assumed an outflow of 23.1 cfs for the 100-year storm. This included flow from the v-ditch and the actual basin itself. Utilizing the basin to within a 1.0 foot of free-board, the maximum outflow is 31.4 cfs. Therefore the difference between these two flows would be the allowable addition from the church property to the basin.

Maximum Allowable Q_{100} from South Shores Church is equal to 8.3 cfs.

It should be noted that while the hydrology report and maps state that 9.2 cfs is being discharged from the property into the v-ditch, 1.0 cfs is being contributed from the Monarch Bay Villas. Since this area was already included in the retention basin's original sizing calculations, it can be ignored. Therefore, the 100-year flow being contributed from the church property is equal to **8.2 cfs**.

Q_{100} Actual < Q_{100} Allowable
Q_{100} =8.2 cfs < Q_{100} 8.3cfs

XII. Hydraulic Analysis of Existing Concrete V-Ditch

Hydraulic Analysis of Existing Concrete V-Ditch

The purpose of this section of the report is to prove that the existing concrete v-ditch that the church property drains to can handle the 100-year frequency 8.2 cfs (See Table A-1, Section IV).

Analyzing the Hydrology & Hydraulic Analysis Report prepared by Hunsaker & Associates (2002), the Monarch Bay Villas also drain to this existing v-ditch. At the end of Pompeii Drive and Atlantis Way, pipes discharge directly to the v-ditch approximately 8.7 cfs and 11.4 cfs, respectively. These flows are the individual flows being contributed from the two subareas of the villas. These flows should cannot be added to find the total flow that confluence in the v-ditch. Per the Hunsaker Drainage Report, the total confluenced flow draining from the Monarch Bay Villas is equal to Q100=19.6 cfs, which is comprised of Areas A1, A2, A65, A66 and A67 (See Developed Condition Hydrology Map in Hunsaker Drainage Report). Downstream of the Monarch Bay Villas, an additional 1.0 acre drains to another v-ditch which ultimately connects to the v-ditch in this analysis. This 1.0 acre (Area A3 of the Hunsaker Developed Condition Hydrology Map) contributes a Q100 of approximately 3.5 cfs. Once confluenced at Node 4.1, the total Q100 draining to the retention basin is equal to 20.3 cfs.

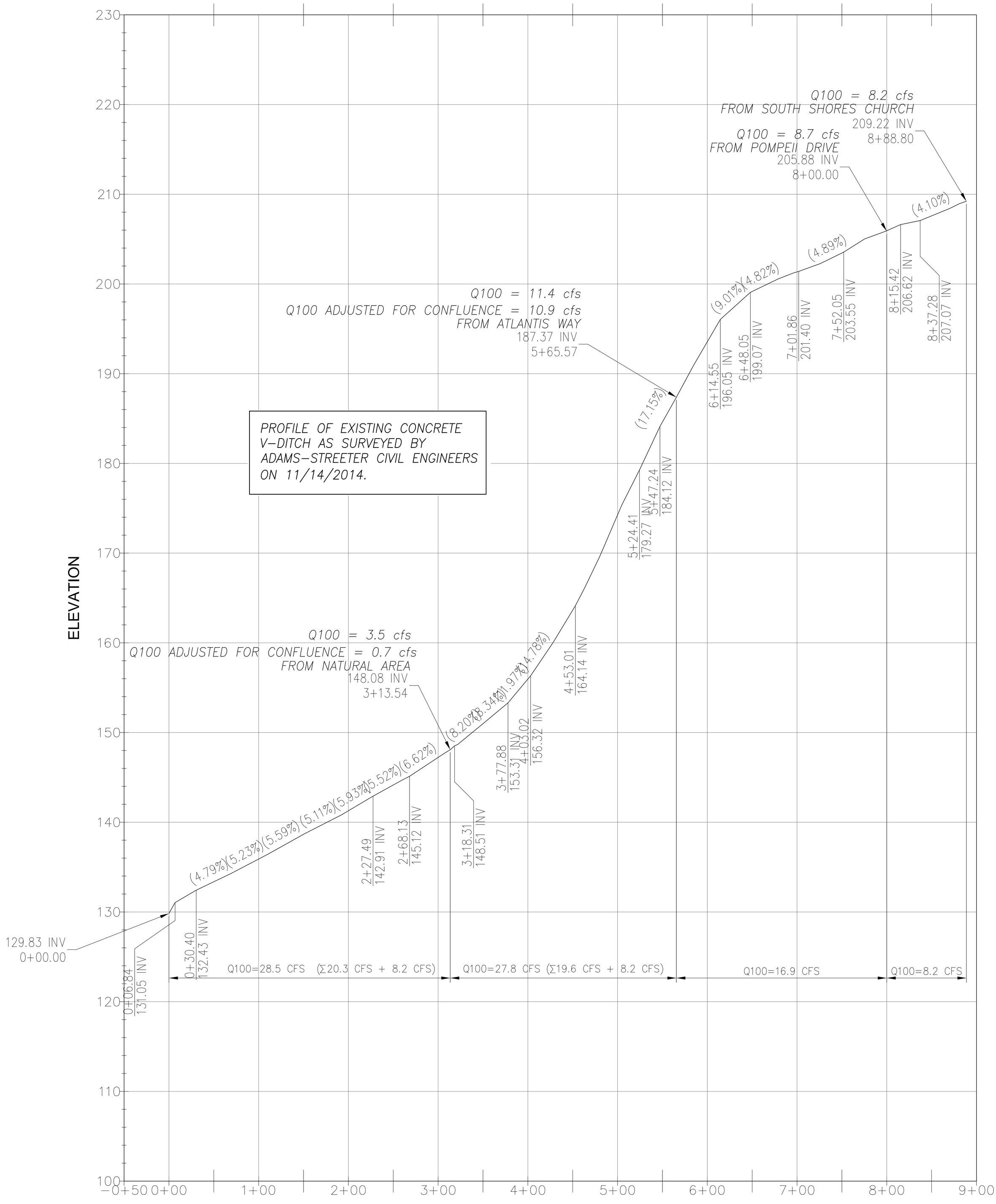
Assuming that the church property drains approximately 8.2 cfs during a 100-year storm event, along with flow from the Monarch Bay Villas and surrounding natural area, the maximum flow in the v-ditch would be 28.5 cfs (20.3 cfs + 8.2 cfs) during a 100-year storm event.

Using the Water Surface Pressure Gradient Program (WSPGW) supplied by Civil Design, the v-ditch can be evaluated by computing the uniform and non-uniform steady flow water surface profiles and pressure gradients in the open channel.

To determine the downstream HGL control, a water surface elevation of 131.33 was assumed (Invert elevation of 131.05 + depth of v-ditch, 1.5'). Since the water surface elevation for the retention basin during a 100-year storm is equal to 114.50, this is a conservative assumption.

As shown in the calculations within this section, the water surface elevation never exceeds the top of the v-ditch, therefore it is acceptable to assume that the v-ditch can sufficiently contain flows during a 100-year storm event.

PROFILE VIEW: EXISTING CONCRETE V-DITCH



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HYDRAULIC ANALYSIS OF EXISTING CONCRETE V-DITCH
100-YEAR STORM FREQUENCY
DANA POINTA, CA

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
.000	129.830	1.242	131.072	28.50	17.11	4.54	135.62	.00	2.14	2.58	1.500	.100	1.00	0 .0
.636	.1784					.0721	.05	1.24	3.75	1.04	.014	.00	1.00	TRAP
.636	129.943	1.247	131.190	28.50	16.97	4.47	135.66	.00	2.14	2.59	1.500	.100	1.00	0 .0
3.373	.1784					.0671	.23	1.25	3.72	1.04	.014	.00	1.00	TRAP
4.009	130.545	1.278	131.823	28.50	16.18	4.07	135.89	.00	2.14	2.66	1.500	.100	1.00	0 .0
2.831	.1784					.0591	.17	1.28	3.50	1.04	.014	.00	1.00	TRAP
6.840	131.050	1.310	132.360	28.50	15.43	3.70	136.06	.00	2.14	2.72	1.500	.100	1.00	0 .0
23.560	.0586					.0543	1.28	1.31	3.30	1.30	.014	.00	1.00	TRAP
30.400	132.430	1.320	133.750	28.50	15.20	3.59	137.34	.00	2.14	2.74	1.500	.100	1.00	0 .0
31.367	.0532					.0532	1.67	1.32	3.24	1.32	.014	.00	1.00	TRAP
61.767	134.098	1.320	135.418	28.50	15.20	3.59	139.00	.00	2.14	2.74	1.500	.100	1.00	0 .0
89.124	.0532					.0535	4.77	1.32	3.24	1.32	.014	.00	1.00	TRAP
150.892	138.837	1.317	140.154	28.50	15.27	3.62	143.77	.00	2.14	2.73	1.500	.100	1.00	0 .0
76.598	.0532					.0575	4.40	1.32	3.26	1.32	.014	.00	1.00	TRAP
227.490	142.910	1.285	144.195	28.50	16.01	3.98	148.18	.00	2.14	2.67	1.500	.100	1.00	0 .0
12.072	.0544					.0622	.75	1.29	3.46	1.31	.014	.00	1.00	TRAP
239.562	143.566	1.276	144.843	28.50	16.23	4.09	148.93	.00	2.14	2.65	1.500	.100	1.00	0 .0
28.568	.0544					.0676	1.93	1.28	3.51	1.31	.014	.00	1.00	TRAP

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HYDRAULIC ANALYSIS OF EXISTING CONCRETE V-DITCH
100-YEAR STORM FREQUENCY
DANA POINTA, CA

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
268.130	145.120	1.245	146.365	28.50	17.02	4.50	150.86	.00	2.14	2.59	1.500	.100	1.00	0 .0
16.492	.0652					.0735	1.21	1.25	3.73	1.27	.014	.00	1.00	TRAP
284.622	146.195	1.234	147.429	28.50	17.30	4.65	152.08	.00	2.14	2.57	1.500	.100	1.00	0 .0
28.918	.0652					.0802	2.32	1.23	3.81	1.27	.014	.00	1.00	TRAP
313.540	148.080	1.204	149.284	28.50	18.15	5.11	154.40	.00	2.14	2.51	1.500	.100	1.00	0 .0
JUNCT STR	.0903					.0892	.00	1.20	4.04		.014	.00	1.00	TRAP
313.551	148.081	1.172	149.253	27.80	18.65	5.40	154.65	.00	2.12	2.44	1.500	.100	1.00	0 .0
13.766	.0813					.0956	1.32	1.17	4.21	1.20	.014	.00	1.00	TRAP
327.317	149.200	1.160	150.360	27.80	19.01	5.61	155.97	.00	2.12	2.42	1.500	.100	1.00	0 .0
22.729	.0813					.1047	2.38	1.16	4.31	1.20	.014	.00	1.00	TRAP
350.046	151.048	1.132	152.179	27.80	19.94	6.17	158.35	.00	2.12	2.36	1.500	.100	1.00	0 .0
15.683	.0813					.1189	1.86	1.13	4.57	1.20	.014	.00	1.00	TRAP
365.729	152.322	1.104	153.426	27.80	20.91	6.79	160.22	.00	2.12	2.31	1.500	.100	1.00	0 .0
12.151	.0813					.1349	1.64	1.10	4.86	1.20	.014	.00	1.00	TRAP
377.880	153.310	1.077	154.387	27.80	21.93	7.47	161.86	.00	2.12	2.25	1.500	.100	1.00	0 .0
5.617	.1197					.1455	.82	1.08	5.15	1.12	.014	.00	1.00	TRAP
383.497	153.983	1.071	155.054	27.80	22.16	7.63	162.68	.00	2.12	2.24	1.500	.100	1.00	0 .0
19.523	.1197					.1574	3.07	1.07	5.22	1.12	.014	.00	1.00	TRAP

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HYDRAULIC ANALYSIS OF EXISTING CONCRETE V-DITCH
100-YEAR STORM FREQUENCY
DANA POINTA, CA

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL	No Wth Prs/Pip / Type Ch
403.020	156.320	1.045	157.365	27.80	23.24	8.39	165.75	.00	2.12	2.19	1.500	.100	1.00	0 .0
25.780	.1564				.1736	4.48	1.04	5.54	1.06	.014	.00	1.00		TRAP
428.800	160.353	1.030	161.383	27.80	23.87	8.85	170.23	.00	2.12	2.16	1.500	.100	1.00	0 .0
24.210	.1564				.1919	4.65	1.03	5.73	1.06	.014	.00	1.00		TRAP
453.010	164.140	1.005	165.145	27.80	25.04	9.74	174.88	.00	2.12	2.11	1.500	.100	1.00	0 .0
31.165	.2119				.1981	6.17	1.00	6.08	1.00	.014	.00	1.00		TRAP
484.175	170.744	1.017	171.761	27.80	24.47	9.30	181.06	.00	2.12	2.13	1.500	.100	1.00	0 .0
26.178	.2119				.1806	4.73	1.02	5.91	1.00	.014	.00	1.00		TRAP
510.354	176.291	1.043	177.334	27.80	23.33	8.45	185.79	.00	2.12	2.19	1.500	.100	1.00	0 .0
14.056	.2119				.1591	2.24	1.04	5.57	1.00	.014	.00	1.00		TRAP
524.410	179.270	1.069	180.339	27.80	22.25	7.69	188.02	.00	2.12	2.24	1.500	.100	1.00	0 .0
2.812	.2124				.1468	.41	1.07	5.25	1.00	.014	.00	1.00		TRAP
527.222	179.867	1.075	180.943	27.80	22.00	7.52	188.46	.00	2.12	2.25	1.500	.100	1.00	0 .0
8.590	.2124				.1361	1.17	1.08	5.17	1.00	.014	.00	1.00		TRAP
535.812	181.692	1.102	182.795	27.80	20.98	6.83	189.63	.00	2.12	2.30	1.500	.100	1.00	0 .0
6.409	.2124				.1199	.77	1.10	4.87	1.00	.014	.00	1.00		TRAP
542.221	183.054	1.130	184.184	27.80	20.00	6.21	190.39	.00	2.12	2.36	1.500	.100	1.00	0 .0
5.019	.2124				.1056	.53	1.13	4.59	1.00	.014	.00	1.00		TRAP

Program Package Serial Number: 1588

WATER SURFACE PROFILE LISTING Date: 2-17-2015 Time: 1:41:48

HYDRAULIC ANALYSIS OF EXISTING CONCRETE V-DITCH
100-YEAR STORM FREQUENCY
DANA POINTA, CA

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
547.240	184.120	1.158	185.278	27.80	19.07	5.65	190.92	.00	2.12	2.42	1.500	.100	1.00	0 .0
2.531	.1773					.0964	.24	1.16	4.33	1.03	.014	.00	1.00	TRAP
549.771	184.569	1.170	185.739	27.80	18.70	5.43	191.17	.00	2.12	2.44	1.500	.100	1.00	0 .0
5.219	.1773					.0883	.46	1.17	4.22	1.03	.014	.00	1.00	TRAP
554.990	185.494	1.200	186.694	27.80	17.83	4.94	191.63	.00	2.12	2.50	1.500	.100	1.00	0 .0
4.209	.1773					.0778	.33	1.20	3.98	1.03	.014	.00	1.00	TRAP
559.199	186.240	1.230	187.470	27.80	17.00	4.49	191.96	.00	2.12	2.56	1.500	.100	1.00	0 .0
3.468	.1773					.0685	.24	1.23	3.75	1.03	.014	.00	1.00	TRAP
562.667	186.855	1.261	188.116	27.80	16.21	4.08	192.20	.00	2.12	2.62	1.500	.100	1.00	0 .0
2.903	.1773					.0604	.18	1.26	3.53	1.03	.014	.00	1.00	TRAP
565.570	187.370	1.292	188.662	27.80	15.46	3.71	192.37	.00	2.12	2.68	1.500	.100	1.00	0 .0
JUNCT STR	.1819					.1066	.00	1.29	3.33		.014	.00	1.00	TRAP
565.581	187.372	.870	188.242	16.90	20.04	6.24	194.48	.00	1.73	1.84	1.500	.100	1.00	0 .0
2.915	.1772					.1556	.45	.87	5.22	.85	.014	.00	1.00	TRAP
568.496	187.889	.872	188.761	16.90	19.94	6.17	194.93	.00	1.73	1.84	1.500	.100	1.00	0 .0
16.935	.1772					.1454	2.46	.87	5.18	.85	.014	.00	1.00	TRAP
585.431	190.890	.894	191.784	16.90	19.01	5.61	197.40	.00	1.73	1.89	1.500	.100	1.00	0 .0
9.923	.1772					.1281	1.27	.89	4.88	.85	.014	.00	1.00	TRAP

Program Package Serial Number: 1588

WATER SURFACE PROFILE LISTING Date: 2-17-2015 Time: 1:41:48

HYDRAULIC ANALYSIS OF EXISTING CONCRETE V-DITCH
100-YEAR STORM FREQUENCY
DANA POINTA, CA

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
595.354	192.648	.917	193.565	16.90	18.13	5.10	198.67	.00	1.73	1.93	1.500	.100	1.00	0 .0
6.844	.1772					.1128	.77	.92	4.60	.85	.014	.00	1.00	TRAP
602.198	193.861	.940	194.801	16.90	17.28	4.64	199.44	.00	1.73	1.98	1.500	.100	1.00	0 .0
5.114	.1772					.0994	.51	.94	4.33	.85	.014	.00	1.00	TRAP
607.312	194.767	.964	195.731	16.90	16.48	4.22	199.95	.00	1.73	2.03	1.500	.100	1.00	0 .0
4.005	.1772					.0876	.35	.96	4.08	.85	.014	.00	1.00	TRAP
611.317	195.477	.988	196.465	16.90	15.71	3.83	200.30	.00	1.73	2.08	1.500	.100	1.00	0 .0
3.233	.1772					.0772	.25	.99	3.85	.85	.014	.00	1.00	TRAP
614.550	196.050	1.013	197.063	16.90	14.98	3.48	200.55	.00	1.73	2.13	1.500	.100	1.00	0 .0
1.700	.0901					.0719	.12	1.01	3.62	.97	.014	.00	1.00	TRAP
616.250	196.203	1.016	197.219	16.90	14.92	3.46	200.67	.00	1.73	2.13	1.500	.100	1.00	0 .0
12.576	.0901					.0672	.85	1.02	3.61	.97	.014	.00	1.00	TRAP
628.826	197.337	1.041	198.378	16.90	14.22	3.14	201.52	.00	1.73	2.18	1.500	.100	1.00	0 .0
8.381	.0901					.0592	.50	1.04	3.40	.97	.014	.00	1.00	TRAP
637.207	198.093	1.067	199.160	16.90	13.56	2.86	202.02	.00	1.73	2.23	1.500	.100	1.00	0 .0
6.126	.0901					.0522	.32	1.07	3.20	.97	.014	.00	1.00	TRAP
643.333	198.645	1.094	199.739	16.90	12.93	2.60	202.33	.00	1.73	2.29	1.500	.100	1.00	0 .0
4.717	.0901					.0460	.22	1.09	3.02	.97	.014	.00	1.00	TRAP

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HYDRAULIC ANALYSIS OF EXISTING CONCRETE V-DITCH
100-YEAR STORM FREQUENCY
DANA POINTA, CA

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL	No Wth Prs/Pip / Type Ch
648.050	199.070	1.122	200.192	16.90	12.33	2.36	202.55	.00	1.73	2.34	1.500	.100	1.00	0 .0
53.810	.0433				.0426	2.29	1.12	2.84	1.12	.014	.00	1.00		TRAP
701.860	201.400	1.127	202.527	16.90	12.22	2.32	204.85	.00	1.73	2.35	1.500	.100	1.00	0 .0
50.190	.0428				.0403	2.02	1.13	2.81	1.12	.014	.00	1.00		TRAP
752.050	203.550	1.146	204.696	16.90	11.84	2.18	206.87	.00	1.73	2.39	1.500	.100	1.00	0 .0
5.150	.0486				.0379	.20	1.15	2.70	1.10	.014	.00	1.00		TRAP
757.200	203.800	1.155	204.955	16.90	11.66	2.11	207.07	.00	1.73	2.41	1.500	.100	1.00	0 .0
11.930	.0486				.0349	.42	1.15	2.65	1.10	.014	.00	1.00		TRAP
769.131	204.380	1.184	205.564	16.90	11.12	1.92	207.48	.00	1.73	2.47	1.500	.100	1.00	0 .0
8.128	.0486				.0308	.25	1.18	2.50	1.10	.014	.00	1.00		TRAP
777.258	204.775	1.214	205.988	16.90	10.60	1.75	207.73	.00	1.73	2.53	1.500	.100	1.00	0 .0
5.970	.0486				.0271	.16	1.21	2.35	1.10	.014	.00	1.00		TRAP
783.228	205.065	1.244	206.309	16.90	10.11	1.59	207.90	.00	1.73	2.59	1.500	.100	1.00	0 .0
4.577	.0486				.0239	.11	1.24	2.22	1.10	.014	.00	1.00		TRAP
787.805	205.287	1.275	206.563	16.90	9.64	1.44	208.00	.00	1.73	2.65	1.500	.100	1.00	0 .0
3.601	.0486				.0210	.08	1.28	2.09	1.10	.014	.00	1.00		TRAP
791.406	205.462	1.307	206.769	16.90	9.19	1.31	208.08	.00	1.73	2.71	1.500	.100	1.00	0 .0
2.879	.0486				.0185	.05	1.31	1.97	1.10	.014	.00	1.00		TRAP

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HYDRAULIC ANALYSIS OF EXISTING CONCRETE V-DITCH
100-YEAR STORM FREQUENCY
DANA POINTA, CA

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
794.284	205.602	1.340	206.942	16.90	8.76	1.19	208.13	.00	1.73	2.78	1.500	.100	1.00	0 .0
2.322	.0486					.0163	.04	1.34	1.85	1.10	.014	.00	1.00	TRAP
796.606	205.715	1.373	207.088	16.90	8.35	1.08	208.17	.00	1.73	2.85	1.500	.100	1.00	0 .0
1.878	.0486					.0144	.03	1.37	1.75	1.10	.014	.00	1.00	TRAP
798.484	205.806	1.407	207.214	16.90	7.97	.99	208.20	.00	1.73	2.91	1.500	.100	1.00	0 .0
1.516	.0486					.0127	.02	1.41	1.65	1.10	.014	.00	1.00	TRAP
800.000	205.880	1.443	207.323	16.90	7.59	.90	208.22	.00	1.73	2.99	1.500	.100	1.00	0 .0
JUNCT STR	.0903					.0244	.00	1.44	1.55		.014	.00	1.00	TRAP
800.011	205.881	.870	206.751	8.20	9.72	1.47	208.22	.00	1.28	1.84	1.500	.100	1.00	0 .0
2.791	.0480					.0362	.10	.87	2.53	.83	.014	.00	1.00	TRAP
802.802	206.015	.876	206.891	8.20	9.60	1.43	208.32	.00	1.28	1.85	1.500	.100	1.00	0 .0
7.448	.0480					.0335	.25	.88	2.49	.83	.014	.00	1.00	TRAP
810.250	206.372	.898	207.270	8.20	9.15	1.30	208.57	.00	1.28	1.90	1.500	.100	1.00	0 .0
5.170	.0480					.0295	.15	.90	2.35	.83	.014	.00	1.00	TRAP
815.420	206.620	.921	207.541	8.20	8.72	1.18	208.72	.00	1.28	1.94	1.500	.100	1.00	0 .0
4.530	.0206					.0283	.13	.92	2.21	.98	.014	.00	1.00	TRAP
819.950	206.713	.912	207.625	8.20	8.89	1.23	208.85	.00	1.28	1.92	1.500	.100	1.00	0 .0
9.603	.0206					.0310	.30	.91	2.26	.98	.014	.00	1.00	TRAP

HYDRAULIC ANALYSIS OF EXISTING CONCRETE V-DITCH
100-YEAR STORM FREQUENCY
DANA POINTA, CA

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
829.553	206.911	.889	207.800	8.20	9.32	1.35	209.15	.00	1.28	1.88	1.500	.100	1.00	0 .0
7.727	.0206					.0352	.27	.89	2.40	.98	.014	.00	1.00	TRAP
837.280	207.070	.867	207.937	8.20	9.78	1.48	209.42	.00	1.28	1.83	1.500	.100	1.00	0 .0
13.391	.0417					.0359	.48	.87	2.55	.85	.014	.00	1.00	TRAP
850.671	207.629	.882	208.511	8.20	9.47	1.39	209.90	.00	1.28	1.86	1.500	.100	1.00	0 .0
11.118	.0417					.0324	.36	.88	2.45	.85	.014	.00	1.00	TRAP
861.790	208.093	.904	208.997	8.20	9.03	1.27	210.26	.00	1.28	1.91	1.500	.100	1.00	0 .0
6.971	.0417					.0285	.20	.90	2.31	.85	.014	.00	1.00	TRAP
868.760	208.384	.927	209.311	8.20	8.61	1.15	210.46	.00	1.28	1.95	1.500	.100	1.00	0 .0
4.885	.0417					.0251	.12	.93	2.17	.85	.014	.00	1.00	TRAP
873.645	208.588	.951	209.538	8.20	8.21	1.05	210.58	.00	1.28	2.00	1.500	.100	1.00	0 .0
3.626	.0417					.0221	.08	.95	2.05	.85	.014	.00	1.00	TRAP
877.271	208.739	.975	209.714	8.20	7.83	.95	210.67	.00	1.28	2.05	1.500	.100	1.00	0 .0
2.781	.0417					.0195	.05	.97	1.93	.85	.014	.00	1.00	TRAP
880.052	208.855	.999	209.854	8.20	7.46	.87	210.72	.00	1.28	2.10	1.500	.100	1.00	0 .0
2.174	.0417					.0172	.04	1.00	1.82	.85	.014	.00	1.00	TRAP
882.226	208.946	1.025	209.970	8.20	7.12	.79	210.76	.00	1.28	2.15	1.500	.100	1.00	0 .0
1.715	.0417					.0151	.03	1.02	1.71	.85	.014	.00	1.00	TRAP

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HYDRAULIC ANALYSIS OF EXISTING CONCRETE V-DITCH
100-YEAR STORM FREQUENCY
DANA POINTA, CA

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
883.942	209.017	1.050	210.068	8.20	6.79	.71	210.78	.00	1.28	2.20	1.500	.100	1.00	0 .0
1.356	.0417					.0133	.02	1.05	1.61	.85	.014	.00	1.00	TRAP
885.298	209.074	1.077	210.151	8.20	6.47	.65	210.80	.00	1.28	2.25	1.500	.100	1.00	0 .0
1.066	.0417					.0117	.01	1.08	1.52	.85	.014	.00	1.00	TRAP
886.364	209.118	1.104	210.222	8.20	6.17	.59	210.81	.00	1.28	2.31	1.500	.100	1.00	0 .0
.826	.0417					.0103	.01	1.10	1.43	.85	.014	.00	1.00	TRAP
887.190	209.153	1.132	210.285	8.20	5.88	.54	210.82	.00	1.28	2.36	1.500	.100	1.00	0 .0
.625	.0417					.0091	.01	1.13	1.35	.85	.014	.00	1.00	TRAP
887.815	209.179	1.160	210.339	8.20	5.61	.49	210.83	.00	1.28	2.42	1.500	.100	1.00	0 .0
.453	.0417					.0080	.00	1.16	1.27	.85	.014	.00	1.00	TRAP
888.267	209.198	1.189	210.387	8.20	5.35	.44	210.83	.00	1.28	2.48	1.500	.100	1.00	0 .0
.303	.0417					.0071	.00	1.19	1.20	.85	.014	.00	1.00	TRAP
888.571	209.210	1.219	210.430	8.20	5.10	.40	210.83	.00	1.28	2.54	1.500	.100	1.00	0 .0
.173	.0417					.0062	.00	1.22	1.13	.85	.014	.00	1.00	TRAP
888.743	209.218	1.250	210.467	8.20	4.86	.37	210.83	.00	1.28	2.60	1.500	.100	1.00	0 .0
.057	.0417					.0055	.00	1.25	1.06	.85	.014	.00	1.00	TRAP
888.800	209.220	1.282	210.502	8.20	4.63	.33	210.83	.00	1.28	2.66	1.500	.100	1.00	0 .0

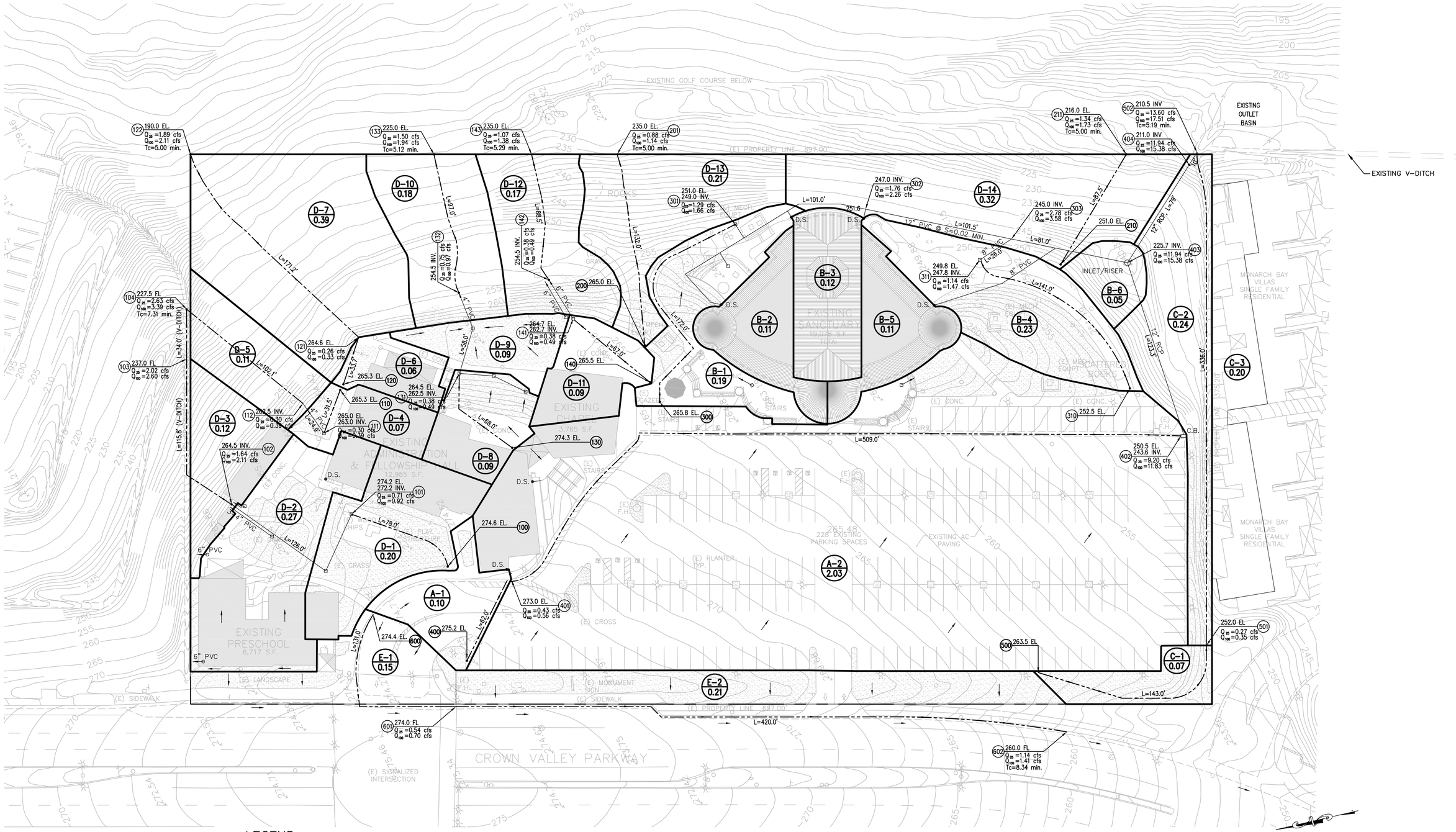
APPENDICES

Proposed Master Site Plan

Hydrology Maps

- Existing Condition
- Developed Condition

Hydrology and Hydraulic Analysis for Tract 14605 prepared by Hunsaker and Associates (2002)



LEGEND

- A-1 / 0.16 — AREA DESIGNATION / AREA IN ACRES
- PATH OF TRAVEL
- L=150' — INITIAL SUB AREA FLOW LENGTH
- TRIBUTARY BOUNDARY
- ELEV / (X) — FINISH GRADE / FLOW LINE / ELEVATION; NODE NUMBER
- Q_{25} = XX.X cfs — DISCHARGE AT NODE IN CFS FOR 25 YEAR STORM
- Q_{100} = XX.X cfs — DISCHARGE AT NODE IN CFS FOR 100 YEAR STORM
- Tc= X.X min. — TIME OF CONCENTRATION IN MINUTES

EXISTING CONDITIONS
HYDROLOGY MAP

30' 20' 10' 0' 30' 60'
GRAPHIC SCALE: 1"=30'

REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. STREETER — No. 70862 — CIVIL — STATE OF CALIFORNIA

PREPARED UNDER THE SUPERVISION OF:
ADAMS • STREETER
CIVIL ENGINEERS, INC.
15 Corporate Park, Irvine, CA 92606
Ph:949 474-2330 Fax:949 474-0251

N.Streeter
NICHOLAS A. STREETER — 12/30/2014
R.C.E. NO.: 70862 — DATE EXP. 06-30-15

HYDROLOGY MAP
EXISTING CONDITIONS
SOUTH SHORES CHURCH
32712 CROWN VALLEY PARKWAY
DANA POINT, CA 92629

SHEET NO. 1
OF 1 SHTS.

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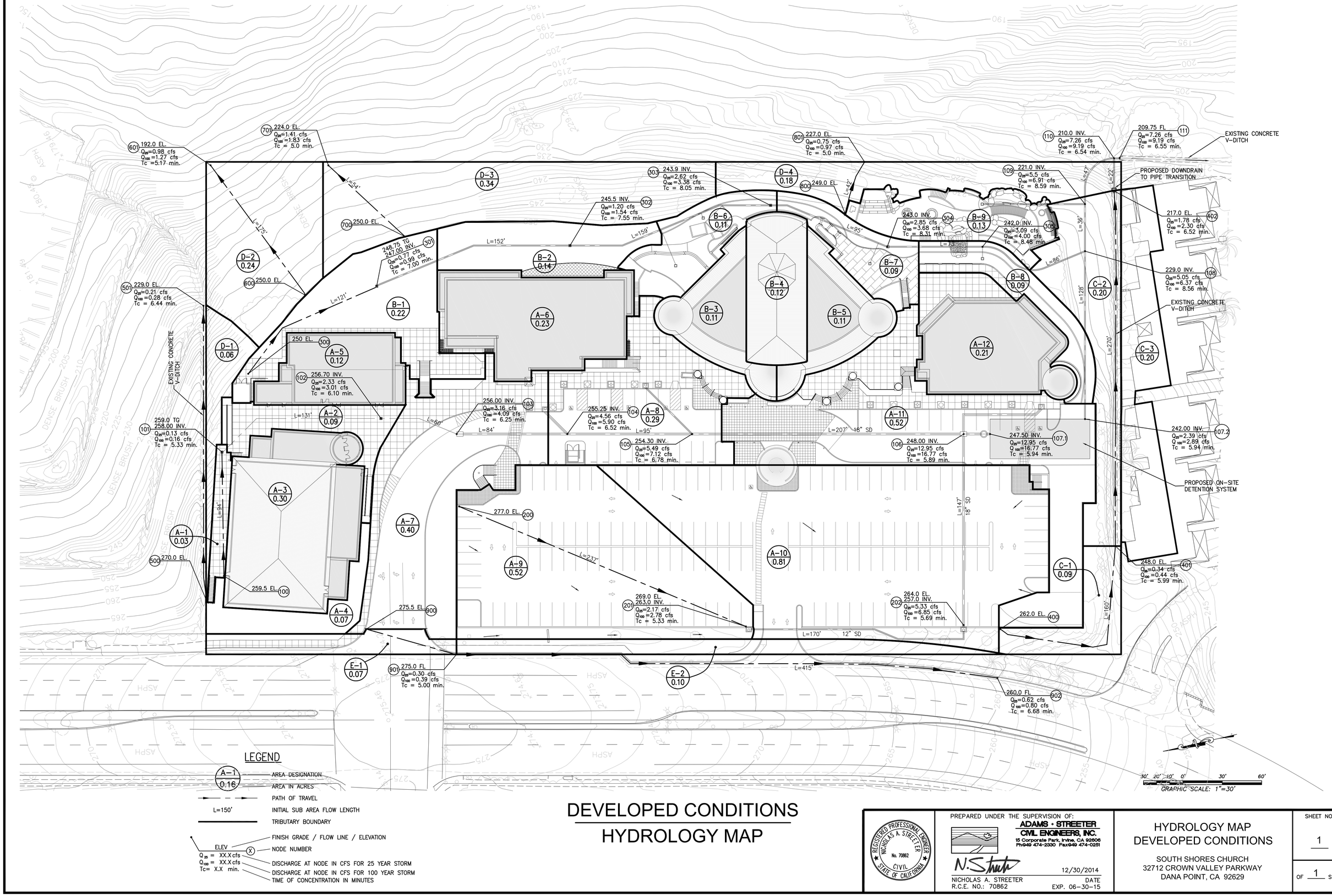

LEGEND

- A-1 / 0.16 — AREA DESIGNATION / AREA IN ACRES
- PATH OF TRAVEL
- L=150' — INITIAL SUB AREA FLOW LENGTH
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- Tc= X.X min. — TIME OF CONCENTRATION IN MINUTES

DEVELOPED CONDITIONS
HYDROLOGY MAP

REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. STREETER — No. 70862 — CIVIL — STATE OF CALIFORNIA

PREPARED UNDER THE SUPERVISION OF:
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CIVIL ENGINEERS, INC.
15 Corporate Park, Irvine, CA 92606
Ph949 474-2330 Fax949 474-0251

N. Streeter
NICHOLAS A. STREETER — 12/30/2014
R.C.E. NO.: 70862 — DATE
EXP. 06-30-15

HYDROLOGY MAP
DEVELOPED CONDITIONS

SOUTH SHORES CHURCH
32712 CROWN VALLEY PARKWAY
DANA POINT, CA 92629

SHEET NO. 1
OF 1 SHTS.

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ATTACHMENT B

REVISED PRELIMINARY WATER QUALITY MANAGEMENT PLAN (WQMP)

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REVISED PRELIMINARY WATER QUALITY MANAGEMENT PLAN (WQMP)

SOUTH SHORES CHURCH
32712 Crown Valley Parkway
Dana Point, CA 92629

CUP NO. 04-21 / SDP 04-31 / CDP 04-21 and V8-11

Prepared for:
South Shores Church
32712 Crown Valley Parkway
Dana Point, CA 92629
949-496-9331

Prepared by:
Adams-Streeter Civil Engineers
15 Corporate Park
Irvine, CA 92606
949.474.2330
Nicholas A. Streeter, PE, PLS, QSD
nstreeter@adams-streeter.com

Prepared on:

February 24, 2015

CITY OF DANA POINT
MEMORANDUM

DATE: March 3, 2015

TO: Matthew Kunk, Brandy Boka, Public Works/Engineering
Saima Qureshy, AICP Senior Planner

FROM: Lisa Zawaski, Water Quality

SUBJECT: Revised Preliminary Water Quality Management Plan (pWQMP) for South Shores Alternative, CUP04-21, SDP04-31, CDP04-11, V04-11

Location: 32712 Crown Valley Parkway
APN: 670-181-02

The Revised Preliminary Water Quality Management Plan (pWQMP), dated February 24, 2015 for the Project Alternative is approved, as noted below. Only the version with approval stamp and this accompanying memo shall be considered the approved version.

Please note the pWQMP approval is contingent upon implementation of a combination of six (6) biofiltration BMPs design to biofiltrate the entire Design Capture Volume (DCV) with required pre-filter detention storage volume, as required per San Diego Regional Water Quality Control Board Order R9-2015-0001. Final design of BMPs shall be in accordance with the Model WQMP & Technical Guidance Document (TGD) for South Orange County, dated December 20, 2013, or any subsequent iteration thereof in response to adoption of Order R9-2015-0001.

1. Please note that the pWQMP is reviewed for conformance with the Model WQMP & TGD only, other structural, geotechnical, hydrological, drainage, flood control, Fire Dept., Health Dept., etc. considerations/comments/revisions may impact final design. This pWQMP approval does not supersede any comments provided by other City Departments nor other regulatory agencies/approvals and any comments provided therein that may impact this design shall be addressed appropriately.

2. A Final WQMP shall be submitted for approval prior to each grading permit issuance and shall contain all details necessary to construct and operate and maintain all the BMPs. The grading plans, building plans and any other construction drawings shall be consistent with the approved WQMP.

3. The Final WQMP submittal shall include a separately-bound, stand-alone, user-friendly Operation & Maintenance Document, including a detailed site plan. An O&M Plan Template is available at www.danapoint.org/wqrequirements.

REVISED PRELIMINARY WATER QUALITY MANAGEMENT PLAN (WQMP)

SOUTH SHORES CHURCH
32712 Crown Valley Parkway
Dana Point, CA 92629

CUP NO. 04-21 / SDP 04-31 / CDP 04-21 and 80-11

Prepared for:
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Prepared on:

February 24, 2015

PROJECT OWNER'S CERTIFICATION			
Permit/Application No.:	CUP No. 04-21 SDP 04-31 CDP 04-11 and V04-11	Grading Permit No.:	Pending Issuance
Tract/Parcel Map and Lot(s)No.:		Building Permit No.:	Pending Issuance
Address of Project Site and APN:	32712 Crown Valley Parkway, Dana Point, CA 92629 APN: 670-181-02		

This Revised Water Quality Management Plan (WQMP) has been prepared for South Shores Church by ADAMS-STREETER CIVIL ENGINEERS, INC. for the proposed master plan alternative the church is now seeking approval for from the City of Dana Point. The WQMP is intended to comply with the requirements of the County of Orange NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan , including the ongoing operation and maintenance of all best management practices (BMPs), and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

OWNER:	South Shores Church
Name:	G.G. Kohlhagen
Title:	Building Committee Chairman / Church Project Manager
Company:	South Shores Church
Address:	32712 Crown Valley Parkway, Dana Point, CA 92629
Email:	ggkohlhagen@cox.net
Telephone:	714-404-4962
Signature:	Date: 2/24/15

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APPENDICES

SECTION I DISCRETIONARY PERMITS AND WATER QUALITY CONDITIONS

PROJECT INFORMATION			
Permit/Application No.:	CUP No. 04-21 SDP 04-31 CDP 04-11 and V04-11	Tract/Parcel Map No.:	
Address of Project Site and APN:	32712 Crown Valley Parkway, Dana Point, CA 92629 APN: 670-181-02		
WATER QUALITY CONDITIONS			
Discretionary Permit(s):	Pending Issuance		
Water Quality Conditions:	Pending Issuance		
WATERSHED-BASED PLAN CONDITIONS			
Applicable conditions from watershed – based plans including WIHMPs and TMDLs:	Not applicable.		

SECTION II PROJECT DESCRIPTION

II.1 PROJECT DESCRIPTION

The South Shores Church is a hillside property located on the east side of Crown Valley Parkway, approximately a quarter-mile from its intersection with Pacific Coast Highway, in the City of Dana Point, California. A Vicinity Map is included in Section VI.

The subject site is bounded at the west by Crown Valley Parkway, at the south by an existing residential community, and at the north by a descending graded cut slope and a vacant area within an existing apartment complex. At the east boundary, a large, natural slope descends to a graded area with a portion of a golf course and a bike path near the toe-of-slope. Salt Creek runs along the adjacent natural basin through the golf course below, and under Pacific Coast highway to drain to the ocean.

The proposed redevelopment of the subject site will include phased demolition of the existing preschool, chapel, and administration/fellowship hall followed by mechanical slope stabilization of the northeast portion of the site. Thereafter, several new buildings will be constructed, including a new Preschool/Administration Building with a Landscaped Garden to the south of the Sanctuary, a Community Life Center in the northwest corner and two new Christian Education Buildings to the north of the existing Sanctuary. A parking deck is proposed that would be at or near grade along the Crown Valley Parkway frontage then would rise to 10-feet above finished grade nearest the interior drive aisle. A lower level of parking would be subterranean nearest Crown Valley Parkway and at grade nearest the interior drive aisle.

The table below summarizes the proposed project.

DESCRIPTION OF PROPOSED PROJECT	
WQMP Development Category:	1. All significant redevelopment projects, where significant redevelopment is defined as the addition or replacement of 5,000 or more square feet of impervious surface on an already developed site. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the facility, or emergency redevelopment activity required to protect public health and safety. If the redevelopment results in the addition or replacement of less than 50 percent of the impervious area on-site and the existing development was not subject to WQMP requirement, the numeric sizing criteria discussed in Section 7.II-2.0 only applies to the addition or replacement area. If the addition or replacement accounts for 50 percent or more of the impervious area, the Project WQMP requirements apply to the entire development.
Project Area (ft^2):	261,497 ft^2 (6.0 acres)
# of Dwelling Units:	Not applicable. Church Site.

SIC Code:	Not applicable. Church Site.
Narrative Project Description:	The proposed redevelopment of the subject site will include phased demolition of the existing preschool, chapel, and administration/fellowship hall. Ground improvement in the form of mechanical slope stabilization will be undertaken at the northeast portion of the site, and several new buildings and retaining walls will be constructed. New buildings will be constructed to the south and north of the existing Sanctuary, which will remain. The new buildings will consist of a new Preschool/Administration Building with a Landscaped Garden to the south of the Sanctuary, and two, new Christian Education Buildings and a Community Life Center to the north of the Sanctuary. The proposed buildings are two-story structures, to be set into gently variable topography with the use of interior and exterior retaining walls. Parking areas and access pathways will be reconfigured with relatively minor cut and fill grading, and a second-story parking deck is proposed for a portion of the parking area, with the lower level partially subterranean.

Project Area:	Pervious Area (ac or ft^2)	Pervious Area Percentage	Impervious Area (ac or ft^2)	Impervious Area Percentage
Pre-Project Conditions:	2.74 AC	45.7%	3.26 AC	54.3%
Post-Project Conditions:	1.87 AC	31.2%	4.13 AC	68.8%

Drainage Patterns/Connections:	Existing Condition: The project site drains in a south-easterly direction, away from Crown Valley Parkway. Approximately 3.25 acres of the site drain to the south-east corner of the property into an existing man-made drainage basin. Of the 3.25 acres, the existing parking lot drains to an existing catch basin via sheet flow and then enters into an underground storm drain before discharging onto a concrete channel which then enters the drainage basin. The remainder of the 3.25 acres enters the underground storm drain system at various points before discharging into the drainage basin. The existing drainage basin discharges to an existing concrete v-ditch that runs south towards the existing retention basin at the Pointe Monarch Community. The balance of the property drains via sheet flow or multiple drainage pipes towards the existing slope on the east side of the property. There is also a small area (approximately 0.2 acres), consisting of driveway and landscaping, that drains towards Crown Valley Parkway. Proposed Condition: The developed condition of the project site consists of four drainage patterns. The majority of the proposed site, Area "A", will drain to an underground storm drain system. Area "A"s runoff water quality will be improved through the use of roof drain planter boxes, storm water planters and a proprietary bio-filter, such as Modular Wetlands. Flows from Area "A" will enter an on-site

	detention system, consisting of a pretreatment Hydrodynamic Separator and underground detention system, which operates as a short-term holding tank to reduce peak flows. The underground detention system will consist of a StormTrap concrete vault system, which will control peak discharge flows with a small regulator pipe at the outlet. After flows leave the on-site detention system, the proposed storm drain pipe will discharge directly into the existing concrete v-ditch, bypassing the existing drainage basin, which will be eliminated. Area "B" runoff will enter the proposed storm drain pipe downstream of the on-site detention system before discharging into the existing concrete v-ditch. Area "B"s water quality will be improved through the use of impervious dispersion, roof drain planter boxes and a proprietary bio-filter, such as Modular Wetlands. Area "C" consists of existing vegetation that will drain via an existing concrete v-ditch on the site's southerly property line. It will ultimately connect to the proposed storm drain system and converge with flows from Area "A" and "B". This area will be left undisturbed and is considered Not a Part of these WQMP requirements. The fourth drainage pattern area, Area "D", consists of existing natural slopes that will continue to sheet flow to the east. This area will be left undisturbed and is considered Not a Part of these WQMP requirements. The final drainage pattern area, Area "E", consists of a portion of driveway entrances and sidewalk totaling 0.2 acres that will continue to sheet flow towards Crown Valley Parkway. This area will be left undisturbed and is considered Not a Part of these WQMP requirements. Approximately 0.20 acres of run-on occurs at the southerly boundary of the site. Run-on from the roof drains of the Monarch Bay Villas that are adjacent to the property drain into the existing v-ditch in Area "C". This area will be left undisturbed and is considered Not a Part of these WQMP requirements. Refer to the Hydrology Study and Supplemental Master Plan Hydrology Report, dated February 17, 2015 and any subsequent revisions thereof, for a comprehensive review of hydrology and storm calculations. See Drainage Exhibits in Section VI for drainage area analysis.

II.2 POTENTIAL STORM WATER POLLUTANTS

The table below, derived from Table 2 of the Orange County Model WQMP Technical Guidance Document (May 2011), summarizes the categories of land use or project features of concern and the general pollutant categories associated with them.

ANTICIPATED & POTENTIAL POLLUTANTS GENERATED BY LAND USE TYPE								
Priority Project Categories and/or Project Features	General Pollutant Categories							
	Suspended Solid/ Sediments	Nutrients	Heavy Metals	Pathogens (Bacteria/Virus)	Pesticides	Oil & Grease	Toxic Organic Compounds	Trash & Debris
Detached Residential Development	E	E	N	E	E	E	N	E
Attached Residential Development	E	E	N	E	E	E(2)	N	E
Commercial/Industrial Development	E(1)	E(1)	E(5)	E(3)	E(1)	E	E	E
Automotive Repair Shops	N	N	E	N	N	E	E	E
Restaurants	E(1)(2)	E(1)	E(2)	E	E(1)	E	N	E
Hillside Development >5,000 ft^2	E	E	N	E	E	E	N	E
Parking Lots	E	E(1)	E	E(4)	E(1)	E	E	E
Streets, Highways & Freeways	E	E(1)	E	E(4)	E(1)	E	E	E
Retail Gasoline Outlets	N	N	E	N	N	E	E	E

Notes:
E = expected to be of concern N = not expected to be of concern

(1) Expected pollutant if landscaping exists on-site, otherwise not expected.
(2) Expected pollutant if the project includes uncovered parking area, otherwise not expected.
(3) Expected pollutant if land use involves food or animal waste products, otherwise not expected.
(4) Bacterial indicators are routinely detected in pavement runoff.
(5) Expected if outdoor storage or metal roofs, otherwise not expected.

Source: County of Orange. (2011, May 19). Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (WQMP). Table 2.1.

Priority Project Categories and/or Features:

- Hillside Development>5,000 ft^2
- Parking Lots

POLLUTANTS OF CONCERN		
Pollutant	E = Expected to be of concern N = Not Expected to be of concern	Additional Information and Comments
Suspended Solid/ Sediment	E	
Nutrients	E	
Heavy Metals	E	
Pathogens (Bacteria/Virus)	E	
Pesticides	E	
Oil & Grease	E	
Toxic Organic Compounds	E	
Trash & Debris	E	

II.3 HYDROLOGIC CONDITIONS OF CONCERN

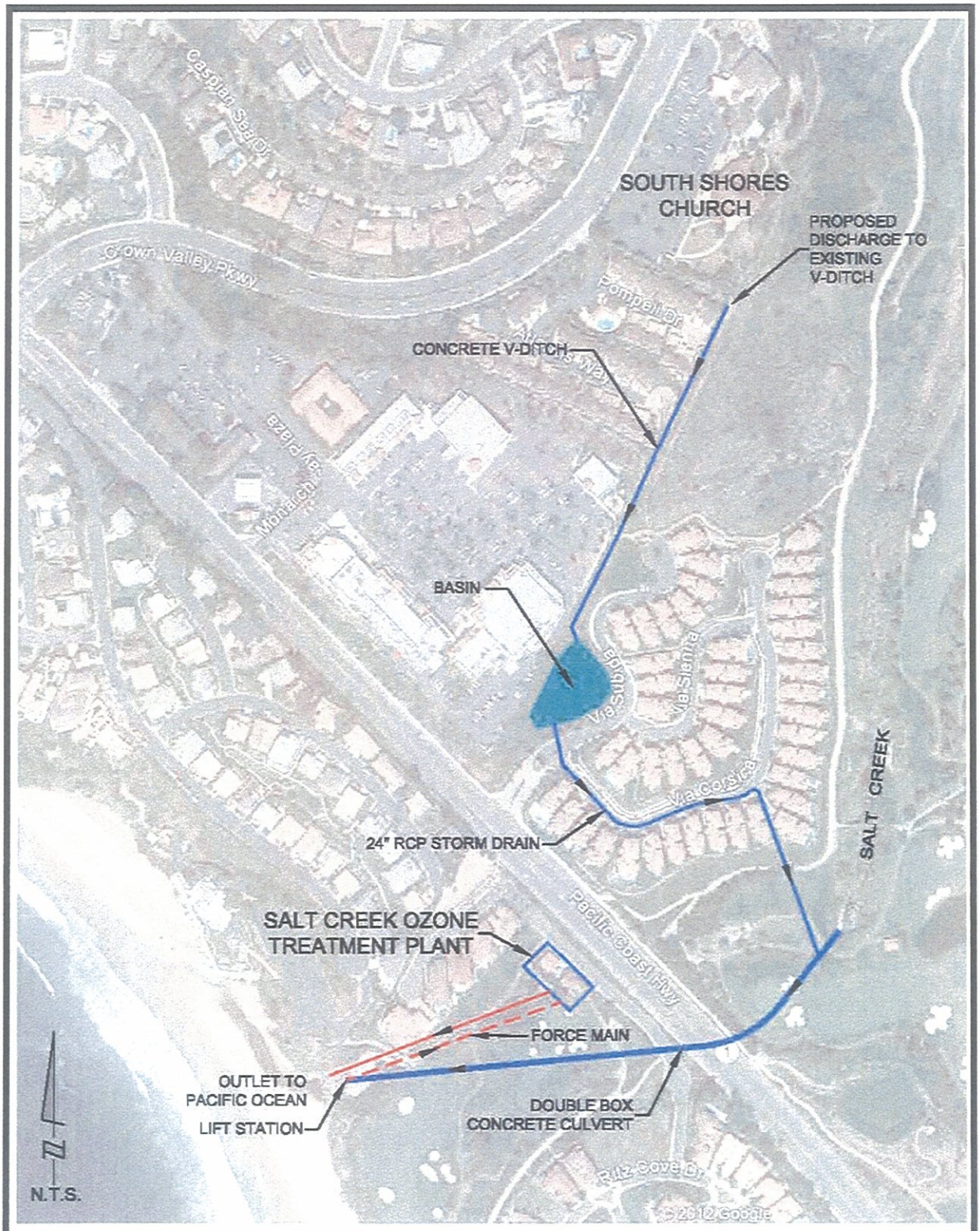
Determine if streams located downstream from the project area are determined to be potentially susceptible to hydromodification impacts. *Refer to Appendix C of the Model WQMP for reference to applicable technical guidance for determining if downstream channels are susceptible to HCOCs.*

Is the proposed project potentially susceptible to hydromodification impacts?

☐ Yes ☒ No (show map)

No, the proposed project discharges into an existing concrete v-ditch at the south corner of the property. Flows within the concrete v-ditch travel south towards the Pointe Monarch community (Tract No. 14605) and enters into a man-made drainage basin. From the basin, flows travel south-east via a RCP storm drain pipe, which connects to a concrete box culvert (O.C.F.C.D. facility No. K01) at the north side of Pacific Coast Highway and the bottom of Salt Creek. Flows then travel within the concrete box culvert underneath Pacific Coast Highway and enter the Salt Creek Ozone Treatment Plant before discharging directly to the Pacific Ocean. See "Path of Discharge" Exhibit below for detailed path of travel.

Refer to the Hydrology Study and Supplemental Master Plan Hydrology Report, dated February 17, 2015 and any subsequent revisions thereof, for a comprehensive review of hydrology and storm calculations and documentation of no hydrologic conditions of concern.



PATH OF DISCHARGE EXHIBIT

SOUTH SHORES CHURCH
DANA POINT, CA

II.4 POST DEVELOPMENT DRAINAGE CHARACTERISTICS

The developed condition of the project site consists of four drainage pattern areas. The majority of the proposed site, Area "A", will drain to an underground storm drain system. Area "A"s water quality will be improved through the use of roof drain planter boxes, proprietary bio-filters, such as Modular Wetlands, and bio-filtration swale / depressed landscape. To reduce peak flows, flows from Area "A" will enter an on-site detention system, consisting of a pretreatment Hydrodynamic Separator and underground detention system, which operates as a short-term holding tank to reduce peak flows. The underground detention system will consist of a StormTrap concrete vault system, which will control peak discharge flows with a small regulator pipe at the outlet. After flows leave the on-site detention system, the proposed storm drain pipe will discharge directly into the existing concrete v-ditch, bypassing the existing drainage basin, which will be eliminated.

Area "B" runoff will enter the proposed storm drain pipe downstream of the on-site detention system before discharging into the existing concrete v-ditch. Area "B"s water quality will be improved through the use of roof drain planter boxes, storm water planters and proprietary bio-filters, such as Modular Wetlands.

Area "C" consists of existing vegetation. Runoff from this area will drain via an existing concrete v-ditch on the site's southerly property line. It will ultimately connect to the proposed storm drain system and converge with flows from Area "A" and "B". Approximately 0.20 acres of Area "C" is run-on from the Monarch Bay Villas. Run-on from the roof drains of the Monarch Bay Villas that are adjacent to the property drain into the existing v-ditch in Area "C".

The fourth drainage pattern area, Area "D", consists of natural slopes that will continue to sheet flow to the east.

The final drainage pattern area, Area "E", consists of a portion of driveway entrances and sidewalk totaling 0.2 acres. Runoff from this area will continue to sheet flow towards Crown Valley Parkway.

II. 5 PROPERTY OWNERSHIP/MANAGEMENT

PROPERTY OWNERSHIP/MANAGEMENT	
Parking Lot / Parking Structure:	South Shores Church
Landscaped Areas:	South Shores Church
Open Space:	South Shores Church
Easements:	South Shores Church
Buildings:	South Shores Church
Structural BMPs:	South Shores Church

South Shores Church will be responsible for inspecting and maintaining all BMPs prescribed for the project. Inspection and maintenance responsibilities are outlined in Section V of this report.

SECTION III SITE DESCRIPTION

III.1 PHYSICAL SETTING

Planning Area/ Community Name:	South Shores Church
Address:	32712 Crown Valley Parkway, Dana Point, CA 92629
Project Area Description:	The South Shores Church is a hillside property located on the east side of Crown Valley Parkway, approximately a quarter-mile from its intersection with Pacific Coast Highway, in the City of Dana Point, California. The subject site is bounded at the west by Crown Valley Parkway, at the south by an existing residential community, and at the north by a descending graded cut slope and a vacant area within an existing apartment complex. At the east boundary, a large, natural slope descends to a graded area with a portion of a golf course and a bike path near the toe-of-slope. Salt Creek runs along the adjacent natural basin through the golf course below, and under Pacific Coast highway to drain to the ocean.
Land Use:	Church
Zoning:	City of Dana Point Zoning Designation is Community Facility
Acreage:	6.0 Acres
Predominant Soil Type:	HSG D
Impervious Conditions:	Existing: 54.3% impervious (45.7% pervious) Proposed: 68.8% impervious (31.2% pervious)

III.2 SITE CHARACTERISTICS

Precipitation Zone:	0.80 inches per Figure XVI-1 of the TGD (see Appendix A)
Topography:	The project site is located on a hillside with variable slopes ranging from minor to moderate. The existing slope on the south-easterly side of the property is comprised of grass, shrubs, and trees. The remainder of the site contains landscaped areas that are regularly maintained.
Drainage Patterns/Connections:	Drainage features include catch basins, an underground detention system, RCP storm drain pipes, concrete v-ditches, an above ground drainage basin, and a concrete box culvert.

Soil Type, Geology, and Infiltration Properties:	HSG D The following soil materials were encountered during investigations prepared by LGC Geotechnical: Artificial Fill Soils, Quaternary Landslide, Tertiary San Onofre Breccia, and Tertiary Monterey Formation. The northeast portion of the site has potentially unstable areas that require slope stabilization in order to achieve stable land for construction of the Community Life Building and the Christian Education Buildings. The site is potentially affected by earthquake-induced landslides that can be mitigated by slope stabilization in accordance with the geotechnical recommendations of the LGC Geotechnical report. The site is not located within an area of potential liquefaction and is not considered a potential risk for lateral spreading, subsidence, or soil collapse, based on the material types underlying the site, and anticipation that site earthwork will be performed in accordance with project specifications. Base on the geotechnical conditions encountered during subsurface evaluations by LGC Geotechnical, it is recommended that no water be purposefully infiltrated to the subsurface on a permanent basis. (See Geotechnical Evaluation and Slope Stabilization Design for EIR Purposes, LGC Geotechnical, 11/12/2012)
Hydrogeologic (Groundwater) Conditions:	Per the soils report prepared by LGC Geotechnical, Inc., a static water table was encountered at approximately 90 feet in depth. (See Geotechnical Evaluation and Slope Stabilization Design for EIR Purposes, LGC Geotechnical, 11/12/2012)
Geotechnical Conditions (relevant to infiltration):	The location of the project indicates that the project's soil type is D, according to Figure XVI-2a of the TGD.
Off-Site Drainage:	Under the existing and proposed condition, approximately 0.2 acres of the Monarch Bay Villas' off-site drainage runs onto the site at the southerly property line discharging directly into the existing v-ditch that runs along said property line.

Utility and Infrastructure Information:	Existing utilities on the project site that are serving buildings to be demolished will be demoed and new dry and wet utilities will be incorporated into the proposed project and will tie into existing facilities associated with the existing development.

III.3 WATERSHED DESCRIPTION

Watershed:	Dana Point Coastal Streams Watershed, also known as Salt Creek Watershed
303(d) Listed Impairments:	Per the 2010 303(d) Integrated Report, the following ESA waterbodies impacted by this project are on the 303(d) List for the impairments indicated and applicable TMDLs: • Salt Creek at Pacific Ocean, Total Coliform, TMDL The bacteria TMDL for Beaches & Creeks was adopted in December 2007.
Applicable TMDLs:	See above.
Pollutants of Concern for the Project:	Pollutants of Concern: Suspended Solid/Sediments, Nutrients, Pathogens Pesticides, Oil & Grease, Trash & Debris. Primary Pollutants of Concern: Total Coliform and Bacteria.
Hydrologic Conditions of Concern (HCOCs):	None. Refer to Section II.3
Environmentally Sensitive and Special Biological Significant Areas:	The project site is not located within or adjacent to a designated Environmentally Sensitive Area (ESA) or designated Area of Special Biological Significance (ASBS).

SECTION IV BEST MANAGEMENT PRACTICES (BMPs)

IV.1 PROJECT PERFORMANCE CRITERIA

Note: A new Order (MS4 NPDES Permit) was adopted on February 11, 2015. Therefore, BMPs will be designed to meet the new language that is approved regarding development and hydromodificiation.

Is there an approved WIHMP or equivalent for the project area that includes more stringent LID feasibility criteria or if there are opportunities identified for implementing LID on regional or sub-regional basis?

☐ Yes ☒ No

PROJECT PERFORMANCE CRITERIA	
Hydromodification Control Performance Criteria (Model WQMP Section 7.II-2.4.2.2)	If a hydrologic condition of concern (HCOC) exists, priority projects are subject to the Interim Hydromodification Criteria identified in Section F.1.h.(5) of the South Orange County MS4 Permit. The Interim Hydromodification Criteria is as follows: PDPs must implement the following criteria by comparing the pre-development (naturally occurring) and post-project flow rates and durations using a continuous simulation hydrologic model such as US EPA's Hydrograph Simulation Program-Fortran (HSPF): (a) For flow rates from 10 percent of the 2-year storm event to the 5 year storm event, the post-project peak flows shall not exceed pre-development (naturally occurring) peak flows. (b) For flow rates from the 5-year storm event to the 10 year storm event the post-project peak flows may exceed pre-development (naturally occurring) flows by up to 10 percent for a 1-year frequency interval.
LID Performance Criteria (Model WQMP Section 7.II-2.4.3)	Infiltrate, harvest and use, evapotranspire, or biotreat/biofilter, the 85th percentile, 24-hour storm event (Design Capture Volume). LID BMPs must be designed to retain, on-site, (infiltrate, harvest and use, or evapotranspire) storm water runoff up to 80 percent average annual capture efficiency

Treatment Control BMP Performance Criteria (Model WQMP Section 7.II-3.2.2)	If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosions, scour, and channeling within the BMP, and must be sized to: (a) Treat 1.5 times the design capture volume not reliably retained onsite (Per ORDER R9-2013-001); or (b) Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite. (Per ORDER R9-2009-002 and R9-2013-0001) If it is not feasible to meet LID performance criteria through retention and/or biotreatment provided on-site or at a sub-regional/regional scale, then treatment control BMPs shall be provided on-site or offsite prior to discharge to waters of the US. Sizing of treatment control BMP(s) shall be based on either the unmet volume after claiming applicable water quality credits, if appropriate.
LID Design Storm Capture Volume	DCV = C x d x A x 43,560 sf/ac x 1/12 in/ft Where: *DCV – design storm capture volume, cu-ft* *C = runoff coefficient = (0.75 x imp + 0.15)* *d=storm depth (inches)* *A=tributary area (acres)* See table in Section IV.2.2

IV.2 Site Design and Drainage Plan

The following section describes the site design BMPs used in this project and the methods used to incorporate them. Careful consideration of site design is a critical first step in storm water pollution prevention from new developments and redevelopments.

IV.2.1 Site Design BMPs

Minimize Impervious Area

Impervious surfaces have been minimized by incorporating landscaped areas throughout the site surrounding the proposed buildings and hardscape areas. The Master Plan Alternative being proposed reduced the development footprint, thereby reducing impervious area by 0.38 acres compared to the original proposed Master Plan.

Maximize Natural Infiltration Capacity

Under the existing conditions, infiltration capacity is very low due to Type D Clayey soils. Under the proposed condition, infiltration capacity will remain limited.

Disconnect Impervious Areas

Landscaping will be provided throughout the site, adjacent to sidewalks, buildings and drive aisles to disconnect impervious areas.

Protect Existing Vegetation and Sensitive Areas, and Revegetate Disturbed Areas

The project will conserve natural hillside areas along the eastern edge of the property and will preserve trees wherever possible. Revegetation will be completed in temporary disturbance areas.

Xeriscape Landscaping

The proposed project will utilize drought tolerant native landscaping to minimize irrigation demands.

IV.2.2 DRAINAGE MANAGEMENT AREAS

In accordance with the MS4 permit and the Model WQMP, the project site has been divided into Drainage Management Areas (DMAs) to be utilized for defining drainage areas and sizing LID and other treatment control BMPs. DMAs have been delineated based on the proposed site grading patterns, drainage patterns, storm drain and catch basin locations.

The design capture volumes (DCV) and treatment flow rates (Q_{Design}) for each DMA are summarized in the table below. These have been derived utilizing the "Simple Method" in accordance with the TGD Section III.1.1. Actual BMP sizing requirements, including 80 percent capture design volumes, flow rates, depths, and other design details for the specific BMPs proposed are provided in Section IV.3.4 below. Locations of DMAs and associated LID and treatment BMPs are identified on the exhibits in Section VI. Additional calculations and TGD Worksheets are provided in Appendix A.

DRAINAGE MANAGEMENT AREAS								
DMA/ Drainage Area ID [1]	BMP	Drainage Area (ac)	% Imp.	Design Storm Depth[2] (in)	Estimated Tc (min.)	Rainfall Intensity[3] (in/hr)	Simple Method DCV[4] (ft^3)	Q_{Design}[5] (cfs)
A-1	Bioretention	0.11	90%	0.80	5	0.26	264	0.051
A-2	Bioretention	0.32	90%	0.80	5	0.26	767	0.150
"A" Remainder	Modular Wetlands System	3.16	85%	0.80	5	0.26	7,227	1.462
B-1	HSC-2	0.46	29%	0.80	5	0.26	0[6]	0[6]
B-2	Bioretention	0.17	90%	0.80	5	0.26	407	0.080
B-3	Bioretention	0.17	90%	0.80	5	0.26	407	0.080
B-4	Modular Wetlands System	0.32	80%	0.80	5	0.26	697	0.141
C	*UNDEVELOPED*	0.29	*NATURAL AREA TO BE UNDEVELOPED (N.A.P.)*					
D	*UNDEVELOPED*	0.83						
E	*UNDEVELOPED*	0.17						
Total at Property Line		6.00	69%					

Notes:
1. Refer to exhibits in Section VI for locations of each DMA.
2. Per Figure XVI-1 of the Model WQMP Technical Guidance Document (2013, December 20). See also Appendix A.
3. Per Figure III.4 of the Model WQMP Technical Guidance Document (2013, December 20). See also Appendix A.
4. Per Section III.1.1 of the Model WQMP Technical Guidance Document.
5. Per Section III.3.3 and Worksheet D of the Model WQMP Technical Guidance Document.
6. See Worksheet A in Appendix A for Hydrologic Source Control Calculations

IV.3 LID BMP SELECTION AND PROJECT CONFORMANCE ANALYSIS

Low Impact Development (LID) BMPs are required in addition to site design measures and source controls to reduce pollutants in storm water discharges. LID BMPs are engineered facilities that are designed to retain or biotreat runoff on the project site. The MS4 Storm Water Permit (Order R9-2015-0001) requires the evaluation and use of LID features and techniques to infiltrate, filter, store, evaporate or retain runoff close to the source of runoff. If on-site retention LID BMPs are technically infeasible, LID biofiltration BMPs may treat any volume that is not retained on-site by the pore spaces and pre-filter detention volume, must be sized to hold at least 0.75 times the design storm volume that is not retained onsite by LID retention BMPs. The following sections summarize the LID BMPs proposed for the project in accordance with the permit hierarchy and performance criteria outlined in Section IV.1.

IV.3.1 Hydrologic Source Controls (HSCs)

Hydrologic source controls (HSCs) can be considered to be a hybrid between site design practices and LID BMPs. HSCs are distinguished from site design BMPs in that they do not reduce the tributary area or reduce the imperviousness of a drainage area; rather they reduce the runoff volume that would result from a drainage area with a given imperviousness compared to what would result if HSCs were not used.

HYDROLOGIC SOURCE CONTROLS		
ID	Name	Included?
HSC-1	Localized on-lot infiltration	☐
HSC-2	Impervious area dispersion (e.g. roof top disconnection)	☒
HSC-3	Street trees (canopy interception)	☐
HSC-4	Residential rain barrels (not actively managed)	☐
HSC-5	Green roofs/Brown roofs	☐
HSC-6	Blue roofs	☐
HSC-7	Impervious area reduction (e.g. permeable pavers, site design)	☐

The project will utilize HSCs (impervious area dispersion) within DMA B-1. Within this area, the sidewalks and hardscape will drain to adjacent landscaping. Based on the capture efficiency calculations, the large amount of landscaping within this area is sufficient to treat runoff from the adjacent impervious surfaces in accordance with the Model WQMP and TGD (meets 80% minimum average annual capture efficiency.) Calculations and associated worksheets are included in Attachment E.

HYDROLOGIC SOURCE CONTROL BMP SUMMARY						
DMA/ Drainage Area ID	HSC Type	Drainage Area (ac)	Pervious to Impervious Ratio Tributary to HSC	$d_{HSC\ total}$ (1)	% Capture by HSC (2)	Sufficient
B-1	HSC-2: Impervious Area Dispersion	0.46	2.45	1"	80%	Yes

Notes:
1. Per chart in Fact Sheet HSC-2 of the Technical Guidance Document, dated December 20, 2013
2. Per Table III.1 of the Technical Guidance Document, dated December 20, 2013.

IV.3.2 Infiltration BMPs

Infiltration BMPs are LID BMPs that capture, store and infiltrate storm water runoff. These BMPs are engineered to store a specified volume of water and have no design surface discharge (underdrain or outlet structure) until this volume is exceeded. Examples of infiltration BMPs include infiltration trenches, bioretention without underdrains, drywells, permeable pavement, and underground infiltration galleries.

INFILTRATION		
ID	Name	Included?
INF-3 INF-4	Bioretention Without Underdrains	☐
	Rain Gardens	☐
	Porous Landscaping	☐
	Infiltration Planters	☐
	Retention Swales	☐
INF-2	Infiltration Trenches	☐
INF-1	Infiltration Basins	☐
INF-5	Drywells	☐
INF-7	Subsurface Infiltration Galleries	☐
--	French Drains	☐
INF-6	Permeable Asphalt	☐
	Permeable Concrete	☐

INFILTRATION		
ID	Name	Included?
	Permeable Concrete Pavers	☐
	Other:	☐

The project site is located in an area comprised of HSG D soil type, according to the TGD. It is also of the professional opinion of the soils engineer for the project, LGC Geotechnical, that no water be purposefully infiltrated to the subsurface. Therefore, infiltration of runoff is considered infeasible.

See Table 2.7: Infiltration BMP Feasibility Worksheet in Appendix A.

IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs

Evapotranspiration BMPs are a class of retention BMPs that discharges stored volume predominately to ET, though some infiltration may occur. ET includes both evaporation and transpiration, and ET BMPs may incorporate one or more of these processes. BMPs must be designed to achieve the maximum feasible ET, where required to demonstrate that the maximum amount of water has been retained on-site. Since ET is not the sole process in these BMPs, specific design and sizing criteria have not been developed for ET-based BMPs.

EVAPOTRANSPIRATION		
ID	Name	Included?
--	HSCs, *see Section IV.3.1*	☒
--	Surface-based infiltration BMPs	☐
--	Biotreatment BMPs, see *Section VI.3.4*	☒
	Other:	☐

Bioretention BMPs are proposed which utilize evapotranspiration as physical process for runoff volume reduction. Bioretention BMPs are described further in Section IV.3.4.

Harvest and use (aka. Rainwater Harvesting) BMPs are LID BMPs that capture and store storm water runoff for later use. These BMPs are engineered to store a specified volume of water and have no design surface discharge until this volume is exceeded. Harvest and use BMPs include both above-ground and below-ground cisterns. Examples of uses for harvested water include irrigation, toilet and urinal flushing, vehicle washing, evaporative cooling, industrial processes and other non-potable uses.

HARVEST & REUSE / RAINWATER HARVESTING		
ID	Name	Included?
HU-1	Above-ground cisterns and basins	☐
HU-2	Underground detention	☐
--	Other:	☐

For the purposes of evaluating feasibility in this WQMP, the Effective Irrigated Area to Tributary Area (EIATA) ratio tool was utilized in accordance with Appendix X of the Model WQMP's Technical Guidance Document (TGD), dated December 20, 2013. The EIATA ratio is calculated as follows:

$$EIATA = \frac{(LA\ X\ K_L)}{(IE\ X\ Tributary\ Impervious\ Area)}$$

Where:

EIATA = effective irrigated area to tributary ratio
K_L = Area-weighted landscape coefficient (Table X.4 of the TGD)
LA = landscape area irrigated with harvested water (square feet)
IE = irrigation efficiency (assumed at 90%)

For a system to be considered "feasible", the system must be designed with a storage volume equal to the DCV from the tributary area and achieve more than 40% capture. The system must also be able to drawdown in 30 days to meet the 40% capture value. In addition, Table X.8 of the Technical Guidance Document sets forth the minimum demand thresholds / minimum irrigated area for potential partial capture feasibility. Projects with irrigation area below this value are not required to evaluate harvest and use further.

TABLE X.8: MINIMUM IRRIGATED AREA FOR POTENTIAL PARTIAL CAPTURE FEASIBILITY						
General Landscape Type	Conservation Design: K_L = 0.35			Active Turf Areas: K_L = 0.7		
Closest ET Station	*Irvine*	*Santa Ana*	*Laguna Beach*	*Irvine*	*Santa Ana*	*Laguna Beach*
Design Capture Storm Depth, inches	Minimum Required Irrigated Area per Tributary Impervious Acre for Potential Partial Capture, ac/ac					
0.60	0.66	0.68	0.72	0.33	0.34	0.36
0.65	0.72	0.73	0.78	0.36	0.37	0.39
0.70	0.77	0.79	0.84	0.39	0.39	0.42
0.75	0.83	0.84	0.90	0.41	0.42	0.45
0.80	0.88	0.90	0.96	0.44	0.45	0.48
0.85	0.93	0.95	1.02	0.47	0.48	0.51

TABLE X.8: MINIMUM IRRIGATED AREA FOR POTENTIAL PARTIAL CAPTURE FEASIBILITY						
General Landscape Type	Conservation Design: K_L = 0.35			Active Turf Areas: K_L = 0.7		
Closest ET Station	*Irvine*	*Santa Ana*	*Laguna Beach*	*Irvine*	*Santa Ana*	*Laguna Beach*
Design Capture Storm Depth, inches	Minimum Required Irrigated Area per Tributary Impervious Acre for Potential Partial Capture, ac/ac					
0.90	0.99	1.01	1.08	0.49	0.51	0.54
0.95	1.04	1.07	1.14	0.52	0.53	0.57
1.00	1.10	1.12	1.20	0.55	0.56	0.60

The following table summarizes the results of the EIATA Demand Calculations based on approximately 1.87 acres of landscaping proposed as part of the project.

EIATA DEMAND CALCULATIONS					
Total Area (ac)	Tributary Impervious Area (ac)	Tributary Landscaped Area (ac)	Landscape Coefficient (K_L)[1]	EIATA (ac/ac)	Minimum EIATA per Table X.8 (ac/ac)
6.00	4.13	1.87	0.7	0.35	0.48

Notes:
1. Assumes 100% turf landscaping per Table X.4 of the WQMP Technical Guidance Document, dated December 20, 2013

The resultant EIATA for the project is less than the minimum EIATA per TGD Table X.8. Therefore, harvest and reuse is not feasible for this project at this time.

Indoor toilet demand was also evaluated, but was found to be infeasible due to the following:

- Local plumbing ordinances which require high level disinfection treatment well beyond storm water treatment requirements prior to indoor use. This would make indoor demand economically infeasible for the church.
- There is an unreliable accumulation of rainwater based on the erratic weather in recent years.

Based on these constraints, indoor flushing demand is infeasible and leaves only the irrigation demand which is insufficient to meet the minimum standards.

IV.3.4 Biotreatment BMPs

Biotreatment BMPs are a broad class of LID BMPs that reduce storm water volume to the maximum extent practicable, treat storm water using a suite of treatment mechanisms characteristic of biologically active systems, and discharge water to the downstream storm drain system or directly to receiving waters. Treatment mechanisms include media filtration (though biologically-active media), vegetative filtration (straining, sedimentation, interception, and stabilization of particles resulting from shallow flow through vegetation), general sorption processes (i.e., absorption, adsorption, ion-exchange, precipitation, surface complexation), biologically-mediated transformations, and other processes to address both suspended and dissolved constituents. Examples of biotreatment BMPs include bioretention with underdrains, storm water planters, and proprietary biotreatment systems.

BIOTREATMENT		
ID	Name	Included?
BIO-1	Bioretention with underdrains	☐
	Storm Water planter boxes with underdrains	☒
	Rain gardens with underdrains	☐
BIO-5	Constructed wetlands	☐
BIO-2	Vegetated swales	☐
BIO-3	Vegetated filter strips	☐
BIO-7	Proprietary vegetated biotreatment systems	☒
BIO-4	Wet extended detention basin	☐
BIO-6	Dry extended detention basins	☐
--	Other:	☐

Since both infiltration and harvest and reuse are considered infeasible, runoff from the project site will be treated through the use of biofiltration BMPs: Storm Water planter boxes with underdrains and proprietary biotreatment systems (Modular Wetlands) with upstream detention. In accordance with the Model WQMP and TGD, the biofiltration BMPs will be sized to treat runoff from the Design Capture Storm (85^{th} percentile, 24-hour). Locations and tributary drainage areas are shown on the WQMP Exhibit included in Section VI. Detailed calculations, associated TGD Worksheets and BMP details are included in Attachment A. Operation and maintenance details are included in Section V and Attachment D (O&M Plan).

Bioretention BMPs in the form of Storm Water planter boxes (downspout planter boxes) with underdrains will be incorporated at the existing sanctuary building (B-2 and B-3) and at the north westerly edge of the Community Life Center (A-1) to pick up roof runoff. A portion of the upper deck of the parking structure

(A-2) will drain towards Crown Valley Parkway were a storm water planter with underdrain will be located. Bioretention Storm water treatment facilities are landscaped shallow depressions that capture and filter Stormwater runoff. These facilities function as soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. Bioretention with underdrains are utilized for areas with low soil permeability such as the proposed project site.

Sizing of the Bioretention facilities utilize the Simple Design Capture Volume Sizing Methodology in accordance with the Model WQMP TGD Appendix III. Results are summarized in the table below.

BIORETENTION DESIGN SUMMARY							
DMA/ Drainage Area ID [1]	Tributary Drainage Area (acres)	% imp.	DCV[2] (ft^3)	BMP Type	Ponding Depth	BMP Footprint Required (ft^2)	BMP Footprint Provided (ft^2)
A-1	0.11	90%	264	Roof drain planter w/ Underdrain	12"	162	235
A-2	0.32	90%	767	Storm water planter w/ Underdrain	12"	472	475
B-2	0.17	90%	407	Roof drain planter w/ Underdrain	6"	407	500
B-3	0.17	90%	407	Roof drain planter w/ Underdrain	12"	250	270

Notes:

1. Refer to WQMP Exhibit in Section VI for locations of BMPs.
2. Per Worksheet B, "Simple Design Capture Volume Sizing Method". See Appendix A for calculation details.

Modular Wetlands by Modular Wetlands Systems, Inc. are proprietary biotreatment systems that utilize multi-stage treatment processes including screening media filtration, settling, and biofiltration. The pre-treatment chamber contains the first three stages of treatment, and includes a catch basin inlet filter to capture trash, debris, gross solids and sediments, a settling chamber for separating out larger solids, and a media filter cartridge for capturing fine TSS, metals, nutrients, and bacteria. Runoff then flows through the wetland chamber where treatment is achieved through a variety of physical, chemical, and biological processes. As storm water passes down through the planting soil, pollutants are filtered, adsorbed, biodegraded and sequestered by the soil and plants, functioning similar to bioretention systems. The discharge chamber at the end of the unit collects treated flows and discharges back into the storm drain system.

Due to the use of flow through design biofiltration BMPs (Modular Wetlands), storage of at least 75% of the Design Capture Volume is required for water quality treatment. Per Permit R9-2009-0002 (p. 35), "Due to the flow through design of biofiltration BMPs, the total volume of the BMP, including pore spaces and prefilter detention volume, must be sized to hold at least 0.75 times the design storm volume that is not retained onsite by LID retention BMPs." To satisfy this requirement, 75% of the Design Capture Volume will be detained upstream of the proposed biofiltration BMP. The permit language does not specify the rate at which the prefilter volume can be released to the downstream biofiltration BMP.

For the Remainder of Area "A", the required DCV is 7,227 cubic feet and 75% of this volume is 5,420 cubic feet. To meet the Permit criteria, 5,420 cubic feet of prefilter runoff will be stored in a detention chamber upstream of the Modular Wetland unit and pumped at a rate that will allow the unit to treat the full Treatment DCV. Once treated, the discharge from the wetland unit will flow to the storm drain system downstream of the retention facilities.

For the Area "B-4", the required DCV is 697 cubic feet and 75% of this volume is 523 cubic feet. To meet the Permit criteria, at least 523 cubic feet of prefilter runoff will be stored in a detention chamber upstream of the Modular Wetland unit and pumped at a rate that will allow the unit to treat the full Treatment DCV. Once treated, the discharge from the wetland unit will flow to the storm drain system downstream of the retention facilities.

Locations and tributary drainage areas are shown on the WQMP Exhibit included in Section VI. BMP details are also included in Section VI. Detailed calculations and associated TGD Worksheets are included in Appendix A. Operation and maintenance details are included in Section V and Appendix D (O&M Plan).

MODULAR WETLAND DESIGN SUMMARY						
DMA/ Drainage Area ID [1][2]	Tributary Drainage Area (acres)	DCV (ft^3)	Prefilter Detention Volume (75% of DCV, ft^3)	Size / Model[4]	Drawdown	Sufficient?
Remainder of Area "A"	3.16	7,227	5,420	MWS-L-4-15 Vault Treats up to 7,623 ft^3 @ 48-Hour Drain Down	48 Hours	Yes
B-4	0.32	697	523	MWS-L-4-4 Vault Treats up to to 2,280 ft^3 @ 48-Hour Drain Down	48 Hours	Yes

Notes:

1. See also Section IV.2.2.
2. Refer to WQMP Exhibit in Section VI for locations of BMPs.

IV.3.5 Hydromodification Control BMPs

The project site is not susceptible to hydromodification and project runoff never enters a stream system (discharges to concrete v-ditch, which discharges to created wetland/flow through retention basin to underground storm drain system to ocean). Therefore, no hydromodification controls were prescribed for the project. LID BMPs (biotreatment) will be utilized for water quality treatment on-site in accordance with the MS4 Permit hierarchy identified at the beginning of this section.

A new Order (MS4 NPDES Permit) was adopted on February 11, 2015. Therefore, BMPs will be designed to meet the new language that is approved regarding development and hydromodification.

IV.3.6 Regional/Sub-Regional LID BMPs

Not applicable. LID BMPs (biotreatment) will be utilized for water quality treatment on-site in accordance with the MS4 Permit hierarchy identified at the beginning of this section.

IV.3.7 Treatment Control BMPs

Treatment control BMPs can only be considered if the project conformance analysis indicates that it is not feasible to retain the full design capture volume with LID BMPs.

TREATMENT CONTROL BMPs		
ID	Name	Included?
TRT-1	Sand Filters	☐
TRT-2	Cartridge Media Filter	☐
PRE-1	Hydrodynamic Separation Device	☒
PRE-2	Catch Basin Insert	☐
	Other:	☐

Not applicable. LID BMPs (biotreatment) will be utilized for water quality treatment on-site in accordance with the MS4 Permit hierarchy identified at the beginning of this section.

A hydrodynamic separation device will be used only as pre-treatment to the underground detention basin and does not factor into the calculation of treating the design capture volume.

IV.3.8 Non-Structural Source Control BMPs

The table below indicates all BMPs to be incorporated in the project. For those designated as not applicable (N/A), a brief explanation why is provided.

NON-STRUCTURAL SOURCE CONTROL BMPs				
ID	Name	Included?	Not Applicable?	If Not Applicable, Provide Brief Reason
N1	Education for Property Owners, Tenants and Occupants	☒	☐	
N2	Activity Restrictions	☒	☐	
N3	Common Area Landscape Management	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	No activities that generate hazardous wastes or materials proposed.
N6	Local Industrial Permit Compliance	☐	☒	Project does not propose any industrial use.
N7	Spill Contingency Plan	☐	☒	No activities that generate hazardous wastes or materials proposed.
N8	Underground Storage Tank Compliance	☐	☒	No USTs proposed.

NON-STRUCTURAL SOURCE CONTROL BMPs				
ID	Name	Included?	Not Applicable?	If Not Applicable, Provide Brief Reason
N9	Hazardous Materials Disclosure Compliance	☐	☒	No activities that generate hazardous wastes or materials proposed.
N10	Uniform Fire Code Implementation	☐	☒	No activities that generate hazardous wastes or materials proposed.
N11	Common Area Litter Control	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☐	☒	No loading docks proposed.
N14	Common Area Catch Basin Inspection	☒	☐	
N15	Street Sweeping Private Streets and Parking Lots	☒	☐	
N16	Retail Gasoline Outlets	☐	☒	No RGOs proposed.

N1, Education for Property Owners, Tenants and Occupants

The Owner will provide Homeowners with storm water pollution prevention educational materials upon first occupancy and on an annual basis thereafter. These materials can be found in Appendix C and on the County of Orange website: www.ocwatersheds.com.

N2, Activity Restrictions

The Owner shall develop ongoing activity restrictions that include those that have the potential to create adverse impacts on water quality. Activities include, but are not limited to: handling and disposal of contaminants, fertilizer and pesticide application restrictions, litter control and pick-up, and vehicle or equipment repair and maintenance, as well as any other activities that may potentially contribute to water pollution.

N3, Common Area Landscape Management

The Owner shall be responsible for ongoing maintenance and management of all landscaped areas on their property, consistent with OC DAMP Section 5.5, Management Guidelines for Use of Fertilizers as well as City standards. Program includes how to reduce the potential pollutant sources of fertilizer and pesticide uses, utilization of water-efficient landscaping practices, ongoing trimming and other landscape maintenance activities and proper disposal of landscape wastes by the owner and/or contractors.

N4, BMP Maintenance

The Owner will be responsible for the implementation and maintenance of each applicable non-structural BMP, as well as scheduling inspections and maintenance of all applicable structural BMP facilities through its staff, landscape contractor, and/or any other necessary maintenance contractors. Details on BMP Maintenance are provided in Section V of this WQMP.

N11, Common Area Litter Control

The Owner will be responsible for performing trash pick-up and sweeping of littered common areas on a weekly basis, and proper disposal of waste collected. Responsibilities will also include investigating, noting and documenting improper disposal materials by residents.

N12, Employee Training

All employees and any contractors will require training to ensure that employees are aware of maintenance activities that may result in pollutants reaching the storm drain. Training will include, but not be limited to, spill cleanup procedures, proper waste disposal, housekeeping practices, etc.

N14, Common Area Catch Basin Inspection

All private on-site catch basin inlets, area drains, ribbon gutters, curb and gutters, basins and other drainage systems shall be inspected and cleaned out by the Owner at least once a year, prior to the rainy season, no later than October 1st of each year in accordance with the fact sheets attached to this WQMP.

N15, Street Sweeping Private Streets and Parking Lots

Private streets and parking stalls shall be swept quarterly at a minimum and prior to the rainy season, no later than October 1st each year.

IV.3.9 Structural Source Control BMPs

The table below indicates all BMPs to be incorporated in the project. For those designated as not applicable (N/A), a brief explanation why is provided.

STRUCTURAL SOURCE CONTROL BMPs				
ID	Name	Included?	Not Applicable?	If Not Applicable, Provide Brief Reason
S1 SD-13	Provide storm drain system stenciling and signage	☒	☐	
S2 SD-34	Design and construct outdoor material storage areas to reduce pollution introduction	☐	☒	No outdoor material storage areas proposed.
S3 SD-32	Design and construct trash and waste storage areas to reduce pollution introduction	☒	☐	
S4 SD-12	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐	
S5	Protect slopes and channels and provide energy dissipation	☒	☐	
S6 SD-31	Properly Design: Dock areas	☐	☒	No dock areas proposed.
S7 SD-31	Properly Design: Maintenance bays	☐	☒	No maintenance bays proposed.
S8 SD-33	Properly Design: Vehicle wash areas	☐	☒	No vehicle wash areas proposed.
S9 SD-36	Properly Design: Outdoor processing areas	☐	☒	No outdoor processing areas proposed.
S10	Properly Design: Equipment wash areas	☐	☒	No equipment wash areas proposed.
S11 SD-30	Properly Design: Fueling areas	☐	☒	No fueling areas proposed.
S12 SD-10	Properly Design: Hillside landscaping	☒	☐	
S13	Properly Design: Wash water control for food preparation areas	☐	☒	No food preparation areas proposed.
S14	Properly Design: Community car wash racks	☐	☒	No car wash racks proposed.

S1/SD-13, Provide storm drain system stenciling and signage

The phrase "NO DUMPING! DRAINS TO OCEAN", or an equally effective phrase approved by the City, will be stenciled on all major storm drain inlets within the project site to alert the public to the destination of pollutants discharged into storm water. Stencils shall be in place prior to release of certificate of occupancy. Stencils shall be inspected for legibility on an annual basis and re-stenciled as necessary.

S3/SD-32 Design and construct trash and waste storage areas to reduce pollution introduction

Design trash storage areas to reduce pollutant introduction. All trash container areas shall meet the following requirements (Limited exclusion: detached residential homes):

1. Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash; and
2. Provide solid roof or awning to prevent direct precipitation.

Connection of trash area drains to the municipal storm drain system is prohibited. Potential conflicts with fire code and garbage hauling activities should be considered in implementing this source control. See CASQA Stormwater Handbook Section 3.2.9. and BMP Fact Sheet SD-32 for additional information.

S4/SD-12, Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control

The Owner will be responsible for the installation and maintenance of all common landscape areas utilizing similar planting materials with similar water requirements to reduce excess irrigation runoff. The developer will be responsible for implementing all efficient irrigation systems for common area landscaping including but not limited to provisions for water sensors and programmable irrigation cycles. The irrigation systems shall be in conformance with water use efficiency guidelines.

S5, Protect slopes and channels and provide energy dissipation

The Owner will be responsible for the installation and maintenance of all slopes and channels. A energy dissipation device for the existing drainage ditch and proposed storm drain connection is to be designed and submitted with the Final WQMP.

S12/SD-10, Properly Design: Hillside Landscape

Slope landscaping will consist of drought-tolerant plantings that will require little or no irrigation to minimize run-off and infiltration. The Owner will be responsible for maintaining the vegetative cover and/or mulch on the project area slopes to eliminate exposed soils, and will inspect the slopes to check for signs of erosion, gullies and sloughing at least twice a year, at the beginning and end of the rainy season, and after all major storm events.

IV.4 ALTERNATIVE COMPLIANCE PLAN

IV.4.1 Water Quality Credits

Local jurisdictions may develop a water quality credit program that applies to certain types of development projects after they first evaluate the feasibility of meeting LID requirements on-site. If it is not feasible to meet the requirements for on-site LID, project proponents for specific project types can apply credits that would reduce project obligations for selecting and sizing other treatment BMPs or participating in other alternative programs.

WATER QUALITY CREDITS	
Credit	Applicable ?
Redevelopment projects that reduce the overall impervious footprint of the project site.	☐
Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface water quality if not redeveloped.	☐
Higher density development projects which include two distinct categories (credits can only be taken for one category): those with more than seven units per acre of development (lower credit allowance); vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2 or those having more than 18 units per acre (greater credit allowance)	☐
Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g. reduced vehicle trip traffic with the potential to reduce sources of water or air pollution).	☐
Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g. bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned	☐
Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping).	☐
Developments with dedication of undeveloped portions to parks, preservation areas and other pervious uses.	☐
Developments in a city center area.	☐
Developments in historic districts or historic preservation areas.	☐

WATER QUALITY CREDITS	
Credit	Applicable ?
Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories.	☐
In-fill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.	☐

Not applicable. Water quality credits will not be applied for the project. LID BMPs will be utilized for water quality treatment on-site in accordance with the MS4 Permit hierarchy identified at the beginning of this Section.

IV.4.2 Alternative Compliance Plan Information

Not applicable. Water quality credits will not be applied for the project. LID BMPs will be utilized for water quality treatment on-site in accordance with the MS4 Permit hierarchy identified at the beginning of this Section.

SECTION V INSPECTION/MAINTENANCE RESPONSIBILITY FOR BMPS

It has been determined that the Owner, South Shores Church, shall assume all BMP inspection and maintenance responsibilities for the project site.

Contact Name:	G.G. Kohlhagen
Title:	Building Committee Chairman / Church Project Manager
Company:	South Shores Church
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Fax:	
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Should the maintenance responsibility be transferred at any time during the operational life of the church, a formal notice of transfer shall be submitted to the City of Dana Point at the time responsibility of the property subject to this WQMP being transferred. The transfer of responsibility shall be incorporated into this WQMP as an amendment.

The Owner shall verify BMP implementation and ongoing maintenance through inspection, self-certification, survey, or other equally effective measure. The certification shall verify that, at a minimum, the inspection and maintenance of all structural BMPs including inspection and performance of any required maintenance in the late summer / early fall, prior to the start of the rainy season. A form that may be used to record implementation, maintenance, and inspection of BMPs is included in Appendix D.

The City of Dana Point may conduct verifications to assure that implementation and appropriate maintenance of structural and non-structural BMPs prescribed within this WQMP is taking place at the project site. The Owner or HOA shall retain operations, inspections and maintenance records of these BMPs and they will be made available to the City or County upon request. All records must be maintained for at least five (5) years after the recorded inspection date for the lifetime of the project.

Long-term funding for BMP maintenance shall be funded through fees paid into the HOA. HQT Placentia, LLC, which will set up the HOA shall oversee that adequate funding for BMP maintenance is included within the HOA fee structure including annual maintenance fees and long-term maintenance reserve funds.

The Operations and Maintenance (O&M) Plan can be found in Appendix D.

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX				
	BMP	Inspection/Maintenance Activities	Minimum Frequency	Responsible Party
BIOTREATMENT BMPs				
BIO-1	Bioretention with underdrain	Inspections should occur semi-annually or after major storm events to check for the following and remove accordingly: standing water, sediment, and trash & debris. Inspections should also look for potential clogging and clean planters or, if necessary, replace the entire filter bed. Inspect for weeds, and prune and/or replace plants in accordance with routine landscape maintenance activities. Replace mulch and prune shrubs as necessary.	2 x per year	Owner
BIO-7	Modular Wetland Systems (1) MWS-4-15V (1) MWS-4-4V	Annual maintenance consists of a minimum of two scheduled visits (every 6 months), one after the rainy season to clean up after the wet season, and one before the wet season to inspect and clean the unit. Each maintenance visit consists of the following: Inspection, cleaning, and/or replacement per manufacturer's recommendations.	2 x per year	Owner
NON-STRUCTURAL SOURCE CONTROL BMPs				
N1	Education for Property Owners, Tenants and Occupants	Provide educational materials to new homeowners upon first occupancy and annually thereafter.	Annually	Owner

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX				
	BMP	Inspection/Maintenance Activities	Minimum Frequency	Responsible Party
N2	Activity Restrictions	The Owner / HOA will prescribe activity restrictions to protect surface water quality, through CC&Rs or other equally effective measure, for the property. Restrictions include, but are not limited to, prohibiting vehicle maintenance or vehicle washing.	Monthly	Owner
N3	Common Area Landscape Management	Maintenance shall be consistent with City requirements, plus fertilizer and/or pesticide usage shall be consistent with County guidelines for use of fertilizers and pesticides (OC DAMP Section 5.5). Maintenance includes mowing, weeding, and debris removal on a weekly basis. Trimming, replanting and replacement of mulch shall be performed on an as-needed basis. Trimmings, clippings, and other waste shall be properly disposed of off-site in accordance with local regulations. Materials temporarily stockpiled during maintenance activities shall be placed away from water courses and drain inlets.	Monthly	Owner
N4	BMP Maintenance	Maintenance of BMPs implemented at the project site shall be performed at the frequency prescribed in this WQMP. Records of inspections and BMP maintenance shall be maintained by the Owner and documented with the WQMP, and shall be available for review upon request. The O&M Plan is included in Appendix D.	Ongoing	Owner

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX				
	BMP	Inspection/Maintenance Activities	Minimum Frequency	Responsible Party
N11	Common Area Litter Control	Litter patrol, violations investigation, reporting and other litter control activities shall be performed in conjunction with maintenance activities. Litter collection and removal shall be performed on a weekly basis.	Weekly	Owner
N12	Employee Training	The Owner shall educate all new employees on storm water pollution prevention, particularly good housekeeping practices, prior to the start of the rainy season (October 1). Refresher courses shall be conducted on an as needed basis. Materials that may be used are attached to this WQMP.	Annually	Owner
N14	Common Area Catch Basin Inspection	Catch basin inlets, area drains, curb-and-gutter systems and other drainage systems shall be inspected after each storm event and, if necessary, cleaned prior to the storm season by October 1st each year.	Annually	Owner
N15	Street Sweeping Private Streets and Parking Lots	Parking areas and streets must be swept at least quarterly, including prior to the start of the rainy season (October 1st).	Quarterly	Owner
STRUCTURAL SOURCE CONTROL BMPs				
S1 SD-13	Provide storm drain system stenciling and signage	Storm drain stencils shall be inspected for legibility, at minimum, once prior to the storm season, no later than October 1st each year. Those determined to be illegible will be re-stenciled as soon as possible.	Annually	Owner

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX				
	BMP	Inspection/Maintenance Activities	Minimum Frequency	Responsible Party
S3 SD-32	Design and construct trash and waste storage areas to reduce pollution introduction	Design trash storage areas to reduce pollutant introduction. See CASQA Stormwater Handbook Section 3.2.9. and BMP Fact Sheet SD-32 for additional information.	One time Occurrence at Design	Owner
S4 SD-12	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	In conjunction with routine maintenance activities, verify that landscape design continues to function properly by adjusting properly to eliminate overspray to hardscape areas, and to verify that irrigation timing and cycle lengths are adjusted in accordance with water demands, given time of year, weather, day or nighttime temperatures based on system specifications and local climate patterns.	Monthly	Owner

Any waste generated from maintenance activities will be disposed of properly. Wash water and other waste from maintenance activities is not to be discharged or disposed of into the storm drain system. Clippings from landscape maintenance (i.e. prunings) will be collected and disposed of properly off-site, and will not be washed into the streets, local area drains/conveyances, or catch basin inlets.

SECTION VI SITE PLAN AND DRAINAGE PLAN

The exhibits provided in this section are to illustrate the post construction BMPs prescribed within this WQMP. Drainage flow information of the proposed project, such as general surface flow lines, concrete or other surface drainage conveyances, and storm drain facilities are also depicted. All structural source control and treatment control BMPs are shown as well.

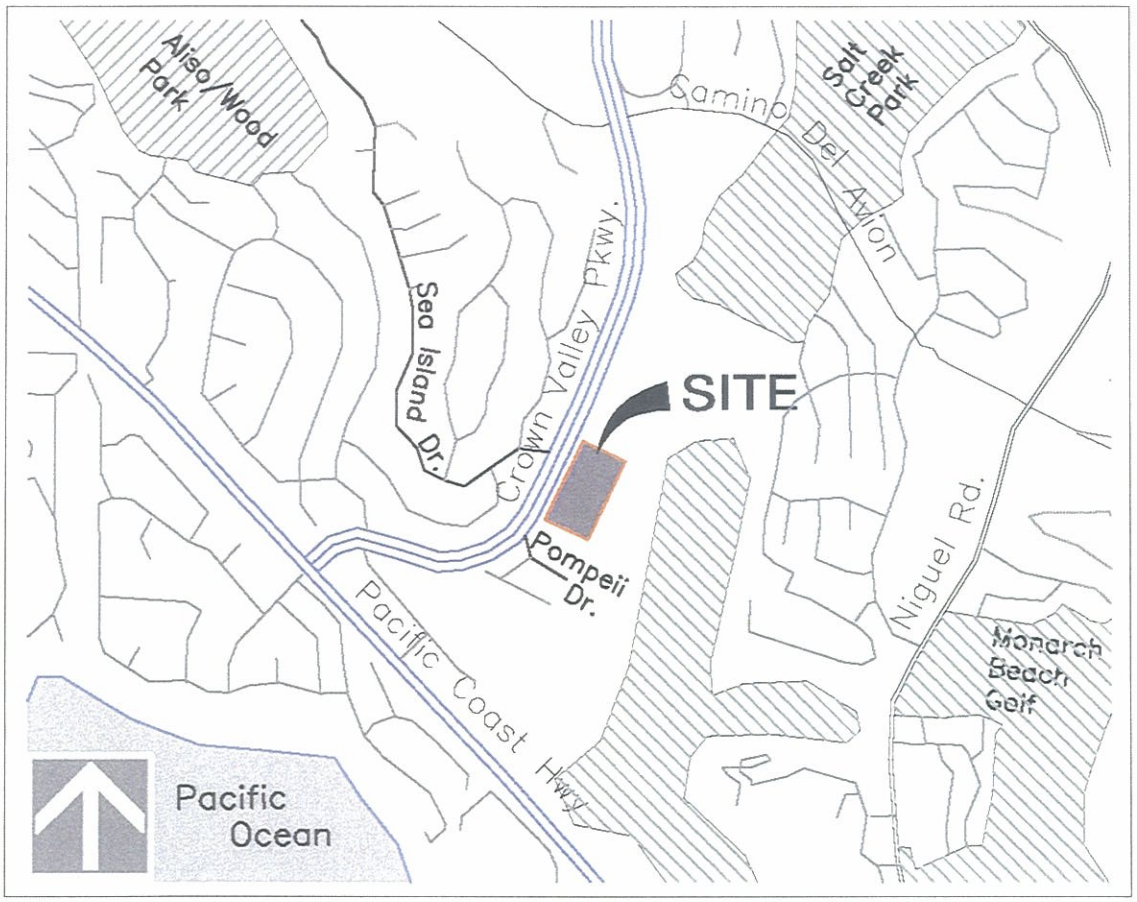
Exhibits

- Vicinity Map
- WQMP Exhibit

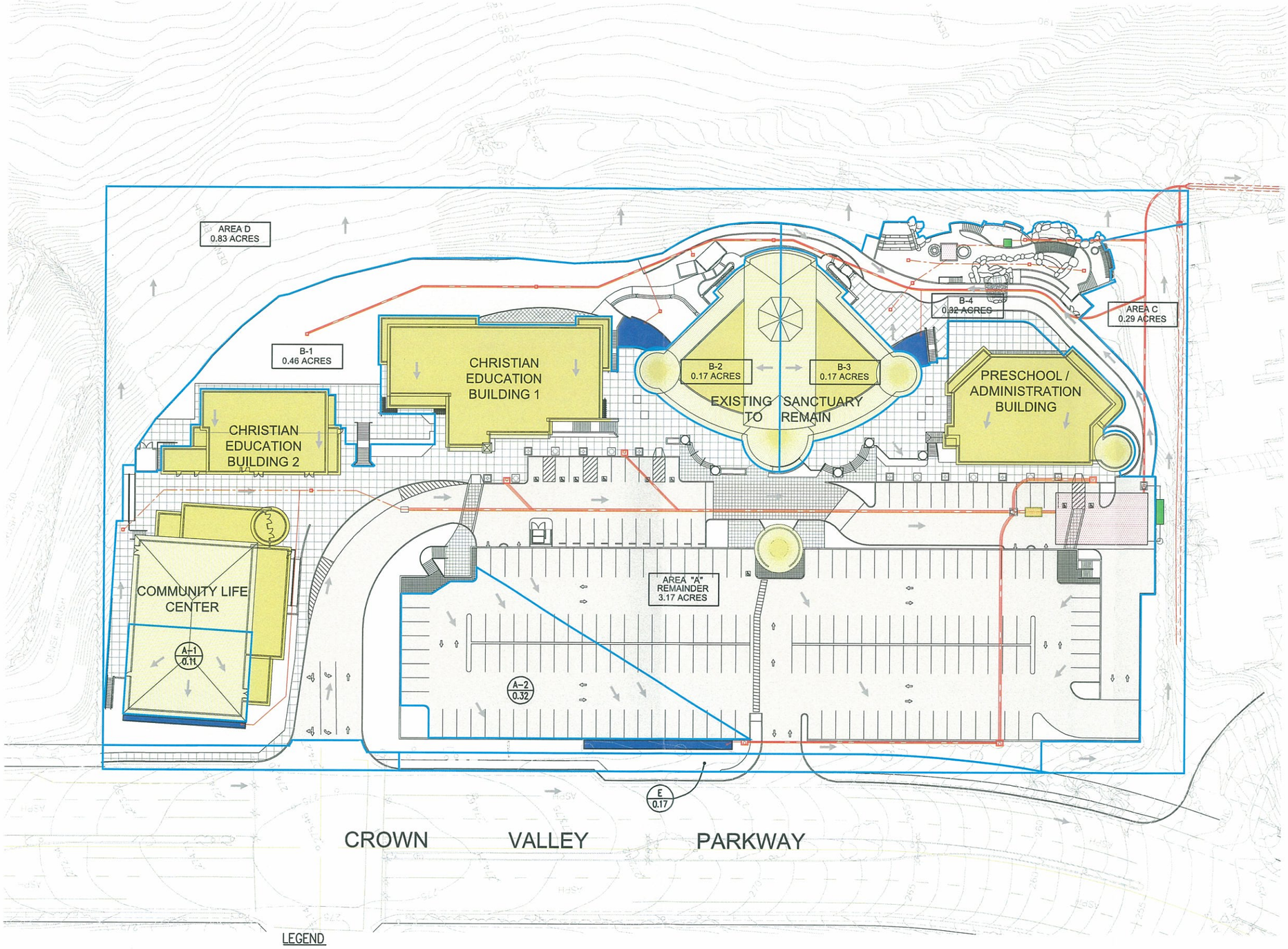
BMP Details

- Bioretention with underdrain
- Modular Wetland Systems

VICINITY MAP



VICINITY MAP



LEGEND

- MODULAR WETLAND UNIT (BIO-7)
- BIORETENTION WITH UNDERDRAIN (BIO-1)
- HYDRODYNAMIC SEPARATION DEVICE (PRE-1)
- STREET SWEEPING PRIVATE STREETS AND PARKING LOT
- BUILDING
- BMP DRAINAGE BOUNDARY
- DIRECTION OF FLOW
- (ENTIRE SITE) COMMON AREA LANDSCAPE MANAGEMENT
- PROPOSED STORM DRAIN (TREATED FLOWS ONLY/LOW FLOW)
- UNDERGROUND DETENTION

NOTE: BMP SURFACE AREAS ARE SHOWN TO SCALE

REGISTERED PROFESSIONAL ENGINEER
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No. 70862
EXP. 06/30/13
CIVIL
STATE OF CALIFORNIA

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NICHOLAS A. STREETER
R.C.E. NO.: 70862

2/24/15
DATE
EXP. 06-30-13

WQMP EXHIBIT
PROPOSED BMPs

SOUTH SHORES CHURCH
32712 CROWN VALLEY PARKWAY
DANA POINT, CA 92629

SHEET NO. 1
OF 1 SHTS.

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BIO-1: Bioretention with Underdrains

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, and plants. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, biodegraded, and sequestered by the soil and plants. Bioretention with an underdrain are utilized for areas with low permeability native soils or steep slopes where the underdrain system that routes the treated runoff to the storm drain system rather than depending entirely on infiltration. **Bioretention must be designed without an underdrain** in areas of high soil permeability.

Also known as:

- *Rain gardens with underdrains*
- *Vegetated media filter*
- *Downspout planter boxes*

Bioretention
Source: Geosyntec Consultants

OC-Specific Design Criteria and Considerations

- ☐ Ponding depth should not exceed 18 inches; fencing may be required if ponding depth is greater than 6 inches to mitigate drowning.
- ☐ The minimum soil depth is 2 feet (3 feet is preferred).
- ☐ The maximum drawdown time of the bioretention ponding area is 48 hours. The maximum drawdown time of the planting media and gravel drainage layer is 96 hours, if applicable.
- ☐ Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.
- ☐ If infiltration in bioretention location is hazardous due to groundwater or geotechnical concerns, a geomembrane liner must be installed at the base of the bioretention facility. This liner should have a minimum thickness of 30 mils.
- ☐ The planting media placed in the cell shall be designed per the recommendations contained in MISC-1: Planting/Storage Media
- ☐ Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 hours; native place species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent feasible
- ☐ The bioretention area should be covered with 2-4 inches (average 3 inches) or mulch at the start and an additional placement of 1-2 inches of mulch should be added annually.
- ☐ Underdrain should be sized with a 6 inch minimum diameter and have a 0.5% minimum slope. Underdrain should be slotted polyvinyl chloride (PVC) pipe; underdrain pipe should be more than 5 feet from tree locations (if space allows).
- ☐ A gravel blanket or bedding is required for the underdrain pipe(s). At least 0.5 feet of washed aggregate must be placed below, to the top, and to the sides of the underdrain pipe(s).
- ☐ An overflow device is required at the top of the bioretention area ponding depth.
- ☐ Dispersed flow or energy dissipation (i.e. splash rocks) for piped inlets should be provided at basin inlet to prevent erosion.
- ☐ Ponding area side slopes shall be no steeper than 3:1 (H:V) unless designed as a planter box BMP with appropriate consideration for trip and fall hazards.