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## Appendix 3

### BMP Sizing Calculator Output

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Valiano  
DMA Data

WQCV Calculations:

Per CASQA BMP Handbook

WQCV= Po \* Total Area

Po= a \* C \* P(85)

a= 1.963 for 48 hour drawdown

C= 0.858i ^3 - 0.78i ^2 + 0.774i + 0.04

i= Impervious Fraction= Impervious Area/Total Area

P(85)= 0.80 in

|     |                |                | BMP Calculator Input |      |                 |      |            |          |           | WQCV Calculations     |      |      |        | BMP Size Provided |                    |                    |                    |        |         |
|-----|----------------|----------------|----------------------|------|-----------------|------|------------|----------|-----------|-----------------------|------|------|--------|-------------------|--------------------|--------------------|--------------------|--------|---------|
| DMA | Developed Area | Landscape Area | Pervious Area        |      | Impervious Area |      | Total Area | Slope    | Soil Type | Impervious Fraction i | C    | Po   | WQCV   | Bottom A          | A at Upper Orifice | D to Upper Orifice | Gravel Layer Depth | V      | % WQCV  |
|     | sf             | sf             | sf                   | ac   | sf              | ac   | ac         |          |           |                       |      | in   |        | sf                | sf                 | ft                 | ft                 | cf     | Treated |
| 1   | 121,312        | 0              | 36,394               | 0.84 | 84,918          | 1.95 | 2.78       | Steep    | D         | 0.70                  | 0.49 | 0.78 | 7,841  | 3,897             | 5,180              | 2.00               | 1.00               | 10,636 | 136%    |
| 2A  | 120,906        | 29,341         | 65,613               | 1.51 | 84,634          | 1.94 | 3.45       | Steep    | D         | 0.56                  | 0.38 | 0.60 | 7,508  | 6,037             | 7,091              | 1.50               | 1.00               | 12,261 | 163%    |
| 2B  | 224,874        | 13,965         | 81,427               | 1.87 | 157,412         | 3.61 | 5.48       | Steep    | D         | 0.66                  | 0.46 | 0.72 | 14,282 | 5,635             | 7,266              | 2.00               | 1.00               | 15,155 | 106%    |
| 2C  | 415,659        | 118,973        | 243,671              | 5.59 | 290,961         | 6.68 | 12.27      | Steep    | D         | 0.54                  | 0.37 | 0.58 | 25,783 | 10,936            | 13,114             | 1.75               | 1.25               | 26,512 | 103%    |
| 2D  | 84,072         | 15,848         | 41,070               | 0.94 | 58,850          | 1.35 | 2.29       | Steep    | D         | 0.59                  | 0.40 | 0.63 | 5,238  | 4,135             | 4,707              | 1.00               | 1.00               | 6,075  | 116%    |
| 2E  | 254,006        | 29,474         | 105,676              | 2.43 | 177,804         | 4.08 | 6.51       | Steep    | D         | 0.63                  | 0.43 | 0.68 | 15,964 | 7,011             | 8,506              | 2.00               | 1.00               | 18,321 | 115%    |
| 2F* | 82,054         | 0              | 41,027               | 0.94 | 41,027          | 0.94 | 1.88       | Steep    | D         | n/a                   |      |      |        |                   |                    |                    |                    |        |         |
| 3A  | 151,844        | 20,889         | 66,442               | 1.53 | 106,291         | 2.44 | 3.97       | Steep    | D         | 0.62                  | 0.42 | 0.66 | 9,513  | 6,594             | 7,421              | 1.00               | 1.00               | 9,645  | 101%    |
| 3B  | 321,766        | 136,100        | 232,630              | 5.34 | 225,236         | 5.17 | 10.51      | Steep    | D         | 0.49                  | 0.33 | 0.52 | 20,021 | 7,325             | 8,861              | 1.50               | 3.00               | 20,930 | 105%    |
| 3C  | 282,211        | 66,026         | 150,689              | 3.46 | 197,548         | 4.54 | 7.99       | Steep    | D         | 0.57                  | 0.38 | 0.60 | 17,532 | 7,202             | 8,453              | 1.50               | 2.00               | 17,503 | 100%    |
| 3D  | 497,203        | 29,040         | 178,201              | 4.09 | 348,042         | 7.99 | 12.08      | Moderate | D         | 0.66                  | 0.46 | 0.72 | 31,606 | 22,061            | 25,814             | 2.00               | 1.00               | 56,699 | 179%    |
| 4A  | 233,188        | 24,975         | 94,931               | 2.18 | 163,232         | 3.75 | 5.93       | Steep    | D         | 0.63                  | 0.43 | 0.68 | 14,677 | 6,159             | 7,436              | 1.75               | 1.25               | 14,975 | 102%    |
| 4B  | 97,519         | 18,297         | 47,553               | 1.09 | 68,263          | 1.57 | 2.66       | Steep    | D         | 0.59                  | 0.40 | 0.63 | 6,076  | 8,153             | 9,022              | 0.50               | 1.00               | 7,555  | 124%    |
| 5A  | 339,934        | 6,578          | 108,558              | 2.49 | 237,954         | 5.46 | 7.95       | Steep    | D         | 0.69                  | 0.48 | 0.76 | 21,836 | 17,846            | 20,176             | 1.50               | 1.00               | 35,655 | 163%    |
| 5B  | 211,233        | 0              | 63,370               | 1.45 | 147,863         | 3.39 | 4.85       | Steep    | D         | 0.70                  | 0.49 | 0.78 | 13,653 | 5,303             | 7,174              | 2.00               | 1.00               | 14,598 | 107%    |
| 5C  | 165,030        | 0              | 49,509               | 1.14 | 115,521         | 2.65 | 3.79       | Flat     | D         | 0.70                  | 0.49 | 0.78 | 10,667 | 9,484             | 10,812             | 1.50               | 1.00               | 19,016 | 178%    |
| 5D* | 122,860        | 44,842         | 81,700               | 1.88 | 86,002          | 1.97 | 3.85       | Moderate | D         | 0.51                  | 0.35 | 0.55 | 7,627  | 4,888             | 5,542              | 1.00               | 1.25               | 7,659  | 100%    |

Developed Area assumed to be 70% Impervious

\* - Recreation Center and Community Park assumed to be 50% Impervious

Offsite Basins

| DMA   | Existing Impervious Area |      | New Impervious Area |      | Total Area |      | Slope    | Soil Type |
|-------|--------------------------|------|---------------------|------|------------|------|----------|-----------|
|       | sf                       | ac   | sf                  | ac   | sf         | ac   |          |           |
| MW1** | 14,747                   | 0.34 | 14,546              | 0.33 | 29,293     | 0.67 | Moderate | D         |
| MW2** | 21,034                   | 0.48 | 15,999              | 0.37 | 37,033     | 0.85 | Moderate | D         |

\*\* - Offsite Road Improvements assumed to be 100% Impervious in Proposed Condition

Valiano  
Orifice Calculations

Methodology:  
BMP Calculator sizes the lower orifice such that the flow through the orifice equals the low flow threshold when the basin is full. Introducing a bioretention component to the bottom of the basin and placing the orifice on the subdrain of the gravel layer changes the amount of head acting on the orifice. Therefore, it is necessary to calculate a new size for the orifice such that the flow rate through the subdrain orifice is also equal to the low flow threshold.

Orifice Equation:  
Per Equation 6-12 of the Drainage Design Manual  
 $Q = C_o * A_o * (2gH_o)^{0.5}$   
 $C_o = 0.6$   
 $A_o = 3.14 * (d^2)/4$   
 $g = 32.2 \text{ ft/sec}^2$   
 $H_o = \text{Head acting on orifice}$

| DMA | BMP Calculator |                  |        |       | With Bioretention |              |            |        |                  |
|-----|----------------|------------------|--------|-------|-------------------|--------------|------------|--------|------------------|
|     | Basin Depth    | Orifice Diameter | Ao     | Q     | Soil Layer        | Gravel Layer | Total Head | Ao     | Orifice Diameter |
|     | ft             | in               | sf     | cfs   | ft                | ft           | ft         | sf     | in               |
| 1   | 5.0            | 1.5              | 0.0123 | 0.132 | 1.50              | 1.00         | 7.50       | 0.0100 | 1.4              |
| 2A  | 4.0            | 1.5              | 0.0123 | 0.118 | 1.50              | 1.00         | 6.50       | 0.0096 | 1.3              |
| 2B  | 4.0            | 2.0              | 0.0218 | 0.210 | 1.50              | 1.00         | 6.50       | 0.0171 | 1.8              |
| 2C  | 4.0            | 3.0              | 0.0491 | 0.472 | 1.50              | 1.25         | 6.75       | 0.0378 | 2.6              |
| 2D  | 3.0            | 1.2              | 0.0079 | 0.065 | 1.50              | 1.00         | 5.50       | 0.0058 | 1.0              |
| 2E  | 4.0            | 2.0              | 0.0218 | 0.210 | 1.50              | 1.00         | 6.50       | 0.0171 | 1.8              |
| 3A  | 3.0            | 2.0              | 0.0218 | 0.182 | 1.50              | 1.00         | 5.50       | 0.0161 | 1.7              |
| 3B  | 4.0            | 3.0              | 0.0491 | 0.472 | 1.50              | 3.00         | 8.50       | 0.0337 | 2.5              |
| 3C  | 4.0            | 2.5              | 0.0341 | 0.328 | 1.50              | 2.00         | 7.50       | 0.0249 | 2.1              |
| 3D  | 4.0            | 2.5              | 0.0341 | 0.328 | 1.50              | 1.00         | 6.50       | 0.0267 | 2.2              |
| 4A  | 4.0            | 2.0              | 0.0218 | 0.210 | 1.50              | 1.25         | 6.75       | 0.0168 | 1.8              |
| 4B  | 2.0            | 2.0              | 0.0218 | 0.148 | 1.50              | 1.00         | 4.50       | 0.0145 | 1.6              |
| 5A  | 4.0            | 2.0              | 0.0218 | 0.210 | 1.50              | 1.00         | 6.50       | 0.0171 | 1.8              |
| 5B  | 4.0            | 2.0              | 0.0218 | 0.210 | 1.50              | 1.00         | 6.50       | 0.0171 | 1.8              |
| 5C  | 3.0            | 1.5              | 0.0123 | 0.102 | 1.50              | 1.00         | 5.50       | 0.0091 | 1.3              |
| 5D* | 4.0            | 1.5              | 0.0123 | 0.118 | 1.50              | 1.25         | 6.75       | 0.0094 | 1.3              |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                 |
|--------------------------------------------------|-----------------|
| Basin Name:                                      | Valiano Basin 1 |
| Receiving Water:                                 |                 |
| Rainfall Basin                                   | Oceanside       |
| Mean Annual Precipitation (inches)               | 13.3            |
| Project Basin Area (acres):                      | 2.78            |
| Watershed Area (acres):                          | 0.00            |
|                                                  |                 |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                 |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                 |
|                                                  |                 |
| Overall Channel Susceptibility (H, M, L):        | HIGH            |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1             |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 28782 | Drains to Pond | BMP 1  | DMA 1 Per   | 0.84      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 28791 | Drains to Pond | BMP 1  | DMA 1 Imp   | 1.95      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 1     | 3375               | 6098            | 5          | 23684.4      | 1.5              | 0.00            | 6.00              | 2.00             | 10.6             | 4.00             | D             | 39.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 2A |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 3.45             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 28794 | Drains to Pond | BMP 1  | DMA 2A Per  | 1.51      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 28795 | Drains to Pond | BMP 1  | DMA 2A Imp  | 1.94      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 2A    | 3750               | 5965            | 4          | 19431.1      | 1.5              | 0.00            | 7.00              | 1.5              | 10.6             | 3.00             | D             | 36.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 2B |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 5.48             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 28798 | Drains to Pond | BMP 1  | DMA 2B Per  | 1.87      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 28799 | Drains to Pond | BMP 1  | DMA 2B Imp  | 3.61      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 2B    | 5500               | 8129            | 4          | 27258.3      | 2.00             | 0.00            | 10.00             | 2.00             | 10.6             | 3.00             | D             | 35.00          |



Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 2C |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 12.27            |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 28802 | Drains to Pond | BMP 1  | DMA 2C Per  | 5.59      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 28803 | Drains to Pond | BMP 1  | DMA 2C Imp  | 6.68      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 2C    | 10000              | 13456           | 4          | 46912.00     | 3.00             | 0.00            | 12.00             | 1.75             | 10.6             | 3.00             | A             | 27.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 2D |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 2.29             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 34182 | Drains to Pond | BMP 1  | DMA 2D Per  | 0.94      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 34183 | Drains to Pond | BMP 1  | DMA 2D Imp  | 1.35      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 2D    | 3750               | 5363            | 3          | 13670.5      | 1.2              | 0.00            | 7.00              | 1.00             | 10.6             | 2.00             | D             | 42.00          |



Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 2E |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 6.51             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 34186 | Drains to Pond | BMP 1  | DMA 2E Per  | 2.43      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 34187 | Drains to Pond | BMP 1  | DMA 2E Imp  | 4.08      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 2E    | 6500               | 9335            | 4          | 31671.8      | 2.00             | 0.00            | 11.00             | 2.00             | 10.6             | 3.00             | D             | 41.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 2F |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 1.88             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type          | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type   | Drainage Soil                     | Slope               |
|-------|---------------|--------|-------------|-----------|-------------------|---------------------|-----------------------------------|---------------------|
| 29444 | Drains to LID | BMP 1  | DMA 2F Per  | 0.94      | Pervious (Pre)    | Landscaping         | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 29445 | Drains to LID | BMP 1  | DMA 2F Imp  | 0.94      | Pervious (Pre)    | Concrete or asphalt | Type D (high runoff - clay soi... | Steep (greater 10%) |

LID Facility Summary

| BMP ID | Type         | Description           | Plan Area (sqft) | Volume 1(cft) | Volume 2(cft) | Orifice Flow (cfs) | Orifice Size (inch) |
|--------|--------------|-----------------------|------------------|---------------|---------------|--------------------|---------------------|
| BMP 1  | Bioretention | Bioretention Basin 2F | 2927             | 2441          | 1756          | 0.045              | 1.00                |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 3A |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 3.97             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 28821 | Drains to Pond | BMP 1  | DMA 3A Per  | 1.53      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 28822 | Drains to Pond | BMP 1  | DMA 3A Imp  | 2.44      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 3A    | 6000               | 8003            | 3          | 21004.5      | 2.00             | 0.00            | 9.00              | 1.00             | 10.6             | 2.00             | D             | 27.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 3B |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 10.51            |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 28825 | Drains to Pond | BMP 1  | DMA 3B Per  | 5.34      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 28826 | Drains to Pond | BMP 1  | DMA 3B Imp  | 5.17      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 3B    | 7250               | 10230           | 4          | 34961.4      | 3.00             | 0.00            | 15.00             | 1.5              | 10.6             | 3.00             | D             | 18.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 3C |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 7.99             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 34190 | Drains to Pond | BMP 1  | DMA 3C Per  | 3.46      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 34191 | Drains to Pond | BMP 1  | DMA 3C Imp  | 4.54      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 3C    | 6500               | 9335            | 4          | 31671.8      | 2.5              | 0.00            | 12.00             | 1.75             | 10.6             | 3.00             | D             | 25.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 3D |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 12.08            |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope              |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|--------------------|
| 34194 | Drains to Pond | BMP 1  | DMA 3D Per  | 4.09      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Moderate (5 - 10%) |
| 34195 | Drains to Pond | BMP 1  | DMA 3D Imp  | 7.99      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Moderate (5 - 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 3D    | 20000              | 24781           | 4          | 89562.9      | 2.5              | 0.00            | 14.00             | 2.00             | 10.6             | 3.00             | D             | 78.00          |



Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 4A |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 5.93             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 28841 | Drains to Pond | BMP 1  | DMA 4A Per  | 2.18      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 28842 | Drains to Pond | BMP 1  | DMA 4A Imp  | 3.75      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 4A    | 5750               | 8432            | 4          | 28365.0      | 2.00             | 0.00            | 11.00             | 1.75             | 10.6             | 3.00             | D             | 34.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 4B |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 2.66             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 28850 | Drains to Pond | BMP 1  | DMA 4B Per  | 1.09      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 28851 | Drains to Pond | BMP 1  | DMA 4B Imp  | 1.57      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 4B    | 8000               | 9495            | 2          | 17495.0      | 2.00             | 0.00            | 9.00              | 0.5              | 10.6             | 1.00             | D             | 24.00          |



Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 5A |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 7.95             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 28866 | Drains to Pond | BMP 1  | DMA 5A Per  | 2.49      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 28867 | Drains to Pond | BMP 1  | DMA 5A Imp  | 5.46      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 5A    | 16000              | 20303           | 4          | 72607.4      | 2.00             | 0.00            | 9.00              | 1.5              | 10.6             | 3.00             | D             | 82.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 5B |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 4.85             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope               |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|---------------------|
| 34198 | Drains to Pond | BMP 1  | DMA 5B Per  | 1.45      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |
| 34199 | Drains to Pond | BMP 1  | DMA 5B Imp  | 3.39      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Steep (greater 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 5B    | 5156               | 7710            | 4          | 25732.6      | 2.00             | 0.00            | 10.00             | 2.00             | 10.6             | 3.00             | D             | 33.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 5C |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 3.79             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope                  |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|------------------------|
| 34202 | Drains to Pond | BMP 1  | DMA 5C Per  | 1.14      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Flat - slope (less ... |
| 34203 | Drains to Pond | BMP 1  | DMA 5C Imp  | 2.65      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Flat - slope (less ... |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 5C    | 9250               | 11702           | 3          | 31428.3      | 1.5              | 0.00            | 12.00             | 1.5              | 10.6             | 2.5              | D             | 87.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Basin 5D |
| Receiving Water:                                 | Outfall          |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 3.85             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptibility (H, M, L):        | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type           | BMP ID | Description | Area (ac) | Pre-Project Cover | Post Surface Type | Drainage Soil                     | Slope              |
|-------|----------------|--------|-------------|-----------|-------------------|-------------------|-----------------------------------|--------------------|
| 33994 | Drains to Pond | BMP 1  | DMA 5D Per  | 1.88      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Moderate (5 - 10%) |
| 33995 | Drains to Pond | BMP 1  | DMA 5D Imp  | 1.97      | Pervious (Pre)    |                   | Type D (high runoff - clay soi... | Moderate (5 - 10%) |

Pond Facility Summary

| Scenario | Description | Bottom Area (sqft) | Top Area (sqft) | Depth (ft) | Volume (cft) | Low Orifice (in) | Low Invert (ft) | High Orifice (in) | High Invert (ft) | Weir Length (ft) | Weir Invert (ft) | Facility Soil | Drawdown (hrs) |
|----------|-------------|--------------------|-----------------|------------|--------------|------------------|-----------------|-------------------|------------------|------------------|------------------|---------------|----------------|
| Design A | Basin 5D    | 4750               | 7211            | 4          | 23922.8      | 1.5              | 0.00            | 6.00              | 2.00             | 10.6             | 3.00             | D             | 52.00          |

Project Summary

|                   |                     |
|-------------------|---------------------|
| Project Name      | Valiano             |
| Project Applicant |                     |
| Jurisdiction      | County of San Diego |
| Parcel (APN)      |                     |
| Hydrologic Unit   | Carlsbad            |

Compliance Basin Summary

|                                                  |                  |
|--------------------------------------------------|------------------|
| Basin Name:                                      | Valiano Offsites |
| Receiving Water:                                 |                  |
| Rainfall Basin                                   | Oceanside        |
| Mean Annual Precipitation (inches)               | 13.3             |
| Project Basin Area (acres):                      | 2.22             |
| Watershed Area (acres):                          | 0.00             |
|                                                  |                  |
| SCCWRP Lateral Channel Susceptiblity (H, M, L):  |                  |
| SCCWRP Vertical Channel Susceptiblity (H, M, L): |                  |
|                                                  |                  |
| Overall Channel Susceptiblity (H, M, L):         | HIGH             |
| Lower Flow Threshold (% of 2-Year Flow):         | 0.1              |

Drainage Management Area Summary

| ID    | Type          | BMP ID | Description             | Area (ac) | Pre-Project Cover | Post Surface Type   | Drainage Soil                     | Slope              |
|-------|---------------|--------|-------------------------|-----------|-------------------|---------------------|-----------------------------------|--------------------|
| 34206 | Drains to LID | BMP 1  | MW1 Existing Impervious | 0.34      | Impervious (Pre)  | Concrete or asphalt | Type D (high runoff - clay soi... | Moderate (5 - 10%) |
| 34208 | Drains to LID | BMP 1  | MW1 New Impervious      | 0.33      | Pervious (Pre)    | Concrete or asphalt | Type D (high runoff - clay soi... | Moderate (5 - 10%) |
| 34209 | Drains to LID | BMP 2  | MW2 Existing Impervious | 0.48      | Impervious (Pre)  | Concrete or asphalt | Type D (high runoff - clay soi... | Moderate (5 - 10%) |
| 34210 | Drains to LID | BMP 2  | MW2 New Impervious      | 0.37      | Pervious (Pre)    | Concrete or asphalt | Type D (high runoff - clay soi... | Moderate (5 - 10%) |

LID Facility Summary

| BMP ID | Type         | Description | Plan Area (sqft) | Volume 1(cft) | Volume 2(cft) | Orifice Flow (cfs) | Orifice Size (inch) |
|--------|--------------|-------------|------------------|---------------|---------------|--------------------|---------------------|
| BMP 1  | Bioretention | Basin MW1   | 1868             | 1556          | 1121          | 0.025              | 0.8                 |
| BMP 2  | Bioretention | Basin MW2   | 2095             | 1745          | 1257          | 0.034              | 0.9                 |

Country Club Drive  
3,450 sf of new pavement

Using sizing factors per County SUSMP dated August 2012

Lower Flow Threshold = 0.1Q2

Soil Group = D

Slope = Flat

Rain Gauge = Oceanside

Sizing Factor A = 0.130

Sizing Factor V1 = 0.1083

Sizing Factor V2 = 0.0780

$A = 3,450 \text{ sf} \times 0.130 = 449 \text{ sf}$

$V1 = 3,450 \text{ sf} \times 0.1083 = 374 \text{ cf}$

$V2 = 3,450 \text{ sf} \times 0.0780 = 269 \text{ cf}$

Summary of Results

Area Required = 449 sf

Area Provided = 450 sf

V1 = 374 cf

V1 Provided = 510 cf

V2 = 269 cf

V2 Provided =  $450 \text{ sf} \times 2.5 \text{ ft} \times 0.4 = 450 \text{ cf}$

| Lower Flow Threshold | Soil Group | Slope    | Rain Gauge | A     | V <sub>1</sub> | V <sub>2</sub> |
|----------------------|------------|----------|------------|-------|----------------|----------------|
| 0.1Q <sub>2</sub>    | D          | Steep    | Lindbergh  | 0.115 | 0.0958         | 0.0690         |
| 0.1Q <sub>2</sub>    | A          | Flat     | Oceanside  | 0.070 | 0.0583         | N/A            |
| 0.1Q <sub>2</sub>    | A          | Moderate | Oceanside  | 0.065 | 0.0542         | N/A            |
| 0.1Q <sub>2</sub>    | A          | Steep    | Oceanside  | 0.060 | 0.0500         | N/A            |
| 0.1Q <sub>2</sub>    | B          | Flat     | Oceanside  | 0.103 | 0.0854         | N/A            |
| 0.1Q <sub>2</sub>    | B          | Moderate | Oceanside  | 0.090 | 0.0750         | N/A            |
| 0.1Q <sub>2</sub>    | B          | Steep    | Oceanside  | 0.075 | 0.0625         | N/A            |
| 0.1Q <sub>2</sub>    | C          | Flat     | Oceanside  | 0.130 | 0.1083         | 0.0780         |
| 0.1Q <sub>2</sub>    | C          | Moderate | Oceanside  | 0.130 | 0.1083         | 0.0780         |
| 0.1Q <sub>2</sub>    | C          | Steep    | Oceanside  | 0.110 | 0.0917         | 0.0660         |
| 0.1Q <sub>2</sub>    | D          | Flat     | Oceanside  | 0.130 | 0.1083         | 0.0780         |
| 0.1Q <sub>2</sub>    | D          | Moderate | Oceanside  | 0.130 | 0.1083         | 0.0780         |
| 0.1Q <sub>2</sub>    | D          | Steep    | Oceanside  | 0.065 | 0.0542         | 0.0390         |
| 0.1Q <sub>2</sub>    | A          | Flat     | L Wohlford | 0.050 | 0.0417         | N/A            |
| 0.1Q <sub>2</sub>    | A          | Moderate | L Wohlford | 0.045 | 0.0375         | N/A            |
| 0.1Q <sub>2</sub>    | A          | Steep    | L Wohlford | 0.040 | 0.0333         | N/A            |
| 0.1Q <sub>2</sub>    | B          | Flat     | L Wohlford | 0.090 | 0.0750         | N/A            |
| 0.1Q <sub>2</sub>    | B          | Moderate | L Wohlford | 0.085 | 0.0708         | N/A            |
| 0.1Q <sub>2</sub>    | B          | Steep    | L Wohlford | 0.065 | 0.0542         | N/A            |
| 0.1Q <sub>2</sub>    | C          | Flat     | L Wohlford | 0.110 | 0.0917         | 0.0660         |
| 0.1Q <sub>2</sub>    | C          | Moderate | L Wohlford | 0.110 | 0.0917         | 0.0660         |
| 0.1Q <sub>2</sub>    | C          | Steep    | L Wohlford | 0.090 | 0.0750         | 0.0540         |
| 0.1Q <sub>2</sub>    | D          | Flat     | L Wohlford | 0.100 | 0.0833         | 0.0600         |
| 0.1Q <sub>2</sub>    | D          | Moderate | L Wohlford | 0.100 | 0.0833         | 0.0600         |
| 0.1Q <sub>2</sub>    | D          | Steep    | L Wohlford | 0.075 | 0.0625         | 0.0450         |

Q<sub>2</sub> = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records

Q<sub>10</sub> = 10-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records

A = Surface area sizing factor

V<sub>1</sub> = Surface volume sizing factor: V<sub>1</sub> = (10/12) x A (V<sub>1</sub> is based on 10" of ponding)

V<sub>2</sub> = Subsurface volume sizing factor: V<sub>2</sub> = A x 1.5 x 0.4 (storage volume for 1.5' depth with 40% void ratio)



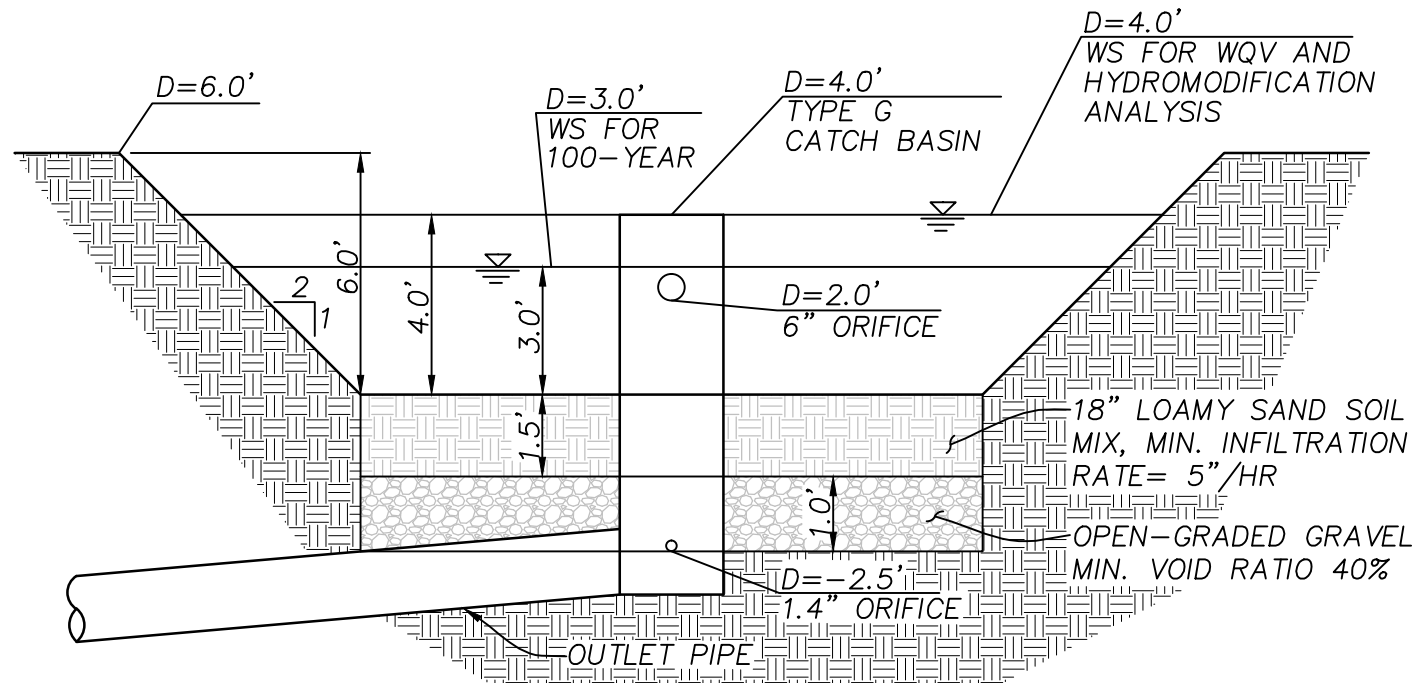
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## **Appendix 4**

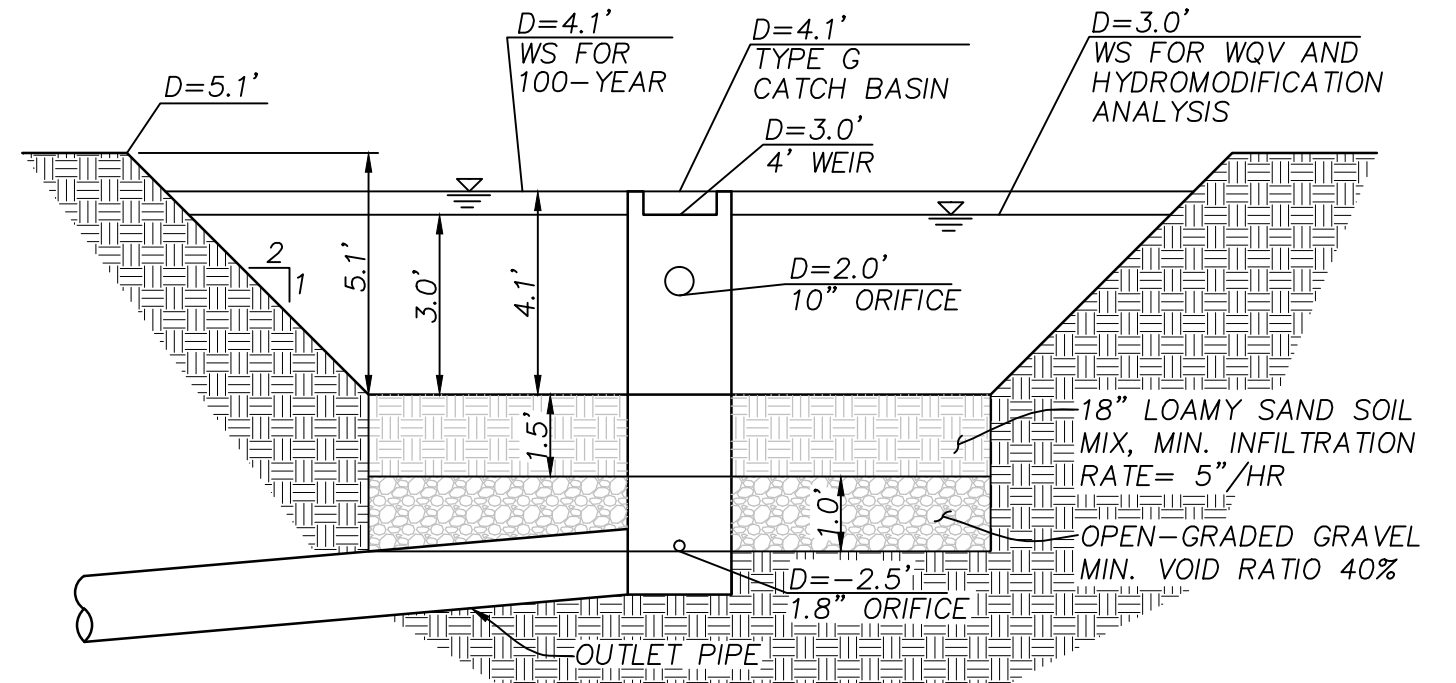
### **Outlet Structure Details**

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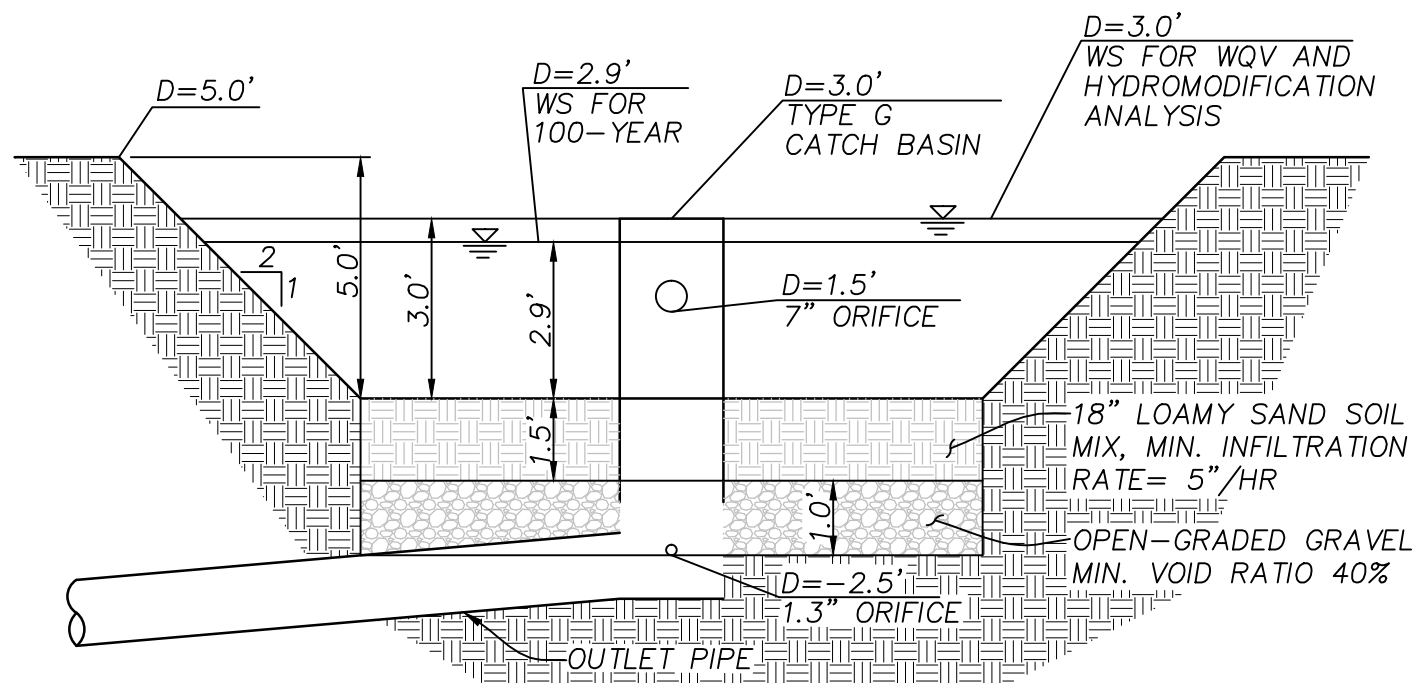




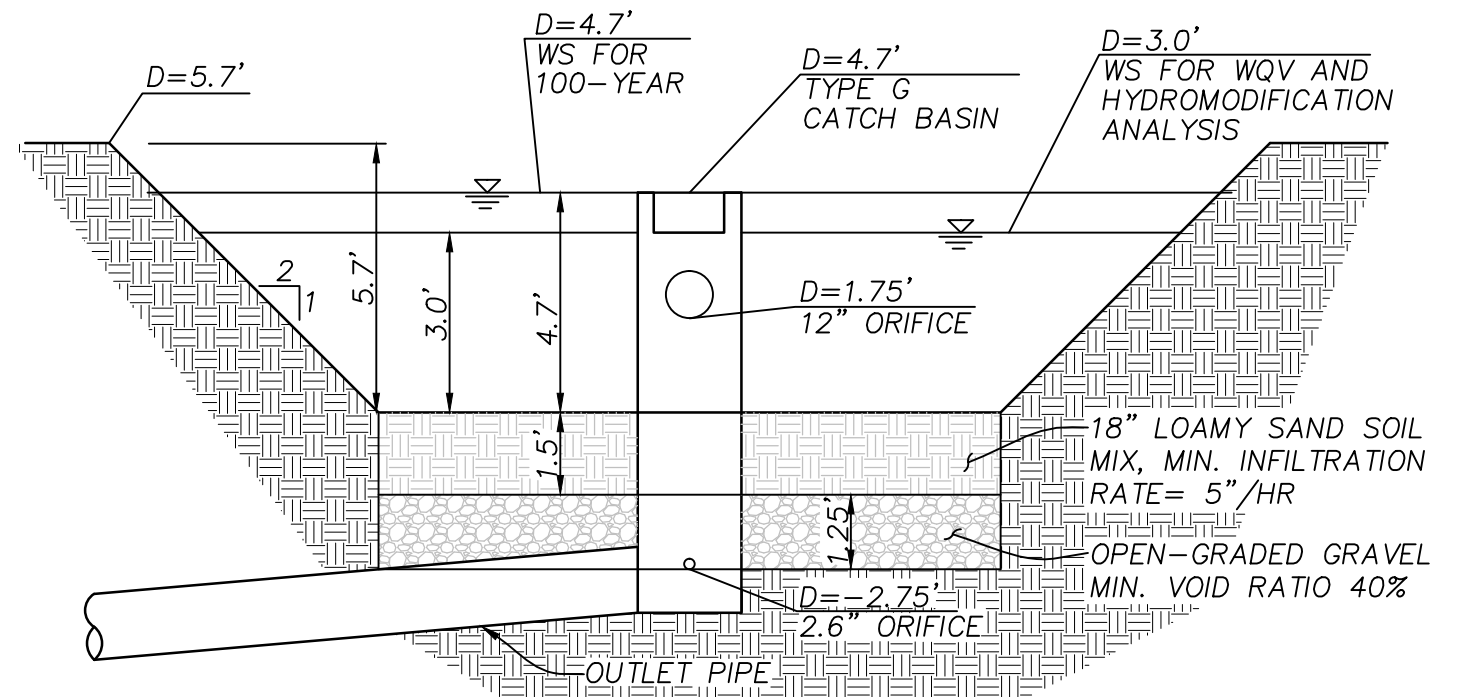
**DMA 1**



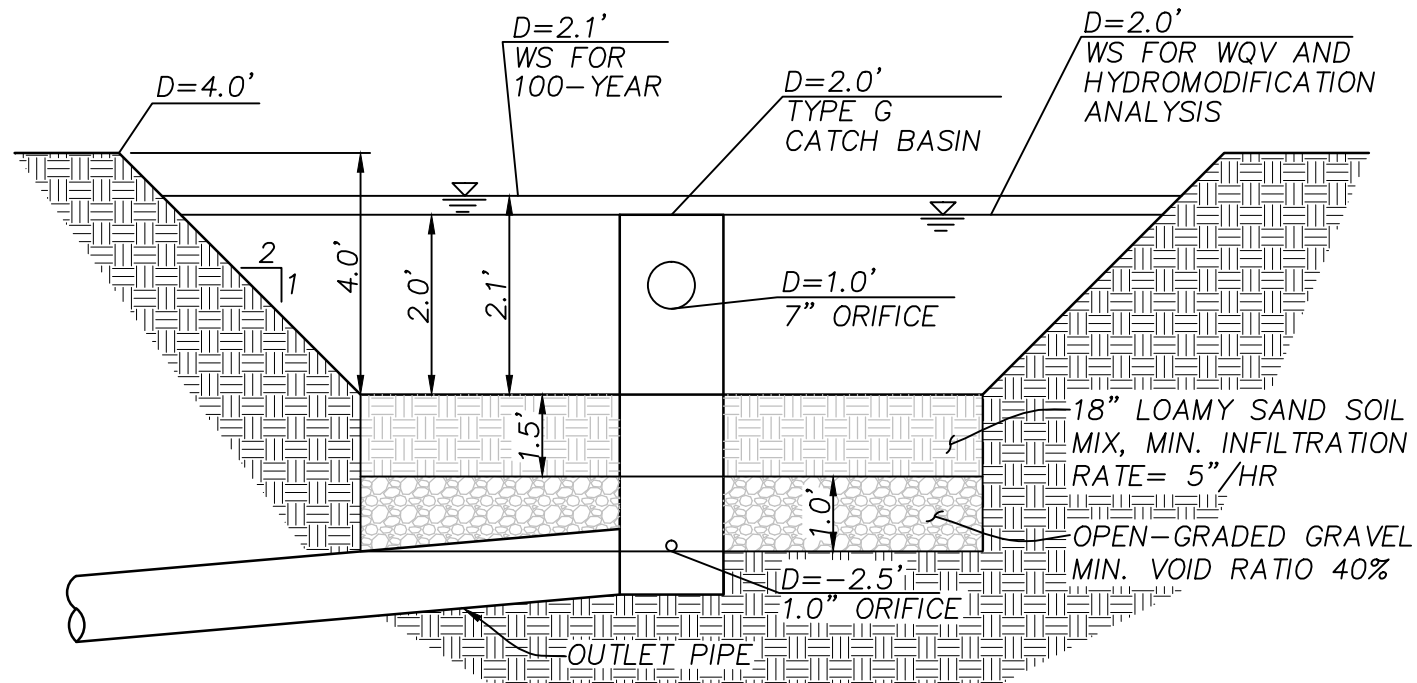
**DMA 2B**



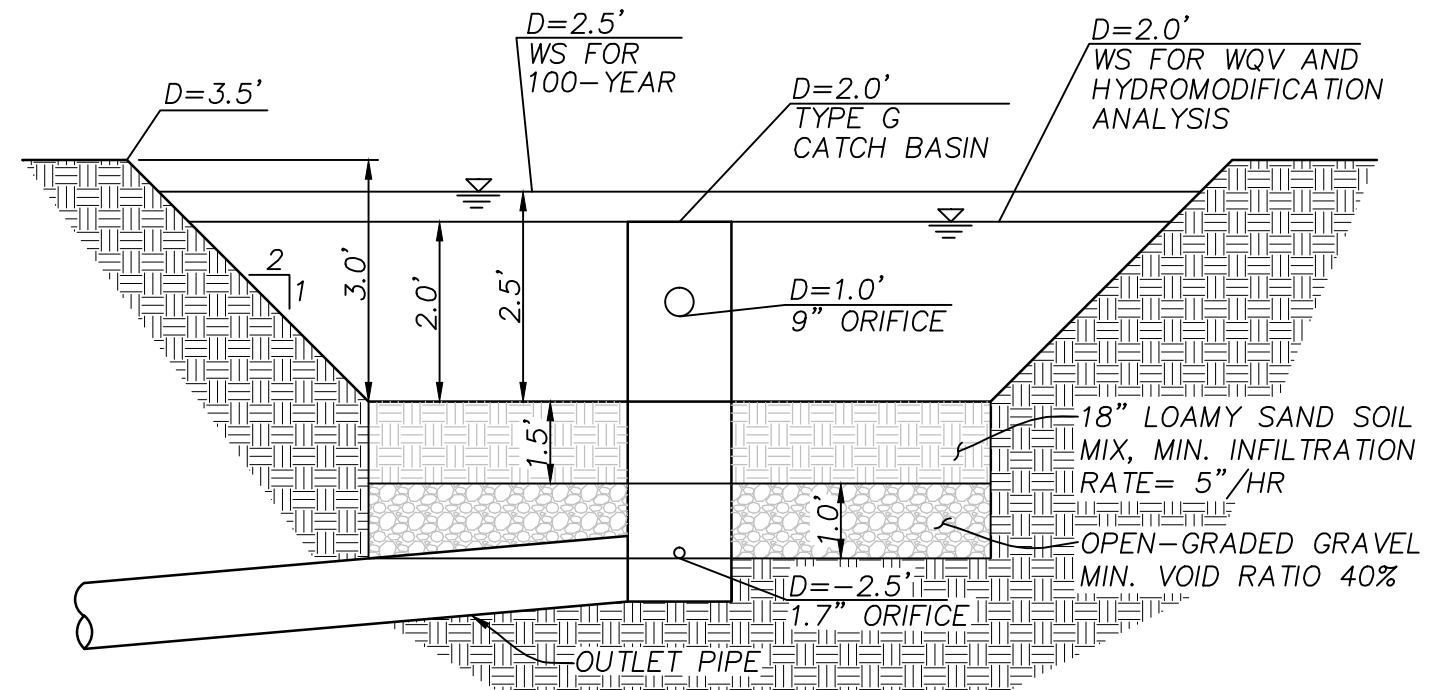
**DMA 2A**



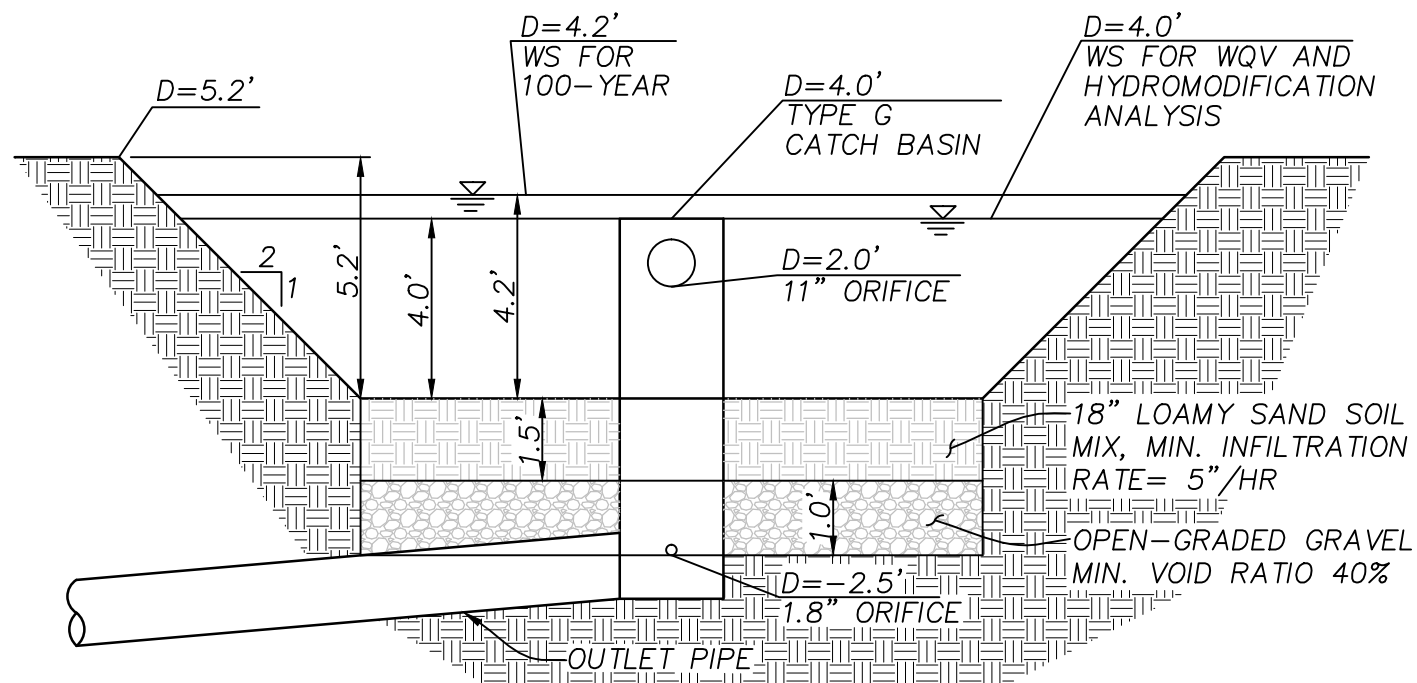
**DMA 2C**



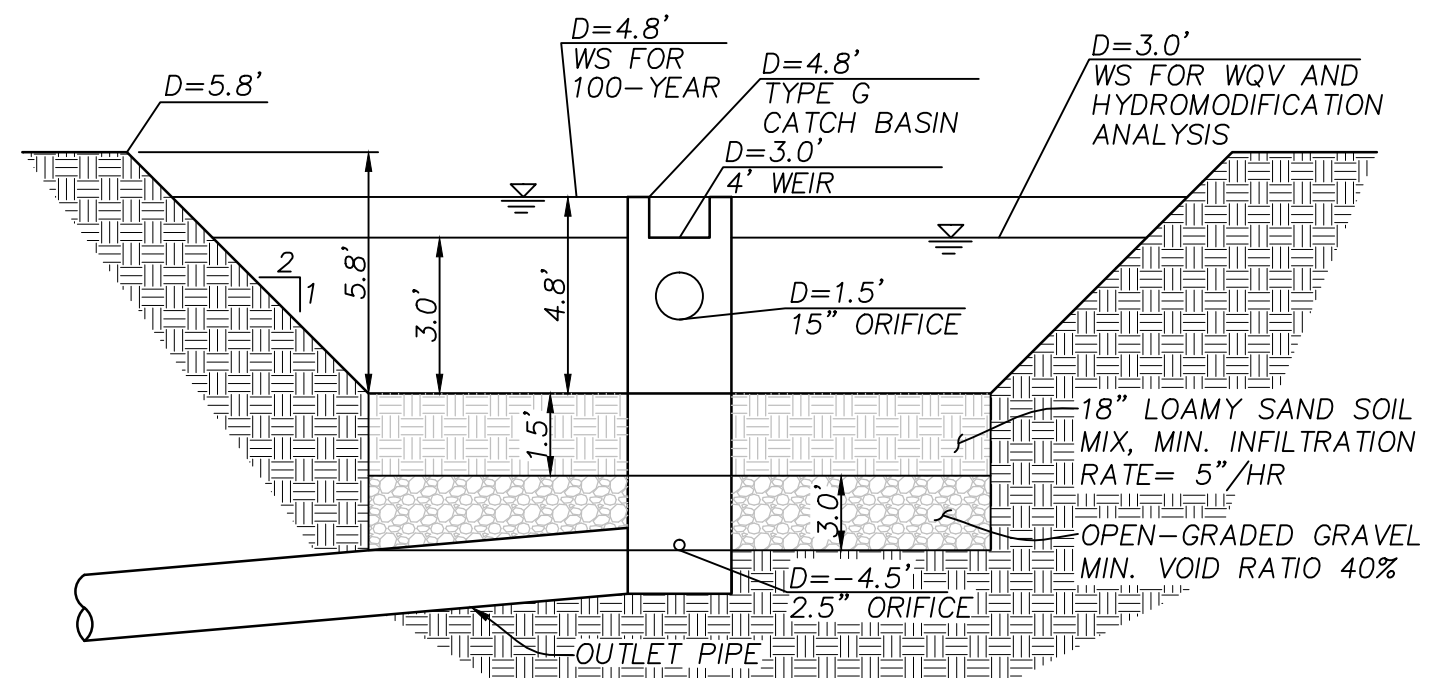
**DMA 2D**



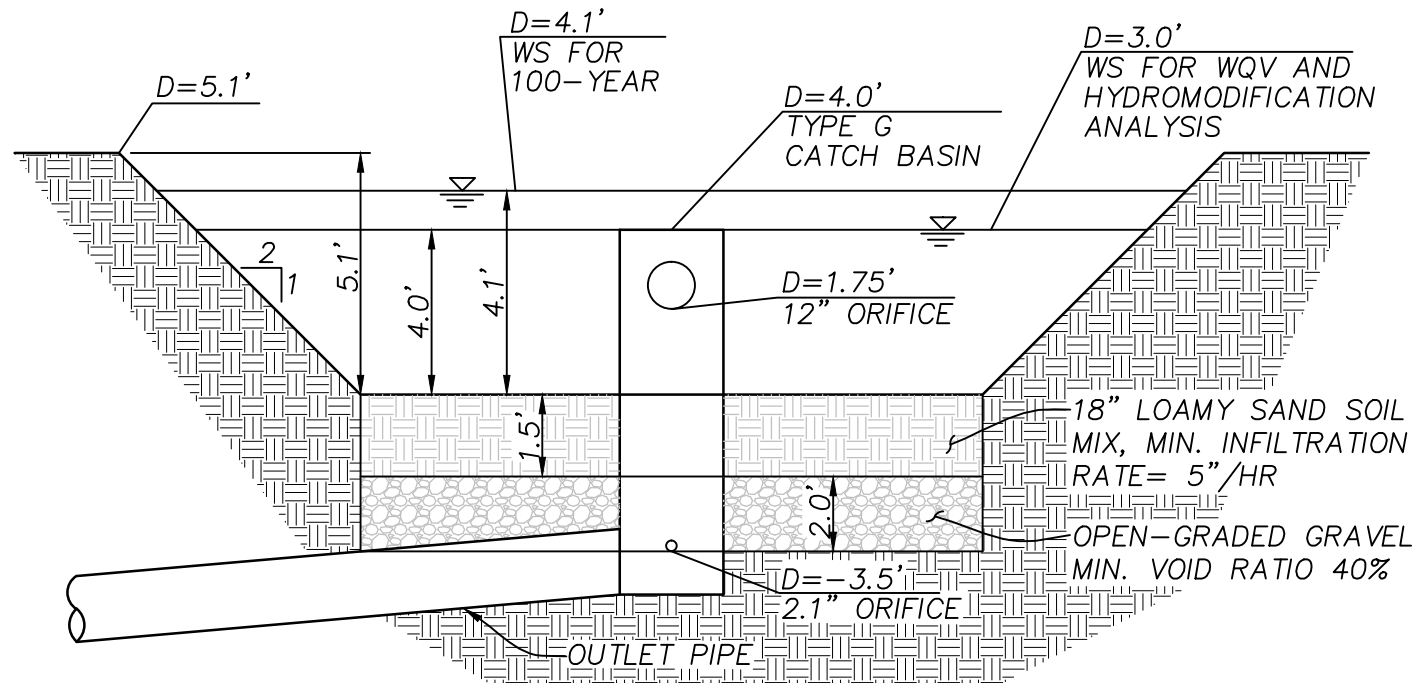
**DMA 3A**



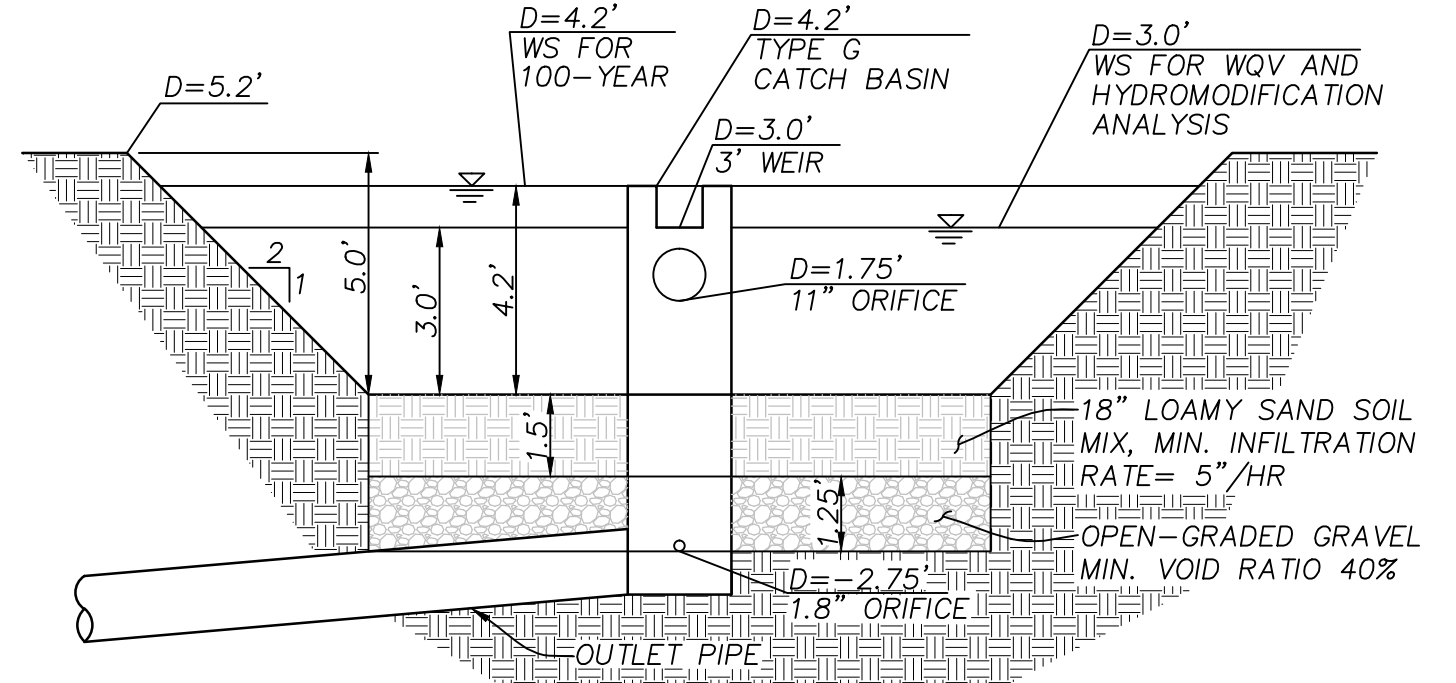
**DMA 2E**



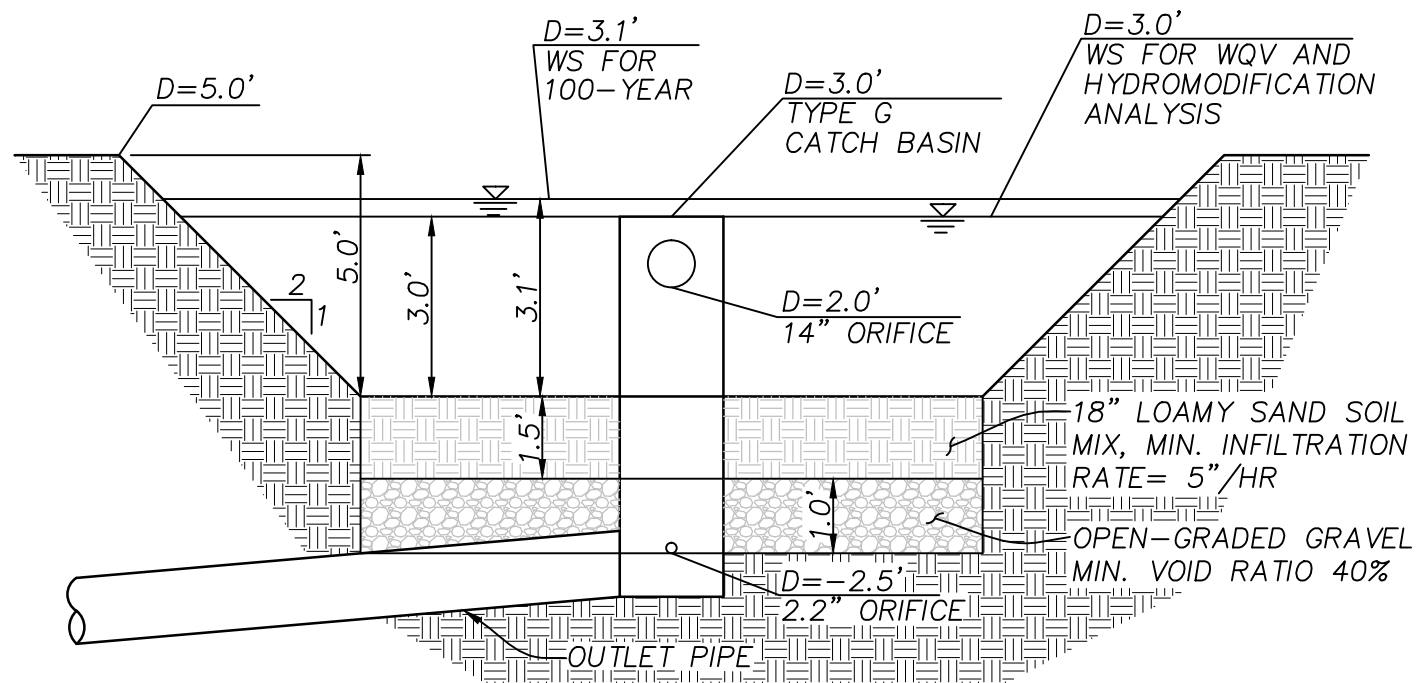
**DMA 3B**



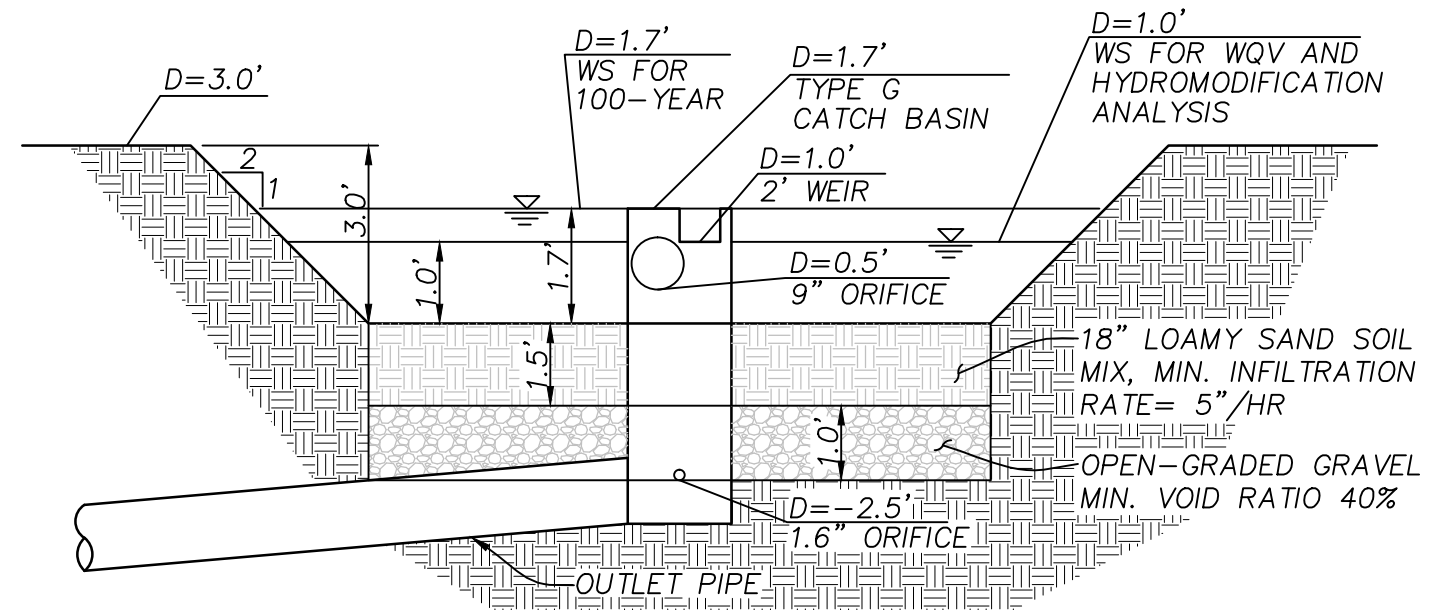
**DMA 3C**



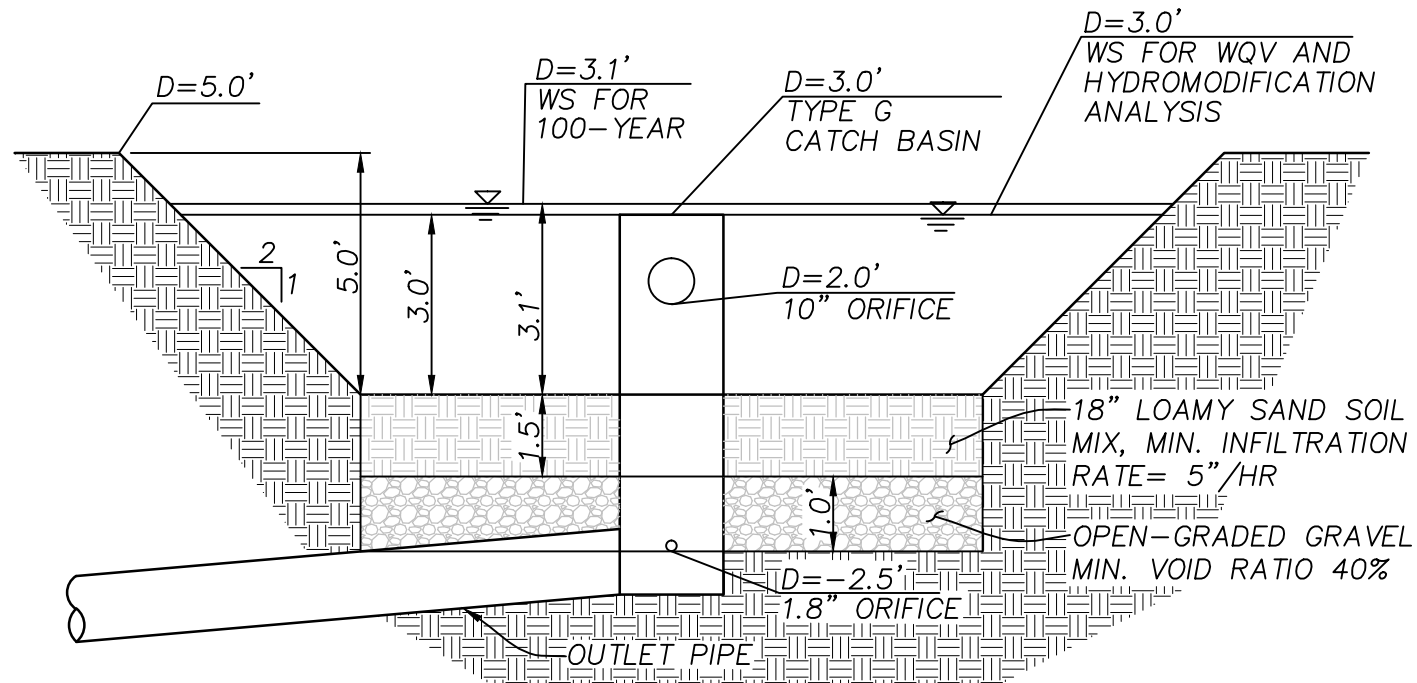
**DMA 4A**



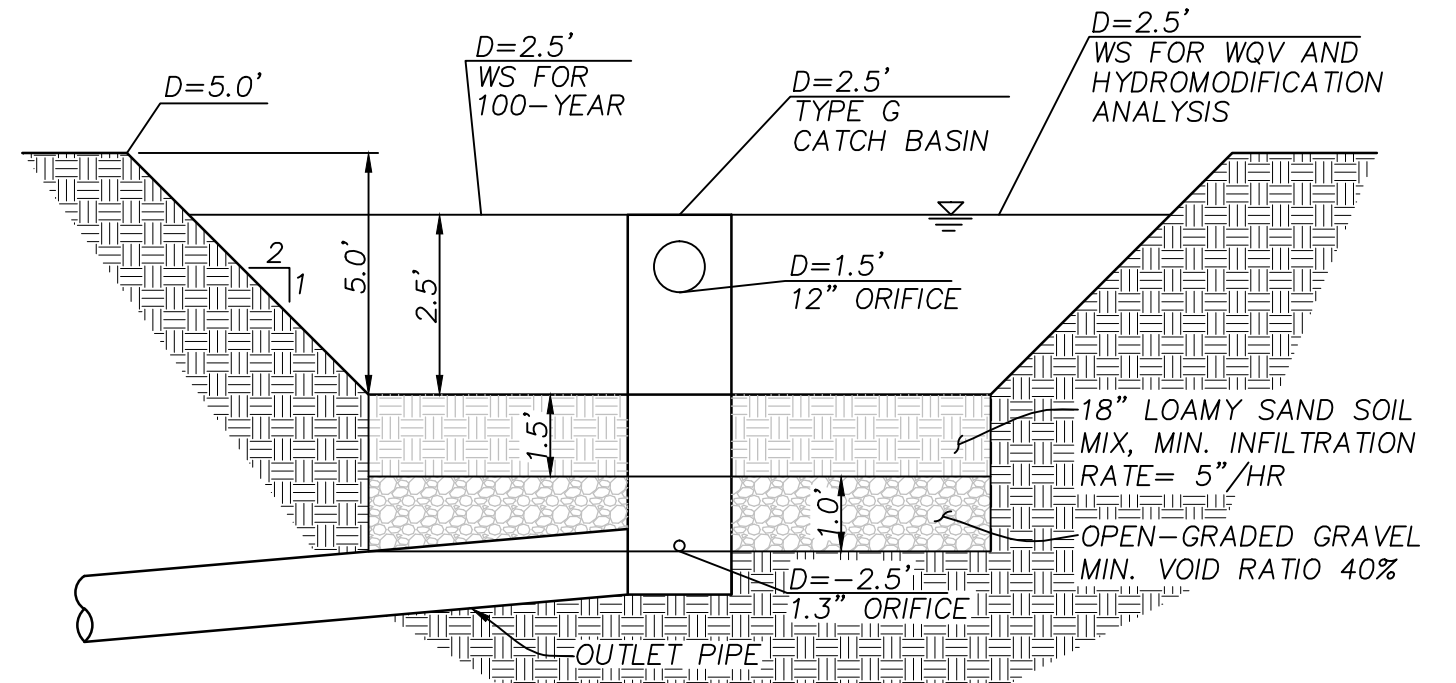
**DMA 3D**



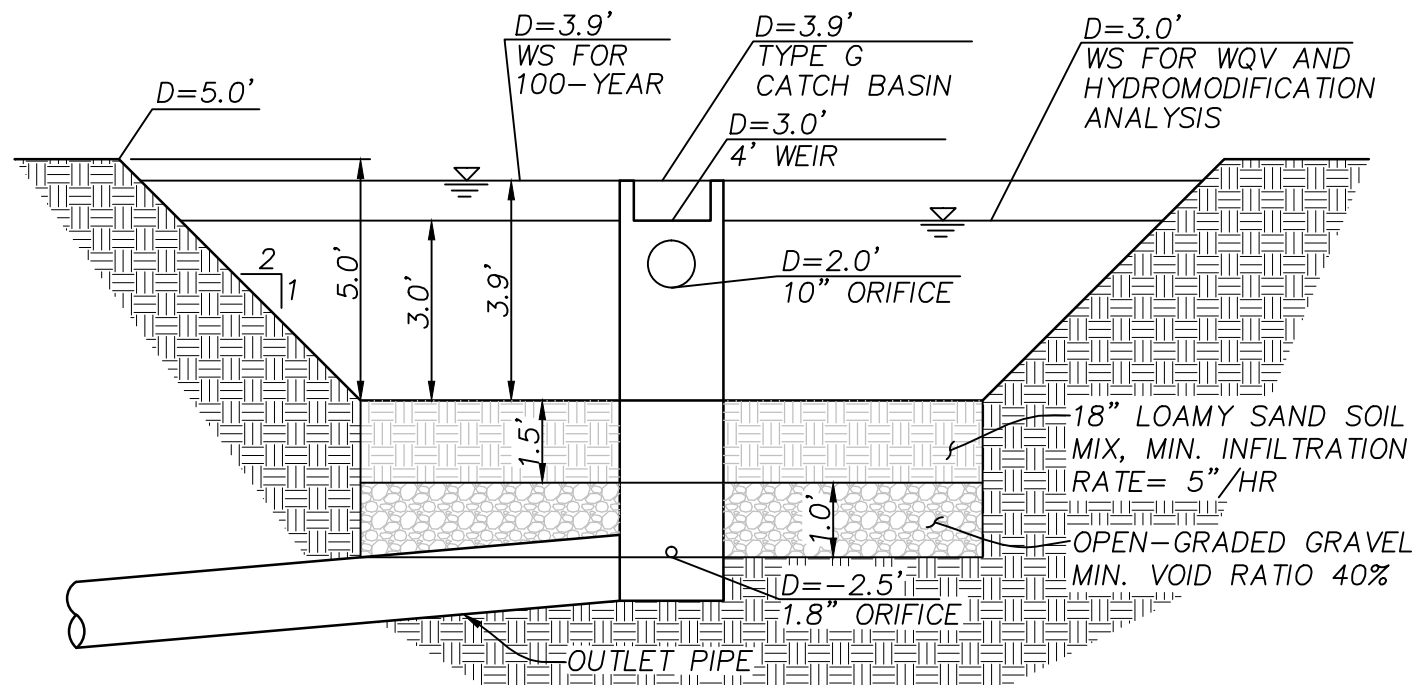
**DMA 4B**



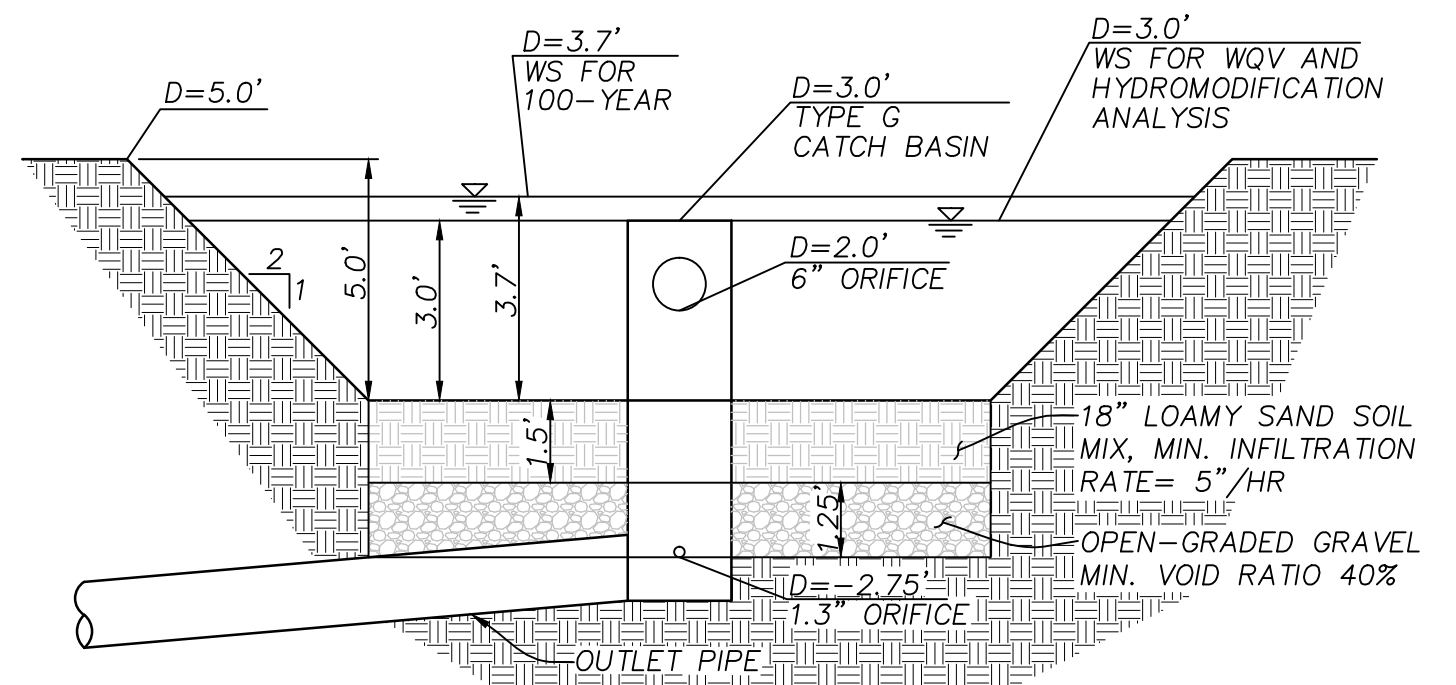
**DMA 5A**



**DMA 5C**



**DMA 5B**



**DMA 5D**

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## **Appendix 5**

### **Hydromodification Management Exhibit**

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