

APPENDIX B – MIXTURE PROPORTIONS

MIXTURE DESIGNATION: *JESTER* (COLOR VARIES, MIX WITH YELLOW PIGMENT IS SHOWN)

CEMENTITIOUS MATERIALS								
Component	Specific Gravity	Volume (ft ³)	Amount of CM (mass/volume) (lb/yd ³)					
Type 1 White Portland Cement	3.15	3.00	590.66					
White Silica Fume	2.20	0.43	58.93					
High-Reactivity Metakaolin	2.60	0.86	139.29					
Total Amount of cementitious materials 788.88 lb/yd ³ c/cm ratio 0.71								
FIBERS								
Component	Specific Gravity	Volume (ft ³)	Amount of Fibers (mass/volume) (lb/yd ³)					
.375" PVA Fibers	1.30	0.39	31.34					
Total Amount of Fibers 31.34 lb/yd ³								
AGGREGATES								
Aggregates	ASTM C330	Abs (%)	MC _{stk} (%)	SG _{SSD}	Base Quantity (lb/yd ³)		Volumess _o (ft ³)	Batch Quantity (at MC _{stk}) (lb/yd ³)
					OD	SSD		
3M™ K15	N	0	0	0.15	78.65	78.65	8.40	78.65
Expanded Shale	Y	13.7	5.1	1.78	270.91	308.14	2.77	284.73
ADMIXTURES								
Admixture	lb/gal	Dosage (fl.oz/cwt)	% Solids	Amount of Water in Admixture (lb/yd ³)				
Silpro C-21 Latex	9.2	792.19	20%	359.34				
ADVA® Cast 575 HRWR	8.9	20.48	40%	6.74				
Eclipse® Floor 200 SRA	7.7	26.24	1%	12.33				
Total Water from Admixtures, $\sum W_{adm}$ 378.41 lb/yd ³								
SOLIDS (LATEX, DYES AND POWDERED ADMIXTURES)								
Component	Specific Gravity	Volume (ft ³)	Amount (mass/volume) (lb/yd ³)					
Silpro C-21 Latex	1.87	0.77	89.84					
Yellow Pigment	4.20	0.09	23.67					
Total Solids from Admixtures 108.51 lb/yd ³								
WATER								
		Amount (mass/volume) (lb/yd ³)					Volume (ft ³)	
Water, lb/yd ³		w: 355.00					5.69	
Total Free Water from All Aggregates, lb/yd ³		$\sum W_{free}$: -23.41						
Total Water from All Admixtures, lb/yd ³		$\sum W_{adm}$: 378.41						
Batch Water, lb/yd ³		W _{batch} : 0						
DENSITIES, AIR CONTENT, RATIOS AND SLUMP								
	cm	fibers	aggregates	solids	water	Total		
Mass of Concrete, M, (lb)	788.88	31.34	386.79	108.51	355.00	$\sum M$: 1670.52		
Absolute Volume of Concrete, V, (ft ³)	4.29	0.39	11.17	0.86	5.69	$\sum V$: 22.40		
Theoretical Density, T, (= $\sum M / \sum V$)	74.58 lb/ft ³		Air Content [= (T - D)/T x 100%]			17.04%		
Measured Density, D	61.87 lb/ft ³		Slump, Slump flow			0.5 in.		
water/cement ratio, w/c:	0.60		water/cementitious material ratio, w/cm:			0.45		