ISO 9001: 2008 Certified

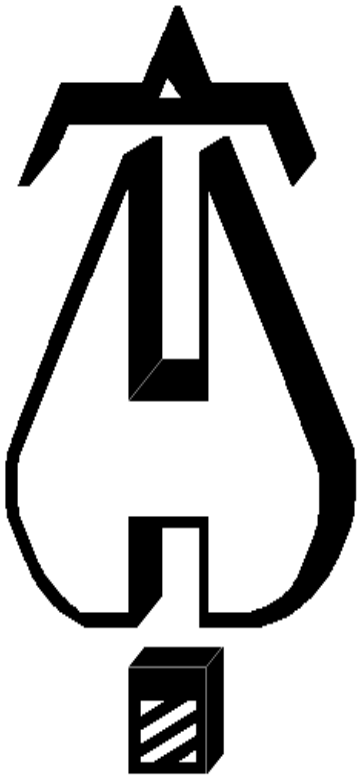
FLSA FIRE & LIFE SAFETY AMERICA PROTECTING AMERICA

1731 Round Rock Drive, Raleigh, NC 27615 ● (919) 872-3250 ● fax (919) 877-5775 ● www.flsamerica.com

OAK HAVEN LOT 38

HYDRAULIC CALCULATIONS

12/20/2021



Hydraulic calculations using HydraCALC

Fire & Life Safety America
1731 Roundrock Drive
Raleigh, NC 27615
P: (919) 872-3250
F: (919) 877-5775

Job Name	:	Oak Haven Lot 38 - RA1
Drawing	:	FP1
Location	:	157 Oak Haven Drive
Remote Area	:	RA1
Contract	:	22NC1551
Data File	:	RA1.WXF

HYDRAULIC CALCULATIONS
for

Project name: Oak Haven Lot 38
Location: 157 Oak Haven Drive
Drawing no: FP1
Date: 12/19/2021

Design

Remote area number: RA1
Remote area location: Master Bedroom
Occupancy classification: Residential
Density: .05 - Gpm/SqFt
Area of application: 257 - SqFt
Coverage per sprinkler: 400 - SqFt
Type of sprinklers calculated: VK494
No. of sprinklers calculated: 1
In-rack demand: N/A - GPM
Hose streams: 3 - GPM
Total water required (including hose streams): 23.03 - GPM @ 28.47 - Psi
Type of system: WET
Volume of dry or preaction system: N/A - Gal

Water supply information

Date: 4/21/2021
Location: NC 42, NC 27540
Source: Fire & Life Safety America

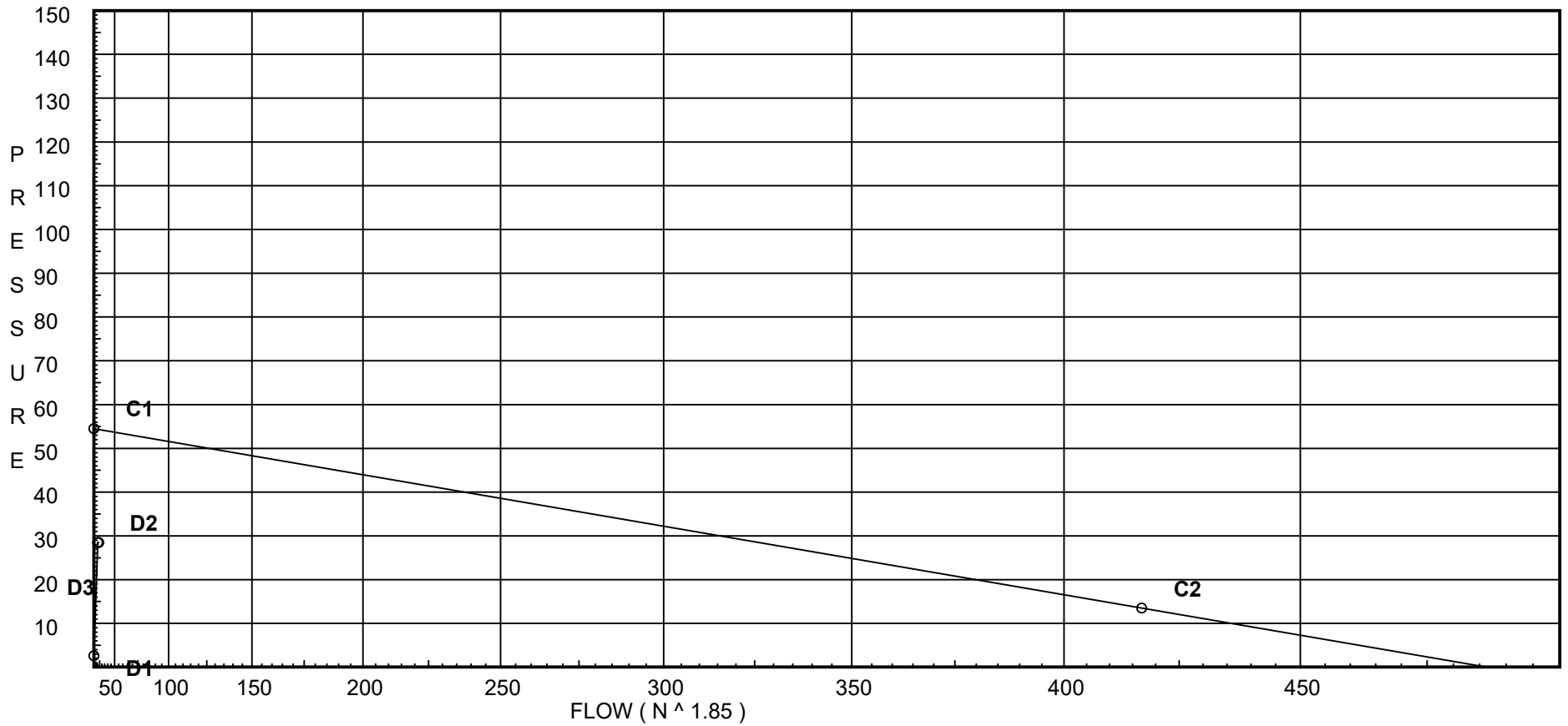
Name of contractor: Fire & Life Safety America
Address: 1731 Roundrock Drive / Raleigh, NC 27615 / P: (919) 872-3250
Phone number: F: (919) 877-57
Name of designer: H. WEYANT
Authority having jurisdiction: Harnett County
Notes: (Include peaking information or gridded systems here.)

Water Supply Curve C

Fire & Life Safety America
Oak Haven Lot 38 - RA1

City Water Supply:
- C1 - Static Pressure : 54.5
- C2 - Residual Pressure: 13.5
- C2 - Residual Flow : 417

Demand:
- D1 - Elevation : 2.599
- D2 - System Flow : 20.024
- D2 - System Pressure : 28.474
- Hose (Demand) : 3
- D3 - System Demand : 23.024
- Safety Margin : 25.833



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

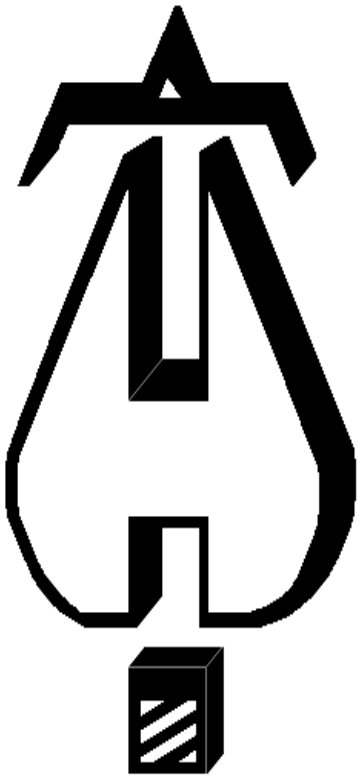
SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	54.5	13.5	417.0	54.307	23.02	28.474

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
S101	9.0	4.9	16.7	20.02	
101	10.0		16.68		
M101	10.0		17.94		
M102	10.0		20.39		
TOR	8.0		22.38		
BOR	3.0		25.57		
UG1	3.0		26.37	3.0	
UG2	-3.0		31.04		
UG3	-3.0		31.05		
TEST	3.0		28.47		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
S101	9	4.90	20.02	1	O	5.0	1.000	150	16.700	
to						0.0	5.000		-0.433	
101	10		20.02	1.101		0.0	6.000	0.0682	0.409	Vel = 6.75
			0.0							
101			20.02						16.676	K Factor = 4.90
101	10		20.02	1	O	5.0	13.583	150	16.676	
to						0.0	5.000		0.0	
M101	10		20.02	1.101		0.0	18.583	0.0682	1.267	Vel = 6.75
			0.0							
M101			20.02						17.943	K Factor = 4.73
M101	10		20.02	1	O	5.0	30.917	150	17.943	
to						0.0	5.000		0.0	
M102	10		20.02	1.101		0.0	35.917	0.0682	2.450	Vel = 6.75
M102	10		0.0	1	O	5.0	11.500	150	20.393	
to						0.0	5.000		0.866	
TOR	8		20.02	1.101		0.0	16.500	0.0682	1.125	Vel = 6.75
			0.0							
TOR			20.02						22.384	K Factor = 4.23
TOR	8		20.02	1	N	7.0	8.000	150	22.384	
to						0.0	7.000		2.166	
BOR	3		20.02	1.101		0.0	15.000	0.0681	1.022	Vel = 6.75
BOR	3		0.0	1	2E	7.65	4.000	150	25.572	
to						0.0	7.650		0.0	
UG1	3		20.02	1.101		0.0	11.650	0.0682	0.795	Vel = 6.75
UG1	3	H3	3.00	1.25	T	9.523	55.000	150	26.367	
to					2E	9.523	19.046		2.599	
UG2	-3		23.02	1.394		0.0	74.046	0.0280	2.071	Vel = 4.84
UG2	-3		0.0	6	2G	9.25	504.083	150	31.037	
to					3E	64.749	95.581		0.0	
UG3	-3		23.02	6.09	2F	21.583	599.664	0	0.013	Vel = 0.25
UG3	-3		0.0	6	T	48.896	1000.000	150	31.050	
to					2E	45.637	99.422		-2.599	
TEST	3		23.02	6.16	G	4.89	1099.422	0	0.023	Vel = 0.25
			0.0							
TEST			23.02						28.474	K Factor = 4.31



Hydraulic calculations using HydraCALC

Fire & Life Safety America
1731 Roundrock Drive
Raleigh, NC 27615
P: (919) 872-3250
F: (919) 877-5775

Job Name	:	Oak Haven Lot 38 - RA2
Drawing	:	FP1
Location	:	157 Oak Haven Drive
Remote Area	:	RA2
Contract	:	22NC1551
Data File	:	RA2.WXF

HYDRAULIC CALCULATIONS
for

Project name: Oak Haven Lot 38
Location: 157 Oak Haven Drive
Drawing no: FP1
Date: 12/19/2021

Design

Remote area number: RA2
Remote area location: Bonus Room
Occupancy classification: Residential
Density: .05 - Gpm/SqFt
Area of application: 275.9 - SqFt
Coverage per sprinkler: 256 - SqFt
Type of sprinklers calculated: VK494
No. of sprinklers calculated: 2
In-rack demand: N/A - GPM
Hose streams: 3 - GPM
Total water required (including hose streams): 29.47 - GPM @ 29.48 - Psi
Type of system: WET
Volume of dry or preaction system: N/A - Gal

Water supply information

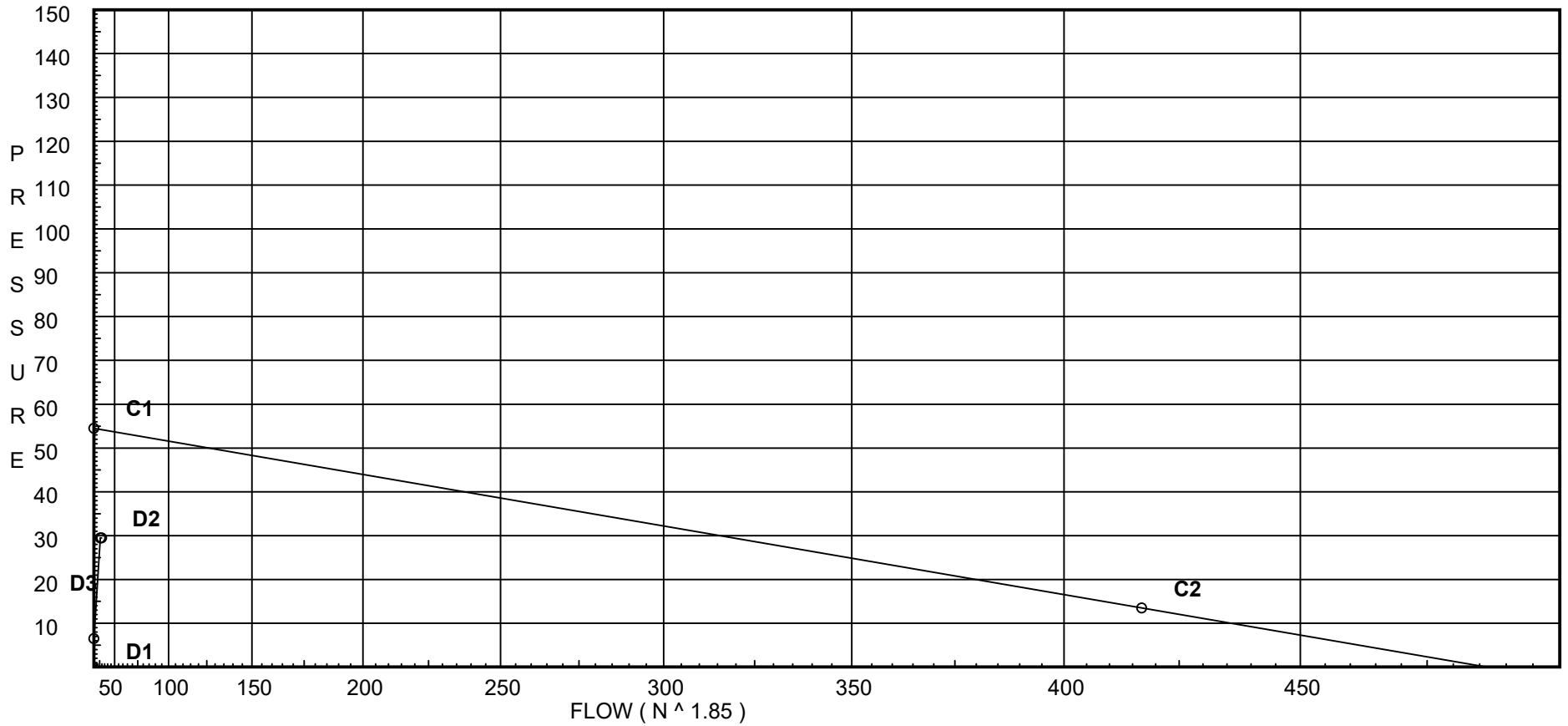
Date: 4/21/2021
Location: NC 42, NC 27540
Source: Fire & Life Safety America

Name of contractor: Fire & Life Safety America
Address: 1731 Roundrock Drive / Raleigh, NC 27615 / P: (919) 872-3250
Phone number: F: (919) 877-57
Name of designer: H. WEYANT
Authority having jurisdiction: Harnett County
Notes: (Include peaking information or gridded systems here.)

Water Supply Curve C

City Water Supply:
- C1 - Static Pressure : 54.5
- C2 - Residual Pressure: 13.5
- C2 - Residual Flow : 417

Demand:
- D1 - Elevation : 6.496
- D2 - System Flow : 26.469
- D2 - System Pressure : 29.478
- Hose (Demand) : 3
- D3 - System Demand : 29.469
- Safety Margin : 24.717



Fittings Used Summary

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Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
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F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	54.5	13.5	417.0	54.195	29.47	29.478

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
S201	18.0	4.9	7.0	12.96	
S202	18.0	4.9	7.6	13.5	
201	19.0		6.81		
202	19.0		7.36		
M102	10.0		14.59		
D102	10.0		16.53		
TOR	8.0		20.94		
BOR	3.0		24.82		
UG1	3.0		26.15	3.0	
UG2	-3.0		32.02		
UG3	-3.0		32.04		
TEST	3.0		29.48		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
S201	18	4.90	12.96	1	N	7.0	1.000	150	7.000	
to						0.0	7.000		-0.433	
201	19		12.96	1.101		0.0	8.000	0.0305	0.244	Vel = 4.37
			0.0							
201			12.96						6.811	K Factor = 4.97
S202	18	4.90	13.50	1	O	5.0	1.000	150	7.596	
to						0.0	5.000		-0.433	
202	19		13.5	1.101		0.0	6.000	0.0328	0.197	Vel = 4.55
			0.0							
202			13.50						7.360	K Factor = 4.98
201	19		12.96	1		0.0	18.000	150	6.811	
to						0.0	0.0		0.0	
202	19		12.96	1.101		0.0	18.000	0.0305	0.549	Vel = 4.37
			0.0							
202			12.96						7.360	K Factor = 4.78
202	19		26.47	1	2N	14.0	15.125	150	7.360	
to						0.0	14.000		3.898	
M102	10		26.47	1.101		0.0	29.125	0.1143	3.328	Vel = 8.92
M102	10		0.0	1	N	7.0	10.000	150	14.586	
to						0.0	7.000		0.0	
D102	10		26.47	1.101		0.0	17.000	0.1143	1.943	Vel = 8.92
D102	10		0.0	1	3O	15.0	9.000	150	16.529	
to					N	7.0	22.000		0.866	
TOR	8		26.47	1.101		0.0	31.000	0.1143	3.542	Vel = 8.92
			0.0							
TOR			26.47						20.937	K Factor = 5.78
TOR	8		26.47	1	N	7.0	8.000	150	20.937	
to						0.0	7.000		2.166	
BOR	3		26.47	1.101		0.0	15.000	0.1143	1.714	Vel = 8.92
BOR	3		0.0	1	2E	7.65	4.000	150	24.817	
to						0.0	7.650		0.0	
UG1	3		26.47	1.101		0.0	11.650	0.1142	1.331	Vel = 8.92
UG1	3	H3	3.00	1.25	T	9.523	55.000	150	26.148	
to					2E	9.523	19.046		2.599	
UG2	-3		29.47	1.394		0.0	74.046	0.0442	3.270	Vel = 6.20
UG2	-3		0.0	6	2G	9.25	504.083	150	32.017	
to					3E	64.749	95.581		0.0	
UG3	-3		29.47	6.09	2F	21.583	599.664	0	0.020	Vel = 0.32
UG3	-3		0.0	6	T	43.037	1000.000	140	32.037	
to					2E	40.168	87.509		-2.599	
TEST	3		29.47	6.16	G	4.304	1087.509	0	0.040	Vel = 0.32
			0.0							
TEST			29.47						29.478	K Factor = 5.43