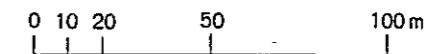
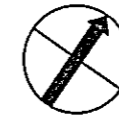
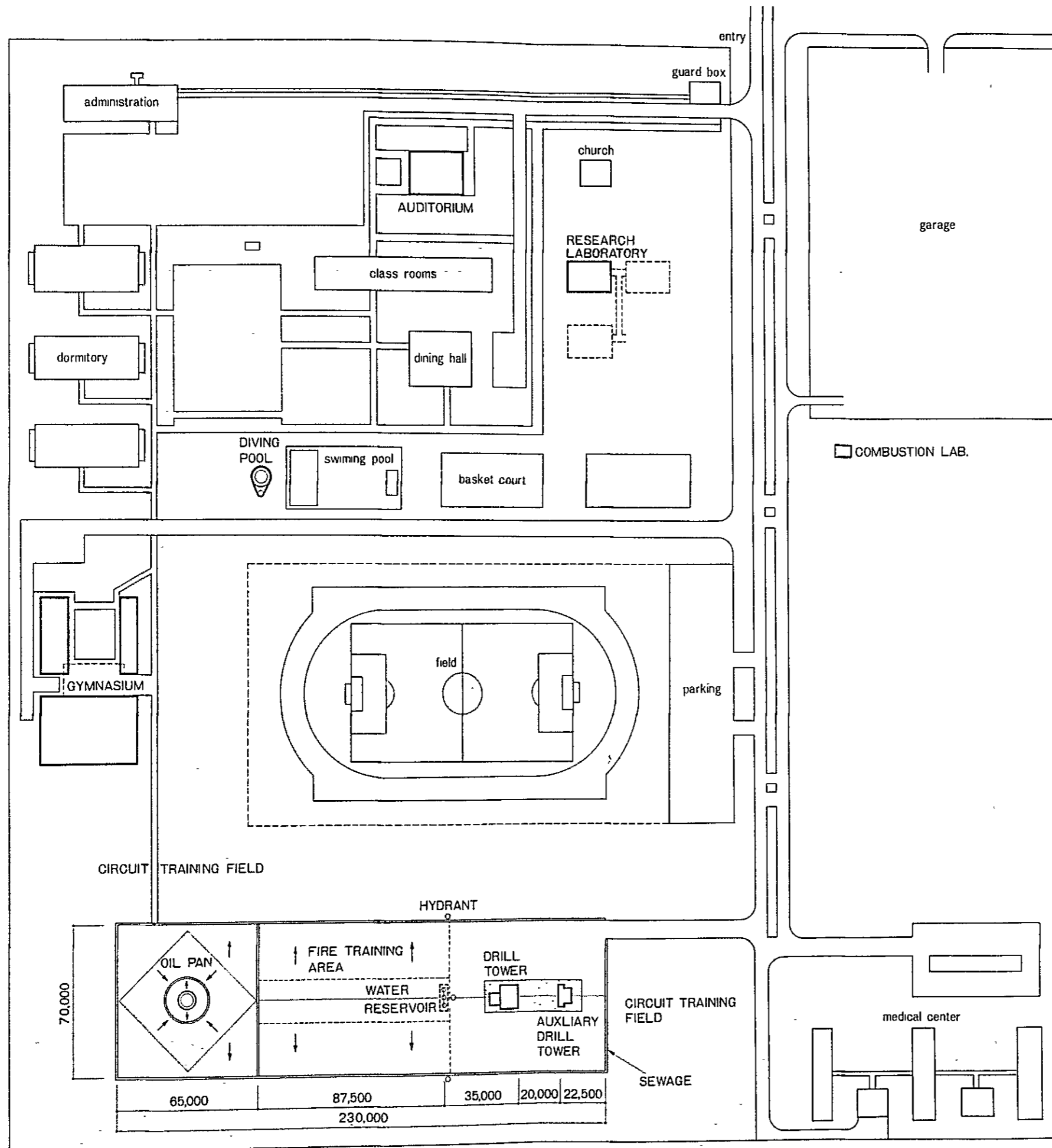
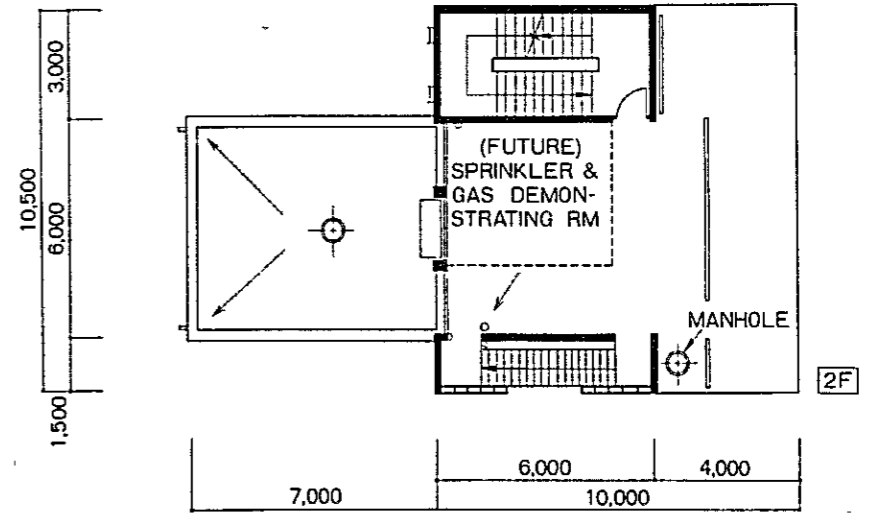
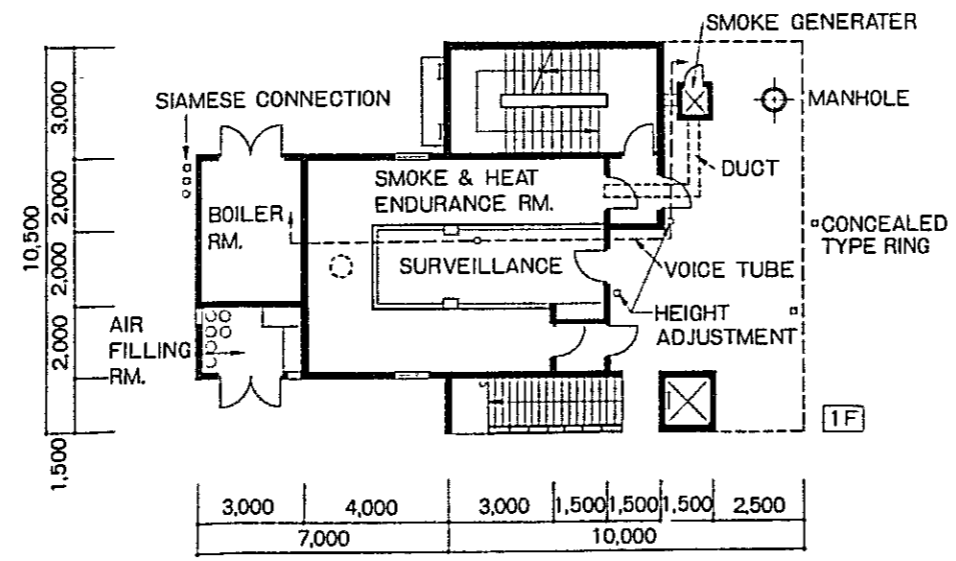
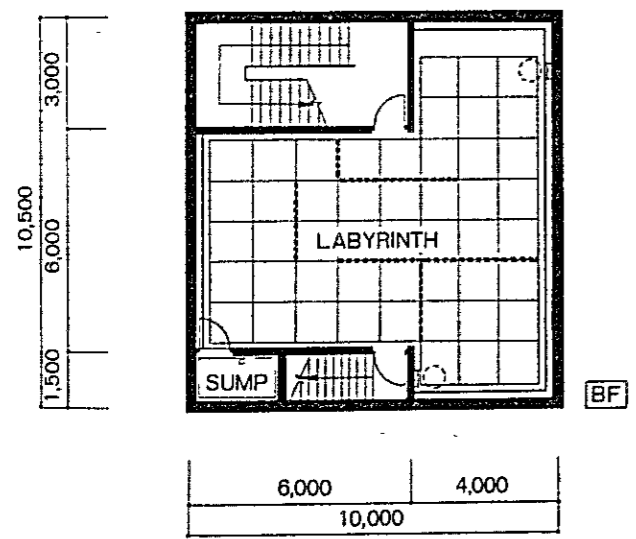
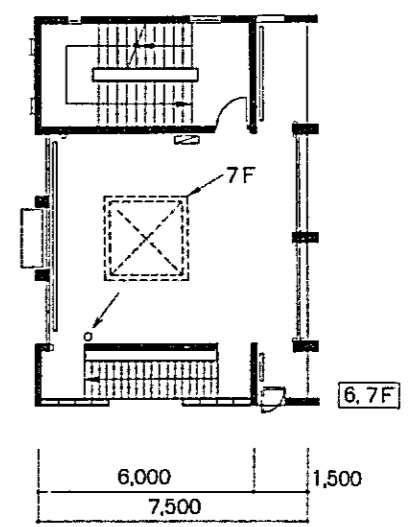
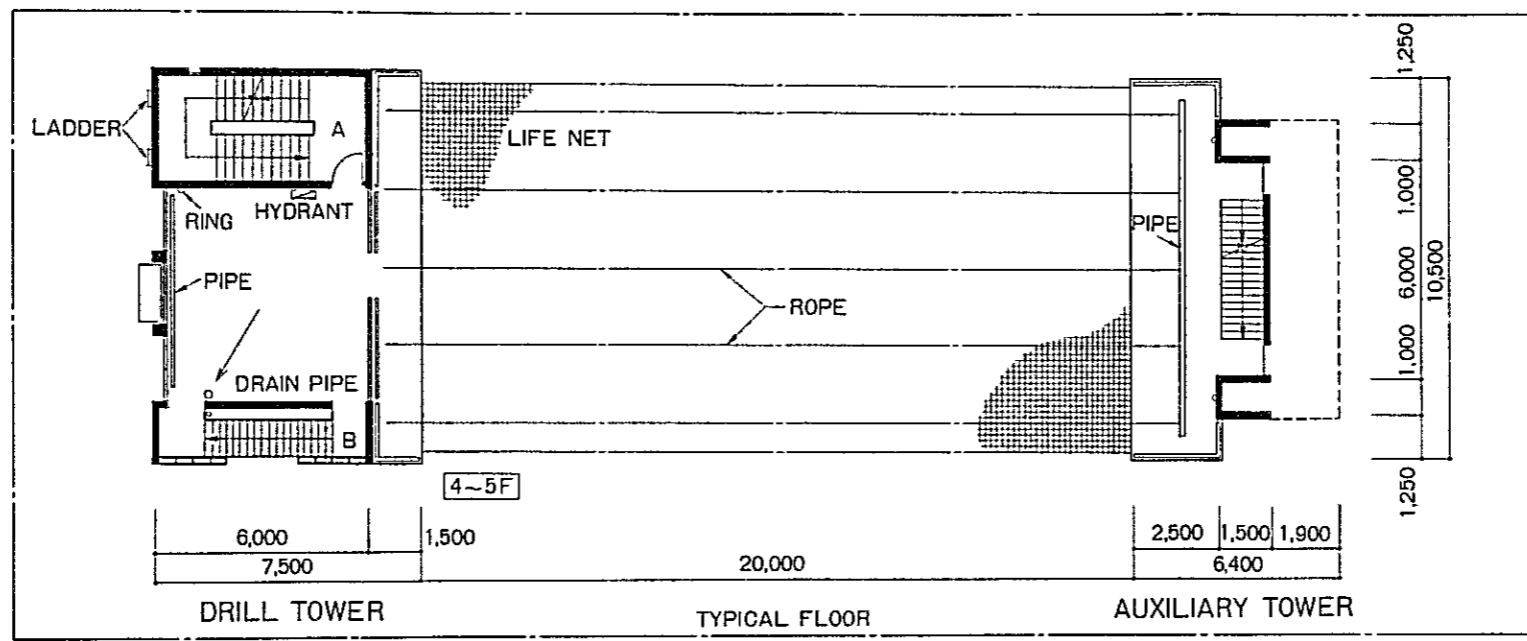
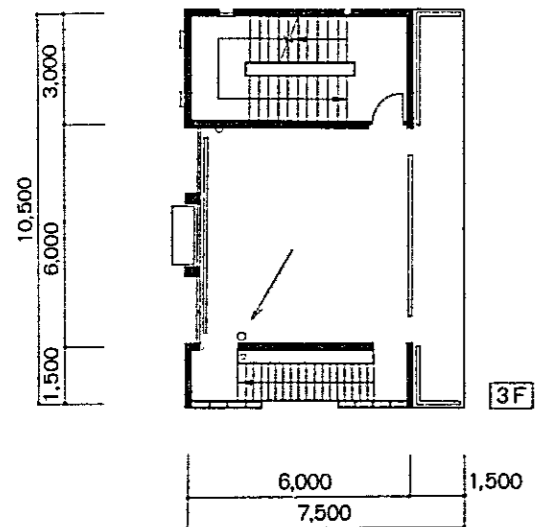
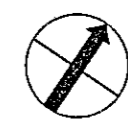
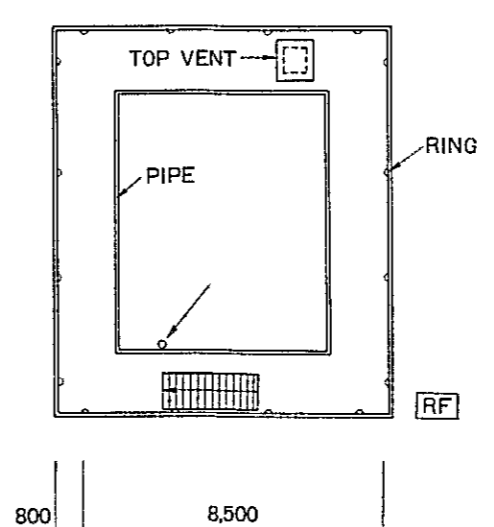
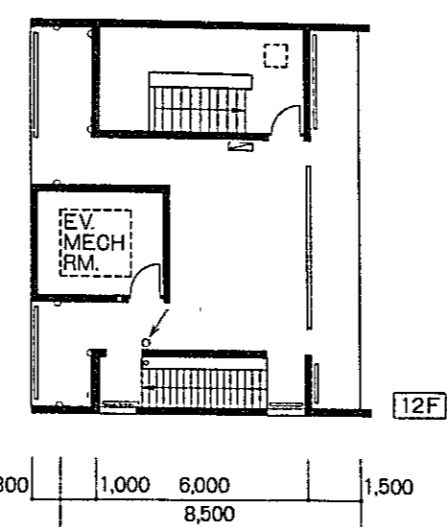
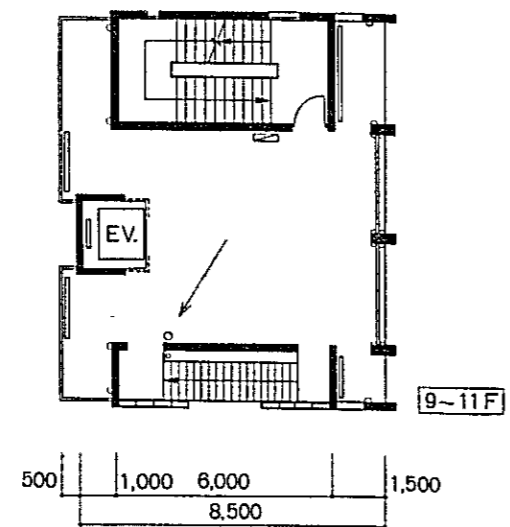
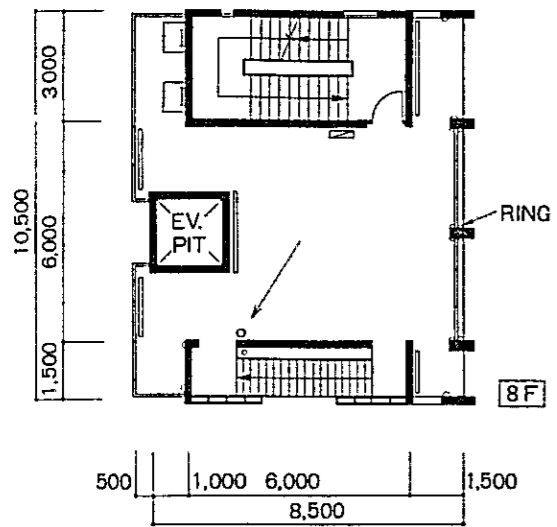


3-1-12 BASIC DESIGN DRAWINGS

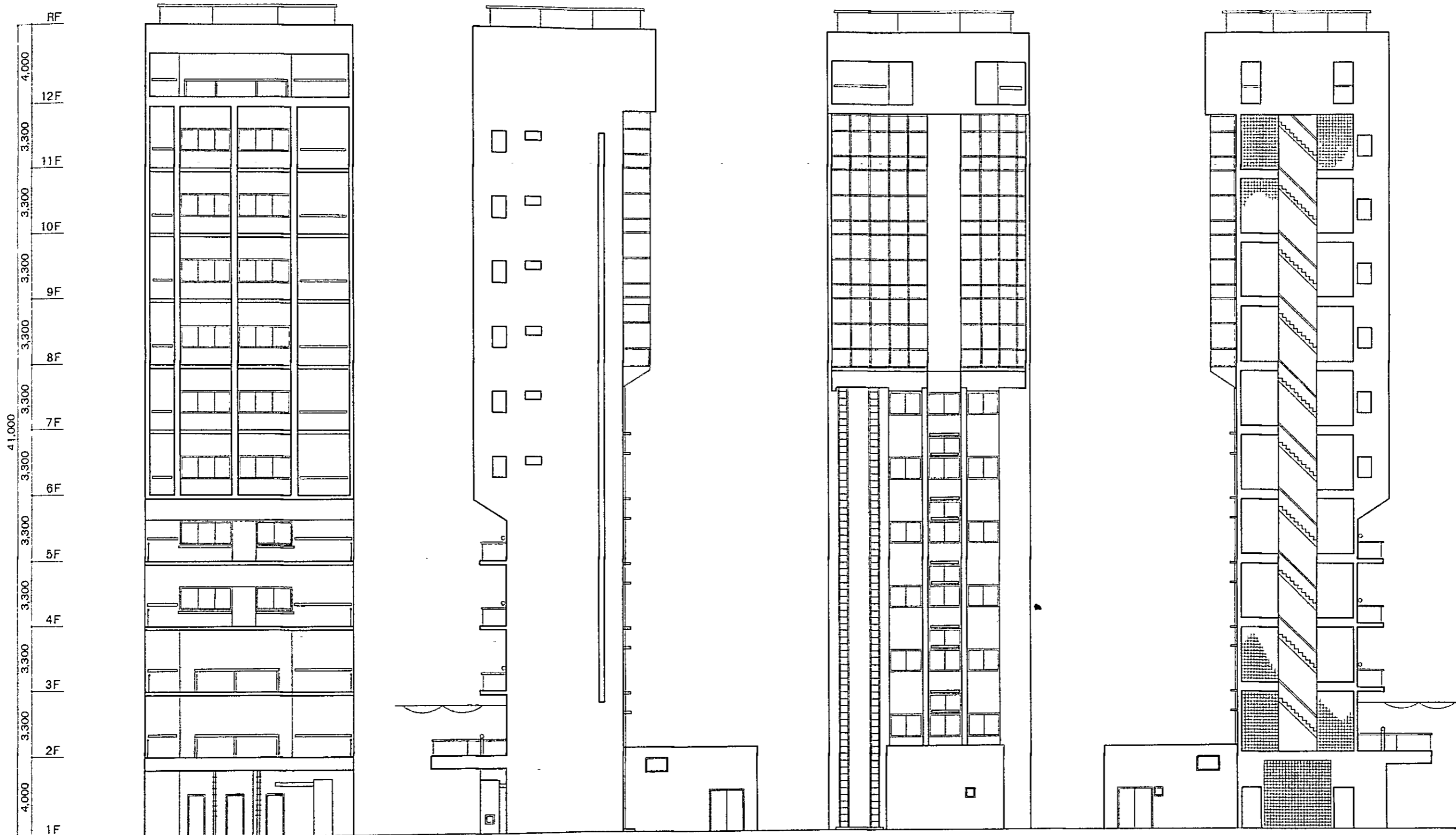
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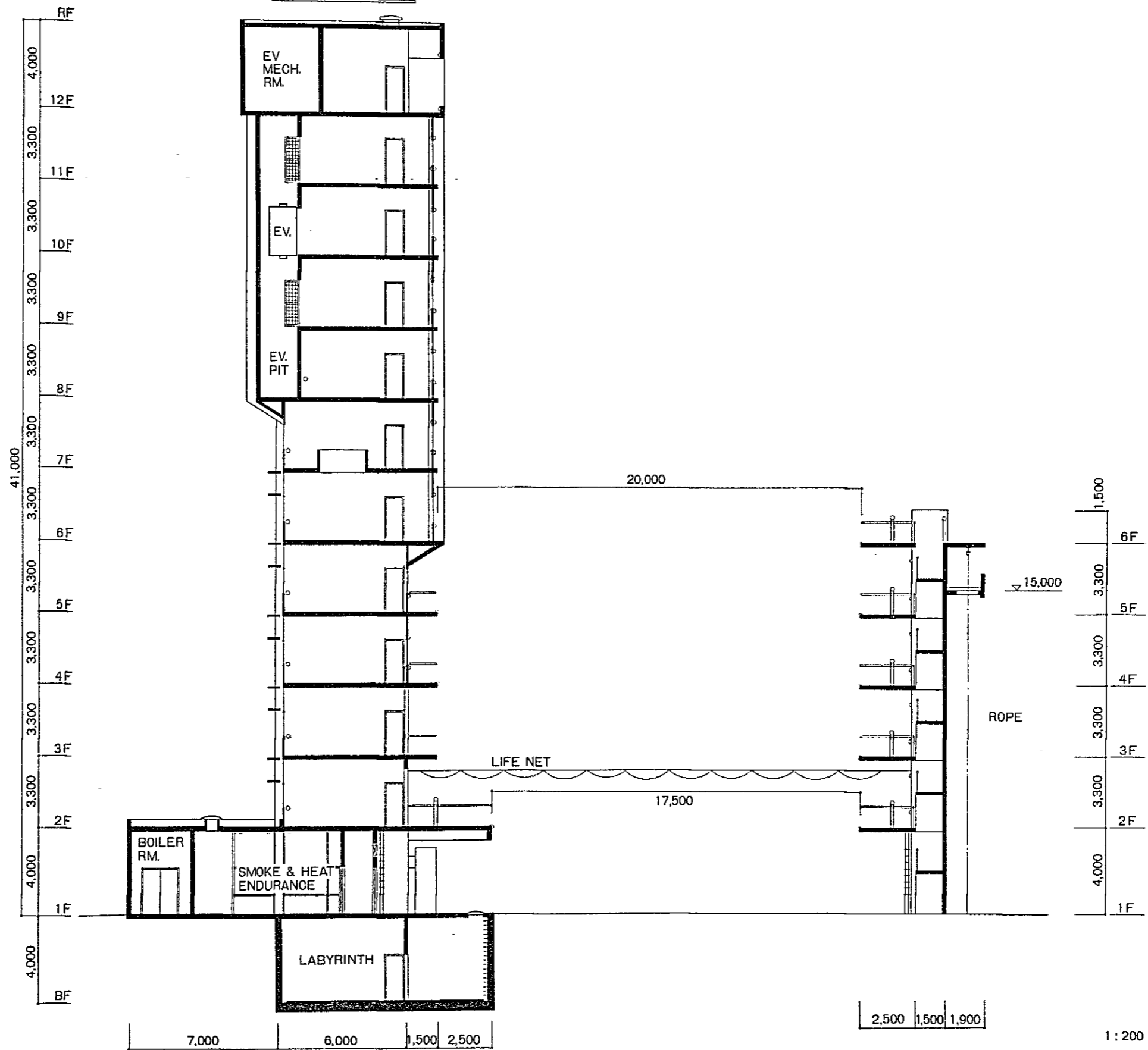
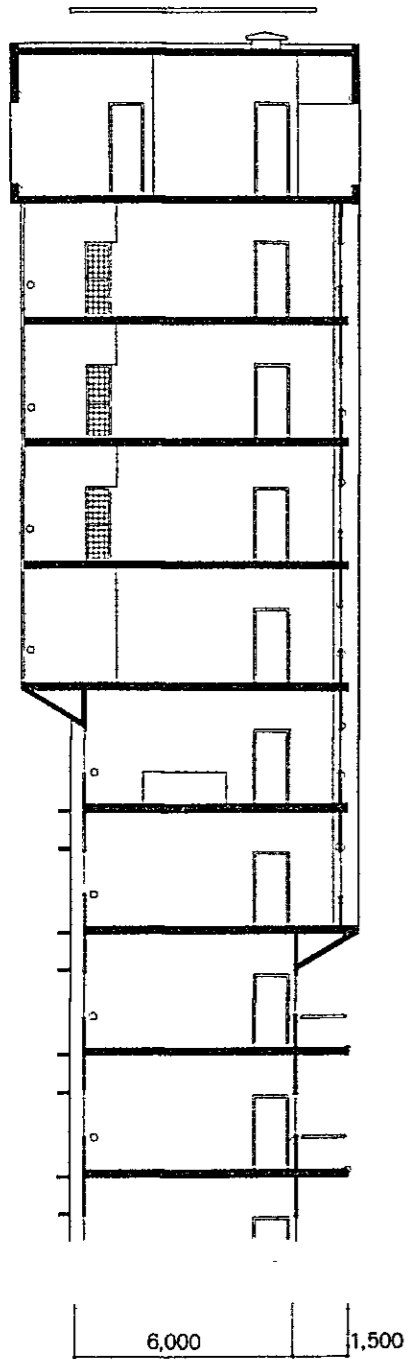
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SITE PLAN



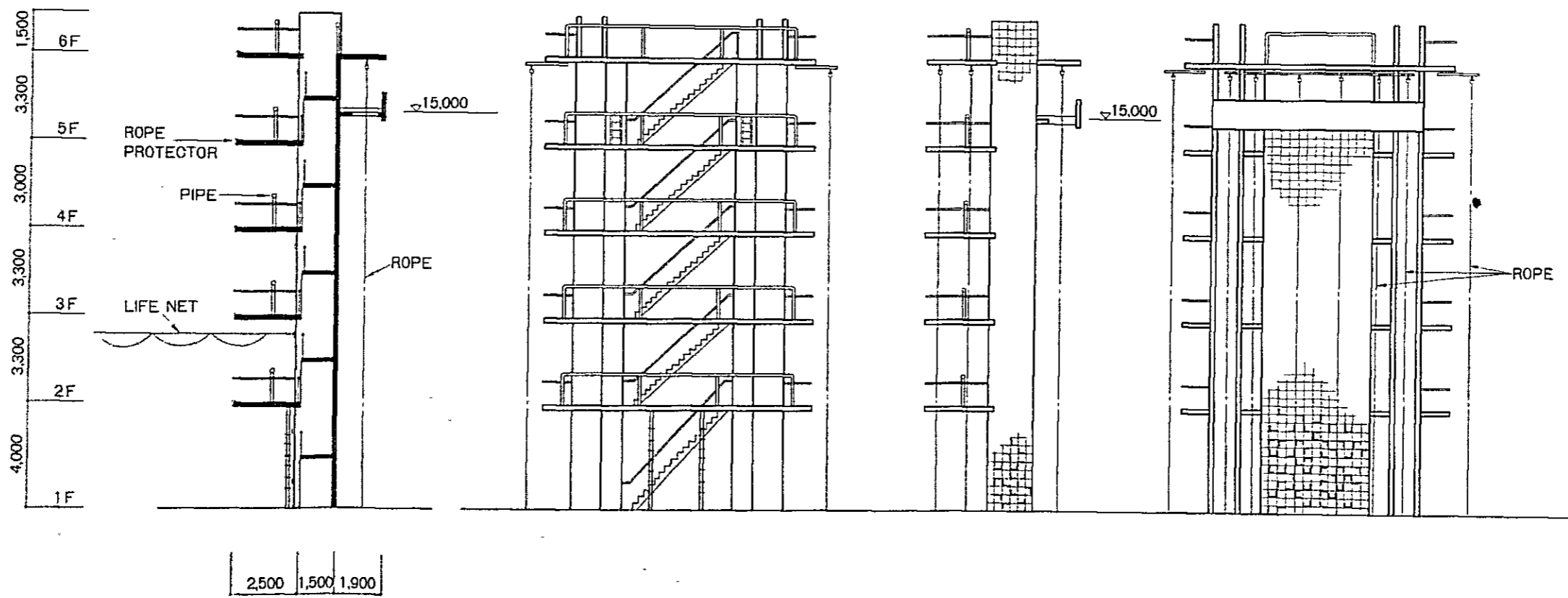
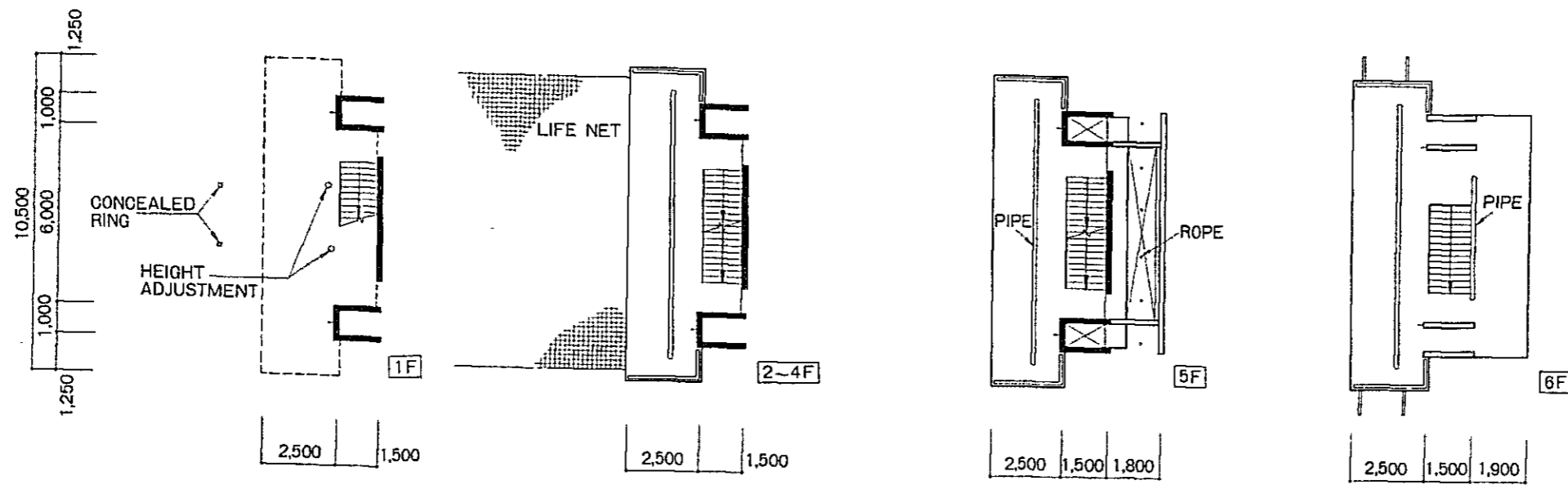
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DRILL TOWER PLAN



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 DRILL TOWER ELEVATION

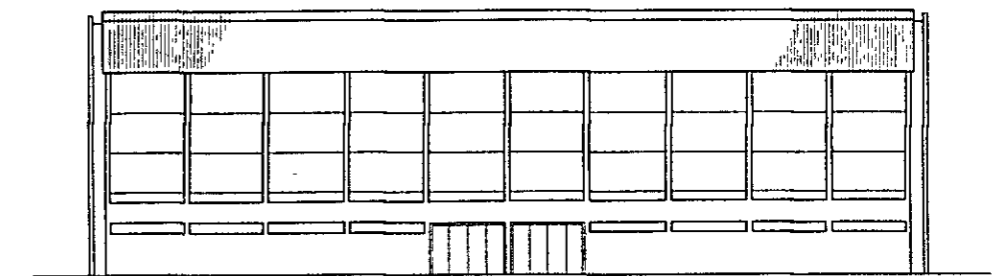
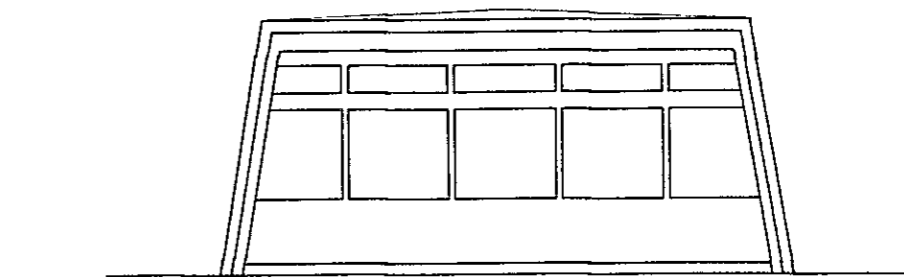
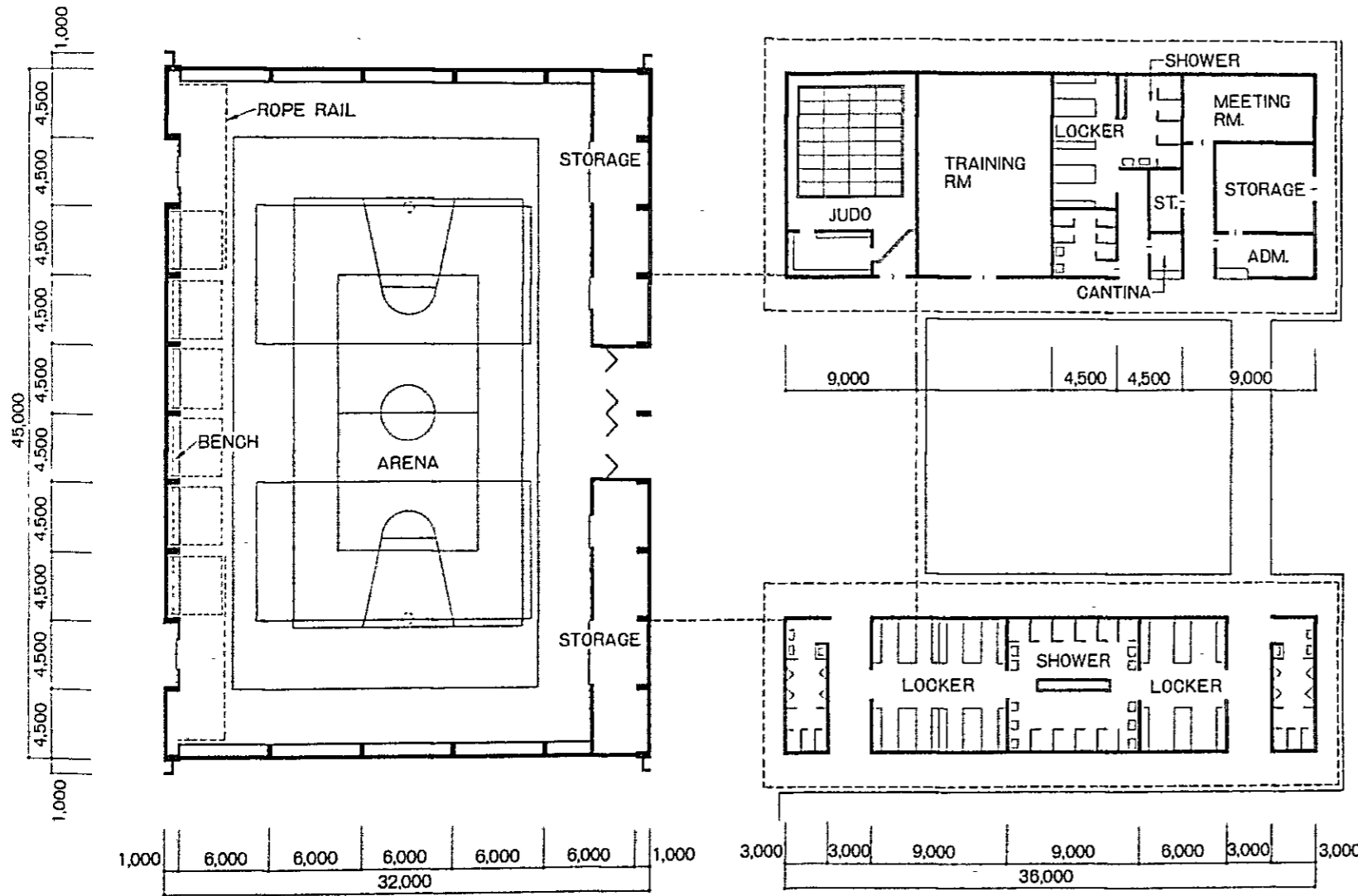
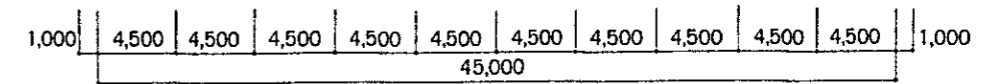
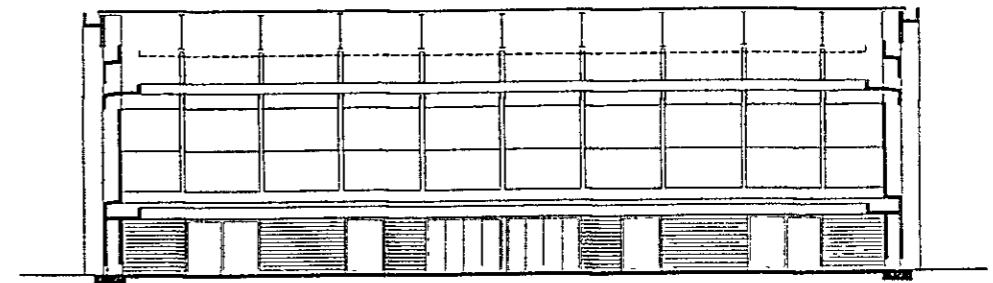
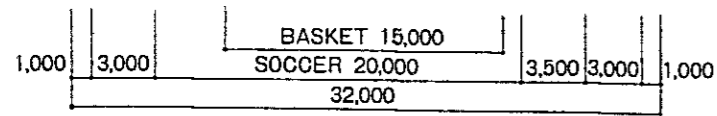
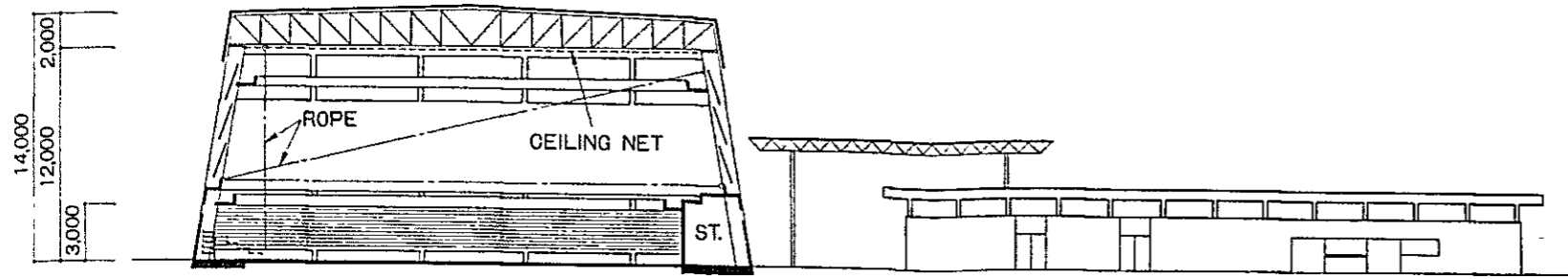


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DRILL TOWER SECTION

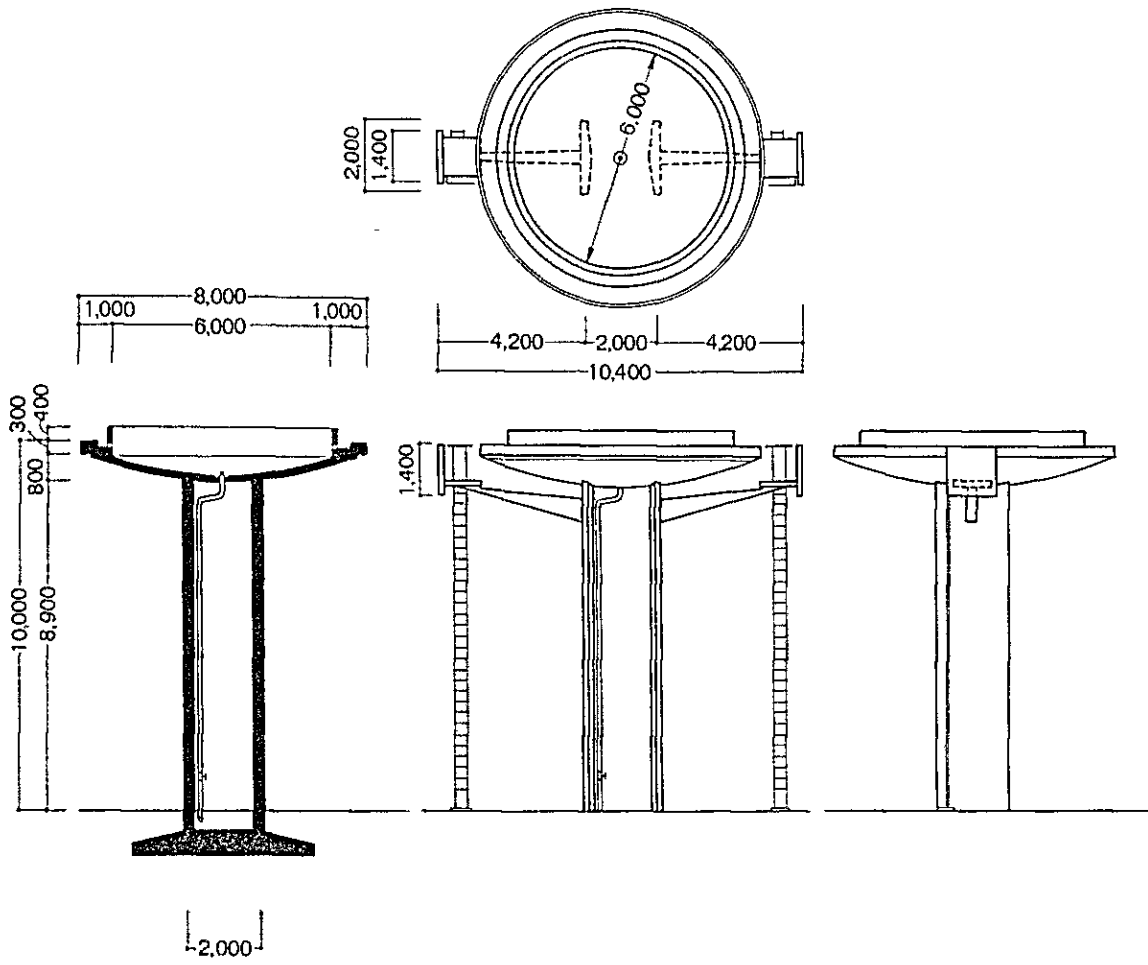


AUXILIARY DRILL TOWER PLAN · SECTION · ELEVATION

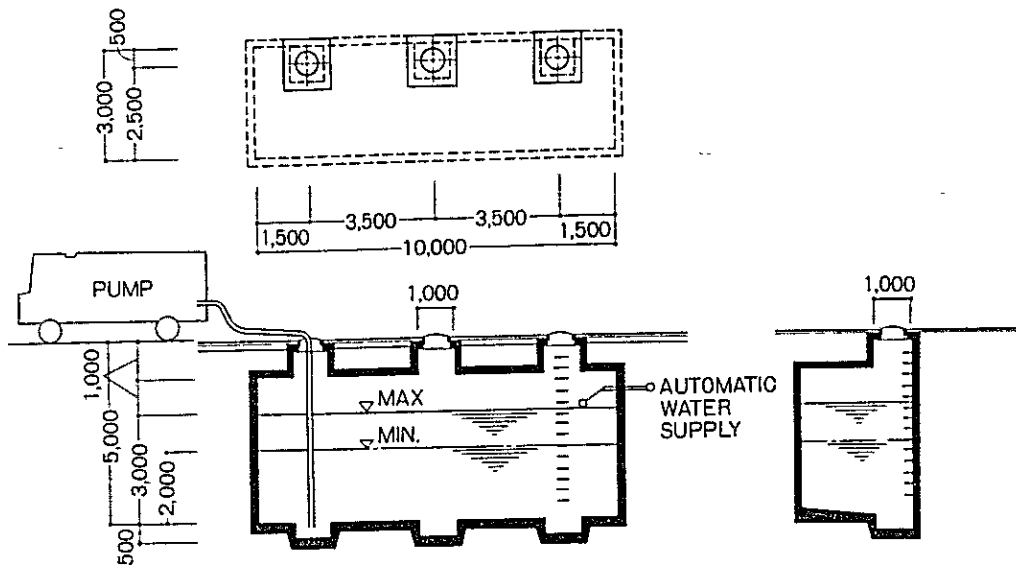
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GYMNASIUM PLAN · SECTION · ELEVATION

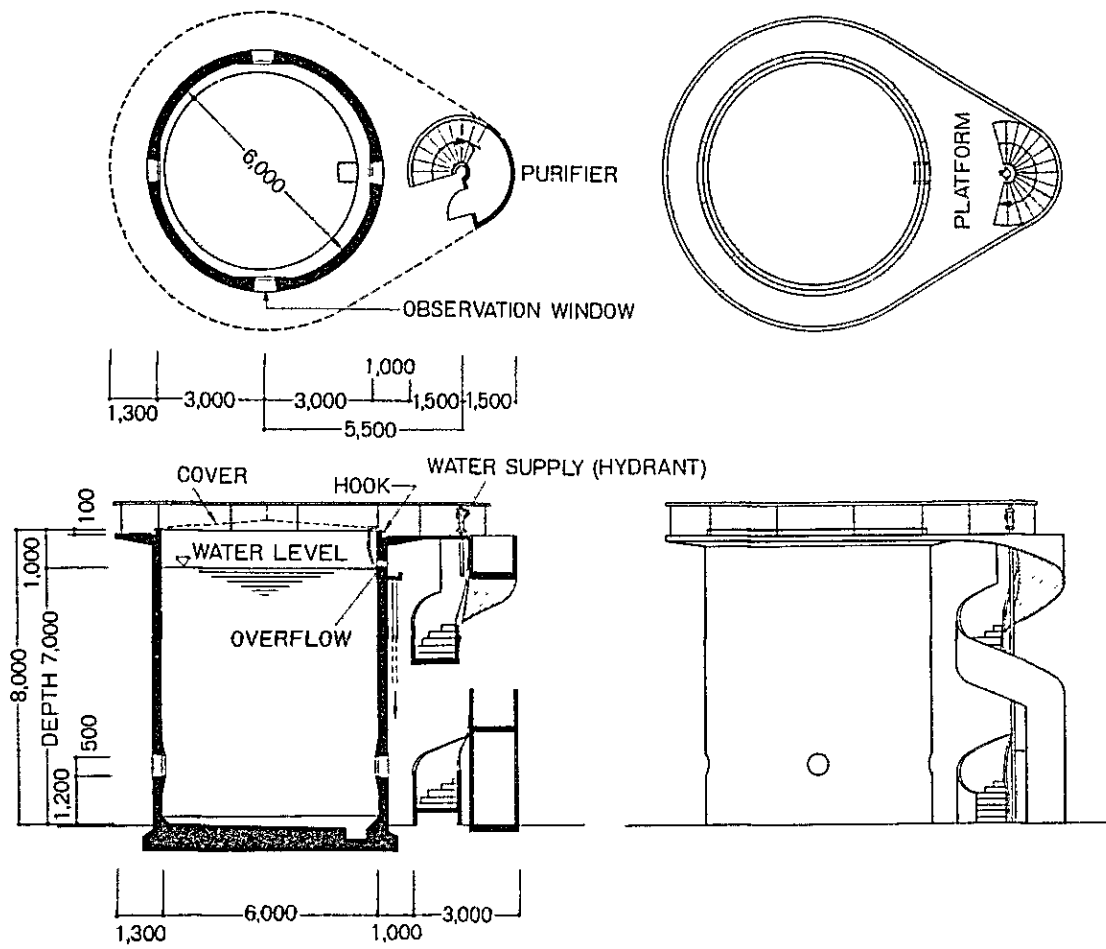


OIL PAN
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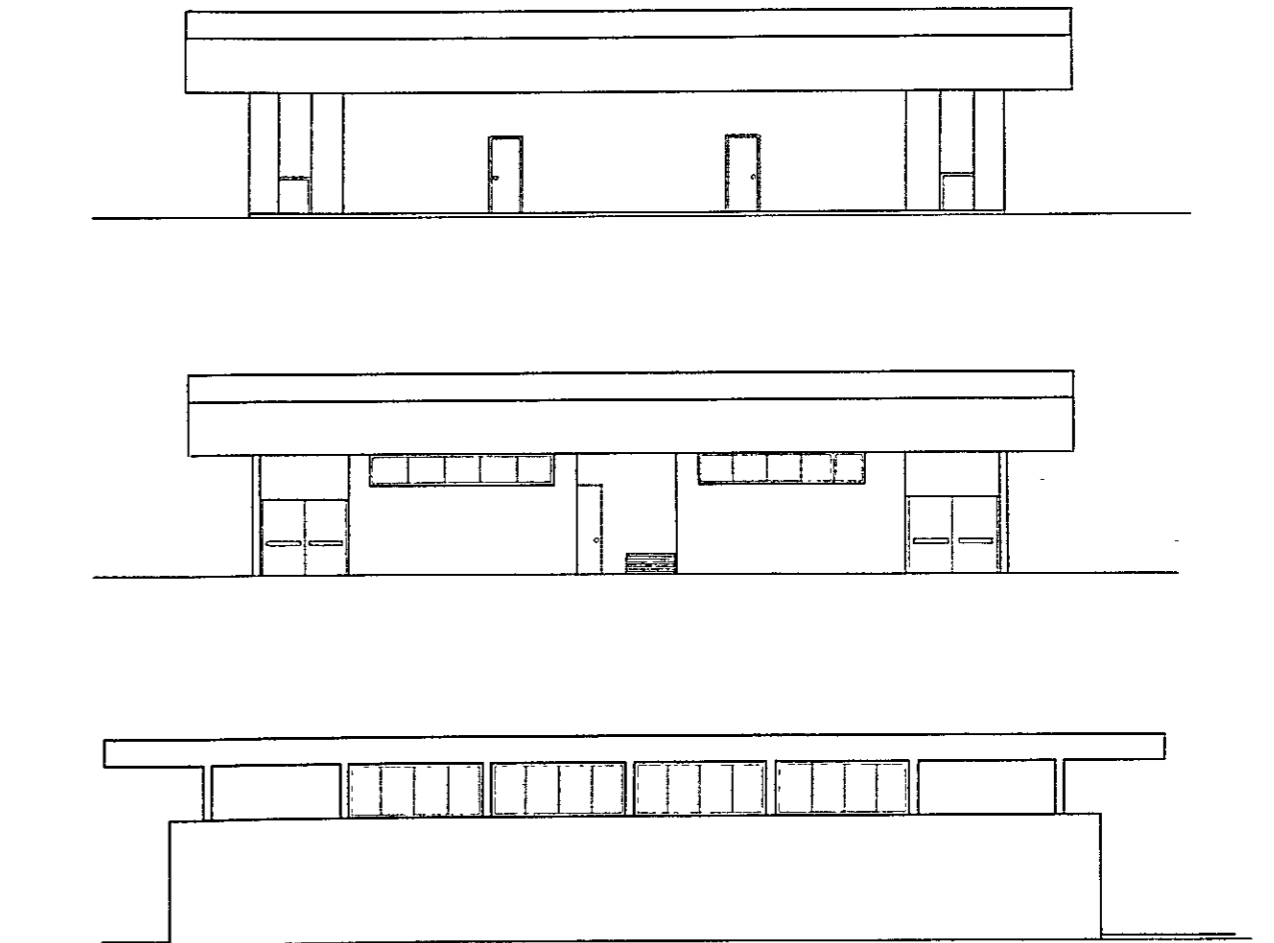
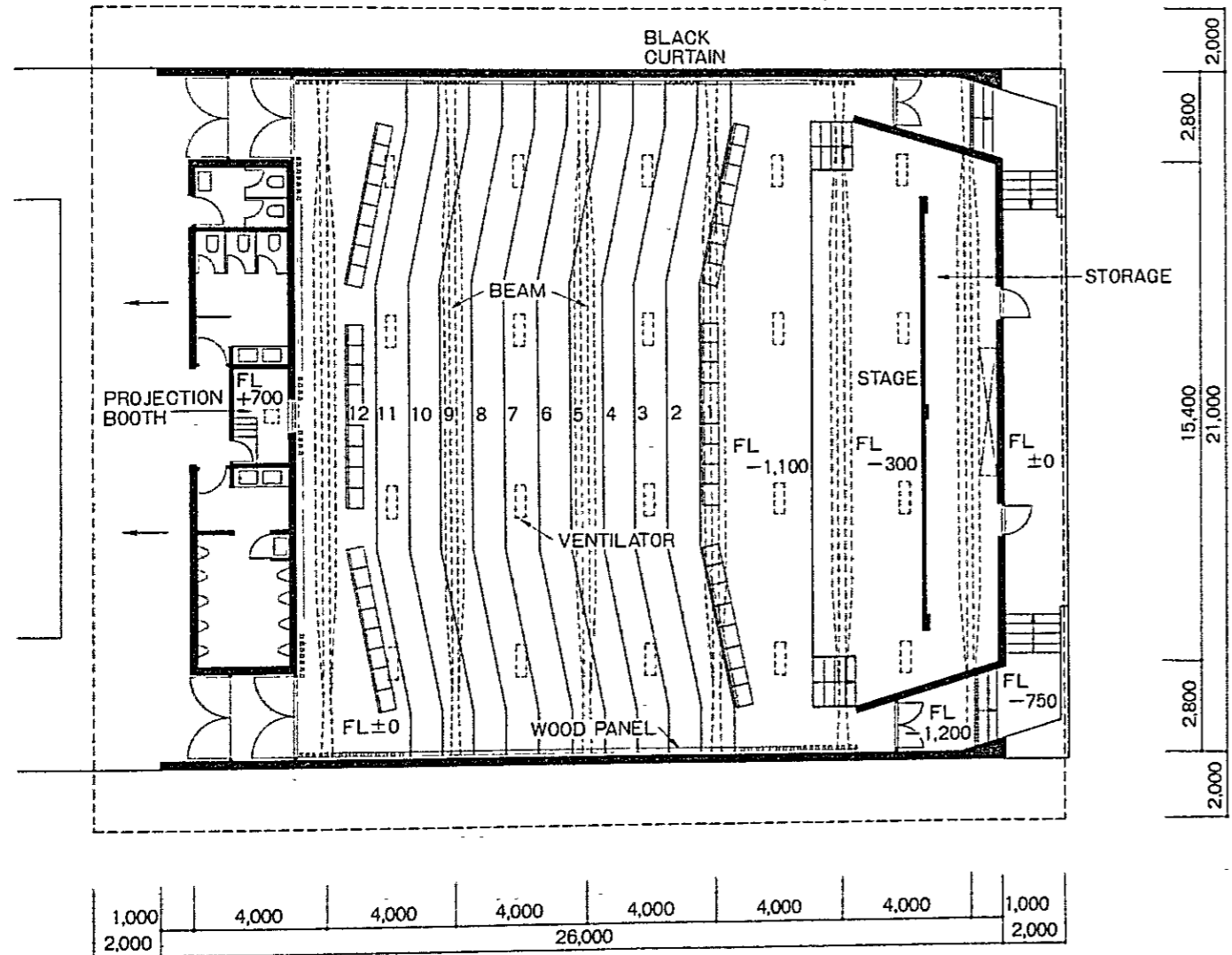
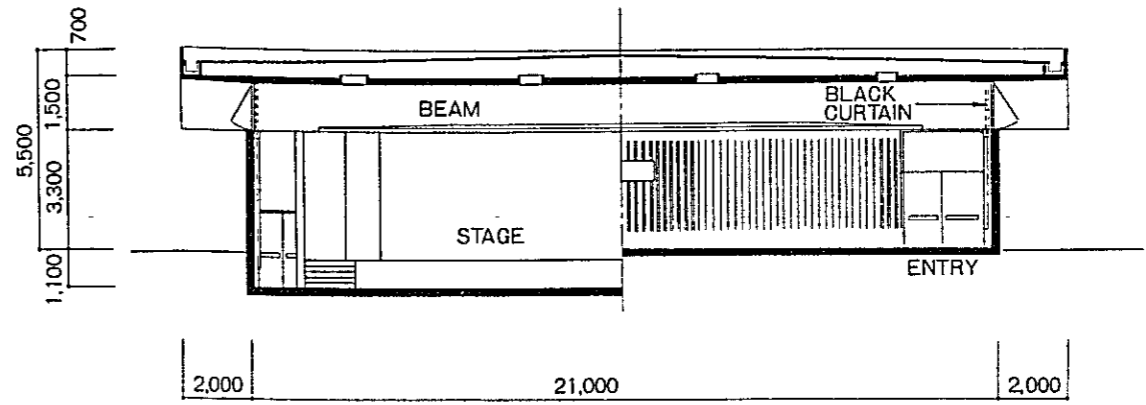
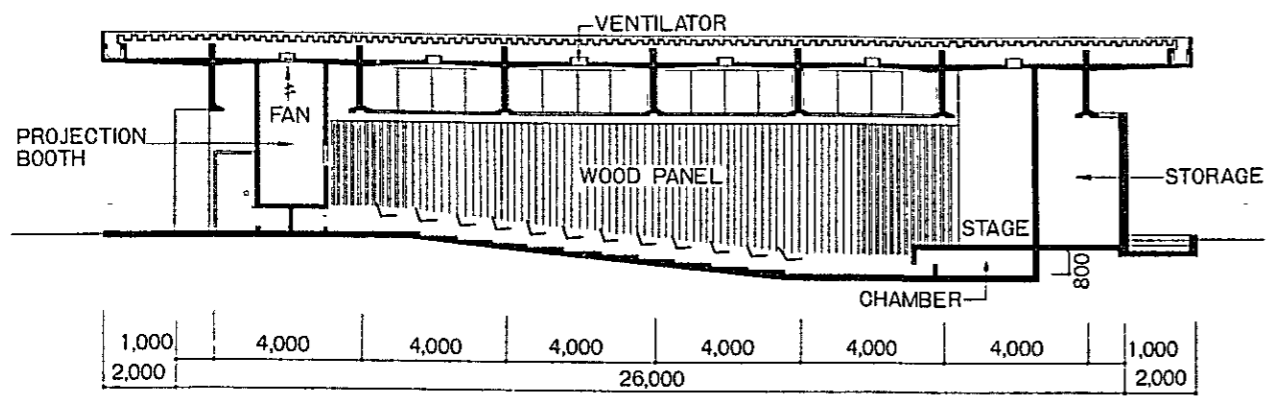


WATER RESERVOIR.

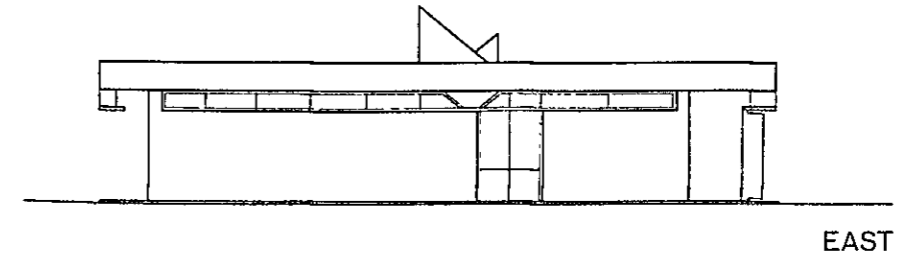
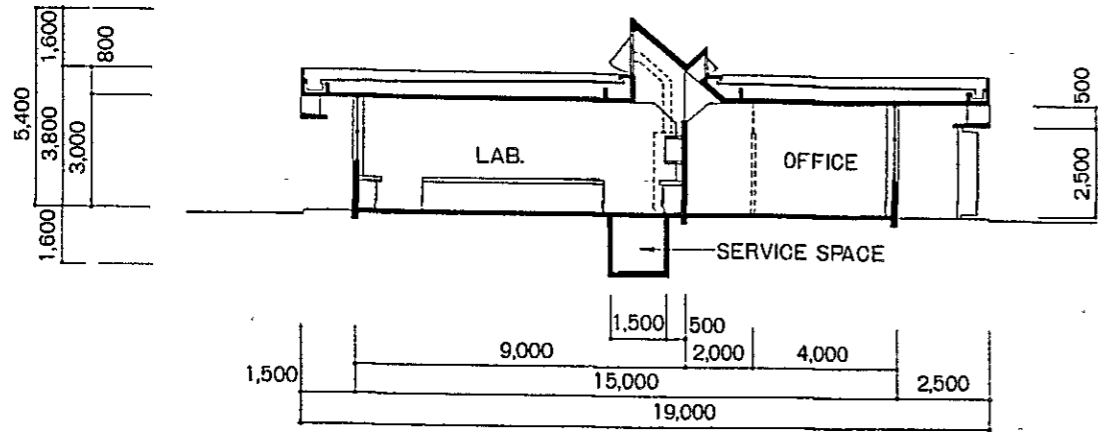
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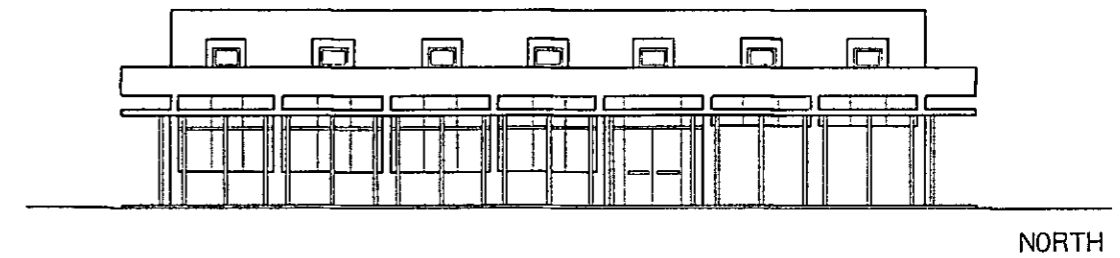
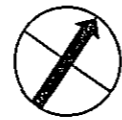
DIVING POOL
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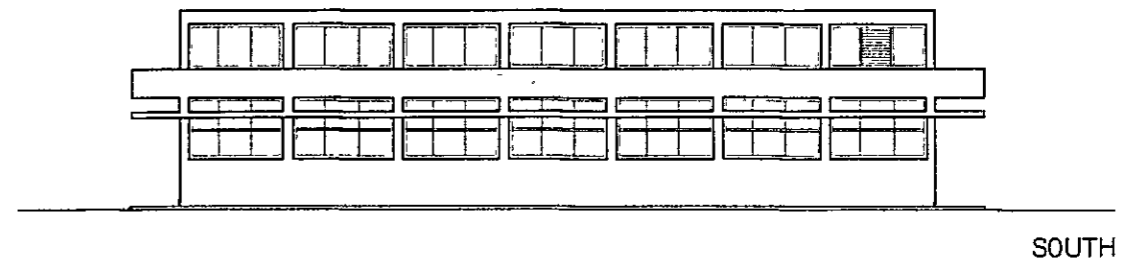
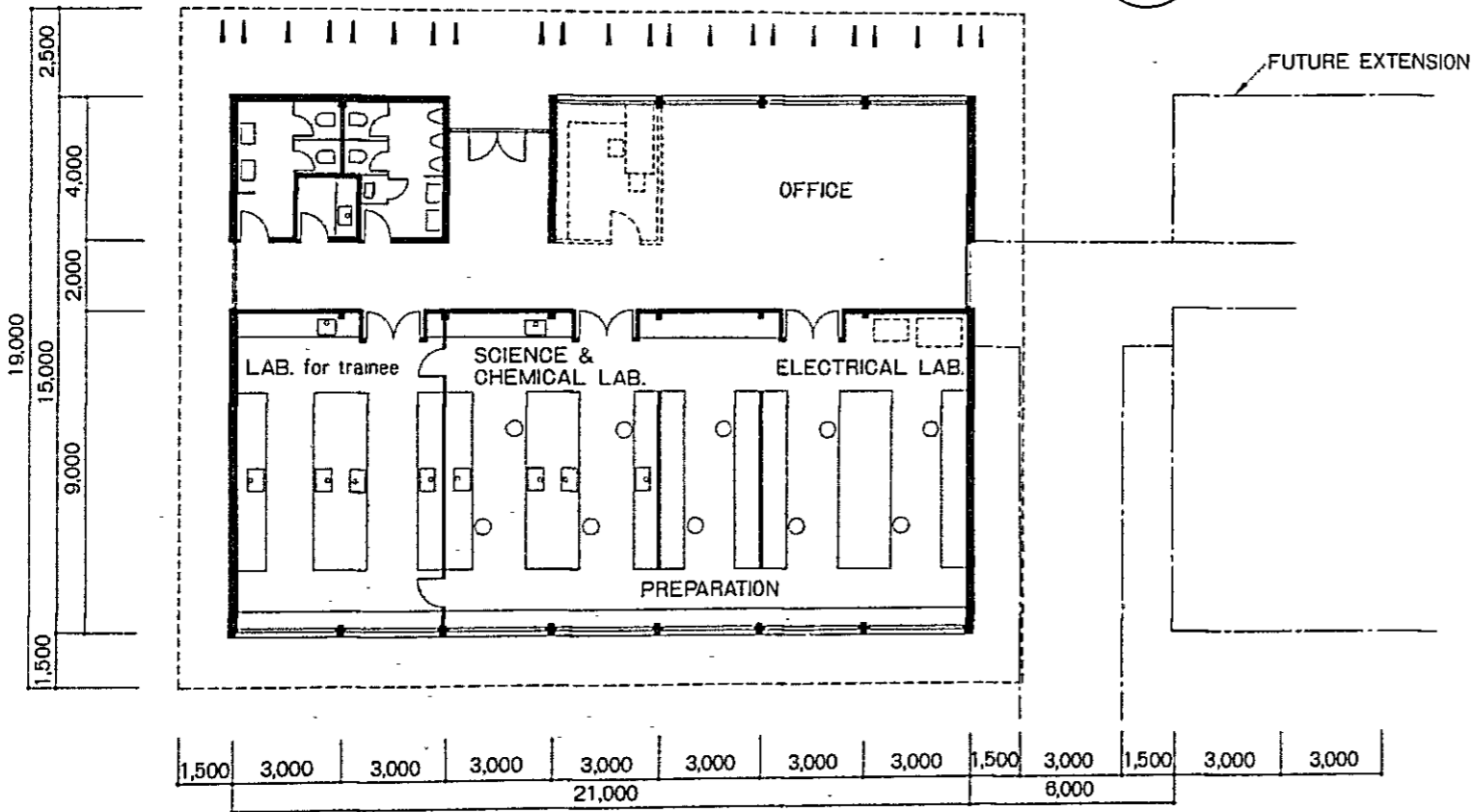
AUDITORIUM PLAN · SECTION · ELEVATION



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NORTH



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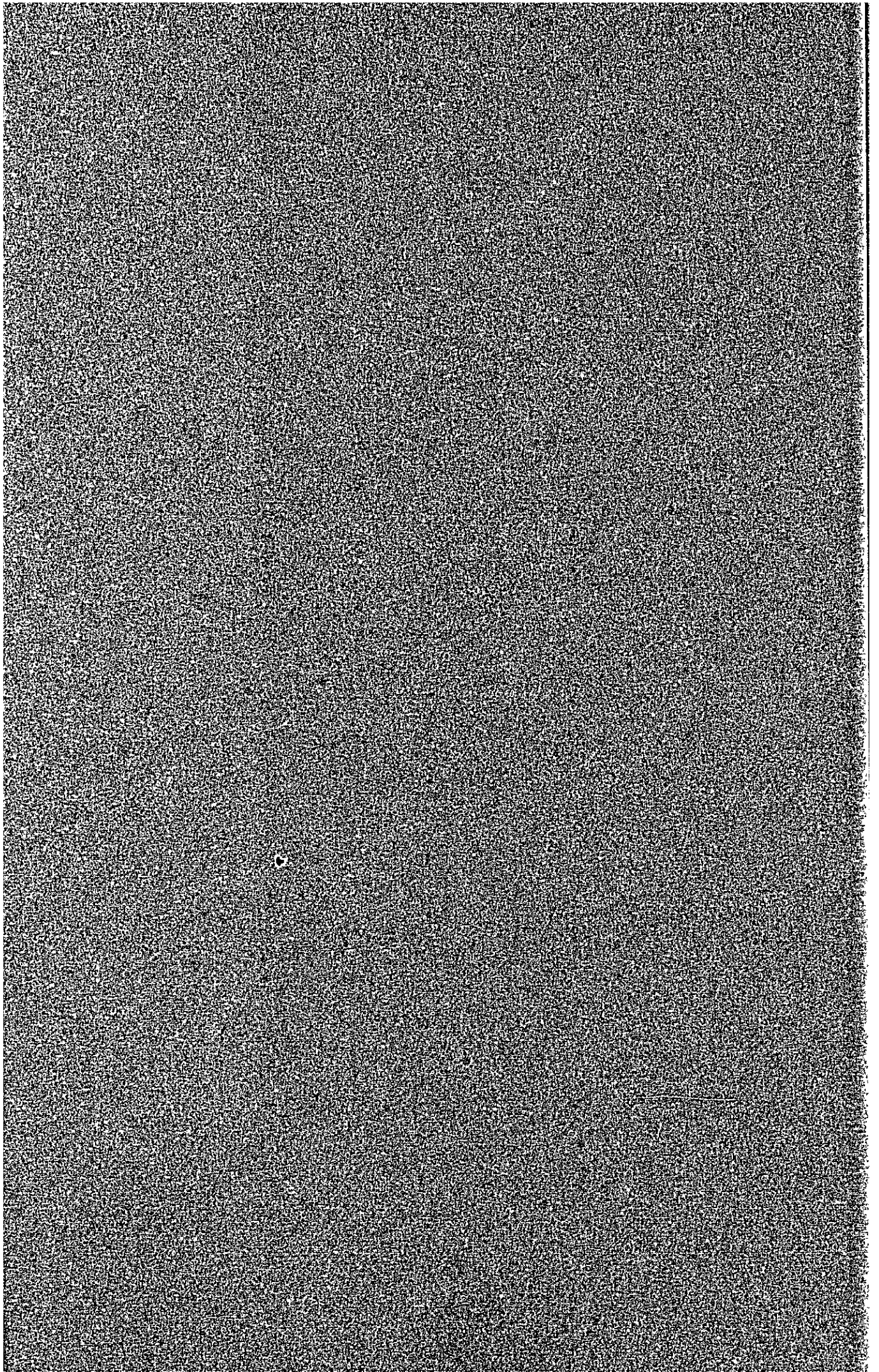
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3-2 TRAINING GUIDANCE



3-2 TRAINING GUIDANCE

3-2-1 INTRODUCTION

A. Basic Concepts

The basic principle in fire fighting is to maintain safety, security and promptness. Among others, to assure safety of a fireman himself is a prerequisite to rescuing endangered occupants. Though fire service organizations and duties in Brazil and Japan being not necessarily same, all commanders should keep in mind the basic rule that the safety of each fireman eventually leads to the safety of the whole company to which he belongs.

The fundamental skills fully mastered will be refined through an advanced course of training. All these will be indispensable for safe, secure, prompt action in an actual fire scene.

B. Safety Securing

In order to secure safety, thorough care should be devoted to the following.

- o As training advances, accidents occur more frequently because trainees, having over-confidence in their acquired skill, tend to become less safety-conscious.
- o Never neglect to wear a lifeline in training.
- o Use a rope capable of withstanding a max. three ton-tensile load.
- o Before using a rope, firemen should be remind of its safety factor, recognizing change in rupture force due to knotting.
- o A safety checking plan should be enforced including, for instance, "three men-mutual attending system" in which three firemen form a party to check and secure the safety of one another.

Then, to follow in the subsequent sub-chapter is the recommended training program operable on the facilities. It is hoped that the training is conducted with due care, its subject being fully understood so as to be proven an effective operation aid.

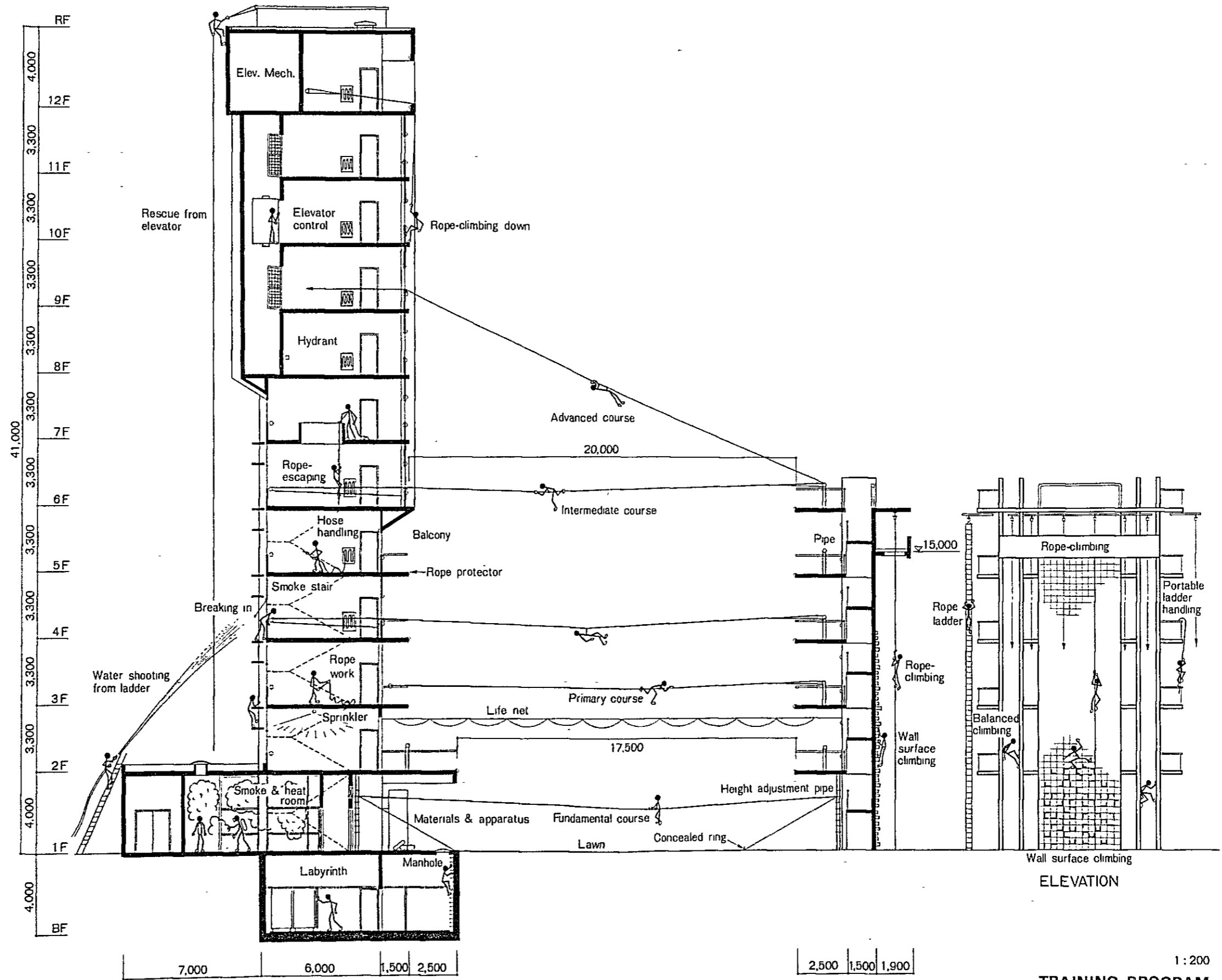
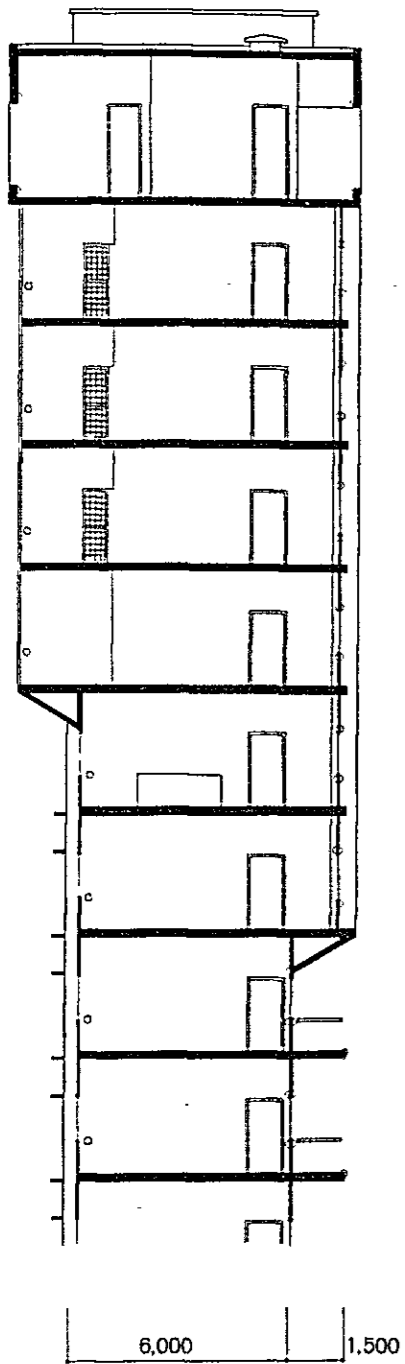
3-2-2 DRILL TOWER AND AUXILIARY DRILL TOWER

- o These structures are primarily intended for training and practicing of fire protection of buildings, rescuing, evacuation, etc. Consequently, for these purposes, they should integrate design features of typical local houses and buildings, such as typical of basements, single-story houses, two-storied houses and apartments, and office buildings. They also are required to be a symbol of the training center.
- o In the design of these towers, the design features are modeled on typical forms of local building walls, windows, balconies, inside stairs, etc. as found in Brasilia, with due consideration given to the training programs now adopted in Brasilia. Since firemen, if properly trained, seem to be able to force their way into a building through a window by climbing up the ornaments on facade wall frequently found in the urban district of Brasilia, wall-climbing training which, in Japan, is done on mountains is also included.
- o In compliance with the Brazilian authority's request, the basement has the labyrinth only. In consideration that the construction may take plural stages, the design is so worked out that the following training can be carried out in those parts of the Training Center which will be completed in the first stage of the project construction.
 - I. Portable ladder-climbing
 - II. Ladder-climbing
 - III. Rope-climbing, rope-crossing and moving-in, etc.Before completion of the Auxiliary Drill Tower temporary steel arms for rope-climbing and temporary poles for rope-crossing are required.

- TRAINING METHODS AT TOWERS -

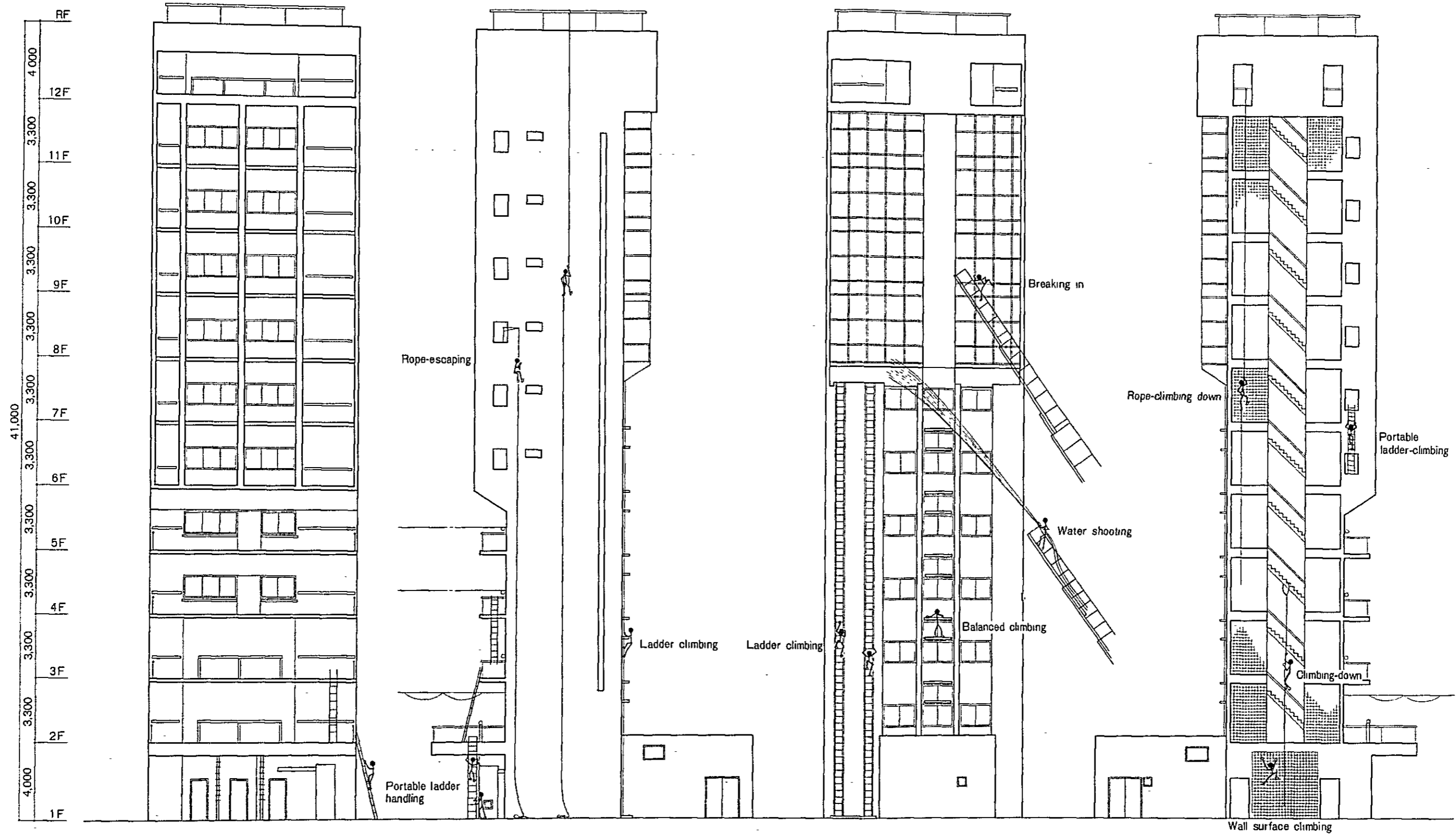
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ELEVATION

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TRAINING PROGRAM



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TRAINING PROGRAM

1. The first part of the document is a list of names and titles, including "The Hon. Mr. Justice G. D. C. O'Connell, Chief Justice of the Supreme Court of the State of New South Wales" and "The Hon. Mr. Justice G. D. C. O'Connell, Chief Justice of the Supreme Court of the State of New South Wales".

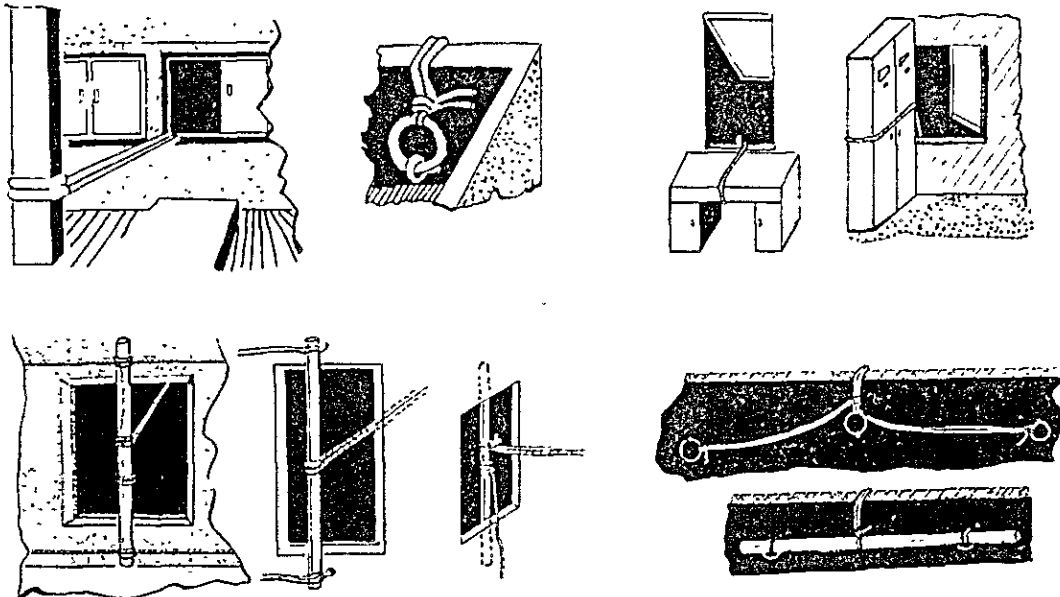
— TRAINING METHODS —

The following training methods and techniques are used in Japan. The Brazilian authorities are recommended to examine how to adopt them in Brazil, referring to them as examples.

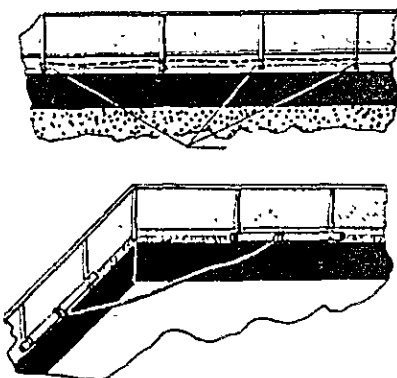
1. Anchor-Setting Training

Anchors are to connect a "fire spot" to a safe place by the rope which serves as a path to go through for access, rescue and escape or to carry materials in and out.

Training is carried out, simulating anchor settings as shown below. Ropes should be hitched firmly to anchor objects, with the protrusions on the buildings or structures appropriately padded with cloth.



Precautions

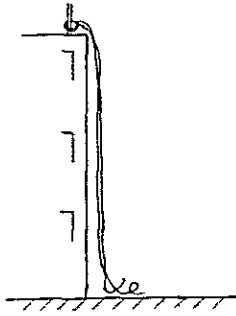


- 1) Set anchors at the safest positions for rescue work.
- 2) Set anchors at the most convenient positions for access and hauling.
- 3) Choose the ropes which can bear over ten times the max. load possibly imposed on the anchors, unless otherwise permitted.
- 4) When using a vertical rope-bridge, install it in such a safe place where the operation is unlikely to be endangered by the adjoining wall or soil collapsing, openings, overhangs, etc.

2. Rope Bridge-Setting Training

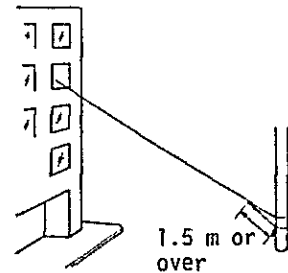
In making a bridge, a basic rule is twisting two lines of ropes into a single line. There are different classifications depending on the numbers of anchors, the conditions of bridges, etc.

(1) Vertical Rope-Bridge



(2) Slanting Rope-Bridge

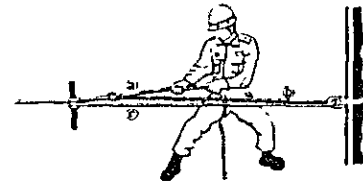
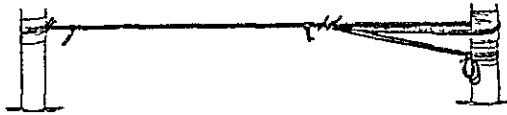
This type of bridge is used when two anchored spots are different in height, for example, between a high-rise building and the ground.



(3) Horizontal Rope-Bridge

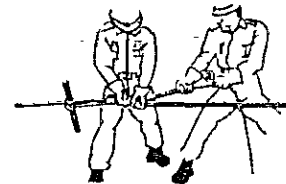
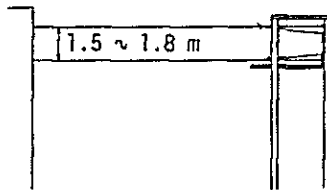
One-Line Rope-Bridge:

Only one rope is used. It can be easily set up, but requires a trained skill for crossing on it.



Two-Line Rope-Bridge:

The bottom line bridge is to keep the footing, the upper (a single rope) serving as a hand-railing.



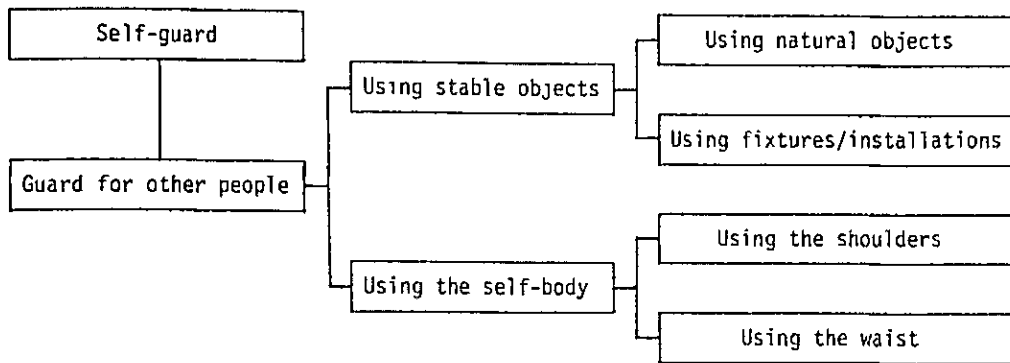
Precautions

- 1) A bridge should consist of two ropes, each being tightened separately.
- 2) Be sure to provide a pad for rope protection at each anchoring point and any other at which the rope contacts protrusions and corners of a building or structure.
- 3) Avoid making hitches at a same point of rope or causing a rope to be subjected to abnormal loading.

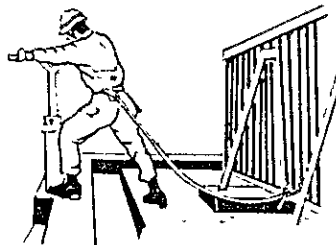
3. Security-Keeping Technique Training

As for the technique to keep security, assurance of self-guard is the very first step, and the technique for keeping others' security should be acquired step by step in training.

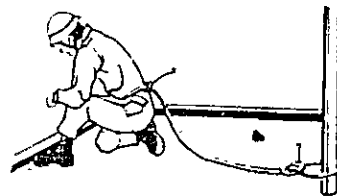
[Security System]



[Self-Guard]



Standing posture



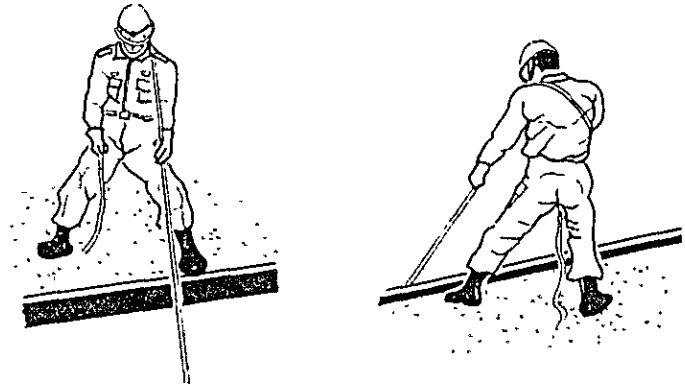
Seated posture

Precautions

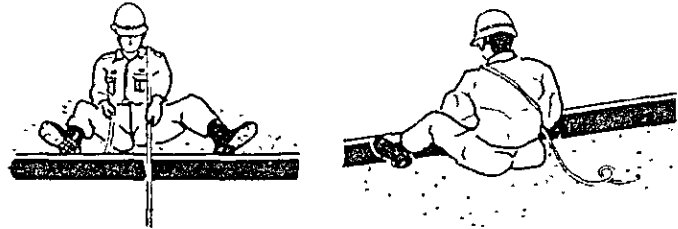
- 1) Do not forget self-guard at any time.
- 2) Do not rely only on this method as some conditions might not permit it.

[Guard by Using the Shoulder]

(Standing posture)



(Seated posture)



Precautions

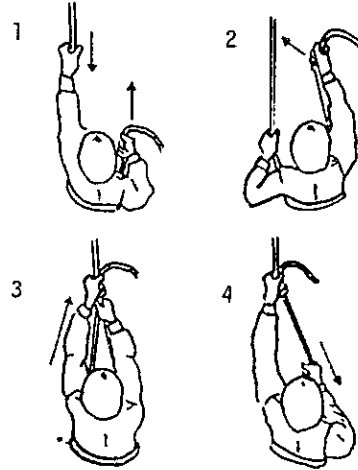
- 1) Adopt this method when no other alternative is available.
- 2) It is much more effective to get a rope around the back toward the chest.
- 3) Take a position with a steady stance in such a manner as is the most effective to exert resistive counter force, facing toward a person on the rope.
- 4) Be flexible with your knees and waist.

[Guard by Using the Waist]

(Standing posture)



[Manipulating a Guard Rope]



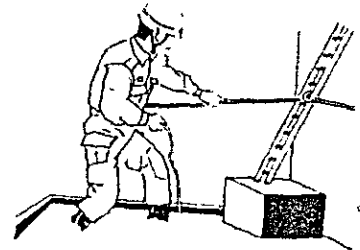
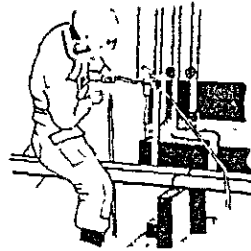
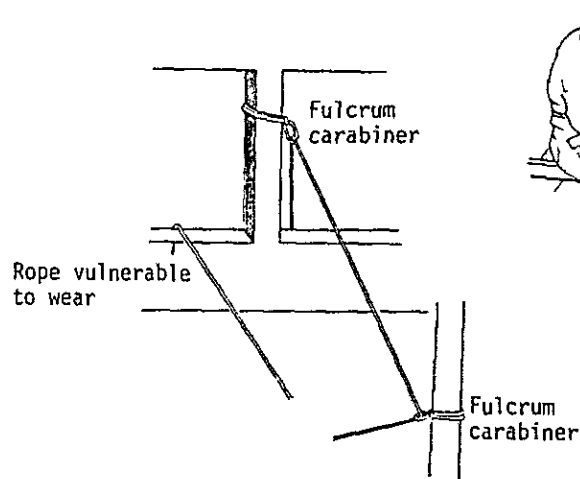
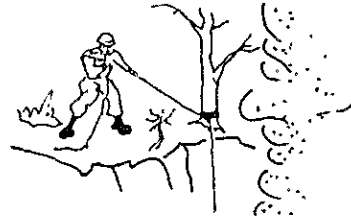
(Seated posture)



Precautions

- 1) Two types of waist guard are available at standing and seated postures.
- 2) The seated posture is safer than the standing posture. The former is recommendable wherever any large open space is available.
- 3) In taking the seated posture, spread the two legs wide apart in a fan shape, fully stretching them against a proper support(s).

[Guard by Using Stable Objects]



Precautions

- 1) Put the face toward the fulcrum because impact force comes from above through the fulcrum.
- 2) Make more fulcrums by using small stuffs, carabiners, etc. when the rope does not seem to carry the weight.

4. Training for Forcing the Way Inside Buildings, Etc.

Whatever the kind of disaster is, there are many circumstances in which a fire company is required to force the way inside the building, etc. by using every feasible attacking method and technique as part of their fire fighting operation. Taking account of the type of disaster involved and the features of buildings or structures and topographical surroundings as well as the crew's skills and apparatus, a specific method should be selected which best suits the scene with compatible safety, security and swiftness.

4-1 Rope Operation

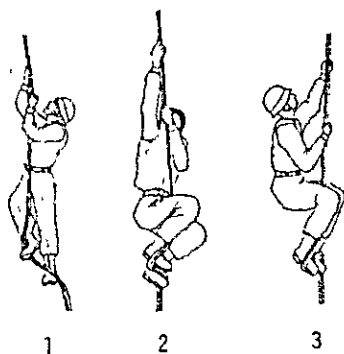
There are a few methods to force the way inside by using ropes, these being generally classified into three types: vertical rope access; horizontal rope access; and slanting rope access. In practice, the vertical rope access includes rope climbing, monkey climbing, etc. (climbing up a rope from the ground) and seated vertical descending, etc. (climbing down from the top). The horizontal rope access includes sailor crossing, monkey crossing, Tirolean crossing, etc.

I. Rope Climbing

a. Two-Leg Climbing

Without using any device, a fireman climbs a rope by himself by exerting the arm and leg force in combination, while the legs clinging to the rope.

Precautions

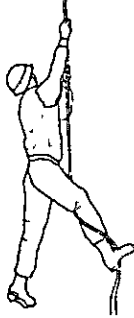


- 1) Stretch the arms up after completely supporting the body by clinging the legs to the rope.
- 2) In climbing up, pulling the rope toward the chest will make the ascending movement easier.
- 3) In climbing down, slightly slack the legs holding the rope and gradually slide the arms down.
- 4) Put on a securing rope in training.

b. One-Leg Climbing (with securing aide)

Precautions

- 1) In climbing rope, hold the rope in both hands and move a hand and a leg alternatively. Also, move the left and the right hands alternatively.
- 2) In climbing, the Climber should shout "one-two-one-two ---." The securing aide should manipulate the rope keeping pace with the alternative movement of climber's legs, listening to the Climber's shouting.
- 3) The higher the climber goes, the more strongly the securing aide has to pull the rope.
- 4) Move the left foot to counterbalance the right foot.
- 5) Irrespective of climbing height, use at all times a securing rope in training.



c. Two-Leg Climbing (with securing aide)

Precautions

- 1) Hold two ropes together, and move the hands and legs alternatively.
- 2) Climb up the ropes, shouting, "right-left-right-left ---." The securing aide should manipulate the ropes in keeping pace with the movement of the climber's legs.
- 3) Before starting this climbing drill, completely master the climbing and supporting technique for the one-leg rope-climbing.
- 4) Put on a securing rope in training.



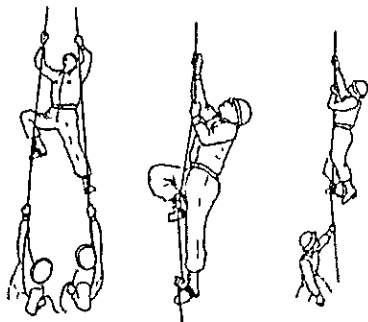
Pull Loosen

II. Rope Climbing with Special Tools

a. Two-Leg Climbing

b. One-Leg Climbing

Climbing up ropes by using only the hands and legs requires much energy. Use of some climbing tools can be a great help in climbing up ropes.



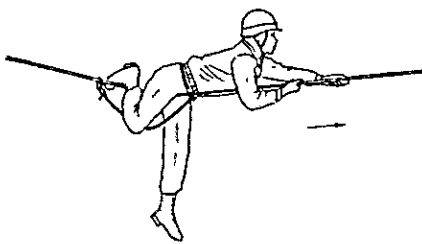
Precautions

- 1) Keep ropes tight to facilitate smooth climbing.
- 2) In this method, maintain max. height at 20 - 25 m.
- 3) Stop climbing up the ropes about 10 - 20 cm below the level of the floor where the climber intends to enter, and, then raise the legs onto the floor, while holding the rope, for landing.

III. Sailor Crossing

Method frequently used to cross on a single rope-bridge.

[Standard Posture]



Precautions

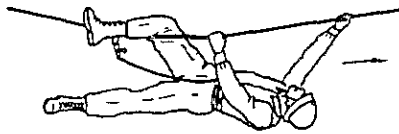
- 1) Be sure to tie a life-line and to fasten a carabiner tightly.
- 2) Maintain the balance of the body, with a leg kept drawn in, as shown left, as the legs are apt to be loosened backward in advancing forward, causing the body to be unbalanced.
- 3) When the sailor is thrown off his balance by shocks of wind, etc.:
 - o in case of a side-to-side swing, relax the entire body, without trying to exert resistive force, to regain the balance; or
 - o in case of an up-and-down swing, advance forward just while a wave of the rope rises, keeping the balance.
- 4) Keep the upper part of the body away from the rope in making the way.
- 5) Carry the hands forward alternatively along the rope, holding it from below.
- 6) Protect the rope by removing any obstacles (a buckle, a fastener of lifeline, etc.) on the abdomen to the side of the body.

IV. Monkey Crossing

Method of rope-crossing in which a rescuer makes his way, hanging himself from a rope and moving his hands and legs alternatively just like a monkey as the name implies. In this method, two types are used: horizontal rope-crossing and slanting rope-crossing.

[Standard Posture]

Precautions



- 1) Be sure to tie a life-line and to fasten a carabiner. The appropriate length of a life-line is from waist to the ground when standing on the ground.
- 2) In putting the legs on a rope, place back of the knee on the rope. Never let both legs go off the rope.
- 3) Unless the body and the rope coincide with each other in their movement and swing, the hands and legs holding the rope may be shaken off from the rope. Hence, move the body to keep pace with the rope swings.
- 4) In order to avoid over-fatigue, swing the body largely from side to side with the limbs straight and try to keep the body as far away from the rope as possible.

V. Tirolean Crossing

Method of rope-crossing in which the rescuer crosses a rope, making a bridge between a burning building and the next safe one for the rescuing and escaping operation. As, in this method, the rescue member crosses with his face up, he can lessen his dread of height to some extent. Furthermore, it requires less energy and enables more swift travel than the Sailor Crossing Method and the Monkey Crossing Method.

[Standard Posture]

Precautions



- 1) Be sure to tie a life-line and to fasten a carabiner.
- 2) Firmly hold the rope and keep the swings of body and rope well harmonized to prevent any hand from being shaken off.
- 3) Be careful of the hands in pulling the rope toward the carabiner to prevent the carabiner from hurting the hands.
- 4) In hitching the rope through the carabiner, attach the carabiner to the left side of the Z-twisted rope and to the right side of the S-twisted rope, facing the advancing direction. (This is recommended to assure smooth, swift travel.)

VI. Vertical Rope Descending

This technique is classified in two types: Vertical Body Method for climbing down with a rope wound around the body; and Seated Vertical Method for climbing down by using a life-line and a carabiner, including the following variants.

o Vertical Body-Hitching Method

In this method, a rescuer climbs down with a rope wound around the body without any tools. Thus, it is easy to operate as compared with other methods.

o Vertical Body(Shoulder)-Hitching Method

Vertical Body(Neck)-Hitching Method

These are used for short distance-descending.

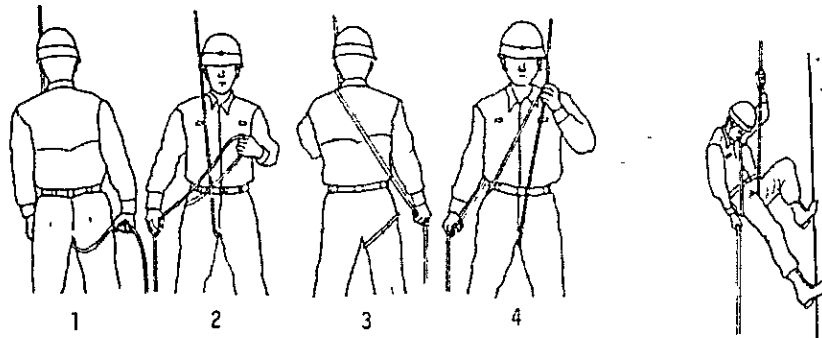
o Seated Vertical Method

Method of holding the body with friction caused on rope which is hitched to the body through a carabiner. This involves less pain to the climber and is readily adaptable to a case carrying an injured victim or tools. This method is adopted to descend a long distance, to do some work halfway on the rope or to carry down an injured person.

a. Vertical Body(Shoulder)-Hitching Method

[Rope Hitching]

[Standard Posture]



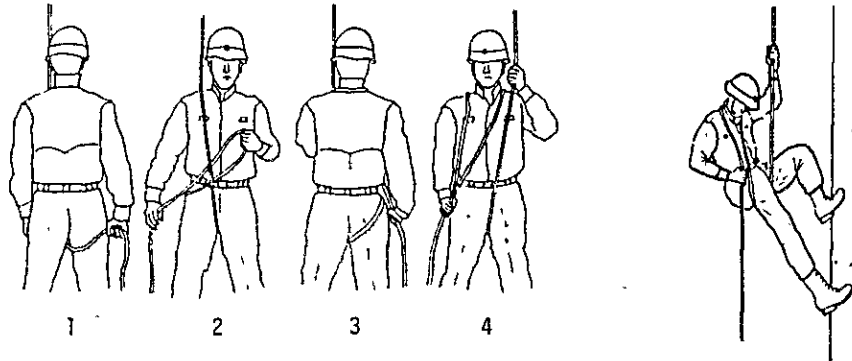
Precautions

- 1) Never take the hands off the rope.
- 2) Throughout descending, keep the eye on the next foot position.
- 3) Keep the rope between the thighs, putting the right foot below the left.
- 4) When braking, pull the rope onto the chest to intensify the friction between them.
- 5) The maximum length to descend by this method is about 7 m because the friction of the rope may give the rescuer considerable pain.

b. Vertical Body(Neck)-Hitching Method

[Rope Hitching]

[Standard Posture]



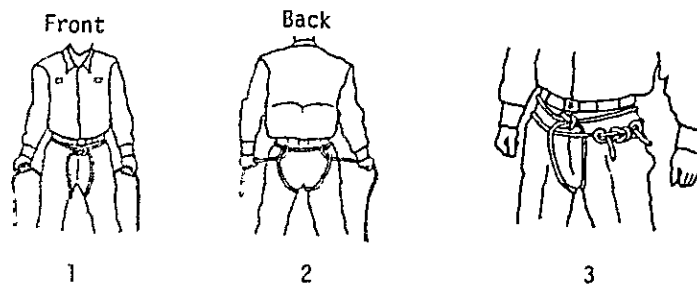
Precautions

Generally take the same precautions as in the Vertical Body(Shoulder)-Hitching Method. In addition, protect the neck from friction, by keeping the collar of working jacket turned up.

c. Seated Vertical Method

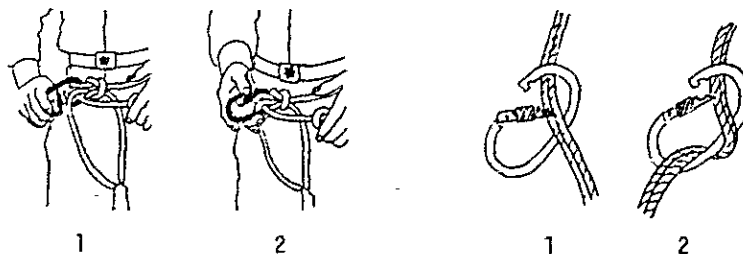
Method of climbing down a rope, holding the body using the friction between a carabiner and the rope which is wound around the carabiner put on the waist. The method involves less pain to enable safe, swift descent in a case of carrying down the injured or implements.

[Preparing Seating Bowline]



[Attaching a Carabiner]

[Roping around a Carabiner]



Precautions

- 1) Get the rope straight before climbing down.
- 2) At all times, hold the rope in the right hand.
- 3) Hold the rope softly in the left hand.
- 4) Stoop low enough to keep the balance.
- 5) Climb down vertically and smoothly, and try not to give big swings to the rope.
- 6) In descending, never stretch the body back.
- 7) Through descending, keep the eye on the next foot position, paying attention to any obstacles.
- 8) Do not swing your body in excess.
- 9) Jump over obstacles, if any.
- 10) Reduce speed just before landing on the ground. (Stop climbing down at a position about 1 m high above the ground.)
- 11) Before the operation, take off a necktie, etc. likely to get entangled with the rope.

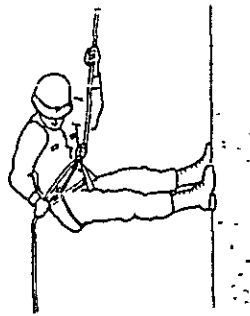
Jumping over Overhang, Etc.

In the seating vertical descending, jump over, as shown below, an overhang or other projection or an opening.

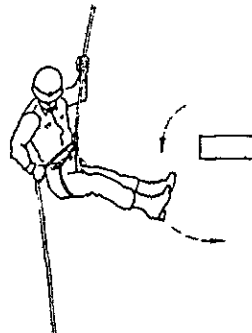
[Standard Posture]

Precautions

- 1) Be sure to keep the rope in both hands.
- 2) Do not stop climbing down halfway.
- 3) In case of beginners, the instructor should caution them by shouting "brake" at an appropriate braking point.



1

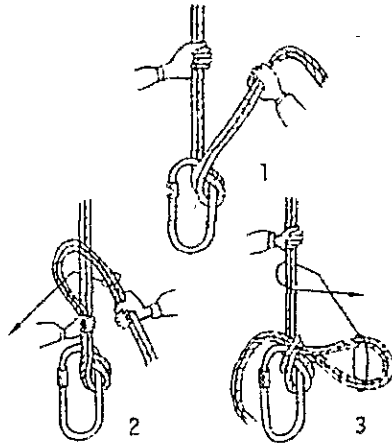


2

Work Operation on the Halfway to the Ground in Seated Vertical Descending

Method of holding the body in position on the halfway by using a rope knot in order to rescue a suspended victim or assist the rescue operation.

[Rope Knotting]



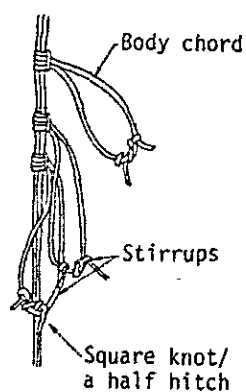
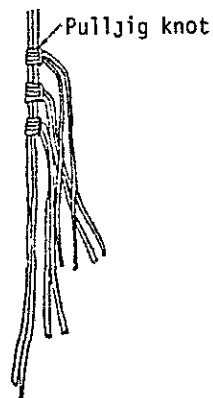
Precautions

- 1) Tie the upper part of the body to the vertical rope, if necessary depending on the operation required.
- 2) Come to a stop a little before the working spot when using the half hitched clove hitch, because that hitch is inevitably dislocated slightly below the stop point.
- 3) Do not stretch the body back, nor bend the body sideways too much.

VII. Pulljig Climbing

Method of climbing up a rope which is thrown down from a upper level or a rope when a rescuer climbs up again after he has descended on the same rope. This method is frequently used where a climber cannot support the weight by his arms alone.

[Knotting]



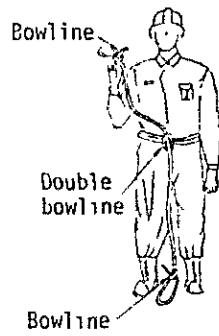
Precautions

- 1) When shifting a knot of pulljig, hold the vertical rope just below the knot with one hand.
- 2) Appropriately adjust the size of a body chord ring and stirrup to suit the climber's size.
- 3) Climbing will be made easier if the rope is kept tightened at the bottom.

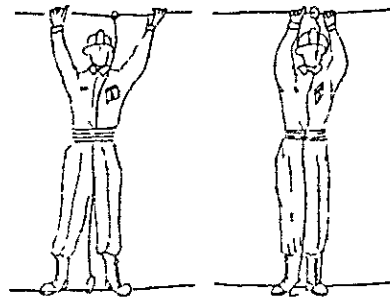
VIII. Crab Crossing

Method of sideway crossing by the use of two parallel ropes, in crab-like movements, while shifting with the aid of hands and legs two life-lines (each secured to the top and bottom ropes) equipped with a carabiner.

[Life-Line Hitching]



[Standard Posture]



Precautions

- 1) Be sure to hitch the life-lines to the ropes.
- 2) Keep the standard posture.

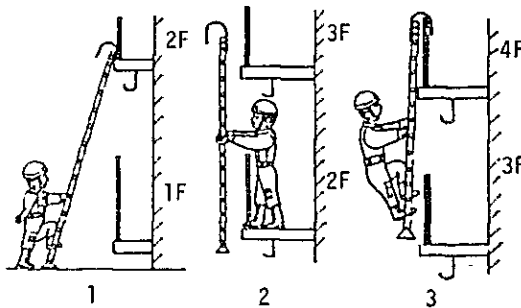
4-2 Ladder-Climbing

Since except in especial cases, fire and other disasters inevitably involve vertical attacking operation, ladder operation is indispensable in actual scenes. Then, due emphasis in training should be given to the drill using portable ladders, folding ladders, etc. carried on a fire truck.

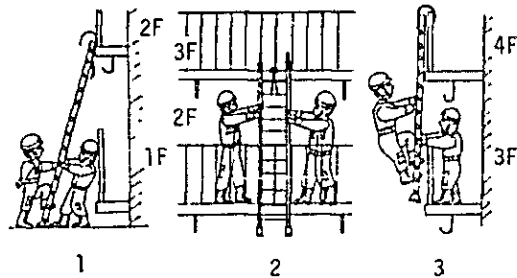
I. Portable Ladder Operation

Method of hanging a ladder by fixing the hooks at guard railing or window frame.

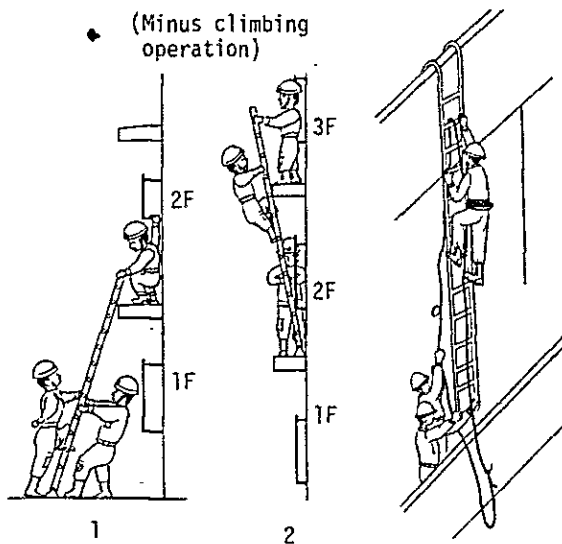
[Operated by one man]



[Operated by two men]



[Operated by three men]



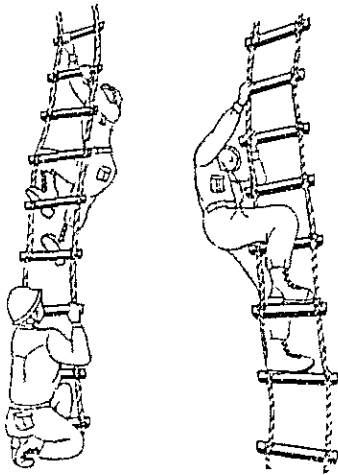
Precautions

- 1) Check if the support receiving hooks is sound enough to carry the weight.
- 2) Prior to climbing, check if the hooks are secured in place.
- 3) Two firemen who form a pair should make efforts to assist each other.
- 4) Except in the minus climbing, secure the ladder to hold it out, duly taking into account the overhang of wall.
- 5) The securing aide should try to warrant full safety of the climber.

II. Rope Ladder

Method for forcing the way inside with a rope ladder.

[Standard Posture]



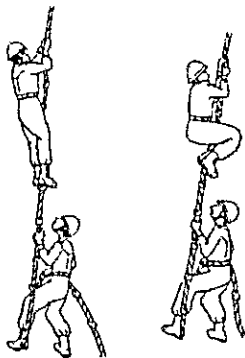
Precautions

- 1) Secure the top end of a ladder to a fixed, firm fixture.
- 2) Take thorough care to watch the step especially when climbing in the front, in which case a ladder can be very unstable, swinging around. An aide who secures the bottom end should carefully observe the climber and the ladder to assure safety.
- 3) Besides an aide who secures the ladder, the climber should be instructed to wear a life-line, and an additional life-line aide should be assigned to prevent the climbers from falling down.

III. Knotted Rope

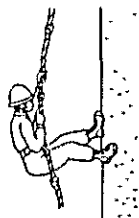
The knotted rope is an ordinary rope which is knotted at 30 to 40 cm intervals to provide footholds and handholds for ascending or descending firemen. Like a rope ladder, a knotted rope usually involves some problems in climbing to force an entry, hence being less frequently used. Instead, the rope is frequently used in descending to force an entry or to leave the scene.

[Standard Posture]



Precautions

- 1) In fixing rope, make sure that the element supporting the rope has enough strength.
- 2) Make use of the knots to the full advantage.
- 3) In climbing, fully stretch arms and draw legs close together to make effective move.
- 4) In climbing a wall surface, secure foothold, taking care to prevent slipping or false stepping.

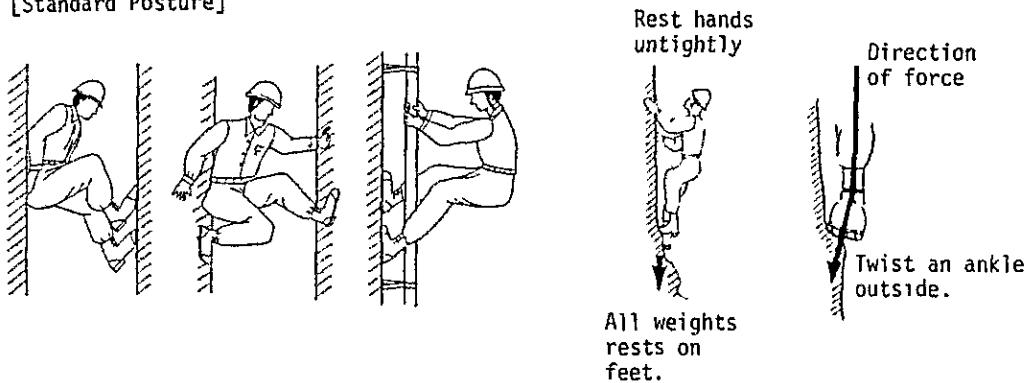


[Standard Posture in Climbing
with Footholds on Wall]

4-3 Balanced Climbing

Method of climbing a wall in which the climber supports himself on two opposing wall surfaces which are narrowly spaced, an ornamented wall surface, a ship laddered-wall, a balcony, etc. by using the three points-supporting method as used in rock climbing.

[Standard Posture]



Precautions

- 1) Use the three point-supporting method.

Here, the three point-supporting method means that out of four limb terminals (i.e., two feet and two hands), the three terminals have firm bearing on a wall, side pieces of ladder or other appropriate foot(hand)-holds, with the remaining one moving upward or downward, i.e. when moving a hand, both feet and the remaining hand are in contact with a wall, or when moving a foot, both hands and the remaining foot are in full contact with a wall to keep appropriate balance of the weight.

- 2) Prior to operation, verify that wall or fixture has sufficient strength.
- 3) Before climbing, establish the location, target point and route.
- 4) In view that this will require fully developed techniques and physical strength, use it on least occasions and, if used, provide full safety securing measures.

4-4 Access through Stairway

Most readily available way of access to the inside. Though no especial techniques are required, forcing an entry amidst heavy smoke requires highly trained firemen fully equipped with appropriate protection devices.

o Recommended Operation

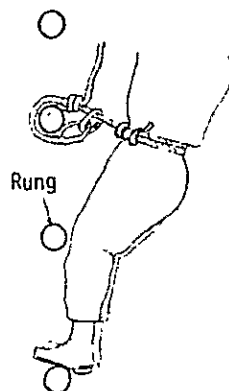
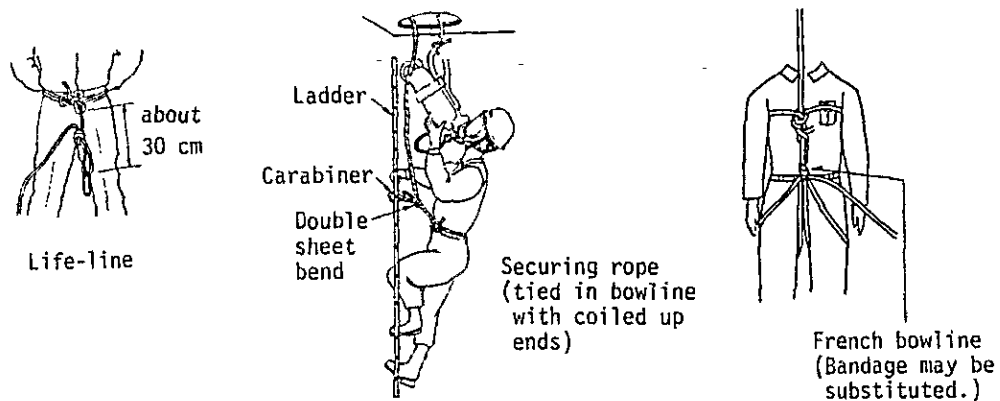
- 1) Put on or carry devices, tools and equipment suitable for attacking the specific disaster.
- 2) On the stairway, proceed step-by-step, watching the step.
- 3) In proceeding under fire, keep stooping posture just like crawling to be least subjected to dense smoke and heat.

Precautions

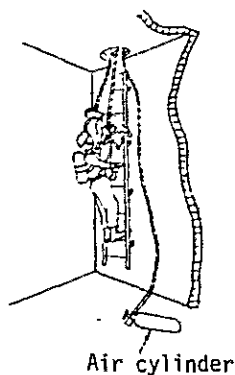
- 1) When carrying heavy or large equipment or tools, be thoroughly careful to avoid falling or stumbling by holding them securely in hand, and, if supported by one or more colleagues, make efforts to equally share the weight without overburdening any specific one.
- 2) Preplan an alternative escape route which must be used when the entrance doors are later closed, the staircase broken or other entrance route shut off.
- 3) Remember that the entrance way cannot always be expected to be an escape way.

4-5 Basement-and Tank-Access

Attacking and rescuing through narrow access way or under poisonous gases.
To secure safety of crew, give an emphasis on use of air breathing apparatus.



Method of securing footing in a case where large rungs are available.



Precautions

- 1) Affix a life-line on the body securely.
- 2) Wherever possible, prepare the operation on the ground free from fire hazard.
- 3) Agree beforehand what signs (signals) are used for instructions, command or confirmation among the attacking company.
- 4) Provide adequate means of lighting.
- 5) Take possible countermeasures against poisonous gas.
- 6) In rescue operation, select posture and roping method suitable for the condition of the fire sufferer.
- 7) Never cause to drop any fixtures, materials or other substances from the upper floor or ground.

5. Rescue Training

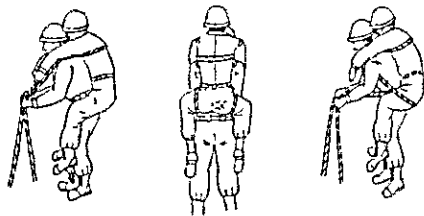
A basic rule in rescue operation is to bring out endangered persons to a safe place by the most reasonable, prompt, safe action based on the rescuer's instantaneous, but thoroughly professional judgement.

5-1 Training with Rope

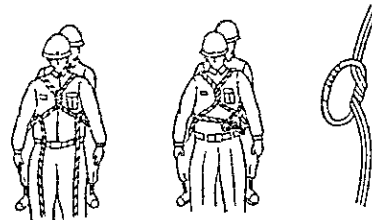
I. On-the-Back-Carrying of a Sufferer in Sitting Position

A rescue method in which a fireman descends a rope carrying a sufferer on the back, with the sufferer kept in sitting position. This method is used to rescue inhabitants who are left injured, suspended on a wall or fail to escape outside from a place in fire especially at a considerable height above ground.

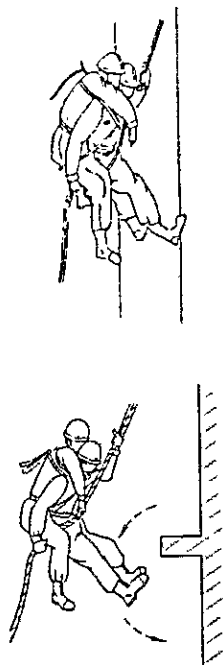
[Carrying Method]



[Rope Binding Method]



[Descending Posture]



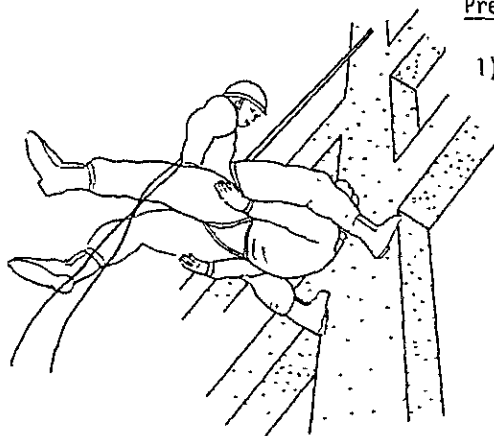
Precautions

- 1) Make sure that a descending rope is bound two times through a carabiner attached to the rescuer's waist.
- 2) Use a sound rope strong enough to carry the weight of two adults.
- 3) Carefully fix and bind the rope.
- 4) Never let the braking hand get off the rope.
- 5) In resting legs against a wall, fully extend the legs with the knees straight, resting the soles and heels fully onto the wall surface.
- 6) Descend slowly by keeping the friction surface as large as possible.
- 7) Slightly move the knot of pulljig. (Sometimes omit using it.)
- 8) In descending the rope, move carefully to minimize impact to the sufferer.

II. In-the-Front-Carrying of a Sufferer in Sitting Position

Method of rescuing a sufferer, holding him with a carabiner attached to the rescuer's waist. This method is suitable for persons inferior in physical strength.

[Descending Posture]

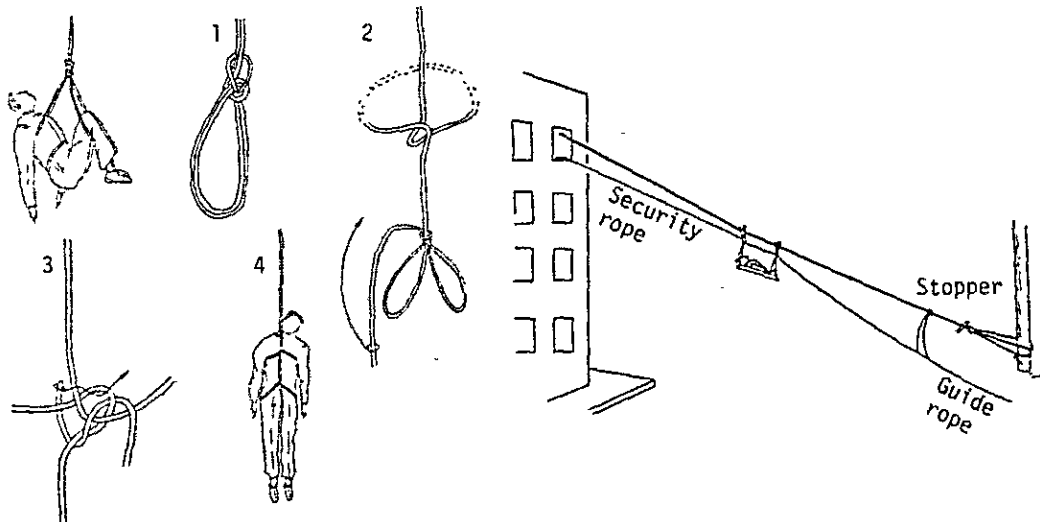


Precautions

- 1) Take care so as not to cause the rescuee to hit his head against the wall.

III. Rescue with Bandage, French Bowline, Stretcher, Etc.

[Knotting]



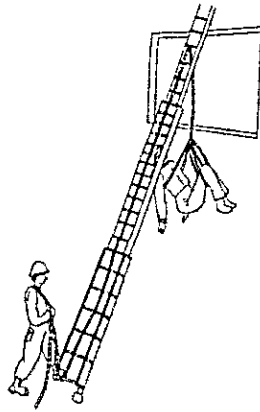
Precautions

- 1) In lowering a stretcher, appropriately brake it by adjusting a guide rope to reduce the speed to finally reach a stopper at a low speed.

5-2 Rescue with Ladder

1. Hanging-Down with Ladder

Method of rescuing a sufferer while supporting him at a rung of temporarily fixed ladder.

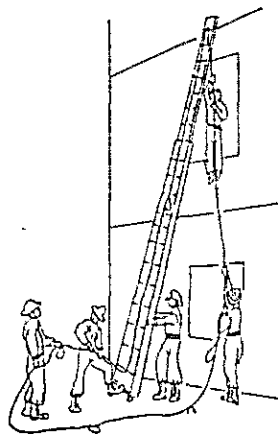
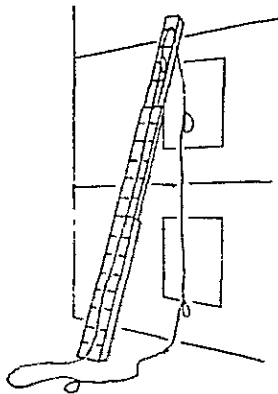


Precautions

- 1) Rigidly fix the lower end of ladder.
- 2) When the sufferer is hung on a rung, but before lowering, carefully observe his posture and stability of a ladder and roping to confirm the safety.
- 3) Carefully lower the rope to assure smooth landing.
- 4) In landing the rescued on the ground, receive and support the body by hands and carry him gently.
- 5) In training, strengthen a supporting rung with a round bar.

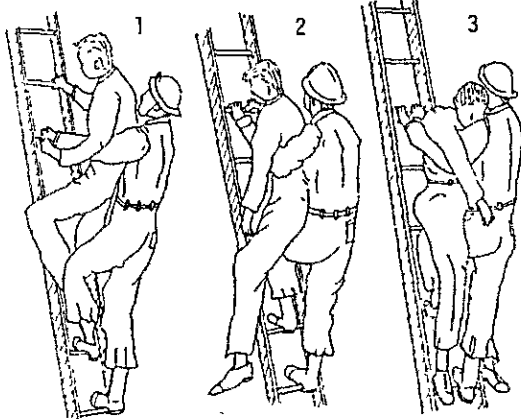
Precautions

- 1) Carefully move the securing rope, with a sufferer secured by Fuhrer hitch.
- 2) Rescue sufferers one by one.
- 3) Be careful in extending the securing rope to allow for full tightening.



II. In-the-Arms Holding Down with Ladder

Method of rescuing a sufferer, holding him in rescuer's arms by using a ladder carried on a fire truck.



- (1) As illustrated left, this method will more contribute to the safety of a sufferer in that if he inadvertently takes off his hands from the ladder or loses his consciousness, the rescuer can hold him with a knee.
- (2) When a sufferer loses his consciousness, the rescuer descends the ladder just like slipping down, while resting the body on his knee.

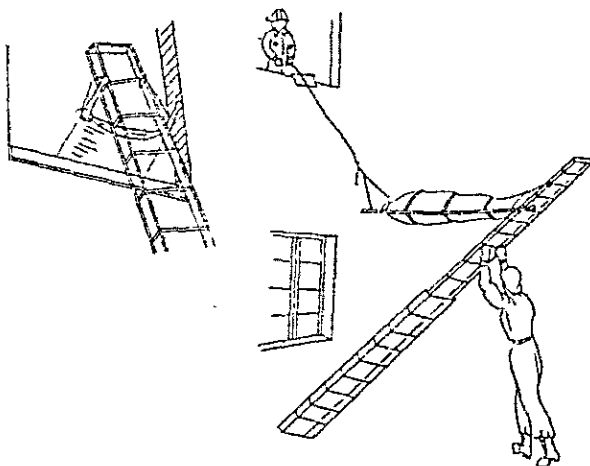
Precautions

- 1) In supporting a sufferer, the rescuer should keep on maintaining his own leg sandwiched between the sufferer's legs.
- 2) In holding a sufferer on his knee, the rescuer should slightly stoop down his waist, hugging the sufferer rather deep.

III. Lateral Roping with Ladder

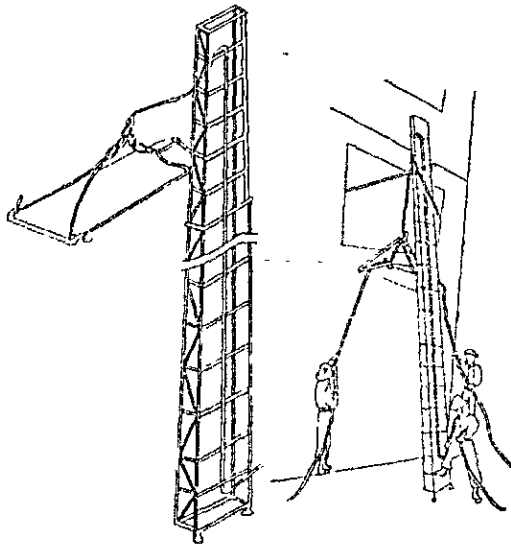
Method of rescuing a sufferer along a lateral rope in combination with a stretcher and a ladder carried on a fire truck.

The securing personnel manipulates a rope to keep the stretcher as lateral as possible.



Precautions

- 1) Firmly secure the lower end of a ladder.
- 2) Carefully manipulate the securing rope. In this connection, other supports will enable to keep the ladder steadily in place.
- 3) Exercise care to keep the stretcher slightly inclined from the head to toe.

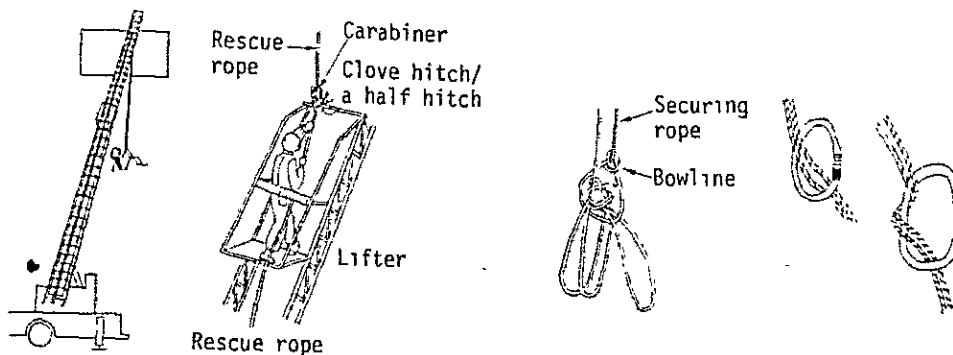


Precautions

- 1) Keep the sufferer's head slightly above the toes.
- 2) Assure complete securing to provide for possible tightening of security rope.
- 3) When detaching the top end of ladder, be careful so as not to endanger its stability.
- 4) Carefully land the stretcher on the ground, taking into account the physical conditions of the victim.
- 5) Thoroughly master skills and procedures for ladder operation.

IV. Aerial Ladder

Method of rescuing by extending a truck-mounted aerial ladder, with a support of rope taken at a side piece of the ladder where a sufferer is left at a height out of reach of a service ladder carried on a truck.



Precautions

- 1) Avoid instantaneously imposing all the weight of sufferer to the side piece.
- 2) Prior to lowering the sufferer, thoroughly check his posture and soundness of securing rope.
- 3) Carefully and smoothly manipulate the rescue rope.
- 4) Cause the rescue company to receive the rescued by hands, without landing him directly on the ground.
- 5) In lowering a sufferer, use a guide rope.
- 6) In training, apply a cloth pad onto the rung which serves as a rope support in order to protect the rope.

5-3 Descending Lifeline Apparatus

An apparatus so devised for a fire on a high-rise building that by hanging a belt, occupants can make gradual descending at a constant speed to the ground.

While the apparatus is basically intended for self-initiated escape, the inherent advantages for escaping purpose may certainly be appreciated by the fire service too and should be fully studied to assure most effective application.

Safety Rating approved by Japanese Governmental Agency

Loads	Speed Rating
25 kg to 100 kg	Not less than 16 cm/sec. Not exceeding 150 cm/sec.

Required Strength

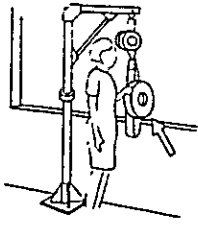
- 1) Rope, fasteners, speed regulator,
hook: 390 kg x max. number of escaping personnel
- 2) Belt: 650 kg

Cautions

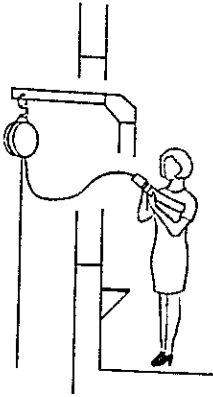
The higher the escaping point is, the more scared the escapers are; so, the apparatus should be operated with utmost care.

- 1) Firmly anchor the apparatus. (Where permanently fixed in a building, turn the arm of the apparatus outward and fix it.)
- 2) Immediately stop using it whenever any defect in any part of it or disorder in the regulator is found.
- 3) Keep either one end of the rope on the ground.
- 4) Be sure to tighten the fastener around under the arms.
- 5) Keep the descending route down to landing point free from any obstacle.
- 6) Avoid imposing weight simultaneously on the both ends of a rope.
- 7) Avoid imposing impact load.
- 8) Never rub or twist a rope.
- 9) Tighten a safety ring without fail.

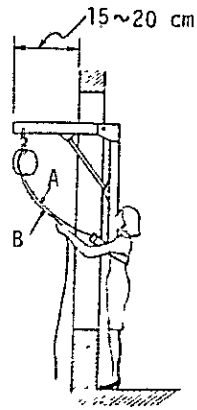
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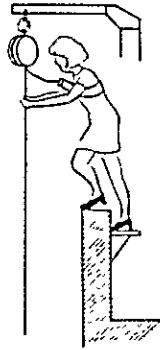
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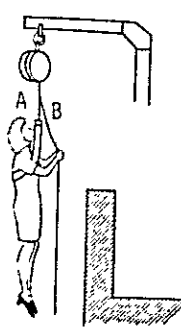
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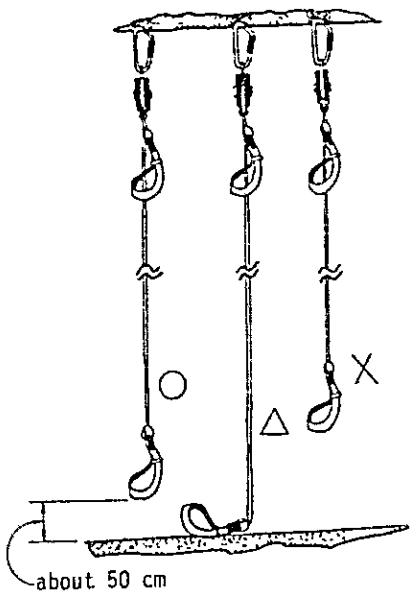
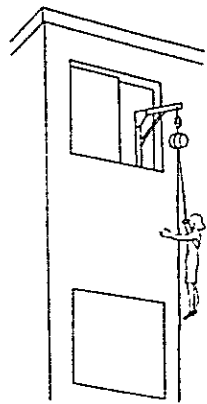
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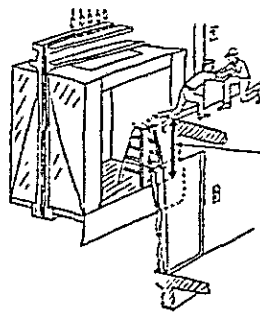
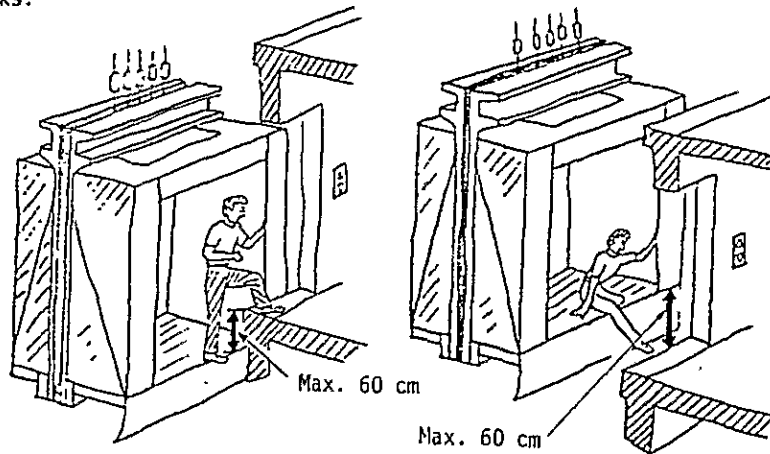


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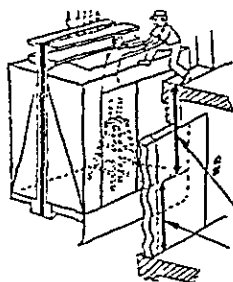
5-4 Rescue from Elevator

In rescuing occupants from an elevator, the rescue crew are required to make a close contact with the passengers to confirm conditions inside the car and, prior to the start of rescue operation, to complete all means for preventing the elevator from moving, including shutting off the power line. The crew are required to perform the operation to best suit the specific type of elevator. Don't attempt to overcome undue risks.



Assure the safety by using a step ladder, etc.

About 60 to 120 cm



Open an escape hatch on ceiling and provide a step ladder to rescue the passengers, while assuring safety.

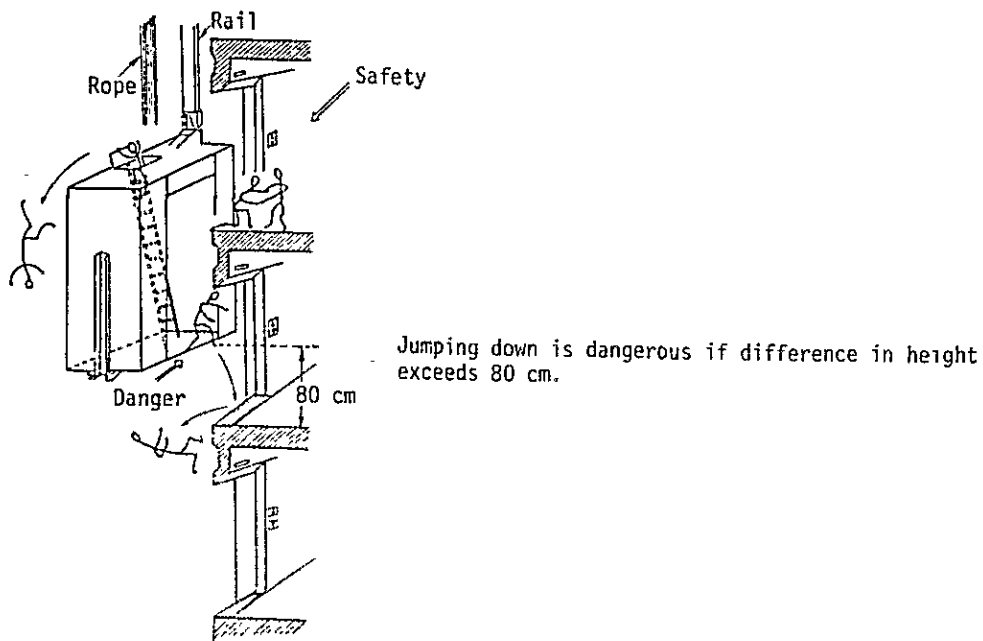
Not less than 120 cm

Not less than 60 cm

Precautions

- 1) Where an elevator car platform is lower than a landing sill, max. difference between these two levels should be taken as about 120 cm to assure safety in rescuing from the upper building floor level.
- 2) Where a platform is higher than a landing sill, max. difference should be taken as about 60 cm to prevent the passenger from falling into an opening left between the car and the floor.

[Rescue Operation]



Precautions

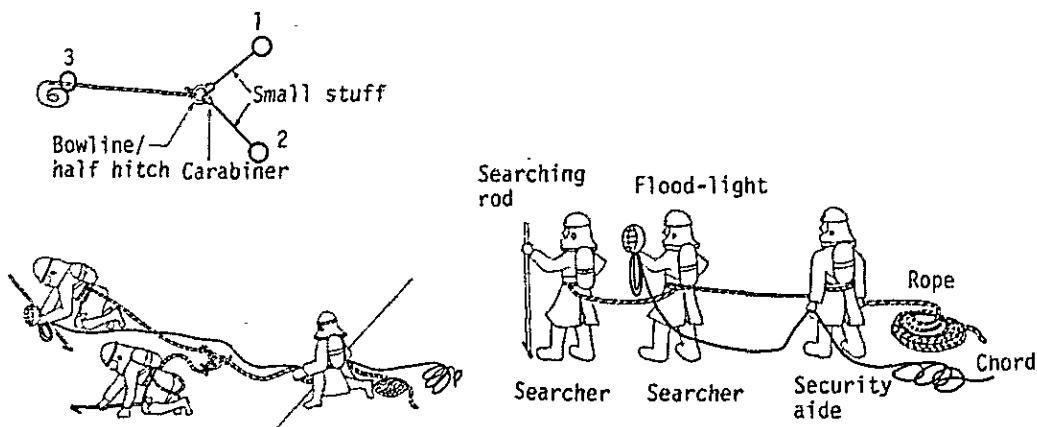
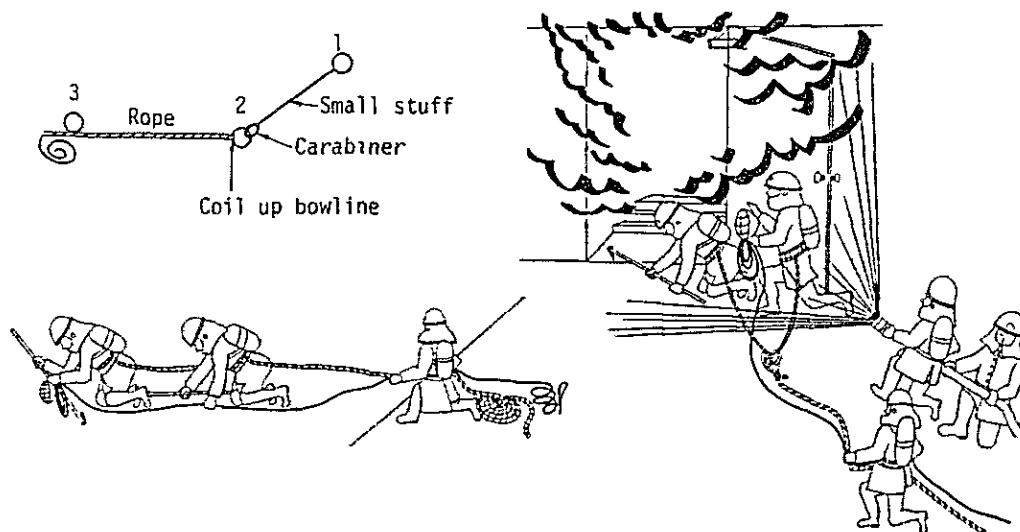
- 1) Be sure to shut off the power line.
- 2) In rescue operation, put on a life-line or safety belt to avoid falling down.
- 3) In case level difference is left between the platform and the landing floor, provide a step ladder, rope or other means to insure safest rescue operation.
- 4) In making an access to a car in which passengers are entrapped, take undangerous method upon consultation with the elevator manufacturer or agent, without recklessly breaking, cutting or moving it.
- 5) Exercise due care not to give psychological shock to the passenger.
- 6) In cutting or breaking the car, carefully select the most suitable operation method and most readily workable part of the car, giving due consideration to causing least impact, heat or other disturbance to the passengers.
- 7) Keep close contact with the personnel involved.

6. Heat and Smoke Endurance Training and Training in Labyrinth

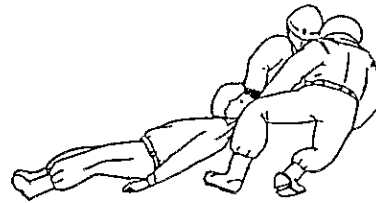
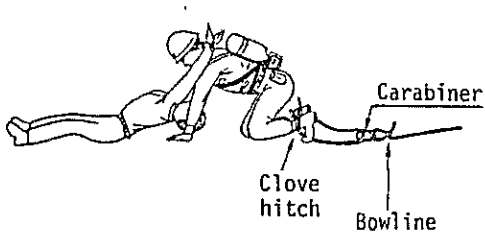
Searching is the first and the most important action that firemen must take in order to rescue the person entrapped in a fire in a safe, certain and prompt manner. It is not too much to say that success of the rescue is predominantly governed by searching.

Thus, the training for searching must be planned with due consideration for the prevailing style and interior features of the buildings in Brasilia. Correct assumption as to the top priority spots in the building that should be searched is equally important. Training must be such that it will enable trainees to learn how to use their five senses to the maximum extent under the given situation.

To conduct the searching drill efficiently but safely and without accidents, trainees should without fail be made to fully recognize the basic principles of searching, the great risk caused by hot smoke and the measures to deal with such risk. It is also important that they should be given a chance to observe in advance the interior features of the place in which the drill is to be conducted.



[Rescuing]



Precautions

Trainees should observe the following precautions:

- 1) Wear full protective outfit.
- 2) Take as low a posture as possible.
- 3) Make searching along walls.
- 4) Keep legs and arms stretched during the search.
- 5) Use a breathing aid.
- 6) Take Burdy formation as a rule.
- 7) Carry a lighting fixture.
- 8) Use back-out security rope. (Send signals by this rope.)
- 9) Proper temperature should be maintained during the drill.

	Summer	Winter
Upper part	40°C	45°C
Lower part	35°C	40°C

Signals

Signals are communicated by giving jerk on the life-line as indicated by the following examples. These life rope signals may be combined with portable radio communication, flash light signals, sound signals, etc.

Signal Examples

- 1) "Start" ----- One big jerk
- 2) "Okay" ----- Two jerks
- 3) "We've found the victim." ----- Three jerks
- 4) "Wait" ----- Four jerks
- 5) "We are backing out" "Come back" ----- Repetitive jerks

7. Smoke Endurance Drill in Stairway

In Brasilia, trainees are given smoke endurance drills in stairway without wearing breathing protectors. This type of drills is not exercised in Japan because of extreme risks which accompany such drills.

Since trainees in Brasilia must undergo this type of drills in graduation examination, the present design includes the facility for such drills. It, however, is absolutely imperative that no smoke producing substance should be used which creates toxic gas. (The kind of toxic gas varies with the substances subjected to combustion. Carbon monoxide is particularly dangerous as it can easily kill a man in 5 to 10 minutes and in 1 to 3 minutes when CO content in air reaches 0.5 % and 1.3 % respectively.) More preferably, the present method of graduation examination should be reconsidered to preclude this dangerous drill.

3-2-3 OUTDOOR FIRE TRAINING AREA

- o The basic pump and hose operation method which seems predominant in Brazil uses one 2.5 inch diam. hose line as extended with three branch lines, each comprizing two 1.5 inch diam. hoses.
- o In this proposal, the Outdoor Fire Training Area is sized in length to fit in with the basic pump and hose operation described above. Additional use of parallel two lines, each comprizing three hoses is worth recommending.
- o For water supply, a water reservoir is provided underground, while assuming that in actual fire scenes, water is frequently pumped up from a pool, pond, etc.

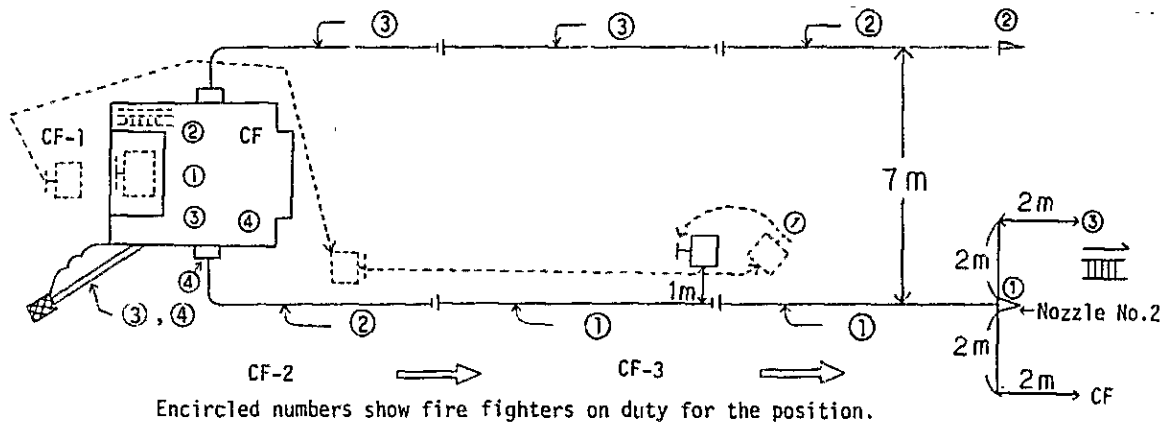
Training

- o In addition to the regular training, special training can be conducted on the Drill Tower and by ladder trucks.
- o Japanese pump and hose operation using parallel two lines, each comprizing three hoses, is shown on the next page for the study by the Brazilian authorities.
- o Remark:

In this training, due care should be taken to prevent from leaking out of oil from a vacuum pump and flowing onto the ground, because such oil will cause a trouble to the subsequent training.

THREE HOSE-TWO LINE OPERATION AND
HOSE LINE EXTENSION TO CONSIDERABLE HEIGHT
 (Typical operation plan in Japan)

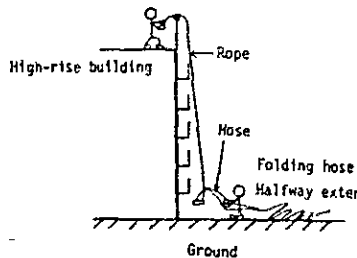
Fighting Crew Disposition & Assignment of Duties



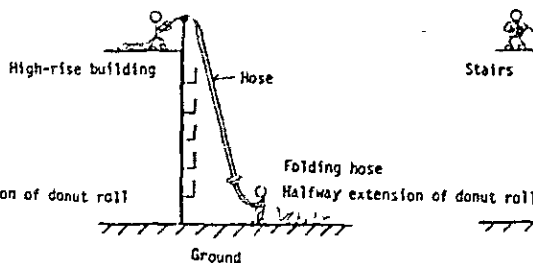
Key to Diagram

CF : Chief fighters Supervising each fighter	---> Route of move	Fire truck	Hose coupling
①: First fighter (water shooting)	— — Connection	Suction hose	Fire fighter
②: Second fighter (water shooting and message)	Hose cart	Nozzle	
③: Third fighter (breaking-up and message)	Ladder	Folding hose	
④: Fourth fighter (Engine)	Pike pole		

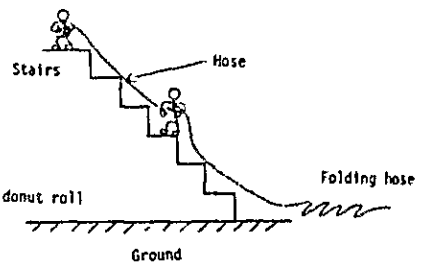
Hose Line Extension to Considerable Height



Pulling up and down of hose by using rope



Pulling up and down of hose by using hose



Hose line stretching on stairway

3-2-4 DIVING POOL

A diver wearing an aqualung has to swallow saliva for every 3 m in depth in order to prevent his eardrums from being ruptured. Then, assuming two times of swallowing, the diving depth is taken as 6 m, with additional 1 m taken to permit his sedentary operation training at the bottom of pool. Further 1 m in depth is added to simulate diving from a boat, thus a pool with a total depth of 8 m is proposed.

Training

The training method now adopted in Brasilia's rescue service is considered sufficient for the purpose. In using the pool, knotted ropes or rope ladders should be sunk in the pool to provide for an emergency case.

3-2-5 OIL PAN

Generally, typical extinguishing agents for an oil fire may be classified into three types: power agents, foaming agents and sprayed water. For the purpose of the present design, it is assumed that the fundamental techniques for extinguishing operation can be practiced on the existing training field.

This oil pan is provided for trainees to master skills in injecting extinguishing agents into oil fire at a considerable height from the ground and practical knowledge on the influence of water shooting to an elevated pan upon an agent's expansion rate.

Training

- I. Extinguishing agent-injection training with the aid of a gooseneck
- II. Extinguishing agent-injection training with the aid of an aerial ladder truck, an elevating platform truck or similar movable apparatus
- III. Extinguishing agent-injection training with the aid of water stream from the ground
- IV. Water shooting training for cooling an oil tank

3-2-6 GYMNASIUM

No especial comment will be required. Steel rings mounted on columns are for use in rope-training. These will serve as a substitute for the roping devices of the Drill Towers when they cannot be used for any reason.

3-2-7 CIRCUIT TRAINING FIELD

Generally the circuit training events are classified into the following according to the types of events and instruments involved.

- a. a group of events through which it is intended to develop comprehensive bodily strength
- b. a group of events through which it is intended to build up each part (especially muscular strength) of a body.

Alternatively, these events are classified into the following:

- a. those of which achievement is evaluated by the number of exercises of an event
- b. those of which achievement is evaluated by the time period in which an event has been exercised.

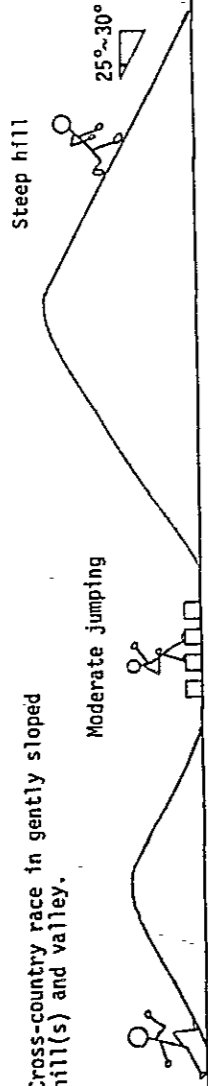
The events here proposed are selected from those which can be evaluated by the time factor with a view to develop comprehensive bodily strength (mainly sustaining strength), while arranging to give those selected some inspiring elements.

Details of training such as period of pause between consecutive events and magnitudes of bodily burdens should preferably be determined to suit Brazilian trainees. In this regard, it may be advisable that various types of events be appropriately combined to form three levels of courses (primary, intermediate and advanced) to assure more conformable, effective training for respective groups.

Circuit Training Field (1200 m in Linear Length)

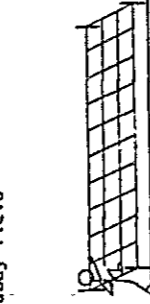
① 400 m track : running

② Cross-country race in gently sloped hill(s) and valley.



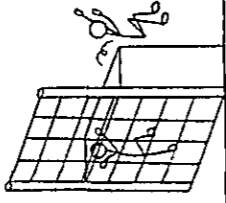
Preparatory exercise (Achilles' tendons and ankles)

③ Passing across paddy field



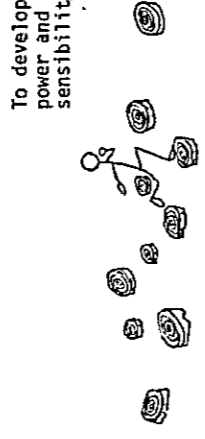
To develop thighs, dorsal muscle and tractive force. Ropes to be tightened slightly below the knee level.

④ Rope climbing



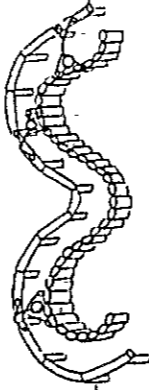
To develop grasping power, abdominal muscle and brachia.

⑤ Stump-jumping



To develop jumping power and balancing sensibility

⑥ Crab-like crossing



To develop dorsal muscle, abdominal muscle, thighs and brachia.

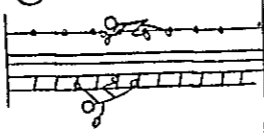
⑦ Carrying a weight



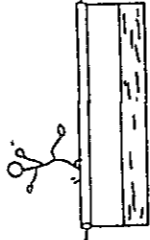
To develop arm, lumbar and dorsal muscles

⑧ Rope ladder-climbing up

Knotted rope-climbing down



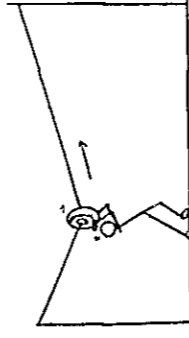
⑨ Log-crossing



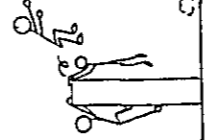
To develop balancing sensibility

⑩ Stump-throwing

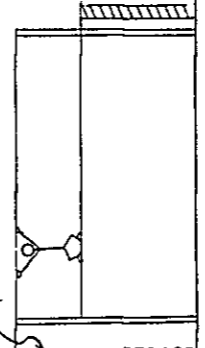
To develop instantaneous force



⑪ Climbing over high wall

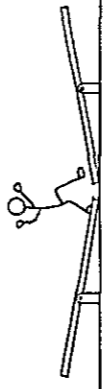


⑬ Crab crossing



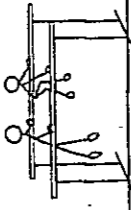
⑭ Seesaw-walking

To develop balancing sensibility



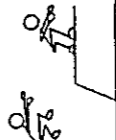
⑮ Parallel bar-crossing

To develop arm and abdominal muscles



⑯ Jumping over a canal

To develop instantaneous force

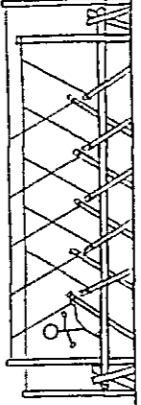


⑰ Passing through tires



⑰ Forcing the way through obstacles

To develop leg muscles, balancing sensibility, etc.

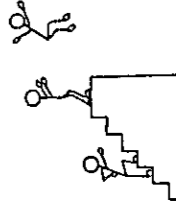


⑲ Curved ladder-crossing

To develop grasping power

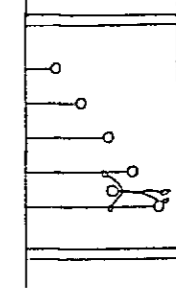


⑳ Stairs-walking and jumping down



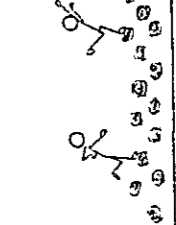
To develop balancing sensibility

㉑ Rope-to-rope crossing

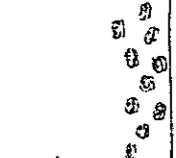


To develop abdominal and arm muscles

㉒ Physical jerks



㉓ Single leg-jumping cross small stumps



㉔ Post-training calisthenics

