

Significant Injury Investigation Report



219 Frederick Avenue

October 2nd 2008



Objective

- *Obtain all available incident facts/information and communicate a detailed validated factual incident review report to MCFRS.*
- *All information contained in the report will be factual documentation of the events leading up to the incident, the incident operations, the fire fighter mayday(s) and incident mitigation to include adequate resources to treat and transport injured personnel.*
- *The resulting findings and recommendations will be used as lessons learned for MCFRS, the region, the State, and the National Fire Service.*



Frederick Avenue- Injuries

- One firefighter seriously burned
 - ~ 35% BSA Burns - 2nd Degree
 - 36 days in burn unit
- Near miss - line of duty death incident



Internal Investigation

- Significant injury event
- External assistance
- Montgomery County members
 - IAFF
 - MCVFRA
 - Safety Section



Investigation Team

External Members

- Deputy Chief Keith Brower (*Loudoun County, VA*)

Internal Members

- Assistant Chief Scott Goldstein
- Chief Buddy Sutton
- Assistant Chief Michael Nelson
- Captain Gary Rebsch, IAFF
- Deputy Chief Craig Lazar, MCVFRA

Support Staff

- Captain Chris Stroup
- Fire Protection Engineer Patsy Warnick



Review and Examination

- Events and actions at Frederick Avenue
- Related local and regional policies and procedures
- Industry standards and regulations
- Performed interviews, fact finding and analysis
- Independent examination of protective gear and equipment
- Fire Modeling – ***still pending***



Investigation Team

Phase 2 Review

Upon significant completion of the report, Investigation Group presented the report to obtain third party review of event and findings of the group.

Reviewers

- Battalion Chief Jennie Collins (*Prince William County, VA*)
- *Past Chief William McGann (Hamilton VFD, Loudoun County, VA)*



Weather Information

October 2, 2008

- Clear chilly night
- Temperature was 46.4° F; 100% humidity, & calm winds.

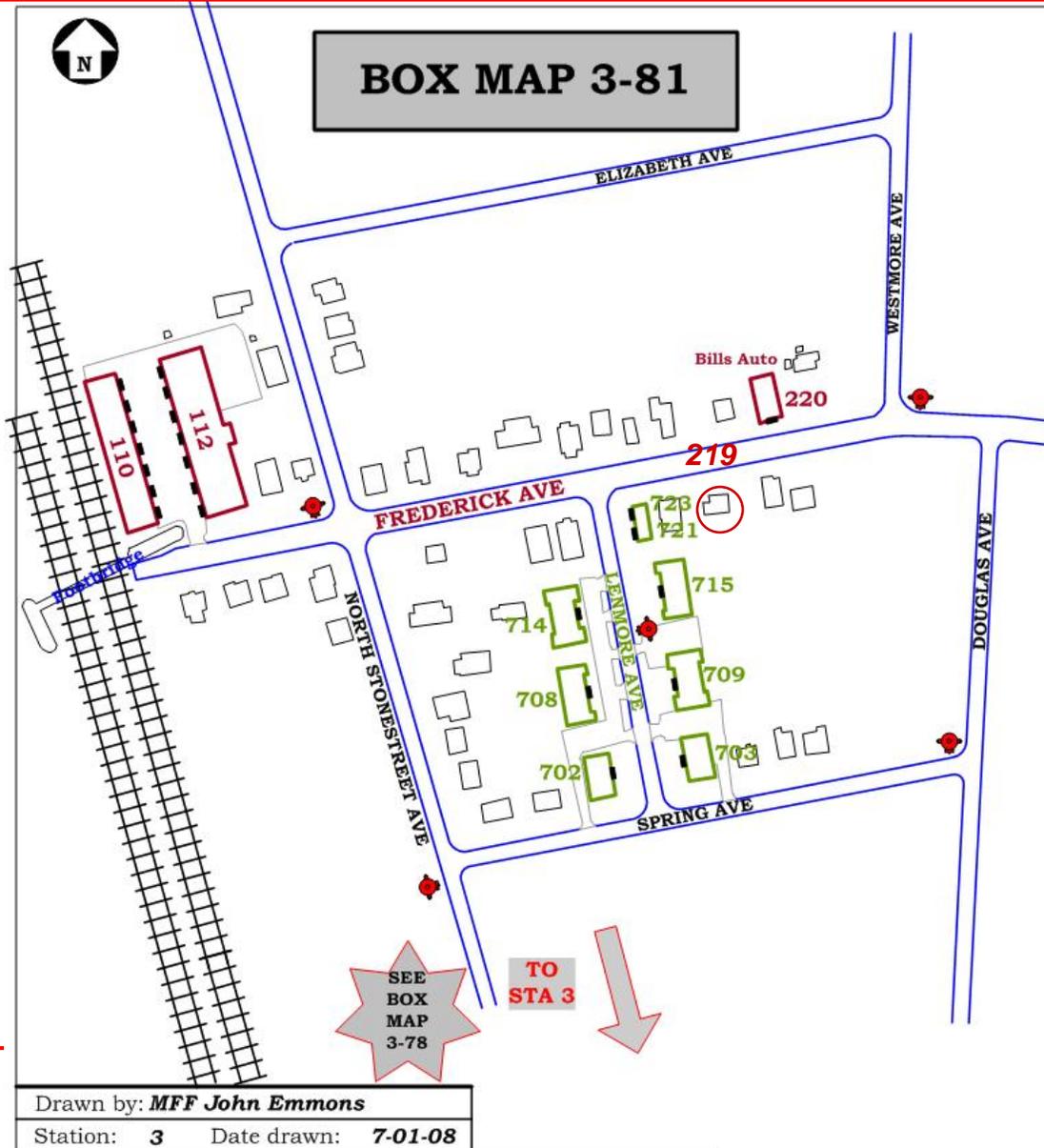


Incident Overview

- **01:26:26** 911 call received
- **01:27:43** Transformer Call dispatched
- **01:30:19** E703 En-route
- **01:31:20** 2nd 911 call received
- **01:34:00** E703 On scene and request house fire assignment, on 7-Bravo



Area Map



219 Frederick Avenue

- Constructed in 1949
- 2 story Cape cod
- 1,044 square feet (720 on 1st floor and 344 on 2nd floor)



Side Alpha



Side Bravo



219 Frederick Avenue



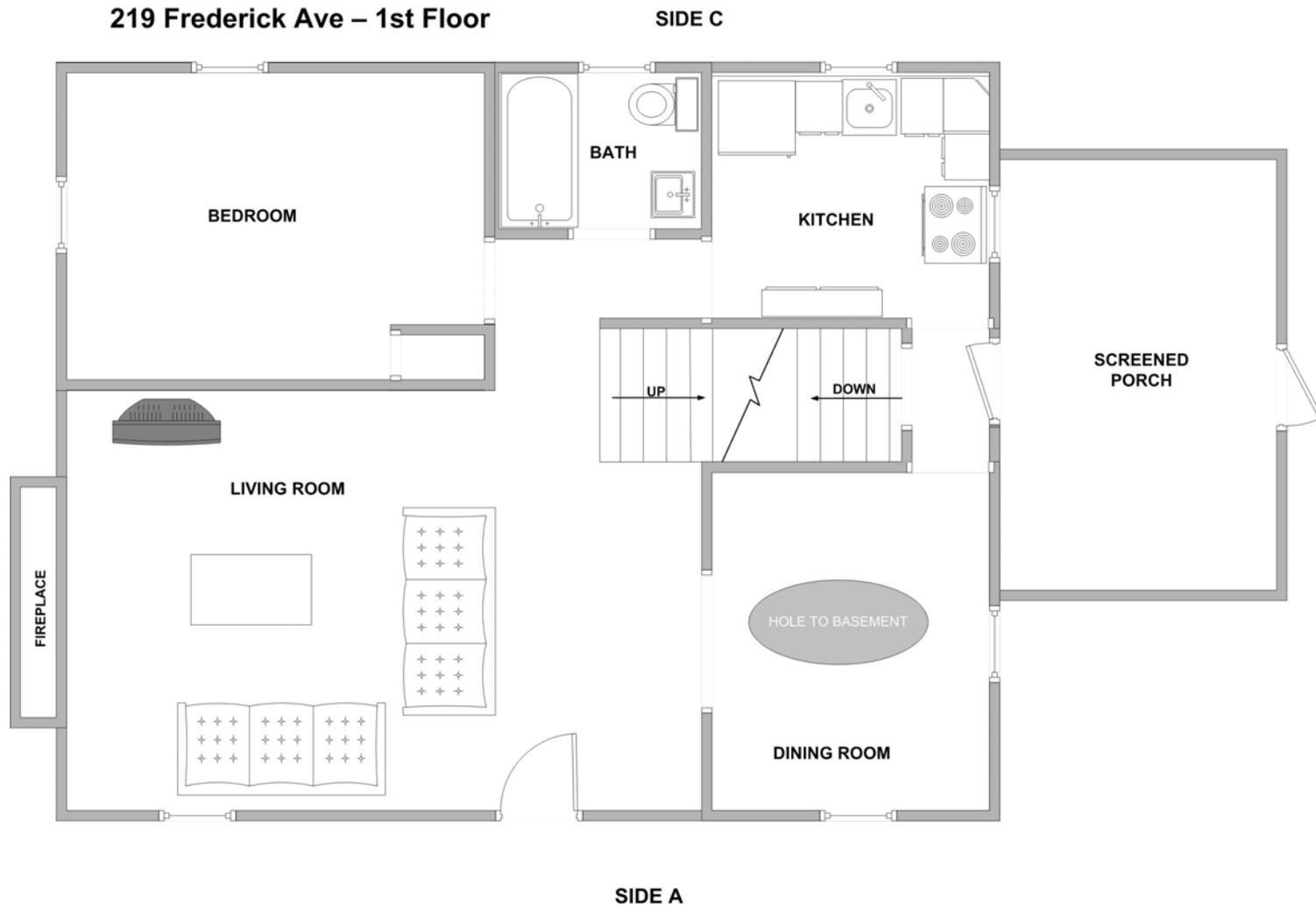
Side Charlie



Side Delta



219 Frederick Avenue – 1st Floor



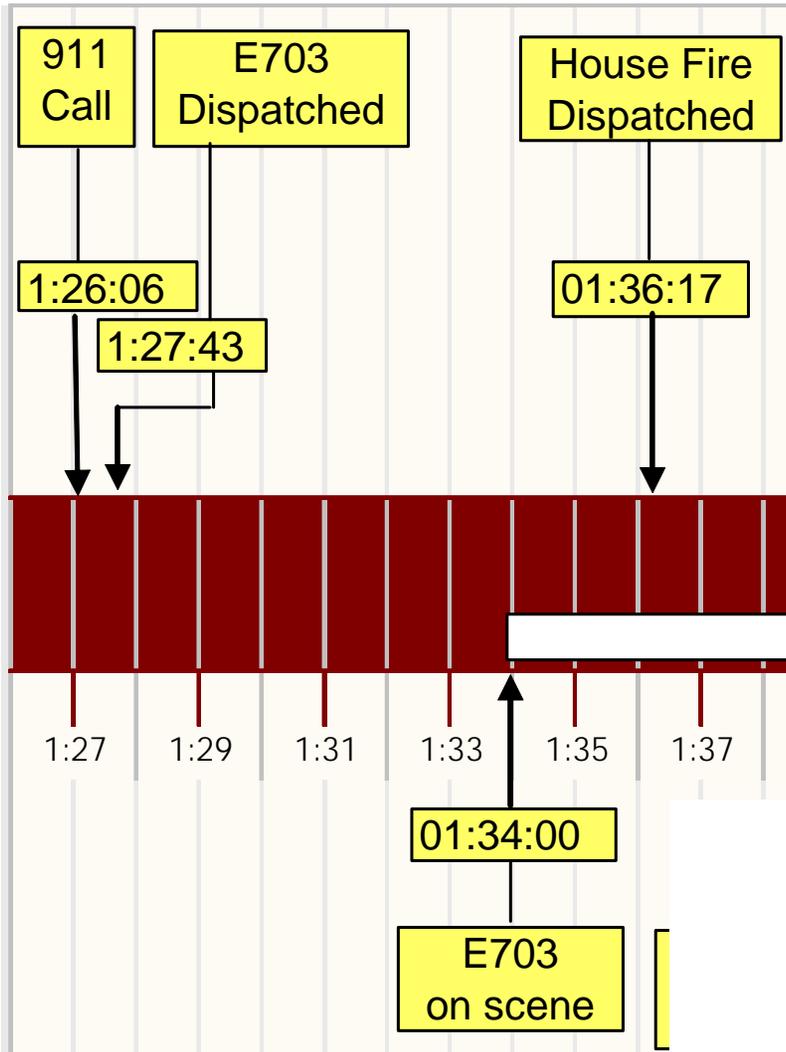
219 Frederick Avenue – 2nd Floor



219 Frederick Avenue - Basement



Critical Event Timeline



~01:39 hrs



Fill Out 1st Alarm Assignment

Type	Dispatch
Engines	E723, E721, E733, E725
Trucks	T703, AT723
Rescue	RS703
EMS	A723
Command	BC703, BC704, Rockville & Kensington Duty Officers
Other	C703, C703B, C703C, C703F, C705D, Safety700, Duty Chief, Duty Chief Bravo



Incident Overview

- **01:36:00** FS3 direct line call notification
- **01:36:17** House fire dispatched
- **01:38:13** E703 Command & 2-Out
Established 
- **01:39:16** RS703 On scene
- **01:39:32** C703C On scene & Assumes
Command
- **01:41:04** T703 On scene
- **01:44:44** Exterior Basement Entrance Found

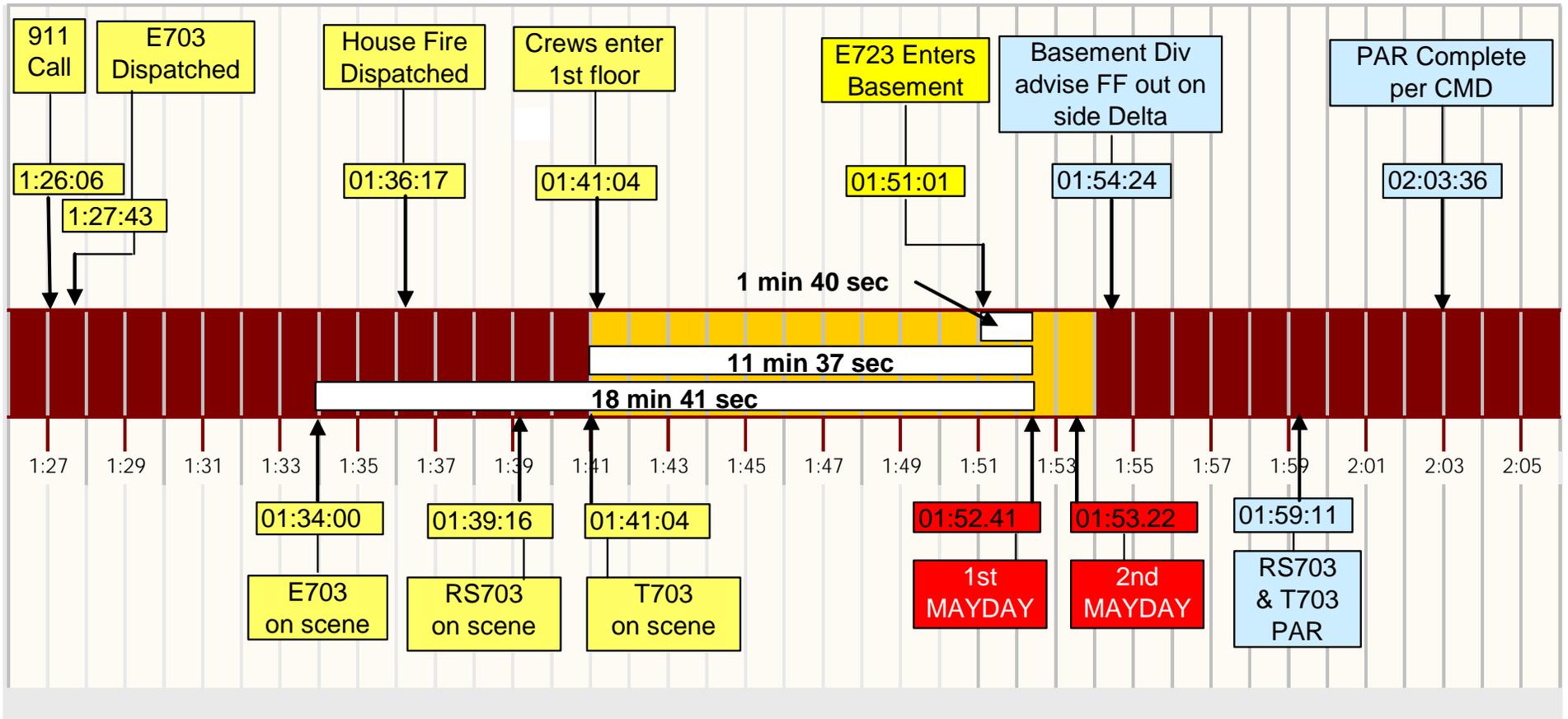


Incident Overview

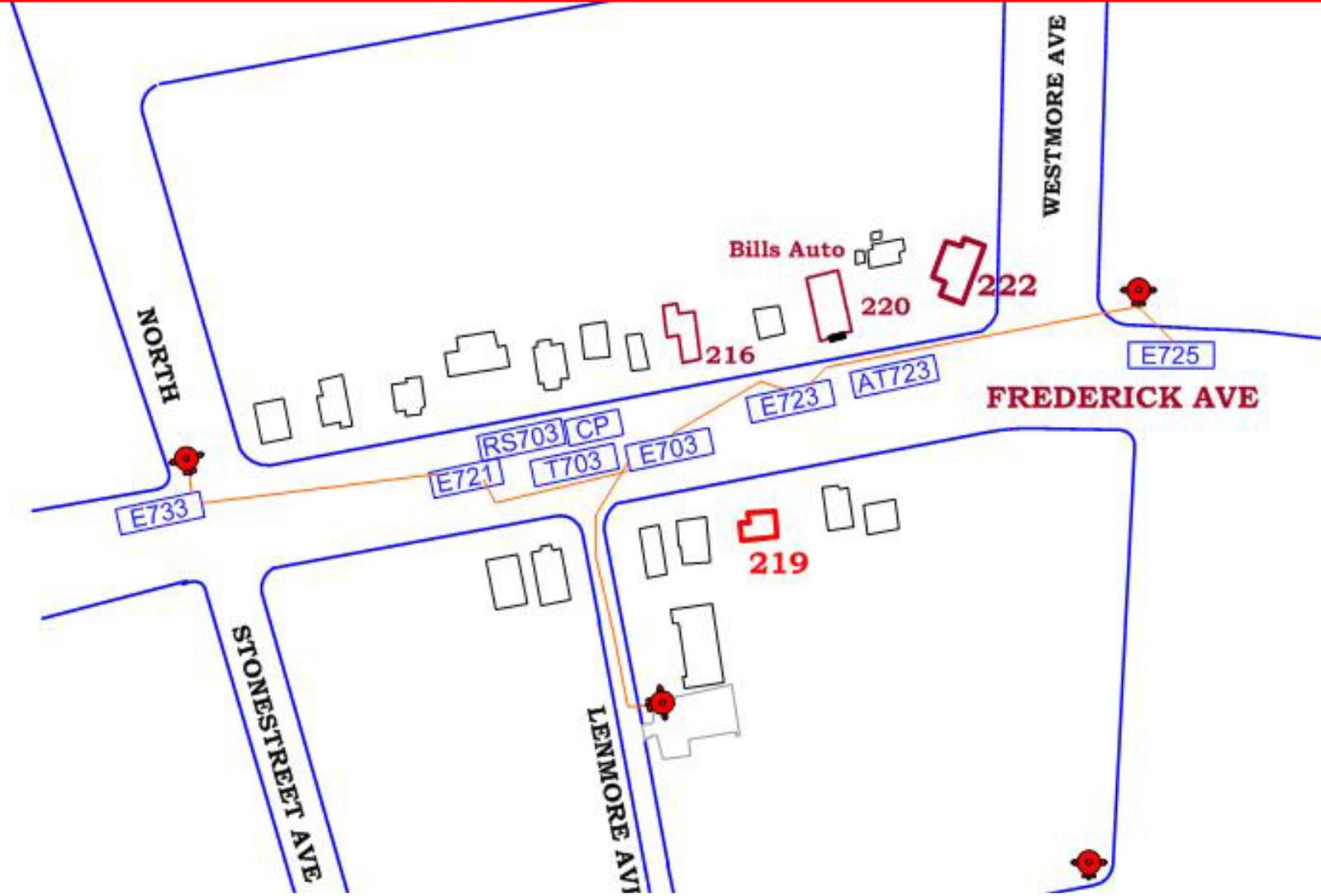
- **01:51:01** Co 23 enters basement
- **01:52:41** 1st ***Mayday*** 
- **01:53:22** 2nd ***Mayday*** 
- **01:54:24** Report that Mayday FF is on SIDE
DELTA being treated by EMS
- **01:56:16** Accountability for Division 1
- **02:03:36** PAR for all units



Critical Event Timeline



Apparatus Placement Overview



Categorizing Recommendations

Immediate 23	Issue/recommendation that must be implemented immediately to impact fire fighter safety and/or fire department operations. <i>Estimated Time to Implement:</i> 30 days
Short Term 15	Issue/recommendation that's solution can be created studied and implementation plan created and that may requires moderate -engineering/financial/policy adjustment and/or coordination. <i>Estimated Time to Implement:</i> 60 to 120 days
Long Term 12	Issue/recommendation that requires extensive engineering/financial/policy adjustment and/or coordination. <i>Estimated Time to Implement:</i> +6 months



Event Factors

- Fire Ground Operations
- Risk vs. Benefit Analysis
- Accountability
- Mayday
- Communications
- Personnel Training & Certification
- Equipment
- PPE/SCBA



Fire Ground Operations

- | | | |
|------------|---|--|
| Immediate | 6 | <ul style="list-style-type: none">■ Turnout Time■ <i>Two-Out</i>■ Water Supply■ Crew Effectiveness |
| Short Term | 2 | <ul style="list-style-type: none">■ <i>Ventilation</i>■ <i>Vacant/Abandoned Structures</i> |
| Long Term | 2 | <ul style="list-style-type: none">■ Command Aide■ Command Officers |



Fire Ground Operations

- Two-Out
 - 2-out designated but not acknowledged/confirmed.
 - Crews entered w/o 2-out in place.
- Ventilation
 - Hydraulic ventilation on 1st while fire un-contained below.
- Vacant/Abandoned Structures
 - No departmental definition of “vacant” vs. “abandoned.”
 - No policy on strategy for operations at.



Fire Ground Operations

Highlighted recommendations:

- ***Two-Out***
 - *Entry team must be in place as defined in SSSFFO.*
 - *2-out designation must be acknowledge by selected unit.*
- ***Ventilation***
 - *Hydraulic ventilation only after fire is confirmed contained.*
- ***Vacant/Abandoned Structures***
 - *Policy developed outlined operations at/on.*



Risk vs. Benefit Analysis

Immediate 0

Short Term 3

Long Term 0

- ***Positioning Above Fire***
- ***Risk vs. Benefit Analysis***



Risk vs. Benefit Analysis

- Positioning Above Fire
 - E703 operated above fire in Quadrant DELTA for approximately 9 minutes .
- Risk vs. Benefit Analysis
 - Reported as “vacant” house.
 - SOP written around occupied or possibly occupied structure.
 - 1st due Engine “protecting” search.



Risk vs. Benefit Analysis

Highlighted recommendations:

- *Positioning Above Fire*
 - *Attack fire directly and avoid extremely dangerous position.*
- *Risk Benefit*
 - *Revise SSSFFO to include Risk/Benefit Analyses.*
 - *Include a section on Search Assessment.*



Accountability

Immediate 5

- ***NFPA 1500***
- ***Assigned Riding Positions***

Short Term 1

- ***PAS Tags***
- ***Crew Integrity***

Long Term 1

- ***Command Officers in IDLH***



Accountability

- NFPA 1500
 - Crosswalk of 1500 to Exec Reg #26-04 identified all but 1 section covered.
- Assigned Riding Positions
 - RS703 5th unknown to RS Officer till after **Mayday.**
- PAS Tags
 - Need to utilize current system and push heavily for improved system.



Accountability

Highlighted recommendations:

- ***NFPA 1500***
 - *Add requirement to Exec Reg # 26-04 that makes crew/unit personnel accountable to the officer.*
- ***Assigned Riding Positions***
 - *Follow Accountability policy and require officer approval of riding.*
- ***PAS Tags***
 - *Follow policy and encourage change to NOVA Passport style system.*



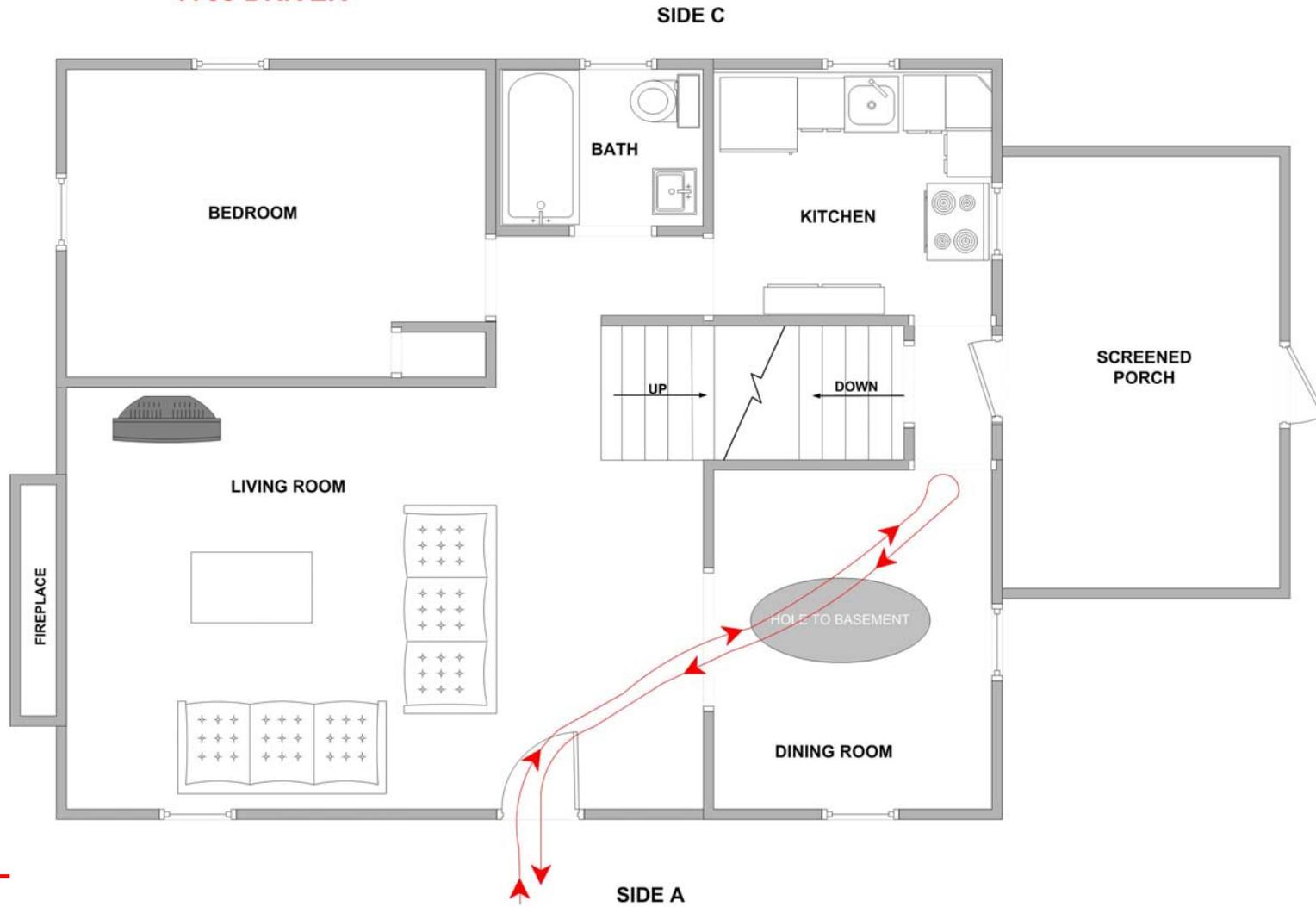
Accountability

- Crew Integrity
 - Very little crew integrity – all units from FS3 had little to no integrity with significant “free-lancing.”
- Command Officers in IDLH
 - OSHA regulations dictate personnel must operate in teams.
 - MCFRS Respiratory Protection Policy (26-06AM) requires personnel to enter IDLH in pairs.
 - Command officers and some unit personnel entered IDLH as single persons.



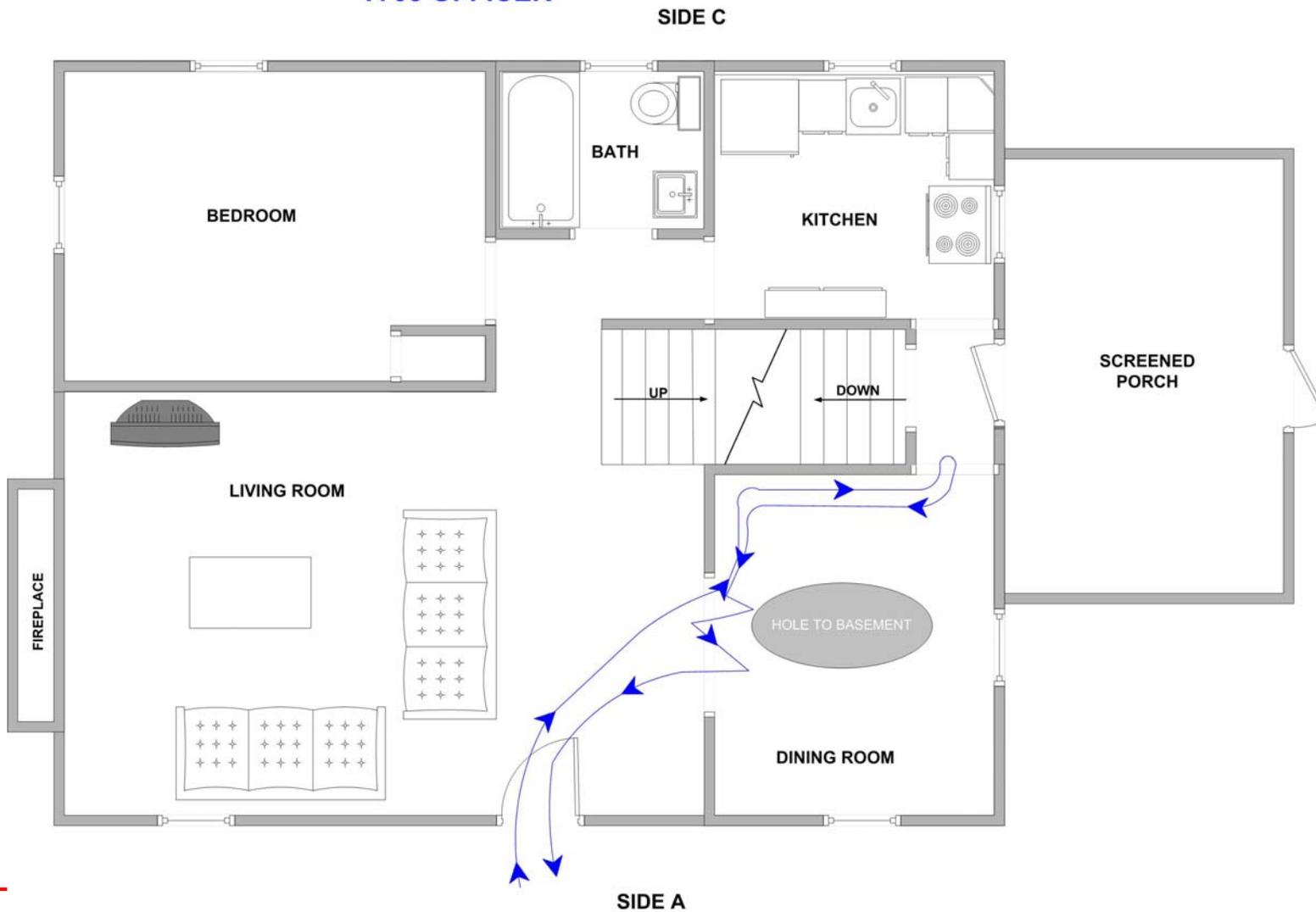
Crew Integrity – Truck 703 Driver

T703 DRIVER

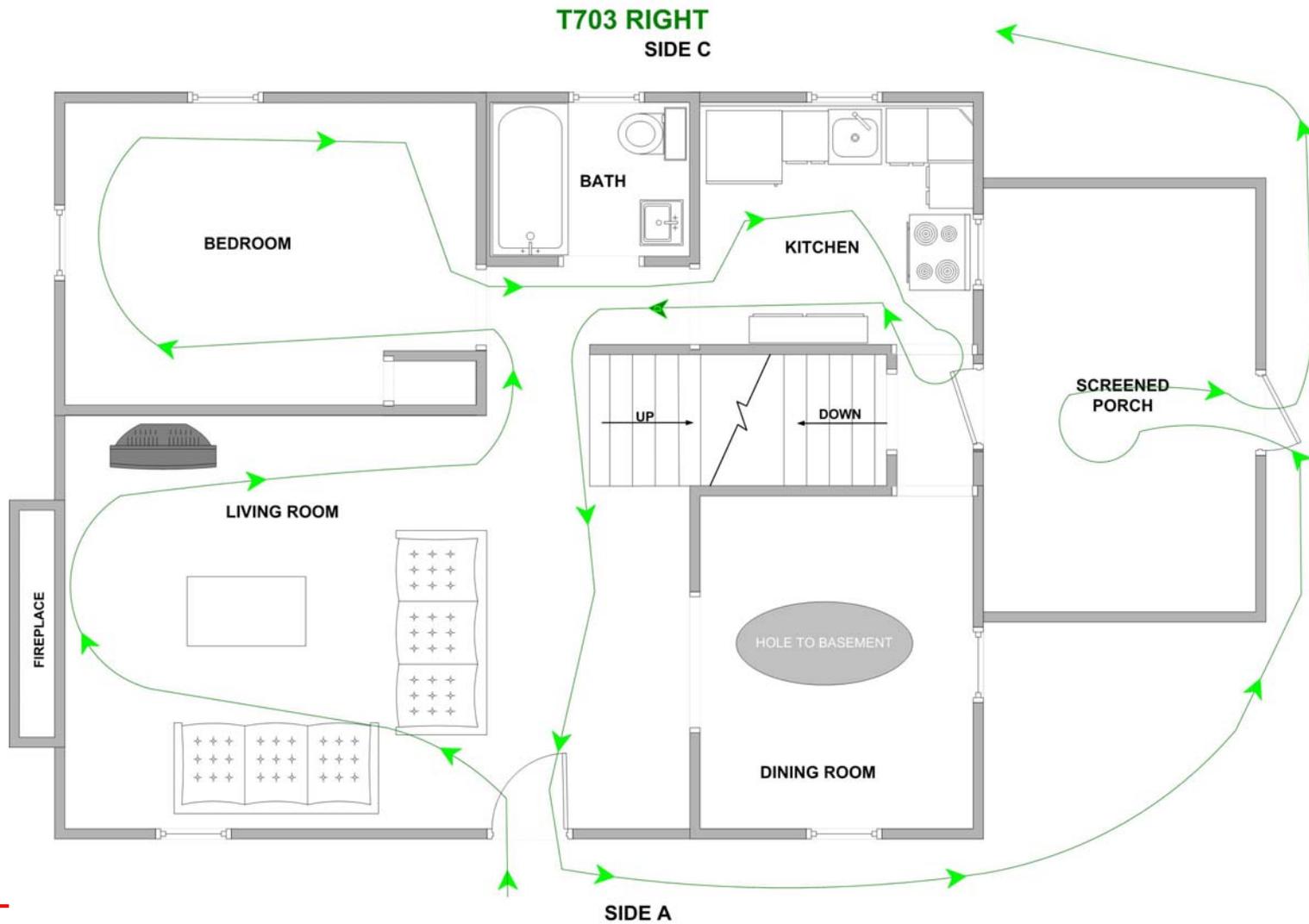


Crew Integrity – Truck 703 Officer

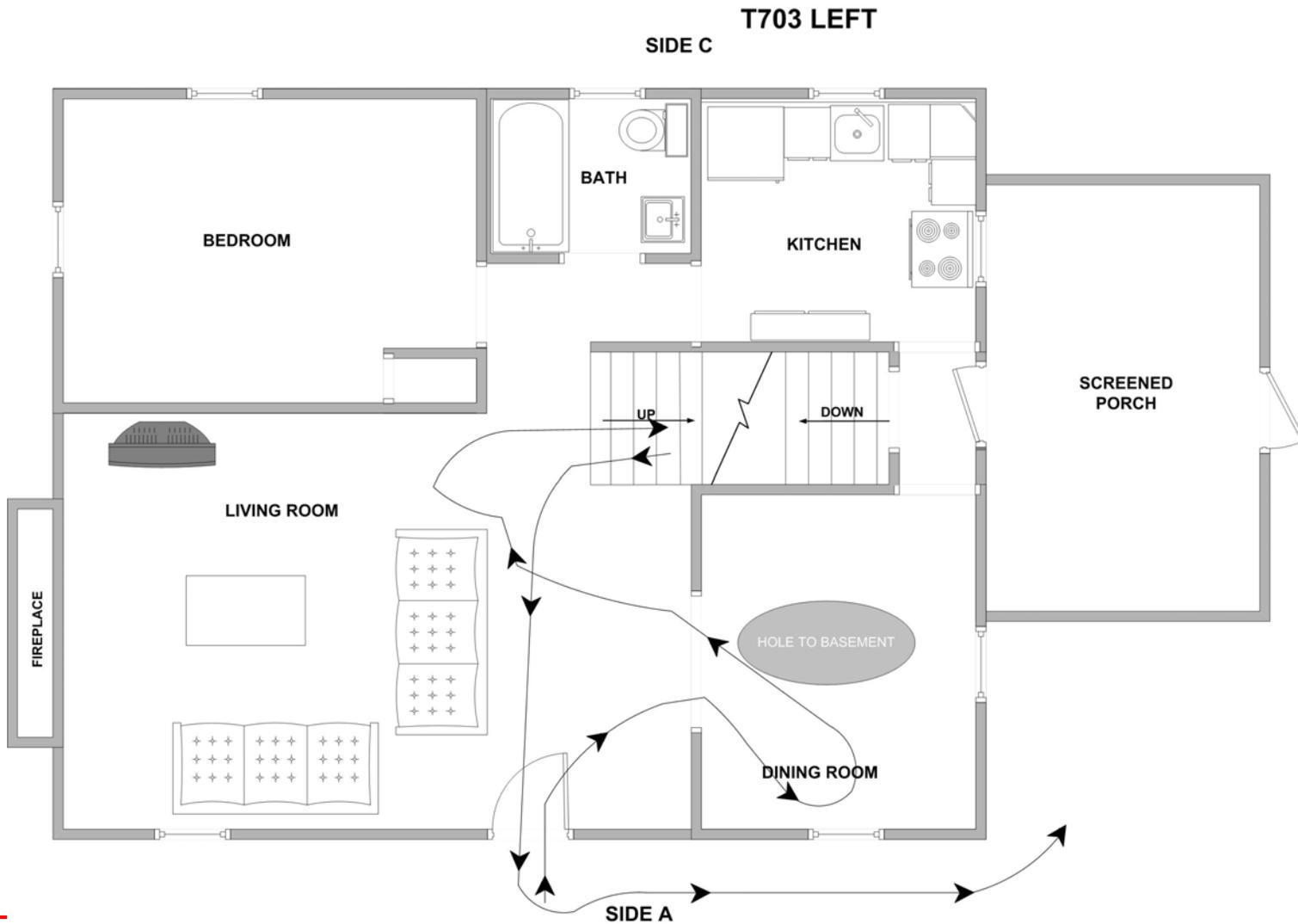
T703 OFFICER



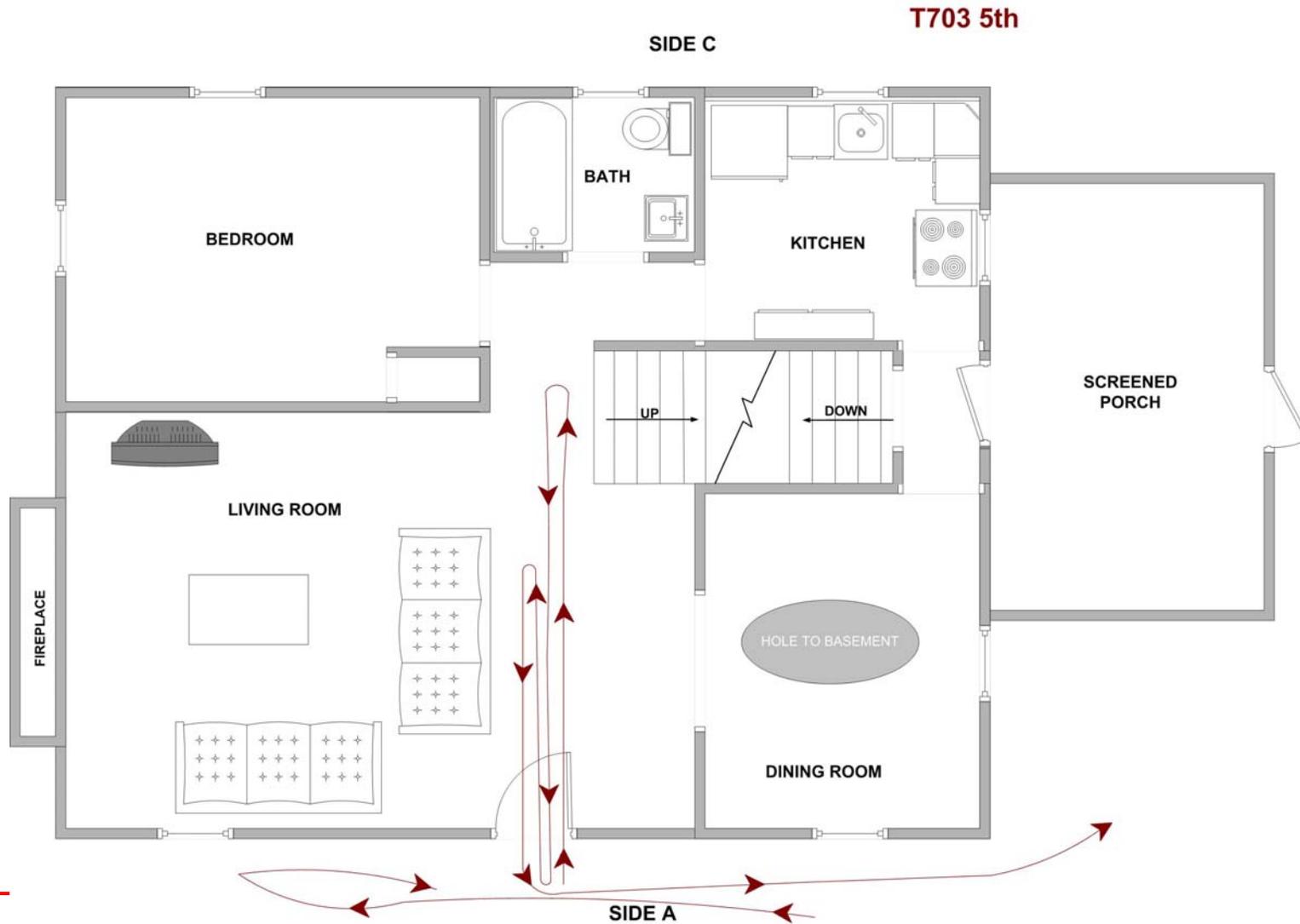
Crew Integrity – Truck 703 Right



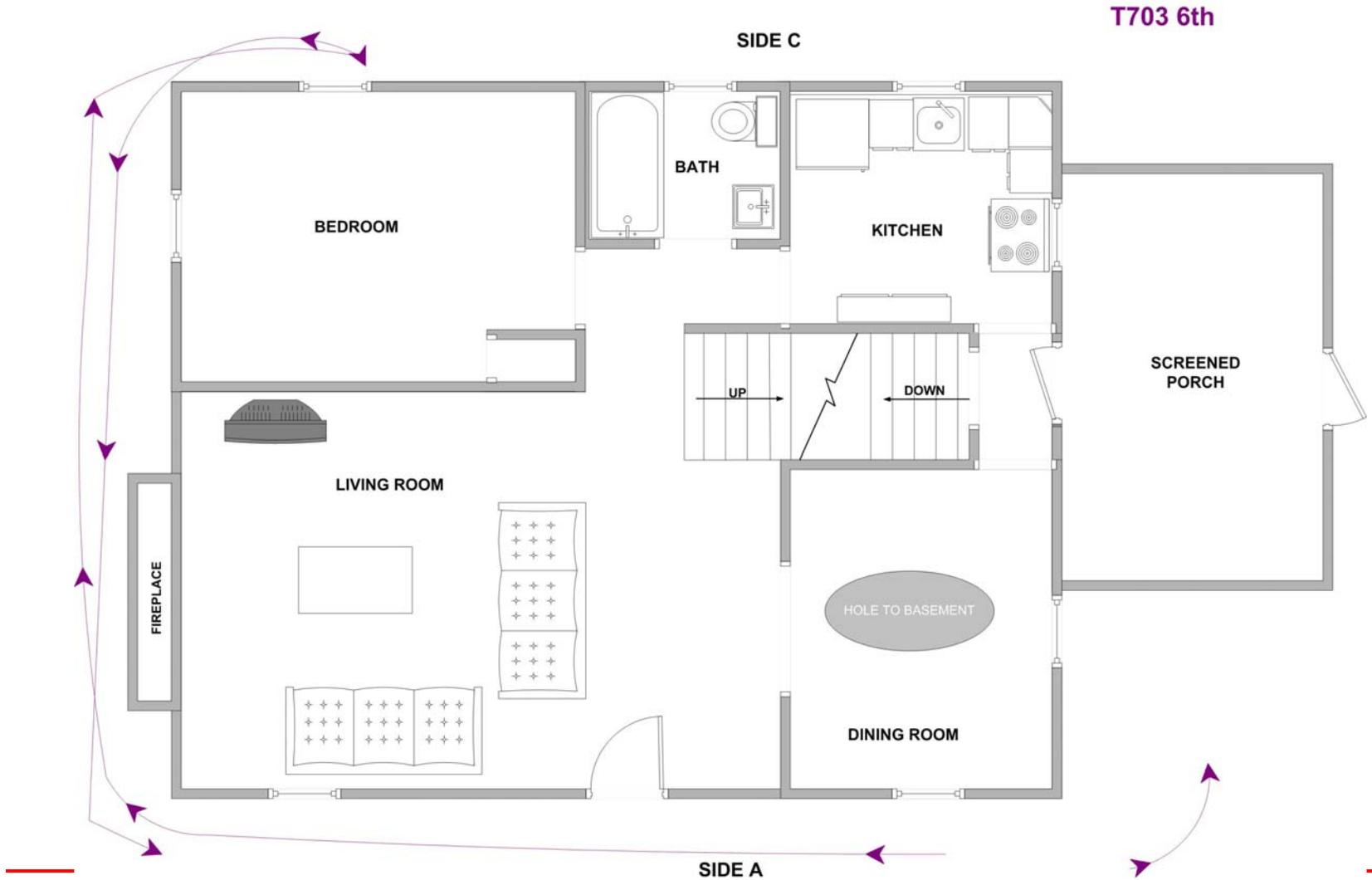
Crew Integrity – Truck 703 Left



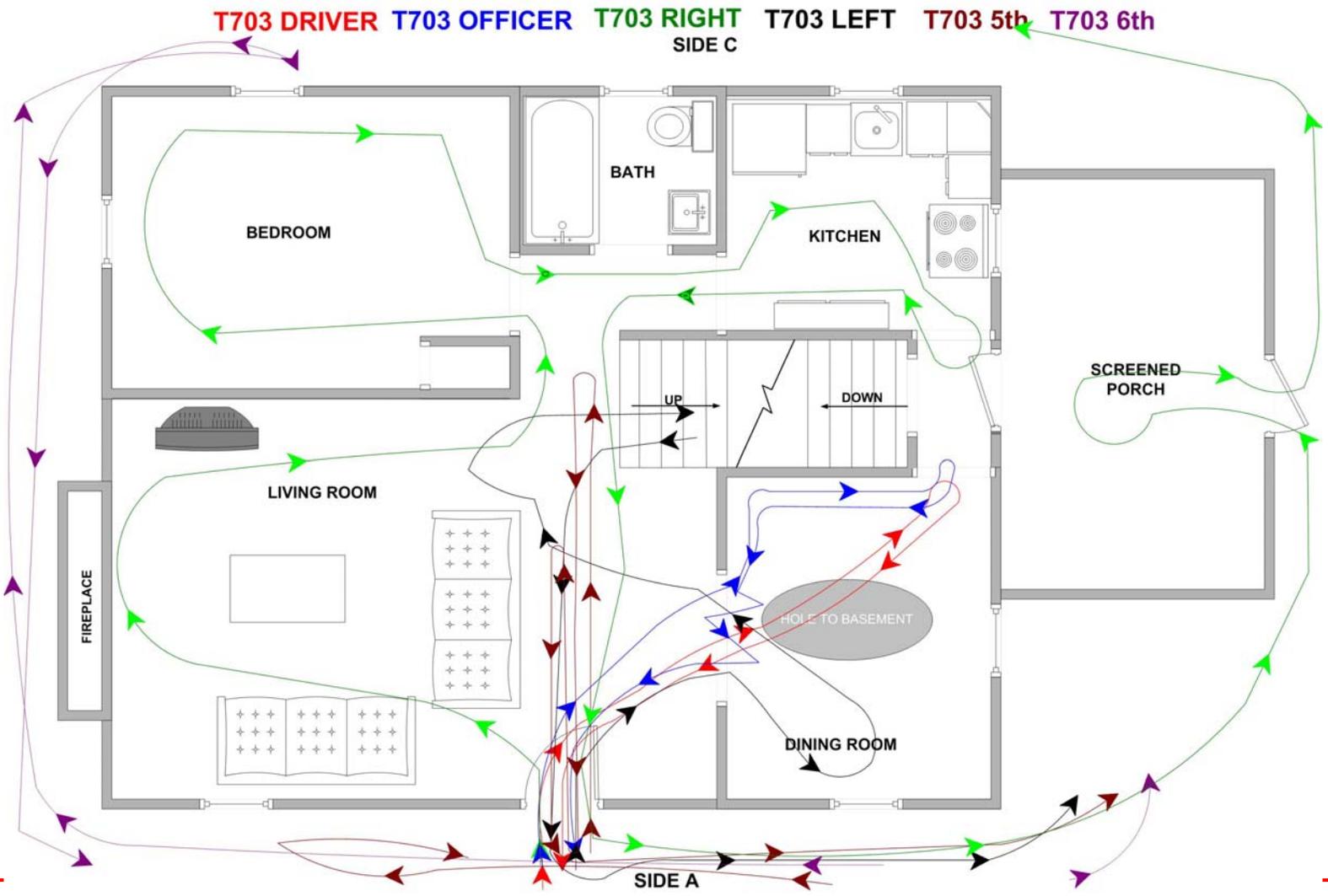
Crew Integrity – Truck 703 5th



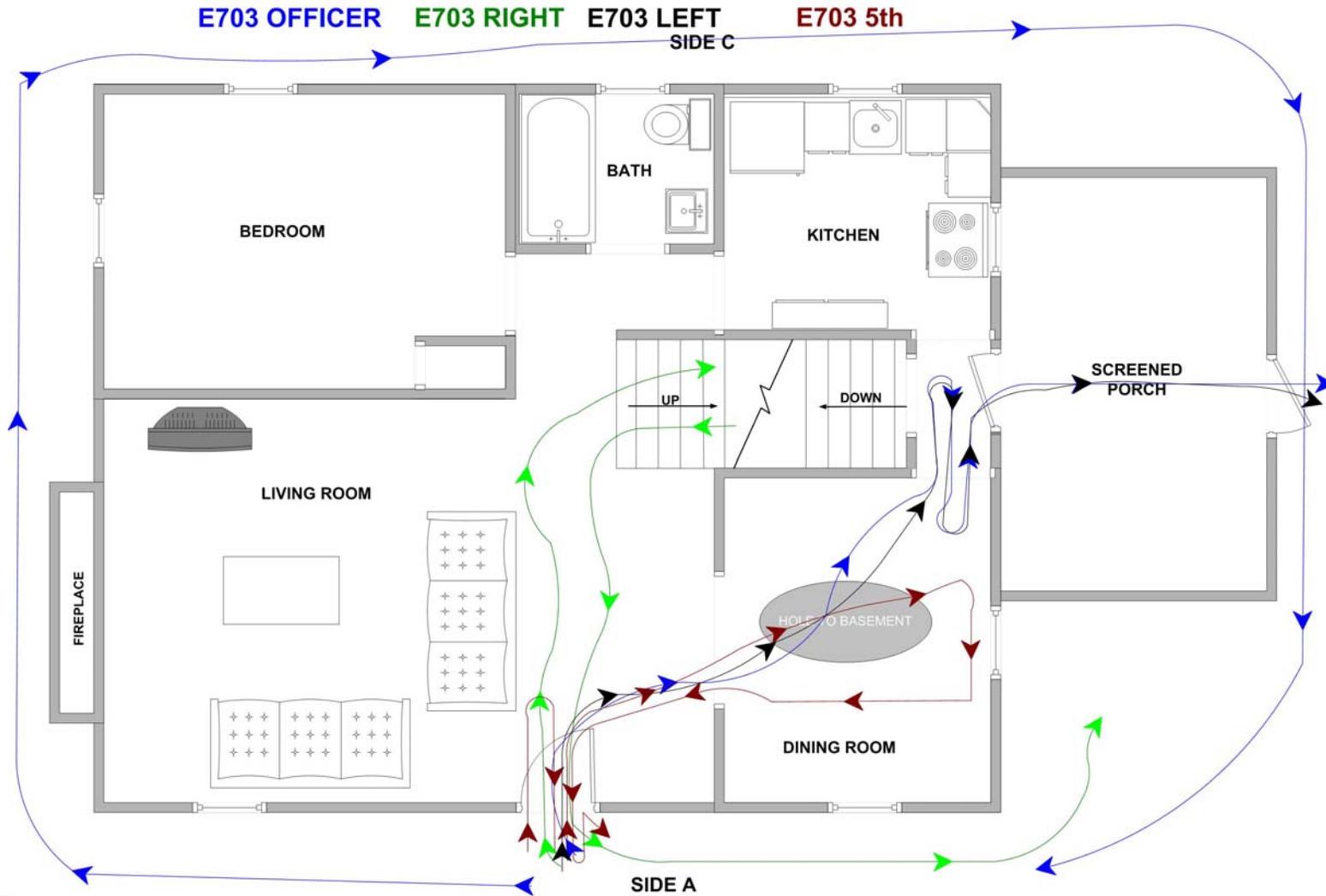
Crew Integrity – Truck 703 6th



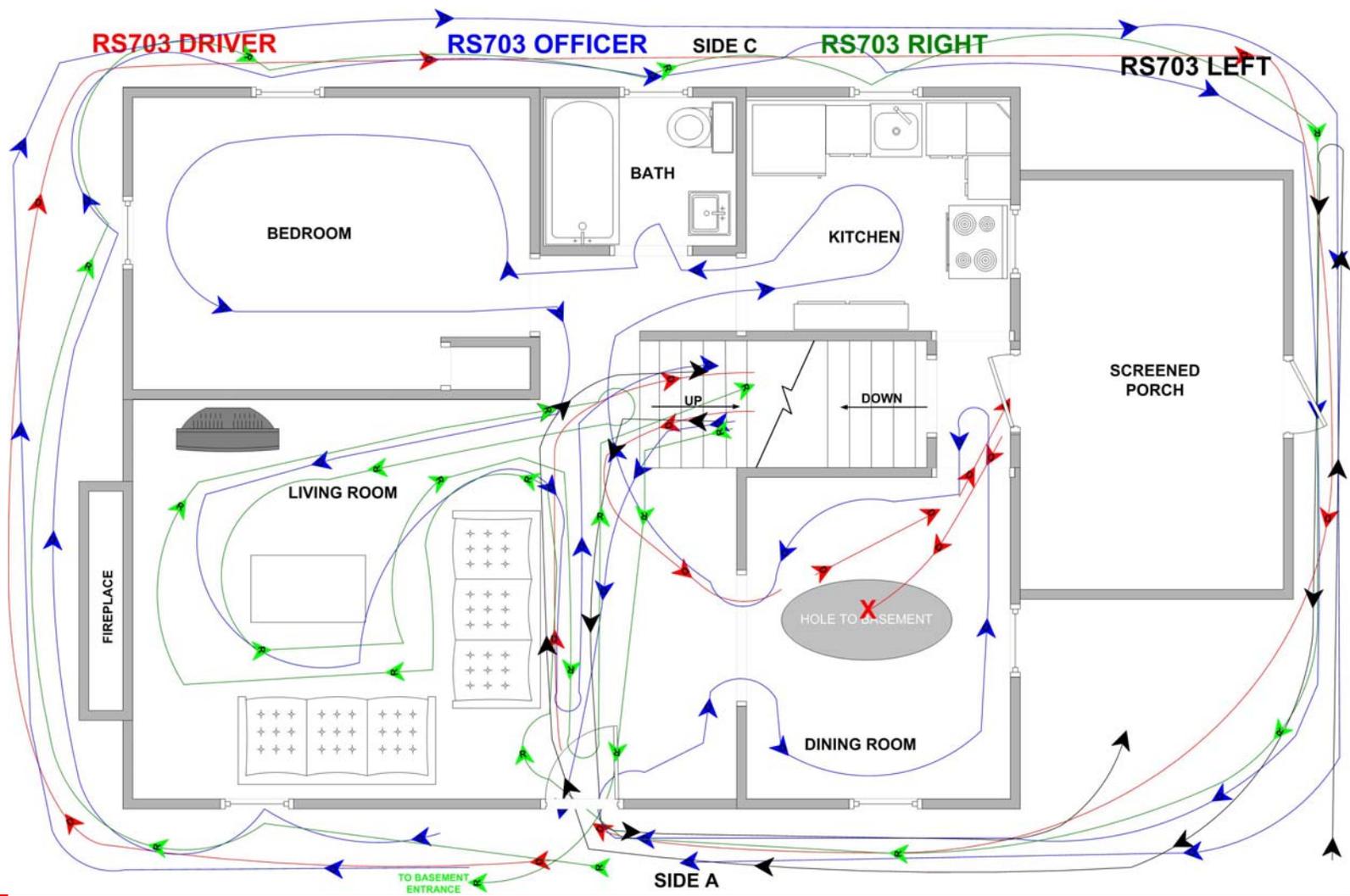
Crew Integrity – Truck 703



Crew Integrity – Engine 703



Crew Integrity – Rescue Squad 703



Accountability

Highlighted recommendations:

- Crew Integrity
 - *Units must work together and all personnel must work in teams.*
- Command Officers in IDLH
 - *All personnel entering IDLH must be partnered up.*



Mayday

Immediate 1

- ***Mayday Training***

- Mayday Protocol

Short Term 4

- NOVA Mayday
Command Protocol

Long Term 1

- ***Non Structure Fire
Mayday Procedure***

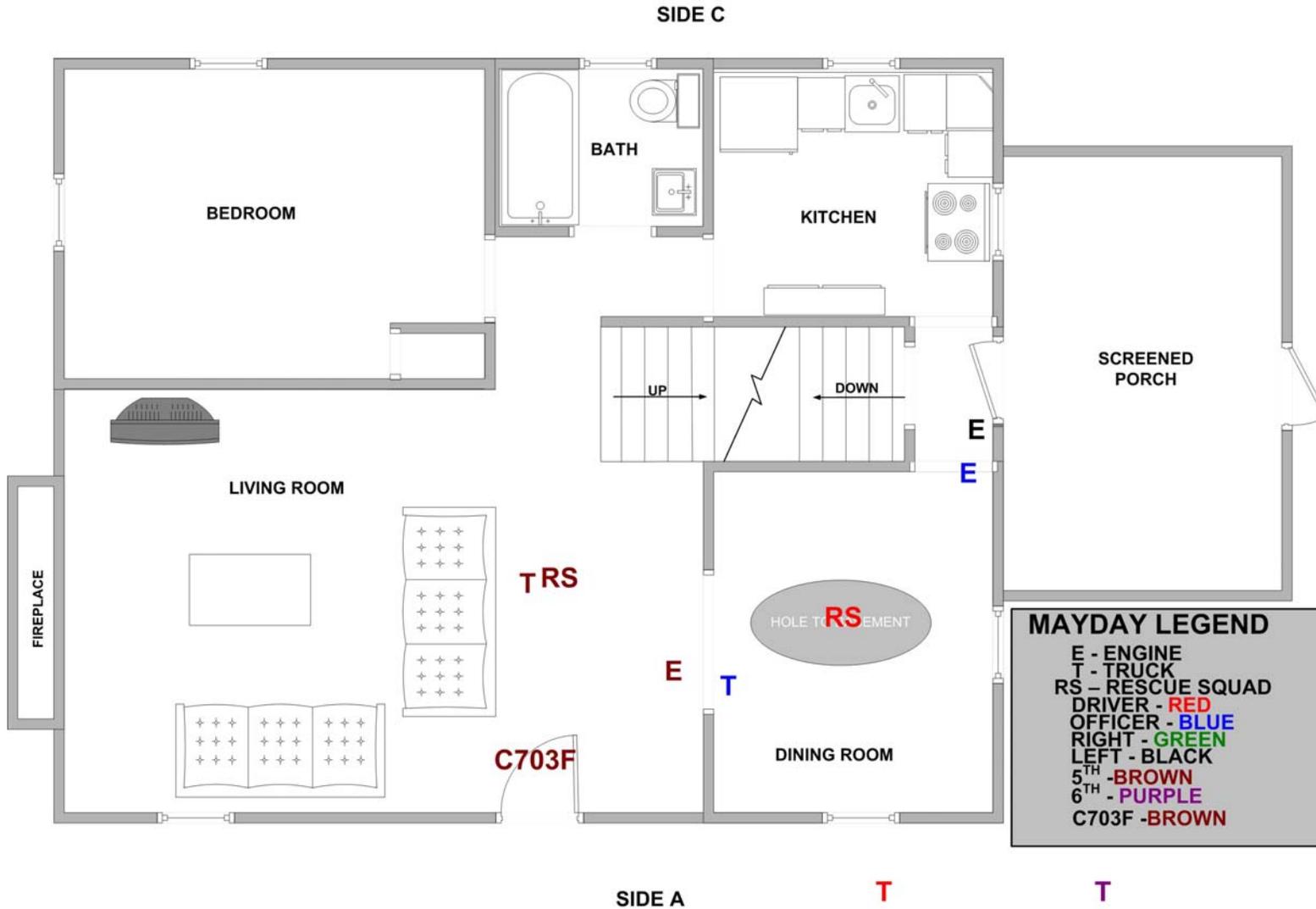


Mayday

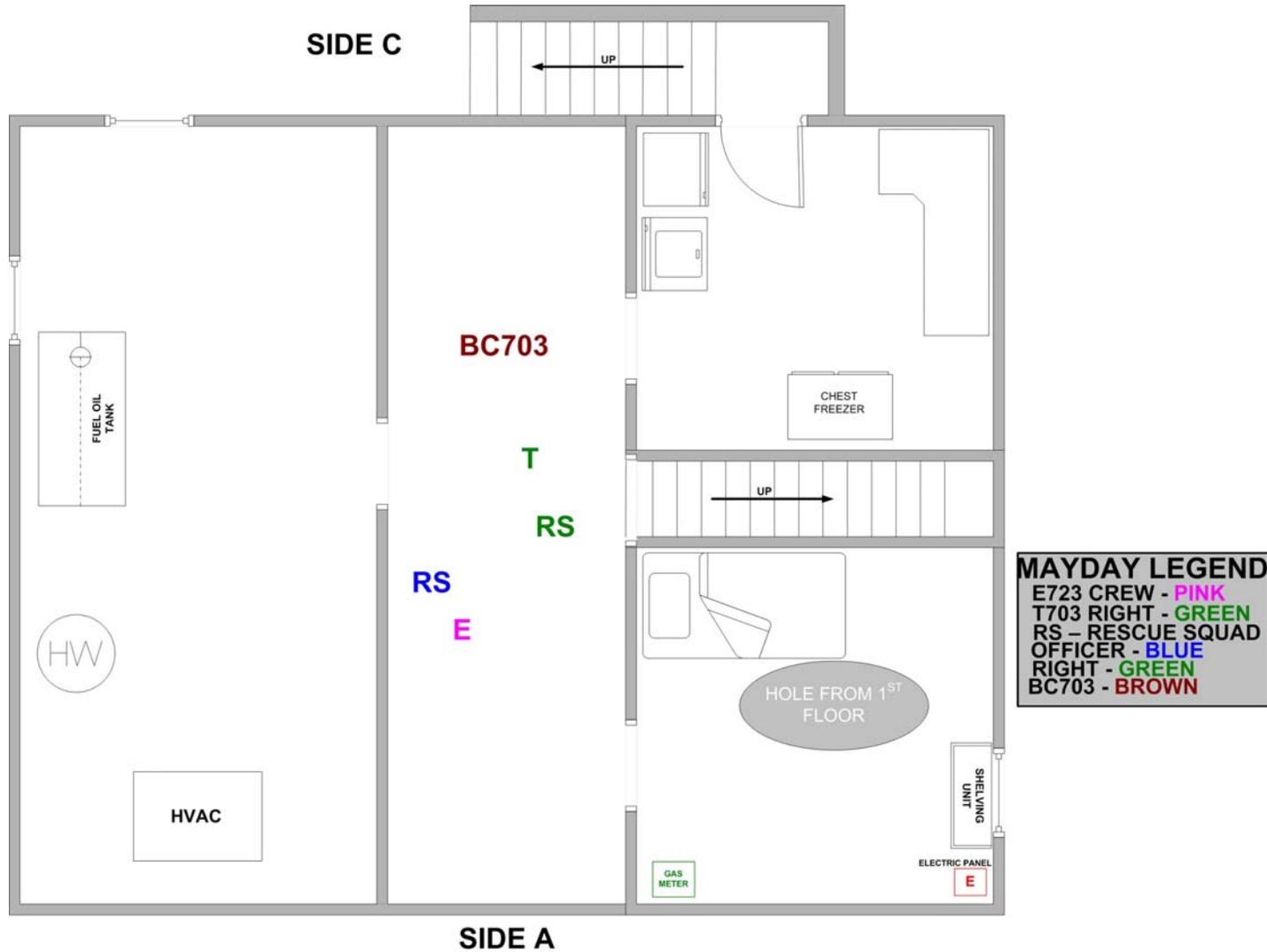
- Mayday Training
 - Upon hearing *Mayday*:
 - Many personnel on fire ground exited the house as natural reaction.
 - Several personnel automatically switch radio talk groups prior to being instructed to.
- Non Structure Fire Mayday Procedure
 - *Mayday* process is only outlined in SSSFFO.
 - Other FD operations expose personnel to similar dangers.



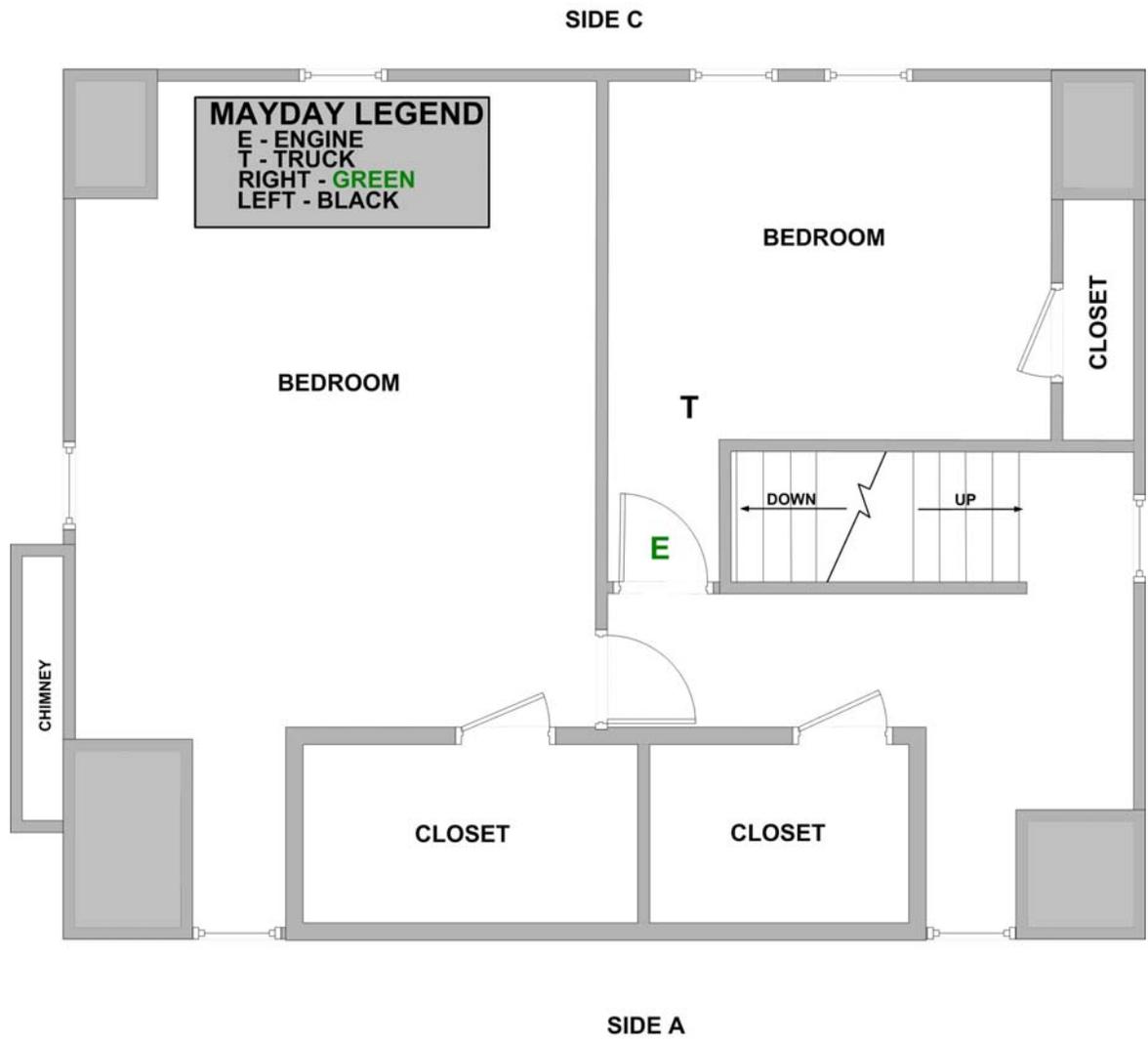
Mayday



Mayday



Mayday



Mayday Transmissions



Time	TG	Unit or Position	Message/Task
1:52:41	7C	T703	<i>Mayday, Mayday, Mayday.</i>
1:52:47	7C	CMD	<i>Command to the last message, repeat?</i>
1:52:52	7C	Div. 1	<i>Division 1 to command. The floor has given way on the first floor; I'm backing the guys out of Division 1 at this point.</i>
1:53:01	7C	CMD	<i>Commands direct.</i>
1:53:09	7C	RS742	<i>Rescue Squad 742's on the scene.</i>
1:53:18	7C	T725	<i>Tower 725's on the scene.</i>
1:53:22	7C	T703	<i>Mayday, Mayday, Mayday, this is Truck company 703.</i>
1:53:32	7C	CMD	<i>Command to Truck 703 go ahead with your Mayday.</i>
1:53:37	7C	T703	<i>Through the floor, at this time all I can tell you is we have several unaccounted for.</i>
1:53:50	7C	C703F	<i>Division 1, Division 1, all units in Division 1, I need you to back out now!</i>
1:53:57	7C	CMD	<i>Units on the fire ground, all units on the fire ground, switch to 7-Delta.</i>



Basement Window – SIDE DELTA



Window 16" high x 31" wide



Window 65" from clean floor



Mayday

Highlighted recommendations:

- Mayday Training
 - *Continuous training/refreshers on response/actions to **Mayday** for all personnel.*
- Non Structure Fire Mayday Procedure
 - *Create separate comprehensive MAYDAY Policy to cover non-structural fire operations.*



Communications

Immediate 3

- ***Mayday Pre-alert tone***
- ***Changing TG's during Mayday***

Short Term 3

- ***Radio Silence***
- **Battalion Aides**
- ***Mayday Task Force***

Long Term 1

- ***Tactical TG Communications***



Communications

- Mayday Pre-alert tone Pre-Alert  Alert 
 - SSSFFO states pre-alert tone will be sounded when a Mayday has been declared.
- Changing TG's / Radio Silence
 - Incident specific conditions dictate the IC's ability and the appropriateness when to have units switch TG's vs. radio silence.
- Mayday Task Force
 - ECC programming still includes Mayday TF.
 - Mayday TF was removed when SSSFFO was revised in Dec 2005.



Communications

Highlighted recommendations:

- Mayday Pre-Alert tone
 - *Change SSSFFO to state Alert tone not pre-alert tone.*
- Changing TG's / Radio Silence
 - *Revise SSSFFO to allow Incident Commander to have option of changing talk groups or declaring radio silence.*
- Mayday Task Force
 - *Remove option from CAD programming.*



Communications

- Tactical Talk Group Communications
 - Additional radios on fire ground/apparatus = more talk.
 - Multiple personnel interviewed expressed frustration about in-ability to transmit critical information due to radio chatter.
 - Between transmissions of Mayday and requests for LUNAR – many non critical transmissions.



Communications

Highlighted recommendation:

- Tactical Talk Group Communications
 - *Reduce non-critical radio transmissions.*
 - *FCGO #08-19 issued in December 2008.*



Personnel Training & Certification

Immediate 2

Short Term 1

Long Term 1

- E703 Staffing
- ***F/R Candidates Entering IDLH***
- ***Helmet Colors***



Personnel Training & Certification

- F/R Candidates Entering IDLH
 - Certification Standards for Training dictates that F/R Candidates can only enter IDLH atmospheres in training.
 - 2 personnel from E703 and 1 from RS703 were candidates and they entered the house.
- Helmet Colors
 - FCGO #05-10 outlines helmet colors for candidates and fire fighters.
 - No mention of recruits & common practice of red helmet designation is in-consistent.



Personnel Training & Certification

Highlighted recommendations:

- F/R Candidates Entering IDLH
 - *Candidates must remain out of IDLH's.*
- Helmet Colors
 - Amend FCGO and provide more clarity on color and its capabilities on fire ground/IDLH.



Equipment

Immediate 6

- MDC
- CAD Self Dispatch
- Headsets

Short Term 0

- ***SCBA's***
- ***Portable Radios***
- ***Thermal Imagers***

Long Term 4

- Hand Lights



Equipment

■ SCBA's

- Due to using RT716 (RA110) with 6 riding positions and AT703 having 5 positions/SCBA's.
- Due to SCBA repair/maintenance FS3 had sent three SCBA's in on October 1st .
- Result T703 had 6 riding positions and only 4 SCBA.

■ Portable Radio's

- E703, T703, RS703 had crew of 17 personnel, only 10 of which had radio assigned to position.
- Post incident battery found dead on RS703 Driver



Equipment

Highlighted recommendations:

- SCBA's
 - *Each riding position be provided a SCBA.*
 - *If needed stager SCBA flow testing to ensure SCBA for every riding position.*
- Portable Radio's
 - *Each riding position be provided a portable radio.*
 - *All portable radios should be checked when assuming riding position.*



Equipment

- Thermal Imagers
 - Neither T703 or RS703 crew included the Thermal Imaging Camera as part of the equipment carried on this event.

Highlighted recommendation:

- Thermal Imagers
 - *Include thermal imager as part of required equipment carried.*
 - *Equip all units, engines/aerials/rescue squads, with thermal imagers.*



Injured FF PPE & SCBA

Immediate 0

- PPE
- Uniforms

Short Term 1

- SCBA
- ***Patient Care***
- Burn Injury Cause

Long Term 2



Injured FF PPE & SCBA

- Patient Care
 - *EMS QA section reviewed patient care.*
 - *Roles/responsibilities of ALS unit on RIG unclear.*

Highlighted recommendation:

- Patient Care
 - *Amend SSSFFO to outline role/responsibilities of the ALS unit on the RIG.*
 - *Amend SSFFO to require an ALS be dispatched as part of RID.*



UL Video

- Structural Stability of Engineered Lumber in Fire Conditions.
 - Excellent video of fire conditions, floor collapse, that mimics this event

The screenshot shows a video player interface for a presentation titled "Structural Stability of Engineered Lumber in Fire Conditions". The player is displaying a video of a 2 x 10 Joist Floor assembly under fire conditions. The video shows a wooden floor assembly with joists and a top layer of material, surrounded by flames. The text "2 x 10 Joist Floor" is overlaid on the video. Below the video, there is a play button icon and the text "Click the button below to view the video." The player interface includes a progress bar at the bottom showing "SLIDE 34 OF 57" and "00:04 / 00:04". The browser address bar shows the URL "http://content.learnshare.com/courses/73/187716/player.html?". The browser title is "Structural Stability of Engineered Lumber in Fire Conditions - Windows Internet Explorer provided by Montgomery County - DTS". The browser status bar shows "Done" and "Internet". The Windows taskbar at the bottom shows the start button, several application icons, and the system tray with the time "5:00 AM".



Summary

- Multiple operational and administrative deficiencies that contributed to the chain of events that lead to significant fire fighter injury.
- SIIG hopes that MCFRS personnel take the opportunity to learn from the issues and recommendations in this Report.



Significant Injury Investigation Report



219 Frederick Avenue

October 2nd 2008

