ISO 9001: 2008 Certified

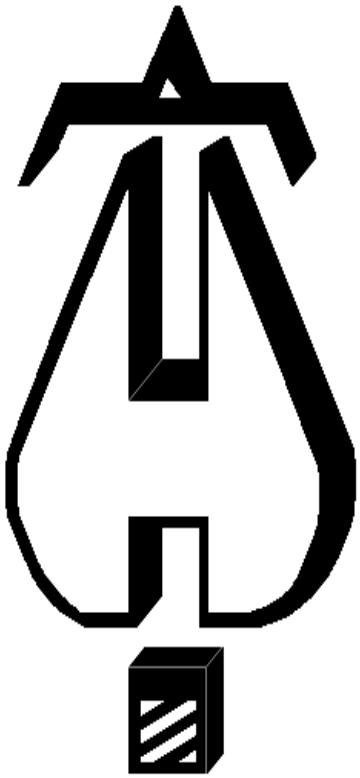
FLSA FIRE & LIFE SAFETY AMERICA PROTECTING AMERICA

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

OAKHAVEN LOT 33

HYDRAULIC CALCULATIONS

12/20/2021



Hydraulic calculations using HydraCALC

FIRE & LIFE SAFETY AMERICA
1731 ROUND ROCK DRIVE
RALEIGH, NC 27615
919-872-3250

Job Name	:	Oakhaven Lot 33
Drawing	:	FP1
Location	:	79 BUCKHAVEN DRIVE
Remote Area	:	RA1
Contract	:	22NC1555
Data File	:	RA1- 2nd Floor Bedroom #2.WXF

HYDRAULIC CALCULATIONS
for

Project name: Oakhaven Lot 33
Location: 79 BUCKHAVEN DRIVE
Drawing no: FP1
Date: 12/20/2021

Design

Remote area number: RA1
Remote area location: 2ND FLOOR - BEDROOM #2
Occupancy classification: RESIDENTIAL
Density: .05 - Gpm/SqFt
Area of application: 166 - 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 @ 34.18 - Psi
Type of system: WET
Volume of dry or preaction system: N/A - Gal

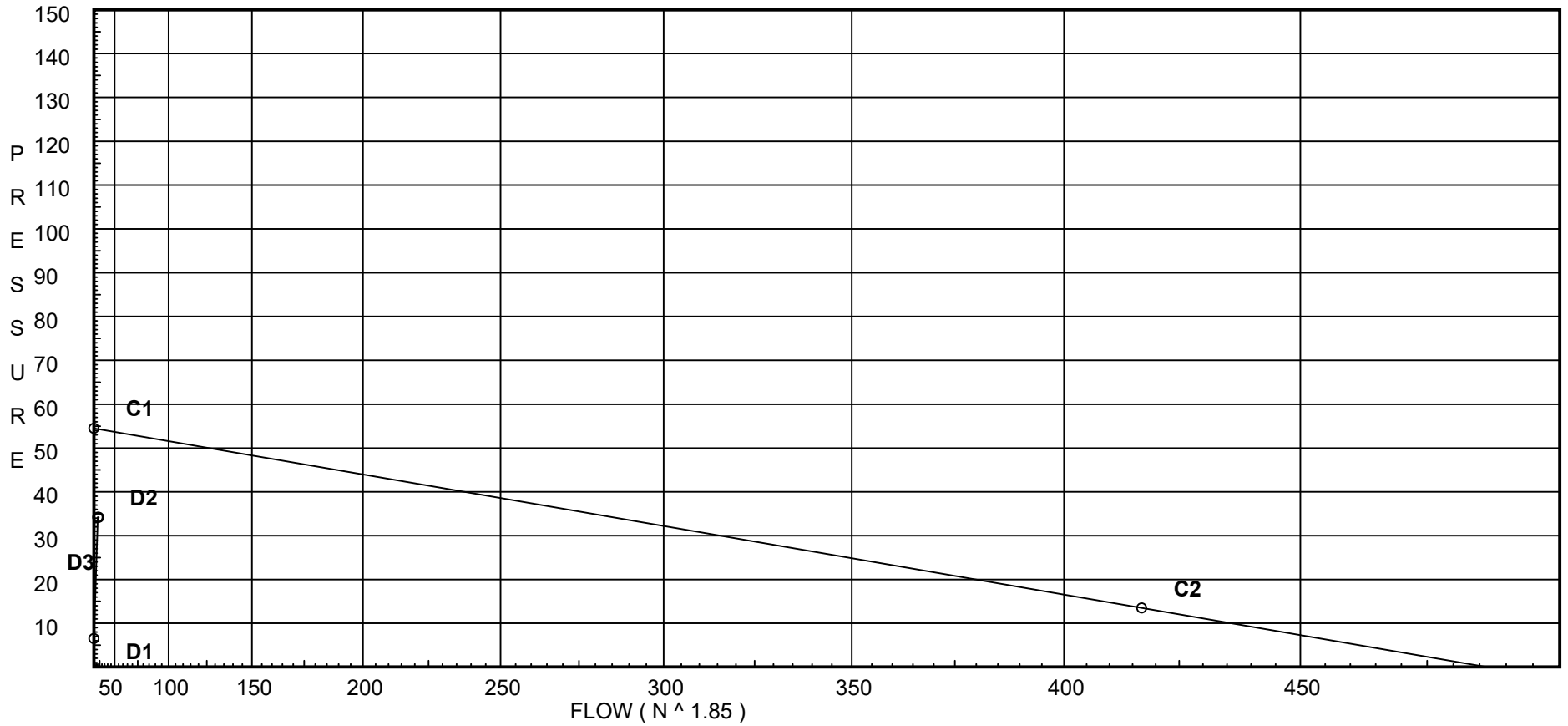
Water supply information

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.)

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 : 20.024
- D2 - System Pressure : 34.186
- Hose (Demand) : 3
- D3 - System Demand : 23.024
- Safety Margin : 20.121



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.

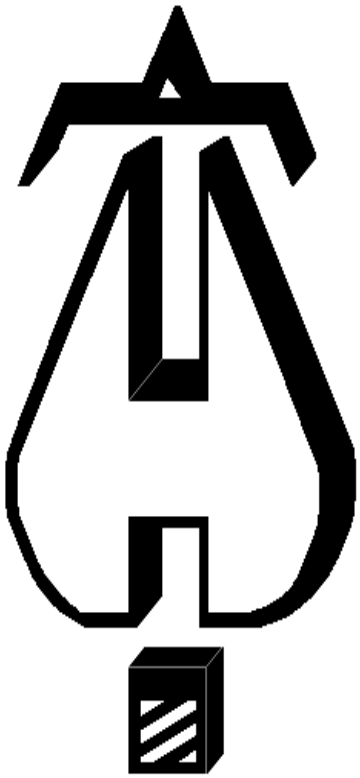
SUPPLY ANALYSIS

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	34.186

NODE ANALYSIS

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*
S101	18.0	4.9	16.7	20.02	
101	19.0		16.81		
M101	19.0		18.18		
M102	10.0		23.06		
M103	10.0		24.17		
TOR	8.0		28.07		
BOR	3.0		31.26		
UG1	3.0		32.05	3.0	
UG2	-3.0		36.73		
UG3	-3.0		36.74		
UG4	-3.0		36.76		
TEST	3.0		34.19		

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	18	4.90	20.02	1	N	7.0	1.000	150	16.700	
to						0.0	7.000		-0.433	
101	19		20.02	1.101		0.0	8.000	0.0681	0.545	Vel = 6.75
			0.0							
101			20.02						16.812	K Factor = 4.88
101	19		20.02	1	N	7.0	8.000	150	16.812	
to					O	5.0	12.000		0.0	
M101	19		20.02	1.101		0.0	20.000	0.0682	1.364	Vel = 6.75
M101	19		0.0	1	O	5.0	9.500	150	18.176	
to						0.0	5.000		3.898	
M102	10		20.02	1.101		0.0	14.500	0.0682	0.989	Vel = 6.75
M102	10		0.0	1	O	5.0	11.167	150	23.063	
to						0.0	5.000		0.0	
M103	10		20.02	1.101		0.0	16.167	0.0682	1.103	Vel = 6.75
M103	10		0.0	1	2N	14.0	30.583	150	24.166	
to						0.0	14.000		0.866	
TOR	8		20.02	1.101		0.0	44.583	0.0682	3.040	Vel = 6.75
			0.0							
TOR			20.02						28.072	K Factor = 3.78
TOR	8		20.02	1	N	7.0	8.000	150	28.072	
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	31.260	
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	32.055	
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	3E	64.749	482.000	150	36.725	
to					2F	21.583	86.332		0.0	
UG3	-3		23.02	6.09		0.0	568.332	0	0.012	Vel = 0.25
UG3	-3		0.0	6	2G	9.25	1149.000	150	36.737	
to					3F	32.374	41.623		0.0	
UG4	-3		23.02	6.09		0.0	1190.623	0	0.026	Vel = 0.25
UG4	-3		0.0	6	T	48.896	1000.000	150	36.763	
to					2E	45.637	99.422		-2.599	
TEST	3		23.02	6.16	G	4.89	1099.422	0	0.022	Vel = 0.25
			0.0							
TEST			23.02						34.186	K Factor = 3.94



Hydraulic calculations using HydraCALC

FIRE & LIFE SAFETY AMERICA
1731 ROUND ROCK DRIVE
RALEIGH, NC 27615
919-872-3250

Job Name	:	Oakhaven Lot 33
Drawing	:	FP1
Location	:	79 BUCKHAVEN DRIVE
Remote Area	:	RA2
Contract	:	22NC1555
Data File	:	RA2- 2nd Floor Bonus Room.WXF

HYDRAULIC CALCULATIONS
for

Project name: Oakhaven Lot 33
Location: 79 BUCKHAVEN DRIVE
Drawing no: FP1
Date: 12/20/2021

Design

Remote area number: RA2
Remote area location: 2ND FLOOR- BONUS ROOM
Occupancy classification: RESIDENTIAL
Density: .05 - Gpm/SqFt
Area of application: 276 - SqFt
Coverage per sprinkler: 196 - 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): 29.27 - GPM @ 28.87 - 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

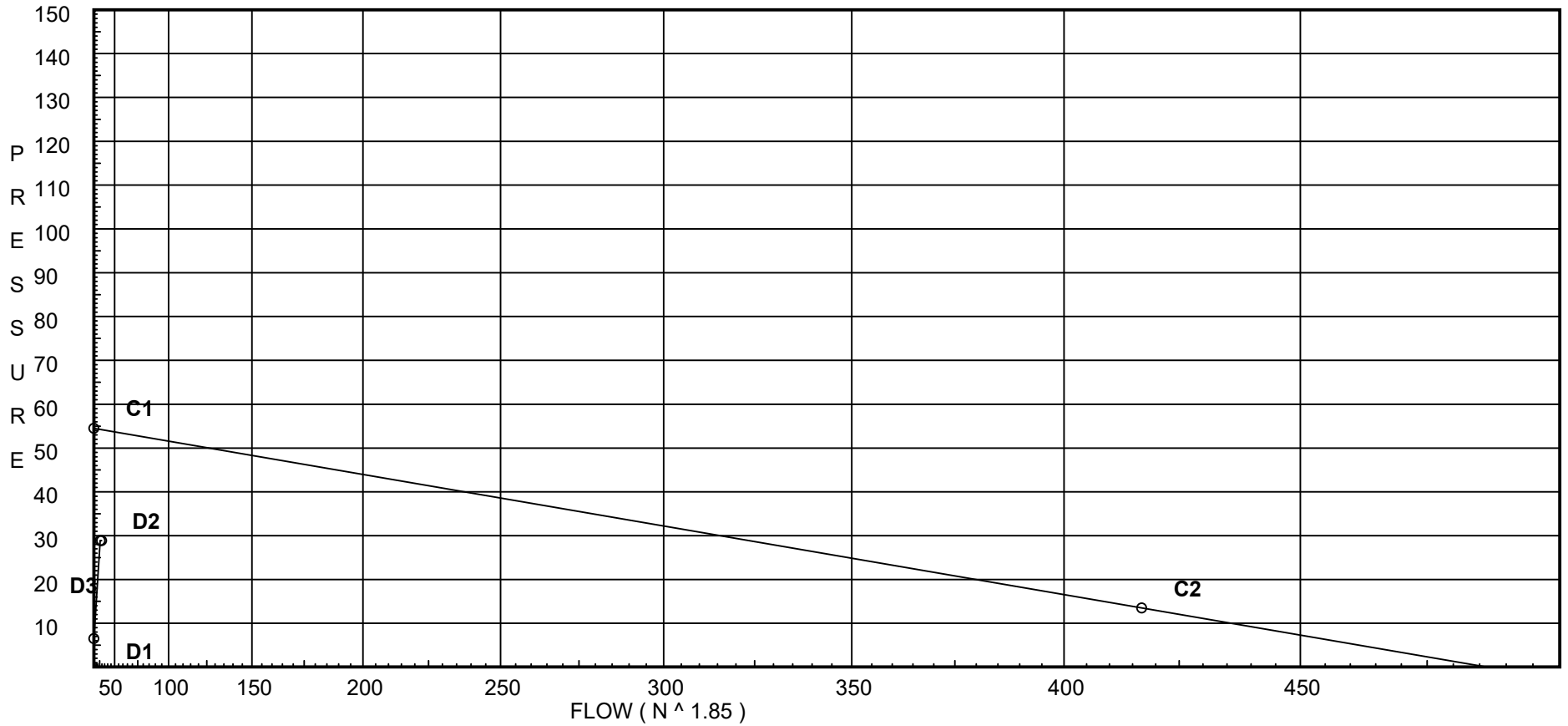
Name of contractor: Fire & Life Safety America
Address: 1731 Roundrock Drive / Raleigh, NC 27615 / P: (919) 872-3250
Phone number: F: (919) 877-57
Name of designer: H. WEYANT
Authority having jurisdiction: HARNETT COUNTY
Notes: (Include peaking information or gridded systems here.)

Water Supply Curve C

FIRE & LIFE SAFETY AMERICA
Oakhaven Lot 33

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 : 26.268
- D2 - System Pressure : 28.873
- Hose (Demand) : 3
- D3 - System Demand : 29.268
- Safety Margin : 25.327



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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	54.199	29.27	28.873

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	7.37	13.3	
201	19.0		7.02		
202	19.0		7.36		
M201	19.0		9.86		
M202	10.0		15.62		
TOR	8.0		20.38		
BOR	3.0		24.24		
UG1	3.0		25.55	3.0	
UG2	-3.0		31.38		
UG3	-3.0		31.4		
UG4	-3.0		31.44		
TEST	3.0		28.87		

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	2N	14.0	1.000	150	7.000	
to						0.0	14.000		-0.433	
201	19		12.96	1.101		0.0	15.000	0.0305	0.458	Vel = 4.37
			0.0							
201			12.96						7.025	K Factor = 4.89
S202	18	4.90	13.30	1	N	7.0	1.000	150	7.372	
to					O	5.0	12.000		-0.433	
202	19		13.3	1.101		0.0	13.000	0.0320	0.416	Vel = 4.48
			0.0							
202			13.30						7.355	K Factor = 4.90
201	19		12.96	1		0.0	10.833	150	7.025	
to						0.0	0.0		0.0	
202	19		12.96	1.101		0.0	10.833	0.0305	0.330	Vel = 4.37
			0.0							
202			12.96						7.355	K Factor = 4.78
202	19		26.27	1	O	5.0	10.250	150	7.355	
to					N	7.0	12.000		0.0	
M201	19		26.27	1.101		0.0	22.250	0.1127	2.507	Vel = 8.85
M201	19		0.0	1	N	7.0	9.500	150	9.862	
to						0.0	7.000		3.898	
M202	10		26.27	1.101		0.0	16.500	0.1127	1.859	Vel = 8.85
M202	10		0.0	1	2N	14.0	15.583	150	15.619	
to					O	5.0	19.000		0.866	
TOR	8		26.27	1.101		0.0	34.583	0.1127	3.897	Vel = 8.85
			0.0							
TOR			26.27						20.382	K Factor = 5.82
TOR	8		26.27	1	N	7.0	8.000	150	20.382	
to						0.0	7.000		2.166	
BOR	3		26.27	1.101		0.0	15.000	0.1126	1.689	Vel = 8.85
BOR	3		0.0	1	2E	7.65	4.000	150	24.237	
to						0.0	7.650		0.0	
UG1	3		26.27	1.101		0.0	11.650	0.1127	1.313	Vel = 8.85
UG1	3	H3	3.00	1.25	T	9.523	55.000	150	25.550	
to					2E	9.523	19.046		2.599	
UG2	-3		29.27	1.394		0.0	74.046	0.0436	3.229	Vel = 6.15
UG2	-3		0.0	6	3E	64.749	482.000	150	31.378	
to					2F	21.583	86.332		0.0	
UG3	-3		29.27	6.09		0.0	568.332	0	0.019	Vel = 0.32
UG3	-3		0.0	6	2G	9.25	1149.000	150	31.397	
to					3F	32.374	41.623		0.0	
UG4	-3		29.27	6.09		0.0	1190.623	0	0.040	Vel = 0.32
UG4	-3		0.0	6	T	48.896	1000.000	150	31.437	
to					2E	45.637	99.422		-2.599	
TEST	3		29.27	6.16	G	4.89	1099.422	0	0.035	Vel = 0.32
			0.0							
TEST			29.27						28.873	K Factor = 5.45