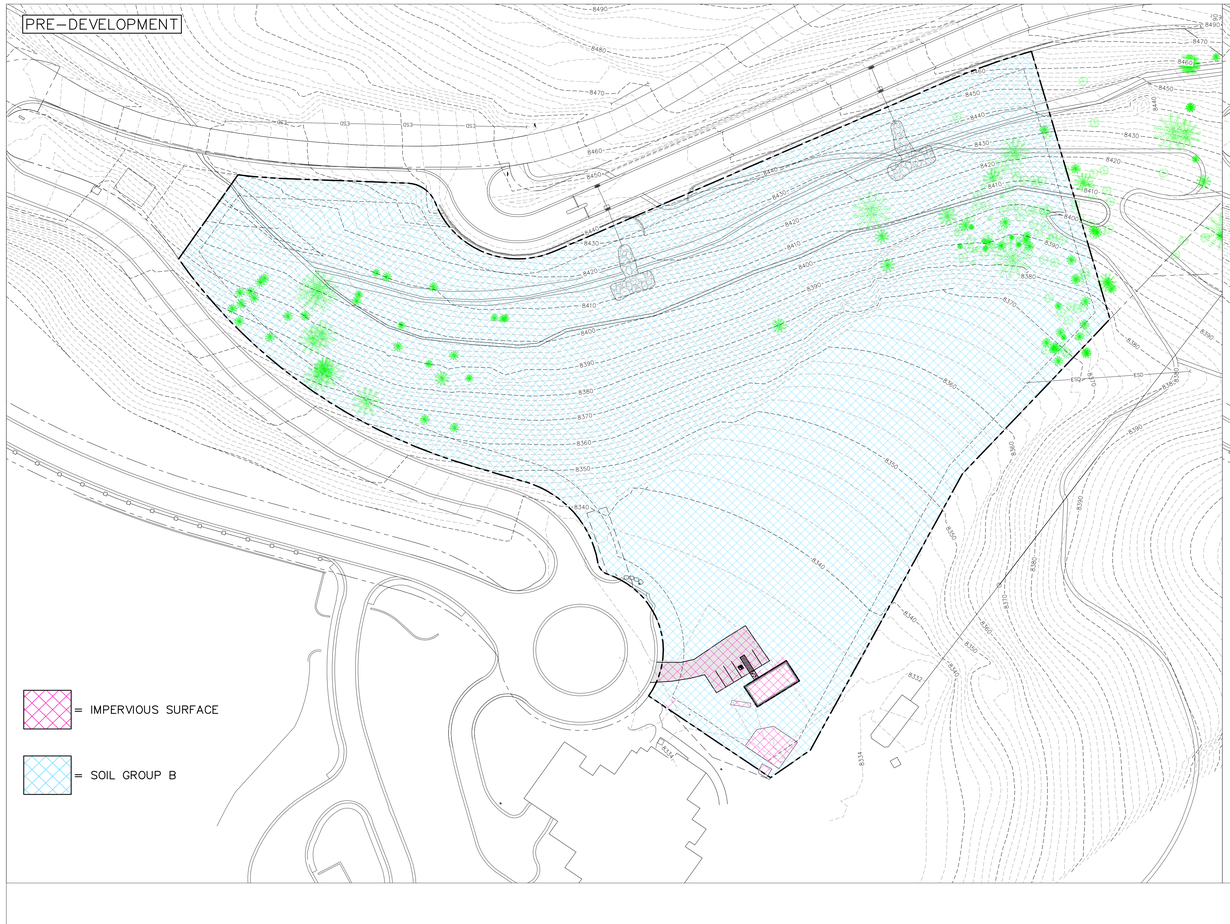

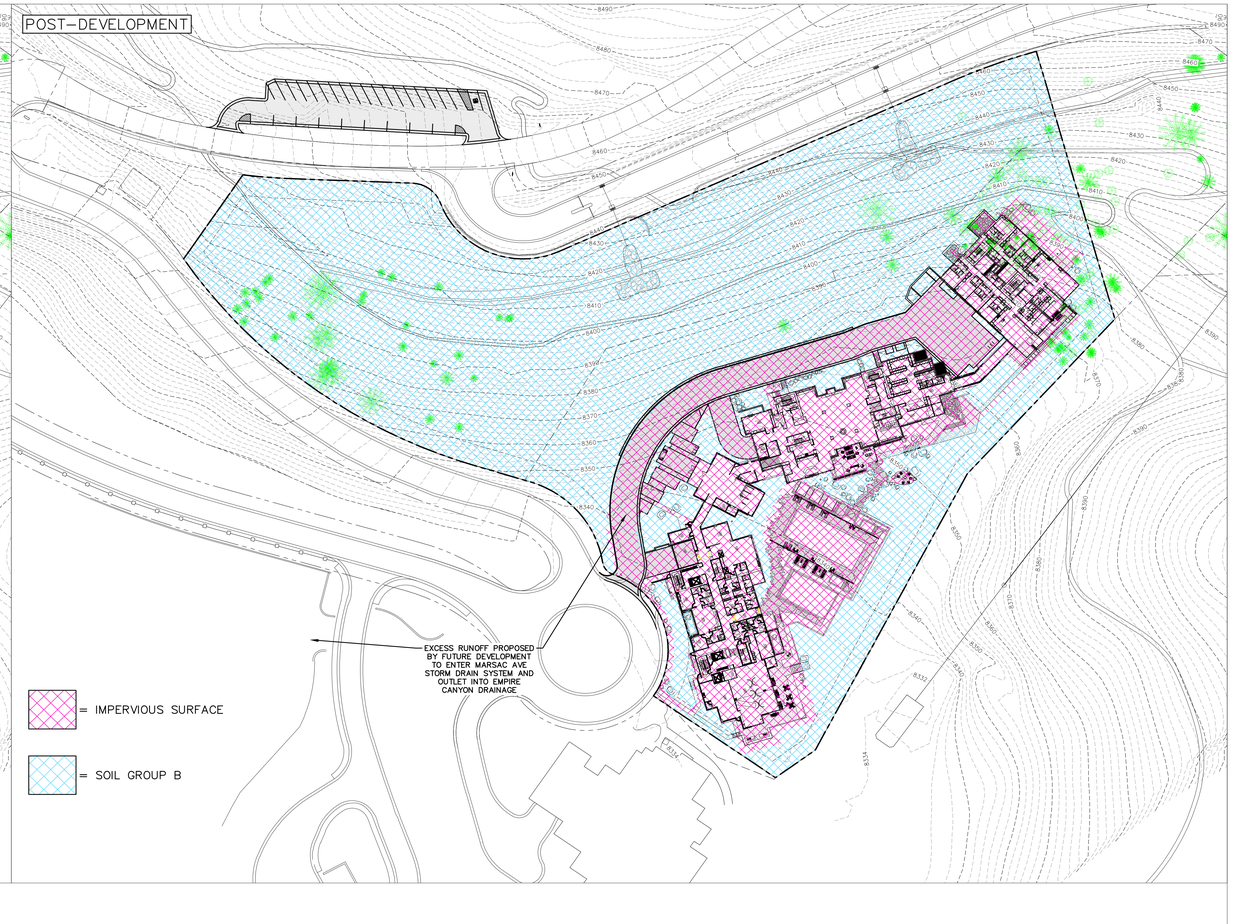

WATER QUALITY VOLUME CALCULATIONS

ASSUMPTIONS

METHOD OF ANALYSIS: $WQ_V = CiTA$

DESIGN STORM: *90TH PERCENTILE EVENT*

NOTE: *INTENSITY = 0.60 IN/HR PER SUMMIT COUNTY MS4.*

VARIABLES

Q = RUNOFF FLOWRATE [CUBIC FEET/SEC]

C = RUNOFF COEFFICIENT

(WEIGHT AVERAGE BY SOIL GROUP AND AREA TYPE)

RUNNOFF COEFFICIENTS "C":

SLOPE	HYDROLOGIC SOIL GROUP			
	A	B	C	D
FLAT (0-2%)	*0.07*	*0.10*	*0.14*	*0.18*
AVERAGE (2-6%)	*0.12*	*0.15*	*0.19*	*0.23*
STEEP (>6%)	*0.16*	*0.21*	*0.27*	*0.33*
SURFACING	**PERVIOUS**		**IMPERVIOUS**	
HARDSCAPE	*0.78*		*0.93*	

i = STORM INTENSITY [FT/HR]

T= STORM DURATION (HR)

NOTE: *T= 1 HR PER SUMMIT COUNTY ORDINANCE 381-A.*

A = AREA [FT^2]

PRE-DEVELOPMENT WATER QUALITY VOLUME

AREAS FOR WEIGHT AVERAGE "C":

SLOPE	HYDROLOGIC SOIL GROUP			
	A	B	C	D
FLAT (0-2%)				
AVERAGE (2-6%)				
STEEP (>6%)		*294,689*		
SURFACING	**PERVIOUS**		**IMPERVIOUS**	
HARDSCAPE				*6,168*

A= 300,858 FT^2

C= 0.22

i= 0.26 FT/HR

t= 24.00 HR

ΔWQ_V = *423,117 CU FT*

POST-DEVELOPMENT WATER QUALITY VOLUME

AREAS FOR WEIGHT AVERAGE "C":

SLOPE	HYDROLOGIC SOIL GROUP			
	A	B	C	D
FLAT (0-2%)				
AVERAGE (2-6%)				
STEEP (>6%)		*210,498*		
SURFACING	**PERVIOUS**		**IMPERVIOUS**	
HARDSCAPE				*90,360*

A= 300,858 FT^2

C= 0.42

i= 0.26 FT/HR

t= 24.00 HR

ΔWQ_V = *799,948 CU FT*

GROUNDWATER RECHARGE VOLUME

ΔWQ_V = *376,831 CU FT*

PEAK RUNOFF CALCULATIONS

ASSUMPTIONS

METHOD OF ANALYSIS: *RATIONAL METHOD Q=CiA*

STORM RETURN PERIOD: *100 YEARS*

NOTE: *FOR THE 100 YR RECURRANCE INTERVAL, THE COMPOSITE "C" VALUE IS ADJUSTED BY A FACTOR OF 1.25 BEFORE COMPUTING Q.*

STORM DURATION: *24 Hour.*

SOUCE: *NOAA ATLAS 14 - PARK CITY RADIO STATION 42-6648*

VARIABLES

Q = RUNOFF FLOWRATE [CUBIC FEET/SEC]

C = RUNOFF COEFFICIENT

(WEIGHT AVERAGE BY SOIL GROUP AND AREA TYPE)

RUNNOFF COEFFICIENTS "C":

SLOPE	HYDROLOGIC SOIL GROUP			
	A	B	C	D
FLAT (0-2%)	*0.07*	*0.10*	*0.14*	*0.18*
AVERAGE (2-6%)	*0.12*	*0.15*	*0.19*	*0.23*
STEEP (>6%)	*0.16*	*0.21*	*0.27*	*0.33*
SURFACING	**PERVIOUS**		**IMPERVIOUS**	
HARDSCAPE	*0.78*		*0.93*	

i = STORM INTENSITY [INCHES/HR]

A = AREA [ACRES]

t = TIME OF CONCENTRATION (SEC.)

V = EXCESS RUNNOFF VOLUME (CU FT) = ΔQt

PRE-DEVELOPMENT PEAK DISCHARGE

AREAS FOR WEIGHT AVERAGE "C":

SLOPE	HYDROLOGIC SOIL GROUP			
	A	B	C	D
FLAT (0-2%)	-	-	-	-
AVERAGE (2-6%)	-	-	-	-
STEEP (>6%)	-	*6.77*	-	-
SURFACING	**PERVIOUS**		**IMPERVIOUS**	
HARDSCAPE		-		*0.14*

A= 6.91 ACRES

C= 0.22

C_{ADJ} = *0.28*

i= 0.13 IN/HR

Q= 0.25 CFS

POST-DEVELOPMENT PEAK DISCHARGE

AREAS FOR WEIGHT AVERAGE "C":

SLOPE	HYDROLOGIC SOIL GROUP			
	A	B	C	D
FLAT (0-2%)	-	-	-	-
AVERAGE (2-6%)	-	-	-	-
STEEP (>6%)	-	*4.83*	-	-
SURFACING	**PERVIOUS**		**IMPERVIOUS**	
HARDSCAPE		-		*2.07*

A= 6.91 ACRES

C= 0.42

C_{ADJ} = *0.53*

i= 0.13 IN/HR

Q= 0.48 CFS

EXCESS RUNOFF STORAGE VOLUME

ΔQ= *0.23 CFS*

t= 86,400 SEC.

V= 19,551 CU FT

THE EXISTING DETENTION POND IN EMPIRE CANYON, SOUTH OF DALY AVENUE, WAS DESIGNED TO ACCOMODATE INCREASE IN STORMWATER FOR THE ENTIRE EMPIRE PASS DEVELOPMENT. THE DETENTION POND WAS CONSTRUCTED IN THE MID 2000'S. THE POND RECEIVES STORMWATER RUNOFF FROM THE ROCK-LINED STREAM CHANNEL SOUTH OF THE DETENTION POND AS WELL AS A PIPING SYSTEM ALONG THE EXISTING DIRT ROAD FROM EMPIRE CANYON TO THE ONTARIO MINE.

THE EMPIRE PASS MASTER DETENTION POND HAS OUTLET CONTROL STRUCTURES DESIGNED TO RETAIN THE 2 YEAR 24 HOUR STORM FOR WATER QUALITY REQUIREMENTS AND TO DETAIN THE 50 AND 100 YEAR STORM EVENTS WITH OUTFLOW AT PRE-DEVELOPMENT RATES. THE 19,551 CU FT OF EXCESS RUNOFF PRODUCED BY THE SOMMET BLANC DEVELOPMENT WILL BE FULL DETAINED IN THE EMPIRE CANYON DETENTION POND.

50' 0 50' 100'

PROFESSIONAL ENGINEER No. 12075305 MARTIN CONNOR DINSMORE 05/17/24 STATE OF UTAH

(435) 649-9467
Alliance Engineering Inc
CONSULTING ENGINEERS LAND PLANNERS SURVEYORS
123 Main Street P.O. Box 2664 Park City, Utah 84060-2664

STAFF: MICHAEL DEMKOWICZ, CONNOR DINSMORE

DATE: 05/17/2024

IFC SET 2 OF 3
STORMWATER CALCULATIONS
SOMMET BLANC DEVELOPMENT

FOR: SOMMET BLANC RESIDENCES I, LLC

JOB NO.: 1-11-18

FILE: X:\Empire\dwg\B2 East Design\B2 East-Civil.dwg

SHEET C.16