CHAPTER 1. GENERAL

1-1. PURPOSE AND SCOPE OF ARCHITECTURAL ANALYSIS.

A. Purpose is to determine the acceptability of the physical improvements, to provide architectural conclusions essential to underwriting determinations to minimize mortgage risk, and to improve housing. It is the responsibility of the Production Branch Chief and/or Team Leader to determine that the architectural analysis is thorough and identifies weaknesses and deficiencies in the proposed design or construction.

B. Scope includes buildings, mechanical and construction elements, and attachments. It includes garages, parking, the adaptation of buildings to the site, land improvements (water supply, sanitary sewage disposal systems, gas main, heating tunnels), availability of services and all other elements of design or construction.

1-2. DATA. To assure fast and accurate architectural analysis, architectural and engineering data must be gathered and maintained.

A. Responsibility. The Production Branch Chief and/or Team Leader must assure that information is pertinent, accurate, current, and accessible.

B. Collection. Collect data for each area in which there are multifamily operations. Data must be so catalogued, identified, and stored that the particular information needed can be retrieved quickly. File data using the 16 basic divisions of the Construction Specification Institute(s) Master Format (See Appendix 1). The architectural data bank should include the following:

1. Material distributed by Headquarters, examples: Minimum Property Standards, Materials Releases, Use of Materials Bulletins, applicable handbooks, etc., in the HUD issuances system.


3. ASTM, ANSI and other Standards in Building Codes.

4. Commercial or product standards prepared by the Department of Commerce.

5. Local codes


8. Soil information classified as to type and bearing capability for areas in jurisdiction.

9. Heating and cooling design factors. Include economic analysis of various fuels and utilities so that information can be used in making a valid comparative analysis in the design stage of the proposed type of equipment, type of fuel or energy, and the method of purchase.

10. Information affecting structural considerations.

11. Information affecting aesthetic design considerations.

12. Information affecting durability considerations.

13. Information affecting fire resistance, flame spread and smoke generation of various materials and assemblies.


15. Information affecting local and national environmental policies.

16. Maps showing the size, location, and continuity of streets, highways, and utilities.

C. Records. Each Design Representative and Inspector should keep records on materials, installations, contractors, construction superintendents, and architects and engineers. Pertinent information should be concisely entered in the Data Bank.

D. Sources. Sources of data bank include the following:

1. Regional or City planning commissions and building departments.

2. Tax assessor's office. (Before communicating with the tax assessor's office, the Production Branch Chief must be notified.

3. Local health authority.

4. HUD Headquarters.

5. Building material manufacturers and distributors.

6. Professional and trade associates.

7. Reference books and other publications.

8. Other projects having similar features.

9. HUD personnel experience, training, and records.

1-3. PROJECT ACCEPTABILITY.

A. General. Each project must satisfy the desires and demands of
the rental market. The physical characteristics of projects vary and depend on such matters as rentals, size of families and comparable projects. The project must also comply with the HUD approved project design program upon which the appraiser based rents, expenses and project value.

B. Design. Housing rental projects must provide a continuing market appeal. Amenities, space and aesthetics must be competitive with other properties catering to the same market segment. The project must be visually pleasing, well suited to the needs of the occupants, and of good design reflecting the architectural standards of the neighborhood and of the community in which it is situated. Site, building and dwelling unit designs must be practical and use space effectively.

C. Cost Concerns. The design should incorporate proven construction cost-saving techniques, durable cost-effective materials suitable for the intended use, energy saving features, and cost-efficient mechanical systems. Minimizing initial construction costs and continuing operation and maintenance costs are essential to reducing mortgage risk.

E. Requirements. To be acceptable, rental projects must:

1. Comply with established HUD standards and requirements.
2. Comply with applicable laws, ordinances and deed restrictions.
3. Comply with good planning and construction practice.
4. Provide accommodations assuring continued livability and marketability.
5. Provide facilities, services and equipment appropriate for use of the intended occupants.
6. Have character and visual appeal.
7. Be designed and constructed to have continuing appeal, economy of maintenance, sustained acceptance, and construction costs which fall within the established budget.
Standards for Housing (MPS). (See Reference 15 of the Foreword)

a. Local Building codes or nationally recognized building codes accepted or designated by the Field Office are part of the MPS.

b. The Local Office enforces and interprets accepted local building codes for HUD.

c. The Local Office does not enforce local building codes for the local Government.


B. Handicapped Accessibility.

1. Uniform Federal Accessibility Standards (UFAS) apply when compliance with Section 504 or specific program criteria is required.

2. The Fair Housing Act (the Act) directs the Secretary of HUD to provide technical assistance to States, local governments, and other persons in implementing the accessibility requirements of the Act. The Act requires that all residential buildings which have four or more units and which are built for first occupancy after March 13, 1991, be designed and constructed to have at least one building entrance on an accessible route, unless it is impracticable to do so because of terrain or unusual site characteristics. Such dwellings must provide for accessibility in all common and public areas. In addition, certain accessibility requirements must be included in all of the dwelling units in buildings with elevators, and in all of the ground floor dwelling units in buildings without elevators (referred to in the Act as "covered multifamily dwellings"). As a part of processing and commitment, HUD will review construction documents for covered multifamily dwellings pursuant to HUD Handbook 4910.1, and the Fair Housing Accessibility Guidelines (the Guidelines). The Guidelines provide minimum accessibility standards. The Guidelines are found in the Federal Register (FR), Vol. 56, No. 44, Wednesday, March 6, 1991. Additional material may be found in the Fair Housing Act Design Manual.

C. Commercial Facilities. The term "Commercial" is applied to any space or facility permitted and acceptable for "Non-residential Use" from which income is derived or anticipated. However, facilities such as swimming pools and garages to be used solely by occupants are not considered commercial even though fees may be collected.
1. The nature and extent of non-residential use are important for underwriting determinations by the State or Area Office. Basis of determinations are suitability, market demand, economic feasibility in the utilization of space, and Regulatory or Statutory limitations.

2. The aggregate commercial floor area may not exceed 10 percent of the gross building floor area and includes corridors, stairs, elevators, lobbies, and other service areas for commercial use, but excludes laundry space, project storage space, and interior tenant parking.

3. Design of commercial facilities must be harmonious with the project and conform to standards of design and construction, and local zoning and building codes.

4. Do not include fixtures, equipment, furnishing or finish for commercial spaces in the mortgage unless customarily provided in competitive projects.

D. Day Care Facilities. Space for day care facilities must be adequate, appropriate to the market need, and conform to local and State requirements. In processing, it is considered as "Commercial" space except that the area of space for day care facilities may be provided over and above the maximum area allowed for commercial uses as stated in paragraph 1-4C above.

E. Works of Art. The Federal Government encourages the fine arts in connection with Federal projects with emphasis on the work of living American artists. HUD concurs in this policy. works of art judiciously collected, executed, and placed to compliment the design of the structure or grounds can increase occupant pleasure and stimulate tenant pride in the project.

1. Works of art include such objects as can be considered a part of the real estate. Works of art consist of sculpture and related construction or appurtenances, decorative mosaics and murals so located that they can be seen by the project occupants.

2. The selection of the artist or sculptor is the responsibility of the project architect or sponsor. HUD will not dictate matters of art, but will review proposals involving works of art and reserve the right to reject any proposal which does not conform to the criteria.
3. Works of art may be attached to, or be integral with, the structure, or they may be free standing. They must be materials suitable for the purpose and location and afford reasonable resistance to exposure, vandalism, and theft.

4. Works of art must compliment design of the structures or grounds. The concept, subject matter, or content should be appropriate to the residential use and likely to appeal to the project occupants. Works of art must be deemed sufficiently beneficial to warrant the anticipated cost and justify their presence if they serve to enrich the project, relieve monotony, and contribute to desirable residential environment.

5. The aggregate cost of works of art in any project will not exceed 1 percent of the estimated cost of the structure, unless approved by Headquarters.

F. Carpet and Cushion. Wall-to-wall carpet and cushion may be included as part of the mortgage security. Carpet and cushion selected by the architect must comply with current applicable Use of Materials Bulletins.

1. Carpet is acceptable in all public spaces except laundry rooms, storage rooms, boiler rooms, and similar service areas.

2. Carpet is acceptable in living units except in kitchens and bathrooms.

G. Blinds and Draperies. Operable draperies, track and hardware, venetian blinds or shades are acceptable as part of the mortgage security when:

1. Appropriate to the property, considering types of windows, rental range, and occupants.

2. Primary uses are to control the intensity of natural light and to provide privacy.

3. The quality and type of materials, appearance, manufacture, manner of fastening and operations are suitable and sufficiently durable to avoid excessive replacement or maintenance expense.

H. Air Conditioning. Where air conditioning is required to provide year-around indoor comfort, assure continued marketability, and prevent premature obsolescence, projects should be air conditioned. In projects acceptable without air conditioning, assure air movement for summer comfort by adequate mechanical or cross ventilation.

I. Eligible Equipment.

1. Equipment included as part of the mortgage security
must be acknowledged by the mortgagor and mortgagee to be part of the real estate and:

a. Be essential for successful operation and market acceptance.

b. Have qualities in design, construction, materials and finishes which are not subject to early deterioration or obsolescence.

c. Be appropriate to the location, the design of the building, and the anticipated occupants.

2. Equipment needed for operation and market acceptance, such as ranges and refrigerators, should be included. The equipment should be relatively long-lived.

   a. Replacement is paid for from a reserve for replacements account that is funded from project income.

   b. Many items formerly considered chattels by custom and legal precedent have status as part of the real estate.

   c. Customs change and if doubts arise as to legal precedent concerning whether an item is chattel or real estate, essential and required items may be covered by a security agreement or chattel mortgage as well as being covered by the mortgage on the real estate if deemed necessary by

   c. Customs change and if doubts arise as to legal precedent the mortgagee and its attorneys.

3. Equipment that may not be included:

   a. Supply items, utensils, tools, vehicles, portable equipment, furniture, furnishings, or accessories normally provided by tenants or management.

   b. Built-in or attached furniture.

J. Water and Sewerage. Public water and sewerage facilities are generally required for multifamily projects. If the extension of public facilities is infeasible, construct a water and/or sewerage system as part of the project or provide services from existing offsite privately owned systems with continuing service at reasonable rates.

1. Water and/or sewerage facilities must:

   a. Provide a sufficient supply of water with adequate pressure, and satisfactory bacterial
and chemical qualities.

b. Provide a sewerage system with adequate collection, treatment and final disposal of domestic waste which requires minimum maintenance and will not endanger the public health.

2. Duplicate water and sewerage systems are not acceptable except where it is determined that the construction of a single system will be infeasible due to the topography of the site.

3. Individual septic systems or sewerage systems designed to dispose of effluent by subsurface soil absorption methods are generally not suited for multifamily construction because of maintenance problems. Satisfactory operation can be expected only under unusually favorable soil conditions. When these methods of sewerage disposal are proposed an environmental (sanitary) engineer, with no other interest in the project, shall be hired by the mortgagor to investigate soil and site conditions and make recommendations. A copy of the report must be available to the design architect and submitted to HUD.

4. Privately Owned Offsite Water and/or Sewerage Systems.

Page 1-9 12/95

4460.1 REV-2

(1-4)  a. Evidences of acceptable control are:

1) Certificate of Convenience and Necessity from the State Utility Regulatory Commission.

2) Franchise from local unit of Government

3) Trust Deed

4) Third Party Beneficiary Agreement

5) An incorporated nonprofit owners association.

b. If control of continuity of service and the equitableness of the service rate schedule is other than 1) above, all legal documents and other appropriate exhibits must be acceptable to the Field Office Counsel.

5. The HUD environmental (sanitary) engineer, if available, advises and makes recommendations on water supply, sewerage, and sanitation health matters.
6. All community systems and privately owned systems must meet local health authority or EPA MCL standards.

K. High Pressure Gas and Liquid Petroleum Transportation Pipelines
   All parts of a residential structure must be at least 10 feet from the outer boundary of the pipeline easement for pipeline maintenance access. (Notice H94-87, Surveyor Identification of Gas and Hazardous Liquids Pipelines Regulated by 49 CFR Parts 192 and 195, and A&E Collection of Pipeline Operator Compliance Certifications - Reference 3 of the Foreword)

L. Reports. The Design Representative must assure that the environmental and/or valuation required reports and requirements, such as seismic, flooding (E011988), underground storage tanks etc., contained in the SAMA/feasibility letter are properly evaluated and are adhered to in the project design.

12/95

Page 1-10

4460.1 REV-2

(1-4) M. Subsurface Explorations. Before, foundation design and application for conditional commitment, reliable information i.e., soils reports, test boring logs, test pit data, soil bearing values, geotechnical study etc., must be available to the architect and to HUD upon request.

1. The Architect must advise the owner of the scope and type of soils information and/or subsurface investigation required for structural design.

2. The Owner must provide the services of a soils engineer or other consultant for determining subsurface conditions. These services shall be provided in accordance with the Owner-Architect Agreement.

3. The Design Representative will assure that the architect has comprehensive, well-documented soils information and that project foundation design follows the report recommendations. When necessary, the Design Representative may request engineering help in reviewing soil reports and related designs.

4. Minimum soils reports requirements.
   a. Soils must be identified and described by the nomenclature of the Unified Soils Classification System ASTM D2487 and/or Description of Soils, Visual Manual Procedures, ASTM D2488.
   b. Borings must be in or adjacent to the proposed foundation area.
   c. At least one boring must be made for every 2500 sq. ft. of foundation area. For buildings supported on piling, one boring must be made
for every 1600 sq. ft of foundation area.

d. Borings must be at least to the bottom of proposed footings and deep enough to locate bearing strata that will support the proposed structure. When rock is encountered, depth of drilling into rock shall be at least 5 feet or enough to establish rock quality regarding voids, fissures and strength, or whether it is a boulder.

e. Borings and sizes and types of samples for standard tests must be according to ASTM D1586 and D1587. Alternate methods must be justified by soils engineer.

f. When ground water conditions influence the building design, observation of ground water levels must be recorded at the time of boring and at least 48 hours later.

5. Load tests must be required when the allowable safe load on the soil is in doubt. A structural engineer must supervise the test and certify the results.

6. Additional information must be required when unusual soil conditions may effect foundation design:

a. Presence of alkali or other deleterious materials in quantities harmful to concrete, steel or masonry.

b. History or evidence of seismic activity, subsidence, or earth slides and rock movement.

c. Presence of stray electrical currents harmful to foundations.

d. History of any type of problem in project area.

N. Noise Abatement and Control. It is the responsibility of the Design Representative in collaboration with the Multifamily Appraiser to identify existing and potential sources of noise which represent a threat to the serenity and quality of life in, and the economic soundness of, HUD assisted multifamily housing projects.

1. The Design Representative will recommend to the Production Branch Chief through the Team Leader appropriate means of separating uncontrollable noise sources from residential areas.
External and Interior noise exposure standards, as outlined in Reference (2) and Reference (3) of the Foreword, should be complied with.

Lead-Based Paint (LBP) Hazard Elimination.

1. General. Lead, a known health hazard to humans, was a major ingredient in many types of paints prior to 1950. In the early 1950's, other pigment materials became more popular, but lead compounds were still used in some pigments and in drying agents until 1978, when the use of lead compounds in the manufacture of paints was prohibited by Federal Statutes.

2. Applicability.
   a. HUD regulations, 24 CFR 200.820, establish procedures to eliminate, as far as practicable, the immediate hazard of LBP poisoning at the time of issuance of mortgage insurance commitment for an existing property pursuant to Section 223(f) or the substantial rehabilitation of a property.
   b. The requirements apply to Section 207 (including applications under Section 207 pursuant to Section 223(f), 213, 220, 221, or 234, including applications under any of these sections pursuant to Section 223(a) (7) and to any handicapped project units housing children under 7 years of age.
   c. The requirements do not apply to Sections 231, 232, 241, and 242, to projects for the elderly or handicapped (except as noted above), to 0 bedroom units or to new construction.

3. Definitions.
   a. Lead-Based Paint Hazard. A lead content of 1.0 milligrams or higher per square centimeter of painted surface.
   b. Applicable Surface. All intact and nonintact interior and exterior painted surfaces of a residential structure.
   c. Chewable Surface. All protruding painted surfaces up to 5-feet from the floor or ground, which are readily accessible to children under 7 years of age, (e.g., corners, window sills and frames, doors and frames, and other protruding woodwork).
d. Defective Paint Surface. Paint on applicable surface that is cracking, scaling, chipping, peeling or loose.

4. Procedures.

a. Pre-1978 projects shall have a random sample of dwelling units, common areas and exterior surfaces tested for lead-based paint. The sponsor will be required to have the project tested and to provide a certified report with the application of mortgage insurance. If LBP is found, treatment of identified chewable surfaces must be required.

b. Pre-1978 projects in addition shall be jointly inspected by Local Office architectural staff and the sponsor's architect for defective paint surfaces before issuance of a commitment. Where defective paint surfaces are found, treatment/abatement of the entire surface will be made a repair condition for an existing structure to be insured pursuant to Section 223(f) or included in the work write-up and made part of the contract documents for substantial rehabilitation.

c. Local Office architectural staff must assure all commitment conditions or contract requirements, including the required abatement procedures, are met as part of the normal inspection process. Abatement must be accomplished prior to final endorsement in all cases.

5. Testing.

a. Tests shall be performed by the State, local health agency, housing agency, or by an inspector or testing laboratory licensed by the State or local health or housing agency.

b. Two basic methods can be used to detect LBP.

1) The first is the use of a portable XRF detector. This instrument X-rays the paint on the surface, causing lead in
the paint, if present, to emit a characteristic frequency of radiation, the intensity of which is measured by the detector and related to the amount of lead in the paint.

2) The second method of detection is laboratory analysis of a sample of the paint, using recognized, highly sophisticated, techniques such as Atomic Absorption Spectrometry (AAS) and Inductively Coupled Plasma - Atomic Emission Spectrometry (ICP-AES). This method of detection has to be approved by the Commissioner.

NOTE: Testing laboratories may be taken from current accreditation lists for inorganic analysis of the American Industrial Hygiene Association (AIHA) and the American Association of Laboratory Accreditation (AALA). In addition, contractors in the USEPA Contract Laboratory Program (CLP) who currently hold contracts in the area of inorganic analysis are included.

c. Chewable and defective paint surfaces in ten randomly selected units shall be tested in projects with 20 or more units. In addition, a sample of chewable and defective surfaces in nondwelling facilities commonly used by children under 7 years of age and exterior applicable surfaces must be tested.

d. Any unit occupied by a child of 7 years of age or younger that has been identified with an elevated blood level must be tested.

e. A project may be considered free of LBP if none of the tests are positive. However, if LBP is found in any unit or common area or exterior surface, all such surfaces must be tested.

6. Treatment/Abatement.

a. Treatment and abatement must be removal or covering of defective paint surfaces. Washing or repainting does not constitute adequate treatment.

b. Removal may be by scraping, heat (infrared or coil type heat guns) or chemicals. Machine sanding or burning is not permitted.
c. Covering may be by adding a layer of wallboard, wood paneling, a fiberglass cloth barrier or permanently attached (non strip) wallpaper. Trim may be treated by covering or replacing.

P. Other Tests. Other exploration or test may be required for environmentally hazardous materials such as asbestos, radon, PCB, gasoline, methane, etc, if:

1. History indicates possible problems in project area.
2. Previous usage of the site indicates possible contamination.
3. There is evidence of possible contamination or presence of hazardous material.

1-5. REQUIRED ARCHITECTURAL SERVICES. The services of a licensed professional are required for elevator and walkup projects, projects of 20 or more living units, and smaller projects of complex design or construction. Projects which follow home mortgage procedures may be exempt at the discretion of the Local Office. (Exemption shall be justified in writing in the Local Office and Washington Docket.)

A. Architects, Engineers or Designers. Persons providing required design and/or construction services must be professionally licensed to render services in the design of buildings by the State in which the project is to be constructed (or site erected).

B. Owner-Architect Agreement. On projects requiring licensed professional service, an agreement between the architect and the owner for architectural services will be executed.

1. The agreement shall be submitted as soon as the appropriate form has been executed. If an agreement is not reached during SAMA stage, the owner shall submit the agreement with the application for Conditional Commitment, or Firm Commitment if the processing stages are combined.

a. The executed agreement shall be AIA Document B 181. Standard Form of Agreement Between Owner and Architect for Housing Services. It shall include the HUD Amendment (Appendix 2).

1) The scope of services shall provide all architectural, structural, mechanical, electrical, civil, landscape, and consulting services necessary to prepare drawings,
specifications and other documents setting forth in detail the requirements for construction of the project. The scope of services shall also provide for administration of the construction contract.

2) The scope of services shall designate the responsibility for the services to be provided, whether by the Architect, Owner, or others.

2. There may be separate agreements for design and construction services if the same architect is not employed. When there is a separate agreement for administration of the construction contract, it must be submitted with the application for firm commitment. Where separate agreements are made, those sections not applicable shall be deleted.

3. Architect with an identity of interest with the owner or general contractor cannot administer the construction contract. An identity of interest is defined in the HUD Amendment (Appendix 2).

Modification of Owner-Architect Agreement. The Document may be changed to reflect the actual agreement between owner and architect for the specific project.

1. Generally modifications can be made by striking out inapplicable provisions and inserting additional provisions in Article 12. Also, adding directly to a specific provision is acceptable.

2. Changes shall not delete any service, either by the architect or owner necessary to the project though the responsibility for a required service may be transferred.

a. The document shall provide a clear and definite statement of how responsibility for providing any required service is to be divided between architect, owner, and others.

b. Required services may not be sublet or delegated to anyone not acceptable to HUD.

3. The basis of compensation (architect's fee) shall be a fixed fee for the services provided by the architect as stated in the Agreement. No other method of stating compensation is acceptable. The amount of compensation for design services and for construction services shall be stated.
4. Where the architect's basis fee exceeds that which may be paid from mortgage proceeds or where the owner-architect contract provides for reimbursables, the person/entity responsible for such extra fees must be identified at the bottom of the HUD Amendment (Appendix 2).

5. Architects are not authorized to request added monies for reimbursable expenses and additional services on Section 202/811 projects, beyond the compensation provided for basic services.

   a. The scope of architectural services required by HUD are described in paragraphs 1.1 through 2.5.15 of the Owner-Architect Agreement, AIA Document B-181, with the compensation (architect's fee) for these basic services stated in paragraph 11.2.1 as a fixed fee.

12/95 Page 1-18 4460.1 REV-2
(1-5) dollar amount. As the Borrower's only source of funds is the project capital advance proceeds which cover only the basic services, any reimbursable item or additional services necessary for a particular project must be identified in Article 12 of the Agreement and compensation included in the architect's fee for basic services.

   b. All Owner-Architect Agreements, AIA Document B-181, for Section 202/811 projects shall be revised by deleting paragraphs 10.2.1 and 10.3.1.

6. HUD shall not be incorporated into any specific provision of the Agreement. The required inclusion of the HUD Amendment in Article 12 is sufficient to incorporate HUD requirements. No modification of the HUD Amendment is permitted.

7. The Design Representative shall review the agreement for compliance with these instructions.

8. Aid from Local Office Counsel may be sought on legal questions, particularly concerning the effect of the State and local law on the terms of the Agreement. Questions on modification or use of the Document shall be referred to Headquarters, Multifamily Technical Support Division, Architectural and Cost Branch.

D. Architectural Considerations in Industrialized Housing. Architectural and engineering services are involved in the development of industrialized housing. The fees for such services are part of the cost of each manufactured unit. The Local Office must determine the acceptability of such services.
by examining the drawings and specifications.

1. These exhibits shall equal in quality the typical construction documents prepared by architects engaged in designing the type of housing proposed.

2. Additional professional services may be required to provide a complete set of construction documents. The additional amount of professional services required must be determined by the field office for each project based on how much of

the total is provided by the housing manufacturer. Usually the architect will integrate the manufacturer's drawings into his set of drawings and specifications, adapting them to the particular project.

3. It is possible that the manufacturer (packager) will provide complete professional design services. If his/her services meet in all respects the quality required, the construction documents shall be accepted.

4. Owner-Architect Agreement, AIA Document B-181, shall be required only to cover the services provided by the Architect. No Owner-Architect Agreement is required for professional services provided within or by the housing manufacturer.

5. In all cases an independent Architect with no identity of interest shall provide general administration of the construction contract.

E. Evaluation and Selection of Architect. The Architect must be one in whom the owner, mortgagee and HUD have confidence.

1. Recommendation for acceptance or rejection is submitted to the Director, Multifamily Housing.

2. If the architect is unacceptable, the Director, Multifamily Housing, may recommend that the sponsor select another professional. Failure to engage an architect acceptable to HUD is basis for rejection of the project.

1-6. APPEALS. When technical determinations are considered unjustified, a review of the case by the Field Office Director, Multifamily Housing, may be requested. If agreement cannot be reached, the Field Office will send the appeal to Headquarters for resolution.