

## Attachment A-4 Drainage Calculations

Nimitz Highway/Ala Moana Boulevard Resurfacing -Additional Staging Areas

| Drainage Area Name | Area  |         | C    | T <sub>c</sub> | I (in/hr) | Correction Factor | I (in/hr) | Q <sub>inc</sub> (cfs) | Q <sub>TOT</sub> (cfs) | Discharge Point No. | Discharge Point Name | Discharge Point Location |             |
|--------------------|-------|---------|------|----------------|-----------|-------------------|-----------|------------------------|------------------------|---------------------|----------------------|--------------------------|-------------|
|                    | (SF)  | (acres) |      |                |           |                   |           |                        |                        |                     |                      | Latitude                 | Longitude   |
| Staging Area 1     | 2030  | 0.05    | 0.3  | 10             | 1.4       | 2.25              | 3.15      | 0.044                  | 20.166                 | 2                   | Keehi Lagoon         | 21.330480                | -157.890740 |
| 2-1                | 7000  | 0.16    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.481                  |                        |                     |                      |                          |             |
| 2-2                | 3500  | 0.08    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.240                  |                        |                     |                      |                          |             |
| 2-3                | 1500  | 0.03    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.103                  |                        |                     |                      |                          |             |
| 2-4                | 4000  | 0.09    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.275                  |                        |                     |                      |                          |             |
| 2-5                | 3500  | 0.08    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.240                  |                        |                     |                      |                          |             |
| 2-6                | 6500  | 0.15    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.447                  |                        |                     |                      |                          |             |
| 2-7                | 3500  | 0.08    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.240                  |                        |                     |                      |                          |             |
| 2-8                | 3500  | 0.08    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.240                  |                        |                     |                      |                          |             |
| 2-9                | 5000  | 0.11    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.343                  |                        |                     |                      |                          |             |
| 2-10               | 5000  | 0.11    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.343                  |                        |                     |                      |                          |             |
| 2-11               | 2500  | 0.06    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.172                  |                        |                     |                      |                          |             |
| 2-12               | 6000  | 0.14    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.412                  |                        |                     |                      |                          |             |
| 2-13               | 89200 | 2.05    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 6.128                  |                        |                     |                      |                          |             |
| 2-14               | 4800  | 0.11    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.330                  |                        |                     |                      |                          |             |
| 2-15               | 7200  | 0.17    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.495                  |                        |                     |                      |                          |             |
| 2-16               | 7200  | 0.17    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.495                  |                        |                     |                      |                          |             |
| 2-17               | 12000 | 0.28    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.824                  |                        |                     |                      |                          |             |
| 2-18               | 7200  | 0.17    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.495                  |                        |                     |                      |                          |             |
| 2-19               | 11200 | 0.26    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.769                  |                        |                     |                      |                          |             |
| 2-20               | 6400  | 0.15    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.440                  |                        |                     |                      |                          |             |
| 2-21               | 12800 | 0.29    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.879                  |                        |                     |                      |                          |             |
| 2-22               | 54000 | 1.24    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 3.710                  |                        |                     |                      |                          |             |
| 2-23               | 11200 | 0.26    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 0.769                  |                        |                     |                      |                          |             |
| 2-24               | 18200 | 0.42    | 0.95 | 10             | 1.4       | 2.25              | 3.15      | 1.250                  |                        |                     |                      |                          |             |

## Attachment A-4 Drainage Calculations

|                                       |       |      |      |    |     |      |      |       |        |       |                                                                 |           |             |
|---------------------------------------|-------|------|------|----|-----|------|------|-------|--------|-------|-----------------------------------------------------------------|-----------|-------------|
| 3-1                                   | 61600 | 1.41 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 4.232 | 15.546 | 3     | Keehi Lagoon                                                    | 21.319850 | -157.890520 |
| 3-2                                   | 8000  | 0.18 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.550 |        |       |                                                                 |           |             |
| 3-3                                   | 39000 | 0.90 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 2.679 |        |       |                                                                 |           |             |
| 3-4                                   | 6000  | 0.14 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.412 |        |       |                                                                 |           |             |
| 3-5                                   | 56700 | 1.30 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 3.895 |        |       |                                                                 |           |             |
| 3-6                                   | 42000 | 0.96 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 2.885 |        |       |                                                                 |           |             |
| 3-7                                   | 2000  | 0.05 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.137 |        |       |                                                                 |           |             |
| 3-8                                   | 5500  | 0.13 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.378 |        |       |                                                                 |           |             |
| 3-9                                   | 5500  | 0.13 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.378 |        |       |                                                                 |           |             |
| Staging Area 2                        | 45725 | 1.05 | 0.3  | 10 | 1.4 | 2.25 | 3.15 | 0.992 | 0.992  | SA2-1 | Honolulu Harbor                                                 | 21.317666 | -157.879009 |
| Staging Area 3                        | 29900 | 0.69 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 2.054 | 2.054  | SA3-1 | Honolulu Harbor & Shore Area<br>Honolulu Waterfront-Aloha Tower | 21.313308 | -157.867148 |
| Staging Area 4                        | 10960 | 0.25 | 0.3  | 10 | 1.4 | 2.25 | 3.15 | 0.238 | 8.993  | 30    | Honolulu Harbor & Shore Area-Kewalo Basin                       | 21.294480 | -157.866600 |
| Staging Area 5<br>(Cooke Street East) | 2950  | 0.07 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.203 |        |       |                                                                 |           |             |
| 30-1                                  | 12800 | 0.29 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.879 |        |       |                                                                 |           |             |
| 30-2                                  | 18800 | 0.43 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 1.292 |        |       |                                                                 |           |             |
| 30-3                                  | 3600  | 0.08 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.247 |        |       |                                                                 |           |             |
| 30-4                                  | 22200 | 0.51 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 1.525 |        |       |                                                                 |           |             |
| 30-5                                  | 18900 | 0.43 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 1.298 |        |       |                                                                 |           |             |
| 30-6                                  | 5700  | 0.13 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.392 |        |       |                                                                 |           |             |
| 30-7                                  | 14400 | 0.33 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.989 |        |       |                                                                 |           |             |
| 30-8                                  | 3250  | 0.07 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.223 |        |       |                                                                 |           |             |
| 30-9                                  | 3250  | 0.07 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.223 |        |       |                                                                 |           |             |
| 30-10                                 | 21600 | 0.50 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 1.484 |        |       |                                                                 |           |             |

## Attachment A-4 Drainage Calculations

|                                               |      |      |      |    |     |      |      |       |       |       |                     |           |             |
|-----------------------------------------------|------|------|------|----|-----|------|------|-------|-------|-------|---------------------|-----------|-------------|
| Staging Area 5<br>(Ilalo Street Mauka West)   | 2200 | 0.05 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.151 | 1.561 | SA5-1 | Kewalo Basin        | 21.293174 | -157.858758 |
| Staging Area 5<br>(Ilalo Street Makai West)   | 2250 | 0.05 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.155 |       |       |                     |           |             |
| Staging Area 5<br>(Ohe Street West)           | 6225 | 0.14 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.428 |       |       |                     |           |             |
| Staging Area 5<br>(Ohe Street East)           | 1450 | 0.03 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.100 |       |       |                     |           |             |
| Staging Area 5<br>(Ilalo Street Mauka Middle) | 2000 | 0.05 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.137 |       |       |                     |           |             |
| Staging Area 5<br>(Ilalo Street Makai Middle) | 2000 | 0.05 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.137 |       |       |                     |           |             |
| Staging Area 5<br>(Koula Street East)         | 1700 | 0.04 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.117 |       |       |                     |           |             |
| Staging Area 5<br>(Ilalo Street Mauka East)   | 2450 | 0.06 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.168 |       |       |                     |           |             |
| Staging Area 5<br>(Ilalo Street Makai East)   | 2450 | 0.06 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.168 |       |       |                     |           |             |
| Ala Moana Staging Area West                   | 5580 | 0.13 | 0.3  | 10 | 1.4 | 2.25 | 3.15 | 0.121 | 0.327 | SA6-1 | Ala Wai Boat Harbor | 21.288228 | -157.841332 |
| Ala Moana Staging Area Middle                 | 3000 | 0.07 | 0.95 | 10 | 1.4 | 2.25 | 3.15 | 0.206 |       |       |                     |           |             |
| Ala Moana Staging Area East                   | 8735 | 0.20 | 0.3  | 10 | 1.4 | 2.25 | 3.15 | 0.189 | 0.189 | SA6-2 | Ala Wai Boat Harbor | 21.287794 | -157.842311 |

Total= 17.799 ac

49.829 cfs