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Mandela Splash Pad Pre-Construction Plan

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Footer Logo

Market research

There is a demand for more summer activities in the Mandela neighborhood, and the best option to provide for this demand is a splash pad on the school property. Mandela may decide to fund the splash pad addition using money from investors or from those who use the splash pad. If they decide to fund the project by selling passes, consider the following model.

The area around Mandela is called Florence. There is a community pool at 30th and Redick street near Mandela. Miller pool offers day passes for \$2 per adult and seasonal passes for \$175 for a family of six¹. While this is an affordable option, Miller can expect up to 400² swimmers on a summer day, and parents can have their hands full trying to keep their kids safe. Mandela will provide a private option available to Mandela ECDC and elementary families.

The Mandela splash pad offers season passes and day passes to families that attend the school. A family season pass costs \$175, and day passes will be offered at a premium price of \$3 per person to encourage families to purchase season passes.

Splash pad maintenance costs \$1310 per year³ for 500,000 gallons of water and regular cleaning and maintenance. The pool costs \$36,900 to install, based on the quantity take-off and budget calculations. Considering 700 day passes sold per year⁴, the graph below represents the time in years it would take to account for the cost of the pool. Revenue rates are based on the number of season passes (SP) sold per year. With this model, the ROI is about 4.8 - 6.3 years.



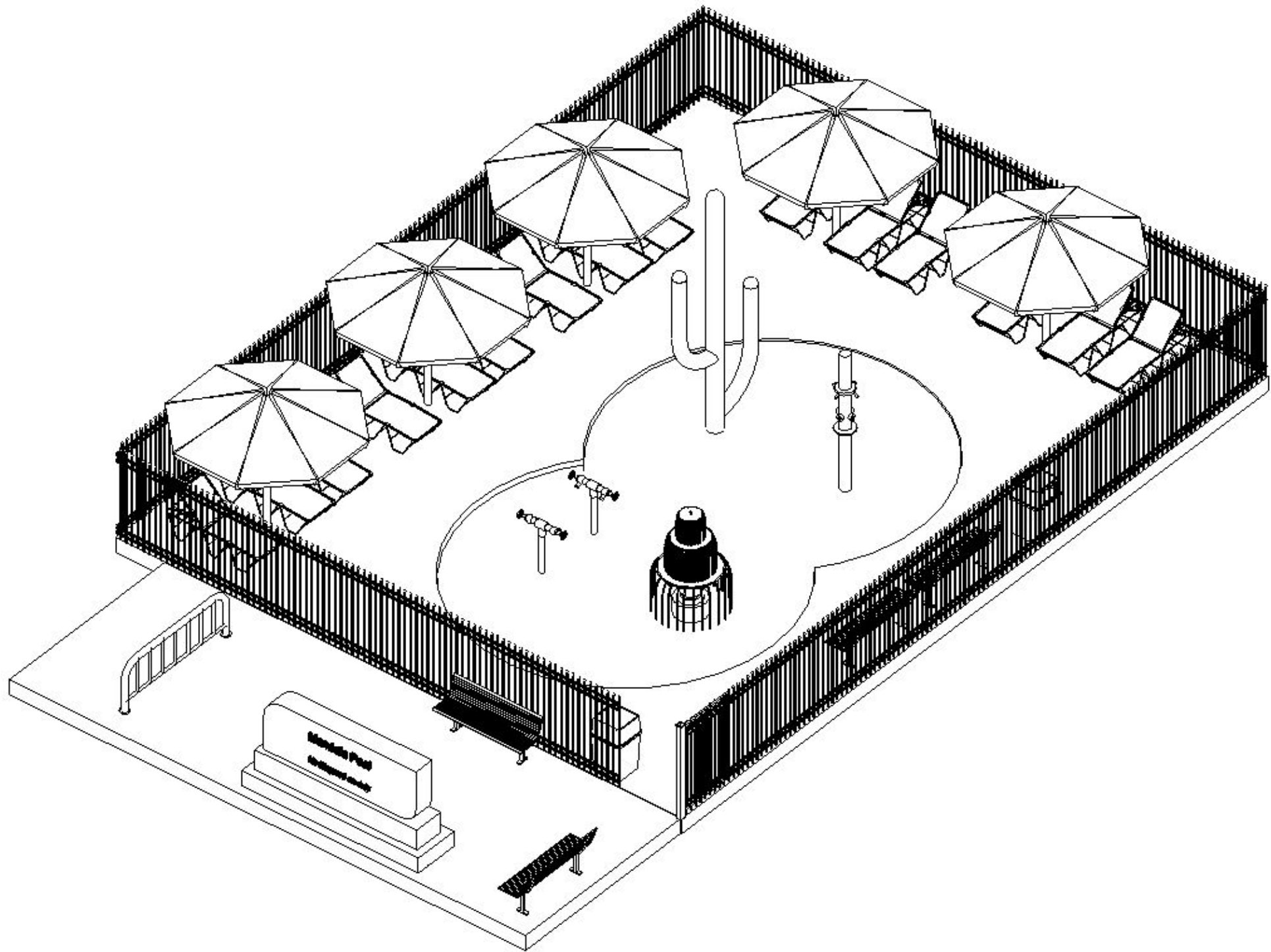
The pool will be composed of two intersecting circles. The splash pad area will be 585 square feet. The area will slope toward two drains. There will be five water features that use 50 - 145 gallons per minute in total.

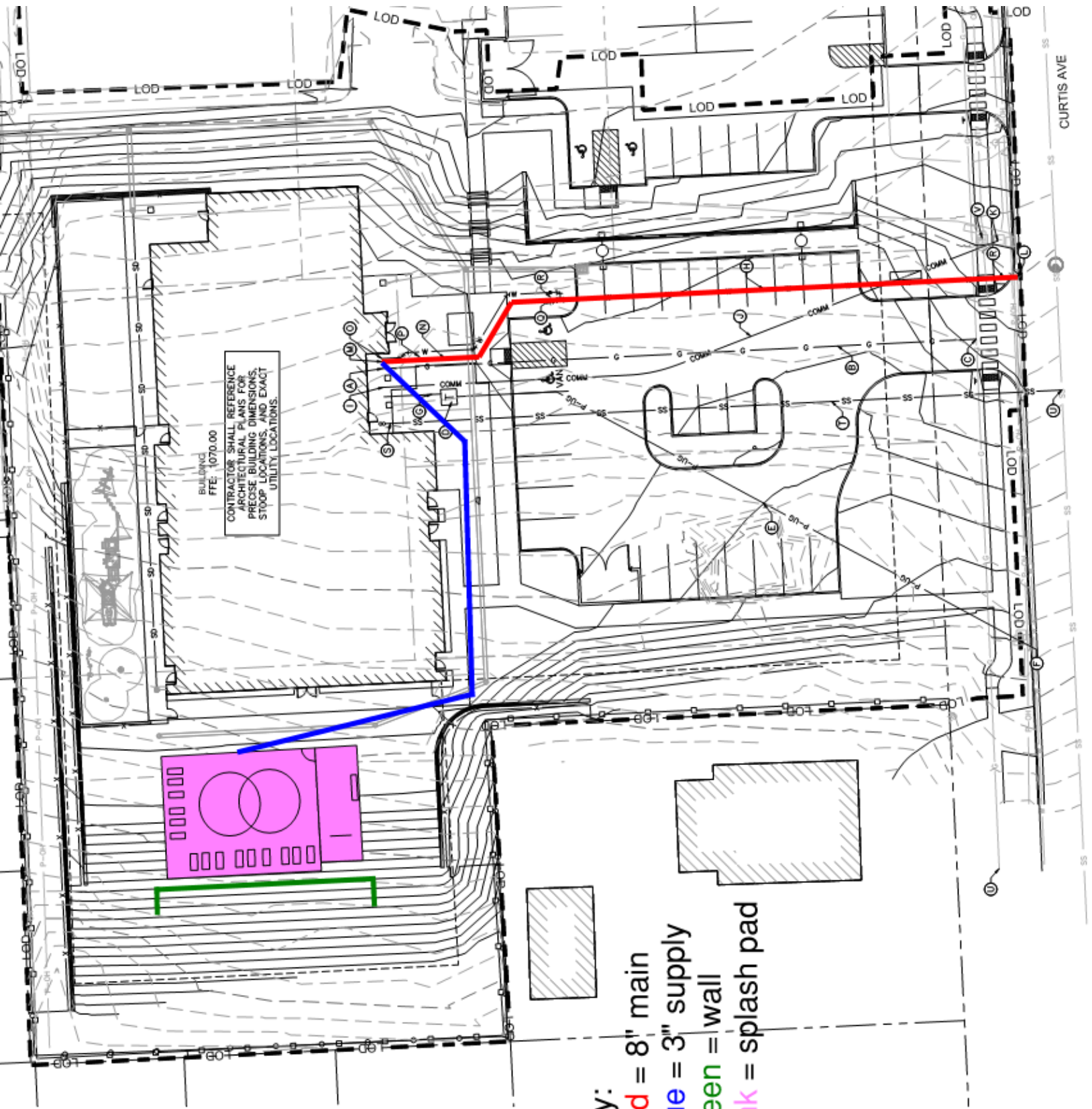
The following applicable regulations can be found in the Nebraska Department of Health Public Swimming Pool design and Construction Standards, article 178 NAC 4⁵:

The Mandela Splash Pad will be Class E: "Spray Park" classification:

1. It must have an impervious and durable surface material.
 - a. concrete
2. The pool deck surrounding the splash pad needs to slope away from the recirculation drains.
3. The drainage system must be able to intake 125% of the recirculation capacity. There must be at least two inlets
 - a. 182 gallons per minute
4. 15 square feet must be provided for each patron.
 - a. With 585 square feet of surface area, the capacity is 39
5. Spray features must not present a safety hazard from corrosion, tripping, or climbing.

- 1) <https://parks.cityofomaha.org/pools/pool-rates-and-passes>
- 2) Personal correspondence with Emma at Parks and Recreation aquatics office, 1/18/2019 and 1/23/2019, (402) 444-5918
- 3) <https://www.homeadvisor.com/cost/swimming-pools-hot-tubs-and-saunas/maintain-a-swimming-pool/#inground>
- 4) 700 day passes sold. This is based on projected pool traffic and swimming season. (25 daily visitors) x (37% day pass users) x (75 good-weather days per season) = 700 passes
- 5) http://www.sos.ne.gov/rules-and-regs/regsearch/Rules/Health_and_Human_Services_System/Title-178/Chapter-04.pdf





BUILDING
FTE: 1070.00
CONTRACTOR SHALL REFERENCE ARCHITECTURAL PLANS FOR PRECISE BUILDING DIMENSIONS, STOOP LOCATIONS, AND EXACT UTILITY LOCATIONS.

- Key:
- Red = 8" main
 - Blue = 3" supply
 - Green = wall
 - Pink = splash pad

CURTIS AVE

Description of Work Performed

All work performed will be done during the construction of Mandela ECDC. I am assuming all crews will perform their work on this splash pad along with their other responsibilities. This reduces mobilization and equipment costs. The west side of the building must be rough graded and the retaining wall installed before Splash Pad construction begins.

Procurement

Splash pad play features and fence will be procured at the beginning of the project. This will take ten days because the features are standard and ordered from splashpdkits.com. The architect will

1. Approve aesthetic appeal of the features and fence according to owner's opinion
2. Confirm that water demand is accounted for
3. Assert that the fence structural design is adequate for its intended purpose

Plumbing site work

The splash pad will use 50-145 gallons per minute. The city water will feed a 200 gallon water tank that filters and recirculates the water. If 80% of the water is recycled, then we will draw 10-30 gallons per minute from the city. The water supply for the Mandela property comes through a 6" pipe from the city. This pipe travels 211' from the water main connection on Curtis avenue to the domestic water service entry location on the south side of the building. If we install an 8" pipe instead, we will add 400 GPM of capacity- more than enough to use on site. An additional water line will branch off from the entry location 136' to the splash pad. This pipe will be 3", which can carry 300-400 GPM. This installation will run around the south and west side of the building. See the site snapshot for the proposed site plan.

The mini excavator will dig the water supply trench and surge tank cavity. Lay water main and supply pipes. Install backflow preventer where the 3" supply line splits from the 8" main line. Then tie in surge tank and pump to the water supply. A crew of three plumbers will complete this task in 12.5 hours.

Foundations

First, crew will excavate piers for fence foundations and a pad for the sign footing. This requires a skid steer with an auger attachment. The fence post piers and sign footing will be 9 cy. We will pour with a skid steer and concrete bucket attachment. For reinforcing bars, there will be three #6 hoops secured to two #6 dowels for the piers. The pad will have two #6 bar running the long way. The rebar will be tied on-site and installed by the concrete crew doing the

foundations. There will be inbeds wet-set for the fence posts and all-thread anchor bolts for the sign. A team of four will complete this task in 5.5 hours.

Formwork

The splash pad deck will be 6" deep. We will use 2x6 to form the edges of the splash pad and pool deck. We will use the skid steer for fine grading. The splash pad will slope toward drains on the north end, and the pool deck will slope away from the splash pad. The flatwork crew of five will fine grade and form in 4 hours.

Plumbing rough-in

Install plumbing stub-ups and water distribution to the different water features. We will use 4" lines from the surge tank. The 4" line will split into 1.5" lines and lead to each water feature. The two drains will feed 4" lines that lead back to the surge tank filter system. We will use the skid steer to move the plumbing supplies. A crew of three plumbers will complete this task in 7 hours.

Flatwork

The flatwork requires 28 cy. There will be expansion joints tied around the inbeds and drains. For the pour, we will use a pump truck and a walk-behind finisher. A crew of five will do this in 5.2 hours.

Electrical

Rough-in for the pump and control panel will be tied into existing electrical of the building. An electrician will complete this task in four hours.

Accessories/tie-in

The splash pad accessories will be installed after the concrete is poured. Chairs, umbrellas, trash cans, bike rack, and sign will be installed as they arrive and by the delivery crews of their respective suppliers. We will devote a laborer to be available to facilitate deliveries and help with installation.

The splash pad spray features will be installed by a general contractor crew of three. This includes receiving, installation, tie-in plumbing and drain covers, and testing. This will take 5 hours to complete.

Fence

The fence will come in 8' sections and will be lifted into places with a skid steer. They will be bolted into the pier inbeds. We are responsible for receiving and staging. This will take a crew of three 5.5 hours to complete.

Equipment

Backhoe excavator, skid steer with bucket, forks, auger, and concrete bucket attachments, pump truck, and a total station. Most equipment will already be on-site.

Man hours

Site work:	37.5
Foundations:	22
Formwork:	20
Plumbing:	21
Flatwork:	26
Electrical:	4
Accessories/tie-in:	15
Fence:	16.5

Schedule

Activity				Predecessors	
ID	Start	Duration		ECDC	Splash
#	Name	date			Pad
1	Procurement	1-May	10	11	
2	Site work	21-Jun	2	33	
3	Foundations	29-Jul	1		2
4	Formwork	30-Jul	1		3
5	Plumbing	31-Jul	1		4
6	Flatwork	1-Aug	1	48	4, 5
7	Electrical	16-Sep	1	68	6
8	Accessories	16-Oct	1		7
9	Fence	2-Dec	1	104	8

- 1) <https://www.hy-techroofdrains.com/water-flow-through-a-pipe/>

Quantity Survey Sheet

Project: Nelson Mandela Pool
 Description: Concrete
 Date: 1/29/2019

Location: Omaha Nebraska
 Estimated By: XYZ Construction
 Sheet No. 1 of 3

DESCRIPTION	No. PCS.	DIMENSIONS			CONCRETE CF	CONCRETE CY	TOTAL CY	REBAR LF
		L'	W'	D'				
FOUNDATIONS								
fence piers	20	1.76625		4.33	152.96	5.67		
piers rebar	100	3					300.00	
sign footing		12.00	3	2.00	72.00	2.67		
footing rebar	1	23.00					23.00	
						8.33		
5% Waste						0.42	9	323.00
SLAB ON GRADE								
pool deck		1,275.00		0.33	420.75	15.58		
splash pad		585.00		0.50	292.50	10.83		
entrance		13.00	35.00	0.33	150.15	5.56		
						31.98		
5% Waste						1.60	34	

Quantity Survey Sheet

Project: Nelson Mandaela Pool
 Description: Finishes
 Date: 1/29/2019

Location: Omaha Nebraska
 Estimated By: XYZ Construction
 Sheet No. 2 of 3

DESCRIPTION	No. PCS.	DIMENSIONS			TOTAL LF
		L'	H'	W'	
<u>POOL ACCESSORIES</u>					
pool chairs	15				174.00
umbrellas	5				
sign	1				
benches	4				
bike rack	1				
fence					
trash cans	2				
pool cactus	1				
dump bucket	1				
spray mushroom	1				
pool fire hydrant	1				
<u>SPLASH PAD PLUMBING</u>					
drains	4				70.00
surge tank	1				
pump	1				
PVC					
8" water main	1	211.00			
3" water supply	1	190.00			211.00
					190.00

Quantity Survey Sheet

Project: Nelson Mandela Pool
 Description: Site Modifications
 Date: 1/29/2019

Location: Omaha Nebraska
 Estimated By: XYZ Construction
 Sheet No. 3 of 3

DESCRIPTION	No. PCS.	DIMENSIONS			TOTAL CY
		L'	W'	H'	
<u>EXCAVATION</u>					
fence piers	20		1.76	4.33	5.65
sign footing	1	12.00	3	2.00	2.67
surge tank	1	3.00	3	4.00	1.33
water supply line		190.00	1	4.00	28.00
total					37.65

Labor

Flatwork		CREW COMPOSITIONS	C6
33513300125			
Quantity	Craft	Hourly rate	
1	Foreman	\$43.05	
4	Laborer	\$41.05	
1	Walk-behind	\$10	
5 Crew		\$217.25	
8 CH / 2000 SF	x 2315 SF	--> 9.2 CH	\$1,998.70

Foundations		CREW COMPOSITIONS	C10
33003702600			
Quantity	Craft	Hourly rate	
1	Foreman	\$43.05	
2	Laborer	\$41.05	
1	Equipment operator	\$51.65	
1	Vibrator	\$3	
4 Crew		\$179.80	
8 CH / 1000 LF rebar	x 323 LF	--> 2.58 CH	\$985.30
8 CH / 26 CY	x 9 CY	--> 2.9 CH	

Install accessorie:		CREW COMPOSITIONS	B14
131113500100			
Quantity	Craft	Hourly rate	
1	Foreman	\$43.05	
2	Interns	\$18.00	
3 Crew		\$79.05	
1 CH / 1 accessoi	x 5 accessories	--> 5 CH	\$395.25

Plumbing		CREW COMPOSITIONS	Q16
225119500010			
Quantity	Craft	Hourly rate	
3	Plumbers	\$56.15	
Crew		\$168.45	
1 CH / 30 Pool SF	x 585 SF	--> 19.5 CH	\$3,284.78

Fence		CREW COMPOSITIONS	B62
323119105600			
Quantity	Craft	Hourly rate	
2	Laborer	\$41.05	
1	Equipment Operator	\$51.65	
3 Crew		\$133.75	
8 CH / 250 LF	x 174 LF	-->5.5 CH	\$735.63

Electrician		CREW COMPOSITIONS	R1A
260519209040			
Quantity	Craft	Hourly rate	
1	Electrician	\$60.05	
1 Crew		\$60.05	
10 LF / 1 CH	x 4 CH	\$240.20	

Labor total: **\$7,639.86**

Material

Foundation

concrete rebar
 \$130 x 9 CY = \$1,170 \$0.75 x 323 ft = \$242

Flatwork

\$130 x 34 CY = \$4,420

Accessories

mini cactus \$2,250
 double dump bucke \$2,725
 mushroom \$2,420
 2 fire hydrants \$2,200
 15 chairs \$2,050
 5 umbrellas \$400
 4 benches \$900
 2 trash cans \$250
 bike rack \$400
 Mandela sign \$1,100

GPM

10-40
 20-50
 10-15
 10-40
 50-145

Plumbing

Splash pad kit* \$3,700
 Backflow preventer \$500

PVC

4", 40' x 6.97 \$278.80
 1.5", 50' x 1.82 \$91.00
 splitters, glue \$50

\$419.80

Water main

8", 230' x 11.78 \$2,709.40
 3", 200' x 6.82 \$1,364.00

Electrical

wire
 \$1 x 40' \$40

Material total: \$29,260

Total: \$36,900

* Splash pad info found at <https://diysplashpadkits.com/product-category/splash-pad-water-play-features/>
 All crew compositions and productivity rates found at <https://www.rsmeansonline.com/>

Line	Task ID	Name	Duration	Start	Predecessors	Finish
2	0100	≡ Mandela Predecessors	150d	5/1/2019		12/3/2019
3	0101	Notice to proceed		5/1/2019		5/1/2019
4	0102	Plumbing underground	5d	6/14/2019		6/20/2019
5	0103	Slab on grade pour	2d	7/30/2019		7/31/2019
6	0104	Rough-in electrical	15d	9/16/2019		10/4/2019
7	0105	Fencing	2d	12/2/2019		12/3/2019
8	0200	≡ Splash Pad Construction	149d	5/1/2019		12/2/2019
9	0210	≡ Procurement	10d	5/1/2019		5/14/2019
10	0211	Splash pad features	10d	5/1/2019	Notice to proceed	5/14/2019
11	0220	≡ Plumbing	28d	6/21/2019		7/31/2019
12	0221	Install water supply and surge tank	2d	6/21/2019	Plumbing underground	6/24/2019
13	0222	Install water distribution and stub-ups	1d	7/31/2019	Fine grade and form splash pad and pool deck	7/31/2019
14	0230	≡ Concrete	4d	7/29/2019		8/1/2019
15	0231	Dig and pour foundations	1d	7/29/2019	Install water supply and surge tank	7/29/2019
16	0232	Fine grade and form splash pad and pool deck	1d	7/30/2019	Dig and pour foundations	7/30/2019
17	0233	Pour and finish flatwork	1d	8/1/2019	Slab on grade pour, Fine grade and form splash pad and pool deck, Install water distribution and stub-ups	8/1/2019
18	0240	≡ Electrical	1d	9/16/2019		9/16/2019
19	0241	Tie in control panel and pump to building	1d	9/16/2019	Pour and finish flatwork, Rough-in electrical	9/16/2019
20	0250	≡ Accessories	1d	10/16/2019		10/16/2019
21	0251	Install splash pad features	1d	10/16/2019	Tie in control panel and pump to building	10/16/2019
22	0252	Install deck features	1d	10/16/2019		10/16/2019
23	0260	≡ Fence	1d	12/2/2019		12/2/2019
24	0261	Install fence	1d	12/2/2019	Fencing	12/2/2019
25	0300	≡ Post-Construction		10/17/2019		10/17/2019
26	0301	3 year warranty begins		10/17/2019	Install splash pad features	10/17/2019