



*Assisting Communities
With Their ISO Rating*

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A Report From

MIKE PIETSCH, P.E. CONSULTING SERVICES, INC.

To

THE CITY OF FERRIS

**Improving
The City of Ferris'
ISO Public Protection Classification**

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Submitted by:

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What is Insurance Services Office, Inc. (ISO)?

To help establish appropriate fire insurance premiums for residential and commercial properties, insurance companies need reliable, up-to-date information about a municipality's fire protection services. Insurance Services Office, Inc. (ISO) is the principal (and most precise) provider of this information through the Public Protection Classification (PPC) program.

What is the Public Protection Classification (PPC) Program?

ISO collects information on a community's public fire protection and analyzes the data using their Fire Suppression Rating Schedule (FSRS). ISO then assigns a Public Protection Classification from 1 to 10. Class 1 represents the best public protection, and Class 10 indicates less than the minimum recognized protection.

By classifying a community's ability to extinguish or control a structural fire, ISO assists communities in evaluating their public fire protection infrastructure. The program provides an objective, countrywide standard that assists communities in planning and budgeting for facilities, equipment, and training. By securing lower fire insurance premiums for communities with better public protection, the PPC program provides incentives and rewards for communities that choose to improve their firefighting services.

ISO has extensive information on more than 48,000 fire-response jurisdictions.

Explanation of the Fire Suppression Rating Schedule (FSRS)

The Fire Suppression Rating Schedule is the manual ISO utilizes in reviewing the firefighting capabilities of individual communities. This schedule evaluates the three major items comprising a community's fire suppression infrastructure and develops a numerical grading called a Public Protection Classification (PPC). The items considered are Fire Alarm, Fire Department, and Water Supply.

Fire Alarms

Ten percent of the grading point total is based on how efficiently calls for emergency service are received and dispatched. ISO Field Representatives will evaluate the communications center. They consider the number of operators at the center, the telephone service, including the number of telephone lines coming into the center, and the listing of emergency numbers in the principal telephone directory. Field Representatives will also evaluate the number of dispatch circuits and how the center notifies firefighters of an emergency.

Fire Department

Fifty percent of the grading point total is based on the infrastructure of the fire department. ISO reviews the distribution of fire companies throughout the graded area and verifies apparatus response to structural alarms of fire. The ISO Field Representative inventories each engine, ladder and service company, both in service and reserve, to verify the existence of nozzles, hose loads, breathing apparatus, and other major equipment. ISO will review the fire-company records to determine:

- Type and extent of training provided fire-company personnel
- Firefighter response to emergency calls for service
- Maintenance and testing of fire department's apparatus
- Engine, ladder and service companies availability for response to first alarm structural fires
- Location of companies to minimize response times to fire emergencies

Water Supply

Forty percent of the grading point total is based on the community's water supply, distribution system, and proximity of fire hydrants to existing structures. This item focuses on the community's ability to provide sufficient water supply for fire suppression beyond maximum daily consumption. ISO surveys all components of the water supply system, including pumps, storage, and filtration. Field Representatives will observe fire-flow tests at representative locations throughout the community to determine the rate of flow provided by the distribution system.

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Last, they count the distribution of fire hydrants no more than 1,000-foot hose lay distance from each needed fire flow (targeted structures).

Texas Addendum

Unique to the State of Texas is a document titled the Texas Addendum (sometimes called the Texas Exception). This document analyzes the effectiveness of the Fire Marshal and Building Code Offices and assigns additional credit for compressed air foam systems on in-service engines. A second section of this document assigns credit to communities that allowed a certain percentage of their firefighters to attend Fireman's Training School and volunteer firefighters that have obtained at least the basic firefighter certification.

Mathematically, this section could add an additional 11.39 points to a grading point total. Normally 4 to 7 additional grading points are achieved via the Texas Addendum.

The Effect of PPC Code on Fire Insurance Premiums

All insurance companies (whether they admit or not) utilize ISO's PPC classes in establishing premiums for both commercial and residential property policies. Here's how it works:

PPC and Commercial Fire Insurance Premiums

Insurers determine insurance premiums for commercial properties after analyzing size, construction type, occupancy, protection (such as fire extinguishers and automatic sprinklers), and exposure to adjacent structures. For individual properties, either class rating or specific rating applies. In class rating, the insurer develops rates for similar types – or classes – of buildings, such as small churches, schools, or motels.

Specific rating includes an on-site survey and analysis of conditions at the particular property to determine the premium rate. Insurers use specific rating for buildings protected by automatic sprinklers, buildings with specific hazards or processes, or other properties that do not meet the criteria for class rating.

Both class rating and specific rating consider the Public Protection Classification at the property. Insurers develop their rating systems in order that the lower (better) the PPC at a given commercial property, the lower the insurance rate.

ISO's Methodology

A community may request an ISO survey anytime they wish. At that time an ISO Field Representative will be assigned the survey. He will contact the community and set a time convenient to both the community and ISO. He will analyze the community's fire defenses as outlined under the "Explanation of the FSRS".

An extensive amount of support data will be required to verify answers to specific questions that are utilized to analyze the three major items that comprise a community's grading point total. When all the questions are answered and the support data is properly formatted the Field Representative will return to his office and complete the grading. When he completes the grading he submits it for review. After the review is complete the grading is then submitted to the community. If the community agrees that the data has been judged fairly the grading is forwarded to the State Fire Marshal's Office for their approval.

Once the State Fire Marshal's Office approves the grading the community is notified via a letter to the City Manager or Mayor of their new rating. This entire process normally takes around one year.

Explanation of Ferris' Study

This report will analyze a grading scenario that should result if the City of Ferris requested a rating review by ISO. This scenario will require that the City of Ferris operate 3 engine companies and 1 ladder/service (rescue) truck company out of the existing 2 fire stations. In addition a reserve engine and a reserve ladder/service (rescue) truck are also required.

Water supply must provide at least 3500-gpm for 3 hours while delivering a maximum daily consumption rate which has occurred during the last 3-years. Throughout the community the distribution system capacity and fire hydrant placement must meet the needed fire flow demand as determined by the ISO rating document.

The communications center will be analyzed based on NFPA 1221 as interpreted by ISO.

The Offices of the Fire Marshal and Chief Building Official will be reviewed based on the Texas Addendum. The Texas Addendum is a separate rating document developed by the Texas Department of Insurance and interpreted by the Texas State Fire Marshal. The Texas Addendum is not an ISO document.

At the conclusion of this scenario a list of suggested improvements will be presented which, if implemented, will improve the ISO Public Protection Classification for the City of Ferris.

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Executive Summary

Based on information obtained during my recent survey of the City of Ferris the fire department will be required by the ISO Fire Suppression Rating Schedule to deploy 3 engine companies and 1 ladder/service (rescue) truck company in-service available to respond to structural alarms of fire operating out of 2 fire stations. Throughout this report the word "company" implies both apparatus and staffing. A reserve engine and reserve ladder/service truck is also required.

At present the City of Ferris has the ISO equivalent of 2.64 engine companies {2 engine companies deployed by the Ferris Fire Department and a third engine company via an automatic aid agreement (which reduces the credit to 0.64 of an Ferris Fire Department engine company) with the City of Red Oak} and 0.12 of a ladder/service (rescue) truck company operating out of 2 fire stations. A reserve engine is not provided. An apparatus that will receive very little credit as a reserve ladder/service (rescue) truck is available.

Areas of significant deficiency within the *Fire Department* section are: Insufficient staffing for the in-service apparatus (by far the most significant deficiency within the entire process that develops the ISO grading point total for your community), a ladder/service (rescue) truck company is not provided, an incomplete training program, a reserve engine is not available, a reserve ladder/service (rescue) truck company is not provided, and a lack of a full complement of equipment for the in-service and reserve apparatus.

The *Water Supply* section demonstrates a fairly good grading point total (32.81 out of a possible 40). 2 items that demonstrate a deficiency are the lack of adequate distribution system capacities in a several areas of the city and the lack of a complete hydrant inspection program.

Fire Service Communications demonstrated the following deficiencies: A lack of a second dispatcher on-duty at all times in the communications center, the emergency power source provided for the communications center is not tested for at least 1-hour each week under a load, phone directory listings are incomplete, progression for fire department calls for emergency service is not provided, a secondary method for dispatching fire department calls for emergency service is not provided, and monitoring for integrity is not provided for the primary dispatch method.

Fire Safety Control has 3 areas of deficiency, 1 is extremely significant and must be corrected prior to an ISO survey. At least the 2003 edition of the International Fire and Building Codes must be adopted by ordinance and enforced throughout the city limits of the City of Ferris. The 2006 edition of the IFC and IBC would add additional grading points, but the 2003 is critical. The second deficiency is the fact that the exit drill reports for the schools within the city limits of the City of Ferris are not on file available for review. The third deficiency is: 1 engine is not

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compressed air foam equipped. I know compressed air foam is not part of fire safety control but this is where credit for compressed air foam was placed.

At present the City of Ferris has an ISO Public Protection Classification of 6 for areas afforded fire hydrant protection. My study indicates that the City of Ferris would achieve a **Class 4**, with Ferris' existing fire defense infrastructure (please see the accompanying information at the conclusion of this report), if the support data required by ISO was properly formatted and presented to the ISO Field Representative by my company.

The current classification is costing the commercial property owners within 5 road-miles of a City of Ferris fire station and 1000 feet of a fire hydrant a possible **7 per cent** on their property insurance. The residential property owners within 5 road-miles of a City of Ferris fire station and 1000 feet of a fire hydrant would save a possible **9 per cent** on their homeowner's insurance if an ISO PPC of 4 were attained.

If a sufficient number of the suggested improvements were implemented in order that an ISO PPC of 3 were attained the commercial property owners within 5 road-miles of a City of Ferris fire station and 1000 feet of a fire hydrant would save a possible 16 per cent (effect of lowering the PPC from a 6 to a 3) and the residential property owners within 5 road-miles of a City of Ferris fire station and 1000 feet of a fire hydrant would save a possible 11 per cent (effect of lowering the PPC from a 6 to a 3).

If a sufficient number of the suggested improvements were implemented in order that an ISO PPC of 2 were attained the commercial property owners within 5 road-miles of a City of Ferris fire station and 1000 feet of a fire hydrant would save a possible **18 per cent** (effect of lowering the PPC from a 6 to a 2) and the residential property owners within 5 road-miles of a City of Ferris fire station and 1000 feet of a fire hydrant would save a possible **19 per cent** (effect of lowering the PPC from a 6 to a 2).

As pointed out in the above paragraphs an ISO PPC of 3 is critical to the commercial property owners and an ISO PPC of 2 is critical to the homeowners.

If a sufficient number of the suggested improvements were implemented in order that an ISO PPC of 1 were attained the commercial property owners within 5 road-miles of a City of Ferris fire station and 1000 feet of a fire hydrant would save a possible **20 per cent** (effect of lowering the PPC from a 6 to a 1) and the residential property owners within 5 road-miles of a City of Ferris fire station and 1000 feet of a fire hydrant would save a possible **19 per cent** (effect of lowering the PPC from a 6 to a 1). Even though a Class 1 does not receive an

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appreciable reduction in insurance premiums over an ISO PPC of 2 it has been shown to be a valuable economic development tool.

As an example of the effect of an improved ISO PPC: Assume a homeowner's premium is \$2,000 per year and the ISO PPC improves from a 6 to a 4 resulting in a 9% reduction in the ISO PPC (the 9% reduction applies to the entire premium in Texas not just the fire portion as it does in other States). In this case the homeowner would see the entire \$180 reduction in annual premium if all endorsements (perils and property value) remained the same. This information is generated and updated by the Texas Department of Insurance and published by The Texas State Fire Marshal's Office; not ISO. Whereas \$180 per year does not seem like a significant amount of money; consider each home in the City of Ferris and extrapolate \$180 per year over the 20-year life span of an ISO PPC and that amount of money is significant to the citizens of your community.

Since the City of Ferris is presently a Class 6 a 2-class (6 to a 4) improvement would result if an ISO PPC of 4 was attained. Normally, all improvements 2 classifications or more are edited at ISO's Home Office in New York (much more severe edit) not ISO's Regional Office in Austin. I know this as fact; I edited these ratings for over 11 years. It has been my experience that an improvement of 2 classifications or more must move well into the new class in order to guarantee that it remains in that class after the review is complete.

I would not feel comfortable submitting a grading less than 63.00 to New York if a Public Protection Classification of 4 was the mission of the City of Ferris. If the mission of the City of Ferris were to achieve a Public Protection Classification of 3 the grading point total would need to exceed 73.00. The point total to exceed is 83.00 if a Public Protection Classification of 2 is to be achieved or 93.00 to attain an ISO PPC 1.

Analysis of the Grading

This report will analyze a grading scenario that should result if an ISO Public Protection Survey was requested. For this scenario a point total to 2 decimal places will result. This point total should occur if an ISO Public Protection Survey was requested. Presently the City of Ferris has been assigned an ISO rating of Class 6 (43.88 grading point total). My study indicates that the point total would be **60.44** (ISO PPC 4) if an ISO survey commenced with the City of Ferris' fire defense infrastructure, as it existed on June 4, 2009. Please see the accompanying grading summary at the conclusion of this report for the development of this point total.

At the conclusion of this scenario will be a list of suggested improvements, which, if implemented, would allow the City of Ferris to improve its ISO rating to a Public Protection Classification of 3, 2, or 1.

All of the suggestions are prioritized by their importance and tempered by their cost. These suggested improvements relate only to fire insurance classification for the City of Ferris. They are not for property loss prevention or life safety purposes and no life safety or property loss prevention suggestions are made.

Grading Scenario

The Basic Fire Flow will be 3500-gpm. Based on the existing fire defense infrastructure of the City of Ferris the point total for this scenario is **60.44 (ISO Class 4)**. Please see the grading summary at the conclusion of this report for a more detailed explanation. The grading point total of 60.44 will be the benchmark for improving this classification to **73.00 (Class 3)**, **83.00 (Class 2)**, or **93.00 (Class 1)**. The suggestions are as follows:

General

1. An excellent map exists which demonstrates the streets and fire hydrants within the city limits of the City of Ferris. Making sure each hydrant (public and private) available to the Ferris Fire Department is plotted on this map is critical to improving the ISO Public Protection Classification of your community. This suggestion is an **absolute**.
2. A second map must be developed that demonstrates the built-upon and non built-upon area with the desired graded boundary served by the Ferris Fire Department. This map must also demonstrate the areas within the city limits of Ferris that cannot be built upon (flood plain, golf course, lake, etc). This suggestion is an **absolute**. No point total will be demonstrated.

Please wait until phase 2 (preparing the pre-survey packet) before developing this map. It may not be required at that time.

4. Additional maps should be developed which are hybrids of the map discussed within suggestion #1 above. Each map below should have the streets, city limit boundary, fire stations, and fire hydrants along with the following:
 - a. Provide a third map with an overlay of the building footprints.
 - b. Provide a fourth map that distinguishes, within the building footprints, which buildings are afforded automatic sprinkler protection. Placing an AS within the building footprint of the buildings afforded automatic sprinkler protection is the method normally utilized by ISO.
 - c. Provide a fifth map that distinguishes, within the building footprints, any buildings that is 3-story or greater in height. The number of stories for each structure should be shown within the building footprint.

Fire Department

For a community to provide a reasonable level of protection under the analysis system used, a fire department should have suitably located apparatus of proper types. In general, the maximum response distances for the first due engine company should not exceed 1.5-miles and for the first due ladder/service truck company should not exceed 2.5-miles. Critical to the timely extinguishment or control of a fire is the need for sufficient firefighters arriving with the first responding apparatus. A comprehensive training program for these firefighters is essential for effective fire ground operations.

At the present time, the apparatus needs of your community under the ISO rating document would be reasonably satisfied by maintaining 3 engine companies and 1 ladder/service (rescue) truck company in-service available to respond to first alarm structural fires. A reserve engine and a reserve ladder/service (rescue) truck are also required.

The following suggestions are offered for your consideration:

1. The Ferris Fire Department has access to 2 fully ISO compliant training facilities in the City of De Soto and the City of Waxahachie. However, utilizing either facility for multi-company drills would strip the City of Ferris's existing fire protection to an unacceptable level. To receive ISO rate credit for training field evolutions all drills must include the firefighters with their apparatus. Therefore, this report suggests providing the Ferris Fire Department with a suitable training facility. This facility must have a 4-story drill tower, a fire resistive fire building, and a flammable liquids pit (demonstrating flammable liquids fire containment and extinguishment via videos is acceptable in lieu of the flammable liquids pit). This facility must be at least a 2-acre site. This report suggests several fire hydrants should be located at the training facility in order to demonstrate proper fire methods. However, these hydrants are not required by the ISO Rating Document.

Many communities share a training facility proximate to each community involved in the sharing arrangement. Erecting the suggested training field approximately ½-way between the cities of Red Oak and Ferris would be the most cost effective to the cities of Ferris and Red Oak along with Ellis County ESD #5. A training facility erected in the ESD within 5-road miles of the city limits of both Ferris and Red Oak would be creditable to all 3 communities based on the ISO rating document. ESD's throughout Texas have utilized this concept to offset costs and then rent their facility to communities that are not part of the sharing arrangement to offset maintenance and fuel costs associated with the training facility.

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To obtain ISO credit this facility must be utilized. As a minimum, 8 drills of 3-hour duration should be accomplished for each firefighter (both paid and volunteer) on an annual basis. These drills must be at the training facility or suitable offsite location. 4 of these drills must be multi-company; the remaining 4 drills can be single-company or multi-company. 2 of either type must be at night. Records must be maintained documenting the drills for full credit. If this was accomplished the grading point total would be improved by **4.73 points**. At present training field evolutions at a training facility have not been performed during the last calendar year.

2. The City of Ferris could receive additional credits allotted to the grading point via the Texas Addendum by allowing a percentage of their firefighters to attend the annual weeklong Fireman's Training School in College Station, Texas. Based on paid or volunteer members of the Ferris Fire Department attending the weeklong session of Fireman's Training School 3.26 additional grading points are available to the City of Ferris via the Texas Addendum. Attendance at Fireman's Training School could be a very important tool in improving the ISO Rating for the City of Ferris. Each paid or volunteer member of the Ferris Fire Department attending the spring or summer session of Fireman's Training School as a student or instructor will **add approximately 0.14 points** to the grading point total. In addition volunteer members of the Ferris Fire Department that receive at least the basic volunteer certification will receive an additional **0.17 points**. This credit is available within the body of The Texas Addendum *not* the Fire Suppression Rating Schedule.
3. Increase the company training in and around the fire station to 20 hours per member per month. These drills should be a minimum of 1-hour in duration. This will **add 1.02 points**. At present each member of the Ferris Fire Department (when averaged between the paid and volunteer firefighters) receives the ISO equivalent of approximately 11-hours of company level drills per month.
4. The City of Ferris is to be commended for providing each engine in-service with 1000-feet of 5-inch hose. This suggestion is an absolute. Without this hose attaining an ISO rating of 3 or better will not be possible.
5. Provide the Ferris Fire Department with a fully equipped ladder/service (rescue) truck. The list of the required equipment is demonstrated in suggestion #6 in the fire department section. If this apparatus and equipment were provided **7.34 points** would be added to the grading point total.
6. The following equipment is required for each engine and ladder/service (rescue) truck. The equipment that is the most heavily weighted within the ISO Rating Document is denoted by an asterisk.

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- a. Engines in-service and reserve:
1. 1000-feet of 5-inch hose (reserve engines require only 800-feet of 2, 2.5 or 3-inch hose in lieu of the 1000-feet of 5-inch)*.
 2. 400-feet of 2, 2.5, or 3-inch hose*.
 3. 300-gallon or larger booster tank.
 4. 200-feet of booster (redline) hose or 200-feet of pre-connected 1.5-inch or 1.75-inch hose.
 5. 400-feet of 1.5 or 1.75-inch hose*.
 6. 200-feet of spare 1.5 or 1.75-inch hose (may be on the apparatus or in the fire station).
 7. 200-feet of spare 2.5 or 3-inch hose (may be on the apparatus or in the fire station).
 8. A heavy stream device (monitor – ground or portable) capable of delivering 1000-gpm*.
 9. A large spray nozzle for the heavy stream device (may be carried on the engine, ladder or ladder/service vehicle for full credit)*.
 10. A distributing, piercing or cellar nozzle.
 11. Foam eductor or a built-in foam pro-portioning system.
 12. 10-gallons of foam concentrate via a built-in tank or in 5-gallon containers.
 13. 15-gallons of foam concentrate in reserve. This can be on the apparatus or in the fire station.
 14. 2, 2.5-inch shut-off straight stream nozzles attached to a play pipe capable of delivering at least 250-gallons per minute*.
 15. 2, 1.5 or 1.75-inch combination nozzles*.
 16. 2, 2.5-inch combination nozzles*.
 17. 4 self contained breathing apparatus (minimum of 30-minute capacity)*.
 18. 4 spare cylinders (minimum capacity of 30-minutes).
 19. 2, 12 x 14-foot salvage covers.
 20. 2 hand lights (flashlights are not creditable).
 21. 1, 2.5 or 5-inch hose clamp.
 22. 1 hydrant hose gate (2.5-inch). A gated wye (2.5-inch x 1.5-inch x 1.5-inch) is creditable.
 23. Gated wye (2.5-inch x 1.5-inch x 1.5-inch).
 24. Mounted radio*.
 25. Portable radio*.
 26. 24-foot extension ladder*.
 27. 12 or 14-foot roof ladder.
- b. Ladder/Service (Rescue) Trucks in service and reserve:

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1. Large spray nozzle (500-gpm minimum - may be carried on engine)*.
2. 6 self-contained breathing apparatus (minimum of 30-minute capacity)*.
3. 6 spare cylinders (minimum capacity of 30-minutes).
4. 10, 12 x 18-foot salvage covers.
5. Electric generator (minimum of 2.5-kw)*.
6. 3 portable flood lights.
7. 1 smoke ejector or positive ventilation fan*.
8. 1 oxy-acetylene cutting unit (a thermal imaging camera, plasma cutting unit or chain saw with a carbide tip will substitute)*.
9. 1 power saw*.
10. 4 hand lights (flashlights are not creditable).
11. A hose hoist or hose roller.
12. 6 pike poles (2 @ 6-feet, 2 @ 8-feet, 2 @ 12-feet).
13. Mounted Radio*.
14. Portable radio*.
15. 1, 14-foot extension ladder.
16. 1, 10-foot collapsible (attic) ladder.

Substitutions exist for some of the above required equipment. Please contact my company for assistance as part of the contract for this report. If each of the in-service and reserve apparatus were fully equipped as outlined above **0.83 points** would be added to the grading point total.

7. Provide the Ferris Fire Department with a reserve ladder/service (rescue) truck if an existing apparatus is available for reserve status. An alternative to providing this reserve apparatus is the development of an agreement (memorandum of understanding) with a neighboring community that has a *reserve ladder/service (rescue) truck or ladder truck (elevating platform or aerial ladder)* available which, would allow the Ferris Fire Department to utilize their apparatus if the ladder/service (rescue) truck provided the Ferris Fire Department was out-of service. There is not a distance restriction on this sharing arrangement. Providing this reserve ladder/service truck or ladder truck would **add 1.08 points** to the grading point total. Oddly enough this apparatus is required by ISO even if the Ferris Fire Department does not deploy a dedicated ladder/service (rescue) truck.
8. This report will not suggest providing a reserve engine unless an existing apparatus is available for reserve status. However, a recent technical decision has been adopted by ISO that allows communities to share reserve apparatus. There is not a distance restriction on this sharing arrangement. If a community with a reserve engine would enter into a

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sharing agreement with the Ferris Fire Department, whereas the Ferris Fire Department could utilize the reserve engine if needed, full credit would be granted by ISO. If this sharing arrangement was documented approximately **0.70 points** would be added to the grading point total for the City of Ferris.

9. The single most deficient item within the entire rating process for the City of Ferris is the lack of firefighters responding to structural alarms of fire. The ISO Rating Document requires that 6 firefighters per company be on duty with each existing engine and ladder truck with 3 firefighters required on-duty for each existing ladder/service (rescue) truck. This level of staffing is needed at the fire site for optimum utilization of the apparatus, and when the staffing level drops below 4 firefighters per company (2 firefighters for the ladder/service {rescue} truck company), the ability to utilize the apparatus effectively is seriously impaired.

For a volunteer fire department the maximum credit than can be attained is the equivalent of 4 career firefighters on duty. The volunteer equivalent of 4 career firefighters is 12 volunteers responding to structural alarms of fire. For the City of Ferris to meet this requirement an average of 30 volunteers should respond to all structural alarms of fire. This level of volunteer response normally is associated with a volunteer roster of approximately 70 firefighters. It is unrealistic to believe the City of Ferris could attract this level of volunteer participation based on the City of Ferris's present population. Therefore, improvement in staffing levels should be developed via paid firefighters.

I would deem this report incomplete unless I point out that no fire department in Texas maintains 6 firefighters per company on-duty with each of the first due apparatus. However, many communities strive to maintain a minimum of 4 firefighters on duty with each of the existing engine and ladder truck companies (2 firefighters for the ladder/service {rescue} truck company).

Several alternatives exist to increase the staffing within the Ferris Fire Department. The first is a duty-crew. The duty-crew is a group of volunteers who are on-duty at a specified fire station during certain hours of the day. A duty-crew member receives the identical credit as a paid firefighter. The hours a duty-crew member is on-duty at the fire station are prorated. For example: 6 duty-crew members on duty 28-hours per-week are the equivalent of 1 paid firefighter. To receive ISO rate credit sufficient documentation must be available demonstrating when duty-crew members are on-duty.

A second method to improve the level of fire department staffing is increasing volunteer response to first alarm structural fires. This normally

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requires increasing the base of volunteers in order that more volunteer firefighters are available to respond. Normally 30 to 60% of the volunteer base responds to first alarm structural fires. Most likely this is not a viable option for the City of Ferris.

A third method of improved fire department staffing levels is the provision of additional paid firefighters. The paid firefighters can be on-duty 24/7 or certain hours of the day when volunteer response is normally at a low level. Paid firefighters on-duty a certain number of hours per day are prorated. For example: 2 paid firefighters on duty 12-hours per day, 7 days per week is the equivalent of 1 paid firefighter on-duty. These additional paid firefighters could perform maintenance duties, prepare the preplans, and assist with the Fire Marshal's building inspections as available. This would take most of the maintenance, preplanning, and building inspection responsibilities away from the volunteer firefighters and allow the volunteer members of the Ferris Fire Department more time at work or home. In most situations this increases the number of volunteers willing to join the fire department.

Each paid firefighter or duty-crew member on-duty 24/7 would **add 1.14 points** to the grading point total.

Each volunteer firefighter or off-duty paid firefighter captured on the incident reports as responding to first alarm structure fires would **add 0.38** to the grading point total.

Please note that there exists a possible 15 points available for staffing. The City of Ferris received only 4.42 of these 15 available points.

Receiving and Handling Alarms of Fire

In order to assure a timely response to fire emergencies a communications center must have adequate telephone facilities (emergency and business circuits) for the public to report emergencies, sufficient operators on duty, and the facilities to dispatch fire department companies without interruption.

The following suggestions are offered for your consideration:

1. Provide additional personnel for the communications center in order that 2 dispatchers and 1 supervisor are maintained on-duty at all times. These must be 3 separate individuals to optimize the ISO rate credit. A supervisor cannot be an on-duty dispatcher and receive dual credit as a dispatcher and a supervisor during the same shift. The dispatchers must be in the communications center while the supervisor must be in the communications center building to be credited by ISO as on-duty. Based on the annual call volume of approximately 9,632 calls for service (Fire EMS, and Law Enforcement) NFPA 1221 and the ISO Rating Document require this level of staffing. At present the ISO equivalent of 1 dispatcher and 1 supervisor are on-duty at all times in the communications center. If these additional personnel were assigned to the communications center **0.99 points** would be added to the grading point total. This item can be prorated therefore each additional dispatcher or supervisor provided will increase the grading point total.
2. Properly list the emergency and business number for the fire department in the business white pages or government pages of the primary phone directory under the title "City of Ferris". If these listings were provided **0.10 points** would be added to the grading point total.
3. Provide progression for the emergency circuit in order that the third and above calls for emergency service would progress (rollover) to a business line. If progression was provided **0.10 points** would be added to the grading point total.
4. Test the emergency power source at the communications center weekly for 1-hour under a load. If this level of testing was performed **0.25 points** would be added to the grading point total.
5. Provide a second independent method to dispatch fire department emergency calls for service. With a fire department annual call volume of greater than 730 calls for service 2 independent dispatch methods are required by the ISO rating document and NFPA 1221. If this second

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independent method were provided **1.75 points** would be added to the grading point total.

6. Provide the primary fire department dispatch circuit with monitoring for integrity. This requires a visual and audible alert be activated if a principal component of the dispatch circuit is rendered inoperable. To receive credit under the ISO Rating Document the following must be satisfied: Please note that any requirement followed by an N/C results in *no credit* for this monitoring even though all the other items are provided. The items without an N/C must be available for full credit. Pro-rated credit is available for the items without an N/C.
 - a. A list of the principal components of the primary dispatch circuit that are monitored must be provided: **N/C**
 - b. All portions of the circuit and all components must be identified for integrity status/failure condition. In addition all circuit components must be monitored for power supply and emergency power integrity/failure with both visual and audible trouble signals: **N/C**
 - c. Power supply and emergency power integrity/failure condition must be monitored for the circuit and all components at all locations including remote radio transmitter/receiver antenna sites. **N/C**
 - d. All portions of the circuit and all components must be identified for integrity status/fault condition and all circuit components must be monitored for power supply and emergency power integrity/failure with visual and audible trouble signals. **N/C**
 - e. Verification of visual signal activation with test circuit failure feature as specified in NFPA Standard 1221 must be provided.
 - f. Verification of audible signal activation with test circuit failure feature as specified in NFPA Standard 1221 must be provided. The audible trouble signal can be an intermittent or continuous tone or buzzer.
 - g. Verification of reactivation of audible trouble signal when an additional fault condition occurs while previous silenced fault condition remains active as specified in NFPA Standard 1221 must be provided.
 - h. Trouble signals routed to a dedicated display screen or panel not used for routine dispatching activities as specified in NFPA Standard 1221 must be provided.

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- i. Trouble signals must be displayed at a location where personnel are in constant attendance and are responsible to respond to a trouble signal as specified in NFPA Standard 1221. **N/C**
- j. For radio circuits duplicate transmitters must be provided for the primary dispatch circuit as specified in NFPA Standard 1221. **N/C**

Providing this level of monitoring would **add 1.50 points** to the grading point total.

Water Supply

For a water supply works to be considered adequate under the analysis system used, it should be able to deliver the basic fire flow (3500-gpm) for a 2-hour period and during that period provide consumption demands at the maximum daily rate.

The arterial mains and secondary feeder mains should be of sufficient capacity to deliver the needed fire flows throughout the community. The arterial mains should extend to all areas of the community; they should be looped for mutual support and spaced at approximately 3000-foot intervals or less. The minimum size distribution main should be 6-inches (8-inches is preferred) in diameter and this size used only in widely spaced residential areas when the gridiron is such that there is not over 600-feet between connections to other mains. A 6-inch dead-end main is not considered satisfactory for supplying fire hydrants. A minimum size of 8-inch pipe (10-inch is preferred) should be used in commercial and high-density residential areas and this size pipe should be limited to areas with an excellent gridiron. This will help insure meeting the corresponding fire demand throughout the community.

Before the water supply available can be fully utilized by the fire department, there must be sufficient fire hydrants in the vicinity of the subject buildings. The number of hydrants required varies with the fire flow demand but when the spacing is not over 300-feet in commercial, industrial, and institutional areas and not over 600-feet in one and two family dwelling areas, sufficient hydrants normally will be available. Hydrants should conform to the American Water Works Association Standards. The connection from the distribution main to the hydrant should be not less than 6-inches in diameter. All hydrants should be inspected twice per year with a pressure test (a pressure test is not a flow test); complete records should be kept of all inspections.

The following suggestions are offered for your consideration:

1. Improving arterial looping, distribution system gridirons, and hydrant distribution will help improve the water supply item of the grading (35 points are available within this item). This is the most heavily weighted item within the development of the grading point total. There exists a possible **6.35 points** available within this grading item. The results based on a flow-testing program throughout the city limits of the City of Ferris will be the single most critical item within the entire grading process for the City of Ferris. A quantitative method does not exist to analyze prospective improvements in this aspect of the grading until such improvements are implemented; therefore, no additional point total will be shown.

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2. Fire hydrants should be inspected semi-annually with proper records maintained throughout the city limits of the City of Ferris. Each hydrant should be pressure tested semi-annually (a pressure test is **not** a flow test) as part of the hydrant inspection process. If this level of hydrant inspections were provided **0.84 points** would be added to the grading point total. At present hydrant inspections are performed annually with a pressure test.

Fire Safety Control

The consistent, systematic application of fire safety control regulations combined with a good public education program in fire prevention can be an important factor in reducing the overall incidence of fire and the consequent fire losses. Successful execution of such programs necessitates that a sufficient number of properly trained personnel be provided. A nationally recognized body of model fire prevention, building and safety codes represent the combined knowledge of many experts in this field and, when adopted with little or no modifications, affords a community the opportunity for reasonable control of hazardous materials and building construction.

The following suggestions are offered for your consideration:

1. The City of Ferris should update the International Fire Code and Building Code to at least the 2003 edition. Without at least the 2003 edition of the International Fire and Building Code adopted by ordinance and enforced throughout the city limits of the City of Ferris improving the ISO PPC to a 3, 2, or 1 will be very expensive. Having the 2006 edition of the International Fire and Building Code allows additional credits. **2.27 points** will be added to grading point total via the Texas Addendum if the 2006 edition of the International Fire and Building Codes are adopted by ordinance and enforced throughout the city limits of the City of Ferris. However, having at least the 2003 edition of the ICC body of codes adopted and enforced will guarantee that credits will not be lost within the body of the ISO rating document. This report assumes that the 2003 edition of the International Fire Code is adopted and enforced throughout the city limits of the City of Ferris for the development of the grading point total based on the ISO rating document. The 2.27 points to be gained would be added to the grading point total via the Texas Addendum.
2. The Office of the Fire Marshal serving the City of Ferris should maintain the fire exit drill reports on file for each school within the city limits of the City of Ferris. At present these drill reports are not available for review. If the drill reports were available for review for the past 3 school years **1.50 points** would be added to the grading point total.
3. Provide a compressed air foam system for 1 of the existing 2 engines. ISO will require that 1 engine equipped with a compressed air foam system responds to all structural alarms of fire within the city limits of the City of Ferris. Providing the compressed air foam unit to an in-service engine would **add 1.50 points** to the grading point total via the Texas Addendum.

Summary of Suggested Improvements

When a sufficient number of the suggested improvements are implemented, hence the point total exceeds the number 73.00, I would feel comfortable requesting a future survey if the mission of the City of Ferris is to obtain an ISO Public Protection Classification of 3.

The point total to exceed is 83.00 if the mission of the City of Ferris is to obtain an ISO PPC of 2 or 93.00 if an ISO PPC 1 is to be attained.

Action Plan # 1: Attain an ISO PPC 4 or 3 prior to January 2010:

1. Implement the suggested improvements that require very little capital expenditures, such as: Improved documentation, adoption of an up-to-date fire and building code, preplanning, maintaining the fire exit drills on file for the schools, etc., in order that the grading point total is maximized within the budget constraints of the City of Ferris.
2. Request a survey date from the ISO Field Representative presently assigned the City of Ferris. Once he has been contacted; initiate a request for his pre-survey packet. Please do not contact ISO's regional office in Austin. Since a Field Representative is already assigned to the City of Ferris this will only confuse the clerks which answer all calls at the ISO Austin office. No one familiar with the Public Protection arm of ISO is part of the staff which handles inquiries concerning ISO at the ISO Austin Office. This packet is extremely time consuming and tedious to complete. I know as I designed this packet in 1997 for all Field Representatives throughout the United States. My assistance would save City Officials a considerable amount of time in filling out this packet. In addition the ISO Field Representative will have the extensive amount of required support data properly formatted to maximize Ferris' ISO rating.
3. Set a mutually convenient time for the City of Ferris and the ISO Field Representative to complete the ISO rating survey for the City of Ferris. The information transfer would proceed effortlessly if I assisted the City of Ferris throughout the survey process. This will save your City Officials a great deal of time and allow them to continue their normal daily activities and assures the ISO Field Representative will have the exact information he requires.

Action Plan # 2: Attain an ISO PPC of 3, 2 or 1 within 3 years:

1. Complete the suggested improvements that are economically feasible within the budget constraints of the City of Ferris that require significant capital expenditures. These would include the a training facility and its utilization, along with improving the Fire Department infrastructure via additional apparatus and staffing.
2. Request a survey from ISO. Once a Field Representative is assigned to the City of Ferris the City of Ferris should initiate a request for a pre-survey packet. This packet is extremely time consuming and tedious to complete. I know as I designed this packet in 1997 for all Field Representatives throughout the United States. My assistance would save City Officials a considerable amount of time in filling out this packet. In addition the ISO Field Representative will have the extensive amount of required support data properly formatted to maximize Ferris's ISO rating.
3. Set a mutually convenient time for the City of Ferris and the ISO Field Representative to complete the ISO rating survey for the City of Ferris. The information transfer will proceed effortlessly if I assisted the City of Ferris throughout the survey process. This will save your City Officials a great deal of time and allow them to continue their normal daily activities and assures that the ISO Field Representative will have the exact information he requires.

Conclusion

Accomplish as many improvements as possible that will have a significant impact on the emergency response and the ISO Rating for the City of Ferris. When these are implemented, request an ISO survey.

I appreciate the opportunity afforded me by the City of Ferris and would like to express my thanks to Mr. Eddie Duran and Mr. Kyle Taylor with the Ferris Fire Department, Mr. Tom Manning for assisting with the map preparation, and Mr. Kevin Bowles with the Ferris Water Department. Without their excellent cooperation the accuracy of this report would be seriously compromised.

I look forward to working with your community in the future.

Sincerely,

W. Michael Pietsch, P.E.
Civil Engineer

WMP/sp

Grading Summary Sheet

The City of Ferris

Classification 4 – 60.44

I.	Receiving & Handling Fire Alarms:		<u>Total 5.31, Maximum = 10</u>
	a.	Item 414 - 1.70	2
	b.	Item 422 - 2.01	3
	c.	Item 432 - 1.60	5
II.	Fire Department		<u>Total 26.78, Maximum = 50</u>
	a.	Item 513 - 8.07	10
	b.	Item 523 - 0.49	1
	c.	Item 532 - 4.50	5
	d.	Item 549 - 0.67	5
	e.	Item 553 - 0.06	1
	f.	Item 561 - 2.37	4
	g.	Item 571 - 4.42	15
	h.	Item 581 - 4.41 + CTT = 1.79	9
III.	Water Supply		<u>Total 32.81, Maximum = 40</u>
	a.	Item 616 - 28.65	35
	b.	Item 621 - 1.86	2
	c.	Item 631 - 2.30	3
IV.	Divergence*	-5.69	
V.	Addendum	<u>1.23</u>	Maximum = 6.50
	<u>Ferris's Total:</u>	<u>60.44</u>	<u>Maximum = 106.50</u>

THE CITY OF FERRIS GRADING SUMMARY

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Fire Suppression Rating Study for the City of Ferris

VI.	<u>Total:</u>		<u>Maximum Credit:</u>
	Fire Alarm	5.31	10.00
	Fire Department	26.78	50.00
	Water Supply	32.81	40.00
	Divergence*	-5.69	
	Addendum Credit	<u>1.23</u>	<u>6.50</u>
	Ferris's Total	60.44	106.50

Class 4

<u>Credit</u>	<u>Relative Classification</u>
90.00 - 100.00	1
80.00 - 89.99	2
70.00 - 79.99	3
60.00- 69.99	4
50.00 - 59.99	5
40.00 - 49.99	6
30.00 - 39.99	7
20.00 - 29.99	8
10.00 - 19.99	9
00.00 - 9.99	10

*Divergence is a reduction in credit to reflect a difference in the relative credits for Fire Department and Water Supply.

THE CITY OF FERRIS GRADING SUMMARY