Form 4.2-4 Hydromodification Assessment for Time of Concentration (DA 1)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	187				213			
2 Change in elevation (ft)	2				1.87			
3 Slope (ft/ft), S_o = *Item 2 / Item 1*	0.011				0.009			
4 Land cover	Commercial				Commercial			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	6							
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*								
7 Cross-sectional area of channel (ft^2)								
8 Wetted perimeter of channel (ft)								
9 Manning's roughness of channel (n)								
10 Channel flow velocity (ft/sec) V_{fps} = *(1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*								
11 Travel time to outlet (min) T_t = *Item 6 / (Item 10 * 60)*								
12 Total time of concentration (min) T_c = *Item 5 + Item 11*	6					6.5		

13 Pre-developed time of concentration (min): 6 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 6.5 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet hydromodification requirement (min): -0.8 $T_{C\text{-}Hydro}$ = *(Item 13 * 0.95) – Item 14*

Form 4.2-5 Hydromodification Assessment for Peak Runoff (DA 1)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA*)			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA*)		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.7 LOG Form 4.2-4 Item 5 /60)*		1.93			1.84		
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		0.59			0.59		
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		1			0.44		
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*		0.98			0.28		
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		0.98			0.122		
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*		0.50			0.91		
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: 0.50 *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*

9 Pre-developed Q_p at T_c for DMA B: 0 *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*

10 Pre-developed Q_p at T_c for DMA C: 0 *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*

10 Peak runoff from pre-developed condition confluence analysis (cfs): 0.50 *Maximum of Item 8, 9, and 10 (including additional forms as needed)*

11 Post-developed Q_p at T_c for DMA A: 0.91
Same as Item 8 for post-developed values

12 Post-developed Q_p at T_c for DMA B: 0
Same as Item 9 for post-developed values

13 Post-developed Q_p at T_c for DMA C: 0
Same as Item 10 for post-developed values

14 Peak runoff from post-developed condition confluence analysis (cfs): 0.91 *Maximum of Item 11, 12, and 13 (including additional forms as needed)*

15 Peak runoff reduction needed to meet Hydromodification Requirement (cfs): 0.40 *$Q_{p\text{-}hydro}$ = (Item 14 * 0.95) – Item 10*

4.3 BMP Selection and Sizing

Complete the following forms for each project site DA to document that the proposed treatment (LID/Bioretention) BMPs conform to the project DCV developed to meet performance criteria specified in the Phase II Small MS4 Permit (WQMP Template Section 4.2). For the LID DCV, the forms are ordered according to hierarchy of BMP selection as required by the Phase II Small MS4 Permit (see Section 5.3 in the TGD for WQMP). The forms compute the following for on-site LID BMP:

- Site Design Measures (Form 4.3-2)
- Retention and Infiltration BMPs (Form 4.3-3) or
- Biotreatment BMPs (Form 4.3-4).

> Please note that the selected BMPs may also be used as dual purpose for on-site, hydromodification mitigation and management.

At the end of each form, additional fields facilitate the determination of the extent of mitigation provided by the specific BMP category, allowing for use of the next category of BMP in the hierarchy, if necessary.

The first step in the analysis, using Section 5.3.2 of the TGD for WQMP, is to complete Forms 4.3-1 and 4.3-3) to determine if retention and infiltration BMPs are infeasible for the project. For each feasibility criterion in Form 4.3-1, if the answer is "Yes," provide all study findings that includes relevant calculations, maps, data sources, etc. used to make the determination of infeasibility.

Next, complete Form 4.3-2 to determine the feasibility of applicable Site Design BMPs, and, if their implementation is feasible, the extent of mitigation of the DCV.

If no site constraints exist that would limit the type of BMP to be implemented in a DA, evaluate the use of combinations of LID BMPs, including all applicable Site Design BMPs to maximize on-site retention of the DCV. If no combination of BMP can mitigate the entire DCV, implement the single BMP type, or combination of BMP types, that maximizes on-site retention of the DCV within the minimum effective area.

If the combination of site design, retention and/or infiltration BMPs is unable to mitigate the entire DCV, then the remainder of the volume-based performance criteria that cannot be achieved with site design, retention and/or infiltration BMPs must be managed through biotreatment BMPs. If biotreatment BMPs are used, then they must be sized to provide equivalent effectiveness based on Template Section 4.3.4.

4.3.1 Exceptions to Requirements for Bioretention Facilities

Contingent on a demonstration that use of bioretention or a facility of equivalent effectiveness is infeasible, other types of biotreatment or media filters (such as tree-box-type biofilters or in-vault media filters) may be used for the following categories of Regulated Projects:

1) Projects creating or replacing an acre or less of impervious area, and located in a designated pedestrian-oriented commercial district (i.e., smart growth projects), and having at least 85% of the entire project site covered by permanent structures;

2) Facilities receiving runoff solely from existing (pre-project) impervious areas; and

3) Historic sites, structures or landscapes that cannot alter their original configuration in order to maintain their historic integrity.

Form 4.3-1 Infiltration BMP Feasibility (DA 1)	
Feasibility Criterion – Complete evaluation for each DA on the Project Site	
[1] Would infiltration BMP pose significant risk for groundwater related concerns? *Refer to Section 5.3.2.1 of the TGD for WQMP*	Yes ☐ No ☒
If Yes, Provide basis: (attach)	
[2] Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? (Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert): • The location is less than 50 feet away from slopes steeper than 15 percent • The location is less than ten feet from building foundations or an alternative setback. • A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.	Yes ☐ No ☒
If Yes, Provide basis: (attach)	
[3] Would infiltration of runoff on a Project site violate downstream water rights?	Yes ☐ No ☒
If Yes, Provide basis: (attach)	
[4] Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils?	Yes ☐ No ☒
If Yes, Provide basis: (attach)	
[5] Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)?	Yes ☐ No ☒
If Yes, Provide basis: (attach)	
[6] Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WMAP, or impair beneficial uses? *See Section 3.5 of the TGD for WQMP and WMAP*	Yes ☐ No ☒
If Yes, Provide basis: (attach)	
[7] Any answer from Item 1 through Item 3 is "Yes": *If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Selection and Evaluation of Biotreatment BMP.* *If no, then proceed to Item 8 below.*	Yes ☐ No ☒
[8] Any answer from Item 4 through Item 6 is "Yes": *If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Site Design BMP.* *If no, then proceed to Item 9, below.*	Yes ☐ No ☒
[9] All answers to Item 1 through Item 6 are "No": *Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.* *Proceed to Form 4.3-2, Site Design BMPs.*	

4.3.2 Site Design BMP

Section E.12.e. of the Small Phase II MS4 Permit emphasizes the use of LID preventative measures; and the use of Site Design Measures reduces the portion of the DCV that must be addressed in downstream BMPs. Therefore, all applicable Site Design Measures shall be provided except where they are mutually exclusive

with each other, or with other BMPs. Mutual exclusivity may result from overlapping BMP footprints such that either would be potentially feasible by itself, but both could not be implemented. Please note that while there are no numeric standards regarding the use of Site Design BMPs. If a project cannot feasibly meet BMP sizing requirements or cannot fully address hydromodification, feasibility of all applicable Site Design BMPs must be part of demonstrating that the BMP system has been designed to retain the maximum feasible portion of the DCV. Complete Form 4.3-2 to identify and calculate estimated retention volume from implementing site design BMP. Refer to Section 5.4 in the TGD for more detailed guidance.

Form 4.3-2 Site Design BMPs (DA 1)

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*			
5 Sum of retention volume achieved from impervious area dispersion (ft^3):		$V_{retention}$ *=Sum of Item 4 for all BMPs*	
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
7 Ponding surface area (ft^2)			
8 Ponding depth (ft) (max. 0.5 ft.)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft) (min. 1 ft.)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) $V_{retention}$ *= (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			
13 Runoff volume retention from on-lot infiltration (ft^3):		$V_{retention}$ *=Sum of Item 12 for all BMPs*	

Form 4.3-2 Site Design BMPs (DA 1)

Form 4.3-2 cont. Site Design BMPs (DA 1)

14 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 14-18. If no, proceed to Item 19*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
15 Number of Street Trees			
16 Average canopy cover over impervious area (ft^2)			
17 Runoff volume retention from street trees (ft^3) $V_{retention}$ = *Item 15 * Item 16 * (0.05/12) assume runoff retention of 0.05 inches*			
18 Runoff volume retention from street tree BMPs (ft^3):	$V_{retention}$ = *Sum of Item 17 for all BMPs*		
19 Total Retention Volume from Site Design BMPs: 0 *Sum of Items 5, 1[illegible] 18*			

4.3.3 Infiltration BMPs

Use Form 4.3-3 to compute on-site retention of runoff from proposed retention and infiltration BMPs. Volume retention estimates are sensitive to the percolation rate used, which determines the amount of runoff that can be infiltrated within the specified drawdown time. The infiltration safety factor reduces field measured percolation to account for potential inaccuracy associated with field measurements, declining BMP performance over time, and compaction during construction. Appendix C of the TGD for WQMP provides guidance on estimating an appropriate safety factor to use in Form 4.3-3.

If site constraints limit the use of BMPs to a single type and implementation of retention and infiltration BMPs mitigate no more than 40% of the DCV, then they are considered infeasible and the Project Proponent may evaluate the effectiveness of BMPs lower in the LID hierarchy of use (Section 5.5 of the TGD for WQMP)

If implementation of infiltrations BMPs is feasible as determined using Form 4.3-1, then LID infiltration BMPs shall be implemented to the MEP (section 4.1 of the TGD for WQMP).

4.3.3.1 Allowed Variations for Special Site Conditions

The bioretention system design parameters of this Section may be adjusted for the following special site conditions:

1) Facilities located within 10 feet of structures or other potential geotechnical hazards established by the geotechnical expert for the project may incorporate an impervious cutoff wall between the bioretention facility and the structure or other geotechnical hazard.

2) Facilities with documented high concentrations of pollutants in underlying soil or groundwater, facilities located where infiltration could contribute to a geotechnical hazard, and facilities located on elevated plazas or other structures may incorporate an impervious liner and may locate the underdrain discharge at the bottom of the subsurface drainage/storage layer (this configuration is commonly known as a “flow-through planter”).

3) Facilities located in areas of high groundwater, highly infiltrative soils or where connection of underdrain to a surface drain or to a subsurface storm drain are infeasible, may omit the underdrain.

4) Facilities serving high-risk areas such as fueling stations, truck stops, auto repairs, and heavy industrial sites may be required to provide adequate pretreatment to address pollutants of concern unless these high-risk areas are isolated from storm water runoff or bioretention areas with no chance of spill migration.

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Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design BMP (ft^3): *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*			
BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA 1 BMP Type	DA 1 DMA 1 BMP Type l	DA 1 DMA 1 BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*			
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*			
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*			
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*			
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*			
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5-7 of the TGD for WQMP*			
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*			
10 Amended soil porosity			
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*			
12 Gravel porosity			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*			
16 Total Retention Volume from LID Infiltration BMPs: *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*			
17 Fraction of DCV achieved with infiltration BMP: % *Retention% = Item 16 / Form 4.2-1 Item 7*			
18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☐ No ☐ *If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.*			

4.3.4 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration. A key consideration when using biotreatment BMP is the effectiveness of the proposed BMP in addressing the pollutants of concern for the project (see Table 5-5 of the TGD for WQMP).

Use Form 4.3-4 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV. Biotreatment computations are included as follows:

- Use Form 4.3-5 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-6 to compute biotreatment in large volume based biotreatment BMP (e.g. constructed wetlands);
- Use Form 4.3-7 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

Form 4.3-4 Selection and Evaluation of Biotreatment BMP (DA 1)

1 Remaining LID DCV not met by site design , or infiltration, BMP for potential biotreatment (ft^3): 962 *Form 4.2-1 Item 7 - Form 4.3-2 Item 19 – Form 4.3-3 Item 16*	List pollutants of concern *Copy from Form 2.3-1.* Pathogens, Phosphorus, Nitrogen, Noxious Aquatic Plants, Sediment, Metals, Oils, Grease, Trash, Pesticides and organic compounds.	
2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)*	Volume-based biotreatment *Use Forms 4.3-5 and 4.3-6 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-7 to compute treated flow*
	☒ Bioretention with underdrain ☐ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention	☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment
3 Volume biotreated in volume based biotreatment BMP (ft^3): 987.5 *Form 4.3-5 Item 15 + Form 4.3-6 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): -26 *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: -2.7% *Item 4 / Item 1*
6 Flow-based biotreatment BMP capacity provided (cfs): 0 *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*		
7 Metrics for MEP determination: • Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development: ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*		

Form 4.3-5 Volume Based Biotreatment (DA 1) – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DA 1 DMA 1 BMP Type Bioretention	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*	Pathogens, Metals, Nitrogen, Phosphorus, Sediments, Organic compounds, pesticides, trash		
2 Amended soil infiltration rate *Typical ~ 5.0*	5		
3 Amended soil infiltration safety factor *Typical ~ 2.0*	2		
4 Amended soil design percolation rate (in/hr) P_{design} = *Item 2 / Item 3*	2.5		
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.3-1*	48		
6 Maximum ponding depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	0.5		
7 Ponding Depth (ft) d_{BMP} = *Minimum of (1, 12 * Item 4 * Item 5) or Item 6*	0.5		
8 Amended soil surface area (ft^2)	500		
9 Amended soil depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	2		
10 Amended soil porosity, *n*	0.4		
11 Gravel depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	1		
12 Gravel porosity, *n*	0.3		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Biotreated Volume (ft^3) $V_{biotreated}$ = *Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	987.5		
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: 987.5 *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-6 Volume Based Biotreatment (DA 1) – Constructed Wetlands and Extended Detention

Biotreatment BMP Type *Constructed wetlands, extended wet detention, extended dry detention, or other comparable proprietary BMP. If BMP includes multiple modules (E.g. forebay and main basin), provide separate estimates for storage and pollutants treated in each module.*	DA DMA BMP Type		DA DMA BMP Type *(Use additional forms for more BMPs)*	
	Forebay	Basin	Forebay	Basin
1 Pollutants addressed with BMP forebay and basin *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*				
2 Bottom width (ft)				
3 Bottom length (ft)				
4 Bottom area (ft^2) A_{bottom} = *Item 2 * Item 3*				
5 Side slope (ft/ft)				
6 Depth of storage (ft)				
7 Water surface area (ft^2) $A_{surface}$ =*(Item 2 + (2 * Item 5 * Item 6)) * (Item 3 + (2 * Item 5 * Item 6))*				
8 Storage volume (ft^3) *For BMP with a forebay, ensure fraction of total storage is within ranges specified in BMP specific fact sheets, see Table 5-6 of the TGD for WQMP for reference to BMP design details* V =*Item 6 / 3 * [Item 4 + Item 7 + (Item 4 * Item 7)^0.5]*				
9 Drawdown Time (hrs) *Copy Item 6 from Form 2.1*				
10 Outflow rate (cfs) Q_{BMP} = *(Item $8_{forebay}$ + Item 8_{basin}) / (Item 9 * 3600)*				
11 Duration of design storm event (hrs)				
12 Biotreated Volume (ft^3) $V_{biotreated}$ = *(Item $8_{forebay}$ + Item 8_{basin}) +(Item 10 * Item 11 * 3600)*				
13 Total biotreated volume from constructed wetlands, extended dry detention, or extended wet detention : *(Sum of Item 12 for all BMP included in plan)*				

Form 4.3-7 Flow Based Biotreatment (DA 1)

Biotreatment BMP Type *Vegetated swale, vegetated filter strip, or other comparable proprietary BMP*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in TGD Table 5-5*			
2 Flow depth for water quality treatment (ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
3 Bed slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
4 Manning's roughness coefficient			
5 Bottom width (ft) b_w = *(Form 4.3-5 Item 6 * Item 4) / (1.49 * Item 2^1.67 * Item 3^0.5)*			
6 Side Slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Cross sectional area (ft^2) *A = (Item 5 * Item 2) + (Item 6 * Item 2^2)*			
8 Water quality flow velocity (ft/sec) *V = Form 4.3-5 Item 6 / Item 7*			
9 Hydraulic residence time (min) *Pollutant specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Length of flow based BMP (ft) *L = Item 8 * Item 9 * 60*			
11 Water surface area at water quality flow depth (ft^2) SA_{top} = *(Item 5 + (2 * Item 2 * Item 6)) * Item 10*			

4.3.5 Conformance Summary

Complete Form 4.3-8 to demonstrate how on-site LID DCV is met with proposed site design, infiltration, and/or biotreatment BMP. The bottom line of the form is used to describe the basis for infeasibility determination for on-site LID BMP to achieve full LID DCV, and provides methods for computing remaining volume to be addressed in an alternative compliance plan. If the project has more than one outlet, then complete additional versions of this form for each outlet.

Form 4.3-8 Conformance Summary and Alternative Compliance Volume Estimate (DA 1)

1 Total LID DCV for the Project DA-1 (ft^3): 962 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design BMP (ft^3): 0 *Copy Item18 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 0 *Copy Item 16 in Form 4.3-3*

4 On-site biotreatment with volume based biotreatment BMP (ft^3): 987.5 *Copy Item 3 in Form 4.3-4*

5 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-4*

6 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design or infiltration BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☒ No ☐
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible; therefore biotreatment BMP provides biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

7 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐
  *Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} = (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

- Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following Phase II Small MS4 General Permit 2013-0001-DWQ 55 February 5, 2013 measures of equivalent effectiveness are demonstrated:
  1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐
  2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐
  3) Equal or greater protection against shock loadings and spills; ☐
  4) Equal or greater accessibility and ease of inspection and maintenance. ☐

4.3.6 Hydromodification Control BMP

Use Form 4.3-9 to compute the remaining runoff volume retention, after Site Design BMPs are implemented, needed to address hydromodification, and the increase in time of concentration and decrease in peak runoff necessary to meet targets for protection of waterbodies with a potential hydromodification. Describe the proposed hydromodification treatment control BMP. Section 5.6 of the TGD for WQMP provides additional details on selection and evaluation of hydromodification control BMP.

Form 4.3-9 Hydromodification Control BMPs (DA 1)

1 Volume reduction needed for hydromodification performance criteria (ft^3): 1,739 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design and infiltration, BMP (ft^3): 0 *Sum of Form 4.3-8 Items 2, 3, and 4. Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID PCV toward achieving hydromodification volume reduction*
3 Remaining volume for hydromodification volume capture (ft^3): 1,739 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site BMPs (ft^3):

5 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☒ No ☐

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site BMP ☐
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐

6 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site retention BMPs ☒

4.4 Alternative Compliance Plan (if applicable)

Describe an alternative compliance plan (if applicable) for projects not fully able to infiltrate, or biotreat the DCV via on-site LID practices. A project proponent must develop an alternative compliance plan to address the remainder of the LID DCV. Depending on project type some projects may qualify for water quality credits that can be applied to reduce the DCV that must be treated prior to development of an alternative compliance plan (see Form 2.4-1, Water Quality Credits). Form 4.3-9 Item 8 includes instructions on how to apply water quality credits when computing the DCV that must be met through alternative compliance.

Alternative Designs — Facilities, or a combination of facilities, of a different design than in Permit Section E.12.e.(ii)(f) may be permitted if all of the following measures of equivalent effectiveness are demonstrated:

1) Equal or greater amount of runoff infiltrated or evapotranspired;

2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment;

3) Equal or greater protection against shock loadings and spills;

4) Equal or greater accessibility and ease of inspection and maintenance.

The Project Proponent will need to obtain written approval for an alternative design from the Lahontan Regional Water Board Executive Officer (see Section 6 of the TGD for WQMP).

Section 5 Inspection and Maintenance Responsibility for Post Construction BMP

All BMPs included as part of the project WQMP are required to be maintained through regular scheduled inspection and maintenance (refer to Section 8, Post Construction BMP Requirements, in the TGD for WQMP). Fully complete Form 5-1 summarizing all BMP included in the WQMP. Attach additional forms as needed. The WQMP shall also include a detailed Operation and Maintenance Plan for all BMP and a Maintenance Agreement. The Maintenance Agreement must also be attached to the WQMP.

Note that at time of Project construction completion, the Maintenance Agreement must be completed, signed, notarized and submitted to the County Stormwater Department

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
Bioretention	Owner	Visual inspection of water ponding for more than 48 hours and debris removal.	Twice a year at the beginning and end of rainy season.
Education Employees.	Owner	Remove accumulated trash and debris in the bioretention at the start and end of rain season. Remove sediments, regrade, and revegetated as necessary.	Before rain seasons
Activity restrictions	Owner	No littering or vehicles driving allowed in the infiltration basin. Pesticide application will be done by a certified personal.	Daily

Section 6 WQMP Attachments

6.1. Site Plan and Drainage Plan

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural Source Control BMP locations
- Site Design Hydrologic Source Control BMP locations
- LID BMP details
- Drainage delineations and flow information
- Drainage connections

6.2 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open. If the local jurisdiction requires specialized electronic document formats (as described in their Local Implementation Plan), this section will describe the contents (e.g., layering, nomenclature, geo-referencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

6.3 Post Construction

Attach all O&M Plans and Maintenance Agreements for BMP to the WQMP.

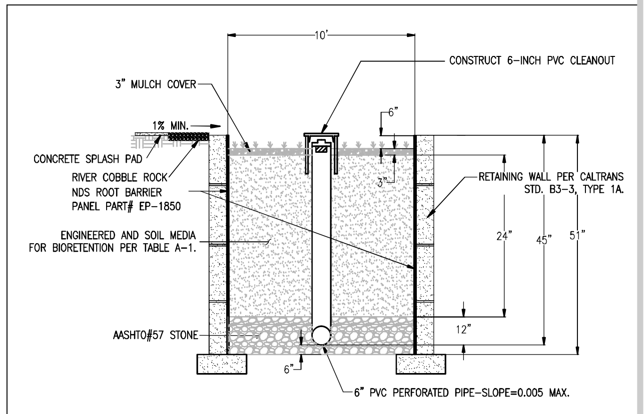
6.4 Other Supporting Documentation

- BMP Educational Materials
- Activity Restriction – C,C&R's & Lease Agreements

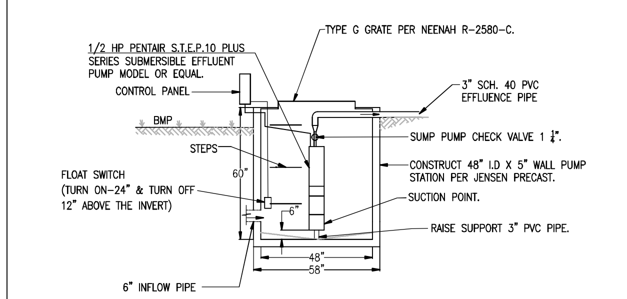
LEGEND

DA#	DRAINAGE AREA (DA)
DMA-#	DRAINAGE MANAGEMENT AREA (DMA)
3,000 SQ.FT.	NET AREA IN SQ.F.
	DIRECTION OF SURFACE FLOW
	DRAINAGE AREA
	PROPOSED STORM DRAIN
	PERVIOUS AREA (LANDSCAPE)
	IMPERVIOUS AREA
	BIORETENTION BASIN (BMP#)
STENCIL	NO DUMPING DRAINS TO OCEAN
	PUMP STATION

A.1: LOCATION OF INLETS
P.1: PLAZAS, SIDEWALKS AND PARKING LOTS



BIORETENTION FACILITY DETAIL NTS



1/2 HP PUMP STATION DETAIL NTS

DIG ALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE
CALL 811
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

42095 ZEVO DR, TEMECULA, CALIFORNIA 92590

CONSULTANT:
ERSC Engineering Resources of Southern Califo
1861 W. Redlands Blvd. Bldg. 7B
Redlands CA. 92373
(909) 890-1255
FAX: (909) 890-0995

PROJECT ADMINISTERED BY:
SAN BERNARDINO COUNTY PROJECT & FACILITIES MANAGEMENT DEPARTMENT

385 N. ARROWHEAD AVE.
SAN BERNARDINO, CA 92415

PROJECT NAME:
FIRE STATION 305 PREFABRICATED METAL STORAGE BUILDING

PROJECT # 10.10.1200

8331 CALIENTE ROAD
HESPERIA, CA 92344

ISSUE INFORMATION:

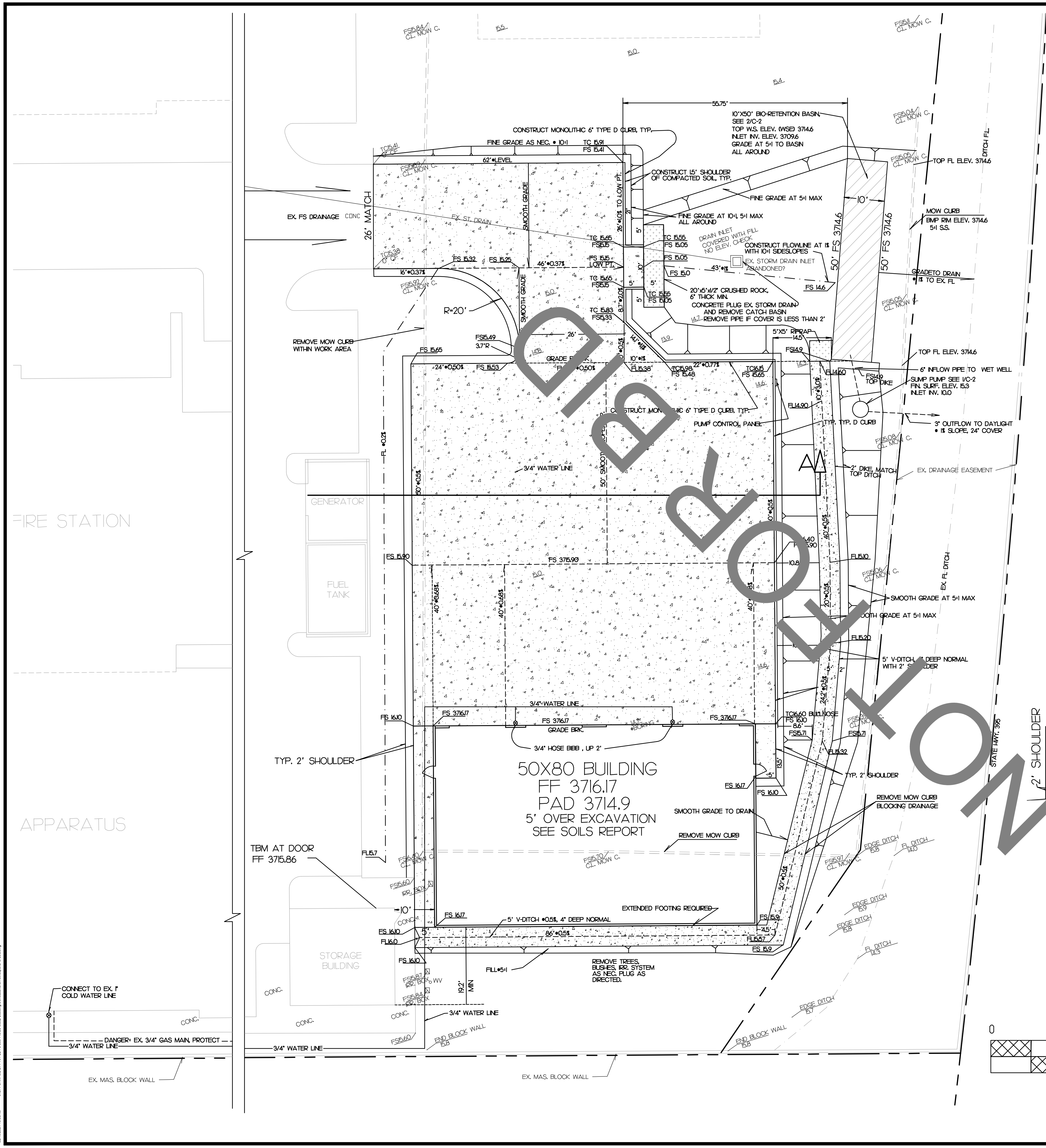
DATE:	INFORMATION:

SHEET INFORMATION:
STK PROJECT NO.: 374-177-23
SCALE: AS NOTED
DATE: FEBRUARY 2024
PLOT DATE: -
DRAWING NAME:

SEAL:
REGISTERED PROFESSIONAL ENGINEER
CIVIL
STATE OF CALIFORNIA

SHEET TITLE:
WQMP PLAN

SHEET NO.:
WQMP-1



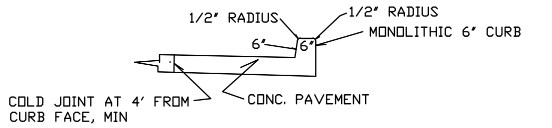
SPECIFICATIONS AND STANDARDS

1. THE CONSTRUCTION WORK SHALL CONFORM TO THE SAN BERNARDINO COUNTY TRANSPORTATION DEPT. "STANDARDS AND SPECIFICATIONS", CURRENT EDITION AND ARCHITECT'S GENERAL SPECIFICATIONS.

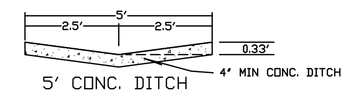
2. SOILS REPORT, BY IFE, PROJECT NO. S168-185 DATED OCTOBER 10, 2023

3. 3/4" HOSE BIBB, ZURN #Z1305-VB ANTI FREEZE WALL HYDRANT. ENCASED HYDRANT WITH BRONZE BODY, ALL BRONZE INTERIOR PARTS, KEY OPERATED CONTROL VALVE, STAINLESS STEEL BOX WITH HINGED COVER AND LOCK.

4. STA-RITE STEP PLUS SERIES PUMP STA. 30 GPM PENTAIR STEP10X30FT PUMP 1/2 HP, IN 5.5' DEEP BY 4' DIA. JENSEN PRECAST, SEE BMP REPORT, TOP ELEV. 3714.8 BASE ELEV. 3709.3



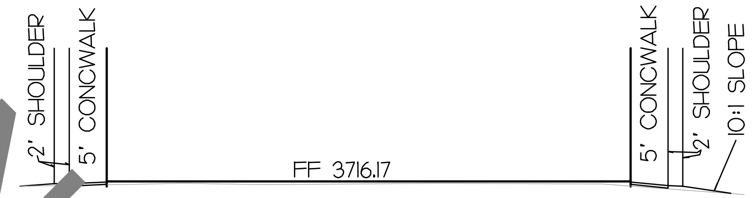
MONOLITHIC CURB DETAIL:
AT CURBS AND DRAIN CHANNELS
NO SCALE



5' CONC. DITCH
NO SCALE

LEGEND:

(pattern)	CONSTRUCT 9" MIN. CONCRETE PAVING OVER 6" CL II BASE OVER 95% COMPACTED SUBGRADE, SEE SPECS. 4500 PSI MIN, REMOVE EXCESS MATERIAL AS NEC. GRADE AS NEC. AND COMPACT PER SOILS REPORT.
(pattern)	CONSTRUCT 4" CONC. SIDEWALK OVER 12" COMPACTED SOIL, PER SOILS REPORT
(pattern)	CONSTRUCT 6" THICK, 3/4" CRUSHED ROCK BLANKET
FS15.39	EX. SPOT ELEVATIONS
FS 15.46	FINISH ELEVATIONS = FS 3715.46
CONC	EX. CONCRETE



SECTION A
NO SCALE

PROJECT NORTH

0 40 80

SCALE: 1" = 10'

DIG ALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE
CALL 811
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

CONSULTANT:

A.J. FRICK CIVIL ENGINEERING
42095 ZEVO DR. SUITE A15
TEMECULA, CA 92590
PHONE: (951) 296-9110

PROJECT ADMINISTERED BY:
SAN BERNARDINO COUNTY PROJECT & FACILITIES MANAGEMENT DEPARTMENT

385 N. ARROWHEAD AVE.
SAN BERNARDINO, CA 92415

PROJECT NAME:
FIRE STATION 305 PREFABRICATED METAL STORAGE BUILDING

PROJECT # 10.10.1200

8331 CALIENTE ROAD
HESPERIA, CA 92344

ISSUE INFORMATION:

DATE:	INFORMATION:

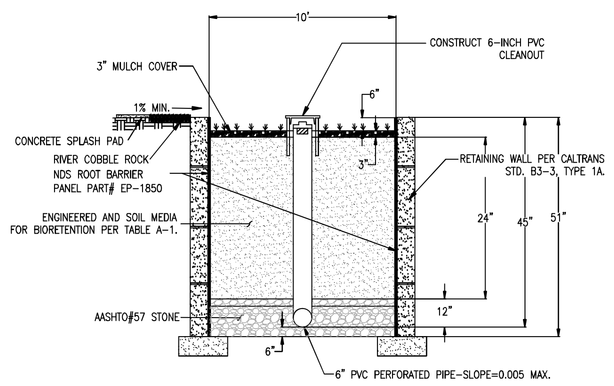
SHEET INFORMATION:
STK PROJECT NO.: 374-164-22
SCALE: AS NOTED
DATE: FEBRUARY 2024
PLOT DATE: -
DRAWING NAME:

SEAL:
EXP. 09-30-25

SHEET TITLE:
GRADING PLAN

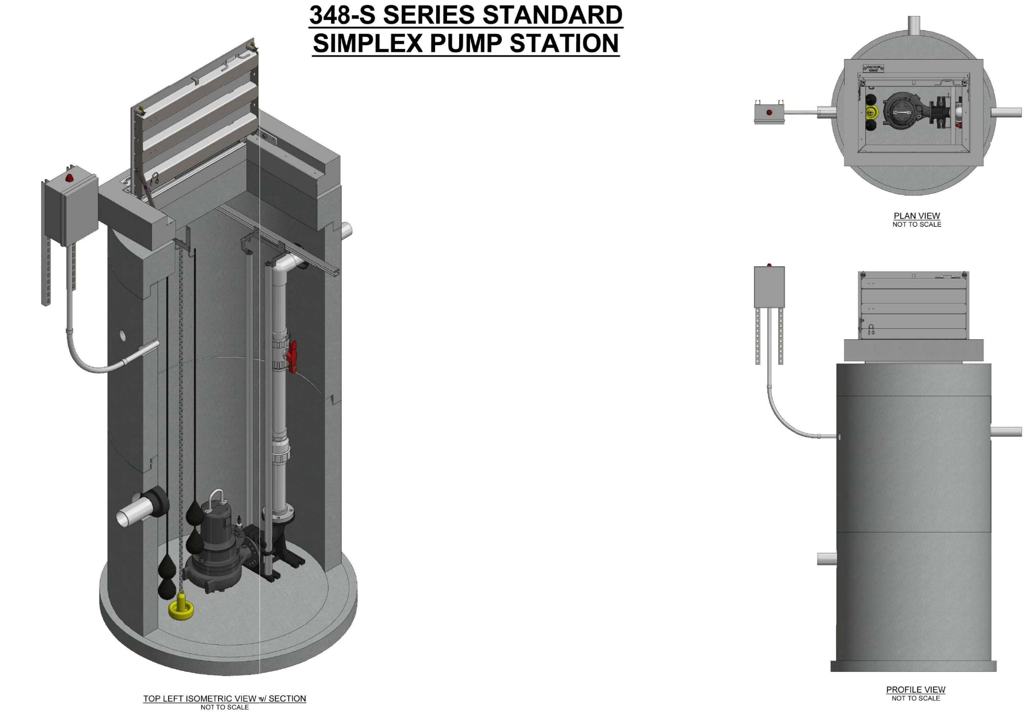
SHEET NO.:
C-1

2 BIORETENTION FACILITY DETAIL



1 PUMP STATION

348-S SERIES STANDARD SIMPLEX PUMP STATION

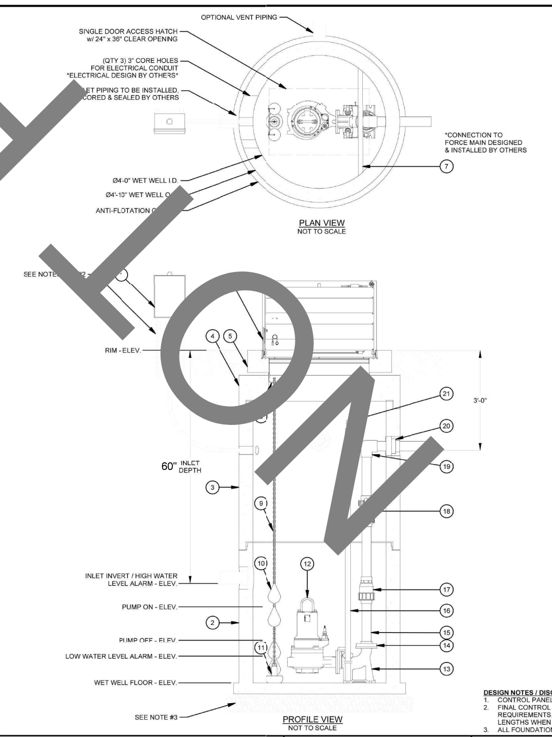


DISCLAIMERS, INCLUDING BUT NOT LIMITED TO:
1.) All elevations have been provided by others, and have not been verified by Jensen Precast. Contractor to verify all dimensions and elevations in field prior to installation.
2.) These layout drawings are intended to show overall system design only. All concrete component thicknesses, dimensions, and joint orientations may vary across Jensen Precast's manufacturing facilities. Contractor to confirm all thicknesses, dimensions, and joint orientations prior to installation.
3.) System design criteria has been provided to Jensen Precast. Others are responsible for verification that system meets intended application.
4.) Foundation, subgrade, and backfill to be designed by others.

JENSEN PUMP STATIONS
521 DUNN CIRCLE, SPARKS, NV 89431
www.jensenwaterresources.com
(855) 468-5600

DESCRIPTION: 348-S SERIES STANDARD
TITLE SHEET
PART NUMBER: 348-S Series Standard
DRAWN BY: T. Handke
CREATED:
MODIFIED: 4/29/2020
REV:
SHEET: 1 OF 2

348-S Series Standard.idw



BILL OF MATERIALS		
ITEM	QTY	DESCRIPTION
1	1	SIMPLEX CONTROL PANEL
2	1	48IN DIA JENSEN PRECAST CONCRETE MANHOLE BASE *HEIGHT VARIES*
3	1	48IN DIA JENSEN PRECAST CONCRETE MANHOLE BARREL *HEIGHT VARIES *
4	1	48IN DIA JENSEN PRECAST CONCRETE MANHOLE FLAT TOP
5	1	JENSEN PRECAST CONCRETE HATCH RISER
6	1	SINGLE DOOR HATCH WITH A CLEAR OPENING OF 24IN X 36IN
7	5 LF	LF STRUT C-CHANNEL 1-5/8 X 1-5/8 12GA SLOTTED 316SS
8	1	FLOAT BRACKET 3 HOOK TYPE 316SS
9	10 LF	LF CHAIN 1/4IN 316SS
10	4	FLOAT SWITCH w/ 100' CABLE
11	1	ANCHOR 15LB PVC COATED
12	1	3IN SUBMERSIBLE PUMP
13	1	AUTOCOUPLING ASSY 3IN FLG STD
14	1	ADAPTER 3IN FLG X SLIP SCH 80 PVC
15	20 LF	LF PIPE PVC SCH 80 3IN DIA
16	20 LF	LF PIPE 1-1/2IN SCH40 GUIDE RAIL 304SS
17	1	BALL CHECK VALVE 3IN SCH 80 PVC SLIP
18	1	BALL VALVE 3IN SCH 80 PVC SLIP
19	1	90 DEG ELBOW 3IN SCH 80 PVC SLIP
20	1	FLEXIBLE PIPE CONNECTOR
21	1	UPPER GUIDE RAIL BRACKET 3IN

PROJECT SPECIFIC INFORMATION	
FINISHED GRADE (Ft.)	14.8
RIM ELEV. (Ft.)	15.0
INLET ELEV. (Ft.)	10
FORCE MAIN DISCHARGE ELEV. (Ft.)	13.5
AVAILABLE POWER SUPPLY	120V [ ] 208V [X] 480V [ ]
AVAILABLE POWER PHASE	Single [ ] Three [X]

SYSTEM CHARACTERISTICS	
APPLICATION	SEWAGE [ ] STORM WATER [X]
DESIGN FLOW (gpm)	50 GPM
TOTAL DYNAMIC HEAD (Ft.)	25'
STATIC HEAD (Ft.)	1' MIN.
PUMP MOTOR (Std / XP)	Standard [X] XP/FM [ ]
PUMP TYPE	Non-Clog [X] Grinder [ ] Chopper [ ] Vortex [ ]
PUMP RATED HP & CURRENT	1/2 HP
ACCESS HATCH LOAD LEVEL	Pedestrian [X] Incidental H-20 [ ] Parking Lot H-20 [ ] Full Traffic H-20 [ ]

ADDITIONAL OPTIONS		
OPTION	YES	NO
CONTROL PANEL SS ENCLOSURE	[ ]	[ ]
CONTROL PANEL AC UNIT	[ ]	[ ]
CONTROL PANEL REMOTE ALARM MONITORING	[ ]	[ ]
AIR RELEASE/VACUUM VALVE	[ ]	[ ]
INTERIOR LINER	[ ]	[ ]
CONCRETE WATERPROOFING	[ ]	[ ]
VENT PIPE	[ ]	[ ]
ODOR CONTROL VALVE	[ ]	[ ]
LIFTING CRANE	[ ]	[ ]
GENERATOR RECEPTACLE	[ ]	[ ]

DESIGN NOTES / DISCLAIMERS:
1. CONTROL PANEL INSTALLATION, MOUNTING DESIGN & HARDWARE BY OTHERS.
2. FINAL CONTROL PANEL LOCATION TO BE DETERMINED ACCORDING TO PROJECT REQUIREMENTS. CONSULT ALL SUBMITTED PUMP AND LEVEL CONTROL CABLE LENGTHS WHEN DETERMINING THE CONTROL PANEL LOCATION.
3. ALL FOUNDATION, SUBGRADE, AND BACKFILL DESIGNED BY OTHERS.

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DESCRIPTION: 348-S SERIES STANDARD
MECHANICAL DETAIL
PART NUMBER: 348-S Series Standard
DRAWN BY: T. Handke
CREATED:
MODIFIED: 4/29/2020
REV:
SHEET: 2 OF 2

348-S Series Standard.idw

CONSULTANT:
A.J. FRICK CIVIL ENGINEERING
42095 ZEVO DR., SUITE A15
TEMECULA, CA 92590
PHONE: (951) 296-9110

PROJECT ADMINISTERED BY:
SAN BERNARDINO COUNTY PROJECT & FACILITIES MANAGEMENT DEPARTMENT
385 N. ARROWHEAD AVE.
SAN BERNARDINO, CA 92415

PROJECT NAME:
FIRE STATION 305 PREFABRICATED METAL STORAGE BUILDING
PROJECT # 10J0J200
8331 CALIENTE ROAD
HESPERIA, CA 92344

ISSUE INFORMATION:

DATE:	INFORMATION:

SHEET INFORMATION:
STK PROJECT NO.: 374-164-22
SCALE: AS NOTED
DATE: FEBRUARY 2024
PLOT DATE: –
DRAWING NAME:

SEAL:
EXP. 09-30-25

SHEET TITLE:
DETAILS

SHEET NO.:
C-2

SAN BERNARDINO COUNTY
FIRE STATION 305
PREFABRICATED METAL STORAGE BUILDING

PROJECT # 10.10.1200

8331 CALIENTE ROAD
HESPERIA, CA 92344

SHEET INDEX

TITLE 24 MANDATORY MEASURES

INSTALLED INSULATING MATERIAL SHALL HAVE BEEN CERTIFIED BY THE MANUFACTURER TO COMPLY WITH THE CALIFORNIA QUALITY STANDARDS FOR INSULATING MATERIAL.

ALL INSULATING MATERIALS SHALL BE INSTALLED IN COMPLIANCE WITH THE FLAME SPREAD RATING AND SMOKE DENSITY REQUIREMENTS OF SECTION 2602 AND 707 OF THE CBC.

ALL EXTERIOR JOINTS AND OPENINGS IN THE BUILDING ENVELOPE THAT ARE OBSERVABLE SOURCES OF AIR LEAKAGE SHALL BE CAULKED, GASKETED, OR WEATHERSTRIPPED.

SITE CONSTRUCTED DOORS, WINDOWS AND SKYLIGHTS SHALL BE CAULKED BETWEEN THE UNIT AND THE BUILDING, AND SHALL BE WEATHER STRIPPED (EXCEPT FOR UNFRAMED GLASS DOORS AND FIRE DOORS)

MANUFACTURED DOORS AND WINDOWS INSTALLED SHALL HAVE AIR INFILTRATION RATES CERTIFIED BY THE MANUFACTURER PER 2-53169(a)1. AFTER JULY 1, 1993, MANUFACTURED FENESTRATION PRODUCTS MUST BE LABELED FOR U-VALUE ACCORDING TO NFRC PROCEDURES. ALSO ALL OVERHEAD DOORS OF APPARATUS ROOM. PROVIDE CERTIFICATES OF COMPLIANCE FOR DOORS, WINDOWS & INSULATION.

NOTES TO GENERAL CONTRACTOR

THE GENE[illegible]LDING CONTRACTOR SHALL SUBMIT TO THE COUNTY OF SAN BERNARDINO DESIGN & C[illegible]TRUCTION DEPARTMENT THE FOLLOWING DOCUMENTS FOR REVIEW AND [illegible]PPROV[illegible]RIOR TO OBTAINING BU[illegible]ING PERMIT:

1. [illegible]ROVIDE PROJECT SIGN PER [illegible]ECIFICATIONS
2. COMPLY W/ C.B.C. SECTION [illegible]03.7 - "PEDESTRIAN PROTECTION" DURING CONSTRUCTION.
3. GENERAL CONTRA[illegible] TO [illegible]ROVIDE ALL BACKING/FRAMING AS NECESSARY FOR LIGHTS, SIGNS, GRAB BA[illegible]
4. DEFERRED SU[illegible]TTAL / SEPA[illegible]TE PE[illegible]

   THE FOLLOWIN[illegible] ARE UNDER DE[illegible] SUBMITTAL/SEPARATE PERMITS (TO BE OBTAINED BY THE GENERA[illegible] CONTRACTOR)

   - PREFABRICATE[illegible]0x80 [illegible]AL SHO[illegible]DING & CO[illegible]ONENTS.

   SUBMITTAL DOCUMENTS [illegible]NS & CAL[illegible]ATIONS) FOR DEFE[illegible]ED ITEMS SHALL BE SUBMITTED TO THE ARCHITECT OR E[illegible]EER OF RECORD, W[illegible] SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING O[illegible]CIAL WITH A NOTATION [illegible]DICATING THAT THE DEFERRED DOCUMENTS HAVE BEEN [illegible]VIEWED AND THAT THE[illegible] HAVE BEEN FOUND TO BE IN GENERAL CONFORMANCE WITH TH[illegible] DESIGN OF THE BUILD[illegible] THE DEFERRED ITEMS SHALL NOT BE INSTALLED UNTIL THEI[illegible] DESIGN AND SUBMIT[illegible] DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL.
5. ELECTRICAL CONDUITS IN COMMERCIAL BUI[illegible]E BURIED 6" BELOW CONCRETE SLAB. [TMCC 15.04.050(C)]
6. VERTICAL GLAZING SHALL HAVE U-FACTORS PER NFRC 100-SB OR D[illegible]ULT V[illegible]ES PER APPENDIX I OR ACM MANUAL. [CEC EXCEPTION TO 116[illegible]2]
7. REQUIRED SPECIAL INSPECTIONS

   THE FOLLOWING SPECIAL INSPECTIONS PER 2016 C.B.C. ARE [illegible]
   -- STRUCTURAL CONCRETE OVER 2,500 P.S.I.
   -- FIELD WELDING.
   -- HIGH-STRENGTH BOLTS.
   -- EXPANSION EPOXY ANCHORS.
8. NO HAZARDOUS MATERIALS ARE TO BE STORED OR USED WITHIN THE BUILDING WHICH EXCEED THE QUANTITIES IN U.B.C. TABLES 3-D & 3-E.
9. THE FACILITY SHALL REMAIN IN OPERATION AT ALL TIMES.

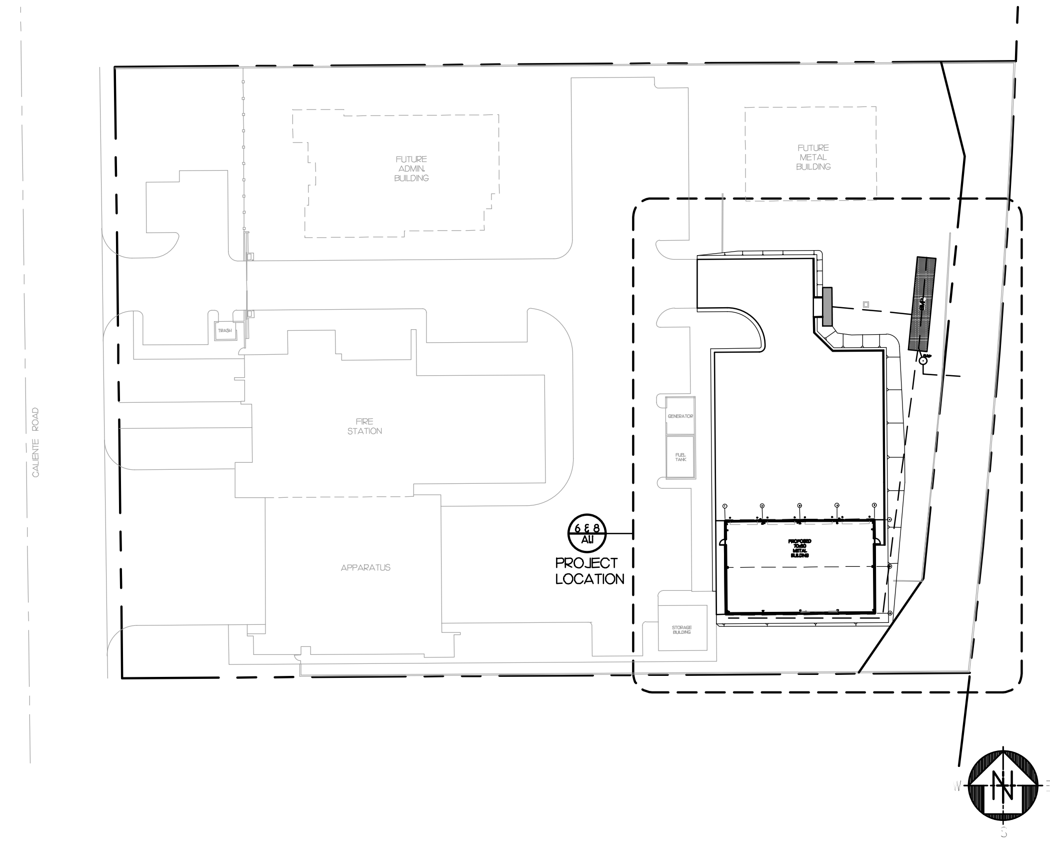
   A. THE IMPROVEMENTS SHALL BE STAGED TO ALLOW INGRESS & EGRESS AT ALL TIMES.

   B. THE WORK ON THE EXTERIOR SHALL BE MADE AS DUST FREE & ODOR FREE AS POSSIBLE AND SHALL NOT PREVENT THE STAFF FROM THEIR REGULAR OPERATIONS.

   C. CONTRACTOR SHALL SUBMIT IN WRITING A WRITTEN METHOD OF PROCEDURE AT THE PRE-CONSTRUCTION MEETING ADDRESSING THE ABOVE CONCERNS.
10. GENERAL CONTRACTOR TO PROVIDE TEMPORARY SAFETY BARRIER OR FENCING FOR THE DURATION OF THE PROJECT AS REQUIRED AT NO ADDED COST TO THE OWNER.
11. GENERAL CONTRACTOR SHALL ENGINEER & CONSTRUCT ALL FOUNDATIONS REQUIRED BY THE PRE-FABRICATED METAL BUILDING COMPANY. CONTRACTOR SHALL PROVIDE ENGINEERED & WET STAMPED SHOP DRAWINGS FOR THE ENTIRE STRUCTURE, INCLUDING THE FOUNDATIONS & MEZZANINE.
13. GENERAL CONTRACTOR SHALL PATCH/REPAIR EXISTING DRIVEWAY AS REQUIRED FOR UTILITY TRENCHING.

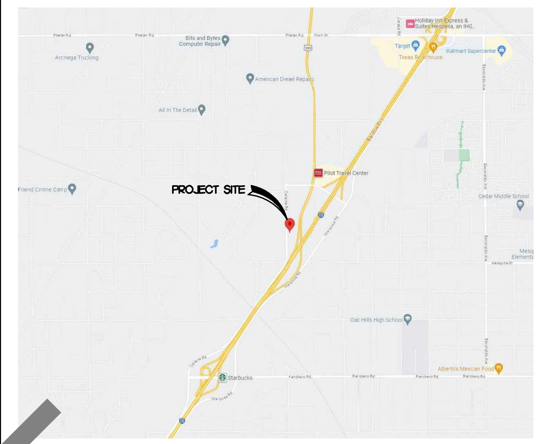
REFERENCE SITE PLAN

N.T.S.



V[illegible]INITY MAP

N.T.S.



CODE ANALYSIS

ASSESSOR'S P[illegible]CEL NU[illegible]BERS: [illegible]00-000-00-0000

BUILDING

OCCUPANCY GROUP	= S-1
TYPE OF CONSTRUCTION	= V-B, NON-SPRINKLERED
STORIES	= 1
HEIGHT	= 29'-3"
BASIC ALLOWABLE FLOOR AREA	= 9,000 S.F. (TABLES 506.2 & 508.3.2)
TOTAL FLOOR AREA	= 5,600 S.F.

PROJECT TEAM

OWNER
SAN BERNARDINO COUNTY
PROJECT AND FACILITIES MANAGEMENT DEPT.
GIL RIOS - PROJECT MANAGER III
385 N. ARROWHEAD AVE., THIRD FLOOR
SAN BERNARDINO, CA 92415
PHONE: (909) 387-5000

ARCHITECTURAL
STK ARCHITECTURE, INC.
TONY FINALDI, ARCHITECT
42095 ZEVO DR., SUITE A15
TEMECULA, CA 92590
(951) 296-9110

CIVIL ENGINEER
A.J. FRICK CIVIL ENGINEERING
ARNIE FRICK, CIVIL ENGINEER
42095 ZEVO DR., SUITE A15
TEMECULA, CA 92590
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MPE ENGINEER
DESIGN WEST ENGINEERING
ADRIAN JACQUEZ
1845 BUSINESS CENTER DR., SUITE 215
SAN BERNARDINO, CA 92408
PHONE: (909) 890-3700
FAX: (909) 890-3770

PROJECT DESCRIPTION

FIRE WISHES TO CONSTRUCT A NEW PREFABRICATED METAL BUILDING TO HOUSE FIRE TRUCKS AND RELATED EQUIPMENT. THE FOLLOWING IS THE SCOPE OF WORK:

1. NEW 50x80 PREFABRICATED METAL BUILDING.
2. STRUCTURAL ENGINEERING OF BUILDING FRAME AND FOUNDATION WILL BE DESIGN/BUILD BY THE GENERAL CONTRACTOR.
3. FOUR OVERHEAD COILING DOORS 14'x14' WITH RAPID RESPONSE MOTOR.
4. INSULATION AT ROOF.
5. UPGRADED TO STANDING SEAM METAL ROOFING.
6. BASIC INTERIOR AND EXTERIOR LIGHTING.
7. MECHANICAL EXHAUST SYSTEM / NOT SOURCE CAPTURE VEHICLE EXHAUST.
8. SITE CONCRETE FOR FIRE TRUCK INGRESS / EGRESS.
9. PROVIDE GAS LINE TO THE BUILDING ALONG WITH PROVIDE 3 UNIT HEATERS.
10. HOSE BIBS.
11. WQMP DESIGN/REPORT, CALCULATIONS, AND INFILTRATION TESTING & REPORT.

APPLICABLE CODES

LIST OF APPLICABLE CODES

ALL WORK SHALL COMPLY WITH CURRENTLY ADOPTED:

2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R. (2021 INTERNATIONAL BUILDING CODE)

2022 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R. (2021 NATIONAL ELECTRICAL CODE)

2022 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24 C.C.R. (2021 UNIFORM MECHANICAL CODE)

2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 C.C.R. (2021 UNIFORM PLUMBING CODE)

2022 CALIFORNIA GREEN BUILDING STANDARDS CODE

2022 CALIFORNIA ENERGY CODE

2022 CALIFORNIA FIRE CODE

AMERICANS WITH DISABILITIES ACT 1990 WITH 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN AND 2010 REVISIONS TO TITLE II

42095 ZEVO DR., TEMECULA, CALIFORNIA 92590-3780
Phone: 951.296.9110 Fax: 951.296.6079 Email: stk@stkinc.com

CONSULTANT:

PROJECT ADMINISTERED BY:
SAN BERNARDINO COUNTY
PROJECT & FACILITIES MANAGEMENT DEPARTMENT

385 N. ARROWHEAD AVE.
SAN BERNARDINO, CA 92415

PROJECT NAME:
FIRE STATION 305
PREFABRICATED METAL STORAGE BUILDING

PROJECT # 10.10.1200

8331 CALIENTE ROAD
HESPERIA, CA 92344

ISSUE INFORMATION:

DATE:	INFORMATION:

SHEET INFORMATION:

STK PROJECT NO.:	374-164-22
SCALE:	AS NOTED
DATE:	FEBRUARY 2024
PLOT DATE:	-
DRAWING NAME:	

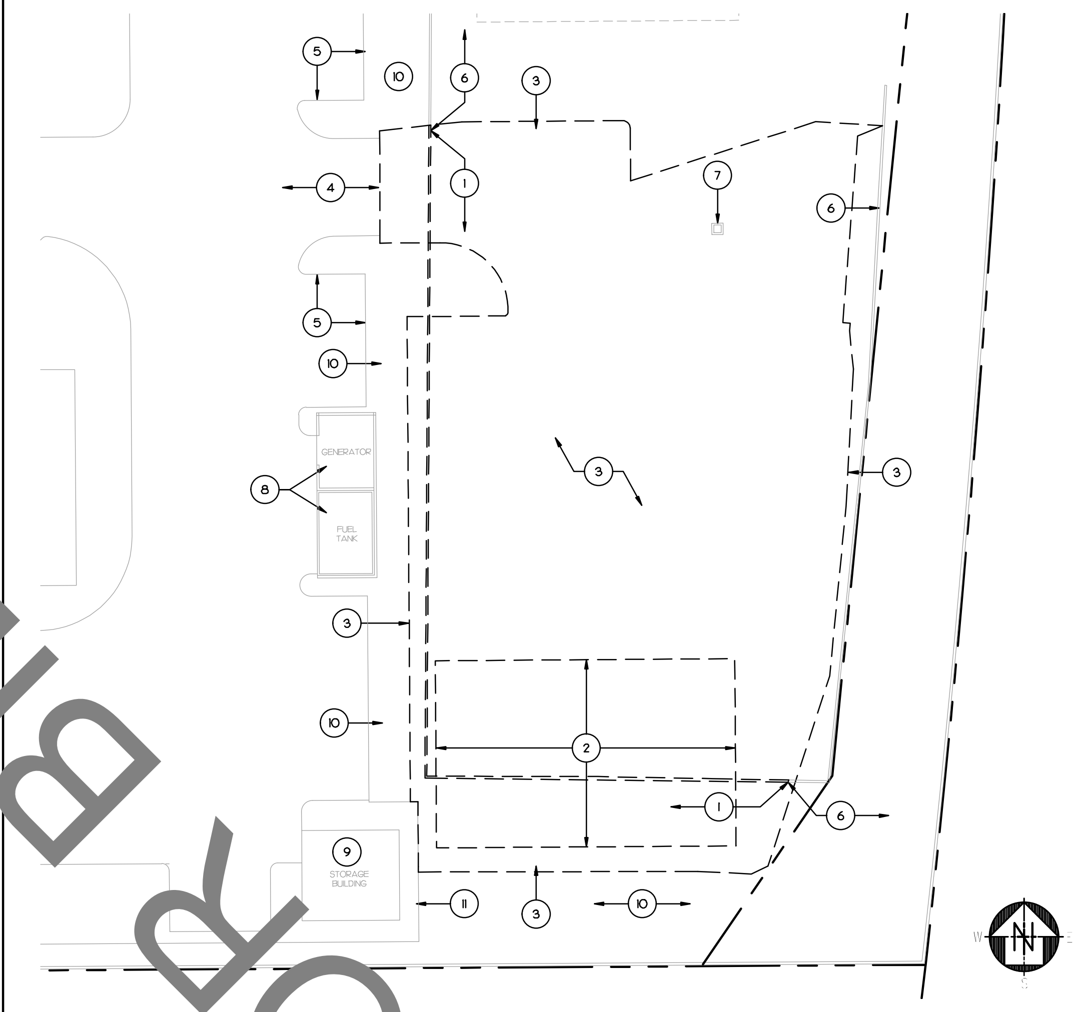
SEAL:

LICENSED ARCHITECT
ANTONIO FINALDI
No. C31476
REN. 07-31-25
STATE OF CALIFORNIA

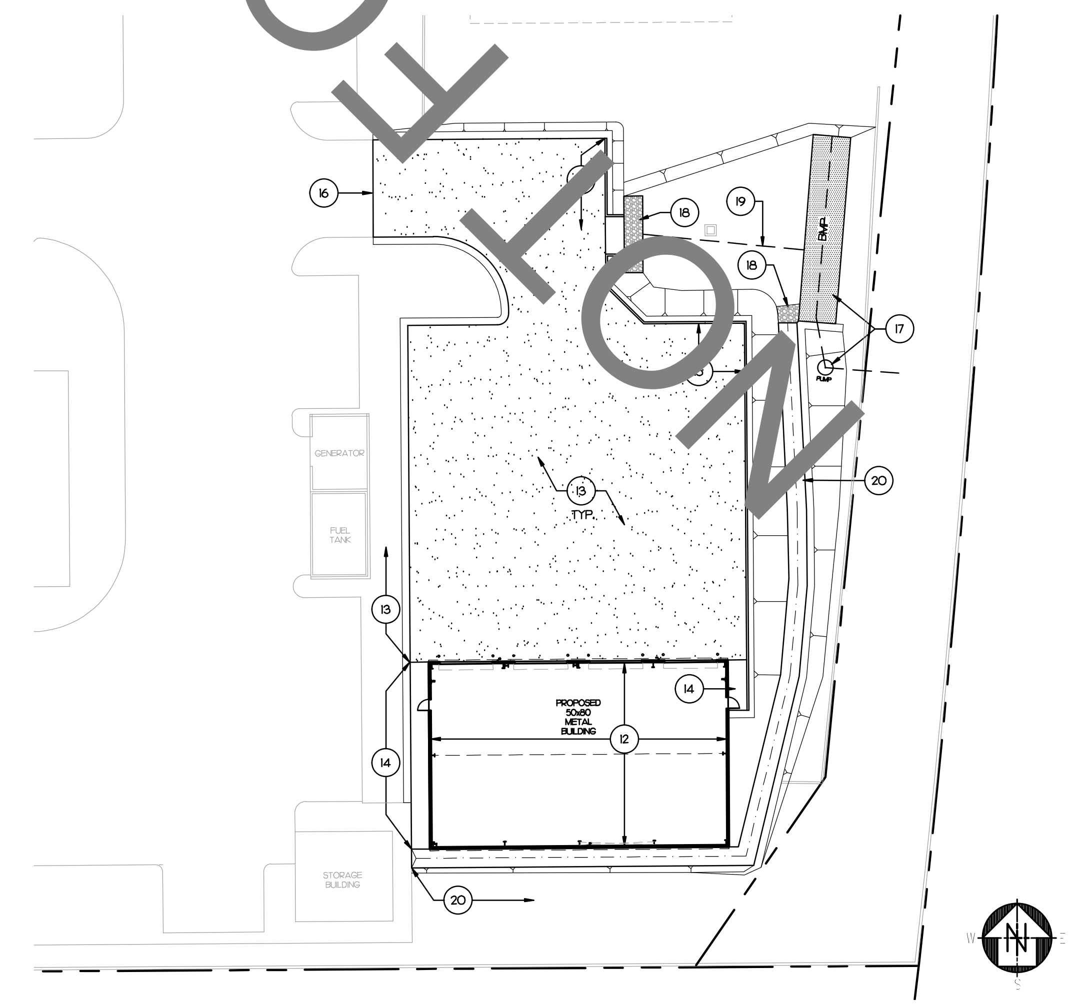
SHEET TITLE:
TITLE SHEET

SHEET NO.:
T1.1

NOT USED



DEMOLITION SITE PLAN — SCALE: 1"=20'-0" — 6

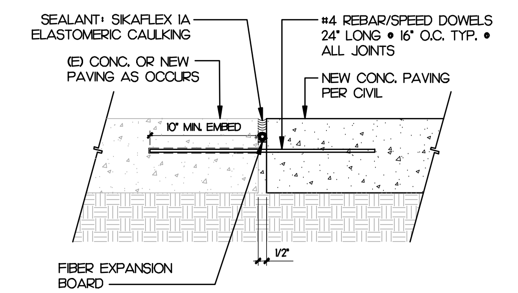


REMODEL SITE PLAN — SCALE: 1"=20'-0" — 8

KEY NOTE (#)

1. REMOVE EXISTING CONCRETE MOW CURB - FIELD VERIFY.
2. APPROXIMATE LOCATION OF NEW PREFAB METAL BUILDING. PREP, OVER-EX, COMPACT, ETC. AS REQUIRED TO ACCEPT NEW BUILDING - FIELD VERIFY.
3. APPROXIMATE LIMIT OF GRADING/SITE SLOPE. CLEAR/SCARIFY EXISTING CONDITION AS REQUIRED - FIELD VERIFY & SEE CIVIL.
4. EXISTING PAVING TO REMAIN / PROTECT. REPAIR/MODIFY AS REQUIRED FOR THE TRANSITION TO THE NEW CONCRETE PAVING - FIELD VERIFY.
5. EXISTING CURB/GUTTER TO REMAIN / PROTECT - FIELD VERIFY.
6. EXISTING CONCRETE CURB TO REMAIN / PROTECT - FIELD VERIFY.
7. EXISTING DRAIN TO REMAIN / PROTECT - FIELD VERIFY.
8. EXISTING FUEL TANK, GENERATOR, ETC. TO REMAIN / PROTECT - FIELD VERIFY.
9. EXISTING BUILDING/STRUCTURE TO REMAIN / PROTECT - FIELD VERIFY.
10. EXISTING LANDSCAPE, ROCK, DIRT, ETC. TO REMAIN / PROTECT - FIELD VERIFY.
11. EXISTING CONCRETE SIDEWALK TO REMAIN / PROTECT - FIELD VERIFY.
12. PREFABRICATED METAL BUILDING & COMPONENTS - SEE SHEET A2.1.
13. 9" MIN. CONCRETE PAVING (4,500 PSI WITH #3 REBAR & 18" O.C.) OVER 6" CLASS II BASE & 95% MIN. COMPACTION - SEE CIVIL. PROVIDE CONTROL & EXPANSION JOINTS AS RECOMMENDED IN THE SOILS REPORT - SEE 4/A1.1. CONTRACTOR TO PROVIDE PLAN OF PROPOSED LOCATIONS OF EXPANSION & CONTROL JOINTS FOR APPROVAL PRIOR TO PLACING CONCRETE.
14. 4" MIN. CONCRETE SIDEWALK (4,500 PSI WITH #3 REBAR & 18" O.C.) OVER 12" MIN. COMPACTED FILLS - SEE CIVIL. PROVIDE CONTROL JOINTS AS RECOMMENDED IN THE SOILS REPORT.
15. CONCRETE CURB - SEE CIVIL.
16. MATCH NEW CONCRETE PAVING WITH EXISTING - SEE CIVIL.
17. BIORETENTION FACILITY & PUMP - SEE WQMP-1 & ELECT. FOR POWER.
18. CRUSHED ROCK RIPRAP - SEE CIVIL.
19. PROVIDE FLOWLINE PER CIVIL.
20. CONCRETE V-DITCH & FLOW LINE PER CIVIL.

DIG ALERT
DIAL BEFORE YOU DIG
TOLL FREE
TWO WORKING DAYS BEFORE YOU DIG
CALL 811
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT



EXPANSION JOINT — SCALE: N.T.S. — 4

NOT FOR BID

CONSULTANT:

PROJECT ADMINISTERED BY:
SAN BERNARDINO COUNTY
PROJECT & FACILITIES
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SHEET TITLE:
SITE PLANS

SHEET NO.:
A1.1