HUITT-ZOLLARS

Town of Fairview

Collin County, Texas

Fire Station #1 - Condition Assessment Report

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Town of Fairview, Collin County, Texas

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SECTION ONE: EXECUTIVE SUMMARY

Fire Station #1 at 500 State Highway 5 is a collection of 5 buildings of various ages and construction. The facility includes a wood framed residential structure which has been converted into offices and sleeping quarters, a CMU block framed carport addition utilized for kitchen, dining area and storage, a wood framed addition currently occupied by the Public Works Department and a wood framed with sheet-metal roofing and siding building with three apparatus bays and a work-out/weight room and an expansion with one larger apparatus bay (see floor plan in Appendix A).

Huitt-Zollars was asked to assess the general condition of this facility and identify any short term or long term repairs/maintenance which might be necessary to extend its useful life. Additional an ADA Compliance Evaluation (see appendix B) was performed to identify any current deficiencies.

Huitt-Zollars staff conducted a site visit to visually observe and document all major building systems and assess their current physical, operational and cosmetic condition. The findings and observations are documented by discipline. Based on our observations and the conditions noted for the Architectural, Structural, HVAC, Plumbing, Electrical Systems and considering the ADA deficiencies documented it is our opinion the current facility is beyond its useful service life with our a major renovation..

To help assess the potential costs associated with addressing the deficiencies we prepared an opinion of probable construction cost for the Architectural, Structural, Mechanical, Plumbing and Electrical repairs not including the potential ADA deficiencies. These will only need to be addressed if repairs are made. The total is approximately $ 570,000. (see Appendix C). This list can be prioritized based on your budget and goals. Swing Space (bunk rooms, restroom, showers, day room & kitchen) to allow the station to continue to function during repairs are estimated to cost between $ 80,000 and $ 100,000 for an 800 sf modular structure.

Based on our findings and the need for Fire Station to be able to serve the community it is our recommendation that planning and programming of a replacement facility be considered. Understanding this will take time and the existing facility will remain occupied in the short term also recommend establishing a working budget and addressing the most urgent life-safety and code issues identified.

SECTION TWO: ARCHITECTURAL

GENERAL DISCRIPTION OF FACILITY

The existing Fire Station #1 at the Town of Fairview is a single story slab on grade structure at 500 State Highway 5. The facility has various sidewalks and an asphalt parking lot for employees. It has a secure fence around portions of the facility. A public works facility is directly to the East. The original building was constructed in the 1960's and is a residential type facility. This brick and wood framed structure has a low slope, gable, with a composite shingle roof. In the 1980's an existing wood framed carport was enclosed by concrete masonry units to create the first addition to this facility. The first addition included a metal roof system that is approximately three foot higher than the original roof. In the 1990's another addition was added by enclosing another carport. The addition is wood framed with siding and has a slightly lower roof line that is composite shingles. The last addition to the facility was a wood framed high eave building with a metal panel wall system and metal panel roof system. The approximate square footage for all the additions is 8,800 square feet. Over the life of the building it has housed the Fire Department, City officials, Public Works, and the Police Department. It is currently is being utilized as a Fire Station and Public Works facility. The Police department and City officials no longer reside there.

Photo A1. Arial Site Plan

ARCHITECTURAL OBSERVATIONS

The facility is useable, but there are a number of heath, life safety, welfare, accessibility and maintenance concerns that are apparent. Some of the concerns are measurable, some are not measurable by costs or easily corrected. A fire station is a first response facility that is vital to serving the community in the event of a disaster or emergency. These types of facilities are assigned importance factors in the building codes that require them to be designed to a higher building standard in order to ensure the likely hood the employees and facility can maintain operations during a disaster. This existing facility does not meet this criterion currently, but should.

Photo A2. Building Additions

A large portion of one of the latter additions is where the ambulance, engines and apparatuses are stored inside. The exhaust fumes from these vehicles when entering or exiting the bays migrate into the corridor, fitness room, recreation space and offices. This is an unhealthy condition that is being created. The wall that separates the vehicles from the administration spaces is not a rated partition, or properly sealed, but should be.

Photo A3. Apparatus Bays

The kitchen area that serves the occupants on each shift has a number of potentially unsanitary condition.

- The door to Shower #1 and a toilet opens directly into the space where food is being prepared.
- A washer and dryer are operated in the kitchen creating an unsanitary condition where food is being prepared.

Photo A4. Kitchen Area

The corridors are very narrow. There are several steps through-out the facility at each addition to address changes in the floor elevation creating trip hazards. The spaces are small, confining and dark. There are very little exterior windows for natural day lighting. As you walk-thru the spaces the materials for the flooring, walls and ceiling make drastic changes. There are many spaces not being utilized, such as offices and storage areas. This makes the facility underutilized due to existing constraints. There is not a dedicated training space, no space for needed equipment to clean gear or hose dryers. These spaces are not planned with the correct adjacencies. For example, the sleeping areas are next to a high traffic areas such as the kitchen. You must also travel thru several corridors and offices to use Shower #2 from the bedrooms. All of these concerns affect the morale, productivity and wellbeing of the occupants. In spaces with abundant day light and planned spaces, studies have shown that employees enjoy being at work, are more productive, sick less, and employee retention is much higher. These are measurable values based on employee logged sick time and turn-over.

The existing building does not have an adequate building envelope. There is very minimum insulation at the roof deck and walls. The exterior windows and doors appear to be uninsulated. The construction from the previous time periods would indicate there is substantial infiltration of outside air. These inadequacies lead to larger mechanical units working more frequently using more energy to condition the spaces. The minimum requirements for insulation, energy efficient doors and windows are far below the baseline standard required by the International Building Code, today. This is not an energy efficient building.

This facility has several on-going maintenance problems including:

- The numerous additions over the life of this building have created undue maintenance problems.
- Several different types of roofs coupled with different intersections and elevations have evolved into an ongoing roof leak that seems to be unrepairable above Office #5.
- The roof conditions over the original building and the additions are in need of replacement, and are failing structurally in some areas.

Photo A5. Roof Leak at Ceiling

Photo A7. Roof Addition

Photo A6. Roof Flashing

Photo A8. Deteriorating Sheathing

The vertical walls where the lower roofs intersect are not properly flashed, the materials and sealants are rapidly deteriorating. To properly address this problem, all the roofing, sidewalls, flashing and sheathing would need to be replaced. However, this would not address the real problem that has been created with existing construction and additions at various elevations and intersections.

The existing roofs at the original 1960's, 1980's and 1990's addition are showing signs of creep, fatigue and failure. Structural repairs are required. The rafters and decking are sagging in both directions. This is an unsafe condition.

Photo A9. Roof Creep, Fatigue, Failure

There is ongoing maintenance required for the exterior facade of the facility. The wood trim at the rake and eaves is severely rotted. The concrete masonry unit walls in the 1980's addition are in need of paint and crack repair. Both of these conditions will lead to substantial maintenance costs if not repaired soon. Water and moisture will infiltrate the facility and likely lead to internal water damage of the adjacent spaces.

Photo A10. Wood Rake and Trim Rotting

Photo A11. Cracks at Exterior Fascade

There is a potential for hazardous materials to exist within the original construction and 1980's addition. Lead paint and asbestos for common building components during this time frame. Asbestos was used in insulation, binders in materials, and many adhesives.

This facility as previously mentioned is not accessible. It does not meet the requirements for the Texas Accessibility Standards. Restrooms and showers do not have the required clearances, grab bars are inappropriate, the water closets are non-compliant, required knee spaces are not provided and toilet accessories are not mounted at the correct heights. The accessible route through the building does not comply. Door hardware is also non-compliant.

ARCHITECTURAL CONCLUSION

The life safety issues and health concerns should be addressed immediately. This includes the corrections to the structural problems with the roof, the rated partition at the vehicle bay. Shower #1 and the washer and dryer should be relocated; this is a health concern creating an unsanitary condition.

The maintenance items should be addressed to prevent additional costs and damages including roof repairs and addressing the exterior facade. If there is a long term desire to stay here then a plan should be developed to renovate the space. The renovations would include upgrading the building envelope to make it more energy efficient. This would include upgrades to the insulation at the walls, roof and installing energy efficient windows and doors. A renovation to the space would also include space organization and proper adjacencies with new compliant showers and restrooms. Additional spaces should be programmed and included for training and dedicated storage. The interior should be modernized with new paint and flooring to make the space more appealing. A hazardous survey should be done to identify suspicious materials and have a plan to abate the hazardous materials from the space.

If all the concerns were addressed, the space would still be confined to the restraints of the perimeter walls. This limits the ability to provide a necessary floorplan that is efficient. These costs would be prohibitive due to the age and existing construction of the facility.

The original building and additions have outlived the useful life of this facility. The heath, life safety, welfare, accessibility and maintenance deficiencies need to be addressed:

- The original building and additions are outdated and are physical constraints for any meaningful future renovation planning.
- The building envelope, insulation, doors and windows are very energy inefficient.
- The original building roof and roof additions have created ongoing maintenance conditions with roof leaks.
- The exterior facade at the original building and additions are in poor condition and will contribute to water infiltration if not proper maintained.
- The kitchen arrangement is currently unsanitary for food preparation with a shower and toilet that open directly into the space.

- The space is not accessibility as required by the Texas Accessibility Standards. (see report in Appendix B)

SECTION THREE: STRUCTURAL

GENERAL DISCRIPTION OF FACILITY

The existing Fire Station #1 was created by making additions to a wood framed single-story residence/house that was constructed in the 1960's. The design and construction used for the original residence as well as the two additions was based on an IBC Risk Category II. Fire stations are required to be designed and constructed to meet IBC Risk Category IV. There is no evidence that the existing fire station construction has been upgraded or investigated to meet the Category IV (essential facility) requirements. This is considered a deficiency that should be corrected by performing an analysis of the structural elements of the facility, to include the roofs, walls, and other elements of the lateral force resisting system for both wind and seismic loads and providing strengthening/stiffening as required. The Town of Fairview governing building code is the 2012 Edition of the International Building Code (2012 IBC), which covers the design of fire stations.

The roof over the circa 1980 addition was found to be sagging in the middle. The sagging appears to be due to a lack of adequate lateral resistance for the rafters in the form of roof ties. Also, everything from the ceiling and above is supported directly or indirectly by these rafters. That includes the HVAC equipment. The rafters could be suffering from overstressing that has exacerbated the creep in deflection that has led to excessive sag. Tension ties in the form of cables have been added across the attic near the east end of this section to resist the lateral thrust from the rafters in this area. As a result, the sagging is significantly less in that area. The entire area of the roof should be shored up and the rafters strengthened/repaired as necessary. It was reported that the roof was sagging so much, the ceiling tiles, which are hung from the rafters, were falling out of their grids. The wires supporting the grid were shortened to level the ceiling grid so the ceiling tiles would not slip out. It is unknown how long this sag has been present, but it is a situation that is unsafe as the sagging represents a state of progressive collapse of the roof.

There is evidence of foundation movement at the original circa 1960 construction and the first addition constructed circa 1980. Cracking in the brick near corners was found on the west end of the old residence. Cracking in the cmu wall on the north side of the 1980 addition was also found. There was cracking above the doors on the interior of the facility that had been repaired and re-cracked.

It is imperative that the recommendations related to the safety of the occupants and to proper function of the fire station shall take priority over recommendations related to non-structural upgrades.

Description of existing conditions at fire station and proposed repairs and upgrades are based on the field inspection and are provided in the following section.

STRUCTURAL OBSERVATIONS

The property is located at 500 State Highway 5 in Fairview, Texas at Lat 33° 8' 17" N and Long 96° 38' 25" W. Fairview Fire Station #1 is housed in a single-story wood-framed and masonry structure formed from four structures. The original structure was a residence constructed in the 1960's and had additions constructed in the 1980's and 1990's. The low-bay wing to the north is comprised of the original residence and two of the addition modules that contain bedrooms, offices, conference rooms, a kitchen, and storage. The high-bay south wing contains offices, waiting room, recreation room, fitness center, storage, and four vehicle bays. Brick veneer is on the exterior of the original module on the west and south sides. Brick veneer was removed or covered over by siding is on the north side of the original module. The addition of the 1980's has cmu on the exterior walls on the north and south sides. These appear to be single wythe cmu walls. The exterior of the 1990's addition consists of siding. The south wing is cladded with brick veneer and metal panels over wood framing.

The foundation for the facility appears to be slab a shallow foundation system with slabs on grade. Signs of post-tensioning were not found, therefore the foundation is most likely conventionally reinforced.

Roofs and Framing

Noticeable rippling/buckling of the composition shingle roof was observed over the original circa 1960 module. Trim and eave boards are in poor condition and in need of replacement/repair.

Photo S1. Ripples in Roof Over Original Construction (1960's) Module

Photo S2. Northern Half of Roof, Trim, and Siding on 1960 Module

The roof over the 1980's addition is sagging. This appears to be due to inadequate lateral ties at the top of walls to resist the kick-out forces from the roof rafters and loads supported by the rafters. The bottom 2x6 ties are twisted and the rafters are deflecting excessively between the bottom tie and the cmu wall on which they bear. The ceiling grid, HVAC equipment, ceiling grid system, and lights are suspended from the rafters. Possible overstressing of the rafters and exacerbated creep are also suspected. The supporting cmu wall has cracking. Some of this cracking is due to the lateral kick-out at the top of the wall due to the roof rafters pushing out. This roof is in a state of progressive collapse. Shoring and bracing should be provided for the short term. Existing rafters and ceiling joists should be strengthened/replaced and the lateral tie system re-established.

Photo S3. Sagging Roof

Photo S4. East End of Attic Space Over 1980's Addition. Notice Cable Tie In Foreground

Photo S5. Cable Spanning Across Attic at East End of Attic

Photo S6. Cable Connection at Rafter

Photo S7. HVAC Equipment Suspended from Rafters

Photo S8. Twisted Bottom Tie

Photo S9. Ceiling Suspension Framing – Original 1960's Module

Photo S10. Suspended Ceiling Hung from Sagging Rafters – 1980's Addition

Foundation Related Issues

Cracking in the exterior brick and cmu walls was found on the original 1960's module and the 1980's addition. The cracking appears to be related to foundation settlement. The cracking of the cmu wall at the 1980's addition could be magnified by the lateral push from the rafters. There was some cracking above doors in these portions of the building also. The cracking above doors has been repaired previously, but has cracked again. All the doors were operable without binding or sticking. Floors should be surveyed for levelness. As an option, piers could be added around the perimeter to level and close cracks in cmu.

Photo S11. Cracking in Brick

Photo S12. Cracking in Brick at Opposite Corner

Photo S13. Cracking in CMU Due to a Combination of Foundation Movement and Lateral Thrust from Rafters

Photo S14. Cracking Above Doors on the Interior

The slab on grade edges leading from the interior to the exterior is cracked due to inadequate wheel load transfer. Inadequate edge thickness and cover over dowels is the likely culprit. The cracking should be repaired to prevent water from entering the sub-base that could lead to dishing of the pavement (pot holes).

Photo S15. Edge of Slab Cracking Due to Wheel Loads at Vehicle Bays

Drainage Issues

The area between the north and south wings of the fire station is in need of improvement from a drainage standpoint. A concrete swale with proper slopes could serve as a combination swale and splash block. Grass will not grow in this area, so the concrete will prevent erosion. The location of the sanitary lift station, which appears to be a converted septic tank (500 gallons), is in an awkward location. The lid of the tank should be marked “No Step”. One end of the tank is very close to the foundation of the 1990 addition.

Photo S16. Area Between the North and South Wings

RECOMMENDATIONS

- It is apparent that the existing fire station #1 was never assessed for a change in use from residential IBC Type II to fire station (essential) IBC Type IV. The facility should be rated for ultimate wind speeds of 120 mph and is in Seismic Design Category C (SDC C), (moderate seismicity).

- Since the facility is in SDC C, lateral restraints on HVAC equipment, sprinkler piping, and suspended ceilings are required.

- The sagging roof should be shored and braced for the short duration and repaired for the long-term.

- The foundation issues noted are minor compared to the first two recommendations. Piers could be added along the north sides of the 1960’s and 1980’s construction modules. Four piers along the west/front of the 1960’s module where cracking was noted could also be accomplished.

- Repair of the vehicle bay slabs is recommended to prevent maintenance issues in the future.

- Converting the area between the north and south wings to a concrete drainage swale would be an improvement to the current conditions.

SECTION FOUR: HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

GENERAL DISCRIPTION OF FACILITY

The existing heating and cooling equipment, including heaters, and fan coil units, etc. are inefficient and at the end of their useful life. Therefore there will likely be ongoing mechanical issues with growing severity if the equipment is not replaced.

It is recommended that the upgrades related to the life safety of the occupants and to the proper function of the fire station shall take priority over recommendations related to upgrading of old systems that can be made in the future.

Among such priorities are installation of the carbon monoxide (CO) and nitrogen dioxide (NOx) sensors and alarm at the entrance to the fire fighters quarters, installation of new vehicle exhaust systems in apparatus bays, upgrading general ventilation system in apparatus bay area, modifications to sanitary sewer lift station, etc.

Existing air-conditioning systems serving fire fighters quarters and plumbing fixtures shall be replaced entirely in the future or as soon as the equipment shows the signs of the failure or if associated space is to be remodeled. The new equipment shall be energy efficient and environmentally friendly.

Detailed description of existing conditions of Heating, Ventilating and air conditioning (HVAC) systems and Plumbing systems at Fire Station #1 and proposed upgrades and modifications to these systems are based on the field inspection and are provided in Section Four and Section Five below. These upgrades will increase energy efficiency of the station's HVAC systems, improve safety and provide ease of maintenance for new equipment.

HVAC OBSERVATIONS

Fire Station #1 is housed in a single-story structure formed from four old buildings adjacent to each other. The property is located at 500 State Highway 5 in Fairview, Texas.

The station is comprised of apparatus bay area for four fire trucks and fire fighters quarters, including waiting area and fitness room, office area and day room /kitchen area, bunk room/ sleeping area and police quarters. Total building floor area is 8,800 sq.ft.

Apparatus Bays

One gas-fired unit heater Lennox model LF24-100A-1 with output capacity of 80,000 kBtu/hr provides heating in the Apparatus Bay area. Local thermostat provides control of unit heater. The second original unit heater has been removed to accommodate for the fire truck parking. Remaining unit capacity does not provide adequate heating to the space.

One wall mounted propeller fan provides general ventilation in the space. The capacity of the fan does not appear to be adequate for the space ventilation requirements.

The vehicle engine exhaust removal systems are not present. Control system to monitor concentration of carbon monoxide (CO) and nitrogen dioxide (NOx) emission from diesel engines is absent.

Required daily tests of the fire trucks are being conducted outside of the apparatus bays at the parking lot in order to avoid space contamination with vehicle engine fumes. Occasionally during bas weather conditions the fire truck engines are run inside the bays. When this happens the vehicle fumes are migrating into adjacent occupied office spaces due to the absence of the local vehicle tail pipe exhaust system and to the inadequate capacity of general ventilation. It is apparent that these conditions compromise fire fighters health safety due to the exposure to the hazardous engine fumes. These conditions are also preventing fire fighters from regulatory fire truck testing during severe weather conditions. This issue shall be addressed as soon as possible.

Fire Fighter's Quarters

Four split fan coil units with gas-fired furnaces and DX-type cooling units provide air-conditioning in quarters. The fan coil units are installed in the attic space at the various locations.

Waiting area and fitness room air-conditioning is provided from one indoor fan coil unit and outdoor condensing unit Train model 2TTR1060A with 5 tons of nominal cooling capacity, 208/1 Volts. The system was installed in 2004. Fan coil unit in the attic is not provided with safe and adequate access.

Office and kitchen area air-conditioning is provided from one indoor fan coil unit Trane model TXH041A and outdoor condensing unit Train model TTR036D with 3 tons of nominal cooling capacity, 208/1 Volts. The system was installed in 2001. There are some complains that this unit does not provide adequate cooling during hot summer days.

Bedrooms and office area air-conditioning is provided from one indoor fan coil unit and outdoor Carrier condensing unit with approximately 3 tons of nominal cooling capacity,. The system was apparently installed prior to 2001.

Former Police Area / current DPW offices air-conditioning is provided from one indoor fan coil unit and outdoor condensing unit Goodman model GSH130361AC with 5 tons of nominal cooling capacity, 208/1 Volts. The system was installed in 2004.

Each fan coil unit is controlled by the local thermostat wall-mounted approximately 5 feet above finished floor and higher. Not compliant with ADA requirements.

All units are charged with R-22 refrigerant which will be completely phased out in the near future.

Three ceiling-mounted exhaust fans provide exhaust ventilation in restrooms. Exhaust fan serving showers and restrooms at office and bedroom areas are interlocked with corresponding light switch. Fans and corresponding ductwork will have to be cleaned.

Gas-fired range in kitchen is equipped with residential type hood without fire protection and need to be replaced with commercial grade hood, if required by local Authority.

Dryer exhaust ductwork apparently is full of the lint and need either to be cleaned or replaced with new exhaust duct.

Existing air-conditioning systems do not have any provisions for outside air supply to the building. Air distribution devices are rusted. Supply and return air ductwork apparently was not cleaned for a long time. The return air from various rooms is provided via open doors. The existing systems are at the end of their life, are in-efficient, lack adequate controls and need to be replaced in the near future.

Photo M1. Clogged Dryer Exhaust Backdraft Damper

RECOMMENDATIONS

A majority of the mechanical equipment at the facility is past its expected service life. This means there will likely be ongoing mechanical issues with growing severity if the equipment is not replaced. Existing HVAC systems shall not be reused when the facility is remodeled. The additional cost of new systems will not be much greater than the cost to alter the existing systems. The new equipment will also be more energy efficient than the existing equipment.

The following recommendations on building air-conditioning system upgrades are arranged in order of their priority in respect to the life safety, and operational functionality of fire station. The probable construction cost estimate associated with incorporating proposed upgrades can be found in Appendix C. The estimate includes contractor's overhead, profit, markups, etc.

- Provide carbon monoxide (CO) and nitrogen dioxide (NOx) sensors and alarm at the entrance to the fire fighters quarters to alarm personnel of the hazardous conditions - $10,000.

- Provide two recirculating engine exhaust removal systems equal to Air Vacuum Corporation model Airvac 911- $30,000.

- Perform calculations of general exhaust ventilation airflows for apparatus bay area and provide additional exhaust fan for general ventilation as required – $8,000.

- Provide pull-down ladder for the safe access to the fan coil unit serving waiting area - $3,000.

- Perform heating load calculations for the apparatus bay and provide additional heating in the area as required. New gas-fired radiant tube heater with approximate capacity of 100 kBtu/hr can be installed at the east bay #1 - $10,000.

- Clean existing ductwork, paint rusted grilles and provide necessary maintenance to four existing air-conditioning systems – $9,000.

- Clean dryer exhaust duct or replace existing duct - $500.

- Replace existing residential grade kitchen hood with new commercial grate grease exhaust hood with exhaust fan and with Ansel fire protection system – $2,000.

- Re-install the dislocated insulation above lay-in ceiling above waiting area and fitness room and above kitchen/office area and sleeping rooms - $5,000.

- Perform cooling load calculations for the office/kitchen area. Replace corresponding air-conditioning system if load calculations confirm that the unit size is inadequate – $15,000.

- Replace all four existing air-conditioning systems at once, including fan coil unit, ductwork, controls and air distribution devices with new high-efficiency system meeting current code requirements - $80,000.

SECTION FIVE: PLUMBING

OBSERVATIONS

Domestic Water System

Existing 2" diameter domestic water pipe provides service to the facility. The piping appears to be in fair condition, though there are few places that this could be verified.

Domestic Water Heating

Domestic hot water supply to the building is provided from two residential grade electric tank-type water heaters Bradford White model M240T6DS, 40 Gal, 208/1 4,500 Watts. Recirculation pumps are not present. Both units are in good condition and adequately supply facility with hot water.

Natural Gas

Existing 1" diameter natural gas piping provides low pressure natural gas distribution to the unit heater in apparatus bays, to the gas furnaces of the fan coil units in the attic and to kitchen range. It was stated that the gas piping was recently repaired to eliminate some gas leaks in the attic. The piping now appears to be in fair condition.

Plumbing fixtures

Various brands of plumbing fixtures are installed at the facility.

Water closets: Existing residential grade Glacier Bay water closets are 1.6 gallon per flush (GPF) and in fair working condition. A majority of the restrooms do not have any ADA accessible water closets.

Lavatories: Existing residential grade lavatory faucets appear to have 1.0 gpm aerators. Existing aerators should be replaced with 0.5 gpm aerators in order to comply with current code requirements. Some of the handles on faucets are broken and it appears that replacement of existing faucets should take place in lieu of repairs.

Showers: It appears that showers were recently repaired and new showers heads were installed.

Kitchen Plumbing Fixtures: It should be verified with the Town code officials if a grease interceptor is to be provided for the type of cooking performed in the kitchen.

The laundry equipment and all chemicals are stored inside the kitchen area in violation of the Texas health code. Washer drain is being discharged to the grade just outside of the kitchen.

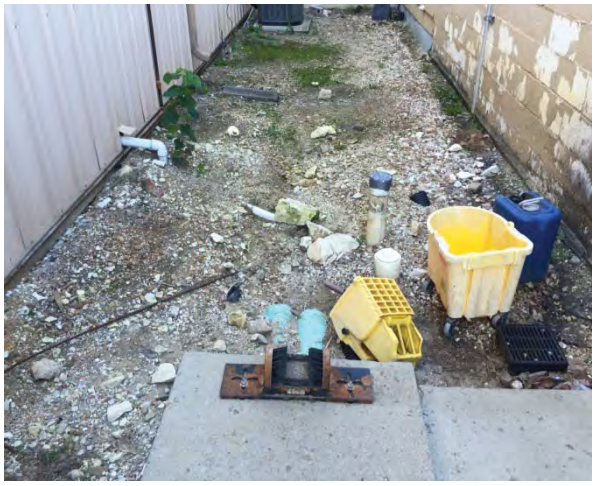
Sanitary Sewer System

The sanitary sewer from the building is discharged into originally built septic tank later converted into the lift station. Existing ¼ HP pump provides lift into the city sanitary waste pipe north of the facility. Existing tank size and the pump configuration do not meet current plumbing code requirements. Larger tank size and a duplex grinder pump shall be provided for the facility.

Photo P1: Sanitary Pump and Septic Tank

Storm Drain

The storm drain from gutters and from downspouts is being discharge to the grade. The grading between the apparatus bay building and office building is washed out over the time. Overflow piping under the walkway is clogged. Thus the standing water between the buildings creates unacceptable anti-sanitary conditions. The system shall be either repaired or modified.



Photos P2/P3. Storm Drain Conditions

RECOMMENDATIONS

The following recommendations on building plumbing systems upgrades are arranged in order of their priority in respect to the life safety, and operational functionality of fire station. The probable construction cost estimate associated with incorporating proposed upgrades can be found in Appendix B. The estimate includes contractor's overhead, profit, markups, etc.

- Replace existing septic tank and sewer pump with new lift station with duplex grinder pump as required by code - $50,000.
- Replace existing lavatory faucets – $1,000.
- Provide garbage disposal on kitchen sink - $300.
- Replace existing plumbing fixtures with new ADA compliant fixtures - $8,000.
- Repair existing gutters and downspouts and modify existing grading to allow for proper drainage of storm water – $10,000.
- Provide grease interceptor for the kitchen - $10,000.

SECTION SIX: ELECTRICAL AND DATA COMMUNICATION

ELECTRICAL OBSERVATIONS

The facility electrical system is comprised of elements which have been added in stages through the years. Three separate electrical services from two different pole-mounted transformers provide power to the building. This violates NFPA 70 (NEC) Article 230.2 which limits buildings to a single service, with certain exceptions. Each 240/120V single-phase service terminates in a 200 amp panelboard. Two of the three panels are not labeled a being suitable for use as service equipment as required by NEC Article 230.66.

Photo E1. Overhead Service

Two additional 125 amp sub-panels provide additional circuit capacity for the facility. Several of the panels do not have the working clearance required in NEC Article 110. This presents a safety hazard to personnel who need to work in these panels. In addition, none of the five panels contain labels warning personnel of a potential arc flash hazard as required by NEC Article 110.16. Also missing at each panel was a field label indicating the calculated available fault current at the panel (NEC 110.24). All panels contain a circuit directory, but it is not clear if the information is accurate. Two of the panels appear to be over 40 years old. The circuit breakers in these panels may have deteriorated over time, impacting their ability to trip when required. One fireman noted that he was unable to identify the source of one of the sub-panels in order to de-energize it. An overall one-line diagram of the facility electrical system was not available. This would be highly beneficial to personnel working on the system and allow work to be performed safely.

Photo E2. Sub-Panel Blocked by Stored Items

The oldest portion of the building (originally a residence) contains nonmetallic sheathed ("Romex") wiring. While it is understood that total replacement of this wiring is not feasible, it appears that some devices were wired with this material after its conversion to a commercial facility. Furthermore, this cable was used outdoors exposed to the elements. This is a violation of NEC Article 334.15.

Photo E3. Improper Use of Type NM Cable

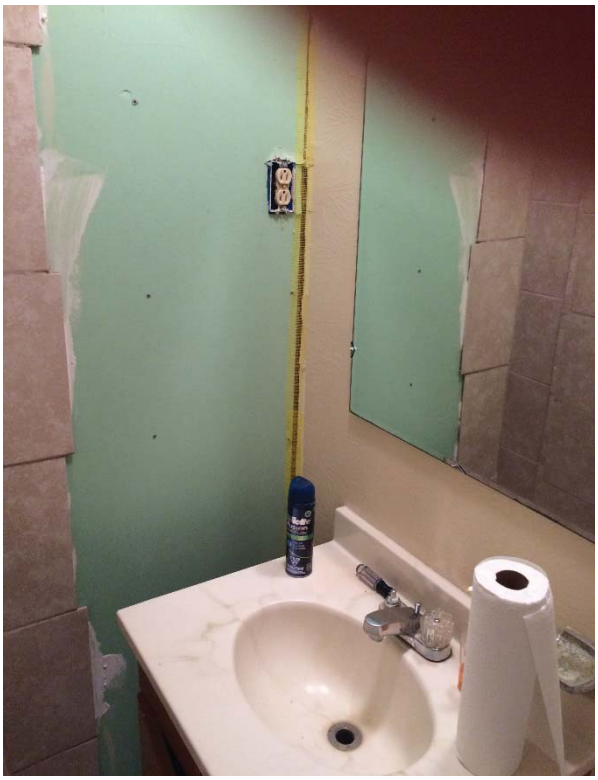
NEC violations were also noted in regard to cable terminations and splices. Conduits and cables are required to be securely attached to boxes and fixtures. Splices must only occur within boxes or listed enclosures. At least two examples of improper splices and/or cable terminations were found.

Photo E4. Splice Not Enclosed in Box

These conditions could easily cause the splices to be disturbed and expose personnel to live wiring. In addition to this, cabling was found to be improperly fastened or supported. All cables and/or conduits are required to be securely fastened within 12 inches of every box, fixture or fitting. In other locations, cabling was found to penetrate through metal wall panels without protection from the sharp metal edges. Over time, the metal panel could cut through the insulation which would result in a ground fault and possible fire hazard. NEC Article 300.4 requires exposed cabling passing through metal members to be protected from physical damage by insulated bushings or grommets.

Photo E5. Cable Through Wall Panel Without Protective Bushing

Receptacles with ground fault circuit interrupters are required in bathrooms and within six feet of any sink. Two receptacle locations were found in violation of this NEC requirement.



Photos E6/E7. Receptacles Requiring GFCI Protection

Beginning with the 1999 Code, the NEC requires arc fault circuit interrupter (AFCI) protection for receptacles in dwelling unit bedrooms. It is recommended that those receptacles be replaced for the protection of personnel using the bedrooms.

The facility lighting is a broad variety of fixture types employing both incandescent and fluorescent lamps of various types. A limited number of LED fixtures have been installed recently. Approximately 2/3 of the fixtures use linear T8 fluorescent lamps housed in either recessed or surface mounted troffers. This type of lamp is marginally acceptable in terms of energy efficiency. A number of other fixtures were found to use older T12 lamps, which are much less efficient than the T8 type.

Photo E8. Typical Fluorescent Fixtures

The troffer type fixtures were used in the kitchen, offices, recreation room, conference rooms and storage rooms. Recessed “can” type fixtures were found in corridors and several other spaces. These fixtures generally used incandescent lamps which are most inefficient. At a minimum, these lamps should be replaced with self-ballasted compact fluorescent (“curly” type) lamps. These lamps could reduce the energy consumed by the recessed cans by 75%.

Fixtures in the vehicle bays are industrial fluorescent strip lights with 8’ linear T12 lamps. These lamps are far less efficient than T8 or T5 lamps. Substantial energy savings could be realized from an upgrade to T8 or T5 lighting. The fixtures were not accessible for close inspection, but it is likely these fixtures employ older magnetic type ballasts, compounding the overall fixture inefficiency.

Many fixtures were found to have missing or nonworking lamps. Others had either damaged or missing lenses. One recessed shower fixture had no trim package or lens, which makes it unsuitable for use in a wet or damp location.

Photo E9. Fixture in Shower

All lighting is controlled manually via wall switches. Significant energy savings could be realized through the use of occupancy sensors. U.S. Department of Energy studies show the following ranges of energy savings for various room types:

Private office	13-15%
Group office	20-28%
Conference room	22-65%
Rest room	30-90%
Corridor	30-80%
Storage rooms	45-80%

For most locations in this facility, occupancy sensors could simply replace the existing manual wall switches with no rewiring. A few larger spaces such as the kitchen and recreation room could require a ceiling mounted sensor which would involve some minor rewiring.

Exit lighting has been provided in accordance with NFPA 101. However, a few fixtures were observed to be non-working. These should be repaired. Most of these fixtures also appear to use fluorescent lamps. Current versions of exit signs use LED lighting exclusively. The LED fixtures consume only 2.5 watts, as opposed to 15 watts for the fluorescent type. Since these fixtures are constantly ON, the potential for energy savings is significant.

Photo E10. Exit Light Not Working

Station personnel are protected by a recently installed fire alarm system. No improvements to this system should be necessary.

The station's telephone and communications needs are served from a small closet at the northwest corner of the facility. As can be seen, the wiring and equipment in the closet is in a state of disarray. The lone equipment rack is covered with cabling and various clutter.

While this state of disorganization does not violate any safety codes, it would likely hamper any troubleshooting efforts when the need arises. The absence of labeling on most of the cables would compound this issue.

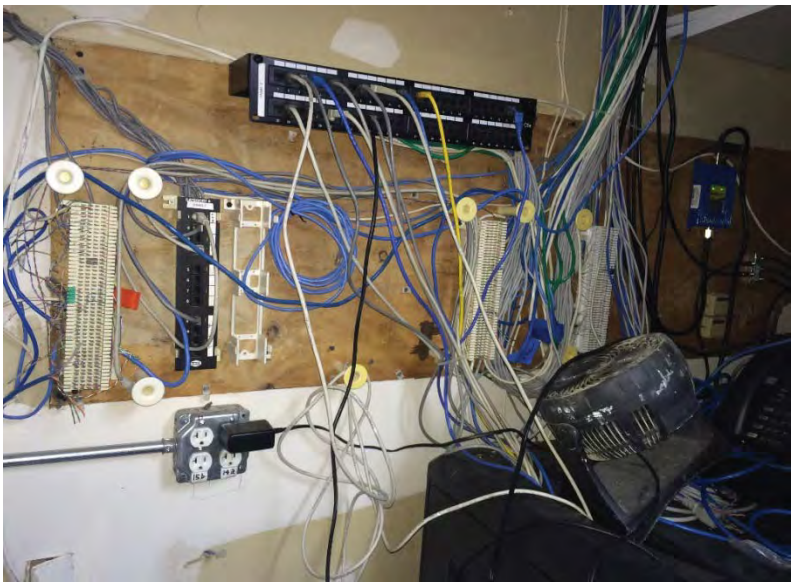


Photo E11. Cluttered Cabling in Telephone Closet

ELECTRICAL CONCLUSIONS

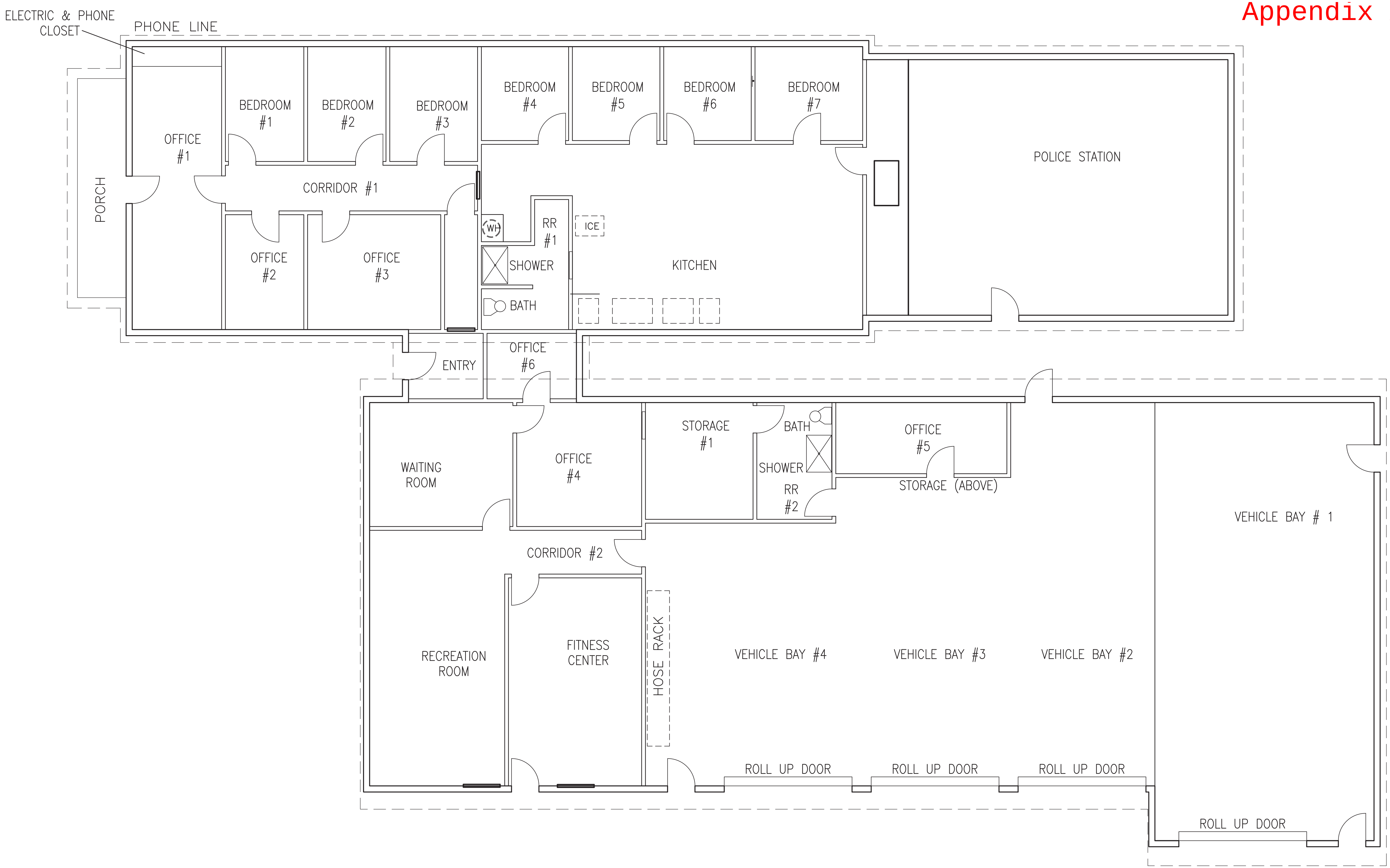
A number of NEC violations were observed in this investigation. Some of these pose immediate hazards to personnel which could lead to serious injury and should be addressed immediately. Others are conditions which could cause electrical faults resulting in equipment damage or fire. Multiple service entrances increase the time to de-energize the building in a fire or other emergency. The issues which should be corrected immediately are as follows:

- Repair inoperative exit signs
- Replace receptacles in rest rooms and near sinks with GFCI type
- Relocate materials stored within the required working spaces of electrical panels
- Install wet location trim and lens to shower fixture

Other wiring problems in violation of NEC, while not as critical, should be corrected as soon as funding allows. As stated previously, these items could cause electrical faults leading to equipment damage and/or a fire.

The facility lighting system is largely outdated and inefficient. Significant energy savings could be realized through replacement of incandescent lamps in recessed can fixtures with fluorescent, replacing manual wall switches with occupancy sensors and replacing exit signs with LED type. All of these upgrades are relatively inexpensive and would require no rewiring.

Appendix A



PLAN NORTH

FLOOR PLAN
SCALE: 3/16" = 1'-0"

DATE	REVISION	NO.

HUITT-ZOLLARS
Huitt-Zollars, Inc. Fort Worth
500 West 7th Street, Suite 300
Fort Worth, Texas 76102-4728
Phone (817) 335-3000 Fax (817) 335-1025

FLOOR PLAN

FAIRVIEW FIRE DEPT.

TOWN OF FAIRVIEW FIRE STATION # 1
500 HIGHWAY 5
TOWN OF FAIRVIEW, TEXAS 75069

DATE: 11/23/2015
DRAWN BY:
DESIGNED BY:
CHECKED BY:
PROJ. NO. –
SHEET: A101

IF THIS SHEET IS NOT 34" x 22" IT IS A REDUCED PRINT. SCALE ACCORDINGLY FILE NAME: A101

FILE NAME: H:\proj\BUS_DEV\Town of Fairview\Fire Station #1\CAD\A101.dwg LAYOUT NAME: Paper PLOTTED: Friday, November 20, 2015 - 12:19pm

Appendix B

Sent To: **Mr. James Fullmer**
Huitt-Zollars, INC.
Via E-Mail: jfullmer@huitt-zollars.com
Hard copies via US Mail

American's with Disabilities (ADA) Compliance Evaluation
JKA # 1116-15
Inspected December 2, 2015

Fairview – Fire Station #1

500 Hwy 5 – Fairview, Texas

Single-Building Facility (Interior & Exterior)
Include assessment for:
Parking, accessible routes, and restroom.

STATEMENT OF QUALIFICATIONS

Johnson - Kelley Associates has been a contract provider for the State of Texas Department of Licensing and Regulation since 1995 and as of January 2002 we are licensed **Registered Accessibility Specialists**. We have completed thousands of plan reviews and inspections for Architects, Engineers and Building Owners to ensure conformance with accessibility standards adopted by the Texas Department of Licensing and Regulation for the purposes of ensuring compliance with Article 9102, Texas Civil Statutes. Additionally the principals at **Johnson - Kelley Associates** are very knowledgeable with the ADA and since 1991 have been consulting architects in the due diligence survey work of real estate property managers for over 350 properties in TX, OK, GA, NC, SC, NY, NV, NH, MO, IA, IL, LA, VT & FL.

Stephen W. Johnson
ICC Certified Accessibility Specialist
972-422-5384 Ext. 1947 sjohnson@johnsonkelley.com

Steve is also a 20 plus year experienced licensed architect. Steve was a licensed Architect from 1988 to 2005 (currently inactive status) and his experience included Hotel, Commercial, Retail many Multifamily Apartment and Condo projects from 1981 through 2001. He also does plan reviews and post-construction inspections. Steve has been a RAS with the T.D.L.R. since 2002. Steve also performs accessibility due diligence assessments for architects and building owners to assess property compliance. Steve is also available for your technical question assistance.

RECENT ADA AMENDMENTS

Highlights of the Final Rule to Amend the Department of Justice's Regulation Implementing Title III of the ADA

The Department of Justice (the Department) has amended its regulation implementing title III of the Americans with Disabilities Act (ADA), which applies to public accommodations (private businesses that fall within one of twelve categories established by the statute) and commercial facilities. The ADA requires the Department to publish ADA design standards that are consistent with the guidelines published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board). Therefore, the title III rule adopts new Standards for Accessible Design that is consistent with the ADA/ABA Accessibility Guidelines developed by the Access Board. The final rule also amends the previous title III regulation to make it consistent with current policies and published guidance, to reflect the Department's experience since the regulation was first published in 1991, and to address and respond to comments received from the public in response to the Department's 2008 Notice of Proposed Rulemaking (NPRM). These revisions took effect on March 15, 2012.

Summary of Changes:

Adoption of the 2010 ADA Standards for Accessible Design.

The Department has adopted revised ADA design standards that include the relevant chapters of the Access Board's 2004 ADA/ABA Accessibility Guidelines as modified by specific provisions of this rule. To minimize compliance burdens on entities subject to more than one legal standard, these design standards have been harmonized with the Federal standards implementing the Architectural Barriers Act and with the private sector model codes that are adopted by most States.

Effective Date.

The rule became effective March 15, 2012. Since March 15, 2012, compliance with the 2010 Standards will be required for new construction and alterations and barrier removal. **Covered entities that should have complied with the 1991 Standards during any new construction or alteration of facilities or elements, but have not done so by March 15, 2012, must comply with the 2010 Standards.**

Element by Element Safe Harbor.

The rule includes a general "safe harbor" under which elements in covered facilities that were built or altered in compliance with the 1991 Standards would not be required to be brought into compliance with the 2010 Standards until the elements are to be altered.

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SCOPE OF WORK PROVIDED WITH THIS ASSESSMENT

The scope of inspections for the subject projects includes appropriate portions of Title III of the **American with Disabilities Act, 42 U.S.C.1991 Standards** (ADA) for the immediate site as well as all regulated interiors and common-use areas.

Johnson - Kelley Associates, Inc. included the following where applicable for each property:

- Site inspection including; walkways, parking facilities, building entries and path of travel from associated accessible parking to each building entrance. Non-accessible facility entrances will be identified where applicable for access requirements.

- Building inspection of all exterior areas including; door maneuvering area and other common areas; interior routes, elements, spaces, and toilet rooms.

- Vertical access via ramp and elevator requirements addressed where applicable.

- Relevant Americans with Disabilities (ADA) criteria is cited to provide documentation of **non-compliance items and include State adopted deviations from ADA.**

- Construction tolerances were not applied to the dimensional requirements of the applicable ADA Standards for this inspection.

Additionally, **1994 Texas Accessibility Standards** (TAS) the State of Texas Accessibility Code was reviewed for possible modifications to the 1991 ADA requirements.

Where applicable provisions of 2010 ADA / 2012 TAS are less stringent or more in alignment with what was encountered than the prior codes used as a basis for this review the requirement that most aligns with the actual field condition will be used to assess compliance.
Requirements will not be imposed that are more restrictive than the current requirements.

Note: Current State Accessibility Code, 2012 TAS also became effective on March 15th. It was adopted to match the technical requirements of 2010 ADA. Both new codes have a safe harbor provision, effectively ensuring that where constructed to meet the prior codes unless modifications are made the new ADA/TAS requirements will not be required to be met. Where corrective modifications are necessary, when an item does not meet requirements of the newer version of the code, 2012 TAS requirements must be met and if 2012 TAS requirements are met then 2010 ADA will be also met.

Local City building codes were not reviewed as part of our investigation.

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ADA VIOLATIONS NOTED BELOW:

The following violations do not comply with 1994 TAS under the Safe Harbor provision. All corrective modifications must comply with 2012 TAS.

X UNACCEPTABLE

1. **The accessible parking spaces did not provide access aisles.**
2. **2 of the accessible parking spaces were not identified with compliant accessible parking space signs.**

1994 and 2012 TAS Requires:

208 Parking Spaces

208.1 General. Where parking spaces are provided, parking spaces shall be provided in accordance with 208.

EXCEPTION: Parking spaces used exclusively for buses, trucks, other delivery vehicles, law enforcement vehicles, or vehicular impound shall not be required to comply with 208 provided that lots accessed by the public are provided with a passenger loading zone complying with 503.

208.2 Minimum Number. Parking spaces complying with 502 shall be provided in accordance with Table 208.2 except as required by 208.2.1, 208.2.2, and 208.2.3. Where more than one parking facility is provided on a site, the number of accessible spaces provided on the site shall be calculated according to the number of spaces required for each parking facility.

208.2.4 Van Parking Spaces. For every six or fraction of six parking spaces required by 208.2 to comply with 502, at least one shall be a van parking space complying with 502.

208.3 Location. Parking facilities shall comply with 208.3

208.3.1 General. Parking spaces complying with 502 that serve a particular building or facility shall be located on the shortest accessible route from parking to an entrance complying with 206.4. Where parking serves more than one accessible entrance, parking spaces complying with 502 shall be dispersed and located on the shortest accessible route to the accessible entrances. In parking facilities that do not serve a particular building or facility, parking spaces complying with 502 shall be located on the shortest accessible route to an accessible pedestrian entrance of the parking facility.

EXCEPTIONS:

2. Parking spaces shall be permitted to be located in different parking facilities if substantially equivalent or greater accessibility is provided in terms of distance from an accessible entrance or entrances, parking fee, and user convenience.

Advisory 208.3.1 General Exception 2. Factors that could affect "user convenience" include, but are not limited to, protection from the weather, security, lighting, and comparative maintenance of the alternative parking site.

502 Parking Spaces

502.1 General. Car and van parking spaces shall comply with 502. Where parking spaces are marked with lines, width measurements of parking spaces and access aisles shall be made from the centerline of the markings.

EXCEPTION: Where parking spaces or access aisles are not adjacent to another parking space or access aisle, measurements shall be permitted to include the full width of the line defining the parking space or access aisle.

502.2 Vehicle Spaces. Car parking spaces shall be 96 inches (2440 mm) wide minimum and van parking spaces shall be 132 inches (3350 mm) wide minimum, shall be marked to define the width, and shall have an adjacent access aisle complying with 502.3.

EXCEPTION: Van parking spaces shall be permitted to be 96 inches (2440 mm) wide minimum where the access aisle is 96 inches (2440 mm) wide minimum.

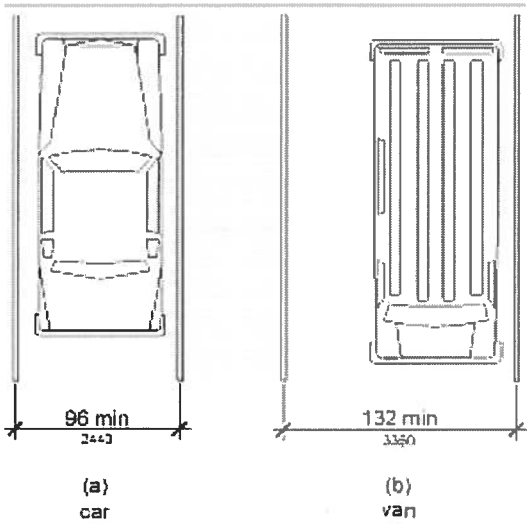

Figure 502.2 Vehicle Parking Spaces

502.3 Access Aisle. Access aisles serving parking spaces shall comply with 502.3. Access aisles shall adjoin an accessible route. Two parking spaces shall be permitted to share a common access aisle.

Advisory 502.3 Access Aisle. Accessible routes must connect parking spaces to accessible entrances. In parking facilities where the accessible route must cross vehicular traffic lanes, marked crossings enhance pedestrian safety, particularly for people using wheelchairs and other mobility aids. Where possible, it is preferable that the accessible route not pass behind parked vehicles.

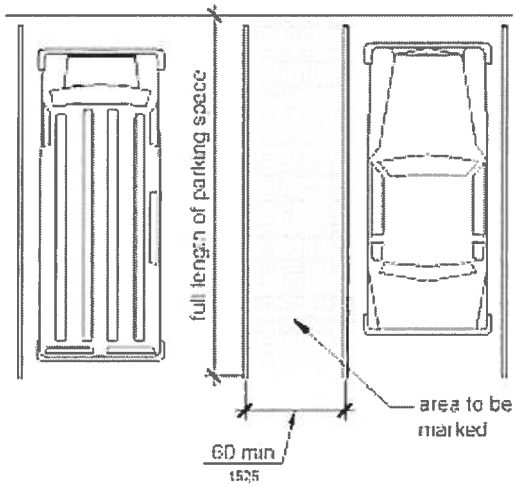

Figure 502.3 Parking Space Access Aisle

502.3.1 Width. Access aisles serving car and van parking spaces shall be 60 inches (1525 mm) wide minimum.

502.3.2 Length. Access aisles shall extend the full length of the parking spaces they serve.

502.3.3 Marking. Access aisles shall be marked so as to discourage parking in them.

Advisory 502.3.3 Marking. The method and color of marking are not specified by these requirements but may be addressed by State or local laws or regulations. Because these requirements permit the van access aisle to be as wide as a parking space, it is important that the aisle be clearly marked.

502.3.4 Location. Access aisles shall not overlap the vehicular way. Access aisles shall be permitted to be placed on either side of the parking space except for angled van parking spaces which shall have access aisles located on the passenger side of the parking spaces.

Advisory 502.3.4 Location. Wheelchair lifts typically are installed on the passenger side of vans. Many drivers, especially those who operate vans, find it more difficult to back into parking spaces than to back out into comparatively unrestricted vehicular lanes. For this reason, where a van and car share an access aisle, consider locating the van space so that the access aisle is on the passenger side of the van space.

502.4 Floor or Ground Surfaces. Parking spaces and access aisles serving them shall comply with 302. Access aisles shall be at the same level as the parking spaces they serve. Changes in level are not permitted.

EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

Advisory 502.4 Floor or Ground Surfaces. Access aisles are required to be nearly level in all directions to provide a surface for wheelchair transfer to and from vehicles. The exception allows sufficient slope for drainage. Built-up curb ramps are not permitted to project into access aisles and parking spaces because they would create slopes greater than 1:48.

502.5 Vertical Clearance. Parking spaces for vans and access aisles and vehicular routes serving them shall provide a vertical clearance of 98 inches (2490 mm) minimum.

Advisory 502.5 Vertical Clearance. Signs provided at entrances to parking facilities informing drivers of clearances and the location of van accessible parking spaces can provide useful customer assistance.

502.6 Identification. Parking space identification signs shall include the International Symbol of Accessibility complying with 703.7.2.1. Signs identifying van parking spaces shall contain the designation "van accessible." Signs shall be 60 inches (1525 mm) minimum above the finish floor or ground surface measured to the bottom of the sign.

Advisory 502.6 Identification. The required "van accessible" designation is intended to be informative, not restrictive, in identifying those spaces that are better suited for van use. Enforcement of motor vehicle laws, including parking privileges, is a local matter.

502.7 Relationship to Accessible Routes. Parking spaces and access aisles shall be designed so that cars and vans, when parked, cannot obstruct the required clear width of adjacent accessible routes.

Advisory 502.7 Relationship to Accessible Routes. Wheel stops are an effective way to prevent vehicle overhangs from reducing the clear width of accessible routes.

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X UNACCEPTABLE

3. The ramp located in front of the entrance had a 26.4% running slope.


4. The curb ramp located outside of the fitness center had a 13.4% running slope.


5. The curb ramp located outside of the fitness center had side flares with a 54.6% slope.


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1994 TAS Requires:

4.7 Curb Ramps.

4.7.2 Slope. Slopes of curb ramps shall comply with 4.8.2. The slope shall be measured as shown in Fig. 11. Transitions from ramps to walks, gutters, or streets shall be flush and free of abrupt changes. Maximum slopes of adjoining gutters, road surface immediately adjacent to the curb ramp, or accessible route shall not exceed 1:20.

4.8 Ramps.

4.8.2* Slope and Rise. The least possible slope shall be used for any ramp. The maximum slope of a ramp in new construction shall be 1:12. The maximum rise for any run shall be 30 in (760 mm) (see Fig. 16). *If it is technically infeasible because of space limitations for* curb ramps and ramps to be constructed on existing sites or in existing buildings *with a slope of 1:12 or less, ramps* may have slopes and rises as allowed in 4.1.6(3)(a).

2012 TAS Requires:

406 Curb Ramps

406.1 General. Curb ramps on accessible routes shall comply with 406, 405.2 through 405.5, and 405.10.

405 Ramps

405.1 General. Ramps on accessible routes shall comply with 405.

405.2 Slope. Ramp runs shall have a running slope not steeper than 1:12.

Advisory 405.2 Slope. To accommodate the widest range of users, provide ramps with the least possible running slope and, wherever possible, accompany ramps with stairs for use by those individuals for whom distance presents a greater barrier than steps, e.g., people with heart disease or limited stamina.

406 Curb Ramps

406.1 General. Curb ramps on accessible routes shall comply with 406, 405.2 through 405.5, and 405.10.

406.2 Counter Slope. Counter slopes of adjoining gutters and road surfaces immediately adjacent to the curb ramp shall not be steeper than 1:20. The adjacent surfaces at transitions at curb ramps to walks, gutters, and streets shall be at the same level.

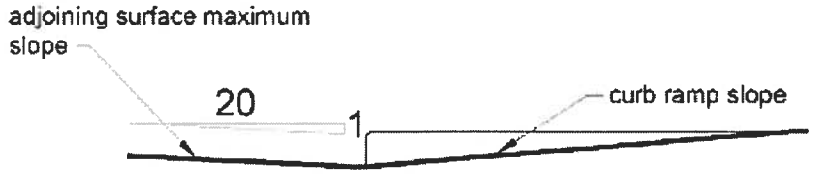

Figure 406.2 Counter Slope of Surfaces Adjacent to Curb Ramps

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406.3 Sides of Curb Ramps. Where provided, curb ramp flares shall not be steeper than 1:10.

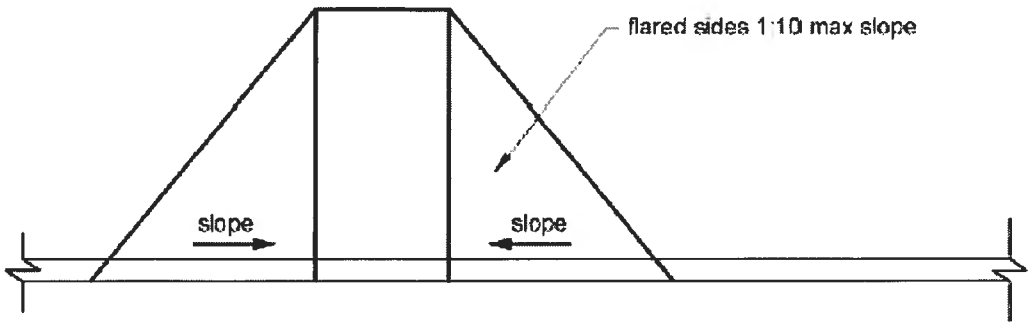
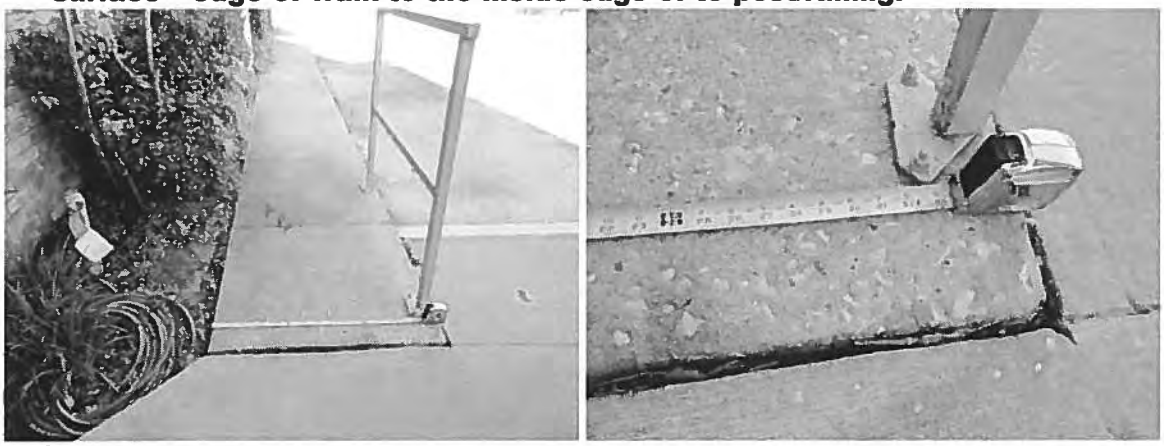


Figure 406.3 Sides of Curb Ramps

X UNACCEPTABLE

6. **The sidewalk located in front of the entry does not provide an accessible width walking surface. The handrail is 48" long and only provides a 32" wide accessible route/ walking surface – edge of walk to the inside edge of to post/railing.**



TAS Requires:

403 Walking Surfaces

403.1 General. Walking surfaces that are a part of an accessible route shall comply with 403.

403.2 Floor or Ground Surface. Floor or ground surfaces shall comply with 302.

403.3 Slope. The running slope of walking surfaces shall not be steeper than 1:20. The cross slope of walking surfaces shall not be steeper than 1:48.

403.4 Changes in Level. Changes in level shall comply with 303.

403.5 Clearances. Walking surfaces shall provide clearances complying with 403.5.

EXCEPTION: Within employee work areas, clearances on common use circulation paths shall be permitted to be decreased by work area equipment provided that the decrease is essential to the function of the work being performed.

403.5.1 Clear Width. Except as provided in 403.5.2 and 403.5.3, the clear width of walking surfaces shall be 36 inches (915 mm) minimum.
EXCEPTION: The clear width shall be permitted to be reduced to 32 inches (815 mm) minimum for a length of 24 inches (610 mm) maximum provided that reduced width segments are separated by segments that are 48 inches (1220 mm) long minimum and 36 inches (915 mm) wide minimum.

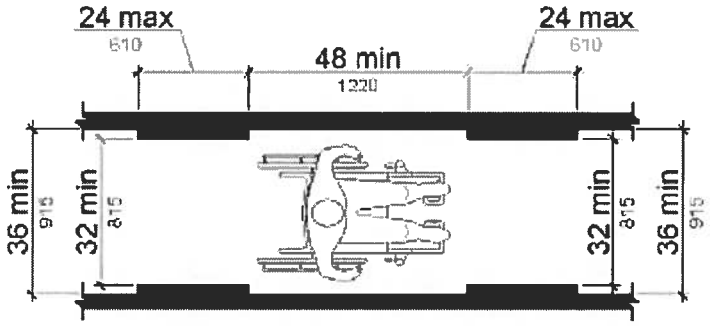


Figure 403.5.1 Clear Width of an Accessible Route

X UNACCEPTABLE

7. The door connecting the entry and waiting room does not provide any door maneuvering clearance on the pull side of the door for front approach.

8. **The door connecting corridor #1 and corridor #2 provides only 6" from the side wall to the strike side of the door for front approach on the pull side.**


9. **The exterior door located in corridor #4 provides only 10" from the side wall to the strike side of the door for front approach on the pull side.**

10. **The door located in corridor #4 provides only 5-1/2" from the side wall to the strike side of the door for front approach on the pull side.**

11. The door located at shower #1 provided only 2-1/2" from the side wall to the strike side of the door for front approach on the pull side.

12. The entry door does not provide the 60" minimum door maneuvering area for front approach on the pull side.
Only 46" door maneuvering clearance is provided on the strike side of the door,

13. The exterior fitness center door provided only 4" door maneuvering from the strike side of the door to the side of the brick.

14. The exterior vehicle bay door provided only 4" door maneuvering from the strike side of the door to the side of the brick.

1994 TAS Requires:

4.13 Doors.

4.13.6 Maneuvering Clearances at Doors. Minimum maneuvering clearances at doors that are not automatic or power-assisted shall be as shown in Fig. 25. The floor or ground area within the required clearances shall be level and clear.

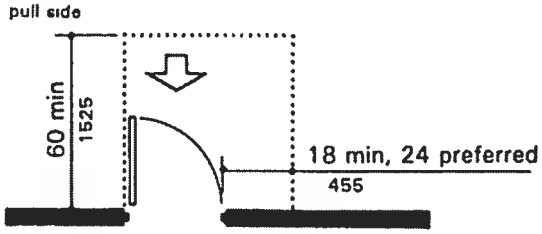


Fig.25 (a) Front Approaches Swinging Doors

2012 TAS Requires:

404 Doors, Doorways, and Gates

404.2.4 Maneuvering Clearances. Minimum maneuvering clearances at doors and gates shall comply with 404.2.4. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.

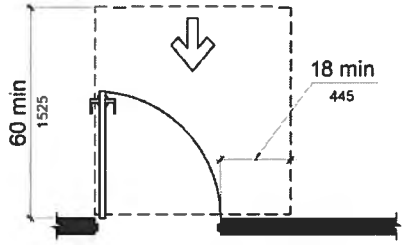


Figure 404.2.4.1 Maneuvering Clearances at Manual Swinging Doors and Gates

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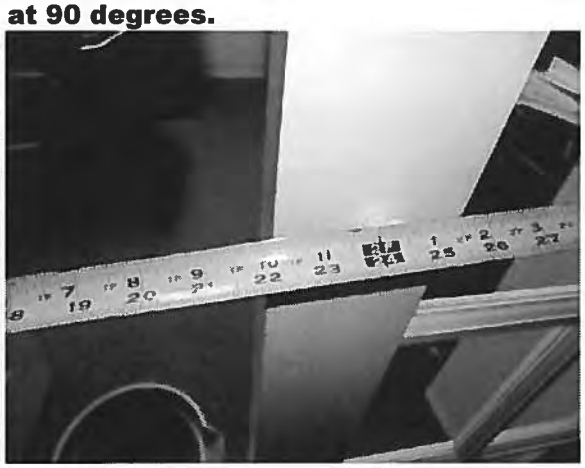
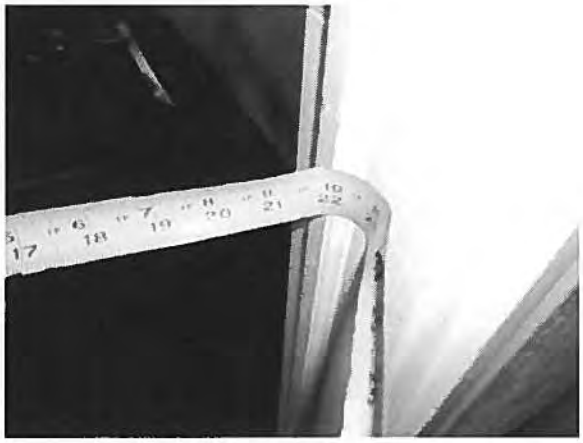
X UNACCEPTABLE

15. The double doors located in office #5 are a pair of 22" doors and only provide a 22" wide clear width when one of the doors open at 90 degrees.



16. The following doors provided only a 22" wide clear width with the door opened at 90 degrees.

Door connecting the fitness room and corridor #3



Shower #2

Shower #1

Vehicle Restroom

17. Bedrooms #1, #2, #3, and #4 doors provided only a 30" wide clear width with the doors open 90 degrees.
Note: Only one bedroom is required to comply with the 2012 TAS
See TM 2012-02 Attached.

18. Office #1 door provided only a 28-1/2" wide clear width with the door open 90 degrees.

19. **Both closet doors located adjacent form the police storage room provided only a 29" wide clear width with the door open at 90 degrees.**
20. **The vehicle storage door provided only a 29-1/2" wide clear width with the door open 90 degrees.**

TAS Requires:

404 Doors, Doorways, and Gates

404.1 General. Doors, doorways, and gates that are part of an accessible route shall comply with 404.

404.2.2 Double-Leaf Doors and Gates. At least one of the active leaves of doorways with two leaves shall comply with 404.2.3 and 404.2.4.

404.2.3 Clear Width. Door openings shall provide a clear width of 32 inches (815 mm) minimum. Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Openings more than 24 inches (610 mm) deep shall provide a clear opening of 36 inches (915 mm) minimum. There shall be no projections into the required clear opening width lower than 34 inches (865 mm) above the finish floor or ground. Projections into the clear opening width between 34 inches (865 mm) and 80 inches (2030 mm) above the finish floor or ground shall not exceed 4 inches (100 mm).
EXCEPTIONS:
1. In alterations, a projection of 5/8 inch (16 mm) maximum into the required clear width shall be permitted for the latch side stop.
2. Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the finish floor or ground.

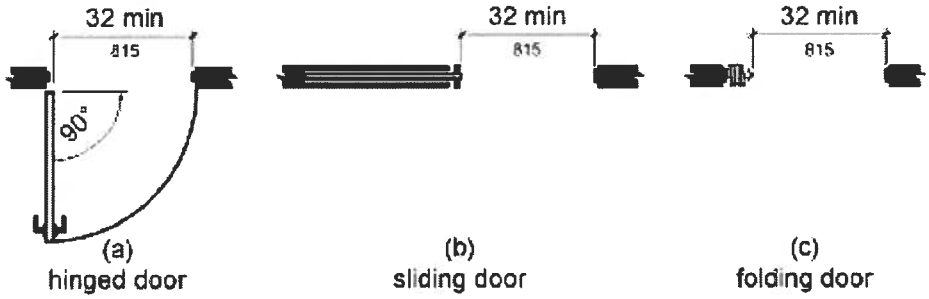
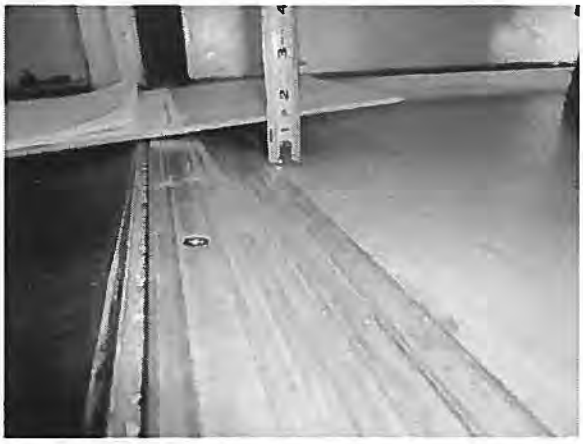


Figure 404.2.3 Clear Width of Doorways

X UNACCEPTABLE

21. The fitness center interior door had a threshold/ vertical edge level change of ¾".

22. The door connecting the vehicle bay and corridor #4 had a threshold of 1-1/4" from the top of the threshold to the finished floor.



23. The double doors in Office #5 has a vertical edge threshold hold measured 2" from the top of the threshold to the finished floor.

24. Shower #1 had a ¾" high threshold that was not properly beveled.

25. The door connecting the kitchen to corridor #4 had a ¾" high vertical edge at the threshold of the door.

26. The closet door adjacent to police storage had a 1-1/2" high vertical edge at the threshold of the door.

27. The door located in corridor #4 adjacent to the kitchen door had a 1" high vertical edge at the threshold of the door.

28. The vehicle storage door had a 1-1/2" high vertical edge at the threshold of the door.

29. The vehicle restroom door had a 3/4" high vertical edge at the threshold of the door.

1994 TAS Requires:

4.13 Doors.

4.13.8* Thresholds at Doorways. Thresholds at doorways shall not exceed 3/4 in (19 mm) in height for exterior sliding doors or 1/2 in (13 mm) for other types of doors. Raised thresholds and floor level changes at accessible doorways shall be beveled with a slope no greater than 1:2 (see 4.5.2).

2012 TAS Requires:

404 Doors, Doorways, and Gates

404.2.5 Thresholds. Thresholds, if provided at doorways, shall be 1/2 inch (13 mm) high maximum. Raised thresholds and changes in level at doorways shall comply with 302 and 303.

EXCEPTION: Existing or altered thresholds 3/4 inch (19 mm) high maximum that have a beveled edge on each side with a slope not steeper than 1:2 shall not be required to comply with 404.2.5.

X UNACCEPTABLE

30. There is 6" level change located in corridor #2 located on an accessible route.

TAS Requires:

303 Changes in Levels:

303.1 General. Where changes in level are permitted in floor or ground surfaces, they shall comply with 303.

EXCEPTIONS:
1. Animal containment areas shall not be required to comply with 303.
2. Areas of sport activity shall not be required to comply with 303.

303.2 Vertical. Changes in level of 1/4 inch (6.4 mm) high maximum shall be permitted to be vertical.

Figure 303.2 Vertical Change in Level

303.3 Beveled. Changes in level between 1/4 inch (6.4 mm) high minimum and 1/2 inch (13 mm) high maximum shall be beveled with a slope not steeper than 1:2.

Advisory 303.3 Beveled. A change in level of 1/2 inch (13 mm) is permitted to be ¼ inch (6.4 mm) vertical plus 1/4 inch (6.4 mm) beveled. However, in no case may the combined change in level exceed 1/2 inch (13 mm). Changes in level exceeding 1/2 inch (13 mm) must comply with 405 (Ramps) or 406 (Curb Ramps).

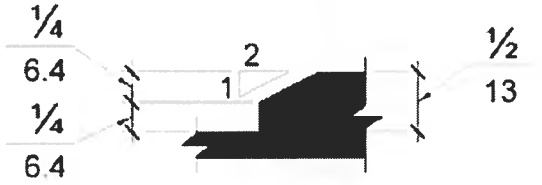


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Figure 303.3 Beveled Change in Level

303.4 Ramps. Changes in level greater than 1/2 inch (13 mm) high shall be ramped, and shall comply with 405 or 406.

X UNACCEPTABLE

31. The door connecting the entry to the waiting room had a 6.9% running slope in the door maneuvering area.

TAS Requires:

402 Accessible Routes

402.1 General. Accessible routes shall comply with 402.

402.2 Components. Accessible routes shall consist of one or more of the following components: walking surfaces with a running slope not steeper than 1:20, doorways, ramps, curb ramps excluding the flared sides, elevators, and platform lifts. All components of an accessible route shall comply with the applicable requirements of Chapter 4.

Advisory 402.2 Components. Walking surfaces must have running slopes not steeper than 1:20, see 403.3. Other components of accessible routes, such as ramps (405) and curb ramps (406), are permitted to be more steeply sloped.

404 Doors, Doorways, and Gates

404.1 General. Doors, doorways, and gates that are part of an accessible route shall comply with 404.
EXCEPTION: Doors, doorways, and gates designed to be operated only by security personnel shall not be required to comply with 404.2.7, 404.2.8, 404.2.9, 404.3.2 and 404.3.4 through 404.3.7.

404.2.4.4 Floor or Ground Surface. Floor or ground surface within required maneuvering clearances shall comply with 302. Changes in level are not permitted.
EXCEPTIONS:
1. Slopes not steeper than 1:48 shall be permitted.
2. Changes in level at thresholds complying with 404.2.5 shall be permitted.

404.2.5 Thresholds. Thresholds, if provided at doorways, shall be 1/2 inch (13 mm) high maximum. Raised thresholds and changes in level at doorways shall comply with 302 and 303.
EXCEPTION: Existing or altered thresholds 3/4 inch (19 mm) high maximum that have a beveled edge on each side with a slope not steeper than 1:2 shall not be required to comply with 404.2.5.

X UNACCEPTABLE

32. Multiple doors located throughout the facility had non- compliant knob type hardware.

1994 TAS Requires:

4.13 Doors.

4.13.9* Door Hardware. Handles, pulls, latches, locks, and other operating devices on accessible doors shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. Lever-operated mechanisms, push-type mechanisms, and U-shaped handles are acceptable designs. When sliding doors are fully open, operating hardware shall be exposed and usable from both sides. Hardware required for accessible door passage shall be mounted no higher than 48 in (1220 mm) above finished floor.

2012 TAS Requires:

404 Doors, Doorways, and Gates

404.2.7 Door and Gate Hardware. Handles, pulls, latches, locks, and other operable parts on doors and gates shall comply with 309.4. Operable parts of such hardware shall be 34 inches (865 mm) minimum and 48 inches (1220 mm) maximum above the finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.

309 Operable Parts

309.4 Operation. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.

X UNACCEPTABLE

33. Shower #1, Shower #2, and Vehicle RR – bathrooms were not designed to be accessible. Bathrooms are allowed to be adaptable in residential dwelling units.
See exceptions below

Shower #1


Shower #2


Vehicle Restroom


1994 TAS Requires:

4.16 Water Closets.

4.16.1 ***General.***

4.16.4* Grab Bars. Grab bars for water closets not located in stalls shall comply with 4.26 and Fig. 29. The grab bar behind the water closet shall be 36 in (915 mm) minimum.

4.16.5* Flush Controls. Flush controls shall be hand operated or automatic and shall comply with 4.27.4. Controls for flush valves shall be mounted on the wide side of toilet areas no more than 44 in (1120 mm) above the floor.

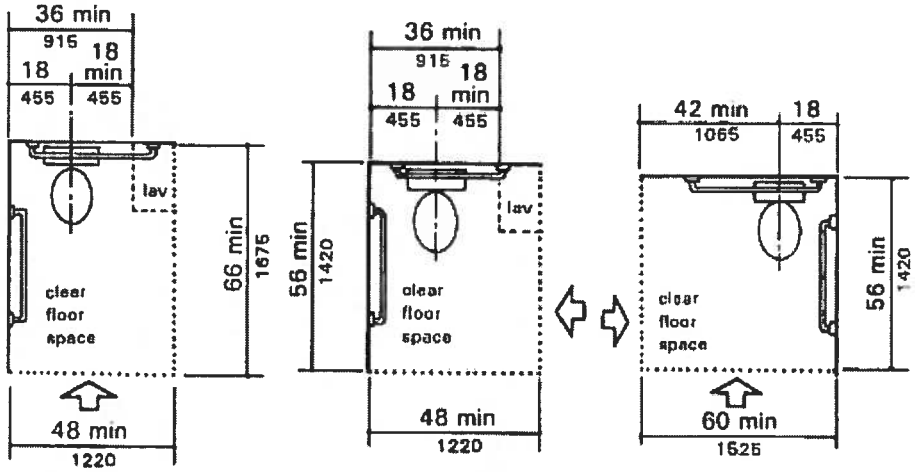

Fig. 28 Clear Floor Space at Water Closets

2012 TAS Requires:

603 Toilet and Bathing Rooms

603.1 General. Toilet and bathing rooms shall comply with 603.

603.2 Clearances. Clearances shall comply with 603.2.

603.2.1 Turning Space. Turning space complying with 304 shall be provided within the room.

603.2.2 Overlap. Required clear floor spaces, clearance at fixtures, and turning space shall be permitted to overlap.

603.2.3 Door Swing. Doors shall not swing into the clear floor space or clearance required for any fixture. Doors shall be permitted to swing into the required turning space.

EXCEPTIONS:
1. Doors to a toilet room or bathing room for a single occupant accessed only through a private office and not for common use or public use shall be permitted to swing into the clear floor space or clearance provided the swing of the door can be reversed to comply with 603.2.3.
2. Where the toilet room or bathing room is for individual use and a clear floor space complying with 305.3 is provided within the room beyond the arc of the door swing, doors shall be permitted to swing into the clear floor space or clearance required for any fixture.

Advisory 603.2.3 Door Swing Exception 1. At the time the door is installed, and if the door swing is reversed in the future, the door must meet all the requirements specified in 404. Additionally, the door swing cannot reduce the required width of an accessible route. Also, avoid violating other building or life safety codes when the door swing is reversed.

603.3 Mirrors. Mirrors located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 40 inches (1015 mm) maximum above the finish floor or ground. Mirrors not located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 35 inches (890 mm) maximum above the finish floor or ground.

Advisory 603.3 Mirrors. A single full-length mirror can accommodate a greater number of people, including children. In order for mirrors to be usable by people who are ambulatory and people who use wheelchairs, the top edge of mirrors should be 74 inches (1880 mm) minimum from the floor or ground.

603.4 Coat Hooks and Shelves. Coat hooks shall be located within one of the reach ranges specified in 308. Shelves shall be located 40 inches (1015 mm) minimum and 48 inches (1220 mm) maximum above the finish floor.

604 Water Closets and Toilet Compartments

604.1 General. Water closets and toilet compartments shall comply with 604.2 through 604.8.

EXCEPTION: Water closets and toilet compartments for children's use shall be permitted to comply with 604.9.

604.2 Location. The water closet shall be positioned with a wall or partition to the rear and to one side. The centerline of the water closet shall be 16 inches (405 mm) minimum to 18 inches (455 mm) maximum from the side wall or partition, except that the water closet shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum from the side wall or partition in the ambulatory accessible toilet compartment specified in 604.8.2. Water closets shall be arranged for a left-hand or right-hand approach.

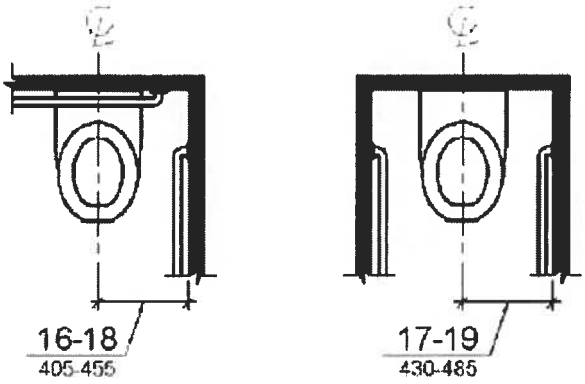

Figure 604.2 Water Closet Location

604.3 Clearance. Clearances around water closets and in toilet compartments shall comply with 604.3.

604.3.1 Size. Clearance around a water closet shall be 60 inches (1525 mm) minimum measured perpendicular from the side wall and 56 inches (1420 mm) minimum measured perpendicular from the rear wall.

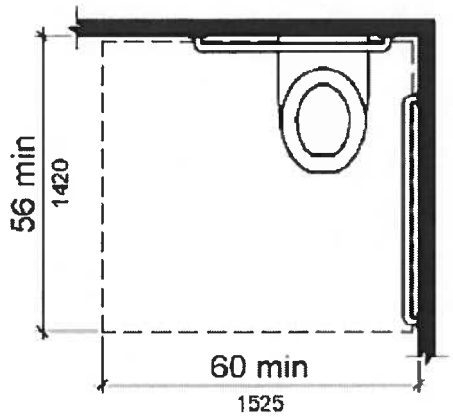

Figure 604.3.1 Size of Clearance at Water Closets

604.3.2 Overlap. The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, dispensers, sanitary napkin disposal units, coat hooks, shelves, accessible routes, clear floor space and clearances required at other fixtures, and the turning space. No other fixtures or obstructions shall be located within the required water closet clearance.

EXCEPTION: In residential dwelling units, a lavatory complying with 606 shall be permitted on the rear wall 18 inches (455 mm) minimum from the water closet centerline where the clearance at the water closet is 66 inches (1675 mm) minimum measured perpendicular from the rear wall.

Advisory 604.3.2 Overlap. When the door to the toilet room is placed directly in front of the water closet, the water closet cannot overlap the required maneuvering clearance for the door inside the room.

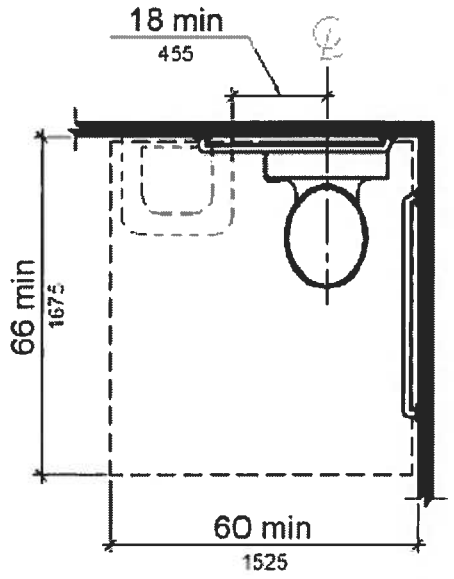

Figure 604.3.2 (Exception) Overlap of Water Closet Clearance in Residential Dwelling Units

604.4 Seats. The seat height of a water closet above the finish floor shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum measured to the top of the seat. Seats shall not be sprung to return to a lifted position.

EXCEPTIONS:

1. A water closet in a toilet room for a single occupant accessed only through a private office and not for common use or public use shall not be required to comply with 604.4.

2. In residential dwelling units, the height of water closets shall be permitted to be 15 inches (380 mm) minimum and 19 inches (485 mm) maximum above the finish floor measured to the top of the seat.

604.5 Grab Bars. Grab bars for water closets shall comply with 609. Grab bars shall be provided on the side wall closest to the water closet and on the rear wall.

EXCEPTIONS:

1. Grab bars shall not be required to be installed in a toilet room for a single occupant accessed only through a private office and not for common use or public use provided that reinforcement has been installed in walls and located so as to permit the installation of grab bars complying with 604.5.

2. In residential dwelling units, grab bars shall not be required to be installed in toilet or bathrooms provided that reinforcement has been installed in walls and located so as to permit the installation of grab bars complying with 604.5.

3. In detention or correction facilities, grab bars shall not be required to be installed in housing or holding cells that are specially designed without protrusions for purposes of suicide prevention.

Advisory 604.5 Grab Bars Exception 2. Reinforcement must be sufficient to permit the installation of rear and side wall grab bars that fully meet all accessibility requirements including, but not limited to, required length, installation height, and structural strength.

606 Lavatories and Sinks

606.1 General. Lavatories and sinks shall comply with 606.

Advisory 606.1 General. If soap and towel dispensers are provided, they must be located within the reach ranges specified in 308. Locate soap and towel dispensers so that they are conveniently usable by a person at the accessible lavatory.

606.2 Clear Floor Space. A clear floor space complying with 305, positioned for a forward approach, and knee and toe clearance complying with 306 shall be provided.

EXCEPTIONS:

1. A parallel approach complying with 305 shall be permitted to a kitchen sink in a space where a cook top or conventional range is not provided and to wet bars.

2. A lavatory in a toilet room or bathing facility for a single occupant accessed only through a private office and not for common use or public use shall not be required to provide knee and toe clearance complying with 306.

3. In residential dwelling units, cabinetry shall be permitted under lavatories and kitchen sinks provided that all of the following conditions are met:

(a) the cabinetry can be removed without removal or replacement of the fixture;
(b) the finish floor extends under the cabinetry; and
(c) the walls behind and surrounding the cabinetry are finished.

609 Grab Bars

609.1 General. Grab bars in toilet facilities and bathing facilities shall comply with 609.

609.2 Cross Section. Grab bars shall have a cross section complying with 609.2.1 or 609.2.2.

609.2.1 Circular Cross Section. Grab bars with circular cross sections shall have an outside diameter of 1 1/4 inches (32 mm) minimum and 2 inches (51 mm) maximum.

609.2.2 Non-Circular Cross Section. Grab bars with non-circular cross sections shall have a cross-section dimension of 2 inches (51 mm) maximum and a perimeter dimension of 4 inches (100 mm) minimum and 4.8 inches (120 mm) maximum.

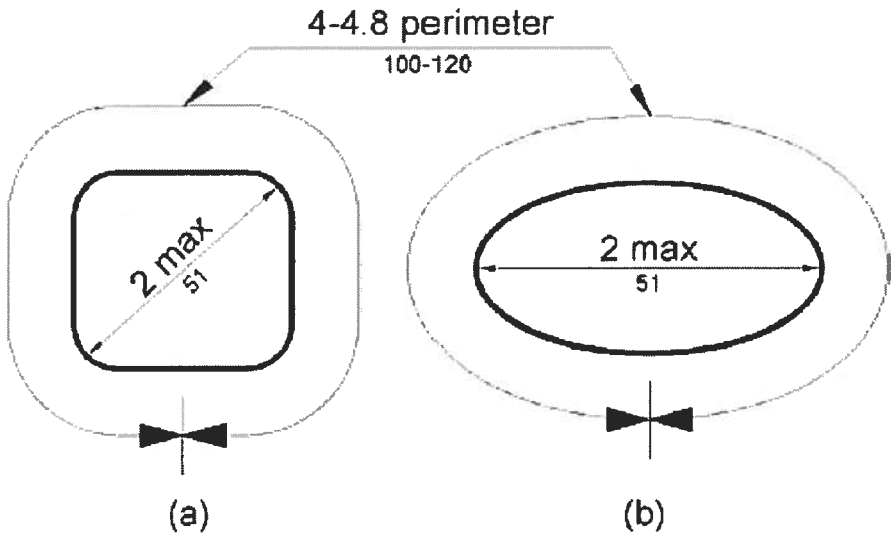

Figure 609.2.2 Grab Bar Non-Circular Cross Section

609.3 Spacing. The space between the wall and the grab bar shall be 1 1/2 inches (38 mm). The space between the grab bar and projecting objects below and at the ends shall be 1 1/2 inches (38 mm) minimum. The space between the grab bar and projecting objects above shall be 12 inches (305 mm) minimum.

EXCEPTION: The space between the grab bars and shower controls, shower fittings, and other grab bars above shall be permitted to be 1 1/2 inches (38 mm) minimum.

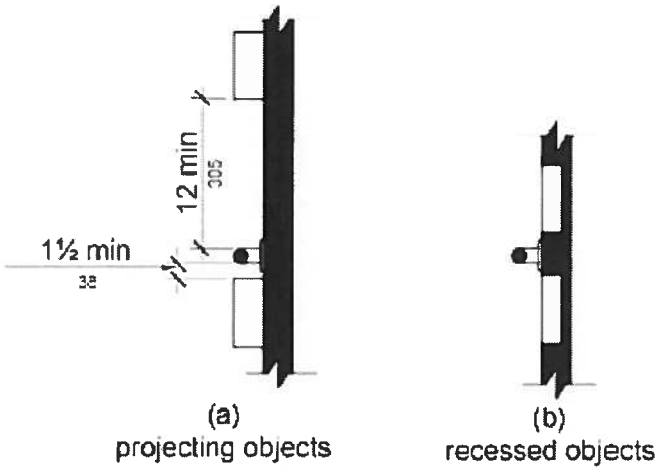

Figure 609.3 Spacing of Grab Bars

609.4 Position of Grab Bars. Grab bars shall be installed in a horizontal position, 33 inches (840 mm) minimum and 36 inches (915 mm) maximum above the finish floor measured to the top of the gripping surface, except that at water closets for children's use complying with 604.9, grab bars shall be installed in a horizontal position 18 inches (455 mm) minimum and 27 inches (685 mm) maximum above the finish floor measured to the top of the gripping surface. The height of the lower grab bar on the back wall of a bathtub shall comply with 607.4.1.1 or 607.4.2.1.

609.5 Surface Hazards. Grab bars and any wall or other surfaces adjacent to grab bars shall be free of sharp or abrasive elements and shall have rounded edges.

609.6 Fittings. Grab bars shall not rotate within their fittings.

609.7 Installation. Grab bars shall be installed in any manner that provides a gripping surface at the specified locations and that does not obstruct the required clear floor space.

609.8 Structural Strength. Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the grab bar, fastener, mounting device, or supporting structure.

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X UNACCEPTABLE

34. Shower #1 and Shower #2 – A shower spray unit with a hose that can be used both as a fixed shower head and as a hand-held shower head was not provided. The fixed shower head measured more than 48" above the finished floor.

35. Shower #2 – the shower threshold measured 4" from the top of the threshold to the finished floor.

36. Shower #1 – the shower threshold measured 5-1/2" from the top of the threshold to the finished floor.

1994 TAS Requires:

4.21 Shower Stalls.

4.21.6 Shower Unit. A shower spray unit with a hose at least 60 in (1525 mm) long that can be used both as a fixed shower head and as a hand-held shower shall be provided. *In a 36 in by 36 in (915 mm by 915 mm) shower stall the mounting device for the hand-held shower head shall comply with 4.2.5 Forward Reach. In a 30 in by 60 in minimum (760 mm by 1525 mm) shower stall the mounting device for the hand-held shower head shall comply with either 4.2.5 Forward Reach or 4.2.6 Side Reach, as appropriate for the stall design.*

EXCEPTION: In unmonitored facilities where vandalism is a consideration, a fixed shower head mounted at 48 in (1220 mm) above the shower floor may be used in lieu of a hand-held shower head.

4.21.7 Curbs. If provided, curbs in shower stalls 36 in by 36 in (915 mm by 915 mm) shall be no higher than 1/2 in (13 mm). Shower stalls that are 30 in by 60 in (760 mm by 1525 mm) minimum shall not have curbs.

2012 TAS Requires:

608 Shower Compartments

608.6 Shower Spray Unit and Water. A shower spray unit with a hose 59 inches (1500 mm) long minimum that can be used both as a fixed-position shower head and as a hand-held shower shall be provided. The shower spray unit shall have an on/off control with a non-positive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars. Shower spray units shall deliver water that is 120°F (49°C) maximum.

EXCEPTION: A fixed shower head located at 48 inches (1220 mm) maximum above the shower finish floor shall be permitted instead of a hand-held spray unit in facilities that are not medical care facilities, long-term care facilities, transient lodging guest rooms, or residential dwelling units.

Advisory 608.6 Shower Spray Unit and Water. Ensure that hand-held shower spray units are capable of delivering water pressure substantially equivalent to fixed shower heads.

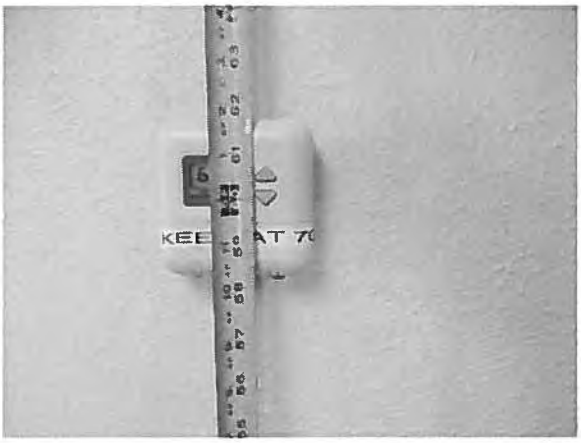
608.7 Thresholds. Thresholds in roll-in type shower compartments shall be 1/2 inch (13 mm) high maximum in accordance with 303. In transfer type shower compartments, thresholds 1/2 inch (13 mm) high maximum shall be beveled, rounded, or vertical.

EXCEPTION: A threshold 2 inches (51 mm) high maximum shall be permitted in transfer type shower compartments in existing facilities where provision of a 1/2 inch (13 mm) high threshold would disturb the structural reinforcement of the floor slab.

X UNACCEPTABLE

37. The coat hooks located in corridor #3 measured 69-1/2" from the top of the coat hook to the finished floor.

38. The thermostat located in corridor #3 measured 60-1/2" from the top of the operable part to the finished floor.



39. Kitchen – The operable parts on the microwave measured 57" from the finished floor.

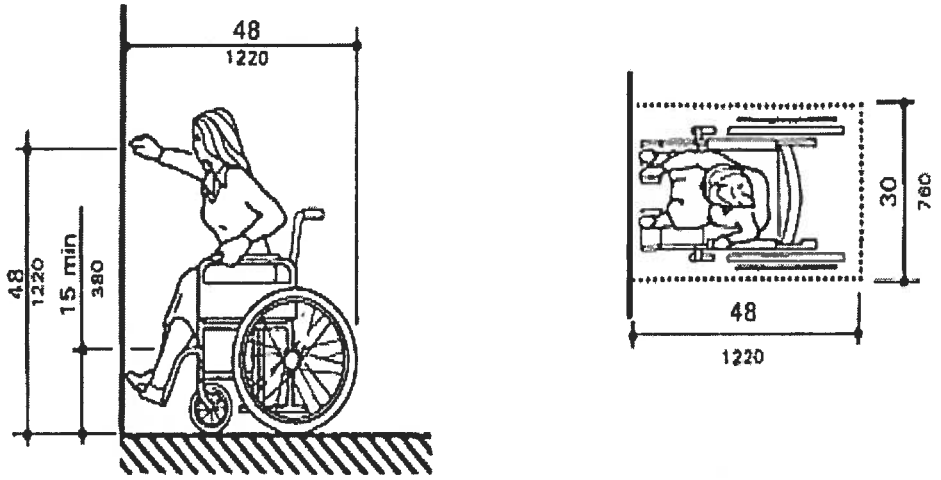
1994 TAS Requires:

4.27 Controls and Operating Mechanisms.

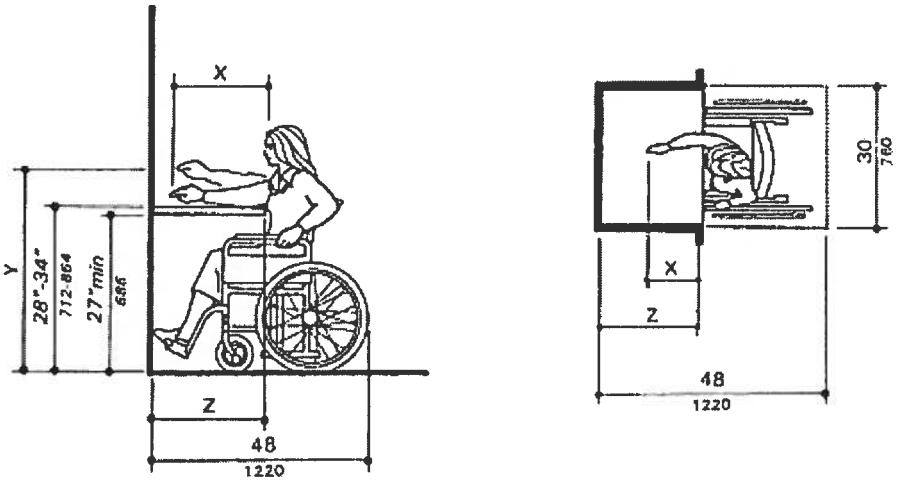
4.27.3* Height. The highest operable part of controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in 4.2.5 and 4.2.6. Electrical and communications system receptacles on walls shall be mounted no less than 15 in (380 mm) above the floor.

4.2 Space Allowances and Reach Ranges.

4.2.5* Forward Reach. If the clear floor space only allows forward approach to an object, the maximum high forward reach allowed shall be 48 in (1220 mm) (see Fig. 5(a)). The minimum low forward reach is 15 in (380 mm). If the high forward reach is over an obstruction, reach and clearances shall be as shown in Fig. 5(b). *For mounting heights suitable in schools and other facilities used primarily by children see section 2.1.1.*



(a) High Forward Reach Limit

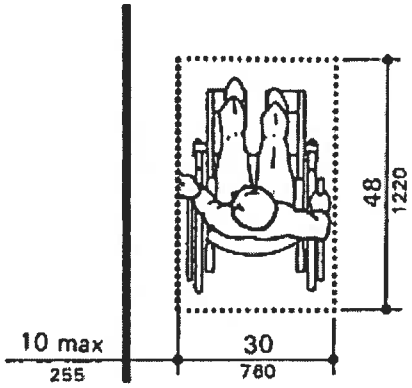


NOTE: x shall be ≤ 25 in(635 mm); z shall be ≥ x. When x < 20 in(510 mm), then y shall be 48 in(1220 mm) maximum. When x is 20 to 25 in(510 to 635 mm), then y shall be 44 in(1120 mm) maximum.

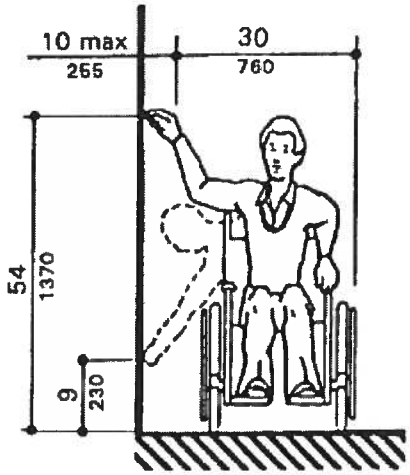
(b) Maximum Forward Reach over an Obstruction

Fig. 5 Forward Reach

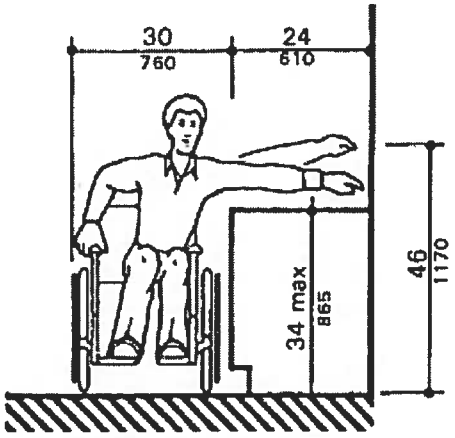
4.2.6* Side Reach. If the clear floor space allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall be 54 in (1370 mm) and the low side reach shall be no less than 9 in (230 mm) above the floor (Fig. 6(a) and 6(b)). If the side reach is over an obstruction, the reach and clearances shall be as shown in Fig. 6(c). *For mounting heights suitable in schools and other facilities used primarily by children see section 2.1.1.*



(a) Clear Floor Space Parallel Approach



(b) High and Low Side Reach Limits



(c) Maximum Side Reach over Obstruction

Fig. 6 Side Reach

2012 TAS Requires:

309 Operable Parts

309.3 Height. Operable parts shall be placed within one or more of the reach ranges specified in 308.

308 Reach Ranges

308.1 General. Reach ranges shall comply with 308.

308.2 Forward Reach.

308.2.1 Unobstructed. Where a forward reach is unobstructed, the high forward reach shall be 48 inches (1220 mm) maximum and the low forward reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

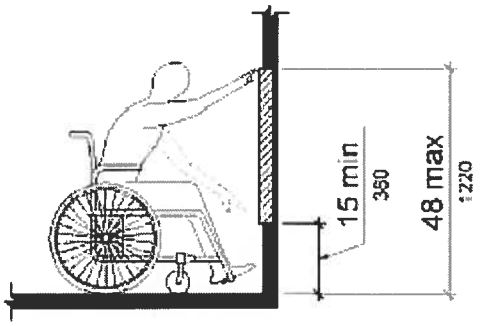


Figure 308.2.1 Unobstructed Forward Reach

308.2.2 Obstructed High Reach. Where a high forward reach is over an obstruction, the clear floor space shall extend beneath the element for a distance not less than the required reach depth over the obstruction. The high forward reach shall be 48 inches (1220 mm) maximum where the reach depth is 20 inches (510 mm) maximum. Where the reach depth exceeds 20 inches (510 mm), the high forward reach shall be 44 inches (1120 mm) maximum and the reach depth shall be 25 inches (635 mm) maximum.

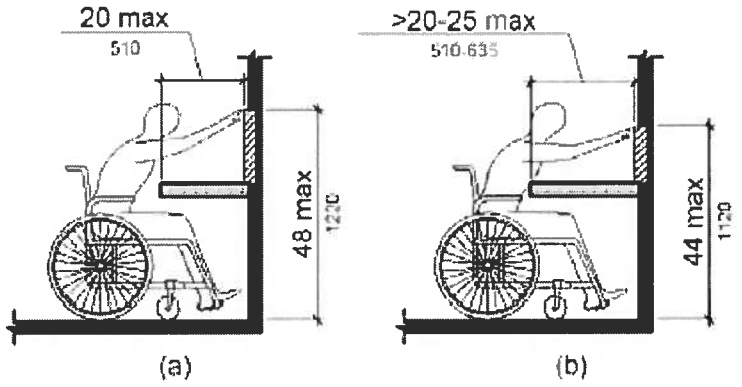


Figure 308.2.2 Obstructed High Forward Reach

308.3 Side Reach.

308.3.1 Unobstructed. Where a clear floor or ground space allows a parallel approach to an element and the side reach is unobstructed, the high side reach shall be 48 inches (1220 mm) maximum and the low side reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

EXCEPTIONS:
1. An obstruction shall be permitted between the clear floor or ground space and the element where the depth of the obstruction is 10 inches (255 mm) maximum.

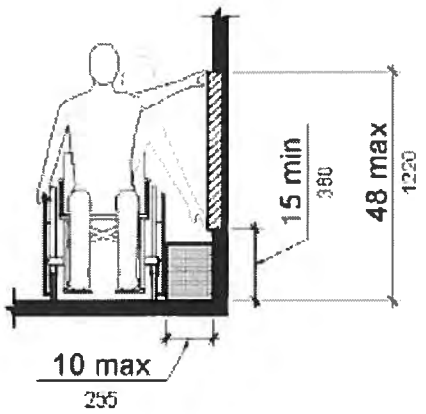


Figure 308.3.1 Unobstructed Side Reach

308.3.2 Obstructed High Reach. Where a clear floor or ground space allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 34 inches (865 mm) maximum and the depth of the obstruction shall be 24 inches (610 mm) maximum. The high side reach shall be 48 inches (1220 mm) maximum for a reach depth of 10 inches (255 mm) maximum. Where the reach depth exceeds 10 inches (255 mm), the high side reach shall be 46 inches (1170 mm) maximum for a reach depth of 24 inches (610 mm) maximum.

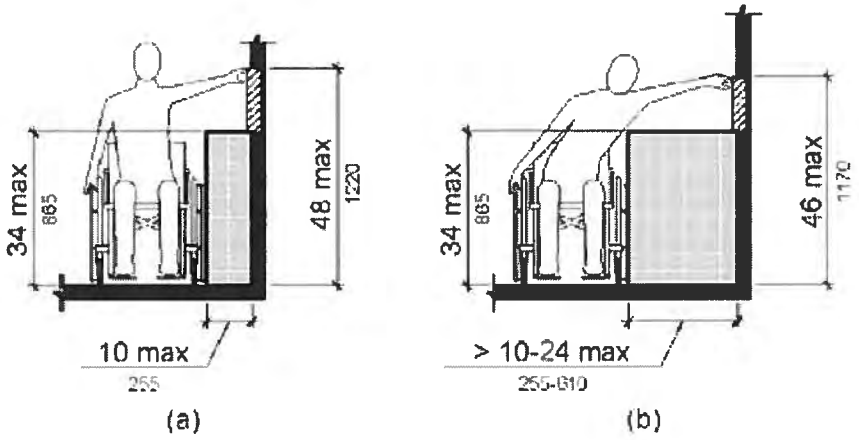


Figure 308.3.2 Obstructed High Side Reach

X UNACCEPTABLE

40. The range/oven located in the kitchen has the controls located above the burners. A user would have to reach over the burners to operate the range/oven.

TAS Requires:

804 Kitchens and Kitchenettes

804.1 General. Kitchens and kitchenettes shall comply with 804.

804.2 Clearance. Where a pass through kitchen is provided, clearances shall comply with 804.2.1. Where a U-shaped kitchen is provided, clearances shall comply with 804.2.2.

804.6.4 Range or Cooktop. Where a forward approach is provided, the clear floor or ground space shall provide knee and toe clearance complying with 306. Where knee and toe space is provided, the underside of the range or cooktop shall be insulated or otherwise configured to prevent burns, abrasions, or electrical shock. The location of controls shall not require reaching across burners.

X UNACCEPTABLE

41. The sink height in the kitchen measured 36-1/2" from the top of the sink rim to the finished floor.
The kitchen sink is allowed to be adaptable in residential dwelling units.

1994 and 2012 TAS Requires:

606 Lavatories and Sinks

606.1 General. Lavatories and sinks shall comply with 606.

Advisory 606.1 General. If soap and towel dispensers are provided, they must be located within the reach ranges specified in 308. Locate soap and towel dispensers so that they are conveniently usable by a person at the accessible lavatory.

606.2 Clear Floor Space. A clear floor space complying with 305, positioned for a forward approach, and knee and toe clearance complying with 306 shall be provided.

EXCEPTIONS:
1. A parallel approach complying with 305 shall be permitted to a kitchen sink in a space where a cook top or conventional range is not provided and to wet bars.
2. A lavatory in a toilet room or bathing facility for a single occupant accessed only through a private office and not for common use or public use shall not be required to provide knee and toe clearance complying with 306.
3. In residential dwelling units, cabinetry shall be permitted under lavatories and kitchen sinks provided that all of the following conditions are met:

(a) the cabinetry can be removed without removal or replacement of the fixture;
(b) the finish floor extends under the cabinetry; and
(c) the walls behind and surrounding the cabinetry are finished.

4. A knee clearance of 24 inches (610 mm) minimum above the finish floor or ground shall be permitted at lavatories and sinks used primarily by children 6 through 12 years where the rim or counter surface is 31 inches (785 mm) maximum above the finish floor or ground.
5. A parallel approach complying with 305 shall be permitted to lavatories and sinks used primarily by children 5 years and younger.
6. The dip of the overflow shall not be considered in determining knee and toe clearances.
7. No more than one bowl of a multi-bowl sink shall be required to provide knee and toe clearance complying with 306.

606.3 Height. Lavatories and sinks shall be installed with the front of the higher of the rim or counter surface 34 inches (865 mm) maximum above the finish floor or ground.

EXCEPTIONS:
1. A lavatory in a toilet or bathing facility for a single occupant accessed only through a private office and not for common use or public use shall not be required to comply with 606.3.
2. In residential dwelling unit kitchens, sinks that are adjustable to variable heights, 29 inches (735 mm) minimum and 36 inches (915 mm) maximum, shall be permitted where rough-in plumbing permits connections of supply and drain pipes for sinks mounted at the height of 29 inches (735 mm).

606.4 Faucets. Controls for faucets shall comply with 309. Hand-operated metering faucets shall remain open for 10 seconds minimum.

606.5 Exposed Pipes and Surfaces. Water supply and drain pipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks

804 Kitchens and Kitchenettes

804.3 Kitchen Work Surface. In residential dwelling units required to comply with 809, at least one 30 inches (760 mm) wide minimum section of counter shall provide a kitchen work surface that complies with 804.3.

804.3.1 Clear Floor or Ground Space. A clear floor space complying with 305 positioned for a forward approach shall be provided. The clear floor or ground space shall be centered on the kitchen work surface and shall provide knee and toe clearance complying with 306.

EXCEPTION: Cabinetry shall be permitted under the kitchen work surface provided that all of the following conditions are met:
(a) the cabinetry can be removed without removal or replacement of the kitchen work surface;
(b) the finish floor extends under the cabinetry; and
(c) the walls behind and surrounding the cabinetry are finished.
804.3.2 Height. The kitchen work surface shall be 34 inches (865 mm) maximum above the finish floor or ground.

EXCEPTION: A counter that is adjustable to provide a kitchen work surface at variable heights, 29 inches (735 mm) minimum and 36 inches (915 mm) maximum shall be permitted.
804.3.3 Exposed Surfaces. There shall be no sharp or abrasive surfaces under the work surface counters.

804.4 Sinks. Sinks shall comply with 606.

X UNACCEPTABLE

42. The washer located in the kitchen did not provide a clear floor space complying with 305. The distance from the front of the washer to the adjacent counter-top measured 21" wide.

1994 and 2012 TAS Requires:

611 Washing Machines and Clothes Dryers

611.1 General. Washing machines and clothes dryers shall comply with 611.

611.2 Clear Floor Space. A clear floor or ground space complying with 305 positioned for parallel approach shall be provided. The clear floor or ground space shall be centered on the appliance.

305 Clear Floor or Ground Space

305.1 General. Clear floor or ground space shall comply with 305.

305.2 Floor or Ground Surfaces. Floor or ground surfaces of a clear floor or ground space shall comply with 302. Changes in level are not permitted.
EXCEPTION: Slopes not steeper than 1:48 shall be permitted.
305.3 Size. The clear floor or ground space shall be 30 inches (760 mm) minimum by 48 inches (1220 mm) minimum.

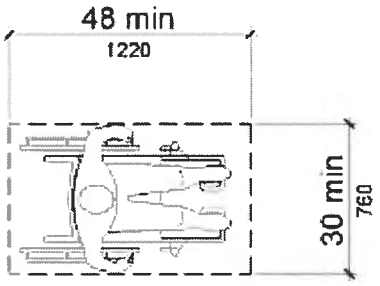


Figure 305.3 Clear Floor or Ground Space

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305.4 Knee and Toe Clearance. Unless otherwise specified, clear floor or ground space shall be permitted to include knee and toe clearance complying with 306.

305.5 Position. Unless otherwise specified, clear floor or ground space shall be positioned for either forward or parallel approach to an element.

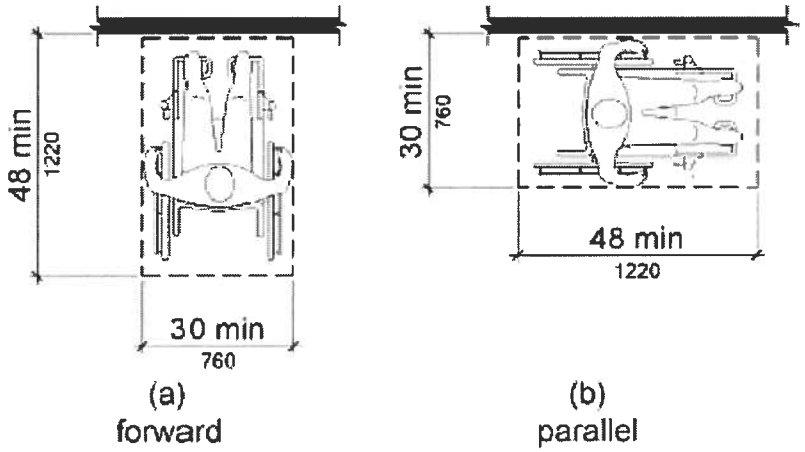

Figure 305.5 Position of Clear Floor or Ground Space

305.6 Approach. One full unobstructed side of the clear floor or ground space shall adjoin an accessible route or adjoin another clear floor or ground space.

305.7 Maneuvering Clearance. Where a clear floor or ground space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearance shall be provided in accordance with 305.7.1 and 305.7.2.

305.7.1 Forward Approach. Alcoves shall be 36 inches (915 mm)wide minimum where the depth exceeds 24 inches (610 mm).

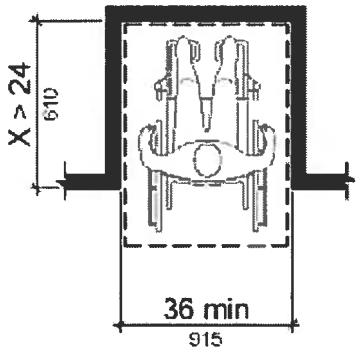

Figure 305.7.1 Maneuvering Clearance in an Alcove, Forward Approach

305.7.2 Parallel Approach. Alcoves shall be 60 inches (1525 mm) wide minimum where the depth exceeds 15 inches (380 mm).

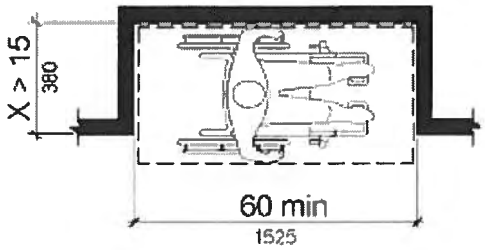

Figure 305.7.2 Maneuvering Clearance in an Alcove, Parallel Approach

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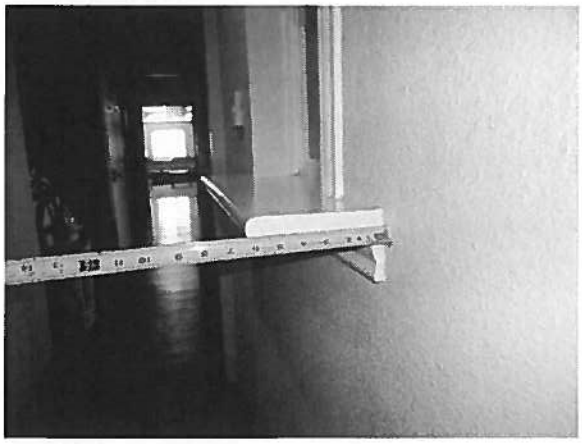
X UNACCEPTABLE

43. The Television located in the recreation room protrudes 5-1/2" from the wall at a height above 27".

44. The microwave located in the kitchen protrudes 15" from the wall at a height above 27".

45. The reception shelf/counter located in corridor #2 protrudes 6-1/4" from the wall at a height above 27".



1994 TAS Requires:

4.4 Protruding Objects.

4.4.1* General. Objects projecting from walls (for example, telephones) with their leading edges between 27 in and 80 in (685 mm and 2030 mm) above the finished floor shall protrude no more than 4 in (100 mm) into walks, halls, corridors, passageways, or aisles (see Fig. 8(a)). Objects mounted with their leading edges at or below 27 in (685 mm) above the finished floor may protrude any amount (see Fig. 8(a) and 8(b)). Free-standing objects mounted on posts or pylons may overhang 12 in (305 mm) maximum from 27 in to 80 in (685 mm to 2030 mm) above the ground or finished floor (see Fig. 8(c) and 8(d)). Protruding objects shall not reduce the clear width of an accessible route or maneuvering space (see Fig. 8(e)).

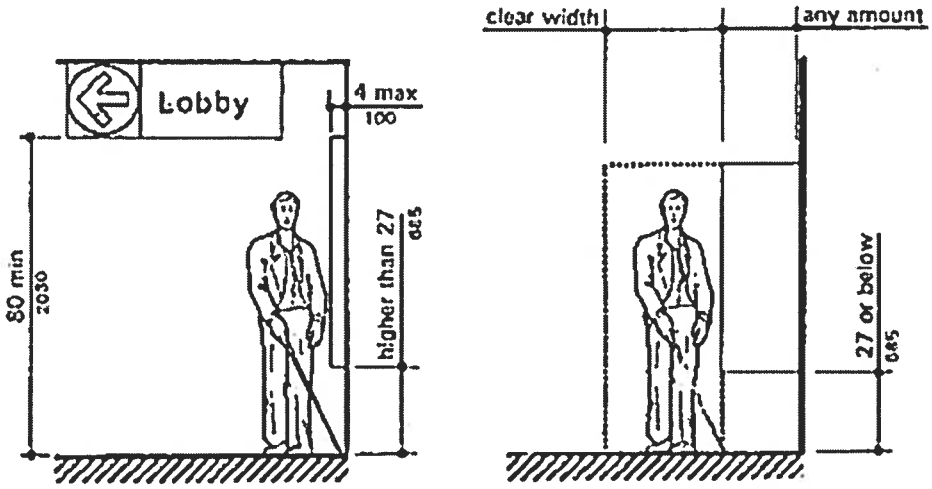


Fig 8(a) Walking Perpendicular to a Wall

2012 TAS Requires:

307 Protruding Objects

307.1 General. Protruding objects shall comply with 307.

307.2 Protrusion Limits. Objects with leading edges more than 27 inches (685 mm) and not more than 80 inches (2030 mm) above the finish floor or ground shall protrude 4 inches (100 mm) maximum horizontally into the circulation path.

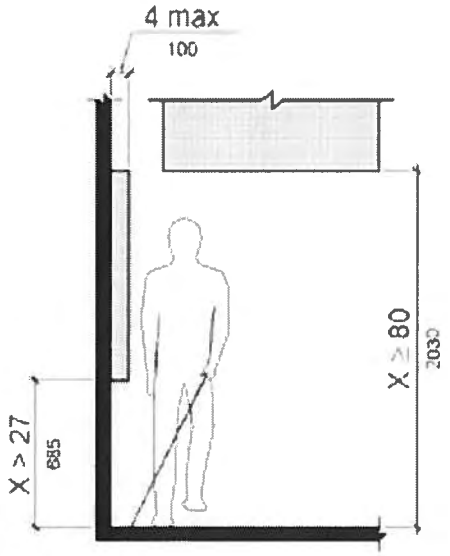


Figure 307.2 Limits of Protruding Objects

46. The transaction/ service counter located in corridor #2 measured 49-1/2 from the top of the counter to the finished floor.

1994 TAS Requires:

7.2 Sales and Service Counters, Teller Windows, Information Counters.

(2) At ticketing counters, teller stations in a bank or *other financial institution, nurse stations in hospitals or other medical facilities, reception and information counters*, registration counters in hotels and motels, box office ticket counters, and other counters that may not have a cash register but at which goods or services are sold or distributed *or information exchanged*, either:

(i) a portion of the main counter which is a minimum of 36 in (915 mm) in length shall be provided with a maximum height of 36 in (915 mm); or

(ii) (Reserved); or

(iii) equivalent facilitation shall be provided (e.g., at a hotel registration counter, equivalent facilitation might consist of: (1) provision of a folding shelf attached to the main counter on which an individual with disabilities can write, and (2) use of the space on the side of the counter or at the concierge desk, for handing materials back and forth *if such use does not block access*).

All accessible sales and service counters shall be on an accessible route complying with 4.3.

2012 TAS Requires:

227 Sales and Service

227.3 Counters. Where provided, at least one of each type of sales counter and service counter shall comply with 904.4. Where counters are dispersed throughout the building or facility, counters complying with 904.4 also shall be dispersed.

Advisory 227.3 Counters. Types of counters that provide different services in the same facility include, but are not limited to, order, pick-up, express, and returns. One continuous counter can be used to provide different types of service. For example, order and pick-up are different services. It would not be acceptable to provide access only to the part of the counter where orders are taken when orders are picked-up at a different location on the same counter. Both the order and pick-up section of the counter must be accessible.

904 Check-Out Aisles and Sales and Service Counters

904.4 Sales and Service Counters. Sales counters and service counters shall comply with 904.4.1 or 904.4.2. The accessible portion of the counter top shall extend the same depth as the sales or service counter top.

EXCEPTION: In alterations, when the provision of a counter complying with 904.4 would result in a reduction of the number of existing counters at work stations or a reduction of the number of existing mail boxes, the counter shall be permitted to have a portion which is 24 inches (610 mm) long minimum complying with 904.4.1 provided that the required clear floor or ground space is centered on the accessible length of the counter.

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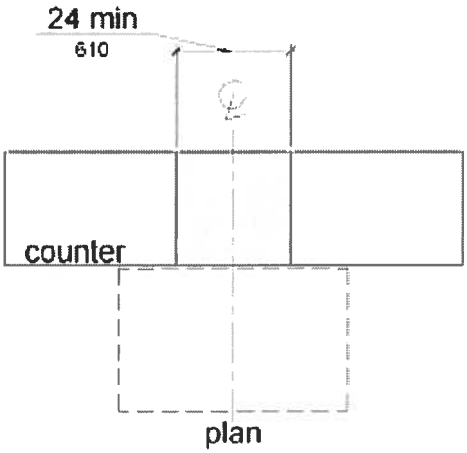

Figure 904.4 (Exception) Alteration of Sales and Service Counters

904.4.1 Parallel Approach. A portion of the counter surface that is 36 inches (915 mm) long minimum and 36 inches (915 mm) high maximum above the finish floor shall be provided. A clear floor or ground space complying with 305 shall be positioned for a parallel approach adjacent to the 36 inch (915 mm) minimum length of counter.

EXCEPTION: Where the provided counter surface is less than 36 inches (915 mm) long, the entire counter surface shall be 36 inches (915 mm) high maximum above the finish floor.

904.4.2 Forward Approach. A portion of the counter surface that is 30 inches (760 mm) long minimum and 36 inches (915 mm) high maximum shall be provided. Knee and toe space complying with 306 shall be provided under the counter. A clear floor or ground space complying with 305 shall be positioned for a forward approach to the counter.

END OF EXTERIOR AND INTERIOR VIOLATIONS.

Note: Building code not reviewed.

Crew quarters are considered residential dwelling units including: Living room, kitchen, bathroom(s), and bedrooms

See Attached – TM 2012-22, TAS 233, and TAS 809

End of Report

Should you have any questions, please feel free to call.

Respectfully submitted:
Johnson - Kelley Associates, Inc.

December 7, 2015
date

Inspector – Steve Johnson

CAVEAT:
THE REVIEW OF THIS PROJECT IS BASED ON A BEST EFFORTS ENDEAVOR. THE REVIEW IN NO WAY WARRANTS COMPLETE COMPLIANCE TO LOCAL BUILDING CODES, THE TEXAS ACCESSIBILITY STANDARDS, THE AMERICANS WITH DISABILITIES ACT, ANSI AND THE FAIR HOUSING GUIDELINES. THE BUSINESS, THE PROFESSIONAL, HIS EMPLOYEES, ENGINEERS, AND CLIENT FOR WHOM THIS REVIEW IS MADE AGREE TO HOLD HARMLESS AND INDEMNIFY THE FIRM AND EMPLOYEES OF JOHNSON KELLEY ASSOC., INC. FROM AND AGAINST ANY LIABILITY ARISING FROM THE PERFORMANCE OF THE WORK.

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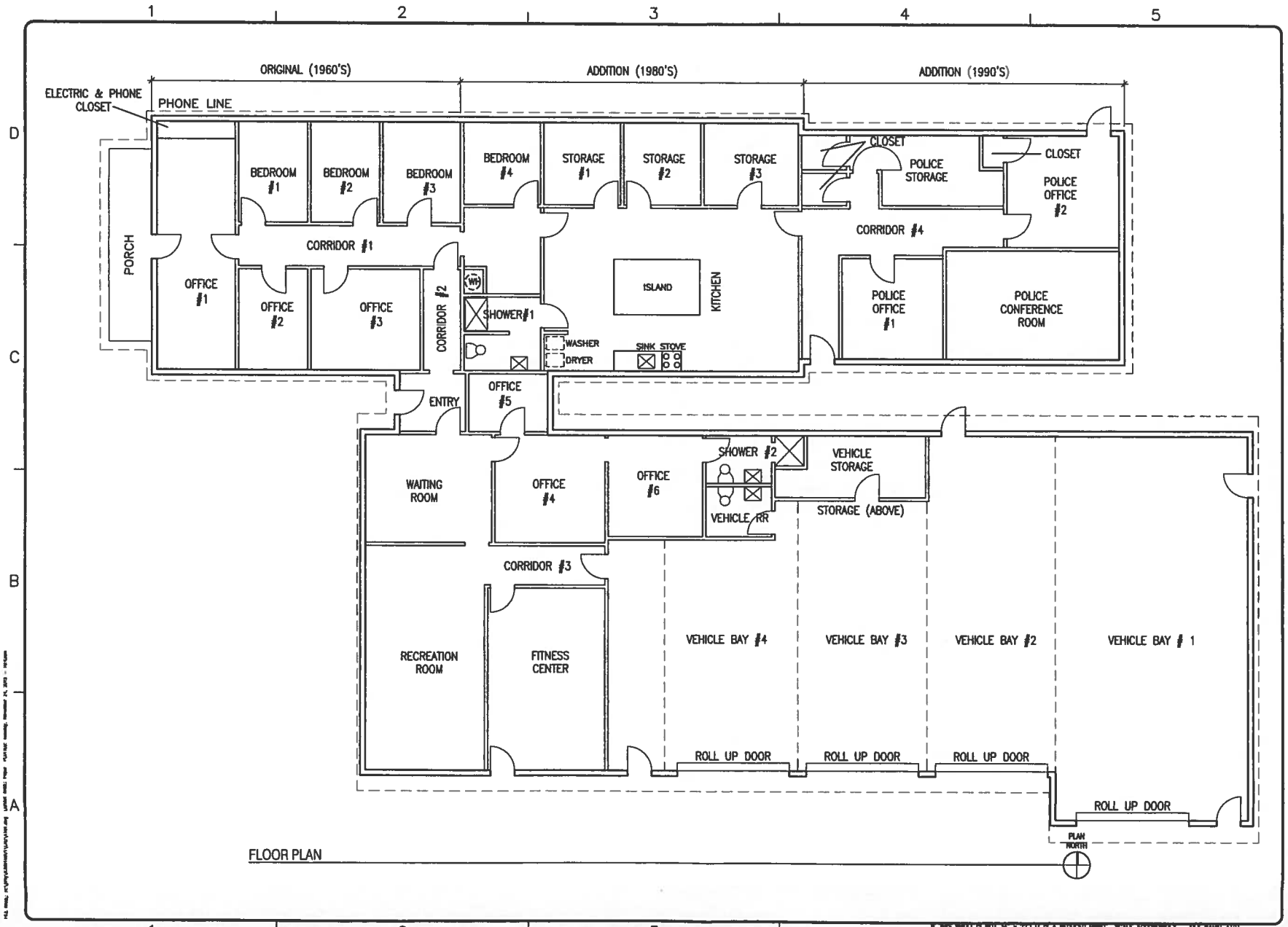

NO.	REVISION	DATE

HUTT-ZOLIARS
Hutt-Zoliars, Inc.
500 West 7th Street, Suite 300
Fort Worth, Texas 76102-4728
Phone (817) 335-3000

FLOOR PLAN

FAIRVIEW FIRE DEPT.

TOWN OF FAIRVIEW FIRE STATION # 1
500 HIGHWAY 5
TOWN OF FAIRVIEW, TEXAS 75069

DATE:	DEC 2015
DRAWN BY:	TT
DESIGNED BY:	DWC
CHECKED BY:	DWC
PROJ. NO.	-
SHEET:	A101

233 Residential Facilities

233.1 General. *Group homes, halfway houses, shelters, or similar social service center establishments that provide either temporary sleeping accommodations or residential dwelling units that are subject to these standards shall comply with the provisions applicable to residential facilities, including, but not limited to, the provisions in sections 233 and 809.*

***EXCEPTIONS**:*

***1.** In sleeping rooms with more than 25 beds covered by this part, a minimum of 5% of the beds shall have clear floor space complying with section 806.2.3.*

***2.** Facilities with more than 50 beds covered by this part that provide common use bathing facilities shall provide at least one roll-in shower with a seat that complies with the relevant provisions of section 608. Transfer-type showers are not permitted in lieu of a roll-in shower with a seat, and the exceptions in sections 608.3 and 608.4 for residential dwelling units are not permitted. When separate shower facilities are provided for men and for women, at least one roll-in shower shall be provided for each group.*

Advisory 233.1 General. Section 233 outlines the requirements for residential facilities subject to Texas Government Code, Chapter 469. The facilities covered by Section 233, as well as other facilities not covered by this section, may still be subject to Federal laws such as the Fair Housing Act and Section 504 of the Rehabilitation Act of 1973, as amended. For example, the Fair Housing Act requires that certain residential structures having four or more multi-family dwelling units, regardless of whether they are privately owned or federally assisted, include certain features of accessible and adaptable design according to guidelines established by the U.S. Department of Housing and Urban Development (HUD). These laws and the appropriate regulations should be consulted before proceeding with the design and construction of residential facilities.

Section 233 is not a stand-alone section; this section only addresses the minimum number of residential dwelling units within a facility required to comply with Chapter 8. However, residential facilities must also comply with the requirements of this document. For example: Section 206.5.4 requires all doors and doorways providing user passage in residential dwelling

units providing mobility features to comply with Section 404; Section 206.7.6 permits platform lifts to be used to connect levels within residential dwelling units providing mobility features; Section 208 provides general scoping for accessible parking and Section 208.2.3.1 specifies the required number of accessible parking spaces for each residential dwelling unit providing mobility features; Section 228.2 requires mail boxes to be within reach ranges when they serve residential dwelling units providing mobility features; play areas are addressed in Section 240; and swimming pools are addressed in Section 242. There are special provisions applicable to facilities containing residential dwelling units at: Exception 3 to 202.3; Exception to 202.4; 203.8; and Exception 4 to 206.2.3

233.2 Residential Dwelling Units Provided by Entities Subject to HUD Section 504 Regulations.

Where facilities with residential dwelling units are provided by entities subject to regulations issued by the *U. S.* Department of Housing and Urban Development (HUD) under Section 504 of the Rehabilitation Act of 1973, as amended, such entities shall comply with applicable HUD regulations *in lieu of complying with these standards issued under Texas Government Code, Chapter 469.*

Advisory 233.2 Residential Dwelling Units Provided by Entities Subject to HUD Section 504 Regulations. Section 233.2 defers to HUD the specification of criteria by which the technical requirements of this document will apply. *Entities subject to HUD 504 regulations should contact the U. S. Department of Housing and Urban Development for guidance.*

233.3 Residential Dwelling Units Provided by Entities Not Subject to HUD Section 504 Regulations. Facilities with residential dwelling units provided by entities not subject to regulations issued by the Department of Housing and Urban Development (HUD) under Section 504 of the Rehabilitation Act of 1973, as amended, shall comply with 233.3.

233.3.1 Minimum Number: New Construction. Newly constructed facilities with residential dwelling units shall comply with 233.3.1.

EXCEPTION: Where facilities contain 15 or fewer residential dwelling units, the requirements of 233.3.1.1 and 233.3.1.2 shall apply to the total number of residential dwelling units that are

constructed under a single contract, or are developed as a whole, whether or not located on a common site.

233.3.1.1 Residential Dwelling Units with Mobility Features. In facilities with residential dwelling units, at least 5 percent, but no fewer than one unit, of the total number of residential dwelling units shall provide mobility features complying with 809.2 through 809.4 and shall be on an accessible route as required by 206.

233.3.1.2 Residential Dwelling Units with Communication Features. In facilities with residential dwelling units, at least 2 percent, but no fewer than one unit, of the total number of residential dwelling units shall provide communication features complying with 809.5.

233.3.2 Residential Dwelling Units for Sale. *(RESERVED)*

233.3.3 Additions. Where an addition to an existing building results in an increase in the number of residential dwelling units, the requirements of 233.3.1 shall apply only to the residential dwelling units that are added until the total number of residential dwelling units complies with the minimum number required by 233.3.1. Residential dwelling units required to comply with 233.3.1.1 shall be on an accessible route as required by 206.

233.3.4 Alterations. Alterations shall comply with 233.3.4.

EXCEPTION: Where compliance with 809.2, 809.3, or 809.4 is technically infeasible, or where it is technically infeasible to provide an accessible route to a residential dwelling unit, the entity shall be permitted to alter or construct a comparable residential dwelling unit to comply with 809.2 through 809.4 provided that the minimum number of residential dwelling units required by 233.3.1.1 and 233.3.1.2, as applicable, is satisfied.

Advisory 233.3.4 Alterations Exception. A substituted dwelling unit must be comparable to the dwelling unit that is not made accessible. Factors to be considered in comparing one dwelling unit to another should include the number of bedrooms; amenities provided within the dwelling unit; types of common spaces provided within the facility; and location with respect to community resources and services, such as public transportation and civic, recreational, and mercantile facilities.

233.3.4.1 Alterations to Vacated Buildings. Where a building is vacated for the purposes of alteration, and the altered building contains more than 15 residential dwelling units, at least 5 percent of the residential dwelling units shall comply with 809.2 through 809.4 and shall be on an accessible route as required by 206. In addition, at least 2 percent of the residential dwelling units shall comply with 809.5.

Advisory 233.3.4.1 Alterations to Vacated Buildings. This provision is intended to apply where a building is vacated with the intent to alter the building. Buildings that are vacated solely for pest control or asbestos removal are not subject to the requirements to provide residential dwelling units with mobility features or communication features.

233.3.4.2 Alterations to Individual Residential Dwelling Units. In individual residential dwelling units, where a bathroom or a kitchen is substantially altered, and at least one other room is altered, the requirements of 233.3.1 shall apply to the altered residential dwelling units until the total number of residential dwelling units complies with the minimum number required by 233.3.1.1 and 233.3.1.2. Residential dwelling units required to comply with 233.3.1.1 shall be on an accessible route as required by 206.

EXCEPTION: Where facilities contain 15 or fewer residential dwelling units, the requirements of 233.3.1.1 and 233.3.1.2 shall apply to the total number of residential dwelling units that are altered under a single contract, or are developed as a whole, whether or not located on a common site.

Advisory 233.3.4.2 Alterations to Individual Residential Dwelling Units. Section 233.3.4.2 uses the terms "substantially altered" and "altered." A substantial alteration to a kitchen or bathroom includes, but is not limited to, alterations that are changes to or rearrangements in the plan configuration, or replacement of cabinetry. Substantial alterations do not include normal maintenance or appliance and fixture replacement, unless such maintenance or replacement requires changes to or rearrangements in the plan configuration, or replacement of cabinetry. The term "alteration" is defined in Section 106 of these requirements.

233.3.5 Dispersion. Residential dwelling units required to provide mobility features complying with 809.2 through 809.4 and residential dwelling units required to provide communication

features complying with 809.5 shall be dispersed among the various types of residential dwelling units in the facility and shall provide choices of residential dwelling units comparable to, and integrated with, those available to other residents.

EXCEPTION: Where multi-story residential dwelling units are one of the types of residential dwelling units provided, one-story residential dwelling units shall be permitted as a substitute for multi-story residential dwelling units where equivalent spaces and amenities are provided in the one-story residential dwelling unit.

809 Residential Dwelling Units

809.1 General. Residential dwelling units shall comply with 809. Residential dwelling units required to provide mobility features shall comply with 809.2 through 809.4. Residential dwelling units required to provide communication features shall comply with 809.5.

809.2 Accessible Routes. Accessible routes complying with Chapter 4 shall be provided within residential dwelling units in accordance with 809.2.

EXCEPTION: Accessible routes shall not be required to or within unfinished attics or unfinished basements.

809.2.1 Location. At least one accessible route shall connect all spaces and elements which are a part of the residential dwelling unit. Where only one accessible route is provided, it shall not pass through bathrooms, closets, or similar spaces.

809.2.2 Turning Space. All rooms served by an accessible route shall provide a turning space complying with 304.

EXCEPTION: Turning space shall not be required in exterior spaces 30 inches (760 mm) maximum in depth or width.

Advisory 809.2.2 Turning Space. It is generally acceptable to use required clearances to provide wheelchair turning space. For example, in kitchens, 804.3.1 requires at least one work surface with clear floor space complying with 306 to be centered beneath. If designers elect to provide clear floor space that is at least 36 inches (915 mm) wide, as opposed to the required 30

inches (760 mm) wide, that clearance can be part of a T-turn, thereby maximizing efficient use of the kitchen area. However, the overlap of turning space must be limited to one segment of the T-turn so that back-up maneuvering is not restricted. It would, therefore, be unacceptable to use both the clearances under the work surface and the sink as part of a T-turn. See Section 304.3.2 regarding T-turns.

809.3 Kitchen. Where a kitchen is provided, it shall comply with 804.

809.4 Toilet Facilities and Bathing Facilities. At least one bathroom shall comply with 603. No fewer than one of each type of fixture provided shall comply with applicable requirements of 603 through 610. Toilet and bathing fixtures required to comply with 603 through 610 shall be located in the same toilet and bathing area, such that travel between fixtures does not require travel between other parts of the residential dwelling unit.

Advisory 809.4 Toilet Facilities and Bathing Facilities. In an effort to promote space efficiency, vanity counter top space in accessible residential dwelling units is often omitted. This omission does not promote equal access or equal enjoyment of the unit. Where comparable units have vanity counter tops, accessible units should also have vanity counter tops located as close as possible to the lavatory for convenient access to toiletries.

809.5 Residential Dwelling Units with Communication Features. Residential dwelling units required to provide communication features shall comply with 809.5.

809.5.1 Building Fire Alarm System. Where a building fire alarm system is provided, the system wiring shall be extended to a point within the residential dwelling unit in the vicinity of the residential dwelling unit smoke detection system.

809.5.1.1 Alarm Appliances. Where alarm appliances are provided within a residential dwelling unit as part of the building fire alarm system, they shall comply with 702.

809.5.1.2 Activation. All visible alarm appliances provided within the residential dwelling unit for building fire alarm notification shall be activated upon activation of the building fire alarm in the portion of the building containing the residential dwelling unit.

809.5.2 Residential Dwelling Unit Smoke Detection System. Residential dwelling unit smoke detection systems shall comply with NFPA 72 (1999 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1).

809.5.2.1 Activation. All visible alarm appliances provided within the residential dwelling unit for smoke detection notification shall be activated upon smoke detection.

809.5.3 Interconnection. The same visible alarm appliances shall be permitted to provide notification of residential dwelling unit smoke detection and building fire alarm activation.

809.5.4 Prohibited Use. Visible alarm appliances used to indicate residential dwelling unit smoke detection or building fire alarm activation shall not be used for any other purpose within the residential dwelling unit.

809.5.5 Residential Dwelling Unit Primary Entrance. Communication features shall be provided at the residential dwelling unit primary entrance complying with 809.5.5.

809.5.5.1 Notification. A hard-wired electric doorbell shall be provided. A button or switch shall be provided outside the residential dwelling unit primary entrance. Activation of the button or switch shall initiate an audible tone and visible signal within the residential dwelling unit. Where visible doorbell signals are located in sleeping areas, they shall have controls to deactivate the signal.

809.5.5.2 Identification. A means for visually identifying a visitor without opening the residential dwelling unit entry door shall be provided and shall allow for a minimum 180 degree range of view.

Advisory 809.5.5.2 Identification. In doors, peepholes that include prisms clarify the image and should offer a wide-angle view of the hallway or exterior for both standing persons and wheelchair users. Such peepholes can be placed at a standard height and permit a view from several feet from the door.

809.5.6 Site, Building, or Floor Entrance. Where a system, including a closed-circuit system, permitting voice communication between a visitor and the occupant of the residential dwelling unit is provided, the system shall comply with 708.4.

Appendix C

Architectural Items - Repair or Replacement

Item to Repair or Replacement	Description	Location	Unit Cost	Quantity	Total Cost
Exterior					
Exterior Personnel Doors	Replace all exterior doors with insulated doors	All Personnel Doors	$2,000	9	$18,000
Exterior Vehicle Doors	Replace exterior vehicle doors with insulated doors	Vehicle Bays	$6,500	4	$26,000
Exterior Windows	Replace exterior windows with High Energy Efficient	All exterior windows	$3,000	9	$27,000
Reseal Masonry Cracks	Apply sealant to control infiltration	1980's Addition	$6,000	1	$6,000
Replace Roof Siding at Walls	Remove, Replace Siding, Flashing at Roof Transitions	Original, 1980's Addition, 1990's Addition	$6,000	1	$6,000
Replace Fascia, Trim, Rake Board	Remove, Replace Eave and Rake Trim at Roof	Original, 1980's Addition, 1990's Addition	$3,500	1	$3,500
Repaint Exterior Walls	Repaint Exterior after Trim and Window Replacement	Original, 1980's Addition, 1990's Addition	$2	2800	$5,600
Roof					
Replace Roof	Remove, replace decking and install New Metal Roof	Original, 1980's Addition, 1990's Addition	$500	38	$19,000
Interior					
Replace Flooring	Replace flooring with Ceramic Tile, Carpet	Original, 1980's Addition, 1990's Addition	$5	3860	$19,300
Patch Repair Ceiling	Repair and replace all of kitchen floor wth epoxy	Office #5	$500	1	$500
Install ADA compliant Hardware	Replace all Door hardware with lever handles	All Door Locations	$500	28	$14,000
Repaint Walls	Repaint Interior Walls to match	All Interior Walls except Vehicle Bays	$1	8500	$8,500
Relocate Washer and Dryer	Relocate Washer and Dryer and Remodel to Storage	Kitchen Area	$3,000	1	$3,000
Upgrade Insulation at Walls	Spray Foram Insulation into Perimeter Walls	Original, 1980's Addition, 1990's Addition	$4	2800	$11,200
Upgrade Insulation at Roof	Install Batt Insulation	Original, 1980's Addition, 1990's Addition	$2	3860	$7,720
Reconstruct Rated Partition	Retrofit Existing Wall create a Rated Partition	Wall Between Fitness/Office #6 and Vehicle Bays	$3,500	1	$3,500
Miscellaneous					
Restrooms non-compliant w/TAS	Renovate Restrooms	Shower #2, Vehicle Restroom	$3,500	2	$7,000
Relocate Shower #1 from Kitchen	Relocate Restroom, Shower, Cap Plumbing	Shower #1 near Kitchen Area	$6,500	1	$6,500
Hazardous Survey	Survey to Test and Identify potential Lead and Asbestos	Original	$3,000	1	$3,000
Asbestos Abatement	Abate Hazardous Materials	Original	(unknown)		
				Sub Total	**$195,320**

Structural Items - Repair or Replacement

Item to Repair or Replacement	Description	Location	Unit Cost	Quantity	Total Cost
Change of use assessment	Analyze IAW IBC 2012 Category IV, SDC C	Fairview, TX	$5,000	1	$5,000
Roof	Replace, brace, strengthen roof framing	1980's construction module	$35,000	1	$35,000
Foundation	Install Piers	Original and 1980's Addition	$750	15	$11,250
Slab at Vehicle Bays	Repair cracked ends of slab	Vehicle Bays 1 thru 4	$1,000	4	$4,000
Drainage Area between north and south wings	Install concrete swale	Area between north and south wings	$6,000	1	$6,000
Entire Fire Station	Change in use upgrades	All HVAC, piping, ceiling grid restraints	$15,000	1	$15,000
				Sub Total	**$76,250**

HVAC Items - Repair or Replacement

Item to Repair or Replacement	Description	Location	Unit Cost	Quantity	Total Cost
New Carbon Monoxide (CO) Detection	Provide carbon monoxide (CO) and nitrogen dioxide (NOx) sensors and alarm at the entrance to the fire fighters quarters to alarm personnel of the hazardous conditions	Apparatus Bay	$10,000	1	$10,000
New Vehicle Exhaust System	Provide two new vehicle exhaust systems in apparatus bays, one system for each pair of fire trucks	Apparatus Bay	$15,000	2	$30,000
New Exuast Fan	Perform calculations of general exhaust ventilation airflows for apparatus bay area and provide additional exhaust fan for general ventilation as required	Apparatus Bay	$8,000	1	$8,000
Pull Down Ladder for Fan Coil Unit	Provide pull-down ladder for the safe access to the fan coil unit serving waiting area	Waiting Area	$3,000	1	$3,000
New Gas-fired Heater	Perform heating load calculations for the apparatus bay and provide additional heating in the area as required. New gas-fired radiant tube heater with approximate	Apparatus Bay	$10,000	1	$10,000
Existing Ductwork on Fan Coil Units	Clean existing ductwork, paint rusted grilles and provide necessary maintenance to four existing air-conditioning systems	Fire Fithers Quarters	$3,000	3	$9,000
Dryer Exhaust	Clean dryer exhaust duct or replace existing duct	Kitchen	$500	1	$500
Kitchen Hood	Replace existing residential grade kitchen hood with new commercial grate grease exhaust hood with exhaust fan and with Ansel fire protection system	Kitchen	$2,000	1	$2,000
Attic Insulation	Re-install the dislocated insulation above lay-in ceiling above waiting area and fitness room and above kitchen/office area and sleeping rooms	Attic	$5,000	1	$5,000
Fan Coil Unit Serving Office/Kitchen Area	Perform cooling load calculations for the office/kitchen area. Replace corresponding air- conditioning system if load calculations confirm that the unit size is inadequate	Office Kitchen Area	$15,000	1	$15,000
All Fan Coil Units	Replace all four existing air-conditioning systems, including fan coil unit, ductwork, controls and air distribution devices with new high-efficiency system meeting current code requirements	Fire Fighters Quarters	$20,000	4	$80,000
				Sub Total	**$172,500**

Plumbing Items - Repair to Replacement

Item to Repair or Replacement	Description	Location	Unit Cost	Quantity	Total Cost
Septic Tank	Replace existing septic tank and sewer pump with new lift station with duplex grinder pump as required by code	Septic Tank	$50,000	1	$50,000
Faucets	Replace existing lavatory faucets	Fire Fighters Quarters	$250	4	$1,000
Lavatories and Toilets	Replace existing plumbing fixtures with new ADA compliant fixtures	Fire Fighters Quarters	$1,000	8	$8,000
Gutters and Downspouts	Repair existing gutters and downspouts and modify existing grading to allow for proper drainage of storm water	General	$10,000	1	$10,000
Gnew Grease Interseptor	Provide grease interceptor for the kitchen	Kitchen	$10,000	1	$10,000
				Sub Total	**$79,000**

Electrical Items - Repair or Replacement

Item to Repair or Replacement	Description	Location	Unit Cost	Quantity	Total Cost
Repair Exit signs	Replace lamps	Various	$25	3	$75
Install GFCI receptacles	Replace std receptacle with GFCI	Shower #2, Kitchen	$100	2	$200
Install AFCI receptacles	Replace bedroom receptacles with AFCI	Bedrooms	$100	10	$1,000
Restore panel working spaces	Relocate stored materials away from electrical eqm't	Outside of Kitchen, office #6, vehicle bay #2	n/a		n/a
Replace exposed nonmetallic sheathed cable	Replace exposed nonmetallic sheathed cable with conductors in metallic conduit	Porch (ckt to flagpole light)	$750	1	$750
Replace Service entrance panels	Remove and replace (3) 200 amp panels	Elec/phone closet, office #6, public works office #2	$7,500	3	$22,500
Replace Sub-panel	Remove and replace antiquated panel	Outside of Kitchen	$6,000	1	$6,000
Correct improper cable terminations/splices	Re-pull wiring into lighting fixtures to eliminate splices or properly terminate	Attic, office #6	$350	2	$700
Provide fault current labels	Provide fault current labels on panels.	Panel locations	$500	Lot	$500
Install occupancy sensors	Replace manual wall switches with occupancy sensors	All interior spaces	$150	24	$3,600
Replace incandescent lamps	Remove incandescent lamps, install compact fluorescent lamps in recessed cans	Various	$15	15	$225
Replace vehicle bay lighting	Replace T12 strip lights in vehicle bays with T5HO	Vehicle Bays	$450	15	$6,750
Provide arc flash warning labels	Perform calculations, provide arc flash warning labels on panels.	Panel locations	$5,000	Lot	$5,000
				Sub Total	**$47,300**

Architectural Repair Cost Subtotal	$195,320
Structural Repair Cost Subtotal	$76,250
Mechanical Repair Cost Subtotal	$172,500
Plumbing Repair Cost Subtotal	$79,000
Electrical Repair Cost Subtotal	$47,300
Grand Total	**$570,370**