



# *Golf Course Irrigation Audit*

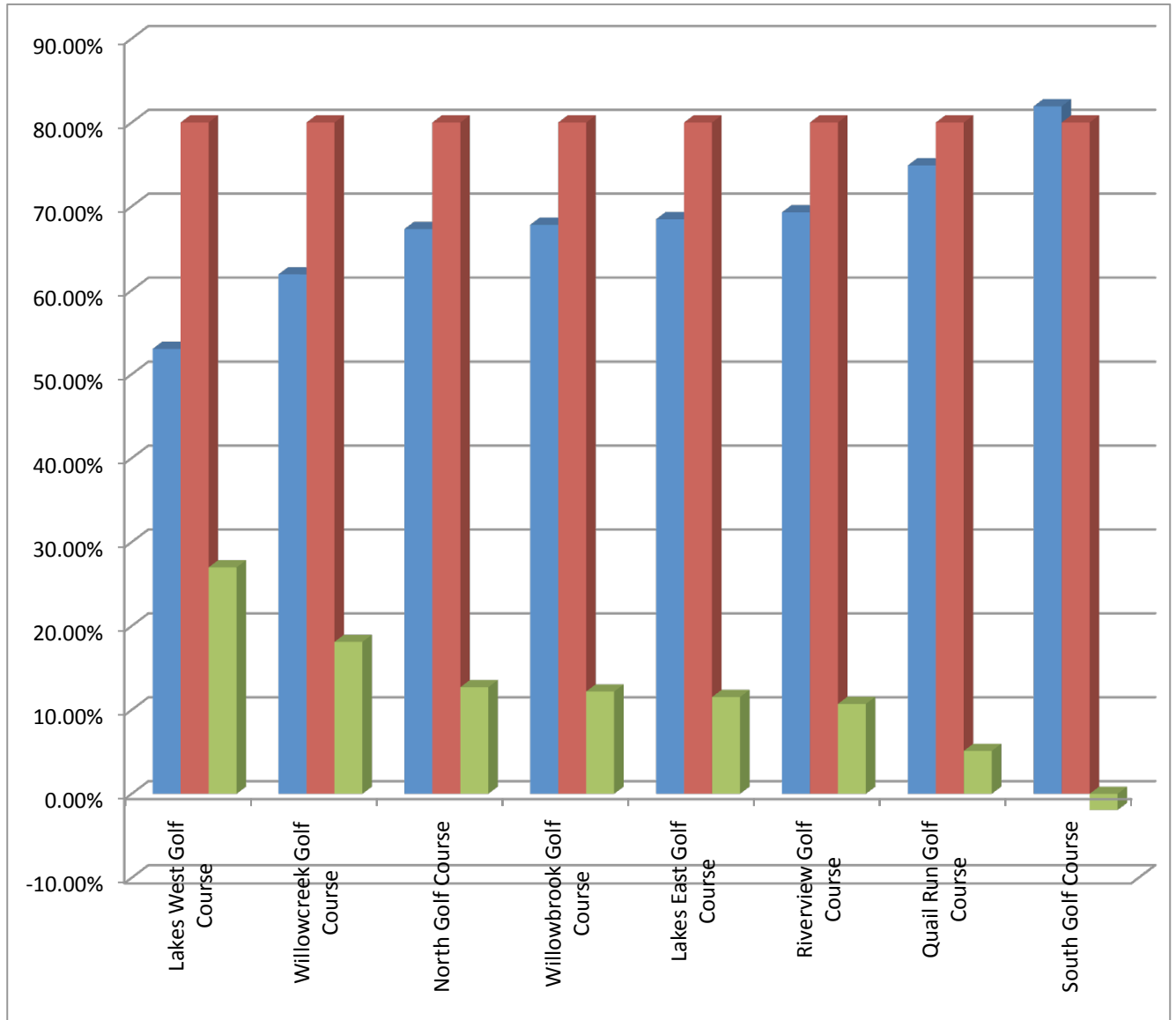


# Golf Course Irrigation Audit



<u>Golf Course</u>	<u>Distribution Uniformity</u>	<u>Water Savings</u>	<u>Savings Per Year</u>	<u>Page</u>
Lakes West Golf Course	53.02%	167.97 A/F	\$9,030.07	4
Willowcreek Golf Course	61.90%	108.7 A/F	\$5,843.71	5
North Golf Course	67.30%	85.84 A/F	\$4,614.76	6
Riverview Golf Course	69.29%	75.06 A/F	\$4,035.23	7
Willowbrook Golf Course	67.81%	55.8 A/F	\$2,999.81	8
Lakes East Golf Course	68.47%	26.37 A/F	\$1,417.65	9
Quail Run Golf Course	74.89%	13.16 A/F	\$707.48	10
South Golf Course	81.93%	0 A/F	\$0.00	11
Totals	68.08%	532.9 A/F	\$28,648.71	

# Golf Course Irrigation Audit



- **Actual Distribution Uniformity**
- **Goal of 80% Distribution Uniformity**
- **Irrigation Inefficiency**



## Lakes West Golf Course Summary

Number of catch cans	90
Number of Catch cans lower Qtr	23
Total ml	2893
Total mL lower Qtr	392
Average mL in Lower Qtr	17.04348
Average ml Over all	32.14444
<b>Distribution Uniformity</b>	<b>53.02%</b>

Recommended Water Use	622.59
Water Use with Deficiencies	790.56
Difference	167.97
Cost per Acre Foot	\$53.76
<b>Total Savings Per Year</b>	<b>\$9,030.07</b>
<b>Total Water Savings Per Year in A/F</b>	<b>167.97</b>

- **Distribution Uniformity 53.02%**
- **Irrigation Inefficiency (26.98%)**
- **Total Cost Savings Per Year \$9,030.07**
- **Total Water Savings 167.97 Acre Feet Per Year**



## Willowcreek Golf Course Summary

Number of catch cans	84
Number of Catch cans lower Qtr	21
Total ml	2365
Total mL lower Qtr	366
Average mL in Lower Qtr	17.42857
Average ml Over all	28.15476
<b>Distribution Uniformity</b>	<b>61.90%</b>

Recommended Water Use	600.6
Water Use with Deficiencies	709.3
Difference	108.7
Cost per Acre Foot	\$53.76
<b>Total Savings Per Year</b>	<b>\$5,843.71</b>
<b>Total Water Savings Per Year in A/F</b>	<b>108.7</b>

- **Distribution Uniformity 61.90%**
- **Irrigation Inefficiency (18.10%)**
- **Total Cost Savings Per Year \$5,843.71**
- **Total Water Savings 108.7 Acre Feet Per Year**

## North Golf Course Summary

# Golf Course Irrigation Audit



Number of catch cans	86
Number of Catch cans lower Qtr	21
Total ml	2081
Total mL lower Qtr	342
Average mL in Lower Qtr	16.28571
Average ml Over all	24.19767
<b>Distribution Uniformity</b>	<b>67.30%</b>

Recommended Water Use	675.98
Water Use with Deficiencies	761.82
Difference	85.84
Cost per Acre Foot	\$53.76
<b>Total Power Savings Per Year</b>	<b>\$4,614.76</b>
<b>Total Water Savings Per Year in A/F</b>	<b>85.84</b>

- **Distribution Uniformity 67.30%**
- **Irrigation Inefficiency (12.7%)**
- **Total Cost Savings Per Year \$4,614.76**
- **Total Water Savings 85.84 Acre Feet Per Year**

**Riverview Golf Course**

# Golf Course Irrigation Audit



Number of catch cans	77
Number of Catch cans lower Qtr	20
Total ml	2745
Total mL lower Qtr	494
Average mL in Lower Qtr	24.7
Average ml Over all	35.64935
<b>Distribution Uniformity</b>	<b>69.29%</b>

Recommended Water Use	700.92
Water Use with Deficiencies	775.98
Difference	75.06
Cost per Acre Foot	\$53.76
<b>Total Savings Per Year</b>	<b>\$4,035.23</b>
<b>Total Water Savings Per Year in A/F</b>	<b>75.06</b>

- **Distribution Uniformity 69.29%**
- **Irrigation Inefficiency (10.71%)**
- **Total Cost Savings Per Year \$4,035.23**
- **Total Water Savings 75.06 Acre Feet Per Year**

## Willowbrook Golf Course Summary

Number of catch cans	90
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# Golf Course Irrigation Audit



Number of Catch cans lower Qtr	22
Total ml	2902
Total mL lower Qtr	481
Average mL in Lower Qtr	21.86364
Average ml Over all	32.24444
<b>Distribution Uniformity</b>	<b>67.81%</b>

Recommended Water Use	457.8
Water Use with Deficiencies	513.6
Difference	55.8
Cost per Acre Foot	\$53.76
<b>Total Savings Per Year</b>	<b>\$2,999.81</b>
<b>Total Water Savings Per Year in A/F</b>	<b>55.8</b>

- **Distribution Uniformity 67.81%**
- **Irrigation Inefficiency (12.19%)**
- **Total Cost Savings Per Year \$2,999.81**
- **Total Water Savings 55.8 Acre Feet Per Year**

## Lakes East Golf Course Summary

Number of catch cans	97
Number of Catch cans lower Qtr	24



# Golf Course Irrigation Audit



Total ml	4067
Total mL lower Qtr	689
Average mL in Lower Qtr	28.70833
Average ml Over all	41.92784
<b>Distribution Uniformity</b>	<b>68.47%</b>

Recommended Water Use	228.79
Water Use with Deficiencies	255.16
Difference	26.37
Cost per Acre Foot	\$53.76
<b>Total Savings Per Year</b>	<b>\$1,417.65</b>
<b>Total Water Savings Per Year in A/F</b>	<b>26.37</b>

- **Distribution Uniformity 68.47%**
- **Irrigation Inefficiency (11.53%)**
- **Total Cost Savings Per Year \$1,417.65**
- **Total Water Savings 26.37 Acre Feet Per Year**

## Quail Run Golf Course Summary

Number of catch cans	90
Number of Catch cans lower Qtr	22
Total ml	3474

# Golf Course Irrigation Audit



Total mL lower Qtr	636
Average mL in Lower Qtr	28.90909
Average ml Over all	38.6
<b>Distribution Uniformity</b>	<b>74.89%</b>

Recommended Water Use	257.7
Water Use with Deficiencies	270.86
Difference	13.16
Cost per Acre Foot	\$53.76
<b>Total Savings Per Year</b>	<b>\$707.48</b>
<b>Total Water Savings Per Year in A/F</b>	<b>13.16</b>

- **Distribution Uniformity 74.89%**
- **Irrigation Inefficiencies (5.11%)**
- **Total Cost Savings Per Year \$707.48**
- **Total Water Savings 13.16 Acre Feet Per Year**

## South Golf Course Summary

Number of catch cans	80
Number of Catch cans lower Qtr	20
Total ml	2773

# Golf Course Irrigation Audit



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Total mL lower Qtr	568
Average mL in Lower Qtr	28.4
Average ml Over all	34.6625
<b>Distribution Uniformity</b>	<b>81.93%</b>

Recommended Water Use	905.66
Water Use with Deficiencies	888.19
Difference	-17.47
Cost per Acre Foot	\$53.76
<b>Total Savings Per Year</b>	<b>\$0.00</b>
<b>Total Water Savings Per Year in A/F</b>	<b>0</b>

- **Distribution Uniformity 81.93%**
- **Irrigation Inefficiency 1.93%**
- **Total Cost Savings Per Year 0**
- **Total Water Savings 0 Acre Feet Per Year**



# Collection Data

**Lakes West Golf Course Hole #1**

# Golf Course Irrigation Audit



<b>x</b>								
<b>58</b>								
	<b>19</b>							
<b>21</b>				<b>21</b>				
	<b>28</b>				<b>17</b>		<b>x</b>	
<b>20</b>				<b>17</b>				<b>43</b>
	<b>19</b>				<b>22</b>			
<b>27</b>				<b>22</b>				<b>51</b>
<b>x</b>	<b>46</b>				<b>15</b>			
<b>44</b>				<b>25</b>				<b>47</b>
	<b>51</b>				<b>18</b>			
<b>49</b>				<b>33</b>				<b>44</b>
	<b>42</b>				<b>23</b>		<b>x</b>	
<b>51</b>				<b>48</b>				<b>44</b>
	<b>58</b>				<b>51</b>			
<b>17</b>				<b>43</b>				<b>48</b>
	<b>19</b>				<b>29</b>			
<b>50</b>				<b>51</b>				<b>19</b>
<b>x</b>	<b>26</b>				<b>20</b>			
				<b>23</b>				<b>24</b>
					<b>17</b>			
							<b>20</b>	
							<b>x</b>	

15	18	20	22	25	33	44	48	51
17	19	20	22	26	42	44	49	51
17	19	20	23	27	43	46	50	51
17	19	21	23	28	43	47	51	58
17	19	21	24	29	44	48	51	58

**Lakes West Golf Course Hole #16**

# Golf Course Irrigation Audit



<b>x</b>								
<b>18</b>								
	<b>15</b>							
<b>23</b>		<b>18</b>						
	<b>19</b>		<b>56</b>		<b>x</b>			
<b>28</b>		<b>20</b>					<b>48</b>	
	<b>18</b>		<b>42</b>					
<b>48</b>		<b>15</b>					<b>41</b>	
<b>x</b>	<b>28</b>		<b>15</b>					
<b>46</b>		<b>31</b>					<b>46</b>	
	<b>15</b>		<b>15</b>					
<b>48</b>		<b>46</b>					<b>46</b>	
	<b>50</b>		<b>17</b>				<b>x</b>	
<b>51</b>		<b>45</b>					<b>18</b>	
	<b>58</b>		<b>21</b>					
<b>23</b>		<b>50</b>					<b>21</b>	
	<b>41</b>		<b>18</b>					
<b>15</b>		<b>20</b>					<b>19</b>	
<b>x</b>	<b>60</b>		<b>19</b>					
		<b>21</b>					<b>18</b>	
			<b>62</b>					
							<b>21</b>	
							<b>x</b>	

15	15	18	19	21	28	45	48	51
15	17	18	20	21	31	46	48	56
15	18	18	20	23	41	46	48	58
15	18	19	21	23	41	46	50	60
15	18	19	21	28	42	46	50	62

## Willowcreek Golf Course Hole #2

# Golf Course Irrigation Audit



<b>x</b>							
<b>14</b>							
	<b>15</b>						
<b>20</b>			<b>15</b>				
	<b>35</b>				<b>40</b>		<b>x</b>
<b>32</b>			<b>40</b>				<b>35</b>
	<b>48</b>				<b>35</b>		
<b>30</b>			<b>40</b>				<b>30</b>
<b>x</b>	<b>30</b>				<b>21</b>		
<b>24</b>			<b>30</b>				<b>38</b>
	<b>20</b>				<b>20</b>		
<b>25</b>			<b>32</b>				<b>21</b>
	<b>32</b>				<b>42</b>		<b>x</b>
<b>28</b>			<b>35</b>				<b>28</b>
	<b>30</b>				<b>50</b>		
<b>45</b>			<b>38</b>				<b>15</b>
<b>x</b>	<b>30</b>				<b>48</b>		
			<b>42</b>				<b>21</b>
					<b>40</b>		<b>x</b>

14	25	48	30	32	35	48	21
20	28	30	15	35	21	40	28
32	45	20	40	38	20	35	15
30	15	32	40	42	42	30	21
24	35	30	30	40	50	38	

## Willowcreek Golf Course Hole #10

# Golf Course Irrigation Audit



X								
15								
		19						
30			13					
		15			20		X	
20			17				19	
		31			15			
41			29				30	
X		34			20			
25			25				27	
		20			30			
35			35				27	
		25			25		X	
17			32				35	
		20			25			
25			30				41	
		29			21			
17			21				25	
X		25			35			
			21				39	
					21			
							30	
							X	

15	35	15	20	29	21	30	21	35
30	17	31	29	25	21	25	19	41
20	25	34	25	35	20	25	30	25
41	17	20	13	32	15	21	27	39
25	19	25	17	30	20	35	27	30

## North Golf Course Hole #8



# Golf Course Irrigation Audit



X						
15						
	13					
22		15			X	25
	25		30			
25		18				22
	30		25			
30		28				20
X	32		22			
15		30				16
	25		25			
25		30				14
	35		20			X
20		22				20
	21		25			
15		25				20
X	15		29			
		30				25
			22			
						20
						X

13	15	20	22	25	25	30
14	16	20	22	25	28	30
15	18	20	22	25	29	30
15	20	21	25	25	30	32
15	20	22	25	25	30	35
15	20	22	25	25	30	

**North Golf Course Hole#14**

# Golf Course Irrigation Audit



X								
28								
	28							
20		30						
	45		20	X				
15		35					15	
	16		25					
38		19					17	
X	20		18					
31		18					25	
	30		18					
41		30					20	
	35		28	X				
28		29					20	
	15		30					
25		30					30	
	20		30					
15		25					28	
X	20		30					
		20					31	
			20					
							29	
							X	

15	17	20	20	25	28	30	30	35
15	18	20	20	25	28	30	30	35
15	18	20	20	25	28	30	30	38
15	18	20	20	28	29	30	31	41
16	19	20	25	28	29	30	31	45

## Riverview Golf Course Hole #12

# Golf Course Irrigation Audit



X 40							
	39						
35			30				
	31				30	X	
20			20			21	
	20				25		
			20			30	
	30				30		20
			39				
			25		20		25
					35		
			25				42
			30		39		X
							40
			22		30		30
					30		
			30				29
					32		
	X		30				39
					40		
							22
							X

20	20	25	30	30	31	39	40
20	21	25	30	30	32	39	42
20	22	25	30	30	35	39	
20	22	29	30	30	35	40	
20	25	30	30	30	39	40	

## Riverview Golf Course Hole #18

# Golf Course Irrigation Audit



x								
60								
	40							
50			32					
	45				39		x	
32			30					35
	40				35			
45			40					40
x	40				40			
49			48					20
	42				55			
58			38					40
	45				45		x	
30			30					35
	45				32			
40			40					35
	39				30			
40			45					30
x	40				45			
			30					39
					40			
							42	
							x	

20	30	35	39	40	40	42	45	49
30	30	35	39	40	40	42	45	50
30	32	35	39	40	40	45	45	55
30	32	35	40	40	40	45	45	58
30	32	38	40	40	40	45	48	60

## Willowbrook Golf Course Hole #5

# Golf Course Irrigation Audit



x								
40								
	50							
36		40						
	42		52				x	
32		46						56
	38		40					
24		40						30
x	36		42					
52		40						34
	50		50					
38		40						24
	38		44					x
26		32						45
	32		32					
30		30						28
	36		36					
36		36						20
x	50		34					
		40						36
			52					
								20
								x

20	28	32	36	36	40	40	45	50
20	30	32	36	36	40	40	46	52
24	30	32	36	38	40	42	50	52
24	30	34	36	38	40	42	50	52
26	32	34	36	38	40	44	50	56

## Willowbrook Golf Course Hole #18

# Golf Course Irrigation Audit



X								
15								
		28						
25			30					
		29		32		X		
28			25				20	
		35		35				
28			30				30	
X		22		28				
21			30				25	
		29		25				
18			32				30	
		25		29		X		
15			20				30	
		28		32				
21			30				29	
		31		28				
16			25				25	
X		30		25				
			28				25	
				30				
							25	
							X	

15	20	25	25	28	28	30	30	32
15	21	25	25	28	29	30	30	32
16	21	25	25	28	29	30	30	32
18	22	25	25	28	29	30	30	35
20	25	25	28	28	29	30	31	35

## Lakes East Golf Course Hole #1

# Golf Course Irrigation Audit



X								
39								
	35							
50				42				
	38				49		X	
40				45				45
	41				50			
41				42				19
X	40				45			
40				28				58
	40				35			
40				50				50
	41				50			X
39				55				49
	31				69			
35				45				50
	39				52			
20				39				60
X	50				50			
				41				50
					50			
								50
								X

19	35	39	40	41	45	50	50	52
20	35	39	40	42	45	50	50	55
28	38	40	41	42	49	50	50	58
31	39	40	41	45	49	50	50	60
35	39	40	41	45	50	50	50	69

## Lakes East Golf Course Hole #16

# Golf Course Irrigation Audit



<b>X</b>								
<b>25</b>								
	<b>28</b>							
			<b>40</b>					
<b>18</b>					<b>30</b>			
	<b>28</b>							
			<b>35</b>					
<b>20</b>					<b>50</b>			
	<b>28</b>						<b>X</b>	
			<b>40</b>					
<b>22</b>					<b>40</b>			
	<b>30</b>							<b>59</b>
			<b>40</b>					
<b>32</b>					<b>30</b>			
<b>X</b>	<b>30</b>							<b>35</b>
			<b>45</b>					
					<b>35</b>			
<b>51</b>	<b>30</b>							<b>38</b>
			<b>45</b>					
					<b>50</b>			
<b>59</b>	<b>35</b>							<b>55</b>
			<b>45</b>					
					<b>41</b>		<b>X</b>	
<b>50</b>	<b>52</b>							
			<b>40</b>					<b>40</b>
					<b>39</b>			
<b>61</b>	<b>48</b>							
			<b>40</b>					<b>50</b>
					<b>40</b>			
<b>41</b>	<b>40</b>							
<b>X</b>			<b>45</b>					<b>50</b>
					<b>42</b>			
	<b>60</b>							
			<b>50</b>					<b>48</b>
					<b>45</b>			
								<b>30</b>
								<b>X</b>

18	28	30	38	40	41	45	50	59
20	30	32	39	40	42	48	50	59
22	30	35	40	40	45	48	50	60
25	30	35	40	40	45	50	51	61
28	30	35	40	40	45	50	52	
28	30	35	40	41	45	50	55	

**Quail Run Golf Course Hole #2**



# Golf Course Irrigation Audit



x								
30								
		41						
31			40					
		40		35		x		
35			39				40	
		35		48				
31			35				31	
x		35		35				
35			41				30	
		41		39				
35			40				25	
		40		35			x	
41			30				20	
		51		30				
28			40				25	
		40		39				
25			41				35	
x		35		40				
			42				32	
				30				
							20	
							x	

20	28	30	35	35	35	40	40	41
20	30	31	35	35	39	40	40	41
25	30	31	35	35	39	40	41	42
25	30	31	35	35	39	40	41	48
25	30	32	35	35	40	40	41	51

## Quail Run Golf Course Hole #4

# Golf Course Irrigation Audit



x								
60								
		59						
40			38					
		49		40		x		
40			41				30	
		48		40				
45			40				35	
x		49		40				
40			49				25	
		69		41				
40			45				30	
		52		55		x		
25			39				32	
		50		41				
20			40				38	
		50		60				
40			52				30	
x		40		51				
			42				28	
				40				
							30	
							x	

20	30	38	40	40	41	45	50	55
25	30	38	40	40	41	48	50	59
25	30	39	40	40	41	49	51	60
28	32	40	40	40	42	49	52	60
30	35	40	40	40	45	49	52	69

## South Golf Course Hole #3

# Golf Course Irrigation Audit



X							
20							
		35					
30			35				
		35		35		X	
35			49				30
		32		40			
41			35				30
X		40		42			
40			40				25
		49		35			
30			30				30
		50		32		X	
30			40				39
		45		40			
30			42				39
X							
		39		35			
			35				35
				20			
							40
							X

20	30	30	35	35	39	40	42
20	30	32	35	35	40	40	45
25	30	32	35	35	40	40	49
30	30	35	35	39	40	41	49
30	30	35	35	39	40	42	50

## South Golf Course Hole #15

# Golf Course Irrigation Audit



*X*  
 30  
 31  
 39  
 45  
 40  
 40  
 30  
*X*  
 35  
 32  
 32  
 32  
 40  
 35  
 40  
 30  
*X*  
 35  
 40  
 30  
 35  
 30  
 32  
 39  
 40  
 25  
*X*

25	30	30	31	32	35	38	40
29	30	30	32	32	35	39	40
29	30	30	32	32	35	39	40
30	30	30	32	32	35	40	40
30	30	31	32	32	35	40	45